

## **APPENDIX H**

**A1 Traffic Data Collection Report**

**A1 Traffic Model Flow Diagrams**

**Chinauley Park Microsimulation**



# A1 Junctions Phase 2

## DMRB Stage 3 and the Publication of Draft Statutory Orders

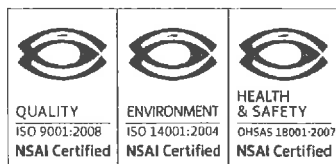
### Traffic Data Collection Report

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## APPENDICES

Appendix A: A1 Traffic Surveys Footage Review

## 1 PROJECT BACKGROUND

The A1 Dual Carriageway forms part of a strategically important north-south arterial route connecting the major cities and ports of Belfast and Dublin. It forms part of the Trans-European Transport Network (TEN-T) Priority Project 13 and is classified as a Key Transport Corridor (KTC) within the Department for Infrastructures Strategic Transport Network. It also acts as the key transport link between the communities in that area and provides a strategic link to Belfast from the South-East of the Province. In that regard, it is considered to have national, regional and local significance both economically and socially.

The section of the A1 under consideration is a 25.2km long stretch of all-purpose dual carriageway, extending from the Dublin Road Junction at Loughbrickland in the south to the Hillsborough Roundabout in the north.

As this stretch of carriageway has undergone development over a number of decades, some sections up to forty years ago, there is a combination of grade separated and at grade junctions, private and farm accesses onto the A1 designed and constructed to different standards with characteristics that would no longer be considered desirable. The significant number of access points coupled with sections of poor horizontal alignment, vertical alignment, visibility and a narrow central reserve results in problems summarised as follows:

- Lack of route consistency
- Gaps in the central reserve permitting crossing manoeuvres
- Issues associated with right turning and u-turning vehicles:
  - Sub-standard right turn facilities resulting in vehicles overhanging or encroaching into the offside lane,
  - Weaving vehicles,
  - Vehicles pulling into the offside lane at low speed from side roads,
  - Multiple vehicles waiting within the central reserve, and
  - Steeply inclined accommodation crossings
- Lack of central reserve barrier along most of the route resulting in errant vehicles crossing the central reserve
- Geometric layout of certain junctions
- Limited weaving lengths between grade-separated junctions and minor road junctions and accesses
- Inconsistent and unreliable journey times

## 2 PROJECT BRIEF

The RPS-Sweco Consortium (RSC) was appointed by the Department for Infrastructure on 7<sup>th</sup> September 2015 to carry out a TD 37/93 Design Manual for Roads and Bridges (DMRB) Stage 3 Assessment to further develop the design and consider the environmental, engineering, economic, safety and traffic advantages, disadvantages and constraints of the preferred option.

### 3 OBJECTIVE OF THIS REPORT

Prior to RSC's appointment the Stage 1 and Stage 2 DMRB Scheme Assessments and the preparation of those Reports were undertaken by Aecom. Following a handover meeting on 26th January 2016, RSC received the spreadsheet traffic model developed by Aecom and the accompanying data that had been used in the assessments of the scheme during Stages 1 and 2. That model has a base year of 2013 and forecast traffic flows for future years of 2018 and 2033. Part of RSC's work involves reviewing and updating the traffic model forecasting and appraisal for the Stage 3 Assessment.

Traffic surveys are required to create a new 2016 base year model representing existing flows on the network. From this base, forecast scenarios for the scheme, year of opening and design year will be developed for use in the appraisal of the preferred scheme. These flows will be used to inform the preliminary design of the scheme and will form the basis of the economic assessment and also the noise and air quality environmental assessments that will be reported in the Environmental Statement.

The model update is being undertaken in line with the UK Department for Transport's Web-based Transport Appraisal Guidance (WebTAG). WebTAG provides detailed information on the development of transport models, validation criteria and acceptability guidelines and the assessment of fitness-for-purpose. The following units are referenced in this report:

- TAG Unit M1.2: Data Sources and Surveys (January 2014); and
- TAG Unit M3.1: Highway Assignment Modelling (January 2014)

This report summarises the existing traffic data available and details new traffic data collection. The data will be used in an update of the spreadsheet model to provide appropriate traffic information for the Stage 3 design and assessment.

The structure of this report is as follows:

- Section 0: Existing Traffic Data
- Section 5: 2016 Data Collection
- Section 6 Survey Outcome
- Section 7 Survey Data Checks
- Section 8: Forecasting
- Section 0: Summary

## 4 EXISTING TRAFFIC DATA

There have been numerous surveys undertaken on this section of the A1 since 2003 that have been used in the creation of the 2013 base model. Those surveys have incorporated fully classified two way link flows, journey times, and junction turning counts, ranging from 3 hour AM and PM surveys to full 12 hour surveys.

In total, 38 junctions within the study area have been surveyed. A full list of the junctions and the year of their most recent survey is provided below in Table 4.1 showing that the majority of sites surveyed were undertaken during or prior to 2010, with a further survey of 10 junctions conducted in 2013.

Table 4.2 and Figure 4.2 below provide the details and locations of the junctions.

Site	Most Recent Survey
Hillsborough Roundabout	2007
Moirra Road	2013
Ballygowan Road/ Dromore Road, Hillsborough	2011
Glen Road	2013
Dromara Road	2007
Dromore Road	2013
Taughblane Road	2007
Backnamullagh Road	2010
Listullycurran Road	2010
Milebush Road (North)	2013
Grove Road	2013
B2 Hillsborough Road	2010
Milebush Road (South)	2013
Connollystown Road	2013
Maypole Hill	2007
B2 Lurgan Road	2007
Lower Quilly Road	2007
Rowantree Road/ B2 Banbridge Road, Dromore	2012
Mackey's Lane/ Boals Lane	2013
Gowdystown Road	2010
Mount Ida Road	N/A
Edenordinary Road	2007
Drumneath Road	2007
Skelton Road	2010
Kilmacrew Road	2013
Graceystown Road	2007
Waringsford Road	2010
A26 Dromore Road	2012
Lisnaree Road	2007
Old Manse Road	2010
Old Manse Road/ Castlewellan Road	2009
Castlewellan Road/ Chinauley Park	2009
Rathfriland Road	2004
Cascum Road/ Newry Road Junction	2010
Springwell Loanin	2013
Banbridge Road	2007
B3 Dublin Road	2012
B3 Grovehill Road	2012

Table 4.1 – Existing junction count survey data

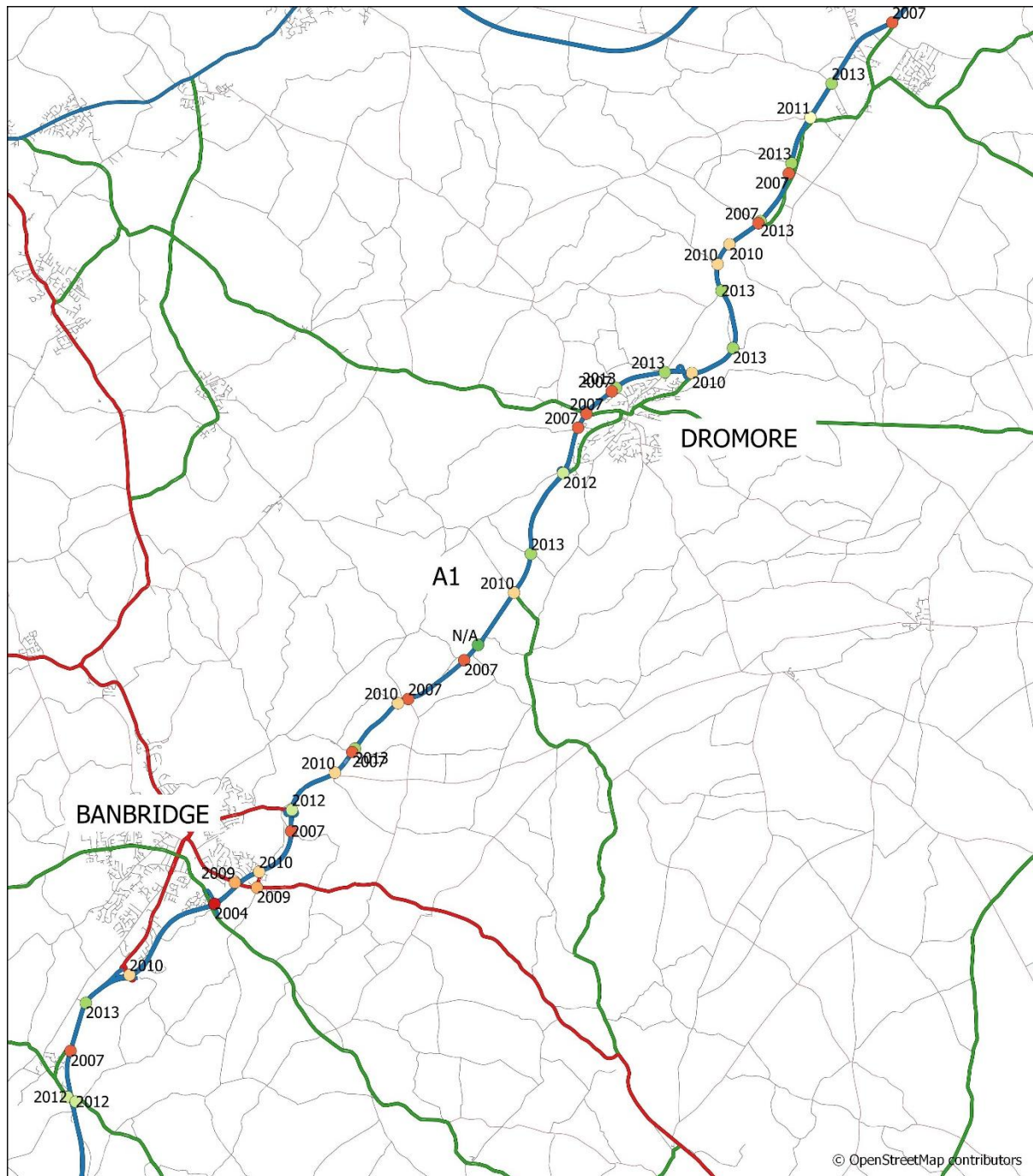


Figure 4.1 – Existing Junction Turning Count Survey Data



In addition to the junction turning count and link flow surveys, Automatic Traffic Count (ATC) data has been supplied by Transport Northern Ireland for 8 sites on the A1 within the study area. Table 4.2 and Figure 4.2 below provide details of these sites.

Site No.	Location
522	A1 - Harry's Road
530	Millvale Road Overpass
11300060	Lisburn @ Commercial Garages (NB)
11300059	Lisburn @ Commercial Garages (SB)
410	South of Rowantree Road / Banbridge Road Junction
411	North of Old Manse Road Junction
41400388	Newry Road/ Cascum Road Junction
419	A1 Loughbrickland – Newry, South of Moneymore Road

Table 4.2 – ATC Survey Information

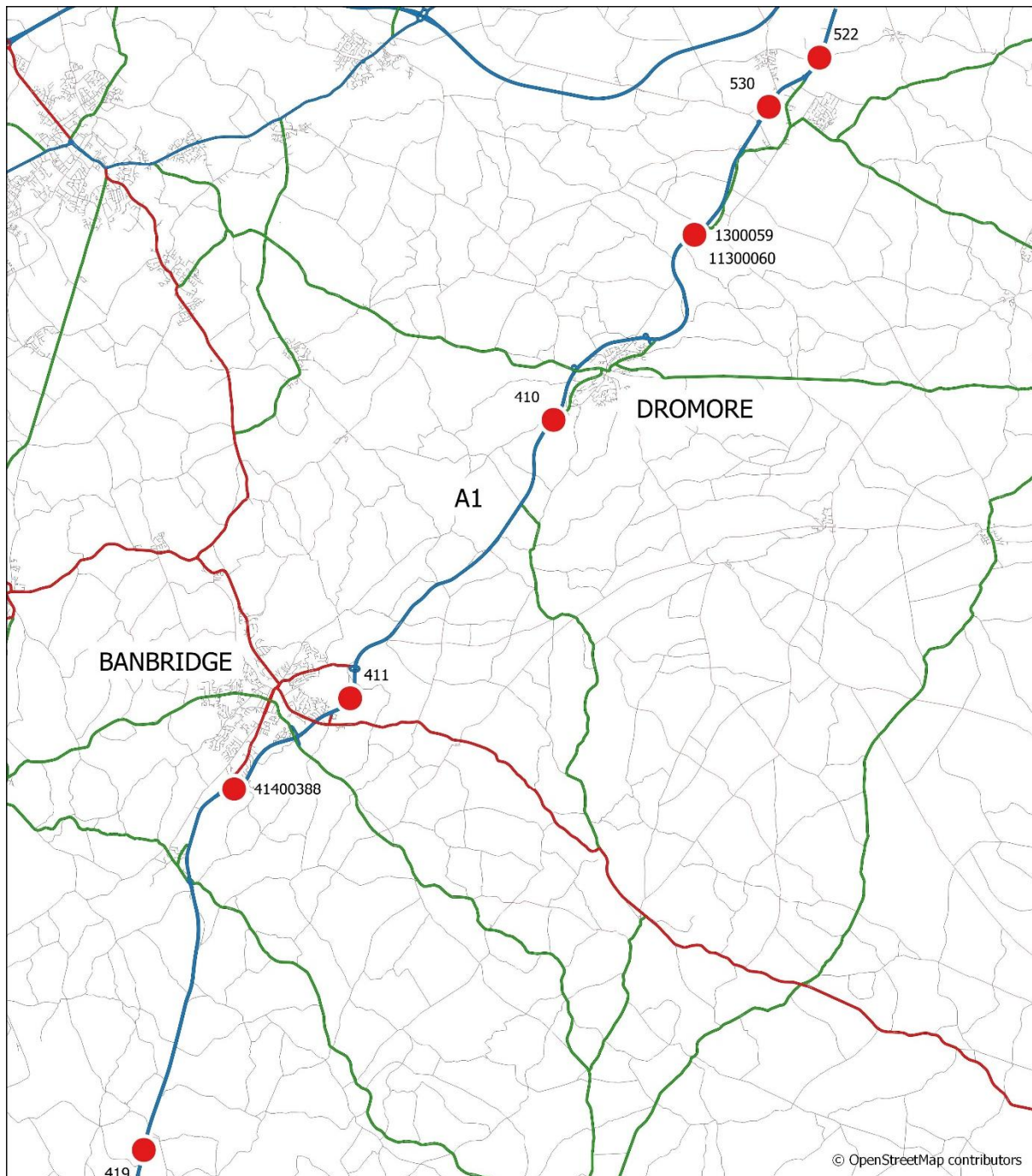


Figure 4.2 – Transport NI ATC Sites

A journey time survey was also previously undertaken along the A1 between Hillsborough Roundabout and Loughbrickland grade separated junction, a total distance of 25.2km. This took place on Thursday 11th April 2013 during 09:30-12:30 and 13:30-16:00. The timing points used in the survey are listed in Table 4.3. The journey time survey data was used to validate journey time outputs from the COBA (COst Benefit Analysis) model in the Stage 2 Assessment.

