

## **Appendix 46**

HTp/1107/TN/15 – M62 Trips

Highgate *Transportation*

**Land at Peel Hall, Warrington**

**Technical Note**

**M62 Trips**

**(HTp/1107/TN/15)**

**February 2017**

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Appendix 2	HTp TN/08 – Number of Vehicular Trips at Each Site Access Location

## 1.0 Introduction

- 1.1 This Technical Note has been prepared by Highgate Transportation Limited (HTp) to summarise the traffic impact on the M62 in terms of vehicle numbers, following a meeting with Highways England on 23<sup>rd</sup> January 2017, using the Peel Hall Gravity Model.
- 1.2 The Peel Hall development can be summarised as:
  - i. Up to 1,200 residential dwellings. This will include a mix of market and affordable homes as well as houses and apartments. The houses are expected to be a mix of two, three and four bedroomed houses and one and two bedroomed apartments. It is anticipated that up to 60 of these dwellings will be provided as a retirement home development.
  - ii. A 100 bedroom care home.
  - iii. An area of employment land comprising up to 7,500sqm Gross Floor Area (GFA) of light industrial units.
  - iv. A local centre comprising a food store of up to 2,000sqm GFA plus up to a further 600sqm GFA of local centre type facilities (such as A1-A5 and D1) plus a family pub and restaurant of up to 800sqm GFA. The local centre car park will be located so that it can also be conveniently used as a school drop off facility.
  - v. Up to a two form entry primary school with a maximum of up to 420 pupils.
  - vi. Relocating and upgrading of existing sports pitches to provide like-for-like replacement in terms of number of pitches and the provision of ancillary facilities, which are expected to include changing facilities for up to four teams at any one time and a function room that can be used for local community uses such as a mother and toddler group.
- 1.3 The aim of the report is to provide an initial summary of the likely level of vehicular impact on the M62 network north of the site.

## 2.0 Trip Distribution

- 2.1 AECOM developed a proposed trip distribution for the Peel Hall development. The distribution of trips was calculated at the zoning level derived from the Warrington Multi Modal Transport Model. AECOM's Technical Note TN/TD02 (August 2016) is contained at **Appendix 1** for reference.
- 2.2 The development trips were grouped into three categories; residential, employment and other. The proposed land uses for the Peel Hall development are set out in Table 1 of the AECOM note, reproduced below for reference.

*Table 1, Trip Type for each Land Use*

Trip Type	Proposed Land Use
Employment	Employment
Residential	150 Dwellings
	700 Dwellings
	330 Dwellings
	20 Dwellings
Other	Primary School
	Food Store
	Local Centre
	Family Pub
	100-Bed Care Home
	Sports and Community Facilities

- 2.3 The trip distribution and number of vehicular trips are set out in **Table 2.1** below. The volume of trips has been taken from HTp Technical Note TN/08 – Number of vehicular trips at each site access location (April 2016), which is contained in **Appendix 2** for reference.
- 2.4 The vehicular trips levels contained in TN/08 resulted from the HTp Technical Note on Trip Rates (TN/02/A), the accompanying addendum for peak period trip rates (TN/02/A/Addendum) and Technical Note TN/06 Trip Discounts.
- 2.5 TN/06 set out that, in the AM peak hour of 0800-0900, discounts were applied as follows:
  - i. Residential 20%
  - ii. Care Home 0%
  - iii. Employment 0%
  - iv. Food Store 60% (+10% pass-by)
  - v. Local Centre 70%
  - vi. Family Pub/Restaurant N/A
  - vii. Primary School 75%
  - viii. Community Uses 0%

2.6 TN/06 set out that, in the PM peak hour of 1700-1800, discounts were applied as follows:

- i. Residential 20%
- ii. Care Home 0%
- iii. Employment 0%
- iv. Food Store 60% (+10% pass-by)
- v. Local Centre 70%
- vi. Family Pub/Restaurant 25%
- vii. Primary School 50%
- viii. Community Uses 0% (but should not be on M62 network in any event)

**Table 2.1 – Trip distribution**

Trip Type		M62 West				M62 East									
		AM (0800-0900)		PM (1700-1800)		AM (0800-0900)		PM (1700-1800)							
		Arr.	Dep.	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.						
<b>Residential</b>	<i>Percentage Distribution</i>	0.6%	2.2%	10.7%	2.5%	0.4%	1.2%	2.2%	1.3%						
	Trips	1	11	53	8	1	6	11	4						
<b>Employment</b>	<i>Percentage Distribution</i>	8.9%	3.4%	8.6%	14.7%	11.2%	1.4%	5.5%	4.4%						
	Trips	6	1	2	7	8	1	1	2						
<b>Other</b>	<i>Percentage Distribution</i>	2.4%	2.8%	0.8%	9.4%	7.8%	1.9%	7.1%	7.5%						
	Trips	2	2	1	12	7	1	9	10						
<b>Total Trip Movements</b>		<b>9</b>	<b>14</b>	<b>56</b>	<b>27</b>	<b>16</b>	<b>8</b>	<b>21</b>	<b>16</b>						
<b>Total Trips</b>		<b>23</b>		<b>83</b>		<b>24</b>		<b>37</b>							
<b>M62 Total Trips AM</b>		<b>47</b>													
<b>M62 Total Trips PM</b>		<b>120</b>													

- 2.7 From the above it can be seen that there may be up to around 47 vehicular trips on the M62 as a result of the Peel Hall development in the AM peak hour. It is considered that this level of trips is within the daily variation of flow on the M62 and Junction 9 and Junction 10 of the M62.
- 2.8 From the above Table it can also be seen that there may be up to around 120 vehicular trips on the M62 as a result of the Peel Hall development in the PM peak hour.

### 3.0 Sensitivity Test

- 3.1 The overall trip generation and attraction of the proposed Peel Hall development profile is set out in **Table 3.1** below for reference (Table 9.1 of HTp TN/02/A, reproduced in TN/06).

**Table 3.1 – Peel Hall trips (100%)**

Development Traffic	AM Peak Hour		PM Peak Hour	
	Arrival	Departure	Arrival	Departure
Residential Trips	270	628	594	368
Care Home Trips	7	7	8	8
Employment Trips	69	39	20	47
Food Store Trips	92	61	181	191
Local Centre Shop Trips	30	29	36	39
Family Pub/Restaurant Trips	-	-	46	30
Primary School Trips	113	79	19	27
Community Uses	10	5	8	7
<b>Total Trips</b>	<b>591</b>	<b>848</b>	<b>912</b>	<b>717</b>

- 3.2 A sensitivity test has been carried out further to comments on forecast trip rates and trip levels associated with the Peel Hall development received from Warrington Borough Council and Highways England.
- 3.3 This sensitivity test uses revised trip discounts for both AM and PM peak hours as follows:
- i. Residential 0%
  - ii. Care Home 0%
  - iii. Employment 0%
  - iv. Food Store 100% (70% discount and 30% pass-by, which will not affect the M62)
  - v. Local Centre 100% (as per Omega application)
  - vi. Family Pub/Restaurant 0%
  - vii. Primary School 50%
  - viii. Community Uses 100% (but will not be on the M62 network, so discounted fully in this scenario test for the avoidance of doubt)
- 3.4 Primary School trips have been reduced to 50% as it is considered fair to conclude that the majority of trips associated with a primary school in this location would come from the site itself and the immediate surroundings, and as such would have little impact on the M62.

- 3.5 Based on the sensitivity test set out above, a revised summary of the proposed Peel Hall development trips is set out on **Table 3.2** below.

**Table 3.2 – Peel Hall sensitivity test trips**

Development Traffic	AM Peak Hour		PM Peak Hour	
	Arrival	Departure	Arrival	Departure
Residential Trips	270	628	594	368
Care Home Trips	7	7	8	8
Employment Trips	69	39	20	47
Food Store Trips	0	0	0	0
Local Centre Shop Trips	0	0	0	0
Family Pub/Restaurant Trips	-	-	46	30
Primary School Trips	56	40	10	14
Community Uses	0	0	0	0
<b>Total Trips</b>	<b>402</b>	<b>714</b>	<b>678</b>	<b>467</b>

- 3.6 The trips set out in **Table 3.2** above can be grouped into the three gravity model categories (see **paragraph 2.2**), as shown in **Table 3.3** below.

**Table 3.3 – Peel Hall gravity model groupings for sensitivity test**

Development Traffic	AM Peak Hour		PM Peak Hour	
	Arrival	Departure	Arrival	Departure
Residential	270	628	594	368
Employment	69	39	20	47
Other	63	47	64	52
<b>Total Trips</b>	<b>402</b>	<b>714</b>	<b>678</b>	<b>467</b>

- 3.7 The resultant trip distributions on the M62 using the gravity model, further to **Table 3.3** above, are set out in **Table 3.4** below.

**Table 3.4 – Trip Distribution**

Trip Type		M62 West				M62 East									
		AM (0800-0900)		PM (1700-1800)		AM (0800-0900)		PM (1700-1800)							
		Arr.	Dep.	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.						
<b>Residential</b>	<i>Percentage Distribution</i>	0.6%	2.2%	10.7%	2.5%	0.4%	1.2%	2.2%	1.3%						
	Trips	2	14	64	9	1	8	13	5						
<b>Employment</b>	<i>Percentage Distribution</i>	8.9%	3.4%	8.6%	14.7%	11.2%	1.4%	5.5%	4.4%						
	Trips	6	1	2	7	8	1	1	2						
<b>Other</b>	<i>Percentage Distribution</i>	2.4%	2.8%	0.8%	9.4%	7.8%	1.9%	7.1%	7.5%						
	Trips	2	1	1	5	5	1	5	4						
<b>Total Trip Movements</b>		<b>10</b>	<b>16</b>	<b>67</b>	<b>21</b>	<b>14</b>	<b>10</b>	<b>19</b>	<b>11</b>						
<b>Total Trips</b>		<b>26</b>		<b>88</b>		<b>24</b>		<b>30</b>							
<b>M62 Total Trips AM</b>		<b>50</b>													
<b>M62 Total Trips PM</b>		<b>118</b>													

- 3.8 From the above **Table 3.4** it can be seen that there may be up to around 50 vehicular trips on the M62 as a result of the Peel Hall development in the AM peak hour under this sensitivity test. As set out in **paragraph 2.7**, it is considered that this level of trips is within the daily variation of flow on the M62 and Junction 9 and Junction 10 of the M62.
- 3.9 From the above Table it can also be seen that there may be up to around 118 vehicular trips on the M62 as a result of the Peel Hall development in the PM peak hour.
- 3.10 Compared to **Table 2.1**, it can be seen from **Table 3.4** that there is actually little difference in the overall trip levels on the M62 when applying the methodology set out in previous HTp Technical Notes to date and the methodology used for the sensitive tests.

## 4.0 Summary

- 4.1 This Technical Note has been prepared by HTp to summarise the traffic impact on the M62 in terms of vehicle numbers using the Peel Hall Gravity Model.
- 4.2 The report provides an initial summary of the likely level of vehicular impact on the M62 network north of the site.
- 4.3 It can be seen from the Tables contained in **Section 2.0** and **Section 3.0** that the actual level of vehicular trips on the M62 network north of the Peel Hall site is relatively low in the AM peak hour (circa 50 vehicles) and as such is well within the daily variation of flow on the M62.
- 4.4 The level of vehicular trips on the M62 network north of the Peel Hall site in the PM peak hour is around 120vph; two vehicles per minute.

## **Appendix 1**

AECOM TN/TD02

Proposed Trip Distribution for Future Year Development Trips

# Technical Note

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Project:	<b>Peel Hall VISSIM Model Assessment</b>	Job No:	<b>60337714</b>
Subject:	<b>Proposed Trip Distribution for Future Year Development Trips</b>		
Prepared by:	<b>Alistair Johnson</b>	Date:	<b>02/08/2016</b>
Checked by:	<b>Duncan Carter</b>	Date:	<b>17/08/2016</b>
Approved by:	<b>Catherine Zoefrig</b>	Date:	<b>17/08/2016</b>

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## Introduction

As part of a commission to produce a package of VISSIM microsimulation models to support the planning application for Peel Hall, Warrington, AECOM have developed a proposed trip distribution for the development. This Technical Note details the exercise and provides an evidence base for Highgate Transport (working on behalf of Satnam Developments Ltd) to enable the proposed distribution to be agreed with Warrington Borough Council (WBC).

The volume of trips to and from the proposed development for each modelled time period was provided by Highgate Transport in their Technical Notes listed below:

- TN/02/A – Trip Rates (peak hour);
- TN/02/A/Addendum – Peak Period Trip Rates;
- TN/06 – Trip Discounts;
- TN/08 – Number of Vehicle Trips at Each Site Access Location; and
- TN/12 - Pub/Restaurant Vehicular Trips Update.

## Methodology

Initially the distribution of trips was calculated at the zoning level (**Appendix A, Figure 2**) derived from the Warrington Multi Modal Transport Model (WMMTM). Development trips were grouped into three categories:

- Residential;
- Employment; and
- Other.

The development location was represented as a single zone for the initial distribution of trips.

For each trip purpose, existing zones (similar land uses) were selected within the modelled area to act as a proxy for the distribution of trips to and from the new developments. The zones used were:

- For residential, zones 21 (Callands) and 69 (Hulme);
- For employment, zone 226 (Winwick Quay); and
- For other developments, zone 152 (Warrington Collegiate).

The proposed land uses within the Peel Hall development each were then categorised within one of the trip types identified above; these are presented in **Table 1** overleaf.

# Technical Note

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*Table 1, Trip Type for each Land Use*

Trip Type	Proposed Land Use
Employment	Employment
Residential	150 Dwellings
	700 Dwellings
	330 Dwellings
	20 Dwellings
Other	Primary School
	Food Store
	Local Centre
	Family Pub
	100-Bed Care Home
	Sports and Community Facilities

The proportion of trips from the new development to each zone within the modelled area and the proportion of trips and directions of travel to zones outside the modelled area were calculated for the AM and PM peak periods on the basis of the updated 2015 trip matrices proportions from these zones. The 2015 matrices were originally developed from the WMMTM and have been updated utilising new traffic counts and matrix estimation techniques within VISUM (TFlowFuzzy).

These proportions were applied to the trip numbers supplied to produce origin-destination matrices for each modelled time period. As the WMMTM model represents a single peak hour period, the trip distribution percentages have been applied to each of the corresponding peak hour periods.

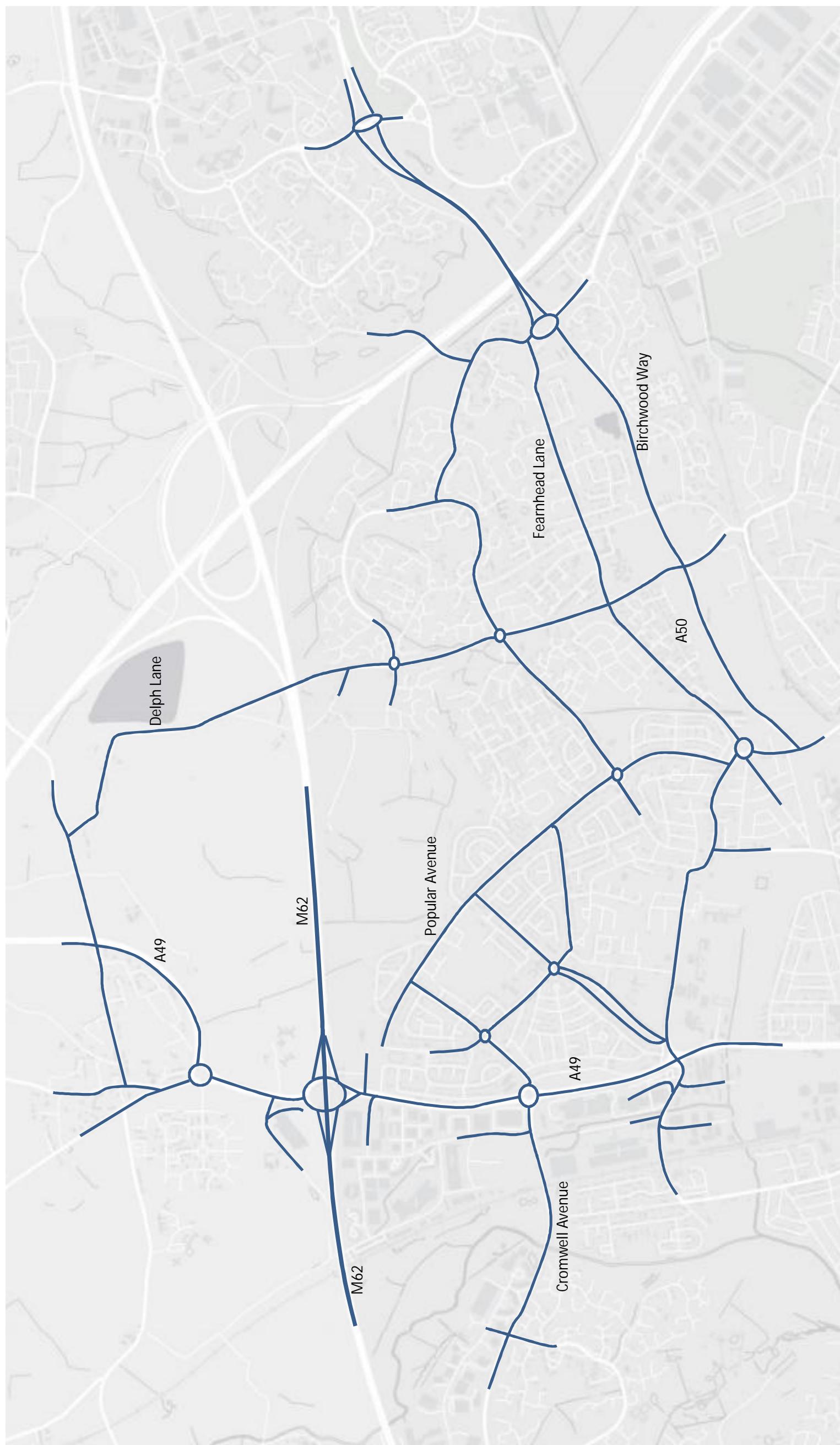
The final trip distributions split by trip type and all together are presented in **Appendix B, Figures 1 – 16**.

**Appendix C, Figures 1 – 48** present the volume of trips split by land use and total trips for each model time period.

As per Highgate Transport TN/08 – “Number of Vehicle Trips at Each Site Access Location”, the proposed development will benefit from six entrance and exit points to the network. The trip distribution (Production and Attraction Factors) presented in **Appendix B, Figure 1 - 16** will be applied to the appropriate development for each of the three trip purposes, and loaded into the VISSIM model as a separate matrix for VISSIM to assign the traffic on the model network via the six proposed access points.

## **Appendix A**

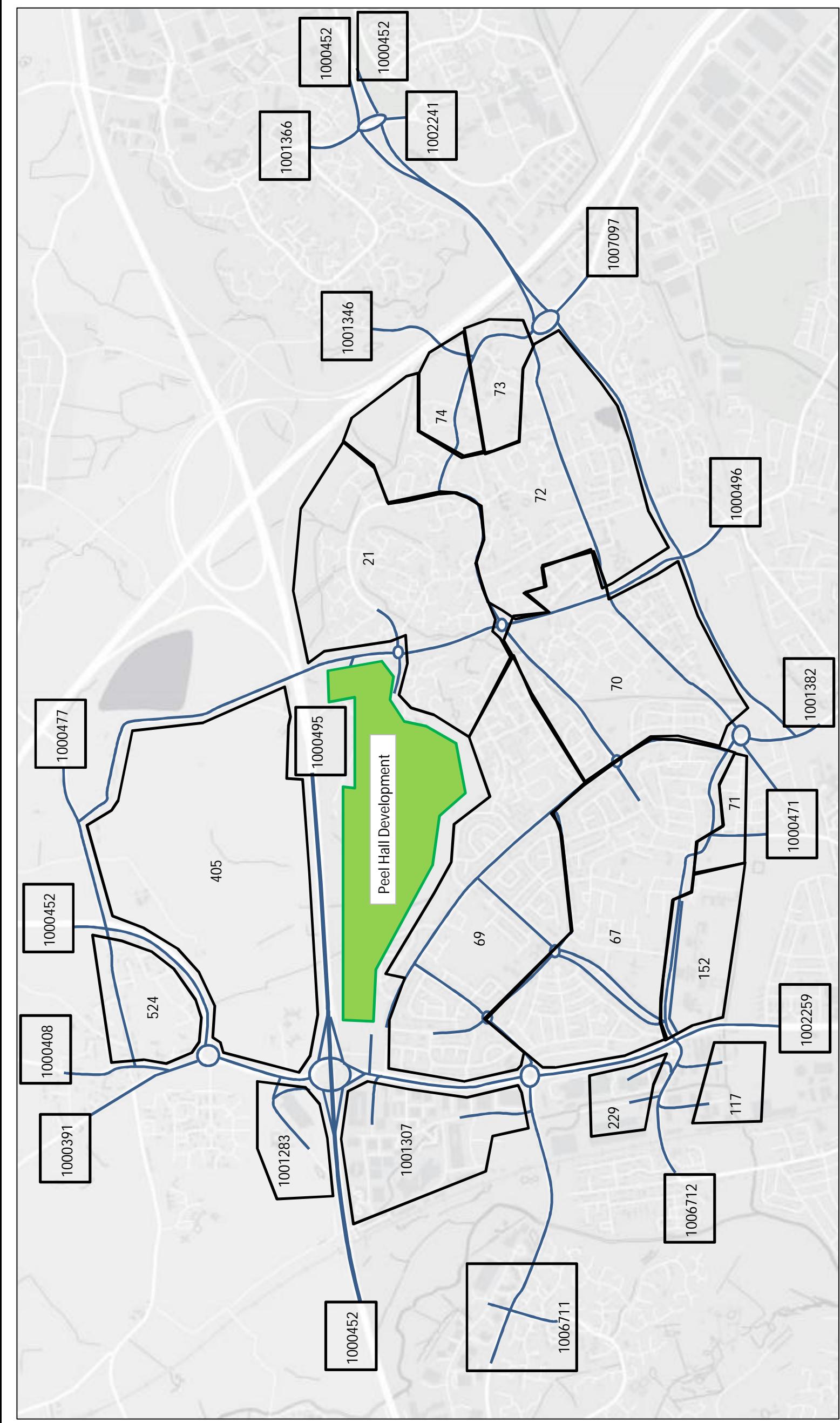
### **Model Network and Zone Structure**



Peel Hall VISSIM Model - Trip  
Distribution

Appendix A, Figure 1, Model Network

**AECOM**



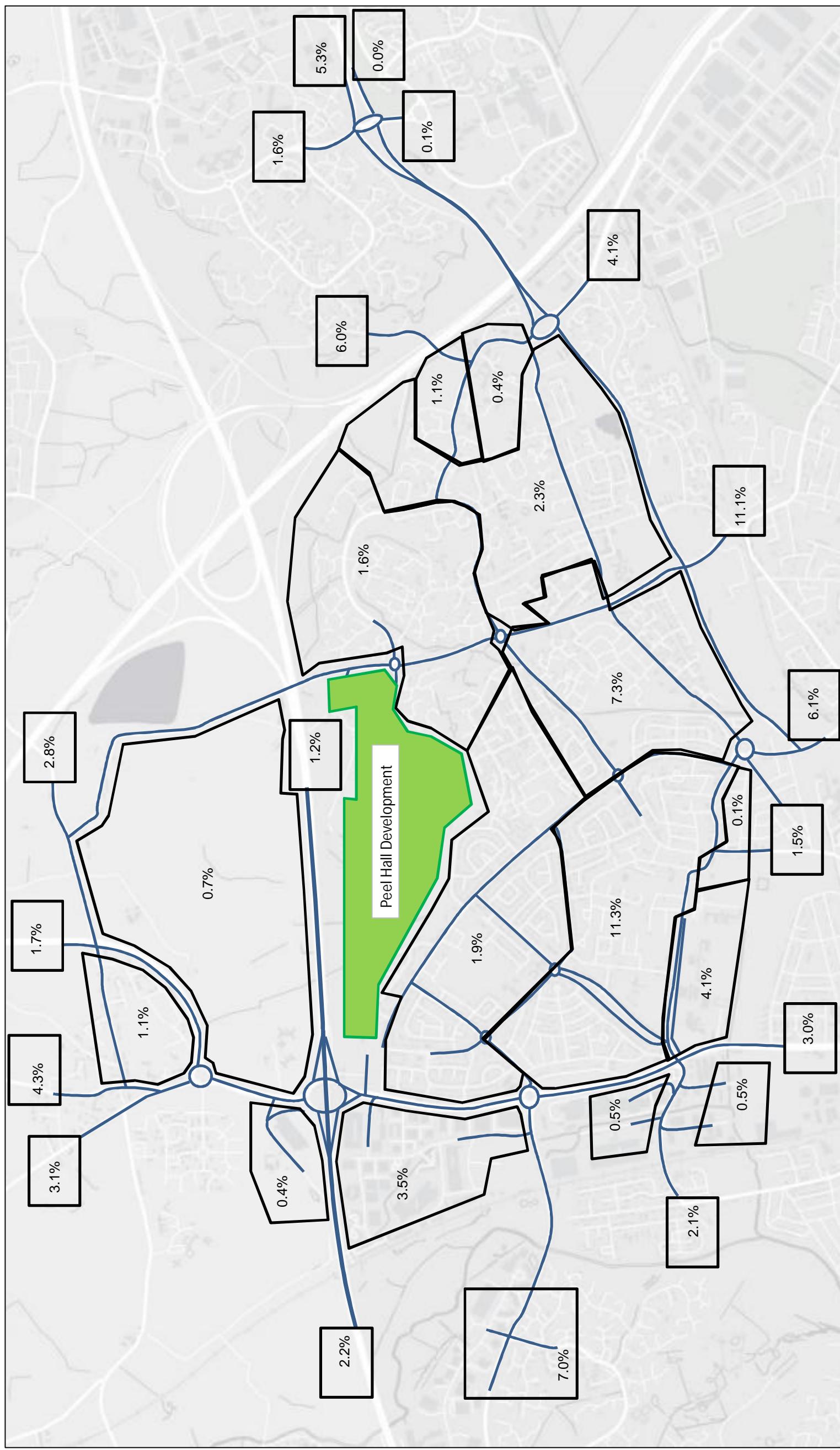
**AECOM**

Appendix A, Figure 2, Zone Plan

Peel Hall VISSIM Model - Trip  
Distribution

## **Appendix B**

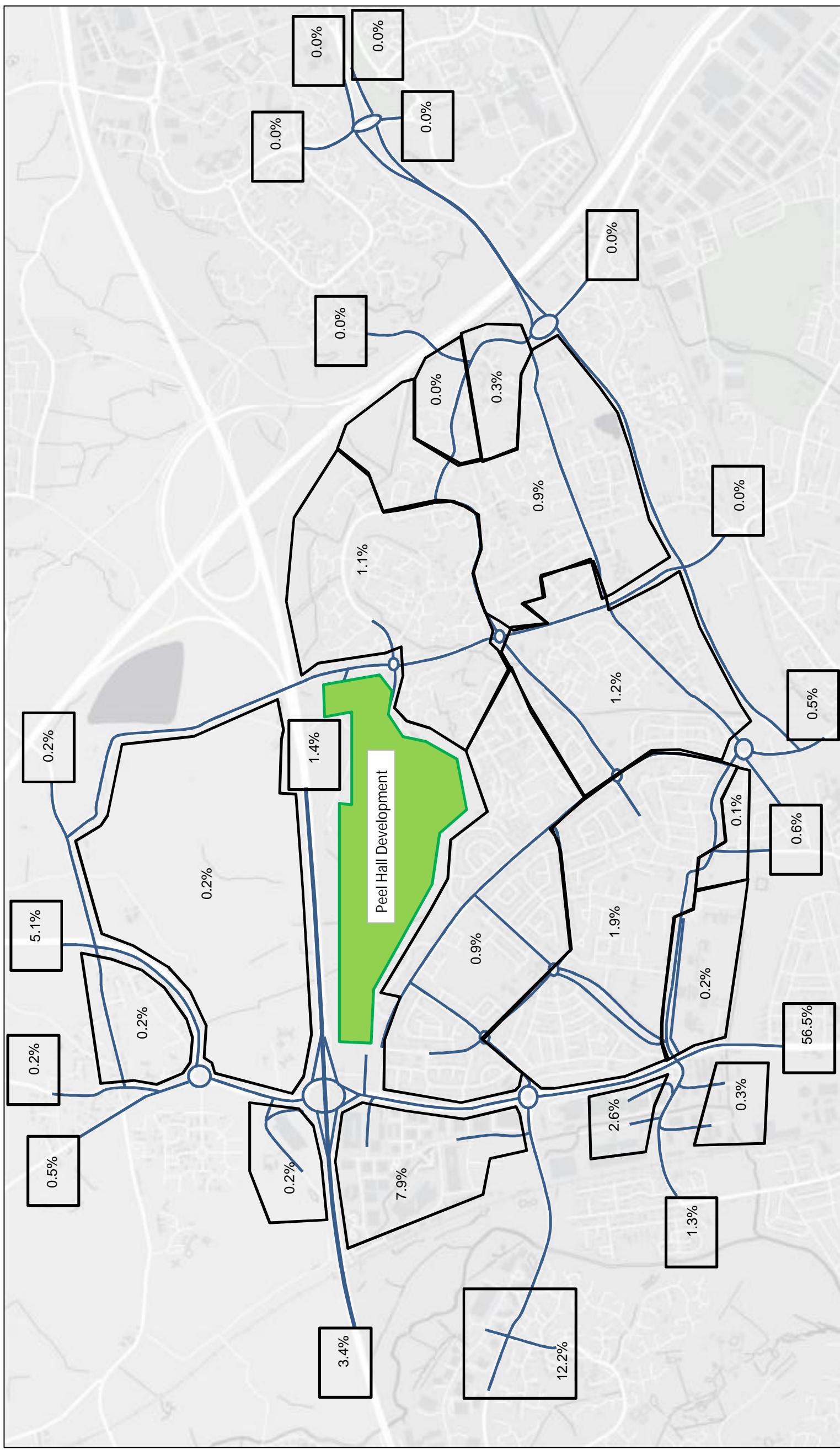
### **Proposed Trip Distribution Percentages**



**AECOM**

Appendix B, Figure 1, AM Percentage Distribution for Residential Trips from Peel Hall Development

Peel Hall VISSIM Model - Trip Distribution

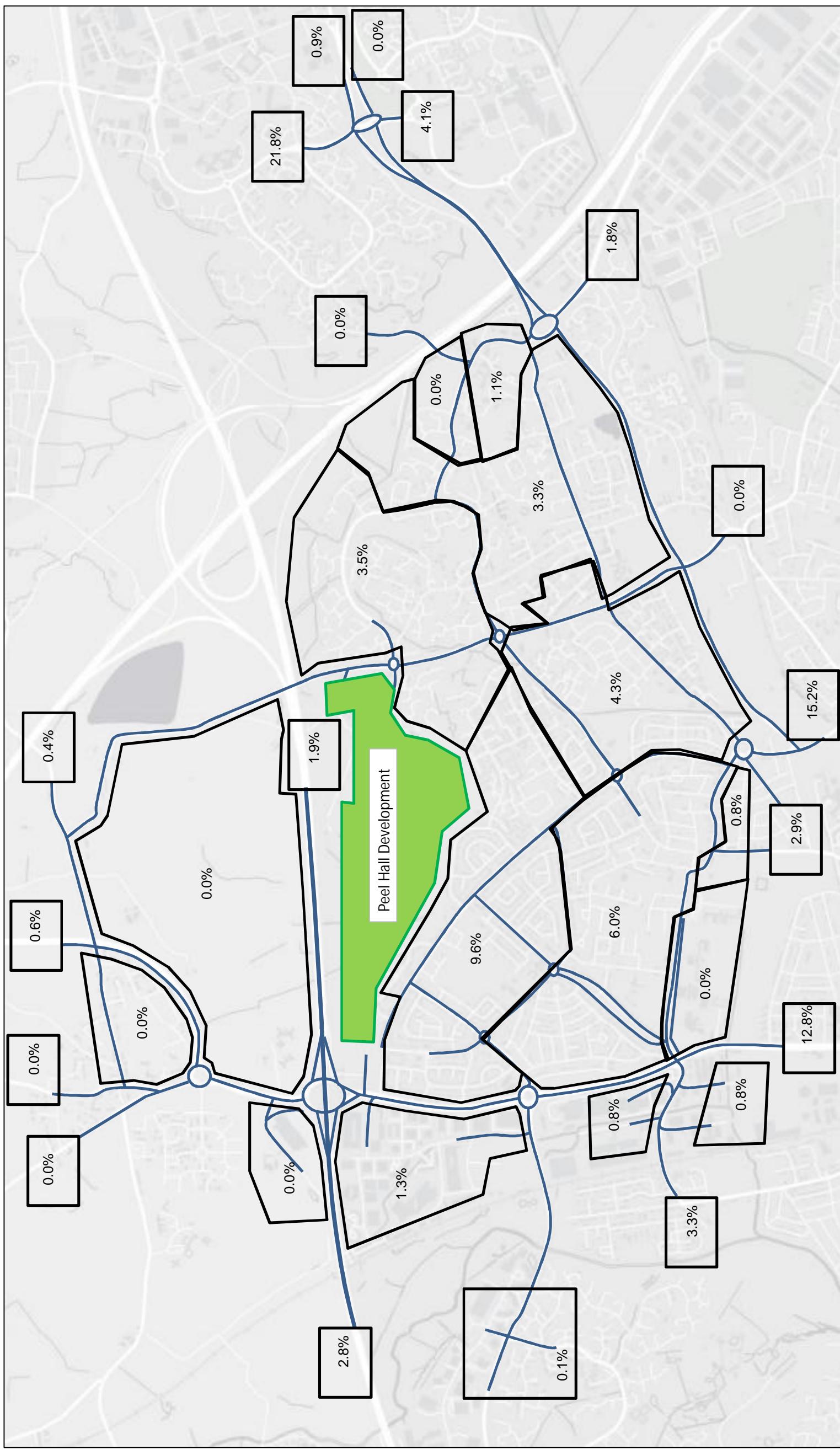


\*\*\* Due to rounding to nearest number within Excel, percentages presented might not fully add to 100%

