

# Land at St Nicholas

## Redrow Homes (South Wales)

**Transport Statement**

**October 2015**

## Contents

	<b>EXECUTIVE SUMMARY</b> .....	<b>1</b>
<b>1</b>	<b>INTRODUCTION</b> .....	<b>2</b>
<b>2</b>	<b>EXISTING CONDITIONS</b> .....	<b>3</b>
	<b>Site Location and Description</b> .....	<b>3</b>
	<b>Local Amenities</b> .....	<b>3</b>
	<b>Accessibility Appraisal</b> .....	<b>5</b>
	<b>Access by Foot and by Cycle</b> .....	<b>5</b>
	<b>Access by Public Transport</b> .....	<b>7</b>
	<b>Local Highway Network</b> .....	<b>8</b>
	<b>Current Traffic Conditions</b> .....	<b>9</b>
	<b>Accident Analysis</b> .....	<b>9</b>
<b>3</b>	<b>PROPOSED DEVELOPMENT</b> .....	<b>11</b>
	<b>Schedule of Accommodation</b> .....	<b>11</b>
	<b>Access</b> .....	<b>11</b>
	<b>Other external Highway Improvements</b> .....	<b>14</b>
	<b>Adjacent Site Access</b> .....	<b>15</b>
	<b>Internal Highway Network</b> .....	<b>16</b>
	<b>Swept Path Analysis</b> .....	<b>17</b>
	<b>Parking</b> .....	<b>17</b>
<b>4</b>	<b>QUANTITATIVE ANALYSIS</b> .....	<b>18</b>
	<b>Assessment Scenarios</b> .....	<b>18</b>
	<b>Committed Development</b> .....	<b>18</b>
	<b>Development Trip Rates and Traffic Generation</b> .....	<b>18</b>
	<b>Development Traffic Distribution</b> .....	<b>19</b>
	<b>Junction Assessment</b> .....	<b>19</b>
	<b>Sensitivity Analysis</b> .....	<b>20</b>
<b>5</b>	<b>SUMMARY AND CONCLUSIONS</b> .....	<b>21</b>
	<b>Summary</b> .....	<b>21</b>
	<b>Conclusion</b> .....	<b>21</b>

## **Figures**

- Figure 1** - Site location plan
- Figure 2** - Walking isochrones
- Figure 3** - Cycling isochrones
- Figure 4** - Local bus routes
- Figure 5** - Local amenities plan
- Figure 6** - Local highway network
- Figure 7** - Development Masterplan
- Figure 8** - Proposed access arrangements
- Figure 9** - Improved village gateway features

## **Appendices**

- Appendix A** - Traffic survey data
- Appendix B** - Traffic flow diagrams
- Appendix C** - Personal injury accident data
- Appendix D** - Previously proposed site access arrangements
- Appendix E** - Revised site access arrangements
- Appendix F** - Correspondence between Vectos and the Highway Officer
- Appendix G** - Stage 1 road safety audit
- Appendix H** - Road safety audit update
- Appendix I** - Proposed A48 gateway features
- Appendix J** - Proposed site access junctions to Redrow and Waterstone Homes sites
- Appendix K** - Swept path analysis
- Appendix L** - TRICS trip rates
- Appendix M** - PICADY results

## EXECUTIVE SUMMARY

Vectos is appointed by Redrow Homes (South Wales) to provide transportation and highways advice for the proposed residential development of the Land at St Nicholas, for 96 new dwellings. The site is currently used for agricultural land, however it benefits from being part of a housing allocation for 100 dwellings in the emerging Vale of Glamorgan Local Development Plan.

The site is located adjacent to a high frequency bus route, served by Stagecoach's X2, Cardiff to Porthcawl service. The X2 service provides a good level of existing public transport provision, connecting the village with key local shopping and employment areas across the region. The development will provide footway and cycle connections to the village, facilitating direct access to the rest of the village as well as the St Nicholas Church in Wales Primary School.

Vehicular access to the development will be achieved by a new priority T-junction with the A48 with a new access road through the existing 'Emmaville' property. The junction will also provide new 2 m wide footways and a right turn ghost island facility. This junction will introduce a change in alignment for traffic travelling along the A48 which will have a traffic calming effect, to help reduce traffic speeds along this stretch of highway. In addition, the development will introduce an improvement scheme to bolster the existing village gateway feature to further reduce vehicle speeds. This will have a positive effect on highway safety for existing residents of St Nicholas.

The development seeks to provide 96 new residential dwellings on a site allocated for housing in the emerging Vale of Glamorgan Local Development Plan and as such, should be supported by officers.

# 1 INTRODUCTION

1.1 Vectos is appointed by Redrow Homes (South Wales) to provide transportation and highways advice for the proposed residential development of the Land at St Nicholas.

1.2 The development site is allocated for the provision of up to 100 homes in Policy MG 2 of the emerging Vale of Glamorgan (VoG) Local Development Plan (LDP). The development site is slightly smaller than the housing allocation site and as such, will provide 96 new homes.

1.3 This Transport Assessment has been prepared in-line with current guidance provided by the Welsh Government's TAN 18 and 'Manual for Streets' (2007).

1.4 The remainder of this report is set out as follows:

- Section 2 – details the development site and the local existing conditions;
- Section 3 – presents the development proposals;
- Section 4 – outlines the quantitative analysis of the development; and
- Section 5 – provides a summary and conclusions.

## 2 EXISTING CONDITIONS

### Site Location and Description

2.1 The development site is irregular in shape and approximately 3.65 Ha in size and is located in the east of St Nicholas. The site is currently used for agricultural land and is bounded by agricultural land to the north and east of the site residential properties to the south and west. The site is allocated in Policy MG 2 the emerging VoG LDP for up to 100 dwellings. The development site is slightly smaller than the LDP allocation site.



Figure 1 – Site location plan

2.2 The site is illustrated in **Figure 1**.

### Local Amenities

2.3 When assessing the accessibility of a site, it is important to understand the local geographical context and general amenities available to future residents. This section assesses the local area for existing amenities, schools and employment opportunities and summarises the walking distances to each. Accessibility is key to ensuring travel by sustainable modes is encouraged from the outset.

2.4 The walking and cycling distance to the facilities, along with approximate walking and cycling times, are summarised in **Table 2.1** and are based on average walk speeds of 5 km/h and average cycle speeds of 15 km/h.

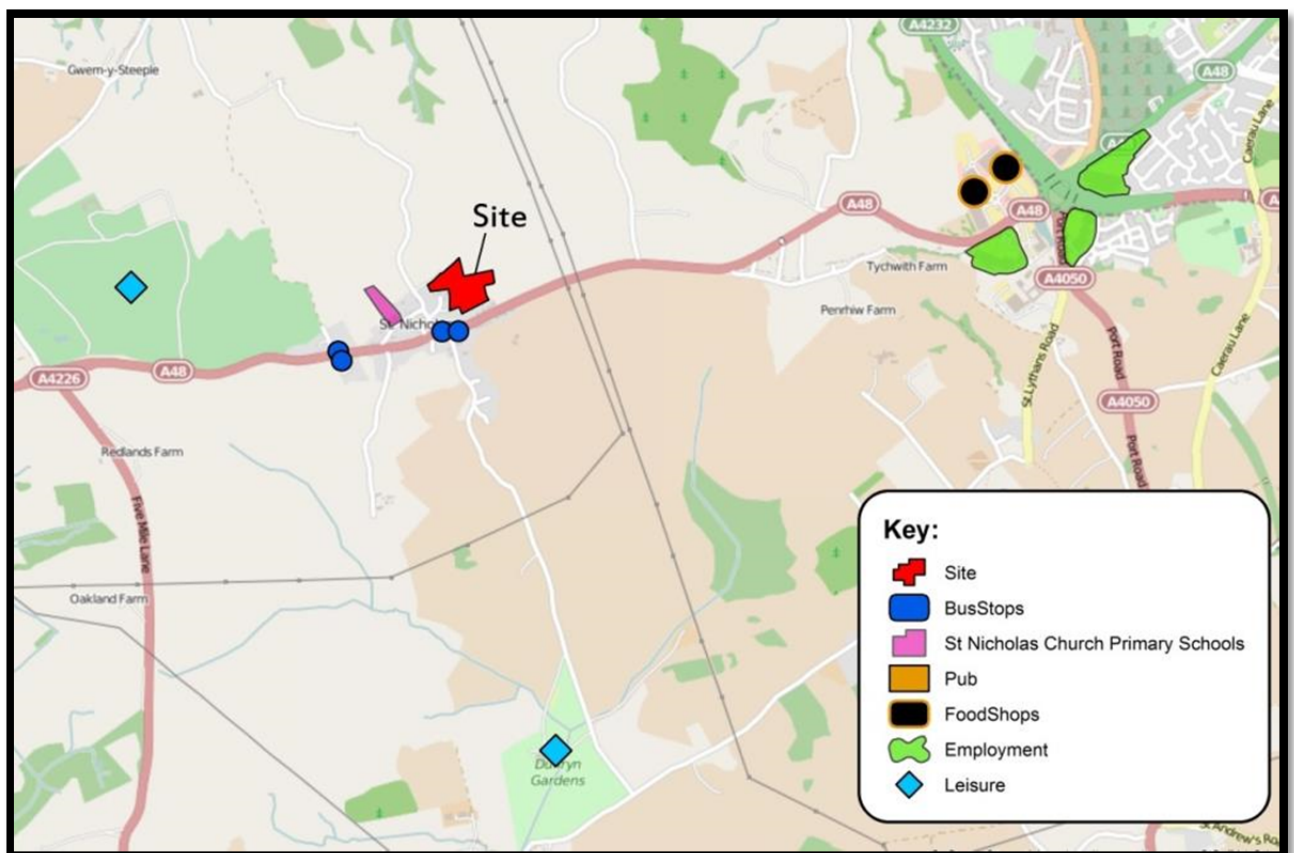
**Table 2.1 – Summary of distances to key local amenities**

Local Amenity	Distance from Site	Walk Time	Cycle Time
St Nicholas Church in Wales Primary School	280 m	3 mins	1 min
Eastbound Bus Stop	250 m	3 mins	1 min
Westbound Bus Stop	300 m	4 mins	1 min
Duffryn Gardens	2,200 m	26 mins	9 mins
Cottrell Park Golf Resort	2,400 m	29 mins	10 mins
Valegate Retail Park	2,400 m	29 mins	10 mins
Marks and Spencer	2,600 m	31 mins	10 mins
Tesco Superstore	2,700 m	32 mins	11 mins
Culverhouse Cross Retail Park	2,800 m	34 mins	11 mins
Red Lion Public House	2,800 m	34 mins	11 mins

2.5 Whilst the retail parks at Culverhouse Cross are considered to be reasonable walk from the site, they are achievable distances on a bicycle. Furthermore, the site and Culverhouse Cross are connected via the frequent X2 bus service, detailed further below.

2.6 **Figure 2** illustrates the local amenities within the vicinity of the site.

**Figure 2 – Local Amenities**



## Accessibility Appraisal

- 2.7 The following section provides a summary of the existing local sustainable transport infrastructure and service provision.

### Access by Foot and by Cycle

- 2.8 To the east of St Nicholas there is a footway located on the southern side of the A48 whilst through the village there are footways on both sides of the highway. Street lighting is provided throughout the village and a controlled pedestrian crossing forms part of the signal controlled junction with Duffryn Lane, approximately 250 m west of the site. This crossing facilitates safe pedestrian movement across the A48 and is illustrated in **Photograph 1**.

**Photograph 1 – A48 and pedestrian crossing facility**



- 2.9 St Nicholas Church in Wales Primary School will be accessed from the site by travelling along Ger-Y-Llan, then School Lane. Whilst neither of these minor roads have a footway provision, this arrangement is typical of rural villages with low traffic movement and is illustrated in **Photograph 2**.

**Photograph 2 – School Lane**



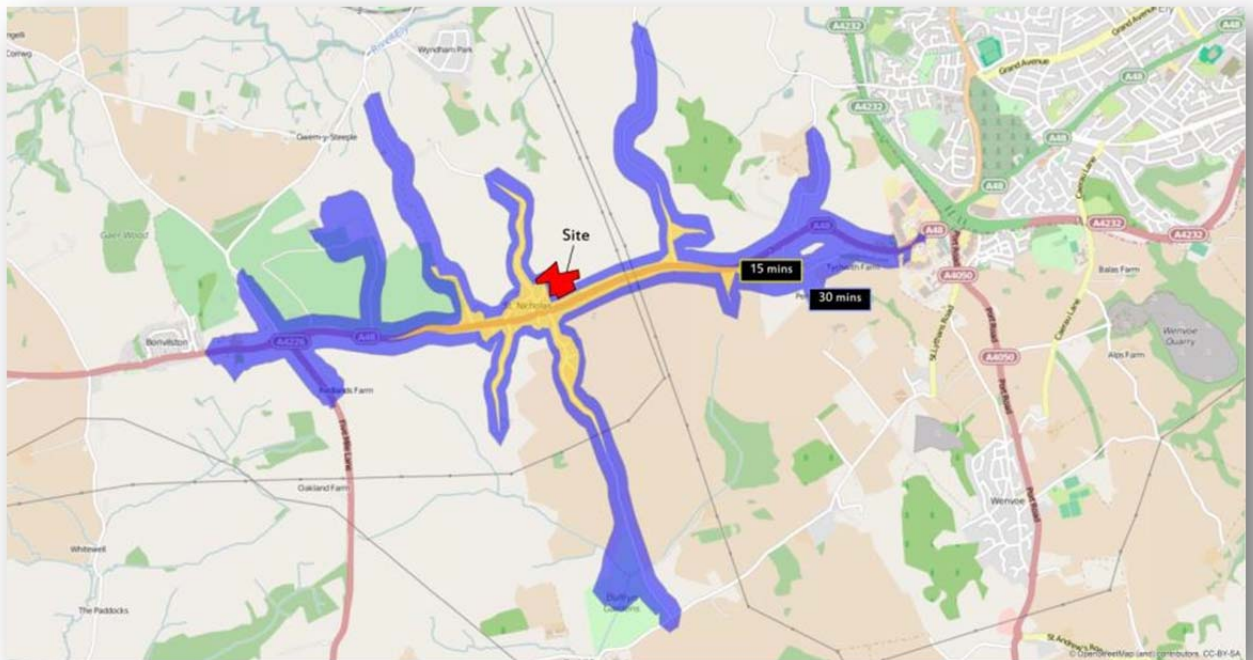
- 2.10 Ger-Y-Llan and School Lane utilise an informal 'shared space' approach which encourages multiple users to use the same highway space. Reduced visibility and narrow width means



that pedestrians, cyclists and vehicles can occupy the road space safely as drivers are aware of the road conditions and drive accordingly, i.e. slowly. Therefore no improvements are considered necessary on highway/pedestrian safety grounds and this would only detract from the established village character.

- 2.11 **Figure 3** illustrates the walk isochrones of 15 minutes and 30 minutes from the site assuming a comfortable average walk speed of 5 km/h (3 mph).

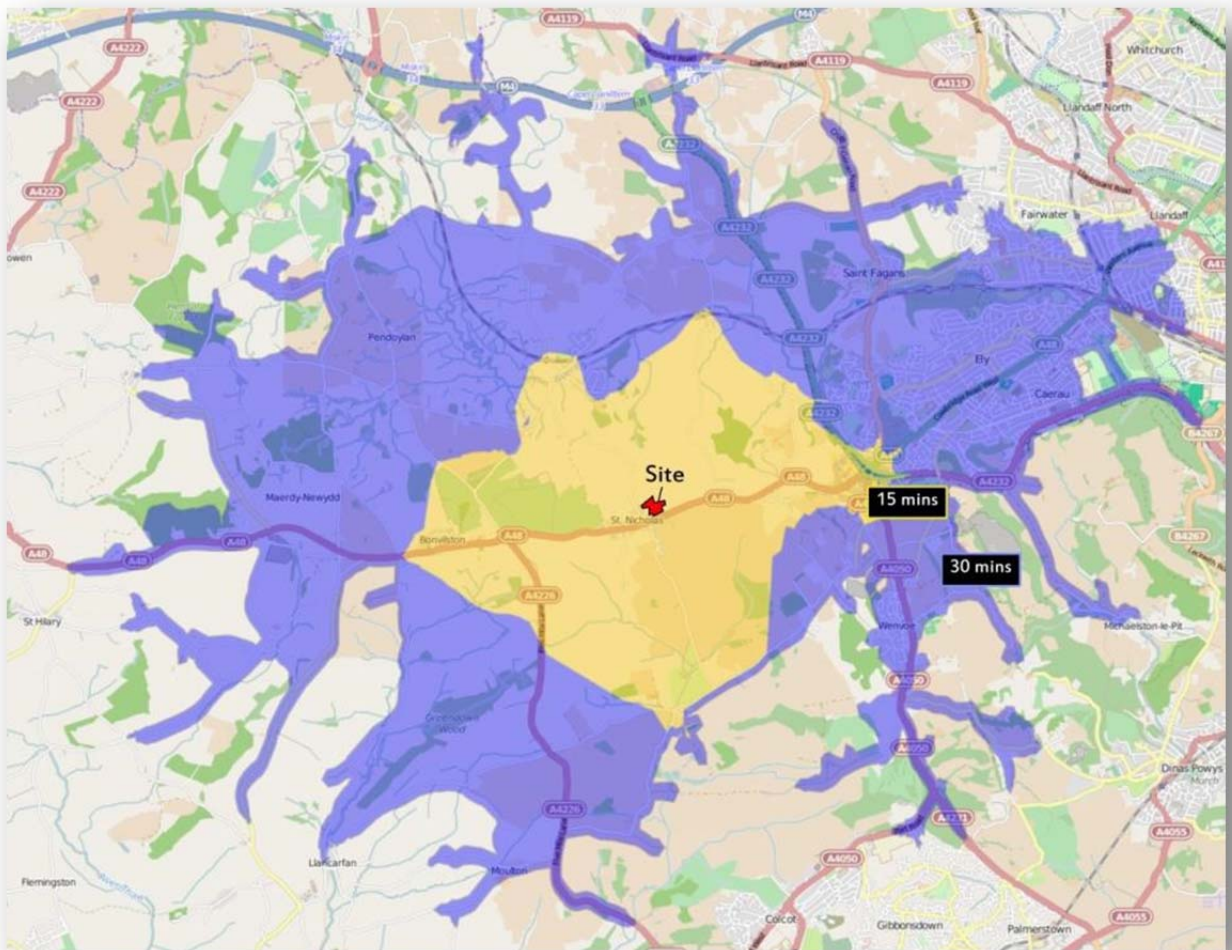
**Figure 3 – Walking isochrones**



- 2.12 **Figure 3** demonstrates that future residents could comfortably walk to a number of key local amenities, including the primary school, bus stops and Culverhouse Cross.

- 2.13 **Figure 4** illustrates the cycle isochrones of 15 minutes and 30 minutes from the site assuming a comfortable average cycle speed of 15 km/h (9 mph).

Figure 4 – Cycling isochrones



2.14 **Figure 4** demonstrates that future residents could comfortably cycle to other local villages as well as key shopping and employment opportunities in northwest Cardiff. This offers future residents the opportunity to travel sustainably from the outset and reduce dependence on the private car.

#### Access by Public Transport

2.15 There are existing bus stops located on the A48, around 250-300 m to the east of the site. Both stops are served by Stagecoach’s X2 service between Cardiff and Porthcawl. Both the eastbound and westbound stops are lay-by arrangements and passengers benefit from shelters, timetable information, flag & pole as well as raised boarding platforms. Raised boarding platforms, when used with low floor buses such as those used by Stagecoach on the X2 service, allow passengers to board and alight in a step-free environment, which is particularly useful for the less abled and parents with pushchairs.

2.16 The current X2 service connects St Nicholas with Cardiff, Bridgend, Cowbridge and Porthcawl with two services an hour, in both directions. The timetable information is summarised in **Table 2.2**.

**Table 2.2 – Summary of X2 bus service**

Direction	Weekday			Saturday			Sunday		
	First	Last	Freq.	First	Last	Freq.	First	Last	Freq.
Cardiff	07.12	22.48	2 / Hr	08.07	22.48	2 / Hr	10.14	22.51	1 / Hr
Porthcawl	08.26	23.27	2 / Hr	09.32	23.27	2 / Hr	11.09	23.34	1 / Hr

2.17 The X2 service also stops on Crack Hill and Cowbridge Road in Bridgend, which services the Waterton Business Park and Bridgend Industrial Estate. Besides Culverhouse Cross and Cardiff City Centre, these are major local employment areas. For future residents of the development, the X2 bus service offers an opportunity to travel sustainably to all of the key local employment areas and the addition of more potential passengers will only make the service more viable.

2.18 **Figure 5** illustrates the local bus routes.

**Figure 5 – Local bus routes**



### Local Highway Network

2.19 The site is located adjacent to the A48 which connects with Culverhouse Cross in the east and Cowbridge in the west. It is a 10.5 m wide single lane highway within the vicinity of the site and the posted speed limit within St Nicholas is 30 mph. Outside of the village, the National Speed Limit applies and the point at which the speed limit changes for eastbound traffic is approximately 100 m to the east of the site. Street lighting is provided within the vicinity of the site also.

2.20 The local highway network is illustrated in **Figure 6**.

**Figure 6 – Local highway network**



### **Current Traffic Conditions**

- 2.21 An Automatic Traffic Counter (ATC) survey was commissioned between 2/2/15 and 9/2/15 to record current traffic flows and speeds on the A48, directly adjacent to the proposed point of access. The average weekday AM and PM peak periods were 08:00 to 09:00 and 17:00 to 18:00 respectively.
- 2.22 The posted speed limit in the village is 30 mph and the recorded 85<sup>th</sup> percentile speeds were 39.4 mph eastbound and 38.3 mph westbound. Further details of how the development proposals will help reduce the existing vehicle speeds are contained in Section 3.
- 2.23 The traffic survey data is contained in **Appendix A** and traffic flow diagrams are contained in **Appendix B**.

### **Accident Analysis**

- 2.24 Personal Injury Accident data was sought from VoG for the most recent five year period available. A detailed copy of all of the PIA data and the accident location plan are contained in **Appendix C**.
- 2.25 Accidents are recorded as either 'slight', 'serious' or 'fatal'. Analysis of the data demonstrated that during the survey period and within the study area there were:
- Only 1 recorded accident causing 3 casualties, of which none were vulnerable road users;

- 1 accident was recorded as slight, none as serious or fatal;
- No accidents occurred in dark conditions or periods requiring street lighting; and
- No accidents occurred during wet/damp conditions.

2.26 There are no common causation factors observed in the profile of accidents within the study data, apart from typical accident types (e.g. shunt / collision).

### 3 PROPOSED DEVELOPMENT

#### Schedule of Accommodation

- 3.1 It is proposed to construct 96 new dwellings on land to the north of the A48. The development site is allocated in the emerging VoG LDP.
- 3.2 **Figure 7** illustrates the proposed site layout.

**Figure 7 – Illustrative Masterplan layout**



#### Access

- 3.3 The development will be accessed via a new priority T-junction with the A48, to be located through the land currently occupied by 'Emmaville', illustrated in Photograph 3 below. The house will be removed to allow for the construction of the new access road, although the mature trees situated at the rear of the property will remain unaffected.
- 3.4 The siting of proposed junction to access the Redrow land is between neighbouring properties, which is not untypical when designing an access into a residential site. The spacing of the residential driveways either side of the proposed access, in combination with

the set-back distance of the neighbouring property walls means that drivers have adequate visibility and hence will have sufficient time to safely react to each other's manoeuvres if they happen to occur at the same time as traffic from the proposed development. In addition, the traffic generated by the neighbouring properties will be so low (almost incidental) that the probability and risk of vehicles arriving and/or departing at the same time as the traffic from the proposed development is extremely low. Moreover, no such highway safety risks were identified in the Road Safety Audit prepared independently to the design.

**Photograph 3 – Location of site access (Emmaville)**



- 3.5 Vectos originally provided a site access junction design for consideration (contained in **Appendix D**) by VoG Highway Officers. The design and layout of this junction was in-line with the principles of MfS and designed to a pedestrian scale, which we believe to be the most appropriate design principles for a small residential development in a rural village. This access arrangement was not agreed as the Highway Officer suggested that the A48 could at some future point become reclassified as a Trunk Road, and hence DMRB standards should be apply.
- 3.6 The A48 is not a Trunk Road, it was de-trunked shortly after the A4 Motorway was constructed in this area. Although the Highway Officer advised that there are aspirations to reclassify the A48 as a Trunk Road, we have not been provided with anything to formally support this view. In 2006, the Welsh Government (WG) proposed that the route 'Culverhouse Cross - St. Nicholas - Sycamore Cross - Waycock Cross - Port Road – Cardiff' Airport should be reclassified as a Trunk Road. This proposal resulted in a Public Inquiry where the Inspector ruled that the proposed Trunking Order should not be made. We are not aware of any further Policy in the public domain that would support the Officer's view that this section of the A48 will be reclassified.

- 3.7 Despite our belief that MfS standards are applicable in this location, and that the road is not a Trunk Road, the site access was extensively redesigned in collaboration with the Highway Officer to meet the significantly more onerous DMRB TD 42/95 design standards.
- 3.8 The junction into the site includes a right turn ghost-island facility on to the A48 which will protect right turning traffic as well preventing traffic accessing the site from blocking through traffic. The access road into the site will be 6 m wide which widens at the bellmouth to accommodate a pedestrian/cycle refuge island. Shared footway / cycleways of 3m will be provided across the site frontage and 2 m wide footways will be provided on both sides of the highway when entering the site.
- 3.9 An illustrative diagram of this revised, DMRB compliant access is contained in **Figure 8**.

**Figure 8 – Illustrative proposed access arrangements**

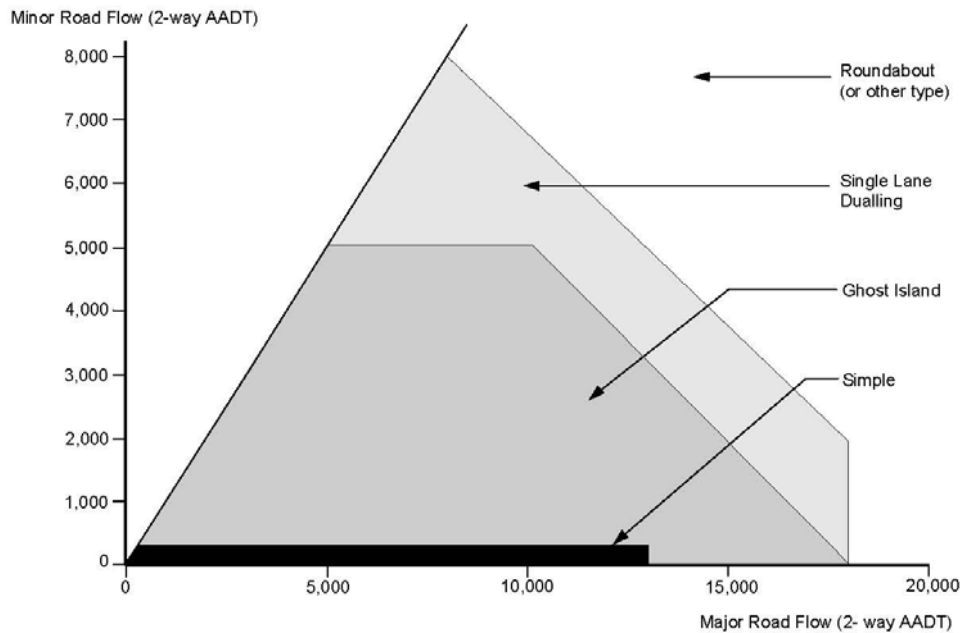


- 3.10 A detailed plan of the revised site access arrangements is included in **Appendix E** which includes 4.5 m x 80 m visibility splays as requested by the Highway Officer and defined by MfS2, using recorded 85<sup>th</sup> percentile speeds on this section of road (see **Appendix F**).
- 3.11 DMRB provides guidance on the use of ghost islands in relation to anticipated / observed traffic flows, which supports the introduction of this type of junction arrangement for access to the development. Furthermore, the Highway Officer noted in this correspondence to Vectos that '*in principal the provision of a ghost island arrangement is suitable subject to agreeing the detailed design*'. The inference here is that the proposed means of access is in principle, acceptable in this location. Correspondence between Vectos and the Highway Officer is contained within **Appendix F**.
- 3.12 The recorded average two-way daily traffic flow on the A48 during the ATC traffic survey was 14,007 vehicles, whilst the calculated daily two-way traffic flow from the development is 401 vehicles. TD 42/95 contains the graph illustrated in **Figure 9**, which recommends a ghost



island junction arrangement, on the basis of the observed major road flows and forecast minor road (site access) flows.

**Figure 9 – Extract from TD 42/95**



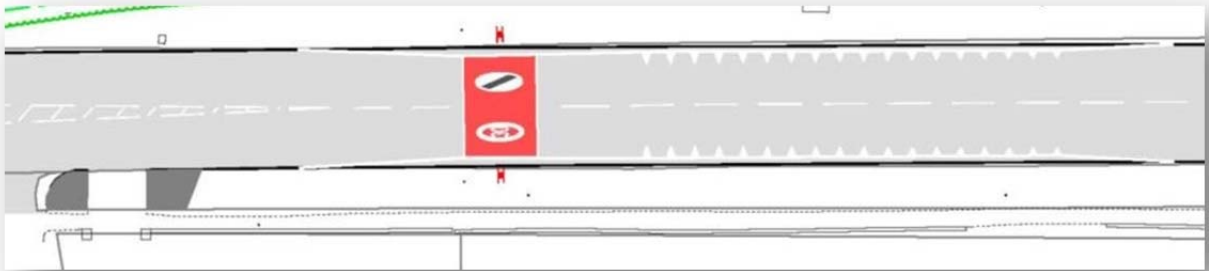
- 3.13 A Stage 1 Road Safety Audit (RSA) was commissioned to appraise the original site access junction, which was based on the principles of MfS. This is contained in **Appendix G**. There was only 1 issue raised in the RSA and this was in relation to the retention of the existing layby, which could be used to park vehicles in and thereby reduce the junction visibility. As such the junction was redesigned to introduce a new kerblin and footway, removing the current layby arrangement completely and therefore removing this issue completely.
- 3.14 A follow-up RSA appraisal has been produced to review the DMRB junction compliant amendments requested by the Highway Officer. This is contained in **Appendix H**. No further issues were noted by the Auditor.

### **Other external Highway Improvements**

- 3.15 As noted in Section 2, the recorded 85<sup>th</sup> percentile speeds were higher than the posted speed limit. The addition of the site access junction and traffic turning into and out of the development will have a natural traffic calming effect in this location, and should subsequently reduce vehicular speeds.

- 3.16 Improvements to the existing speed limit change gateway feature (located approximately 100 m to the east of proposed site access) are proposed to further combat traffic speeds in the village, which we consider to be caused by the excessive width of the A48 highway.
- 3.17 The gateway feature improvements will include extending the red surface treatment across the whole highway as well as providing white lined channels on both edges to introduce a visual narrowing effect, thus slowing westbound traffic. This will be reinforced with ‘dragon’s teeth’ road markings on the eastern side of the feature to ensure drivers are aware they are entering a village and the speed limit changes to 30 mph. Eastbound traffic will have to negotiate the change in road alignment that will be introduced by the ghost island site access junction, which effectively introduces a subtle chicane which will have a traffic calming effect.
- 3.18 A detailed plan of the proposed access arrangements is included in **Appendix I**, whilst an illustrative diagram is contained in **Figure 9**.

**Figure 9 – Proposed gateway improvement scheme**

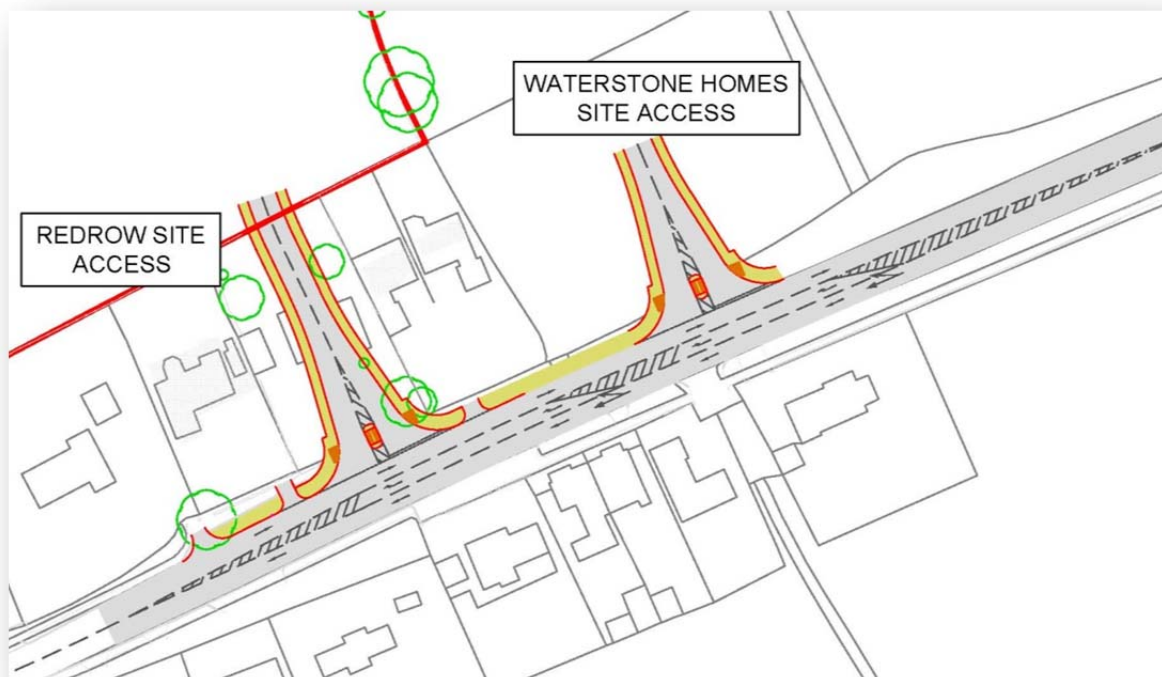


### **Adjacent Site Access**

- 3.19 A planning application (Ref: 2015/00662/FUL) has also been submitted by Waterstone Homes for 20 new residential dwellings to the east of the development site. This application proposes a new frontage access approximately 72 m to the east of our proposed access. The Highway Officer has suggested that only one access should be used to access both the Redrow and Waterstone Homes sites. This of course would result in a ransom situation which would be unacceptable. However, all permutations should be addressed in the eventuality that either or both developments receive planning consent.
- 3.20 To that end, there is no highway reason to subjectively prefer one junction location over the other and there is no reason why both developments and importantly the access junctions could not be granted consent and operate safely together. To demonstrate this we have

produced a detailed plan of both of the proposed access arrangements. This is included in **Appendix J**, whilst an illustrative diagram is contained in **Figure 10**. It should be noted that whilst the current application for the Waterstone Homes site does not include a DMRB compliant junction (they have designed to MfS as per the Vectos design for access to the Redrow land) we have assumed that a DMRB TD 42/95 compliant junction would be required.

**Figure 10 – Proposed site access junctions to Redrow and Waterstone Homes sites**



- 3.21 The Safety Auditor has also reviewed the highway arrangement with both site access junctions in place and this review is contained in **Appendix H**. The conclusion is that there is no highway safety or capacity reasons why both junctions could not operate safely together.

### **Internal Highway Network**

- 3.22 The internal highways are 5.5 m wide, with 2 m wide footways provided at the side of the primary access road. Some of the internal highways are intended to be shared space streets and as such, do not have separate footways. This is in-keeping with the DfT's 'Manual for Streets' approach to residential streetscape design and is intended to reduce vehicle speeds and allow vehicles, cyclists and pedestrians to share the space road space safely.

- 3.23 The internal street network has been designed to allow for future development in adjacent fields, which will fulfil the VoG LDP housing allocation. The site access has been tested in Section 4 for the whole housing allocation, not just the proposed development.
- 3.24 The western internal access road will physically connect with Ger-Y-Lan, however a form of gated access will be constructed to allow pedestrian and cycle access only, so that residents can easily and safely reach the rest of the village and primary school.
- 3.25 A farm access will be retained on the north-eastern street, for access to the agricultural land to the north of the development.

### **Swept Path Analysis**

- 3.26 Swept path analysis has been undertaken to review the site access junction for a large refuse vehicle vehicles. This is contained in **Appendix K**.

### **Parking**

- 3.27 The VoG are currently consulting on the adoption of Parking Standards Supplementary Planning Guidance (SPG), based on the 2008 CSS Wales Parking Standards. This is the latest guidance available and the most appropriate to use for the proposed development.
- 3.28 The standards for a Zone 5 (countryside) residential development are 1 space per bedroom for houses and apartments (up to a maximum of 3 spaces per dwelling). The guidance also allows up to 1 visitor space for every 5 dwellings. This allows a maximum permissible provision of 225 parking spaces across the development
- 3.29 The development will provide 183 resident spaces and 2 visitor spaces, which accords with the emerging VoG SPG Parking Standards.
- 3.30 Cycle parking is provided for in either the detached or integral garages for each open market house, whilst cycle hoops are provided for each of the affordable units.

## 4 QUANTITATIVE ANALYSIS

### Assessment Scenarios

- 4.1 The anticipated development delivery will be around four dwellings per month with the first completion in October 2016. Final completion is likely to be around July 2018. Therefore we have tested the traffic effect of the completed development in 2018.
- 4.2 Traffic growth factors have been derived from the TEMPRO database and these factors are summarised in **Table 4.1**.

Period	AM Peak	PM Peak
2015 – 2018	1.0493	1.0496
2015 – 2020	1.0848	1.0850

- 4.3 Traffic flow diagrams are contained in **Appendix C**.

### Committed Development

- 4.4 There are no known local committed development schemes that require inclusion into this traffic effect assessment.

### Development Trip Rates and Traffic Generation

- 4.5 The TRICS database was interrogated to produce multi-modal trip rates that are relevant to the proposed residential development in terms of location and size. The trip rates are summarised in **Table 4.2** and contained in full in **Appendix L**.

**Table 4.2 – Summary of trip rates**

Mode	AM Peak		PM Peak	
	Arrivals	Departures	Arrivals	Departures
Bus Passengers	0.007	0.019	0.016	0.003
Cyclists	0.006	0.024	0.017	0.010
Pedestrians	0.036	0.161	0.137	0.075
Vehicles	0.144	0.399	0.380	0.224

- 4.6 The forecast traffic generation is contained in **Table 4.3**.

**Table 4.3 – Summary of traffic generation**

Mode	AM Peak		PM Peak	
	Arrivals	Departures	Arrivals	Departures
Bus Passengers	1	2	1	0
Cyclists	0	2	1	1
Pedestrians	3	13	11	6
Vehicles	11	32	30	18

- 4.7 The forecast traffic generation is considered to be a worst case scenario as a Framework Travel Plan (FTP) has been produced (as a separate document) to accompany the application with the intention of increasing sustainable transport use by future residents. The FTP contains advice pertaining to how a future Travel Plan can be implemented as well as achievable targets for modal shift.

### Development Traffic Distribution

- 4.8 Development traffic has been distributed according to base traffic directional proportions.

### Junction Assessment

- 4.9 A PICADY model has been built to assess the proposed priority T-junction site access in the future year scenarios 2017 and 2020, in the AM and PM peak periods.
- 4.10 The results of the site access PICADY junction assessment are summarised in **Table 4.4** and contained in full in **Appendix M**.

**Table 4.4 – Summary of PICADY results**

Year	Movement	AM Peak		PM Peak	
		RFC	Queue	RFC	Queue
2018	Site egress	0.112	0 vehicles	0.060	0 vehicles
	Right turn	0.007	0 vehicles	0.037	0 vehicles
2020	Site egress	0.116	0 vehicles	0.061	0 vehicles
	Right turn	0.008	0 vehicles	0.037	0 vehicles

- 4.11 **Table 4.4** demonstrates that the proposed site access priority junction, with right turn lane, is forecast to operate well within its theoretical capacity limits with no queuing predicted at the site egress or in the right turn lane.

