M2.1 Maidenhill, Newton Mearns

Strategic Transport Assessment Sensitivity Test Addendum

April 2015

Prepared for:

Maidenhill, Newton Mearns

Prepared by:

Transport Planning Ltd
Forsyth House
93 George Street
Edinburgh
EH2 3ES

www.tranplanworld.co.uk

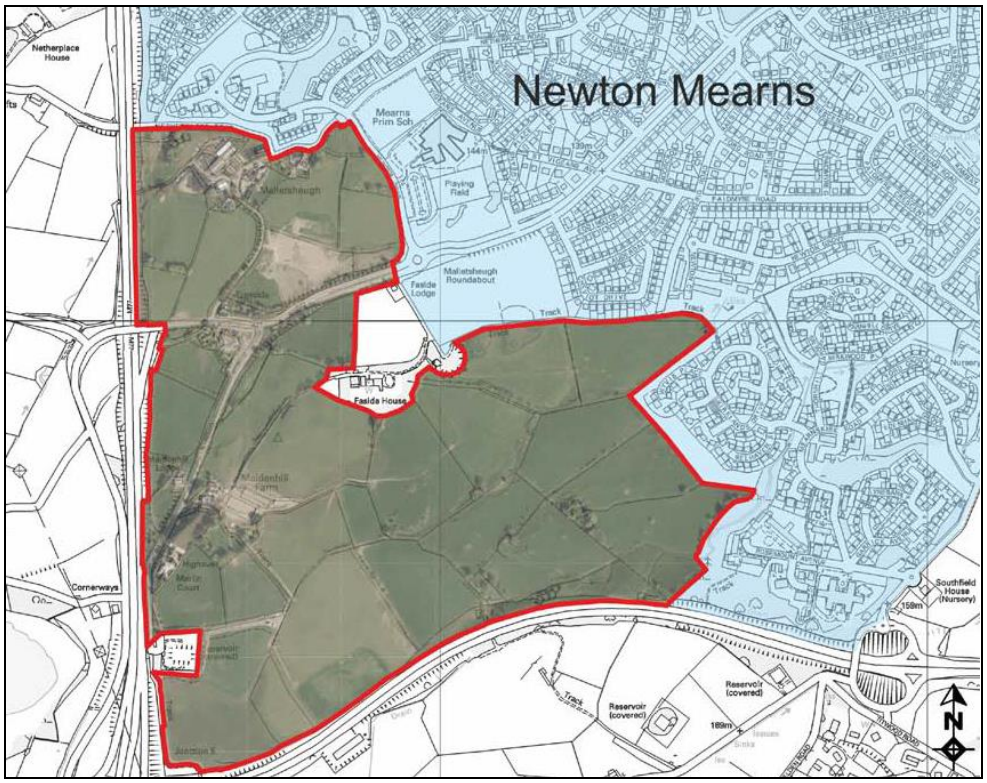
Content Page

1. INTRODUCTION

Background

1.1 Transport Planning Ltd was appointed to prepare a Strategic Transport Assessment to examine travel and transport matters at the Maidenhill site area (denoted M2.1 in the East Renfrewshire Council (ERC) Local Development Plan (LDP)).

1.2 The M2.1 area is illustrated in Map 1 of the Development Framework document prepared for the site as reproduced below.



Extract from Development Framework – Map 1

1.3 During February 2014 the full Transport Assessment was produced and this was subsequently updated during May 2014, the only change being the inclusion in the May 2014 report of two additional sketches.

1.4 More recently, East Renfrewshire Council has sought a traffic sensitivity test aimed at looking more closely at the vehicular trip rates used to assess traffic in the February and May 2014 reports. More specifically, the request relates to a sensitivity test using trip rates generated from an interpretation of 2011 census data. This data was still unavailable when the original reporting was being carried out.

1.5 This Transport Assessment addendum therefore discusses the vehicular trip rates and retests several local road junctions for future capacity.

1.6 It is noted that during March 2014 an appraisal of last years original Transport Assessment was carried out by JMP Consultants Ltd on behalf of Transport Scotland. Their conclusion in relation to trip rate values was *"Both the overall approach and*

resulting mode share and people trips seem reasonable, and when the car vehicle numbers are compared with those based on the observed survey data, the latter seem robust enough. The vehicle trip rates are lower that would normally be accepted for edge of town sites. Given that they are based on observed flows, however, and taking into consideration the diluted effects of distribution with distance from the site, we would not seek to ask for these rates to be revised in this instance"

1.7 Given the trunk road authority are content with the trip rate information provided previously, no further assessment in relation to trunk road impacts is carried out in this report.

1.8 Furthermore, in the intervening period the trunk road authority has also responded on consultation requests in relation to at least two live applications within the M2.1 area – those at:

- Malletsheugh for Mactaggart and Mickel; and
- Adjacent to the Indian Platform restaurant for Mansell Homes.

In both cases the trunk road authority has raised no objection indicating further their acceptance of the original reporting.

Report content

1.9 This report therefore discusses the vehicular trip rates used in the original reporting. It then goes on to comment on the results of specific junction capacity analyses originally carried out and that more recently carried out using a 'sensitivity' trip rate.

2. BACKGROUND TRAFFIC INFORMATION FROM ORIGINAL REPORTS

Scope of study area and existing traffic conditions

2.1 Residential developments typically generate the largest amount of traffic during the weekday AM and PM peak periods. Following consultation with East Renfrewshire Council (ERC) roads, agreement was previously reached that the weekday AM and PM peaks should be considered.

2.2 Initial discussion with ERC indicated the scope of the study should include consideration of the following local road junctions:

- A77/ link from terminal roundabout priority;
- A77/ Malletsheugh Road (towards the B769 Dodside Road) priority (west of the M77 overbridge);
- A77/ Malletsheugh Road (towards Netherplace Road) priority (east of the M77 overbridge);
- A77 Ayr Road/ Hunter Drive roundabout;
- Hunter Drive/ Mallots View priority (for calculating residential trip rates);
- A77 Ayr Road/ St Vigeans Avenue/ Paidmyre Road crossroads;
- Ayr Road/ Barrhead Road/ Gilmourton Crescent traffic signals (Mearns Cross);
- A77 Ayr Road/ Eaglesham Road traffic signals (Mearns Cross);
- Barrhead Road/ Westacres Road (west) priority;
- Barrhead Road/ Westacres Road (east) priority;
- B769 Aurs Road/ B769 Stewarton Road/ Barrhead Road roundabout;
- Eaglesham Road/ Paidmyre Crescent (east) priority;
- Mearns Road/ Eaglesham Road priority;
- B769 Stewarton Road/ Capelrig Road/ Patterton Park & Ride car park roundabout; and
- B769 Stewarton Road/ Crookfur Road/ Link Road to M77 roundabout.

2.3 Classified junction surveys at all junction locations noted in paragraph 2.2 were carried out.

2.4 The weekday AM and weekday PM peak periods were extracted from these junction surveys. The weekday AM network peak hour period for the Ayr Road corridor was found to occur between 0800 and 0900 with the weekday PM peak hour found to occur between 1715 and 1815.

2.5 The turning movements at the junctions within the study area during these two peak hours are shown again in Diagrams 1a&b respectively (Appendix A). The 2013 traffic count data was fully classified by vehicle type, with HGVs and PCVs shown in Diagrams 2a&b (Appendix A). This allowed the count data to be converted into standard Passenger Car Units (PCU's) for the purposes of assessment as shown in Diagrams 3a&b (Appendix A).

Years of assessment and traffic growth

2.6 The Government publication 'Transport Assessment Guidance' notes at para 2.9 the following:-

- The assessment years will be year of opening or completion for developments with short construction periods (say up to 2 years), and year of opening (or first full year) plus year of completion for developments which are phased over 3 or more years.

- No future year transport growth will be applied beyond year of opening or first year of assessment. The assumption is that any growth prior to opening year should apply since nothing is being done as a consequence of the development to influence this, but that beyond that time the emphasis should be on the applicant/developer addressing the impacts of their additional transport movements and ensuring that measures are in place to deal with those specific impacts.

2.7 The practical consequence of that advice is that traffic growth will be applied to surveyed background flow up until the year of opening of the development and then development traffic will be added to that to establish the traffic profile for junction testing for the complete development.

2.8 Assessment years were therefore '2015' (year of opening) and 'year of completion' (i.e. no specific calendar year but 2015 traffic plus development traffic).

Traffic growth

2.9 Traffic growth is linked to the economy and an element of this is directly attributable to the likelihood of future development within the surrounding area. Due to the nature of the adjacent area, the National Road Traffic Forecasts (NRTF) 'Low' growth factor, obtained from the Department of the Environment, Transport and the Regions, was considered appropriate and was used to predict future background traffic levels on the local road network for the future year of opening. The 'low' growth factor between the years of 2013 and 2015 corresponds to an overall growth factor of approximately 1.023% and this was applied to the 2013 flows to give 2015 predicted traffic flows. A breakdown of the NRTF estimate used is shown in Table 2.1 below.

Table 2.1 – NRTF 'Low' Growth Estimates

Growth Period	Percentage Increase
2013 – 2015 (2 Years Growth)	1.023%

Committed developments

2.10 ERC confirmed during previous discussions that there were no committed developments that should be considered within the Transport Assessment.

Other scoping matters

2.11 A meeting to discuss scoping of this report was held with ERC and Transport Scotland on 5th November 2013. Several other meetings to discuss the content of the report were also been held with ERC (and SPfT).

2.12 A key outcome from these meetings was agreement over the use of an actual residential area survey to assess likely trip rates for the new area.

Summary

2.13 The extent of the study area was previously agreed with ERC.

2.14 The 2013 base traffic flows were projected to 2015 design year flows using NRTF factors.

2.15 The 2015 weekday AM and PM projected traffic flows are shown in Diagrams 4a&b (Appendix A).

3. GENERATION AND DISTRIBUTION OF THE PROPOSED DEVELOPMENT

Introduction

3.1 Discussion on the volume and distribution of the traffic likely to be generated by the proposed residential development, and likely to impact on the study network, is presented in this Chapter, which largely reflects the content of the equivalent Chapter in the original reporting. However, this text has now been updated to take account of the sensitivity trip rate.

3.2 Two approaches were originally used to estimate vehicular trips from the proposed residential development. Firstly, the people trip approach was used which provided an estimation of the level of trip generation to and from the development by a range of travel modes, while secondly a traffic survey of the residential area served by Mallots View was carried out.

Residential area traffic survey

3.3 In addition to the people trip approach carried out originally, the traffic survey of Mallots View allowed vehicular trip rates to be established for the 156 privately owned residential properties accessed via Mallots View, as shown in Table 3.1 below.

Table 3.1 – Vehicular Trip Rates Based on Traffic Surveys

Travel Mode	Weekday AM Peak (0800-0900)			Weekday PM Peak (1700-1800)		
	Arrive	Depart	Total	Arrive	Depart	Total
Car Driver (Mallots View)	0.122	0.365	0.487	0.423	0.173	0.596

3.4 It is understood that ERC subsequently carried out their own independent check of this survey with very similar results, however, ERC considered it would be inappropriate to rely on this data across the Maidenhill M2.1 release hence the request to consider census data and ward profiles as part of a sensitivity test.

Comparison of people trip, residential area and sensitivity trip rate approaches

3.5 More recently, ERC have requested a sensitivity test using trip rates generated from an interpretation of 2011 census data. This data was still unavailable when the original reporting was being carried out.

3.6 It can be seen in Table 3.2 below that when the sensitivity trip rates are included, they are higher than the other comparators used originally. However, it should also be noted that the sensitivity rates are based on data sets that exclude those people that are not economically active (e.g. retired) and most likely do not travel at peak times plus it is also noted that the more recent census data sets record those that are working from home (14%) – a trend which is increasing and would further serve to dilute peak time travel.

Table 3.2 – Vehicular Trip rate comparison						
Travel Mode	Weekday AM Peak (0800-0900)			Weekday PM Peak (1700-1800)		
	Arrive	Depart	Total	Arrive	Depart	Total
People trips – all private housing	0.098	0.440	0.538	0.283	0.165	0.448
Surveyed Veh Trip Rate	0.122	0.365	0.487	0.423	0.173	0.596
People Trips – mixed tenure	0.073	0.342	0.415	0.248	0.109	0.357
Sensitivity trip rates	0.175	0.422	0.597	0.412	0.203	0.615

Estimation of generated vehicular trips

3.7 The predicted vehicular trips at the proposed residential development during the weekday AM and PM peak hours, using the surveyed vehicle trip rates (i.e. those used in the original reporting) and the sensitivity trip rates from Table 3.2, are shown in Table 3.3 below.

Table 3.3 – Proposed Vehicle Trips						
Travel Mode	Weekday AM Peak (0800-0900)			Weekday PM Peak (1700-1800)		
	Arrive	Depart	Total	Arrive	Depart	Total
Car – surveyed rates	134	402	536	465	190	655
Car – sensitivity rates	192	464	656	453	223	676

3.8 Table 3.3 shows that 130 additional trips would be projected during the AM period using the sensitivity trip rate.

3.9 However, during the PM period the difference amounts to only 21 trips and when spread across the network, the impact at individual junctions is in line with rounding errors and well within the limits of daily traffic variation.

Design year projected traffic flows

3.10 The (sensitivity) generated traffic flows for the proposed residential development during the weekday AM and weekday PM peak hours are shown in Diagrams 5S.1a&b to 5S.4sa&b (Appendix A) for each land parcel, with Diagrams 6Sa&b (Appendix A) showing the total generated traffic flows for up to 1,100 dwellings in the design test year.

3.11 The (sensitivity) trips associated with the proposed residential development have also been added to the 2015 projected traffic flows to create design year total traffic flows for the weekday AM and PM peak periods. The total design year traffic flows are shown in Diagrams 7Sa&b (Appendix A).

Other uses on the site

3.12 The reporting focuses on the bulk (residential) element of the proposals although it is recognised there are other masterplan components to the M2.1 site. These are described below;-

- School – a primary school is planned for the main area of the site to the

south of Ayr Road. In relation to school trips then the school is intended to be non-denominational with the catchment likely to be the site itself. Trips to and from that will not therefore externalise on the wider network. Additionally, the original reporting was based on surveys of actual housing in the area so any school trips generated by that housing would have been included in the original surveys and applied trip rates. Furthermore, ERCs recent request to utilise census data relies upon the dataset "All people aged 4 and over who are studying or aged 16 to 74 in employment the week before the census", so education (and employment) trip patterns are within the census table selected. The school is therefore accounted for as part of the calculations made.

- A religious facility is also earmarked for the site and its location is again likely to be south of Ayr Road. The final use of this is unknown and the facility may result in non peak time trip patterns. However, given the uncertainty of the proposals it would be sensible to exclude this use for the time being and seek a separate Transport Assessment for it when scaled proposals are brought forwards if these proposals exceed the TA thresholds at that time.

- Finally there is a small commercial area indicated for the ground around the area of the current Indian Platform restaurant. That is also unspecified, but it is said in the development framework that a "small scale local neighbourhood convenience shop" would be an appropriate use. Such a facility (i.e. of purely local significance) would not only capitalise on passing trips but would also offer a travel benefit as it would prevent residents of the area travelling further afield to shop for convenience items. Given such shopping patterns are already included in the trip rates gathered (and given some use is already present on the site) we do not consider this merits separate inclusion.

Summary

3.13 The sensitivity test trip rates have been presented in this Chapter.

3.14 The total future year (sensitivity) traffic flows, including the proposed development, have been predicted to allow detailed analysis to be undertaken where appropriate.

4. SENSITIVITY TRAFFIC IMPACT OF THE PROPOSED DEVELOPMENT

Introduction

4.1 This Chapter presents the sensitivity capacity assessment of the junctions to be tested on the surrounding road network.

Junction analysis

4.2 The performance of the junctions has been measured using three standard outputs for PICADY - Ratio of Flow to Capacity (RFC), Maximum Queuing (Q) and Inclusive Queuing Delay (IQD), while for LINSIG the standard outputs are Degree of Saturation (DoS), Mean Maximum Queue (MMQ), Total Delay (Delay) and Practical Reserve Capacity (PRC).

4.3 The output files for the PICADY 5.0 and LINSIG assessments are included in electronic format within Appendix B.

4.4 The scenarios that have been tested are as follows:

1. 2013 weekday AM Peak surveyed
2. 2015 weekday AM Peak projected
3. Design year weekday AM Peak projected + proposed residential development

3S. Design year weekday AM Peak projected + proposed residential development - sensitivity

4. 2013 weekday PM Peak surveyed
5. 2015 weekday PM Peak projected
6. Design year weekday PM Peak projected + proposed residential development

6S. Design year weekday PM Peak projected + proposed residential development - sensitivity

Traffic capacity calculations

4.5 The testing in the original reporting showed that only Mearns Cross was expected to come close to capacity post development.

4.6 Of the other junctions tested, the A77 Ayr Road / Old Ayr Road priority junction (in its current layout) exhibited a maximum ratio of flow to capacity of 0.769 whilst the Mearns Road/ Eaglesham Road priority junction operated with a maximum ratio of flow to capacity of 0.768. As both these results occurred in the AM peak when the sensitivity flows are higher, these junctions, together with Mearns Cross, have been tested again.

4.7 The remaining junctions within the original study carried ample capacity ‘headroom’ to remain unaffected by any sensitivity testing.

A77 Ayr Road/ Old Ayr Road priority

4.8 The existing layout of the A77 Ayr Road/ Old Ayr Road priority has been analysed and Table 4.1 below summarises the PICADY results for scenarios 3, 3S, 6 and 6S.

Table 4.1 – Summary of PICADY Analysis Results (A77 Ayr Road/ Old Ayr Road priority)

Scenario	A77 Ayr Road (east)			Old Ayr Road			A77 Ayr Road (west)			Incl Queuing Delay
	RFC	Queue	Delay	RFC	Queue	Delay	RFC	Queue	Delay	
		(pcu)	(min/ pcu)		(pcu)	(min/ pcu)		(pcu)	(min/ pcu)	
3	-	-	-	0.769	3.09	0.36	0.148	0.32	0.16	0.11
3S	-	-	-	0.913	7.31	0.58	0.215	0.47	0.16	0.18
6	-	-	-	0.379	0.60	0.19	0.516	1.57	0.20	0.08
6S	-	-	-	0.444	0.79	0.21	0.502	1.50	0.20	0.09

4.9 The assessment indicates that the junction is predicted to exceed its notional capacity of 0.85 during the AM morning sensitivity test on the side (Old Ayr Road) arm.

4.10 However, there are two further factors to consider in relation to this junction:-

- The testing carried out assumes all of the main M2.1 (i.e. CALA / Taylor Wimpey and Mansell) site traffic will use this junction and none will use the left in / out arrangement on the GSO. Clearly, this is a very onerous and unlikely scenario and even minor redistribution of traffic to the GSO would cause betterment to the capacity at this junction.

- ERC have previously suggested that a reversal of priority be considered at this location with the 'main road' becoming Ayr Road / Old Ayr Road into the CALA / Taylor Wimpey/ Mansell site area with the existing Ayr Road outside the Indian Platform restaurant becoming the minor arm.

4.11 Further testing of this junction will be reported within the main CALA / Taylor Wimpey Transport Assessment which has yet to be submitted. This report will also test the capacity of the change in priority.

4.12 It should also be noted that in the original reporting, the proposed left in / left out (LILO) access onto the Glasgow Southern Orbital route was not allocated any traffic for the purposes of loading local road junctions to a greater degree (use of the LILO would dilute traffic effects on the local road junctions within Newton Mearns).

4.13 The LILO proposals are currently being taken forwards and the CALA / Taylor Wimpey Transport Assessment will contain further information on the operation of the LILO.

