Technical Note

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

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.

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).

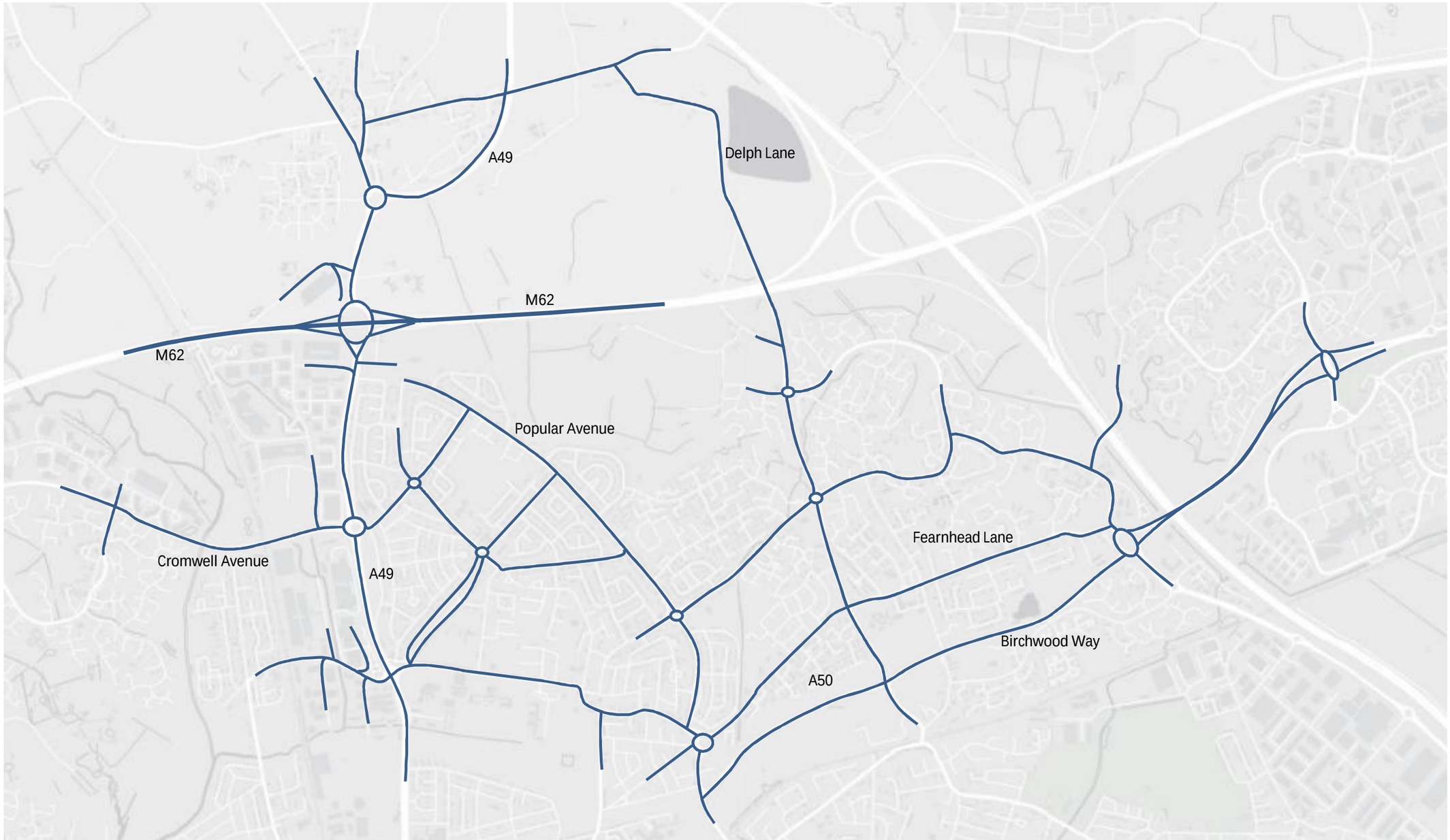
These proportions were applied to the trip numbers supplied to produce origin-destination matrices for each modelled time period. As the WMMTM model represents a single peak hour period, the trip distribution percentages have been applied to each of the corresponding peak hour periods.

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

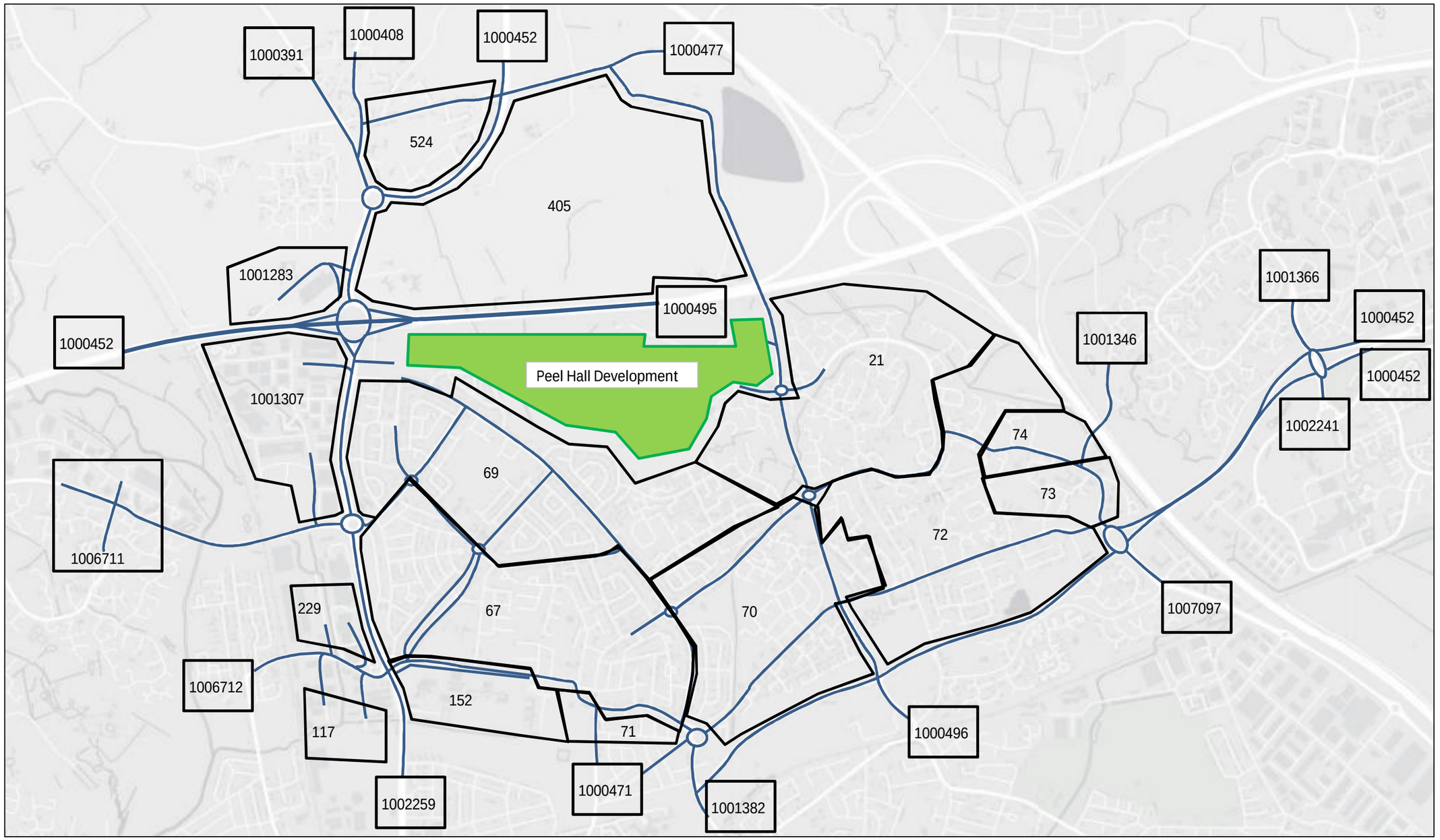
Appendix C, **Figures 1 – 48** present the volume of trips split by land use and total trips for each model time period.

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

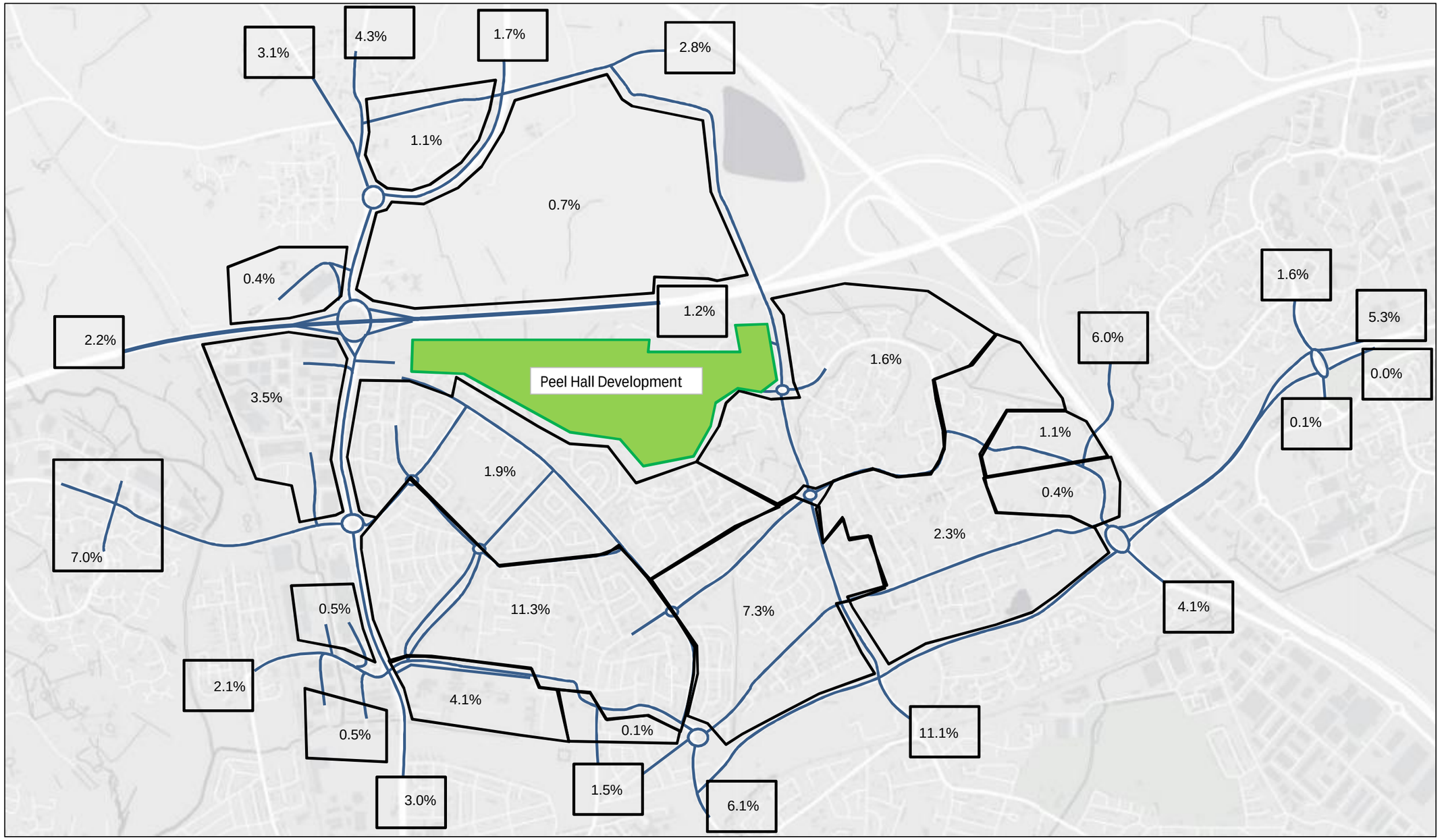


Peel Hall VISSIM Model - Trip Distribution	Appendix A, Figure 1, Model Network	AECOM



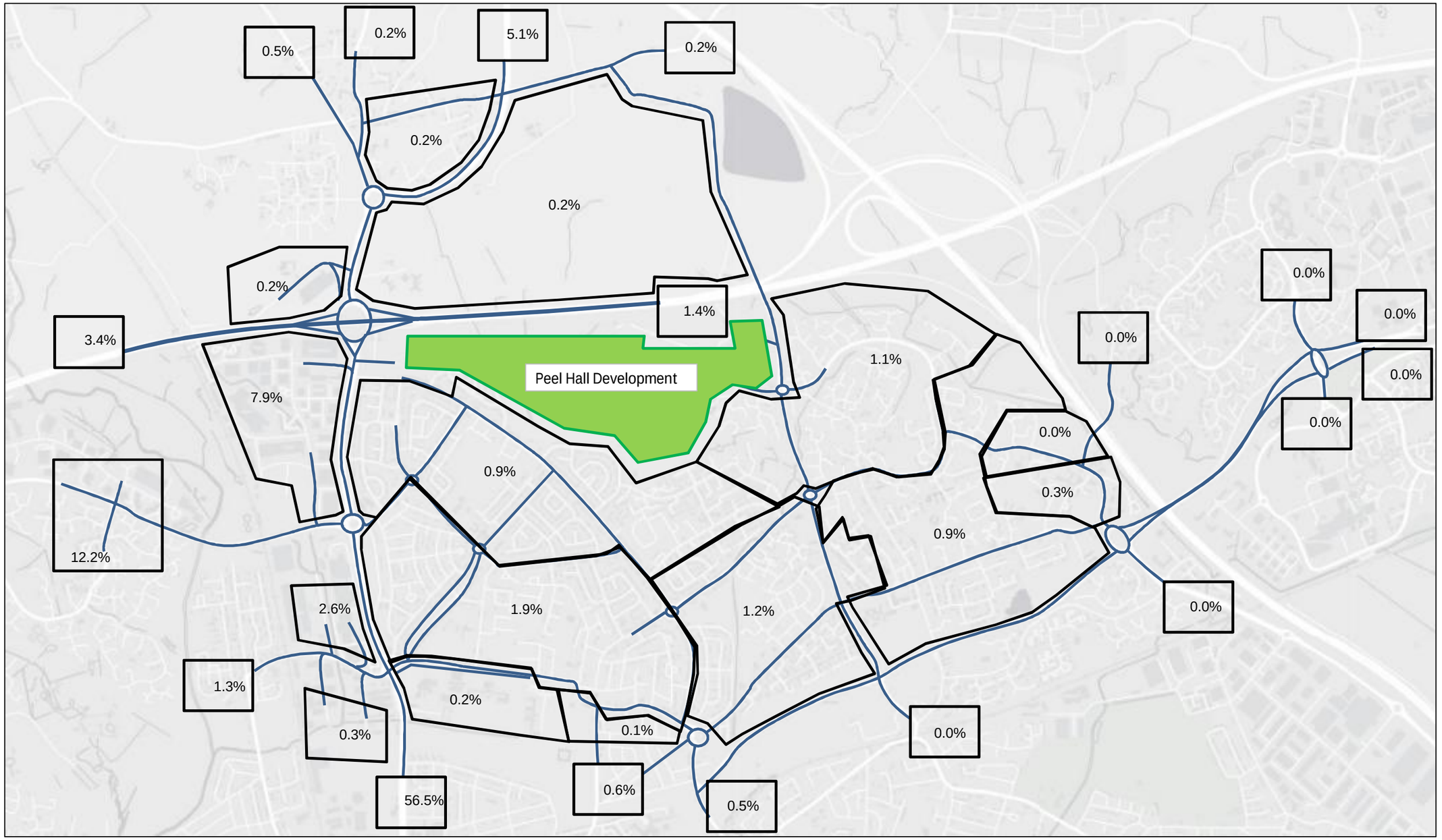
Peel Hall VISSIM Model - Trip Distribution	Appendix A, Figure 2, Zone Plan	AECOM

Appendix B
Proposed Trip Distribution Percentages



** 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 1, AM Percentage Distribution for Residential Trips from Peel Hall Development	AECOM



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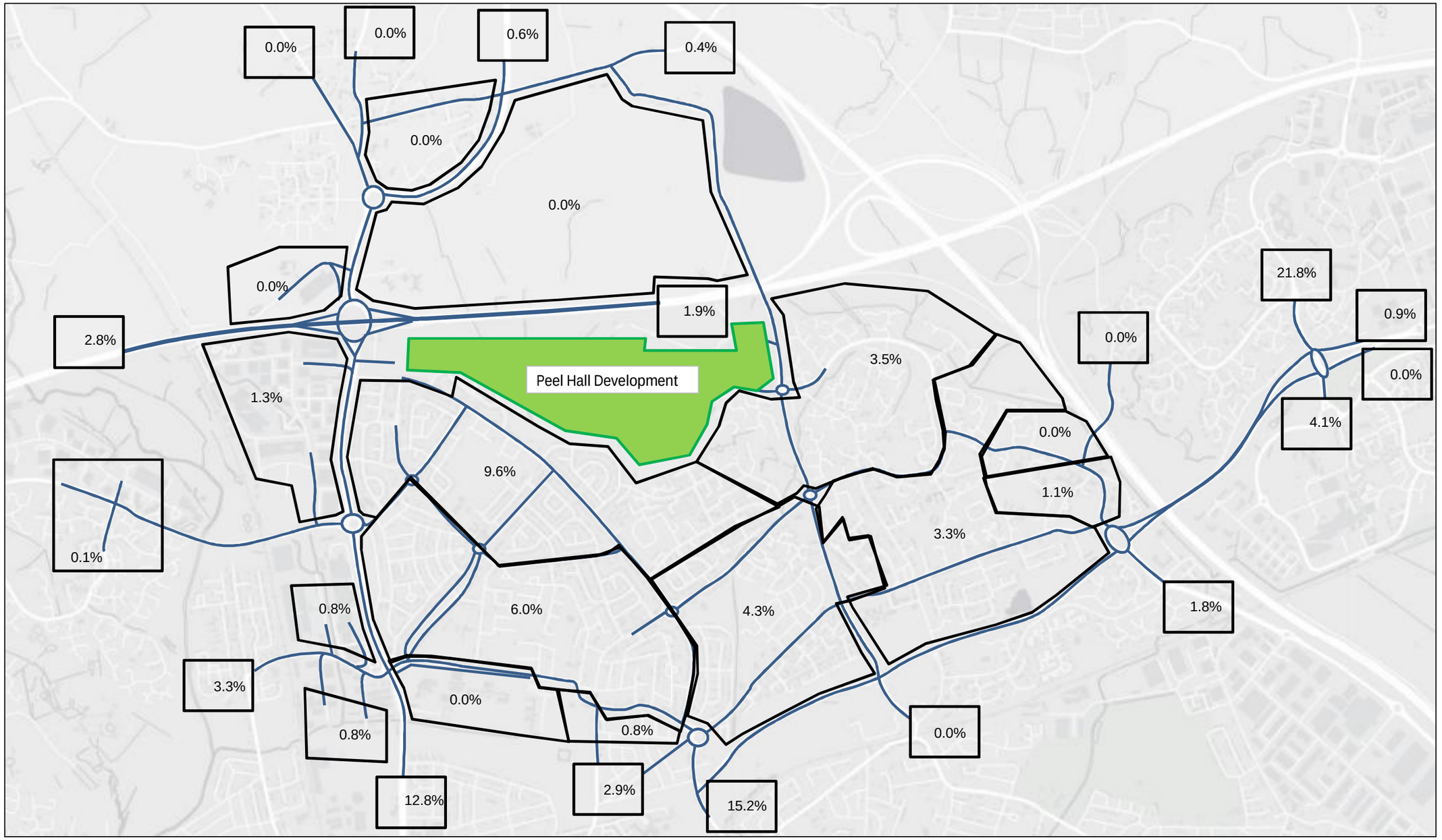
Peel Hall VISSIM Model - Trip Distribution	Appendix B, Figure 2, AM Percentage Distribution for Work Trips from Peel Hall Development	AECOM



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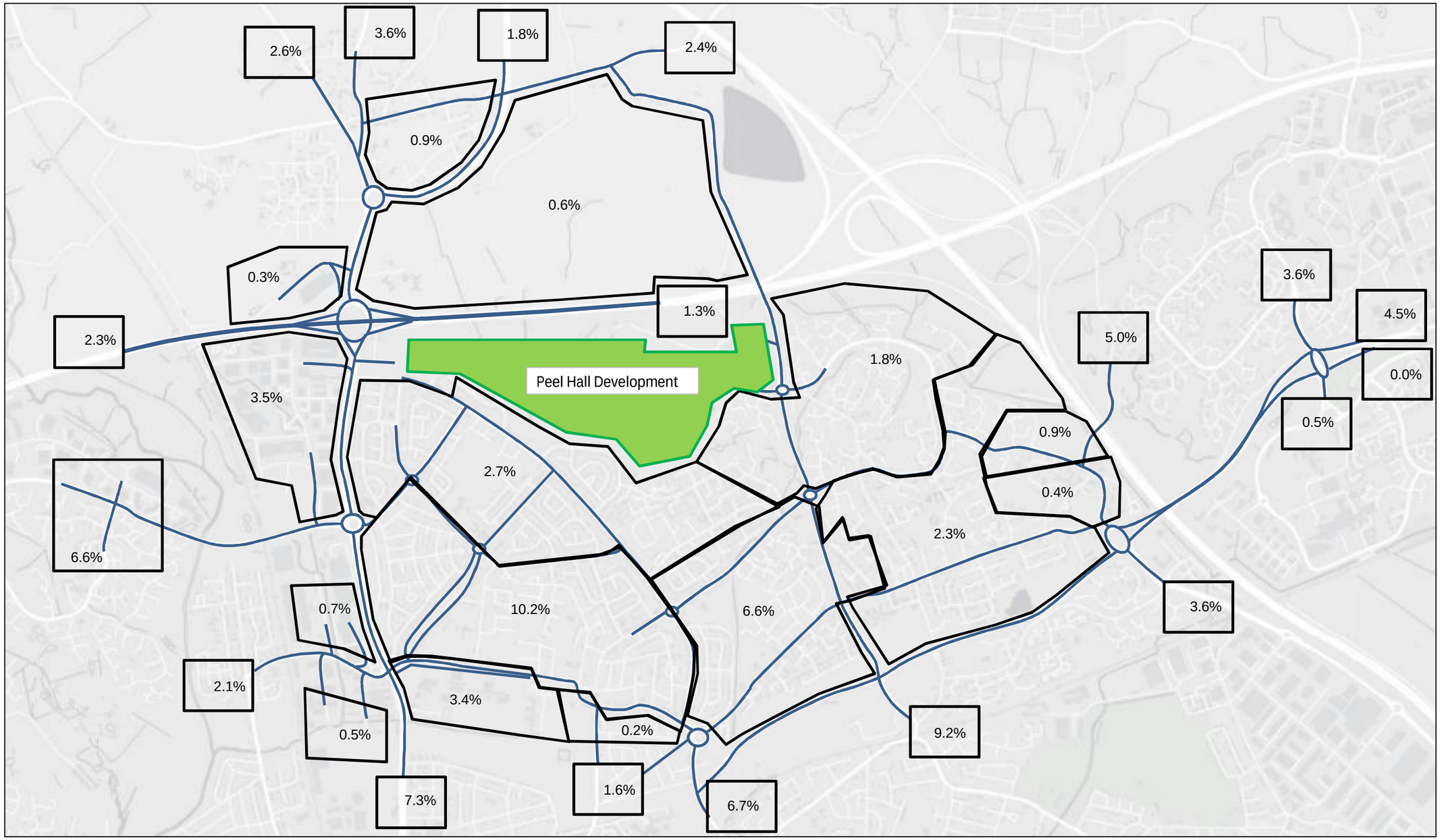
Peel Hall VISSIM Model - Trip Distribution	Appendix B, Figure 3, AM Percentage Distribution for Other Trips from Peel Hall Development	AECOM



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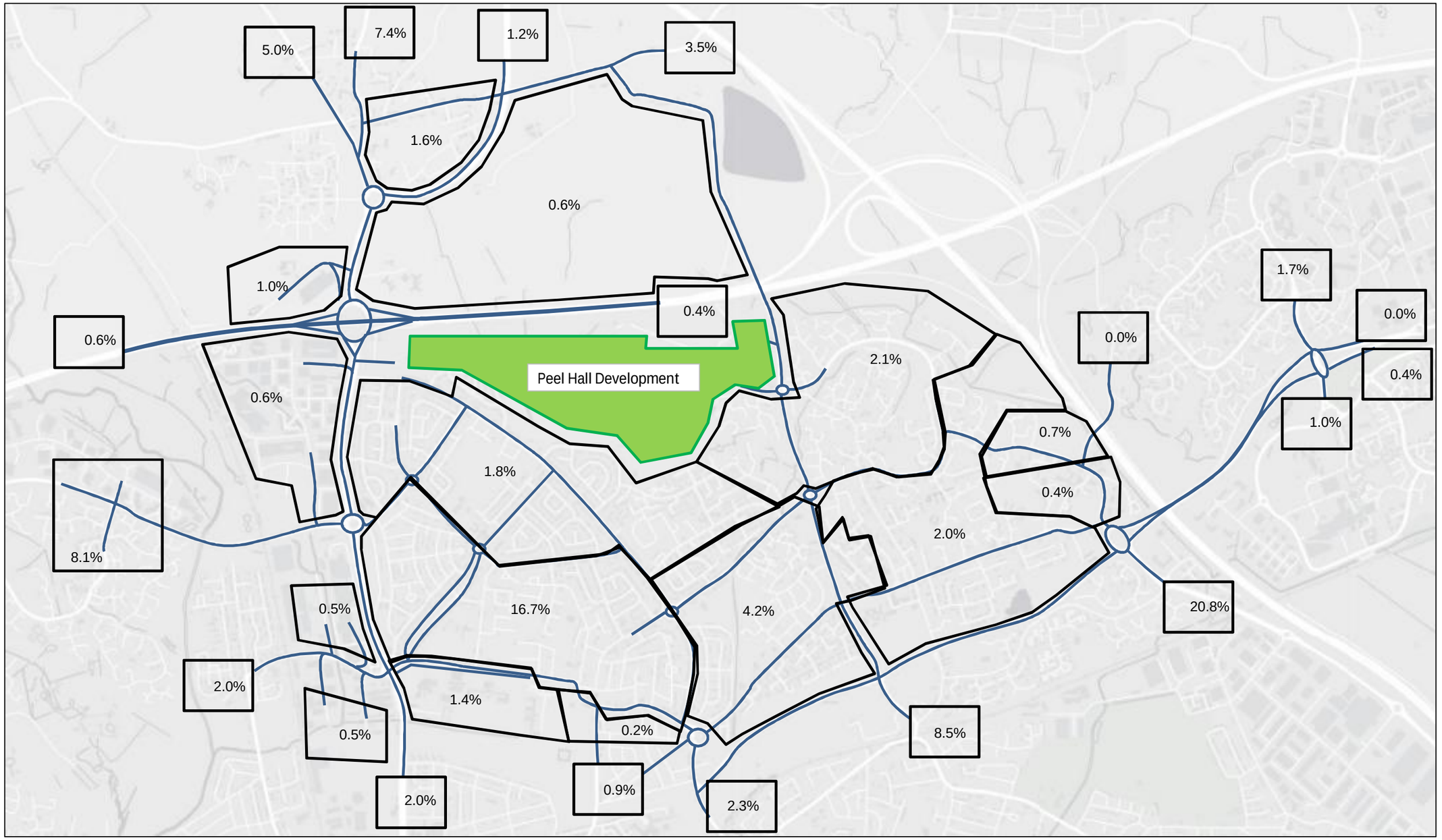
Peel Hall VISSIM Model - Trip Distribution	Appendix B, Figure 4, AM Percentage Distribution for All Trips from Peel Hall Development	AECOM



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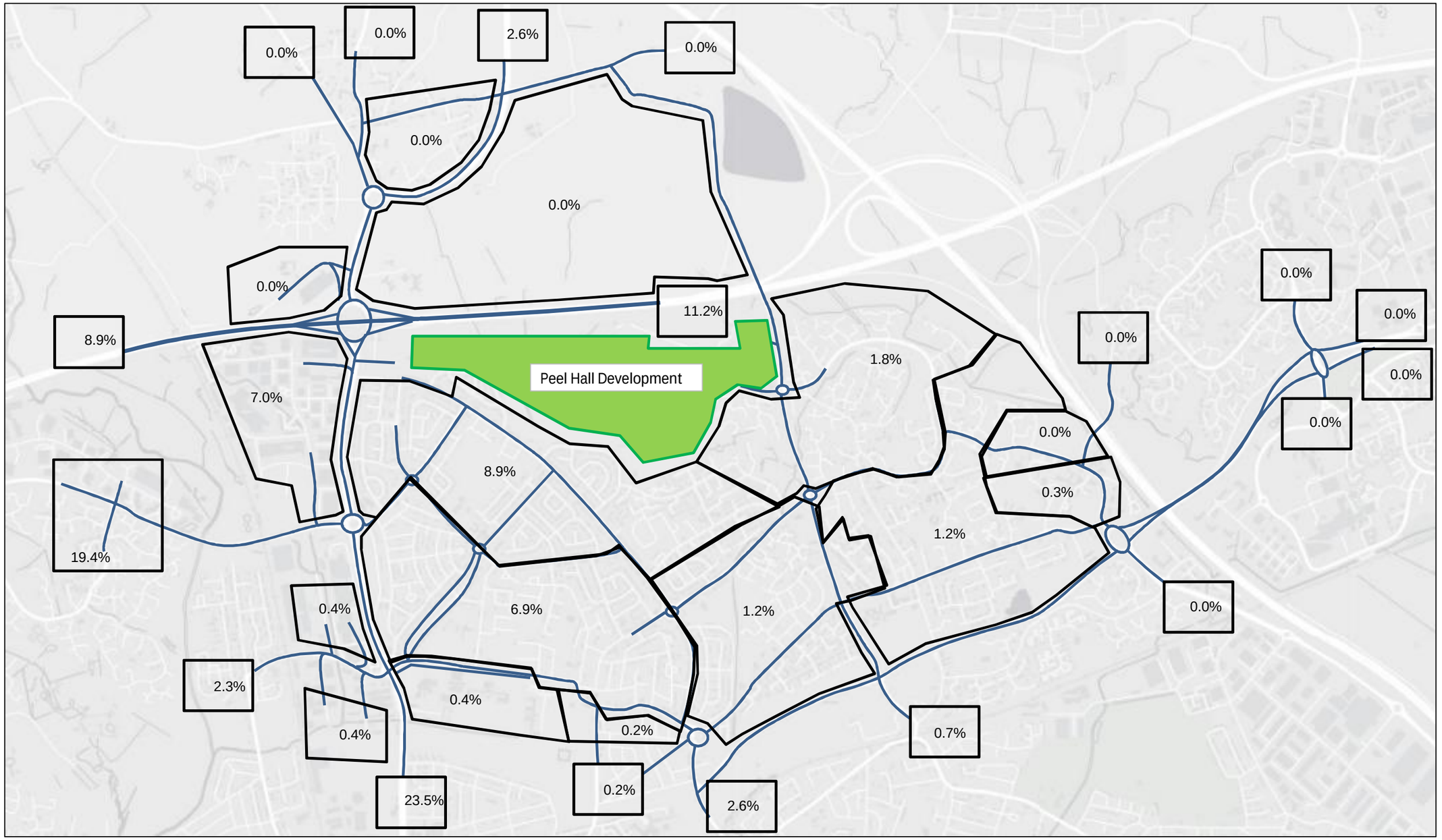
Peel Hall VISSIM Model - Trip Distribution	Appendix B, Figure 5, AM Percentage Distribution for Residential Trips to Peel Hall Development	AECOM



