TRAFFIC & TRANSPORT ASSESSMENT

CROSSHAVEN DEVELOPMENT

Cork County Council
C1003
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OCSC
O'CONNOR | SUTTON | CRONIN
Multidisciplinary
Consulting Engineers

TRAFFIC & TRANSPORT ASSESSMENT

CROSSHAVEN DEVELOPMENT

NOTICE

DOCUMENT CONTROL & HISTORY

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1 INTRODUCTION

APPOINTMENT

Cork County Council intends to apply for planning permission for development on this 0.93-hectare site in Crosshaven, Co. Cork.

O'Connor Sutton Cronin (OCSC) has been instructed to prepare a Traffic Impact Assessment for the proposed development.

DEVELOPMENT DESCRIPTION

The Development will consist of the following:

- The construction of 26 no. new residential units comprising 14 no. 1 bed units and 12 no. 3-bed units.
- The refurbishment of 7 no. existing residential cottages comprising of 7 no. 2 bed units.
- New access roads and junctions to connect the north and south of the site to the existing road network.
- Modifications to `Lower Road' access road junction and Coastguard Station access road.
- Hard landscaping including parking areas, turning bays, footpaths, boundary walls, access steps and street lighting.
- Soft landscaping, including green spaces, planting, and tress.
  Connection to public utilities.
- All associated site works.

ADMINISTRATIVE JURISDICTION

The site is located within the administrative jurisdiction of Cork County Council whose offices are located at County Hall, Carrigrohane Road, Cork.

SITE LOCATION

The subject site is located on the western side of Crosshaven, just south of the Yacht Club. Access to the site will be via Prospect Villas, and the Coast Guard access road which intersects with the R612. The site is immediately bound by:

- The R612, to the east;
- Coastguard Cottages, to the north;
- Crosshaven Coast Guard Station to the west; and
- Prospect Villas to the south.

The location of the site can be seen in the figure below:

Figure 1: Locality Plan

The purpose of this report is to provide a detailed and conservative assessment of the development proposals from a traffic perspective.

In carrying out the above, this assessment has given due consideration to the relevant guidelines including:

- *Traffic & Transport Assessment Guidelines (2014)* as published by the former National Roads Authority (NRA) now Transport Infrastructure Ireland (TII);
- *Guidelines for Traffic & Transportation Assessment (1997)* as published by the Chartered Institute of Highways & Transportation.

2 BACKGROUND TRAFFIC VOLUMES

Background traffic volumes are based on junction surveys conducted at locations in the study area. Details of the junction surveys used for this development are shown in Table 1:

No	Junction	Source	Survey Date	Survey Times
1	R612 Lower Road/Coast Guard Access Road	IDASO	15/12/2021	07:00 to 19:00
2	R612 Upper Road/Prospect Villas	IDASO	15/12/2021	07:00 to 19:00

Table 1: Junction Survey Details

An eight-fold classification system was used which recorded the following vehicle types:

- Bicycle
- Motorcycle
- Car
- Light Goods Vehicle
- OGV1
- OGV2
- Bus
- Taxi

The exact locations of these junctions are highlighted in Figure 2 overleaf.

Figure 2: Survey Locations

Junction surveys also include queue length surveys which recorded the maximum queue lengths observed on a per lane basis at each approach of each junction over 15-minute intervals as well as pedestrian crossing surveys.

A full copy of the results of all traffic surveys can be found in *Appendix A*, attached to this report.

The recorded flows during the above peak hours, and across the course of an average day are shown in the following:

- Diagram 1: 2021 A.M. Peak Hour Base Flows (08:00 – 9:00);
- Diagram 2: 2021 School Peak Hour Base Flows (14:00 – 15:00);
- Diagram 3: 2021 P.M. Peak Hour Base Flows (17:00 – 18:00);
- Diagram 4: 2021 Annual Average Daily Traffic Base Flows.

These diagrams, and all others referenced in this text, can be found in *Appendix B*, attached to this report. Any apparent discrepancy in flows between sites may be attributed to vehicles accessing developments and minor roads between surveyed junctions.

3 STUDY METHODOLOGY

The short-term traffic counts were expanded to Annual Average Daily Traffic (AADT) using expansion factors[1] from TII. The base year flows were then adjusted to the predicted Year of Opening for the development (2023) and the Design Year (2038) using medium-range TII growth factors[2]. This is conservative as traffic growth estimates are directly influenced by projections for economic activity which are now unlikely to be realised due to the impact of the global pandemic, while commuter patterns are also expected to be permanently impacted.

The traffic generation potential of the subject site was then assessed using the Trics[3] planning database. This database contains information on thousands of sites in Ireland and the U.K. and can be used to predict the traffic that will be generated by numerous types of development.

The estimated additional traffic was assigned to the local road network and its impact on the operation of the local links and junctions was assessed using guidance from TII, Dublin City Council, and the *Design Manual for Roads and Bridges* (DMRB), Junctions 9 and Transyt 15 traffic modelling software.

SCENARIOS

To assess the actual impact of the operational development on the local road network, three different years have been identified, and will be investigated as required:

- *Base Year (2021)* – The current performance of the local road network;
- *Year of Opening (2023)* – The performance of the local road network during the Year of Opening;
- *Design Year (2038)* – The performance of the local road network during the Design Year.

The future year assessments considered the following scenarios:

[1] Project Appraisal Guidelines for National Roads Unit 16.1 - Expansion Factors for Short Period Traffic Counts, TII (October 2016)
[2] Project Appraisal Guidelines for National Roads Unit 5.3 - Travel Demand Projections, TII (May 2019)
[3] **T**rip **R**ate **I**nformation **C**omputer **S**ystem

The future year assessments considered the following scenarios:

- *Do Nothing:* - This assessment allows for only normal background traffic growth, with no other developments in the area.
- *Do Something:* - This assessment allows for everything considered in the Do Nothing scenario, with the addition of the trips generated by the development.

TRAFFIC GROWTH

To accurately assess the impact of the proposed development in the future, the base traffic flows for the local network in 2021 have been expanded to the Year of Opening and the Design Year using the medium-range TII growth factors detailed in Table 2:

Year	Growth Rates	
	Light Vehicles	Heavy Vehicles
2021 - 2023	3.82%	7.68%
2021 - 2038	26.85%	58.41%

Table 2: Background Traffic Growth Factors

The application of the above growth factors should be further considered in the context of the Covid 19 pandemic which is expected to have a lasting impact on the traffic growth potential and travel patterns over the coming years. Specifically, growth factors are generally developed using projections for economic growth. The global pandemic has had a significant impact in this regard which means such projections are now unlikely to be realised, meaning traffic growth is expected to be similarly over-estimated.

Furthermore, restrictions imposed because of the pandemic response have resulted in a significant portion of the population being forced to work from home. This has highlighted the viability of this approach in industries where it was previously thought to be incompatible. The knock-on effect is expected to be that a percentage of workers continue to be based at home on a part- or full-time basis even after the pandemic restrictions are lifted. This in turn will have a knock-on effect on commuter and peak traffic levels. The National Transport Authority (NTA) has acknowledged this likelihood in a recently circulated note titled "Alternative Future Scenario for Travel Demand" dated November 2020 where it defines the Covid 19 pandemic as a "shock wave" that "can lead to an acceleration in the natural rate of change in society". The note concludes that the total number of daily trips could be up to 8% lower than previous projections.

Thus, considering the above, the applied growth factors are very conservative.

The future year traffic flows without development can be seen in *Appendix B* as follows:

- Diagram 5: 2023 A.M. Peak Hour Flows – Do Nothing;
- Diagram 6: 2023 School Peak Hour Flows – Do Nothing;
- Diagram 7: 2023 P.M. Peak Hour Flows – Do Nothing;
- Diagram 8: 2023 AADT – Do Nothing;

4 THE RECEIVING ENVIRONMENT

OVERVIEW

The receiving environment is urban in nature. The existing primary artery through the study area is the R612 Upper Road. The R612 is a regional road in Ireland that runs from Carrigaline to Crosshaven. The access to the development lands will be located on Prospect Villas Road, which branches off from the R612. Prospect Villas is also used by the Crosshaven Boy's School, specifically as a set-down area during peak school hours.

Outside of the study area, development generated traffic will dissipate considerably and so is expected to have a negligible impact on the operation of the wider network. While there is substantial variation in the type of traffic travelling on the links locally, during the peak travel hours, they would primarily be expected to carry commuter traffic.

As noted earlier, base traffic levels have been surveyed on the local network during 2021. By combining these base flows with the traffic generation estimates for the proposed development, the following peaks were identified:

- A.M. Peak Hour: 08:00 – 09:00;
- School Peak Hour: 14:00 – 15:00;
- P.M. Peak Hour: 17:00 – 18:00.

SUSTAINABLE TRANSPORT

BUS NETWORK

An existing bus stop is located along the R612 Lower Road, which is approximately 350m (4 min walking time) from the southern development access and 200m (3 min walking time) from the northern access. This bus stop serves Bus Éireann route 220 & 220X. The details of these routes are shown in Table 3 overleaf.

Route No.	Description	Peak Frequency	Daily Service
220	Ovens (EMC) - Ballincollig - City Centre - Maryborough Hill - Carrigaline (Liosbourne & Ferney Road)	4 per hour	78 per day
220X	Ovens – Ballincollig – Cork City – Carrigaline – Crosshaven	1 per hour	18 per day

Table 3: Bus Route Services

RAIL

There are currently no easily accessible rail services within the immediate area.

PEDESTRIAN/CYCLING INFRASTRUCTURE

The R612 Lower Road is a narrow road, without shoulders, and no walking/cycling infrastructure. A stormwater channel is located on the north-eastern side of the road. A screenshot of the road can be seen in the image below:

Figure 3: R612 Lower Road

The R612 Upper Road does have a pedestrian walkway along the southern edge; however, no cycling lanes are present. This is shown in the image below:

Figure 4: R612 Upper Road

The proposed site plan provides a pedestrian walkway along the northern access road to the site which links up with the walkway shown above.

ACCESS ROAD

The access road to be used for the development is Prospect Villas Road. This road is also used by the Crosshaven Boy's School, which is located to the south of the site. The school mainly uses this road for a set-down area and parking. To determine the extent of utilisation, video surveys were conducted of this during a normal weekday.

The survey footage was reviewed, with a specific focus on the morning peak. The reason for this is that this period would be where the highest interaction between school traffic and development traffic would occur. From this review, it is evident that the road is mainly used for informal parking.

Figure 5: Survey Footage at 8:45 am

The above image illustrates the situation at 8:45 am, showing several vehicles parked along the road. At 9:35 am the situation is the same. This means that these vehicles are parked for more than 45 minutes. From this, an assumption can be made that this road is used as a daily parking space for staff members, rather than a drop-off area for parents.

Vehicles leaving this road are either reversing onto the R612 Upper Road or using access to the site to make a turnaround. An example of the latter occurring is shown in the image overleaf.

Figure 6: Vehicle using site access to turn around

5 CHARACTERISTICS OF THE DEVELOPMENT

DEVELOPMENT & SITE OVERVIEW

The overall gross site area is **c.0.93-hectares**.

The site is currently brownfield in nature, with a carpentry workshop located on a portion of the site. Access to the site is via the Prospect Villas Road which aligns the southern side of the site.