# Peel Hall VISSIM Model - Trip Distribution

## Appendix B, Figure 2, AM Percentage Distribution for Work Trips from Peel Hall Development

**AECOM**

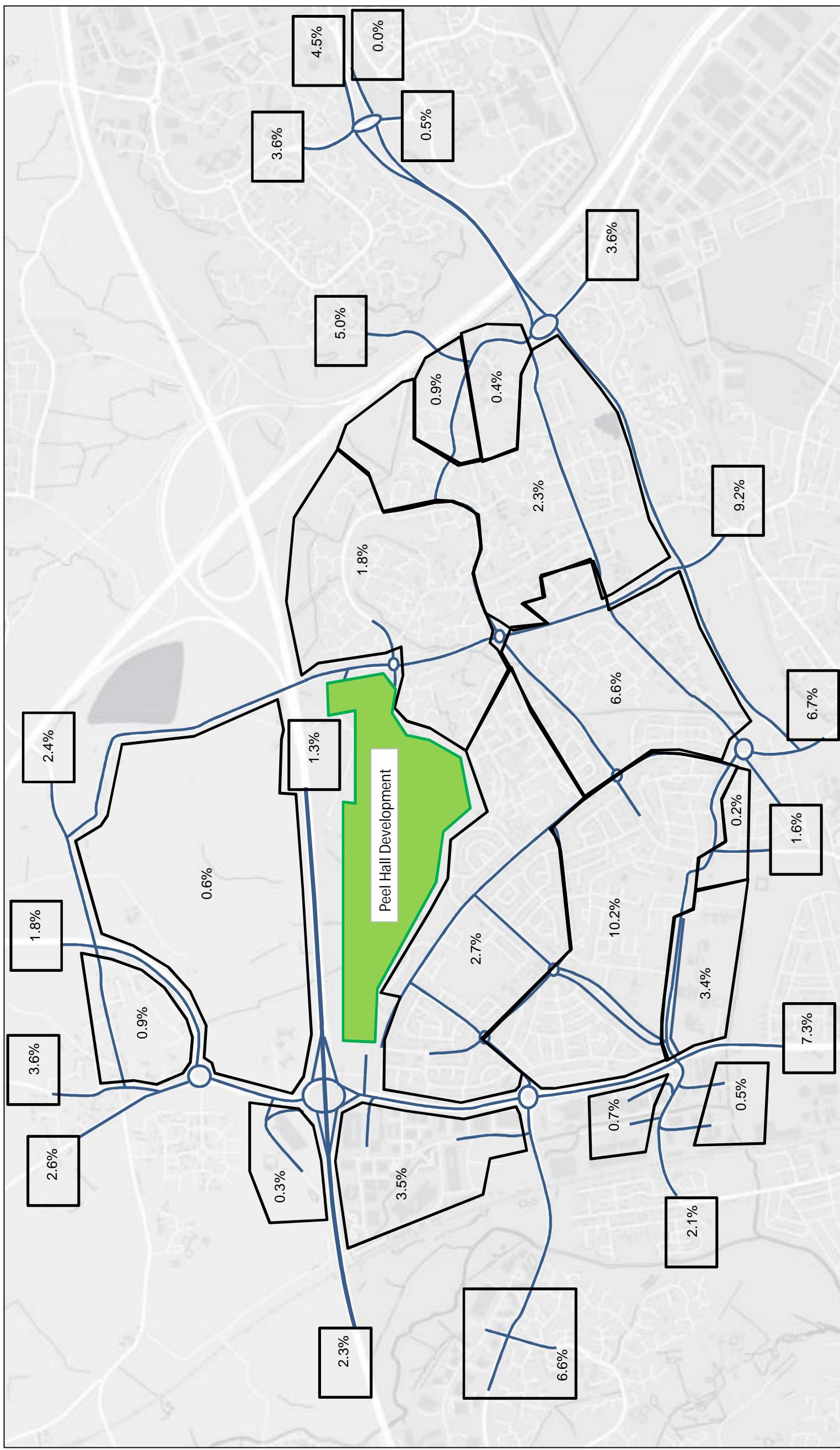


\*\*\* Due to rounding to nearest number within Excel, percentages presented might not fully add to 100%

# Peel Hall VISSIM Model - Trip Distribution

## Appendix B, Figure 3, AM Percentage Distribution for Other Trips from Peel Hall Development

**AECOM**

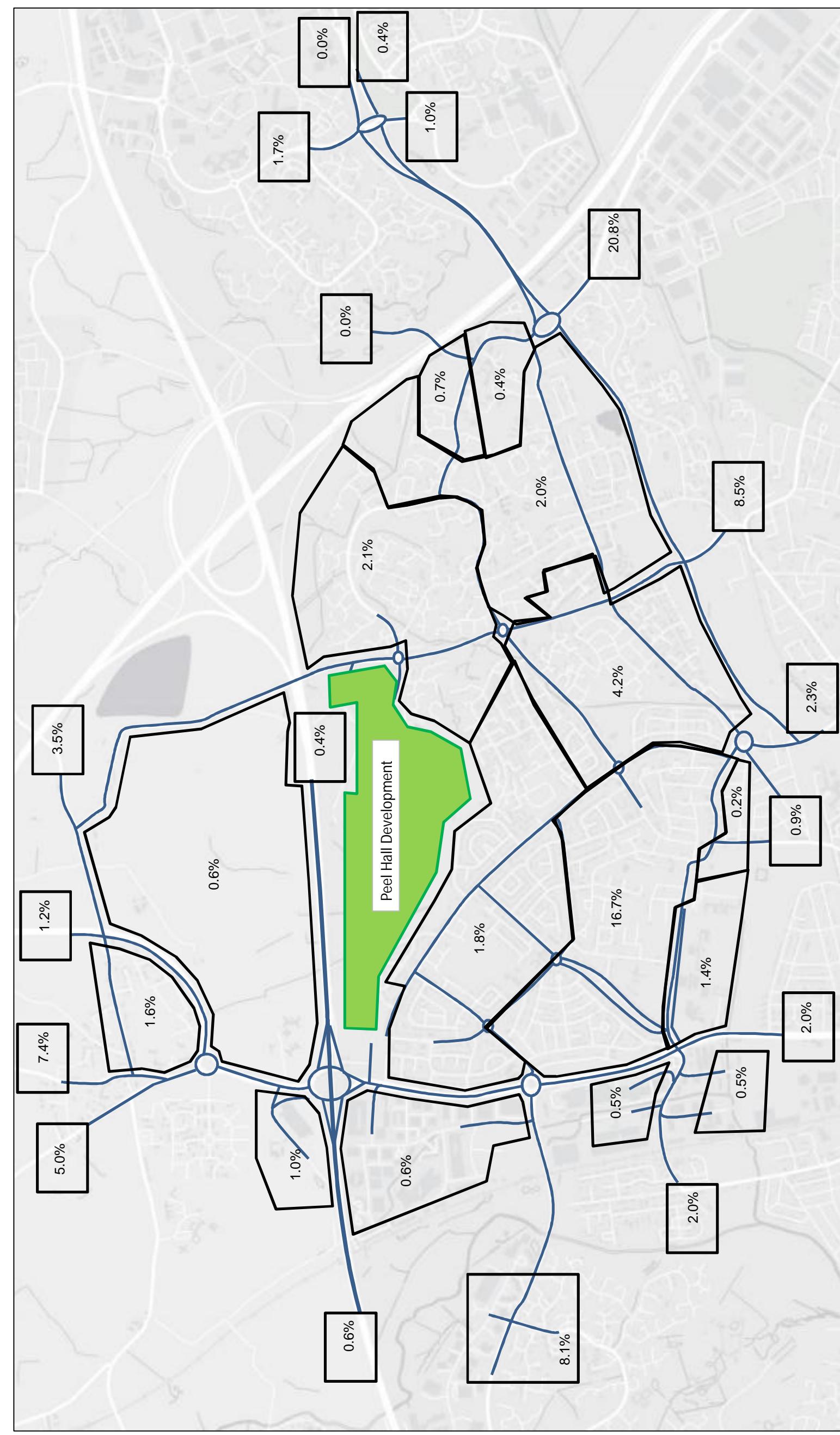


\*\*\* Due to rounding to nearest number within Excel, percentages presented might not fully add to 100%

# Peel Hall VISSIM Model - Trip Distribution

## Appendix B, Figure 4, AM Percentage Distribution for All Trips from Peel Hall Development

**AECOM**

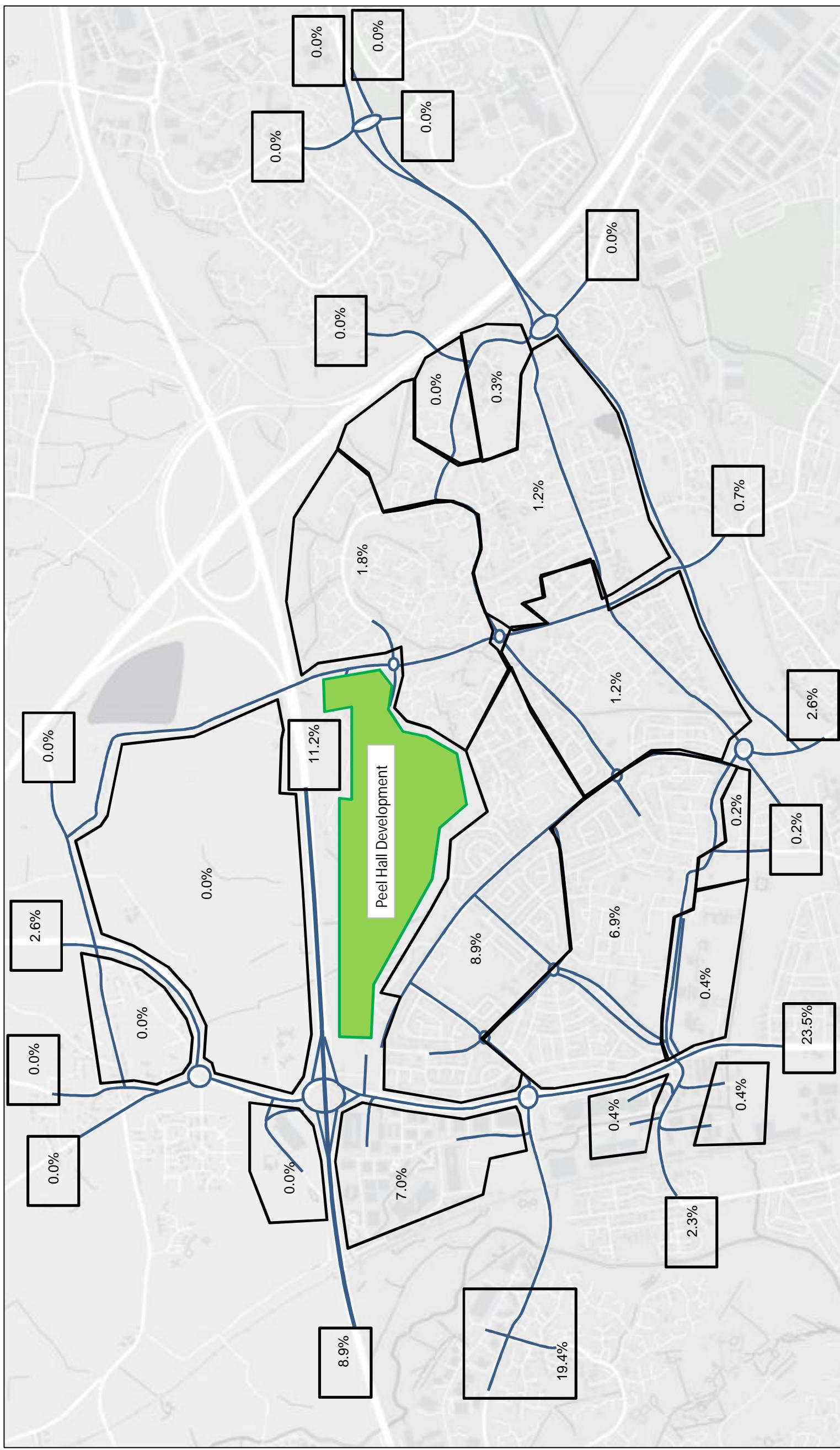


\*\* Due to rounding to nearest number within Excel, percentages presented might not fully add to 100%.

## Peel Hall VISSIM Model - Trip Distribution

Appendix B, Figure 5, AM Percentage Distribution for Residential Trips to Peel Hall Development



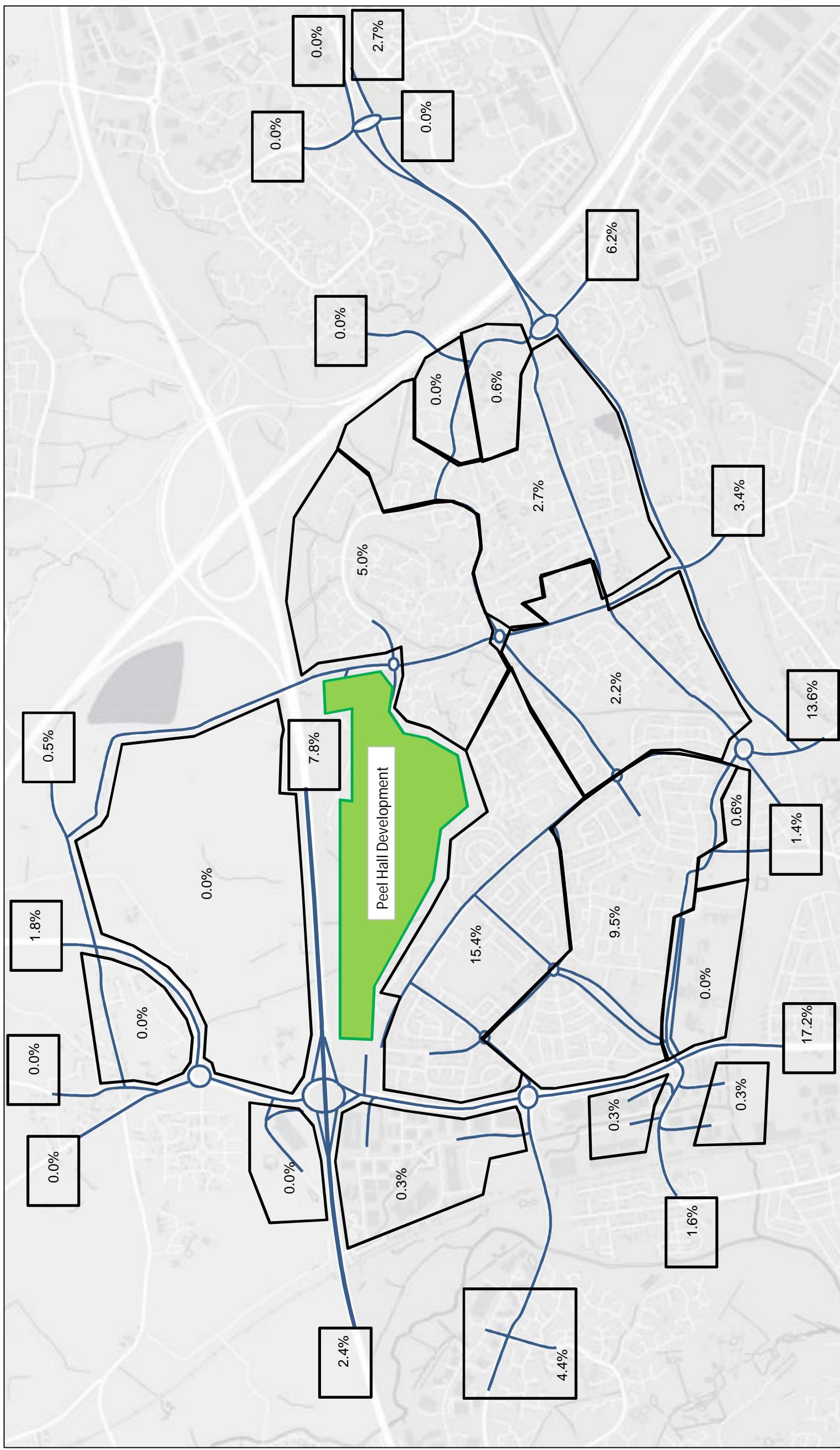


\*\*\* Due to rounding to nearest number within Excel, percentages presented might not fully add to 100%

# Peel Hall VISSIM Model - Trip Distribution

## Appendix B, Figure 6, AM Percentage Distribution for Work Trips to Peel Hall Development

**AECOM**

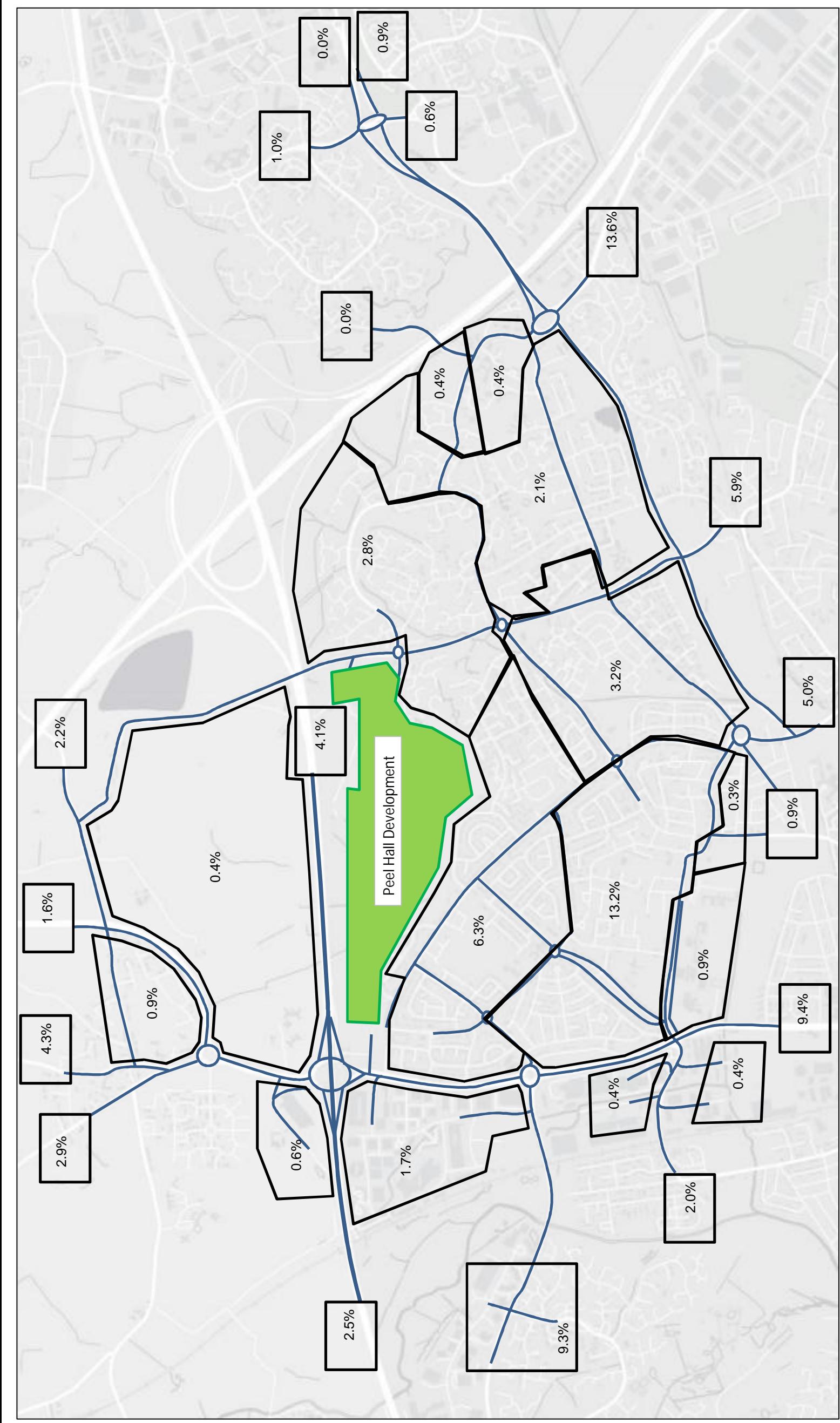


\*\*\* Due to rounding to nearest number within Excel, percentages presented might not fully add to 100%

# Peel Hall VISSIM Model - Trip Distribution

## Appendix B, Figure 7, AM Percentage Distribution for Other Trips to Peel Hall Development

**AECOM**

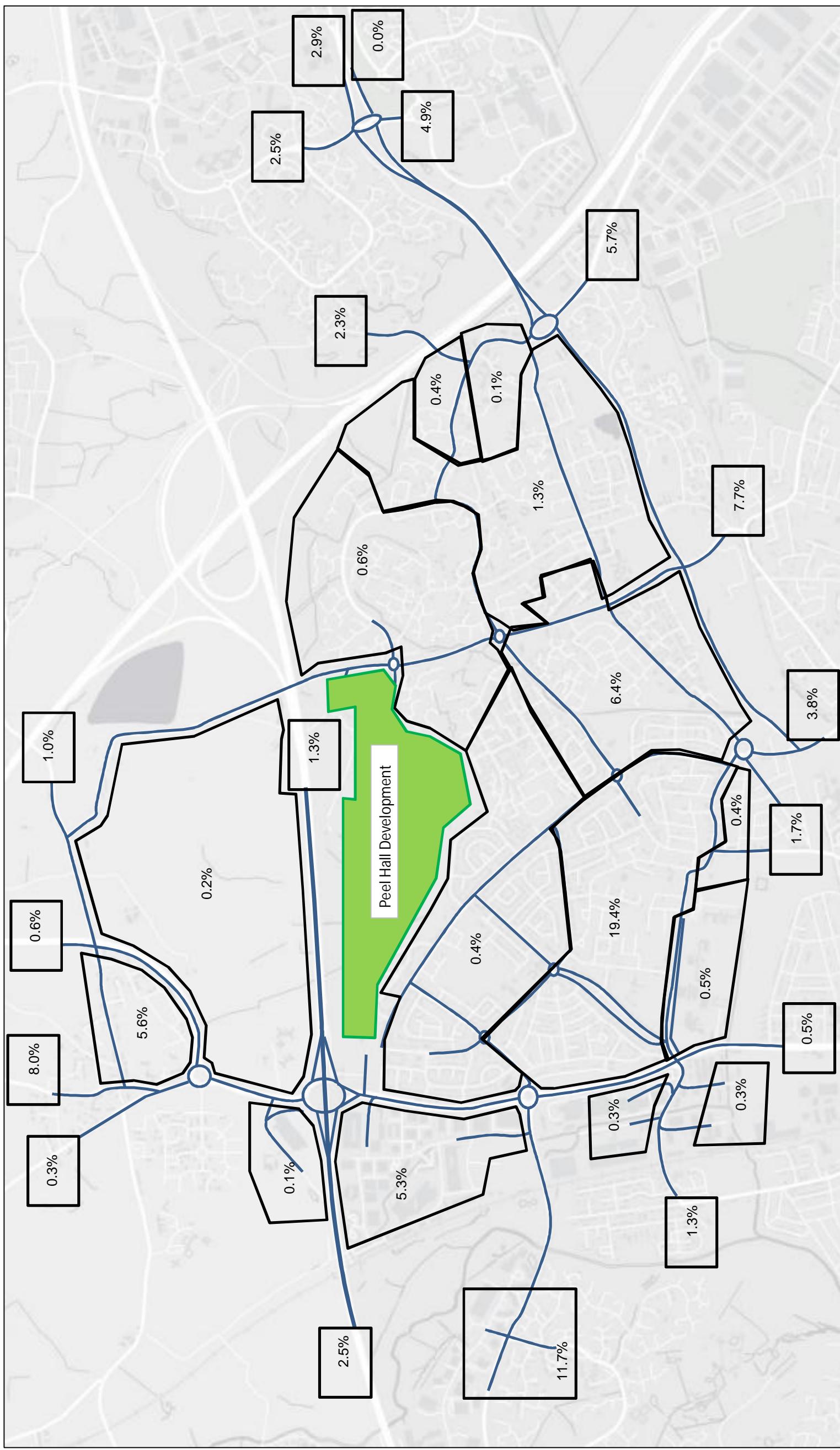


\*\* Due to rounding to nearest number within Excel, percentages presented might not fully add to 100%

## Peel Hall VISSIM Model - Trip Distribution

Appendix B, Figure 8, AM Percentage Distribution for All Trips to Peel Hall Development

**AECOM**

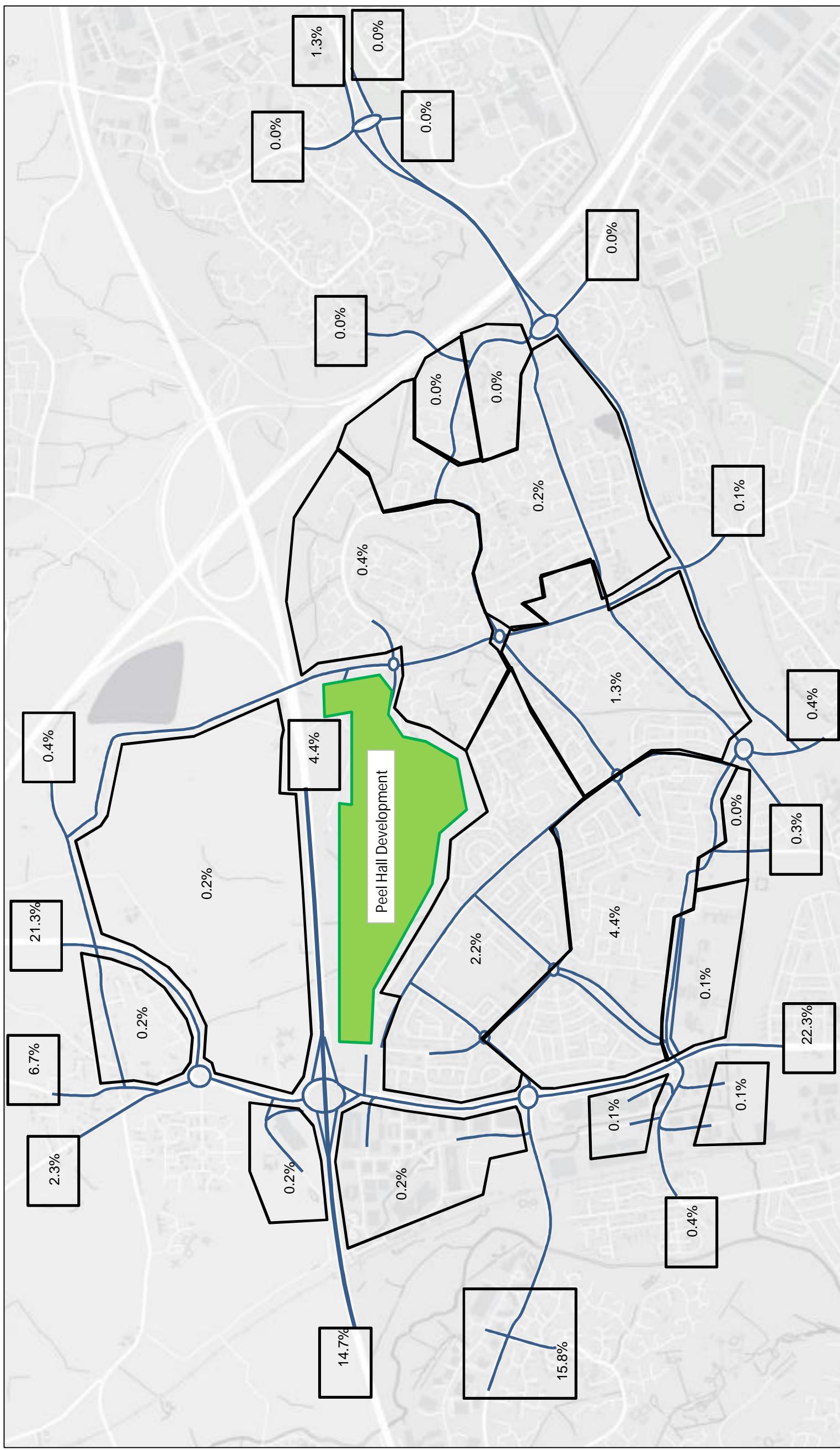


\*\*\* Due to rounding to nearest number within Excel, percentages presented might not fully add to 100%

# Peel Hall VISSIM Model - Trip Distribution

## Appendix B, Figure 9, PM Percentage Distribution for Residential Trips from Peel Hall Development

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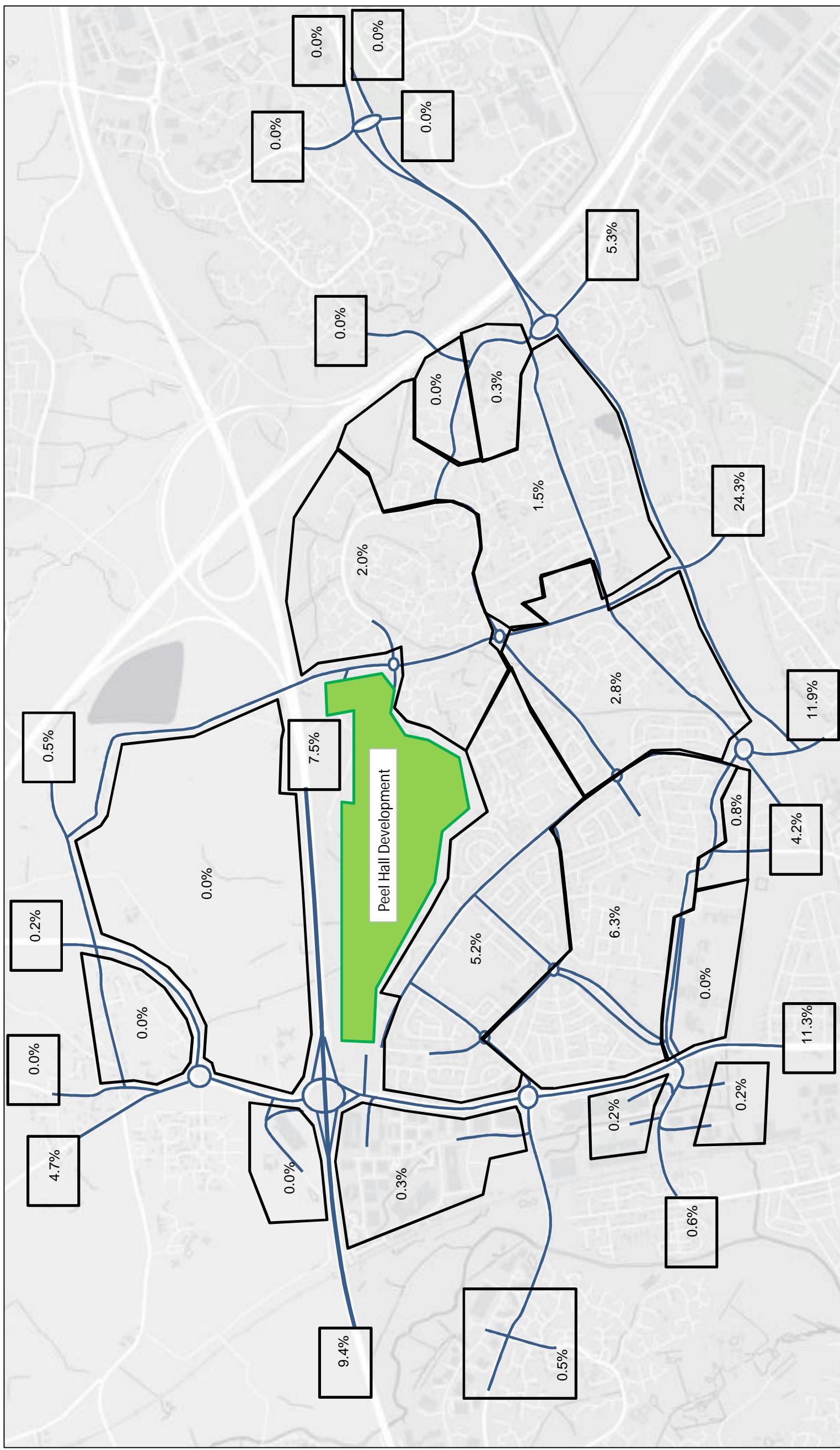


\*\*\* Due to rounding to nearest number within Excel, percentages presented might not fully add to 100%

# Peel Hall VISSIM Model - Trip Distribution

## Appendix B, Figure 10, PM Percentage Distribution for Work Trips from Peel Hall Development

**AECOM**

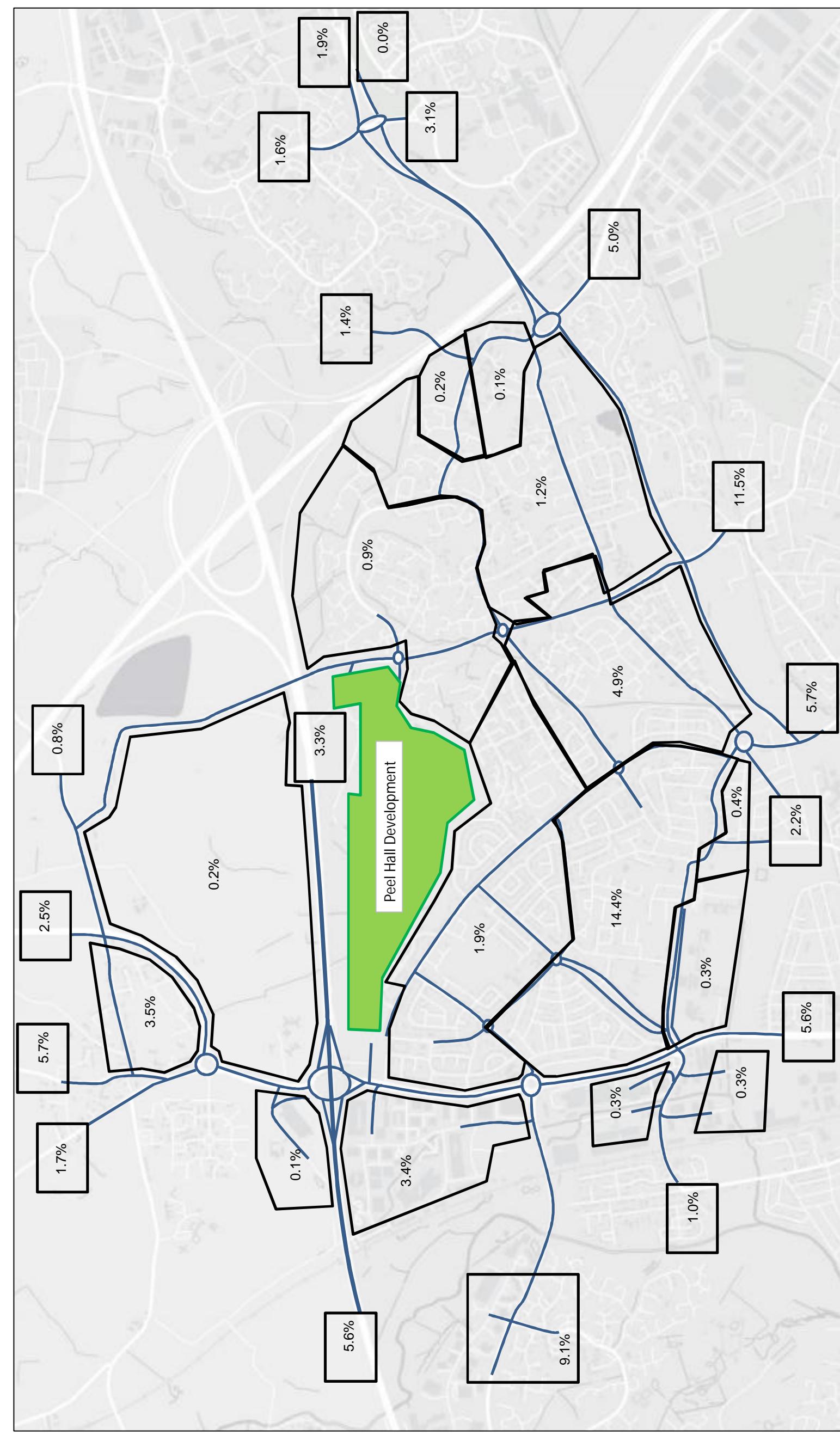


\*\*\* Due to rounding to nearest number within Excel, percentages presented might not fully add to 100%