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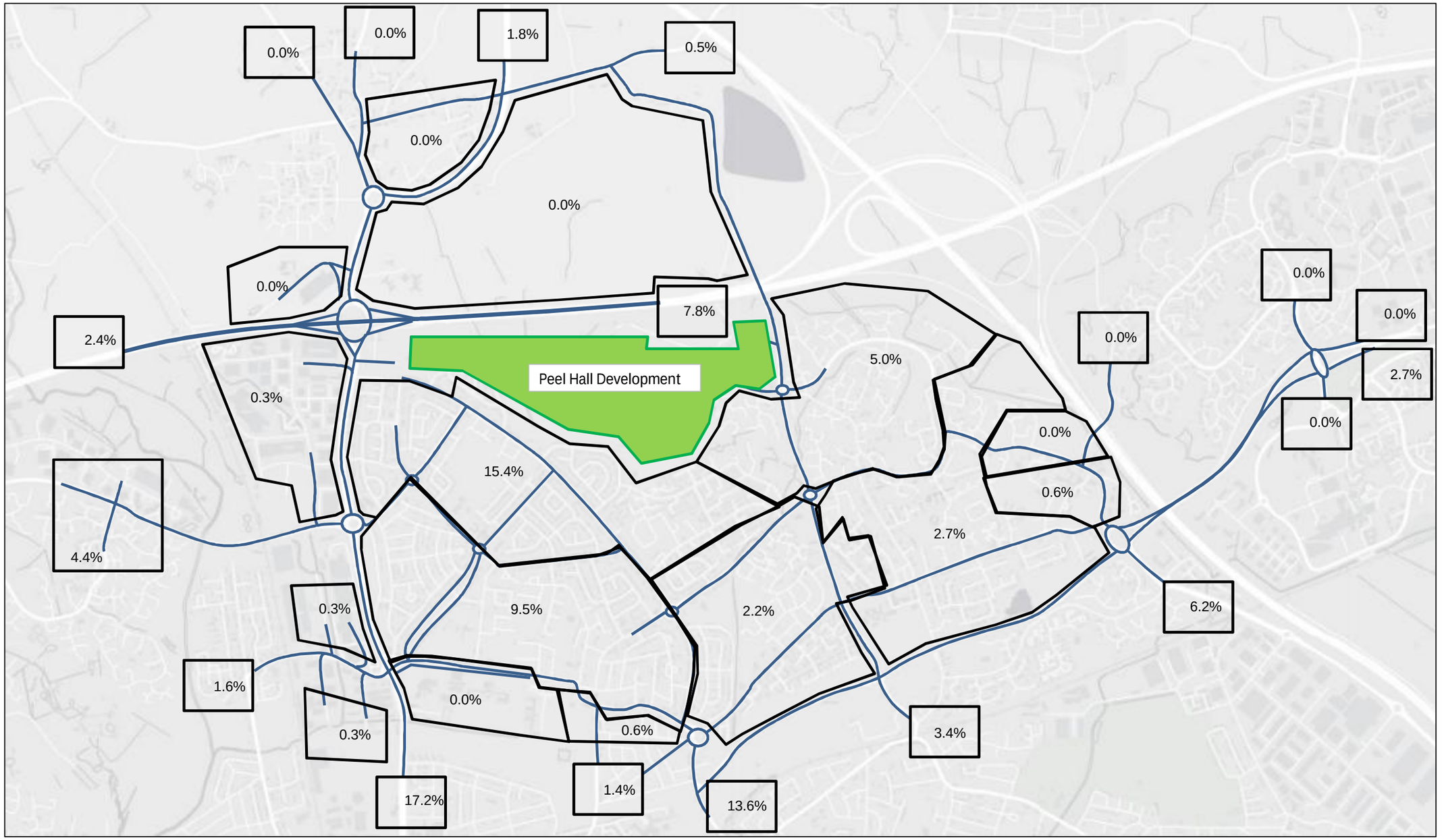
Peel Hall VISSIM Model - Trip Distribution	Appendix B, Figure 6, AM Percentage Distribution for Work Trips to Peel Hall Development	AECOM



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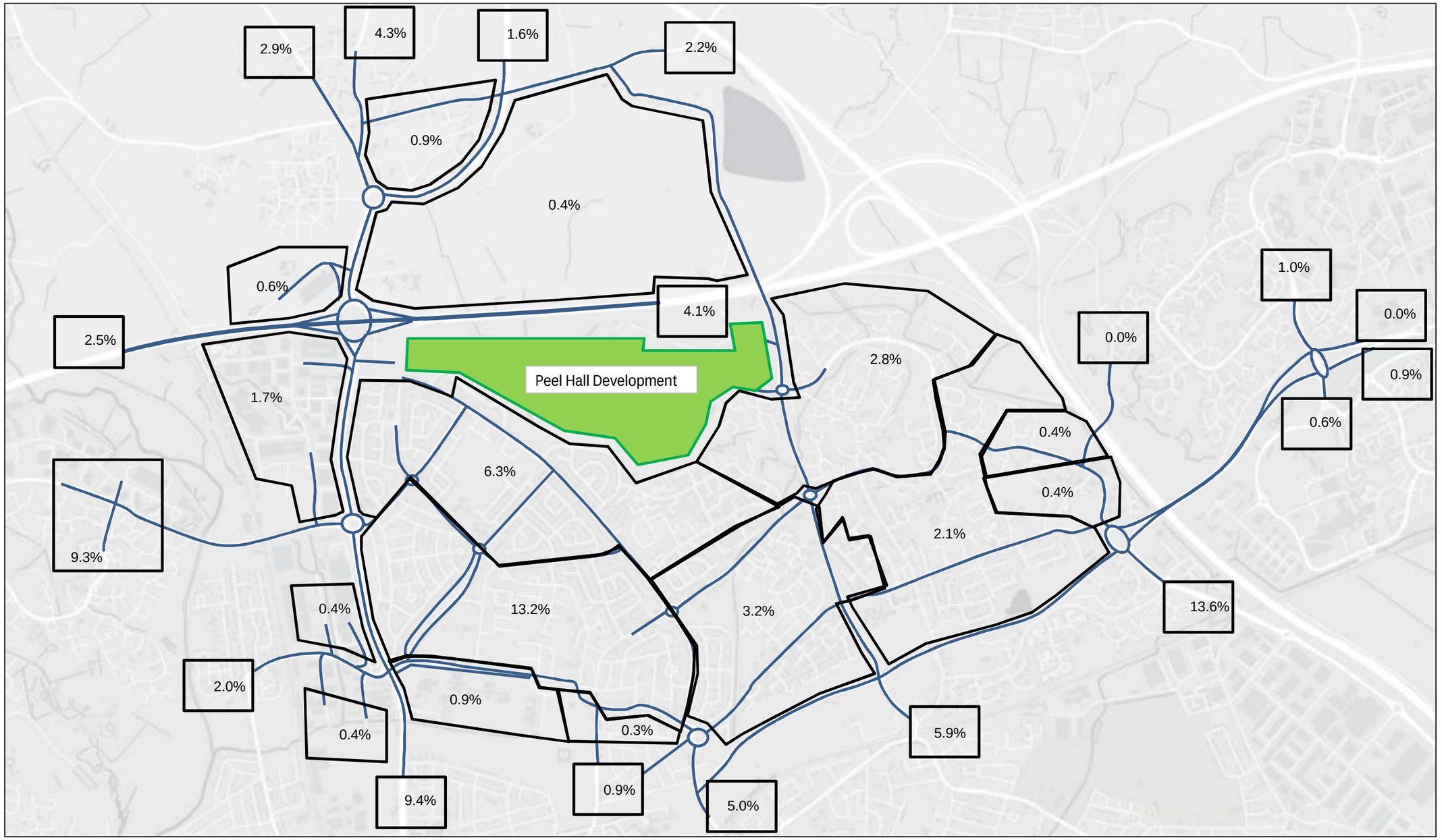
Peel Hall VISSIM Model - Trip Distribution	Appendix B, Figure 7, AM Percentage Distribution for Other Trips to Peel Hall Development	AECOM



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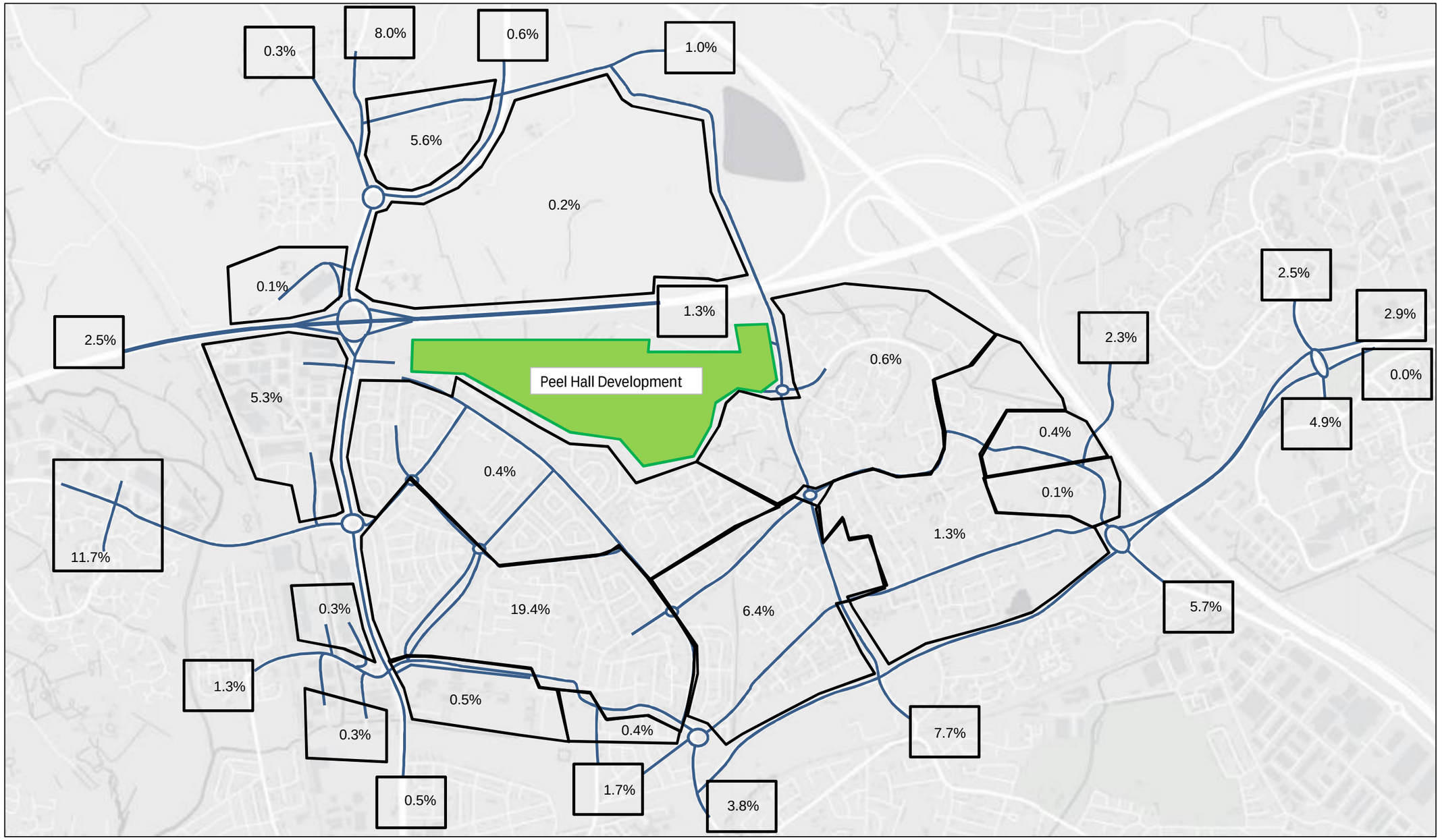
Peel Hall VISSIM Model - Trip Distribution	Appendix B, Figure 8, AM Percentage Distribution for All Trips to Peel Hall Development	AECOM



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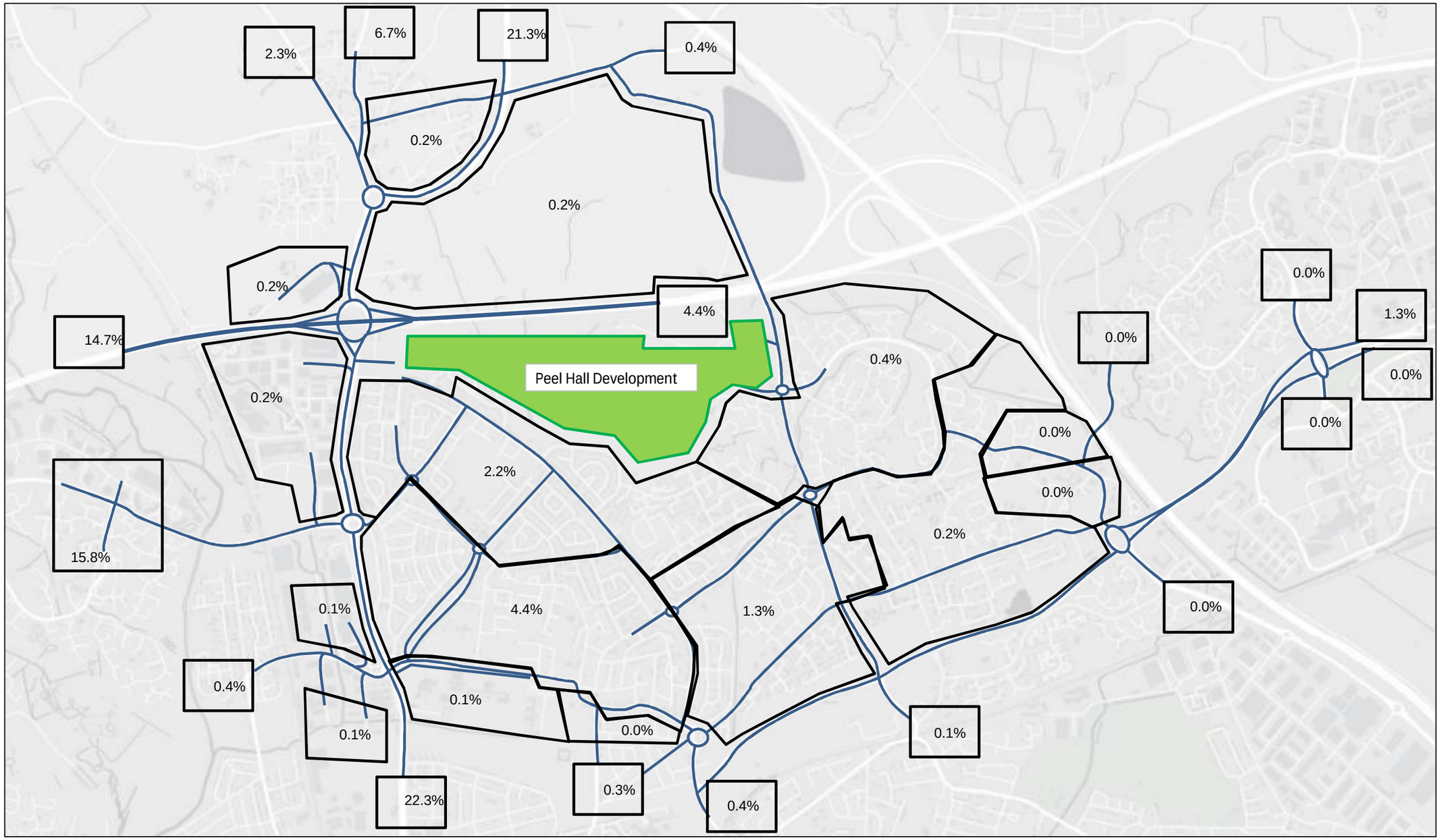
Peel Hall VISSIM Model - Trip Distribution	Appendix B, Figure 9, PM Percentage Distribution for Residential Trips from Peel Hall Development	AECOM



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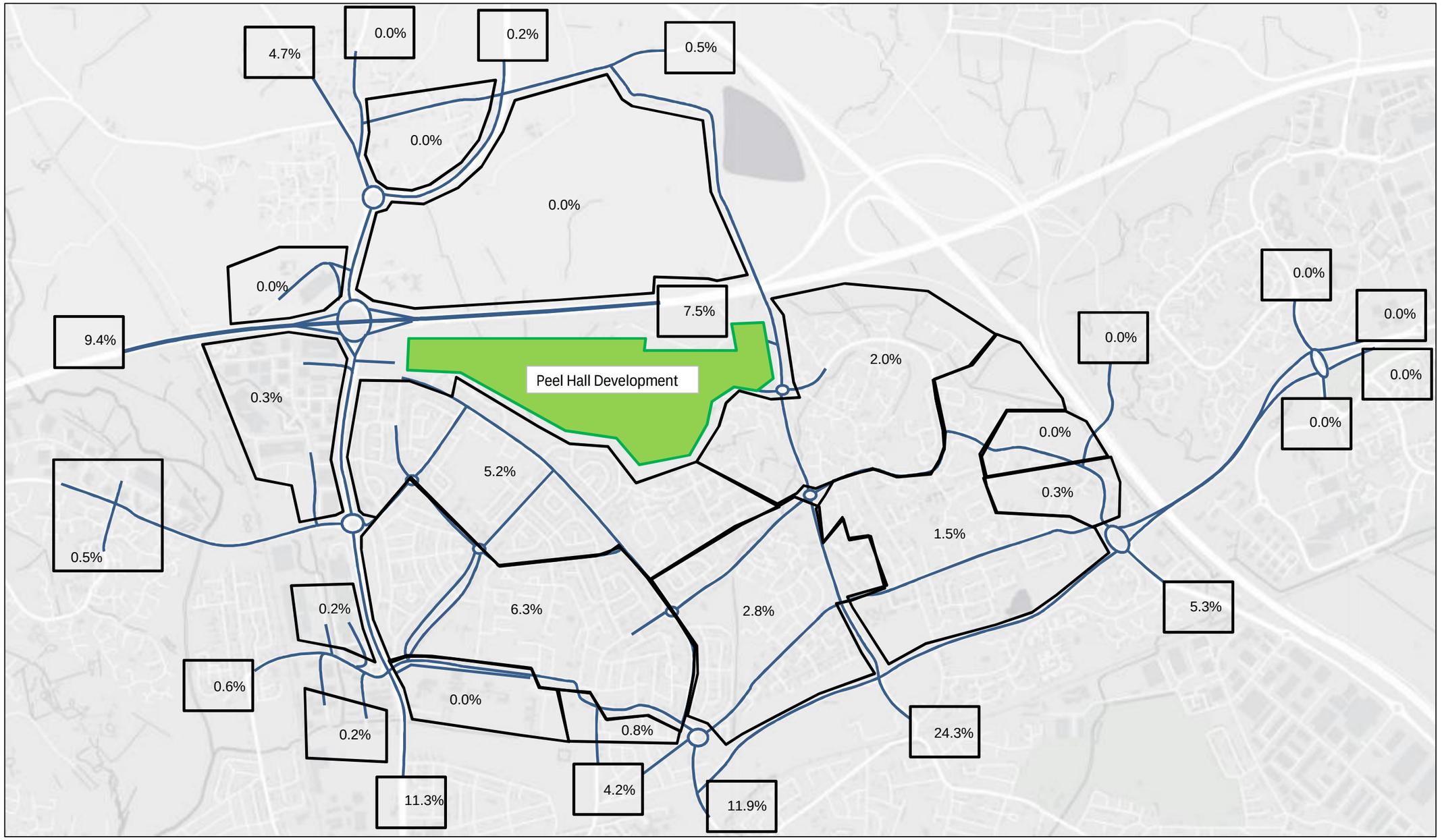
Peel Hall VISSIM Model - Trip Distribution	Appendix B, Figure 10, PM Percentage Distribution for Work Trips from Peel Hall Development	AECOM



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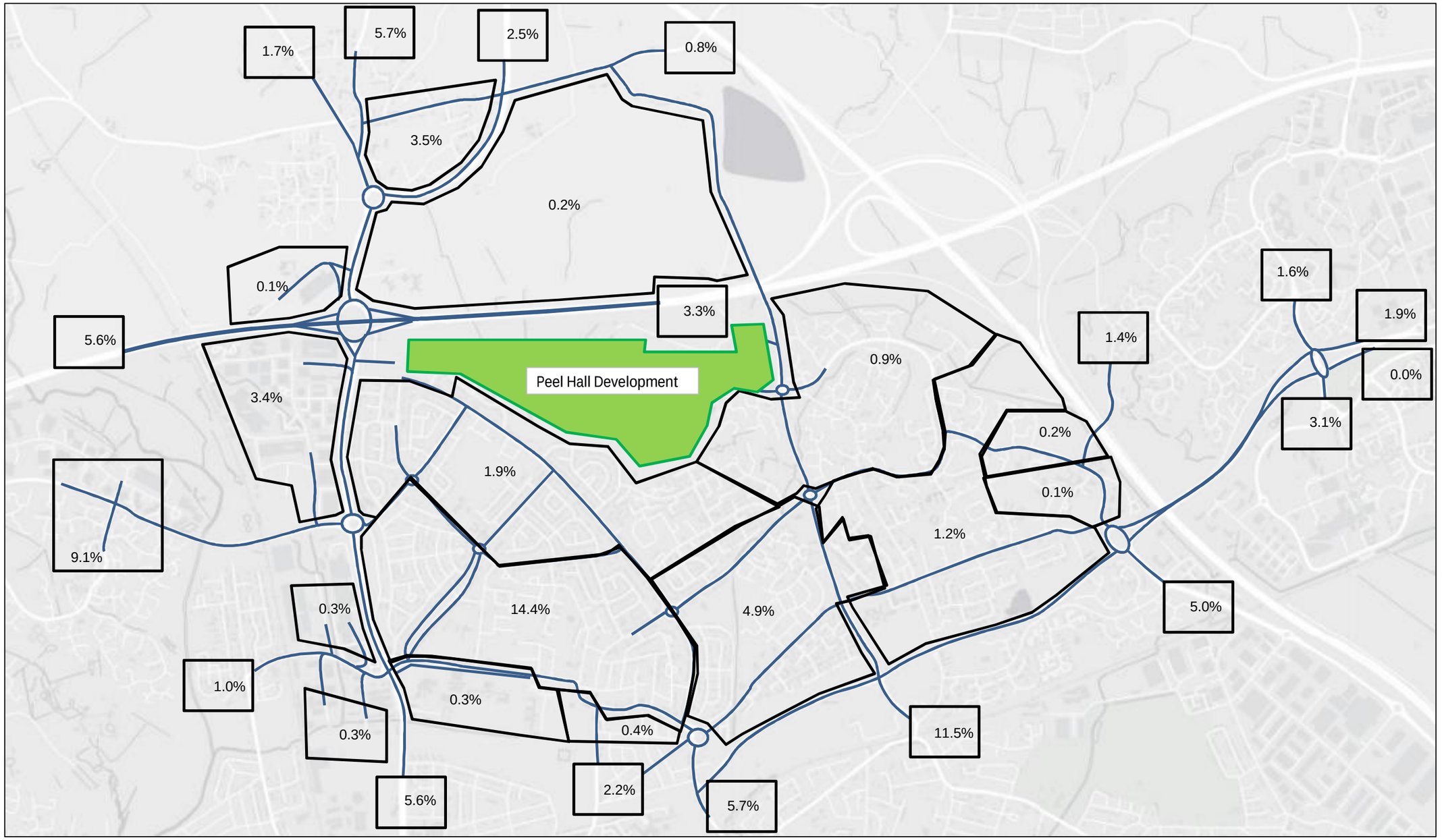
Peel Hall VISSIM Model - Trip Distribution	Appendix B, Figure 11, PM Percentage Distribution for Other Trips from Peel Hall Development	AECOM



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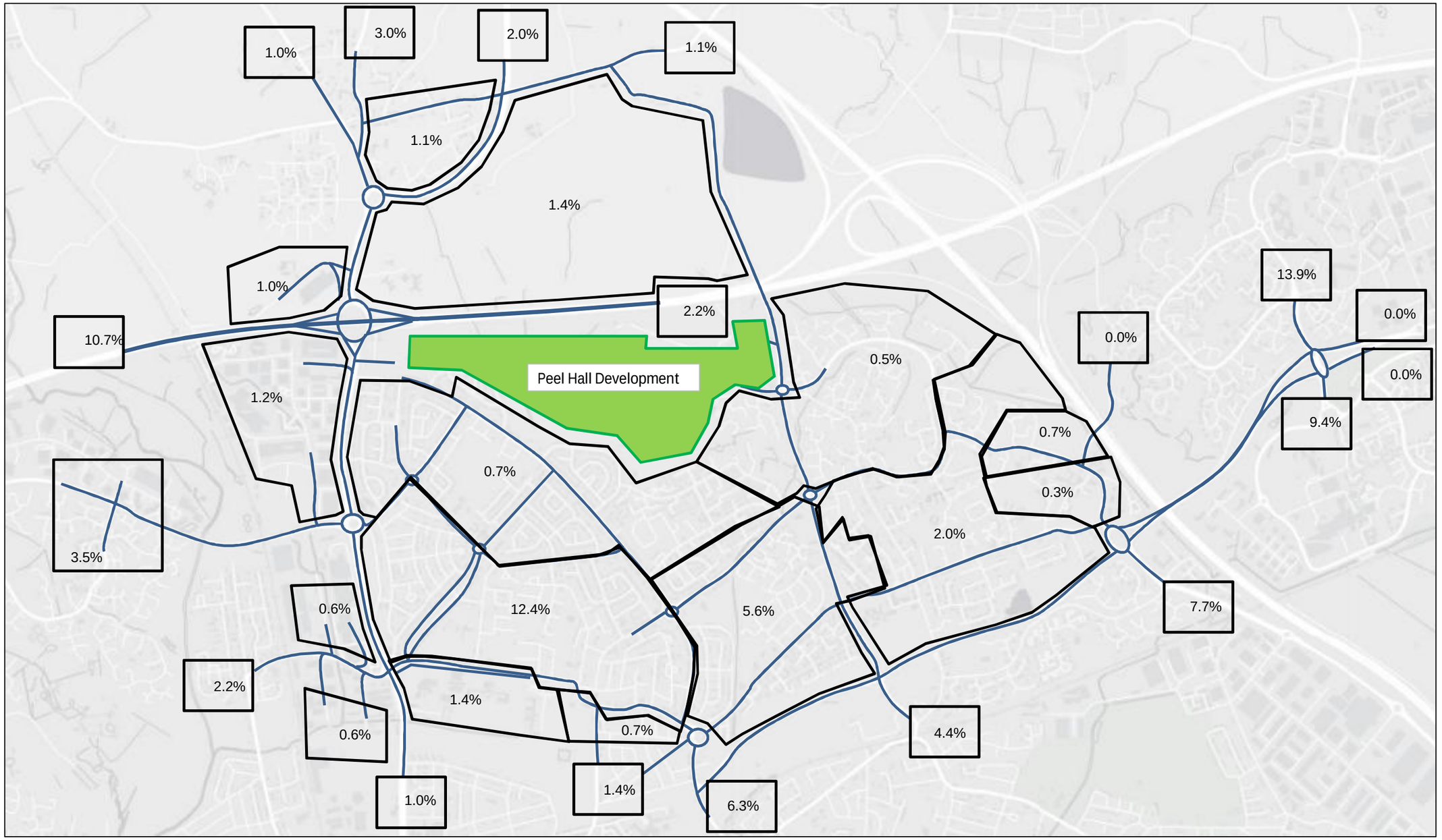
Peel Hall VISSIM Model - Trip Distribution	Appendix B, Figure 12, PM Percentage Distribution for All Trips from Peel Hall Development	AECOM



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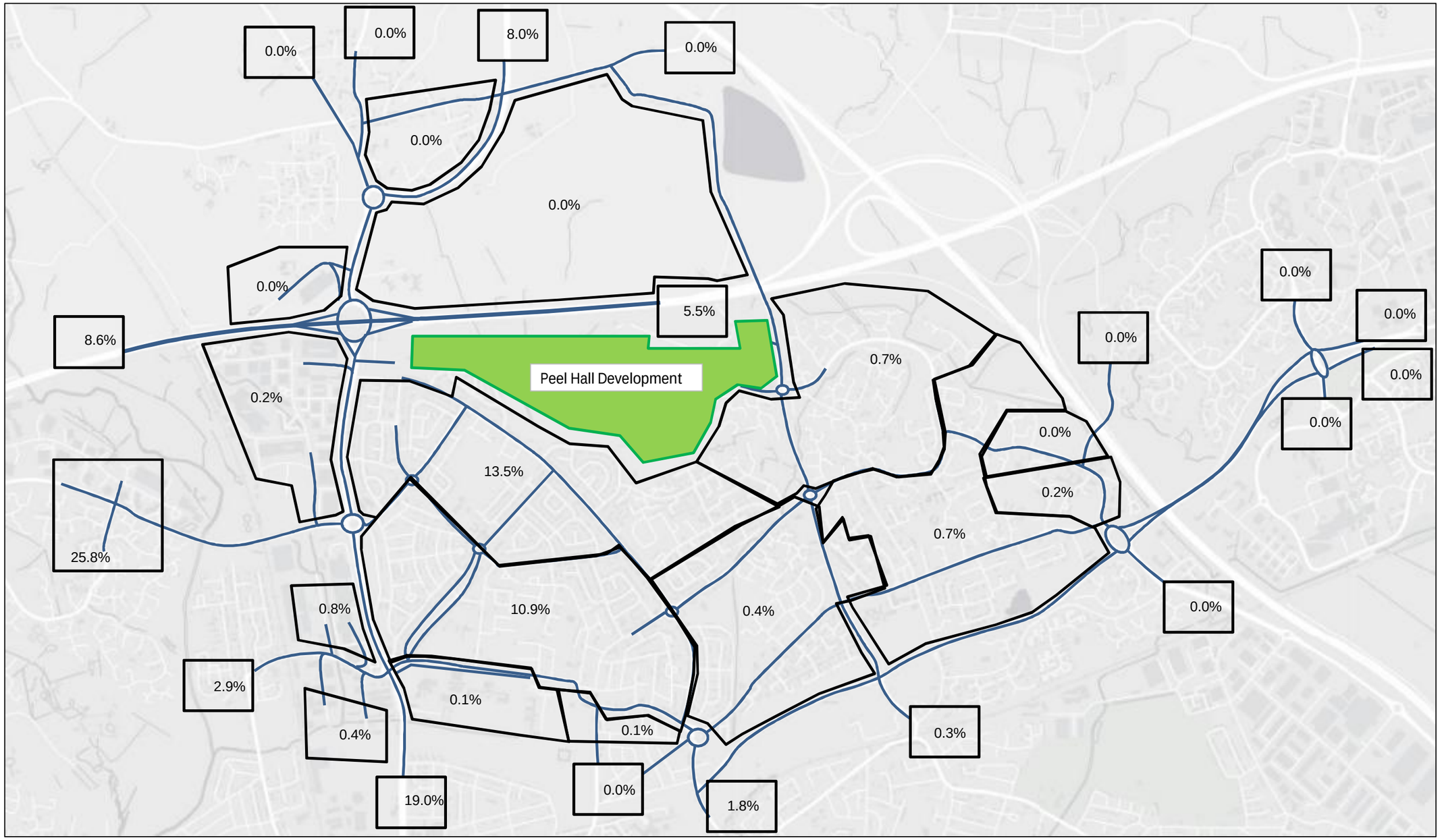
Peel Hall VISSIM Model - Trip Distribution	Appendix B, Figure 13, PM Percentage Distribution for Residential Trips to Peel Hall Development	AECOM



