Appendix F

Traffic Impact Assessment

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APPENDICES

1 INTRODUCTION

This report assesses the transportation impact of the Corrib Onshore Pipeline development and it is a stand-alone document complementing the traffic section in Chapter 7 in the overall EIS. This report should be read in conjunction with the Traffic Management Plan, prepared by Tobin Consulting Engineers and layout plans and project description sections of the EIS.

The characteristics of the onshore pipeline development are such that the dominant traffic impact will be during its construction stage. The operational stage will have minimal traffic movements associated with periodic maintenance checks. During the scoping phase of this project, it was recognised that the proposed development is likely to have a higher traffic impact on the surrounding road network during the construction phase rather than the operational and decommissioning phase. As a result, this Traffic Impact Assessment (TIA) focuses on the traffic impacts associated with the construction phase of the proposed development.

The main purpose of this report is to consider the traffic implications of the revised development. This TIA assesses the impact of the development on the local road network and deals with the traffic and highway considerations of the development proposals. This includes an assessment of the existing traffic conditions and of the future traffic conditions with and without the proposed development in place. In addition, mitigation measures are proposed in order to alleviate any significant negative impacts that may arise from the proposed development. This assessment has been prepared with ongoing discussions with the Project Team, and Shell E&P Ireland Ltd. (SEPIL).

This TIA has been undertaken in accordance with the National Roads Authority *Traffic and Transport Assessment Guidelines,* the Institution of Highways and Transportation's (IHT) document *Guidelines for Traffic Impact Assessment,* and the NRA document *Design Manual for Roads and Bridges.*

2 METHODOLOGY

The methodology, as described below, was adopted for this TIA.

2.1 STUDY AREA

The proposed study area includes two regional roads, the R313 and the R314, and a number of local roads. Eight priority junctions, that surround the proposed pipeline route corridor, were included in the assessment of the study area.

A review and assessment of the existing road network and traffic conditions was undertaken to gain an appreciation of the current traffic patterns and trends within the study area. This included the following:

- Existing traffic conditions with the aid of traffic surveys, accident data;
- Road geometry assessing the adequacy of the road network;
- Junction capacity assessments determining possible queues and delays at individual junctions; and
- Link flow capacity assessment on roads within the study area, which would establish if the current road conditions can cater for the existing traffic volumes.

2.2 ASSESSMENT CRITERIA

2.2.1.1 Construction Phase

Future traffic flows for all roads in the study network were forecasted using the NRA growth factors (NRA Future Traffic Forecasts 2002 – 2040, August 2003) in conjunction with recorded 2007 traffic flows. Each junction potentially impacted by the proposed development was assessed for junction capacity using the PICADY (Priority Intersection Capacity and Delay) computer modelling programme for predicting capacities, queues and delay at junctions. In addition, an assessment of the link flow capacity and the geometrics on each road impacted by the proposed development was undertaken to determine whether the road network has adequate capacity to cater for the traffic associated with the development.

2.2.1.2 Operational Phase

There will be minimal traffic associated with the operation of the proposed development, such as maintenance checks. Once every 4-5 years the LVI will require a maintenance inspection, which will require the use of heavy machinery, but this will not involve a high number of traffic movements. Given that there will be no significant traffic impacts during the operational phase, an assessment of the operational phase traffic on the surrounding road network was not deemed necessary. A Traffic Management Plan will be prepared for the operational stage of the onshore pipeline.

2.3 FORECASTING METHODS

The estimated 'future year' traffic volumes within the Study Area for the 'construction year', 'opening year' and 'design year' were calculated using the National Roads Authority's (NRA) traffic growth figures (*NRA Future Traffic Forecasts 2002 – 2040, August 2003*).

The NRA traffic growth factors used to determine the growth in background traffic on the surrounding road network have been summarised in **Table 2.1.** The road network within the study area for this project consists of Non National Roads only. Using the factors, together with existing traffic flows, the future year scenarios were forecasted for all roads in the study network.

Table 2.1: Traffic Growth Factors

Road Type	Growth Period	Growth Factor (Cars & LGVs*)	Growth Factor (HCV**)
Non National	2007 – 2011	1.06	1.06
	2007 – 2013	1.09	1.08
	2007 – 2028	1.23	1.26

* LGVs – Light Goods Vehicles similar to that of a van/ commercial vehicle

** HCVs – Heavy Goods Vehicles similar to that of a truck or lorry

The 'future traffic' volumes combined with committed development volumes and the traffic associated with the proposed development were inputted into an Excel Spreadsheet model. A number of scenarios, described later, were tested to assess the traffic impact of the proposed development on the surrounding road network. These scenarios included the comparison of *Do Nothing* (that is without the development in place) and *Do Something* (that is with the development in place).

2.4 GUIDELINES

This TIA has been undertaken in accordance with the EPA document *Guidelines for Information to be contained in Environmental Impact Statements (2002),* the NRA document *Traffic and Transport Assessment Guidelines (2007)* and the Institute of Highways and Transportation document *Guidelines for Traffic Impact Assessment (1994).* Other sources referred to included:-

- EPA, 2003 *Advice Notes on Current Practices (in the preparation of Environmental Impact Statements)*;
- National Roads Authority, Design Manual for Roads & Bridges;
- Highways Agency (UK), Design Manual for Roads & Bridges;
- National Roads Authority, September 2007, Draft Traffic and Transport Assessment Guidelines;
- Dublin Transportation Office, May 2003, Traffic Management Guidelines Manual;
- Expansion Factors for Short Period Traffic Counts 1978 by J Delvin;
- Greater Manchester Transportation Unit, May 1991, The estimation and Appraisal of Saturation Flows In Conjunction With SATURN Networks – Note 155; and
- Reference has also been made to a number of previous studies including the Bellanaboy Bridge Gas Terminal EIS, 2003 and the Corrib Offshore EIS 2001.

2.5 PREVIOUS STUDIES

This section gives details of the studies already carried out in relation to this project.

2.5.1 Bellanaboy Bridge Gas Terminal EIS

An EIS was undertaken for the Bellanaboy Bridge Gas Terminal in 2003. This was undertaken by RSK ENSR Environment LTD. on behalf of Shell E&P Ireland Ltd. (previously Enterprise Energy Ireland). The Bellanaboy Bridge Gas Terminal is located approximately 17km to the east of Belmullet and 10km north of Bangor Erris. It is situated to the north of the R314 Regional Road.

The traffic chapter is contained in Section 16.3 of the EIS. In order to establish the baseline traffic flows on the road network, at the time of the study, junction turning count surveys were undertaken at eight locations across the study area between March 2001 and October 2003.

These locations included the following priority junctions:

- R313 with the R314
- Cross roads with the R314, the L1202 and the L5284
- R314 with the L5243
- Cross roads with the R314 and the L1204
- R314 with the L1202
- R314 with the L1203 towards Rossport
- R313 with the L1204
- R313 with the L12044

A detailed road network inventory was undertaken and following this the recommended route to the construction site was considered to be: N59 to Bangor Erris, R313 to County Road L1204 to R314 and then to the site access road.

In preparation of the site for construction it was required to remove approximately 450,000m^3 of peat to a deposition site, approximately 10km south of the terminal site. It was estimated that 400 return journeys per day would be required during this phase.

The Bellanaboy Bridge Gas Terminal EIS predicted that the maximum number of car trips made to the proposed Terminal by site operatives would be 328 vehicles in the morning peak hour in any month during the construction phase of the project based on a maximum 500 site operatives. During some periods it was estimated that there will be up to 100 trucks trips per day but during the majority of the construction period the frequency of heavy commercial vehicles (HCVs) movements would be much lower.

It was estimated that 50 people would be employed when the Terminal is operational. The development will operate in four shifts, which means there will be approximately 15 to 20 people on site at any time. There will also be a low number of commercial vehicle movements to and from the Bellanaboy Bridge Gas Terminal when operational, such as catering supplies and maintenance vehicles. It was estimated that no more than 3 HCVs or light good vehicles (LGVs) per day (on average) would service the site.

The worst-case scenario, during the operational stage of the Bellanaboy Bridge Gas Terminal , was taken for traffic modelling purposes and it was assumed that 20 vehicles enter and 20 vehicles leave

the site during the peak hour to account for overlap in traffic due to shift changes. It was also assumed that 100% of traffic would arrive from Bangor via the L1204 and from Glenamoy simultaneously in order to model the onerous case of right turning vehicles.

Junction capacity assessments were carried out on the junctions that will be impacted on as a result of the development. These were the junction of the R313 with the L1204, site access junction and the junction of the R314 with the L1204. The scenarios tested were the peat haulage stage, the construction stage and the operational stage. It was found that the junctions could cater for all of these scenarios adequately.

It was found that the main impact of the construction vehicles would be in relation to the possible damage to the pavement due to the amount of traffic using the route during the construction phase.

The findings of the EIS were that the development would not have any significant traffic effects when it is operational. During the construction phase the volumes of traffic can be catered for on the road network. The report recommended that the haulage route be strengthened to mitigate against the damaging effects of the HCVs on the road pavement and structures along the route. It also recommended where necessary that the haul route be widened to ensure that vehicles can pass safely.

As a result of the recommendations from the Bellanaboy Bridge Gas Terminal EIS, road widening and strengthening works were undertaken on the L1204 in order to accommodate the construction vehicles. The R313/L1204 junction and the R314/L1204 junctions were improved in order to provide additional sight visibility and junction radii.

2.5.2 Corrib Offshore Pipeline EIS

The 'Corrib Field Development (Offshore Field to Gas Terminal)' EIS was prepared in 2001 in respect of the offshore elements of the pipeline between the gas field and Terminal.

The traffic chapter is contained in Section 19.15 of the EIS. In order to establish the baseline traffic flows on the road network, at the time of the study, junction turning count surveys were undertaken at six locations across the study area in March 2001.

These locations included the following priority junctions:

- R313 with the R314
- Cross roads with the R314, the L1202 and the L5284
- R314 with the L5243
- Cross roads with the R314 and the L1204
- R314 with the L1202
- R314 with the L1203

The results of the traffic surveys show that the levels of traffic on the study area road network were low. They also showed that the R313 junction with the R314 was the most heavily trafficked location.

A detailed road network inventory was undertaken in the area and following this it was recommended that the route for the construction workers be the N59 to Bangor, R313 to County Road L1204 (The L1204 was referred to LP204 in the Corrib Offshore Pipeline EIS), County Road L1204 to R314 and then to site access road. For HCVs it was recommended that they use only regional roads to access

the site. This would mean that they use the N59 to Bangor, R313 to R314, and R314 to the site access road.

2.5.2.1 Predicted Traffic Impacts

It was predicted that during the construction phase there would be a maximum of 90 site operatives employed with an associated maximum number of car movements of 120 per day. The maximum number of HCVs during the construction phase was predicted as 40 per day.

The predicted impact of the construction phase was assessed separately for staff/labour and the HCV movements. For the staff/labour two junctions were modelled-namely the junction of the L1204 and the R314, and the junction of the R314 and the proposed site access road. Two different scenarios were assessed for each of these junctions; the scenario of

- All trips to the site via construction route L1204 and
- All trips to the site divided equally over all routes to the site.

It was found that in both scenarios the two junctions were operating within capacity.

It was proposed in the Corrib Offshore Pipeline EIS, that HCV movements to the site would not arrive to the site before 9:30 or leave after 16:30, due to the remote location of the site. All HCVs would use the recommended haulage route, the maximum number of HCV movements to the site would be 41 per day and these movements would be averaged over the day giving a figure of 6 movements per hour. It was found that, on the basis of the existing background traffic, the additional HCV movements generated would not have a negative impact on the operation of the study area road network, in terms of reserve capacity or queuing. The main impact of the construction vehicles was in the context of damage to the pavement due to the amount of traffic using the route.

2.5.2.2 Mitigation Measures

The following is a list of the key mitigation measures were recommended by the report:

- To avoid delay to the school buses and peak hour traffic in the area, all trips to the site by construction workers were made before 08:00hrs each morning to avoid the morning rush;
- Consideration was given to the provision of a minibus service to bring construction staff to the site, to minimise the traffic impact;
- The bulk of deliveries of both plant and materials to the construction site, whenever possible was restricted to the hours between 09:30 hrs and 14:30 hrs;
- All signage relating to the proposed construction routes for construction traffic must be positioned clearly and designed to the satisfaction of Mayo County Council; and
- The developers were committed to reinstating the proposed haul route following the completion of the construction phase.

2.5.3 Bellanaboy Bridge Gas Terminal, Traffic Management Plan

Tobin Consulting Engineers undertook a Traffic Management Plan for the construction of the Bellanaboy Bridge Gas Terminal in February 2004, which was updated on a regular basis to reflect changes in the various construction phases. The Traffic Management Plan contains details of existing traffic and road conditions, the haulage route, proposed road improvements and a breakdown of truck movements for construction. It also includes details of the transportation of materials associated with the pipeline construction and road improvement works.

2.5.3.1 Review of the Peat Transport Operation

Movement of the large volume of peat, from the Bellanaboy Bridge Gas Terminal Site to the Bord na Móna Deposition Site on the outskirts of Bangor, was covered in the Bellanaboy Bridge Gas Terminal, Traffic Management Plan by detailed planning of the logistics of the operation. The peat haulage operation commenced in April 2005, and continued for a short period before being discontinued due to disruption of the project. It was resumed and completed in the summer of 2007. The operation adhered to the detail of the Traffic Management Plans, with the exception of installation of GPS recorders in the haulage vehicles, intended to prevent unauthorised out of hours use. This was not required, since all haulage was performed by a single Licensed Haulage Contractor, who parked all vehicles each evening at the Terminal Site. In retrospect, the operation was a success and it established a sustainable and safely manageable level of HCV traffic on the R313, L1204 and R314 sections of the haul route.

2.5.3.2 The Haul Route

A review of the haulage route stated in the Bellanaboy Bridge Gas Terminal, Traffic Management Plan stated that the haulage of materials to the site for the construction project had a local origin-destination profile for materials such as aggregates, concrete and roadmaking materials, but was national in scale for the more specialised equipment, most of which entered the country via the Port of Dublin.

The haulage route from the Port of Dublin was via the Port Tunnel, M50, M4/N4, N59, R313, L1204 and the R314. Traffic impacts on these routes, in terms of normal HCV loads, was minimal in the overall volume of such traffic using these routes daily.

The focus of the Plan was primarily on the Haul Route as it nears the Terminal Site, since this is where impacts on local traffic are likely to be greatest. The relevant sections of the Haul Route lie along the L1204 county road, linking Bellanaboy to the R313 at Bangor Erris and with the R314 from Glenamoy to the Bellanaboy Bridge Gas Terminal.

The L1204 is the principal artery, and materials flows continue to be preferentially directed onto the upgraded pavement on this route.

2.5.3.3 Road Improvements

The road improvement works comprised of:-

1. The widening of the Haul Route to provide a minimum of 5.5m paved width throughout its length.
2. The removal of visibility deficiencies through a combination of minor realignments and hedge trimming.

3. The replacement of weak bridge structures at Cloontakilla and Glenturk Beg and a piped culvert at Cloontakilla.
4. The carrying out of pavement strengthening works over the full extent of the local route.

2.5.3.4 Truck Movements

The Bellanaboy Bridge Gas Terminal, Traffic Management Plan estimated that a total of 180 loads of pipework, tanks, refining equipment, mechanical and electrical control equipment and ancillary equipment was brought to site, predominantly in 2008 (though some arrived on site in 2007), prior to commissioning of the Gas Terminal.

Apart from these scheduled loads of equipment, there was on-going HCV traffic associated with the haulage of aggregates, concrete, road making materials and similar commodity construction materials.

2.5.3.5 Parallel Materials Transport Related to Pipeline Works

The projected profile of combined project traffic for 2008 shows that HCV traffic averages between 50 and 60 vehicles per day in the period from March to September. Traffic associated with personnel employed on the construction work, both at the Terminal and at the Pipeline sites, varies between 400 and 500 vehicles per day approximately.

These HCV traffic volumes are well within those experienced previously with the peat haulage operation. The greater number of private vehicle movements associated with the workforce tends to be more concentrated at the start and end of the working day. In 2009, the traffic volumes are less and taper off towards August of that year.

2.5.3.6 Traffic Management

The traffic management of the haulage operation is formed by strictly controlling the following elements:

- Road Signage
- Communication by Radio, Telecoms and Print Media
- Lighting of Junctions and Working Areas
- Areas of Restricted Carriageway Width
- Speed Limits and Separation Distances
- Accommodating the needs of Local Residents
- Record Keeping
- Driver Training
- Inspections
- Road Condition Maintenance
- Emergencies and Contingencies
- Strict adherence to approved working hours

Based on the recommendations from previous studies (EIS and Traffic Management Plans developed for different stages of the Corrib Gas Project), an extensive programme of road improvements were undertaken on the L1204 with junction improvements at the intersection of the R313 and R314. The road improvements comprised road widening and strengthening works in order to accommodate construction vehicles accessing the Bellanaboy Bridge Gas Terminal site. In addition road improvements works were also undertaken on the L1202 between the junction with the R313 and Aghoos.

In addition to the improvements to the road infrastructure, contractors undertaking the peat haulage operation from Bellanaboy Bridge Gas Terminal site in 2005 and 2007 gained vital experience in the effective management of construction related traffic through extensive training programmes for HCV drivers and speed control and convoy management. It is proposed to use the proven methods adopted by contractors on previous stages of the project in order to manage HCV movement to the site compounds at Aghoos and Glengad.

3 EXISTING ENVIRONMENT

The proposed development is located within the administrative area of Mayo County Council. It is situated in a predominantly rural area in northwest County Mayo. It is approximately 10km to the east of Belmullet and 12km to the north of Bangor Erris. The R314 regional road, which links Belmullet to Ballycastle, is to the south of the proposed development. All other roads in the immediate vicinity of the proposed route are of local road status and provide linkages to villages such as Rossport, Carrowteige, Porturlin, Inver, Aghoos, Glenamoy, Belmullet and Pollatomish. Pollatomish National School is located on the L1202 in Pollatomish village.

Traffic surveys were carried out in August 2007 (Wednesday 8th to Tuesday 14th August 2007) and again in September 2007 (Monday 17th to Sunday 23rd September 2007). It is standard practice to undertake traffic surveys during the school term as this normally coincides with the highest traffic level. However given that the region of Erris is a tourist area, it was deemed appropriate to carry out surveys during the peak tourist season (August). The survey periods were selected to give traffic data during, the busy tourist period during the summer months and the standard traffic levels during the school term. This will ensure that peak existing traffic volumes will be considered in this assessment.

It should be noted that these traffic surveys were undertaken in the same locations as the traffic data collected in the Bellanaboy Bridge Gas Terminal EIS and the Corrib Offshore Pipeline EIS. The survey results showed a small increase in traffic on the local road network, which would be expected as the previous EIS data were collected in 2001 and 2002. However it should be noted that due to current and short-term predicted economic conditions and other national and regional policy measures for reducing car usage levels, in general growth rates in background traffic flows have reduced from the peak levels of 2006/2007.

The Belmullet Arts Festival took place from the 15th - 19th of August 2007. The traffic surveys were undertaken before this festival in August and, therefore, this traffic is not included in the traffic data.

3.1 TRAFFIC SURVEY DETAILS

In order to gain an appreciation of the existing traffic patterns in the area, the following traffic surveys, summarised in **Table 3.1** were undertaken within the study area. The locations of the surveys are shown in **Figure TR0001 in Appendix A.**

Table 3.1: Location and Type of Junction Surveyed

Location	Survey Type	Site Reference Number from Figure TR0001
R313/R314	12 Hour Manual Classified Turning Count and Three 7 Day Link Flow Surveys	1
Cross roads with the R314, the County Road to Inver and the L5284	12 Hour Manual Classified Turning Count	2
R314 with County Road to Pollatomish	12 Hour Manual Classified Turning Count and Three 7 Day Link Flow Surveys	3
Cross roads with the R314 and the L1204	12 Hour Manual Classified Turning Count	4
R314 with County Road L1202	12 Hour Manual Classified Turning Count	5
R314 with County Road towards Rossport	12 Hour Manual Classified Turning Count and Three 7 Day Link Flow Surveys	6
Pollatomish	12 Hour Manual Classified Turning Count	7
R313 with County Road L1204	12 Hour Manual Classified Turning Count and Three 7 Day Link Flow Surveys	8

3.1.1 Manual Classified Junction Turning Counts

Junction Turning Counts were undertaken for a 12-hour period on Wednesday 8th August 2007 and on Wednesday 19th September 2007 at the eight survey sites shown in **Figure TR0001**. This data was assessed in terms of total through movements, primary through movement, % HCV etc for the full 12 hour period, AM peak, PM peak and off peak time periods.

In January 2009, a one day turning movement count was undertaken in Rossport at the junction of the L1203 and the Leana Mhianaigh Road. However as proposed haulage route would be confined to the roads south of Sruwaddacon Bay and the extent of the study area is to the Junction of the R314/L1203 it is considered that this junction survey data will not be required for this Traffic Impact Assessment.

3.1.1.1 Peak Hour Traffic Flows

The traffic survey data were examined in order to identify the traffic flow patterns and trends. The existing daily traffic flow profiles for the road network surrounding the proposed site were analysed to identify the periods of peak traffic flow at all junctions as summarised below.

- The weekday AM peak hour period was identified as 09:00 – 10:00 hours for both survey periods.
- The weekday PM peak hour period was identified as 17:00 – 18:00 hours and 18:00 – 19:00 hours for the August and September Survey periods respectively. To ensure a robust assessment was undertaken the traffic flow for the PM Peak Hour at each junction was used as a worst-case scenario.The analysis of these traffic flows has enabled the periods of maximum total traffic at each junction to be determined. The turning movements for the all eight sites are contained in the recorded traffic data provided in **Appendix B** of this report.

3.1.2 Existing AADTs on the Road Network

The AADTs on the road network were calculated using the 12 hour link flows over the two 7 day periods. The link flow data was converted to Annual Average Daily Traffic (AADT) using the

appropriate expansion factors from *Expansion Factors for Short Period Traffic Counts 1978 by J Delvin.* Table 3.2 overleaf gives a summary of the results. The existing 2007 AADTs for the study area are also shown in **Figure TR0002 in Appendix A**.

Table 3.2:Existing AADT within the Study Area

Reference Number from Figure TR0001	Location Description	August Surveys		September Surveys		AADT Estimate
		Average Weekday Flows	HCV %	Average Weekday Flows	HCV %	
Site 1, Link A	Northwest side of the R313 at the junction with the R313 and R314	3,840	6.47	3,377	7.5	**3,624**
Site 1, Link B	R314 east of the junction with the R313	1,379	3.52	1,265	3.05	**1,324**
Site 1, Link C	Southeast side of the R313 at the junction with the R313 and R314	2,557	8.01	2,177	10.16	**2,382**
Site 3, Link D	West side of the R314 at the junction with the L5243 and R314	1,058	3.86	940	6.9	**993**
Site 3, Link E	L5243 north of the junction with the R314	268	4.21	370	5.82	**310**
Site 3, Link F	East side of the R314 at the junction with the L5243 and R314	845	3.69	813	7.75	**820**
Site 6, Link G	West side of the R314 at the junction with the L1203 and R314	995	5.6	897	5.96	**944**
Site 6, Link H	L1203 north of the junction with the R314	708	6.87	622	5.22	**665**
Site 6, Link I	East side of the R314 at the junction with the L1203 and R314	745	4.44	674	6.01	**709**
Site 8, Link J	West side of the R313 at the junction with the L1204 and R313	1,881	9.47	1,602	9.47	**1,750**
Site 8, Link K	L1204 north of the junction with the R313	697	7.65	808	17.79	**745**
Site 8, Link L	East side of the R313 at the junction with the L1203 and R313	2,560	9.6	2,348	10.97	**2,457**
Site 2, L1202*	L1202 north of the junction with the R314 and the L5284	788	5.2	635	4.7	**703**
Site 4, L5244*	L5244 north of the junction with R314	295	2.4	NA	NA	**319**
Site 5, L1202*	L1202 north of the junction with the R314	235	6.0	243	5.4	**233**
Site 5, R314*	R314 west of the junction with the L1202	869	4.8	800	5.0	**818**
Site 7, L1202 Westbound**	West side of the L1202 at the junction with the L1202 and the L5243	261	8.8	166**	8.6	**282**

*Based on one day 12 hour counts undertaken in August and September
** Based on one day 11.5 hour count undertaken in September. For a worst case analysis August 2007 flow was used to calculate AADT
NA= Not Available due to technical complications

The traffic flows show the highest movements are on the R313 near Belmullet. The traffic flows generally do not exceed an average weekday flow of 1,000 vehicles throughout the majority of the road network. The average weekday flows only exceed 1,000 vehicles on some of the regional roads. The regional roads are a higher standard of road compared to local roads and are capable of catering for this traffic volume.

The following provides a brief description of each location where AADT surveys were undertaken. Note that the reference numbers stated refer to **Table 3.2** and **Figure TR0001.** The existing road networks AADTs are shown in **Figure TR0002**.

3.1.2.1 Site 1 (R314/R313)

This junction is located approximately 5 km southeast of Belmullet and is the main junction between Bangor and Belmullet on the R313. All the roads leading to this junction are of good quality and classed as regional roads. This junction is a 3 arm priority junction where the R313 has priority. The R314 is the minor arm with road width of 5.5m. Generally the major movements through this junction are on the R313.

Link A The survey results showed that the R313 on the northwest side of Site 1 had average weekday flows of 3,840 (6.47% HCVs) and 3,377 (7.5% HCVs) in August and September respectively. The AADT for this section of road was estimated as **3,624** vehicles.

Link B The survey results showed that the R314 on the east side of Site 1 had average weekday flows of 1,379 (3.52% HCVs) and 1,265 (3.05% HCVs) in August and September respectively. The AADT for this section of road was estimated as **1,324** vehicles.

Link C The survey results showed that the R313 on the southeast side of Site 1 had average weekday flows of 2,557 (8.01% HCVs) and 2,177 (10.16% HCVs) in August and September respectively. The AADT for this section of road was estimated as **2,382** vehicles.

3.1.2.2 Site 3 (R314/L5243)

This junction is located approximately 12.5 km east of Belmullet, 7.5km to the east of Site 1 and 5km to the south of Pollatomish. It links Pollatomish and Knocknalower to the R314. The roads leading to this junction are of reasonable quality and the major arms are classed as regional roads with the minor being a local road. This junction is a 3 arm priority junction where the R314 has priority. The L5243 is the minor arm with road width of approximately 5m. Generally the major movements through this junction are on the R314.

Link D The survey results showed that the R314 on the west side of Site 3 had average weekday flows of 1,058 with 3.86% HCVs and 940 with 6.9% HCVs in August and September respectively. The AADT for this section of road was estimated as **993** vehicles.

Link E The survey results showed that the L5243 on the north side of Site 3 had average weekday flows of 268 with 4.21% HCVs and 370 with 5.82% HCVs in August and September respectively. The AADT for this section of road was estimated as **310** vehicles.

Link F The survey results showed that the R314 on the east side of Site 3 had average weekday flows of 845 with 3.69% HCVs and 813 with 7.75% HCVs in August and September respectively. The AADT for this section of road was estimated as **820** vehicles.

3.1.2.3 Site 6 (R314/L1203)

This junction is located approximately 8km to the east of Site 3 and is located in the townland of Glenamoy. It links the villages of Rossport and Carrowteige to the R314. The roads leading to this junction are of reasonable quality and the major arms are classed as regional roads with the minor being a local road. This junction is a 3 arm priority junction where the R314 has priority. The L1203 is the minor arm with road width of approximately 8m. Car parking is available at this junction for approximately 4 cars and cars are parked here regularly throughout the day as locals use this junction as a meeting point before going to Ballina and Bangor. Generally the major movements through this junction are on the R314.

Link G The survey results showed that the R314 on the west side of Site 6 had average weekday flows of 995 with 5.6% HCVs and 897 with 5.96% HCVs in August and September respectively. The AADT for this section of road was estimated as **944** vehicles.

Link H The survey results showed that the L1203 on the north side of Site 6 had average weekday flows of 708 with 6.87% HCVs and 622 with 5.22% HCVs in August and September respectively. The AADT for this section of road was estimated as **665** vehicles.

Link I The survey results showed that the R314 on the east side of Site 6 had average weekday flows of 745 with 4.44% HCVs and 674 with 6.01% HCVs in August and September respectively. The AADT for this section of road was estimated as **709** vehicles.

3.1.2.4 Site 8 (R313/L1204/Srahmore Peat Deposition Site)

This junction is located approximately 2km west of Bangor Erris. The roads leading to this junction are of reasonable quality and the major arms are classed as regional roads with the minor being a local road. This junction is a 3 arm priority junction where the R313 has priority. The L1204 is the minor arm with road width of approximately 6m. Generally the major movements through this junction are on the R313.

Link J The survey results showed that the R313 on the west side of Site 8 had average weekday flows of 1,881 with 9.47% HCVs and 1,602 with 9.47% HCVs in August and September respectively. The AADT for this section of road was estimated as **1,750** vehicles.

Link K The survey results showed that the L1204 on the north side of Site 8 had average weekday flows of 697 with 7.65% HCVs and 808 with 17.79% HCVs in August and September respectively. The AADT for this section of road was estimated as **745** vehicles.

Link L The survey results showed that the R313 on the east side of Site 8 had average weekday flows of 2,560 with 9.6% HCVs and 2,348 with 10.97% HCVs in August and September respectively. The AADT for this section of road was estimated as **2,457** vehicles.

3.1.2.5 Site 2, (R314/L1202/L5284)

This junction is located approximately 6km to the east of Site 1 and is located in the townland of Barnatra. The roads leading to this junction are of reasonable quality and the major arms are classed as regional roads with the minor arms being local roads. This junction is a 4 arm priority junction where the R314 has priority. The L1202 and the L5284 are the minor arms. Car parking is available at this junction for approximately 4 cars and there is also a bottle bank facility at this junction. Turning movement surveys were undertaken over a 12 hour period on the Wednesday 8th August and Wednesday 19th September 2007. These results were used to calculate the AADT on the L1202 north of this junction. The AADTs for the R314 were calculated at other sites with 7 day data available for the two survey periods. The survey results showed that the L1202 on the north side of Site 2 had average weekday flows of 788 with 5.2% HCVs and 635 with 4.7% HCVs in August and September respectively. The AADT for L1202 on the north side of Site 2 was estimated as **703** vehicles.

3.1.2.6 Site 4, (R314/L1204/L5244)

This junction is located approximately 13km to the east of Site 3 and is located in the townland of Bellanaboy. The roads leading to this junction are of reasonable quality and the major arms are classed as regional roads with the minor arms being local roads. This junction is a 4 arm right/left

staggered priority junction where the R314 has priority. The L1204 and the L5244 are the minor arms. Turning movement surveys were undertaken over a 12 hour period on the Wednesday 8th August but due to a technical fault traffic data was not collected in September. The August results were used to calculate the AADT on the L5244 north of this junction. The AADTs for the R314 and the L1204 were calculated at other sites with 7-day data available for the two survey periods. The survey results showed that the L5244 on the north side of Site 4 had average weekday flows of 295 with 2.4% HCVs in August. The AADT for this section of road was estimated as **319** vehicles.

3.1.2.7 Site 5, (R314/L1202)

This junction is located approximately 2km to the west of Site 6 and is located in the townland of Bellagelly South. This junction is a 3 arm priority junction where the R314 has priority. The L1202 is the minor arm. Turning movement surveys were undertaken over a 12 hour period on the Wednesday 8th August and Wednesday 19th September 2007. These results were used to calculate the AADT on the L1202 north of this junction.

The survey results showed that the L1202 on the north side of Site 5 had average weekday flows of 235 with 6.0% HCVs and 243 with 5.4% HCVs in August and September respectively. The survey results showed that the R314 on the west side of Site 5 had average weekday flows of 869 with 4.8% HCVs and 800 with 5.0% HCVs in August and September respectively.

The AADT for the L1202 was estimated as **233** vehicles and on the R314 west of the Site as **818** vehicles.

3.1.2.8 Site 7, (L1202/L5244)

This junction is located approximately 5km to the north of Site 3 and is located in the townland of Pollatomish. The roads leading to this junction are of varied quality and all arms are classed as local roads. This junction is a 3 arm priority junction where the L1202 has priority. The L5243 is the minor arm. Turning movement surveys were undertaken over a 12 hour period on the Wednesday 8th August but due to a technical fault traffic data only 11.5 hours were recorded in September 2007. A comparison between the August 2007 and September 2007 results show that the flows were higher in August. Therefore to provide a robust case analysis the August flows were used to calculate the AADT on the L1202 west of this junction. The survey results showed that the L1202 on the west side of Site 7 had average weekday flows of 261 with 8.8% HCVs in August. The AADT for this section of road was estimated as **282** vehicles.

3.1.3 7 Day Traffic Profiles

The seven-day surveys undertaken in August and September were assessed to establish the traffic flow profiles on each link.

The surveys were undertaken from 7:00 to 19:00 each day. No firm conclusion can be made about the traffic levels during the hours of 19:00 and 7:00 but it is reasonable to assume that the traffic levels would be relatively low compared to the daytime traffic flows. **Table 3.3** below summarises the traffic information from the link flow surveys.

Table 3.3: 7 Day Profile Summary

Location		Survey Periods	Time Period of Maximum Hour Traffic	Flows Range on Link (vehicles)
Site*	Link			
1	A	August	16:00-17:00, Tuesday 14th	300-450
		September	18:00-19:00, Sunday 23rd	250-400
1	B	August	14:00-15:00, Saturday 11th	100-200
		September	15:00-16:00, Friday 21st	80-140
1	C	August	16:00-17:00, Friday 10th	200-300
		September	18:00-19:00, Sunday 23rd	150-250
3	D	August	15:00-16:00, Monday 13th	75-150
		September	15:00-16:00, Friday 21st	60-120
3	E	August	14:00-15:00, Monday 13th	20-40
		September	12:00-13:00, Saturday 22nd	15-30
3	F	August	17:00-18:00, Friday 10th	60-100
		September	15:00-16:00, Friday 21st	50-100
6	G	August	17:00-18:00, Wednesday 8th	60-120
		September	18:00-19:00, Tuesday 18th	60-100
6	H	August	13:00-14:00, Saturday 11th	40-100
		September	18:00-19:00, Monday 17th	40-90
6	I	August	12:00-13:00, Friday 10th	40-85
		September	12:00-13:00, Saturday 22nd	40-80
8	J	August	16:00-17:00, Tuesday 14th	150-200
		September	18:00-19:00, Sunday 23rd	100-150
8	K	August	18:00-19:00, Tuesday 14th	35-80
		September	18:00-19:00, Friday 21st	40-100
8	L	August	18:00-19:00, Tuesday 14th	150-250
		September	18:0019:00, Friday 21st	150-250

* Seven day surveys were only taken on all links into Sites 1, 3, 6 and 8 .

Data was not collected at the following locations and time periods due to technical failures:

- Site 1
  - Sunday 12th August after 11:00
- Site 3
  - Tuesday 18th September after 12:45
  - Friday 21st September after 17:00
- Site 6
  - Tuesday 14th August, after 17:50
  - Thursday 20th September after 12:00
  - Friday 21st September after 12:30

The extent of this loss in data equals approximately 2% of the proposed data collection and does not impact on the calculation of AADT for all links in the study area and is not significant to the robustness of the assessment.

3.2 EXISTING ROAD NETWORK

For this study the road network in the vicinity of the proposed haul route, shown in **Figure TR0002,** was assessed for its ability to cater for vehicles associated with the proposed development. This assessment included a review of the road widths, lengths, road and junction geometry, junction visibility and the impact of HCV turning movements. The following summarises the assessment for those roads within the affected road network.

3.2.1 N59 Ballysadare and Galway

The N59 is a National Secondary Road which runs between Ballysadare and Galway via Ballina, Bangor, Westport and Clifden. It is a single carriageway for the full length with road widths from 5.5m to 6.5m. The horizontal and vertical alignments on this route vary substantially, which results in some restrictions relating to sight distances and safe passing at some locations. HCV movements can be readily accommodated on this road.

3.2.2 R313 Bangor to Belmullet

The R313 is a regional road and runs from Bangor to Belmullet. It has an approximate length of 25km with road width varying from 4.5m to 6.5m. The pavement condition is generally good over the whole length of the road.

3.2.3 R314 Derrycorrib to Glenamoy

The R314 is a regional road and runs from Ballina to Derrycorrib via the towns of Killala and Ballycastle. This route is known as the North Coast Road and it is widely used by tourists as there are a number of scenic views along the route. The road width is generally greater than 5.5m. The horizontal and vertical alignments of the road vary considerably along the full length of the route. The R314 does cater for HCV movements in relation to peat extraction , timber transport and the transportation of stone and plant/materials.

3.2.4 L1204

The L1204 is classed as a local road and is located to the east of Carrowmore Lake. It is a link between the R314 and the R313 and has an approximate length of 9.5km. The road width is an average of 5.5m and has a good road surface condition. The full length of this road was upgraded in 2005 to cater for haulage associated with the construction of Bellanaboy Bridge Gas Terminal. The L1204 is also used for the transport of trees from tree felling operations in Bellanaboy Bridge at the north end of the road. There are a small number of residential dwellings along this route.

3.2.5 L5284

The L5284 is classed as a local road and is located to the west of Carrowmore Lake. It is a link between the R314 and the R313 and has an approximate length of 8km. On average the road width is less than 5m and has a general poor road surface condition. This road is known locally as Carrowmore Drive and is protected in the County Development Plan because of the scenic views of high importance along the route.

3.2.6 L1202

The L1202 is classed as a local road and runs from the R314 through the townland of Inver and the village of Pollatomish and reconnects with the R314 just to the east of the Bellanaboy Bridge GasTerminal site. It has an approximate length of 16km. The road has a width greater than 5.5m for significant stretches of the eastern end between the R314 and Glengad but can narrow to 4.0m to 4.5m in places, between Glengad and Aghoos. The majority of the reduced carriageway sections are currently located adjacent to a Public House and on the steep gradient stretch of the L1202 just west of Pollatomish. Between Glengad and Barnatra via Inver the road width is approximately 5.5m for significant stretches of the route. There are approximately 100 houses along this route the greatest number of which are in Inver and Pollatomish.

3.2.7 L5243

The L5243 is classed as a local road and runs from Pollatomish south to the R314, through Knocknalower. It is approximately 5km and has an average width of approximately 3.5m.

3.2.8 L5244

The L5244 is classed as a local road and connects the L1202 to the R314. It has an approximate length of 3km and has an average width of 5m but becomes narrower in some sections. This section of road has recently been upgraded by Mayo County Council from the R314 to Gate 2 of the Bellanaboy Bridge Gas Terminal site.

3.2.9 L1203

The L1203 is classed as a local road and runs from the R314 at Glenamoy to Portacloy. It has an approximate length of 13.5km with an average width of 6m. The road has a small number of houses on it with the majority of the road fronted with agricultural lands, which are primarily used for peat extraction.

3.2.10 Existing Road Network Capacity

A link capacity assessment was undertaken of the road network in the study area. This would determine whether the existing road conditions could cater for the current traffic volumes. The NRA's document "Road Link Design" TD 9/07 was used to establish the theoretical capacity of the road sections within the study area. This document gives a number of different road types and the corresponding theoretical capacity of each in Table 4 'Recommended Rural Road Layouts'. The smallest road type provided is the reduced single (7.0m) carriageway S2. The roads within the study area have cross sections less than 7.0m and, therefore, the theoretical capacity for the reduced single (7.0m) carriageway S2 required a reduction to reflect this.

The saturation flows for a 7.0m carriageway and the road widths within the study area were calculated using the Greater Manchester Transportation Unit- Note 155, May 1991, The Estimation and Appraisal of Saturation Flows in Conjunction with SATURN Networks. The ratio between the 7m carriageway and the other road widths were calculated. These ratios were then applied to the 7m carriageway's theoretical capacity to establish the theoretical capacity for the roads within the study area.

Using these theoretical capacities and the existing AADTs on the road network it was possible to calculate the percentage link capacity, which is currently being used on the roads in the study area. **Table 3.4** below summarises the results.

Table 3.4: Link Capacity Assessment for the study area road network.

Road Section	Survey Site	Theoretical Capacity* (AADT)	Demand (AADT)	% Used Capacity
R313 Bangor to Belmullet	Site 1, Link A	8381	3,624	43.2%
	Site 8, Link L	8381	2,457	29.3%
	Site 8, Link J	8381	1,750	20.9%
R314	Site 1, Link B	8381	1,324	15.8%
	Site 6,Link G	8381	944	11.3%
L1202	North of Site 5	8250	233	2.8%
L1203	Site 6 Link H	8381	665	7.9%
L1204	Site 8, Link K	8250	745	9.0%

***The Theoretical Capacity corresponds to a carriageway width of 6m for the R313, R314 and L1203. The Theoretical Capacity corresponds to a carriageway width of 5.5m for the L1202 and the L1204.**

The results show that there is spare capacity on the current road network in the study area.

3.2.11 Existing Traffic Impact at Pollatomish National School

In order to gain an appreciation of the existing scale of traffic and the parking arrangements during the peak 'drop off' and 'collection' periods at Pollatomish National School a traffic observation survey was undertaken on Friday March 19th 2010. During the morning 'drop off' period (8:45am to 9:40am), five vehicles arrived and stayed at the school. In total, 19 vehicles stopped outside the school (17 cars directly outside the school with two cars stopping on the opposed side) and dropped of one or more students in the 55-minute period. A bus arrived at the school with 13 pupils with another four arriving by foot with three of these pupils crossing the road unaccompanied. It was noted that four vehicles who set-down to drop off children performed 'U-Turns' at the school and caused a brief obstruction to vehicles arriving.

During the afternoon 'collection' period (2:45pm to 3:15pm), 17 cars, one van and one bus parked on both sides of road at 3pm. Three cars and the bus were double-parked. Several children crossed the road unattended.

It was also noted that no vehicles passed the school at excessive speeds during the peak 'drop off' and 'collection' periods.

3.3 ACCIDENT DATA

An assessment of the accident data within the Study Area was undertaken to determine if there were any existing problems on the road network. The NRA accident data for a 16-year period (1990– 2006) was extracted for the road network in the vicinity of the proposed development. The examination of this information has been summarised in **Table 3.5** below. The results of the accident data were divided into different categories of 'Fatal', 'Serious' or 'Minor'. The accident locations have been shown in **Figure TR0003 in Appendix A.** The recorded accident data does not include "material damage only" accidents, or accidents which were not reported to or recorded by An Gárda Siochana.

Table 3.5: Accident Statistics for study area road network.

Road Section	Fatal Injury (Number of Incidents)	Serious Injury (Number of Incidents)	Minor Injury (Number of Incidents)
R313 Bangor to Belmullet	2	4	23
R314 Ballina to Glenamoy	0	3	9
L1204	0	1	0
L5284	0	0	0
L1202	2	1	2
L5243	0	0	1
L1203	0	1	4
L5245	0	0	2

The results show that the majority of accidents were recorded on the R313 with two of these being fatal accidents. The R314 had a number of accidents but none of these were fatal. A number of accidents did occur near Site 2, the cross roads with the R314, the L1202 to Inver and the L5284. On the local roads in the study area the majority of accidents were minor ones with a small number of serious accidents and two fatal accidents. Since this data was published a fatal accident occurred in the R313 near Belmullet in 2009 in which two people were killed.

A serious accident occurred on the south end of the L1204 near the R313. This was a single vehicle accident and occurred on the 4th June 2001. However, it should be noted that this accident took place prior to the widening and upgrade works carried out in 2005. One serious and two fatal accidents occurred on the L1202 road. One of the fatal accidents occurred on the L1202 north of the Bellanaboy Bridge Gas Terminal site, which is part of the proposed haulage route This was a single vehicle accident and it occurred on the 16th February 1998. The second fatal accident occurred in Inver area.

It is noted that the section of the L1202 where the accident occurred and which will be used by construction vehicles was upgraded by Mayo County Council in 2008.

3.4 PUBLIC TRANSPORT

The study area is served by a number of bus routes. Bus Éireann provides regular service (No. 446) from Belmullet to Ballina and vice versa stopping at various locations including Bangor and Bellacorick.

There are also a number of additional local bus services supplied by private bus companies. These bus routes serve a number of locations within the Study Area. A bus service runs every weekday departing Rossport at approximately 10.00am to Belmullet and it returns to Rossport approximately 6.00 PM (on Fridays there is an extra bus back which arrives at Rossport at approximately 2.00pm). There is also a service from Aghoos/Glengad to Belmullet (Monday to Friday), departing Aghoos/Glengad at approximately 10.30am and returning to Aghoos/Glengad at approximately 2.00pm. There is a service from Pollatomish to Ballina (Monday to Friday) which departs Pollatomish at approximately 10.15am and returns to Pollatomish at approximately 6.15pm.

