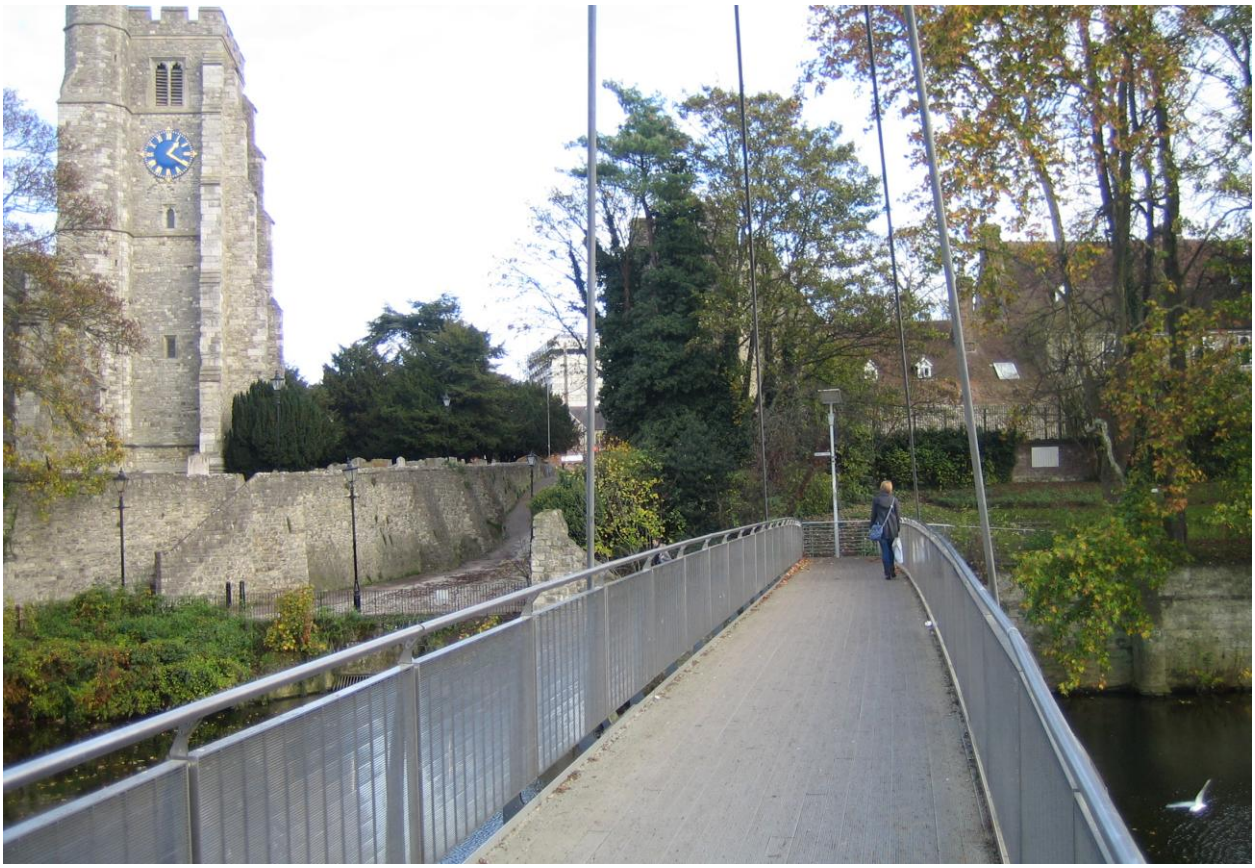

Maidstone Integrated Parking Strategy Research

Option Appraisal Report

Draft Final Report

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JMP Consultants Limited
3 Harbour Exchange Square
London E14 9GE

T 020 7536 8040
F 020 7005 0462
E docklands@jmp.co.uk

www.jmp.co.uk

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Prepared by Jon Bunney

Verified Jon Bunney

Approved by Peter Hardy

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Maidstone Integrated Parking Strategy Research

Option Appraisal Report

Report

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Contents

Tables and Figures

Appendices

1 Introduction

Overview

1.1 Maidstone Borough Council (MBC) appointed JMP Consultants Ltd (JMP) to undertake a series of research tasks to support the development of the Council's Integrated Transport Strategy. The strategy aims to assess the current and future demand for travel and the infrastructure required to support the development growth outlined within the Maidstone Core Strategy (2011).

Content

1.2 This report is the third output of the research study and presents the appraisal work that has been undertaken of a series of potential scheme options to be included within the Integrated Transport Strategy. This includes a discussion of:

- Stakeholder engagement;
- Establishing the appraisal objectives;
- Scenario specification;
- Transport modelling outputs;
- Park & Ride demand and revenue forecasting
- Assessment of Town Centre Car Park impacts
- Economic impacts
- Cost benefit analysis
- The performance of packages against objectives
- Assessment of individual measures

1.3 A summary of the analysis undertaken for each of these elements is presented in the following sections.

2 Stakeholder Engagement

Overview

2.1 An important aspect of the development of the Integrated Transport Strategy is to understand the issues and views of local stakeholders. MBC have an on-going process of stakeholder engagement that has collected and collated initial views and will continue with further consultation as the draft strategy emerges.

2.2 A key aspect of the engagement process has been to understand the views of local businesses in Maidstone. To aid this process to forms of consultation have been undertaken:

- A business workshop
- A business questionnaire

2.3 In addition, consultation has also recently been undertaken with the Highway Agency to understand their views and concerns.

Business Workshop

2.4 A Business Workshop was undertaken on Wednesday 7th March 2012. Invitations were sent out to businesses across the borough of Maidstone via business forums, including the Town Centre Management group and the Chamber of Commerce.

2.5 The purpose of the workshop was to seek to understand the views of businesses in relation to current transport provision in the borough of Maidstone and how it affects the way they operate their business. Looking further forward, the impact of growth on transport demand was also presented leading on to a discussion of potential solutions to identified problems.

2.6 The feedback received helps form part of the context for developing the scheme options to be incorporated within the draft Integrated Transport Strategy. It will also help inform the appraisal of the economic impact of the packages of measures.

2.7 The feedback received has been summarised in a Meeting Note that is included in **Appendix A**. A summary of the key issues and outputs is provided below

Issues

2.8 The first part of the workshop focused on businesses views of existing transport provision in Maidstone and the impact that it has upon business operations. The key issues that were identified are as follows:

- Highway network congestion is a major concern to business both currently and in the future
- Rail links, particularly to London, need improving
- Bus interchange and service provision requires improving
- There is a general acceptance that there is, at least, sufficient town centre car parking, if not an over-provision
- It is acknowledged that town centre car parking charges impact upon individuals travel decisions and, in particular, affects the attractiveness of Park & Ride

2.9 The second part of the workshop focused on potential solutions to the identified issues. The main solutions put forward by businesses at the workshop included:

- South East Maidstone Strategic Link (SEMSL)
- Local road improvements, including the gyratory and motorway junctions, and expansion of the existing Urban Traffic Management & Control (UTMC)
- Improved rail services to London and other major centres
- Improved park & ride, including rail park & ride
- Improved bus service provision, including school services
- Measures to encourage walking & cycling to school
- Improved integration between modes
- Measures to reduce the need to travel, including business travel plans for large companies

Business Survey

2.10 As part of the business engagement process a questionnaire was designed and sent out to businesses in order to collection direct information about the operations of business, how transport affects these operations, and potential improvements to transport that would create an enhanced business operational environment.

2.11 A copy of the survey form can be found within **Appendix B**. This section provides a summary of the survey responses.

Business Respondents

2.12 Surveys were sent out to businesses across the borough of Maidstone via business forums, including the Town Centre Management group and the Chamber of Commerce.

2.13 In total, only eight surveys were returned. A breakdown of the type of firms is provided in table 2.1.

Table 2.1 Type of business

Employees	Respondents	Percentage
Retail	2	25.0%
Property	2	25.0%
Construction/Property	1	12.5%
Publishing	1	12.5%
Consultant	1	12.5%
Business Support	1	12.5%
Total	**8**	**100.0%**

2.14 Most of the businesses that replied were small in size, employing less than 10 individuals. A breakdown of business size is provided in Table 6.2.

Table 2.2 Size of business

Employees	Respondents	Percentage
0 to 10	5	62.5%
11 to 50	3	37.5%
51 plus	0	0.0%
Total	**8**	**100.0%**

2.15 Businesses were asked to identify what type of operations they undertake, in order to gauge the importance of transport in their day-to-day business.

2.16 Table 2.3 provides a breakdown of the types of operations.

Table 2.3 Business operational activities

Employees	Respondents	Percentage of all respondents
Office Work	8	100.0%
Site Work	7	87.5%
Deliveries	6	75.0%
Sales visits	3	37.5%

2.17 All businesses that responded involved office work, with the majority also conducting site work, of some form. Three quarters of the companies also relied heavily upon deliveries either to or from their office location.

2.18 Businesses were also asked to identify the general area in which their business is located in order to provide context for the impact that transport has on their operations.

2.19 Table 2.4 provides the breakdown of the location of businesses.

Table 2.4 Location of business

Employees	Respondents	Percentage of all respondents
Town centre	2	25.0%
North West	1	12.5%
North East	3	37.5%
South East	0	0.0%
South West	0	0.0%
Other	1	12.5%
Multi-locations	1	12.5%

2.20 Two of the businesses were located in the core town centre, with a further three in the North East Sector. One business had multiple business locations across Maidstone.

2.21 Businesses were also asked about the availability of parking at their sites for both their staff and their customers.

2.22 Table 2.5 provides a breakdown of parking provision.

Table 2.5 Availability of parking

Employees	Respondents	Percentage of all respondents
Parking for all staff	4	50.0%
Parking for some staff	2	25.0%
Parking for customers	3	37.5%
No car parking	1	12.5%

2.23 Half of the businesses had adequate parking provision for all their staff. A further 25% had limited parking available for staff. Notably, both businesses located within the town centre had adequate parking for all staff members.

2.24 Three businesses had car parking for customers. Only one business had no available car parking.

Current Transport Provision

2.25 Businesses were asked to rate current transport provision within Maidstone on a scale of 1 to 5, with 1 indicting poor performance and five high performance.

2.26 Table 2.6 provides a breakdown of the minimum, maximum and average rating from respondents.

Table 2.6 Ratings of Current Transport Provision within Maidstone

Transport Provision	Minimum Rating	Maximum Rating	Average Rating
Vehicle access on main roads into/across town	2	4	3.0
Vehicle circulation around town centre	2	4	2.9
Parking in town centre	2	5	3.6
Bus service provision	2	4	3.0
Rail service provision	2	3	2.7
Walking & cycling provision	3	3	3.0

2.27 The overall results suggest that transport provision is considered to be average, with most of the average ratings around the value 3.

2.28 Parking in the town centre scored highest, on average, at 3.6, and also had the most variation in scoring with a low score of 2 and a high score of 5.

2.29 Rail service provision scored lowest, on average, at 2.7. Walking & cycling had the most consistent scoring with all those who rated it scoring a 3.

Impact of transport upon business operations

2.30 Business respondents were also asked to rate the impact of current transport congestion upon their business operations, again on a scale of 1 to 5, with 1 indicting little impact and five a large impact.

2.31 Table 2.7 provides a breakdown of the minimum, maximum and average rating from respondents

Table 2.7 Impact of current transport congestion upon business operations

Aspect of Business	Minimum Rating	Maximum Rating	Average Rating
Business travel to or from your premises	2	5	3.3
Deliveries to or from your premises	1	4	2.4
Customer travel to your premises	1	5	2.6
Employee commuter travel to work	1	4	2.4

2.32 Transport congestion was considered to have the largest impact upon business travel to and from business premises, with an average score of 3.3 and a highest rating of 5.

2.33 Customer travel was considered to be the next most important, with an average of 2.6, and again, a highest score of 5.

2.34 Business respondents were also asked to rate the impact of parking charges upon their business operations, again on a scale of 1 to 5, with 1 indicting little impact and five a large impact.

2.35 Table 2.8 provides a breakdown of the minimum, maximum and average rating from respondents

Table 2.8 Impact of parking charges upon business operations

Aspect of Business	Minimum Rating	Maximum Rating	Average Rating
Customers accessing your premises	1	4	1.6
Employees travelling to work	1	4	1.7
Business travel to or from your premises	1	4	1.6

2.36 There was considerable variation in the scoring with all three aspects of business operations scoring both 1's and 4's. Overall, however, the results suggest that parking charges are less of an impact upon business operations than transport congestion, with average scores of between 1.6 to1.7 rather than 2.4 to 3.3.

Benefits of improvements

2.37 Business respondents were also asked to rate how beneficial various transport improvements would be to their business operations, again on a scale of 1 to 5, with 1 indicting little impact and five a large impact.

2.38 Table 2.9 provides a breakdown of the minimum, maximum and average rating from respondents

Table 2.9 Benefits of transport improvements on business operations

Potential Improvement	Minimum Rating	Maximum Rating	Average Rating
Reduce vehicle journey times into town	2	5	3.4
Reduce vehicle journey times across town	3	5	3.9
Improve vehicle circulation around town centre	3	5	3.9
Improve bus service provision	1	5	2.5
Improve rail service provision	1	5	3.4
Improve walking and cycling provision	1	5	2.5

2.39 The results suggest that the business respondents view vehicle journey times across town and vehicle circulation around town as the most important improvements, both scoring 3.9 on average.

2.40 Reduced vehicle journey times into town and improved rail services also scored, on average, above 3.

2.41 Improved bus services and walking & cycling provision were rated the less important improvements.

2.42 Businesses were also given the opportunity to highlight what they deem to be the single most important transport improvement that could be implemented across Maidstone.

2.43 Three businesses indicated that the South East Maidstone Strategic Link (SEMSL) was the most important as it would increase connectivity to the motorway from the south of the borough and would relieve town centre congestion.

2.44 One other business indicated that improved rail links to London were the most important improvement.

Summary

2.45 The sample sizes collected from the survey mean that it is difficult to draw any strong conclusions from the questionnaire results in terms of the overall views of business across Maidstone.

2.46 The results suggest, however, that rail services and vehicle circulation around the town are the major areas where improvements are required in order to support business activity.

2.47 Parking provision is currently considered to be more than adequate and businesses were, generally, not significantly concerned about the impact of parking charges upon business operations. Instead it is transport congestion, and the effect upon business travel, that has the greatest impact upon business operations.

2.48 The focus of preferred improvements is an improved rail service, in particular to London, and improved vehicle circulation across and around the town, with specific support for SEMSL as a way of relieving town centre congestions.

Highways Agency

Overview

2.49 As part of the stakeholder engagement process MBC established a meeting with the Highways Agency (HA) in order to discuss the potential impacts of the Core Strategy development on the strategic road network (SRN) and how the potential impact of proposed transport mitigation measures.

2.50 Full details of this meeting are available from MBC Council Officers; however, the clear focus of discussions related to capacity constraints along the M20 motorway and access to and from the motorway through Junction 5, 6, 7 and 8.

2.51 It is a clear requirement of the HA to ensure efficient operation of the SRN and so it is important that the emerging Integrated Transport Strategy takes dues consideration of potential traffic generation that could utilise the M20 during peak periods and ensure that it does not have a significant detrimental impact on congestion through appropriate mitigation.

3 Establishing the Appraisal Objectives

Overview

3.1 An important aspect of any appraisal process is to establish a set of key objectives against which to both develop scheme options, as well as to subsequently assess potential performance. These objectives need to be based upon a detailed understanding of the issues and opportunities that need to be addressed.

3.2 A summary of the identified issues and opportunities is provided below, drawing upon baseline transport modelling outputs, the stakeholder engagement process, as well as the data collected and collated within the previous Data and Analysis Reports from this study.

Issues and Opportunities

Core Strategy Development Assumptions

3.3 The previous 'Analysis Report' set out a summary of the proposed development strategy within the MBCs Core Strategy. The overall borough-wide strategy is to deliver 10,080 homes and around 10,000 additional jobs within this period.

3.4 The residential development is spread across the town centre and urban fridge, but with a specific focus upon the southeast of the town centre and the northwest. Residential development is also outlined for more rural parts of the borough including Staplehurst, Marden, Headcorn, Lenham, and Harrietsham.

3.5 Allocations for employment development are also spread across the town but with a specific focus around the east/southeast/south of the town, as well as to the north. There are also development opportunities outlined in Staplehurst and Marden.

3.6 Retail development growth is mainly focused upon the core town centre.

Transport Model Outputs

3.7 The Maidstone Visum Model provides a useful tool with which to translate the future year development assumptions into forecasts for transport movements across the borough. Section 5 provides a detailed overview of the specification of the transport model along with the main outputs; however, the following summary outputs detail the predicted impact of future year growth on the performance of the transport network in and around Maidstone:

- 43% increase in transport movements during the AM peak hour from 2007 travel patterns
- 42% increase in transport movements during the PM peak hour from 2007 travel patterns
- 87% transport movements are undertaken by car in the AM peak (90% in the PM peak)
- There is a forecast reduction in mode share for bus, rail and park & ride.
- Significant congestion on major routes leading into Maidstone Town Centre, specifically along the A229 Royal Engineers Road / Gyratory / Loose Road corridor.
- Notable capacity constraints along sections of the M20 between Junctions 4 and 8 in the AM peak.

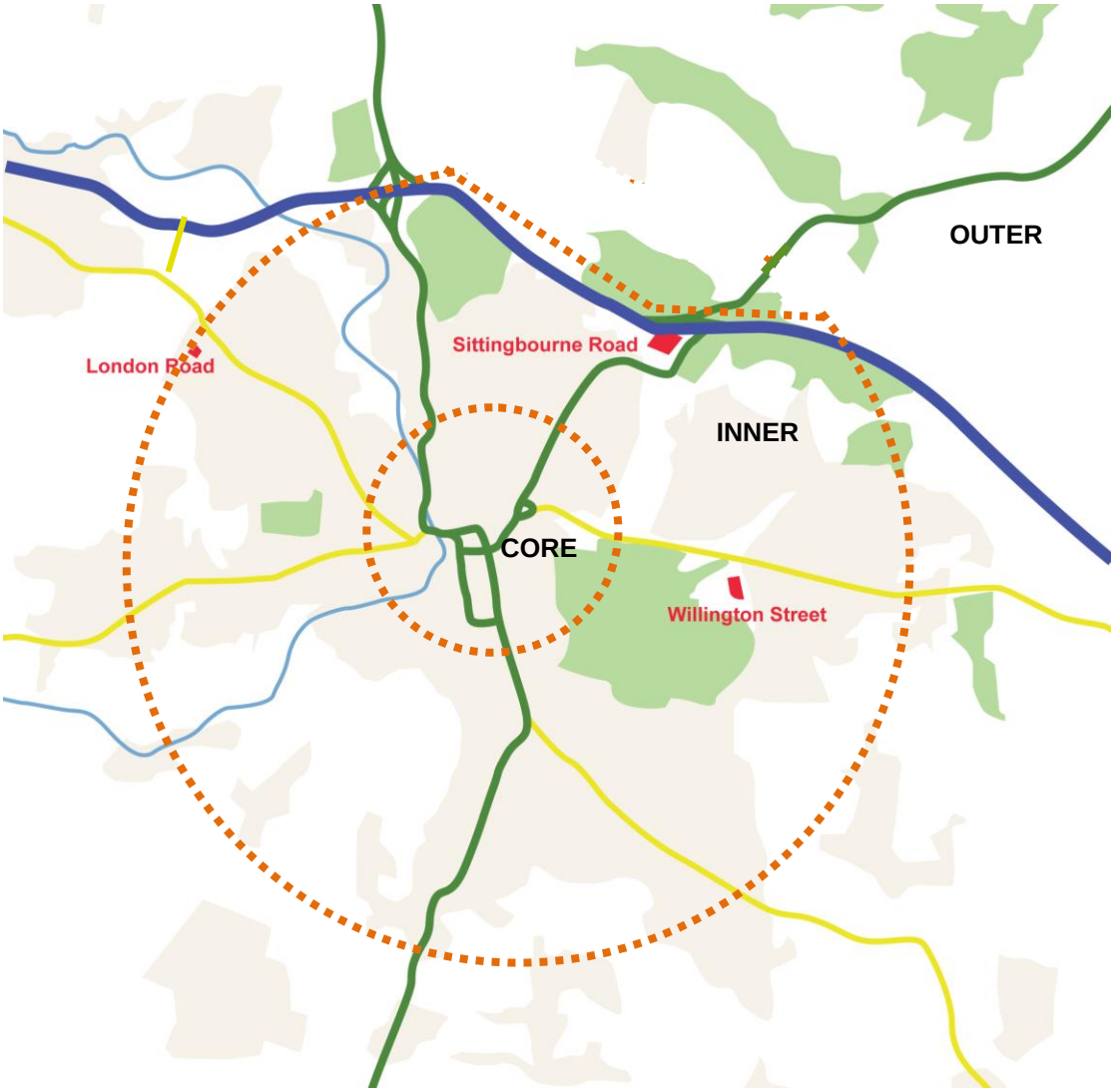
3.8 The transport model also provides the opportunity to assess broad patterns of travel for trips either originating or terminating within the borough of Maidstone.

3.9 To assist in such travel pattern analysis the model outputs have been disaggregated into five broad sectors, reflecting the special proximity to Maidstone Town Centre, as follows:

- Core Maidstone Sector (representing the core town centre retail and employment area)
- Inner Maidstone Sector (representing the rest of the Maidstone Town urban area)
- Outer Maidstone Sector (representing all other areas within the borough)
- Rest of Kent
- London and rest of the South

3.10 Figure 3.1 provides a geographical representation of the Core and Inner sectors.

Figure 3.1 Model Output Sectors (within Borough of Maidstone)



3.11 The model forecasts that there will be in the region of 52,000 transport movements within the AM peak hour in 2026. This excludes all walking and cycling trips that are not explicitly modelled within the software.

3.12 The transport movements have the following breakdown in origins:

- 13% of movements originate in the Core Maidstone Sector
- 26% of movements originate in the Inner Maidstone Sector
- 25% of movements originate in the Outer Maidstone Sector (within Borough of Maidstone)
- 29% of movements originate in the rest of Kent
- 7% of movements originate in London and the rest of the South of England

3.13 The breakdown in destinations is as follows:

- 20% of trips are to the Maidstone Core Sector
- 25% of trips are to the Inner Maidstone Sector
- 25% of trips are to the Outer Maidstone Sector (within Borough of Maidstone)
- 22% of trips are to the rest of Kent
- 7% of trips are to London and the rest of the South of England

3.14 The largest movements between each of the five sectors are as follows:

- 10.7% of trips are from the rest of Kent to Outer Maidstone Sector
- 9.6% of trips are from the rest of Kent to Inner Maidstone Sector
- 9.4% of trips are from the Outer Maidstone Sector to the rest of Kent
- 8.6% of trips are from the Inner Maidstone Sector to the rest of Kent
- 8.4% of trips are from the rest of Kent to Core Maidstone Sector

3.15 At least three quarters of all transport movements are considered to be medium/long distance (>5 miles). Around a third of these long distance trips (25% of all movements) either originate or terminate in the Core Maidstone Sector and so could, theoretically, be served by a rail service, depending upon the proximity to a rail station.