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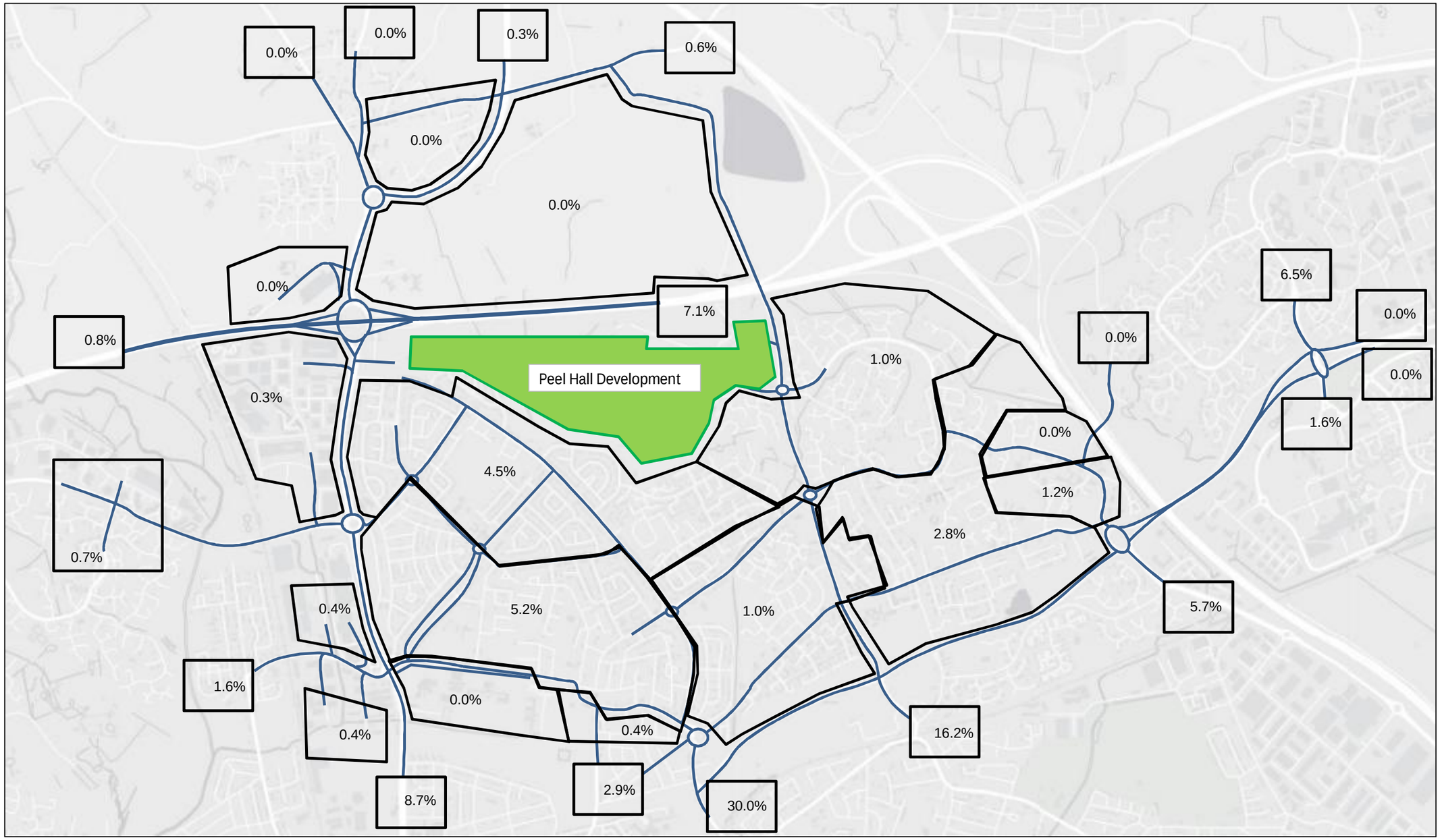
Peel Hall VISSIM Model - Trip Distribution	Appendix B, Figure 14, PM Percentage Distribution for Work Trips to Peel Hall Development	AECOM



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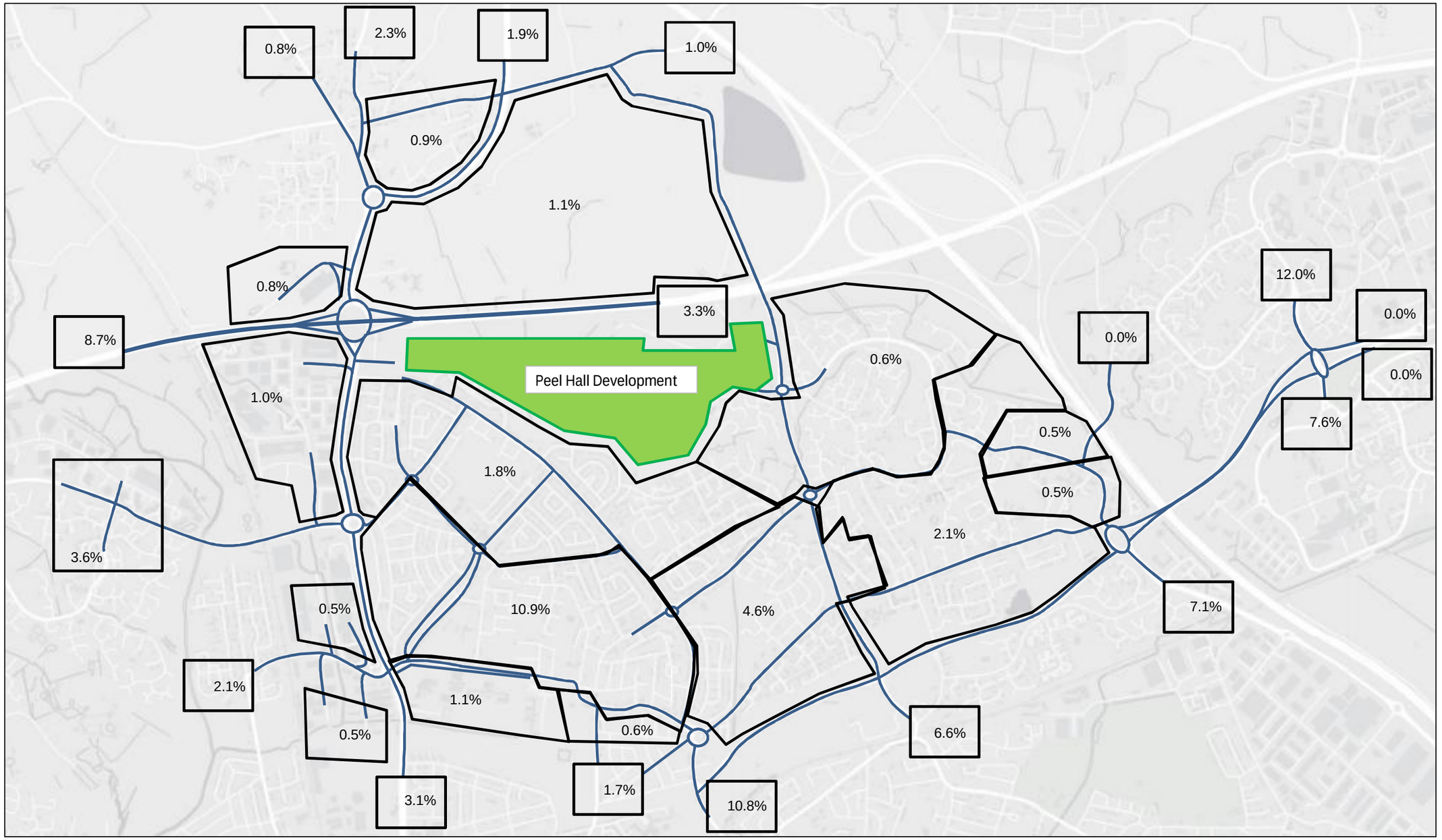
Peel Hall VISSIM Model - Trip Distribution	Appendix B, Figure 15, PM Percentage Distribution for Other Trips to Peel Hall Development	AECOM



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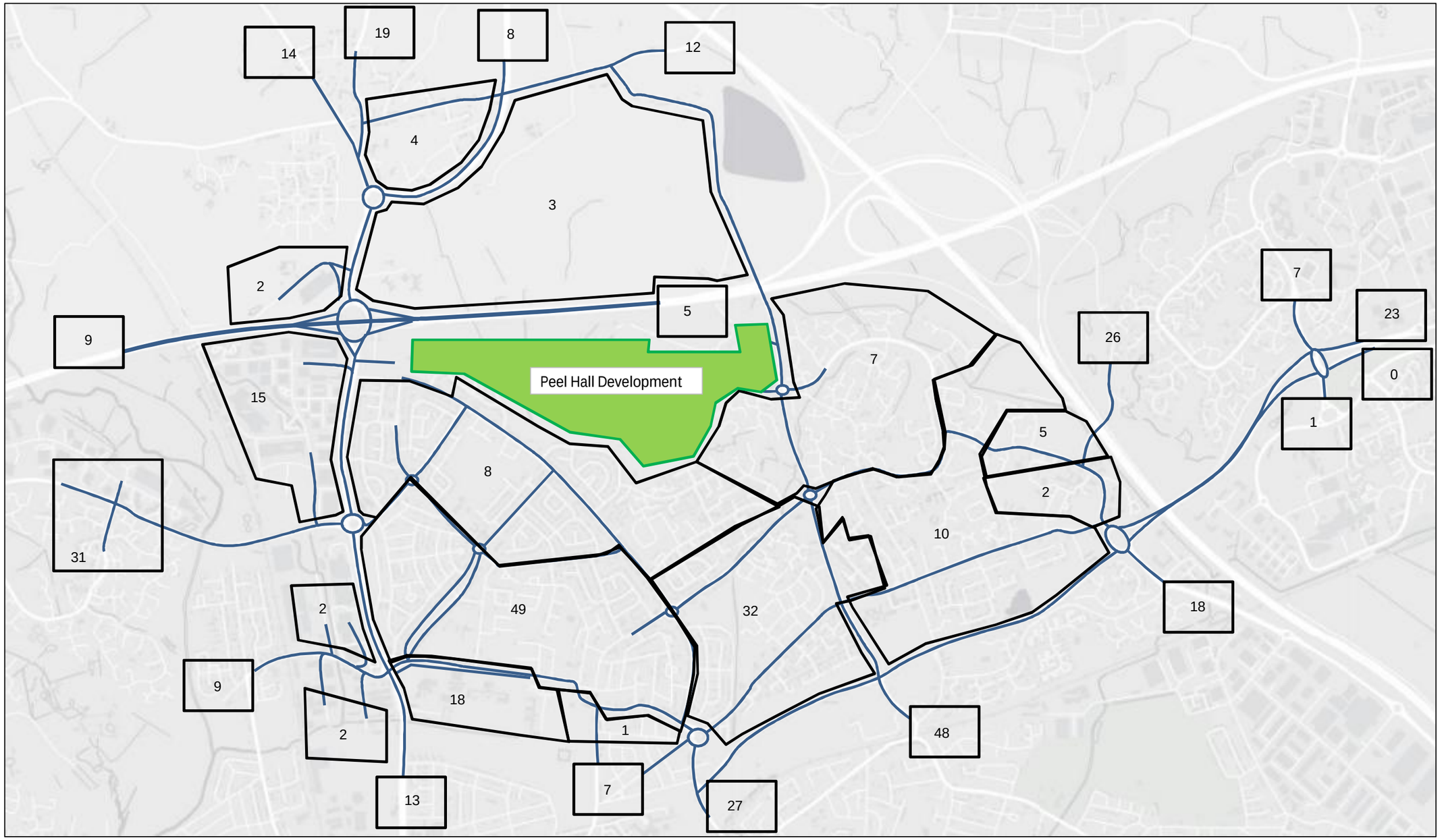
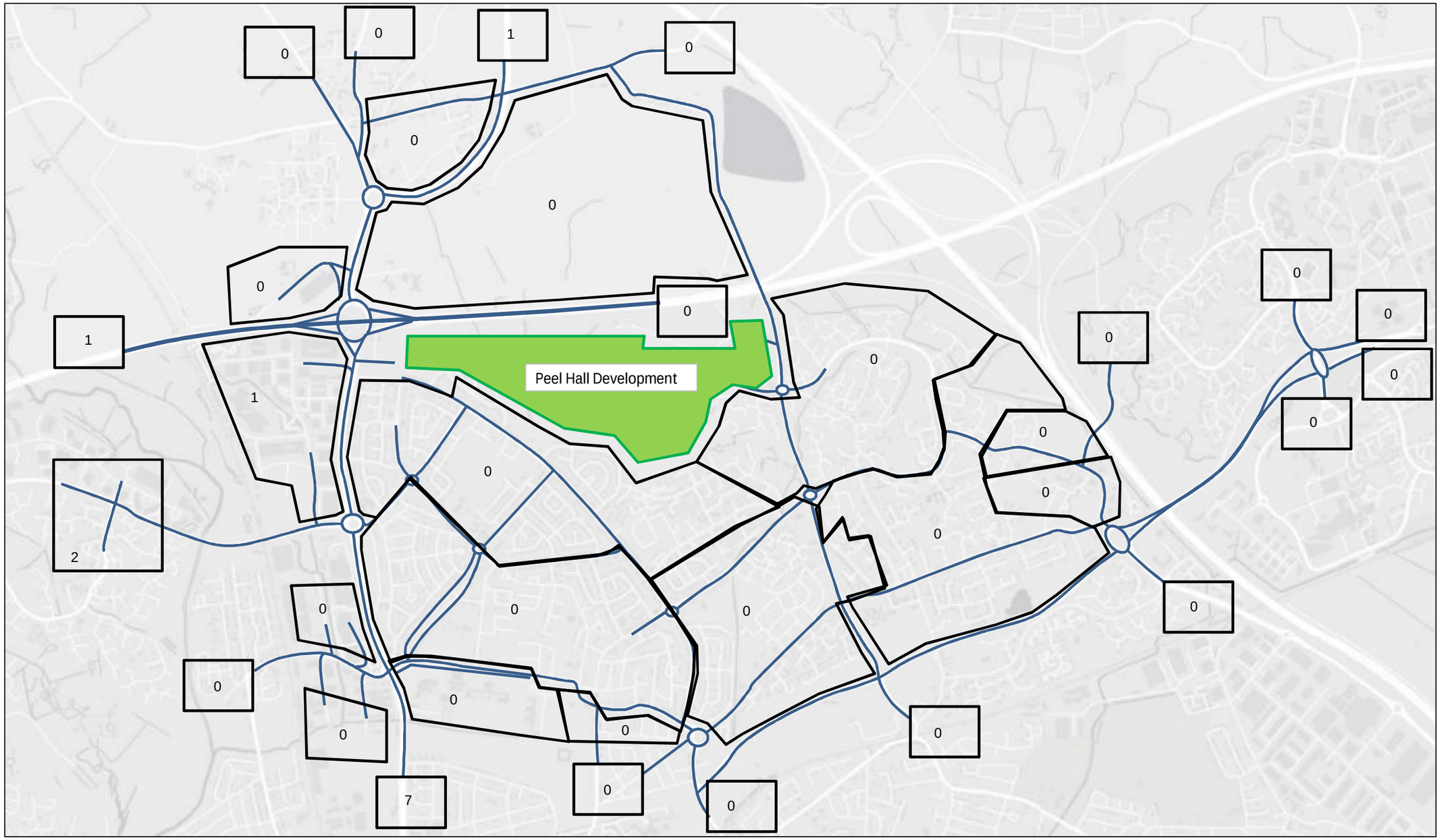
Peel Hall VISSIM Model - Trip Distribution	Appendix B, Figure 16, PM Percentage Distribution for All Trips to Peel Hall Development	AECOM

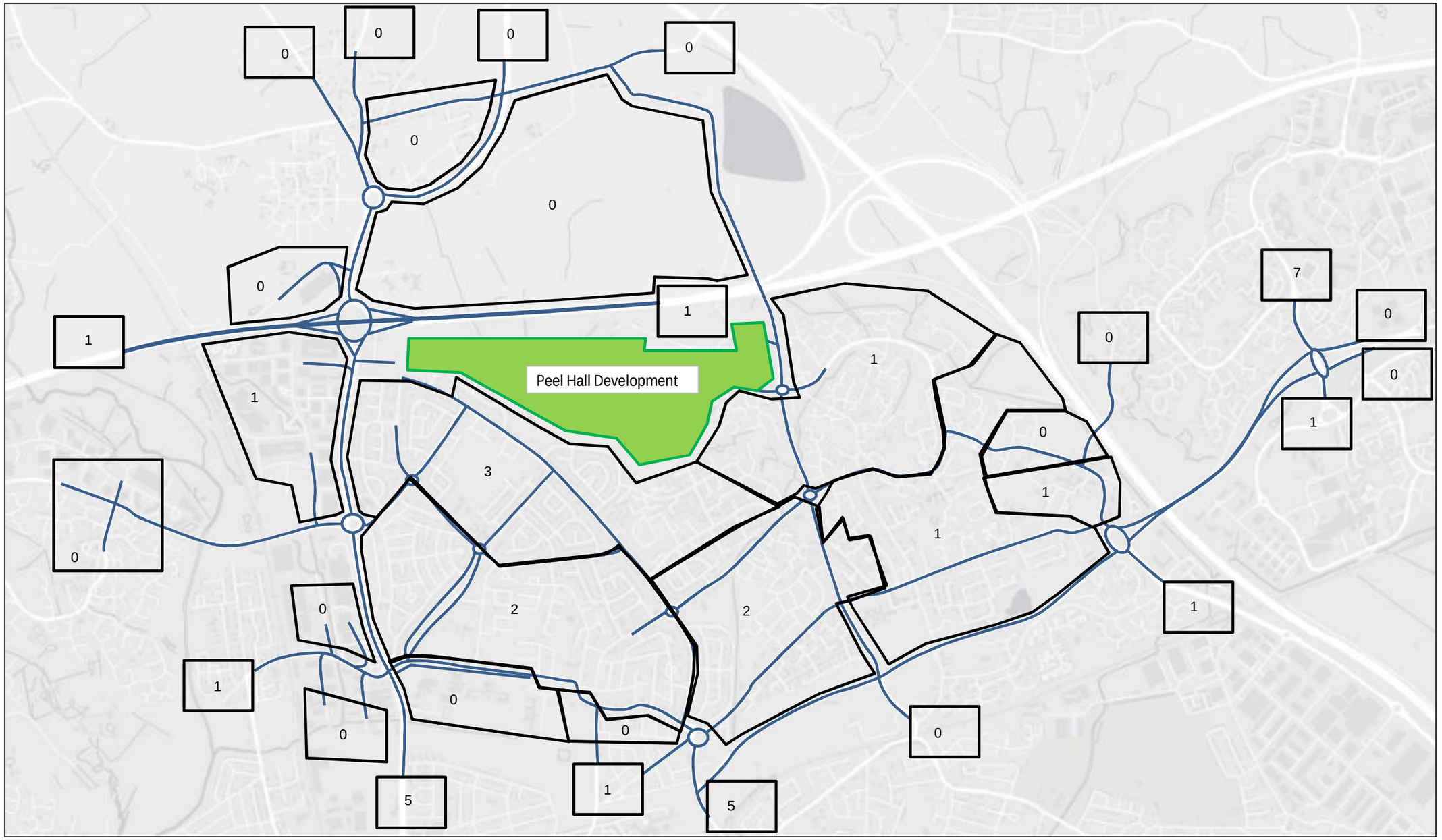
Appendix C
Total Proposed Trips per Time Period



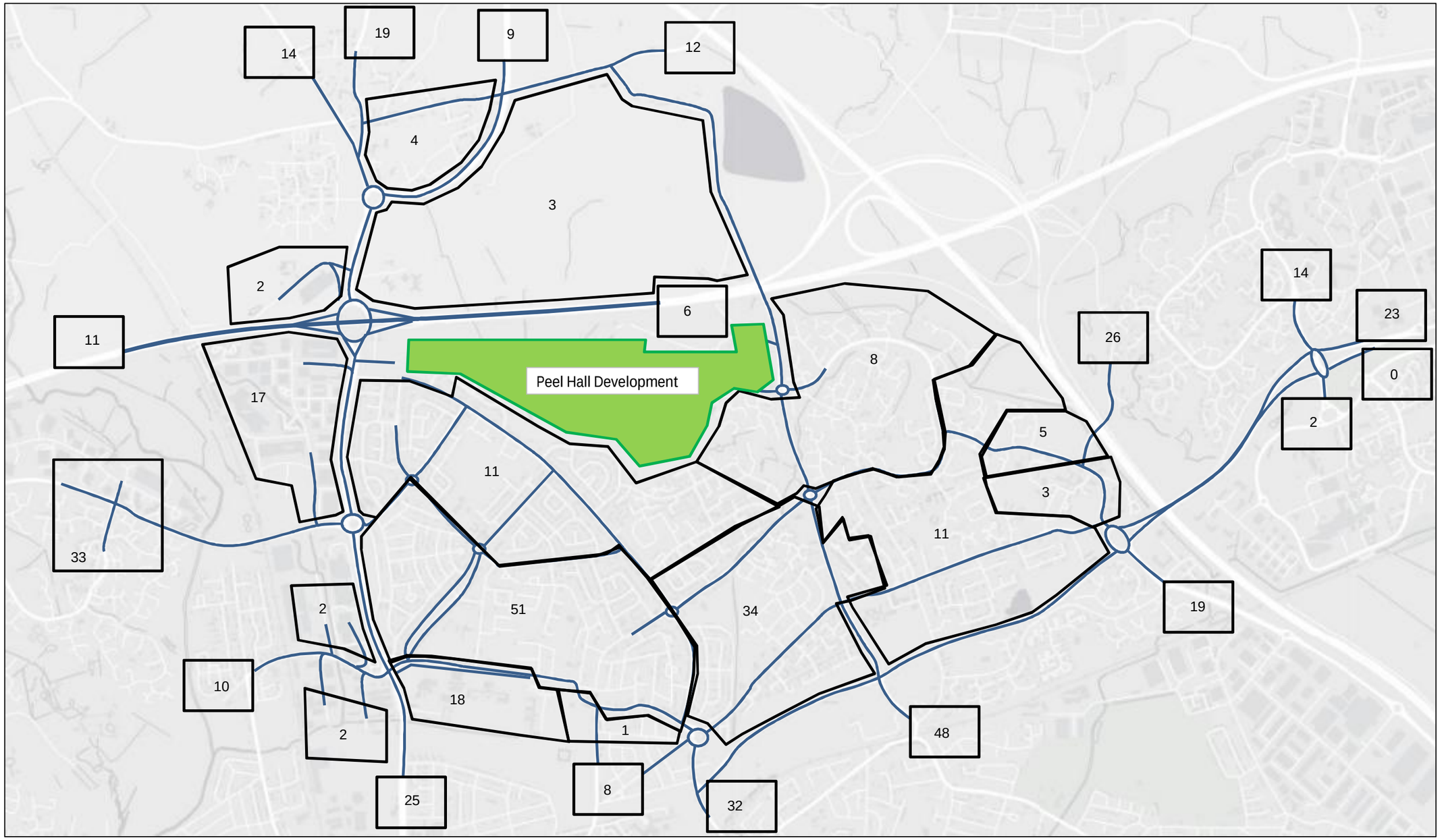
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 1, AM (0700-0800) Residential Trips from Peel Hall Development	AECOM



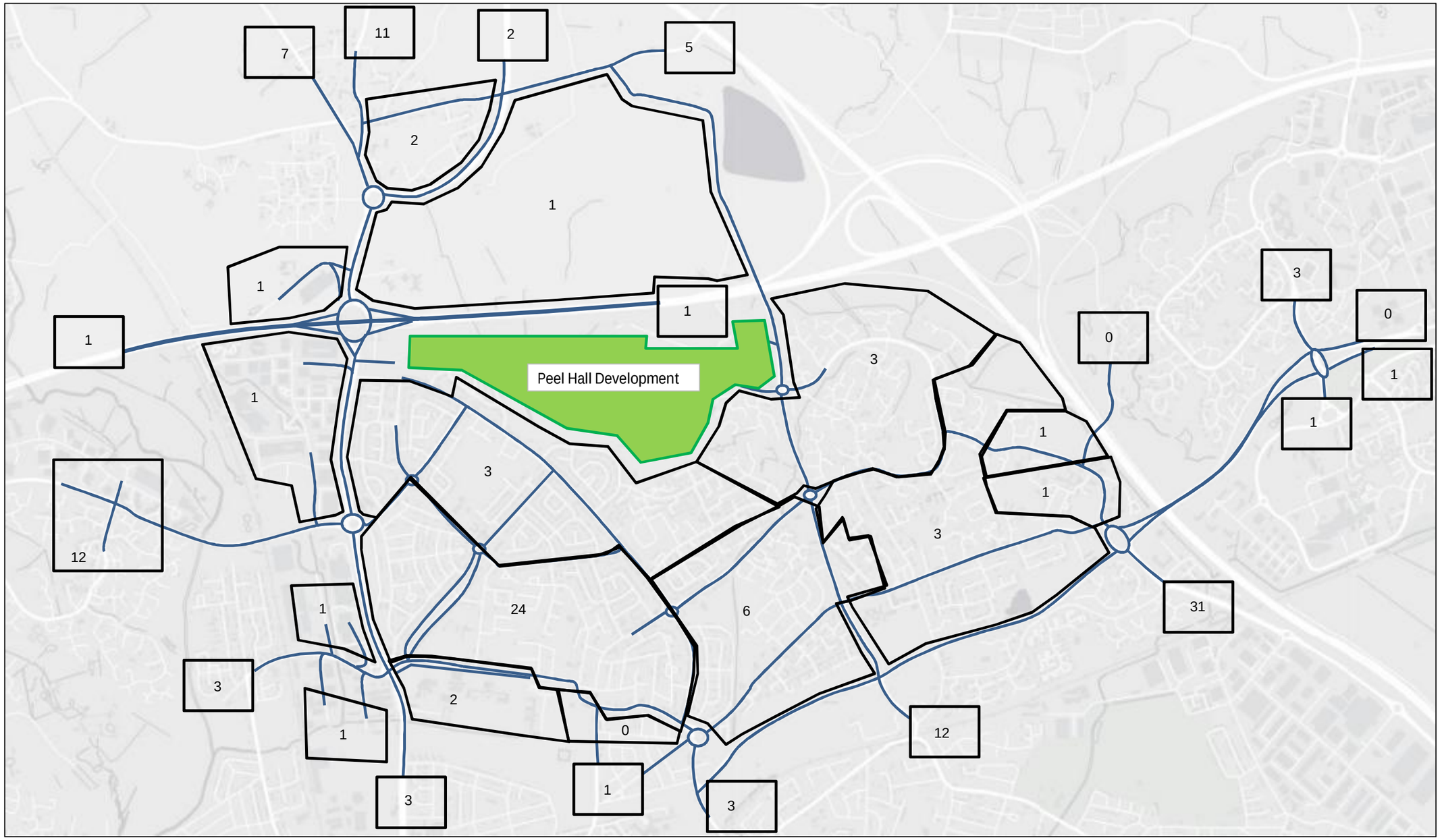
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 2, AM (0700-0800) Work Trips from Peel Hall Development	AECOM



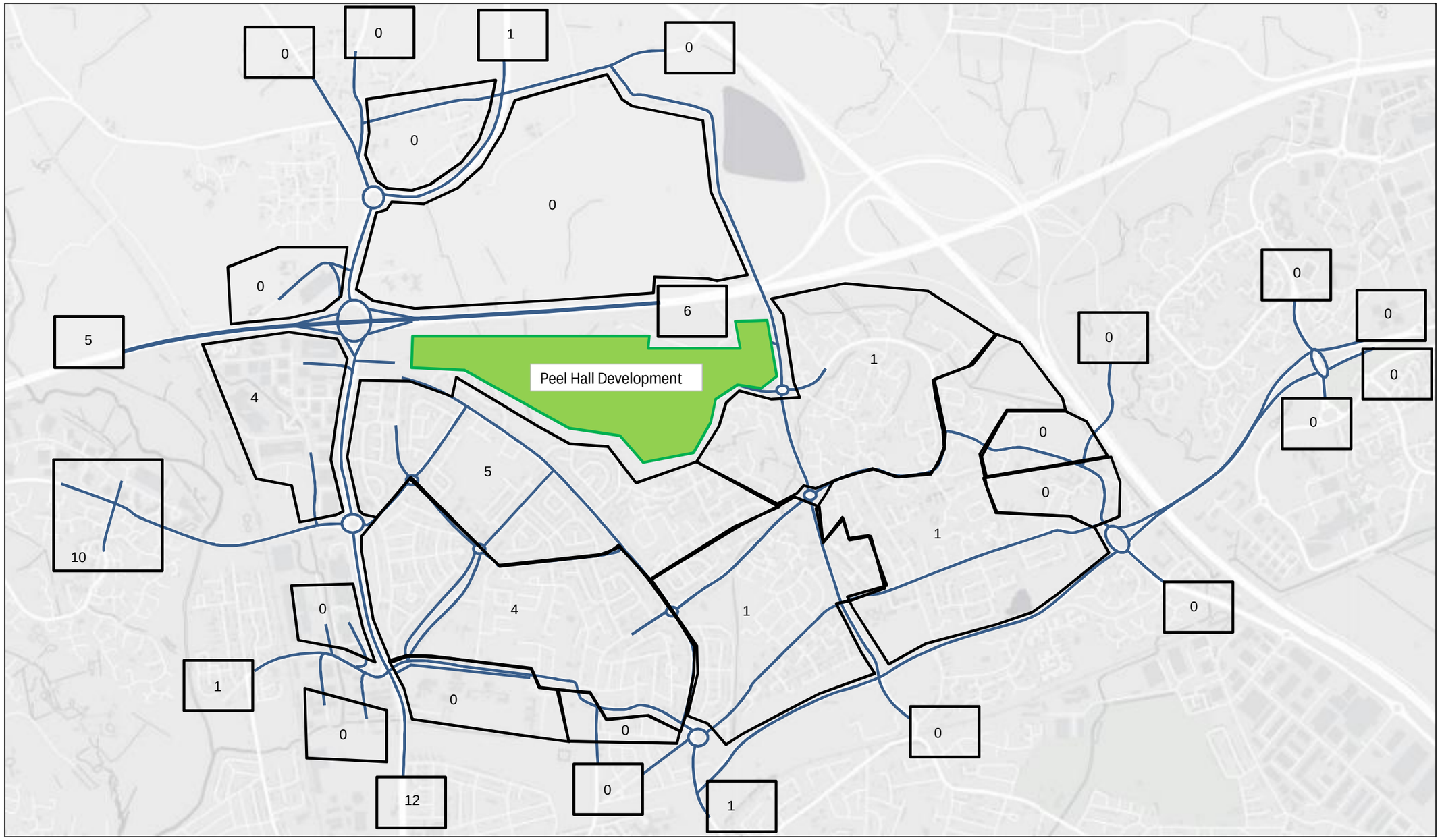
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 3, AM (0700-0800) Other Trips from Peel Hall Development	AECOM



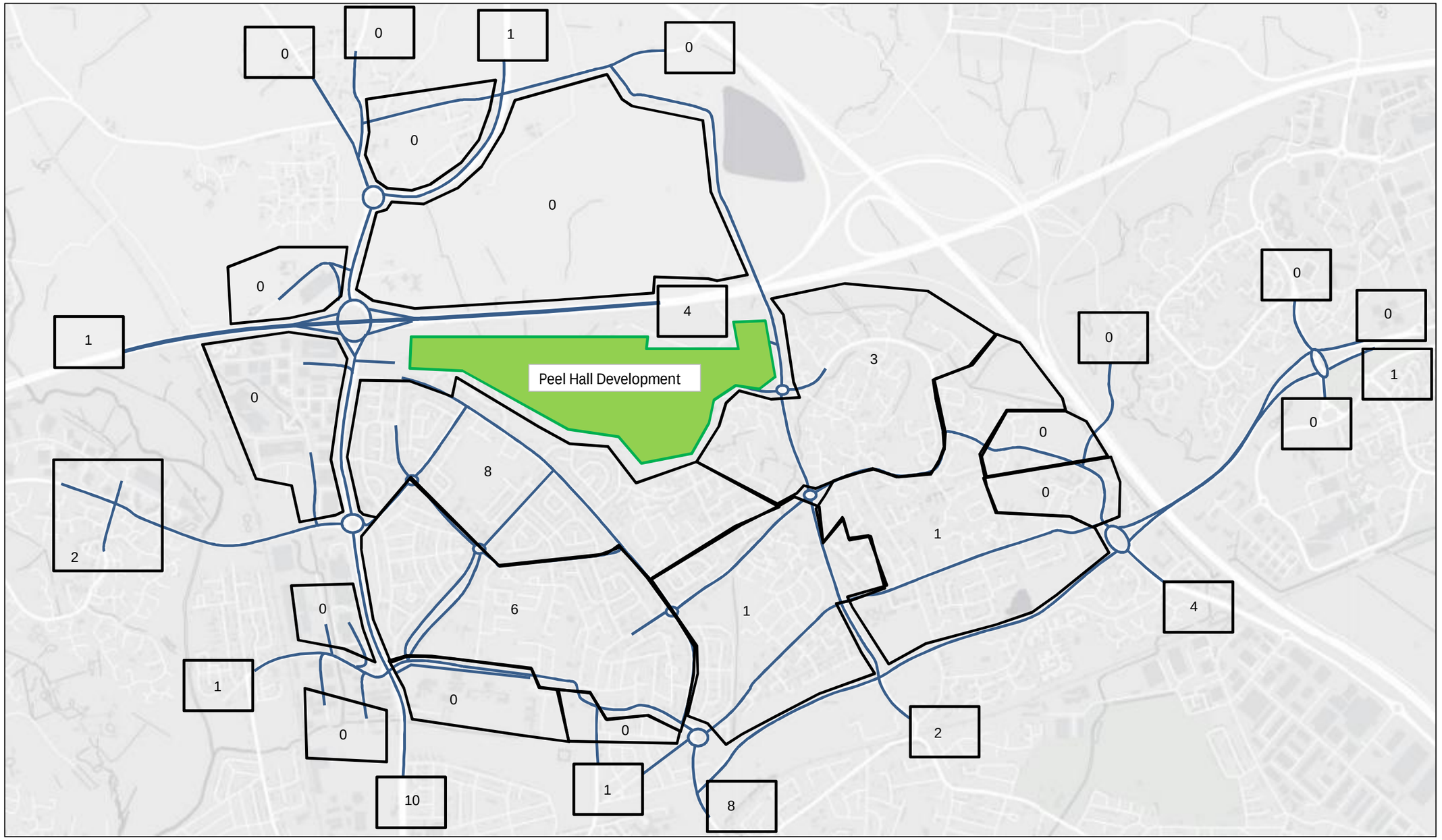
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 4, AM (0700-0800) Total Trips from Peel Hall Development	AECOM