There are private bus services from Belmullet (predominately for college students) to Galway and Limerick.

In addition to these services, there are daily school services throughout the Erris area, which serve the schools within the vicinity of the study area. There are also taxi services available in the study area. There are limited cycling and pedestrian facilities available within the study area.

3.5 COMMITTED DEVELOPMENT AND TRAFFIC GENERATORS

A review of planning applications submitted to Mayo County Council over the past five years was undertaken to establish the extent of development which received planning permission within the vicinity of the proposed onshore pipeline. This information would determine if the planned development would result in increased traffic levels within the vicinity of the proposed onshore pipeline. It was also assessed whether any additional traffic flows would have been accounted for in the traffic surveys undertaken in 2007.

3.5.1 Bellanaboy Bridge Gas Terminal

Given that the Terminal construction is essentially complete, it will not coincide with the construction programme of the pipeline. The peak traffic movements for pipeline commissioning on the Bellanaboy Bridge Gas Terminal during the Onshore Pipeline construction period are predicted to be 349 personnel daily trips and 43 HCVs daily trips to the site in Month 21. However this volume of HCV trips is scheduled to occur in Month 21 (due to testing of the pipeline), with a volume of 11 HCV a day occurring in Month 20 and a volume of eight HCV a day predicted for the remaining months. The trips related to the terminal have been included in the overall trip generation volumes estimated as part of this traffic assessment.

Transport Haulage associated with Bellanaboy Bridge Gas Terminal for August and September 2007, the months when the traffic surveys were undertaken, was examined. This showed that there was an average daily volume of 135 cars and 66 HCVs in August and 180 cars and 57 HCVs in September predicted to access the Terminal site. These flows would have been reflected in the junction counts when the surveys were undertaken. In order to provide a robust assessment these flows have been left in the background traffic flows for this traffic impact assessment.

3.5.2 Kilcommin GAA Club

Kilcommin GAA Club have submitted a planning application to develop the GAA pitch and facilities at their grounds at Lenarevagh, Glenamoy (approximately 20km away from the proposed development site). The development of the GAA Pitch and facilities will generate additional traffic volumes on the network but due to the distance away from the proposed development it is considered that the traffic impact of these trips would have dissipated into the background traffic flows within our study area. It also noted that due to current economic conditions and other national and regional policy measures for reducing car usage levels, in general growth rates in traffic flows have reduced since 2007. However, to ensure a robust assessment the recorded 2007 traffic flows were factored upwards using the NRA growth rates. Therefore it is considered that using the conservative approach when predicting the growth in background traffic flows between 2007 and 2011 will account for the any typical weekday traffic volumes generated by the proposed development of Kilcommin GAA club

3.5.3 Other Committed Development

The remaining committed developments relate to one-off houses or amendments to existing dwellings, which would not add a significant traffic contribution to the road network in this locality. They have therefore been discounted in terms of the traffic assessment.

4 PROPOSED DEVELOPMENT

4.1 DESCRIPTION OF PROPOSED DEVELOPMENT

The proposed Corrib Onshore Gas Pipeline will travel between the landfall at Gleann an Ghad (Glengad) and the Gas Terminal at Béal an Átha Buí (Bellanaboy). The proposed development consists of the following elements, which are considered in Volumes 1 & 2 of this EIS:

- 8.3km onshore gas pipeline extending from a landfall located at Gleann an Ghad (Glengad) to the permitted Gas Terminal at Béal an Átha Buí (Bellanaboy);
- Landfall Valve Installation (LVI) located approximately 50m from the landfall in the townland of Gleann an Ghad or Dún Ceartáin (Glengad/Dooncarton);
- Associated services which extend from the Bellanaboy Bridge Gas Terminal to the landfall (and continues to the subsea manifold in the Corrib Field); and
- Outfall pipeline extending from the Bellanaboy Bridge Gas Terminal to the landfall (and continues to a discharge location approximately 12.7km from the landfall).

An assessment of the peat volumes showed that no more than 75,000m^3 of peat will be deposited at the Srahmore Peat Deposition Site. This peat will be excavated during the construction of the onshore pipeline. There will also be a requirement to reuse / dispose of approximately up to 66,000m^3 of excavated tunnelling material to local quarries and landfills.

Construction of the Corrib Onshore Pipeline in Sruwaddacon Bay will be by a trenchless technique generally known as segment lined tunnelling. This tunnel will be constructed for approximately 4.9km from Aghoos to Glengad.

A tunnel will be constructed below ground generally using a Tunnel Boring Machine (TBM) without excavating from the surface. Tunnelling methods are designed to minimise surface disturbance during construction, and are particularly suitable for environmentally sensitive areas.

The onshore pipeline and associated utilities will be pulled into place within the segment lined tunnel. This technology uses a Tunnel Boring Machine (TBM) to gradually excavate a tunnel at the front of the concrete segments. As the excavation moves forward, new sections of concrete segments are assembled directly behind the TBM. Cuttings are pumped to the surface through hoses within the tunnel bore. Tunnelling operations involve the use of sophisticated guidance/control equipment to ensure that the tunnel can be excavated along a predetermined path.

4.2 ROUTE DESCRIPTION

The proposed route starts at the landfall, crossing an area of grassland in an area known at Gleann an Ghad (Glengad) or Dún Ceartáin (Dooncarton). It then crosses under Sruwaddacon Bay for approximately 4.6km (4.9km including land sections between start pit and reception pit). It then turns in an easterly direction for approximately 0.9km traversing an area of blanket bog within which it crosses a small estuarine river channel that is approximately 40m wide. The route then rejoins the previously approved route through an area of forested bog. From here the route turns again in a southerly direction, to enter the Bellanaboy Bridge Gas Terminal site.

4.3 AGHOOS WORKS

The proposed works in Aghoos is divided into three sections:

1. Trenchless Tunnelling Compound (SC3);

2. Pipeline stringing area; and

3. Site Compound (SC4)

In Aghoos the initial stage of the construction phase will include the export of peat to Srahmore and the importation of stone from quarries to construct the access roads, compound and stringing areas. Other items such as site cabins, bogmats, fencing, concrete, specialised tunnelling equipment and miscellaneous construction plant and equipment would also be delivered to the site.

The tunnelling construction compound will be constructed by excavating the peat and replacing it with stone. A tarmacadam layer will then be placed over the stone surface. When construction is complete, the tarmacadam and a layer of stone will be removed and a regulation layer of peat will be spread upon the stone. The stringing area will be constructed in a similar manner. Peat for reinstatement will be stored temporarily at a designated location in Aghoos.

There will be two access roads to SC3 and the stringing area at Aghoos. One will enter into the compound and the other will serve the stringing area. The access to the compound will be constructed first with the access road to the stringing area being constructed approximately ten months later during the construction of the stringing area. The proposed access to SC4 will be located to the east of string area on the L1202.

4.4 GLENGAD WORKS

The proposed works in Glengad will comprise the following:

- Construction of Access Road and Site Compound (SC1) for the LVI (approx size = 60m x 75m);

- Construction of the pipeline spread (approx size = 10m wide 0.3m deep along pipe trench); and

- Construction of Site Compound (SC2) which includes the reception pit (approx size = 5m x 5m) for the tunnelling works.

In Glengad, the initial stage of construction will include the excavation of subsoil, importation of quarry stone for access roads and compounds and delivery of fencing, site cabins, concrete, plant and equipment.

The proposed access road to Glengad will be a temporary road approximately 6.0m wide. On completion of the construction, this temporary road will be reinstated to provide a 3.5m permanent access road to serve maintenance of the LVI. The access point is located to ensure that maximum sight visibility and stopping sight distance is provided along the L1202.

4.5 CONSTRUCTION

The construction of the proposed pipeline is expected to take approximately 26 months to complete. The construction of the pipeline will involve a number of key activities. These activities have been summarised below:

- Mobilisation and compound set-up in Glengad and Aghoos, which includes fencing and setting up cabins and tunnelling compound equipment installation. Peat haulage and stone importation will be required at Aghoos;
- Construction of the Landfall Valve Installation (LVI) and umbilical pull ashore and commissioning in Glengad;
- Construction of a short section of the pipeline in Glengad;
- Construction of the segment lined tunnel from Aghoos to Glengad (which will involve delivery of materials on a daily basis);
- Commissioning works on the pipeline between Aghoos and Glengad; and
- Construction of the pipeline from Aghoos to the Bellanaboy Bridge Gas Terminal

In general, pipeline construction on arable land will be carried out using an 'open-cut' technique known as the 'Spread Technique'. This technique uses a pipeline temporary working area that follows the route of the pipeline. The working area will contain the right of way for the construction traffic. This right of way for construction traffic will be used as much as possible and be accessed via the proposed junctions shown in the EIS. In areas of peat a stone road will be constructed to provide access. The gas pipeline and services will be laid within the stone road.

4.6 OPERATION

No further disturbance to land will be required during the operational phase except for access to the LVI for inspection and maintenance purposes and periodic access to the route again for inspection and maintenance purposes. A 14m wide permanent wayleave will remain in place for the duration of the operational phase in non peat areas and 20m wide permanent wayleave in peat areas. The permanent wayleave is contained within the wider temporary working area.

4.7 DECOMMISSIONING

Decommissioning will involve the removal of any above ground elements at the LVI and will occur when the resources of the Corrib Gas Field have been exhausted.

4.8 HAULAGE ROUTE

The haulage route for the construction traffic travelling to and from the proposed construction site will use the national primary and secondary road network as much as possible. When the construction vehicles leave the N59 to route to the site compounds at Aghoos and Glengad, the roads used will be the R313, the upgraded L1204, the R314 and the L1202 as far as Glengad. The proposed haulage route is shown in **Figure TR0004 in Appendix A**.

The proposed haulage route was used previously to transport materials associated with the offshore pipeline to Glengad Landfall. In 2005 and 2007 sections of the haul route were used to transport significant volumes of peat (transportation by road of over 448,000m3 of peat) from the Bellanaboy Bridge Gas Terminal site to the Bord na Móna Peat Deposition site at Srahmore. The previous need to haul extensive amounts of material resulted in sections of the proposed haulage route being upgraded to accommodate HCVs.

5 FUTURE TRAFFIC FORECASTS

5.1 FUTURE BACKGOUND TRAFFIC FLOWS

The estimated future year traffic volumes within the Study Area were calculated using the National Roads Authority's (NRA) traffic growth figures (*NRA Future Traffic Forecasts 2002 – 2040, August 2003*) as shown in **Table 5.1.** These growth factors were applied to the existing traffic flows on the road network surrounding the development. A summary of the existing traffic flows and the proposed background traffic flows are shown below in **Table 5.1** and are also shown in **Figures TR0005-TR0007 in Appendix A**.

Table 5.1: Future Background Traffic Flows

Road Section	2007 AADT	2011 AADT Construction[1] Year	2013 AADT Opening Year[2]	2028 AADT Design Year[3]
R313 west of junction with R314	3624	3841	3948	4465
R313 east of junction with R314	2382	2525	2594	2936
R313 west of Junction with L1204	1750	1855	1906	2157
R313 east of junction with L1204	2457	2604	2676	3030
R314 north of junction with R313	1324	1403	1443	1630
R314 west of junction with L5243	993	1053	1082	1223
R314 west of junction with L1204	820	869	893	1010
R314 west of junction with L1202	818	867	891	1007
R314 east of junction with L1202	944	1001	1028	1163
R314 east of junction with L1203	709	752	772	873
L1204 north of junction with R313	745	790	811	919
L1202 west of junction with R314	233	247	254	287
L1202 west of Pollatomish	282	299	307	348
L1202 south of Inver	703	745	766	866
L1203 west of junction with R314	665	705	724	819
L5243	310	329	338	382
L5244	319	338	348	393

The future predicted traffic volumes combined with the traffic demand associated with the construction of the proposed development were entered into an Excel Spreadsheet model. These scenarios included the comparison of *Do Nothing* (without the development in place) and *Do Something* (with the development in place).

[1] Construction year 2011: this refers to the year where construction commences
[2] Opening year 2013: this refers to the year when the pipeline commences operation
[3] Design year 2028: this refer to a period 15 years after the opening year which is a standard criteria for assessing the traffic impact of a development.

6 POTENTIAL IMPACTS

This section examines the potential impact of the proposed development on the surrounding road network. The road network is tested with and without the proposed development in place i.e. 'Do Nothing' and 'Do Something'. The proposed development traffic in the 'Do Something' Scenario includes the traffic from construction delivery and activities (both HCV and personnel trips).

6.1 OPERATIONAL PHASE IMPACTS

There will be very little traffic associated with the operation of the Corrib Onshore Pipeline. The traffic movements associated with the occasional safety checks and maintenance will be negligible and will not generate a potential traffic impact on the surrounding road network. Once every 4-5 years the LVI will require a maintenance inspection, which will require the use of heavy machinery, but this will not involve a high number of traffic movements.

6.2 CONSTRUCTION PHASE IMPACTS

6.2.1 Trip Generation

It is estimated that construction will take approximately 26 months to complete. The proposed construction schedule was used to generate traffic volumes for the works.

In Aghoos, the highest number of traffic movements in the first three months of construction is associated with the import of stone and the removal of excess peat. Stone will come from the local quarries and peat will be transported to the Bord na Móna Peat Deposition site at Srahmore.

There will also be stone road construction and peat removal in Aghoos during Months 13 to 15. The tunnelling operations at Aghoos are expected to be running for a 15 month period between Months 5 and 19. The highest vehicle movements associated with the tunnelling operations are related to tunnel arisings being taken from the compound and tunnelling materials being delivered to Aghoos.

In Glengad, the scale of HCV movement is significantly less than Aghoos, with the highest HCV movements associated with the excavation work for the LVI, the umbilical pull ashore, erection of fencing and access road construction. These activities are expected to occur for a three-month period between Months 2 and 4. Other construction activities that will generate traffic movements at Glengad will include the movement of mechanical equipment and miscellaneous material associated with the LVI and general equipment associated with the civil and structural works.

It is estimated that the highest daily number of HCV movements at Aghoos will occur in Months 13-15 as the tunnelling works coincide with stone road construction and peat removal in the Aghoos area. It is estimated that a total of 368 two-way HCV trips will be generated daily at Aghoos in Months 13-15.

It is estimated that the highest daily number of HCV movements at Glengad will occur in Month 2 as the LVI excavation works coincide with the importation of stone for the access road. It is estimated that 48 two-way HCV daily trips will be generated at Glengad during Month 2. However this peak will only occur in month two and by month five the number of HCV movements at Glengad is expected not to exceed 20 two-way trips per day for the remaining 20 months of the construction programme (except Months 19 and 20 were Glengad will generate a maximum 30 two-way HCV trips a day) .

In addition to the traffic movements associated with the site compounds at Aghoos and Glengad, there will also be traffic generation from Srahmore Peat Deposition site and the Bellanaboy Bridge Gas Terminal site. These traffic movements have been included in this trip generation assessment.

In terms of personnel trips, it is proposed that a significant number of the staff will be transferred to the site compounds at Aghoos and Glengad from the Bellanaboy Bridge Gas Terminal using shuttle buses. To ensure a robust assessment of both scenarios, additional car trips were assigned to the sites at Glengad and Aghoos to account for multiple daily trips by management and supervisors. Also, an additional ten two-way car trips per day were assigned to Glengad to account for the escort vehicles associated with the HCV convoys.

For the purpose of the assessments, it is assumed that all stone material HCV trips will come from local quarries.

To avoid the possible conflict between HCV movement and pedestrian movement at Pollatomish National School, it is proposed that HCV trips past the school will not take place during school opening and closing time periods.

In order to provide a robust assessment of the traffic impact generated by the proposed works it is proposed to assess two different scenarios. As the movement of HCV is the critical issue during construction, the core scenario will be an assessment of the actual peak construction period for HCV movements in the study area (The study area comprises all compounds at Glengad, Aghoos, Bellanaboy Bridge Gas Terminal and Srahmore). The actual peak construction period for HCV movements in the study area occurs in Month 2 in the construction programme.

The construction programme shows that the peak HCV movements and peak personnel movements will not occur simultaneously. The programme also shows that the peak construction periods for each site will not occur simultaneously. However, to provide a robust assessment of the traffic levels on the road network it is proposed to assess a hypothetical 'worst-case' scenario where all peak HCV/Personnel trips for each site are combined and assigned to the network. This scenario cannot occur in the construction programme but for the purpose of undertaking a robust traffic impact assessment, the scenario was assessed to show that the junctions have sufficient capacity to cater for the demand.

Therefore the following two scenarios will be assessed in this TIA:

- Peak Construction Period for HCV Movements
- A hypothetical 'Worst Case' scenario where the peak HCV and Personnel trips for the works at Aghoos, Glengad, Bellanaboy Bridge Gas Terminal and Srahmore Peat Deposition Site are assumed to occur simultaneously

6.2.1.1 Peak Construction Period for HCV Movements – Trip Generation

The estimated traffic volumes generated by the proposed works during the peak period for HCV movement was extracted from the construction schedule. A breakdown of the construction movements at each site has been summarised in **Table 6.1**.

Table 6.1 Traffic Movements during the Peak Period for (Month 2- April 2011)

	AM Peak		PM Peak		Daily	
Construction	**Arrivals**	**Departures**	**Arrivals**	**Departures**	**Arrivals**	**Departures**
Glengad						
HCV	3	3	3	3	24	24
Cars/Buses	6	0	0	6	21	21
Aghoos						
HCV	16	16	16	16	157	157
Cars/Buses	8	0	0	8	18	18
Bellanaboy Terminal						
HCV	1	1	1	1	8	8
Cars/Buses	272	7	7	272	279	279
Srahmore						
HCV	5	5	5	5	47	47
Cars/Buses	13	0	0	13	13	13
Total	**324**	**32**	**32**	**324**	**567**	**567**

It is estimated that the four sites would generate a total of 472 daily two-way HCVs trips and 662 daily car/bus two-way trips during the peak period for HCV movement.

Table 6.1 also shows the estimated trips generated during the AM and PM Peak Hour. It is assumed that HCVs will arrive and depart the site compounds at a uniform rate over a typical ten-hour working day. Therefore, the scale of the AM and PM peak hour HCV trips is 10% of the daily flows. The HCV arriving in the AM peak hour will avoid school opening periods.

It is also assumed that all employee car trips to each of the sites will arrive in the AM Peak Hour and depart in the PM Peak Hour. In relation to the buses transporting employees from Bellanaboy Bridge Gas Terminal to the site compounds, it is assumed that the majority of bus trips will arrive at the site compounds in the AM Peak Hour and depart in the PM Peak Hour. Since the buses are leaving the Bellanaboy Bridge Gas Terminal to go to the site compounds the majority of buses will depart the Terminal in the AM Peak Hour and arrive back in the PM Peak Hour. During the day bus transfers may be required for small personnel movements between the site compounds and the Terminal

6.2.1.2 Peak HCV and Personnel trips for all sites occurring simultaneously

The estimated traffic volumes generated by a hypothetical 'worst-case' scenario of all peak HCV and personnel movements at each site occurring simultaneously was extracted from the construction schedules. A breakdown of the construction traffic movements at each site has been summarised in **Table 6.2**.

Table 6.2 Traffic Movements if all the peak movements at all sites occurred simultaneously

	AM Peak		PM Peak		Daily	
Construction	**Arrivals**	**Departures**	**Arrivals**	**Departures**	**Arrivals**	**Departures**
Glengad						
HCV	3	3	3	3	24	24
Cars/Buses	9	0	0	9	24	24
Aghoos						
HCV	19	19	19	19	184	184
Cars/Buses	12	0	0	12	22	22
Bellanaboy Terminal						
HCV	5	5	5	5	43	43
Cars/Buses	349	8	8	349	357	357
Srahmore						
HCV	6	6	6	6	52	52
Cars/Buses	31	0	0	31	31	31
Total	**434**	**41**	**41**	**434**	**737**	**737**

It is estimated that the four sites combined could generate a total of 606 daily two-way HCVs trips and 868 daily car/bus two-way trips if the peak construction activities at each of the sites were to occur simultaneously. However the total figures shown in Table 6.2 are only been used for capacity assessment purposes and they will not occur on the network within the construction programme.

The AM and PM Peak Hour traffic volumes were estimated using the same methodology as used in the first scenario.

The estimated trip generation traffic volumes that are expected to occur in the Peak Construction Period for HCV Movements (Month 2) are shown in **Figures TR0008 Appendix A**.

6.2.2 Trip Distribution

The number of HCVs trips were distributed between sections of the road network in accordance with the proposed haulage route.

The personnel trips (including the employee bus trips) were distributed onto the road network based on the recorded 2007 percentage distribution of traffic volumes on the local road network. The distribution of the construction related traffic flows for the peak month for HCV movements are shown in **Figure TR0009 in Appendix A**.

6.3 TRAFFIC ASSESSMENTS

Based on the existing traffic flows, the proposed haul route and the location of the site compounds, it was determined that the proposed study area comprises all of the key links and junctions within the confines of the following locations:

- Junction of R313/R314 - located approximately 5 km southeast of Belmullet (Site 1)
- Junction of the R314/L1203 - located in the townland of Glenamoy (Site 5).

  To maintain consistency with previous studies, the junction of the R314/L1203 will be included in the study area for this assessment. However the curtailments of the proposed haul route to the south of Sruwaddacon Bay will result in no construction related HCV impact at the junction of the R314/L1203.

- Junction of the R313/L1204/Entrance to Srahmore Peat Deposition Site - located approximately 2km west of Bangor Erris (Site 8)

It is expected that construction related HCV trips will use the N59 and the National Primary Roads to access key locations (including ports) around the country. However it is considered the volume of construction related HCV trips generated by the onshore pipeline works would be significantly less than the background traffic flow on the relevant National Road network and the direct traffic impact would dissipate into the background traffic flow. Therefore detailed capacity analysis was not required on the National Road network.

To ensure a robust traffic study, two traffic scenarios were assessed. The first scenario is the daily construction traffic during the predicted peak month for HCV movement, which is the second month of construction programme, and the second scenario is hypothetical scenario which relates to the daily construction traffic flows if all construction activities were to peak simultaneously.

6.3.1 Peak Period for HCV Movements

6.3.1.1 Link Capacity

A link capacity assessment of the road network in the study area was undertaken for the month of peak HCV traffic movements. This followed the same approach as described in section 3.2.11 of this report, which is based on the NRA document “Road Link Design” TD 9/07. **Table 6.3** summarises the results.

Table 6.3: Link Capacity Assessment for the study area road network.

Road Section	Theoretical Capacity* (AADT)	Demand (AADT)	% Used Capacity
R313 west of junction with R314	8381	4110	49%
R313 east of junction with R314	8381	2536	30%
R313 west of junction with L1204	8381	2002	24%
R313 east of junction with L1204	8381	2978	36%
R314 north of junction with R313	8381	1660	20%
R314 west of junction with L5243	8381	1291	15%
R314 west of junction with L1204	8381	1108	13%
R314 west of junction with L1202	8381	1582	19%
R314 east of junction with L1202	8381	1227	15%
R314 east of junction with L1203	8381	977	12%
L1204 north of junction with R313	8250	1284	16%
L1202 west of junction with R314	8250	651	8%
L1202 west of Pollatomish	7944	371	5%
L1202 south of Inver	8250	763	9%
L1203 west of junction with R314	8250	705	9%
L5243	7944	329	4%
L5244	7944	357	4%

***The Theoretical Capacity corresponds to a carriageway width of 6m for the R313, R314 and L1203. The Theoretical Capacity corresponds to a carriageway width of 5.5m for sections of the L1202 (east of Aghoos), L1203 and the L1204. The Theoretical Capacity corresponds to a carriageway width of 4m for the L1202 west of Pollatomish, L5243 and L5244**

Table 6.3 indicates that the road network has sufficient capacity to accommodate the estimated peak HCV volumes. It is considered that queuing and delays will not occur on the road network during this period. The carriageway widths for R313, R314, L1204 and the L1202 as far as Aghoos has sufficient width to allow two HCVs to pass each other without obstruction. However, the carriageway width on sections of the L1202, west of Pollatomish, can drop to approx 4.0m which is not sufficient to allow two HCVs to pass simultaneously. Therefore, even though the road has sufficient capacity to cater for the volume of vehicles, the reduced carriageway width would result in the need for all HCV movements to Glengad on the L1202, west of Pollatomish, to be managed carefully.

6.3.1.2 HCV Movement to Glengad – West of Pollatomish

Only HCVs travelling to Glengad would use the L1202 west of Pollatomish and the scale of HCV movement at Glengad is significantly less than the scale of HCV movement at Aghoos, where the tunnelling activity will take place.

It is estimated that the works at Glengad would generate 48 two-way daily HCV trips during the peak month. The peak scale of HCV movement in Glengad is expected to last for only three months and HCV movements will significantly drop after the fourth month of the construction programme.

HGV traffic to Glengad will be managed using a controlled convoy system, which will be further developed from the management of HCV movements used previously during the Landfall construction. The peak daily HCV movement to the Landfall site was more than the peak daily volume of HCV movement estimated at Glengad for these onshore pipeline works. The Traffic Management Plan, developed by Tobin Consulting Engineers, which complements this TIA, provides details of the proposed convoy system and illustrates the measures proposed to be put in place in order to ensure the safe movement of HCV traffic to Glengad.

6.3.1.3 Junction Capacity

Ensuring the safe movement of HCV will be the critical traffic concern during the construction stage. In order to provide a robust assessment, peak hour capacity analysis was undertaken at key junctions along the haul route.

From on-site observations during site visits in February 2010 and a review of the recorded traffic data in the study area, it was determined that the following are the key junctions along the haul route:

- Cross roads with the R314, the L1204 and the L5244 (Site 4)
- Junction R314/L1202 (Site 5)
- Junction L1202/L5243 in Pollatomish (Site 7)
- Junction R313/L1204/ Entrance to Srahmore Peat Deposition Site (Site 8)

The four priority junctions that will be most affected during the construction period were analysed for operational capacity in order to determine whether they will operate effectively or have capacity issues such as queuing and delays.

The junctions were analysed using the junction capacity model, PICADY (Priority Intersection Capacity and Delay) version 5.0. The junction models are based on the Ratio of Flow to Capacity (RFC), which is the output figure of each junction arm. If the RFC value exceeds 0.85, then the junction is considered to be operating unsatisfactorily and would experience junction delays and queuing.

The following summarises the results of the junction capacity analysis for each junction during the Construction Year 2011. The relevant turning count traffic flows information for each junction are shown in **Appendix A**. Note that the junction locations are referred to by names and reference numbers used in **Figure TR0001.**

Cross roads with the R314, the L1204 and the L5244 (Site 4)

The priority junction was modelled, using PICADY, for future traffic flows with and without the construction traffic. The junction arm labelling convention is as follows:

- Arm A – R314 East
- Arm B – L1204
- Arm C – R314 West
- Arm D – L5244

The relevant turning counts can be seen in **Figures TR0010 and TR0011 in Appendix A**. **Table 6.4** summarises the results of the crossroads capacity analysis.

Table 6.4: Site 4 - Junction Capacity Analysis Results (Month 2)

	Arm A R314 East		Arm B L1204		Arm C R314 West		Arm D L5244	
Scenario	**Max RFC**	**Max Q**	**Max RFC**	**Max Q**	**Max RFC**	**Max Q**	**Max RFC**	**Max Q**
2011 "Do Nothing" AM Peak	0.002	0.0	0.035	0.0	0.005	0.0	0.008	0.0
2011 "Do Nothing" PM Peak	0.013	0.0	0.059	0.1	0.027	0.0	0.058	0.1
2011 "Do Something" AM Peak	0.002	0.0	0.215	0.3	0.005	0.0	0.009	0.0
2011 "Do Something" PM Peak	0.013	0.0	0.150	0.2	0.029	0.0	0.070	0.1

* Q denotes the number of vehicles in a queue on a given junction arm

Table 6.4 indicates that the crossroads junction with the R314, the L1204 and the L5244 will operate below capacity during the AM and PM peak hours in the peak construction period for HCV Movements. It is considered that queuing and delay will not occur at this junction. Therefore, the junction is expected to perform satisfactorily.

L1202 Local Road and R314 Junction (Site 5)

The priority junction was modelled, using PICADY for future traffic flows with and without the construction traffic. The junction arm labelling convention is as follows:

- Arm A – R314 West
- Arm B – L1202
- Arm C – R314 East

The relevant turning counts can be seen in **Figures TR0013 and TR0014 in Appendix A**. **Table 6.5** summarises the results of the crossroads capacity analysis.

Table 6.5: Site 5 - Junction Capacity Analysis Results (Month 2)

	Arm A R314 West		Arm B L1202		Arm C R314 East	
Scenario	**Max RFC**	**Max Q**	**Max RFC**	**Max Q**	**Max RFC**	**Max Q**
2011 "Do Nothing" AM Peak	0.000	0.0	0.021	0.0	0.007	0.0
2011 "Do Nothing" PM Peak	0.000	0.0	0.023	0.0	0.018	0.0
2011 "Do Something" AM Peak	0.000	0.0	0.115	0.1	0.011	0.0
2011 "Do Something" PM Peak	0.000	0.0	0.143	0.2	0.020	0.0

* Q denotes the number of vehicles in a queue on a given junction arm

Table 6.5 indicates that the junction of the R314/L1202 will operate significantly below capacity during the AM and PM peak hours in the peak construction period for HCV Movements. Arm A does not have any values as its associated movements are not required to give way to any other arms (i.e. straight through movement and a left turn movement). It is considered that queuing and delay will not occur at this junction. Therefore, the junction is expected to perform satisfactorily.

L1202/L5243 in Pollatomish Junction (Site 7)

The priority junction was modelled, using PICADY for future traffic flows with and without the construction traffic. The junction arm labelling convention is as follows:

- Arm A – L1202 East
- Arm B – L5243
- Arm C – L1202 West

The relevant turning counts can be seen in **Figures TR0016 and TR0017 in Appendix A**. **Table 6.6** summarises the results of the crossroads capacity analysis.

Table 6.6: Site 7 - Junction Capacity Analysis Results (Month 2)

	Arm A L1202 East		Arm B L5243		Arm C L1202 West	
Scenario	**Max RFC**	**Max Q**	**Max RFC**	**Max Q**	**Max RFC**	**Max Q**
2011 "Do Nothing" AM Peak	0.000	0.0	0.012	0.0	0.005	0.0
2011 "Do Nothing" PM Peak	0.000	0.0	0.010	0.0	0.006	0.0
2011 "Do Something" AM Peak	0.000	0.0	0.012	0.0	0.005	0.0
2011 "Do Something" PM Peak	0.000	0.0	0.010	0.0	0.006	0.0

* Q denotes the number of vehicles in a queue on a given junction arm

Table 6.6 indicates that the junction of the L1202/L5243 will operate below capacity during the AM and PM peak hours in the peak construction period for HCV Movements. Arm A does not have any values as its associated movements are not required to give way to any other arms (i.e. straight through movement and a left turn movement). It is considered that queuing and delay will not occur at this junction. Therefore, the junction is expected to perform satisfactorily.

R313/L1204/Srahmore Junction (Site 8)

The priority junction was modelled, using PICADY for future traffic flows with and without the construction traffic. The junction arm labelling convention is as follows:

- Arm A – R313 West
- Arm B – L1204
- Arm C – R313 East
- Arm D – Srahmore Entrance

The relevant turning counts can be seen in **Figures TR0019 and TR0020 In Appendix A**. **Table 6.7** summarises the results of the crossroads capacity analysis.

Table 6.7 Site 8 - Junction Capacity Analysis Results (Month 2)

	Arm A R313 West		Arm B L1204		Arm C R313 East		Arm D Srahmore Entrance	
Scenario	**Max RFC**	**Max Q**	**Max RFC**	**Max Q**	**Max RFC**	**Max Q**	**Max RFC**	**Max Q**
2011 "Do Nothing" AM Peak	0.000	0.0	0.040	0.0	0.048	0.1	0.001	0.0
2011 "Do Nothing" PM Peak	0.000	0.0	0.073	0.1	0.072	0.1	0.004	0.0
2011 "Do Something" AM Peak	0.016	0.0	0.087	0.1	0.188	0.3	0.025	0.0
2011 "Do Something" PM Peak	0.004	0.0	0.210	0.3	0.158	0.2	0.037	0.0

* Q denotes the number of vehicles in a queue on a given junction arm

Table 6.7 indicates that the junction of the R313/L1204/Srahmore Entrance will operate below capacity during the AM and PM peak hours in the peak construction period for HCV Movements.. It is considered that queuing and delay will not occur at this junction. Therefore the junction is expected to perform satisfactorily.

Conclusion from the Junction Assessments for the Peak Period for HCV Movement

The results shown in Tables 6.4 –6.7 indicate that all of the key junctions on the haul route will operate within capacity for the AM and PM Peak Hours based on the estimated traffic demand generated by construction activities during the peak month of HCV movement. It is predicted that the additional volumes generated during the peak month of construction will not cause queuing and delays at the junctions.

6.3.2 Hypothetical Scenario - Peak HCV and Personnel trips for all sites occurring simultaneously

6.3.2.1 Link Capacity

A link capacity assessment was undertaken of the road network in the study area for the hypothetical scenario of all construction related traffic (both HCV and Personnel) peaking simultaneously. This followed the same approach as described in section 3.2.11 of this report, which is based on the NRA document "Road Link Design" TD 9/07. **Table 6.8** summarises the results.

Table 6.8: Link Capacity Assessment for the study area road network.

Road Section	Theoretical Capacity* (AADT)	Demand (AADT)	% Used Capacity
R313 west of junction with R314	8381	4196	50%
R313 east of junction with R314	8381	2554	30%
R313 west of junction with L1204	8381	2002	24%
R313 east of junction with L1204	8381	3166	38%
R314 north of junction with R313	8381	1729	21%
R314 west of junction with L5243	8381	1359	16%
R314 west of junction with L1204	8381	1176	14%
R314 west of junction with L1202	8381	1799	21%
R314 east of junction with L1202	8381	1291	15%
R314 east of junction with L1203	8381	1042	12%
L1204 north of junction with R313	8250	1439	17%
L1202 west of junction with R314	8250	712	9%
L1202 west of Pollatomish	7944	374	5%
L1202 south of Inver	8250	765	9%
L1203 west of junction with R314	8250	705	9%
L5243	7944	329	4%
L5244	7944	361	5%

***The Theoretical Capacity corresponds to a carriageway width of 6m for the R313, R314 and L1203. The Theoretical Capacity corresponds to a carriageway width of 5.5m for sections of the L1202 (east of Aghoos), L1203 and the L1204. The Theoretical Capacity corresponds to a carriageway width of 4m for the L1202 west of Pollatomish, L5243 and L5244**

Table 6.8 indicates that the road network surrounding the development can accommodate the hypothetical scenario of all peak activities occurring simultaneously. It is considered that queuing and delays will not occur on the road network during this period.

6.3.2.2 HCV Movement to Glengad – West of Pollatomish

The volume of HCV movement assumed for Glengad in this scenario (peak activities occurring simultaneously) is 48 two-way HCV daily trips which is the same as the volume assessed in the previous scenario (peak month for HCV movement). Therefore the methodology for operated and managed the HCV movement to Glengad, outlined in Section 6.3.1.2, will be sufficient to cater for peak HCV demand at Glengad.

6.3.2.3 Junction Capacity

The following summarises the results of the junction capacity analysis for each junction during the Construction Year 2011 based on all construction activities peaking simultaneously. The relevant turning count traffic flows for each junction are shown in **Appendix A.** Note that the junction locations are referred to by names and reference numbers used in **Figure TR0001.**

Cross roads with the R314, the L1204 and the L5244 (Site 4)

The priority junction was modelled, using PICADY, for future traffic flows with and without the construction traffic. The junction arm labelling convention is as follows:

- Arm A – R314 East
- Arm B – L1204

- Arm C – R314 West
- Arm D – L5244

The relevant turning counts can be seen in **Figures TR0010 and TR0012 in Appendix A**. **Table 6.9** summarises the results of the crossroads capacity analysis.

Table 6.9: Site 4 - Junction Capacity Analysis Results

	Arm A R314 East		Arm B L1204		Arm C R314 West		Arm D L5244	
Scenario	**Max RFC**	**Max Q**	**Max RFC**	**Max Q**	**Max RFC**	**Max Q**	**Max RFC**	**Max Q**
2011 "Do Nothing" AM Peak	0.002	0.0	0.035	0.0	0.005	0.0	0.008	0.0
2011 "Do Nothing" PM Peak	0.013	0.0	0.059	0.1	0.027	0.0	0.058	0.1
2011 "Do Something" AM Peak	0.002	0.0	0.276	0.4	0.005	0.0	0.009	0.0
2011 "Do Something" PM Peak	0.014	0.0	0.183	0.2	0.030	0.0	0.078	0.1

* Q denotes the number of vehicles in a queue on a given junction arm

Table 6.9 indicates that the crossroads junction with the R314, the L1204 and the L5244 will operate below capacity during the AM and PM peak hours for the scenario of all construction activities peaking at the same time. It is considered that queuing and delay will not occur at this junction. Therefore the junction is expected to perform satisfactorily.

L1202 Local Road and R314 Junction (Site 5)

The priority junction was modelled, using PICADY, for future traffic flows with and without the construction traffic. The junction arm labelling convention is as follows:

- Arm A – R314 West
- Arm B – L1202
- Arm C – R314 East

The relevant turning counts can be seen in **Figures TR0013 and TR0015 in Appendix A**. **Table 6.10** summarises the results of the crossroads capacity analysis.

Table 6.10: Site 5 - Junction Capacity Analysis Results

	Arm A R314 West		Arm B L1202		Arm C R314 East	
Scenario	**Max RFC**	**Max Q**	**Max RFC**	**Max Q**	**Max RFC**	**Max Q**
2011 "Do Nothing" AM Peak	0.000	0.0	0.021	0.0	0.007	0.0
2011 "Do Nothing" PM Peak	0.000	0.0	0.023	0.0	0.018	0.0
2011 "Do Something" AM Peak	0.000	0.0	0.131	0.1	0.017	0.0
2011 "Do Something" PM Peak	0.000	0.0	0.170	0.2	0.020	0.0

* Q denotes the number of vehicles in a queue on a given junction arm

Table 6.10 indicates that the junction of the R314/L1202 will operate significantly below capacity during the AM and PM peak hours for the scenario of all construction activities peaking at the same time. Arm A does not have any values as its associated movements are not required to give way to

any other arms (i.e. straight through movement and a left turn movement). It is considered that queuing and delay will not occur at this junction. Therefore the junction is expected to perform satisfactorily.

L1202/L5243 in Pollatomish Junction (Site 7)

The priority junction was modelled, using PICADY for future traffic flows with and without the construction traffic. The junction arm labelling convention is as follows:

- Arm A – L1202 East
- Arm B – L5243
- Arm C – L1202 West

The relevant turning counts can be seen in **Figures TR0016 and TR0018 in Appendix A**. **Table 6.11** summarises the results of the crossroads capacity analysis.

Table 6.11: Site 7 - Junction Capacity Analysis Results

	Arm A L1202 East		Arm B L5243		Arm C L1202 West	
Scenario	**Max RFC**	**Max Q**	**Max RFC**	**Max Q**	**Max RFC**	**Max Q**
2011 "Do Nothing" AM Peak	0.000	0.0	0.012	0.0	0.005	0.0
2011 "Do Nothing" PM Peak	0.000	0.0	0.010	0.0	0.006	0.0
2011 "Do Something" AM Peak	0.000	0.0	0.008	0.0	0.012	0.0
2011 "Do Something" PM Peak	0.000	0.0	0.010	0.0	0.006	0.0

* Q denotes the number of vehicles in a queue on a given junction arm

Table 6.11 indicates that the junction of the L1202/L5243 will operate below capacity during the AM and PM peak hours for the scenario of all construction activities peaking at the same time. Arm A does not have any values as its associated movements are not required to give way to any other arms (i.e. straight through movement and a left turn movement). It is considered that queuing and delay will not occur at this junction. Therefore the junction is expected to perform satisfactorily.

R313/L1204/Srahmore Junction (Site 8)

The priority junction was modelled, using PICADY for future traffic flows with and without the construction traffic. The junction arm labelling convention is as follows:

- Arm A – R313 West
- Arm B – L1204
- Arm C – R313 East
- Arm D – Srahmore Entrance

The relevant turning counts can be seen in **Figures TR0019 and TR0021 in Appendix A**. **Table 6.12** summarises the results of the crossroads capacity analysis.

Table 6.12 Site 8 - Junction Capacity Analysis Results

	Arm A R313 West		Arm B L1204		Arm C R313 East		Arm D Srahmore Entrance	
Scenario	**Max RFC**	**Max Q**	**Max RFC**	**Max Q**	**Max RFC**	**Max Q**	**Max RFC**	**Max Q**
2011 "Do Nothing" AM Peak	0.000	0.0	0.040	0.0	0.048	0.1	0.001	0.0
2011 "Do Nothing" PM Peak	0.000	0.0	0.073	0.1	0.072	0.1	0.004	0.0
2011 "Do Something" AM Peak	0.034	0.0	0.113	0.1	0.251	0.4	0.030	0.0
2011 "Do Something" PM Peak	0.003	0.0	0.264	0.4	0.188	0.2	0.068	0.1

* Q denotes the number of vehicles in a queue on a given junction arm

Table 6.12 indicates that the junction of the R313/L1204/Srahmore Entrance will operate below capacity during the AM and PM peak hours for the scenario of all construction activities peaking at the same time. It is considered that queuing and delay will not occur at this junction. Therefore the junction is expected to perform satisfactorily.

Conclusion from the Junction Assessments for the hypothetical scenario of all construction activity occurring simultaneously

The results shown in Tables 6.9 – 6.12 indicate that all of the key junctions on the haul route will operate within capacity for the AM and PM Peak Hours, based on a hypothetical scenario of peak traffic demand generated by all construction activities at each site occuring simultaneously. It is predicted that this scenario would not cause queuing and delays at the junctions.

6.3.2.4 Public Transport Impacts

There will be no significant impact on public transport within the study area during the construction stage.

6.3.3 HCV Traffic Impact in Belmullet

In order to undertake an assessment of the potential traffic impact of the proposed construction works in 'non-rural' areas, it was determined that a scenario where a percentage of HCV trips carrying tunnelling material through Belmullet should be assessed.

An assessment of the potential available capacity at the proposed Tallagh landfill site in the Belmullet area showed that an estimated maximum of five daily HCV loads could be accommodated based on the annual capacity of the proposed landfill. Therefore, this would equate to a maximum of ten two-way trips per day through Belmullet.

In September 2008, Abacus Transportation Surveyors undertook a traffic survey in the centre of Belmullet at the roundabout junction of American Street/ Main Street/ High Street/ Barrack Street. The survey was undertaken for a 12-hour period between 07:00-19:00. The total two-way flow for the 12-hour period on Barrack Street and American Street was 4,424 vehicles and 5,412 respectively. Therefore the traffic impact generated by an additional 10 HCV trips would be negligible in relation to the existing scale of traffic flow in the town.

6.4 JUNCTION VISIBILITY FOR HCV MOVEMENT

6.4.1 Access Junctions

6.4.1.1 Aghoos

There will be two access roads to Site Compound SC3 and the Stringing Area at Aghoos.. The access to the compound will be constructed first and the access road to the stringing area will be constructed approximately ten months later. Once both access roads are complete a one-way system will be put in operation whereby one road will be used as an entrance only and the other as an exit only. The proposed junctions will be approximately 100m apart. The proposed access to Site Compound SC4 will be located to the east of string area on the L1202.

The proposed access roads will be located adjacent to an upgraded section of the L1202. The area surrounding the Aghoos compounds is flat terrain which will provide good visibility for HCV access/egress the site. The access points will be located in strategic positions to ensure that sufficient sight visibility and stopping sight distance is provided along the L1202. The L1202 has a carriageway width greater than 5.5m, adjacent to the proposed site compounds. This will allow two HCV to pass each other simultaneously. Diagrams 6.1 and 6.2 give an overview of the proposed sight visibility distances at the Aghoos complemented with photographs of the adjacent road network.

