Proposed Residential Development

Cross Road | Deal

GLADMAN DEVELOPMENTS LTD

Transport Assessment

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CROFT

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Contents

Contents

1 INTRODUCTION

1.1 Preamble

1.1.1 Croft have been instructed by Gladman Developments Ltd to advise on the traffic and transportation issues relating to a proposed residential development on land to the east of Cross Road in Deal, Kent.

1.1.2 The report will form supplementary information to assist in the determination of a forthcoming outline planning application on the site for up to 100 residential dwellings.

1.1.3 A Travel Plan Framework has also been prepared to ensure that travel to and from the site by sustainable modes is maximised.

1.2 Planning History

1.2.1 The site forms part of wider development proposals which have been the subject of a recent outline planning application (App Ref: DOV/17/00505) for up to 235 dwellings with landscaping, appearance, layout and scale to be reserved.

1.2.2 The application was subsequently refused for a number of reasons including the following in relation to means of access:

'The application, which seeks approval for the means of access, has been accompanied by an insufficient level of information to demonstrate that:

(i) Opportunities have been taken to facilitate access to/from the site by sustainable transport modes including the provision of public footpath connections;

(ii) The public highway network has the capacity to accommodate the proposed increase in road traffic or that the impact on the public highway network can be satisfactorily mitigated; and

(iii) The site would be accessed by a safe and suitable form of vehicular access.'

1.2.3 Further discussions held with Kent County Council (KCC) as part of the wider development proposals identified that the potential impact on Station Road was a key concern for KCC.

1.2.4 To facilitate the approval of the revised proposals, Gladman are now proposing to bring forward the eastern portion of the wider site, in isolation, for up to 100 dwellings with a new point of access located to the north of the site off Cross Road. The proposed access strategy will facilitate a more efficient access to and from the north which will reduce the traffic impact of the proposals along Station Road while also providing improvements to Cross Road.

1.3 Scope of Report

1.3.1 This Transport Assessment (TA) has been prepared to consider the development in transport and highways terms and provide the necessary reassurance that the proposals can be accommodated by the local transport network.

1.3.2 The scope of the TA has been discussed with KCC, the local highway authority, in relation to previous proposals on the site. The current proposals are very similar to those discussed with KCC, albeit for a lesser number of units. As such, the bulk of the previously agreed scope has been incorporated into this TA.

1.3.3 The TA also conforms to the guidance provided in the Ministry of Housing, Communities and Local Government (MHCLG) Planning Practice Guidance 'Transport Evidence Bases in Plan Making'.

1.3.4 The guidance covers the following issues;

- Reducing the need to travel, especially by car – ensure at the outset that thought is given to reducing the need to travel; consider the types of uses (or mix of uses) and the scale of development in order to promote multipurpose or linked trips;
- Sustainable accessibility – promote accessibility by all modes of travel, in particular public transport, cycling and walking; assess the likely travel behaviour or travel

pattern to and from the proposed site; and develop appropriate measures to influence travel behaviour;

- Dealing with 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; and

- Mitigation measures – ensure as much as possible that the proposed mitigation measures avoid unnecessary physical improvements to highways and promote innovative and sustainable transport solutions.

1.3.5 As a Travel Plan Framework has also been prepared, reference has also been made to guidance presented in the DfT documents entitled 'Making Residential Travel Plans Work' published in June 2007 and 'Good Practice Guidelines: Delivering Travel Plans through the Planning Process' published in August 2009.

1.4 Structure of Report

1.4.1 Following this introduction, Section 2 of the report will detail the existing site conditions and describe the adjacent highway, while Section 3 will set out the development proposals, including vehicular access.

1.4.2 Section 4 will consider relevant national and local policy, while Section 5 will consider the accessibility of the site by non-car modes, including walking, cycling and public transport. Section 6 will contain details of the Framework Travel Plan.

1.4.3 Section 7 will consider the trip generation and traffic impact assessment of the local highway network. A review of road safety and personal injury accidents in the vicinity of the site over the last 5 years will be detailed in Section 8.

1.4.4 Lastly, Section 9 will draw together the report's findings and conclusions.

2 EXISTING CONDITIONS

2.1 Introduction

2.1.1 This section will detail the existing site and surroundings and provide details about the existing highway network.

2.2 Existing Site Information

2.2.1 The application site is located approximately 3 kilometres south west of Deal town centre. The location of the site in relation to the surrounding area is identified in **Plan 1**.

2.2.2 The site is bound by existing residential properties fronting Lydia Road and Sydney Road to the north and east. Station Road bounds the site to the south and Cross Road to the west.

2.2.3 The predominant land use in the vicinity of the site is residential with areas of open space.

2.2.4 The site is undeveloped and comprises of agricultural land with no formal vehicular access off Cross Road.

2.3 Local Highway Network

2.3.1 Cross Road runs in an approximate north to south alignment along the western boundary of the site. It is subject to a 30mph speed limit to the north of the site and a 60mph speed limit along the site frontage to the south. The change in speed limit occurs at the northern boundary of the site.

2.3.2 In the vicinity of the site, Cross Road is a rural two-way single carriageway road with no footway provision. It has a carriageway width of approximately 3.0 metres and has no street lighting. An existing passing place is located midway along the site frontage.

2.3.3 To the north of the site, Cross Road becomes more urban in nature with a carriageway width of approximately 6.4 metres wide, street lighting and 1.2 metre footways on both sides of the carriageway. Cross Road goes on to form the minor arm of the staggered priority junction with St Richard's Road and Mill Hill.

2.3.4 To the south, Cross Road forms the northern minor arm at the crossroads with Station Road/Coldblow/Ellens Road. Station Road runs along the southern boundary of the site in an approximate east to west alignment and is subject to a 60mph speed limit. It has a carriageway width of circa 3.5 to 4.0 metres with intermittent passing places and has no footways or street lighting in the vicinity of the site.

2.3.5 Continuing west, Station Road meets Sydney Road where it becomes urban in nature and subject to a 30mph speed limit. A number of priority junctions, serving residential development, are provided on Station Road, including the junctions of Court Road, Menzies Road, John Tapping Close and Nevill Gardens. Footways and street lighting are provided on Station Road between Sydney Road and the A258 Dover Road to the west.

2.3.6 Ellens Road links the site to Mongeham Road to the east, it is subject to a 60mph speed limit and is rural in nature with no footways or street lighting. It has a carriageway width of circa 3.5 metres wide with intermittent passing places along its entire length.

2.4 Baseline Transport Data

2.4.1 The site is currently undeveloped, and so apart from any associated agricultural traffic does not generate any traffic movements.

3 DEVELOPMENT PROPOSALS

3.1 Introduction

3.1.1 The following paragraphs will describe the development proposals and report on the proposed access arrangements and car parking.

3.2 Proposed Development

3.2.1 It is proposed to develop the site to provide up to 100 residential dwellings. The residential development will comprise a mix of house types including an element of affordable units.

3.2.2 The proposed indicative masterplan is shown in **Plan 2**.

3.3 Car Parking and Internal Layout

3.3.1 As the application is in outline form with all matters reserved except for access, full details of internal site layout and car parking will be determined at the time of a reserved matters application. Notwithstanding this, car parking across the site will comply with those set out Kent County Council's current car parking standards which are as follows:

- 1/2 bed dwellings – 1 space per unit.
- 3 bed dwellings – 1.5 to 2 spaces per unit.
- 4+ bed dwellings – 2 spaces per unit.

3.3.2 The internal layout will be designed to accord with Manual for Streets and will incorporate predominantly 20mph roads so to promote walking and cycling and create a pedestrian friendly environment.

3.4 Vehicular Access

3.4.1 The proposed site will be served via a vehicular access point located off Cross Road, to the north of the site.

3.4.2 Cross Road will be widened to 5.5 metres between the northern boundary of the site and the proposed site access.

3.4.3 As part of the site access proposals, it is recommended that the existing 30mph zone, which begins in the vicinity of the northern site boundary, is extended to encompass the site access, thus incorporating the proposed residential extension to the 'built up' urban area.

3.4.4 In addition, a new traffic calming feature in the form of a priority give-way arrangement is proposed on Cross Road to allow for the extension to the 30 mph zone and to formally control the existing narrow section of Cross Road to the north of the site.

3.4.5 The geometric parameters used for the proposed site access junction will accord with current design guidance. The site access design incorporates a carriageway width of 5.5 metres, footways on either side of the carriageway of 1.8 metres in width and junction radii of 10 metres to the north and 4.5 metres to the south. The southern, left turn radii, has been reduced to discourage southbound traffic onto the narrow section of Cross Road.

3.4.6 Visibility splays of 2.4 by 43 metres, in accordance with Manual for Street standards for a 30mph, have been applied and can be achieved in both directions from the proposed site access junction.

3.4.7 It is therefore, concluded that the vehicular access strategy is appropriate for the purposes of this particular development and the design will encourage the majority of development traffic to travel north from the site along the urban section of Cross Road.

3.4.8 The proposed vehicular access arrangement is shown on **Plan 3**.

3.4.9 In addition, it is considered that an improvement scheme would not only mitigate the impact of the development but also improve the operation of the existing narrow section of Station Road to the south of the site. The proposed improvement scheme consists of a priority give-way arrangement with physical kerbline amendments to formalise and traffic calm Station Road. The improvement also provides a new 1.0 metre wide pedestrian footway and two new pedestrian crossing points in the form of dropped kerbs and tactile paving. The proposed improvement scheme can be seen at **Plan 4**.

3.4.10 Discussions in relation to the site access proposals and potential improvement scheme will continue as the planning application progresses to ensure that any remaining issues are addressed to KCC's satisfaction.

3.5 Pedestrian and Cycle Access

3.5.1 Pedestrian and cycle access into the site will be afforded via the proposed vehicular access point into the development from Cross Road as well as via connections to Station Road and Sydney Road. These connections link with existing pedestrian infrastructure located within the vicinity of the site providing links to nearby amenities.

3.5.2 The existing pedestrian footways to the north of the site on Cross Road will be retained and enhanced to provide a continuous footway into the site from the north, as shown on Plan 3.

3.5.3 Footway improvements will also be provided to Station Road as shown in Plan 4.

3.5.4 There are currently no Public Rights of Way (PRoWs) in the vicinity of the site, however, a well-trodden established pedestrian track runs across the site between Sydney Road and Cross Road.

3.5.5 As part of the proposed development, existing pedestrian links will be retained and diverted through the site as appropriate.

4 RELEVANT PLANNING POLICY

4.1 Introduction

4.1.1 This section of the TA reviews the relevant national transport planning policy and guidance documents in the context of the proposed development.

4.1.2 It will focus on the National Planning Policy Framework (NPPF), which was first published in March 2012 and updated in February 2019, sets out the Government's planning policies for achieving sustainable development. It will also make reference to National Planning Practice Guidance and PPG13 Good Practice Guide, issued in 1995.

4.1.3 Local transport planning policy for Deal is taken from the fourth Kent Local Transport Plan (2016-2031) and the Dover District Council Local Development Framework (LDF) Core Strategy, published in February 2010. This section will briefly outline the pertinent policies relating to the proposed development.

4.2 National Planning Policy Framework (NPPF)

4.2.1 The Ministry of Housing, Communities and Local Government (MHCLG) updated its National Planning Policy Framework (NPPF) in February 2019. The NPPF replaces previous 2018 Planning Policy Guidance (PPG).

4.2.2 The NPPF continues to provide guidance on the same key themes for Local Authorities when preparing Development Plans and associated Policies, with a presumption in favour of sustainable development unless any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in the framework taken as a whole. However, the three key objectives in the updated NPPF include:

- *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;*

- *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;*

- *to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land.*

4.2.3 The revised NPPF provides more guidance on how Local Authorities should form Development Plans, policies and the decision-making process. Greater emphasis is placed on early consultation and the addressing of location, provision and design issues during the planning stages in order to ensure high-quality sustainable developments are brought forward, rather than applying numerous planning conditions to planning decisions.

4.2.4 Local authorities are expected to grant permission, for proposals that accord with an up-to-date development plan without delay.

4.2.5 Where there are no relevant development plan policies, or the policies which are most important for determining the application are out-of-date, granting permission unless:

i. the application of policies in this Framework that protect areas or assets of particular importance provides a clear reason for refusing the development proposed; or

ii. any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole.

4.2.6 At the heart of NPPF is *'a presumption in favour of sustainable development'* (Paragraph 11).

4.2.7 With regard to sustainable transport the NPPF states in paragraph 103 that:

'Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making.'

4.2.8 The NPPF goes on to consider parking provision, stating in paragraph 106 *'Maximum parking standards for residential and non-residential development should only be set where there is a clear and compelling justification that they are necessary for managing the local road network, or for optimising the density of development in city and town centres and other locations that are well served by public transport. In town centres, local authorities should seek to improve the quality of parking so that it is convenient, safe and secure, alongside measures to promote accessibility for pedestrians and cyclists.'*

4.2.9 In determining planning proposals, paragraph 108 of the NPPF states:

'In assessing sites that may be allocated for development in plans, or specific applications for development, it should be ensured that:

a) appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;

b) safe and suitable access to the site can be achieved for all users; and

c) 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.'

4.2.10 The NPPF states in paragraph 34:

'Plans should set out the contributions expected from development. This should include setting out the levels and types of affordable housing provision required, along with other infrastructure (such as that needed for education, health, transport, flood and water management, green and digital infrastructure). Such policies should not undermine the deliverability of the plan.'

4.2.11 Paragraph 59 goes on to state:

'To support the Government's objective of significantly boosting the supply of homes, it is important that a sufficient amount and variety of land can come forward where it is needed, that the needs of groups with specific housing requirements are addressed and that land with permission is developed without unnecessary delay.'

4.2.12 Paragraph 109 goes on to state:

'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.'

4.2.13 Developments are required to provide and promote pedestrian and cyclist movements as a priority, facilitate access to public transport services and maximise the catchment areas for bus and other public transport services.

4.2.14 It is demonstrated in the subsequent sections of this TA that the site is located close to good pedestrian links and public transport networks and is therefore ideally situated to encourage trips by sustainable modes of travel.

4.2.15 Therefore, developments should be located and designed where practical to;

a) 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;

b) address the needs of people with disabilities and reduced mobility in relation to all modes of transport;

c) 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;

d) *allow for the efficient delivery of goods, and access by service and emergency vehicles; and*

e) *be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations.*

4.2.16 The location of the proposed development facilitates access to a number of local amenities in accordance with the guidance contained within paragraph 20, which states that:

'Strategic policies should set out an overall strategy for the pattern, scale and quality of development, and make sufficient provision for:

a) *housing (including affordable housing), employment, retail, leisure and other commercial development;*

b) *infrastructure for transport, telecommunications, security, waste management, water supply, wastewater, flood risk and coastal change management, and the provision of minerals and energy (including heat);*

c) *community facilities (such as health, education and cultural infrastructure); and*

d) *conservation and enhancement of the natural, built and historic environment, including landscapes and green infrastructure, and planning measures to address climate change mitigation and adaptation'.*

4.2.17 It is therefore concluded that as the development is located a short distance from a range of local amenities, is accessible by public transport and has been designed in accordance with the guidance contained within Manual for Streets, it is considered that the proposed development accords with the aims and objectives of the Framework.

4.2.18 Paragraph 111 of the NPPF states:

'All developments that will generate significant amounts of movement should be required to provide 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'.

4.2.19 In order to satisfy this policy requirement, this TA is accompanied by a Travel Plan Framework which provides commitment to produce a full Travel Plan upon completion of the development.

4.2.20 Furthermore, the report also demonstrates that the proposals will not have a material impact on the adjoining highway network.

4.2.21 It is therefore clear from the NPPF that development:

- Should be assessed with a presumption in favour of approval.
- Should be capable of being accessed satisfactorily with safe and suitable access provided for all.
- Should be sustainable, with preference given to accessibility by sustainable modes of transport.

4.3 National Planning Practice Guidance

4.3.1 The National Planning Practice Guidance (NPPG) web-based resource was published on 6 March2014 by the Department for Communities and Local Government, now MHCLG. This resource collates relevant planning practice guidance and provides links between the NPPF and relevant legislation and guidance.

4.3.2 Within the guidance, there is specific section clarifying the over-arching principles on Travel Plans, Transport Assessments and Transport Statements. There are also sections advising further on each of the three documents discussed.

4.3.3 The guidance advises that in determining whether a Transport Assessment or Statement will be needed for a proposed development, local planning authorities should take into account a number of considerations. It is considered that the size and nature of this development requires a full Transport Assessment.

4.3.4 It also clarifies the process for establishing a scope for the assessment, and what the document should contain. The guidance has been considered in the preparation of this TA and the scope previously discussed with KCC.

4.3.5 The guidance on Travel Plans reinforces the requirement for a Travel Plan, the scope of the document, and need for monitoring to continue the strategy into the future. The guidance has been considered in the production of the accompanying Framework Travel Plan.

4.4 Dover District Council Local Development Framework (LDF) – Core Strategy 2010

4.4.1 The Dover District Council Local Development Framework (LDF) Core Strategy 2010 details the aims and strategies for the district and in relation to transport it aims to:

'Improve ease of travel to, from and within the District for both people and freight; concentrate development where it can best align with facilities and reduce the need for travel, especially at the Regional Hub of Dover; encourage walking, cycling and public transport through the provision of new facilities.'

4.4.2 Relevant transport policy contained within the Core Strategy include Policy DM11 and DM12 as detailed below:

4.4.3 Policy DM11 Location of Development and Managing Travel Demand states:

'Planning applications for development that would increase travel demand should be supported by a systematic assessment to quantify the amount and type of travel likely to be generated and include measures that satisfy demand to maximise walking, cycling and the use of public transport. Development that would generate travel will not be permitted outside the urban boundaries and rural settlement confines unless justified by development plan policies. Development that would generate high levels of travel will only be permitted within the urban areas in locations that are, or can be made to be, well served by a range of means of transport.'

4.4.4 Policy DM 12 Road Hierarchy and Development states:

'The access arrangements of development proposals will be assessed with regard to the Highway Network set out in the Local Transport Plan for Kent. Planning applications that would involve the construction of a new access or the increased use of an existing access

onto a trunk or primary road will not be permitted if there would be a significant increase in the risk of crashes or traffic delays unless the proposals can incorporate measures that provide sufficient mitigation.'

4.5 Kent County Council Local Transport Plan (LTP4)

4.5.1 Under the Transport Act of 2000 (amended by the Local Transport Act 2008), every local transport authority in the country has to publish a Local Transport Plan (LTP).

4.5.2 The LTP should set out the authority's transport policies and its proposals for the implementation of those policies.

4.5.3 Kent County Council's fourth Local Transport Plan (LTP4) came into force in July 2017 and covers the period 2016 to 2031. The plan sets out the following transport ambitions within LTP4 to deliver safe and effective transport, ensuring that all Kent's communities and businesses benefit:

- *'Deliver resilient transport infrastructure and schemes that reduce congestion and improve journey time reliability to enable economic growth and appropriate development, meeting demand from a growing population.'*
- *'Promote affordable, accessible and connected transport to enable access for all to jobs, education, health and other services.'*
- *'Provide a safer road, footway and cycleway network to reduce the likelihood of casualties, and encourage other transport providers to improve safety on their networks.'*
- *'Deliver schemes to reduce the environmental footprint of transport, and enhance the historic and natural environment.'*
- *'Provide and promote active travel choices for all members of the community to encourage good health and wellbeing, and implement measures to improve local air quality.'*

4.6 Planning Policy Summary

4.6.1 The NPPF seeks to ensure access to all road users including pedestrians and cyclists, as well as delivering a scheme, which allows the promotion of travel by public transport to result in an encompassing strategy to provide a high-quality development whilst not compromising a high level of sustainability.

4.6.2 As will be detailed in the following section, the proposed site layout will ensure the development is within walking and/or cycling distance of key services or amenities.

4.6.3 Reference to national guidance contained within NPPF has helped to establish that the site is well related to the surrounding area and will contribute towards the creation of a sustainable development.

4.6.4 One of the key aims of local policy is to focus on the accessibility of a site by modes other than the private car to ensure that new development is located where a range of transport modes can access it. Locations which offer alternatives to the use of the private car should be encouraged.

4.6.5 The site is located to assist in delivering these aims and aspirations and has potential, through the implementation of the site Travel Plan to deliver a highly sustainable development in transport terms.

4.6.6 It can therefore be concluded that the development proposals fully conform to the main aims and aspirations of the wider and economic objectives of national and local policy.

5 ACCESSIBILITY BY NON CAR MODES

5.1 Introduction

5.1.1 In order to accord with the aspirations of the NPPF, any new proposals should extend the choice in transport and secure mobility in a way that supports sustainable development.

5.1.2 New proposals should attempt to influence the mode of travel to the development in terms of gaining a shift in modal split towards non-car modes, thus assisting in meeting the aspirations of current national and local planning policy.

5.1.3 The accessibility of the proposed site has been considered by the following modes of transport:

- Accessibility on foot.
- Accessibility by cycle.
- Accessibility by bus.
- Accessibility by rail.

5.2 Accessibility on Foot

5.2.1 It is important to create a choice of direct, safe and attractive routes between where people live and where they need to travel in their day-to-day life. This philosophy clearly encourages the opportunity to walk whatever the journey purpose and also helps to create more active streets and a more vibrant neighbourhood.

5.2.2 The nearest footways are located approximately 110 metres from the centre of the site on Station Road with a width of around 2 metres. These footways provide pedestrian links throughout Walmer and Deal and provide direct linkages to the nearby day to day amenities within the town. Nearby local amenities include educational institutions, healthcare, employment opportunities, recreational facilities, and retail establishments.

5.2.3 The CIHT document 'Planning for Walking' from 2015 states, in paragraph 2.1, that in 2012 that 79% of all journeys made in the UK of less than a mile (1.6 kilometres) are carried out on foot.

5.2.4 Within the Institution of Highways and Transportation (IHT) document, entitled "Guidelines for Providing for Journeys on Foot", Table 2.2 suggests distances for desirable, acceptable and preferred maximum walks to 'town centres', 'commuting/schools' and 'elsewhere'. The 'preferred maximum' distances are shown below in **Table 5.1**.

Suggested Preferred Maximum Walk		
Town Centre	**Commuting/School**	**Elsewhere**
800m	2,000m	1,200m

Table 5.1 – IHT 'Providing for Journeys on Foot' Walk Distances

5.2.5 Reference to the 2,000 metre walk distance is also made in the now superseded Planning Policy Guidance (PPG) Note 13 which advised that 'walking is the most important mode of travel at the local level and offers the greatest potential to replace short car trips, particularly under 2km'.

5.2.6 Manual for Streets (MfS) continues the theme of the acceptability of the 2,000 metre distance in paragraph 4.4.1. This states that '*walkable neighbourhoods are typically characterised by having a range of facilities within 10 minutes' (up to about 800m) walking distance of residential areas which residents may access comfortably on foot. However, this is not an upper limit and PPS13 states that walking offers the greatest potential to replace short car trips, particularly those under 2 km*'.

5.2.7 **Table 5.2** below summarises this guidance in tabular form.

'Comfortable' Walk	'Preferred Maximum' Walk
800m	2,000m

Table 5.2 – Manual for Streets Walk Distances

5.2.8 More specific guidance on the distances that children will walk to school is found in the July 2014 document published by the Department for Education (DfE) entitled 'Home to School Travel and Transport' statutory guidance document. This suggests that the maximum walking distance to schools is 2 miles (3.2 kilometres) for children under 8 and 3 miles (4.8 kilometres) for children over the age of 8. This is summarised below in **Table 5.3**.

Children under 8 Walk Distance	Children over 8 Walk Distance
3,200m	4,800m

Table 5.3 – DfE Walk Distances to Schools

5.2.9 Further evidence that people will walk further than the suggested 'preferred maximum' distances in the IHT 'Providing for Journeys on Foot' is contained in a WYG Report entitled 'Accessibility – How Far do People Walk and Cycle'. This report refers to National Travel Survey (NTS) data for the UK as a whole, excluding London, that the 85th percentile walk distance for:

- All journey purposes – 1,930 metres.
- Commuting – 2, 400 metres.
- Shopping – 1,600 metres.
- Education – 3,200 or 4,800 metres.

- Personal business – 1,600 metres.

5.2.10 Overall, in Table 5.1, the document states that 1,950 metres is the 85th percentile distance for walking as the main mode of travel. **Table 5.4** below summarises the various 85th percentile walk distances suggested as guidelines in the WYG Study.

85th Percentile Walk Distances					Overall Recommended Preferred Max
All Journeys	Commuting	Shopping	Education	Personal	
1,950m	2,100m	1,600m	3,200/4,800m	1,600m	1,950m

Table 5.4 – WYG Report/NTS Data Walk Distances

5.2.11 In summary, it is considered that the distance of 1,950 metres, or around 2 kilometres, represents an acceptable maximum walking distance for the majority of land uses although clearly the DfE guidance for walking to school is up to 3.2 kilometres.

5.2.12 Section 3.1 of the CIHT guidance 'Planning for Walking' mentioned earlier in this report provides a useful reminder of the health benefits of walking. This states that:

'A brisk 20 minute walk each day could be enough to reduce an individual's risk of an early death'.

