Project: Land South of Radwinter Road, Saffron Walden

Client: Rosconn

Technical Note: TN01 Proposed Development Trips and Junction Modelling

Project No: CTP-20-1142

Date: 15 February 2021

1. Introduction

1.1 The purpose of this note is to set out the derivation of the base traffic flows, the proposed development trips and the scope and approach to the junction modelling.

1.2 The distribution and assignment of development trips is based on the assumption that the consented link road between Radwinter Road and Thaxted Road has been constructed.

1.3 The development site is located to the south of Radwinter Road and sits between the eastern edge of Saffron Walden and the village of Sewards End as shown in the plan below.

Figure 1: Site Location Plan

1.4 The proposal is to provide up to 240 residential units with access taken from Radwinter Road. The current masterplan for the site is shown below although it should be noted that the layout is evolving in response to ongoing input from the various technical disciplines.

Figure 2: Draft Concept Masterplan

2. Base Traffic Flows

2.1 As agreed previously with ECC, the base flows for this assessment have been based on the Transport Addendum – Link Road Assessment (dated September 2018), that was prepared by Peter Brett Associates (PBA) for Land East of Thaxted Road on behalf of Kier Living.

2.2 At Appendix F of the PBA report there are AM and PM peak traffic flow diagrams showing the 2023 Forecast Year Cumulative Link Road Scenario. These show the reassignment of background traffic to the consented link road together with committed development traffic from the Kier Living, Shire Hill Farm and Linden Homes sites.

2.3 The PBA report did not assess the Radwinter Road / Elizabeth Road traffic signal junction or junctions on Ashdon Road and therefore the base flows for these junctions has been taken from the Highways Impact Assessment (dated April 2028) prepared by Iceni on behalf of Dianthus Land.

2.4 To factor the 2018 Iceni flows and the 2023 PBA traffic flows to the proposed assessment year of 2026, TEMPro growth rates have been used. The TEMPro rates have been adjusted using the 'Alternative Assumptions' function to remove the consented dwellings from the Kier Living, Shire Hill Farm and Linden Homes sites from the future year housing supply in the Uttlesford Authority Area and Uttlesford 002 MSOA. This approach has been agreed with ECC.

2.5 It has also been agreed with ECC that the predicted traffic flows from the former Pulse Packaging site being promoted by Endurance Estates should be included in the proposed assessment. Accordingly, these flows have been added to the 2026 base flows and are regarded as committed development.

3. Trip Generation

3.1 The latest version of the TRICS database (version 7.7.4) has been used to estimate the trip generation at the proposed development. TRICS provides trip rate information for a range of land uses throughout the United Kingdom and in this instance sites in the *houses privately owned* category of the *residential* land use have been used.

3.2 Site selection has been refined to only include developments in the range 100 to 300 units with an edge of town location. Sites in Greater London, Ireland, Scotland and Wales have been excluded.

3.3 TRICS identified 20 sites matching these criteria and the peak hour trip rates are shown in the table below. The TRICS data is attached to this note as **Appendix A**. Trip rates are expressed as trips per dwelling.

Land Use	AM Peak		PM Peak	
	Arrivals	Departs	Arrivals	Departs
Residential	0.149	0.393	0.358	0.166

Table 1: Proposed vehicular Trip Rates from TRICS

3.4 The trip rates presented above have been applied to the number of residential units proposed and the resultant trip generation is set out in the table below.

Proposed Development	AM Peak		PM Peak	
	Arrivals	Departs	Arrivals	Departs
Up to 240 units	36	94	86	40

Table 2: Proposed Trip Generation

4. Trip Distribution

4.1 The spatial distribution of trips generated by the proposed development is based on 2011 Census Journey to Work data for the Uttlesford 002 MSOA. This includes most of the built-up area of Saffron Walden. The data has been filtered to provide the place of employment for journeys made by car. It is considered that the existing journey to work patterns within the output area will provide a robust estimate of the distribution of trips generated by the proposed development during the peak hours.

4.2 For each MSOA to which residents of Uttlesford 002 drive to work, a route has been allocated. Trips have been split to those that are external to the town and those that remain in the town.

4.3 For the external trips, trips have been allocated to seven main routes from the development site and these are summarised in the table below. Assignments are based on the route finder in Google Maps. Where more than one route is identified, trips are split between the various route options depending on travel time and distance.

Route	Proportion
Bridge Street	32.34%
Newport Road	20.51%
Radwinter Road East	13.63%
Audley End Road	4.12%
Ashdon Road East	3.32%
Little Walden Road	3.12%
Thaxted Road	1.60%
Total (external)	**78.64%**

Table 3: External Trip Distribution

4.4 Traffic flow diagrams showing the external trip distribution are presented in **Appendix B.**

4.5 The remaining 21.36% of trips stay within Saffron Walden and have been allocated to six key destinations within the town as follows:

- Northern end of Town Centre - 20%
- Southern end of Town Centre – 20%
- Shire Hill Industrial Estate – 30%
- Industry north of Ashdon Road – 10%
- Thaxted Road retail – 10%
- Audley Road including UDC & High School – 10%

4.6 Traffic flow diagrams showing the internal trip distribution are also presented in **Appendix B** together with diagrams showing the full distribution.

5. Geographical Scope of Junction Assessments

5.1 Figure 3 identifies 19 principal junctions in Saffron Walden where base traffic flow data is available while the table below Figure 3 describes each junction and identifies the junction type and any restrictions to movement at the junction.

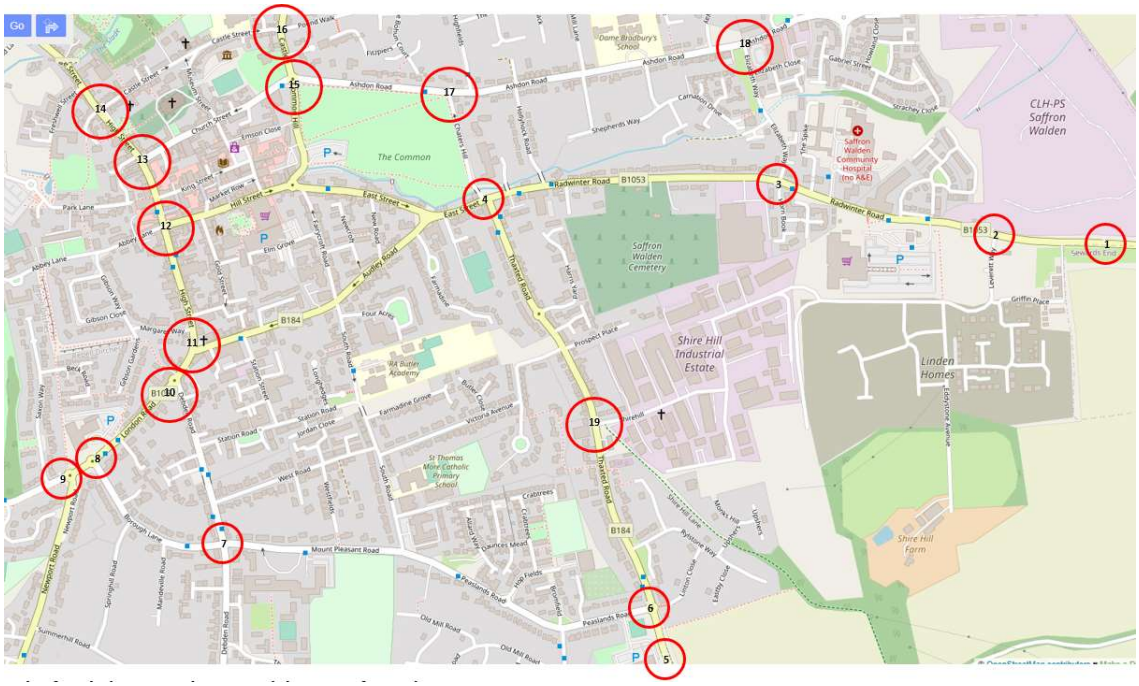


Figure 3: Principal Junctions in Saffron Walden

Map Reference	Junction Description	Junction Type
1	Radwinter Road / Proposed Site Access	3-arm priority junction
2	Radwinter Road / Linden Access	3-arm priority junction
3	Radwinter Road / Elizabeth Road / Horn Brook	4-arm traffic signals
4	Radwinter Road / Thaxted Road / East Street / Chatters Hill	4-arm traffic signals – Chatters Way exit only
5	Thaxted Road / Consented Link Road	3-arm priority junction
6	Thaxted Road / Peaslands Road	3-arm mini roundabout
7	Mount Pleasant Road / Borough Lane / Debden Road	4-arm traffic signals