Photo A

Photo B

Photo C

Photo D

Photo E

Photo F

TELECOM POLE

GATE

HEDGE / DITCH

WALL

3.0m x 160m VISIBILITY SPLAY

Access drawings and photographs provided courtesy of Tobin Consulting Engineers

N O T E S

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING

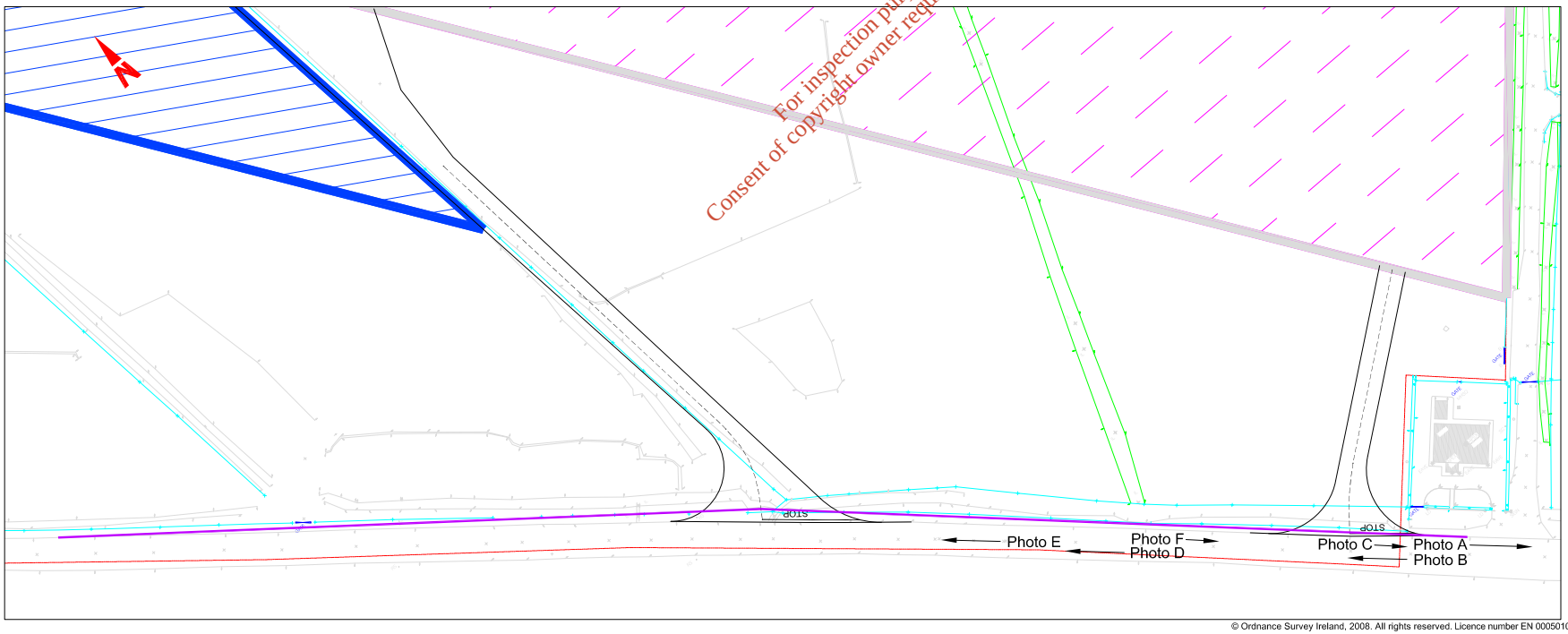
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE

3. ENGINEER TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES

4. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Scale @ A3 1:1000

Diagram 6.1 - Aghoos Site Access A



Corrib natural gas

RPS

Photo A

Photo B

Photo C

Photo D

Photo E

Photo F

TELECOM POLE

GATE

HEDGE / DITCH

WALL

3.0m x 160m VISIBILITY SPLAY

Access drawings and photographs provided courtesy of Tobin Consulting Engineers

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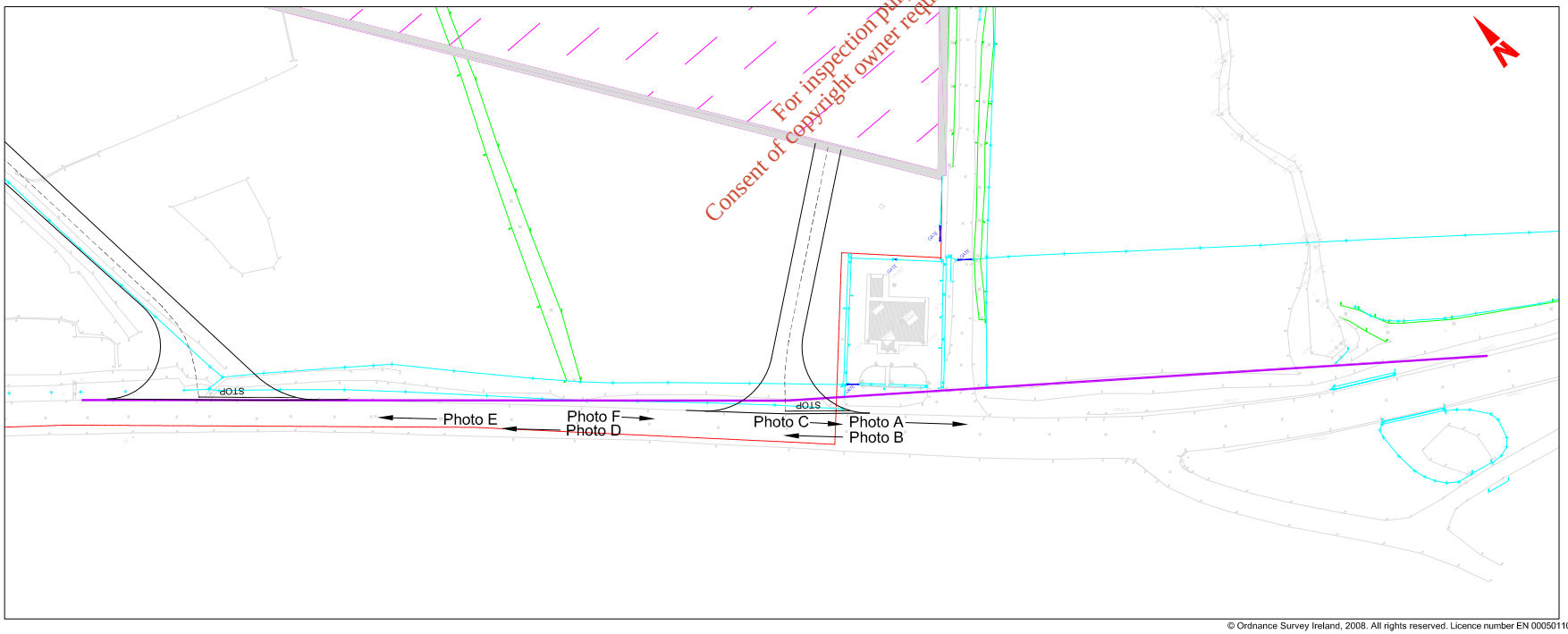
4. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Scale @ A3 1:1000

Diagram 6.2 - Aghoos Site Access B



Corrib natural gas

RPS

6.4.1.2 Glengad

The proposed access road to the Glengad Compounds will be a temporary road approximately 6.0m wide. On completion of the construction, this temporary road will be reinstated to provide a 3.5m permanent access road to serve the LVI. The access point is located to ensure that maximum sight visibility and stopping sight distance is provided along the L1202.

Diagram 6.3 gives an overview of the proposed sight visibility distances at the access roads to the Glengad site (complemented with photographs of the adjacent road network).

6.4.1.3 Srahmore Peat Deposition site

The access to the Srahmore Peat Deposition Site is located off the R313 with the access junction forming a crossroads junction with the R313 and L1204. The crossroads junction was upgraded before the site opened for peat deposition in 2005. The proposed access road has a carriageway width of 7.6m on approach to the R313. The entry width of the access road is approximately 11m at the intersection with the R313. The junction radii are adequate to allow HCV to access/egress the Srahmore Site without obstructing the opposing lane on the access road.

Due to flat terrain surrounding the junction and the horizontal alignment of the R313, the sight visibility distance along the R313 from 3m back along the access road is adequate to the west of the access road.

However the sight visibility distance to the east of the access road is restricted for cars to approx 40m due to the position of street furniture adjacent to the R313. It is considered that this sign would not restrict visibility for HCV drivers but it should be set-back outside the sight visibility splay from a 3m set back to ensure that maximum sightlines are provided for all vehicles.

Diagram 6.4 gives an overview of the existing sight visibility distances at the Srahmore Site Deposition Site complemented with photographs of the adjacent R313.

6.4.1.4 Bellanaboy Bridge Gas Terminal

The main traffic to the Bellanaboy Bridge Gas Terminal site will be predominately light vehicles, however, there will be HCV movements to the terminal for general deliveries/services and during the pipeline construction and commissioning phase. The construction compound at the terminal will be used as a base for project construction management employees and also be used as outlined below,

- HCVs will use the terminal as a temporary holding point during the operation of convoys to Glengad.
- HCVs will park over night at the terminal
- HCVs will use the terminal as a secure serviced holding facility for HCV construction traffic.
- Designated destination point for group transport by bus of specific construction personnel to construction compounds in Aghoos and Glengad.

Diagrams 6.5 and 6.6 gives an overview of the existing sight visibility distances at the Bellanaboy Bridge Gas Terminal complemented with photographs of the adjacent R314.

PHOTO A

PHOTO B

PHOTO C

TELECOM POLE
GATE
HEDGE / DITCH
WALL
3.0m x 160m VISIBILITY SPLAY

Access drawings and photographs provided courtesy of Tobin Consulting Engineers

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Scale @ A3 1:1000

Diagram 6.3 - Glengad Site Access

Corrib natural gas

RPS

PHOTO A1
(0m Set Back)

PHOTO A2
(3.0m Set Back)

PHOTO B

PHOTO C1
(3.0m Set Back)

PHOTO C2
(0m Set Back)

TELECOM POLE
GATE
HEDGE / DITCH
PALISADE FENCING
3.0m x 160m VISIBILITY SPLAY

Access drawings and photographs provided courtesy of Tobin Consulting Engineers

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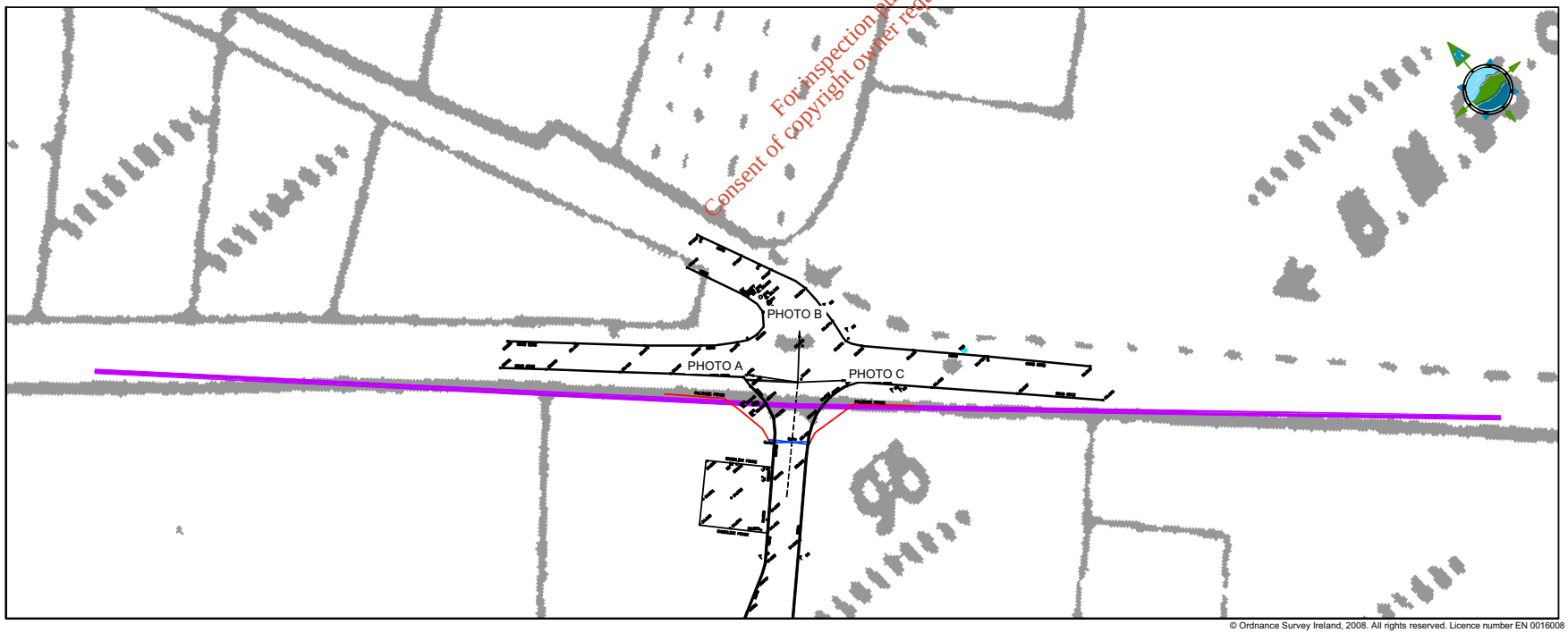
Scale @ A3 1:1000

Diagram 6.4 -
Srahmore Site Access



Corrib natural gas

RPS

PHOTO A

PHOTO B

3.0m x 160m VISIBILITY SPLAY

Access drawings and photographs provided courtesy of Tobin Consulting Engineers

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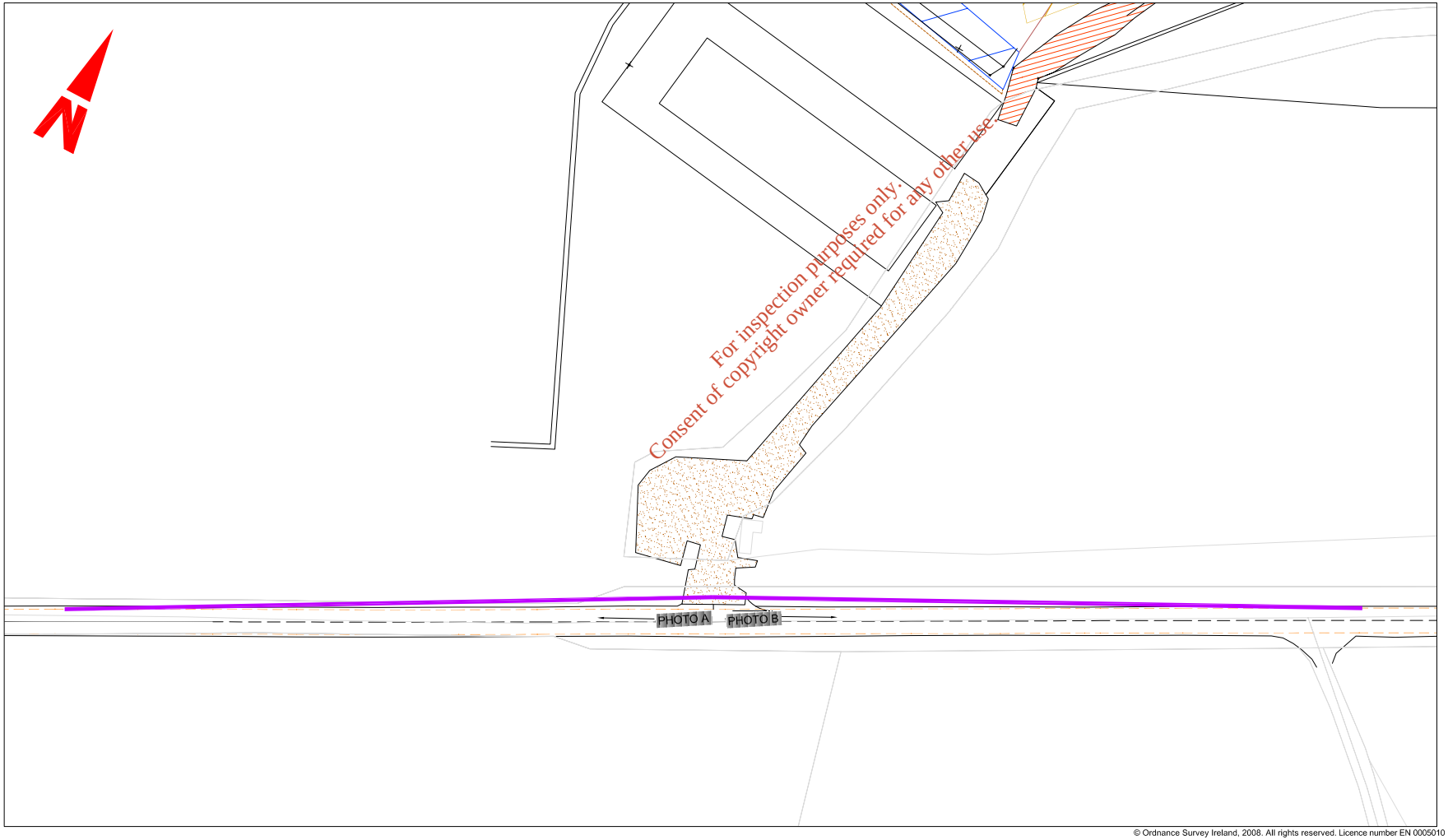
Scale @ A3 1:1000

Diagram 6.5 - Bellanaboy Terminal Access 1



Corrib natural gas

RPS

PHOTO A

PHOTO B

3.0m x 160m VISIBILITY SPLAY

Access drawings and photographs provided courtesy of Tobin Consulting Engineers

NOTES

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4. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Scale @ A3 1:5000

Diagram 6.6 - Bellanaboy Terminal Access 2

Corrib natural gas

RPS

6.4.2 Existing Junctions on the Haul Route

The provision of adequate sight visibility distances at key junctions on the haul route is critical to ensuring that HCVs can manoeuvre safely at the junctions. At three junctions on the haul route, HCVs will be crossing traffic streams when manoeuvring from the minor arm to the major arm of the junction. The following is a brief description of the existing sight visibility at these three junctions.

6.4.2.1 Cross roads with the R314, the L1204 and the L5244 (Site 4)

The L1204 and R313 were upgraded to accommodate HCV traffic associated with the construction stage of Bellanaboy Bridge Gas Terminal. As part of these works, the junction of the R314/L1204 was upgraded with adequate visibility provided along the R314 for HCVs turning onto the Regional Road. The sight visibility at this junction did not have any negative implications on road safety during the construction stage for the Bellanaboy Bridge Gas Terminal. A profile of the sight visibility at the junction is shown in the plate 1.

Plate 1: Sight visibility at Site 4

6.4.2.2 L1202 Local Road and R314 Junction (Site 5)

Sections of the L1202, including the junction with the R314, were upgraded as part of the Corrib Offshore Pipeline Landfall Works. The upgrade works improved the visibility along the R314 for HCVs accessing from the L1202. However, in order to maintain the sight visibility, maintenance of the verges and hedgerows is necessary to ensure that all vegetation remains cut-back on the R314. A profile of the sight visibility at the junction is shown in the plates 2 and 3 below.

Plate 2: Sight visibility at Site 5 **Plate 3: Sight visibility at Site 5**

6.4.2.3 R313/L1204/Srahmore Junction (Site 8)

The junction of the R313 and the L1204 was upgraded as part of the improvement works for the Bellanaboy Bridge Gas Terminal construction haul route. The flat profile of the surrounding terrain and the broad splays at the intersection of the L1204 and the R313 provide adequate visibility along the R313. As the entrance to Srahmore Peat Deposition Site is located directly opposite the L1204 and a significant number of HCV trips will be between Aghoos and Srahmore, this would result in a number of HCV trips crossing the R313. From on-site observations it is considered that drivers would have adequate sight visibility distances to see HCVs crossing at this junction and that HCVs will have ample distance to see oncoming vehicles. A profile of the sight visibility at the junction is shown in plate 4 and 5 below.

Plate 4: Sight visibility at Site 8 **Plate 5: Sight visibility at Site 8**

7 MITIGATION MEASURES

7.1 OPERATIONAL MITIGATION MEASURES

The development of the pipeline will have minimal traffic associated with it during its operation apart for safety checks and maintenance purposes. It is proposed to develop a Traffic Management Plan for the operation stage of the pipeline.

7.2 CONSTRUCTION MITIGATION MEASURES

7.2.1 Road Upgrades

The traffic assessment confirms that the existing road network and proposed materials haul route for the onshore pipeline can cater for the overall construction traffic volumes generated by the scheme. However, the project aims to minimise the overall traffic impact of the construction phase on residents and on the general environment within the study area. With this in mind, a Traffic Management Plan has been developed by Tobin Consulting Engineers to actively manage the control of HCVs arriving/departing the site compounds at Aghoos, Glengad and Srahmore and the times at which such traffic movements can occur.

The management of the movement of construction vehicles between the site compounds, the Bellanaboy Bridge Gas Terminal and the peat deposition site will draw on the experience of previous traffic management plans developed for the construction of the Bellanaboy Bridge Gas Terminal where significant amounts of peat were transferred from the Terminal site to Srahmore in 2005 and 2007. During the construction period for Bellanaboy Bridge Gas Terminal, the L1204 was upgraded to provide sufficient infrastructure for the transport of the peat. Also, the L1202 was upgraded from the junction with the R314 to Aghoos during the Landfall construction stage albeit some sections could not be upgraded at the time. Therefore, the roads on the haul route (R313, L1204, R314 and L1202) are of adequate quality to cater for HCV movements as far as the Aghoos where the majority of HCV movement will be generated.

In relation to the L1202 between Aghoos and Glengad, road widening and strengthening has been implemented on sections of the route. SEPIL in conjunction with Mayo County Council intend to undertake further works on the sections of the L1202, as outlined in Appendix E TMP, which is expected to be completed prior to the commencement of the Onshore Pipeline works. It is acknowledged that, not all the roads maybe widened so 'pinch points' may remain for HCVs. However, as the number of peak daily HCV trips generated by the works at Glengad will be significantly less than at Aghoos and less than the Landfall peak daily movements in 2009, it is considered that the 'convoy' system and traffic controls proposed in the Traffic Management Plan will ensure the safe movement of HCVs from Glengad.

7.2.2 Other Mitigation Measures

In addition to the suitability of the road infrastructure for catering for HCV trips, the following restrictions are recommended to provide for an ordered and regulated system of traffic management for this operation. A number of mitigation measures are proposed as follows:

- To minimise any impacts on other road users and to maximise road safety on the haulage route, a comprehensive Traffic Management Plan has been developed in addition to this TIA. This Plan

includes measures to ensure that the construction traffic will be carefully marshalled and managed;

- Haulage traffic must share the route with forestry traffic, local residents, school buses, and other road users. The common usage of the local road network by haulage and local traffic presents risks. These risks will be reduced by proper road signs, regular communication, awareness of school bus runs, driver training and communication, speed controls and the maintenance of clean loading and unloading areas on the site;

- It is proposed that a minibus service will be implemented to bring site operatives to and from the construction site and the terminal site;

- Although the construction works at the Aghoos Site Compound (SC3) will be undertaken 24-hours a day/seven days a week, HCV movement associated with the construction stage will be restricted to the hours of 07:00 – 19:00, Monday to Friday, 08:00 – 16:00 on Saturday with no HCV movements on Sundays or Bank Holidays (However occasional abnormal loads may have to arrive at the Bellanaboy Bridge Gas Terminal outside these working hours due to permit requirements). To avoid the possible conflict between HCV movement and pedestrian movement at Pollatomish National School, HCV trips will be restricted to/from the Glengad during school opening and closing time periods. Special provision will also be made to restrict HCV movement during periods of irregular short term local traffic periods at the local church in Aghoos;

- All signage relating to the proposed construction routes for construction traffic must be positioned clearly and designed to the satisfaction of Mayo County Council. Advanced warning signs were positioned on the R313 to warn drivers of HCV movement as part of the construction works for the Bellanaboy Bridge Gas Terminal. It is recommended that these signs be provided on the R314 and L1202 on approaches to key junctions and the accesses to the site compounds. Drivers of vehicles failing to observe the signed routes will initially be given a warning and thereafter be subject to consequential actions;

- The maintenance of adequate sight visibility distances at key existing junctions and the proposed access to the compounds is essential. Therefore, all vegetation should be cut-back (in consultation with the project ecologist) and maintained to ensure that visibility isn't restricted. In addition the street sign to the east of the Srahmore Peat Deposition site will need to be set back accordingly to provide adequate sight visibility for cars;

- At areas of reduced carriageway width, where two trucks cannot safely pass, priority will be given to the laden vehicle and signage will be provided at such locations to warn drivers to this effect. A pause point for the yielding vehicles will also be provided at these locations. The implementation of an effective communications system will facilitate this proposal;

- A maximum speed limit of 60 km/hr will be imposed for HCVs on the Haul Route on the R313, L1204, R314, L1202 (between Aghoos and Glengad on reduced widths sections of the L1202 the maximum speed limit varies between 30 km/hr and 50 km/hr) and all other local roads during the construction phase. A pacing vehicle will from time to time be deployed as part of the enforcement of this requirement;

- As part of the Traffic Management Plan drivers will be instructed to maintain, as far as possible, the separation between vehicles travelling in the same direction so that the space available for locally widened sections at areas of poor sight distance, and where oncoming traffic must yield, need not be designed to accommodate more than two vehicles waiting. The separation distances may vary on direction from An Garda Síochána. In any queuing situation on the local road network drivers will be instructed to maintain a minimum separation of 20m from each other and from entrances to dwellings so that safe visibility around each vehicle can be maintained;

- SEPIL is proposing to reinstate the proposed haul route following the completion phase, to be agreed with Mayo County Council. It is proposed that a pre and post construction survey of the route be undertaken and that the route be reinstated to its original condition;

- At points where construction related vehicles travel from the works area onto the public road network they will be inspected and cleaned where necessary. The public road network in the vicinity of the works will be inspected daily and will be maintained as required. Road cleanliness will be maintained using road sweepers. In dry, windy periods site roads used for the construction works will be sprayed where required with water to prevent raising dust;

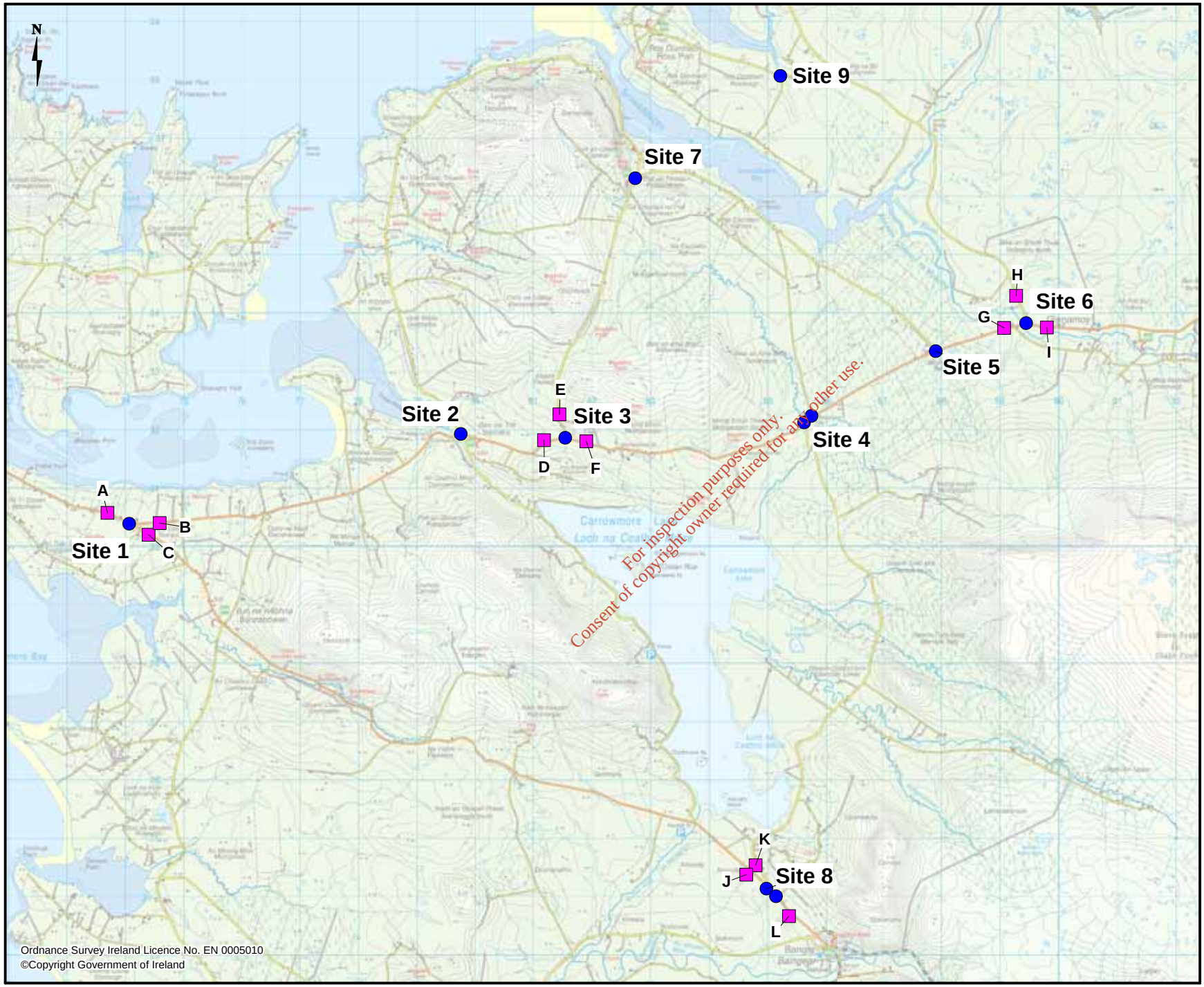
- Whilst parking will be provided on site for both employees and visitors, restrictions will be put in place to ensure only designated parking areas are used. Parking will not be allowed on the local roads surrounding the developments construction sites associated with the development.

8 RESIDUAL IMPACTS

The proposed development has been assessed with the recommended mitigation measures detailed in this TIA. The results show that no operational difficulties are expected and that the adverse traffic impacts during construction can be satisfactorily mitigated. It can be stated, therefore, that the overall impact of pipeline in terms of traffic will be imperceptible (as defined under the EPA *Guidelines for Information to be Contained in Environmental Impact Statements)*. The EPA *Guidelines for Information to be Contained in Environmental Impact Statements* describe the magnitude of change due to a proposal under four headings (imperceptible, slight, noticeable or significant). An Imperceptible Impact is categorised as impact capable of measurement but without noticeable consequences.

APPENDIX A

Figures



LEGEND:

- Link Surveys
- Junction Surveys

Traffic Survey Locations

Figure TR0001

File Ref: COR25MDR0470Mi2119A03
Date: May 2010

CORRIB ONSHORE PIPELINE

Corrib natural gas

RPS

LEGEND:

R313	Road Numbers
4244	2007 AADTs
9.6%	HCVs

AADT = ANNUAL AVERAGE DAILY TRAFFIC

Road Network & 2007 AADTs

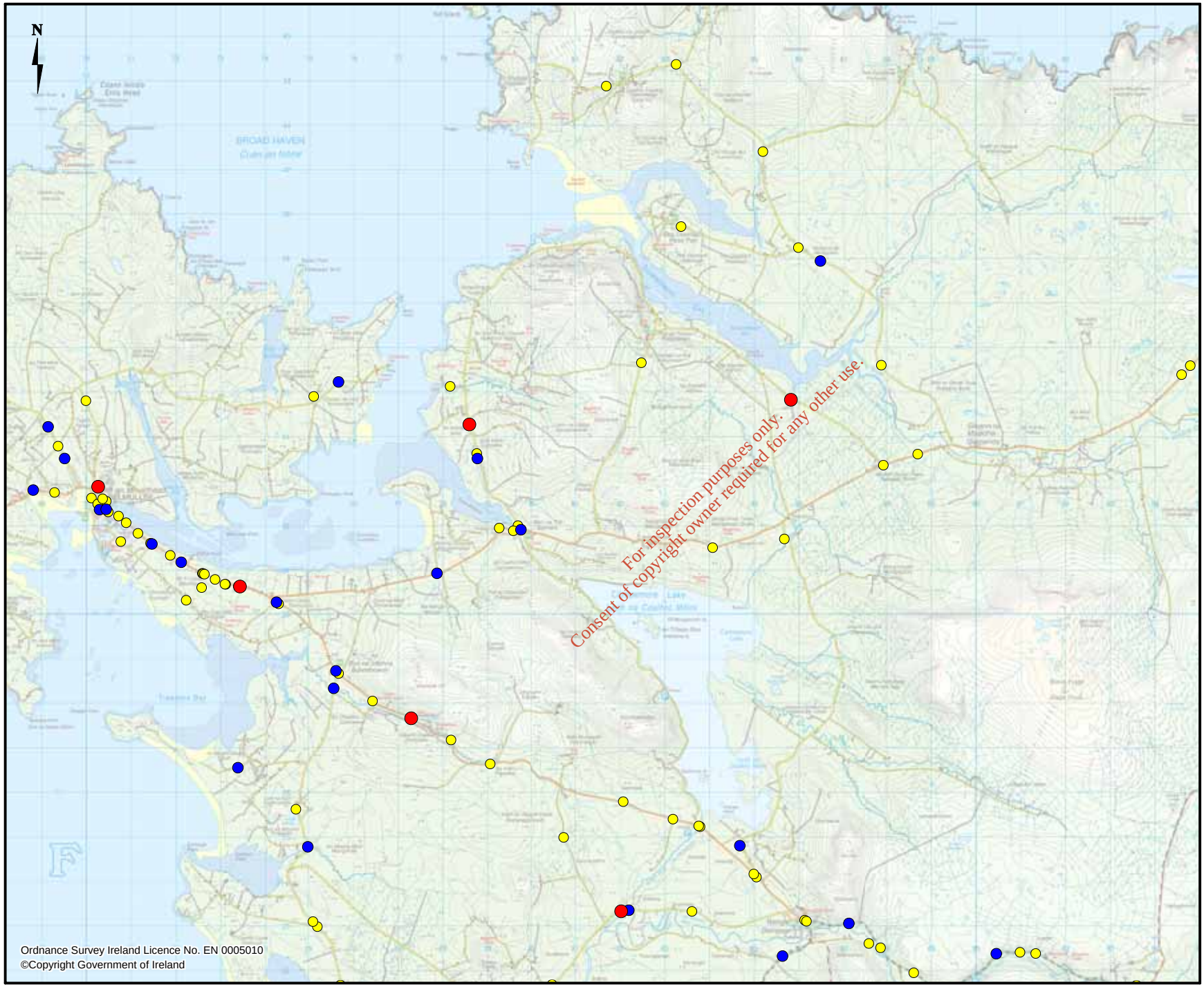
Figure TR0002

File Ref: MDR0470TR0002 - 2010
Date: May 2010

CORRIB ONSHORE PIPELINE

Corrib natural gas

RPS



LEGEND:

Accidents from 1990 to 2006

Source NRA and RSA

- Minor (73)
- Serious (22)
- Fatal (6)

Accident Data

Figure TR0003

File Ref: COR25MDR0470Mi2121A03
Date: May 2010

CORRIB ONSHORE PIPELINE

Corrib natural gas

RPS

LEGEND:

Proposed Access/Haulage Route

Proposed Access/Haulage Routes

Figure TR0004

File Ref: MDR0470TR0004 - 2010
Date: May 2010

CORRIB ONSHORE PIPELINE

Corrib natural gas

RPS

LEGEND:

R313	Road Numbers
3805	2011 AADTs
7.0%	HCVs

AADT = ANNUAL AVERAGE DAILY TRAFFIC

2011 Background Traffic Flows (Construction Year)

Figure TR0005

File Ref: MDR0470TR0005 - 2010
Date: May 2010

CORRIB ONSHORE PIPELINE

Corrib natural gas

RPS

LEGEND:

R313	Road Numbers
3855	2013 AADTs
7.0%	HCVs

AADT = ANNUAL AVERAGE DAILY TRAFFIC

2013 Background Traffic Flows (Opening Year)

Figure TR0006

File Ref: MDR0470TR0006 - 2010
Date: May 2010

CORRIB ONSHORE PIPELINE

Corrib natural gas

RPS

LEGEND:

R313	Road Numbers
4464	2028 AADTs
7.0%	HCVs

AADT = ANNUAL AVERAGE DAILY TRAFFIC

2028 Background Traffic Flows (Design Year)

Figure TR0007

File Ref: MDR0470TR0007 - 2010
Date: May 2010

CORRIB ONSHORE PIPELINE

Corrib natural gas

RPS

NOT TO SCALE

LEGEND:

R313 Road Numbers

AADT = ANNUAL AVERAGE DAILY TRAFFIC

2011 Peak Construction Period (Month 2) AADT Flows

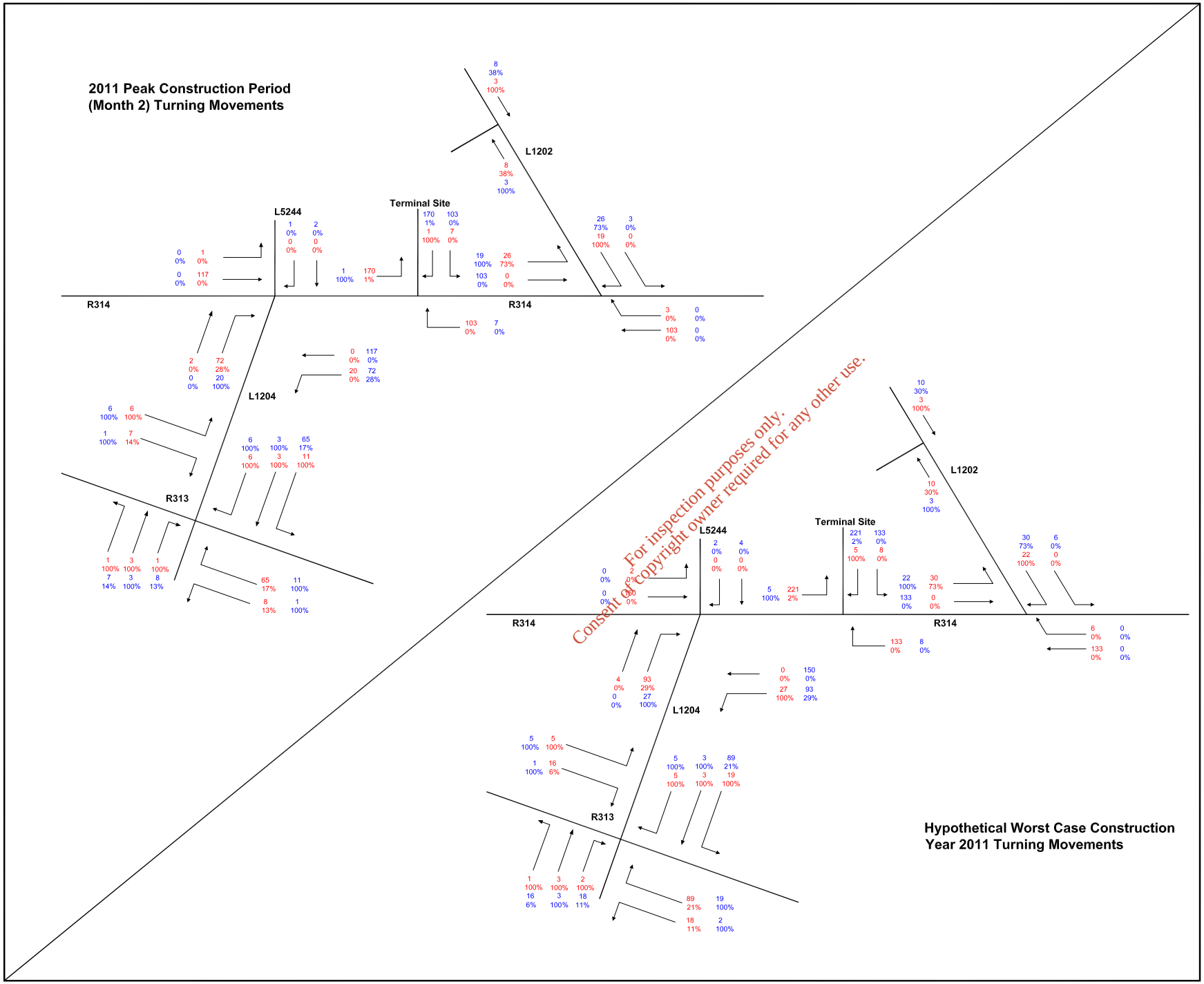
Figure TR0008

File Ref: MDR0470TR0008 - 2010
Date: May 2010

CORRIB ONSHORE PIPELINE

Corrib natural gas

RPS



LEGEND:

2011

AM
PM

8 = Total Vehicles

100% = % HCVs

2011 Construction
Traffic Distribution

Figure TR0009

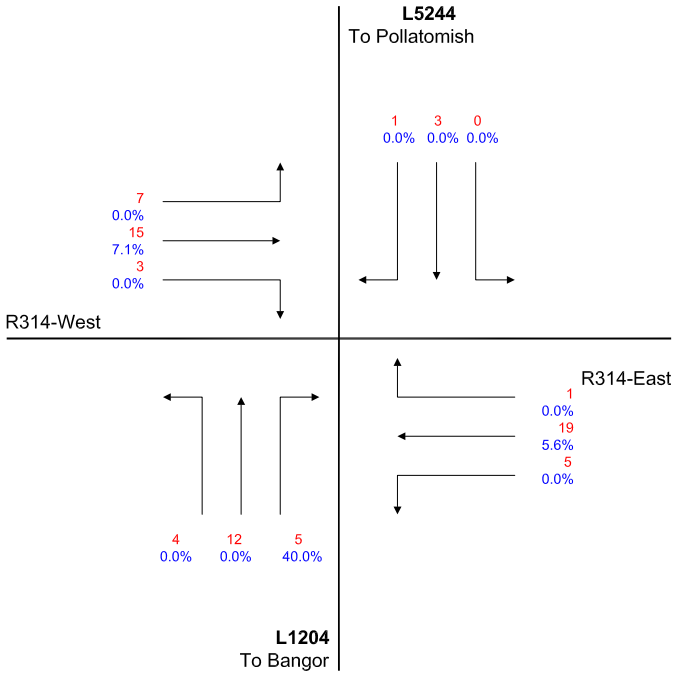
File Ref: MDR0470TR0009-0021 - 2010
Date: May 2010

CORRIB ONSHORE PIPELINE

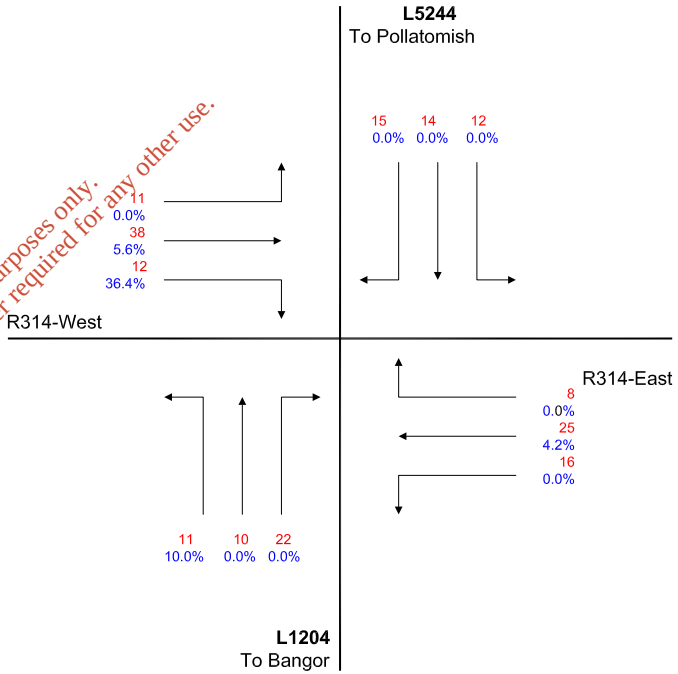
Corrib natural gas

RPS

AM Peak



PM Peak



LEGEND:

12 = Total Vehicles

0.0% = %HCVs

2011 AM & PM Peak Turning Movements without Construction Traffic

Site 4

Figure TR0010

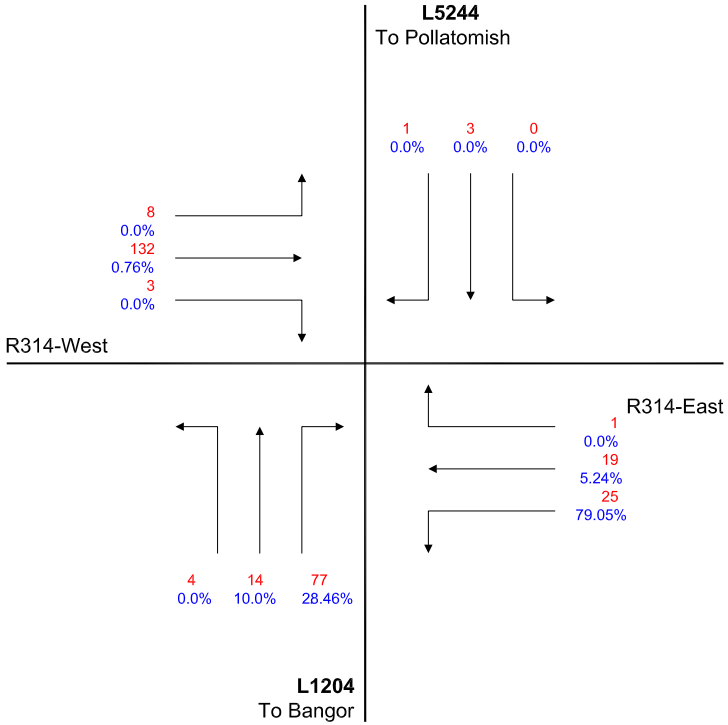
File Ref: MDR0470TR0009-0021 - 2010
Date: May 2010