Journey Time Timing Points
Hillsborough Roundabout
Moirá Road
Dromore Road / Ballygowan Road Grade-separated Junction, Hillsborough (Pantridge Link)
Dromore Rd
Listullycurran Rd
Grove Rd
B2 Hillsborough Road Grade-separated Junction, Dromore
Church St
Banbridge Rd
Boals Ln
Gowdystown Rd
Skeltons Rd
Waringsford Rd
Dromore St
Castlewellan Rd
Rathfriland Rd
Newry Road Grade-separated Junction
Old Newry Rd
Loughbrickland Grade-separated Junction

Table 4.3 – Journey Time Timing Points

## 5 2016 SURVEY SPECIFICATION

WebTAG Unit M3.1 recommends that trips matrices should not be adopted from existing models unless trips are based on survey data less than six years old. In order to comply with the advice provided in the guidance, it was proposed to make use of data that was collected in 2013 or later but collect new data at sites where data was collected prior to 2013. This will also ensure that flows for all junctions on the network will reflect any changes to the network as a result of the grade separated junctions completed in 2010 as part of the Phase 1 scheme.

JTCs were carried out over a 12 hour period and include queue length data collection at proposed grade separated junctions to be used in operational assessment.

Table 5.1 below provides location coordinates of the 2016 survey sites.

Site	Name	WGS X	WGS Y
1	Hillsborough Roundabout	-6.07767	54.47291
2	Ballygowan Road/ Dromore Road, Hillsborough	-6.09977	54.45879
3	Dromara Road	-6.1058	54.45038
4	Taughblane Road	-6.11408	54.44295
5	Backnamullagh Road	-6.12179	54.43985
6	Listullycurran Road	-6.12505	54.43689
7	B2 Hillsborough Road	-6.13252	54.42046
8	Maypole Hill	-6.1536	54.41799
9	B2 Lurgan Road	-6.16035	54.41456
10	Lower Quilly Road	-6.16264	54.41246
11	Rowantree Road/ B2 Banbridge Road, Dromore	-6.16685	54.4056
12	Gowdstown Road	-6.18053	54.38758
13	Mount Ida Road	-6.19026	54.37977
14	Edenordinary Road	-6.19396	54.3775
15	Drumneath Road	-6.20885	54.37181
16	Skelton Road	-6.21155	54.3712
17	Graceystown Road	-6.2238	54.36392
18	Waringsford Road	-6.22847	54.36086
19	A26 Dromore Road	-6.23995	54.35523
20	Lisnaree Road	-6.24029	54.352
21	Old Manse Road	-6.24891	54.34596
22	Old Manse Road/ Castlewellan Road	-6.24958	54.34356

Site	Name	WGS X	WGS Y
23	Castlewellan Road/ Chinauley Park	-6.25529	54.34441
24	Rathfriland Road	-6.26075	54.34124
25	Cascum Road/ Newry Road Junction	-6.28337	54.33076
26	Banbridge Road	-6.29923	54.31943
27	B3 Dublin Road & B3 Grovehill Road	-6.29918	54.31182

Table 5.1 – Site Locations

Figure 5.1 illustrates the location of the survey sites graphically and also provides existing data sites surveyed in 2013.

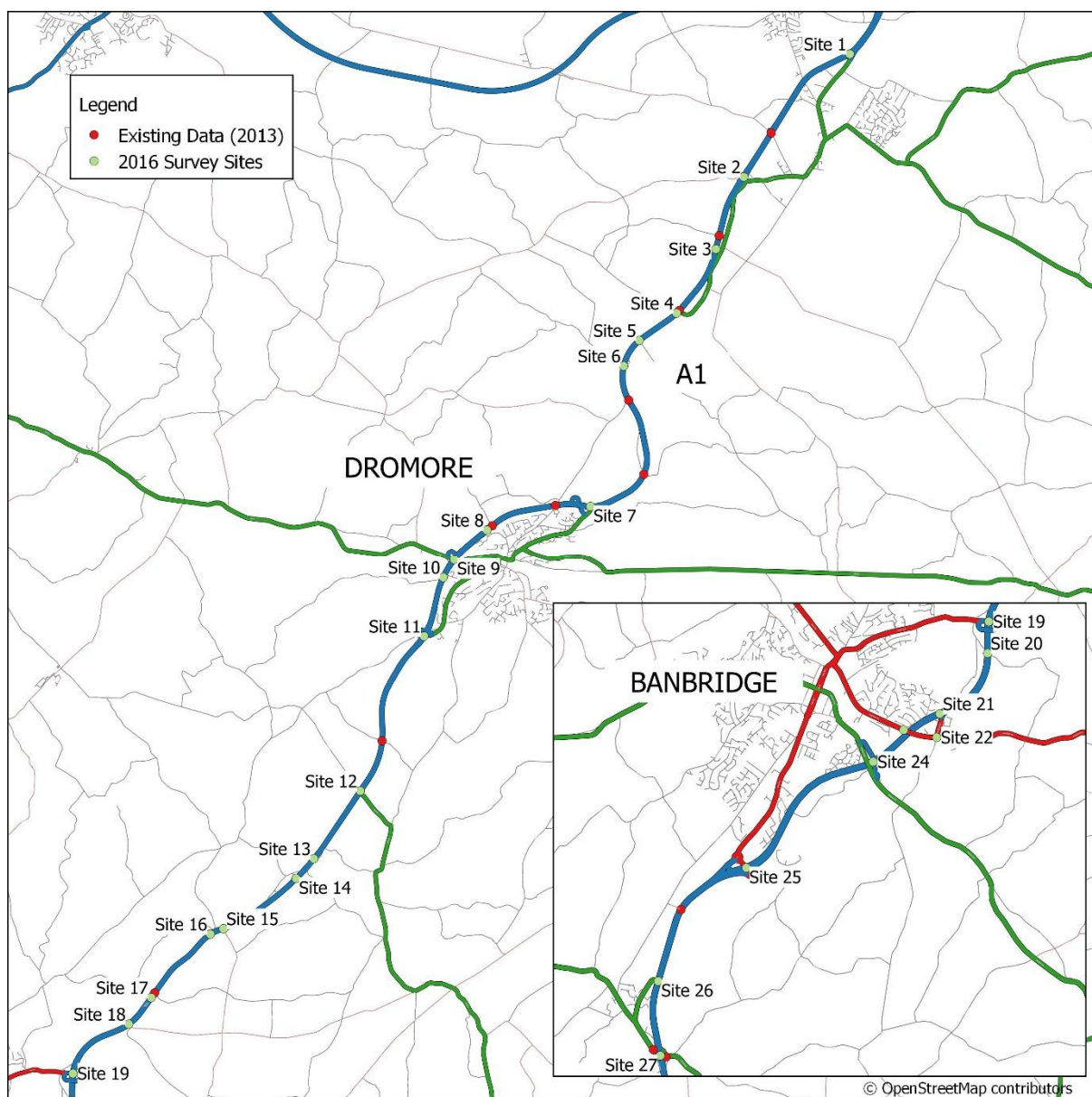


Figure 5.1 – 2016 Junction Turning Count Survey Locations

WebTAG Unit M1.2 recommends that data collection is undertaken within a neutral month including:

- late March and April – excluding the weeks before and after Easter;
- May - excluding the Thursday before and all of the week of each Bank Holiday;
- June;
- September – excluding school holidays or return to school weeks;
- all of October; and
- all of November – provided adequate lighting is available.

These neutral months avoid main and local holiday periods, school holidays and other non-standard traffic periods. The new classified junction turning count surveys for the Stage 3 Assessment were undertaken between 0700 and 1900 on Wednesday 23rd November 2016, in line with WebTAG guidance. Before the surveys took place, the survey company confirmed and cleared dates and times of the surveys with Armagh City, Banbridge and Craigavon Borough Council, Lisburn and Castlereagh City Council, Transport Northern Ireland and the Police Service of Northern Ireland to ensure that the routes were clear of road works and that no planned events resulted in atypical data.

Journey time survey data will also be used to revalidate journey time outputs from the COBA model in the Stage 3 Assessment. 2016 journey time surveys have been undertaken to cover both peak and interpeak periods in line with guidance within the COBA manual. Journey times have been collected using the moving observer technique for a minimum of 5 runs in each direction. Timing points are illustrated in Figure 5.2.



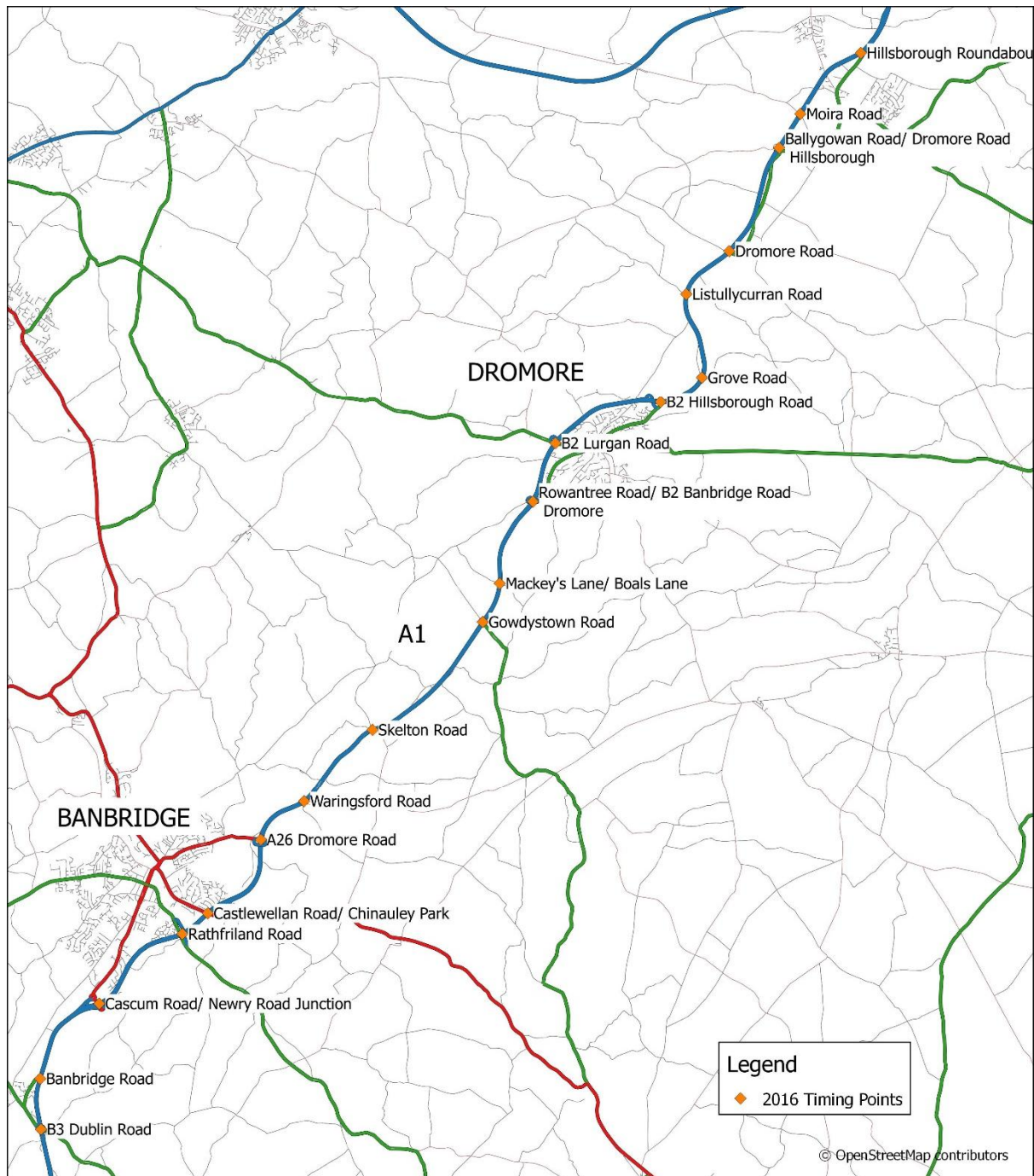


Figure 5.2 – Journey Time Timing Points

## 6 SURVEY OUTCOME

Survey equipment for traffic turning counts was in place on Wednesday 23<sup>rd</sup> and Thursday 24<sup>th</sup> November 2016. Two days were filmed to provide two days of data in case of incidents causing unrepresentative data.