Map Reference	Junction Description	Junction Type
8	London Road / Borough Lane	3-arm mini roundabout
9	London Road / Audley End Road / Newport Road	3-arm mini roundabout
10	London Road / Debden Road	3-arm mini roundabout
11	High Street / Debden Road / Audley Road	3-arm priority junction – Audley Road entry only
12	High Street / George Street / Abbey Lane	4-arm traffic signals – George Street & Abbey Lane exits only
13	High Street/ Church Street	3-arm priority junction – Church Street entry only
14	High Street / Bridge Street / Castle Street / Myddylton Place	4-arm priority junction – Castle Street exit only
15	Church Street / Castle Hill / Ashdon Road / Common Hill	4-arm mini roundabout – Castle Hill exit only
16	Castle Street / Castle Hill / Little Walden Road / Pound Walk	4-arm priority junction – Castle Street entry only
17	Ashdon Road / Chatters Hill	3-arm priority junction – Chatter Hill entry only
18	Ashdon Road / Elizabeth Way	3-arm priority junction
19	Thaxted Road / Shire Hill	3-arm priority junction

Table 4: Junction Details

5.2 To establish whether the junctions identified above should be considered in detail in the Transport Assessment, peak hour traffic flows with and without development have been extracted from the 2026 'with' and 'without development' traffic flow diagrams which are presented in **Appendix C**. The 'without development' traffic flows include the committed development sites as described in Section 2, while the 'with development' traffic flows include the committed development and the proposed development.

5.3 The tables below show the number of additional trips and percentage impact at each junction as a result of the proposed development in the AM and PM peaks. This assessment is based on the scenario with the consented link road constructed.

Junction Reference	AM Peak			
	2026 no Dev	2026 + Dev	Dev Trips	% Increase
1	569	699	130	22.85%
2	731	843	112	15.32%
3	1571	1654	83	5.28%
4	1508	1539	31	2.06%
5	1090	1121	31	2.84%
6	1535	1560	25	1.63%
7	1336	1353	17	1.27%
8	1588	1624	36	2.27%
9	1777	1813	36	2.03%
10	1531	1550	19	1.24%
11	1677	1700	23	1.37%
12	1294	1311	17	1.31%
13	1263	1303	40	3.17%
14	1359	1403	44	3.24%
15	1631	1677	46	2.82%
16	1018	1030	12	1.18%
17	1007	1053	46	4.57%
18	1298	1351	53	4.08%
19	1492	1500	8	0.54%

Table 5: Increase in Traffic Flows as a Result of Development During AM Peak

Junction Reference	PM Peak			
	2026 no Dev	2026 + Dev	Dev Trips	% Increase
1	514	640	126	24.51%
2	664	772	108	16.27%
3	1652	1734	82	4.96%
4	1621	1659	38	2.34%
5	1087	1115	28	2.58%
6	1593	1618	25	1.57%
7	1238	1254	16	1.29%
8	1447	1481	34	2.35%
9	1422	1456	34	2.39%
10	1429	1447	18	1.26%
11	1559	1579	20	1.28%
12	1331	1363	32	2.40%
13	1033	1062	29	2.81%
14	1391	1436	45	3.24%
15	1525	1562	37	2.43%
16	1155	1177	22	1.90%
17	979	1016	37	3.78%
18	1101	1145	44	4.00%
19	1586	1595	9	0.57%

Table 6: Increase in Traffic Flows as a Result of Development During PM Peak

5.4 The junctions shaded in light green show where the development results in a greater than 2% increase in flows through the junction and increases the flow through the junction by more than 30 trips in either peak. This is considered a reasonable approach to determining whether junction should be considered in detail in the TA. It is noted that existing daily variations in traffic flows at junctions will likely be higher than 2% and / or 30 vehicles and so this is considered a robust approach to determining which junctions are considered in detail. The proposal is to undertake capacity assessments at the 13 junctions shaded in light green in tables 5 and 6 and for completeness these are identified in Figure 4 below.

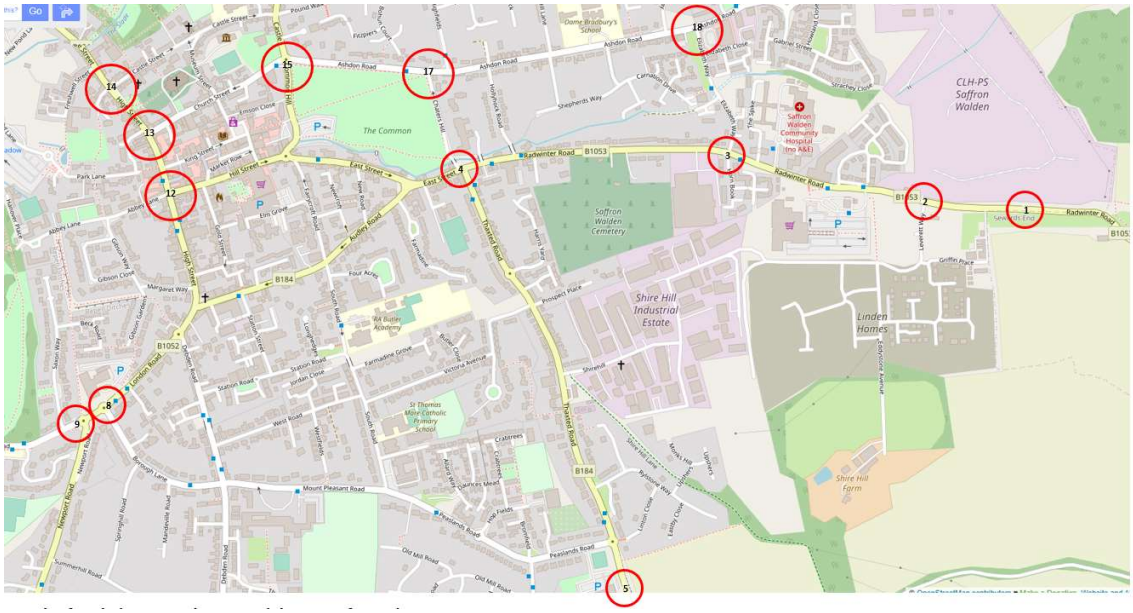


Figure 4: Proposed Scope of Junction Modelling

6. Approach to Modelling

6.1 It was agreed at the scoping meeting with ECC that based on the scale of development, it is not appropriate to assess the proposed development using a strategic transport model. Due to the current pandemic, there are also issues surrounding the collection of new traffic data which could affect the reliability of the model particularly in relation to model validation.

6.2 The junctions identified for consideration within the TA are either traffic signals, mini roundabouts, or priority junctions. The proposal is to use the industry standard software packages LinSig (traffic signals) and Junctions 9 (roundabouts and priority

junctions) to assess the performance of junctions.

6.3 Referring to Figure 4 there are only two junctions that are sufficiently close to each other that would warrant being modelled together. These are junctions 8 and 9 (London Road / Borough Lane and London Road / Newport Road / Audley End Road).