5.2.13 A 20 minute walk equates to a walking distance of around 1,600 metres.

5.2.14 In light of the above review, a pedestrian catchment of 2 kilometres from the centre of the site, using all usable pedestrian routes, has been provided in **Plan 5** and provides an illustrative indication of the areas that can be reached based on a leisurely walk from the site.

5.2.15 In addition, to the pedestrian catchment plan, a review of the proximity of local facilities has been undertaken and the location of these is also shown in Plan 5.

5.2.16 The 2,000 metre pedestrian catchment illustrates that the majority of Walmer can be accessed along with various amenities such as a Londis (Dover Road), Walmer Pharmacy, Gilliver News, St Mary's Catholic Primary School, The Cooperative, Goodwin Academy, Parnham's Newsagents, Premier Convenience Store and the Telegraph Public House.

5.2.17 **Table 5.5** below, shows the walking distance from the centre of the site to the local amenities in the vicinity of the site. The table also confirms whether or not the particular amenity is within the 'preferred maximum' walk distances using the above guideline criteria:

Local Amenity	Distance	Guidance Criteria	Meets with Guidance?
Londis (Dover Road)	650m	1,600m	**YES**
Walmer Pharmacy	790m	1,600m	**YES**
Gilliver News	830m	1,600m	**YES**
St Mary's Catholic Primary School	950m	3,200m	**YES**
The Cooperative	1,060m	1,600m	**YES**
Goodwin Academy Secondary School	1,400m	4,800m	**YES**
Parnham's Newsagents	1,450m	1,600m	**YES**
Premier Convenience Store	1,600m	1,600m	**YES**
Telegraph Public House	1,870m	1,950m	**YES**

Table 5.5 - Distance from Site to Local Facilities

5.2.1 As can be seen in the above table, the site is located within close proximity to a number of local amenities including primary services as well as leisure facilities.

5.2.2 All of the day to day amenities are well within the 'preferred maximum' walk distances described earlier in this section and indeed many, including the nearest convenience

store, pharmacy and nearest primary school, are around the 800 metres 'comfortable walk' from the site as contained within MfS guidance.

5.2.3 It is therefore considered that the existing pedestrian infrastructure will facilitate safe and direct pedestrian linkages between the site and local destinations.

5.3 Access by Cycle

5.3.1 An alternative mode of travel to the site could be achieved by bicycle.

5.3.2 A distance of 5 kilometres is generally accepted as a distance where cycling has the potential to replace short car journeys. This distance equates to a journey of around 25 minutes based on a leisurely cycle speed of 12 kilometres per hour and would encompass Kingsdown, East Studdal, Northbourne and Hacklinge.

5.3.3 National cycle route 1 is located approximately 1.6 kilometres from the centre of the site. This cycle route runs from Colchester and the Shetland Islands forms the majority of the British part of the North Sea Cycle Route.

5.3.4 The site can therefore be considered as being accessible by cycle.

5.4 Access by Bus

5.4.1 The nearest bus stop is located to the east of the site on Court Road within an approximate walking distance of 400 metres, around a 5 minute walk, from the centre of the site. The stop consists of a bus stop pole with passing services shown and bus timetable information. All the nearest bus stops to the site are shown on Plan 4.

5.4.2 A summary of the services available from the nearest bus stops from the development site is provided in **Table 5.6** below.

Service No	Route	Monday – Friday Frequency per hour				Sat	Sun
		AM Peak	Midday	PM Peak	Eve		
80	Sandwich - Dover	1	0	1	0	0	0
81	Sandwich -Dover	1	1	2	0	1	0.5
83	Deal – Walmer - Deal	1	1	1	0	1	0

Table 5.6 - Existing Bus Services Operating Close to the Site

5.4.3 As can be seen from Table 5.6, the nearest bus stops provide access to up to 4 services in peak periods to Dover and Sandwich.

5.4.4 It is noted that the above services provide a choice of how people travel with the bus services operating from around 7am to around 9pm, making travel by public transport a real alternative to travelling by car.

5.4.5 In order to demonstrate the level of accessibility some example journey times by bus are presented below **Table 5.7** below.

Destination	Duration
Dover town centre	29 minutes
Sandwich	44 minutes

Table 5.7 - Example Bus Journey Times from the Site

5.4.6 The above table demonstrates that Dover town centre is just a 29-minute bus journey from the site and Sandwich is just a 44-minute bus journey.

5.4.7 It is therefore concluded that the proposed development site is accessible by bus.

5.5 Accessibility by Rail

5.5.1 The nearest train station to the site is Walmer which is situated approximately 490 metres to the east of the site, around a 6 minute walk. This train station is managed by Southeastern and has 2 platforms, offering 4 services per hour to destinations such as Ramsgate and London St Pancras International.

5.5.2 This provides opportunities to travel to and from the site via rail.

5.6 Accessibility Summary

5.6.1 The proposals have been considered in terms of accessibility by non-car modes for the proposed residential development.

5.6.2 The following conclusions can be drawn from this section of the report:

- The site is accessible on foot and these connections will be improved as part of the works on the development site.
- The services from the bus stops on Court Road, travelling to Dover and Sandwich, demonstrates that the proposed development can be accessed by bus.
- The site is accessible via rail with Walmer train station located around 490 metres, around a 6 minute walk, from the site.

5.6.3 In light of the above, it is considered the site is highly accessible by non-car modes and will cater for needs of the development's residents and assist in promoting a choice of travel modes other than the private car.

6 PROMOTING SMARTER CHOICES VIA TRAVEL PLANS

6.1 Introduction

6.1.1 In order to manage the travel by residents at the new development, the applicant wishes to offer a Travel Plan to encourage travel to the site by non-car modes.

6.2 Travel Planning Guidance

6.2.1 A Framework Travel Plan is included at **Appendix 1**. The objective of the Travel Plan is the delivery of the objectives of National Planning Policy, i.e. to encourage residents to travel by non-car modes of travel. The Travel Plan outlines physical and management measures that are designed to achieve this objective.

6.2.2 The effectiveness of Travel Plans in assisting the use of non-car modes for journeys is intrinsically linked to the accessibility of a given site by means other than the private car.

6.2.3 The proposed development is accessible by non-car modes and it should, therefore, be expected that the adoption of a Travel Plan would be particularly effective.

7 TRAFFIC IMPACT ANALYSIS

7.1 Introduction

7.1.1 Having established that the development site is highly accessible by modes of transport other than the private car and would be in general accordance with land use and transport policies, the following section considers the traffic impact of the development proposals on the local highway network.

7.2 Assessment Criteria

7.2.1 Given the proposed residential land use, it is assumed reasonable to consider the AM and PM weekday peak hours, as being those with the greatest impact on the local highway network.

7.3 Traffic Survey Data

7.3.1 In order to establish current levels of traffic, traffic counts were undertaken on Wednesday 1st May 2019 between 0730 and 0930 hours in the morning and 1630 and 1830 hours in the evening.

7.3.2 The junctions included in the survey are set out below:

- St Richard's Road/Cross Road/Mill Road;
- A528 Dover Road/Station Road; and
- Cross Road/Station Road/Coldblow/Ellens Road.

7.3.3 The full traffic survey data is contained within **Appendix 2**.

7.3.4 The peak hours were identified as 0745 to 0845 hours and 1645 to 1745 hours, for the AM and PM peaks respectively.

7.3.5 The surveyed flows for the peak hours converted into Passenger Car Units (PCU's) are shown in **Figures 1** and **2**.

7.4 Growthed Traffic Flows

7.4.1 For the purpose of this TA, assessments have been undertaken for a design horizon of 2022, representing the forecast year of completion.

7.4.2 To derive the future year traffic flows, the 2019 surveyed flows have been factored using the NTEM adjusted National Road Traffic Model growth factor for the Burnley Middle Super Output Area: Dover 007, within which the site is located. The resultant growth factors are shown below:

- 2019 to 2022 AM Peak - 1.0522
- 2019 to 2022 PM Peak - 1.0524

7.4.3 The resultant 2022 factored flows are shown in **Figures 3** and **4** for the 2022 AM and PM peak periods.

7.5 Committed Development

7.5.1 During the preparation of this TA, consideration has been given to any committed developments in the area that would need to be included. These are as follows:

- App Ref: 14/00361 – 223 dwellings at land off Station Road.

7.5.2 The traffic flows for the above committed developments have been taken from the relevant Transport Assessments with the committed development flows shown in **Figure 5** and **6** for the AM and PM peak periods.

7.5.3 Recently completed developments including the 20 dwelling development on Station Road and new development at Church Lane, Deal have also been accounted for within the traffic surveys undertaken in May 2019.

7.5.4 Consideration has also been given to other committed development sites in the area, namely:

- Whitfield Urban Expansion – Phase 1 (Outline permission for 1400 dwellings located in Whitfield, Dover).

7.5.5 A review of the above-mentioned site confirmed that, due to the distribution of development traffic and location of this development at circa 10 kilometres from the site, the forecast impact on the highway network under consideration is minimal. As such, it is considered that the traffic associated with this development will be adequately accounted for via the application of traffic growth.

7.6 Base Flows

7.6.1 To establish the 2022 base flows, the committed development flows shown in Figures 5 and 6 have been added to the 2022 factored flows shown in Figures 3 and 4.

7.6.2 The resulting 2022 base flows are shown in **Figures 7** and **8** for the AM and PM peak hours respectively.

7.7 Trip Distribution

7.7.1 The directional distribution for the proposed development has been based on the current pattern of traffic flows on the local highway network.

7.7.2 This distribution is considered appropriate as it takes account of existing constraints on the surrounding highway network, in particular the rural narrow roads which are likely to influence residents route choice, with residents choosing to travel via the wider more urban nature roads when given a choice. This is reflected in the observed pattern of traffic on the highway network.

7.7.3 The proposed distribution for the AM Peak period is shown in **Figure 9** whilst the proposed distribution for the PM Peak period is shown in **Figure 10**.

7.8 Proposed Development

7.8.1 As previously stated, it is proposed to develop up to 100 dwellings.

7.8.2 In order to establish the number of trips which the proposed residential element is forecast to generate, trip rates as established from the TRICS database and as previously agreed with Highways Officers at KCC in support of the 'Land at Station Road, Kent' committed development site have been applied.

7.8.3 These trip rates have previously been agreed with KCC for use on this application site.

7.8.4 The forecast trip generation based on the provision of 100 dwellings are summarised within **Table 7.1**.

Peak Period	Trip Rate (per unit)		Number of Trips		
	Arr	Dep	Arr	Dep	2-Way
AM Peak Hour	0.16	0.42	16	42	58
PM Peak Hour	0.39	0.23	39	23	62

Table 7.1 - Forecast Trip Generation of Proposed Residential Development

7.8.5 As demonstrated above, the residential development is forecast to generate a two-way total of approximately 58 trips in the AM peak hour and around 62 trips in the PM peak hour.

7.8.6 The resulting traffic assignment for the AM and PM peak periods are shown in **Figures 11** and **12.**

7.9 With Development Flows

7.9.1 In order to calculate the 2022 'with development' flows, the development flows contained within Figures 11 and 12 have been added to the 2022 base flows contained within Figure 7 and 8.

7.9.2 The resulting 2022 'with development' flows are presented in **Figures 13** and **14** respectively for the AM and PM peak hours.

7.10 Changes in Traffic

7.10.1 Having established the levels of traffic that would occur as a result of the proposed development, the likely changes in traffic that would be experienced on the local highway network can be derived.

7.10.2 **Table 7.2** summarises the changes in traffic that are predicted to occur at the junctions on the local highway network during the weekday peak periods as a result of the proposed development.

	2022 Base	2022 'With Dev'	Change in Traffic	Percentage Change
1) St Richard's Road/Cross Road/Mill Road				
Weekday AM Peak	847	882	+35	+4.1%
Weekday PM Peak	901	942	+41	+4.6%
2) A528 Dover Road/Station Road				
Weekday AM Peak	1776	1790	+14	+0.8%
Weekday PM Peak	1834	1849	+15	+0.8%
3) Cross Road/Station Road/Coldblow/Ellens Road				
Weekday AM Peak	122	144	+22	+18.0%
Weekday PM Peak	127	148	+21	+16.5%
4) Two-way Impact on Station Road				
Weekday AM Peak	102	116	+14	+14%
Weekday PM Peak	105	120	+15	+14%

Table 7.2 - Predicted Changes in Traffic Flow Resulting from Proposed Development

7.10.3 The Department for Transport (DfT) document 'Guidance on Transport Assessment' provided some suggested thresholds in respect to traffic impact and, at Appendix B, states that the formal assessment of a junction may not be required for developments that would typically generate fewer than 30 two-way additional trips. It is acknowledged that the DfT guidance was withdrawn in 2014, however, the document still represents good practice as the document sets out a pragmatic approach to assessing the transport impacts of a development.

7.10.4 Therefore, based on the above detailed junction analysis has only be undertaken at those junctions where there is forecast to be an increase of 30 two-way vehicle movements or above.

7.11 Capacity Assessments

7.11.1 In addition to the site access junction, in order to assess the operation of the junctions on the local highway network, capacity assessments have been undertaken at the following junctions;

- Site Access/Cross Road; and
- St Richard's Road/Cross Road/Mill Road.

Proposed Site Access/Cross Road

7.11.2 It can be robustly assumed that a site access junction located off Cross Road will operate with substantial reserve capacity due to the very low volume of traffic travelling along Cross Road. As such, capacity assessments have not been undertaken at the junction as it is considered that the access can adequately accommodate the forecast increase in traffic.

St Richard's Road/Cross Road/Mill Road Staggered Priority Junction

7.11.3 The operation of the above junction was tested using the PICADY module of the Junctions 8 program.

7.11.4 Assessments were undertaken using the 2022 base and 'with development' flows, the results of which are summarised within **Table 7.3** with the full results contained within **Appendix 3**.

ARM	2022 Base				2022 Base + Development			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
Cross Road	0.51	1	0.45	1	0.57	1	0.49	1
St Richard's Road (E)	0.05	0	0.11	0	0.05	0	0.12	0
Mill Road	0.13	0	0.11	0	0.13	0	0.12	0
St Richard's Road (W)	0.28	1	0.48	1	0.31	1	0.53	1

Table 7.3 - Summary of PICADY Results for St Richard's Road/Cross Road/Mill Road

7.11.5 As can be seen in the above table, the St Richard's Road/Cross Road/Mill Road junction is forecast to operate well within its theoretical capacity in the 2022 Base scenarios. With the addition of the proposed development traffic, the junction is forecast to continue to operate well within capacity with minimal increases in the RFC and no forecast increase in Max Queues.

7.11.6 The impact of the proposed development on the operation of this junction can, therefore, be considered minimal.

7.12 Capacity Assessments Summary

7.12.1 This section of the report has considered the impact of the proposal in transport terms.

7.12.2 The above assessment has demonstrated that the impact of the proposals will not give rise to any particular highway capacity issues.

7.12.3 It is therefore considered that the predicted level of traffic can be accommodated onto the local highway network.

7.12.4 In addition, the proposed priority give-way arrangements and carriageway widening proposed in the vicinity of the site on Cross Road and Station Road will provide a safe and efficient access into the site and improve the operational efficiency of the local highway network.

7.12.5 On that basis, it can be assumed that the impact of the proposals on the local highway network would be minimal.

8 ROAD SAFETY

8.1 Introduction

8.1.1 In order to consider the potential impact of the development on road safety, a review of the Crashmap website (www.crashmap.co.uk) has been undertaken.

8.1.2 The information provided on the website covered the most recent five year period, from January 2014 to January 2019, in the vicinity of the development site. The Crashmap personal injury accident data, including location maps is contained within **Appendix 4**.

8.2 Accident Analysis

8.2.1 For the purposes of this analysis, the study area has been split up into key areas to establish whether there are any particular accident hotspots on the local highway network. Each of the areas listed below have been considered in turn:

- St Richard's Road/Cross Road/Mill Road;
- Cross Road/Station Road/Coldblow/Ellens Road;
- Station Road/Court Road;
- Along Station Road; and
- A528 Dover Road/Station Road.

St Richard's Road/Cross Road/Mill Road

8.2.2 A review of the personal injury data shows that there has been a total of two accidents in the vicinity of this junction during the study period. Both of these accidents were classified as slight in severity and one involved a pedestrian.

Cross Road/Station Road/Coldblow/Ellens Road

8.2.3 One slight severity accident has been recorded at the Cross Road/Station Road/Coldblow/Ellens Road junction during the study period.

Station Road/Court Road

8.2.4 There has been a total of three personal injury accidents in the vicinity of the Station Road/Court Road junction during the study period. Two slight severity accidents occurred at the junction whilst a serious accident occurred to the north of the junction on Court Road. The serious accident involved a pedestrian.

Along Station Road

8.2.5 One slight severity accident has been recorded on Station Road in the vicinity of Nevill Gardens.

A528 Dover Road/Station Road

8.2.6 There has been one recorded accident at the A528 Dover Road/Station Road junction. This accident was classified as a serious and involved two vehicles.

8.3 Accident Summary

8.3.1 In view of this information it can be concluded that the local highway network in the vicinity of the site does not have an unduly poor safety record and is essentially operating safely when considering the volumes of traffic the local highway network accommodates and the severity of accidents that have occurred.

8.3.2 There are no reasons to assume that this situation should be significantly worsened as a consequence of the development proposals and the proposed improvements to Cross Road in the vicinity of the proposed site access will also provide an element of traffic calming in the form of a priority give-way arrangement which will improve highway safety.

9 CONCLUSIONS

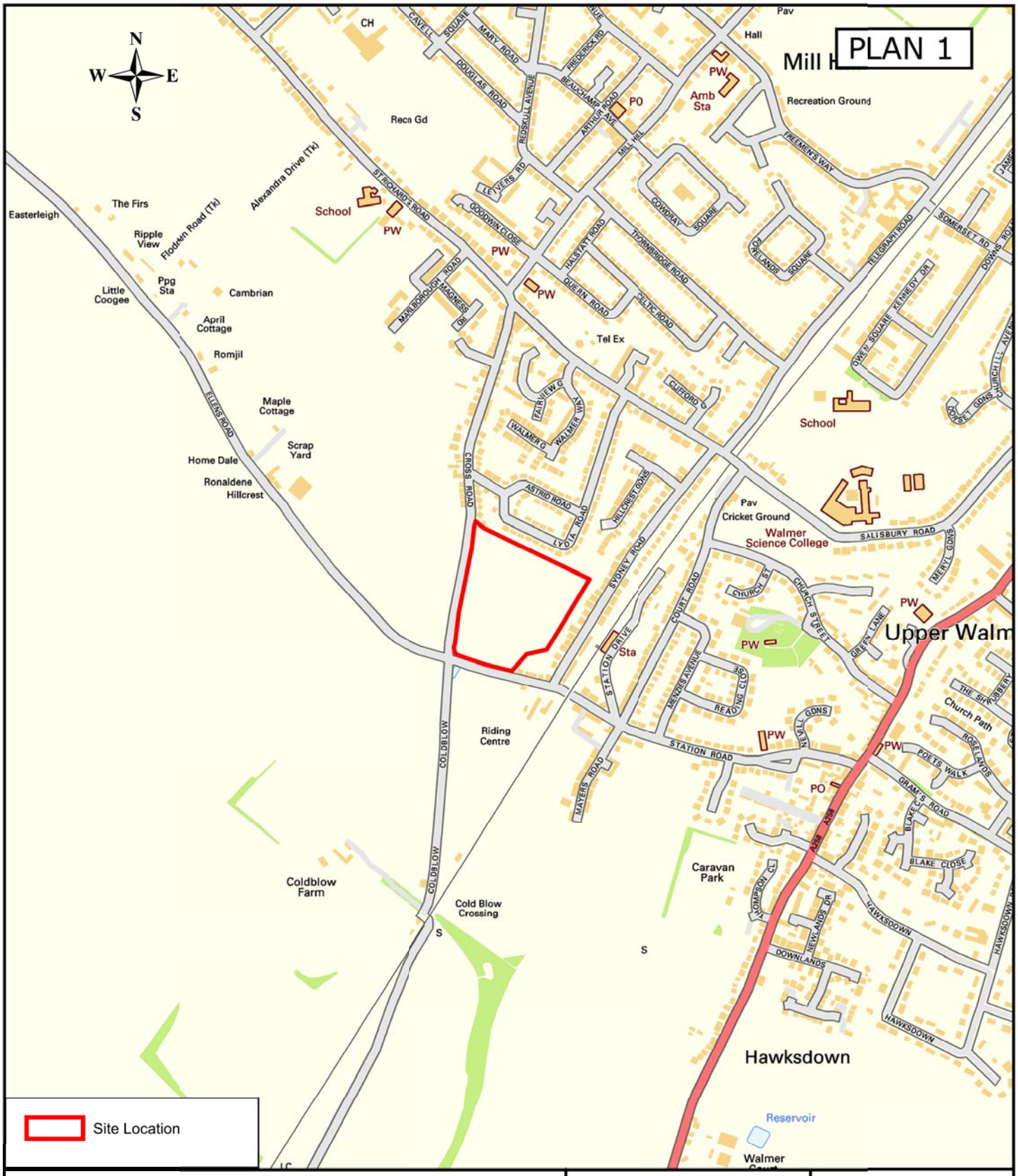
9.1.1 Croft have been instructed to advise on the traffic and transport aspects of a proposed residential development on land at Cross Road in Deal, Kent.

9.1.2 The following conclusions can be drawn with regard to the proposed development:

- The proposed development will be accessed by a safe and efficient vehicular access arrangement.
- The internal layout will be designed in accordance with Manual for Streets guidance and car parking provision across the site will comply with current standards.
- The proposals accord with the aims and aspirations of both national and local policy and will deliver a sustainable development.
- The application site is highly accessible by non-car travel modes, such as walking and cycling.
- The proposed development is ideally located to encourage journeys by bus via the bus services available in the vicinity of the site.
- The site is within a short walk of Walmer railway station.
- A Framework Travel Plan will be implemented to encourage the use of non-car modes.
- The traffic impact assessment indicated that the proposed development would be able to be accommodated on the local highway network.
- The proposals will have a minimal impact on the local highway network and will provide highway improvements in the vicinity of the proposed site on Cross Road and Station Road.
- There is no evidence to suggest that the proposals would have an adverse effect on road safety or the number of accidents in the vicinity, or increase the risk of instances of vehicular collisions.

9.1.3 In conclusion, the proposals will provide a sustainable development in transport terms and planning permission should be granted in accordance with the National Planning Policy Framework.

PLANS



GLADMAN

PROPOSED RESIDENTIAL DEVELOPMENT
CROSS ROAD, DEAL
SITE LOCATION PLAN

Croft Transport Planning & Design
Hill Quays
9 Jordan Street
Manchester
M15 4PY

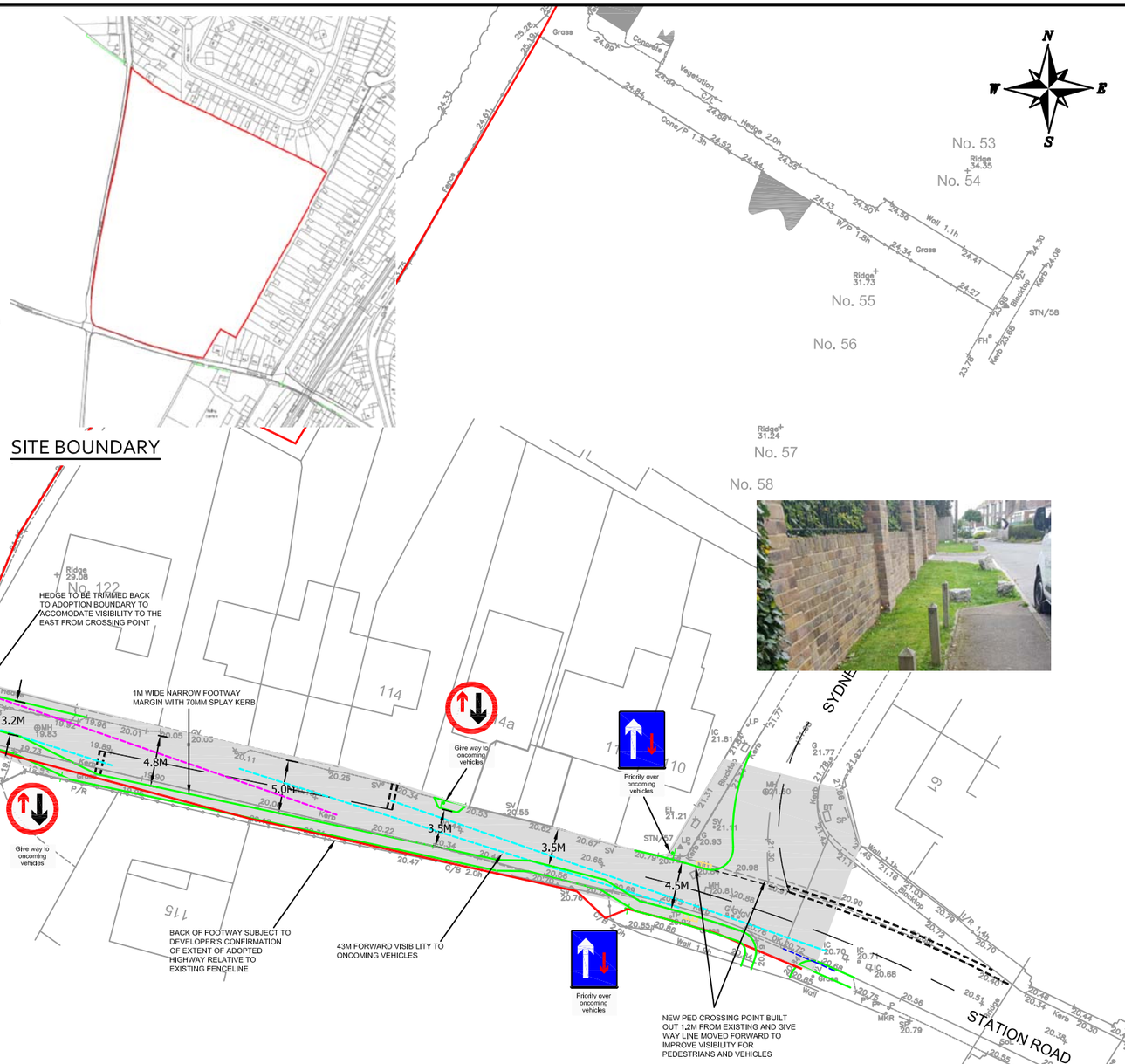
Email: info@croftts.co.uk
Tel: 0161 667 3746
Web: www.croftts.co.uk

CROFT

DRAWN:	DATE:	CHECKED:	DATE:	SCALE:	DRAWING NUMBER:	REVISION:
GM	16.04.19	MTC	16.04.19	N.T.S	2243-01	.