Mearns Road/ Eaglesham Road priority junction

4.14 This priority junction has also been tested and table 4.2 below summarises the PICADY results for scenarios 1 to 6S.

Table 4.2 – Summary of PICADY Analysis Results (Mearns Road/ Eaglesham Road priority)

Scenario	Mearns Road (north)			Eaglesham Road			Mearns Road (south)			Incl Queuing Delay
	RFC	Queue (pcu)	Delay (min/ pcu)	RFC (pcu)	Queue (min/ pcu)	Delay	RFC	Queue (pcu)	Delay (min/ pcu)	
1	-	-	-	L 0.649 R 0.610	1.79 1.51	0.25 0.29	0.524	1.09	0.16	0.11
2	-	-	-	L 0.672 R 0.632	1.97 1.66	0.27 0.30	0.539	1.15	0.16	0.12
3	-	-	-	L 0.768 R 0.639	3.08 1.70	0.33 0.31	0.562	1.27	0.17	0.13
3S	-	-	-	L 0.783 R 0.645	3.33 1.75	0.34 0.32	0.573	1.32	0.17	0.14
4	-	-	-	L 0.553 R 0.526	1.21 1.09	0.21 0.23	0.340	0.51	0.12	0.10
5	-	-	-	L 0.570 R 0.543	1.30 1.16	0.21 0.23	0.349	0.53	0.12	0.10
6	-	-	-	L 0.614 R 0.560	1.55 1.24	0.23 0.25	0.427	0.74	0.13	0.11
6S	-	-	-	L 0.623 R 0.559	1.60 1.24	0.23 0.24	0.424	0.73	0.13	0.12

4.15 The assessment indicates that the junction operates satisfactorily during the weekday morning and evening peak periods with a maximum RFC of 0.783 and a 3 vehicle queue occurring on the Eaglesham Road left turn lane.

Mearns Cross

4.16 Mearns Cross has also been sensitivity tested. Tables 4.3 and 4.4 below summarise the LINSIG results for scenarios 1 to 6S.

Table 4.3 – Summary of LINSIG Analysis Results (Ayr Road/ Barrhead Road/ Gilmourton Crescent Traffic Signals)

Scenario	Ayr Road (east)			Gilmourton Crescent			Ayr Road (west)			Barrhead Road			
	DoS	MMQ	Total Delay	DoS	MMQ	Total Delay	DoS	MMQ	Total Delay	DoS	MMQ	Total Delay	PRC
	(%)	(pcu)	(pcu/hr)	(%)	(pcu)	(pcu/hr)	(%)	(pcu)	(pcu/hr)	(%)	(pcu)	(pcu/hr)	(%)
1	LS 24.1	0.5	0.3	26.5	1.2	0.7	75.2	12.8	6.7	49.9	8.9	3.8	19.6
	R 72.9	8.6	3.7										
2	LS 24.7	0.6	0.3	26.5	1.2	0.7	76.9	13.4	6.9	51.1	9.1	3.9	17.1
	R 74.5	9.3	3.9										
3	LS 27.1	0.8	0.4	24.9	1.1	0.6	88.1	20.0	10.1	55.4	9.9	4.6	2.1
	R 84.8	13.3	5.5										
3S	LS 28.2	0.8	0.4	25.7	1.1	0.6	88.8	20.8	10.4	59.0	10.2	4.8	1.4
	R 87.9	15.1	6.2										
4	LS 16.8	0.8	0.2	6.6	0.8	0.4	54.7	8.8	6.4	65.1	13.9	5.7	38.2
	R 51.3	12.6	3.8										
5	LS 17.1	0.8	0.2	6.6	0.8	0.4	55.9	9.0	6.5	66.7	14.4	5.9	35.0
	R 52.5	12.9	3.9										
6	LS 21.1	2.0	0.4	4.4	0.7	0.3	69.3	16.8	8.7	78.1	17.9	8.0	15.3
	R 69.2	16.3	5.7										
6S	LS 29.0	7.7	0.8	3.6	0.7	0.3	70.0	14.4	8.6	70.4	15.2	6.4	27.8
	R 70.3	14.3	5.8										

Table 4.4 – Summary of LINSIG Analysis Results (Ayr Road/ Eaglesham Road Traffic Signals)

Scenario	Ayr Road (east)			Eaglesham Road			Ayr Road (west)			PRC
	DoS	MMQ	Delay	DoS	MMQ	Delay	DoS	MMQ	Delay	
	(%)	(pcu)	(pcu/hr)	(%)	(pcu)	(pcu/hr)	(%)	(pcu)	(pcu/hr)	(%)
1	70.6	11.9	5.6	76.1	10.0	6.8	S 40.5 R 65.4	2.5 7.1	0.9 3.0	18.3
2	74.1	12.7	6.1	76.1	10.1	6.8	S 41.4 R 64.4	2.5 7.0	0.9 2.9	18.3
3	76.9	13.8	6.6	78.0	10.9	7.2	S 44.4 R 73.5	2.0 9.1	0.9 3.6	15.4
3S	80.2	14.6	7.1	78.0	10.9	7.1	S 46.2 R 72.2	2.5 8.6	1.0 3.5	12.3
4	62.4	17.9	7.2	57.7	13.1	6.0	S 21.4 R 43.5	3.6 13.6	0.4 3.5	44.3
5	63.8	18.5	7.5	63.4	13.8	6.5	S 21.8 R 44.5	3.6 13.9	0.4 3.6	41.1
6	65.3	19.6	7.7	63.4	14.8	6.7	S 25.0 R 51.3	2.6 16.8	0.5 4.1	37.8
6S	70.1	22.7	8.6	63.4	17.0	7.2	S 23.5 R 49.2	2.9 15.7	0.5 4.0	28.4

4.17 The assessment indicates that the junction operates satisfactorily during the weekday morning and evening peak periods with a maximum DoS of 88.8% and 21 vehicle queue occurring on the Ayr Road west approach.

4.18 However, the presence of the development traffic does bring this junction close to its 90% capacity threshold.

Microprocessor Optimised Vehicle Actuation (MOVA)

4.19 What is proposed for the signal set at Mearns Cross is an upgrade to new equipment incorporating the Transport Research Laboratory's (TRL's) MOVA system. In general text for MOVA emanating from TRL themselves, it is said that:-

- *"MOVA is a product developed to overcome some of the problems associated with traditional Vehicle Actuated (VA) control. It is more responsive to traffic conditions and can lead to a significant increase in capacity at a junction."*

- *"MOVA has two modes of operation depending on the road conditions – these are congested and free flowing (un-congested). In free flowing mode the aim of MOVA is to disperse any queues which have built up on red, it then assesses the traffic flows approaching on each arm of the junction and calculates if extending the green would be beneficial. If it is beneficial then the green is extended and the calculations repeated. This continues until there is no benefit in extending the green and the signals move to the next stage."*

- *"When the network is congested MOVA operates in capacity maximising mode. This assesses which approaches are overloaded and how efficient the green is being used and seeks to determine a set of signal timings which will maximise the throughput of the junction under the current conditions."*

4.20 Traffic Advisory Leaflet 3/97 notes that *"TRL/Department of Transport (DOT) trials have shown that MOVA reduces delays by an average of 13% compared to the earlier, vehicle actuated system."*

4.21 A more recent Traffic Advisory Note (1/09) on 'Compact MOVA' reports that *"The peaked-peak considers a level of demand that was high enough to assess very oversaturated conditions. (Statistically significant results are shown in bold)."*

4.22 The Note illustrates that in the peaked peak, benefits to vehicle delay of Compact MOVA over VA reached over 15% and the same table notes standard MOVA benefits of over 17%.

4.23 Traffic Advisory Note 1/09 also states *"MOVA is extremely effective at all types of isolated signal control junctions. It can also be applied effectively as 'linked' MOVA in small networks, especially signalised roundabouts. Not only is MOVA effective at minimising delay or maximising capacity (whichever is appropriate at the time)…."*

4.24 In any event, there is a clear benefit in traffic management to be had from the installation of the MOVA system.

4.25 Additionally, MOVA remains a standard requirement for new installations on the trunk road as illustrated in Design Manual for Roads and Bridges TD35.

4.26 The information available illustrates that installation / upgrading of the Mearns Cross signal set to incorporate MOVA would therefore offer capacity / delay benefits at least of the magnitude required to offset the proposed application.

4.27 As an example of the benefits able to be obtained through MOVA, a 13% reduction in the maximum tested degree of saturation of 88.8% would result in a new maximum DoS of 77.3%.

5. REPORT SUMMARY AND CONCLUSIONS

5.1 This Transport Assessment addendum has reported on traffic sensitivity testing using increased vehicular trip rates to examine traffic from the Maidenhill (M2.1) site in East Renfrewshire.

5.2 The existing road network in the area has previously been extensively surveyed.

5.3 Many of the surrounding roads are lightly trafficked and capacity testing from the original February 2014 Transport Assessment illustrated that, for the most part, the existing traffic network can cater for the development flows.

5.4 Under the sensitivity test conditions the trunk road impact rises to 5.8%. However the trunk road authority has previously commented on the original reporting and has, meantime, responded offering no objections on at least two live applications. It is further noted that the presence of other development such as that currently under construction at Darnley plus development in Ayrshire will raise background traffic levels on the trunk road network, causing the percentage impact of traffic arising from Maidenhill to fall.

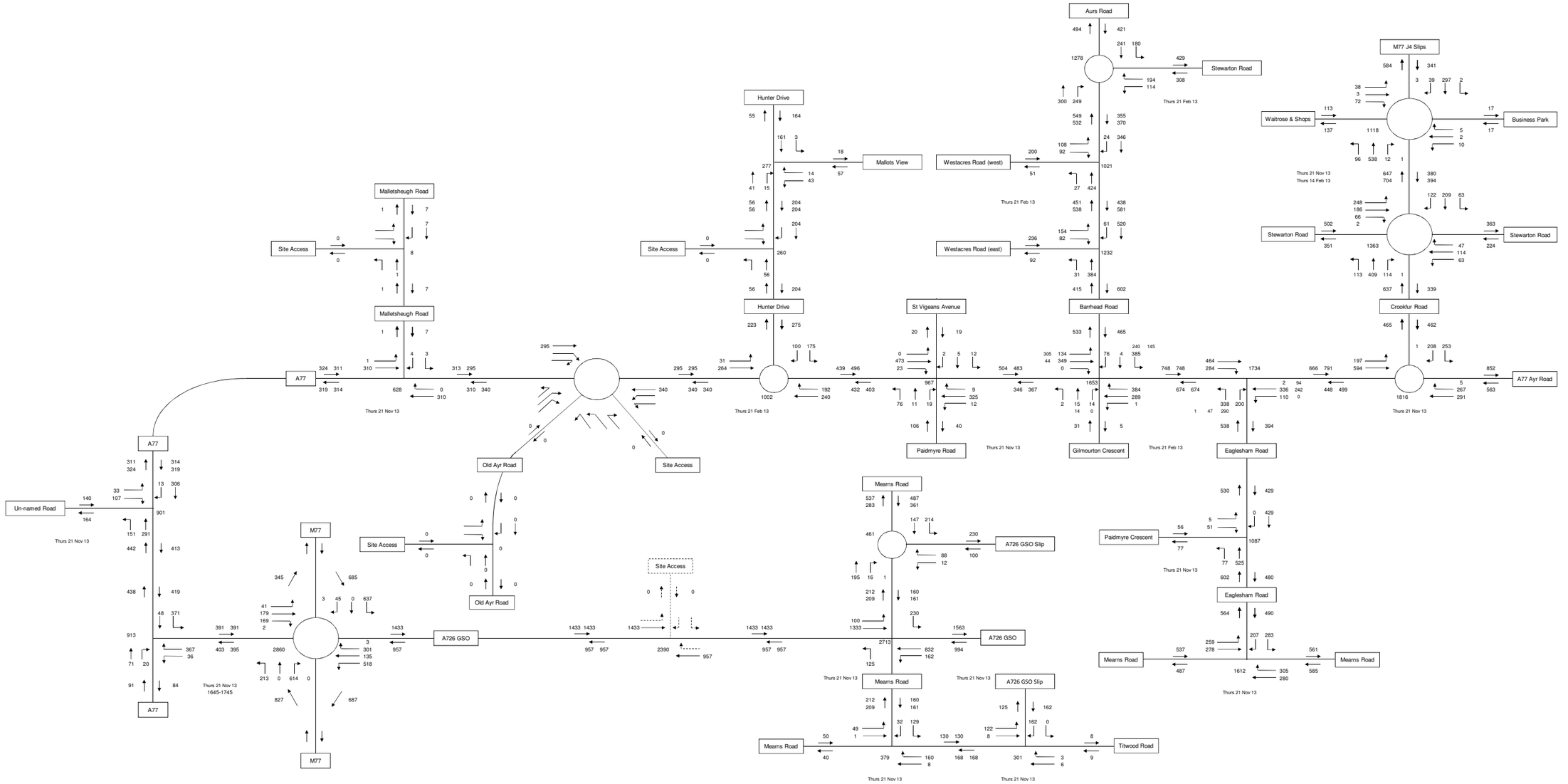
5.5 This report has therefore examined those three local road locations in the study area where available traffic capacity was lowest.

5.6 The sensitivity testing illustrates that two of the three junctions tested are projected to remain within capacity with the third (old Ayr Road / Ayr Road) to be the subject of further consideration within the forthcoming Taylor Wimpey / CALA area transport Assessment.

5.7 Taken together, there remain no traffic or transport related matters that suggest the Maidenhill M2.1 site cannot be developed for the intended use.