CORRIB ONSHORE PIPELINE

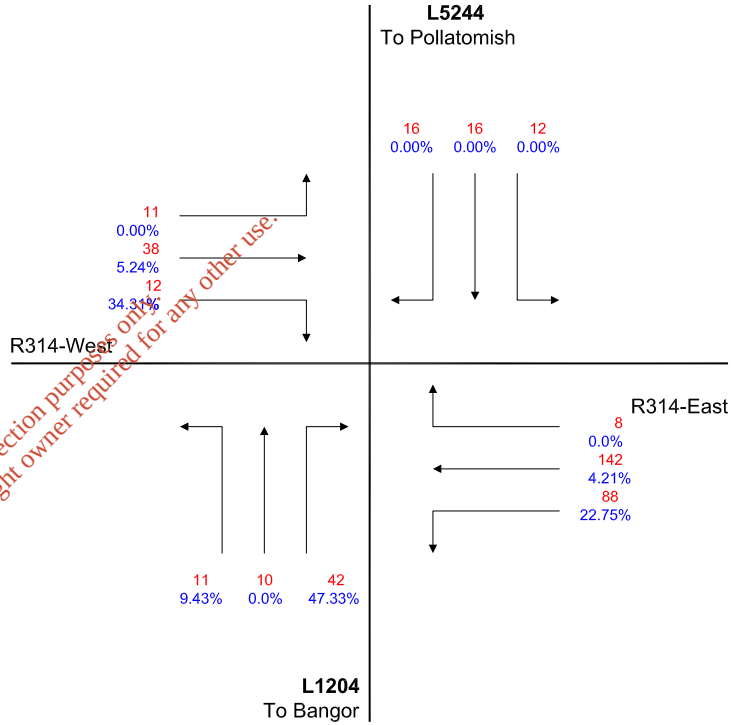
Corrib natural gas

RPS

AM Peak



PM Peak



LEGEND:

12 = Total Vehicles

0.0% = %HCVs

2011 AM & PM Peak Turning Movements with Peak (Month 2) Construction Traffic

Site 4

Figure TR0011

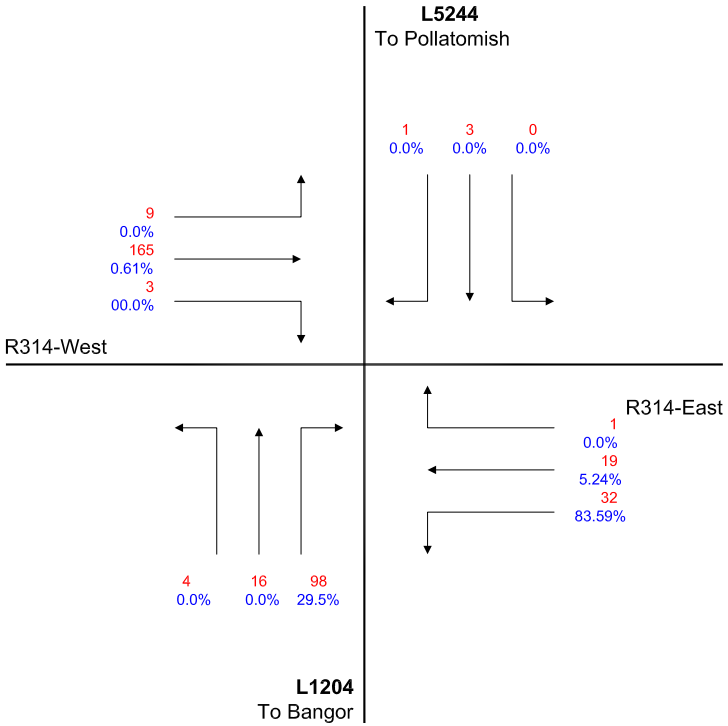
File Ref: MDR0470TR0009-0021 - 2010
Date: May 2010

CORRIB ONSHORE PIPELINE

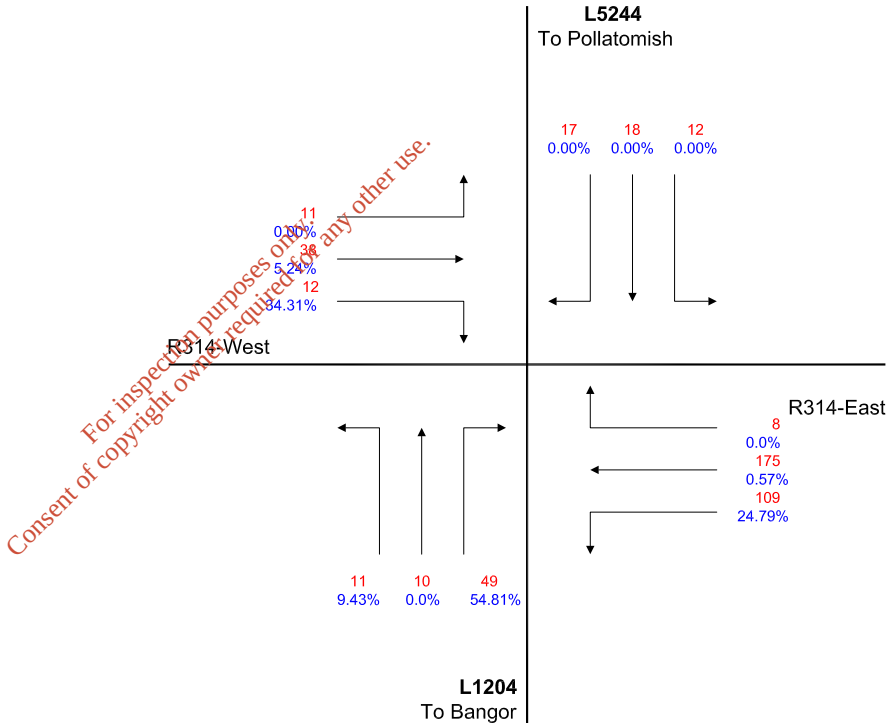
Corrib natural gas

RPS

AM Peak



PM Peak



LEGEND:

12 = Total Vehicles

0.0% = %HCVs

2011 AM & PM Peak Turning Movements with Worst-Case Construction Traffic

Site 4

Figure TR0012

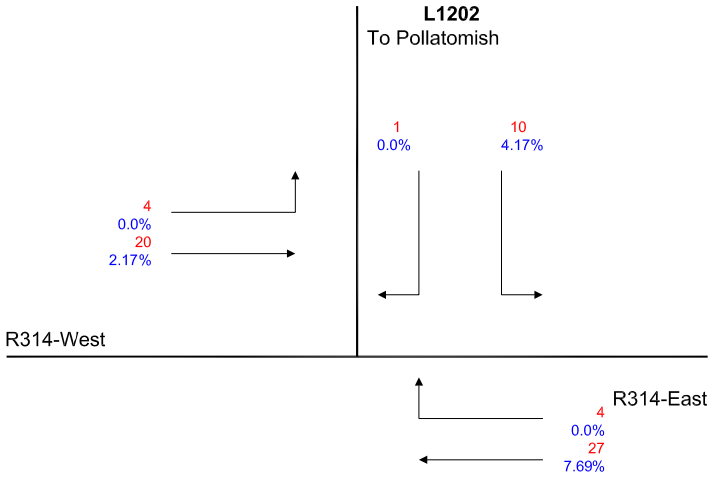
File Ref: MDR0470TR0009-0021 - 2010
Date: May 2010

CORRIB ONSHORE PIPELINE

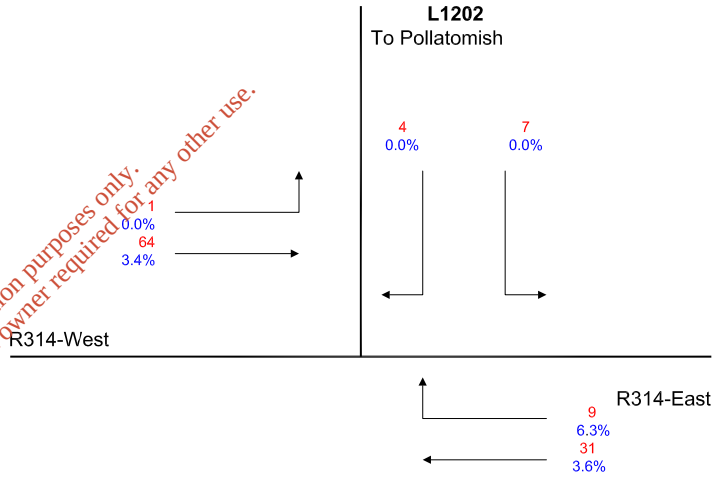
Corrib natural gas

RPS

AM Peak



PM Peak



LEGEND:

8 = Total Vehicles

0.0% = %HCVs

2011 AM & PM Peak Turning Movements without Construction Traffic

Site 5

Figure TR0013

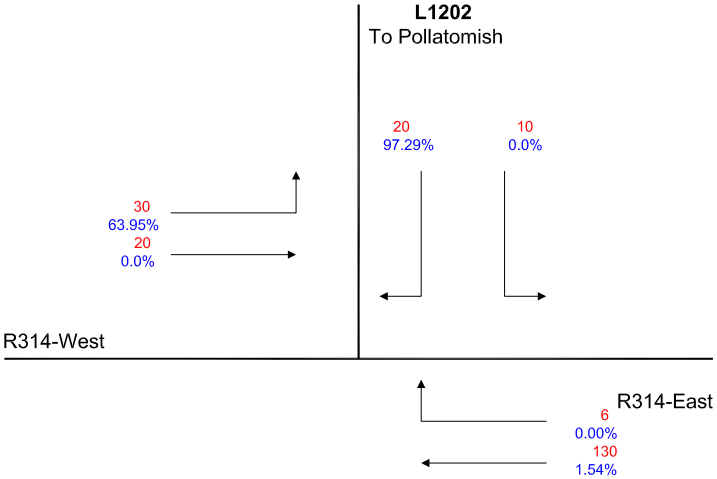
File Ref: MDR0470TR0009-0021 - 2010
Date: May 2010

CORRIB ONSHORE PIPELINE

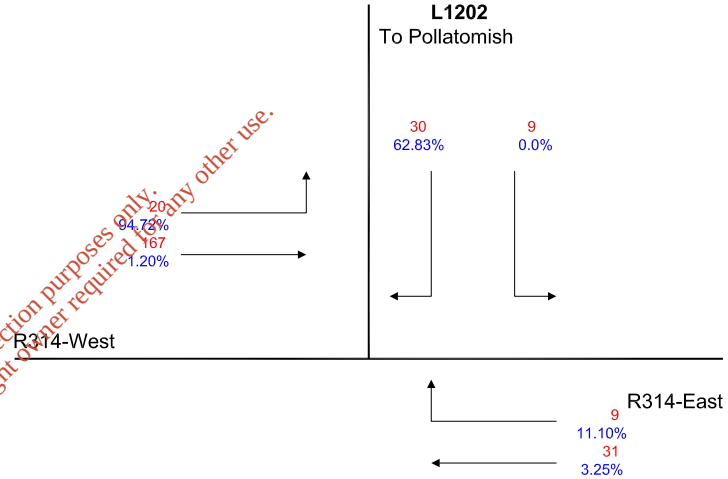
Corrib natural gas

RPS

AM Peak



PM Peak



LEGEND:

89 = Total Vehicles

14.3% = %HCVs

2011 AM & PM Peak Turning Movements with Peak (Month 2) Construction Traffic

Site 5

Figure TR0014

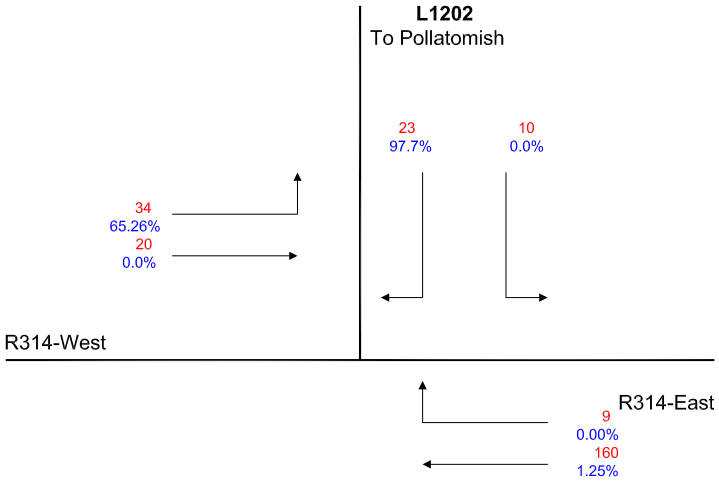
File Ref: MDR0470TR0009-0021 - 2010
Date: May 2010

CORRIB ONSHORE PIPELINE

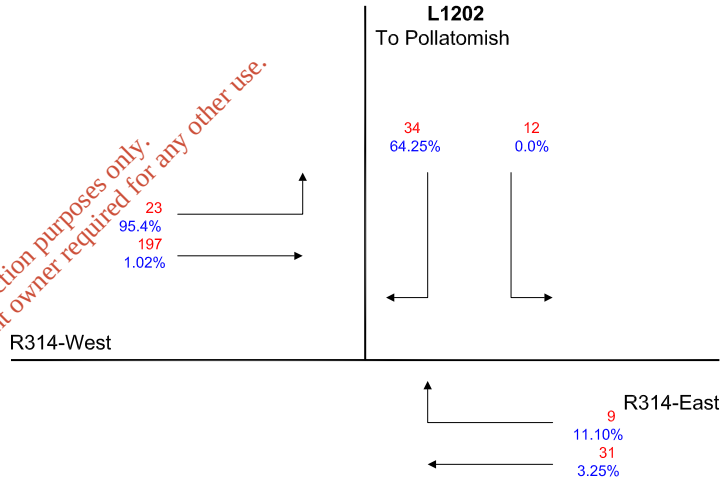
Corrib natural gas

RPS

AM Peak



PM Peak



LEGEND:

89 = Total Vehicles

14.3% = %HCVs

2011 AM & PM Peak Turning Movements with Worst-Case Construction Traffic

Site 5

Figure TR0015

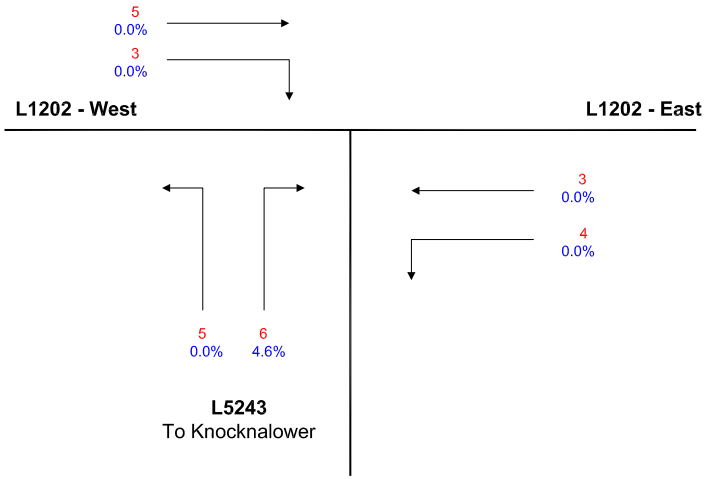
File Ref: MDR0470TR0009-0021 - 2010
Date: May 2010

CORRIB ONSHORE PIPELINE

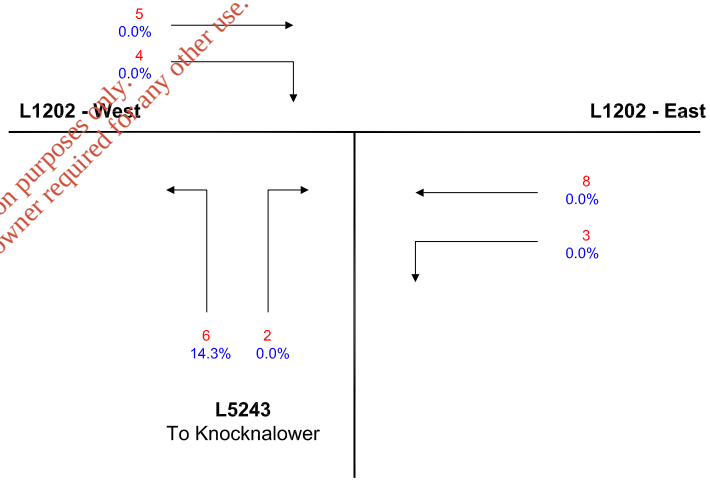
Corrib natural gas

RPS

AM Peak



PM Peak



LEGEND:

25 = Total Vehicles

8.3% = %HCVs

2011 AM & PM Peak Turning Movements without Construction Traffic

Site 7

Figure TR0016

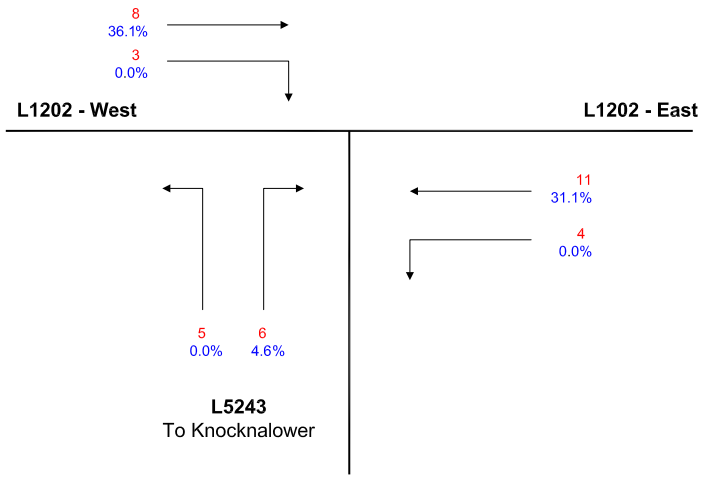
File Ref: MDR0470TR0009-0021 - 2010
Date: May 2010

CORRIB ONSHORE PIPELINE

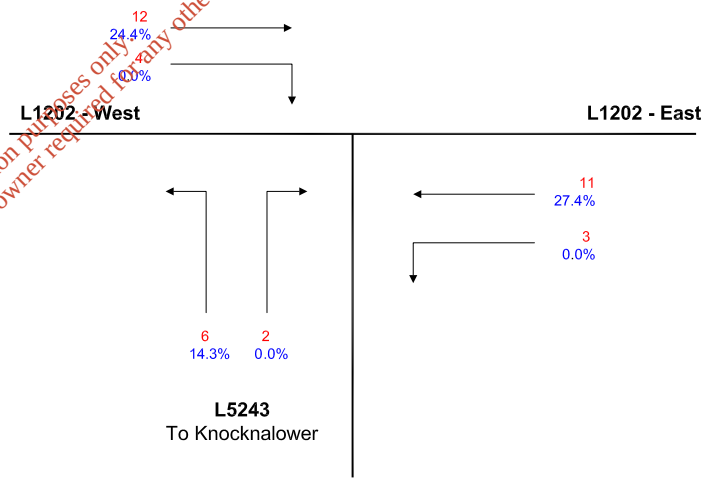
Corrib natural gas

RPS

AM Peak



PM Peak



LEGEND:

78 = Total Vehicles

13.16% = %HCVs

2011 AM & PM Peak Turning Movements with Peak (Month 2) Construction Traffic

Site 7

Figure TR0017

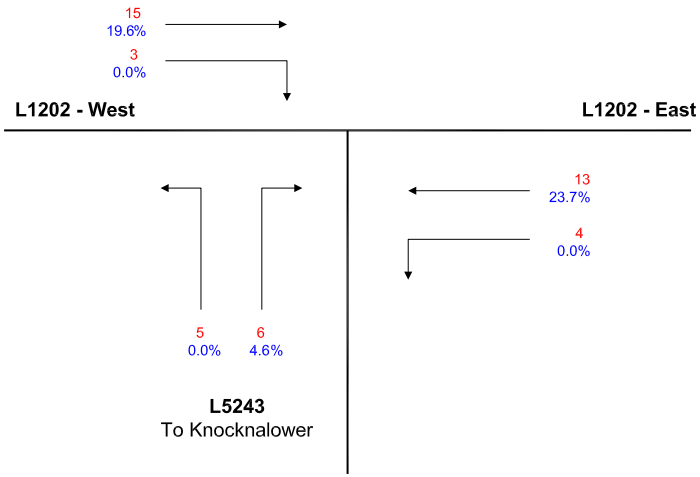
File Ref: MDR0470TR0009-0021 - 2010
Date: May 2010

CORRIB ONSHORE PIPELINE

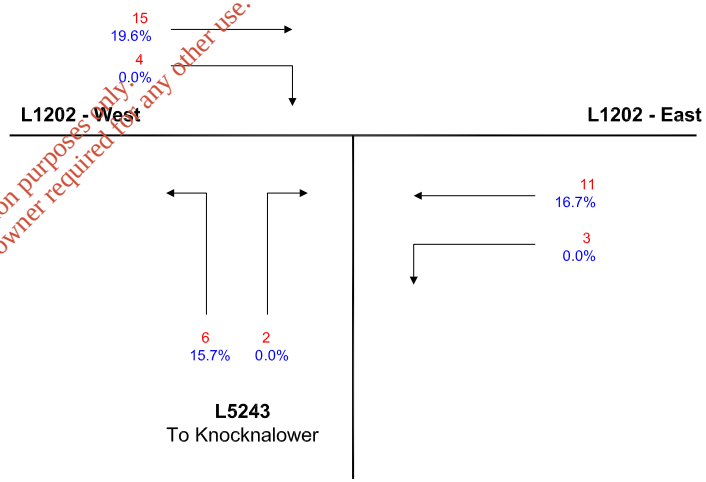
Corrib natural gas

RPS

AM Peak



PM Peak



LEGEND:

78 = Total Vehicles

13.16% = %HCVs

2011 AM & PM Peak Turning Movements with Worst-Case Construction Traffic

Site 7

Figure TR0018

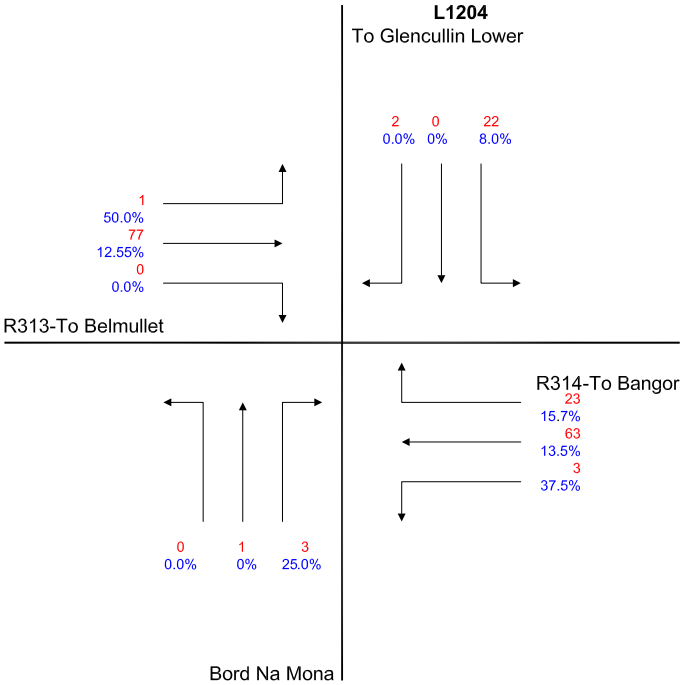
File Ref: MDR0470TR0009-0021 - 2010
Date: May 2010

CORRIB ONSHORE PIPELINE

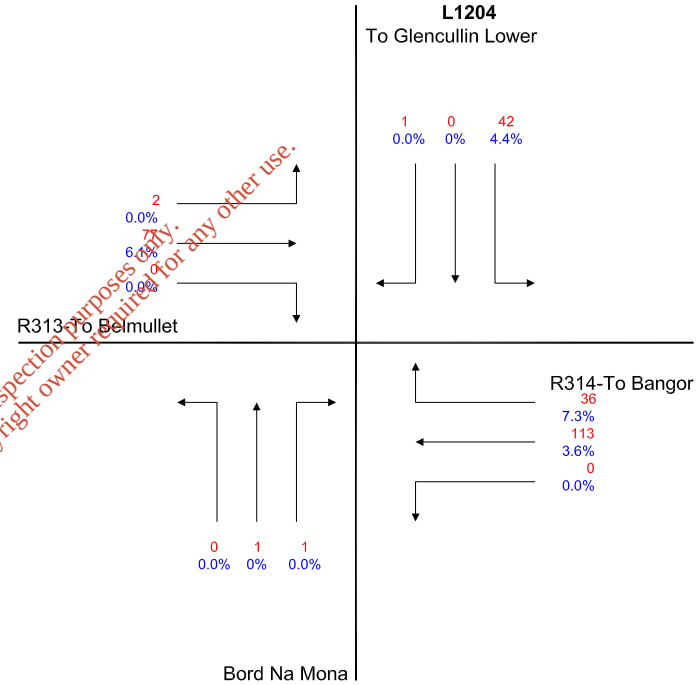
Corrib natural gas

RPS

AM Peak



PM Peak



LEGEND:

35 = Total Vehicles

0.0% = %HCVs

2011 AM & PM Peak Turning Movements without Construction Traffic

Site 8

Figure TR0019

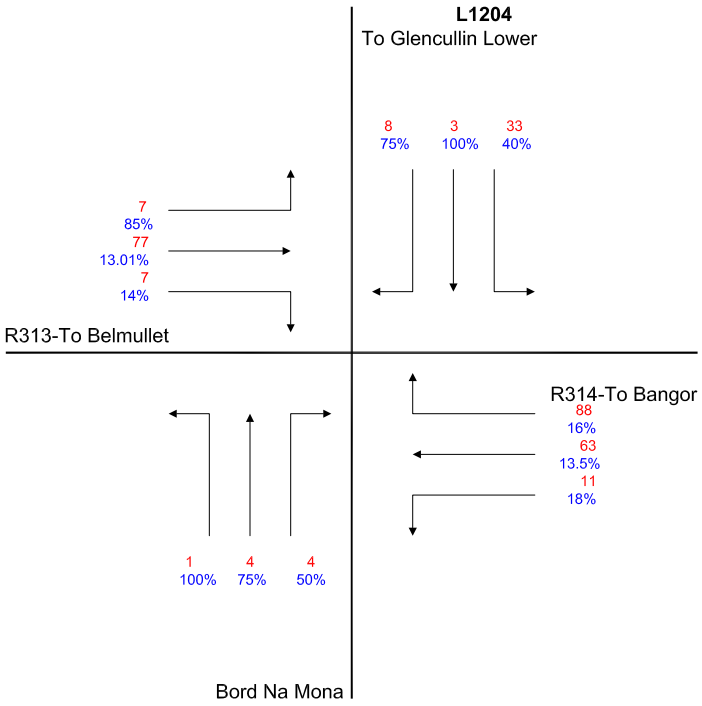
File Ref: MDR0470TR0009-0021 - 2010
Date: May 2010

CORRIB ONSHORE PIPELINE

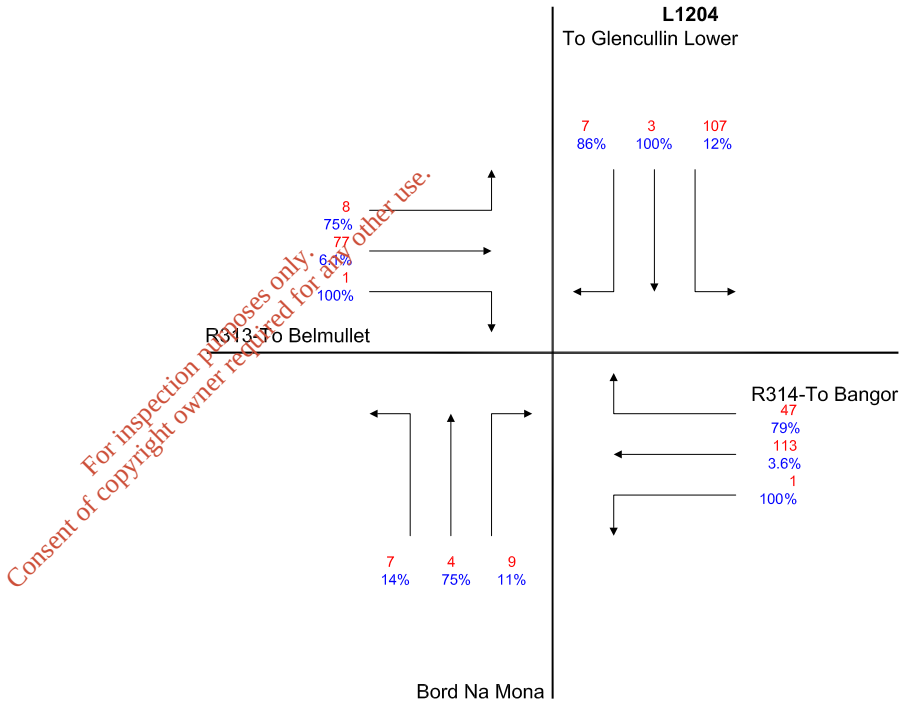
Corrib natural gas

RPS

AM Peak



PM Peak



LEGEND:

13 = Total Vehicles

100% = %HCVs

2011 AM & PM Peak Turning Movements with Peak (Month 2) Construction Traffic

Site 8

Figure TR0020

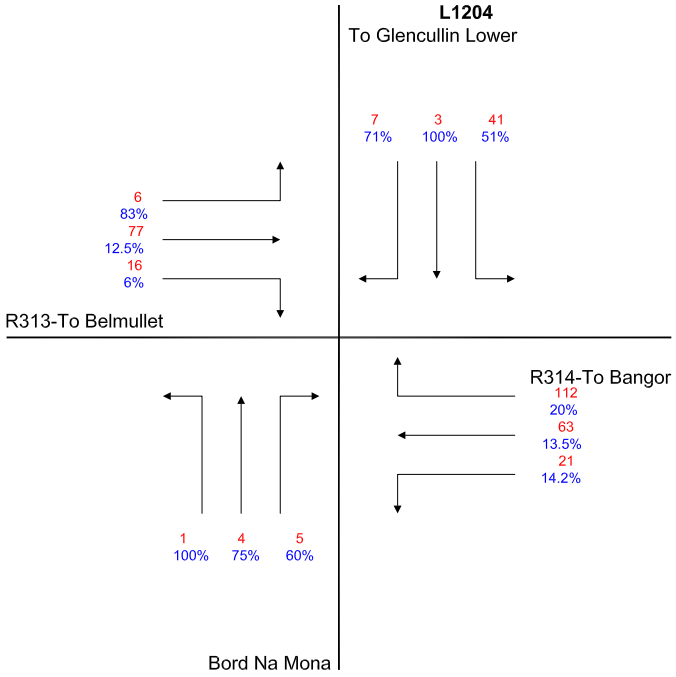
File Ref: MDR0470TR0009-0021 - 2010
Date: May 2010

CORRIB ONSHORE PIPELINE

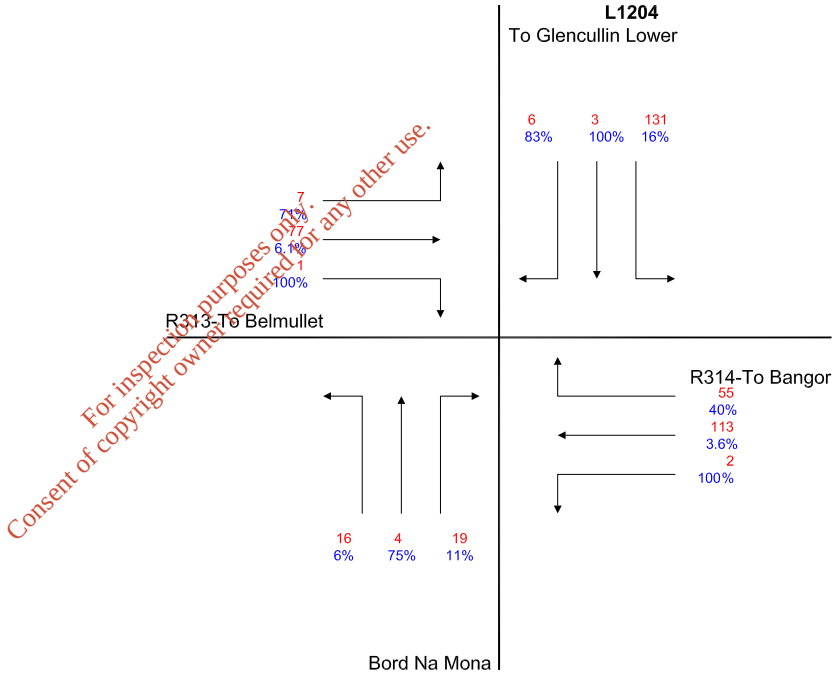
Corrib natural gas

RPS

AM Peak



PM Peak



LEGEND:

35 = Total Vehicles

0.0% = %HCVs

2011 AM & PM Peak Turning Movements with Worst-Case Construction Traffic

Site 8

Figure TR0021

File Ref: MDR0470TR0009-0021 - 2010
Date: May 2010

CORRIB ONSHORE PIPELINE

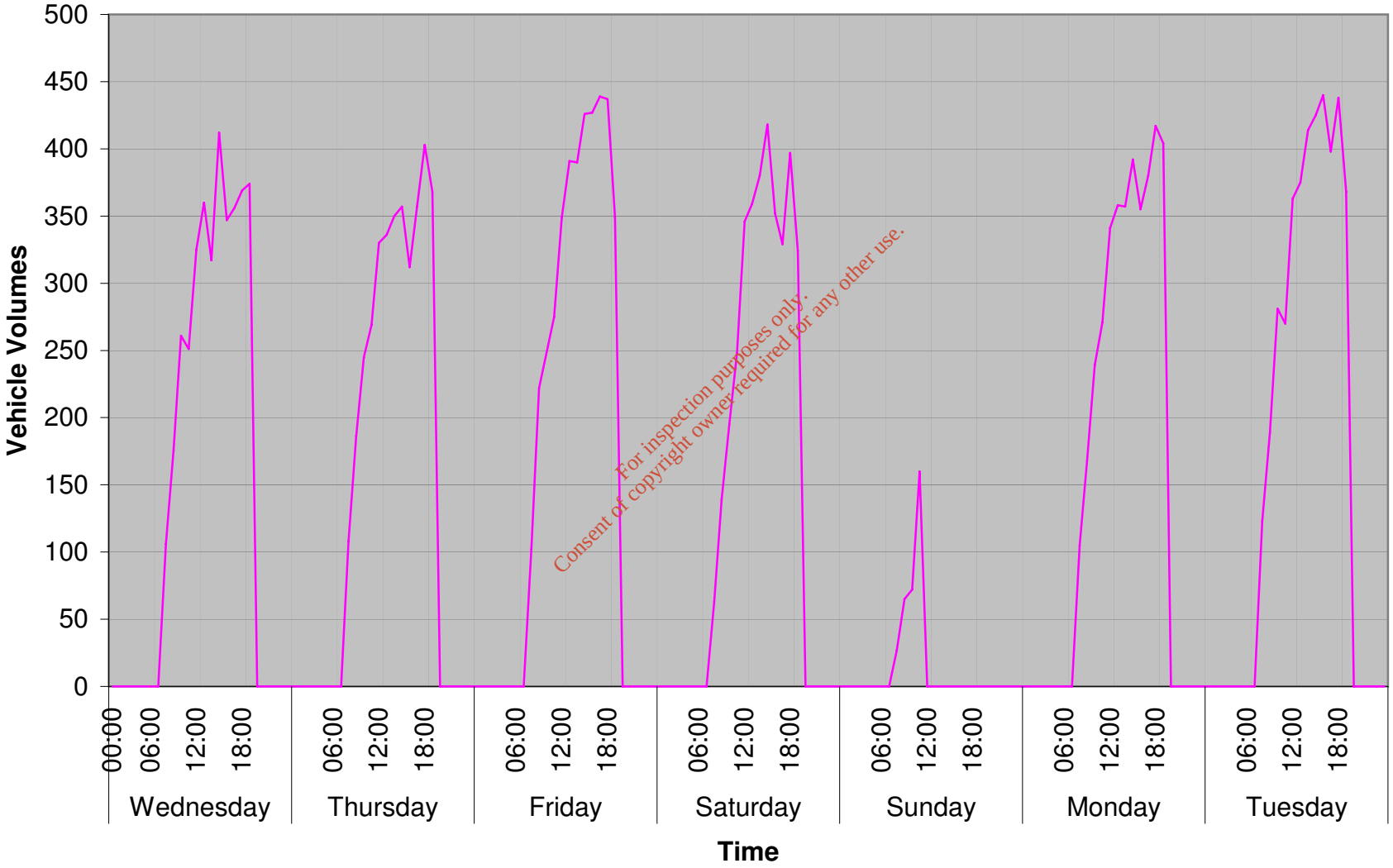
Corrib natural gas

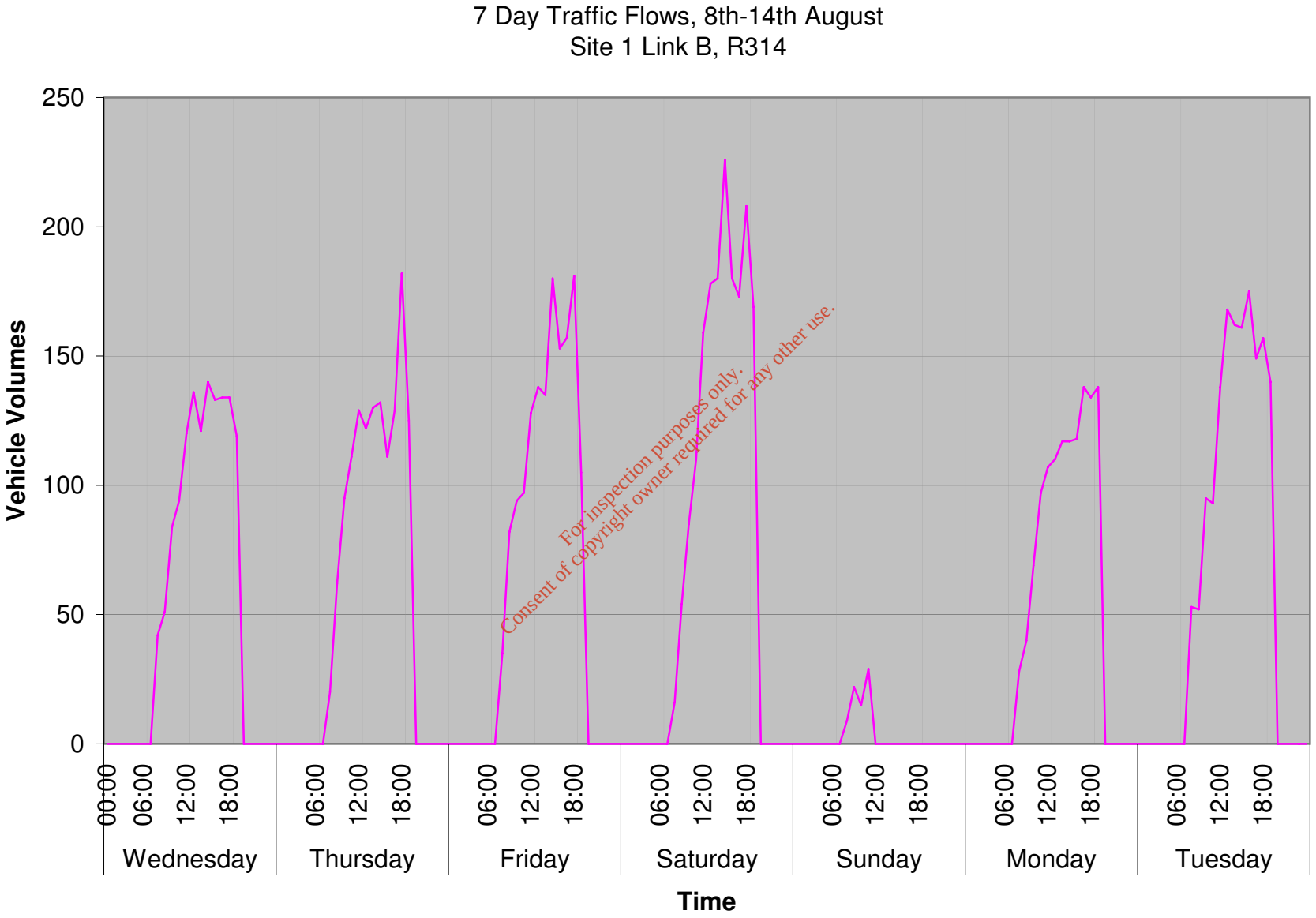
RPS

APPENDIX B

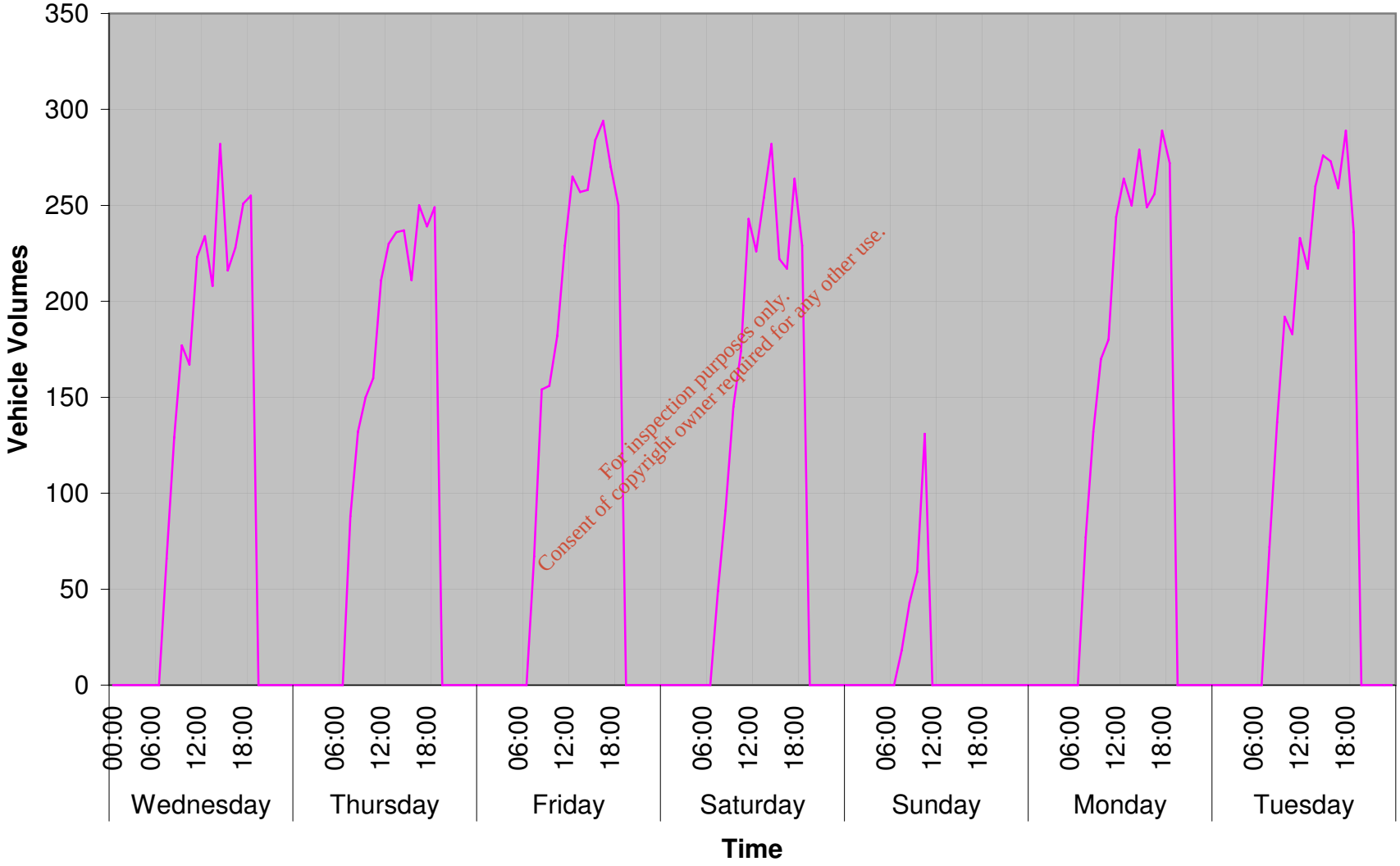
Traffic Data

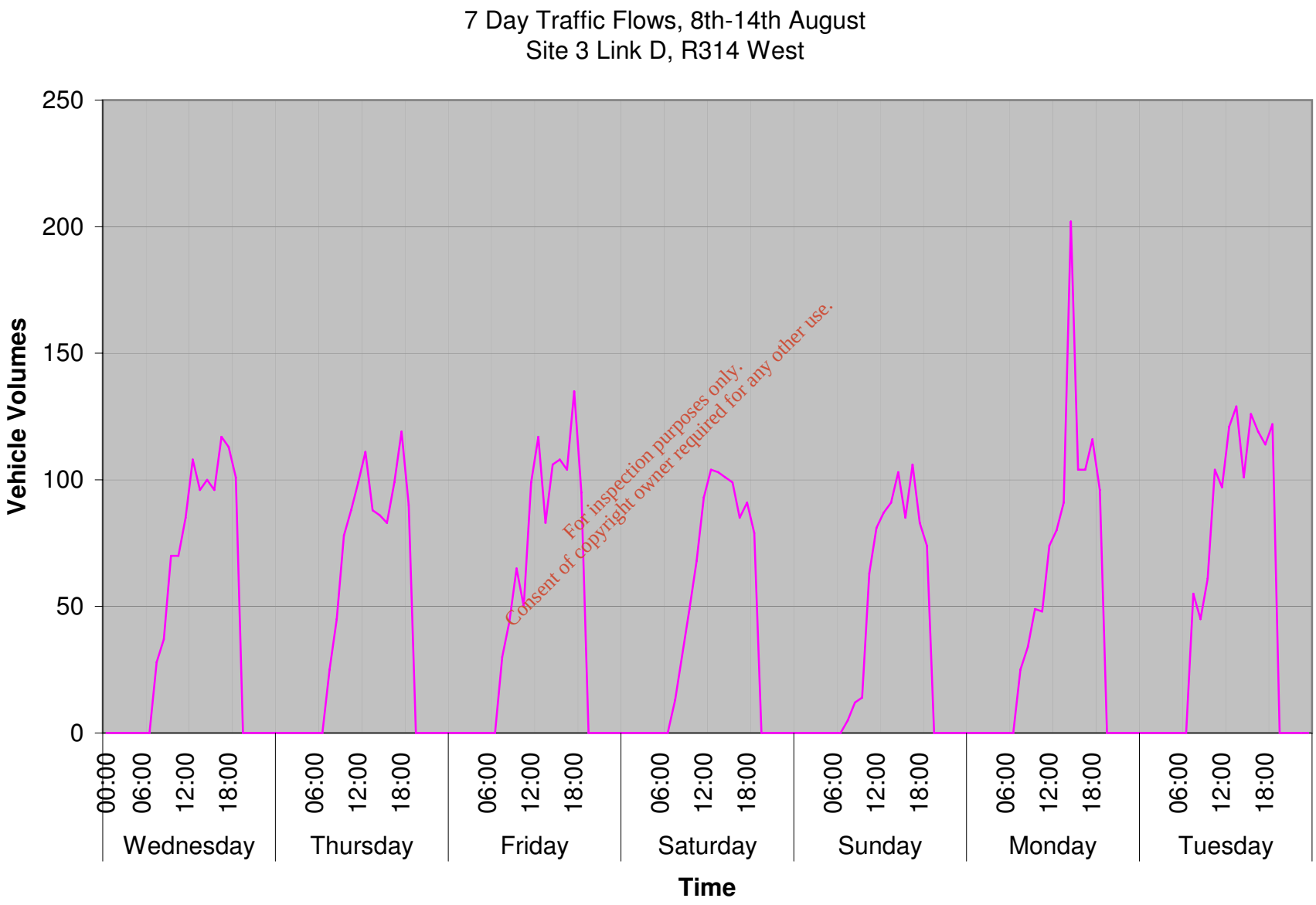
7 Day Traffic Flows, 8th-14th August 2007
Site 1 Link A, R313 To Belmullet