6.4 Junctions 8 and 9 and therefore they will be modelled together as a pair of linked mini roundabouts.

6.5 In terms of queues extending from one junction to affect the operation of another junction, this will be considered on a site-specific basis by looking at the predicted queues at each junction to determine the likelihood of upstream queueing at adjacent junctions.

Appendix A: TRICS Data

Calculation Reference: AUDIT-701101-210211-0254

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : A - HOUSES PRIVATELY OWNED

TOTAL VEHICLES

Selected regions and areas:

02	**SOUTH EAST**		
	ES	EAST SUSSEX	2 days
	HF	HERTFORDSHIRE	1 days
	KC	KENT	2 days
	SC	SURREY	1 days
	WS	WEST SUSSEX	3 days
04	**EAST ANGLIA**		
	NF	NORFOLK	3 days
06	**WEST MIDLANDS**		
	ST	STAFFORDSHIRE	1 days

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

Primary Filtering selection:

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

Parameter: No of Dwellings
Actual Range: 110 to 297 (units:)
Range Selected by User: 100 to 300 (units:)

Parking Spaces Range: All Surveys Included

Parking Spaces per Dwelling Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/12 to 08/10/20

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

Selected survey days:

Monday	4 days
Tuesday	1 days
Wednesday	2 days
Thursday	3 days
Friday	3 days

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

Selected survey types:

Manual count	11 days
Directional ATC Count	2 days

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

Selected Locations:

Edge of Town	13

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

Selected Location Sub Categories:

Residential Zone	12
Out of Town	1

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

Secondary Filtering selection:

Use Class:

C3	13 days

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

Population within 500m Range:

All Surveys Included

Population within 1 mile:

1,000 or Less	1 days
1,001 to 5,000	2 days
5,001 to 10,000	4 days
10,001 to 15,000	4 days
15,001 to 20,000	1 days
20,001 to 25,000	1 days

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

Population within 5 miles:

5,001 to 25,000	2 days
25,001 to 50,000	2 days
50,001 to 75,000	1 days
75,001 to 100,000	3 days
125,001 to 250,000	5 days

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

Car ownership within 5 miles:

0.6 to 1.0	2 days
1.1 to 1.5	9 days
1.6 to 2.0	2 days

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

Travel Plan:

Yes	8 days
No	5 days

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

PTAL Rating:

No PTAL Present	13 days

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

LIST OF SITES relevant to selection parameters

1 **ES-03-A-03** **MIXED HOUSES & FLATS** **EAST SUSSEX**
SHEPHAM LANE
POLEGATE

Edge of Town
Residential Zone
Total No of Dwellings: 212
Survey date: MONDAY *11/07/16* *Survey Type: MANUAL*

2 **ES-03-A-04** **MIXED HOUSES & FLATS** **EAST SUSSEX**
NEW LYDD ROAD
CAMBER

Edge of Town
Residential Zone
Total No of Dwellings: 134
Survey date: FRIDAY *15/07/16* *Survey Type: MANUAL*

3 **HF-03-A-03** **MIXED HOUSES** **HERTFORDSHIRE**
HARE STREET ROAD
BUNTINGFORD

Edge of Town
Residential Zone
Total No of Dwellings: 160
Survey date: MONDAY *08/07/19* *Survey Type: MANUAL*

4 **KC-03-A-04** **SEMI-DETACHED & TERRACED** **KENT**
KILN BARN ROAD
AYLESFORD
DITTON
Edge of Town
Residential Zone
Total No of Dwellings: 110
Survey date: FRIDAY *22/09/17* *Survey Type: MANUAL*

5 **KC-03-A-07** **MIXED HOUSES** **KENT**
RECULVER ROAD
HERNE BAY

Edge of Town
Residential Zone
Total No of Dwellings: 288
Survey date: WEDNESDAY *27/09/17* *Survey Type: MANUAL*

6 **NF-03-A-06** **MIXED HOUSES** **NORFOLK**
BEAUFORT WAY
GREAT YARMOUTH
BRADWELL
Edge of Town
Residential Zone
Total No of Dwellings: 275
Survey date: MONDAY *23/09/19* *Survey Type: MANUAL*

7 **NF-03-A-07** **MIXED HOUSES & FLATS** **NORFOLK**
SILFIELD ROAD
WYMONDHAM

Edge of Town
Out of Town
Total No of Dwellings: 297
Survey date: FRIDAY *20/09/19* *Survey Type: DIRECTIONAL ATC COUNT*

8 **NF-03-A-16** **MIXED HOUSES & FLATS** **NORFOLK**
NORWICH COMMON
WYMONDHAM

Edge of Town
Residential Zone
Total No of Dwellings: 138
Survey date: TUESDAY *20/10/15* *Survey Type: DIRECTIONAL ATC COUNT*

LIST OF SITES relevant to selection parameters (Cont.)

9 **SC-03-A-05** **MIXED HOUSES** **SURREY**
REIGATE ROAD
HORLEY

Edge of Town
Residential Zone
Total No of Dwellings: 207
Survey date: MONDAY *01/04/19* *Survey Type: MANUAL*

10 **ST-03-A-07** **DETACHED & SEMI-DETACHED** **STAFFORDSHIRE**
BEACONSIDE
STAFFORD
MARSTON GATE
Edge of Town
Residential Zone
Total No of Dwellings: 248
Survey date: WEDNESDAY *22/11/17* *Survey Type: MANUAL*

11 **WS-03-A-04** **MIXED HOUSES** **WEST SUSSEX**
HILLS FARM LANE
HORSHAM
BROADBRIDGE HEATH
Edge of Town
Residential Zone
Total No of Dwellings: 151
Survey date: THURSDAY *11/12/14* *Survey Type: MANUAL*

12 **WS-03-A-08** **MIXED HOUSES** **WEST SUSSEX**
ROUNDSTONE LANE
ANGMERING

Edge of Town
Residential Zone
Total No of Dwellings: 180
Survey date: THURSDAY *19/04/18* *Survey Type: MANUAL*

13 **WS-03-A-09** **MIXED HOUSES & FLATS** **WEST SUSSEX**
LITTLEHAMPTON ROAD
WORTHING
WEST DURRINGTON
Edge of Town
Residential Zone
Total No of Dwellings: 197
Survey date: THURSDAY *05/07/18* *Survey Type: MANUAL*

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

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

TOTAL VEHICLES

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	13	200	0.103	13	200	0.318	13	200	0.421
08:00 - 09:00	13	200	0.149	**13**	**200**	**0.393**	**13**	**200**	**0.542**
09:00 - 10:00	13	200	0.153	13	200	0.186	13	200	0.339
10:00 - 11:00	13	200	0.130	13	200	0.158	13	200	0.288
11:00 - 12:00	13	200	0.129	13	200	0.150	13	200	0.279
12:00 - 13:00	13	200	0.160	13	200	0.154	13	200	0.314
13:00 - 14:00	13	200	0.171	13	200	0.156	13	200	0.327
14:00 - 15:00	13	200	0.174	13	200	0.211	13	200	0.385
15:00 - 16:00	13	200	0.291	13	200	0.181	13	200	0.472
16:00 - 17:00	13	200	0.298	13	200	0.181	13	200	0.479
17:00 - 18:00	**13**	**200**	**0.358**	13	200	0.166	13	200	0.524
18:00 - 19:00	13	200	0.313	13	200	0.191	13	200	0.504
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.429			2.445			4.874