4.12 The development effect on the wider highway network is considered to be minor, with a vehicle movement, on average, once every 2 minutes towards Culverhouse Cross and once every 3 minutes towards Cowbridge, during the peak periods. This volume of traffic would be unnoticeable to existing drivers and would amount to less than the daily variation in background traffic.

### Sensitivity Analysis

4.13 The development site is slightly smaller than the housing allocation site however the internal street network has been designed to accommodate a future expansion in to the adjacent land. As such the site access has been tested for the full housing allocation of 100 dwellings in 2020, which is the worst case scenario.

4.14 **Table 4.5** summarises the PICADY results of the sensitivity analysis, whilst the results are contained in full in **Appendix M**.

Year	Movement	AM Peak		PM Peak	
		RFC	Queue	RFC	Queue
2020	Site egress	0.145	0 vehicles	0.083	0 vehicles
	Right turn	0.008	0 vehicles	0.047	0 vehicles

4.15 **Table 4.5** demonstrates that the proposed site access junction is able to accommodate the full VoG LDP housing allocation of 100 dwellings and the submitted schemes of 116 dwellings with no predicted queuing at the site egress or in the right turn lane.

## 5 SUMMARY AND CONCLUSIONS

### Summary

- 5.1 Vectos is appointed by Redrow Homes (South Wales) to provide transportation and highways advice for the proposed residential development of the Land at St Nicholas.
- 5.2 The development site is allocated for the provision of up to 100 homes in Policy MG 2 of the emerging Vale of Glamorgan (VoG) Local Development Plan (LDP). The development site is slightly smaller than the housing allocation site and as such, will provide 96 new homes.
- 5.3 The site is located adjacent to the high frequency bus service between Cardiff, Cowbridge, Bridgend and Porthcawl. The X2 service is operated by Stagecoach and the nearest bus stops are located approximately 250 to 300 m from the site. This is a good existing bus service which will provide future residents with sustainable connections with key local shopping destinations and employment areas.
- 5.4 The development will be accessed by a new priority T-junction on the A48 which will include a right turn ghost island facility to protect right turning traffic and prevent the blocking of through traffic.
- 5.5 An improvement scheme is proposed to improve the existing speed limit change gateway feature, to help combat vehicle speeds on this section of the A48. This will be provided in addition to the site access junction, which will also have a traffic calming effect.
- 5.6 A planning application for 20 new houses is made by Waterstone Homes (Ref: 2015/00662/FUL) on the site to the east of St Nicholas and adjacent to the proposed development. This Transport Statement has demonstrated that either or both site access junctions on to the A48 can be designed to DMRB TD 42/95 standards, and can operate safely and without capacity issues.

### Conclusion

- 5.7 The site is allocated for residential development within the emerging VoG LDP and this report has demonstrated that, from a highways and transport perspective, development ought to be encouraged.



## **APPENDIX A**

18470 ST NICHOLAS									
FEBRUARY 2015									
Site	Location	Direction	Start Date	End Date	Posted Speed Limit (PSL)	Total Vehicles	5 Day Ave.	7 Day Ave.	Average 85%ile Speed
Site No: 18470001	A48, St Nicholas (LC 70) ST 09326 74379	Channel: Eastbound	Tue 03-Feb-15	Mon 09-Feb-15	30	49194	7638	7028	39.4
		Channel: Westbound	Tue 03-Feb-15	Mon 09-Feb-15		48854	7482	6979	38.3

18470		ST NICHOLAS			Posted Speed Limit (PSL)	Average Mean Speed
		FEBRUARY 2015				
Site	Location	Direction	Start Date	End Date		
Site No: 18470001	A48, St Nicholas (LC 70) ST 09326 74379	Channel: Eastbound	Tue 03-Feb-15	Mon 09-Feb-15	30	34.5
		Channel: Westbound	Tue 03-Feb-15	Mon 09-Feb-15		32.2

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Eastbound

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	MOTOR-CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
<b>Tue 03-Feb-15</b>											
00:00	5	0	0.0	5	100.0	0	0.0	0	0.0	0	0.0
01:00	6	0	0.0	5	83.3	1	16.7	0	0.0	0	0.0
02:00	4	0	0.0	2	50.0	1	25.0	1	25.0	0	0.0
03:00	9	0	0.0	9	100.0	0	0.0	0	0.0	0	0.0
04:00	22	0	0.0	20	90.9	1	4.6	1	4.6	0	0.0
05:00	78	1	1.3	75	96.2	2	2.6	0	0.0	0	0.0
06:00	273	2	0.7	254	93.0	12	4.4	5	1.8	0	0.0
07:00	1069	2	0.2	1001	93.6	49	4.6	10	0.9	7	0.7
08:00	1153	4	0.4	1079	93.6	43	3.7	22	1.9	5	0.4
09:00	639	0	0.0	582	91.1	38	6.0	15	2.4	4	0.6
10:00	460	0	0.0	408	88.7	37	8.0	11	2.4	4	0.9
11:00	412	1	0.2	374	90.8	25	6.1	10	2.4	2	0.5
12:00	434	2	0.5	384	88.5	37	8.5	10	2.3	1	0.2
13:00	418	2	0.5	369	88.3	30	7.2	16	3.8	1	0.2
14:00	433	2	0.5	390	90.1	31	7.2	7	1.6	3	0.7
15:00	520	4	0.8	465	89.4	35	6.7	12	2.3	4	0.8
16:00	436	2	0.5	394	90.4	27	6.2	11	2.5	2	0.5
17:00	420	0	0.0	402	95.7	14	3.3	3	0.7	1	0.2
18:00	278	0	0.0	263	94.6	11	4.0	3	1.1	1	0.4
19:00	175	1	0.6	166	94.9	3	1.7	4	2.3	1	0.6
20:00	110	0	0.0	107	97.3	2	1.8	0	0.0	1	0.9
21:00	90	0	0.0	87	96.7	1	1.1	2	2.2	0	0.0
22:00	68	0	0.0	64	94.1	2	2.9	0	0.0	2	2.9
23:00	26	0	0.0	24	92.3	2	7.7	0	0.0	0	0.0
12H,7-19	6672	19	0.3	6111	91.6	377	5.7	130	2.0	35	0.5
16H,6-22	7320	22	0.3	6725	91.9	395	5.4	141	1.9	37	0.5
18H,6-24	7414	22	0.3	6813	91.9	399	5.4	141	1.9	39	0.5
24H,0-24	7538	23	0.3	6929	91.9	404	5.4	143	1.9	39	0.5

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Eastbound

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	MOTOR-CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
<b>Wed 04-Feb-15</b>											
00:00	9	0	0.0	7	77.8	2	22.2	0	0.0	0	0.0
01:00	7	0	0.0	6	85.7	0	0.0	1	14.3	0	0.0
02:00	7	0	0.0	3	42.9	2	28.6	2	28.6	0	0.0
03:00	10	0	0.0	8	80.0	1	10.0	1	10.0	0	0.0
04:00	21	0	0.0	21	100.0	0	0.0	0	0.0	0	0.0
05:00	93	1	1.1	86	92.5	4	4.3	2	2.2	0	0.0
06:00	253	2	0.8	231	91.3	14	5.5	6	2.4	0	0.0
07:00	1115	3	0.3	1047	93.9	43	3.9	15	1.4	7	0.6
08:00	1080	3	0.3	1003	92.9	55	5.1	14	1.3	5	0.5
09:00	593	2	0.3	537	90.6	35	5.9	17	2.9	2	0.3
10:00	441	1	0.2	398	90.3	31	7.0	8	1.8	3	0.7
11:00	428	4	0.9	376	87.9	33	7.7	13	3.0	2	0.5
12:00	477	1	0.2	416	87.2	46	9.6	12	2.5	2	0.4
13:00	478	5	1.1	432	90.4	26	5.4	14	2.9	1	0.2
14:00	465	2	0.4	403	86.7	44	9.5	12	2.6	4	0.9
15:00	524	3	0.6	459	87.6	42	8.0	16	3.1	4	0.8
16:00	482	2	0.4	441	91.5	26	5.4	12	2.5	1	0.2
17:00	418	1	0.2	397	95.0	14	3.4	4	1.0	2	0.5
18:00	256	1	0.4	238	93.0	12	4.7	4	1.6	1	0.4
19:00	174	0	0.0	164	94.3	8	4.6	1	0.6	1	0.6
20:00	97	0	0.0	91	93.8	4	4.1	1	1.0	1	1.0
21:00	99	0	0.0	96	97.0	2	2.0	1	1.0	0	0.0
22:00	53	1	1.9	45	84.9	5	9.4	0	0.0	2	3.8
23:00	22	0	0.0	21	95.5	1	4.6	0	0.0	0	0.0
12H,7-19	6757	28	0.4	6147	91.0	407	6.0	141	2.1	34	0.5
16H,6-22	7380	30	0.4	6729	91.2	435	5.9	150	2.0	36	0.5
18H,6-24	7455	31	0.4	6795	91.2	441	5.9	150	2.0	38	0.5
24H,0-24	7602	32	0.4	6926	91.1	450	5.9	156	2.1	38	0.5

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Eastbound

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	MOTOR-CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
<b>Thu 05-Feb-15</b>											
00:00	9	0	0.0	9	100.0	0	0.0	0	0.0	0	0.0
01:00	10	0	0.0	9	90.0	1	10.0	0	0.0	0	0.0
02:00	8	0	0.0	5	62.5	1	12.5	2	25.0	0	0.0
03:00	14	0	0.0	12	85.7	1	7.1	1	7.1	0	0.0
04:00	23	0	0.0	20	87.0	3	13.0	0	0.0	0	0.0
05:00	85	1	1.2	72	84.7	8	9.4	4	4.7	0	0.0
06:00	280	1	0.4	259	92.5	15	5.4	5	1.8	0	0.0
07:00	1037	4	0.4	967	93.3	43	4.2	18	1.7	5	0.5
08:00	1101	3	0.3	1050	95.4	35	3.2	10	0.9	3	0.3
09:00	614	2	0.3	562	91.5	35	5.7	12	2.0	3	0.5
10:00	494	1	0.2	448	90.7	31	6.3	13	2.6	1	0.2
11:00	466	7	1.5	412	88.4	33	7.1	13	2.8	1	0.2
12:00	450	2	0.4	390	86.7	36	8.0	19	4.2	3	0.7
13:00	433	1	0.2	395	91.2	23	5.3	10	2.3	4	0.9
14:00	428	3	0.7	379	88.6	31	7.2	13	3.0	2	0.5
15:00	537	2	0.4	474	88.3	45	8.4	12	2.2	4	0.7
16:00	464	1	0.2	431	92.9	28	6.0	2	0.4	2	0.4
17:00	456	0	0.0	438	96.1	11	2.4	5	1.1	2	0.4
18:00	293	0	0.0	283	96.6	8	2.7	1	0.3	1	0.3
19:00	173	0	0.0	165	95.4	5	2.9	3	1.7	0	0.0
20:00	95	0	0.0	92	96.8	1	1.1	1	1.1	1	1.1
21:00	96	0	0.0	89	92.7	6	6.3	1	1.0	0	0.0
22:00	53	1	1.9	48	90.6	2	3.8	1	1.9	1	1.9
23:00	37	0	0.0	37	100.0	0	0.0	0	0.0	0	0.0
12H,7-19	6773	26	0.4	6229	92.0	359	5.3	128	1.9	31	0.5
16H,6-22	7417	27	0.4	6834	92.1	386	5.2	138	1.9	32	0.4
18H,6-24	7507	28	0.4	6919	92.2	388	5.2	139	1.9	33	0.4
24H,0-24	7656	29	0.4	7046	92.0	402	5.3	146	1.9	33	0.4

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Eastbound

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	MOTOR-CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
<b>Fri 06-Feb-15</b>											
00:00	16	0	0.0	13	81.3	2	12.5	1	6.3	0	0.0
01:00	5	0	0.0	4	80.0	0	0.0	1	20.0	0	0.0
02:00	3	0	0.0	3	100.0	0	0.0	0	0.0	0	0.0
03:00	10	0	0.0	9	90.0	0	0.0	1	10.0	0	0.0
04:00	27	0	0.0	25	92.6	0	0.0	2	7.4	0	0.0
05:00	83	0	0.0	76	91.6	6	7.2	1	1.2	0	0.0
06:00	225	1	0.4	211	93.8	10	4.4	3	1.3	0	0.0
07:00	1018	4	0.4	956	93.9	34	3.3	18	1.8	6	0.6
08:00	893	4	0.5	837	93.7	33	3.7	13	1.5	6	0.7
09:00	580	2	0.3	524	90.3	38	6.6	14	2.4	2	0.3
10:00	505	0	0.0	465	92.1	30	5.9	7	1.4	3	0.6
11:00	525	0	0.0	481	91.6	37	7.1	4	0.8	3	0.6
12:00	532	4	0.8	479	90.0	30	5.6	16	3.0	3	0.6
13:00	511	3	0.6	467	91.4	32	6.3	8	1.6	1	0.2
14:00	528	3	0.6	466	88.3	39	7.4	16	3.0	4	0.8
15:00	554	2	0.4	505	91.2	35	6.3	7	1.3	5	0.9
16:00	592	4	0.7	556	93.9	23	3.9	8	1.4	1	0.2
17:00	521	1	0.2	491	94.2	18	3.5	8	1.5	3	0.6
18:00	414	1	0.2	387	93.5	19	4.6	4	1.0	3	0.7
19:00	164	0	0.0	151	92.1	8	4.9	4	2.4	1	0.6
20:00	80	0	0.0	77	96.3	1	1.3	1	1.3	1	1.3
21:00	88	1	1.1	81	92.1	5	5.7	1	1.1	0	0.0
22:00	129	1	0.8	124	96.1	4	3.1	0	0.0	0	0.0
23:00	114	0	0.0	106	93.0	8	7.0	0	0.0	0	0.0
12H,7-19	7173	28	0.4	6614	92.2	368	5.1	123	1.7	40	0.6
16H,6-22	7730	30	0.4	7134	92.3	392	5.1	132	1.7	42	0.5
18H,6-24	7973	31	0.4	7364	92.4	404	5.1	132	1.7	42	0.5
24H,0-24	8117	31	0.4	7494	92.3	412	5.1	138	1.7	42	0.5

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Eastbound

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	MOTOR-CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
<b>Sat 07-Feb-15</b>											
00:00	71	1	1.4	65	91.6	5	7.0	0	0.0	0	0.0
01:00	51	1	2.0	47	92.2	3	5.9	0	0.0	0	0.0
02:00	37	0	0.0	36	97.3	0	0.0	1	2.7	0	0.0
03:00	37	0	0.0	34	91.9	1	2.7	2	5.4	0	0.0
04:00	31	0	0.0	30	96.8	1	3.2	0	0.0	0	0.0
05:00	44	0	0.0	40	90.9	4	9.1	0	0.0	0	0.0
06:00	60	0	0.0	50	83.3	8	13.3	2	3.3	0	0.0
07:00	152	1	0.7	132	86.8	15	9.9	3	2.0	1	0.7
08:00	309	1	0.3	285	92.2	16	5.2	5	1.6	2	0.7
09:00	486	2	0.4	454	93.4	24	4.9	4	0.8	2	0.4
10:00	522	3	0.6	492	94.3	19	3.6	7	1.3	1	0.2
11:00	612	5	0.8	590	96.4	11	1.8	4	0.7	2	0.3
12:00	597	3	0.5	571	95.6	15	2.5	6	1.0	2	0.3
13:00	598	2	0.3	577	96.5	16	2.7	2	0.3	1	0.2
14:00	545	6	1.1	525	96.3	8	1.5	4	0.7	2	0.4
15:00	473	1	0.2	456	96.4	12	2.5	2	0.4	2	0.4
16:00	400	2	0.5	384	96.0	9	2.3	3	0.8	2	0.5
17:00	313	4	1.3	300	95.9	7	2.2	0	0.0	2	0.6
18:00	230	2	0.9	218	94.8	4	1.7	4	1.7	2	0.9
19:00	192	2	1.0	182	94.8	4	2.1	3	1.6	1	0.5
20:00	111	1	0.9	100	90.1	7	6.3	2	1.8	1	0.9
21:00	76	1	1.3	72	94.7	3	4.0	0	0.0	0	0.0
22:00	79	0	0.0	71	89.9	7	8.9	0	0.0	1	1.3
23:00	50	0	0.0	49	98.0	1	2.0	0	0.0	0	0.0
<b>12H,7-19</b>	<b>5237</b>	<b>32</b>	<b>0.6</b>	<b>4984</b>	<b>95.2</b>	<b>156</b>	<b>3.0</b>	<b>44</b>	<b>0.8</b>	<b>21</b>	<b>0.4</b>
<b>16H,6-22</b>	<b>5676</b>	<b>36</b>	<b>0.6</b>	<b>5388</b>	<b>94.9</b>	<b>178</b>	<b>3.1</b>	<b>51</b>	<b>0.9</b>	<b>23</b>	<b>0.4</b>
<b>18H,6-24</b>	<b>5805</b>	<b>36</b>	<b>0.6</b>	<b>5508</b>	<b>94.9</b>	<b>186</b>	<b>3.2</b>	<b>51</b>	<b>0.9</b>	<b>24</b>	<b>0.4</b>
<b>24H,0-24</b>	<b>6076</b>	<b>38</b>	<b>0.6</b>	<b>5760</b>	<b>94.8</b>	<b>200</b>	<b>3.3</b>	<b>54</b>	<b>0.9</b>	<b>24</b>	<b>0.4</b>



18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Eastbound

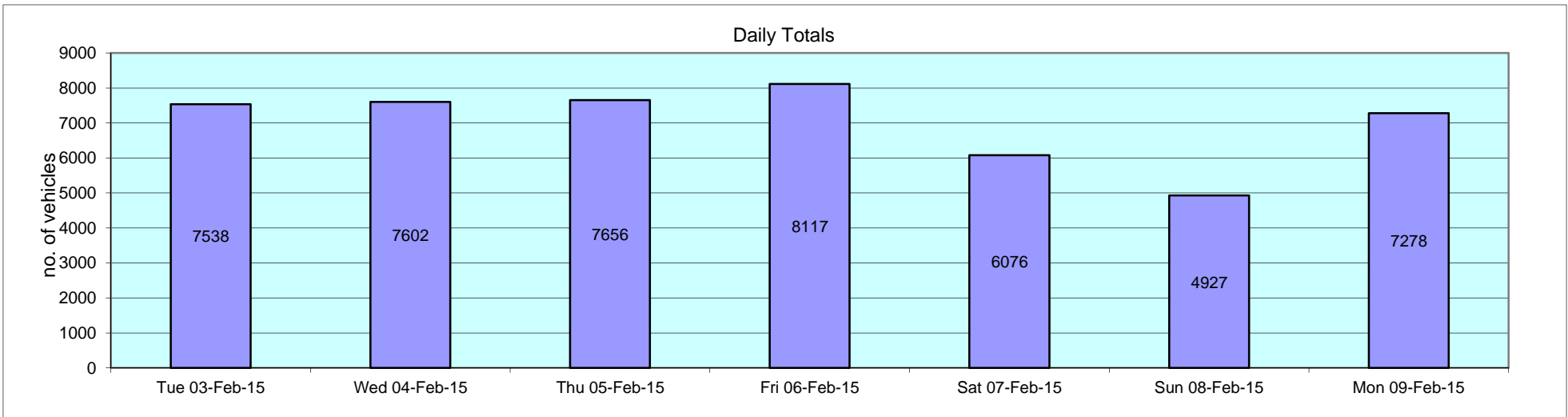
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	MOTOR-CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
<b>Sun 08-Feb-15</b>											
00:00	27	0	0.0	26	96.3	1	3.7	0	0.0	0	0.0
01:00	25	0	0.0	22	88.0	2	8.0	1	4.0	0	0.0
02:00	15	0	0.0	13	86.7	0	0.0	2	13.3	0	0.0
03:00	7	0	0.0	5	71.4	1	14.3	1	14.3	0	0.0
04:00	15	0	0.0	12	80.0	1	6.7	2	13.3	0	0.0
05:00	33	0	0.0	29	87.9	1	3.0	2	6.1	1	3.0
06:00	39	0	0.0	33	84.6	3	7.7	1	2.6	2	5.1
07:00	68	1	1.5	62	91.2	3	4.4	2	2.9	0	0.0
08:00	137	0	0.0	128	93.4	6	4.4	3	2.2	0	0.0
09:00	283	1	0.4	274	96.8	5	1.8	3	1.1	0	0.0
10:00	451	1	0.2	434	96.2	13	2.9	3	0.7	0	0.0
11:00	524	5	1.0	502	95.8	15	2.9	2	0.4	0	0.0
12:00	543	6	1.1	523	96.3	11	2.0	3	0.6	0	0.0
13:00	500	8	1.6	477	95.4	10	2.0	4	0.8	1	0.2
14:00	501	4	0.8	481	96.0	10	2.0	6	1.2	0	0.0
15:00	469	10	2.1	451	96.2	4	0.9	4	0.9	0	0.0
16:00	430	8	1.9	405	94.2	10	2.3	7	1.6	0	0.0
17:00	309	0	0.0	297	96.1	9	2.9	3	1.0	0	0.0
18:00	216	2	0.9	208	96.3	4	1.9	2	0.9	0	0.0
19:00	137	0	0.0	133	97.1	3	2.2	1	0.7	0	0.0
20:00	88	0	0.0	85	96.6	2	2.3	1	1.1	0	0.0
21:00	58	1	1.7	55	94.8	1	1.7	1	1.7	0	0.0
22:00	29	0	0.0	25	86.2	3	10.3	1	3.5	0	0.0
23:00	23	0	0.0	23	100.0	0	0.0	0	0.0	0	0.0
12H,7-19	4431	46	1.0	4242	95.7	100	2.3	42	1.0	1	0.0
16H,6-22	4753	47	1.0	4548	95.7	109	2.3	46	1.0	3	0.1
18H,6-24	4805	47	1.0	4596	95.7	112	2.3	47	1.0	3	0.1
24H,0-24	4927	47	1.0	4703	95.5	118	2.4	55	1.1	4	0.1

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Eastbound

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	MOTOR-CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
<b>Mon 09-Feb-15</b>											
00:00	11	0	0.0	11	100.0	0	0.0	0	0.0	0	0.0
01:00	3	0	0.0	3	100.0	0	0.0	0	0.0	0	0.0
02:00	5	0	0.0	3	60.0	0	0.0	2	40.0	0	0.0
03:00	6	0	0.0	6	100.0	0	0.0	0	0.0	0	0.0
04:00	36	0	0.0	34	94.4	1	2.8	1	2.8	0	0.0
05:00	81	0	0.0	74	91.4	7	8.6	0	0.0	0	0.0
06:00	254	1	0.4	226	89.0	20	7.9	7	2.8	0	0.0
07:00	998	3	0.3	941	94.3	36	3.6	13	1.3	5	0.5
08:00	1121	6	0.5	1046	93.3	46	4.1	17	1.5	6	0.5
09:00	600	1	0.2	544	90.7	38	6.3	13	2.2	4	0.7
10:00	425	0	0.0	382	89.9	26	6.1	14	3.3	3	0.7
11:00	440	4	0.9	392	89.1	35	8.0	7	1.6	2	0.5
12:00	403	1	0.3	360	89.3	25	6.2	14	3.5	3	0.7
13:00	436	4	0.9	386	88.5	28	6.4	14	3.2	4	0.9
14:00	416	4	1.0	363	87.3	37	8.9	11	2.6	1	0.2
15:00	462	3	0.7	412	89.2	31	6.7	9	2.0	7	1.5
16:00	519	2	0.4	480	92.5	26	5.0	9	1.7	2	0.4
17:00	415	1	0.2	386	93.0	19	4.6	8	1.9	1	0.2
18:00	281	0	0.0	263	93.6	9	3.2	7	2.5	2	0.7
19:00	150	0	0.0	136	90.7	10	6.7	3	2.0	1	0.7
20:00	69	0	0.0	62	89.9	5	7.3	1	1.5	1	1.5
21:00	72	0	0.0	66	91.7	4	5.6	2	2.8	0	0.0
22:00	48	0	0.0	46	95.8	1	2.1	0	0.0	1	2.1
23:00	27	0	0.0	25	92.6	2	7.4	0	0.0	0	0.0
12H,7-19	6516	29	0.5	5955	91.4	356	5.5	136	2.1	40	0.6
16H,6-22	7061	30	0.4	6445	91.3	395	5.6	149	2.1	42	0.6
18H,6-24	7136	30	0.4	6516	91.3	398	5.6	149	2.1	43	0.6
24H,0-24	7278	30	0.4	6647	91.3	406	5.6	152	2.1	43	0.6

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Eastbound

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	MOTOR-CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
<b>Daily Totals</b>											
Tue 03-Feb-15	7538	23	0.3	6929	91.9	404	5.4	143	1.9	39	0.5
Wed 04-Feb-15	7602	32	0.4	6926	91.1	450	5.9	156	2.1	38	0.5
Thu 05-Feb-15	7656	29	0.4	7046	92.0	402	5.3	146	1.9	33	0.4
Fri 06-Feb-15	8117	31	0.4	7494	92.3	412	5.1	138	1.7	42	0.5
Sat 07-Feb-15	6076	38	0.6	5760	94.8	200	3.3	54	0.9	24	0.4
Sun 08-Feb-15	4927	47	1.0	4703	95.5	118	2.4	55	1.1	4	0.1
Mon 09-Feb-15	7278	30	0.4	6647	91.3	406	5.6	152	2.1	43	0.6
<b>Total Vehicles</b>											
[--]	49194	230	0.5	45505	92.7	2392	4.7	844	1.7	223	0.4



18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Westbound

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	MOTOR-CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
<b>Tue 03-Feb-15</b>											
00:00	16	0	0.0	14	87.5	1	6.3	1	6.3	0	0.0
01:00	4	0	0.0	4	100.0	0	0.0	0	0.0	0	0.0
02:00	6	0	0.0	3	50.0	2	33.3	0	0.0	1	16.7
03:00	10	0	0.0	10	100.0	0	0.0	0	0.0	0	0.0
04:00	14	0	0.0	9	64.3	5	35.7	0	0.0	0	0.0
05:00	28	0	0.0	22	78.6	3	10.7	3	10.7	0	0.0
06:00	126	0	0.0	102	81.0	13	10.3	10	7.9	1	0.8
07:00	370	0	0.0	319	86.2	37	10.0	12	3.2	2	0.5
08:00	336	2	0.6	292	86.9	33	9.8	8	2.4	1	0.3
09:00	338	1	0.3	285	84.3	39	11.5	10	3.0	3	0.9
10:00	317	0	0.0	270	85.2	40	12.6	5	1.6	2	0.6
11:00	356	1	0.3	306	86.0	35	9.8	12	3.4	2	0.6
12:00	404	0	0.0	369	91.3	24	5.9	10	2.5	1	0.3
13:00	434	3	0.7	393	90.6	28	6.5	9	2.1	1	0.2
14:00	533	1	0.2	486	91.2	31	5.8	9	1.7	6	1.1
15:00	633	1	0.2	576	91.0	39	6.2	12	1.9	5	0.8
16:00	858	4	0.5	798	93.0	40	4.7	12	1.4	4	0.5
17:00	948	5	0.5	887	93.6	37	3.9	17	1.8	2	0.2
18:00	602	3	0.5	566	94.0	22	3.7	8	1.3	3	0.5
19:00	308	3	1.0	291	94.5	9	2.9	4	1.3	1	0.3
20:00	239	2	0.8	225	94.1	7	2.9	4	1.7	1	0.4
21:00	156	0	0.0	147	94.2	6	3.9	2	1.3	1	0.6
22:00	102	0	0.0	100	98.0	2	2.0	0	0.0	0	0.0
23:00	65	0	0.0	62	95.4	2	3.1	0	0.0	1	1.5
12H,7-19	6129	21	0.3	5547	90.5	405	6.6	124	2.0	32	0.5
16H,6-22	6958	26	0.4	6312	90.7	440	6.3	144	2.1	36	0.5
18H,6-24	7125	26	0.4	6474	90.9	444	6.2	144	2.0	37	0.5
24H,0-24	7203	26	0.4	6536	90.7	455	6.3	148	2.1	38	0.5

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Westbound

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	MOTOR-CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
<b>Wed 04-Feb-15</b>											
00:00	17	0	0.0	14	82.4	2	11.8	1	5.9	0	0.0
01:00	11	0	0.0	7	63.6	2	18.2	2	18.2	0	0.0
02:00	8	0	0.0	7	87.5	1	12.5	0	0.0	0	0.0
03:00	1	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0
04:00	16	0	0.0	11	68.8	5	31.3	0	0.0	0	0.0
05:00	25	0	0.0	16	64.0	6	24.0	3	12.0	0	0.0
06:00	118	0	0.0	95	80.5	11	9.3	11	9.3	1	0.9
07:00	382	0	0.0	342	89.5	33	8.6	7	1.8	0	0.0
08:00	373	2	0.5	316	84.7	39	10.5	13	3.5	3	0.8
09:00	306	1	0.3	262	85.6	31	10.1	10	3.3	2	0.7
10:00	341	3	0.9	274	80.4	49	14.4	13	3.8	2	0.6
11:00	370	5	1.4	325	87.8	32	8.7	6	1.6	2	0.5
12:00	443	2	0.5	396	89.4	35	7.9	8	1.8	2	0.5
13:00	409	1	0.2	357	87.3	36	8.8	13	3.2	2	0.5
14:00	532	5	0.9	464	87.2	45	8.5	14	2.6	4	0.8
15:00	604	4	0.7	535	88.6	49	8.1	11	1.8	5	0.8
16:00	921	5	0.5	836	90.8	52	5.7	23	2.5	5	0.5
17:00	1025	6	0.6	952	92.9	43	4.2	20	2.0	4	0.4
18:00	839	2	0.2	796	94.9	25	3.0	13	1.6	3	0.4
19:00	334	2	0.6	318	95.2	13	3.9	0	0.0	1	0.3
20:00	213	0	0.0	203	95.3	9	4.2	0	0.0	1	0.5
21:00	138	0	0.0	131	94.9	4	2.9	2	1.5	1	0.7
22:00	114	0	0.0	111	97.4	2	1.8	1	0.9	0	0.0
23:00	52	0	0.0	45	86.5	4	7.7	2	3.9	1	1.9
12H,7-19	6545	36	0.6	5855	89.5	469	7.2	151	2.3	34	0.5
16H,6-22	7348	38	0.5	6602	89.9	506	6.9	164	2.2	38	0.5
18H,6-24	7514	38	0.5	6758	89.9	512	6.8	167	2.2	39	0.5
24H,0-24	7592	38	0.5	6814	89.8	528	7.0	173	2.3	39	0.5

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Westbound

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	MOTOR-CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
<b>Thu 05-Feb-15</b>											
00:00	16	1	6.3	14	87.5	0	0.0	1	6.3	0	0.0
01:00	10	0	0.0	7	70.0	2	20.0	1	10.0	0	0.0
02:00	3	0	0.0	2	66.7	1	33.3	0	0.0	0	0.0
03:00	8	0	0.0	6	75.0	1	12.5	0	0.0	1	12.5
04:00	12	0	0.0	7	58.3	4	33.3	1	8.3	0	0.0
05:00	32	0	0.0	25	78.1	4	12.5	3	9.4	0	0.0
06:00	116	1	0.9	89	76.7	16	13.8	9	7.8	1	0.9
07:00	374	2	0.5	326	87.2	34	9.1	11	2.9	1	0.3
08:00	350	2	0.6	308	88.0	31	8.9	6	1.7	3	0.9
09:00	299	4	1.3	251	84.0	35	11.7	5	1.7	4	1.3
10:00	309	1	0.3	272	88.0	28	9.1	6	1.9	2	0.7
11:00	392	1	0.3	333	85.0	41	10.5	12	3.1	5	1.3
12:00	441	2	0.5	393	89.1	32	7.3	8	1.8	6	1.4
13:00	448	9	2.0	389	86.8	32	7.1	15	3.4	3	0.7
14:00	560	7	1.3	491	87.7	49	8.8	8	1.4	5	0.9
15:00	668	1	0.2	613	91.8	35	5.2	13	2.0	6	0.9
16:00	806	1	0.1	743	92.2	36	4.5	23	2.9	3	0.4
17:00	995	1	0.1	948	95.3	34	3.4	9	0.9	3	0.3
18:00	806	3	0.4	768	95.3	20	2.5	11	1.4	4	0.5
19:00	405	1	0.3	375	92.6	23	5.7	4	1.0	2	0.5
20:00	264	0	0.0	247	93.6	14	5.3	2	0.8	1	0.4
21:00	178	1	0.6	166	93.3	9	5.1	1	0.6	1	0.6
22:00	124	0	0.0	120	96.8	4	3.2	0	0.0	0	0.0
23:00	56	0	0.0	53	94.6	2	3.6	0	0.0	1	1.8
12H,7-19	6448	34	0.5	5835	90.5	407	6.3	127	2.0	45	0.7
16H,6-22	7411	37	0.5	6712	90.6	469	6.3	143	1.9	50	0.7
18H,6-24	7591	37	0.5	6885	90.7	475	6.3	143	1.9	51	0.7
24H,0-24	7672	38	0.5	6946	90.5	487	6.4	149	1.9	52	0.7

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Westbound

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	MOTOR-CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
<b>Fri 06-Feb-15</b>											
00:00	20	0	0.0	18	90.0	1	5.0	1	5.0	0	0.0
01:00	6	0	0.0	5	83.3	1	16.7	0	0.0	0	0.0
02:00	6	0	0.0	5	83.3	0	0.0	1	16.7	0	0.0
03:00	8	0	0.0	5	62.5	0	0.0	2	25.0	1	12.5
04:00	7	1	14.3	3	42.9	3	42.9	0	0.0	0	0.0
05:00	27	0	0.0	20	74.1	4	14.8	3	11.1	0	0.0
06:00	130	1	0.8	103	79.2	17	13.1	9	6.9	0	0.0
07:00	343	3	0.9	292	85.1	35	10.2	13	3.8	0	0.0
08:00	368	1	0.3	308	83.7	42	11.4	13	3.5	4	1.1
09:00	319	1	0.3	265	83.1	38	11.9	12	3.8	3	0.9
10:00	372	3	0.8	307	82.5	44	11.8	13	3.5	5	1.3
11:00	422	2	0.5	365	86.5	41	9.7	12	2.8	2	0.5
12:00	524	4	0.8	473	90.3	29	5.5	14	2.7	4	0.8
13:00	479	2	0.4	428	89.4	31	6.5	15	3.1	3	0.6
14:00	624	1	0.2	557	89.3	50	8.0	12	1.9	4	0.6
15:00	979	4	0.4	871	89.0	62	6.3	34	3.5	8	0.8
16:00	984	7	0.7	904	91.9	43	4.4	27	2.7	3	0.3
17:00	742	4	0.5	699	94.2	25	3.4	11	1.5	3	0.4
18:00	466	2	0.4	433	92.9	23	4.9	6	1.3	2	0.4
19:00	266	0	0.0	255	95.9	9	3.4	0	0.0	2	0.8
20:00	129	0	0.0	124	96.1	3	2.3	1	0.8	1	0.8
21:00	89	2	2.3	83	93.3	2	2.3	2	2.3	0	0.0
22:00	455	0	0.0	437	96.0	13	2.9	3	0.7	2	0.4
23:00	253	0	0.0	234	92.5	18	7.1	0	0.0	1	0.4
12H,7-19	6622	34	0.5	5902	89.1	463	7.0	182	2.8	41	0.6
16H,6-22	7236	37	0.5	6467	89.4	494	6.8	194	2.7	44	0.6
18H,6-24	7944	37	0.5	7138	89.9	525	6.6	197	2.5	47	0.6
24H,0-24	8018	38	0.5	7194	89.7	534	6.7	204	2.5	48	0.6

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Westbound

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	MOTOR-CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
<b>Sat 07-Feb-15</b>											
00:00	98	0	0.0	88	89.8	9	9.2	0	0.0	1	1.0
01:00	77	0	0.0	69	89.6	5	6.5	3	3.9	0	0.0
02:00	52	0	0.0	49	94.2	2	3.9	1	1.9	0	0.0
03:00	40	0	0.0	38	95.0	1	2.5	0	0.0	1	2.5
04:00	13	0	0.0	10	76.9	3	23.1	0	0.0	0	0.0
05:00	23	0	0.0	15	65.2	6	26.1	2	8.7	0	0.0
06:00	64	2	3.1	48	75.0	11	17.2	3	4.7	0	0.0
07:00	102	0	0.0	90	88.2	11	10.8	1	1.0	0	0.0
08:00	193	1	0.5	168	87.1	20	10.4	4	2.1	0	0.0
09:00	247	5	2.0	215	87.0	20	8.1	5	2.0	2	0.8
10:00	408	4	1.0	382	93.6	14	3.4	5	1.2	3	0.7
11:00	487	4	0.8	458	94.1	18	3.7	6	1.2	1	0.2
12:00	583	6	1.0	538	92.3	29	5.0	8	1.4	2	0.3
13:00	587	1	0.2	555	94.6	24	4.1	7	1.2	0	0.0
14:00	589	5	0.9	560	95.1	17	2.9	5	0.9	2	0.3
15:00	576	1	0.2	548	95.1	18	3.1	7	1.2	2	0.4
16:00	588	3	0.5	562	95.6	16	2.7	5	0.9	2	0.3
17:00	522	0	0.0	494	94.6	20	3.8	6	1.2	2	0.4
18:00	320	0	0.0	299	93.4	14	4.4	5	1.6	2	0.6
19:00	232	0	0.0	223	96.1	5	2.2	2	0.9	2	0.9
20:00	129	0	0.0	121	93.8	5	3.9	2	1.6	1	0.8
21:00	113	0	0.0	109	96.5	3	2.7	0	0.0	1	0.9
22:00	132	0	0.0	121	91.7	10	7.6	0	0.0	1	0.8
23:00	91	0	0.0	85	93.4	4	4.4	1	1.1	1	1.1
12H,7-19	5202	30	0.6	4869	93.6	221	4.3	64	1.2	18	0.4
16H,6-22	5740	32	0.6	5370	93.6	245	4.3	71	1.2	22	0.4
18H,6-24	5963	32	0.5	5576	93.5	259	4.3	72	1.2	24	0.4
24H,0-24	6266	32	0.5	5845	93.3	285	4.6	78	1.2	26	0.4