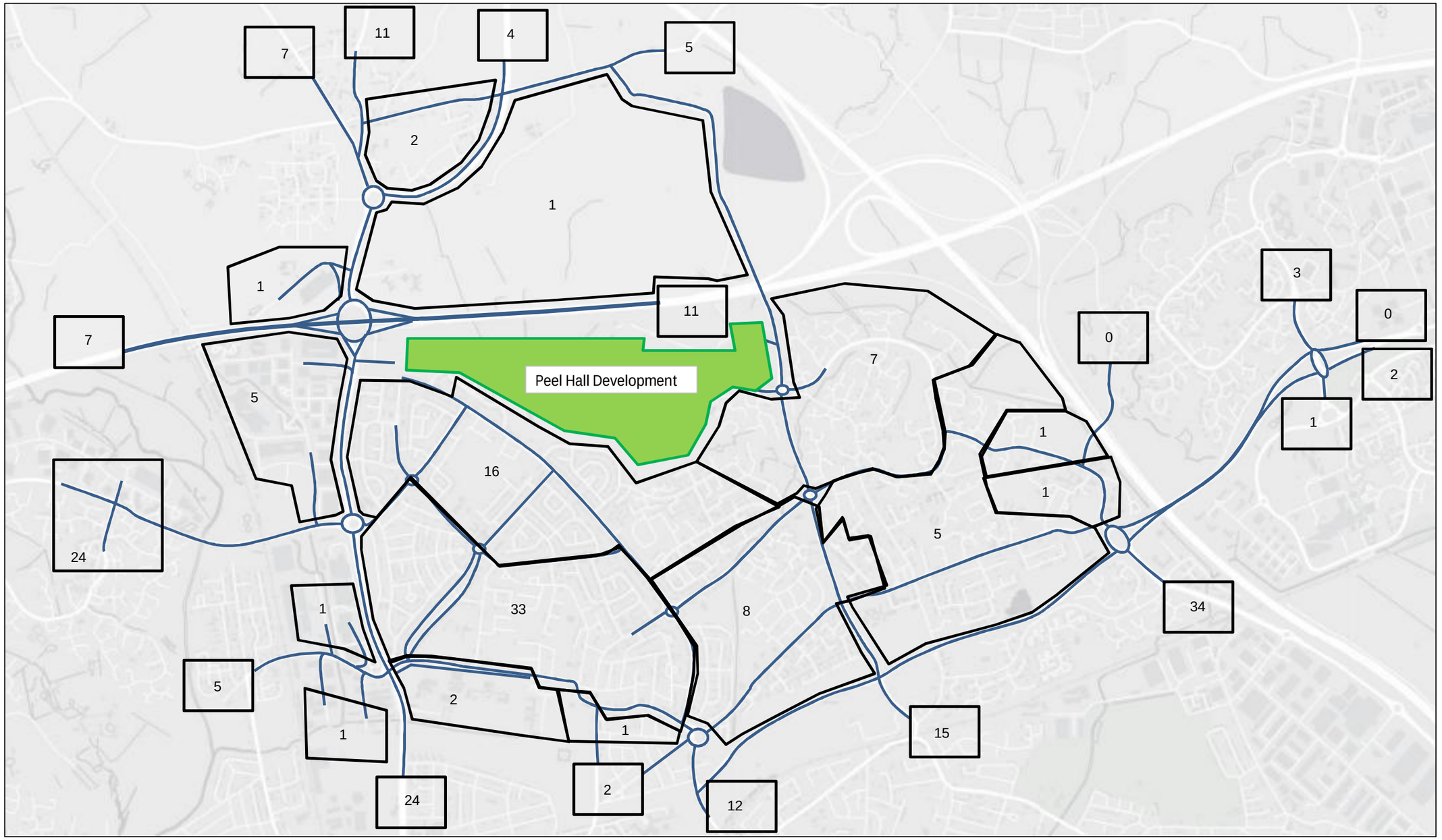
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 5, AM (0700-0800) Residential Trips to Peel Hall Development	AECOM



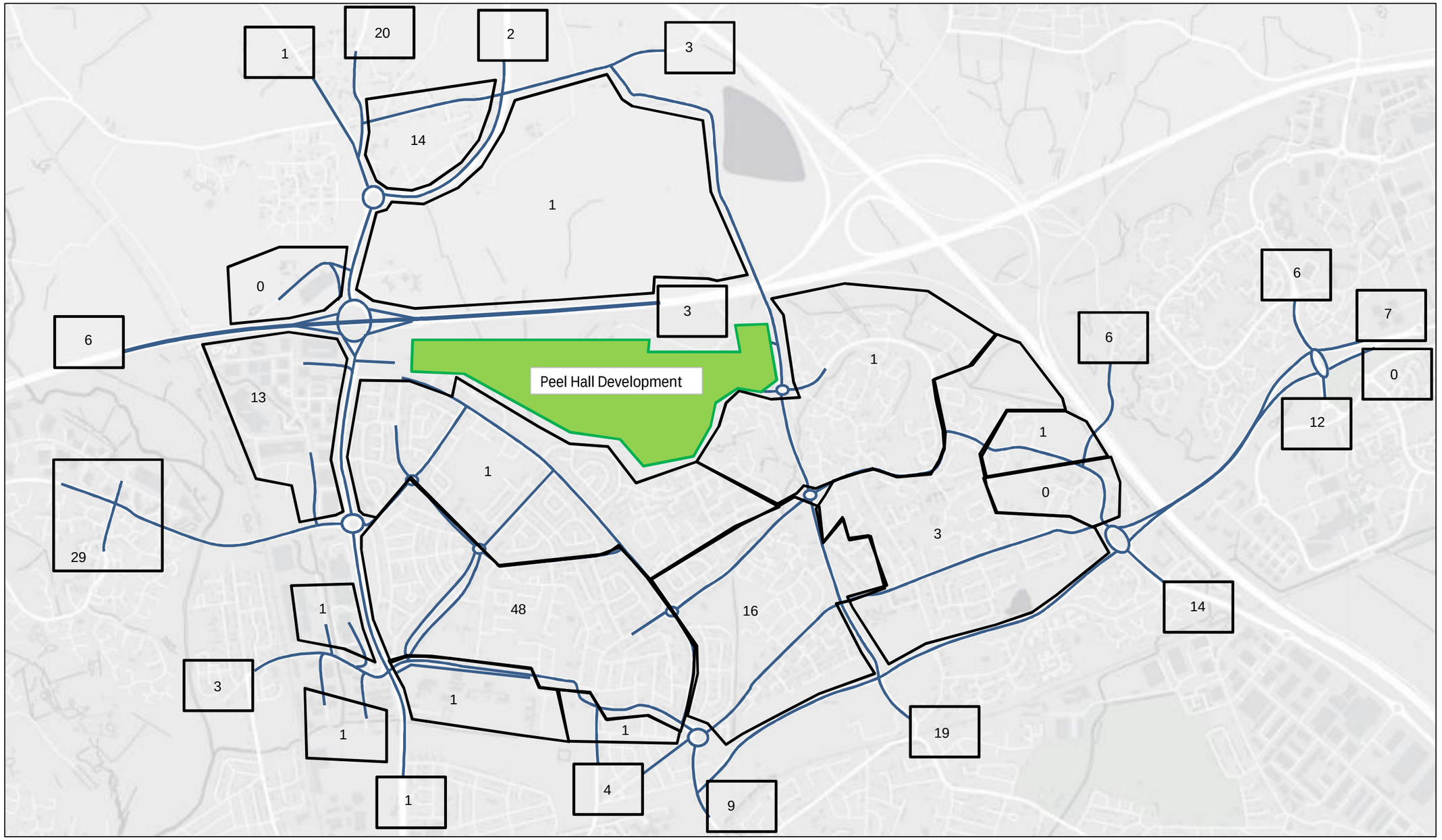
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 6, AM (0700-0800) Work Trips to Peel Hall Development	AECOM



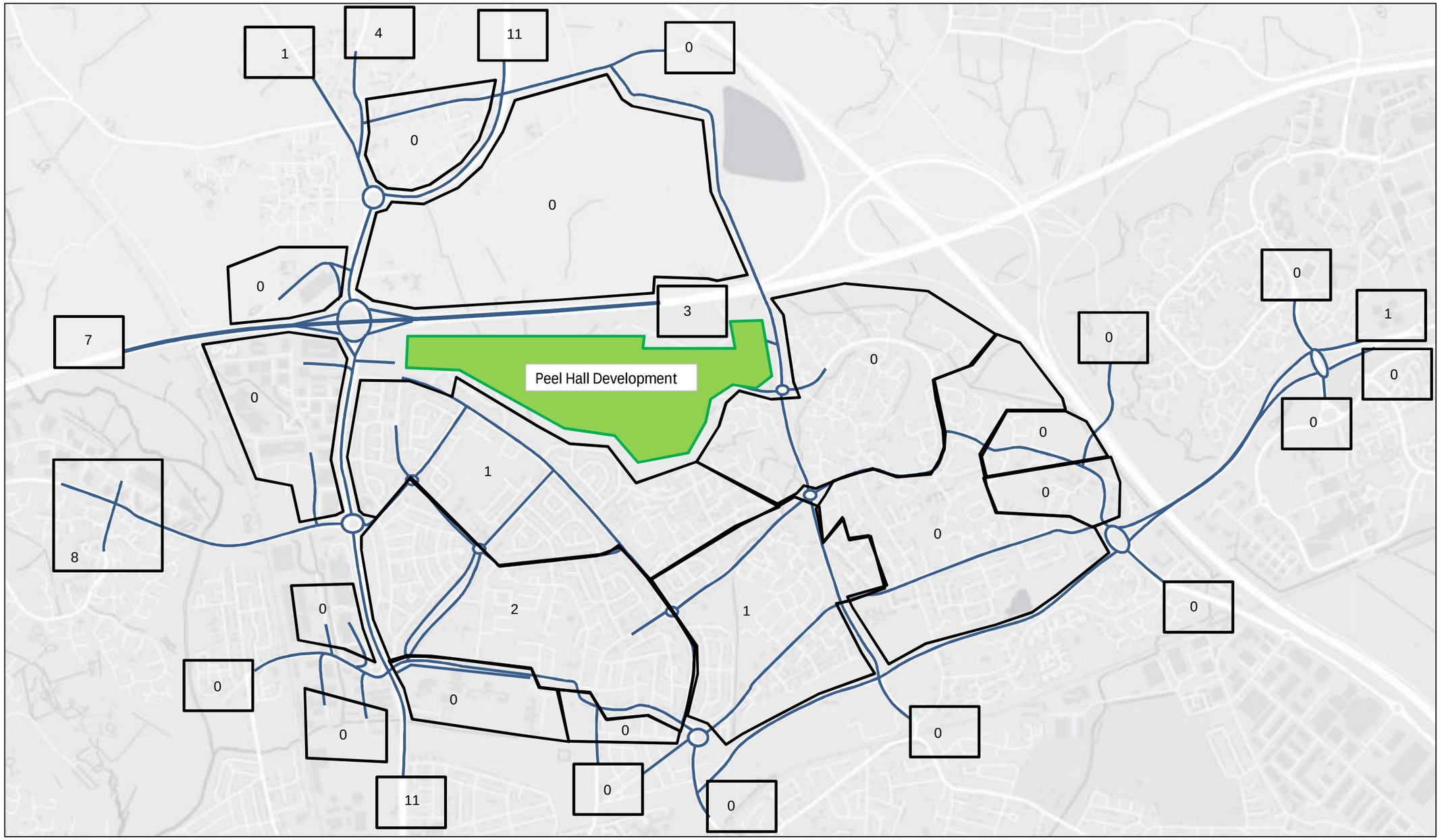
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 7, AM (0700-0800) Other Trips to Peel Hall Development	AECOM



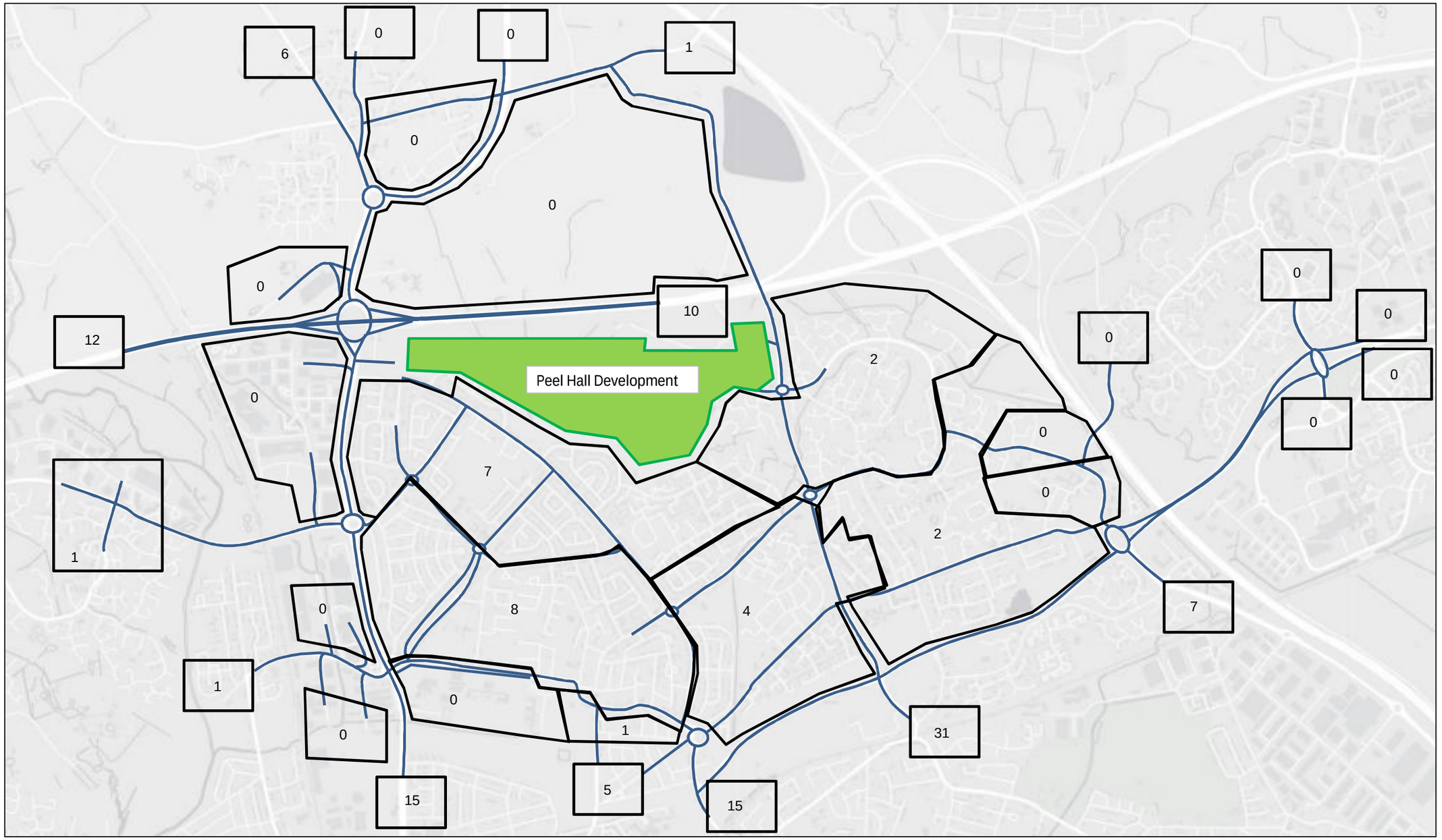
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 8, AM (0700-0800) Total Trips to Peel Hall Development	AECOM



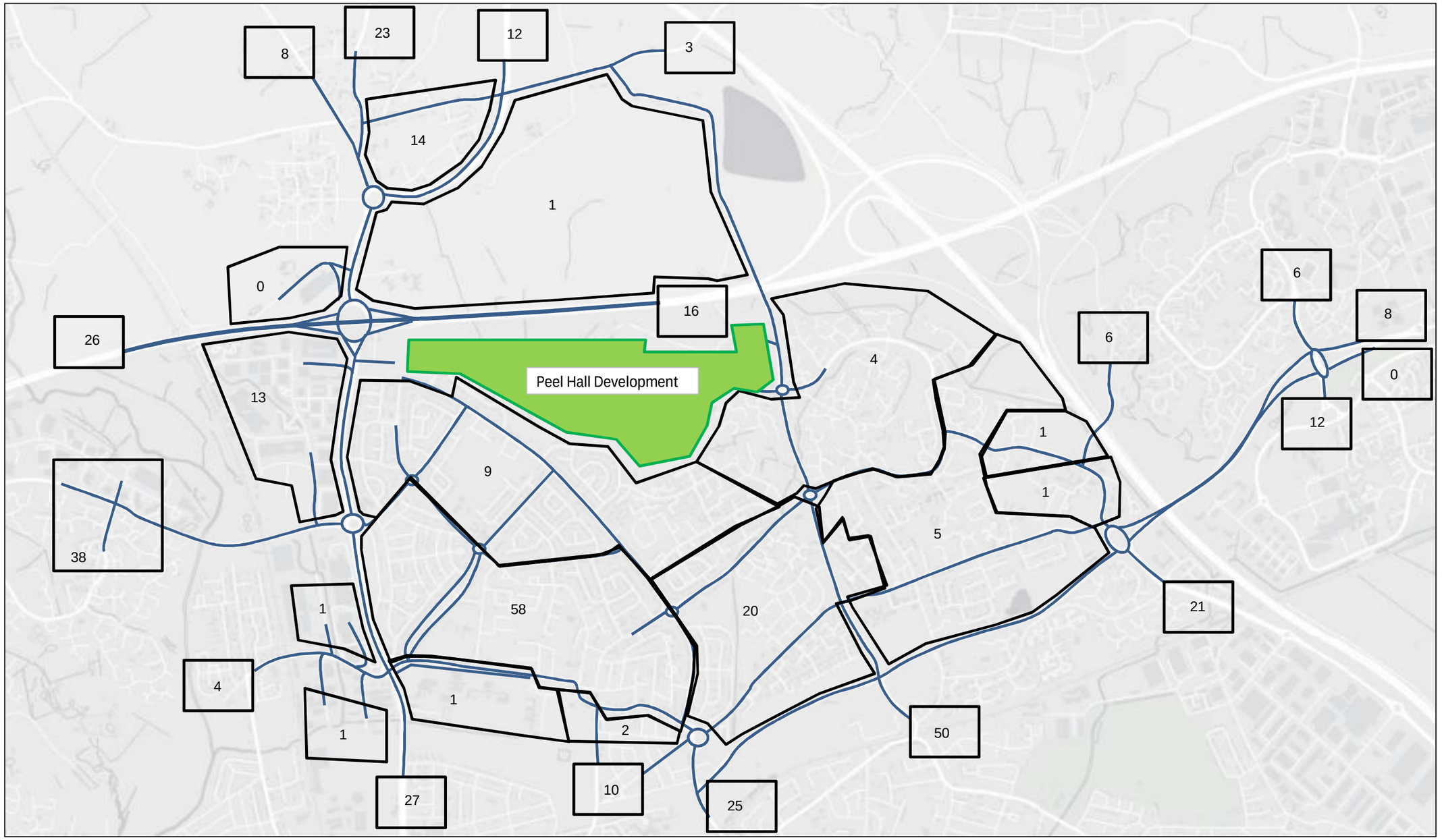
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 9, PM (1600-1700) Residential Trips from Peel Hall Development	AECOM



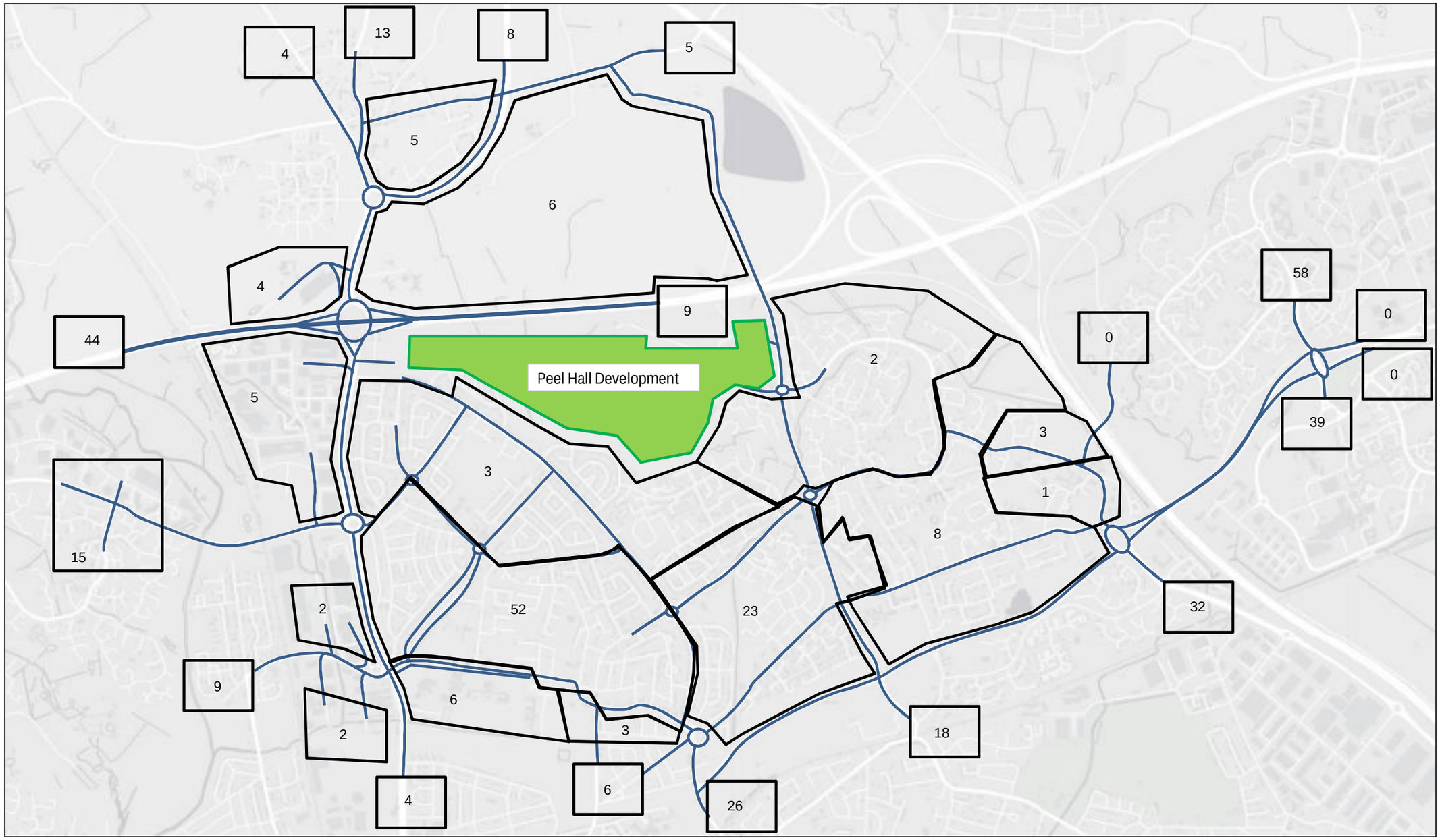
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 10, PM (1600-1700) Work Trips from Peel Hall Development	AECOM



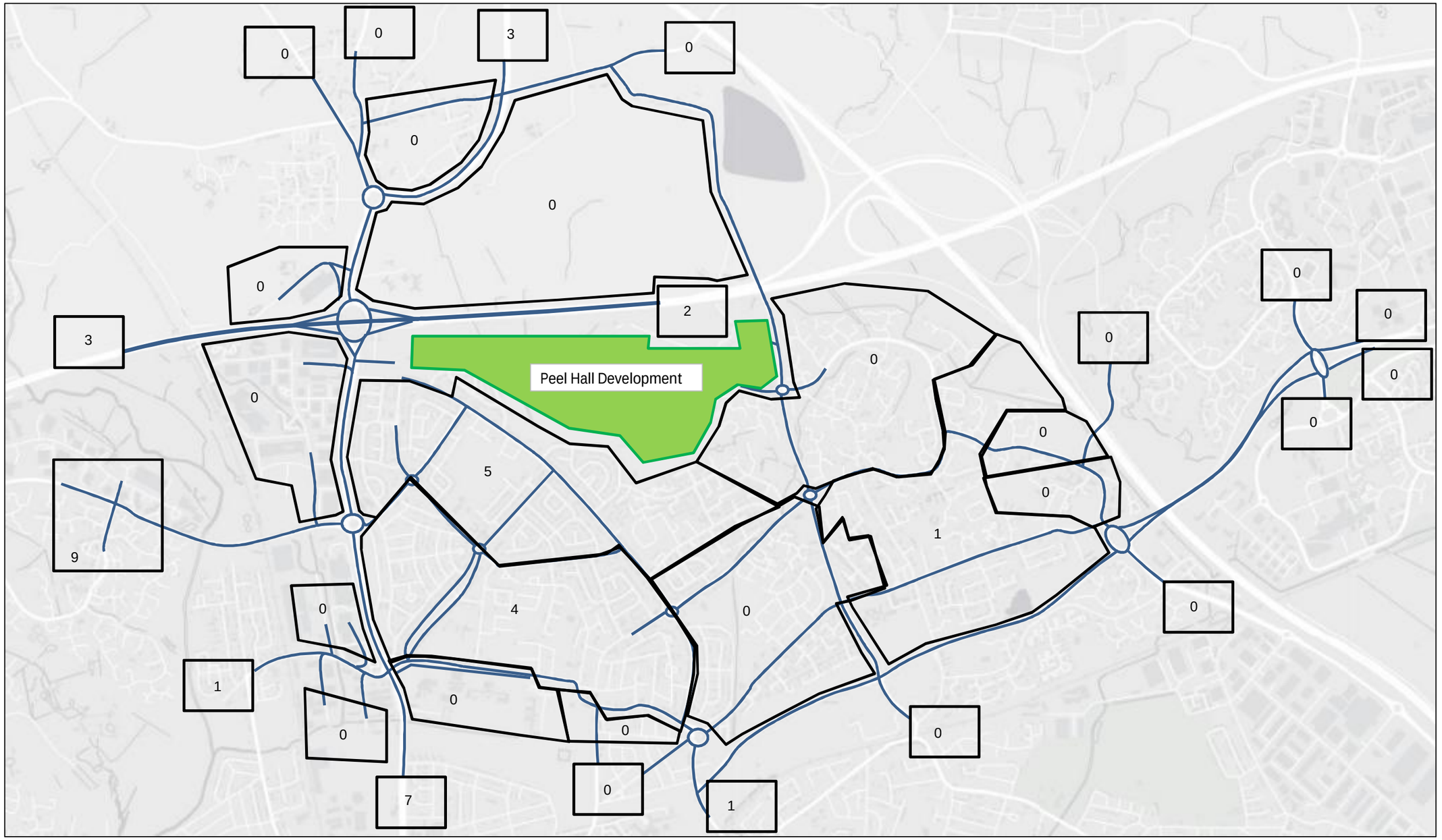
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 11, PM (1600-1700) Other Trips from Peel Hall Development	AECOM



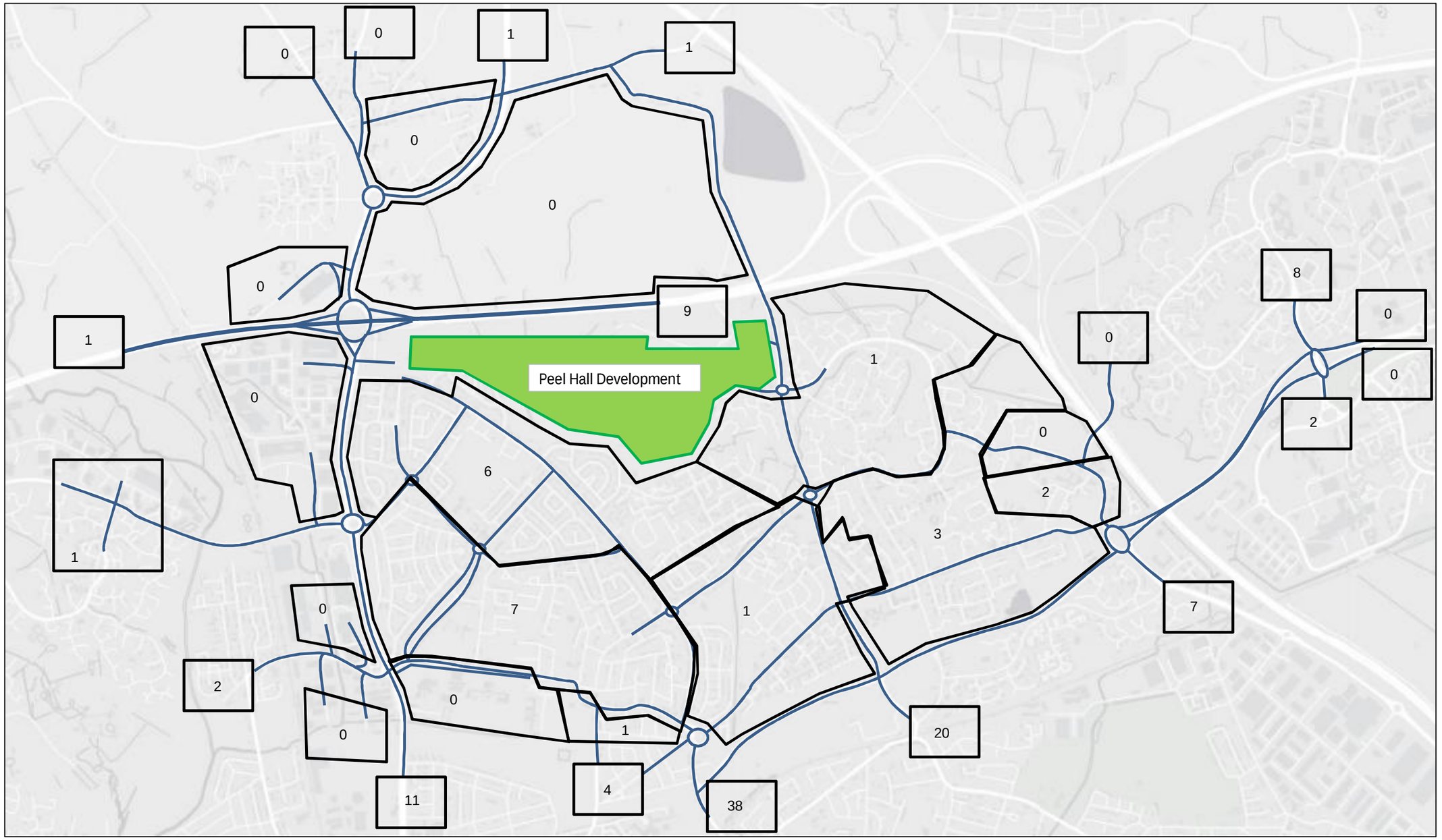
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 12, PM (1600-1700) Total Trips from Peel Hall Development	AECOM



