



ADCOCKS DRINKS COMPANY LTD

**PROPOSED RESIDENTIAL DEVELOPMENT
OFF CREASE DROVE, CROWLAND, LINCOLNSHIRE**

TRANSPORT STATEMENT

**October 2015
apk/15036/v1**

Northern Transport Planning Ltd

Suite 7, Vincent House, 136 Westgate, Wakefield, WF2 9SR

Tel: 01924 367460 Fax: 01924 368931

Email: mail@ntpconsultants.co.uk Internet: www.ntpconsultants.co.uk

PROPOSED RESIDENTIAL DEVELOPMENT OFF CREASE DROVE, CROWLAND, LINCOLNSHIRE

Document Status – Draft

Produced by:	-----	Andy Kirby	Date:	5 October 2015
Checked by:	-----	John Vernon	Date:	5 October 2015
Approved by:	-----	Andy Kirby	Date:	5 October 2015

COPYRIGHT

The contents of this document must not be copied or reproduced in whole or in part without the written consent of **Northern Transport Planning Ltd**

CONTENTS

1	INTRODUCTION	1
1.1	Introduction	1
1.2	Scope of this Report	1
2	TRANSPORT POLICY CONSIDERATIONS	2
2.1	Introduction	2
2.2	National Planning Policy Framework	2
2.3	South Holland Local Plan	3
2.4	Summary	4
3	ACCESSIBILITY	5
3.1	Introduction	5
3.2	Walking and Cycling	5
3.3	Bus Services	6
3.4	Summary	6
4	EXISTING CONDITIONS	8
4.1	Introduction	8
4.2	The Local Highway Network.....	8
4.3	Existing Traffic Flows	9
4.4	Road Safety.....	10
4.6	Operational Assessment	11
4.7	Summary	13
5	TRANSPORT IMPLICATIONS OF THE PROPOSED DEVELOPMENT.....	15
5.1	Introduction	15
5.2	Trip Generation.....	15
5.3	Traffic Generation	16
5.4	Site Access Arrangements	17
5.5	Traffic Distribution and Assignment	18
5.6	Committed Development	20
5.7	Future Traffic Flows	20
5.8	Operational Assessment	21
5.9	Summary	24
6	SUMMARY AND CONCLUSIONS	26
6.1	Introduction	26
6.2	Transport Policy Considerations	26
6.3	Accessibility	26
6.4	Existing Conditions.....	27
6.5	Transport Implications of Development.....	28
6.6	Overall Conclusion.....	29

TABLES

Table 3.1 Existing Bus Services	6
Table 4.1 Existing Traffic Flows (2015)	10
Table 4.2 Operational Assessment – Junction of Crease Drove and Broadway (2015)	11
Table 4.3 Operational Assessment – Junction of Harvester Way and Peterborough Road and Broadway (2015)	11
Table 4.4 Operational Assessment – Junction of Peterborough Road and James Road (2015)	12
Table 5.1 Daily Trip Making Generated by the Proposed Development (45 dwellings)	15
Table 5.2 Weekday Peak Hour Traffic Generation – Proposed Development (45 dwellings)	16
Table 5.3 Weekday Peak Hour Traffic Generation – Established Use (1529sqm)	16
Table 5.5 Traffic Assignment (Proposed and Established Uses)	19
Table 5.6 Weekday Peak Hour Traffic Generation – Committed Development (50 dwellings)	20
Table 5.7 Operational Assessment – Junction of Crease Drove and Broadway (2020)	22
Table 5.8 Operational Assessment – Junction of Harvester Way and Peterborough Road and Broadway (2020)	22
Table 5.9 Operational Assessment – Junction of Peterborough Road and James Road (2020)	23
Table 5.10 2020 Weekday Peak Hour Traffic Flows on Crease Drove (Single Track Section)	24

FIGURES

- 1 Site Location**
- 2 Local Setting**
- 3 Proposed Site Access Arrangements**
- 4 Walking and Cycling Catchments**
- 5 Existing (2015) Morning Peak Hour Traffic Flows**
- 6 Existing (2015) Evening Peak Hour Traffic Flows**
- 7 Distribution of Generated Traffic**
- 8 Assignment of Generated Traffic – Morning Peak Hour (45 dwellings)**
- 9 Assignment of Generated Traffic – Evening Peak Hour (45 dwellings)**
- 10 Assignment of Generated Traffic – Morning Peak Hour (Established Light Industrial Use – 1529sqm)**
- 11 Assignment of Generated Traffic – Evening Peak Hour (Established Light Industrial Use – 1529sqm)**
- 12 Assignment of Generated Traffic – Morning Peak Hour (Committed Development of 50 dwellings)**
- 13 Assignment of Generated Traffic – Evening Peak Hour (Committed Development of 50 dwellings)**
- 14 Existing Morning Peak Hour Traffic Flows – Factored to a 2020 Level**
- 15 Existing Evening Peak Hour Traffic Flows – Factored to a 2020 Level**
- 16 2020 Morning Peak Hour Traffic Flows – With Established Use of the Application Site and Committed Development**
- 17 2020 Evening Peak Hour Traffic Flows – With Established Use of the Application Site and Committed Development**
- 18 2020 Morning Peak Hour Traffic Flows – With Proposed and Committed Developments**
- 19 2020 Evening Peak Hour Traffic Flows – With Proposed and Committed Developments**

APPENDICES (Bound Separately)

A	Extract from the County Council's Map of Cycling Facilities
B	Traffic Count Data
C	Road Traffic Accident Data
D	PICADY Output (2015)
E	TRICS Output
F	Traffic Distribution
G	Committed Development
H	PICADY Output (2020)

1 INTRODUCTION

1.1 Introduction

1.1.1 This Transport Statement considers the transport implications of a proposed residential development of some 45 dwellings on land off Crease Drove, Crowland, Lincolnshire. Crowland is a small town some 15km north of Peterborough and a similar distance south of Spalding. The development is proposed on previously developed land within the defined settlement boundary, to the south of the town centre as may be seen in figure 1.

1.1.2 The site has a western frontage of some 84 metres to Crease Drove, as may be seen generally in figure 2. The site is currently occupied by a single commercial building fronting Crease Drove, a further unit to the rear having been recently demolished. The site is located within an easy walking distance of the town centre where a range of shops and community facilities are available.

1.1.3 Access to the proposed development would be from Crease Drove, as shown in figure 3 and would be provided in accordance with normal highway standards. The site access works include provision of a short section of nearside footway between the existing footway on Crease Drove to the north of the site and the footway to be provided on the site frontage. The proposals for development are at this stage submitted in outline, however there is scope to provide a site layout in accordance with normal standards and consistent with current best practice.

1.2 Scope of this Report

- 1.2.1 Subsequent sections of the report consider the following matters:
- Section Two – considers relevant transport policy issues
 - Section Three – considers accessibility issues
 - Section Four - considers existing traffic conditions in the vicinity of the site
 - Section Five - considers the transport implications of the proposed development
 - Section Six – provides a summary and conclusion to the report

2 TRANSPORT POLICY CONSIDERATIONS

2.1 Introduction

2.1.1 This section of the report considers transport related policy issues relevant to the proposed development.

2.2 National Planning Policy Framework

2.2.1 A National Planning Policy Framework (NPPF) was published by Government on Tuesday 27 March 2012, establishing a presumption in favour of sustainable development. NPPF replaces previous Planning Policy Guidance Notes and Planning Policy Statements, which are now revoked.

2.2.2 Paragraph 32 of NPPF requires that developments that generate significant amounts of movement should be supported by a Transport Statement or Transport Assessment. The proposed development is of a scale requiring a Transport Statement which is duly provided by this report. Paragraph 32 of NPPF identifies three transport related criteria which should be taken into account when decisions are made on Development Plans and planning applications, as follows:

‘Decisions should take account of whether:

- *The opportunities for sustainable transport modes have been taken up depending on the nature and location of the site, to reduce the need for major transport infrastructure;*
- *Safe and suitable access to the site can be achieved for all people; and*
- *Improvements can be undertaken within the transport network that cost effectively limit the significant impacts of the development. Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe.’*

2.2.3 The following comments are relevant in relation to the above:

- *Opportunities for sustainable transport – as indicated in section 3 of this report the site is conveniently accessible for pedestrians and cyclists, with regular bus services available within an easy walking distance on Broadway.*

- *Safe and suitable access for all – As demonstrated in section 5 of this report, safe and suitable access to the site will be available from Crease Drove. Walking, cycling and the use of public transport will also be realistic options for many trips by future residents*
- *Impact of development – The analysis provided in section 5 of this report demonstrates that demands for movement generated by the proposed development can be safely and adequately accommodated on the local transport network such that any resulting impacts are minor and not severe.*

2.3 South Holland Local Plan

- 2.3.1 South Holland District Council and Boston Borough Council are preparing a new Local Plan that on completion will be applicable to both local authority areas. The emerging Local Plan has however not yet completed the necessary public consultation and scrutiny stages in its preparation and cannot therefore be significant weight in decision making on land use and development issues. Whilst the Local Plan adopted in July 2006 may be somewhat outdated, it remains the Council's main policy statement in relation to land use and development.
- 2.3.2 Subject to certain caveats, the adopted Local Plan establishes (in Policy SG1) a presumption in favour of sustainable development. Policy SG2 deals with the distribution of development, advocating a sequential approach to the release of land for development, favouring previously developed sites in accessible locations where generated traffic movements can be suitably accommodated.
- 2.3.3 Crowland is categorised as an 'Area Centre' in the settlement hierarchy defined in the adopted Local Plan, being a location where a range of community facilities are available and 'some significant future growth' may be anticipated. It is notable that the emerging Local Plan takes a broadly consistent position in relation to provision for future housing, with the Preferred Options version of the emerging Plan advocating development of 300 new dwellings in Crowland in the period to 2031.

- 2.3.4 Policy SG15 of the adopted Local Plan deals with facilities for road users, pedestrians and cyclists, requiring that new development provides safe and convenient access for such users (being broadly comparable with second of the three transport related criteria set out in paragraph 32 of NPPF and considered in 2.2.2 above). Subsequent sections of this report demonstrate that safe and convenient access to the proposed development will be available for all highway users, consistent with national and local policy guidance.

2.4 Summary

- 2.4.1 The main thrust of national and local transport related policy is that residential development should be located in areas that are conveniently accessible by a range of transport modes, which is confirmed in section 3 of this report. The emerging Local Plan envisages new housing development being focussed within sustainable communities such as Crowland, which is designated an 'Area Centre' in the adopted Local Plan, with preference given to brownfield land such as the application site at Crease Drove.

3 ACCESSIBILITY

3.1 Introduction

3.1.1 This section of the report considers accessibility issues relevant to the proposed development.

3.2 Walking and Cycling

3.2.1 Walking is considered the most important mode of travel at a local level with potential to replace short car trips particularly under 2 kilometres (equivalent to a 20 minute walk at a walking speed of 1.33 metres/second), whilst cycling also has potential to substitute for short car trips, particularly those under 5km (equivalent to a 20 minute cycle ride at a cycling speed of 15kph). The walking and cycling catchments are shown in figure 4, with the 2km walking catchment including the full extent of Crowland and the 5km cycling catchment also extending to include outlying rural areas.

3.2.2 As indicated in figure 3, the proposed site access works include construction of a new footway connecting to the existing footway on Crease Drove. From this point suitable footway provision is already for pedestrian access to the central areas of Crowland and for pedestrian access to local bus stops, shops, schools and other community facilities. With a range of community facilities available within the local area, walking will be a realistic option for many trips by future residents.

3.2.3 With regard to cycling, the site is conveniently located for access to the extensive network of cycle routes available within the local area. National Cycle Route No12 passes through Crowland and when completed will provide a continuous cycle route between London and Spalding, via Peterborough and Crowland. As indicated on the extract of the County Council's map of cycle routes included as Appendix A, there also are numerous routes 'found useful by local cyclists' in the Crowland area. With generally favourable local topography and a network of lightly trafficked minor roads in the local area, cycling will be a realistic option for many local trips by future residents.

3.2.4 A range of community facilities are available locally in Crowland which will be conveniently accessible to future residents, as identified below:

- South View Primary School, Postland Road - approximately 1100 metres from the site – a walking time of around 14 minutes or a cycle ride of less than 5 minutes.
- Crowland Medical Centre, Thorney Road - approximately 1000 metres from the site – a 12 minute walk or a cycle ride of less than 5 minutes
- Sports and Recreation facilities, Thorney Road - approximately 1000 metres from the site – a 12 minute walk or a cycle ride of less than 5 minutes
- Crowland Library, Hall Street, approximately 700 metres from the site – a 9 minute walk or a cycle ride of less than 5 minutes.

3.2.5 In addition to the above, convenience stores, a post office and pharmacy, public houses, cafes, restaurants, take-away food stores and a range of small shops are available in Crowland town centre, approximately 600 metres from the site.

3.3 Bus Services

3.3.1 Hourly bus services are available to Peterborough and Spalding from bus stops on Broadway approximately 450 metres from the site access on Crease Drove, equivalent to a walking time of 6 minutes at a normal walking speed. Journey time by bus is approximately 40 minutes to Peterborough and 30 minutes to Spalding. With early morning and early evening buses available, travel by bus to and from places of work in Peterborough or Spalding will be realistic options for future residents.

Service	Route	Frequency (minutes)			
		Monday to Friday		Saturday	Sunday
		Daytime	Evening		
37	Peterborough – Crowland – Spalding	60	Services operate until around 9pm	60	4 return services

Table 3.1 Existing Bus Services

3.4 Summary

3.4.1 Walking, cycling and the use of public transport will be realistic options for many trips to be made by future residents. A range of community facilities including shops, schools and health care facilities are available locally in Crowland and will be conveniently accessible to future residents by a choice of transport modes.

- 3.4.2 The site is located within some 450 metres of bus stops on Broadway where regular bus services are available to Peterborough and Spalding. With the improved footway provision to be made as part of the site access works, suitable footway provision will be available for pedestrian movement throughout the local area. With generally favourable local topography and a network of lightly trafficked minor roads available locally cycling will also be a realistic option for many local trips by future residents.

4 EXISTING CONDITIONS

4.1 Introduction

- 4.1.1 This section of the report considers existing traffic conditions in the vicinity of the proposed development.