During the survey period, the presence of fog was noted by both RSC staff and the surveyors on both survey days, with Wednesday 23<sup>rd</sup> being the lesser affected of the two survey days. Tracsis Ltd. provided record a footage review of this day to confirm that counting was unaffected. This is provided in Appendix A.

Additional checks were undertaken using available permanent count data provided by Transport NI to ensure weather conditions had not affected the level of traffic flow. Comparisons were made based on sites located closest to permanent counters, as shown in Table 6.1.

ATC No.	Site No.	Location	2015 Average Wednesday 0700 – 1000 ATC Flow (excluding holidays)	2016 0700 – 1000 Surveyed Flow	%Diff
522	1	A1 - Harry's Road	8,982	9,574	6.2%
530	2	Millvale Road Overpass	7,433	7,494	0.8%
410	11	South of Rowantree Road / Banbridge Road Junction	6,809	7,216	5.6%
411	21	North of Old Manse Road Junction	6,239	6,327	1.4%

Table 6.1 – ATC & Survey Comparison

As 2016 surveyed flows were similar or higher than the 2015 0700 – 1000 ATC average, it was inferred that weather conditions had not reduced traffic flows during data collection.

Between 7 and 10 journey time runs were achieved for each peak and interpeak period in each direction.

## 7 SURVEY DATA CHECKS

Flow and labelling errors at some junctions were identified and corrected in liaison with the survey company.

Logic checks were undertaken to ensure that traffic counts undertaken at adjacent junctions had a reasonably consistent traffic flow between them. Initially, data provided for Site 9 showed inconsistent flows with Site 10. Tracsis, the survey company commissioned, provided revised data at this site based on a recount. The final table of differences is presented in Table 7.1



Site Nos.	Location on A1	Flow Difference (12 hrs)		% Difference	
		Northbound	Southbound	Northbound	Southbound
4 & 5	Taughblane Rd & Backnamullagh Rd	148	-247	1%	-2%
8 & 9	Maypolehill Rd & B2 Lurgan Road	-417	269	-3%	2%
9 & 10	B2 Lurgan Rd & Lower Quilly Rd	-20	-359	0%	-3%
10 & 11	Lower Quilly Rd & Rowantree Rd	10	-192	0%	-2%
12 & 13	Gowdystown Rd & Mount Ida Rd	6	136	0%	1%
13 & 14	Edenordinary Rd & Drumneath Rd	-439	24	-3%	0%
17 & 18	Graceystown Rd & Waringsford Rd	3	35	0%	0%
18 & 19	Waringsford Rd & Dromore Rd	32	161	0%	1%
19 & 20	Dromore Rd & Lisnaree Rd	-45	158	0%	1%
20 & 21	Lisnaree Rd & Old Manse Rd	46	-113	0%	-1%
21 & 24	Old Manse Rd & Rathfriland Rd	-86	327	-1%	3%
24 & 25	Rathfriland Rd & Newry Rd	74	93	1%	1%
27 & 28	Banbridge Rd & Dublin Rd	223	-43	2%	0%

Table 7.1 – Adjacent Survey Flow Differences

After revisions, these flow differences between adjacent surveyed junctions were deemed to be acceptable.

To ensure that the 12HR 2016 survey data was typical the A1 mainline traffic flows from the survey were compared with available 12HR Wednesday average ATC data from 2015 provided by Transport NI. Comparisons were made based on sites located closest to permanent counters.

The comparison and percentage difference is shown in Table 7.2.

ATC No.	Site No.	Location	2015 Average Wednesday 12-hr ATC Flow (excluding holidays)	2016 Surveyed 12-hr Flow	%Diff
522	1	A1 - Harry's Road	35,932	36,976	2.8%
530	2	Millvale Road Overpass	29,440	29,627	0.6%
410	11	South of Rowantree Road / Banbridge Road Junction	25,609	27,053	5.3%
411	21	North of Old Manse Road Junction	22,904	23,707	3.4%

Table 7.2 – ATC & Survey Comparison

These differences were deemed to be within acceptable limits for daily variation and thus the survey was deemed to be representative for a typical weekday.

The final revisions to the survey data provided are named as follows:

- 3251-SCO A1 Traffic Surveys - JTC Sites 1-13 v3;
- 3251-SCO JTC Site 9 (Day 2);
- 3251-SCO A1 Traffic Surveys JTC Site 10;
- 3251-SCO A1 Traffic Surveys - JTC Sites 14-27 v3;
- 3251-SCO A1 Traffic Surveys JTC Site 16 v2; and
- 3251-SCO A1 Traffic Surveys - JTC Site 25 v3.

## 8 FORECASTING

Forecast traffic flows will be required in the various assessments that are required in the Stage 3 process. Survey data from previous years will be factored to the 2016 base year using historic ATC data for a consistent base year. Forecast flows are required at both the scheme opening year (currently estimated as 2021) and fifteen years after opening (2036).

Annual 24 hour data from permanent automatic traffic counters will be used to determine how local traffic growth rates compare with National Road Traffic Forecasts (NRTF). RSC will also continue to liaise with Transport NI regarding the ongoing update of TEMPRO NI and whether timescales and data suitability will enable TEMPRO NI to be used as a comparison against modelled flows.

Most assessments in the appraisal will require forecasts based on a typical day. Factors will be determined from the ATC sites to convert turning count data from peak period or 12 hour samples to annual average daily traffic flows (AADT).

Planned developments will be taken into consideration during the forecasting process. Developments modelled during Stage 2 will be reviewed to determine whether their status has changed and any new planned developments in the area will be considered. Significant committed developments will be assigned to the modelled network based on available information from planning applications. Committed development trips will be differentiated from background traffic growth to avoid double-counting of generated traffic.

## 9 SUMMARY

This report has detailed existing and recently collected traffic data that will be used to appraise the A1 Junctions Phase 2 Scheme. This data will be used to develop a new 2016 base traffic model for use in scheme design and assessment.

New survey sites have been chosen based on their location in context with the scheme proposals as well as the age of previous data collected.

Surveys were undertaken on Wednesday 23<sup>rd</sup> and Thursday 24<sup>th</sup> November 2016, with the data for Wednesday 23<sup>rd</sup> subsequently processed. Checks were undertaken to ensure that weather had not adversely affected data quality and that the surveys were representative of a typical neutral weekday. Following revisions to the data provided, RSC consider the data to be suitable for use in the Stage 3 DMRB assessment.

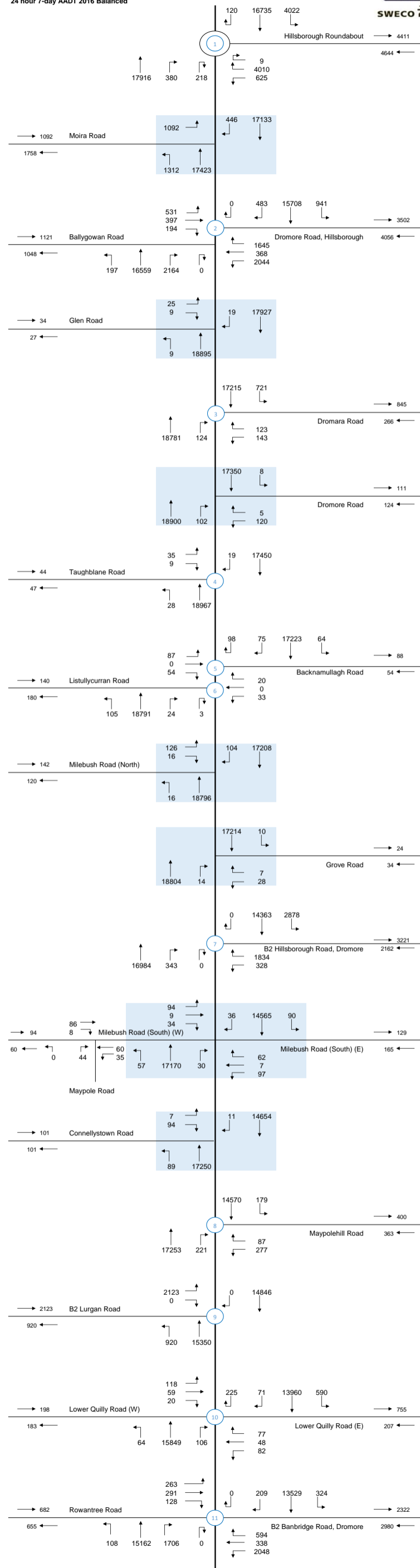
Forecast flows will be derived from the surveyed data based on local growth rates determined from ATC sites or NRTF factors, in combination with planning data. Traffic counts will be converted to annual average daily traffic (AADT) flows for assessment.