PLAN 3

NORTH SOUTH AERIAL VIEW



NOTES

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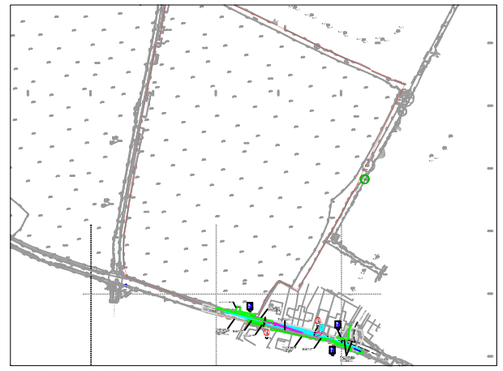
- INDICATIVE SITE BOUNDARY
- DENOTES NEW KERBS
- EXISTING ADOPTED HIGHWAY



SITE LAYOUT NTS

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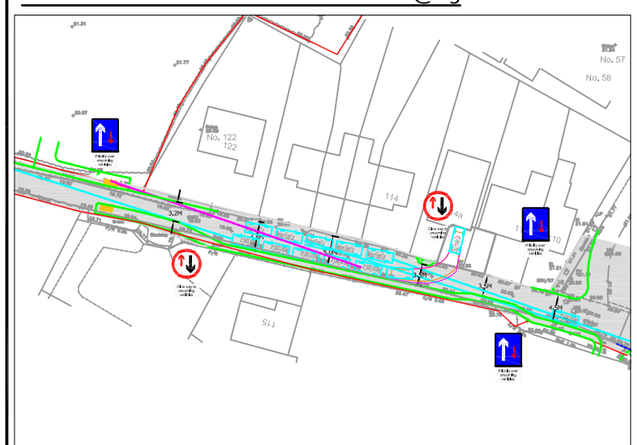
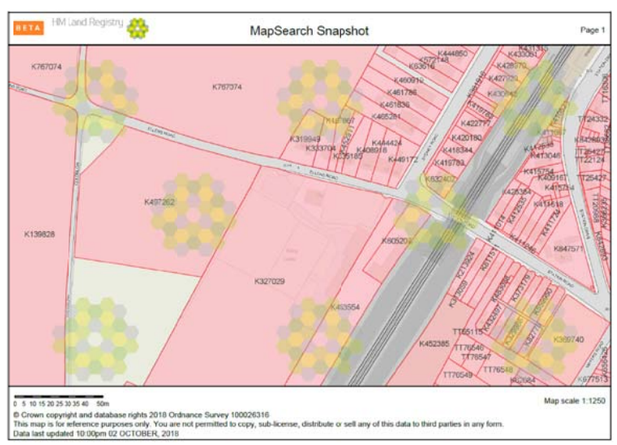
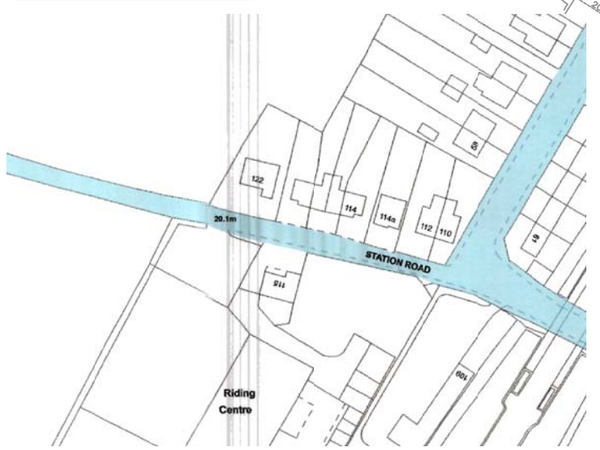


LAND REGISTRY



ADOPTION BOUNDARY



REV	DETAILS	DRAWN	CHECKED	DATE
F	ACCESS REMOVED, FOOTWAY ADDED	LB	MC	MAY 19

CLIENT:

GLADMAN

PROJECT:

CROSS ROAD, DEAL

DRAWING TITLE:

POTENTIAL STATION ROAD IMPROVEMENTS

SCALES:

1:500 @ A3

DRAWN:	CHECKED:	DATE:
MC	MC	MAY 19

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DRAWING NUMBER:	REVISION:
2243-F01	F

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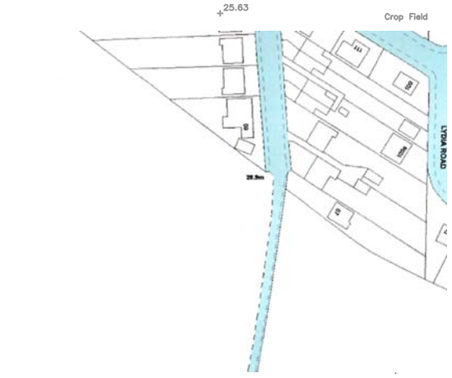
PLAN 4



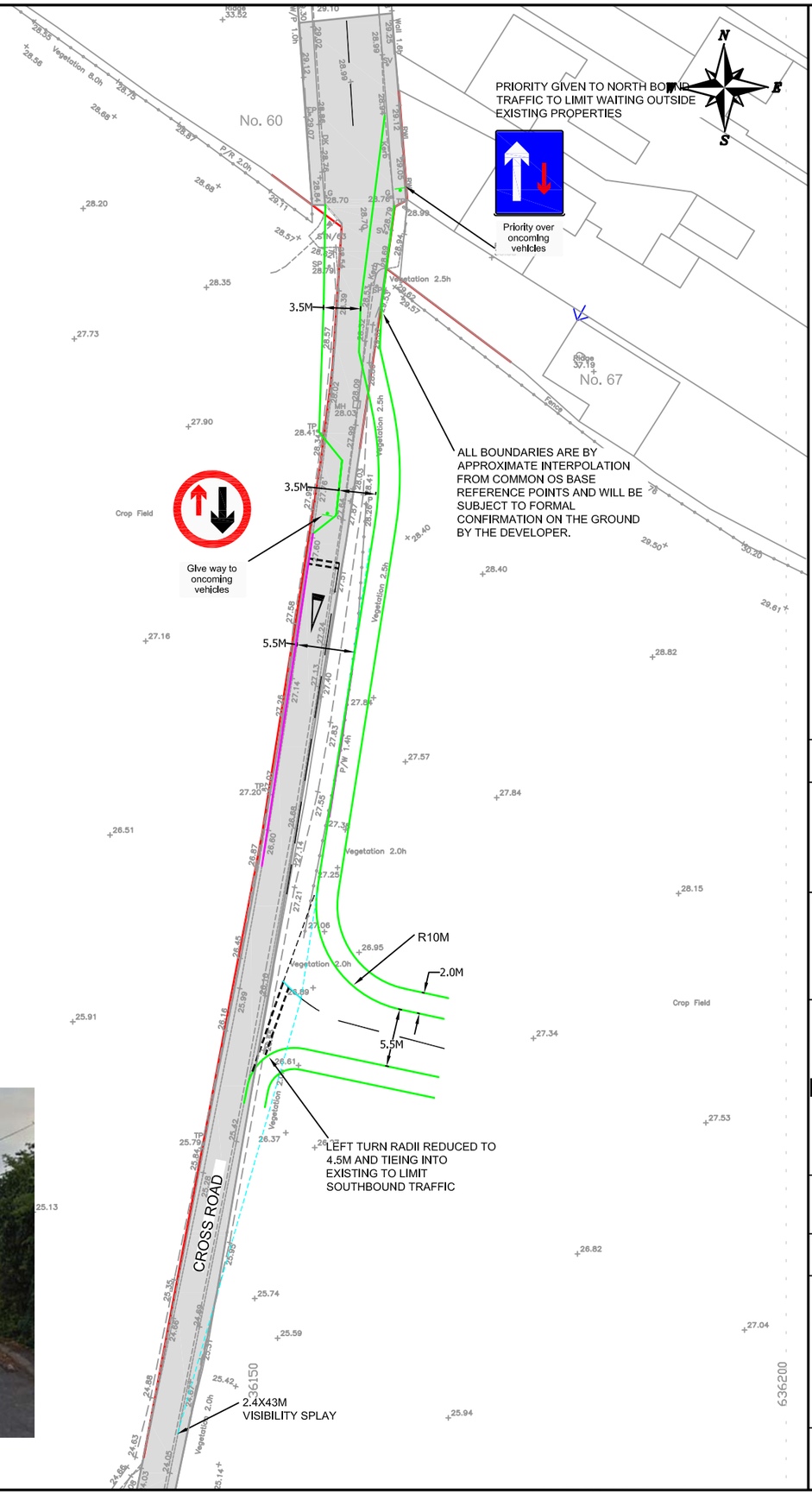
ADOPTION BOUNDARY

LAND REGISTRY

LAND REGISTRY

SITE BOUNDARY

CROSS ROAD



NOTES

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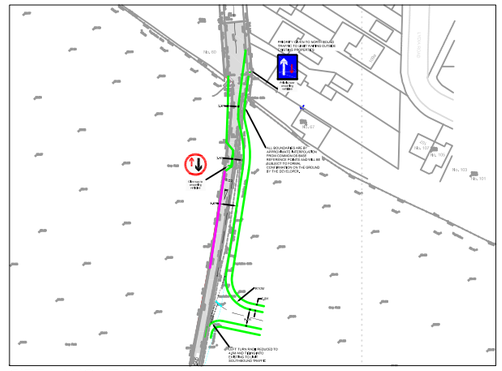
INDICATIVE BOUNDARIES TRANSPOSED DIRECTLY FROM OS REFERENCE BASE

DENOTES NEW KERBS



SITE LAYOUT NTS

REV	DETAILS	DRAWN	CHECKED	DATE
A	ONE WAY PRIORITY MOVED DUE TO LAND OWNERSHIP	LB	JC	MAR 19

CLIENT:

GLADMAN

PROJECT:

CROSS ROAD, DEAL

DRAWING TITLE:

PROPOSED ACCESS ARRANGEMENT

SCALES:

1:500 @ A3

DRAWN:	CHECKED:	DATE:
MC	MC	FEB 19

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PLAN 5

NOTES

Legend

- Site Location
- 800m Pedestrian Catchment
- 2km Pedestrian Catchment
- Train Station
- Nearest Bus Stops
- Cafe/Takeaway/Public House
- Leisure/Sport
- Education
- Healthcare/Medical
- Post Office
- Retail

REV	DETAILS	DRAWN	CHECKED	DATE
-	-	-	-	-

CLIENT:

GLADMAN

PROJECT:

PROPOSED RESIDENTIAL DEVELOPMENT
CROSS ROAD, DEAL

DRAWING TITLE:

800M & 2KM PEDESTRIAN CATCHMENT WITH AMENITIES

SCALES:

NTS @ A3

DRAWN:	CHECKED:	DATE:
GM	MTC	APR 19

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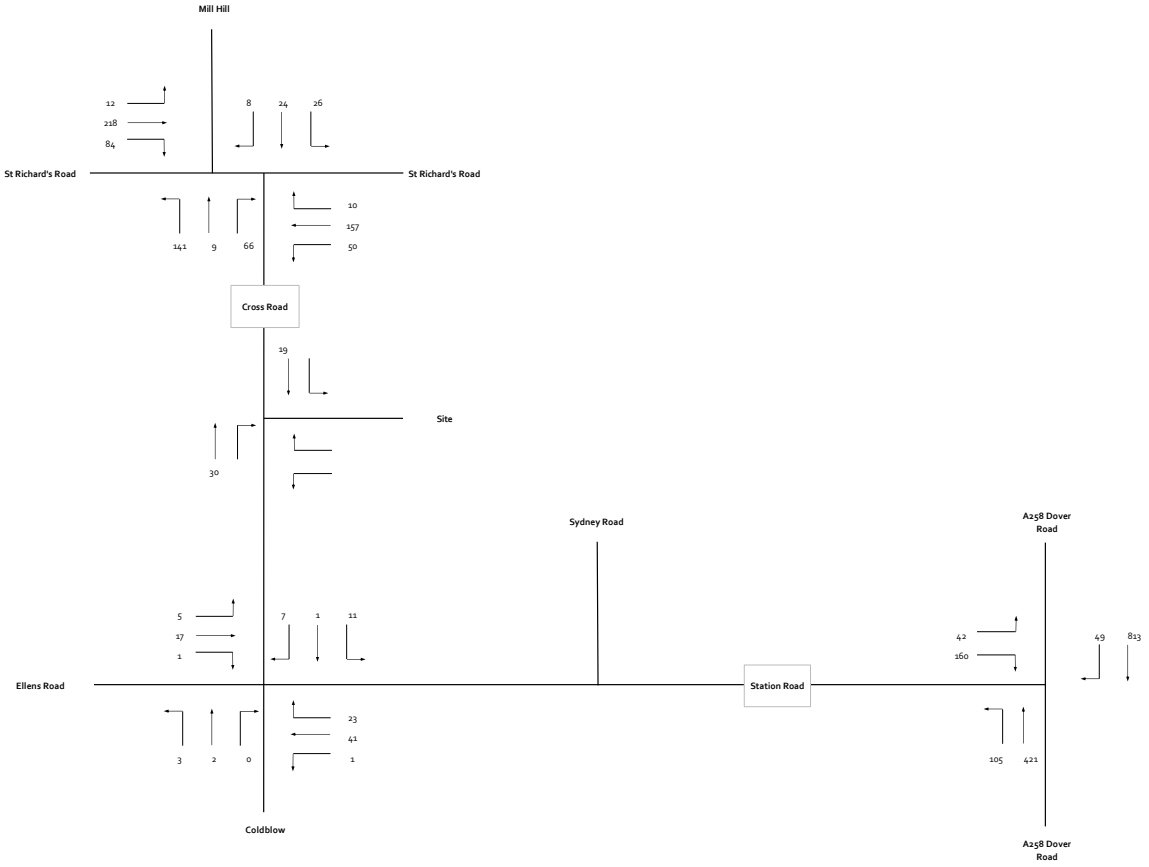

Figure 1 - 2019 Surveyed Flows - AM Peak

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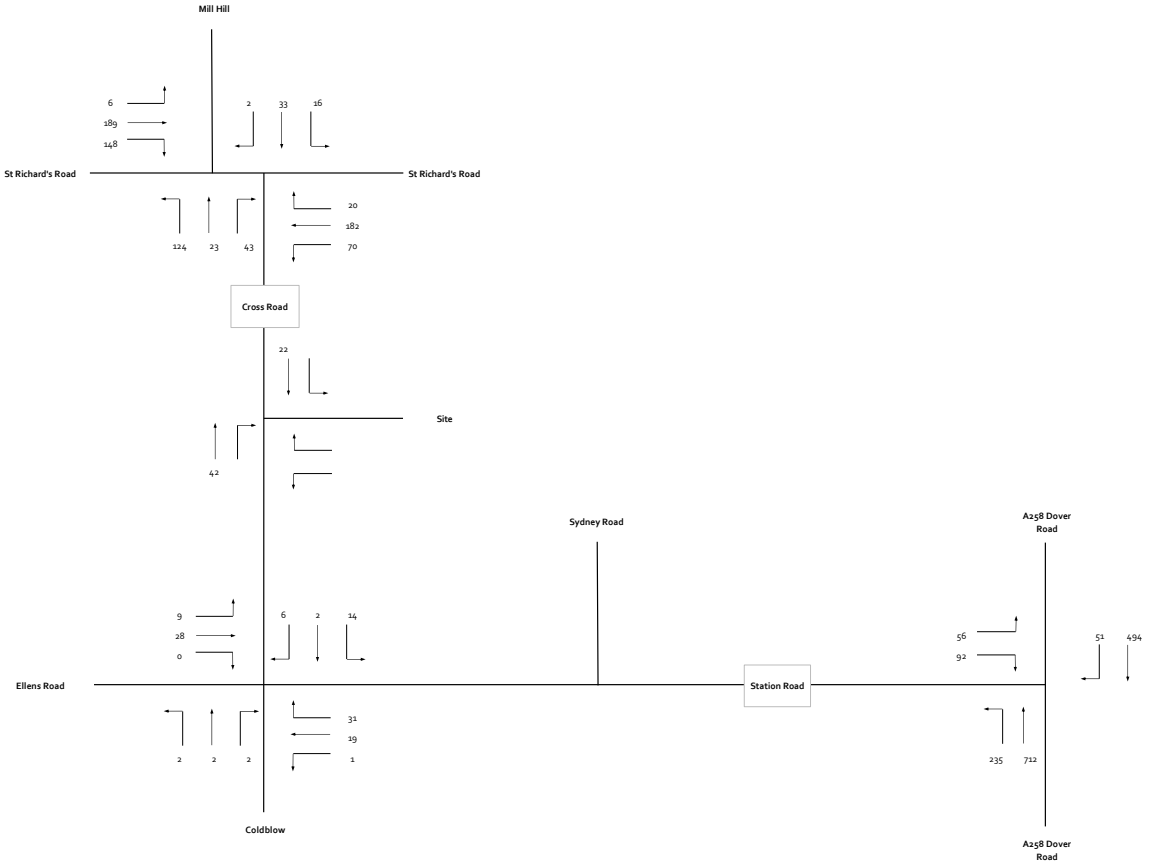

Figure 2 - 2019 Surveyed Flows - PM Peak

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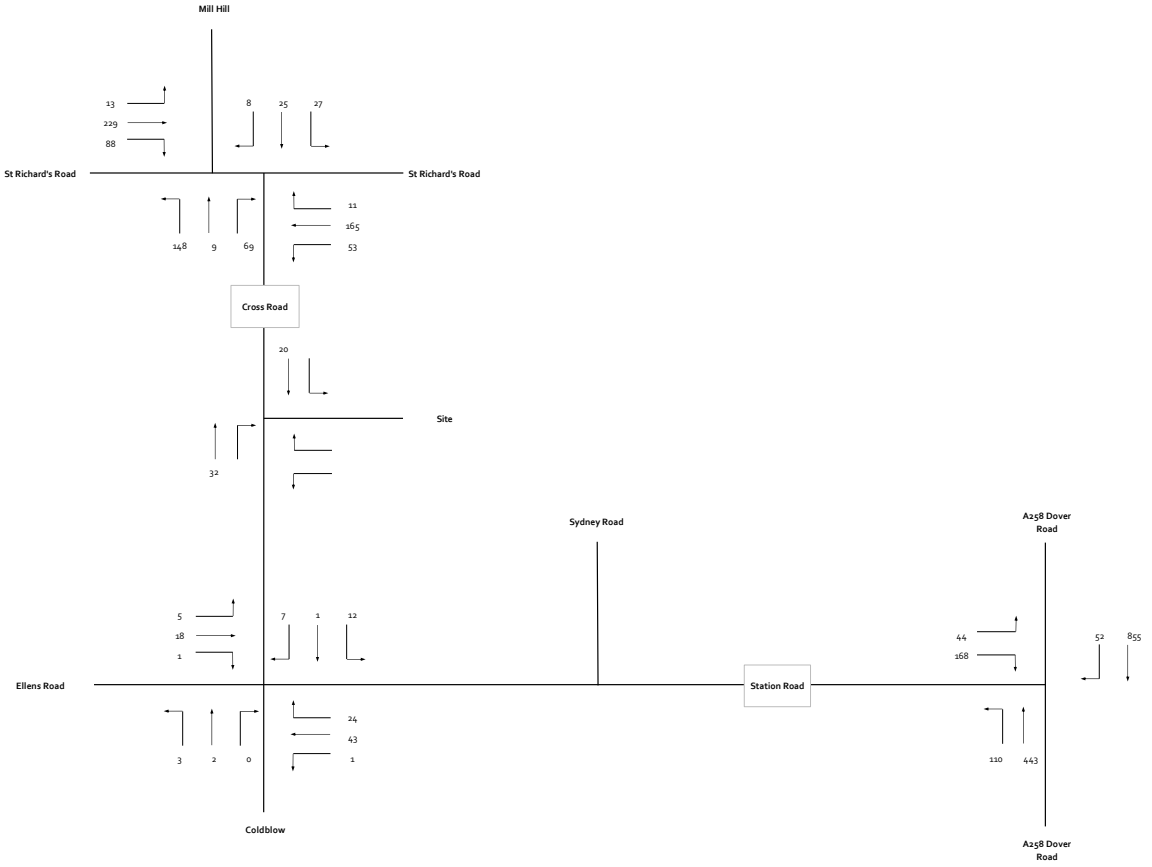

AM Peak TEMPRO Adjusted NTM Factor 2019-2022 = 1.052

Figure 3 - 2022 Factored Flows - AM Peak

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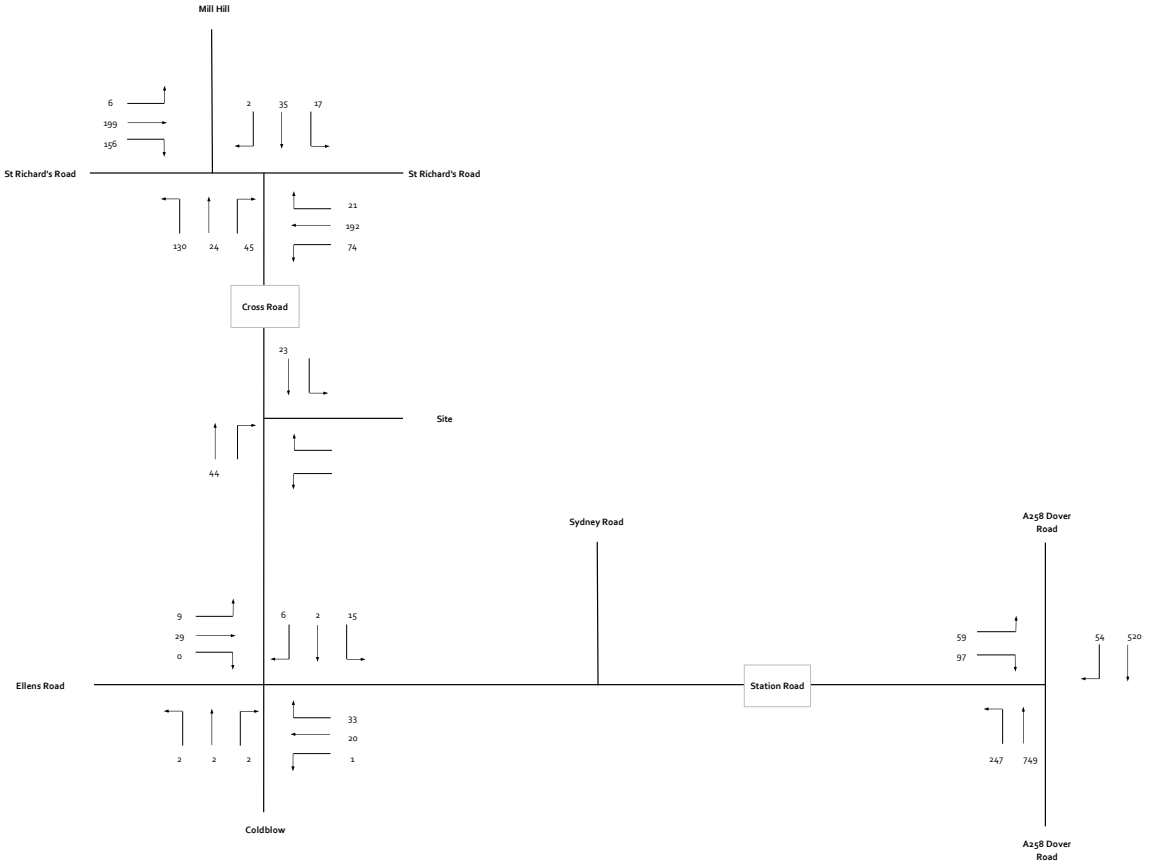
M15 4PY