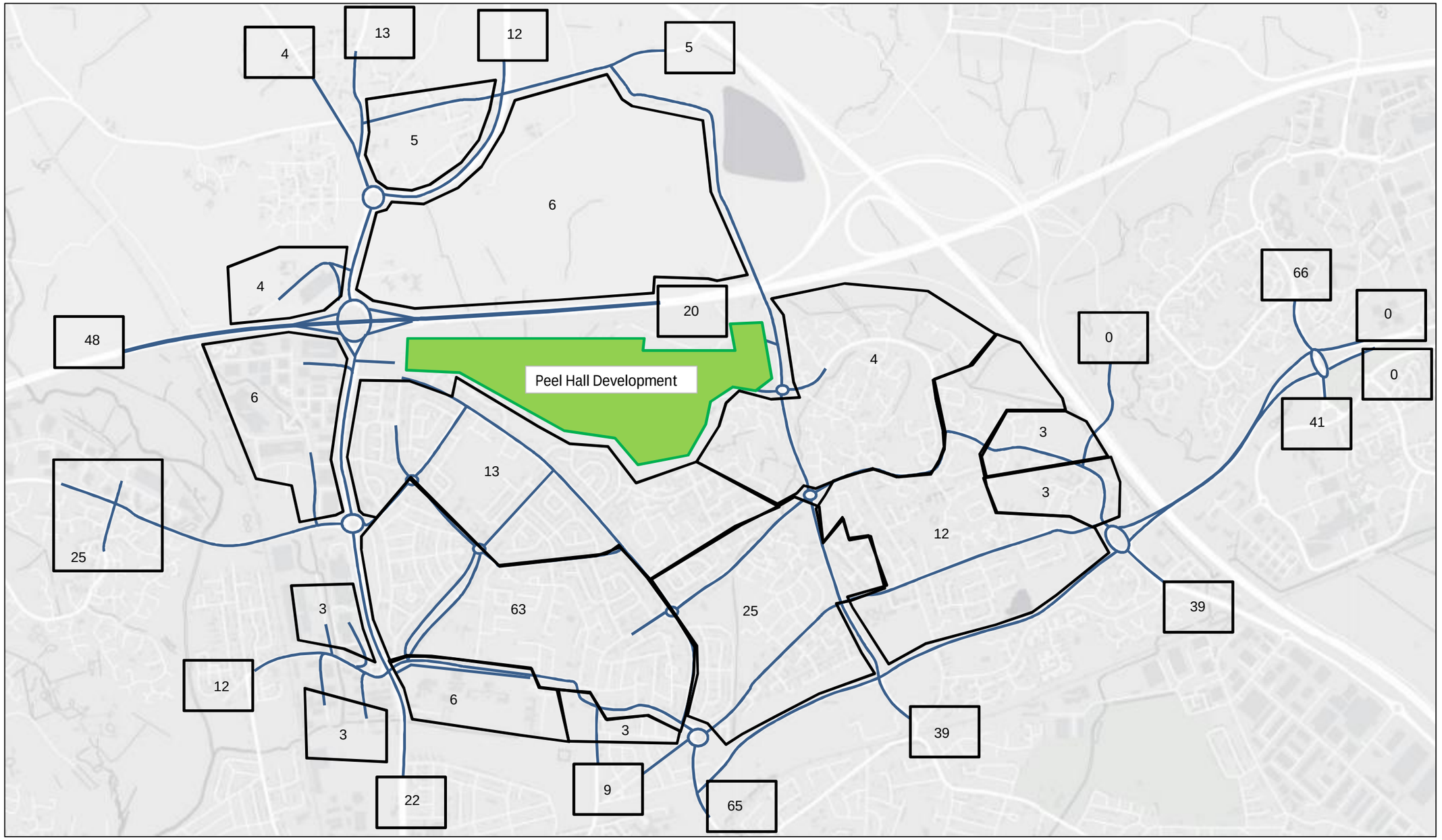
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 13, PM (1600-1700) Residential Trips to Peel Hall Development	AECOM



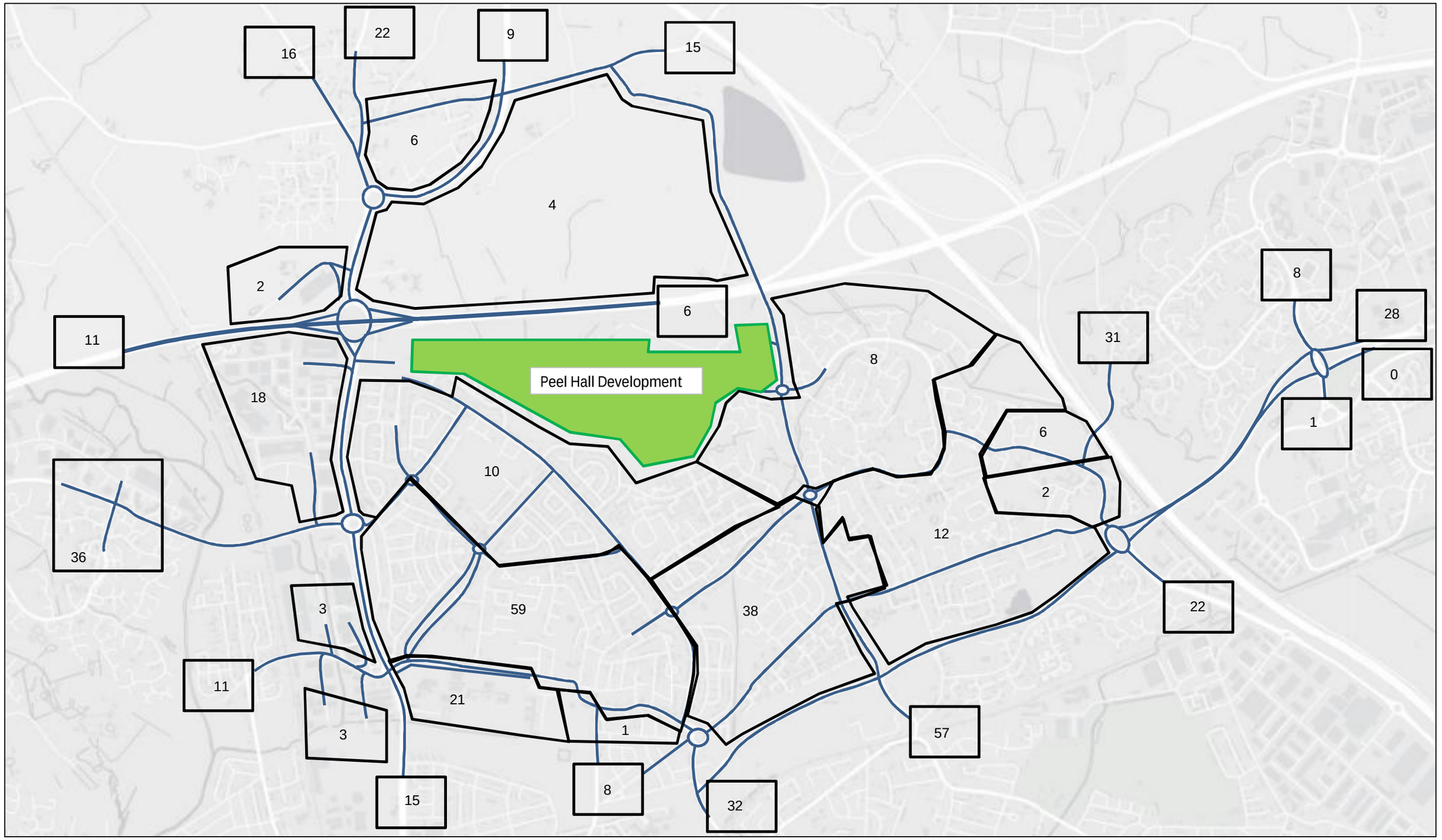
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 14, PM (1600-1700) Work Trips to Peel Hall Development	AECOM



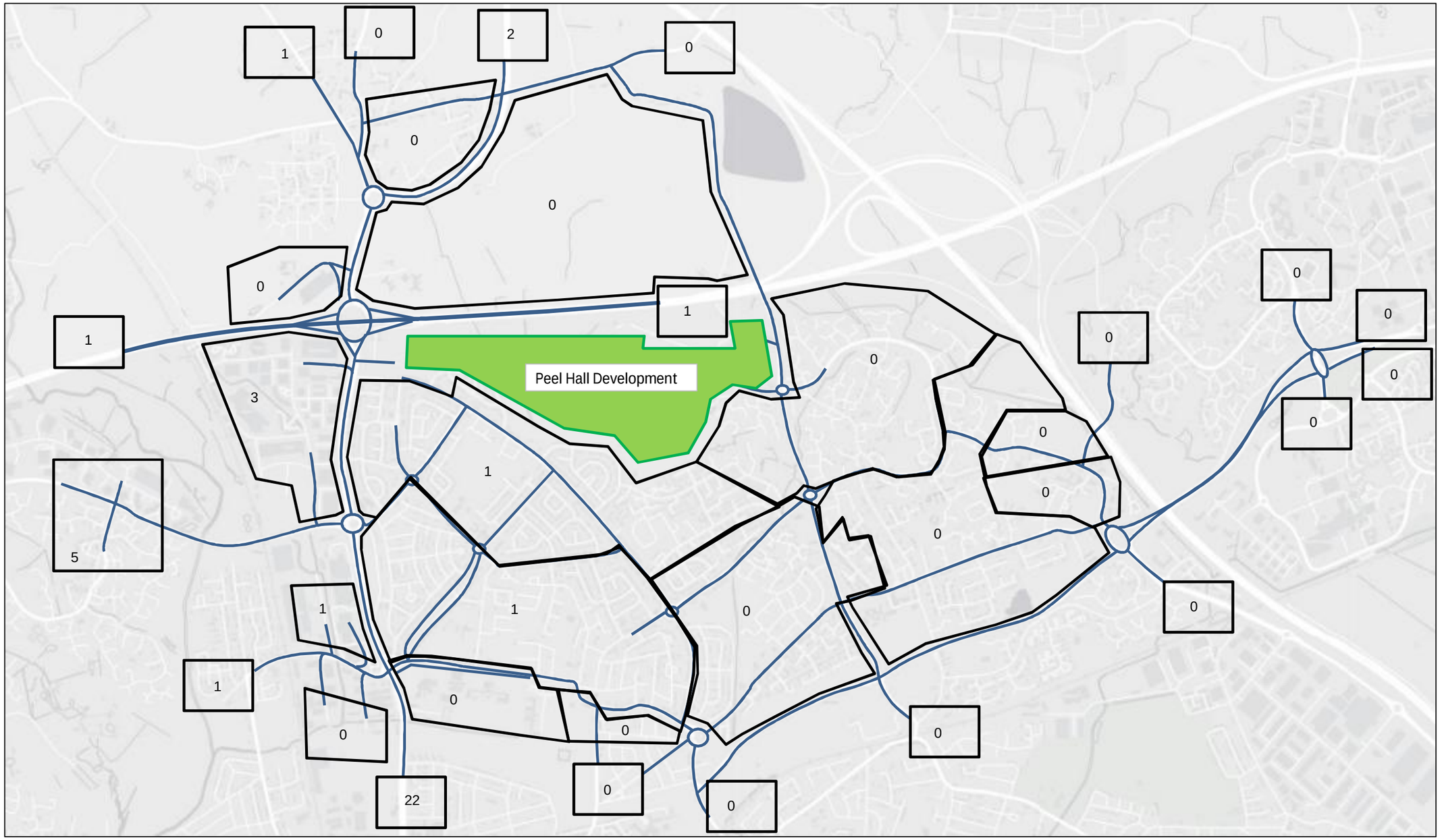
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 15, PM (1600-1700) Other Trips to Peel Hall Development	AECOM



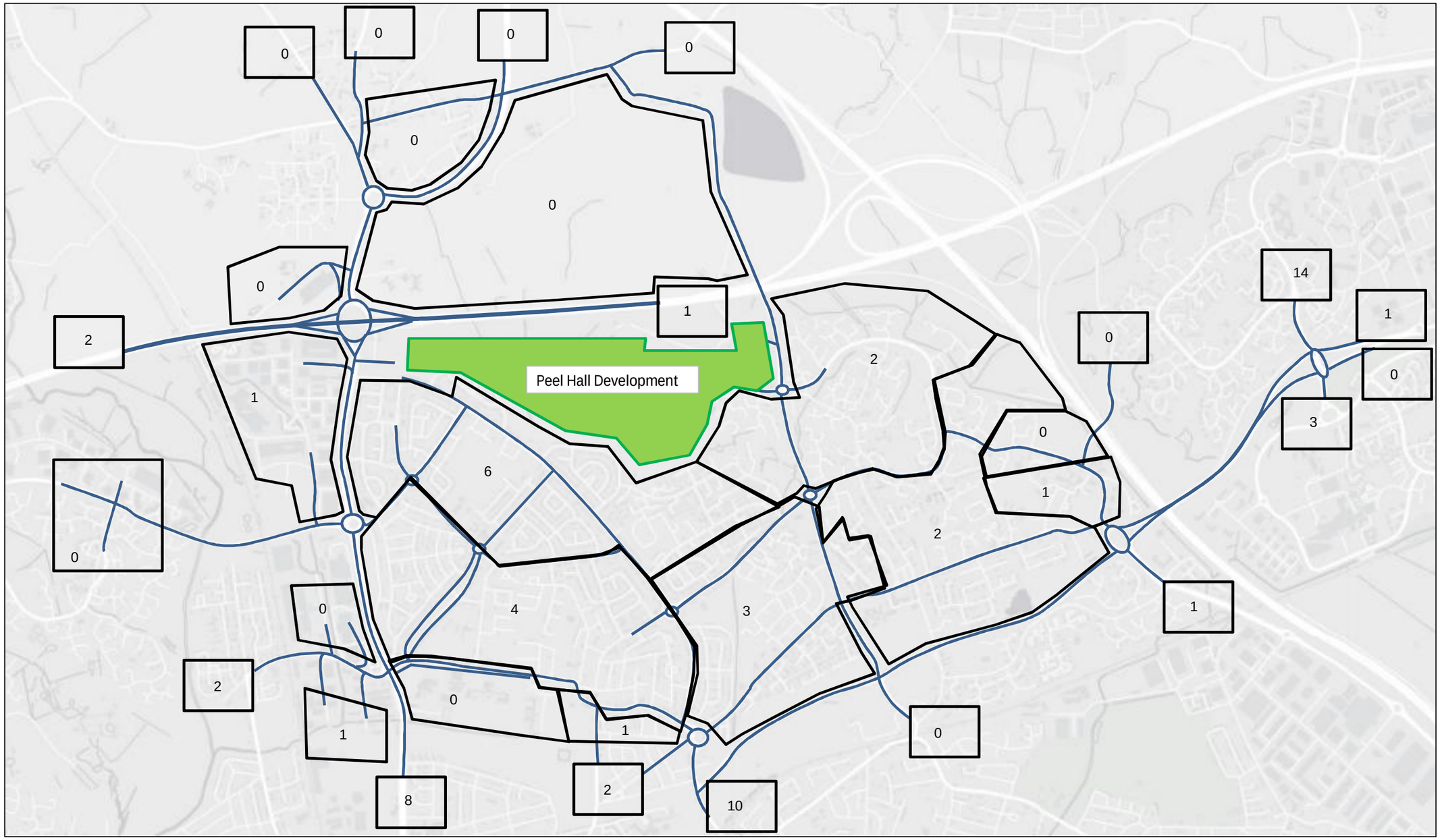
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 16, PM (1600-1700) Total Trips to Peel Hall Development	AECOM



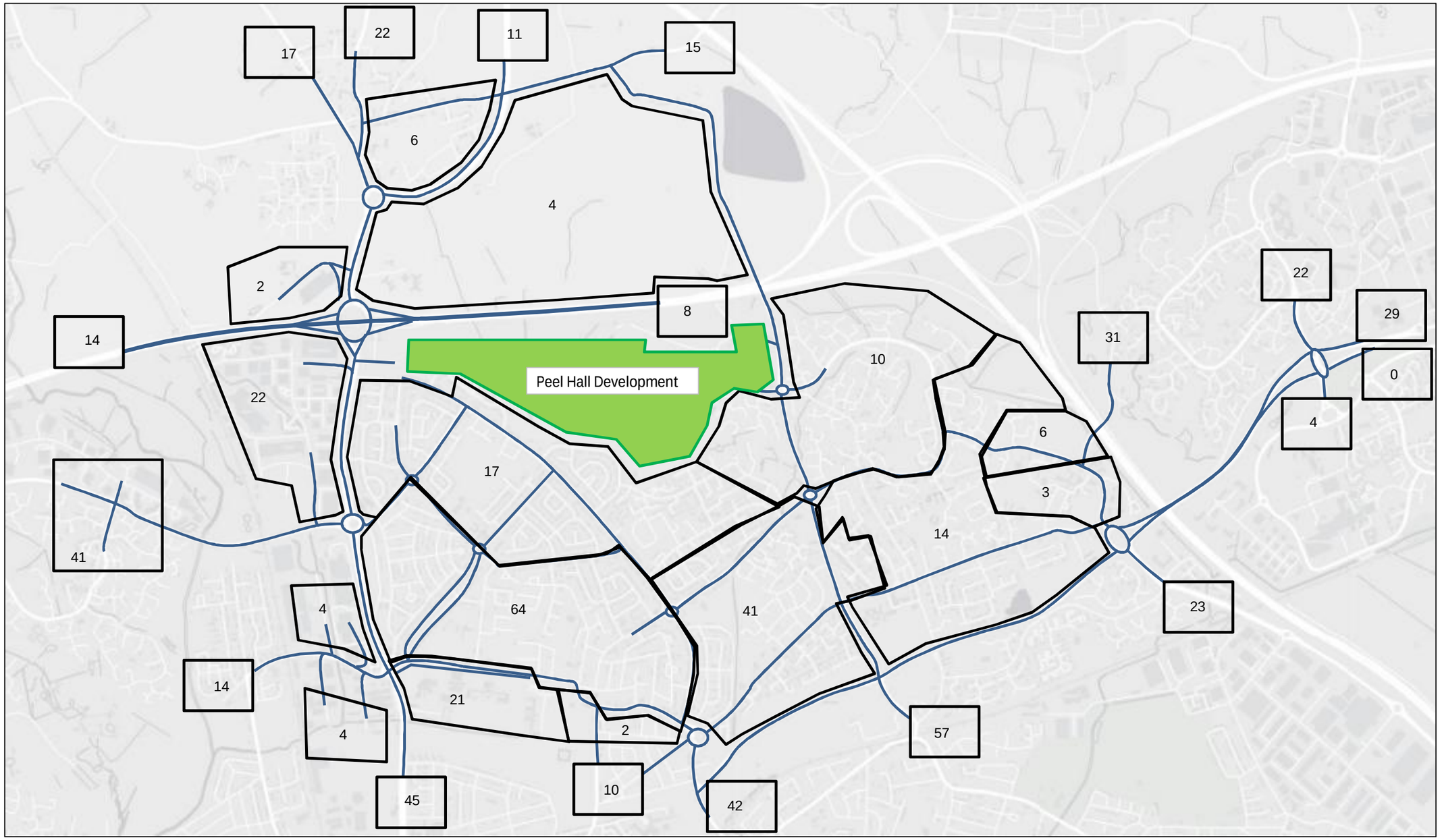
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 17, AM (0800-0900) Residential Trips from Peel Hall Development	AECOM



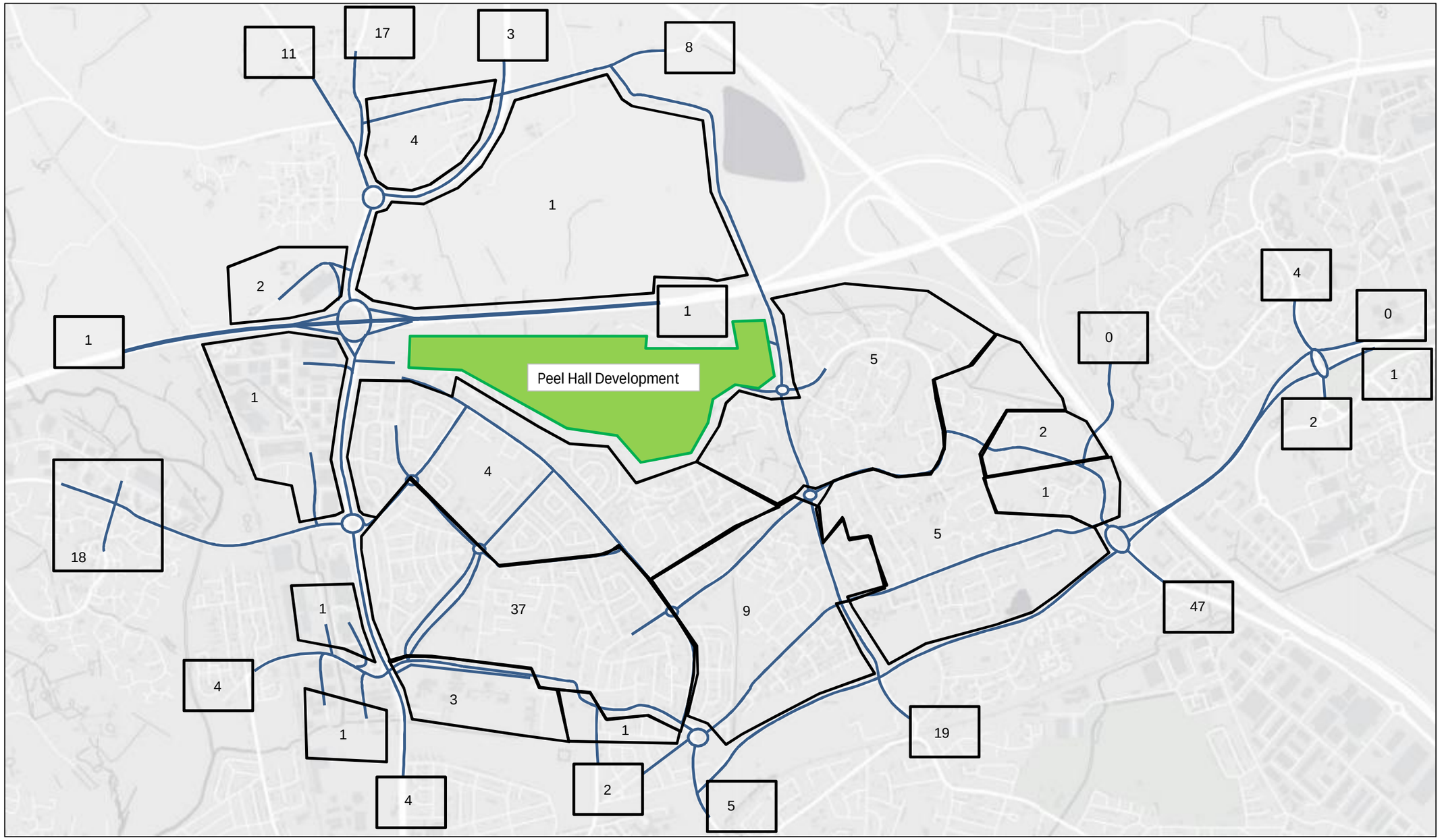
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 18, AM (0800-0900) Work Trips from Peel Hall Development	AECOM



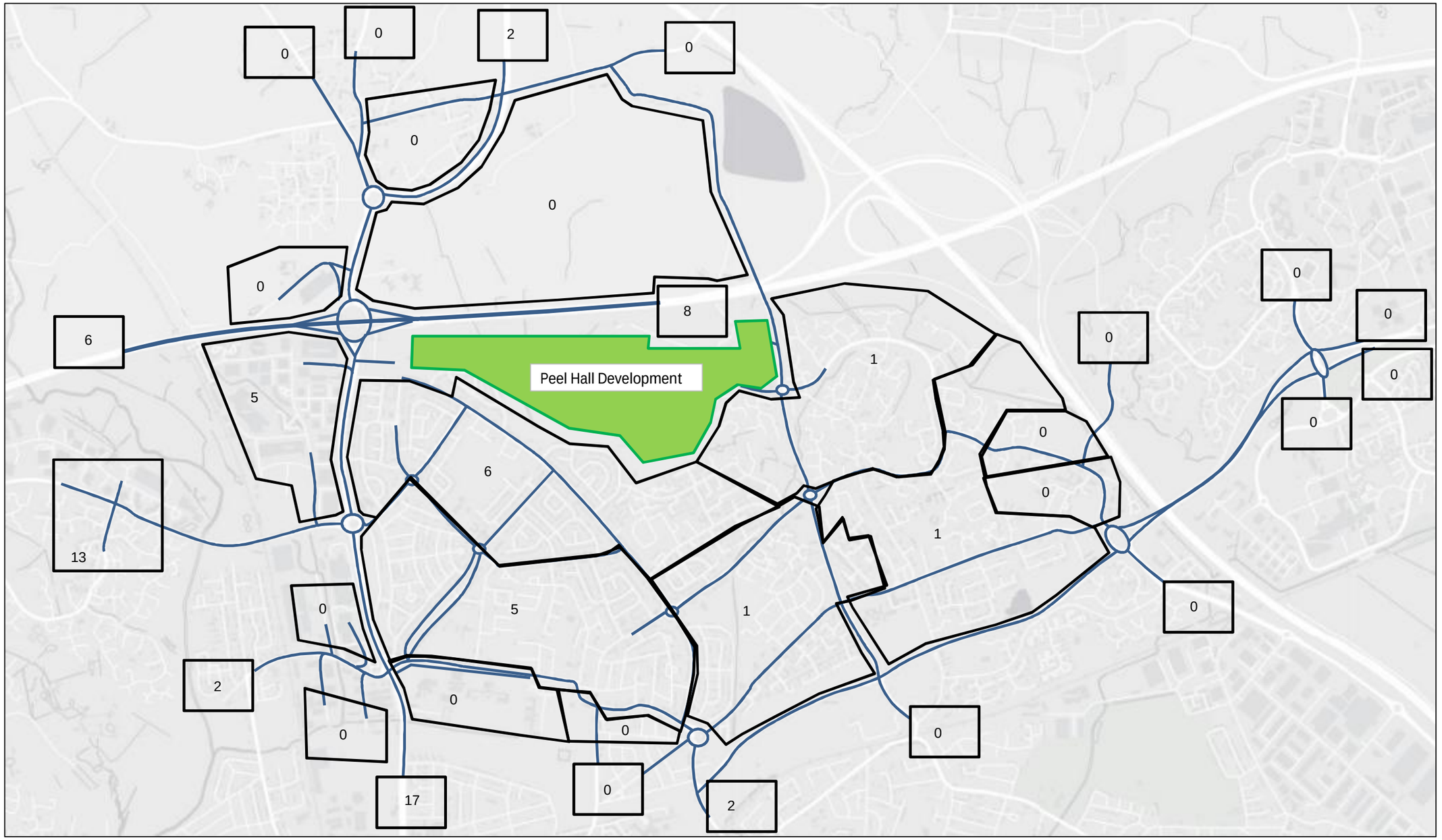
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 19, AM (0800-0900) Other Trips from Peel Hall Development	AECOM



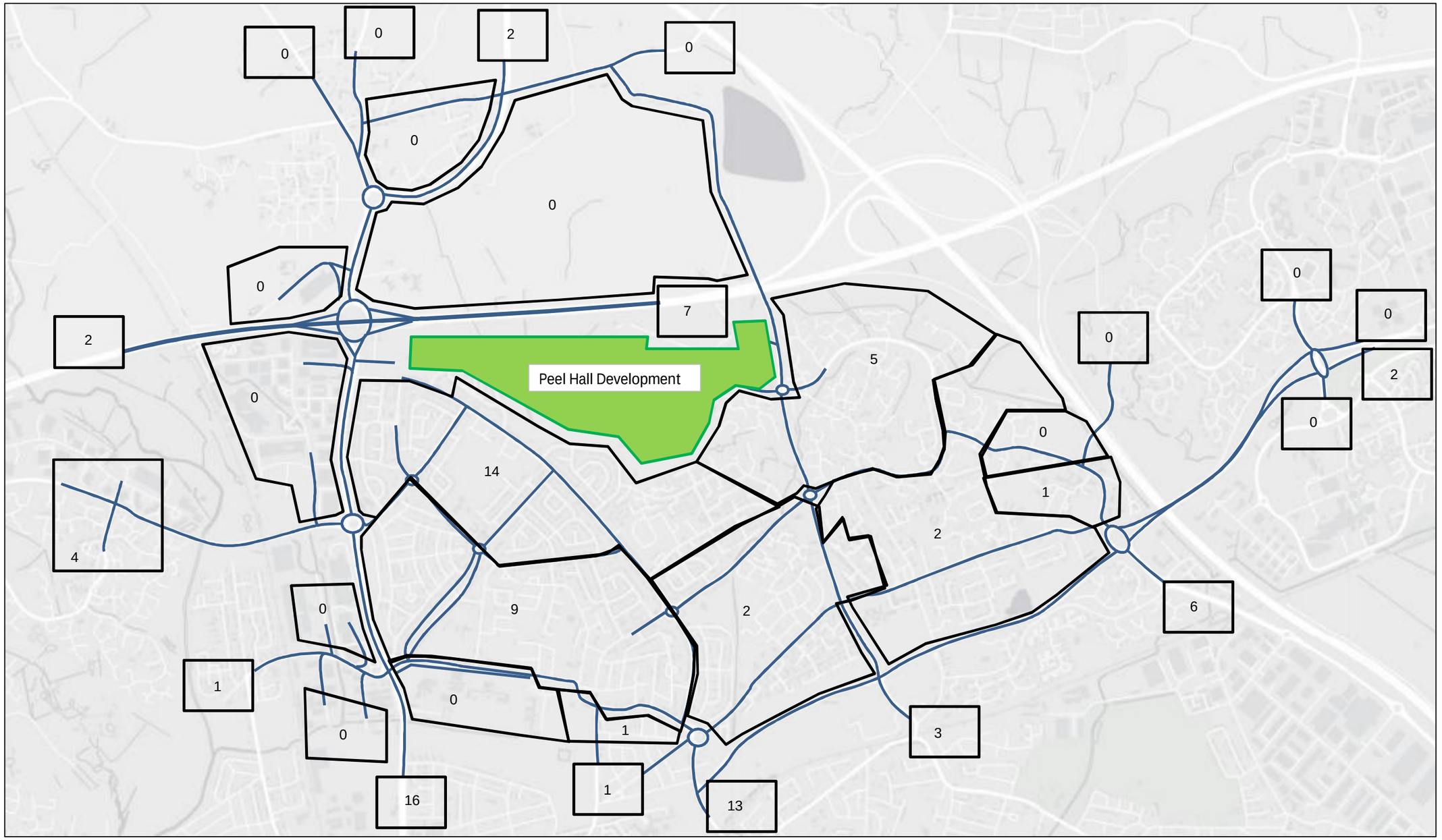
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 20, AM (0800-0900) Total Trips from Peel Hall Development	AECOM