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

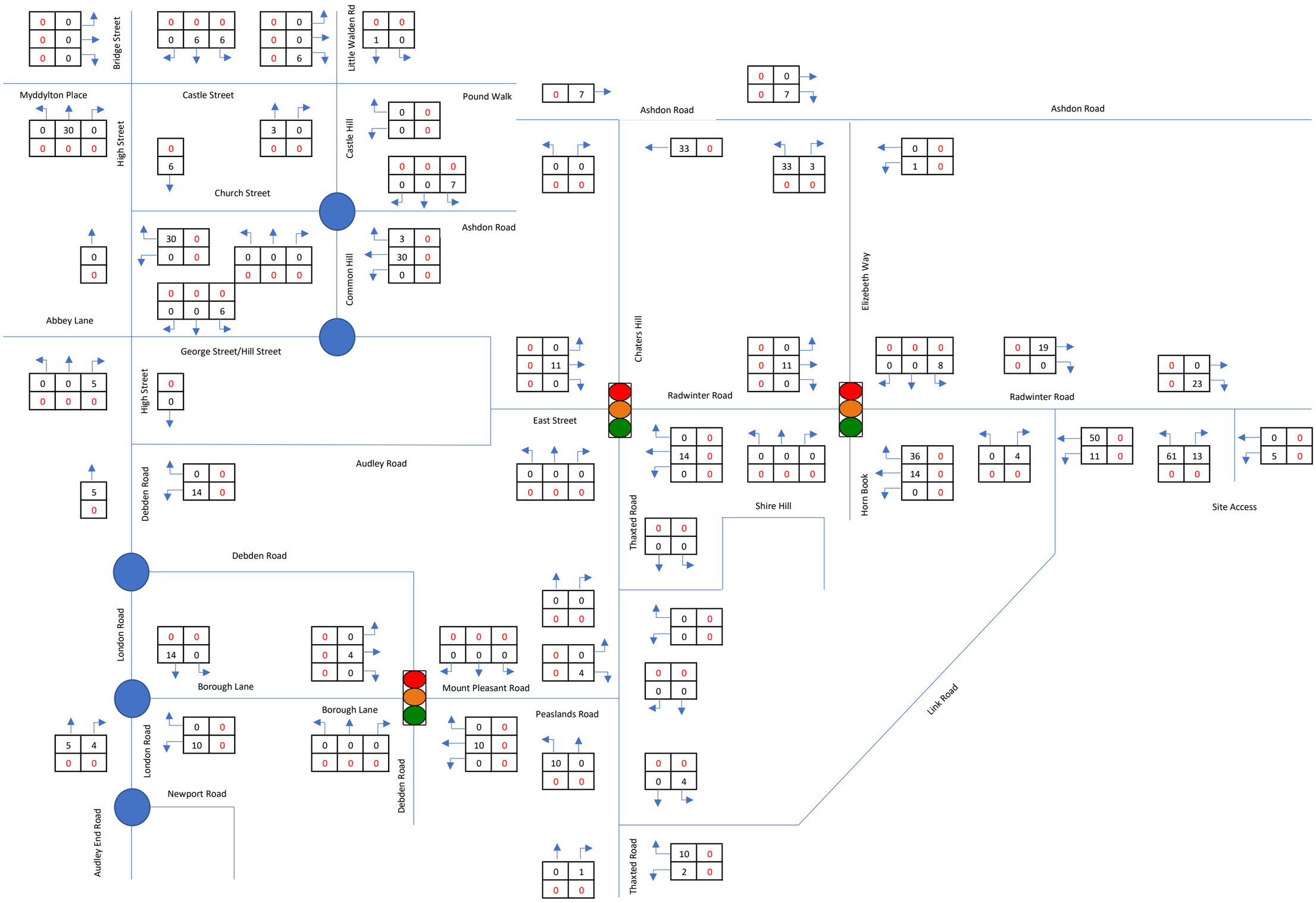
*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected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

Parameter summary

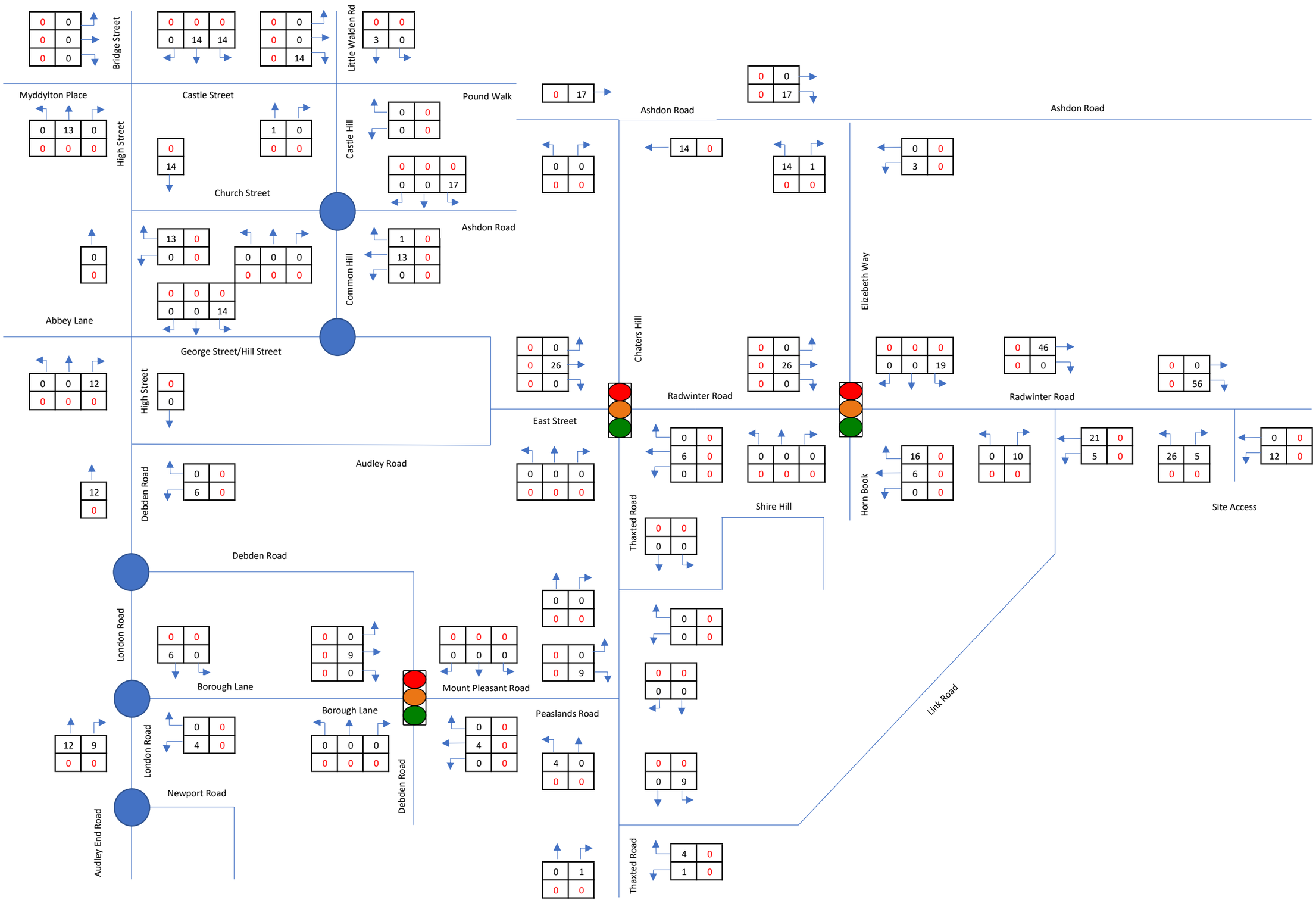
Trip rate parameter range selected:	110 - 297 (units:)
Survey date date range:	01/01/12 - 08/10/20
Number of weekdays (Monday-Friday):	17
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	3
Surveys manually removed from selection:	0