PM Peak TEMPRO Adjusted NTM Factor 2019-2022 = 1.052

Figure 4 - 2022 Factored Flows - PM Peak

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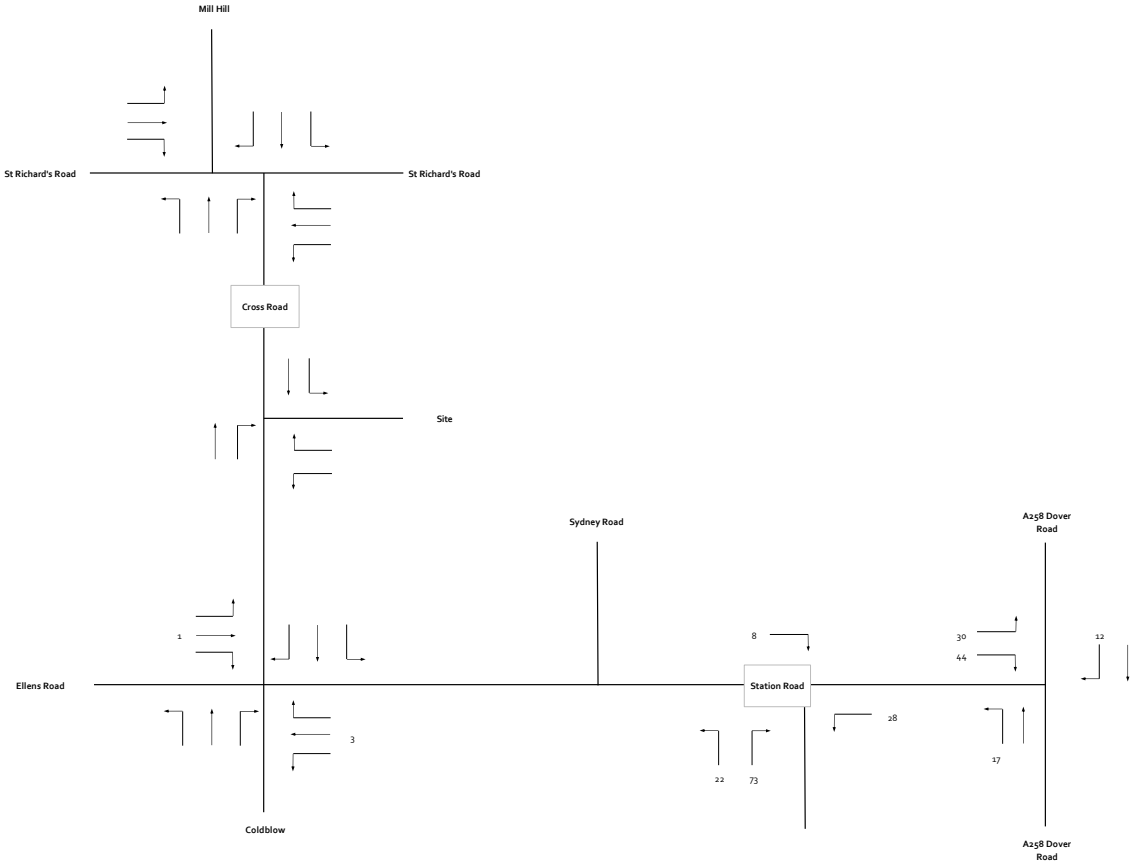

Figure 5 - Committed Development Flows - AM Peak (Land at Station Road - 226 Dwellings)

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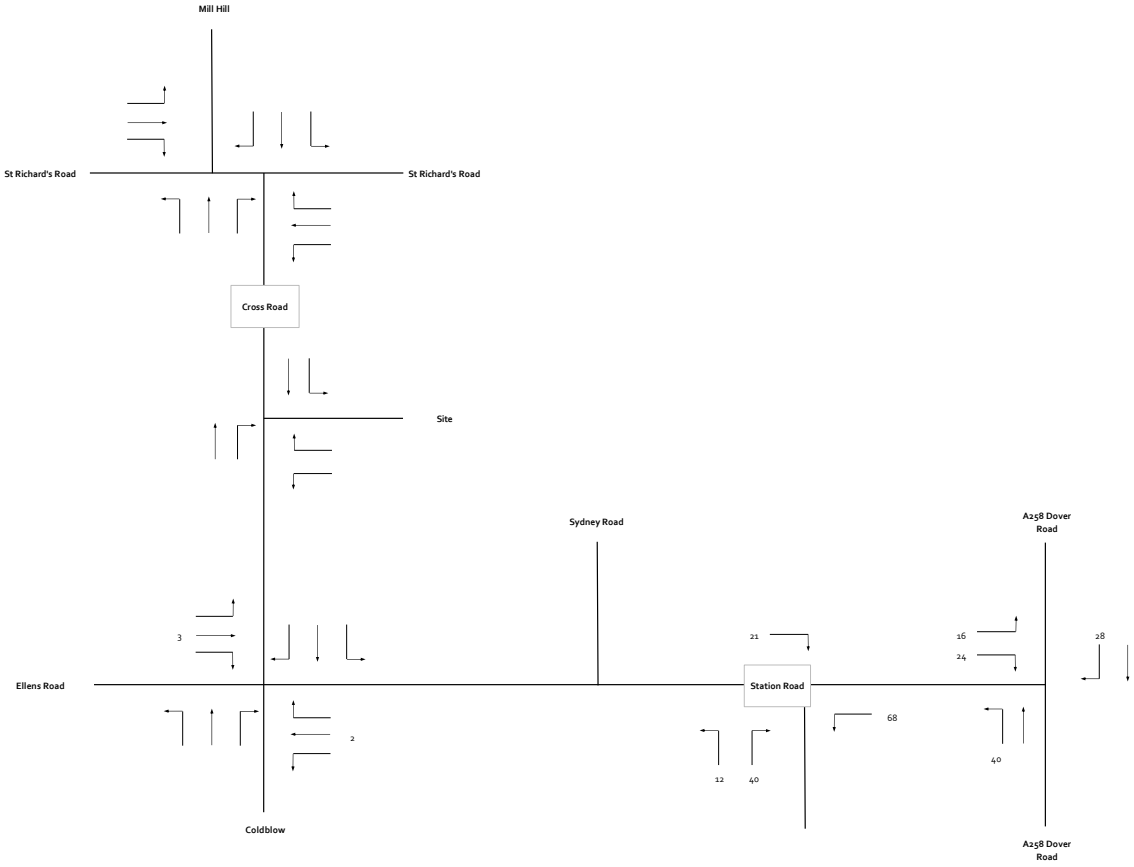

Figure 6 - Committed Development Flows - PM Peak (Land at Station Road - 226 Dwellings)

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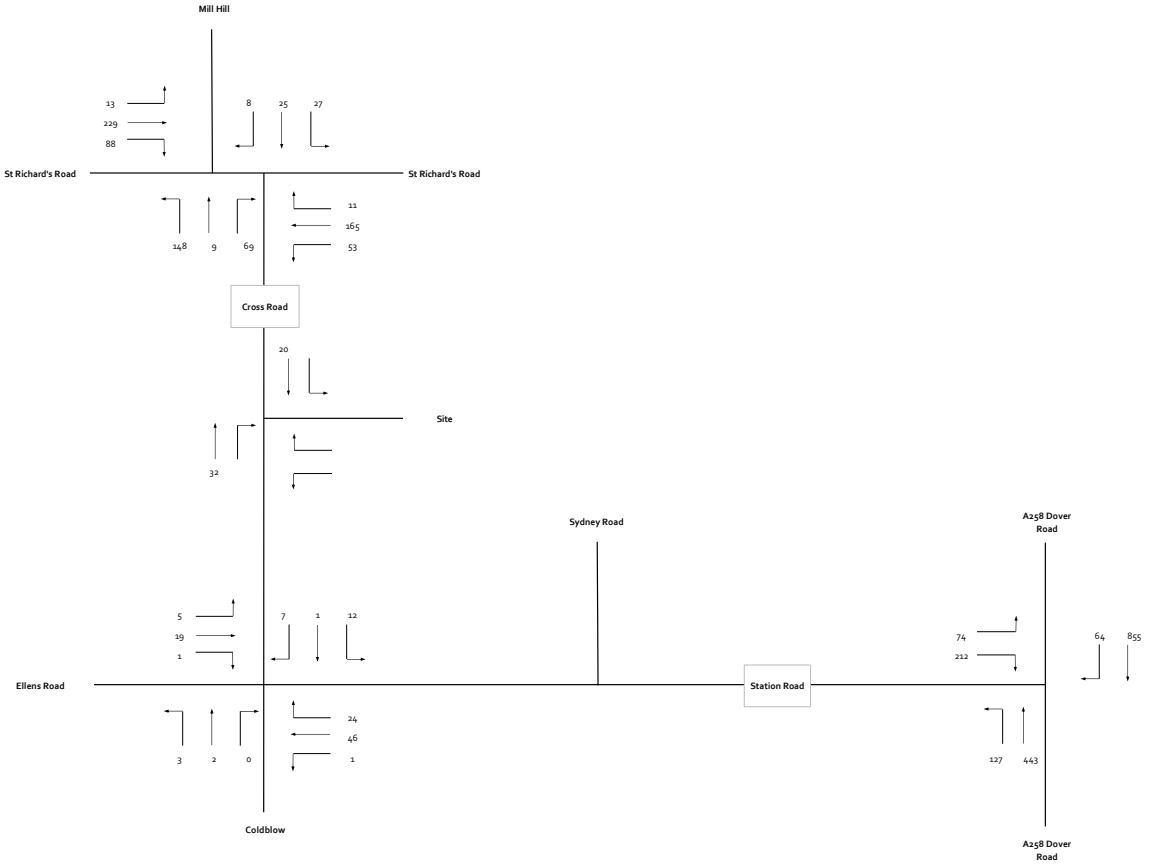

Figure 7 - 2022 Base Flows - AM Peak

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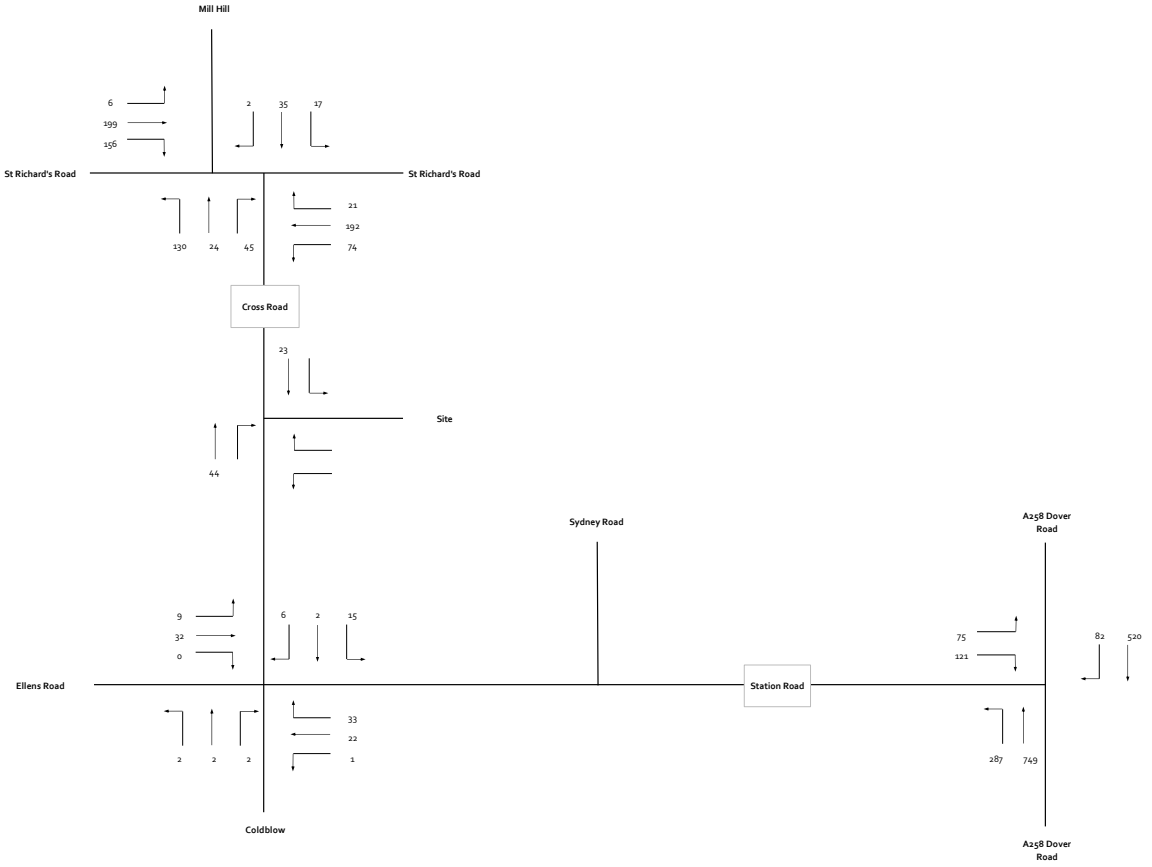

Figure 8 - 2022 Base Flows - PM Peak

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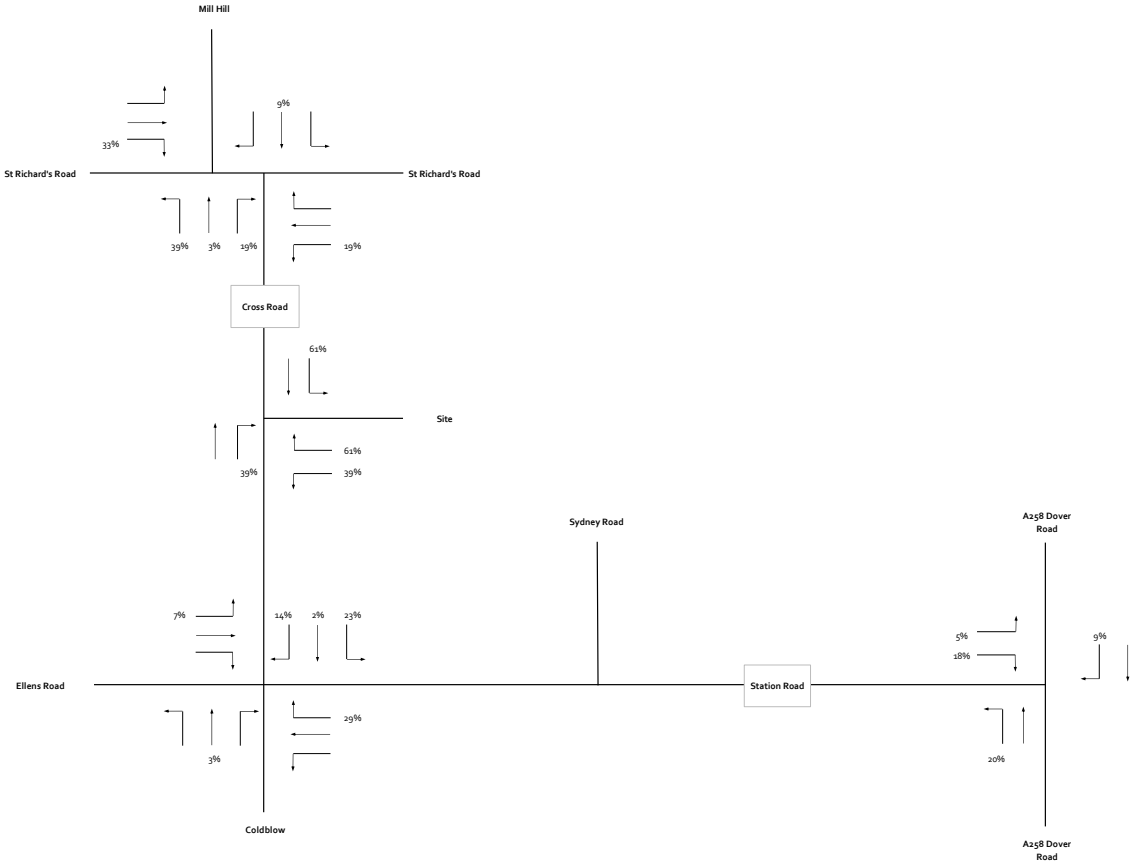

Figure 9 - Trip Distribution - AM Peak

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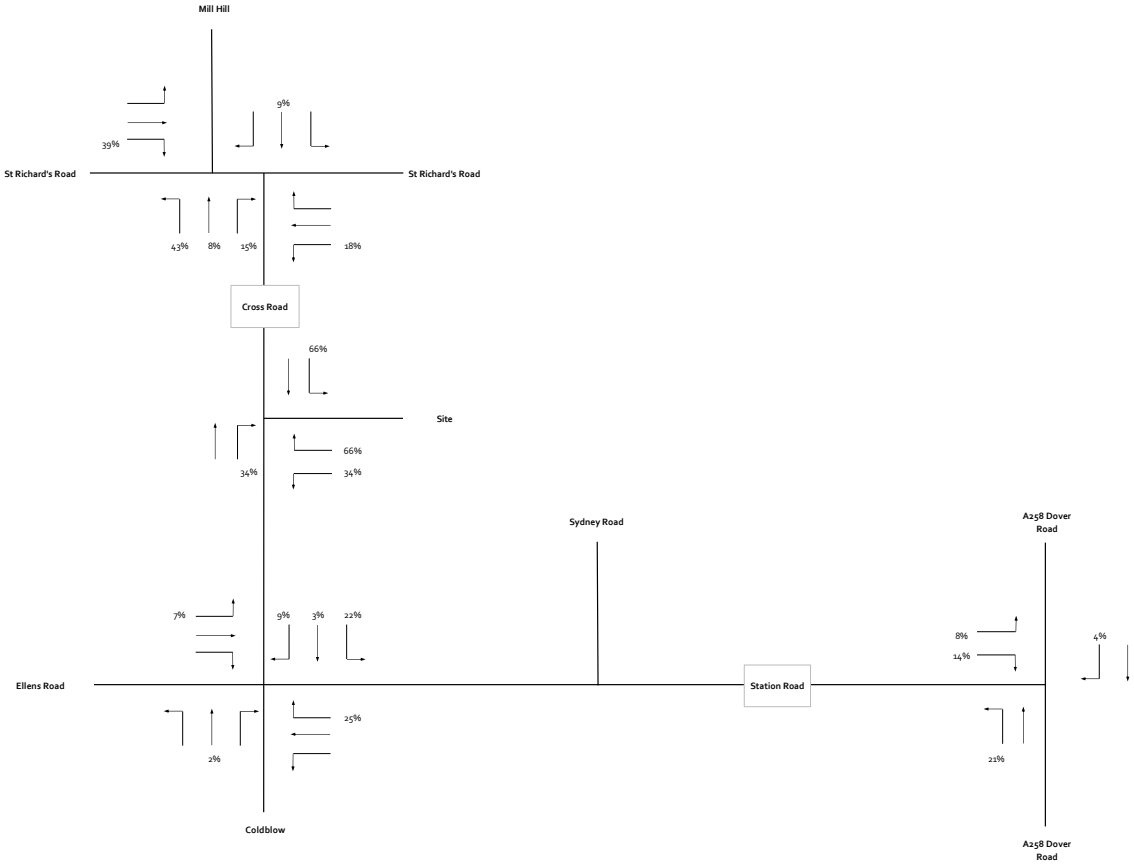

Figure 10 - Trip Distribution - PM Peak

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Figure 11 - Proposed Development Flows - AM Peak

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Figure 12 - Proposed Development Flows - PM Peak

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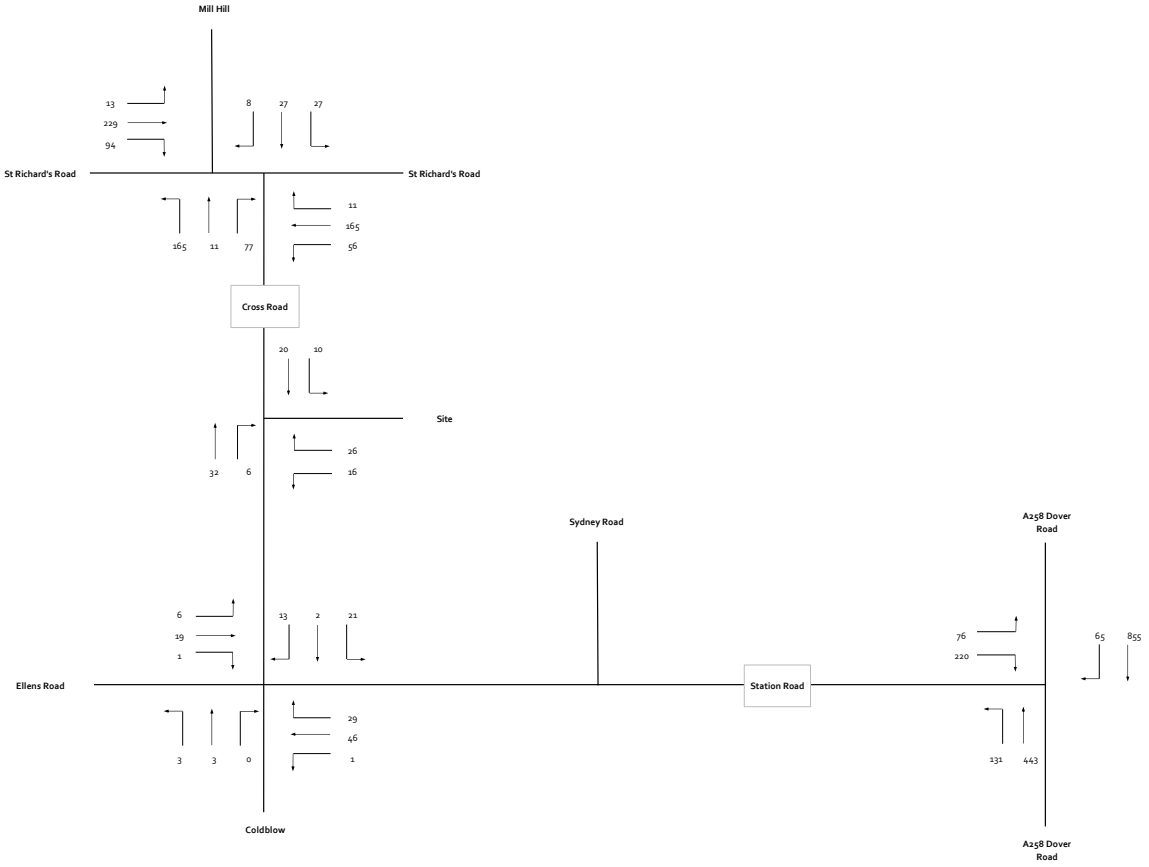

Figure 13 - 2022 With Development Flows - AM Peak

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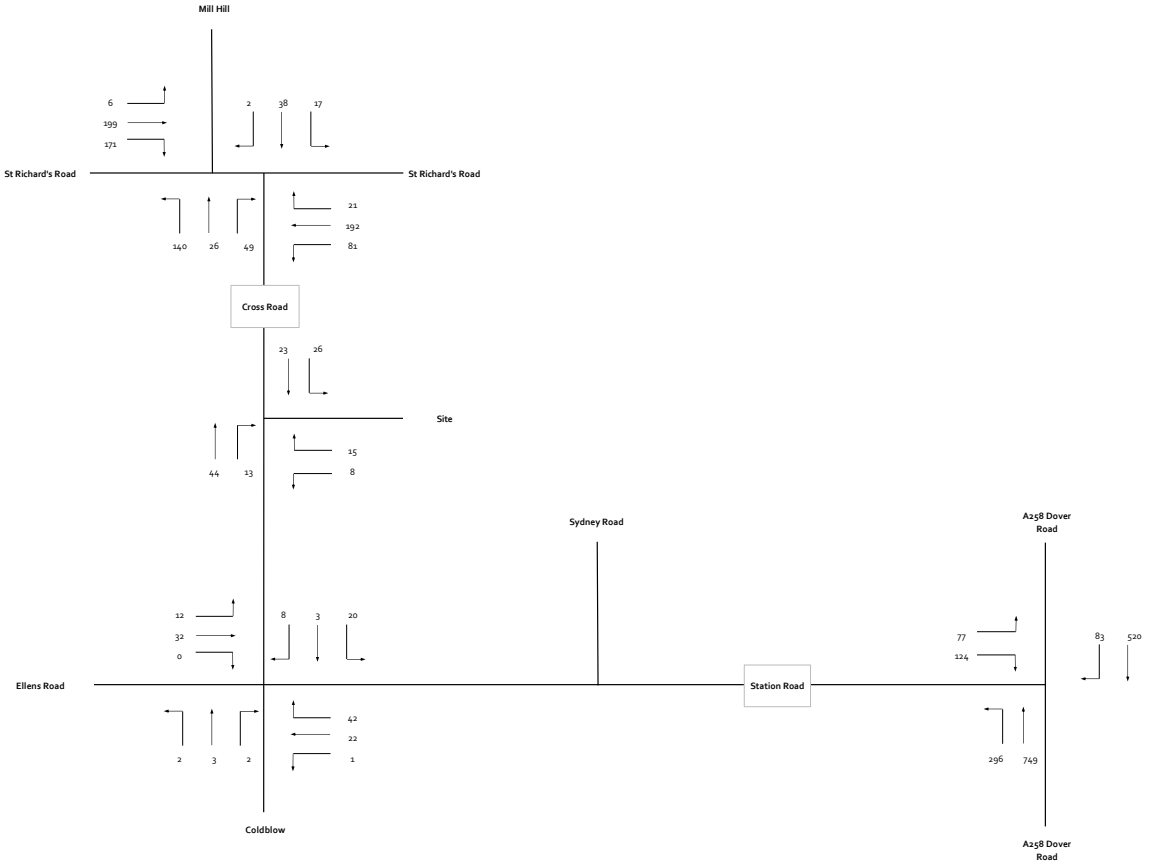