# Peel Hall VISSIM Model - Trip Distribution

## Appendix B, Figure 11, PM Percentage Distribution for Other Trips from Peel Hall Development

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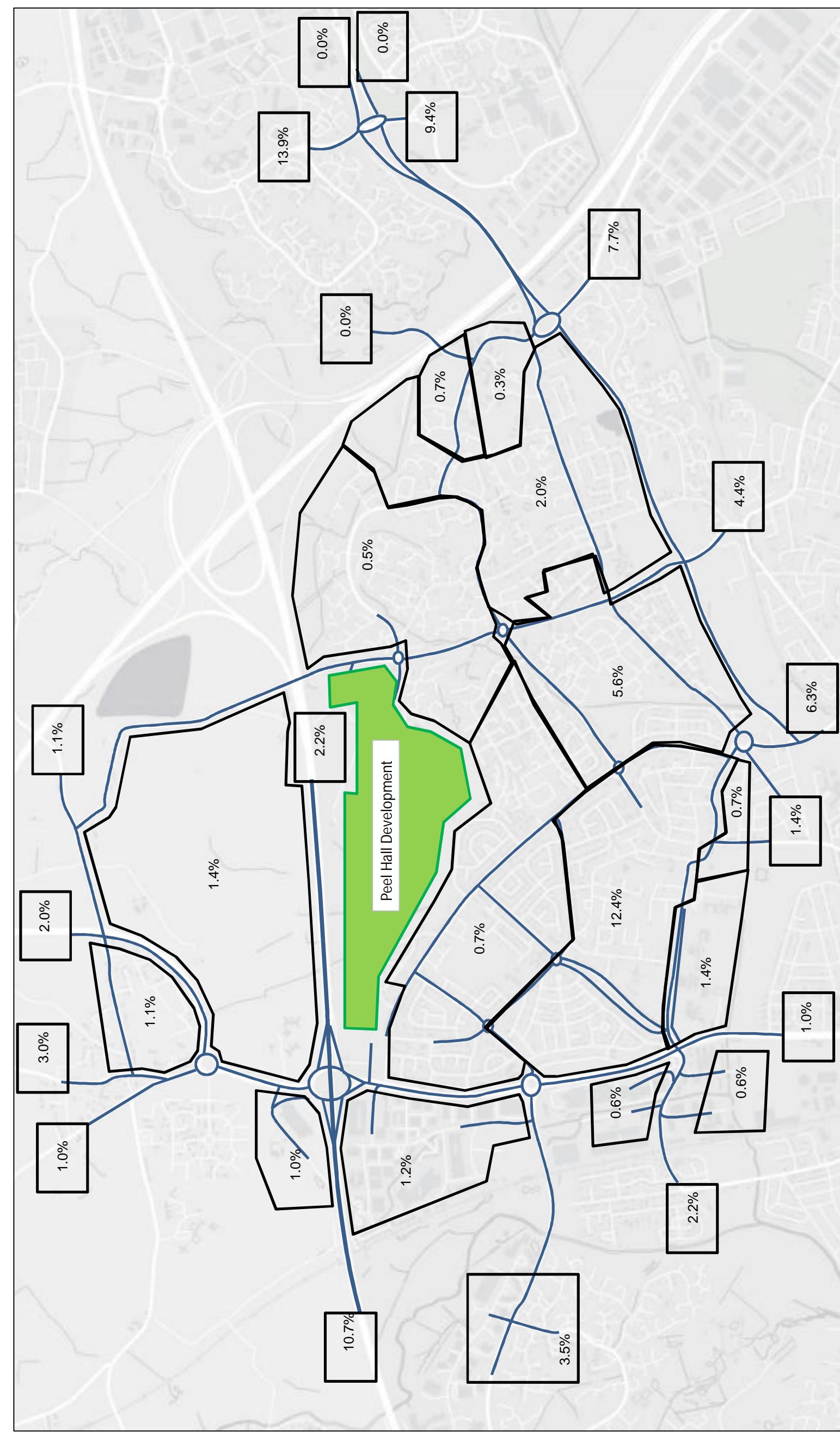


\*\* Due to rounding to nearest number within Excel, percentages presented might not fully add to 100%

**Peel Hall VISSIM Model - Trip Distribution**

**Appendix B, Figure 12, PM Percentage Distribution for All Trips from Peel Hall Development**



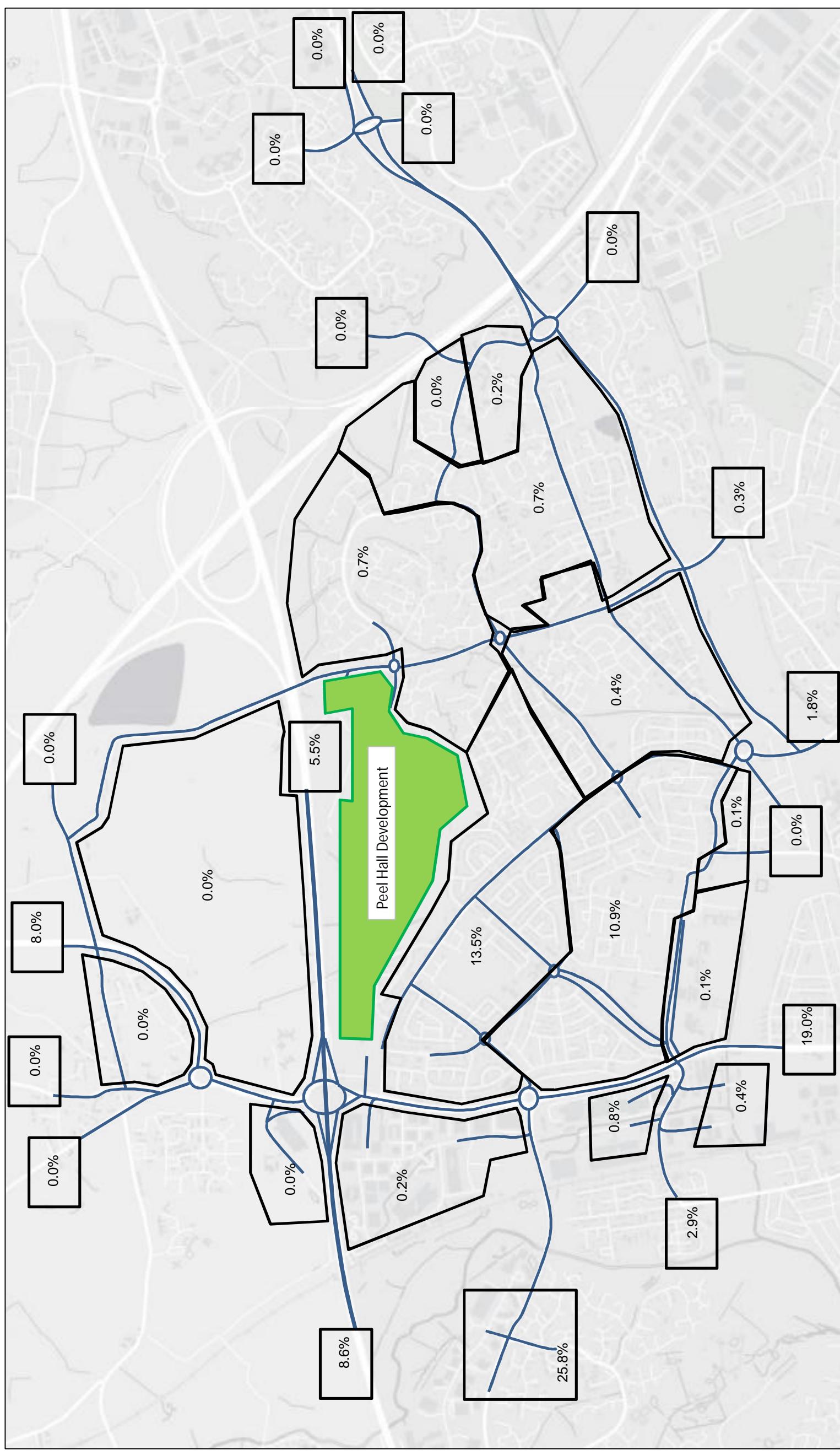


\*\* Due to rounding to nearest number within Excel, percentages presented might not fully add to 100%

**Peel Hall VISSIM Model - Trip  
Distribution**

**Appendix B, Figure 13, PM Percentage  
Distribution for Residential Trips to Peel  
Hall Development**



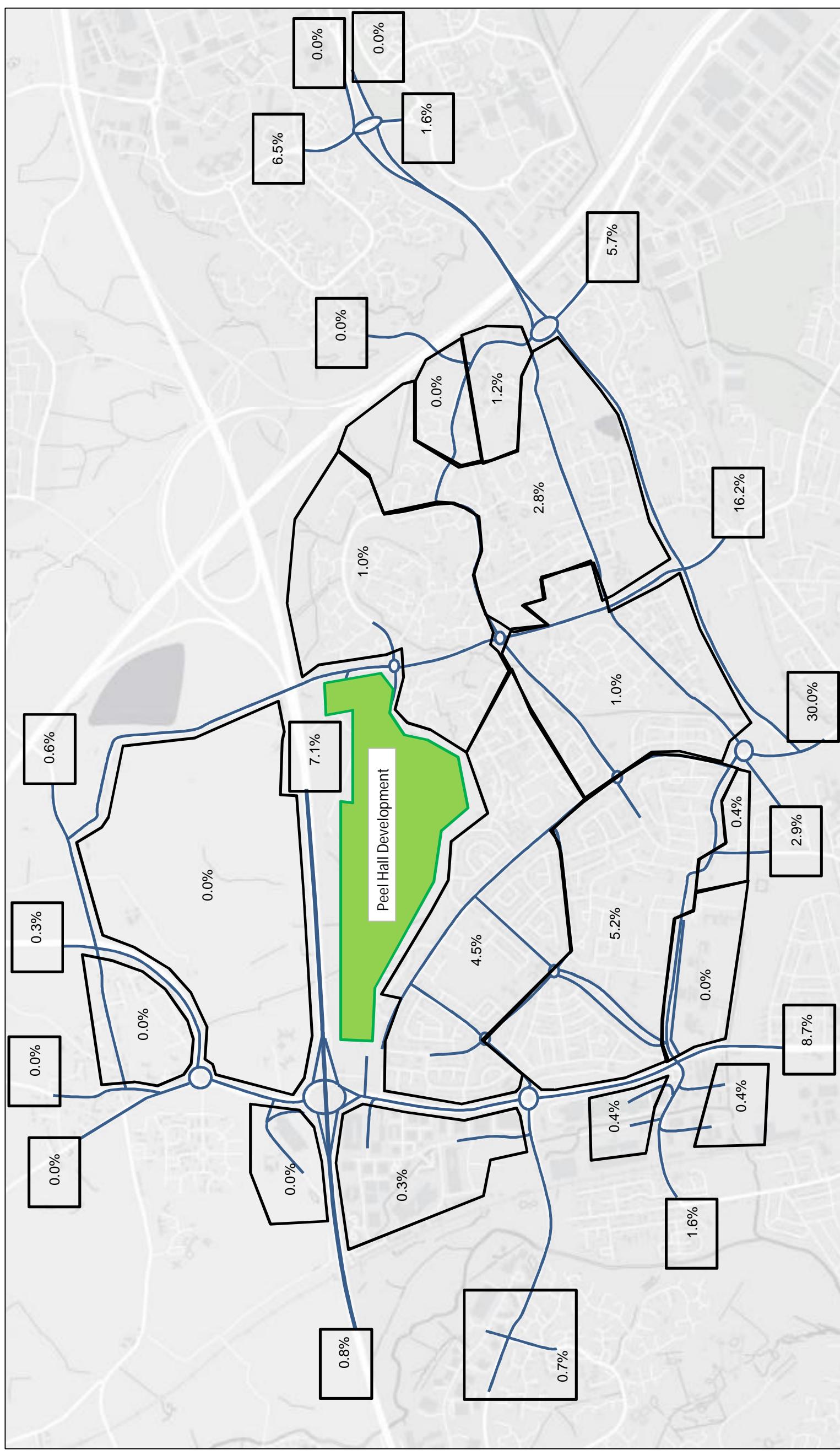


\*\* Due to rounding to nearest number within Excel, percentages presented might not fully add to 100%

# Peel Hall VISSIM Model - Trip Distribution

## Appendix B, Figure 14, PM Percentage Distribution for Work Trips to Peel Hall Development

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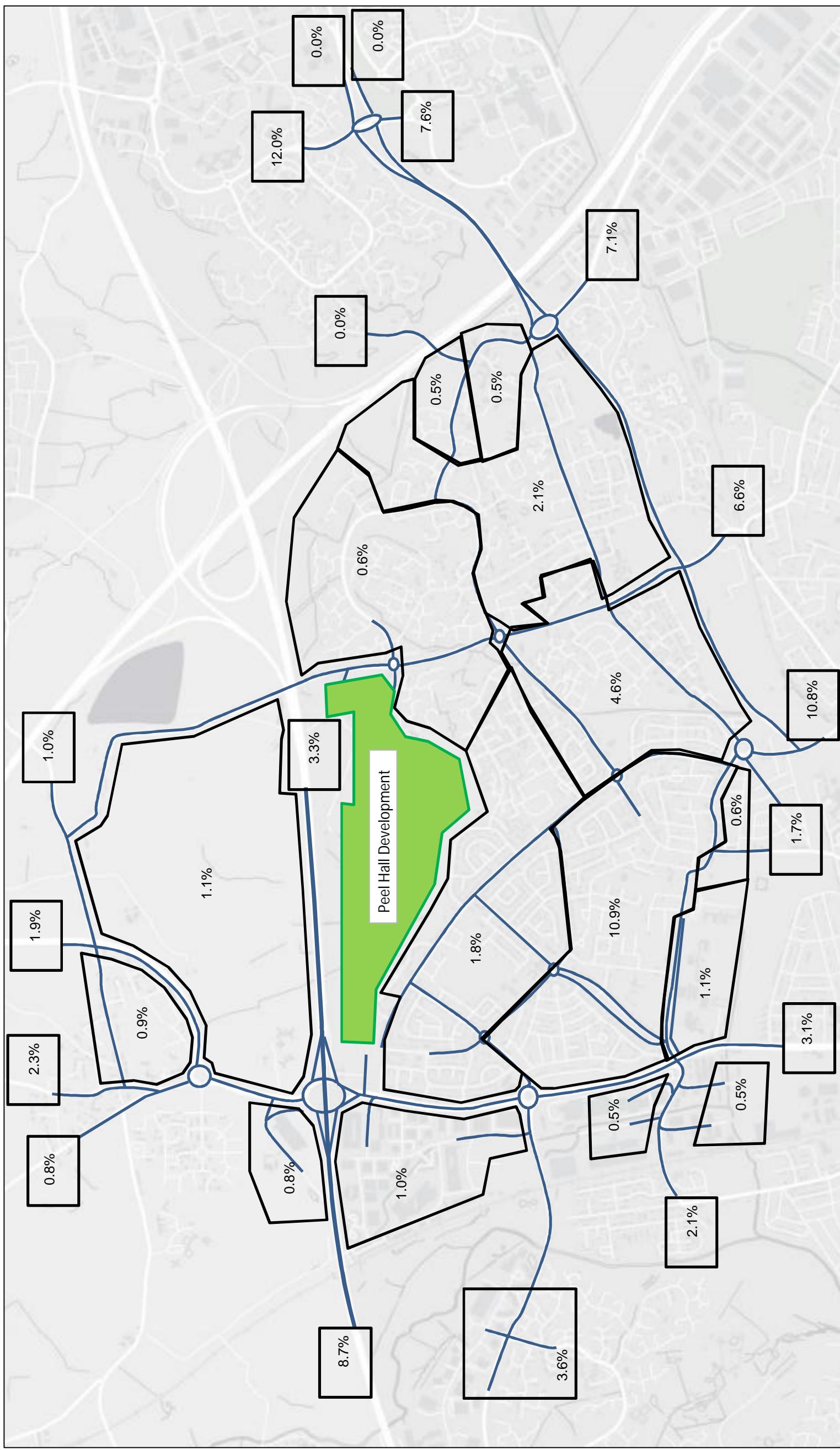


\*\* Due to rounding to nearest number within Excel, percentages presented might not fully add to 100%

# Peel Hall VISSIM Model - Trip Distribution

## Appendix B, Figure 15, PM Percentage Distribution for Other Trips to Peel Hall Development

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\*\*\* Due to rounding to nearest number within Excel, percentages presented might not fully add to 100%

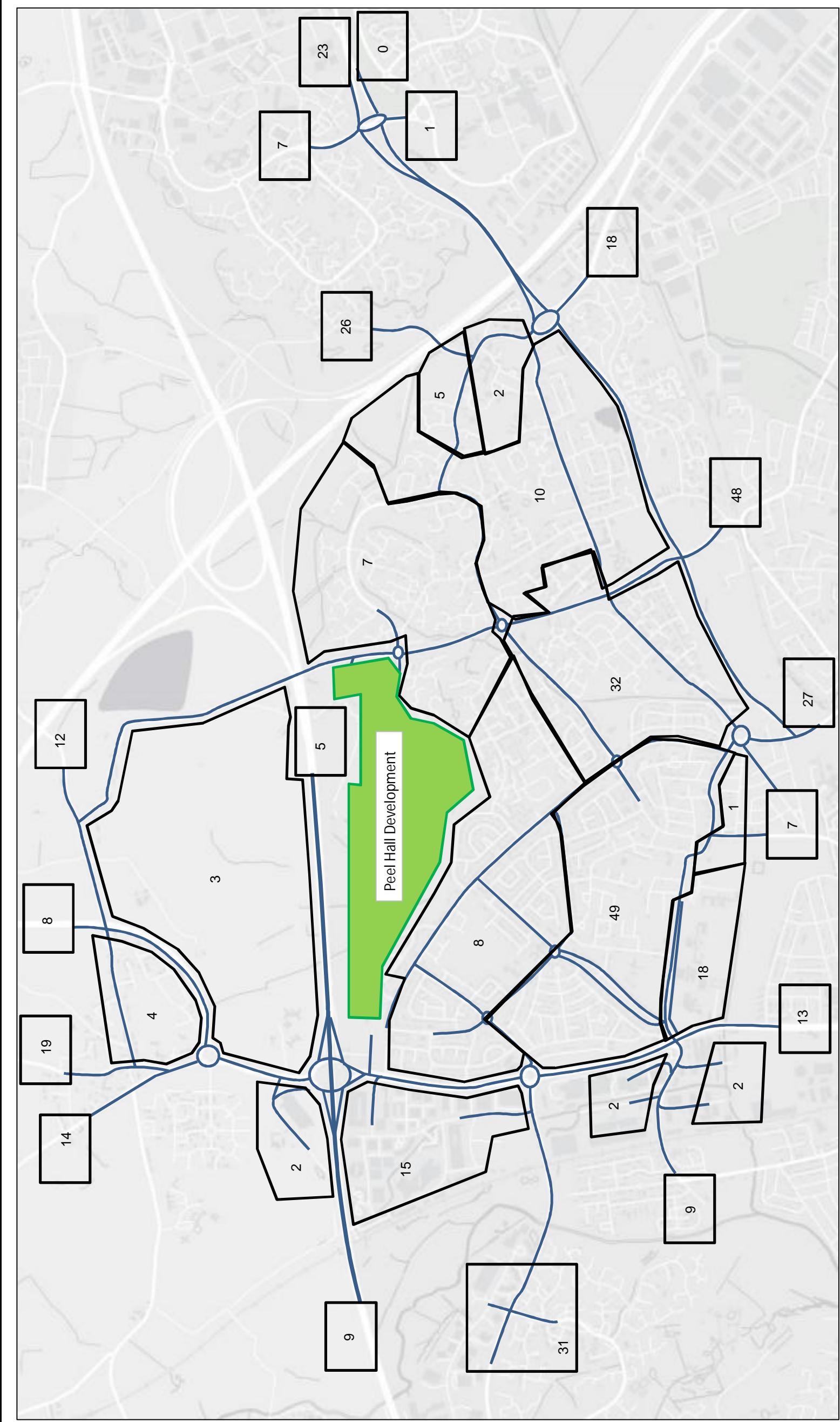
# Peel Hall VISSIM Model - Trip Distribution

## Appendix B, Figure 16, PM Percentage Distribution for All Trips to Peel Hall Development

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## **Appendix C**

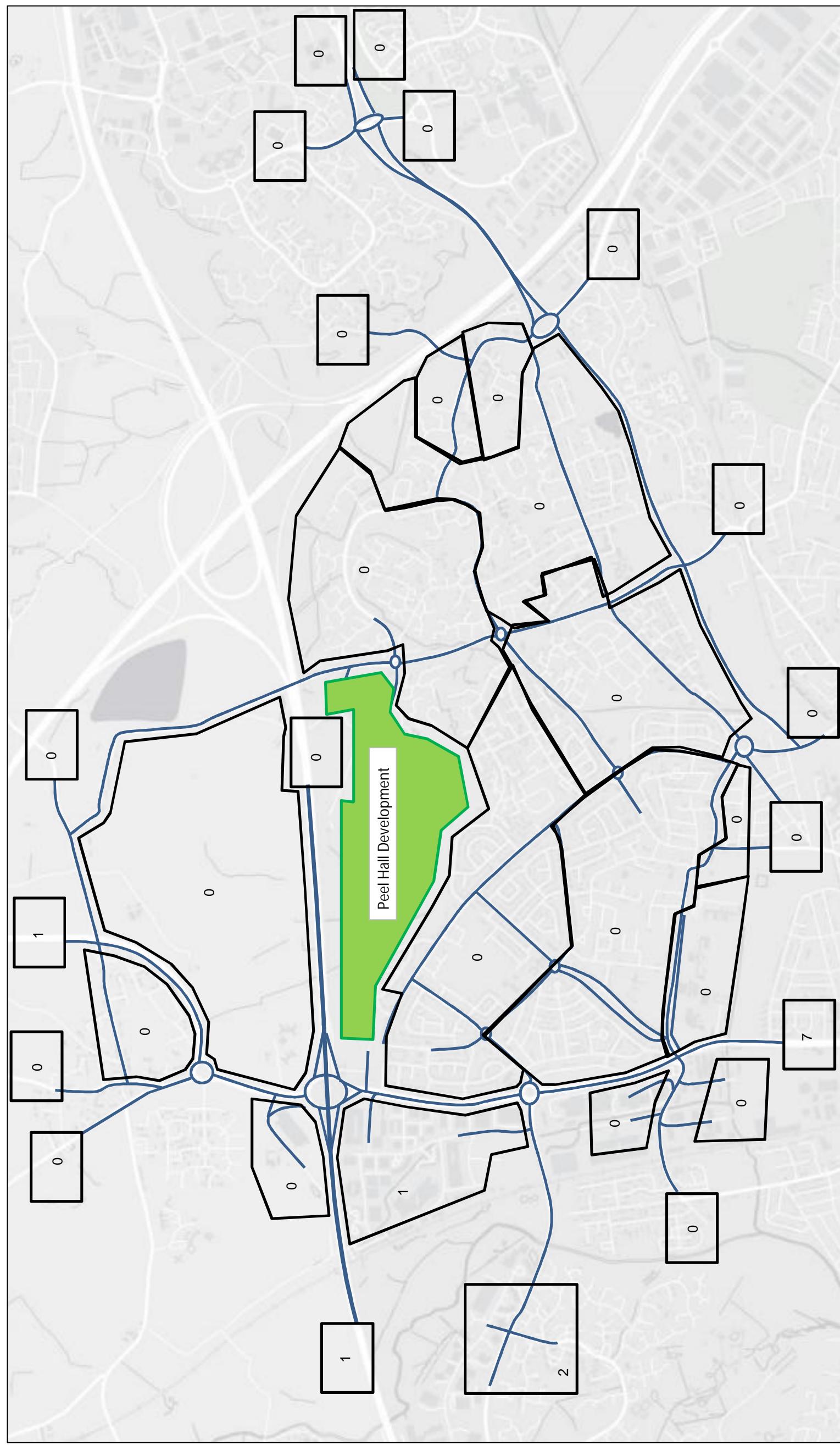
### **Total Proposed Trips per Time Period**



Peel Hall VISSIM Model - Trip Distribution

Appendix C, Figure 1, AM (0700-0800)  
Residential Trips from Peel Hall Development

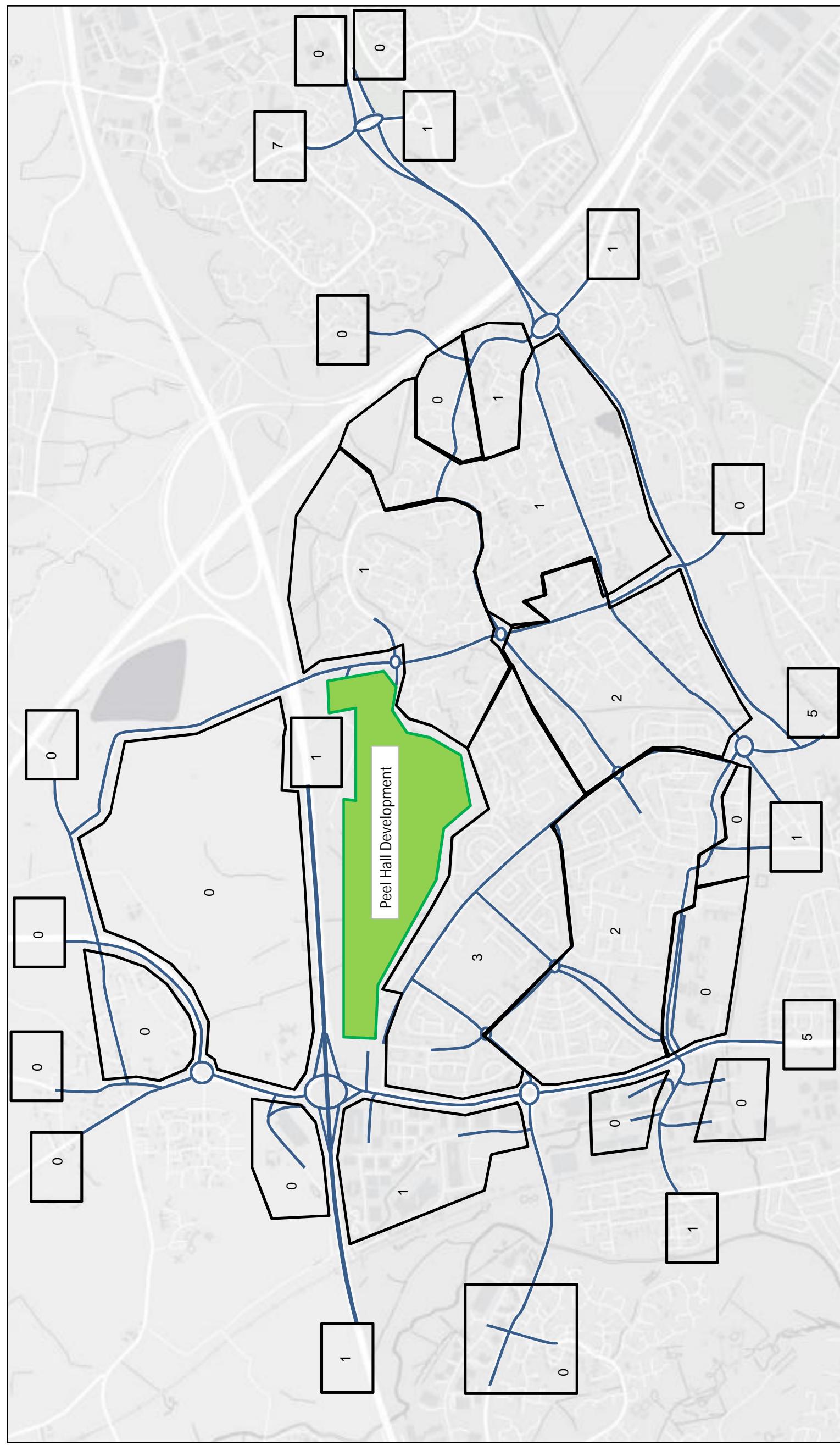
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# Peel Hall VISSIM Model - Trip Distribution

## Appendix C, Figure 2, AM (0700-0800) Work Trips from Peel Hall Development

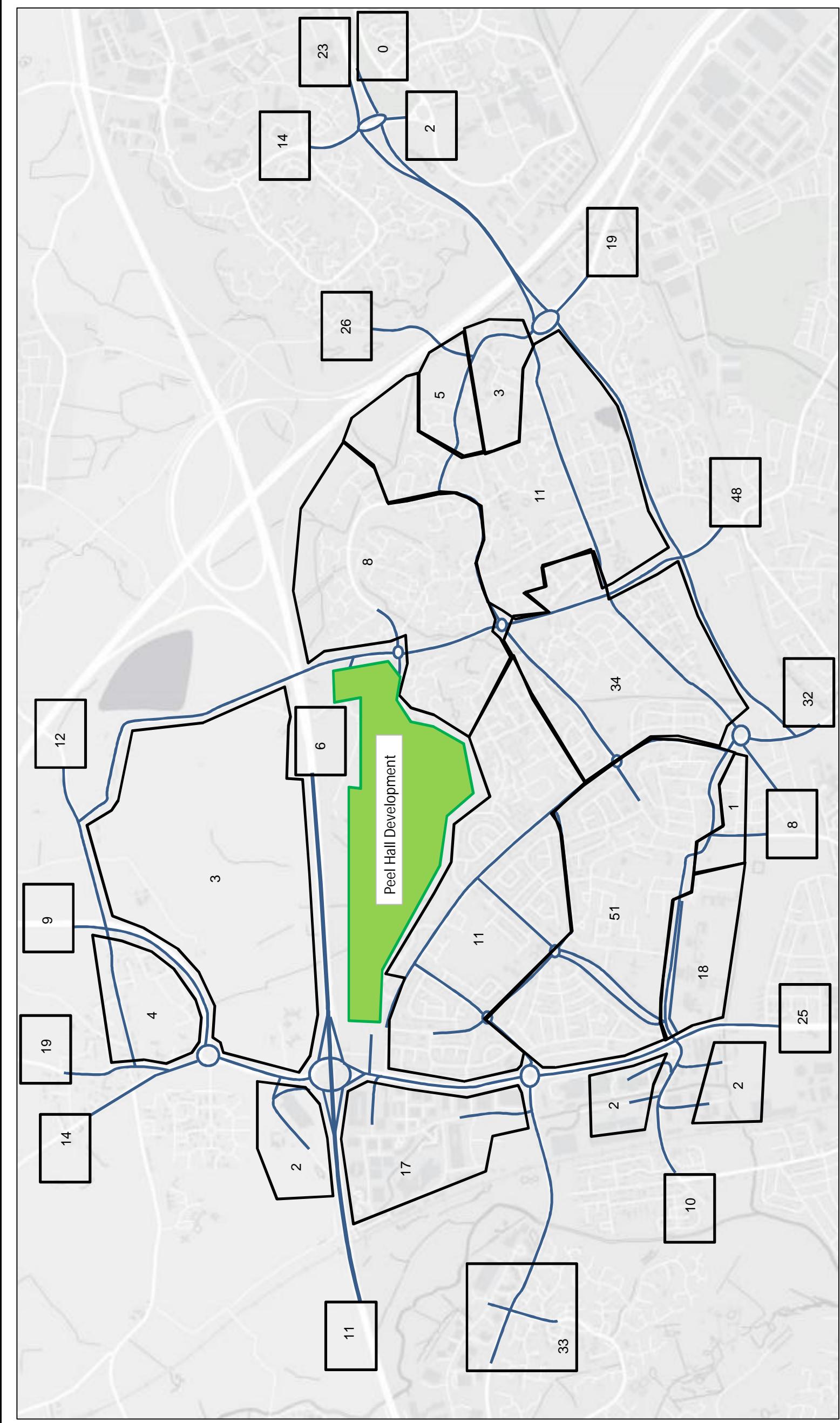
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# Peel Hall VISSIM Model - Trip Distribution

## Appendix C, Figure 3, AM (0700-0800) Other Trips from Peel Hall Development

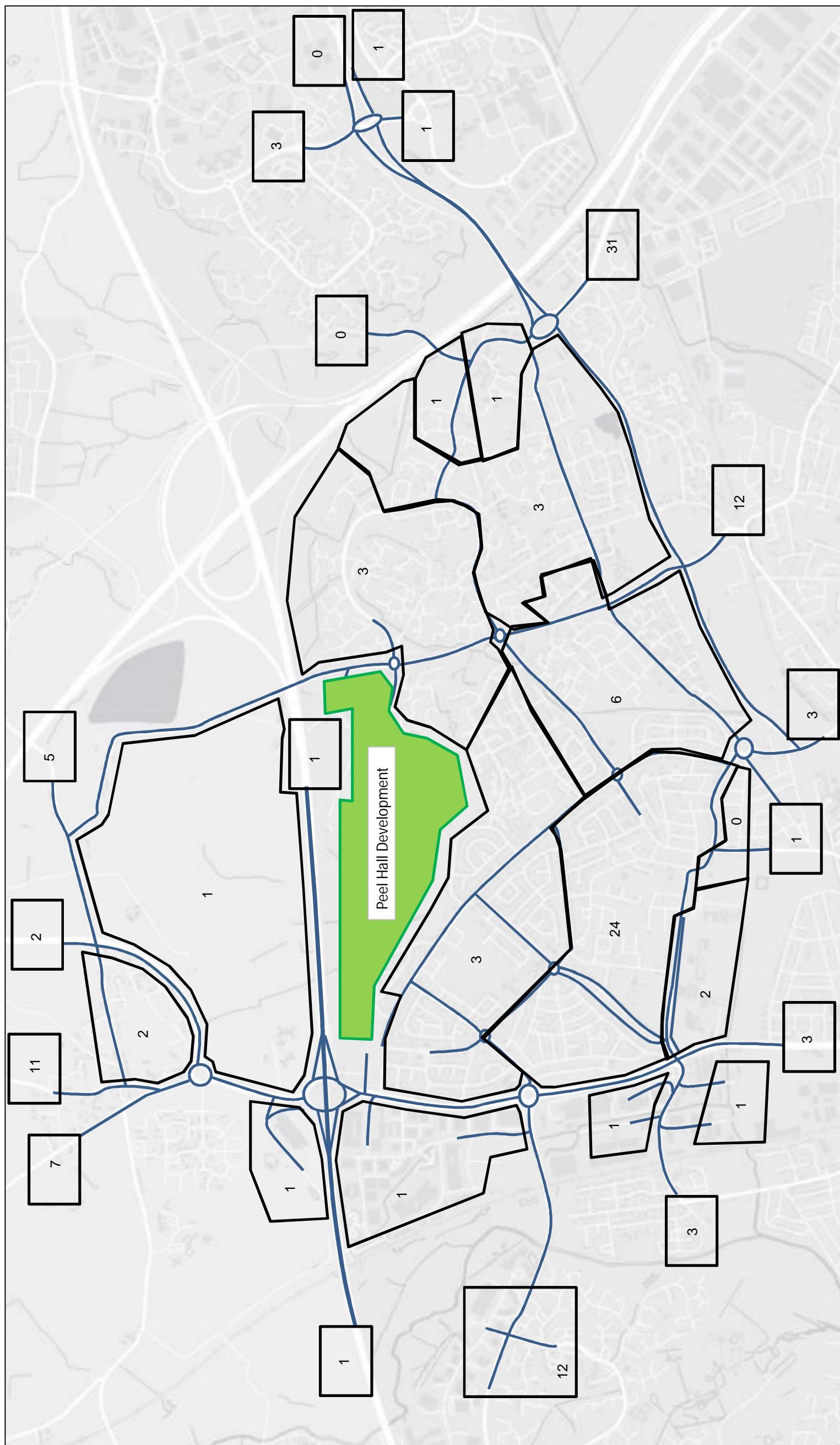
The AECOM logo consists of the word "AECOM" in a bold, black, sans-serif font. The letter "E" is stylized with a horizontal bar above it and a vertical bar below it, both of which are partially filled with a green-to-blue gradient.