3.16 Just over a third of all transport movements have both an origin and a destination in the Borough of Maidstone. These trips could, theoretically, be served by an urban and rural bus network across the borough.

3.17 The number of movements with originating and terminating within the Core and Inner Maidstone Sectors represents around 14.5%. Many of these trips will be relatively short in distance and so have the potential to be undertaken by walking or cycling, depending upon the precise origins and destinations.

3.18 The number of movements originating in the Outer Maidstone Sector, Kent or London and terminating in the Core Maidstone Sector represents around 14.5% of total transport movements in the AM peak. Many of these trips could, theoretically, be targeted to travel by park & ride.

Summary

3.19 Based upon the analysed data the key issues and opportunities for current and future travel in Maidstone are summarised as follows:

- A significant increase in transport movements is forecast by 2026 resulting from both underlying growth as well as the core strategy development proposals. This growth is spread across the borough.

- The majority of these transport movements are over medium/long distance with over a third travelling from the rest of Kent or the London area into the borough of Maidstone during the AM peak.
- One fifth of movements have a destination within the Core Maidstone Town Centre, whilst half of all movements terminate in the Inner and Outer Maidstone areas in the AM peak.
- The overwhelming majority of future transport movements are forecast to be undertaken by car.
- Vehicular congestion in the town centre is the primary issue affecting both current and future travel in Maidstone. The capacity of the gyratory system and single road bridge over the River Medway affects both vehicle flows to the town centre, as well as those travelling across town and on through trips.
- Large vehicle movements in the town centre will also affect local air quality, whilst increased vehicle trips across the whole borough will affect carbon emissions.
- Connectivity to the strategic road network is a key element for the current and future prosperity of the town and this is considered to be constrained from the south of the borough
- Despite being served by two rail lines, rail services are considered inadequate by many stakeholders, in particular in terms of connections to London and other major centres.
- Existing bus services are considered to be reasonable, with, in particular, a good service offered to the south of the town centre. None-the-less bus mode share remains low and is forecast to fall further, indicating that an improved service is required in order to encourage greater use of bus services.
- Of the existing park & ride sites, only Sittingbourne Road has significant utilisation during the AM peak period, with the other primarily serving the inter-peak market. This reduces the effectiveness of the service to reduce peak period congestion and also severely affects the ability for the operations to break-even financially
- Whilst the Sittingbourne Road site currently offers the best operational performance, it is still considered to have relatively poor access and facilities that affect utilisation of the site.
- There is currently considered to be an over-supply of town centre car parking, with survey work indicating around 40% spare capacity across all car parks, and around 33% spare capacity within MBC operated car parks.
- Town centre car parking charges are considered to competitive in comparison to other urban centres; however, the current pricing structure is considered, by some stakeholders, to undermine the competiveness of the existing park & ride services.
- There are considered to be major barriers to pedestrian and cycle movements leading into the town centre, resulting from the nature of the road network, the rail network and the River Medway. Whilst the town centre itself is currently in the process of a major urban realm improvement project that will provide significant benefits to pedestrians and cyclists, access to and from the core centre remains challenging, and often imposing, by non-vehicular modes.
- School travel is considered to be a major contributor to peak period car travel across the town centre, with a perception that there is little alternative to dropping school children off by car.

Appraisal Objectives

3.20 Based upon the issues and opportunities summarised above, the following appraisal objectives are proposed as the basis for appraising the packages of measures proposed as part of the Integrated Transport Strategy:

i. Support the proposed Core Strategy development through appropriate provision of transport network capacity

ii. Maintain and enhance the operation of the primary road network in and around Maidstone Town Centre

iii. Maintain and enhance connectivity to the Strategic Road Network and ensure no detrimental impacts to the operation of the Strategic Road Network

iv. Encourage travel by public transport through appropriate provision

v. Encourage travel by walking and cycling for short distance trips

vi. Increase the level of high occupancy vehicle trips

vii. Reduce the overall need to travel

viii. Maintain and enhance local air quality and reduce carbon emissions

ix. Ensure transport investment represents high value for money in terms of economic and social returns

x. Ensure on-going operating and maintenance costs are sustainable and minimise the requirement for public subsidy

4 Package Specification

Overview

4.1 Based upon the principles established within the outline objectives, a series of scheme options were developed that seek to address the issues and opportunities identified. These scheme options are summarised by mode in the sections below.

Highways

4.2 The baseline analysis work is clear that by 2026 there will be significant pressure upon the highway network within Maidstone, but in particular in the Town Centre and the existing gyratory system and bridge. Direct measures to improve the capacity are limited due to both spatial and financial implications; however, a series of highway schemes have been proposed to improve capacity of the network in general, including:

- South East Maidstone Strategic Link (SEMSL)
- M20 junction enhancements
- Small-scale highway capacity improvements
- Expansion of UTMC network

Public Transport

4.3 The baseline analysis work identified various perceived issues with the current rail service provision, in particularly with links to London and other major centres. Bus services are generally considered to be reasonable, although some areas are much better served than others. Park & Ride services are identified as an area that requires improvement, in particular it is not well used in the peak periods.

4.4 Potential public transport measures include:

- Improved rail services
- Enhanced bus service frequencies
- Additional bus routes connecting with future development areas, as well as School Bus service provision
- Bus priority measures, including bus lanes and signal priorities
- Improved Park & Ride services
- New Park & Ride sites
- Improved public transport interchange facilities

Walking & Cycling

4.5 Walking & cycling measures can play an important part in helping to relieve transport congestion, as well as to promote active forms of travel. Potential scheme measures include:

- Cycle routes, lanes and priority at junctions
- Cycle storage facilities
- Walking & cycling signage and navigation measures
- Pedestrian priority measures at junctions
- Pedestrianisation

Behavioural Change

4.6 Measures to encourage travel by different forms of transport (generally non-car-based) are another tool with which to impact upon transport congestion. Potential scheme measures include:

- School travel plans
- Travel plans for new development sites
- Business travel plans
- Walking & cycling promotional activities
- Car clubs and car share schemes

Package development

4.7 The Integrated transport Strategy will form a package of transport measures to support the Core Strategy. In order to be able to assess the potential impact of different measures a series of packages have been developed.

4.8 Four packages have been created as follows:

- Option 1 - Reference Case
- Option 2 – Bus and Radial Park & Ride
- Option 3 – Bus and North/South Spine Park & Ride
- Option 4 – SEMSL

4.9 Each is described in details in the sections that follow.

Option 1 – Reference Case

4.10 Option 1 represents what is considered to be the minimum required provision of transport services that will be required by 2026. It includes all existing transport infrastructure provision and services, some additional committed schemes, as well as some significant improvement to public transport and walking & cycling provision.

Scheme measures

4.11 A series of measures have been identified that are either committed schemes in the future, or that offer high value for money against objectives and so should be incorporated into the Transport Strategy. These include:

- Thameslink rail services to London
- M20 traffic signals
- Increased bus frequencies on all main radial routes into Town Centre to 10 minute frequencies
- Romney Place bus lane
- Upgrade existing Park & Ride site facilities
- Walking & cycling infrastructure
- Travel plans for new development sites

4.12 All other transport provision within the reference case scenario is assumed to remain as it is currently provided.

Costings

4.13 Since all the elements of the reference case are common to all options they have not been costed as part of this relative appraisal exercise. The exception is the upgrade and operation of the existing Park & Ride site facilities which is not common to all options.

4.14 The unique capital costs associated with the Option 1 package, relative to the other packages, are presented in Table 4.1.

Table 4.1 Option 1 Capital Costs - Outline Estimates (2011 prices)

Infrastructure Element	Minimum Cost Estimate (£'000)	Maximum Cost Estimate (£'000)
Upgrade London Road Park & Ride Site	1,430	1,780
Upgrade Sittingbourne Road Park & Ride Site	2,060	2,910
Upgrade Willington Street Park & Ride Site	1,390	1,740
Total Capital Costs Estimates	**4,880**	**6,430**

4.15 In addition, to the outlined capital costs, it is also assumed that there will be renewal costs for the three park & ride sites across the 60 year lifetime of the appraisal assessment. These are assumed to occur every 20 years.

4.16 The unique operating costs associated with the Option 1 package, relative to the other packages, are presented in Table 4.2.

Table 4.2 Option 1 Annual Operating Costs - Outline Estimates (2011 prices)

Infrastructure Element	Minimum Cost Estimate (£'000)	Maximum Cost Estimate (£'000)
Land Rental London Road Park & Ride Site	10	10
Land Rental Sittingbourne Road Park & Ride Site	100	100
Park & Ride Site Operating Costs	140	150
London Road Bus Operating Costs	250	290
Sittingbourne Road Bus Operating Costs	310	350
Willington Street Bus Operating Costs	250	290
Total Annual Operating Costs Estimates	**1,060**	**1,190**

Option 2 – Bus and Radial Park & Ride

Overview

4.17 Option 2 is based around the enhancement of all bus provision across the network alongside improvement to park & ride facilities and services on all approaches to Maidstone.

4.18 The option includes all elements of the reference case, as well as the following infrastructure and public transport service enhancements.

Additional Infrastructure provision

4.19 The additional transport infrastructure measures included in Option 2 are as follows:

- A229 Inbound Bus Lane / High Occupancy Vehicle Lane (Gibraltar lane to Southfield Roundabout)
- A274 Inbound Bus Lane / High Occupancy Vehicle Lane (Willington Street to Wheatsheaf Junction)
- Bus priority measures (Huntsman Lane / Ashford road Junction and Willington Road / Ashford Road Junction)
- St. Andrew's Bus Gate
- Bluebell Hill Park & Ride Site
- Sutton Road Park & Ride Site
- Linton Corner Park & Ride Site
- Replacement of Sittingbourne Road Park & Ride Site with Newnham Court Park & Ride Site

Additional Public Transport service provision

4.20 The additional public transport measures included in Option 2 are as follows:

- Through bus service from Bluebell Hill to Sutton Road at 10 minute frequency
- Through bus service from London Road to Willington Street at 10 minute frequency
- Through bus service from Linton Corner to Newnham Court at 10 minute frequency
- Increased Park & Ride fares (£3.00 peak / £2.00 off-peak)

Revised Parking provision

4.21 The changes in parking provision included in Option 2 are as follows:

- Reduction in Town Centre car parking supply (by 366 spaces)
- Increase in long-stay (>4+ hours) car parking tariff (+150%)
- Increase in short-stay (<4+ hours) car parking tariff (+20%)

Capital Costs

4.22 The additional capital costs associated with the Option 2 package, relative to Option 1, are presented in Table 4.3.

Table 4.3 Option 2 Capital Costs - Outline Estimates (2011 prices)

Infrastructure Element	Minimum Cost Estimate (£'000)	Maximum Cost Estimate (£'000)
A229 Inbound bus / HOV lane	3,260	4,100
A274 Inbound bus / HOV lane	8,560	10,870
Bus priority measures (Ashford Road junctions)	1,160	1,660
St. Andrew's bus gate	630	990
Bluebell Hill Park & Ride Site	9,720	13,740
Sutton Road Park & Ride Site	1,340	1,950
Linton Corner Park & Ride Site	4,600	6,520
Newnham Court Park & Ride Site	8,860	12,490
Upgrade London Road Park & Ride Site	1,430	1,780
Upgrade Willington Street Park & Ride Site	1,390	1,740
Total Capital Costs Estimates	**40,950**	**55,840**

4.23 In addition, to the outlined capital costs, it is also assumed that there will be renewal costs for the bus lanes, bus priority and the six park & ride sites across the 60 year lifetime of the appraisal assessment. Maintenance of the bus / HOV lanes is assumed to occur every five years and every 20 years for the park & ride sites.

Operating and Maintenance Costs

4.24 The additional operating costs associated with the Option 2 package, relative to Option 1, are presented in Table 4.4.

Table 4.4 Option 2 Annual Operating Costs - Outline Estimates (2011 prices)

Infrastructure Element	Minimum Cost Estimate (£'000)	Maximum Cost Estimate (£'000)
Park & Ride Site Operating Costs	220	240
Bluebell Hill / Sutton Rd Bus Operating Costs	910	1,050
London Rd/Willington Str. Bus Operating Costs	620	720
Linton Corner / Newnham Crt. Bus Operating Costs	810	940
Total Annual Operating Costs Estimates	**2,560**	**2,950**

Option 3 – Bus and North/South Spine Park & Ride

Overview

4.25 Option 3 is also based around the enhancement of all bus provision across the network along with improvements to park & ride facilities and services along the north / south spine corridor (A229/A274).

4.26 The option includes all elements of the reference case, as well as the following infrastructure and public transport service enhancements.

Additional Infrastructure provision

4.27 The additional transport infrastructure measures included in Option 3 are as follows:

- A229 Inbound Bus Lane / High Occupancy Vehicle Lane (Gibraltar lane to Southfield Roundabout)
- A229 Outbound Bus Lane / High Occupancy Vehicle Lane (White Rabbit Roundabout to Southfield Roundabout and Gibraltar lane to Running Horse Roundabout)
- A229 Gyratory Bus Lane / High Occupancy Vehicle Lane (both directions south from town centre)
- A274 Inbound Bus Lane / High Occupancy Vehicle Lane (Willington Street to Wheatsheaf Junction)
- Bus priority measures at Coldharbour Roundabout
- Romney Place Bus Lane
- St. Andrew's Bus Gate
- Cobtree Park & Ride Site
- Sutton Road Park & Ride Site
- Closure of existing three Park & Ride Sites (London Road / Sittingbourne Road / Willington Street)
- Upgrade link between Bircholt Road and Heath Road (B2163)
- Upgrade of Heath Road

Additional Public Transport service provision

4.28 The additional public transport measures included in Option 3 are as follows:

- New NorthEast Express Loop bus service (10 minute frequency)
- Through bus service from Cobtree to Sutton Road at 10 minute frequency
- Circular route from Cobtree to Town Centre at 5 minute peak frequency / 10 minute inter-peak
- Increased Park & Ride fares (£3.00 peak / £2.00 off-peak)

Revised Parking provision

4.29 The changes in parking provision included in Option 3 are as follows:

- Reduction in Town Centre car parking supply (by 366 spaces)
- Increase in long-stay (>4+ hours) car parking tariff (+150%)
- Increase in short-stay (<4+ hours) car parking tariff (+20%)

Capital Costs

4.30 The additional capital costs associated with the Option 3 package, relative to Option 1, are presented in Table 4.5.

Table 4.5 Option 3 Capital Costs - Outline Estimates (2011 prices)

Infrastructure Element	Minimum Cost Estimate (£'000)	Maximum Cost Estimate (£'000)
A229 Inbound bus / HOV lane	3,260	4,100
A229 Outbound bus / HOV lane	3,050	3,840
A229 Gyratory bus / HOV lane	480	640
A274 Inbound bus / HOV lane	8,560	10,870
Coldharbour Roundabout bus priority	10,760	12,830
St. Andrew's bus gate	630	990
Cobtree Park & Ride Site	14,010	18,840
Sutton Road Park & Ride Site	4,060	5,760
Traffic Enforcement Cameras	900	1,500
Live Traffic Information Board	120	200
Bircholt Rd to Heath Rd Upgrade	7,010	8,550
Total Capital Costs Estimates	**52,840**	**68,120**

4.31 In addition, to the outlined capital costs, it is also assumed that there will be renewal costs for the bus lanes, bus priority and the two park & ride sites across the 60 year lifetime of the appraisal assessment. Maintenance of the bus / HOV lanes is assumed to occur every five years and every 20 years for the park & ride sites.

Operating and Maintenance Costs

4.32 The additional operating costs associated with the Option 2 package, relative to Option 1, are presented in Table 4.6.

Table 4.6 Option 3 Annual Operating Costs - Outline Estimates (2011 prices)

Infrastructure Element	Minimum Cost Estimate (£'000)	Maximum Cost Estimate (£'000)
Park & Ride Site Operating Costs	120	130
Cobtree / Sutton Rd Bus Operating Costs	840	980
Cobtree to Town Loop Bus Operating Costs	120	135
NW Express Loop Bus Operating Costs	910	1,050
Total Annual Operating Costs Estimates	**1,990**	**2,295**

Option 4 – SEMSL

Overview

4.33 The final option for consideration relates to the provision of the South East Maidstone Strategic Link (SEMSL).

Infrastructure provision

4.34 SEMSL is a proposed highway link that would connect the M20 Junction 8 through to the A274 north of Langley Heath. Outline proposals also include a link forming a bypass of the A274 from west of Langley to just north of the Five Wents junction with the B2163.

4.35 The scheme would be a single carriageway link with a 60mph speed limit that would provide direct access to the M20 motorway from the south east of Maidstone Borough.

Capital Costs

4.36 The capital costs of the scheme have not been fully costed as part of this work; however, previous quantification work estimated that it would be in the region of £76million. This included up to £13 million for a grade separated junction connecting SEMSL to the A20.

4.37 The preliminary designs for the SEMSL route and associated junctions have been reviewed and it has been concluded that the outline costs are considered to be appropriate.

5 Transport Modelling Results

Overview

5.1 To support the appraisal work of the packages of transport measures, MBC commissioned Jacobs to undertake a transport modelling exercise.

5.2 The details of the model specification, operation and results are all outlined within the Maidstone Option Testing – Model Output Report (Jacobs 2012), referred to throughout the rest of this document as the 'Jacobs Report'.

5.3 This section provides a brief overview of the model and presents the key outputs relevant to the appraisal process.

Maidstone Multi-modal Transport Model

5.4 A multi-modal model has previously been developed by Jacobs on behalf of Kent County Council using the VISUM modelling software package. The original model was built, calibrated and validated using 2007 survey data. The model encompasses Maidstone Borough and the immediate surrounding area in detail, whilst the wider network extends to include major transport routes across Kent and into London to reflect long distance travel. The model is based upon a single AM peak hour and a single PM peak hour.

5.5 The Jacobs report provides a detailed summary of the operation of the model; however, it is useful to highlight some of the core elements of the process. The main functions of the model are that it is able to:

- Forecast future year trips between different land-uses
- Assess the mode of transport that will be used to travel between individual origins and destinations
- Distribute these trips across the transport network to show levels of demand and capacity constraints

5.6 The process of forecasting travel by different modes is undertaken via the comparative assessment of average cost (e.g. vehicle operating costs, public transport fares) and journey times by different modes. Note: the model excludes walking and cycling trips from this assessment.

5.7 The distribution of trips across the network takes into account further travel parameters, such as the amount of interchange and waiting time for public transport, and walk times to and from public transport or car parks

5.8 It is also important to understand that the model allows peak spreading to occur. If the model considers that the network is becoming too congested to travel in the peak hour then it will reallocate some trips to the shoulders of the peaks. Since the model only encompasses a single AM and PM peak hour these trips do not appear in the model output. As a result of this the total trips presented by each model option vary.

2026 Model

5.9 A 2026 model has been developed that takes into account both forecast underlying growth in travel across the South East (as detailed in TEMPRO) as well as the impact of the additional, residential housing, employment and retail growth planned within the Core Strategy. The relative impact of each type of trip growth is roughly as follows:

- 13,500 underlying growth in trips
- 8,250 Core Strategy development growth in trips

5.10 This demonstrates that the underlying growth actually has a larger impact on trip generation in the model than the Core Strategy development growth.

5.11 It is important to note that the model is able to replicate future growth more accurately within the borough of Maidstone External and surrounding area, than it does for the wider, external zones. This has implications for when assessing trips to and from the external zones, which is discussed later in the report.

Reference Model (Option 1)

5.12 The reference model (Option 1) is based upon the original 2007 model data but incorporates that additional growth in underlying trips and Core Strategy development assumptions. In addition, it incorporates changes to the transport network to reflect the committed schemes and scheme measures outlined in Section 4.11.

Alternative Models (Options 2 and 3)

5.13 The Option 2 and 3 models build directly upon the Option 1 model but incorporate the changes to bus and Park & Ride provision outlined from Section 4.18 and 4.26, respectively.

5.14 It should be noted that the trip distribution element of the model was not providing credible results for Option 2 and 3 bus and rail and so the same profile as Option 1 was applied by Jacobs.

Reference Case - Option 1

5.15 This section provides a summary of the key outputs from the Option 1 modelling work. A more detailed assessment is presented with the Jacobs Report.

Mode Share

5.16 The model provides an overall assessment of the number of trips that are forecast to be undertaken by each mode of transport. The results for the reference case model are presented in Table 5.1.

Table 5.1 Reference Case (Option 1) Mode Share

Mode	AM Peak		PM Peak	
Bus	3,590	7%	2,197	5%
Rail	2,611	5%	1,777	4%
Car	46,860	87%	43,129	90%
P&R	590	1%	857	2%
Total	**53,651**	**100%**	**47,960**	**100%**

Maidstone Visum Model

5.17 This indicates that car trips are by far the most dominant mode share with around 90% of trips undertaken by this mode.

5.18 This same mode share data is available for the more disaggregate sectoral analysis, as presented in Figure 3.1. **Appendix C** provides a full spatial presentation of the origins and destinations of trips by each mode for Option 1.

5.19 The sectoral analysis provides the following information for the AM peak hour movements:

- A third of trips either between the Inner Maidstone and Core Maidstone Sectors (and vice versa), or solely within the Core Maidstone Sector, are undertaken by bus.
- Overall, 12% of trips originating in the Core Maidstone Sector, and 15% terminating, are by bus.
- 40% of trips from the Inner Maidstone Sector to London are by rail. In total, 23% of all trips to London are by rail.
- 17.5% of trips from London to the Core Maidstone Sector are by rail, with a further 6% by park & ride.
- 76% of trips terminating in the Core Maidstone Sector are by car
- 96% of trips terminating in the Outer Maidstone Sector are by car

Link Flows

5.20 The Transport Model outputs have assessed vehicle flows along key routes across the Maidstone highway network. A total of 27 locations have been assessed across Maidstone, along with flows along the M20 Motorway. Jacobs Report provides full details of all locations, along with the forecast flows for Options 1, 2, and 3.

5.21 For Option 1, the results indicate that the A229 Royal Engineers Road is forecast to be the busiest road corridor leading into Maidstone Town Centre with the highest inbound and outbound flows in both the AM and PM peak hours. The A249 Sittingbourne Road is the next busiest corridor, followed by the A229 Loose Road.

5.22 Comparative analysis is also available that demonstrates the forecast increase in vehicle flows between the 2007 base model and 2026 Option 1 model. This indicates that overall vehicle flows, along the reported corridors, will increase by around 50% in the AM peak and 20% in the PM peak.

5.23 Flows along the A229 Royal Engineers Road are predicted to increase between 70% to 80%, and between 70% to 110% along the A249 Sittingbourne Road, in the AM peak.