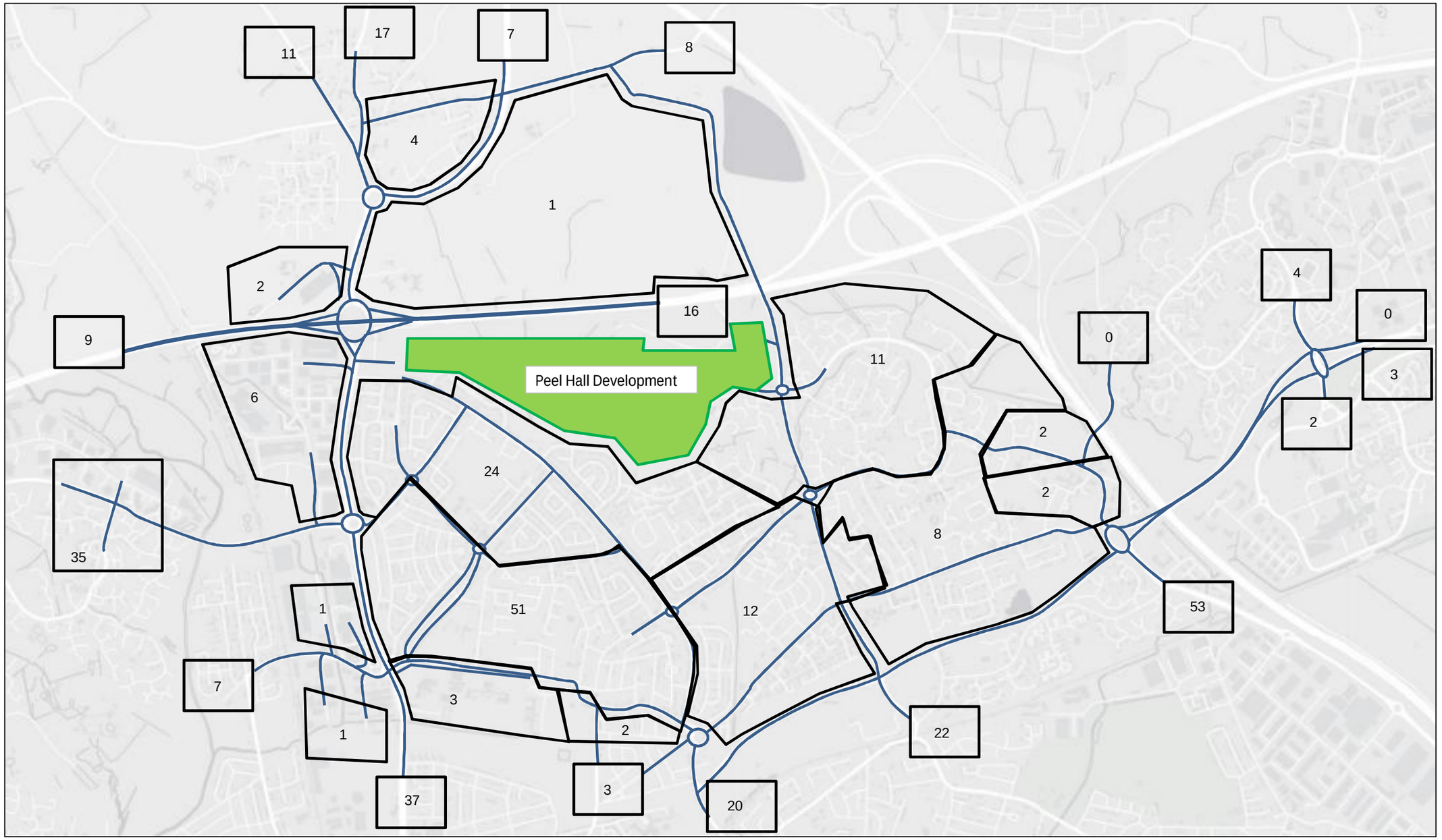
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 21, AM (0800-0900) Residential Trips to Peel Hall Development	AECOM



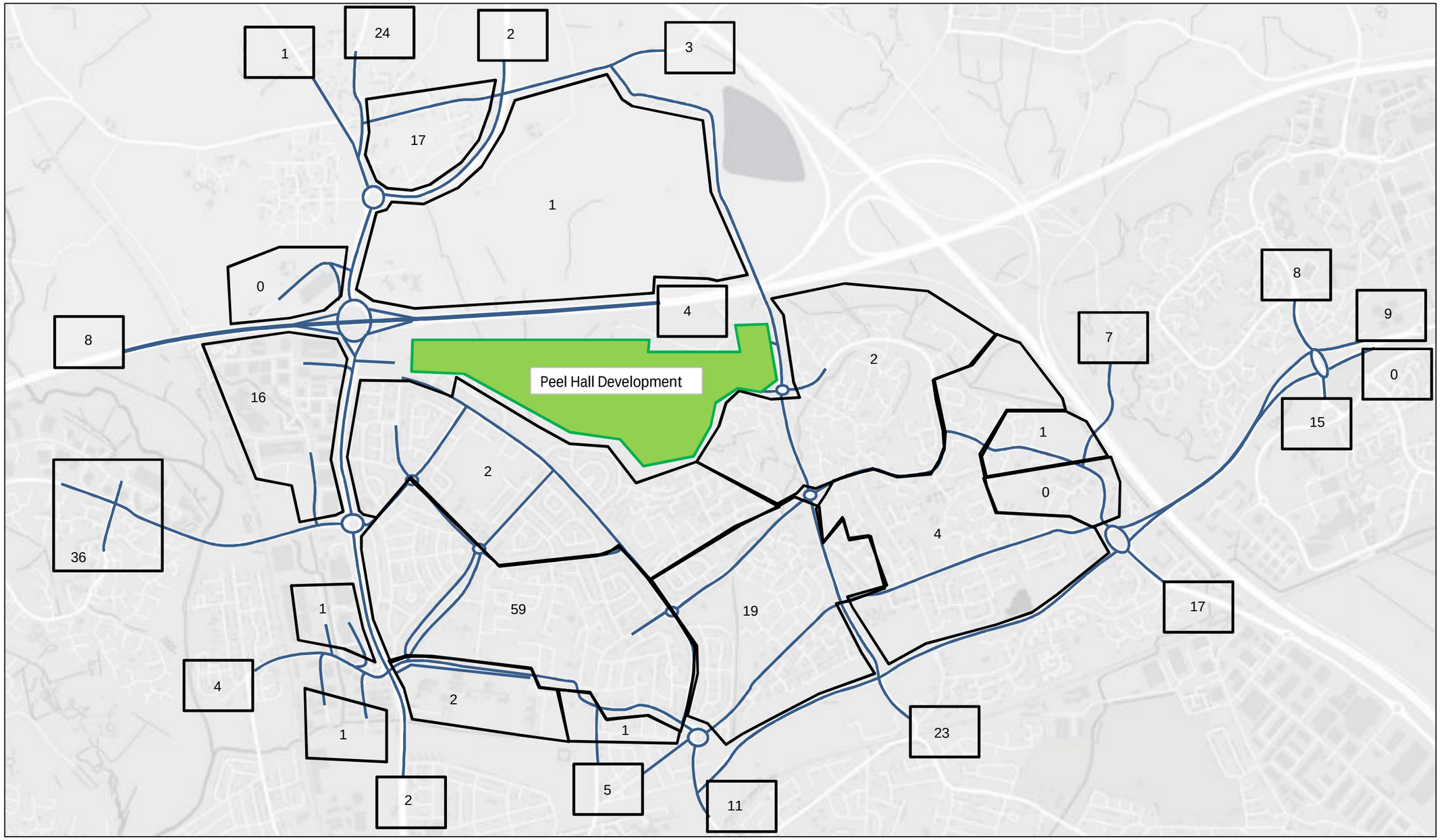
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 22, AM (0800-0900) Work Trips to Peel Hall Development	AECOM



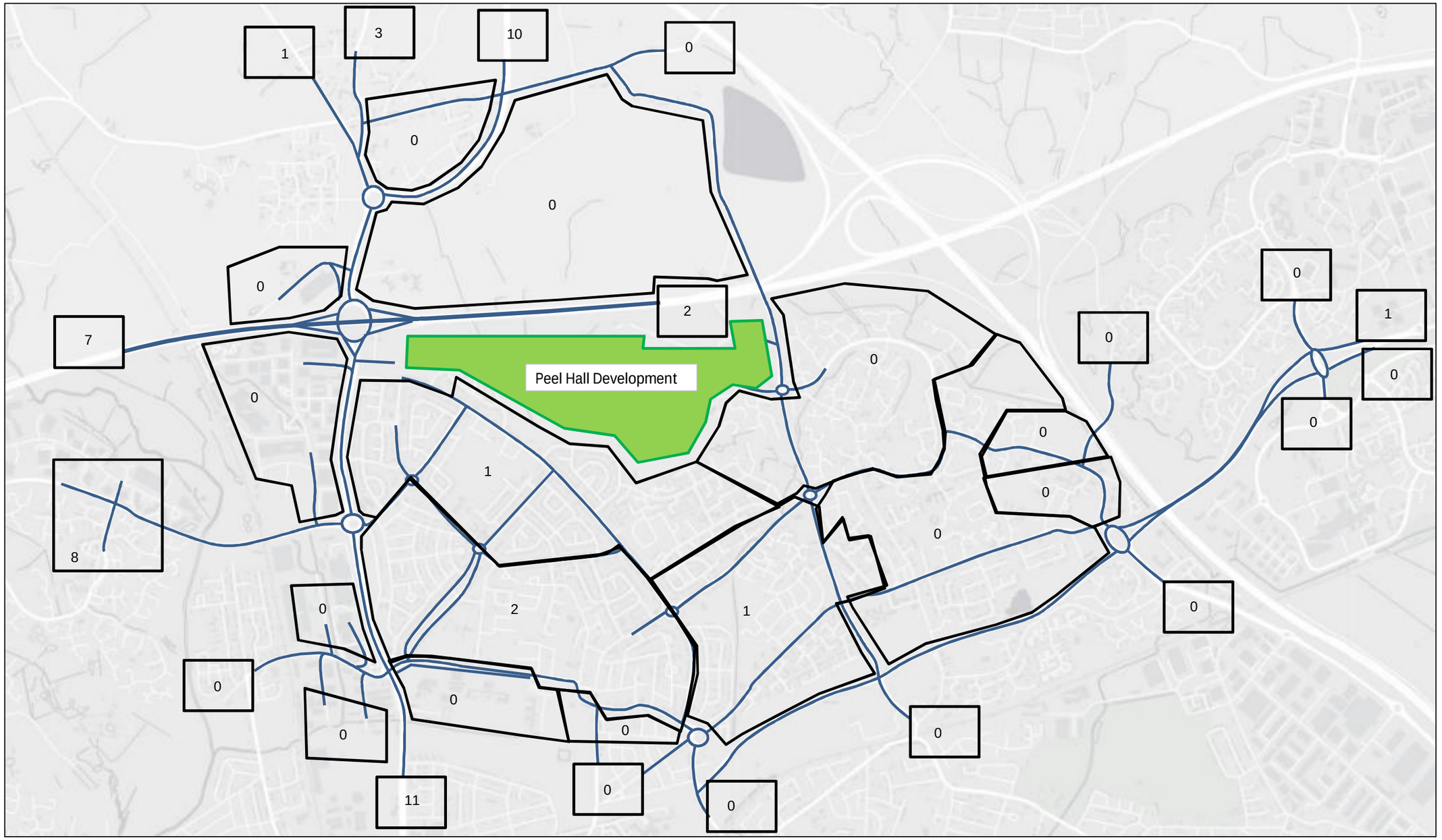
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 23, AM (0800-0900) Other Trips to Peel Hall Development	AECOM



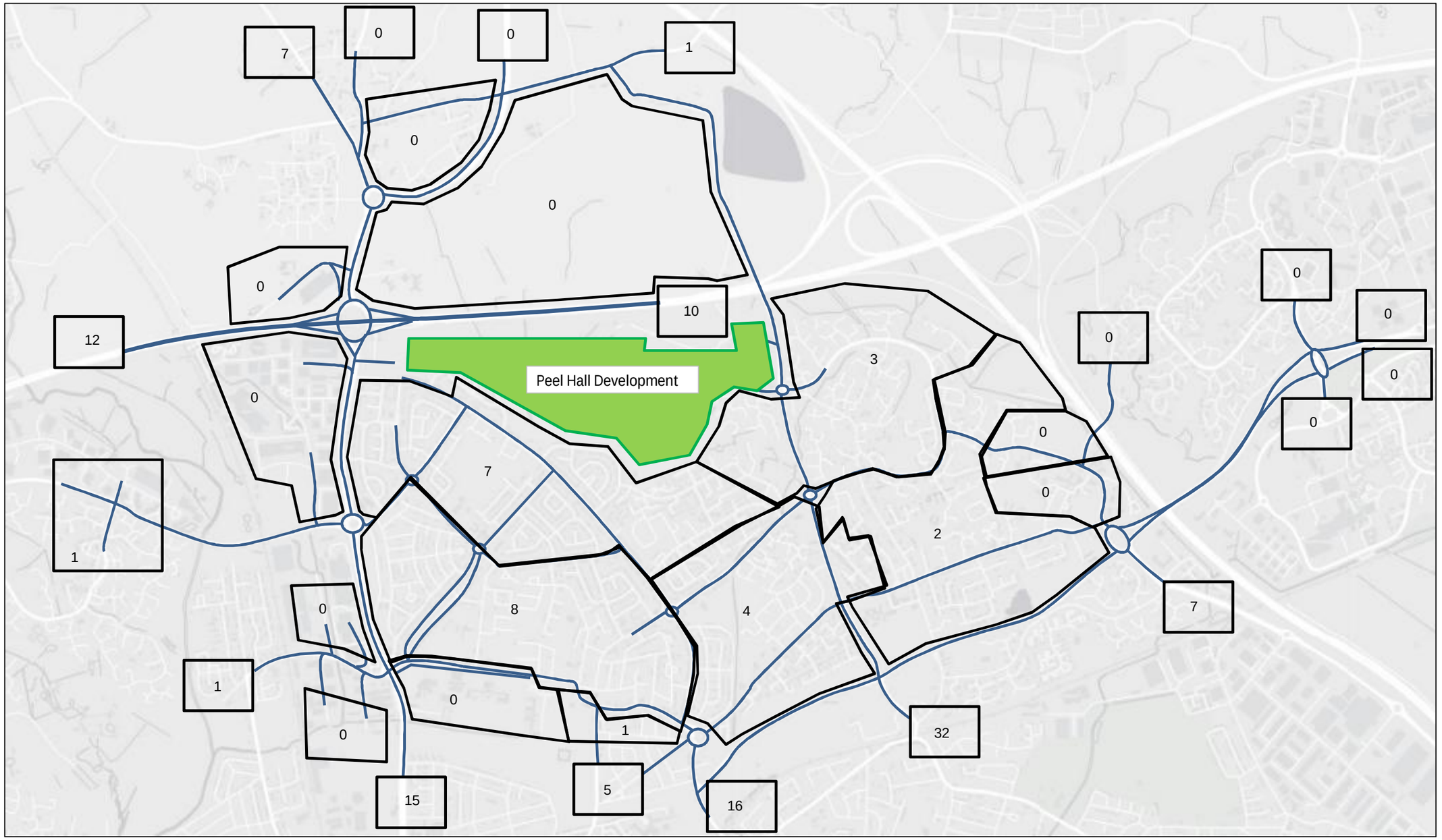
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 24, AM (0800-0900) Total Trips to Peel Hall Development	AECOM



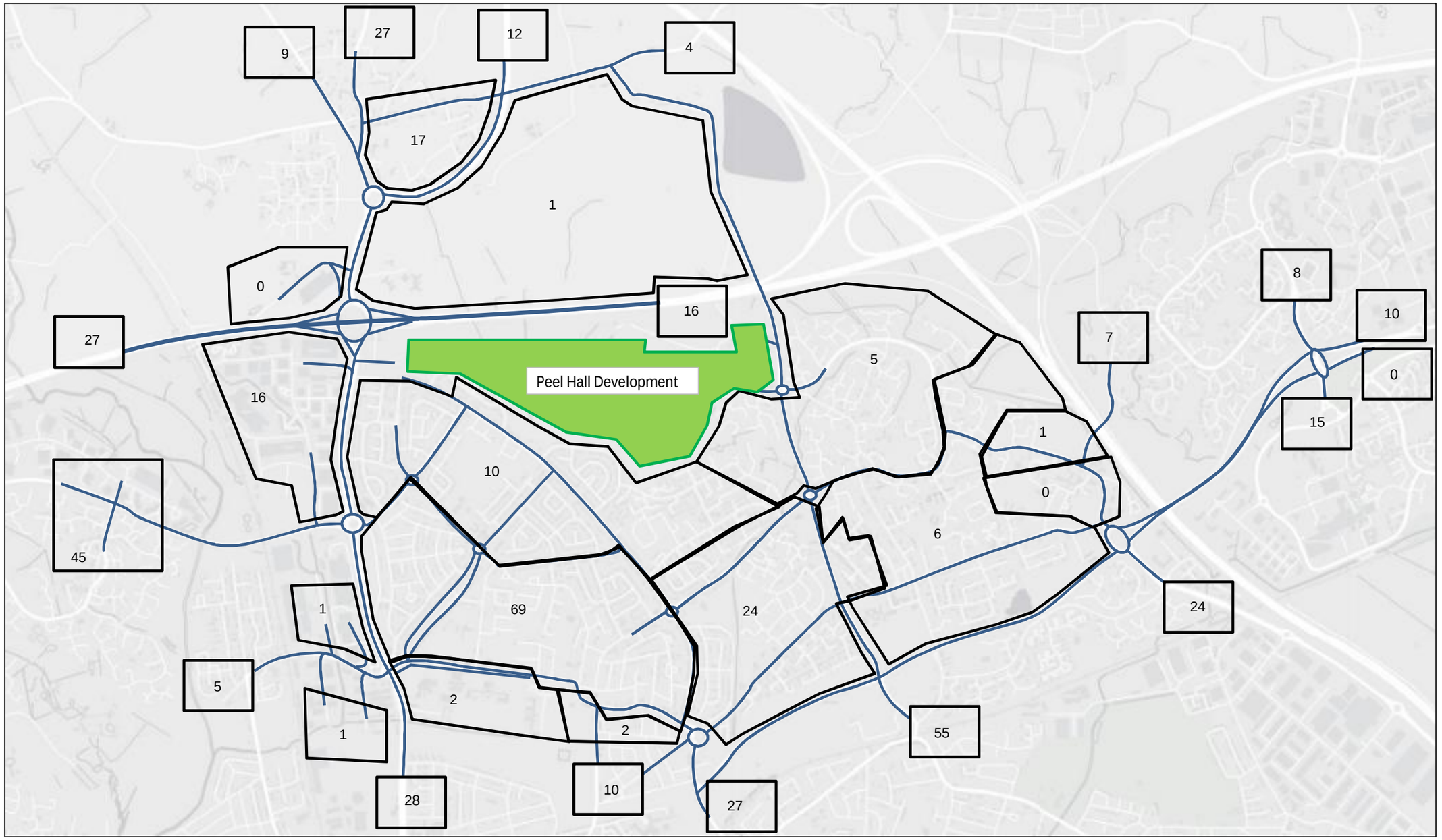
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 25, PM (1700-1800) Residential Trips from Peel Hall Development	AECOM



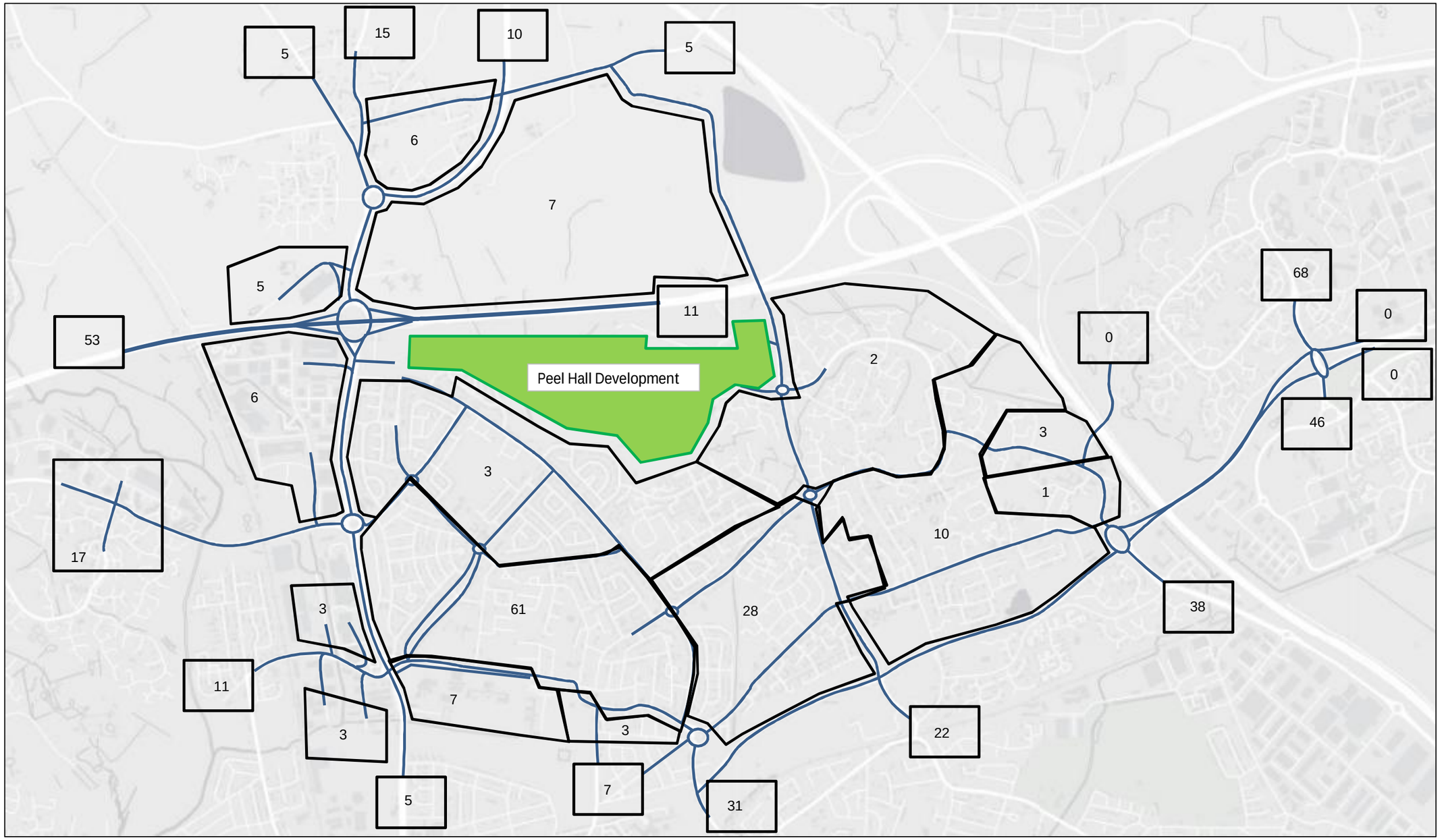
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 26, PM (1700-1800) Work Trips from Peel Hall Development	AECOM



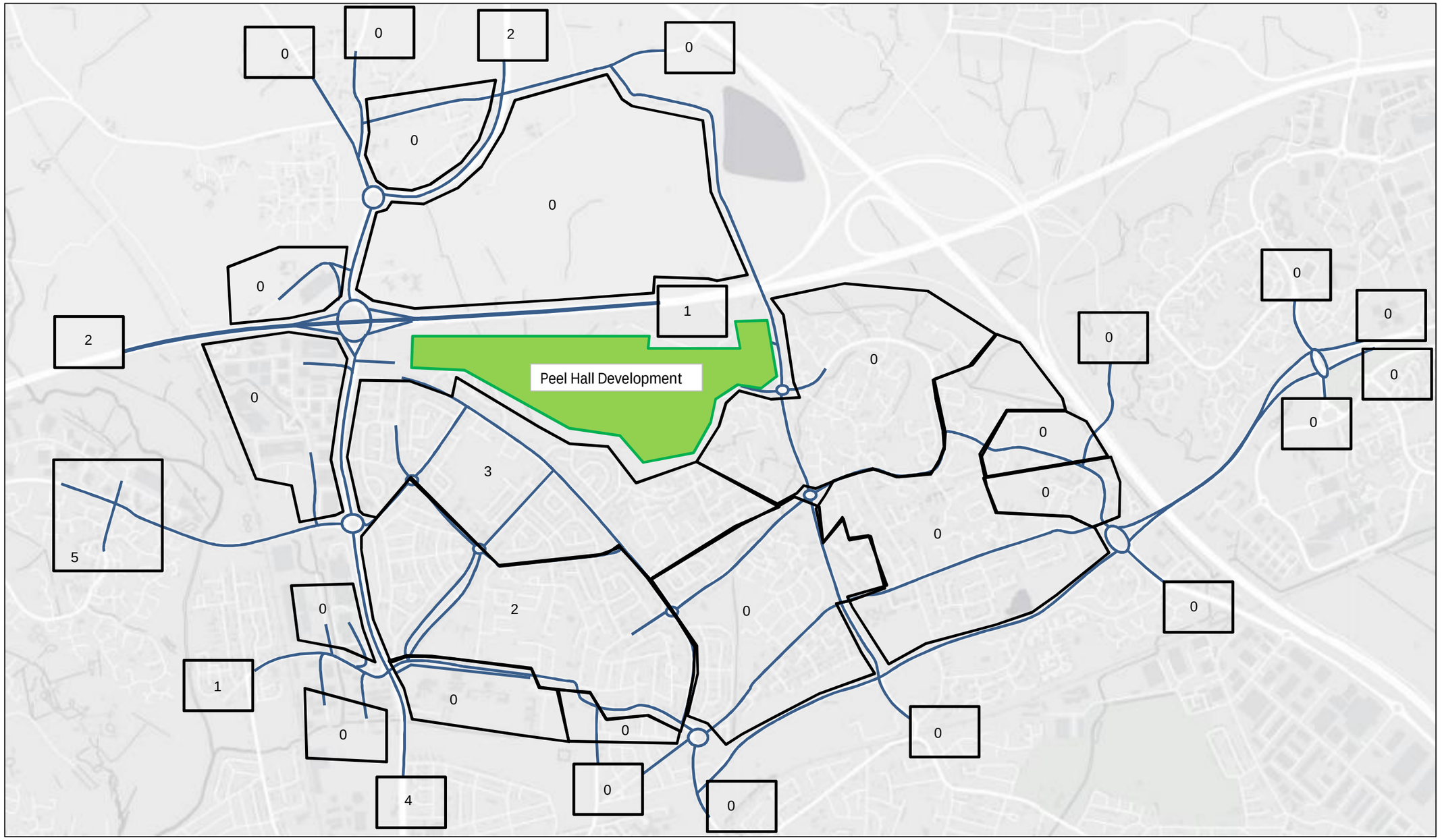
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 27, PM (1700-1800) Other Trips from Peel Hall Development	AECOM



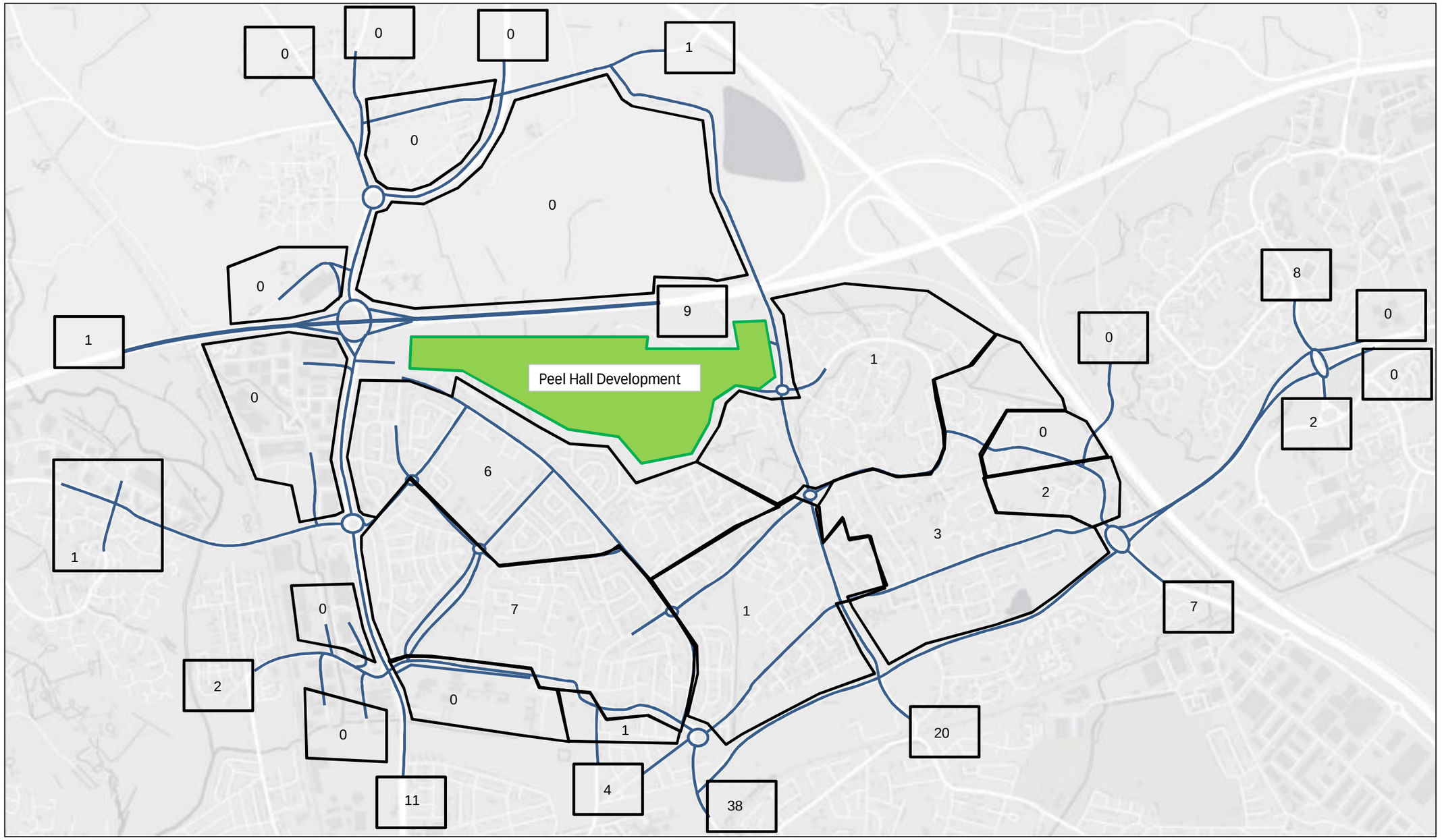
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 28, PM (1700-1800) Total Trips from Peel Hall Development	AECOM



