REPORT

Tonkin+Taylor

48 Esmonde Road Development

Proposed Plan Change Integrated Transport Assessment

Prepared for
KBS Capital Limited
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1 Introduction

Tonkin & Taylor Ltd (T+T) has been commissioned by KBS Capital Limited to prepare an Integrated Transportation Assessment (ITA) for a proposed Plan Change for the proposed residential development at 48 Esmonde Road, Auckland. The proposed development comprises of short-term managed visitor accommodation, residential apartments and a number of ancillary land uses such as cafes, fitness centre etc. The non-residential activities are intended to support the local residential community while not undermining the role, function and viability of existing centres nearby.

The proposal is to provide in the order of 550 residential dwellings comprised of short-term managed visitor accommodation and residential apartments. The proposal is also seeking to provide a limited quantum of gross floor area (GFA) for ancillary commercial activities and healthcare facilities.

The site will be developed in a staged approach with an expected opening year of 2023 for the first stages.

Resource consent has been granted for Stage 1 and Stage 2 (Application number LUC60359471) and comprises:

- Stage 1 – The construction of 187 short term managed visitor accommodation units with 164 one-bed studios, 18 one-bed suites and 5 two-bedroom penthouse apartments.
- Stage 2 – The construction of 86 residential apartments with 37 one-bedroom, 32 two-bedroom and 17 three-bedroom apartments
- Stage 1 and 2 – non-residential ancillary uses and approximate GFA:
  - Fitness centre (managed apartments operated – for visitor accommodation and residents (203 m^2))
  - Early Learning Centre – for residents only (216 m^2)
  - Convenience Store (100 m^2)
  - Café (100 m^2)
  - Communal Bookable Room (471 m^2)
  - Healthcare facility – small to serve the residents only (167 m^2)
  - Total GFA = 1257m^2
- Upgrades to the site access and intersection with Esmonde Road and street frontage including bus and cycling infrastructure.

The purpose of this ITA is to assess the effects of developing the remainder of the site consistent with the current zoning provision of Residential - Terrace Housing and Apartment Buildings Zone. Via consultation with Auckland Council and Auckland Transport a maximum of 420 peak period vehicle trips has been identified as a limiting factor. As such a sample of possible development scenarios have been developed as shown in Appendix H.

For the basis of this assessment the following has been assumed as the proposal.

- Stage 3 – The construction of 270 residential apartments (with a mix of 1, 2 and 3 bedroom units) and 5 short term managed visitor accommodation units subject to agreement on massing, building height, apartment yield and up to 743m^2 GFA of non-residential ancillary uses.

The proposed masterplan for the site is shown in Figure 1.1 and Stage 3 is highlighted in blue.

It is important to note that the location of the site is in close proximity to significant Auckland Transport (AT) and New Zealand Transport Agency (NZTA) projects, these are as follows:

- Lake Road Improvements (AT) – The project aims to improve accessibility and mode choice for those travelling in the Devonport Peninsula and along Esmonde Road[1]. The business case has been approved by the AT board and the project is awaiting funding.
- Northern Pathway (NZTA) – A dedicated walking and cycling link between Auckland's City Centre and the North Shore which will connect to existing local paths to extend the regions walking and cycling network[2]:
  - Westhaven to Akoranga.
  - Akoranga to Constellation Drive.
  - Constellation Drive to Albany.

These projects emphasize the significant investment in transport mode choice which will occur in the area over the next 5 years. This increases the opportunity for the development to complement the surrounding infrastructure i.e. safer walking and cycling crossing facilities.

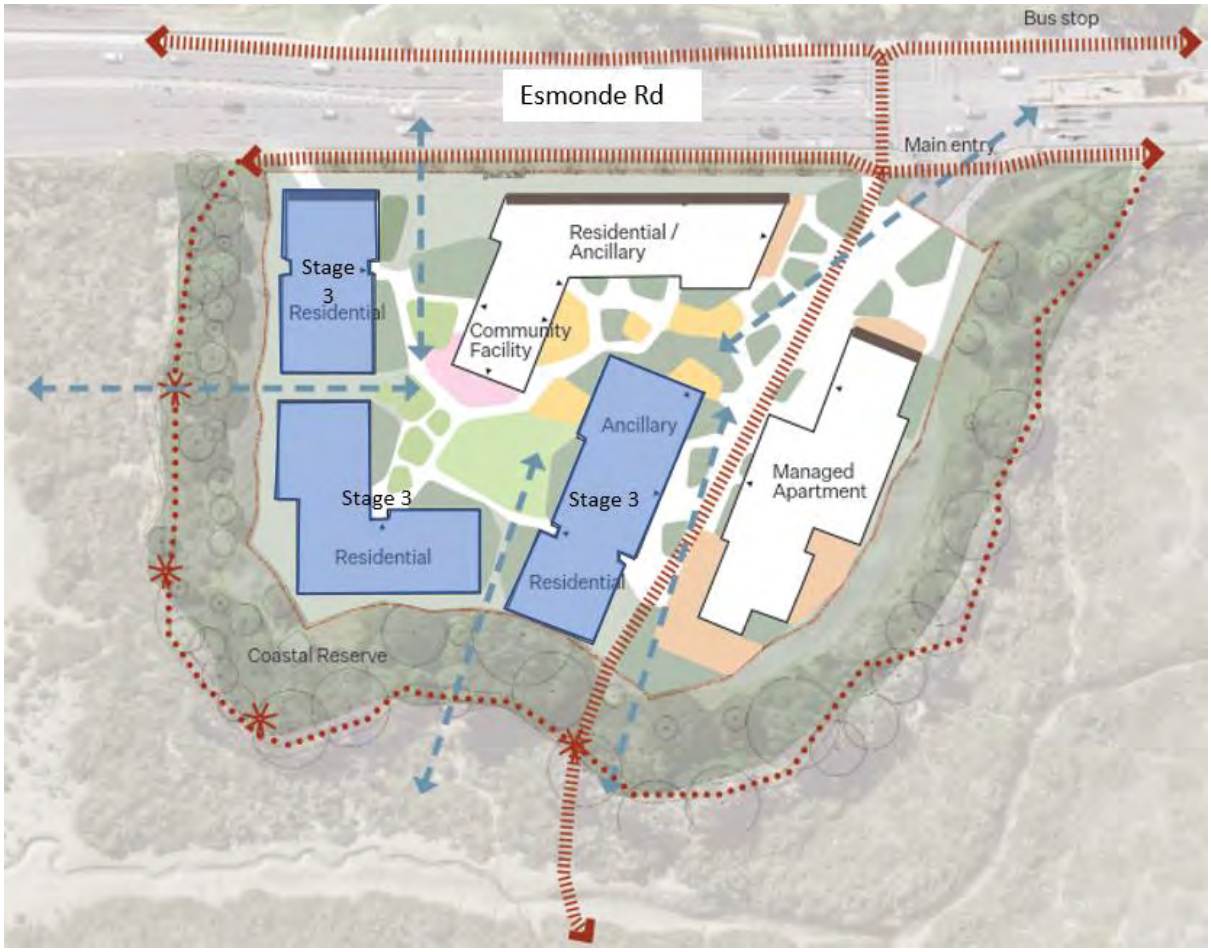


Figure 1.1: Proposed Masterplan for 48 Esmonde Road

This report considers the establishment of a new Precinct Plan that seeks to provide for the comprehensive and integrated redevelopment of the site. The precinct enables a new residential community comprising a mixture of housing types within a unique urban setting.

[1] Auckland Transport. (2020, Dec). *Lake Road improvements*. Retrieved from Auckland Transport: https://at.govt.nz/projects-roadworks/lake-road-improvements/
[2] NZTA. (2020, April). *Northern Pathway*. Retrieved from Waka Kotahi: https://www.nzta.govt.nz/projects/northern-pathway

The purpose of this report is to assess the key transportation considerations of the proposed development for Stage 3 including:

- The forecast trip generation associated with the proposed development, including mode share and parking requirements;
- The proposed access / egress arrangements for vehicles, pedestrians and cyclists;
- The likelihood of a change to the site in the future, based on the activities that could be carried out as of right or with respect to resource consents that have been granted;
- The expected impact of additional traffic flows on the surrounding transport network and the ability of the surrounding road network to safely and efficiently accommodate traffic generated by potential development; and
- Assess the proposed Precinct Plan provisions and confirm their suitability from a transport perspective.

2 Existing Environment

2.1 Site location

The proposed site is located at 48 Esmonde Road in Takapuna, Auckland. The 2.16 ha site lies on the southern side of Esmonde Road, 0.9 km east of the Esmonde Road interchange as shown in Figure 2.1. The site is zoned as 'Residential – Terrace Housing and Apartment Buildings Zone' under the Auckland Unitary Plan (AUP) and is currently accessed via a signalised intersection with Esmonde Road, with an additional exit on the north-western corner of the site, as shown in Figure 2.2.

Figure 2.1: Location of 48 Esmonde Road (Map source: Auckland Council GEOMAPS)

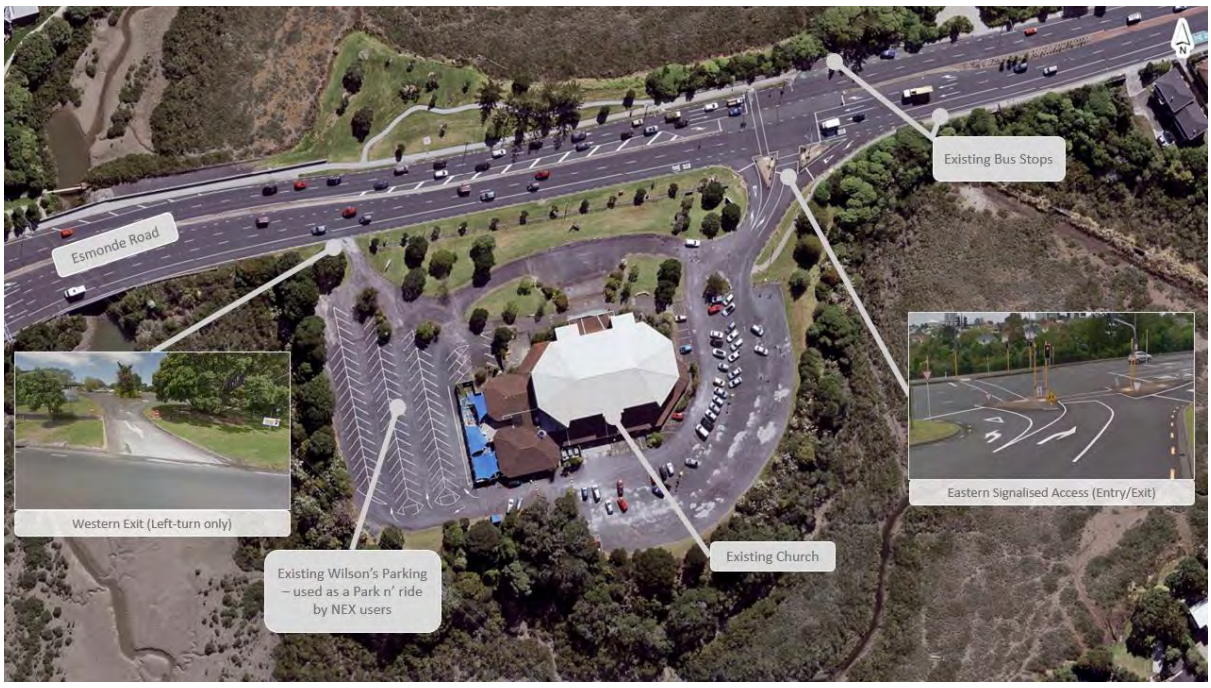


Figure 2.2: Existing site plan (Map source: Auckland Council GEOMAPS)

2.2 Road network

Esmonde Road is classified as a "Regional" road and has a posted speed limit of 50 km/h east of the intersection and 60 km/h west of the intersection until the Esmonde Road interchange. Lake Road to the east is classified as a "Regional" road and both Barrys Point Road and Fred Thomas Drive are classified as "Arterial" roads.

Esmonde Road has a relatively straight alignment directly adjacent to the site with slight curves either side of the existing site entrance. Esmonde Road adjacent to the site is sealed and has two general traffic lanes in each direction and a westbound bus lane.

The site is proposed to be accessed via the existing signalised intersection, which intersects with Esmonde Road towards the eastern edge of the site boundary (as shown above in Figure 2.2).

2.3 Accessibility

2.3.1 Private vehicles

The site is well located with regards to road connectivity to the wider Auckland Region. It is close to SH1, which provides direct access to the city centre as well as the rest of the north shore. The site is approximately 8.4 km from downtown Auckland.

Figure 2.3 shows the current road layout just in front of the site, with the various road widths and existing westbound bus lane heading towards SH1.

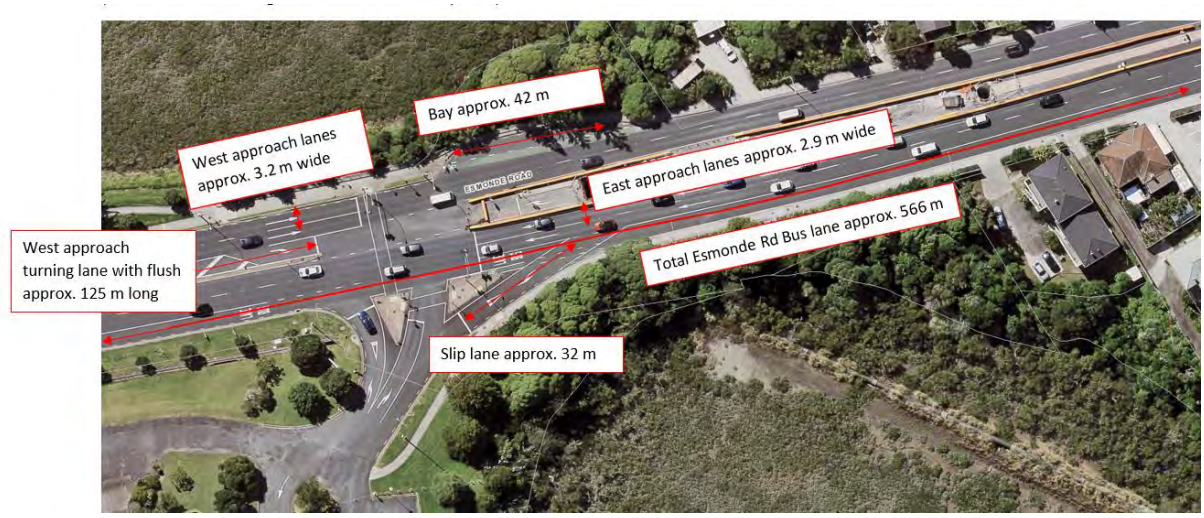


Figure 2.3: Current road layout in front of development site

At peak times the travel time between the site to the city centre is between 15 and 25 minutes and is sensitive to the SH1 motorway flows and the associated demands at the Onewa Road interchange.

A review of existing traffic at intersections was undertaken along Esmonde Road between Lake Road and Fred Thomas Drive. Traffic volumes at each intersection were obtained from 2019 SCATS loop counts[3], and graphed to produce daily traffic profiles, as shown in Figure 2.4. These traffic volumes remain elevated between the weekday AM and PM peak periods.

[3] The Sydney Co-Ordinated Adaptive Traffic System (SCATS) programme uses inductive loop detectors, to provide its vehicle volume data. Detectors are placed on all lanes, of all approaches of a signalised intersection. The SCATS data in this section was provided by the Auckland Transport Operations Centre (ATOC) for five traffic signal sites along Esmonde Road

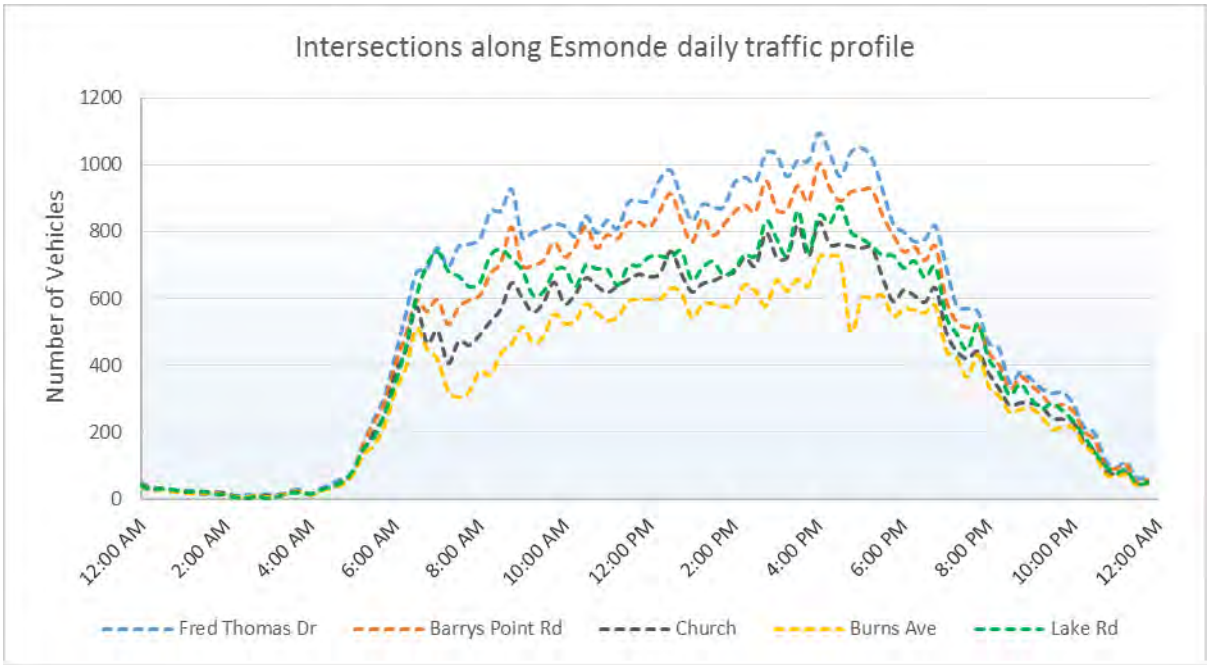


Figure 2.4: Esmonde Road route traffic profile by intersection (SCATS count date Tuesday 2nd April 2019[4])

2.3.2 Public transport

Auckland Transport operate a number of services in the vicinity of the site with two services operating directly adjacent to the site, as shown in Figure 2.5. The 82 and 802 are a frequent service and peak hour service respectively. Both these services utilise the existing westbound bus lane on Esmonde Road.

The 82 bus service operates at least every 15 minutes from 7.00 am to 7.00 pm, seven days a week, with less frequency in the early morning and night. The peak 802 bus departs Bayswater every 15 minutes between 6:30 am and 8:15 am, and Mayoral Drive every 20 minutes between 4:20 pm and 5:50 pm, arriving at Esmonde Road at varying intervals.

The closest stops for these routes are within 100 m of the existing site access point. The bus stop for bus services in the westbound direction is bus stop 4111 and in the eastbound direction is 3708. All other bus stops and bus infrastructure within the vicinity of the site is shown in Figure 2.6.

Akoranga bus station which is part of the northern busway is a 900 m walk from the existing site access. There are three services which run on the Northern Busway through Akoranga station, these are the NX1, NX2 and 866. Between these services there are buses arriving less than every two minutes at Akoranga bus station in the morning peak.

At present, approximately eight buses (Route 82) pass the site on Esmonde Road heading to Auckland Central between 8 am and 9 am on weekdays[5]. From the Northern Busway Station, the frequency of peak period services is 30+ buses during the same period. Assuming a bus capacity of 50 passengers per bus (Route 82), the total capacity of buses passing the site in the peak hour on Esmonde Road is 400.

Takapuna town centre, which has a high number of services running through is considered a key connection point on the network and is a 1.5 km walk from the existing site access.

[4] on a typical weekday, Tuesday 2nd April 2019 was selected to compare against 2019 mid-year traffic survey counts at the site/Esmonde Road signalised intersection.
[5] Approximate peak period frequency sourced from AT's online Journey Planner.

Figure 2.5: Existing public transport network (figure base source: Auckland Transport)

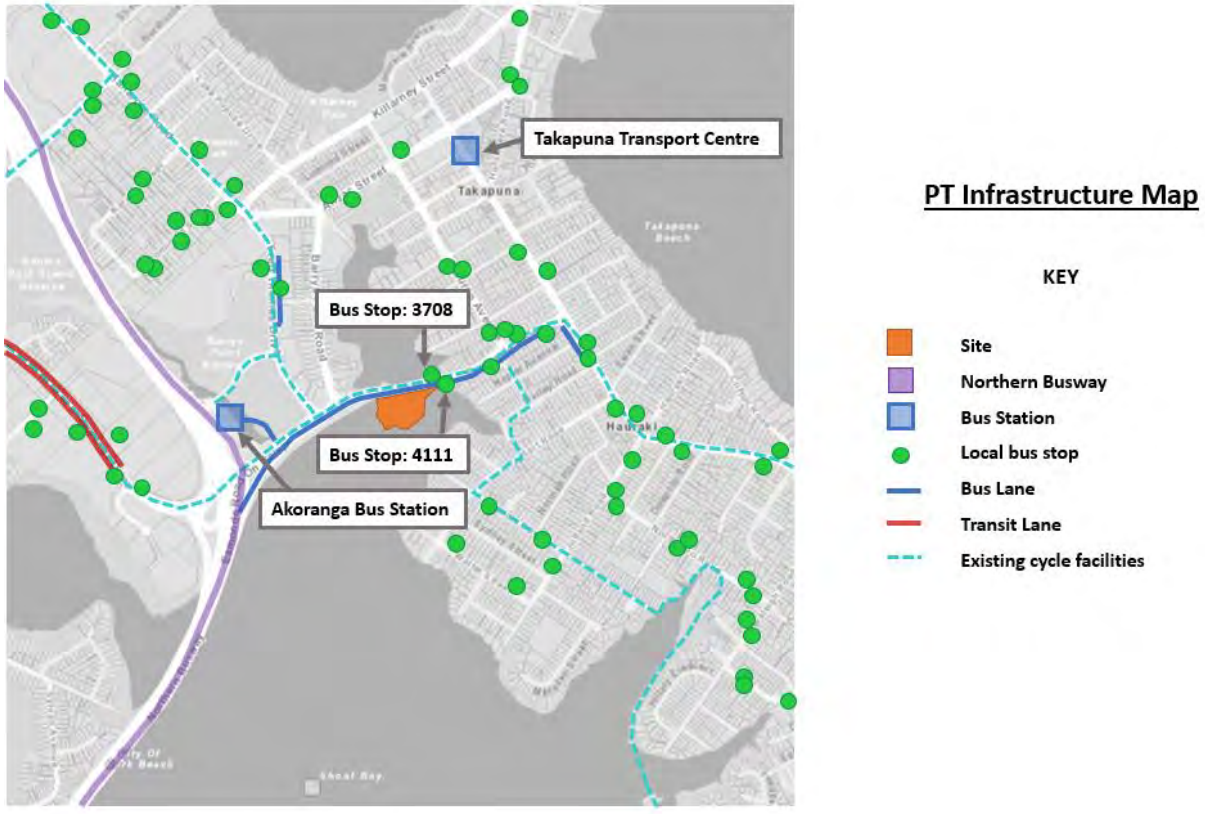


Figure 2.6: Existing public transport infrastructure, bus priority measures and cycle facilities

2.3.3 Walking and Cycling

According to AT's Roads and Streets Framework the acceptable walking distance and catchment area is shown in Figure 2.7. The acceptable walking distance to a rapid bus service is between 600 – 1200m and the same applies to intermediate/high schools. The site will have a day-care, convenience store and health facility available to residents on the premise.

Figure 2.7: AT's RASF catchment matrix

Footpaths along Esmonde Road are relatively wide at between 2.0 – 3.0 m wide and as such, have a high capacity.

Currently there is a shared path on the northern side of Esmonde Road extending west from the site access intersection, connecting to the nearby Auckland University of Technology (AUT) Akoranga Campus and Akoranga Bus Station. To the east there are footpaths on both sides of the road and an on-road eastbound cycle lane from the site.

Key local destinations (and the walking facility provided) within the walking distance of 1.2 km is shown in Figure 2.8. The site is in a strategic and well-connected area and has access to Akoranga Bus Station, schools, AUT (north campus) and commercial/retail facilities. The key destinations within an approximately 1.2 km walking distance are:

- Akoranga Bus Station (1 km);
- Countdown Takapuna (1 km);
- Takapuna Town Centre (1.2 km);
- AUT (north campus) (1.1 km);
- Rosmini College (1.2 km);
- St Joseph's Catholic School (1.6 km);
- Shore City Shopping Centre (1.4 km);
- Lake House Arts Centre (900 m); and

- Takapuna Beach (1.1 km).

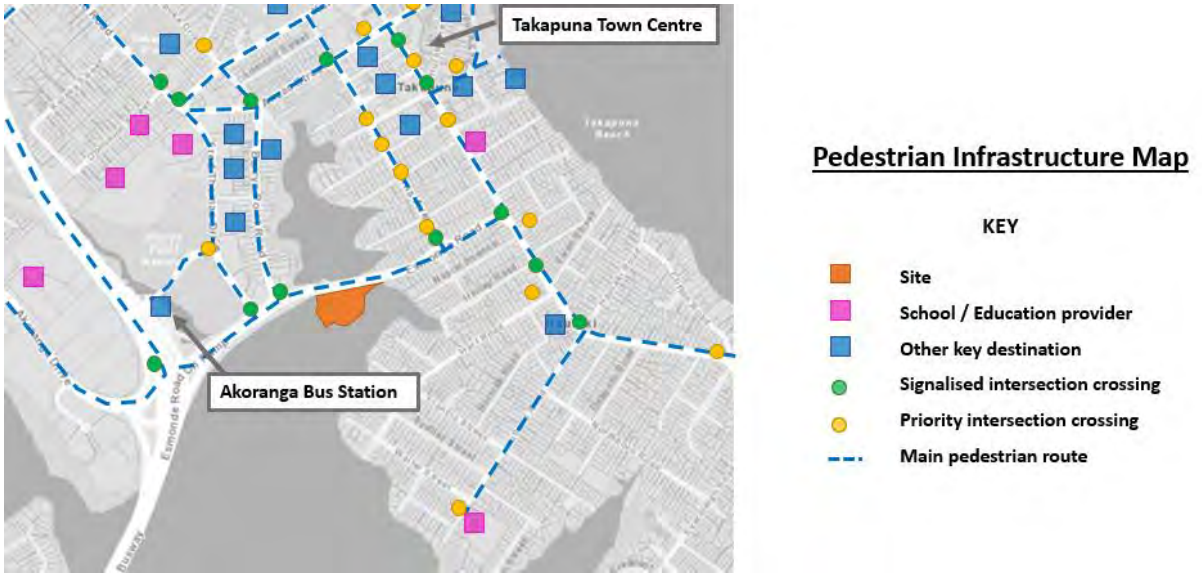


Figure 2.8: Pedestrian infrastructure and key destinations

There is a westbound on-road cycle lane on Esmonde Road between Lake Road and Eldon Street. South of Esmonde Road, Lake Road has on-road cycle lanes in both directions. The existing cycle facilities currently provided near the site are shown in Figure 2.9 and the key cycle routes are shown earlier in Figure 2.6.

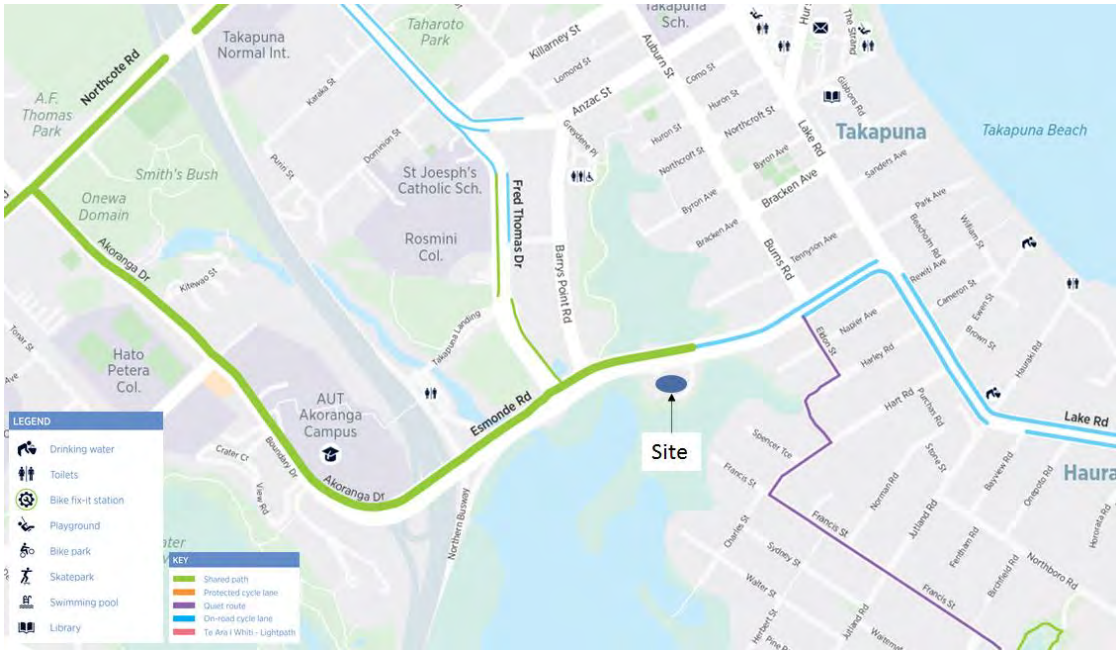


Figure 2.9: Existing cycle network map (Auckland Transport, 2020)6

[6] Reworked map originally sourced from Auckland Transport (2020) Cycle network maps N1 - Northern Maps https://at.govt.nz/media/1977813/cycle-network-map-n1-north-shore.pdf

Using the Waka Kotahi NZ Transport Agency Research Report 426, the average cycling trip length is approximately 3.0 km which means the primary catchment area for cyclists would be based on a radius of 3.0 km. Key local destinations supported by the cycling facilities near to the site in addition to the walking key destinations are:

- Smales Farm (2.3 km);
- Lake Pupuke (2.3 km);
- Northcote (2.9 km);
- YMCA North Shore Recreation Centre (2.2 km);
- Hauraki (1.4 km);
- Belmont (2.5 km);
- North Shore Hospital (2.9 km);
- Takapuna Grammar School (2.2 km); and
- Westlake Girls' High School (2.7 km).

Overall, the site is well served by high frequency Public Transport options and by walking and cycling connections. This makes the site ideal to support alternative modes of transport to vehicles.

2.4 Traffic volumes

2.4.1 Auckland Transport traffic volumes

Table 2.1 outlines the traffic volumes of the various roads surrounding the site.

Table 2.1: Traffic volumes

Road	Direction	Location	Date	7-Day ADT (veh/day)	Peak hour	Peak traffic volume
Esmonde Road	Westbound	Lake Road to Burns Avenue	18/06/2018	27,725	1045	2,390
Esmonde Road	Eastbound	Burns Ave to Lake Road	30/01/2019	36,090	1445	2,908
Barrys Point Road	Northbound	Anzac Street to Des Swann Drive	19/10/2016	10,906	1645	1,037
Barrys Point Road	Southbound	Des Swann Drive to Esmonde Road	24/06/2018	10,660	1315	1,135
Fred Thomas Drive	Southbound	Anzac St to Des Swann Drive	9/06/2017	6,805	745	791
Lake Road	Northbound	Napier Ave	8/02/2019	18,901	800	1,602

As shown above, Esmonde Road carries high daily and peak hourly traffic volumes, which is expected for a main Regional road that connects to SH1 and is the only road access to Devonport peninsula.

For the purposes of the assessment in this report, the typical Auckland average traffic growth rate of 2% per annum has been used to calculate future year traffic growth for year of opening. This is based on continued growth in line with historical traffic count data and assumes ongoing residential development. Given the current constrained traffic environment on Esmonde Road, this is a conservative growth rate and provides 'worst-case' results.

2.4.2 Surveyed traffic volumes

Traffic count surveys were undertaken on Wednesday 8th May 2019[7] at the two locations where the site currently accesses and Esmonde Road. One count was taken at the signalised intersection; the other was taken at the site's western exit lane. These traffic surveys were conducted over a morning period (7:00 to 10:00am) and an evening period (3:00 to 6:00pm). From the survey, the AM peak hour was identified as 9:15 to 10:15am, while the PM peak hour was 3:30 to 4:30pm. Trips generated at the site for an AM and PM peak hour were 62 and 79 trips, respectively.

In response to queries raised by AT, the AM/IP/Saturday peak periods were determined from the total volumes through the intersection on Esmonde Road (the network) from the survey attached in Appendix A.

Trip rates for the peak periods of the site development traffic (which may occur at different time to the highway network peak period) was then added to the peak of the highway network to ensure a robust worst case assessment.

2.5 Crash analysis

A search was undertaken of the Waka Kotahi NZ Transport Agency's Crash Analysis System (CAS) for all reported crashes for the period from 2015 to April 2022 (inclusive) along Esmonde Road covering the mid-block section either side of the site access. From this search a total of 9 crashes were recorded.

Whilst the analysis period includes 2020 and 2021, it should be noted that due to the effects of Covid-19, there was a large reduction in average traffic and consequently a lower crash risk for large periods throughout the year.

The full site detail crash report and collision diagram is attached in Appendix B.

Table 2.2:Crash severity summary

Year	Fatal	Serious	Minor	Non-injury	Total
2015	**0**	**0**	**2**	**0**	**2**
2016	**0**	**0**	**0**	**0**	**0**
2017	**0**	**0**	**0**	**3**	**3**
2018	**0**	**0**	**0**	**1**	**1**
2019	**0**	**0**	**1**	**1**	**2**
2020	**0**	**0**	**0**	**0**	**0**
2021	**0**	**0**	**1**	**0**	**1**
2022*	**0**	**0**	**0**	**0**	**0**
Total	**0**	**0**	**4**	**5**	**9**

*Retrieved on 12 April 2022

[7] Due to the on-going COVID 19 impact on traffic flows this analysis has used this 2019 survey data as being representative of the existing site under typical conditions.

Table 2.3: Crash factor summary

Crash type	Crash numbers
Overtaking crashes	4
Rear end / obstruction	4
Crossing / turning	1
Total	**9**

Observations from the crash review include the following:

- All the crashes were minor or non-injury crashes and were spread throughout the length of the corridor analysed, with the exception of four crashes at the intersection of Esmonde Road and the existing site access; and
- Four of the five crashes occurring at the intersection were non-injury crashes. The other one was a minor-injury head-to-tail crash occurred in 2021 due to a driver hit the accelerator instead of brakes. Only one crash is associated with a vehicle accessing/exiting the site. This was due to the driver failing to give-way to the right.

3 Proposed development

3.1 Overview

Via consultation with Auckland Council and Auckland Transport a maximum of 420 peak period vehicle trips has been identified as a limiting factor. As such a sample of possible development scenarios have been developed as shown in Appendix H.

For the basis of this assessment the Stage 3 proposal is assumed to be the construction of 270 residential apartments with a mix of 1, 2 and 3 bedroom units and 5 short term managed visitor accommodation units subject to agreement on massing, building height and apartment yield. The total redevelopment of the site will comprise 548 dwellings with up to 2,000m^2 GFA of non-residential activities proposed to service the residents of the development.

3.2 Site layout

As advised by KBS Capital Limited, the 2.16 ha site will comprise of three stages. Stage 1 and Stage 2 have already been granted resource consent and for the purpose of this assessment the proposed development for Stage 3 assumed is 270 residential apartments and 5 short term managed visitor accommodation units.

The site is proposed to be accessed via one vehicle entrance, the existing site access at the signalised intersection with Esmonde Road. However, it is proposed that all slip lanes will be removed to allow for safer walking and cycling crossing facilities. The existing exit on the north-west corner of the site is proposed to be closed. KBS Capital Limited also propose to relocate the existing westbound bus stop from 50 m east of the site access to approximately 30m west of the site access to improve access to public transport. The intersection layout and bus stop layout approved as part of the resource consents for Stage 1 and Stage 2 are shown in Appendix C with the relevant associated conditions described below:

Engineering Plan Approval

The engineering plans shall include but not limited to the following information regarding the following engineering works:

a *Bus stop - Bus stop (30 m), two bus shelters and platform (30 m long and 2 m) on Esmonde Road and Kassel kerb (if the kerb is altered or changed);*

b *Intersection - Intersection alignment/layout and changes to road frontage including:*

- *i The cycle lane transition ramp from the road to the footpath (southern side of the intersection;)*
- *ii The left-hand turn pocket;*
- *iii The footpath/ cycle paths on the southern-eastern & southern-western corners of the intersection;*
- *iv The alignment of the entrance to the site;*
- *v The shared paired pedestrian/ cycle crossings on the western and southern legs of the intersection;*
- *vi Kerb/ channel and changes to the footpath/cycle path; and*
- *vii Road markings.*

c *Intersection signals - details of any changes to the intersection signal hardware or software;*

d *Street lights - lighting plan and design (if required) for any street lights that require relocation;*

e *Footpath - plan with details of the footpath around the bus stop area;*

f *Removal of existing bus stop - details of the removal of the existing bus stop on the southern side of Esmonde Road; and*

g *Stormwater - plans/details confirming that the existing public road drainage CP's are sufficient to collect all public run off resulting from the changes to the intersection or to add/upgrade CP's where necessary*

Pedestrian Boardwalk/Path

Prior to the commencement of earthworks, the consent holder shall submit to Auckland Council for approval in conjunction with Auckland Transport and the Council's Arboricultural Specialist, the final design of the boardwalk/path along the front of the subject site and this shall include, at the minimum, the following details:

a The final alignment and location of the path (including details of how bus shelters or any public transport facilities will relate to the dripline/overhang of any street trees to provide a generally 3m width for this path);

b Details of how the boardwalk will provide linkage to existing and/or any future adjacent footpaths or shared paths;

c Details of the path from end-of-trip facilities to the bus stop;

d Details on how the retained street trees are going to be retained while the path can maintain a 3m width for the majority of the length; and

e Details of the construction and surface/materials of the 'path' and the materials that are used to construct the path need to be suitable for cyclists.

3.3 Transport connectivity/ Access Strategy

The AT Transport Design Manual outlines several intersection principles to ensure intersections can be seamlessly navigated, safely and easily for all users. These principles include:

- Making intersections safe for all users.
- Design for context.
- Integrate time and space.

Based on these principles, the proposed intersection layout is shown in Figure 3.1 on the right. This proposed layout keeps all vehicle movements similar except for combining the left turn into the site with the westbound bus lane, and removal of all slip lanes, which are known to provide poor amenity for pedestrians. A result of this, will be signalisation of left turns at the intersection. To optimise the signal phasing efficiency in the new layout, it is proposed to ban Esmonde Road eastbound U-turn movement (i.e. to allow right in, left out and westbound U-turns to run concurrently in same phase). This will result in eastbound U-turn movements being redistributed 300m downstream to the Eldon Street signalised intersection. This is assessed to have an insignificant impact to the Eldon Street intersection due to the low number of movements being redistributed[8]. The existing form of Eldon Street can accommodate this movement.

With the likely increase in pedestrian and cyclist movements due to the development and other investments in the area, this layout allows for safe, direct and accessible crossing facilities for both pedestrians and cyclists as part of the design. This layout also connects pedestrians and cyclists travelling between Takapuna and the Devonport Peninsula to the Akoranga bus station and the

[8] Four and seven eastbound U-turn movements were recorded in the weekday AM and PM peak hours respectively (approximately 1-2 movements every 15min): Surveys counts were undertaken on Wednesday, 8th May 2019 by Matrix Traffic and Transport Data

future Northern Pathway project, providing further connectivity to the Auckland City Centre and the rest of the North Shore.

Figure 3.1: Existing (left) and proposed (right) intersection layout (Map source: Auckland Council GEOMAPS)

The Auckland Unitary Plan (AUP) identifies a Vehicle Access Restriction (Motorway Interchange Control) along the site's Esmonde Road frontage with a gap in the restriction at the existing signalised intersection for the site to the east – refer to Figure 3.2. To comply with this restriction the application includes removal of the western most access (existing left out) and consolidation of all traffic movements at the existing signalised intersection. Accordingly, it is considered the proposal complies with the rules related to Vehicle Access Restrictions under AUP Table E27.4.1 by removal of the non-complying access and rationalisation of all movements to the controlled intersection.

Figure 3.2: Site vehicle access restrictions (AUP planning maps, accessed July 2020)

4 Trip generation

4.1 Estimated trip generation

To estimate the vehicle trip generation of the proposed site during the AM and PM peak hours, several guides were referenced to determine the appropriate vehicle trip rates. These rates, source referenced and the vehicle trip generation estimation of the site is outlined in Table 4.1.

The rates were chosen due to their appropriateness for the site location. The residential land use rate is based on high density non-CBD residential buildings which was deemed suitable for this assessment due to the travel demand measures adopted and the site's location. As no trip generation rates for short term managed visitor accommodation were found, the trip generation rate for hotels was used. The NZTA Research Report 453 outlines a trip generation rate for Hotels which include "conference facilities such as seminar rooms" [9] of 1.2 peak hour trip per room.

The non-apartment ancillary land uses within the site could include two cafés, a restaurant, a fitness centre, an early learning centre, a communal bookable room, a convenience store, and a health care clinic. These are planned to primarily service residents/workers of the development including those staying in the visitor apartments and will have limited parking provisions (up to 20 spaces allocated for commercial activities and healthcare facilities). As a result, the external vehicle trip generation for these ancillary land uses is estimated to be substantially lower than normal as most customers/users will be from within the site. The trip generation potential for the development's ancillary land uses has been based on the following:

- Maximum average hourly parking turnover of two per allocated space with each turnover resulting in one entry and one exit vehicle movement, plus
- Six vehicle trips an hour to account for pick-up/drop-off movements (e.g. for staff) and for the occasional service vehicle.

Based on the above assumptions a trip generation potential of 86 trips/hour has been adopted for the ancillary land uses (20 parking spaces x 2 turnover x 2 (entry movement + exit movement) + 6 (non-parked trips).

A check has been carried out on the above 1st principles calculation by comparing this with the estimated number of staff for the ancillary uses (using NZ and UK data on FTE and GFA ratios) as summarised in in Table 4.1 below:

[9] NZ Transport Agency. (2011). *NZTA Research Report 453: Trips and parking related to land use* . NZTA.

Table 4.1: Stages 1 and 2 Ancillary Uses FTE estimation

	Estimated number of staff	GFA (m^2)	Estimated number of Full Time Employees
Cafe	1 FTE per 30m^2	100	4
Fitness centre/Gym	1 FTE per 100m^2	203	3
Early learning centre	1 FTE per 120m^2	216	2
Healthcare Facility	1 FTE per 120m^2	167	2
Convenience store	1 FTE per 19m^2	100	6
Total		**1,257**	**17**

For the residual 743m^2 ancillary uses in Stage 3, if the highest FTE to GFA ratio of 1 FTE per 19m^2 GFA is used as a worst case then this would result in 39 FTE staff. Therefore, total ancillary staff would equal 56. Assuming as a worst case that all of these all arrive by car (either parked in one of the 20 spaces or dropped off) in the peak period then this is much lower than the 86 peak hour vehicle trips calculated in the first principles calculation.

Table 4.2: Vehicle trip generation weekday AM and PM peak periods

Land use	No.	Peak hour trip rate	Unit	Peak hour Trips	Source
Residential apartments	356	0.29	per unit	104	RTA Guide to Trip Generating Developments[10]
Short term visitor accommodation	192	1.2	per room	230	ITE Trip Generation Rates - 9th Edition[11]
Ancillary uses	NA	NA	NA	86	Derived from first principles
Total				**420**	

Based on the above table, the total vehicle trips in each of the AM and PM peak hours is estimated at up to 420 trips. For comparison, the existing site land uses have a surveyed AM and PM peak hour trip generation of 62 and 79 trips respectively[12]. The forecast net traffic increase for the site is therefore between 341-358 trips an hour.

In addition to the above AM and PM peak hours, vehicle trips for the weekday interpeak and Saturday peak hours were also estimated for the purpose of informing the traffic modelling assessment. Trip rates for the Saturday peak period were assumed to be comparable to those of the weekday AM/PM peak periods. The interpeak trip rate for residential apartments was taken as 60%

[10] Roads and Traffic Authority, NSW. (2002). *Guide to Traffic Generating Developments.* Sydney: Roads and Traffic Authority, NSW.
[11] Institute of Transportation Engineers. (2012). *Trip Generation Manual, 9th Edition* . Institute of Transportation Engineers.
[12] Based on AM and PM peak period traffic count surveys undertaken on Wednesday, 8th May 2019 by Matrix Traffic and Transport Data (9:15am – 10:15am and 15:30pm – 16:30pm)

of the weekday peak rate based on analysis of traffic surveys of similar developments in Queensland (QLD), Australia[13]. See Figure 4.1 below for the typical weekday daily traffic profile of the surveyed developments.

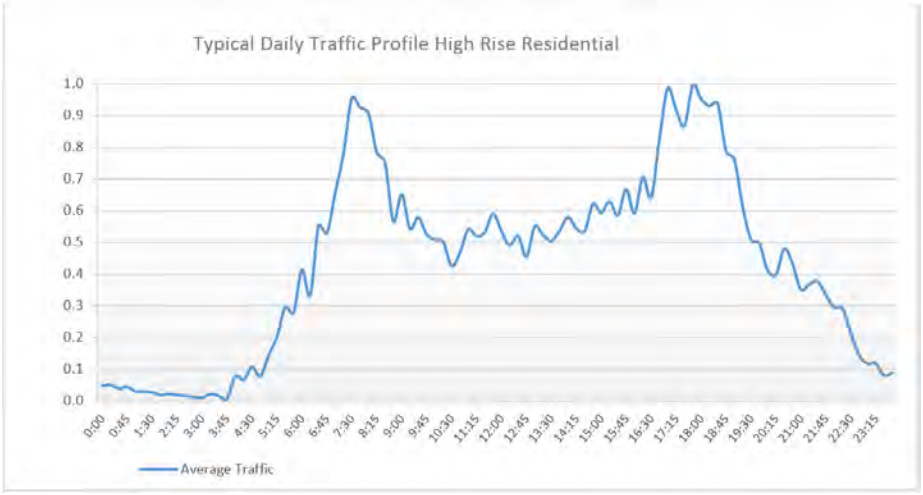


Figure 4.1: Typical daily traffic profiles high rise residential apartments (weekdays)

Interpeak trip rates for short term visitor accommodation and ancillary land uses will typically be more uniform between the AM and PM peak period compared to that of residential land uses. In assessing the interpeak trip rates for the visitor accommodation a review of traffic surveys of six serviced apartment[14] developments in QLD, Australia was undertaken. The average weekday daily traffic profiles from these sites, plotted in Figure 4.2[15] show that the traffic volumes remain elevated from around 8:00 am to 7:00 pm. Hence, the short-term accommodation weekday AM/PM peak trip rate has been conservatively adopted as its interpeak trip rate.