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Appendix C, Figure 4, AM (0700-0800)  
Total Trips from Peel Hall Development

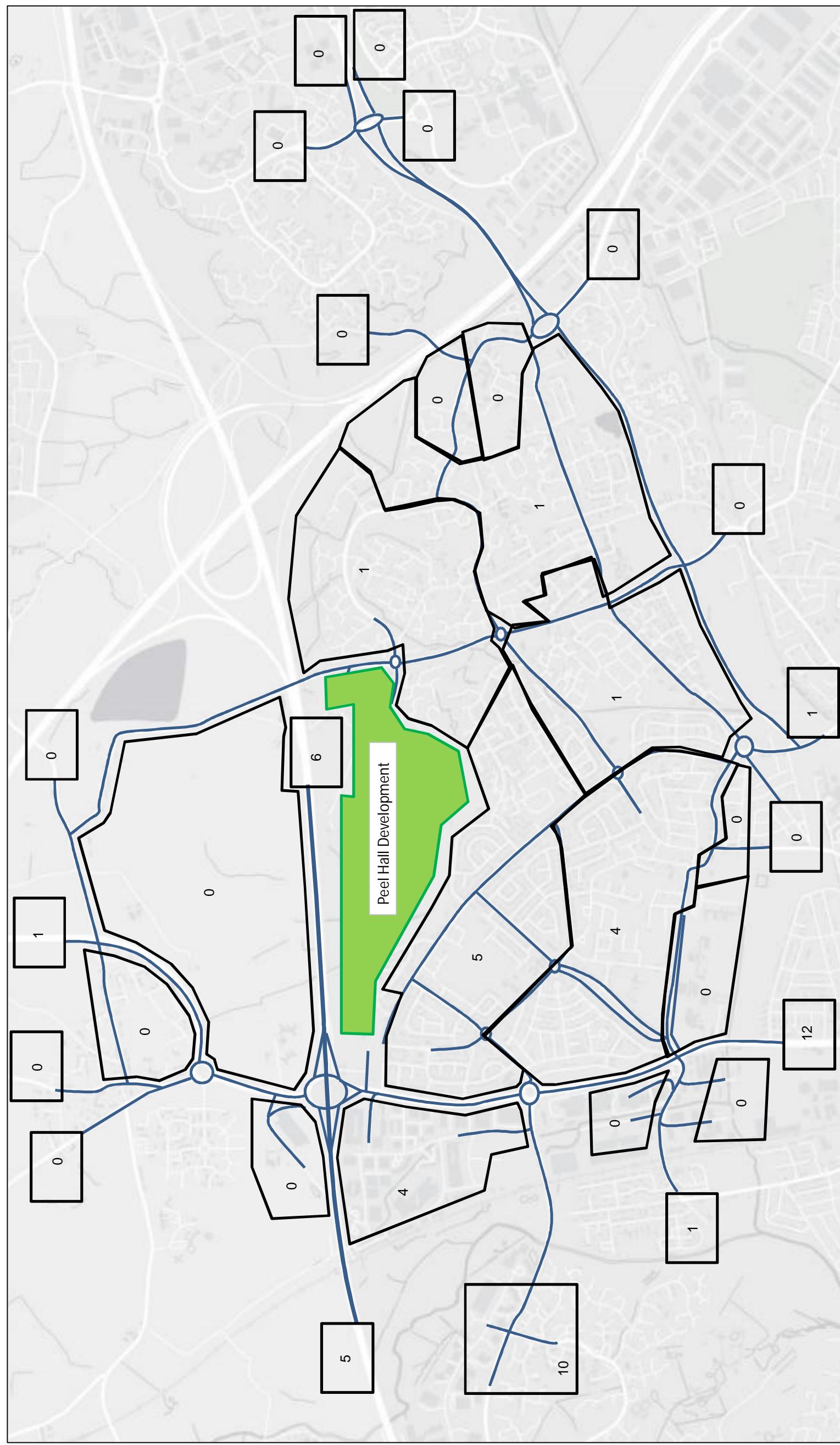
Peel Hall VISSIM Model - Trip  
Distribution



# Peel Hall VISSIM Model - Trip Distribution

## Appendix C, Figure 5, AM (0700-0800) Residential Trips to Peel Hall Development

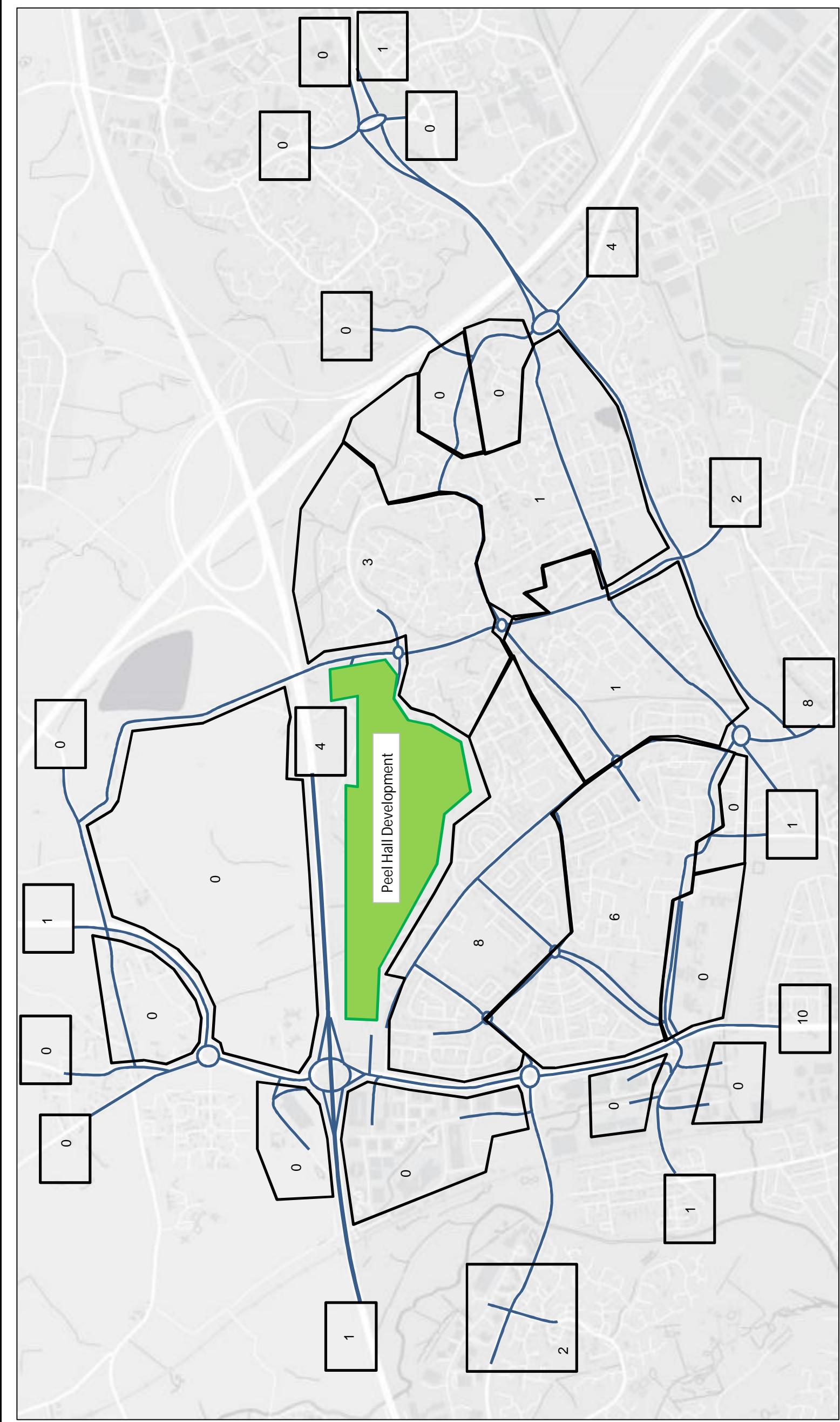
The AECOM logo consists of the word "AECOM" in a bold, black, sans-serif font. The letter "E" is stylized with a horizontal bar above it and a vertical bar below it, both of which are partially filled with a light blue color gradient.



# Peel Hall VISSIM Model - Trip Distribution

## Appendix C, Figure 6, AM (0700-0800) Work Trips to Peel Hall Development

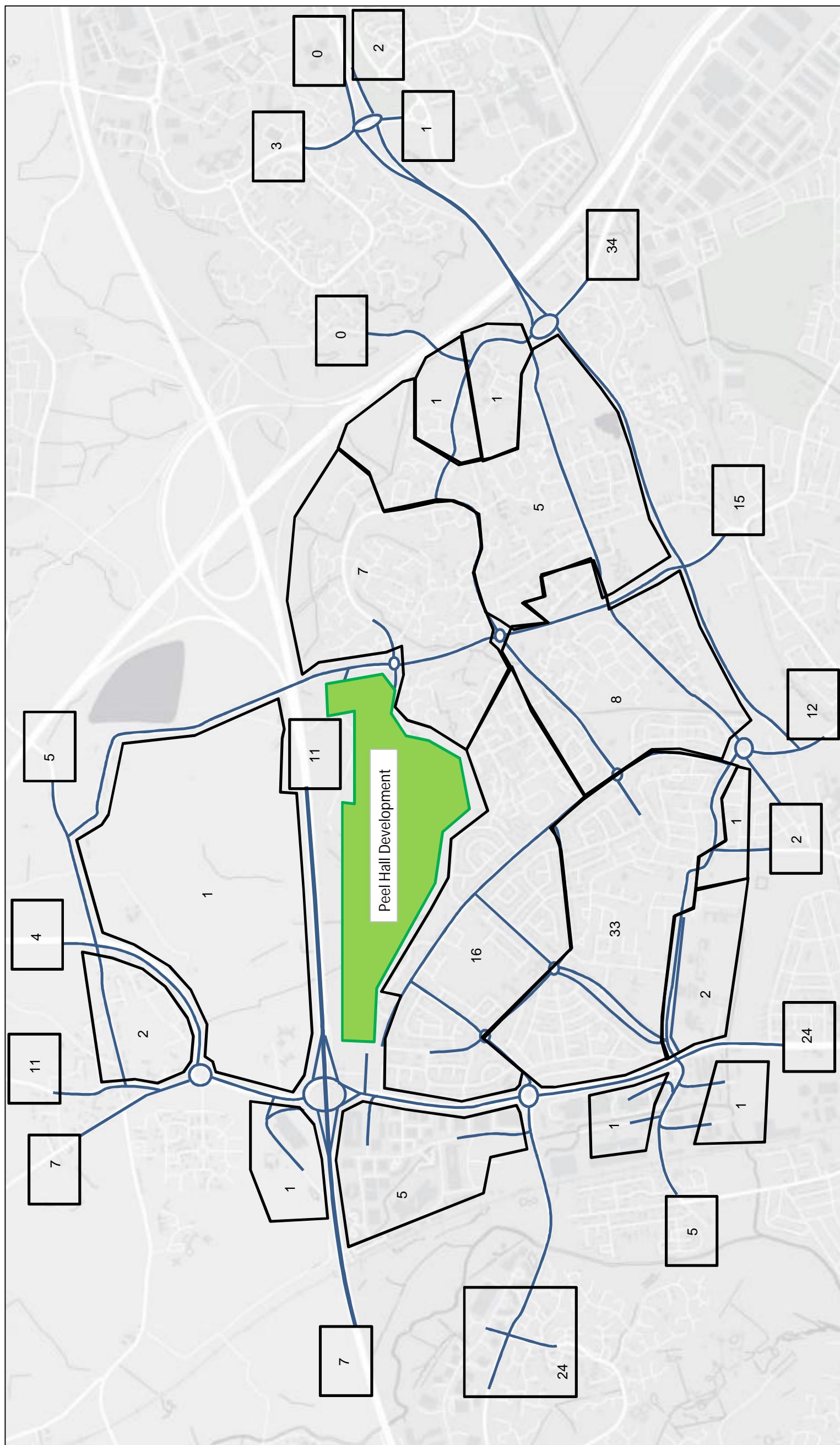
The AECOM logo consists of the word "AECOM" in a bold, black, sans-serif font. The letter "E" is stylized with a horizontal bar above it, and the letters "A" and "C" are partially overlaid by a green horizontal bar.



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Appendix C, Figure 7, AM (0700-0800)  
Other Trips to Peel Hall Development

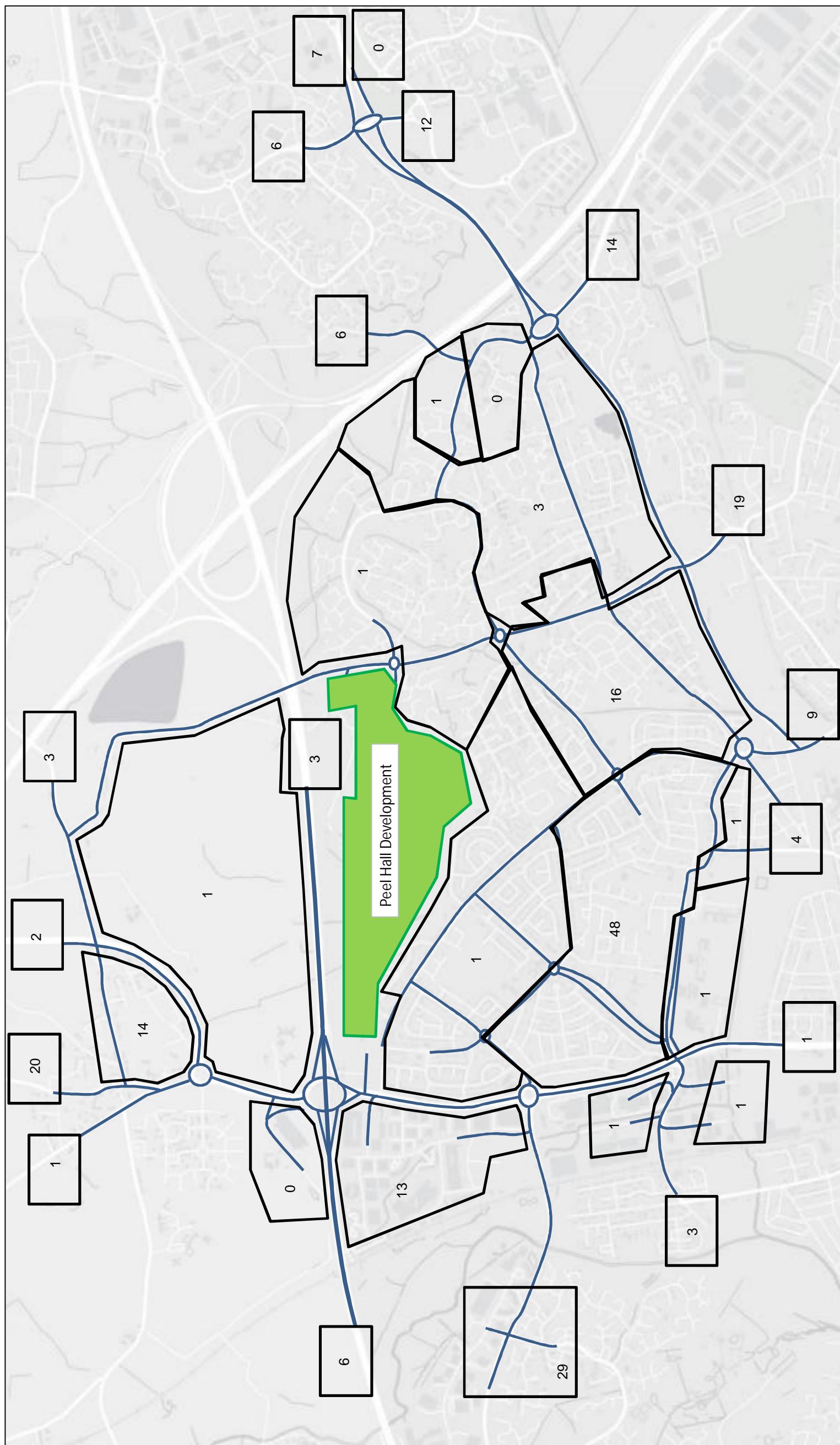
Peel Hall VISSIM Model - Trip  
Distribution



# Peel Hall VISSIM Model - Trip Distribution

## Appendix C, Figure 8, AM (0700-0800) Total Trips to Peel Hall Development

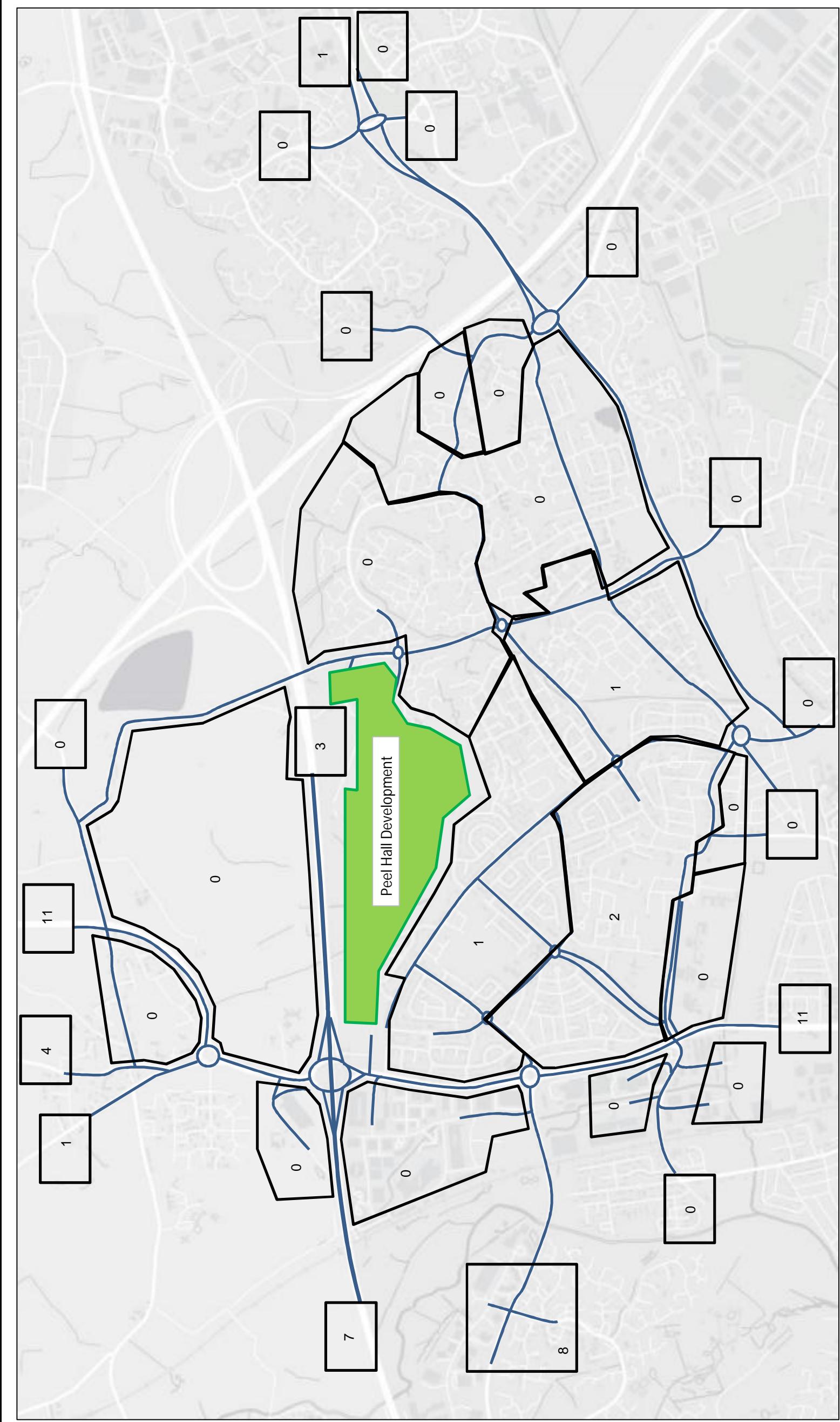
**AECOM**



# Peel Hall VISSIM Model - Trip Distribution

# Appendix C, Figure 9, PM (1600-1700) Residential Trips from Peel Hall Development

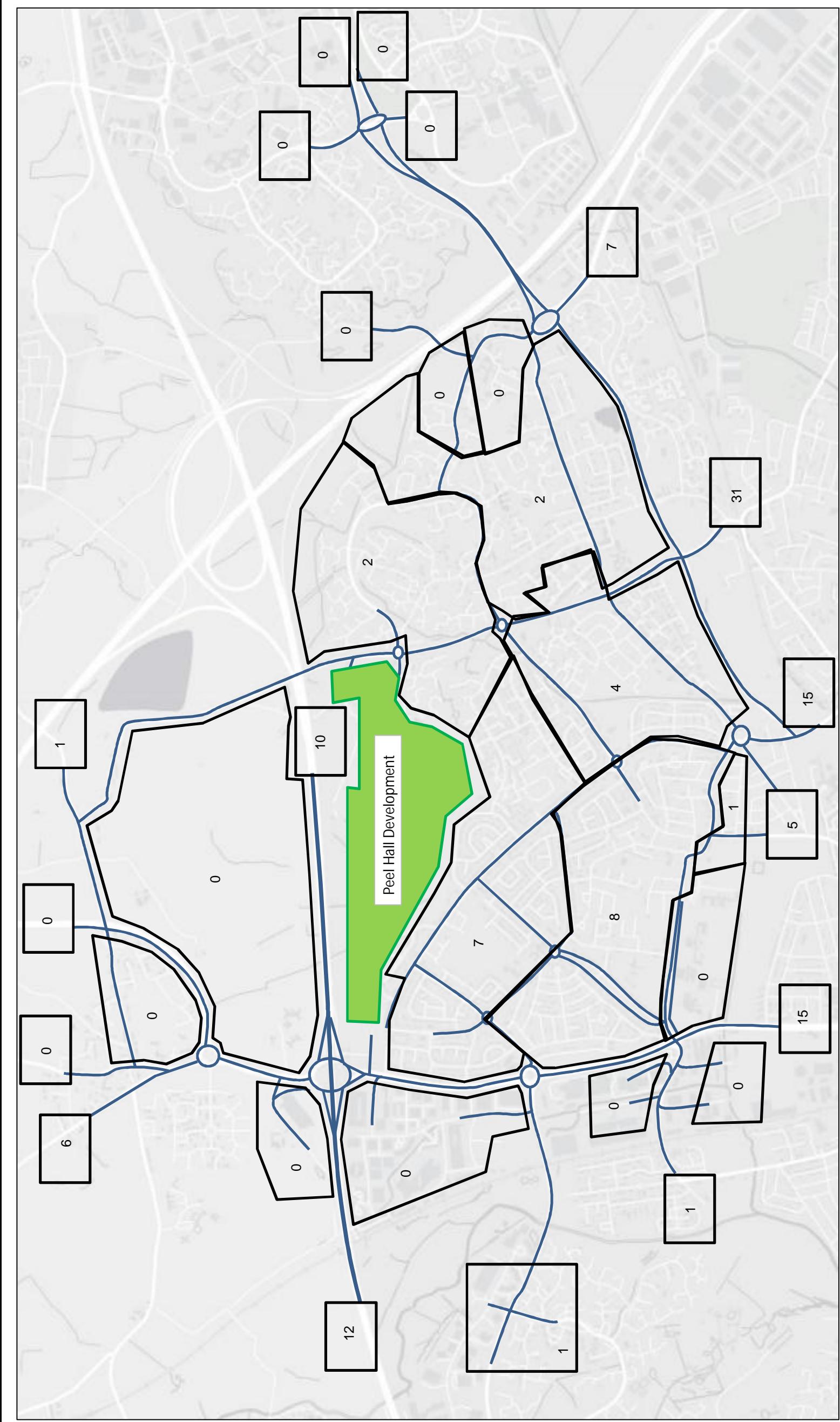
The AECOM logo consists of the word "AECOM" in a bold, black, sans-serif font. The letter "E" is stylized with a horizontal bar above it, and the letters "A" and "C" are partially overlaid by a green horizontal bar.

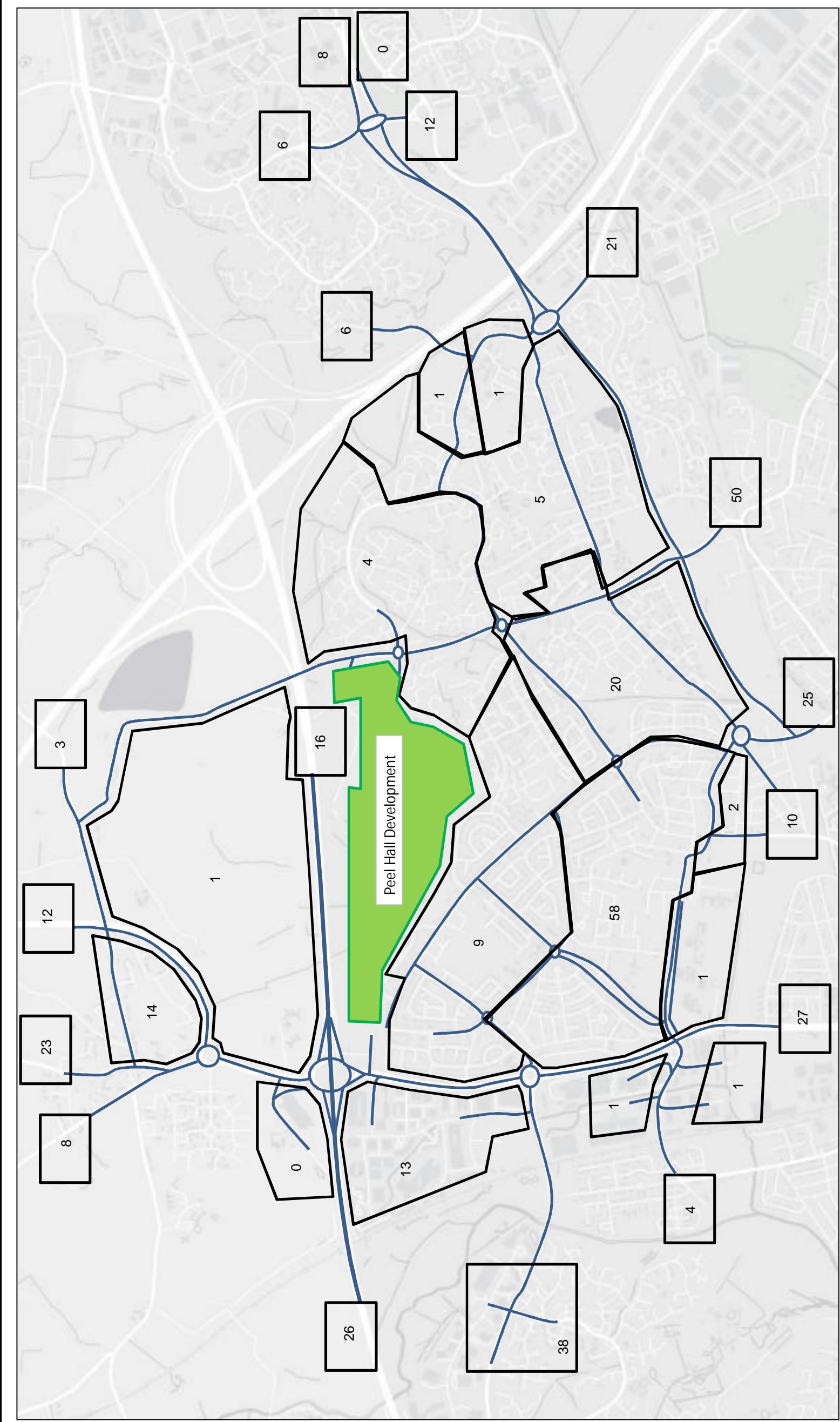


Peel Hall VISSIM Model - Trip  
Distribution

Appendix C, Figure 10, PM (1600-1700)  
Work Trips from Peel Hall Development

**AECOM**

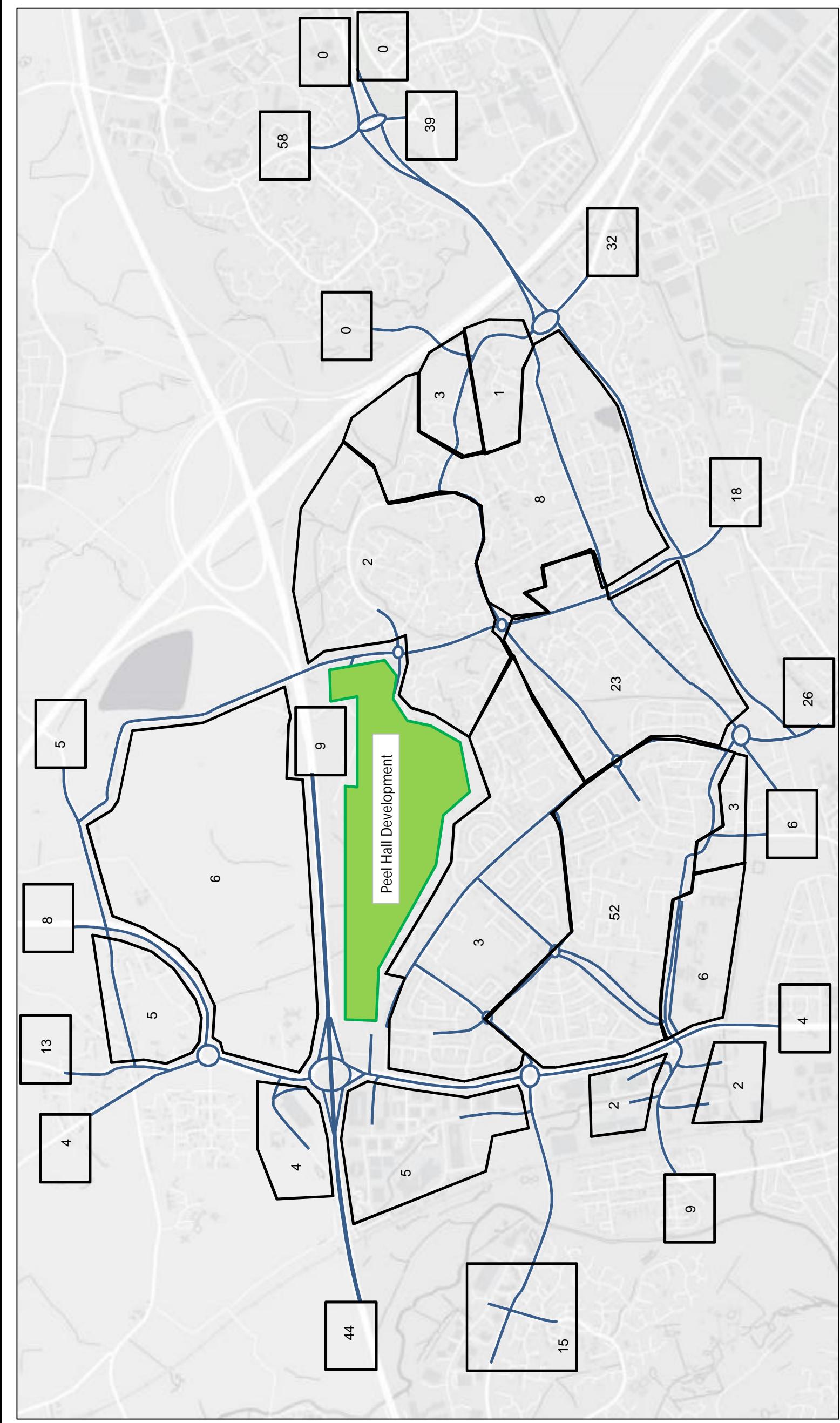




Peel Hall VISSIM Model - Trip  
Distribution

Appendix C, Figure 12, PM (1600-1700)  
Total Trips from Peel Hall Development

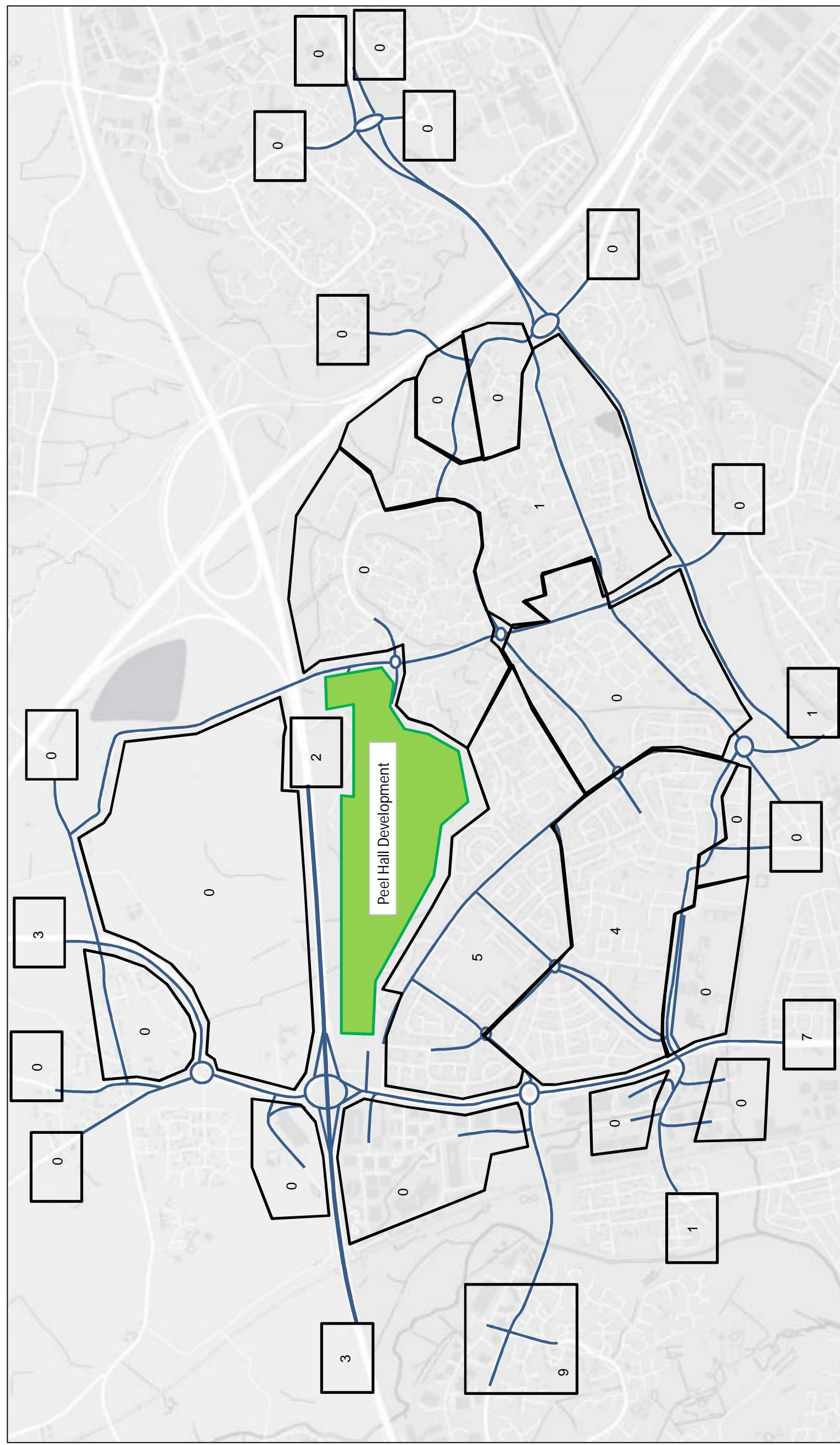
**AECOM**



Peel Hall VISSIM Model - Trip  
Distribution

Appendix C, Figure 13, PM (1600-1700)  
Residential Trips to Peel Hall Development