Travel Times

5.24 The model provides an assessment of selection of travel times for key routes leading to and from Maidstone Town Centre. Full details are provided within the Jacobs Report.

5.25 In summary, the journey times along all routes represent a significant increase above free-flow time. They are also considered to be considerably higher than the baseline 2007 journey times, although this direct comparison is not available. The impact in terms of congestion is considered further in the network congestion section below.

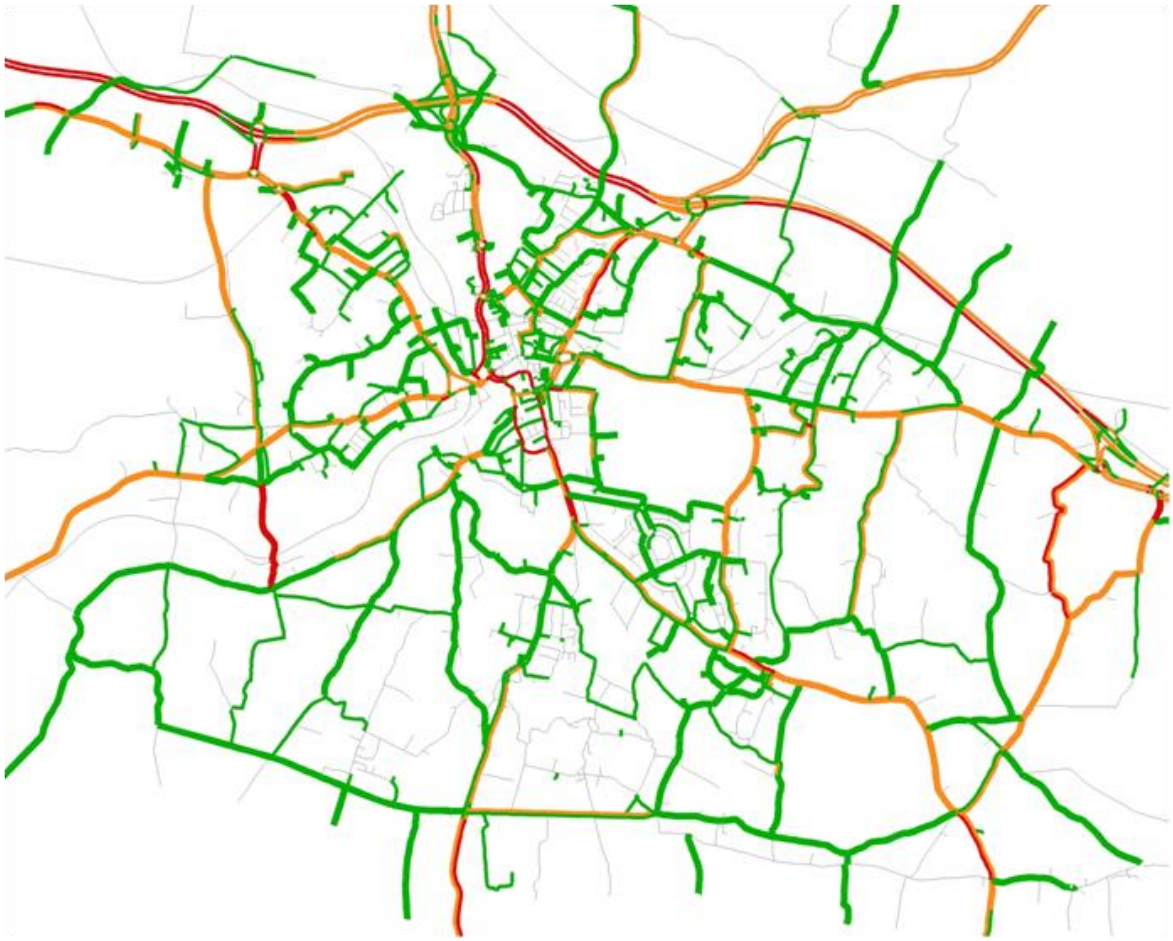
Network Congestion

5.26 The model is able to provide an assessment of overall network congestion in terms of volume of traffic against highway capacity.

5.27 Figure 5.1 replicates the output presented within the report and demonstrates the areas of congestion.

5.28 The links in green are operating within capacity, those highlighted in orange are heavily trafficked (volume to capacity ratio up to 95%) but are just below their operating capacity, while the links in red (volume to capacity ratio over 95%) are already close to or over capacity.

Figure 5.1 Network Congestion (AM Peak) - Reference Case (Option 1)



Maidstone Visum Model

5.29 The network congestion map highlights a number of road links where demand is forecast to be very close or exceeding operating capacity in the AM peak and so result in significant congestion. This includes north and southbound sections of the A229 Royal Engineers Road, as well as the A229 Gyratory System. Sections of the A249 Sittingbourne Road inbound and the A20 London Road inbound.

5.30 Many of the other main arterial roads leading into Maidstone are forecast to be heavily trafficked (up to 95% of capacity).

5.31 The congestion map also indicates capacity constraints along the M20. The Jacobs Report presents flow data for the M20 as a percentage of overall link flow capacity along each section of the motorway. The results for Option 1 indicate that vehicle flows are forecast to exceed link capacity for three links in the AM peak, as follows:

- M20 J6 to J7 (Eastbound) = 108% (volume/capacity)
- M20 J5 to Jn 4 (Westbound) = 129% (volume/capacity)
- M20 J8 to Jn 7 (Westbound) = 102% (volume/capacity)

5.32 In addition, vehicle flows are forecast to exceed link capacity for one link in the PM peak, as follows:

- M20 J5 to Jn 4 (Westbound) = 102% (volume/capacity)

Option 2 – Bus & Radial Park & Ride

5.33 This section provides a summary of the key outputs from the Option 2 modelling work. A more detailed assessment is presented with the Jacobs Report.

Mode Share

5.34 The breakdown in mode share for Option 2 is presented in Table 5.2, followed by the relative change in mode share between Option 2 and the reference case (Option 1) in Table 5.3.

Table 5.2 Option 2 Peak Hour Mode Share

Mode	AM Peak		PM Peak	
Bus	4,471	8%	5,075	10%
Rail	2,018	4%	1,938	4%
Car	44,671	83%	39,719	81%
P&R	2,380	4%	2,406	5%
Total	**53,540**	**100%**	**49,138**	**100%**

Maidstone Visum Model

Table 5.3 Change in Peak Hour Mode Share – Option 2 vs Reference Case (Option 1)

Mode	AM Peak		PM Peak	
Bus	+881	+25%	+2,878	+131%
Rail	-593	-23%	+161	+9%
Car	-2,189	-5%	-3,410	-8%
P&R	+1,790	+303%	+1,549	+181%
Total	**-111**	**0%**	**+1,178**	**2%**

Maidstone Visum Model

5.35 The outputs indicate that car remains the dominant mode but that there is forecast to be a reduction of 5% in AM peak car trips and 8% of PM peak car trips. The majority of these trips switch to either bus or park & ride.

5.36 This same mode share data is available for the more disaggregate sectoral analysis, as presented in Figure 3.1. **Appendix D** provides a full spatial presentation of the origins and destinations of trips by each mode for Option 2.

5.37 The sectoral analysis provides the following information for the AM peak hour movements:

- 38% of trips either between the Inner Maidstone and Core Maidstone Sectors (and vice versa), or solely within the Core Maidstone Sector, are undertaken by bus, a 5% increase from Option 1.
- Overall, 15% of trips originating in the Core Maidstone Sector, and 16% terminating, are by bus, a 3% and 1% increase from Option 1, respectively.
- 35% of trips from the Inner Maidstone Sector to London are by rail, a 5% reduction from Option 1. In total, 20% of all trips to London are by rail, a 3% reduction from Option 1.
- 12.5% of trips from London to the Core Maidstone Sector are by rail, a 5% reduction from Option 1, but a further 20% by park & ride, a 14% increase from Option 1.
- 60% of trips terminating in the Core Maidstone Sector are by car, a reduction of 16% from Option 1.
- 95% of trips terminating in the Outer Maidstone Sector are by car, a reduction of 1% from Option 1.

Link Flows

5.38 The link flow data provided within the Jacobs Report indicates that there is a marginal increase (4%) in movements along the main arterial corridors leading in Maidstone in the AM peak. This would appear to be in slight contrast to the overall origin – destination data from the Visum Model (described above) which forecasts that car trips into Maidstone will decrease.

5.39 Table 5.4 provides a summary of the predicted change in AM peak vehicle flows, for a selection of links, between the Option 2 model outputs and the reference case (Option 1).

Table 5.4 Change in AM Peak Hour Vehicle Flows – Option 2 vs Reference Case (Option 1)

Mode	Inbound		Outbound	
A229 Royal Engineers Road	-451	-14%	+102	+4%
A249 Sittingbourne Road	+176	+12%	+47	+4%
A20 London Road	+308	+37%	-348	-35%
A20 Ashford Road	+294	+19%	+135	+38%
A229 Loose Road (nrth of Wheatsheaf)	+57	+5%	+93	+8%

Maidstone Visum Model

5.40 The results indicate that there will be a notable reduction in inbound flows along the A229 Royal Engineers Road and Outbound along the A20 London Road. All other links show an increase in vehicle flows.

5.41 A full list of vehicle flows on each link, along with the PM peak data, is presented within the Jacobs Report.

Travel Times

5.42 The travel time data presented in the Jacobs report indicates that travel times are forecast to be higher under the Option 2 scenario along all corridors leading into Maidstone Town Centre than for Option 1. This is not the intuitive result that might be anticipated from the Option 2 measures. The increased town centre car parking charges, supported by the additional park & ride measures, might be envisaged to help to alleviate town centre congestion. The origin – destination data appears to support this view with the volume of car trips terminating in the core town centre reducing; however, this does not appear to translate to a reduction in journey times, with some corridors forecast to see increases. It is recommended that the reasons for this are investigated further by the modelling team.

5.43 The following key comparisons between the Option 2 and Option 1 outputs can be made:

- Inbound AM peak travel times into Maidstone are predicted to increase by over 2 minutes for vehicle trips along the A229 Royal Engineers Road, A249 Sittingbourne Road and A20 London Road.
- Outbound PM peak travel times from Maidstone are predicted to increase by over 3 minutes for vehicle trips along the A229 Royal Engineers Road, A274 Sutton Road and A20 London Road.
- Inbound PM peak travel times from Maidstone are predicted to increase by over 3½ minutes for vehicle trips along the A229 Royal Engineers Road, A249 Sittingbourne Road and A20 Ashford Road.

- Outbound PM peak travel times from Maidstone are predicted to increase by over 3 minutes for vehicle trips along the A229 Royal Engineers Road, A274 Sutton Road and A26 Tonbridge Road.
- Travel times along the M20 in the AM peak either remain broadly constant or are reduced, with the exception of an increase between Junctions 7 and 8
- Travel times along the M20 in the PM peak are reduced for all movements.

Network Congestion

5.44 Figure 5.2 presents the forecast areas of congestion in Option 2.

Figure 5.2 Network Congestion (AM Peak) - Option 2

Maidstone Visum Model

5.45 The network congestion map highlights a number of road links where demand is forecast to be close to or exceeding operating capacity in the AM peak and so results in significant congestion. This includes the whole of the north and southbound sections of the A229 Royal Engineers Road. Whilst some parts of A229 Gyratory System remain very close to capacity, generally congestion is much reduced in comparison to Option 1.

5.46 Sections of the A249 Sittingbourne Road and A20 Ashford Road inbound are also heavily congested.

5.47 Many of the other main arterial roads leading into Maidstone are forecast to be heavily trafficked (up to 95% of capacity), although the A20 London Road shows reduced inbound congestion, along with the M20 Junction 5.

5.48 The congestion map also indicates capacity constraints along the M20, although less than for Option 1. The Jacobs Report presents flow data for the M20 as a percentage of overall link flow capacity along each section of the motorway. The results for Option 2 indicate that two vehicle flows are forecast to exceed link capacity for the AM peak, as follows:

- M20 J5 to Jn 4 (Westbound) = 124% (volume/capacity)
- M20 J8 to Jn 7 (Westbound) = 107% (volume/capacity)

5.49 The volume to capacity value for Jn 5 to Jn 4 represents a marginal improvement to the reference case (Option 1); however, the opposite is true for Jn 8 to Jn 7.

5.50 No vehicle flows are forecast to exceed link capacity for the PM peak.

Option 3 – Bus & North/South Spine Park & Ride

5.51 This section provides a summary of the key outputs from the Option 3 modelling work. A more detailed assessment is presented with the Jacobs Report.

Mode Share

5.52 The breakdown in mode share for Option 3 is presented in Table 5.5, followed by the relative change in mode share between Option 3 and the reference case (Option 1) in Table 5.6.

Table 5.5 Option 3 Peak Hour Mode Share

Mode	AM Peak		PM Peak	
Bus	4,522	9%	5,108	11%
Rail	2,919	6%	1,975	4%
Car	44,252	84%	39,686	83%
P&R	1,239	2%	1,297	3%
Total	**52,932**	**100%**	**48,066**	**100%**

Maidstone Visum Model

Table 5.6 Change in Peak Hour Mode Share – Option 3 vs Reference Case (Option 1)

Mode	AM Peak		PM Peak	
Bus	+932	+26%	+2,911	+132%
Rail	+309	+12	+198	+11%
Car	-2,608	-6%	-3,443	-8%
P&R	+649	+110%	+1,549	+51%
Total	**-719**	**-1%**	**106**	**0%**

Maidstone Visum Model

5.53 A similar pattern is found with the Option 3 results with car remaining the dominant mode but with a forecast reduction of 6% in AM peak car trips and 8% of PM peak car trips. Again the majority of these trips switch to either bus or park & ride.

5.54 This same mode share data is available for the more disaggregate sectoral analysis, as presented in Figure 3.1. **Appendix E** provides a full spatial presentation of the origins and destinations of trips by each mode for Option 3.

5.55 The sectoral analysis provides the following information for the AM peak hour movements:

- 39% of trips either between the Inner Maidstone and Core Maidstone Sectors (and vice versa), or solely within the Core Maidstone Sector, are undertaken by bus, a 6% increase from Option 1.
- Overall, 15% of trips originating in the Core Maidstone Sector, and 18% terminating, are by bus, a 3% increase from Option 1 for both, respectively.
- 44% of trips from the Inner Maidstone Sector to London are by rail, a 4% increase from Option 1. In total, 27% of all trips to London are by rail, a 4% increase from Option 1.
- 18.5% of trips from London to the Core Maidstone Sector are by rail, a 1% increase from Option 1, with a further 12% by park & ride, a 6% increase from Option 1.
- 64% of trips terminating in the Core Maidstone Sector are by car, a reduction of 12% from Option 1.
- 94% of trips terminating in the Outer Maidstone Sector are by car, a reduction of 2% from Option 1.

Link Flows

5.56 The link flow data provided within the Jacobs Report indicates that there is a marginal increase (3%) in movements along the main arterial corridors leading into Maidstone in the AM peak. This would appear to be in slight contrast to the overall origin – destination data from the Visum Model (described above) which forecasts that car trips into Maidstone will decrease.

5.57 Table 5.7 provides a summary of the predicted change in AM peak vehicle flows, for a selection of links, between the Option 3 model outputs and the reference case (Option 1).

Table 5.7 Change in AM Peak Hour Vehicle Flows – Option 3 vs Reference Case (Option 1)

Mode	Inbound		Outbound	
A229 Royal Engineers Road	-219	-7%	+2	0%
A249 Sittingbourne Road	+72	+5%	-202	+16%
A20 London Road	-76	-9%	-14	-1%
A20 Ashford Road	+135	+9%	+109	+31%
A229 Loose Road (nrth of Wheatsheaf)	+173	+14%	+272	+22%

Maidstone Visum Model

5.58 The results indicate that there will be a reduction in inbound flows along the A229 Royal Engineers Road, although not as significant as for Option 2. There will also be reductions inbound and outbound on the A20 London Road, and outbound on the A249 Sittingbourne Road.

5.59 A full list of vehicle flows on each link, along with the PM peak data, is presented within the Jacobs Report.

Travel Times

5.60 The travel time data presented in the Jacobs report indicates that a large proportion of travel times in the AM peak are forecast to be lower under the Option 3 scenario along the corridors leading into Maidstone Town Centre than for Option 1.

5.61 The following key comparisons between the Option 3 and Option 1 outputs can be made:

- Inbound AM peak travel times into Maidstone are predicted to reduce by over 3 ½ minutes for vehicle trips along the A229 Royal Engineers Road, A249 Sittingbourne Road, A20 London Road and A20 Ashford Road.
- Outbound PM peak travel times from Maidstone are predicted to reduce by over 4 minutes for vehicle trips along the A26 Tonbridge Road and A20 London Road.
- Inbound PM peak travel times from Maidstone are predicted to increase by over 1½ minutes for vehicle trips along the A249 Sittingbourne Road, A229 Loose Road and A20 London Road.
- Outbound PM peak travel times from Maidstone are predicted to increase by over 3 minutes for vehicle trips along the A274 Sutton Road and A229 Loose Road but to decrease by over 4 minutes along the A26 Tonbridge Road and A20 London Road.
- Travel times along the M20 in the AM peak increase between Jn 5 and Jn 6 eastbound and between Jn 8 and 5 westbound.
- Travel times along the M20 in the PM peak are reduced for all movements.

Network Congestion

5.62 Figure 5.3 presents the forecast areas of congestion in Option 3.

Figure 5.3 Network Congestion (AM Peak) - Option 3

Maidstone Visum Model

5.63 The network congestion map highlights a number of road links where demand is forecast to be close to or exceeding operating capacity in the AM peak and so result in significant congestion. This includes the whole of the north and southbound sections of the A229 Royal Engineers Road. Whilst some parts of A229 Gyratory System remain very close to capacity, generally congestion is much reduced in comparison to Option 1.

5.64 Sections of the A249 Sittingbourne Road and A20 Ashford Road inbound and the A229 Loose Road outbound up to the Wheatsheaf Junction are also heavily congested.

5.65 Many of the other main arterial roads leading into Maidstone are forecast to be heavily trafficked (up to 95% of capacity), although the A20 London Road shows reduced inbound congestion, along with the M20 Junction 5.

5.66 The congestion map also indicates capacity constraints along the M20, although less than for Option 1. The Jacobs Report presents flow data for the M20 as a percentage of overall link flow capacity along each section of the motorway. The results for Option 3 indicate that two vehicle flows are forecast to exceed link capacity for the AM peak, as follows:

- M20 J4 to Jn 5 (Eastbound) = 130% (volume/capacity)
- M20 J6 to Jn 7 (Westbound) = 102% (volume/capacity)
- M20 J5 to Jn 4 (Westbound) = 138% (volume/capacity)
- M20 J7 to Jn 6 (Westbound) = 106% (volume/capacity)
- M20 J8 to Jn 7 (Westbound) = 107% (volume/capacity)

5.67 The data indicates that there is forecast to be a significant increase in traffic flow between Junctions 2 and 5, but particularly in the eastbound direction.

5.68 No vehicle flows are forecast to exceed link capacity for the PM peak.

North West Express Loop Bus

5.69 The Option 3 modelling incorporates an express bus service that travels in a loop around the A229 Royal Engineers Road, the M20 (Junction 6 to 5), Hermitage Lane, and back to town along the A26.

5.70 The service would operate in both directions with a service frequency of 10 minutes. This would mean a total of 6 buses per hour in each direction throughout the day.

5.71 Table 5.8 provides the forecast patronage levels during the peak periods.

Table 5.8 North West Express Loop Bus Service Patronage Forecasts – Option 3

Time Period	Clockwise	Anti-Clockwise	Total
AM Peak	12	64	76
PM Peak	171	115	286

Maidstone Visum Model

5.72 The results suggest that patronage for the service is relatively low, particularly in the AM peak period. Whilst much higher in the PM peak the loadings per bus would still remain relatively low, with an average of 24 passengers per bus per loop.

Option 4 – SEMSL

5.73 There are two sets of modelling outputs that help provide an insight into the potential impact of SEMSL in delivering against the primary objectives of the Integrated Transport Strategy. The SEMSL scheme was modelled directly as part of the assessment of the South East Urban Extension. The more up-to-date modelling exercise also provides information regarding the potential demand for SEMSL through the assessment of future trips patterns.

5.74 Both sets of outputs are reviewed in the sections below.

Original Modelling Work

5.75 The SEMSL scheme option has previously been modelled in December 2009 as part of preliminary work to assess the impact of the then proposed South East Urban Extension (SEUE) and potential measures to support the associated growth in person and vehicle trips. The SEUE included 4,000 residential units located near Parkwood off the A274. Whilst the land-use assumptions within this modelling work no longer remain valid, as the SEUE is no longer planned, the work does potentially provide some insight into the impact of the SEMSL scheme.

5.76 It is difficult to draw strong conclusions from this modelling work as the analysis work compared with and without SEMSL scenarios from different modelled year. An initial 2017 model run did not include SEMSEL, and only 1,000 additional residential units at Parkwood, whilst the second model year was 2026 that included SEMSL and the full SEUE at Parkwood.

5.77 The results demonstrate that, even with the introduction of SEMSL, the level of traffic movements in Maidstone would continue to increase with some key routes in the town centre remaining over capacity. It is clear, however, that SEMSL would provide significant capacity relief to the overall impact of growth in trips from the SEUE, even if the modelling report does not allow the precise volume to be assessed.

5.78 The 2009 modelling report concludes:

> *The additional capacity provided by the SEMSL in 2026 has assisted in improving the traffic pressure from South and East of Maidstone and hence mitigating the congestion in Maidstone as a whole. However, the overcapacity is still flagged on some of the key routes as well as the minor routes in the town. The general traffic congestion in Maidstone is greater in the PM than in the AM peak. Supplementary traffic management strategies for both AM and PM are essential to an overall approach in tackling the growth in traffic level for Maidstone.*

5.79 This suggests that whilst SEMSL clearly has the ability to help relieve some of the future capacity constraints across the highway network in Maidstone it is not a measure that would resolve all of the predicted issues and would require supplementary schemes alongside it.

Forecast Demand for SEMSL from latest Modelling Work

5.80 The more recent modelling work incorporates the revised land-use assumptions and so provides a more accurate assessment of the future demand and profile of travel across Maidstone. Whilst the SEMSL scheme has not been directly modelled as part of this work, it is still feasible to use the reference case model to assess the potential demand for SEMSL through the assessment of future trips patterns.

5.81 The analysis work extracted the overall matrix of forecast 2026 vehicle trips in order to assess where individuals will be travelling to and from based on the future Core Strategy land-use

assumptions. A detailed assessment of all potential movements that could potentially use the SEMSL scheme was then undertaken. These trips were then in turn extracted from the matrix to provide an overall forecast of maximum trips that would utilise SEMSL. **Appendix F** provides a more detailed assessment of the approach undertaken.

5.82 The results indicate that a maximum of around 5,360 two-way movements may use SEMSL in an AM peak hour. This breaks down into 2,585 movements in a south-westerly direction and 2,775 in a north-easterly direction.