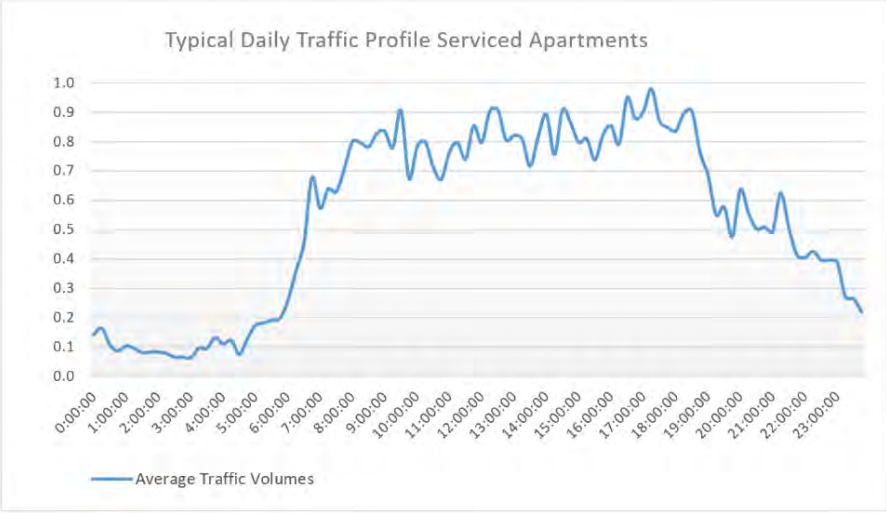


Figure 4.2: Typical daily traffic profiles serviced apartments

[13] Interpeak vehicle trip rate is based on a 0.6 factor of the weekday 0.29 trips/peak hour rate from the RTA Guide. This interpeak factor was derived from traffic surveys of eleven high rise residential apartment sites in QLD in 2017 and 2019 by Department of Transport and Main Roads (DTMR). Online data reference: https://www.data.qld.gov.au/dataset/traffic-generation-data-2006-2019

[14] Serviced apartments are a type of short-term accommodation in QLD

[15] Traffic surveys of six serviced apartment sites in QLD in 2017. Survey data sourced from the Department of Transport and Main Roads (DTMR). Online data reference: https://www.data.qld.gov.au/dataset/traffic-generation-data-2006-2019

Due to limited guidance otherwise, the AM/PM peak trip rate for ancillary land use has also been conservatively adopted as its interpeak period.

Forecast vehicle trip rates for all interpeak and Saturday peak hours are outlined in Table 4.3.

Table 4.3: Vehicle trip generation Interpeak and Saturday peak hours

Land use	No.	Trip rates		Unit	Trips		Source
		Interpeak	Saturday		Interpeak	Saturday	
Residential apartments	356	0.174	0.29	per unit	62	104	RTA Guide to Trip Generating Developments[10]
Short term visitor accommodation	192	1.2	1.2	per room	230	230	ITE Trip Generation Rates - 9th Edition[11]
Ancillary uses	NA	NA	NA	NA	86	86	Derived from first principles
Total					**378**	**420**	

4.2 Existing trip generation

The intersection of Esmonde Road and Harbourside Church (site location) was surveyed to understand the existing traffic movements and volumes at the site, and this included the additional exit lane. The surveyed volumes in the AM peak recorded 127 vehicles for inbound and 24 vehicles outbound at the main intersection, and 38 vehicles outbound at the additional exit lane. In the PM peak there were 53 vehicles inbound and 69 vehicles outbound at the main intersection and 56 vehicles outbound at the additional exit lane.

4.3 Trip distribution

4.3.1 Development trip distribution

The distribution of development trips at the access intersection has been based on a two-step approach. Initially the ITE Trip Generation Rates splits were used to determine the percentage splits of vehicles travelling in/out of the development. These splits were then applied to the total peak hour trip generation of 420, as shown in Table 4.4. Existing intersection traffic volume counts, which were conducted in May 2019, were then used to determine the turn movement splits. These turn splits were applied to the calculated development traffic distributions are shown in Figure 4.3.

Table 4.4: Assumed traffic distributions for weekday peak hours

Land use	Percentage Splits				Distribution of generated trips			
	AM IN	AM Out	PM IN	PM Out	AM IN	AM Out	PM IN	PM Out
Residential	20%	80%	65%	35%	21	83	67	37
Managed visitor accommodation	60%	40%	50%	50%	138	92	115	115
Ancillary uses	52%	48%	50%	50%	45	41	43	43
					204	**216**	**225**	**195**

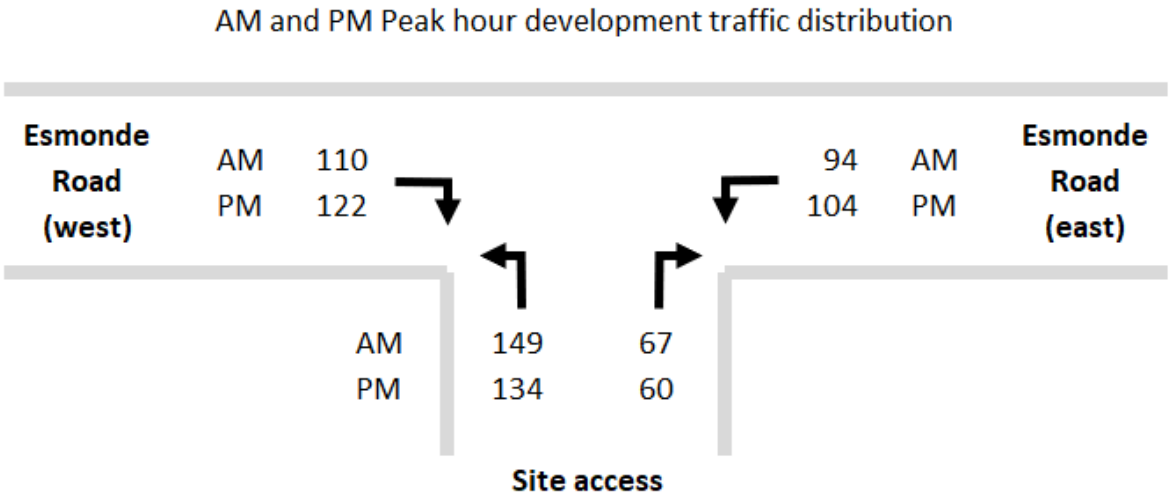


Figure 4.3: Weekday AM and PM Peak hour traffic distribution

In addition to the weekday AM and PM peak hours, development traffic distribution was also estimated for the weekday interpeak and Saturday peak period to inform different traffic model scenarios along Esmonde Road. As these peak periods are outside the traditional commuter peak periods, they are more likely to have even splits. Therefore, for the purpose of this assessment an even 50/50 in/out split was adopted for the interpeak and Saturday peak periods. These splits were applied to the total interpeak and Saturday weekday trip rate of 378 and 419 respectively, as shown in Table 4.5. The corresponding applied traffic turn distribution shown in Figure 4.3.

Table 4.5: Assumed traffic distributions for weekday interpeak and Saturday peak hours

Land use	Percentage Splits				Distribution of generated trips			
	IP IN	IP OUT	Sat IN	Sat IN	IP IN	IP OUT	Sat IN	Sat OUT
Residential	50%	50%	50%	50%	31	31	52	52
Managed visitor accommodation	50%	50%	50%	50%	115	115	115	115
Ancillary uses	50%	50%	50%	50%	43	43	43	43
					189	**189**	**210**	**210**

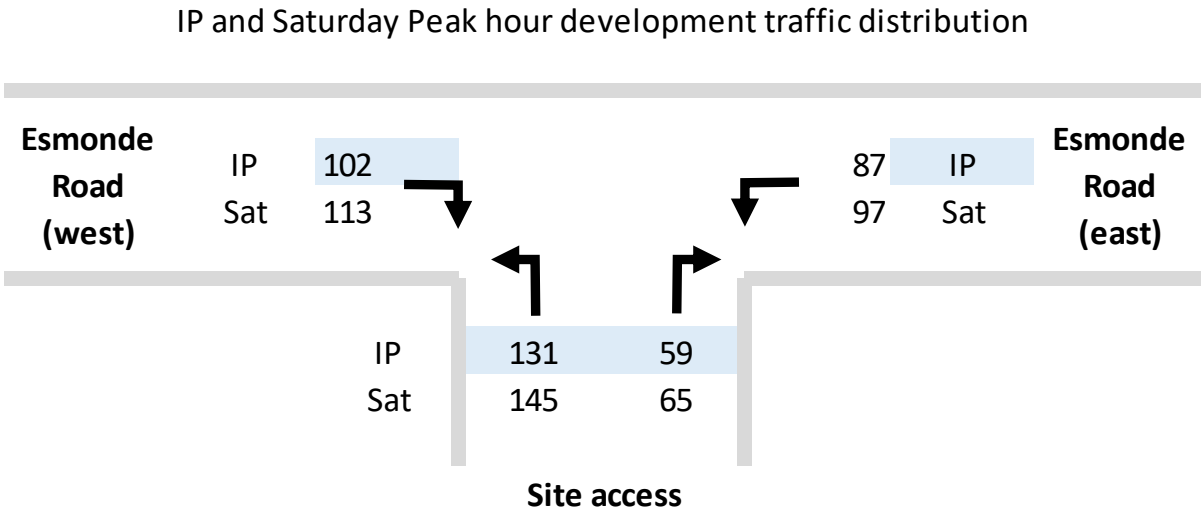


Figure 4.4: Weekday interpeak and Saturday peak hour traffic distribution

In response to AT comments on the trip distribution, from site inspections carried out close to the survey time in 2019, the site was observed being used as a Park and Ride, in addition to the Church. The trip distribution used in all time periods was derived from the traffic survey data in Appendix A. (including the left out only access) and the following was used:

- Inbound trips – 54% from the west/46% from the east.
- Outbound trips – 69% to the west/31% to the east.

Any uncertainty in these assumptions was further tested as part of the sensitivity modelling scenario assessments detailed in section 5 below.

5 Assessment of effects

5.1 Assessment Extents

Esmonde Road serves as the most direct connection to the northern motorway for people travelling to/from the Devonport peninsula. The Esmonde Road corridor is an urban corridor with existing congestion issues in the peak periods due to existing constraints on the network such as the State Highway 1 on and off ramps. On average, the corridor carries over 36,000 vehicles per day.

In the future year afternoon peak period, it is expected that 61% of the development traffic travels to/from the west and 39% to/from the east. Directly to the west of the development intersection lies the Barrys Point Road/Esmonde Road intersection. The trips generated from the development in the afternoon peak will form less than 5% of the traffic travelling through the Barrys Point Road intersection.

This is considered to cause minimal impact to the delay vehicles experience at the Barrys Point Road intersection, particularly as the intersection is signalised and all movements are fully controlled. This is also being further mitigated by the travel demand measures outlined elsewhere in this report. Hence this assessment focuses on the intersection of Esmonde Road and the development access.

5.2 Intersection Performance

SIDRA Intersection v9 2020 (SIDRA) was used to determine the anticipated performance of the intersection of Esmonde Road and the development access. SIDRA provides estimates of capacity, level of service and a wide range of performance measures including delay and queue length. The Level of Service (LOS) criteria used to assess the performance of the signalised intersection is shown in Table 5.1[16].

Table 5.1: LOS criteria for signalised intersections (Austroads, 2017)

LOS	Control delay (s/vehicle)
A	0-10
B	> 10-20
C	> 20-35
D	> 35-55
E	> 55-80
F	> 80

Based on forecast 2023 traffic flows on Esmonde Road, development trips and turn count proportions calculated, SIDRA models were created for the weekday morning and afternoon peaks, the weekday interpeak and the Saturday peak periods using the existing road layout and the proposed layout as outlined in Section 3.

A summary of the intersection performance for the 'Base model', which is a representation of the existing conditions on site[17], as well as the proposed development scenarios modelled are shown in Table 5.2, Table 5.3 and Table 5.4. The full detailed modelling outputs can be found in Appendix D.

[16] Source Austroads, 2017 *Guide to Traffic Management Part 3: Traffic Studies and Analysis* Table 6.6

[17] SIDRA Base models were calibrated using AM and PM peak traffic queue surveys undertaken on Wednesday, 8th May 2019 by Matrix Traffic and Transport Data as well as SCATS signal timings for the same periods provided by ATOC

The observed queue length survey identified an even lane usage split of the through lanes on Esmonde Road.

Table 5.2: Base model

Base Model (2019)									
Approach	Turn	Average Delay (Seconds)				95th Percentile back of queue (metres)			
		AM	IP	PM	Sat	AM	IP	PM	Sat
South (48 Esmonde Rd)	Left	6.7	4.5	7.6	6.8	0	0	2	1
	Right	41.6	52.8	68.7	48.6	3	2	5	1
East (Esmonde Rd)	Left	4.7	4.6	4.6	4.7	0	0	0	0
	Through	8.6	2.5	7.6	6.5	111	63	157	112
	U-turn	53.1	64.9	87.0	61.2	1	2	4	1
West (Esmonde Rd)	Through	8.2	2.4	7.3	6.3	93	58	140	103
	Right	53.0	65.9	86.2	69.3	9	11	11	27
	U-turn	54.6	67.5	87.7	70.9	9	11	11	27
Overall Intersection		**9.0**	**3.3**	**8.4**	**7.9**	**111**	**63**	**157**	**112**

Table 5.3: Intersection delays

Scenario year: 2023		Average Delay (Seconds)							
		Existing Layout (no development)				Proposed Layout (with development)			
Approach	Turn	AM	IP	PM	Sat	AM	IP	PM	Sat
South (48 Esmonde Rd)	Left	8.1	8.6	10.2	10.4	28.9	29.0	48.3	28.9
	Right	71.2	70.3	70.8	46.0	40.9	40.1	65.7	40.8
East (Esmonde Rd)	Left	4.9	4.9	4.8	5.1	7.0	6.8	7.1	7.0
	Through	9.8	10.0	10.8	13.4	15.1	14.8	16.5	15.9
	U-turn	89.9	90.5	90.9	60.4	48.6	49.7	72.0	48.4
West (Esmonde Rd)	Through	9.3	9.7	10.3	13.0	14.2	14.3	15.8	15.4
	Right	90.7	90.6	90.2	63.2	51.4	52.4	76.3	51.7
	U-turn	92.3	92.3	91.6	64.8	-	-	-	-
Overall Intersection		**10.7**	**10.9**	**11.5**	**14.3**	**17.0**	**16.7**	**20.0**	**17.7**

Table 5.4: Intersection queues

Scenario year: 2023		95th Percentile back of queue (metres)							
		Existing Layout (no development)				Proposed Layout (with development)			
Approach	Turn	AM	IP	PM	Sat	AM	IP	PM	Sat
South (48 Esmonde Rd)	Left	1	3	3	2	35	30	52	34
	Right	6	3	6	1	19	16	27	18
East (Esmonde Rd)	Left	1	0	0	0	7	6	9	7
	Through	172	180	216	183	163	167	257	184
	U-turn	2	3	5	1	2	2	4	1
West (Esmonde Rd)	Through	143	168	194	176	136	151	249	180
	Right	18	17	13	27	36	34	61	37
Overall Intersection		**172**	**180**	**216**	**183**	**163**	**167**	**257**	**184**

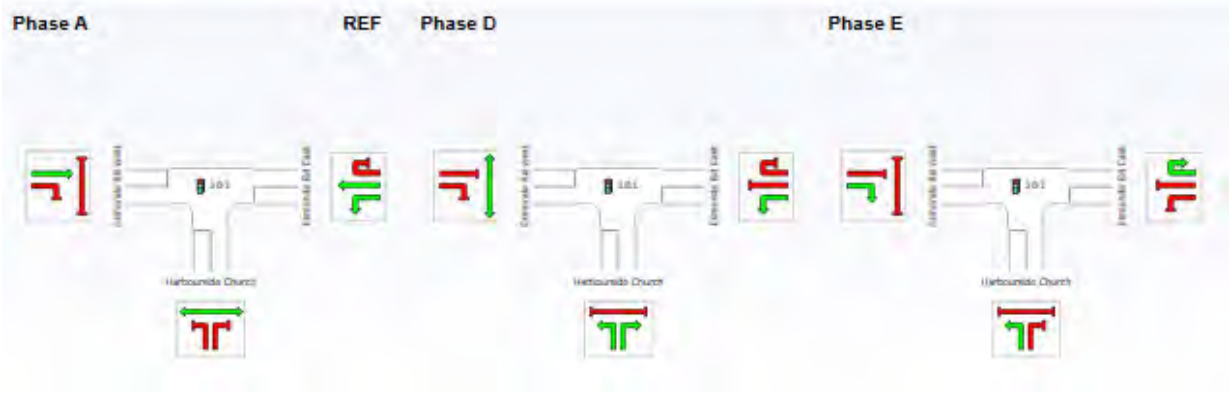
Key observations made from a comparison of results include:

- The average intersection delay and queue length (95th Percentile) for the site increases slightly between the 2019 and 2023 base model scenarios. This is due to the adopted increase in background traffic of 2% per annum.
- The average delay and queue length (95th Percentile) of vehicles turning left into the development increases between the 2023 existing layout and the proposed development scenario. This is also the case for vehicles turning left out of the development (south approach). The increase in delay and queue length in both these cases is attributed to the removal of the free left turn lanes at the intersection and the net increase in site traffic.
- The queue length (95th Percentile) of vehicles turning right into the development increases between the 2023 existing and proposed development scenarios however remains within the right turn's storage capacity of approximately 90m.
- The proposed layout has a minimum impact on the intersection, particularly through movements on Esmonde Road compared to the existing layout.
- The results show that the average delay per vehicle is forecast to increase by around 2-10 seconds with the development. Overall, this results in a LOS of "C" which is considered acceptable for a signalised urban intersection[18].

Based on anticipated trip generation and predicted traffic volumes, the Esmonde Road/Site access intersection will have the capacity for traffic volumes from the full development. This is based on all three stages of the development being constructed and normal uptake in public transport and walking and cycling, and thus considered a conservative scenario. It is likely that the surrounding future infrastructure will influence the mode choice of commuters and the development may have lower trip generation rates than outlined in this report.

As requested by AT, further details on the signal phasing are provided. Signal phasing, as agreed with AT/ATOC, is shown in the extract below from the signal design plan FIG 1010685.3000-F01 Rev 2, which is attached in Appendix E. Appendix E also includes the existing phasing plan.

[18] Level of Service (LOS) is based on *Guide to Traffic Management Part 3: Traffic Studies and Analysis* Table 6.6.



The shared pedestrian/cycle crossing on Esmonde Road will operate in the same phase as traffic exiting the development (Phase D) however with full protection for cyclists and partial protection for pedestrians as per Auckland Transport Standards. Left turn traffic from the development will also be permitted in Phase E. Full protection for cyclists and partial protection for pedestrians will be provided as per Auckland Transport Standards. The signal design EPA has this arrangement which has been reviewed by AT/ATOC as part of the EPA process.

Following AT comments it is confirmed that the latest design has updated the left turn pocket to provide a left turn lane of approximately 12m (see Appendix C). This will accommodate 2 cars. A check of the SIDRA modelling has confirmed that this 3m change in the modelled lane length has no impact on the modelling results.

AT requested details of calibration of the base SIDRA models. Initially the average phase times from SCATS was used and then the timings were adjusted between the minimum and maximum times to calibrate the 2019 AM and PM peak models based on the survey queue length data. The Interpeak model used the average phase times from SCATS. It should also be noted that whilst the SCATS data indicates 7 phase sequencing, the SCATS History Statistic indicates that during all peak times, only 3 phases (A, D and E) are present. Hence the 2019 base model only has these 3 phases modelled.

AT also requested that the SIDRA model needs to take into account capacity constraints such as downstream queuing towards the motorway in the morning peak period. Initial discussions with AT at the outset of preparing the ITA confirmed that the key focus for the modelling scope extent was the Esmonde Road/Church Access signalised intersection (i.e. that modelling was not expected for the Esmonde Road/Barry's Point Road and Fred Thomas Drive intersections).

Appendix D provides a copy of the movement summary (including delays) for buses, pedestrians and cyclists at the signalised intersection of the main access with Esmonde Road. This demonstrates that with the development traffic and improved layout, delays to pedestrians and buses are no worse than the base situation. Cyclists were not specified as a movement class in this model, so it is not possible to comment on this, other than it is anticipated that since pedestrian delays are no worse, then this would also apply to cyclists.

5.3 Sensitivity assessment

Sensitivity testing has been used to explore the impact of uncertainty around adopted model parameters. One key uncertainty identified through discussions with AT includes the possibility of higher through volumes on Esmonde Road in the future. To assess the sensitivity of this uncertainty the worst performing model scenario (2023 PM peak[19]) was tested with an additional 20% through traffic.

[19] Worse peak period based on highest overall modelled intersection delay (with development)

A summary of the intersection performance for this sensitivity scenario with and without development traffic is shown in Table 5.5.

Table 5.5: Sensitivity model (+20% Esmonde Road through traffic)

Scenario: 2023 PM Peak	Turn	Average Delay (Seconds)		95th Percentile back of queue (metres)	
Approach		Existing Layout (no development)	Proposed Layout (with development)	Existing Layout (no development)	Proposed Layout (with development)
South (48 Esmonde Rd)	Left	15.0	45.1	4	59
	Right	70.8	62.3	6	31
East (Esmonde Rd)	Left	4.8	7.3	1	12
	Through	12.7	18.3	306	301
	U-turn	90.9	67.1	5	4
West (Esmonde Rd)	Through	11.9	17.4	270	292
	Right	90.2	73.7	13	71
	U-turn	91.6	-	13	-
Overall Intersection		**13.1**	**21.6**	**306**	**301**

Key observations made from a comparison of the sensitivity results include:

- There is only a minor increase in the average intersection delay (8.5 seconds) between the with and the without development scenarios for the PM peak period.
- The queue length (95th Percentile) of the through movements on Esmonde Road on both the eastern and western approaches increase by a maximum of 42% in the sensitivity assessment when compared with the forecast 2023 model results. These queues however do not extend through upstream intersections of Eldon Street or Barrys Point Road and are therefore considered acceptable.

6 Parking

6.1 Proposed Auckland Unitary Plan requirements

Based on the information in the Auckland Unitary Plan Operative in Part Section E27 Transport, there are no minimum or maximum requirements for the development land uses except for the Stage 2 convenience store (100 m^2) and café (100m^2) which require a minimum of one car park space per 30 m^2 of ground floor area (GFA) and outdoor seating area. This equates to four allocated parking spaces for each of the café and convenience store. All other car parking spaces within the development will be managed by the body corporate.

The development will control the number of car parking spaces that are available with a maximum of 321 for the Precinct proposed. This is based on a car park ratio of 0.55 for all residential activities and 548 dwellings.

Table 6.1 shows the proposed car parking provision for dwellings and other land uses.

Table 6.1: On-site car parking allocations

Activity/parking type	Car parking spaces
Residential dwellings	301
Commercial activities and healthcare facilities	20
Total:	**321**

The minimum requirement for accessible car parking is shown in Table 6.2 and is as per AS/NZS 2890.6:2009[20].

Table 6.2: Provision of accessible car parking space

Total number of car spaces	Number of accessible car spaces
1 – 20	Not less than 1
21 – 50	Not less than 2
For every additional 50 car spaces or part thereof	Not less than 1

Based on the 301 residential car park spaces provided, the development requires seven accessible spaces, three of which have been included in the consented proposal for Stage 1 and Stage 2.

A parking management plan has been prepared for Stage 1 and Stage 2 which provides information on the mechanisms in place limiting the trips generated by the site. It is intended this parking management plan will be appliable to the wider Precinct. This can be found in Appendix F.

As part of the conditions of the resource consent for Stage 1 and Stage 2, certification of the parking management plan is required. The condition states that the consent holder shall submit a finalised parking management plan for certification by Council in general accordance with the parking management plan as referenced in condition 1, including but not limited to details of the following:

a The finalised allocation of car parking spaces;

[20] Joint Technical Committee CE-001. (2009). *Parking facilities Part 6: Off-street parking for people with disabilities.* Wellington: Standards Australian and Standards New Zealand.

b Signage to indicate visitor parking spaces, restrictions on vertical clearance on some of the stacked parking spaces, line marking for the coach parking space, loading space, the mini-bus/shuttle space, and any pick-up and drop-off zone;

c Details of how the online pre-booking of car parking spaces will work;

d Details of entity established to manage and implement the certified parking management plan

It is important to note that the development's limited provision of car parking is being used as a travel demand measure to encourage fewer trips by private transport and to promote the use of more sustainable transport modes. This measure is supported by provision of cycle parking, end of trip facilities, a relocated bus stop fronting the site on Esmonde Road and improvements to walking and cycling connections and amenity. Another consideration to account for in terms of likely parking demand is the complementary land uses within the site that are aimed to service development residents and short-term accommodation guests (e.g. supporting business centre, fitness centre, childcare, convenience store).

Only approximately half the residential apartments will be sold with allocated parking spaces. The buyers of apartments without car spaces will not be permitted to have cars parked onsite and as a result are unlikely to purchase if this is unsuitable. If rented out the same philosophy applies with only prospective tenants that do not require a car space likely to move into the apartments without spaces. To provide alternative transport options for apartment residents without car spaces, there are cycle parking provisions, a car share scheme, development shuttle bus and high-quality public transport nearby (Akoranga Bus Station - Northern Busway and Route 82 frequent service on Esmonde Road).

Short term managed visitor accommodation is proposed to operate similar to a CBD hotel with limited parking provided for guests who will have to pre-book spaces prior to arrival. The day to day booking of car spaces for both visitor accommodation staff and guests will be managed via on-site staff. In support of this arrangement the on-site staff will also operate a mini-bus service for accommodation guests. There will also be pick-up and drop-off spaces provided for ride share and taxi services.

There are five proposed shared visitor spaces for the identified for Stage 1 and Stage 2 of the development servicing visitors of the residential apartments as well as other short-term parking. These will be time restricted and managed via on-site staff. Further visitor parking requirements will be identified as the development progresses.

6.2 On-Street parking

No on-street parking exists on Esmonde Road near the site. The nearest on-street parking to the site is located greater than 400 m walking distance away on Eldon Street to the east. Other on-street parking in the area includes Barrys Point Road and Burns Avenue and is between 400 m – 600 m walking distance away. Due to the inconvenience of these parking options, it is expected that they will be seldom used by the development residents or visitors.

6.3 Bus parking

The development will provide for one mini-bus parking space in the covered parking area. This will be used to park the short-term visitor accommodation's shuttle bus when not in use. The development will also accommodate an area for coach parking (12.6 m long). This area will allow up to two coaches to park in tandem.

6.4 Cycle parking

The development will provide a minimum of 94 long term and 25 visitor/short term bicycle parking spaces to comply with the Auckland Unitary Plan (AUP) as part of Stage 1 and Stage 2. Table 6.3

outlines the development's bicycle parking requirements under the AUP and the development provisions.

Table 6.3: Auckland Unitary Plan bicycle parking requirements for Stages 1 and 2

Land Use	Unitary Plan Bicycle Parking Requirement			Development Numbers	Visitor / Short term No.	Long term no.
	Activity	Visitor / Short term rate	Long term rate			
Hotel / managed apartment	Visitor accommodation and boarding houses	1 space plus 1 space per 20 rooms/beds	1 per 10 FTE employees	187 rooms	*104*	*2 (assumed max 20 FTEs)*
Residential apartment	Developments of 20 or more dwellings	1 per 20 dwellings	1 per dwelling without a dedicated garage	86 apartments	*4.3*	*86*
Café restaurant	Retail (Food and beverage)	1 per 350 m^2 GFA	1 per 300 m^2 GFA	100 m^2	*1*	*1*
Gym	Entertainment and community facilities (Community facilities)	1 per 200 m^2 GFA	1 per 500 m^2 GFA	203 m^2	*2*	*1*
Early Learning Centre	Care centre	1 space plus 1 space per 50 people	1 space per 10 FTE employees	216 m^2	*2 (assumed max 50 people)*	*1 (assumed 2 FTEs)*
Convenience Store	Retail (Food and beverage)	1 per 350 m^2 GFA	1 per 300 m^2 GFA	100 m^2	*1*	*1*
Communal bookable rooms	Entertainment and community facilities (Community facilities)	1 per 200 m^2 GFA	1 per 500 m^2 GFA	471 m^2	*3*	*1*
Health care clinic	Medical facilities (Healthcare services	1 space plus 1 space per 10 FTE practitioners	1 per 8 FTE practitioners	167 m^2	*2 (assumed 2 FTE practitioners)*	*1 (assumed 2 FTE practitioners)*
Total					**25**	**94**

Note bicycle parking for ancillary uses for the short-term managed accommodation in Building 1 are assumed to be covered by the hotel/managed apartments activity rate. For Stage 3 the cycle requirements are expected to comply with AUPs requirements and will be detailed as the development stages are confirmed.

6.5 Service vehicles and vehicle tracking

As well as the mentioned vehicle and cycle parking, the site will incorporate space and parking for service vehicles for loading / unloading (minimum dimensions 8.0 m x 3.5 m).

Vehicle tracking has been completed to ensure the site and proposed intersection footprint are adequate. The following vehicle tracking assumptions were made:

- Tracking is based on guidance from Auckland Transport's **Transport Design Manual Urban and Rural Roadway Design Guide**: Table 2: Design vehicles for street types. Intersection type Local to Arterial or Collector.
- 12.6 m Coach adopted as the "check vehicle" (largest vehicle expected to use the site).
- 8.3 m Truck adopted as the "design vehicle" (largest vehicle expected to frequently use the site – should remain within marked lane whilst turning).
- 6.4 m AT Delivery Van adopted to simulate a mini-bus accessing the minibus parking space.
- Coach turnaround on-site is to occur at the southern end of the access, away from general traffic. The coach turnaround facility (one-way loop) also acts as coach parking (two spaces tandem). In the unlikely occurrence that a second coach arrives on-site and needs to pass a parked coach this will be coordinated with on-site management.
- Turning speed of 10 km/h used at the Esmonde Road intersection.
- A 0.5m vehicle body clearance has been included for buses and trucks and 0.3m for cars.

This has shown that the site is of adequate size to accommodate the vehicles expected to use it. Tracking drawings can be found in Appendix G.

7 Access

7.1 Internal road design

The main access road into the site has been granted resource consent as part of Stage 1 and Stage 2 and has met the general design criteria set out in the AUP. The same provisions will be used for Stage 3 to ensure it follows the design criteria.

For Stage 3 the general criteria will be sufficient to accommodate an 8.3 m rigid body truck as the design vehicle, and a 12.6 m coach as the check vehicle.

7.2 Access to individual sites

The proposed development provides 80 parking spaces in total for Stage 1 and Stage 2. Most of the car parking will be available in the form of 3 – tier car stackers with 5 non-stacker spaces also provided for accessible or car share use. No parking will be within the traffic lane thereby mitigating adverse effects on amenity of the development. For the balance of the site, the car parking access requirements are expected to comply with AUP requirements and be confirmed as development stages are confirmed.

7.3 Pedestrians and cyclists

Safe access and egress for pedestrians will be provided by having a footpath access to all buildings within the development. The development will promote a low vehicle speed environment through use of urban design such as landscaping, pavement surface changes and threshold treatments.

Safe cyclist movements will be facilitated through a low volume, low speed shared street environment within the site. The upgrade of the site access/ Esmonde Road intersection will furthermore provide for signalised cycle crossing facilities.

The proposed masterplan in Figure 7.1 shows the pedestrian and cycle connection within the site and includes the board walk. Public pedestrians and cyclists will have unrestricted access through the site with facilities designed in accordance with the NZTA Pedestrian Design Manual and/or NZS 4404.2010 Land Development and Subdivision Infrastructure Standard.

Figure 7.1: Proposed masterplan for site (source: Jasmax - Esmonde Road proposed planning approach)

7.3.1 Internal facilities

The road within the site will not be publicly vested. However there will be pedestrian connection to the site that will accommodate pedestrians and cyclists which will be 3.0 m wide.

7.3.2 External facilities

The existing pedestrian and cycle infrastructure is detailed in Section 2.3.3. The existing walking and cycling pedestrian connections are considered sufficient for safe and efficient movement between the site and the Akoranga Bus Station.

The Devonport-Takapuna Greenways Plan June 2015 identified two priority projects. The Auburn and Patuone Reserves to Esmonde Road (G8) would be part of the Auckland Cycle Network (ACN), and Francis Street Pedestrian Bridge (G9) which would connect Hauraki to Esmonde Road.

The G8 route connects the site to Takapuna metropolitan centre via the esplanade reserve. This all connects to the supermarket that is located on Barrys Point Road.

The G9 route provides a connection from Hauraki to Esmonde Road and would provide direct access for residents to walk or cycle between Hauraki, Takapuna and the Akoranga Bus Station. At present there are three options for this connection which are:

- A pedestrian footbridge at the north end of Francis Street.
- Esplanade reserve at Harley Close.
- Road network: Francis Street, Hart Road, Harley Close, Harley Road, Eldon Street to Esmonde Road.

Figure 7.2 shows the G8 and G9 routes which are within close proximity to the site location.

Figure 7.2: Devonport-Takapuna Greenway projects near site

7.4 Public transport, active modes, and Travel Demand Management (TDM)

As previously outlined in Sections 2.3.2 and 2.3.3, there is currently a high level of public transport and walking and cycling facilities in the area surrounding the site. As part of the development proposal KBS Capital Limited is proposing several TDM measures to minimise use of private vehicles, as follows:

- Upgrades to the access intersection to improve walking and cycling safety, as well as connectivity between the development to Akoranga Bus Station.
- A 'car share' scheme for apartment users with two spaces provided initially. This could be expanded upon as the development is progressed through the stages or as demand increases.
- An on-site shuttle bus service for the whole development to utilise, this will have a dedicated parking space and be expanded upon as the development is progressed through the stages.

In the medium term, as surrounding projects are constructed, there will be more transport mode choices between the development and the wider area, particularly with Northern Pathways enabling a 9 km bicycle trip to Auckland City Centre.

It is likely that staff of the development may choose to use active modes to travel to work, therefore end of trip facilities such as lockers, showers and change rooms will be provided in the development.

8 Precinct Plan response

8.1 General

The Precinct Plan provisions have been developed to provide for a comprehensive and integrated development of part of the site. The site is strategically located and adjacent to Esmonde Road, which provides for multi-modal transport connections to Takapuna Metropolitan Centre and the City Centre. The precinct also has good walking and cycling connections throughout the Takapuna area. All of these criteria are seen as essential to support urban growth and residential liveability.

8.2 Capacity Constraints

As noted previously in this report the key findings in relation to capacity are:

- Upgrading the Esmonde Road / Site Access as per the Resource Consent for Stage 1 and Stage 2 is required to provide sufficient traffic capacity to the site.
- This is based on a total peak hour trip generation for the Precinct of 420 trips.

8.3 Maximum number of dwellings and ancillary uses

The precinct plan seeks to control the number of dwellings that are enabled to manage effects on the transportation network and on intersections providing access to the precinct. The precinct wants to create a vibrant and diverse community that enables a range of household sizes and dwelling typologies, including integrated residential development.

The consented activity is a mix of residential apartments and short-term visitor accommodation. From a trip generation perspective, the activity types have different trip profiles and cannot be simply added together to provide total dwellings. In order to calculate the amount of dwellings in future development stages a sliding scale of development approach is suggested for the Precinct Provisions. This is based on the agreed ITA peak hour vehicle trip generation of 420 (of which 334 are residential trips and 86 are assumed to be ancillary uses trips) and is based on the following assumptions:

- Residential apartments (356 units) = 0.29 vehicle trips per peak hour per unit and a car parking provision of 0.55 space per unit.
- Short term visitor accommodation (192 units) = 1.2 vehicle trips per peak hour per room with a car parking provision of 0.55 space per unit.
- Ancillary uses serving the site (< 2000m^2 GFA total and individual units <200m^2 each and total of 20 car park spaces i.e. 2 car park spaces per 100m^2). All users/visitors are internal to the site and peak hour external vehicle trip generation for staff and delivery trips = 86.

Susequent to the above assumptions, through the development of the Precinct Provisions the applicant has confirmed ancillary uses will be limited to 1,257m^2 (as per the Resource Consent granted for Stage 1 and Stage 2 (Application number LUC60359471)).

Based on the agreed total peak hour trip generation of 420 vehicles/hour, sliding scale variations of the residential apartments (with a 0.55 maximum car park space provision per unit), short term visitor accommodation (with a maximum 0.55 car park space provision per unit) and ancillary uses (up to a total maximum GFA of 1,257m^2 with no individual unit to exceed 200m^2 GFA and maximum provision of 2 car park spaces per 100m^2 GFA) would be permitted as shown in the examples in the attached spreadsheet in Appendix H.

The sliding scale of development would be used to permit a change in the ITA assumed number of residential apartments or short-term visitor accommodation units or the ancillary uses. This would

be permitted as long as the change does not result in an increase over the agreed 420 peak hour trip generation.

Any change in development proposals which would result in the 420 peak hour trip generation being exceeded would be a Discretionary Activity and would require re-assessment within an updated Integrated Transport Assessment to the satisfaction of Auckland Transport and Auckland Council.

8.4 Suggested Measures

8.4.1 Transport Infrastructure Development Upgrade Thresholds

Triggers are provided for within the Precinct Plan provisions to assess the capacity of the local transport network to accommodate the planned growth, and to provide for upgrades to the primary signalised intersection servicing the precinct, along with upgrades to cycle paths.

The transport infrastructure development upgrade thresholds are described in Table 8.1.

Table 8.1: Transport infrastructure development upgrade thresholds

Occupation threshold	Transport infrastructure required in order to exceed the occupation threshold
1 dwelling or any non-residential activity.	Provision of a private shuttle bus between the site and Takapuna for residents, to encourage behaviour change away from private vehicle and towards public transport.
	Provision of the pedestrian/cycle connection along the extent of Esmonde Road identified on Precinct Plan 1.
	Provision of a Parking and Traffic Management Plan.
	Provision of an upgrade to the signalised intersection of the site access with Esmonde Road to improve pedestrian and cyclist safety and amenity and increase traffic capacity as required to support 420 vehicle movements generated by the precinct in any peak hour: • removal of the left turn slip lanes from Esmonde Road (westbound) and from the site access road • addition of separate left and right turn lanes (with at least 12m of queue length and 3m taper (total of 15m)) on the site approach to the intersection • addition of a separate left turn lane (with at least 21 m queue length) on the Esmonde Road (westbound) approach to the intersection • provision of dual pedestrian and cyclist signalised crossings on the site access and Esmonde Road (eastbound) arms of the intersection.

8.4.2 On-site Parking

To support reduced vehicular trip generation the development will control the number of parking spaces that are available with a maximum of 321 for the Precinct proposed.

This is based on a car park ratio of 0.55 for all residential activities and 548 dwellings. It is inclusive of the 48 allocated to the consented residential apartments, and the already consented ancillary uses. Table 8.2 shows the proposed car parking provision for dwellings and other land uses.

Table 8.2: On-site car parking allocations

Activity/parking type	Car parking spaces
Residential dwellings	301
Commercial activities and healthcare facilities	20
Total:	**321**

9 Integration with future transport network

This section provides a review of current policy and plans which affect the proposed development.

9.1 Government Policy Statement (GPS) on Land Transport

The Government Policy Statement (GPS) on Land Transport details how the National Land Transport Fund will provide for the land transport system over 10 years. The GPS recognises the role of transportation in liveability and community wellbeing; it contributes to five key outcomes summarised in the Ministry of Transport's Transport Outcomes Framework in Figure 9.1.

The Precinct already benefits from the existing local amenity, landscape, and coastal setting, in addition to nearby local transportation centres. Redevelopment of the Esmonde Road site provides further transportation opportunities in the form of shared pedestrian and cycle paths, walkways, and recreation areas.

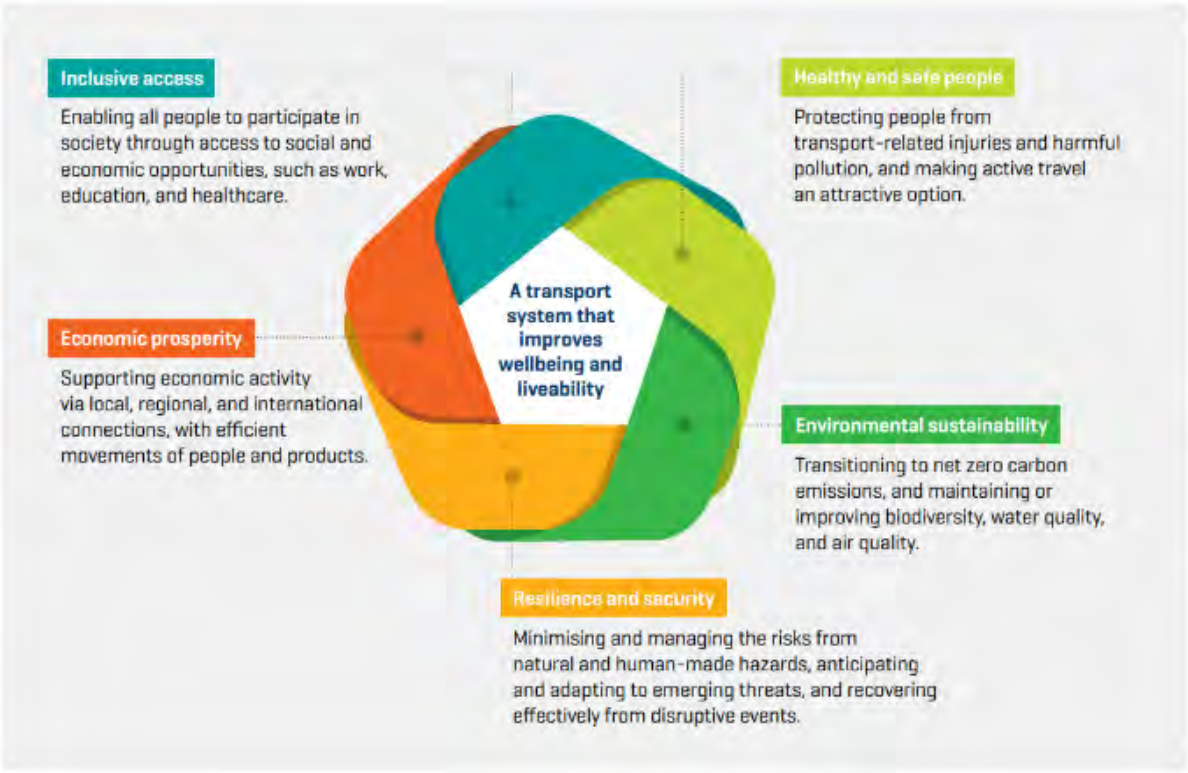


Figure 9.1: Ministry of Transport's Transport Outcomes Framework

9.2 Regional Plans and Policies

The following subsections describe Auckland plans and programmes which influence Precinct development. Consistent with themes of modal shift, design for liveability, providing for growth, and building flourishing communities, the site is along Esmonde Road, near to many amenities in Takapuna and Northcote. Frequent bus routes service the Precinct on bus lanes, leading to the Akoranga Bus Station (on the Northern Busway) and Takapuna Transport Centre allowing access to locations across Auckland. While the development is designed to encourage mode shift, travel times are reduced for drivers as transit lanes are available on nearby streets and motorway ramps are nearby. Pedestrian and cycle routes usually have signalised or priority crossing provisions, integrated with greenways along the coast. Further improvement of this infrastructure is expected during the Precinct development.

9.2.1 Auckland Plan 2050

The Auckland Plan 2050 presents long-term objectives allowing for growth and opportunity, while addressing its challenges. Six key areas for progress were identified, including Transport and Access.

The desired outcome for Transport and Access is for Aucklanders to "be able to get where they want to go, more easily, safely and sustainably"[21]. To reach this outcome, there are seven focus areas:

- Make better use of existing transport networks.
- Target new transport investment to the most significant challenges.
- Maximise the benefits from transport technology.
- Make walking, cycling and public transport preferred choices for many more Aucklanders.
- Better integrate land-use and transport.
- Move to a safe transport network, free from death and serious injury.
- Develop a sustainable and resilient transport system.

Successfully targeting these areas would reduce traffic congestion from population growth. Of relevance to the Precinct development is the Plan's aim to encourage mode shift away from private vehicles and towards public transport and active modes.

These are addressed through upgrades to the intersection into the Esmonde Road site, and surrounding cycle paths, consistent with Auckland Plan intentions. Triggers have also been identified so that transport network capacity can be assessed as growth occurs.

9.2.2 Auckland Transport Alignment Project 2021 – 2031

The Auckland Transport Alignment Project 2021 – 2031 (ATAP) is the continuation of a strategic agreement between central government and Auckland Council for transport investments. The current ATAP programme focuses on critical infrastructure and services, with renewed attention to modal shift, climate change, and housing development.

The ATAP 2021 – 2031 package focuses on the following priorities:

- Mode shift from cars to public transport and active modes.
- Increased job accessibility by 14 percent for a 30-minute car journey, and 60 percent for a 45-minute public transport journey.
- Reduced congestion for bus passengers and arterial routes, but increased congestion on motorways.
- Significantly improved safety across the Auckland region, an expected reduction in deaths and serious injury of 60 percent by 2031.

9.2.3 Auckland Regional Land Transport Plan 2018 – 2028

The Regional Land Transport Plan (RLTP) forms part of the National Land Transport Programme. Representing the combined intentions of AT, the NZ Transport Agency, and KiwiRail, it sets the investment programme for transport in Auckland over the next 10 years.

Investment priority is emphasised in the following areas:

- Transport infrastructure – light rail, mass transit, bus priority and cycleways, supported by improvements to bus, rail and ferry services.

[21] Auckland Plan 2050

- Walking and cycling facilities, supported by more shared spaces, amenity improvements, cycleways and footpaths, better network connections, end of journey facilities, more and improved pedestrian crossings, pedestrian priority in signal phasing, and safer traffic speeds.
- Safety improvements, where a comprehensive programme includes improvements to high-risk intersections and corridors, and speed management.

9.2.4 Auckland Regional Public Transport Plan

The Auckland Regional Public Transport Plan (RPTP) is required by the Land Transport Management Act and describes public transport needs and opportunities within Auckland. An increasing public transport demand reflects major investment from Auckland Transport and requires improving frequency, reliability and customer service. The RPTP aims to meet challenges over the next 10 years by focusing on the following areas:

- Expanding and enhancing rapid and frequent networks.
- Improving customer access to public transport.
- Harnessing emerging technologies.
- Improving Māori responsiveness.

9.2.5 Auckland Unitary Plan

The Auckland Unitary Plan (AUP) Operative in Part 2016 is a statutory planning document for Auckland. It shapes the way Auckland grows by providing guidance on its economic and housing needs. Chapter E27 pertains to transport infrastructure, managing the requirements of private vehicle travel, and supporting active modes. To achieve these objectives, recommendations are made to manage parking, influence trip generation, and provide public transport and active mode facilities. These would encourage a mode shift away from private vehicles.

The AUP's guidance on urban growth is aligned with the densification allowed by the Precinct zoning. Reduced parking within the development, coupled with convenience to nearby public transport and active mode infrastructure, provides residents with attractive choices to private vehicle travel.