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

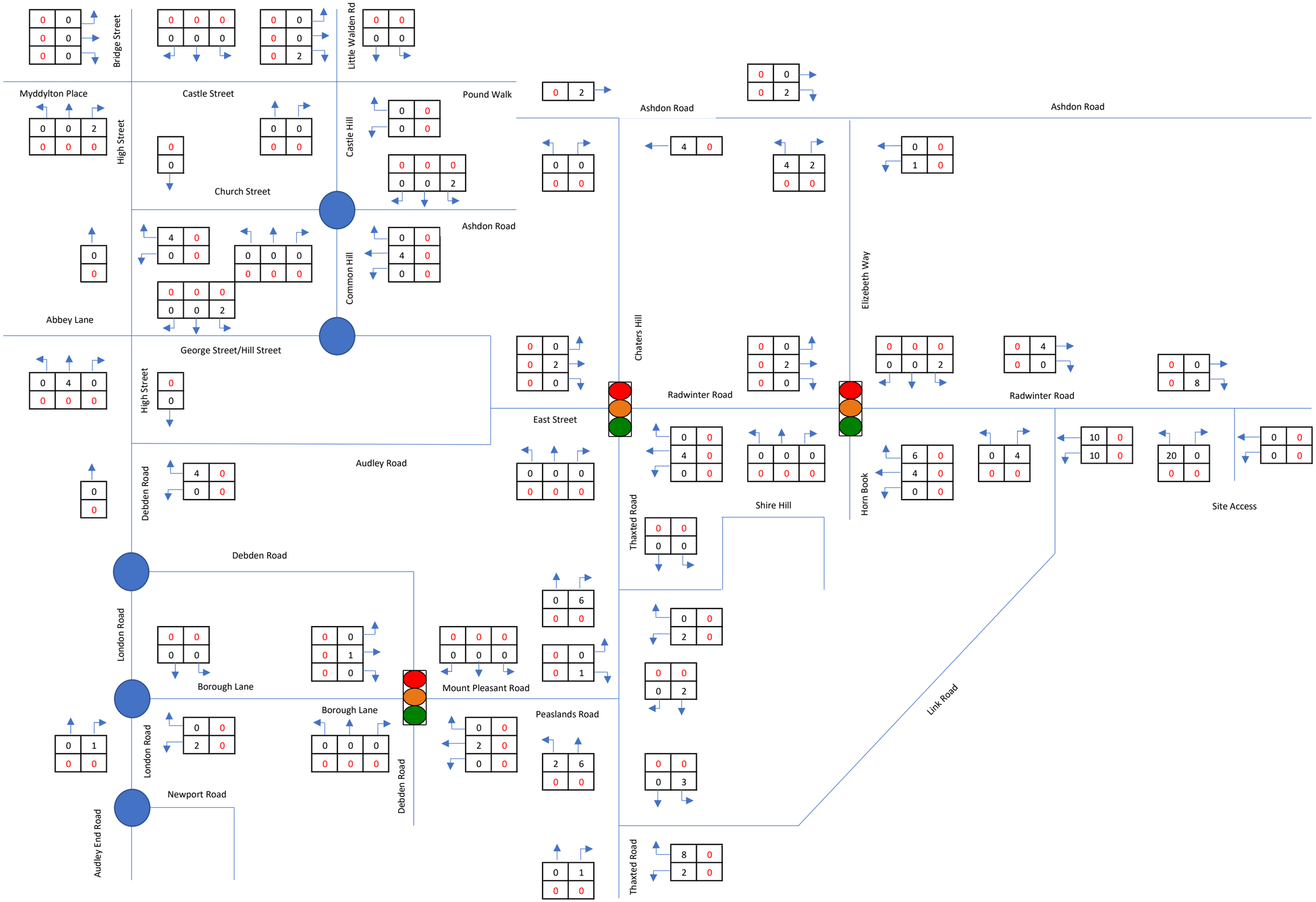
Appendix B: Distribution of Development Trips