5.83 To put this into context, the 5,360 AM peak movements represent around 11.5% of total movement within the model.

5.84 Around two-thirds of these trips are forecast to route through the town centre in a scenario without SEMSL. This suggests that the SEMSL scheme has the potential to reduce AM peak hour movements through the town centre by up to 3,500 journeys. Again, to put this into context, the latest model outputs predict that around 22,000 vehicle movements occur on the main routes leading into Maidstone in the AM peak. The two-way vehicle trips that could potentially use the SEMSL link would therefore represent a 16% reduction in traffic on the major town centre north-south corridors. It should be reiterated that this analysis of town trip reduction from SEMSL represents the maximum potential scale of reduction. It does, however, provide an indication of the level of benefits that could be derived from the scheme.

6 Park & Ride Demand and Revenue Forecasting

Introduction

6.1 A key potential element of the Integrated Transport Strategy is the on-going use and expansion of park & ride services. This section summarises the current operation of park & ride and goes on to examine the proposed future year operations and forecasts of potential demand and operating revenue.

Existing Park & Ride

6.2 There are currently three park & ride sites around Maidstone at London Road, Sittingbourne Road, and Willington Street. All of these have been operating since 1989. The sites operate between 07:00 and 18:45 Monday to Fridays, with a later opening time of 08:00 on Saturdays.

6.3 The current park & ride bus operations are contracted out to Arriva, who operate services to and from each site to the town centre at a frequency of at least every 15 minutes. The current tariffs for travel are as follows:

- Peak Return (up to 9am Monday to Friday) = £2.50
- Off-peak return = £1.50
- Ten single trip tickets = £10
- Twelve week season ticket = £100
- Annual season ticket = £400

6.4 The latest revenue data available for the park & ride sites indicates that the service requires a subsidy from MBC over and above the farebox revenue in order to cover the costs of the Arriva operating contract. This position is considered to be unsustainable in the long term.

Demand

Existing demand (2011)

6.5 Ticket sales data provides a detailed analysis of the level of demand for each of the three existing park & ride sites. In November 2011, considered a neutral month, the total level of demand across the month at each of the three sites was as follows:

- London Road = 25,519
- Sittingbourne Road = 22,664
- Willington Street = 26,309

6.6 This data would suggest that Willington Street is the most successful site, followed by London Road and Sittingbourne Road. Whilst this is true in terms of absolute demand, the profile of demand is quite different between the sites and reveals a more complex appraisal.

6.7 Translating the monthly data into an estimate of an average weekday daily demand provides the following breakdown:

- London Road = 1,046
- Sittingbourne Road = 931
- Willington Street = 1,053

6.8 Further analysis of ticket types and application of the park & ride site utilisation surveys (reported within the previous Data Report) allows an assessment of AM peak hour 2011 demand:

- London Road = 86
- Sittingbourne Road = 143
- Willington Street = 90

6.9 It can now bee seen that a completely different outcome is presented with Sittingbourne Road displaying the highest AM peak hour demand followed by London Road and Willington Street.

6.10 AM peak period demand is considered to be an important metric for park & ride for two reasons:

i. It is during the peak periods, when traffic congestion is at its highest, that park & ride demand has the greatest impact in reducing vehicles on the network and, hence, congestion

ii. Average fares are higher during the peak periods and so higher demand increases the opportunity for the park & ride scheme to be financially self-sufficient

Forecast future year demand (AM Peak 2026)

6.11 Future year forecasts of peak period demand have been developed for Options 1, 2 and 3. These forecasts have utilised the mode share outputs from the AM peak hour Maidstone Visum Model.

Option 1

6.12 The Maidstone Visum Model produced the following AM peak forecasts of demand for each park & ride site for Option 1:

- London Road = 68
- Sittingbourne Road = 508
- Willington Street = 13

6.13 The outputs predict a substantial increase in AM peak hour demand at the Sittingbourne Road site as a result of both the increase in underlying demand for travel and the prevailing transport network conditions. Demand at London Road is forecast to remain broadly similar, with Willington Street demand decreasing to a minimal level.

6.14 Within the context of the wider analysis, detailed in Section 5, it is considered likely that the level of congestion forecast to occur around Junction 5 of the M20 and along the A20 London Road is likely to reduce the attractiveness of the London Road site in the AM peak. Furthermore, constraints on east-west movements across the River Medway also mean that park & ride bus journey times into Maidstone Town Centre are also slow in comparison to some other corridors.

6.15 In contrast, access to Sittingbourne Road from Junction 7 of the M20 is less congested and the journey times into the Town Centre by bus park & ride are much shorter.

6.16 Access to the Willington Street site from the strategic road network is more convoluted and it would appear that the Sittingbourne Road site is preferential for travellers coming along the M20 westbound. The data also suggests that the site is in direct competition with both Bearsted Rail Station, as well as urban bus services travelling along the A20 Ashford Road.

Option 2

6.17 The corresponding AM peak forecasts of demand for each park & ride site for Option 2 are as follows:

- London Road = 90
- Newnham Court = 1,203
- Willington Street = 77
- Bluebell Hill = 329
- Sutton Road = 130
- Linton Corner = 551

6.18 Again, the London Road site is forecast to retain a broadly similar level of demand as existing; however, in this option Willington Street is also predicted to maintain similar levels of demand to 2011. The Newnham Court site, that would replace Sittingbourne Road, is predicted to have a significant AM peak hour demand.

6.19 At the other new sites, there is predicted to be relatively strong demand at Linton Corner, as well as Bluebell Hill, well in excess of previous expectations for these sites. The Sutton Road site, however, is forecast to have relatively low AM peak hour demand.

6.20 Newnham Court is predicted to attract across Kent and along the M20 corridor, accounting for 90% of the demand. In particular substantial volumes of trips are predicted to originate from Swale, Ashford, and Medway.

6.21 The model also predicts that Bluebell Hill will attract trips from along the M20 corridor, although it is felt in reality that access to this site is likely to deter this type of activity. Trips are considered more likely to be derived from north of the site from Medway, Gravesham and Dartford.

6.22 The Linton Corner site is predicted to attract a substantial number of trips originating from the eastern side of the borough of Tunbridge Wells (along the A229 corridor) and from East Sussex, as well as from Yalding, Marden and residential areas on the urban fringe to the south and south west of Maidstone.

6.23 The Sutton Road demand originates primarily from the close local vicinity, with some trips from further to the South East of the site. There are very few longer distance trips from further south in the borough.

Option 3

6.24 The corresponding AM peak forecasts of demand for each park & ride site for Option 3 are as follows:

- Cobtree = 766
- Sutton Road = 473

6.25 Both sites are forecast to perform well, with the Cobtree site in particular having high demand, with trips forecast to be attracted from across Kent and along the M20 corridor.

6.26 The Sutton Road site is predicted to generate significantly more demand than in Option 2 with many trips that would use the Linton Corner site instead diverting to Sutton Road, including trips from the east of the borough of Tunbridge Wells, Yalding and Marden.

Forecast future year daily demand (2026)

6.27 Full forecasts of future year daily demand have been produced based upon the AM peak hour forecasts, presented above, along with the profiles of daily demand provided by the existing park & ride revenue data.

6.28 The AM peak hour forecasts have been factored by 1.85 in order to produce an estimate of the AM peak 2-hour period.

6.29 The inter-peak demand for the London Road, Sittingbourne Road, and Willington Street has been based upon the November 2011 profile of demand at each of these sites. The Sittingbourne Road profile data has also been applied for Newnham Court, given that it should serve an almost identical market.

6.30 The demand profiles for the three existing sites fall into two categories. The London Road and Willington Street sites have very similar profiles, with limited AM peak hour demand but a considerable amount of inter-peak OAP demand. The Sittingbourne Road site follows a different profile with considerably greater AM peak period demand. In order to provide a basis with which to forecast inter-peak demand at the four other new sites (Bluebell Hill, Cobtree, Sutton Road and Linton Corner) an averaged demand profile has been created between the London Road / Willington Street profile and the Sittingbourne Road profile. This averaged profile provides the basis for predicting inter-peak demand at the new sites.

6.31 Tables 6.1, 6.2 and 6.3 provide a summary of the forecasts levels of daily demand for each of the options.

Table 6.1 Daily Park & Ride Demand Forecasts – Option 1

Park & Ride Site	AM Peak Demand	Inter-peak Demand	Daily Demand
London Road	127	1,024	1,151
Sittingbourne Road	940	776	1,716
Willington Street	24	1,041	1,065
Total	**1,091**	**2,841**	**3,932**

Table 6.2 Daily Park & Ride Demand Forecasts – Option 2

Park & Ride Site	AM Peak Demand	Inter-peak Demand	Daily Demand
London Road	167	1,126	1,293
Newnham Court	2,225	970	3,195
Willington Street	143	1,145	1,288
Bluebell Hill	610	325	935
Sutton Road	240	350	590
Linton Corner	1,019	550	1,569
Total	**4,403**	**4,466**	**8,869**

Table 6.3 Daily Park & Ride Demand Forecasts – Option 3

Park & Ride Site	AM Peak Demand	Inter-peak Demand	Daily Demand
Sutton Road	874	625	1,499
Cobtree	1,418	1,619	3,036
Total	**2,292**	**2,244**	**4,535**

Car Park Capacity

6.32 The forecasts presented in Tables 6.1 to 6.3 represent an unconstrained demand for park & ride. In reality the available land for the construction of each park & ride site may constrain the number of car parking spaces available, and hence the level of demand that can be accommodated.

6.33 As an example, the forecast level of AM peak demand predicted for the Sittingbourne Road site in Option 1 (940 person trips) is likely to exceed the current available car parking spaces (610), even when you take into account that some individuals will share a car to access the park & ride site.

6.34 The estimate site capacities required to accommodate total daily demand under each scenario, including an allowance for car sharing and for vehicle turnover, are presented in Table 6.4 to 6.6. **Appendix G** provides a summary of the estimation process.

Table 6.4 Park & Ride Site Estimated Capacity Requirements – Option 1

Park & Ride Site	Capacity Requirement
London Road	325
Sittingbourne Road	1,150
Willington Street	200
Total	**1,675**

Table 6.5 Park & Ride Site Estimated Capacity Requirements – Option 2

Park & Ride Site	Capacity Requirement
London Road	375
Newnham Court	2,425
Willington Street	350
Bluebell Hill	650
Sutton Road	300
Linton Corner	1,100
Total	**5,200**

Table 6.6 Park & Ride Site Estimated Capacity Requirements – Option 3

Park & Ride Site	Capacity Requirement
Cobtree	1,725
Sutton Road	975
Total	**2,700**

6.35 Under Option 1 it can be seen that the total car parking capacity required for Sittingbourne Road exceeds the existing supply of 610 spaces. If this site were to continue operation then demand would be constrained to around 850 daily trips, the majority of which would be in the AM peak period.

Revenue Forecasts

6.36 A preliminary assessment of operating revenues that would be generated from each site is presented in Tables 6.7, 6.8 and 6.9.

6.37 They are again based upon the November 2011 revenue data and the profile of different ticket types that are currently sold. The forecasts take due consideration of peak and off-peak travel, with all peak travel assumed to either purchase season tickets or peak period fares. Inter-peak travel assumes off-peak fares, multi-ticket purchases or OAP concessions.

6.38 The Option 1 data is based upon the current peak and off-peak ticket prices. Options 2 and 3 include an uplift for peak and off-peak tickets (£3.00 and £2.00, respectively) with all other ticket types adjusted accordingly, with the exception of OAP concessions, which are kept constant.

6.39 These revenue forecasts are also based upon the unconstrained estimates of demand, outlined in Tables 6.1 to 6.3.

Table 6.7 Park & Ride Site Forecast Operating Revenues – Option 1

Park & Ride Site	Estimated Annual Operating Revenue (£'000)
London Road	£250
Sittingbourne Road	£630
Willington Street	£210
Total	**£1,090**

Table 6.8 Park & Ride Site Forecast Operating Revenues – Option 2

Park & Ride Site	Estimated Annual Operating Revenue (£'000)
London Road	£350
Newnham Court	£1,640
Willington Street	£350
Bluebell Hill	£450
Sutton Road	£240
Linton Corner	£750
Total	**£3,780**

Table 6.9 Park & Ride Site Forecast Operating Revenues – Option 3

Park & Ride Site	Estimated Annual Operating Revenue (£'000)
Cobtree	£1,280
Sutton Road	£690
Total	**£1,960**

6.40 The results indicate that Option 2 will generate the highest operating revenues, reflecting the higher overall demand. There is significant variation in revenue across the sites; however, with the Sutton Road, London Road and Willington Street generating much lower revenues than Newnham Court and Linton Corner.

6.41 The Option 3 results indicate that both sites would generate substantial annual revenues.

6.42 For Option 1, the London Road and Willington Street sites are forecast to generate relatively low annual revenues, reflecting the low proportion of park & ride users in the AM peak who would be charged peak period fares.

Financial Assessment

6.43 Utilising the operating revenues, outlined in the section above, along with the bus park & ride operating costs, outlined in Section 4, an outline assessment of the annual financial profit and loss of each park & ride site is feasible.

Table 6.10 Park & Ride Site Financial Assessment – Option 1

Park & Ride Site	Estimated Annual Operating Cost (£'000)*	Estimated Annual Operating Revenue (£'000)	Estimated Annual Operating Profit / Loss (£'000)
London Road	345	250	-95
Sittingbourne Road	500	630	130
Willington Street	335	210	-125
Total	**1,180**	**1,090**	**-90**

** high forecasts of operating costs*

Table 6.11 Park & Ride Site Financial Assessment – Option 2

Park & Ride Site	Estimated Annual Operating Cost (£'000)*	Estimated Annual Operating Revenue (£'000)	Estimated Annual Operating Profit / Loss (£'000)
London Road	400	350	-40
Newnham Court	510	1,640	1,130
Willington Street	400	350	-50
Bluebell Hill	565	450	-115
Sutton Road	565	240	-325
Linton Corner	510	750	240
Total	**2,950**	**3,780**	**830**

** high forecasts of operating costs*

Table 6.12 Park & Ride Site Financial Assessment – Option 3

Park & Ride Site	Estimated Annual Operating Cost (£'000)*	Estimated Annual Operating Revenue (£'000)	Estimated Annual Operating Profit / Loss (£'000)
Cobtree	690	1,280	590
Sutton Road	555	690	135
Total	**1,245**	**1,960**	**715**

** high forecasts of operating costs*

6.44 The financial assessment has been based upon the upper end of the forecast operating costs, outlined in Section 4, and so are considered to be a robust assessment.

Option 1

6.45 The results demonstrate that, overall, the Option 1 park & ride specification would potentially not cover the operating costs of the service. This is mainly as a result of the poor performance of the London Road and Willington Street sites, where AM peak period demand is forecast to be very low

and hence peak period revenue generation is also low. This leaves these sites unable to cover their operating costs.

6.46 The Sittingbourne Road site is forecast to cover its operating cost; however, it should be cautioned that the revenue generation has been based upon the unconstrained level of demand. If the analysis is re-run with demand constrained to the current available parking spaces then operating revenue is forecast to fall to £470,000 pa, which would leave the site generating a marginal loss of £30,000 pa, albeit against the high operating costs. In reality it is considered that operations could be adjusted to ensure that this site operates at breakeven under a constrained demand scenario.

Option 2

6.47 Option 2 highlights the same issues for London Road and Willington Street, albeit with lower operating loss. The improved performance results for higher forecast AM peak demand for these sites. It is again considered that operations could be adjusted to ensure that these sites operate at breakeven.

6.48 The Bluebell Hill and Sutton Road sites are also forecast to operate at a considerable loss in Option 2. This is as a result of both the relatively poor demand, and hence revenues, at Sutton Road, but also the much higher operating costs for the bus service that would run from Bluebell Hill all the way through town to Sutton Road. This is by far the longest park & ride service and therefore incurs both additional vehicle operating costs, but also a higher number of buses to maintain a 10 minute frequency.

6.49 The Newnham Court and Linton Corner sites are both forecast to make substantial profits, particularly in the case of the Newnham Court. This is as of a direct result of the AM peak period forecasts for demand, and hence revenue generation. As with Sittingbourne Road, there remains the question as to whether the level of demand forecast can be accommodated within the allocated park & ride site areas. the Newnham Court site certainly has sufficient space to accommodate demand; however, the site also has wider development aspirations that may constrain available land. The identified site at Linton Corner is certainly unable to accommodate the forecast level of demand. There are, however, other potential sites in the area, along with the possibility to create multiple sites along the A229 Linton Hill.

Option 3

6.50 Option 3 represents the most consistent performing option in terms of financial operations with both the Cobtree and Sutton Road sites forecast to cover their operating costs. There are also no issues with capacity constraints at either site with both able to accommodate the forecast level of demand.

7 Town Centre Car Parks

Introduction

7.1 In order to support the proposed public transport measures and encourage modal shift, the scheme assessment process has incorporated measures within Options 2 and 3 that will discourage long-stay car parking within the town centre.

7.2 These measures include the removal of some long-stay car parking in MBC car parks in and around the core town centre, along with the increase of long-stay car parking charges by 150%. In addition, short-stay car parks are also increased by 20%.

7.3 The analysis of public transport demand has indicated that these measures are successful in encouraging modal shift to public transport. In particular, the increased cost of town centre car park is forecast to deter car trips into the centre.

7.4 As well as encouraging modal shift to public transport trips, the parking measures will also have a range of financial impacts. This relates to changes in car parking revenue, as well as car park operating cost changes, as well as potential land values resulting from the reduction in car parking spaces. This section provides a summary of these three impacts.

Revenue Impacts

Overview

7.5 The proposed parking measures have conflicting impacts upon parking revenue generation. The reduction in available car parking spaces will potentially reduce the revenue generated from these car parks. In contrast, the increase in parking tariffs could potentially increase revenues, although this depends upon the extent to which total demand for parking decreases as a result of the higher tariffs.

Impact of space reductions

7.6 A stand-alone assessment of the impact of reducing car parking spaces on MBC revenue has been undertaken. This exercise has utilised information about the reduction in spaces in each car park, the current utilisation of those car parks, the availability of substitute parking spaces in nearby MBC car parks, as well as the revenue generated from each car park.

7.7 Table 7.1 presents a breakdown of the current capacity and utilisation of the car parks that are proposed to have a reduction in spaces. It also presents the availability of parking capacity in other MBC car parks in close proximity.

7.8 By assessing the number of cars that would be displaced from each car park, and determining whether they can be accommodated in other nearby car parks, it is possible to calculate an estimate of displacement of parking demand from MBC car parks. This is estimated to be 236 vehicles.

Table 7.1 Impact of reduced car parking spaces on MBC parking demand

MBC Car Park	Current Capacity	Current Utilisation	Proposed reduction in capacity	Nearby Spare MBC Capacity	Estimated Displacement in MBC Parking
King Street	219	216	120	0	107
Brooks Place	7	6	7	0	6
Brunswick Street	66	65	66	0	65
Sittingbourne Road	99	46	99	9	37
Well Street	29	25	29	7	18
Mill Street	132	90	66	10	3
Total	**552**	**448**	**387**	**26**	**236**

7.9 The weekly revenue generated from each car park has then been used to determine an average income of the maximum occupancy of each car park. This is a simplistic way in which to assess the value generated by the car park occupancy. This figure for each car park has then been multiplied by the estimated displaced vehicles to give a total loss of revenue to MBC.

7.10 This total loss of revenue is presented in Table 7.2, alongside the current revenue generated from each of these car parks.

Table 7.2 Forecast revenue Impact from loss of car parking

MBC Car Park	Current Annual Car Park Revenue	Forecast Annual MBC Revenue Loss
King Street	42,000	42,000
Brooks Place	156,000	77,000
Brunswick Street	37,000	30,000
Sittingbourne Road	18,000	13,000
Well Street	5,000	5,000
Mill Street	110,000	4,000
Total	**368,000**	**171,000**

7.11 The results indicate that around 46% of revenue from these car parks is forecast to be lost if these spaces were removed. This assumes that all else remains constant.

Impact of increased car parking tariffs

7.12 As mentioned above, the impact of the proposed increased car parking tariffs has two affects: average revenues will go up but overall demand for MBC parking will decrease. The overall impact upon MBC revenue depends upon relative strength of each impact.

7.13 The output from the Maidstone Visum model provides an indication of the impact of the packages of measures upon vehicle trips into the core town centre. This indicates that in Option 2 vehicle trips will decrease by 370 in the AM peak hour, and by 440 in Option 3. Given that it is only MBC car parking charges that have changed and that the largest change is for long-stay car parking, it is reasonable to assume that these decreases in trips will translate to decreases in long-stay car parking in MBC car parks.

7.14 The 2011 Town Centre Car park utilisation surveys, presented within the Data Report, provide a forecast of current AM peak hour long-stay car parking. This has been translated into 2026 using the forecast growth in vehicle trips. The provides the following forecasts:

- 2026 (Option 1) long-stay car parking (AM peak hour) = 600
- 2026 (Option 1) short-stay car parking (AM peak hour) = 360

7.15 Assuming that the short-stay car parking remains constant, we can generate forecasts for Options 2 and 3 f long-stay car parking by subtracting the reduction in trips to the core town centre, presented above. This gives:

- 2026 (Option 2) long-stay car parking (AM peak hour) = 230
- 2026 (Option 3) long-stay car parking (AM peak hour) = 160

7.16 Using these forecasts we can now generate an estimate of revenue under each option, incorporating the change in tariffs between Option 1 and Options 2 and 3. This is presented in Table 7.3.

Table 7.3 Forecast revenue Impact from change in tariffs

Option	Long-stay revenue (AM peak hour)	Short-stay revenue (AM peak hour)	Total revenue (AM peak hour)	Annual Forecast Change in AM Revenue
Option 1	2,700	720	3,420	-
Option 2	2,558	864	3,452	-
Option 3	1,800	720	2,520	-
Option 2 vs Option 1	**-113**	**144**	**32**	**19,924**
Option 3 vs Option 1	**-900**	**144**	**-756**	**-478,170**

7.17 The results indicate that the fall in demand in Option 2 is off-set by the increase in tariffs. This is not the case with Option 3 where demand is forecast to fall even further resulting in an overall loss of revenue.

Operating Costs

Overview

7.18 The reduction in car parks and car parking spaces will result in a reduction in car park operating costs. These have been calculated from current operating cost data, with car parks that only have a partial reduction in spaces given a pro-rated saving. Table 7.4 presents the results.

Table 7.4 Forecast car park operating cost savings

MBC Car Park	Forecast Annual MBC Operating cost savings
King Street	17,902
Brooks Place	36,853
Brunswick Street	17,284
Sittingbourne Road	11,925
Well Street	9,783
Mill Street	10,779
Total	**104,500**

Land Values

7.19 In addition to the direct operation cost savings, the closure, or part-closure, of car parks will release land value. Estimating the potential value of this land is difficult as it depend upon both the economic climate at the time of the sale and the specific demand for uses.