Figure 14 - 2022 With Development Flows - PM Peak

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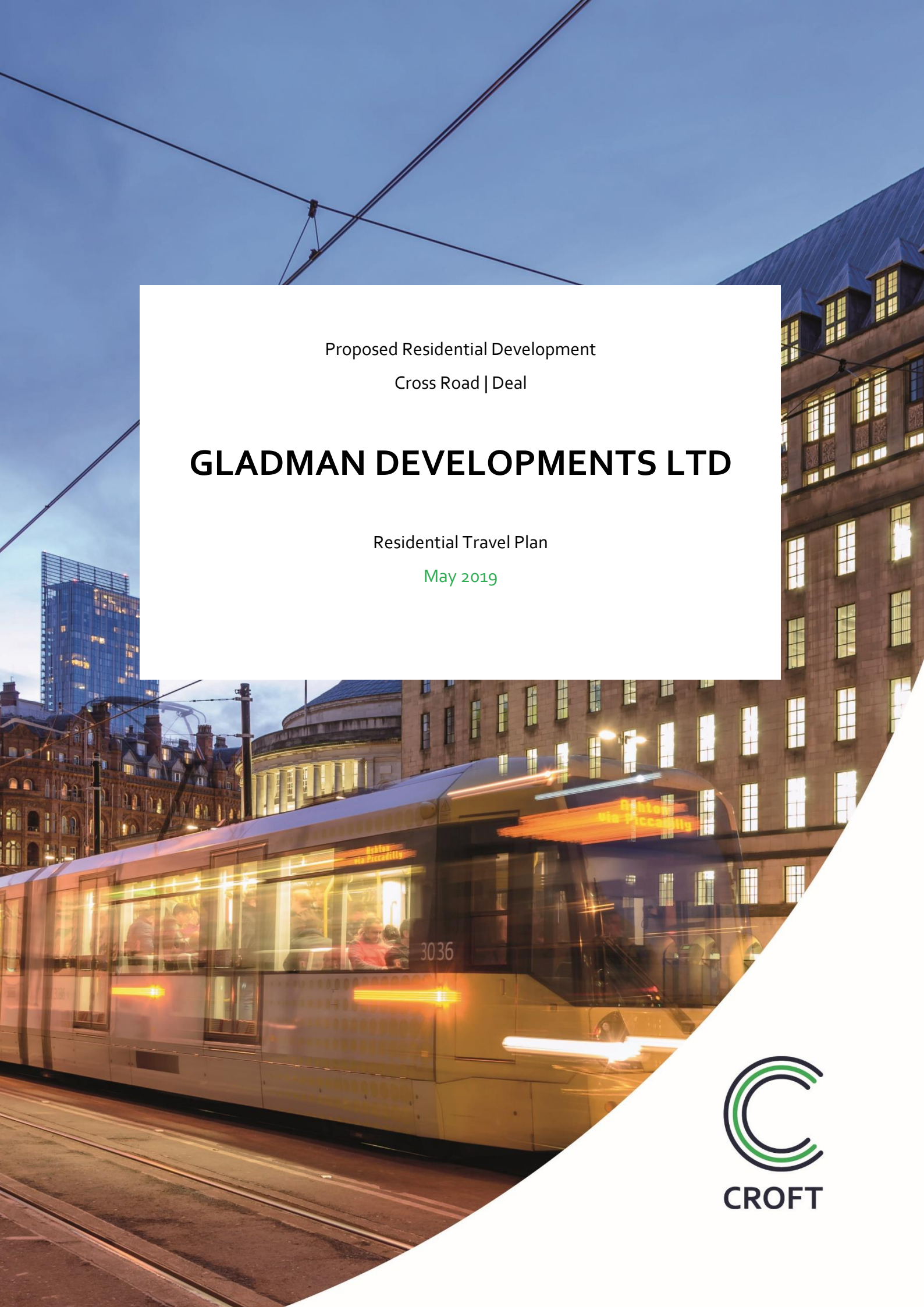
APPENDICES

APPENDIX 1

Framework Travel Plan



Proposed Residential Development

Cross Road | Deal

GLADMAN DEVELOPMENTS LTD

Residential Travel Plan

May 2019

CROFT

REPORT CONTROL

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Contents

PLANS

(See Transport Assessment)

1 INTRODUCTION

1.1 Preamble

1.1.1 Croft have been instructed by Gladman Developments Ltd to advise on the traffic and transportation issues relating to a proposed residential development on land to the east of Cross Road in Deal, Kent.

1.1.2 The location of the site in relation to the surrounding area is presented in **Plan 1,** contained within the Transport Assessment (TA).

1.1.3 This Travel Plan Framework will set out the principal strategies that will be put in place once the development is open and residents are occupying the dwellings, to encourage sustainable travel to the development.

1.1.4 The Department for Transport has issued two separate guides on the preparation of travel plans which are of relevance to this proposed development, these documents are as follows;

- Making Residential Travel Plans Work - Published in September 2005.
- Good Practice Guidelines: Delivering Travel Plans through the Planning Process - Published in April 2009.

1.2 Structure of the Travel Plan

1.2.1 Following this introduction, Section 2 details Travel Plan Policy and guidance and presents the 'Travel Plan Pyramid'.

1.2.2 Section 3 sets out a series of management measures that will be implemented as part of the Travel Plan.

1.2.3 Section 4 of the Travel Plan considers the accessibility of the site by non-car modes, including walking, cycling and public transport. Section 5 discusses targets for reducing trips by the private car while Section 6 details the monitoring of the Travel Plan.

1.2.4 Section 7 draws together the findings and conclusions.

1.3 Development Proposals

1.3.1 It is proposed to develop the site to provide up to 100 residential dwellings. The residential development will comprise a mix of house types including an element of affordable units.

1.3.2 The proposed site will be served via a vehicular access point located off Cross Road, to the north of the site.

1.3.3 The proposed indicative site masterplan is included within other documents submitted as part of the planning application.

1.3.4 Pedestrian and cycle access into the site will be afforded via the proposed vehicular access point into the development from Cross Road as well as via connections to Station Road and Sydney Road. These connections link with existing pedestrian infrastructure located within the vicinity of the site providing links to nearby amenities.

1.4 The Travel Plan

1.4.1 The aim of the Travel Plan is as follows:

- To encourage residents and visitors to use alternatives to the private car;
- To increase the awareness of the advantages and potential for travel by more environmentally friendly modes; and

- To introduce a package of management measures that will facilitate travel by modes of transport other than the private car.

1.5 Residents Travel Pack

1.5.1 The principal measure will consist of a Residents Travel Pack containing relevant material to promote non-car modes of travel and the provision of certain physical measures. This will be discussed further in Section 3.

2 TRAVEL PLANNING POLICY AND GUIDANCE

2.1 Travel Planning Policy

2.1.1 The need to manage transport in new developments is included within national and local policy. The need to reduce car dependency, increase travel choices and encourage sustainable distribution is supported by the National Planning Policy Framework (NPPF) which states that all developments which generate significant amounts of movement should be required to provide a Travel Plan.

2.1.2 The NPPF further reinforces the importance of travel plans in the planning context and states "*Travel Plans should be considered in parallel to development proposals and readily integrated into the design and occupation of a new site".*

2.2 Travel Planning Guidance

2.2.1 The preparation and adoption of a Travel Plan is an important element of managing the demand for travel to all modern developments.

2.2.2 The document, entitled *'Good Practice Guidelines: Delivering Travel Plans through the Planning Process'* sets out an overview of the process and delivery of Travel Plans and states that "*A Travel Plan is a long-term management strategy for an occupier or site that seeks to deliver sustainable transport objectives through positive action and is articulated in a document that is regularly reviewed*."

2.2.3 The DfT document entitled "*Making Residential Travel Plans Work"* states that *Travel Planning is one of a range of measures known as smarter choices which have been found to be effective on reducing traffic and improving accessibility in residential areas" and goes on to say "Travel Planning is one of a range of measures known as smarter choices which have been found to be effective on reducing traffic and improving accessibility in residential areas".*

2.2.4 The DfT's *'Making Residential Travel Plans Work'* also introduces the concept of a 'Travel Plan Pyramid'. This helps demonstrate how successful plans are built on the firm foundations of a good location and site design. The pyramid is presented in **Figure 2.1** below;

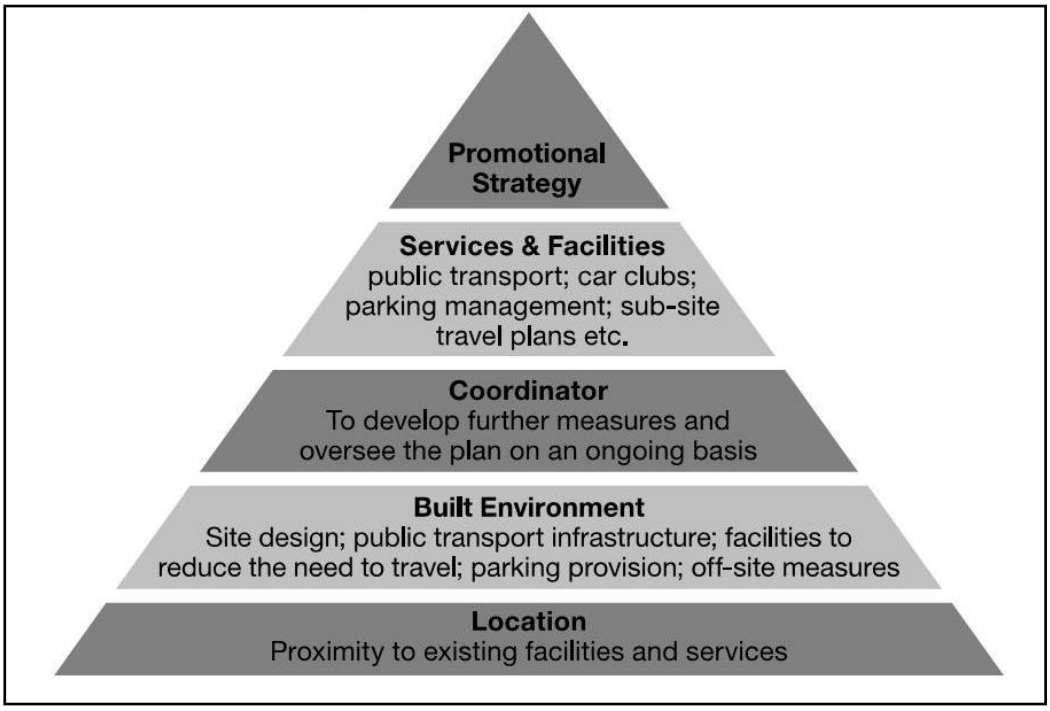


Figure 2.1 – The Travel Plan Pyramid

2.2.5 The hierarchy of 5 tiers of measures and criteria are well illustrated in pyramid form since the concept presented within that "good practice" is that each higher layer builds upon the more important foundations of the criteria and initiatives below it.

2.2.6 The most important layer of the pyramid is considered to be the base, this shows the key to making Travel Plans work is the actual location of the development and its proximity to local facilities and services essential to everyday life.

2.2.7 The second layer of the pyramid refers to how the layout of the site can assist in reducing the need to travel, which in this instance is again linked to the existing level of provision to facilitate sustainable travel.

2.2.8 As indicated in level 3 of the pyramid, the Travel Plan co-ordinator will be free to develop further measures to maximise the sustainability of the site.

2.2.9 The fourth layer of the pyramid looks at how parking management and public transport can influence travel choice, while the top layer of the pyramid relates to how the Travel Plan will be marketed and how the measures within are to be promoted.

3 MANAGEMENT MEASURES

3.1 Introduction

3.1.1 The following Travel Plan measures will be implemented:

i) Appointment of Travel Plan Co-ordinator

ii) Resident's Travel Pack

iii) Travel Awareness and Information

iv) Promotion of Lift Share Scheme

v) Encouraging Walking/Cycling

vi) Encouraging Home Working and Delivery Services

vii) Encouraging Travel by Public Transport

viii) Marketing and Promotion

3.2 Appointment of Travel Co-ordinator

3.2.1 A Travel Plan Co-ordinator (TPC) is to be appointed by the housebuilder or developer at least one month before the first properties being occupied.

3.2.2 The TPC will be responsible for all aspects of the Travel Plan.

3.2.3 Their primary functions will be as follows;

- Liaison with the local planning and highways authorities;
- Provision of a Residents Travel Pack containing information for residents;

- Promotion of the sustainable transport options available to residents, including public transport, cycle, walking and car sharing schemes; and
- Maintenance of all necessary systems, data and paperwork.

3.2.4 The role of the TPC will also be to develop and manage the Travel Plan for the site.

3.2.5 The duties will include monitoring, reviewing targets and forming action plans to remedy areas where the Travel Plan in not performing. Annual progress reports will be prepared and submitted to the Council.

3.2.6 Details of the nominated TPC will be submitted to the Planning and Highway Authority and the appropriate local bus companies at least one month prior to first occupation at the site. Similarly, the TPC will be advised of appropriate contact personnel at the Council.

3.3 Resident's Travel Pack

3.3.1 It is an important and emerging principle in residential developments that where appropriate, the implementation of travel plan type measures can establish a pattern of travel behaviour favouring sustainable modes from the inception of the development.

3.3.2 The proposed development is very well placed for encouraging access on foot or by cycle to a wide range of facilities. Similarly, the existence of a local bus and rail services will encourage choice of public transport as a primary means of travel for the development.

3.3.3 However, in order to build on these locational advantages, it is recommended that a Residents' Travel Pack is provided for the occupants of each new dwelling.

3.3.4 The contents of such a travel pack would include information relating to walking and cycling routes in the area and the provision of up to date bus and rail timetable information, as well as identification of the location of nearby amenity facilities as part of the information supplied to prospective purchasers.

3.3.1 The contents of the packs will vary depending upon the information available on sources such as the internet or local bus stops.

3.3.2 However, the Travel Packs will include:

- Information about the local area, e.g. location, distance and directions to local shops, schools, Post Offices, Doctor Surgeries, Hospitals, Banks, Libraries, Parks, attractions and other local amenities.
- Copies of the most recently published public transport information.
- Details of web sites and other sources of information which can be accessed in the future such as:
    - Public Transport - Links to timetable information e.g. www.traveline.org.uk and www.nationalrail.co.uk
    - Car Sharing - Links to websites that co-ordinate car sharing such as www.carshare.com, www.liftshare.org.uk and www.nationalcarshare.co.uk to encourage car sharing.
    - Cycling - Link to the UK's National Cyclists Organisation website www.ctc.org.uk and Sustrans www.sustrans.org.uk
    - Local Amenities - local supermarkets offering internet shopping would reduce the need for car travel.

3.3.3 The adoption of such travel packs is recognised as being an important element in ensuring that access by non-car modes is promoted from the earliest occupation of a residential development. Within the Resident's Welcome Pack, residents will be encouraged to consider ways in which to reduce their need to travel such as home delivery for shopping and working from home.

3.3.4 The first issue of the Resident's Travel Pack will be the responsibility of the house builder.

3.4 Travel Awareness and Information

3.4.1 Residents will be made aware of the existence of the Travel Plan and its aims. As mentioned previously, Resident's Travel Packs will be issued for new residents moving into the development and prospective buyers will be made aware of the Travel Plan when viewing properties.

3.5 Promotion of Lift Share Scheme

3.5.1 The Travel Plan Co-ordinator will promote the use of car sharing via registering on the Liftshare website. It allows users to register their details, where they are travelling to, if they are offering a lift or need a lift to their destination.

3.5.2 The website can be found at the following location www.liftshare.com

3.6 Encouraging Walking/Cycling

3.6.1 Residents will be provided with information and advice concerning safe pedestrian and cycle routes to the site through the WalkBUDi/BikeBUDi schemes.

3.6.2 Information on these schemes is available on the following websites www.walkbudi.com and www.bikebudi.com.

3.6.3 The WalkBUDi/BikeBUDi schemes are part of the National Lift Share Network and are simple and free to use. They simply match individuals with others walking or cycling the same way so they can walk or cycle together. The matches are displayed in both table and map format, allowing the user to easily find the most suitable people.

3.6.4 The WalkBUDi/BikeBUDi schemes aim to help individuals to meet others wanting to travel the same way. They can be used for regular trips such as walking or cycling to the office or going to the station as well as making a journey safer.

3.6.5 As part of these schemes the provision of walking/cycling signage will be investigated by the Travel Plan Co-ordinator, this signage could provide details on the routes and distances to and from local services and amenities in the area.

3.7 Encouraging Travel by Public Transport

3.7.1 The TPC will liaise with the local bus operators to promote the use of bus and rail services and ensure that up to date timetable information is readily available to residents.

3.7.2 Travel by public transport will be promoted and residents will be encouraged to access the public transport information provided on relevant websites, as well as utilising the Journey Planning tools available.

3.8 Marketing and Promotion

3.8.1 To ensure that potential residents of the site are informed about the Travel Plan and its goals from the earliest stage, the Travel Plan will have a significant presence within the sales suite of the development which will include a display outlining the sustainable travel measures being implemented and details of access by sustainable travel modes.

3.8.2 The sales staff will be given training to promote the Travel Plan as an asset and selling point of the development and key concepts relating to accessibility included in marketing/sales particulars.

4 ACCESSIBILITY BY NON CAR MODES

4.1 Introduction

4.1.1 In order to accord with the aspirations of the NPPF, any new proposals should extend the choice in transport and secure mobility in a way that supports sustainable development.

4.1.2 New proposals should attempt to influence the mode of travel to the development in terms of gaining a shift in modal split towards non-car modes, thus assisting in meeting the aspirations of current national and local planning policy.

4.1.3 The accessibility of the proposed site has been considered by the following modes of transport:

- Accessibility on foot.
- Accessibility by cycle.
- Accessibility by bus.
- Accessibility by rail.

4.2 Accessibility on Foot

4.2.1 It is important to create a choice of direct, safe and attractive routes between where people live and where they need to travel in their day-to-day life. This philosophy clearly encourages the opportunity to walk whatever the journey purpose and also helps to create more active streets and a more vibrant neighbourhood.

4.2.2 The nearest footways are located approximately 110 metres from the centre of the site on Station Road with a width of around 2 metres. These footways provide pedestrian links throughout Walmer and Deal and provide direct linkages to the nearby day to day amenities within the town. Nearby local amenities include educational institutions, healthcare, employment opportunities, recreational facilities, and retail establishments.

4.2.3 The CIHT document 'Planning for Walking' from 2015 states, in paragraph 2.1, that in 2012 that 79% of all journeys made in the UK of less than a mile (1.6 kilometres) are carried out on foot.

4.2.4 Within the Institution of Highways and Transportation (IHT) document, entitled "Guidelines for Providing for Journeys on Foot", Table 2.2 suggests distances for desirable, acceptable and preferred maximum walks to 'town centres', 'commuting/schools' and 'elsewhere'. The 'preferred maximum' distances are shown below in **Table 4.1**.

Suggested Preferred Maximum Walk		
Town Centre	**Commuting/School**	**Elsewhere**
800m	2,000m	1,200m

Table 4.1 – IHT 'Providing for Journeys on Foot' Walk Distances

4.2.5 Reference to the 2,000 metre walk distance is also made in the now superseded Planning Policy Guidance (PPG) Note 13 which advised that 'walking is the most important mode of travel at the local level and offers the greatest potential to replace short car trips, particularly under 2km'.

4.2.6 Manual for Streets (MfS) continues the theme of the acceptability of the 2,000 metre distance in paragraph 4.4.1. This states that '*walkable neighbourhoods are typically characterised by having a range of facilities within 10 minutes' (up to about 800m) walking distance of residential areas which residents may access comfortably on foot. However, this is not an upper limit and PPS13 states that walking offers the greatest potential to replace short car trips, particularly those under 2 km*'.

4.2.7 **Table 4.2** below summarises this guidance in tabular form.

'Comfortable' Walk	'Preferred Maximum' Walk
800m	2,000m

Table 4.2 – Manual for Streets Walk Distances

4.2.8 More specific guidance on the distances that children will walk to school is found in the July 2014 document published by the Department for Education (DfE) entitled 'Home to School Travel and Transport' statutory guidance document. This suggests that the maximum walking distance to schools is 2 miles (3.2 kilometres) for children under 8 and 3 miles (4.8 kilometres) for children over the age of 8. This is summarised below in **Table 4.3**.

Children under 8 Walk Distance	Children over 8 Walk Distance
3,200m	4,800m

Table 4.3 – DfE Walk Distances to Schools

4.2.9 Further evidence that people will walk further than the suggested 'preferred maximum' distances in the IHT 'Providing for Journeys on Foot' is contained in a WYG Report entitled 'Accessibility – How Far do People Walk and Cycle'. This report refers to National Travel Survey (NTS) data for the UK as a whole, excluding London, that the 85th percentile walk distance for:

- All journey purposes – 1,930 metres.
- Commuting – 2, 400 metres.
- Shopping – 1,600 metres.
- Education – 3,200 or 4,800 metres.
- Personal business – 1,600 metres.

4.2.10 Overall, in Table 5.1, the document states that 1,950 metres is the 85th percentile distance for walking as the main mode of travel. **Table 4.4** below summarises the various 85th percentile walk distances suggested as guidelines in the WYG Study.

85th Percentile Walk Distances					Overall Recommended Preferred Max
All Journeys	Commuting	Shopping	Education	Personal	
1,950m	2,100m	1,600m	3,200/4,800m	1,600m	1,950m

Table 4.4 – WYG Report/NTS Data Walk Distances

4.2.11 In summary, it is considered that the distance of 1,950 metres, or around 2 kilometres, represents an acceptable maximum walking distance for the majority of land uses although clearly the DfE guidance for walking to school is up to 3.2 kilometres.

4.2.12 Section 3.1 of the CIHT guidance 'Planning for Walking' mentioned earlier in this report provides a useful reminder of the health benefits of walking. This states that:

'A brisk 20 minute walk each day could be enough to reduce an individual's risk of an early death'.

4.2.13 A 20 minute walk equates to a walking distance of around 1,600 metres.

4.2.14 In light of the above review, a pedestrian catchment of 2 kilometres from the centre of the site, using all usable pedestrian routes, has been provided in **Plan 4** of the accompanying Transport Assessment and provides an illustrative indication of the areas that can be reached based on a leisurely walk from the site.

4.2.15 In addition, to the pedestrian catchment plan, a review of the proximity of local facilities has been undertaken and the location of these is also shown in Plan 4.

4.2.16 The 2,000 metre pedestrian catchment illustrates that the majority of Walmer can be accessed along with various amenities such as a Londis (Dover Road), Walmer Pharmacy, Gilliver News, St Mary's Catholic Primary School, The Cooperative, Goodwin Academy, Parnham's Newsagents, Premier Convenience Store and the Telegraph Public House.

4.2.17 **Table 4.5** below, shows the walking distance from the centre of the site to the local amenities in the vicinity of the site. The table also confirms whether or not the particular amenity is within the 'preferred maximum' walk distances using the above guideline criteria:

Local Amenity	Distance	Guidance Criteria	Meets with Guidance?
Londis (Dover Road)	650m	1,600m	**YES**
Walmer Pharmacy	790m	1,600m	**YES**
Gilliver News	830m	1,600m	**YES**
St Mary's Catholic Primary School	950m	3,200m	**YES**
The Cooperative	1,060m	1,600m	**YES**
Goodwin Academy Secondary School	1,400m	4,800m	**YES**
Parnham's Newsagents	1,450m	1,600m	**YES**
Premier Convenience Store	1,600m	1,600m	**YES**
Telegraph Public House	1,870m	1,950m	**YES**

Table 4.5 - Distance from Site to Local Facilities

4.2.18 As can be seen in the above table, the site is located within close proximity to a number of local amenities including primary services as well as leisure facilities.

4.2.19 All of the day to day amenities are well within the 'preferred maximum' walk distances described earlier in this section and indeed many, including the nearest convenience store, pharmacy and nearest primary school, are around the 800 metres 'comfortable walk' from the site as contained within MfS guidance.

4.2.20 It is therefore considered that the existing pedestrian infrastructure will facilitate safe and direct pedestrian linkages between the site and local destinations.

4.3 Access by Cycle

4.3.1 An alternative mode of travel to the site could be achieved by bicycle.

4.3.2 A distance of 5 kilometres is generally accepted as a distance where cycling has the potential to replace short car journeys. This distance equates to a journey of around 25 minutes based on a leisurely cycle speed of 12 kilometres per hour and would encompass Kingsdown, East Studdal, Northbourne and Hacklinge.

4.3.3 National cycle route 1 is located approximately 1.6 kilometres from the centre of the site. This cycle route runs from Colchester and the Shetland Islands forms the majority of the British part of the North Sea Cycle Route.

4.3.4 The site can therefore be considered as being accessible by cycle.

4.4 Access by Bus

4.4.1 The nearest bus stop is located to the east of the site on Court Road within an approximate walking distance of 400 metres, around a 5 minute walk, from the centre of the site. The stop consists of a bus stop pole with passing services shown and bus timetable information. All the nearest bus stops to the site are shown on Plan 4.