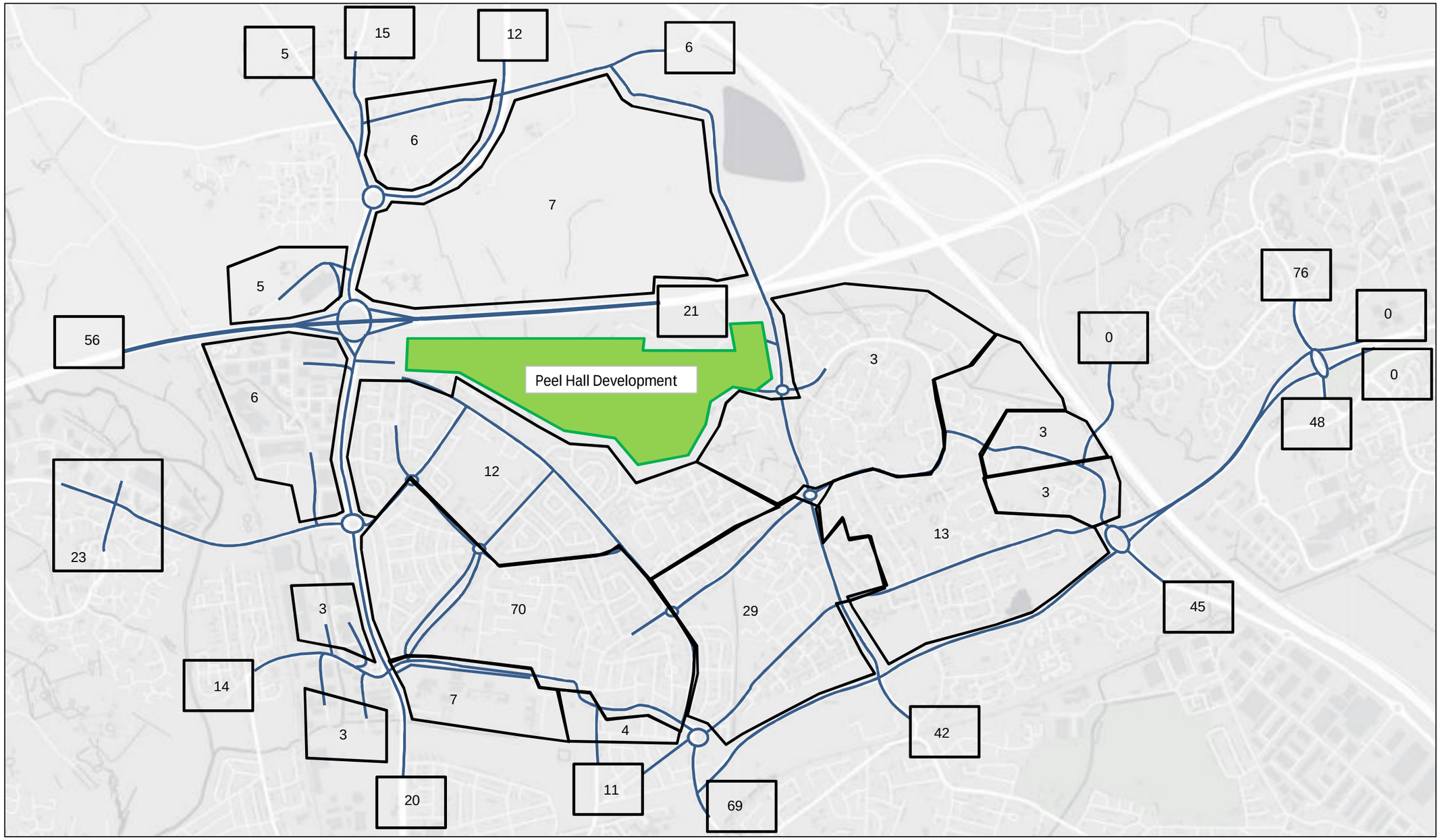
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 29, PM (1700-1800) Residential Trips to Peel Hall Development	AECOM



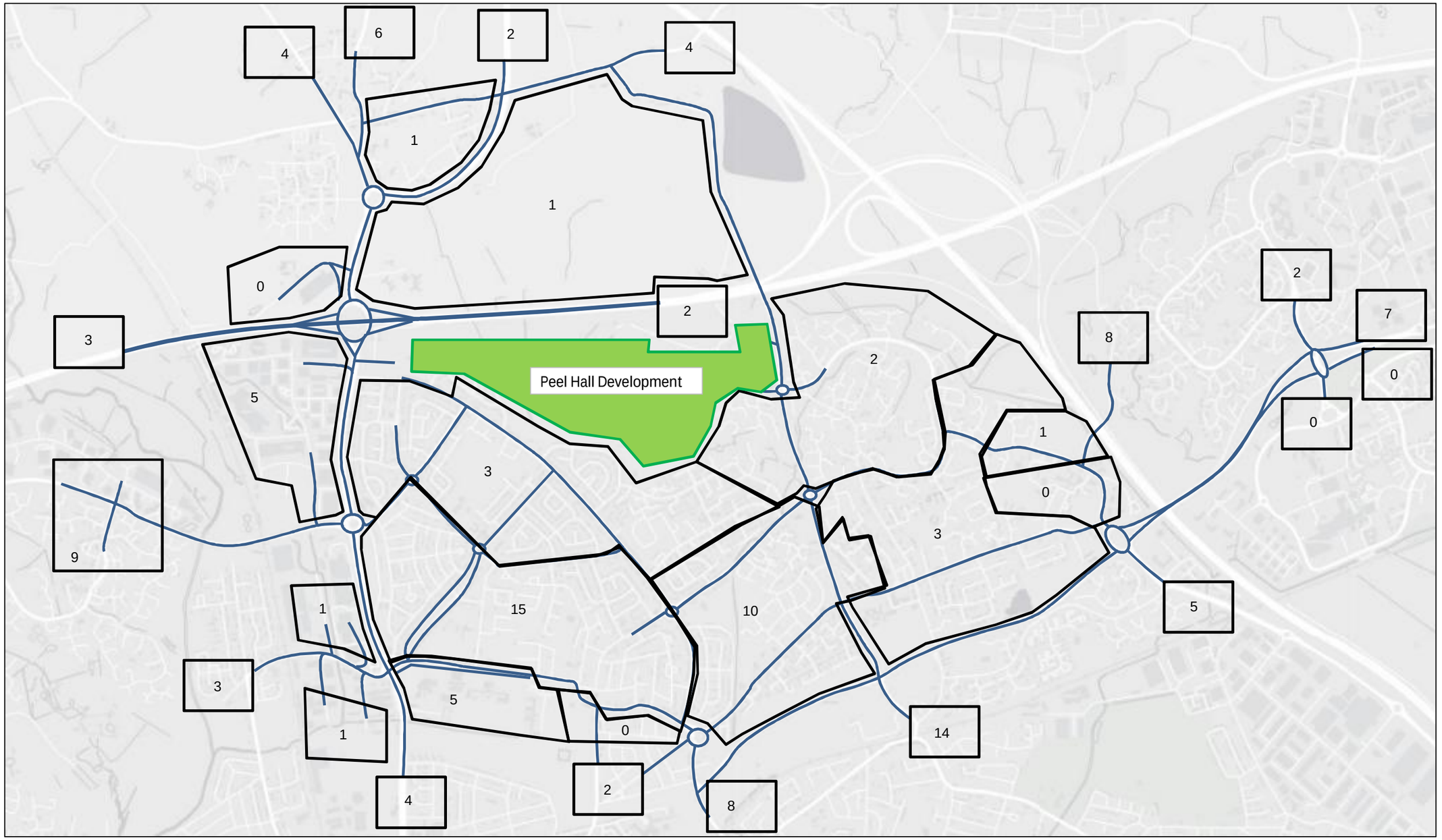
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 30, PM (1700-1800) Work Trips to Peel Hall Development	AECOM



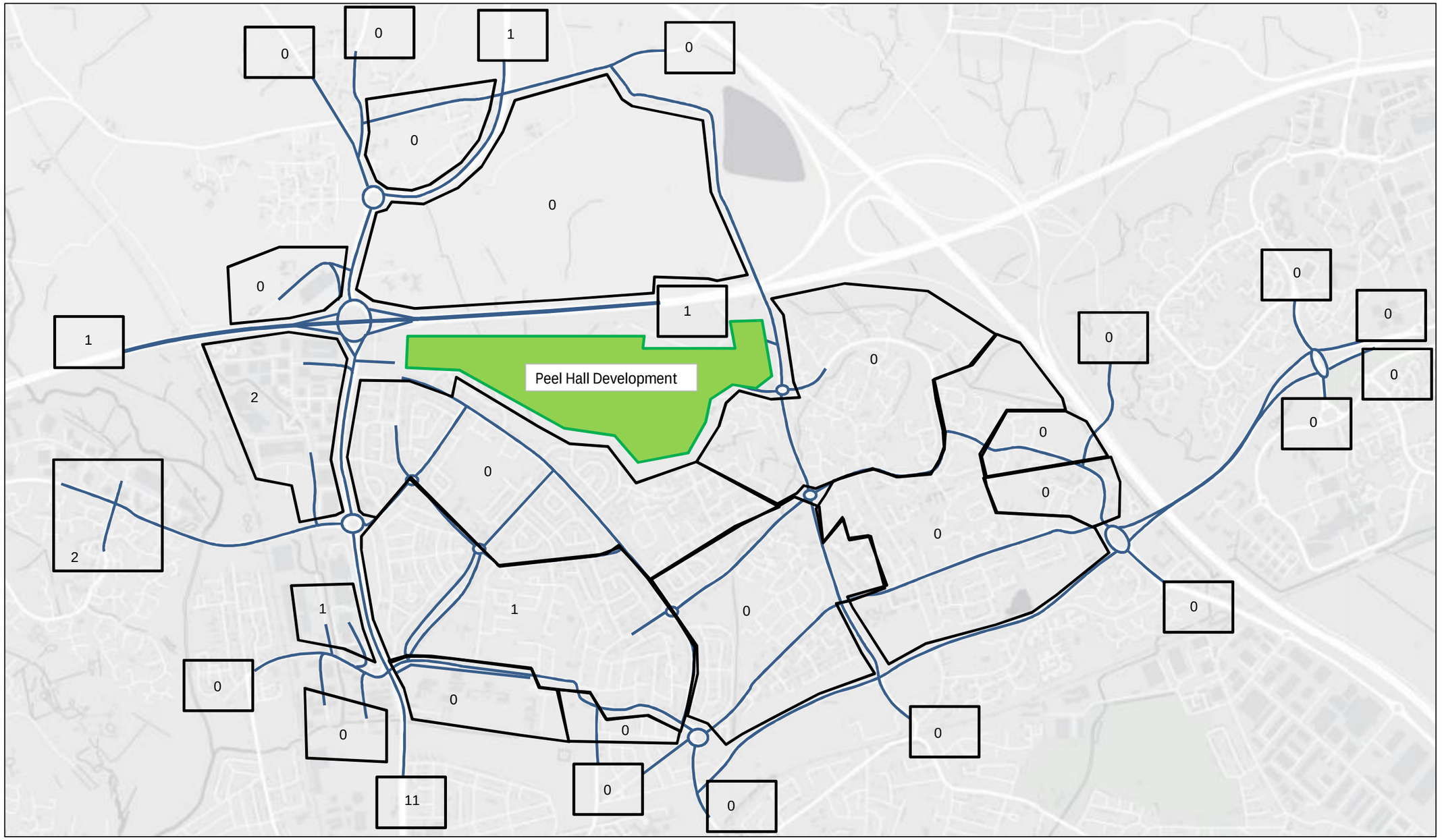
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 31, PM (1700-1800) Other Trips to Peel Hall Development	AECOM



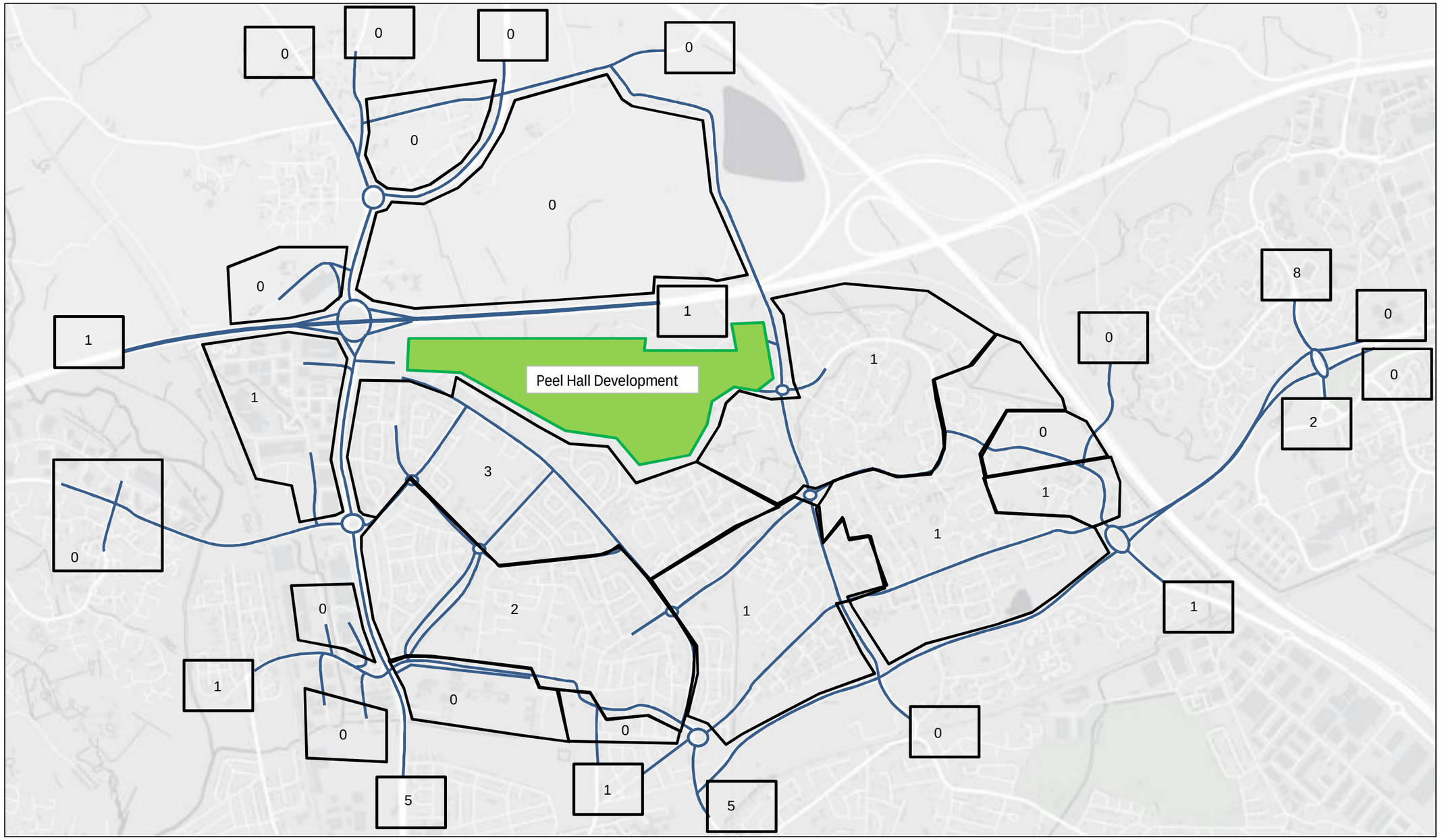
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 32, PM (1700-1800) Total Trips to Peel Hall Development	AECOM



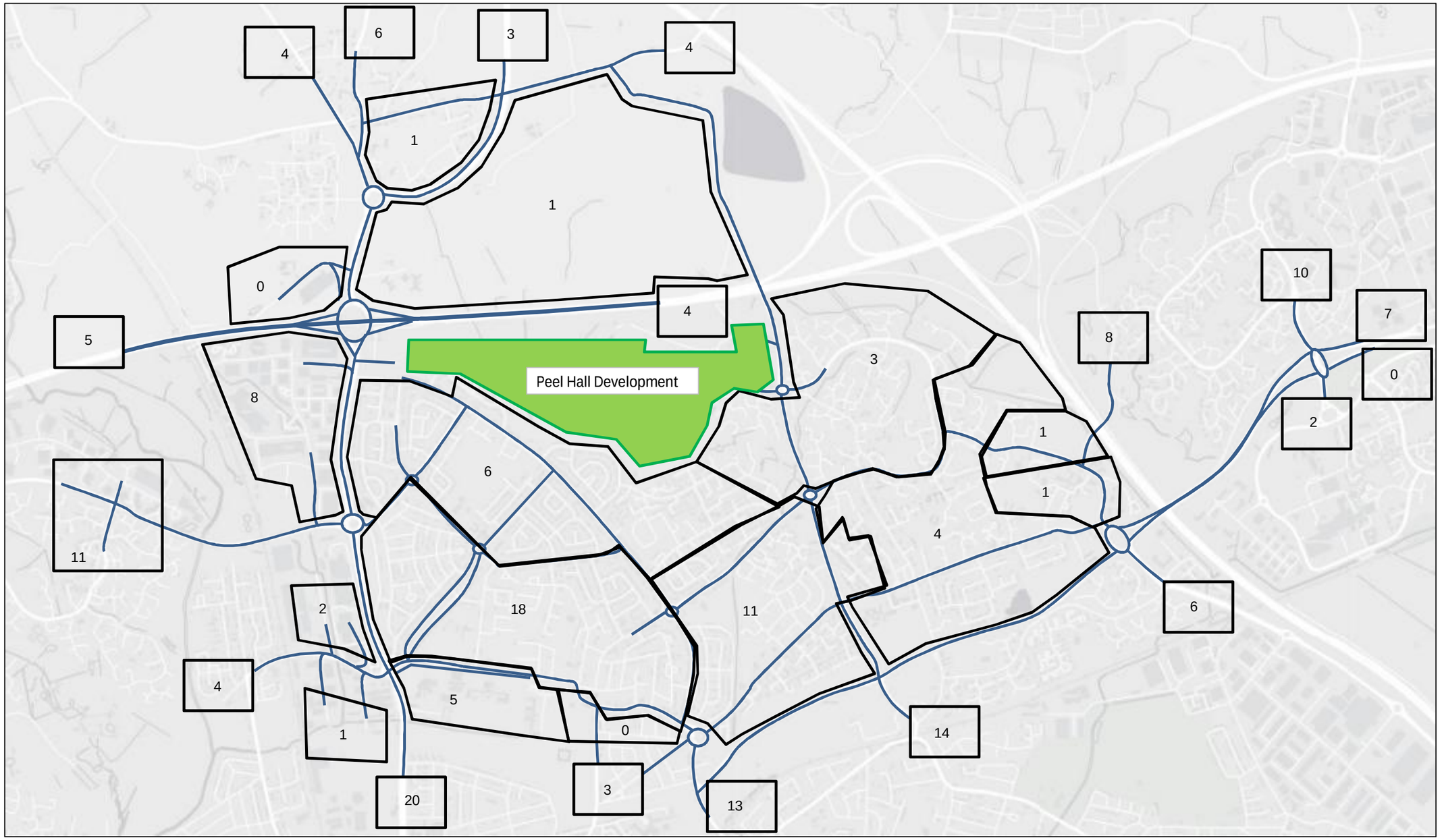
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 33, AM (0900-0930) Residential Trips from Peel Hall Development	AECOM



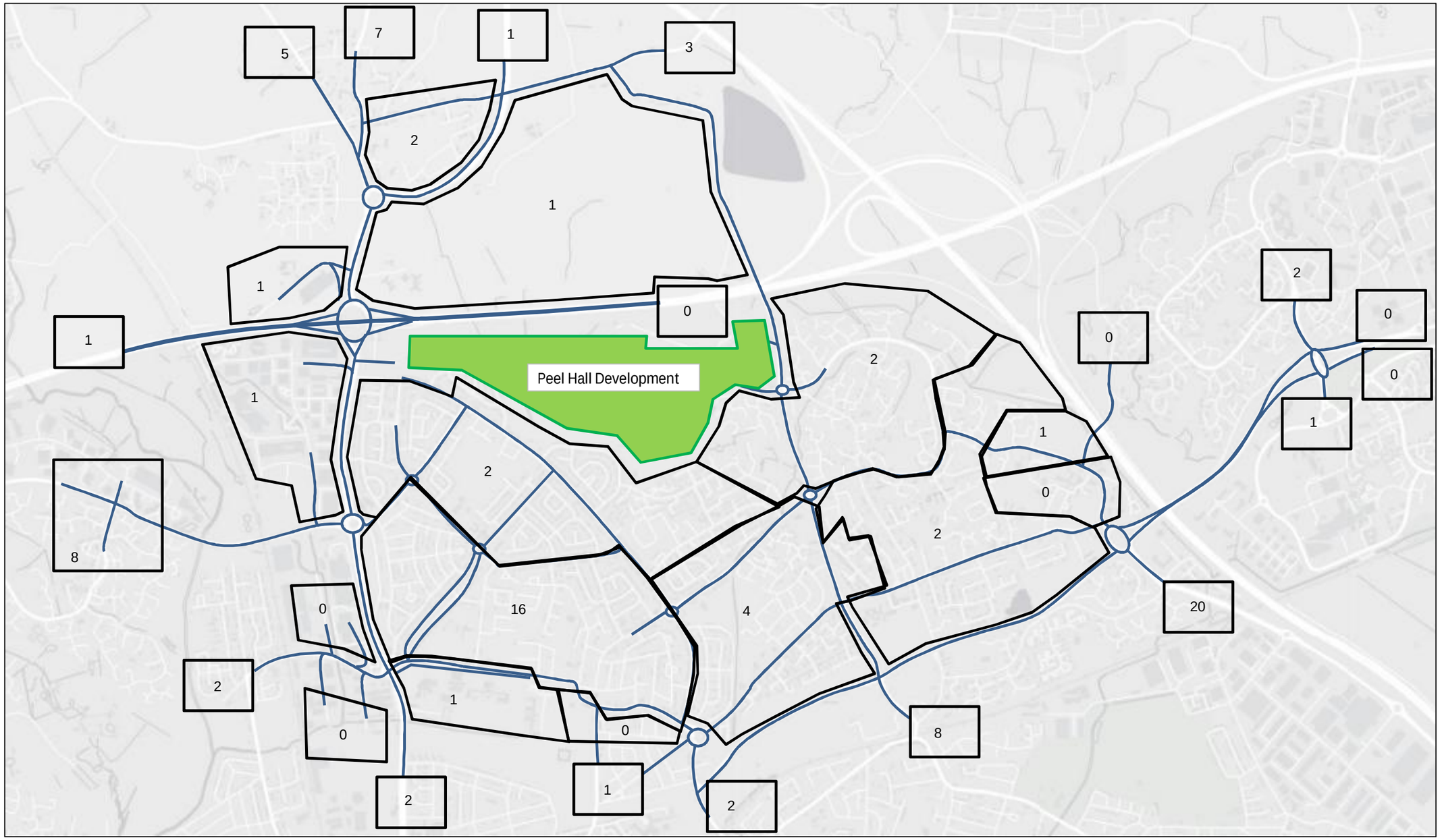
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 34, AM (0900-0930) Work Trips from Peel Hall Development	AECOM



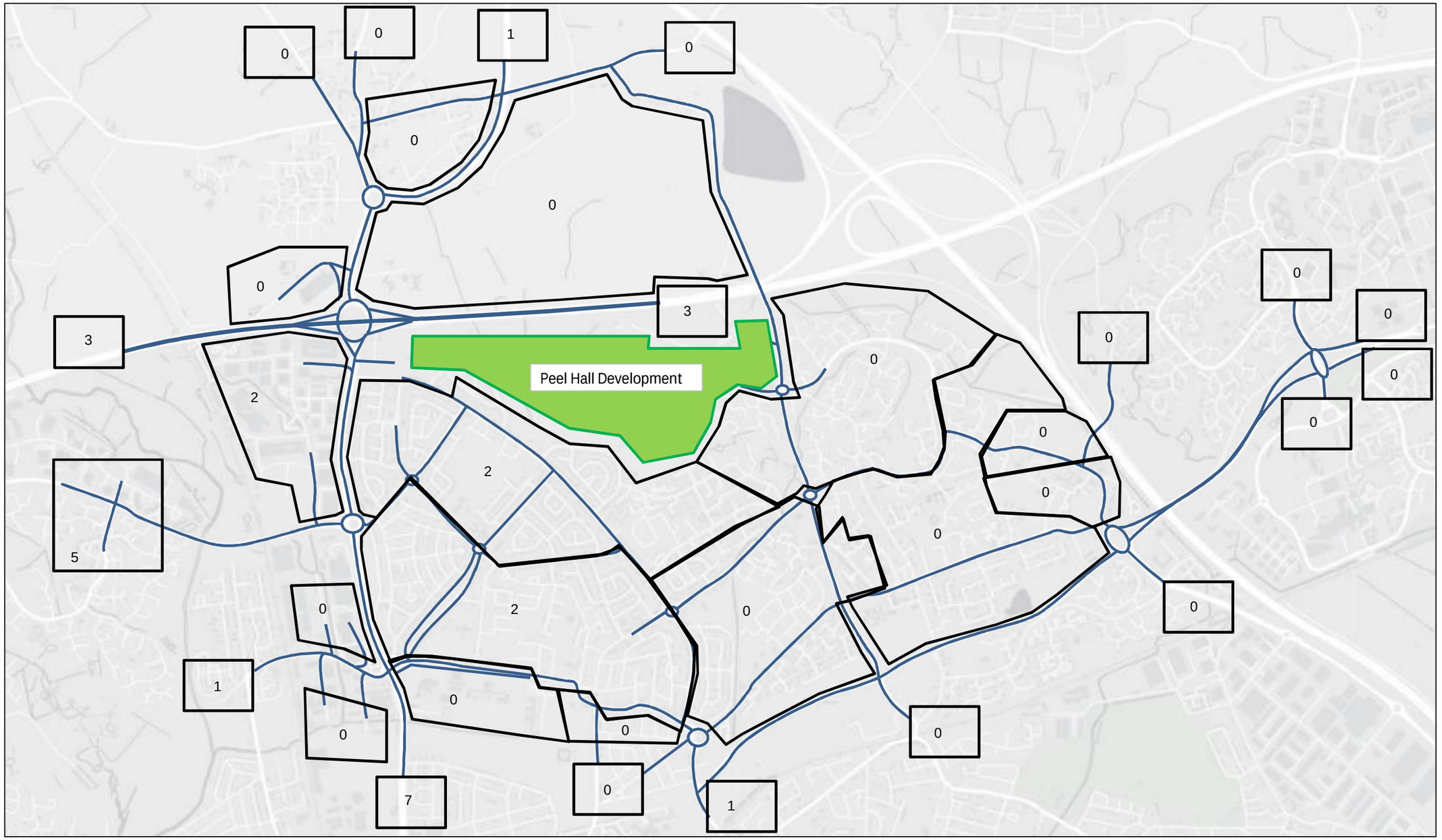
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 35, AM (0900-0930) Other Trips from Peel Hall Development	AECOM



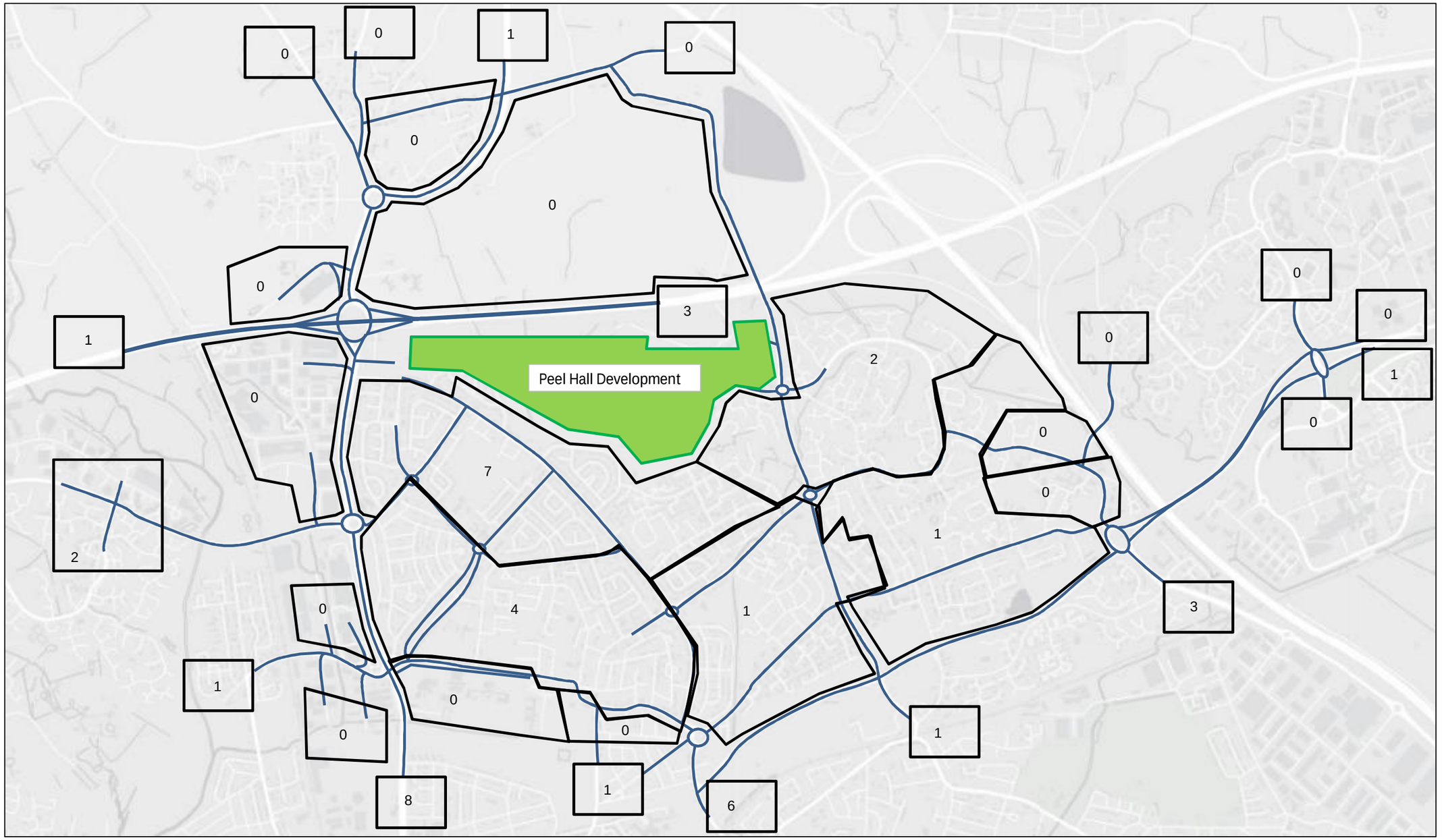
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 36, AM (0900-0930) Total Trips from Peel Hall Development	AECOM



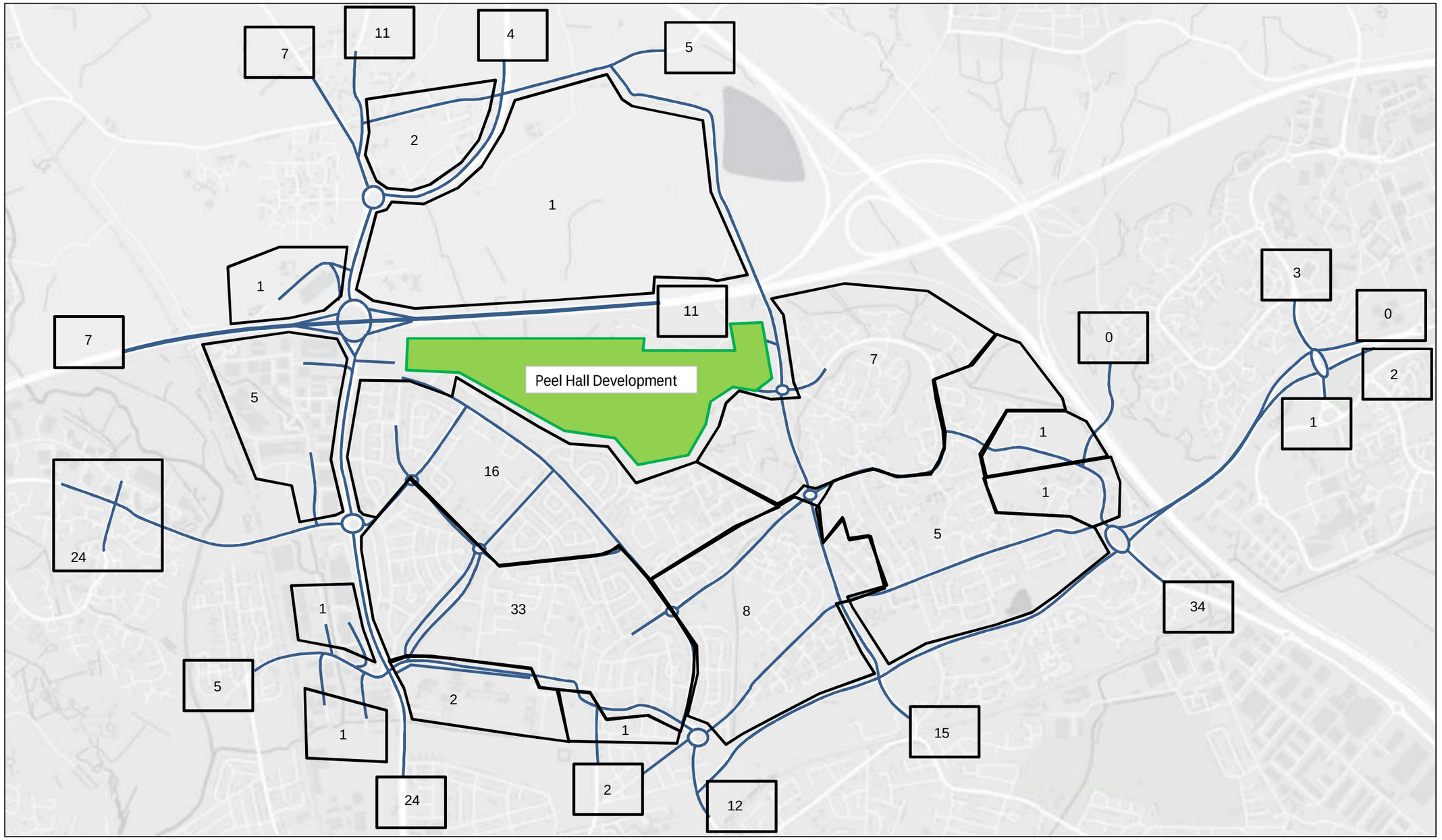
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 37, AM (0900-0930) Residential Trips to Peel Hall Development	AECOM