7.20 Previous work by GL Hearn carried out to assess the land value for the King Street Car Park provides a benchmark against which to assess the other sites.

7.21 Table 7.5 provides a summary of the assumed development quantums and assumed land uses together with an estimate of minimum and maximum land value.

Table 7.5 Outline forecast of land values

MBC Car Park	Development Levels	Development Area (m2)	Land Use	Estimated Maximum Land Value	Estimated Minimum Land Value
King Street	5	72,150	Resi, Retail, Car Park	270,000	180,000
Brooks Place	2	2,990	Resi	80,000	50,000
Brunswick Street	3	31,850	Resi, Office	330,000	210,000
Sittingbourne Road	3	54,600	Resi	430,000	280,000
Well Street	2	8,905	Resi	120,000	80,000
Mill Street	3	112,710	Resi, Office, Car Park	250,000	160,000
Sub-Total (Car Park)		**283,205**	**-**	**1,500,000**	**1,000,000**
Willington Street	2	8,400	Resi (detached units)	175,000	50,000

7.22 An assessment of the Willington Street Park & Ride Site Land value is also included. It is understood that there are likely to be some significant development controls on this site, given its location within Mote Park. This will impact upon the land value and makes an assessment more intangible. It has been assumed that a maximum of 20 units would be constructed on this site, of a style in keeping with the surrounding residential area.

8 Economic Impact Assessment

Context

Introduction

8.1 The impacts of transport constraints or transport improvements upon an economy are varied and can be assessed in a number of ways. Businesses can be affected directly by transport, in terms of the time and cost of travel for their staff and customers across a network, but there are often wider impacts on their operations as well. These can include the affect of transport on access to labour, the affect on the efficiency of market operations, or the benefits that can be derived from greater effective economy density (referred to as agglomeration).

8.2 Whilst the direct impacts of transport on the economy can be measured through transport modelling and economic appraisal tools, the wider impacts require separate, qualitative assessment.

8.3 This section provides an overview of the potential economic impacts resulting from the proposed transport measures within the Integrated Transport strategy packages outlined in Section 4.

National Planning Policy

8.4 The National Planning Policy Framework (NPPF), published March 2012, sets out the Government's commitment to securing economic growth and to create jobs and prosperity. It recognises the role of promoting competitive town centre environments, as well as strong rural economies. There are clear objectives are to promote the vitality and viability of town centres, and meet the needs of consumers for high quality and accessible retail services

8.5 At the same time, the NPPF reiterates that the government is committed to securing economic growth in a sustainable manner with transport playing an important role in facilitating sustainable development. To this end it highlight that developments should be located and designed, where practical, to:

- accommodate the efficient delivery of goods and supplies;
- give priority to pedestrian and cycle movements, and have access to high quality public transport facilities;
- create safe and secure layouts which minimise conflicts between traffic and cyclists or pedestrians, avoiding street clutter and where appropriate establishing home zones;
- incorporate facilities for charging plug-in and other ultra-low emission vehicles; and
- consider the needs of people with disabilities by all modes of transport

8.6 The NPPF provides an important policy framework in assessing the economic impacts of the transport strategy packages.

Core Strategy Proposals

8.7 The emerging Core Strategy document generates a clear aim to create additional employment across the borough of Maidstone, alongside residential housing growth. There is a target to create 10,000 jobs across the borough but with a specific focus on employment site around the east / southeast / south of the town, as well as to the north. There are also employment development opportunities outlined in Staplehurst and Marden.

8.8 If these aspirations for employment growth are to be attained there is a requirement to ensure that there is adequate infrastructure to support both growth, as well as maintain and expand existing economic activities across the borough. Such infrastructure will include all aspects of public service provision, but transport provision is a key aspect in supporting economic activity across the borough.

Maidstone Town Centre Study

8.9 The Maidstone Town Centre Study provides an evidence base to support the preparation of the wider Core Strategy as well as an Area Action Plan for Maidstone Town Centre. It includes a review of the socio-economic role of the town centre, current development policies, existing property market, and traffic and transport issues.

8.10 Within the planning and regeneration context, the study highlights wider research into the needs of Maidstone Town centre, referencing the *Employment Land Study Review (September 2009)* that forecasts a future office floorspace requirement of between 15,000m^2 and 40,000m^2, as well as the *Retail Needs Assessment Study (updated 2009)* that concluded there is a requirement for between 32,500 m^2 and 118,500 m^2 of comparison floorspace and up to 4,650 m^2 of convenience floorspace by 2026.

8.11 The study also highlights Maidstone's role as the county town of Kent and a major transportation hub, and the requirement for it to continue to maintain and develop its role in the future, particularly in response to the challenges posed by other competitor towns in the region. The report indicates that Maidstone's role as the premier shopping centre in Kent is challenged by both other regional town centres, as well as large-scale shopping facilities, such as Bluewater.

8.12 The study also references the *Maidstone Borough Economic Development Strategy (2008)* which suggests that the boroughs economy does not 'punch its weight' and that there is a requirement to develop greater sectoral specialism's, create a more innovative and entrepreneurial economy, and attract and retain investment. This document highlights the following weaknesses within the economy that are linked to transport:

- Traffic congestion and limited accessibility in the town centre
- Traffic congestion on the M20 west of Maidstone
- Operation stack disrupting business and residents in the borough; and
- Rail connectivity to London slow and infrequent when compared to elsewhere

8.13 Whilst some of these issues may have moved on since 2008, they still represent the underlying issues with transport that affect economic activity in the borough.

8.14 The conclusions from the Economic Development Strategy are reiterated within the *South East Plan (2009)* that states that Maidstone needs to provide a focus for investment, new markets, new major retail and employment development.

8.15 Within the property market assessment the study concludes that there is relatively poor demand for office space in the town due to a combination of the condition of much of the office stock, but together with perceptions of the area, including poor public transport and traffic congestion. Whilst the study recognises that these issues are not unique to Maidstone there is a requirement to improve the perception of the town centre as a place to conduct business.

8.16 In terms of general conclusions in relation to transport and the economic activity, the Town Centre Study identifies that, despite a number of stations, rail provision is considered relatively poor, in particular in terms of links to/from Central London. It highlights the perceptions of significant congestion around the town that impacts upon the attractiveness of the location for businesses. More generally, the barriers created by the vehicular routes surrounding the town centre are acknowledged to creating movement difficulties for pedestrians and cyclists reducing town centre accessibility. This is compounded by limited crossings of the River Medway. It also highlights the excessive number of town centre car parks, many of which are very small, for which the land could be better utilised.

Impact of transport on business operations

8.17 Section 2 outlined the business engagement process that has been undertaken to ascertain both the views of business on current and future transport provision, but also to undertaken the key ways that transport in Maidstone affects their business operations.

8.18 The outputs indicated that rail services and vehicle circulation around the town are the major areas where improvements are required in order to support business activity.

8.19 Highway network congestion is a major concern to business, both currently and in the future, and many consider that connectivity to the strategic road network, in particular the M20 motorway, is key issue for business prosperity. Access to the M20 from the south of the borough is currently considered poor.

8.20 Rail services to London were highlighted as an area for further improvement. Whilst it was accepted that the high speed services were a positive introduction, more still needed to be done to reduce journey times across the day.

8.21 Town centre parking provision is currently considered to be more than adequate and businesses were, generally, not significantly concerned about the impact of parking charges upon business operations. Instead it is transport congestion, and the effect upon business travel, that has the greatest impact upon business operations.

Summary

8.22 The background policy and planning studies identify a wide range of issues that are currently affecting economic activity across the borough. In terms of transport, there a number of reoccurring themes that are summarised as follows:

- Town centre vehicle congestion reduces accessibility and creates a poor perception of the location as a place to undertake business
- Vehicle congestion also restricts access across the borough, in particular to and from the M20. This particularly affects business operation in the south of the borough.
- Rail connectivity to London and other major centre is poor and results in Maidstone being less competitive than other centres
- Generally, public transport accessibility across the borough is considered insufficient for certain corridors making access to work for those without a car difficult.
- Town centre car parking supply is considered more than adequate and could be rationalised. Parking tariffs are also considered to be reasonable and are not restrictive to business operations.

Transport and Economic Activity

Background Research

8.23 There is a growing body of evidence that is trying to establish the links between transport provision and economic activity. Much of this has sought to understand the consequences that poor transport provision and traffic congestion has upon both local economies in terms of existing business activities, as well as the ability to attract new investment.

8.24 The Department for Transports (DfT) New Approach to Transport Appraisal (NATA) establishes a range of area in which transport affects wider economic activity. These are based upon on-going research work dating back to 1999 and the SACTRA report on Transport and the Economy. The most recent DfT advice on assessing wider economic impacts focuses upon three elements:

- agglomeration impacts,
- increased or decreased output in imperfectly competitive markets
- labour market impacts: more/less people able to access work or move to more/less productive jobs

8.25 Agglomeration impacts relate to phenomenon known as effective economic density, which provides a measure of the mass of economic activity within an area. This measure reflects the accessibility of firms and workers to each other, with the importance of one firm/worker to another declining over distance. Empirical evidence has demonstrated that the closer that firms and workers are to each other, in terms of relative journey times, the more opportunities there are for these companies to benefit from economies of scale, such as reduced cost from suppliers and greater specialisation. It also allows the labour force to be more transferable and flexible. This results in overall higher output for the local economy.

8.26 Output changes in imperfectly competitive markets relate to situations where existing firms enjoy a competitive advantage over other firms in the market that allows them control prices and outputs. A reduction in transport costs (to a business and/or freight), through improved transport access (e.g. less congestion) allows other firms to increase production, or output. This increases competition and provides welfare gains to consumers of these products.

8.27 Labour market impacts relate to the decisions that the potential labour force make whether to work or whether to change jobs. Improved transport accessibility may incentivise individuals previously not working to enter the labour market or alternative to change to a better paid job. Both outcomes result in increased economic activity for the local economy.

8.28 Recent research in the US by the National Cooperative Highway Research Program has sought to examine the specific impacts of urban traffic congestion on the business activity. This sought to examine how sensitive business costs, productivity, and output are to congestion.

8.29 This research concluded that the level of sensitivity to traffic congestion is attributable to an individual industry sector's reliance on skilled labour, or specialised inputs, and geographic area available to obtain those inputs. In other words, congestion effectively contracts the market area for inputs, increasing their costs, and, hence, increasing production costs. The research also demonstrated that industries will compensate for congestion and try to reduce costs through location choices, but also other strategies such as changing operations.

The findings of the US research compliment the UK research work with the recognition that the real monetary cost of congestion to an economy is greater than just the direct transport impacts in terms of travel times and costs for users, with the full cost includes additional productivity costs.

8.30 It identifies the link between productivity and the ability of businesses to substitute among inputs (and workers) as they adjust to the higher costs of travel as a key element. Congestion effectively shrinks business market areas and reduces (eliminates) the scale economies (agglomeration benefits) of operating in large urban areas.

Impact of Packages

8.31 The research work to date has demonstrated that the direct impacts of transport constraints or transport improvements should be considered not just in terms of the observable impact of journey times and costs for transport users, but also the wider implications on business operations.

8.32 The impact of travel time, the costs associated with travel, and the reliability of travel upon economic activity should be considered in the following contexts:

- ***Employment growth:*** the recent performance, and on-going uncertainty, in the macro economy means that it is difficult to forecast direct impacts of transport beyond the short-term instability. It is challenging to attribute future employment change with any robustness to the existing and future state of the transport network.
- ***Existing businesses and commercial areas:*** these represent the underlying drivers of economic competitiveness within the local and regional economy. Existing operations require servicing, as well as access by customers, the majority of which is road based. Access across the borough and connectivity to the M20 is a critical element. Highly congested conditions will impact significantly on business operations, increasing transport costs, and reducing outputs. It will also create negative agglomeration impacts as effective economic density (e.g. accessibility between firms) increases.
- ***Labour market:*** An effective labour market relies upon good accessibility between residential and employment areas. Increasing congestion and journey times distorts the market reducing the available supply or increasing the cost. The current nature of the labour market with high unemployment means that this is less of an issue at present, although it will affect the choice of jobs that individuals take. The Maidstone jobs market is currently not considered to be over specialised, which reduces the sensitivity of accessibility changes on the availability of suitable labour. However, if the borough aims to develop the economy further and diversify into new innovative sectors then access to labour will become a more critical factor.
- ***Road freight:*** Whilst modern Just-in-Time production and delivery means that anticipated transport delays can partly be scheduled into itineraries, the reliability of the transport network is a critical aspect. It is therefore important that access to and from the strategic road network is efficient and reliable.
- ***Town centre:*** accessibility to the retail core is critical for both individual businesses but also the overall perception of Maidstone as a premier retail centre.
- ***Rural economy:*** the rural economy often has a much great reliance upon the highway network with employment and residential densities often reducing the viability of public transport provision. Marinating efficient and reliable highway network is, therefore, critical with connections to town centres and the strategic road network of premium importance. Public transport connections to town centres will also enhance economic activity, not least in providing greater access to the labour market.

- ***Inward investment:*** A congested, dislocated and traffic polluted local economy is not conducive to inward investment, especially as road transport forms the dominant modal share in the UK. Poor mainline rail connections to Central London are also a deterrent. If traffic conditions are exacerbated , this will create a clear disincentive investment; and
- ***Development capacity:*** the local planning studies have identified the requirement for the local economy to diversify and unlocking development capacity is an opportunity to achieve this aim. Poor transport connectivity will deter investors and sites, without improvements to accessibility, from coming forward to create jobs and economic growth.

Option Assessment

Overview

8.33 The transport model analysis has provided an insight into the impact of the packages of measures upon overall transport network provision. It provides a series of metrics that can be utilised to assess the potential impacts on the wider economy and economic activity. This includes:

- Peak period vehicle flows
- Peak period journey times
- Peak period network congestion

8.34 In addition, the proposed enhancements to transport capacity can be examined in terms of the opportunities they will provide to increase accessibility across the borough.

Reference Case (Option 1)

8.35 The modelling outputs indicate that there will be around a 50% increase in traffic movements on the main road corridors leading in and out from Maidstone between 2007 and 2026. The largest increases will be to the north of the borough along the A229 and A249. The impact that this growth in trips will have on the highway network is to increase journey times along these corridors and create additional congestion.

8.36 Figure 5.1 (Section 5) highlights the predicted network congestion within the AM peak under Option 1, and highlighted both the A229 and A249 as operating either close or over capacity.

8.37 The impact that this level of congestion will have upon the local economy is widespread. Not only will journey times to access business and clients increase significantly, the reliability of the highway network is likely to deteriorate considerably on those links that are operating so close, or over capacity. Given the importance of these links in accessing the strategic road network, i.e. the M20, it is considered likely that this will represent a significant disbenefit to business operations.

8.38 North-south routes through the town centre are predicted to be particularly affected by the additional congestion, which will have a particularly affect upon businesses located south of the town centre wishing to access the M20.

8.39 The option does provide enhanced bus operations across the network that will provide significant improvements to public transport accessibility. The Thameslink Rail project also provides enhanced rail connectivity to London.

8.40 Enhancements to walking and cycling provision will also improve accessibility to town centre employment and retail opportunities.

8.41 The impact upon each key economic element is assessed below:

- ***Existing business:*** the increasing levels of underlying highway congestion will increase transport costs with the likely impact to reduce outputs in competitive markets. The reduced accessibility will also reduce effective economic density between companies therefore reducing agglomeration benefits.
- ***Labour market:*** increased highway congestion will also result in reduce efficiency of the labour market. Improved bus and rail provision, alongside walking and cycling infrastructure, will help to readdress the balance, although bus services along corridors without dedicated bus lanes will also be affected by the increased highway congestion.
- ***Road freight:*** increased highway congestion and reduced reliability will directly affect freight accessibility. Access to and from the M20 will be affected, as will deliveries into the town centre and trips required to travel through the town centre to the south of the borough.
- ***The Town Centre:*** Accessibility to the town centre by car will be significantly affected by increased congestion, particularly in the peak periods. This will impact both directly upon business operations, as well as affecting the perceptions of the Town Centre as a retail core. Enhanced public transport services will provide countering benefits with improved connectivity by rail to London. It is envisaged that there will be particular improvements in the inter-peak periods where bus services will be much more frequent.
- ***The rural economy:*** Network congestion is mainly focused on the main arterial routes leading into Maidstone Town Centre; however, this is likely to affect business operations in terms of cross-borough movements and access to the M20 from the south of the borough. Improvements to bus services should provide enhanced access to labour markets and improve the competitiveness of business.
- ***Encouraging inward investment:*** the vehicle network congestion, with associated disbenefits, is likely to affect the perception of Maidstone as a location to invest. Improved rail connectivity to London will assist in countering this impact; however, the overall impacts are likely to be detrimental in comparison with other competing area.
- ***Unlocking development capacity:*** the forecast congestion and unreliability of the highway network will impact significantly upon connectivity and hence the opportunity to unlock development capacity. The attractiveness of town centre development will be reduced due to peak period congestion, as will sites to the south of the town that require primary access along the A229 corridor. Improved public transport provision will improve accessibility to the town centre and so potentially assist in encouraging retail development, although this would be countered by freight access issues.

Option 2

8.42 The impacts of the additional transport measures incorporated within Option 2 are assessed against the Option 1 results.

8.43 The modelling outputs indicate that there will be around a 5% increase in peak traffic movements on the main road corridors leading in and out from Maidstone with the Option 2 packages in comparison to Option 1. This is on top of the significant increase from the 2007 peak vehicle flows.

8.44 There are decreases, however, on one of the key corridors, the A229 Royal Engineers Road, leading to the town centre from the north of the borough. Figure 5.2 (Section 5) highlights the predicted network congestion within the AM peak under Option 2. This indicates that the A229

Royal Engineers Road remains highly congested, along with the A249. Congestion along the A229 Loose Road, to the south of the town centre is forecast to reduce, as is congestion around Junction 5 of M20, thus improving access to the strategic road network.

8.45 The impact that the vehicle congestion will have upon the local economy will remain widespread, as with Option 1. Journey times to access business and clients would remain high in peak periods and the reliability on the very congested elements of the highway network is likely to remain poor. Given the importance of these links in accessing the strategic road network, i.e. the M20, it is considered likely that this will still represent a significant disbenefit to business operations.

8.46 North-south routes through the town centre will remain affected by the heavy congestion in peak periods, although access to the town centre from the south of the borough will improve. Businesses in the south wishes to access the M20 will still be affected by congestion on the A229 Royal Engineers Road.

8.47 The enhanced park & ride services will provide greater accessibility by public transport into the town centre, in particular along the A229 / A274 corridors where bus lanes and bus priority measures will be provided.

8.48 The impact upon each key economic element of the additional measures included in Option 2 is assessed below:

- ***Existing business:*** highway congestion would continue to increase transport costs and reduce outputs in competitive markets. The reduced accessibility will also continue to affect agglomeration benefits.
- ***Labour market:*** highway congestion would continue to reduce efficiency of the labour market, albeit countered by the bus and rail enhancements provided in both Options 1 and 2. Improved park & ride provision in Option 2 would improve accessibility to the town centre further, in particular from rural areas and from workers outside of Maidstone. This could enhance the diversity of the available labour market. The increased long-stay car parking charges will deter commuter travel into Maidstone Town Centre by car. Whilst this could potentially reduce the size of the available labour market for those without access to alternative modes, the availability of both a significantly enhanced bus network and six park & ride sites is considered sufficient to ensure that this would not be the case.
- ***Road freight:*** highway congestion and reduced reliability would continue to affect freight accessibility. Access to and from the M20 will be affected, as would deliveries into the town centre. There would be an improvement in reliability for trips from the south of the borough into the town centre, although onward access to the M20 will remain poor.
- ***The Town Centre:*** Accessibility to the town centre by car would continue to be significantly affected by increased congestion, particularly in the peak periods, impacting upon business operations and the perception of the Town Centre as a retail core. Enhanced public transport services would continue to provide countering benefits with improved connectivity by rail to London. The enhanced park & ride provision in Option 2 would also much improve access to the town centre. Increased long-stay car parking charges will impact primarily upon commuter traffic with the modelling analysis indicating that short-distance commuters will switch to bus services.
- ***The rural economy:*** business operations would continue to be affected by cross-borough vehicle movements and access to the M20, although access from the south of the borough will be improved. The improved bus services would continue provide enhanced access to labour

markets and improves the competitiveness of business. In addition, the park & ride services would provide a convenient transport option within which to access the town centre.

- ***Encouraging inward investment:*** the vehicle network congestion, with associated disbenefits, would continue to affect the perception of Maidstone as a location to invest. Improved rail connectivity to London would continue to assist in countering this impact. The enhance park & ride provision would improve town centre accessibility and so would provide a positive encouragement to retail investment.
- ***Unlocking development capacity:*** the congestion and unreliability of the highway network would continue to impact upon vehicle connectivity and hence the opportunity to unlock development capacity. Improved public transport provision, specifically the enhance park & ride services would improve accessibility to the town centre and assist in encouraging retail development.

Option 3

8.49 The impacts of the additional transport measures incorporated within Option 3 are assessed against the Option 1 results.

8.50 The modelling outputs indicate that there will be around a 3% increase in overall peak traffic movements on the main road corridors leading in and out from Maidstone with the Option 3 packages in comparison to Option 1. This is on top of the significant increase from the 2007 peak vehicle flows.

8.51 There are decreases, however, on the A229 Royal Engineers Road and the A249 Sittingbourne Road leading to the town centre from the north of the borough. Figure 5.3 (Section 5) highlights the predicted network congestion within the AM peak under Option 2. This indicates that the A229 Royal Engineers Road remains highly congested, along with parts of the A249. Congestion along the A229 Loose Road, to the south of the town centre is forecast to reduce, as is congestion around Junction 5 of M20, thus improving access to the strategic road network.

8.52 The impact that the vehicle congestion will have upon the local economy will remain widespread, as with Option 1. Journey times to access business and clients would remain high in peak periods and the reliability on the very congested elements of the highway network is likely to remain poor. Given the importance of these links in accessing the strategic road network, i.e. the M20, it is considered likely that this will still represent a significant disbenefit to business operations.

8.53 North-south routes through the town centre will remain affected by the heavy congestion in the peak periods, although access to the town centre from the south of the borough will improve. Businesses in the south wishing to access the M20 will still be affected by congestion on the A229 Royal Engineers Road.

8.54 The enhanced park & ride services will provide greater accessibility by public transport into the town centre, in particular along the A229 / A274 corridors where bus lanes and bus priority measures will be provided. The North West Express Loop bus service will also provide greater connectivity between the town centre and proposed development sites to the south of Junction 5 of the M20.