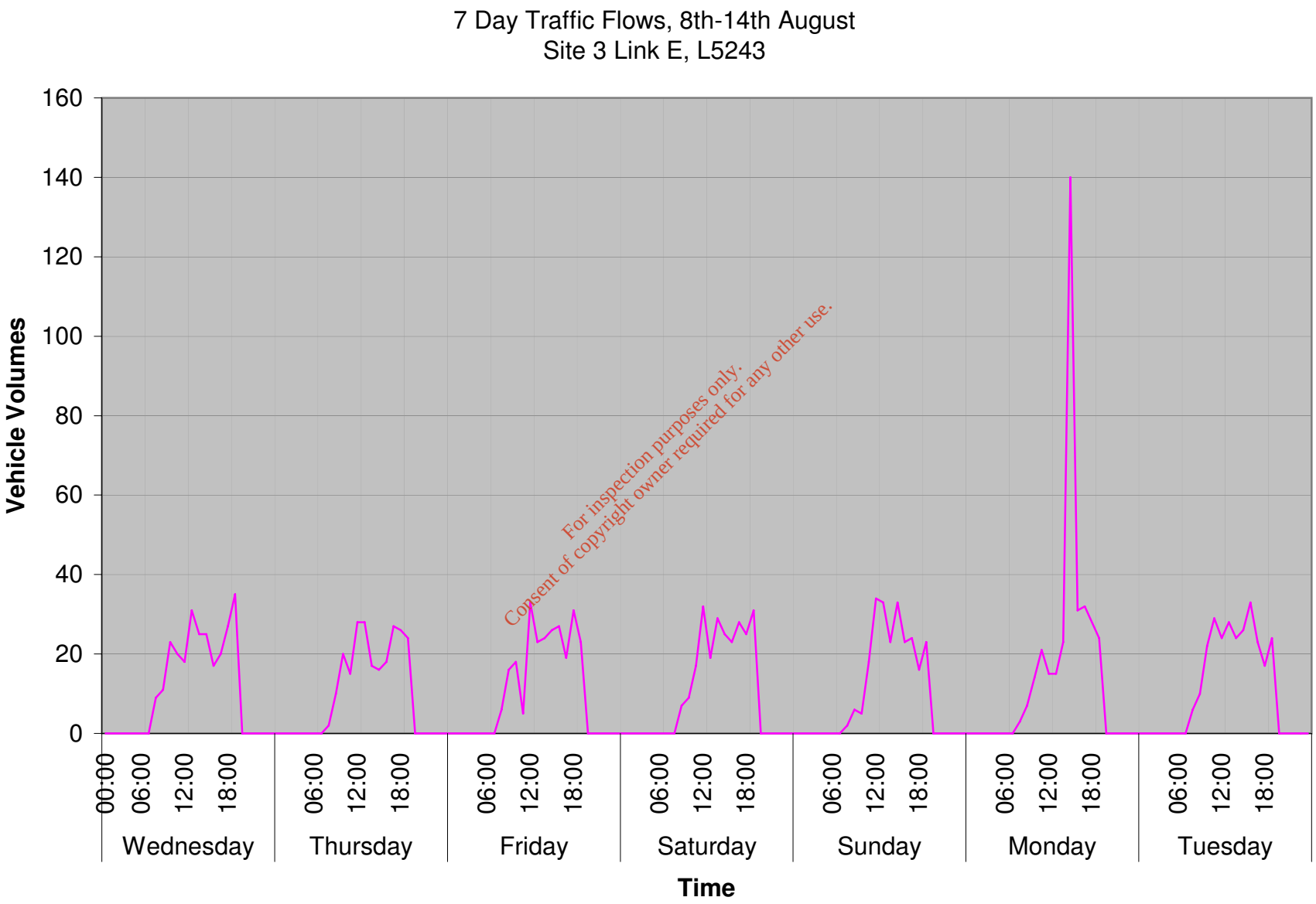


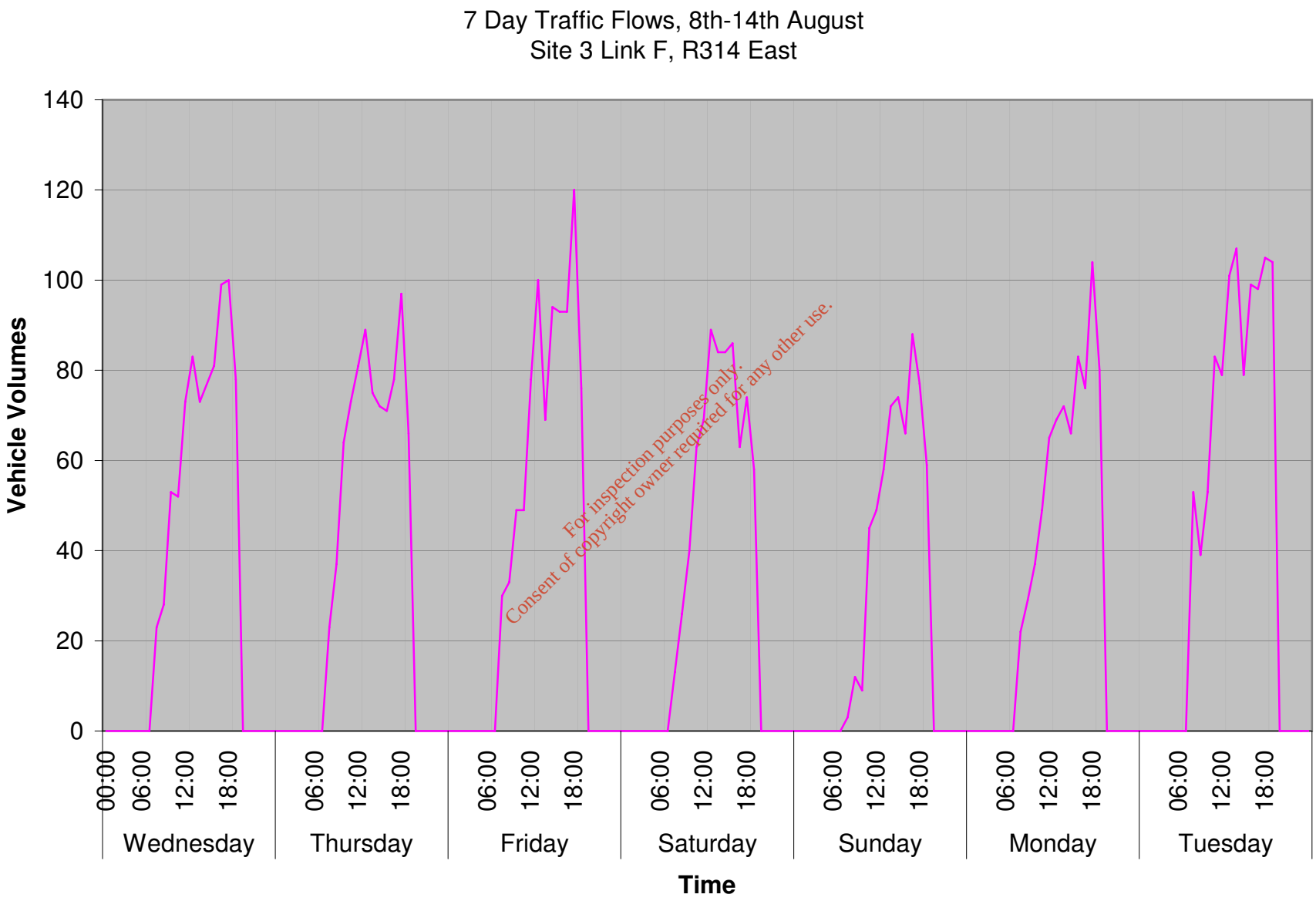


7 Day Traffic Flows, 8th-14th August
Site 1 Link C, R313 To Bangor

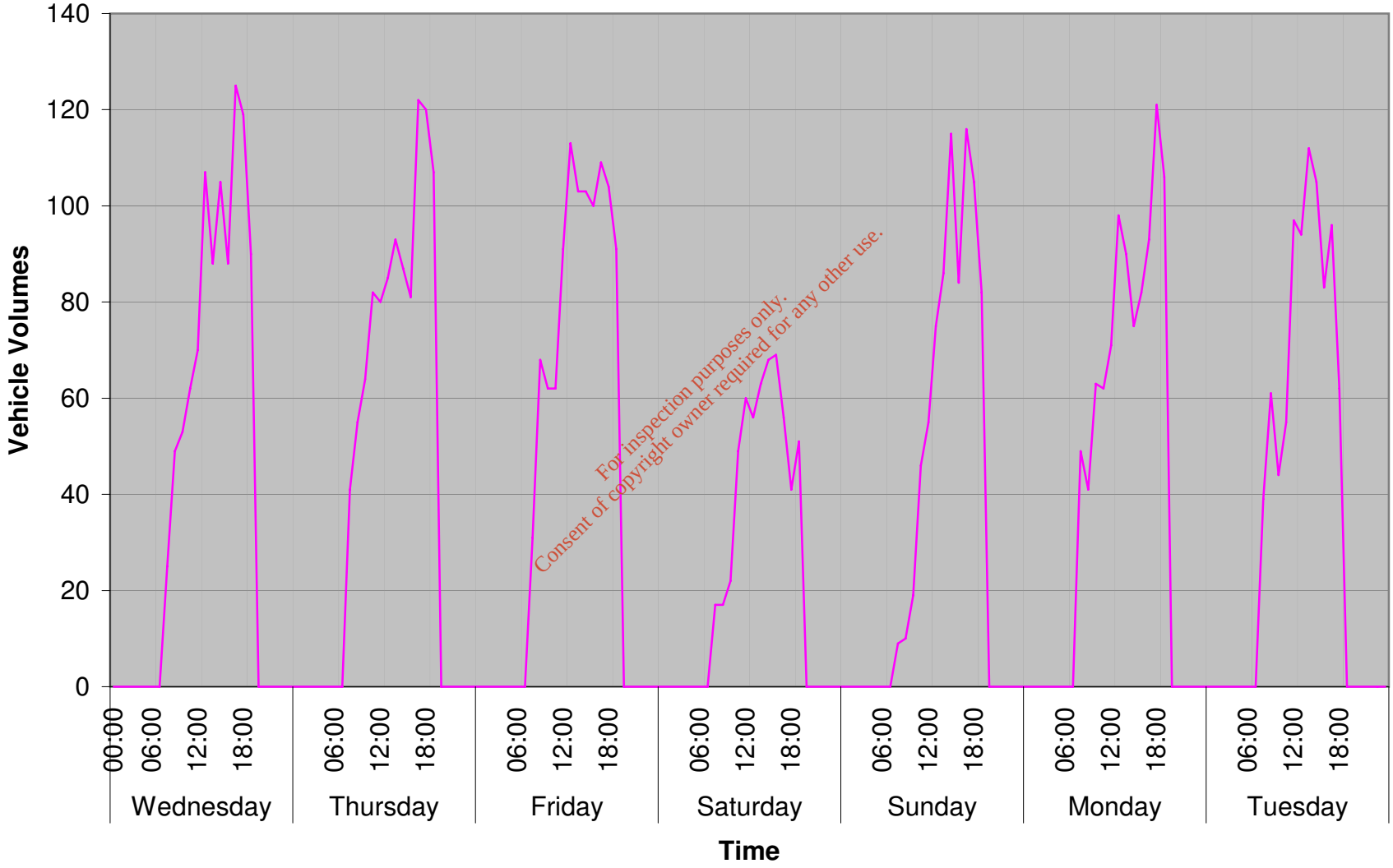




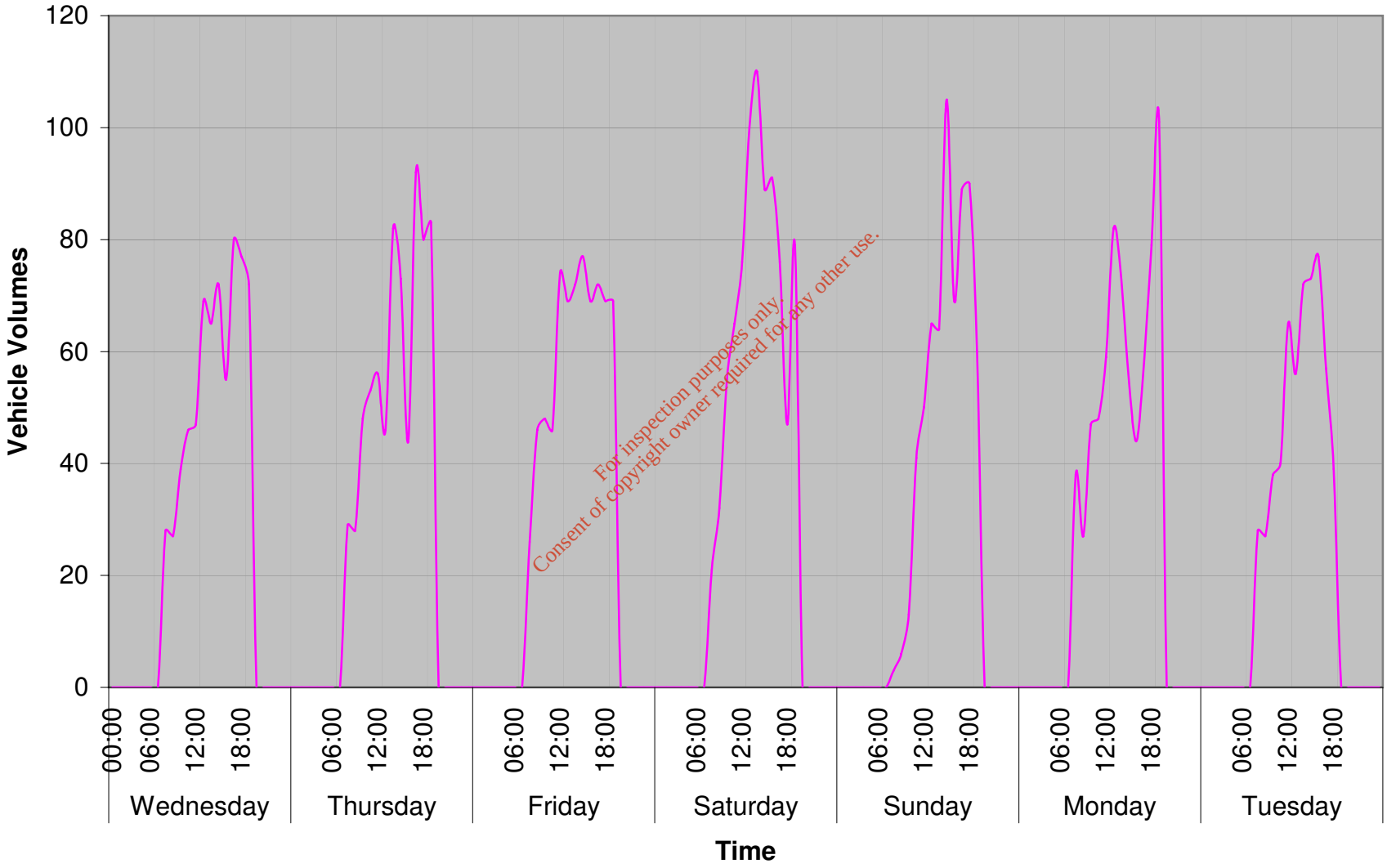


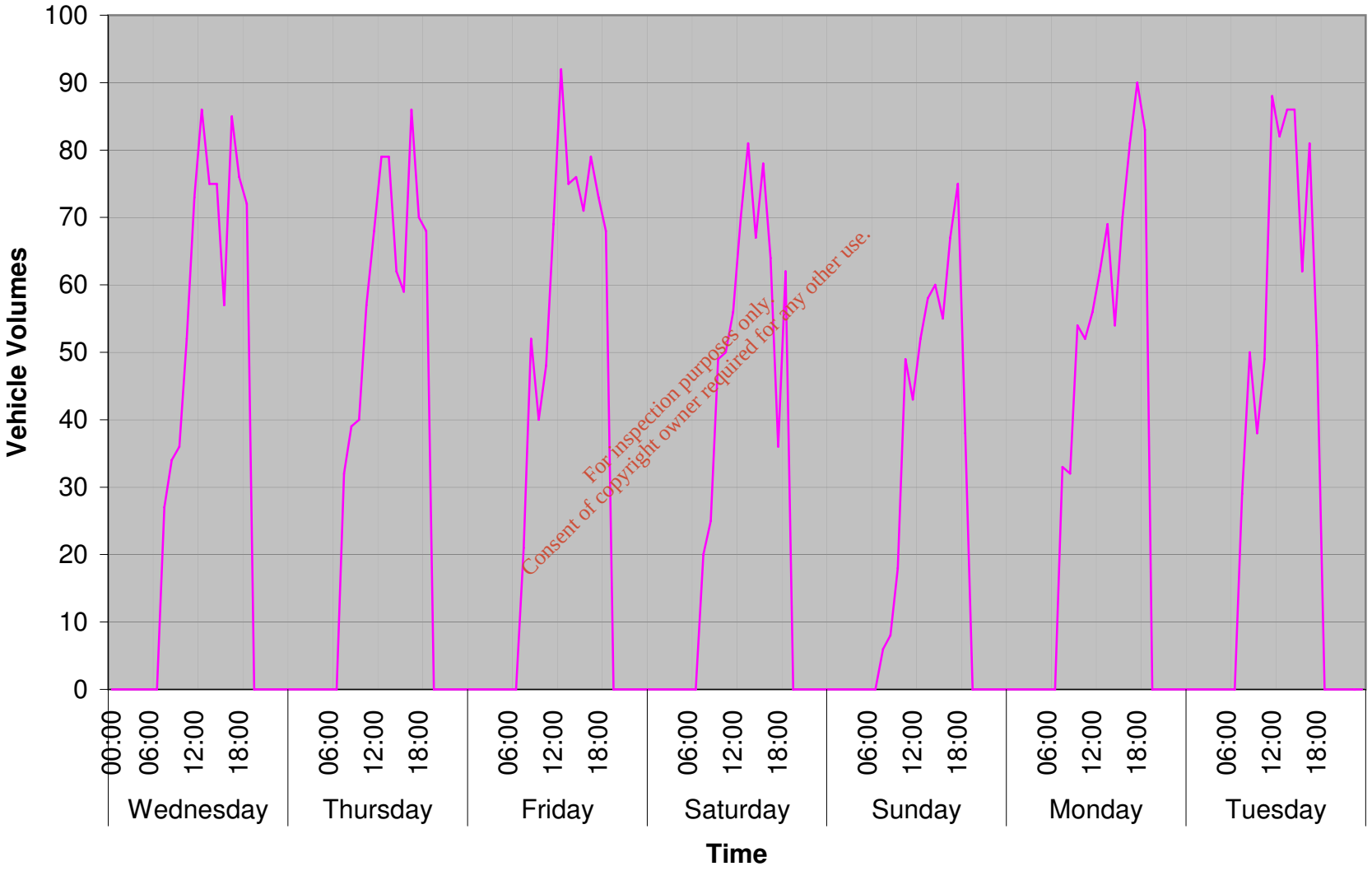


7 Day Traffic Flows, 8th-14th August
Site 6 Link G, R314 West

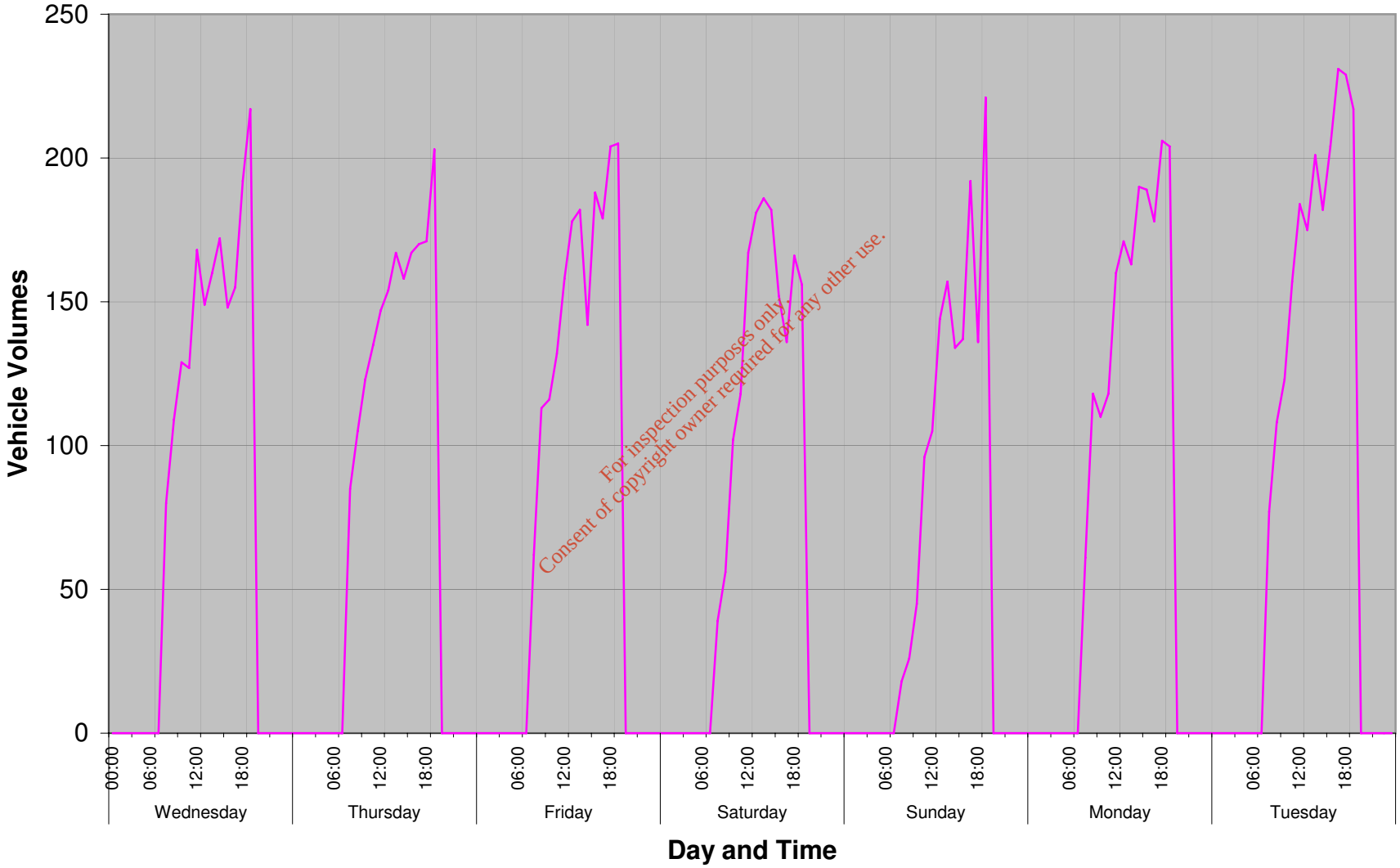


7 Day Traffic Flows, 8th-14th August
Site 6 Link H, L1203

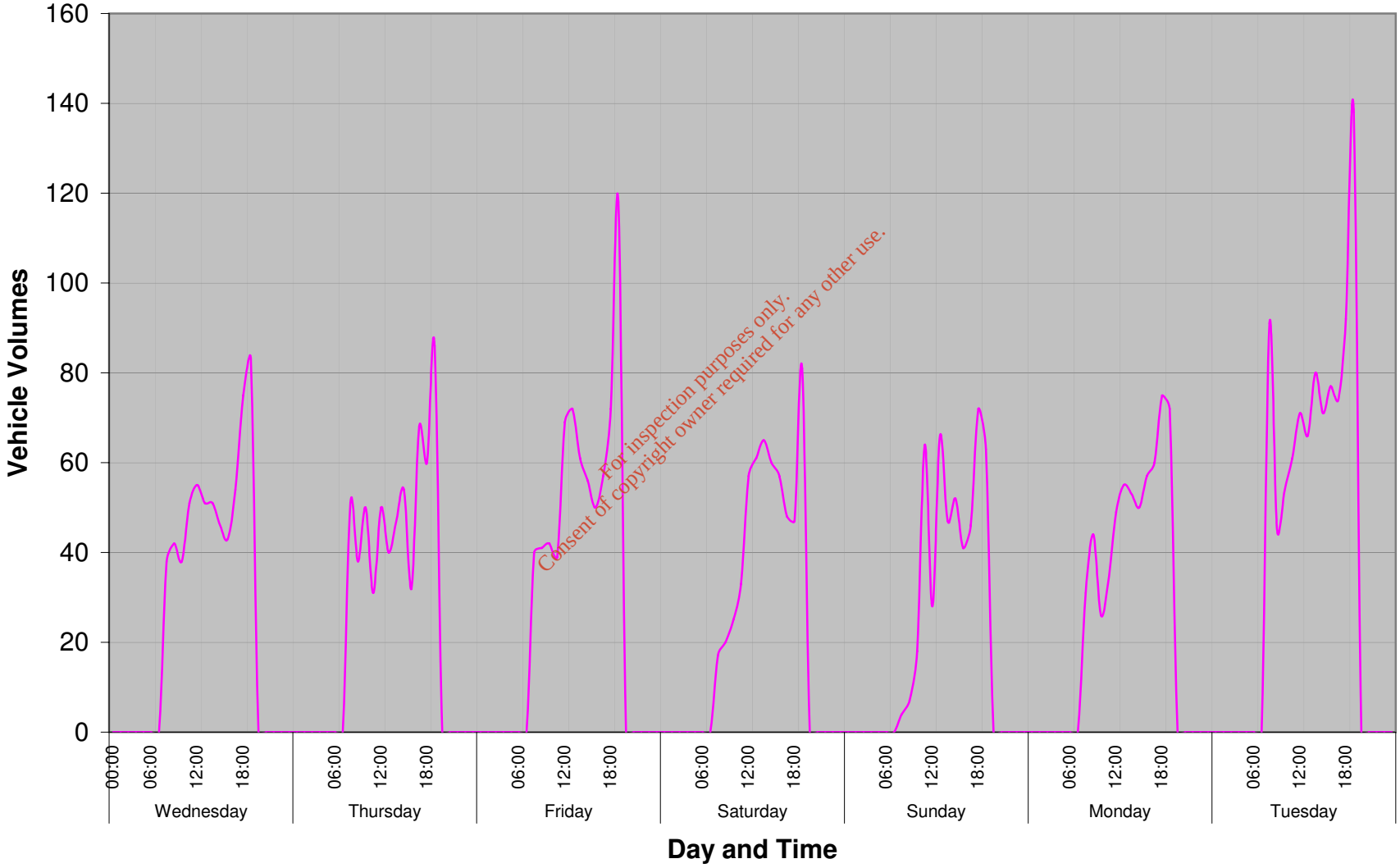




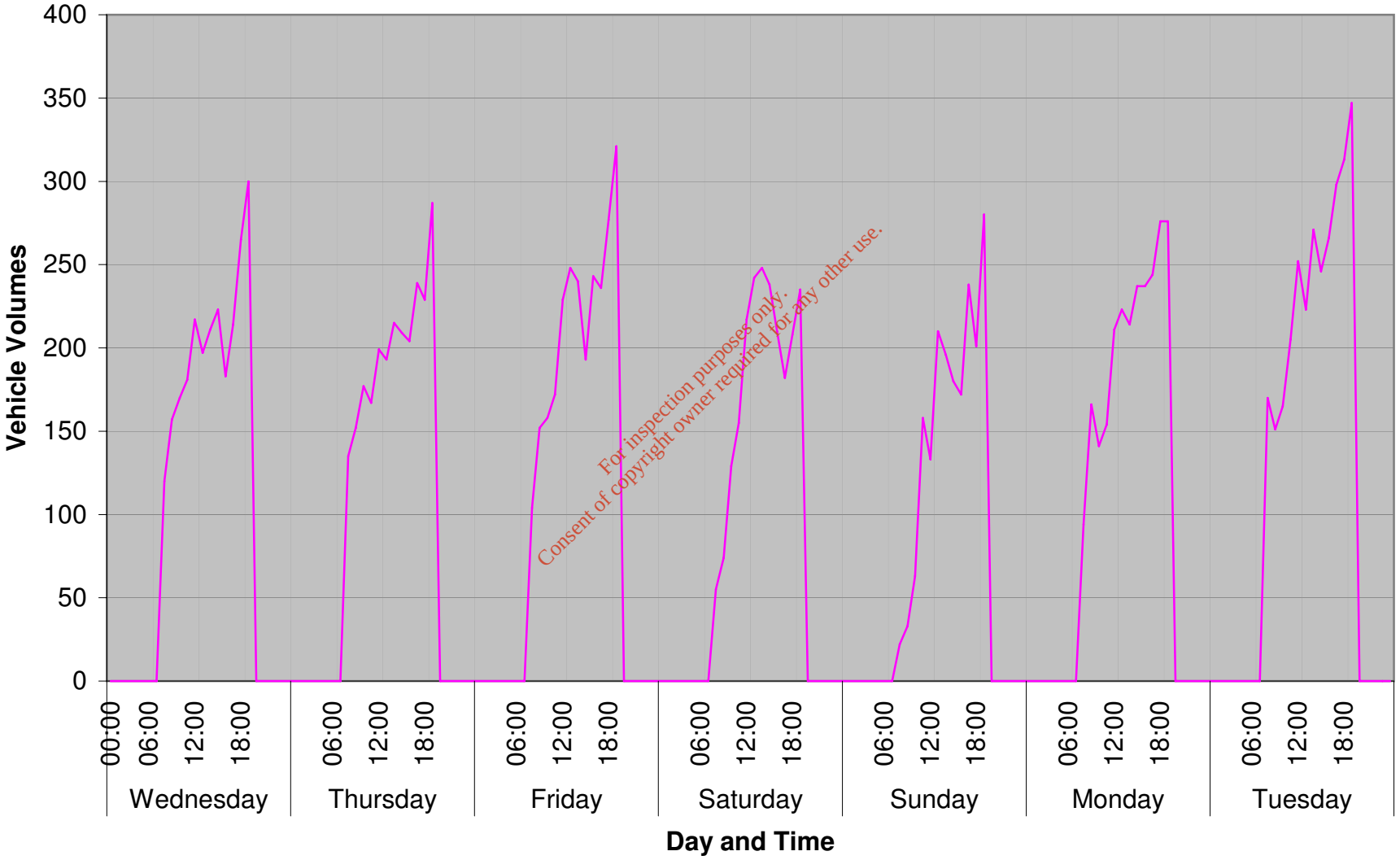
7 Day Traffic Flows, 8th-14th August
Site 8 Link J, R313 West to Belmullet



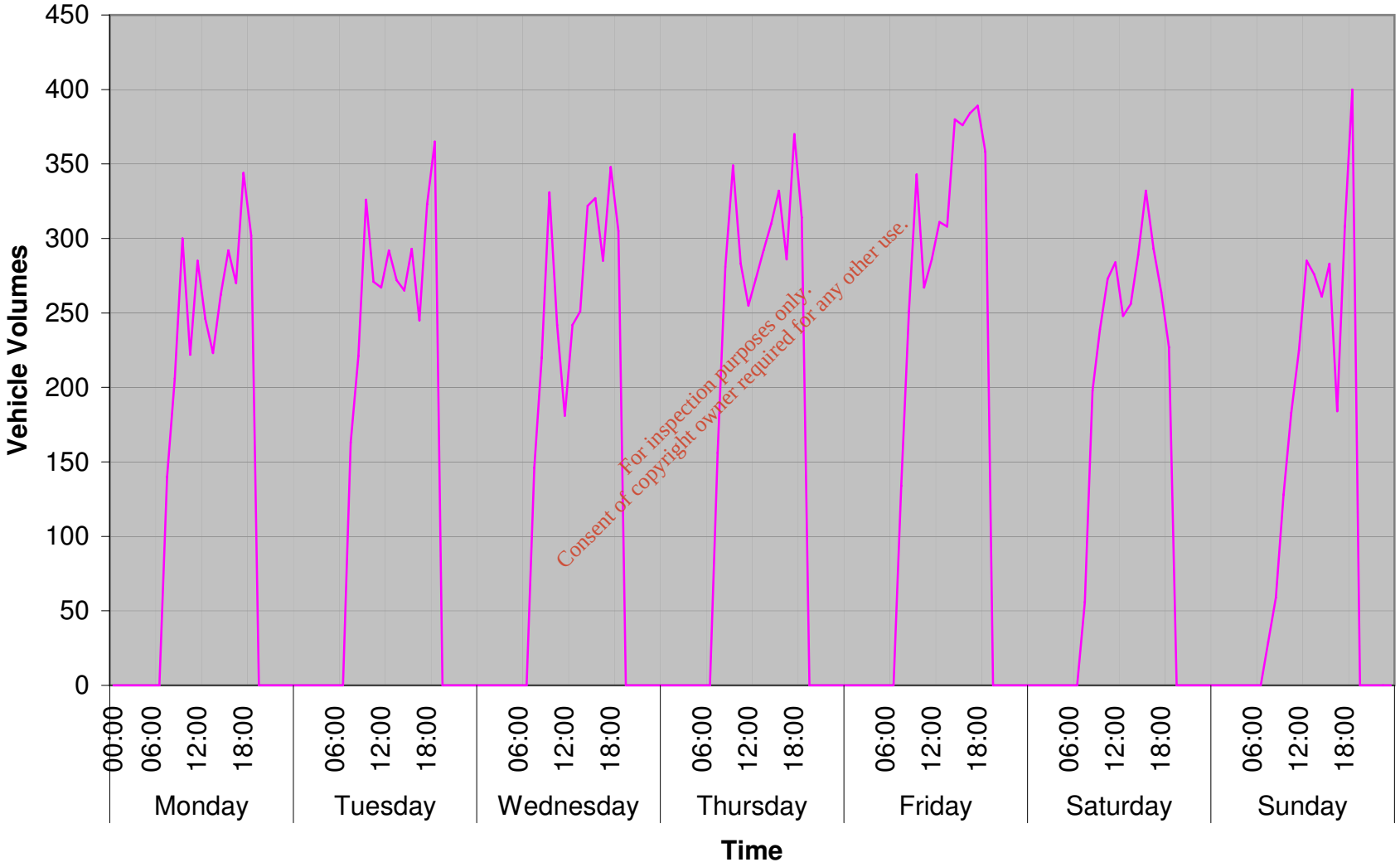
7 Day Traffic Flows, 8th-14th August
Site 8 Link K, Local Road L1204 North



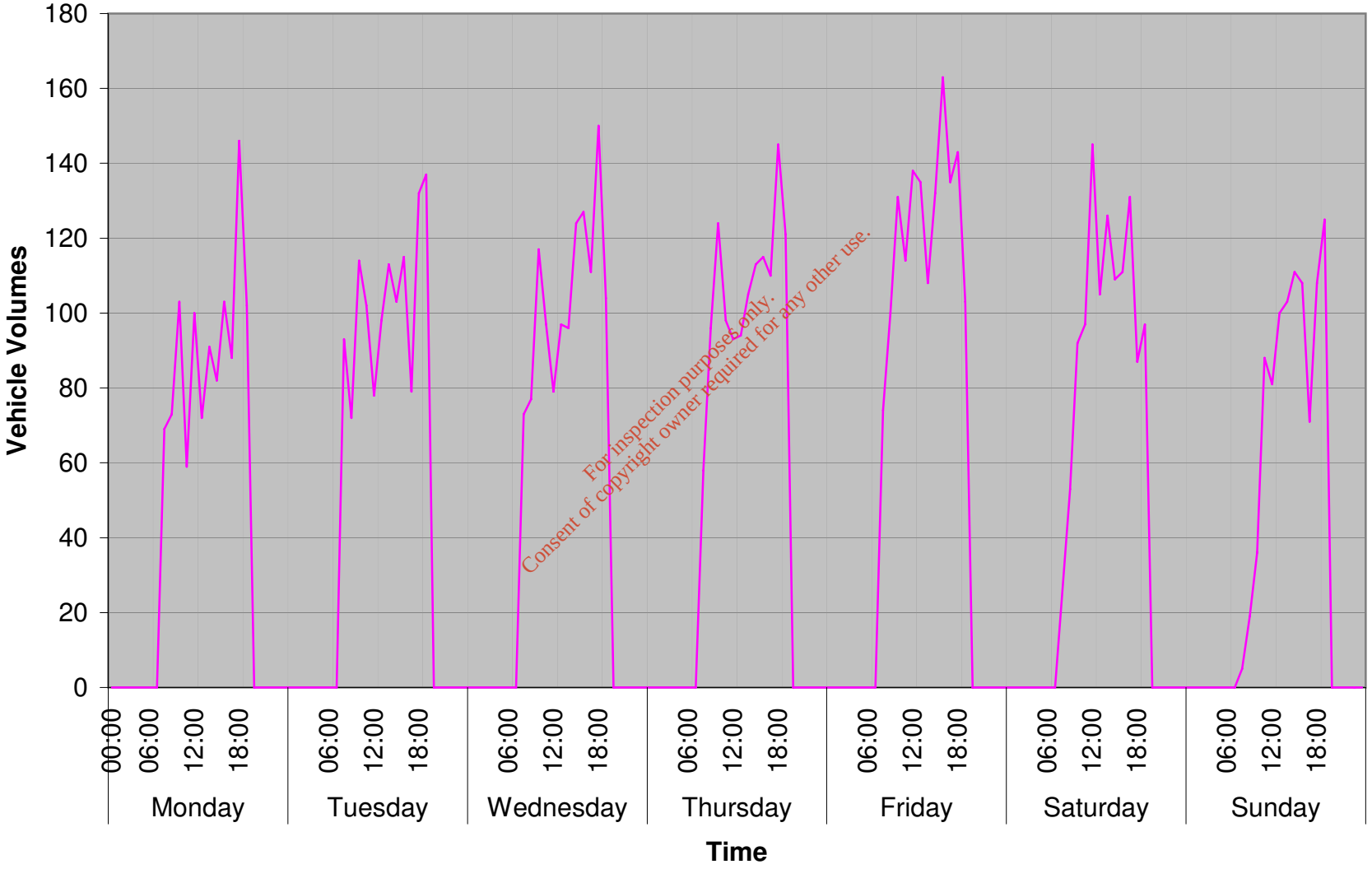
7 Day Traffic Flows, 8th-14th August
Site 8 Link L, R313 East to Bangor



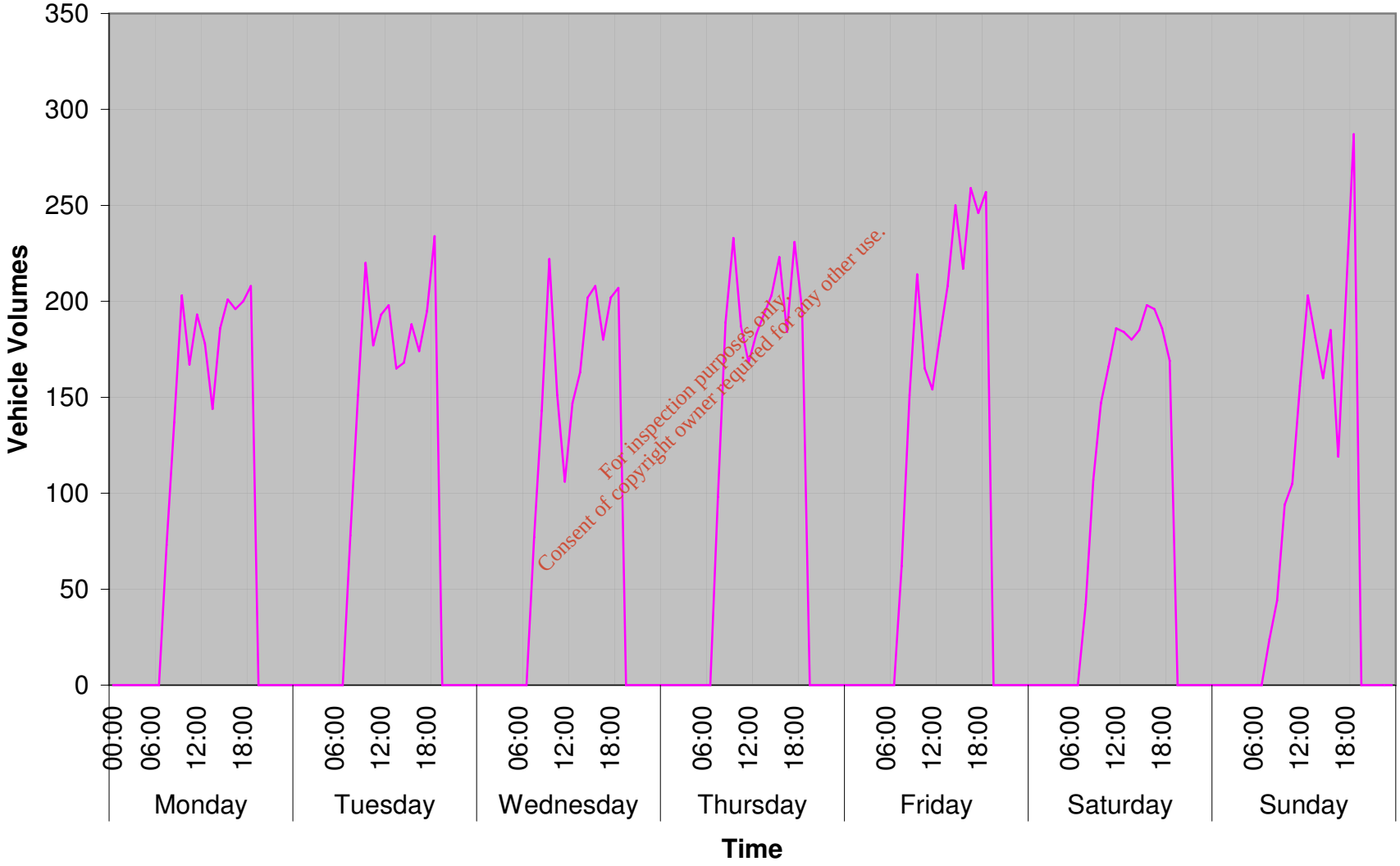
7 Day Traffic Flows, 17th-23rd September 2007
Site 1 Link A, R313 To Belmullet