18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Westbound

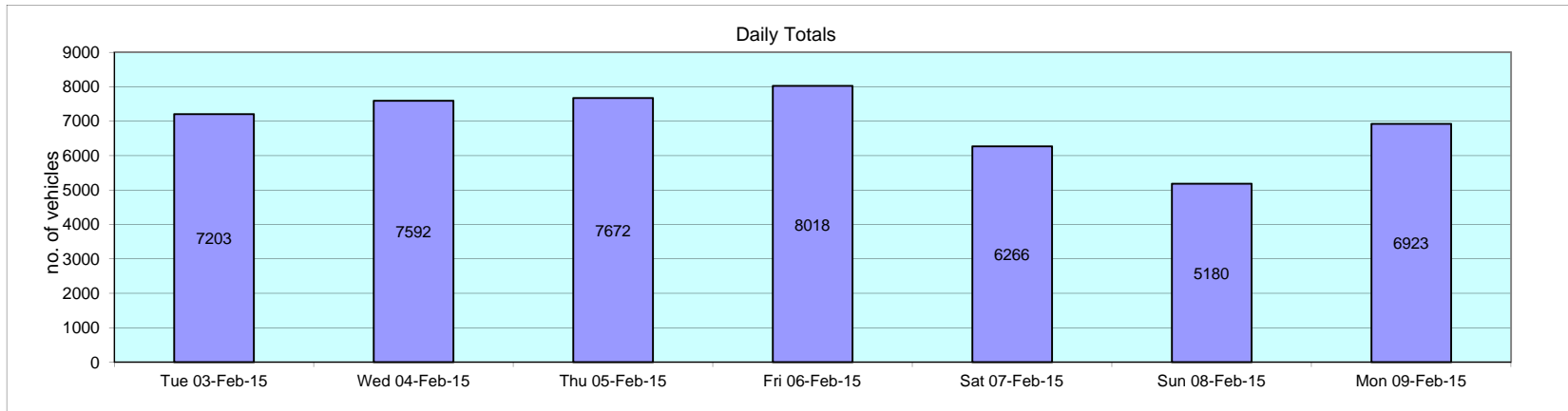
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	MOTOR-CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
<b>Sun 08-Feb-15</b>											
00:00	48	0	0.0	45	93.8	2	4.2	1	2.1	0	0.0
01:00	29	0	0.0	27	93.1	1	3.5	1	3.5	0	0.0
02:00	16	0	0.0	14	87.5	2	12.5	0	0.0	0	0.0
03:00	12	0	0.0	9	75.0	2	16.7	1	8.3	0	0.0
04:00	14	0	0.0	11	78.6	2	14.3	0	0.0	1	7.1
05:00	22	0	0.0	17	77.3	3	13.6	2	9.1	0	0.0
06:00	45	1	2.2	36	80.0	6	13.3	2	4.4	0	0.0
07:00	86	4	4.7	71	82.6	8	9.3	3	3.5	0	0.0
08:00	125	0	0.0	117	93.6	7	5.6	1	0.8	0	0.0
09:00	168	8	4.8	146	86.9	10	6.0	4	2.4	0	0.0
10:00	298	9	3.0	271	90.9	14	4.7	4	1.3	0	0.0
11:00	429	14	3.3	398	92.8	12	2.8	4	0.9	1	0.2
12:00	631	7	1.1	597	94.6	17	2.7	9	1.4	1	0.2
13:00	611	5	0.8	581	95.1	14	2.3	11	1.8	0	0.0
14:00	569	6	1.1	537	94.4	16	2.8	10	1.8	0	0.0
15:00	535	6	1.1	511	95.5	14	2.6	4	0.8	0	0.0
16:00	523	3	0.6	490	93.7	18	3.4	12	2.3	0	0.0
17:00	360	2	0.6	342	95.0	11	3.1	5	1.4	0	0.0
18:00	209	1	0.5	198	94.7	9	4.3	1	0.5	0	0.0
19:00	140	1	0.7	124	88.6	12	8.6	2	1.4	1	0.7
20:00	122	0	0.0	118	96.7	4	3.3	0	0.0	0	0.0
21:00	101	0	0.0	93	92.1	5	5.0	3	3.0	0	0.0
22:00	53	0	0.0	48	90.6	5	9.4	0	0.0	0	0.0
23:00	34	0	0.0	31	91.2	1	2.9	1	2.9	1	2.9
12H,7-19	4544	65	1.4	4259	93.7	150	3.3	68	1.5	2	0.0
16H,6-22	4952	67	1.4	4630	93.5	177	3.6	75	1.5	3	0.1
18H,6-24	5039	67	1.3	4709	93.5	183	3.6	76	1.5	4	0.1
24H,0-24	5180	67	1.3	4832	93.3	195	3.8	81	1.6	5	0.1

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Westbound

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	MOTOR-CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
<b>Mon 09-Feb-15</b>											
00:00	22	0	0.0	19	86.4	2	9.1	1	4.6	0	0.0
01:00	8	0	0.0	8	100.0	0	0.0	0	0.0	0	0.0
02:00	2	0	0.0	2	100.0	0	0.0	0	0.0	0	0.0
03:00	4	0	0.0	2	50.0	1	25.0	1	25.0	0	0.0
04:00	7	0	0.0	5	71.4	2	28.6	0	0.0	0	0.0
05:00	31	0	0.0	24	77.4	5	16.1	2	6.5	0	0.0
06:00	111	1	0.9	88	79.3	18	16.2	4	3.6	0	0.0
07:00	345	0	0.0	298	86.4	34	9.9	11	3.2	2	0.6
08:00	343	2	0.6	301	87.8	28	8.2	10	2.9	2	0.6
09:00	293	1	0.3	246	84.0	36	12.3	8	2.7	2	0.7
10:00	314	2	0.6	266	84.7	33	10.5	11	3.5	2	0.6
11:00	359	2	0.6	304	84.7	46	12.8	5	1.4	2	0.6
12:00	392	1	0.3	366	93.4	17	4.3	6	1.5	2	0.5
13:00	425	0	0.0	383	90.1	29	6.8	11	2.6	2	0.5
14:00	529	3	0.6	469	88.7	39	7.4	13	2.5	5	1.0
15:00	662	0	0.0	584	88.2	56	8.5	17	2.6	5	0.8
16:00	758	3	0.4	705	93.0	36	4.8	10	1.3	4	0.5
17:00	956	5	0.5	906	94.8	25	2.6	16	1.7	4	0.4
18:00	593	2	0.3	560	94.4	19	3.2	9	1.5	3	0.5
19:00	310	1	0.3	288	92.9	16	5.2	3	1.0	2	0.7
20:00	190	0	0.0	182	95.8	6	3.2	1	0.5	1	0.5
21:00	138	0	0.0	129	93.5	7	5.1	1	0.7	1	0.7
22:00	94	1	1.1	88	93.6	5	5.3	0	0.0	0	0.0
23:00	37	0	0.0	35	94.6	1	2.7	0	0.0	1	2.7
12H,7-19	5969	21	0.4	5388	90.3	398	6.7	127	2.1	35	0.6
16H,6-22	6718	23	0.3	6075	90.4	445	6.6	136	2.0	39	0.6
18H,6-24	6849	24	0.4	6198	90.5	451	6.6	136	2.0	40	0.6
24H,0-24	6923	24	0.4	6258	90.4	461	6.7	140	2.0	40	0.6

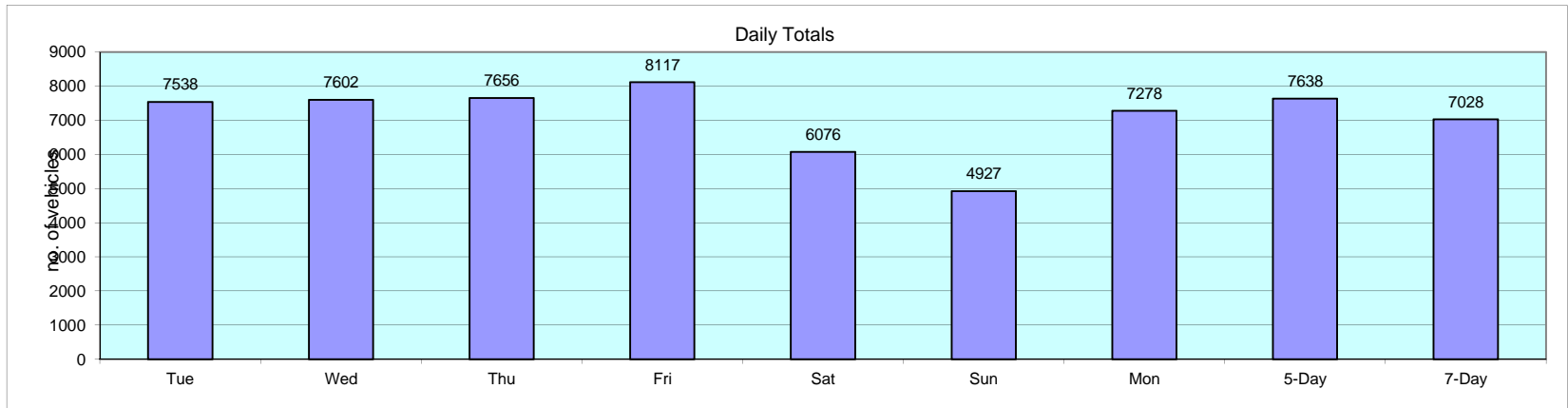
18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Westbound

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	MOTOR-CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
<b>Daily Totals</b>											
Tue 03-Feb-15	7203	26	0.4	6536	90.7	455	6.3	148	2.1	38	0.5
Wed 04-Feb-15	7592	38	0.5	6814	89.8	528	7.0	173	2.3	39	0.5
Thu 05-Feb-15	7672	38	0.5	6946	90.5	487	6.4	149	1.9	52	0.7
Fri 06-Feb-15	8018	38	0.5	7194	89.7	534	6.7	204	2.5	48	0.6
Sat 07-Feb-15	6266	32	0.5	5845	93.3	285	4.6	78	1.2	26	0.4
Sun 08-Feb-15	5180	67	1.3	4832	93.3	195	3.8	81	1.6	5	0.1
Mon 09-Feb-15	6923	24	0.4	6258	90.4	461	6.7	140	2.0	40	0.6
<b>Total Vehicles</b>											
[--]	48854	263	0.6	44425	91.1	2945	5.9	973	1.9	248	0.5



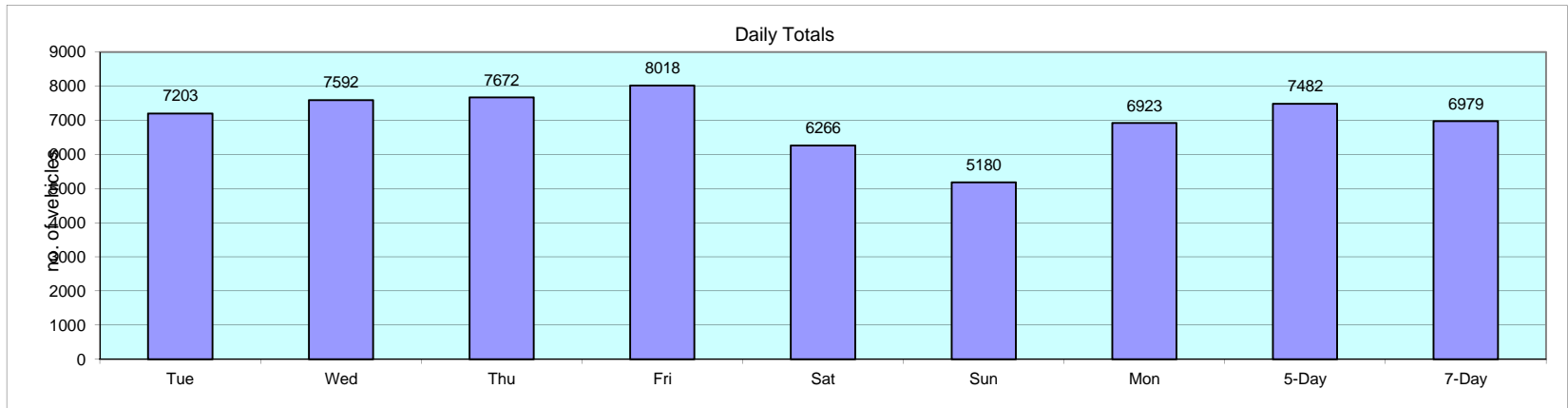
18470	ST NICHOLAS		Site No: 18470001		Location		A48, St Nicholas (LC 70)		
	Channel: Eastbound								
TIME PERIOD	Tue 03/02/15	Wed 04/02/15	Thu 05/02/15	Fri 06/02/15	Sat 07/02/15	Sun 08/02/15	Mon 09/02/15	5-Day Av	7-Day Av
Week Begin: 03-Feb-15									
00:00	5	9	9	16	71	27	11	10	21
01:00	6	7	10	5	51	25	3	6	15
02:00	4	7	8	3	37	15	5	5	11
03:00	9	10	14	10	37	7	6	10	13
04:00	22	21	23	27	31	15	36	26	25
05:00	78	93	85	83	44	33	81	84	71
06:00	273	253	280	225	60	39	254	257	198
07:00	1069	1115	1037	1018	152	68	998	1047	780
08:00	1153	1080	1101	893	309	137	1121	1070	828
09:00	639	593	614	580	486	283	600	605	542
10:00	460	441	494	505	522	451	425	465	471
11:00	412	428	466	525	612	524	440	454	487
12:00	434	477	450	532	597	543	403	459	491
13:00	418	478	433	511	598	500	436	455	482
14:00	433	465	428	528	545	501	416	454	474
15:00	520	524	537	554	473	469	462	519	506
16:00	436	482	464	592	400	430	519	499	475
17:00	420	418	456	521	313	309	415	446	407
18:00	278	256	293	414	230	216	281	304	281
19:00	175	174	173	164	192	137	150	167	166
20:00	110	97	95	80	111	88	69	90	93
21:00	90	99	96	88	76	58	72	89	83
22:00	68	53	53	129	79	29	48	70	66
23:00	26	22	37	114	50	23	27	45	43
12H,7-19	6672	6757	6773	7173	5237	4431	6516	6778	6223
16H,6-22	7320	7380	7417	7730	5676	4753	7061	7382	6762
18H,6-24	7414	7455	7507	7973	5805	4805	7136	7497	6871
24H,0-24	7538	7602	7656	8117	6076	4927	7278	7638	7028
Am	08:00	07:00	08:00	07:00	11:00	11:00	08:00	-	-
Peak	1153	1115	1101	1018	612	524	1121	1102	949
Pm	15:00	15:00	15:00	16:00	13:00	12:00	16:00	-	-
Peak	520	524	537	592	598	543	519	538	548

18470	ST NICHOLAS		Site No: 18470001	Location		A48, St Nicholas (LC 70)			
			Channel: Eastbound						
<b>TIME PERIOD</b>	<b>Tue</b>	<b>Wed</b>	<b>Thu</b>	<b>Fri</b>	<b>Sat</b>	<b>Sun</b>	<b>Mon</b>	<b>5-Day</b>	<b>7-Day</b>
	03/02/15	04/02/15	05/02/15	06/02/15	07/02/15	08/02/15	09/02/15	Av	Av



18470	ST NICHOLAS		Site No: 18470001		Location		A48, St Nicholas (LC 70)		
	Channel: Westbound								
TIME PERIOD	Tue 03/02/15	Wed 04/02/15	Thu 05/02/15	Fri 06/02/15	Sat 07/02/15	Sun 08/02/15	Mon 09/02/15	5-Day Av	7-Day Av
Week Begin: 03-Feb-15									
00:00	16	17	16	20	98	48	22	18	34
01:00	4	11	10	6	77	29	8	8	21
02:00	6	8	3	6	52	16	2	5	13
03:00	10	1	8	8	40	12	4	6	12
04:00	14	16	12	7	13	14	7	11	12
05:00	28	25	32	27	23	22	31	29	27
06:00	126	118	116	130	64	45	111	120	101
07:00	370	382	374	343	102	86	345	363	286
08:00	336	373	350	368	193	125	343	354	298
09:00	338	306	299	319	247	168	293	311	281
10:00	317	341	309	372	408	298	314	331	337
11:00	356	370	392	422	487	429	359	380	402
12:00	404	443	441	524	583	631	392	441	488
13:00	434	409	448	479	587	611	425	439	485
14:00	533	532	560	624	589	569	529	556	562
15:00	633	604	668	979	576	535	662	709	665
16:00	858	921	806	984	588	523	758	865	777
17:00	948	1025	995	742	522	360	956	933	793
18:00	602	839	806	466	320	209	593	661	548
19:00	308	334	405	266	232	140	310	325	285
20:00	239	213	264	129	129	122	190	207	184
21:00	156	138	178	89	113	101	138	140	130
22:00	102	114	124	455	132	53	94	178	153
23:00	65	52	56	253	91	34	37	93	84
12H,7-19	6129	6545	6448	6622	5202	4544	5969	6343	5923
16H,6-22	6958	7348	7411	7236	5740	4952	6718	7134	6623
18H,6-24	7125	7514	7591	7944	5963	5039	6849	7405	6861
24H,0-24	7203	7592	7672	8018	6266	5180	6923	7482	6979
Am	07:00	07:00	11:00	11:00	11:00	11:00	11:00	-	-
Peak	370	382	392	422	487	429	359	385	406
Pm	17:00	17:00	17:00	16:00	14:00	12:00	17:00	-	-
Peak	948	1025	995	984	589	631	956	982	875

18470	ST NICHOLAS	Site No: 18470001	Location	A48, St Nicholas (LC 70)					
		Channel: Westbound							
<b>TIME PERIOD</b>	<b>Tue</b>	<b>Wed</b>	<b>Thu</b>	<b>Fri</b>	<b>Sat</b>	<b>Sun</b>	<b>Mon</b>	<b>5-Day</b>	<b>7-Day</b>
	03/02/15	04/02/15	05/02/15	06/02/15	07/02/15	08/02/15	09/02/15	Av	Av



18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Eastbound

Time Period	Total Vehicles	85%ile Speed	Mean Speed	Stand Dev.	<11Mph	11-<16	16-<21	21-<26	26-<31	31-<36	36-<41	41-<46	46-<51	51-<56	56-<61	=>61
<b>Tue 03-Feb-15</b>																
00:00	5	-	40.5	8.4	0	0	0	0	0	2	1	1	0	1	0	0
01:00	6	-	46	11.3	0	0	0	0	0	1	2	0	1	1	0	1
02:00	4	-	46	13.2	0	0	0	0	0	1	1	0	1	0	0	1
03:00	9	-	47.9	9.9	0	0	0	0	0	0	3	1	3	0	0	2
04:00	22	48.8	44.4	5.9	0	0	0	0	0	0	6	10	4	0	2	0
05:00	78	52.8	42.9	8.5	0	0	0	1	4	8	24	18	8	8	6	1
06:00	273	44.9	39.4	5.4	0	0	0	0	7	64	111	63	22	6	0	0
07:00	1069	37	32.9	4.5	0	0	1	38	279	557	169	16	7	1	1	0
08:00	1153	35.6	31.8	4.7	1	17	7	34	384	582	115	10	2	1	0	0
09:00	639	39.2	34.6	4.5	0	0	2	4	96	337	160	34	4	1	1	0
10:00	460	38.5	34.2	4.3	0	0	2	0	79	256	105	14	2	1	1	0
11:00	412	38.6	33.9	4.7	1	0	1	3	88	208	93	12	5	1	0	0
12:00	434	38.2	33.6	4.5	0	1	1	2	105	221	88	12	3	1	0	0
13:00	418	36.7	33	4.6	0	1	2	3	117	224	60	4	6	0	1	0
14:00	433	38.6	34	4.8	0	0	0	7	88	231	79	19	6	3	0	0
15:00	520	38.3	33.7	4.5	0	0	4	5	115	260	123	8	5	0	0	0
16:00	436	37.9	33.5	4.4	0	1	0	2	105	233	76	16	3	0	0	0
17:00	420	39.2	34.4	4.8	0	0	1	12	56	229	91	22	9	0	0	0
18:00	278	40.7	35.7	5.3	0	0	0	5	41	104	92	29	6	1	0	0
19:00	175	40.7	36.2	5.8	0	0	1	0	18	78	55	13	6	2	2	0
20:00	110	44.3	37.8	5.8	0	0	0	0	7	46	22	27	7	1	0	0
21:00	90	43.8	38.2	5.6	0	0	0	0	7	25	31	23	3	0	1	0
22:00	68	46.4	38.7	7.8	0	1	0	0	4	22	22	8	4	6	1	0
23:00	26	-	48.3	9.2	0	0	0	0	0	3	1	8	5	4	1	4
12H,7-19	6672	38.1	33.5	4.7	2	20	21	115	1553	3442	1251	196	58	10	4	0
16H,6-22	7320	38.8	33.9	5	2	20	22	115	1592	3655	1470	322	96	19	7	0
18H,6-24	7414	38.9	34	5.1	2	21	22	115	1596	3680	1493	338	105	29	9	4
24H,0-24	7538	39.1	34.1	5.4	2	21	22	116	1600	3692	1530	368	122	39	17	9



18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Eastbound

Time Period	Total Vehicles	85%ile Speed	Mean Speed	Stand Dev.	<11Mph	11-<16	16-<21	21-<26	26-<31	31-<36	36-<41	41-<46	46-<51	51-<56	56-<61	=>61
<b>Wed 04-Feb-15</b>																
00:00	9	-	41.8	6.3	0	0	0	0	0	2	1	5	0	1	0	0
01:00	7	-	41.4	7.1	0	0	0	0	1	0	2	2	2	0	0	0
02:00	7	-	37.1	7	0	0	0	0	1	3	1	1	1	0	0	0
03:00	10	56	45.5	9.3	0	0	0	0	0	1	2	4	1	0	1	1
04:00	21	50.4	44	6.8	0	0	0	0	0	2	6	5	5	2	1	0
05:00	93	50	42.6	7.5	0	0	0	1	5	6	27	30	12	7	4	1
06:00	253	45	39.4	5.7	0	0	0	2	5	59	101	59	21	4	1	1
07:00	1115	36.5	32.9	4	0	0	0	23	283	626	168	10	4	1	0	0
08:00	1080	35.6	31.7	4.6	0	4	15	67	334	535	108	17	0	0	0	0
09:00	593	38.9	34.4	4.2	0	2	0	3	86	327	147	27	1	0	0	0
10:00	441	37.6	33.2	4.6	1	0	1	12	105	232	75	12	2	1	0	0
11:00	428	36.9	32.8	4.3	0	1	1	6	128	215	66	11	0	0	0	0
12:00	477	36.7	33	4.2	0	1	1	8	120	265	72	6	4	0	0	0
13:00	478	36.4	32.3	5.4	3	5	7	12	134	240	61	12	3	1	0	0
14:00	465	37	33.2	4.3	0	0	3	4	112	261	75	9	0	0	0	1
15:00	524	37.1	33.2	4.1	0	0	3	6	121	298	80	16	0	0	0	0
16:00	482	39	34.1	4.8	0	2	1	6	94	231	124	18	5	1	0	0
17:00	418	38.2	33.6	4.5	1	1	3	1	84	225	91	11	1	0	0	0
18:00	256	40.7	36	5.2	0	0	0	0	37	99	86	26	5	3	0	0
19:00	174	43.2	37.3	5.7	0	0	0	1	14	64	57	26	9	3	0	0
20:00	97	44.8	38.9	6.2	0	0	0	0	7	25	34	21	6	3	1	0
21:00	99	42.7	37.3	5.4	0	0	0	0	8	35	35	17	3	0	1	0
22:00	53	48.6	41.1	8.1	0	0	0	0	4	7	21	10	5	3	1	2
23:00	22	51.3	41.7	8.4	0	0	0	0	2	3	7	4	2	3	1	0
12H,7-19	6757	37.5	33.1	4.6	5	16	35	148	1638	3554	1153	175	25	7	0	1
16H,6-22	7380	38.4	33.6	4.9	5	16	35	151	1672	3737	1380	298	64	17	3	2
18H,6-24	7455	38.5	33.6	5	5	16	35	151	1678	3747	1408	312	71	23	5	4
24H,0-24	7602	38.8	33.8	5.2	5	16	35	152	1685	3761	1447	359	92	33	11	6

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Eastbound

Time Period	Total Vehicles	85%ile Speed	Mean Speed	Stand Dev.	<11Mph	11-<16	16-<21	21-<26	26-<31	31-<36	36-<41	41-<46	46-<51	51-<56	56-<61	=>61
<b>Thu 05-Feb-15</b>																
00:00	9	-	42.4	7.9	0	0	0	0	0	3	1	1	3	1	0	0
01:00	10	56	45	9.8	0	0	0	0	1	1	1	2	3	0	2	0
02:00	8	-	39.1	8.3	0	0	0	0	1	3	1	0	3	0	0	0
03:00	14	59.5	47.8	9.9	0	0	0	0	0	1	3	3	3	0	2	2
04:00	23	53.1	45.2	9.1	0	0	1	0	0	1	4	6	5	5	0	1
05:00	85	48.9	41.1	7.4	0	0	0	1	4	13	30	18	10	7	1	1
06:00	280	44.7	38.8	5.5	0	0	0	0	8	78	121	41	25	7	0	0
07:00	1037	36.3	32.6	4.1	0	1	0	18	329	525	143	20	1	0	0	0
08:00	1101	36.2	32.4	4.9	1	5	28	27	294	574	141	30	1	0	0	0
09:00	614	37.5	33.6	4	0	1	0	3	126	355	118	8	2	1	0	0
10:00	494	35.1	31	4.5	0	6	3	13	229	205	36	1	0	0	0	1
11:00	466	35.3	31.5	4	0	0	2	17	193	215	34	5	0	0	0	0
12:00	450	36.1	32.7	4.1	0	0	1	9	129	242	60	9	0	0	0	0
13:00	433	35.4	32	3.9	0	2	2	2	158	233	31	4	1	0	0	0
14:00	428	37.7	33.4	4.4	0	1	1	1	108	227	75	13	1	1	0	0
15:00	537	37.8	33.3	4.3	0	1	1	4	141	274	98	17	1	0	0	0
16:00	464	37.7	33.3	4.5	0	0	1	8	121	238	75	19	2	0	0	0
17:00	456	39	34.5	4.2	0	0	1	0	74	243	115	20	3	0	0	0
18:00	293	40.6	36.2	5.6	0	0	0	2	35	115	104	28	4	1	3	1
19:00	173	43	37.5	5.6	0	0	0	0	14	59	66	19	14	0	1	0
20:00	95	42.5	37.3	5.9	0	1	0	1	5	30	39	14	4	0	1	0
21:00	96	44	38.2	5.7	0	0	0	1	6	26	36	20	5	2	0	0
22:00	53	45	38.7	6.4	0	0	0	0	4	16	15	12	5	0	1	0
23:00	37	53	44.2	8.7	0	0	0	0	2	4	7	11	5	5	1	2
12H,7-19	6773	37	32.9	4.5	1	17	40	104	1937	3446	1030	174	16	3	3	2
16H,6-22	7417	38.1	33.3	4.9	1	18	40	106	1970	3639	1292	268	64	12	5	2
18H,6-24	7507	38.2	33.4	5	1	18	40	106	1976	3659	1314	291	74	17	7	4
24H,0-24	7656	38.5	33.6	5.2	1	18	41	107	1982	3681	1354	321	101	30	12	8

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Eastbound

Time Period	Total Vehicles	85%ile Speed	Mean Speed	Stand Dev.	<11Mph	11-<16	16-<21	21-<26	26-<31	31-<36	36-<41	41-<46	46-<51	51-<56	56-<61	=>61
<b>Fri 06-Feb-15</b>																
00:00	16	54.5	44.4	9.8	0	0	0	0	0	4	3	3	1	3	1	1
01:00	5	-	44.5	9.6	0	0	0	0	0	1	1	1	1	0	1	0
02:00	3	-	38.5	5	0	0	0	0	0	1	1	1	0	0	0	0
03:00	10	53.5	45.5	9	0	0	0	0	0	1	2	4	0	2	0	1
04:00	27	49.9	44.2	7.7	0	0	0	0	1	3	3	10	7	1	1	1
05:00	83	49.7	42.7	7.4	0	0	0	0	2	11	26	20	15	3	5	1
06:00	225	45.3	39.3	6.1	0	0	1	0	9	60	73	55	18	9	0	0
07:00	1018	37.8	33.6	3.9	0	1	4	6	195	577	224	10	1	0	0	0
08:00	893	38.4	33.8	4.3	0	2	1	6	191	463	197	32	0	1	0	0
09:00	580	38.9	34.2	4.6	0	0	1	8	109	292	143	20	6	1	0	0
10:00	505	39.8	34.8	4.8	1	0	0	5	81	234	143	36	5	0	0	0
11:00	525	39.4	34.5	4.7	1	0	0	7	88	253	142	31	2	1	0	0
12:00	532	38.6	33.9	5	2	0	5	10	87	289	112	23	3	0	0	1
13:00	511	39	34.6	4.2	0	0	3	2	61	285	136	22	2	0	0	0
14:00	528	39.2	34.5	4.5	0	1	2	5	78	268	148	23	3	0	0	0
15:00	554	40	35.4	4.6	1	0	0	3	58	271	173	39	9	0	0	0
16:00	592	38.6	33.8	5	1	10	1	2	103	314	139	18	4	0	0	0
17:00	521	39.8	35	4.6	0	0	0	1	77	256	142	41	2	1	1	0
18:00	414	40.2	35.8	4.5	0	0	0	1	42	187	143	35	5	1	0	0
19:00	164	43.6	37.7	5.9	0	0	0	1	10	59	57	23	9	4	1	0
20:00	80	43.9	37.7	6.4	0	0	0	0	10	24	26	13	3	4	0	0
21:00	88	44.4	38	6.6	0	0	0	0	9	28	27	15	6	1	2	0
22:00	129	44.4	38	6.4	0	0	0	1	16	31	46	22	10	2	1	0
23:00	114	45.8	39.4	6.9	0	0	1	0	4	29	44	19	13	1	1	2
12H,7-19	7173	39.1	34.4	4.6	6	14	17	56	1170	3689	1842	330	42	5	1	1
16H,6-22	7730	39.5	34.7	4.8	6	14	18	57	1208	3860	2025	436	78	23	4	1
18H,6-24	7973	39.6	34.8	4.9	6	14	19	58	1228	3920	2115	477	101	26	6	3
24H,0-24	8117	39.8	34.9	5.1	6	14	19	58	1231	3941	2151	516	125	35	14	7

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Eastbound

Time Period	Total Vehicles	85%ile Speed	Mean Speed	Stand Dev.	<11Mph	11-<16	16-<21	21-<26	26-<31	31-<36	36-<41	41-<46	46-<51	51-<56	56-<61	=>61
-------------	----------------	--------------	------------	------------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	------

**Sat 07-Feb-15**

00:00	71	49.4	42.9	7.2	0	0	0	0	1	9	21	20	13	3	2	2
01:00	51	50.9	44.1	7	0	0	0	0	1	2	16	15	9	5	2	1
02:00	37	48	40.9	7.7	0	0	0	0	3	7	9	10	5	2	0	1
03:00	37	53.4	45.1	8.1	0	0	0	0	0	5	8	7	9	4	3	1
04:00	31	50.6	44.8	7.4	0	0	0	0	0	3	6	11	6	2	2	1
05:00	44	50.9	43.5	8	0	0	0	0	2	4	12	11	8	5	0	2
06:00	60	45.6	40.1	6.1	0	0	0	0	2	13	21	15	7	1	1	0
07:00	152	43.2	37.4	6.8	0	0	1	2	21	34	62	20	8	2	0	2
08:00	309	40.9	36.1	5.7	0	1	0	4	34	129	97	30	8	6	0	0
09:00	486	38.8	34	4.6	0	0	1	2	111	237	109	21	4	1	0	0
10:00	522	37.7	33.4	4.4	0	0	0	3	138	272	90	15	2	1	1	0
11:00	612	37.5	33.3	4.4	1	2	1	7	138	338	110	11	4	0	0	0
12:00	597	37.5	33.5	4.1	0	0	0	5	137	331	110	10	4	0	0	0
13:00	598	38.7	34.4	4.1	0	0	0	2	88	341	142	23	1	0	0	1
14:00	545	38.4	34	4.2	0	3	0	1	96	299	131	13	2	0	0	0
15:00	473	37.1	33.5	4	1	0	0	5	85	295	74	12	0	1	0	0
16:00	400	39.9	35.1	4.7	0	0	0	1	56	204	100	33	4	2	0	0
17:00	313	40.4	35.7	4.8	0	0	0	1	32	154	90	31	4	0	0	1
18:00	230	42.4	36.7	5.6	0	0	0	0	23	100	64	29	11	2	1	0
19:00	192	43.5	36.9	6.1	0	0	0	0	28	67	54	27	12	4	0	0
20:00	111	44.9	38.3	6.3	0	0	0	0	5	45	29	19	9	3	1	0
21:00	76	44.9	38.4	6.2	0	0	0	0	8	19	27	13	7	2	0	0
22:00	79	45.7	40.7	7.1	0	0	0	0	3	16	25	24	5	3	1	2
23:00	50	48.2	40.7	7.7	0	0	1	0	3	6	19	9	9	2	0	1
12H,7-19	5237	39	34.3	4.7	2	6	3	33	959	2734	1179	248	52	15	2	4
16H,6-22	5676	39.4	34.6	4.9	2	6	3	33	1002	2878	1310	322	87	25	4	4
18H,6-24	5805	39.6	34.7	5.1	2	6	4	33	1008	2900	1354	355	101	30	5	7
24H,0-24	6076	40.1	35.1	5.5	2	6	4	33	1015	2930	1426	429	151	51	14	15

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Eastbound

Time Period	Total Vehicles	85%ile Speed	Mean Speed	Stand Dev.	<11Mph	11-<16	16-<21	21-<26	26-<31	31-<36	36-<41	41-<46	46-<51	51-<56	56-<61	=>61
-------------	----------------	--------------	------------	------------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	------

**Sun 08-Feb-15**

00:00	27	46.6	40.7	6.1	0	0	0	0	1	5	8	8	4	1	0	0
01:00	25	52.3	46.1	6.9	0	0	0	0	0	1	4	9	6	3	1	1
02:00	15	49.1	42.5	7.2	0	0	0	0	0	2	6	3	2	1	1	0
03:00	7	-	43.5	11.6	0	0	0	0	1	1	1	1	2	0	0	1
04:00	15	49.1	41.2	7.9	0	0	0	0	1	4	2	4	2	2	0	0
05:00	33	48.1	39.3	9	0	1	1	0	0	8	12	3	6	1	1	0
06:00	39	48.6	41.7	7.8	0	0	0	0	3	5	11	10	7	1	1	1
07:00	68	46.8	38.9	7.2	0	0	0	0	9	17	17	13	8	4	0	0
08:00	137	43.2	36.6	6.3	0	0	1	0	19	52	36	18	9	1	1	0
09:00	283	41	36.4	5.4	0	0	2	1	24	120	93	33	5	5	0	0
10:00	451	39.9	35.6	4.1	0	0	0	2	25	251	135	34	3	1	0	0
11:00	524	39.5	34.8	4.6	0	2	3	2	68	259	159	28	2	1	0	0
12:00	543	39.6	35	4.5	0	2	0	1	65	282	156	29	7	1	0	0
13:00	500	39.8	35.5	4.7	0	0	1	0	54	239	173	22	8	1	1	1
14:00	501	40	35.5	4.4	0	0	0	3	46	248	159	41	3	0	1	0
15:00	469	40.2	35.5	5.4	0	2	0	1	54	235	127	40	3	3	2	2
16:00	430	39.9	35.1	4.9	0	0	1	0	69	205	116	29	8	2	0	0
17:00	309	40.2	35.5	4.9	0	0	0	1	49	126	102	23	8	0	0	0
18:00	216	41.9	37.2	5.1	0	0	0	0	11	87	81	24	10	3	0	0
19:00	137	42.8	37.3	5.2	0	0	0	0	9	53	47	19	9	0	0	0
20:00	88	45.3	38.8	6.7	0	0	0	1	8	21	28	19	9	1	0	1
21:00	58	47.8	40.6	6.8	0	0	0	0	2	10	26	8	8	3	0	1
22:00	29	50.5	43	7.8	0	0	0	0	1	6	5	5	8	3	1	0
23:00	23	51.1	43.5	7	0	0	0	0	1	1	6	9	2	3	1	0
12H,7-19	4431	40.2	35.5	4.9	0	6	8	11	493	2121	1354	334	74	22	5	3
16H,6-22	4753	40.4	35.8	5.1	0	6	8	12	515	2210	1466	390	107	27	6	6
18H,6-24	4805	40.5	35.8	5.2	0	6	8	12	517	2217	1477	404	117	33	8	6
24H,0-24	4927	40.6	36	5.4	0	7	9	12	520	2238	1510	432	139	41	11	8

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Eastbound

Time Period	Total Vehicles	85%ile Speed	Mean Speed	Stand Dev.	<11Mph	11-<16	16-<21	21-<26	26-<31	31-<36	36-<41	41-<46	46-<51	51-<56	56-<61	=>61
<b>Mon 09-Feb-15</b>																
00:00	11	53.1	44	8.9	0	0	0	0	0	3	1	3	1	2	1	0
01:00	3	-	45.2	5.9	0	0	0	0	0	0	1	0	2	0	0	0
02:00	5	-	44.5	12	0	0	0	0	0	1	2	0	1	0	0	1
03:00	6	-	40.2	7.6	0	0	0	0	0	2	2	1	0	1	0	0
04:00	36	53.9	45.3	8.7	0	0	0	0	3	2	5	9	7	7	2	1
05:00	81	50.3	43.6	7.8	0	0	1	0	2	8	13	34	12	4	6	1
06:00	254	45.8	39.8	6.3	0	0	0	0	11	56	96	55	22	12	1	1
07:00	998	36.8	32.7	4.4	1	2	0	11	320	489	150	22	2	0	1	0
08:00	1121	36.8	32.8	4.1	0	1	4	19	315	585	180	17	0	0	0	0
09:00	600	38.7	34.3	4.4	0	2	0	0	104	325	144	18	6	1	0	0
10:00	425	39.2	34.5	4.5	0	1	0	0	69	227	99	25	4	0	0	0
11:00	440	38.2	33.4	4.9	0	1	4	13	92	228	79	20	3	0	0	0
12:00	403	30.7	27.9	3.5	0	0	6	88	262	45	2	0	0	0	0	0
13:00	436	34.4	29.6	4.6	1	0	2	62	245	88	32	6	0	0	0	0
14:00	416	38.7	34.5	4	0	0	0	1	55	244	99	14	2	1	0	0
15:00	462	38.3	33.7	4.3	0	1	1	2	99	246	94	19	0	0	0	0
16:00	519	37.6	33.5	4.4	0	2	2	5	105	297	91	14	2	1	0	0
17:00	415	40	35.4	4.9	1	0	0	1	53	192	130	31	6	0	0	1
18:00	281	40.3	35.6	4.8	0	0	0	0	38	123	90	25	4	1	0	0
19:00	150	42	36.5	5.3	0	0	0	2	13	61	47	21	6	0	0	0
20:00	69	43.5	38	6.2	0	0	0	0	9	15	26	16	0	2	1	0
21:00	72	47.2	39.9	7.6	0	0	0	0	8	13	24	14	7	3	3	0
22:00	48	43.9	38.6	6.6	0	0	0	1	4	9	20	11	0	2	1	0
23:00	27	49.6	42.9	7.8	0	0	0	0	0	5	6	10	2	2	1	1
12H,7-19	6516	37.9	33.1	4.8	3	10	19	202	1757	3089	1190	211	29	4	1	1
16H,6-22	7061	38.7	33.5	5.1	3	10	19	204	1798	3234	1383	317	64	21	6	2
18H,6-24	7136	38.8	33.6	5.2	3	10	19	205	1802	3248	1409	338	66	25	8	3
24H,0-24	7278	39.1	33.8	5.5	3	10	20	205	1807	3264	1433	385	89	39	17	6