The proposed residential development consists of the construction of 26 no. new residential units distributed throughout three blocks, with 7 no. existing units within a fourth block. The breakdown of the development is as follows:

- Block A: 2 units
  - 2 no. 1-bed units
- Block B: 12 units
  - 6 no. 1-bed units
  - 6 no. 3-bed units
- Block C: 12 units
  - 6 no. 1-bed units
  - 6 no. 3-bed units
- Cottage Block: 7 units (existing)

The proposed site layout is shown in Figure 7 overleaf.

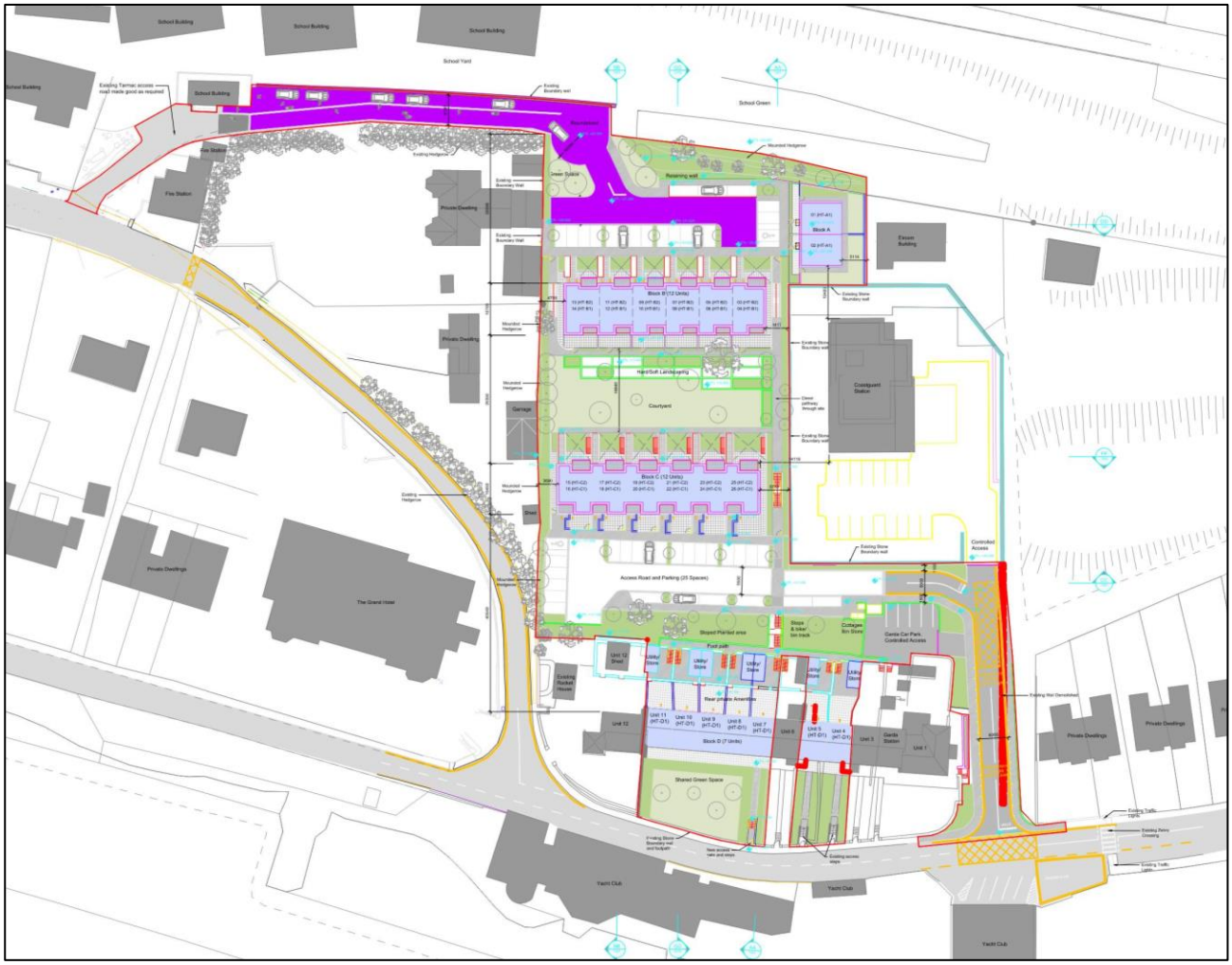


Figure 7: Proposed Development Layout

The proposed development layout shows a separation of the site into two main blocks divided by a landscaped courtyard. This means that the development will have two accesses, one on the northern side of the site servicing 12 of the 26 no. new units, and one on the southern side servicing 14 of the 26 no. new units.

The dual access arrangement, which causes the site to be split into two is necessary due to two main reasons.

Firstly, from the top of the site to the bottom (north to south), there is an approximately 15m level change. This can be seen in the figure overleaf, extracted from Google Earth, showing the northern part of the site (left) at 5m and the southern part of the site (right) at 20m. This elevation change occurs over a distance of approximately 133m.

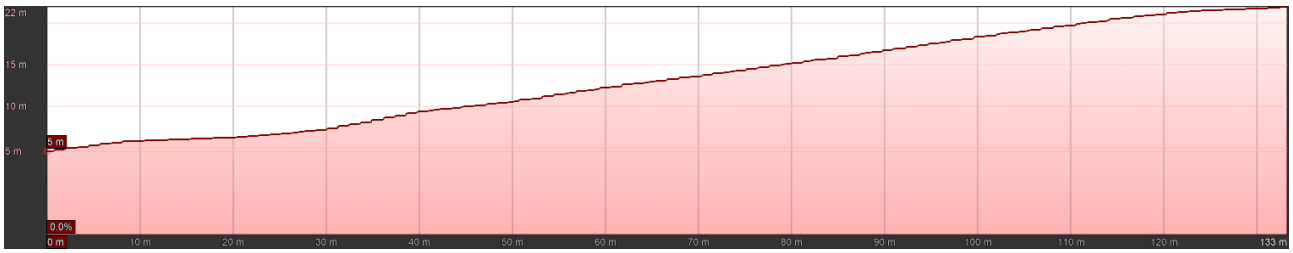


Figure 8: Elevation of Site

Should only one access point be included for the site, a road with a slope of 1:6 would be required, up or down, to provide access to the other side of the site. This arrangement would not comply with the Design Manual for Urban Roads and Street (DMURS) or part M, as it would not be suitable for traffic or pedestrians/people with disabilities.

Secondly, creating a north-south connecting road would require a large portion of the existing site, rendering the site unusable for development.

TRIP GENERATION

The traffic generation potential of the proposed development has been estimated using the Trics software modelling database. This database contains records of surveys carried out at a range of development types across the UK and Ireland. It records a variety of details including the number and type of vehicles entering and exiting the site as well as several other site-specific factors.

When developing traffic generation estimates for any development, several surveys are selected from the database based on a range of factors including development type, size, location, public transport etc. The results are then used to establish trip rates for the development in question which is ultimately used to derive estimates for traffic generation.

The trip generation estimates for the proposed office development are shown in Table 4. The Trics output files relative to this assessment can be found in *Appendix C* of this report. Only the proposed 26 new units have been assessed in terms of trip generation, as the existing 7 units' trips are already on the local road network.

Time Range	Flats Privately Owned		
	26 No. Dwellings		*Total*
	Arrivals	*Departures*	
07:00-08:00	2	5	6
08:00-09:00	**4**	**6**	**9**
09:00-10:00	3	4	6
10:00-11:00	4	4	7
11:00-12:00	4	4	7
12:00-13:00	4	4	7
13:00-14:00	4	3	6
14:00-15:00	**3**	**4**	**5**
15:00-16:00	4	4	6
16:00-17:00	5	4	7
17:00-18:00	**5**	**4**	**8**
18:00-19:00	7	5	11
Daily Trips:	**49**	**51**	**85**

Table 4: Estimated Trips Generated by the Residential Development

Based on Table 4, the proposed development is expected to generate approximately 85 additional trips per day. Of these, approximately **4 arrivals** and **6 departures** are expected during the A.M. peak (08:00 – 09:00), approximately **3 arrivals** and **4 departures** during the school peak (14:00 – 15:00), while approximately **5 arrivals** and **4 departures** are expected in the P.M peak hour (17:00 – 18:00). The maximum trip generation occurs between 18:00 and 19:00, with 7 arrivals and 5 departures, however, these trips do not coincide with the peak hours of the local road network.

The above traffic has been assigned to the local road network based on an overall consideration of its existing layout combined with surveyed traffic patterns in the study area. The assigned development traffic can be seen in the following:

- Diagram 9: A.M. Peak Hour Trip Generation & Assignment;
- Diagram 10: School Peak Hour Trip Generation & Assignment;
- Diagram 11: P.M. Peak Hour Trip Generation & Assignment;
- Diagram 12: AADT Trip Generation & Assignment.

LOWER ACCESS ARRANGEMENT

The proposed access arrangement at the lower part of the site which connects to the R612 Lower Road is shown in Figure 9.

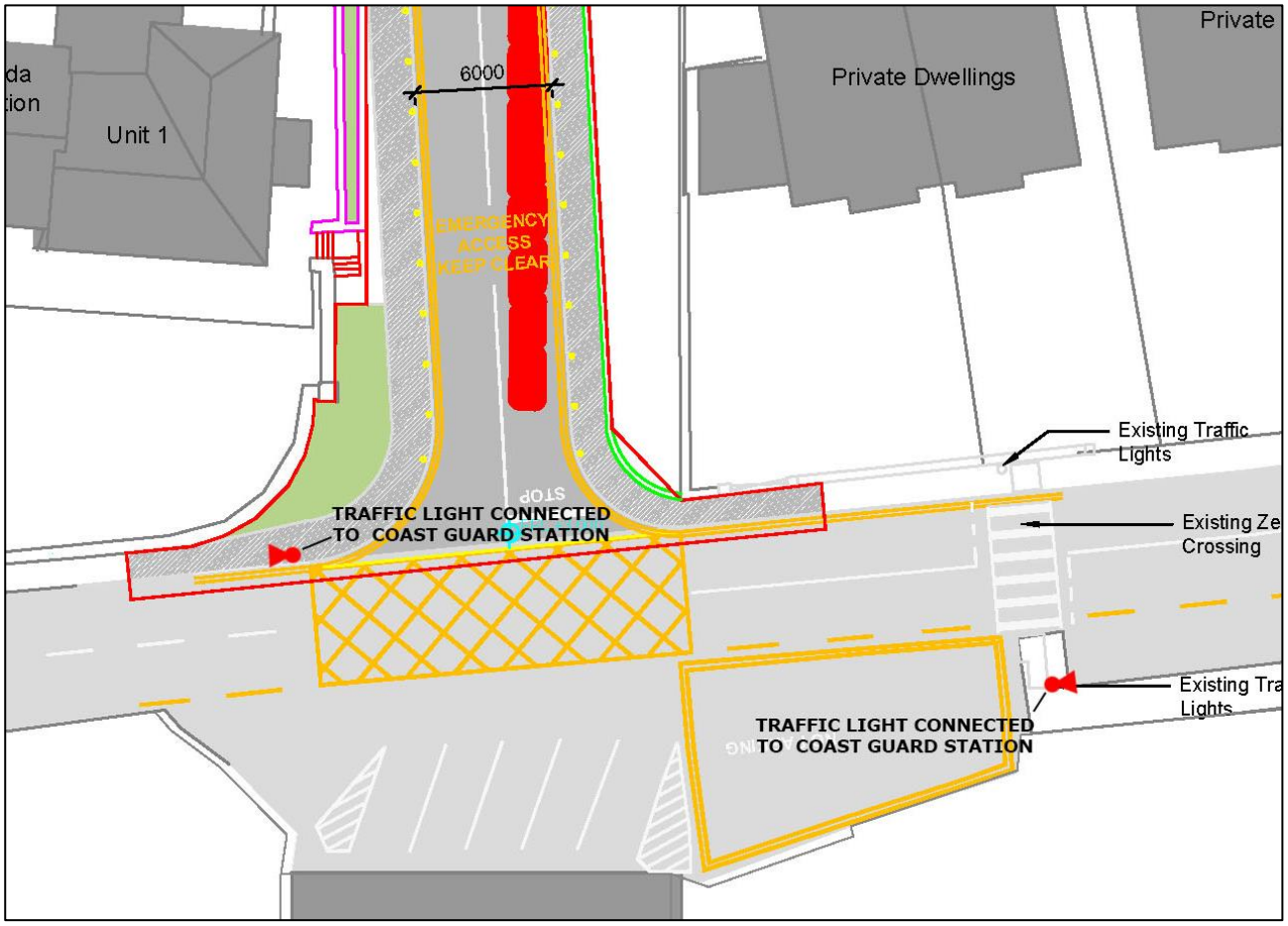


Figure 9: Proposed Main Entrance Junction

The connection onto the R612 Lower Road will be through a priority-controlled junction. Footpaths along the connecting road are proposed to tie in with existing footpaths along the R612.