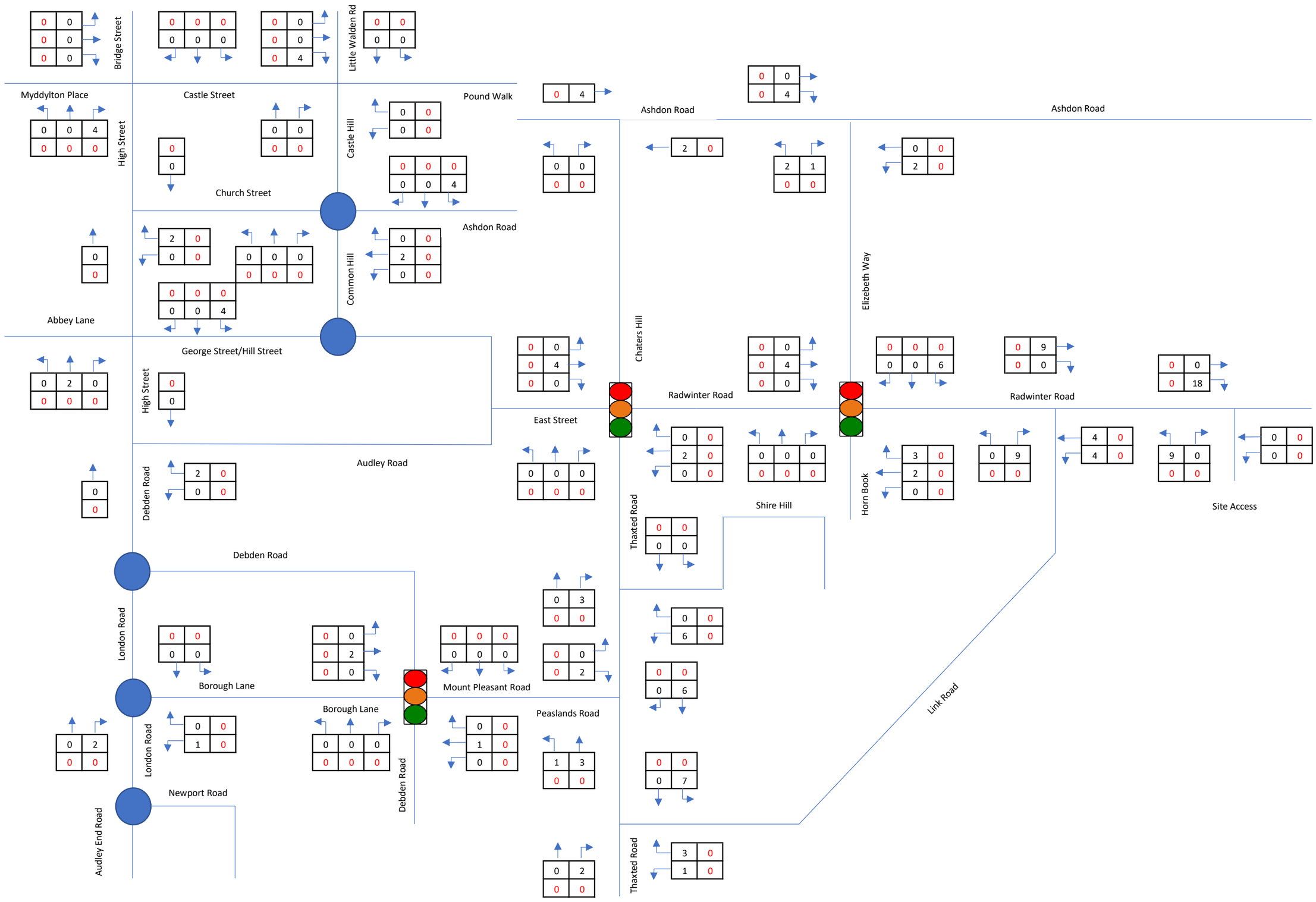
AM Peak External Development Trips



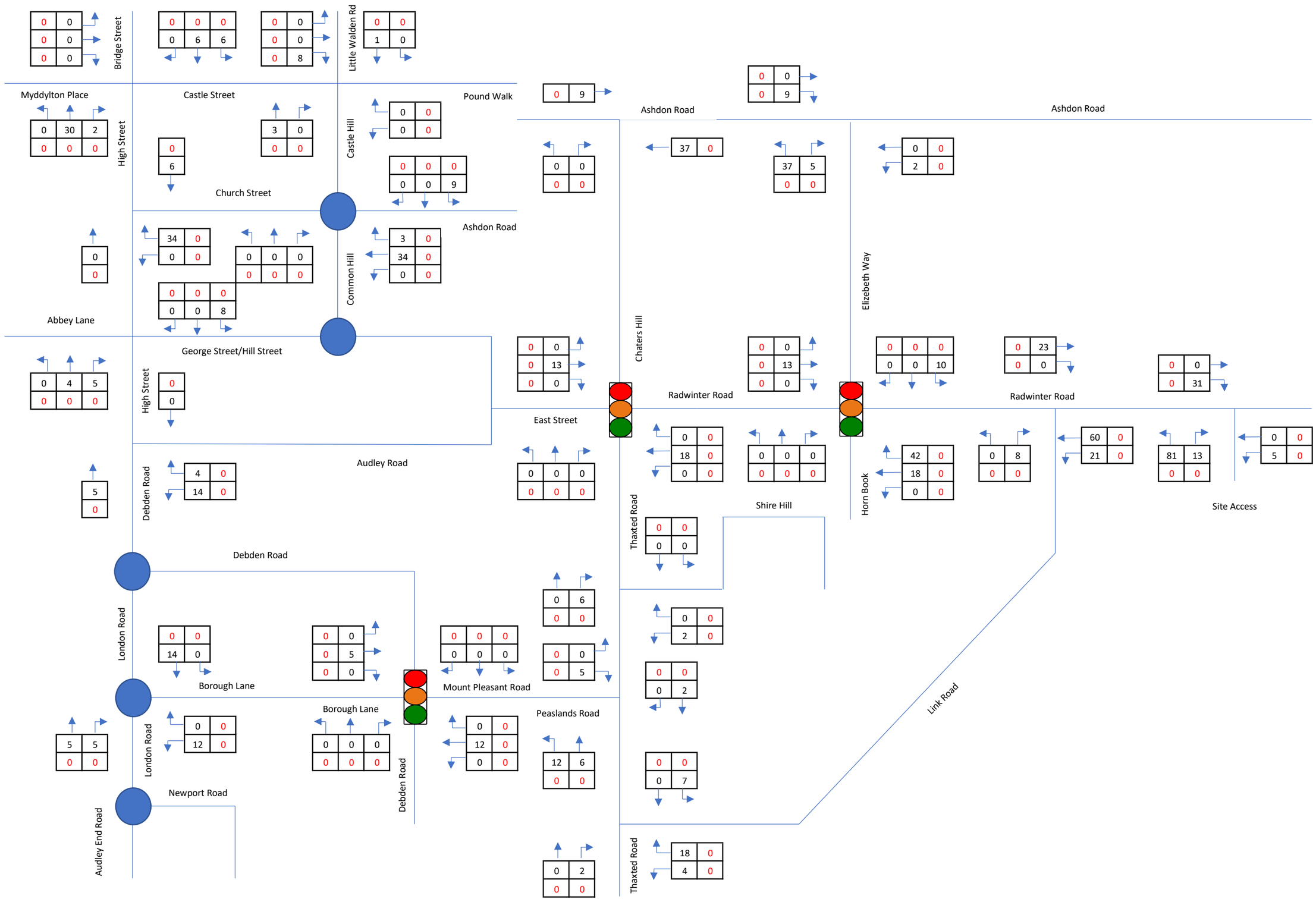
PM Peak External Development Trips



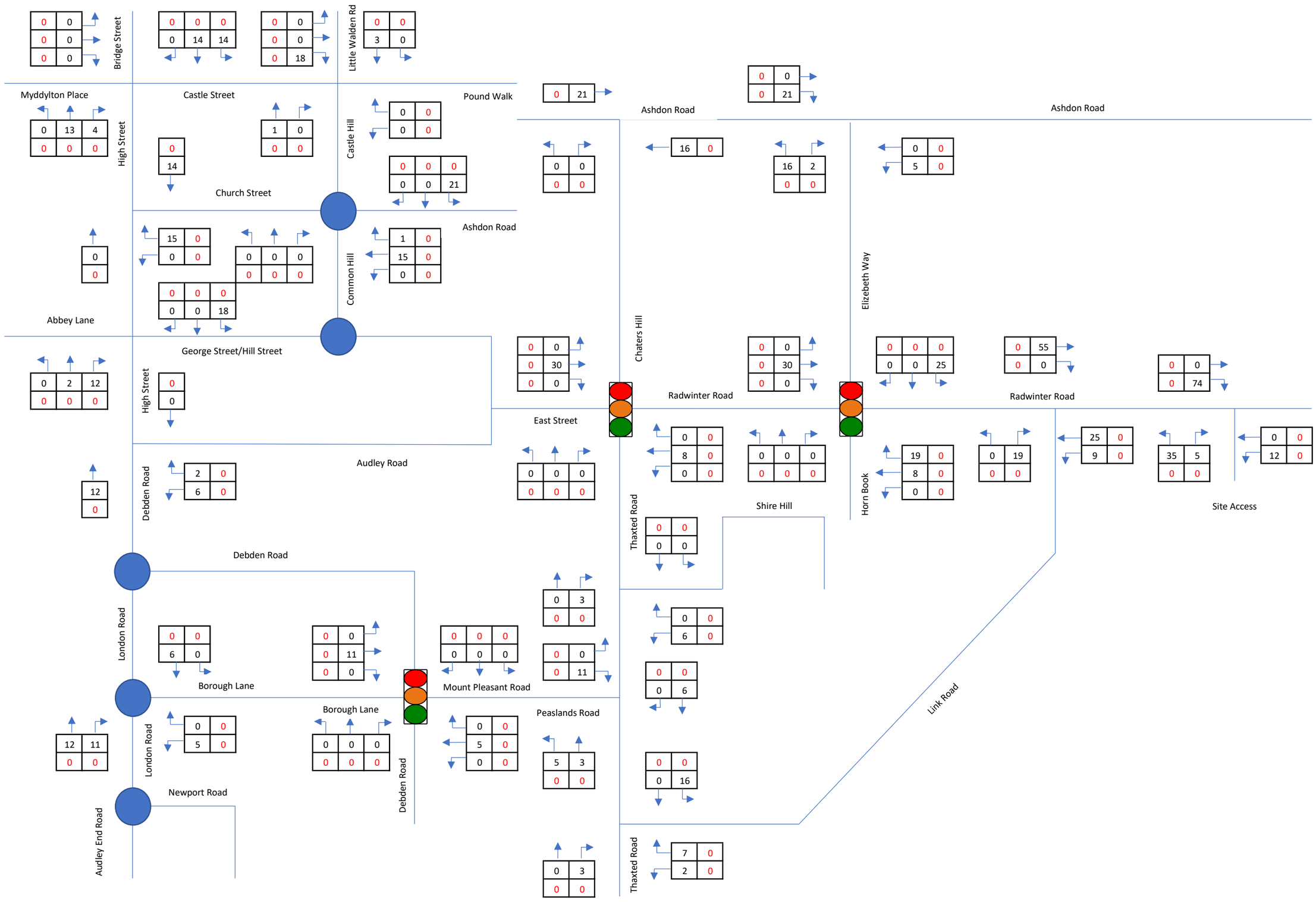
AM Peak Internal Development Trips



PM Peak Internal Development Trips

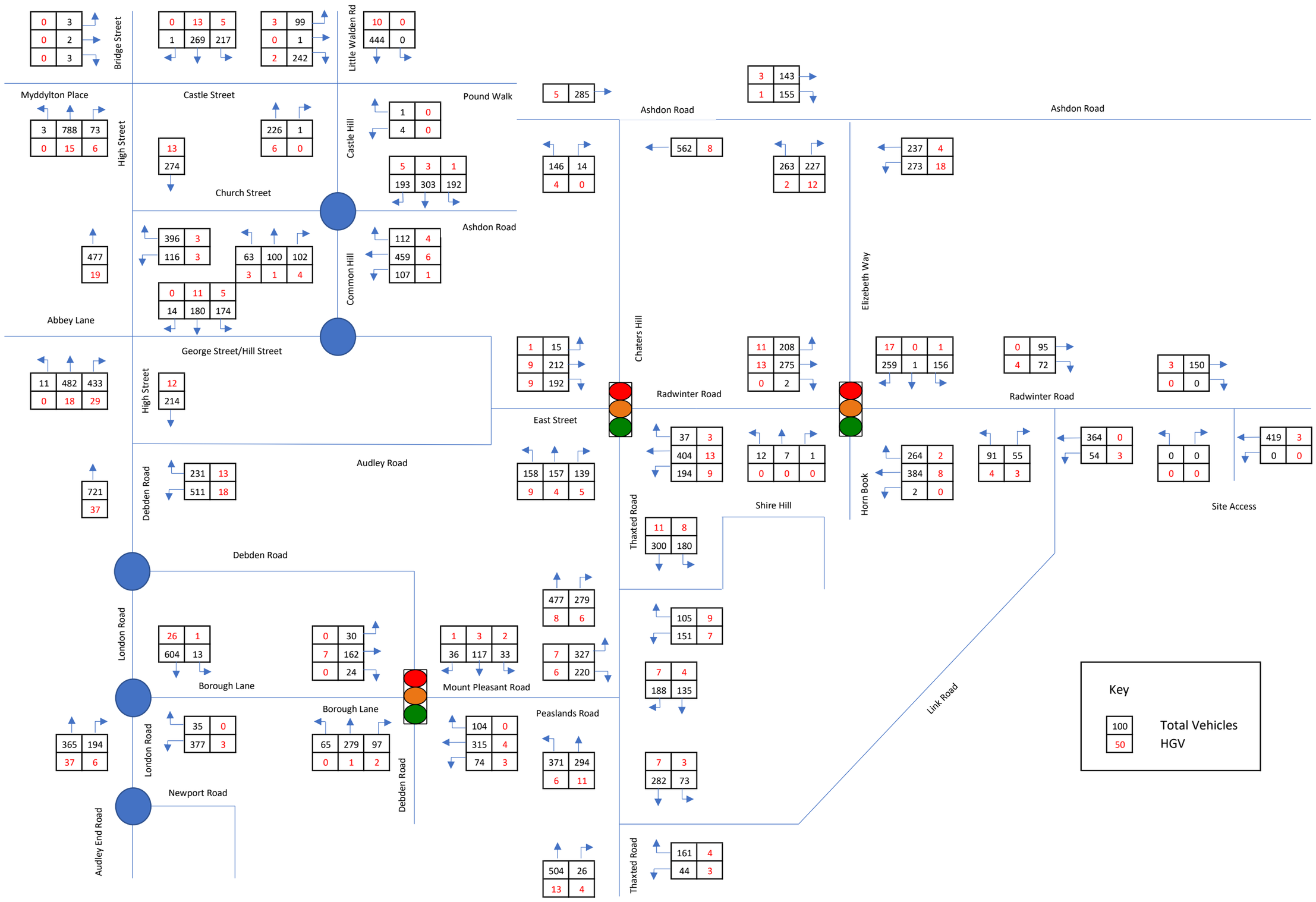


AM Peak Total Development Trips

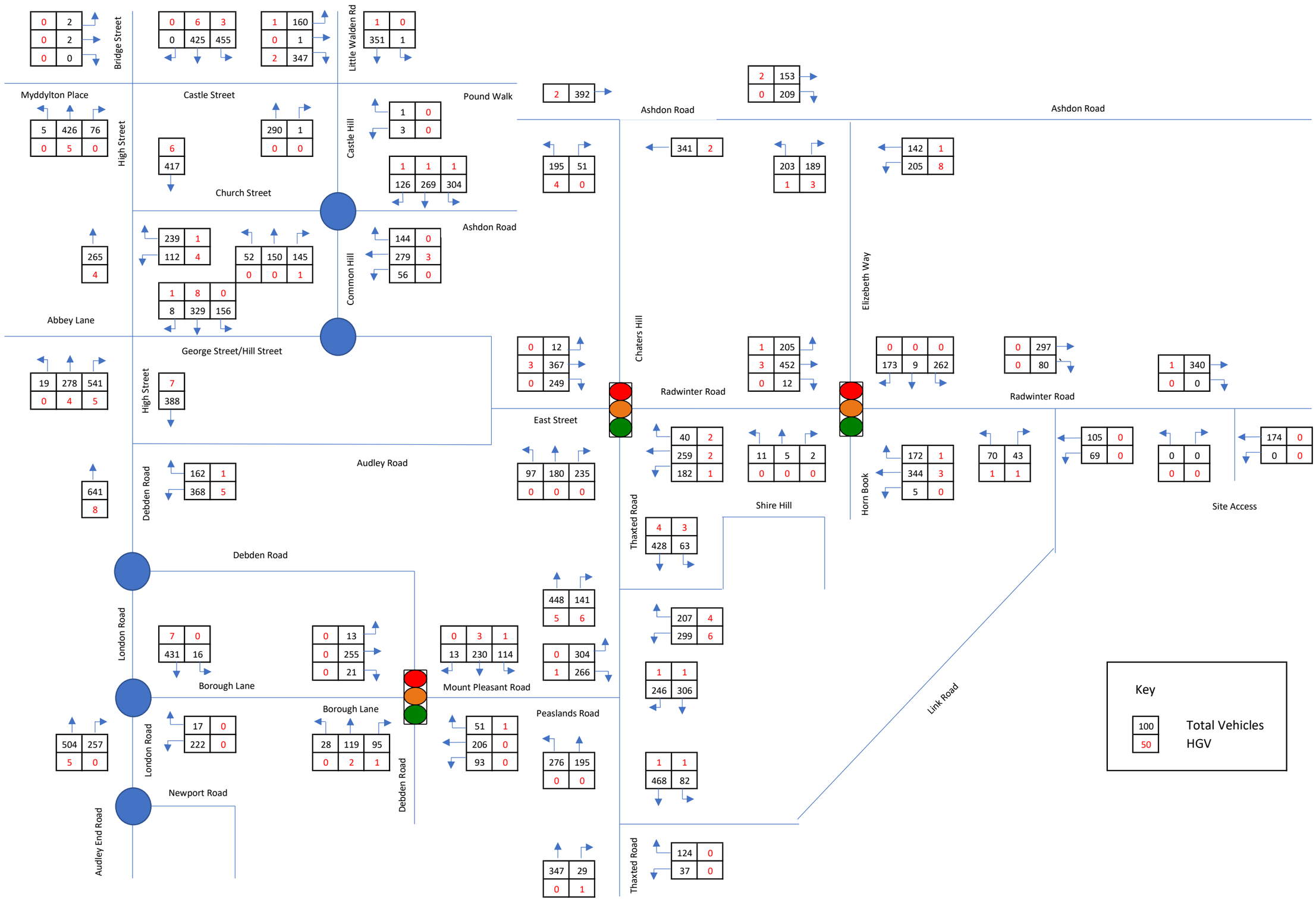


PM Peak Total Development Trips