APPENDIX A

Traffic Flow Diagrams



TRANSPORT PLANNING

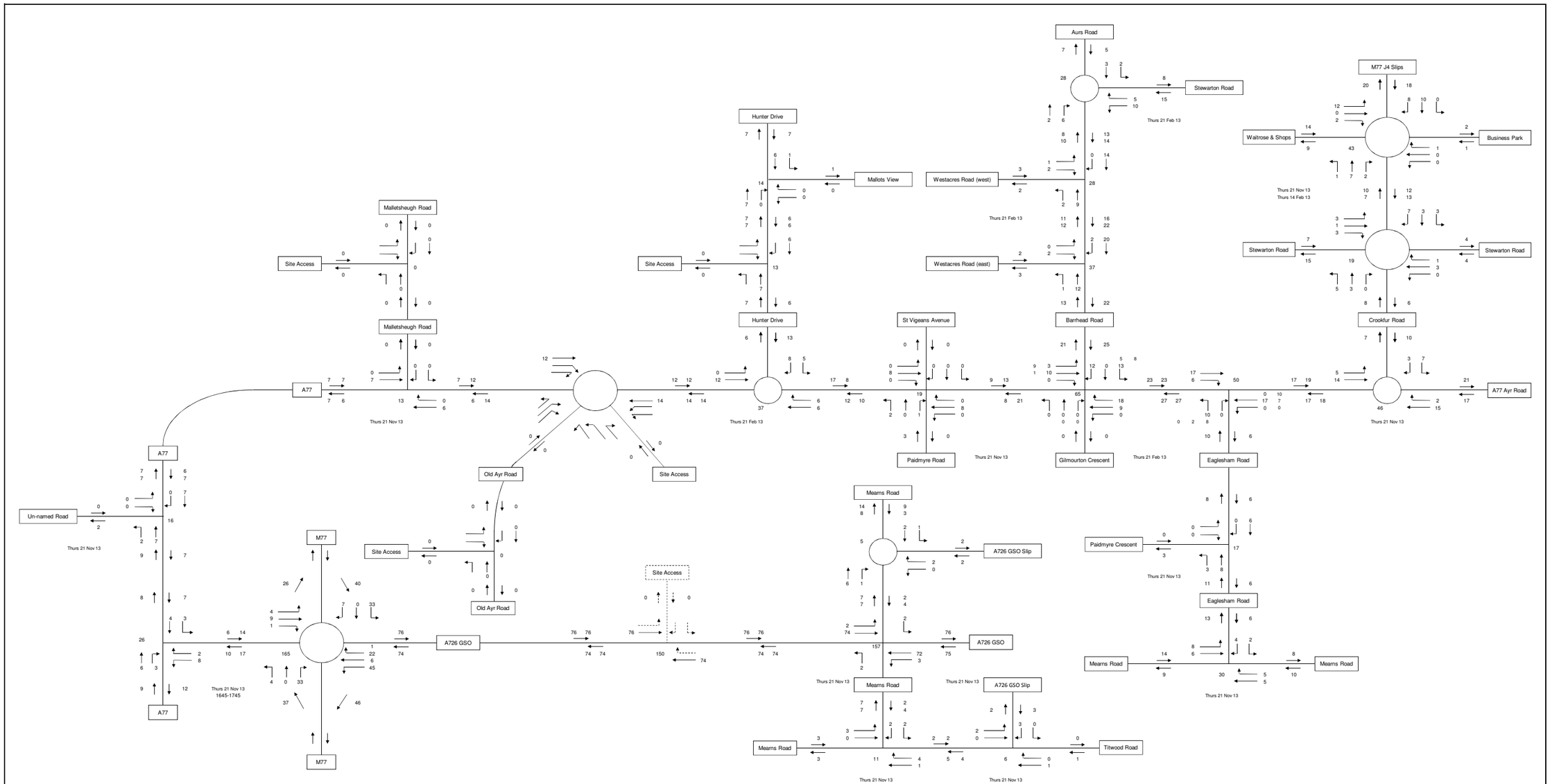
TITLE

Maidenhill, Newton Mearns
Proposed Residential Development

2013 Surveyed Traffic Flows (Vehs)
Weekday AM (0800-0900) Peak Hour

Diagram

1a



TRANSPORT PLANNING

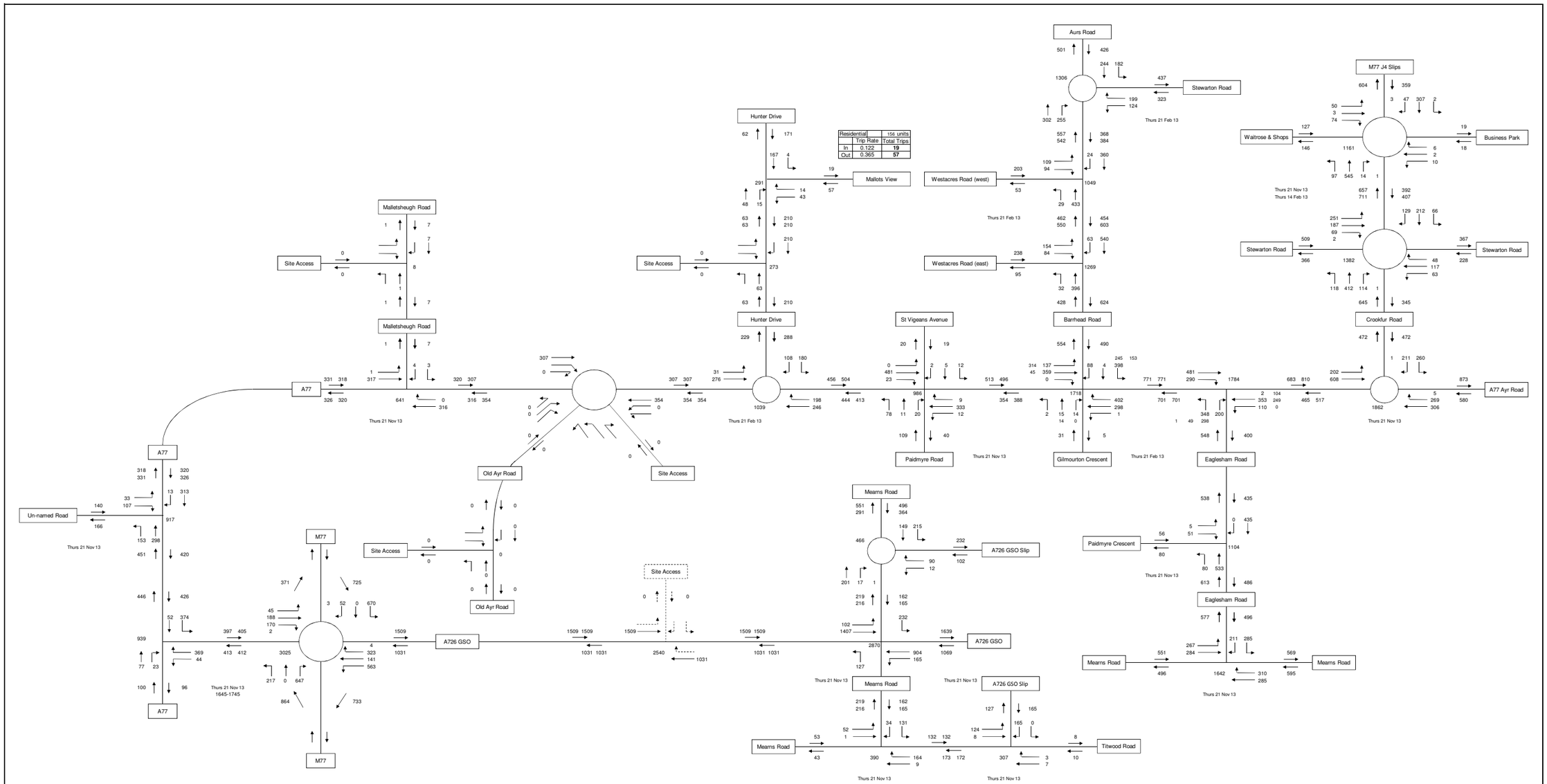
TITLE

Maidenhill, Newton Mearns
Proposed Residential Development

2013 Surveyed Traffic Flows (HGVs)
Weekday AM (0800-0900) Peak Hour

Diagram

2a



TRANSPORT PLANNING

TITLE

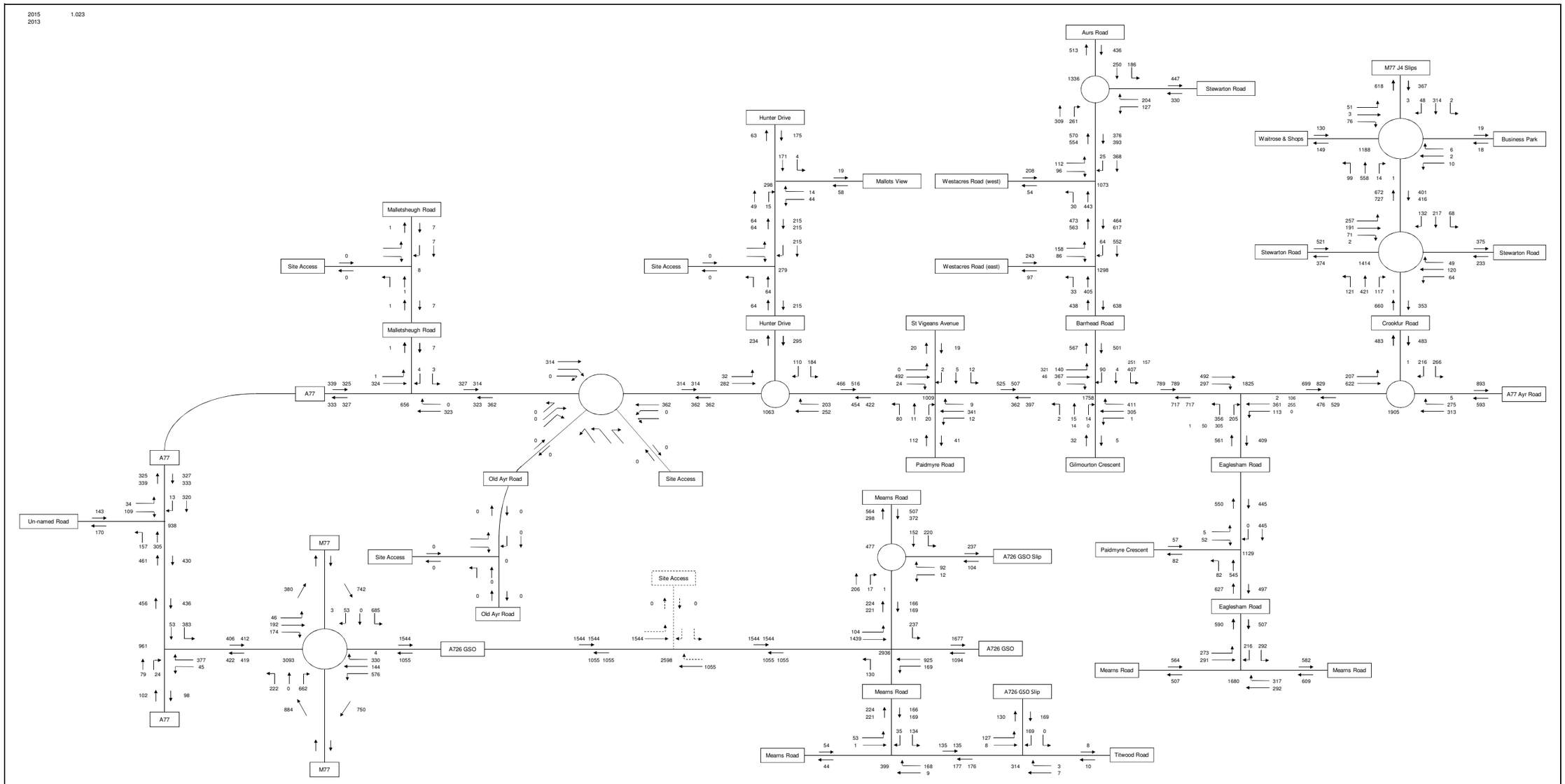
Maidenhill, Newton Mearns
Proposed Residential Development

2013 Surveyed Traffic Flows (PCUs)
Weekday AM (0800-0900) Peak Hour

Diagram

3a

2015 1.023
2013



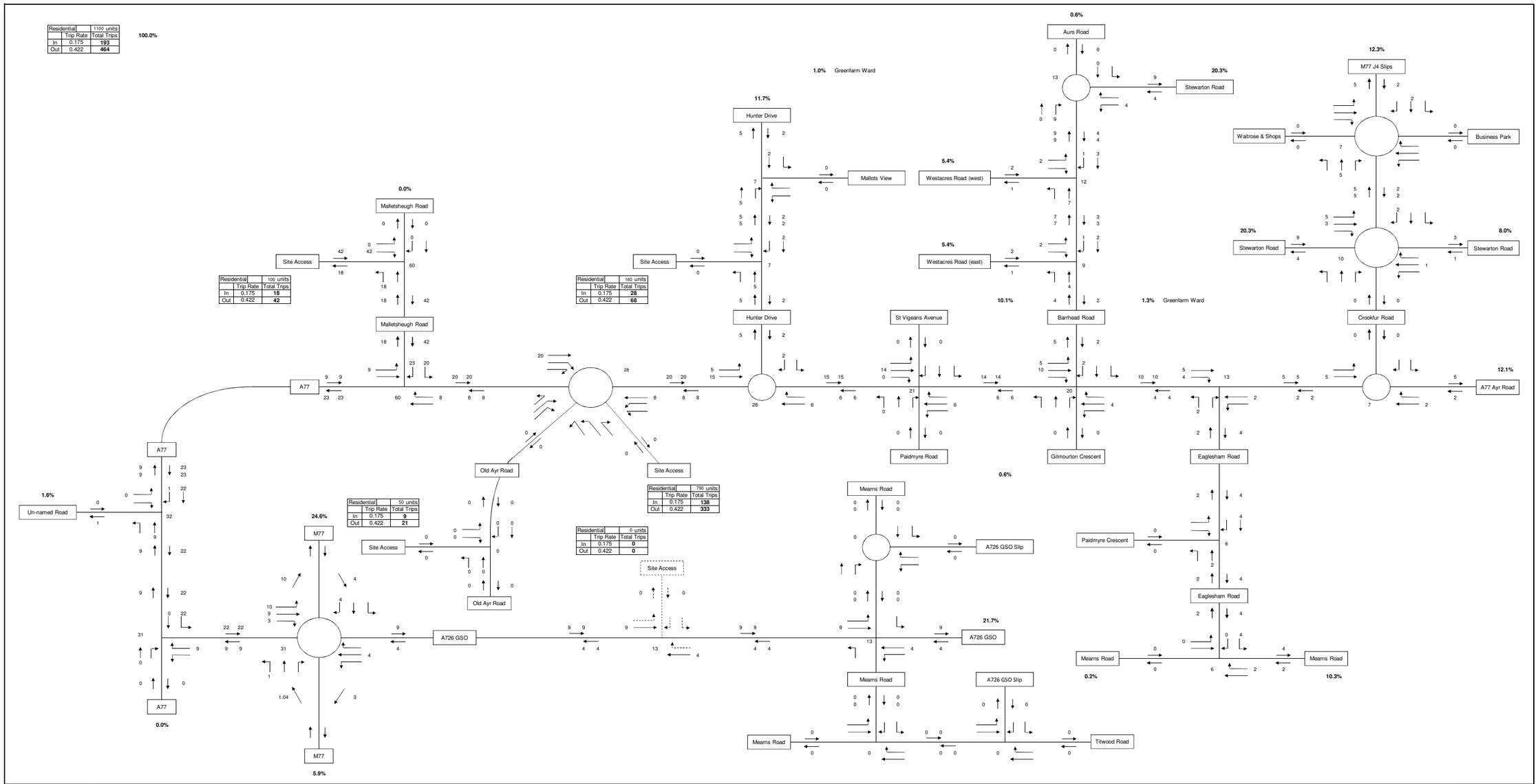
TRANSPORT PLANNING

TITLE

Maidenhill, Newton Mearns
Proposed Residential Development

2015 Projected Traffic Flows (PCUs)
Weekday AM (0800-0900) Peak Hour

Diagram
4a



TRANSPORT PLANNING

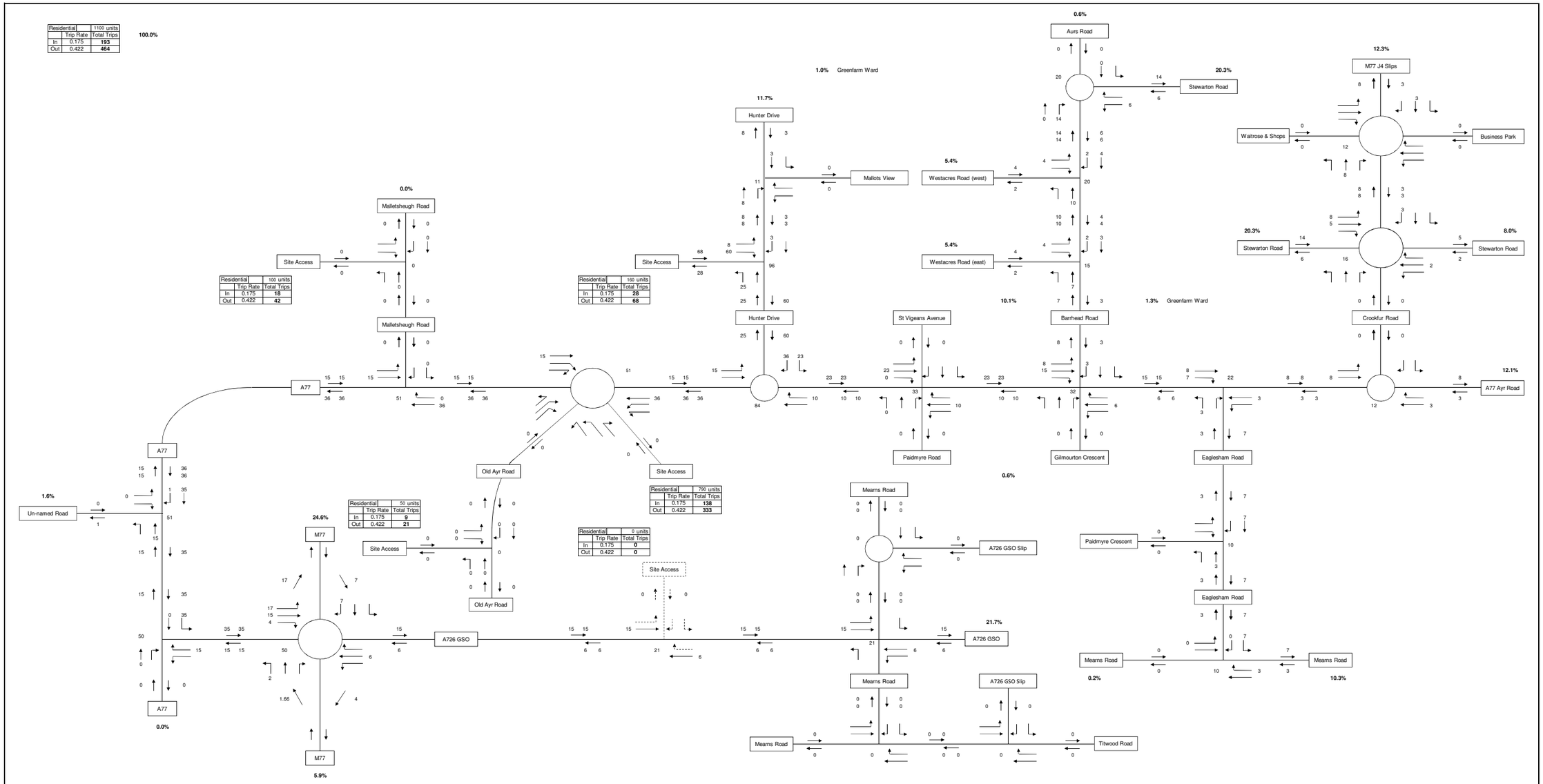
TITLE

Maidenhill, Newton Mearns
Proposed Residential Development

Site Accessed from Malletsheugh Road Traffic Flows - Sensitivity Trip Rates (Vehs)
Weekday AM (0800-0900) Peak Hour

Diagram

5S.1a



TRANSPORT PLANNING

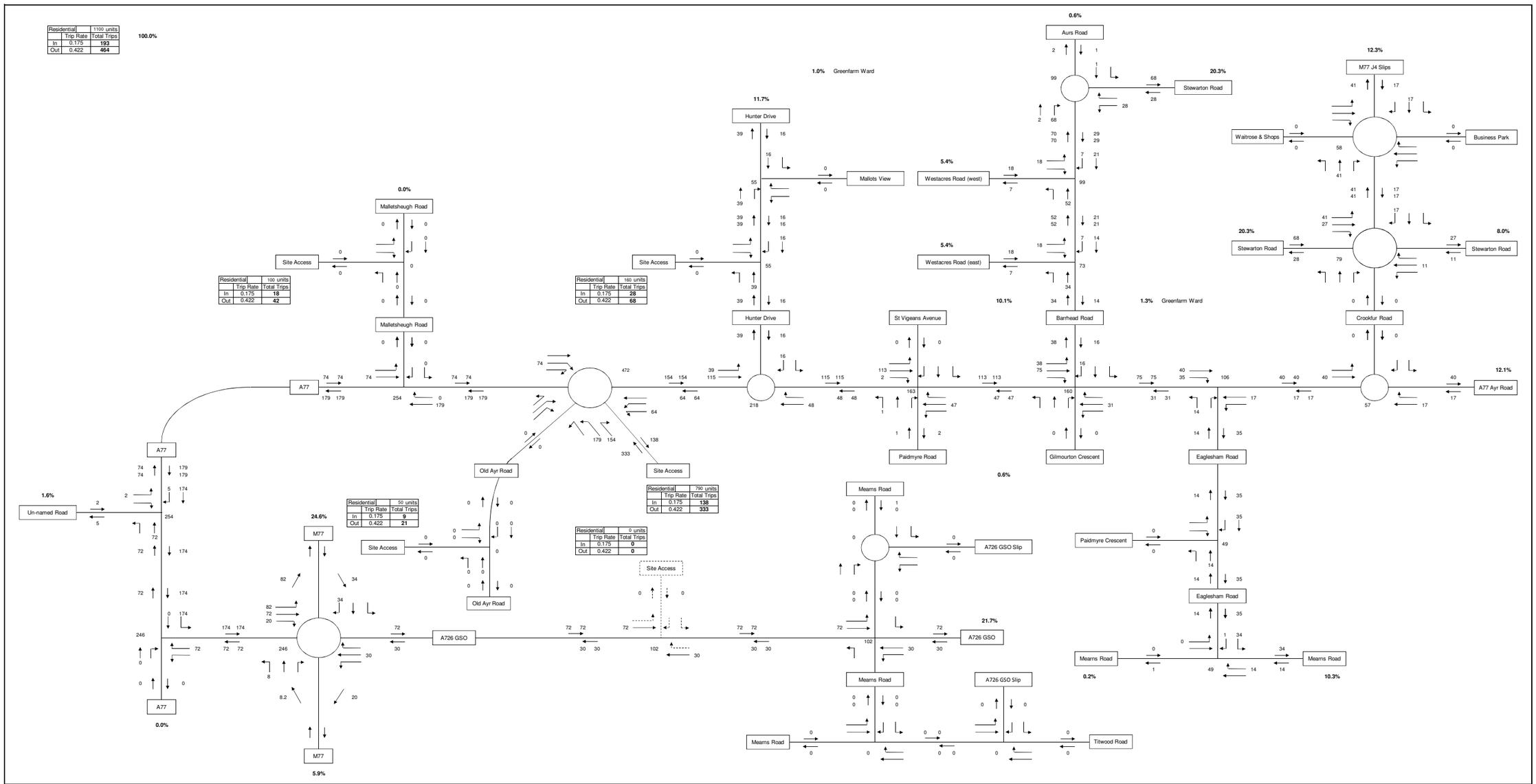
TITLE

Maidenhill, Newton Mearns
Proposed Residential Development

Site Accessed from Hunter Drive Traffic Flows - Sensitivity Trip Rates (Vehs)
Weekday AM (0800-0900) Peak Hour