A yellow junction box is proposed to be implemented to keep the junction clear for emergencies. Together with this, a traffic signal system is proposed which will be connected to the Coast Guard Station. The purpose of this system will be to allow the Coast Guard to stop public vehicles and gain priority at the junction in case of an emergency.

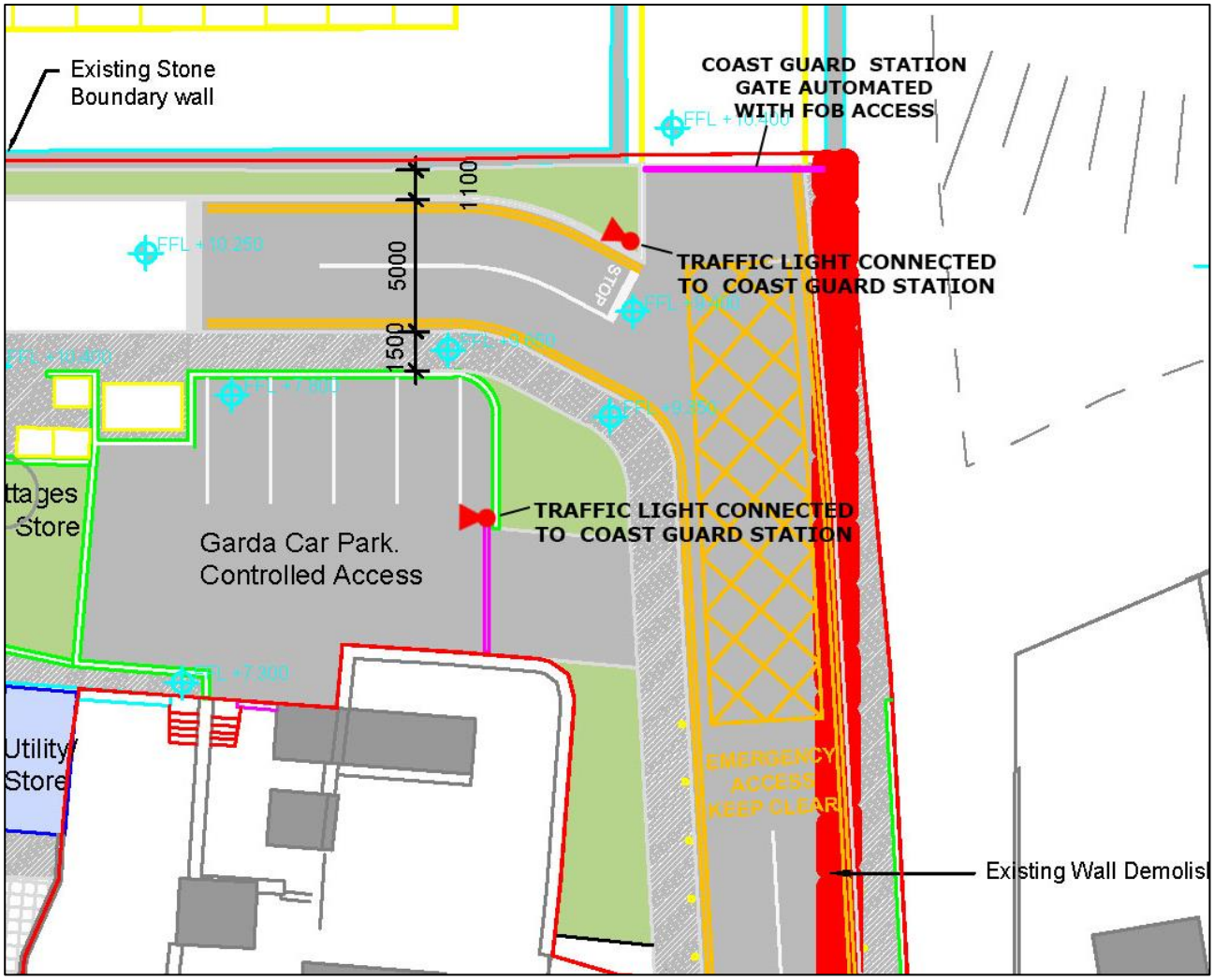


Figure 10: Proposed Residential Road Entrance

Similar to the R612 junction, the junction with the proposed entrance road to the residential development will operate similarly. A yellow junction box is proposed which will keep the junction clear for emergencies with the associated traffic light system allowing for the Coast Guard to force priority over public vehicles, as shown in the above figure.

6 CAR PARKING STRATEGY

The location and nature of the site predispose it to a reduced need for car usage, ownership and, by association, provision of car parking which is in line with local and national objectives to reduce dependency on car-based travel and promote sustainable modes.

In developing the car parking provision, consideration has been given to a wide variety of factors including the applicable standards, realistic demand and measures that can be put in place to manage and control parking at the site. Each of these factors is discussed in further detail following.

CAR PARKING STANDARDS

Chapter 12 of Volume 1 of the *Cork County Development Plan 2022,* which is the current official plan at the time of writing, sets out objectives and requirements concerning transportation. Table 12.6 sets out the car parking requirements for the development with the relevant standards recreated below.

Residential (All areas):

- Dwelling House: 2 spaces per dwelling;
- Apartments: 1.25 spaces per apartment.

This means that according to the Development Plan, for a total of 33 units, 41 no. car parking spaces are required.

The "*Sustainable Urban Housing: Design Standards for New Apartments*" (December 2020) defines three types of urban areas:

- Central/Accessible Urban - In larger scale and higher density developments, comprising wholly of apartments in more central locations that are well served by public transport, the default policy is for car parking provision to be minimised, substantially reduced or wholly eliminated in certain circumstances (15 minutes' walk of city centre/employment location, 10 minutes of rail, 5 minutes of high-frequency bus services (10 min peak hour frequency);
- Intermediate Urban Locations - suburban/urban locations served by public transport or close to town centres or employment areas and particularly for housing schemes with more than

45 dwellings per hectare net (18 per acre), planning authorities must consider a reduced overall car parking standard and apply an appropriate maximum car parking standard;
- Peripheral/Less Accessible Urban Locations - one car parking space per unit, together with an element of visitor parking, such as one space for every 3-4 apartments, should generally be required

As this site is located within the town of Crosshaven itself, within walking distance (less than 500m) of high-frequency bus stops, it can be considered an Intermediate Urban Location.

Intermediate urban locations are generally defined by the following:

- Sites within or close to i.e., within reasonable walking distance (i.e., up to 10 minutes or 800-1000m), of principal town or suburban centres or employment locations, that may include hospitals and third-level institutions;
- Sites within walking distance (i.e., between 10-15 minutes or 1000-1500m) of high capacity urban public transport stops or within reasonable walking distance (i.e., between 5-10 minutes or up to 1000m) of high-frequency urban bus services or where such services can be provided;
- Sites within easy walking distance (i.e., up to 5 minutes or 400-500m) of reasonably frequent urban bus services.

Therefore, a slight reduction in car parking may be justified.

CAR PARKING PROVISION

The development will provide for a total of 44 no. car parking spaces, with 19 no. spaces provided for the southern portion of the development, and 25 no. spaces provided for the northern portion.

This means that the provision of car parking is sufficient and satisfies the criteria of the Development Plan.

7 POTENTIAL IMPACT OF DEVELOPMENT CONSTRUCTION

Relative to the operation stage, the construction period will be temporary. Construction traffic is expected to consist of the following categories:

- Private vehicles owned and driven by site construction staff and by full-time site supervisory staff and occasional professional supervisory staff i.e., design team members and supervisory staff from utility companies;
- Materials delivery and removal vehicles.

It is difficult to assess the exact quantum of traffic that will be generated during the construction period. However, the following points are noted regarding construction traffic:

- In general, the construction day will begin and end outside of peak travel hours. As a result, most workers travelling to and from the site will arrive before the a.m. peak hour and depart after the p.m. peak hour;
- Adequate on-site compounding will be provided to prevent any potential overflow onto the local transport network;
- The potential for construction staff to be brought to the site in vans/minibuses will be investigated while other mobility management measures such as the provision of cycle parking for workers. This would serve to reduce the overall car trip generation potential of the construction period;
- Delivery vehicles travelling to and from the site will be spread across the course of the working day meaning the number of HGVs travelling during the peak hours will be relatively low.

Overall, it is expected that the level of traffic generated by the construction works will be less than that assessed for the operational phase of the development. As a result, a detailed analysis of this stage has not been deemed necessary.

Nevertheless, a Construction Management Plan will be prepared by the Contractor and agreed upon with the Local Authority, before the commencement of construction, giving details on the following:

- Daily and weekly working hours;
- Agreed haul routes for incoming materials;

- Licensed hauliers to be used;
- Disposal sites;
- Travel arrangements for construction personnel;
- Appropriate on-site parking arrangements for construction personnel to prevent overspill parking on the local road network;
- Temporary construction entrances to be provided;
- Wheel wash facilities if required;
- Road cleaning and sweeping measures to be put in place if required;
- Temporary construction signage to be put in place and maintained;
- Any proposed traffic management measures such as temporary traffic lights and signage on any public roads.