8.55 The impact upon each key economic element of the additional measures included in Option 3 is assessed below:

- ***Existing business:*** highway congestion would continue to increase transport costs and reduce outputs in competitive markets. The reduced accessibility will also continue to affect agglomeration benefits.
- ***Labour market:*** highway congestion would continue to reduce efficiency of the labour market, albeit countered by the bus and rail enhancements provided in both Options 1 and 3. Improved park & ride provision in Option 3 would improve accessibility to the town centre further, in particular from rural areas and from workers outside of Maidstone. This could enhance the diversity of the available labour market. The increased long-stay car parking charges will deter commuter travel into Maidstone Town Centre by car. Whilst this could potentially reduce the size of the available labour market for those without access to alternative modes, the availability of both a significantly enhanced bus network and the north and south park & ride sites is considered sufficient to ensure that this would not be the case.
- ***Road freight:*** highway congestion and reduced reliability would continue to affect freight accessibility. Access to and from the M20 will be affected, as would deliveries into the town centre. There would be an improvement in reliability for trips from the south of the borough into the town centre, although onward access to the M20 will remain poor.
- ***The Town Centre:*** Accessibility to the town centre by car would continue to be significantly affected by increased congestion, particularly in the peak periods, impacting upon business operations and the perception of the Town Centre as a retail core. Enhanced public transport services would continue to provide countering benefits with improved connectivity by rail to London. The enhanced park & ride provision in Option 3, along with the North West Express Loop bus service would also much improve access to the town centre. Increased long-stay car parking charges will impact primarily upon commuter traffic with the modelling analysis indicating that short-distance commuters will switch to bus services.
- ***The rural economy:*** business operations would continue to be affected by cross-borough vehicle movements and access to the M20, although access from the south of the borough will be improved. The improved bus services would continue provide enhanced access to labour markets and improves the competitiveness of business. In addition, the park & ride services would provide a convenient transport option within which to access the town centre.
- ***Encouraging inward investment:*** the vehicle network congestion, with associated disbenefits, would continue to affect the perception of Maidstone as a location to invest. Improved rail connectivity to London would continue to assist in countering this impact. The enhance park & ride provision would improve town centre accessibility and so would provide a positive encouragement to retail investment. The North West Express Loop bus service would also enhance connectivity between the development sites in the North West and the town centre.
- ***Unlocking development capacity:*** the congestion and unreliability of the highway network would continue to impact upon vehicle connectivity and hence the opportunity to unlock development capacity. Improved public transport provision, specifically the enhance park & ride services and North West Express Loop bus service would improve accessibility to the town centre and assist in encouraging retail development.

Option 4

8.56 The SEMSL scheme, within Option 4, will provide additional highway capacity and will provide both enhanced connectivity from the south of the borough to the strategic road network, as well as provide some congestion relief to the town centre.

8.57 The impact upon each key economic element of the SEMSL scheme is assessed below:

- ***Existing business:*** the scheme will enhance connectivity to the strategic road network for businesses located in the south of the borough and would reduce transport costs and increase outputs in competitive markets. The improved accessibility would also have positive agglomeration benefits for these businesses. The scheme should also help relieve some of the town centre highway congestion and so provide businesses located within the town centre or those who are required to travel across the town.
- ***Labour market:*** the new highway link and reduced highway congestion would improve accessibility to the south of the borough and to the town centre improving the efficiency of the labour market for those with access to car.
- ***Road freight:*** the new highway link and reduced highway congestion would improve accessibility from the strategic road network to the south of the borough and the reliability to journeys to the town centre.
- ***The Town Centre:*** reduced highway congestion would improve accessibility to the town centre and improve business operations and the perception of the Town Centre as a retail core.
- ***The rural economy:*** business operations in the south of the borough would benefit from improved accessibility to the strategic road network as well as to the town centre by car and would enhance competitiveness.
- ***Encouraging inward investment:*** the reduced vehicle network congestion would enhance the perception of Maidstone as a location to invest.
- ***Unlocking development capacity:*** the new road link and enhanced accessibility to the strategic road network would unlock development opportunities. Reduced network congestion would also encourage wider development opportunities.

9 Cost Benefit Analysis

Overview

9.1 This section presents the cost benefit analysis of Options 2, 3 and 4 in relation to the reference case (Option 1). It assesses the impact of each package of measures against the DfT's New Approach to Transport Appraisal (NATA) criteria elements:

- Economy;
- Environment;
- Accessibility and Social Inclusion;
- Integration; and
- Safety;

9.2 The primary focus is upon the direct impact of the transport measures upon the economy, along with an accident analysis. A qualitative assessment has been undertaken for the other elements.

Economy Objective

Overview

9.3 The economic objective seeks to assess the benefits of the packages of measures against both direct and indirect impacts on the economy.

9.4 The direct impacts relate to the Transport Economic Efficiency of the package in terms of improvements in journey times and reduction in travel costs. In addition, journey time reliability is also assessed. This is assessed in terms of groups travelling for different purposes, including businesses, commuters and other shopping, leisure and personal trips.

9.5 The indirect impacts relate to the potential affects upon the wider economy. This analysis has already been presented in Section 7.

9.6 The Economy Objective also includes the overall assessment of benefits against the cost to the Public Accounts. This is considered at the end of the Section 8.

Transport Economic Efficiency

9.7 The outputs from the Maidstone Visum modelling work have been used as the basis upon which to assess the Transport Economic Efficiency benefits relating from the scheme. These summarise the present value of user and non-user benefits for consumers and businesses over the lifetime of the scheme.

9.8 A standard approach to the analysis has been undertaken utilising the DfT's Transport User Benefits Appraisal (TUBA) modelling software and in full accordance with WebTAG requirements.

TUBA Modelling Approach

9.9 The TUBA modelling has utilised the forecast 2026 person trips, journey times, distances travelled, public transport fares and vehicle parking charges. These have been provided from the modelled AM peak hour and PM peak hour periods.

9.10 In the absence of a second modelled year this has been simulated for 2041 through the application of TEMPRO growth rates to factor up the levels of person flows. The same journey times,

distances travelled, public transport fares and vehicle parking charges matrices have been applied as the 2026 model.

9.11 A scheme opening year of 2026 has been applied with a final appraisal year of 2085. A peak period factor of 2.5 and annulisation factor of 253 has been applied, giving 632 AM peak and 632 PM Peak hours within the analysis. No allowance has been made for inter-peak, off-peak or weekend impacts due to an absence of transport modelling data.

9.12 All monetary values presented are in 2002 market prices and values are discounted to 2002 applying a discount rate of 3.5% for benefits within the first 30 years of appraisal and 3.0% beyond.

9.13 The TUBA model assesses the change in travel patterns/demand, travel times, and travel distances between the modelled reference case (Option 1) and the do-something cases (Options 2 and 3) in order to assess the impact upon travel time and vehicle operating costs.

9.14 Default values of time, and growth in values of time, and vehicle operating costs have been applied (as specified in WebTAG) in order to monetise the benefits/disbenefits associated with the mitigation measures.

9.15 The results are presented for the impact upon commuters, other non-business trips, and for business trips.

Limitations of the TUBA modelling

9.16 The TUBA modelling process has been restricted due to a number of limitations relating to the Maidstone Visum Model. These are summarised below.

- Modelled period: the availability of only a single AM peak and single PM peak hour has restricted the ability of the TUBA modelling to assess all day impacts. The profile of delays and congestion in the inter-peak, off-peak and weekends was considered to dissimilar to the single hour peak models to warrant legitimate extrapolation of the results. This is likely to result in an under-reporting of the benefits from the schemes.
- Modelled years: TUBA requires two modelled years in order to be able to assess costs and benefits over time. In the absence of a second modelled year a crude process has been undertaken to simulate a second modelled year, as described above. This is again, likely to result in an under-reporting of the benefits from the schemes, as we would expect congestion to worsen over time as a result of increased person trips.
- Model Specifications: when originally constructed in 2007, the Maidstone Visum modelled focused mainly upon replicating the transport network and movements within the borough of Maidstone. Whilst a range of other external zones were included, to represent the rest of Kent and beyond, these were not modelled in great detail. The 2012 modelling work has revealed that the output data for these zones resulting from the trips distribution module is unreliable. It has therefore been necessary to discard much of this data from the TUBA modelling, in particular in relation to rail and bus trips. Unfortunately, due to the nature of the Park & Ride measures that have been assessed, many of these trips originate within these external zones. This has affected the accuracy of these results within the TUBA model outputs.

- Model Matrices: due to some of the issues described above in relation to the model specification, it has not been possible to utilise all of the Visum output matrices within the TUBA modelling. This includes the rail matrices and the car park charge matrices. Whilst an alternative assessment of the car park charges has been undertaken and incorporated into the TUBA outputs, no account of rail trips is included in the assessment. This is anticipated to under-estimate some of the benefits.
- Model Scenarios: the Option 4 package has not been specifically modelled against the revised Core Strategy development proposals. Previous modelling work has been carried out that provides an indication of the impact of the scheme. No TUBA analysis has been conducted for Option 4, instead a separate exercise has been conducted to assess the potential benefits.

9.17 It is important that these limitations are taken into account when assessing the TUBA model results.

Transport Economic Efficiency Analysis Outputs

9.18 The results of the TUBA modelling work for each Options 2 and 3 are presented in Tables 9.1 and 9.2, respectively.

Table 9.1 Transport User Impacts – TUBA Output – Option 2

Mode	Journey Time Benefits (£'000s)	User Charge Impacts (£'000s)	Vehicle Operating Cost Impacts (£'000s)
Car	433,280	-10,044	71,861
Bus	549	-	-
Rail	n/a*	n/a*	n/a*
Park & Ride	-100,728	-13,757	-
Total	**333,101**	**-23,801**	**71,861**

TUBA Modelling – all outputs in £'000s, over 60 years, discounted to 2002 and in 2002 prices

** rail trips have been removed from the TUBA model due to limitations with the external zone of the Maidstone Visum Model*

9.19 The results demonstrate that the Option 2 measures are forecast to generate significant journey time savings for travellers. The benefits are all derived by car users, resulting from less congestion.

9.20 There is a reduction journey time benefits for park & ride users; however, this is considered to be partly as a result of the issue with the external zones in the Maidstone Visum model. It may partly reflect the fact that park & ride services on three of the six corridors benefit for no bus lanes and so journey times may not be any quicker than car but individuals are choosing to use park & ride as it is much cheaper than long-stay parking in the town centre.

Table 9.2 Transport User Impacts – TUBA Output – Option 3

Mode	Journey Time Benefits (£'000s)	User Charge Impacts (£'000s)	Vehicle Operating Cost Impacts (£'000s)
Car	738,637	-7,247	70,419
Bus	-57,159	-	-
Rail	n/a*	n/a*	n/a*
Park & Ride	-13,606	-4,302	-3,016
Total	**667,873**	**-11,549**	**67,402**

TUBA Modelling – all outputs in £'000s, over 60 years, discounted to 2002 and in 2002 prices

** rail trips have been removed from the TUBA model due to limitations with the external zone of the Maidstone Visum Model*

9.21 A similar pattern is recorded for Option 3, although the journey time benefits are forecast to be much greater.

9.22 There is only a marginal negative journey time impact for park & ride reflecting the fact that all services have bus lane and bus priority measures.

9.23 Table 9.3 provides an overall summary of private and business benefits for Options 2 and 3 and presents the overall present value of TEE benefits.

Table 9.3 Transport Economic Efficiency Benefits – TUBA Output – Option 2 and 3

Mode	Option 2 (£'000s)	Option 3 (£'000s)
Commuter User Benefits	90,653	174,749
Other User Benefits	140,628	191,226
Business User Benefits	149,880	357,751
Private Sector Impacts	27,205	35,122
Other Business Impacts	-4,451	-
Present Value of Transport Economic Efficiency Benefits	**403,915**	**758,849**

TUBA Modelling – all outputs in £'000s, over 60 years, discounted to 2002 and in 2002 prices

9.24 The five user groups presented in Table 9.3 are defined as follows:

Commuter User Benefits: net benefits to commuters travelling to and from a place of work

Other User Benefits: net benefits to non-commuters and non-business users on shopping, leisure, personal business trips

Business User Benefits: net benefits to businesses from any business-related journeys undertaken by staff or by freight

Private Sector Benefits: net benefits to private sector public transport operators in terms of reduced operating costs or increased revenues (note: these relate to bus operator benefits)

Other Business Impacts: Developer contributions (note: the Option 2 impacts relate to an assumed developer contribution to the park & ride site at Newnham Court)

9.25 The outputs indicate that Option 3 is forecast to generate considerably larger user benefits than Option 2. The largest benefits are derived by the business users, reflecting the fact that they value journey time savings more highly than commuters and other users.

9.26 The Option 3 business user benefits, calculated over 60 years, discounted to 2002 and in 2002 prices, are in the region of £358 million. In order to put this value into some form of present day context this could be considered as the equivalent of generating £7.75 million of benefits to business in 2012 and for every subsequent year over 59 years, although in practice benefits would have a much different profile. The equivalent 2012 proxy value for Option 2 business benefits would be £3.25 million.

9.27 More detailed assessment of the outputs indicates that the majority of benefits generated for Option 2 are associated with the PM peak. In comparison, Option 3 provides equal AM and PM peak period benefits.

Reliability

9.28 In addition to outright travel time impacts from the packages of measures, the reliability of travel time is also an important element of potential scheme benefits.

9.29 The network congestion maps for Options 2 and Options 3 (Figures 5.2 and 5.3) indicate that a number of highway links within the network will remain operating above or very close to capacity. Whilst this does not represent a deterioration from the Option 1 outputs, it still indicates that vehicle journey times could potentially be subject to unreliability.

9.30 Whilst a detailed assessment of network congestion for Option 4 is unavailable the indication from the assessment of potential impacts suggests that the scheme will help to reduce congestion within the town. This should have a positive impact upon the reliability of journey times along the A229 corridor.

9.31 The additional bus priority measures that are included within the Option 2 and 3 will improve the reliability of bus and park & ride journey times. The incorporation of bus / HOV lanes will also enhance journey time reliability for buses and multi-occupancy vehicles.

Safety Objective

9.32 The safety objective encompasses two elements: accidents and personal safety and security.

9.33 The accident analysis has been conducted using COBA modelling software approach to assess the impacts of the package options upon accident levels.

9.34 A qualitative assessment road safety and personal security has also been undertaken.

Accidents Analysis

9.35 The outputs from the Maidstone Visum modelling work have been used as the basis upon which to assess the impact upon accident levels resulting from the packages of measures. These summarise the present value of accident impacts for all highway users over the lifetime of the scheme.

9.36 A standard approach to the analysis has been undertaken utilising the COBA11 modelling software and in full accordance with WebTAG requirements. The assessment is not available for Option 4 due to an absence of transport modelling data.

COBA Modelling Approach

9.37 The COBA modelling has utilised the Maidstone Visum model to provide a list of links in each scenario, including link lengths and the classes of road. In addition the forecast flows along each link within each modelled scenarios are also utilised.

9.38 A scheme opening year of 2026 has been applied with a final appraisal year of 2085. An annulisation factor of 632 has been applied. All monetary values presented are in 2002 market prices and values are discounted to 2002 applying a discount rate of 3.5% for costs within the first 30 years of appraisal and 3.0% beyond.

9.39 The COBA model attributes accident rates to link types and assesses the volume of flows associated with these each link. As such, when assessing the impact of the mitigation measures it will assess both the impact that this has upon link types and lengths of links, as well as the volume traffic forecast to use each link.

9.40 Default accident rates, and changes in accident rates over time, and accident costs have been applied (as specified in WebTAG) in order to monetise the benefits/disbenefits associated with the mitigation measures

Accident Analysis Outputs

9.41 The results of the COBA modelling work for Options 2 and 3 are presented in Table 9.4. This indicates the number of accidents over the lifetime of the appraisal and the monetised value of the impacts.

Table 9.4 Accident Analysis Outputs

Option Assessment	Number of Fatal Accidents	Number of Serious Accidents	Number of Slight Accidents	Present Value of Accident Savings (£'000)
Option 2 vs Option 1	+14	+118	+697	-30,372
Option 3 vs Option 1	-5	-26	-669	+9,776

COBA Modelling, benefits over 60 years, monetary value discounted to 2002 and in 2002 prices

9.42 The results indicate that Option 2 is forecast to have an increase in the level of accidents, resulting from the change in vehicle trips distribution across the network.

9.43 Conversely, Option 3 is forecast to have a minor improvement.

Personal Safety and Security

9.44 The impacts of the packages on personal safety and security are considered to be minimal; however, all the park & ride sites within Options w and 3 are assumed to incorporate high quality parking and waiting facilities, including CCTV.

Environment Objective

Overview

9.45 The environment objective aims to protect the built and natural environment. This includes reducing the direct and indirect impacts of transport schemes and their use on the environment. There are 10 sub-objectives, which include:

- Noise,
- Local Air Quality,
- Greenhouse Gases,
- Landscape,
- Townscape,
- Heritage of Historic Resources,
- Biodiversity,
- Water Environment,
- Physical Fitness, and
- Journey Ambience.

9.46 The environmental assessment provides an indicative high level assessment of the environmental criteria set out above, with a specific focus upon air quality, greenhouse gases, and landscape & townscape. This provides a discussion of the potential issues relating to each option but is not meant to provide a detailed appraisal. A full strategic environmental assessment would be required for this purpose.

Local Air Quality

9.47 Local air quality is affected by the levels of vehicle trips, and hence emissions, in urban areas where there is exposure to properties. Whilst a detailed analysis has not been undertaken, Options 2 and 3 both reduce the overall number of car trips into the town centre, albeit that the Visum model outputs indicates that on the major corridors leading into the town centre the number of vehicle movement increases marginally. Overall it is anticipated that both options should improve local air quality within the core town centre.

9.48 Option 4 will also reduce vehicle trips through the town centre and so would have a benefit of improving local air quality along the A229 corridor. Conversely trips to the south east of the town centre would increase and have a negative impact on properties in this locality.

Greenhouse Gases

9.49 The TUBA modelling provides an assessment of greenhouse gases (or carbon impact) for the measures including within Options 2 and 3. Table 9.5 summaries the outputs.

Table 9.5 Greenhouse Gas Analysis Outputs

Option Assessment	AM Peak Carbon Saving (tonnes)	PM Peak Carbon Saving (tonnes)	Present Value of Carbon Savings (£'000)
Option 2	-38,727	-144,869	+18,814
Option 3	-62,276	-111,473	+17,802

TUBA Modelling – all outputs in £'000s, over 60 years, discounted to 2002 and in 2002 prices

9.50 The results indicate that, overall, both packages of measures are forecast to have very similar impacts upon reducing greenhouse gas emissions. A larger proportion of benefits are associated with the PM peak period, where vehicle trip reductions are forecast to be higher.

9.51 The absence of modelling data for Option 4 means that a quantitative analysis of greenhouse gas impacts is unavailable. The SEMSL scheme, however, would create additional vehicle trips and so have a negative impact on greenhouse gas production.

Landscape & Townscape

9.52 Options 2 and 3 will have some impacts upon landscape and townscape. The major infrastructure works relate to the construction of the new park & ride sites and the creation of bus / HOV lanes.

9.53 Some of the park & ride sites are proposed to be constructed on green fields and so would have a negative impact on visual appearance.

9.54 Whilst some of the bus / HOV lanes will be constructed on existing carriageway (e.g. along the A229 gyratory) other section will require land take and will therefore have a negative impact upon townscape along these corridors, primarily the A229 and A274.

9.55 There will also be negative impacts during the construction phases of all the infrastructure elements.

9.56 Option 4 will have a much greater impact upon landscape with the SEMSL being constructed across green fields, with some bridge work and grade separated junctions. In addition the increased traffic volumes within the area will also impact upon the visual aspect of the landscape. There will also be negative impacts during the construction phase.

Other Environmental Impacts

9.57 There are a range of other potential environmental impacts that are discussed in brief below:

- Noise: traffic volumes in built up areas will impact upon noise measures. All options should help to reduce traffic volumes within the core town centre, although flows along some corridors will worsen. In particularly, option 4 would generate significant disbenefit in the south east of the borough
- Heritage: infrastructure construction can impact upon a range of heritage criteria including monuments, listed buildings, and tree preservation orders, amongst others. No information is currently available as to whether any of the measures would impact upon these criteria.
- Biodiversity: infrastructure construction can impact upon a range of biodiversity criteria including designated sites, habitats, and protected species, amongst others. No information is currently available as to whether any of the measures would impact upon these criteria.
- Water environment: infrastructure construction can impact upon a range of water-related criteria including surface water, ground Water, and flood risk, amongst others. No information is currently available as to whether any of the measures would impact upon these criteria.
- Physical fitness: Options 2 and 3 incorporate additional public transport measures that would encourage walking at either end of the public transport leg of the journey. This should have a minor positive impact upon physical fitness. Option 4 will encourage trips by car so could have a negative impact upon physical fitness.
- Journey ambience: the enhanced park & ride facilities in Option 2 and 3 will improve journey ambience for these trips.

Accessibility Objective

Overview

9.58 The accessibility objective comprises three sub-objectives:

- Option Values,
- Severance, and
- Access to the Transport System.

9.59 The Maidstone Visum Model outputs have been used to assess the impact of the packages on accessibility between residential areas and key locations of employment, education, and other facilities and services.

Option Values

9.60 Option values provide a measure as to whether a package of measures increases the available transport options to individuals. WebTAG Unit 3.6.1 describes the option value sub-objective as particularly important for the schemes that will substantially change the availability of the transport services within the study area.

9.61 Options 2 and 3 provide new park & ride services along transport corridors into Maidstone, although Option 3 also removes some services. Option 2 is therefore considered to provide strong positive option value benefits. Option 3 is also considered to provide positive benefits as the new designation of park & ride services provides access to the town centre from both the north and the south of the borough, rather than the currently predominance of services in the north.

Severance

9.62 This sub-objective is concerned with severance (as a result of a proposed scheme) to non-motorised modes, especially pedestrians. Cyclists and equestrians should also be considered but are less susceptible to severance because they can travel more quickly than people on foot.

9.63 Options 2 and 3 will have limited impact upon severance, although the reduction in vehicle trips into the town centre should reduce barriers to pedestrian movements caused be vehicle flows.

9.64 Option 4 will create additional barriers to movement for pedestrians and cyclists around junctions of SEMSL, although this is considered likely to affect only a relative small number of trips.

Access to the Transport System

9.65 The access to the Transport System sub-objective assesses the access to the transport system based on two variables: availability of a vehicle for private use and the proximity to a public transport service.

9.66 The additional park & ride services in Options 2 and 3 do potentially increase the access of individuals to public transport services, although this is restricted, in general, to those with prior access to a car with which to access the park & ride site.

9.67 The additional North West Express Loop bus service in Option 3 will provide additional public transport connectivity to the north west of the town.

Integration Objective

9.68 The integration objective comprises the sub-objectives:

- Transport Interchange,
- Land Use and Other Government Policy

9.69 The NATA integration criterion covers both the impact of measures on integration with the existing transport network, as well as integration with overarching policy. Both aspects have been assessed qualitatively, the former by determining how the packages improve interchange between public transport modes, the latter through a review of key policy documents.