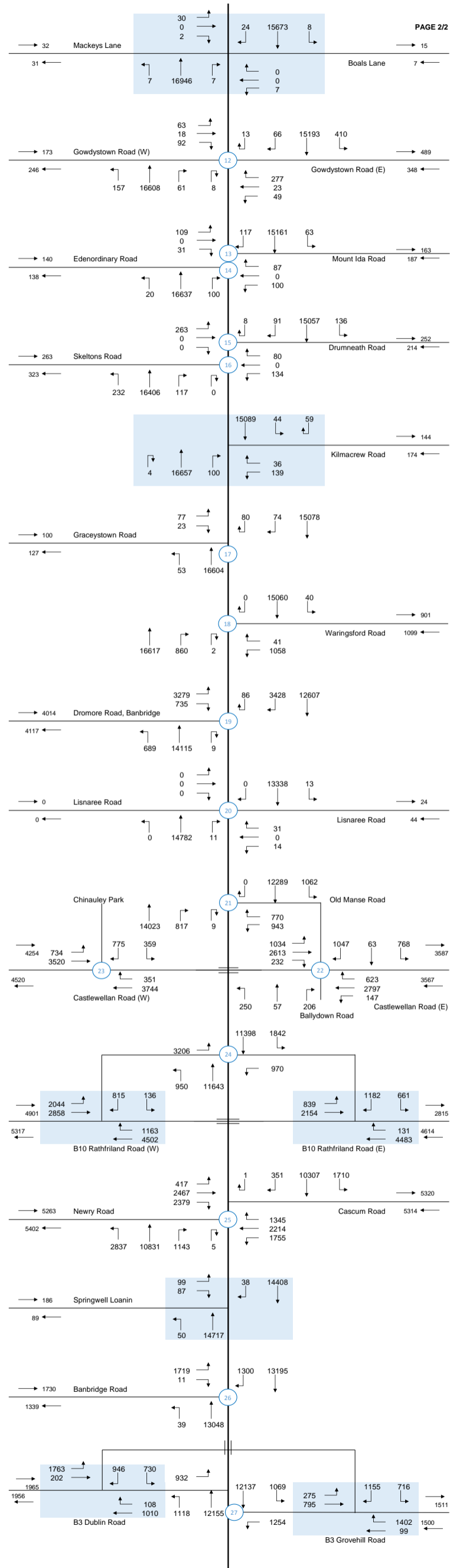
## APPENDIX A

### A1 Junctions Phase 2 – A1 Traffic Surveys Footage Review

# A1 Junctions Phase 2 - Network Flow Diagrams

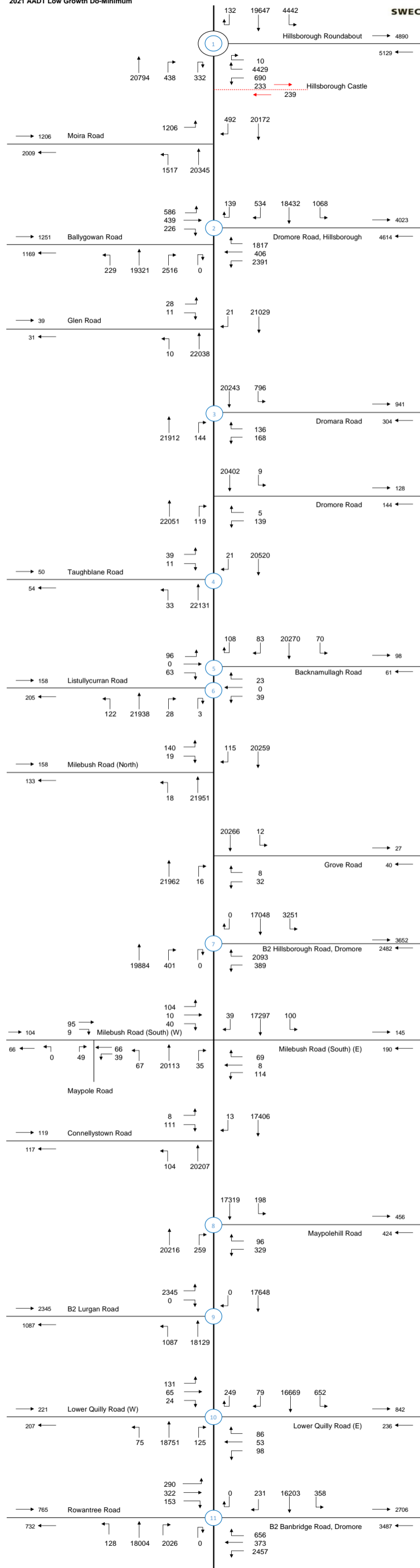
24 hour 7-day AADT 2016 Balanced

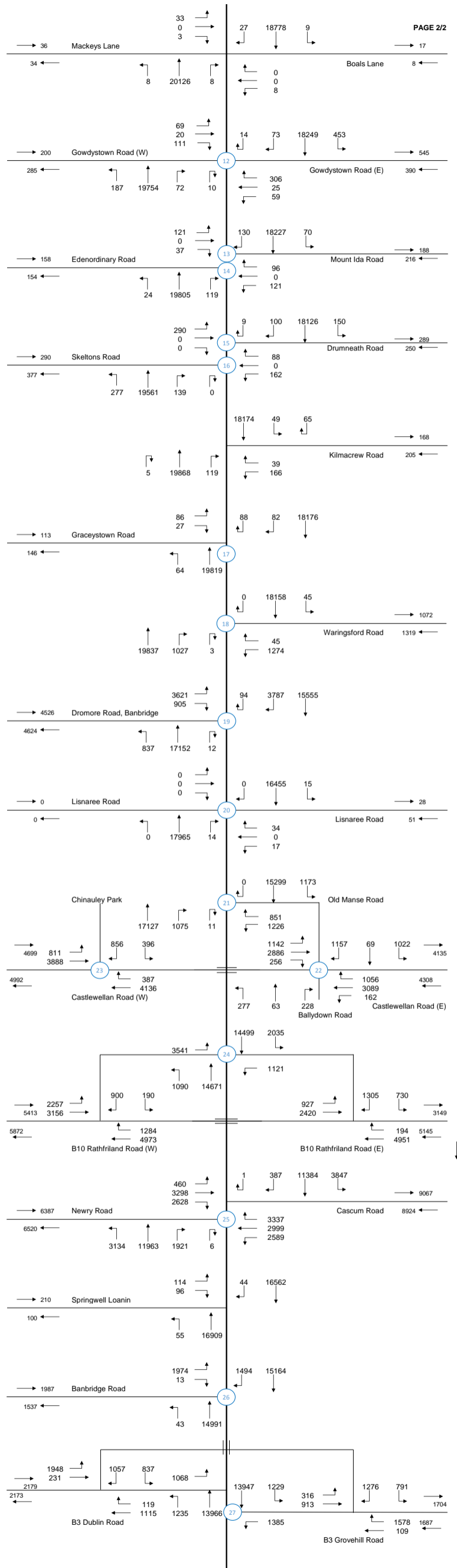




# A1 Junctions Phase 2 - Network Flow Diagrams

2021 AADT Low Growth Do-Minimum

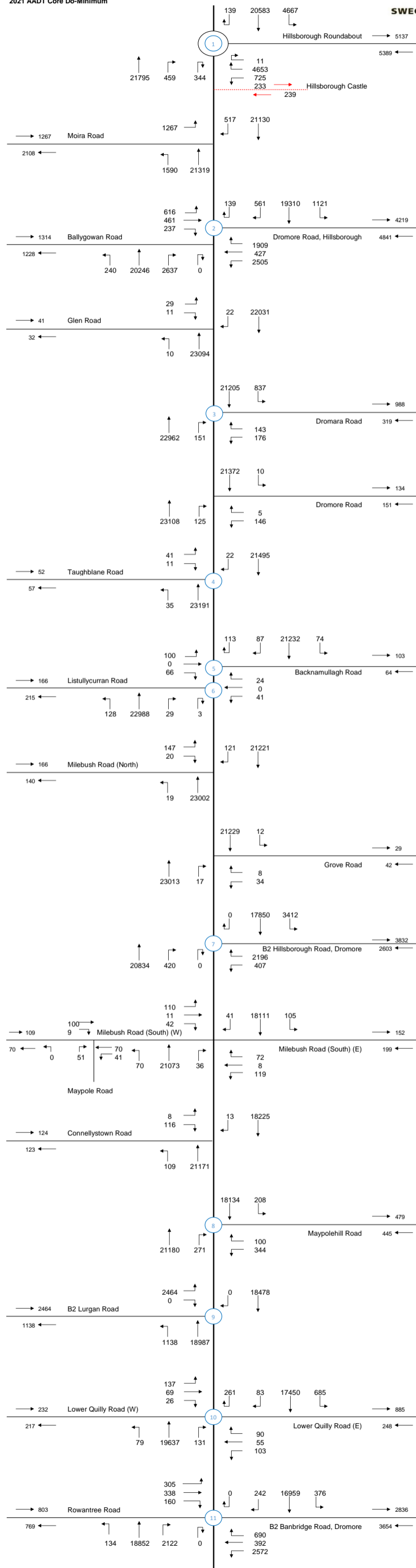


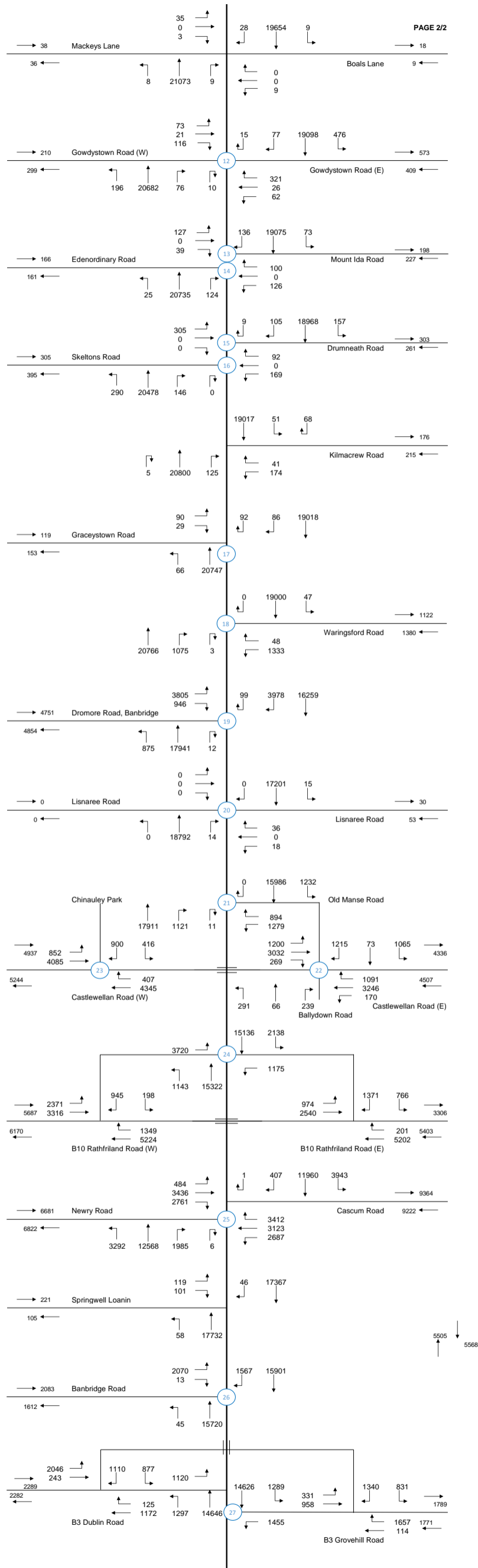




# A1 Junctions Phase 2 - Network Flow Diagrams

2021 AADT Core Do-Minimum