4.4.2 A summary of the services available from the nearest bus stops from the development site is provided in **Table 4.6** below.

Service No	Route	Monday – Friday Frequency per hour				Sat	Sun
		AM Peak	Midday	PM Peak	Eve		
80	Sandwich - Dover	1	0	1	0	0	0
81	Sandwich -Dover	1	1	2	0	1	0.5
83	Deal – Walmer - Deal	1	1	1	0	1	0

Table 4.6 - Existing Bus Services Operating Close to the Site

4.4.3 As can be seen from Table 4.6, the nearest bus stops provide access to up to 4 services in peak periods to Dover and Sandwich.

4.4.4 It is noted that the above services provide a choice of how people travel with the bus services operating from around 7am to around 9pm, making travel by public transport a real alternative to travelling by car.

4.4.5 In order to demonstrate the level of accessibility some example journey times by bus are presented below **Table 4.7** below.

Destination	Duration
Dover town centre	29 minutes
Sandwich	44 minutes

Table 4.7 - Example Bus Journey Times from the Site

4.4.6 The above table demonstrates that Dover town centre is just a 29-minute bus journey from the site and Sandwich is just a 44-minute bus journey.

4.4.7 It is therefore concluded that the proposed development site is accessible by bus.

4.5 Accessibility by Rail

4.5.1 The nearest train station to the site is Walmer which is situated approximately 490 metres to the east of the site, around a 6 minute walk. This train station is managed by Southeastern and has 2 platforms, offering 4 services per hour to destinations such as Ramsgate and London St Pancras International.

4.5.2 This provides opportunities to travel to and from the site via rail.

4.6 Accessibility Summary

4.6.1 The proposals have been considered in terms of accessibility by non-car modes for the proposed residential development.

4.6.2 The following conclusions can be drawn from this section of the report:

- The site is accessible on foot and these connections will be improved as part of the works on the development site.
- The services from the bus stops on Court Road, travelling to Dover and Sandwich, demonstrates that the proposed development can be accessed by bus.
- The site is accessible via rail with Walmer train station located around 490 metres, around a 6 minute walk, from the site.

4.6.3 In light of the above, it is considered the site is highly accessible by non-car modes and will cater for needs of the development's residents and assist in promoting a choice of travel modes other than the private car.

5 TRAVEL PLAN TARGETS

5.1 Introduction

5.1.1 This section of the Travel Plan deals with the post development scenario i.e. once the development is complete, occupied and the Travel Plan has been implemented and relates to targets against which the success of the Plan in achieving its objectives will be measured.

5.1.2 The targets are designed to be quantifiable, be relevant to both measures and objectives identified in the Plan and to include timescale.

5.1.3 In order to set the targets, further information (e.g. through a travel survey) may have to be obtained in order to establish against which to set the targets. This information will be related to existing patterns of movement (i.e. the proportion of residents who travel to their workplace by non-car mode) and may be obtained from sources such as the National Travel Survey and the National Census.

5.1.4 More accurate information to establish the baseline targets however, will be obtained from a Residents Travel Survey which will be undertaken within one month of the development being 75% occupied.

5.1.5 Suitable targets for reducing the need to travel by private car will be set against the baseline targets and agreed with the Council and included in the final Residential Travel Plan for the whole development.

5.2 Potential Targets

5.2.1 The targets are designed to be quantifiable, be relevant to both measures and objectives identified in the Plan and to include timescale.

5.2.2 Targets which according to the DfT may potentially be included in the Travel Plan include the following:

- Car trips per household - targets set on the basis of predicted trip rates for the development.
- Uptake of alternatives - targets for bus patronage, registration and participation in the Liftshare car share scheme, cycle counts and pedestrian counts.
- Car ownership and mode of travel - trip based targets may be supplemented by targets related to car ownership, travel to work by mode and travel to school by mode.
- Travel Plan awareness targets - for example, a target can be established to ensure a significant percentage of residents are aware of the Travel Plan and its purpose.

5.3 Action Plan

5.3.1 **Table 5.1** below provides an Action Plan and timescales to assist the Travel Plan Co-ordinator (TPC) to implement the obligations of the Travel Plan;

Action	Target Date	Indicator/Measured by	Responsibility
Appointment of TPC	TPC appointed one month prior to first occupation of site	Appointment of TPC by target date	Housebuilder
Production of Residents Travel Pack	Upon Occupation	Resident travel survey	Housebuilder
Undertake initial travel surveys	Within 1 month of reaching 75% occupation of development	Receipt of survey results	TPC
Agree Travel Plan Targets	1 month after initial travel survey undertaken	Receipt of written agreements of targets	TPC
Achieve target car driver travel to work mode split	5 years after initial travel survey	Residents travel surveys conducted in years 1, 3 and 5	TPC

Table 5.1 – Travel Plan Action Plan and Timescales

5.3.2 The table above sets out the key tasks that will need to be undertaken by the Travel Plan Co-ordinator as part of the Travel Plan including guidance as to timescales for the tasks to be undertaken.

6 PLAN MONITORING AND ASSESSMENT

6.1.1 DfT best practice guidelines state that monitoring of the Travel Plan should normally take place on the following basis:

- Early on in the occupation period of the site - for example, triggered by 75% occupancy to provide the information base for the review of the plan;
- Annually or at least every two years thereafter to provide on-going information on the impact of the plan;
- Monitoring should take place over a wide range of time periods to reflect the different pattern of journeys that can be generated by residential development.

6.1.2 The monitoring could include items such as:

- Full residential surveys to be completed in year 1, year 3 and year 5 and snap shot surveys to be completed every 6 to 12 months.
- Feedback from bus operators to establish demand for local bus services.

6.1.3 Once planning permission has been granted, consideration will be given on how best to monitor and measure the success of the Travel Plan measures when preparing the final Travel Plan for the development. Appropriate monitoring arrangements will be discussed and agreed with the Council.

6.1.4 The monitoring and assessment of the Travel Plan will include the submission of annual progress reports detailing the results of the travel surveys with regards to targets, budgets, general effectiveness and current initiatives.

6.1.5 An annual report is to be submitted to the local authority no later than one month following the anniversary of the approval of the Travel Plan.

6.1.6 This will allow effective measures to be promoted and increased while ineffective measures can be revised and rectified. New initiatives for the coming year will also be contained within the report and submitted to officers at the Council.

7 CONCLUSIONS

7.1.1 This Travel Plan has detailed the proposals associated with the development site to promote sustainable modes of travel and reduce the dependency of the private car.

7.1.2 Additionally, the Travel Plan has presented a series of measures to be implemented to reduce the number of single car occupancy trips.

7.1.3 The information contained within the Travel Plan and details of sustainable modes of transport in the vicinity of the site will be accessible to residents and visitors to the development. The aim of the Travel Plan is:

- to encourage residents to use sustainable modes of transport to access the site;
- reduce the reliance on single car occupancy journeys; and
- generally reduce traffic related pollution and noise.

7.1.4 A wide range of measures and actions will be used to encourage car sharing, public transport use, cycling and walking.

7.1.5 The Travel Plan Co-ordinator will ensure the Travel Plan is implemented and is operating effectively.

7.1.6 A detailed resident Travel Survey will be undertaken to establish travel modes of residents and following this, specific targets will be set and agreed with the Travel Plan team at the Council.

7.1.7 The site has been demonstrated to benefit from excellent non-car accessibility and it should, therefore, be expected that the adoption of a Travel Plan would be particularly effective.

7.1.8 It can therefore be concluded that the proposals will provide a highly sustainable development and should be considered acceptable to the local highway authority.

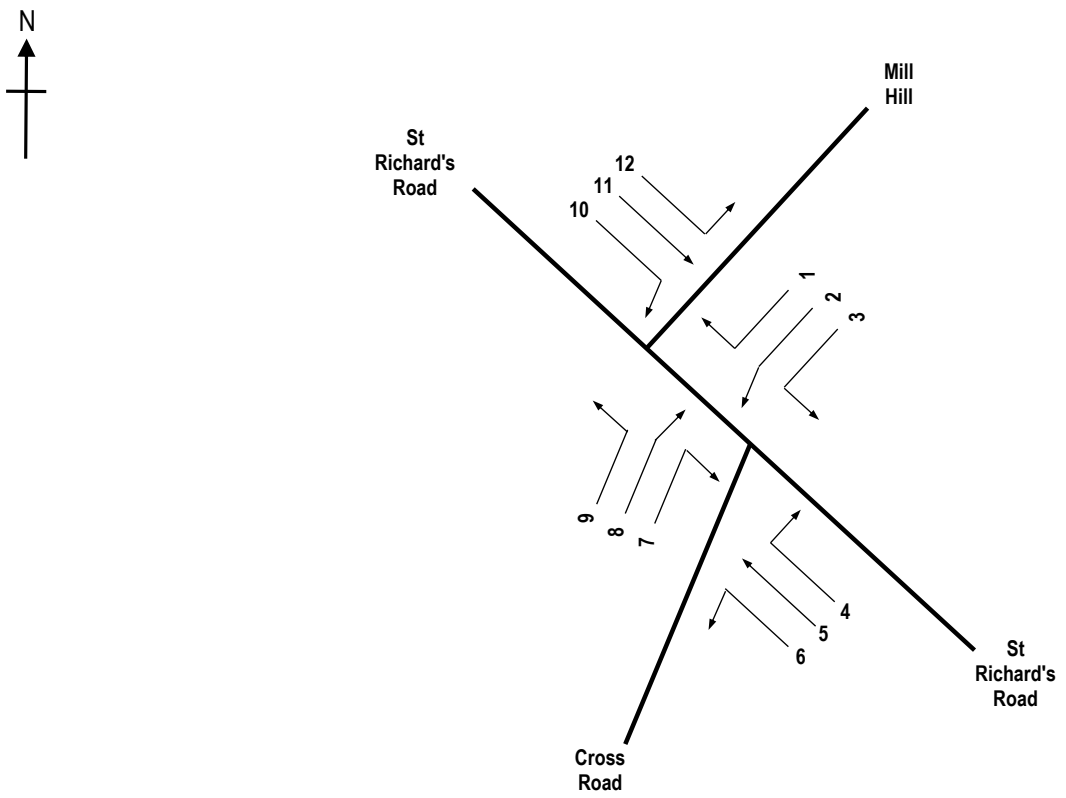
APPENDIX 2

Traffic Survey Data

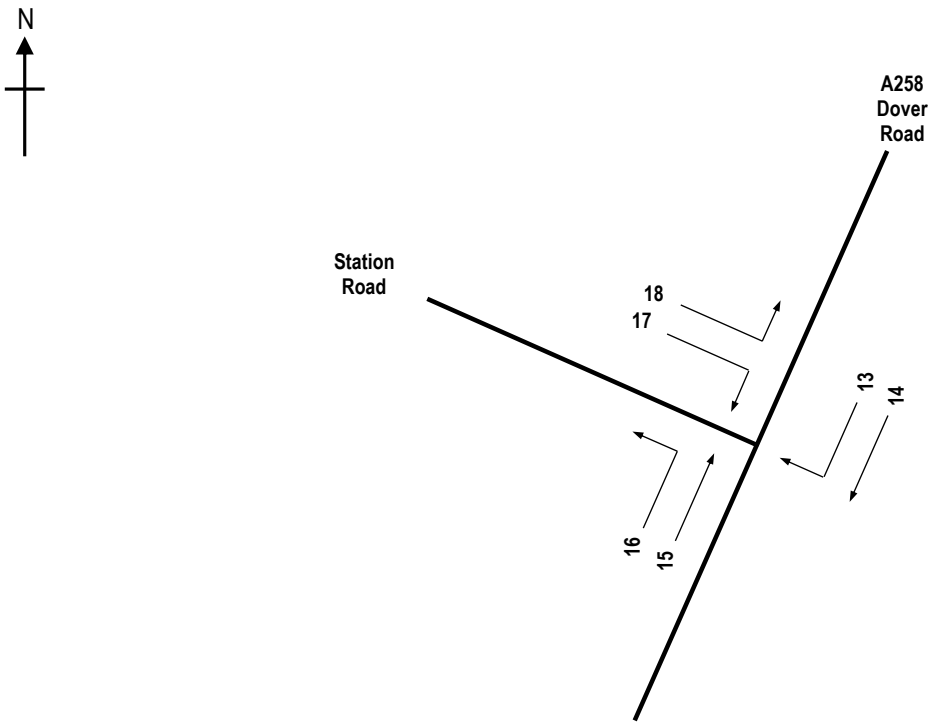
SURVEY CONTROL

Client:	Croft Transport Planning & Design
Client Contact:	Mark Cleary
Survey Location:	Walmer
Date(s) of Survey:	Wednesday 1 May 2019
Notes:	
On Site Supervisor:	Neil Harley
Data Checking:	David Cheng
Survey Reference:	2019.091 Walmer
Status:	Final
Date of Issue:	2 May 2019

JUNCTION 1



JUNCTION 2

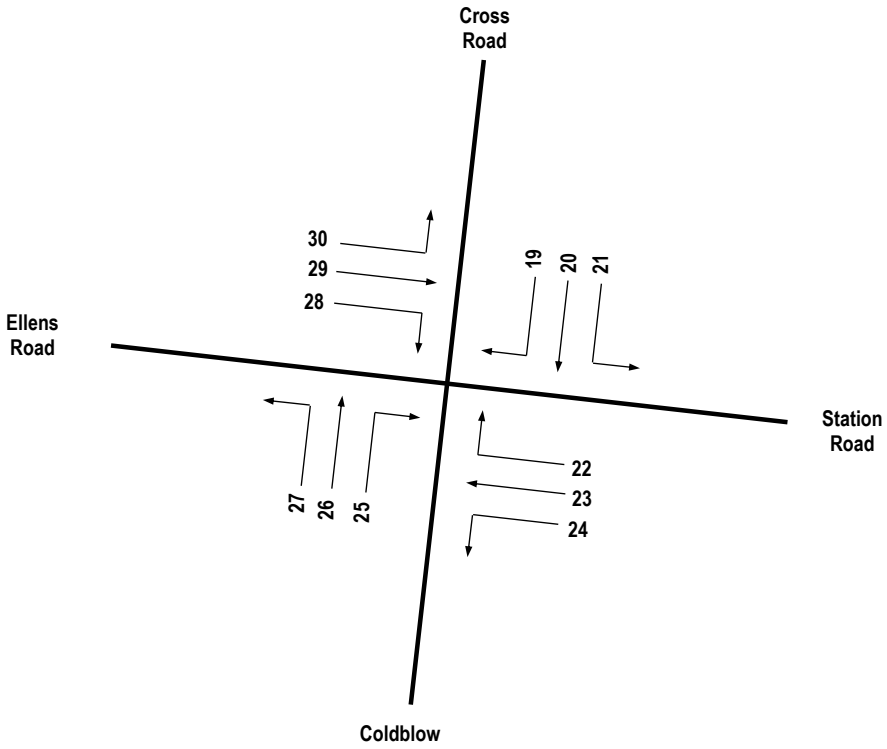


DRAWING TITLE: **TRAFFIC MOVEMENT REFERENCE**			
JOB TITLE: **2019.091 WALMER**			
DRAWN BY: DC	DATE: MAY 2019	SCALE: NTS	REF: FIGURE 1

signal surveys
Traffic Counts and Car Park Surveys
Parkway House, Palatine Road, Northenden, Manchester, M22 4DB
Tel 0161 998 4226

N

JUNCTION 3



DRAWING TITLE: **TRAFFIC MOVEMENT REFERENCE**			
JOB TITLE: **2019.091 WALMER**			
DRAWN BY: DC	DATE: MAY 2019	SCALE: NTS	REF: FIGURE 2

signal surveys

Traffic Counts and Car Park Surveys

Parkway House, Palatine Road, Northenden, Manchester, M22 4DB

Tel 0161 998 4226

Time Beginning	Mill Hill/St Richard's Road/Cross Road - Wednesday 1 May 2019																							
	1		2		3		4		5		6		7		8		9		10		11		12	
	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV
0730	2	0	4	0	5	0	0	0	42	0	7	1	3	0	3	0	32	3	14	1	54	0	3	0
0745	0	0	4	0	9	0	3	0	45	0	12	0	9	2	2	0	30	0	15	0	60	0	5	0
0800	2	0	5	0	5	0	0	0	36	0	8	2	14	0	1	0	29	2	16	1	56	0	2	0
0815	2	0	7	0	6	0	2	0	31	0	5	0	13	0	1	0	33	0	25	1	48	1	3	0
0830	4	0	8	0	6	0	5	0	45	0	17	2	26	0	5	0	41	2	22	1	50	1	2	0
0845	1	0	4	0	4	0	3	0	47	0	12	0	15	0	4	0	29	2	15	1	38	0	2	0
0900	0	0	10	0	6	0	1	0	41	0	16	1	13	0	4	0	42	3	16	0	44	1	1	0
0915	0	0	2	0	1	0	1	0	22	0	18	0	9	0	4	0	17	1	19	2	41	1	2	0

Time Beginning	Mill Hill/St Richard's Road/Cross Road - Wednesday 1 May 2019																							
	1		2		3		4		5		6		7		8		9		10		11		12	
	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV
1630	2	0	6	0	8	0	0	0	40	0	15	1	11	0	1	0	35	1	35	1	37	0	0	0
1645	1	0	8	0	3	0	4	0	65	1	8	0	8	0	3	0	30	1	39	0	41	0	3	0
1700	1	0	10	0	7	0	5	0	33	1	22	1	18	0	5	0	36	0	29	0	55	0	2	0
1715	0	0	9	0	3	0	7	0	34	0	18	0	7	0	11	0	29	0	37	0	47	0	1	0
1730	0	0	6	0	3	0	4	0	46	0	18	1	8	1	4	0	23	2	39	2	42	2	0	0
1745	2	0	6	0	2	0	0	0	26	0	24	0	13	0	5	0	27	1	41	1	39	0	1	0
1800	2	0	11	0	5	0	3	0	28	0	11	1	15	0	4	0	21	0	33	0	44	0	0	0
1815	2	0	9	0	1	0	1	0	38	0	18	0	7	0	8	0	35	0	24	1	43	0	0	0

Time Beginning	Station Road/A258 Dover Road - Wednesday 1 May 2019											
	13		14		15		16		17		18	
	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV
0730	17	1	206	1	72	4	21	3	41	0	13	0
0745	8	0	209	3	100	3	23	0	41	5	10	0
0800	11	1	232	4	103	4	31	3	29	1	6	0
0815	9	3	187	3	92	4	20	0	34	0	10	1
0830	13	0	147	9	94	5	21	2	38	3	14	0
0845	23	0	144	0	132	4	16	1	29	0	20	0
0900	9	0	147	5	109	7	33	2	26	3	12	0
0915	5	2	122	3	96	3	20	1	33	2	16	0

Time Beginning	Station Road/A258 Dover Road - Wednesday 1 May 2019											
	13		14		15		16		17		18	
	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV
1630	15	0	119	3	162	1	53	1	11	1	14	0
1645	13	0	125	2	156	3	54	0	23	0	15	0
1700	13	0	139	4	173	1	53	0	20	2	12	0
1715	9	1	114	0	181	3	68	1	18	0	16	0
1730	14	0	94	5	182	3	56	1	25	1	13	0
1745	10	0	89	1	201	0	52	2	18	0	9	0
1800	13	0	87	0	169	1	62	2	26	1	14	0
1815	8	0	90	0	166	1	33	1	23	0	12	0

Time Beginning	Cross Road/Station Road/Coldblow/Ellens Road - Wednesday 1 May 2019																							
	19		20		21		22		23		24		25		26		27		28		29		30	
	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV
0730	1	0	0	0	3	0	6	0	6	0	0	0	0	0	0	0	0	0	0	0	11	0	2	0
0745	2	0	0	0	4	0	8	0	11	0	1	0	0	0	0	0	1	0	0	0	5	0	1	0
0800	0	0	1	0	2	0	3	1	8	0	0	0	0	0	1	0	0	0	0	0	2	0	1	0
0815	1	0	0	0	2	0	3	0	12	0	0	0	0	0	0	0	2	0	1	0	5	0	2	0
0830	4	0	0	0	3	0	5	1	10	0	0	0	0	0	1	0	0	0	0	0	5	0	1	0
0845	2	0	0	0	3	0	2	0	7	0	0	0	0	0	1	0	0	0	0	0	8	0	1	0
0900	0	0	0	0	2	0	8	0	4	0	1	0	2	0	2	0	0	0	0	0	0	0	3	0
0915	1	0	0	0	5	0	2	0	4	1	0	0	0	0	0	0	0	0	0	0	8	0	0	0

Time Beginning	Cross Road/Station Road/Coldblow/Ellens Road - Wednesday 1 May 2019																							
	19		20		21		22		23		24		25		26		27		28		29		30	
	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV
1630	3	0	0	0	0	0	14	0	5	0	0	0	0	0	0	0	1	0	0	0	5	0	4	0
1645	0	1	0	0	1	0	4	0	6	0	1	0	0	0	0	0	1	0	0	0	9	0	2	0
1700	2	0	0	0	3	0	9	0	5	0	0	0	0	0	1	0	0	0	0	0	9	0	3	0
1715	2	0	2	0	7	0	10	0	5	0	0	0	0	0	0	0	1	0	0	0	2	0	3	0
1730	0	0	0	0	3	0	8	0	3	0	0	0	2	0	1	0	0	0	0	0	8	0	1	0
1745	2	0	1	0	2	0	6	0	5	0	1	0	2	0	1	0	2	0	2	0	11	0	2	0
1800	0	0	0	0	4	0	11	0	9	0	0	0	0	0	2	0	0	0	0	0	4	0	2	0
1815	0	0	0	0	6	0	6	0	1	0	2	0	0	0	0	0	1	0	1	0	6	0	2	0

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APPENDIX 3

PICADY Output – St Richard's Road/Cross Road/Mill Hill

Junctions 8

PICADY 8 - Priority Intersection Module

Version: 8.0.6.541 [19821,26/11/2015]

For sales and distribution information, program advice and maintenance, contact TRL:
Tel: +44 (0)1344 770758 email: software@trl.co.uk Web: http://www.trlsoftware.co.uk

Filename: St Richard's Rd_Cross Rd_Mill Hill.arc8
Path: Z:\projects\2243 Cross Road, Deal\Picady
Report generation date: 05/05/2019 15:15:22

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
Existing Layout - 2022 Base Flows								
Stream B-ACD	1.01	14.77	0.51	B	0.80	13.29	0.45	B
Stream A-B	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-
Stream A-D	-	-	-	-	-	-	-	-
Stream AB-CD	0.07	5.09	0.05	A	0.24	5.30	0.11	A
Stream AB-C	-	-	-	-	-	-	-	-
Stream D-ABC	0.14	7.79	0.13	A	0.12	7.43	0.11	A
Stream C-D	-	-	-	-	-	-	-	-
Stream C-A	-	-	-	-	-	-	-	-
Stream C-B	-	-	-	-	-	-	-	-
Stream CD-AB	0.58	7.02	0.28	A	1.21	10.33	0.48	B
Stream CD-A	-	-	-	-	-	-	-	-
Existing Layout - 2022 With Dev Flows								
Stream B-ACD	1.29	16.94	0.57	C	0.94	14.48	0.49	B
Stream A-B	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-
Stream A-D	-	-	-	-	-	-	-	-
Stream AB-CD	0.08	5.06	0.05	A	0.25	5.30	0.12	A
Stream AB-C	-	-	-	-	-	-	-	-
Stream D-ABC	0.15	7.86	0.13	A	0.13	7.54	0.12	A
Stream C-D	-	-	-	-	-	-	-	-
Stream C-A	-	-	-	-	-	-	-	-
Stream C-B	-	-	-	-	-	-	-	-
Stream CD-AB	0.63	7.24	0.31	A	1.44	11.40	0.53	B
Stream CD-A	-	-	-	-	-	-	-	-

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

"D1 - 2022 Base Flows, AM " model duration: 07:30 - 09:00
"D2 - 2022 Base Flows, PM" model duration: 16:30 - 18:00
"D3 - 2022 With Dev Flows, AM" model duration: 07:30 - 09:00
"D4 - 2022 With Dev Flows, PM" model duration: 16:30 - 18:00

Run using Junctions 8.0.6.541 at 05/05/2019 15:15:18

File summary

Title	St Richard's Road/Cross Road/Mill Hill
Location	Walmer
Site Number	
Date	05/05/2019
Version	
Status	TIA
Identifier	
Client	
Jobnumber	2243
Enumerator	Mark Cleary
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

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

Existing Layout - 2022 Base Flows, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set(s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
Existing Layout	N/A		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
2022 Base Flows, AM	2022 Base Flows	AM		ONE HOUR	07:30	09:00	90	15				✓		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Do Geometric Delay	Junction Delay (s)	Junction LOS
1	St Richard's Road/Cross Road/Mill Hill	NS-OS Stagger (UK LR Stagger)	Two-way	A,B,C,D		10.56	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	St Richard's Road (E)		Major
B	B	Cross Road		Minor
C	C	St Richard's Road (W)		Major
D	D	Mill Hill		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
A	6.00		0.00		2.20	100.00	✓	0.00
C	6.00		0.00		2.20	0.00	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm	Lane Width	Lane Width	Lane Width (Right) (m)	Width at give-way	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length	Visibility To Left (m)	Visibility To Right (m)