4.2 The Local Highway Network

- 4.2.1 The site is situated to the south of the town centre, with a western frontage of some 84 metres to Crease Drove. Crease Drove is an adopted highway maintainable at public expense which provides for local traffic movement and access extending on a generally north-south alignment from Broadway to the junction with Harvester Way. The extent of the carriageway is well defined over the northern half of the site frontage, being 5.0 metres in width, with clearly defined verges to each side. Over the southern half of the frontage to Crease Drove, the farside verge continues however the boundary between the site and the public highway is less clearly defined with 3.3 metre carriageway width available at the southern boundary of the site
- 4.2.2 Access to local facilities within Crowland would be via the section of Crease Drove to the north of the site. The section of Crease Drove between the site and the junction with Broadway, 300 metres to the north of the proposed site access, provides a carriageway generally 5.45 metres in width with a 1.5 metre eastern footway and a 1.9 metre western footway. This section of Crease Drove is lit and traffic movement is subject to a 30 mph speed limit. Over this 300 metre length Crease Drove is from the east and west by various residential access roads at simple priority junctions; Monks Meadow, Alderlands Close, Glebe Gardens and Coronation Avenue. The junction of Crease Drove and Broadway is a simple priority junction at which Crease Drove is the minor road.
- 4.2.3 Access to the A16 and routes towards Peterborough is likely to be via Crease Drove to the south of the site, Harvester Way, Peterborough Road and James Road. The section of Crease Drove to the south of the site is straight and flat, with a carriageway of generally 3.3 metres flanked by a verge to each side available over an initial length of 170 metres between the site and the Crowland Cranes premises. Carriageway provision then increases to more than 5.5 metres over the 50 metre length of the Crowland Cranes frontage. Carriageway width then reduces to around 3.5 metres over a further length of some 30 metres before the simple priority junction with Harvester Way is then reached.

- 4.2.4 Harvester Way provides a recently constructed 6.75 metre carriageway, with a 2.0 metre footway to each side. The route to the A16 is then completed via Peterborough Road and James Road before joining the A16 at the southern terminal roundabout of the A16 Crowland Bypass, which was opened to traffic in 2010. Completion of the A16 bypass has had the beneficial effect of removing non-local traffic from Crowland, such that current traffic flows within the town are now generally lower than they were pre-bypass.

4.3 Existing Traffic Flows

- 4.3.1 Surveys to establish existing weekday peak period traffic flows at key locations in the local highway network were undertaken on Monday 28 September 2015. Weather conditions on the day of the survey were favourable and there were no reports of abnormal events that would prejudice the reliability of the results. The surveys were undertaken at the following locations:

- i. The single track section of Crease Drove, to the south of the site
- ii. The junction of Crease Drove and Broadway, to the north of the site (a simple priority junction)
- iii. The junction of Harvester Way and Peterborough Road (a simple priority junction)
- iv. The junction of James Road with Peterborough Road and Carrington Drove (a priority controlled staggered cross-roads)

- 4.3.2 The surveys were undertaken during weekday peak periods (from 0700-0900 hours and from 1600-1800 hours) to enable any significant interaction between peak traffic flows on the local highway network and peak traffic generation by the proposed development to be identified and assessed. It should be noted that the existing building on part of the application site was unoccupied during the survey periods. The weekday peak hours were found to be from 0730-0830 hours and from 1645-1745 hours respectively. 2015 weekday morning and evening peak hour traffic flows are shown in figures 5 and 6 and in the table below, with full results of the surveys provided in full in Appendix B.

- 4.3.3 It can be seen that traffic flows on the single-track section of Crease Drove to the south of the site are at a low level with two-way flows of 36 vehicles in the morning peak hour and 29 vehicles in the evening peak hour. Included within these traffic movements were several tractors with trailers transporting potatoes. It is notable that the majority of traffic movements to and from the Crowland Cranes depot located towards the southern end of Crease Drove were via Harvester Way and Peterborough Road and not via the single track section of Crease Drove to the north of the depot.

4.3.4 Broadway, to the north of the site was also lightly trafficked with two-way flows of around 120 vehicles per hour in the morning and evening peaks. Traffic flows on Peterborough Road and James Road were found to be at more significant levels, with traffic movements on James Road exhibiting significant tidality; traffic flows towards Peterborough being dominant in the morning peak and traffic from Peterborough dominant in the evening peak.

Location	Direction	Morning Peak Hour (vehicles)	Evening Peak Hour (vehicles)
Crease Drove - South of the application Site	Northbound towards the site	16	12
	Southbound towards Harvester Way	20	17
Broadway - West of Crease Drove	Eastbound towards Crowland	73	47
	Westbound from Crowland	48	60
Broadway - East of Crease Drove	Eastbound towards Crowland	84	48
	Westbound from Crowland	56	67
Harvester Way - West of Peterborough Road	Eastbound towards P'boro Road	88	61
	Westbound from P'boro Road	46	74
Peterborough Road - North of Harvester Way	Northbound towards Crowland centre	116	205
	Southbound from Crowland centre	240	72
Peterborough Road - South of Harvester Way	Northbound towards Crowland centre	121	228
	Southbound from Crowland centre	294	81
James Road - North of Harvester Way	Northbound towards Crowland	116	205
	Southbound from Crowland	240	72
James Road - South of Harvester Way	Northbound towards Crowland	141	550
	Southbound from Crowland	767	135

Table 4.1 Existing Traffic Flows (2015)

4.4 Road Safety

4.4.1 Details of road traffic accidents recorded in the vicinity of the site have been obtained for the period from 1 January 2010 to 31 December 2014. During this period 2 road traffic accidents involving injury, classified as being of 'slight' severity occurred at locations relevant to the proposed development, as indicated below and with further details provided in Appendix C.

- In December 2012 a goods vehicle whilst in the process of turning on Crease Drove on the site frontage was in collision with a passing car, resulting in slight injuries to the driver and passengers of the car.
- In July 2011 a car turning right at the junction of Peterborough Road and James Road was in collision with a non-turning motor cycle, resulting in 'slight' injuries to the motorcyclist.

4.4.2 With regard to the incident on Crease Drove it should be noted that the introduction of a residential land use on the application site will have the beneficial effect of reducing the volume of HGV traffic using Crease Drove. The access to the proposed residential development will also be provided fully in accordance with normal highway standards. Having regard to the generally satisfactory safety record of the local highway network and the limited number of recorded incidents it is considered that there are no road safety issues that would justify withholding planning permission for the proposed residential development.

4.6 Operational Assessment

4.6.1 Weekday peak hour operation of the key junctions listed in paragraph 4.2.2 above has been analysed using the Transport Research Laboratory computer program PICADY. The results of the analysis are summarised in the tables below and presented in full in Appendix D. It can be seen that peak hour traffic flows at each junction are within capacity, with each junction operating satisfactorily. This finding is generally consistent with observations on site, although it is noted that during the morning peak hour occasional short term peaks in flow on James Road, can lead to a brief build up in traffic on Peterborough Road, with any queue quickly dissipating.

Traffic Movement	MORNING PEAK HOUR (0730-0830)		EVENING PEAK HOUR (1645-1745)	
	Ratio of Flow to Capacity	Maximum Queue (vehicles)	Ratio of Flow to Capacity	Maximum Queue (vehicles)
Crease Drove	0.10	0.11	0.07	0.08
Broadway West	0.04	0.04	0.04	0.05

Table 4.2 Operational Assessment – Junction of Crease Drove and Broadway (2015)

Traffic Movement	MORNING PEAK HOUR (0730-0830)		EVENING PEAK HOUR (1645-1745)	
	Ratio of Flow to Capacity	Maximum Queue (vehicles)	Ratio of Flow to Capacity	Maximum Queue (vehicles)
Harvester Way	0.24	0.32	0.16	0.19
Peterborough Road North	0.05	0.08	0.05	0.06

Table 4.3 Operational Assessment – Junction of Harvester Way and Peterborough Road and Broadway (2015)

Traffic Movement	MORNING PEAK HOUR (0730-0830)		EVENING PEAK HOUR (1645-1745)	
	Ratio of Flow to Capacity	Maximum Queue (vehicles)	Ratio of Flow to Capacity	Maximum Queue (vehicles)
Peterborough Road left to James Road	0.04	0.04	0.03	0.03
Peterborough Road right turn to James Road	0.55	1.20	0.14	0.16
James Road Northbound	0.00	0.00	0.01	0.01
Carrington Drove left to James Road	0.00	0.00	0.00	0.00
Carrington Drove right to James Road	0.00	0.00	0.00	0.00
James Road Southbound	0.06	0.11	0.02	0.03

Table 4.4 Operational Assessment – Junction of Peterborough Road and James Road (2015)

- 4.6.2 It is recognised that with a carriageway width of generally 3.3 metres, the 170 metre length of Crease Drove between the site and the Crowland Cranes premises is not wide enough for two vehicles to pass. Observations on site however indicate that this section of Crease Drove operates safely and satisfactorily, with drivers giving way to approaching traffic should the need arise and waiting within the two-way sections at either end of the one-way section to allow an oncoming vehicle to pass (consistent with guidance provided in paragraph 155 of the Highway Code).
- 4.6.3 When considering operation of single track roads with passing places, to avoid oncoming vehicles meeting within the one-way section it is necessary for drivers approaching the one-way section to see an approaching vehicle before passing the two-way sections. With Crease Drove having a straight and flat alignment forward visibility is available over a length of at least 400 metres, such that the driver of a vehicle joining Crease Drove at the junction with Harvester Way can see an approaching vehicle beyond the junction with Alderlands Close (and vice versa).
- 4.6.4 Drivers approaching the single track section of Crease Drove will therefore have a good perception of approaching traffic, such that the criterion set out in the paragraph above in relation to visibility is satisfied. As such drivers on Crease Drove should have no difficulty in perceiving when it is necessary to wait in a two-way section to allow an oncoming vehicle to pass. Safety and operation is also assisted by the fact that most users of single track section of Crease Drove will be regular users who are familiar with the road layout and drive accordingly.

4.6.5 Various studies have been undertaken to consider the capacity on single track roads with suitable passing opportunities as available on Crease Drove to the south of the site, indicating capacity for up to around 280 to 300 vehicle movements per hour:

- Road Research Laboratory LR71, ('Single Track Roads in the Scottish Highlands' available from <http://trl.co.uk/>) published in 1967, considered this issue concluding that a capacity of 280 vehicle movements per hour was appropriate, on a road with good alignment and visibility.
- Appendix 4 of 'Residential Roads and Footpaths' published by Government in 1977 notes the findings of further studies concluding that flow levels of up to 300 vehicles per hour could be accommodated on suitably designed single track sections before delays were significantly increased.
- Volume 15 of the Design Manual for Roads and Bridges (The Economic Assessment of Road Schemes in Scotland – NESAs) considers the limiting capacity of single track roads to be 280 vehicles per hour (in figure 7/9/6).

4.6.6 It is clear from the above therefore, that with good visibility and alignment and with passing opportunities available at each end, current two-way traffic flows of around 40 vehicles per hour on the single track section of Crease Drove are well within capacity.

4.7 Summary

4.7.1 The site is situated to the south of the town centre, with a western frontage of some 84 metres to Crease Drove. Access to local facilities within Crowland would be via the section of Crease Drove to the north of the site. Access to the A16 and routes towards Peterborough is likely to be via Crease Drove to the south, Harvester Way, Peterborough Road and James Road. The section of Crease Drove to the south of the site is straight and flat, however over a length of some 170 metres is effectively a single track road with passing places at each end.

4.7.2 Existing weekday peak hour traffic flows have been established by traffic surveys at key locations. Operational analysis demonstrates that peak hour flows within capacity, although it is noted that during the morning peak hour occasional short term peaks in flow on James Road, can lead to a brief build up in traffic on Peterborough Road, with any queue quickly dissipating. The local highway network has a generally satisfactory safety record with no issues that would justify restricting the grant of planning permission for the proposed development.

- 4.7.3 Existing peak hour traffic flows on the single track section of Crease Drove are at a low level, with two-way flows of around 40 vehicles per hour. Independent research into the has however found that single track roads with good visibility and alignment, such as the section of Crease Road to the south of the site should have capacity for up to around 280 to 300 vehicles per hour. As such, existing traffic flows on the single track section of Crease Drove are well within capacity.

5 TRANSPORT IMPLICATIONS OF THE PROPOSED DEVELOPMENT

5.1 Introduction

5.1.1 This section of the report considers the transport implications arising from a proposed residential development of some 45 dwellings.

5.2 Trip Generation

5.2.1 Trip making generated by the proposed development has been assessed by reference to multi-modal data contained in the TRICS database (version 7.2.2). The 'Residential – Houses Privately Owned' section of the database has been used for this purpose. Trip rates have been derived by comparison with established developments in UK mainland locations, excluding sites in Greater London, town centres and edge of town centre locations. Output from the TRICS database is included as Appendix E.

5.2.2 Multi-modal data has been considered initially to estimate trip making by all modes of transport. Demands for movement typically generated by a residential development of 45 dwellings as indicated in the table below. With regard to pedestrian movements, cycling and trip making by public transport, it can be seen that the proposed residential development would generate modest additional demands. In view of the infrastructure and services available in the local area and the provisions to be made as part of the development, further more detailed analysis in relation to these modes of transport is not considered necessary. Subsequent paragraphs therefore focus on the traffic effects of development.

Mode of Transport	Proportion of Trips	Number of Trips per Day
Vehicle Occupants	78.8%	299
Pedestrians	17.0%	65
Cyclists	2.4%	9
Public Transport Users	1.8%	7
Total	100.0%	380

Table 5.1 Daily Trip Making Generated by the Proposed Development (45 dwellings)

NB. The number of trips indicated is the sum of arrivals and departures.

5.3 Traffic Generation

5.3.1 Data from the TRICS database has been considered further to assess the volume of vehicular traffic likely to be generated by a development of 45 dwellings, as indicated in table 5.2 below. The analysis focusses on the weekday morning and evening peak hours when any significant interaction between existing traffic and that generated by the proposed development may be anticipated.

5.3.2 It can be seen that the proposed development would generate only a modest volume of traffic. A total of 25 vehicle movements are indicated in the morning and evening peak hours, equivalent on average to around one vehicle movement every 2 minutes. It is notable also that the volume of traffic generated by the proposed development is below the 'materiality threshold' of 30 vehicle movements per hour set out in Government guidance (paragraph 2.11 of 'Guidance on Transport Assessment', published by Government in March 2007). As such, it is considered that traffic generated by the proposed development is unlikely to materially affect operation of the local highway network.