8 POTENTIAL IMPACT OF DEVELOPMENT OPERATION

JUNCTION ANALYSES

Section 12.11 of the Cork County Development Plan 2022 specifies the County's requirements in terms of traffic and transport assessments. Specifically, item 12.11.2 states that "*Where traffic movements associated with a development proposal have the potential to have a material impact on the safety and free flow of traffic on a National or Regional Route, this Plan will require the submission of a Traffic Impact Assessment (TIA), Traffic and Transport Assessment (TTA) and a Road Safety Audit to be prepared in accordance with the Traffic Management Guidelines Manual 2003 issued by the Department of Transport and the Traffic and Transport Assessment Guidelines published by the TII in 2014.*"

The *Traffic and Transport Assessment Guidelines (TII - May 2014),* Table 2.1 specifies certain Traffic Management Guidelines Thresholds for Transport Assessments. These consider the thresholds at which the production of Traffic and Transport Assessments in relation to planning applications are recommended. To determine which junctions require detailed analysis, these thresholds were used, and are specified in the table below:

Number	Threshold
1	Traffic to and from the development exceeds 10% of the traffic flow on the adjoining road.
2	Traffic to and from the development exceeds 5% of the traffic flow on the adjoining road where congestion exists or the location is sensitive.*
3	Residential development in excess of 200 dwellings.
4	Retail and leisure development in excess of 1,000m2.
5	Office, education and hospital development in excess of 2,500m2.
6	Industrial development in excess of 5,000m2.
7	Distribution and warehousing in excess of 10,000m2.

* In locations that experience particularly heavy congestion and when traffic flows from a proposed development are less than 5% of the traffic flows on the adjoining road, a Transport Assessment may still be required. When in doubt, the requirement for a Transport Assessment should always be scoped with the relevant local authority.

Table 5: Traffic Management Guidelines Thresholds for Transport Assessments

This development is not considered to impact a "sensitive" location, as the area doesn't experience heavy congestion. Thus, from Table 5, of particular relevance to this development are thresholds 1 and 3:

Threshold 3 – Residential development in excess of 200 dwellings

The proposed development includes 26 residential units, with 7 existing units on the site. The 26 new units are well below the threshold of 200 units as stipulated in the *Traffic and Transport Assessment Guidelines 2014.*

Threshold 1 – Traffic to and from the development exceeds 10% of the traffic flow on the adjoining road

To determine if this threshold is exceeded, the survey data mentioned earlier in this report was assessed in combination with the expected trip generation values at the two affected junctions.

The development trips added to each junction were compared to the projected opening year volumes at that junction and expressed as a percentage figure. This is shown in the table below, with Junction 1 being the junction with the R612 Lower Road, and Junction 2 being the junction with the R612 Upper Road:

Peak Hour		Junction 1 - R612 Lower Road	Junction 2 – R612 Upper Road
AM Peak	2023 Do Nothing	491	232
	Development Trips	5	5
	% Impact	**1.02%**	**2.16%**
School Peak	2023 Do Nothing	459	134
	Development Trips	3	4
	% Impact	**0.65%**	**2.99%**
PM Peak	2023 Do Nothing	484	88
	Development Trips	5	5
	% Impact	**1.03%**	**5.68%**
AADT	2023 Do Nothing	5875	1279
	Development Trips	46	54
	% Impact	**0.78%**	**4.22%**

Table 6: Junction Impact

From Table 6 it is evident that the development trips will have a negligible impact on both of the junctions.

The referenced Table 2.1 contains a series of sub-thresholds for when a Traffic & Transport Assessment should take place. These are summarised as follows:

- The character and total number of trips in/out combined per day are such that as to cause concern;
- The site is not consistent with national guidance or local plan policy or accessibility criteria contained in the Development Plan;
- The development is part of incremental development that will have significant transport implications;
- The development may generate traffic at peak times in a heavily trafficked/ congested area or near a junction with a main traffic route;
- The development may generate traffic, particularly heavy vehicles in a residential area;
- There are concerns over the development's potential effects on road safety;
- The development is in a tourist area with the potential to cause congestion;
- The planning authority considers that the proposal will result in a material change in trip patterns or raise other significant transport implications.

Given the nature and estimated traffic generation potential of the proposed development, it is felt that it does not meet any of the above thresholds.

Based on the abovementioned thresholds, as stipulated by the *Traffic and Transport Assessment Guidelines (TII - May 2014)*, the development will have a negligible impact on the local road network, and as such, a detailed junction assessment is not required.

ACCESS ROAD ANALYSIS

To determine the extent of the impact on the Prospect Villas Road, and by extension the interaction with school traffic, an analysis was conducted on this road, and the potential trips added. The junction survey was used to determine the existing traffic volumes utilising the road.

Only the base year was assessed in this regard, as the only future growth which will be applied to this road will come from developments along the road, which is the development that is the subject of this study.

Assessing the hourly traffic on this road, as well as the additional trips added by the development leads to the table shown overleaf.

Time Range	Existing Trips			Generated Trips		
	Arrivals	*Departures*	*Total*	*Arrivals*	*Departures*	*Total*
07:00-08:00	1	0	1	1	3	3
08:00-09:00	**17**	**1**	**18**	**2**	**3**	**5**
09:00-10:00	1	1	2	2	2	3
10:00-11:00	4	2	6	2	2	4
11:00-12:00	1	2	3	2	2	4
12:00-13:00	2	1	3	2	2	4
13:00-14:00	2	3	5	2	2	3
14:00-15:00	**2**	**15**	**17**	**2**	**2**	**3**
15:00-16:00	2	4	6	2	2	3
16:00-17:00	2	4	6	3	2	4
17:00-18:00	**0**	**2**	**2**	**3**	**2**	**4**
Daily Trips:	**34**	**35**	**69**	**27**	**27**	**46**

Table 7: Existing vs Generated Trips - Prospect Villas

As can be seen from the above table, the development trips will be low compared to the existing trips in the peak hours, except for the afternoon peak. However, during this peak, the school will have closed and there should be no conflict.

Furthermore looking at the number of additional vehicles that will be added to Prospect Villas per minute, reveals the following:

Time Range	Additional Vehicles per Hour			Additional Vehicles per Minute		
	Arrivals	*Arrivals*	*Arrivals*	*Arrivals/min*	*Departures/min*	*Total/min*
07:00-08:00	1	1	1	0.02	0.05	0.05
08:00-09:00	**2**	**2**	**2**	**0.03**	**0.05**	**0.08**
09:00-10:00	2	2	2	0.03	0.03	0.05
10:00-11:00	2	2	2	0.03	0.03	0.07
11:00-12:00	3	3	3	0.03	0.03	0.07
12:00-13:00	3	3	3	0.03	0.03	0.07
13:00-14:00	2	2	2	0.03	0.03	0.05
14:00-15:00	**2**	**2**	**2**	**0.03**	**0.03**	**0.05**
15:00-16:00	2	2	2	0.03	0.03	0.05
16:00-17:00	3	3	3	0.05	0.03	0.07
17:00-18:00	**4**	**4**	**4**	**0.05**	**0.03**	**0.07**
Daily Trips:	**26**	**26**	**26**	**0.45**	**0.45**	**0.77**

Table 8: Additional Vehicles per Minute

The previous table aims to illustrate the very low impact that this development will have on the surroundings.

SUMMARY

The previous two sections can be summarised as follows:

- According to the *Traffic and Transport Assessment Guidelines (TII - May 2014),* two different thresholds can be used to determine if a detailed junction analysis is required
  - Threshold 3 - Residential development in excess of 200 dwellings: The development is well below this threshold;
  - Threshold 1 - Traffic to and from the development exceeds 10% of the traffic flow on the adjoining road: Again, the development is below this threshold.
- Based on the above, none of the surveyed junctions require detailed analysis as the development impact is assumed to be negligible;
- The current utilisation of Prospect Villas is quite low with it mainly being used as informal parking for staff members and a set-down area for parents of the school;
- Nevertheless, the impact of the development on this road will be low and will not have any negative implications for the school.

9 REMEDIAL/MITIGATION MEASURES

Based on the previous summary, no capacity-related remedial or mitigation measures are necessary.

As there is a school in the vicinity that will utilise the same access road as the development, several remedial measures can be implemented, which could be agreed with the school. These include:

- Traffic calming measures;
- The surface treatment will aid to reduce speed and increase awareness;
- Shared surfacing, has the same impact as above.

However, it is projected with the size of the development and the anticipated trips generated, the impact on the school and its operations will be minor.

10 MONITORING

While it has been demonstrated that the proposed development can be accommodated on the current road infrastructure, it is nevertheless recommended that the local area should be monitored in terms of transportation efficiencies in the future.

11 VERIFICATION

This report was compiled and verified by:

Wian Marais BE (US), BE (Hons) (UP), Professional Engineer (ECSA)

Civil Engineer

O'Connor Sutton Cronin & Associates

Appendix A **TRAFFIC SURVEY DATA**

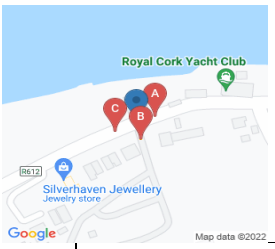
Data Analysis Services
Traffic-Transportation- Commercial-Innovation

227 21484 Crosshaven

with compliments

IDASO

Survey Name: 227 21484 Crosshaven
Date: Wed 15 Dec 2021



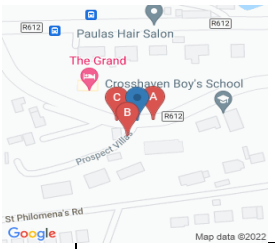
IDASO

Survey Name: 227 21484 Crosshaven
Site: Site 1
Location: R612 Lower Road/Unnamed Road
Date: Wed 15-Dec-2021

	A => A										A => B										A => C									
TIME	**P/C**	**M/C**	**CAR**	**TAXI**	**LGV**	**OGV1**	**OGV2**	**PSV**	**TOT**	**PCU**	**P/C**	**M/C**	**CAR**	**TAXI**	**LGV**	**OGV1**	**OGV2**	**PSV**	**TOT**	**PCU**	**P/C**	**M/C**	**CAR**	**TAXI**	**LGV**	**OGV1**	**OGV2**	**PSV**	**TOT**
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	0	3	0	1	1	37
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	0	6	2	1	2	53
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62	0	4	1	0	0	67
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0	5	1	0	3	59
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	186	0	18	4	2	6	216
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	49	0	3	1	0	0	54
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58	0	6	1	0	2	67
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66	0	7	0	0	3	76
08:45	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	76	0	5	1	0	1	84
H/TOT	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	249	0	21	3	0	6	281
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0	78	0	5	0	0	0	84
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0	5	1	0	1	57
09:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	1	5	0	0	0	42
09:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	0	6	0	1	3	46
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0	200	1	21	1	1	4	229
10:00	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	39	0	6	2	0	0	47
10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	0	3	4	0	1	40
10:30	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	35	0	3	0	0	0	38
10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31	0	2	0	0	2	35
H/TOT	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	1	1	0	0	137	0	14	6	0	3	160
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46	0	7	0	0	0	53
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45	0	3	0	1	1	50
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	0	6	1	1	0	56
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0	42	1	6	1	0	2	53
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0	181	1	22	2	2	3	212
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	0	2	1	0	0	47
12:15	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	34	0	4	0	0	1	39
12:30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	2	1	0	50	0	6	0	0	0	57
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	0	4	2	0	2	44
H/TOT	0	0	1	0	0	0	0	0	1	1	0	0	1	0	1	0	0	0	2	2	1	0	164	0	16	3	0	3	187
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	35	0	3	0	1	0	40
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	27	0	4	1	0	1	34
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	48	0	9	0	0	0	58
13:45	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	43	0	4	1	0	1	50
H/TOT	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	3	1	153	0	20	2	1	2	182
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	30	0	6	0	0	1	38
14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	0	4	0	0	1	31
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68	0	10	1	0	0	79
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51	0	5	2	1	1	60
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	175	0	25	3	1	3	208
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	34	0	4	1	0	1	41
15:15	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	1	36	0	4	1	0	1	43
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54	1	5	2	0	1	63
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	55	0	9	2	0	0	67
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1	2	179	1	22	6	0	3	214
16:00	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	1	1	0	0	34	0	7	2	1	2	46
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	0	11	0	0	1	54
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49	0	9	2	1	0	61
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	0	7	2	1	2	48
H/TOT	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	1	1	0	0	161	0	34	6	3	5	209
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	50	0	5	0	0	0	55
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	29	0	1	1	0	1	33
17:30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	1	33	0	4	0	0	0	38
17:45	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	34	0	0	0	0	2	36
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3	3	1	1	146	0	10	1	0	3	162
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0	1	0	0	1	27
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	0	1	0	0	0	22
18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	1	1	0	1	27
18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0	1	0	0	2	33
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	4	1	0	4	109
12 TOT	0	0	4	0	1	0	0	0	5	5	0	0	6	0	4	0	0	0	10	10	10	5	2031	3	227	38	10	45	2369