Transport Interchange

9.70 The Transport Interchanges sub-objective is aimed at assessing a scheme against the Government's objective of achieving truly integrated transport. WebTAG guidance sets out a series of passenger indicators:

- Waiting environment
- Level of facilities
- Level of information
- Visible staff presence
- Physical linkage for next stage of journey
- Reliability of connection

9.71 The new park & ride facilities in Options 2 and 3 will provide high quality waiting environment, along with associated facilities and information provision. In addition, the bus priority and bus lane provision will ensure a reliability of connection.

9.72 The park & ride services will also significantly improve interchange with rail and other bus services in the town centre.

Policy Integration

9.73 The policy integration sub-objectives assess the extent to which the packages are integrated with the land use proposals and policies.

9.74 The National Planning Framework, referred to in Section 3, emphasise the importance of designing new development to provide the right conditions to encourage walking, cycling and the use of public transport.

9.75 Options 2 and 3 clearly integration with the NPF policy through encouraging public transport trips and reducing the need to drive. The opposite is true for Option 4 which will encourage car use.

Overall Quantified Impact

9.76 An overall assessment of the quantified and monetised impacts from the appraisal process has been undertaken in order to provide an overall indication of the scale of the potential costs and benefits associated within each package.

9.77 It should be noted that the quantified element of the assessment is only one element of the overall appraisal and should be considered along with the qualitative assessment.

9.78 For Options 2 and 3 the assessment has utilised the TUBA and COBA modelling outputs. A separate analysis has been conducted for Option 4.

Present Value of Benefits

9.79 This section summarises the performance of the scheme option against the quantified and monetised impacts, outlined in the previous sections. This includes the transport user (TEE) impacts, the accident impacts, carbon impacts, and indirect tax revenue impacts (e.g. VAT on fuel).

9.80 Table 9.6 presents the overall impact upon the Present Value of Benefits (PVB) associated with the package.

Table 9.6 Overall Present Value of Benefits – Option 2 and 3

Element	Option 2 (£'000s)	Option 3 (£'000s)
Present Value of TEE benefits	403,915	758,849
Present Value of Accident Impacts	-30,372	9,776
Present Value of Carbon Impacts	18,814	17,802
Present Value of Indirect Tax Revenues	-43,224	-39,912
Overall Present Value of Benefits	**349,133**	**746,515**

TUBA Modelling – all outputs in £'000s, discounted to 2002 and in 2002 prices

Present Value of Scheme Costs

9.81 The scheme costs for each option, presented in Section 5, have been profiled over the lifetime of the appraisal and discounted. The net capital and operating costs between the reference case and Options 2 and 3 have been calculated.

9.82 Table 9.7 presents the present value of net costs to Government

Table 9.7 Overall Present Value of Costs to Government – Option 2 and 3

Public Accounts	Option 2 (£'000s)	Option 3 (£'000s)
Local Government Funding		
Revenue Cost (park & ride)	-34,879	-13,244
Revenue Cost (parking)	-212	6,047
Operating Costs	19,717	16,683
Investment Costs	4,384	1,308
Developer Contributions	-4,451	-
Net Local Government Funding	**-15,441**	**10,794**
Central Government Funding		
Revenue	-	-
Operating Costs	-	-
Investment Costs	10,875	17,018
Developer Contributions	-	-
Net Central Government Funding	**10,875**	**17,018**
Broad Transport Budget	**-4,566**	**27,812**

TUBA Modelling – all outputs in £'000s, over 60 years, discounted to 2002 and in 2002 prices
negative values represent a benefit to Government i.e. a revenue not a cost

9.83 The outputs indicate that Option 3 has a higher cost to Government over the lifetime of the appraisal and that Option 2 is forecast to generate sufficient revenue from park & ride to cover both the operating costs and the capital costs of the scheme. This is a direct result of the high overall forecasts of park & ride from the model, specifically at Newnham Court.

Quantified Package Performance - Option 2

9.84 The overall net impact of the proposed package of measures in Option 2, in terms of user and non-user benefits, private sector benefits, and Government costs are as follows:

- Net Present Value (NPV) = £384 million
- Benefit to Cost Ratio (BCR) = (negative costs make BCR calculation irrelevant)

9.85 The NPV represents a positive indication that the package of measures in Option 2 is considered to generate benefits well in excess of the associated costs. A BCR cannot be calculated since the scheme is not forecast to represent a cost to Government due to the revenue generation of the park & ride scheme.

9.86 The scheme would also generate inter-peak, off-peak and weekend benefits that are not included within this analysis.

9.87 A separate exercise has been undertaken to look at the time period over which the measures outlined in Option 2 would breakeven in economic terms i.e. when the net capital and operating costs are off-set by the revenue and economic benefits to the economy. The analysis has evaluated all of the capital and operating costs, alongside park & ride and town centre car parking revenue impacts, as well as the economic business benefits.

9.88 The result is that the Option 2 measures are forecast to breakeven, in economic terms, just six years after the assumed scheme opening year of 2026.

Quantified Package Performance - Option 3

9.89 The overall net impact of the proposed package of measures in Option 3, in terms of user and non-user benefits, private sector benefits, and Government costs are as follows:

- Net Present Value (NPV) = £709 million
- Benefit to Cost Ratio (BCR) = 26 to 1

9.90 The BCR represents a very strong positive indication that the package of measures in Option 3 is considered to generate benefits in excess of the associated costs. Again, this is associated with the revenue generation of the park & ride scheme.

9.91 The scheme would also generate inter-peak, off-peak and weekend benefits that are not included within this analysis.

9.92 Again, a separate exercise has been undertaken to look at the time period over which the measures outlined in Option 3 would breakeven in economic terms i.e. when the net capital and operating costs are off-set by the revenue and economic benefits to the economy.

9.93 The result is that the Option 3 measures are forecast to breakeven, in economic terms, just four years after the assumed scheme opening year of 2026.

Quantified Package Performance - Option 4

9.94 A separate assessment of Option 4 has been undertaken as there was insufficient transport modelling output available to conduct a TUBA or COBA analysis.

9.95 This has utilised the transport model outputs described in Section 5 in order to estimate the potential number of vehicles that might use SEMSL, as well as those other vehicle drivers who would benefit from reduced congestion in Maidstone Town Centre.

SEMSL User Benefits

9.96 The Section 5 analysis indicated that around 5,360 vehicle movements would be in scope to potentially use SEMSL. For the purpose of the cost benefit assessment it has been assumed that 85% would choose to use the route, with others utilising alternative routes, including choosing to travel through the town centre as part of linked trips with intermediate destinations. This would give a forecast two-movement along SEMSL of 4,500 AM peak trips.

9.97 Information is unavailable regarding the potential time savings that these trips would benefit from but for the purpose of the analysis it has been assumed that there would be an average journey time saving of 5 minutes. This would mean that for some travellers the time saving would be much greater but for others for whom, it might be more difficult to access SEMSL, the benefits would be less.

9.98 Based upon this 5 minute journey times saving, and applying the average value of time from the Maidstone Visum Model (8.48 pence per minute) and applying the same peak period factor of 2.5, this would generate an estimated annual journey time benefit of £2.4 million.

Other Non-User Benefits for Town Centre Vehicle Trips

9.99 The Visum model has also been used to assess the number of vehicle trips travelling into Maidstone that could benefit from reduced congestion as a result of other vehicle diverting to use SEMSL. It is estimated that around 17,500 vehicle trips could potentially benefit in some level.

9.100 Again, information is unavailable regarding the potential time savings that these town centre trips would benefit from but for the purpose of the analysis it has been assumed that there would be an average journey time saving of 2 minutes. Again, this would mean that for some travellers the time saving would be much greater (for example those travelling along the whole of the A229 corridor) but for others who only cut across the main A229 corridor the benefits would be much less.

9.101 Based upon this 2 minute journey times saving, and applying the average value of time from the Maidstone Visum Model (8.48 pence per minute) and applying the same peak period factor of 2.5, this would generate an estimated annual journey time benefit of £3.7 million.

Total Peak Period User and Non-User Benefits

9.102 The total peak period user and non-user benefits, based upon the assumed journey time savings, are estimated to be £6.1 million per annum.

9.103 As a sensitivity test, if average journey time savings were increased to 7.5 minutes and 3 minutes, respectively, then total peak period user and non-user benefits would be estimated at £9.2 million per annum.

Construction, Maintenance and Renewal Costs

9.104 Section 4 provides an estimate of the SEMSL scheme capital costs at £76 million. Over a 60 year appraisal period an allowance is required for on-going maintenance and renewal costs. For annual

maintenance an allowance of 0.25% of the scheme capital costs has been incorporated. Every 20 years a renewal cost allowance of 10% of scheme capital costs has been allowed.

Present value of Costs and Benefits

9.105 The present value of costs and benefits of the scheme over a 60-year appraisal period (discounted to 2002 and in 2002 prices) has been calculated as follows:

- Present Value of Benefits = £58 million
- Present value of Costs = £44 million

9.106 Based upon these values the SEMSL scheme would generate the following overall economic performance:

- Net Present Value (NPV) = £14 million
- Benefit to Cost Ratio (BCR) = 1.3 to 1

9.107 If the higher journey time savings outlined in the sensitivity test were applied these values would increase to:

- Net Present Value (NPV) = £25 million
- Benefit Cost Ratio (BCR) = 1.6 to 1

9.108 The scheme would also generate inter-peak, off-peak and weekend benefits; however, since these are excluded from the assessment of Options 2 and 3, they have also been excluded for Option 4.

9.109 The results are inconclusive as to whether the SEMSL scheme has the potential to generate sufficient journey time benefits with which to off-set the costs of construction and maintenance of the scheme.

10 Package Performance against Objectives

Introduction

10.1 The section provides an overall summary of the performance of each package of measures against the appraisal objectives and the NATA cost benefit objectives.

Appraisal Objectives

Introduction

10.2 Section 3 established nine appraisal objectives against which to assess the packages of measures. This section provides a summary of the performance of Options 2, 3 and 4, drawing upon previous analysis presented earlier in the report.

Support the Core Strategy development

10.3 Options 2 and 3 provide additional public transport capacity for routes leading into the town centre. The analysis has indicated that this would target around 15% of the future year trips. Given the spatially diverse nature of the development proposals the park & ride schemes will only directly support a proportion of the development areas. The radial park & ride options within Option 2 offer greater accessibility to public transport across the borough.

10.4 The wider aim of the park & ride measures is to encourage greater public transport mode share and reduce vehicle trips into the town centre. This will the help reduce town centre congestion and support development across the borough. The overall origin – destination analysis suggests that the schemes are successful in this aim, with a large reduction in car trips into the Core Town Centre. The link flow analysis; however, is less conclusive in this matter, suggesting overall increases in flows into the town along major arterial corridors.

10.5 In terms of journey time savings, Option 3 is forecast to generate greater benefits; however the network congestion map presented still indicated that parts of the A229 corridor, and some other links, will still be operating above or very close to capacity.

10.6 Option 4 will provide a significant enhancement to development proposals within the south east, and more generally, the south of the borough through enhanced accessibility to the strategic road network. It will also offer some congestion relief to the town centre, although the extent to which this will occur is less clear. Given the spatially diverse nature of the Core Strategy proposals this measure would appear to be limited in geographic extend of its benefits.

Maintain and enhance primary road network

10.7 Option 4 offers a direct enhancement to the primary road network through additional capacity, in addition, it would offer some congestion relief to the A229 corridor through the town centre by diverting through traffic to Junction 8 of the M20.

10.8 Option 2 and 3 appear to reduce overall car trips leading into Maidstone; however, the modelling results appear inconclusive about the extent to which this improves congestion, although some benefits will definitely be materialised on certain points of the network. Option 2 performs worse than Option 3 against this objective with forecast increases in journey times along key routes leading into the town centre in the AM peak.

Maintain and enhance connectivity to, and operation performance of, the SRN

10.9 Option 4 offers a direct enhancement to access to the strategic road network, as well as indirect benefits through reducing town centre congestion. This option will also significantly impact upon the distribution of trips on the M20 with increased flows between Junction 6 and 8 in both directions. Overall trips on other section of the M20 may also increase.

10.10 The network congestion maps indicate that both Options 2 and 3 will improve access to the M20 through Junction 5; however, the results are less conclusive regard the impact on congestion and journey times on the A229 and A249 corridors, although Option 3 would appear to outperform Option 2.

10.11 The model output indicates that capacity constraints will occur on the M20 under both Options 2 and 3, with some flows higher than in the reference case. Option 3 is forecast to induce higher flows on the sections of the M20 leading to Junction 6 due to the concentration of flows accessing the Cobtree P&R site.

Encourage public transport usage

10.12 Both Options 2 and 3 clearly encourage public transport usage with increases in bus and park & ride mode share. Option 3 also increases rail mode share. The increases in public transport trips are particularly prevalent on trips leading into the town centre, reflecting the impact of the increased car parking charges upon individuals' choice of mode.

10.13 It is also considered that the nature of the mode share forecasting of the Maidstone Visum model will under report the potential impacts of the increased bus frequencies across the network, suggesting that bus patronage could be higher than presented.

10.14 Option 4 will have no positive impact on encouraging public transport usage and is likely to results in the opposite.

Encourage walking and cycling

10.15 All options, including the reference options, incorporate walking and cycling measures to encourage walking and cycling.

Increase high occupancy vehicle trips

10.16 All options, including the reference options, incorporate travel planning measures that will seek to encourage car sharing trips.

10.17 Options 2 and 3 both incorporate HOV lanes along the A229 corridor. These will encourage high occupancy vehicle trips through reduced journey times, although no forecast of predicted change has been feasible as high occupancy vehicle were not modelled separately within the Visum model.

10.18 Option 4 is includes no specific measures to encourage high occupancy vehicle trips and is considered more likely to generate the opposite impact and encourage more single occupancy trips across the network.

Reduce the overall need to travel

10.19 All options, including the reference options, incorporate travel planning measures that will seek to reduce the need to travel.

Maintain and enhance local air quality and reduce carbon emissions

10.20 Options 2 and 3 both reduce the overall number of car trips into the town centre, albeit that the Visum model outputs indicates that on the major corridors leading into the town centre the number of vehicle movement increases marginally. Overall it is anticipated that both options should improve local air quality within the core town centre. Both options are also predicted to generate overall reduction in carbon emissions.

10.21 Option 4 will also reduce vehicle trips through the town centre and so would improve local air quality along the A229 corridor. Conversely trips to the south east of the town centre would increase and have a negative impact on properties in this locality. No direct measure of carbon impacts has been feasible; however, it is likely that a negative impact would be generated as a result of increased vehicle trips across the network.

Value for money

10.22 The quantified assessment of value for money indicates that Option 2 offers the highest socio-economic returns on public investment due to the significant revenues forecast to be generated by park & ride, which would cover both the operational cost and capital investment costs. Option 3 is also forecast to generate positive value for money, particularly if inter-peak, off-peak and weekend benefits are added into the appraisal process.

10.23 A detailed appraisal of Option 4 has not been feasible; however an outline assessment indicates that the scheme may offer lower value for money than both Option 2 and 3.

On-going operating and maintenance costs

10.24 Options 2 and 3 incorporate significant additional public transport operating costs in the form of park & ride operations and, for Option 3, the North West Express Loop bus. The analysis of park & ride revenue generation, based upon the peak period demand forecasts from the Visum model, indicates that overall both options would generate sufficient revenues to cover the operating costs.

10.25 Within Option 2, however, it is clear that some of the individual park & ride sites would not operate at a profit. This includes London Road, Willington Street, Bluebell Hill and Sutton Road.

10.26 Revenue data is unavailable for the North West Express Loop bus services; however it is clear from the levels of patronage forecast, particularly in the AM peak, that the service would require a substantial subsidy if it were to operate at the 10 minute frequency specified within the package.

10.27 Option 4 would require on-going maintenance of the SEMSL link which would be a cost to the public account for which there is no corresponding revenue source.

NATA Objectives

Introduction

10.28 This section provides a brief overview of the findings from Section 8.

Economy

10.29 Option 3 is forecast to generate the greatest user benefits in terms of journey time savings, vehicle operating costs and user charges. Option 2 is forecast to generate around half the benefits of Option 3. Option 4 has not been robustly assessed but is estimated to generate lower journey time savings across the network than either Option 2 or 3.

10.30 Neither Option 2 nor 3 are forecast to improve road journey time reliability with notable parts of the network forecast to remain above or close to operation capacity. Public transport reliability would be enhanced through bus priority and bus lanes. Option 4 is anticipated to provide some benefits to road journey time reliability.

10.31 In terms of wider economic impacts, Option 4 is anticipated to provide the greatest benefits to highway accessibility, particularly in terms of access to the M20, and so would generate positive economic benefits. The impact of Options 2 and 3 is not entirely clear from the model outputs with network congestion expected to remain high on routes into the town centre that will impact upon the attractiveness of the area for economic activity.

Safety

10.32 The measures in Option 2 are forecast to result in a marginal increase in accidents across the network. Option 3 is forecast to results in a marginal improvement. Option 4 was not assessed.

10.33 There are no major personal security benefits for any of the options, although all public transport measures will be designed and built to high safety specifications.

Environment

10.34 Options 2 and 3 are clearly forecast to generate environmental benefits in terms of greenhouse gas reduction and will also improve local air quality along certain corridors. The associated infrastructure measures would require careful planning, with appropriate mitigation measures, to ensure that landscape, townscape, biodiversity, heritage and water impacts are minimal. These options will also improve public transport journey ambience.

10.35 Option 4 is likely to create a range of negative environmental impacts, particularly in terms of emissions. Again all construction elements would have to be carefully managed with appropriate mitigation measures.

Accessibility

10.36 Options 2 and 3 offer option value benefits through the provision of new park and ride and bus services.

10.37 None of the options are considered to have a major impact upon severance, although Option 4 would have the largest impact.

10.38 Options 2 and 3 will provide the largest improvements to access to the transport system through additional public transport provision and interchange between park & ride, rail and bus.

Integration

10.39 Options 2 and 3 will provide high quality transport interchange at the park & ride sites and through interchange between park & ride, rail and bus.

10.40 Options 2 and 3 also encourage sustainable travel supporting Government policy, whilst Option 1 is likely to encourage increased car use.

Summary

Option 2

10.41 This package of measures is forecast to increase bus and park & ride patronage, as well as significantly reduce the volume of vehicle trips. The journey time analysis indicates that bus and, to

a lesser extent, park & ride, do not offer a significant journey time saving over car but that commuters are forecast to change modes from car due to the increase in town centre parking tariffs.

10.42 Vehicle congestion remains across parts of the primary road network leading into the town centre, with some journey times forecast to increase on key routes. This will continue to have both direct impacts on vehicle accessibility and wider impacts upon economic activity. In contrast the enhanced public transport provision will provide labour market and retail sector accessibility benefits.

10.43 Whilst the package of measures is forecast to generate sufficient revenue to cover operational costs, there are individual schemes that would require subsidy. In addition, there are notable capital investment costs which, in combination with the operating costs, mean that, whilst the package is anticipated to generate an acceptable rate of return on investment, it does not perform as well as Option 3.

Option 3

10.44 As with Option 2, the package of measures is forecast to increase bus and park & ride patronage, as well as significantly reduce the volume of vehicle trips. The journey time analysis indicates that bus does not offer a significant journey time saving over car but that commuters are forecast to change modes from car due to the increase in town centre parking tariffs.

10.45 Vehicle congestion remains across parts of the primary road network leading into the town centre, but there are forecast to be some journey time reductions on key routes. The network congestion would continue to have impacts upon vehicle accessibility and upon economic activity, although offer an improvement over Option 2. The enhanced public transport provision would also provide labour market and retail sector accessibility benefits.

10.46 The package of measures is forecast to generate sufficient revenue to cover operational costs. The park & ride measures would be financially self-sufficient; however, the North West Express Loop bus service would require a significant subsidy, as currently specified. There are significant capital investment costs but even in combination with the operating costs, the package is forecast to offer a good anticipated rate of return on investment.

Option 4

10.47 Whilst this option has not been modelled in the same detail as the other packages, Option 4 would increase vehicle network accessibility to the strategic road network from the south east of the borough. It would also generate congestion relief benefits in the town centre, although the extent of these benefits is not clear, with previous modelling work indicating that the reduction in trips through the town centre would not have a significant impact.

10.48 Whilst this Option would clearly generate positive impacts upon the economy to the southeast of Maidstone and would support development activity in this sector, the benefits across the borough as a whole would be less significant. Given the geographical spread of the development proposals within the Core Strategy this option is considered to be too spatially focused to be the sole focus of the transport measures.

10.49 The SEMSL scheme measures could be incorporated within a wider package of measures; however, the scheme cost may then become prohibitively expensive. Obviously, if part of cost of the scheme could be covered through private sector developer contributions this could make it more deliverable.

11 Assessment of individual measures

Introduction

11.1 This section seeks to provide an overall assessment of each individual element of the package options. In some cases this is easier to do than others, since by its nature, the modelling of packages makes it difficult to determine the impact that each individual element are having on transport performance.

Park & Ride

Site Performance

11.2 Overall, the performance of the park & ride measures specified within Options 1, 2, and 3 provide sufficient evidence that these measures can have an important role within integrated transport provision for the borough of Maidstone. Within each option at least one site is considered to perform strongly enough, in terms of demand generation, to warrant potential inclusion within the strategy. At the same time it is clear that not all sites perform adequately, either in absolute terms or in combination with other sites.

11.3 Both the Option 1 and 2 packages demonstrate that London Road and Willington Street do not perform strongly in terms of peak period demand generation. This is considered to be due to a combination of site access issues, lack of bus priority measures leading into town, and competition with other public transport modes. It is, therefore, not recommended that either of these sites are taken forward to the final strategy.

11.4 In terms of other sites in Option 1 and 2, the Sittingbourne Road / Newnham Court locations are forecast to generate significant demand from both the A249 corridor but also along the wider M20 corridor. The analysis suggests that Sittingbourne Road will suffer from capacity constraints in the future but may also be restricted by site access issues in comparison to Newnham Court, although it must be noted that Option 1 does not include increased town centre parking charges and so we would expect lower demand.

11.5 The Newnham Court site appears to perform exceptionally well and would generate a significant operating profit if the demand forecast were to be realised. Its direct access of the M20 and A249 corridors, along with relative short journey distance to the town centre appear to provide it with a competitive advantage.

11.6 Bluebell Hill generates reasonable levels of demand; however the increased bus operating costs from the site, resulting from the additional distance to the town centre, mean that this site is not forecast to make a profit. The modelling outputs also suggest that much of the demand will be from along the M20 corridor to the east. Whilst there may be some journey time benefits for travellers using this route if their ultimate destination is on the north side of the town centre, overall it is considered that this is likely to be considered an unfavourable route choice. The level of demand at this site is, therefore, considered to be optimistic.

11.7 The Linton Corner site is also forecast to perform well above initial expectations and would cover its operating costs. The forecast levels of demand would exceed the identified site capacity so a new or additional site would need to be identified along the same A229 Linton Hill corridor. If demand was constrained to 400 spaces then the site would not cover the cost, nor justify, the 10 minute bus frequency throughout the day.