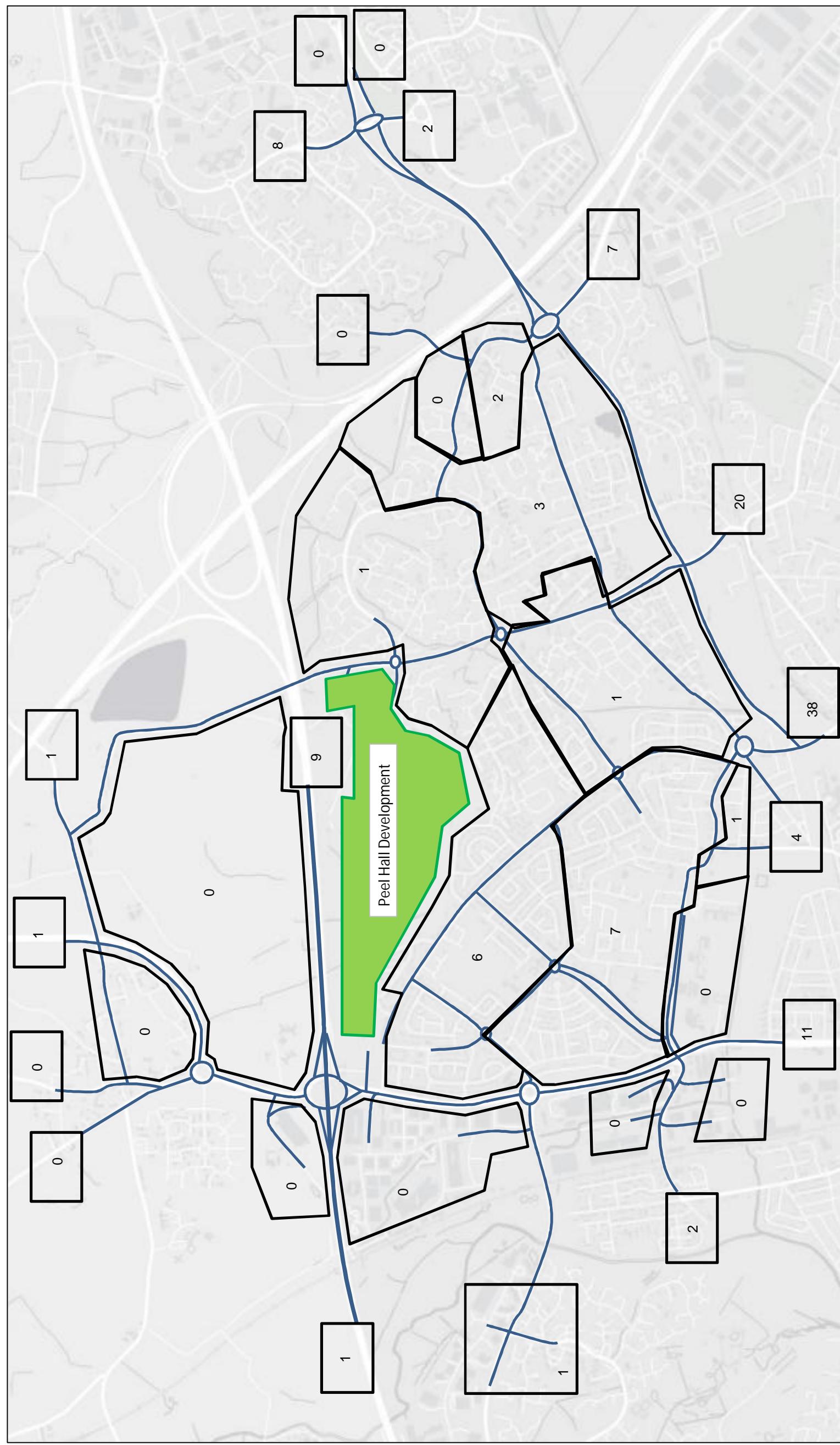
**AECOM**



# Peel Hall VISSIM Model - Trip Distribution

Appendix C, Figure 14, PM (1600-1700)  
Work Trips to Peel Hall Development

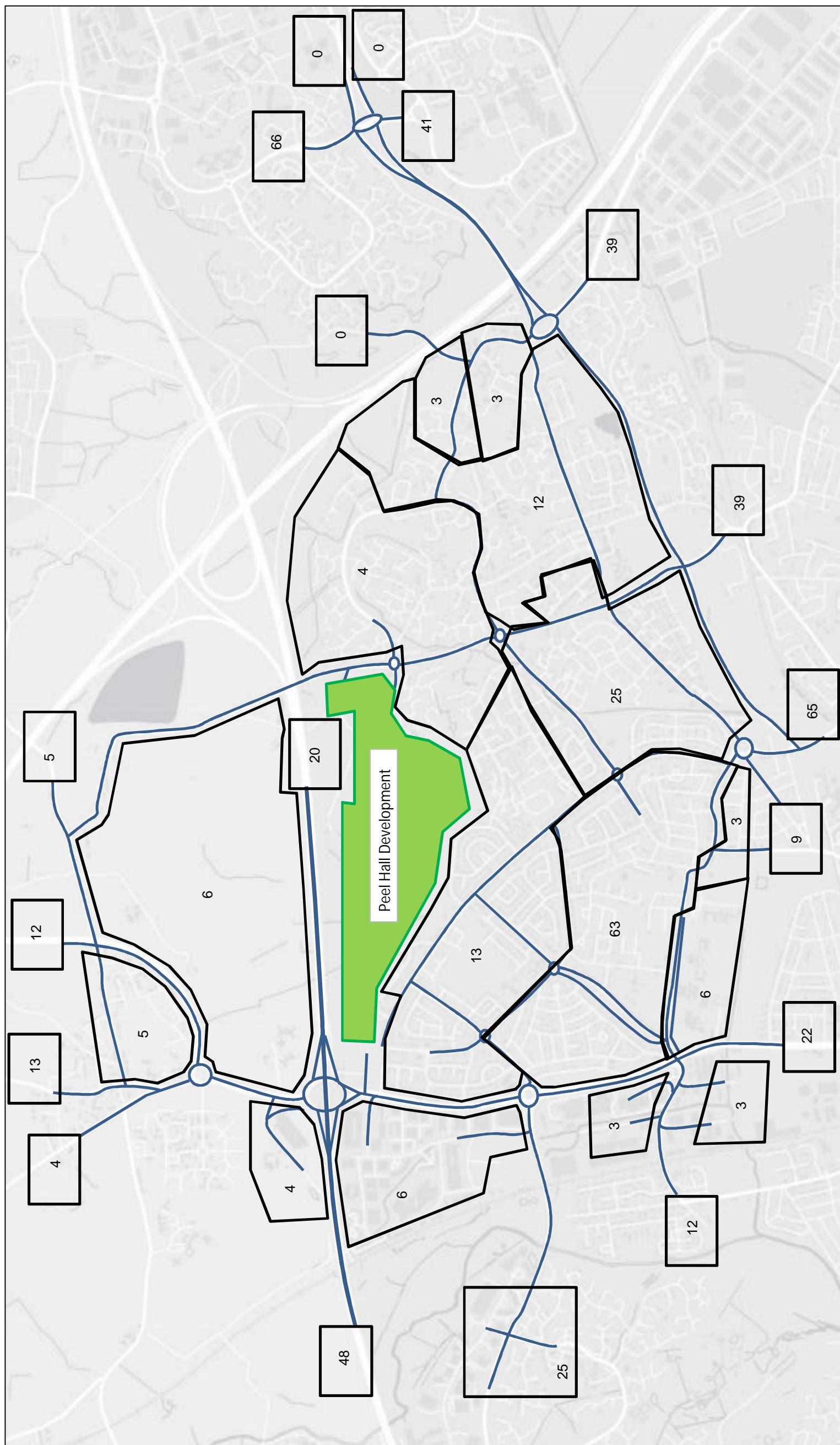
**AECOM**



# Peel Hall VISSIM Model - Trip Distribution

## Appendix C, Figure 15, PM (1600-1700) Other Trips to Peel Hall Development

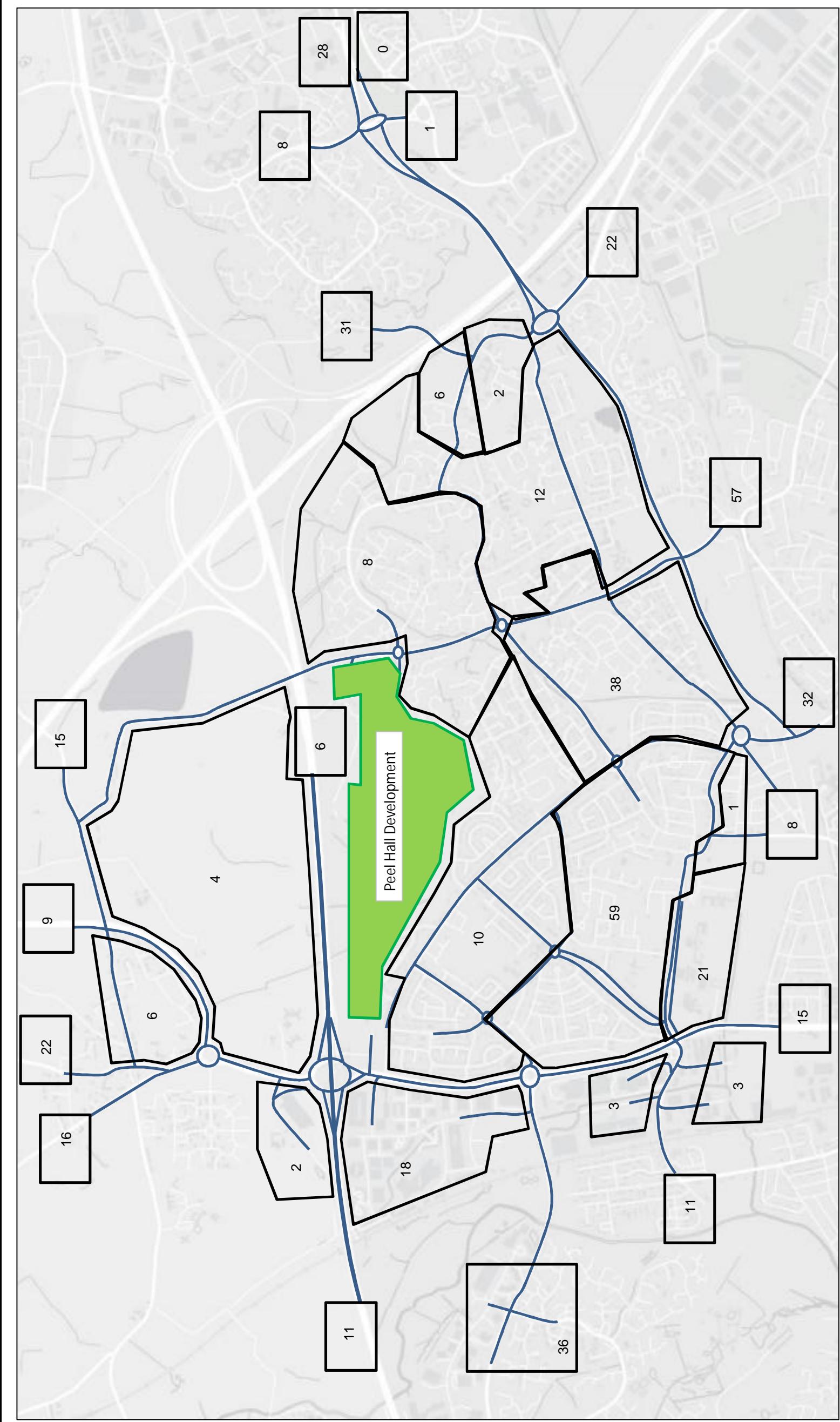
The AECOM logo consists of the word "AECOM" in a bold, black, sans-serif font. The letter "A" is stylized with a horizontal bar extending from its top, and the letters "E", "C", "O", and "M" are stacked vertically.



# Peel Hall VISSIM Model - Trip Distribution

## Appendix C, Figure 16, PM (1600-1700) Total Trips to Peel Hall Development

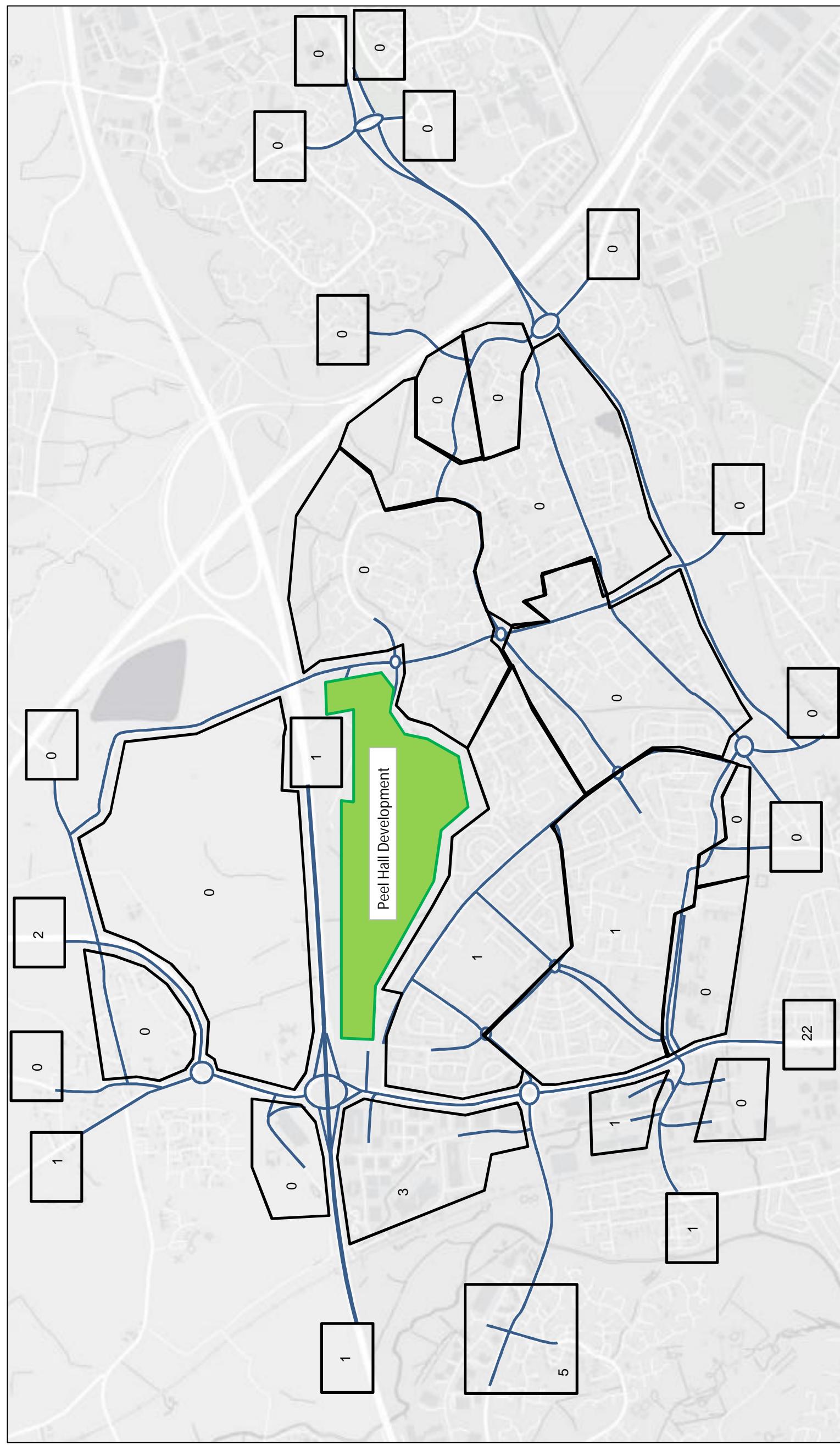
**AECOM**



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Appendix C, Figure 17, AM (0800-0900)  
Residential Trips from Peel Hall  
Development

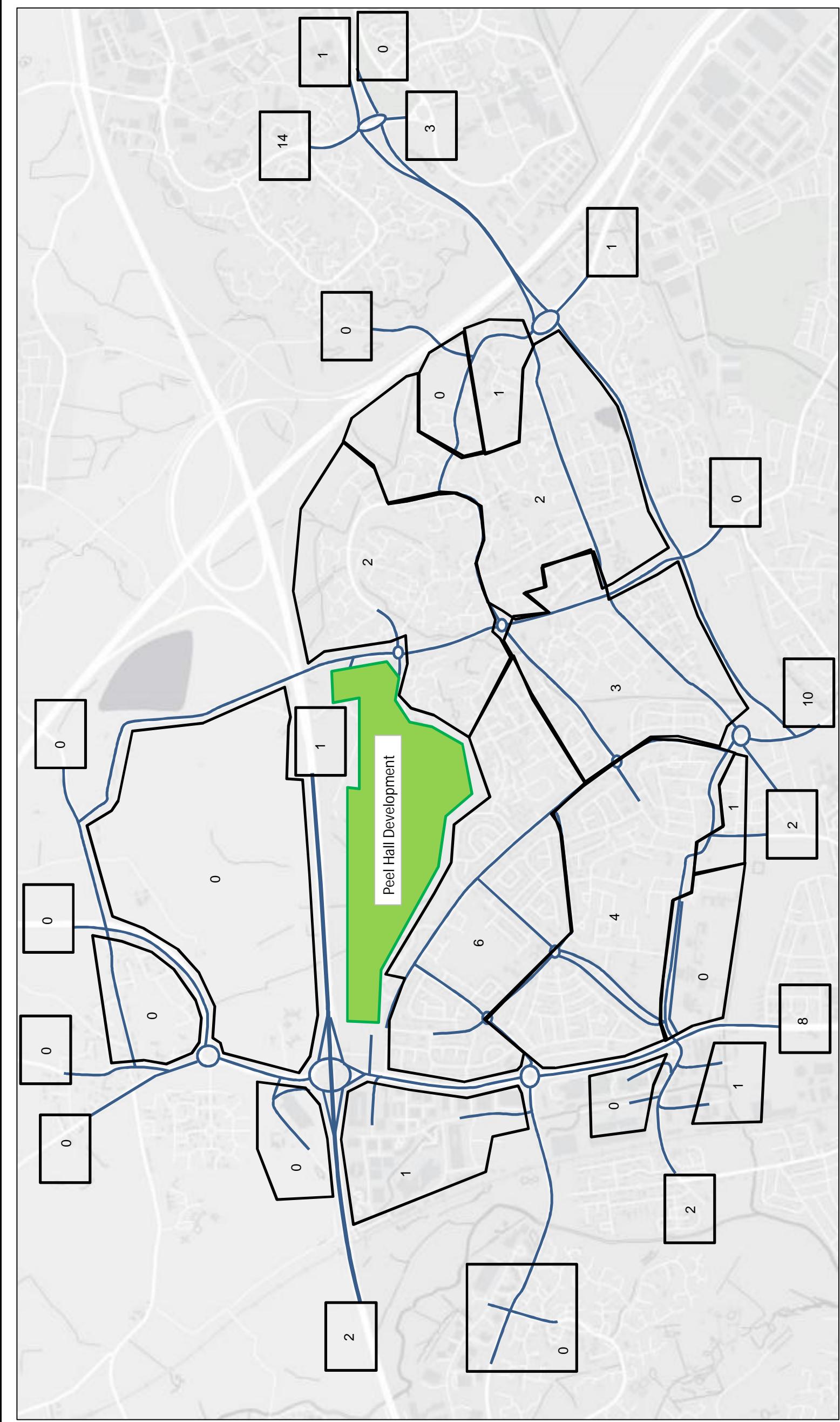
Peel Hall VISSIM Model - Trip  
Distribution



# Peel Hall VISSIM Model - Trip Distribution

## Appendix C, Figure 18, AM (0800-0900) Work Trips from Peel Hall Development

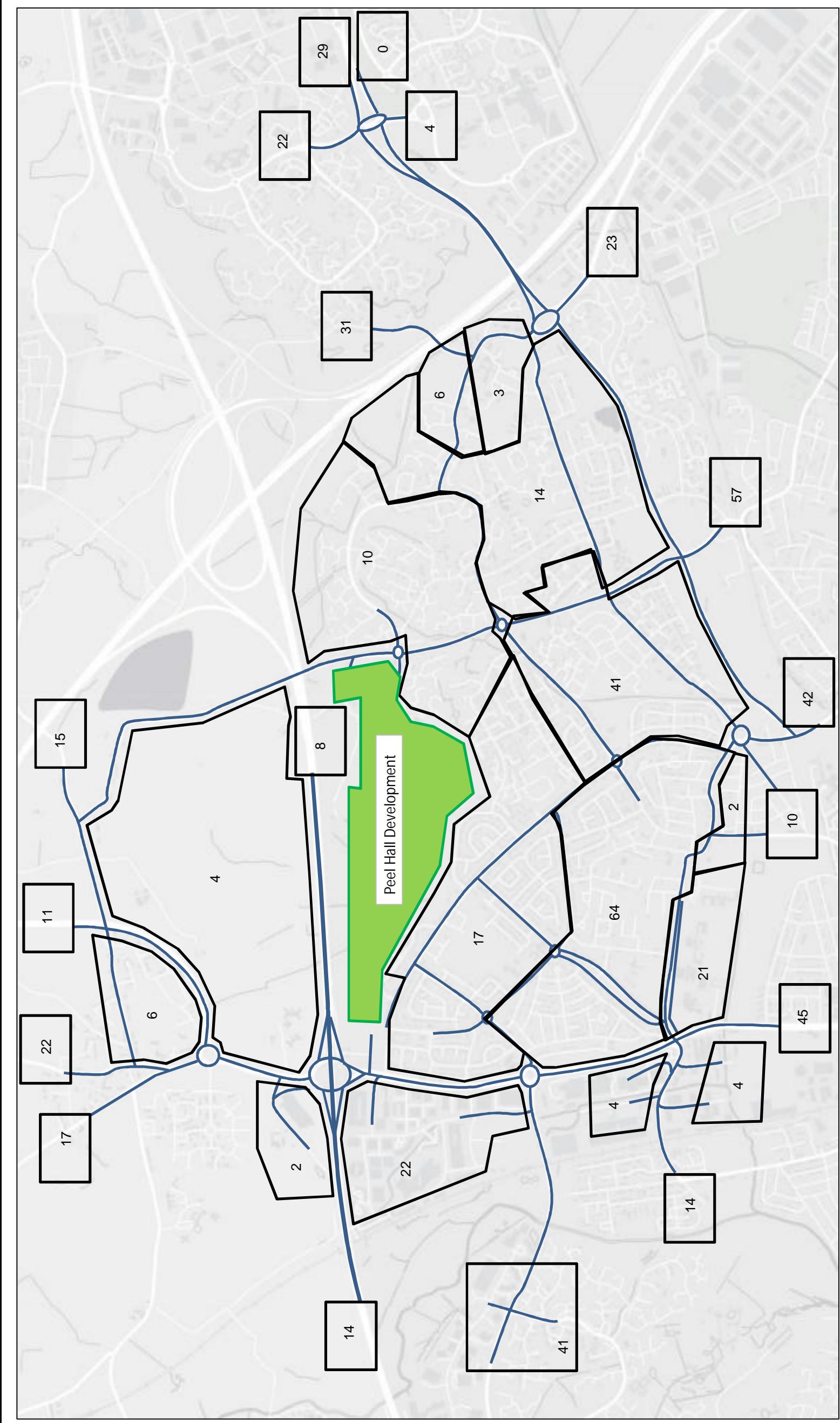
**AECOM**



Peel Hall VISSIM Model - Trip  
Distribution

Appendix C, Figure 19, AM (0800-0900)  
Other Trips from Peel Hall Development

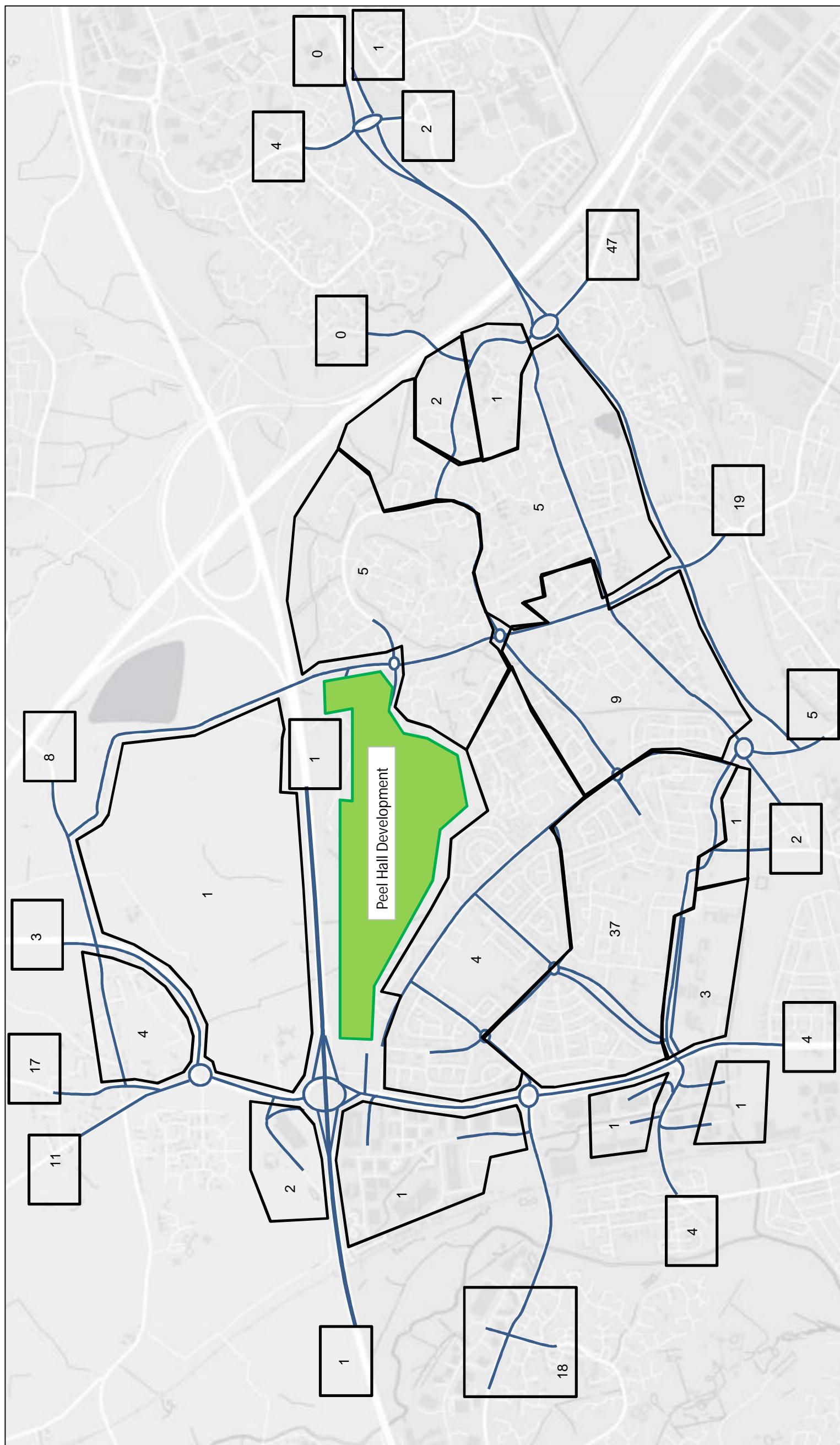
**AECOM**



Peel Hall VISSIM Model - Trip  
Distribution

Appendix C, Figure 20, AM (0800-0900)  
Total Trips from Peel Hall Development

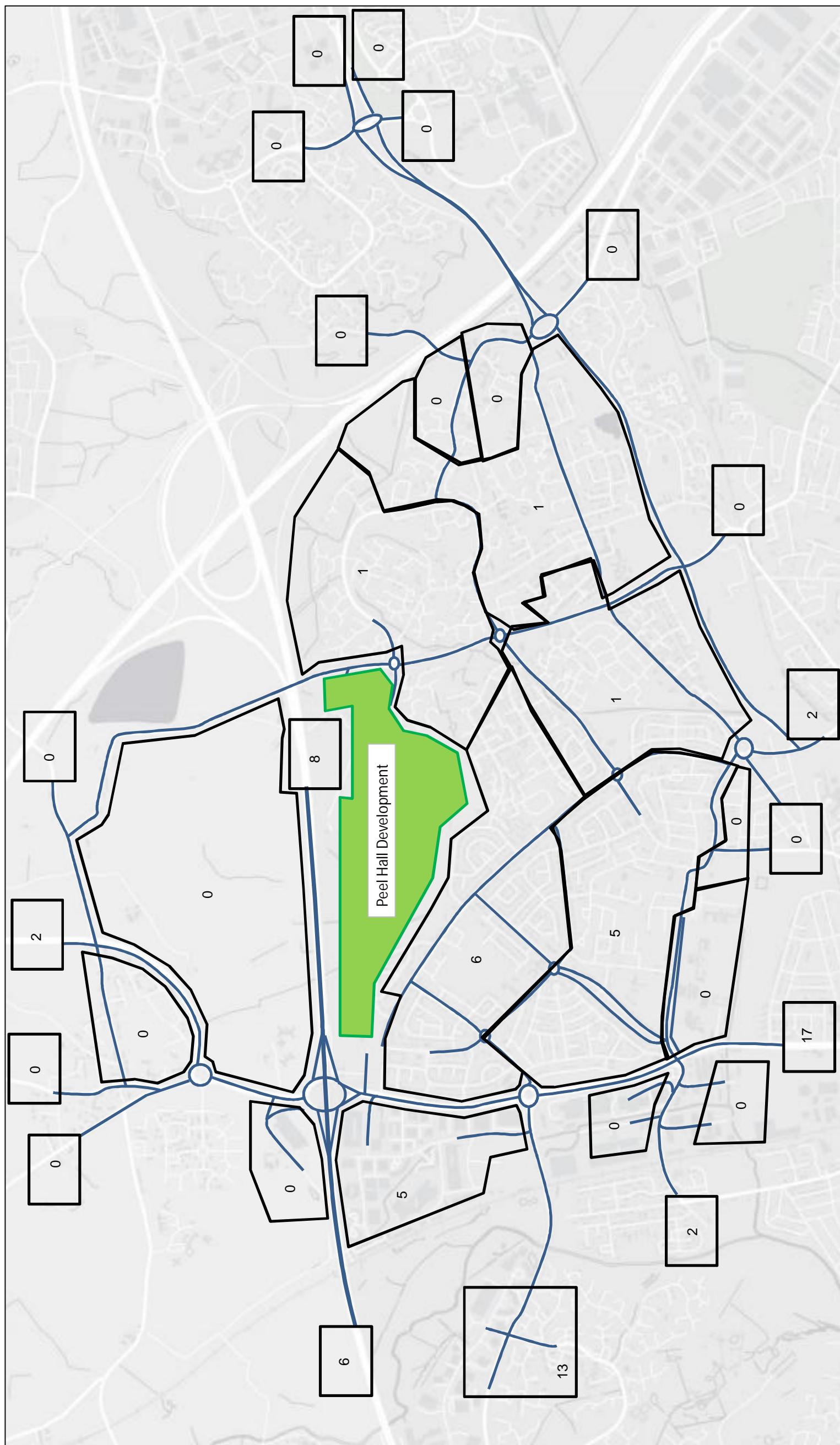
**AECOM**



# Peel Hall VISSIM Model - Trip Distribution

## Appendix C, Figure 21, AM (0800-0900) Residential Trips to Peel Hall Development

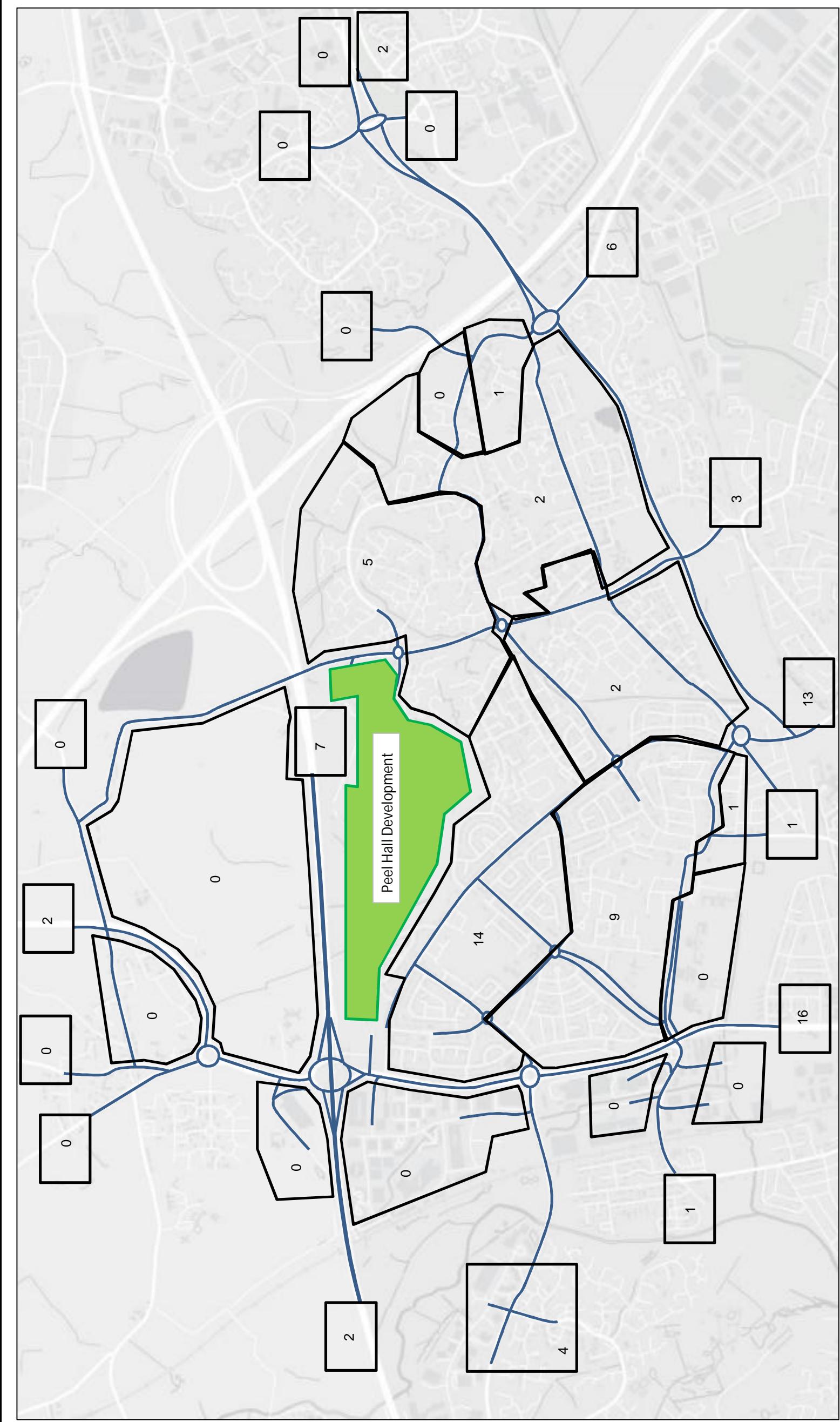
**AECOM**



# Peel Hall VISSIM Model - Trip Distribution

## Appendix C, Figure 22, AM (0800-0900) Work Trips to Peel Hall Development

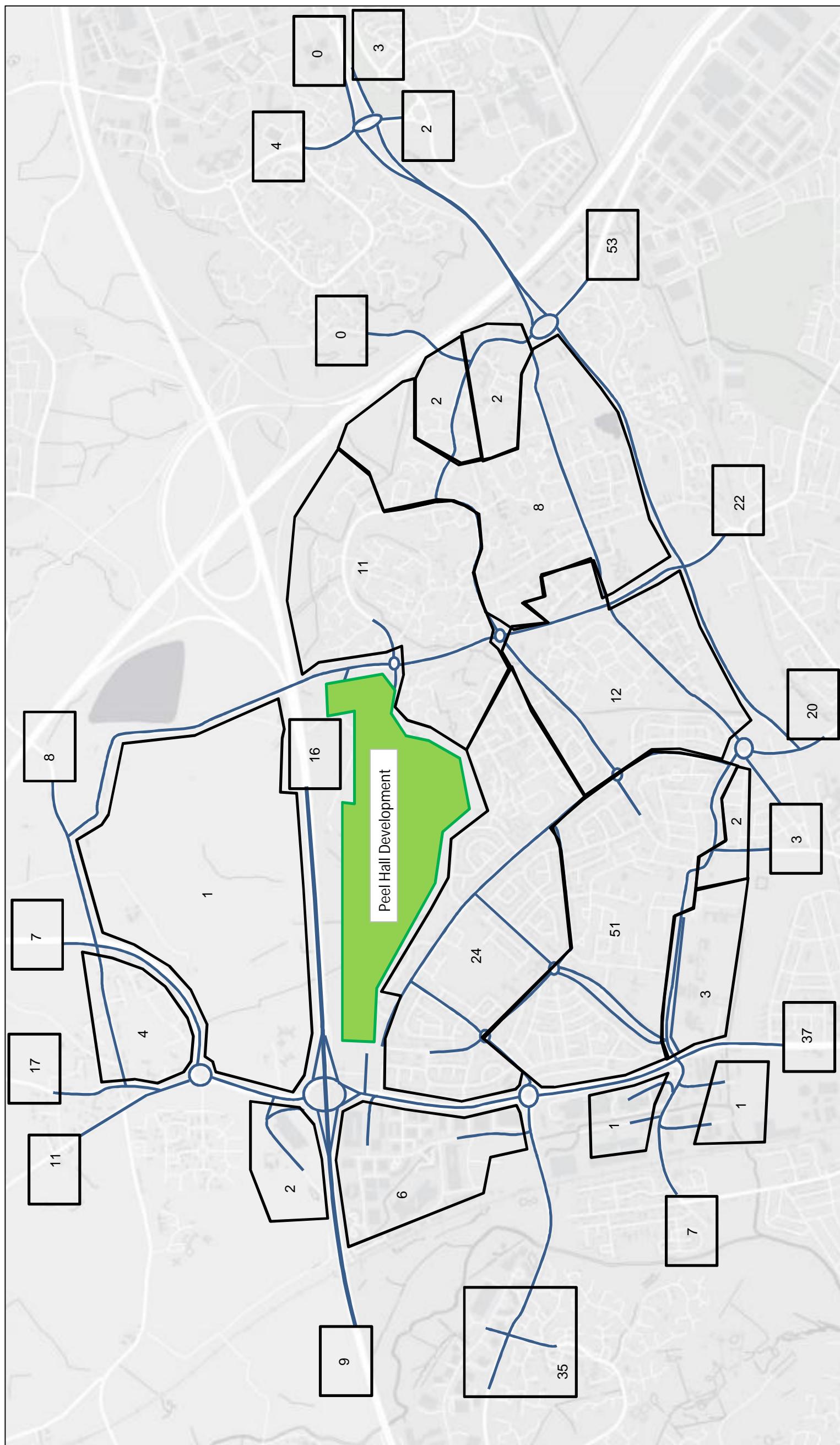
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Peel Hall VISSIM Model - Trip  
Distribution