	B => A										B => B										B => C									
PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
39.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
62.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
226.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
53.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
287.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83.2	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58.5	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50.3	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
234	0	0	2	0	1	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
52.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
57.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
217.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2
47.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56.2	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
190.7	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
40.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
34.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50.9	0	1	0	0	0	0	0	0	1	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183.3	0	1	0	0	0	0	0	0	1	0.4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
38.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
213	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	2
41.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
50.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
52.3	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
220.9	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2
55	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
33.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
164.1	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
22	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
28.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113.5	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	2
2435	0	1	7	0	1	0	0	0	9	8.4	0	0	0	0	0	0	0	0	0	0	0	0	8	0	7	0	0	0	15	15

C => A										C => B										C => C									
P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
0	0	9	0	0	1	0	2	12	14.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	11	0	2	0	0	1	14	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	16	0	2	0	1	1	20	22.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	19	0	2	1	1	2	26	29.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	55	0	6	2	2	6	72	81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	24	0	9	0	0	0	33	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	52	0	8	0	0	1	61	62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	48	0	7	1	0	0	57	56.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	31	0	6	1	0	1	39	40.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	155	0	30	2	0	2	190	192.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	19	0	10	1	0	1	31	32.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	27	1	2	2	1	0	33	35.3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
0	0	24	0	5	2	0	2	33	36	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
0	0	22	0	4	2	0	1	29	31	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	92	1	21	7	1	4	126	134.8	0	0	1	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2	2
0	0	12	0	3	0	0	0	15	15	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	27	0	5	1	0	1	34	35.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	18	0	4	0	0	1	23	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	24	0	4	0	0	0	29	28.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	81	0	16	1	0	2	101	102.7	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	24	0	7	0	0	0	31	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	34	0	10	2	1	0	47	49.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	33	2	7	0	0	2	44	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	29	0	2	0	0	0	31	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	120	2	26	2	1	2	153	157.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	33	0	2	0	0	0	35	35	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	43	0	3	1	0	0	47	47.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	44	0	4	0	1	0	49	50.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	48	0	4	0	0	1	54	54.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	168	0	13	1	1	1	185	187	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	33	0	7	1	1	1	43	45.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	43	0	6	0	0	0	49	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	54	0	2	0	0	0	58	56.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	34	0	1	2	0	1	38	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	164	0	16	3	1	2	188	191.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	57	0	6	0	0	1	65	65.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	48	0	9	3	0	0	60	61.5	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	1	49	0	1	1	0	1	53	53.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	44	0	3	0	0	1	49	49.2	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
2	1	198	0	19	4	0	3	227	229.8	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
0	0	44	0	3	1	0	1	49	50.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	65	1	7	2	0	2	77	80	0	0	1	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
0	0	63	0	5	0	0	0	68	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	58	0	7	2	0	1	68	70	0	1	0	0	0	0	0	0	1	0.4	0	0	0	0	0	0	0	0	0	0
0	0	230	1	22	5	0	4	262	268.5	0	1	1	0	1	0	0	0	3	2.4	0	0	0	0	0	0	0	0	0	0
0	0	49	1	12	0	1	1	64	66.3	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	47	0	7	5	0	0	59	61.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	49	0	7	0	0	2	58	60	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
2	0	57	0	5	0	0	0	64	62.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	202	1	31	5	1	3	245	250.2	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
0	0	71	0	5	0	0	1	77	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	64	0	6	1	0	0	71	71.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	65	0	6	0	0	2	73	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	66	0	5	2	0	0	73	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	266	0	22	3	0	3	294	298.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	66	0	4	1	0	0	72	71.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	45	0	8	0	0	0	53	53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	42	0	3	1	0	1	47	48.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	38	0	4	0	0	1	43	44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	191	0	19	2	0	2	215	217.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	2	1922	5	241	37	7	34	2258	2310.4	0	1	7	0	2	0	0	0	10	9.4	0	0	2	0	0	0	0	0	2	2



IDASO

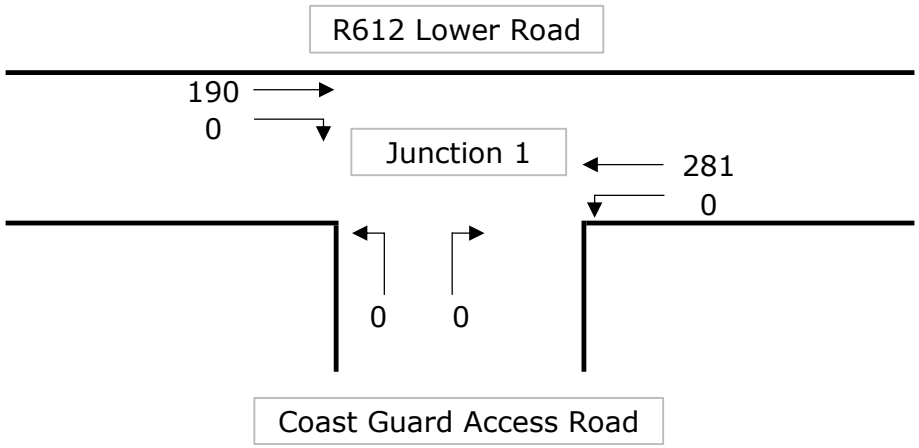
Survey Name: 227 21484 Crosshaven
Site: Site 2
Location: R612 Upper Road/Prospect Villas
Date: Wed 15-Dec-2021

	A => A										A => B										A => C									
TIME	**P/C**	**M/C**	**CAR**	**TAXI**	**LGV**	**OGV1**	**OGV2**	**PSV**	**TOT**	**PCU**	**P/C**	**M/C**	**CAR**	**TAXI**	**LGV**	**OGV1**	**OGV2**	**PSV**	**TOT**	**PCU**	**P/C**	**M/C**	**CAR**	**TAXI**	**LGV**	**OGV1**	**OGV2**	**PSV**	**TOT**
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	1	0	0	0	11
07:30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	16	0	0	0	0	0	16
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	12
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	43	0	1	0	0	0	44
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	9
08:15	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	1	1	0	0	17	1	0	0	0	0	18
08:30	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3	0	0	33	0	3	0	0	3	39
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	0	6	0	0	0	54
H/TOT	0	0	1	0	0	0	0	0	1	1	0	0	4	0	0	0	0	0	4	4	0	0	107	1	9	0	0	3	120
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	1	0	0	0	21
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	9
09:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	6
09:45	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	5	0	2	0	0	0	7
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	37	0	6	0	0	0	43
10:00	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	7	0	1	0	0	0	8
10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4
10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	1	0	0	0	6
10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	6
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	22	0	2	0	0	0	24
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	9
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	1	0	0	7
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	1	0	0	0	7
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	0	1	1	0	0	25
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5
12:30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	9	0	1	0	0	0	10
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1	0	0	4
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	18	0	2	1	0	0	21
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	2	0	0	0	11
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3
13:30	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	24	0	1	0	0	0	25
13:45	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	4	0	0	1	0	0	5
H/TOT	0	0	2	0	0	0	0	0	2	2	0	0	1	0	0	0	0	0	1	1	0	0	40	0	3	1	0	0	44
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	2	0	0	0	5
14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0	0	5
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	0	1	0	0	0	36
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0	4	0	0	0	54
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	0	0	0	0	0	5
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	6
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	4	0	0	0	12
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	26	0	4	0	0	0	31
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	1	0	0	0	10
16:15	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	8	0	4	0	0	0	12
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	4	0	0	0	15
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	2	0	0	0	6
H/TOT	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	32	0	11	0	0	0	43
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	1	0	0	0	12
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	6
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0	1	0	0	0	31
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5
18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8
18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	6
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	0	0	0	0	0	22
12 TOT	0	0	4	0	0	0	0	0	4	4	0	0	9	0	0	0	0	0	9	9	0	1	450	1	44	3	0	3	502

	B => A										B => B										B => C									
PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
8	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7.5	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25.5	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21.5	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2
5.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	11	11
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2
54	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	14	14
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3	3
30.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	4	4
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3	3
43	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3	3
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
505.9	0	0	7	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	25	0	3	0	0	0	28	28

C => A										C => B										C => C									
P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	OGV1	OGV2	PSV	TOT	PCU
0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	3	0	1	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	5	0	4	0	0	0	10	9.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	12	0	5	0	0	0	18	17.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	5	0	8	0	0	0	13	13	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	24	0	0	0	0	0	24	24	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
0	0	20	0	1	0	0	0	21	21	0	0	8	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0
0	0	23	0	1	0	0	0	24	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	72	0	10	0	0	0	82	82	0	0	13	0	0	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0
0	0	10	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	4	0	1	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	5	0	1	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	22	0	2	0	0	0	24	24	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
0	0	3	0	1	0	0	0	4	4	0	0	1	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
0	0	5	0	1	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	4	0	0	0	0	0	4	4	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	16	0	2	0	0	0	18	18	0	0	2	0	1	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
0	0	6	0	0	0	0	0	6	6	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	6	0	1	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	5	0	2	1	0	0	8	8.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	21	0	3	1	0	0	25	25.5	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	5	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	8	0	1	1	0	0	10	10.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	6	0	0	0	0	0	6	6	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	22	0	1	1	0	0	24	24.5	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	10	0	0	0	0	0	10	10	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	9	0	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	7	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	5	0	1	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	31	0	1	0	0	0	32	32	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	12	0	1	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	15	0	3	0	0	0	19	18.2	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	8	0	0	0	0	1	9	10	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0	0	13	0	0	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	48	0	4	0	0	1	54	54.2	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
0	0	6	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	11	0	1	0	0	2	14	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	12	0	2	0	0	0	14	14	0	0	1	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
0	0	4	0	2	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	33	0	5	0	0	2	40	42	0	0	1	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
0	0	8	0	2	0	0	0	10	10	0	0	1	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
0	0	9	0	1	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	9	0	1	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	15	0	0	0	0	0	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	41	0	4	0	0	0	45	45	0	0	1	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
0	0	8	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	16	0	0	0	0	0	16	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	13	0	0	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	11	0	1	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	48	0	1	0	0	0	49	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	8	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	11	0	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	7	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	7	0	0	1	0	0	8	8.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	33	0	0	1	0	0	34	34.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	399	0	38	3	0	3	445	448.1	0	0	22	0	3	0	0	0	25	25	0	0	1	0	0	0	0	0	1	1