Diagram

5S.2a



TRANSPORT PLANNING

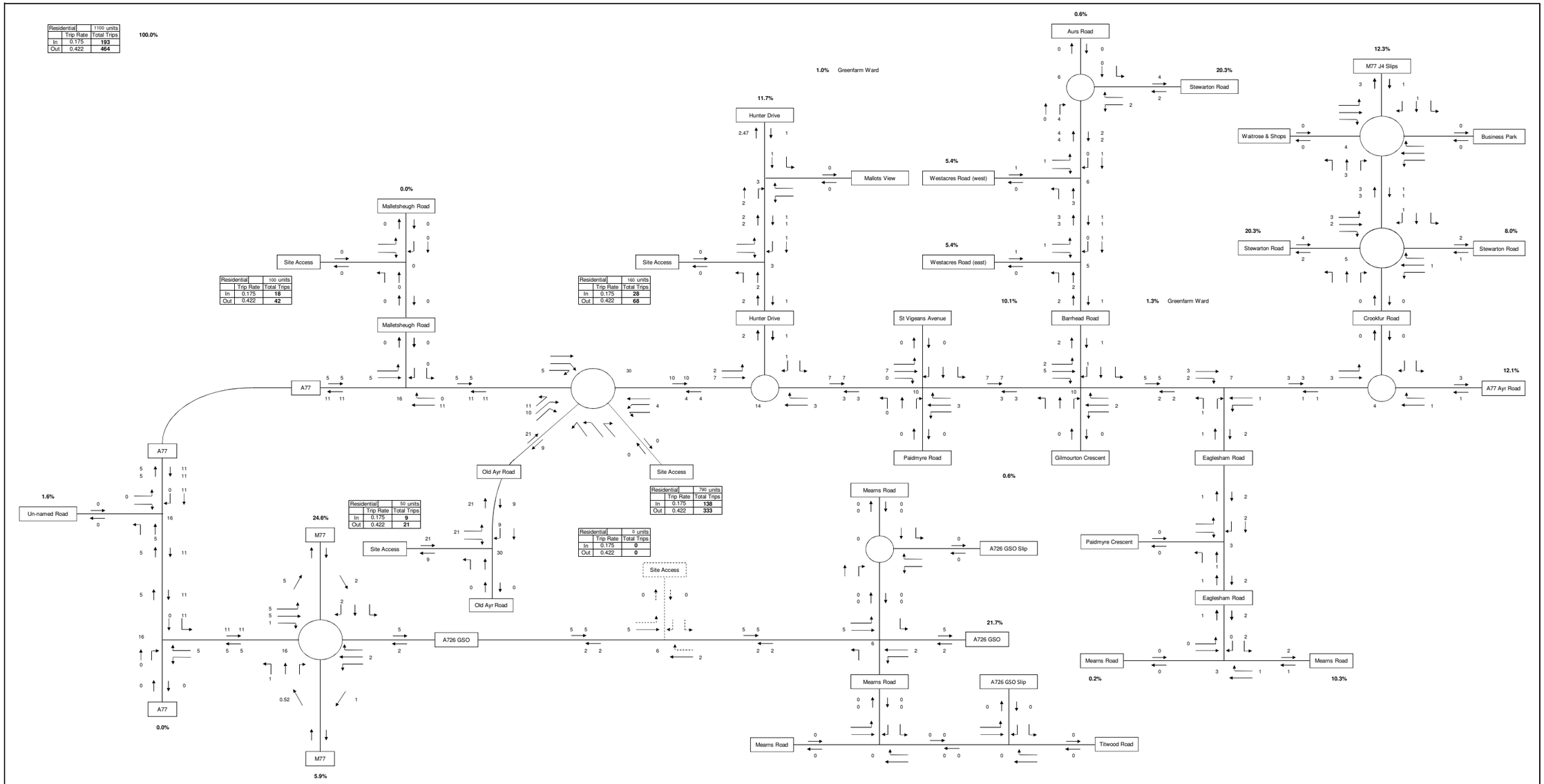
TITLE

Maidenhill, Newton Mearns
Proposed Residential Development

Site Accessed from A77 Traffic Flows - Sensitivity Trip Rates (Vehs)
Weekday AM (0800-0900) Peak Hour

Diagram

5S.3a



TRANSPORT PLANNING

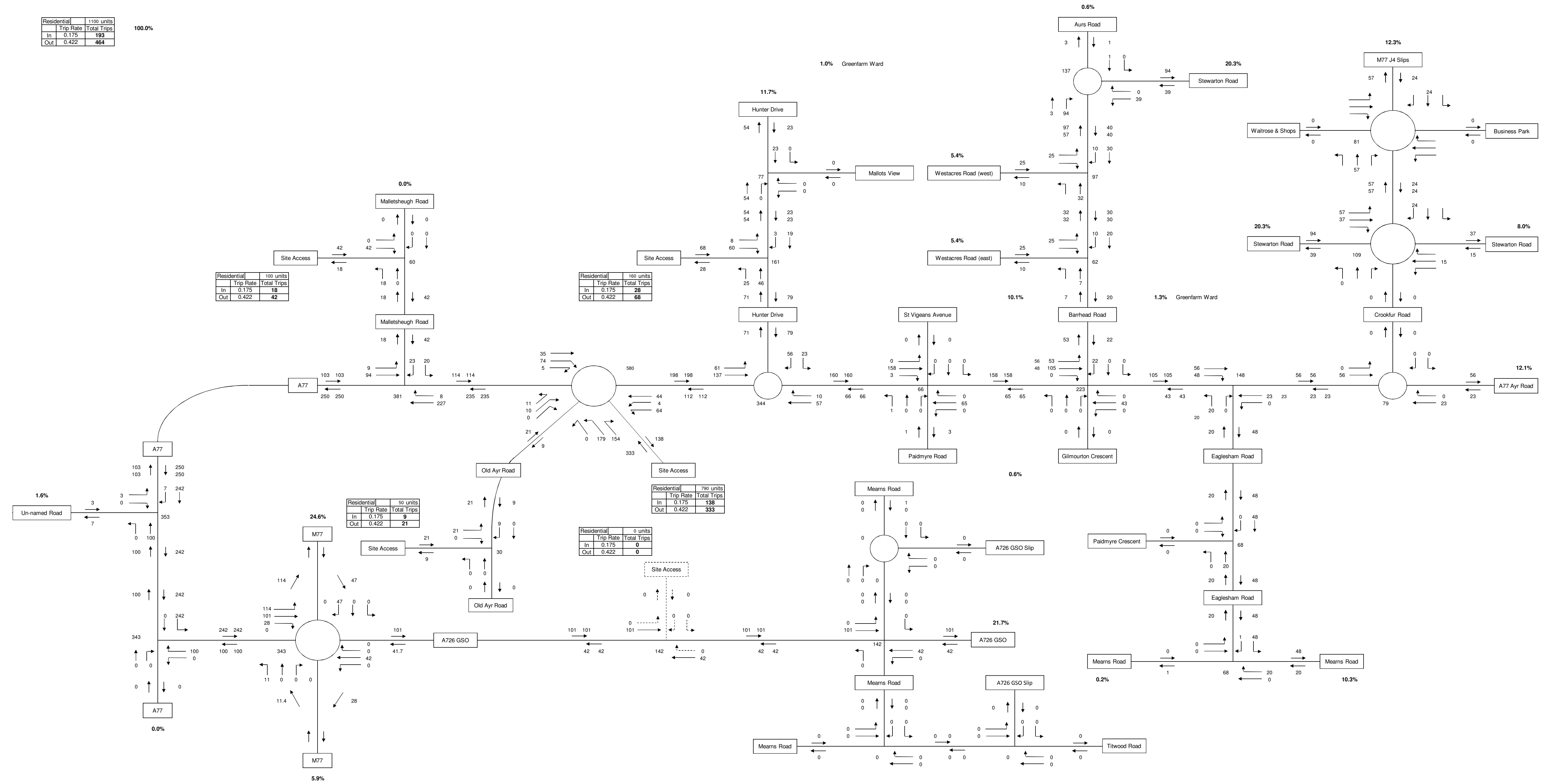
TITLE

Maidenhill, Newton Mearns
Proposed Residential Development

Site Accessed from Old Ayr Road Traffic Flows - Sensitivity Trip Rates (Vehs)
Weekday AM (0800-0900) Peak Hour

Diagram

5S.4a



TRANSPORT PLANNING

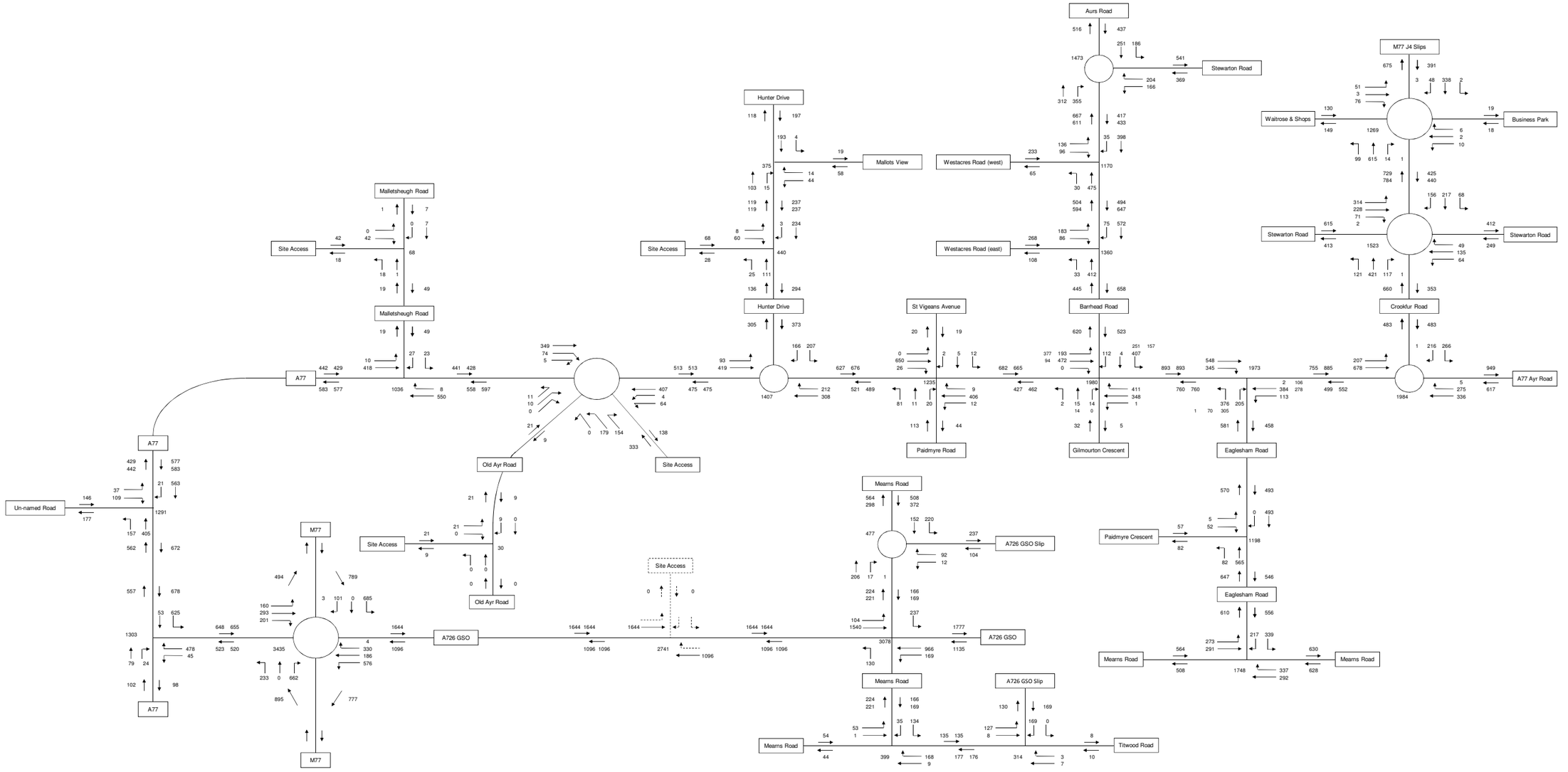
TITLE

Maidenhill, Newton Mearns
Proposed Residential Development

Total Residential Traffic Flows - Sensitivity Trip Rates (Vehs)
Weekday AM (0800-0900) Peak Hour

Diagram

6Sa



TRANSPORT PLANNING

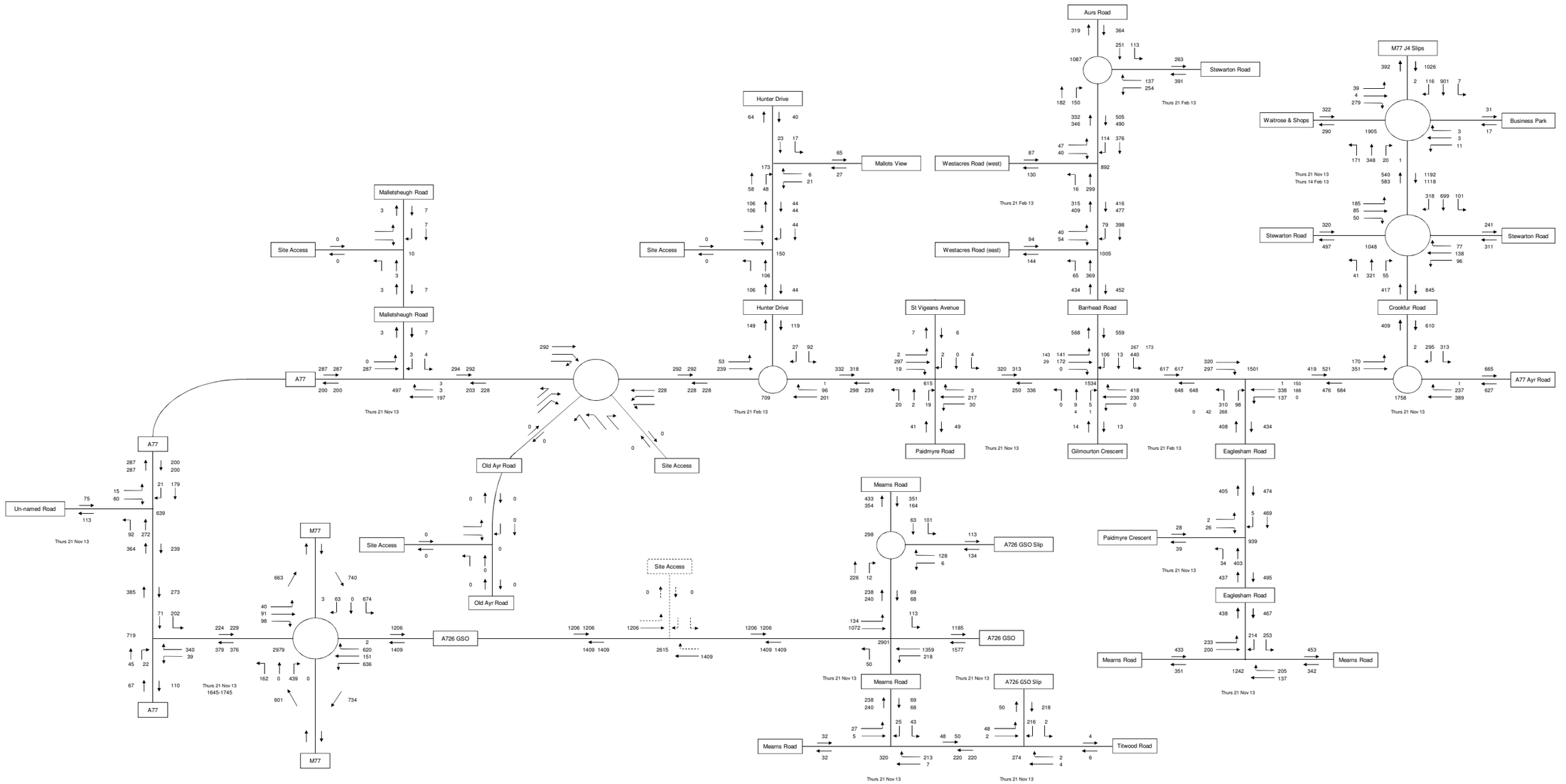
TITLE

Maidenhill, Newton Mearns
Proposed Residential Development

Design Year Projected + Proposed Residential Development Traffic Flows - Sensitivity Trip Rates (PCUs)
Weekday AM (0800-0900) Peak Hour