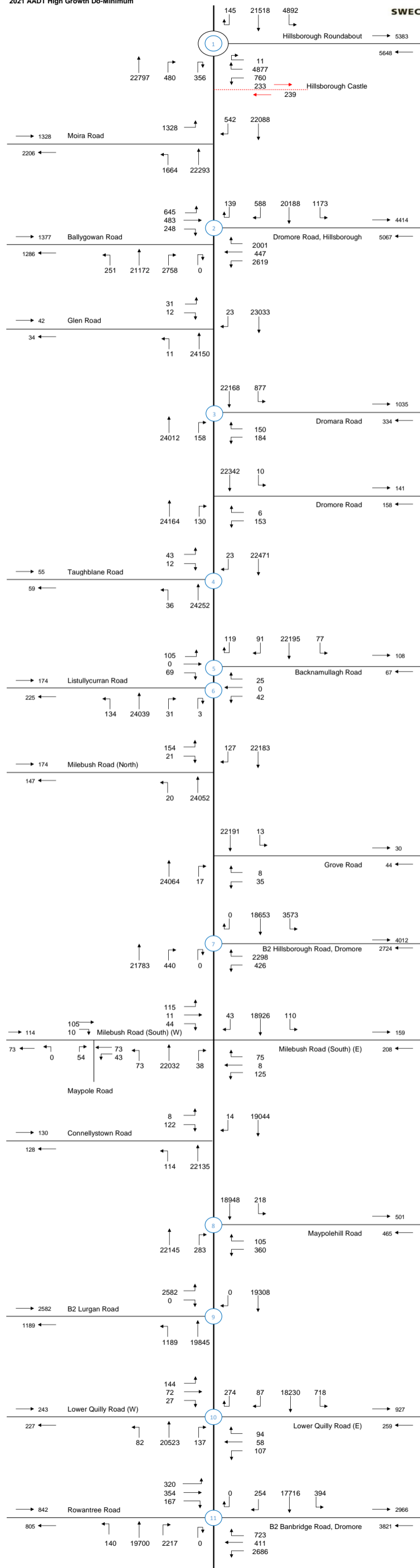


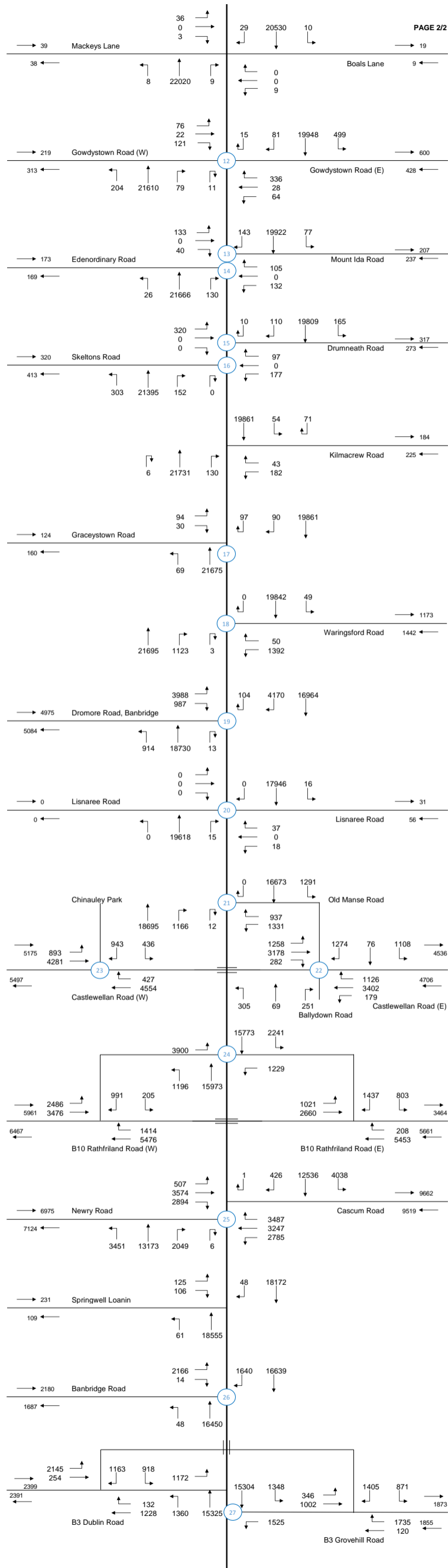


# A1 Junctions Phase 2 - Network Flow Diagrams

2021 AADT High Growth Do-Minimum

RPS

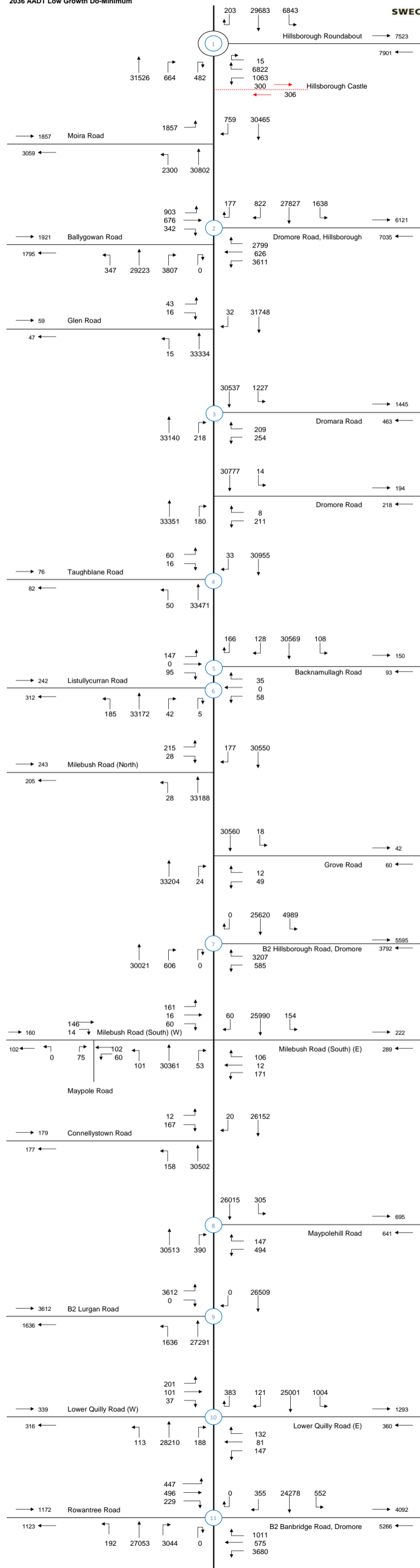


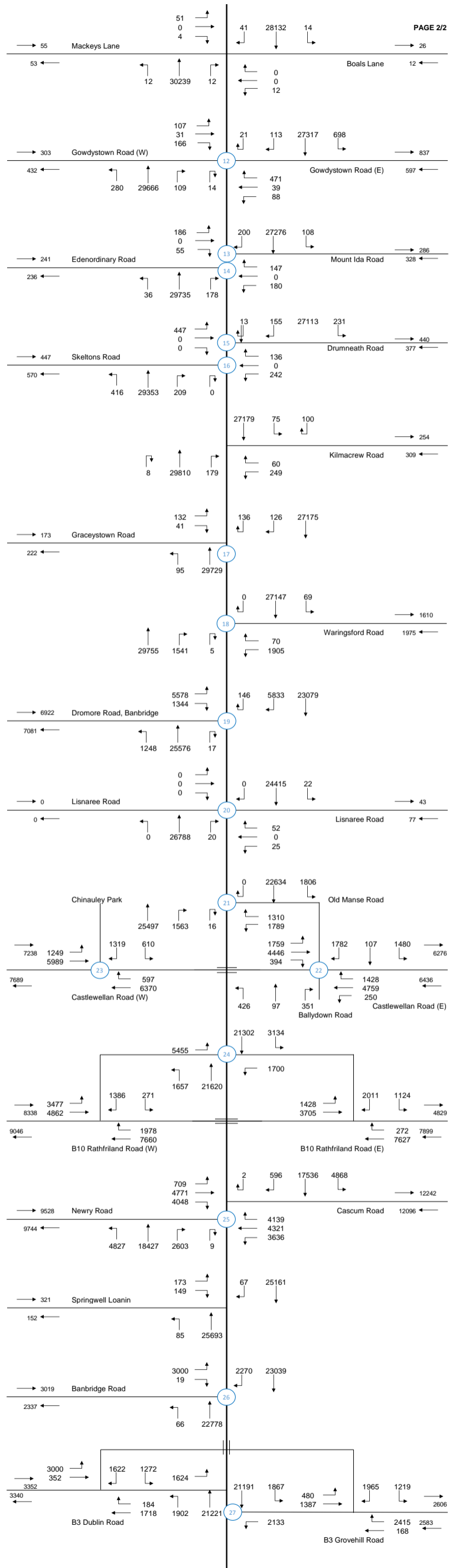


# A1 Junctions Phase 2 - Network Flow Diagrams

2036 AADT Low Growth Do-Minimum

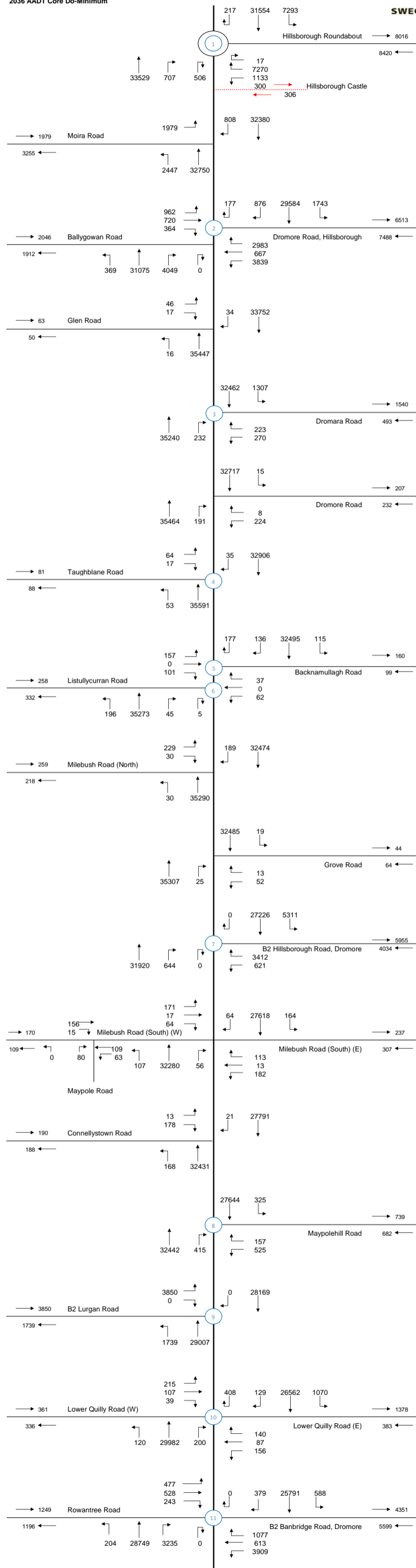
RPS

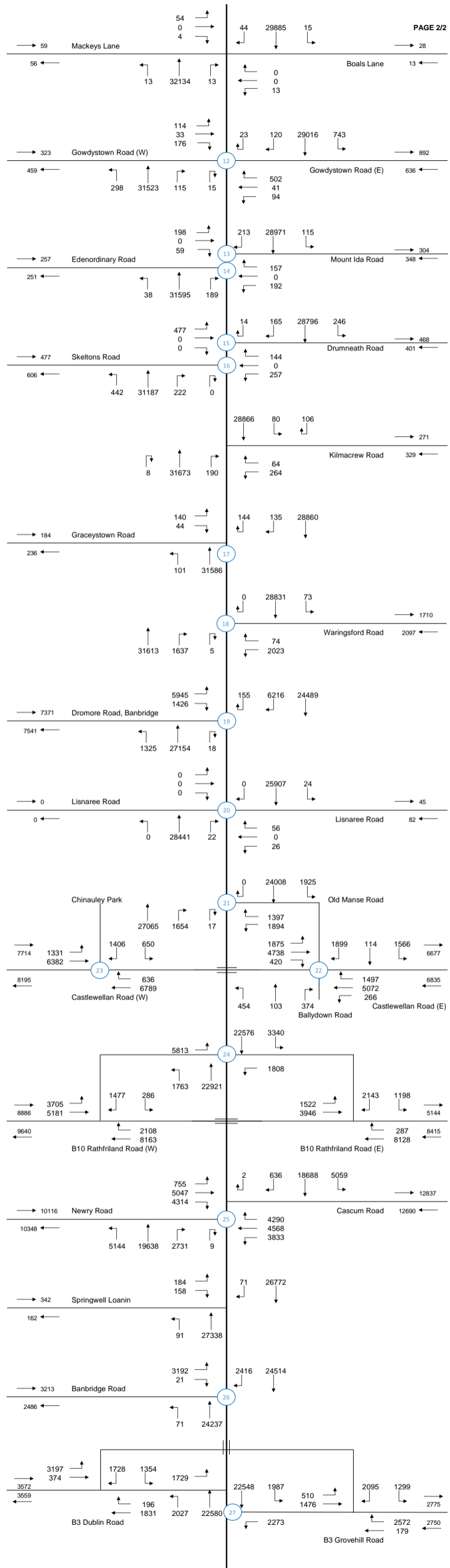




# A1 Junctions Phase 2 - Network Flow Diagrams

2036 AADT Core Do-Minimum