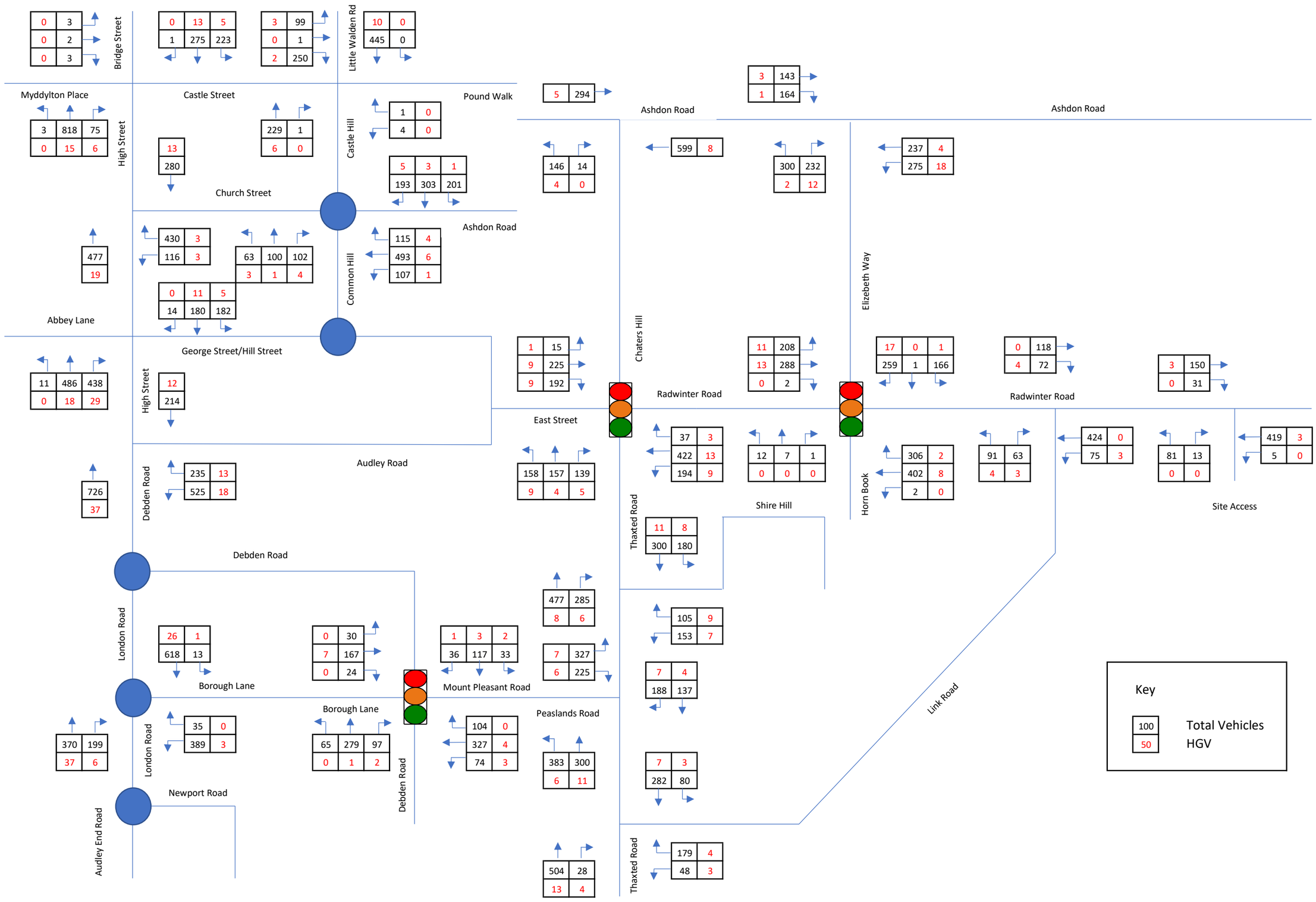
Appendix C: 2026 ‘With’ and ‘Without’ Development Flows

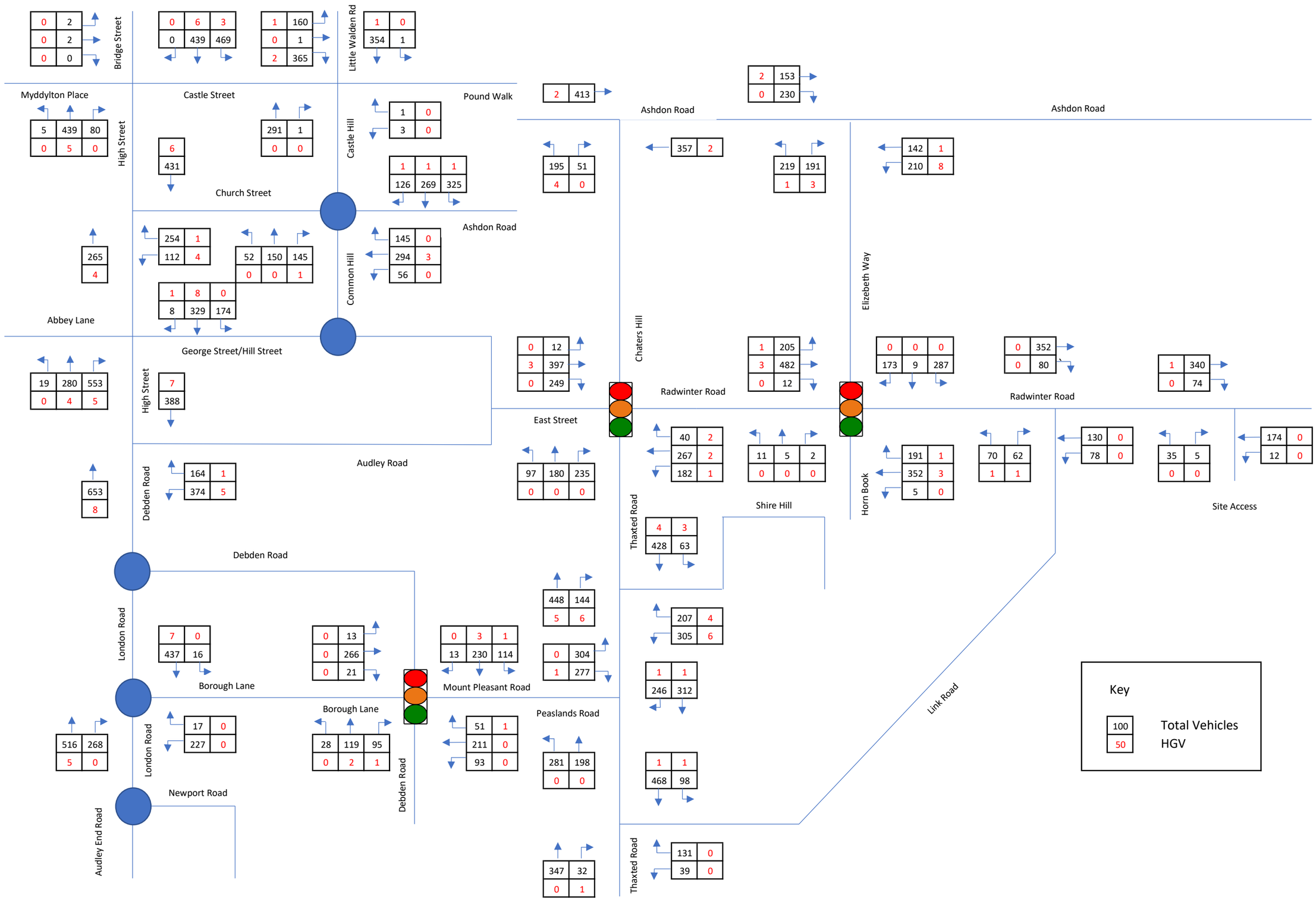


2026 AM Peak Flows Without Development



2026 PM Peak Flows Without Development


Bridge Street
Little Walden Rd
Myddylton Place
Castle Street
Pound Walk
High Street
Castle Hill
Church Street
Ashdon Road
Ashdon Road
Common Hill
Abbey Lane
George Street/Hill Street
High Street
Chaters Hill
Elizebeth Way
Radwinter Road
Radwinter Road
East Street
Audley Road
Debden Road
Shire Hill
Horn Book
Site Access
Thaxted Road
Debden Road
London Road
Borough Lane
Mount Pleasant Road
Borough Lane
Peaslands Road
London Road
Newport Road
Link Road
Audley End Road
Thaxted Road
Key
Total Vehicles
HGV
2026 AM Peak Flows With Development



2026 PM Peak Flows With Development