9.3 AT Transport Design Manual

Road improvements from the proposed development will require design guidance from approved standards including Auckland Transport's Transport Design Manual. The Austroads and NZS4404 standards may also be used for additional requirements, ensuring resource consenting requirements are met.

9.4 National Policy Statement on Urban Design

The National Policy Statement on Urban Design (NPS-UD) sets out objectives and policies for urban development under the Resource Management Act 1991. The purpose of the document is to improve the urban response to growth, enabling housing affordability and community wellbeing. Councils must give effect to these objectives and policies.

There are several major policies within the NPS-UD that are of relevance to the Precinct development:

- Intensification: Greater height and density – particularly in areas with high demand and accessibility by active and public transport.
- Car parking: Developers are free to determine the number of car parks in their developments, with no parking minimums permitted in the Unitary Plan.

9.5 Te Tāruke-ā-Tāwhiri: Auckland's Climate Plan

The Auckland region is already experiencing the effects of climate change, with major changes needing to be made in less than a decade to avoid the worst impacts.

The Plan's core goals are to:

- Reduce greenhouse gas emissions by 50% by 2030 and achieve net zero emissions by 2050.
- Adapt to the impacts of climate change by ensuring we plan changes expected from our current emissions pathway.

Transport is one of the Plan's eight priorities for action. The transport sector is Auckland's biggest source of emissions at 43.6% of total emissions, 86% of which is attributable to travel by road. The Precinct can contribute to the Plan's core goals by making public transport more appealing than personal vehicles and improving the safety, connectivity, and amenity of walking and cycling infrastructure.

10 Construction traffic

The existing site is occupied and demolition works followed by earth works would be required before any new development could be constructed. This would need to go through resource consenting processes.

The existing signalised intersection would be used to accommodate truck movements to and from the site. The volume of earthworks is unknown at this stage as this will need to be worked out to determine the number of truck movements required.

The development is proposed to start construction in 2021 and will be staged over a number of years. Construction traffic accessing the site will fluctuate over time depending on the stage of works. A Construction Traffic Management Plan (CTMP) will be put in place that will help to mitigate the impacts of construction traffic on the surrounding road and transport network. It will include the following information:

- Control procedures for trucks unloading/loading, particularly hours of operation and when restrictions of hours on delivery may be necessary to maintain access, network function or safety;
- The types of trucks /vehicles (i.e. that will deliver machinery/materials to the site, removal of soil etc);
- The number of vehicle movements to and from the site per day, the frequency of the movements and how long vehicles will be on site;
- The routes that trucks /heavy vehicles will take;
- Methods to avoid unnecessary truck waiting and queueing within the road;
- Wheel cleaning (soil removal) prior to egressing the site;
- Identification of parking for worker/contractor/subcontractor vehicles to maintain the availability of public on-street parking as far as practical;
- Pedestrian/cyclist movements and pedestrian control/safety on Esmonde Road;
- Equipment to be used for traffic control;
- Details of all signage (to comply with COPTTM);
- On-street parking controls and liaison with Auckland Transport, with availability of public parking being maintained as far as practicable without affecting the construction activity;
- Impact on street lighting;
- Liaison with emergency services; and
- How to keep paths and roadway clean and uncluttered.

The construction activities can be managed, bearing in mind the capacity within the existing road network (Esmonde Road) and with the appropriate CTMP in place and above measures implemented any transport effects can be appropriately mitigated.

11 Consultation

The Integrated Transport Assessment report has been issued in draft form to Auckland Transport and Auckland Council for their comment. Their feedback has been received and the report has been updated and finalised.

12 Conclusions

Based on the above assessment of transport effects the site for the proposed development at 48 Esmonde Road as per the proposed Precinct Plan, it can be concluded that:

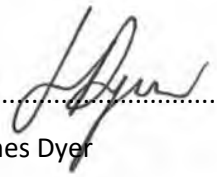
- The signalised intersection, subject to mitigation details, can accommodate trip generation thresholds detailed in Section 4;
- The site is strategically located and has good accessibility to walking, cycling and public transport infrastructure;
- Parking on-site will be restricted and controlled, with various travel demand management plans for the site; and
- The proposed development encourages key regional and district transport policies, supported by Precinct provisions.

13 Applicability

This report has been prepared for the exclusive use of our client KBS Capital Limited, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

We understand and agree that our client will submit this report as part of an application for resource consent and that Auckland Council as the consenting authority will use this report for the purpose of assessing that application.

Tonkin & Taylor Ltd

Report prepared by:	Authorised for Tonkin & Taylor Ltd by:
	
.....	.....
James Dyer	Chris Perks
Principal Transport Planner	Project Director

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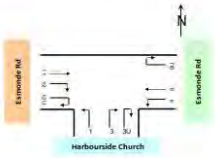
Appendix A: Traffic Count Survey

Job No.	NZ185
Client	Tonkin + Taylor
Suburb	Harbourside Church
Location	1. Esmonde Rd / Harbourside Church (Signalised)
Day/Date	Wed, 8th May 2019
Weather	Fine
Description	Classified Intersection Count
	15 mins Data



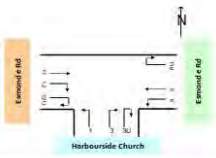
MATRIX

Classifications	Class 1	Class 2	Class 3
	Lights	Heavies	Buses

Approach	Harbourside Church												Esmonde Rd											
Direction	Direction 1 (Left Turn)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6U (U Turn)			
Time Period	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total
7:00 to 7:15	0	0	0	0	1	0	0	1	0	0	0	0	9	0	1	10	167	2	3	172	1	0	0	1
7:15 to 7:30	1	0	0	1	0	0	1	1	0	0	0	0	15	0	0	15	159	3	1	163	0	0	0	0
7:30 to 7:45	1	0	0	1	1	0	0	1	0	0	0	0	6	0	0	6	164	4	7	175	0	0	0	0
7:45 to 8:00	1	0	0	1	3	0	0	3	0	0	0	0	10	0	0	10	187	1	5	193	0	0	0	0
8:00 to 8:15	2	0	0	2	3	0	0	3	0	0	0	0	8	0	0	8	218	7	4	229	0	0	0	0
8:15 to 8:30	1	0	0	1	3	0	0	3	0	0	0	0	7	0	0	7	270	3	5	278	2	0	0	2
8:30 to 8:45	1	0	0	1	1	0	0	1	0	0	0	0	7	0	0	7	234	6	3	243	2	0	0	2
8:45 to 9:00	0	0	0	0	4	0	0	4	0	0	0	0	5	0	0	5	282	2	3	287	3	0	0	3
9:00 to 9:15	5	0	0	5	2	0	0	2	0	0	0	0	5	0	0	5	275	8	2	285	6	0	0	6
9:15 to 9:30	2	0	0	2	1	0	0	1	0	0	0	0	7	0	0	7	324	13	4	340	3	0	0	3
9:30 to 9:45	0	0	0	0	4	0	0	4	0	0	0	0	5	0	0	5	354	8	5	365	2	0	0	2
9:45 to 10:00	2	0	0	2	1	0	0	1	0	0	0	0	3	0	0	3	309	15	1	325	0	0	0	0
10:00 to 10:15	1	0	0	1	2	1	0	3	0	0	0	0	4	1	0	5	289	17	2	308	0	0	0	0
10:15 to 10:30	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	290	13	2	305	1	0	0	1
10:30 to 10:45	0	0	0	0	1	0	0	1	0	0	0	0	3	0	0	3	286	5	3	294	0	0	0	0
10:45 to 11:00	3	0	0	3	2	0	0	2	0	0	0	0	2	0	0	2	287	13	1	301	1	0	0	1
AM Totals	**18**	**0**	**0**	**18**	**29**	**2**	**1**	**32**	**0**	**0**	**0**	**0**	**95**	**1**	**1**	**97**	**4,087**	**139**	**47**	**4,263**	**20**	**0**	**0**	**20**
11:00 to 11:15	4	0	0	4	3	0	0	3	0	0	0	0	1	0	0	1	385	13	2	400	0	0	0	0
11:15 to 11:30	5	0	0	5	1	0	0	1	0	0	0	0	4	0	0	4	383	8	2	403	1	0	0	1
11:30 to 11:45	3	1	0	4	0	0	0	0	0	0	0	0	4	0	0	4	376	11	2	389	3	0	0	3
11:45 to 12:00	2	0	0	2	3	0	0	3	0	0	0	0	4	0	0	4	372	12	4	388	1	0	0	1
12:00 to 12:15	3	0	0	3	2	0	0	2	0	0	0	0	3	0	0	3	370	5	5	380	2	0	0	2
12:15 to 12:30	8	0	0	8	0	0	0	0	0	0	0	0	2	0	0	2	378	7	4	389	1	0	0	1
12:30 to 12:45	4	0	0	4	2	0	0	2	0	0	0	0	2	0	0	2	369	4	6	379	0	0	0	0
12:45 to 13:00	4	0	0	4	4	0	0	4	0	0	0	0	2	0	0	2	336	5	2	343	4	0	0	4
13:00 to 13:15	4	0	0	4	4	0	0	4	0	0	0	0	4	0	0	4	356	5	2	363	0	0	0	0
13:15 to 13:30	6	0	0	6	7	0	1	8	0	0	0	0	4	0	1	5	346	1	2	349	4	0	0	4
13:30 to 13:45	7	0	0	7	3	0	0	3	0	0	0	0	3	0	0	3	348	2	2	352	0	0	0	0
13:45 to 14:00	2	0	0	2	2	0	0	2	0	0	0	0	4	0	0	4	278	1	2	281	3	0	0	3
PM Totals	**52**	**1**	**0**	**55**	**37**	**0**	**1**	**38**	**0**	**0**	**0**	**0**	**37**	**0**	**1**	**38**	**4,208**	**74**	**33**	**4,377**	**19**	**0**	**0**	**19**

Approach	Esmonde Rd							
Direction	Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)			
Time Period	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total
7:00 to 7:15	265	6	2	273	7	0	0	7	0	0	0	0
7:15 to 7:30	257	6	3	266	8	0	0	8	0	0	0	0
7:30 to 7:45	225	6	4	235	10	0	0	10	2	0	0	2
7:45 to 8:00	250	11	3	264	2	0	0	2	0	0	0	0
8:00 to 8:15	241	5	2	250	9	0	0	9	0	0	0	0
8:15 to 8:30	292	8	2	302	5	0	0	5	0	0	0	0
8:30 to 8:45	289	6	2	300	6	0	0	6	0	0	0	0
8:45 to 9:00	269	15	0	284	12	0	0	12	1	0	0	1
9:00 to 9:15	274	10	4	288	14	0	0	14	1	0	0	1
9:15 to 9:30	283	12	3	298	7	0	0	7	0	0	0	0
9:30 to 9:45	259	11	3	273	3	0	0	3	1	1	0	2
9:45 to 10:00	298	14	2	314	7	0	0	7	1	0	0	1
10:00 to 10:15	280	9	2	291	5	1	0	6	1	0	0	1
10:15 to 10:30	261	9	1	271	2	0	0	2	3	0	0	3
10:30 to 10:45	276	10	2	288	3	0	0	3	3	0	0	3
10:45 to 11:00	302	19	2	323	3	0	0	3	2	0	0	2
AM Totals	**4,310**	**175**	**43**	**4,527**	**103**	**1**	**0**	**104**	**15**	**1**	**0**	**16**
11:00 to 11:15	304	8	2	314	4	0	0	4	0	0	0	0
11:15 to 11:30	327	9	5	341	4	1	0	5	0	0	0	0
11:30 to 11:45	333	11	2	345	4	0	0	4	2	0	0	2
11:45 to 12:00	351	4	7	362	3	0	0	3	1	0	0	1
12:00 to 12:15	349	9	3	361	3	0	0	3	3	0	0	3
12:15 to 12:30	366	2	1	369	3	0	0	3	1	0	0	1
12:30 to 12:45	346	1	5	352	1	0	0	1	1	0	0	1
12:45 to 13:00	365	2	3	370	5	0	0	5	2	0	0	2
13:00 to 13:15	369	0	3	372	8	0	0	8	3	0	0	3
13:15 to 13:30	407	0	2	409	3	0	0	3	0	0	0	0
13:30 to 13:45	366	2	5	373	2	0	0	2	0	0	0	0
13:45 to 14:00	366	2	4	372	3	0	0	3	1	0	0	1
PM Totals	**4,250**	**59**	**43**	**4,333**	**43**	**1**	**0**	**44**	**14**	**0**	**0**	**14**

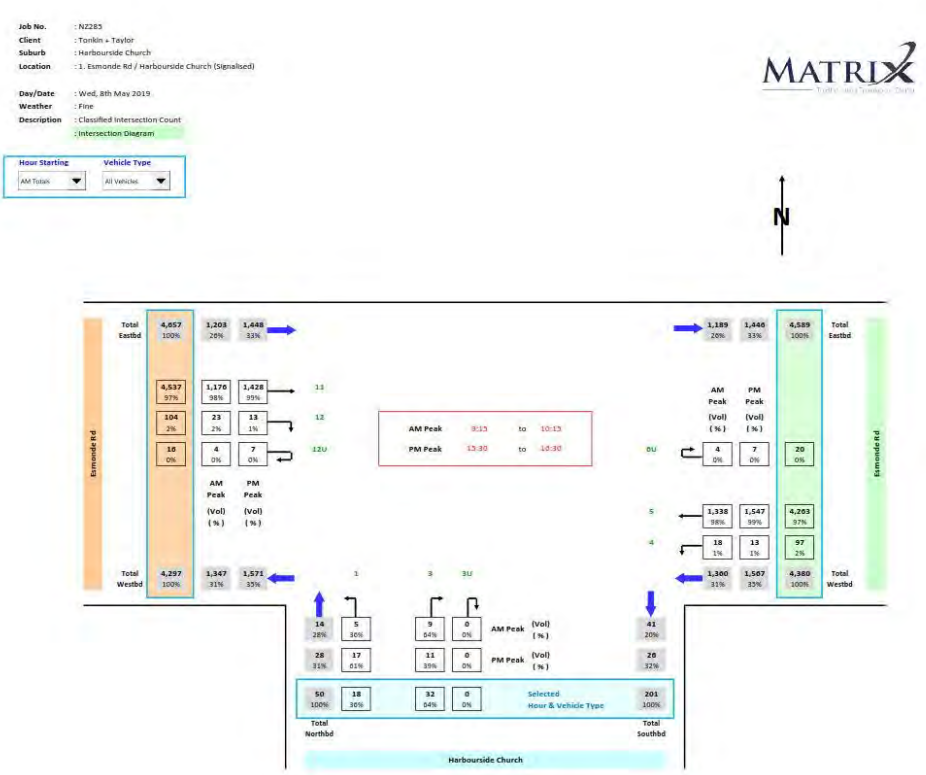
Job No.	: NZ285
Client	: Tonkin + Taylor
Suburb	: Harbourside Church
Location	: 1. Esmonde Rd / Harbourside Church (Signalised)
Day/Date	: Wed, 8th May 2019
Weather	: Fine
Description	: Classified Intersection Count
	: Hourly Summary



MATRIX

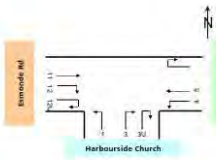
Approach	Harbourside Church												Esmonde Rd											
Direction	Direction 1 (Left Turn)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6U (U Turn)			
Time Period	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total
7:00 to 8:00	5	0	0	5	9	0	1	10	0	0	0	0	40	0	1	41	677	50	16	703	1	0	0	1
7:15 to 8:15	5	0	0	5	9	0	1	10	0	0	0	0	39	0	0	39	706	31	17	760	0	0	0	0
7:30 to 8:30	5	0	0	5	10	0	0	10	0	0	0	0	31	0	0	31	836	35	21	875	2	0	0	2
7:45 to 8:45	5	0	0	5	10	0	0	10	0	0	0	0	32	0	0	32	906	37	37	943	4	0	0	4
8:00 to 9:00	4	0	0	4	11	0	0	11	0	0	0	0	27	0	0	27	1,004	38	15	1,057	7	0	0	7
8:15 to 9:15	3	0	0	3	10	0	0	10	0	0	0	0	24	0	0	24	1,061	38	13	1,093	13	0	0	13
8:30 to 9:30	3	0	0	3	8	0	0	8	0	0	0	0	24	0	0	24	1,113	28	12	1,153	13	0	0	13
8:45 to 9:45	5	0	0	5	11	0	0	11	0	0	0	0	20	0	0	20	1,235	30	12	1,277	13	0	0	13
9:00 to 10:00	7	0	0	7	8	0	0	8	0	0	0	0	18	0	0	18	1,263	43	10	1,315	10	0	0	10
9:15 to 10:15	5	0	0	5	7	2	0	9	0	0	0	0	17	1	0	18	1,270	52	10	1,332	4	0	0	4
9:30 to 10:30	3	0	0	3	7	2	0	9	0	0	0	0	12	1	0	12	1,242	53	8	1,303	1	0	0	1
9:45 to 10:45	3	0	0	3	4	2	0	6	0	0	0	0	11	1	0	12	1,170	50	9	1,232	2	0	0	2
10:00 to 11:00	4	0	0	4	5	2	0	7	0	0	0	0	10	1	0	11	1,150	48	9	1,208	2	0	0	2
AM Totals	**18**	**0**	**0**	**18**	**39**	**2**	**1**	**52**	**0**	**0**	**0**	**0**	**95**	**1**	**1**	**97**	**4,087**	**118**	**47**	**4,263**	**20**	**0**	**0**	**20**
15:00 to 16:00	14	1	0	15	7	0	0	7	0	0	0	0	13	0	0	13	1,527	44	10	1,581	3	0	0	3
15:15 to 16:15	13	1	0	14	6	0	0	6	0	0	0	0	13	0	0	13	1,513	36	13	1,561	7	0	0	7
15:30 to 16:30	16	1	0	17	11	0	0	11	0	0	0	0	13	0	0	13	1,497	35	13	1,547	7	0	0	7
15:45 to 16:45	17	0	0	17	13	0	0	13	0	0	0	0	11	0	0	11	1,480	28	19	1,527	4	0	0	4
16:00 to 17:00	19	0	0	19	14	0	0	14	0	0	0	0	9	0	0	9	1,445	21	17	1,483	7	0	0	7
16:15 to 17:15	20	0	0	20	16	0	0	16	0	0	0	0	10	0	0	10	1,429	22	14	1,464	3	0	0	3
16:30 to 17:30	16	0	0	16	17	0	1	18	0	0	0	0	12	0	1	13	1,367	15	12	1,394	8	0	0	8
16:45 to 17:45	21	0	0	21	18	0	1	19	0	0	0	0	13	0	1	14	1,556	23	8	1,577	6	0	0	6
17:00 to 18:00	19	0	0	19	16	0	1	17	0	0	0	0	13	0	1	14	1,298	9	8	1,315	7	0	0	7
PM Totals	**52**	**1**	**0**	**53**	**57**	**0**	**1**	**58**	**0**	**0**	**0**	**0**	**57**	**0**	**1**	**58**	**4,268**	**74**	**55**	**4,377**	**19**	**0**	**0**	**19**

Approach	Esmonde Rd											
Direction	Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)			
Time Period	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total
7:00 to 8:00	997	29	12	1,038	27	0	0	27	2	0	0	2
7:15 to 8:15	979	28	12	1,019	29	0	0	29	2	0	0	2
7:30 to 8:30	1,010	31	11	1,052	26	0	0	26	2	0	0	2
7:45 to 8:45	1,094	34	9	1,137	22	0	0	22	0	0	0	0
8:00 to 9:00	1,087	38	12	1,137	32	0	0	32	1	0	0	1
8:15 to 9:15	1,118	51	14	1,183	37	0	0	37	2	0	0	2
8:30 to 9:30	1,109	54	15	1,178	30	0	0	30	2	0	0	2
8:45 to 9:45	1,079	56	16	1,151	36	0	0	36	5	1	0	4
9:00 to 10:00	1,114	55	12	1,181	31	0	0	31	2	1	0	4
9:15 to 10:15	1,120	46	10	1,176	22	1	0	23	3	1	0	4
9:30 to 10:30	1,099	43	8	1,149	17	1	0	18	6	1	0	7
9:45 to 10:45	1,117	48	7	1,172	17	1	0	18	8	0	0	8
10:00 to 11:00	1,121	53	7	1,181	13	1	0	14	9	0	0	9
AM Totals	**6,219**	**175**	**63**	**6,537**	**103**	**1**	**0**	**104**	**13**	**1**	**0**	**10**
15:00 to 16:00	1,324	20	14	1,364	13	1	0	14	5	0	0	5
15:15 to 16:15	1,364	23	15	1,402	14	1	0	15	6	0	0	6
15:30 to 16:30	1,393	22	13	1,428	13	0	0	13	7	0	0	7
15:45 to 16:45	1,407	22	16	1,455	10	0	0	10	6	0	0	6
16:00 to 17:00	1,421	10	12	1,443	12	0	0	12	7	0	0	7
16:15 to 17:15	1,446	5	12	1,463	17	0	0	17	7	0	0	7
16:30 to 17:30	1,487	3	13	1,503	17	0	0	17	6	0	0	6
16:45 to 17:45	1,510	3	13	1,526	16	0	0	16	3	0	0	3
17:00 to 18:00	1,521	2	14	1,529	16	0	0	16	4	0	0	4
PM Totals	**6,256**	**38**	**40**	**6,335**	**63**	**1**	**0**	**64**	**14**	**0**	**5**	**19**


Job No. : N2285
Client : Tonkin + Taylor
Suburb : Harbourside Church
Location : 1. Esmonde Rd / Harbourside Church (Signalised)
Day/Date : Wed, 8th May 2019
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram
Hour Starting
AM Totals
Vehicle Type
All Vehicles
MATRIX
N
Esmonde Rd
Total Eastbd
4,657 100%
1,203 26%
1,448 31%
4,537 97%
1,176 98%
1,428 99%
104 2%
23 2%
13 1%
16 0%
4 0%
7 0%
AM Peak (Vol) (%)
PM Peak (Vol) (%)
Total Westbd
4,297 100%
1,347 31%
1,571 35%
AM Peak 8:15 to 10:15
PM Peak 13:30 to 16:30
1,189 26%
1,446 33%
4,589 100%
20 0%
1,338 98%
1,547 99%
4,263 97%
18 1%
13 1%
97 2%
1,380 31%
1,567 35%
4,380 100%
14 28%
5 36%
9 64%
0 0%
28 31%
17 61%
11 39%
0 0%
41 20%
26 32%
50 100%
18 36%
32 64%
0 0%
201 100%
Selected Hour & Vehicle Type
Total Northbd
Total Southbd
Harbourside Church

Job No. : NZ285
Client : Tonkin + Taylor
Suburb : Harbourside Church
Location : 1. Esmonde Rd / Harbourside Church (Signalised)

Day/Date : Wed, 8th May 2019
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary

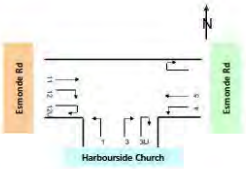


MATRIX Traffic and Transport Data

Approach	Harbourside Church				Esmonde Rd				Esmonde Rd				Grand Total
Time Period	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	
AM 10:15 to 10:15	12	2	0	14	1,297	53	10	1,360	1,145	48	10	1,205	2,577
PM 17:30 to 18:00	27	1	0	28	1,517	35	15	1,567	1,419	22	13	1,448	3,045

Approach	Harbourside Church				Esmonde Rd				Esmonde Rd				Grand Total
Time Period	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	
7:00 to 8:00	8	0	1	9	718	10	17	745	1,026	28	12	1,067	1,821
7:15 to 8:15	12	0	1	13	767	15	17	798	1,006	28	12	1,046	1,858
7:30 to 8:30	15	0	0	15	871	15	21	908	1,038	31	11	1,080	2,003
7:45 to 8:45	15	0	0	15	945	17	17	979	1,096	34	9	1,139	2,135
8:00 to 9:00	15	0	0	15	1,016	16	13	1,071	1,120	38	12	1,170	2,256
8:15 to 9:15	15	0	0	15	1,098	19	13	1,130	1,157	51	14	1,222	2,367
8:30 to 9:30	14	0	0	14	1,152	26	13	1,192	1,150	54	15	1,219	2,425
8:45 to 9:45	16	0	0	16	1,268	30	12	1,310	1,118	57	26	1,201	2,517
9:00 to 10:00	15	0	0	15	1,290	45	10	1,345	1,148	56	12	1,216	2,574
9:15 to 10:15	12	2	0	14	1,297	53	10	1,360	1,145	48	10	1,205	2,577
9:30 to 10:30	10	2	0	12	1,256	54	8	1,318	1,121	45	8	1,174	2,504
9:45 to 10:45	7	2	0	9	1,188	51	8	1,245	1,142	48	7	1,198	2,453
10:00 to 11:00	9	2	0	11	1,166	49	6	1,221	1,143	54	7	1,204	2,436
AM Totals	**47**	**2**	**1**	**50**	**4,212**	**120**	**68**	**4,380**	**4,437**	**177**	**43**	**4,657**	**9,087**
15:00 to 16:00	21	1	0	22	1,545	44	10	1,599	1,542	27	14	1,583	3,004
15:15 to 16:15	19	1	0	20	1,534	36	13	1,583	1,564	24	13	1,625	3,026
15:30 to 16:30	27	1	0	28	1,517	35	15	1,567	1,415	22	13	1,448	3,045
15:45 to 16:45	30	0	0	30	1,495	28	10	1,542	1,425	12	14	1,451	3,023
16:00 to 17:00	33	0	0	33	1,459	21	17	1,497	1,440	10	12	1,462	2,992
16:15 to 17:15	36	0	0	36	1,444	21	14	1,479	1,478	3	12	1,487	3,002
16:30 to 17:30	35	0	1	36	1,387	15	13	1,415	1,510	7	13	1,526	2,977
16:45 to 17:45	39	0	1	40	1,377	15	9	1,399	1,535	5	13	1,548	2,986
17:00 to 18:00	35	0	1	36	1,320	8	9	1,338	1,531	3	14	1,548	2,922
PM Totals	**89**	**1**	**1**	**91**	**4,524**	**74**	**56**	**4,634**	**4,519**	**40**	**40**	**4,593**	**9,018**

Job No.	: NZ285
Client	: Tonkin + Taylor
Suburb	: Harbourside Church
Location	: 2. Esmonde Rd / Harbourside Church (Unsignalised)
Day/Date	: Wed. 8th May 2019
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data



MATRIX
Traffic and Transport Data

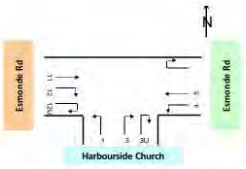
Classifications	Class 1	Class 2	Class 3
	Lights	Heavies	Buses

Approach	Harbourside Church												Esmonde Rd											
Direction	Direction 1 (Left Turn)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 8U (U Turn)			
Time Period	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total
7:00 to 7:15	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	167	2	3	172	0	0	0	0
7:15 to 7:30	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	165	3	1	169	0	0	0	0
7:30 to 7:45	7	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	170	3	7	180	0	0	0	0
7:45 to 8:00	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	196	2	5	203	0	0	0	0
8:00 to 8:15	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	215	7	4	226	0	0	0	0
8:15 to 8:30	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	289	6	4	299	0	0	0	0
8:30 to 8:45	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	248	6	4	258	0	0	0	0
8:45 to 9:00	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	276	3	3	282	0	0	0	0
9:00 to 9:15	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	285	8	2	295	0	0	0	0
9:15 to 9:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	322	11	4	337	0	0	0	0
9:30 to 9:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	360	10	3	373	0	0	0	0
9:45 to 10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	321	14	1	336	0	0	0	0
10:00 to 10:15	7	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	289	17	2	308	0	0	0	0
10:15 to 10:30	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	297	13	2	312	0	0	0	0
10:30 to 10:45	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	291	5	1	297	0	0	0	0
10:45 to 11:00	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	284	12	1	297	0	0	0	0
AM Totals	**53**	**0**	**0**	**53**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4,169**	**122**	**47**	**4,338**	**0**	**0**	**0**	**0**
15:00 to 15:15	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	394	14	2	410	0	0	0	0
15:15 to 15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	402	9	2	413	0	0	0	0
15:30 to 15:45	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	370	10	2	382	0	0	0	0
15:45 to 16:00	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	373	11	4	388	0	0	0	0
16:00 to 16:15	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	380	7	5	392	0	0	0	0
16:15 to 16:30	10	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	395	7	4	406	0	0	0	0
16:30 to 16:45	7	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	365	4	6	375	0	0	0	0
16:45 to 17:00	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	337	5	2	344	0	0	0	0
17:00 to 17:15	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	357	5	2	364	0	0	0	0
17:15 to 17:30	24	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	327	1	2	330	0	0	0	0
17:30 to 17:45	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	352	2	2	356	0	0	0	0
17:45 to 18:00	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	274	1	2	277	0	0	0	0
PM Totals	**65**	**0**	**0**	**65**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4,326**	**76**	**35**	**4,437**	**0**	**0**	**0**	**0**

Approach	Esmonde Rd											
Direction	Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)			
Time Period	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total
7:00 to 7:15	271	6	2	279	0	0	0	0	0	0	0	0
7:15 to 7:30	264	6	3	273	0	0	0	0	0	0	0	0
7:30 to 7:45	238	6	4	248	0	0	0	0	0	0	0	0
7:45 to 8:00	255	10	3	268	0	0	0	0	0	0	0	0
8:00 to 8:15	253	6	2	261	0	0	0	0	0	0	0	0
8:15 to 8:30	300	9	2	311	0	0	0	0	0	0	0	0
8:30 to 8:45	288	10	3	301	0	0	0	0	0	0	0	0
8:45 to 9:00	291	14	5	300	0	0	0	0	0	0	0	0
9:00 to 9:15	290	18	4	312	0	0	0	0	0	0	0	0
9:15 to 9:30	297	12	3	312	0	0	0	0	0	0	0	0
9:30 to 9:45	270	13	3	286	0	0	0	0	0	0	0	0
9:45 to 10:00	304	13	2	319	0	0	0	0	0	0	0	0
10:00 to 10:15	293	13	2	308	0	0	0	0	0	0	0	0
10:15 to 10:30	257	8	1	266	0	0	0	0	0	0	0	0
10:30 to 10:45	286	13	2	301	0	0	0	0	0	0	0	0
10:45 to 11:00	312	19	2	333	0	0	0	0	0	0	0	0
AM Totals	**4,469**	**178**	**43**	**4,690**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
15:00 to 15:15	311	8	2	321	0	0	0	0	0	0	0	0
15:15 to 15:30	345	4	3	352	0	0	0	0	0	0	0	0
15:30 to 15:45	339	11	2	352	0	0	0	0	0	0	0	0
15:45 to 16:00	362	4	7	373	0	0	0	0	0	0	0	0
16:00 to 16:15	341	5	3	349	0	0	0	0	0	0	0	0
16:15 to 16:30	370	2	1	373	0	0	0	0	0	0	0	0
16:30 to 16:45	364	1	5	370	0	0	0	0	0	0	0	0
16:45 to 17:00	363	2	3	368	0	0	0	0	0	0	0	0
17:00 to 17:15	376	0	3	379	0	0	0	0	0	0	0	0
17:15 to 17:30	410	0	2	412	0	0	0	0	0	0	0	0
17:30 to 17:45	371	1	5	377	0	0	0	0	0	0	0	0
17:45 to 18:00	367	2	4	373	0	0	0	0	0	0	0	0
PM Totals	**4,319**	**40**	**40**	**4,399**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Job No. : NZ285
Client : Tonkin + Taylor
Suburb : Harbourside Church
Location : 2. Esmonde Rd / Harbourside Church (Unsignalised)

Day/Date : Wed, 8th May 2019
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



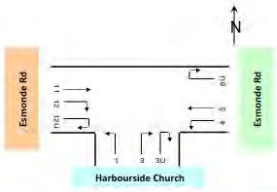
MATRIX Traffic and Transport Data

Approach	Harbourside Church												Esmonde Rd											
Direction	Direction 1 (Left Turn)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6U (U Turn)			
Time Period	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total
7:00 to 8:00	23	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	698	10	16	724	0	0	0	0
7:15 to 8:15	23	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	746	15	17	778	0	0	0	0
7:30 to 8:30	24	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	870	18	20	908	0	0	0	0
7:45 to 8:45	19	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	948	21	17	986	0	0	0	0
8:00 to 9:00	15	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	1,028	22	15	1,065	0	0	0	0
8:15 to 9:15	12	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	1,098	23	13	1,134	0	0	0	0
8:30 to 9:30	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	1,131	28	13	1,172	0	0	0	0
8:45 to 9:45	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1,243	32	12	1,287	0	0	0	0
9:00 to 10:00	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1,288	43	10	1,341	0	0	0	0
9:15 to 10:15	7	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	1,286	52	10	1,348	0	0	0	0
9:30 to 10:30	8	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	1,261	54	8	1,323	0	0	0	0
9:45 to 10:45	12	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	1,192	49	6	1,247	0	0	0	0
10:00 to 11:00	13	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	1,155	47	6	1,208	0	0	0	0
AM Totals	**53**	**0**	**0**	**53**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4,109**	**122**	**47**	**4,338**	**0**	**0**	**0**	**0**
15:00 to 16:00	9	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	1,539	44	10	1,593	0	0	0	0
15:15 to 16:15	10	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	1,525	37	13	1,575	0	0	0	0
15:30 to 16:30	20	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	1,518	33	15	1,566	0	0	0	0
15:45 to 16:45	25	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	1,513	29	19	1,561	0	0	0	0
16:00 to 17:00	21	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	1,477	23	17	1,517	0	0	0	0
16:15 to 17:15	21	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	1,454	21	14	1,489	0	0	0	0
16:30 to 17:30	35	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	1,386	33	12	1,431	0	0	0	0
16:45 to 17:45	34	0	0	34	0	0	0	0	0	0	0	0	0	0	0	0	1,373	19	8	1,394	0	0	0	0
17:00 to 18:00	35	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	1,310	9	8	1,327	0	0	0	0
PM Totals	**65**	**0**	**0**	**65**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4,326**	**76**	**35**	**4,437**	**0**	**0**	**0**	**0**

Approach	Esmonde Rd											
Direction	Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)			
Time Period	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total
7:00 to 8:00	1,028	28	12	1,068	0	0	0	0	0	0	0	0
7:15 to 8:15	1,010	28	12	1,050	0	0	0	0	0	0	0	0
7:30 to 8:30	1,046	31	11	1,088	0	0	0	0	0	0	0	0
7:45 to 8:45	1,096	35	10	1,141	0	0	0	0	0	0	0	0
8:00 to 9:00	1,122	39	12	1,173	0	0	0	0	0	0	0	0
8:15 to 9:15	1,159	51	14	1,224	0	0	0	0	0	0	0	0
8:30 to 9:30	1,156	54	15	1,225	0	0	0	0	0	0	0	0
8:45 to 9:45	1,138	57	15	1,210	0	0	0	0	0	0	0	0
9:00 to 10:00	1,101	56	12	1,229	0	0	0	0	0	0	0	0
9:15 to 10:15	1,164	51	10	1,225	0	0	0	0	0	0	0	0
9:30 to 10:30	1,124	47	8	1,179	0	0	0	0	0	0	0	0
9:45 to 10:45	1,140	49	7	1,196	0	0	0	0	0	0	0	0
10:00 to 11:00	1,148	55	7	1,210	0	0	0	0	0	0	0	0
AM Totals	**4,459**	**178**	**43**	**4,680**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
15:00 to 16:00	1,357	27	14	1,398	0	0	0	0	0	0	0	0
15:15 to 16:15	1,387	24	15	1,426	0	0	0	0	0	0	0	0
15:30 to 16:30	1,412	22	13	1,447	0	0	0	0	0	0	0	0
15:45 to 16:45	1,437	12	16	1,465	0	0	0	0	0	0	0	0
16:00 to 17:00	1,438	10	12	1,460	0	0	0	0	0	0	0	0
16:15 to 17:15	1,473	5	12	1,490	0	0	0	0	0	0	0	0
16:30 to 17:30	1,513	3	13	1,529	0	0	0	0	0	0	0	0
16:45 to 17:45	1,520	5	11	1,536	0	0	0	0	0	0	0	0
17:00 to 18:00	1,524	3	14	1,541	0	0	0	0	0	0	0	0
PM Totals	**4,319**	**40**	**40**	**4,399**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Job No. : NZ285
Client : Tonkin + Taylor
Suburb : Harbourside Church
Location : 2. Esmonde Rd / Harbourside Church (Unsignalised)

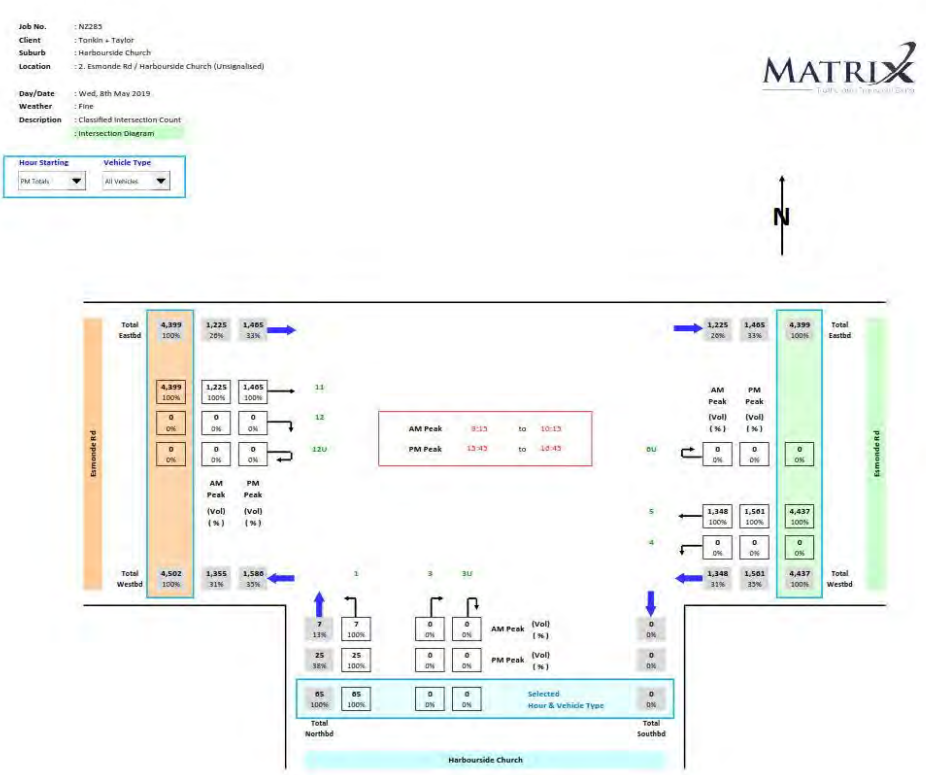
Day/Date : Wed, 8th May 2019
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary



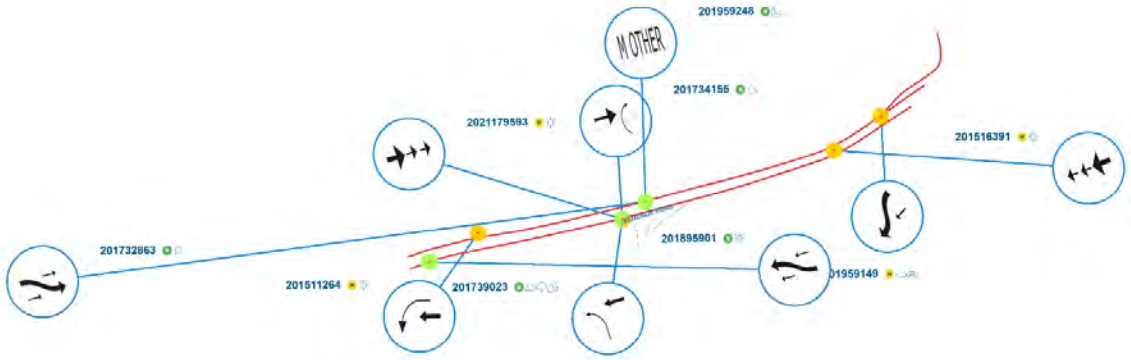
MATRIX Traffic and Transport Data

	Approach	Harbourside Church				Esmonde Rd				Esmonde Rd				Grand Total
	Time Period	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	
AM	9:15 to 10:15	7	0	0	**7**	1,280	52	10	**1,348**	1,164	51	10	**1,225**	**2,580**
PM	16:45 to 17:45	25	0	0	**25**	1,513	29	19	**1,561**	1,437	12	16	**1,465**	**3,051**

Approach	Harbourside Church				Esmonde Rd				Esmonde Rd				Grand Total
Time Period	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	Lights	Heavies	Buses	Total	
7:00 to 8:00	23	0	0	**23**	698	10	16	**724**	1,028	28	12	**1,068**	**1,815**
7:15 to 8:15	23	0	0	**23**	746	15	17	**778**	1,010	28	12	**1,050**	**1,851**
7:30 to 8:30	24	0	0	**24**	670	18	20	**908**	1,040	31	11	**1,088**	**2,020**
7:45 to 8:45	19	0	0	**19**	948	21	17	**986**	1,096	35	10	**1,141**	**2,146**
8:00 to 9:00	15	0	0	**15**	1,038	22	15	**1,065**	1,122	39	12	**1,173**	**2,253**
8:15 to 9:15	12	0	0	**12**	1,098	23	13	**1,134**	1,159	51	14	**1,224**	**2,370**
8:30 to 9:30	6	0	0	**6**	1,131	28	13	**1,172**	1,156	54	15	**1,225**	**2,403**
8:45 to 9:45	4	0	0	**4**	1,243	32	12	**1,287**	1,138	57	15	**1,210**	**2,501**
9:00 to 10:00	2	0	0	**2**	1,288	43	10	**1,341**	1,161	56	12	**1,229**	**2,572**
9:15 to 10:15	7	0	0	**7**	1,280	52	10	**1,348**	1,164	51	10	**1,225**	**2,580**
9:30 to 10:30	8	0	0	**8**	1,261	54	8	**1,323**	1,124	47	8	**1,179**	**2,510**
9:45 to 10:45	12	0	0	**12**	1,192	49	6	**1,247**	1,140	49	7	**1,196**	**2,455**
10:00 to 11:00	13	0	0	**13**	1,155	47	6	**1,208**	1,146	55	7	**1,210**	**2,431**
AM Totals	**53**	**0**	**0**	**53**	**4,189**	**122**	**47**	**4,338**	**4,459**	**178**	**43**	**4,680**	**9,071**
15:00 to 16:00	9	0	0	**9**	1,539	44	10	**1,593**	1,357	27	14	**1,398**	**3,000**
15:15 to 16:15	10	0	0	**10**	1,525	37	13	**1,575**	1,387	24	15	**1,426**	**3,011**
15:30 to 16:30	20	0	0	**20**	1,518	35	15	**1,568**	1,412	22	13	**1,447**	**3,035**
15:45 to 16:45	25	0	0	**25**	1,513	29	19	**1,561**	1,437	12	16	**1,465**	**3,051**
16:00 to 17:00	21	0	0	**21**	1,477	23	17	**1,517**	1,438	10	12	**1,460**	**2,998**
16:15 to 17:15	21	0	0	**21**	1,454	21	14	**1,489**	1,473	5	12	**1,490**	**3,000**
16:30 to 17:30	35	0	0	**35**	1,386	15	12	**1,413**	1,513	3	13	**1,529**	**2,977**
16:45 to 17:45	34	0	0	**34**	1,373	13	8	**1,394**	1,520	3	13	**1,536**	**2,964**
17:00 to 18:00	35	0	0	**35**	1,310	9	8	**1,327**	1,524	3	14	**1,541**	**2,903**
PM Totals	**65**	**0**	**0**	**65**	**4,326**	**70**	**35**	**4,437**	**4,319**	**40**	**40**	**4,399**	**8,901**


Job No. : N2285
Client : Tonkin + Taylor
Suburb : Harbourside Church
Location : 2. Esmonde Rd / Harbourside Church (Unsignalised)
Day/Date : Wed, 8th May 2019
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram
Hour Starting
PM Totals
Vehicle Type
All Vehicles
MATRIX
N
Esmonde Rd
Total Eastbd
Total Westbd
AM Peak 8:15 to 10:15
PM Peak 13:45 to 15:45
AM Peak (Vol) (%)
PM Peak (Vol) (%)
Selected Hour & Vehicle Type
Total Northbd
Total Southbd
Harbourside Church

Appendix B: CAS Crash Data


201959248
MOTHER
201734155
2021179593
201516391
201732863
201895901
201511264
201739023
01959149

NZ TRANSPORT AGENCY WAKA KOTAHI | CAS

Untitled query

Saved sites

48 Esmonde Road

Crash year

2015 — 2022

Site details report

Fatal crashes: 0 | **Injury crashes:** 4 | **Non-injury crashes:** 5 | **Total crashes:** 9

Overall crash statistics

Crash severity

Crash severity	Number	%	Social cost $(m)
Fatal	0	0	0
Serious	0	0	0
Minor-injury	4	44.44	0.21
Non-injury	5	55.56	0.10
TOTAL	9	100	0.31

Crash numbers

Year	Fatal	Serious	Minor	Non-injury
2015	0	0	2	0
2017	0	0	0	3
2018	0	0	0	1
2019	0	0	1	1
2021	0	0	1	0
TOTAL	0	0	4	5
Percent	0	0	44.44	55.55

Crash type and cause statistics

Overall casualty statistics

Injury severity

Injury severity	Number	% all casualties
Fatal	0	0.00
Serious Injured	0	0.00
Minor Injured	8	100.00
TOTAL	8	100.00

Casualty numbers

Year	Fatal	Serious Injured	Minor Injured
2015	0	0	6
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	1
2020	0	0	0
2021	0	0	1
2022	0	0	0
TOTAL	0	0	8
Percent	0.00	0.00	100.00

Note: Last 5 years of crashes shown (unless query includes specific date range).

Crash type

Crash type	Crash numbers	% All crashes
Overtaking crashes	4	44.44
Straight road lost control/head on	0	0
Bend - lost control/Head on	0	0
Rear end/obstruction	4	44.44
Crossing/turning	1	11.11
Pedestrian crashes	0	0
Miscellaneous crashes	0	0
TOTAL	9	100

Casualty types

Casualty types	Fatalities	Serious injuries	Minor injuries
Cyclists	0	0	1
Drivers	0	0	4
Motorcycle pillions	0	0	0
Motorcycle riders	0	0	0
Passengers	0	0	3
Pedestrians	0	0	0
Other	0	0	0
TOTAL	0	0	8

Note: Motorcycle stats include Mopeds.

Driver and vehicle statistics

Drivers at fault or part fault in injury crashes - by age

Age	Male	Female	Unknown	Total	Percentage (%)
0-4	0	1	0	1	20.00
5-9	0	0	0	0	0.00
10-14	0	0	0	0	0.00
15-19	0	0	0	0	0.00
20-24	0	0	0	0	0.00
25-29	0	0	0	0	0.00
30-34	0	0	0	0	0.00
35-39	1	0	0	1	20.00
40-44	0	0	0	0	0.00
45-49	0	0	0	0	0.00
50-54	0	0	0	0	0.00
55-59	0	0	0	0	0.00
60-64	2	0	0	2	40.00
65-69	0	0	0	0	0.00
70-74	0	0	0	0	0.00
75-79	0	0	0	0	0.00
80-84	0	0	0	0	0.00
85-89	0	0	0	0	0.00
90-94	0	0	0	0	0.00
95-99	0	1	0	1	20.00
100+	0	0	0	0	0.00
Unknown	0	0	0	0	0.00
TOTAL	3	2	0	5	–
Percent	60.00	40.00	0.00	100.00	–

Note: Driver information is not calculated for non-injury crashes.