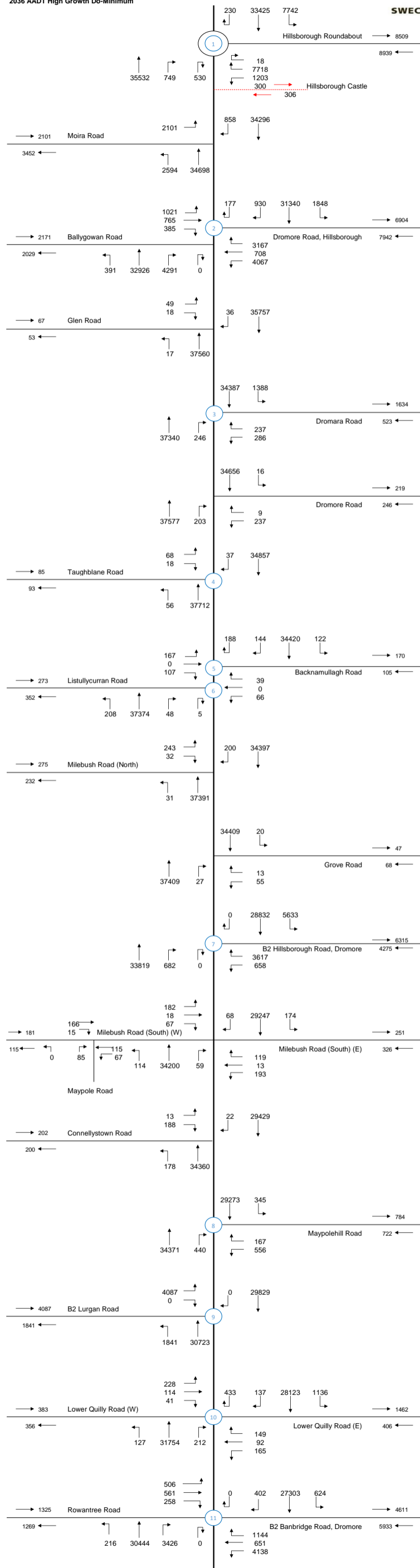


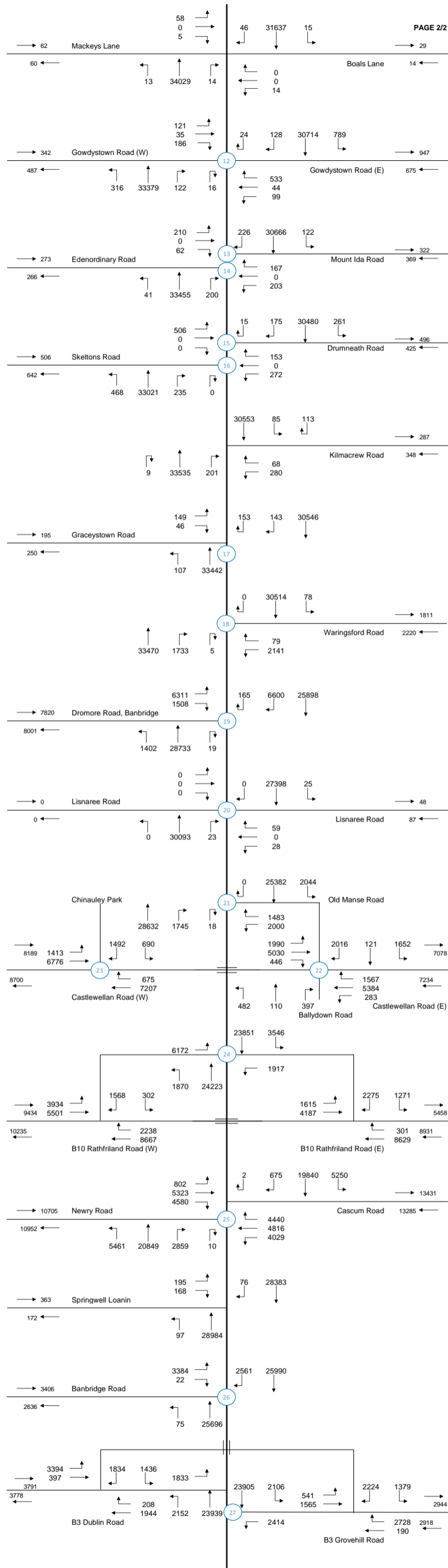




# A1 Junctions Phase 2 - Network Flow Diagrams

2036 AADT High Growth Do-Minimum



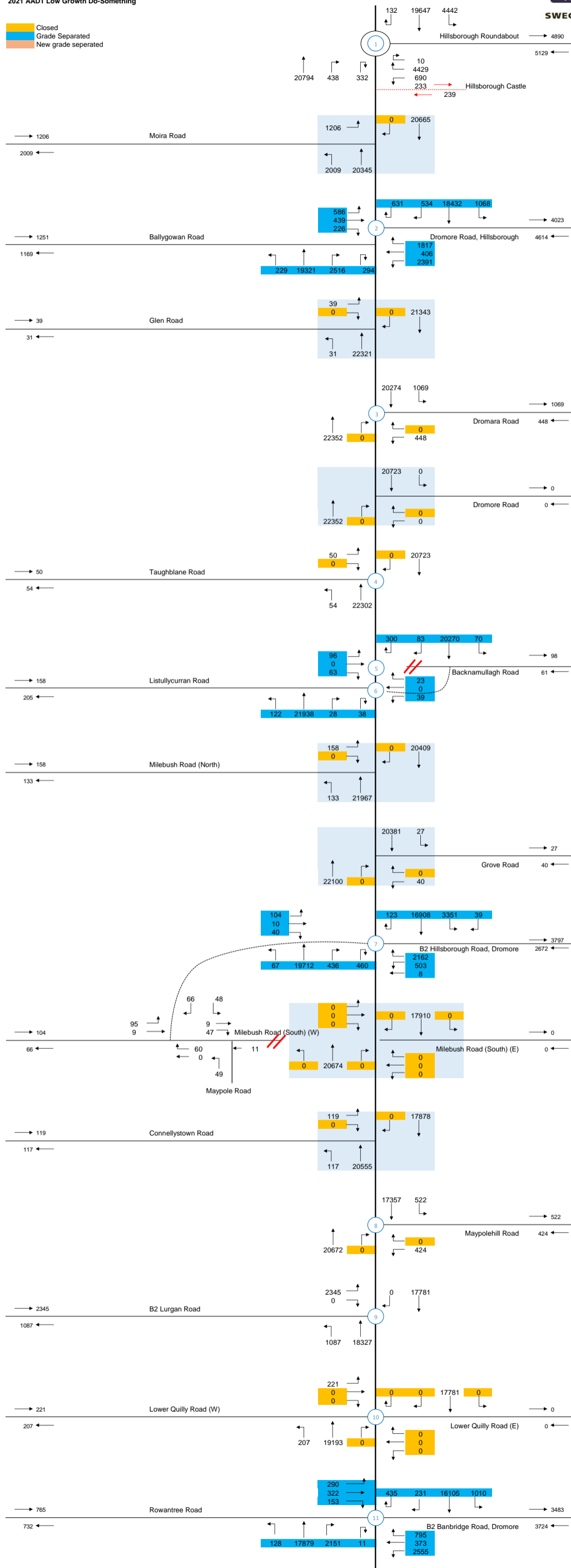


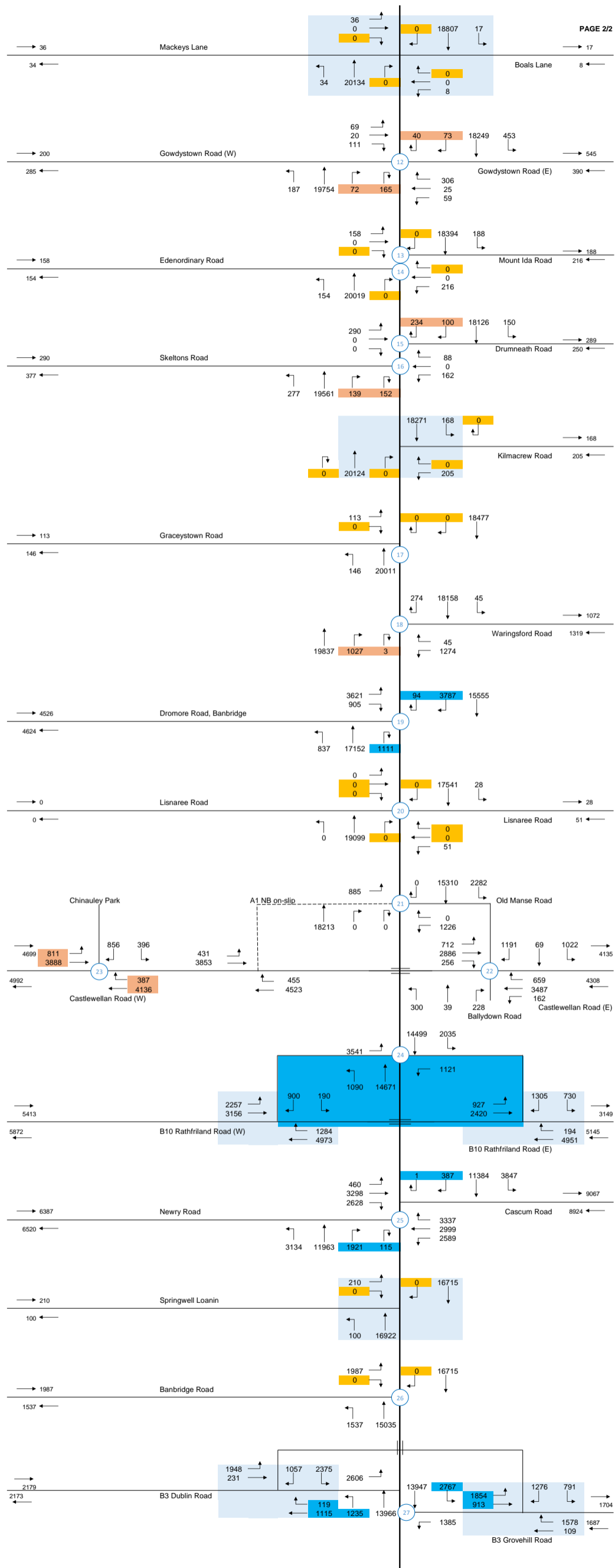
# A1 Junctions Phase 2 - Network Flow Diagrams

2021 AADT Low Growth Do-Something



- Closed
- Grade Separated
- New grade seperated



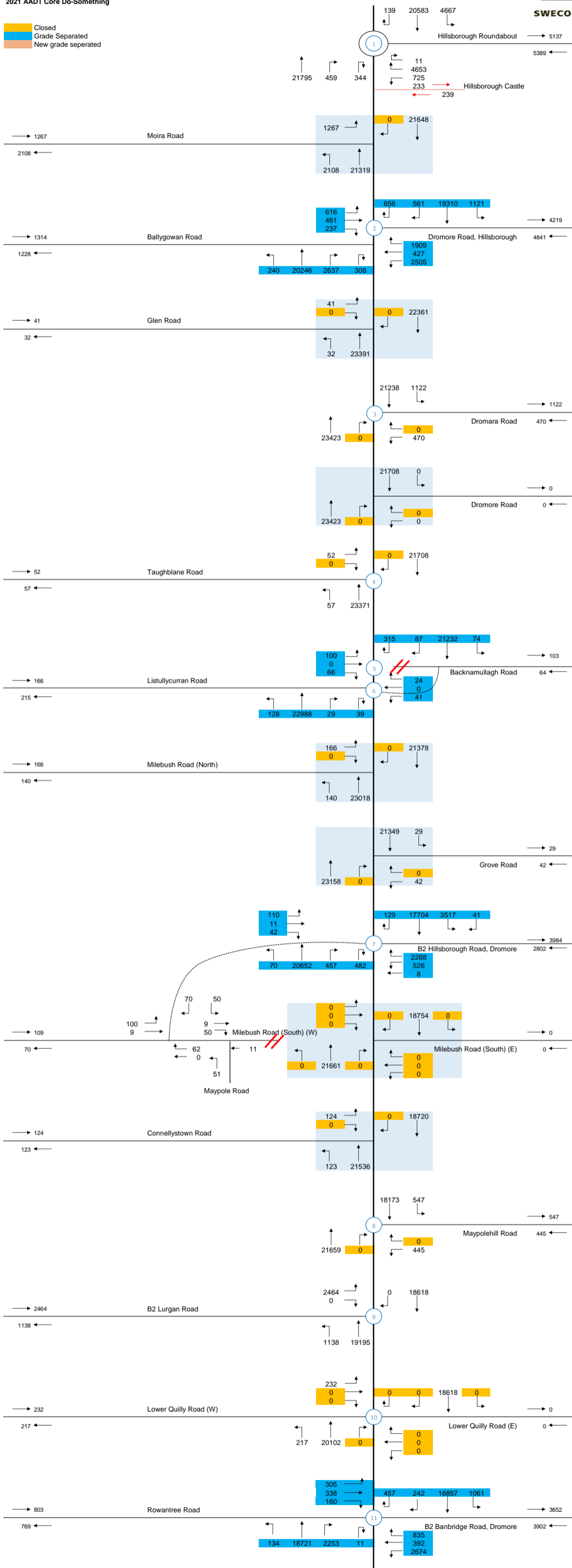


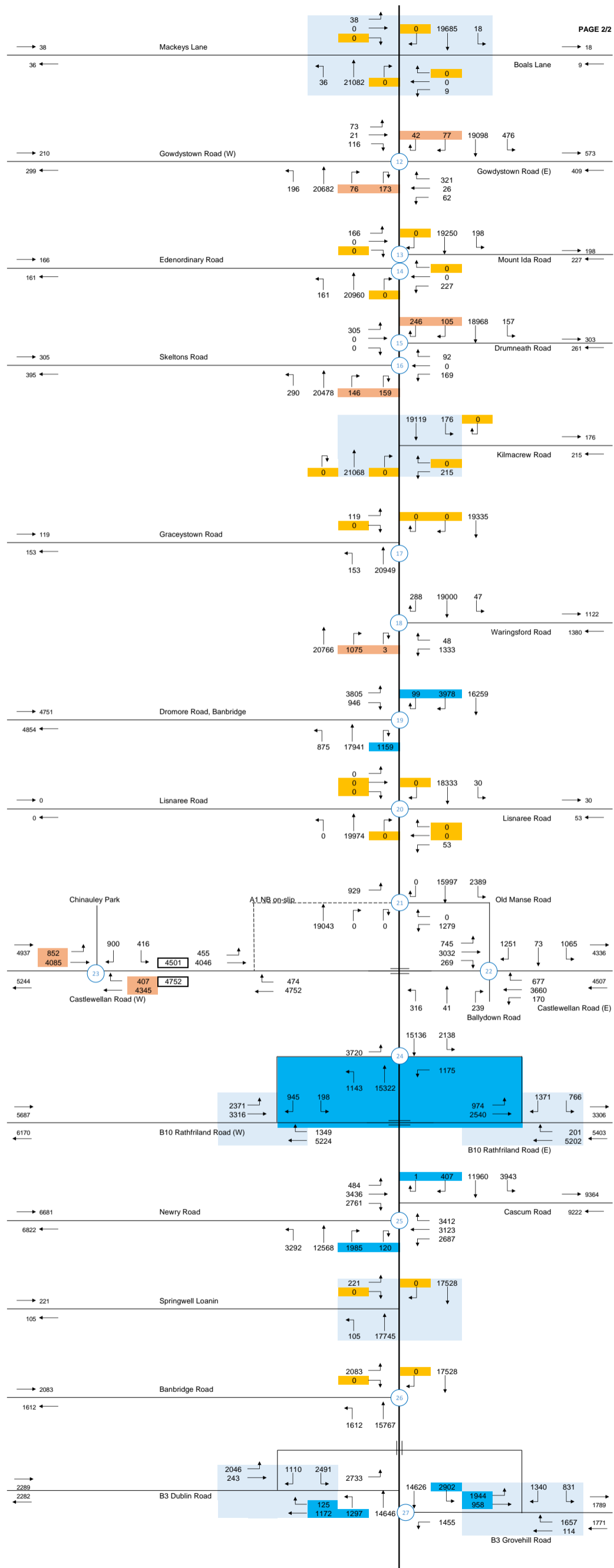
# A1 Junctions Phase 2 - Network Flow Diagrams