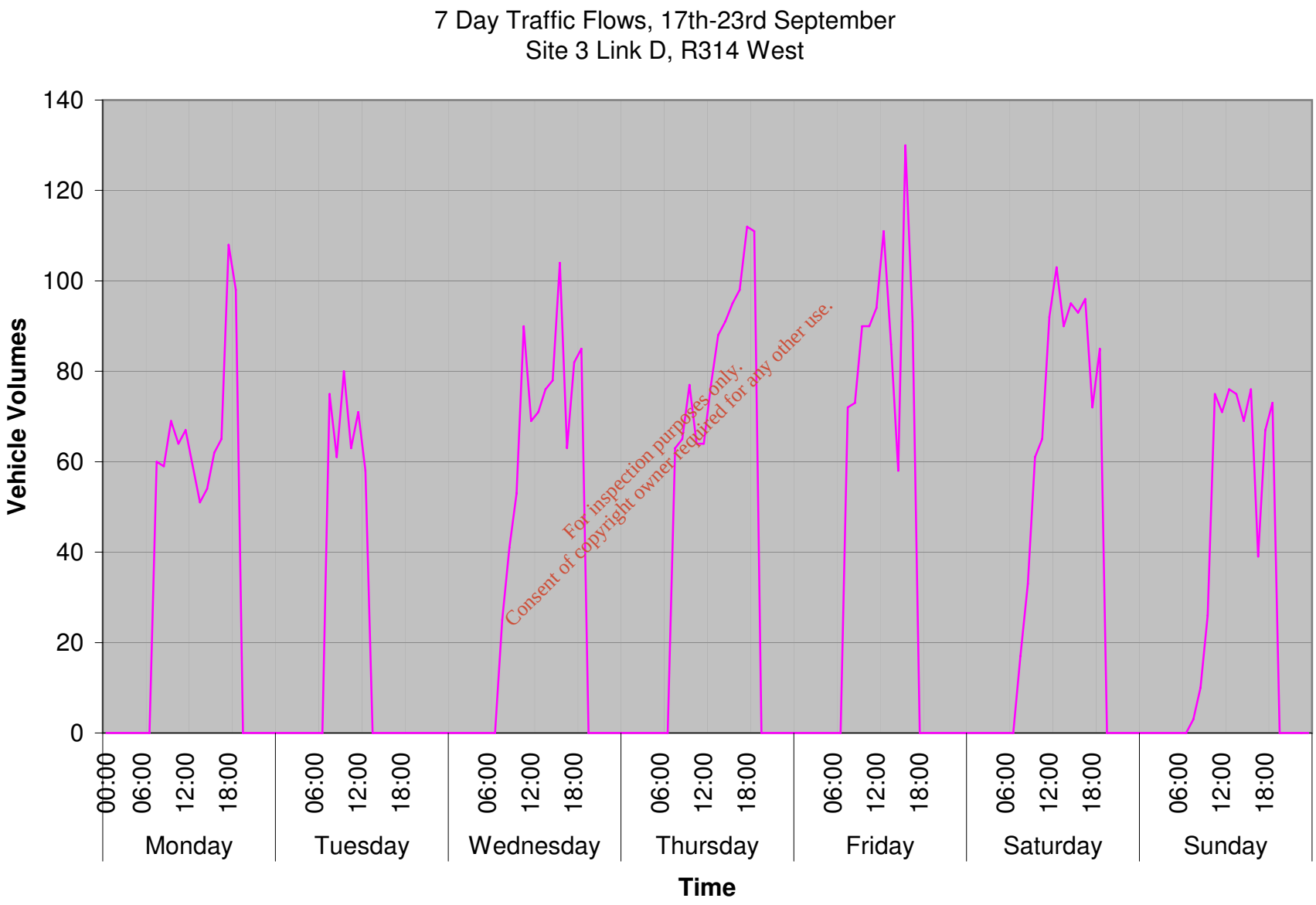


7 Day Traffic Flows, 17th-23rd September
Site 1 Link B, R314

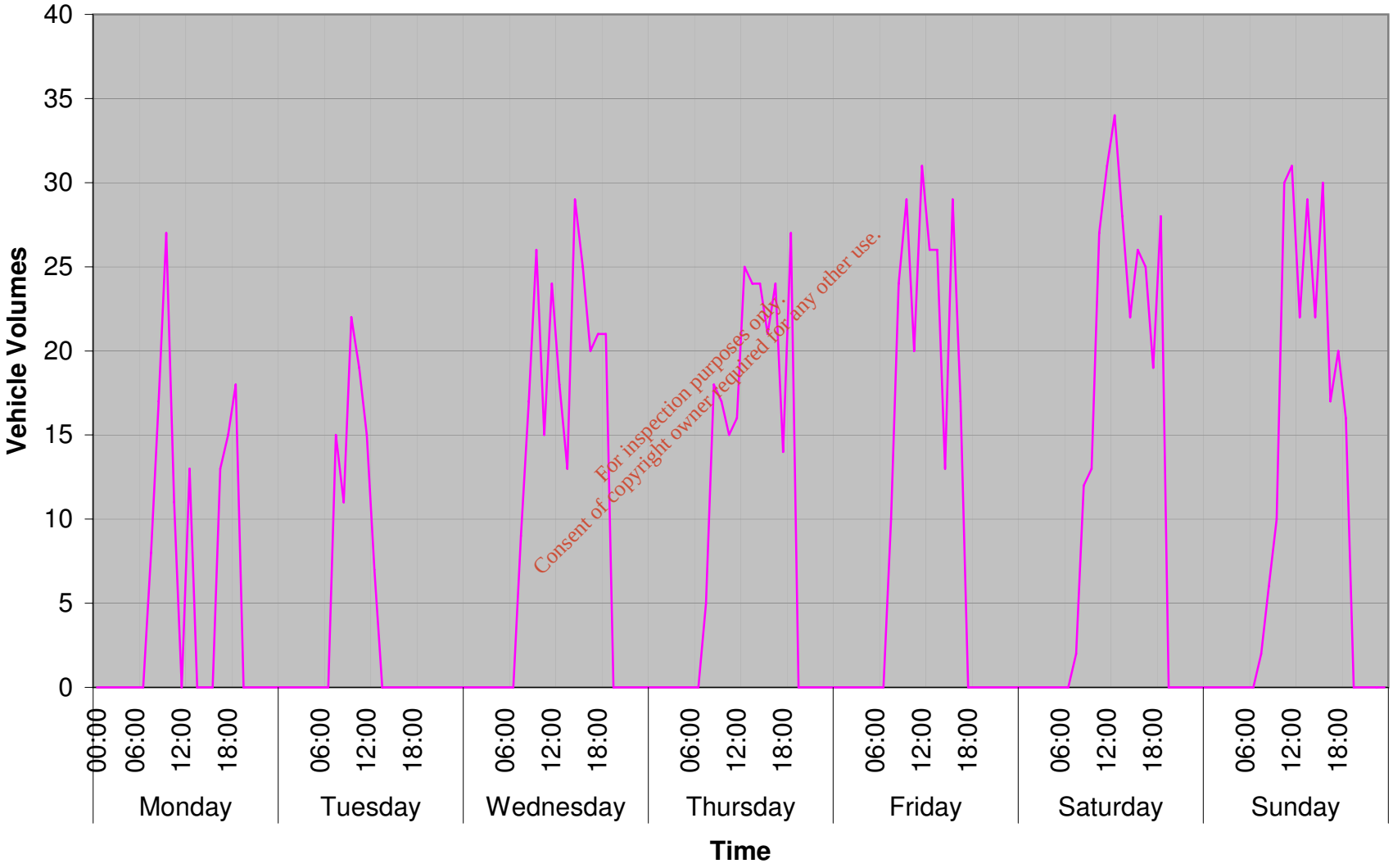


7 Day Traffic Flows, 17th-23rd September 2007
Site 1 Link C, R313 To Bangor

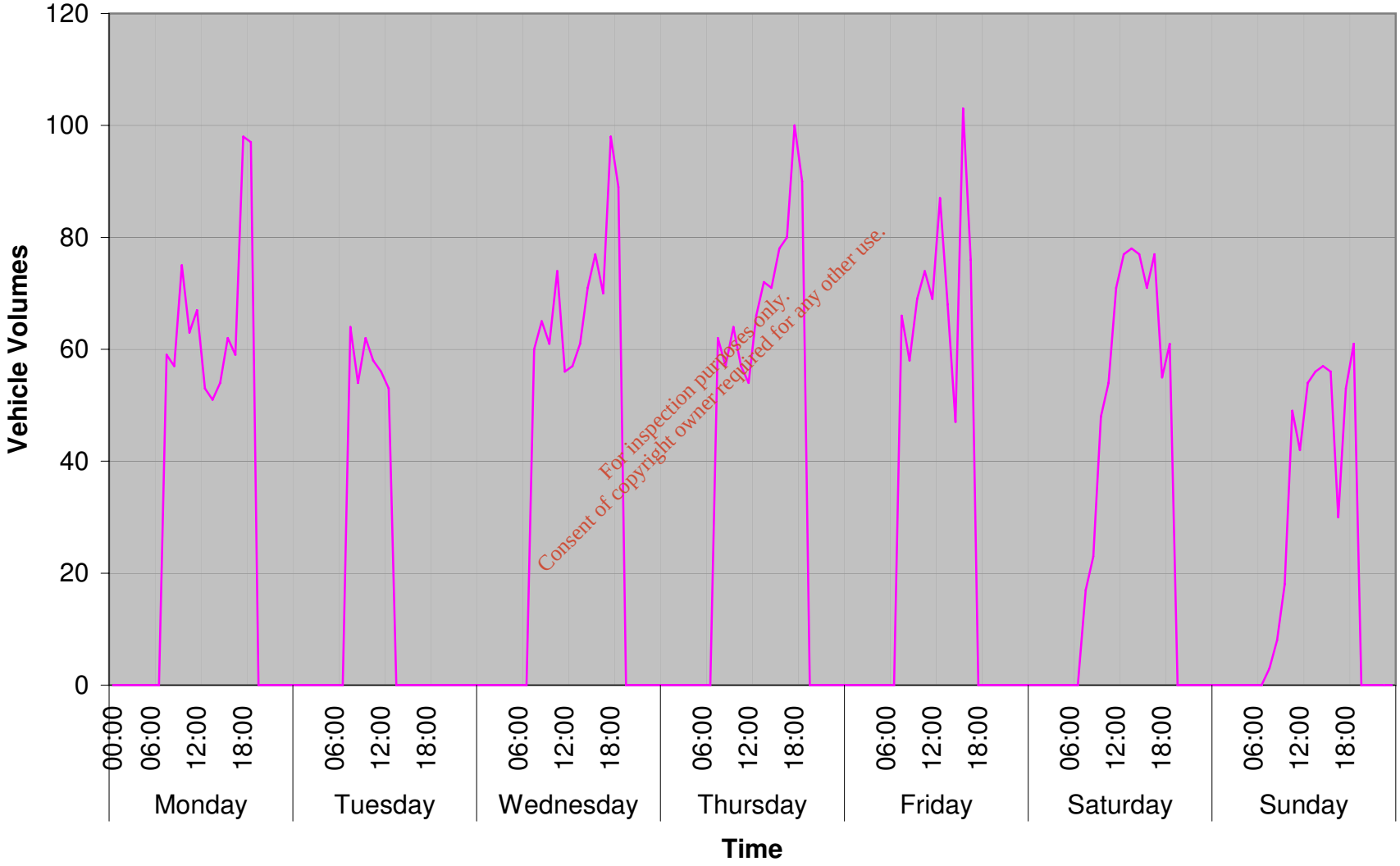




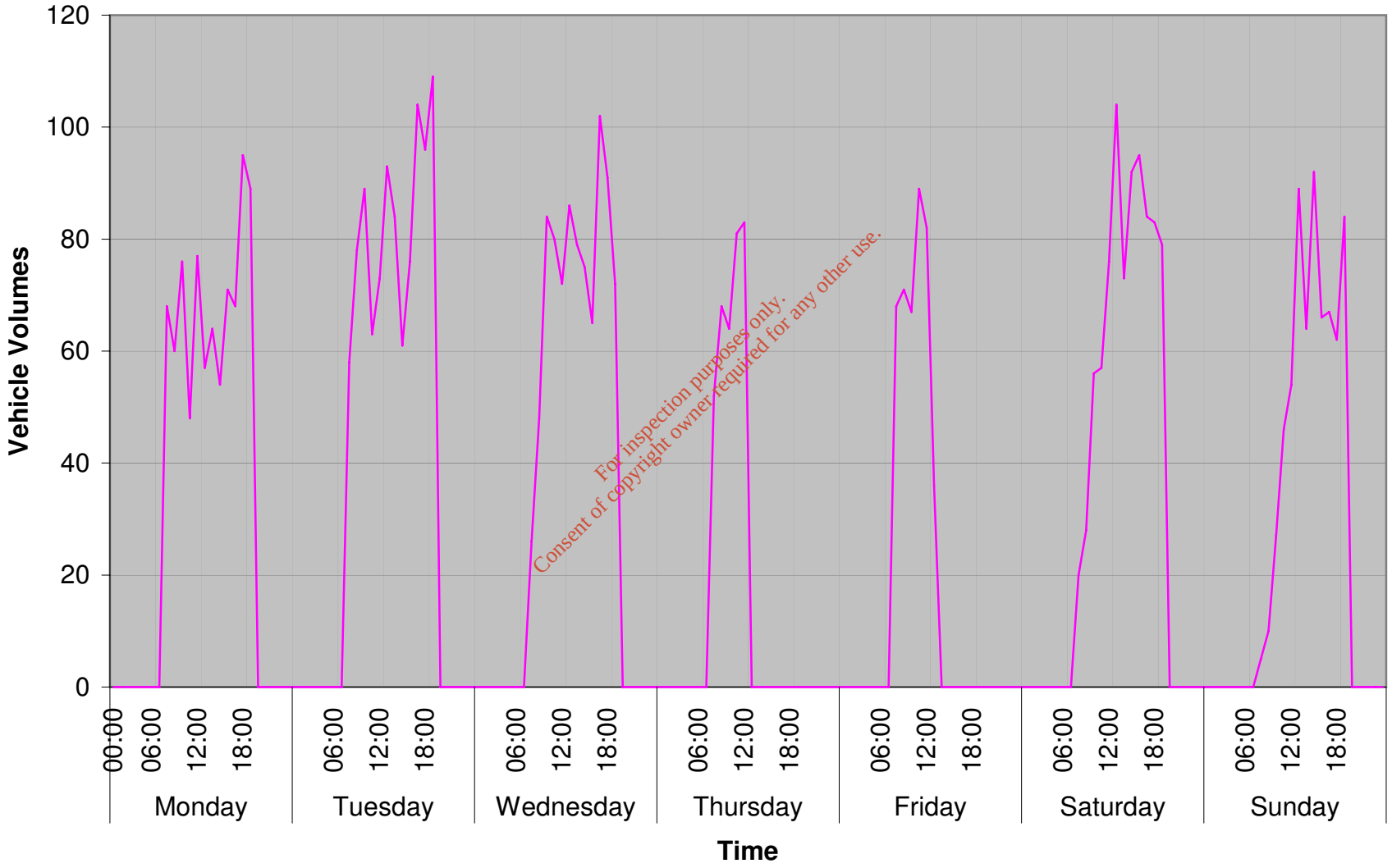
7 Day Traffic Flows, 17th-23rd September
Site 3 Link E, L5243



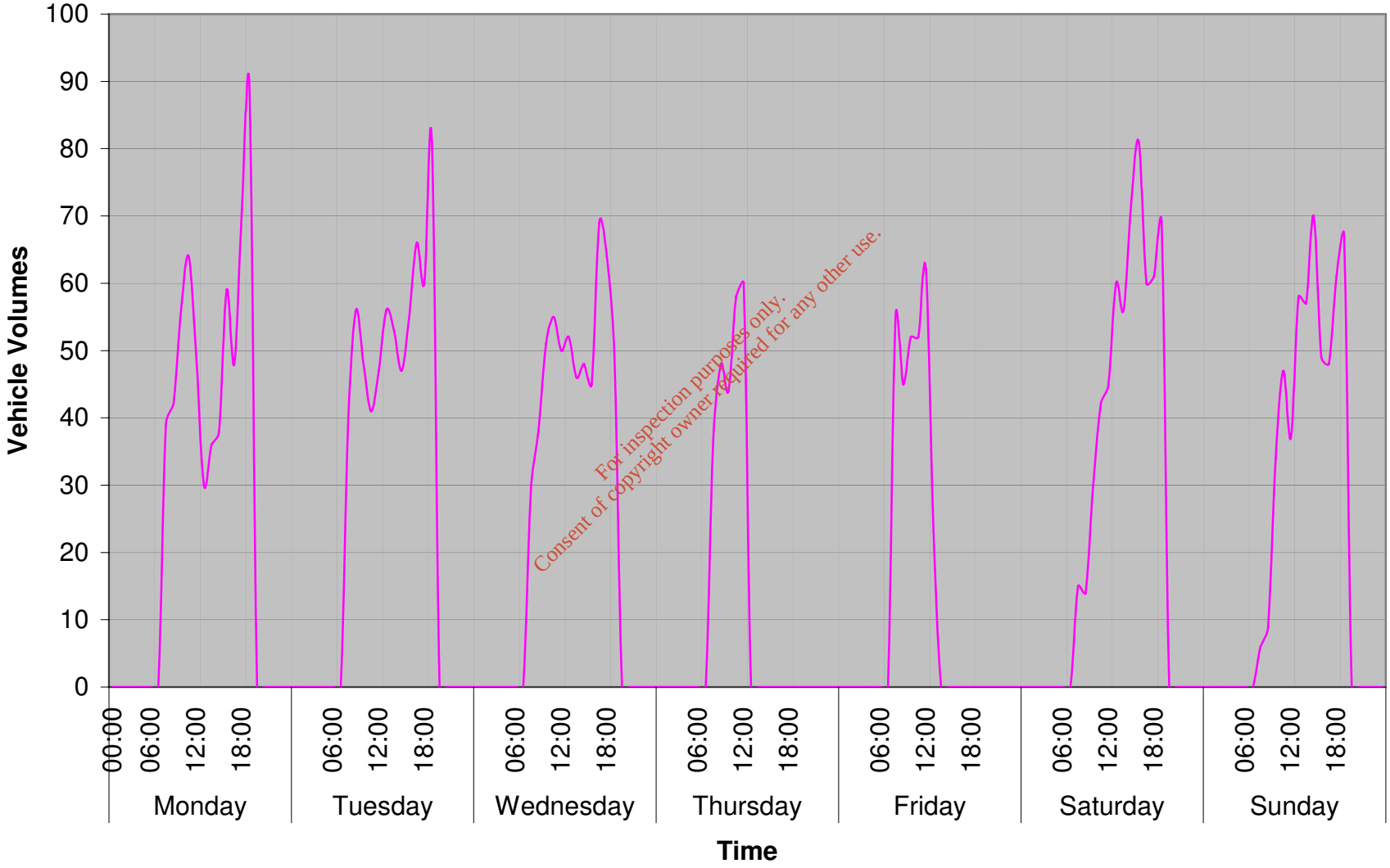
7 Day Traffic Flows, 17th-23rd September
Site 3 Link F, R314 East



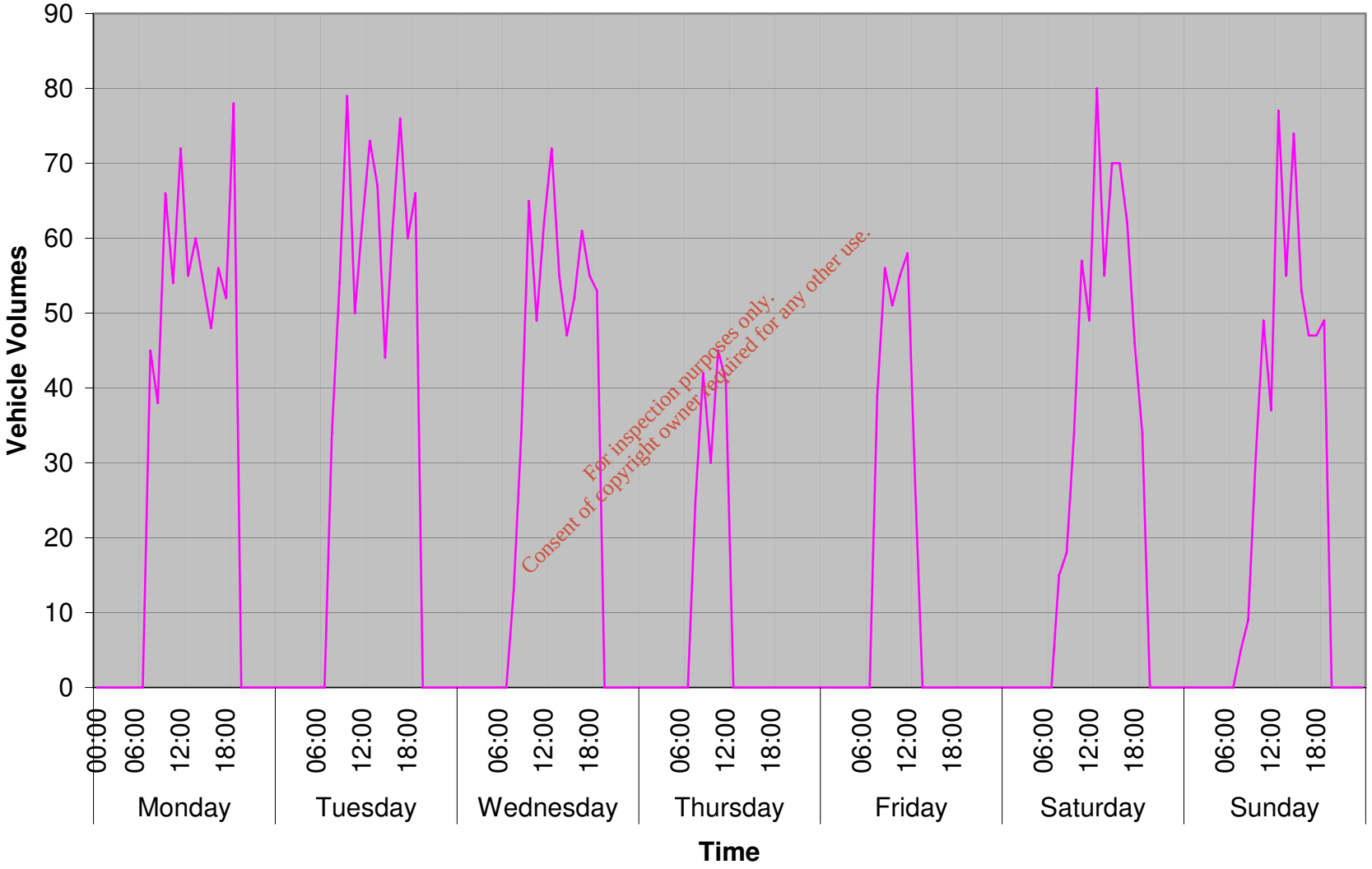
7 Day Traffic Flows, 17th-23rd September
Site 6 Link G, R314 West



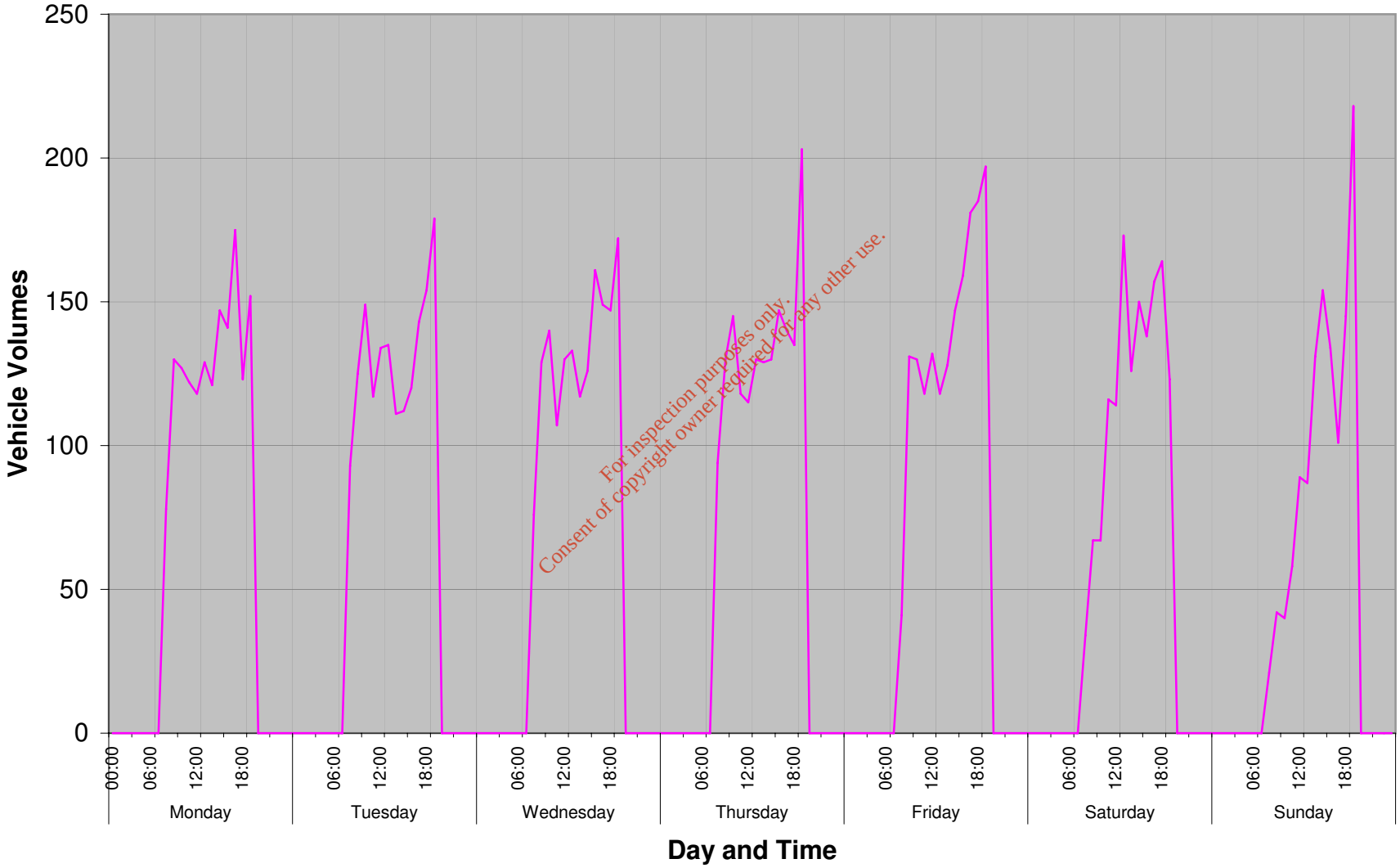
7 Day Traffic Flows, 17th-23rd September
Site 6 Link H, L1203



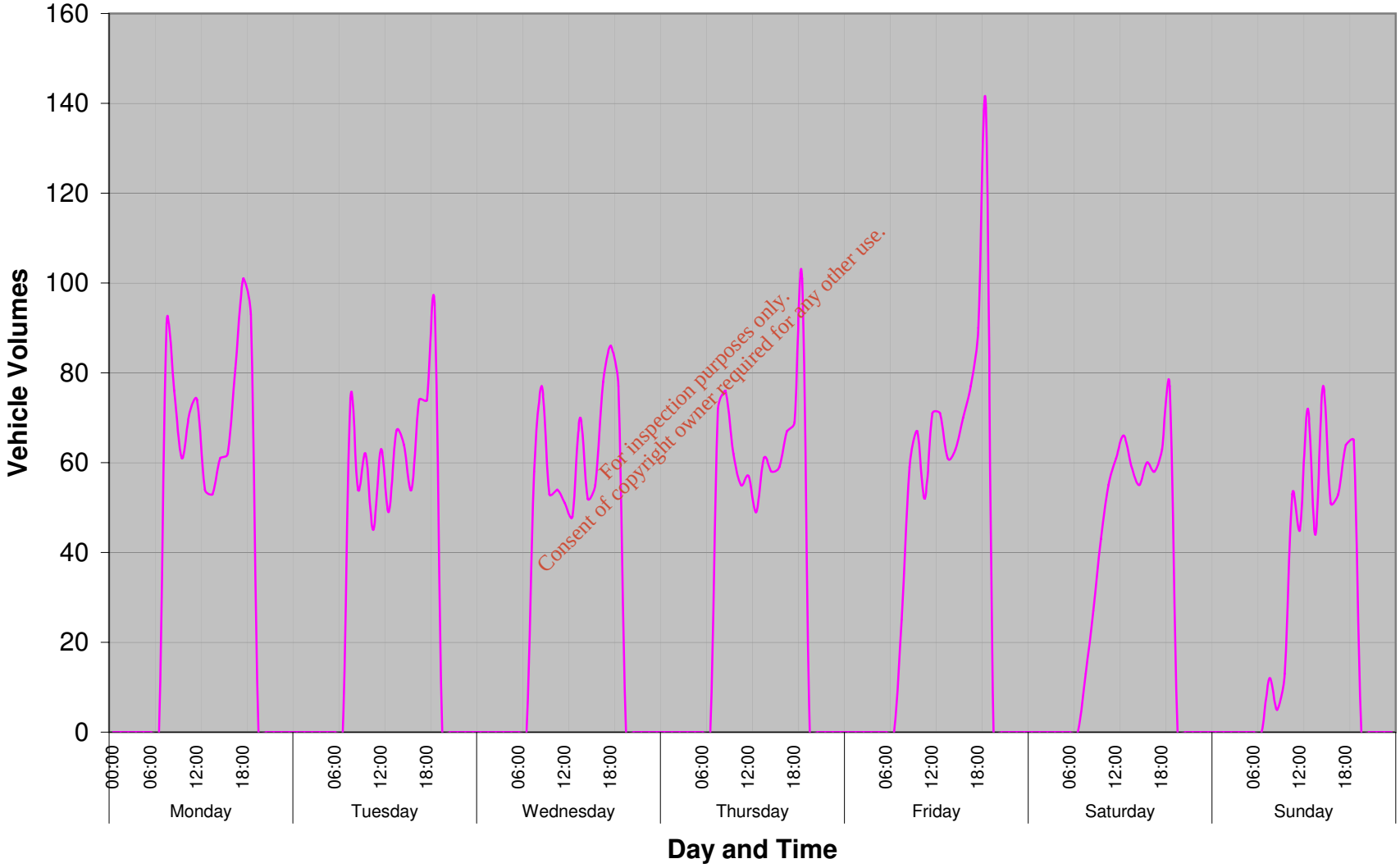
7 Day Traffic Flows, 17th-23rd September
Site 6 Link I, R314 East



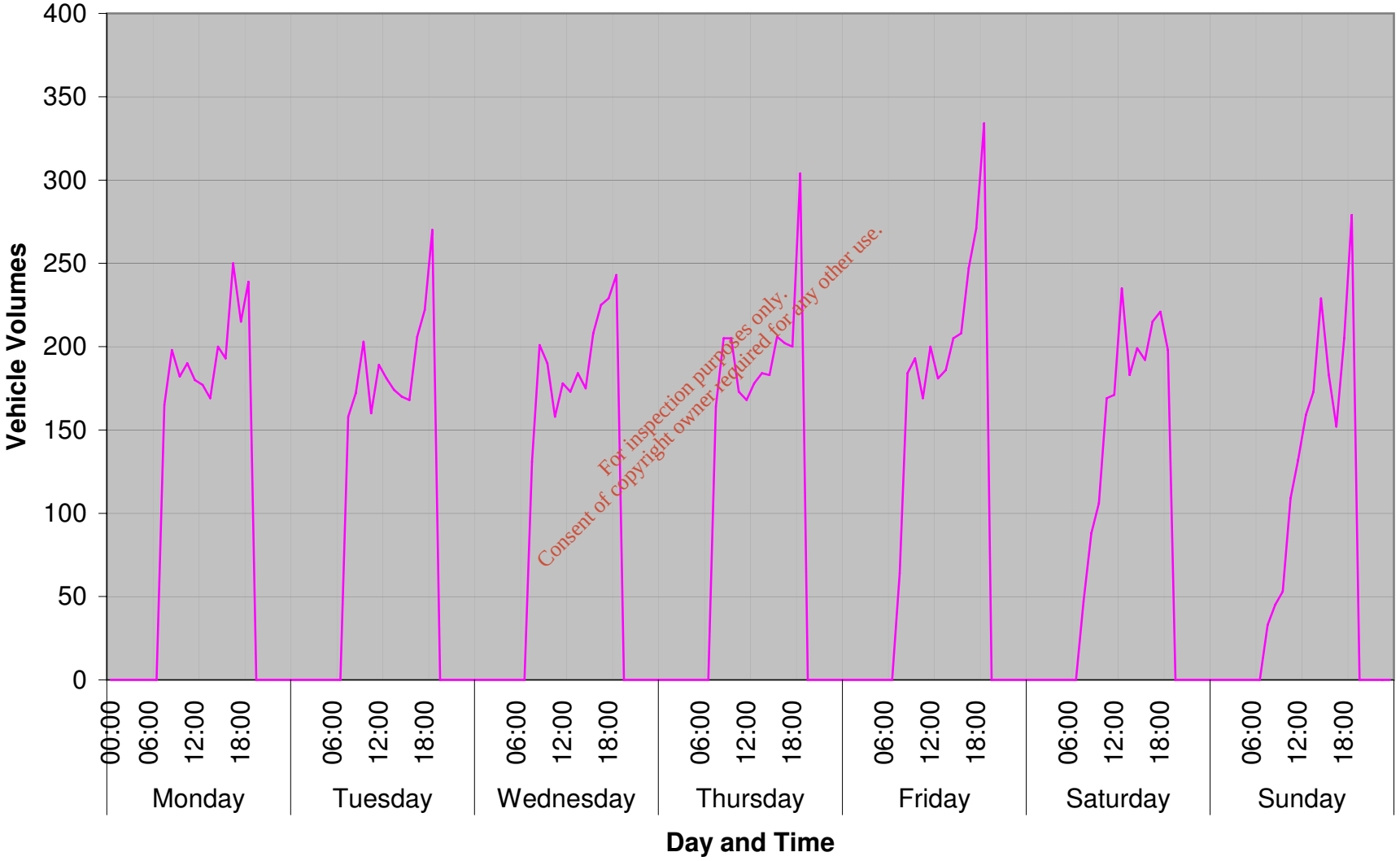
7 Day Traffic Flows, 17th-23rd September
Site 8 Link J, R313 West to Belmullet



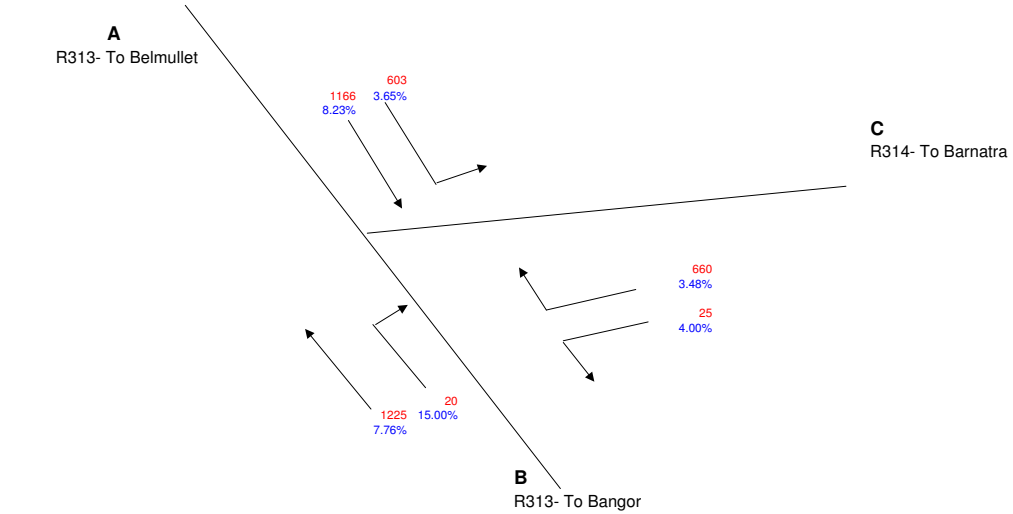
7 Day Traffic Flows, 17th-23rd September
Site 8 Link K, Local Road L1204 North



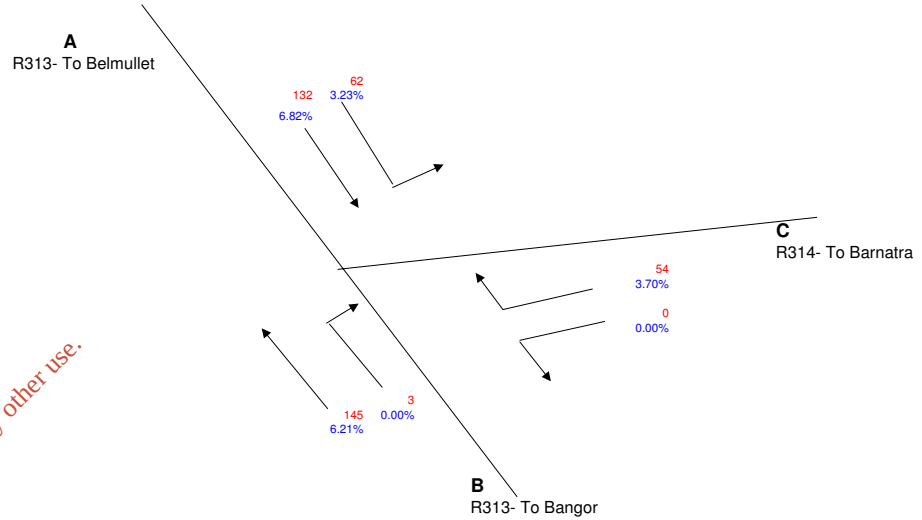
7 Day Traffic Flows, 17th-23rd September
Site 8 Link L, R313 East to Bangor



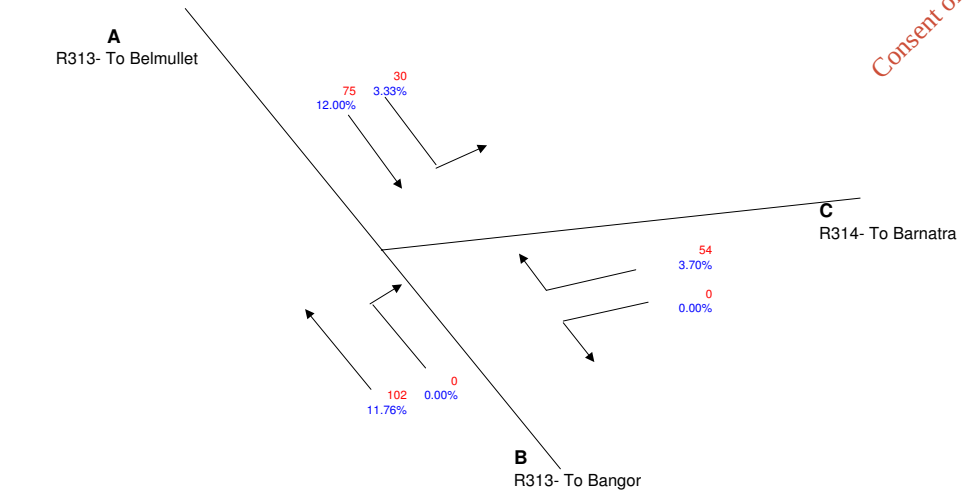
Site 1 - 08/08/07
12 Hour Movements (07:00-19:00)
TOTAL VEHICLES
% HGVs



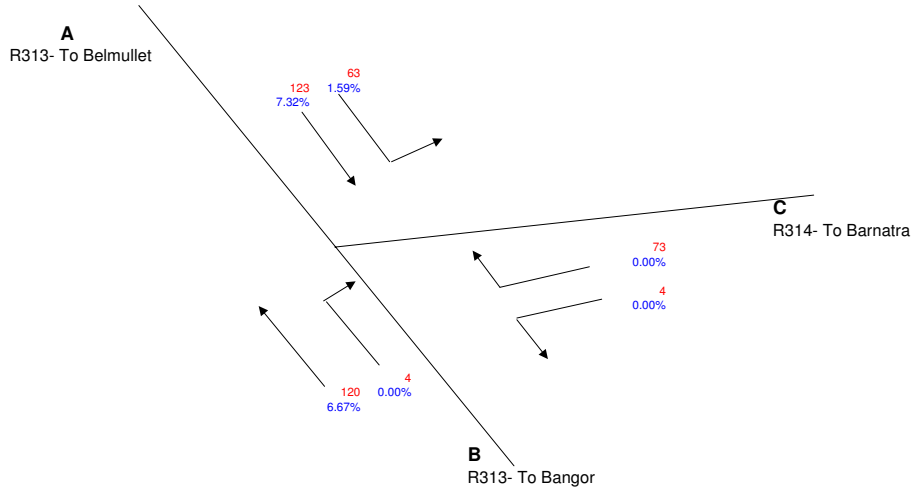
Site 1 - 08/08/07
Mid Movements (14:00-15:00)
TOTAL VEHICLES
% HGVs