Time Range	ARRIVALS		DEPARTURES	
	Trip Rate (veh/dw)	Trips (vehicles)	Trip Rate (veh/dw)	Trips (vehicles)
Morning Peak Hour	0.156	7	0.404	18
Evening Peak Hour	0.362	16	0.210	9

Table 5.2 Weekday Peak Hour Traffic Generation – Proposed Development (45 dwellings)

5.3.3 When considering the traffic effects of the proposed development it appropriate to deduct traffic movements generated by the established use of the site from those generated by the proposed use. The single remaining building on the application site (1529sqm) was unoccupied at the time of the baseline traffic survey but was previously used for a range of commercial purposes. An assessment of the traffic generating potential of this existing building has been made by further reference to the TRICS database, based on a light industrial use. The results of this analysis are summarised in table 5.3 below, with relevant TRICS output contained in Appendix E.

Time Range	ARRIVALS		DEPARTURES	
	Trip Rate (veh/100sqm)	Trips (vehicles)	Trip Rate (veh/100sqm)	Trips (vehicles)
Morning Peak Hour	0.982	15	0.109	2
Evening Peak Hour	0.061	1	0.766	12

Table 5.3 Weekday Peak Hour Traffic Generation – Established Use (1529sqm)

5.3.4 It can be seen by comparing tables 5.2 and 5.3 that traffic movements generated by the proposed residential development are only marginally greater than those associated with the established use, which could be resumed without further planning consent, as detailed below:

- In the morning peak hour the proposed residential development would generate 25 vehicle movements whereas the established light industrial use would generate 17 vehicle movements
- In the evening peak hour the proposed residential development would generate 25 vehicle movements whereas the established light industrial use would generate 13 vehicle movements

5.3.5 It should be noted that until 2014, a second building (of 1882sqm) was present on the site and clearly if traffic movements associated with this building used for light industrial purposes were also considered, traffic movements generated by the site as a whole would exceed those generated by the proposed residential use. Whilst a planning application for a light industrial building similar to that recently demolished would be difficult to resist, to provide a robust assessment the analysis provided in further sections of this report has regard only to the traffic generating potential of the existing building on the application site.

5.4 Site Access Arrangements

5.4.1 As may be seen in the site layout plan provided as figure 3, Crease Drove is to be widened to provide a 5.5 metre carriageway on the site frontage, except for tapers at the site boundaries. A 2.0 metre nearside footway would be provided on the site frontage with a suitable footway also provided within the nearside verge area connecting the site frontage footway and the existing footway on Crease Drove to the north of the site.

5.4.2 The site access would be centrally located providing a 5.5 metre carriageway, with 2.0 metre footway to each side, with 6.0 metre junction radii and 2.4 x 43 metre sight lines to left and right, consistent with normal standards. The proposals for development are at this stage submitted in outline, however there is scope to provide a site layout in accordance with normal standards and consistent with current best practice.

5.5 Traffic Distribution and Assignment

- 5.5.1 The distribution of generated traffic is based on the distribution of car driver commuting trips in the South Holland Super Output Area for Crowland (South Holland 011), within which the site is located, as recorded in the 2011 census. Whilst vehicle trips are generated for various purposes, the geographical distribution of journey to work trips is considered generally representative. The data which is provided in Appendix F indicates 31.3% of vehicle movements being contained locally within the South Holland area, with 43.1% of trips to and from the Peterborough administrative area.
- 5.5.2 The distribution of traffic generated by the proposed residential development is shown diagrammatically in figure 7, with the resulting morning and evening peak hour assignments shown in figures 8 and 9. The key features of the traffic distribution are as follows:
- 73.7% of traffic movements are via Harvester Way, Peterborough Road and James Road, south of the site (plus 0.8% of trips to and from the Crease Drove industrial area to the south of the site).
 - 20.9% of traffic movements are via Broadway West and
 - 4.6% of traffic movements are via Broadway East
- 5.5.3 The traffic distribution set out in figure 7 has also been applied to the traffic generating potential of the established light industrial use of the existing building on the application site (table 5.3), with the resulting traffic assignment shown in figure 10 and 11. The assignments for the proposed and established uses are compared in table 5.4 below, which also indicates the difference in resulting traffic volumes at key locations in the local highway network. The analysis confirms that the volume traffic generated by the proposed residential development and established light industrial use volumes does not differ materially, with the proposed residential use giving rise to a small increase in traffic in certain instances and a small reduction at others.

Location	Direction	Morning Peak Hour			Evening Peak Hour		
		Proposed Residential Development	Established Light Industrial Use	Difference	Proposed Residential Development	Established Light Industrial Use	Difference
Crease Drive - South of the application Site	Northbound towards the site	5	11	-6	12	1	11
	Southbound towards Harvester Way	14	1	13	7	9	-2
Broadway - West of Crease Drive	Eastbound towards Crowland	1	3	-2	3	0	3
	Westbound from Crowland	4	0	4	2	2	0
Broadway - East of Crease Drive	Eastbound towards Crowland	1	0	1	0	1	-1
	Westbound from Crowland	0	1	0	1	0	1
Harvester Way - West of Peterborough Road	Eastbound towards P'boro Road	13	1	12	7	9	-2
	Westbound from P'boro Road	5	11	-6	12	1	11
Peterborough Road - North of Harvester Way	Northbound towards Crowland centre	0	0	0	0	0	0
	Southbound from Crowland centre	0	0	0	0	0	0
Peterborough Road - South of Harvester Way	Northbound towards Crowland centre	5	11	-6	12	1	11
	Southbound from Crowland centre	13	1	12	7	9	-2
James Road - North of Harvester Way	Northbound towards Crowland	0	0	0	0	0	0
	Southbound from Crowland	0	0	0	0	0	0
James Road - South of Harvester Way	Northbound towards Crowland	5	11	-6	12	1	11
	Southbound from Crowland	13	1	12	7	9	-2

Table 5.5 Traffic Assignment (Proposed and Established Uses)

NB. A positive figure in the difference column indicates that the proposed residential development would generate more traffic than the established light industrial use

5.6 Committed Development

5.6.1 When considering future operation of the local highway network, it is appropriate to have regard to consented developments. Of relevance in this context is a consented residential development of 50 dwellings (H02-0468-14), which will take access from Peterborough Road, north of the junction with James Road. A masterplan for the consented development is included as Appendix G.

5.6.2 As a Transport Statement does not appear to have been required as part of the planning application, generated traffic movements have been assessed by applying the trip rates and traffic distribution derived for the development now proposed at Crease Drove. The resulting traffic generation for the committed development is set out in the table below, with the traffic assignment shown in figures 12 and 13.

Time Range	ARRIVALS		DEPARTURES	
	Trip Rate (veh/dw)	Trips (vehicles)	Trip Rate (veh/dw)	Trips (vehicles)
Morning Peak Hour	0.156	8	0.404	20
Evening Peak Hour	0.362	18	0.210	11

Table 5.6 Weekday Peak Hour Traffic Generation – Committed Development (50 dwellings)

5.7 Future Traffic Flows

5.7.1 Consistent with Government guidance the traffic implications of the proposed development have been considered in an assessment year 5 years after the date of the planning application. Peak hour traffic flows in 2020, without the proposed and allocated development, has been derived by applying growth factors obtained from TEMPRO (version 6.2), with local adjustment factors for South Holland from the National Transport Model (dataset AF09) to existing (2015) traffic flows. Growth factors of 8.62% for the morning peak period and 9.01% for the evening peak have been obtained in this way. Existing morning and evening weekday peak hour traffic flows factored to a 2020 level are shown in figures 14 and 15.

5.7.2 The impact of traffic generated by the proposed development may be assessed by comparing operation of the local highway network in the two weekday peak hour scenario indicated below.

- Traffic Flows in 2020 with established use of the application site and committed development - Existing traffic flows factored to a 2020 level with the addition of traffic movements generated by resumption of the established use of the application site and with the addition of traffic generated by the identified committed development
- Traffic flows in 2020 with the proposed use of the application site and committed development - Existing traffic flows factored to a 2020 level with the addition of traffic movements generated by the proposed residential development and the addition of traffic generated by the identified committed development

5.7.3 Traffic flows in 2020 without the proposed development have been obtained by summing traffic generated by the established light industrial use (figures 10 and 11), traffic generated by the consented residential development of Peterborough Road (figures 12 and 13) to existing traffic flows factored to a 2020 level (figures 14 and 15). These 2020 weekday peak hour traffic flows without the proposed development are shown in figures 16 and 17.

5.7.4 Traffic flows in 2020 with the proposed development have been obtained by summing traffic generated by the proposed residential development (figures 8 and 9), traffic generated by the consented residential development of Peterborough Road (figures 12 and 13) to existing traffic flows factored to a 2020 level (figures 14 and 15). These 2020 weekday peak hour traffic flows with the proposed development are shown in figures 18 and 19.

5.8 Operational Assessment

5.8.1 Further operational analysis has been undertaken using the Transport Research Laboratory computer program PICADY to assess weekday peak hour operation of the key junctions in the 2020 assessment year, in the two development scenarios identified in paragraph 5.7.2 above. The results of this analysis are summarised in the tables below and presented in full in Appendix H. It can be seen that traffic flows at the key junctions remain within capacity in each scenario. With traffic volumes generated by the proposed and established uses of the site being broadly similar, the analysis confirms that traffic generated by the proposed residential development does not materially affect operation of the local highway network

Traffic Movement	WITH ESTABLISHED USE AND COMMITTED DEVELOPMENT				WITH PROPOSED AND COMMITTED DEVELOPMENTS			
	MORNING PEAK HOUR		EVENING PEAK HOUR		MORNING PEAK HOUR		EVENING PEAK HOUR	
	Ratio of Flow to Capacity	Maximum Queue (vehicles)	Ratio of Flow to Capacity	Maximum Queue (vehicles)	Ratio of Flow to Capacity	Maximum Queue (vehicles)	Ratio of Flow to Capacity	Maximum Queue (vehicles)
Crease Drove	0.11	0.12	0.08	0.09	0.12	0.13	0.08	0.09
Broadway West	0.05	0.06	0.04	0.05	0.04	0.05	0.05	0.06

Table 5.7 Operational Assessment – Junction of Crease Drove and Broadway (2020)

Traffic Movement	WITH ESTABLISHED USE AND COMMITTED DEVELOPMENT				WITH PROPOSED AND COMMITTED DEVELOPMENTS			
	MORNING PEAK HOUR		EVENING PEAK HOUR		MORNING PEAK HOUR		EVENING PEAK HOUR	
	Ratio of Flow to Capacity	Maximum Queue (vehicles)	Ratio of Flow to Capacity	Maximum Queue (vehicles)	Ratio of Flow to Capacity	Maximum Queue (vehicles)	Ratio of Flow to Capacity	Maximum Queue (vehicles)
Harvester Way	0.27	0.37	0.21	0.26	0.31	0.44	0.20	0.25
Peterborough Road North	0.06	0.09	0.05	0.07	0.06	0.09	0.05	0.07

Table 5.8 Operational Assessment – Junction of Harvester Way and Peterborough Road and Broadway (2020)

Traffic Movement	WITH ESTABLISHED USE AND COMMITTED DEVELOPMENT				WITH PROPOSED AND COMMITTED DEVELOPMENTS			
	MORNING PEAK HOUR		EVENING PEAK HOUR		MORNING PEAK HOUR		EVENING PEAK HOUR	
	Ratio of Flow to Capacity	Maximum Queue (vehicles)	Ratio of Flow to Capacity	Maximum Queue (vehicles)	Ratio of Flow to Capacity	Maximum Queue (vehicles)	Ratio of Flow to Capacity	Maximum Queue (vehicles)
Peterborough Road left to James Road	0.05	0.05	0.03	0.03	0.05	0.05	0.03	0.03
Peterborough Road right turn to James Road	0.65	1.77	0.19	0.23	0.67	1.96	0.19	0.23
James Road Northbound	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01
Carrington Drove left to James Road	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Carrington Drove right to James Road	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
James Road Southbound	0.07	0.13	0.02	0.03	0.00	0.13	0.02	0.03

Table 5.9 Operational Assessment – Junction of Peterborough Road and James Road (2020)

5.8.2 The table below indicates 2020 weekday peak hour traffic volumes on the single track section of Crease Drove, between the application site and the Crowland Cranes premises in the two development scenarios. It can be seen that in all scenarios the two-way peak hour traffic flow on Crease Drove would remain less than 60 vehicles per hour and on average less than 1 vehicle per minute.

5.8.3 The analysis set out in section 4.6 above indicates that single track roads, such as Crease Drove to the south of the application site, with good visibility and alignment, provide a capacity of around 280 – 300 vehicle movements per hour. With traffic volumes on this section of Crease Drove likely to remain less than 60 vehicles an hour in all scenarios, it is clear that highway improvements on this section of Crease Drove are not necessitated by the proposed residential development.

Time Range	2020 WITH ESTABLISHED USE AND COMMITTED DEVELOPMENT	2020 WITH PROPOSED AND COMMITTED DEVELOPMENTS
Morning Peak Hour	52 vehicles	58 vehicles per hour
Evening Peak Hour	41 vehicles	51 vehicles per hour

Table 5.10 2020 Weekday Peak Hour Traffic Flows on Crease Drove (Single Track Section)

5.9 Summary

5.9.1 Demands for movement generated by the proposed development have been assessed by reference to the TRICS database. With regard to pedestrian movements, cycling and trip making by public transport, the proposed residential development would generate modest additional demands which with the provisions to be made as part of site access works and the infrastructure and services already available in the local area, can be suitably accommodated.

5.9.2 The proposed development of 45 dwellings would generate some 25 vehicle movements in the morning and evening peak hours. It should be noted that this modest volume of traffic is below the 'materiality threshold' of 30 vehicle movements per hour indicated in Government guidance. Generated traffic flows are only marginally in excess of the traffic generating potential of the established light industrial use of the site, which would generate 17 vehicle movements in the morning peak hour and 13 vehicle movements in the evening peak hour. After allowing for traffic generated by the established use, the increase in traffic arising from the proposed residential development would be minimal.