Appendix B **TRAFFIC FLOW DIAGRAMS**



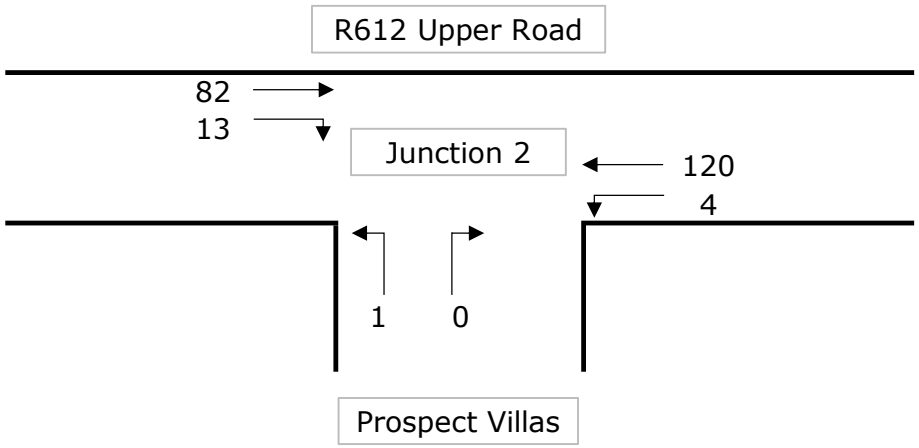


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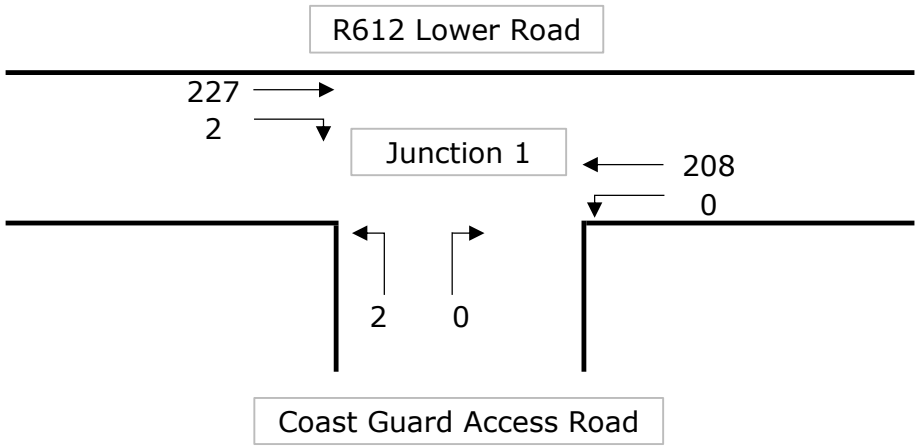
Diagram 01: AM Peak Hour Base Flows



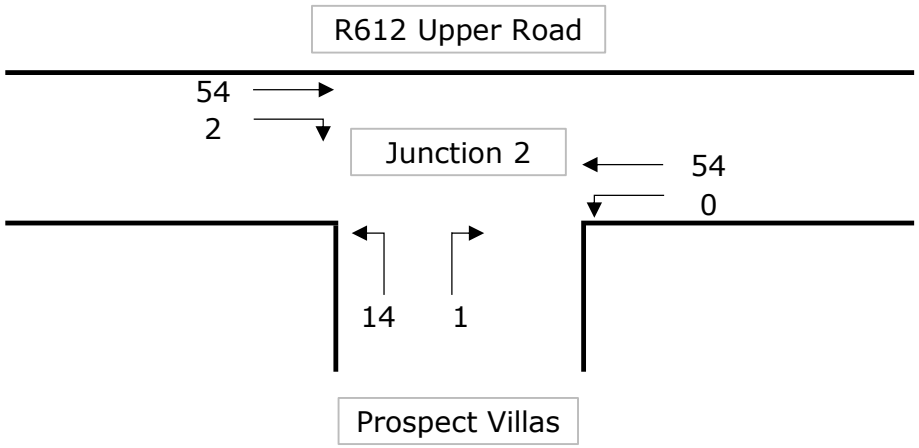


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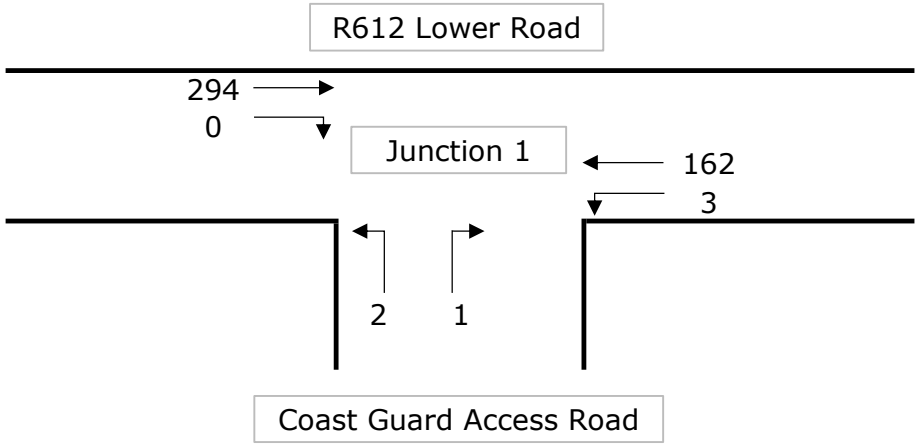
Diagram 02: School Peak Hour Base Flows



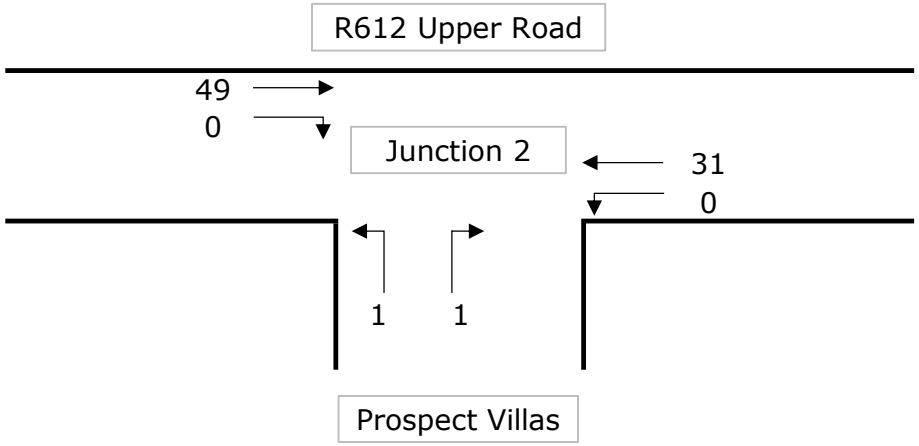


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Diagram 03: PM Peak Hour Base Flows

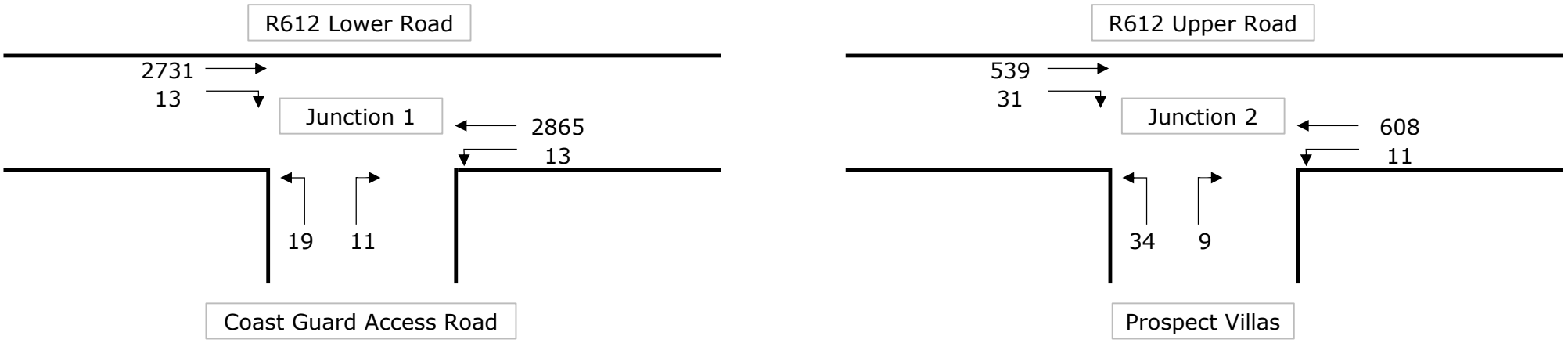

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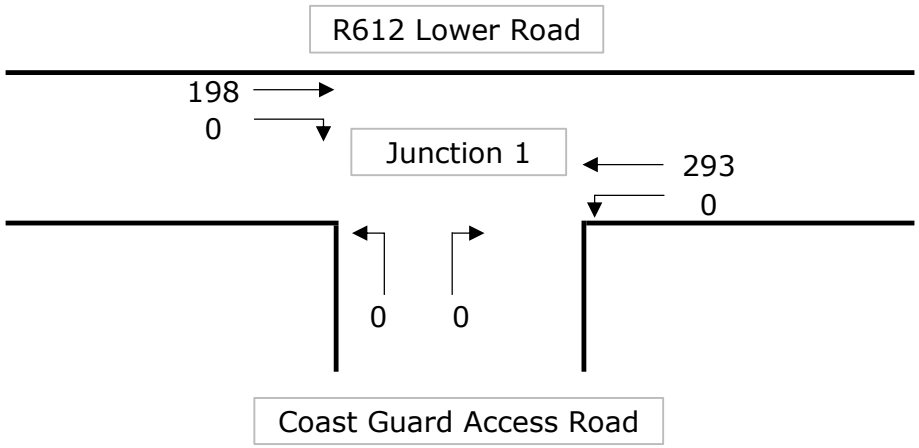
Diagram 04: AADT Base Flows



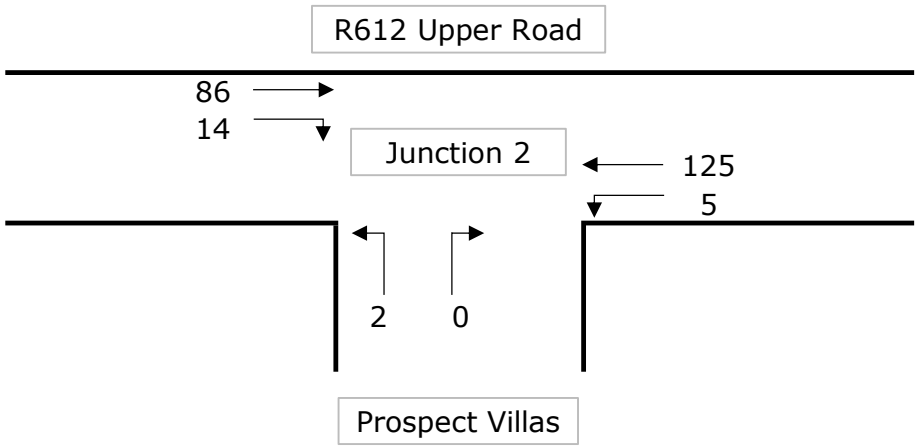


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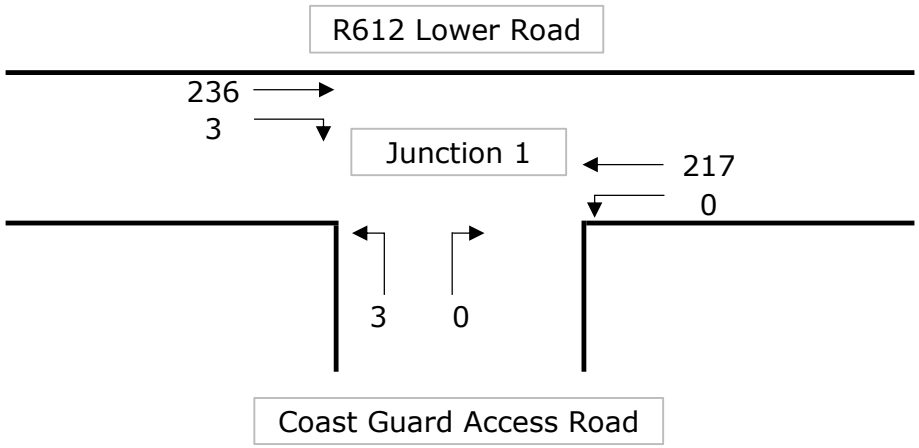
Diagram 05: 2023 AM Peak Hour Flows - Do Nothing