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Eastbound

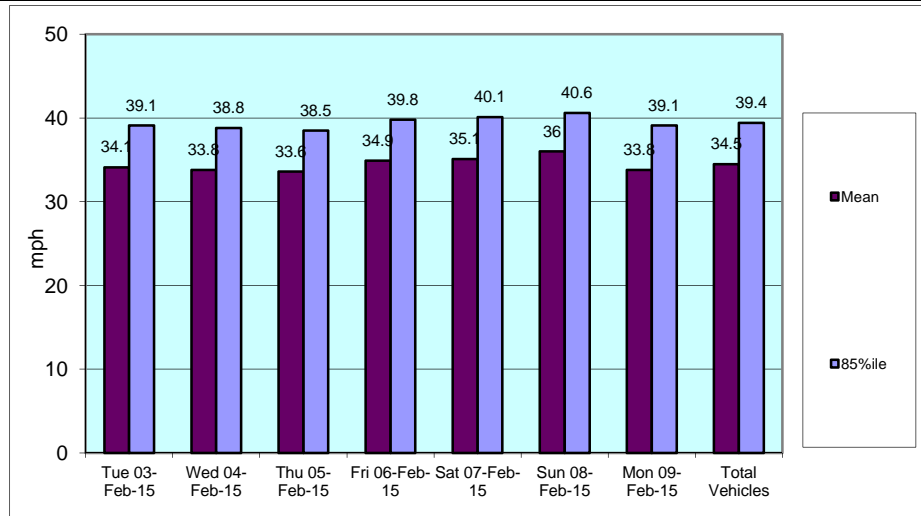
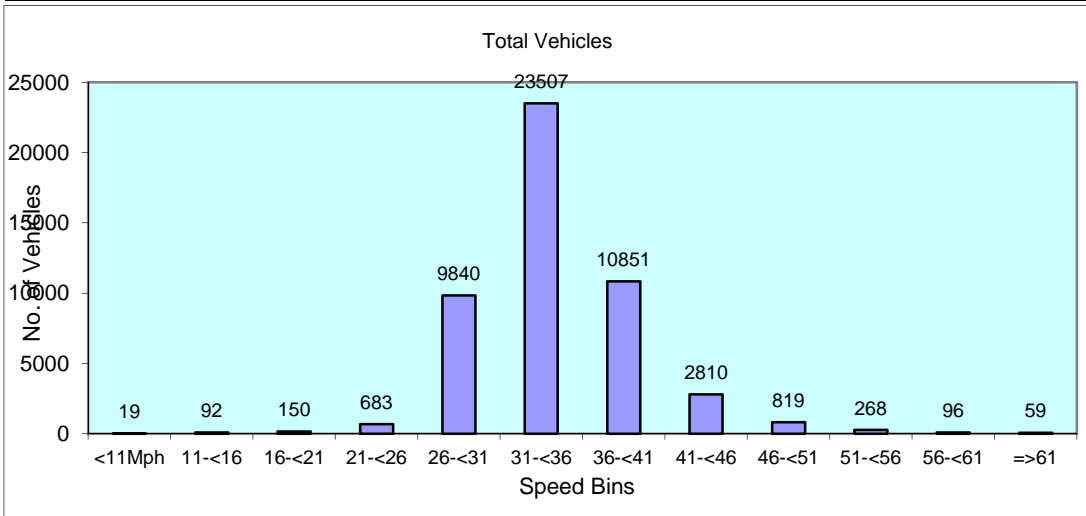
Time Period	Total Vehicles	85%ile Speed	Mean Speed	Stand Dev.	<11Mph	11-<16	16-<21	21-<26	26-<31	31-<36	36-<41	41-<46	46-<51	51-<56	56-<61	=>61
-------------	----------------	--------------	------------	------------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	------

**Daily Totals**

Tue 03-Feb-15	<b>7538</b>	39.1	34.1	5.4	2	21	22	116	1600	3692	1530	368	122	39	17	9
Wed 04-Feb-15	<b>7602</b>	38.8	33.8	5.2	5	16	35	152	1685	3761	1447	359	92	33	11	6
Thu 05-Feb-15	<b>7656</b>	38.5	33.6	5.2	1	18	41	107	1982	3681	1354	321	101	30	12	8
Fri 06-Feb-15	<b>8117</b>	39.8	34.9	5.1	6	14	19	58	1231	3941	2151	516	125	35	14	7
Sat 07-Feb-15	<b>6076</b>	40.1	35.1	5.5	2	6	4	33	1015	2930	1426	429	151	51	14	15
Sun 08-Feb-15	<b>4927</b>	40.6	36	5.4	0	7	9	12	520	2238	1510	432	139	41	11	8
Mon 09-Feb-15	<b>7278</b>	39.1	33.8	5.5	3	10	20	205	1807	3264	1433	385	89	39	17	6

**Total Vehicles**

[--]	<b>49194</b>	39.4	34.5	5.3	19	92	150	683	9840	23507	10851	2810	819	268	96	59
------	--------------	------	------	-----	----	----	-----	-----	------	-------	-------	------	-----	-----	----	----



18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Westbound

Time Period	Total Vehicles	85%ile Speed	Mean Speed	Stand Dev.	<11Mph	11-<16	16-<21	21-<26	26-<31	31-<36	36-<41	41-<46	46-<51	51-<56	56-<61	=>61
<b>Tue 03-Feb-15</b>																
00:00	16	51.3	41.3	9	0	0	0	0	1	2	9	0	1	2	0	1
01:00	4	-	41	10.4	0	0	0	0	1	0	1	1	0	1	0	0
02:00	6	-	41	8.9	0	0	0	0	0	3	0	1	1	1	0	0
03:00	10	47.7	41	6.5	0	0	0	0	0	3	2	2	3	0	0	0
04:00	14	48	42.4	10.7	0	0	0	0	1	4	1	5	1	0	0	2
05:00	28	51.5	43.5	8.9	0	0	0	0	2	2	9	5	5	3	0	2
06:00	126	45	38.6	7.6	0	0	0	0	15	38	33	26	5	4	3	2
07:00	370	39.9	33.5	6.3	0	0	2	9	139	126	49	28	13	3	0	1
08:00	336	39.1	33	6.1	0	1	2	13	120	124	40	27	7	1	0	1
09:00	338	39.3	33	6.9	1	6	15	7	84	134	61	19	8	3	0	0
10:00	317	38.2	32.9	5.3	0	0	0	13	108	129	44	16	6	1	0	0
11:00	356	35.7	31.1	5.2	0	3	1	25	167	113	36	7	3	1	0	0
12:00	404	35.9	31.6	4.7	0	0	3	12	191	141	44	10	2	1	0	0
13:00	434	35.8	31	5.7	0	1	14	38	179	142	38	18	3	0	1	0
14:00	533	35.7	31.4	5.2	0	0	2	57	204	200	50	13	5	2	0	0
15:00	633	35.7	31	5.2	0	2	14	47	273	216	63	15	1	2	0	0
16:00	858	34.4	29.6	5.3	0	2	15	150	422	206	44	10	5	1	1	2
17:00	948	33.6	28.2	5.7	8	14	54	180	454	182	42	12	2	0	0	0
18:00	602	37.6	32.3	5.4	0	3	0	45	203	234	82	27	8	0	0	0
19:00	308	39.1	33.4	5.8	0	0	1	16	89	123	52	15	11	1	0	0
20:00	239	41.6	36	6.5	0	1	0	1	41	94	63	22	10	5	1	1
21:00	156	44.9	36.4	8.1	0	1	1	3	32	54	24	22	11	6	0	2
22:00	102	45.8	37.7	6.9	0	0	0	0	15	35	21	16	12	3	0	0
23:00	65	46.5	38.4	7.1	0	0	0	1	6	20	19	8	7	4	0	0
12H,7-19	6129	35.9	31.1	5.8	9	32	122	596	2544	1947	593	202	63	15	2	4
16H,6-22	6958	37	31.6	6.1	9	34	124	616	2721	2256	765	287	100	31	6	9
18H,6-24	7125	37.4	31.7	6.2	9	34	124	617	2742	2311	805	311	119	38	6	9
24H,0-24	7203	37.6	31.9	6.3	9	34	124	617	2747	2325	827	325	130	45	6	14



18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Westbound

Time Period	Total Vehicles	85%ile Speed	Mean Speed	Stand Dev.	<11Mph	11-<16	16-<21	21-<26	26-<31	31-<36	36-<41	41-<46	46-<51	51-<56	56-<61	=>61
<b>Wed 04-Feb-15</b>																
00:00	17	47.6	39.4	7.7	0	0	0	0	2	5	3	3	3	1	0	0
01:00	11	50.3	42.1	10.3	0	0	0	0	2	1	1	5	0	1	0	1
02:00	8	-	42.3	11	0	0	0	0	0	4	0	1	2	0	0	1
03:00	1	-	33.5	-	0	0	0	0	0	1	0	0	0	0	0	0
04:00	16	46.5	37.9	8.2	0	0	0	0	3	5	4	1	1	2	0	0
05:00	25	48.2	39.9	9.8	0	0	0	0	7	2	4	6	4	0	1	1
06:00	118	47.5	39.9	7	0	0	0	0	10	27	32	25	20	2	1	1
07:00	382	38.9	33.3	5.5	0	2	1	11	123	140	82	16	5	2	0	0
08:00	373	36.5	31	5.8	0	0	5	53	155	99	42	14	4	0	1	0
09:00	306	39.5	33.2	5.9	0	0	0	7	125	97	44	24	7	1	1	0
10:00	341	35.2	30.5	5	1	2	5	25	172	100	29	6	1	0	0	0
11:00	370	35.2	30.8	4.6	0	0	5	23	183	122	28	8	1	0	0	0
12:00	443	34.5	29.9	4.5	0	3	3	43	248	113	28	4	1	0	0	0
13:00	409	35.5	31.5	4.7	0	1	2	13	194	151	35	7	6	0	0	0
14:00	532	35.2	30.5	5.1	0	2	17	34	259	165	42	11	1	1	0	0
15:00	604	35.5	30.2	5.7	0	6	23	64	271	166	54	17	3	0	0	0
16:00	921	34.8	29.4	5.8	1	15	51	125	395	254	64	11	3	1	1	0
17:00	1025	34.6	29.5	5.2	0	5	27	172	493	240	69	16	2	1	0	0
18:00	839	37.3	31.6	5.9	0	0	16	82	338	250	99	40	11	2	1	0
19:00	334	40.8	35	5.9	0	0	1	7	77	119	82	37	8	2	1	0
20:00	213	42.9	36.1	6.4	0	0	0	7	34	74	54	30	10	4	0	0
21:00	138	45.4	37.8	7.9	0	0	0	3	20	46	25	26	10	5	1	2
22:00	114	46.9	38.3	7.9	0	0	0	0	13	44	25	13	8	8	2	1
23:00	52	50.7	40.9	8.8	0	0	0	0	4	13	15	7	5	5	1	2
12H,7-19	6545	35.6	30.7	5.5	2	36	155	652	2956	1897	616	174	45	8	4	0
16H,6-22	7348	36.8	31.3	6	2	36	156	669	3097	2163	809	292	93	21	7	3
18H,6-24	7514	37.1	31.5	6.1	2	36	156	669	3114	2220	849	312	106	34	10	6
24H,0-24	7592	37.3	31.5	6.2	2	36	156	669	3128	2238	861	328	116	38	11	9

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Westbound

Time Period	Total Vehicles	85%ile Speed	Mean Speed	Stand Dev.	<11Mph	11-<16	16-<21	21-<26	26-<31	31-<36	36-<41	41-<46	46-<51	51-<56	56-<61	=>61
<b>Thu 05-Feb-15</b>																
00:00	16	42.8	35.4	8.8	0	0	0	1	5	4	2	3	0	0	1	0
01:00	10	51	41	10.1	0	0	0	0	2	1	3	1	1	1	1	0
02:00	3	-	40.2	7.6	0	0	0	0	0	1	1	0	1	0	0	0
03:00	8	-	41	11.1	0	0	0	0	1	3	1	0	1	1	1	0
04:00	12	49.5	43.1	8.7	0	0	0	0	1	2	1	4	2	1	1	0
05:00	32	54.6	44.8	10.6	0	0	0	1	4	1	6	4	5	8	1	2
06:00	116	49.4	39.9	8.9	0	0	0	1	21	21	24	17	21	7	2	2
07:00	374	39.5	33.5	6.1	0	1	1	16	120	132	68	21	13	0	2	0
08:00	350	37.8	32	5.8	0	0	7	23	136	114	48	15	5	2	0	0
09:00	299	36.7	32.4	4.9	0	0	1	10	114	124	35	12	2	1	0	0
10:00	309	33.4	29.1	4.3	0	0	4	49	181	58	14	3	0	0	0	0
11:00	392	33.4	29	4.8	0	0	14	60	227	66	17	7	1	0	0	0
12:00	441	35.2	30.3	5.2	0	0	5	62	205	122	33	10	3	1	0	0
13:00	448	35.1	30.6	4.9	0	2	6	33	228	135	34	5	5	0	0	0
14:00	560	35.8	31.1	5.2	0	1	7	49	247	178	58	16	3	1	0	0
15:00	668	34.7	29.5	5.2	0	3	28	91	330	154	53	8	1	0	0	0
16:00	806	34.1	28.8	5.3	1	6	23	179	372	166	46	9	3	1	0	0
17:00	995	34.4	28.9	5.5	0	18	45	173	457	225	63	11	3	0	0	0
18:00	806	35.7	31.1	5.4	2	3	19	66	307	305	75	26	2	1	0	0
19:00	405	41.6	35.4	6.7	0	2	0	4	88	165	80	38	18	7	1	2
20:00	264	42.6	35.6	7.3	0	1	0	11	70	55	77	31	11	5	3	0
21:00	178	45	36.4	7.2	0	0	0	1	39	64	34	16	17	6	1	0
22:00	124	46.5	38.6	8	0	0	0	1	15	39	31	18	9	7	2	2
23:00	56	49.1	40.9	9	0	0	0	0	6	12	13	13	5	3	1	3
12H,7-19	6448	35.4	30.3	5.5	3	34	160	811	2924	1779	544	143	41	7	2	0
16H,6-22	7411	36.3	31	6.1	3	37	160	828	3142	2084	759	245	108	32	9	4
18H,6-24	7591	36.8	31.2	6.3	3	37	160	829	3163	2135	803	276	122	42	12	9
24H,0-24	7672	37	31.3	6.4	3	37	160	831	3176	2147	817	288	132	53	17	11

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Westbound

Time Period	Total Vehicles	85%ile Speed	Mean Speed	Stand Dev.	<11Mph	11-<16	16-<21	21-<26	26-<31	31-<36	36-<41	41-<46	46-<51	51-<56	56-<61	=>61
<b>Fri 06-Feb-15</b>																
00:00	20	52.3	43.8	8.5	0	0	0	0	0	4	6	1	5	2	2	0
01:00	6	-	47.7	12.1	0	0	0	0	0	2	0	0	1	2	0	1
02:00	6	-	44.3	5.1	0	0	0	0	0	0	2	1	3	0	0	0
03:00	8	-	36	8.1	0	0	0	0	2	3	2	0	0	1	0	0
04:00	7	-	41.4	8.6	0	0	0	0	1	1	1	2	1	1	0	0
05:00	27	49.5	40.5	9.7	0	0	0	0	5	6	3	5	5	1	1	1
06:00	130	46	38.5	7.9	0	1	0	1	12	41	37	18	9	8	1	2
07:00	343	39.6	33.4	6.3	2	0	1	17	103	124	62	22	9	3	0	0
08:00	368	38.2	32.9	5.2	0	1	1	14	118	155	52	25	1	1	0	0
09:00	319	38.3	32.6	5.9	0	1	3	12	122	114	40	22	2	2	0	1
10:00	372	35.8	27.1	9.8	51	15	15	37	114	87	40	11	1	1	0	0
11:00	422	35.9	30.3	6.1	1	6	21	39	178	115	47	13	1	1	0	0
12:00	524	37.8	31.9	5.9	0	5	6	43	193	171	74	24	8	0	0	0
13:00	479	37.8	32.4	5.1	0	0	2	21	182	176	70	26	2	0	0	0
14:00	624	37.3	32.3	5.2	0	0	1	35	237	234	85	23	8	1	0	0
15:00	979	34.5	27.6	7.2	19	50	84	198	337	208	55	26	0	2	0	0
16:00	984	34.2	28.8	5.6	3	11	38	213	439	203	51	24	1	1	0	0
17:00	742	36.4	31.5	5.3	0	0	4	73	297	249	85	25	9	0	0	0
18:00	466	40	34.1	5.6	0	0	0	13	130	182	89	40	9	3	0	0
19:00	266	43.4	36.1	6.9	0	0	0	2	63	85	61	31	17	4	3	0
20:00	129	44.4	37.8	6.6	0	0	0	2	18	30	42	25	9	2	1	0
21:00	89	46.1	37.4	8.1	0	0	0	0	20	26	21	8	7	5	1	1
22:00	455	39.4	33.7	5.7	0	0	0	11	141	183	76	32	8	2	2	0
23:00	253	42.3	36.3	6.4	0	0	0	2	38	106	62	25	12	5	3	0
12H,7-19	6622	36.7	30.8	6.5	76	89	176	715	2450	2018	750	281	51	15	0	1
16H,6-22	7236	37.8	31.3	6.8	76	90	176	720	2563	2200	911	363	93	34	6	4
18H,6-24	7944	38.1	31.6	6.8	76	90	176	733	2742	2489	1049	420	113	41	11	4
24H,0-24	8018	38.3	31.7	6.9	76	90	176	733	2750	2505	1063	429	128	48	14	6

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Westbound

Time Period	Total Vehicles	85%ile Speed	Mean Speed	Stand Dev.	<11Mph	11-<16	16-<21	21-<26	26-<31	31-<36	36-<41	41-<46	46-<51	51-<56	56-<61	=>61
<b>Sat 07-Feb-15</b>																
00:00	98	49.7	40.7	8.1	0	0	0	0	9	23	21	21	12	8	4	0
01:00	77	52.8	43.2	9	0	0	0	0	3	19	14	9	17	8	5	2
02:00	52	54.4	43.5	9.6	0	0	0	0	5	7	9	14	4	7	4	2
03:00	40	55.2	47.6	8.2	0	0	0	0	0	5	3	7	11	9	3	2
04:00	13	53.8	44.7	10.3	0	0	0	0	2	0	2	4	2	1	1	1
05:00	23	50.2	42.4	9	0	0	0	0	2	5	3	4	6	2	0	1
06:00	64	48.4	38.2	8.9	0	1	0	1	13	13	13	9	8	6	0	0
07:00	102	45.8	37.7	7.4	0	0	0	0	17	35	18	17	11	3	0	1
08:00	193	41.9	35.9	6.8	0	0	1	1	40	72	46	19	7	5	1	1
09:00	247	40	33.8	6.1	0	1	1	3	89	75	51	20	5	1	1	0
10:00	408	36.1	31.5	5.4	0	0	3	28	189	125	44	11	6	2	0	0
11:00	487	35.7	31.2	5.2	0	1	7	34	220	161	46	14	2	1	1	0
12:00	583	35.5	31	5.2	0	0	4	57	262	193	45	13	7	2	0	0
13:00	587	36.9	31.5	5.5	0	0	4	56	249	177	71	21	8	1	0	0
14:00	589	35.8	31.6	5.3	0	0	5	49	224	233	55	13	7	1	2	0
15:00	576	35.8	31.3	5.6	0	0	10	66	217	204	46	25	7	1	0	0
16:00	588	37.8	32.4	5.6	0	0	1	36	223	209	86	18	11	3	0	1
17:00	522	39.5	33.3	6	0	0	4	20	175	189	80	41	7	4	2	0
18:00	320	40.9	34.8	6	0	0	0	3	88	113	69	35	8	3	1	0
19:00	232	45.1	36.8	7.5	0	0	0	5	44	80	44	29	18	9	3	0
20:00	129	43.4	37	6.8	0	0	0	0	20	47	35	15	5	5	2	0
21:00	113	44.9	36.6	7.6	0	1	0	0	22	41	23	11	12	1	1	1
22:00	132	44.9	37.3	7.6	0	0	0	1	22	49	21	24	9	2	3	1
23:00	91	48.2	38.3	8.6	0	0	1	2	10	29	25	5	11	3	5	0
12H,7-19	5202	37.9	32.3	5.8	0	2	40	353	1993	1786	657	247	86	27	8	3
16H,6-22	5740	38.7	32.7	6.2	0	4	40	359	2092	1967	772	311	129	48	14	4
18H,6-24	5963	39	32.9	6.3	0	4	41	362	2124	2045	818	340	149	53	22	5
24H,0-24	6266	39.8	33.4	6.8	0	4	41	362	2145	2104	870	399	201	88	39	13

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Westbound

Time Period	Total Vehicles	85%ile Speed	Mean Speed	Stand Dev.	<11Mph	11-<16	16-<21	21-<26	26-<31	31-<36	36-<41	41-<46	46-<51	51-<56	56-<61	=>61
<b>Sun 08-Feb-15</b>																
00:00	48	46.3	40.6	6.1	0	0	0	0	2	6	21	11	6	1	1	0
01:00	29	48.6	40.6	7.9	0	0	0	0	1	8	10	2	6	1	0	1
02:00	16	53.8	44.4	8.7	0	0	0	0	0	4	1	5	2	2	2	0
03:00	12	57.8	45.2	12.5	0	0	0	1	1	1	1	2	2	1	2	1
04:00	14	52	41.7	9	0	0	0	0	1	3	4	2	1	2	1	0
05:00	22	45.5	40.1	7.1	0	0	0	0	2	5	4	8	1	2	0	0
06:00	45	48.1	38.6	8.1	0	0	0	2	7	8	12	5	9	2	0	0
07:00	86	40.7	34.2	9.2	1	2	3	4	18	25	21	5	2	3	1	1
08:00	125	42.5	34.6	7	0	0	0	4	41	39	17	16	4	4	0	0
09:00	168	41.7	34.5	7	0	0	5	4	43	58	30	17	8	3	0	0
10:00	298	36.9	32	5.8	0	2	6	15	108	116	34	10	5	2	0	0
11:00	429	39.1	33.2	5.6	1	1	1	13	143	157	77	30	5	1	0	0
12:00	631	36.7	31.5	5.8	1	3	13	58	223	227	75	22	8	1	0	0
13:00	611	37.1	32	5.6	0	0	4	43	246	209	77	20	8	1	3	0
14:00	569	37.7	32.4	5.5	1	0	1	41	195	219	76	28	7	1	0	0
15:00	535	38.7	33.2	5.6	0	2	4	20	158	219	94	31	4	2	1	0
16:00	523	38.9	32.7	5.8	0	0	4	36	179	168	97	31	7	1	0	0
17:00	360	40.3	34.4	6.3	1	0	0	8	97	143	66	29	10	3	2	1
18:00	209	44.2	36.7	7.2	0	0	0	0	46	68	46	27	9	11	2	0
19:00	140	45.7	38.1	7.3	0	0	0	0	21	42	35	22	13	4	3	0
20:00	122	45.3	38.8	7.5	0	0	0	0	17	30	33	27	5	7	2	1
21:00	101	51.3	41.3	9.3	0	0	0	0	11	22	23	19	10	7	5	4
22:00	53	47.9	40.2	8	0	0	0	0	7	9	14	13	4	4	2	0
23:00	34	57.4	45.9	10.3	0	0	0	0	1	7	5	4	5	5	5	2
12H,7-19	4544	38.9	32.9	6.1	5	10	41	246	1497	1648	710	266	77	33	9	2
16H,6-22	4952	39.7	33.4	6.5	5	10	41	248	1553	1750	813	339	114	53	19	7
18H,6-24	5039	39.9	33.6	6.7	5	10	41	248	1561	1766	832	356	123	62	26	9
24H,0-24	5180	40.2	33.8	6.8	5	10	41	249	1568	1793	873	386	141	71	32	11

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Westbound

Time Period	Total Vehicles	85%ile Speed	Mean Speed	Stand Dev.	<11Mph	11-<16	16-<21	21-<26	26-<31	31-<36	36-<41	41-<46	46-<51	51-<56	56-<61	=>61
<b>Mon 09-Feb-15</b>																
00:00	22	48.2	40.5	7.1	0	0	0	0	1	7	3	5	5	1	0	0
01:00	8	-	42.9	10.9	0	0	0	0	2	1	0	0	3	2	0	0
02:00	2	-	46	3.5	0	0	0	0	0	0	0	1	1	0	0	0
03:00	4	-	46	13.2	0	0	0	0	0	1	1	0	1	0	0	1
04:00	7	-	42.8	12.7	0	0	0	0	1	2	1	0	1	1	0	1
05:00	31	55.8	46.6	8.8	0	0	0	0	1	4	2	7	8	4	4	1
06:00	111	48	39.5	7.7	0	0	0	0	10	34	26	19	12	8	1	1
07:00	345	40	33.8	6.6	0	0	0	17	113	118	56	22	11	7	0	1
08:00	343	39.4	33	5.8	0	1	1	13	133	106	55	26	8	0	0	0
09:00	293	39.3	33.2	5.9	0	0	0	21	91	102	53	19	5	1	1	0
10:00	314	38.7	32.9	6	0	0	1	16	117	109	44	18	7	0	1	1
11:00	359	36.9	31.8	5.4	1	2	2	23	142	126	46	14	3	0	0	0
12:00	392	30.6	27.4	4.1	0	1	8	121	219	36	5	0	2	0	0	0
13:00	425	32.1	28.4	4.9	0	2	5	106	237	48	18	6	2	1	0	0
14:00	529	38.1	32.4	5.6	0	0	3	31	207	178	71	28	9	2	0	0
15:00	662	35.5	30.6	5.4	0	1	14	83	276	208	58	18	3	1	0	0
16:00	758	35.8	31.3	5.1	0	1	4	63	323	264	76	21	5	0	1	0
17:00	956	34.4	29.9	4.4	0	0	6	118	516	255	46	14	1	0	0	0
18:00	593	37.8	32.4	5.4	0	0	0	31	239	202	90	19	10	1	1	0
19:00	310	41.2	35.4	6.8	1	0	2	3	68	112	76	27	12	7	1	1
20:00	190	43.4	36.7	6.9	0	0	1	0	39	54	53	29	7	5	1	1
21:00	138	44.3	36.9	7.5	0	0	0	0	29	43	37	12	9	5	2	1
22:00	94	44.4	36.9	7.6	0	1	0	0	19	30	17	18	4	4	1	0
23:00	37	46	37.7	6.9	0	0	0	0	5	13	9	4	5	1	0	0
12H,7-19	5969	36.1	31.2	5.6	1	8	44	643	2613	1752	618	205	66	13	4	2
16H,6-22	6718	37.6	31.8	6	2	8	47	646	2759	1995	810	292	106	38	9	6
18H,6-24	6849	37.8	31.9	6.1	2	9	47	646	2783	2038	836	314	115	43	10	6
24H,0-24	6923	38	32	6.2	2	9	47	646	2788	2053	843	327	134	51	14	9

18470 ST NICHOLAS Site No: 18470001 Location A48, St Nicholas (LC 70)  
 Tue 03-Feb-15 to Mon 09-Feb-15 Channel: Westbound

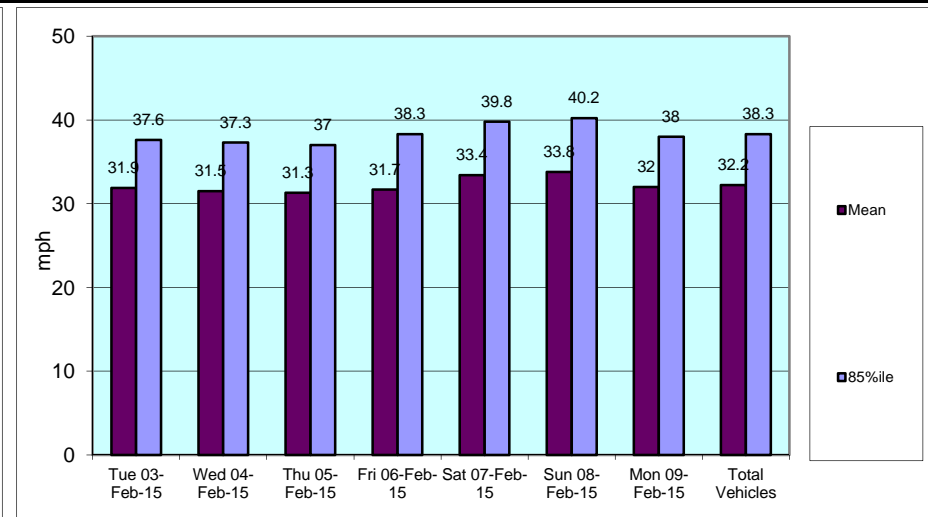
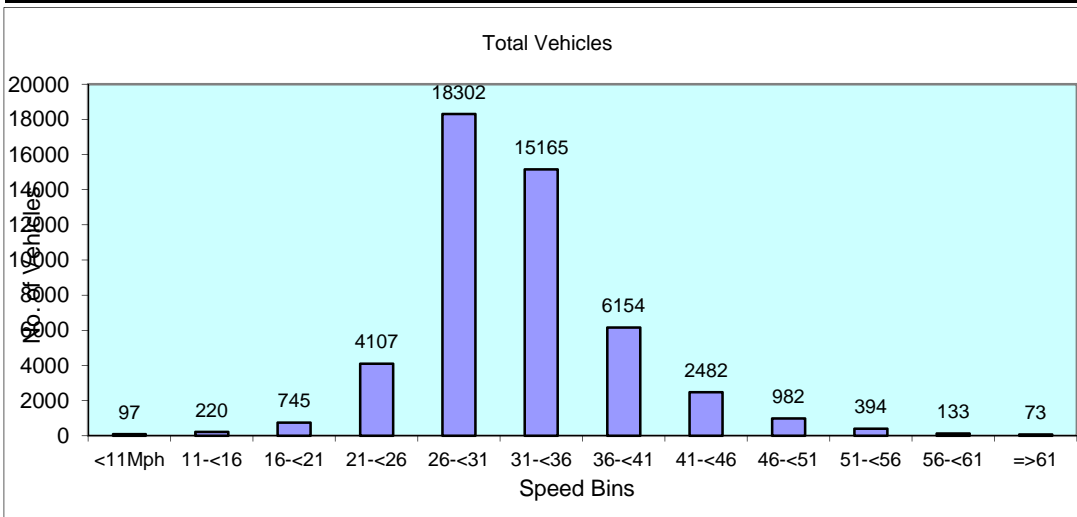
Time Period	Total Vehicles	85%ile Speed	Mean Speed	Stand Dev.	<11Mph	11-<16	16-<21	21-<26	26-<31	31-<36	36-<41	41-<46	46-<51	51-<56	56-<61	=>61
-------------	----------------	--------------	------------	------------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	------

**Daily Totals**

Tue 03-Feb-15	<b>7203</b>	37.6	31.9	6.3	9	34	124	617	2747	2325	827	325	130	45	6	14
Wed 04-Feb-15	<b>7592</b>	37.3	31.5	6.2	2	36	156	669	3128	2238	861	328	116	38	11	9
Thu 05-Feb-15	<b>7672</b>	37	31.3	6.4	3	37	160	831	3176	2147	817	288	132	53	17	11
Fri 06-Feb-15	<b>8018</b>	38.3	31.7	6.9	76	90	176	733	2750	2505	1063	429	128	48	14	6
Sat 07-Feb-15	<b>6266</b>	39.8	33.4	6.8	0	4	41	362	2145	2104	870	399	201	88	39	13
Sun 08-Feb-15	<b>5180</b>	40.2	33.8	6.8	5	10	41	249	1568	1793	873	386	141	71	32	11
Mon 09-Feb-15	<b>6923</b>	38	32	6.2	2	9	47	646	2788	2053	843	327	134	51	14	9

**Total Vehicles**

[--]	<b>48854</b>	38.3	32.2	6.5	97	220	745	4107	18302	15165	6154	2482	982	394	133	73
------	--------------	------	------	-----	----	-----	-----	------	-------	-------	------	------	-----	-----	-----	----



# Classification Schemes

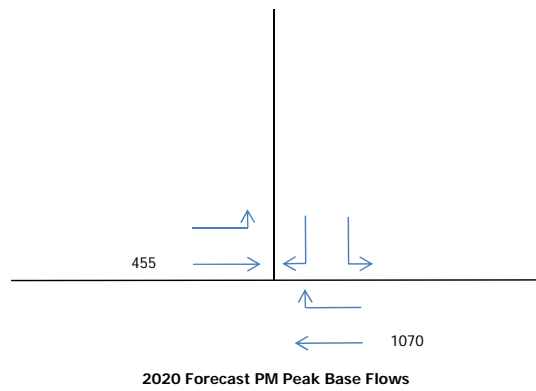
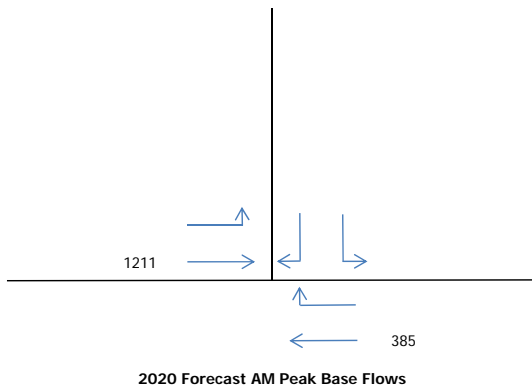
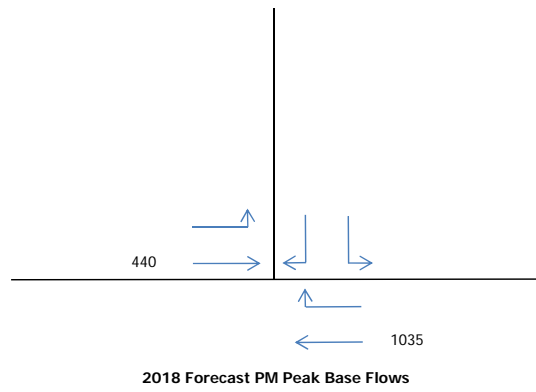
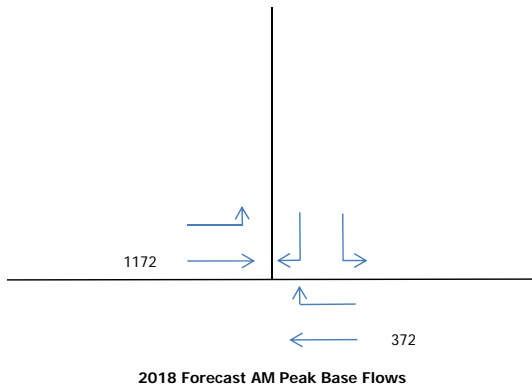
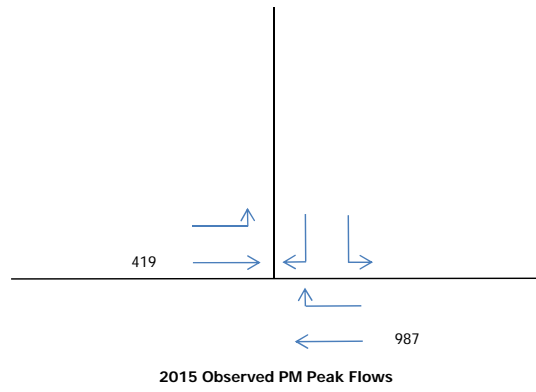
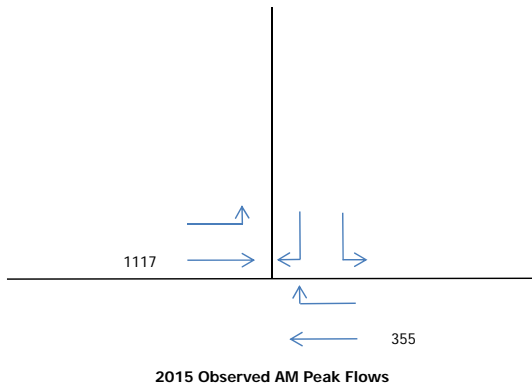
## Scheme F Classification Scheme (Non-metric)

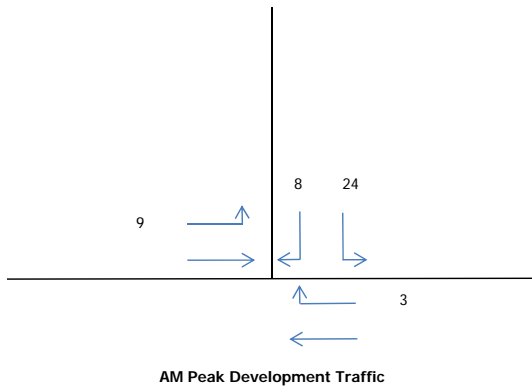
Scheme F is an attempt to implement the FWHA's visual classification scheme as an axle-based classification scheme. This is one of several interpretations.