Diagram

7Sa



TRANSPORT PLANNING

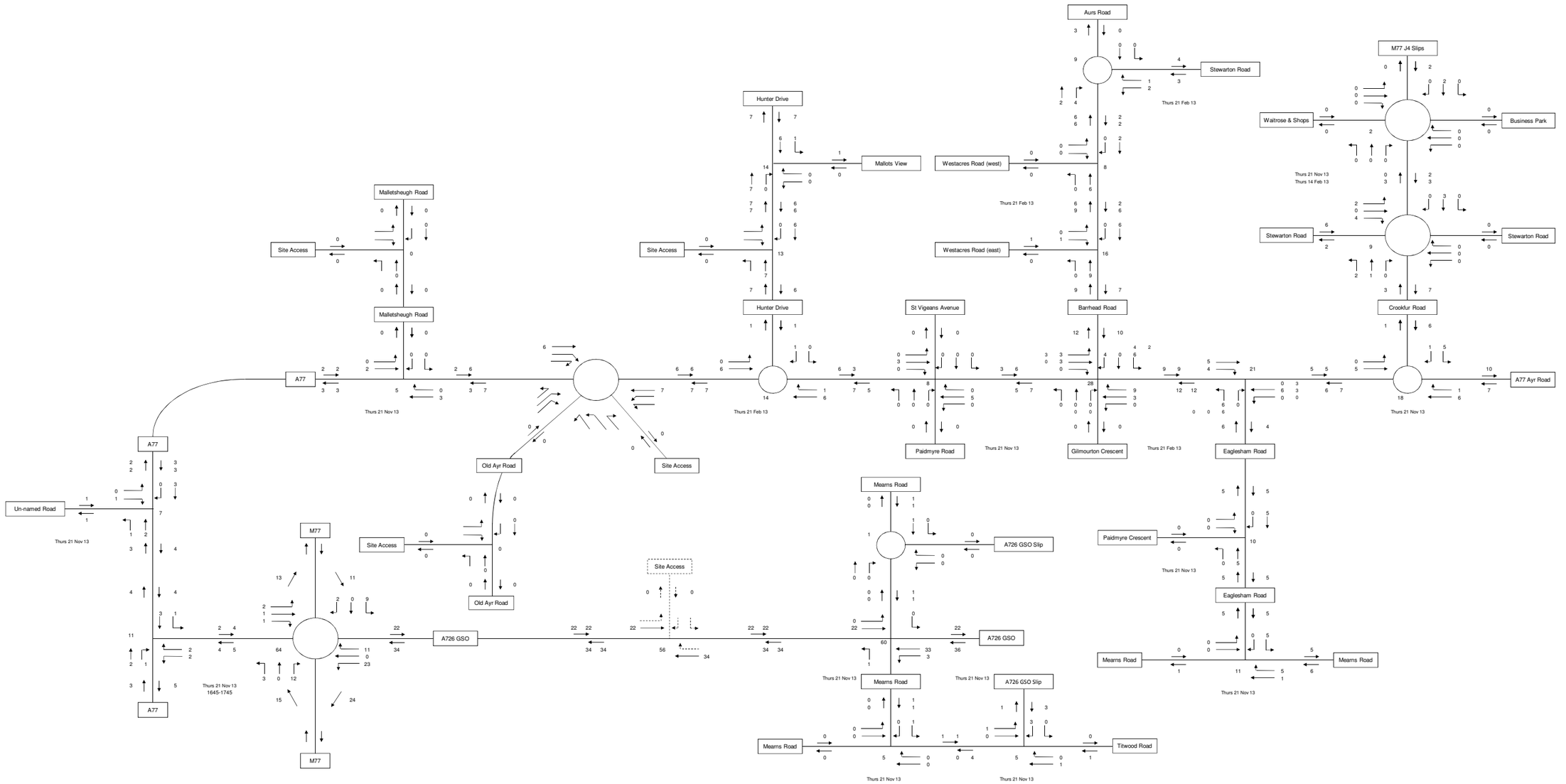
TITLE

Maidenhill, Newton Mearns
Proposed Residential Development

2013 Surveyed Traffic Flows (Vehs)
Weekday PM (1715-1815) Peak Hour

Diagram

1b



TRANSPORT PLANNING

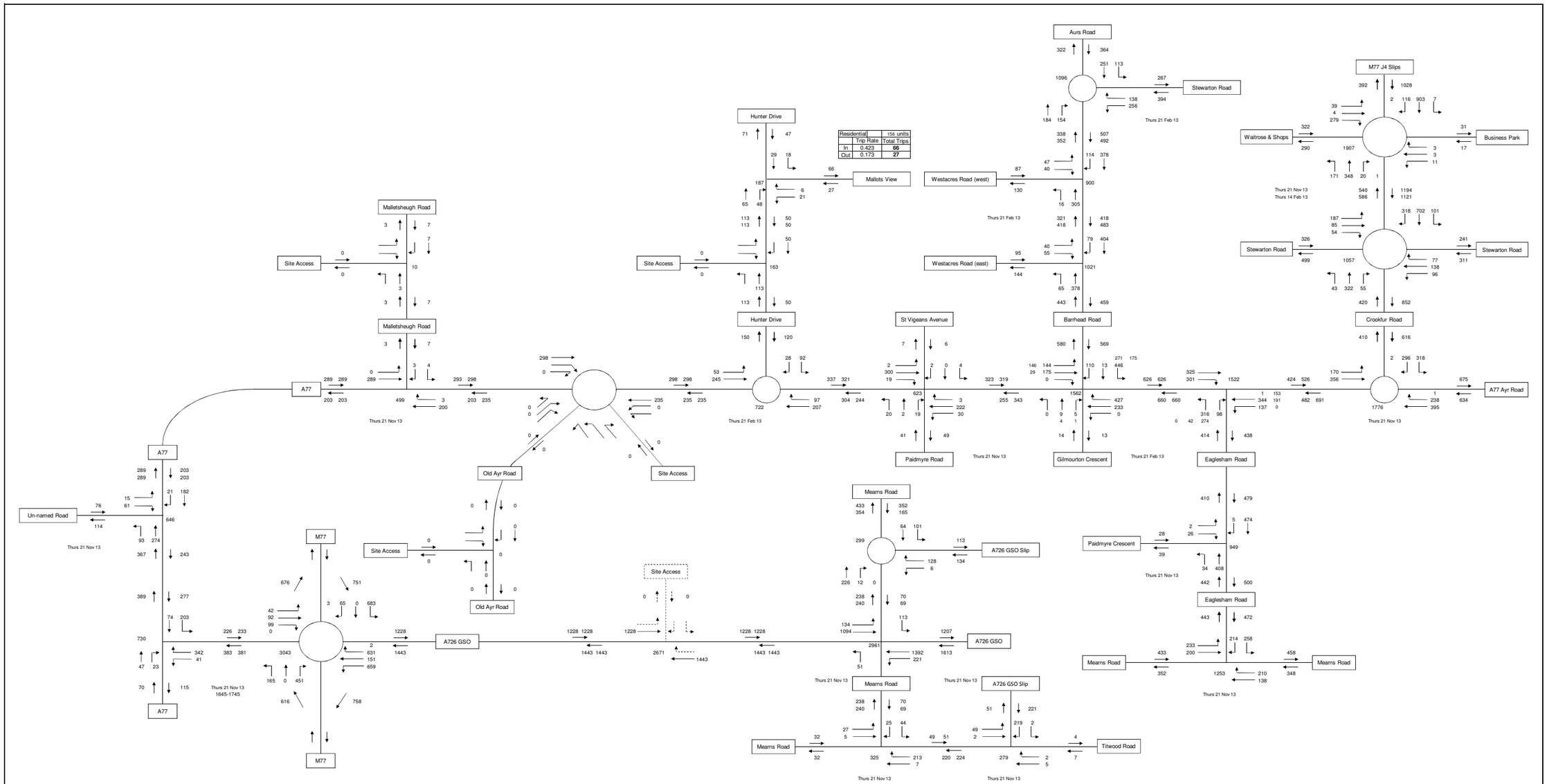
TITLE

Maidenhill, Newton Mearns
Proposed Residential Development

2013 Surveyed Traffic Flows (HGVs)
Weekday PM (1715-1815) Peak Hour

Diagram

2b



TRANSPORT PLANNING

TITLE

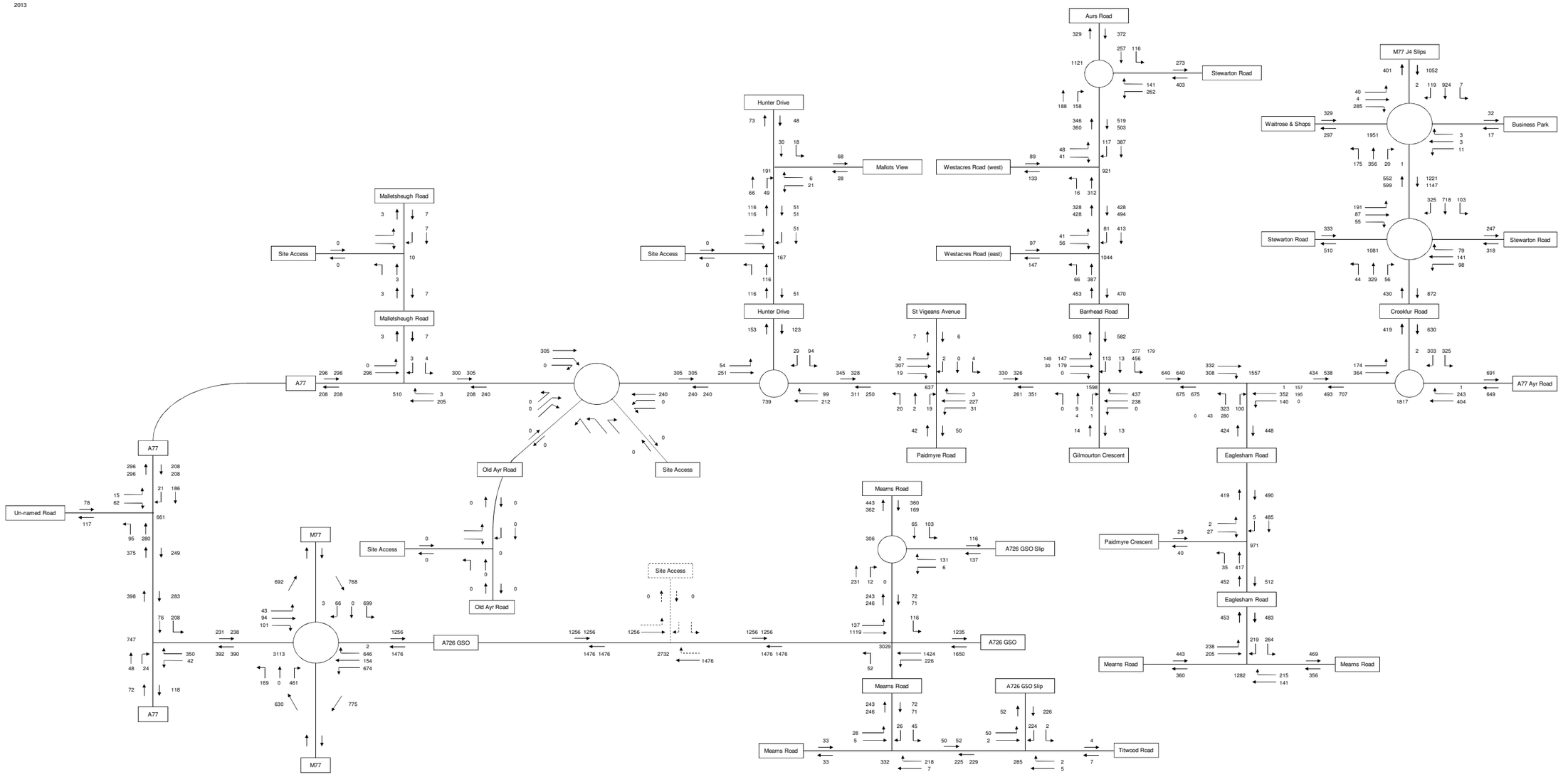
Maidenhill, Newton Mearns
Proposed Residential Development

2013 Surveyed Traffic Flows (PCUs)
Weekday PM (1715-1815) Peak Hour

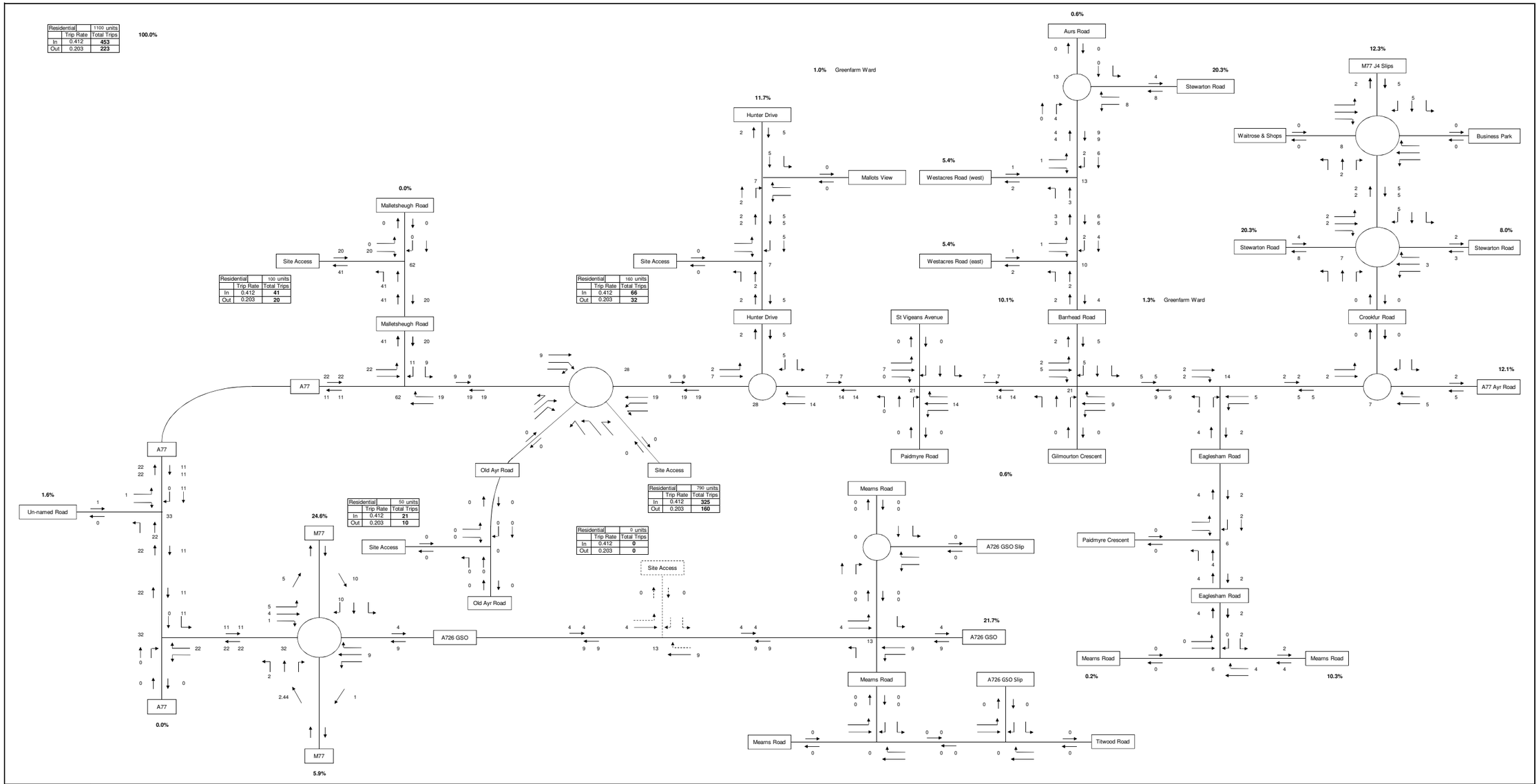
Diagram

3b

2015 1.023
2013



TRANSPORT PLANNING	TITLE	Maidenhill, Newton Mearns Proposed Residential Development 2015 Projected Traffic Flows (PCUs) Weekday PM (1715-1815) Peak Hour	Diagram **4b**



TRANSPORT PLANNING

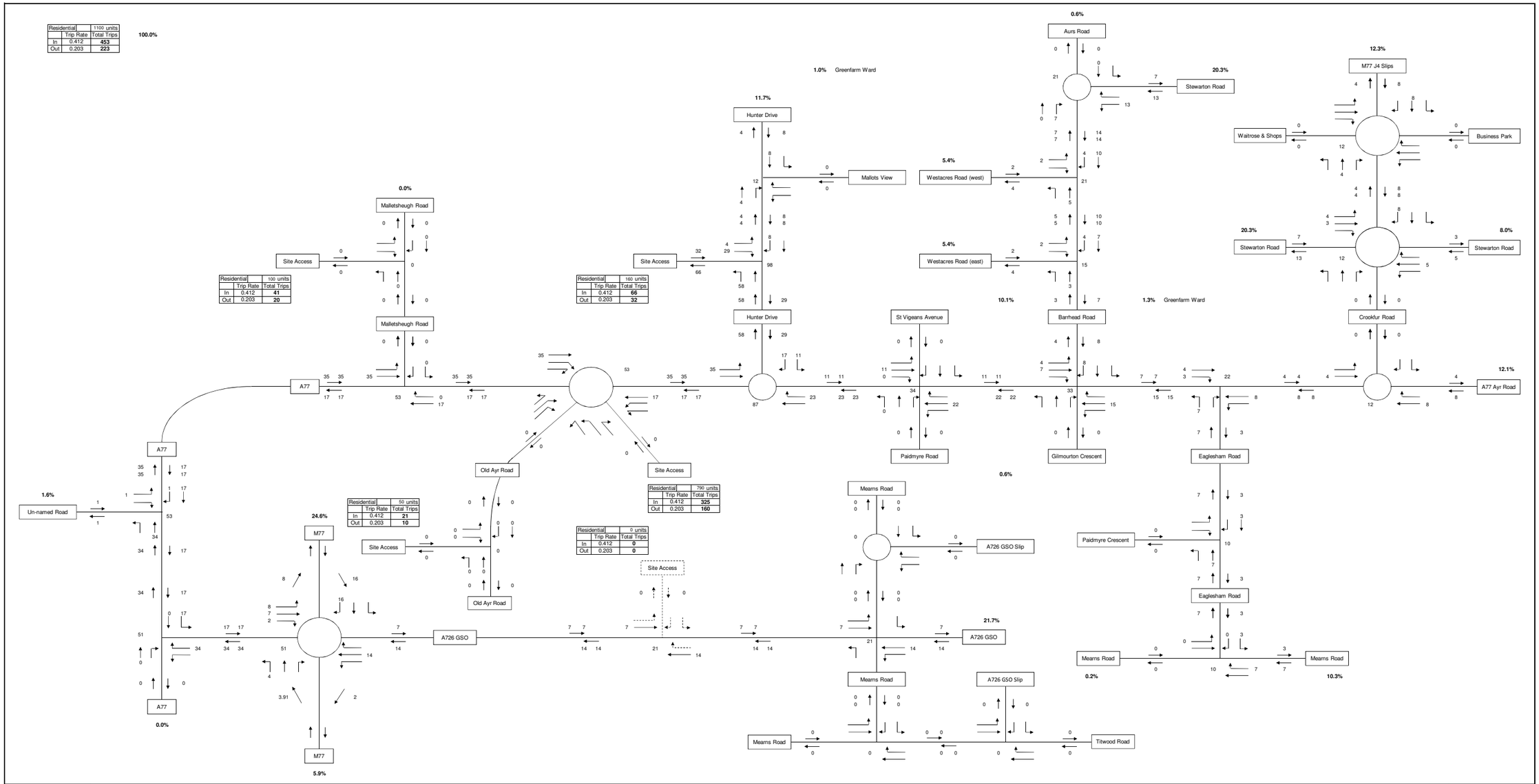
TITLE

Maidenhill, Newton Mearns
Proposed Residential Development

Site Accessed from Malletsheugh Road Traffic Flows - Sensitivity Trip Rates (Vehs)
Weekday PM (1615-1715) Peak Hour

Diagram

5S.1b



TRANSPORT PLANNING

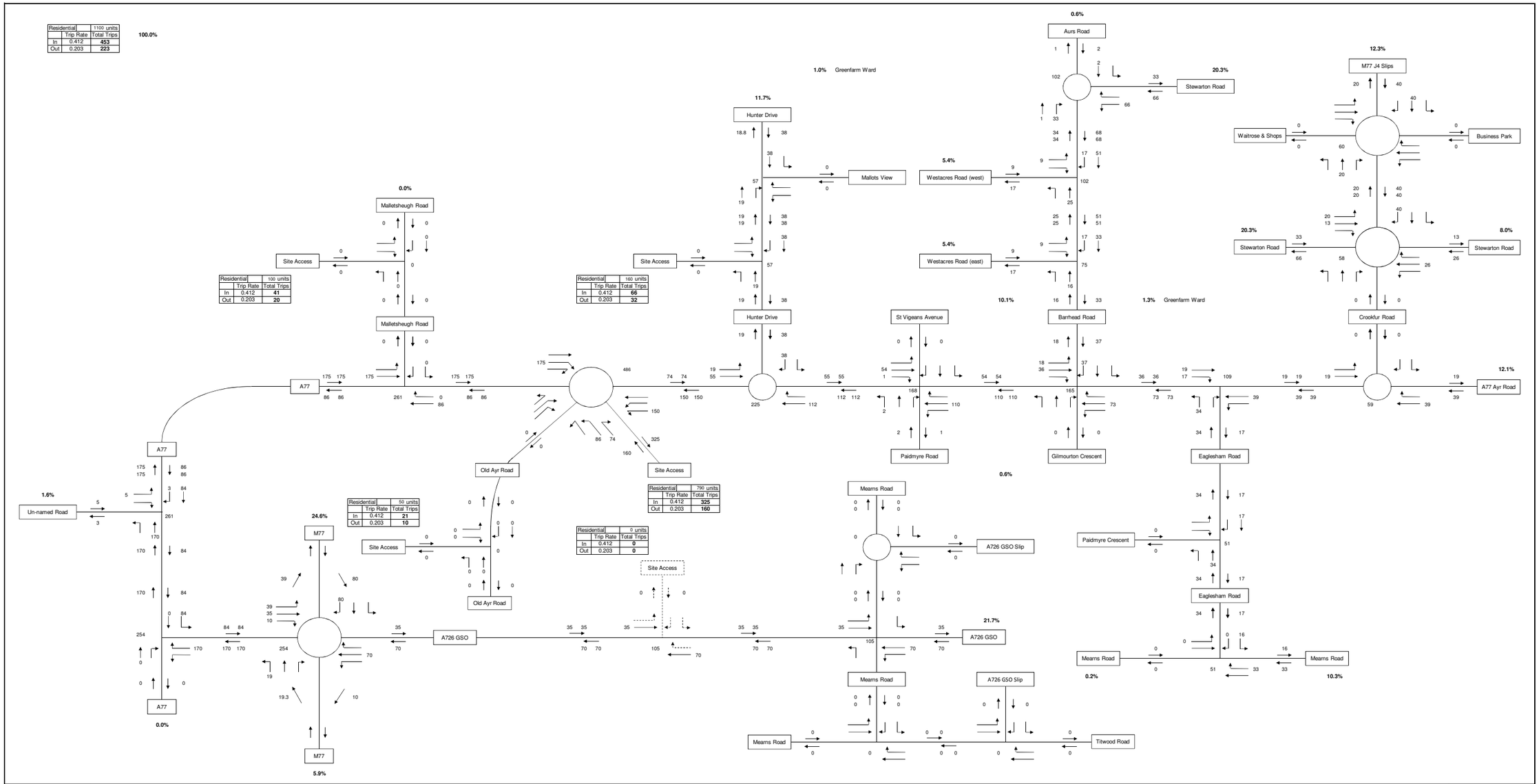
TITLE

Maidenhill, Newton Mearns
Proposed Residential Development

Site Accessed from Hunter Drive Traffic Flows - Sensitivity Trip Rates (Vehs)
Weekday PM (1615-1715) Peak Hour