2021 AADT Core Do-Something



- Closed
- Grade Separated
- New grade seperated



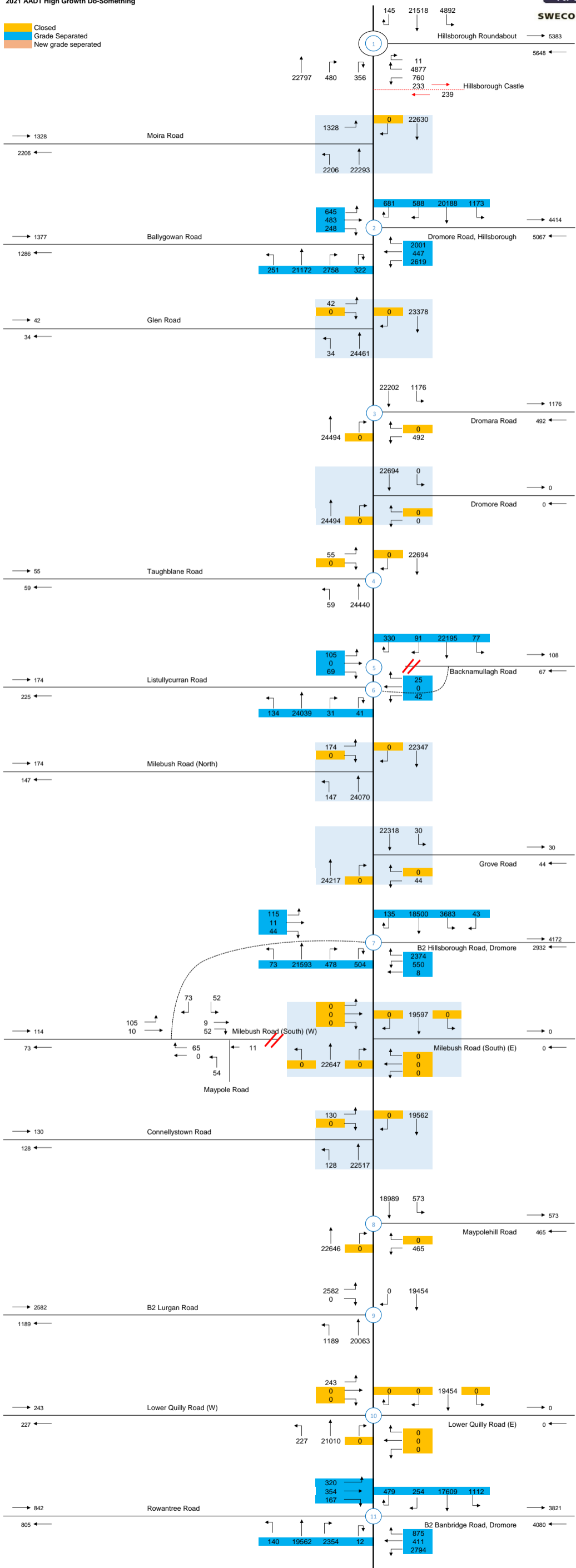


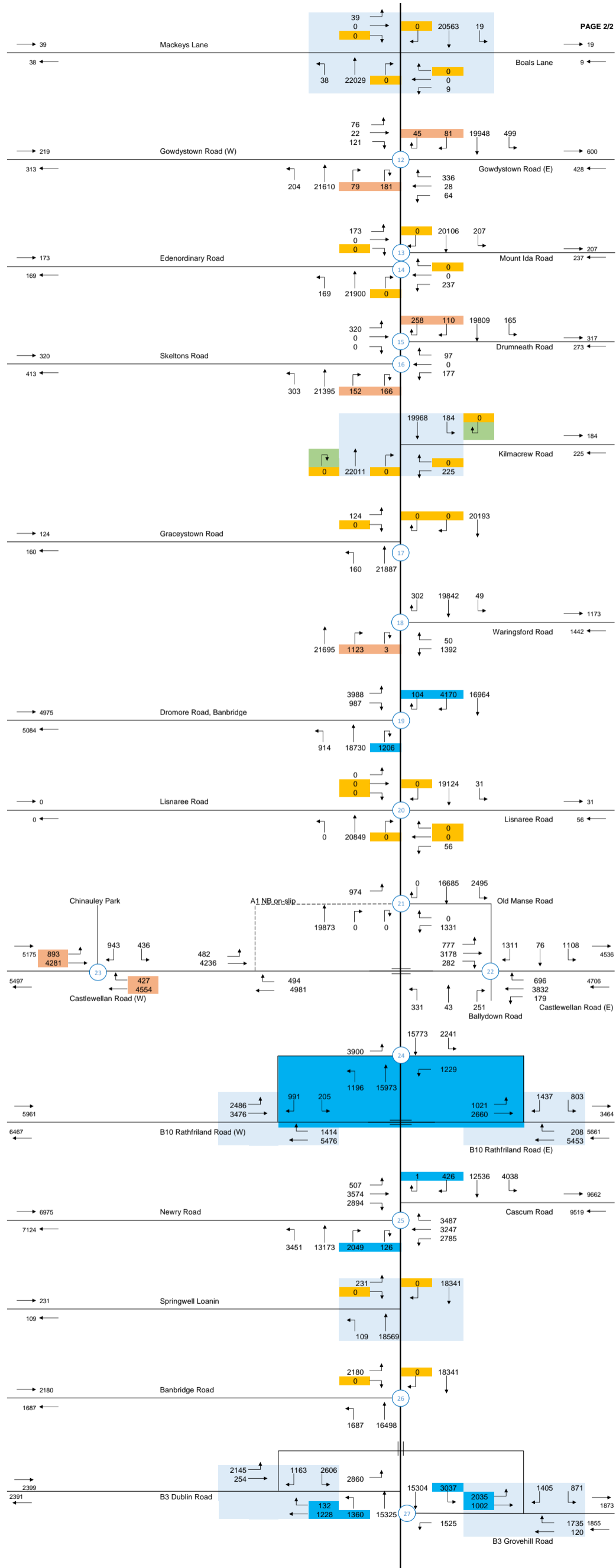
# A1 Junctions Phase 2 - Network Flow Diagrams

2021 AADT High Growth Do-Something



- Closed
- Grade Separated
- New grade seperated





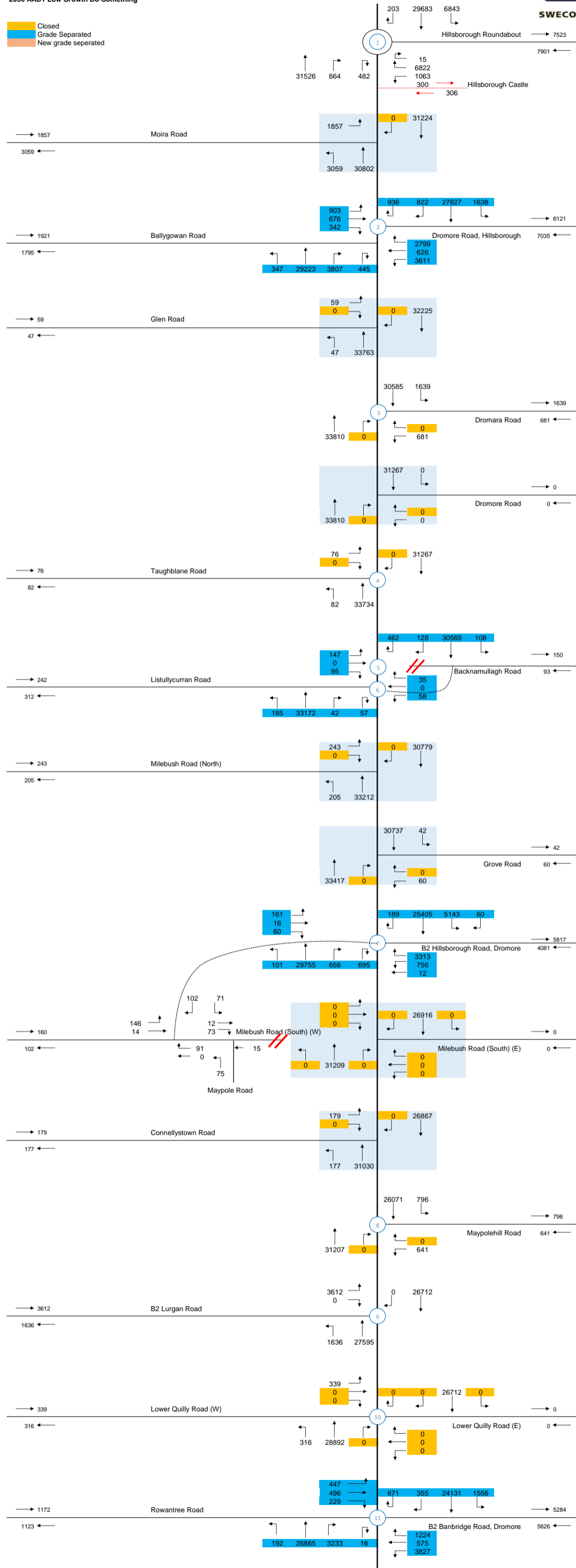


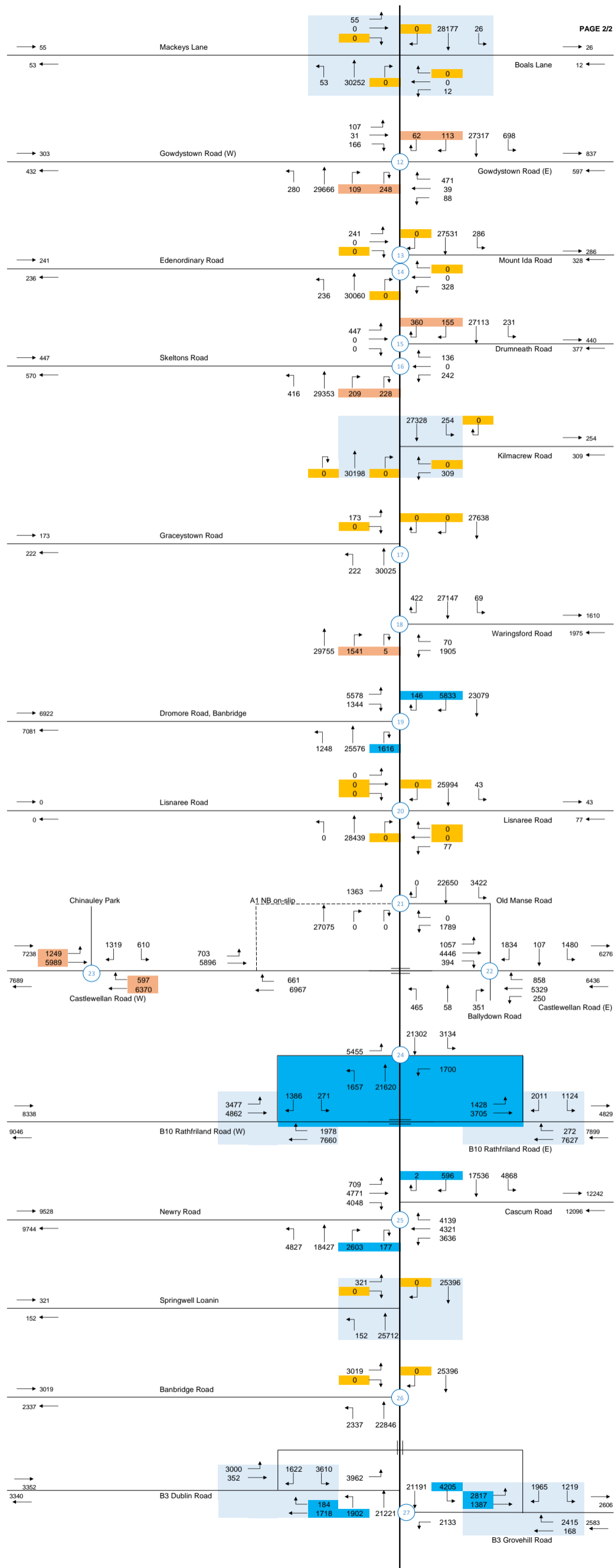
# A1 Junctions Phase 2 - Network Flow Diagrams

2036 AADT Low Growth Do-Something



- Closed
- Grade Separated
- New grade seperated



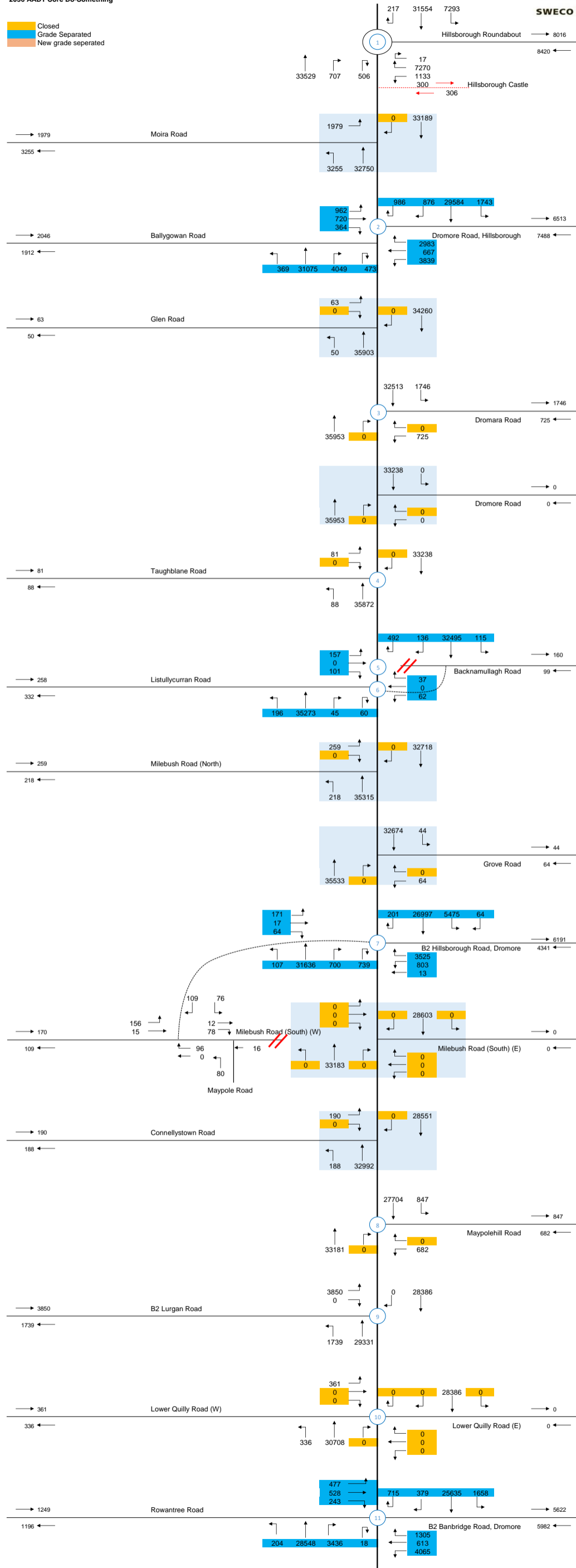


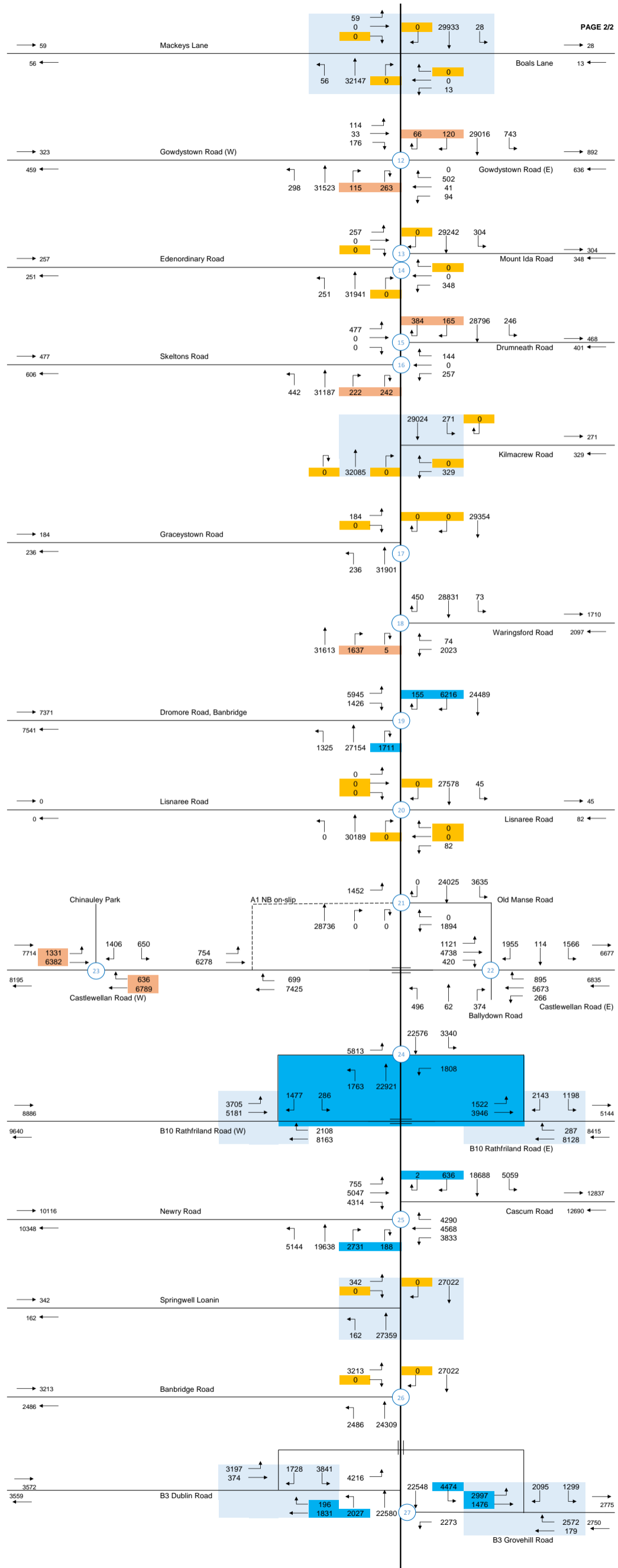
# A1 Junctions Phase 2 - Network Flow Diagrams