Class	Vehicle Type	No. of Axles	Axle spacing in feet				
			Axle 1 to 2	Axle 2 to 3	Axle 3 to 4	Axle 4 to 5	Axle 5 to 6
1	motorcycle	2	<6.0				
2	passenger car	2	6.0 - 10.0				
	car + 1 axle trailer	3	<10.0	10.0 - 18.0			
	car + 2 axle trailer	4	<10.0		<3.5		
3	pickup	2	10.0 - 15.0				
	pickup + 1 axle trailer	3	10.0 - 15.0	10.0 - 18.0			
	pickup + 2 axle trailer	4	10.0 - 15.0		<3.5		
	pickup + 3 axle trailer	5	9.9 - 15.0			<3.5	
4	Traditional bus/coach	2	>20.0				
	Traditional bus/coach	3	>19.0				
5	single unit truck/bus - dual rear axle	2	14.9 - 20.0			<3.5	
6	3 axle truck	3		<18.0			
7	4 axle truck	4					
8	2S1	3		>18.0			
	2S2	4		>5.0	>3.5		
	3S1	4		<5.0	>10.0		
9	3S2	5		<6.1		3.5 - 8.0	
	5 axle combination	5					
10	6 axle combination	6			3.5 - 5.0		
	3S3	6					
11	2S1-2	5		>6.0			
12	3S1-2	6					>10.0
13	truck	7 or more					

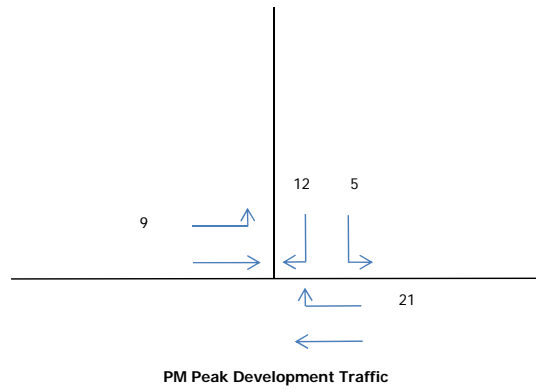


## **APPENDIX B**

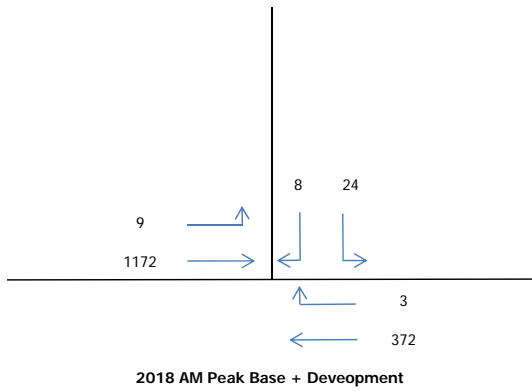




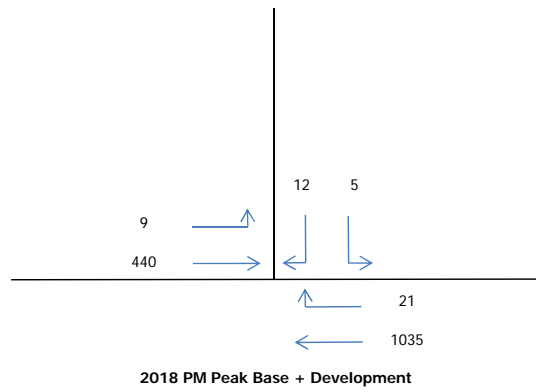
AM Peak Development Traffic



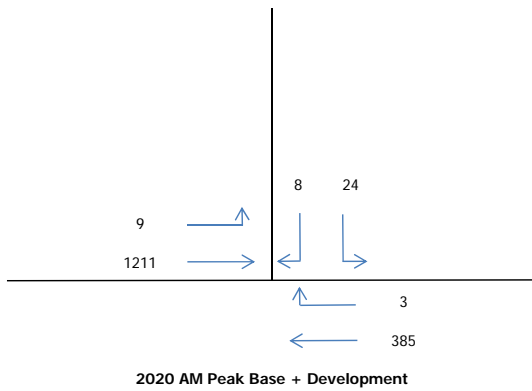
PM Peak Development Traffic



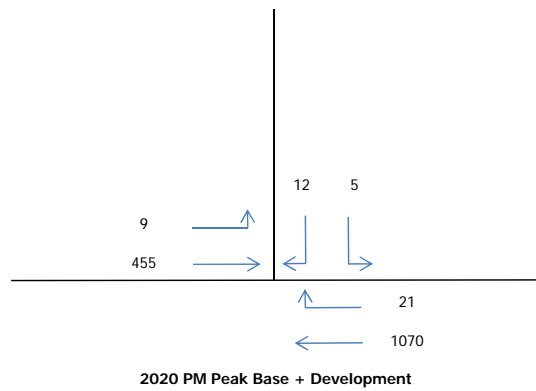
2018 AM Peak Base + Development



2018 PM Peak Base + Development

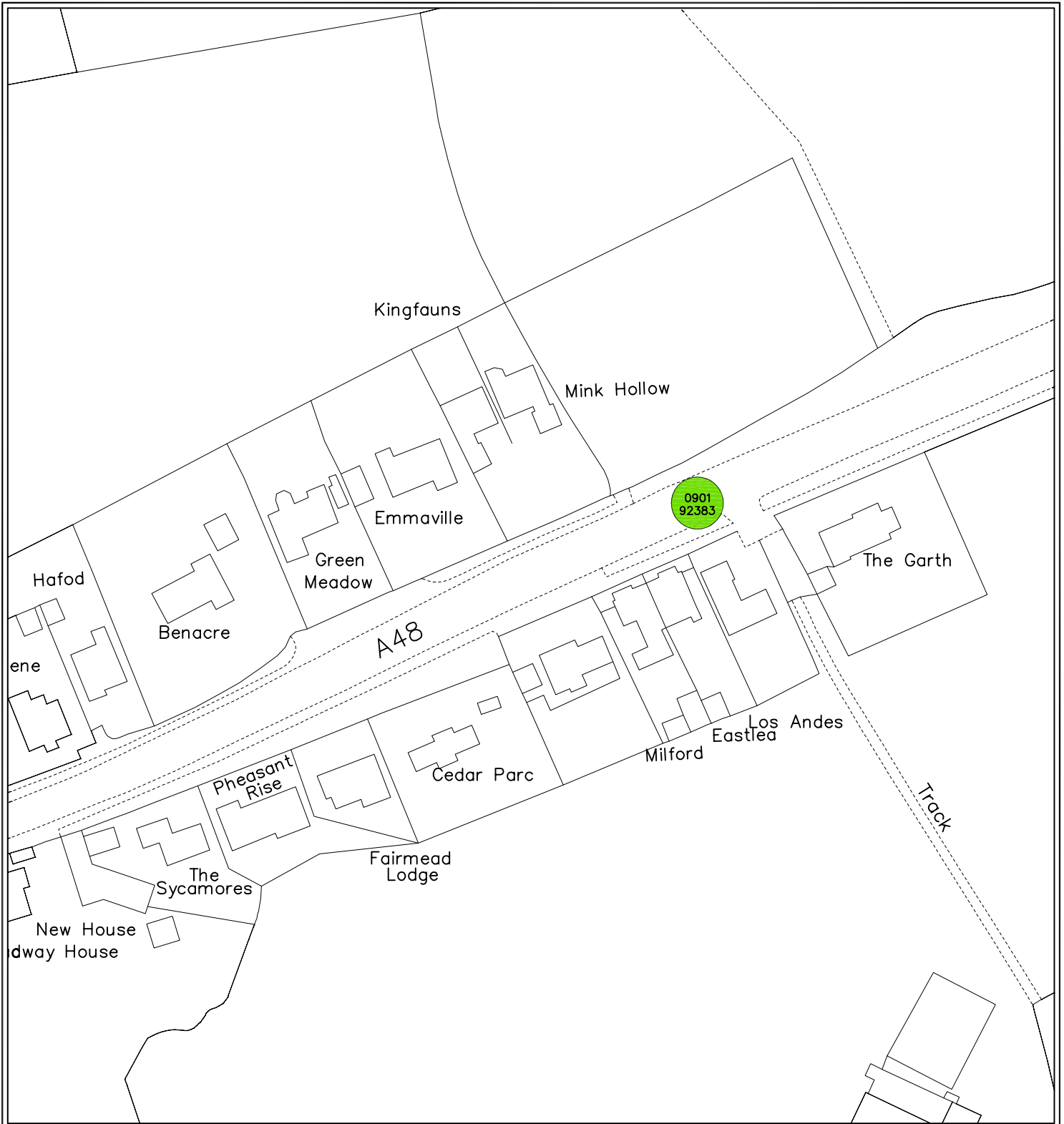


2020 AM Peak Base + Development



2020 PM Peak Base + Development

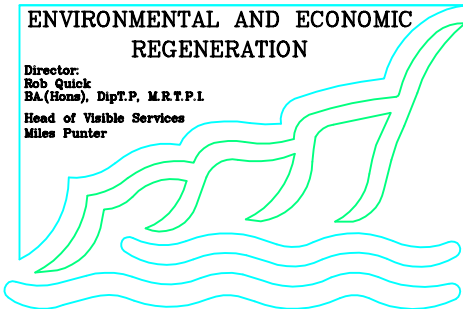
## **APPENDIX C**



**VALE of GLAMORGAN**

**ENVIRONMENTAL AND ECONOMIC  
REGENERATION**

Director:  
Rob Quick  
BA(Hons), Dip.T.P., M.R.T.P.I  
Head of Visible Services  
Miles Punter



**BRO MORGANNWG**



**ENGINEERING DESIGN  
AND PROCUREMENT**

Rev	By	Description of Amendment	Revisions	Chk by	Date

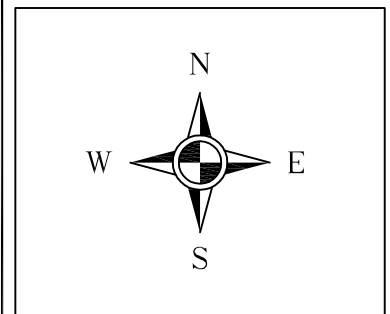
**Client**  
Vectos Limited

**Project**

▲ Fatal	▲ Fatal (pedestrian)
■ Serious	■ Serious (pedestrian)
● Slight	● Slight (pedestrian)

**Drawing Title**  
A48, St Nicholas  
Road Traffic Collisions  
(31/12/2008 to 30/12/2013)

Drawn	M. Simpson	Scale	1:1250	Drawing No.	T/14/138/MS
Date	16/02/15	File		Rev	
Checked		Window			
Date					



© Crown Copyright. All rights reserved  
The Vale of Glamorgan Council,  
Licence No. 100023424. 2009.

© Hawlfraint y Goron. Cedwir pob hawl  
Cyngor Bro Morgannwg  
rhif trwydded 100023424. 2009.

SEVERITY <b>SLIGHT</b>	District The Vale of Glamorgan Ref.No 090192383	<b>A48, St Nicholas</b>	Grid Reference 309380 / 174400 Police Officer Attend: Yes
---------------------------	--	-------------------------	--

Date 04/08/2009 Day Tuesday Time 12:10 Weather Fine without high winds Road Surface Dry Street Lighting Daylight	Road A48 Location A48 St Nicholas Description V2 Failed to See That V1 Had Stopped and Drove into Rear of V1. of Accident
--	---

SITE DETAILS		SPECIAL SITE CONDITIONS None
Speed Limit 30 MPH Carriageway Single carriageway Junction Detail Not at or within 20 metres of junction Junction Control 2nd Road Number Pedestrian Facilities None within 50 metres No physical crossing facility within 50 m	CARRIAGEWAY HAZARDS None	

VEHICLES INVOLVED 2	CASUALTIES INVOLVED 3
---------------------	-----------------------

Veh.No. 1 Vehicle type Car Make Model Manoeuvre Going ahead other Veh. direction from East to West Towing? No tow or articulation Skidded No skidding, jack-knifing or overturning Veh location at impact (restricted lane) On main carriageway not in restricted lane Junct. location of veh. at 1st impact Not at or within 20m of junction Veh left carriageway? Did not leave carriageway Hit object in c'way? None Hit object off c'way? None First point of impact Back Veh registration no. Other veh.hit (ref.no) 2 Hit and run Not hit and run Drivers age 35 yrs Sex Male Breath test Negative Driving Lic Left Hand Drive Unknown Foreign veh. Not foreign registered vehicle Journey purpose Other	Cas No 1 Cas Class Driver or Rider Veh ref No 1 Severity SLIGHT Age 35 yrs Sex Male Post code Car Passenger? Not a passenger PSV Passenger? Not a passenger Seat Belt Unknown Cycle Helmet Ped Movement Not applicable Ped Location Not applicable Ped Direction to Not applicable School Pupil Other Roadworker injured
---	--

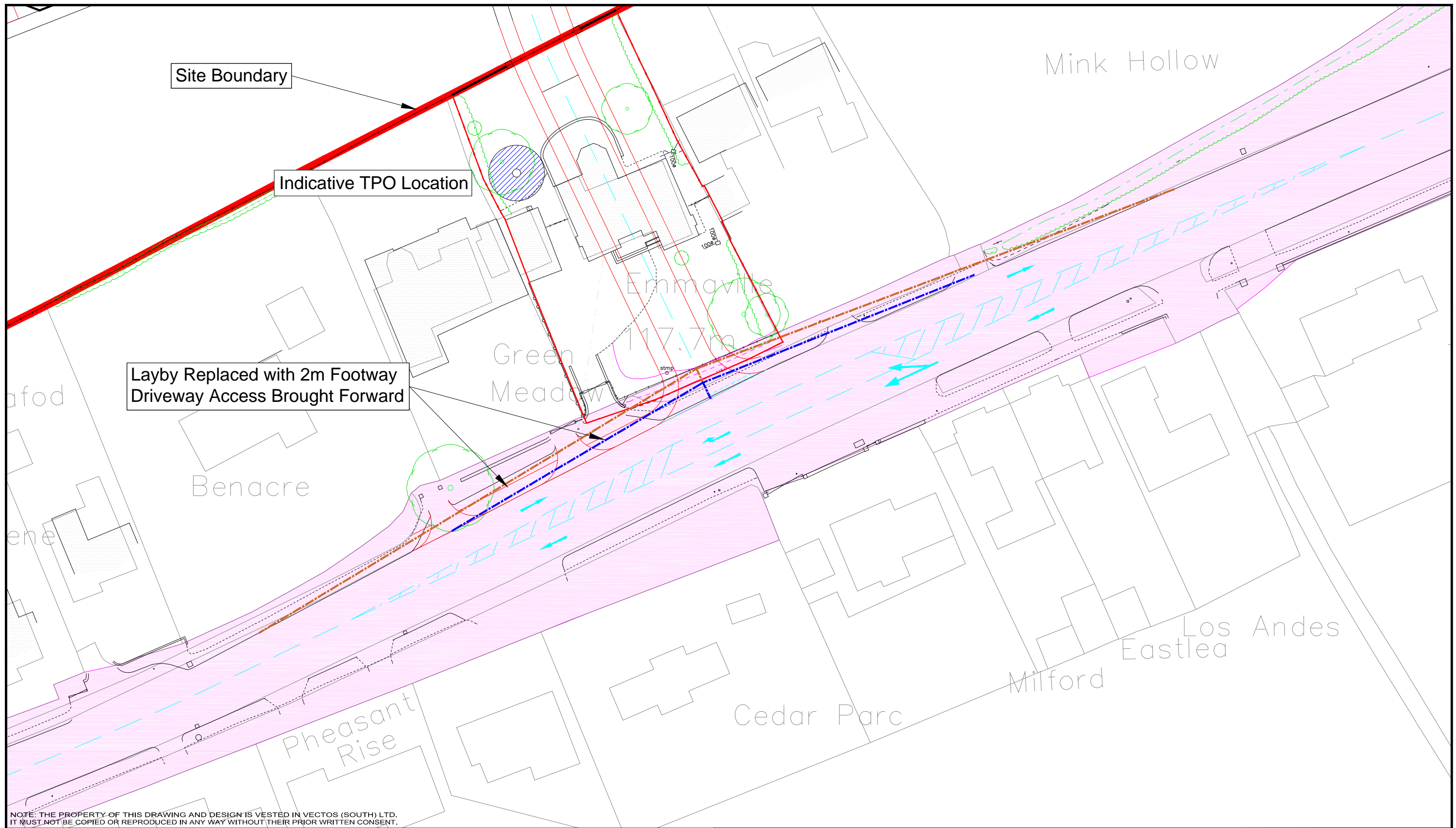
Veh.No. 2 Vehicle type Car Make Model Manoeuvre Going ahead other Veh. direction from East to West Towing? No tow or articulation Skidded No skidding, jack-knifing or overturning Veh location at impact (restricted lane) On main carriageway not in restricted lane Junct. location of veh. at 1st impact Not at or within 20m of junction Veh left carriageway? Did not leave carriageway Hit object in c'way? None Hit object off c'way? None First point of impact Front Veh registration no. Other veh.hit (ref.no) 1 Hit and run Not hit and run Drivers age 78 yrs Sex Female Breath test Negative Driving Lic Left Hand Drive Unknown Foreign veh. Not foreign registered vehicle Journey purpose Other	Cas No 2 Cas Class Driver or Rider Veh ref No 2 Severity SLIGHT Age 78 yrs Sex Female Post code Car Passenger? Not a passenger PSV Passenger? Not a passenger Seat Belt Unknown Cycle Helmet Ped Movement Not applicable Ped Location Not applicable Ped Direction to Not applicable School Pupil Other Roadworker injured
--	--

Veh.No. 3 Cas Class Passenger Veh ref No 1 Severity SLIGHT Age 51 yrs Sex Male Post code Car Passenger? Rear seat passenger PSV Passenger? Not a passenger Seat Belt Unknown Cycle Helmet Ped Movement Not applicable Ped Location Not applicable Ped Direction to Not applicable School Pupil Other Roadworker injured
---

[Other Details](#)

## **APPENDIX D**





NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN VECTOS (SOUTH) LTD. IT MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR PRIOR WRITTEN CONSENT.

REV.	DETAILS	DRAWN	CHECKED	DATE
A	Adopted Highway and TPO Added	AP	MT	02.07.14
B	Site internal layout added, access narrowed to 5.5m / 6m radius	AP	MT	30.01.15
C	Extend footway and remove layby	AP	MT	30.01.15
D	Additional Visibility Splay added	AP	MT	13.01.15

**Notes:**

- This is not a construction drawing and is intended for illustrative purposes only.
- White lining is indicative only.

**Legend:**

- 2.4m x 40m Visibility Splay
- 4.5m x 70m Visibility Splay
- Area of Adopted Highway

**St. Nicholas**

**Potential Ghost Island Right Turn Arrangement with Indicative TPO Location, Adopted Highway Boundary & Site Internal Layout**

DRAWN: AP    CHECKED: TCB    DATE: 28.01.14    SCALES: 1:500 at A3

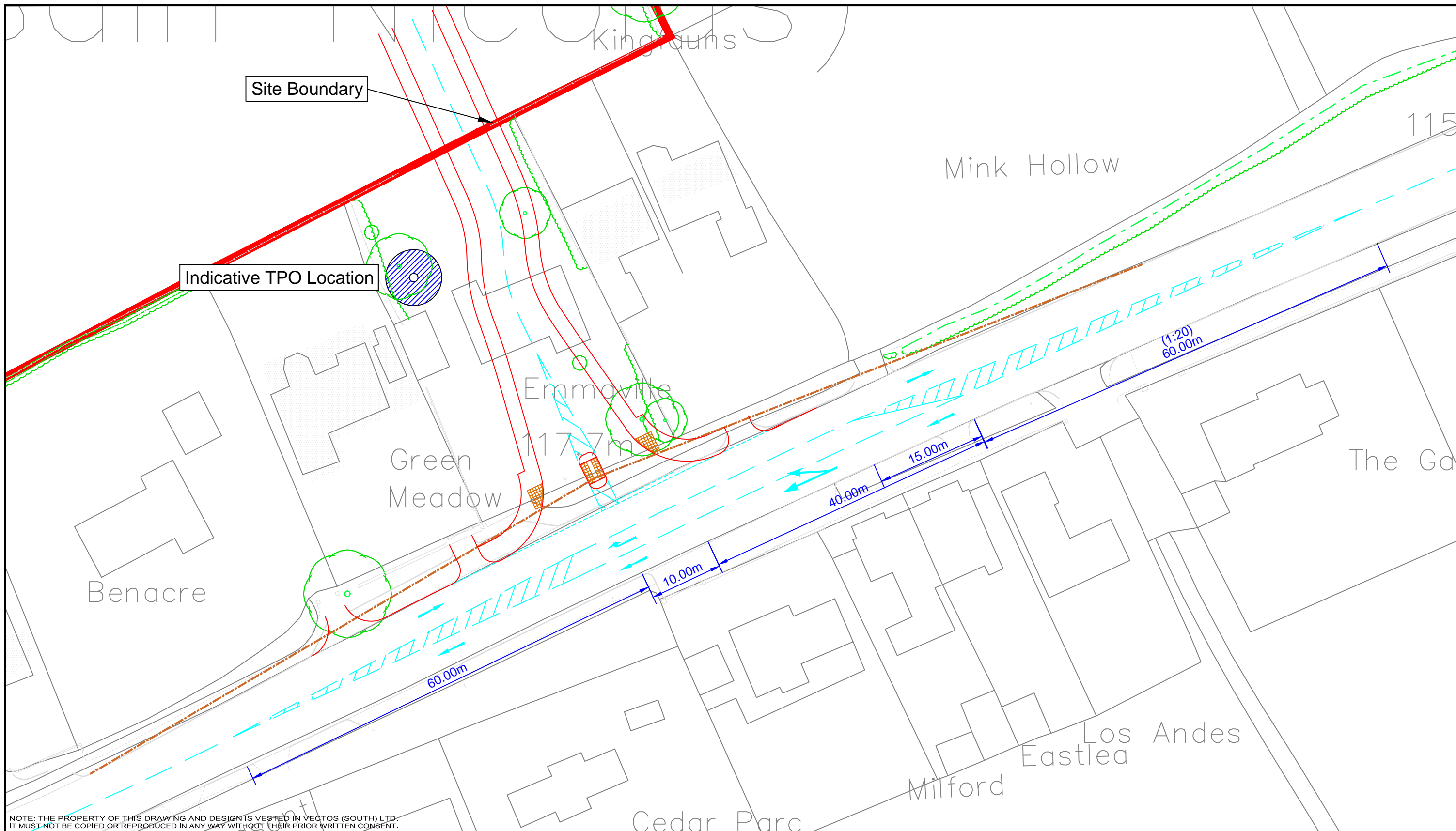
**Redrow Homes**



10th Floor, Belmont House, Churchill Way, Cardiff CF10 2HE  
t: 02920 720 860    e: enquiries@vectos.co.uk

DRAWING NUMBER: **W141341\_A03**    REVISION: **D**

## **APPENDIX E**



REV.	DETAILS	DRAWN	CHECKED	DATE
A	Adopted Highway and TPO Added	AP	MT	02.07.14
B	Site internal layout added, access narrowed to 5.5m / 6m radius	AP	MT	30.01.15
C	Extend footway and remove layby	AP	MT	30.01.15
D	Additional Visibility Splay added	AP	MT	13.01.15
E	TOPO Survey data added	AP	MT	16.02.15
F	Junction design amended	AP	MT	29.07.15
G	Junction design amended	AP	MT	03.08.15
H	Junction moved East 2m	AP	MT	03.08.15
I	Central island added, taper @ 1 in 6m over 30m	AP	MT	07.08.15
J	Connection with new masterplan	CE	MT	10.08.15

**Notes:**  
 1. This is not a construction drawing and is intended for illustrative purposes only.  
 2. White lining is indicative only.

**Legend:**  
 — 4.5m x 80m Visibility Splay

**St. Nicholas**

**Potential Ghost Island Right Turn Arrangement with Indicative TPO Location, Adopted Highway Boundary & Site Internal Layout**

DRAWN: AP    CHECKED: TCB    DATE: 28.01.14    SCALES: 1:500 at A3

**Redrow Homes**



10th Floor, Belmont House, Churchill Way, Cardiff CF10 2HE  
 t: 02920 720 860    e: enquiries@vectos.co.uk

DRAWING NUMBER: **W141341\_A03**    REVISION: **J**

## APPENDIX F

## Chris Evans

---

**From:** Howells, Lee M <LMHowells@valeofglamorgan.gov.uk>  
**Sent:** 31 July 2015 08:56  
**To:** Matt Thomas  
**Cc:** james.morgan@redrow.co.uk; Terry Egan; Rennie, Steven; Bevan, Tom F; Arthur, Steven; Cameron, Clare; Chris Evans; Alastair Pike; Andrew Muir (Andy.Muir@btconnect.com)  
**Subject:** RE: St Nicholas - Redrow Development  
**Attachments:** Redrow - St Nicholas - comments on access - 30th July 2015.pdf

Matt,

Further to your earlier email enclosing your revised layout, I would advise that myself and my traffic Management colleagues have reviewed the submitted junction arrangement and would advise that the proposals still require alterations both on the major and minor (appropriate radii / tapers, widths of carriageway ) to conform with TD42/95 based on the 85th percentile speeds along the A48 and not the posted limit of 30mph.

I have attached for assistance an annotated plan identifying areas to be reviewed.

In terms of your request for a relaxation relating to the removal from the design of the pedestrian / traffic at the mouth of junction on the minor arm will require Justification.

Kind Regards

Lee

Lee Howells  
Principal Engineer  
Planning and Transportation Services  
Vale of Glamorgan Council / Cyngor Bro Morgannwg  
tel / ffôn: 01446 704619  
e-mail / e-bost: [LMHowells@valeofglamorgan.gov.uk](mailto:LMHowells@valeofglamorgan.gov.uk)

Visit our Website at [www.valeofglamorgan.gov.uk](http://www.valeofglamorgan.gov.uk)  
Ewch i'n gwefan yn [www.bromorgannwg.gov.uk](http://www.bromorgannwg.gov.uk)

[Find us on Facebook / Cewch ddod o hyd i ni ar Facebook](#)  
[Follow us on Twitter / Dilynwch ni ar Twitter](#)

*Consider the environment. Please don't print this e-mail unless you really need to.  
Ystyriwch yr amgylchedd. Peidiwch ag argraffu'r neges hon oni bai fod gwir angen.*

---

**From:** Matt Thomas [mailto:Matt.Thomas@vectos.co.uk]  
**Sent:** 30 July 2015 10:13  
**To:** Howells, Lee M  
**Cc:** james.morgan@redrow.co.uk; Terry Egan; Rennie, Steven; Bevan, Tom F; Arthur, Steven; Cameron, Clare; Chris

Evans; Alastair Pike; Andrew Muir (Andy.Muir@btconnect.com)

**Subject:** RE: St Nicholas - Redrow Development

**Importance:** High

Good morning Lee. I've now had a chance to consider your views in some detail and I have set out my thoughts below.

Whilst I don't necessarily agree with some of the points that you raise, particularly as an independent RSA has confirmed that our proposals are low risk / safe, we are keen to progress this with the authority and expedite outstanding matters swiftly.

As such, I have attached a slightly modified scheme (W141341\_A03 F) which addresses most of your points with an explanation in the following;

- The corner radii have been increased to 10.5 m within the junction design.
- There is no ultimate destination for pedestrians to the east of the site and as such, given the extremely low footfall of pedestrian movements in combination with the low volume of site traffic, we do not consider that a separation island on the access road is necessary to protect crossing pedestrians. The likelihood of a pedestrian and car meeting is extremely low and the width of the site access road is minimal for pedestrians to navigate. There is sufficient visibility for cars exiting the site together with vehicles turning into the site, to observe any pedestrians that may be crossing the road and act accordingly. Providing a pedestrian refuge island within the access road would create an overly large access junction (to accommodate large vehicle swept paths) that would be out of character and detract from the nature of the village of St Nicholas. We have instead provided an informal crossing point with dropped kerbs and tactile paving, which is in keeping with the anticipated traffic/pedestrian volumes and village character.
- 4.5 m x 80 m visibility splays are achievable in both directions as illustrated.
- The ghost island has been updated in the attached plan to include 3.65 m wide running lanes and a 3 m wide right turn lane.
- It is noted that a pedestrian island is necessary and the location is to be agreed as part of the detailed design process.
- A 3.5 m wide cycleway along the site boundary has been included in the updated plan.
- All other footways within the site are 2m wide.

I trust that this information is now sufficient for your support of the proposals and we very much look forward to hearing from you. We have a meeting with the landowner later this afternoon and whilst I appreciate that this is short notice, any feedback that you may have before this would be gratefully received.

I look forward to hearing from you.

Many thanks.

**Matt Thomas**

Director

Vectos

029 2072 0864 (T) 07866 923 029 (M)

10th Floor Helmont House, Churchill Way, Cardiff, CF10 2HE

---

**From:** Howells, Lee M [<mailto:LMHowells@valeofglamorgan.gov.uk>]

**Sent:** 29 July 2015 12:22

**To:** Matt Thomas <[Matt.Thomas@vectos.co.uk](mailto:Matt.Thomas@vectos.co.uk)>

**Cc:** [james.morgan@redrow.co.uk](mailto:james.morgan@redrow.co.uk); Terry Egan <[terry.egan@redrow.co.uk](mailto:terry.egan@redrow.co.uk)>; Rennie, Steven <[srennie@valeofglamorgan.gov.uk](mailto:srennie@valeofglamorgan.gov.uk)>; Bevan, Tom F <[TBevan@valeofglamorgan.gov.uk](mailto:TBevan@valeofglamorgan.gov.uk)>; Arthur, Steven <[sarthur@valeofglamorgan.gov.uk](mailto:sarthur@valeofglamorgan.gov.uk)>; Cameron, Clare <[CCameron@valeofglamorgan.gov.uk](mailto:CCameron@valeofglamorgan.gov.uk)>

**Subject:** RE: St Nicholas - Redrow Development

Morning Matt,

I would advise that we would not be accepting MFS criteria for the design of the proposed Ghost Island Junction. Or any traffic calming along the A48.

The design must be based on DMRB due to the classification of the road and number / number of vehicular movements.

Required dimensions – Access onto A48

- In terms of junction radii Min of 10.5m + Taper incorporating Separation Island / (pedestrian / cycling crossing facility )
- Visibility Splays “X “ = 4.5, “y” based on the 85<sup>th</sup> percentile – 39mph – desirable 100m , absolute Min 80m Based on MFS2 – See attached graph )
- Lane width along A48 shall be 3.65 in both directions with a turning lane width of 3m Min
- The ghost island shall incorporate a pedestrian crossing facility on the A48 Type / location to be agreed
- Site frontage along the A48 shall incorporate a combined footway / cycle facility, min width 3.5m unless Otherwise agreed in writing.
- Footways shall have a minimum width of 2m

Kind Regards

Lee

Lee Howells  
Principal Engineer  
Planning and Transportation Services  
Vale of Glamorgan Council / Cyngor Bro Morgannwg  
tel / ffôn: 01446 704619  
e-mail / e-bost: [LMHowells@valeofglamorgan.gov.uk](mailto:LMHowells@valeofglamorgan.gov.uk)

Visit our Website at [www.valeofglamorgan.gov.uk](http://www.valeofglamorgan.gov.uk)  
Ewch i'n gwefan yn [www.bromorgannwg.gov.uk](http://www.bromorgannwg.gov.uk)

[Find us on Facebook / Cewch ddod o hyd i ni ar Facebook](#)  
[Follow us on Twitter / Dilynwch ni ar Twitter](#)

*Consider the environment. Please don't print this e-mail unless you really need to.  
Ystyriwch yr amgylchedd. Peidiwch ag argraffu'r neges hon oni bai fod gwir angen.*

---

**From:** Matt Thomas [<mailto:Matt.Thomas@vectos.co.uk>]  
**Sent:** 29 July 2015 09:21  
**To:** Howells, Lee M; Bevan, Tom F; Arthur, Steven  
**Cc:** [james.morgan@redrow.co.uk](mailto:james.morgan@redrow.co.uk); Terry Egan  
**Subject:** RE: St Nicholas - Redrow Development

Lee, Tom, Steven

Further to my email of 5<sup>th</sup> June 2015 below we have yet to receive any feedback on this important issue.

Please can we have some form of response this week?

thanks

**Matt Thomas**  
Director  
Vectos  
029 2072 0864 (T) 07866 923 029 (M)  
10th Floor Helmont House, Churchill Way, Cardiff, CF10 2HE

---

**From:** Matt Thomas  
**Sent:** 16 June 2015 13:41  
**To:** 'Howells, Lee M' <[LMHowells@valeofglamorgan.gov.uk](mailto:LMHowells@valeofglamorgan.gov.uk)>; 'Bevan, Tom F' <[TBevan@valeofglamorgan.gov.uk](mailto:TBevan@valeofglamorgan.gov.uk)>; Arthur, Steven ([sarthur@valeofglamorgan.gov.uk](mailto:sarthur@valeofglamorgan.gov.uk)) <[sarthur@valeofglamorgan.gov.uk](mailto:sarthur@valeofglamorgan.gov.uk)>  
**Cc:** [james.morgan@redrow.co.uk](mailto:james.morgan@redrow.co.uk); Terry Egan <[terry.egan@redrow.co.uk](mailto:terry.egan@redrow.co.uk)>  
**Subject:** RE: St Nicholas - Redrow Development

Good afternoon all

I was just wondering when we could expect to receive some feedback on this please?

Many thanks

Kind Regards

Matt

**Matt Thomas**  
Director



02920720864 (T) 07866923029 (M)  
[matt.thomas@vectos.co.uk](mailto:matt.thomas@vectos.co.uk)

Helmont House, Churchill Way, Cardiff CF102HE



**We are pleased to announce that Vectos is now providing microsimulation modelling expertise from a central Birmingham office.**

**Please contact 0121 213 6376 for further information or email [microsim@vectos.co.uk](mailto:microsim@vectos.co.uk)**

Registered address: Vectos (South) Limited, Hardwick House, Prospect Place, Swindon SN1 3LJ. Company no. 7591661

This e-mail transmission is strictly confidential and intended solely for the addressee. It may contain privileged and confidential information and if you are not the intended recipient, you must not copy, distribute or take any action in reliance upon it. If you have received this e-mail in error, please notify the sender or [enquiries@vectos.co.uk](mailto:enquiries@vectos.co.uk) and delete the e-mail transmission (including any attachments) immediately.

---

**From:** Matt Thomas  
**Sent:** 05 June 2015 10:25  
**To:** 'Howells, Lee M'; Bevan, Tom F; Arthur, Steven ([sarthur@valeofglamorgan.gov.uk](mailto:sarthur@valeofglamorgan.gov.uk))  
**Cc:** [james.morgan@redrow.co.uk](mailto:james.morgan@redrow.co.uk)  
**Subject:** FW: St Nicholas - Redrow Development

This time without the TA due to file size

Please see original message below

Kind Regards



Matt

Matt Thomas  
Director



02920720864 (T) 07866923029 (M)  
[matt.thomas@vectos.co.uk](mailto:matt.thomas@vectos.co.uk)

Helmont House, Churchill Way, Cardiff CF102HE



**We are pleased to announce that Vectos is now providing microsimulation modelling expertise from a central Birmingham office.**

**Please contact 0121 213 6376 for further information or email [microsim@vectos.co.uk](mailto:microsim@vectos.co.uk)**

Registered address: Vectos (South) Limited, Hardwick House, Prospect Place, Swindon SN1 3LJ. Company no. 7591661

This e-mail transmission is strictly confidential and intended solely for the addressee. It may contain privileged and confidential information and if you are not the intended recipient, you must not copy, distribute or take any action in reliance upon it. If you have received this e-mail in error, please notify the sender or [enquiries@vectos.co.uk](mailto:enquiries@vectos.co.uk) and delete the e-mail transmission (including any attachments) immediately.

---

**From:** Matt Thomas  
**Sent:** 05 June 2015 10:17  
**To:** 'Howells, Lee M'  
**Cc:** Rennie, Steven; Arthur, Steven; Bevan, Tom F; [james.morgan@redrow.co.uk](mailto:james.morgan@redrow.co.uk)  
**Subject:** St Nicholas - Redrow Development

Lee thanks for your email.

The table below shows the geometry for the proposed design compared to DMRB geometry.

	PROPOSED DESIGN	DMRB – TD42/95
Corner Radii	6m	(7.17) 6m min no HGV (10m with HGV)
Visibility Splay	4.5m x 70m / 2.4m x 40m	
<b>Ghost Island Dimensions</b>		
Turning Length	10m	(7.32) - 10m in all circumstances
Deceleration Length	25m	(table 7/5a) - 50-60kph – 25m
Through Lane Width	3.45m	(7.35) – 3.5m Desirable – 3m Min
Turning Lane Width	3.45m	(7.35) – 3.5m Desirable – 3m Min
Direct Taper Length	5m	(table 7/4) – 50-60kph – 5m
Central Turn Lane Taper	1:20 – 68m	(table 7/3) – 50-60-70kph – 1:20

### Visibility Splays

	DESIRABLE	ACHIEVABLE
38.9mph – (Our Max Achievable)	2.4m x 96.6m	2.4m x 96.6m
85 <sup>th</sup> %ile – 39mph	2.4m x 98m	N/A
31mph (50kph)	4.5m x 70m	4.5m x 70m
37mph (60kph)	2.4m x 90m	2.4m x 90m

I have also attached the Transport Assessment which was submitted as part of the application and I appreciate that you may not have seen this.

At section 3.10, it describes the proposed village gateway features as part of the application with the aim of reducing existing speeds which are higher than the prescribed speed limit. The 85<sup>th</sup> 'ile existing traffic speeds are 39mph and average speeds between 32-34.5 mph. Given the proximity of the existing 30mph limit next to the National Speed Limit, with no transition of speed limit in between the two, it is hardly surprising that the observed speeds at this location are above 30mph.

The corresponding village gateway proposal drawing is shown in Appendix F of this document. This is relevant to reducing vehicle speeds and hence visibility.

We say that Manual for Streets (MfS), the most contemporary modern guidance available, is the most appropriate basis to design a junction of this type. DMRB is an historic, archaic document dating to 1995 with the research underpinning this dating back some years before the document's publication. DMRB standards were designed to be applicable to motorways and Trunk Roads. The proposed development is accessed from neither of these types of road and hence to request DMRB standards for visibility is inappropriate and out of context.

Nevertheless we have made the comparison of SSD requirements.

At 39mph DMRB requirements are 98m. The design can achieve 96.6m although there is some tolerance as to where the junction can be repositioned to slightly increase the visibility  
At 30mph DMRB requirements are 70m. The design can achieve 96.6m.

At 39mph MfS requires 60.4m. The design can achieve 96.6m  
At 30mph MfS requires 40m. The design can achieve 96.6m

The purpose of introducing the village gateway feature is to reduce speeds hence the achievable visibility are entirely appropriate.

An independent Stage 1 Road Safety Audit also confirms that the proposals are fit for purpose and safe based on the prevailing road conditions including traffic flows, speeds and accident data.

I trust this clarifies the position.

Kind Regards

Matt

**Matt Thomas**  
Director



02920720864 (T) 07866923029 (M)  
[matt.thomas@vectos.co.uk](mailto:matt.thomas@vectos.co.uk)

Helmont House, Churchill Way, Cardiff CF102HE



**We are pleased to announce that Vectos is now providing microsimulation modelling expertise from a central Birmingham office.**

**Please contact 0121 213 6376 for further information or email [microsim@vectos.co.uk](mailto:microsim@vectos.co.uk)**

Registered address: Vectos (South) Limited, Hardwick House, Prospect Place, Swindon SN1 3LJ. Company no. 7591661

This e-mail transmission is strictly confidential and intended solely for the addressee. It may contain privileged and confidential information and if you are not the intended recipient, you must not copy, distribute or take any action in reliance upon it. If you have received this e-mail in error, please notify the sender or [enquiries@vectos.co.uk](mailto:enquiries@vectos.co.uk) and delete the e-mail transmission (including any attachments) immediately.

---

**From:** Howells, Lee M [<mailto:LMHowells@valeofglamorgan.gov.uk>]

**Sent:** 21 May 2015 09:57

**To:** Matt Thomas

**Cc:** Rennie, Steven; Arthur, Steven; Bevan, Tom F

**Subject:** RE: St Nicholas - Redrow Development

**Importance:** High

Matt,

Further to our earlier conversation regarding the proposed junction arrangement to serve the Above site. I would inform that we have recently approved a very similar access arrangement for A Redrow development at Wenvoe which again is directly accessed onto a major strategic route Into the vale and any junction must be designed in accordance with DMRB – TD42/95 ( Major / Minor Junctions )

I trust the above / attached is off assistance

Kind Regards

Lee

Lee Howells  
Principal Engineer  
Planning and Transportation Services  
Vale of Glamorgan Council / Cyngor Bro Morgannwg  
tel / ffôn: 01446 704619  
e-mail / e-bost: [LMHowells@valeofglamorgan.gov.uk](mailto:LMHowells@valeofglamorgan.gov.uk)

Visit our Website at [www.valeofglamorgan.gov.uk](http://www.valeofglamorgan.gov.uk)  
Ewch i'n gwefan yn [www.bromorgannwg.gov.uk](http://www.bromorgannwg.gov.uk)

[Find us on Facebook / Cewch ddod o hyd i ni ar Facebook](#)  
[Follow us on Twitter / Dilynwch ni ar Twitter](#)

*Consider the environment. Please don't print this e-mail unless you really need to.  
Ystyriwch yr amgylchedd. Peidiwch ag argraffu'r neges hon oni bai fod gwir angen.*

---

**From:** Matt Thomas [<mailto:Matt.Thomas@vectos.co.uk>]

**Sent:** 21 May 2015 09:42

**To:** Howells, Lee M

**Subject:**

Lee as discussed

Kind Regards

Matt

**Matt Thomas**  
Director



02920720864 (T) 07866923029 (M)  
[matt.thomas@vectos.co.uk](mailto:matt.thomas@vectos.co.uk)

Helmont House, Churchill Way, Cardiff CF102HE



***We are pleased to announce that Vectos is now providing microsimulation modelling expertise from a central Birmingham office.***

***Please contact 0121 213 6376 for further information or email [microsim@vectos.co.uk](mailto:microsim@vectos.co.uk)***

Registered address: Vectos (South) Limited, Hardwick House, Prospect Place, Swindon SN1 3LJ. Company no. 7591661

This e-mail transmission is strictly confidential and intended solely for the addressee. It may contain privileged and confidential information and if you are not the intended recipient, you must not copy, distribute or take any action in reliance upon it. If you have received this e-mail in error, please notify the sender or [enquiries@vectos.co.uk](mailto:enquiries@vectos.co.uk) and delete the e-mail transmission (including any attachments) immediately.

## Chris Evans

---

**From:** Matt Thomas  
**Sent:** 03 August 2015 14:40  
**To:** Howells, Lee M  
**Cc:** james.morgan@redrow.co.uk; Terry Egan; Rennie, Steven; Bevan, Tom F; Arthur, Steven; Cameron, Clare; Chris Evans; Alastair Pike; Andrew Muir (Andy.Muir@btconnect.com)  
**Subject:** RE: St Nicholas - Redrow Development  
**Attachments:** W141341\_A03 - REV G & AT\_C Series - Proposed Ghost Island Access.zip

Lee good afternoon and thanks for the chat this morning.

I understand that we are in a slightly abnormal and hybrid situation with this application with respect to the status of the A48 and other applications in this area, hence the request for what I would consider to be, detailed design level of detail.

However we have considered your comments and prepared the revised access arrangement which accommodates the swept path from a large refuse vehicle as requested.

We have not provided a pedestrian refuge on the access road. Instead we are proposing drop kerbs and tactiles set back from the junction itself together with improvements to the pedestrian / cycle infrastructure on either side of the junction. If we provide the pedestrian refuge, then the junction starts to become out of proportion and not in keeping with this area. Moreover, pedestrian desire will be to the west towards the village itself where there are amenities including a primary school and bus stops.