Crash factors

Crash factors	Crash numbers	% All crashes
#N/A	2	22.22
Alcohol	1	11.11
Disabled, old age or illness	0	0.00
Failed to give way or stop	2	22.22
Fatigue	0	0.00
Incorrect lanes or position	4	44.44
Miscellaneous factors	1	11.11
Overtaking	0	0.00
Pedestrian factors	0	0.00
Poor handling	1	11.11
Poor judgement	0	0.00
Poor observation	3	33.33
Position on Road	0	0.00
Road factors	0	0.00
Travel Speed	1	11.11
Unknown	0	0.00
Vehicle factors	0	0.00
Weather	0	0.00
TOTAL	15	166.67

Crashes with:

Factor groups	Crash numbers	% All crashes
All road user factors	2	22.22
Driver only factors	9	100.00
Pedestrian factors	0	0.00
Vehicle factors	0	0.00
Road factors	0	0.00
Environment factors	0	0.00
No identifiable factors	0	0.00
Retired codes - no future use	2	22.22
TOTAL	13	144.44

Notes: Factors are counted once against a crash - i.e. two fatigued drivers count as one fatigue crash factor.

Driver/vehicle factors are not available for non-injury crashes for Northland, Auckland, Waikato and Bay of Plenty before 2007. This will influence numbers and percentages.

% represents the % of crashes in which the cause factor appears.

Number of parties in crash

Party type	All crashes	% All crashes
Single party	1	11.11
Multiple party, including pedestrian	0	0.00
Multiple party, excluding pedestrian	8	88.89
TOTAL	9	100

Drivers at fault or part fault in injury crashes - by licence

Licence	Male	Female	Unknown	Total	Percentage (%)
Full	3	1	0	4	80.00
Learner	0	0	0	0	0.00
Restricted	0	0	0	0	0.00
Overseas	0	0	0	0	0.00
Wrong class	0	0	0	0	0.00
Never Licensed	0	0	0	0	0.00
Unknown	0	1	0	1	20.00
Forbidden	0	0	0	0	0.00
TOTAL	3	2	0	5	–
Percent	60.00	40.00	0.00	100.00	–

Note: Driver information is not calculated for non-injury crashes.

Vehicles involved in injury crashes (vehicle count)

Vehicle type	No. of vehicles	% of vehicles in injury crashes
Unknown	0	0.00
Car/Wagon	7	63.64
SUV	0	0.00
Van	0	0.00
Ute	1	9.09
Truck	0	0.00
Truck HPMV	0	0.00
Bus	2	18.18
Motorcycle	0	0.00
Moped	0	0.00
Train	0	0.00
Cycle	1	9.09
Other	0	0.00
Unknown	0	0.00
50 Max	0	0.00
Left scene	0	0.00
Uncoupled towed vehicle	0	0.00
TOTAL	11	100.00

Vulnerable road users

Crash types	Number	Percentage (%)
Cyclist crashes	1	11.11
Pedestrian crashes	0	0.00
Motorcycle crashes	0	0.00
All other crashes	8	88.89

Note: Some crashes involve more than one vulnerable road user type.

Note: Motorcycle stats include Mopeds.

Road environment statistics

Road type

Road type	State highway	Local road	Unknown	N/A	Total	Percentage (%)
Urban	0	9	0	0	9	100.00
Open	0	0	0	0	0	0.00
Unknown	0	0	0	0	0	0.00
TOTAL	0	9	0	0	9	–
Percent	0.00	100.00	0.00	0.00	100.00	–

Natural light conditions

Conditions	Injury	Non-injury	Total	%
Light/overcast	4	4	8	88.89
Dark/twilight	0	1	1	11.11
Unknown	0	0	0	0.00
TOTAL	4	5	9	100

Conditions

Conditions	Injury	Non-injury	Total	%
Dry	4	4	8	88.89
Ice or Snow	0	0	0	0.00
Wet	0	1	1	11.11
Null	0	0	0	0.00
TOTAL	4	5	9	100

Intersection/midblock

Intersection/mid-block	Total	%
Intersection	7	77.78
Midblock	2	22.22
TOTAL	9	100

Vehicles involved in injury crashes (crash count)

Vehicle type	Injury crashes	% of injury crashes
Unknown	0	0.00
Car/Wagon	4	100.00
SUV	0	0.00
Van	0	0.00
Ute	1	25.00
Truck	0	0.00
Truck HPMV	0	0.00
Bus	2	50.00
Motorcycle	0	0.00
Moped	0	0.00
Train	0	0.00
Cycle	1	25.00
Other	0	0.00
Unknown	0	0.00
50 Max	0	0.00
Left scene	0	0.00
Uncoupled towed vehicle	0	0.00
TOTAL	8	200.00

Objects struck

Objects struck	Injury crashes	%	Non-injury crashes	%
Crashes w/obj struck	0	0.00	1	11.11

Object struck	Injury crashes	%	Non-injury crashes	%
Animals	0	0.00	0	0.00
Bridges/Tunnels	0	0.00	0	0.00
Cliffs	0	0.00	0	0.00
Debris	0	0.00	0	0.00
Embankments	0	0.00	0	0.00
Fences	0	0.00	0	0.00
Guide/Guard rails	0	0.00	0	0.00
Houses	0	0.00	0	0.00
Traffic Islands	0	0.00	0	0.00
Street Furniture	0	0.00	0	0.00
Kerbing	0	0.00	0	0.00
Landslips	0	0.00	0	0.00
Parked vehicle	0	0.00	0	0.00
Trains	0	0.00	0	0.00
Sight Rails	0	0.00	0	0.00
Poles	0	0.00	0	0.00
Stationary Vehicle	0	0.00	0	0.00
Roadwork	0	0.00	0	0.00
Traffic Sign	0	0.00	0	0.00
Trees	0	0.00	1	11.11
Drainage Structures	0	0.00	0	0.00
Ditches	0	0.00	0	0.00
Other	0	0.00	0	0.00
Thrown or dropped objects	0	0.00	0	0.00
Water	0	0.00	0	0.00
TOTAL	0	–	1	–

Note: % represents the % of crashes in which the object is struck.

Vehicle usage in injury crashes

Vehicle usage	Fatal Crash	Serious Crash	Minor Crash	Total	Percentage (%)
Private	0	0	2	2	18.18
Attenuator Truck	0	0	0	0	0.00
Agricultural	0	0	0	0	0.00
Ambulance	0	0	0	0	0.00
Campervan	0	0	0	0	0.00
Concrete mixer	0	0	0	0	0.00
Fire	0	0	0	0	0.00
Logging truck	0	0	0	0	0.00
Mobile crane	0	0	0	0	0.00
Police	0	0	0	0	0.00
Rental	0	0	0	0	0.00
Road Working	0	0	0	0	0.00
Scheduled service Bus	0	0	0	0	0.00
School bus	0	0	1	1	9.09
Tanker	0	0	0	0	0.00
Taxi	0	0	0	0	0.00
Tour Bus	0	0	0	0	0.00
Trade person	0	0	1	1	9.09
Work travel	0	0	1	1	9.09
Work vehicle	0	0	0	0	0.00
Other	0	0	0	0	0.00
Null	0	0	6	6	54.55
TOTAL	0	0	11	11	–
Percent	0.00	0.00	100.00	100.00	–

Time period statistics

Month by injury/ non-injury crashes

Month	Injury crashes	%	Non-injury crashes	%	Total	%
Jan	1	25	0	0	1	11.11
Feb	2	50	2	40	4	44.44
Mar	0	0	1	20	1	11.11
Apr	0	0	0	0	0	0
May	0	0	1	20	1	11.11
Jun	0	0	0	0	0	0
Jul	0	0	0	0	0	0
Aug	1	25	0	0	1	11.11
Sep	0	0	0	0	0	0
Oct	0	0	0	0	0	0
Nov	0	0	1	20	1	11.11
Dec	0	0	0	0	0	0
TOTAL	4	100	5	100	9	100

Day/period

Day/Period	All crashes	% All crashes
Weekday	6	66.67
Weekend	3	33.33
TOTAL	9	100

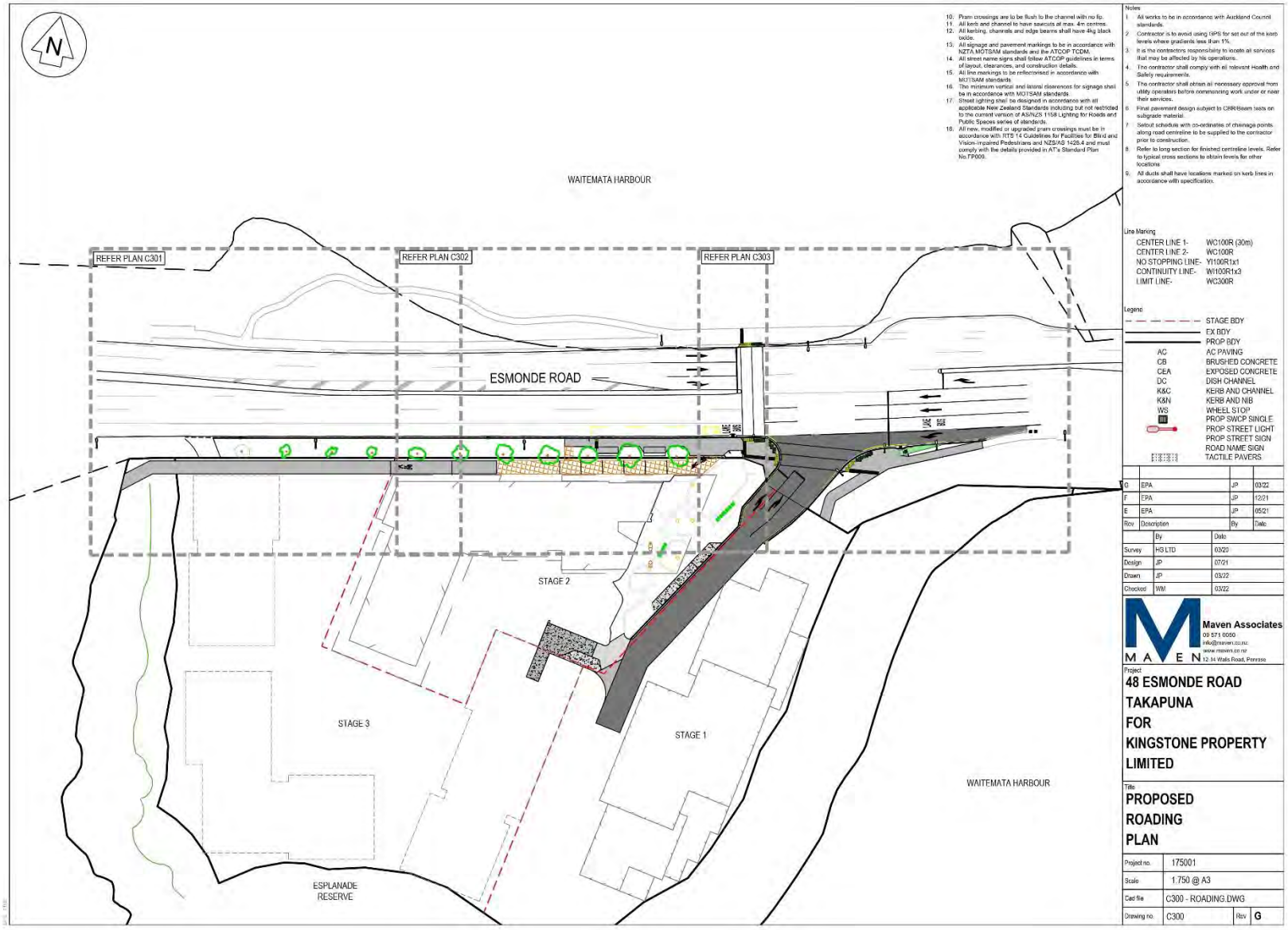
Day/period by hour

Day/Period	00:00 - 02:59	03:00 - 05:59	06:00 - 08:59	09:00 - 11:59	12:00 - 14:59	15:00 - 17:59	18:00 - 20:59	21:00 - 23:59	Total
Weekday	0	0	3	1	0	2	0	0	6
Weekend	1	0	0	2	0	0	0	0	3
TOTAL	1	0	3	3	0	2	0	0	9

Day/period by hour DOW

Day/Period	00:00 - 02:59	03:00 - 05:59	06:00 - 08:59	09:00 - 11:59	12:00 - 14:59	15:00 - 17:59	18:00 - 20:59	21:00 - 23:59	Total
Mon	0	0	1	0	0	0	0	0	1
Tue	0	0	1	0	0	1	0	0	2
Fri	0	0	1	1	0	1	0	0	3
Sat	0	0	0	1	0	0	0	0	1
Sun	1	0	0	1	0	0	0	0	2
TOTAL	1	0	3	3	0	2	0	0	9

Appendix C: Intersection Layout


N
WAITEMATA HARBOUR
REFER PLAN C301
REFER PLAN C302
REFER PLAN C303
ESMONDE ROAD
STAGE 2
STAGE 3
STAGE 1
WAITEMATA HARBOUR
ESPLANADE RESERVE
10. Pram crossings are to be flush to the channel with no lip.
11. All kerb and channel to have sawcuts at max. 4m centres.
12. All kerbing, channels and edge beams shall have 4kg black oxide.
13. All signage and pavement markings to be in accordance with NZTA MOTSAM standards and the ATCOP TCDM.
14. All street name signs shall follow ATCOP guidelines in terms of layout, clearances, and construction details.
15. All line markings to be reflectorised in accordance with MOTSAM standards.
16. The minimum vertical and lateral clearances for signage shall be in accordance with MOTSAM standards.
17. Street lighting shall be designed in accordance with all applicable New Zealand Standards including but not restricted to the current version of AS/NZS 1158 Lighting for Roads and Public Spaces series of standards.
18. All new, modified or upgraded pram crossings must be in accordance with RTS 14 Guidelines for Facilities for Blind and Vision-impaired Pedestrians and NZS/AS 1428.4 and must comply with the details provided in AT's Standard Plan No.FP009.
Notes
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2. Contractor is to avoid using GPS for set out of the kerb levels where gradients less than 1%.
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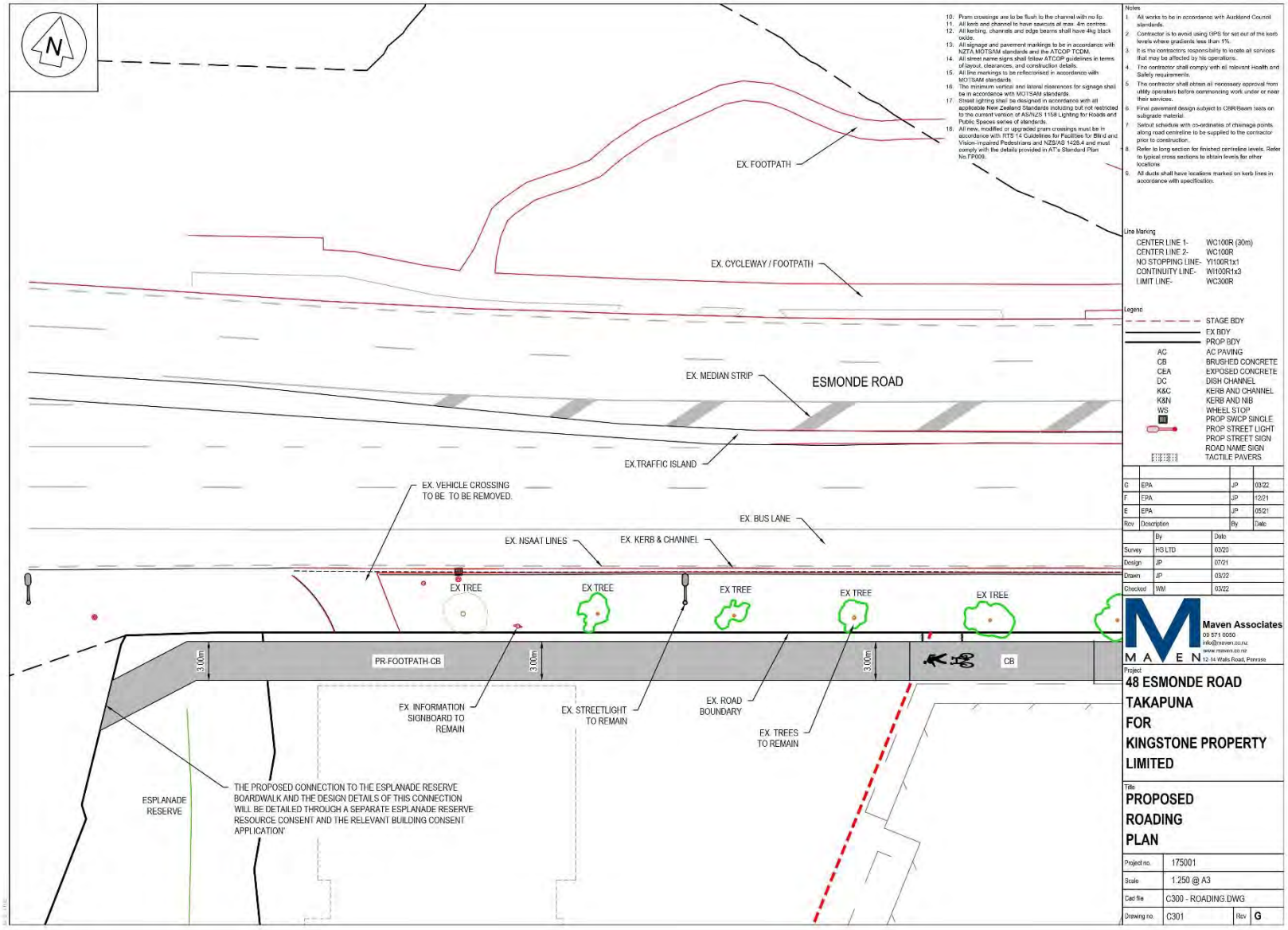
4. The contractor shall comply with all relevant Health and Safety requirements.
5. The contractor shall obtain all necessary approval from utility operators before commencing work under or near their services.
6. Final pavement design subject to CBR/Beam tests on subgrade material.
7. Setout schedule with co-ordinates of chainage points along road centreline to be supplied to the contractor prior to construction.
8. Refer to long section for finished centreline levels. Refer to typical cross sections to obtain levels for other locations.
9. All ducts shall have locations marked on kerb lines in accordance with specification.
Line Marking
CENTER LINE 1- WC100R (30m)
CENTER LINE 2- WC100R
NO STOPPING LINE- Y100R1x1
CONTINUITY LINE- W100R1x3
LIMIT LINE- WC300R
Legend
STAGE BDY
EX BDY
PROP BDY
AC AC PAVING
CB BRUSHED CONCRETE
CEA EXPOSED CONCRETE
DC DISH CHANNEL
K&C KERB AND CHANNEL
K&N KERB AND NIB
WS WHEEL STOP
PROP SWCP SINGLE
PROP STREET LIGHT
PROP STREET SIGN
ROAD NAME SIGN
TACTILE PAVERS
G EPA JP 03/22
F EPA JP 12/21
E EPA JP 05/21
Rev Description By Date
By Date
Survey HS LTD 03/20
Design JP 07/21
Drawn JP 03/22
Checked WM 03/22
Maven Associates
09 571 0050
info@maven.co.nz
www.maven.co.nz
12-14 Wells Road, Penrose
Project
48 ESMONDE ROAD
TAKAPUNA
FOR
KINGSTONE PROPERTY
LIMITED
Title
PROPOSED
ROADING
PLAN
Project no. 175001
Scale 1:750 @ A3
Cad file C300 - ROADING.DWG
Drawing no. C300 Rev G


N
EX. FOOTPATH
EX. CYCLEWAY / FOOTPATH
EX. MEDIAN STRIP
ESMONDE ROAD
EX.TRAFFIC ISLAND
EX. VEHICLE CROSSING TO BE TO BE REMOVED.
EX. BUS LANE
EX. NSAAT LINES
EX. KERB & CHANNEL
EX TREE
EX TREE
EX TREE
EX TREE
EX TREE
3.00m
PR-FOOTPATH-CB
3.00m
3.00m
CB
EX. INFORMATION SIGNBOARD TO REMAIN
EX. STREETLIGHT TO REMAIN
EX. ROAD BOUNDARY
EX. TREES TO REMAIN
ESPLANADE RESERVE
THE PROPOSED CONNECTION TO THE ESPLANADE RESERVE BOARDWALK AND THE DESIGN DETAILS OF THIS CONNECTION WILL BE DETAILED THROUGH A SEPARATE ESPLANADE RESERVE RESOURCE CONSENT AND THE RELEVANT BUILDING CONSENT APPLICATION'
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Line Marking
CENTER LINE 1- WC100R (30m)
CENTER LINE 2- WC100R
NO STOPPING LINE- Y100R1x1
CONTINUITY LINE- W100R1x3
LIMIT LINE- WC300R
Legend
STAGE BDY
EX BDY
PROP BDY
AC AC PAVING
CB BRUSHED CONCRETE
CEA EXPOSED CONCRETE
DC DISH CHANNEL
K&C KERB AND CHANNEL
K&N KERB AND NIB
WS WHEEL STOP
PROP SWCP SINGLE
PROP STREET LIGHT
PROP STREET SIGN
ROAD NAME SIGN
TACTILE PAVERS
G EPA JP 03/22
F EPA JP 12/21
E EPA JP 05/21
Rev Description By Date
By Date
Survey HS LTD 03/20
Design JP 07/21
Drawn JP 03/22
Checked WM 03/22
Maven Associates
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12-14 Wells Road, Penrose
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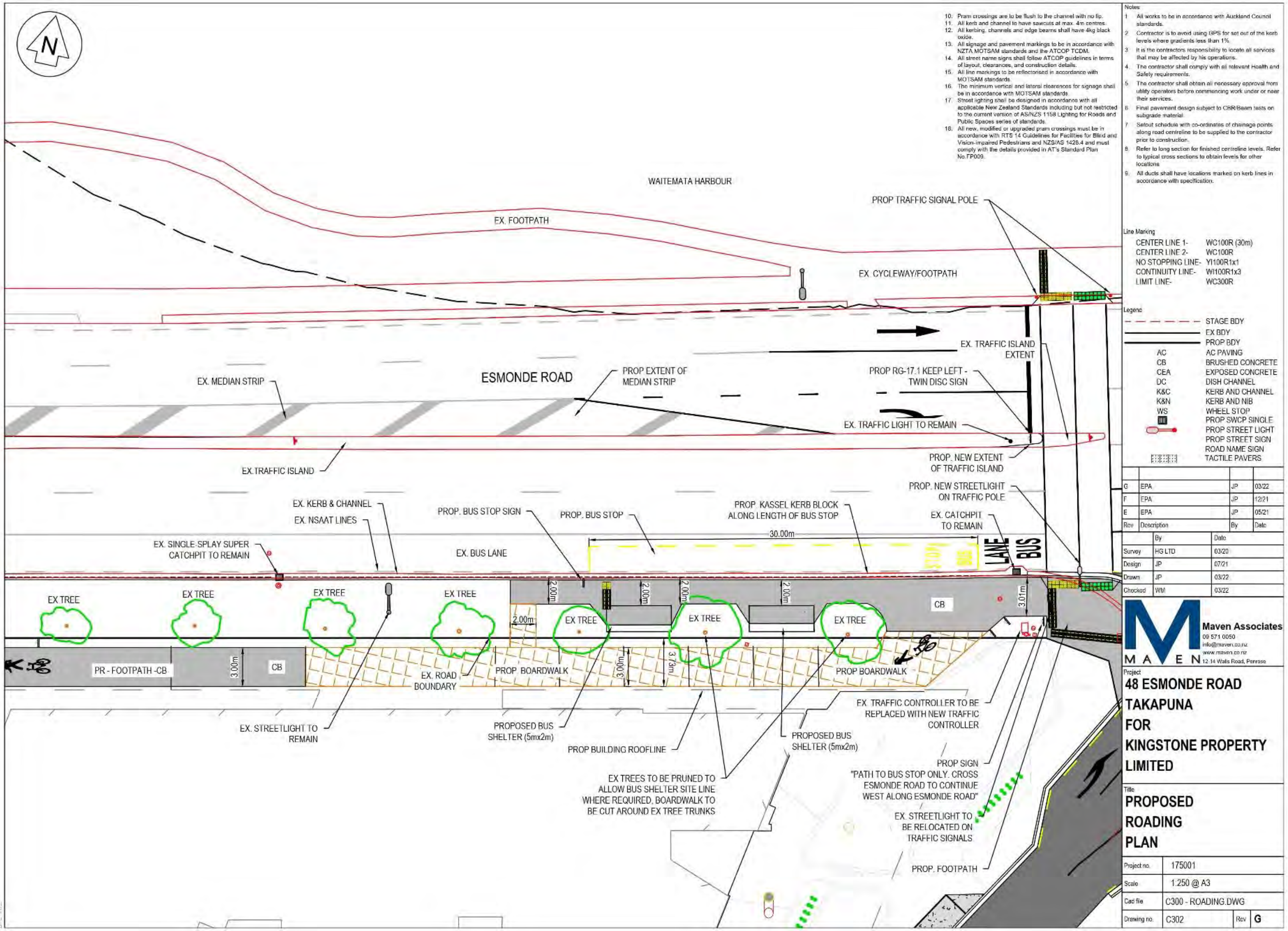
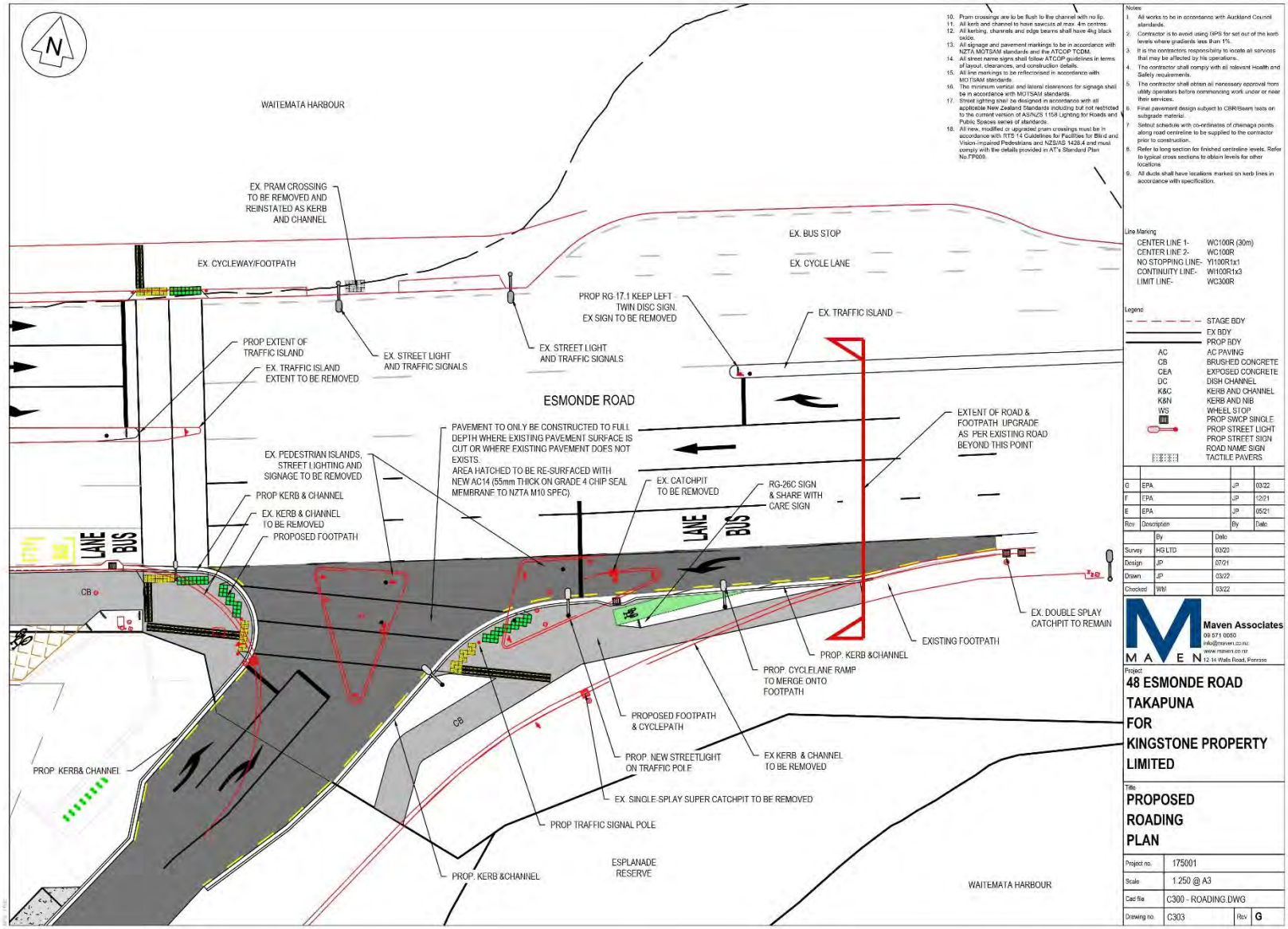
48 ESMONDE ROAD
TAKAPUNA
FOR
KINGSTONE PROPERTY
LIMITED
Title
PROPOSED
ROADING
PLAN
Project no. 175001
Scale 1:250 @ A3
Cad file C300 - ROADING.DWG
Drawing no. C301 Rev G



WAITEMATA HARBOUR
EX. FOOTPATH
EX. CYCLEWAY/FOOTPATH
PROP TRAFFIC SIGNAL POLE
EX. TRAFFIC ISLAND EXTENT
ESMONDE ROAD
EX. MEDIAN STRIP
PROP EXTENT OF MEDIAN STRIP
PROP RG-17.1 KEEP LEFT - TWIN DISC SIGN
EX. TRAFFIC LIGHT TO REMAIN
EX TRAFFIC ISLAND
PROP. NEW EXTENT OF TRAFFIC ISLAND
PROP. NEW STREETLIGHT ON TRAFFIC POLE
EX. KERB & CHANNEL
EX. NSAAT LINES
PROP. BUS STOP SIGN
PROP. BUS STOP
PROP. KASSEL KERB BLOCK ALONG LENGTH OF BUS STOP
EX. CATCHPIT TO REMAIN
EX. SINGLE SPLAY SUPER CATCHPIT TO REMAIN
EX. BUS LANE
30.00m
BUS LANE
EX TREE
CB
PR - FOOTPATH -CB
EX. ROAD BOUNDARY
PROP. BOARDWALK
EX. STREETLIGHT TO REMAIN
PROPOSED BUS SHELTER (5mx2m)
PROP BUILDING ROOFLINE
EX TREES TO BE PRUNED TO ALLOW BUS SHELTER SITE LINE WHERE REQUIRED. BOARDWALK TO BE CUT AROUND EX TREE TRUNKS
EX. TRAFFIC CONTROLLER TO BE REPLACED WITH NEW TRAFFIC CONTROLLER
PROP SIGN "PATH TO BUS STOP ONLY. CROSS ESMONDE ROAD TO CONTINUE WEST ALONG ESMONDE ROAD"
EX. STREETLIGHT TO BE RELOCATED ON TRAFFIC SIGNALS
PROP. FOOTPATH
Line Marking
CENTER LINE 1- WC100R (30m)
CENTER LINE 2- WC100R
NO STOPPING LINE- YI100R1x1
CONTINUITY LINE- WI100R1x3
LIMIT LINE- WC300R
Legend
STAGE BDY
EX BDY
PROP BDY
AC AC PAVING
CB BRUSHED CONCRETE
CEA EXPOSED CONCRETE
DC DISH CHANNEL
K&C KERB AND CHANNEL
K&N KERB AND NIB
WS WHEEL STOP
PROP SWCP SINGLE
PROP STREET LIGHT
PROP STREET SIGN
ROAD NAME SIGN
TACTILE PAVERS
Maven Associates
MAVEN
Project
48 ESMONDE ROAD TAKAPUNA FOR KINGSTONE PROPERTY LIMITED
Title
PROPOSED ROADING PLAN
Project no. 175001
Scale 1:250 @ A3
Cad file C300 - ROADING.DWG
Drawing no. C302
Rev G


N
WAITEMATA HARBOUR
EX. PRAM CROSSING TO BE REMOVED AND REINSTATED AS KERB AND CHANNEL
EX. CYCLEWAY/FOOTPATH
EX. BUS STOP
EX. CYCLE LANE
PROP RG-17.1 KEEP LEFT - TWIN DISC SIGN. EX SIGN TO BE REMOVED
EX. TRAFFIC ISLAND
PROP EXTENT OF TRAFFIC ISLAND
EX. TRAFFIC ISLAND EXTENT TO BE REMOVED
EX. STREET LIGHT AND TRAFFIC SIGNALS
EX. STREET LIGHT AND TRAFFIC SIGNALS
ESMONDE ROAD
EXTENT OF ROAD & FOOTPATH UPGRADE AS PER EXISTING ROAD BEYOND THIS POINT
PAVEMENT TO ONLY BE CONSTRUCTED TO FULL DEPTH WHERE EXISTING PAVEMENT SURFACE IS CUT OR WHERE EXISTING PAVEMENT DOES NOT EXISTS.
AREA HATCHED TO BE RE-SURFACED WITH NEW AC14 (55mm THICK ON GRADE 4 CHIP SEAL MEMBRANE TO NZTA M10 SPEC).
EX. PEDESTRIAN ISLANDS, STREET LIGHTING AND SIGNAGE TO BE REMOVED
EX. CATCHPIT TO BE REMOVED
RG-26C SIGN & SHARE WITH CARE SIGN
PROP KERB & CHANNEL
EX. KERB & CHANNEL TO BE REMOVED
PROPOSED FOOTPATH
LANE
BUS
LANE
BUS
CB
CB
EX. DOUBLE SPLAY CATCHPIT TO REMAIN
EXISTING FOOTPATH
PROP. KERB &CHANNEL
PROP. CYCLELANE RAMP TO MERGE ONTO FOOTPATH
PROPOSED FOOTPATH & CYCLEPATH
PROP. KERB& CHANNEL
PROP. NEW STREETLIGHT ON TRAFFIC POLE
EX KERB & CHANNEL TO BE REMOVED
EX. SINGLE SPLAY SUPER CATCHPIT TO BE REMOVED
PROP TRAFFIC SIGNAL POLE
PROP. KERB &CHANNEL
ESPLANADE RESERVE
WAITEMATA HARBOUR
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LIMIT LINE- WC300R
Legend
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EX BDY
PROP BDY
AC AC PAVING
CB BRUSHED CONCRETE
CEA EXPOSED CONCRETE
DC DISH CHANNEL
K&C KERB AND CHANNEL
K&N KERB AND NIB
WS WHEEL STOP
PROP SWCP SINGLE
PROP STREET LIGHT
PROP STREET SIGN
ROAD NAME SIGN
TACTILE PAVERS
G EPA JP 03/22
F EPA JP 12/21
E EPA JP 05/21
Rev Description By Date
Survey HG LTD 03/20
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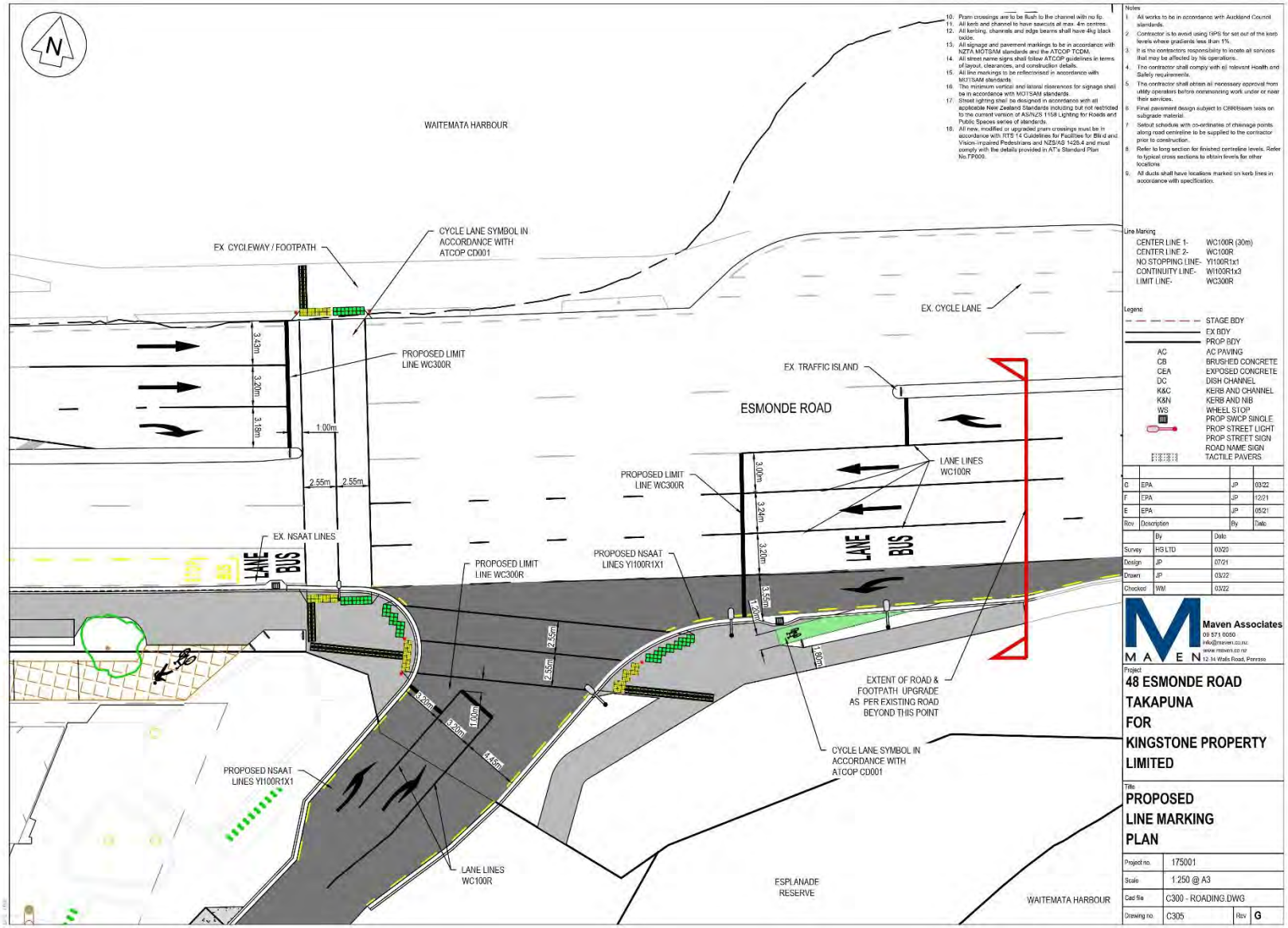
Title
PROPOSED
ROADING
PLAN
Project no. 175001
Scale 1:250 @ A3
Cad file C300 - ROADING.DWG
Drawing no. C303 Rev G



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CENTER LINE 2-	WC100R
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CONTINUITY LINE-	W1100R1x3
LIMIT LINE-	WC300R

Legend

	STAGE BDY
	EX BDY
	PROP BDY
AC	AC PAVING
CB	BRUSHED CONCRETE
CEA	EXPOSED CONCRETE
DC	DISH CHANNEL
K&C	KERB AND CHANNEL
K&N	KERB AND NIB
WS	WHEEL STOP
	PROP SWCP SINGLE
	PROP STREET LIGHT
	PROP STREET SIGN
	ROAD NAME SIGN
	TACTILE PAVERS

Rev	Description	By	Date
G	EPA	JP	03/22
F	EPA	JP	12/21
E	EPA	JP	05/21

	By	Date
Survey	HS LTD	03/20
Design	JP	07/21
Drawn	JP	03/22
Checked	WM	03/22

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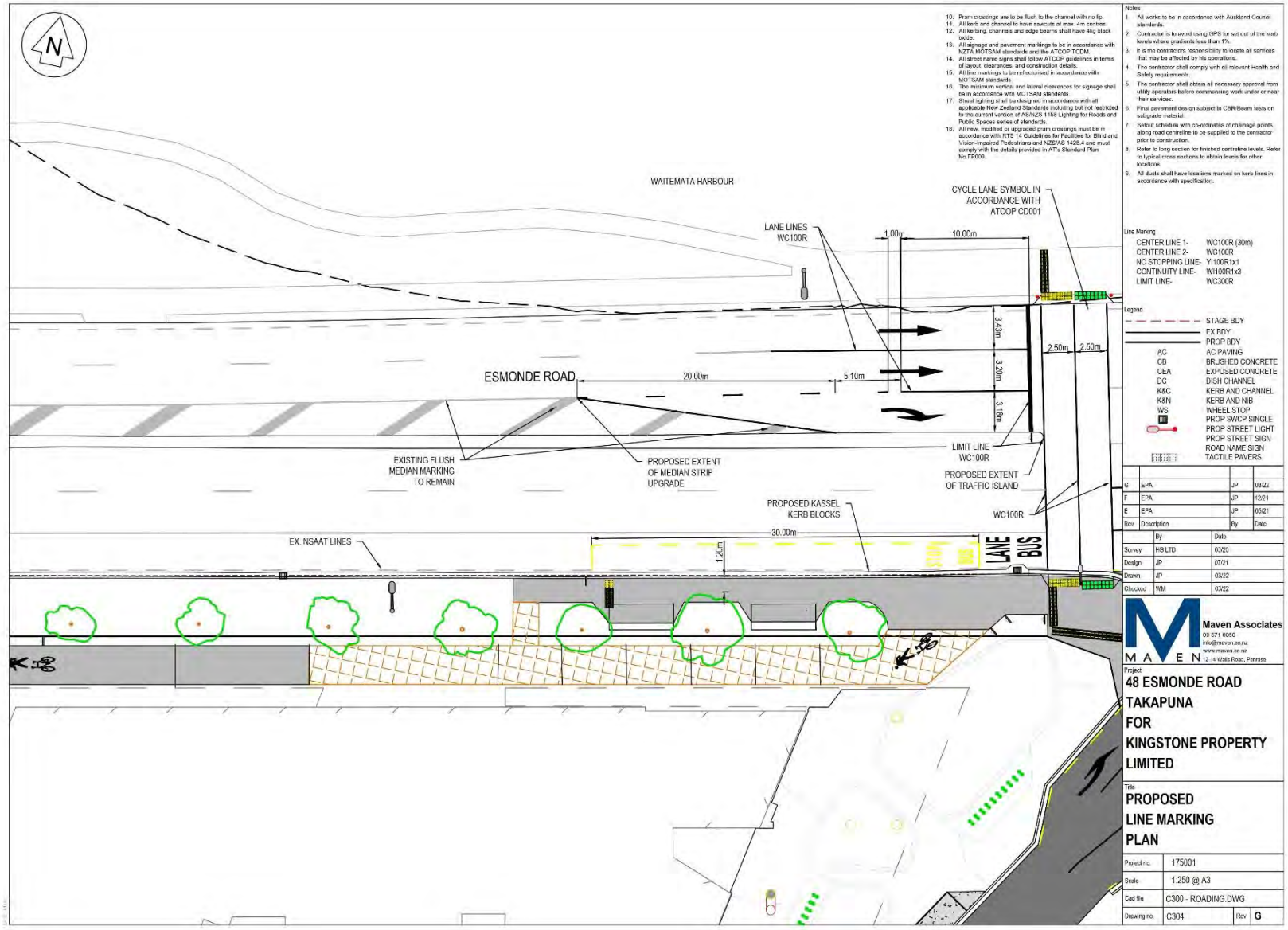
info@maven.co.nz
www.maven.co.nz
12-14 Walls Road, Penrose

Project
48 ESMONDE ROAD
TAKAPUNA
FOR
KINGSTONE PROPERTY LIMITED

Title
PROPOSED LINE MARKING PLAN

Project no.	175001
Scale	1:250 @ A3
Cad file	C300 - ROADING.DWG
Drawing no.	C305 Rev G


N
WAITEMATA HARBOUR
CYCLE LANE SYMBOL IN ACCORDANCE WITH ATCOP CD001
LANE LINES WC100R
1.00m
10.00m
ESMONDE ROAD
20.00m
5.10m
3.43m
3.20m
3.18m
2.50m
2.50m
EXISTING FLUSH MEDIAN MARKING TO REMAIN
PROPOSED EXTENT OF MEDIAN STRIP UPGRADE
LIMIT LINE WC100R
PROPOSED EXTENT OF TRAFFIC ISLAND
WC100R
PROPOSED KASSEL KERB BLOCKS
EX. NSAAT LINES
30.00m
1.20m
LANE
BUS
Notes
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16. The minimum vertical and lateral clearances for signage shall be in accordance with MOTSAM standards.
17. Street lighting shall be designed in accordance with all applicable New Zealand Standards including but not restricted to the current version of AS/NZS 1158 Lighting for Roads and Public Spaces series of standards.
18. All new, modified or upgraded pram crossings must be in accordance with RTS 14 Guidelines for Facilities for Blind and Vision-impaired Pedestrians and NZS/AS 1428.4 and must comply with the details provided in AT's Standard Plan No.FP009.
Line Marking
CENTER LINE 1- WC100R (30m)
CENTER LINE 2- WC100R
NO STOPPING LINE- Y100R1x1
CONTINUITY LINE- W100R1x3
LIMIT LINE- WC300R
Legend
STAGE BDY
EX BDY
PROP BDY
AC AC PAVING
CB BRUSHED CONCRETE
CEA EXPOSED CONCRETE
DC DISH CHANNEL
K&C KERB AND CHANNEL
K&N KERB AND NIB
WS WHEEL STOP
PROP SWCP SINGLE
PROP STREET LIGHT
PROP STREET SIGN
ROAD NAME SIGN
TACTILE PAVERS
G EPA JP 03/22
F EPA JP 12/21
E EPA JP 05/21
Rev Description By Date
Survey HS LTD 03/20
Design JP 07/21
Drawn JP 03/22
Checked WM 03/22
Maven Associates
09 571 0050
info@maven.co.nz
www.maven.co.nz
12-14 Wells Road, Penrose
Project
48 ESMONDE ROAD
TAKAPUNA
FOR
KINGSTONE PROPERTY
LIMITED
Title
PROPOSED
LINE MARKING
PLAN
Project no. 175001
Scale 1:250 @ A3
Cad file C300 - ROADING.DWG
Drawing no. C304 Rev G


ESMONDE ROAD
GREEN TACTILES FOR CYCLE PATH
2.40m
3.30m
0.60m
0.98m
7.20m
N
PRAM CROSSING 1
SCALE 1:50
ESMONDE ROAD
GREEN TACTILES FOR CYCLE PATH
6.88m
PRAM CROSSING 2
SCALE 1:50
PRAM CROSSING 3
SCALE 1:50
NOTE: ALL TACTILE PAVERS TO BE MINIMUM 300mm FROM FACE OF KERB.
KERB RAMPS TO HAVE A GRADIENT NO STEEPER THAN 1 IN 12.
Notes
1. All works to be in accordance with Auckland Council standards.
2. Contractor is to avoid using RPS for set out of the kerb levels where gradients less than 1%.
3. It is the contractors responsibility to locate all services that may be affected by his operations.
4. The contractor shall comply with all relevant Health and Safety requirements.
5. The contractor shall obtain all necessary approval from utility operators before commencing work under or near their services.
6. Final pavement design subject to CBR/Beam tests on subgrade material.
7. Setout schedule with co-ordinates of chainage points along road centreline to be supplied to the contractor prior to construction.
8. Refer to long section for finished centreline levels. Refer to typical cross sections to obtain levels for other locations.
9. All ducts shall have locations marked on kerb lines in accordance with specification.
10. Pram crossings are to be flush to the channel with no lip.
11. All kerb and channel to have sawcuts at max. 4m centres.
12. All kerbing, channels and edge beams shall have 4kg black oxide.
13. All signage and pavement markings to be in accordance with NZTA MOTSAM standards and the ATCOP TCDM.
14. All street name signs shall follow ATCOP guidelines in terms of layout, clearances, and construction details.
15. All line markings to be reflectorised in accordance with MOTSAM standards.
16. The minimum vertical and lateral clearances for signage shall be in accordance with MOTSAM standards.
17. Street lighting shall be designed in accordance with all applicable New Zealand Standards including but not restricted to the current version of AS/NZS 1158 Lighting for Roads and Public Spaces series of standards.
18. All new, modified or upgraded pram crossings must be in accordance with RTS 14 Guidelines for Facilities for Blind and Vision-impaired Pedestrians and NZS/AS 1428.4 and must comply with the details provided in AT's Standard Plan No FP009.
Legend
DIRECTIONAL PAVERS
TACTILE PAVERS
G EPA JP 03/22
F EPA JP 12/21
E EPA JP 05/21
Rev Description By Date
Survey HS LTD 03/20
Design JP 07/21
Drawn JP 03/22
Checked WM 03/22
Maven Associates
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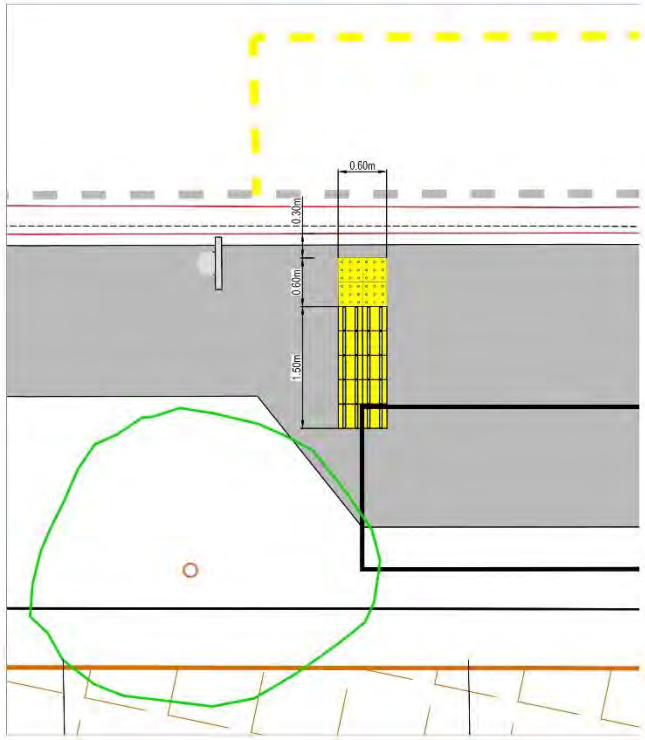
www.maven.co.nz
12-14 Walls Road, Penrose
Project
48 ESMONDE ROAD
TAKAPUNA
FOR
KINGSTONE PROPERTY
LIMITED
Title
PROPOSED
INTERSECTION PRAM
CROSSING DETAILS
Project no. 175001
Scale AS SHOWN
Cad file C300 - ROADING.DWG
Drawing no. C306 Rev G

NOTE: ALL TACTILE PAVERS TO BE MINIMUM 300mm FROM FACE OF KERB.
KERB RAMPS TO HAVE A GRADIENT NO STEEPER THAN 1 IN 12.