Appendix C, Figure 23, AM (0800-0900)  
Other Trips to Peel Hall Development

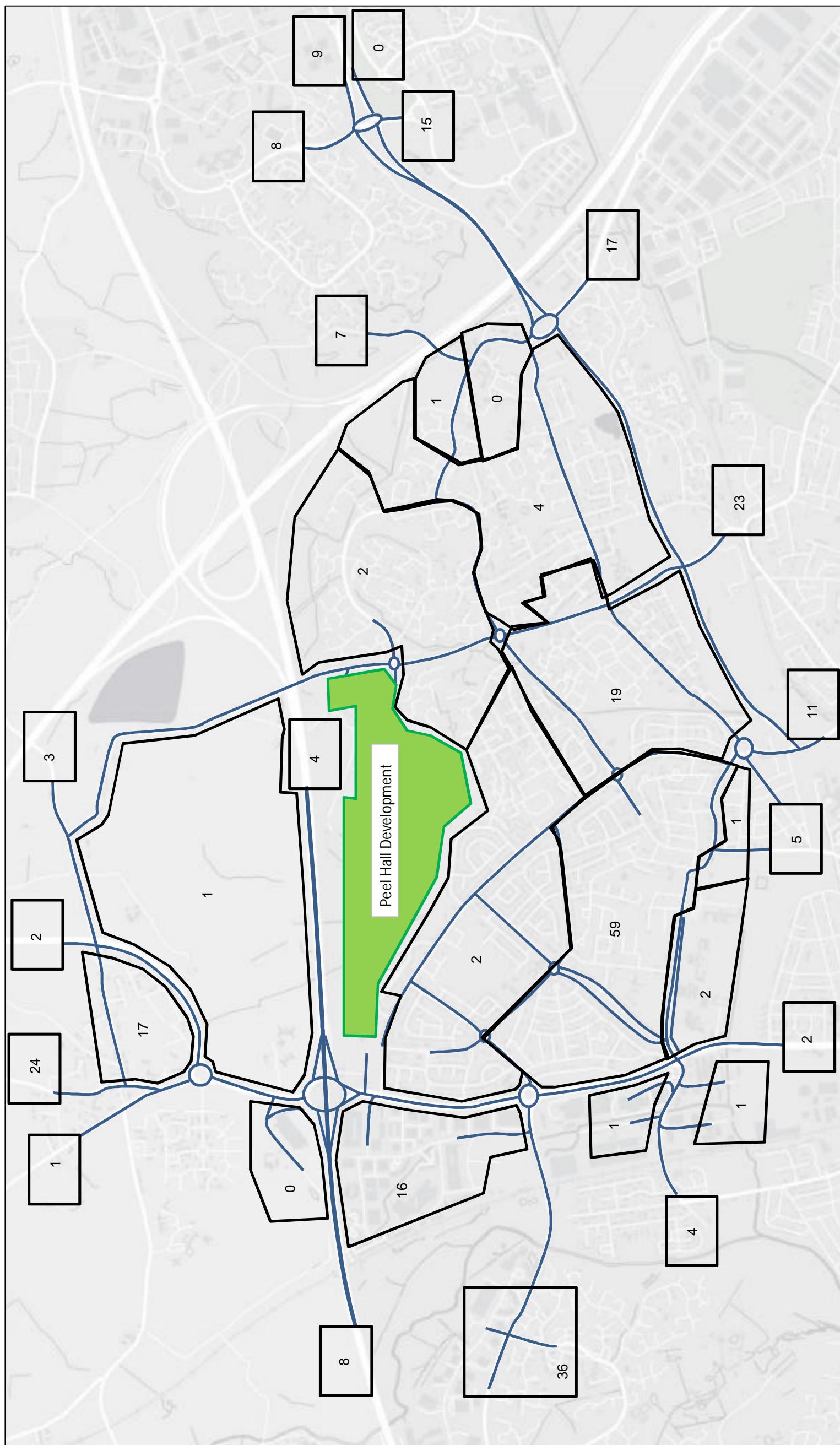
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# Peel Hall VISSIM Model - Trip Distribution

## Appendix C, Figure 24, AM (0800-0900) Total Trips to Peel Hall Development

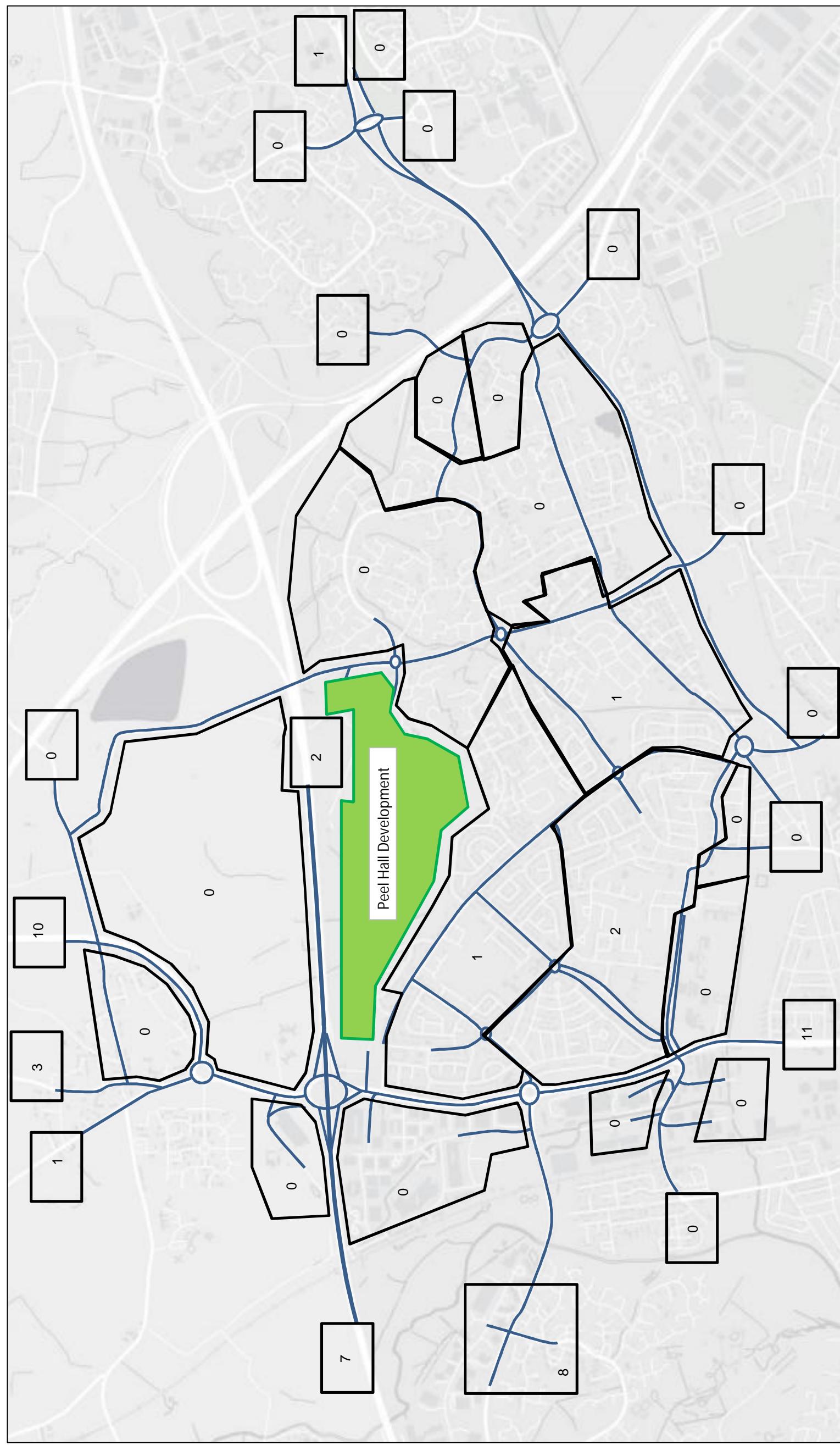
AECOM



# Peel Hall VISSIM Model - Trip Distribution

# Appendix C, Figure 25, PM (1700-1800) Residential Trips from Peel Hall Development

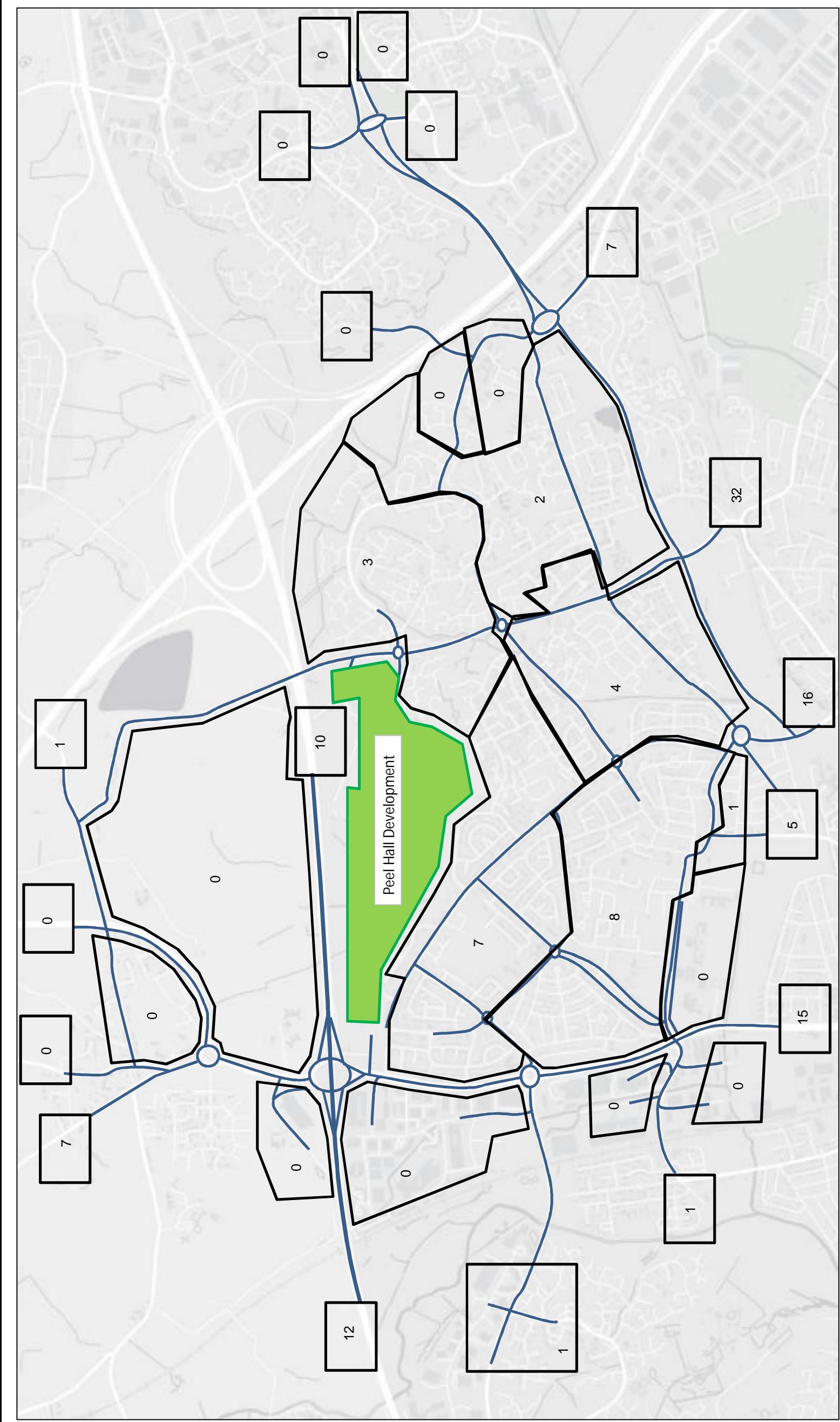
**AECOM**



# Peel Hall VISSIM Model - Trip Distribution

## Appendix C, Figure 26, PM (1700-1800) Work Trips from Peel Hall Development

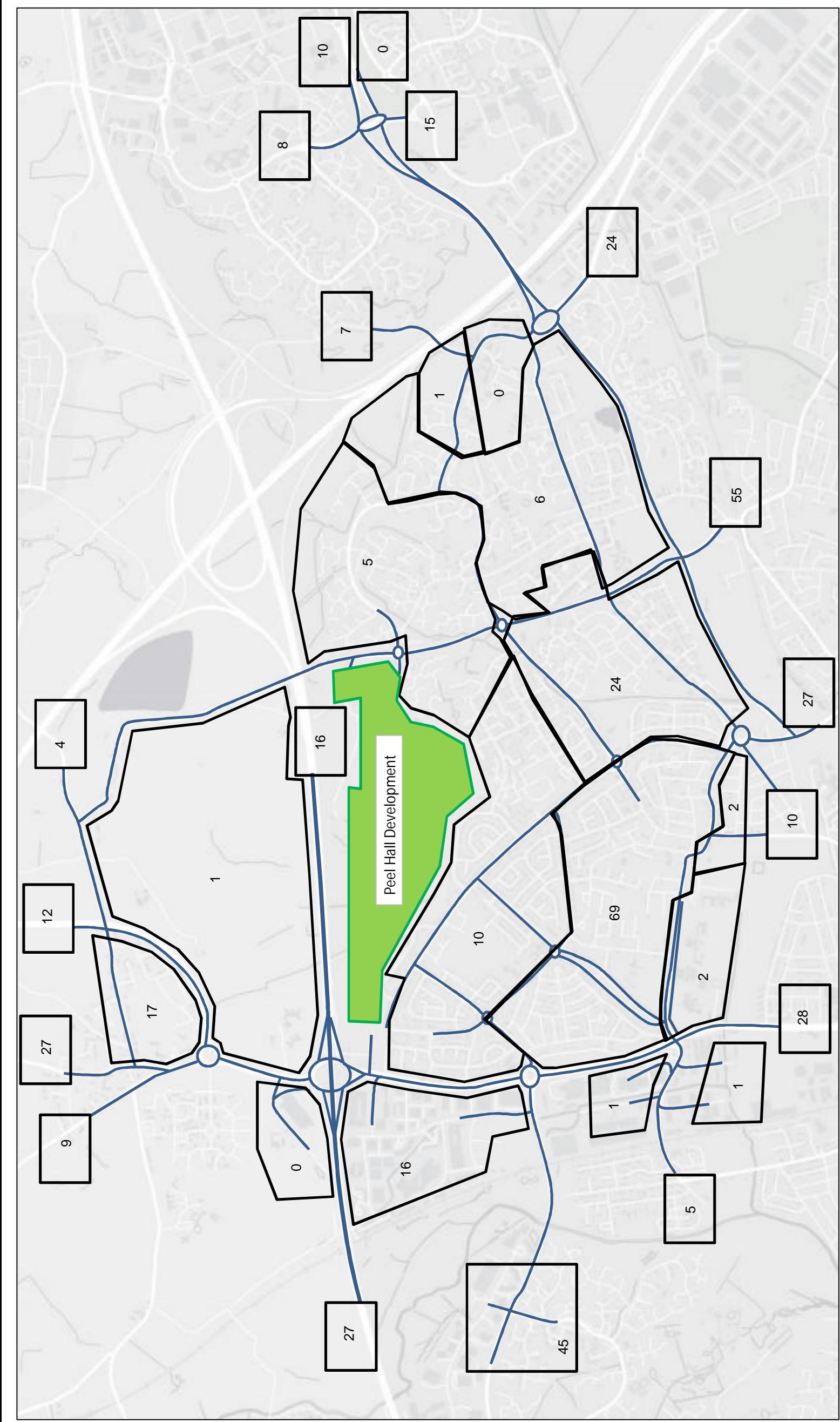
AECOM



Peel Hall VISSIM Model - Trip  
Distribution

Appendix C, Figure 27, PM (1700-1800)  
Other Trips from Peel Hall Development

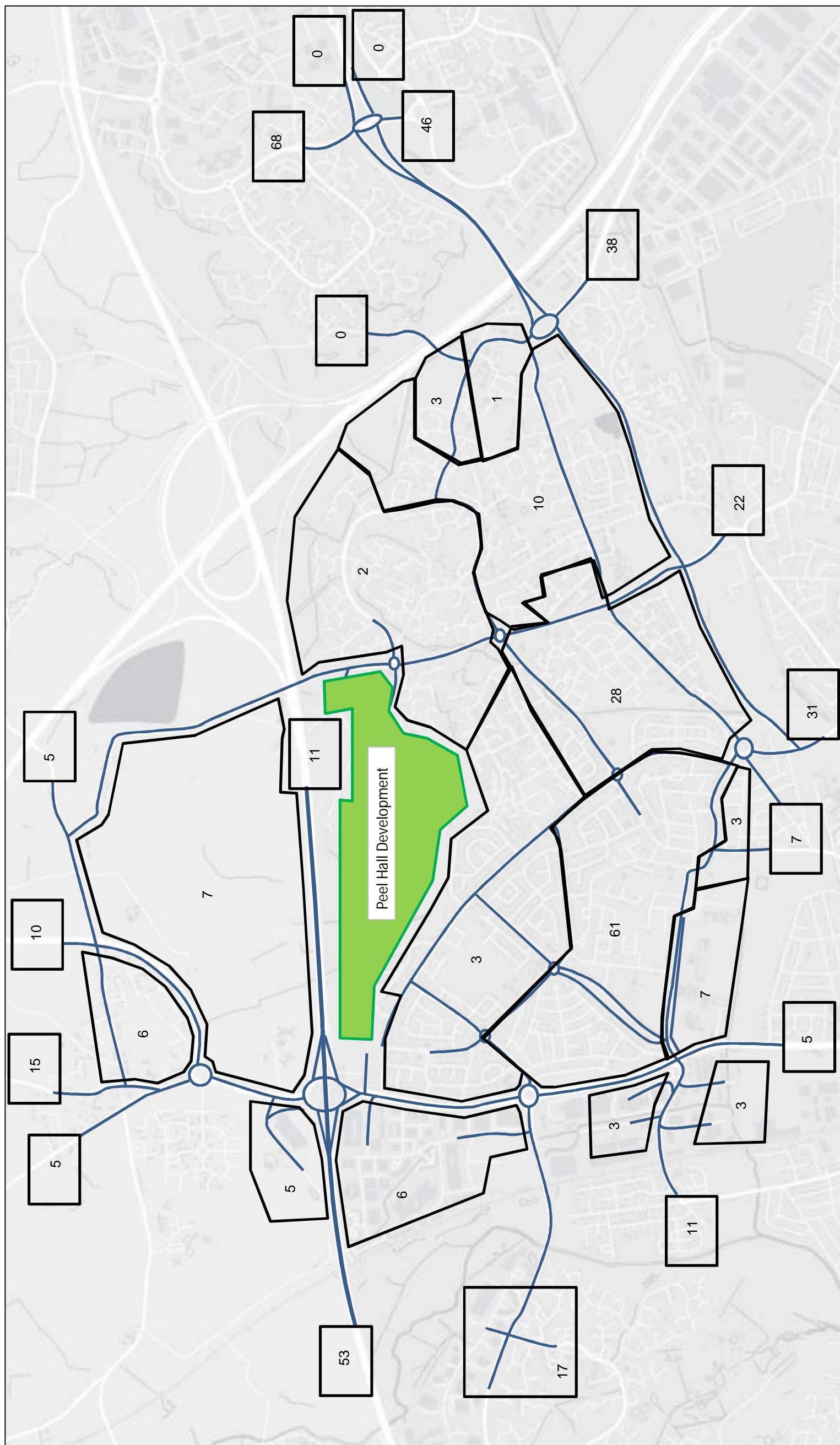
**AECOM**



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Appendix C, Figure 28, PM (1700-1800)  
Total Trips from Peel Hall Development

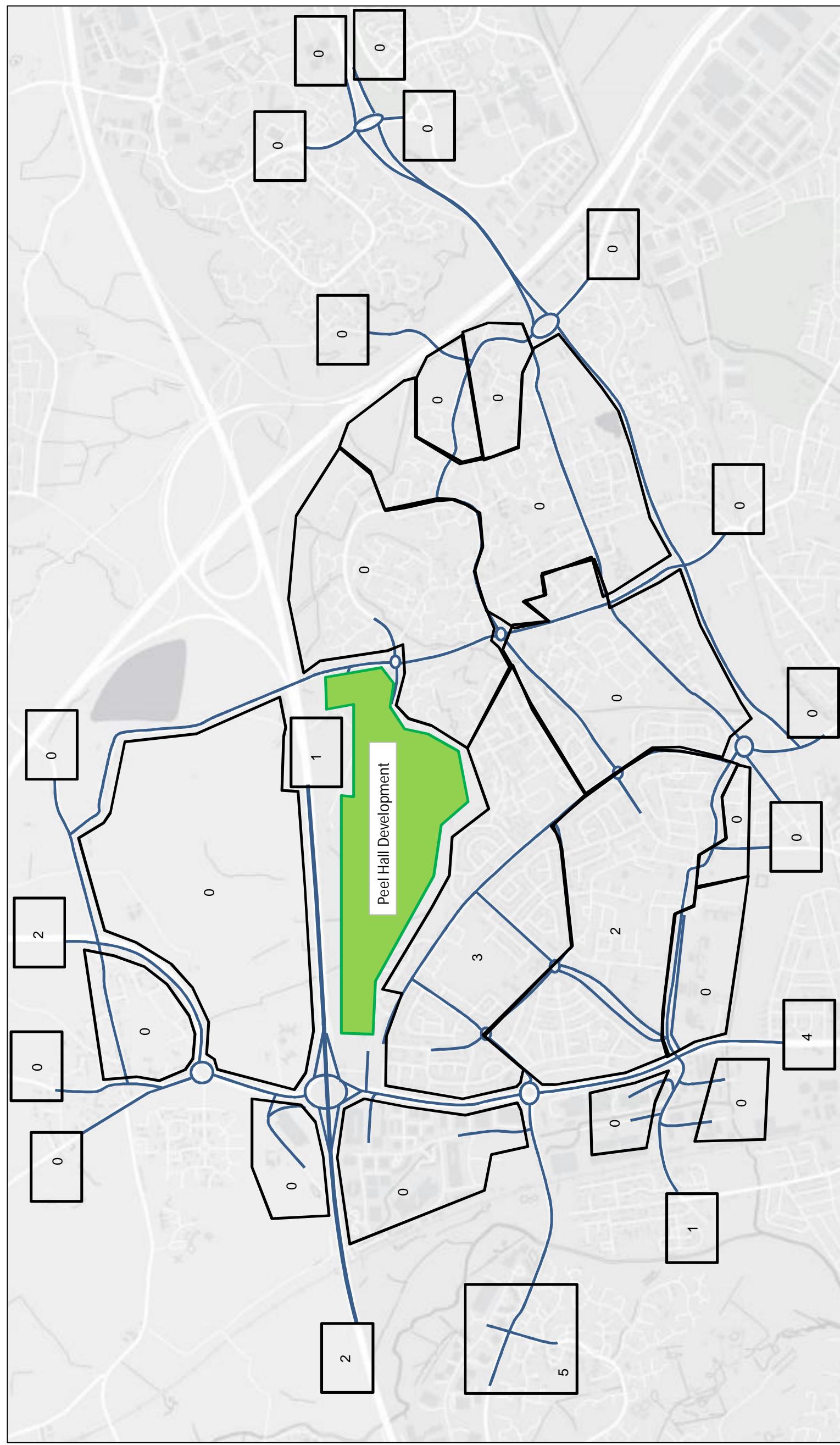
Peel Hall VISSIM Model - Trip  
Distribution



# Peel Hall VISSIM Model - Trip Distribution

## Appendix C, Figure 29, PM (1700-1800) Residential Trips to Peel Hall Development

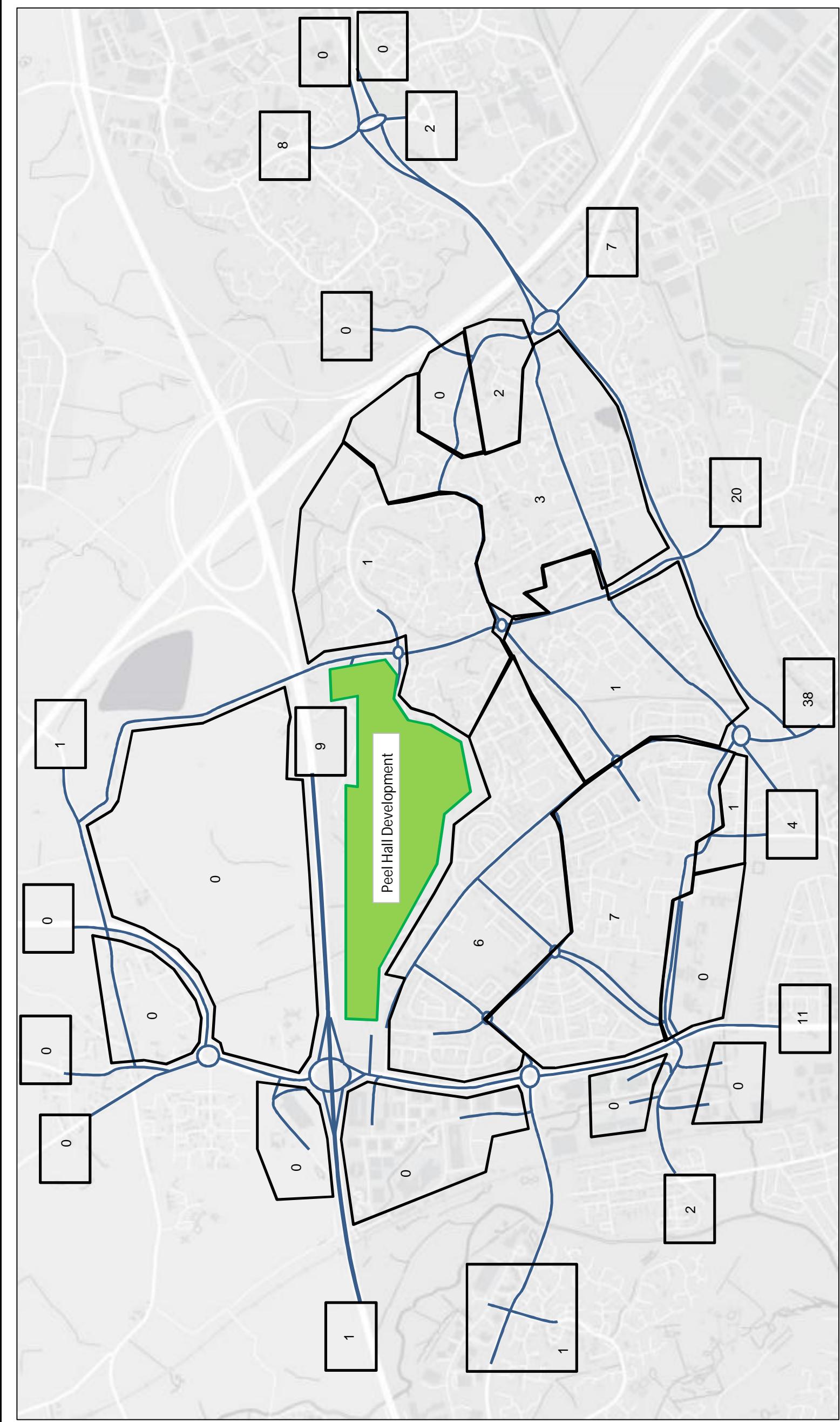
**AECOM**

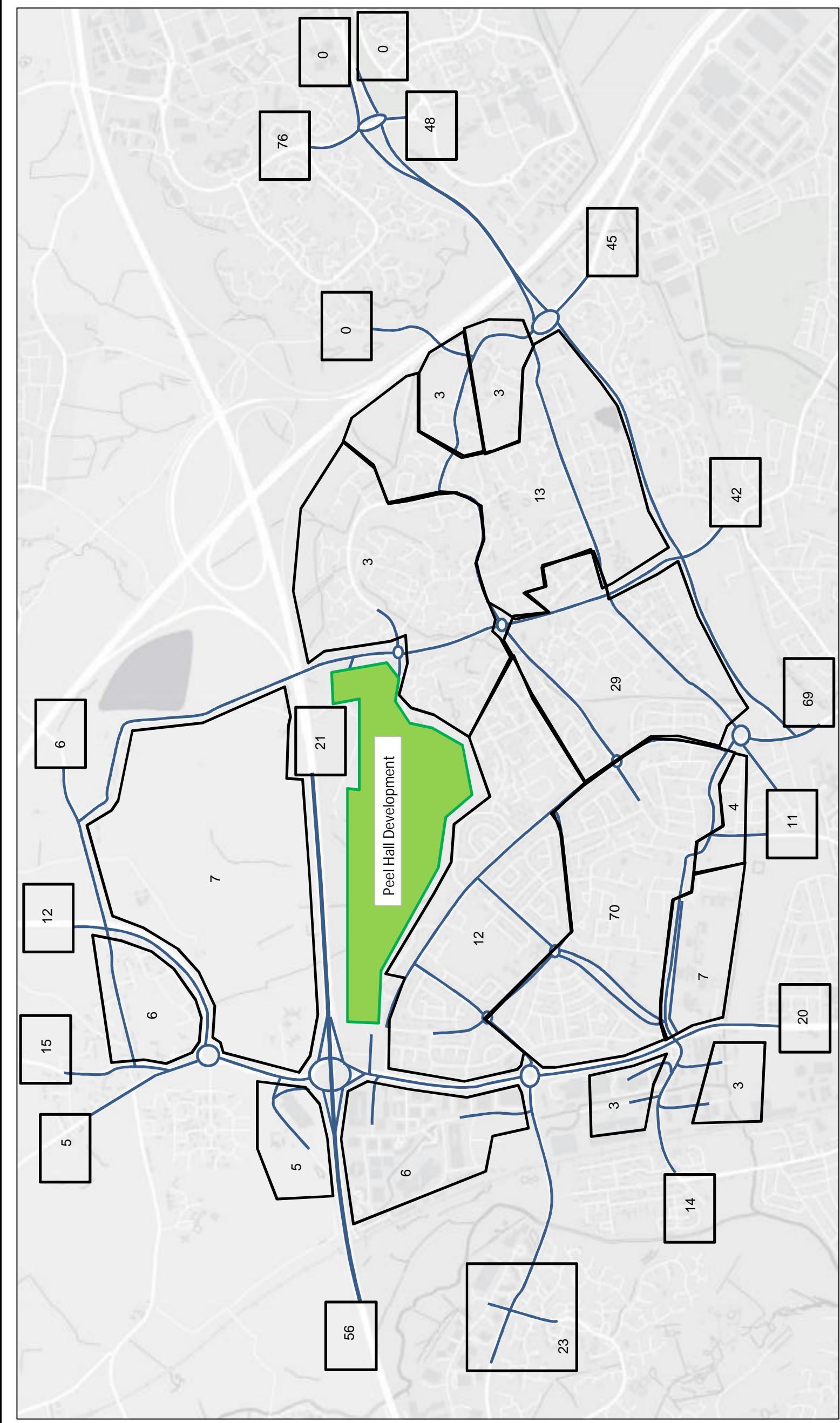


# Peel Hall VISSIM Model - Trip Distribution

## Appendix C, Figure 30, PM (1700-1800) Work Trips to Peel Hall Development

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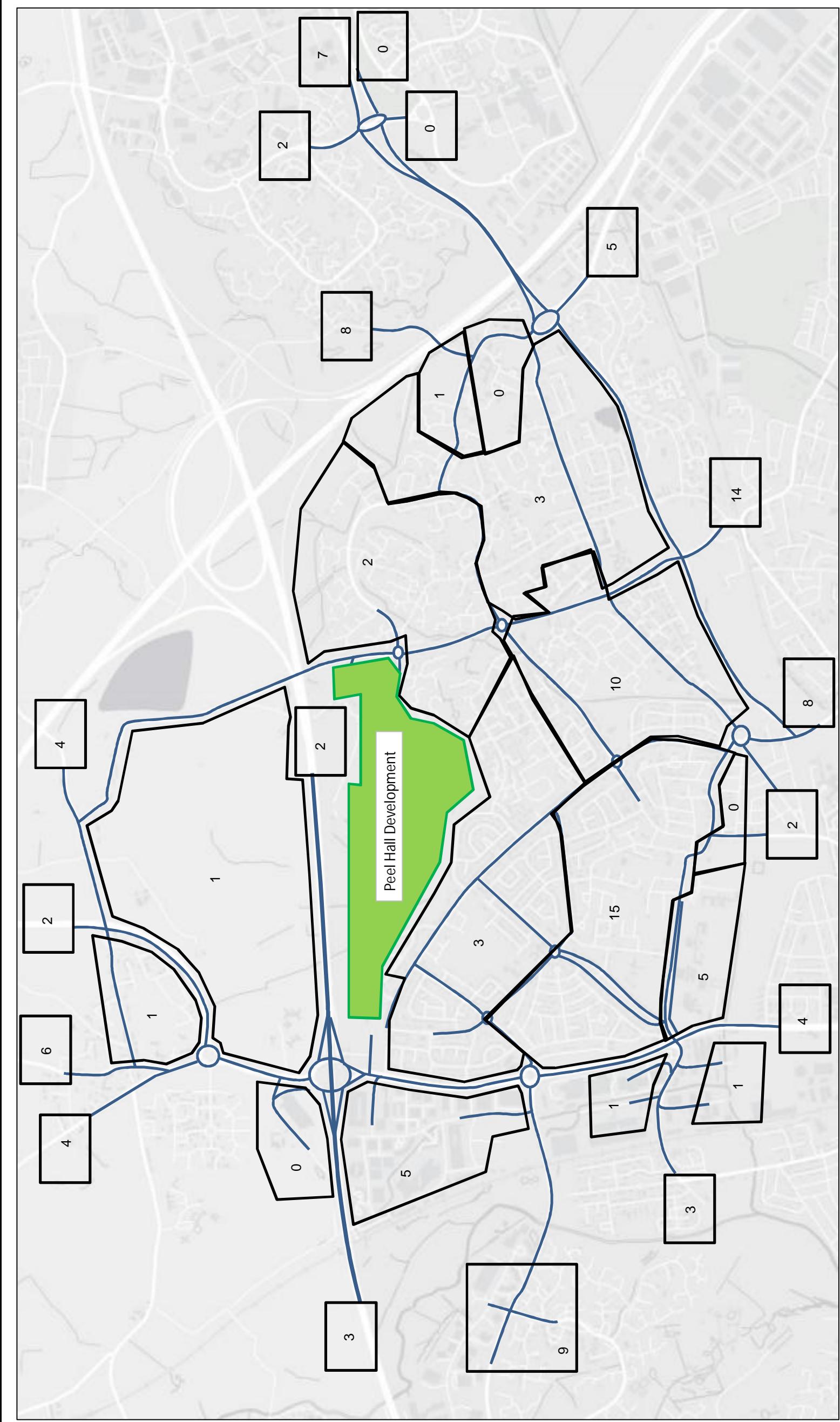




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Appendix C, Figure 32, PM (1700-1800)  
Total Trips to Peel Hall Development