Diagram

5S.2b



TRANSPORT PLANNING

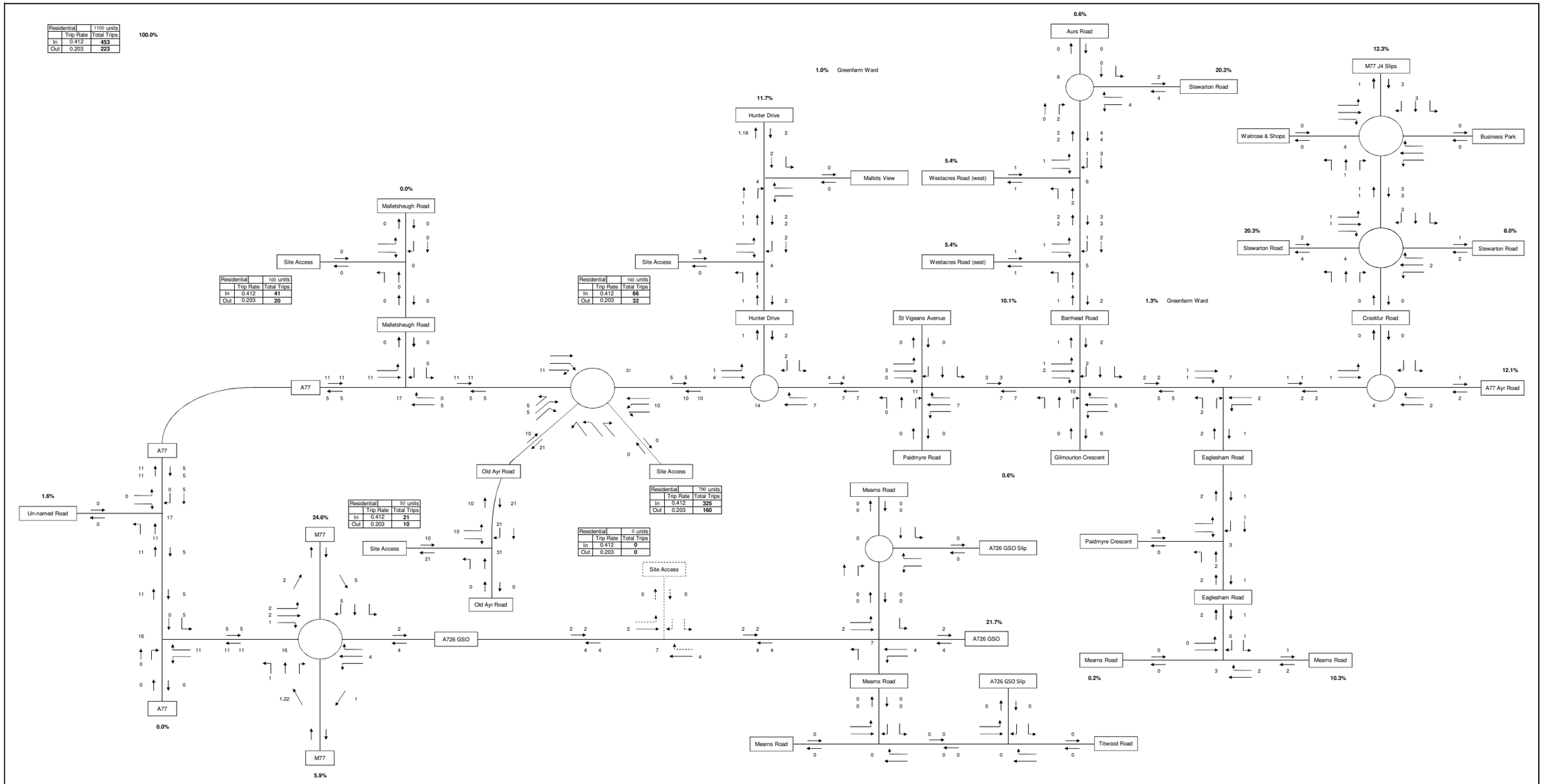
TITLE

Maidenhill, Newton Mearns
Proposed Residential Development

Site Accessed from A77 Traffic Flows - Sensitivity Trip Rates (Vehs)
Weekday PM (1615-1715) Peak Hour

Diagram

5S.3b



TRANSPORT PLANNING

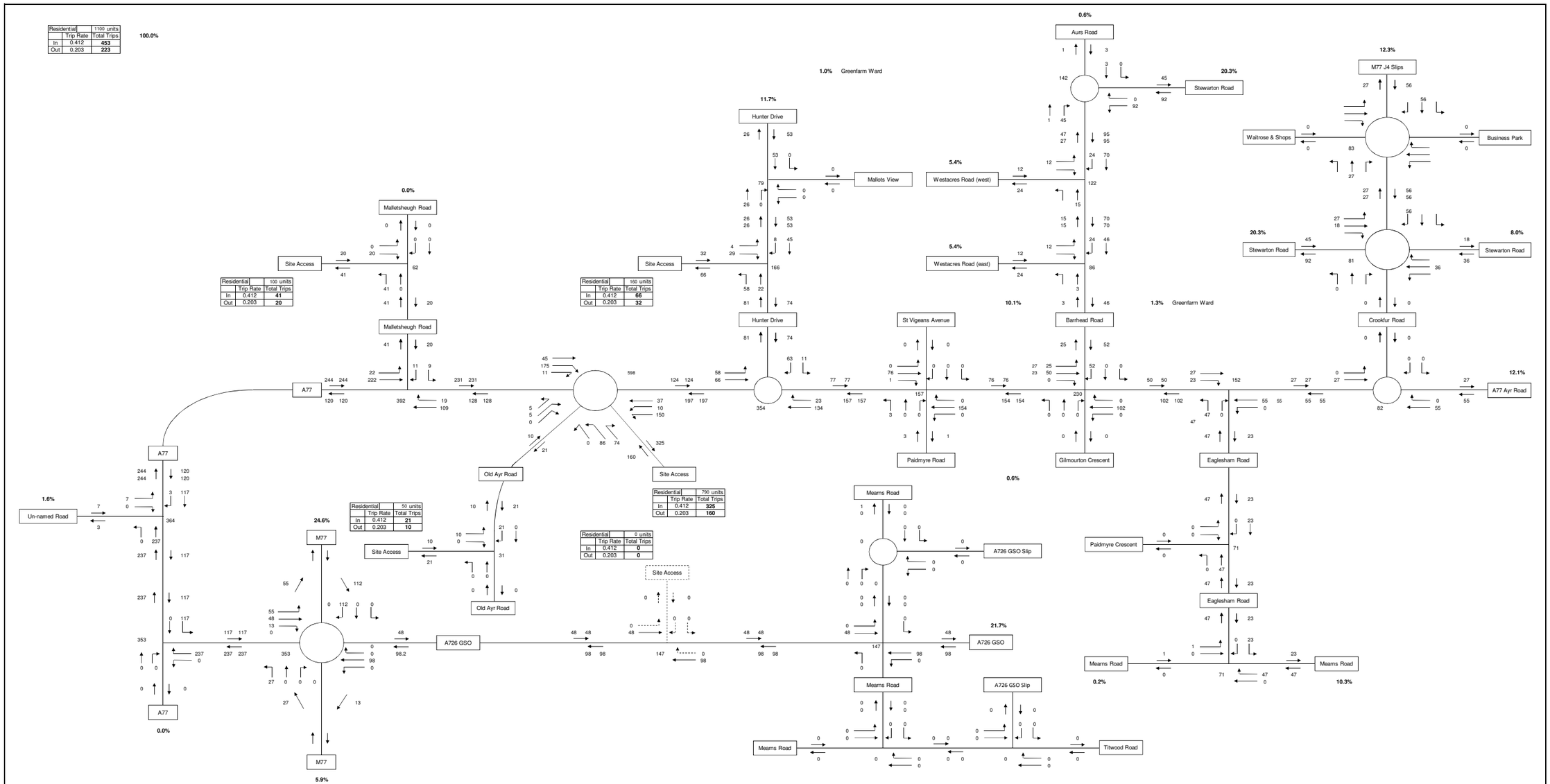
TITLE

Maidenhill, Newton Mearns
Proposed Residential Development

Site Accessed from Old Ayr Road Traffic Flows - Sensitivity Trip Rates (Vehs)
Weekday PM (1615-1715) Peak Hour

Diagram

5S.4b



TRANSPORT PLANNING

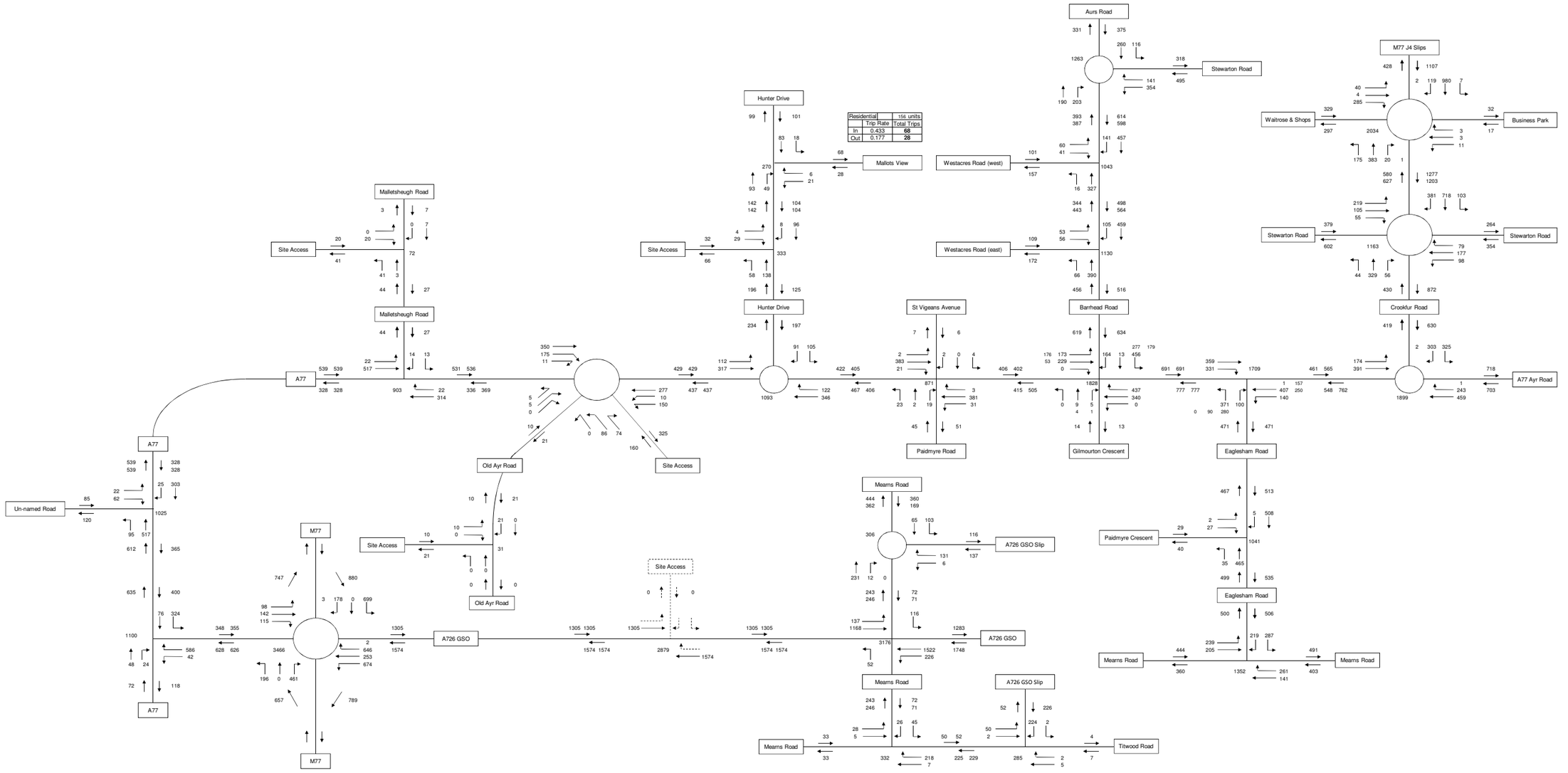
TITLE

Maidenhill, Newton Mearns
Proposed Residential Development

Total Residential Traffic Flows - Sensitivity Trip Rates (Vehs)
Weekday PM (1615-1715) Peak Hour

Diagram

6Sb



TRANSPORT PLANNING	TITLE	Diagram
	Maidenhill, Newton Mearns Proposed Residential Development Design Year Projected + Proposed Residential Development Traffic Flows - Sensitivity Trip Rates (PCUs) Weekday PM (1715-1815) Peak Hour	**7Sb**

APPENDIX B

PICADY and LINSIG output files

TRL LIMITED

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

PICADY 5.1 ANALYSIS PROGRAM
RELEASE 5.0 (JUNE 2010)

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

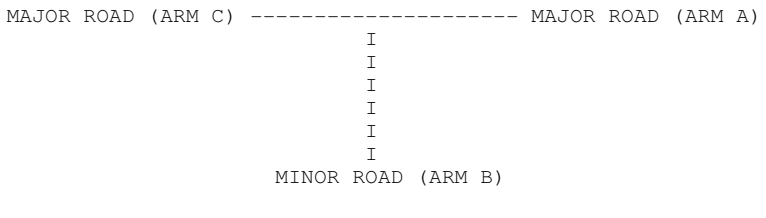
Run with file:-
"C:\Users\Stuart\Documents\TPL\Newton Mearns, Maidenhill\Junction Analysis - Sensitivity\PICADY\
A77_Old Ayr Road 840 units.vpi"
(drive-on-the-left) at 13:41:31 on Monday, 23 February 2015

RUN INFORMATION
****

RUN TITLE	: A77/ Old Ayr Road 840 units - Sensitivity Trip Rates
LOCATION	: Maidenhill, Newton Mearns
DATE	: 23/02/15
CLIENT	: Maidenhill Developers
ENUMERATOR	: SL
JOB NUMBER	: TPL115
STATUS	:
DESCRIPTION	:

MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA



ARM A IS A77 (east)
ARM B IS Old Ayr Road
ARM C IS A77 (west)

STREAM LABELLING CONVENTION

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

GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.30 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	2.20 M.
- VISIBILITY	(VC-B)	100.00 M.
- BLOCKS TRAFFIC (SPACES)		YES (0)
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	70.0 M.
- VISIBILITY TO RIGHT	(VB-A)	70.0 M.
- LANE 1 WIDTH	(WB-C)	3.00 M.
- LANE 2 WIDTH	(WB-A)	0.00 M.

.SLOPES AND INTERCEPT

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

Intercept For STREAM B-C	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
668.00	0.24	0.10

Intercept For STREAM B-A	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B	Slope For Opposing STREAM C-A	Slope For Opposing STREAM C-B
535.21	0.23	0.09	0.15	0.33

Intercept For STREAM C-B	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
631.87	0.23	0.23

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

TRAFFIC DEMAND DATA

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

Demand set: Design Year AM Peak + Prop Residential Dev

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

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

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	5.94	8.91	5.94
ARM B	15.00	45.00	75.00	4.43	6.64	4.43
ARM C	15.00	45.00	75.00	5.35	8.02	5.35

Demand set: Design Year AM Peak + Prop Residential Dev

TIME	FROM/TO	ARM A	ARM B	ARM C
07.45 - 09.15				
	ARM A	0.000	0.143	0.857
		0.0	68.0	407.0
		(0.0)	(0.0)	(0.0)
	ARM B	0.463	0.000	0.537
		164.0	0.0	190.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.815	0.185	0.000
		349.0	79.0	0.0
		(0.0)	(0.0)	(0.0)

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

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET Design Year AM Peak + Prop Residential Dev
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
07.45-08.00									
B-AC	4.44	8.06	0.551		0.00	1.18	16.2		0.27
C-AB	1.54	12.19	0.126		0.00	0.22	3.3		0.09
C-A	3.83								
A-B	0.85								
A-C	5.11								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-AC	5.30	7.67	0.692		1.18	2.07	28.2		0.40
C-AB	2.02	12.55	0.161		0.22	0.31	4.7		0.10
C-A	4.39								
A-B	1.02								
A-C	6.10								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-AC	6.50	7.12	0.912		2.07	6.12	70.9		0.92
C-AB	2.81	13.07	0.215		0.31	0.47	7.1		0.10
C-A	5.04								
A-B	1.25								
A-C	7.47								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-AC	6.50	7.12	0.913		6.12	7.31	101.8		1.21
C-AB	2.82	13.08	0.215		0.47	0.47	7.1		0.10
C-A	5.04								
A-B	1.25								
A-C	7.47								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-AC	5.30	7.67	0.692		7.31	2.45	47.2		0.55
C-AB	2.03	12.56	0.161		0.47	0.32	4.8		0.10
C-A	4.39								
A-B	1.02								
A-C	6.10								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-AC	4.44	8.06	0.551		2.45	1.28	20.7		0.29
C-AB	1.55	12.20	0.127		0.32	0.23	3.4		0.09
C-A	3.82								
A-B	0.85								
A-C	5.11								

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	1.2	*
08.15	2.1	**
08.30	6.1	******
08.45	7.3	*******
09.00	2.4	**
09.15	1.3	*

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.2
08.15	0.3
08.30	0.5
08.45	0.5
09.00	0.3
09.15	0.2

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-AC	487.3	324.8	284.9	0.58	285.0	0.58
C-AB	191.4	127.6	30.4	0.16	30.4	0.16
C-A	397.7	265.1				
A-B	93.6	62.4				
A-C	560.2	373.5				
ALL	1730.2	1153.4	315.3	0.18	315.4	0.18

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

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

.SLOPES AND INTERCEPT

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

Intercept For STREAM B-C	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
668.00	0.24	0.10

Intercept For STREAM B-A	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B	Slope For Opposing STREAM C-A	Slope For Opposing STREAM C-B
535.21	0.23	0.09	0.15	0.33

Intercept For STREAM C-B	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
631.87	0.23	0.23

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

TRAFFIC DEMAND DATA

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

Demand set: Design Year PM Peak + Prop Residential Dev

TIME PERIOD BEGINS 17.00 AND ENDS 18.30

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

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	5.46	8.19	5.46
ARM B	15.00	45.00	75.00	2.13	3.19	2.13
ARM C	15.00	45.00	75.00	6.70	10.05	6.70

Demand set: Design Year PM Peak + Prop Residential Dev

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

TIME	FROM/TO	ARM A	ARM B	ARM C
17.00 - 18.30	ARM A	0.000	0.366	0.634
		0.0	160.0	277.0
		(0.0)	(0.0)	(0.0)
	ARM B	0.465	0.000	0.535
		79.0	0.0	91.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.653	0.347	0.000
		350.0	186.0	0.0
		(0.0)	(0.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET Design Year PM Peak + Prop Residential Dev
AND FOR TIME PERIOD 2

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
B-AC	2.13	8.04	0.265		0.00	0.36	5.1		0.17
C-AB	3.62	12.29	0.294		0.00	0.57	8.4		0.11
C-A	3.11								
A-B	2.01								
A-C	3.48								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
B-AC	2.55	7.62	0.334		0.36	0.49	7.1		0.20
C-AB	4.74	12.68	0.374		0.57	0.84	12.7		0.13
C-A	3.29								
A-B	2.40								
A-C	4.15								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
B-AC	3.12	7.04	0.443		0.49	0.77	11.0		0.25
C-AB	6.64	13.25	0.501		0.84	1.47	22.1		0.15
C-A	3.19								
A-B	2.94								
A-C	5.08								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
B-AC	3.12	7.03	0.444		0.77	0.79	11.7		0.26
C-AB	6.66	13.27	0.502		1.47	1.50	22.8		0.15
C-A	3.17								
A-B	2.94								
A-C	5.08								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
18.00-18.15									
B-AC	2.55	7.61	0.335		0.79	0.51	8.0		0.20
C-AB	4.76	12.70	0.375		1.50	0.88	13.4		0.13
C-A	3.27								
A-B	2.40								
A-C	4.15								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
18.15-18.30									
B-AC	2.13	8.03	0.266		0.51	0.37	5.7		0.17
C-AB	3.64	12.31	0.295		0.88	0.59	8.9		0.12
C-A	3.09								
A-B	2.01								
A-C	3.48								