- 5.9.3 Further operational analysis has been undertaken using the Transport Research Laboratory computer program PICADY to assess operation of key junctions in the local highway network in the 2020 assessment year. Traffic flows at the key junctions have been found to remain within capacity, with and without the proposed residential development. With traffic volumes generated by the proposed and established uses of the site being broadly similar, the analysis confirms that traffic generated by the proposed residential development does not materially affect operation of the local highway network
- 5.9.4 Peak hour two-way traffic flows on the single track section of Crease Drove to the south of the site would remain less than 60 vehicles per hour (two-way), with or without the proposed development, equivalent on average to less than 1 vehicle per minute. Traffic volumes on this section of Crease Drove are not materially affected by the proposed development and would remain well within capacity, which independent studies have found to be around 280 – 300 vehicle movements per hour. It is clear therefore that highway improvements on this section of Crease Drove are not necessitated by the proposed residential development

6 SUMMARY AND CONCLUSIONS

6.1 Introduction

6.1.1 This Transport Statement considers the transport implications of a proposed residential development of some 45 dwellings on land off Crease Drove, Crowland, Lincolnshire. The site is currently occupied by a single commercial unit fronting Crease Drove, a further unit to the rear having been recently demolished. The site is located within an easy walking distance of the town centre where a range of shops and community facilities are available.

6.1.2 Access to the proposed development would be from Crease Drove and would be provided in accordance with normal highway standards. The site access works include provision of a short section of nearside footway between the existing footway on Crease Drove to the north of the site and the footway to be provided on the site frontage. The proposals for development are at this stage submitted in outline, however there is scope to provide a site layout in accordance with normal standards and consistent with current best practice.

6.2 Transport Policy Considerations

6.2.1 The main thrust of national and local transport related policy is that residential development should be located in areas that are conveniently accessible by a range of transport modes, which is confirmed in section 3 of this report. The emerging Local Plan envisages new housing development being focussed within sustainable communities such as Crowland, which is designated an 'Area Centre' in the adopted Local Plan, with preference given to brownfield land such as the application site at Crease Drove.

6.3 Accessibility

6.3.1 Walking, cycling and the use of public transport will be realistic options for many trips to be made by future residents. A range of community facilities including shops, schools and health care facilities are available locally in Crowland and will be conveniently accessible to future residents by a choice of transport modes.

- 6.3.2 The site is located within some 450 metres of bus stops on Broadway where regular bus services are available to Peterborough and Spalding. With the improved footway provision to be made as part of the site access works, suitable footway provision will be available for pedestrian movement throughout the local area. With generally favourable local topography and a network of lightly trafficked minor roads available locally cycling will also be a realistic option for many local trips by future residents.

6.4 Existing Conditions

- 6.4.1 The site is situated to the south of the town centre, with a western frontage of some 84 metres to Crease Drove. Access to local facilities within Crowland would be via the section of Crease Drove to the north of the site. Access to the A16 and routes towards Peterborough is likely to be via Crease Drove to the south, Harvester Way, Peterborough Road and James Road. The section of Crease Drove to the south of the site is straight and flat, however over a length of some 170 metres is effectively a single track road with passing places at each end.
- 6.4.2 Existing weekday peak hour traffic flows have been established by traffic surveys at key locations. Operational analysis demonstrates that peak hour flows within capacity, although it is noted that during the morning peak hour occasional short term peaks in flow on James Road, can lead to a brief build up in traffic on Peterborough Road, with any queue quickly dissipating. The local highway network has a generally satisfactory safety record with no issues that would justify restricting the grant of planning permission for the proposed development.
- 6.4.3 Existing peak hour traffic flows on the single track section of Crease Drove are at a low level, with two-way flows of around 40 vehicles per hour. Independent research into the has however found that single track roads with good visibility and alignment, such as the section of Crease Road to the south of the site should have capacity for up to around 280 to 300 vehicles per hour. As such, existing traffic flows on the single track section of Crease Drove are well within capacity.

6.5 Transport Implications of Development

- 6.5.1 Demands for movement generated by the proposed development have been assessed by reference to the TRICS database. With regard to pedestrian movements, cycling and trip making by public transport, the proposed residential development would generate modest additional demands which with the provisions to be made as part of site access works and the infrastructure and services already available in the local area, can be suitably accommodated.
- 6.5.2 The proposed development of 45 dwellings would generate some 25 vehicle movements in the morning and evening peak hours. It should be noted that this modest volume of traffic is below the 'materiality threshold' of 30 vehicle movements per hour indicated in Government guidance. Generated traffic flows are only marginally in excess of the traffic generating potential of the established light industrial use of the site, which would generate 17 vehicle movements in the morning peak hour and 13 vehicle movements in the evening peak hour. After allowing for traffic generated by the established use, the increase in traffic arising from the proposed residential development would be minimal.
- 6.5.3 Further operational analysis has been undertaken using the Transport Research Laboratory computer program PICADY to assess operation of key junctions in the local highway network in the 2020 assessment year. Traffic flows at the key junctions have been found to remain within capacity, with and without the proposed residential development. With traffic volumes generated by the proposed and established uses of the site being broadly similar, the analysis confirms that traffic generated by the proposed residential development does not materially affect operation of the local highway network
- 6.5.4 Peak hour two-way traffic flows on the single track section of Crease Drove to the south of the site would remain less than 60 vehicles per hour (two-way), with or without the proposed development, equivalent on average to less than 1 vehicle per minute. Traffic volumes on this section of Crease Drove are not materially affected by the proposed development and would remain well within capacity, which independent studies have found to be around 280 – 300 vehicle movements per hour. It is clear therefore that highway improvements on this section of Crease Drove are not necessitated by the proposed residential development

6.6 Overall Conclusion

- 6.6.1 Having regard to the above, it is considered that the proposed residential development of some 45 dwellings on land off Crease Drove, Crowland is acceptable from a transport viewpoint.

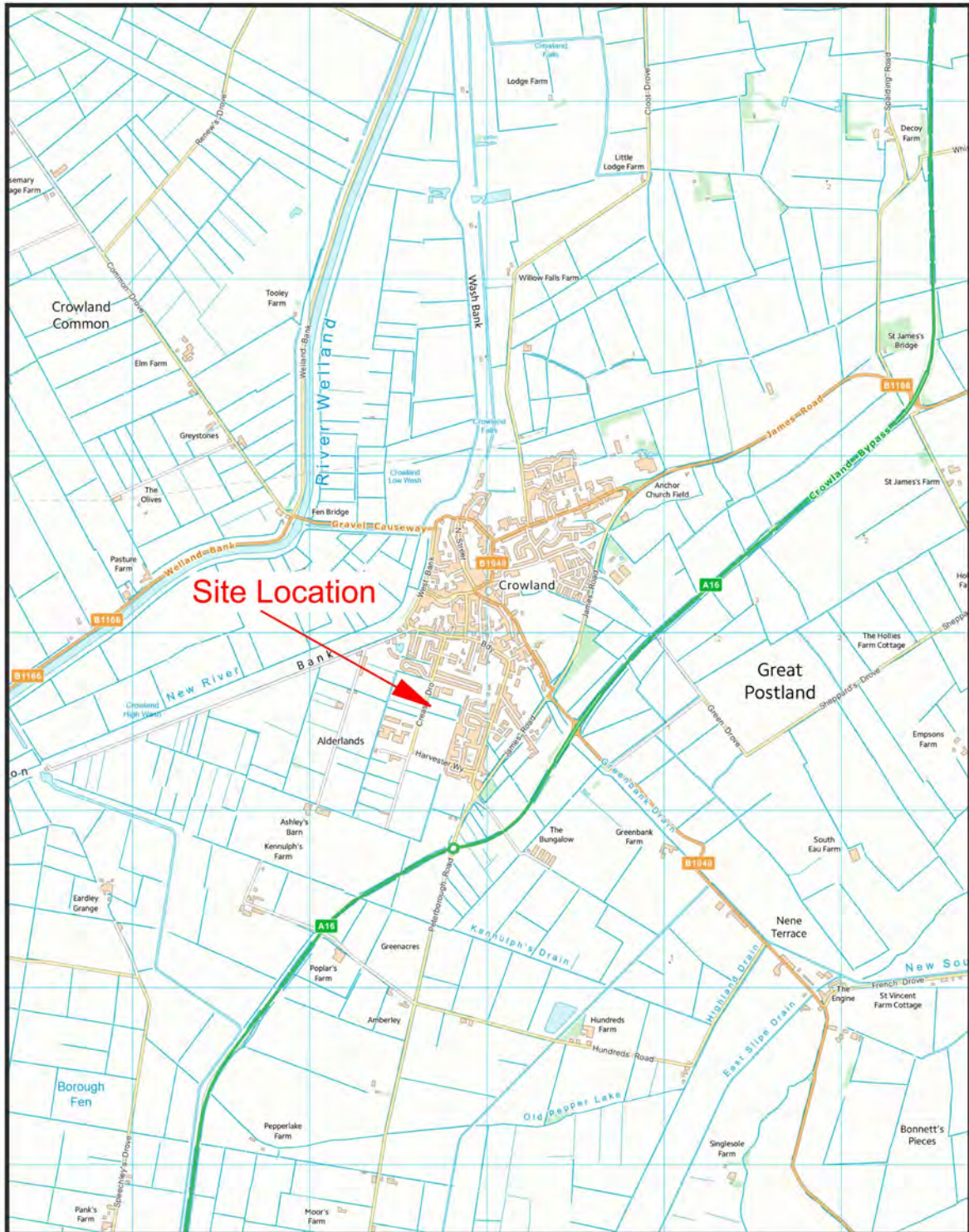
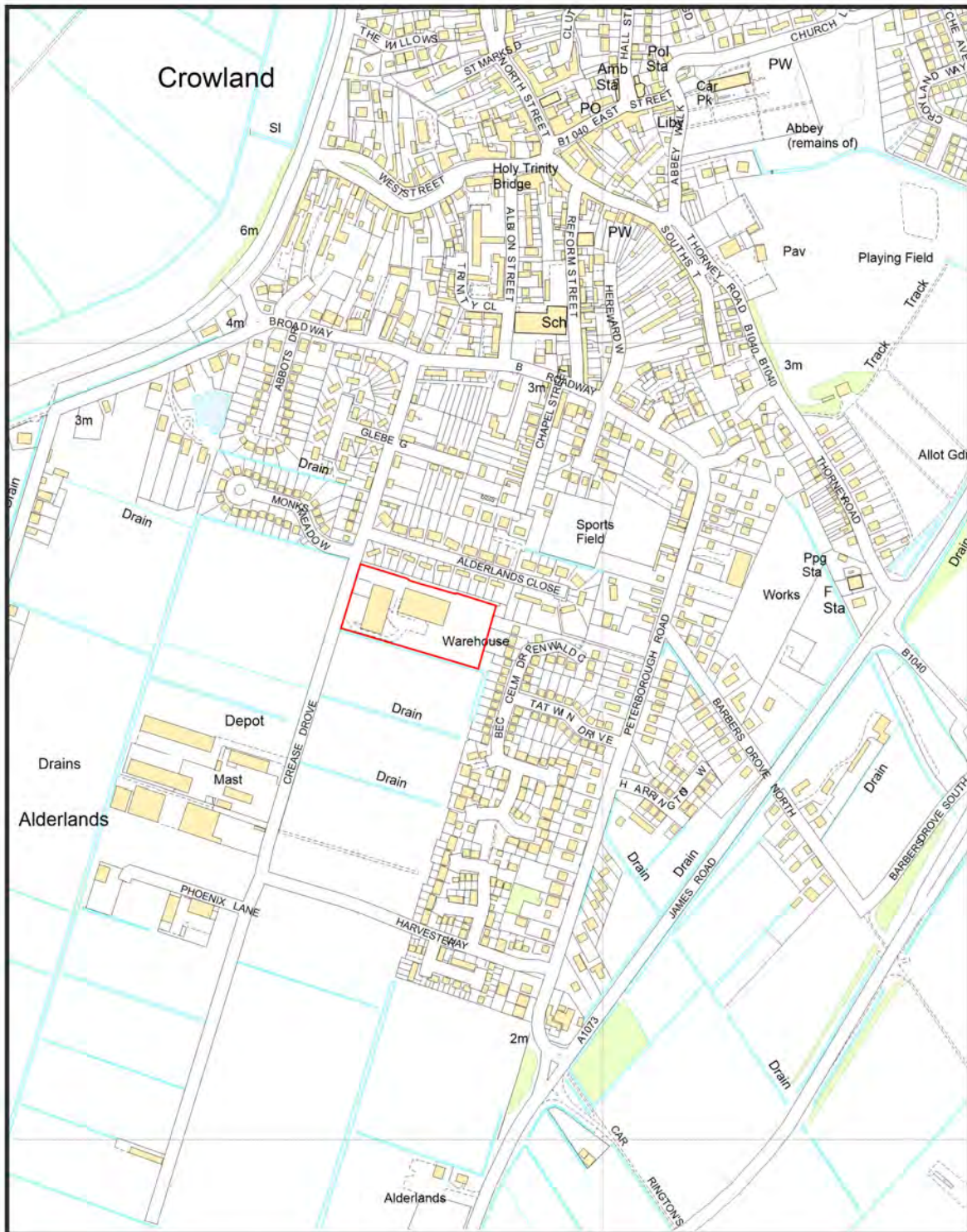


Figure 1
Site Location

Northern Transport Planning Ltd
Suite 7, Vincent House
136 Westgate, Wakefield
West Yorkshire, WF2 9SR
Tel: 01924 367460