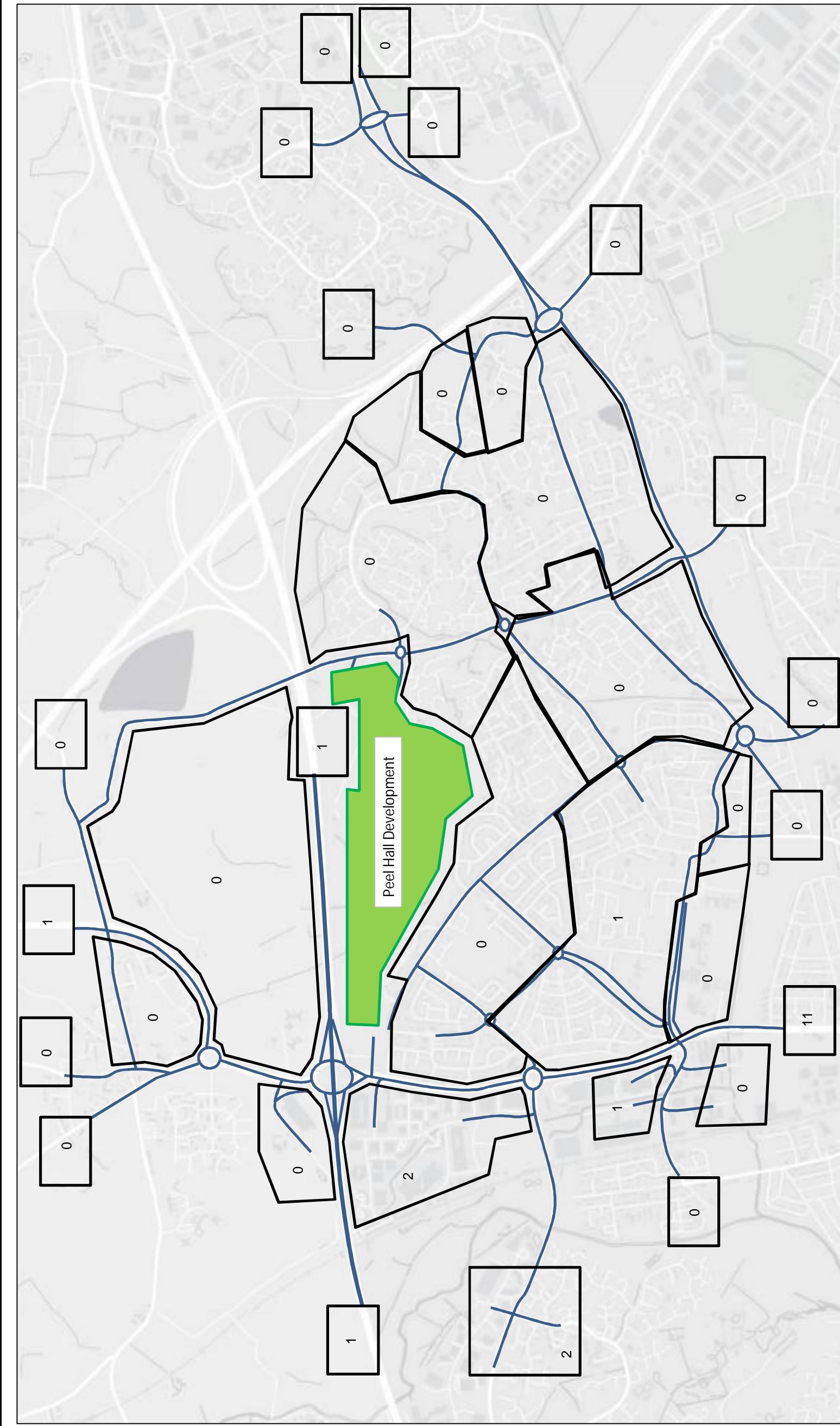
Peel Hall VISSIM Model - Trip  
Distribution

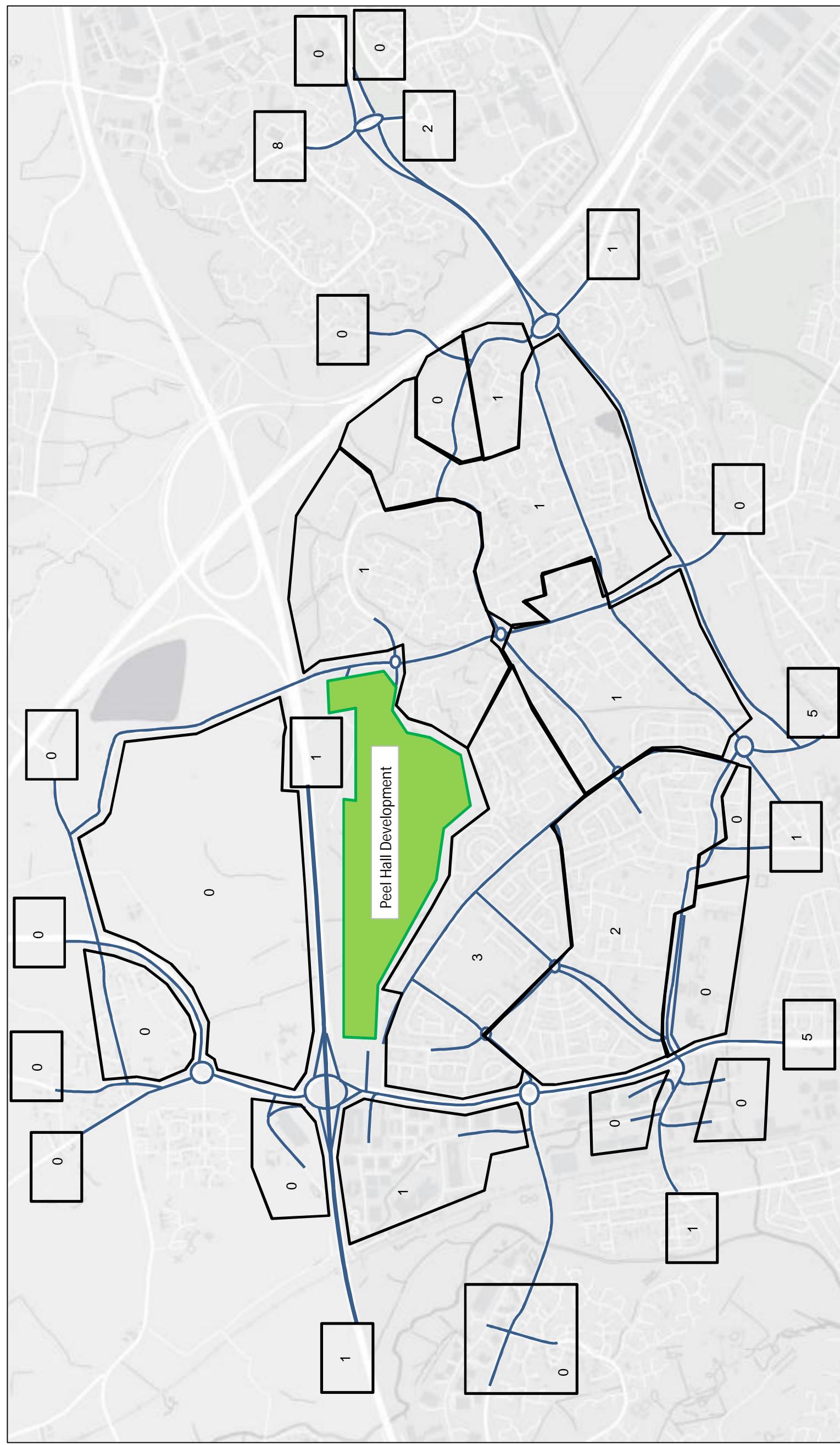


Peel Hall VISSIM Model - Trip  
Distribution

Appendix C, Figure 33, AM (0900-0930)  
Residential Trips from Peel Hall  
Development

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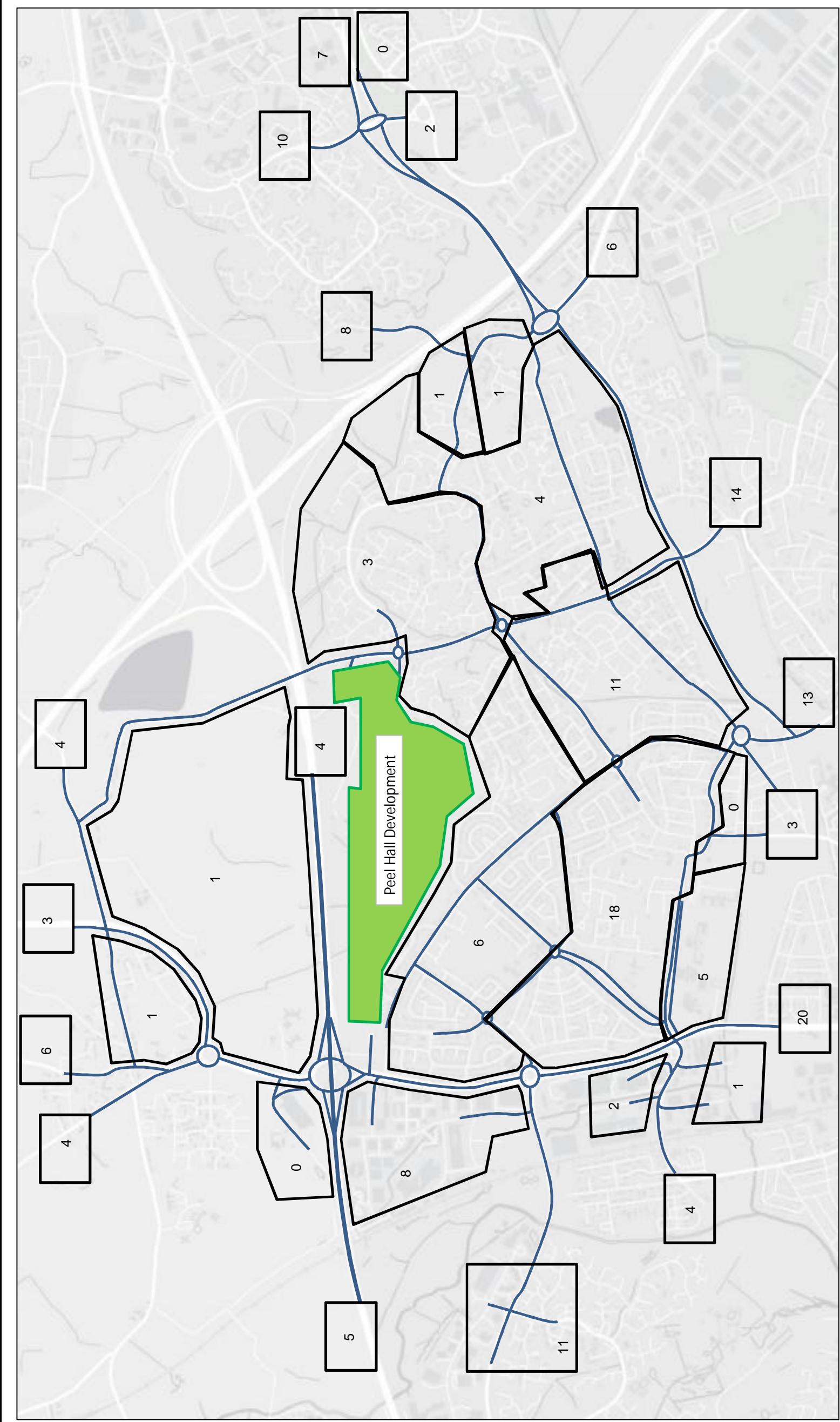




# Peel Hall VISSIM Model - Trip Distribution

## Appendix C, Figure 35, AM (0900-0930) Other Trips from Peel Hall Development

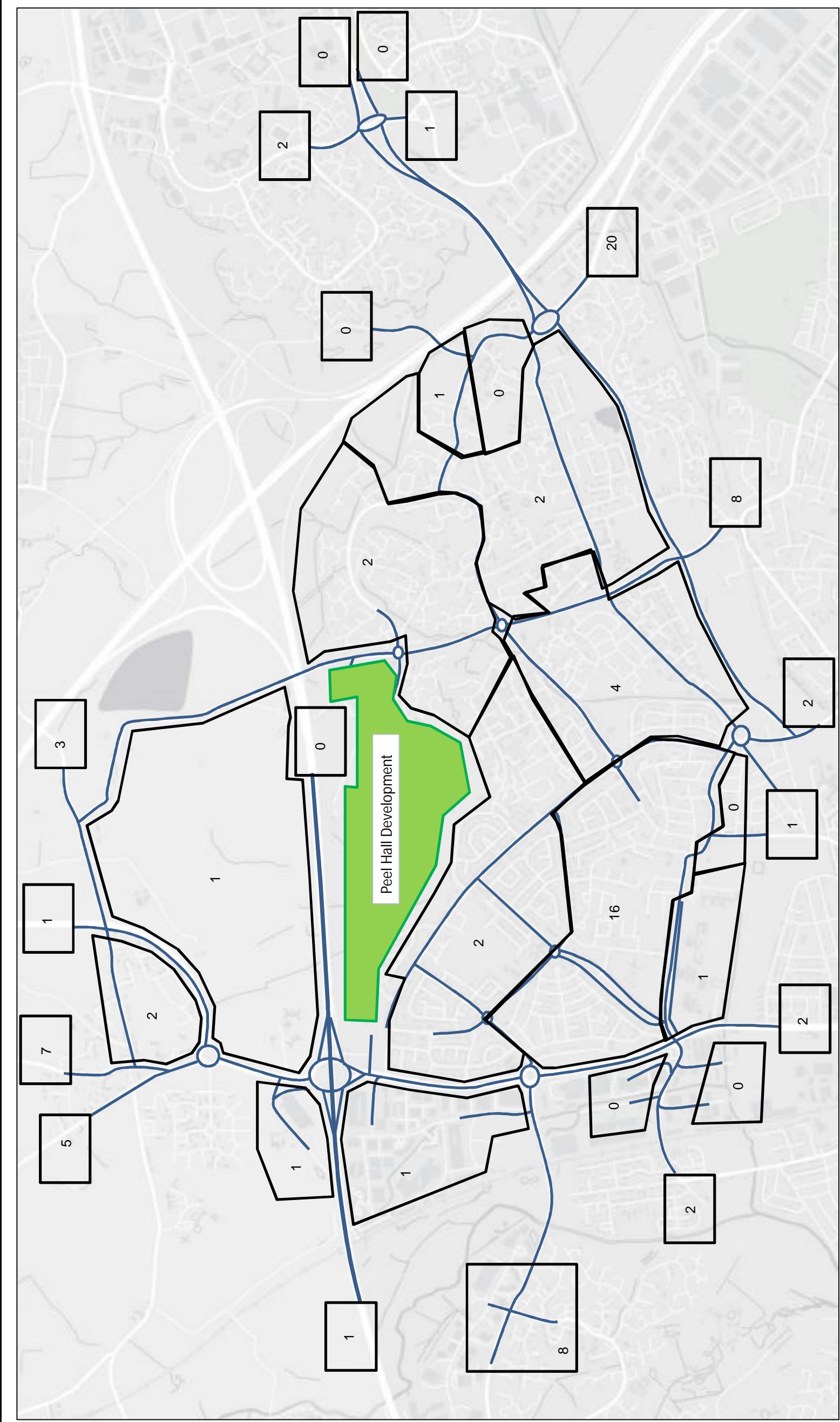
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Peel Hall VISSIM Model - Trip  
Distribution

Appendix C, Figure 36, AM (0900-0930)  
Total Trips from Peel Hall Development

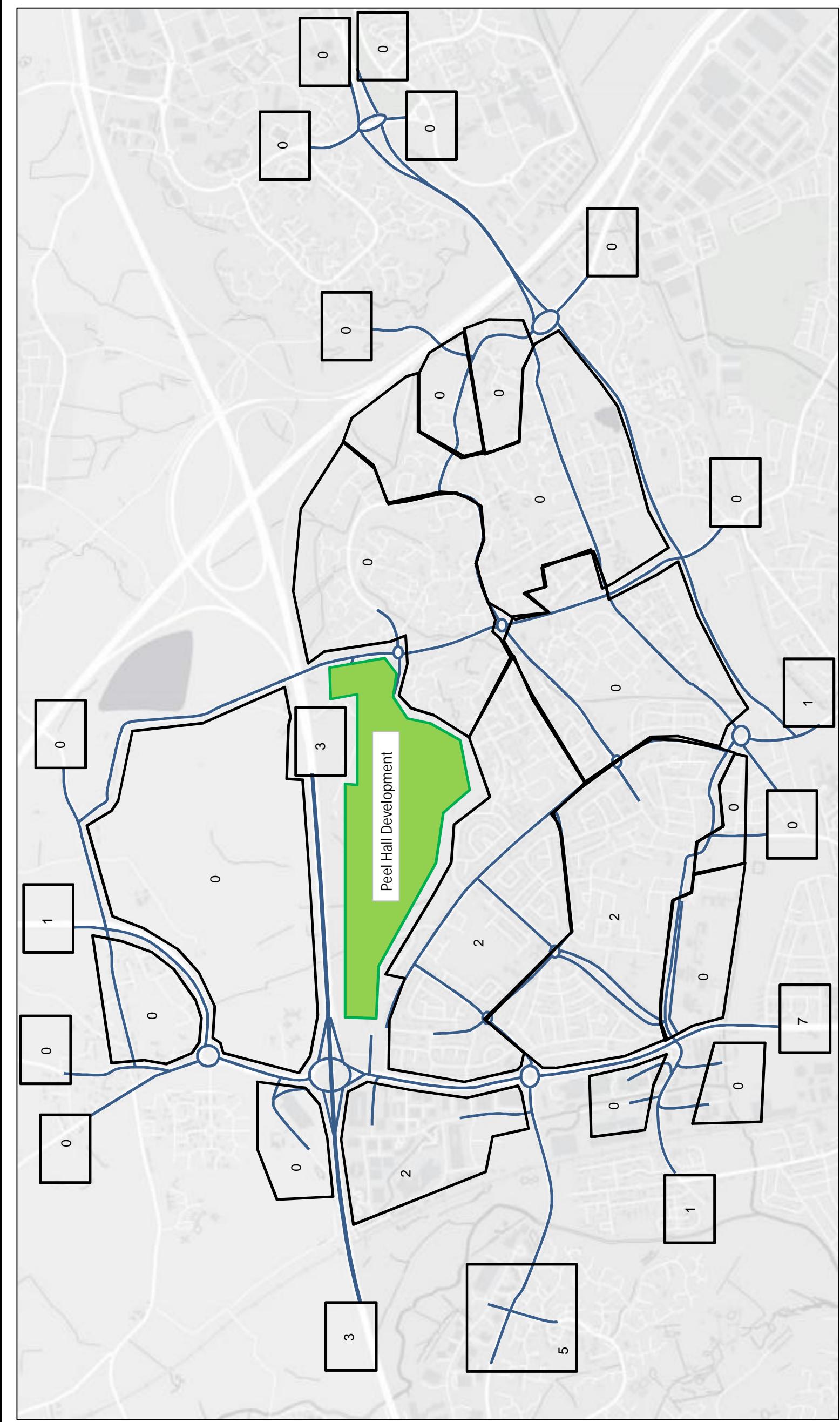
**AECOM**



Peel Hall VISSIM Model - Trip  
Distribution

Appendix C, Figure 37, AM (0900-0930)  
Residential Trips to Peel Hall Development

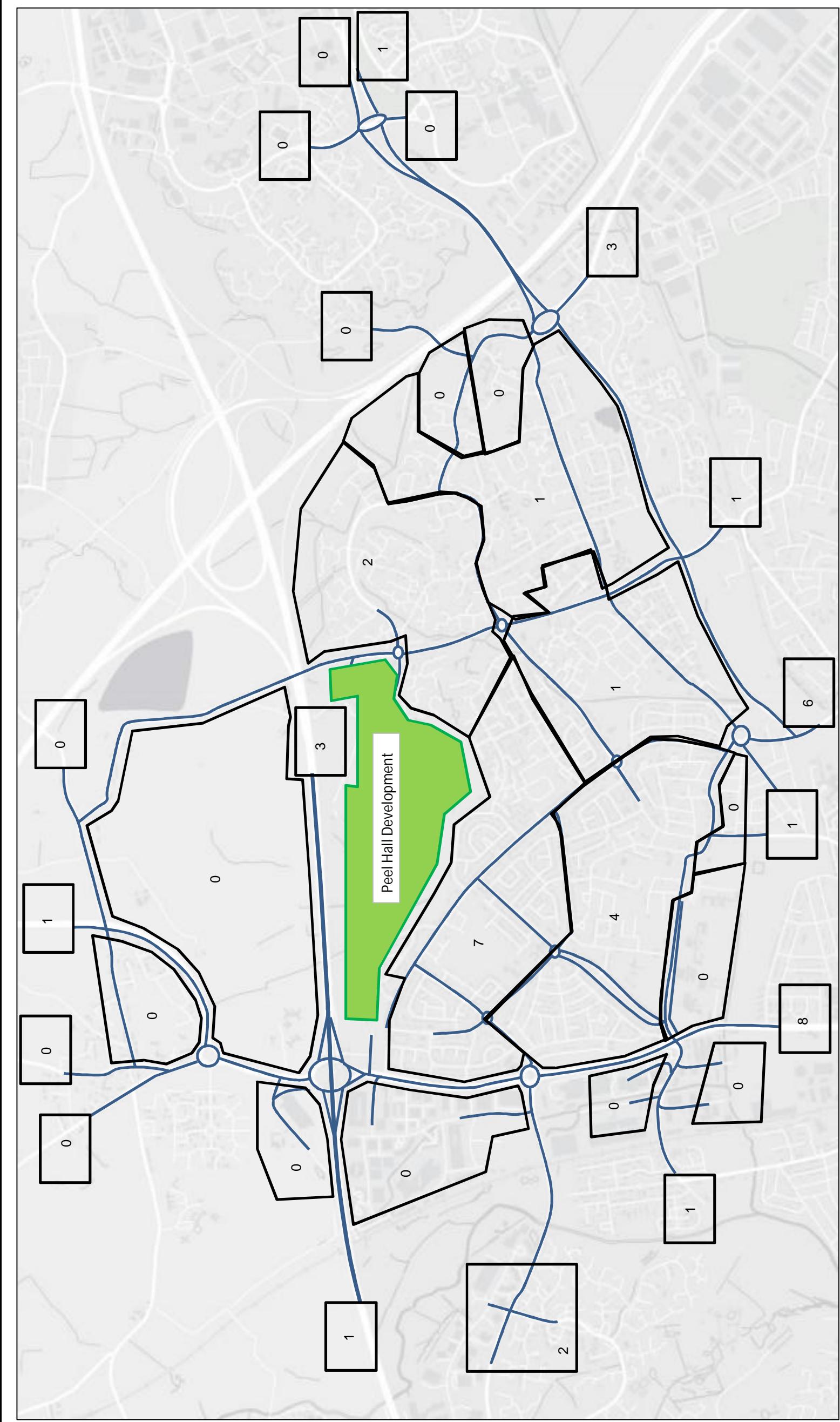
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Appendix C, Figure 38, AM (0900-0930)  
Work Trips to Peel Hall Development

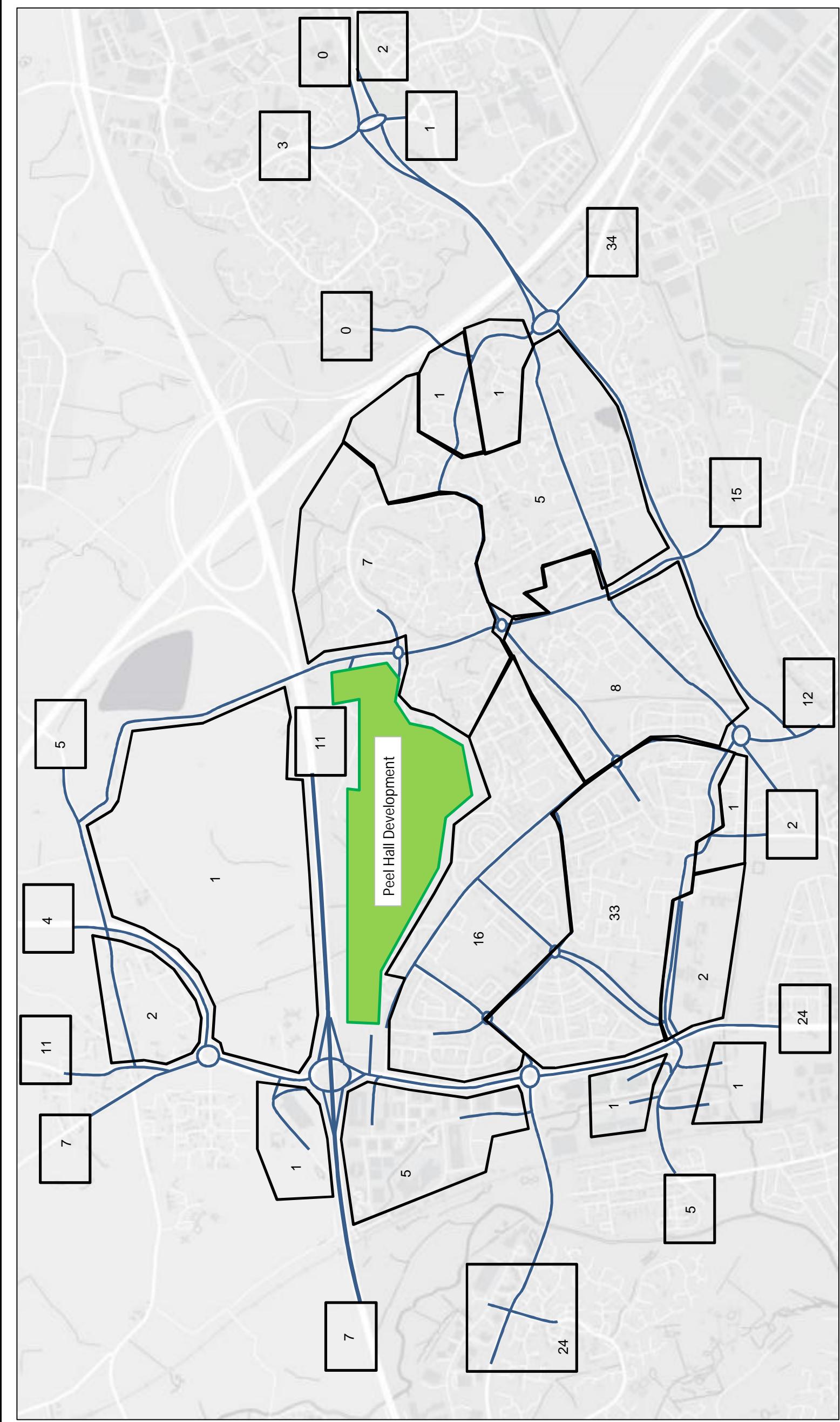
Peel Hall VISSIM Model - Trip  
Distribution



Peel Hall VISSIM Model - Trip  
Distribution

Appendix C, Figure 39, AM (0900-0930)  
Other Trips to Peel Hall Development

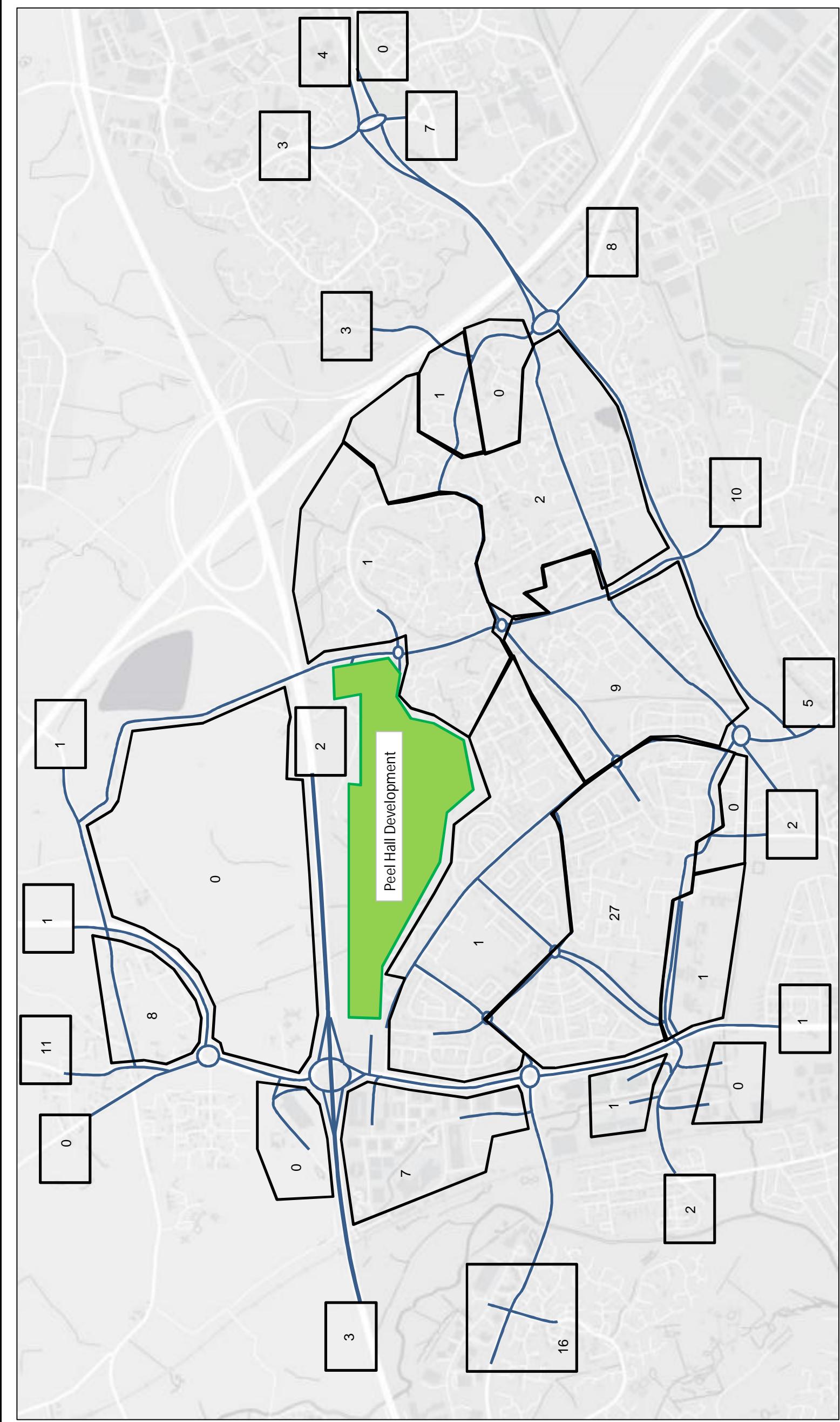
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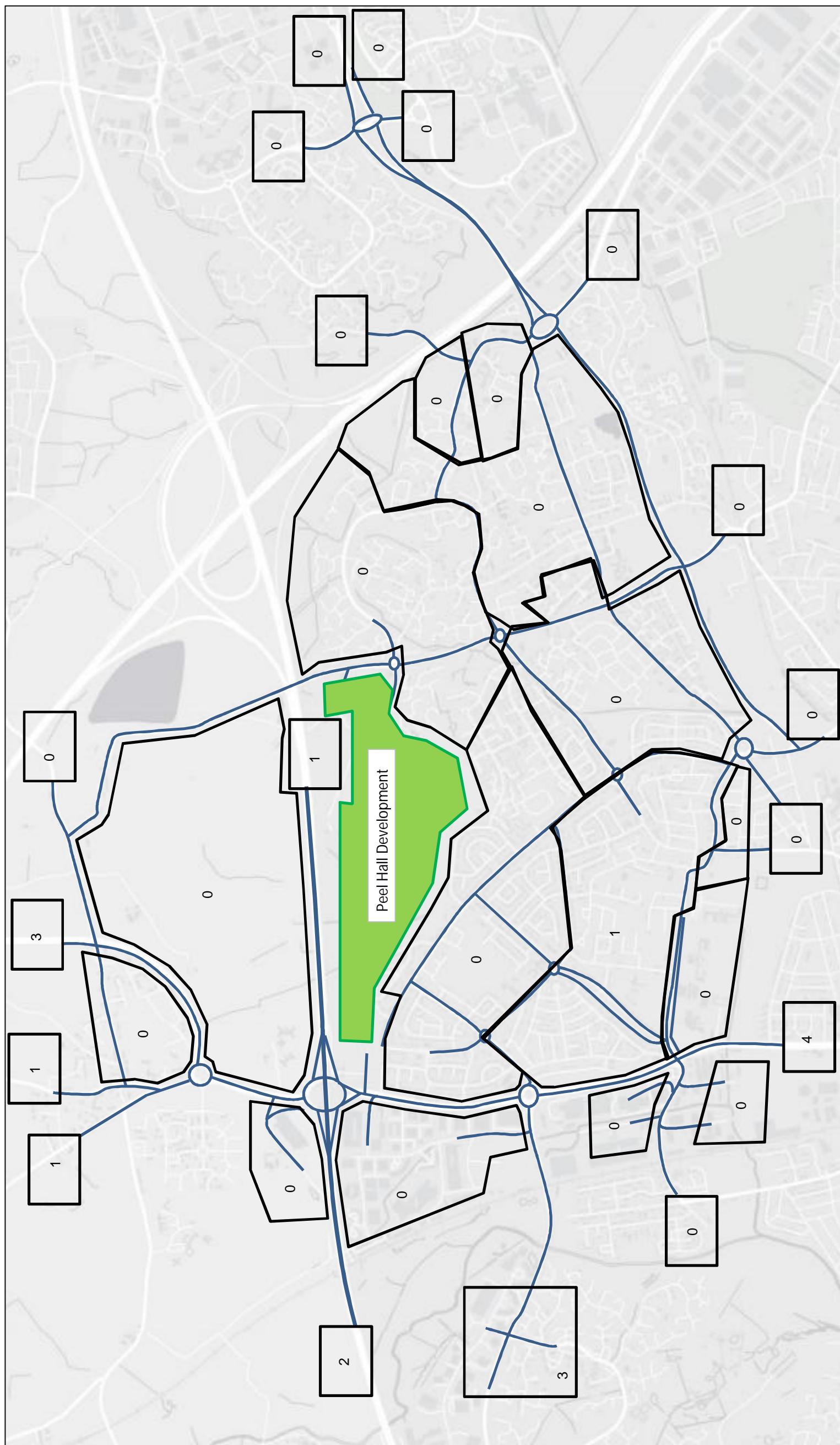