I trust this meets with your approval and I look forward to hearing from you.

**Matt Thomas**  
**Director**  
**029 2072 0864 (T) 07866 923 029 (M)**  
**10th Floor Helmont House, Churchill Way, Cardiff, CF10 2HE**

---

**From:** Howells, Lee M [mailto:LMHowells@valeofglamorgan.gov.uk]  
**Sent:** 31 July 2015 08:56  
**To:** Matt Thomas <Matt.Thomas@vectos.co.uk>  
**Cc:** james.morgan@redrow.co.uk; Terry Egan <terry.egan@redrow.co.uk>; Rennie, Steven <srennie@valeofglamorgan.gov.uk>; Bevan, Tom F <TBevan@valeofglamorgan.gov.uk>; Arthur, Steven <sarthur@valeofglamorgan.gov.uk>; Cameron, Clare <CCameron@valeofglamorgan.gov.uk>; Chris Evans <Chris.Evans@vectos.co.uk>; Alastair Pike <Alastair.Pike@vectos.co.uk>; Andrew Muir (Andy.Muir@btconnect.com) <Andy.Muir@btconnect.com>  
**Subject:** RE: St Nicholas - Redrow Development

Matt,

Further to your earlier email enclosing your revised layout, I would advise that myself and my traffic Management colleagues have reviewed the submitted junction arrangement and would advise that the proposals still require alterations both on the major and minor (appropriate radii / tapers, widths of carriageway ) to conform with TD42/95 based on the 85th percentile speeds along the A48 and not the posted limit of 30mph.

I have attached for assistance an annotated plan identifying areas to be reviewed.

In terms of your request for a relaxation relating to the removal from the design of the pedestrian / traffic at the mouth of junction on the minor arm will require Justification.

Kind Regards

Lee

Lee Howells  
Principal Engineer  
Planning and Transportation Services  
Vale of Glamorgan Council / Cyngor Bro Morgannwg  
tel / ffôn: 01446 704619  
e-mail / e-bost: [LMHowells@valeofglamorgan.gov.uk](mailto:LMHowells@valeofglamorgan.gov.uk)

Visit our Website at [www.valeofglamorgan.gov.uk](http://www.valeofglamorgan.gov.uk)  
Ewch i'n gwefan yn [www.bromorgannwg.gov.uk](http://www.bromorgannwg.gov.uk)

[Find us on Facebook / Cewch ddod o hyd i ni ar Facebook](#)  
[Follow us on Twitter / Dilynwch ni ar Twitter](#)

*Consider the environment. Please don't print this e-mail unless you really need to.  
Ystyriwch yr amgylchedd. Peidiwch ag argraffu'r neges hon oni bai fod gwir angen.*

---

**From:** Matt Thomas [<mailto:Matt.Thomas@vectos.co.uk>]  
**Sent:** 30 July 2015 10:13  
**To:** Howells, Lee M  
**Cc:** [james.morgan@redrow.co.uk](mailto:james.morgan@redrow.co.uk); Terry Egan; Rennie, Steven; Bevan, Tom F; Arthur, Steven; Cameron, Clare; Chris Evans; Alastair Pike; Andrew Muir ([Andy.Muir@btconnect.com](mailto:Andy.Muir@btconnect.com))  
**Subject:** RE: St Nicholas - Redrow Development  
**Importance:** High

Good morning Lee. I've now had a chance to consider your views in some detail and I have set out my thoughts below.

Whilst I don't necessarily agree with some of the points that you raise, particularly as an independent RSA has confirmed that our proposals are low risk / safe, we are keen to progress this with the authority and expedite outstanding matters swiftly.

As such, I have attached a slightly modified scheme (W141341\_A03 F) which addresses most of your points with an explanation in the following;

- The corner radii have been increased to 10.5 m within the junction design.
- There is no ultimate destination for pedestrians to the east of the site and as such, given the extremely low footfall of pedestrian movements in combination with the low volume of site traffic, we do not consider that a separation island on the access road is necessary to protect crossing pedestrians. The likelihood of a pedestrian and car meeting is extremely low and the width of the site access road is minimal for pedestrians to navigate. There is sufficient visibility for cars exiting the site together with vehicles turning into the site, to observe any pedestrians that may be crossing the road and act accordingly. Providing a pedestrian refuge island within the access road would create an overly large access junction (to accommodate large vehicle swept paths) that would be out of character and detract from the nature of the village of St Nicholas. We

have instead provided an informal crossing point with dropped kerbs and tactile paving, which is in keeping with the anticipated traffic/pedestrian volumes and village character.

- 4.5 m x 80 m visibility splays are achievable in both directions as illustrated.
- The ghost island has been updated in the attached plan to include 3.65 m wide running lanes and a 3 m wide right turn lane.
- It is noted that a pedestrian island is necessary and the location is to be agreed as part of the detailed design process.
- A 3.5 m wide cycleway along the site boundary has been included in the updated plan.
- All other footways within the site are 2m wide.

I trust that this information is now sufficient for your support of the proposals and we very much look forward to hearing from you. We have a meeting with the landowner later this afternoon and whilst I appreciate that this is short notice, any feedback that you may have before this would be gratefully received.

I look forward to hearing from you.

Many thanks.

**Matt Thomas**  
Director  
Vectos  
029 2072 0864 (T) 07866 923 029 (M)  
10th Floor Helmont House, Churchill Way, Cardiff, CF10 2HE

---

**From:** Howells, Lee M [<mailto:LMHowells@valeofglamorgan.gov.uk>]

**Sent:** 29 July 2015 12:22

**To:** Matt Thomas <[Matt.Thomas@vectos.co.uk](mailto:Matt.Thomas@vectos.co.uk)>

**Cc:** [james.morgan@redrow.co.uk](mailto:james.morgan@redrow.co.uk); Terry Egan <[terry.egan@redrow.co.uk](mailto:terry.egan@redrow.co.uk)>; Rennie, Steven <[srennie@valeofglamorgan.gov.uk](mailto:srennie@valeofglamorgan.gov.uk)>; Bevan, Tom F <[TBevan@valeofglamorgan.gov.uk](mailto:TBevan@valeofglamorgan.gov.uk)>; Arthur, Steven <[sarthur@valeofglamorgan.gov.uk](mailto:sarthur@valeofglamorgan.gov.uk)>; Cameron, Clare <[CCameron@valeofglamorgan.gov.uk](mailto:CCameron@valeofglamorgan.gov.uk)>

**Subject:** RE: St Nicholas - Redrow Development

Morning Matt,

I would advise that we would not be accepting MFS criteria for the design of the proposed Ghost Island Junction. Or any traffic calming along the A48.

The design must be based on DMRB due to the classification of the road and number / number of vehicular movements.

Required dimensions – Access onto A48

- In terms of junction radii Min of 10.5m + Taper incorporating Separation Island / (pedestrian / cycling crossing facility )
- Visibility Splays “X “ = 4.5, “y” based on the 85<sup>th</sup> percentile – 39mph – desirable 100m , absolute Min 80m Based on MFS2 – See attached graph )
- Lane width along A48 shall be 3.65 in both directions with a turning lane width of 3m Min
- The ghost island shall incorporate a pedestrian crossing facility on the A48 Type / location to be agreed
- Site frontage along the A48 shall incorporate a combined footway / cycle facility, min width 3.5m unless Otherwise agreed in writing.
- Footways shall have a minimum width of 2m

Kind Regards

Lee

Lee Howells  
Principal Engineer  
Planning and Transportation Services  
Vale of Glamorgan Council / Cyngor Bro Morgannwg  
tel / ffôn: 01446 704619  
e-mail / e-bost: [LMHowells@valeofglamorgan.gov.uk](mailto:LMHowells@valeofglamorgan.gov.uk)

Visit our Website at [www.valeofglamorgan.gov.uk](http://www.valeofglamorgan.gov.uk)  
Ewch i'n gwefan yn [www.bromorgannwg.gov.uk](http://www.bromorgannwg.gov.uk)

[Find us on Facebook / Cewch ddod o hyd i ni ar Facebook](#)  
[Follow us on Twitter / Dilynwch ni ar Twitter](#)

*Consider the environment. Please don't print this e-mail unless you really need to.  
Ystyriwch yr amgylchedd. Peidiwch ag argraffu'r neges hon oni bai fod gwir angen.*

---

**From:** Matt Thomas [<mailto:Matt.Thomas@vectos.co.uk>]  
**Sent:** 29 July 2015 09:21  
**To:** Howells, Lee M; Bevan, Tom F; Arthur, Steven  
**Cc:** [james.morgan@redrow.co.uk](mailto:james.morgan@redrow.co.uk); Terry Egan  
**Subject:** RE: St Nicholas - Redrow Development

Lee, Tom, Steven

Further to my email of 5<sup>th</sup> June 2015 below we have yet to receive any feedback on this important issue.

Please can we have some form of response this week?

thanks

**Matt Thomas**  
Director  
Vectos  
029 2072 0864 (T) 07866 923 029 (M)  
10th Floor Helmont House, Churchill Way, Cardiff, CF10 2HE

---

**From:** Matt Thomas  
**Sent:** 16 June 2015 13:41  
**To:** 'Howells, Lee M' <[LMHowells@valeofglamorgan.gov.uk](mailto:LMHowells@valeofglamorgan.gov.uk)>; 'Bevan, Tom F' <[TBevan@valeofglamorgan.gov.uk](mailto:TBevan@valeofglamorgan.gov.uk)>; Arthur, Steven (<[sarthur@valeofglamorgan.gov.uk](mailto:sarthur@valeofglamorgan.gov.uk)> <[sarthur@valeofglamorgan.gov.uk](mailto:sarthur@valeofglamorgan.gov.uk)>)  
**Cc:** [james.morgan@redrow.co.uk](mailto:james.morgan@redrow.co.uk); Terry Egan <[terry.egan@redrow.co.uk](mailto:terry.egan@redrow.co.uk)>  
**Subject:** RE: St Nicholas - Redrow Development

Good afternoon all

I was just wondering when we could expect to receive some feedback on this please?

Many thanks

Kind Regards



Matt

**Matt Thomas**  
Director



02920720864 (T) 07866923029 (M)  
[matt.thomas@vectos.co.uk](mailto:matt.thomas@vectos.co.uk)

Helmont House, Churchill Way, Cardiff CF102HE



***We are pleased to announce that Vectos is now providing microsimulation modelling expertise from a central Birmingham office.***

***Please contact 0121 213 6376 for further information or email [microsim@vectos.co.uk](mailto:microsim@vectos.co.uk)***

Registered address: Vectos (South) Limited, Hardwick House, Prospect Place, Swindon SN1 3LJ. Company no. 7591661

This e-mail transmission is strictly confidential and intended solely for the addressee. It may contain privileged and confidential information and if you are not the intended recipient, you must not copy, distribute or take any action in reliance upon it. If you have received this e-mail in error, please notify the sender or [enquiries@vectos.co.uk](mailto:enquiries@vectos.co.uk) and delete the e-mail transmission (including any attachments) immediately.

---

**From:** Matt Thomas

**Sent:** 05 June 2015 10:25

**To:** 'Howells, Lee M'; Bevan, Tom F; Arthur, Steven ([sarthur@valeofglamorgan.gov.uk](mailto:sarthur@valeofglamorgan.gov.uk))

**Cc:** [james.morgan@redrow.co.uk](mailto:james.morgan@redrow.co.uk)

**Subject:** FW: St Nicholas - Redrow Development

This time without the TA due to file size

Please see original message below

Kind Regards

Matt

**Matt Thomas**  
Director



02920720864 (T) 07866923029 (M)  
[matt.thomas@vectos.co.uk](mailto:matt.thomas@vectos.co.uk)

Helmont House, Churchill Way, Cardiff CF102HE



***We are pleased to announce that Vectos is now providing microsimulation modelling expertise from a central Birmingham office.***

***Please contact 0121 213 6376 for further information or email [microsim@vectos.co.uk](mailto:microsim@vectos.co.uk)***

Registered address: Vectos (South) Limited, Hardwick House, Prospect Place, Swindon SN1 3LJ. Company no. 7591661

This e-mail transmission is strictly confidential and intended solely for the addressee. It may contain privileged and confidential information and if you are not the intended recipient, you must not copy, distribute or take any action in reliance upon it. If you have received this e-mail in error, please notify the sender or [enquiries@vectos.co.uk](mailto:enquiries@vectos.co.uk) and delete the e-mail transmission (including any attachments) immediately.

---

**From:** Matt Thomas

**Sent:** 05 June 2015 10:17

To: 'Howells, Lee M'

Cc: Rennie, Steven; Arthur, Steven; Bevan, Tom F; [james.morgan@redrow.co.uk](mailto:james.morgan@redrow.co.uk)

Subject: St Nicholas - Redrow Development

Lee thanks for your email.

The table below shows the geometry for the proposed design compared to DMRB geometry.

	PROPOSED DESIGN	DMRB – TD42/95
Corner Radii	6m	(7.17) 6m min no HGV (10m with HGV)
Visibility Splay	4.5m x 70m / 2.4m x 40m	
<b>Ghost Island Dimensions</b>		
Turning Length	10m	(7.32) - 10m in all circumstances
Deceleration Length	25m	(table 7/5a) - 50-60kph – 25m
Through Lane Width	3.45m	(7.35) – 3.5m Desirable – 3m Min
Turning Lane Width	3.45m	(7.35) – 3.5m Desirable – 3m Min
Direct Taper Length	5m	(table 7/4) – 50-60kph – 5m
Central Turn Lane Taper	1:20 – 68m	(table 7/3) – 50-60-70kph – 1:20

### Visibility Splays

	DESIRABLE	ACHIEVABLE
<b>38.9mph – (Our Max Achievable)</b>	2.4m x 96.6m	2.4m x 96.6m
<b>85<sup>th</sup> %ile – 39mph</b>	2.4m x 98m	N/A
<b>31mph (50kph)</b>	4.5m x 70m	4.5m x 70m
<b>37mph (60kph)</b>	2.4m x 90m	2.4m x 90m

I have also attached the Transport Assessment which was submitted as part of the application and I appreciate that you may not have seen this.

At section 3.10, it describes the proposed village gateway features as part of the application with the aim of reducing existing speeds which are higher than the prescribed speed limit. The 85<sup>th</sup> 'ile existing traffic speeds are 39mph and average speeds between 32-34.5 mph. Given the proximity of the existing 30mph limit next to the National Speed Limit, with no transition of speed limit in between the two, it is hardly surprising that the observed speeds at this location are above 30mph.

The corresponding village gateway proposal drawing is shown in Appendix F of this document. This is relevant to reducing vehicle speeds and hence visibility.

We say that Manual for Streets (MfS), the most contemporary modern guidance available, is the most appropriate basis to design a junction of this type. DMRB is an historic, archaic document dating to 1995 with the research underpinning this dating back some years before the document's publication. DMRB standards were designed to be applicable to motorways and Trunk Roads. The proposed development is accessed from neither of these types of road and hence to request DMRB standards for visibility is inappropriate and out of context.

Nevertheless we have made the comparison of SSD requirements.

At 39mph DMRB requirements are 98m. The design can achieve 96.6m although there is some tolerance as to where the junction can be repositioned to slightly increase the visibility

At 30mph DMRB requirements are 70m. The design can achieve 96.6m.

At 39mph MfS requires 60.4m. The design can achieve 96.6m

At 30mph MfS requires 40m. The design can achieve 96.6m

The purpose of introducing the village gateway feature is to reduce speeds hence the achievable visibility are entirely appropriate.

An independent Stage 1 Road Safety Audit also confirms that the proposals are fit for purpose and safe based on the prevailing road conditions including traffic flows, speeds and accident data.

I trust this clarifies the position.

Kind Regards

Matt

**Matt Thomas**  
Director



02920720864 (T) 07866923029 (M)

[matt.thomas@vectos.co.uk](mailto:matt.thomas@vectos.co.uk)

Helmont House, Churchill Way, Cardiff CF102HE



***We are pleased to announce that Vectos is now providing microsimulation modelling expertise from a central Birmingham office.***

***Please contact 0121 213 6376 for further information or email [microsim@vectos.co.uk](mailto:microsim@vectos.co.uk)***

Registered address: Vectos (South) Limited, Hardwick House, Prospect Place, Swindon SN1 3LJ. Company no. 7591661

This e-mail transmission is strictly confidential and intended solely for the addressee. It may contain privileged and confidential information and if you are not the intended recipient, you must not copy, distribute or take any action in reliance upon it. If you have received this e-mail in error, please notify the sender or [enquiries@vectos.co.uk](mailto:enquiries@vectos.co.uk) and delete the e-mail transmission (including any attachments) immediately.

---

**From:** Howells, Lee M [<mailto:LMHowells@valeofglamorgan.gov.uk>]

**Sent:** 21 May 2015 09:57

**To:** Matt Thomas

**Cc:** Rennie, Steven; Arthur, Steven; Bevan, Tom F

**Subject:** RE: St Nicholas - Redrow Development

**Importance:** High

Matt,

Further to our earlier conversation regarding the proposed junction arrangement to serve the Above site. I would inform that we have recently approved a very similar access arrangement for A Redrow development at Wenvoe which again is directly accessed onto a major strategic route Into the vale and any junction must be designed in accordance with DMRB – TD42/95 ( Major / Minor Junctions )

I trust the above / attached is off assistance

Kind Regards

Lee

Lee Howells  
Principal Engineer  
Planning and Transportation Services  
Vale of Glamorgan Council / Cyngor Bro Morgannwg  
tel / ffôn: 01446 704619  
e-mail / e-bost: [LMHowells@valeofglamorgan.gov.uk](mailto:LMHowells@valeofglamorgan.gov.uk)

Visit our Website at [www.valeofglamorgan.gov.uk](http://www.valeofglamorgan.gov.uk)  
Ewch i'n gwefan yn [www.bromorgannwg.gov.uk](http://www.bromorgannwg.gov.uk)

[Find us on Facebook / Cewch ddod o hyd i ni ar Facebook](#)  
[Follow us on Twitter / Dilynwch ni ar Twitter](#)

*Consider the environment. Please don't print this e-mail unless you really need to.  
Ystyriwch yr amgylchedd. Peidiwch ag argraffu'r neges hon oni bai fod gwir angen.*

---

**From:** Matt Thomas [<mailto:Matt.Thomas@vectos.co.uk>]  
**Sent:** 21 May 2015 09:42  
**To:** Howells, Lee M  
**Subject:**

Lee as discussed

Kind Regards

Matt

**Matt Thomas**  
Director



02920720864 (T) 07866923029 (M)  
[matt.thomas@vectos.co.uk](mailto:matt.thomas@vectos.co.uk)

Helmont House, Churchill Way, Cardiff CF102HE



***We are pleased to announce that Vectos is now providing microsimulation modelling expertise from a central Birmingham office.***

***Please contact 0121 213 6376 for further information or email [microsim@vectos.co.uk](mailto:microsim@vectos.co.uk)***

Registered address: Vectos (South) Limited, Hardwick House, Prospect Place, Swindon SN1 3LJ. Company no. 7591661

This e-mail transmission is strictly confidential and intended solely for the addressee. It may contain privileged and confidential information and if you are not the intended recipient, you must not copy, distribute or take any action in reliance upon it. If you have received this e-mail in error, please notify the sender or [enquiries@vectos.co.uk](mailto:enquiries@vectos.co.uk) and delete the e-mail transmission (including any attachments) immediately.

## Chris Evans

---

**From:** Matt Thomas  
**Sent:** 07 September 2015 18:01  
**To:** srennie@valeofglamorgan.gov.uk; developmentcontrol@valeofglamorgan.gov.uk; mgoldsworthy@valeofglamorgan.gov.uk  
**Cc:** Howells, Lee M; james.morgan@redrow.co.uk; Chris Evans; Jane Carpenter (jane.carpenter@redrow.co.uk); Andrew Muir (Andy.Muir@btconnect.com); Wayne Rees; Andrew Muir (Andy.Muir@btconnect.com)  
**Subject:** St Nicholas - 2015/00249/FUL - Highways and Transport commentary re access proposals  
**Attachments:** W141341\_A03 - REV I - Proposed Ghost Island Access.pdf  
**Importance:** High

Steven, good evening and thank you for your email of 27th August 2015 detailing the feedback from your Highway Officer.

We are naturally disappointed at the negativity contained within this response particularly given the lengthy consultation and engagement with this Officer. However it is evident that such a negative response received carries no technical weight for the following reasons.

Firstly your Highway Officer notes that ‘*in principal the provision of a ghost island arrangement is suitable subject to agreeing the detailed design*’. The inference here is that the proposed means of access, as depicted on drawing W141341\_A03-REV I (attached) developed in consultation with Mr Lee Howells is technically in principle, acceptable in this location. This is of no surprise given the lengths at which we have gone to in order to conform to the highway design standards specified by you Officer as per TD 42/95. You will note that despite our adherence to the design standards contained within TD 42/95 that all the correspondence on file demonstrates that we do not believe that these are the correct design standards to apply in this context, rather we believe that Manual for Streets (MfS) 2007 and MfS2 2010 should be applicable in this context.

The measured 85th percentile speeds on this section of road are below 40mph. In addition, this Road is not a Trunk Road (it was de- Trunked in the region of 20 years ago) despite the thrust of the Council’s insistence on the standards contained within TD42/95 which are applicable to Trunk Roads. Whilst there may be a remote possibility (and we have seen no policy wording to support this) of the A48 being reclassified as a Trunk Road in the future, the Council’s insistence of applying standards (which are 20 years old) within TD 42/95 in this context is wrong. The character of the A48 in this location will change following residential development as per the Council’s LDP allocation. As such, more enlightened and modern guidance as contained within MfS and MfS2 ought to apply here particularly where observed traffic speeds are below 40mph and where the proposals put forward by Redrow are to relocate the village gateway (and 30 mph speed limit) further east on the A48.

Your Highways Officer’s reasoning for preferring a single access ( I stress in the response – ‘*we would require*’) to serve both developments rather than individual access points, is given in terms of safety and capacity. Taking these points in turn;

### Highway Safety

The siting of proposed junction to access the Redrow land is between neighbouring properties, which is not untypical when designing an access into a site. The spacing of the residential driveways either side of the proposed access, in combination with the set-back distance of the neighbouring property walls means that drivers have sufficient visibility and hence will have sufficient time to safely react to each other’s

manoeuvres if they happen to occur at the same time as traffic from the proposed development. The traffic generated by the neighbouring properties will be so low (almost incidental) that the probability and risk of vehicles arriving and/or departing at the same time as the traffic from the proposed development is extremely low. No such risks were identified in the Road Safety Audit prepared independently to the design. The proposed site access to the adjacent land to the east of Mink Hollow is also situated close to and opposite a similar number of existing residential properties that would likely give rise to a comparable quantum of conflicting turning movements. Therefore the case presented that there is a better location available to access both development sites carries no weight and is merely conjecture. It is our view that either or both access junctions could be consented without any detrimental effect to highway safety.

There is no reason to subjectively prefer one junction location over the other and there is no reason why both junctions could not be granted and operate safely together. The email contains a reference to para 3.3 of TD 42/95 which states that ‘a saving in accidents may be achieved by reducing the number of lightly trafficked minor road connections onto major roads’. Firstly, this acknowledges that your Highway Officer confirms that the proposed access will be lightly trafficked and this contradicts the highway capacity part of the objection (addressed below) and secondly has no technical substantiation and therefore it is merely supposition. Again this stance adopted by the Highway Officer is based on a document (TD 42/95) which is 20 years old with the research underpinning this document dating back beyond this. There is no modern guidance or evidence which suggests that two points of access located within 70-80m could give rise to highway safety issues. Indeed the contemporary (2010) transport planning guidance as per MfS2 para 9.2.1 states that there is little evidence that junction spacing criteria based on SSD are justified on safety or other grounds. Conversely, frontage activity on a road is likely to reduce vehicle speeds thereby improving highway safety.

Indeed, more than one access could reduce vehicular speeds, thereby improving highway safety. The Council’s objection also fails to note the village gateway proposals which are designed to extend the 30mph speed limit eastwards and hence reduce overall traffic speeds on this part of the network.

Furthermore, the Planning Officer notes that ‘*individually the access points as proposed may be acceptable, although the concern is related to two access points proposed a short distance apart as is currently before us*’. The inference of this statement suggests that our access, as proposed, is acceptable and that the only reason it is now not acceptable is that there is a competing site from which access could theoretically be taken, although there is of course no guarantee that competing site east of Mink Hollow will obtain a planning consent.

## **Highway Capacity**

In terms of highway capacity, there is no technical evidence put forward by the Council to suggest that one or both access points into residential development on the A48 in this location be to the detriment of highway capacity. It has been demonstrated within our Transport Statement that there are no capacity issues relating to a development of circa 100 units in this location – indeed there is plenty of spare highway capacity with RFC’s below 0.2. In addition, a ghost island right turn lane is provided to access the Redrow site which benefits both a highway safety and traffic capacity. Again, it is worth reiterating that the Highway Officer confirms within the email that the access points will be lightly trafficked. Highway Capacity is simply not an issue for debate nor a sound technical reason to rebut either a single access proposal or combination of access points into the overall LDP site.

With respect to the proposed development of circa 20 units at Mink Hollow, then it would appear that the landowner for this site has not been asked to consider revising the junction layout proposals as per TD 42/95 and hence there would appear to be a lack of consistency from the Council in this respect.

## **Summary**

In summary, we have proposed a compliant access as per TD 42/95 at the insistence of your Highway Officer to adhere to these stringent design standards. In addition to this, our original design for access to the site (W141341\_A03-REV B) based on the principles of MfS and as shown within the Transport Statement accompanying the application was considered to be safe and appropriate for a development of this magnitude. Furthermore it was also accompanied by an independent Road Safety Audit which considered the design of the access to be appropriate and safe. As such there is no reason to suppose the proposed means of access to the Redrow land is either unsafe or does not have sufficient capacity.

There is also no substantive technical evidence put forward by the Council to suggest that two points of access within 70-80m on the same side of a carriageway would constitute concerns in relation to highway safety and highway capacity.

The two points of access into the individual sites fall within different landownerships and hence any notion that a ransom situation would not occur if one access is preferred over another is commercially naïve.

In addition, there does not appear to be a stated preference within the Deposit LDP to accessing this land via the adjacent field to the east of Mink Hollow as indicated in your response.

I look forward to receiving your considered response to the above.

Many thanks

----- Forwarded Message -----

**Subject:**St Nicholas

**Date:**Thu, 27 Aug 2015 08:14:52 +0000

**From:**Rennie, Steven <[srennie@valeofglamorgan.gov.uk](mailto:srennie@valeofglamorgan.gov.uk)>

**To:**[andy.muir@btconnect.com](mailto:andy.muir@btconnect.com) <[andy.muir@btconnect.com](mailto:andy.muir@btconnect.com)>

2015/00249/FUL

Dear Mr Muir

Following consultation meetings with the Highways Authority Officers it is clear that there is a concern with the forming of two separate access points to serve the residential development proposals in this part of St Nicholas. Comments from the Highways Traffic Officer conclude the following:

*'As discussed, with regards to the two developments proposed towards the east of St Nicholas, in principal the provision of a ghost island arrangement is suitable (for both applications) subject to agreeing the detailed design. However, as mentioned previously, based on safety and capacity reasons we would require a single access point to serve both developments and not two in close proximity.'*

*Note para 3.3 of TD 42/95 - A saving in accidents may be achieved, and an improvement made in operational performance, by reducing the number of lightly trafficked minor road connections onto major roads. The cost effectiveness of connecting such routes together with a link road before they join a new major road should always be investigated. Further, TAN 18 advises that the combining of individual access points along a road should be encouraged to help improve road safety.'*

As such, proposals with the 2 separate applications that would result in two separate access points would not be considered an acceptable arrangement due to the potential risk to highways safety that this arrangement may result in. It may be that individually the access points as proposed may be acceptable, though the concern is related to two access points proposed a short distance apart as is currently before us.

As such, we have to consider which of the access points would be appropriate. This is not just a case of which application was first to be submitted as we will be making an assessment based on planning and highway matters. It

is considered that the proposal for the Redrow development, resulting in the demolition of the dwelling Emmaville, would not be the preferred option and that in planning and highway safety terms there are concerns with such an arrangement. The junction as proposed with your application has limited frontage width and would be set in close proximity to private accesses to neighbouring residences. This would result in will in conflicting manoeuvres within the proposed new junction area to the detriment of highway / public safety along this priority route. Also, there is concern with regards the proposed access to the Redrow development between two existing dwellings and its potential impact on the quality of life of the occupants. This is not a highways issue, though in planning terms this is another indication that the access via the existing field to the east of Mink Hollow would provide a more suitable access to the housing developments, which it is also noted was always the access point considered with the Deposit LDP.

On this basis we would strongly advise discussions between your client and the adjacent landowner to enable a single access into the site to serve all the dwellings proposed. This is a logical solution and is considered positive in terms of trying to secure a well planned development, with minimal impact to existing dwelling occupants (significantly less than the potential impact from forming a new access set between two existing dwellings). It has been confirmed to us that there is no ransom issue/request on the part of the adjacent landowner and therefore we would advise discussions between all parties towards a single access point and a more comprehensive development.

I understand that this would result in a significant change in the proposals, though in our recent meeting we all discussed the positive benefits in planning and highway safety terms of a single access into a comprehensive development.

Please consider the above points with your client and get back to me when possible letting me know how you wish to proceed. Please email any response to our generic email address [developmentcontrol@valeofglamorgan.gov.uk](mailto:developmentcontrol@valeofglamorgan.gov.uk) as I shall be on leave until the 14<sup>th</sup> September. It would then be picked up by my manager.

All comments above are made without prejudice to the formal determination of any planning application by the Local Planning Authority.

Regards

Steven Rennie  
Senior Planner  
Planning and Transportation Services  
Vale of Glamorgan Council / Cyngor Bro Morgannwg  
tel / ffôn: 01446 704653  
e-mail / e-bost: [srennie@valeofglamorgan.gov.uk](mailto:srennie@valeofglamorgan.gov.uk)

Visit our Website at [www.valeofglamorgan.gov.uk](http://www.valeofglamorgan.gov.uk)  
Ewch i'n gwefan yn [www.bromorgannwg.gov.uk](http://www.bromorgannwg.gov.uk)

[Find us on Facebook / Cewch ddod o hyd i ni ar Facebook](#)  
[Follow us on Twitter / Dilynwch ni ar Twitter](#)

*Consider the environment. Please don't print this e-mail unless you really need to.  
Ystyriwch yr amgylchedd. Peidiwch ag argraffu'r neges hon oni bai fod gwir angen.*

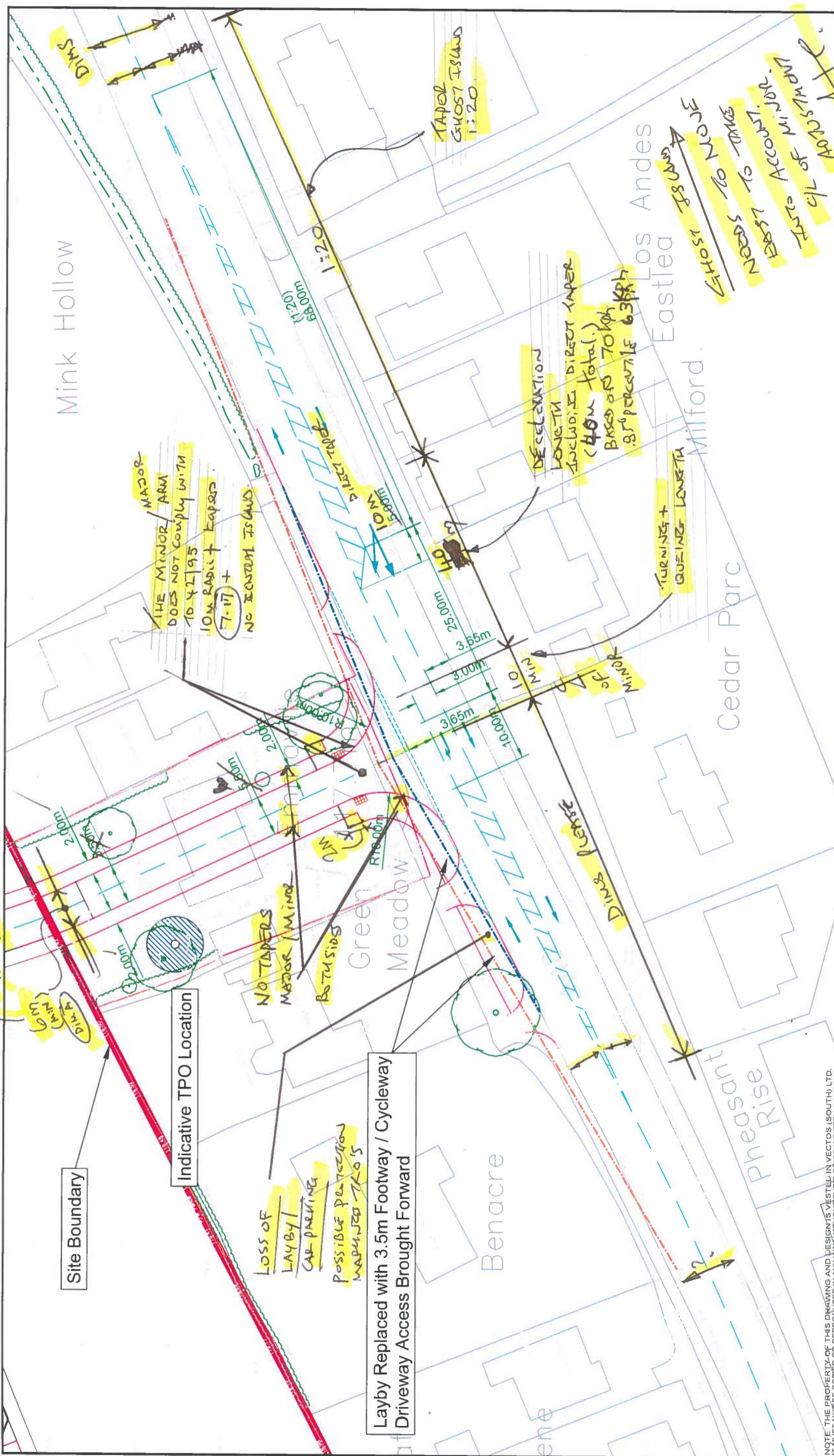


**Matt Thomas**

**Director**

**029 2072 0864 (T) 07866 923 029 (M)**

**10th Floor Belmont House, Churchill Way, Cardiff, CF10 2HE**



Site Boundary

Indicative TPO Location

Layby Replaced with 3.5m Footway / Cycleway  
Driveway Access Brought Forward

LOSS OF LAYBY / CAR PARKING  
POSSIBLE PROTECTION WAPUNED TPO'S

**Redrow Homes**

10th Floor, Helmont House, Churchill Way, Cardiff CF10 2HE  
t: 02920 720 860 e: enquiries@vectos.co.uk

DRAWING NUMBER: **W141341\_A03** REVISION: **F**

**St. Nicholas**

**Potential Ghost Island Right Turn Arrangement with Indicative TPO Location, Adopted Highway Boundary & Site Internal Layout**

DRAWN: AP CHECKED: TCB DATE: 28.01.14 SCALES: 1:500 at A3

NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN VECTOS (SOUTH) LTD. IT MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR PRIOR WRITTEN CONSENT.

REV	DETAILS	DRAWN	CHECKED	DATE
A	Adopted Highway and TPO Added	AP	MT	02.07.14
B	Site internal layout added, access narrowed to 5.5m / 6m radius	AP	MT	30.01.15
C	Extend footway and remove layby	AP	MT	30.01.15
D	Additional Visibility Splay added	AP	MT	13.01.15
E	TOPO Survey data added	AP	MT	16.02.15
F	Junction design amended	AP	MT	29.07.15

**Notes:**

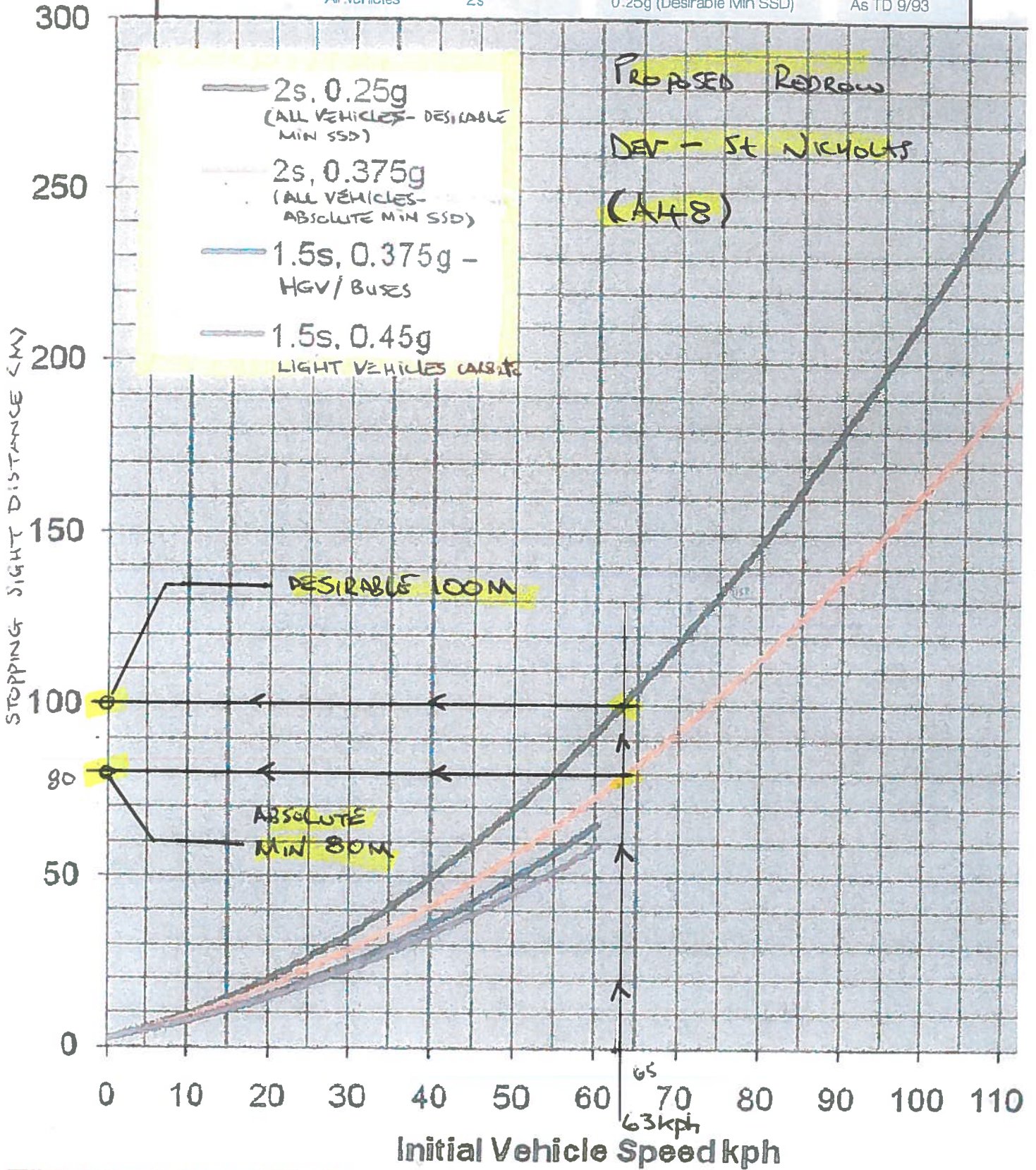
- This is not a construction drawing and is intended for illustrative purposes only.
- White lining is indicative only.