2036 AADT Core Do-Something



- Closed
- Grade Separated
- New grade seperated



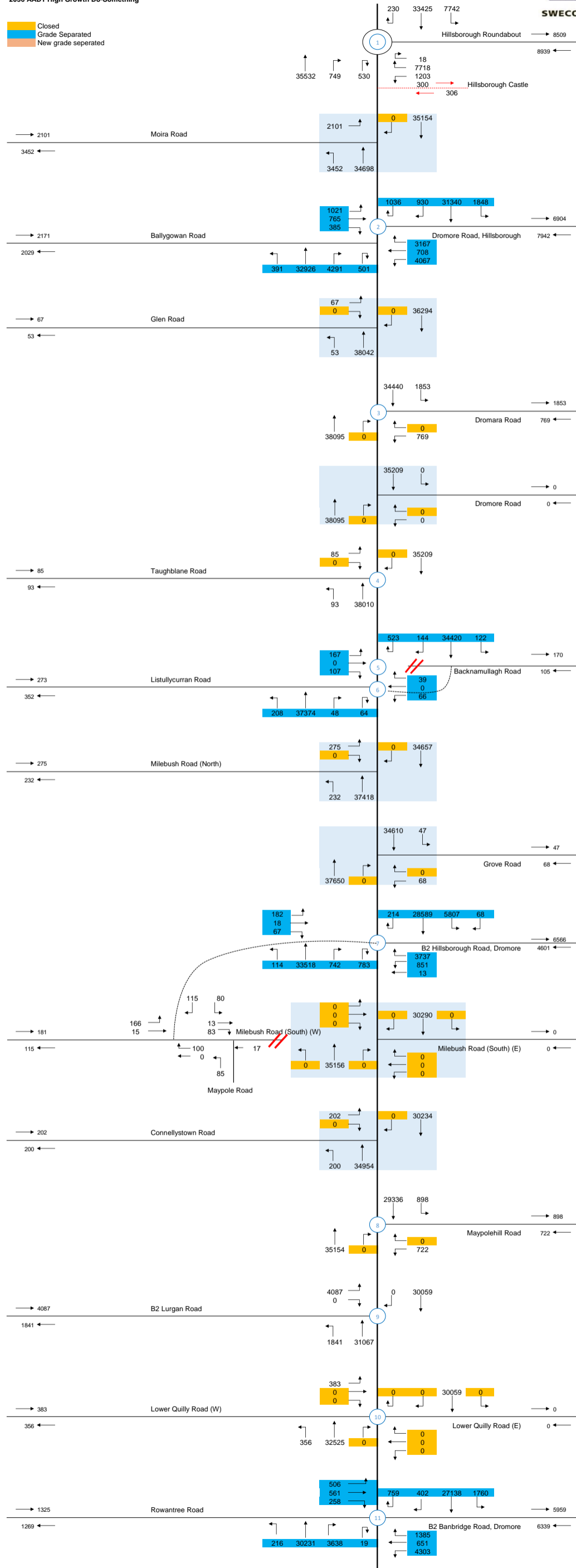


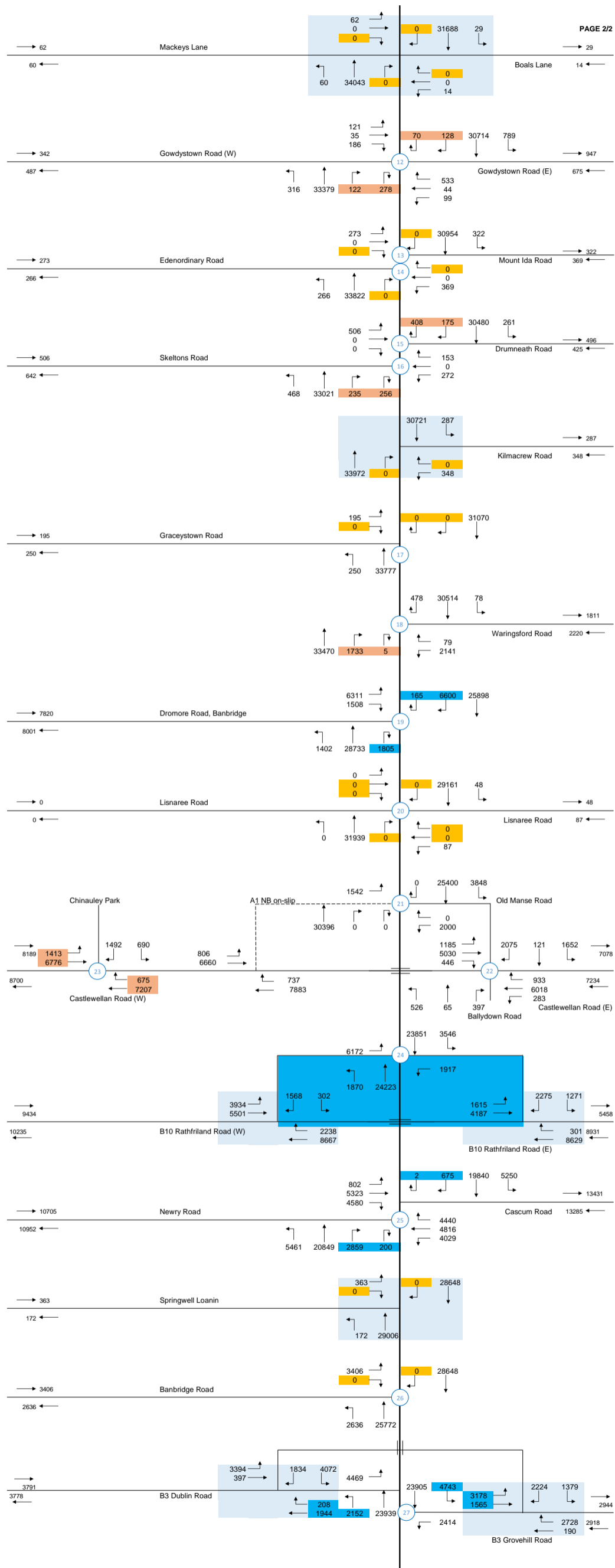
# A1 Junctions Phase 2 - Network Flow Diagrams

2036 AADT High Growth Do-Something



- Closed
- Grade Separated
- New grade seperated





# A1 Junctions Phase 2 - Chinauley Park Microsimulation

## Turning Count Calibration 0800-0900

	Description	Direction	Link	Traffic Flow (Vehicles)				GEH	WebTAG Criteria Met	< 700 vph	700 - 2700 vph	> 2700 vph	WebTAG Criteria Met
				Observed	Modelled	Difference				< 100 vph Diff	< 15% Diff	< 400 vph Diff	
0800- 0900	Castlewellan Rd (A50) - East	EB	12:14	264	262	-2	-0.8%	0.1	YES	YES			YES
	Castlewellan Rd (A50) - East	WB	14:12	412	410	-2	-0.5%	0.1	YES	YES			YES
	Kids Academy access road	SB	10:19	17	17	0	0.0%	0.0	YES	YES			YES
	Kids Academy access road	NB	19:10	29	29	0	0.0%	0.0	YES	YES			YES
	Castlewellan Rd (A50) - West	WB	11:18	506	505	-1	-0.2%	0.0	YES	YES			YES
	Castlewellan Rd (A50) - West	EB	18:11	260	259	-1	-0.4%	0.1	YES	YES			YES
	Chinauley Park - West	WB	15:08	5	5	0	0.0%	0.0	YES	YES			YES
	Chinauley Park - West	EB	08:15	4	4	0	0.0%	0.0	YES	YES			YES
	Chinauley Park - North	NB	02:20	34	34	0	0.0%	0.0	YES	YES			YES
	Chinauley Park - North	SB	20:02	121	121	0	0.0%	0.0	YES	YES			YES
								MAX GEH					
								0.1	100.0%			100.0%	

# A1 Junctions Phase 2 - Chinauley Park Microsimulation

## Turning Count Calibration 1700-1800

	Description	Direction	Link	Traffic Flow (Vehicles)				GEH	WebTAG Criteria Met	< 700 vph	700 - 2700 vph	> 2700 vph	WebTAG Criteria Met
				Observed	Modelled	Difference				< 100 vph Diff	< 15% Diff	< 400 vph Diff	
1700-1800	Castlewellan Rd (A50) - East	EB	12:14	407	406	-1	-0.2%	0.0	YES	YES			YES
	Castlewellan Rd (A50) - East	WB	14:12	434	433	-1	-0.2%	0.0	YES	YES			YES
	Kids Academy access road	SB	10:19	34	34	0	0.0%	0.0	YES	YES			YES
	Kids Academy access road	NB	19:10	47	47	0	0.0%	0.0	YES	YES			YES
	Castlewellan Rd (A50) - West	WB	11:18	429	427	-2	-0.5%	0.1	YES	YES			YES
	Castlewellan Rd (A50) - West	EB	18:11	483	481	-2	-0.4%	0.1	YES	YES			YES
	Chinauley Park - West	WB	15:08	6	6	0	0.0%	0.0	YES	YES			YES
	Chinauley Park - West	EB	08:15	5	5	0	0.0%	0.0	YES	YES			YES
	Chinauley Park - North	NB	02:20	153	153	0	0.0%	0.0	YES	YES			YES
	Chinauley Park - North	SB	20:02	60	60	0	0.0%	0.0	YES	YES			YES
								MAX GEH	WebTAG Criteria Met				
								0.1	100.0%			100.0%	



# A1 Junctions Phase 2 - Chinauley Park Microsimulation

Journey Time Validation 0800-0900

	Movement	Modelled (s)	Observed (s)	Difference	% Difference	Within 15%	Within 1 Minute	WebTAG Criteria
0800-0900	2-3	18	19	1	8%	YES	YES	YES
	2-5	20	20	0	0%	YES	YES	YES
	2-7	20	28	8	41%	NO	YES	YES
	2-9	22	22	0	-1%	YES	YES	YES
	4-1	24	29	5	23%	NO	YES	YES
	4-5	14	14	0	0%	YES	YES	YES
	4-7	-	-	-	-	-	-	-
	4-9	-	-	-	-	-	-	-
	6-1	20	17	-3	-17%	NO	YES	YES
	6-3	16	12	-4	-23%	NO	YES	YES
	6-7	13	23	10	80%	NO	YES	YES
	6-9	16	16	0	3%	YES	YES	YES
	8-1	22	36	14	64%	NO	YES	YES
	8-3	-	-	-	-	-	-	-
	8-5	25	42	17	68%	NO	YES	YES
	8-9	-	-	-	-	-	-	-
	10-1	24	26	2	10%	YES	YES	YES
	10-3	-	-	-	-	-	-	-
	10-5	11	31	20	191%	NO	YES	YES
10-7	-	-	-	-	-	-	-	

# A1 Junctions Phase 2 - Chinauley Park Microsimulation

Journey Time Validation 1700-1800

	Movement	Modelled (s)	Observed (s)	Difference	% Difference	Within 15%	Within 1 Minute	WebTAG Criteria
1700-1800	2-3	18	17	-1	-4%	YES	YES	YES
	2-5	20	20	0	0%	YES	YES	YES
	2-7	21	30	9	43%	NO	YES	YES
	2-9	24	25	1	4%	YES	YES	YES
	4-1	24	26	2	7%	YES	YES	YES
	4-5	14	12	-2	-15%	YES	YES	YES
	4-7	-	-	-	-	-	-	-
	4-9	28	20	-8	-28%	NO	YES	YES
	6-1	20	16	-4	-21%	NO	YES	YES
	6-3	14	9	-5	-35%	NO	YES	YES
	6-7	13	21	8	62%	NO	YES	YES
	6-9	16	16	0	2%	YES	YES	YES
	8-1	18	28	10	57%	NO	YES	YES
	8-3	-	-	-	-	-	-	-
	8-5	12	38	26	217%	NO	YES	YES
	8-9	-	-	-	-	-	-	-
	10-1	11	28	17	150%	NO	YES	YES
	10-3	15	24	9	60%	NO	YES	YES
	10-5	11	36	25	219%	NO	YES	YES
	10-7	-	-	-	-	-	-	-