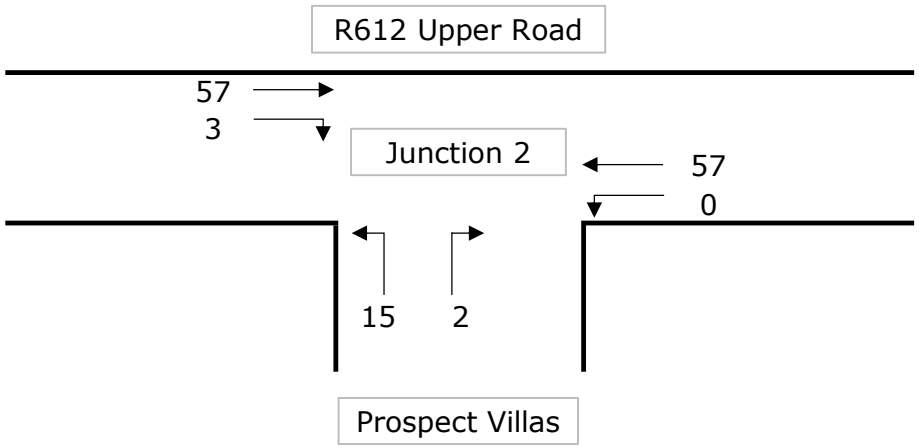


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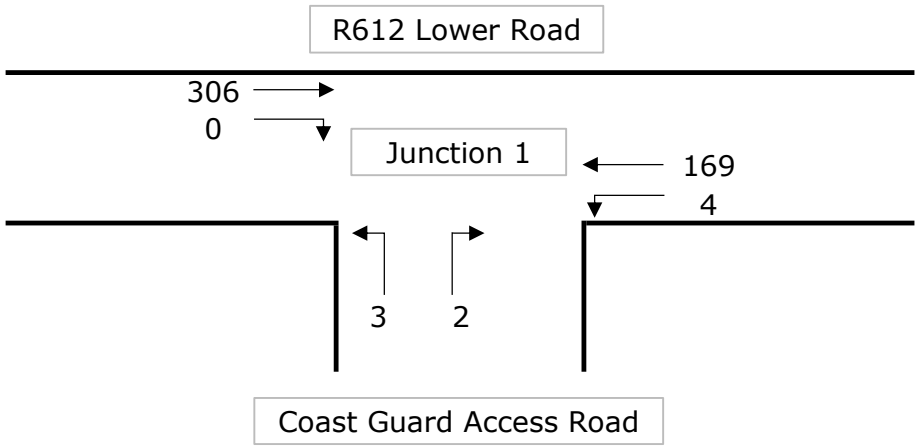
Diagram 06: 2023 School Peak Hour Flows - Do Nothing



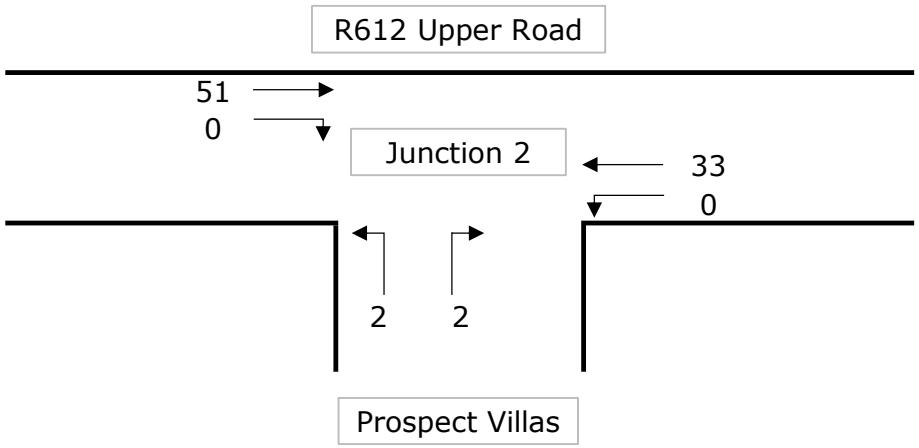


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Diagram 07: 2023 PM Peak Hour Flows - Do Nothing

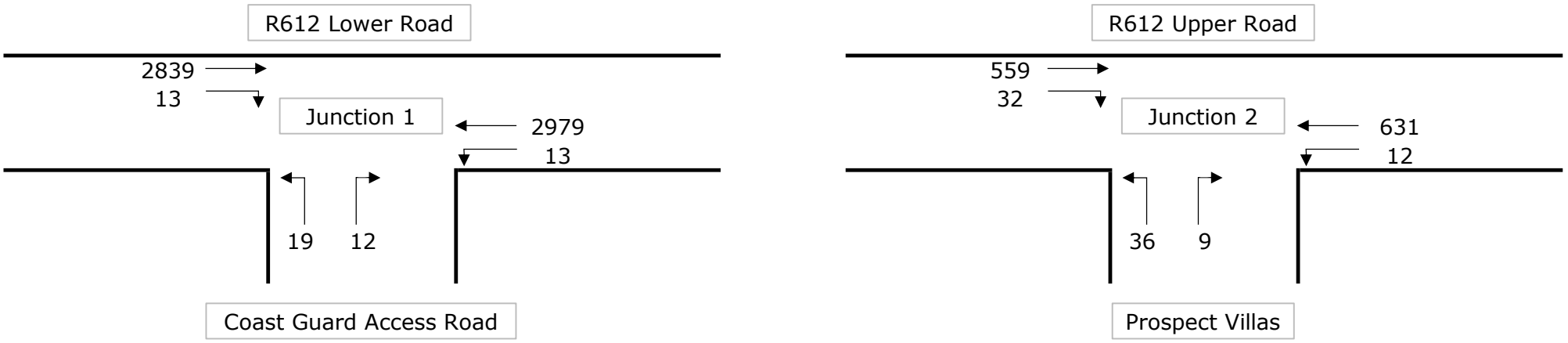

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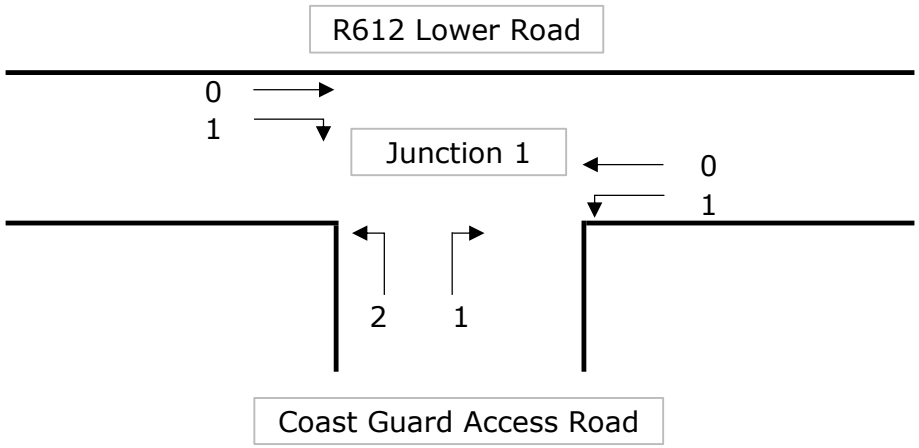
Diagram 07: 2023 AADT Flows - Do Nothing



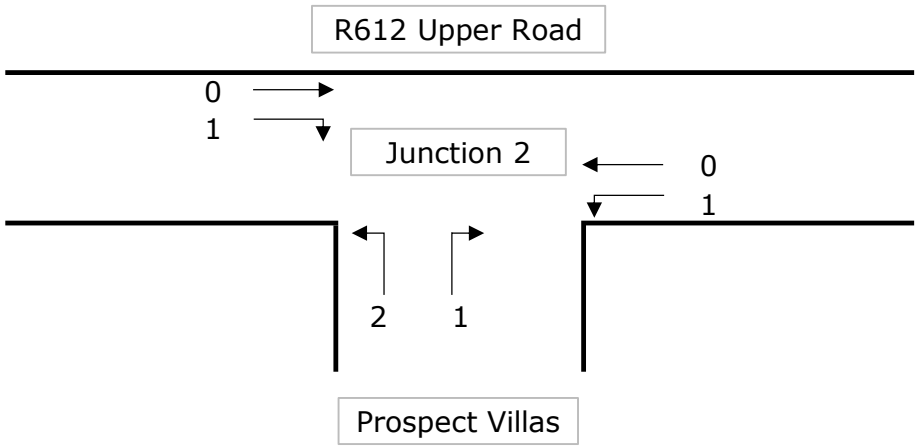


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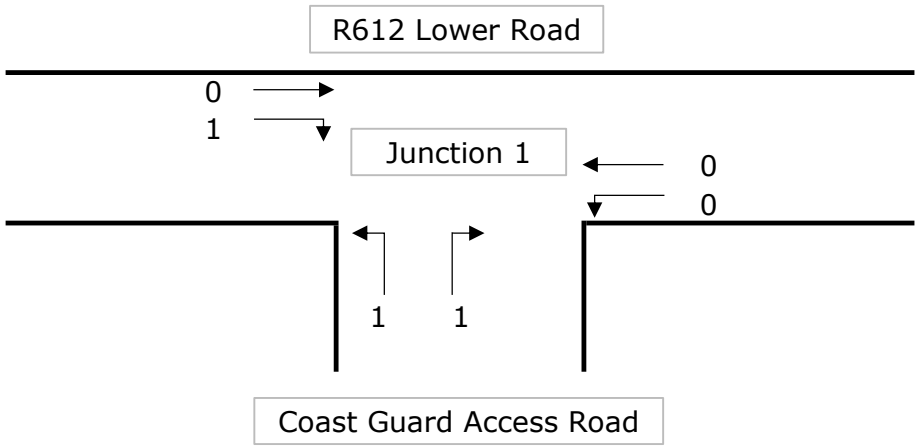
Diagram 09: AM Peak Hour Trip Generation & Assignment