**Legend:**

- 2.4m x 40m Visibility Splay
- 4.5m x 80m Visibility Splay

*NOT ACCEPTABLE PLEASE REVIEW BEFORE REPLY WITH DESIRABLE 4.5m x 100m*

Design Speed	Vehicle Type	Reaction Time	Deceleration Rate	Comments
60kph and below	Light vehicles	1.5s	0.45g	
	HGVs	1.5s	0.375g	See 10.1.9
	Buses	1.5s	0.375g	See 10.1.10
Above 60kph	All vehicles	2s	0.375g (Absolute Min SSD)	As TD 9/93
	All vehicles	2s	0.25g (Desirable Min SSD)	As TD 9/93



CONVERSION FACTORS	
1mph	= 1.609344 Kph
1kph	= 0.621371192 mph

**85<sup>th</sup> PERCENTILE FIGURE**  
**PROVIDED BY VECTOS.**  
**39 mph - 62.76 kph. (63kph)**  
**(HGV/BUS ROUTE.)**

## **APPENDIX G**

**Redrow Homes**  
**A48, St Nicholas**  
**Proposed Access Arrangement**

**Stage 1 Road Safety Audit**

**February 2015**

## Contents

<b>1</b>	<b>INTRODUCTION .....</b>	<b>1</b>
<b>2</b>	<b>QUALIFICATIONS AND EXPERIENCE OF THE REPORT WRITERS.....</b>	<b>2</b>
<b>3</b>	<b>MATTERS ARISING FROM THIS AUDIT .....</b>	<b>3</b>
	<b>Departures from Standards.....</b>	<b>3</b>
	<b>Audit Issues .....</b>	<b>3</b>
<b>4</b>	<b>AUDIT TEAM STATEMENT .....</b>	<b>4</b>

## Appendices

- Appendix A - Site Location Plan**
- Appendix B - General Arrangement Drawing**
- Appendix C - CV of Asa John Plant**

## **1 INTRODUCTION**

- 1.1 This report results from a Stage 1 Road Safety Audit (RSA) carried out on Wednesday 4<sup>th</sup> February 2015. The audit was carried out on the instructions of the Vectos Planning Team based in the Cardiff Office, on behalf of Redrow Homes.
- 1.2 A site visit was undertaken on Wednesday 4<sup>th</sup> February 2015 at 12:45 by the Audit Team. The weather was dry and fine. Moderate levels of traffic were generally observed. A site location plan can be found at Appendix A of this report.
- 1.3 The terms of reference of the audit are as set out in HD 19/03 and the Chartered Institution of Highways and Transportation document "Road Safety Audit" 2008). Where appropriate, cognisance has also been taken of the Manual for Streets 1 and 2 (MfS1 and MfS2) and of the guidelines for reducing mobility handicaps. The writers have examined and reported only on road safety implications of the scheme as presented and have not examined or identified the compliance of the design to any other criteria.
- 1.4 The Audit Team has examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the designs to any other criteria. However, to clearly explain a safety problem or the recommendation to resolve a problem the Audit Team may, on occasion, have referred to a design standard without touching on technical audit.
- 1.5 The proposals are to provide a new residential access on to A48, St Nicholas.
- 1.6 The Audit Team has been provided with a general arrangement drawing, which can be found at Appendix B:
- Vectos Drawing: W141341\_A03 Rev B
- 1.7 Whilst recommendations have been made within this report, there may be equally satisfactory alternatives. The Audit Team will be pleased to consider alternatives if required.

## **2 QUALIFICATIONS AND EXPERIENCE OF THE REPORT WRITERS**

2.1 This Audit has been carried out by the following:

A J PLANT MCIHT, MSoRSA, HA Certificate of Competency – Audit Team Leader  
Associate  
Vectos

I MEDD MCIHT, FSoRSA - Audit Team Member  
Independent Road Safety Consultant

2.2 A summary of the team leader's qualifications and experience can be found in Appendix C of this report.



### **3 MATTERS ARISING FROM THIS AUDIT**

#### **Departures from Standards**

- 3.1 The Auditors are not advised of any departures from standards.

#### **Audit Issues**

- 3.2 PROBLEM

Location: Layby to the west of the proposed access.

Summary: A parking layby is provided to the west of the proposed access, which will restrict visibility of and from the junction. This could result in conflict between ahead traffic and egressing vehicles.

#### RECOMMENDATION

Remove existing layby provision to ensure visibility splays can be maintained and free of obstruction.

#### Designers Response

Noted. Access junction design has been amended to introduce a new kerbline, effectively removing the layby.

## 4 AUDIT TEAM STATEMENT

4.1 I certify that this Audit has been carried out in accordance with the requirements of HD 19/03.

Signed:   
A J PLANT (Audit Team Leader)

Date: 4<sup>th</sup> February 2015

4.2 A summary of the team leader's qualifications and experience can be found in Appendix C of this report.

# **APPENDIX A**

## **Site Location Plan**



## **APPENDIX B**

### **General Arrangement Drawing**

## **APPENDIX C**

### **CV of Asa John Plant**

## **APPENDIX H**

Matt Thomas  
Vectos  
10th Floor Helmont House  
Churchill Way  
Cardiff  
CF10 2HE

1<sup>st</sup> October 2015

**Stage 1 Road Safety Audit Addendum – St Nicholas**

Dear Mr Thomas

The Audit Team, consisting of Ian Medd and I, have reviewed the revised design drawings for the amended site access on to the A48.

We have been provided with the following drawings, further to the Stage 1 Road Safety Audit we undertook 4<sup>th</sup> February 2015.

- W141341\_A03 – Potential Ghost Island Right Turn Arrangement
- W141341/A/10 – Illustrative Redrow and Waterstone Homes Combined site Access Arrangements

The Audit Team has reviewed the above drawings and believe that the only previous issue highlighted, in relation to the existing layby to the west of the access, is no longer relevant. In addition, the Audit Team does not consider the revised proposals give rise to any material road safety issues.

Yours sincerely

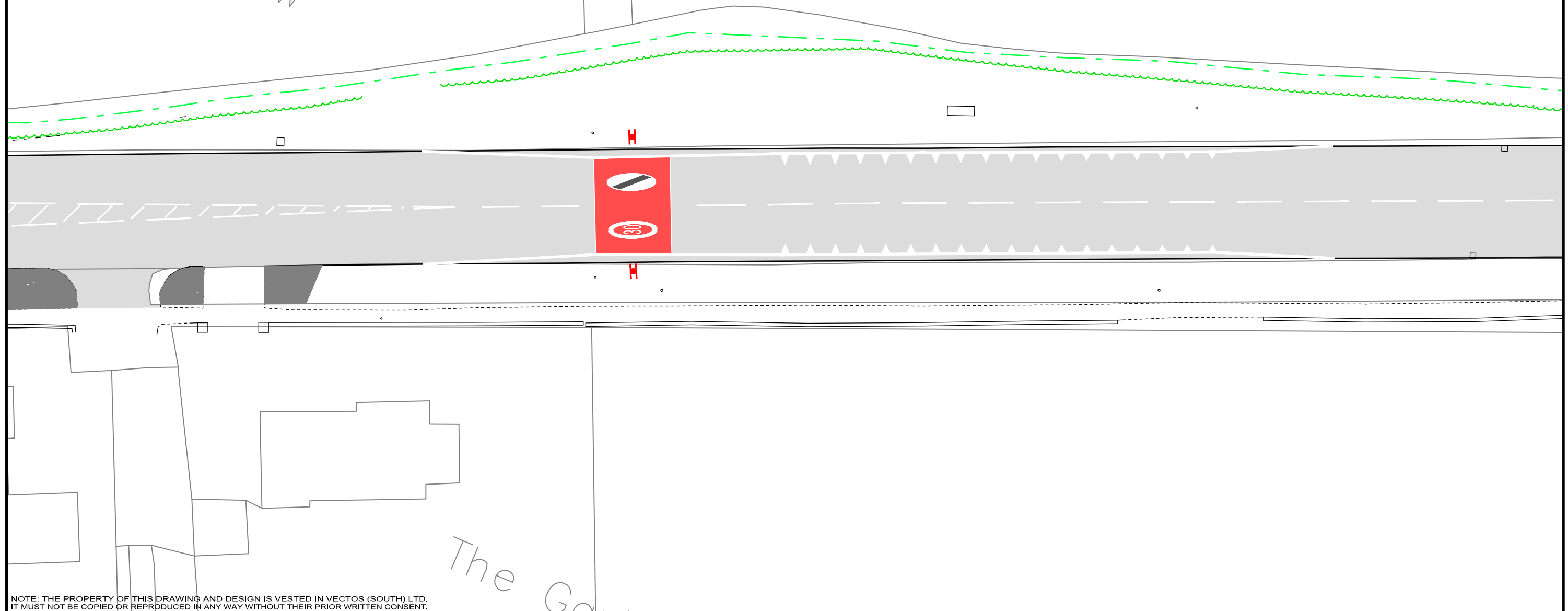


Asa John Plant  
Associate



## **APPENDIX I**

Mink Hollow



NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN VECTOS (SOUTH) LTD. IT MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR PRIOR WRITTEN CONSENT.

REV.	DETAILS	DRAWN	CHECKED	DATE

**Notes:**  
 1. This is not a construction drawing and is intended for illustrative purposes only.  
 2. White lining is indicative only.

St. Nicholas

Village Entry Speed Gateway

DRAWN: AP	CHECKED: TCB	DATE: 28.01.14	SCALES: NTS
--------------	-----------------	-------------------	----------------

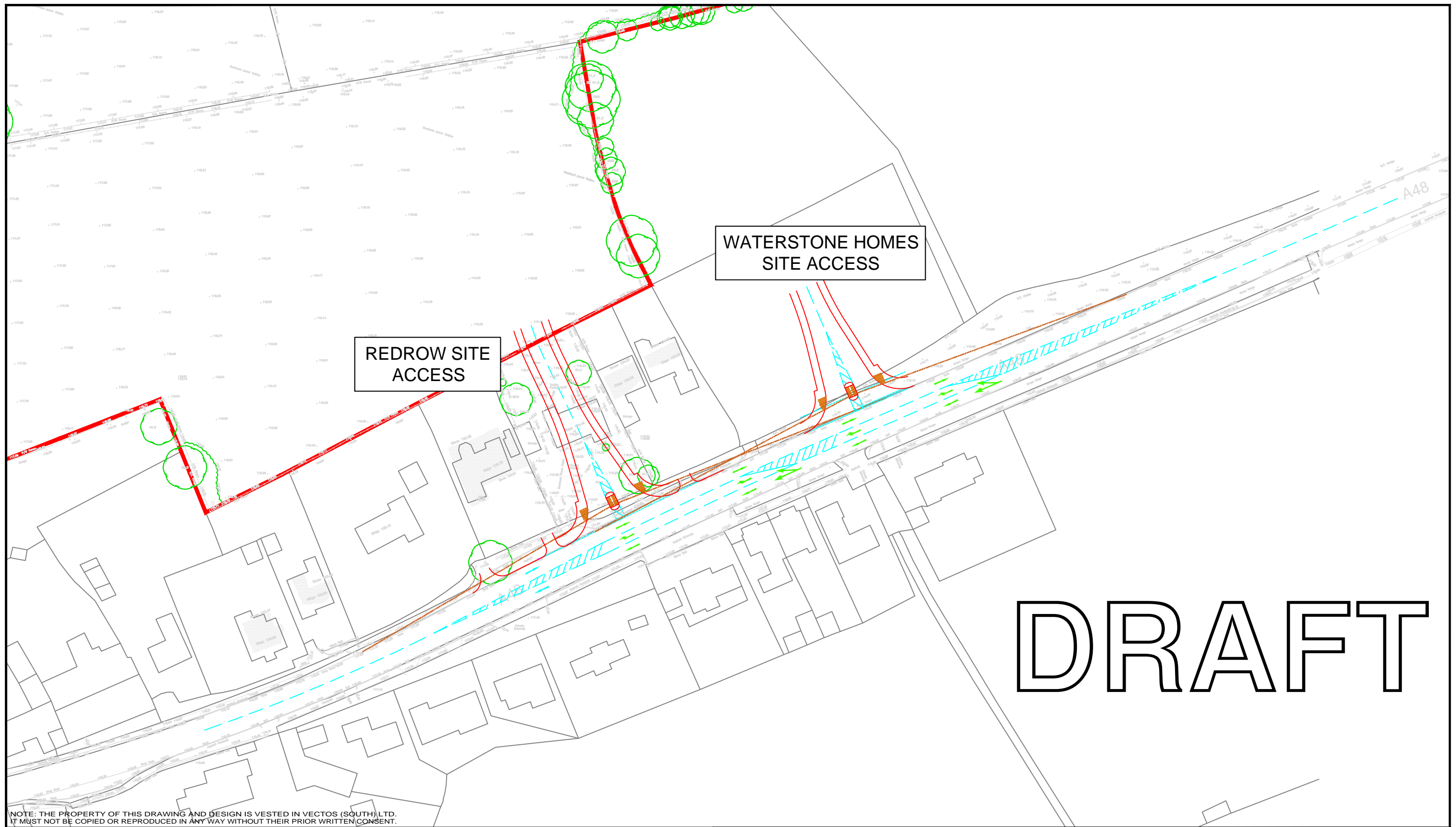
Redrow Homes



10th Floor, Belmont House, Churchill Way, Cardiff CF10 2HE  
 t: 02920 720 860 e: enquiries@vectos.co.uk

DRAWING NUMBER: W141341_A06	REVISION: .
--------------------------------	----------------

## **APPENDIX J**




NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN VECTOS (SOUTH) LTD.  
IT MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR PRIOR WRITTEN CONSENT.

REV.	DETAILS	DRAWN	CHECKED	DATE

**Notes:**

1. This is not a construction drawing and is intended for illustrative purposes only.
2. Levels based on existing channel line. Proposed site access levels not available at this stage and subject to full detail design.
3. To be read in conjunction with Vectos plan W141341/A/09.
4. Waterstone Homes site access arrangement based on image overlay drawing number 2132/101, May 2015.

**Legend:**

 4.5m x 80m Visibility Splay

St. Nicholas

Illustrative Redrow and Waterstone Homes  
Combined Site Access Arrangements

DRAWN: AP    CHECKED: CNE    DATE: 22.09.15    SCALES: 1:1000 at A3

Redrow Homes

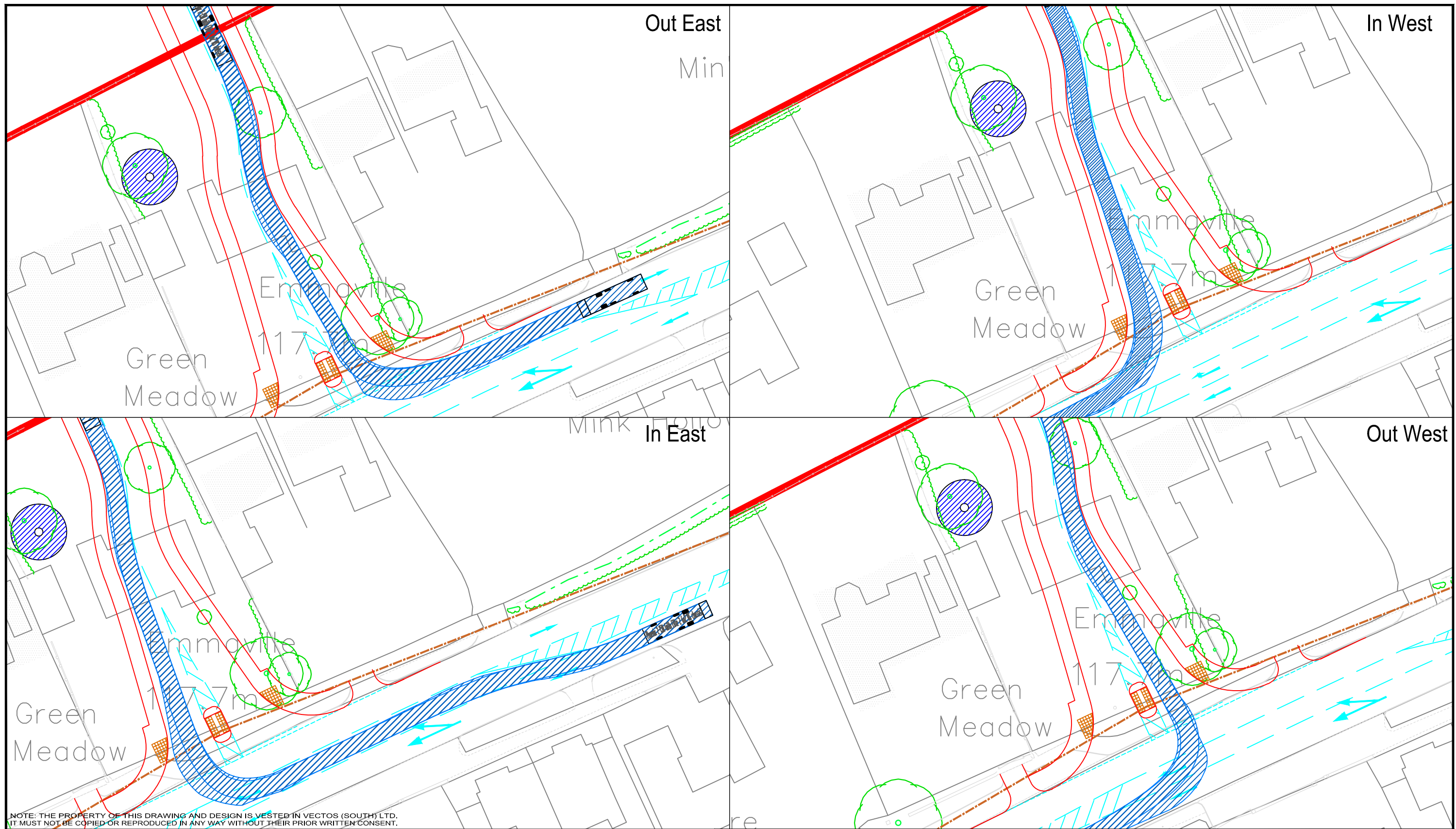


transport planning specialists

10th Floor, Helmont House, Churchill Way, Cardiff CF10 2HE  
t: 02920 720 860    e: enquiries@vectos.co.uk

DRAWING NUMBER: W141341/A/10    REVISION: .

## **APPENDIX K**



NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN VECTOS (SOUTH) LTD.  
IT MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR PRIOR WRITTEN CONSENT.

REV.	DETAILS	DRAWN	CHECKED	DATE

**Notes:**

- This is not a construction drawing and is intended for illustrative purposes only.
- White lining is indicative only.

Phoenix 2-15N (with Elite 2 6x2 MS chassis)

Overall Length	9,595mm
Overall Width	2,520mm
Overall Body Height	3,659mm
Min Body Ground Clearance	625mm
Track Width	2,000mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	9,300mm

**St. Nicholas**

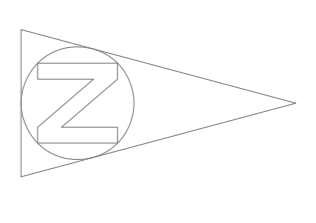
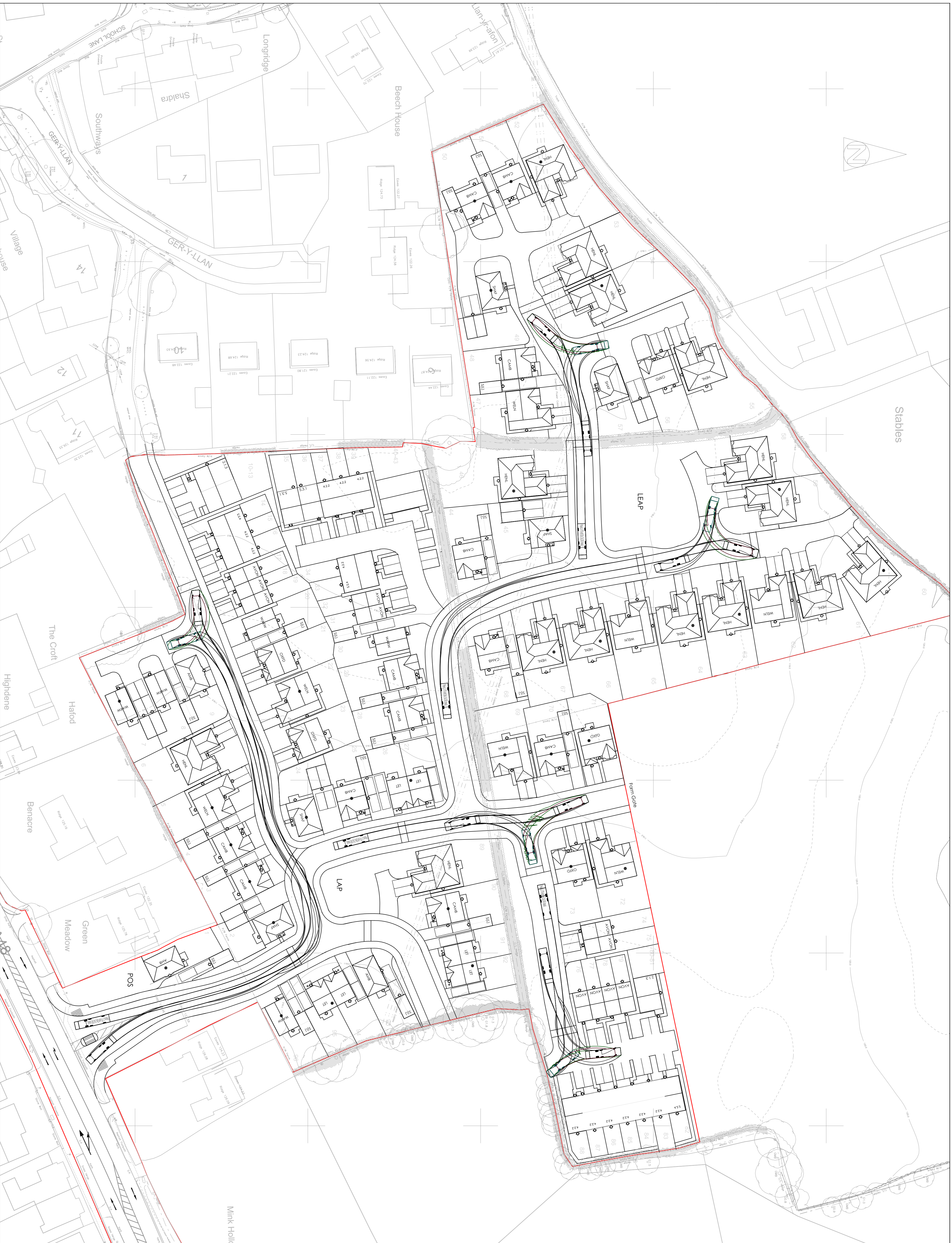
Potential Ghost Island Right Turn Arrangement  
Large Refuse Swept Path Analysis

DRAWN: AP	CHECKED: CNE	DATE: 10.08.15	SCALES: 1:500 at A3
--------------	-----------------	-------------------	------------------------

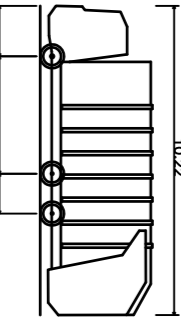
**Redrow Homes**

10th Floor, Helmont House, Churchill Way, Cardiff CF10 2HE  
t: 02920 720 860 e: enquiries@vectos.co.uk

DRAWING NUMBER: W141341_AT_E01	REVISION: .
-----------------------------------	----------------



- GENERAL NOTES**
1. D5 Not Scale
  2. Proposed excavations shall be checked and worked in accordance with the dimensions and levels indicated on the drawings. All excavations shall be worked in accordance with the current building legislation, British Standards, including regulations etc. Excavations shall be worked in accordance with the current building legislation, British Standards, including regulations etc. Excavations shall be worked in accordance with the current building legislation, British Standards, including regulations etc.
  3. Excavations shall be worked in accordance with the current building legislation, British Standards, including regulations etc. Excavations shall be worked in accordance with the current building legislation, British Standards, including regulations etc.
  4. Excavations shall be worked in accordance with the current building legislation, British Standards, including regulations etc. Excavations shall be worked in accordance with the current building legislation, British Standards, including regulations etc.
  5. Excavations shall be worked in accordance with the current building legislation, British Standards, including regulations etc. Excavations shall be worked in accordance with the current building legislation, British Standards, including regulations etc.
  6. This drawing is schematic for clarity only. Positions of pipe runs and fittings may vary on site due to site conditions. Major 1537-01 Rev D.
  7. The above notes shall be read in conjunction with and checked against all other drawings, Engineering Details, Specification and any structural, geotechnical or other specialist documents provided.



Phoenix 2-17N (with Erite 2 6x2 ML 0099919)  
 Overall Width 3862mm  
 Overall Height 1022mm  
 Min. Bay Ground Clearance 238mm  
 Max. Bay Ground Clearance 238mm  
 Lock to Lock Time 4500mm  
 Kerb to Kerb Turning Radius 10350mm

A 14/09/2015 Updated following layout review.  
 Project: **St Nicholas**  
**Vale of Glamorgan**



Client: **Redrow Homes**  
 Drawing: **Refuse Tracking Planning**  
 Scale: 1:500@A1 Date: February 2015 Drawn By: SJD  
 Drawing No: **3936-15-06-PL03** Rev: A



Unit 8, Walsley Garage, Tŷfan Road, Leake Road, Merthyr Tydfil, CF64 5RN  
 Tel: 01495 777777  
 Email: enquiries@phoenixdesign.co.uk  
 www.phoenixdesign.co.uk

This drawing is the copyright of Phoenix Design Partnership Ltd. No liability will be accepted for amendments by others to either the period or original format.

Dwg Status: **FOR PLANNING**

## APPENDIX L



Vectos Churchill Way Cardiff

Licence No: 152302

## TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL  
 Category : A - HOUSES PRIVATELY OWNED  
 MULTI-MODAL VEHICLES

Selected regions and areas:

02	SOUTH EAST	
	SC SURREY	1 days
03	SOUTH WEST	
	CW CORNWALL	1 days
	WL WILTSHIRE	1 days
04	EAST ANGLIA	
	NF NORFOLK	1 days
	SF SUFFOLK	2 days
05	EAST MIDLANDS	
	LN LINCOLNSHIRE	2 days
	NT NOTTINGHAMSHIRE	1 days
06	WEST MIDLANDS	
	SH SHROPSHIRE	2 days
	WM WEST MIDLANDS	2 days
	WO WORCESTERSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE	
	NY NORTH YORKSHIRE	3 days
	SY SOUTH YORKSHIRE	1 days
08	NORTH WEST	
	CH CHESHIRE	1 days
09	NORTH	
	CB CUMBRIA	1 days
10	WALES	
	CF CARDIFF	1 days
11	SCOTLAND	
	AD ABERDEEN CITY	1 days
	FA FALKIRK	1 days
	FI FIFE	1 days
	HI HIGHLAND	2 days
	SR STIRLING	1 days

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

Vectos Churchill Way Cardiff

Licence No: 152302

## Filtering Stage 2 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: Number of dwellings  
 Actual Range: 52 to 196 (units: )  
 Range Selected by User: 50 to 200 (units: )

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/06 to 20/05/14

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	9 days
Tuesday	4 days
Wednesday	4 days
Thursday	3 days
Friday	7 days

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

Selected survey types:

Manual count	27 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 undertaken using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	15
Edge of Town	12

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:

Residential Zone	22
Out of Town	1
No Sub Category	4

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.

## Filtering Stage 3 selection:

Use Class:

C3	27 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®.

Vectos Churchill Way Cardiff

Licence No: 152302

## Filtering Stage 3 selection (Cont.):

Population within 1 mile:

1,001 to 5,000	2 days
5,001 to 10,000	7 days
10,001 to 15,000	3 days
15,001 to 20,000	9 days
20,001 to 25,000	4 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:

5,001 to 25,000	1 days
25,001 to 50,000	4 days
50,001 to 75,000	3 days
75,001 to 100,000	5 days
100,001 to 125,000	6 days
125,001 to 250,000	5 days
250,001 to 500,000	3 days

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

Car ownership within 5 miles:

0.5 or Less	1 days
0.6 to 1.0	7 days
1.1 to 1.5	19 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	27 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.

LIST OF SITES relevant to selection parameters

1	AD-03-A-01 SPRINGFIELD ROAD	SEMI -DETACHED		ABERDEEN CITY
	ABERDEEN Suburban Area (PPS6 Out of Centre) Residential Zone Total Number of dwellings: 59 Survey date: FRIDAY 18/05/12			
2	CB-03-A-04 MOORCLOSE ROAD	SEMI DETACHED		Survey Type: MANUAL CUMBRIA
	SALTERBACK WORKINGTON Edge of Town No Sub Category Total Number of dwellings: 82 Survey date: FRIDAY 24/04/09			
3	CF-03-A-02 DROPE ROAD	MIXED HOUSES		Survey Type: MANUAL CARDIFF
	CARDIFF Edge of Town Residential Zone Total Number of dwellings: 196 Survey date: FRIDAY 05/10/07			
4	CH-03-A-06 CREWE ROAD	SEMI -DET./BUNGALOWS		Survey Type: MANUAL CHESHIRE
	CREWE Suburban Area (PPS6 Out of Centre) No Sub Category Total Number of dwellings: 129 Survey date: TUESDAY 14/10/08			
5	CW-03-A-02 BOSVEAN GARDENS	SEMI D./DETACHED		Survey Type: MANUAL CORNWALL
	TRURO Suburban Area (PPS6 Out of Centre) Residential Zone Total Number of dwellings: 73 Survey date: TUESDAY 18/09/07			
6	FA-03-A-02 ROSEBANK AVENUE & SPRINGFIELD DRIVE	MIXED HOUSES		Survey Type: MANUAL FALKIRK
	FALKIRK Suburban Area (PPS6 Out of Centre) Residential Zone Total Number of dwellings: 161 Survey date: WEDNESDAY 29/05/13			
7	FI-03-A-03 WOODMILL ROAD	MIXED HOUSES		Survey Type: MANUAL FIFE
	DUNFERMLINE Edge of Town Residential Zone Total Number of dwellings: 155 Survey date: MONDAY 30/04/07			

LIST OF SITES relevant to selection parameters (Cont.)

8	HI-03-A-11	BUNGALOWS		HIGHLAND
	STEVENSON ROAD			
	INSHES			
	INVERNESS			
	Edge of Town			
	Residential Zone			
	Total Number of dwellings:		85	
	Survey date:	MONDAY	05/06/06	Survey Type: MANUAL
9	HI-03-A-14	SEMI-DETACHED		HIGHLAND
	CALEDONIAN ROAD			
	DALNEIGH			
	INVERNESS			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total Number of dwellings:		73	
	Survey date:	FRIDAY	13/05/11	Survey Type: MANUAL
10	LN-03-A-01	MIXED HOUSES		LINCOLNSHIRE
	BRANT ROAD			
	BRACEBRIDGE			
	LINCOLN			
	Edge of Town			
	Residential Zone			
	Total Number of dwellings:		150	
	Survey date:	TUESDAY	15/05/07	Survey Type: MANUAL
11	LN-03-A-02	MIXED HOUSES		LINCOLNSHIRE
	HYKEHAM ROAD			
	LINCOLN			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total Number of dwellings:		186	
	Survey date:	MONDAY	14/05/07	Survey Type: MANUAL
12	NF-03-A-02	HOUSES & FLATS		NORFOLK
	DEREHAM ROAD			
	NORWICH			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total Number of dwellings:		98	
	Survey date:	MONDAY	22/10/12	Survey Type: MANUAL
13	NT-03-A-03	SEMI DETACHED		NOTTINGHAMSHIRE
	B6018 SUTTON ROAD			
	KIRKBY-IN-ASHFIELD			
	Edge of Town			
	Residential Zone			
	Total Number of dwellings:		166	
	Survey date:	WEDNESDAY	28/06/06	Survey Type: MANUAL
14	NY-03-A-06	BUNGALOWS & SEMI DET.		NORTH YORKSHIRE
	HORSEFAIR			
	BOROUGHBRIDGE			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total Number of dwellings:		115	
	Survey date:	FRIDAY	14/10/11	Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

15	NY-03-A-09	MIXED HOUSING GRAMMAR SCHOOL LANE		NORTH YORKSHIRE
		NORTHALLERTON Suburban Area (PPS6 Out of Centre) Residential Zone Total Number of dwellings: 52 Survey date: MONDAY 16/09/13		Survey Type: MANUAL
16	NY-03-A-10	HOUSES AND FLATS BOROUGHBRIDGE ROAD		NORTH YORKSHIRE
		RIPON Edge of Town No Sub Category Total Number of dwellings: 71 Survey date: TUESDAY 17/09/13		Survey Type: MANUAL
17	SC-03-A-04	DETACHED & TERRACED HIGH ROAD		SURREY
		BYFLEET Edge of Town Residential Zone Total Number of dwellings: 71 Survey date: THURSDAY 23/01/14		Survey Type: MANUAL
18	SF-03-A-01	SEMI DETACHED A1156 FELIXSTOWE ROAD RACECOURSE IPSWICH		SUFFOLK
		Suburban Area (PPS6 Out of Centre) Residential Zone Total Number of dwellings: 77 Survey date: WEDNESDAY 23/05/07		Survey Type: MANUAL
19	SF-03-A-03	MIXED HOUSES BARTON HILL FORNHAM ST MARTIN BURY ST EDMUNDS		SUFFOLK
		Edge of Town Out of Town Total Number of dwellings: 101 Survey date: MONDAY 15/05/06		Survey Type: MANUAL
20	SH-03-A-04	TERRACED ST MICHAEL'S STREET		SHROPSHIRE
		SHREWSBURY Suburban Area (PPS6 Out of Centre) No Sub Category Total Number of dwellings: 108 Survey date: THURSDAY 11/06/09		Survey Type: MANUAL
21	SH-03-A-05	SEMI-DETACHED/TERRACED SANDCROFT SUTTON HILL TELFORD		SHROPSHIRE
		Edge of Town Residential Zone Total Number of dwellings: 54 Survey date: THURSDAY 24/10/13		Survey Type: MANUAL

Vectos Churchill Way Cardiff

Licence No: 152302

LIST OF SITES relevant to selection parameters (Cont.)

22	SR-03-A-01	DETACHED		STIRLING
	BENVIEW			
	STIRLING			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total Number of dwellings:	115		
	Survey date: MONDAY	23/04/07		Survey Type: MANUAL
23	SY-03-A-01	SEMI DETACHED HOUSES		SOUTH YORKSHIRE
	A19 BENTLEY ROAD			
	BENTLEY RISE			
	DONCASTER			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total Number of dwellings:	54		
	Survey date: WEDNESDAY	18/09/13		Survey Type: MANUAL
24	WL-03-A-01	SEMI D./TERRACED W.	BASSETT	WILTSHIRE
	MAPLE DRIVE			
	WOOTTON BASSETT			
	Edge of Town			
	Residential Zone			
	Total Number of dwellings:	99		
	Survey date: MONDAY	02/10/06		Survey Type: MANUAL
25	WM-03-A-01	TERRACED		WEST MIDLANDS
	FOLESHILL ROAD			
	FOLESHILL			
	COVENTRY			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total Number of dwellings:	79		
	Survey date: FRIDAY	03/02/06		Survey Type: MANUAL
26	WM-03-A-03	MIXED HOUSING		WEST MIDLANDS
	BASELEY WAY			
	ROWLEYS GREEN			
	COVENTRY			
	Edge of Town			
	Residential Zone			
	Total Number of dwellings:	84		
	Survey date: MONDAY	24/09/07		Survey Type: MANUAL
27	WO-03-A-03	DETACHED		WORCESTERSHIRE
	BLAKEBROOK			
	BLAKEBROOK			
	KIDDERMINSTER			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total Number of dwellings:	138		
	Survey date: FRIDAY	05/05/06		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.

Vectos Churchill Way Cardiff

Licence No: 152302

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

MULTI-MODAL VEHICLES

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	27	105	0.071	27	105	0.286	27	105	0.357
08:00 - 09:00	27	105	0.144	27	105	0.399	27	105	0.543
09:00 - 10:00	27	105	0.162	27	105	0.227	27	105	0.389
10:00 - 11:00	27	105	0.146	27	105	0.176	27	105	0.322
11:00 - 12:00	27	105	0.168	27	105	0.167	27	105	0.335
12:00 - 13:00	27	105	0.197	27	105	0.172	27	105	0.369
13:00 - 14:00	27	105	0.189	27	105	0.183	27	105	0.372
14:00 - 15:00	27	105	0.182	27	105	0.188	27	105	0.370
15:00 - 16:00	27	105	0.266	27	105	0.194	27	105	0.460
16:00 - 17:00	27	105	0.322	27	105	0.189	27	105	0.511
17:00 - 18:00	27	105	0.380	27	105	0.224	27	105	0.604
18:00 - 19:00	27	105	0.253	27	105	0.200	27	105	0.453
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
<b>Total Rates:</b>			<b>2.480</b>			<b>2.605</b>			<b>5.085</b>

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: 52 - 196 (units: )  
 Survey date date range: 01/01/06 - 20/05/14  
 Number of weekdays (Monday-Friday): 27  
 Number of Saturdays: 0  
 Number of Sundays: 0  
 Surveys manually removed from selection: 2

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 shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.