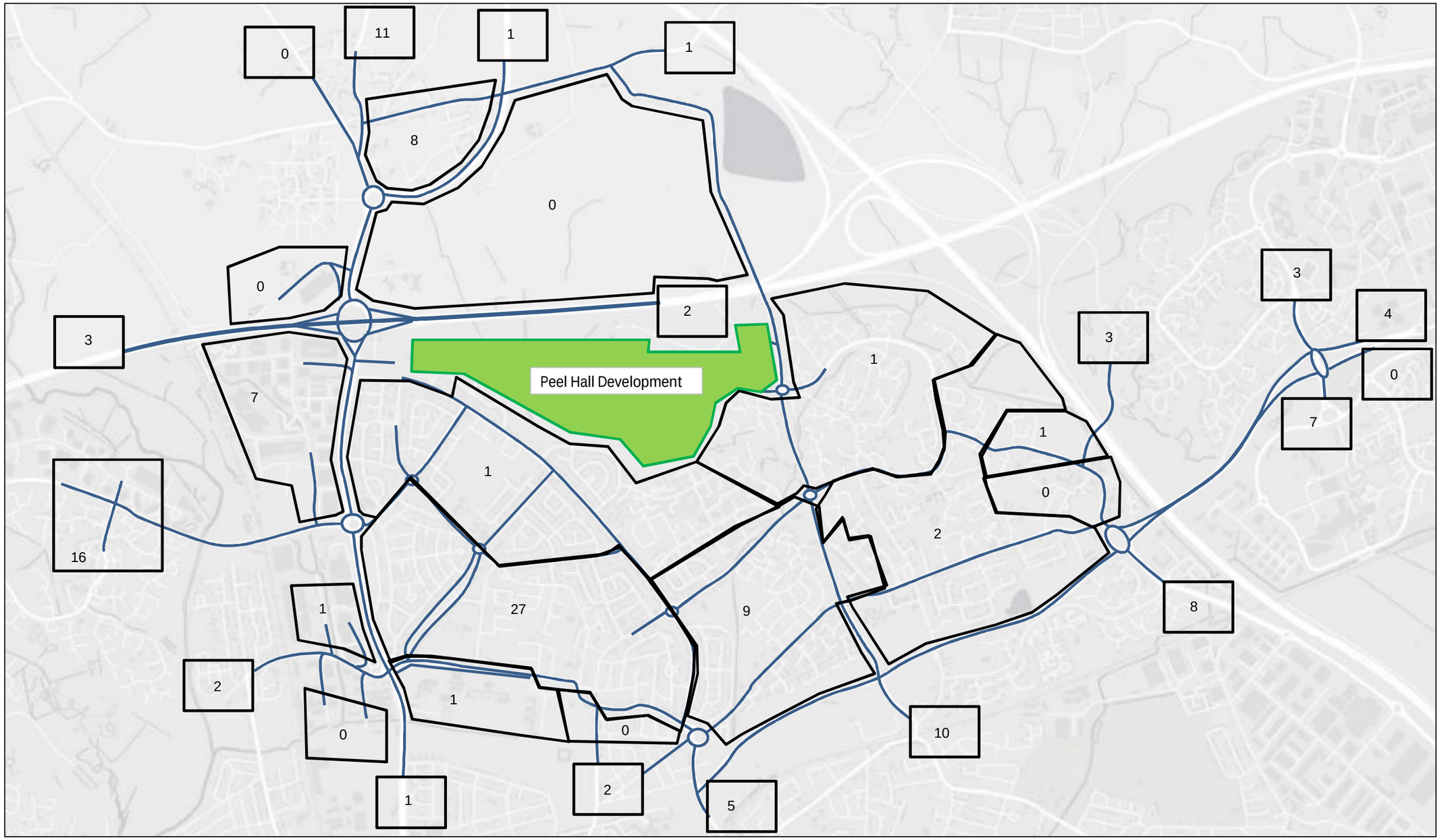
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 38, AM (0900-0930) Work Trips to Peel Hall Development	AECOM



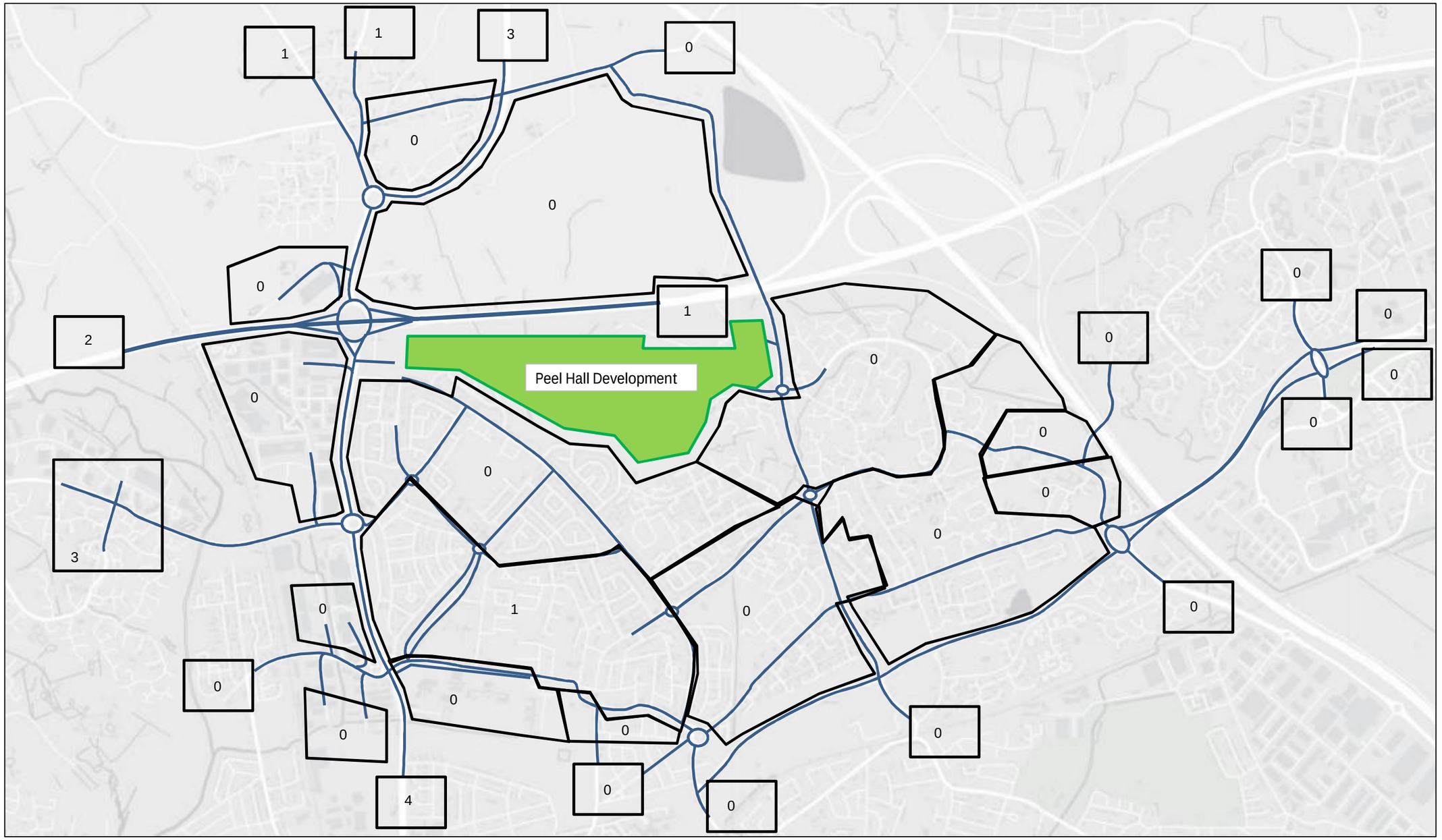
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 39, AM (0900-0930) Other Trips to Peel Hall Development	AECOM



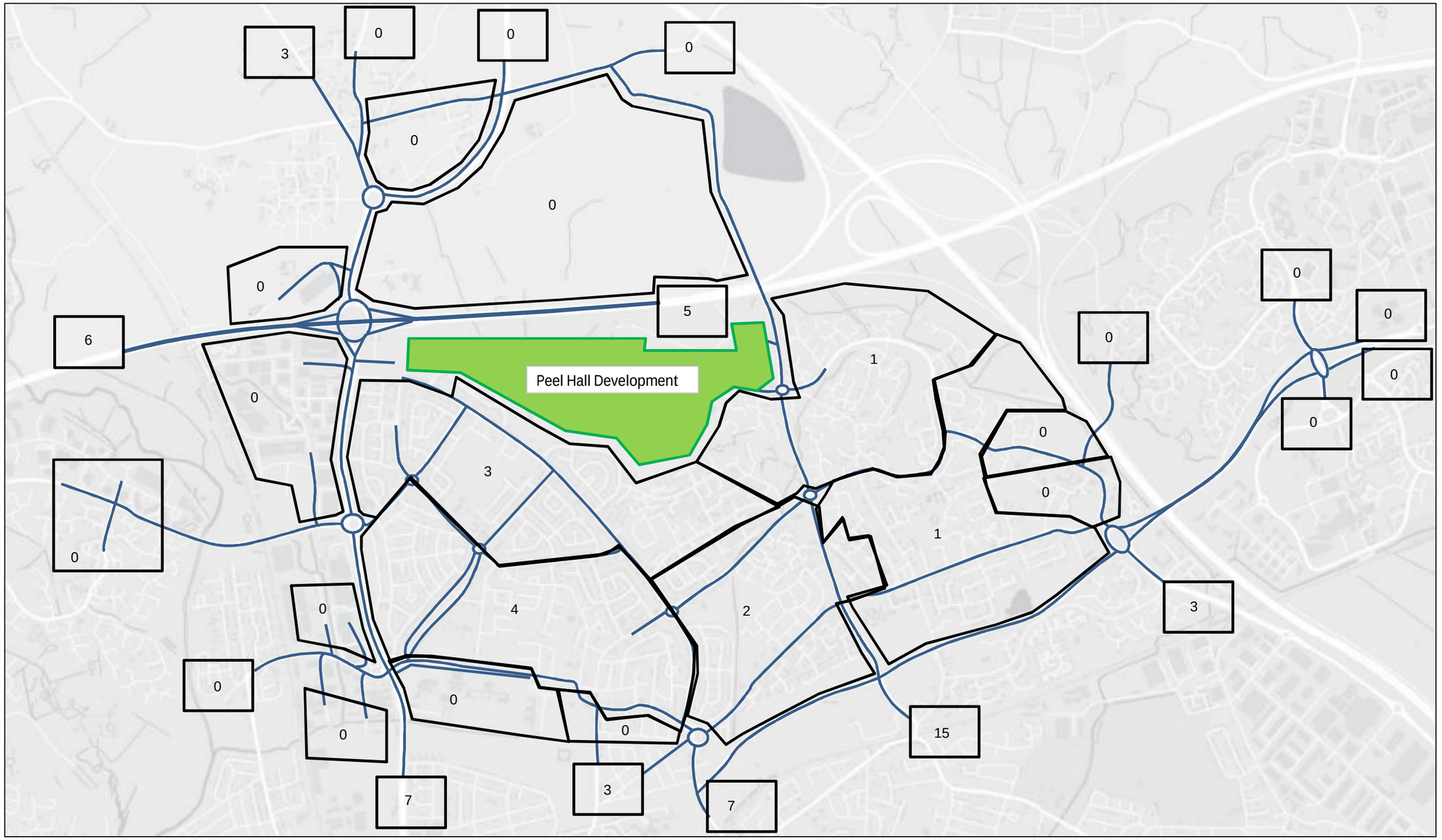
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 40, AM (0900-0930) Total Trips to Peel Hall Development	AECOM



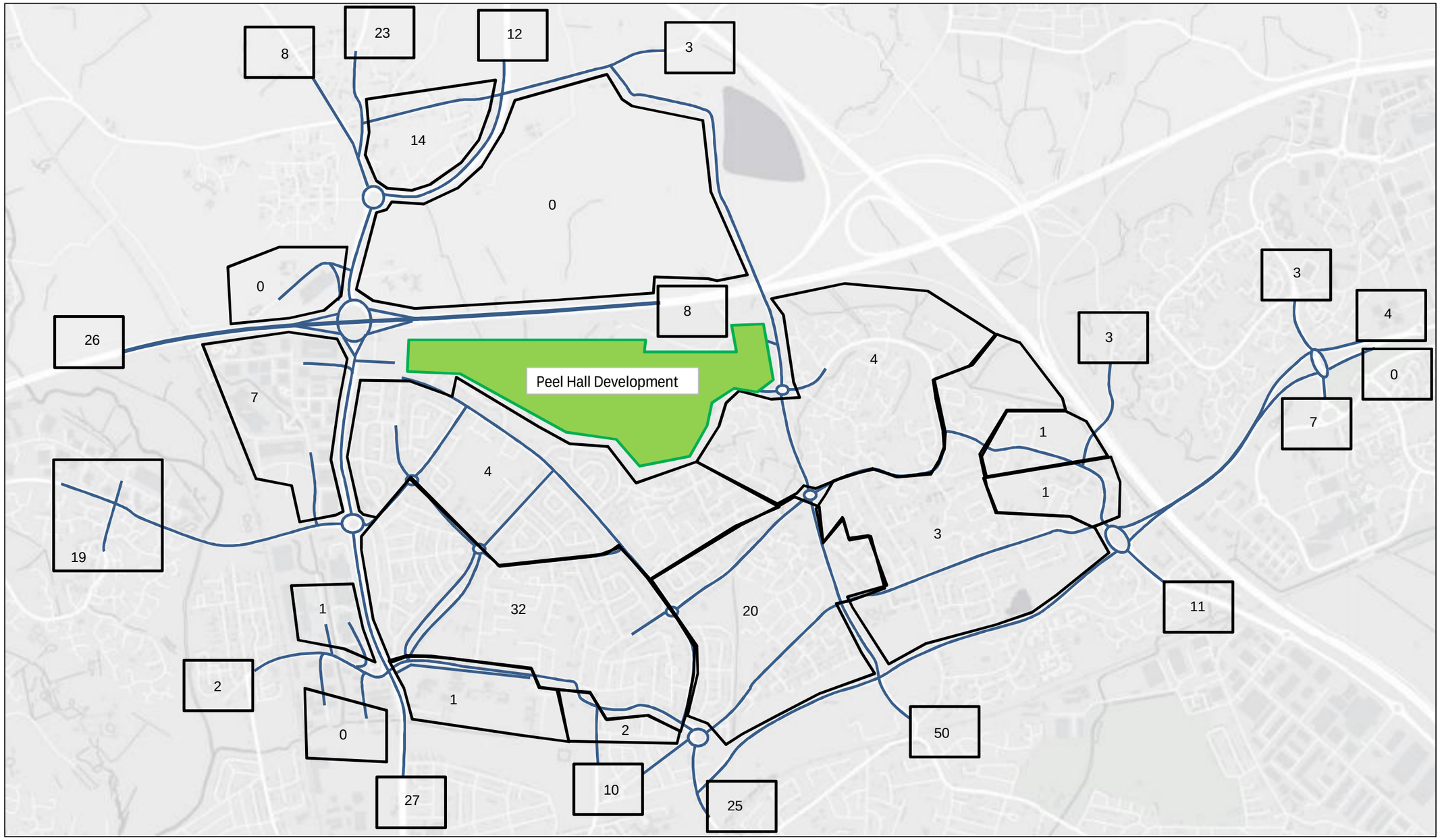
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 41, PM (1800-1830) Residential Trips from Peel Hall Development	AECOM



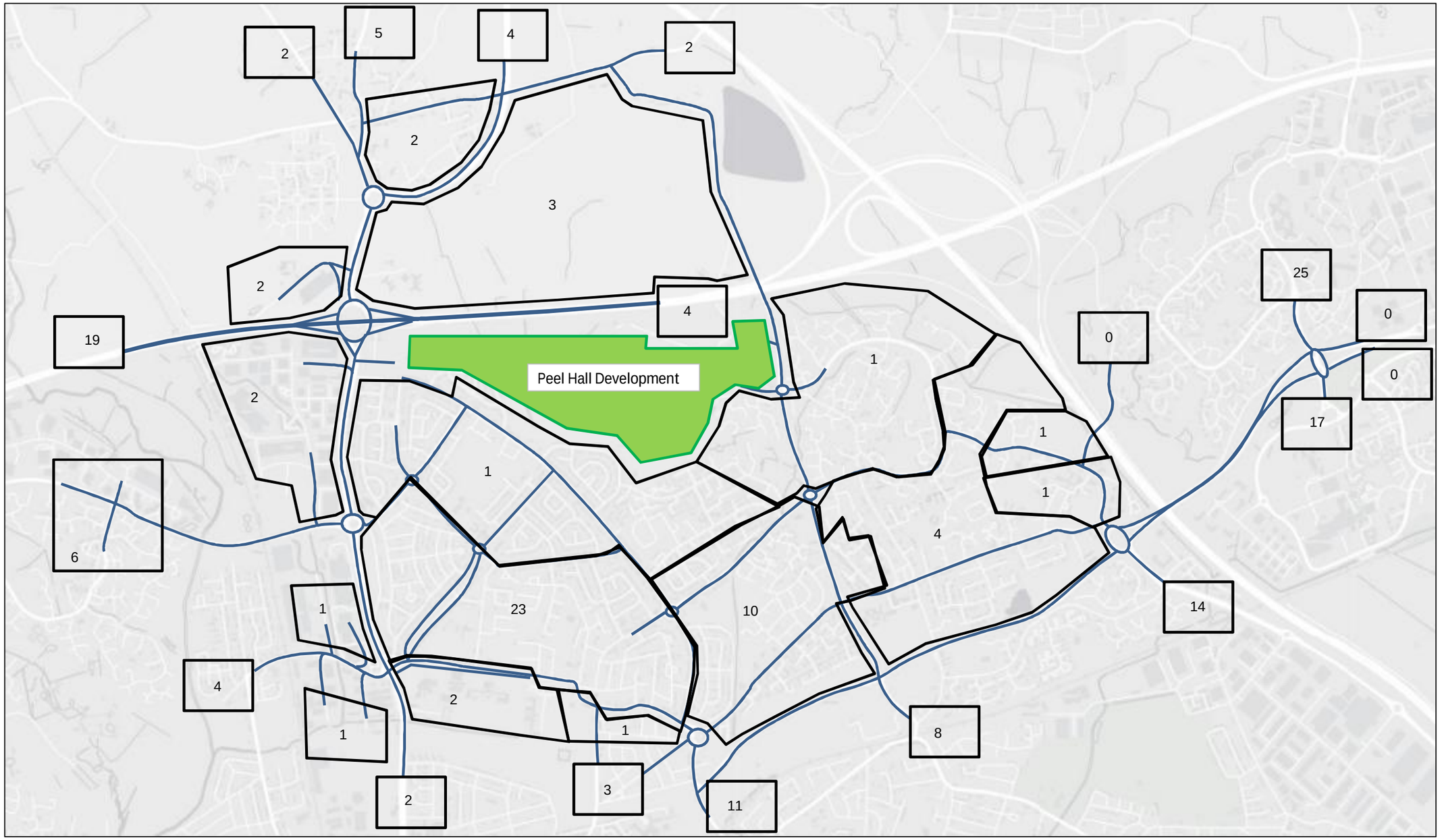
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 42, PM (1800-1830) Work Trips from Peel Hall Development	AECOM



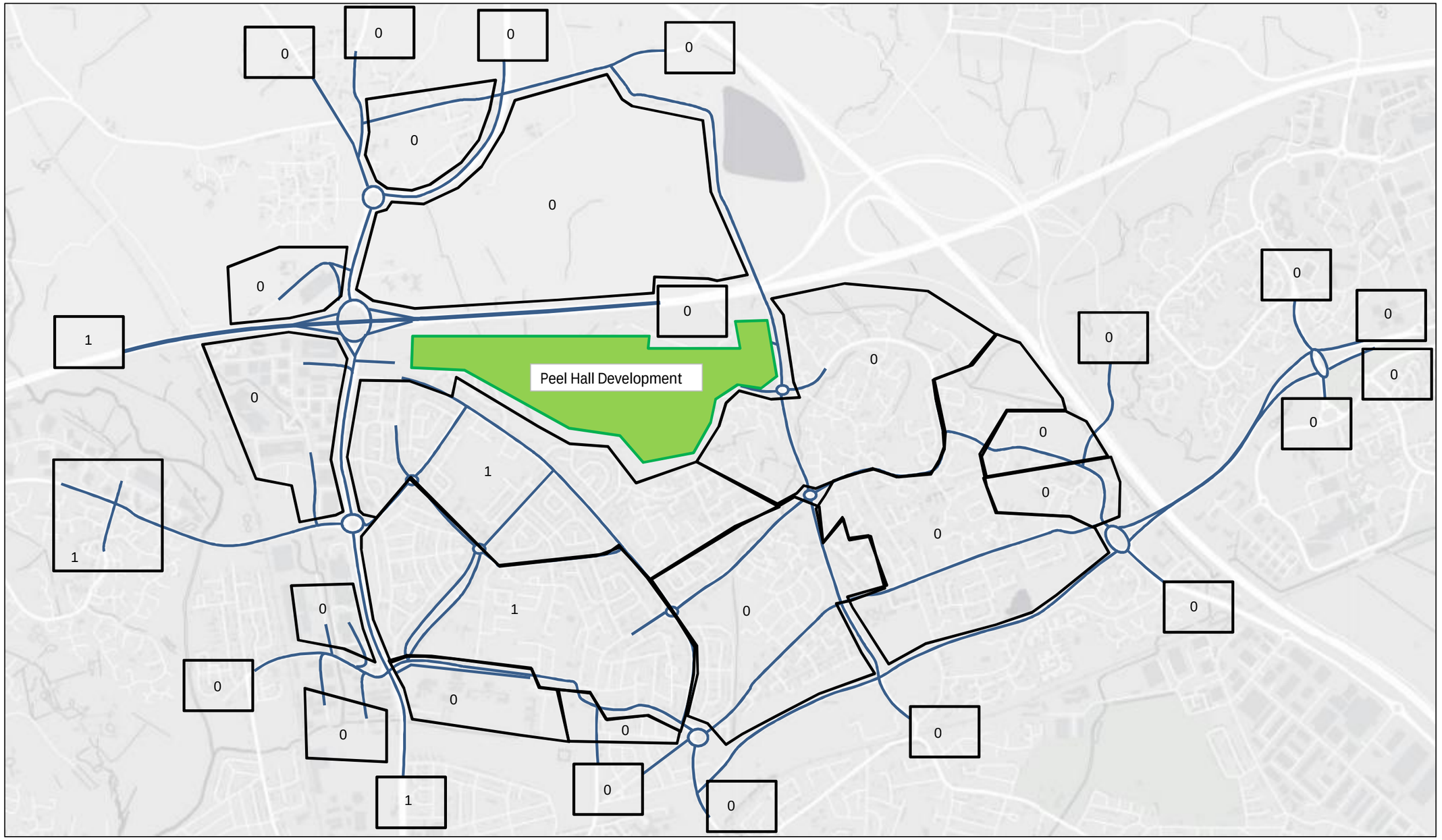
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 43, PM (1800-1830) Other Trips from Peel Hall Development	AECOM



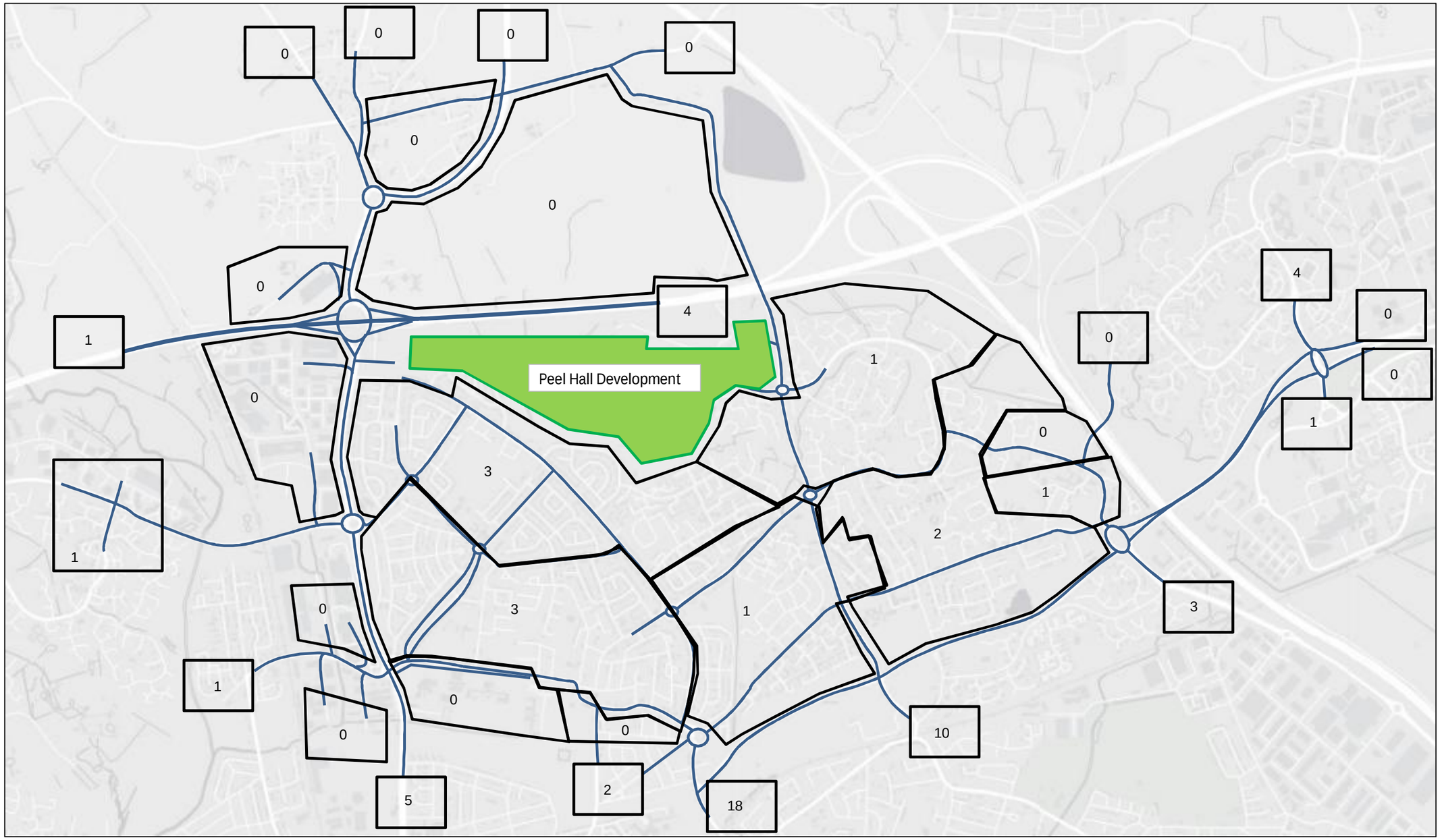
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 44, PM (1800-1830) Total Trips from Peel Hall Development	AECOM



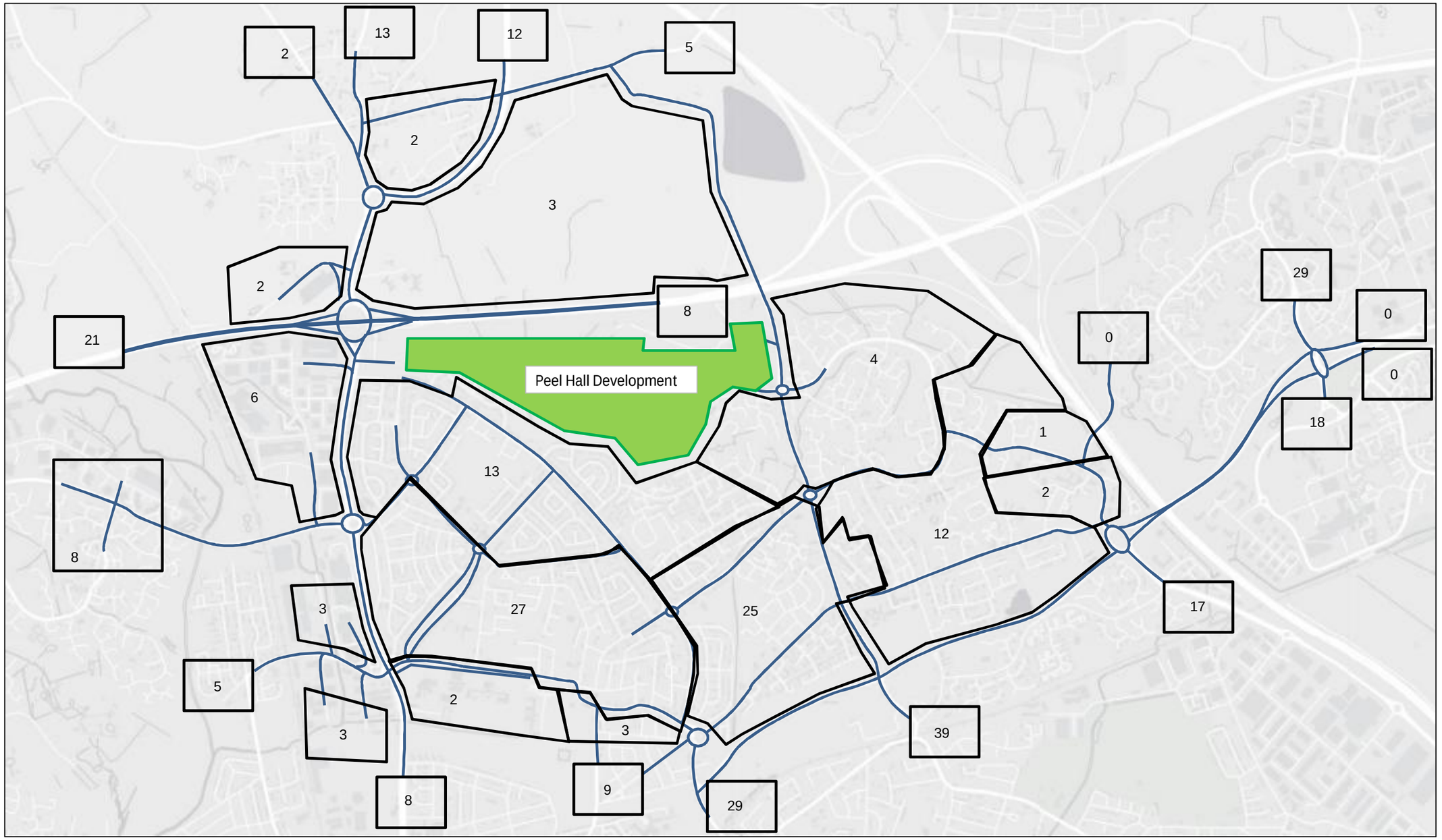
Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 45, PM (1800-1830) Residential Trips to Peel Hall Development	AECOM



Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 46, PM (1800-1830) Work Trips to Peel Hall Development	AECOM



Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 47, PM (1800-1830) Other Trips to Peel Hall Development	AECOM



Peel Hall VISSIM Model - Trip Distribution	Appendix C, Figure 48, PM (1800-1830) Total Trips to Peel Hall Development	AECOM