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	0.4	
17.30	0.5	
17.45	0.8	*
18.00	0.8	*
18.15	0.5	*
18.30	0.4	

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	0.6	*
17.30	0.8	*
17.45	1.5	*
18.00	1.5	*
18.15	0.9	*
18.30	0.6	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
B-AC	234.0	156.0	48.7	0.21	48.7	0.21
C-AB	450.8	300.5	88.5	0.20	88.5	0.20
C-A	287.0	191.3				
A-B	220.2	146.8				
A-C	381.3	254.2				
ALL	1573.3	1048.8	137.1	0.09	137.1	0.09

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

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

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

Printed at 13:41:45 on 23/02/2015]

TRL LIMITED

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

PICADY 5.1 ANALYSIS PROGRAM
RELEASE 5.0 (JUNE 2010)

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TRL SOFTWARE SALES
TEL: CROWTHORNE (01344) 770758, FAX: 770356
EMAIL: software@trl.co.uk

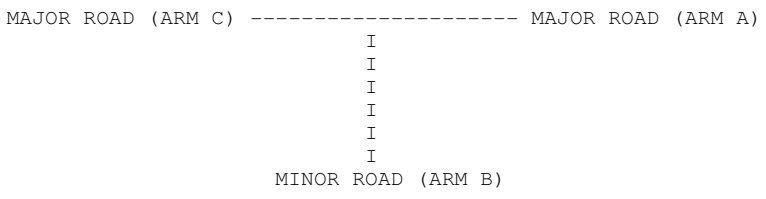
Run with file:-
"C:\Users\Stuart\Documents\TPL\Newton Mearns, Maidenhill\Junction Analysis - Sensitivity\PICADY\
Mearns Road_Eaglesham Road 1100 units.vpi"
(drive-on-the-left) at 13:46:01 on Monday, 23 February 2015

RUN INFORMATION

RUN TITLE	: Mearns Road/ Eaglesham Road 1100 units - Sensitivity Trip Rates
LOCATION	: Maidenhill, Newton Mearns
DATE	: 23/02/15
CLIENT	: Maidenhill Developers
ENUMERATOR	: SL
JOB NUMBER	: TPL115
STATUS	:
DESCRIPTION	:

MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA



ARM A IS Mearns Road (south)
ARM B IS Eaglesham Road
ARM C IS Mearns Road (north)

STREAM LABELLING CONVENTION

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

GEOMETRIC DATA

DATA ITEM	MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 11.80 M.
CENTRAL RESERVE WIDTH	(WCR) 5.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 4.50 M.
- VISIBILITY	(VC-B)100.00 M.
- BLOCKS TRAFFIC (SPACES)	NO (0)
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 70.0 M.
- VISIBILITY TO RIGHT	(VB-A) 70.0 M.
- LANE 1 WIDTH	(WB-C) 2.80 M.
- LANE 2 WIDTH	(WB-A) 2.80 M.

.SLOPES AND INTERCEPT

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

Intercept For STREAM B-C	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
654.63	0.19	0.08

Intercept For STREAM B-A	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B	Slope For Opposing STREAM C-A	Slope For Opposing STREAM C-B
583.05	0.18	0.07	0.11	0.26

Intercept For STREAM C-B	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
790.04	0.23	0.23

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

TRAFFIC DEMAND DATA

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

Demand set: Design Year AM Peak + Prop Residential Dev

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

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

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	7.05	10.58	7.05
ARM B	15.00	45.00	75.00	6.95	10.42	6.95
ARM C	15.00	45.00	75.00	7.86	11.79	7.86

Demand set: Design Year AM Peak + Prop Residential Dev

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

TIME	FROM/TO	ARM A	ARM B	ARM C
07.45 - 09.15	ARM A	0.000	0.484	0.516
		0.0	273.0	291.0
		(0.0)	(0.0)	(0.0)
	ARM B	0.390	0.000	0.610
		217.0	0.0	339.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.464	0.536	0.000
		292.0	337.0	0.0
		(0.0)	(0.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET Design Year AM Peak + Prop Residential Dev
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
07.45-08.00									
B-C	4.25	9.03	0.471		0.00	0.87	12.1		0.20
B-A	2.72	7.31	0.373		0.00	0.58	8.2		0.21
C-A	3.66								
C-B	4.23	11.55	0.366		0.00	0.57	8.2		0.14
A-B	3.43								
A-C	3.65								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-C	5.08	8.60	0.591		0.87	1.38	19.4		0.28
B-A	3.25	6.83	0.476		0.58	0.88	12.5		0.28
C-A	4.38								
C-B	5.05	11.23	0.449		0.57	0.80	11.6		0.16
A-B	4.09								
A-C	4.36								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-C	6.22	7.97	0.781		1.38	3.11	40.3		0.51
B-A	3.98	6.18	0.645		0.88	1.68	22.8		0.43
C-A	5.36								
C-B	6.18	10.80	0.573		0.80	1.30	18.4		0.21
A-B	5.01								
A-C	5.34								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-C	6.22	7.94	0.783		3.11	3.33	48.6		0.56
B-A	3.98	6.17	0.645		1.68	1.75	25.8		0.45
C-A	5.36								
C-B	6.18	10.80	0.573		1.30	1.32	19.7		0.22
A-B	5.01								
A-C	5.34								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-C	5.08	8.57	0.593		3.33	1.52	25.2		0.31
B-A	3.25	6.82	0.477		1.75	0.94	15.2		0.29
C-A	4.38								
C-B	5.05	11.23	0.449		1.32	0.83	13.1		0.16
A-B	4.09								
A-C	4.36								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-C	4.25	9.01	0.472		1.52	0.92	14.6		0.21
B-A	2.72	7.29	0.373		0.94	0.61	9.6		0.22
C-A	3.66								
C-B	4.23	11.55	0.366		0.83	0.59	9.1		0.14
A-B	3.43								
A-C	3.65								

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.9	*
08.15	1.4	*
08.30	3.1	***
08.45	3.3	***
09.00	1.5	**
09.15	0.9	*

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.6	*
08.15	0.9	*
08.30	1.7	**
08.45	1.7	**
09.00	0.9	*
09.15	0.6	*

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.6	*
08.15	0.8	*
08.30	1.3	*
08.45	1.3	*
09.00	0.8	*
09.15	0.6	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-C	466.6	311.1	160.2	0.34	160.2	0.34
B-A	298.7	199.1	94.1	0.31	94.1	0.32
C-A	401.9	267.9				
C-B	463.9	309.2	79.9	0.17	80.0	0.17
A-B	375.8	250.5				
A-C	400.5	267.0				
ALL	2407.4	1604.9	334.2	0.14	334.3	0.14

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

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

.SLOPES AND INTERCEPT

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

Intercept For STREAM B-C	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
654.63	0.19	0.08

Intercept For STREAM B-A	Slope For Opposing STREAM A-B	Slope For Opposing STREAM C-A	Slope For Opposing STREAM C-B
583.05	0.18	0.07	0.11	0.26

Intercept For STREAM C-B	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
790.04	0.23	0.23

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

TRAFFIC DEMAND DATA

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

Demand set: Design Year PM Peak + Prop Residential Dev

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

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

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	5.55	8.33	5.55
ARM B	15.00	45.00	75.00	6.32	9.49	6.32
ARM C	15.00	45.00	75.00	5.03	7.54	5.03

Demand set: Design Year PM Peak + Prop Residential Dev

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

TIME	FROM/TO	ARM A	ARM B	ARM C
07.45 - 09.15	ARM A	0.000	0.538	0.462
		0.0	239.0	205.0
		(0.0)	(0.0)	(0.0)
	ARM B	0.433	0.000	0.567
		219.0	0.0	287.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.351	0.649	0.000
		141.0	261.0	0.0
		(0.0)	(0.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET Design Year PM Peak + Prop Residential Dev
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
07.45-08.00									
B-C	3.60	9.32	0.386		0.00	0.62	8.8		0.17
B-A	2.75	7.99	0.344		0.00	0.51	7.3		0.19
C-A	1.77								
C-B	3.27	11.89	0.275		0.00	0.38	5.4		0.12
A-B	3.00								
A-C	2.57								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-C	4.30	8.97	0.479		0.62	0.90	12.8		0.21
B-A	3.28	7.65	0.429		0.51	0.73	10.5		0.23
C-A	2.11								
C-B	3.91	11.64	0.336		0.38	0.50	7.3		0.13
A-B	3.58								
A-C	3.07								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-C	5.27	8.47	0.622		0.90	1.56	21.7		0.30
B-A	4.02	7.19	0.559		0.73	1.21	17.0		0.31
C-A	2.59								
C-B	4.79	11.30	0.424		0.50	0.72	10.5		0.15
A-B	4.39								
A-C	3.76								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-C	5.27	8.46	0.623		1.56	1.60	23.8		0.31
B-A	4.02	7.18	0.559		1.21	1.24	18.5		0.32
C-A	2.59								
C-B	4.79	11.30	0.424		0.72	0.73	10.9		0.15
A-B	4.39								
A-C	3.76								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-C	4.30	8.95	0.480		1.60	0.95	15.1		0.22
B-A	3.28	7.65	0.429		1.24	0.77	12.2		0.23
C-A	2.11								
C-B	3.91	11.64	0.336		0.73	0.51	7.9		0.13
A-B	3.58								
A-C	3.07								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-C	3.60	9.30	0.387		0.95	0.64	10.1		0.18
B-A	2.75	7.98	0.344		0.77	0.53	8.4		0.19
C-A	1.77								
C-B	3.27	11.89	0.275		0.51	0.38	5.9		0.12
A-B	3.00								
A-C	2.57								

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.6	*
08.15	0.9	*
08.30	1.6	**
08.45	1.6	**
09.00	0.9	*
09.15	0.6	*

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.5	*
08.15	0.7	*
08.30	1.2	*
08.45	1.2	*
09.00	0.8	*
09.15	0.5	*

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.4	
08.15	0.5	
08.30	0.7	*
08.45	0.7	*
09.00	0.5	*
09.15	0.4	

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-C	395.0	263.4	92.3	0.23	92.3	0.23
B-A	301.4	201.0	73.8	0.24	73.8	0.24
C-A	194.1	129.4				
C-B	359.2	239.5	47.9	0.13	47.9	0.13
A-B	329.0	219.3				
A-C	282.2	188.1				
ALL	1860.9	1240.6	214.0	0.12	214.1	0.12

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

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

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

Printed at 13:46:08 on 23/02/2015]

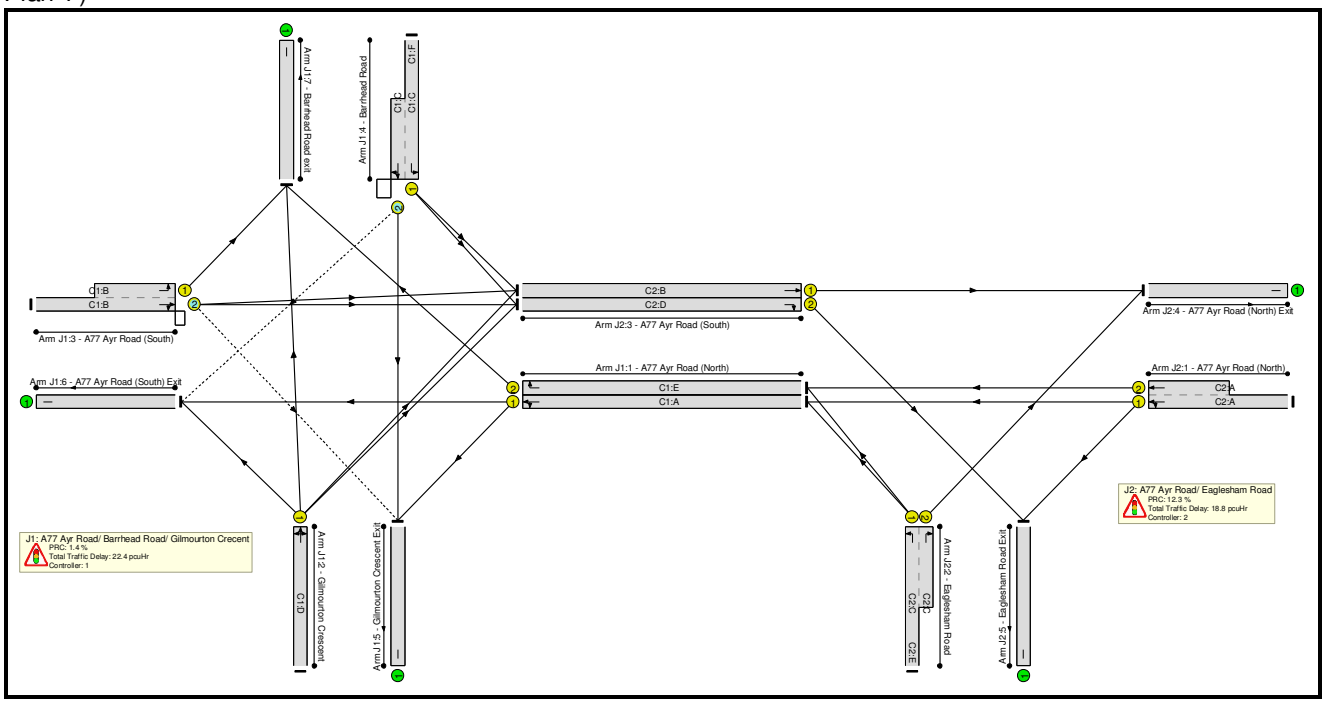
Basic Results Summary

User and Project Details

Project:	**Maidenhill Masterplan**
Title:	**A77 Ayr Road/ Barrhead Road/ Gilmourton Crescent/ Eaglesham Road**
Location:	Newton Mearns
File name:	A77 Ayr Road_Barrhead Road_Gilmourton Crescent_Eaglesham Road 150223.lsg3x
Author:	Stuart
Company:	TPL
Address:	
Notes:	

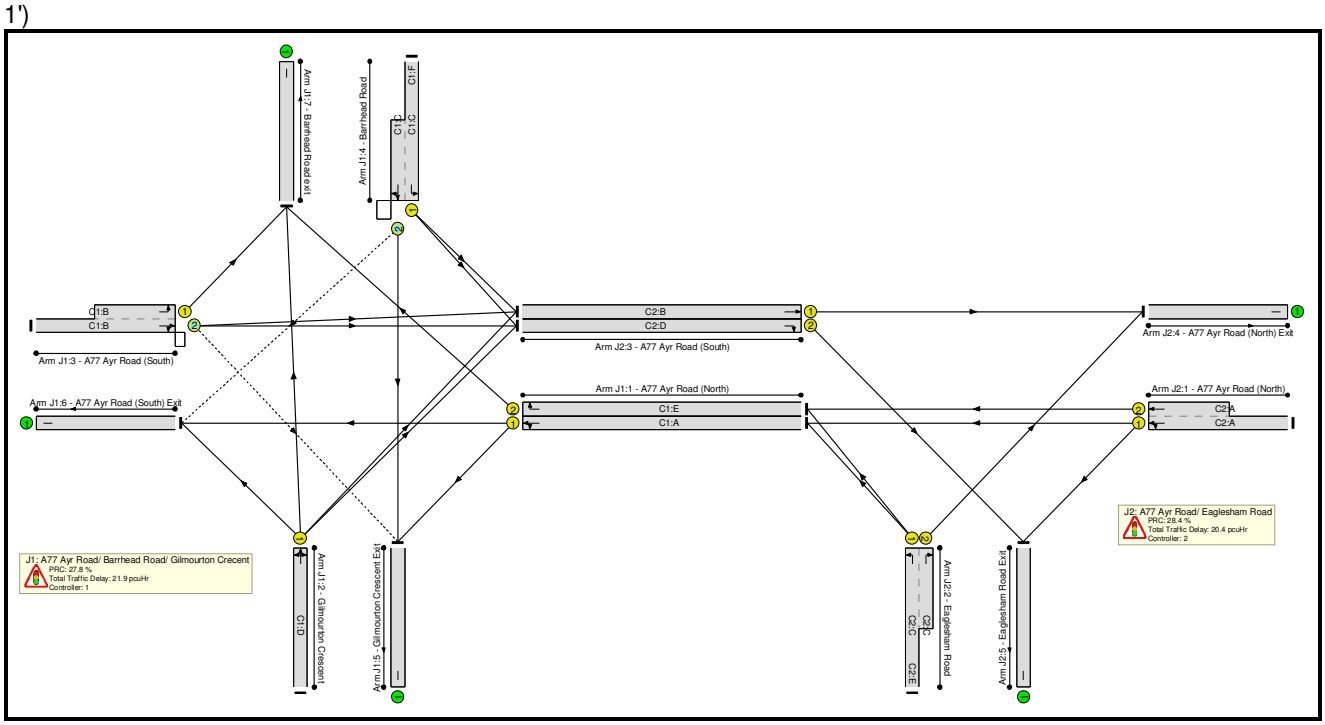
Network Layout Diagram

Scenario 1: 'Scenario 3' (FG3: 'Design Year Weekday AM Peak + Prop Residential Dev', Plan 1: 'Network Control Plan 1')



Basic Results Summary

Scenario 2: 'Scenario 6' (FG6: 'Design Year Weekday PM Peak + Prop Residential', Plan 1: 'Network Control Plan 1')

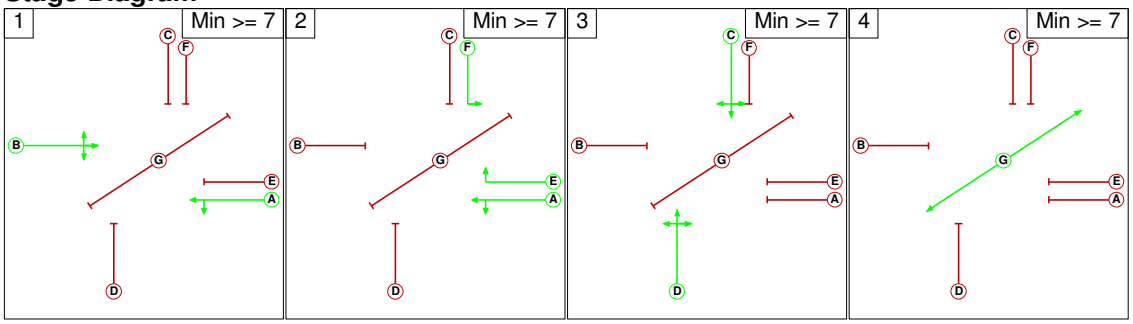


C1

Phase Intergreens Matrix

		Starting Phase						
		A	B	C	D	E	F	G
Terminating Phase	A		-	7	7	-	-	7
	B	-		7	7	7	-	7
	C	7	7		-	7	-	7
	D	7	7	-		7	7	7
	E	-	7	7	7		-	7
	F	-	7	-	7	-		7
	G	14	14	14	14	14	14	