BUST STOP TSGI
SCALE 1:50

Notes
1. All works to be in accordance with Auckland Council standards.
2. Contractor is to avoid using GPS for set out of the kerb levels where gradients less than 1%.
3. It is the contractors responsibility to locate all services that may be affected by his operations.
4. The contractor shall comply with all relevant Health and Safety requirements.
5. The contractor shall obtain all necessary approval from utility operators before commencing work under or near their services.
6. Final pavement design subject to CBR/Beam tests on subgrade material.
7. Setout schedule with co-ordinates of chainage points along road centreline to be supplied to the contractor prior to construction.
8. Refer to long section for finished centreline levels. Refer to typical cross sections to obtain levels for other locations.
9. All ducts shall have locations marked on kerb lines in accordance with specification.
10. Point crossings are to be flush to the channel with no lip.
11. All kerb and channel to have sawcuts at max. 4m centres.
12. All kerbing, channels and edge beams shall have 4kg black oxide.
13. All signage and pavement markings to be in accordance with NZTA MOTSAM standards and the ATCOP TCDM.
14. All street name signs shall follow ATCOP guidelines in terms of layout, clearances, and construction details.
15. All line markings to be reflectorised in accordance with MOTSAM standards.
16. The minimum vertical and lateral clearances for signage shall be in accordance with MOTSAM standards.
17. Street lighting shall be designed in accordance with all applicable New Zealand Standards including but not restricted to the current version of AS/NZS 1158 Lighting for Roads and Public Spaces series of standards.
18. All new, modified or upgraded prem crossings must be in accordance with RTS 14 Guidelines for Facilities for Blind and Vision-impaired Pedestrians and NZS/AS 1428.4 and must comply with the details provided in AT's Standard Plan No FP009.

Legend

DIRECTIONAL PAVERS

TACTILE PAVERS

Rev	Description	By	Date
B	EPA	JP	03/22
A	EPA	JP	11/21

	By	Date
Survey	HS LTD	03/20
Design	JP	07/21
Drawn	JP	03/22
Checked	WM	03/22

Maven Associates
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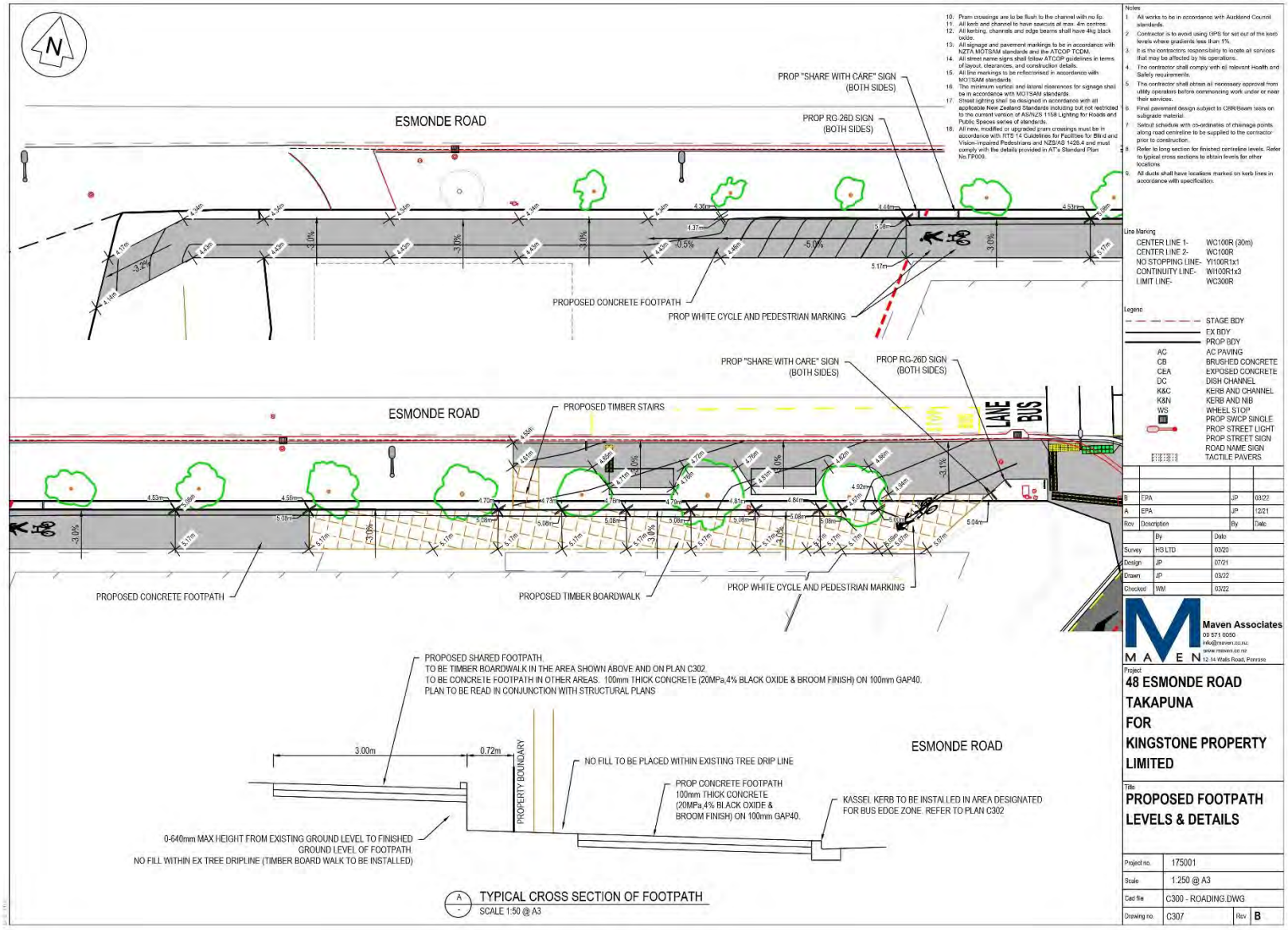
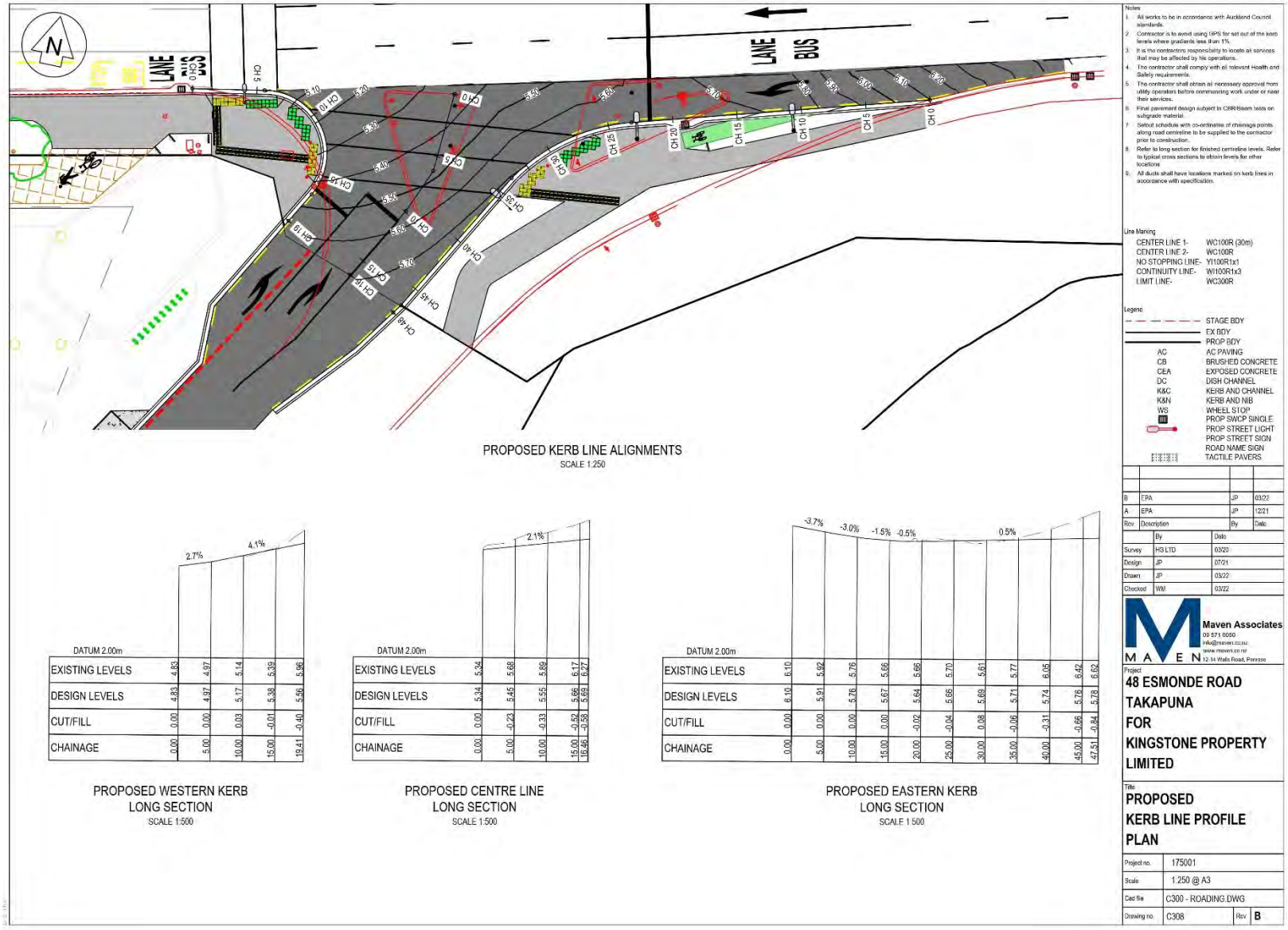
www.maven.co.nz
12-14 Walls Road, Penrose

Project
48 ESMONDE ROAD
TAKAPUNA
FOR
KINGSTONE PROPERTY
LIMITED

Title
PROPOSED
TGSI
DETAILS

Project no.	175001
Scale	AS SHOWN
Cad file	C300 - ROADING.DWG
Drawing no.	C306A
Rev	B

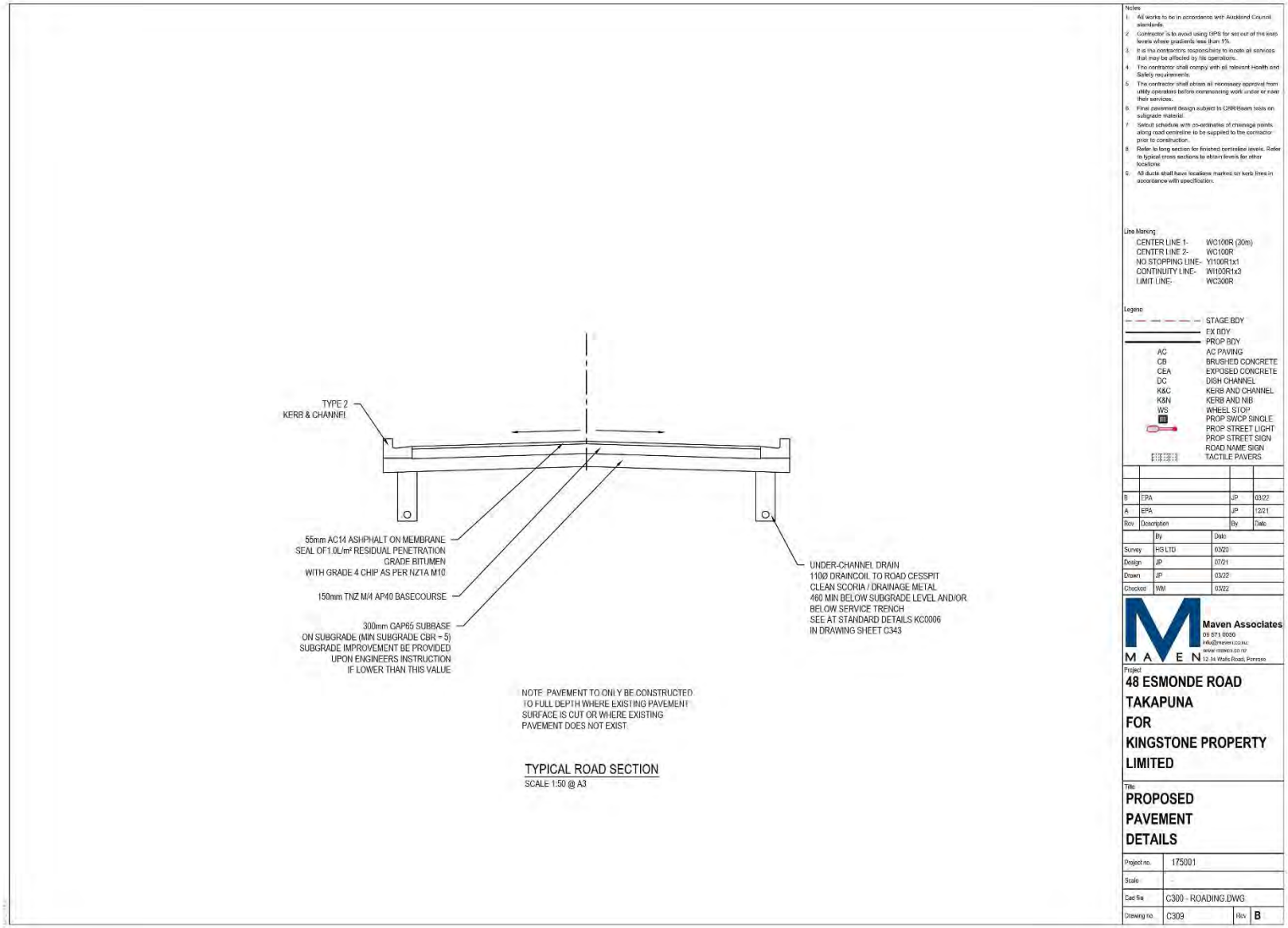

ESMONDE ROAD
PROP "SHARE WITH CARE" SIGN (BOTH SIDES)
PROP RG-26D SIGN (BOTH SIDES)
PROPOSED CONCRETE FOOTPATH
PROP WHITE CYCLE AND PEDESTRIAN MARKING
PROPOSED TIMBER STAIRS
PROPOSED TIMBER BOARDWALK
PROPOSED SHARED FOOTPATH.
TO BE TIMBER BOARDWALK IN THE AREA SHOWN ABOVE AND ON PLAN C302.
TO BE CONCRETE FOOTPATH IN OTHER AREAS: 100mm THICK CONCRETE (20MPa,4% BLACK OXIDE & BROOM FINISH) ON 100mm GAP40.
PLAN TO BE READ IN CONJUNCTION WITH STRUCTURAL PLANS
3.00m
0.72m
PROPERTY BOUNDARY
NO FILL TO BE PLACED WITHIN EXISTING TREE DRIP LINE
PROP CONCRETE FOOTPATH 100mm THICK CONCRETE (20MPa,4% BLACK OXIDE & BROOM FINISH) ON 100mm GAP40.
KASSEL KERB TO BE INSTALLED IN AREA DESIGNATED FOR BUS EDGE ZONE. REFER TO PLAN C302
0-640mm MAX HEIGHT FROM EXISTING GROUND LEVEL TO FINISHED GROUND LEVEL OF FOOTPATH.
NO FILL WITHIN EX TREE DRIPLINE (TIMBER BOARD WALK TO BE INSTALLED)
TYPICAL CROSS SECTION OF FOOTPATH
SCALE 1:50 @ A3
Maven Associates
48 ESMONDE ROAD
TAKAPUNA
FOR
KINGSTONE PROPERTY LIMITED
PROPOSED FOOTPATH LEVELS & DETAILS
Project no. 175001
Scale 1:250 @ A3
Cad file C300 - ROADING.DWG
Drawing no. C307
Rev B



DATUM 2.00m						
EXISTING LEVELS	4.83	4.97	5.14	5.39	5.96	
DESIGN LEVELS	4.83	4.97	5.17	5.38	5.56	
CUT/FILL	0.00	0.00	0.03	-0.01	-0.40	
CHAINAGE	0.00	5.00	10.00	15.00	19.41	

DATUM 2.00m						
EXISTING LEVELS	5.34	5.68	5.89	6.17	6.27	
DESIGN LEVELS	5.34	5.45	5.55	5.66	5.69	
CUT/FILL	0.00	-0.23	-0.33	-0.52	-0.58	
CHAINAGE	0.00	5.00	10.00	15.00	16.46	

DATUM 2.00m												
EXISTING LEVELS	6.10	5.92	5.76	5.66	5.66	5.70	5.81	5.77	6.05	6.42	6.62	
DESIGN LEVELS	6.10	5.91	5.76	5.67	5.64	5.66	5.69	5.71	5.74	5.76	5.78	
CUT/FILL	0.00	0.00	0.00	0.00	-0.02	-0.04	0.08	-0.06	-0.31	-0.66	-0.84	
CHAINAGE	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	47.51	


TYPE 2
KERB & CHANNEL
55mm AC14 ASHPHALT ON MEMBRANE
SEAL OF 1.0L/m² RESIDUAL PENETRATION
GRADE BITUMEN
WITH GRADE 4 CHIP AS PER NZTA M10
150mm TNZ M/4 AP40 BASECOURSE
300mm GAP65 SUBBASE
ON SUBGRADE (MIN SUBGRADE CBR = 5)
SUBGRADE IMPROVEMENT BE PROVIDED
UPON ENGINEERS INSTRUCTION
IF LOWER THAN THIS VALUE
UNDER-CHANNEL DRAIN
110Ø DRAINCOIL TO ROAD CESSPIT
CLEAN SCORIA / DRAINAGE METAL
460 MIN BELOW SUBGRADE LEVEL AND/OR
BELOW SERVICE TRENCH
SEE AT STANDARD DETAILS KC0006
IN DRAWING SHEET C343
NOTE: PAVEMENT TO ONLY BE CONSTRUCTED
TO FULL DEPTH WHERE EXISTING PAVEMENT
SURFACE IS CUT OR WHERE EXISTING
PAVEMENT DOES NOT EXIST.
TYPICAL ROAD SECTION
SCALE 1:50 @ A3
Notes
1. All works to be in accordance with Auckland Council standards.
2. Contractor is to avoid using GPS for set out of the kerb levels where gradients less than 1%.
3. It is the contractors responsibility to locate all services that may be affected by his operations.
4. The contractor shall comply with all relevant Health and Safety requirements.
5. The contractor shall obtain all necessary approval from utility operators before commencing work under or near their services.
6. Final pavement design subject to CBR/Beam tests on subgrade material.
7. Setout schedule with co-ordinates of chainage points along road centreline to be supplied to the contractor prior to construction.
8. Refer to long section for finished centreline levels. Refer to typical cross sections to obtain levels for other locations.
9. All ducts shall have locations marked on kerb lines in accordance with specification.
Line Marking
CENTER LINE 1- WC100R (30m)
CENTER LINE 2- WC100R
NO STOPPING LINE- Y1100R1x1
CONTINUITY LINE- W1100R1x3
LIMIT LINE- WC300R
Legend
STAGE BDY
EX BDY
PROP BDY
AC AC PAVING
CB BRUSHED CONCRETE
CEA EXPOSED CONCRETE
DC DISH CHANNEL
K&C KERB AND CHANNEL
K&N KERB AND NIB
WS WHEEL STOP
PROP SWCP SINGLE
PROP STREET LIGHT
PROP STREET SIGN
ROAD NAME SIGN
TACTILE PAVERS
B EPA JP 03/22
A EPA JP 12/21
Rev Description By Date
By Date
Survey HS LTD 03/20
Design JP 07/21
Drawn JP 03/22
Checked WM 03/22
Maven Associates
09 571 0000
info@maven.co.nz
www.maven.co.nz
12-14 Wells Road, Ponsonby
Project
48 ESMONDE ROAD
TAKAPUNA
FOR
KINGSTONE PROPERTY
LIMITED
Title
PROPOSED
PAVEMENT
DETAILS
Project no. 175001
Scale -
Cad file C300 - ROADING.DWG
Drawing no. C309 Rev B

Appendix D: SIDRA outputs

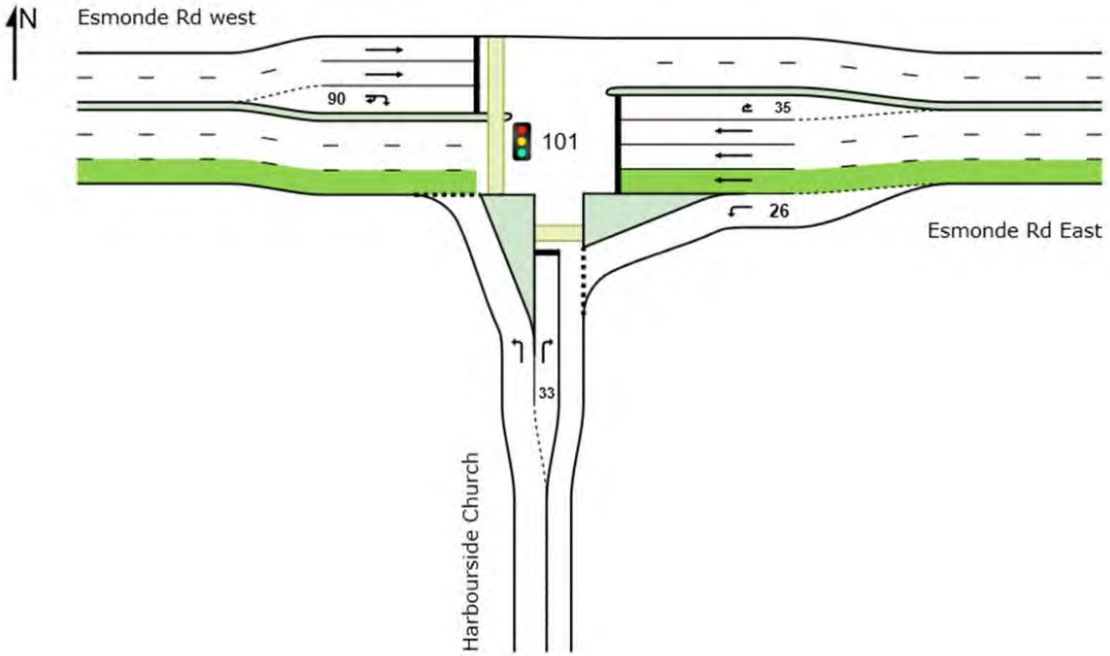
2019 Base Model – AM Peak

SITE LAYOUT

Site: 101 [AM 2019 Base (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [AM 2019 Base (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 91 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h]	INPUT VOLUMES [HV] veh/h	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS [HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE [Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	5	0	5	0.0	0.007	6.7	LOS A	0.0	0.3	0.26	0.55	0.26	41.1
3	R2	9	2	9	22.2	* 0.040	41.6	LOS D	0.4	2.9	0.89	0.66	0.89	19.9
Approach		14	2	14	14.3	0.040	29.2	LOS C	0.4	2.9	0.66	0.62	0.66	24.8
East: Esmonde Rd East														
4	L2	18	1	18	5.6	0.010	4.7	LOS A	0.0	0.3	0.09	0.51	0.09	42.4
5	T1	1338	62	1339	4.7	* 0.534	8.6	LOS A	15.4	111.3	0.57	0.51	0.57	41.4
6u	U	4	0	4	0.0	0.053	55.1	LOS D	0.2	1.3	0.97	0.64	0.97	20.7
Approach		1360	63	1361	4.7	0.534	8.7	LOS A	15.4	111.3	0.56	0.51	0.56	41.3
West: Esmonde Rd west														
11	T1	1176	56	1177	4.8	0.474	8.2	LOS A	12.8	93.2	0.53	0.48	0.53	41.8
12	R2	23	1	23	4.3	* 0.292	53.0	LOS D	1.3	9.4	0.99	0.71	0.99	18.0
12u	U	4	1	4	25.0	0.292	54.6	LOS D	1.3	9.4	0.99	0.71	0.99	22.5
Approach		1203	58	1204	4.9	0.474	9.2	LOS A	12.8	93.2	0.54	0.49	0.54	40.9
All Vehicles		2577	123	2578	4.8	0.534	9.0	LOS A	15.4	111.3	0.55	0.50	0.55	41.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

2019 Base Model – Inter Peak

MOVEMENT SUMMARY

Site: 101 [IP 2019 Base (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 97 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	25	0	25	0.0	0.013	4.5	LOS A	0.0	0.2	0.03	0.50	0.03	43.7
3	R2	6	0	6	0.0	0.053	52.8	LOS D	0.3	2.0	0.96	0.65	0.96	17.2
Approach		31	0	31	0.0	0.053	13.9	LOS B	0.3	2.0	0.21	0.53	0.21	34.3
East: Esmonde Rd East														
4	L2	9	1	9	11.1	0.005	4.6	LOS A	0.0	0.1	0.03	0.50	0.03	42.3
5	T1	1368	57	1368	4.2	* 0.439	2.5	LOS A	8.7	63.2	0.30	0.27	0.30	47.2
6u	U	6	0	6	0.0	0.210	84.9	LOS E	0.3	2.3	1.00	0.65	1.00	10.4
Approach		1383	58	1383	4.2	0.439	2.7	LOS A	8.7	63.2	0.30	0.27	0.30	46.9
West: Esmonde Rd west														
11	T1	1287	54	1287	4.2	0.413	2.4	LOS A	7.9	57.6	0.29	0.26	0.29	47.3
12	R2	22	1	22	4.5	* 0.752	65.9	LOS E	1.5	11.0	1.00	0.82	1.45	15.6
12u	U	4	1	4	25.0	0.752	67.5	LOS E	1.5	11.0	1.00	0.82	1.45	20.0
Approach		1313	56	1313	4.3	0.752	3.7	LOS A	7.9	57.6	0.30	0.27	0.31	45.9
All Vehicles		2727	114	2728	4.2	0.752	3.3	LOS A	8.7	63.2	0.30	0.28	0.30	46.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

2019 Base Model – PM Peak

MOVEMENT SUMMARY

Site: 101 [PM 2019 Base (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 148 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES: [Total veh/h	HV] veh/h	DEMAND FLOWS: [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE: [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	17	1	17	5.9	0.035	7.6	LOS A	0.2	1.8	0.24	0.56	0.24	40.1
3	R2	11	0	11	0.0	* 0.055	68.7	LOS E	0.7	5.0	0.93	0.66	0.93	14.4
Approach		28	1	28	3.6	0.055	31.6	LOS C	0.7	5.0	0.51	0.60	0.51	24.2
East: Esmonde Rd East														
4	L2	13	0	13	0.0	0.007	4.6	LOS A	0.0	0.2	0.06	0.51	0.06	42.9
5	T1	1547	50	1548	3.3	* 0.533	7.6	LOS A	22.1	157.4	0.44	0.41	0.44	42.2
6u	U	7	0	7	0.0	0.150	87.0	LOS F	0.5	3.7	1.00	0.66	1.00	15.2
Approach		1567	50	1568	3.2	0.533	8.0	LOS A	22.1	157.4	0.44	0.41	0.44	41.9
West: Esmonde Rd west														
11	T1	1428	35	1429	2.5	0.495	7.3	LOS A	19.5	139.5	0.42	0.39	0.42	42.5
12	R2	13	0	13	0.0	* 0.358	86.2	LOS F	1.6	10.9	1.00	0.70	1.00	12.9
12u	U	7	0	7	0.0	0.358	87.7	LOS F	1.6	10.9	1.00	0.70	1.00	16.9
Approach		1448	35	1449	2.5	0.495	8.4	LOS A	19.5	139.5	0.43	0.39	0.43	41.5
All Vehicles		3043	86	3045	2.9	0.533	8.4	LOS A	22.1	157.4	0.44	0.40	0.44	41.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing).

2019 Base Model – Saturday Peak

MOVEMENT SUMMARY

Site: 101 [Sat 2019 Base (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 102 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	12	0	12	0.0	0.021	6.8	LOS A	0.1	0.8	0.25	0.56	0.25	41.1
3	R2	2	0	2	0.0	0.010	48.6	LOS D	0.1	0.6	0.91	0.61	0.91	18.2
Approach		14	0	14	0.0	0.021	12.7	LOS B	0.1	0.8	0.34	0.56	0.34	35.3
East: Esmonde Rd East														
4	L2	1	0	1	0.0	0.001	4.7	LOS A	0.0	0.0	0.08	0.50	0.08	42.8
5	T1	1432	60	1432	4.2	* 0.522	6.5	LOS A	15.5	111.9	0.48	0.44	0.48	43.2
6u	U	3	0	3	0.0	0.055	61.2	LOS E	0.2	1.1	0.96	0.63	0.96	19.1
Approach		1436	60	1436	4.2	0.522	6.6	LOS A	15.5	111.9	0.48	0.44	0.48	43.1
West: Esmonde Rd West														
11	T1	1358	57	1358	4.2	0.496	6.3	LOS A	14.2	103.3	0.46	0.42	0.46	43.4
12	R2	57	3	57	5.3	* 0.888	69.3	LOS E	3.6	26.6	1.00	0.98	1.64	15.1
12u	U	4	1	4	25.0	0.888	70.9	LOS E	3.6	26.6	1.00	0.98	1.64	19.4
Approach		1419	61	1419	4.3	0.888	9.1	LOS A	14.2	103.3	0.49	0.45	0.51	40.9
All Vehicles		2869	121	2870	4.2	0.888	7.9	LOS A	15.5	111.9	0.48	0.44	0.50	42.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

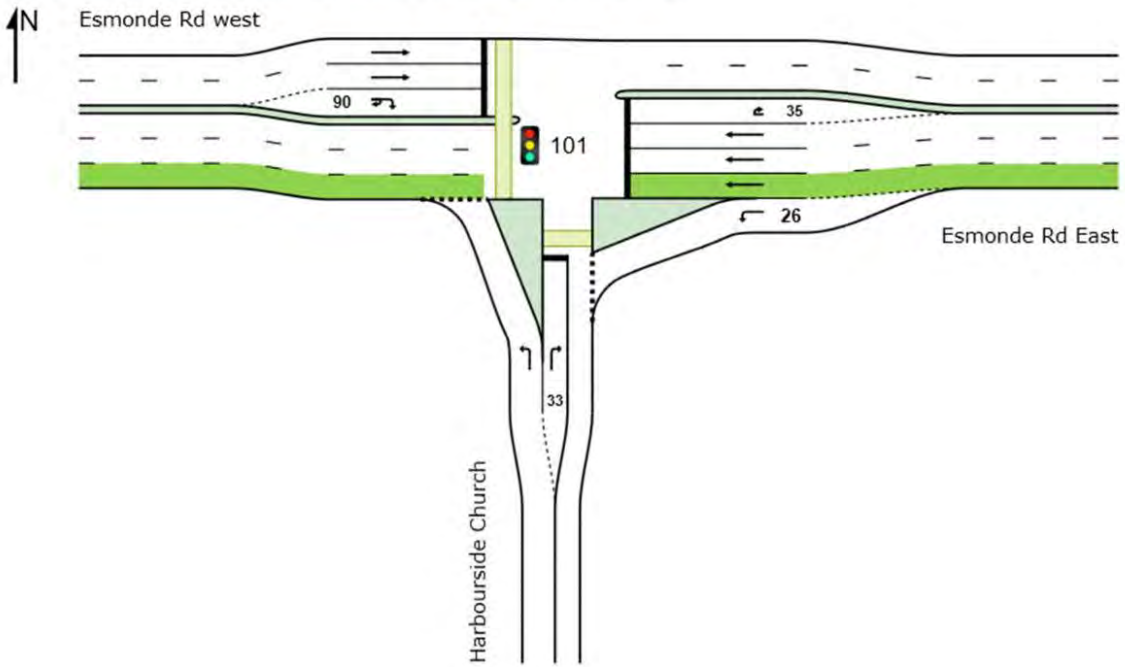
2023 Existing Layout Base Case – AM Peak

SITE LAYOUT

Site: 101 [AM 2023 Base Case - Existing Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [AM 2023 Base Case - Existing Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 158 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	5	0	5	0.0	0.009	8.1	LOS A	0.1	0.5	0.25	0.55	0.25	39.7
3	R2	10	2	10	20.0	* 0.051	71.2	LOS E	0.7	5.6	0.91	0.67	0.91	14.0
Approach		15	2	15	13.3	0.051	50.2	LOS D	0.7	5.6	0.69	0.63	0.69	18.2
East: Esmonde Rd East														
4	L2	19	1	19	5.3	0.011	4.9	LOS A	0.1	0.6	0.09	0.51	0.09	42.4
5	T1	1448	67	1449	4.7	* 0.524	9.8	LOS A	23.8	171.9	0.48	0.44	0.48	40.4
6u	U	4	0	4	0.0	0.076	89.9	LOS F	0.3	2.2	0.99	0.64	0.99	14.9
Approach		1471	68	1472	4.7	0.524	10.0	LOS A	23.8	171.9	0.47	0.44	0.47	40.2
West: Esmonde Rd west														
11	T1	1273	61	1274	4.8	0.465	9.3	LOS A	19.6	143.1	0.45	0.41	0.45	40.9
12	R2	25	1	25	4.0	* 0.450	90.7	LOS F	2.4	17.6	1.00	0.72	1.00	12.4
12u	U	4	1	4	25.0	0.450	92.3	LOS F	2.4	17.6	1.00	0.72	1.00	16.3
Approach		1302	63	1303	4.9	0.465	11.1	LOS B	19.6	143.1	0.46	0.42	0.46	39.4
All Vehicles		2788	133	2789	4.8	0.524	10.7	LOS B	23.8	171.9	0.47	0.43	0.47	39.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

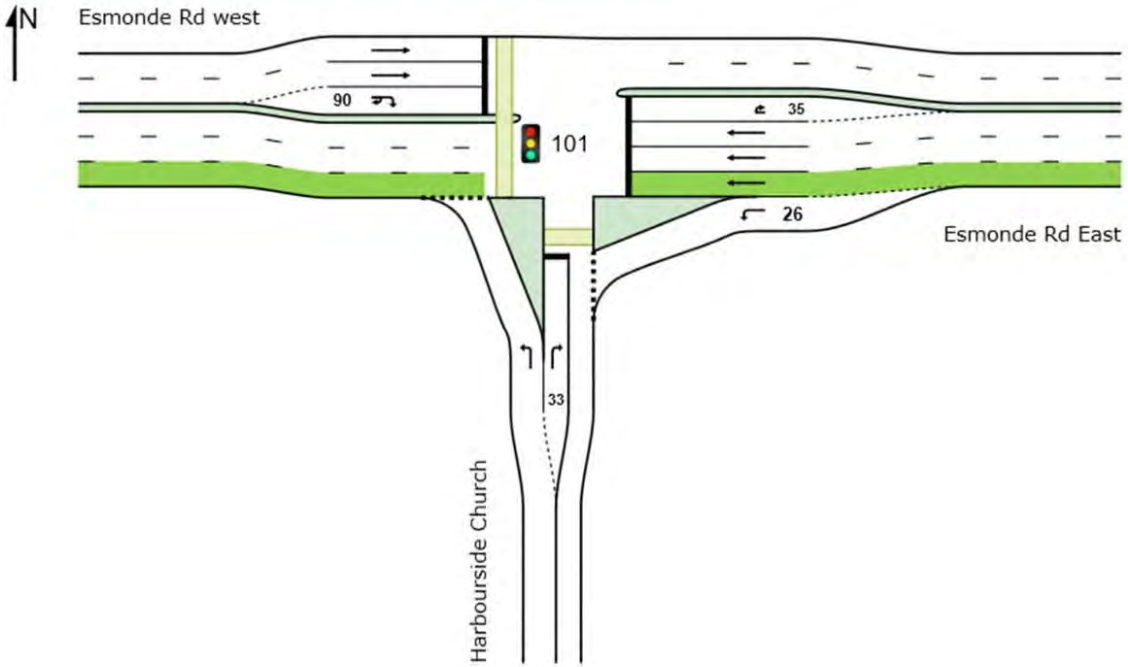
2023 Existing Layout Base Case – Inter Peak

SITE LAYOUT

Site: 101 [IP 2023 Base Case - Existing Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [IP 2023 Base Case - Existing Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 158 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	27	0	27	0.0	0.051	8.6	LOS A	0.5	3.2	0.27	0.57	0.27	39.2
3	R2	6	0	6	0.0	0.027	70.3	LOS E	0.4	2.8	0.91	0.65	0.91	14.1
Approach		33	0	33	0.0	0.051	19.8	LOS B	0.5	3.2	0.39	0.59	0.39	30.3
East: Esmonde Rd East														
4	L2	10	1	10	10.0	0.006	4.9	LOS A	0.0	0.3	0.09	0.51	0.09	42.1
5	T1	1480	61	1480	4.1	* 0.539	10.0	LOS B	24.9	180.0	0.48	0.45	0.48	40.3
6u	U	6	0	6	0.0	0.114	90.5	LOS F	0.5	3.4	0.99	0.66	0.99	14.8
Approach		1496	62	1496	4.2	0.539	10.3	LOS B	24.9	180.0	0.48	0.45	0.48	40.0
West: Esmonde Rd west														
11	T1	1393	58	1393	4.2	0.515	9.7	LOS A	23.1	167.6	0.47	0.43	0.47	40.5
12	R2	24	1	24	4.2	* 0.436	90.6	LOS F	2.3	17.0	1.00	0.72	1.00	12.4
12u	U	4	1	4	25.0	0.436	92.3	LOS F	2.3	17.0	1.00	0.72	1.00	16.4
Approach		1421	60	1421	4.2	0.515	11.3	LOS B	23.1	167.6	0.48	0.44	0.48	39.2
All Vehicles		2950	122	2951	4.2	0.539	10.9	LOS B	24.9	180.0	0.48	0.44	0.48	39.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

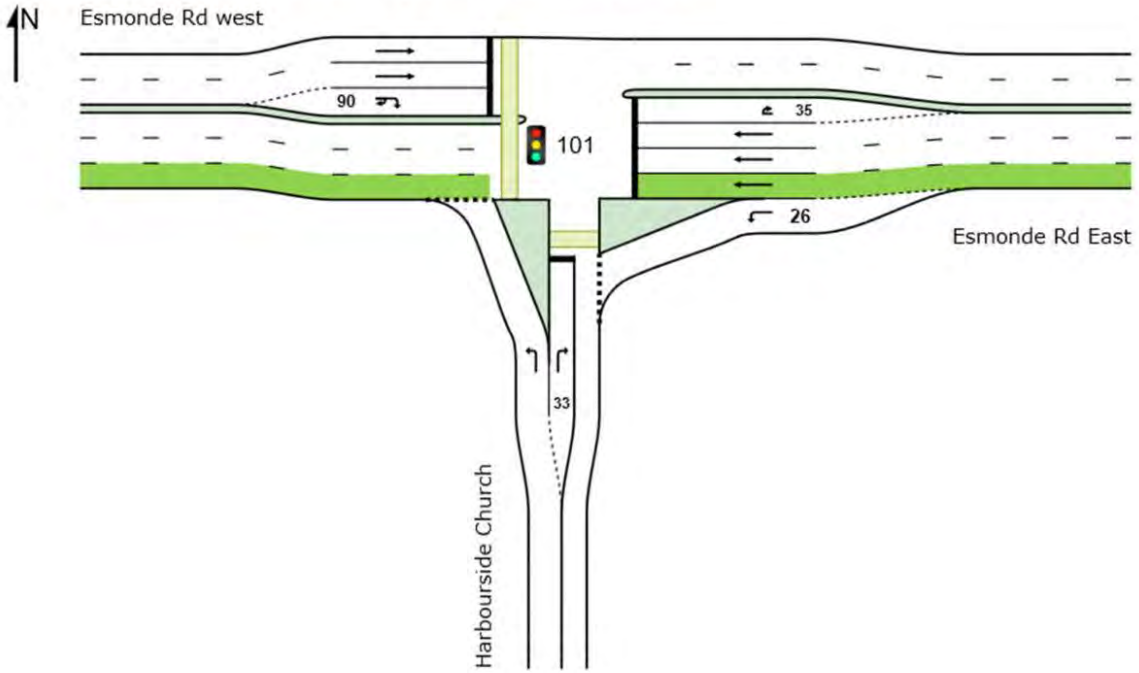
2023 Existing Layout Base Case – PM Peak

SITE LAYOUT

Site: 101 [PM 2023 Base Case - Existing Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [PM 2023 Base Case - Existing Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 158 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	18	1	18	5.6	0.039	10.2	LOS B	0.4	2.7	0.31	0.58	0.31	37.6
3	R2	12	0	12	0.0	* 0.054	70.8	LOS E	0.8	5.7	0.91	0.68	0.91	14.1
Approach		30	1	30	3.3	0.054	34.4	LOS C	0.8	5.7	0.55	0.62	0.55	23.1
East: Esmonde Rd East														
4	L2	14	0	14	0.0	0.008	4.8	LOS A	0.1	0.4	0.09	0.51	0.09	42.7
5	T1	1674	54	1675	3.3	* 0.600	10.8	LOS B	30.2	215.6	0.52	0.48	0.52	39.7
6u	U	8	0	8	0.0	0.152	90.9	LOS F	0.6	4.5	0.99	0.67	0.99	14.7
Approach		1696	54	1697	3.2	0.600	11.1	LOS B	30.2	215.6	0.52	0.48	0.52	39.4
West: Esmonde Rd west														
11	T1	1546	38	1547	2.5	0.564	10.3	LOS B	27.1	193.9	0.50	0.46	0.50	40.1
12	R2	14	0	14	0.0	* 0.352	90.2	LOS F	1.8	12.7	1.00	0.71	1.00	12.5
12u	U	8	0	8	0.0	0.352	91.6	LOS F	1.8	12.7	1.00	0.71	1.00	16.5
Approach		1568	38	1569	2.5	0.564	11.4	LOS B	27.1	193.9	0.51	0.46	0.51	39.2
All Vehicles		3294	93	3296	2.9	0.600	11.5	LOS B	30.2	215.6	0.51	0.48	0.51	39.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