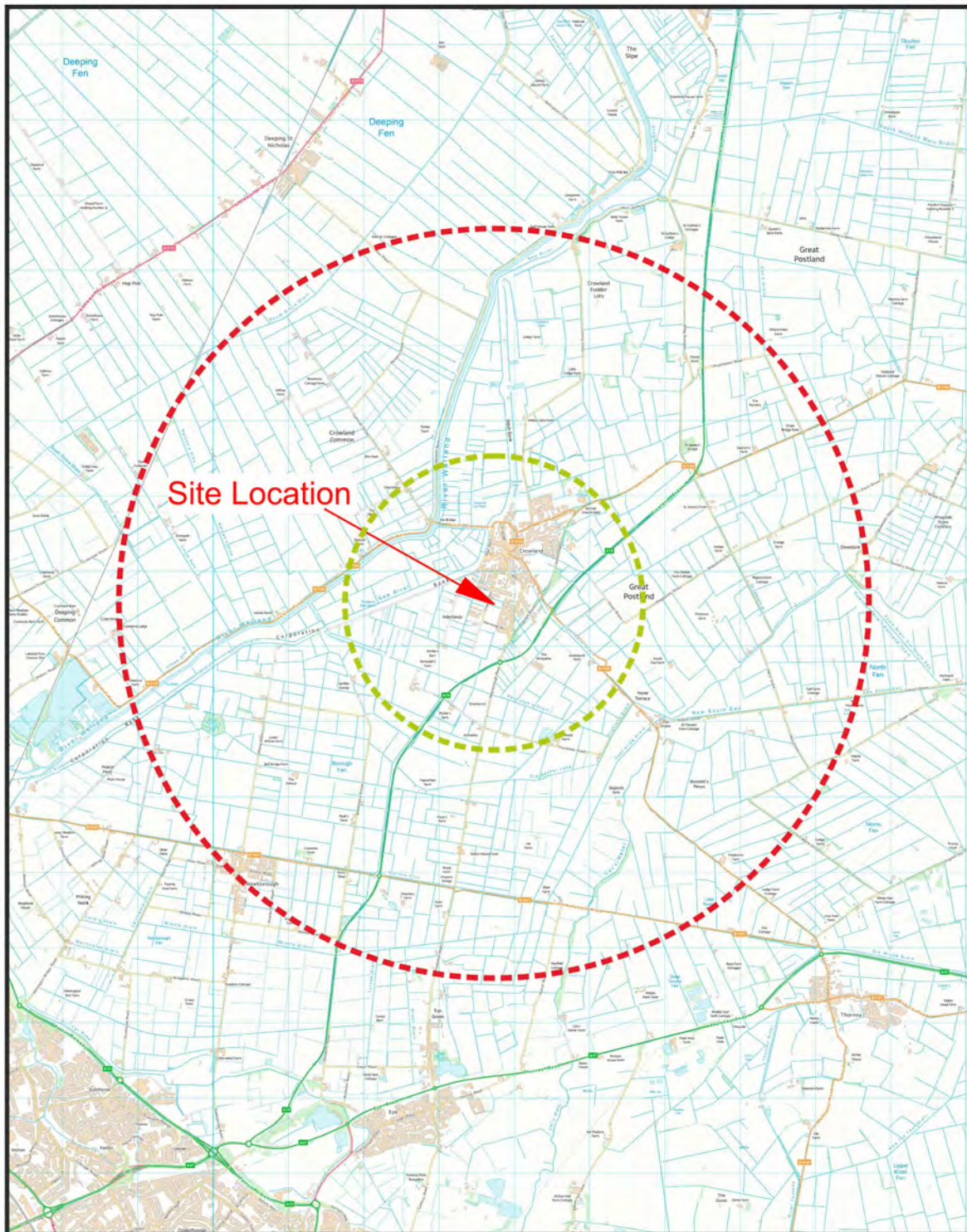


Site of Proposed Development

Figure 2
Local Setting

Northern Transport Planning Ltd
Suite 7, Vincent House
136 Westgate, Wakefield
West Yorkshire, WF2 9SR
Tel: 01924 367460





2km Walking
Catchment



5km Cycling
Catchment

Figure 4
Walking and Cycling Catchments

Northern Transport Planning Ltd
Suite 7, Vincent House
136 Westgate, Wakefield
West Yorkshire, WF2 9SR
Tel: 01924 367460



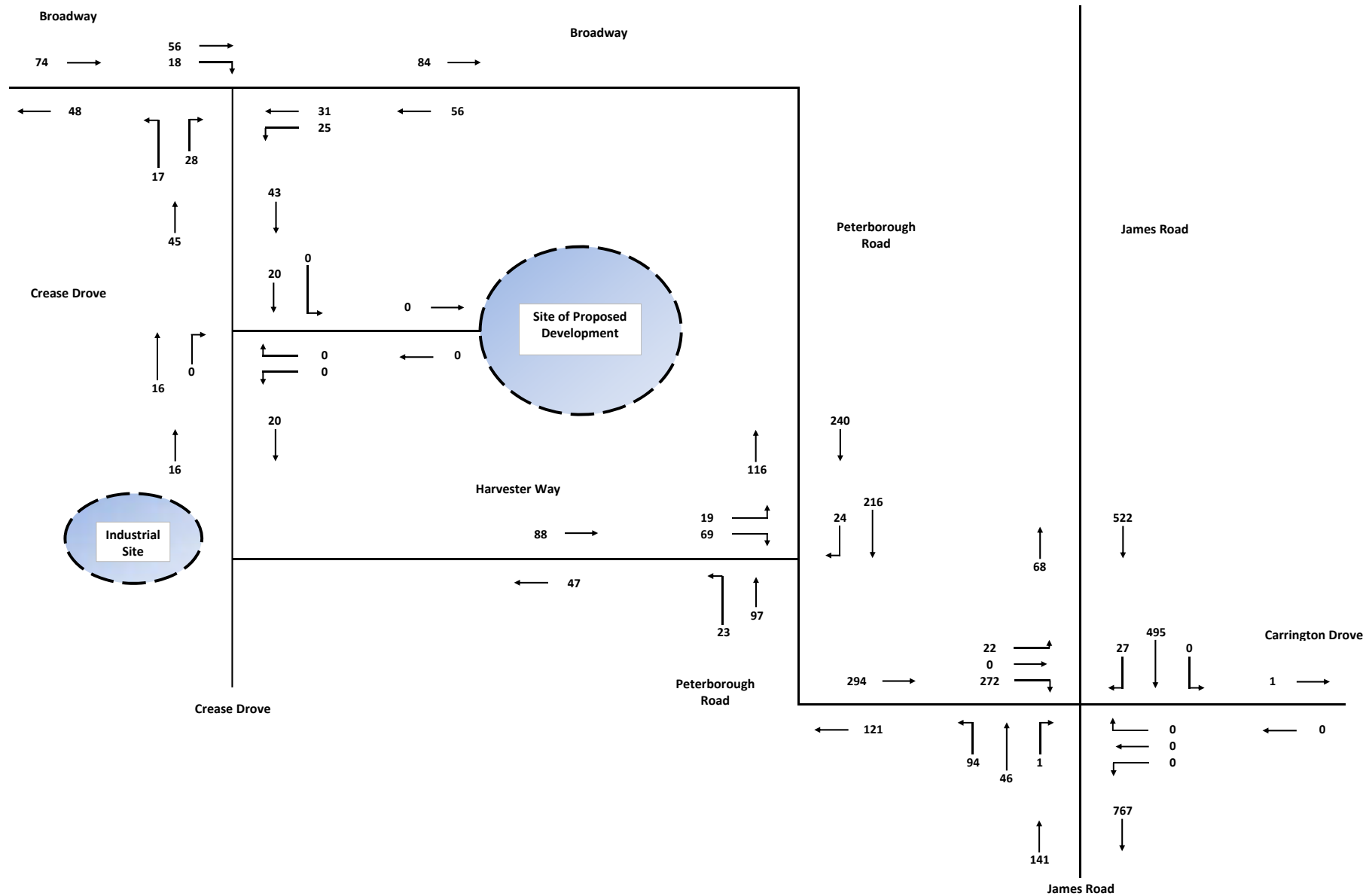


Figure 5.
Existing Morning Peak Hour Traffic Flows
(07:30-08:30 hours)

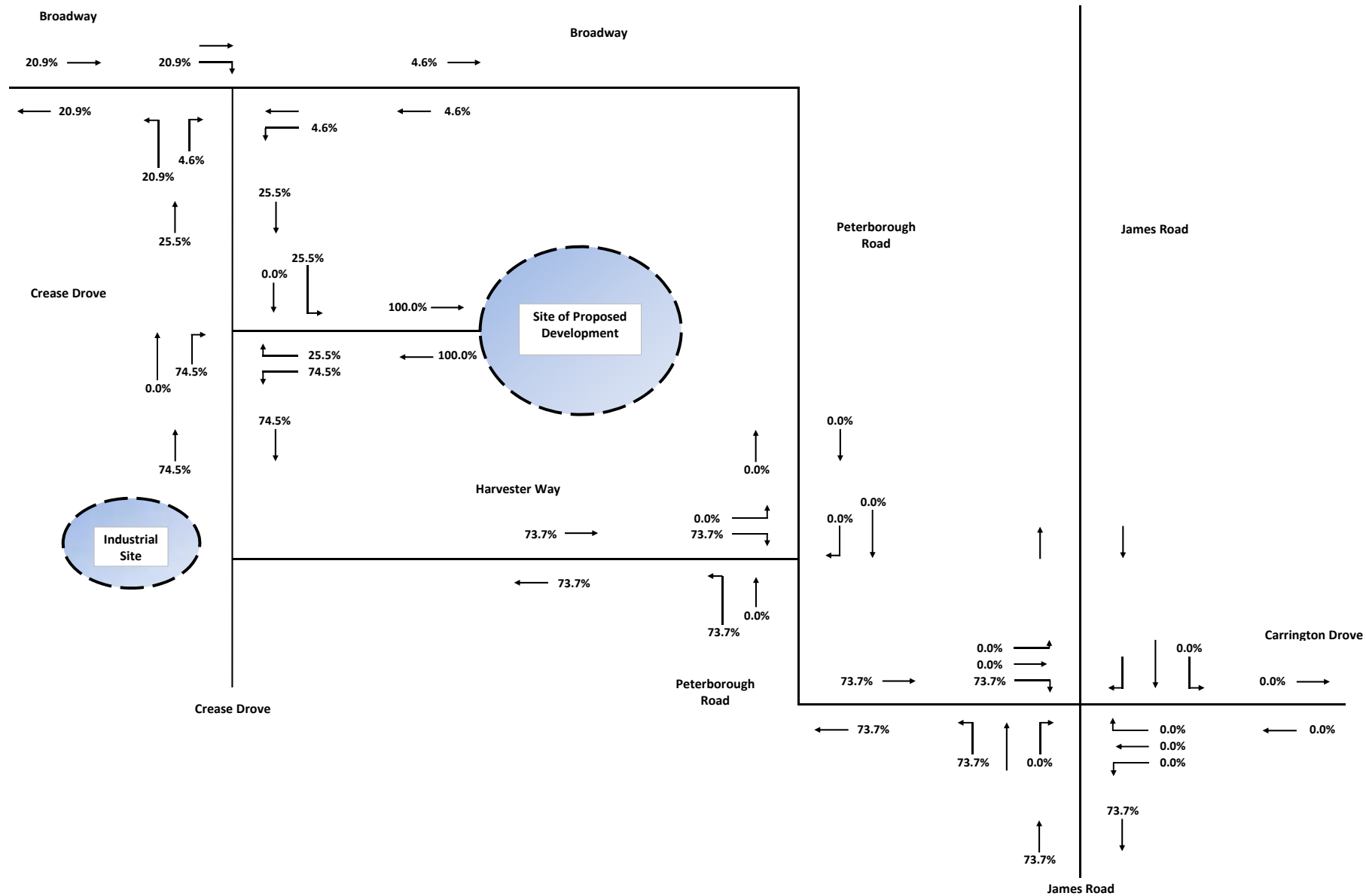


Figure 7.
Distribution of Generated Traffic

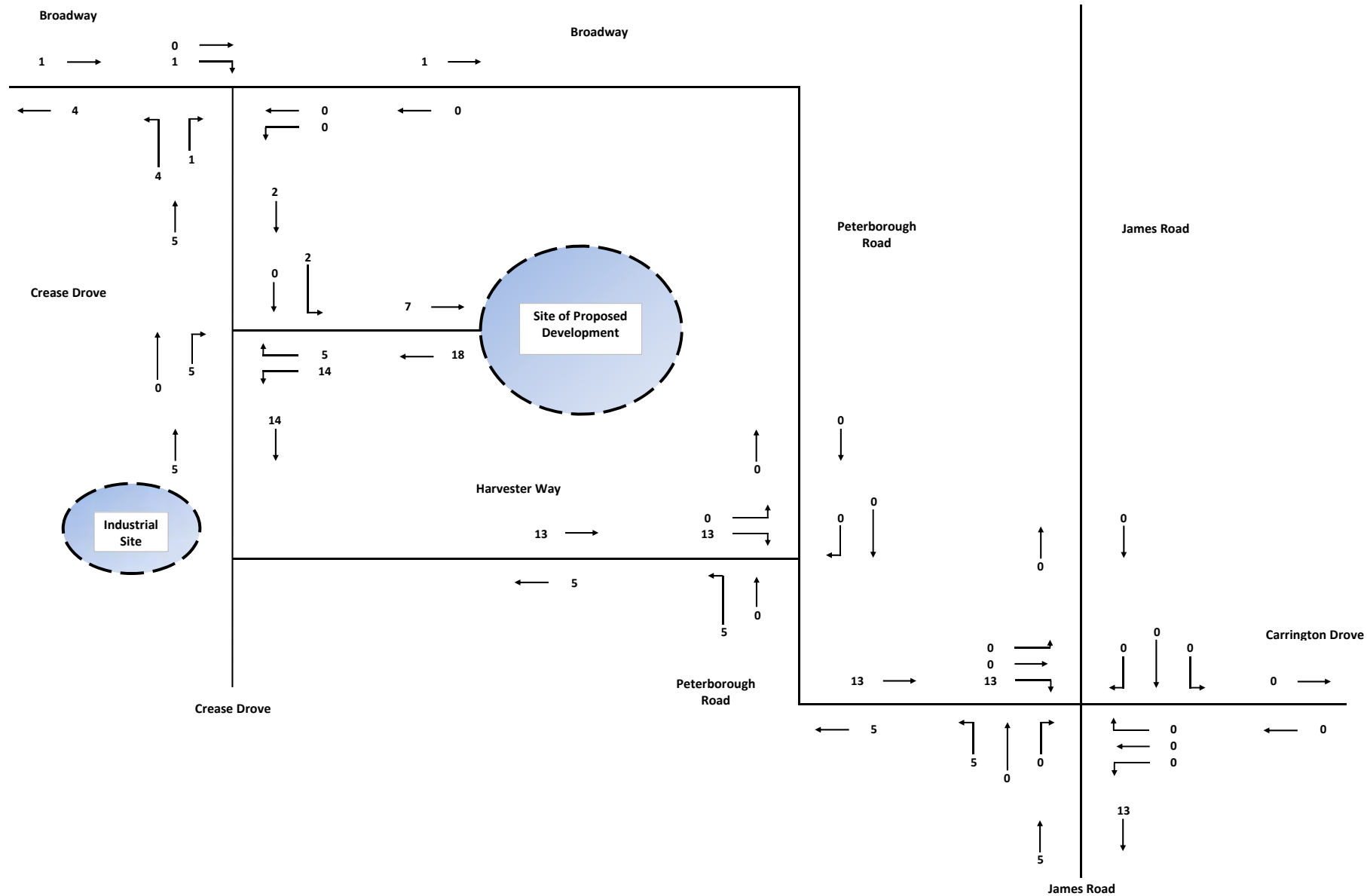


Figure 8.
Assignment of Generated Traffic
(Morning Peak Hour - 45 dwellings)