Vectos Churchill Way Cardiff

Licence No: 152302

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED  
 MULTI-MODAL CYCLISTS  
 Calculation factor: 1 DWELLS  
 BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	27	105	0.007	27	105	0.015	27	105	0.022
08:00 - 09:00	27	105	0.006	27	105	0.024	27	105	0.030
09:00 - 10:00	27	105	0.005	27	105	0.006	27	105	0.011
10:00 - 11:00	27	105	0.003	27	105	0.006	27	105	0.009
11:00 - 12:00	27	105	0.004	27	105	0.003	27	105	0.007
12:00 - 13:00	27	105	0.004	27	105	0.006	27	105	0.010
13:00 - 14:00	27	105	0.006	27	105	0.004	27	105	0.010
14:00 - 15:00	27	105	0.007	27	105	0.005	27	105	0.012
15:00 - 16:00	27	105	0.015	27	105	0.006	27	105	0.021
16:00 - 17:00	27	105	0.017	27	105	0.013	27	105	0.030
17:00 - 18:00	27	105	0.017	27	105	0.010	27	105	0.027
18:00 - 19:00	27	105	0.010	27	105	0.004	27	105	0.014
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
<b>Total Rates:</b>			<b>0.101</b>			<b>0.102</b>			<b>0.203</b>

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: 52 - 196 (units: )  
 Survey date date range: 01/01/06 - 20/05/14  
 Number of weekdays (Monday-Friday): 27  
 Number of Saturdays: 0  
 Number of Sundays: 0  
 Surveys manually removed from selection: 2

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 shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

Vectos Churchill Way Cardiff

Licence No: 152302

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED  
 MULTI-MODAL PEDESTRIANS  
 Calculation factor: 1 DWELLS  
 BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	27	105	0.027	27	105	0.060	27	105	0.087
08:00 - 09:00	27	105	0.036	27	105	0.161	27	105	0.197
09:00 - 10:00	27	105	0.043	27	105	0.049	27	105	0.092
10:00 - 11:00	27	105	0.039	27	105	0.042	27	105	0.081
11:00 - 12:00	27	105	0.036	27	105	0.037	27	105	0.073
12:00 - 13:00	27	105	0.035	27	105	0.030	27	105	0.065
13:00 - 14:00	27	105	0.033	27	105	0.046	27	105	0.079
14:00 - 15:00	27	105	0.043	27	105	0.046	27	105	0.089
15:00 - 16:00	27	105	0.137	27	105	0.075	27	105	0.212
16:00 - 17:00	27	105	0.088	27	105	0.055	27	105	0.143
17:00 - 18:00	27	105	0.067	27	105	0.047	27	105	0.114
18:00 - 19:00	27	105	0.061	27	105	0.050	27	105	0.111
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
<b>Total Rates:</b>			<b>0.645</b>			<b>0.698</b>			<b>1.343</b>

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: 52 - 196 (units: )  
 Survey date date range: 01/01/06 - 20/05/14  
 Number of weekdays (Monday-Friday): 27  
 Number of Saturdays: 0  
 Number of Sundays: 0  
 Surveys manually removed from selection: 2

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 shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

Vectos Churchill Way Cardiff

Licence No: 152302

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED  
 MULTI-MODAL BUS/TRAM PASSENGERS  
 Calculation factor: 1 DWELLS  
 BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	27	105	0.002	27	105	0.010	27	105	0.012
08:00 - 09:00	27	105	0.007	27	105	0.019	27	105	0.026
09:00 - 10:00	27	105	0.003	27	105	0.005	27	105	0.008
10:00 - 11:00	27	105	0.004	27	105	0.005	27	105	0.009
11:00 - 12:00	27	105	0.004	27	105	0.005	27	105	0.009
12:00 - 13:00	27	105	0.005	27	105	0.008	27	105	0.013
13:00 - 14:00	27	105	0.005	27	105	0.005	27	105	0.010
14:00 - 15:00	27	105	0.005	27	105	0.004	27	105	0.009
15:00 - 16:00	27	105	0.008	27	105	0.009	27	105	0.017
16:00 - 17:00	27	105	0.006	27	105	0.004	27	105	0.010
17:00 - 18:00	27	105	0.016	27	105	0.003	27	105	0.019
18:00 - 19:00	27	105	0.007	27	105	0.001	27	105	0.008
19:00 - 20:00	1	73	0.000	1	73	0.000	1	73	0.000
20:00 - 21:00	1	73	0.000	1	73	0.000	1	73	0.000
21:00 - 22:00	1	73	0.000	1	73	0.000	1	73	0.000
22:00 - 23:00									
23:00 - 24:00									
<b>Total Rates:</b>			<b>0.072</b>			<b>0.078</b>			<b>0.150</b>

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: 52 - 196 (units: )  
 Survey date date range: 01/01/06 - 20/05/14  
 Number of weekdays (Monday-Friday): 27  
 Number of Saturdays: 0  
 Number of Sundays: 0  
 Surveys manually removed from selection: 2

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 shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

## **APPENDIX M**

TRL LIMITED

(C) COPYRIGHT 2010

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.1 ANALYSIS PROGRAM  
RELEASE 5.0 (JUNE 2010) (Patch 15 Apr 2011)

ADAPTED FROM PICADY/3 WHICH IS CROWN COPYRIGHT  
BY PERMISSION OF THE CONTROLLER OF HMSO

-----  
FOR SALES AND DISTRIBUTION INFORMATION,  
PROGRAM ADVICE AND MAINTENANCE CONTACT:  
TRL SOFTWARE SALES  
TEL: CROWTHORNE (01344) 770758, FAX: 770356  
EMAIL: software@trl.co.uk  
-----

THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS  
IN NO WAY RELIEVED OF HIS/HER RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

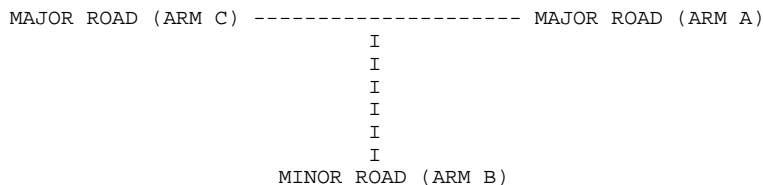
Run with file:-  
"H:\Projects\W140000\W141341 - St. Nicholas\Picady\Site access.vpi"  
(drive-on-the-left) at 12:03:12 on Wednesday, 18 February 2015

RUN INFORMATION  
\*\*\*\*\*

RUN TITLE : Site Access  
LOCATION : St Nicholas  
DATE : 12/02/15  
CLIENT : Redrow Homes  
ENUMERATOR : Chris.Evans [VECC-LAP007]  
JOB NUMBER : W141341  
STATUS :  
DESCRIPTION :

MAJOR/MINOR JUNCTION CAPACITY AND DELAY  
\*\*\*\*\*

INPUT DATA  
-----



ARM A IS A48 west  
ARM B IS Site Access  
ARM C IS A48 east

STREAM LABELLING CONVENTION  
-----

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B  
STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C  
ETC.

-----  
 GEOMETRIC DATA  
 -----

I	DATA ITEM	I	MINOR ROAD B	I
I	TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	I	( W ) 10.50 M.	I
I	CENTRAL RESERVE WIDTH	I	( WCR ) 0.00 M.	I
I		I		I
I	MAJOR ROAD RIGHT TURN - WIDTH	I	( WC-B ) 3.50 M.	I
I	- VISIBILITY	I	( VC-B ) 136.00 M.	I
I	- BLOCKS TRAFFIC ( SPACES )	I	NO ( 0 )	I
I		I		I
I	MINOR ROAD - VISIBILITY TO LEFT	I	( VB-C ) 21.0 M.	I
I	- VISIBILITY TO RIGHT	I	( VB-A ) 40.0 M.	I
I	- LANE 1 WIDTH	I	( WB-C ) 2.75 M.	I
I	- LANE 2 WIDTH	I	( WB-A ) 0.00 M.	I

-----  
 .SLOPES AND INTERCEPT  
 -----

(NB:Streams may be combined, in which case capacity will be adjusted)

I	Intercept For	Slope For	Opposing	Slope For	Opposing	I
I	STREAM B-C	STREAM	A-C	STREAM	A-B	I
I	632.87	0.20		0.08		I

I	Intercept For	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	I
I	STREAM B-A	STREAM	A-C	STREAM	A-B	STREAM	C-A	STREAM	C-B	I
I	491.41	0.18		0.07		0.11		0.26		I

I	Intercept For	Slope For	Opposing	Slope For	Opposing	I
I	STREAM C-B	STREAM	A-C	STREAM	A-B	I
I	745.07	0.23		0.23		I

(NB These values do not allow for any site specific corrections)

-----  
 TRAFFIC DEMAND DATA  
 -----

I	ARM	I	FLOW SCALE(%)	I
I	A	I	100	I
I	B	I	100	I
I	C	I	100	I

Demand set: 2018 AM Peak Base + Development

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MIN.  
 LENGTH OF TIME SEGMENT - 15 MIN.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

I	ARM	I	NUMBER OF MINUTES FROM START WHEN	I	RATE OF FLOW (VEH/MIN)	I								
I	I	I	FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP I AFTER	I	I	I								
I	I	I	TO RISE I IS REACHED I FALLING I PEAK I OF PEAK I PEAK	I	I	I								
I	I	I	I	I	I	I								
I	ARM A	I	15.00	I	45.00	I	75.00	I	14.76	I	22.14	I	14.76	I
I	ARM B	I	15.00	I	45.00	I	75.00	I	0.40	I	0.60	I	0.40	I
I	ARM C	I	15.00	I	45.00	I	75.00	I	4.69	I	7.03	I	4.69	I

Demand set:		2018 AM Peak Base + Development					
		TURNING PROPORTIONS					
		TURNING COUNTS					
		(PERCENTAGE OF H.V.S)					
TIME	FROM/TO	ARM	A	ARM	B	ARM	C
08.00 - 08.15	ARM A	0.000	0.0	0.008	9.0	0.992	1172.0
		( 0.0)	( 0.0)	( 0.0)	( 1.4)		
	ARM B	0.250	8.0	0.000	0.0	0.750	24.0
		( 0.0)	( 0.0)	( 0.0)	( 0.0)		
	ARM C	0.992	372.0	0.008	3.0	0.000	0.0
		( 2.5)	( 0.0)	( 0.0)	( 0.0)		
08.15 - 08.30	ARM A	0.000	0.0	0.008	0.0	0.992	0.0
		( 0.0)	( 0.0)	( 0.0)	( 1.4)		
	ARM B	0.250	0.0	0.000	0.0	0.750	0.0
		( 0.0)	( 0.0)	( 0.0)	( 0.0)		
	ARM C	0.992	0.0	0.008	0.0	0.000	0.0
		( 2.5)	( 0.0)	( 0.0)	( 0.0)		
08.30 - 08.45	ARM A	0.000	0.0	0.008	0.0	0.992	0.0
		( 0.0)	( 0.0)	( 0.0)	( 0.0)		
	ARM B	0.250	0.0	0.000	0.0	0.750	0.0
		( 0.0)	( 0.0)	( 0.0)	( 0.0)		
	ARM C	0.992	0.0	0.008	0.0	0.000	0.0
		( 0.0)	( 0.0)	( 0.0)	( 0.0)		
08.45 - 09.00	ARM A	0.000	0.0	0.008	0.0	0.992	0.0
		( 0.0)	( 0.0)	( 0.0)	( 0.0)		
	ARM B	0.250	0.0	0.000	0.0	0.750	0.0
		( 0.0)	( 0.0)	( 0.0)	( 0.0)		
	ARM C	0.992	0.0	0.008	0.0	0.000	0.0
		( 0.0)	( 0.0)	( 0.0)	( 0.0)		
09.00 - 09.15	ARM A	0.000	0.0	0.008	0.0	0.992	0.0
		( 0.0)	( 0.0)	( 0.0)	( 0.0)		
	ARM B	0.250	0.0	0.000	0.0	0.750	0.0
		( 0.0)	( 0.0)	( 0.0)	( 0.0)		
	ARM C	0.992	0.0	0.008	0.0	0.000	0.0
		( 0.0)	( 0.0)	( 0.0)	( 0.0)		
09.15 - 09.30	ARM A	0.000	0.0	0.008	0.0	0.992	0.0
		( 0.0)	( 0.0)	( 0.0)	( 0.0)		
	ARM B	0.250	0.0	0.000	0.0	0.750	0.0
		( 0.0)	( 0.0)	( 0.0)	( 0.0)		
	ARM C	0.992	0.0	0.008	0.0	0.000	0.0
		( 0.0)	( 0.0)	( 0.0)	( 0.0)		







TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.15-09.30									
B-AC	0.40	6.73	0.060		0.09	0.06	1.0		0.16
C-A	4.67								
C-B	0.04	8.98	0.004		0.01	0.00	0.1		0.11
A-B	0.11								
A-C	14.71								

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.1
08.45	0.1
09.00	0.1
09.15	0.1
09.30	0.1

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0
09.30	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	STREAM	I	TOTAL DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I		
I	I	I	I	I	* DELAY *	I	* DELAY *	I		
I	I	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)	I		
I	B-AC	I	44.0	I	29.4	I	8.2	I	0.19	I
I	C-A	I	512.0	I	341.4	I		I		I
I	C-B	I	4.1	I	2.8	I	0.5	I	0.12	I
I	A-B	I	12.4	I	8.3	I		I		I
I	A-C	I	1613.2	I	1075.4	I		I		I
I	ALL	I	2185.8	I	1457.2	I	8.7	I	0.00	I

\* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD  
 \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD  
 \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

\*\*\*\*\*END OF RUN\*\*\*\*\*

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted)

I	Intercept For	Slope For	Opposing	Slope For	Opposing	I
I	STREAM B-C	STREAM	A-C	STREAM	A-B	I
I	632.87		0.20		0.08	I

I	Intercept For	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	I
I	STREAM B-A	STREAM	A-C	STREAM	A-B	STREAM	C-A	STREAM	C-B	I
I	491.41		0.18		0.07		0.11		0.26	I

I	Intercept For	Slope For	Opposing	Slope For	Opposing	I
I	STREAM C-B	STREAM	A-C	STREAM	A-B	I
I	745.07		0.23		0.23	I

(NB These values do not allow for any site specific corrections)

TRAFFIC DEMAND DATA

I	ARM	I	FLOW SCALE(%)	I
I	A	I	100	I
I	B	I	100	I
I	C	I	100	I

Demand set: 2018 PM Peak Base + Development

TIME PERIOD BEGINS 17.00 AND ENDS 18.30

LENGTH OF TIME PERIOD - 90 MIN.  
 LENGTH OF TIME SEGMENT - 15 MIN.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

I	ARM	I	NUMBER OF MINUTES FROM START WHEN	I	RATE OF FLOW (VEH/MIN)	I								
I	I	I	FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP I AFTER	I	I	I								
I	I	I	TO RISE I IS REACHED I FALLING I PEAK I OF PEAK I PEAK	I	I	I								
I	ARM A	I	15.00	I	45.00	I	75.00	I	5.61	I	8.42	I	5.61	I
I	ARM B	I	15.00	I	45.00	I	75.00	I	0.21	I	0.32	I	0.21	I
I	ARM C	I	15.00	I	45.00	I	75.00	I	13.20	I	19.80	I	13.20	I

Demand set: 2018 PM Peak Base + Development									
TURNING PROPORTIONS									
TURNING COUNTS									
(PERCENTAGE OF H.V.S)									
TIME	FROM/TO	ARM	A	ARM	B	ARM	C		
17.00 - 17.15	ARM A		0.000	0.020		0.980			
			0.0	9.0		440.0			
			( 0.0)	( 0.0)		( 1.5)			
	ARM B		0.706	0.000		0.294			
			12.0	0.0		5.0			
			( 0.0)	( 0.0)		( 0.0)			
	ARM C		0.980	0.020		0.000			
			1035.0	21.0		0.0			
			( 1.6)	( 0.0)		( 0.0)			
17.15 - 17.30	ARM A		0.000	0.020		0.980			
			0.0	0.0		0.0			
			( 0.0)	( 0.0)		( 1.5)			
	ARM B		0.706	0.000		0.294			
			0.0	0.0		0.0			
			( 0.0)	( 0.0)		( 0.0)			
	ARM C		0.980	0.020		0.000			
			0.0	0.0		0.0			
			( 1.6)	( 0.0)		( 0.0)			
17.30 - 17.45	ARM A		0.000	0.020		0.980			
			0.0	0.0		0.0			
			( 0.0)	( 0.0)		( 0.0)			
	ARM B		0.706	0.000		0.294			
			0.0	0.0		0.0			
			( 0.0)	( 0.0)		( 0.0)			
	ARM C		0.980	0.020		0.000			
			0.0	0.0		0.0			
			( 0.0)	( 0.0)		( 0.0)			
17.45 - 18.00	ARM A		0.000	0.020		0.980			
			0.0	0.0		0.0			
			( 0.0)	( 0.0)		( 0.0)			
	ARM B		0.706	0.000		0.294			
			0.0	0.0		0.0			
			( 0.0)	( 0.0)		( 0.0)			
	ARM C		0.980	0.020		0.000			
			0.0	0.0		0.0			
			( 0.0)	( 0.0)		( 0.0)			
18.00 - 18.15	ARM A		0.000	0.020		0.980			
			0.0	0.0		0.0			
			( 0.0)	( 0.0)		( 0.0)			
	ARM B		0.706	0.000		0.294			
			0.0	0.0		0.0			
			( 0.0)	( 0.0)		( 0.0)			
	ARM C		0.980	0.020		0.000			
			0.0	0.0		0.0			
			( 0.0)	( 0.0)		( 0.0)			
18.15 - 18.30	ARM A		0.000	0.020		0.980			
			0.0	0.0		0.0			
			( 0.0)	( 0.0)		( 0.0)			
	ARM B		0.706	0.000		0.294			
			0.0	0.0		0.0			
			( 0.0)	( 0.0)		( 0.0)			
	ARM C		0.980	0.020		0.000			
			0.0	0.0		0.0			
			( 0.0)	( 0.0)		( 0.0)			





TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
18.15-18.30									
B-AC	0.21	6.38	0.033		0.05	0.03	0.5		0.16
C-A	12.99								
C-B	0.26	11.11	0.024		0.03	0.02	0.4		0.09
A-B	0.11								
A-C	5.52								

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.15	0.0
17.30	0.0
17.45	0.1
18.00	0.1
18.15	0.0
18.30	0.0

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.0
18.15	0.0
18.30	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	STREAM	I	TOTAL DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I	
I	I	I	I	I	* DELAY *	I	* DELAY *	I	
I	I	(VEH)	(VEH/H)	I	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)	
I	B-AC	I	23.4	I	15.6	I	4.3	I	0.18
I	C-A	I	1424.6	I	949.7	I		I	
I	C-B	I	28.9	I	19.3	I	2.7	I	0.10
I	A-B	I	12.4	I	8.3	I		I	
I	A-C	I	605.6	I	403.8	I		I	
I	ALL	I	2094.9	I	1396.6	I	7.0	I	0.00

\* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD  
 \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD  
 \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

\*\*\*\*\*END OF RUN\*\*\*\*\*

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted)

I	Intercept For	Slope For	Opposing	Slope For	Opposing
I	STREAM B-C	STREAM	A-C	STREAM	A-B
I	632.87		0.20		0.08

I	Intercept For	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing
I	STREAM B-A	STREAM	A-C	STREAM	A-B	STREAM	C-A
I	491.41		0.18		0.07		0.11
							0.26

I	Intercept For	Slope For	Opposing	Slope For	Opposing
I	STREAM C-B	STREAM	A-C	STREAM	A-B
I	745.07		0.23		0.23

(NB These values do not allow for any site specific corrections)

TRAFFIC DEMAND DATA

I	ARM	I	FLOW SCALE(%)	I
I	A	I	100	I
I	B	I	100	I
I	C	I	100	I

Demand set: 2020 AM Peak Base + Development

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MIN.  
 LENGTH OF TIME SEGMENT - 15 MIN.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

I	ARM	I	NUMBER OF MINUTES FROM START WHEN	I	RATE OF FLOW (VEH/MIN)	I								
I	I	I	FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP I AFTER	I	I	I								
I	I	I	TO RISE I IS REACHED I FALLING I PEAK I OF PEAK I PEAK	I	I	I								
I	ARM A	I	15.00	I	45.00	I	75.00	I	15.25	I	22.88	I	15.25	I
I	ARM B	I	15.00	I	45.00	I	75.00	I	0.40	I	0.60	I	0.40	I
I	ARM C	I	15.00	I	45.00	I	75.00	I	4.85	I	7.27	I	4.85	I



Demand set: 2020 AM Peak Base + Development										
TURNING PROPORTIONS										
TURNING COUNTS										
(PERCENTAGE OF H.V.S)										
TIME	FROM/TO	ARM	A	ARM	B	ARM	C			
08.00 - 08.15	ARM A		0.000	0.007	0.993					
			0.0	9.0	1211.0					
			( 0.0)	( 0.0)	( 0.0)					
	ARM B		0.250	0.000	0.750					
			8.0	0.0	24.0					
			( 0.0)	( 0.0)	( 0.0)					
	ARM C		0.992	0.008	0.000					
			385.0	3.0	0.0					
			( 0.0)	( 0.0)	( 0.0)					
	08.15 - 08.30	ARM A		0.000	0.007	0.993				
				0.0	0.0	0.0				
				( 0.0)	( 0.0)	( 0.0)				
ARM B			0.250	0.000	0.750					
			0.0	0.0	0.0					
			( 0.0)	( 0.0)	( 0.0)					
ARM C			0.992	0.008	0.000					
			0.0	0.0	0.0					
			( 0.0)	( 0.0)	( 0.0)					
08.30 - 08.45		ARM A		0.000	0.007	0.993				
				0.0	0.0	0.0				
				( 0.0)	( 0.0)	( 0.0)				
	ARM B		0.250	0.000	0.750					
			0.0	0.0	0.0					
			( 0.0)	( 0.0)	( 0.0)					
	ARM C		0.992	0.008	0.000					
			0.0	0.0	0.0					
			( 0.0)	( 0.0)	( 0.0)					
	08.45 - 09.00	ARM A		0.000	0.007	0.993				
				0.0	0.0	0.0				
				( 0.0)	( 0.0)	( 0.0)				
ARM B			0.250	0.000	0.750					
			0.0	0.0	0.0					
			( 0.0)	( 0.0)	( 0.0)					
ARM C			0.992	0.008	0.000					
			0.0	0.0	0.0					
			( 0.0)	( 0.0)	( 0.0)					
09.00 - 09.15		ARM A		0.000	0.007	0.993				
				0.0	0.0	0.0				
				( 0.0)	( 0.0)	( 0.0)				
	ARM B		0.250	0.000	0.750					
			0.0	0.0	0.0					
			( 0.0)	( 0.0)	( 0.0)					
	ARM C		0.992	0.008	0.000					
			0.0	0.0	0.0					
			( 0.0)	( 0.0)	( 0.0)					
	09.15 - 09.30	ARM A		0.000	0.007	0.993				
				0.0	0.0	0.0				
				( 0.0)	( 0.0)	( 0.0)				
ARM B			0.250	0.000	0.750					
			0.0	0.0	0.0					
			( 0.0)	( 0.0)	( 0.0)					
ARM C			0.992	0.008	0.000					
			0.0	0.0	0.0					
			( 0.0)	( 0.0)	( 0.0)					





TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.15-09.30									
B-AC	0.40	6.63	0.061		0.09	0.07	1.0		0.16
C-A	4.83								
C-B	0.04	8.86	0.004		0.01	0.00	0.1		0.11
A-B	0.11								
A-C	15.20								

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.1
08.45	0.1
09.00	0.1
09.15	0.1
09.30	0.1

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0
09.30	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	STREAM	I	TOTAL DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I
I	I	I	I	I	* DELAY *	I	* DELAY *	I
I	I	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)	I
I	B-AC	I 44.0	I 29.4	I 8.4	I 0.19	I 8.4	I 0.19	I
I	C-A	I 529.9	I 353.3	I	I	I	I	I
I	C-B	I 4.1	I 2.8	I 0.5	I 0.13	I 0.5	I 0.13	I
I	A-B	I 12.4	I 8.3	I	I	I	I	I
I	A-C	I 1666.9	I 1111.2	I	I	I	I	I
I	ALL	I 2257.3	I 1504.9	I 8.9	I 0.00	I 8.9	I 0.00	I

\* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD  
 \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD  
 \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

\*\*\*\*\*END OF RUN\*\*\*\*\*

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted)

I	Intercept For	Slope For	Opposing	Slope For	Opposing
I	STREAM B-C	STREAM	A-C	STREAM	A-B
I					
I	632.87		0.20		0.08

I	Intercept For	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing
I	STREAM B-A	STREAM	A-C	STREAM	A-B	STREAM	C-A
I							
I	491.41		0.18		0.07		0.11
I							0.26

I	Intercept For	Slope For	Opposing	Slope For	Opposing
I	STREAM C-B	STREAM	A-C	STREAM	A-B
I					
I	745.07		0.23		0.23

(NB These values do not allow for any site specific corrections)

TRAFFIC DEMAND DATA

I	ARM	I	FLOW SCALE(%)	I
I	A	I	100	I
I	B	I	100	I
I	C	I	100	I

Demand set: 2020 PM Peak Base + Development

TIME PERIOD BEGINS 17.00 AND ENDS 18.30

LENGTH OF TIME PERIOD - 90 MIN.  
 LENGTH OF TIME SEGMENT - 15 MIN.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

I	ARM	I	NUMBER OF MINUTES FROM START WHEN	I	RATE OF FLOW (VEH/MIN)	I			
I	I	I	FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP I AFTER	I	I	I			
I	I	I	TO RISE I IS REACHED I FALLING I PEAK I OF PEAK I PEAK	I	I	I			
I	I	I	I	I	I	I			
I	ARM A	I	15.00	I 45.00	I 75.00	I 5.80	I 8.70	I 5.80	I
I	ARM B	I	15.00	I 45.00	I 75.00	I 0.21	I 0.32	I 0.21	I
I	ARM C	I	15.00	I 45.00	I 75.00	I 13.64	I 20.46	I 13.64	I

Demand set: 2020 PM Peak Base + Development									
TURNING PROPORTIONS									
TURNING COUNTS									
(PERCENTAGE OF H.V.S)									
TIME	FROM/TO	ARM	A	ARM	B	ARM	C		
17.00 - 17.15	ARM A	0.000	0.019	0.981	0.0	9.0	455.0	(0.0)	(0.0)
	ARM B	0.706	0.000	0.294	12.0	0.0	5.0	(0.0)	(0.0)
	ARM C	0.981	0.019	0.000	1070.0	21.0	0.0	(0.0)	(0.0)
17.15 - 17.30	ARM A	0.000	0.019	0.981	0.0	0.0	0.0	(0.0)	(0.0)
	ARM B	0.706	0.000	0.294	0.0	0.0	0.0	(0.0)	(0.0)
	ARM C	0.981	0.019	0.000	0.0	0.0	0.0	(0.0)	(0.0)
17.30 - 17.45	ARM A	0.000	0.019	0.981	0.0	0.0	0.0	(0.0)	(0.0)
	ARM B	0.706	0.000	0.294	0.0	0.0	0.0	(0.0)	(0.0)
	ARM C	0.981	0.019	0.000	0.0	0.0	0.0	(0.0)	(0.0)
17.45 - 18.00	ARM A	0.000	0.019	0.981	0.0	0.0	0.0	(0.0)	(0.0)
	ARM B	0.706	0.000	0.294	0.0	0.0	0.0	(0.0)	(0.0)
	ARM C	0.981	0.019	0.000	0.0	0.0	0.0	(0.0)	(0.0)
18.00 - 18.15	ARM A	0.000	0.019	0.981	0.0	0.0	0.0	(0.0)	(0.0)
	ARM B	0.706	0.000	0.294	0.0	0.0	0.0	(0.0)	(0.0)
	ARM C	0.981	0.019	0.000	0.0	0.0	0.0	(0.0)	(0.0)
18.15 - 18.30	ARM A	0.000	0.019	0.981	0.0	0.0	0.0	(0.0)	(0.0)
	ARM B	0.706	0.000	0.294	0.0	0.0	0.0	(0.0)	(0.0)
	ARM C	0.981	0.019	0.000	0.0	0.0	0.0	(0.0)	(0.0)







TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
18.15-18.30									
B-AC	0.21	6.30	0.034		0.05	0.04	0.5		0.16
C-A	13.43								
C-B	0.26	11.07	0.024		0.03	0.02	0.4		0.09
A-B	0.11								
A-C	5.71								

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.15	0.0
17.30	0.0
17.45	0.1
18.00	0.1
18.15	0.0
18.30	0.0

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.0
18.15	0.0
18.30	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	STREAM	I	TOTAL DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I	
I	I	I	I	I	* DELAY *	I	* DELAY *	I	
I	I	I	I	I	I	I	I	I	
I	I	(VEH)	(VEH/H)	I	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)	
I	B-AC	I	23.4	I	15.6	I	4.3	I	0.19
I	C-A	I	1472.8	I	981.9	I		I	
I	C-B	I	28.9	I	19.3	I	2.8	I	0.10
I	A-B	I	12.4	I	8.3	I		I	
I	A-C	I	626.3	I	417.5	I		I	
I	ALL	I	2163.7	I	1442.5	I	7.1	I	0.00

\* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD  
 \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD  
 \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

\*\*\*\*\*END OF RUN\*\*\*\*\*

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted)

I	Intercept For	Slope For	Opposing	Slope For	Opposing
I	STREAM B-C	STREAM	A-C	STREAM	A-B
I	I	I	I	I	I
I	632.87		0.20		0.08

I	Intercept For	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing
I	STREAM B-A	STREAM	A-C	STREAM	A-B	STREAM	C-A
I	I	I	I	I	I	I	I
I	491.41		0.18		0.07		0.11
							0.26

I	Intercept For	Slope For	Opposing	Slope For	Opposing
I	STREAM C-B	STREAM	A-C	STREAM	A-B
I	I	I	I	I	I
I	745.07		0.23		0.23

(NB These values do not allow for any site specific corrections)

TRAFFIC DEMAND DATA

I	ARM	I	FLOW SCALE(%)	I
I	I	I	I	I
I	A	I	100	I
I	B	I	100	I
I	C	I	100	I

Demand set: 2020 AM Peak Base + Full Housing Allocation

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

LENGTH OF TIME PERIOD - 90 MIN.  
 LENGTH OF TIME SEGMENT - 15 MIN.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

I	ARM	I	NUMBER OF MINUTES FROM START WHEN	I	RATE OF FLOW (VEH/MIN)	I								
I	I	I	FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP I AFTER	I	I	I								
I	I	I	TO RISE I IS REACHED I FALLING I PEAK I OF PEAK I PEAK	I	I	I								
I	I	I	I	I	I	I								
I	ARM A	I	15.00	I	45.00	I	75.00	I	15.27	I	22.91	I	15.27	I
I	ARM B	I	15.00	I	45.00	I	75.00	I	0.50	I	0.75	I	0.50	I
I	ARM C	I	15.00	I	45.00	I	75.00	I	4.85	I	7.27	I	4.85	I

Demand set: 2020 AM Peak Base + Full Housing Allocation

I		I		TURNING PROPORTIONS	I
I		I		TURNING COUNTS	I
I		I		(PERCENTAGE OF H.V.S)	I

	TIME	FROM/TO	ARM	A	ARM	B	ARM	C
I	08.00 - 08.15	I		I		I		I
I		I	ARM A	I 0.000	I 0.009	I 0.991	I	I
I		I		I 0.0	I 11.0	I 1211.0	I	I
I		I		I ( 0.0)	I ( 0.0)	I ( 0.0)	I	I
I		I		I	I	I	I	I
I		I	ARM B	I 0.250	I 0.000	I 0.750	I	I
I		I		I 10.0	I 0.0	I 30.0	I	I
I		I		I ( 0.0)	I ( 0.0)	I ( 0.0)	I	I
I		I		I	I	I	I	I
I		I	ARM C	I 0.992	I 0.008	I 0.000	I	I
I		I		I 385.0	I 3.0	I 0.0	I	I
I		I		I ( 0.0)	I ( 0.0)	I ( 0.0)	I	I
I		I		I	I	I	I	I

I	08.15 - 08.30	I		I		I		I
I		I	ARM A	I 0.000	I 0.009	I 0.991	I	I
I		I		I 0.0	I 0.0	I 0.0	I	I
I		I		I ( 0.0)	I ( 0.0)	I ( 0.0)	I	I
I		I		I	I	I	I	I
I		I	ARM B	I 0.250	I 0.000	I 0.750	I	I
I		I		I 0.0	I 0.0	I 0.0	I	I
I		I		I ( 0.0)	I ( 0.0)	I ( 0.0)	I	I
I		I		I	I	I	I	I
I		I	ARM C	I 0.992	I 0.008	I 0.000	I	I
I		I		I 0.0	I 0.0	I 0.0	I	I
I		I		I ( 0.0)	I ( 0.0)	I ( 0.0)	I	I
I		I		I	I	I	I	I

I	08.30 - 08.45	I		I		I		I
I		I	ARM A	I 0.000	I 0.009	I 0.991	I	I
I		I		I 0.0	I 0.0	I 0.0	I	I
I		I		I ( 0.0)	I ( 0.0)	I ( 0.0)	I	I
I		I		I	I	I	I	I
I		I	ARM B	I 0.250	I 0.000	I 0.750	I	I
I		I		I 0.0	I 0.0	I 0.0	I	I
I		I		I ( 0.0)	I ( 0.0)	I ( 0.0)	I	I
I		I		I	I	I	I	I
I		I	ARM C	I 0.992	I 0.008	I 0.000	I	I
I		I		I 0.0	I 0.0	I 0.0	I	I
I		I		I ( 0.0)	I ( 0.0)	I ( 0.0)	I	I
I		I		I	I	I	I	I

I	08.45 - 09.00	I		I		I		I
I		I	ARM A	I 0.000	I 0.009	I 0.991	I	I
I		I		I 0.0	I 0.0	I 0.0	I	I
I		I		I ( 0.0)	I ( 0.0)	I ( 0.0)	I	I
I		I		I	I	I	I	I
I		I	ARM B	I 0.250	I 0.000	I 0.750	I	I
I		I		I 0.0	I 0.0	I 0.0	I	I
I		I		I ( 0.0)	I ( 0.0)	I ( 0.0)	I	I
I		I		I	I	I	I	I
I		I	ARM C	I 0.992	I 0.008	I 0.000	I	I
I		I		I 0.0	I 0.0	I 0.0	I	I
I		I		I ( 0.0)	I ( 0.0)	I ( 0.0)	I	I
I		I		I	I	I	I	I

I	09.00 - 09.15	I		I		I		I
I		I	ARM A	I 0.000	I 0.009	I 0.991	I	I
I		I		I 0.0	I 0.0	I 0.0	I	I
I		I		I ( 0.0)	I ( 0.0)	I ( 0.0)	I	I
I		I		I	I	I	I	I
I		I	ARM B	I 0.250	I 0.000	I 0.750	I	I
I		I		I 0.0	I 0.0	I 0.0	I	I
I		I		I ( 0.0)	I ( 0.0)	I ( 0.0)	I	I
I		I		I	I	I	I	I
I		I	ARM C	I 0.992	I 0.008	I 0.000	I	I
I		I		I 0.0	I 0.0	I 0.0	I	I
I		I		I ( 0.0)	I ( 0.0)	I ( 0.0)	I	I
I		I		I	I	I	I	I

I	09.15 - 09.30	I		I		I		I
I		I	ARM A	I 0.000	I 0.009	I 0.991	I	I
I		I		I 0.0	I 0.0	I 0.0	I	I
I		I		I ( 0.0)	I ( 0.0)	I ( 0.0)	I	I
I		I		I	I	I	I	I
I		I	ARM B	I 0.250	I 0.000	I 0.750	I	I
I		I		I 0.0	I 0.0	I 0.0	I	I
I		I		I ( 0.0)	I ( 0.0)	I ( 0.0)	I	I
I		I		I	I	I	I	I
I		I	ARM C	I 0.992	I 0.008	I 0.000	I	I
I		I		I 0.0	I 0.0	I 0.0	I	I
I		I		I ( 0.0)	I ( 0.0)	I ( 0.0)	I	I
I		I		I	I	I	I	I





TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.15-09.30									
B-AC	0.50	6.62	0.076		0.11	0.08	1.3		0.16
C-A	4.83								
C-B	0.04	8.86	0.004		0.01	0.00	0.1		0.11
A-B	0.14								
A-C	15.20								

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.1
08.45	0.2
09.00	0.2
09.15	0.1
09.30	0.1

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0
09.30	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	STREAM	I	TOTAL DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I		
I	I	I	I	I	* DELAY *	I	* DELAY *	I		
I	I	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)	I		
I	B-AC	I	55.1	I	36.7	I	10.7	I	0.19	I
I	C-A	I	529.9	I	353.3	I		I		I
I	C-B	I	4.1	I	2.8	I	0.5	I	0.13	I
I	A-B	I	15.1	I	10.1	I		I		I
I	A-C	I	1666.9	I	1111.2	I		I		I
I	ALL	I	2271.1	I	1514.1	I	11.2	I	0.00	I

\* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD  
 \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD  
 \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

\*\*\*\*\*END OF RUN\*\*\*\*\*

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted)

I	Intercept	For Slope	For Opposing	Slope For Opposing	I
I	STREAM B-C	STREAM	A-C	STREAM A-B	I
I	632.87		0.20	0.08	I

I	Intercept	For Slope	For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I	STREAM B-A	STREAM	A-C	STREAM A-B	STREAM C-A	STREAM C-B	I
I	491.41		0.18	0.07	0.11	0.26	I

I	Intercept	For Slope	For Opposing	Slope For Opposing	I
I	STREAM C-B	STREAM	A-C	STREAM A-B	I
I	745.07		0.23	0.23	I

(NB These values do not allow for any site specific corrections)

TRAFFIC DEMAND DATA

I	ARM	I	FLOW SCALE(%)	I
I	A	I	100	I
I	B	I	100	I
I	C	I	100	I

Demand set: 2020 PM Peak Base + Full Housing Allocation

TIME PERIOD BEGINS 17.00 AND ENDS 18.30

LENGTH OF TIME PERIOD - 90 MIN.  
 LENGTH OF TIME SEGMENT - 15 MIN.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

I	ARM	I	NUMBER OF MINUTES FROM START WHEN	I	RATE OF FLOW (VEH/MIN)	I								
I	I	I	FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP I AFTER	I	I	I								
I	I	I	TO RISE I IS REACHED I FALLING I PEAK I OF PEAK I PEAK	I	I	I								
I	ARM A	I	15.00	I	45.00	I	75.00	I	5.82	I	8.74	I	5.82	I
I	ARM B	I	15.00	I	45.00	I	75.00	I	0.29	I	0.43	I	0.29	I
I	ARM C	I	15.00	I	45.00	I	75.00	I	13.71	I	20.57	I	13.71	I

Demand set: 2020 PM Peak Base + Full Housing Allocation

		TURNING PROPORTIONS					
		TURNING COUNTS					
		(PERCENTAGE OF H.V.S)					
TIME	FROM/TO	ARM	A	ARM	B	ARM	C
17.00 - 17.15	ARM A	0.000	0.024	0.976	0.0	11.0	455.0
		( 0.0)	( 0.0)	( 0.0)			
	ARM B	0.696	0.000	0.304	16.0	0.0	7.0
		( 0.0)	( 0.0)	( 0.0)			
	ARM C	0.975	0.025	0.000	1070.0	27.0	0.0
		( 0.0)	( 0.0)	( 0.0)			
17.15 - 17.30	ARM A	0.000	0.024	0.976	0.0	0.0	0.0
		( 0.0)	( 0.0)	( 0.0)			
	ARM B	0.696	0.000	0.304	0.0	0.0	0.0
		( 0.0)	( 0.0)	( 0.0)			
	ARM C	0.975	0.025	0.000	0.0	0.0	0.0
		( 0.0)	( 0.0)	( 0.0)			
17.30 - 17.45	ARM A	0.000	0.024	0.976	0.0	0.0	0.0
		( 0.0)	( 0.0)	( 0.0)			
	ARM B	0.696	0.000	0.304	0.0	0.0	0.0
		( 0.0)	( 0.0)	( 0.0)			
	ARM C	0.975	0.025	0.000	0.0	0.0	0.0
		( 0.0)	( 0.0)	( 0.0)			
17.45 - 18.00	ARM A	0.000	0.024	0.976	0.0	0.0	0.0
		( 0.0)	( 0.0)	( 0.0)			
	ARM B	0.696	0.000	0.304	0.0	0.0	0.0
		( 0.0)	( 0.0)	( 0.0)			
	ARM C	0.975	0.025	0.000	0.0	0.0	0.0
		( 0.0)	( 0.0)	( 0.0)			
18.00 - 18.15	ARM A	0.000	0.024	0.976	0.0	0.0	0.0
		( 0.0)	( 0.0)	( 0.0)			
	ARM B	0.696	0.000	0.304	0.0	0.0	0.0
		( 0.0)	( 0.0)	( 0.0)			
	ARM C	0.975	0.025	0.000	0.0	0.0	0.0
		( 0.0)	( 0.0)	( 0.0)			
18.15 - 18.30	ARM A	0.000	0.024	0.976	0.0	0.0	0.0
		( 0.0)	( 0.0)	( 0.0)			
	ARM B	0.696	0.000	0.304	0.0	0.0	0.0
		( 0.0)	( 0.0)	( 0.0)			
	ARM C	0.975	0.025	0.000	0.0	0.0	0.0
		( 0.0)	( 0.0)	( 0.0)			







TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
18.15-18.30									
B-AC	0.29	6.31	0.046		0.06	0.05	0.7		0.17
C-A	13.43								
C-B	0.34	11.06	0.031		0.04	0.03	0.5		0.09
A-B	0.14								
A-C	5.71								

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.15	0.0
17.30	0.1
17.45	0.1
18.00	0.1
18.15	0.1
18.30	0.0

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.0
18.15	0.0
18.30	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	DEMAND (VEH/H)	* QUEUEING * * DELAY * (MIN)	* INCLUSIVE QUEUEING * * DELAY * (MIN/VEH)
B-AC	31.7	21.1	6.0	0.19
C-A	1472.8	981.9		
C-B	37.2	24.8	3.6	0.10
A-B	15.1	10.1		
A-C	626.3	417.5		
ALL	2183.0	1455.3	9.6	0.00

\* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD  
 \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES  
 WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD  
 \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS  
 A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

\*\*\*\*\*END OF RUN\*\*\*\*\*

==== end of file =====