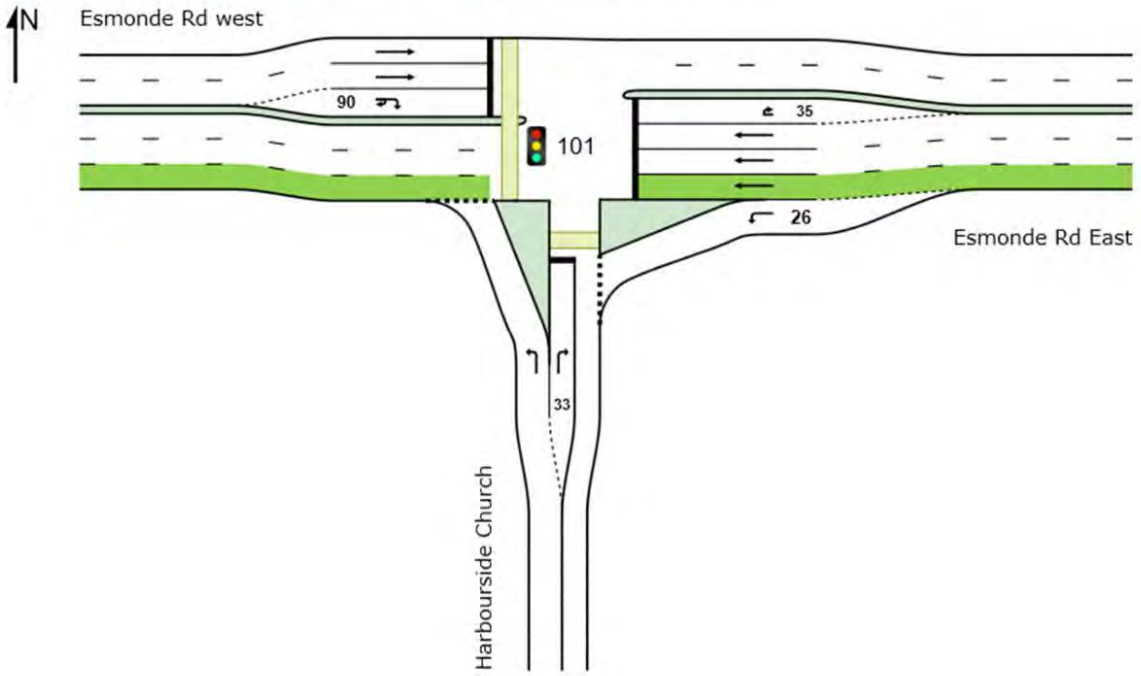
2023 Existing Layout Base Case – Saturday Peak

SITE LAYOUT

Site: 101 [Sat 2023 Base Case - Existing Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [Sat 2023 Base Case - Existing Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 107 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	13	0	13	0.0	0.022	10.4	LOS B	0.2	1.5	0.39	0.59	0.39	37.5
3	R2	2	0	2	0.0	0.007	46.0	LOS D	0.1	0.6	0.87	0.61	0.87	18.8
Approach		15	0	15	0.0	0.022	15.1	LOS B	0.2	1.5	0.45	0.59	0.45	33.4
East: Esmonde Rd East														
4	L2	1	0	1	0.0	0.001	5.1	LOS A	0.0	0.0	0.14	0.51	0.14	42.4
5	T1	1550	65	1550	4.2	* 0.654	13.4	LOS B	25.3	182.8	0.68	0.63	0.68	37.8
6u	U	3	0	3	0.0	0.039	60.4	LOS E	0.2	1.1	0.97	0.63	0.97	19.2
Approach		1554	65	1554	4.2	0.654	13.5	LOS B	25.3	182.8	0.68	0.63	0.68	37.7
West: Esmonde Rd west														
11	T1	1469	61	1469	4.2	0.640	13.0	LOS B	24.3	176.1	0.66	0.61	0.66	38.1
12	R2	61	3	61	4.9	* 0.659	63.2	LOS E	3.7	27.0	1.00	0.82	1.14	16.1
12u	U	4	1	4	25.0	0.659	64.8	LOS E	3.7	27.0	1.00	0.82	1.14	20.5
Approach		1534	65	1534	4.3	0.659	15.1	LOS B	24.3	176.1	0.68	0.61	0.68	36.5
All Vehicles		3103	130	3104	4.2	0.659	14.3	LOS B	25.3	182.8	0.68	0.62	0.68	37.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

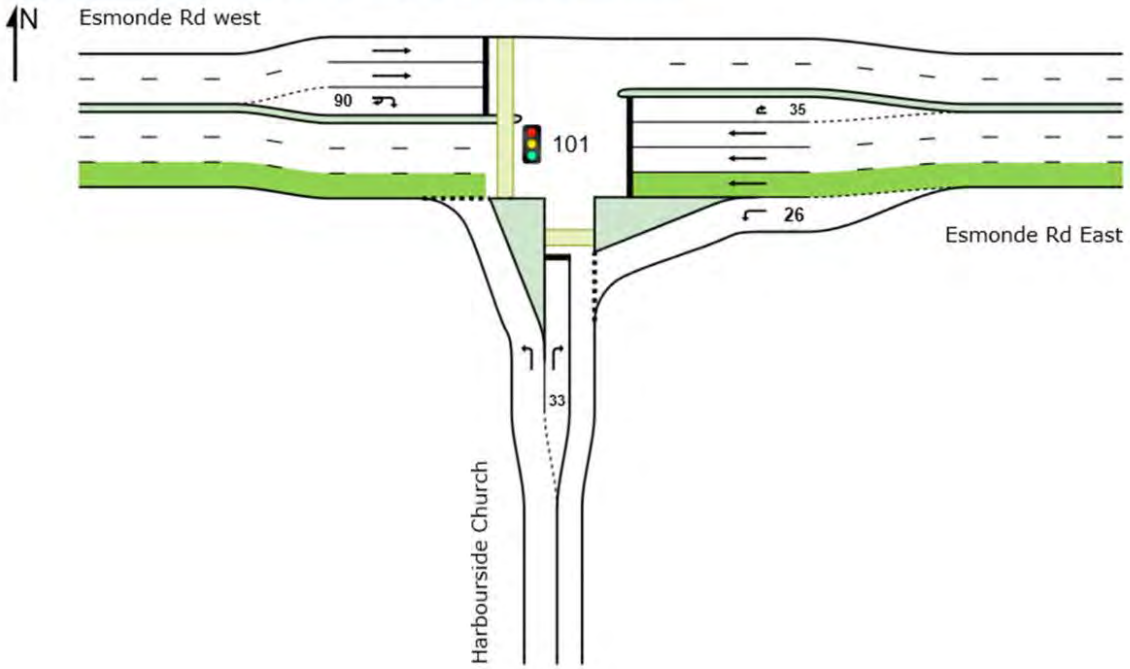
2023 Existing Layout Base Case – PM Peak + 20%

SITE LAYOUT

Site: 101 [PM 2023 Base Case - Existing Layout 20% (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [PM 2023 Base Case - Existing Layout 20% (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 158 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	18	1	18	5.6	0.045	15.0	LOS B	0.5	3.7	0.41	0.61	0.41	33.6
3	R2	12	0	12	0.0	* 0.054	70.8	LOS E	0.8	5.7	0.91	0.68	0.91	14.1
Approach		30	1	30	3.3	0.054	37.3	LOS D	0.8	5.7	0.61	0.64	0.61	22.1
East: Esmonde Rd East														
4	L2	14	0	14	0.0	0.008	4.8	LOS A	0.1	0.4	0.09	0.51	0.09	42.7
5	T1	2009	65	2010	3.3	* 0.719	12.7	LOS B	42.9	305.9	0.62	0.58	0.62	38.3
6u	U	8	0	8	0.0	0.152	90.9	LOS F	0.6	4.5	0.99	0.67	0.99	14.7
Approach		2031	65	2032	3.2	0.719	13.0	LOS B	42.9	305.9	0.61	0.58	0.61	38.1
West: Esmonde Rd west														
11	T1	1856	46	1857	2.5	0.676	11.9	LOS B	37.7	269.7	0.58	0.54	0.58	38.8
12	R2	14	0	14	0.0	* 0.352	90.2	LOS F	1.8	12.7	1.00	0.71	1.00	12.5
12u	U	8	0	8	0.0	0.352	91.6	LOS F	1.8	12.7	1.00	0.71	1.00	16.5
Approach		1878	46	1879	2.5	0.676	12.9	LOS B	37.7	269.7	0.58	0.54	0.58	38.1
All Vehicles		3939	112	3941	2.9	0.719	13.1	LOS B	42.9	305.9	0.60	0.56	0.60	37.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

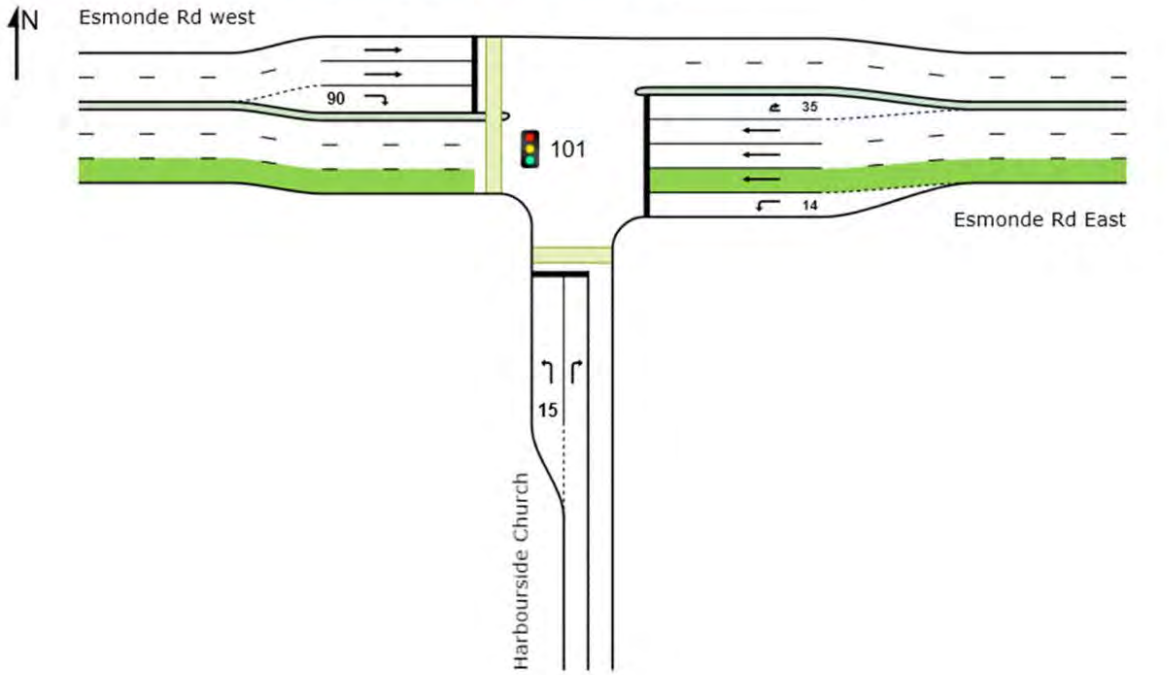
2023 Proposed Layout Development Case – AM Peak

SITE LAYOUT

Site: 101 [AM 2023 Development - Proposed Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [AM 2023 Development - Proposed Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 91 seconds (Site Optimum Cycle Time - Minimum Delay)

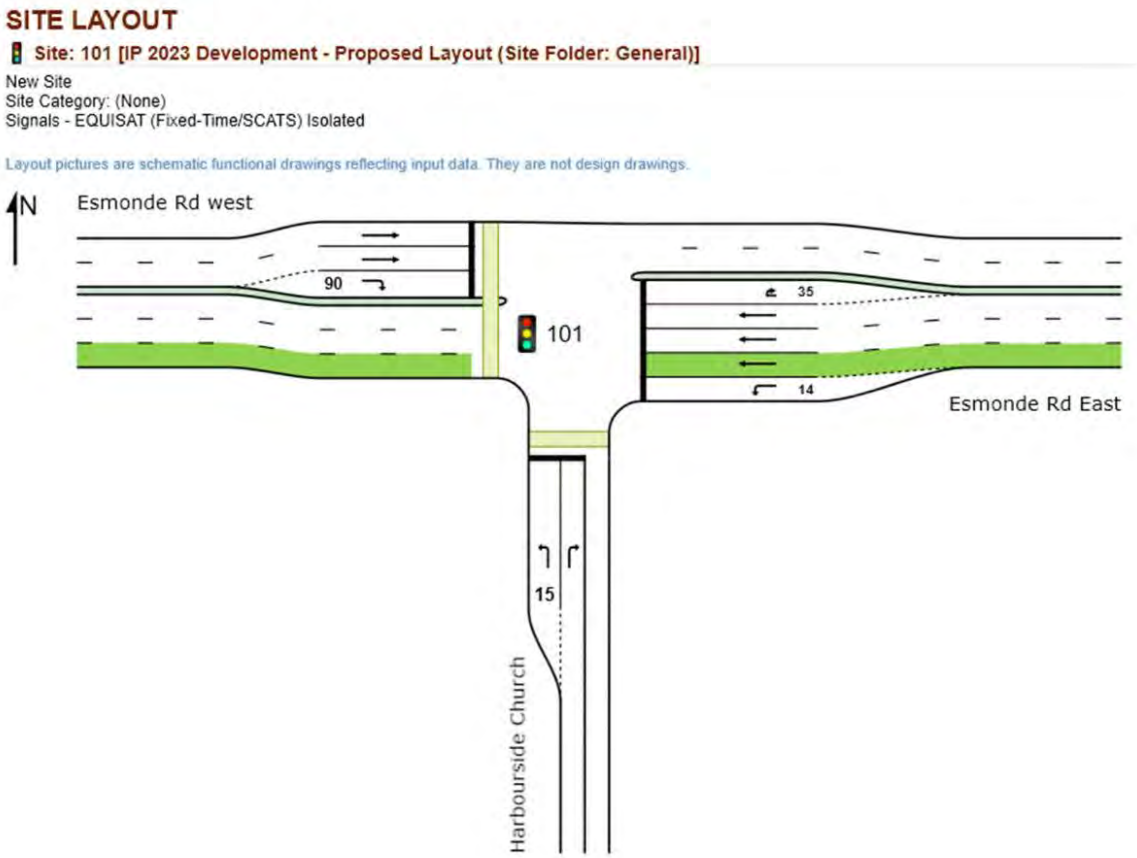
Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	149	0	149	0.0	0.282	28.9	LOS C	5.0	34.8	0.79	0.75	0.79	23.2
3	R2	67	0	67	0.0	* 0.236	40.9	LOS D	2.7	18.8	0.92	0.74	0.92	18.1
Approach		216	0	216	0.0	0.282	32.6	LOS C	5.0	34.8	0.83	0.75	0.83	21.5
East: Esmonde Rd East														
4	L2	94	0	94	0.0	0.065	7.0	LOS A	0.9	6.6	0.24	0.60	0.24	36.1
5	T1	1448	67	1449	4.7	* 0.680	15.1	LOS B	22.6	163.4	0.76	0.69	0.76	36.6
6u	U	4	0	4	0.0	0.033	48.6	LOS D	0.2	1.2	0.94	0.65	0.94	21.8
Approach		1546	67	1547	4.4	0.680	14.7	LOS B	22.6	163.4	0.73	0.69	0.73	36.6
West: Esmonde Rd west														
11	T1	1273	61	1274	4.8	0.604	14.2	LOS B	18.7	136.1	0.72	0.65	0.72	37.2
12	R2	110	0	110	0.0	* 0.663	51.4	LOS D	5.1	35.8	1.00	0.83	1.11	16.4
Approach		1383	61	1384	4.5	0.663	17.2	LOS B	18.7	136.1	0.74	0.66	0.75	35.0
All Vehicles		3145	128	3146	4.1	0.680	17.0	LOS B	22.6	163.4	0.74	0.68	0.75	34.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

2023 Proposed Layout Development Case – Inter Peak



MOVEMENT SUMMARY

Site: 101 [IP 2023 Development - Proposed Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h]	INPUT VOLUMES [HV] veh/h	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS [HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist [m]	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	131	0	131	0.0	0.243	29.0	LOS C	4.3	30.3	0.79	0.74	0.79	23.2
3	R2	59	0	59	0.0	* 0.205	40.1	LOS D	2.3	16.3	0.91	0.74	0.91	18.4
Approach		190	0	190	0.0	0.243	32.4	LOS C	4.3	30.3	0.83	0.74	0.83	21.6
East: Esmonde Rd East														
4	L2	87	0	87	0.0	0.060	6.8	LOS A	0.8	5.8	0.23	0.59	0.23	36.4
5	T1	1480	61	1480	4.1	* 0.691	14.8	LOS B	23.1	166.8	0.77	0.70	0.77	36.8
6u	U	6	0	6	0.0	0.056	49.7	LOS D	0.3	1.8	0.95	0.66	0.95	21.5
Approach		1573	61	1573	3.9	0.691	14.5	LOS B	23.1	166.8	0.74	0.69	0.74	36.7
West: Esmonde Rd west														
11	T1	1393	58	1393	4.2	0.651	14.3	LOS B	20.9	151.4	0.74	0.67	0.74	37.2
12	R2	102	0	102	0.0	* 0.695	52.4	LOS D	4.8	33.5	1.00	0.85	1.16	16.2
Approach		1495	58	1495	3.9	0.695	16.9	LOS B	20.9	151.4	0.76	0.68	0.77	35.2
All Vehicles		3258	119	3258	3.7	0.695	16.7	LOS B	23.1	166.8	0.75	0.69	0.76	35.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

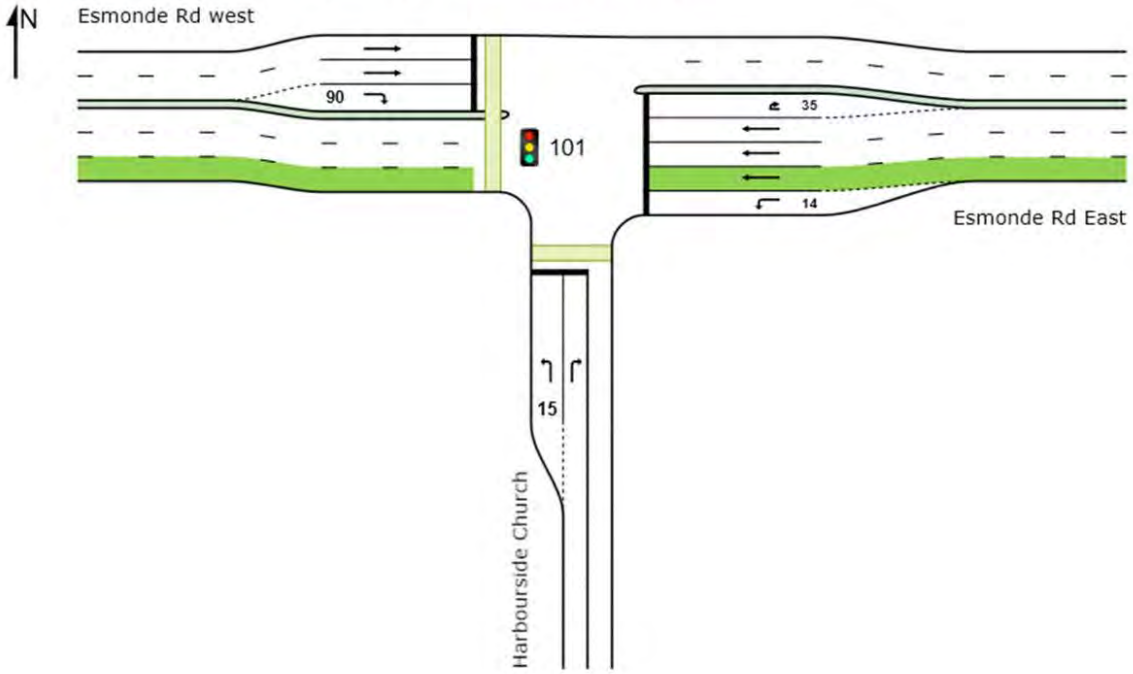
2023 Proposed Layout Development Case – PM Peak

SITE LAYOUT

Site: 101 [PM 2023 Development - Proposed Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [PM 2023 Development - Proposed Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 146 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	134	0	134	0.0	0.321	48.3	LOS D	7.4	52.1	0.83	0.76	0.83	17.2
3	R2	60	0	60	0.0	* 0.271	65.7	LOS E	3.9	27.3	0.94	0.75	0.94	13.1
Approach		194	0	194	0.0	0.321	53.7	LOS D	7.4	52.1	0.86	0.76	0.86	15.8
East: Esmonde Rd East														
4	L2	104	0	104	0.0	0.068	7.1	LOS A	1.3	9.4	0.20	0.59	0.20	36.0
5	T1	1674	54	1675	3.3	* 0.671	16.5	LOS B	36.0	256.8	0.67	0.62	0.67	35.8
6u	U	8	0	8	0.0	0.060	72.0	LOS E	0.5	3.7	0.94	0.68	0.94	17.2
Approach		1786	54	1787	3.1	0.671	16.2	LOS B	36.0	256.8	0.64	0.62	0.64	35.6
West: Esmonde Rd west														
11	T1	1546	38	1547	2.5	0.658	15.8	LOS B	34.8	248.8	0.64	0.59	0.64	36.2
12	R2	122	0	122	0.0	* 0.675	76.3	LOS E	8.8	61.4	1.00	0.82	1.06	12.5
Approach		1668	38	1669	2.3	0.675	20.2	LOS C	34.8	248.8	0.67	0.61	0.67	33.2
All Vehicles		3648	92	3650	2.6	0.675	20.0	LOS C	36.0	256.8	0.67	0.62	0.67	33.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

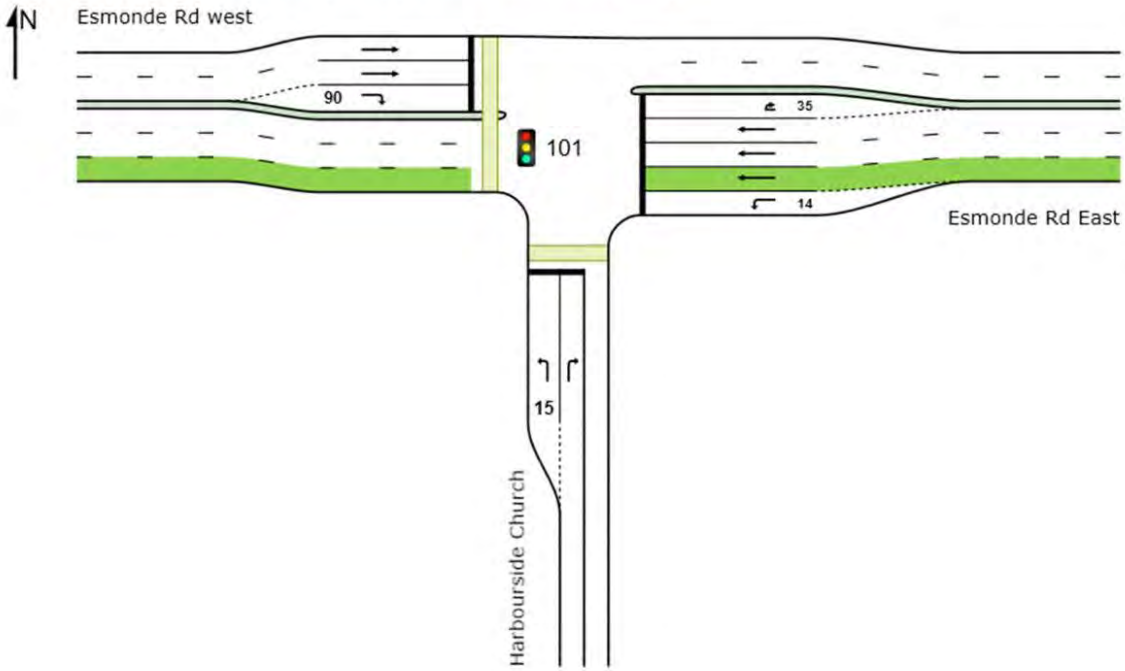
2023 Proposed Layout Development Case – Saturday Peak

SITE LAYOUT

Site: 101 [Sat 2023 Development - Proposed Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [Sat 2023 Development - Proposed Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 91 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	145	0	145	0.0	0.272	28.9	LOS C	4.8	33.8	0.79	0.75	0.79	23.3
3	R2	65	0	65	0.0	* 0.229	40.8	LOS D	2.6	18.2	0.92	0.74	0.92	18.2
Approach		210	0	210	0.0	0.272	32.6	LOS C	4.8	33.8	0.83	0.75	0.83	21.5
East: Esmonde Rd East														
4	L2	97	0	97	0.0	0.067	7.0	LOS A	1.0	6.8	0.24	0.60	0.24	36.1
5	T1	1550	65	1550	4.2	* 0.731	15.9	LOS B	25.5	184.3	0.80	0.73	0.80	36.1
6u	U	3	0	3	0.0	0.025	48.4	LOS D	0.1	0.9	0.94	0.64	0.94	21.8
Approach		1650	65	1650	4.0	0.731	15.4	LOS B	25.5	184.3	0.77	0.72	0.77	36.1
West: Esmonde Rd west														
11	T1	1469	61	1469	4.2	0.721	15.4	LOS B	24.8	180.1	0.78	0.71	0.78	36.4
12	R2	113	0	113	0.0	* 0.681	51.7	LOS D	5.3	37.0	1.00	0.84	1.13	16.4
Approach		1582	61	1582	3.9	0.721	18.0	LOS B	24.8	180.1	0.79	0.72	0.80	34.5
All Vehicles		3442	126	3442	3.7	0.731	17.7	LOS B	25.5	184.3	0.78	0.72	0.79	34.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

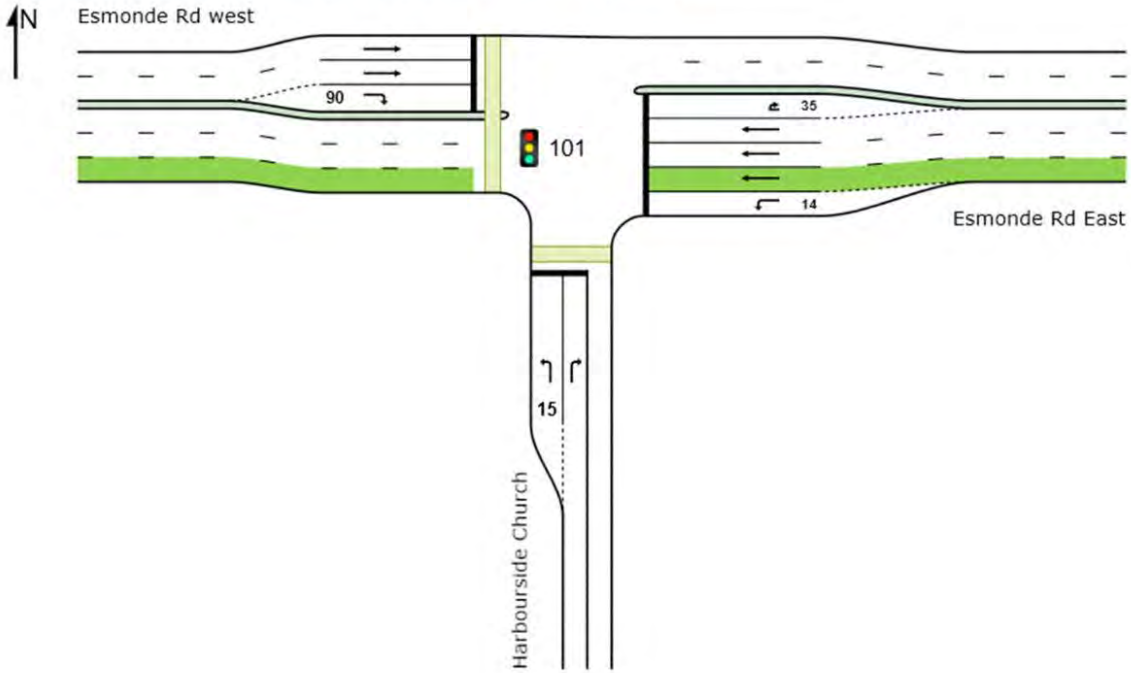
2023 Proposed Layout Development Case – PM Peak + 20%

SITE LAYOUT

Site: 101 [PM 2023 Development - Proposed Layout 20% (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [PM 2023 Development - Proposed Layout 20% (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 137 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	134	0	161	0.0	0.380	45.1	LOS D	8.4	58.9	0.83	0.77	0.83	18.0
3	R2	60	0	72	0.0	* 0.407	62.3	LOS E	4.4	31.0	0.95	0.75	0.95	13.6
Approach		194	0	233	0.0	0.407	50.4	LOS D	8.4	58.9	0.87	0.76	0.87	16.5
East: Esmonde Rd East														
4	L2	104	0	125	0.0	0.083	7.3	LOS A	1.6	11.5	0.22	0.59	0.22	35.8
5	T1	1674	54	1842	3.3	* 0.756	18.3	LOS B	42.2	301.0	0.76	0.70	0.76	34.7
6u	U	8	0	9	0.0	0.062	67.1	LOS E	0.5	3.8	0.93	0.68	0.93	18.0
Approach		1786	54	1976	3.1	0.756	17.8	LOS B	42.2	301.0	0.72	0.70	0.72	34.6
West: Esmonde Rd west														
11	T1	1546	38	1701	2.5	0.744	17.4	LOS B	40.8	291.9	0.72	0.67	0.72	35.2
12	R2	122	0	146	0.0	* 0.760	73.7	LOS E	10.1	71.0	1.00	0.87	1.14	12.8
Approach		1668	38	1847	2.3	0.760	21.9	LOS C	40.8	291.9	0.74	0.68	0.75	32.3
All Vehicles		3648	92	4056	2.5	0.760	21.6	LOS C	42.2	301.0	0.74	0.69	0.74	32.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

LANE SUMMARY

Site: 101 [PM 2023 Base Case - Existing Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 158 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h]	HV [%]	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh.	Dist.] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Harbourside Church													
Lane 1	18	5.6	460	0.039	100	10.2	LOS B	0.4	2.7	Full	100	0.0	0.0
Lane 2	12	0.0	222	0.054	100	70.8	LOS E	0.8	5.7	Short	33	0.0	NA
Approach	30	3.3		0.054		34.4	LOS C	0.8	5.7				
East: Esmonde Rd East													
Lane 1	14	0.0	1814	0.008	100	4.8	LOS A	0.1	0.4	Short	26	0.0	NA
Lane 2	17	100.0	856	0.020	100	6.2	LOS A	0.3	4.5	Full	260	0.0	0.0
Lane 3	834	2.3	1391	0.600	100	10.9	LOS B	30.2	215.6	Full	260	0.0	0.0
Lane 4	824	2.3	1374[1]	0.600	100	10.8	LOS B	29.6	211.0	Full	260	0.0	0.0
Lane 5	8	0.0	53	0.152	100	90.9	LOS F	0.6	4.5	Short	35	0.0	NA
Approach	1697	3.2		0.600		11.1	LOS B	30.2	215.6				
West: Esmonde Rd west													
Lane 1	783	2.5	1389	0.564	100	10.4	LOS B	27.1	193.9	Full	302	0.0	0.0
Lane 2	763	2.5	1354	0.564	100	10.2	LOS B	26.0	185.8	Full	302	0.0	0.0
Lane 3	22	0.0	64	0.352	100	90.7	LOS F	1.8	12.7	Short	90	0.0	NA
Approach	1569	2.5		0.564		11.4	LOS B	27.1	193.9				
Intersection	3296	2.9		0.600		11.5	LOS B	30.2	215.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Approach Lane Flows (veh/h)

South: Harbourside Church

Mov: From S To Exit:	L2 W	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. St. Ov. %	Ov. Lane No.
Lane 1	18	-	18	5.6	460	0.039	100	NA	NA
Lane 2	-	12	12	0.0	222	0.054	100	0.0	1
Approach	18	12	30	3.3		0.054			

East: Esmonde Rd East

Mov: From E To Exit:	L2 S	T1 W	U E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. St. Ov. %	Ov. Lane No.
Lane 1	14	-	-	14	0.0	1814	0.008	100	0.0	2
Lane 2	-	17	-	17	100.0	856	0.020	100	NA	NA
Lane 3	-	834	-	834	2.3	1391	0.600	100	NA	NA
Lane 4	-	824	-	824	2.3	1374[1]	0.600	100	NA	NA
Lane 5	-	-	8	8	0.0	53	0.152	100	0.0	4
Approach	14	1675	8	1697	3.2		0.600			

West: Esmonde Rd west

Mov: From W To Exit:	T1 E	R2 S	U W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. St. Ov. %	Ov. Lane No.
Lane 1	783	-	-	783	2.5	1389	0.564	100	NA	NA
Lane 2	763	-	-	763	2.5	1354[1]	0.564	100	NA	NA
Lane 3	-	14	8	22	0.0	64	0.352	100	0.0	2
Approach	1547	14	8	1569	2.5		0.564			

	Total	%HV	Deg Satn (v/c)
Intersection	3296	2.9	0.600

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis

	Exit Lane	Short Lane	Percent Opng in	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Flow	Capacity	Deg. Satn	Min. Delay	Merge Delay

	Number	Length m	Lane %	veh/h	pcu/h	sec	sec	Rate veh/h	veh/h	v/c	sec	sec
South Exit: Harbourside Church Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Esmonde Rd East Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Esmonde Rd west Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										

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Project: \\ttgroup.local\corporate\Auckland\Projects\1010685\WorkingMaterial\02 Modelling\Esmonde Rd ITA model v6 - Jul 2021 Plan Change updates.sip9

LANE SUMMARY

Site: 101 [AM 2019 Base (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 91 seconds (Site User-Given Phase Times)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh.	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Harbourside Church													
Lane 1	5	0.0	678	0.007	100	6.7	LOS A	0.0	0.3	Full	100	0.0	0.0
Lane 2	9	22.2	228	0.040	100	41.6	LOS D	0.4	2.9	Short	33	0.0	NA
Approach	14	14.3		0.040		29.2	LOS C	0.4	2.9				
East: Esmonde Rd East													
Lane 1	18	5.6	1751	0.010	100	4.7	LOS A	0.0	0.3	Short	26	0.0	NA
Lane 2	11	100.0	775	0.014	100	5.6	LOS A	0.2	2.0	Full	260	0.0	0.0
Lane 3	666	3.9	1247	0.534	100	8.7	LOS A	15.4	111.3	Full	260	0.0	0.0
Lane 4	662	3.9	1239[1]	0.534	100	8.6	LOS A	15.2	110.1	Full	260	0.0	0.0
Lane 5	4	0.0	76	0.053	100	53.1	LOS D	0.2	1.3	Short	35	0.0	NA
Approach	1361	4.7		0.534		8.7	LOS A	15.4	111.3				
West: Esmonde Rd west													
Lane 1	588	4.8	1240	0.474	100	8.2	LOS A	12.8	93.2	Full	302	0.0	0.0
Lane 2	588	4.8	1240	0.474	100	8.2	LOS A	12.8	93.2	Full	302	0.0	0.0
Lane 3	27	7.5	93	0.292	100	53.3	LOS D	1.3	9.4	Short	90	0.0	NA
Approach	1204	4.9		0.474		9.2	LOS A	12.8	93.2				
Intersection	2578	4.8		0.534		9.0	LOS A	15.4	111.3				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Approach Lane Flows (veh/h)

South: Harbourside Church

Mov: From S To Exit:	L2 W	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. St. Ov. %	Ov. Lane No.
Lane 1	5	-	5	0.0	678	0.007	100	NA	NA
Lane 2	-	9	9	22.2	228	0.040	100	0.0	1
Approach	5	9	14	14.3		0.040			

East: Esmonde Rd East

Mov: From E To Exit:	L2 S	T1 W	U E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. St. Ov. %	Ov. Lane No.
Lane 1	18	-	-	18	5.6	1751	0.010	100	0.0	2
Lane 2	-	11	-	11	100.0	775	0.014	100	NA	NA
Lane 3	-	666	-	666	3.9	1247	0.534	100	NA	NA
Lane 4	-	662	-	662	3.9	1239[1]	0.534	100	NA	NA
Lane 5	-	-	4	4	0.0	76	0.053	100	0.0	4
Approach	18	1339	4	1361	4.7		0.534			

West: Esmonde Rd west

Mov: From W To Exit:	T1 E	R2 S	U W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. St. Ov. %	Ov. Lane No.
Lane 1	588	-	-	588	4.8	1240	0.474	100	NA	NA
Lane 2	588	-	-	588	4.8	1240	0.474	100	NA	NA
Lane 3	-	23	4	27	7.5	93	0.292	100	0.0	2
Approach	1177	23	4	1204	4.9		0.474			

	Total	%HV	Deg Satn (v/c)
Intersection	2578	4.8	0.534

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis

	Exit Lane	Short Lane	Percent Opng in	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Flow	Capacity	Deg. Satn	Min. Delay	Merge Delay

	Number	Length m	Lane %	veh/h	pcu/h	sec	sec	Rate veh/h	veh/h	v/c	sec	sec
South Exit: Harbourside Church Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Esmonde Rd East Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Esmonde Rd west Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										

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LANE SUMMARY

Site: 101 [IP 2019 Base (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 97 seconds (Site User-Given Phase Times)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV [%	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Harbourside Church													
Lane 1	25	0.0	1884	0.013	100	4.5	LOS A	0.0	0.2	Full	100	0.0	0.0
Lane 2	6	0.0	114	0.053	100	52.8	LOS D	0.3	2.0	Short	33	0.0	NA
Approach	31	0.0		0.053		13.9	LOS B	0.3	2.0				
East: Esmonde Rd East													
Lane 1	9	11.1	1763	0.005	100	4.6	LOS A	0.0	0.1	Short	26	0.0	NA
Lane 2	4	100.0	970	0.004	100	1.6	LOS A	0.0	0.4	Full	260	0.0	0.0
Lane 3	685	3.9	1560	0.439	100	2.5	LOS A	8.7	63.2	Full	260	0.0	0.0
Lane 4	679	3.9	1547[1]	0.439	100	2.5	LOS A	8.6	62.3	Full	260	0.0	0.0
Lane 5	6	0.0	29	0.210	100	64.9	LOS E	0.3	2.3	Short	35	0.0	NA
Approach	1383	4.2		0.439		2.7	LOS A	8.7	63.2				
West: Esmonde Rd west													
Lane 1	644	4.2	1557	0.413	100	2.4	LOS A	7.9	57.6	Full	302	0.0	0.0
Lane 2	644	4.2	1557	0.413	100	2.4	LOS A	7.9	57.6	Full	302	0.0	0.0
Lane 3	26	7.8	35	0.752	100	66.2	LOS E	1.5	11.0	Short	90	0.0	NA
Approach	1313	4.3		0.752		3.7	LOS A	7.9	57.6				
Intersection	2728	4.2		0.752		3.3	LOS A	8.7	63.2				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Approach Lane Flows (veh/h)

South: Harbourside Church

Mov: From S To Exit:	L2 W	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. St. Ov. %	Ov. Lane No.
Lane 1	25	-	25	0.0	1884	0.013	100	NA	NA
Lane 2	-	6	6	0.0	114	0.053	100	0.0	1
Approach	25	6	31	0.0		0.053			

East: Esmonde Rd East

Mov: From E To Exit:	L2 S	T1 W	U E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. St. Ov. %	Ov. Lane No.
Lane 1	9	-	-	9	11.1	1763	0.005	100	0.0	2
Lane 2	-	4	-	4	100.0	970	0.004	100	NA	NA
Lane 3	-	685	-	685	3.9	1560	0.439	100	NA	NA
Lane 4	-	679	-	679	3.9	1547[1]	0.439	100	NA	NA
Lane 5	-	-	6	6	0.0	29	0.210	100	0.0	4
Approach	9	1368	6	1383	4.2		0.439			

West: Esmonde Rd west

Mov: From W To Exit:	T1 E	R2 S	U W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. St. Ov. %	Ov. Lane No.
Lane 1	644	-	-	644	4.2	1557	0.413	100	NA	NA
Lane 2	644	-	-	644	4.2	1557	0.413	100	NA	NA
Lane 3	-	22	4	26	7.8	35	0.752	100	0.0	2
Approach	1287	22	4	1313	4.3		0.752			

	Total	%HV	Deg Satn (v/c)
Intersection	2728	4.2	0.752

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis

	Exit Lane	Short Lane	Percent Opng in	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Flow	Capacity	Deg. Satn	Min. Delay	Merge Delay

	Number	Length m	Lane %	veh/h	pcu/h	sec	sec	Rate veh/h	veh/h	v/c	sec	sec
South Exit: Harbourside Church Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Esmonde Rd East Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Esmonde Rd west Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										

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LANE SUMMARY

Site: 101 [PM 2019 Base (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 148 seconds (Site User-Given Phase Times)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV [%	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Harbourside Church													
Lane 1	17	5.9	482	0.035	100	7.6	LOS A	0.2	1.8	Full	100	0.0	0.0
Lane 2	11	0.0	200	0.055	100	68.7	LOS E	0.7	5.0	Short	33	0.0	NA
Approach	28	3.6		0.055		31.6	LOS C	0.7	5.0				
East: Esmonde Rd East													
Lane 1	13	0.0	1849	0.007	100	4.6	LOS A	0.0	0.2	Short	26	0.0	NA
Lane 2	16	100.0	890	0.018	100	4.6	LOS A	0.3	3.5	Full	260	0.0	0.0
Lane 3	770	2.3	1447	0.533	100	7.7	LOS A	22.1	157.4	Full	260	0.0	0.0
Lane 4	762	2.3	1430	0.533	100	7.6	LOS A	21.6	154.4	Full	260	0.0	0.0
Lane 5	7	0.0	47	0.150	100	87.0	LOS F	0.5	3.7	Short	35	0.0	NA
Approach	1568	3.2		0.533		8.0	LOS A	22.1	157.4				
West: Esmonde Rd west													
Lane 1	714	2.5	1445	0.495	100	7.3	LOS A	19.5	139.5	Full	302	0.0	0.0
Lane 2	714	2.5	1445	0.495	100	7.3	LOS A	19.5	139.5	Full	302	0.0	0.0
Lane 3	20	0.0	57	0.358	100	86.8	LOS F	1.6	10.9	Short	90	0.0	NA
Approach	1449	2.5		0.495		8.4	LOS A	19.5	139.5				
Intersection	3045	2.9		0.533		8.4	LOS A	22.1	157.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Approach Lane Flows (veh/h)

South: Harbourside Church

Mov: From S To Exit:	L2 W	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	17	-	17	5.9	482	0.035	100	NA	NA
Lane 2	-	11	11	0.0	200	0.055	100	0.0	1
Approach	17	11	28	3.6		0.055			

East: Esmonde Rd East

Mov: From E To Exit:	L2 S	T1 W	U E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	13	-	-	13	0.0	1849	0.007	100	0.0	2
Lane 2	-	16	-	16	100.0	890	0.018	100	NA	NA
Lane 3	-	770	-	770	2.3	1447	0.533	100	NA	NA
Lane 4	-	762	-	762	2.3	1430[1]	0.533	100	NA	NA
Lane 5	-	-	7	7	0.0	47	0.150	100	0.0	4
Approach	13	1548	7	1568	3.2		0.533			

West: Esmonde Rd west

Mov: From W To Exit:	T1 E	R2 S	U W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	714	-	-	714	2.5	1445	0.495	100	NA	NA
Lane 2	714	-	-	714	2.5	1445	0.495	100	NA	NA
Lane 3	-	13	7	20	0.0	57	0.358	100	0.0	2
Approach	1429	13	7	1449	2.5		0.495			

	Total	%HV	Deg Satn (v/c)
Intersection	3045	2.9	0.533

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis

	Exit Lane	Short Lane	Percent Opng in	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Flow	Capacity	Deg. Satn	Min. Delay	Merge Delay

	Number	Length m	Lane %	veh/h	pcu/h	sec	sec	Rate veh/h	veh/h	v/c	sec	sec
South Exit: Harbourside Church Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Esmonde Rd East Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Esmonde Rd west Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										

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LANE SUMMARY

Site: 101 [Sat 2019 Base (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 102 seconds (Site User-Given Phase Times)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV [%	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Harbourside Church													
Lane 1	12	0.0	580	0.021	100	6.8	LOS A	0.1	0.8	Full	100	0.0	0.0
Lane 2	2	0.0	199	0.010	100	48.6	LOS D	0.1	0.6	Short	33	0.0	NA
Approach	14	0.0		0.021		12.7	LOS B	0.1	0.8				
East: Esmonde Rd East													
Lane 1	1	0.0	1840	0.001	100	4.7	LOS A	0.0	0.0	Short	26	0.0	NA
Lane 2	4	100.0	853	0.005	100	4.0	LOS A	0.1	0.7	Full	260	0.0	0.0
Lane 3	716	3.9	1372	0.522	100	6.5	LOS A	15.5	111.9	Full	260	0.0	0.0
Lane 4	712	3.9	1365[1]	0.522	100	6.5	LOS A	15.3	111.0	Full	260	0.0	0.0
Lane 5	3	0.0	54	0.055	100	61.2	LOS E	0.2	1.1	Short	35	0.0	NA
Approach	1436	4.2		0.522		6.6	LOS A	15.5	111.9				
West: Esmonde Rd west													
Lane 1	679	4.2	1370	0.496	100	6.3	LOS A	14.2	103.3	Full	302	0.0	0.0
Lane 2	679	4.2	1370	0.496	100	6.3	LOS A	14.2	103.3	Full	302	0.0	0.0
Lane 3	61	6.6	69	0.888	100	69.4	LOS E	3.6	26.6	Short	90	0.0	NA
Approach	1419	4.3		0.888		9.1	LOS A	14.2	103.3				
Intersection	2870	4.2		0.888		7.9	LOS A	15.5	111.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Approach Lane Flows (veh/h)

South: Harbourside Church

Mov: From S To Exit:	L2 W	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	12	-	12	0.0	580	0.021	100	NA	NA
Lane 2	-	2	2	0.0	199	0.010	100	0.0	1
Approach	12	2	14	0.0		0.021			

East: Esmonde Rd East

Mov: From E To Exit:	L2 S	T1 W	U E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	-	-	1	0.0	1840	0.001	100	0.0	2
Lane 2	-	4	-	4	100.0	853	0.005	100	NA	NA
Lane 3	-	716	-	716	3.9	1372	0.522	100	NA	NA
Lane 4	-	712	-	712	3.9	1365[1]	0.522	100	NA	NA
Lane 5	-	-	3	3	0.0	54	0.055	100	0.0	4
Approach	1	1432	3	1436	4.2		0.522			

West: Esmonde Rd west

Mov: From W To Exit:	T1 E	R2 S	U W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	679	-	-	679	4.2	1370	0.496	100	NA	NA
Lane 2	679	-	-	679	4.2	1370	0.496	100	NA	NA
Lane 3	-	57	4	61	6.6	69	0.888	100	0.0	2
Approach	1358	57	4	1419	4.3		0.888			

	Total	%HV	Deg Satn (v/c)
Intersection	2870	4.2	0.888

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis

	Exit Lane	Short Lane	Percent Opng in	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Flow	Capacity	Deg. Satn	Min. Delay	Merge Delay

	Number	Length m	Lane %	veh/h	pcu/h	sec	sec	Rate veh/h	veh/h	v/c	sec	sec
South Exit: Harbourside Church Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Esmonde Rd East Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Esmonde Rd west Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										