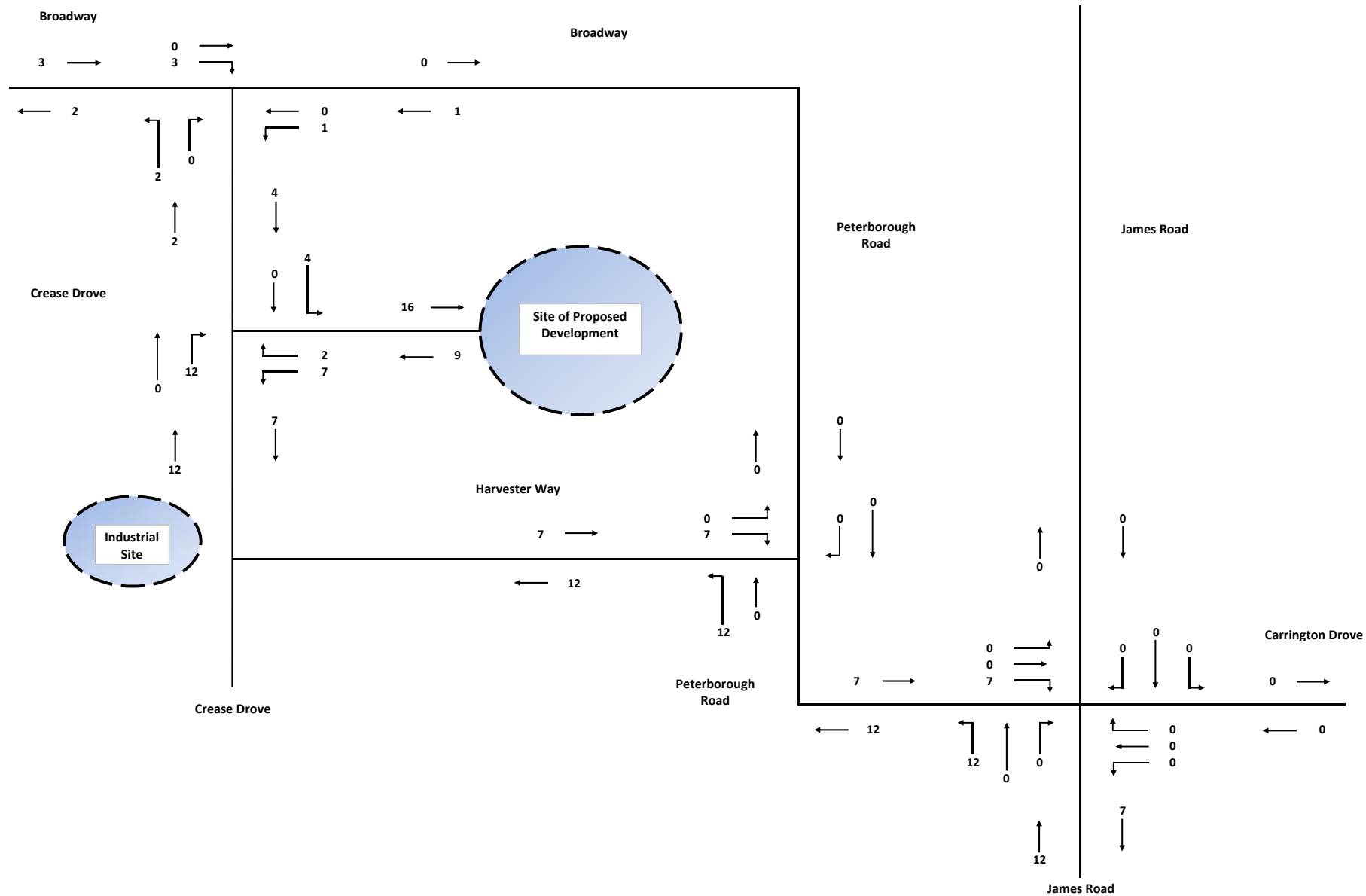


Figure 9.
Assignment of Generated Traffic
(Evening Peak Hour - 45 dwellings)

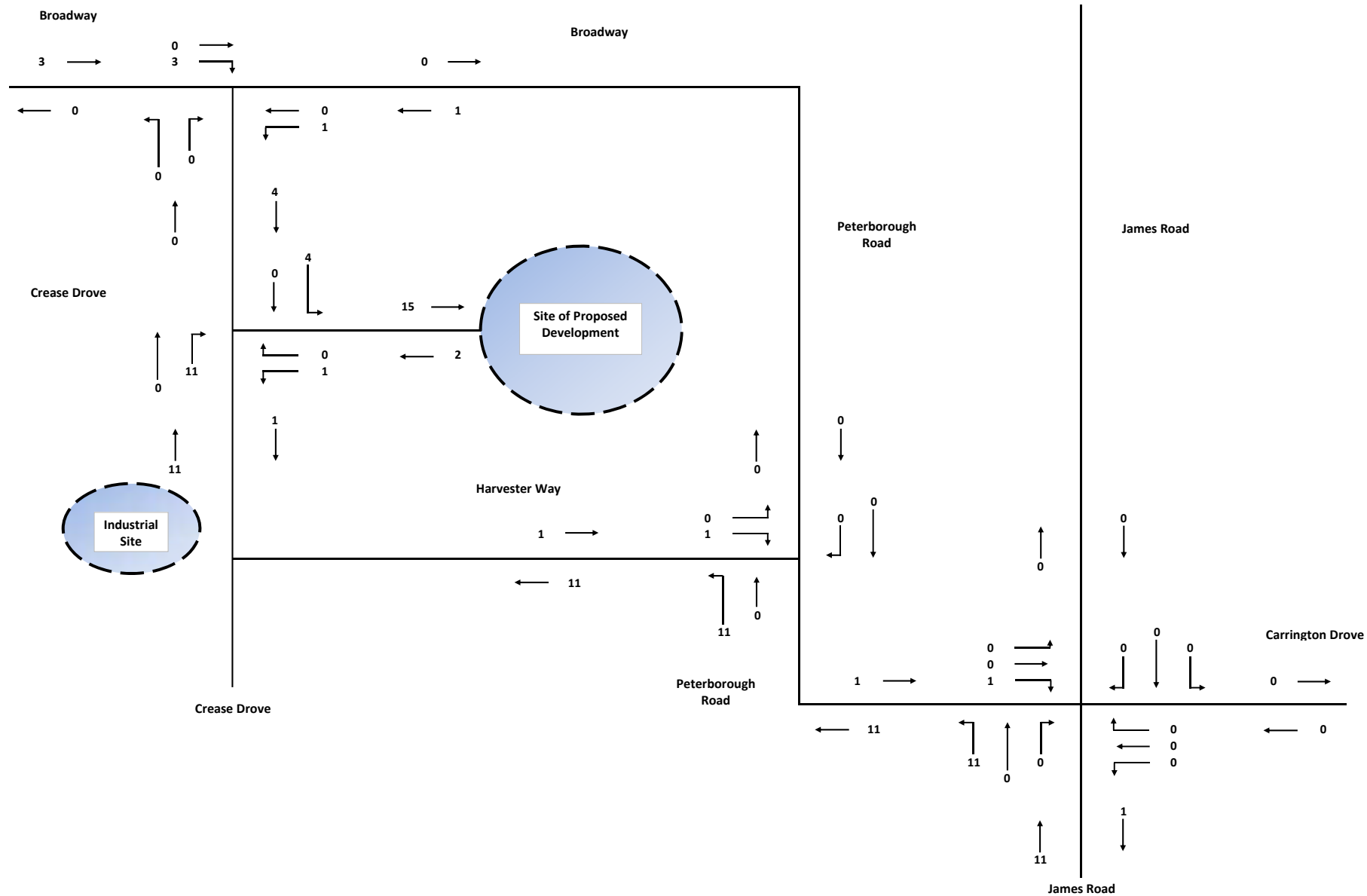


Figure 10.
Assignment of Generated Traffic Morning Peak Hour
(Established Light Industrial Use - 1529sqm)

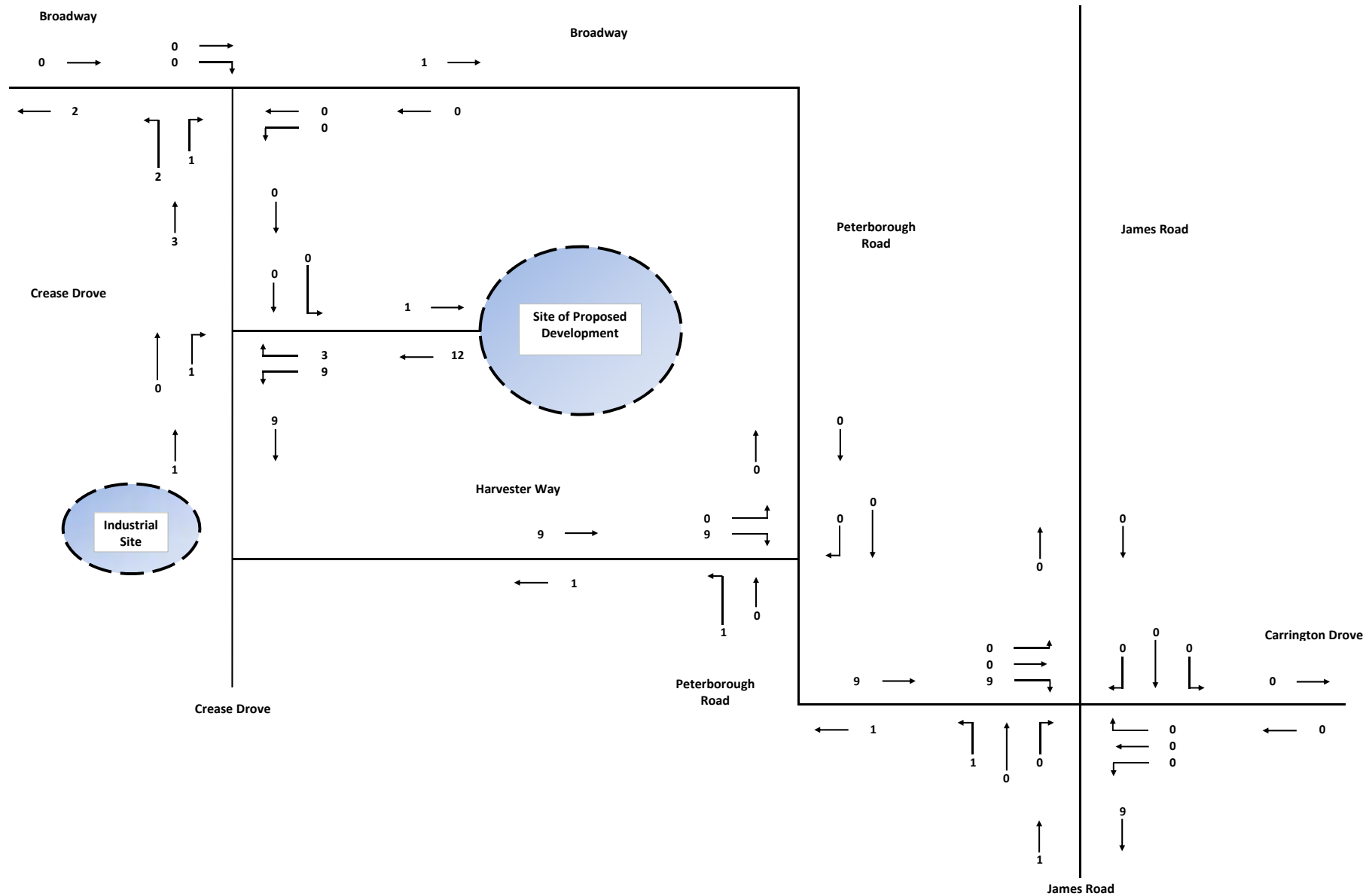


Figure 11.
Assignment of Generated Traffic Evening Peak Hour
(Established Light Industrial Use - 1529sqm)

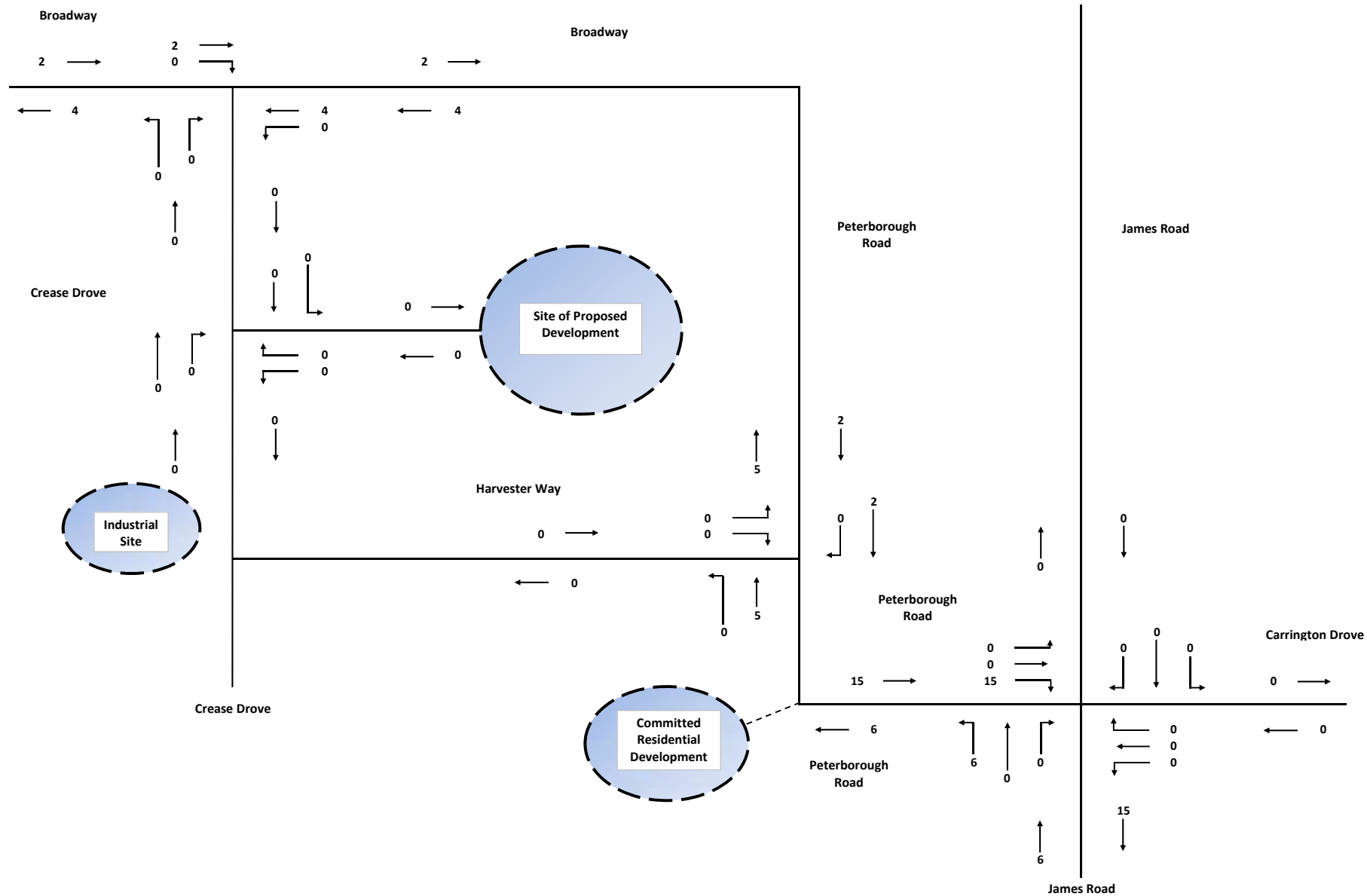


Figure 12.
Assingment of Generated Traffic
(Morning Peak Hour - Committed Development of 50 dwellings)