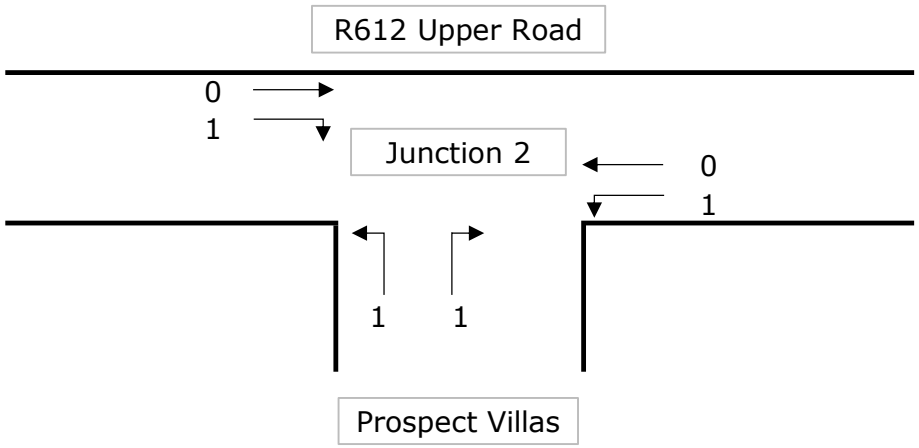


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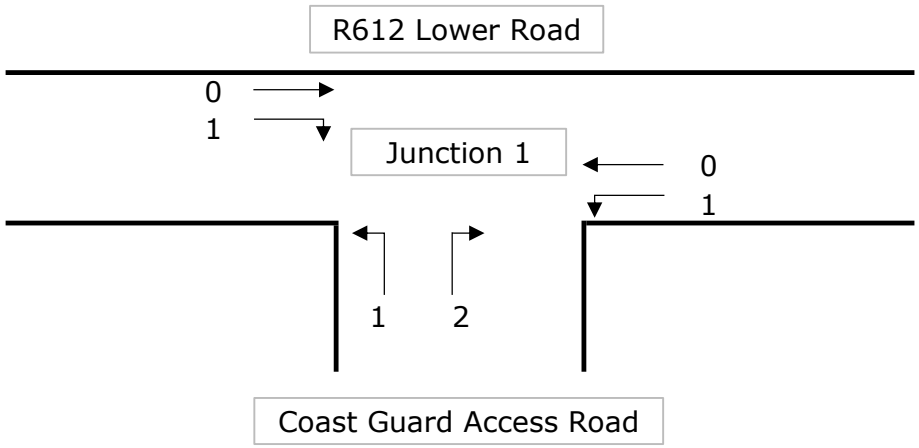
Diagram 10: School Peak Hour Trip Generation & Assignment



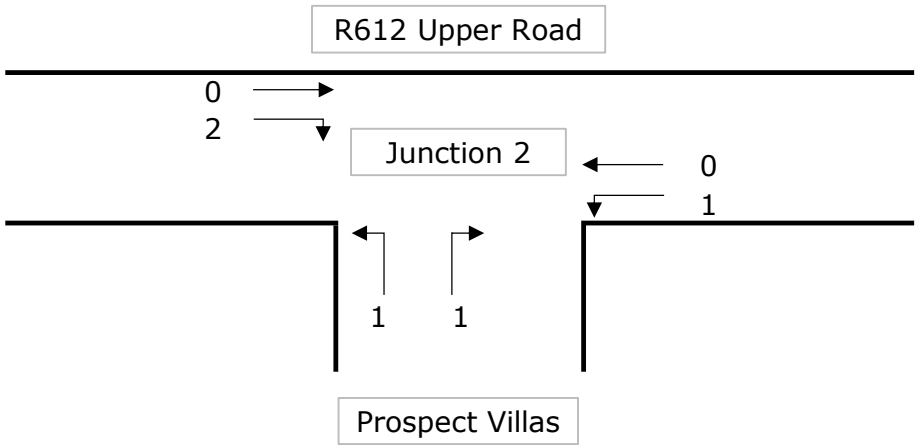


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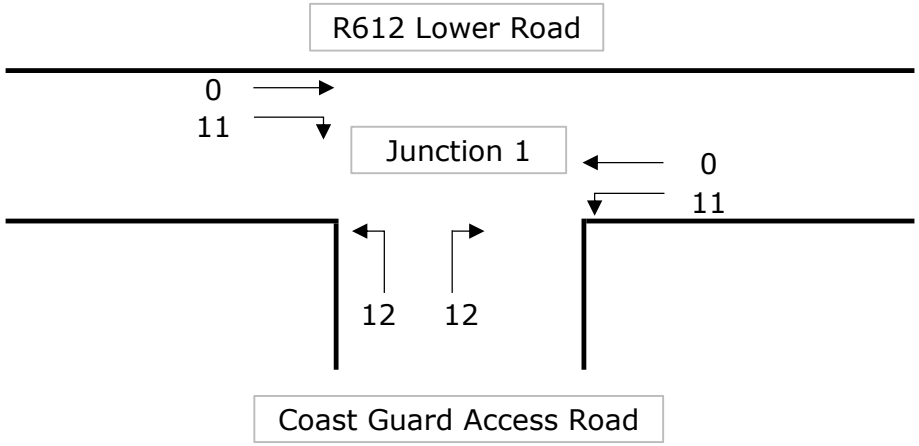
Diagram 11: PM Peak Hour Trip Generation & Assignment



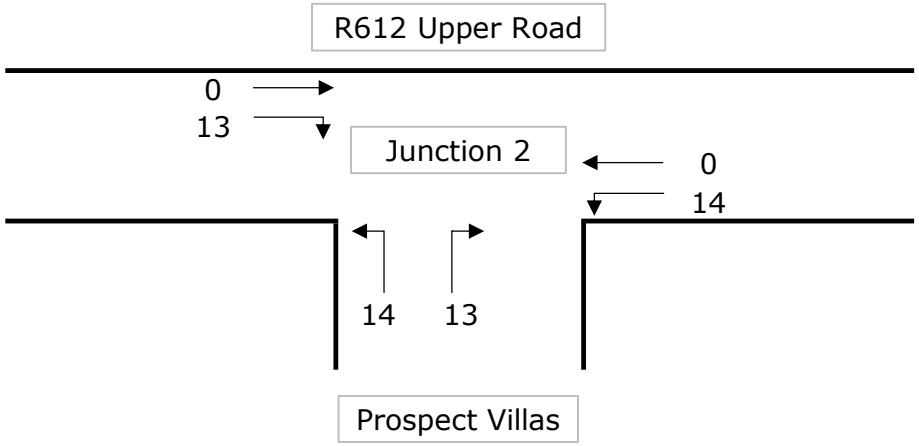


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Diagram 12: AADT Trip Generation & Assignment

Appendix C **TRICS OUTPUT FILES**

Calculation Reference: AUDIT-322901-220209-0220

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : C - FLATS PRIVATELY OWNED
TOTAL VEHICLES

Selected regions and areas:

02	SOUTH EAST		
	BD	BEDFORDSHIRE	1 days
04	EAST ANGLIA		
	NF	NORFOLK	1 days
	SF	SUFFOLK	1 days
08	NORTH WEST		
	MS	MERSEYSIDE	1 days
14	LEINSTER		
	LU	LOUTH	1 days

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

Primary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: No of Dwellings
Actual Range: 24 to 69 (units:)
Range Selected by User: 6 to 493 (units:)

Parking Spaces Range: All Surveys Included

Parking Spaces per Dwelling Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Monday-Friday 0700-1900
Include days where PT not known: Yes
Range: 50 to 500

Date Range: 01/01/13 to 30/06/21

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	1 days
Tuesday	1 days
Wednesday	1 days
Thursday	2 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	5 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Edge of Town Centre	5

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Development Zone	1
Residential Zone	3
Built-Up Zone	1

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Secondary Filtering selection:

Use Class:

C3	5 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 500m Range:

All Surveys Included

Population within 1 mile:

10,001 to 15,000	1 days
15,001 to 20,000	1 days
20,001 to 25,000	1 days
25,001 to 50,000	2 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

25,001 to 50,000	1 days
50,001 to 75,000	2 days
125,001 to 250,000	2 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	1 days
1.1 to 1.5	3 days
1.6 to 2.0	1 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

No	5 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	5 days

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1 BD-03-C-02 BLOCKS OF FLATS BEDFORDSHIRE
STANBRIDGE ROAD
LEIGHTON BUZZARD

Edge of Town Centre
Residential Zone
Total No of Dwellings: 62
Survey date: TUESDAY *15/05/18* *Survey Type: MANUAL*

2 LU-03-C-01 BLOCKS OF FLATS LOUTH
DONORE ROAD
DROGHEDA

Edge of Town Centre
Residential Zone
Total No of Dwellings: 52
Survey date: THURSDAY *12/09/13* *Survey Type: MANUAL*

3 MS-03-C-04 BLOCK OF FLATS MERSEYSIDE
HOY DRIVE
NEWTON-LE-WILLOWS
EARLESTOWN
Edge of Town Centre
Residential Zone
Total No of Dwellings: 24
Survey date: MONDAY *12/04/21* *Survey Type: MANUAL*

4 NF-03-C-01 BLOCKS OF FLATS NORFOLK
PAGE STAIR LANE
KING'S LYNN

Edge of Town Centre
Built-Up Zone
Total No of Dwellings: 51
Survey date: THURSDAY *11/12/14* *Survey Type: MANUAL*

5 SF-03-C-05 BLOCKS OF FLATS SUFFOLK
FORE STREET
IPSWICH
IPSWICH WATERFRONT
Edge of Town Centre
Development Zone
Total No of Dwellings: 69
Survey date: WEDNESDAY *23/06/21* *Survey Type: MANUAL*

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

MANUALLY DESELECTED SITES

Site Ref	Reason for Deselection
BD-03-C-01	PT
BD-03-C-03	PT
CO-03-C-01	PT
HF-03-C-03	PT
KI-03-C-03	PT
LU-03-C-02	PT
LU-03-C-03	PT
NF-03-C-01	PT
SA-03-C-01	PT
SF-03-C-01	PT
SY-03-C-01	PT
WM-03-C-04	PT

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED
TOTAL VEHICLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	5	52	0.054	5	52	0.155	5	52	0.209
08:00 - 09:00	5	52	0.085	5	52	0.209	5	52	0.294
09:00 - 10:00	5	52	0.074	5	52	0.097	5	52	0.171
10:00 - 11:00	5	52	0.089	5	52	0.132	5	52	0.221
11:00 - 12:00	5	52	0.128	5	52	0.097	5	52	0.225
12:00 - 13:00	5	52	0.112	5	52	0.112	5	52	0.224
13:00 - 14:00	5	52	0.089	5	52	0.078	5	52	0.167
14:00 - 15:00	5	52	0.074	5	52	0.089	5	52	0.163
15:00 - 16:00	5	52	0.097	5	52	0.089	5	52	0.186
16:00 - 17:00	5	52	0.143	5	52	0.089	5	52	0.232
17:00 - 18:00	5	52	0.163	5	52	0.097	5	52	0.260
18:00 - 19:00	5	52	0.240	5	52	0.151	5	52	0.391
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.348			1.395			2.743

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter summary

Trip rate parameter range selected:	24 - 69 (units:)
Survey date date range:	01/01/13 - 30/06/21
Number of weekdays (Monday-Friday):	5
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	1
Surveys manually removed from selection:	12

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

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