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LANE SUMMARY

Site: 101 [AM 2023 Base Case - Existing Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 158 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh.	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Harbourside Church													
Lane 1	5	0.0	542	0.009	100	8.1	LOS A	0.1	0.5	Full	100	0.0	0.0
Lane 2	10	20.0	194	0.051	100	71.2	LOS E	0.7	5.6	Short	33	0.0	NA
Approach	15	13.3		0.051		50.2	LOS D	0.7	5.6				
East: Esmonde Rd East													
Lane 1	19	5.3	1741	0.011	100	4.9	LOS A	0.1	0.6	Short	26	0.0	NA
Lane 2	12	100.0	856	0.014	100	6.2	LOS A	0.2	3.1	Full	260	0.0	0.0
Lane 3	721	3.9	1377	0.524	100	9.9	LOS A	23.8	171.9	Full	260	0.0	0.0
Lane 4	716	3.9	1367[1]	0.524	100	9.9	LOS A	23.5	170.0	Full	260	0.0	0.0
Lane 5	4	0.0	53	0.076	100	89.9	LOS F	0.3	2.2	Short	35	0.0	NA
Approach	1472	4.7		0.524		10.0	LOS A	23.8	171.9				
West: Esmonde Rd west													
Lane 1	637	4.8	1369	0.465	100	9.3	LOS A	19.6	143.1	Full	302	0.0	0.0
Lane 2	637	4.8	1369	0.465	100	9.3	LOS A	19.6	143.1	Full	302	0.0	0.0
Lane 3	29	7.0	65	0.450	100	90.9	LOS F	2.4	17.6	Short	90	0.0	NA
Approach	1303	4.9		0.465		11.1	LOS B	19.6	143.1				
Intersection	2789	4.8		0.524		10.7	LOS B	23.8	171.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Approach Lane Flows (veh/h)

South: Harbourside Church

Mov: From S To Exit:	L2 W	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	5	-	5	0.0	542	0.009	100	NA	NA
Lane 2	-	10	10	20.0	194	0.051	100	0.0	1
Approach	5	10	15	13.3		0.051			

East: Esmonde Rd East

Mov: From E To Exit:	L2 S	T1 W	U E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	19	-	-	19	5.3	1741	0.011	100	0.0	2
Lane 2	-	12	-	12	100.0	856	0.014	100	NA	NA
Lane 3	-	721	-	721	3.9	1377	0.524	100	NA	NA
Lane 4	-	716	-	716	3.9	1367[1]	0.524	100	NA	NA
Lane 5	-	-	4	4	0.0	53	0.076	100	0.0	4
Approach	19	1449	4	1472	4.7		0.524			

West: Esmonde Rd west

Mov: From W To Exit:	T1 E	R2 S	U W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	637	-	-	637	4.8	1369	0.465	100	NA	NA
Lane 2	637	-	-	637	4.8	1369	0.465	100	NA	NA
Lane 3	-	25	4	29	7.0	65	0.450	100	0.0	2
Approach	1274	25	4	1303	4.9		0.465			

	Total	%HV	Deg Satn (v/c)
Intersection	2789	4.8	0.524

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis

	Exit Lane	Short Lane	Percent Opng in	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Flow	Capacity	Deg. Satn	Min. Delay	Merge Delay

	Number	Length m	Lane %	veh/h	pcu/h	sec	sec	Rate veh/h	veh/h	v/c	sec	sec
South Exit: Harbourside Church Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Esmonde Rd East Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Esmonde Rd west Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										

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LANE SUMMARY

Site: 101 [IP 2023 Base Case - Existing Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 158 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Harbourside Church													
Lane 1	27	0.0	531	0.051	100	8.6	LOS A	0.5	3.2	Full	100	0.0	0.0
Lane 2	6	0.0	222	0.027	100	70.3	LOS E	0.4	2.8	Short	33	0.0	NA
Approach	33	0.0		0.051		19.8	LOS B	0.5	3.2				
East: Esmonde Rd East													
Lane 1	10	10.0	1687	0.006	100	4.9	LOS A	0.0	0.3	Short	26	0.0	NA
Lane 2	4	100.0	856	0.005	100	6.1	LOS A	0.1	1.1	Full	260	0.0	0.0
Lane 3	742	3.9	1377	0.539	100	10.1	LOS B	24.9	180.0	Full	260	0.0	0.0
Lane 4	734	3.9	1363	0.539	100	10.0	LOS B	24.5	177.0	Full	260	0.0	0.0
Lane 5	6	0.0	53	0.114	100	90.5	LOS F	0.5	3.4	Short	35	0.0	NA
Approach	1496	4.2		0.539		10.3	LOS B	24.9	180.0				
West: Esmonde Rd west													
Lane 1	708	4.2	1375	0.515	100	9.8	LOS A	23.1	167.6	Full	302	0.0	0.0
Lane 2	685	4.2	1330	0.515	100	9.6	LOS A	21.9	159.0	Full	302	0.0	0.0
Lane 3	28	7.3	65	0.436	100	90.9	LOS F	2.3	17.0	Short	90	0.0	NA
Approach	1421	4.2		0.515		11.3	LOS B	23.1	167.6				
Intersection	2951	4.2		0.539		10.9	LOS B	24.9	180.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Approach Lane Flows (veh/h)

South: Harbourside Church

Mov: From S To Exit:	L2 W	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. St. Ov. %	Ov. Lane No.
Lane 1	27	-	27	0.0	531	0.051	100	NA	NA
Lane 2	-	6	6	0.0	222	0.027	100	0.0	1
Approach	27	6	33	0.0		0.051			

East: Esmonde Rd East

Mov: From E To Exit:	L2 S	T1 W	U E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. St. Ov. %	Ov. Lane No.
Lane 1	10	-	-	10	10.0	1687	0.006	100	0.0	2
Lane 2	-	4	-	4	100.0	856	0.005	100	NA	NA
Lane 3	-	742	-	742	3.9	1377	0.539	100	NA	NA
Lane 4	-	734	-	734	3.9	1363[1]	0.539	100	NA	NA
Lane 5	-	-	6	6	0.0	53	0.114	100	0.0	4
Approach	10	1480	6	1496	4.2		0.539			

West: Esmonde Rd west

Mov: From W To Exit:	T1 E	R2 S	U W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. St. Ov. %	Ov. Lane No.
Lane 1	708	-	-	708	4.2	1375	0.515	100	NA	NA
Lane 2	685	-	-	685	4.2	1330[1]	0.515	100	NA	NA
Lane 3	-	24	4	28	7.3	65	0.436	100	0.0	2
Approach	1393	24	4	1421	4.2		0.515			

	Total	%HV	Deg Satn (v/c)
Intersection	2951	4.2	0.539

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis

	Exit Lane	Short Lane	Percent Opng in	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Flow	Capacity	Deg. Satn	Min. Delay	Merge Delay

	Number	Length m	Lane %	veh/h	pcu/h	sec	sec	Rate veh/h	veh/h	v/c	sec	sec
South Exit: Harbourside Church Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Esmonde Rd East Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Esmonde Rd west Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										

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LANE SUMMARY

Site: 101 [Sat 2023 Base Case - Existing Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 107 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Harbourside Church													
Lane 1	13	0.0	593	0.022	100	10.4	LOS B	0.2	1.5	Full	100	0.0	0.0
Lane 2	2	0.0	276	0.007	100	46.0	LOS D	0.1	0.6	Short	33	0.0	NA
Approach	15	0.0		0.022		15.1	LOS B	0.2	1.5				
East: Esmonde Rd East													
Lane 1	1	0.0	1710	0.001	100	5.1	LOS A	0.0	0.0	Short	26	0.0	NA
Lane 2	4	100.0	736	0.006	100	7.9	LOS A	0.1	1.0	Full	260	0.0	0.0
Lane 3	775	3.9	1184	0.654	100	13.4	LOS B	25.3	182.8	Full	260	0.0	0.0
Lane 4	771	3.9	1179[1]	0.654	100	13.4	LOS B	25.1	181.4	Full	260	0.0	0.0
Lane 5	3	0.0	78	0.039	100	60.4	LOS E	0.2	1.1	Short	35	0.0	NA
Approach	1554	4.2		0.654		13.5	LOS B	25.3	182.8				
West: Esmonde Rd west													
Lane 1	756	4.2	1183	0.640	100	13.2	LOS B	24.3	176.1	Full	302	0.0	0.0
Lane 2	713	4.2	1114[1]	0.640	100	12.7	LOS B	22.0	159.7	Full	302	0.0	0.0
Lane 3	65	6.2	99	0.659	100	63.3	LOS E	3.7	27.0	Short	90	0.0	NA
Approach	1534	4.3		0.659		15.1	LOS B	24.3	176.1				
Intersection	3104	4.2		0.659		14.3	LOS B	25.3	182.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Approach Lane Flows (veh/h)

South: Harbourside Church

Mov: From S To Exit:	L2 W	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	13	-	13	0.0	593	0.022	100	NA	NA
Lane 2	-	2	2	0.0	276	0.007	100	0.0	1
Approach	13	2	15	0.0		0.022			

East: Esmonde Rd East

Mov: From E To Exit:	L2 S	T1 W	U E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	-	-	1	0.0	1710	0.001	100	0.0	2
Lane 2	-	4	-	4	100.0	736	0.006	100	NA	NA
Lane 3	-	775	-	775	3.9	1184	0.654	100	NA	NA
Lane 4	-	771	-	771	3.9	1179[1]	0.654	100	NA	NA
Lane 5	-	-	3	3	0.0	78	0.039	100	0.0	4
Approach	1	1550	3	1554	4.2		0.654			

West: Esmonde Rd west

Mov: From W To Exit:	T1 E	R2 S	U W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	756	-	-	756	4.2	1183	0.640	100	NA	NA
Lane 2	713	-	-	713	4.2	1114[1]	0.640	100	NA	NA
Lane 3	-	61	4	65	6.2	99	0.659	100	0.0	2
Approach	1469	61	4	1534	4.3		0.659			

	Total	%HV	Deg Satn (v/c)
Intersection	3104	4.2	0.659

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis

	Exit Lane	Short Lane	Percent Opng in	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Flow	Capacity	Deg. Satn	Min. Delay	Merge Delay

	Number	Length m	Lane %	veh/h	pcu/h	sec	sec	Rate veh/h	veh/h	v/c	sec	sec
South Exit: Harbourside Church Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Esmonde Rd East Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Esmonde Rd west Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										

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LANE SUMMARY

Site: 101 [AM 2023 Base Case - Existing Layout 20% (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 158 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV [%	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Harbourside Church													
Lane 1	6	0.0	464	0.013	100	10.8	LOS B	0.1	0.9	Full	100	0.0	0.0
Lane 2	12	16.7	199	0.060	100	71.3	LOS E	0.8	6.6	Short	33	0.0	NA
Approach	18	11.1		0.060		51.1	LOS D	0.8	6.6				
East: Esmonde Rd East													
Lane 1	23	4.3	1748	0.013	100	4.9	LOS A	0.1	0.7	Short	26	0.0	NA
Lane 2	14	100.0	856	0.016	100	6.2	LOS A	0.3	3.7	Full	260	0.0	0.0
Lane 3	865	3.9	1377	0.628	100	11.3	LOS B	32.5	235.4	Full	260	0.0	0.0
Lane 4	859	3.9	1367[1]	0.628	100	11.2	LOS B	32.1	232.3	Full	260	0.0	0.0
Lane 5	5	0.0	53	0.095	100	90.2	LOS F	0.4	2.8	Short	35	0.0	NA
Approach	1766	4.6		0.628		11.4	LOS B	32.5	235.4				
West: Esmonde Rd west													
Lane 1	779	4.8	1369	0.569	100	10.5	LOS B	27.1	197.9	Full	302	0.0	0.0
Lane 2	749	4.8	1316[1]	0.569	100	10.2	LOS B	25.4	185.0	Full	302	0.0	0.0
Lane 3	35	5.8	65	0.540	100	91.5	LOS F	2.9	21.2	Short	90	0.0	NA
Approach	1563	4.8		0.569		12.2	LOS B	27.1	197.9				
Intersection	3347	4.8		0.628		11.9	LOS B	32.5	235.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Approach Lane Flows (veh/h)

South: Harbourside Church

Mov: From S To Exit:	L2 W	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	6	-	6	0.0	464	0.013	100	NA	NA
Lane 2	-	12	12	16.7	199	0.060	100	0.0	1
Approach	6	12	18	11.1		0.060			

East: Esmonde Rd East

Mov: From E To Exit:	L2 S	T1 W	U E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	23	-	-	23	4.3	1748	0.013	100	0.0	2
Lane 2	-	14	-	14	100.0	856	0.016	100	NA	NA
Lane 3	-	865	-	865	3.9	1377	0.628	100	NA	NA
Lane 4	-	859	-	859	3.9	1367[1]	0.628	100	NA	NA
Lane 5	-	-	5	5	0.0	53	0.095	100	0.0	4
Approach	23	1738	5	1766	4.6		0.628			

West: Esmonde Rd west

Mov: From W To Exit:	T1 E	R2 S	U W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	779	-	-	779	4.8	1369	0.569	100	NA	NA
Lane 2	749	-	-	749	4.8	1316[1]	0.569	100	NA	NA
Lane 3	-	30	5	35	5.8	65	0.540	100	0.0	2
Approach	1528	30	5	1563	4.8		0.569			

	Total	%HV	Deg Satn (v/c)
Intersection	3347	4.8	0.628

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis

	Exit Lane	Short Lane	Percent Opng in	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Flow	Capacity	Deg. Satn	Min. Delay	Merge Delay

	Number	Length m	Lane %	veh/h	pcu/h	sec	sec	Rate veh/h	veh/h	v/c	sec	sec
South Exit: Harbourside Church Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Esmonde Rd East Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Esmonde Rd west Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										

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LANE SUMMARY

Site: 101 [PM 2023 Base Case - Existing Layout 20% (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 158 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV [%	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh.	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Harbourside Church													
Lane 1	18	5.6	401	0.045	100	15.0	LOS B	0.5	3.7	Full	100	0.0	0.0
Lane 2	12	0.0	222	0.054	100	70.8	LOS E	0.8	5.7	Short	33	0.0	NA
Approach	30	3.3		0.054		37.3	LOS D	0.8	5.7				
East: Esmonde Rd East													
Lane 1	14	0.0	1814	0.008	100	4.8	LOS A	0.1	0.4	Short	26	0.0	NA
Lane 2	20	100.0	856	0.023	100	6.2	LOS A	0.4	5.4	Full	260	0.0	0.0
Lane 3	1000	2.3	1391	0.719	100	12.9	LOS B	42.9	305.9	Full	260	0.0	19.7
Lane 4	990	2.3	1377[1]	0.719	100	12.7	LOS B	42.0	299.5	Full	260	0.0	17.8
Lane 5	8	0.0	53	0.152	100	90.9	LOS F	0.6	4.5	Short	35	0.0	NA
Approach	2032	3.2		0.719		13.0	LOS B	42.9	305.9				
West: Esmonde Rd west													
Lane 1	939	2.5	1389	0.676	100	12.1	LOS B	37.7	269.7	Full	302	0.0	0.0
Lane 2	918	2.5	1359[1]	0.676	100	11.8	LOS B	36.1	258.5	Full	302	0.0	0.0
Lane 3	22	0.0	64	0.352	100	90.7	LOS F	1.8	12.7	Short	90	0.0	NA
Approach	1879	2.5		0.676		12.9	LOS B	37.7	269.7				
Intersection	3941	2.9		0.719		13.1	LOS B	42.9	305.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Approach Lane Flows (veh/h)

South: Harbourside Church

Mov: From S To Exit:	L2 W	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. St. Ov. %	Ov. Lane No.
Lane 1	18	-	18	5.6	401	0.045	100	NA	NA
Lane 2	-	12	12	0.0	222	0.054	100	0.0	1
Approach	18	12	30	3.3		0.054			

East: Esmonde Rd East

Mov: From E To Exit:	L2 S	T1 W	U E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. St. Ov. %	Ov. Lane No.
Lane 1	14	-	-	14	0.0	1814	0.008	100	0.0	2
Lane 2	-	20	-	20	100.0	856	0.023	100	NA	NA
Lane 3	-	1000	-	1000	2.3	1391	0.719	100	NA	NA
Lane 4	-	990	-	990	2.3	1377[1]	0.719	100	NA	NA
Lane 5	-	-	8	8	0.0	53	0.152	100	0.0	4
Approach	14	2010	8	2032	3.2		0.719			

West: Esmonde Rd west

Mov: From W To Exit:	T1 E	R2 S	U W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. St. Ov. %	Ov. Lane No.
Lane 1	939	-	-	939	2.5	1389	0.676	100	NA	NA
Lane 2	918	-	-	918	2.5	1359[1]	0.676	100	NA	NA
Lane 3	-	14	8	22	0.0	64	0.352	100	0.0	2
Approach	1857	14	8	1879	2.5		0.676			

	Total	%HV	Deg Satn (v/c)
Intersection	3941	2.9	0.719

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis

	Exit Lane	Short Lane	Percent Opng in	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Flow	Capacity	Deg. Satn	Min. Delay	Merge Delay

	Number	Length m	Lane %	veh/h	pcu/h	sec	sec	Rate veh/h	veh/h	v/c	sec	sec
South Exit: Harbourside Church Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Esmonde Rd East Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Esmonde Rd west Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										

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LANE SUMMARY

Site: 101 [AM 2023 Development - Proposed Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 91 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV [%	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Harbourside Church													
Lane 1	149	0.0	528[1]	0.282	100	28.9	LOS C	5.0	34.8	Short	15	0.0	NA
Lane 2	67	0.0	284	0.236	100	40.9	LOS D	2.7	18.8	Full	40	0.0	0.0
Approach	216	0.0		0.282		32.6	LOS C	5.0	34.8				
East: Esmonde Rd East													
Lane 1	94	0.0	1441	0.065	100	7.0	LOS A	0.9	6.6	Short	14	0.0	NA
Lane 2	12	100.0	659	0.018	100	9.4	LOS A	0.2	2.9	Full	260	0.0	0.0
Lane 3	721	3.9	1060	0.680	100	15.2	LOS B	22.6	163.4	Full	260	0.0	0.0
Lane 4	716	3.9	1054[1]	0.680	100	15.1	LOS B	22.4	161.8	Full	260	0.0	0.0
Lane 5	4	0.0	122	0.033	100	48.6	LOS D	0.2	1.2	Short	35	0.0	NA
Approach	1547	4.4		0.680		14.7	LOS B	22.6	163.4				
West: Esmonde Rd west													
Lane 1	637	4.8	1054	0.604	100	14.2	LOS B	18.7	136.1	Full	302	0.0	0.0
Lane 2	637	4.8	1054	0.604	100	14.2	LOS B	18.7	136.1	Full	302	0.0	0.0
Lane 3	110	0.0	166	0.663	100	51.4	LOS D	5.1	35.8	Short	90	0.0	NA
Approach	1384	4.5		0.663		17.2	LOS B	18.7	136.1				
Intersection	3146	4.1		0.680		17.0	LOS B	22.6	163.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Approach Lane Flows (veh/h)

South: Harbourside Church

Mov From S To Exit	L2 W	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. St. Ov. %	Ov. Lane No.
Lane 1	149	-	149	0.0	528[1]	0.282	100	83.9	2
Lane 2	-	67	67	0.0	284	0.236	100	NA	NA
Approach	149	67	216	0.0		0.282			

East: Esmonde Rd East

Mov From E To Exit	L2 S	T1 W	U E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. St. Ov. %	Ov. Lane No.
Lane 1	94	-	-	94	0.0	1441	0.065	100	0.0	2
Lane 2	-	12	-	12	100.0	659	0.018	100	NA	NA
Lane 3	-	721	-	721	3.9	1060	0.680	100	NA	NA
Lane 4	-	716	-	716	3.9	1054[1]	0.680	100	NA	NA
Lane 5	-	-	4	4	0.0	122	0.033	100	0.0	4
Approach	94	1449	4	1547	4.4		0.680			

West: Esmonde Rd west

Mov From W To Exit	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. St. Ov. %	Ov. Lane No.
Lane 1	637	-	637	4.8	1054	0.604	100	NA	NA
Lane 2	637	-	637	4.8	1054	0.604	100	NA	NA
Lane 3	-	110	110	0.0	166	0.663	100	0.0	2
Approach	1274	110	1384	4.5		0.663			

	Total	%HV	Deg Satn (v/c)
Intersection	3146	4.1	0.680

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis

	Exit Lane	Short Lane	Percent Opng in	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Flow	Capacity	Deg. Satn	Min. Delay	Merge Delay

	Number	Length m	Lane %	veh/h	pcu/h	sec	sec	Rate veh/h	veh/h	v/c	sec	sec
South Exit: Harbourside Church Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Esmonde Rd East Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Esmonde Rd west Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										

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LANE SUMMARY

Site: 101 [IP 2023 Development - Proposed Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh.	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Harbourside Church													
Lane 1	131	0.0	540[1]	0.243	100	29.0	LOS C	4.3	30.3	Short	15	0.0	NA
Lane 2	59	0.0	287	0.205	100	40.1	LOS D	2.3	16.3	Full	40	0.0	0.0
Approach	190	0.0		0.243		32.4	LOS C	4.3	30.3				
East: Esmonde Rd East													
Lane 1	87	0.0	1457	0.060	100	6.8	LOS A	0.8	5.8	Short	14	0.0	NA
Lane 2	4	100.0	666	0.006	100	9.0	LOS A	0.1	1.0	Full	260	0.0	0.0
Lane 3	741	3.9	1072	0.691	100	14.9	LOS B	23.1	166.8	Full	260	0.0	0.0
Lane 4	735	3.9	1063[1]	0.691	100	14.8	LOS B	22.7	164.3	Full	260	0.0	0.0
Lane 5	6	0.0	108	0.056	100	49.7	LOS D	0.3	1.8	Short	35	0.0	NA
Approach	1573	3.9		0.691		14.5	LOS B	23.1	166.8				
West: Esmonde Rd west													
Lane 1	697	4.2	1070	0.651	100	14.3	LOS B	20.9	151.4	Full	302	0.0	0.0
Lane 2	697	4.2	1070	0.651	100	14.3	LOS B	20.9	151.4	Full	302	0.0	0.0
Lane 3	102	0.0	147	0.695	100	52.4	LOS D	4.8	33.5	Short	90	0.0	NA
Approach	1495	3.9		0.695		16.9	LOS B	20.9	151.4				
Intersection	3258	3.7		0.695		16.7	LOS B	23.1	166.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Approach Lane Flows (veh/h)

South: Harbourside Church

Mov: From S To Exit:	L2 W	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	131	-	131	0.0	540[1]	0.243	100	70.4	2
Lane 2	-	59	59	0.0	287	0.205	100	NA	NA
Approach	131	59	190	0.0		0.243			

East: Esmonde Rd East

Mov: From E To Exit:	L2 S	T1 W	U E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	87	-	-	87	0.0	1457	0.060	100	0.0	2
Lane 2	-	4	-	4	100.0	666	0.006	100	NA	NA
Lane 3	-	741	-	741	3.9	1072	0.691	100	NA	NA
Lane 4	-	735	-	735	3.9	1063[1]	0.691	100	NA	NA
Lane 5	-	-	6	6	0.0	108	0.056	100	0.0	4
Approach	87	1480	6	1573	3.9		0.691			

West: Esmonde Rd west

Mov: From W To Exit:	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	697	-	697	4.2	1070	0.651	100	NA	NA
Lane 2	697	-	697	4.2	1070	0.651	100	NA	NA
Lane 3	-	102	102	0.0	147	0.695	100	0.0	2
Approach	1393	102	1495	3.9		0.695			

	Total	%HV	Deg Satn (v/c)
Intersection	3258	3.7	0.695

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis

	Exit Lane	Short Lane	Percent Opng in	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Flow	Capacity	Deg. Satn	Min. Delay	Merge Delay

	Number	Length m	Lane %	veh/h	pcu/h	sec	sec	Rate veh/h	veh/h	v/c	sec	sec
South Exit: Harbourside Church Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Esmonde Rd East Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Esmonde Rd west Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										

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LANE SUMMARY

Site: 101 [PM 2023 Development - Proposed Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 146 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh.	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Harbourside Church													
Lane 1	134	0.0	418[1]	0.321	100	48.3	LOS D	7.4	52.1	Short	15	0.0	NA
Lane 2	60	0.0	221[1]	0.271	100	65.7	LOS E	3.9	27.3	Full	40	0.0	29.1[3]
Approach	194	0.0		0.321		53.7	LOS D	7.4	52.1				
East: Esmonde Rd East													
Lane 1	104	0.0	1518	0.068	100	7.1	LOS A	1.3	9.4	Short	14	0.0	NA
Lane 2	17	100.0	765	0.022	100	9.5	LOS A	0.4	5.4	Full	260	0.0	0.0
Lane 3	834	2.3	1244	0.671	100	16.6	LOS B	36.0	256.8	Full	260	0.0	3.9
Lane 4	824	2.3	1229[1]	0.671	100	16.5	LOS B	35.2	251.4	Full	260	0.0	2.0
Lane 5	8	0.0	133	0.060	100	72.0	LOS E	0.5	3.7	Short	35	0.0	NA
Approach	1787	3.1		0.671		16.2	LOS B	36.0	256.8				
West: Esmonde Rd west													
Lane 1	818	2.5	1242	0.658	100	16.4	LOS B	34.8	248.8	Full	302	0.0	0.0
Lane 2	729	2.5	1107[1]	0.658	100	15.1	LOS B	28.7	204.9	Full	302	0.0	0.0
Lane 3	122	0.0	181	0.675	100	76.3	LOS E	8.8	61.4	Short	90	0.0	NA
Approach	1669	2.3		0.675		20.2	LOS C	34.8	248.8				
Intersection	3650	2.6		0.675		20.0	LOS C	36.0	256.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

8 Probability of Blockage has been set on the basis of a queue that overflows from a short lane.

Approach Lane Flows (veh/h)

South: Harbourside Church

Mov: From S To Exit:	L2 W	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	134	-	134	0.0	418[1]	0.321	100	100.0	2
Lane 2	-	60	60	0.0	221[1]	0.271	100	NA	NA
Approach	134	60	194	0.0		0.321			

East: Esmonde Rd East

Mov: From E To Exit:	L2 S	T1 W	U E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	104	-	-	104	0.0	1518	0.068	100	0.0	2
Lane 2	-	17	-	17	100.0	765	0.022	100	NA	NA
Lane 3	-	834	-	834	2.3	1244	0.671	100	NA	NA
Lane 4	-	824	-	824	2.3	1229[1]	0.671	100	NA	NA
Lane 5	-	-	8	8	0.0	133	0.060	100	0.0	4
Approach	104	1675	8	1787	3.1		0.671			

West: Esmonde Rd west

Mov: From W To Exit:	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	818	-	818	2.5	1242	0.658	100	NA	NA
Lane 2	729	-	729	2.5	1107[1]	0.658	100	NA	NA
Lane 3	-	122	122	0.0	181	0.675	100	0.0	2
Approach	1547	122	1669	2.3		0.675			

	Total	%HV	Deg. Satn (v/c)
Intersection	3650	2.6	0.675

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Harbourside Church Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Esmonde Rd East Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Esmonde Rd west Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										

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LANE SUMMARY

Site: 101 [Sat 2023 Development - Proposed Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 91 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV [%	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh.	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Harbourside Church													
Lane 1	145	0.0	533[1]	0.272	100	28.9	LOS C	4.8	33.8	Short	15	0.0	NA
Lane 2	65	0.0	284	0.229	100	40.8	LOS D	2.6	18.2	Full	40	0.0	0.0
Approach	210	0.0		0.272		32.6	LOS C	4.8	33.8				
East: Esmonde Rd East													
Lane 1	97	0.0	1441	0.067	100	7.0	LOS A	1.0	6.8	Short	14	0.0	NA
Lane 2	4	100.0	659	0.006	100	9.3	LOS A	0.1	1.1	Full	260	0.0	0.0
Lane 3	775	3.9	1060	0.731	100	15.9	LOS B	25.5	184.3	Full	260	0.0	0.0
Lane 4	771	3.9	1055[1]	0.731	100	15.9	LOS B	25.3	183.0	Full	260	0.0	0.0
Lane 5	3	0.0	122	0.025	100	48.4	LOS D	0.1	0.9	Short	35	0.0	NA
Approach	1650	4.0		0.731		15.4	LOS B	25.5	184.3				
West: Esmonde Rd west													
Lane 1	763	4.2	1059	0.721	100	15.8	LOS B	24.8	180.1	Full	302	0.0	0.0
Lane 2	706	4.2	980[1]	0.721	100	15.0	LOS B	21.9	158.8	Full	302	0.0	0.0
Lane 3	113	0.0	166	0.681	100	51.7	LOS D	5.3	37.0	Short	90	0.0	NA
Approach	1582	3.9		0.721		18.0	LOS B	24.8	180.1				
Intersection	3442	3.7		0.731		17.7	LOS B	25.5	184.3				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Approach Lane Flows (veh/h)

South: Harbourside Church

Mov: From S To Exit:	L2 W	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	145	-	145	0.0	533[1]	0.272	100	80.9	2
Lane 2	-	65	65	0.0	284	0.229	100	NA	NA
Approach	145	65	210	0.0		0.272			

East: Esmonde Rd East

Mov: From E To Exit:	L2 S	T1 W	U E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	97	-	-	97	0.0	1441	0.067	100	0.0	2
Lane 2	-	4	-	4	100.0	659	0.006	100	NA	NA
Lane 3	-	775	-	775	3.9	1060	0.731	100	NA	NA
Lane 4	-	771	-	771	3.9	1055[1]	0.731	100	NA	NA
Lane 5	-	-	3	3	0.0	122	0.025	100	0.0	4
Approach	97	1550	3	1650	4.0		0.731			

West: Esmonde Rd west

Mov: From W To Exit:	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	763	-	763	4.2	1059	0.721	100	NA	NA
Lane 2	706	-	706	4.2	980[1]	0.721	100	NA	NA
Lane 3	-	113	113	0.0	166	0.681	100	0.0	2
Approach	1469	113	1582	3.9		0.721			

	Total	%HV	Deg Satn (v/c)
Intersection	3442	3.7	0.731

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis

	Exit Lane	Short Lane	Percent Opng in	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Flow	Capacity	Deg. Satn	Min. Delay	Merge Delay

	Number	Length m	Lane %	veh/h	pcu/h	sec	sec	Rate veh/h	veh/h	v/c	sec	sec
South Exit: Harbourside Church Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Esmonde Rd East Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Esmonde Rd west Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										

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LANE SUMMARY

Site: 101 [AM 2023 Development - Proposed Layout 20% (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 88 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h]	HV [%]	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh.]	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Harbourside Church													
Lane 1	179	0.0	522[1]	0.343	100	27.8	LOS C	5.8	40.5	Short	15	0.0	NA
Lane 2	80	0.0	294	0.274	100	39.5	LOS D	3.1	21.9	Full	40	0.0	6.2[1]
Approach	259	0.0		0.343		31.4	LOS C	5.8	40.5				
East: Esmonde Rd East													
Lane 1	113	0.0	1428	0.079	100	7.1	LOS A	1.1	8.0	Short	14	0.0	NA
Lane 2	12	100.0	641	0.019	100	9.8	LOS A	0.2	3.1	Full	260	0.0	0.0
Lane 3	793	3.9	1032	0.768	100	17.0	LOS B	26.7	193.2	Full	260	0.0	0.0
Lane 4	788	3.9	1026[1]	0.768	100	17.0	LOS B	26.5	191.4	Full	260	0.0	0.0
Lane 5	4	0.0	126	0.035	100	47.0	LOS D	0.2	1.3	Short	35	0.0	NA
Approach	1710	4.3		0.768		16.4	LOS B	26.7	193.2				
West: Esmonde Rd west													
Lane 1	706	4.8	1026	0.688	100	15.6	LOS B	22.0	160.2	Full	302	0.0	0.0
Lane 2	694	4.8	1009	0.688	100	15.4	LOS B	21.4	155.9	Full	302	0.0	0.0
Lane 3	132	0.0	171	0.770	100	51.9	LOS D	6.1	43.0	Short	90	0.0	NA
Approach	1532	4.4		0.770		18.7	LOS B	22.0	160.2				
Intersection	3502	4.0		0.770		18.5	LOS B	26.7	193.2				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

8 Probability of Blockage has been set on the basis of a queue that overflows from a short lane.

Approach Lane Flows (veh/h)

South: Harbourside Church

Mov: From S To Exit:	L2 W	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov Lane No.
Lane 1	179	-	179	0.0	522[1]	0.343	100	99.0	2
Lane 2	-	80	80	0.0	294	0.274	100	NA	NA
Approach	179	80	259	0.0		0.343			

East: Esmonde Rd East

Mov: From E To Exit:	L2 S	T1 W	U E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov Lane No.
Lane 1	113	-	-	113	0.0	1428	0.079	100	0.0	2
Lane 2	-	12	-	12	100.0	641	0.019	100	NA	NA
Lane 3	-	793	-	793	3.9	1032	0.768	100	NA	NA
Lane 4	-	788	-	788	3.9	1026[1]	0.768	100	NA	NA
Lane 5	-	-	4	4	0.0	126	0.035	100	0.0	4
Approach	113	1593	4	1710	4.3		0.768			

West: Esmonde Rd west

Mov: From W To Exit:	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov Lane No.
Lane 1	706	-	706	4.8	1026	0.688	100	NA	NA
Lane 2	694	-	694	4.8	1009	0.688	100	NA	NA
Lane 3	-	132	132	0.0	171	0.770	100	0.0	2
Approach	1400	132	1532	4.4		0.770			

	Total	%HV	Deg. Satn (v/c)
Intersection	3502	4.0	0.770

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Harbourside Church Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Esmonde Rd East Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Esmonde Rd west Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										

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LANE SUMMARY

Site: 101 [PM 2023 Development - Proposed Layout 20% (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 137 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV [%	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Harbourside Church													
Lane 1	161	0.0	423[1]	0.380	100	45.1	LOS D	8.4	58.9	Short	15	0.0	NA
Lane 2	72	0.0	177[1]	0.407	100	62.3	LOS E	4.4	31.0	Full	40	0.0	40.3[3]
Approach	233	0.0		0.407		50.4	LOS D	8.4	58.9				
East: Esmonde Rd East													
Lane 1	125	0.0	1497	0.083	100	7.3	LOS A	1.6	11.5	Short	14	0.0	NA
Lane 2	19	100.0	747	0.025	100	9.7	LOS A	0.4	5.8	Full	260	0.0	0.0
Lane 3	917	2.3	1214	0.756	100	18.5	LOS B	42.2	301.0	Full	260	0.0	18.3
Lane 4	906	2.3	1199[1]	0.756	100	18.3	LOS B	41.2	294.2	Full	260	0.0	16.2
Lane 5	9	0.0	142	0.062	100	67.1	LOS E	0.5	3.8	Short	35	0.0	NA
Approach	1976	3.1		0.756		17.8	LOS B	42.2	301.0				
West: Esmonde Rd west													
Lane 1	902	2.5	1213	0.744	100	18.2	LOS B	40.8	291.9	Full	302	0.0	1.9
Lane 2	799	2.5	1075[1]	0.744	100	16.5	LOS B	32.8	234.8	Full	302	0.0	0.0
Lane 3	146	0.0	193	0.760	100	73.6	LOS E	10.1	71.0	Short	90	0.0	NA
Approach	1847	2.3		0.760		21.9	LOS C	40.8	291.9				
Intersection	4056	2.5		0.760		21.6	LOS C	42.2	301.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

8 Probability of Blockage has been set on the basis of a queue that overflows from a short lane.

Approach Lane Flows (veh/h)

South: Harbourside Church

Mov: From S To Exit:	L2 W	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov Lane No.
Lane 1	161	-	161	0.0	423[1]	0.380	100	100.0	2
Lane 2	-	72	72	0.0	177[1]	0.407	100	NA	NA
Approach	161	72	233	0.0		0.407			

East: Esmonde Rd East

Mov: From E To Exit:	L2 S	T1 W	U E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov Lane No.
Lane 1	125	-	-	125	0.0	1497	0.083	100	0.0	2
Lane 2	-	19	-	19	100.0	747	0.025	100	NA	NA
Lane 3	-	917	-	917	2.3	1214	0.756	100	NA	NA
Lane 4	-	906	-	906	2.3	1199[1]	0.756	100	NA	NA
Lane 5	-	-	9	9	0.0	142	0.062	100	0.0	4
Approach	125	1842	9	1976	3.1		0.756			

West: Esmonde Rd west

Mov: From W To Exit:	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov Lane No.
Lane 1	902	-	902	2.5	1213	0.744	100	NA	NA
Lane 2	799	-	799	2.5	1075[1]	0.744	100	NA	NA
Lane 3	-	146	146	0.0	193	0.760	100	0.0	2
Approach	1701	146	1847	2.3		0.760			

	Total	%HV	Deg. Satn (v/c)
Intersection	4056	2.5	0.760

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Harbourside Church Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Esmonde Rd East Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Esmonde Rd west Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										

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MOVEMENT SUMMARY

Site: 101 [AM 2019 Base (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 91 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	5	0	5	0.0	0.007	6.7	LOS A	0.0	0.3	0.26	0.55	0.26	41.1
3	R2	9	2	9	22.2	↑0.040	41.6	LOS D	0.4	2.9	0.89	0.66	0.89	19.9
Approach		14	2	14	14.3	0.040	29.2	LOS C	0.4	2.9	0.66	0.62	0.66	24.8
East: Esmonde Rd East														
4	L2	18	1	18	5.6	0.010	4.7	LOS A	0.0	0.3	0.09	0.51	0.09	42.4
5	T1	1338	62	1339	4.7	↑0.534	8.6	LOS A	15.4	111.3	0.57	0.51	0.57	41.4
6u	U	4	0	4	0.0	0.053	53.1	LOS D	0.2	1.3	0.97	0.64	0.97	20.7
Approach		1360	63	1361	4.7	0.534	8.7	LOS A	15.4	111.3	0.58	0.51	0.58	41.3
West: Esmonde Rd west														
11	T1	1176	56	1177	4.8	0.474	8.2	LOS A	12.8	93.2	0.53	0.48	0.53	41.8
12	R2	23	1	23	4.3	↑0.292	53.0	LOS D	1.3	9.4	0.99	0.71	0.99	18.0
12u	U	4	1	4	25.0	0.292	54.6	LOS D	1.3	9.4	0.99	0.71	0.99	22.5
Approach		1203	58	1204	4.9	0.474	9.2	LOS A	12.8	93.2	0.54	0.49	0.54	40.9
All Vehicles		2577	123	2578	4.8	0.534	9.0	LOS A	15.4	111.3	0.55	0.50	0.55	41.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

↑ Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Harbourside Church												
P1	Full	50	53	38.9	LOS D	0.1	0.1	0.93	0.93	60.8	28.5	0.47
West: Esmonde Rd west												
P4	Full	50	53	38.9	LOS D	0.1	0.1	0.93	0.93	70.4	41.0	0.58
All Pedestrians		100	105	38.9	LOS D	0.1	0.1	0.93	0.93	65.6	34.8	0.53

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [IP 2019 Base (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 97 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	25	0	25	0.0	0.013	4.5	LOS A	0.0	0.2	0.03	0.50	0.03	43.7
3	R2	6	0	6	0.0	0.053	52.8	LOS D	0.3	2.0	0.96	0.65	0.96	17.2
Approach		31	0	31	0.0	0.053	13.9	LOS B	0.3	2.0	0.21	0.53	0.21	34.3
East: Esmonde Rd East														
4	L2	9	1	9	11.1	0.005	4.6	LOS A	0.0	0.1	0.03	0.50	0.03	42.3
5	T1	1368	57	1368	4.2	*0.439	2.5	LOS A	8.7	63.2	0.30	0.27	0.30	47.2
6u	U	6	0	6	0.0	0.210	64.9	LOS E	0.3	2.3	1.00	0.65	1.00	18.4
Approach		1383	58	1383	4.2	0.439	2.7	LOS A	8.7	63.2	0.30	0.27	0.30	46.9
West: Esmonde Rd west														
11	T1	1287	54	1287	4.2	0.413	2.4	LOS A	7.9	57.6	0.29	0.26	0.29	47.3
12	R2	22	1	22	4.5	*0.752	65.9	LOS E	1.5	11.0	1.00	0.82	1.45	15.6
12u	U	4	1	4	25.0	0.752	67.5	LOS E	1.5	11.0	1.00	0.82	1.45	20.0
Approach		1313	56	1313	4.3	0.752	3.7	LOS A	7.9	57.6	0.30	0.27	0.31	45.9
All Vehicles		2727	114	2728	4.2	0.752	3.3	LOS A	8.7	63.2	0.30	0.28	0.30	46.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Harbourside Church												
P1	Full	50	53	41.8	LOS E	0.1	0.1	0.93	0.93	63.8	28.5	0.45
West: Esmonde Rd west												
P4	Full	50	53	41.8	LOS E	0.1	0.1	0.93	0.93	73.4	41.0	0.56
All Pedestrians		100	105	41.8	LOS E	0.1	0.1	0.93	0.93	68.6	34.8	0.51

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [PM 2019 Base (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 148 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h]	INPUT VOLUMES [HV] veh/h	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS [HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE [Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	17	1	17	5.9	0.035	7.6	LOS A	0.2	1.8	0.24	0.56	0.24	40.1
3	R2	11	0	11	0.0	*0.055	68.7	LOS E	0.7	5.0	0.93	0.68	0.93	14.4
Approach		28	1	28	3.6	0.055	31.6	LOS C	0.7	5.0	0.51	0.60	0.51	24.2
East: Esmonde Rd East														
4	L2	13	0	13	0.0	0.007	4.6	LOS A	0.0	0.2	0.06	0.51	0.06	42.9
5	T1	1547	50	1548	3.3	*0.533	7.6	LOS A	22.1	157.4	0.44	0.41	0.44	42.2
6u	U	7	0	7	0.0	0.150	87.0	LOS F	0.5	3.7	1.00	0.66	1.00	15.2
Approach		1567	50	1568	3.2	0.533	8.0	LOS A	22.1	157.4	0.44	0.41	0.44	41.9
West: Esmonde Rd west														
11	T1	1428	35	1429	2.5	0.496	7.3	LOS A	19.5	139.5	0.42	0.39	0.42	42.5
12	R2	13	0	13	0.0	*0.358	86.2	LOS F	1.6	10.9	1.00	0.70	1.00	12.9
12u	U	7	0	7	0.0	0.358	87.7	LOS F	1.6	10.9	1.00	0.70	1.00	16.9
Approach		1448	35	1449	2.5	0.496	8.4	LOS A	19.5	139.5	0.43	0.39	0.43	41.5
All Vehicles		3043	86	3045	2.9	0.533	8.4	LOS A	22.1	157.4	0.44	0.40	0.44	41.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Harbourside Church												
P1	Full	50	53	67.3	LOS F	0.2	0.2	0.95	0.95	89.2	28.5	0.32
West: Esmonde Rd west												
P4	Full	50	53	67.3	LOS F	0.2	0.2	0.95	0.95	98.9	41.0	0.41
All Pedestrians		100	105	67.3	LOS F	0.2	0.2	0.95	0.95	94.0	34.8	0.37

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [Sat 2019 Base (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 102 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h]	INPUT VOLUMES [HV] veh/h	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS [HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	12	0	12	0.0	0.021	6.8	LOS A	0.1	0.8	0.25	0.56	0.25	41.1
3	R2	2	0	2	0.0	0.010	48.6	LOS D	0.1	0.6	0.91	0.61	0.91	18.2
Approach		14	0	14	0.0	0.021	12.7	LOS B	0.1	0.8	0.34	0.56	0.34	35.3
East: Esmonde Rd East														
4	L2	1	0	1	0.0	0.001	4.7	LOS A	0.0	0.0	0.08	0.50	0.08	42.8
5	T1	1432	60	1432	4.2	* 0.522	6.5	LOS A	15.5	111.9	0.48	0.44	0.48	43.2
6u	U	3	0	3	0.0	0.055	61.2	LOS E	0.2	1.1	0.98	0.63	0.98	19.1
Approach		1436	60	1436	4.2	0.522	6.6	LOS A	15.5	111.9	0.48	0.44	0.48	43.1
West: Esmonde Rd west														
11	T1	1358	57	1358	4.2	0.496	6.3	LOS A	14.2	103.3	0.46	0.42	0.46	43.4
12	R2	57	3	57	5.3	* 0.888	69.3	LOS E	3.6	26.6	1.00	0.98	1.64	15.1
12u	U	4	1	4	25.0	0.888	70.9	LOS E	3.6	26.6	1.00	0.98	1.64	19.4
Approach		1419	61	1419	4.3	0.888	9.1	LOS A	14.2	103.3	0.49	0.45	0.51	40.9
All Vehicles		2869	121	2870	4.2	0.888	7.9	LOS A	15.5	111.9	0.48	0.44	0.50	42.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Harbourside Church												
P1	Full	50	53	44.3	LOS E	0.1	0.1	0.93	0.93	66.3	28.5	0.43
West: Esmonde Rd west												
P4	Full	50	53	44.3	LOS E	0.1	0.1	0.93	0.93	75.9	41.0	0.54
All Pedestrians		100	105	44.3	LOS E	0.1	0.1	0.93	0.93	71.1	34.8	0.49

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [AM 2023 Base Case - Existing Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 158 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h]	INPUT VOLUMES [HV] veh/h	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS [HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE [Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	5	0	5	0.0	0.009	8.1	LOS A	0.1	0.5	0.25	0.55	0.25	39.7
3	R2	10	2	10	20.0	*0.051	71.2	LOS E	0.7	5.6	0.91	0.67	0.91	14.0
Approach		15	2	15	13.3	0.051	50.2	LOS D	0.7	5.6	0.69	0.63	0.69	18.2
East: Esmonde Rd East														
4	L2	19	1	19	5.3	0.011	4.9	LOS A	0.1	0.6	0.09	0.51	0.09	42.4
5	T1	1448	67	1449	4.7	*0.524	9.8	LOS A	23.8	171.9	0.48	0.44	0.48	40.4
6u	U	4	0	4	0.0	0.076	89.9	LOS F	0.3	2.2	0.99	0.64	0.99	14.9
Approach		1471	68	1472	4.7	0.524	10.0	LOS A	23.8	171.9	0.47	0.44	0.47	40.2
West: Esmonde Rd west														
11	T1	1273	61	1274	4.8	0.466	9.3	LOS A	19.6	143.1	0.45	0.41	0.45	40.9
12	R2	25	1	25	4.0	*0.450	90.7	LOS F	2.4	17.6	1.00	0.72	1.00	12.4
12u	U	4	1	4	25.0	0.450	92.3	LOS F	2.4	17.6	1.00	0.72	1.00	16.3
Approach		1302	63	1303	4.9	0.465	11.1	LOS B	19.6	143.1	0.46	0.42	0.46	39.4
All Vehicles		2788	133	2789	4.8	0.524	10.7	LOS B	23.8	171.9	0.47	0.43	0.47	39.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Harbourside Church												
P1	Full	50	53	72.3	LOS F	0.2	0.2	0.96	0.96	94.2	28.5	0.30
West: Esmonde Rd west												
P4	Full	50	53	72.3	LOS F	0.2	0.2	0.96	0.96	103.9	41.0	0.39
All Pedestrians		100	105	72.3	LOS F	0.2	0.2	0.96	0.96	99.0	34.8	0.35