Stage Diagram



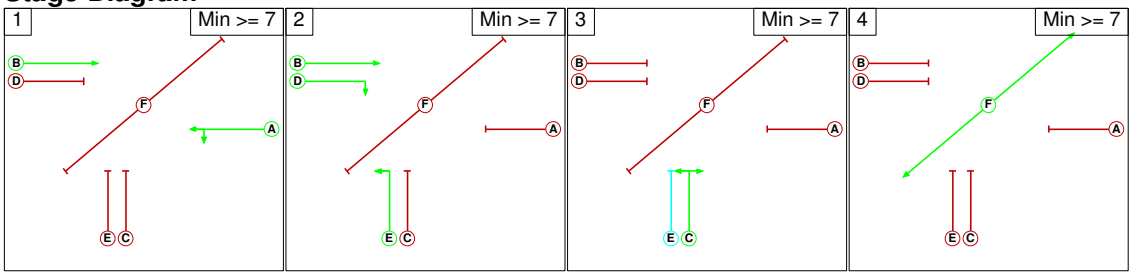
Basic Results Summary

C2

Phase Intergreens Matrix

Terminating Phase	Starting Phase						
		A	B	C	D	E	F
	A		-	7	7	7	7
	B	-		7	-	-	7
	C	7	7		7	-	7
	D	7	-	7		-	7
	E	7	-	-	-		7
	F	14	14	14	14	14	

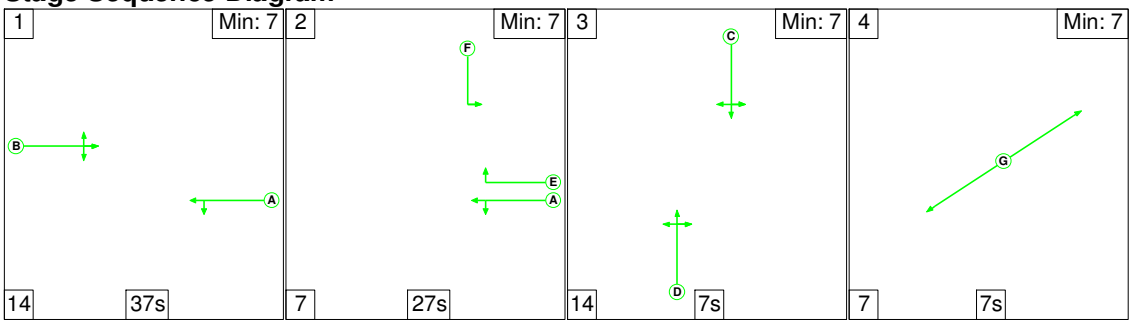
Stage Diagram



Scenario 1: 'Scenario 3' (FG3: 'Design Year Weekday AM Peak + Prop Residential Dev', Plan 1: 'Network Control Plan 1')

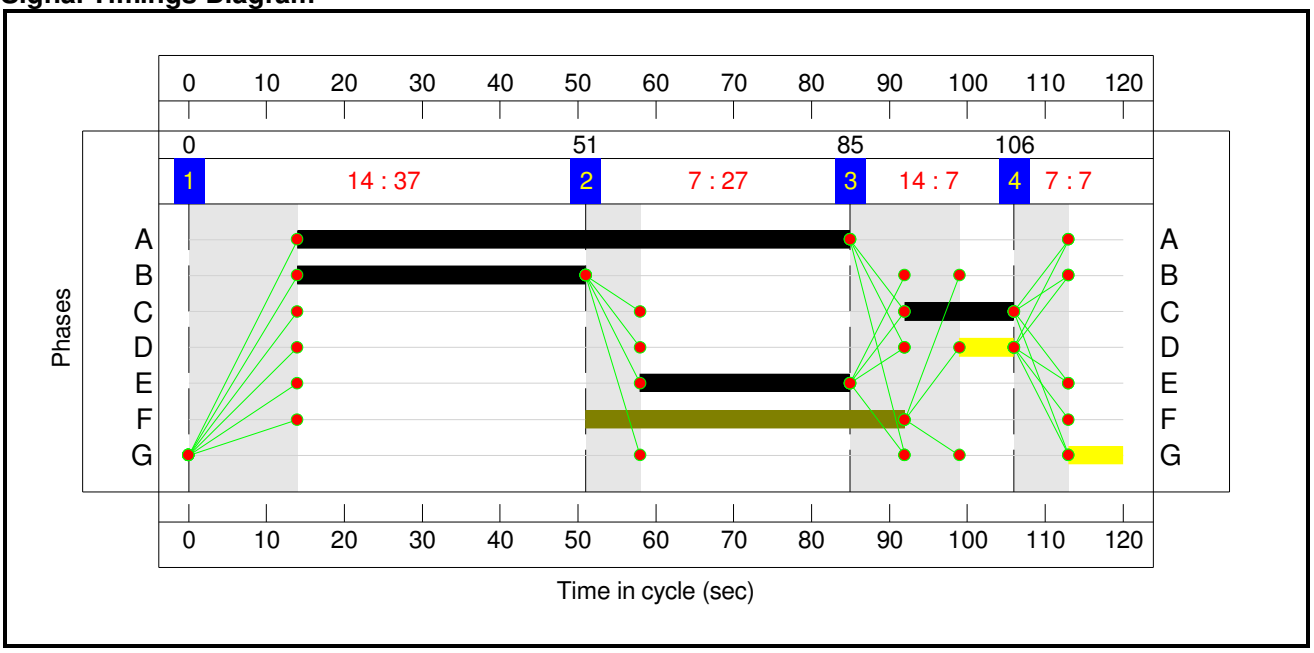
C1

Stage Sequence Diagram



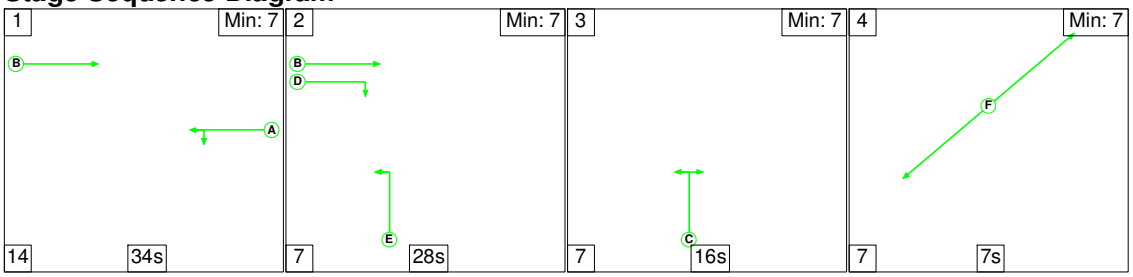
Basic Results Summary

Signal Timings Diagram

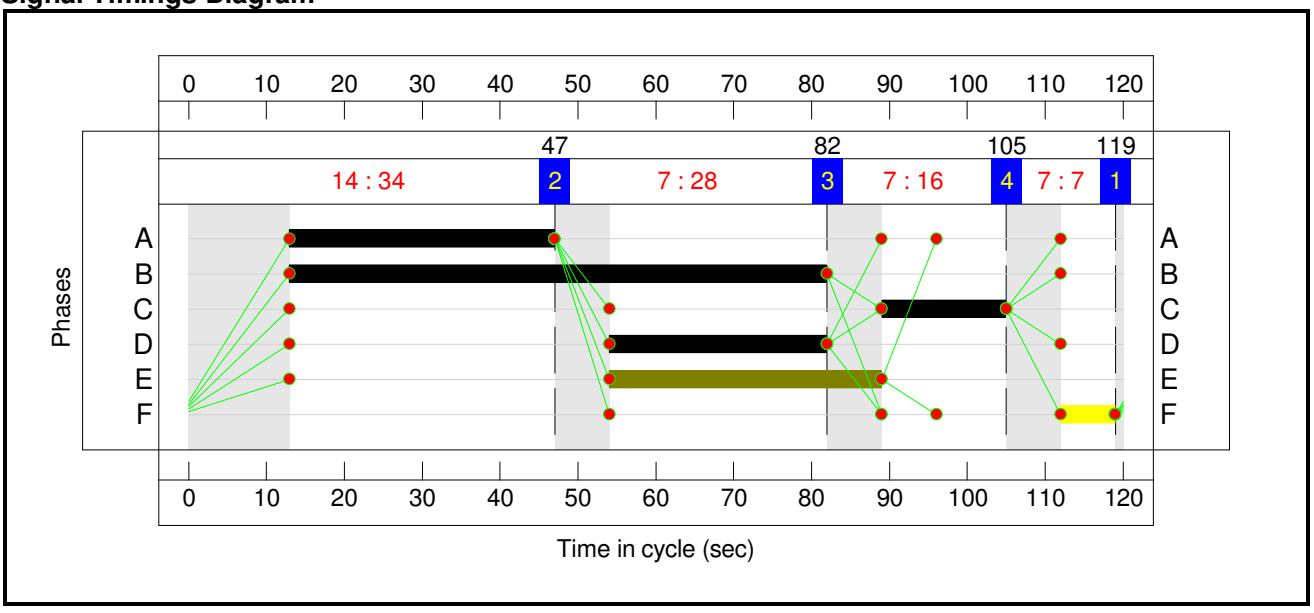


C2

Stage Sequence Diagram



Signal Timings Diagram



Basic Results Summary

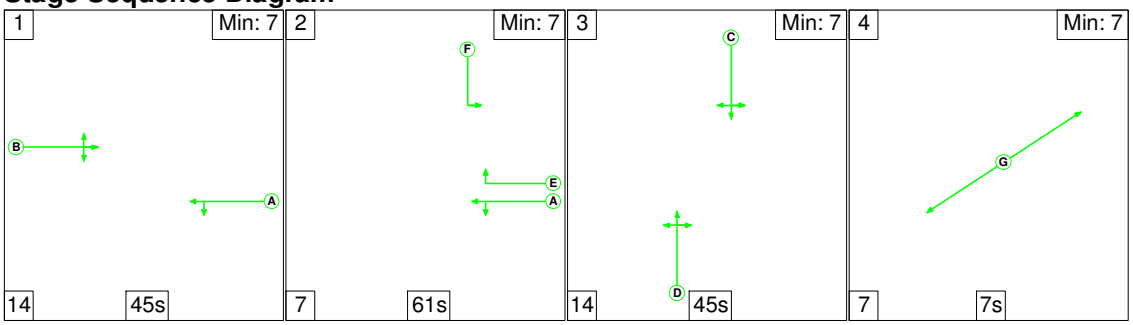
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A77 Ayr Road/ Barrhead Road/ Gilmourton Crescent/ Eaglesham Road	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**88.8%**	**37**	**76**	**0**	**41.2**	**-**	**-**
J1: A77 Ayr Road/ Barrhead Road/ Gilmourton Crecent	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**88.8%**	**37**	**76**	**0**	**22.4**	**-**	**-**
1/1	A77 Ayr Road (North) Left Ahead	U	C1:A		1	71	-	349	2064	1238	28.2%	-	-	-	0.4	3.9	0.8
1/2	A77 Ayr Road (North) Right	U	C1:E		1	27	-	411	2005	468	87.9%	-	-	-	6.2	54.4	15.1
2/1	Gilmourton Crescent Left Right Ahead	U	C1:D		1	7	-	31	1810	121	25.7%	-	-	-	0.6	73.2	1.1
3/2+3/1	A77 Ayr Road (South) Right Ahead Left	O+U	C1:B		1	37	-	665	2045:1772	532+217	88.8 : 88.8%	1	0	0	10.4	56.2	20.8
4/1+4/2	Barrhead Road Ahead Right Left	U+O	C1:C	C1:F	1	55:14	41	524	1764:1897	719+196	56.8 : 59.0%	36	76	0	4.8	32.9	10.2
J2: A77 Ayr Road/ Eaglesham Road	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**80.2%**	**0**	**0**	**0**	**18.8**	**-**	**-**
1/1+1/2	A77 Ayr Road (North) Ahead Left	U	C2:A		1	34	-	497	1847:2040	488+132	80.2 : 80.2%	-	-	-	7.1	51.5	14.6
2/1+2/2	Eaglesham Road Left Right	U	C2:C	C2:E	1	51:16	35	581	1727:1855	482+263	78.0 : 78.0%	-	-	-	7.1	44.2	10.9
3/1	A77 Ayr Road (South) Ahead	U	C2:B		1	69	-	548	2035	1187	46.2%	-	-	-	1.0	6.5	2.5
3/2	A77 Ayr Road (South) Right	U	C2:D		1	28	-	345	1977	478	72.2%	-	-	-	3.5	36.7	8.6

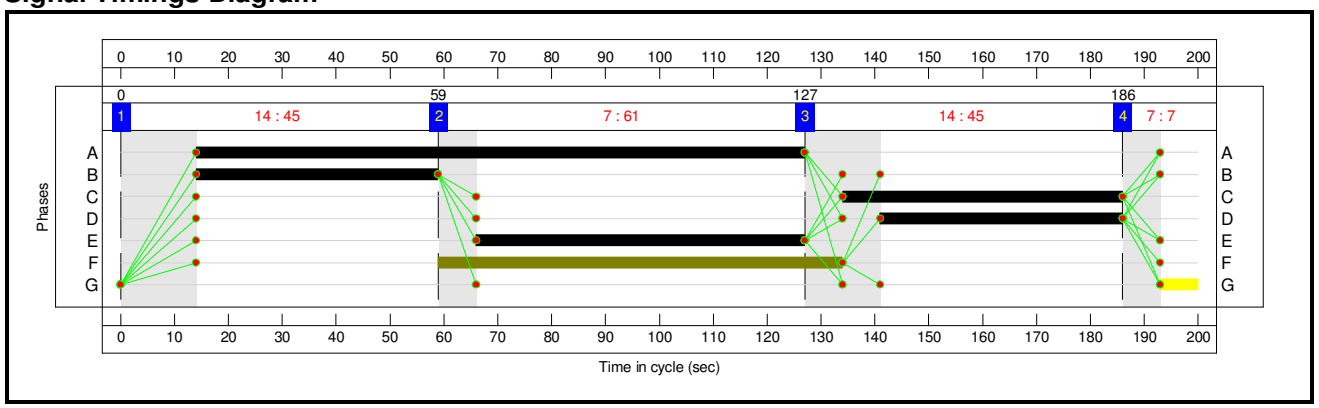
Basic Results Summary

C1	PRC for Signalled Lanes (%):	1.4	Total Delay for Signalled Lanes (pcuHr):	22.39	Cycle Time (s):	120
C2	PRC for Signalled Lanes (%):	12.3	Total Delay for Signalled Lanes (pcuHr):	18.77	Cycle Time (s):	120
	PRC Over All Lanes (%):	1.4	Total Delay Over All Lanes(pcuHr):	41.16		

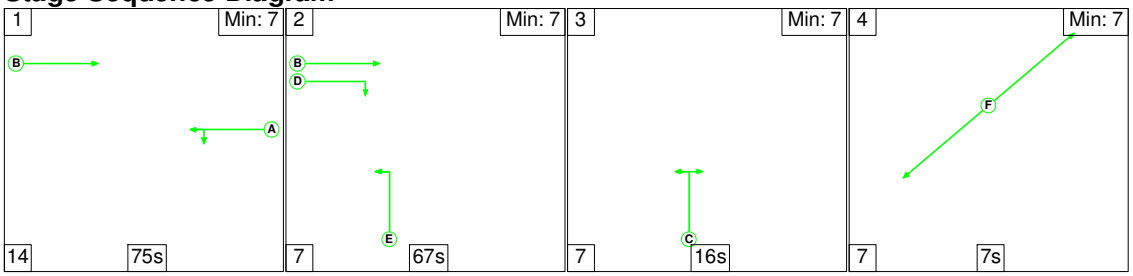
Basic Results Summary
Scenario 2: 'Scenario 6' (FG6: 'Design Year Weekday PM Peak + Prop Residential', Plan 1: 'Network Control Plan 1')
C1
Stage Sequence Diagram



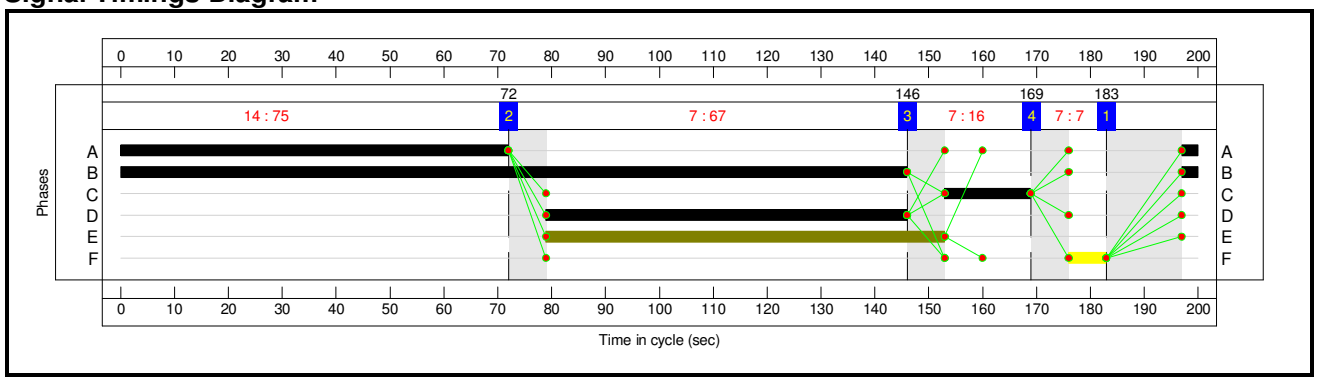
Signal Timings Diagram



C2
Stage Sequence Diagram



Signal Timings Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A77 Ayr Road/ Barrhead Road/ Gilmourton Crescent/ Eaglesham Road	-	-	-		-	-	-	-	-	-	**70.4%**	**121**	**44**	**0**	**42.3**	-	-
J1: A77 Ayr Road/ Barrhead Road/ Gilmourton Crecent	-	-	-		-	-	-	-	-	-	**70.4%**	**121**	**44**	**0**	**21.9**	-	-
1/1	A77 Ayr Road (North) Left Ahead	U	C1:A		1	113	-	341	2064	1176	29.0%	-	-	-	0.8	8.0	7.7
1/2	A77 Ayr Road (North) Right	U	C1:E		1	61	-	437	2005	622	70.3%	-	-	-	5.8	47.5	14.3
2/1	Gilmourton Crescent Left Right Ahead	U	C1:D		1	45	-	15	1830	421	3.6%	-	-	-	0.3	64.3	0.7
3/2+3/1	A77 Ayr Road (South) Right Ahead Left	O+U	C1:B		1	45	-	403	2044:1772	329+247	70.0 : 70.0%	1	0	0	8.6	77.2	14.4
4/1+4/2	Barrhead Road Ahead Right Left	U+O	C1:C	C1:F	1	127:52	75	633	1764:1904	647+251	70.4 : 70.4%	120	44	0	6.4	36.7	15.2
J2: A77 Ayr Road/ Eaglesham Road	-	-	-		-	-	-	-	-	-	**70.1%**	**0**	**0**	**0**	**20.4**	-	-
1/1+1/2	A77 Ayr Road (North) Ahead Left	U	C2:A		1	75	-	547	1834:2040	556+224	70.1 : 70.1%	-	-	-	8.6	56.8	22.7
2/1+2/2	Eaglesham Road Left Right	U	C2:C	C2:E	1	90:16	74	470	1727:1855	583+158	63.4 : 63.4%	-	-	-	7.2	55.4	17.0
3/1	A77 Ayr Road (South) Ahead	U	C2:B		1	149	-	359	2035	1526	23.5%	-	-	-	0.5	5.4	2.9
3/2	A77 Ayr Road (South) Right	U	C2:D		1	67	-	331	1977	672	49.2%	-	-	-	4.0	44.0	15.7

Basic Results Summary

C1	PRC for Signalled Lanes (%):	27.8	Total Delay for Signalled Lanes (pcuHr):	21.88	Cycle Time (s):	200
C2	PRC for Signalled Lanes (%):	28.4	Total Delay for Signalled Lanes (pcuHr):	20.44	Cycle Time (s):	200
	PRC Over All Lanes (%):	27.8	Total Delay Over All Lanes(pcuHr):	42.32		