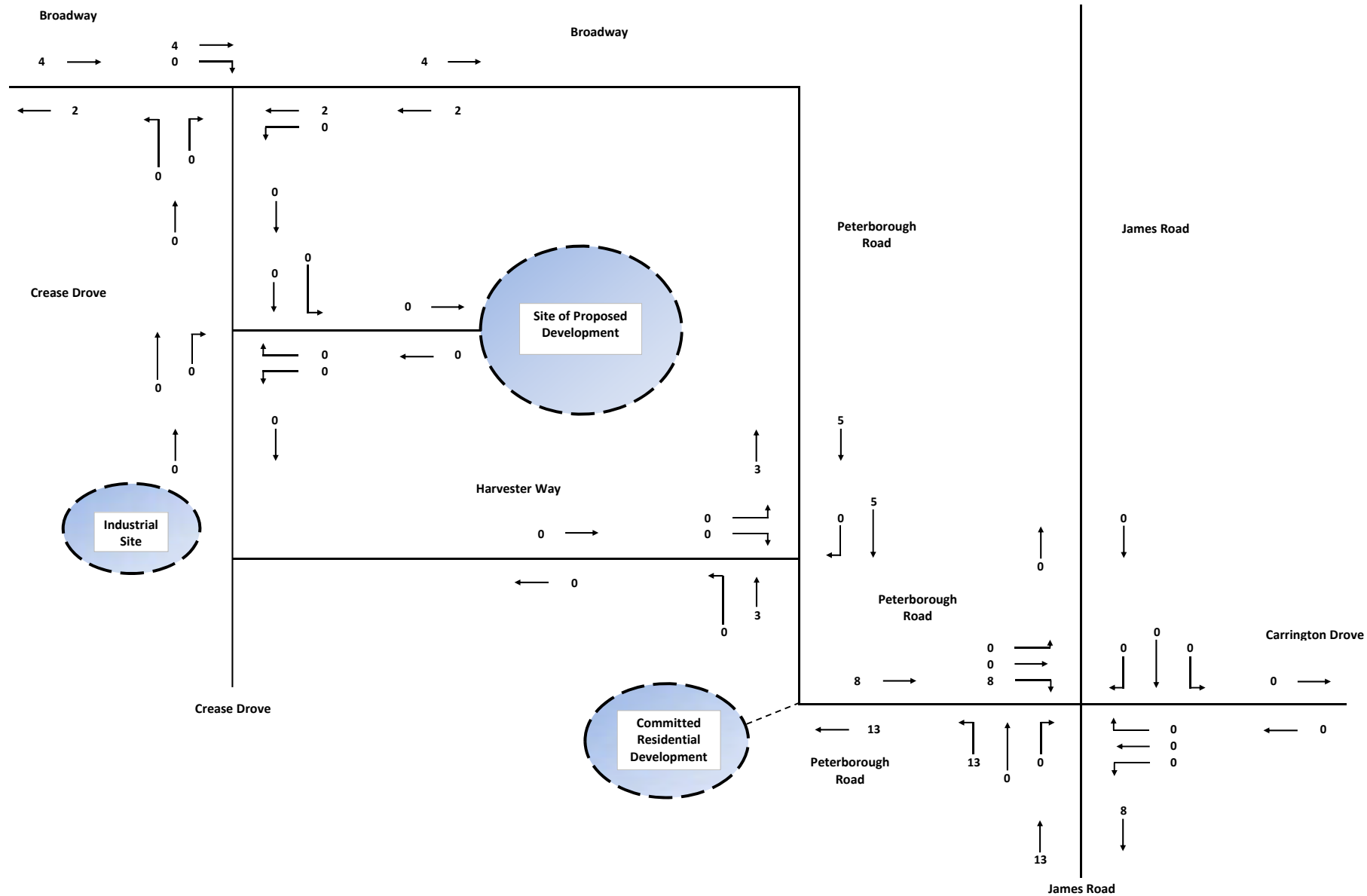


Figure 13.
Assingment of Generated Traffic
(Evening Peak Hour - Committed Development of 50 dwellings)