	Type	(m)	(Left) (m)		(m)						(PCU)		
B	One lane	3.00										30	18
D	One lane	3.25										28	25

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B
1	AB-D	631.874	-	-	-	-	-	0.245	0.245	0.245	-	-
1	B-A	496.154	0.090	0.228	0.228	-	-	0.144	0.326	-	0.144	0.326
1	B-CD	635.268	0.097	0.246	0.246	-	-	-	-	-	-	-
1	CD-B	573.963	0.222	0.222	0.222	-	-	-	-	-	-	-
1	D-AB	655.686	-	-	-	-	-	0.254	0.254	0.101	-	-
1	D-C	511.438	-	0.148	0.336	0.148	0.336	0.235	0.235	0.093	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	229.00	100.000
B	ONE HOUR	✓	226.00	100.000
C	ONE HOUR	✓	330.00	100.000
D	ONE HOUR	✓	60.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	0.000	53.000	165.000	11.000
	B	69.000	0.000	148.000	9.000
	C	229.000	88.000	0.000	13.000
	D	27.000	25.000	8.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	0.00	0.23	0.72	0.05
	B	0.31	0.00	0.65	0.04
	C	0.69	0.27	0.00	0.04
	D	0.45	0.42	0.13	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	0.0	0.0	0.0	0.0
	B	0.0	0.0	0.0	0.0
	C	0.0	0.0	0.0	0.0
	D	0.0	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
B-ACD	0.51	14.77	1.01	B	207.38	311.07	63.37	12.22	0.70	63.39	12.23
A-B	-	-	-	-	48.63	72.95	-	-	-	-	-
A-C	-	-	-	-	151.41	227.11	-	-	-	-	-
A-D	-	-	-	-	10.09	15.14	-	-	-	-	-
AB-CD	0.05	5.09	0.07	A	29.05	43.58	4.89	6.74	0.05	4.89	6.74
AB-C	-	-	-	-	276.29	414.43	-	-	-	-	-
D-ABC	0.13	7.79	0.14	A	55.06	82.59	10.10	7.34	0.11	10.10	7.34
C-D	-	-	-	-	11.93	17.89	-	-	-	-	-
C-A	-	-	-	-	210.13	315.20	-	-	-	-	-
C-B	-	-	-	-	80.75	121.13	-	-	-	-	-
CD-AB	0.28	7.02	0.58	A	158.66	237.99	38.16	9.62	0.42	38.16	9.62
CD-A	-	-	-	-	179.89	269.83	-	-	-	-	-

Main Results for each time segment

Main results: (07:30-07:45)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	170.14	42.54	168.25	0.00	523.38	0.325	0.00	0.47	10.085	B
A-B	39.90	9.98	39.90	0.00	-	-	-	-	-	-
A-C	124.22	31.06	124.22	0.00	-	-	-	-	-	-
A-D	8.28	2.07	8.28	0.00	-	-	-	-	-	-
AB-CD	21.61	5.40	21.45	0.00	728.72	0.030	0.00	0.04	5.090	A
AB-C	227.78	56.94	227.78	0.00	-	-	-	-	-	-
D-ABC	45.17	11.29	44.82	0.00	561.60	0.080	0.00	0.09	6.961	A
C-D	9.79	2.45	9.79	0.00	-	-	-	-	-	-
C-A	172.40	43.10	172.40	0.00	-	-	-	-	-	-
C-B	66.25	16.56	66.25	0.00	-	-	-	-	-	-
CD-AB	118.95	29.74	117.79	0.00	670.75	0.177	0.00	0.29	6.505	A
CD-A	158.55	39.64	158.55	0.00	-	-	-	-	-	-

Main results: (07:45-08:00)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	203.17	50.79	202.47	0.00	510.53	0.398	0.47	0.65	11.659	B
A-B	47.65	11.91	47.65	0.00	-	-	-	-	-	-
A-C	148.33	37.08	148.33	0.00	-	-	-	-	-	-
A-D	9.89	2.47	9.89	0.00	-	-	-	-	-	-
AB-CD	27.82	6.96	27.77	0.00	748.91	0.037	0.04	0.05	4.992	A
AB-C	271.05	67.76	271.05	0.00	-	-	-	-	-	-
D-ABC	53.94	13.48	53.85	0.00	547.60	0.099	0.09	0.11	7.291	A
C-D	11.69	2.92	11.69	0.00	-	-	-	-	-	-

C-A	205.87	51.47	205.87	0.00	-	-	-	-	-	-
C-B	79.11	19.78	79.11	0.00	-	-	-	-	-	-
CD-AB	152.22	38.05	151.81	0.00	690.68	0.220	0.29	0.39	6.688	A
CD-A	179.43	44.86	179.43	0.00	-	-	-	-	-	-

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	248.83	62.21	247.46	0.00	492.54	0.505	0.65	0.99	14.603	B
A-B	58.35	14.59	58.35	0.00	-	-	-	-	-	-
A-C	181.67	45.42	181.67	0.00	-	-	-	-	-	-
A-D	12.11	3.03	12.11	0.00	-	-	-	-	-	-
AB-CD	37.43	9.36	37.35	0.00	775.86	0.048	0.05	0.07	4.874	A
AB-C	328.25	82.06	328.25	0.00	-	-	-	-	-	-
D-ABC	66.06	16.52	65.93	0.00	528.11	0.125	0.11	0.14	7.786	A
C-D	14.31	3.58	14.31	0.00	-	-	-	-	-	-
C-A	252.13	63.03	252.13	0.00	-	-	-	-	-	-
C-B	96.89	24.22	96.89	0.00	-	-	-	-	-	-
CD-AB	204.16	51.04	203.44	0.00	718.29	0.284	0.39	0.57	7.001	A
CD-A	202.00	50.50	202.00	0.00	-	-	-	-	-	-

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	248.83	62.21	248.77	0.00	492.43	0.505	0.99	1.01	14.765	B
A-B	58.35	14.59	58.35	0.00	-	-	-	-	-	-
A-C	181.67	45.42	181.67	0.00	-	-	-	-	-	-
A-D	12.11	3.03	12.11	0.00	-	-	-	-	-	-
AB-CD	37.58	9.39	37.58	0.00	776.43	0.048	0.07	0.07	4.875	A
AB-C	329.02	82.25	329.02	0.00	-	-	-	-	-	-
D-ABC	66.06	16.52	66.06	0.00	528.06	0.125	0.14	0.14	7.791	A
C-D	14.31	3.58	14.31	0.00	-	-	-	-	-	-
C-A	252.13	63.03	252.13	0.00	-	-	-	-	-	-
C-B	96.89	24.22	96.89	0.00	-	-	-	-	-	-
CD-AB	204.45	51.11	204.43	0.00	718.57	0.285	0.57	0.58	7.020	A
CD-A	201.82	50.45	201.82	0.00	-	-	-	-	-	-

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	203.17	50.79	204.49	0.00	510.37	0.398	1.01	0.68	11.821	B
A-B	47.65	11.91	47.65	0.00	-	-	-	-	-	-
A-C	148.33	37.08	148.33	0.00	-	-	-	-	-	-
A-D	9.89	2.47	9.89	0.00	-	-	-	-	-	-
AB-CD	28.02	7.00	28.10	0.00	749.79	0.037	0.07	0.05	4.991	A
AB-C	272.26	68.07	272.26	0.00	-	-	-	-	-	-
D-ABC	53.94	13.48	54.07	0.00	547.53	0.099	0.14	0.11	7.296	A
C-D	11.69	2.92	11.69	0.00	-	-	-	-	-	-
C-A	205.87	51.47	205.87	0.00	-	-	-	-	-	-
C-B	79.11	19.78	79.11	0.00	-	-	-	-	-	-
CD-AB	152.61	38.15	153.30	0.00	691.10	0.221	0.58	0.41	6.713	A
CD-A	179.22	44.81	179.22	0.00	-	-	-	-	-	-

Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	170.14	42.54	170.89	0.00	523.12	0.325	0.68	0.49	10.241	B
A-B	39.90	9.98	39.90	0.00	-	-	-	-	-	-
A-C	124.22	31.06	124.22	0.00	-	-	-	-	-	-
A-D	8.28	2.07	8.28	0.00	-	-	-	-	-	-
AB-CD	21.84	5.46	21.90	0.00	729.88	0.030	0.05	0.04	5.085	A
AB-C	229.37	57.34	229.37	0.00	-	-	-	-	-	-
D-ABC	45.17	11.29	45.26	0.00	561.51	0.080	0.11	0.09	6.976	A
C-D	9.79	2.45	9.79	0.00	-	-	-	-	-	-
C-A	172.40	43.10	172.40	0.00	-	-	-	-	-	-
C-B	66.25	16.56	66.25	0.00	-	-	-	-	-	-
CD-AB	119.59	29.90	120.01	0.00	671.22	0.178	0.41	0.30	6.542	A
CD-A	158.29	39.57	158.29	0.00	-	-	-	-	-	-

Queueing Delay Results for each time segment

Queueing Delay results: (07:30-07:45)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	6.75	0.45	10.085	B	B
A-B	-	-	-	-	-
A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	0.57	0.04	5.090	A	A
AB-C	-	-	-	-	-
D-ABC	1.26	0.08	6.961	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	4.29	0.29	6.505	A	A
CD-A	-	-	-	-	-

Queueing Delay results: (07:45-08:00)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	9.35	0.62	11.659	B	B
A-B	-	-	-	-	-
A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	0.77	0.05	4.992	A	A
AB-C	-	-	-	-	-
D-ABC	1.59	0.11	7.291	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	5.93	0.40	6.688	A	A
CD-A	-	-	-	-	-

Queueing Delay results: (08:00-08:15)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	14.07	0.94	14.603	B	B
A-B	-	-	-	-	-
A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	1.08	0.07	4.874	A	A
AB-C	-	-	-	-	-
D-ABC	2.08	0.14	7.786	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	8.64	0.58	7.001	A	A
CD-A	-	-	-	-	-

Queueing Delay results: (08:15-08:30)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	14.99	1.00	14.765	B	B
A-B	-	-	-	-	-
A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	1.09	0.07	4.875	A	A
AB-C	-	-	-	-	-
D-ABC	2.13	0.14	7.791	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	8.75	0.58	7.020	A	A
CD-A	-	-	-	-	-

Queueing Delay results: (08:30-08:45)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	10.60	0.71	11.821	B	B
A-B	-	-	-	-	-
A-C	-	-	-	-	-

A-D	-	-	-	-	-
AB-CD	0.78	0.05	4.991	A	A
AB-C	-	-	-	-	-
D-ABC	1.69	0.11	7.296	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	6.07	0.40	6.713	A	A
CD-A	-	-	-	-	-

Queueing Delay results: (08:45-09:00)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	7.62	0.51	10.241	B	B
A-B	-	-	-	-	-
A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	0.59	0.04	5.085	A	A
AB-C	-	-	-	-	-
D-ABC	1.35	0.09	6.976	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	4.48	0.30	6.542	A	A
CD-A	-	-	-	-	-

Existing Layout - 2022 Base Flows, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set(s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
Existing Layout	N/A		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
2022 Base Flows, PM	2022 Base Flows	PM		ONE HOUR	16:30	18:00	90	15				✓		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Do Geometric Delay	Junction Delay (s)	Junction LOS
1	St Richard's Road/Cross Road/Mill Hill	NS-OS Stagger (UK LR Stagger)	Two-way	A,B,C,D		10.43	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type

A	A	St Richard's Road (E)		Major
B	B	Cross Road		Minor
C	C	St Richard's Road (W)		Major
D	D	Mill Hill		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
A	6.00		0.00		2.20	100.00	✓	0.00
C	6.00		0.00		2.20	0.00	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.00										30	18
D	One lane	3.25										28	25

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B
1	AB-D	631.874	-	-	-	-	-	0.245	0.245	0.245	-	-
1	B-A	496.154	0.090	0.228	0.228	-	-	0.144	0.326	-	0.144	0.326
1	B-CD	635.268	0.097	0.246	0.246	-	-	-	-	-	-	-
1	CD-B	573.963	0.222	0.222	0.222	-	-	-	-	-	-	-
1	D-AB	655.686	-	-	-	-	-	0.254	0.254	0.101	-	-
1	D-C	511.438	-	0.148	0.336	0.148	0.336	0.235	0.235	0.093	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	287.00	100.000
B	ONE HOUR	✓	199.00	100.000
C	ONE HOUR	✓	361.00	100.000
D	ONE HOUR	✓	54.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To			
		A	**B**	**C**	**D**
From	**A**	0.000	74.000	192.000	21.000
	B	45.000	0.000	130.000	24.000
	C	199.000	156.000	0.000	6.000

	D	17.000	35.000	2.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	0.00	0.26	0.67	0.07
	B	0.23	0.00	0.65	0.12
	C	0.55	0.43	0.00	0.02
	D	0.31	0.65	0.04	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	0.0	0.0	0.0	0.0
	B	0.0	0.0	0.0	0.0
	C	0.0	0.0	0.0	0.0
	D	0.0	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
B-ACD	0.45	13.29	0.80	B	182.61	273.91	51.30	11.24	0.57	51.31	11.24
A-B	-	-	-	-	67.90	101.86	-	-	-	-	-
A-C	-	-	-	-	176.18	264.27	-	-	-	-	-
A-D	-	-	-	-	19.27	28.90	-	-	-	-	-
AB-CD	0.11	5.30	0.24	A	68.23	102.34	15.54	9.11	0.17	15.54	9.11
AB-C	-	-	-	-	268.33	402.50	-	-	-	-	-
D-ABC	0.11	7.43	0.12	A	49.55	74.33	8.71	7.03	0.10	8.71	7.03
C-D	-	-	-	-	5.51	8.26	-	-	-	-	-
C-A	-	-	-	-	182.61	273.91	-	-	-	-	-
C-B	-	-	-	-	143.15	214.72	-	-	-	-	-
CD-AB	0.48	10.33	1.21	B	254.07	381.10	75.37	11.87	0.84	75.38	11.87
CD-A	-	-	-	-	119.35	179.03	-	-	-	-	-

Main Results for each time segment

Main results: (16:30-16:45)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	149.82	37.45	148.25	0.00	526.49	0.285	0.00	0.39	9.480	A
A-B	55.71	13.93	55.71	0.00	-	-	-	-	-	-
A-C	144.55	36.14	144.55	0.00	-	-	-	-	-	-
A-D	15.81	3.95	15.81	0.00	-	-	-	-	-	-
AB-CD	49.22	12.31	48.76	0.00	728.33	0.068	0.00	0.11	5.296	A
AB-C	225.86	56.47	225.86	0.00	-	-	-	-	-	-
D-ABC	40.65	10.16	40.35	0.00	577.38	0.070	0.00	0.08	6.701	A
C-D	4.52	1.13	4.52	0.00	-	-	-	-	-	-

C-A	149.82	37.45	149.82	0.00	-	-	-	-	-	-
C-B	117.44	29.36	117.44	0.00	-	-	-	-	-	-
CD-AB	192.22	48.05	190.11	0.00	640.87	0.300	0.00	0.53	7.965	A
CD-A	113.91	28.48	113.91	0.00	-	-	-	-	-	-

Main results: (16:45-17:00)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	178.90	44.72	178.35	0.00	511.39	0.350	0.39	0.53	10.790	B
A-B	66.52	16.63	66.52	0.00	-	-	-	-	-	-
A-C	172.60	43.15	172.60	0.00	-	-	-	-	-	-
A-D	18.88	4.72	18.88	0.00	-	-	-	-	-	-
AB-CD	65.33	16.33	65.14	0.00	752.17	0.087	0.12	0.16	5.244	A
AB-C	264.17	66.04	264.17	0.00	-	-	-	-	-	-
D-ABC	48.54	12.14	48.47	0.00	563.33	0.086	0.08	0.09	6.992	A
C-D	5.39	1.35	5.39	0.00	-	-	-	-	-	-
C-A	178.90	44.72	178.90	0.00	-	-	-	-	-	-
C-B	140.24	35.06	140.24	0.00	-	-	-	-	-	-
CD-AB	244.17	61.04	243.29	0.00	655.22	0.373	0.53	0.75	8.747	A
CD-A	121.64	30.41	121.64	0.00	-	-	-	-	-	-

Main results: (17:00-17:15)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	219.10	54.78	218.06	0.00	490.03	0.447	0.53	0.79	13.185	B
A-B	81.48	20.37	81.48	0.00	-	-	-	-	-	-
A-C	211.40	52.85	211.40	0.00	-	-	-	-	-	-
A-D	23.12	5.78	23.12	0.00	-	-	-	-	-	-
AB-CD	89.43	22.36	89.15	0.00	781.91	0.114	0.16	0.23	5.202	A
AB-C	313.84	78.46	313.84	0.00	-	-	-	-	-	-
D-ABC	59.46	14.86	59.34	0.00	543.81	0.109	0.09	0.12	7.428	A
C-D	6.61	1.65	6.61	0.00	-	-	-	-	-	-
C-A	219.10	54.78	219.10	0.00	-	-	-	-	-	-
C-B	171.76	42.94	171.76	0.00	-	-	-	-	-	-
CD-AB	324.63	81.16	322.86	0.00	675.18	0.481	0.75	1.19	10.229	B
CD-A	123.37	30.84	123.37	0.00	-	-	-	-	-	-

Main results: (17:15-17:30)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	219.10	54.78	219.06	0.00	489.80	0.447	0.79	0.80	13.293	B
A-B	81.48	20.37	81.48	0.00	-	-	-	-	-	-
A-C	211.40	52.85	211.40	0.00	-	-	-	-	-	-
A-D	23.12	5.78	23.12	0.00	-	-	-	-	-	-
AB-CD	89.79	22.45	89.78	0.00	782.43	0.115	0.23	0.24	5.205	A
AB-C	314.26	78.56	314.26	0.00	-	-	-	-	-	-
D-ABC	59.46	14.86	59.45	0.00	543.79	0.109	0.12	0.12	7.431	A
C-D	6.61	1.65	6.61	0.00	-	-	-	-	-	-
C-A	219.10	54.78	219.10	0.00	-	-	-	-	-	-
C-B	171.76	42.94	171.76	0.00	-	-	-	-	-	-
CD-AB	325.25	81.31	325.17	0.00	675.72	0.481	1.19	1.21	10.332	B
CD-A	122.87	30.72	122.87	0.00	-	-	-	-	-	-

Main results: (17:30-17:45)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	178.90	44.72	179.90	0.00	511.06	0.350	0.80	0.55	10.905	B
A-B	66.52	16.63	66.52	0.00	-	-	-	-	-	-
A-C	172.60	43.15	172.60	0.00	-	-	-	-	-	-
A-D	18.88	4.72	18.88	0.00	-	-	-	-	-	-
AB-CD	65.79	16.45	66.07	0.00	752.97	0.087	0.24	0.17	5.248	A
AB-C	264.91	66.23	264.91	0.00	-	-	-	-	-	-
D-ABC	48.54	12.14	48.65	0.00	563.30	0.086	0.12	0.10	6.998	A
C-D	5.39	1.35	5.39	0.00	-	-	-	-	-	-
C-A	178.90	44.72	178.90	0.00	-	-	-	-	-	-
C-B	140.24	35.06	140.24	0.00	-	-	-	-	-	-
CD-AB	244.94	61.23	246.66	0.00	656.03	0.373	1.21	0.78	8.859	A
CD-A	121.05	30.26	121.05	0.00	-	-	-	-	-	-

Main results: (17:45-18:00)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	149.82	37.45	150.39	0.00	526.08	0.285	0.55	0.40	9.598	A
A-B	55.71	13.93	55.71	0.00	-	-	-	-	-	-
A-C	144.55	36.14	144.55	0.00	-	-	-	-	-	-
A-D	15.81	3.95	15.81	0.00	-	-	-	-	-	-
AB-CD	49.79	12.45	49.98	0.00	729.35	0.068	0.17	0.12	5.302	A
AB-C	226.96	56.74	226.96	0.00	-	-	-	-	-	-
D-ABC	40.65	10.16	40.73	0.00	577.34	0.070	0.10	0.08	6.711	A
C-D	4.52	1.13	4.52	0.00	-	-	-	-	-	-
C-A	149.82	37.45	149.82	0.00	-	-	-	-	-	-
C-B	117.44	29.36	117.44	0.00	-	-	-	-	-	-
CD-AB	193.21	48.30	194.14	0.00	641.56	0.301	0.78	0.55	8.079	A
CD-A	113.27	28.32	113.27	0.00	-	-	-	-	-	-

Queueing Delay Results for each time segment

Queueing Delay results: (16:30-16:45)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	5.60	0.37	9.480	A	A
A-B	-	-	-	-	-
A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	1.70	0.11	5.296	A	A
AB-C	-	-	-	-	-
D-ABC	1.09	0.07	6.701	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	7.77	0.52	7.965	A	A
CD-A	-	-	-	-	-

Queueing Delay results: (16:45-17:00)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	7.66	0.51	10.790	B	B
A-B	-	-	-	-	-
A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	2.44	0.16	5.244	A	A
AB-C	-	-	-	-	-
D-ABC	1.38	0.09	6.992	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	11.28	0.75	8.747	A	A
CD-A	-	-	-	-	-

Queueing Delay results: (17:00-17:15)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	11.28	0.75	13.185	B	B
A-B	-	-	-	-	-
A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	3.52	0.23	5.202	A	A
AB-C	-	-	-	-	-
D-ABC	1.79	0.12	7.428	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	17.97	1.20	10.229	B	B
CD-A	-	-	-	-	-

Queueing Delay results: (17:15-17:30)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	11.92	0.79	13.293	B	B
A-B	-	-	-	-	-

A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	3.57	0.24	5.205	A	A
AB-C	-	-	-	-	-
D-ABC	1.83	0.12	7.431	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	18.40	1.23	10.332	B	B
CD-A	-	-	-	-	-

Queueing Delay results: (17:30-17:45)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	8.57	0.57	10.905	B	B
A-B	-	-	-	-	-
A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	2.51	0.17	5.248	A	A
AB-C	-	-	-	-	-
D-ABC	1.46	0.10	6.998	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	11.75	0.78	8.859	A	A
CD-A	-	-	-	-	-

Queueing Delay results: (17:45-18:00)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	6.26	0.42	9.598	A	A
A-B	-	-	-	-	-
A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	1.79	0.12	5.302	A	A
AB-C	-	-	-	-	-
D-ABC	1.17	0.08	6.711	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	8.21	0.55	8.079	A	A
CD-A	-	-	-	-	-

Existing Layout - 2022 With Dev Flows, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set(s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
Existing Layout	N/A		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
2022 With Dev Flows, AM	2022 With Dev Flows	AM		ONE HOUR	07:30	09:00	90	15				✓		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Do Geometric Delay	Junction Delay (s)	Junction LOS
1	St Richard's Road/Cross Road/Mill Hill	NS-OS Stagger (UK LR Stagger)	Two-way	A,B,C,D		11.74	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	St Richard's Road (E)		Major
B	B	Cross Road		Minor
C	C	St Richard's Road (W)		Major
D	D	Mill Hill		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
A	6.00		0.00		2.20	100.00	✓	0.00
C	6.00		0.00		2.20	0.00	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.00										30	18
D	One lane	3.25										28	25

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B
1	AB-D	631.874	-	-	-	-	-	0.245	0.245	0.245	-	-
1	B-A	496.154	0.090	0.228	0.228	-	-	0.144	0.326	-	0.144	0.326
1	B-CD	635.268	0.097	0.246	0.246	-	-	-	-	-	-	-
1	CD-B	573.963	0.222	0.222	0.222	-	-	-	-	-	-	-
1	D-AB	655.686	-	-	-	-	-	0.254	0.254	0.101	-	-
1	D-C	511.438	-	0.148	0.336	0.148	0.336	0.235	0.235	0.093	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	232.00	100.000
B	ONE HOUR	✓	253.00	100.000
C	ONE HOUR	✓	336.00	100.000
D	ONE HOUR	✓	62.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	0.000	56.000	165.000	11.000
	B	77.000	0.000	165.000	11.000
	C	229.000	94.000	0.000	13.000
	D	27.000	27.000	8.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	0.00	0.24	0.71	0.05
	B	0.30	0.00	0.65	0.04
	C	0.68	0.28	0.00	0.04
	D	0.44	0.44	0.13	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	0.0	0.0	0.0	0.0
	B	0.0	0.0	0.0	0.0
	C	0.0	0.0	0.0	0.0
	D	0.0	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
B-ACD	0.57	16.94	1.29	C	232.16	348.24	78.39	13.51	0.87	78.41	13.51
A-B	-	-	-	-	51.39	77.08	-	-	-	-	-
A-C	-	-	-	-	151.41	227.11	-	-	-	-	-
A-D	-	-	-	-	10.09	15.14	-	-	-	-	-
AB-CD	0.05	5.06	0.08	A	32.67	49.00	5.62	6.88	0.06	5.62	6.88
AB-C	-	-	-	-	290.06	435.09	-	-	-	-	-
D-ABC	0.13	7.86	0.15	A	56.89	85.34	10.50	7.38	0.12	10.50	7.38
C-D	-	-	-	-	11.93	17.89	-	-	-	-	-
C-A	-	-	-	-	210.13	315.20	-	-	-	-	-
C-B	-	-	-	-	86.26	129.38	-	-	-	-	-
CD-AB	0.31	7.24	0.63	A	169.98	254.96	41.54	9.77	0.46	41.54	9.78
CD-A	-	-	-	-	175.91	263.87	-	-	-	-	-