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [IP 2023 Base Case - Existing Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 158 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h]	INPUT VOLUMES [HV] veh/h	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS [HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE [Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	27	0	27	0.0	0.051	8.6	LOS A	0.5	3.2	0.27	0.57	0.27	39.2
3	R2	6	0	6	0.0	0.027	70.3	LOS E	0.4	2.8	0.91	0.65	0.91	14.1
Approach		33	0	33	0.0	0.051	19.8	LOS B	0.5	3.2	0.39	0.59	0.39	30.3
East: Esmonde Rd East														
4	L2	10	1	10	10.0	0.006	4.9	LOS A	0.0	0.3	0.09	0.51	0.09	42.1
5	T1	1480	61	1480	4.1	0.539	10.0	LOS B	24.9	180.0	0.48	0.45	0.48	40.3
6u	U	6	0	6	0.0	0.114	90.5	LOS F	0.5	3.4	0.99	0.66	0.99	14.8
Approach		1496	62	1496	4.2	0.539	10.3	LOS B	24.9	180.0	0.48	0.45	0.48	40.0
West: Esmonde Rd west														
11	T1	1393	58	1393	4.2	0.515	9.7	LOS A	23.1	167.6	0.47	0.43	0.47	40.5
12	R2	24	1	24	4.2	0.436	90.6	LOS F	2.3	17.0	1.00	0.72	1.00	12.4
12u	U	4	1	4	25.0	0.436	92.3	LOS F	2.3	17.0	1.00	0.72	1.00	16.4
Approach		1421	60	1421	4.2	0.515	11.3	LOS B	23.1	167.6	0.48	0.44	0.48	39.2
All Vehicles		2950	122	2951	4.2	0.539	10.9	LOS B	24.9	180.0	0.48	0.44	0.48	39.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Harbourside Church												
P1	Full	50	53	72.3	LOS F	0.2	0.2	0.96	0.96	94.2	28.5	0.30
West: Esmonde Rd west												
P4	Full	50	53	72.3	LOS F	0.2	0.2	0.96	0.96	103.9	41.0	0.39
All Pedestrians		100	105	72.3	LOS F	0.2	0.2	0.96	0.96	99.0	34.8	0.35

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [PM 2023 Base Case - Existing Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 158 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h]	INPUT VOLUMES HV] veh/h	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	18	1	18	5.6	0.039	10.2	LOS B	0.4	2.7	0.31	0.58	0.31	37.6
3	R2	12	0	12	0.0	*0.054	70.8	LOS E	0.8	5.7	0.91	0.68	0.91	14.1
Approach		30	1	30	3.3	0.054	34.4	LOS C	0.8	5.7	0.55	0.62	0.55	23.1
East: Esmonde Rd East														
4	L2	14	0	14	0.0	0.008	4.8	LOS A	0.1	0.4	0.09	0.51	0.09	42.7
5	T1	1674	54	1675	3.3	*0.600	10.8	LOS B	30.2	215.6	0.52	0.48	0.52	39.7
6u	U	8	0	8	0.0	0.152	90.9	LOS F	0.6	4.5	0.99	0.67	0.99	14.7
Approach		1696	54	1697	3.2	0.600	11.1	LOS B	30.2	215.6	0.52	0.48	0.52	39.4
West: Esmonde Rd west														
11	T1	1546	38	1547	2.5	0.564	10.3	LOS B	27.1	193.9	0.50	0.46	0.50	40.1
12	R2	14	0	14	0.0	*0.352	90.2	LOS F	1.8	12.7	1.00	0.71	1.00	12.5
12u	U	8	0	8	0.0	0.352	91.6	LOS F	1.8	12.7	1.00	0.71	1.00	16.5
Approach		1568	38	1569	2.5	0.564	11.4	LOS B	27.1	193.9	0.51	0.46	0.51	39.2
All Vehicles		3294	93	3296	2.9	0.600	11.5	LOS B	30.2	215.6	0.51	0.48	0.51	39.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Harbourside Church												
P1	Full	50	53	72.3	LOS F	0.2	0.2	0.96	0.96	94.2	28.5	0.30
West: Esmonde Rd west												
P4	Full	50	53	72.3	LOS F	0.2	0.2	0.96	0.96	103.9	41.0	0.39
All Pedestrians		100	105	72.3	LOS F	0.2	0.2	0.96	0.96	99.0	34.8	0.35

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [Sat 2023 Base Case - Existing Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 107 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h]	INPUT VOLUMES HV] veh/h	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	13	0	13	0.0	0.022	10.4	LOS B	0.2	1.5	0.39	0.59	0.39	37.5
3	R2	2	0	2	0.0	0.007	46.0	LOS D	0.1	0.6	0.87	0.61	0.87	18.8
Approach		15	0	15	0.0	0.022	15.1	LOS B	0.2	1.5	0.45	0.59	0.45	33.4
East: Esmonde Rd East														
4	L2	1	0	1	0.0	0.001	5.1	LOS A	0.0	0.0	0.14	0.51	0.14	42.4
5	T1	1550	65	1550	4.2	↑0.654	13.4	LOS B	25.3	182.8	0.68	0.63	0.68	37.8
6u	U	3	0	3	0.0	0.039	60.4	LOS E	0.2	1.1	0.97	0.63	0.97	19.2
Approach		1554	65	1554	4.2	0.654	13.5	LOS B	25.3	182.8	0.68	0.63	0.68	37.7
West: Esmonde Rd west														
11	T1	1469	61	1469	4.2	0.640	13.0	LOS B	24.3	176.1	0.66	0.61	0.66	38.1
12	R2	61	3	61	4.9	↑0.659	63.2	LOS E	3.7	27.0	1.00	0.82	1.14	16.1
12u	U	4	1	4	25.0	0.659	64.8	LOS E	3.7	27.0	1.00	0.82	1.14	20.5
Approach		1534	65	1534	4.3	0.659	15.1	LOS B	24.3	176.1	0.68	0.61	0.68	36.5
All Vehicles		3103	130	3104	4.2	0.659	14.3	LOS B	25.3	182.8	0.68	0.62	0.68	37.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

↑ Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Harbourside Church												
P1	Full	50	53	46.8	LOS E	0.1	0.1	0.94	0.94	68.8	28.5	0.41
West: Esmonde Rd west												
P4	Full	50	53	46.8	LOS E	0.1	0.1	0.94	0.94	78.4	41.0	0.52
All Pedestrians		100	105	46.8	LOS E	0.1	0.1	0.94	0.94	73.6	34.8	0.47

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [AM 2023 Base Case - Existing Layout 20% (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 158 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h]	INPUT VOLUMES [HV] veh/h	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS [HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE [Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	6	0	6	0.0	0.013	10.8	LOS B	0.1	0.9	0.32	0.57	0.32	37.1
3	R2	12	2	12	16.7	0.060	71.3	LOS E	0.8	6.6	0.91	0.68	0.91	14.0
Approach		18	2	18	11.1	0.060	51.1	LOS D	0.8	6.6	0.72	0.64	0.72	18.0
East: Esmonde Rd East														
4	L2	23	1	23	4.3	0.013	4.9	LOS A	0.1	0.7	0.09	0.51	0.09	42.4
5	T1	1737	80	1738	4.6	0.628	11.2	LOS B	32.5	235.4	0.54	0.51	0.54	39.4
6u	U	5	0	5	0.0	0.095	90.2	LOS F	0.4	2.8	0.99	0.65	0.99	14.8
Approach		1765	81	1766	4.6	0.628	11.4	LOS B	32.5	235.4	0.54	0.51	0.54	39.2
West: Esmonde Rd west														
11	T1	1527	73	1528	4.8	0.569	10.3	LOS B	27.1	197.9	0.50	0.46	0.50	40.0
12	R2	30	1	30	3.3	0.540	91.3	LOS F	2.9	21.2	1.00	0.74	1.03	12.4
12u	U	5	1	5	20.0	0.540	92.9	LOS F	2.9	21.2	1.00	0.74	1.03	16.3
Approach		1562	75	1563	4.8	0.569	12.2	LOS B	27.1	197.9	0.51	0.47	0.51	38.6
All Vehicles		3345	158	3347	4.8	0.628	11.9	LOS B	32.5	235.4	0.53	0.49	0.53	38.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Harbourside Church												
P1	Full	50	53	72.3	LOS F	0.2	0.2	0.96	0.96	94.2	28.5	0.30
West: Esmonde Rd west												
P4	Full	50	53	72.3	LOS F	0.2	0.2	0.96	0.96	103.9	41.0	0.39
All Pedestrians		100	105	72.3	LOS F	0.2	0.2	0.96	0.96	99.0	34.8	0.35

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [PM 2023 Base Case - Existing Layout 20% (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 158 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h]	INPUT VOLUMES [HV] veh/h	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS [HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	18	1	18	5.6	0.045	15.0	LOS B	0.5	3.7	0.41	0.61	0.41	33.6
3	R2	12	0	12	0.0	*0.054	70.8	LOS E	0.8	5.7	0.91	0.68	0.91	14.1
Approach		30	1	30	3.3	0.054	37.3	LOS D	0.8	5.7	0.61	0.64	0.61	22.1
East: Esmonde Rd East														
4	L2	14	0	14	0.0	0.008	4.8	LOS A	0.1	0.4	0.09	0.51	0.09	42.7
5	T1	2009	65	2010	3.3	*0.719	12.7	LOS B	42.9	305.9	0.62	0.58	0.62	38.3
6u	U	8	0	8	0.0	0.152	90.9	LOS F	0.6	4.5	0.99	0.67	0.99	14.7
Approach		2031	65	2032	3.2	0.719	13.0	LOS B	42.9	305.9	0.61	0.58	0.61	38.1
West: Esmonde Rd west														
11	T1	1856	46	1857	2.5	0.676	11.9	LOS B	37.7	269.7	0.58	0.54	0.58	38.8
12	R2	14	0	14	0.0	*0.352	90.2	LOS F	1.8	12.7	1.00	0.71	1.00	12.5
12u	U	8	0	8	0.0	0.352	91.6	LOS F	1.8	12.7	1.00	0.71	1.00	16.5
Approach		1878	46	1879	2.5	0.676	12.9	LOS B	37.7	269.7	0.58	0.54	0.58	38.1
All Vehicles		3939	112	3941	2.9	0.719	13.1	LOS B	42.9	305.9	0.60	0.56	0.60	37.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Harbourside Church												
P1	Full	50	53	72.3	LOS F	0.2	0.2	0.96	0.96	94.2	28.5	0.30
West: Esmonde Rd west												
P4	Full	50	53	72.3	LOS F	0.2	0.2	0.96	0.96	103.9	41.0	0.39
All Pedestrians		100	105	72.3	LOS F	0.2	0.2	0.96	0.96	99.0	34.8	0.35

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [AM 2023 Development - Proposed Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 91 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h]	INPUT VOLUMES HV] veh/h	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	149	0	149	0.0	0.282	28.9	LOS C	5.0	34.8	0.79	0.75	0.79	23.2
3	R2	67	0	67	0.0	*0.236	40.9	LOS D	2.7	18.8	0.92	0.74	0.92	18.1
Approach		216	0	216	0.0	0.282	32.6	LOS C	5.0	34.8	0.83	0.75	0.83	21.5
East: Esmonde Rd East														
4	L2	94	0	94	0.0	0.065	7.0	LOS A	0.9	6.6	0.24	0.60	0.24	36.1
5	T1	1448	67	1449	4.7	*0.680	15.1	LOS B	22.6	163.4	0.76	0.69	0.76	36.6
6u	U	4	0	4	0.0	0.033	48.6	LOS D	0.2	1.2	0.94	0.65	0.94	21.8
Approach		1546	67	1547	4.4	0.680	14.7	LOS B	22.6	163.4	0.73	0.69	0.73	36.6
West: Esmonde Rd west														
11	T1	1273	61	1274	4.8	0.604	14.2	LOS B	18.7	136.1	0.72	0.65	0.72	37.2
12	R2	110	0	110	0.0	*0.663	51.4	LOS D	5.1	35.8	1.00	0.83	1.11	16.4
Approach		1383	61	1384	4.5	0.663	17.2	LOS B	18.7	136.1	0.74	0.66	0.75	35.0
All Vehicles		3145	128	3146	4.1	0.680	17.0	LOS B	22.6	163.4	0.74	0.68	0.75	34.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Harbourside Church												
P1	Full	50	53	38.9	LOS D	0.1	0.1	0.93	0.93	60.8	28.5	0.47
West: Esmonde Rd west												
P4	Full	50	53	38.9	LOS D	0.1	0.1	0.93	0.93	70.4	41.0	0.58
All Pedestrians		100	105	38.9	LOS D	0.1	0.1	0.93	0.93	65.6	34.8	0.53

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [IP 2023 Development - Proposed Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h]	HV] veh/h	DEMAND FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	131	0	131	0.0	0.243	29.0	LOS C	4.3	30.3	0.79	0.74	0.79	23.2
3	R2	59	0	59	0.0	* 0.205	40.1	LOS D	2.3	16.3	0.91	0.74	0.91	18.4
Approach		190	0	190	0.0	0.243	32.4	LOS C	4.3	30.3	0.83	0.74	0.83	21.6
East: Esmonde Rd East														
4	L2	87	0	87	0.0	0.060	6.8	LOS A	0.8	5.8	0.23	0.59	0.23	36.4
5	T1	1480	61	1480	4.1	* 0.691	14.8	LOS B	23.1	166.8	0.77	0.70	0.77	36.8
6u	U	6	0	6	0.0	0.056	49.7	LOS D	0.3	1.8	0.95	0.66	0.95	21.5
Approach		1573	61	1573	3.9	0.691	14.5	LOS B	23.1	166.8	0.74	0.69	0.74	36.7
West: Esmonde Rd west														
11	T1	1393	58	1393	4.2	0.651	14.3	LOS B	20.9	151.4	0.74	0.67	0.74	37.2
12	R2	102	0	102	0.0	* 0.695	52.4	LOS D	4.8	33.5	1.00	0.85	1.16	16.2
Approach		1495	58	1495	3.9	0.695	16.9	LOS B	20.9	151.4	0.76	0.68	0.77	35.2
All Vehicles		3258	119	3258	3.7	0.695	16.7	LOS B	23.1	166.8	0.75	0.69	0.76	35.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Harbourside Church												
P1	Full	50	53	38.4	LOS D	0.1	0.1	0.92	0.92	60.3	28.5	0.47
West: Esmonde Rd west												
P4	Full	50	53	38.4	LOS D	0.1	0.1	0.92	0.92	69.9	41.0	0.59
All Pedestrians		100	105	38.4	LOS D	0.1	0.1	0.92	0.92	65.1	34.8	0.53

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [PM 2023 Development - Proposed Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 146 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h]	INPUT VOLUMES HV [veh/h]	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV [%]	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist [m]	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	134	0	134	0.0	0.321	48.3	LOS D	7.4	52.1	0.83	0.76	0.83	17.2
3	R2	60	0	60	0.0	*0.271	65.7	LOS E	3.9	27.3	0.94	0.75	0.94	13.1
Approach		194	0	194	0.0	0.321	53.7	LOS D	7.4	52.1	0.86	0.76	0.86	15.8
East: Esmonde Rd East														
4	L2	104	0	104	0.0	0.068	7.1	LOS A	1.3	9.4	0.20	0.59	0.20	36.0
5	T1	1674	54	1675	3.3	*0.671	16.5	LOS B	36.0	256.8	0.67	0.62	0.67	35.8
6u	U	8	0	8	0.0	0.060	72.0	LOS E	0.5	3.7	0.94	0.68	0.94	17.2
Approach		1786	54	1787	3.1	0.671	16.2	LOS B	36.0	256.8	0.64	0.62	0.64	35.6
West: Esmonde Rd west														
11	T1	1546	38	1547	2.5	0.658	15.8	LOS B	34.8	248.8	0.64	0.59	0.64	36.2
12	R2	122	0	122	0.0	*0.675	76.3	LOS E	8.8	61.4	1.00	0.82	1.06	12.5
Approach		1668	38	1669	2.3	0.675	20.2	LOS C	34.8	248.8	0.67	0.61	0.67	33.2
All Vehicles		3648	92	3650	2.6	0.675	20.0	LOS C	36.0	256.8	0.67	0.62	0.67	33.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Harbourside Church												
P1	Full	50	53	66.3	LOS F	0.2	0.2	0.95	0.95	88.2	28.5	0.32
West: Esmonde Rd west												
P4	Full	50	53	66.3	LOS F	0.2	0.2	0.95	0.95	97.9	41.0	0.42
All Pedestrians		100	105	66.3	LOS F	0.2	0.2	0.95	0.95	93.0	34.8	0.37

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [Sat 2023 Development - Proposed Layout (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 91 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h]	INPUT VOLUMES HV] veh/h	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	145	0	145	0.0	0.272	28.9	LOS C	4.8	33.8	0.79	0.75	0.79	23.3
3	R2	65	0	65	0.0	*0.229	40.8	LOS D	2.6	18.2	0.92	0.74	0.92	18.2
Approach		210	0	210	0.0	0.272	32.6	LOS C	4.8	33.8	0.83	0.75	0.83	21.5
East: Esmonde Rd East														
4	L2	97	0	97	0.0	0.067	7.0	LOS A	1.0	6.8	0.24	0.60	0.24	36.1
5	T1	1550	65	1550	4.2	*0.731	15.9	LOS B	25.5	184.3	0.80	0.73	0.80	36.1
6u	U	3	0	3	0.0	0.025	48.4	LOS D	0.1	0.9	0.94	0.64	0.94	21.8
Approach		1650	65	1650	4.0	0.731	15.4	LOS B	25.5	184.3	0.77	0.72	0.77	36.1
West: Esmonde Rd west														
11	T1	1469	61	1469	4.2	0.721	15.4	LOS B	24.8	180.1	0.78	0.71	0.78	36.4
12	R2	113	0	113	0.0	*0.681	51.7	LOS D	5.3	37.0	1.00	0.84	1.13	16.4
Approach		1582	61	1582	3.9	0.721	18.0	LOS B	24.8	180.1	0.79	0.72	0.80	34.5
All Vehicles		3442	126	3442	3.7	0.731	17.7	LOS B	25.5	184.3	0.78	0.72	0.79	34.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Harbourside Church												
P1	Full	50	53	38.9	LOS D	0.1	0.1	0.93	0.93	60.8	28.5	0.47
West: Esmonde Rd west												
P4	Full	50	53	38.9	LOS D	0.1	0.1	0.93	0.93	70.4	41.0	0.58
All Pedestrians		100	105	38.9	LOS D	0.1	0.1	0.93	0.93	65.6	34.8	0.53

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [AM 2023 Development - Proposed Layout 20% (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 88 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h]	INPUT VOLUMES [HV] veh/h	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS [HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE [Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	149	0	179	0.0	0.343	27.8	LOS C	5.8	40.5	0.79	0.76	0.79	23.7
3	R2	67	0	80	0.0	*0.274	39.5	LOS D	3.1	21.9	0.92	0.75	0.92	18.5
Approach		216	0	259	0.0	0.343	31.4	LOS C	5.8	40.5	0.83	0.76	0.83	22.0
East: Esmonde Rd East														
4	L2	94	0	113	0.0	0.079	7.1	LOS A	1.1	8.0	0.26	0.60	0.26	36.0
5	T1	1448	67	1593	4.6	*0.768	16.9	LOS B	26.7	193.2	0.84	0.77	0.85	35.5
6u	U	4	0	4	0.0	0.035	47.0	LOS D	0.2	1.3	0.93	0.65	0.93	22.2
Approach		1546	67	1710	4.3	0.768	16.4	LOS B	26.7	193.2	0.80	0.76	0.81	35.5
West: Esmonde Rd west														
11	T1	1273	61	1400	4.8	0.688	15.5	LOS B	22.0	160.2	0.78	0.71	0.78	36.4
12	R2	110	0	132	0.0	*0.770	51.9	LOS D	6.1	43.0	1.00	0.91	1.25	16.3
Approach		1383	61	1532	4.4	0.770	18.7	LOS B	22.0	160.2	0.80	0.72	0.82	34.0
All Vehicles		3145	128	3502	4.0	0.770	18.5	LOS B	26.7	193.2	0.80	0.74	0.82	33.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Harbourside Church												
P1	Full	50	53	37.4	LOS D	0.1	0.1	0.92	0.92	59.3	28.5	0.48
West: Esmonde Rd west												
P4	Full	50	53	37.4	LOS D	0.1	0.1	0.92	0.92	68.9	41.0	0.60
All Pedestrians		100	105	37.4	LOS D	0.1	0.1	0.92	0.92	64.1	34.8	0.54

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [PM 2023 Development - Proposed Layout 20% (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 137 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Harbourside Church														
1	L2	134	0	161	0.0	0.380	45.1	LOS D	8.4	58.9	0.83	0.77	0.83	18.0
3	R2	60	0	72	0.0	*0.407	62.3	LOS E	4.4	31.0	0.95	0.75	0.95	13.6
Approach		194	0	233	0.0	0.407	50.4	LOS D	8.4	58.9	0.87	0.76	0.87	16.5
East: Esmonde Rd East														
4	L2	104	0	125	0.0	0.083	7.3	LOS A	1.6	11.5	0.22	0.59	0.22	35.8
5	T1	1674	54	1842	3.3	*0.756	18.3	LOS B	42.2	301.0	0.76	0.70	0.76	34.7
6u	U	8	0	9	0.0	0.062	67.1	LOS E	0.5	3.8	0.93	0.68	0.93	18.0
Approach		1786	54	1976	3.1	0.756	17.8	LOS B	42.2	301.0	0.72	0.70	0.72	34.6
West: Esmonde Rd west														
11	T1	1546	38	1701	2.5	0.744	17.4	LOS B	40.8	291.9	0.72	0.67	0.72	35.2
12	R2	122	0	146	0.0	*0.760	73.7	LOS E	10.1	71.0	1.00	0.87	1.14	12.8
Approach		1668	38	1847	2.3	0.760	21.9	LOS C	40.8	291.9	0.74	0.68	0.75	32.3
All Vehicles		3648	92	4056	2.5	0.760	21.6	LOS C	42.2	301.0	0.74	0.69	0.74	32.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Harbourside Church												
P1	Full	50	53	61.8	LOS F	0.2	0.2	0.95	0.95	83.7	28.5	0.34
West: Esmonde Rd west												
P4	Full	50	53	61.8	LOS F	0.2	0.2	0.95	0.95	93.4	41.0	0.44
All Pedestrians		100	105	61.8	LOS F	0.2	0.2	0.95	0.95	88.5	34.8	0.39

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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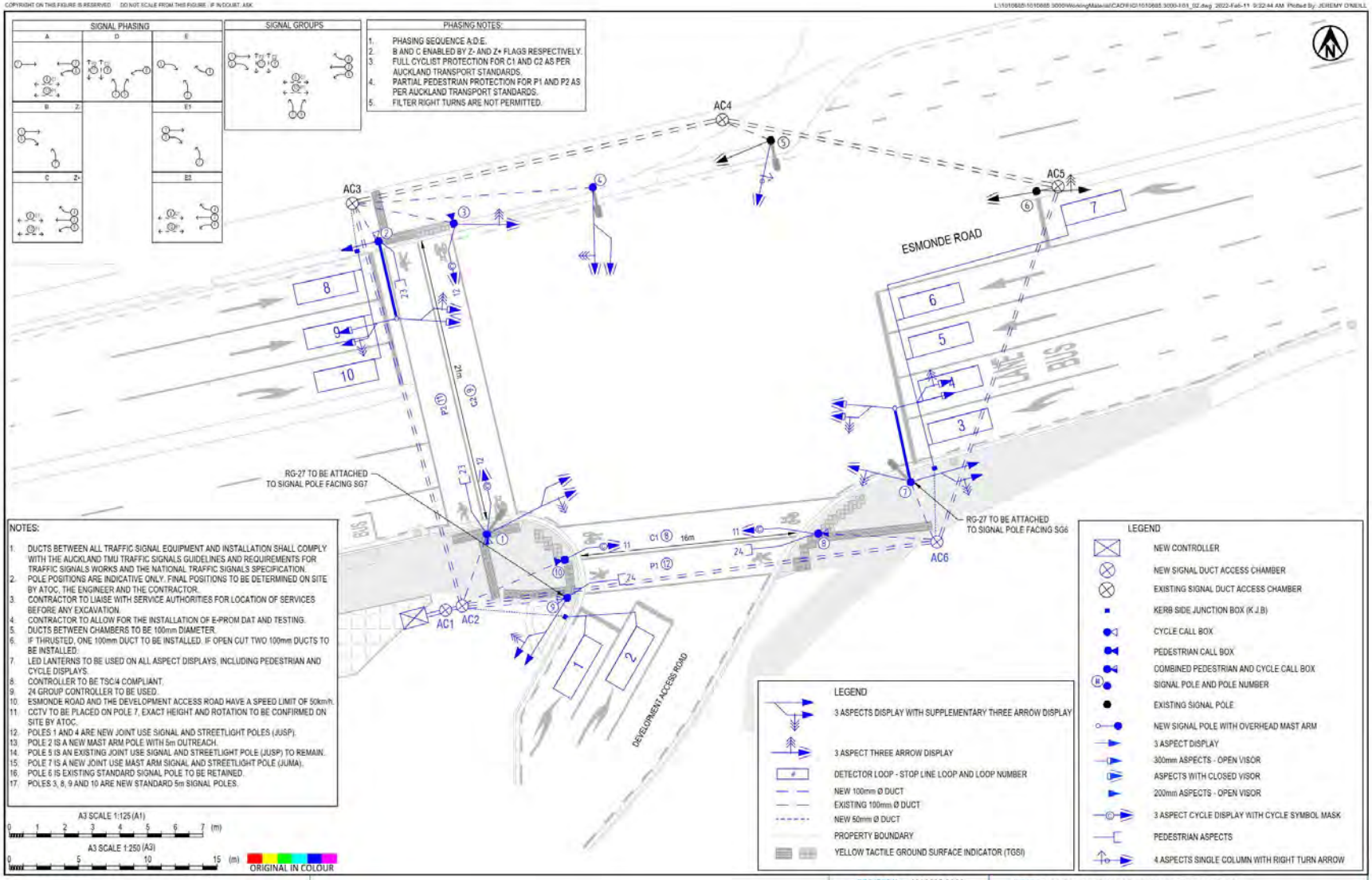
Appendix E: Traffic Signal Phasing Plans


TCS 1310
TAKAPUNA
NTHEST
SS=75
7 PHASES
A
E
B
E1
C
E2
D
1307
ESMONDE RD
ESMONDE RD
A
CHURCH
1912
1
2
3
4
5
6
7
8
9
10



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PROJECT No.	1010685.3000	
DESIGNED	MAAH	Feb.22
DRAWN	IARA	Feb.22
CHECKED	JEON	Feb. 22
NOT FOR CONSTRUCTION		
APPROVED	DATE	

CLIENT **KINGSTONE PROPERTY LIMITED**
PROJECT **48 ESMONDE ROAD, TAKAPUNA**
TITLE ESMONDE ROAD/ DEVELOPMENT ACCESS ROAD TRAFFIC SIGNAL PLAN
SCALE (A3) AS SHOWN FIG No. 1010685.3000-F01 REV 2

Appendix F Parking Management Plan

AMAIA, 48 Esmonde Road, Takapuna
On-Site Parking Management Plan (a part of the site operation Manual)

KBS Capital Limited is committed to develop its flagship project AMAIA at 48 Esmonde Road as a sustainable urban village of the 21st century. The village will be primarily a self-sufficient and high-density residential development with a limited number of non-residential uses in order to achieve a 'live-work-play' situation for its residents. The intention of the development is just not to create a group of buildings, but to create an interactive and resilient community which will minimise the necessity for vehicle trip generation and will be less dependent on private vehicles.

To achieve development's sustainability outcome, the adopted transport strategy and associated parking management plan at the operational stage would play an important role for the entire development. The objectives of this particular transport strategy are to:

- Absolute maximisation of foot and cycle traffic to and from the site.
- Absolute minimisation of vehicle traffic and associated trip generation to and from the site.
- Effective utilisation of public transport and other form of alternative transport modes, ie. shared car, cycle, shuttle bus etc. to reduce car dependency for both residents and visitors.

We are fully committed and determined to achieve the above objectives. In this respect, our proposed master plan for the site is designed to:

- Improve accessibility, connectivity and legibility for an integrated movement and open space network within and around the site not only for pedestrians and cyclists of the site, but also involving general public from outside the site.
- Ensure an effective connection of the proposed development with the current and future mass transit routes through Esmonde Road and the Akoranga Bus Station in the vicinity.

At the same time, we have adopted an effective 'on-site parking management plan' for operational purposes as soon as the development starts to function on site from day one. The backbone of this Plan is the proposed car parking allocations which are outlined below.

On-site car parking allocations – Amaia, Stages 1 and 2

Activity/parking type	Comments	Car park spaces
Short term managed Apartments	Pre-booked parking system for guest (managed via on-site staff and website)	14
Visitor spaces	Shared provision for visitor parking spaces for residents (pre-booking necessary, managed via on-site staff and mobile application)	5
Residential apartments	Some apartments will be sold without parking spaces with approximately half having dedicated spaces (0.55 spaces/apartment)	48
Accessible	Accessible parking only – all activities	3
Car Share	Dedicated for apartment residents	2
Convenience store	Dedicated (1 space per 30m²)	4
Café	Dedicated (1 space per 30m²)	4
Shuttle Bus	Dedicated for the whole development and can be used by general public to visit to and from the site (managed via on-site staff and website)	1
Total		**81**

The key aspects of this Plan are:

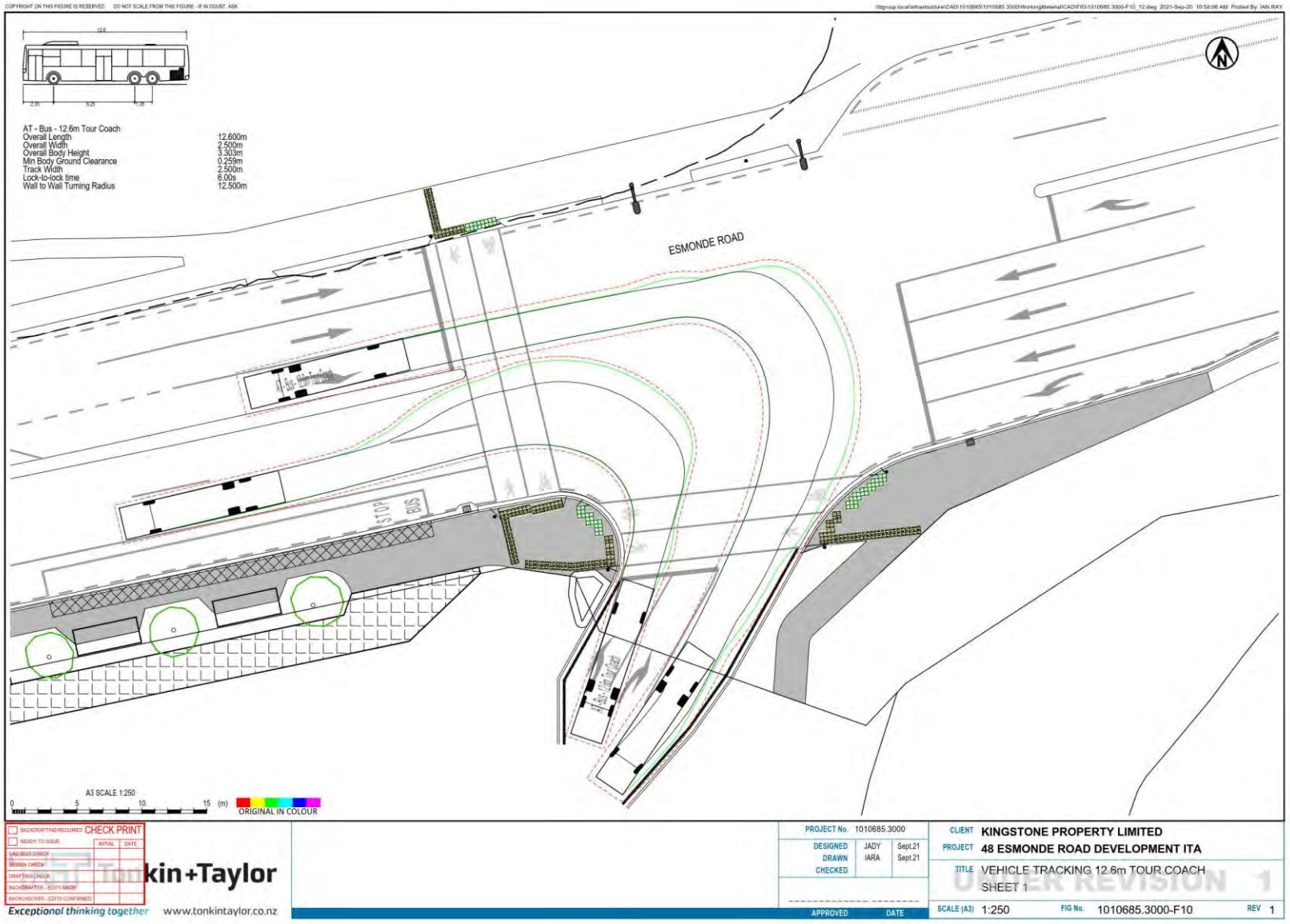
1. Limited number of on-site parking spaces for allocated activities and uses only.
2. All carparking spaces will be clearly marked with numbers and allocated users' names.
3. Only one vehicle entrance (entry and exit both) to the site will operate.
4. No person (including residents and visitors) will be allowed to enter into the site with a vehicle without the proof of a prior carpark space booking (ie. an Amaia tag attached to the front screen of the vehicle), and this message will be displayed by clear and appropriate signs at the vehicular entry point and various other communal spaces of Amaia.
5. An on-line carparking booking system will be used by all residents and visitors for pre-booking of parking spaces.
6. A swipe card will be required by residents and regular carparking users for entering into the dedicated parking area under the podium.
7. An on-line generated code will be required by visitors for entering into the dedicated parking area under the podium.
8. A shuttle bus service will be running from the site to the CBD, Takapuna Central, Albany Centre, Auckland Airport, Northcote, Baywater and Devonport Ferry Terminals, Akoranga, Smales Farm, Constellation Drive and Albany Bus Stations for residents and visitors.
9. A dedicated shuttle bus service will run twice a day between Amaia and Takapuna Central for the childcare centre, fitness centre, health centre and community facility users.
10. The shuttle bus service will require pre-booking by all users through the on-line system.
11. Two shared cars, five shared e-bikes and two shared kayaks will be available to hire by residents and regular users to the site.
12. The shared car, bike and kayak hiring service will require pre-booking by all users through the on-line system.
13. The bus stop on Esmonde Road will operate near the entrance of the site with a shelter on-top and a dedicated pathway and sign guiding bus users from the site to the shelter will be constructed.
14. The timetable for buses running through Esmonde Road and, to and from Akoranga Bus Station, and the ferry timetable for Northcote, Bayswater and Devonport will be available on the Amaia Website, on the community notice bords within the development and paper copies of these timetables will be available from the Amaia Site Management Office.
15. A publicly accessible walkway and cycleway through and around the site (within the esplanade reserve) will be informed, guided and legible by appropriate site amenity (seating, soft and hard landscapes, bike racks, drinking water fountains etc.) and directional signs.
16. The entire 'on-site parking management plan' of Amaia will be implemented and managed by the Amaia Body Corporate and will be administered by the on-site management office which will be attended by appropriate number of staffs during 24 hours a day and 7 days a week.

KBS Capital Ltd. has developed the 'On-Site Parking Management Plan' as part of Amaia's site operation manual.

(Edison Xin)

Managing Director
KBS Capital Limited

Appendix G Vehicle Tracking


COPYRIGHT ON THIS FIGURE IS RESERVED DO NOT SCALE FROM THIS FIGURE - IF IN DOUBT, ASK
AT - Bus - 12.6m Tour Coach
Overall Length 12.600m
Overall Width 2.500m
Overall Body Height 3.303m
Min Body Ground Clearance 0.259m
Track Width 2.500m
Lock-to-lock time 6.00s
Wall to Wall Turning Radius 12.500m
ESMONDE ROAD
STOP
BUS
A3 SCALE 1:250
0 5 10 15 (m)
ORIGINAL IN COLOUR
CHECK PRINT
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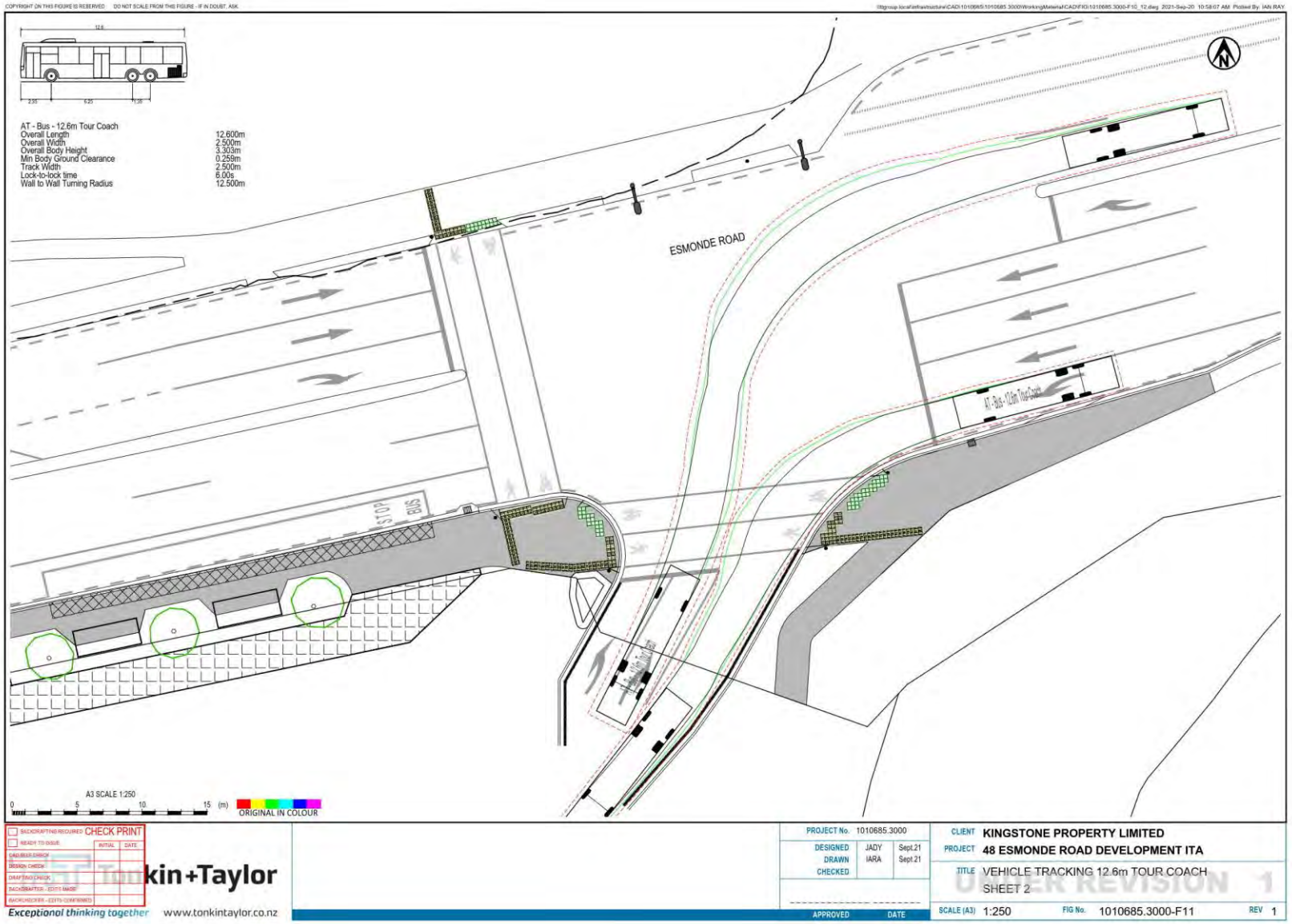
PROJECT No. 1010685.3000
DESIGNED JADY Sept.21
DRAWN IARA Sept.21
CHECKED
APPROVED DATE
CLIENT KINGSTONE PROPERTY LIMITED
PROJECT 48 ESMONDE ROAD DEVELOPMENT ITA
TITLE VEHICLE TRACKING 12.6m TOUR COACH SHEET 1
SCALE (A3) 1:250 FIG No. 1010685.3000-F10 REV 1


COPYRIGHT ON THIS FIGURE IS RESERVED DO NOT SCALE FROM THIS FIGURE - IF IN DOUBT, ASK
AT - Bus - 12.6m Tour Coach
Overall Length 12.600m
Overall Width 2.500m
Overall Body Height 3.303m
Min Body Ground Clearance 0.259m
Track Width 2.500m
Lock-to-lock time 6.00s
Wall to Wall Turning Radius 12.500m
ESMONDE ROAD
STOP
BUS
A3 SCALE 1:250
0 5 10 15 (m)
ORIGINAL IN COLOUR
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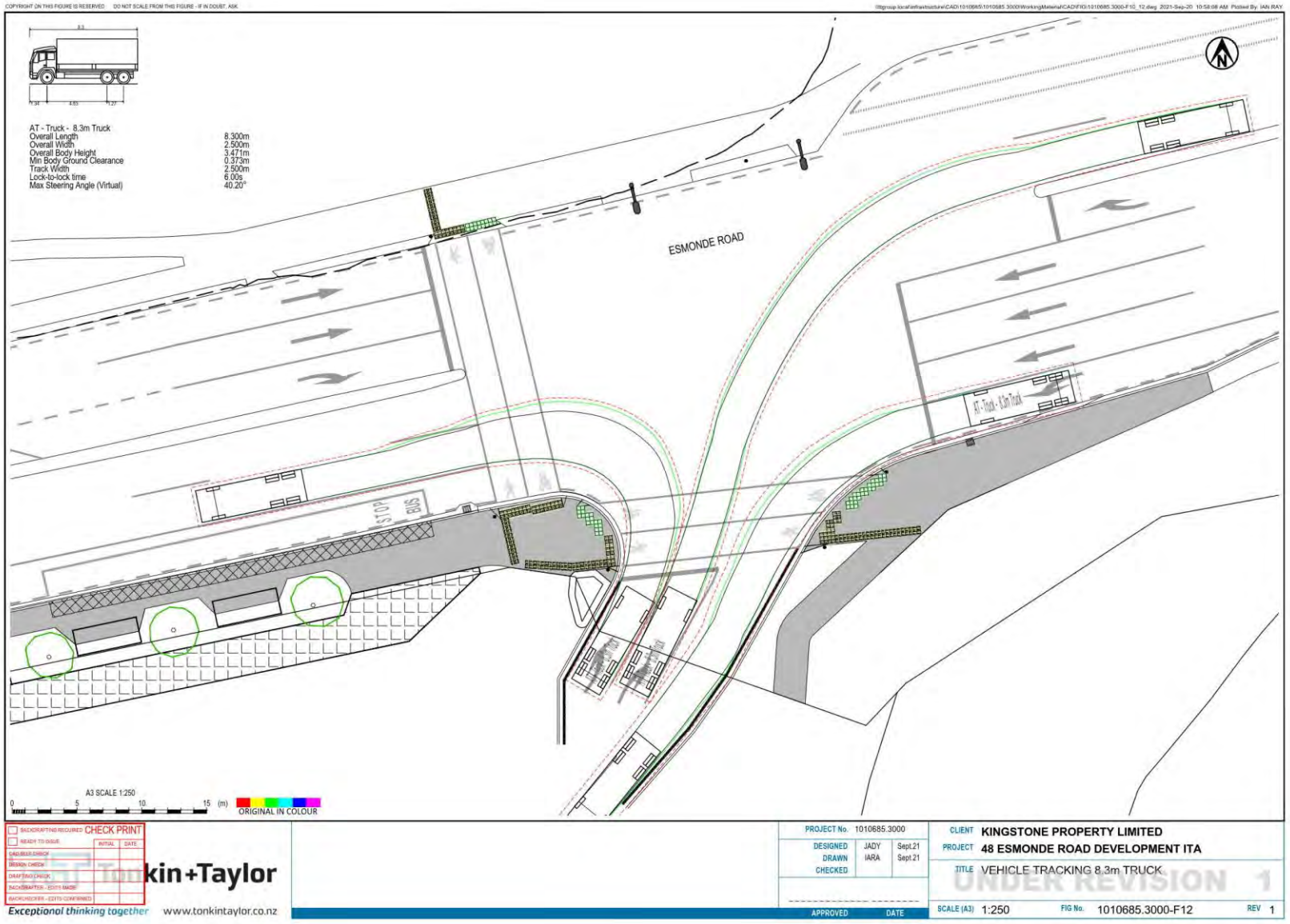
PROJECT 48 ESMONDE ROAD DEVELOPMENT ITA
TITLE VEHICLE TRACKING 12.6m TOUR COACH SHEET 2
SCALE (A3) 1:250 FIG No. 1010685.3000-F11 REV 1
UNDER REVISION


COPYRIGHT ON THIS FIGURE IS RESERVED. DO NOT SCALE FROM THIS FIGURE - IF IN DOUBT, ASK
AT - Truck - 8.3m Truck
Overall Length 8.300m
Overall Width 2.500m
Overall Body Height 3.471m
Min Body Ground Clearance 0.373m
Track Width 2.500m
Lock-to-lock time 6.00s
Max Steering Angle (Virtual) 40.20°
ESMONDE ROAD
STOP
BUS
AT - Truck - 8.3m Truck
A3 SCALE 1:250
0 5 10 15 (m)
ORIGINAL IN COLOUR
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PROJECT 48 ESMONDE ROAD DEVELOPMENT ITA
TITLE VEHICLE TRACKING 8.3m TRUCK
UNDER REVISION 1
SCALE (A3) 1:250
FIG No. 1010685.3000-F12
REV 1

Appendix H: Sliding Scale of Development

48 Esmonde Road - Sliding scale of development calculation

Red indicates land use changes assumed and the resultant changes in trip generation and car park spaces

ITA development assumption

	Residential apartments	Visitor accommodation	Ancillary uses	Total
No Units/GFA	356	192	2000	
Trip Generation (per unit/room/first principles per 100m2GFA)	0.29	1.20	4.30	
Peak hour trips	104	230	86	420

Scenario 1 more residential apartments, consented visitor accommodation, more ancillary uses

	Residential apartments	Visitor accommodation	Ancillary uses	Total
No Units/GFA	439	187	1257	
Trip Generation (per unit/room/first principles per 100m2GFA)	0.29	1.20	4.30	
Peak hour trips	142	224	54	420

Scenario 2 consented residential apartments, more visitor accommodation, consented ancillary uses

	Residential apartments	Visitor accommodation	Ancillary uses	Total
No Units/GFA	86	284	1257	
Trip Generation (per unit/room/first principles per 100m2GFA)	0.29	1.20	4.30	
Peak hour trips	25	341	54	420

Scenario 3 more residential apartments and consented visitor accommodation, more ancillary uses

	Residential apartments	Visitor accommodation	Ancillary uses	Total
No Units/GFA	379	187	2000	
Trip Generation (per unit/room/first principles per 100m2GFA)	0.29	1.20	4.30	
Peak hour trips	110	224	86	420

Scenario 4 consented residential apartments and more visitor accommodation, more ancillary uses

	Residential apartments	Visitor accommodation	Ancillary uses	Total
No Units/GFA	86	157	2000	
Trip Generation (per unit/room/first principles per 100m2GFA)	0.29	1.20	4.30	
Peak hour trips	25	308	86	419

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