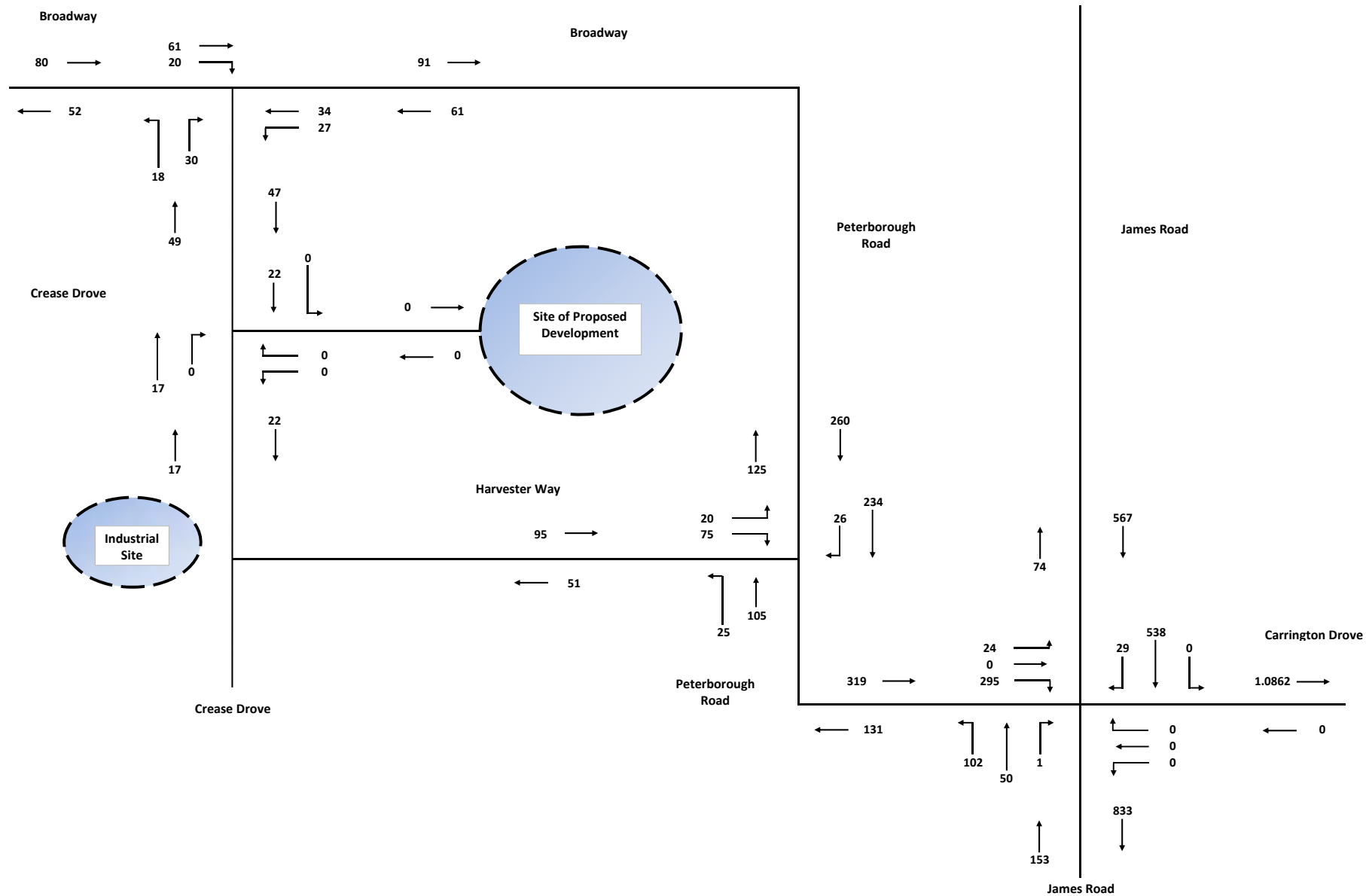


Figure 14.
Existing Morning Peak Hour Traffic Flows Factored to a 2020 Level

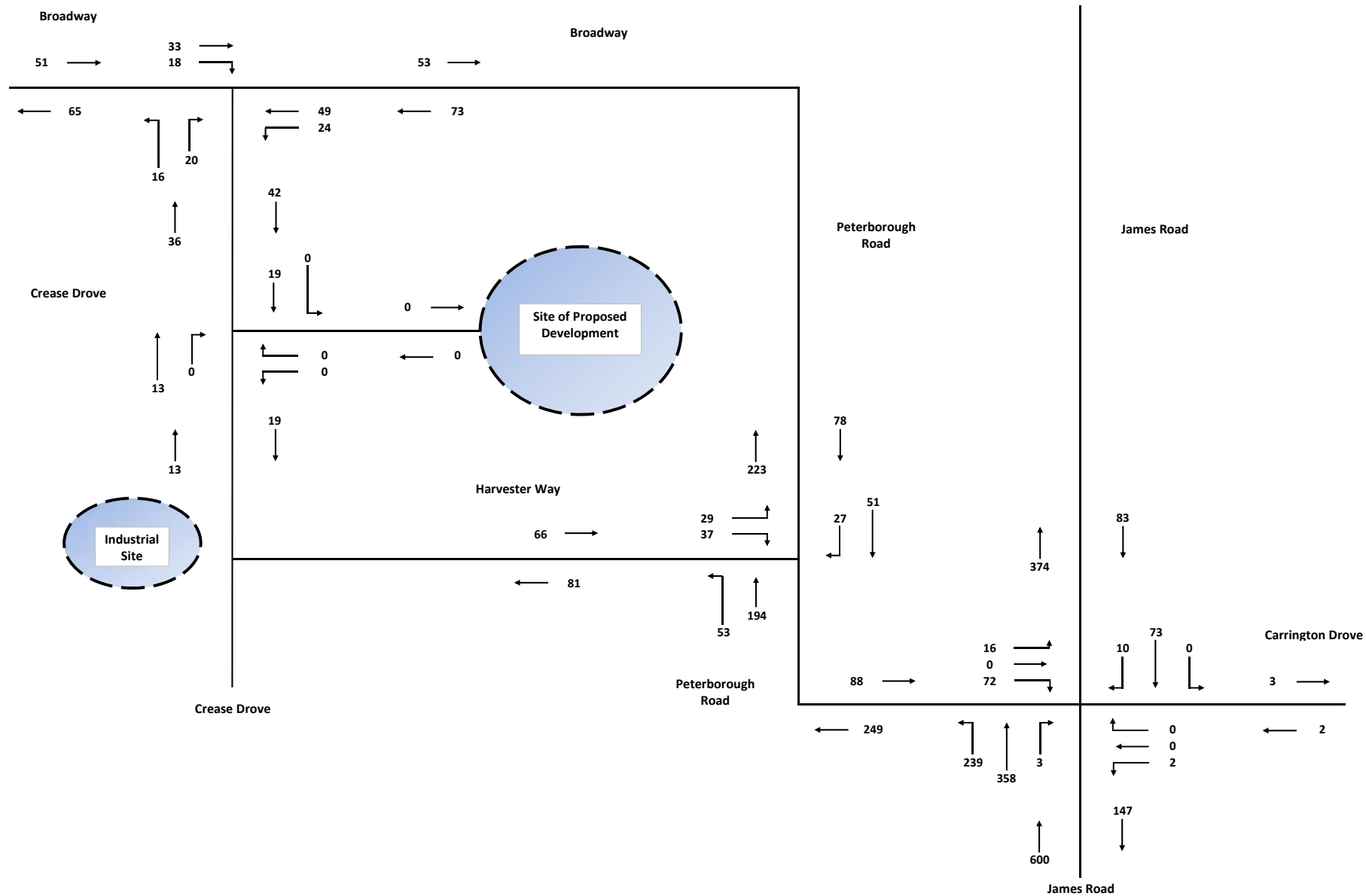


Figure 15.
Existing Evening Peak Hour Traffic Flows Factored to a 2020 Level

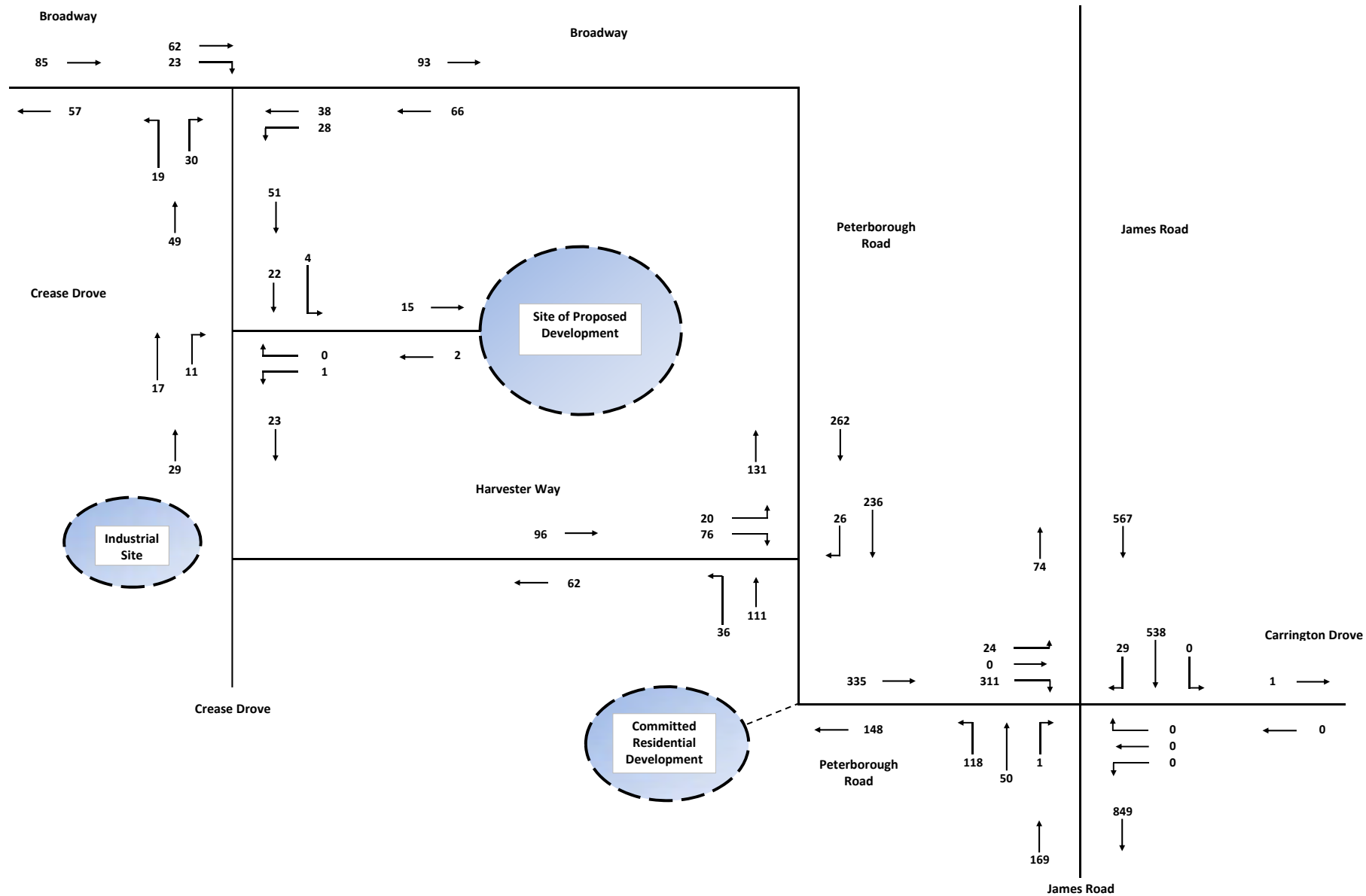


Figure 16.
2020 Morning Peak Hour Traffic Flows - With Established Use of the Application
Site and Committed Development

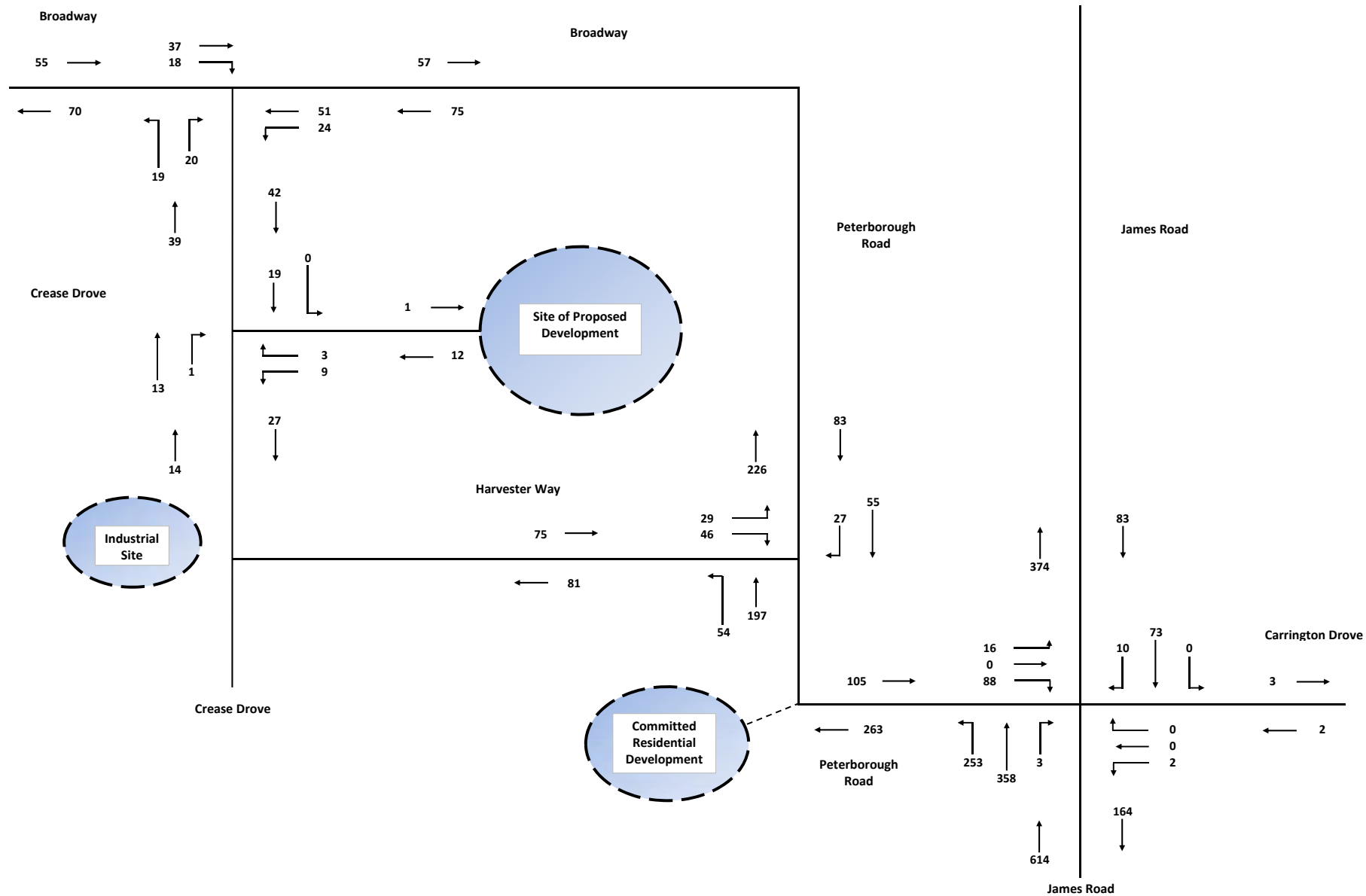


Figure 17.
2020 Evening Peak Hour Traffic Flows - With Established Use of the Application
Site and Committed Development

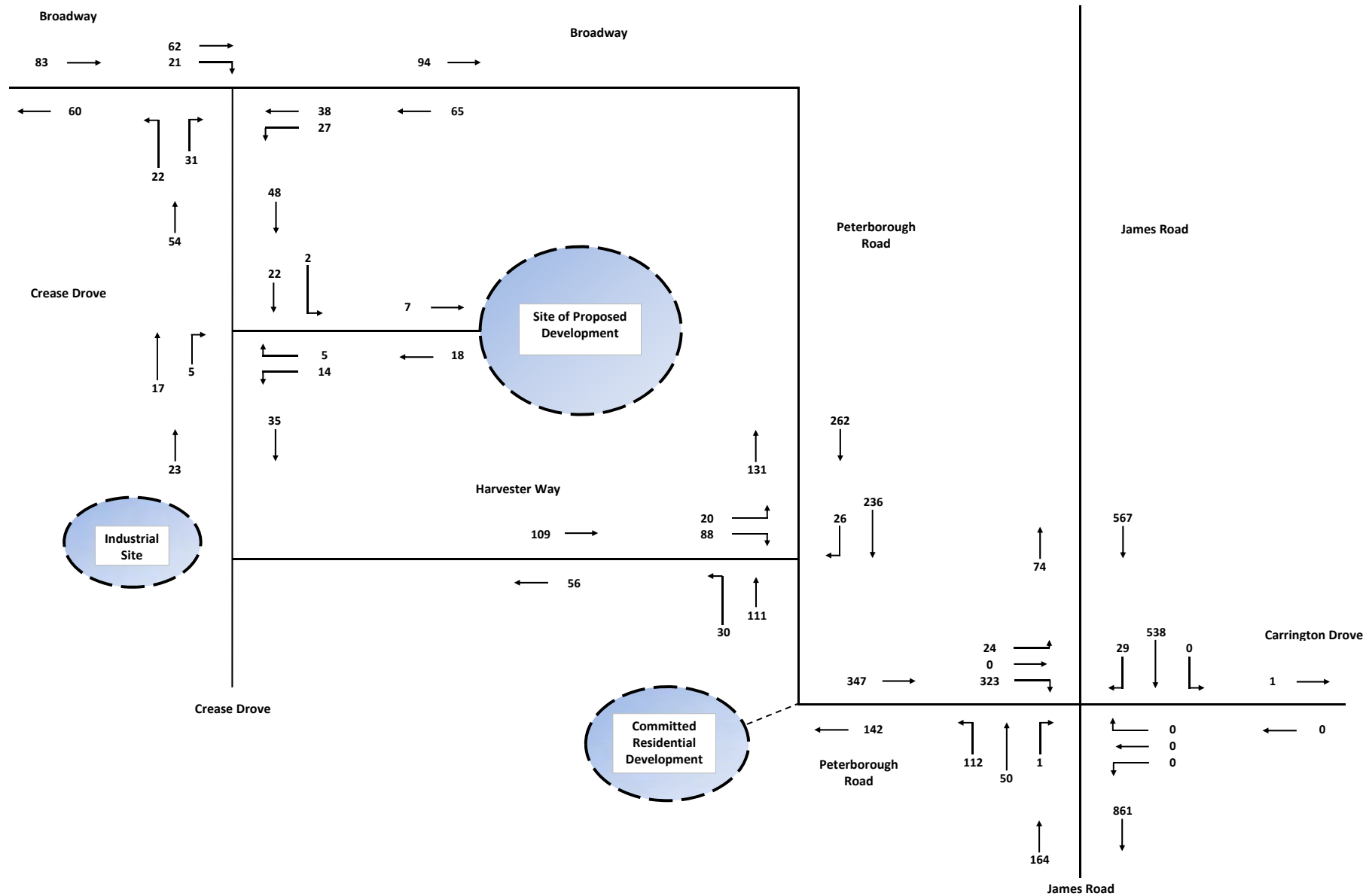


Figure 18.
2020 Morning Peak Hour Traffic Flows - With Proposed and Committed
Developments

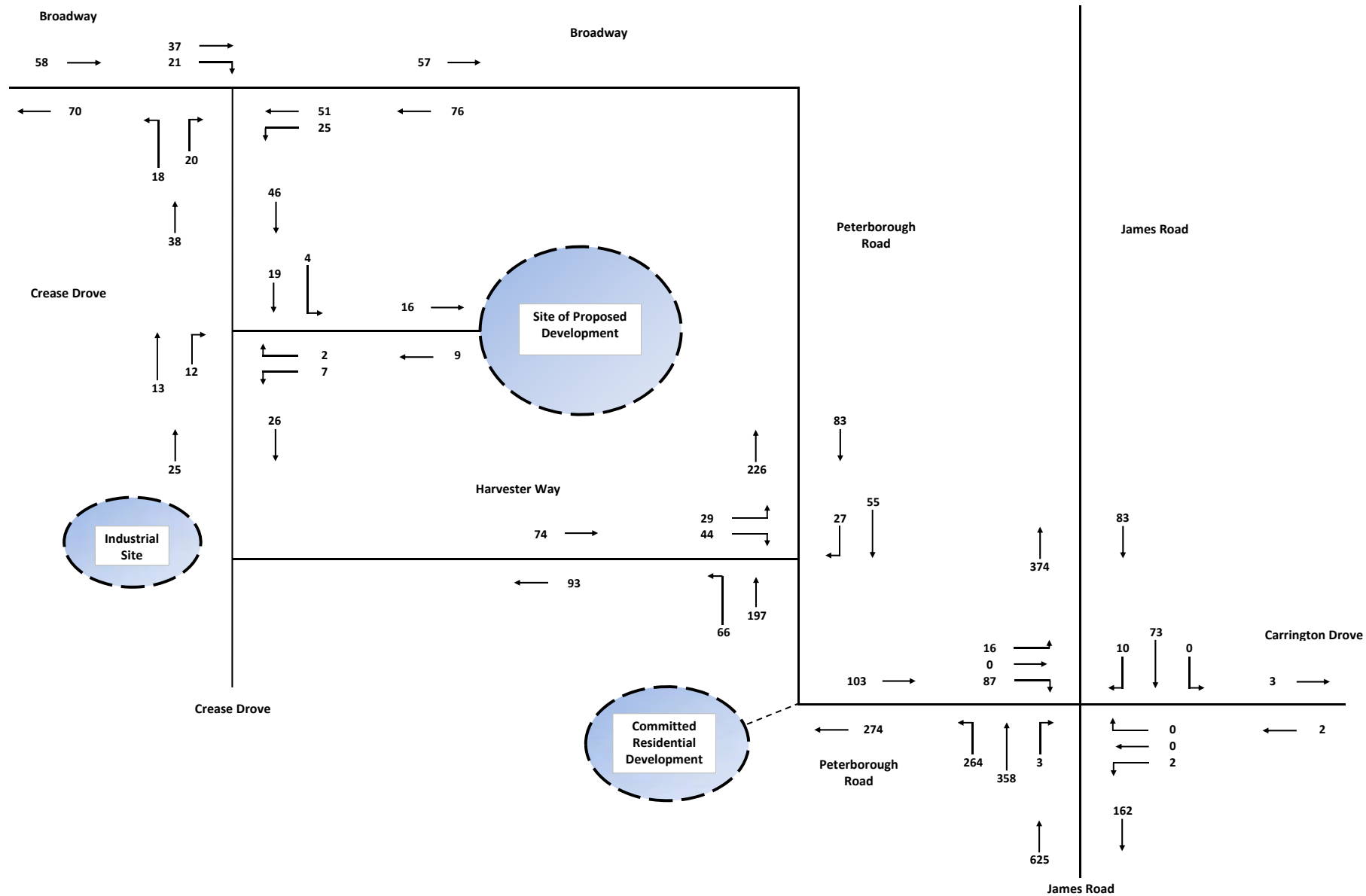


Figure 19.
2020 Evening Peak Hour Traffic Flows - With Proposed and Committed
Developments