Main Results for each time segment

Main results: (07:30-07:45)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	190.47	47.62	188.22	0.00	522.37	0.365	0.00	0.56	10.704	B
A-B	42.16	10.54	42.16	0.00	-	-	-	-	-	-
A-C	124.22	31.06	124.22	0.00	-	-	-	-	-	-
A-D	8.28	2.07	8.28	0.00	-	-	-	-	-	-
AB-CD	24.18	6.04	24.00	0.00	735.97	0.033	0.00	0.04	5.057	A
AB-C	239.26	59.81	239.26	0.00	-	-	-	-	-	-
D-ABC	46.68	11.67	46.32	0.00	560.87	0.083	0.00	0.09	6.992	A
C-D	9.79	2.45	9.79	0.00	-	-	-	-	-	-
C-A	172.40	43.10	172.40	0.00	-	-	-	-	-	-
C-B	70.77	17.69	70.77	0.00	-	-	-	-	-	-
CD-AB	127.40	31.85	126.15	0.00	670.30	0.190	0.00	0.31	6.609	A
CD-A	156.11	39.03	156.11	0.00	-	-	-	-	-	-

Main results: (07:45-08:00)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	227.44	56.86	226.54	0.00	509.24	0.447	0.56	0.79	12.692	B
A-B	50.34	12.59	50.34	0.00	-	-	-	-	-	-
A-C	148.33	37.08	148.33	0.00	-	-	-	-	-	-
A-D	9.89	2.47	9.89	0.00	-	-	-	-	-	-
AB-CD	31.25	7.81	31.19	0.00	757.61	0.041	0.04	0.06	4.957	A
AB-C	284.57	71.14	284.57	0.00	-	-	-	-	-	-
D-ABC	55.74	13.93	55.65	0.00	546.54	0.102	0.09	0.11	7.333	A
C-D	11.69	2.92	11.69	0.00	-	-	-	-	-	-
C-A	205.87	51.47	205.87	0.00	-	-	-	-	-	-
C-B	84.50	21.13	84.50	0.00	-	-	-	-	-	-
CD-AB	163.06	40.76	162.61	0.00	690.17	0.236	0.31	0.43	6.831	A
CD-A	175.78	43.94	175.78	0.00	-	-	-	-	-	-

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	278.56	69.64	276.67	0.00	490.83	0.568	0.79	1.26	16.656	C
A-B	61.66	15.41	61.66	0.00	-	-	-	-	-	-
A-C	181.67	45.42	181.67	0.00	-	-	-	-	-	-
A-D	12.11	3.03	12.11	0.00	-	-	-	-	-	-
AB-CD	42.17	10.54	42.07	0.00	786.29	0.054	0.06	0.08	4.839	A
AB-C	344.07	86.02	344.07	0.00	-	-	-	-	-	-
D-ABC	68.26	17.07	68.12	0.00	526.58	0.130	0.11	0.15	7.849	A
C-D	14.31	3.58	14.31	0.00	-	-	-	-	-	-
C-A	252.13	63.03	252.13	0.00	-	-	-	-	-	-
C-B	103.50	25.87	103.50	0.00	-	-	-	-	-	-
CD-AB	218.74	54.69	217.94	0.00	717.70	0.305	0.43	0.63	7.214	A
CD-A	196.22	49.06	196.22	0.00	-	-	-	-	-	-

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	278.56	69.64	278.46	0.00	490.71	0.568	1.26	1.29	16.938	C
A-B	61.66	15.41	61.66	0.00	-	-	-	-	-	-
A-C	181.67	45.42	181.67	0.00	-	-	-	-	-	-
A-D	12.11	3.03	12.11	0.00	-	-	-	-	-	-
AB-CD	42.39	10.60	42.39	0.00	787.05	0.054	0.08	0.08	4.835	A
AB-C	345.10	86.28	345.10	0.00	-	-	-	-	-	-
D-ABC	68.26	17.07	68.26	0.00	526.52	0.130	0.15	0.15	7.855	A
C-D	14.31	3.58	14.31	0.00	-	-	-	-	-	-
C-A	252.13	63.03	252.13	0.00	-	-	-	-	-	-
C-B	103.50	25.87	103.50	0.00	-	-	-	-	-	-
CD-AB	219.07	54.77	219.04	0.00	718.00	0.305	0.63	0.63	7.235	A
CD-A	196.01	49.00	196.01	0.00	-	-	-	-	-	-

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	227.44	56.86	229.28	0.00	509.05	0.447	1.29	0.83	12.950	B
A-B	50.34	12.59	50.34	0.00	-	-	-	-	-	-
A-C	148.33	37.08	148.33	0.00	-	-	-	-	-	-
A-D	9.89	2.47	9.89	0.00	-	-	-	-	-	-
AB-CD	31.53	7.88	31.63	0.00	758.79	0.042	0.08	0.06	4.951	A
AB-C	286.19	71.55	286.19	0.00	-	-	-	-	-	-
D-ABC	55.74	13.93	55.87	0.00	546.45	0.102	0.15	0.11	7.342	A
C-D	11.69	2.92	11.69	0.00	-	-	-	-	-	-
C-A	205.87	51.47	205.87	0.00	-	-	-	-	-	-
C-B	84.50	21.13	84.50	0.00	-	-	-	-	-	-
CD-AB	163.50	40.87	164.26	0.00	690.63	0.237	0.63	0.44	6.864	A
CD-A	175.54	43.88	175.54	0.00	-	-	-	-	-	-

Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	190.47	47.62	191.44	0.00	522.09	0.365	0.83	0.58	10.921	B
A-B	42.16	10.54	42.16	0.00	-	-	-	-	-	-
A-C	124.22	31.06	124.22	0.00	-	-	-	-	-	-
A-D	8.28	2.07	8.28	0.00	-	-	-	-	-	-
AB-CD	24.49	6.12	24.55	0.00	737.37	0.033	0.06	0.05	5.052	A
AB-C	241.19	60.30	241.19	0.00	-	-	-	-	-	-
D-ABC	46.68	11.67	46.77	0.00	560.76	0.083	0.11	0.09	7.004	A
C-D	9.79	2.45	9.79	0.00	-	-	-	-	-	-
C-A	172.40	43.10	172.40	0.00	-	-	-	-	-	-
C-B	70.77	17.69	70.77	0.00	-	-	-	-	-	-
CD-AB	128.09	32.02	128.56	0.00	670.80	0.191	0.44	0.32	6.654	A
CD-A	155.81	38.95	155.81	0.00	-	-	-	-	-	-

Queueing Delay Results for each time segment

Queueing Delay results: (07:30-07:45)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	7.99	0.53	10.704	B	B
A-B	-	-	-	-	-
A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	0.65	0.04	5.057	A	A
AB-C	-	-	-	-	-
D-ABC	1.31	0.09	6.992	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	4.64	0.31	6.609	A	A
CD-A	-	-	-	-	-

Queueing Delay results: (07:45-08:00)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	11.32	0.75	12.692	B	B
A-B	-	-	-	-	-
A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	0.88	0.06	4.957	A	A
AB-C	-	-	-	-	-
D-ABC	1.65	0.11	7.333	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	6.43	0.43	6.831	A	A
CD-A	-	-	-	-	-

Queueing Delay results: (08:00-08:15)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	17.73	1.18	16.656	C	B

A-B	-	-	-	-	-
A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	1.25	0.08	4.839	A	A
AB-C	-	-	-	-	-
D-ABC	2.16	0.14	7.849	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	9.45	0.63	7.214	A	A
CD-A	-	-	-	-	-

Queueing Delay results: (08:15-08:30)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	19.14	1.28	16.938	C	B
A-B	-	-	-	-	-
A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	1.27	0.08	4.835	A	A
AB-C	-	-	-	-	-
D-ABC	2.22	0.15	7.855	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	9.58	0.64	7.235	A	A
CD-A	-	-	-	-	-

Queueing Delay results: (08:30-08:45)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	13.08	0.87	12.950	B	B
A-B	-	-	-	-	-
A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	0.90	0.06	4.951	A	A
AB-C	-	-	-	-	-
D-ABC	1.76	0.12	7.342	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	6.60	0.44	6.864	A	A
CD-A	-	-	-	-	-

Queueing Delay results: (08:45-09:00)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	9.13	0.61	10.921	B	B
A-B	-	-	-	-	-
A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	0.67	0.04	5.052	A	A
AB-C	-	-	-	-	-
D-ABC	1.40	0.09	7.004	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	4.84	0.32	6.654	A	A
CD-A	-	-	-	-	-

Existing Layout - 2022 With Dev Flows, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout	Description	Include In	Use Specific	Specific	Locked	Network Flow	Network Capacity	Reason For

	Capacity Model		Report	Demand Set(s)	Demand Set(s)		Scaling Factor (%)	Scaling Factor (%)	Scaling Factors
Existing Layout	N/A		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
2022 With Dev Flows, PM	2022 With Dev Flows	PM		ONE HOUR	16:30	18:00	90	15				✓		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Do Geometric Delay	Junction Delay (s)	Junction LOS
1	St Richard's Road/Cross Road/Mill Hill	NS-OS Stagger (UK LR Stagger)	Two-way	A,B,C,D		11.34	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	St Richard's Road (E)		Major
B	B	Cross Road		Minor
C	C	St Richard's Road (W)		Major
D	D	Mill Hill		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
A	6.00		0.00		2.20	100.00	✓	0.00
C	6.00		0.00		2.20	0.00	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.00										30	18
D	One lane	3.25										28	25

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B
1	AB-D	631.874	-	-	-	-	-	0.245	0.245	0.245	-	-
1	B-A	496.154	0.090	0.228	0.228	-	-	0.144	0.326	-	0.144	0.326
1	B-CD	635.268	0.097	0.246	0.246	-	-	-	-	-	-	-
1	CD-B	573.963	0.222	0.222	0.222	-	-	-	-	-	-	-
1	D-AB	655.686	-	-	-	-	-	0.254	0.254	0.101	-	-
1	D-C	511.438	-	0.148	0.336	0.148	0.336	0.235	0.235	0.093	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	294.00	100.000
B	ONE HOUR	✓	215.00	100.000
C	ONE HOUR	✓	376.00	100.000
D	ONE HOUR	✓	57.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	0.000	81.000	192.000	21.000
	B	49.000	0.000	140.000	26.000
	C	199.000	171.000	0.000	6.000
	D	17.000	38.000	2.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	0.00	0.28	0.65	0.07
	B	0.23	0.00	0.65	0.12
	C	0.53	0.45	0.00	0.02
	D	0.30	0.67	0.04	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To			
		A	B	C	D
From	A	0.0	0.0	0.0	0.0
	B	0.0	0.0	0.0	0.0
	C	0.0	0.0	0.0	0.0
	D	0.0	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
B-ACD	0.49	14.48	0.94	B	197.29	295.93	59.05	11.97	0.66	59.06	11.98
A-B	-	-	-	-	74.33	111.49	-	-	-	-	-
A-C	-	-	-	-	176.18	264.27	-	-	-	-	-
A-D	-	-	-	-	19.27	28.90	-	-	-	-	-
AB-CD	0.12	5.30	0.25	A	72.46	108.69	16.70	9.22	0.19	16.70	9.22
AB-C	-	-	-	-	275.08	412.63	-	-	-	-	-
D-ABC	0.12	7.54	0.13	A	52.30	78.46	9.30	7.11	0.10	9.30	7.12
C-D	-	-	-	-	5.51	8.26	-	-	-	-	-
C-A	-	-	-	-	182.61	273.91	-	-	-	-	-
C-B	-	-	-	-	156.91	235.37	-	-	-	-	-
CD-AB	0.53	11.40	1.44	B	278.34	417.50	88.23	12.68	0.98	88.25	12.68
CD-A	-	-	-	-	111.60	167.40	-	-	-	-	-

Main Results for each time segment

Main results: (16:30-16:45)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	161.86	40.47	160.10	0.00	523.62	0.309	0.00	0.44	9.857	A
A-B	60.98	15.25	60.98	0.00	-	-	-	-	-	-
A-C	144.55	36.14	144.55	0.00	-	-	-	-	-	-
A-D	15.81	3.95	15.81	0.00	-	-	-	-	-	-
AB-CD	52.00	13.00	51.51	0.00	730.79	0.071	0.00	0.12	5.298	A
AB-C	231.97	57.99	231.97	0.00	-	-	-	-	-	-
D-ABC	42.91	10.73	42.59	0.00	574.90	0.075	0.00	0.08	6.758	A
C-D	4.52	1.13	4.52	0.00	-	-	-	-	-	-
C-A	149.82	37.45	149.82	0.00	-	-	-	-	-	-
C-B	128.74	32.18	128.74	0.00	-	-	-	-	-	-
CD-AB	210.45	52.61	208.06	0.00	639.81	0.329	0.00	0.60	8.310	A
CD-A	109.20	27.30	109.20	0.00	-	-	-	-	-	-

Main results: (16:45-17:00)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	193.28	48.32	192.63	0.00	507.82	0.381	0.44	0.60	11.397	B
A-B	72.82	18.20	72.82	0.00	-	-	-	-	-	-
A-C	172.60	43.15	172.60	0.00	-	-	-	-	-	-
A-D	18.88	4.72	18.88	0.00	-	-	-	-	-	-
AB-CD	69.32	17.33	69.12	0.00	755.52	0.092	0.12	0.17	5.249	A
AB-C	270.90	67.72	270.90	0.00	-	-	-	-	-	-
D-ABC	51.24	12.81	51.16	0.00	560.29	0.091	0.08	0.10	7.071	A
C-D	5.39	1.35	5.39	0.00	-	-	-	-	-	-
C-A	178.90	44.72	178.90	0.00	-	-	-	-	-	-
C-B	153.73	38.43	153.73	0.00	-	-	-	-	-	-
CD-AB	267.42	66.86	266.37	0.00	654.01	0.409	0.60	0.86	9.295	A
CD-A	114.57	28.64	114.57	0.00	-	-	-	-	-	-

Main results: (17:00-17:15)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	236.72	59.18	235.43	0.00	485.39	0.488	0.60	0.92	14.326	B
A-B	89.18	22.30	89.18	0.00	-	-	-	-	-	-
A-C	211.40	52.85	211.40	0.00	-	-	-	-	-	-
A-D	23.12	5.78	23.12	0.00	-	-	-	-	-	-
AB-CD	95.23	23.81	94.92	0.00	786.13	0.121	0.17	0.25	5.212	A
AB-C	321.07	80.27	321.07	0.00	-	-	-	-	-	-
D-ABC	62.76	15.69	62.64	0.00	540.00	0.116	0.10	0.13	7.539	A
C-D	6.61	1.65	6.61	0.00	-	-	-	-	-	-
C-A	219.10	54.78	219.10	0.00	-	-	-	-	-	-
C-B	188.27	47.07	188.27	0.00	-	-	-	-	-	-
CD-AB	355.72	88.93	353.49	0.00	673.78	0.528	0.86	1.42	11.249	B
CD-A	112.10	28.02	112.10	0.00	-	-	-	-	-	-

Main results: (17:15-17:30)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	236.72	59.18	236.66	0.00	485.10	0.488	0.92	0.94	14.481	B
A-B	89.18	22.30	89.18	0.00	-	-	-	-	-	-
A-C	211.40	52.85	211.40	0.00	-	-	-	-	-	-
A-D	23.12	5.78	23.12	0.00	-	-	-	-	-	-
AB-CD	95.67	23.92	95.66	0.00	786.76	0.122	0.25	0.25	5.215	A
AB-C	321.58	80.39	321.58	0.00	-	-	-	-	-	-
D-ABC	62.76	15.69	62.76	0.00	539.97	0.116	0.13	0.13	7.542	A
C-D	6.61	1.65	6.61	0.00	-	-	-	-	-	-
C-A	219.10	54.78	219.10	0.00	-	-	-	-	-	-
C-B	188.27	47.07	188.27	0.00	-	-	-	-	-	-
CD-AB	356.48	89.12	356.38	0.00	674.45	0.529	1.42	1.44	11.402	B
CD-A	111.45	27.86	111.45	0.00	-	-	-	-	-	-

Main results: (17:30-17:45)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	193.28	48.32	194.52	0.00	507.40	0.381	0.94	0.63	11.553	B
A-B	72.82	18.20	72.82	0.00	-	-	-	-	-	-
A-C	172.60	43.15	172.60	0.00	-	-	-	-	-	-
A-D	18.88	4.72	18.88	0.00	-	-	-	-	-	-
AB-CD	69.89	17.47	70.18	0.00	756.48	0.092	0.25	0.18	5.253	A
AB-C	271.79	67.95	271.79	0.00	-	-	-	-	-	-
D-ABC	51.24	12.81	51.36	0.00	560.26	0.091	0.13	0.10	7.074	A
C-D	5.39	1.35	5.39	0.00	-	-	-	-	-	-
C-A	178.90	44.72	178.90	0.00	-	-	-	-	-	-
C-B	153.73	38.43	153.73	0.00	-	-	-	-	-	-
CD-AB	268.36	67.09	270.53	0.00	655.00	0.410	1.44	0.90	9.454	A
CD-A	113.82	28.45	113.82	0.00	-	-	-	-	-	-

Main results: (17:45-18:00)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-ACD	161.86	40.47	162.55	0.00	523.14	0.309	0.63	0.45	10.002	A
A-B	60.98	15.25	60.98	0.00	-	-	-	-	-	-
A-C	144.55	36.14	144.55	0.00	-	-	-	-	-	-
A-D	15.81	3.95	15.81	0.00	-	-	-	-	-	-
AB-CD	52.65	13.16	52.85	0.00	731.94	0.072	0.18	0.13	5.305	A
AB-C	233.21	58.30	233.21	0.00	-	-	-	-	-	-
D-ABC	42.91	10.73	42.99	0.00	574.86	0.075	0.10	0.08	6.771	A
C-D	4.52	1.13	4.52	0.00	-	-	-	-	-	-
C-A	149.82	37.45	149.82	0.00	-	-	-	-	-	-
C-B	128.74	32.18	128.74	0.00	-	-	-	-	-	-
CD-AB	211.58	52.90	212.71	0.00	640.60	0.330	0.90	0.62	8.454	A
CD-A	108.46	27.11	108.46	0.00	-	-	-	-	-	-

Queueing Delay Results for each time segment

Queueing Delay results: (16:30-16:45)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	6.28	0.42	9.857	A	A
A-B	-	-	-	-	-
A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	1.83	0.12	5.298	A	A
AB-C	-	-	-	-	-
D-ABC	1.16	0.08	6.758	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	8.80	0.59	8.310	A	A
CD-A	-	-	-	-	-

Queueing Delay results: (16:45-17:00)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	8.71	0.58	11.397	B	B

A-B	-	-	-	-	-
A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	2.61	0.17	5.249	A	A
AB-C	-	-	-	-	-
D-ABC	1.47	0.10	7.071	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	13.01	0.87	9.295	A	A
CD-A	-	-	-	-	-

Queueing Delay results: (17:00-17:15)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	13.15	0.88	14.326	B	B
A-B	-	-	-	-	-
A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	3.79	0.25	5.212	A	A
AB-C	-	-	-	-	-
D-ABC	1.91	0.13	7.539	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	21.40	1.43	11.249	B	B
CD-A	-	-	-	-	-

Queueing Delay results: (17:15-17:30)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	14.00	0.93	14.481	B	B
A-B	-	-	-	-	-
A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	3.84	0.26	5.215	A	A
AB-C	-	-	-	-	-
D-ABC	1.96	0.13	7.542	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	22.03	1.47	11.402	B	B
CD-A	-	-	-	-	-

Queueing Delay results: (17:30-17:45)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	9.84	0.66	11.553	B	B
A-B	-	-	-	-	-
A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	2.69	0.18	5.253	A	A
AB-C	-	-	-	-	-
D-ABC	1.56	0.10	7.074	A	A
C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	13.65	0.91	9.454	A	A
CD-A	-	-	-	-	-

Queueing Delay results: (17:45-18:00)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-ACD	7.07	0.47	10.002	A	A
A-B	-	-	-	-	-
A-C	-	-	-	-	-
A-D	-	-	-	-	-
AB-CD	1.94	0.13	5.305	A	A
AB-C	-	-	-	-	-
D-ABC	1.24	0.08	6.771	A	A

C-D	-	-	-	-	-
C-A	-	-	-	-	-
C-B	-	-	-	-	-
CD-AB	9.35	0.62	8.454	A	A
CD-A	-	-	-	-	-

APPENDIX 4

Accident Data

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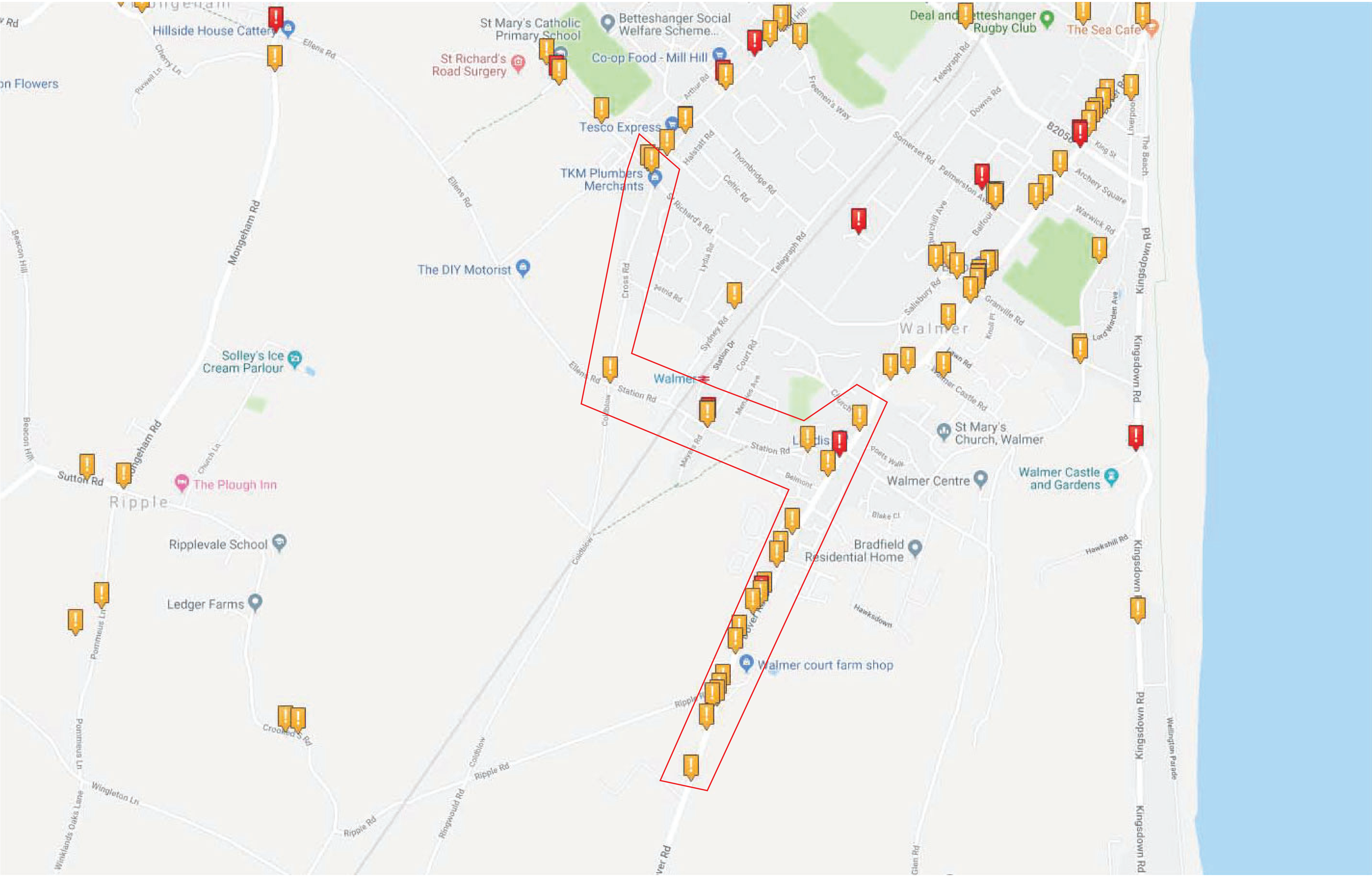

Hillside House Cattery
St Mary's Catholic Primary School
Betteshanger Social Welfare Scheme...
Deal and Betteshanger Rugby Club
The Sea Cafe
St Richard's Road Surgery
Co-op Food - Mill Hill
Tesco Express
TKM Plumbers Merchants
The DIY Motorist
Mongeham Rd
Solley's Ice Cream Parlour
Walmer
Station Rd
St Mary's Church, Walmer
Walmer Centre
Walmer Castle and Gardens
Sutton Rd
The Plough Inn
Ripple
Ripplevale School
Bradfield Residential Home
Ledger Farms
Walmer court farm shop
Kingsdown Rd
Ripple Rd
Wingleton Ln
Ringwould Rd
Crooked S Rd
Ellens Rd
Telegraph Rd
Granville Rd
Archery Square
Warwick Rd
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