Peel Hall VISSIM Model - Trip  
Distribution

Appendix C, Figure 40, AM (0900-0930)  
Total Trips to Peel Hall Development

**AECOM**

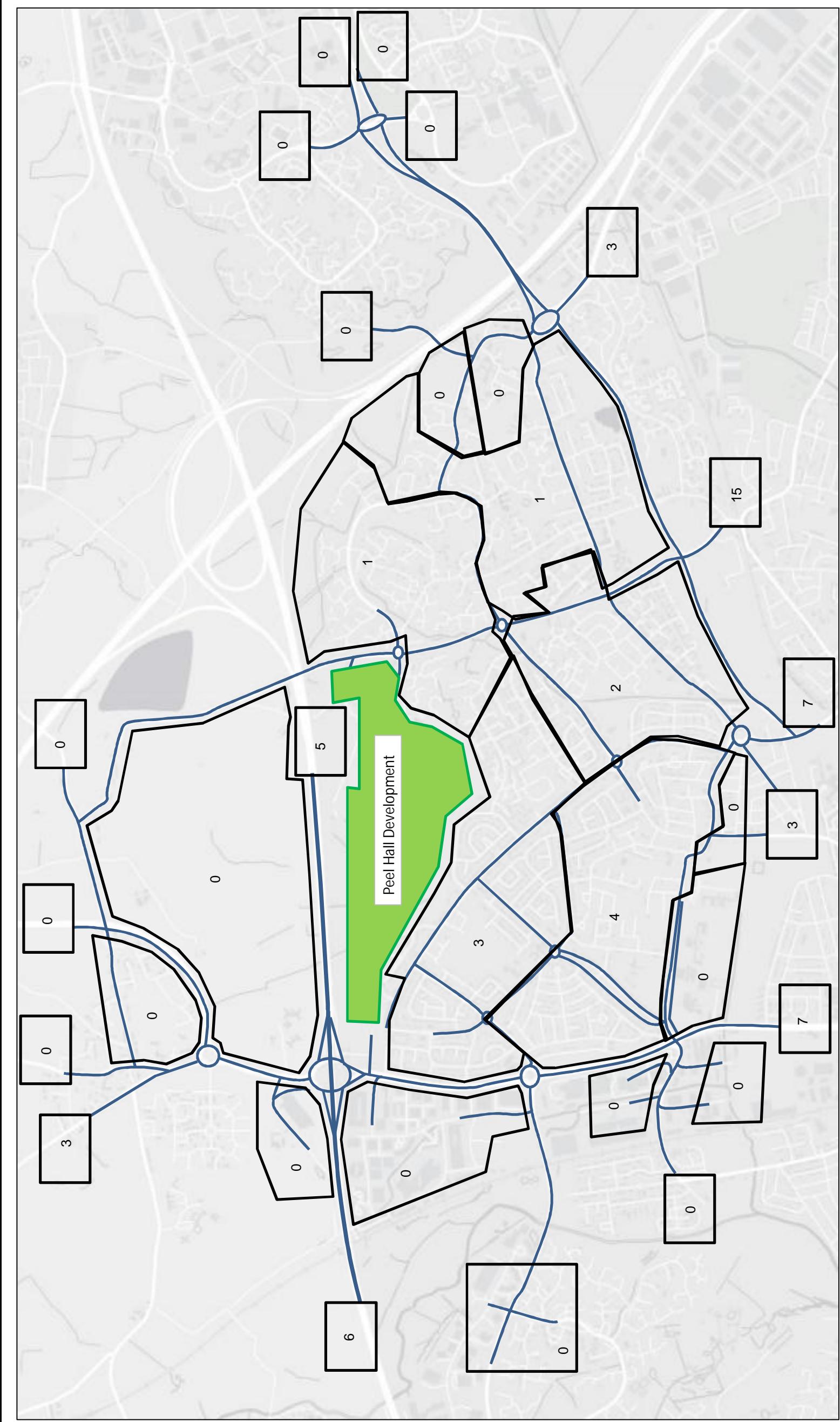




# Peel Hall VISSIM Model - Trip Distribution

## Appendix C, Figure 42, PM (1800-1830) Work Trips from Peel Hall Development

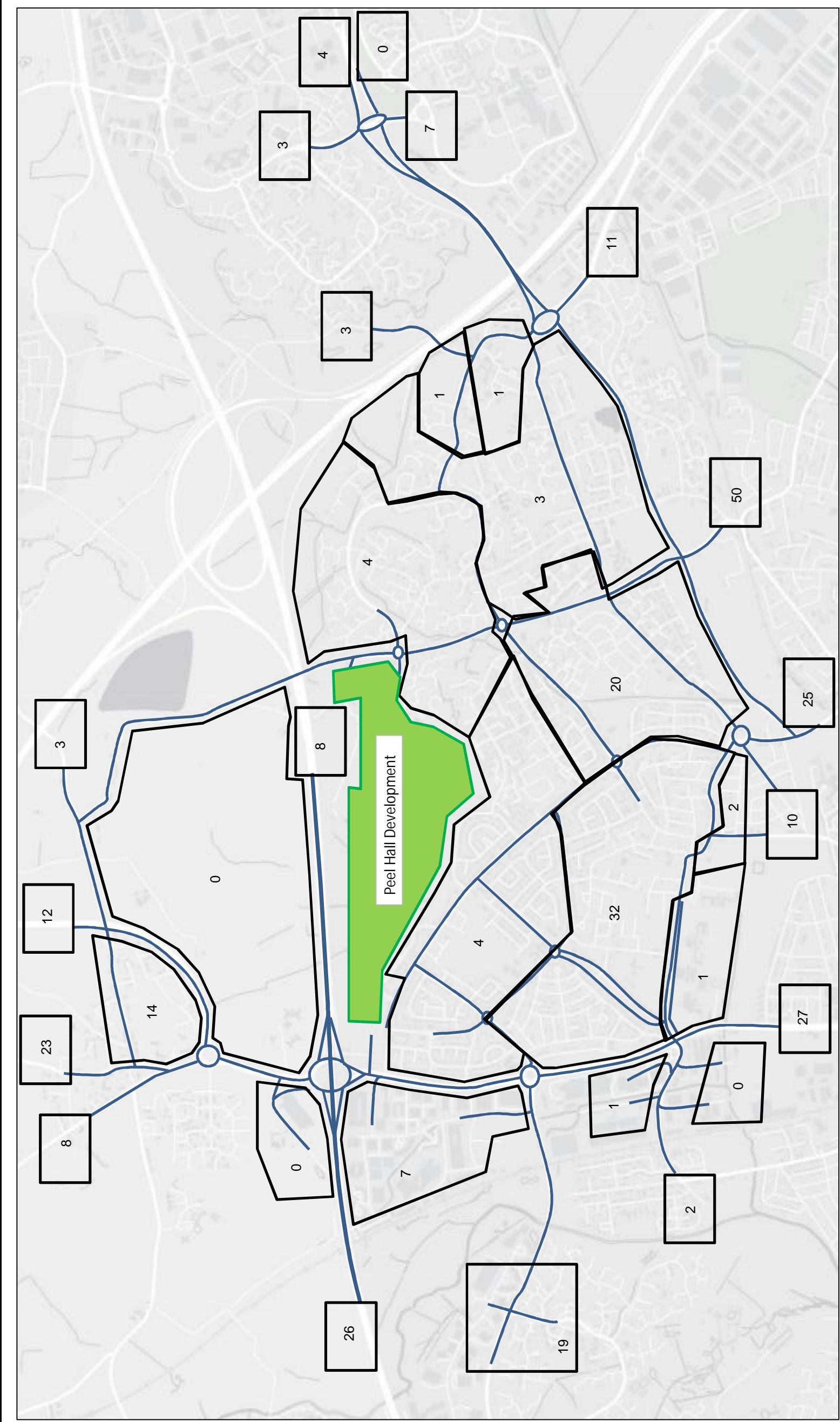
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Peel Hall VISSIM Model - Trip  
Distribution

Appendix C, Figure 43, PM (1800-1830)  
Other Trips from Peel Hall Development

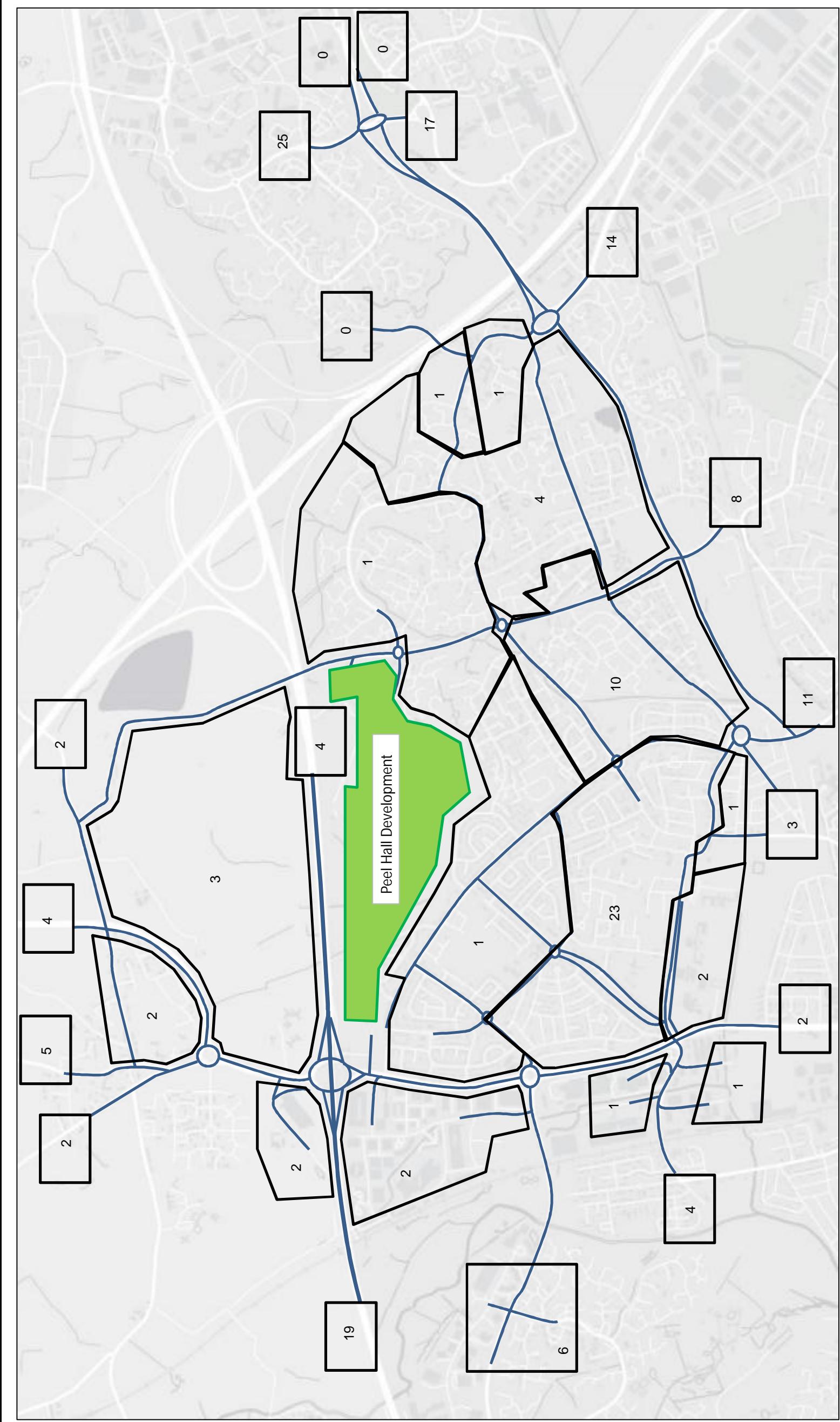
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Peel Hall VISSIM Model - Trip  
Distribution

Appendix C, Figure 44, PM (1800-1830)  
Total Trips from Peel Hall Development

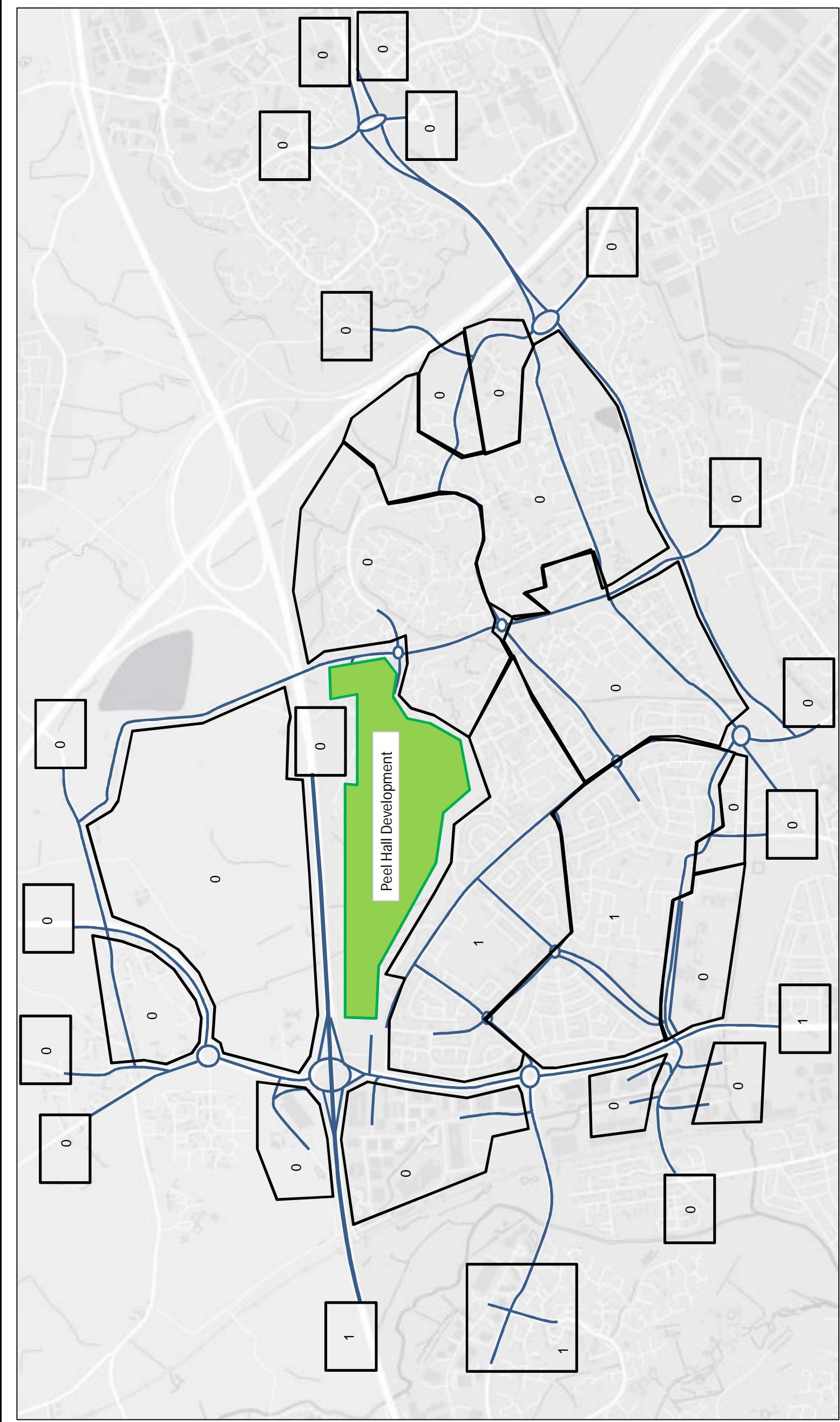
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Appendix C, Figure 45, PM (1800-1830)  
Residential Trips to Peel Hall Development

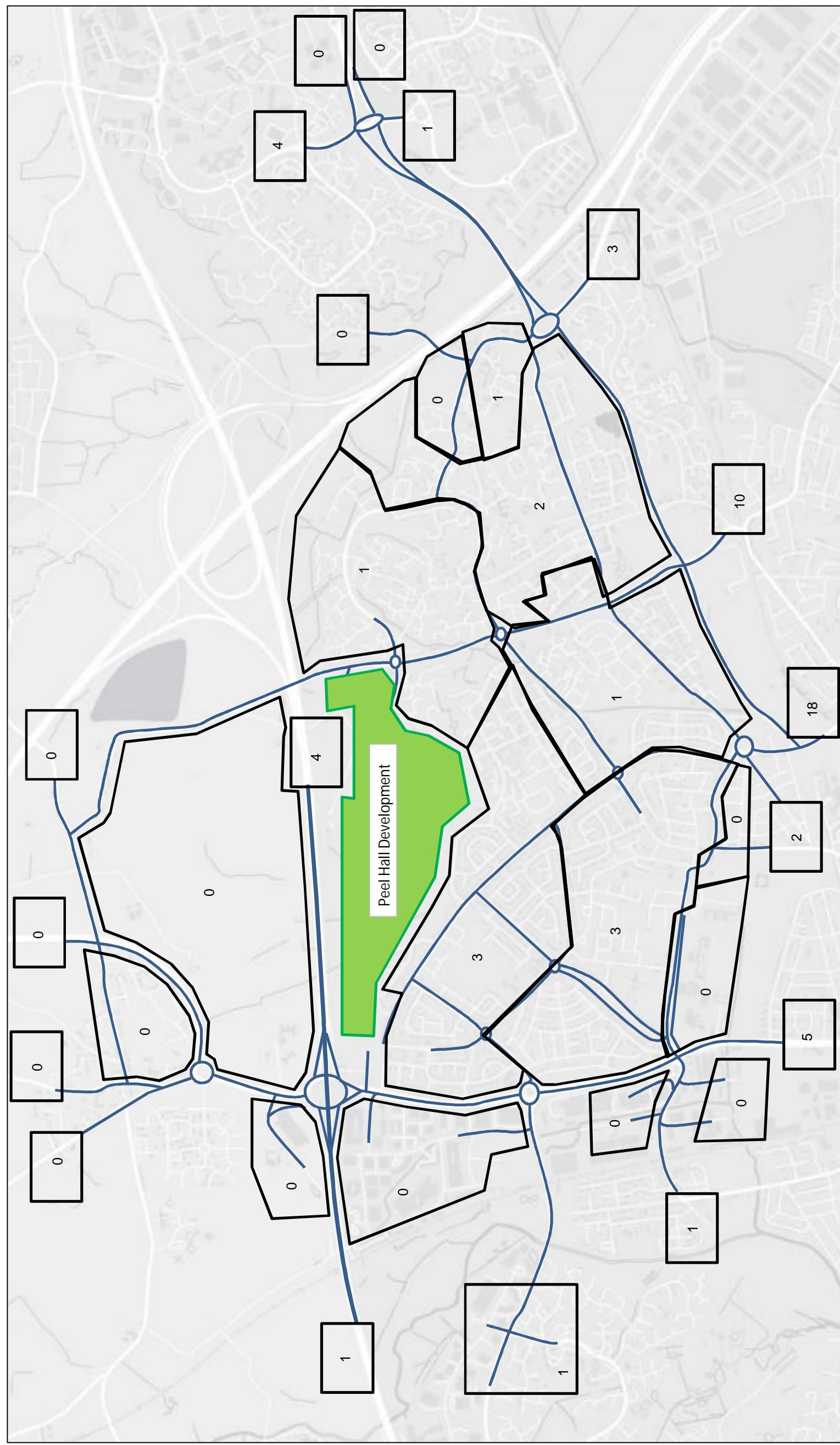
Peel Hall VISSIM Model - Trip  
Distribution



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Appendix C, Figure 46, PM (1800-1830)  
Work Trips to Peel Hall Development

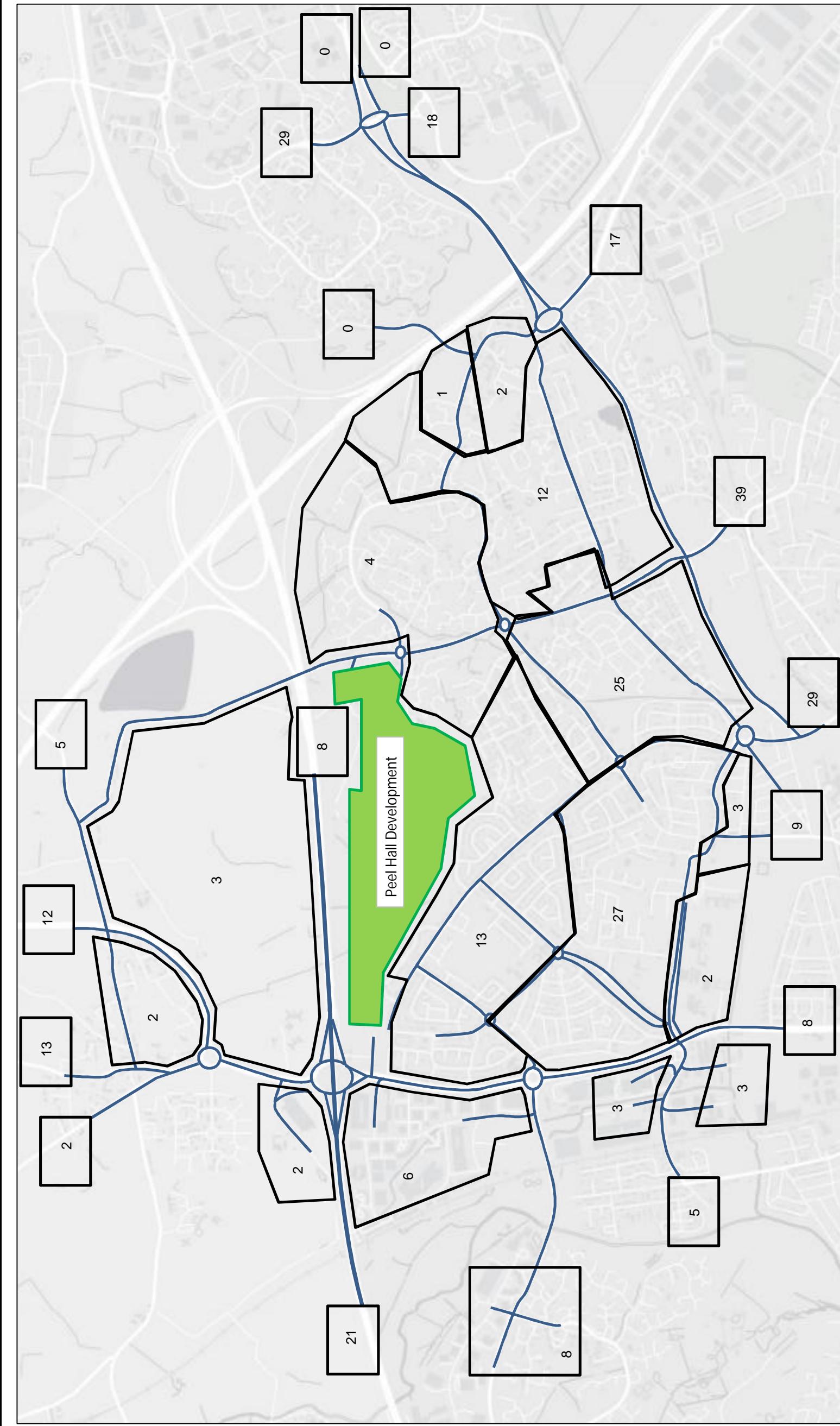
Peel Hall VISSIM Model - Trip  
Distribution



# Peel Hall VISSIM Model - Trip Distribution

## Appendix C, Figure 47, PM (1800-1830) Other Trips to Peel Hall Development

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Appendix C, Figure 48, PM (1800-1830)  
Total Trips to Peel Hall Development

Peel Hall VISSIM Model - Trip  
Distribution

# Technical Note

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## Appendix 2

HTp TN/08

Number of Vehicular Trips at Each Site Access Location

Highgate *Transportation*

**Land at Peel Hall, Warrington**  
**Technical Note on Number of Vehicular Trips**  
**at Each Site Access Location**  
**(HTp/1107/TN/08)**

**April 2016**

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2.0 Trip Distribution Tables	2

## **Appendices**

Appendix 1              Peel Hall Access Locations (HTp/1107/19/C)

## 1.0 Introduction

- 1.1 This initial Technical Note on internal trip distribution has been prepared by Highgate Transportation Limited (HTp) to set out the number of peak period vehicular trips at each of the proposed vehicular access points on the Peel Hall development site, for each proposed land use, to inform the forthcoming modelling and AECOM gravity model.
- 1.2 An overview of the site access locations are provided on the plan HTp/1107/19/C contained at **Appendix 1** of this report for reference.
- 1.3 This Technical Note should be read in conjunction with HTp Technical Note on Trip Rates (TN/02/A), the accompanying addendum for peak period trip rates (TN/02/A/Addendum) and Technical Note TN/06 Trip Discounts.
- 1.4 It is anticipated that there will be a follow-up report to this Technical Note (TN/08) that sets out the traffic distribution on the wider highway network, further to the assumptions set out in TN/06 and the results of the AECOM gravity model.

## 2.0 Trip Distribution Tables

- 2.1 The following **Tables 2.1 to 2.6** set out the total number of trips at each of the access points for the land uses proposed for the Peel Hall development.
- 2.2 A discount has not been applied to the residential vehicular trip rates at Mill Lane/Blackbrook Avenue and Birch Avenue as these areas are self-contained with restricted vehicular permeability and therefore any vehicular trip will require travel off site. Therefore the overall total trip figures provided in each of the following **Tables 2.1 to 2.6** are higher than shown in Table 3.3 of HTp Technical Note TN/06.
- 2.3 It should be noted that although motorised vehicular access will be restricted from both the Mill Lane/Blackbrook Avenue and the Birch Avenue residential plots, pedestrian and cycle routes will be provided that connect into the wider Peel Hall site.

**Table 2.1 – Number of Vehicular Trips at Site Accesses 0700-0800**

Access	Units/sqm	AM Peak 0700-0800				Total Trips			
		Trip Rate	Arrival	Departure	Trips	Internal Trips	Arrival	Departure	
Mill Lane	150 Dwellings	0.127	0.380	19	57	0%	19	57	
Mill Lane/Blackbrook Avenue	700 Dwellings	0.127	0.380	89	266	5%	85	253	
Primary School (up to 420 pupils)	0.057	0.023	24	10	0%	24	10		
330 Dwellings	0.127	0.380	42	125	5%	40	119		
Food Store (2,000sqm)	1.801	1.082	36	22	60%	14*	9*		
Poplars Ave. (Central)	Local Centre (600sqm)	4.257	3.792	26	23	70%	8	7	
	Family Pub/ Restaurant (1,600sqm)	-	-	-	-	-	-	-	
	100-Bed Care Home	0.075	0.083	8	8	0%	8	8	
Poplars Ave. (West)	Employment (7,500sqm)	0.688	0.164	52	12	0%	52	12	
Birch Avenue	20 Dwellings	0.127	0.380	3	8	0%	3	8	
Grasmere Avenue	Sports Pitches and Community Facilities	-	-	0	0	0%	0	0	
	<b>Total</b>		299	531	-		<b>253</b>	<b>483</b>	<b>736</b>

\*Pass-by trips account for 10%

**Table 2.2 – Number of Vehicular Trips at Site Accesses 0800-0900**

Access	Units/sqm	AM Peak 0800-0900				Total Trips	
		Trip Rate	Arrival	Departure	Trips	Discounts/ Internal Trips	Arrival
Mill Lane	150 Dwellings	0.225	0.523	34	79	0%	34
Mill Lane	700 Dwellings	0.225	0.523	158	366	20%	126
Mill Lane/ Blackbrook Avenue	Primary School (up to 420 pupils)	0.269	0.189	113	79	75%	28
	330 Dwellings	0.225	0.523	74	173	20%	59
	Food Store (2,000sqm)	4.615	3.030	92	61	60%	37*
Poplars Ave. (Central)	Local Centre (600sqm)	5.025	4.780	30	29	70%	9
	Family Pub/ Restaurant (1,600sqm)	-	-	-	-	-	-
	100-Bed Care Home	0.068	0.068	7	7	0%	7
Poplars Ave. (West)	Employment (7,500sqm)	0.919	0.514	69	39	0%	69
Birch Avenue	20 Dwellings	0.225	0.523	5	11	0%	5
	Sports Pitches and Community Facilities	-	-	10	5	0%	10
	<b>Total</b>			592	849	-	<b>1,009</b>
						<b>384</b>	<b>625</b>

\*Pass-by trips account for 10%

**Table 2.3 - Number of Vehicular Trips at Site Accesses 0900-0930**

Access	Units/sqm	AM Peak 0900-0930				Discounts/ Internal Trips	Arrival	Departure	Total Trips
		Trip Rate	Arrival	Departure	Trips				
Mill Lane	150 Dwellings	0.109	0.147	16	22	0%	16	22	
Mill Lane	700 Dwellings	0.109	0.147	76	103	30%	53	72	
Primary School (up to 420 pupils)	0.024	0.028	10	12	75%	3	3		
330 Dwellings	0.109	0.147	36	49	30%	25	34		
Food Store (2,000sqm)	3.368	2.554	67	51	60%	27*	20*		
Poplars Ave. (Central)	Local Centre (600sqm)	2.851	2.601	17	16	70%	5	5	
	Family Pub/ Restaurant (1,600sqm)	-	-	-	-	-	-	-	
	100-Bed Care Home	0.045	0.019	5	2	0%	5	2	
Poplars Ave. (West)	Employment (7,500sqm)	0.354	0.272	27	20	0%	27	20	
Birch Avenue	20 Dwellings	0.109	0.147	2	3	0%	2	3	
	Sports Pitches and Community Facilities	-	-	3	5	0%	3	5	
	<b>Total</b>	259		283		-	<b>166</b>	<b>186</b>	
							<b>352</b>		

\*Pass-by trips account for 10%

**Table 2.4 - Number of Vehicular Trips at Site Accesses 1600-1700**

Access	Units/sqm	PM Peak 1600-1700				Total Trips			
		Trip Rate	Arrival	Departure	Trips	Internal Trips	Arrival	Departure	
Mill Lane	150 Dwellings	0.419	0.248	63	37	0%	63	37	
Mill Lane/ Blackbrook Avenue	700 Dwellings	0.419	0.248	293	174	20%	234	139	
Primary School (up to 420 pupils)	0.116	0.165	49	69	50%	25	35		
330 Dwellings	0.419	0.248	138	82	20%	110	66		
Food Store (2,000sqm)	8.121	7.697	162	154	60%	65*	62*		
Poplars Ave. (Central)	Local Centre (600sqm)	5.735	5.828	34	35	70%	10	11	
	Family Pub/ Restaurant (1,600sqm)	1.828	1.195	29	19	25%	22	14	
	100-Bed Care Home	0.068	0.053	7	5	0%	7	5	
Poplars Ave. (West)	Employment (7,500sqm)	0.473	0.668	36	50	0%	36	50	
Birch Avenue	20 Dwellings	0.419	0.248	8	5	0%	8	5	
Grasmere Avenue	Sports Pitches and Community Facilities	-	-	8	7	0%	8	7	
	<b>Total</b>		827	637	-		<b>588</b>	<b>431</b>	<b>1,019</b>

\*Pass-by trips account for 10%

**Table 2.5 - Number of Vehicular Trips at Site Accesses 1700-1800**

Access	Units/sqm	PM Peak 1700-1800				Total Trips			
		Trip Rate	Arrival	Departure	Trips	Internal Trips	Discounts/	Arrival	Departure
Mill Lane	150 Dwellings	0.495	0.307	74	46	0%	74	46	
Mill Lane/ Blackbrook Avenue	700 Dwellings	0.495	0.307	347	215	20%	278	172	
	Primary School (up to 420 pupils)	0.045	0.063	19	27	50%	10	14	
	330 Dwellings	0.495	0.307	163	101	20%	130	81	
	Food Store (2,000sqm)	9.056	9.550	181	191	60%	72*	76*	
Poplars Ave. (Central)	Local Centre (600sqm)	6.039	6.495	36	39	70%	11	12	
	Family Pub/ Restaurant (1,600sqm)	2.847	1.845	46	30	25%	35	23	
	100-Bed Care Home	0.083	0.113	8	11	0%	8	11	
Poplars Ave. (West)	Employment (7,500sqm)	0.262	0.621	20	47	0%	20	47	
	Birch Avenue	20 Dwellings	0.495	0.307	10	6	0%	10	6
	Sports Pitches and Community Facilities	-	-	7	8	0%	7	8	
	<b>Total</b>		911		721		-	<b>655</b>	<b>496</b>
								<b>1,151</b>	

\*Pass-by trips account for 10%

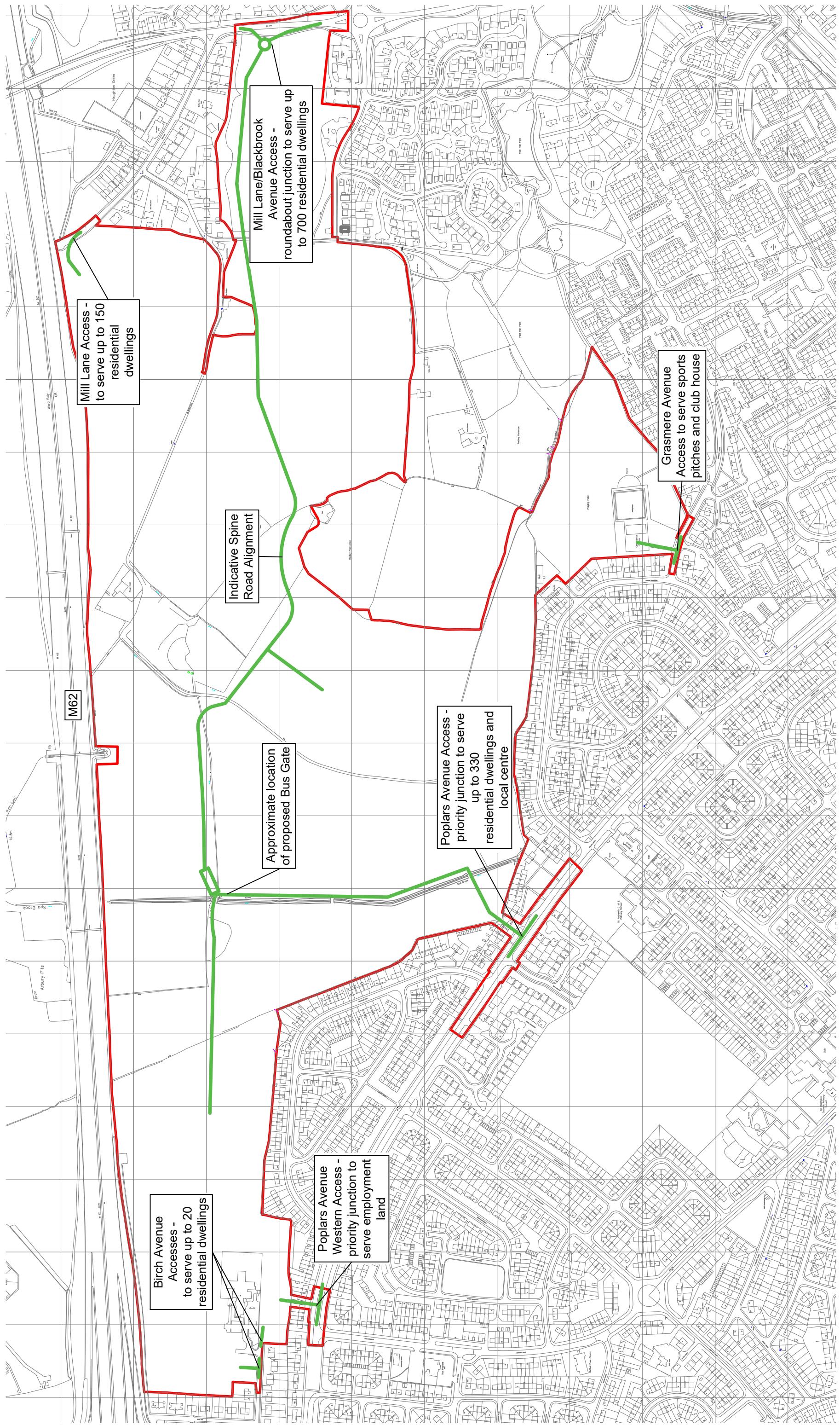
**Table 2.6 - Number of Vehicular Trips at Site Accesses 1800-1830**

Access	Units/sqm	PM Peak 1800-1830				Total Trips			
		Trip Rate	Arrival	Departure	Trips	Internal Trips	Discounts/	Arrival	Departure
Mill Lane	150 Dwellings	0.182	0.137	27	21	0%	27	21	
Mill Lane	700 Dwellings	0.182	0.137	127	96	20%	102	77	
Mill Lane/ Blackbrook Avenue	Primary School (up to 420 pupils)	0.020	0.015	8	6	50%	4	3	
	330 Dwellings	0.182	0.137	60	45	20%	48	36	
	Food Store (2,000sqm)	3.554	4.251	71	85	60%	28*	34*	
Poplars Ave. (Central)	Local Centre (600sqm)	2.910	3.049	18	18	70%	5	5	
	Family Pub/ Restaurant (1,600sqm)	1.512	1.257	24	20	25%	18	15	
	100-Bed Care Home	0.049	0.053	5	5	0%	5	5	
Poplars Ave. (West)	Employment (7,500sqm)	0.067	0.216	5	16	0%	5	16	
Birch Avenue	20 Dwellings	0.182	0.137	4	3	0%	4	3	
Grasmere Avenue	Sports Pitches and Community Facilities	-	-	10	5	0%	10	5	
	<b>Total</b>			359	320	-	<b>256</b>	<b>220</b>	<b>476</b>

\*Pass-by trips account for 10%

## Appendix 1

Peel Hall Access Locations (HTp/1107/19/C)



NOTES:  
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PROJECT: PEEL HALL, WARRINGTON  
CLIENT: SATNAM

ISSUE	DATE	REASON FOR REVISION	DRAWN BY:	CHECKED:
12/01/15	12/04/16 04/03/16 19/02/16	FB	DT	

TITLE: PROPOSED ACCESS POINTS AND INDICATIVE SPINE ROAD  
PROJECT REFERENCE: 1107 DRAWING NUMBER: 19 SCALE: Not to scale

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