Site 1 - 08/08/07
AM Movements (9:00-10:00)
TOTAL VEHICLES
% HGVs

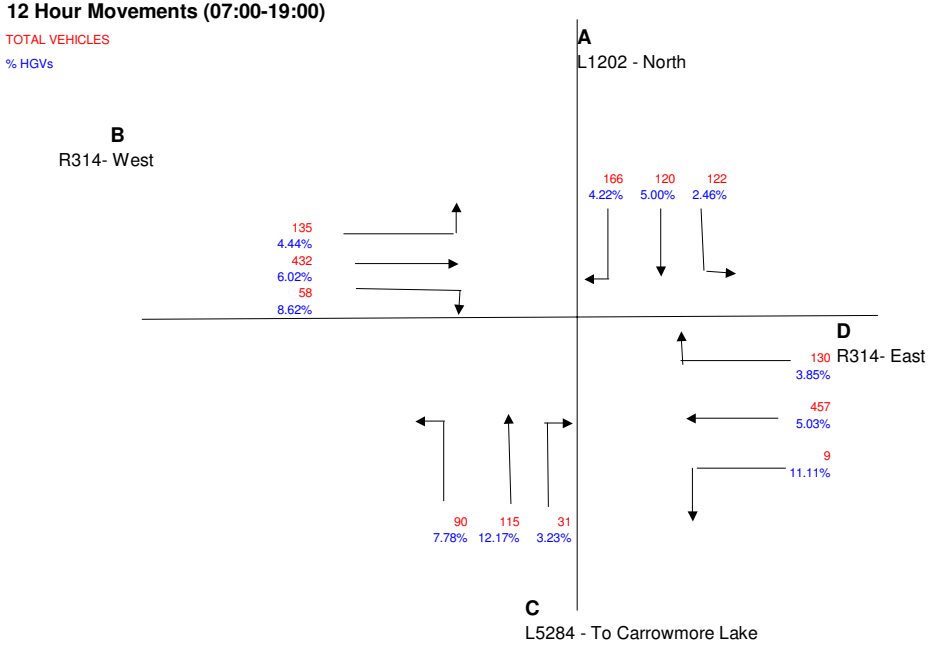


Site 1 - 08/08/07
PM Movements (17:00-18:00)
TOTAL VEHICLES
% HGVs



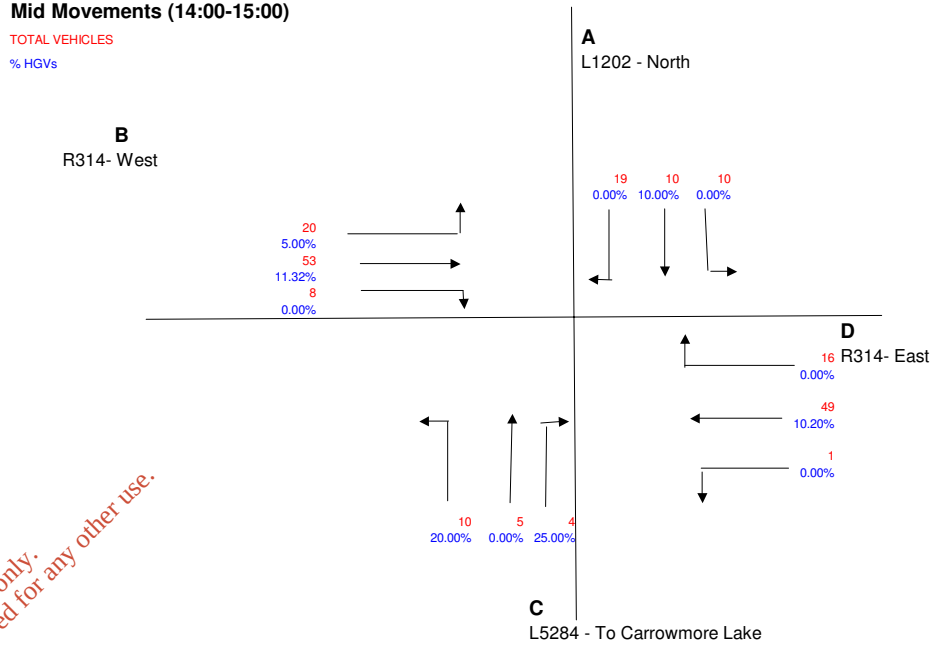
2007 - Site 2 - 08/08/07
12 Hour Movements (07:00-19:00)

TOTAL VEHICLES
% HGVs



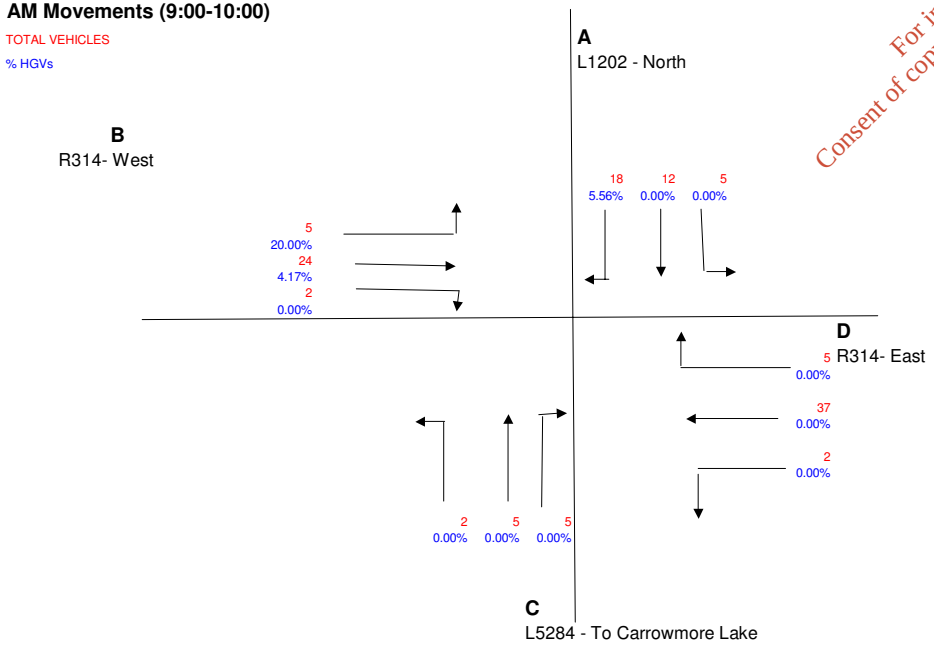
2007 - Site 2 - 08/08/07
Mid Movements (14:00-15:00)

TOTAL VEHICLES
% HGVs



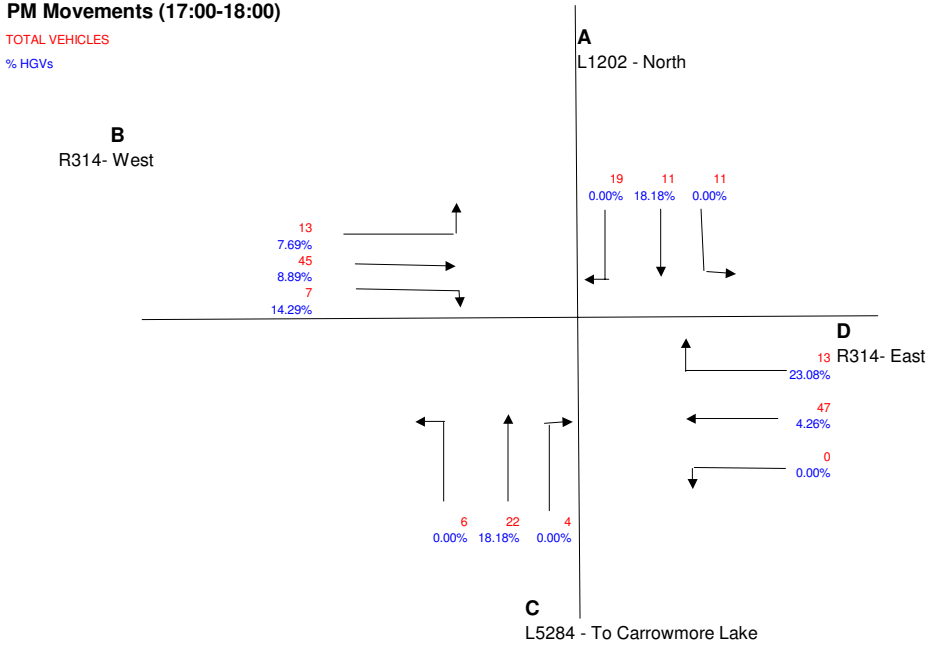
2007 - Site 2 - 08/08/07
AM Movements (9:00-10:00)

TOTAL VEHICLES
% HGVs



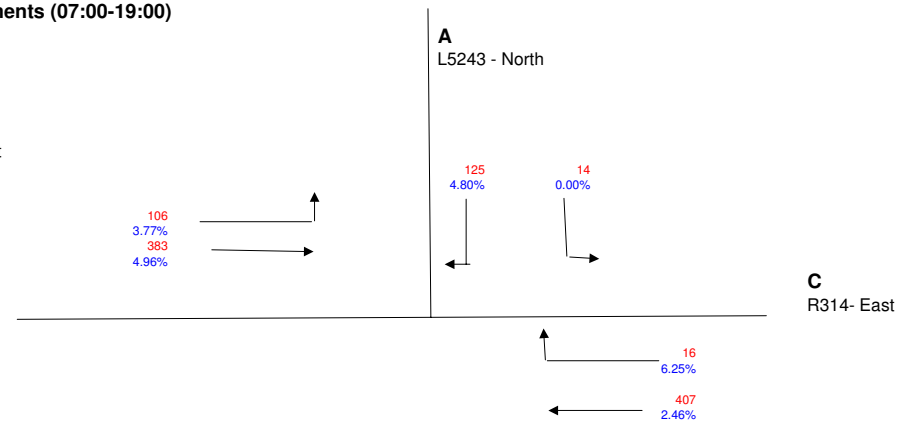
2007 - Site 2 - 08/08/07
PM Movements (17:00-18:00)

TOTAL VEHICLES
% HGVs



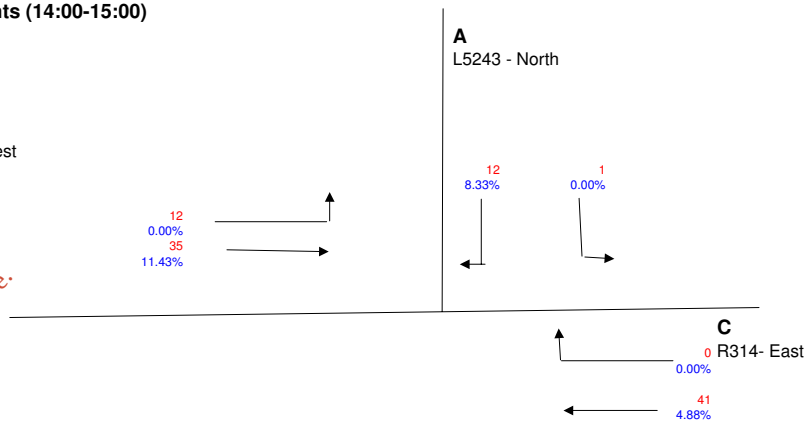
2007 - Site 3 - 08/08/07
12 Hour Movements (07:00-19:00)

TOTAL VEHICLES
% HGVs
No. of HGVs



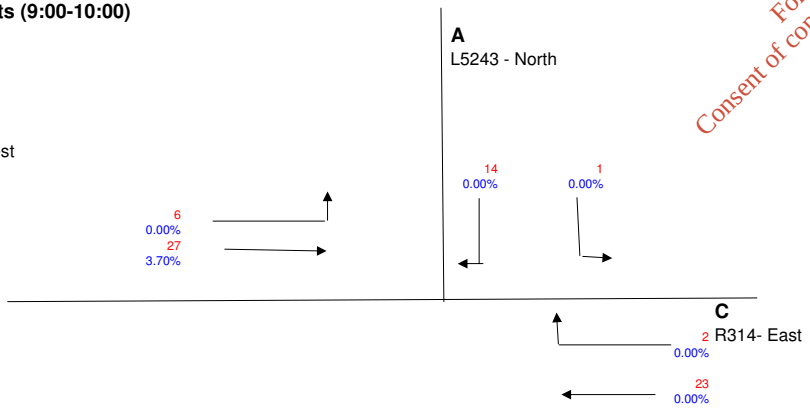
2007 - Site 3 - 08/08/07
Mid Movements (14:00-15:00)

TOTAL VEHICLES
% HGVs



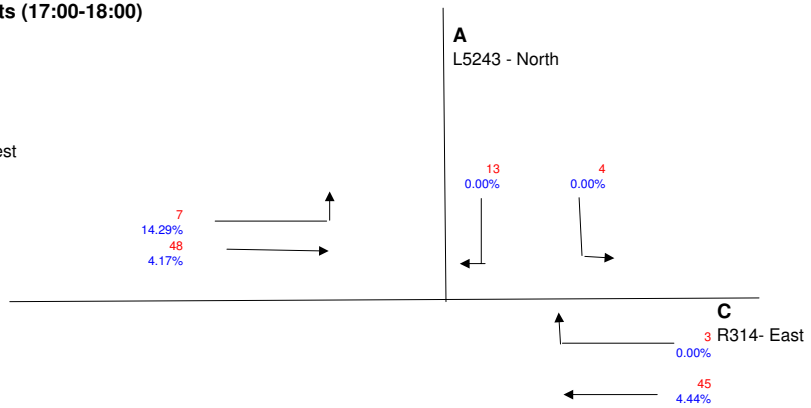
2007 - Site 3 - 08/08/07
AM Movements (9:00-10:00)

TOTAL VEHICLES
% HGVs



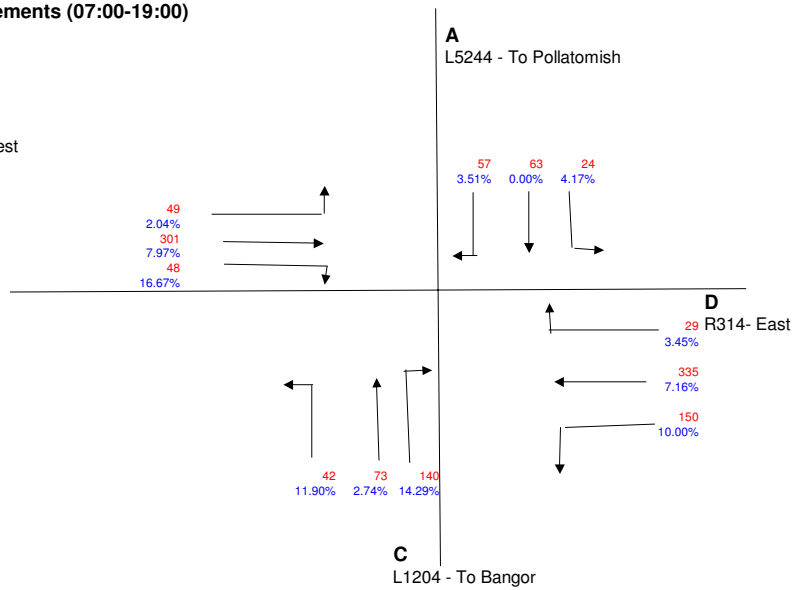
2007 - Site 3 - 08/08/07
PM Movements (17:00-18:00)

TOTAL VEHICLES
% HGVs



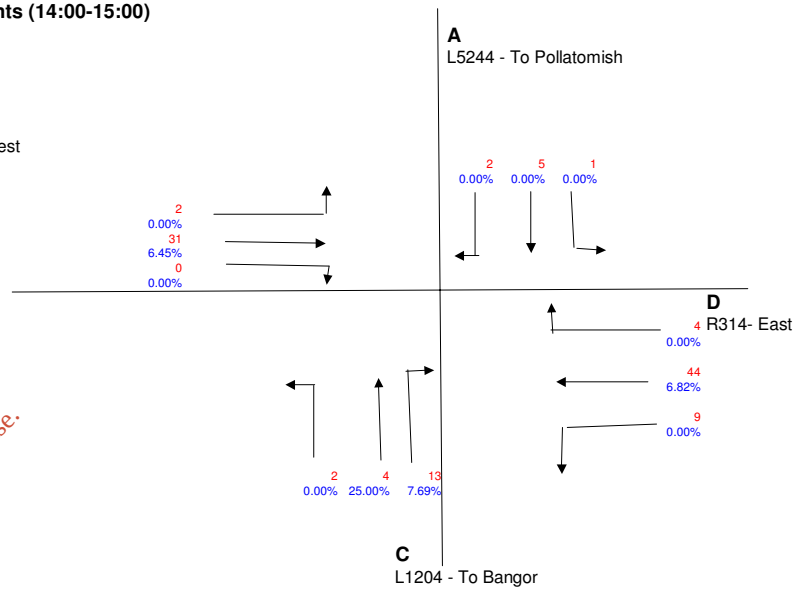
2007 - Site 4 - 08/08/07
12 Hour Movements (07:00-19:00)

TOTAL VEHICLES
% HGVs



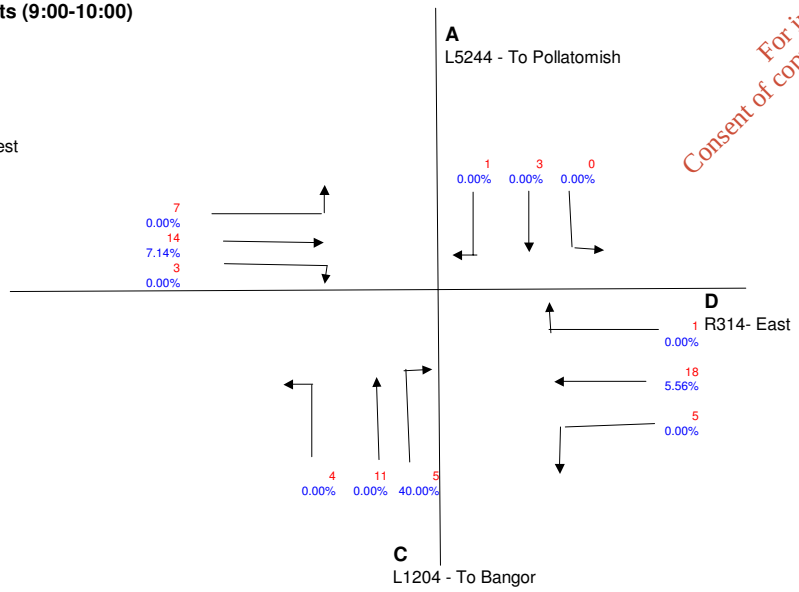
2007 - Site 4 - 08/08/07
Mid Movements (14:00-15:00)

TOTAL VEHICLES
% HGVs



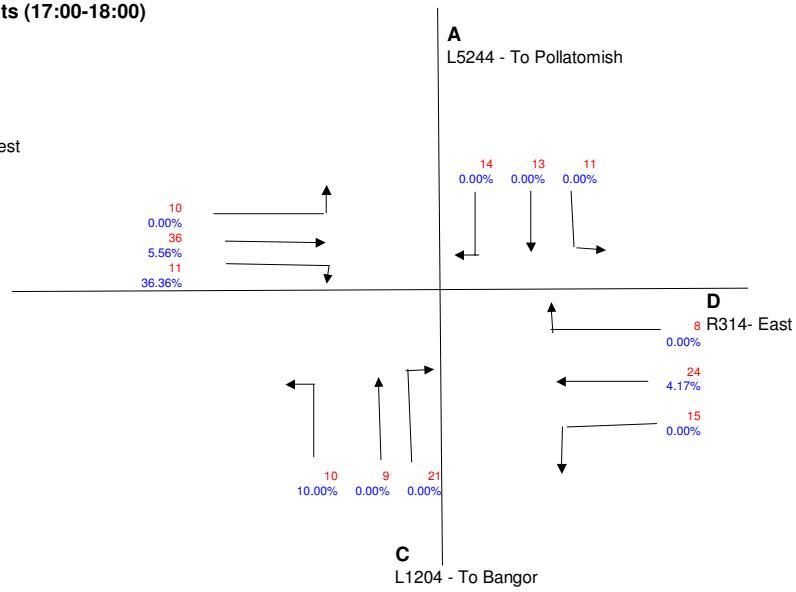
2007 - Site 4 - 08/08/07
AM Movements (9:00-10:00)

TOTAL VEHICLES
% HGVs



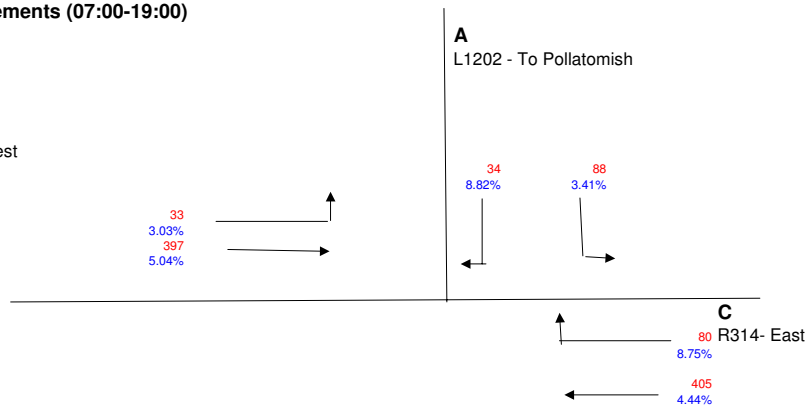
2007 - Site 4 - 08/08/07
PM Movements (17:00-18:00)

TOTAL VEHICLES
% HGVs



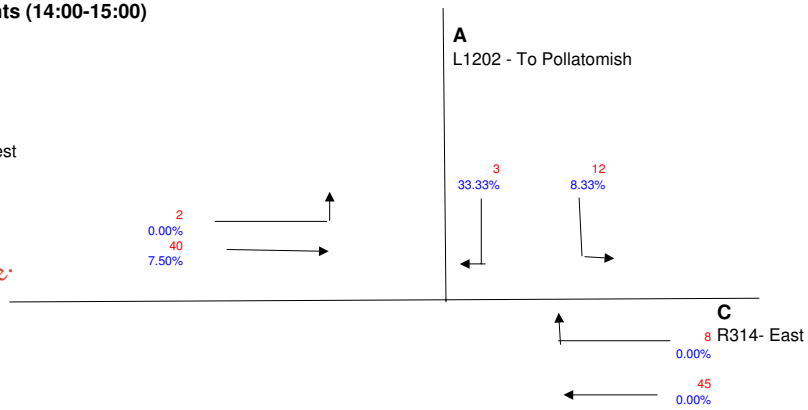
2007 - Site 5 - 08/08/07
12 Hour Movements (07:00-19:00)

TOTAL VEHICLES
% HGVs



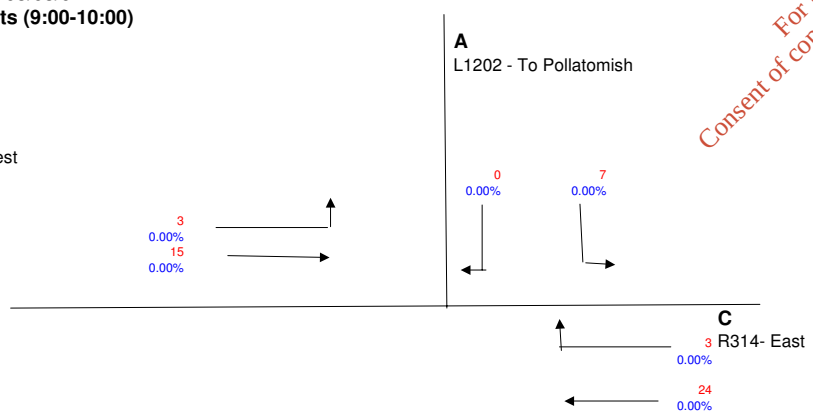
2007 - Site 5 - 08/08/07
Mid Movements (14:00-15:00)

TOTAL VEHICLES
% HGVs



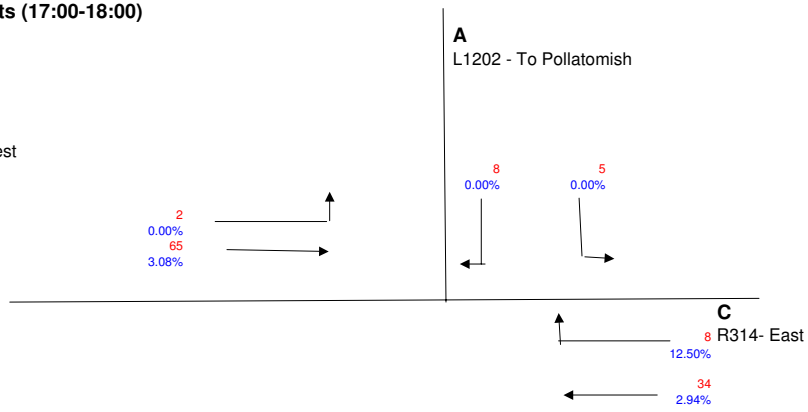
2007 - Site 5 - 08/08/07
AM Movements (9:00-10:00)

TOTAL VEHICLES
% HGVs



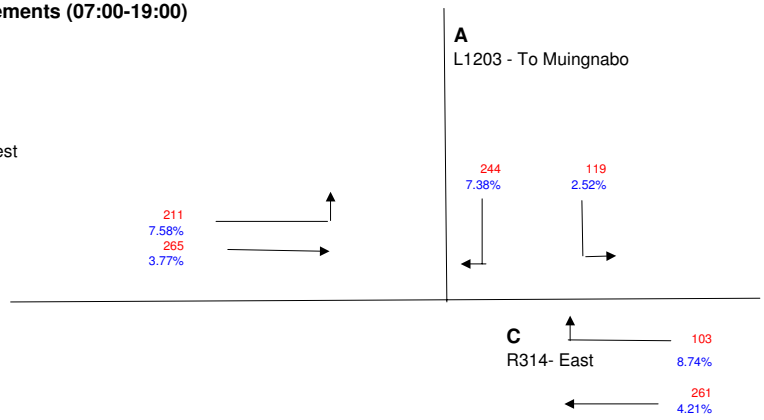
2007 - Site 5 - 08/08/07
PM Movements (17:00-18:00)

TOTAL VEHICLES
% HGVs



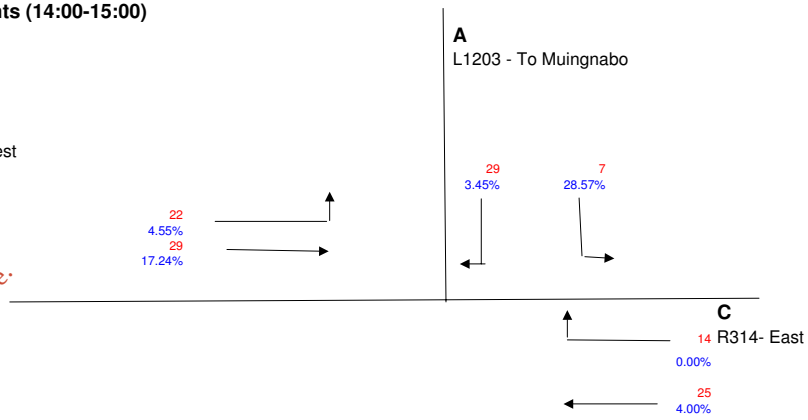
2007 - Site 6 - 08/08/07
12 Hour Movements (07:00-19:00)

TOTAL VEHICLES
% HGVs



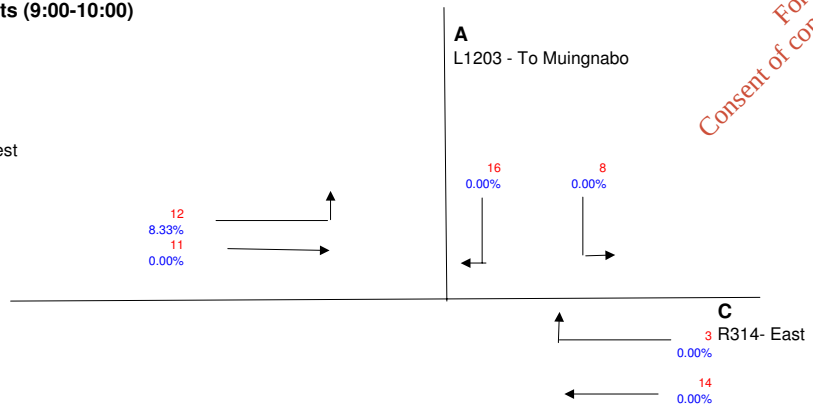
2007 - Site 6 - 08/08/07
Mid Movements (14:00-15:00)

TOTAL VEHICLES
% HGVs



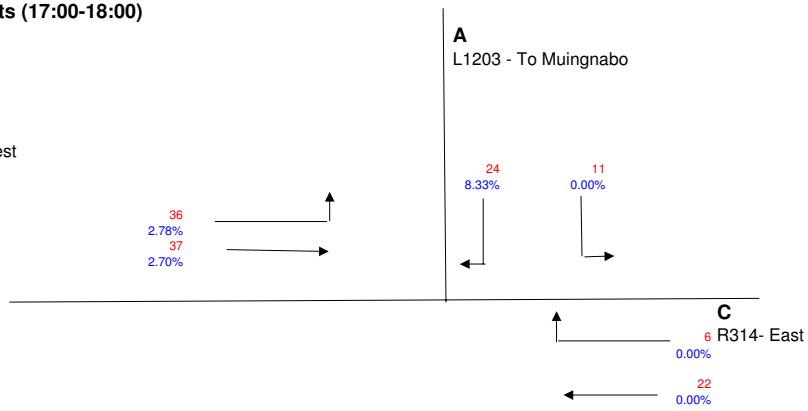
2007 - Site 6 - 08/08/07
AM Movements (9:00-10:00)

TOTAL VEHICLES
% HGVs

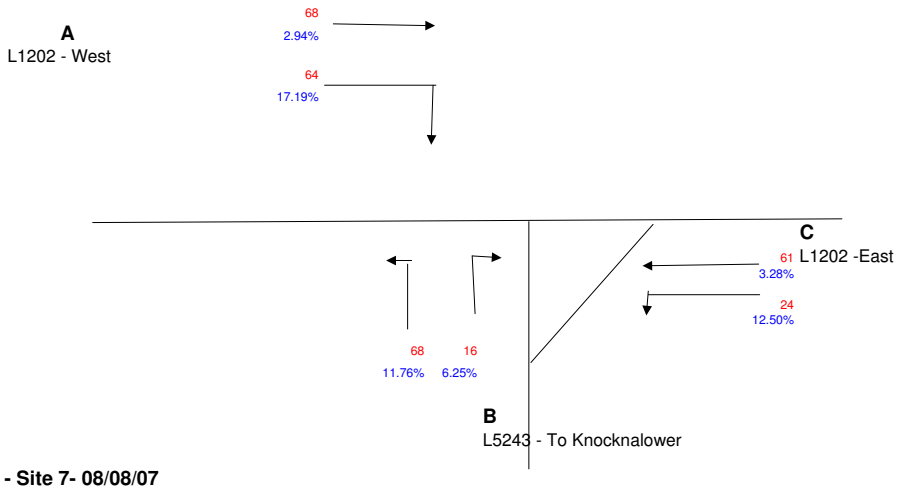


2007 - Site 6 - 08/08/07
PM Movements (17:00-18:00)

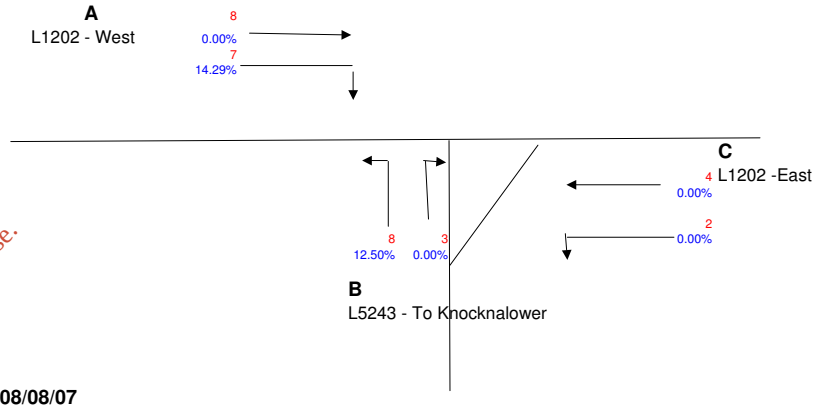
TOTAL VEHICLES
% HGVs



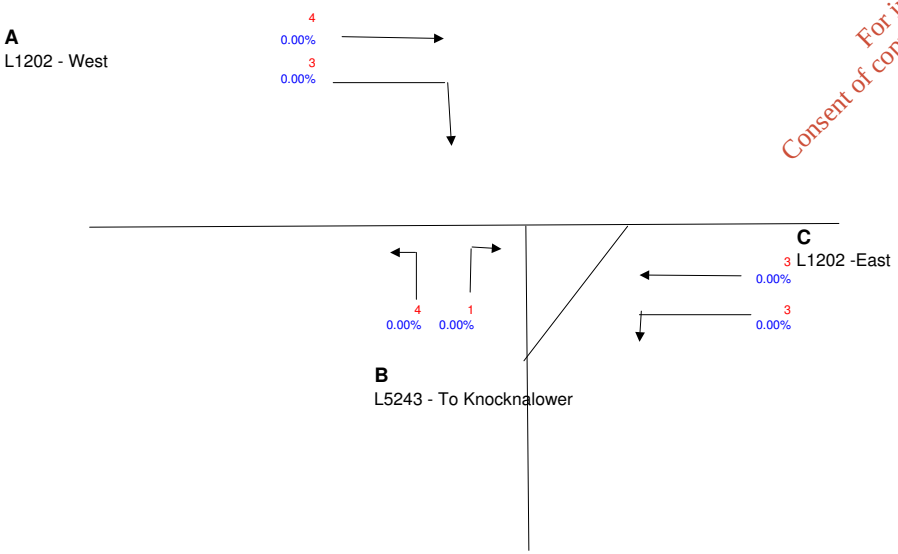
2007 - Site 7- 08/08/07
12 Hour Movements (07:00-19:00)
TOTAL VEHICLES
% HGVs



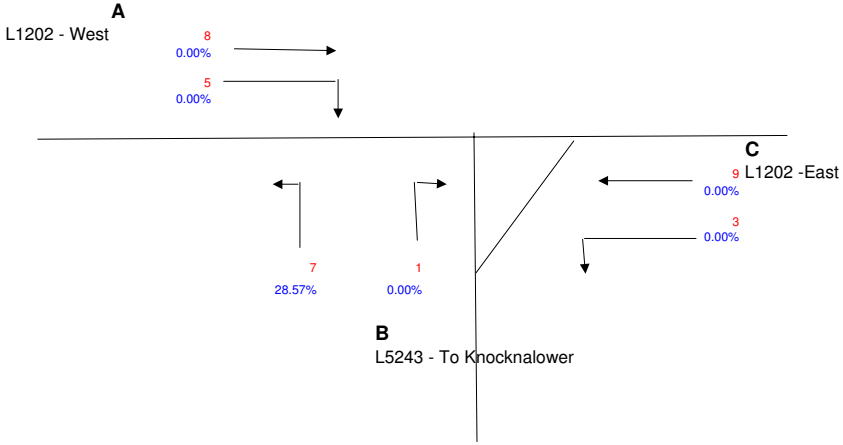
2007 - Site 7- 08/08/07
Mid Movements (14:00-15:00)
TOTAL VEHICLES
% HGVs



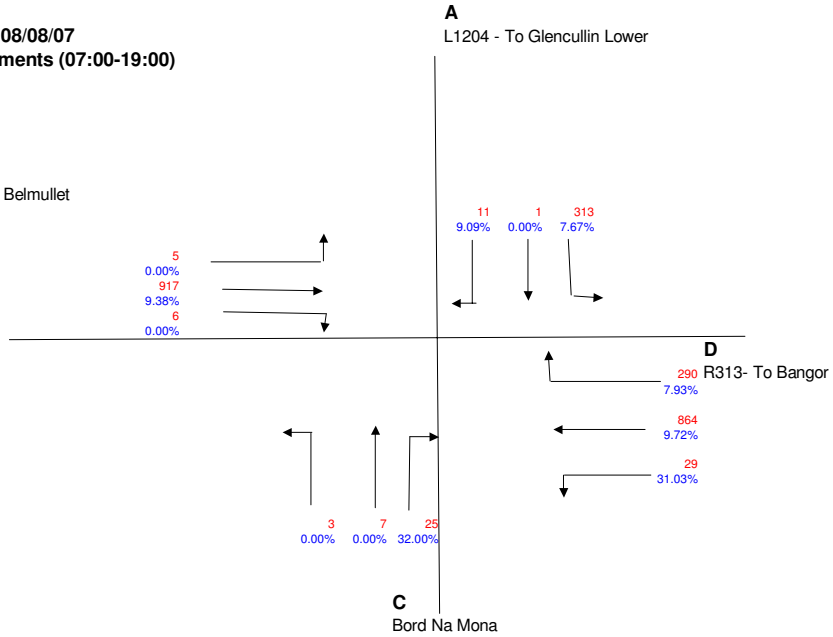
2007 - Site 7- 08/08/07
AM Movements (9:00-10:00)
TOTAL VEHICLES
% HGVs



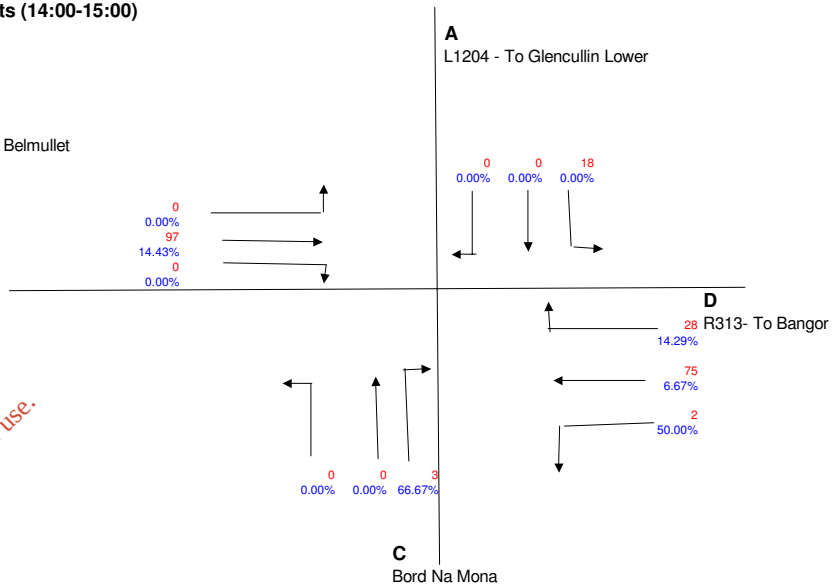
2007 - Site 7- 08/08/07
PM Movements (17:00-18:00)
TOTAL VEHICLES
% HGVs



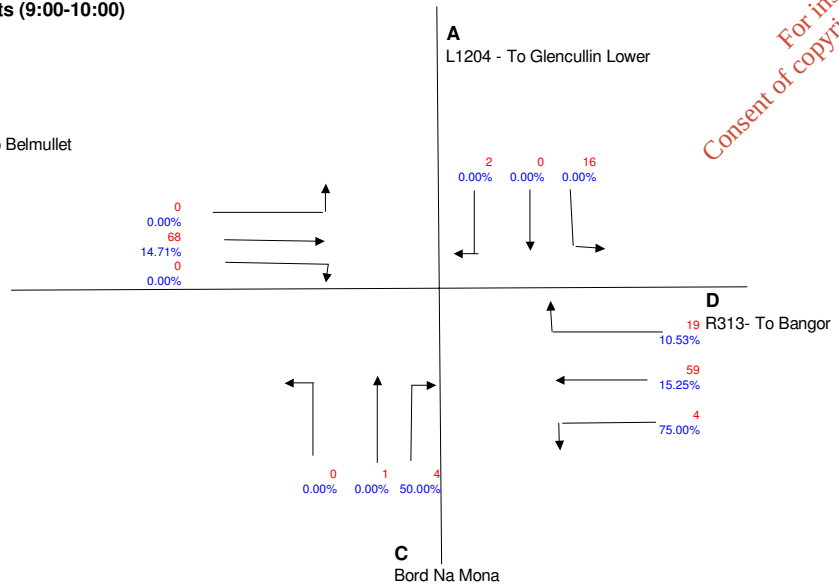
2007 - Site 8 - 08/08/07
12 Hour Movements (07:00-19:00)
TOTAL VEHICLES
% HGVs



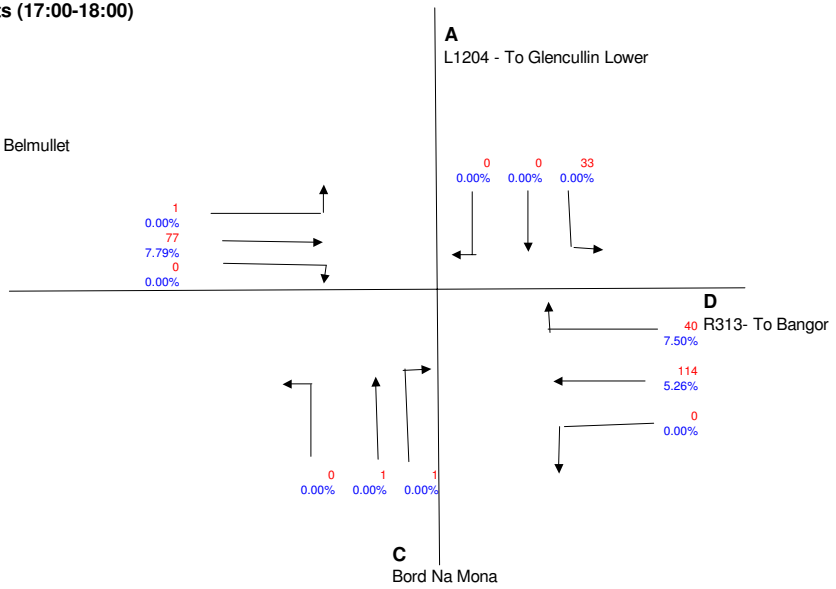
2007 - Site 8 - 08/08/07
Mid Movements (14:00-15:00)
TOTAL VEHICLES
% HGVs



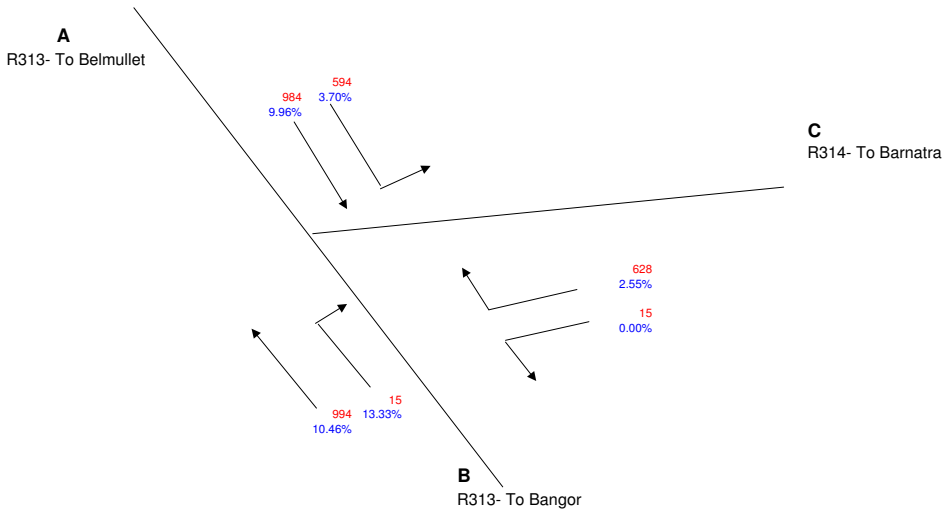
2007 - Site 8 - 08/08/07
AM Movements (9:00-10:00)
TOTAL VEHICLES
% HGVs



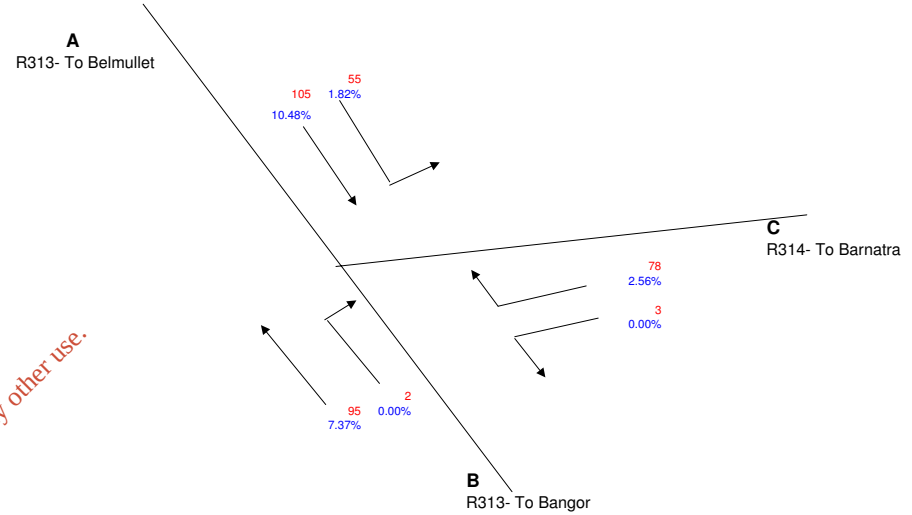
2007 - Site 8 - 08/08/07
PM Movements (17:00-18:00)
TOTAL VEHICLES
% HGVs



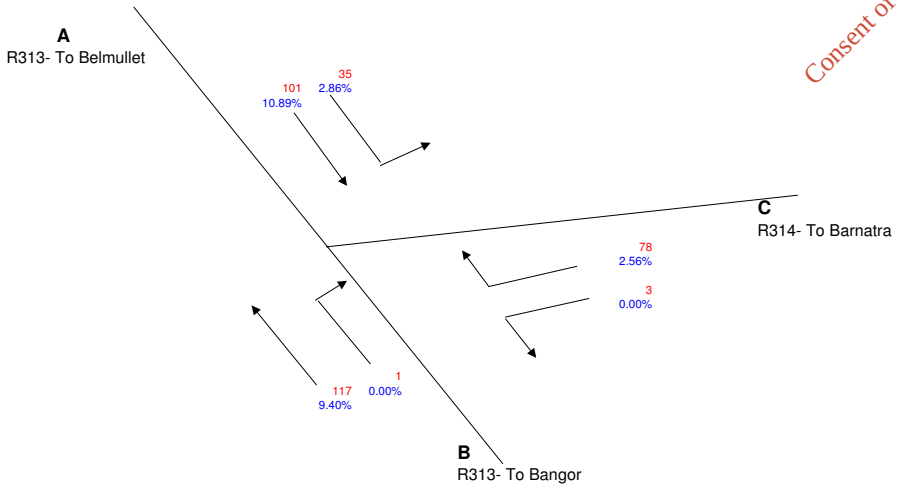
2007 - Site 1 - 19/09/07
12 Hour Movements (07:00-19:00)
TOTAL VEHICLES
% HGVs



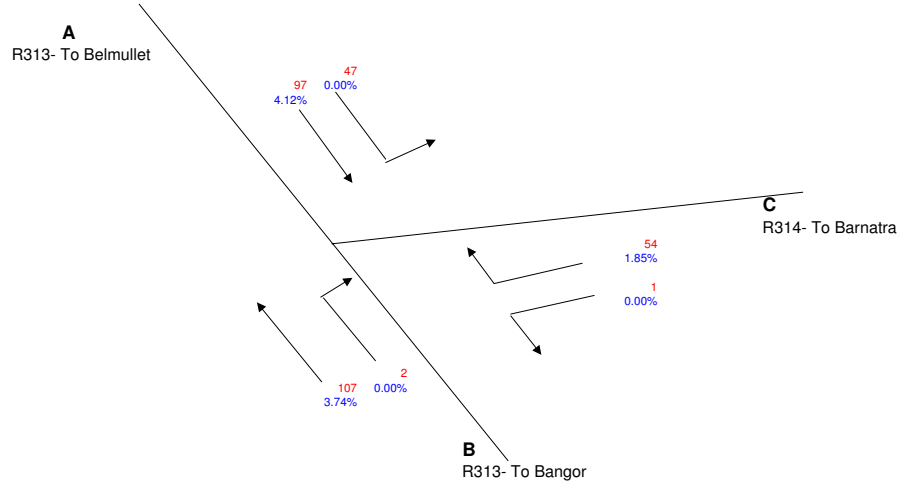
2007 - Site 1 - 19/09/07
Mid Movements (14:00-15:00)
TOTAL VEHICLES
% HGVs



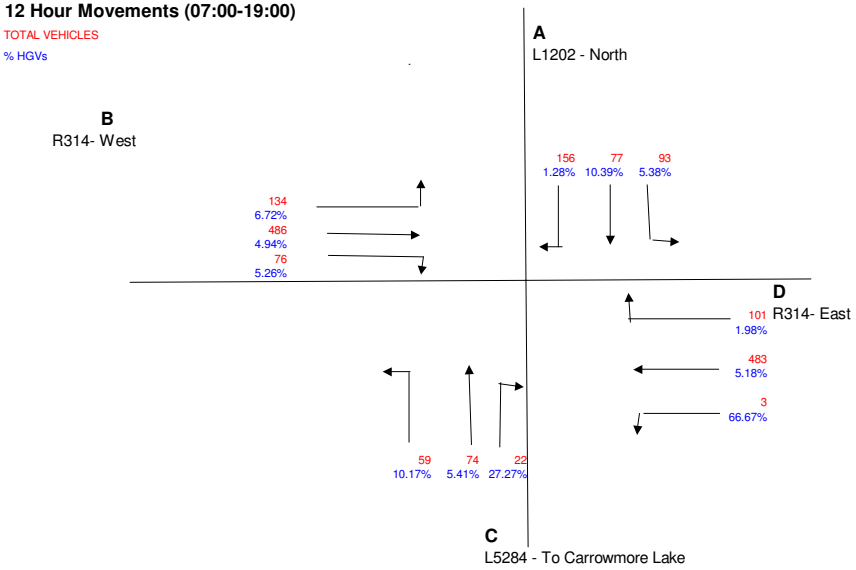
2007 - Site 1 - 19/09/07
AM Movements (9:00-10:00)
TOTAL VEHICLES
% HGVs



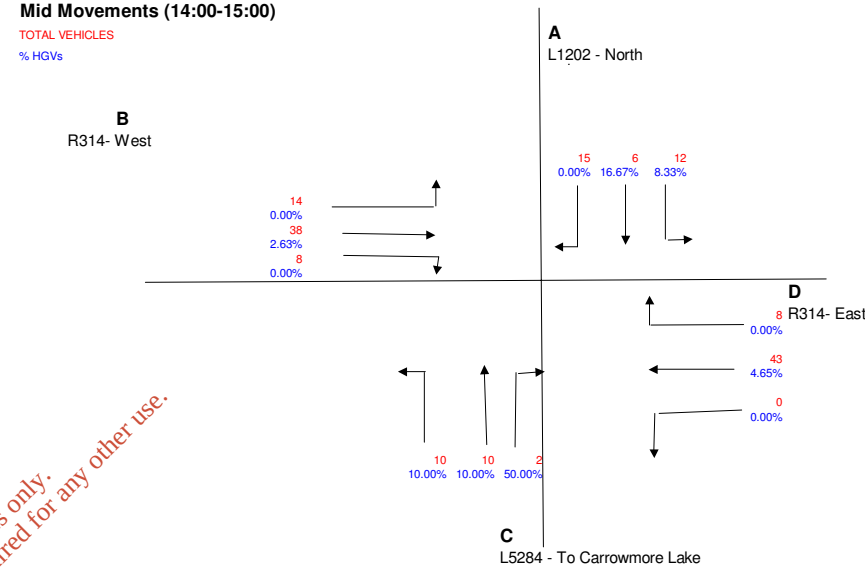
2007 - Site 1 - 19/09/07
PM Movements (18:00-19:00)
TOTAL VEHICLES
% HGVs



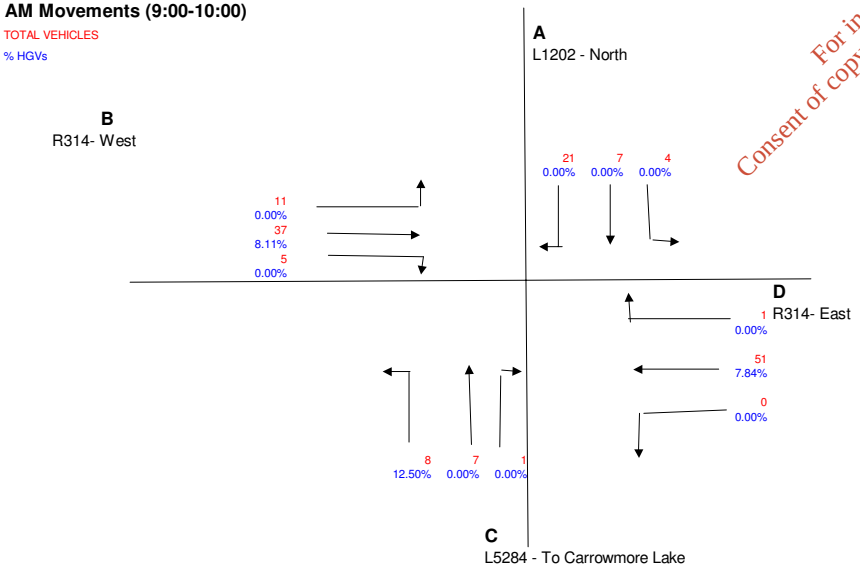
2007 - Site 2 - 19/09/07
12 Hour Movements (07:00-19:00)



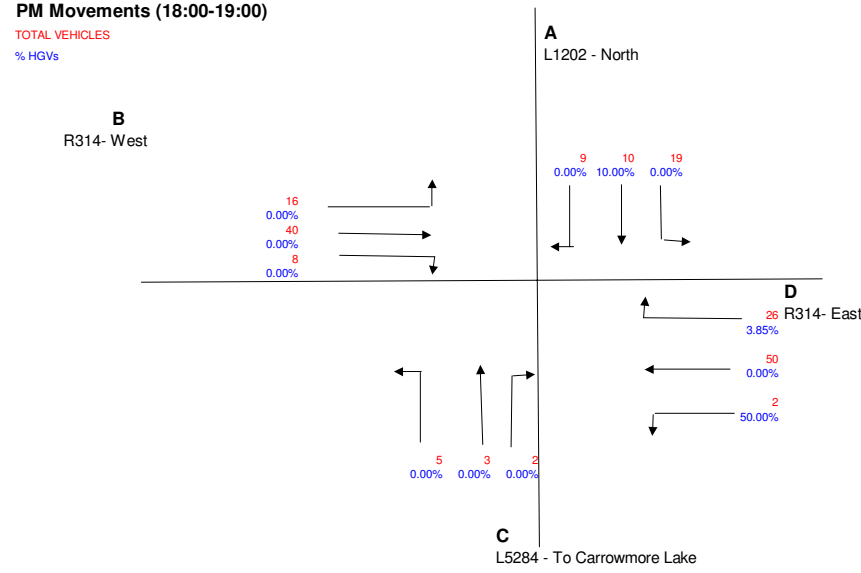
2007 - Site 2 - 19/09/07
Mid Movements (14:00-15:00)



2007 - Site 2 - 19/09/07
AM Movements (9:00-10:00)

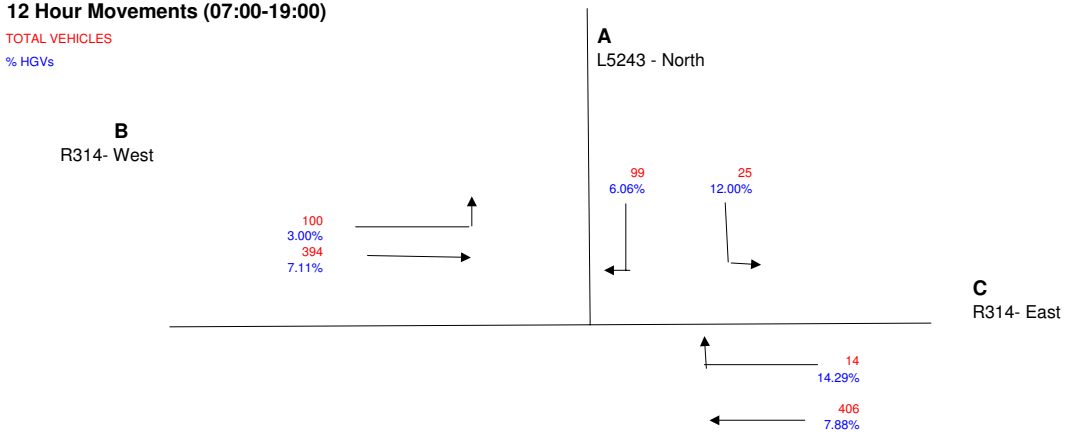


2007 - Site 2 - 19/09/07
PM Movements (18:00-19:00)



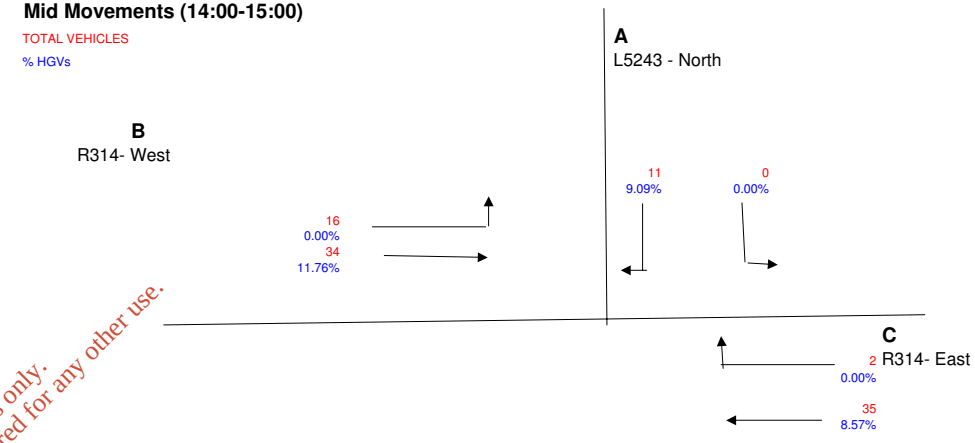
2007 - Site 3 - 19/09/07
12 Hour Movements (07:00-19:00)

TOTAL VEHICLES
% HGVs



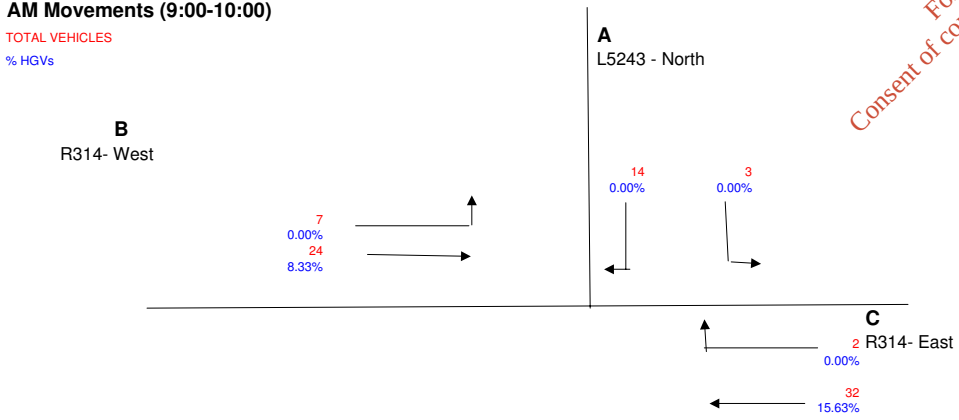
2007 - Site 3 - 19/09/07
Mid Movements (14:00-15:00)

TOTAL VEHICLES
% HGVs



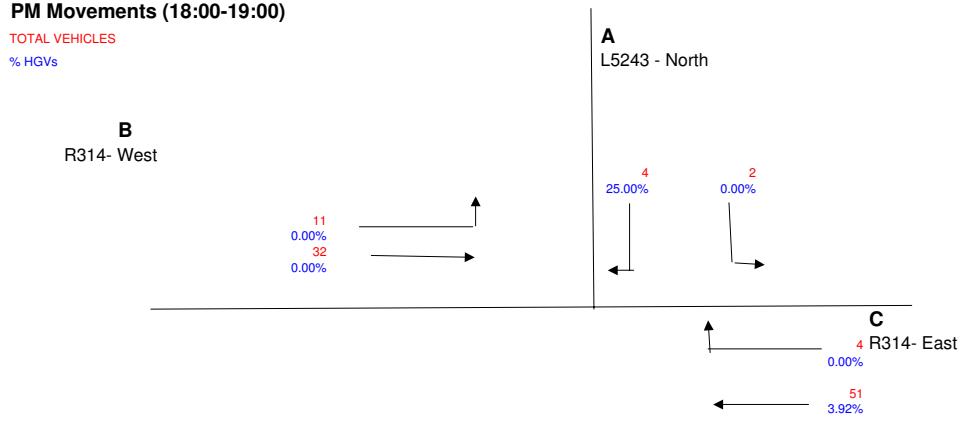
2007 - Site 3 - 19/09/07
AM Movements (9:00-10:00)

TOTAL VEHICLES
% HGVs



2007 - Site 3 - 19/09/07
PM Movements (18:00-19:00)

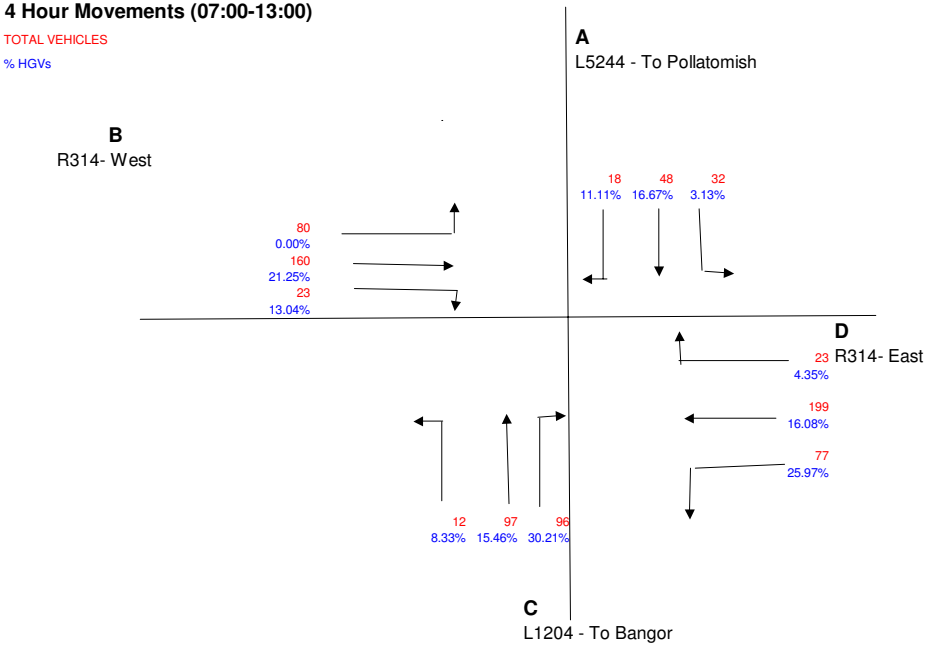
TOTAL VEHICLES
% HGVs



2007 - Site 4 - 19/09/07
4 Hour Movements (07:00-13:00)

TOTAL VEHICLES

% HGVs

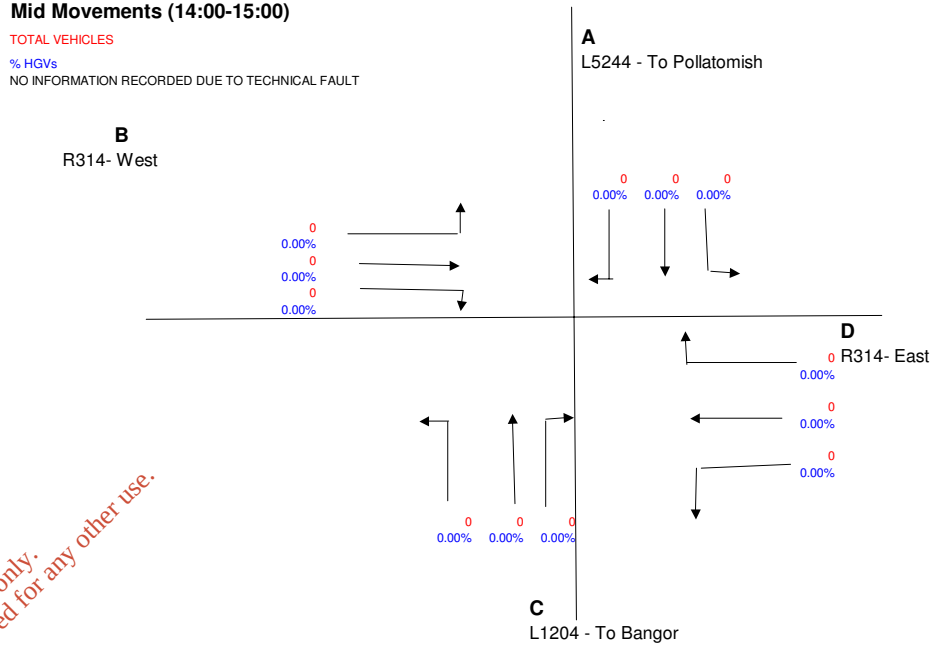


2007 - Site 4 - 19/09/07
Mid Movements (14:00-15:00)

TOTAL VEHICLES

% HGVs

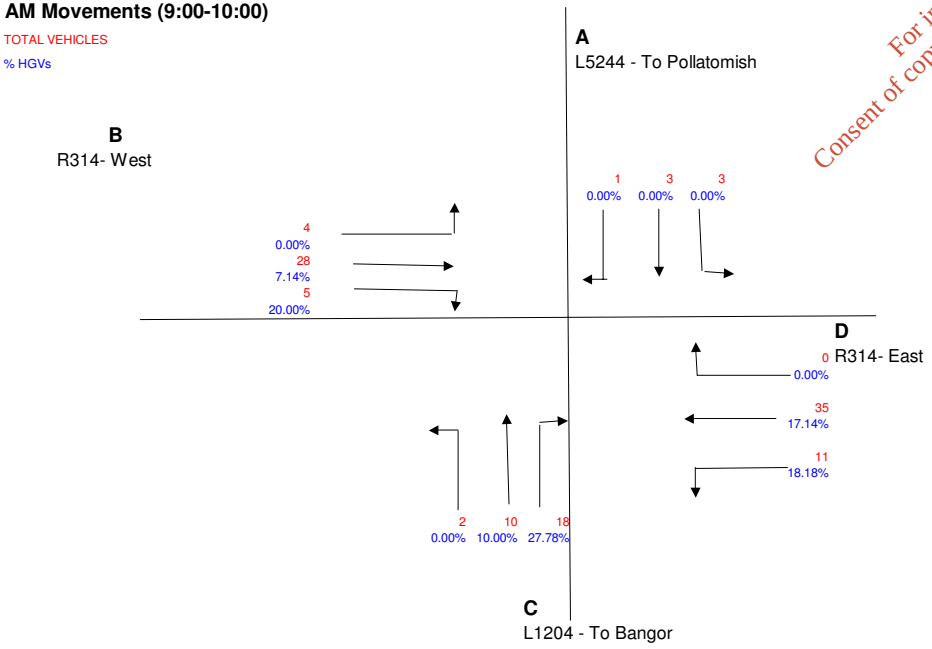
NO INFORMATION RECORDED DUE TO TECHNICAL FAULT



2007 - Site 4 - 19/09/07
AM Movements (9:00-10:00)

TOTAL VEHICLES

% HGVs

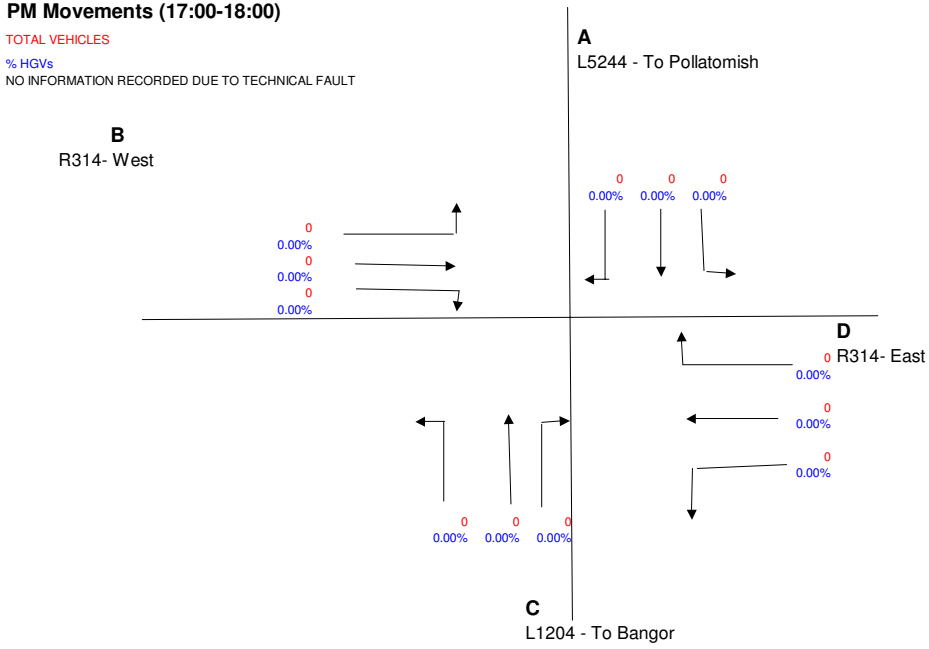


2007 - Site 4 - 19/09/07
PM Movements (17:00-18:00)

TOTAL VEHICLES

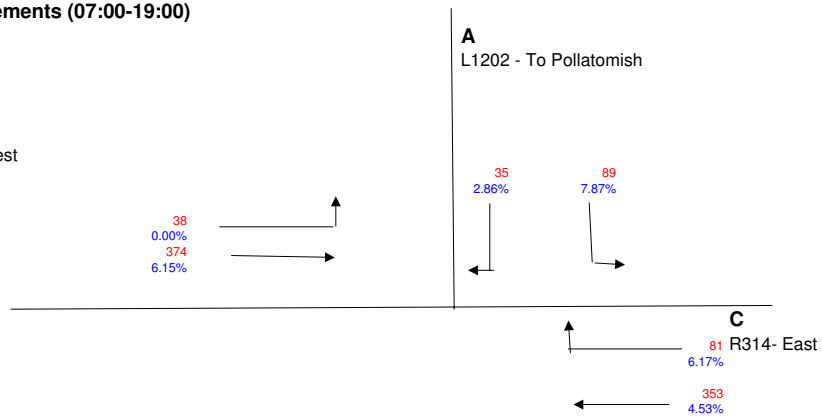
% HGVs

NO INFORMATION RECORDED DUE TO TECHNICAL FAULT



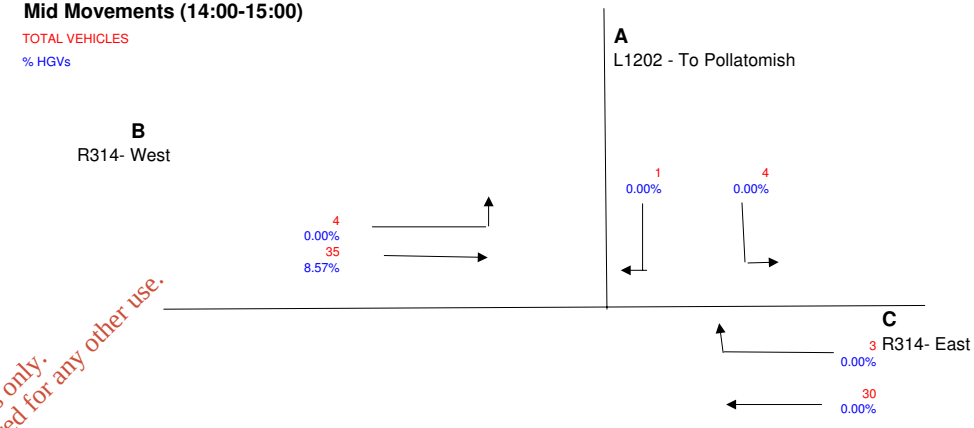
2007 - Site 5 - 19/09/07
12 Hour Movements (07:00-19:00)

TOTAL VEHICLES
% HGVs



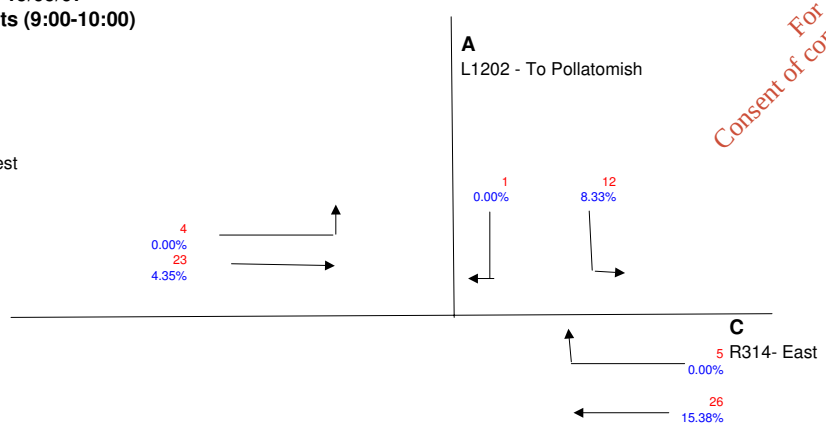
2007 - Site 5 - 19/09/07
Mid Movements (14:00-15:00)

TOTAL VEHICLES
% HGVs



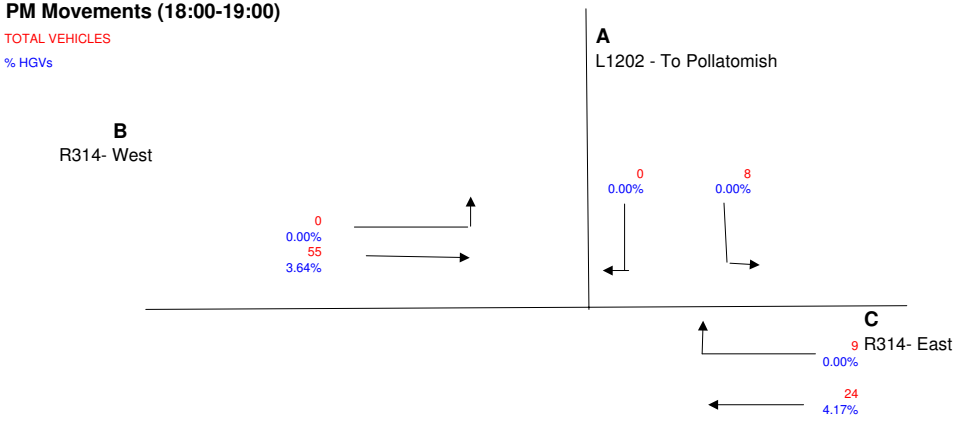
2007 - Site 5 - 19/09/07
AM Movements (9:00-10:00)

TOTAL VEHICLES
% HGVs



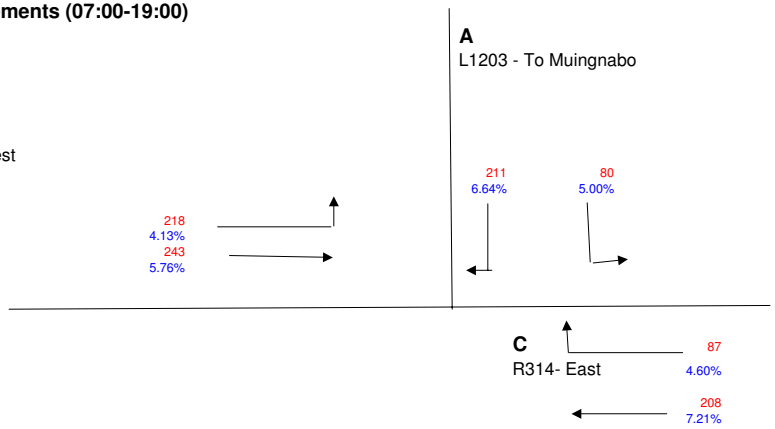
2007 - Site 5 - 19/09/07
PM Movements (18:00-19:00)

TOTAL VEHICLES
% HGVs



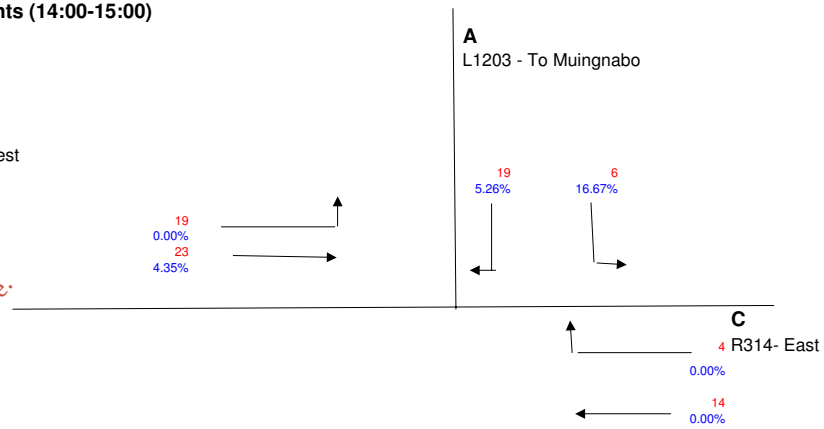
2007 - Site 6 - 19/09/07
12 Hour Movements (07:00-19:00)

TOTAL VEHICLES
% HGVs



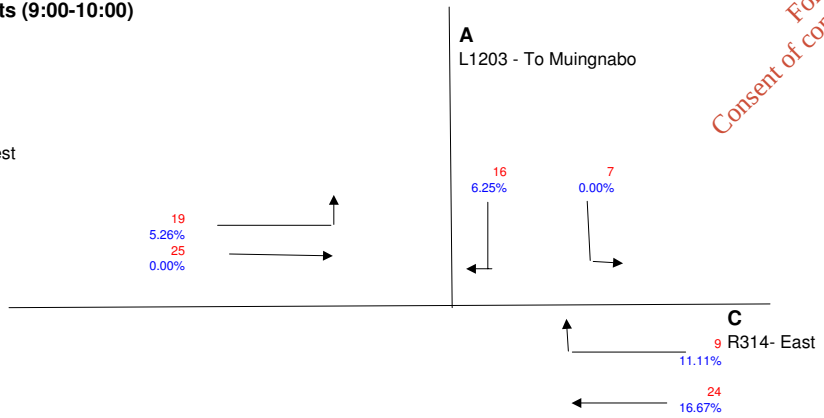
2007 - Site 6 - 19/09/07
Mid Movements (14:00-15:00)

TOTAL VEHICLES
% HGVs



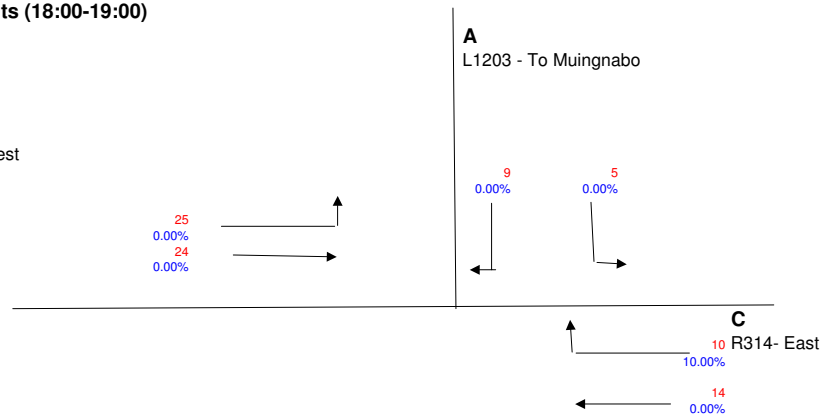
2007 - Site 6 - 19/09/07
AM Movements (9:00-10:00)

TOTAL VEHICLES
% HGVs

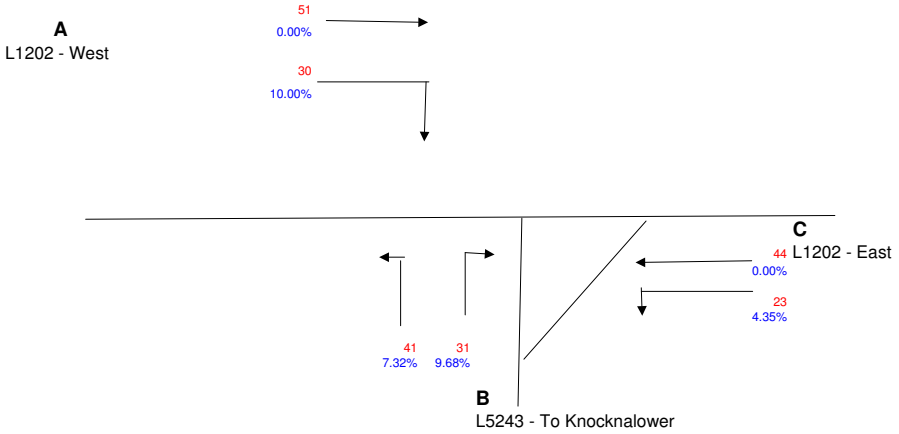


2007 - Site 6 - 19/09/07
PM Movements (18:00-19:00)

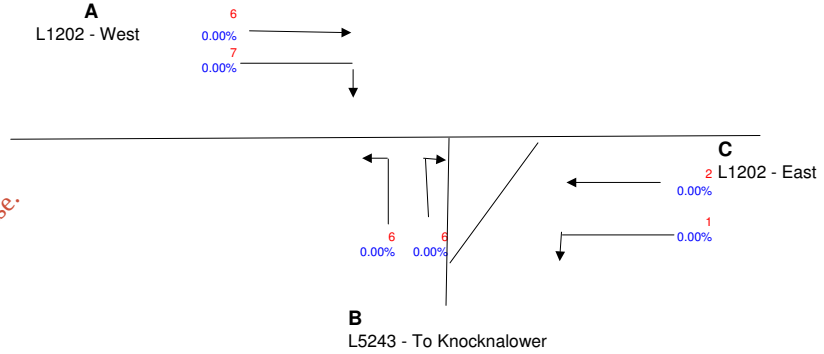
TOTAL VEHICLES
% HGVs



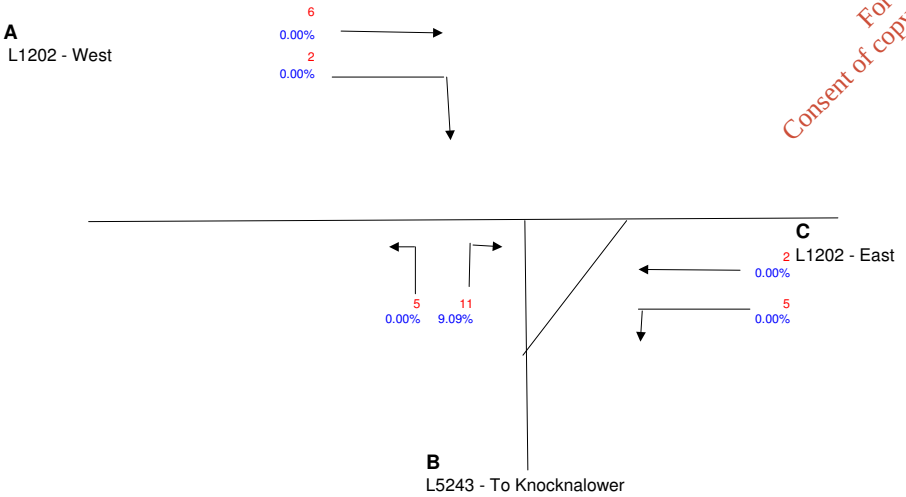
2007 - Site 7- 19/09/07
12 Hour Movements (07:00-19:00)
TOTAL VEHICLES
% HGVs



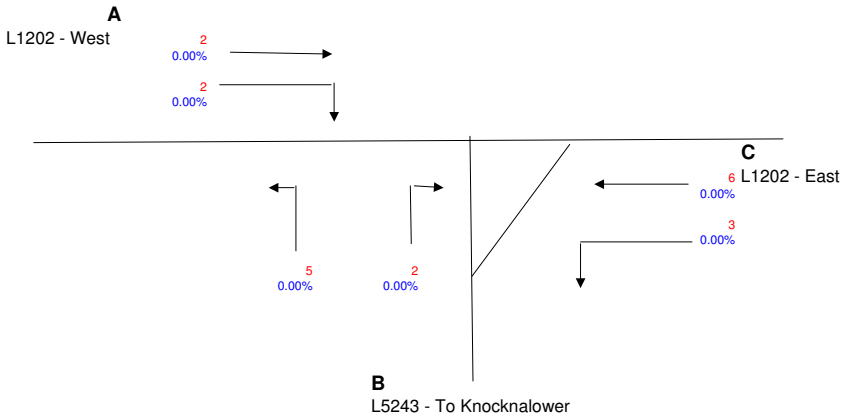
2007 - Site 7- 19/09/07
Mid Movements (14:00-15:00)
TOTAL VEHICLES
% HGVs



2007 - Site 7- 19/09/07
AM Movements (9:00-10:00)
TOTAL VEHICLES
% HGVs

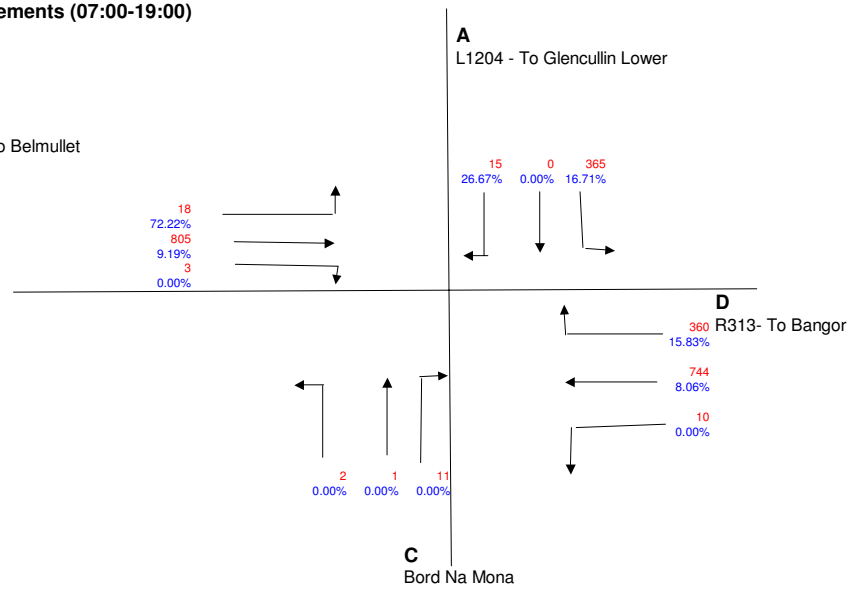


2007 - Site 7- 19/09/07
PM Movements (18:00-19:00)
TOTAL VEHICLES
% HGVs



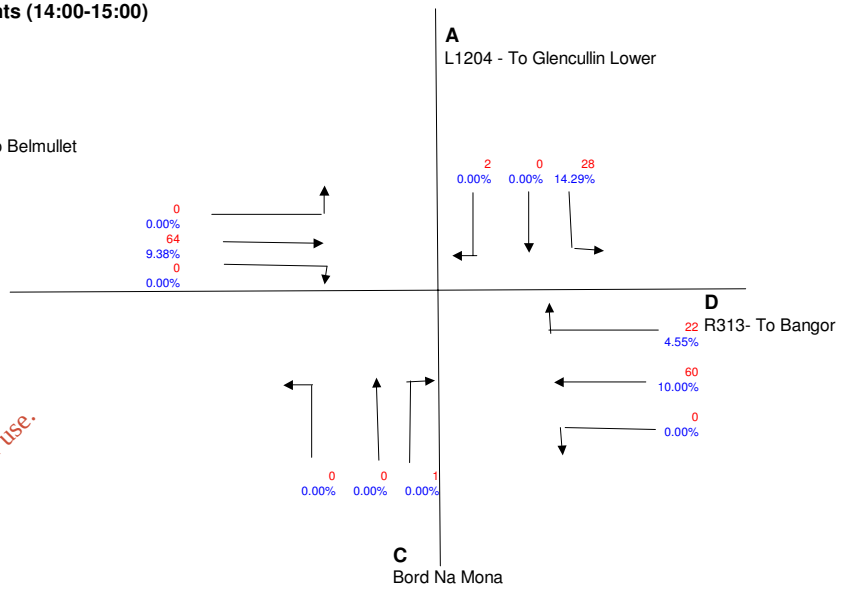
2007 - Site 8 - 19/09/07
12 Hour Movements (07:00-19:00)

TOTAL VEHICLES
% HGVs



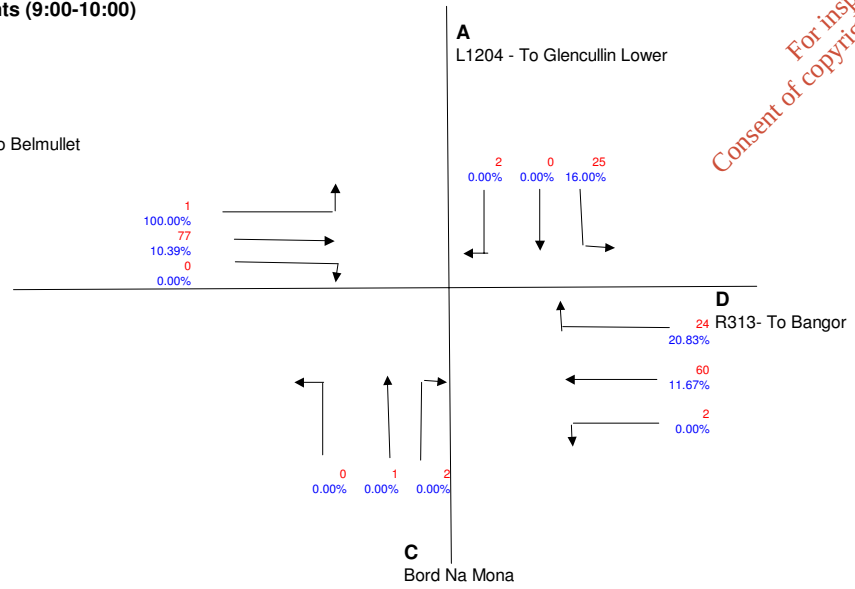
2007 - Site 8 - 19/09/07
Mid Movements (14:00-15:00)

TOTAL VEHICLES
% HGVs



2007 - Site 8 - 19/09/07
AM Movements (9:00-10:00)

TOTAL VEHICLES
% HGVs



2007 - Site 8 - 19/09/07
PM Movements (18:00-19:00)

TOTAL VEHICLES
% HGVs