11.8 The Sutton Road site does not perform well within the Option 2 package as it appears to be competing directly with Linton Corner. The site is only forecast to attract trips from the local vicinity with no long-distance trips accessing the site. Under Option 3, as the sole site the south of the town, Sutton Road performs well and would cover its operational costs. Analysis of the demand profile indicates that it would extract much, but not all of the demand that goes to Linton Corner in Option 2. The advantage of the Sutton Road site over Linton Corner is that there is a clearly identified land parcel of more than sufficient size to accommodate demand. From a purely demand driven assessment, however, it would appear that the Linton Corner site is more favourable.

11.9 The Cobtree site is forecast to generate significant demand and would cover the operational costs of the site. The capital costs associated with the site are significant with major junctions works required. There also remain questionmarks about how well the junction will operate with the additional traffic generated by the site and this would require further detailed modelling work.

Preferred Options

11.10 The analysis work indicates that the Option 2 park & ride measures do not provide a complete solution. They are much more expensive to operate than the Option 3 park & ride sites, although they are also forecast to generate higher revenues. The inclusion of London Road and Willington Street are considered to offer very poor value for money. As such, it is not recommended that this option is taken forward in its entirety.

11.11 Option 3 does provide significant benefits and would cover the cost of operations. The detailed assessment of the individual sites, however, would suggest that whilst the principle of north/south spine is correct, it may be that alternative site would offer even greater benefits and value for money.

11.12 The analysis work would appear to indicate that the Newnham Court site is the preferred site for park & ride in terms of overall demand generation. This is despite the fact that there are no associated bus lanes provided along the A249 to provide priority access the town centre, although some junction priority is included. The overall capital costs of this site are, therefore, less and there is the significant potential for developer contributions that would increase the financial viability of the site. In terms of cost benefit analysis this site would appear to perform better than the Cobtree site.

11.13 In the south, the analysis has already indicated that Linton Corner is a preferred site, in terms of demand, in comparison to Sutton Road. The choice of site, however, will be dependent upon the availability of land along the A229 Linton Hill corridor of sufficient size to accommodate the demand forecast at Linton Corner.

Bus Measures

North West Express Loop Bus

11.14 The analysis of the North West Express Loop (NWEL) bus service indicates that it will not generate sufficient patronage to justify the 10 minute frequency in each direction and the associated capital cost. It is therefore not recommended that this option is pursued as currently specified.

11.15 It has been highlighted that existing bus services operating along the A26 to the Hospital are currently duplicating part of the NWEL bus route. There is, therefore, the potential to rationalise the bus services along this corridor and increase loadings on the NWEL bus service. Without further detailed analysis it is not feasible to assess the success of such a rationalisation process but it is considered that there would need to be a substantial cost saving to justify the NWEL bus service.

Bus priority and bus lanes

11.16 The provision of bus priority measures at junctions across the network should be pursued as part of the underlying scheme option to increase bus frequencies across the network.

11.17 The choice of specific bus lanes and junction enhancements to prioritise bus movements will be dependent upon the final configuration of park and ride measures, the density of bus services across the network, and the availability of carriageway space.

11.18 The majority of the proposed bus / HOV lane measures are along the A229 north/south corridor, as well as the A274. These were clearly designed in support of the Cobtree and Sutton Road park & ride option. If the north/south axis were to be switched to Newnham Court and Linton Corner then this would impact upon the justification of certain sections of bus lane. Clearly the section of the A229 gyratory and Loose Road leading to the Wheatsheaf junction still provides benefits to buses travelling to/from Linton Corner.

11.19 Since there is insufficient carriageway width on the A229 Loose Road (south of the Wheatsheaf junction) and the A274 to incorporate bus lanes, it is not simply a case of switching provision to a potential new Northeast/South axis park & ride axis. The fact that both the Newnham Court and Linton Corner sites are forecast to perform well without such priority measures indicates that such measures are not required anyway to support these park & ride services.

11.20 The bus lanes on the A229 Royal Engineers Road and A274 could still be provided to support local bus services. The journey time analysis for buses appears to indicate that they remain uncompetitive against car travel, therefore the provision of bus lanes along major corridors will help improve this disparity. The associated cost involved, however, may not justify this approach.

High Occupancy Vehicle Lanes

11.21 The analysis has not been able to assess the success of the high occupancy vehicle lanes as high occupancy vehicles have not been modelled separately within the Maidstone Visum model. The implication from the Option 3 results is, however, that the additional capacity available to car has helped to reduce journey times along these corridors.

11.22 Having shared bus and HOV lanes will clearly have a detrimental impact upon bus journey times. Again, it is very difficult to ascertain the extent to which buses will be delayed without appropriate modelling tools; however, clearly the more successful the HOV lane is at attracting HOVs, the greater the delays to bus. It is recommended that further analysis is conducted in to the impact of joint bus and HOV lanes.

Town Centre Car Parking

11.23 The business engagement process focused specifically upon the issue of town centre car parking and tariffs. The outputs from this process indicated that transport accessibility, and more specifically, vehicle accessibility, were considered much more important issues for business operations than parking charges.

11.24 The impact of long-stay car parking charges will have limited impact upon retail shoppers and so will have limited affect on the attractiveness of the town as a retail destination. The long-stay charges will impact most upon commuters. It is, therefore, imperative to provide an integrated package of measures that provides an alternative means of access for commuters in to the town. Park & ride is considered an ideal alternative since it still allows individuals to drive to a park & ride

site, hence giving flexibility. Alongside that, improvements to bus service provision will provide an alternative to commuters living within the urban fringe to travel into the town.

11.25 The town centre car park utilisation surveys indicated that there is clearly an oversupply of parking in the town centre. This has been confirmed through the various stakeholder engagement processes. The reduction of long stay car parking is, therefore, considered to be an appropriate measure, but, again, only as long as it is supported by improved public transport provision.

11.26 In terms of an overall package of measures, the restriction of town centre car parking and increased long-stay parking charges is considered to be imperative to developing a successful park & ride service. Experience from elsewhere around the UK has demonstrated that successful park & ride goes hand-in-hand with tight controls on town centre parking and parking tariffs.

Appendix A

Business Workshop Meeting Note

Note of Meeting

Date	16 March 2012
Job No/ Name	ST12118
Present	Peter Court, Jason Lewis, John Foster, Robert Patterson (Arriva), Graeme Wyles (MTCM), Bill Moss (TCM), Jane Shortliff (Downs Mail), Sean Whittam, Matt Startin (Enterprise Rent A Car), David Chen (D. Chen Consultancy), John Taylor (CoC), Andrew Aves (FoSB), Mike Fitgerald (Cllr), David Burton (Cllr), Malcolm Robertson (Cllr), Fran Wilson (Cllr)
Subject	Maidstone Business Workshop

1. Introduction

This note provides a summary of the feedback received at the Maidstone Business Workshop undertaken on Wednesday 7th march 2012.

The purpose of the workshop was to seek to understand the views of business of current transport provision in the borough of Maidstone and how it affects the way they operate their business. Looking further forward, the impact of growth on transport demand was also presented leading on to a discussion of potential solutions to identified problems.

The feedback received will form part of the basis for developing the scheme options to be incorporated within the draft Integrated Transport Strategy. This document will then be subject to further consultation and review.

The feedback received is summarised in the sections below. In some cases the views expressed represent those of individual businesses present at the workshop but this is highlighted in the text where this is the case.

2. Existing Transport Provision - Areas of transport that work well

Park & Ride	-	Generally considered to work well
	-	Thought by some to be the way forward
	-	Service currently good but not always reliable
	-	Infrastructure is poor, should be consolidated
Rail	-	Some services work well, the arrival of High Speed services is welcomed
Buses	-	High frequency services to the south very good

3. Existing Transport Provision - Areas of transport with problems

Rail	-	Links to London, and other cities, not good enough.
	-	This needs to be encouraged as London workers spend income in Maidstone
	-	Too much rail heading
	-	Fares not affordable, poor commuter offer
	-	Maidstone East / Maidstone West have poor connections

Buses	-	Bus station in poor location and visually intimidating
	-	Bus station should be a County Hall
	-	Scheduling of bus services could be better
	-	Low frequency services serving some parts of the borough
Parking	-	Location and mix designation
Road network	-	Maidstone gyratory, no link around Maidstone
	-	Through traffic is a problem
	-	Upper Stone Street / Sutton road / Rush Wood / Rural – South/East all congested
	-	Very poor, congested, particularly in the south
	-	Pinch-points on the network

4. Parking

Overall supply	-	some considered the town centre parking is under-utilised, e.g. over-supply
	-	Others considered there to be the right amount
Designation	-	Some considered there to be too much long stay that encourages commuters

5. The effect of transport on business operations

Parking	-	the supply, designation and location all affect business
	-	Insufficient car parking in residential areas
Road network	-	survey indicated 70% of businesses see road vehicles as critical to operations, only 7% considered buses to be critical
	-	links to the SRN are very important
	-	Congestion in town centre is a problem, deterring investment, particularly to the south
	-	unpredictability of the network makes planning difficult with contingency required
Rail	-	links to London and south of the borough are important
Air quality	-	differing opinions on whether this is an important factor but some consider that businesses need to face up to the issue of the environment

6. Impact of town centre car parking on business

Supply	-	Ease of parking / legibility impacts congestion
Charges	-	politically difficult to change
	-	Charges should not be used as a traffic management measure
	-	Parking should be free during the evening to support the evening economy
Relation to P&R	-	Cheap car parks undermines P&R service
	-	Charing P&R by the car rather than for bus ticket will increase competitiveness
	-	Commuters more willing to use P&R than staff who prefer to drive into town
Workplace	-	Workplace parking levy must not be introduced

7. Concerns for future transport conditions

Road network	-	Maidstone gyratory
	-	Congestion will worsen with economic recovery
	-	Growth in car ownership will create more congestion
	-	Better use of Urban traffic management system will be required to avoid hotspots
Cost of fuel	-	rising cost of fuel is a real concern for business
Parking	-	Workplace parking levy must not be introduced
Trains	-	increasing fares will deter travel by this mode
	-	Further loss of service to London, potential loss of High Speed service
Airport	-	Thames Estuary Airport will create economic problems for Maidstone
Improvements	-	Who will pick up the cost for required improvements?

8. General Solutions

SEMSL	-	reduce through traffic from the south and relieve town centre congestion
	-	Make freight more efficient and safer
	-	Improve access to Archbishops palace, Carriage Museum, Riverside
	-	BUT does this stimulate out-of-town development and encourage more car trips?
Park & Ride	-	Sticks and carrots
	-	Support night time economy by operating longer
	-	Provide more reliable, more comfortable service
School Travel	-	Promote public transport trips to / from school and provide more bus services
Buses	-	Bus lanes generally unrealistic due to space constraints
	-	Bus route through Mote Park
	-	Provide new vehicles and make greater use of technology
Cycling	-	Need segregated provision as safer
Integration	-	make switching between modes much easier
Car sharing	-	promote car clubs as a financial benefit to users not just environmentally friendly
	-	Insufficient capacity on the road network for HOV lanes but encourage car sharing
Car rental	-	pay per hour car rental scheme
UTMC	-	expand where possible to make best use of existing road capacity
Reduce travel	-	encourage working from home
	-	Provide better broadband connections

9. Mode Specific Solutions

Business travel plans	-	Some considered that Employers can play a role in influencing travel
	-	Large employers have greater opportunities
	-	Some scepticism about their ability to be successful
	-	Should focus upon travel options and providing information
	-	Car sharing works best where there are financial benefits to the individuals
	-	Concern that travel plans are a cost to business

Walking & Cycling-		Encourage walking and cycling to school
	-	Cycle lanes could be introduced, in particular along River
	-	Good for health
	-	An alternative view was that nothing should be done to discourage walking & cycling but that there should not be disproportionate spend
Buses	-	Bus lanes would be good but concern about available space
	-	Mote Park bus route
	-	Hybrid buses / quiet
	-	Increase frequency of services and extend evening and weekend services
	-	Improve rural bus services to encourage young people to work for rural-based companies
	-	Improve comfort of vehicles
	-	Cheaper fares
	-	Some concern about levels of subsidies required
Rail	-	Lower fares
	-	Parkway station / cheaper more extensive parking at stations / Park & Ride (West Malling / Barming / Bearsted)
	-	Lobby franchises for improved services
Park & Ride	-	Sticks and carrots have to be right
	-	More reliable and comfortable
	-	More capacity in car parks (1,500 space minimum)
	-	More locations
	-	Express or 'String or pearls' approach with multiple car parks along a route from rural areas
	-	Charge per car rather than per person
	-	Longer operating hours
	-	More secure car parks
	-	Better waiting facilities
	-	Better promotion / signage
	-	Willington Street considered to be probably too close
	-	Blue Bell Hill P&R interchange – connectivity issues
	-	Oxford is a good example
	-	Park & sail
SEMSL	-	Good for freight
	-	Relieves Maidstone Gyratory
	-	Solves north – south through traffic issue
	-	Essential if it can be afforded
Local Roads	-	Widening of Peter's Street Bridge to add extra lane
	-	No right turns in peak periods
	-	Improve motorway junctions, particularly junction 7
	-	Additional lane on Upper Stone Street and provide parking for servicing of local retailers

	-	Pedestrianisation to force use of Park & Ride
Car Parking	-	Get on-street / residential car parking right and don't just displace traffic from town centre into these areas
	-	Sunday charges should be flat rate, as for evenings
	-	Have more 'pay on exit' car parking
	-	Car park charges must not undermine P&R
	-	Car parking is a valuable asset to town centre business for staff and commuters
	-	Could reduce long-stay
	-	Short-stay should increase in price
Car sharing	-	Often can be impractical and difficult to make work
	-	Need individuals to be motivated financially not just environmentally

10. Conclusions

The following strong conclusions can be draw from the workshop:

- Highway network congestion is a major concern to business both currently and in the future
- Rail link, particularly to London, need improving
- Bus interchange and service provision requires improving
- There is a general acceptance that there is, at least, sufficient town centre car parking, if not an over-provision
- It is acknowledged that town centre car parking charges impact upon individuals travel decisions and, in particular, affects the attractiveness of Park & Ride
- Potential solutions include:
    - SEMSL
    - Local road improvements and more use of UTMC
    - Improved rail services to London and other major centres
    - Improved Park & Ride, including Rail Park & Ride
    - Improved Bus service provision, including school services
    - Measures to encourage walking & cycling to school
    - Improved integration between modes
    - Measures to reduce the need to travel, including business travel plans for large companies

Distribution	MBC
Name/ Signed	Jon Bunney

Appendix B

Maidstone Business Travel Survey Form

Maidstone Business Travel Survey Form

Maidstone Borough Council is seeking to develop an integrated transport strategy to support long-term growth and development across the borough. Part of this process is to understand the needs of businesses, how current transport provision affects business operations, and what improvements businesses would like to prioritise going forward. Please take the time to complete this questionnaire and return to the Council.

SECTION 1 – Your Business

Please indicate which of the following industries or sectors you business operates within?

Production / Manufacturing	☐	Property	☐
Construction	☐	Motor trade	☐
Wholesale	☐	Catering	☐
Retail	☐	Services	☐
Agriculture, hunting, forestry/fishing	☐	Other _____	☐

Please indicate the scale of you business operations in terms of number of employees?

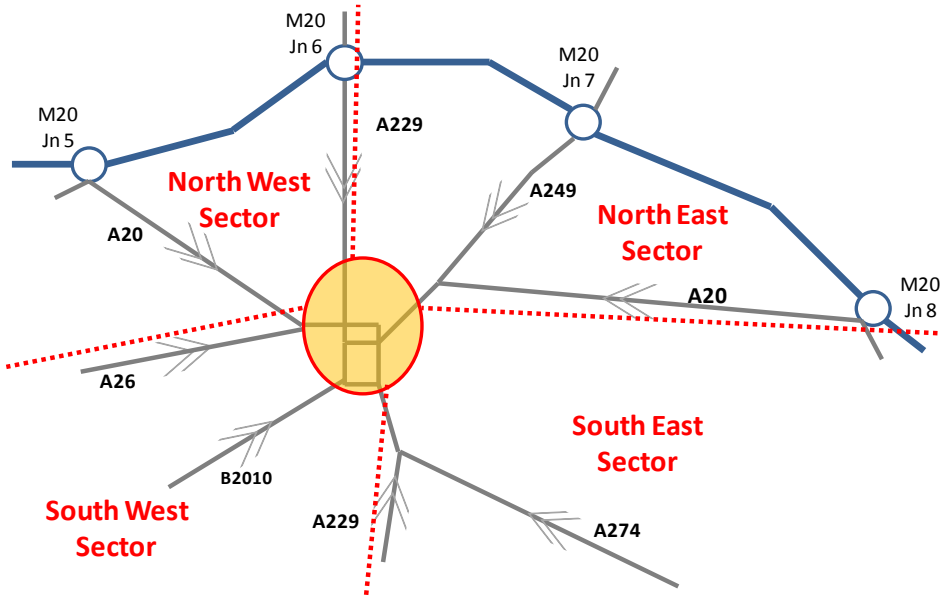
Employees (number)			
0 to 10	☐	51 to 250	☐
11 to 50	☐	251 plus	☐

Please indicate which of the following operations are undertaken by your business:

Office work	☐	Site work	☐
Deliveries to clients/customers	☐	Sales visits to clients/customers	☐

Please indicate (roughly) in which sector (or village), on the map below, your business is located in relation to Maidstone Town Centre.

In Town Centre	☐
Northwest Sector	☐
Northeast Sector	☐
Southeast Sector	☐
Southwest Sector	☐
Marden	☐
Staplehurst	☐
Headcorn	☐
Lenham	☐
Harrietsham	☐
Other (fill below)	☐



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Does your business have private car parking available for customers and/or staff?

Car parking for all staff		Car parking for some staff	
Car parking for customers		No car parking	

SECTION TWO – Current Transport

How would you rate current transport provision within Maidstone?

(5=very good, 1=very poor)	5	4	3	2	1	Don't Know
Vehicle access on main roads into/across the borough						
Vehicle circulation around the borough						
Parking in Maidstone town centre						
Bus service provision						
Rail service provision						
Walking & cycling provision						

How much of an impact does current transport congestion have upon the following aspects of your business operation?

(5=large impact, 1=limited impact)	5	4	3	2	1	Not applicable
Business travel to or from your premises						
Deliveries to or from your premises						
Customer travel to your premises						
Employee commuter travel to work						

What impact do town centre parking charges have upon your business operation?

(5=large impact, 1=limited impact)	5	4	3	2	1	Not applicable
Customers accessing your premises						
Employees travelling to work						
Business travel to or from your premises						

SECTION THREE –Transport Improvements

Please rate how beneficial each of the following transport improvements would be to your business.

(5=large impact, 1=limited impact)	5	4	3	2	1	Don't Know
Reduce vehicle journey times into Maidstone town centre						
Reduce vehicle journey times across the borough						
Improve vehicle circulation around the borough						
Improve bus service provision						
Improve rail service provision						
Improve walking and cycling provision						

Please describe what single transport improvement you consider would be the most important for your business and how it would enhance the operation of your business.

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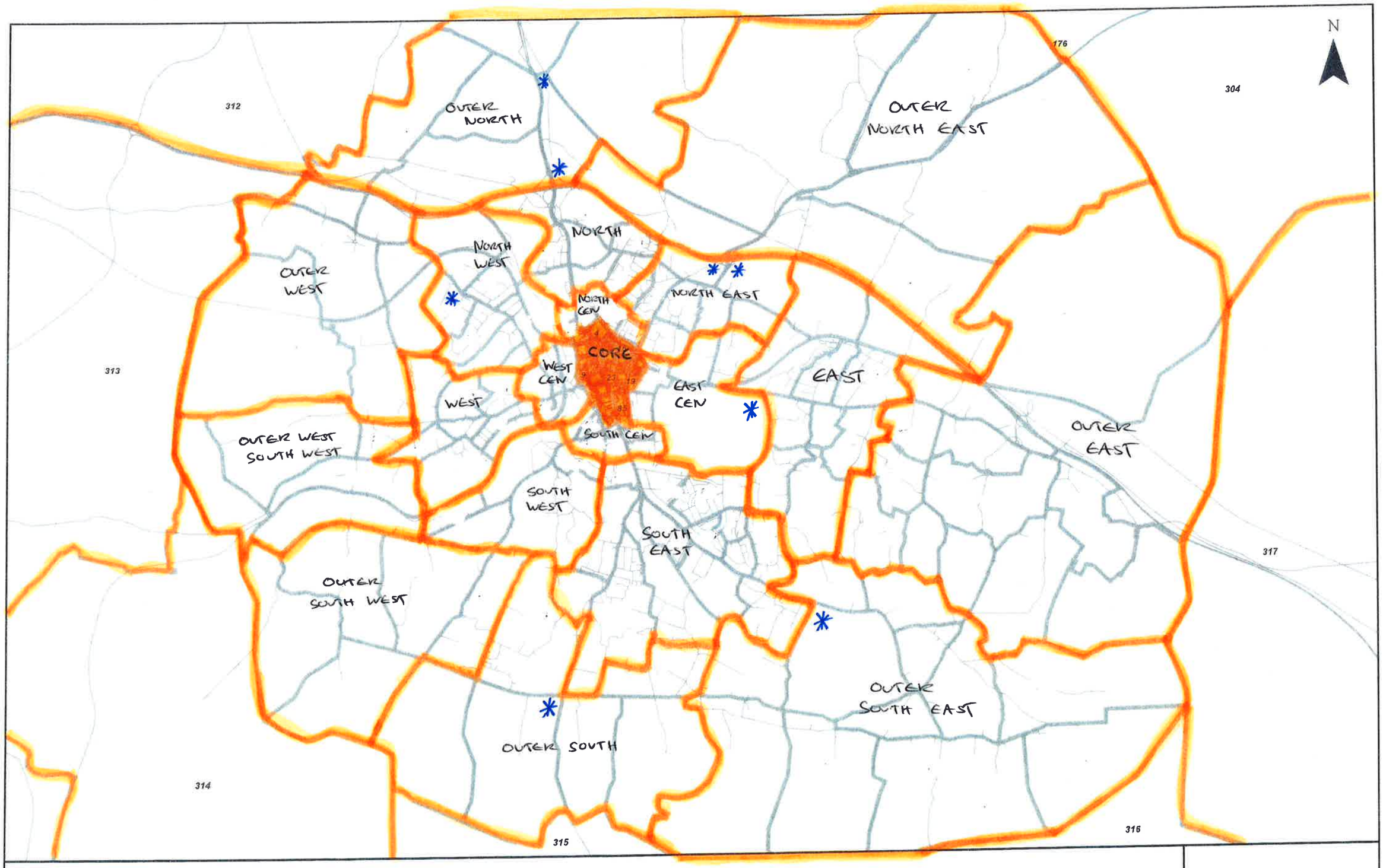
Appendix C

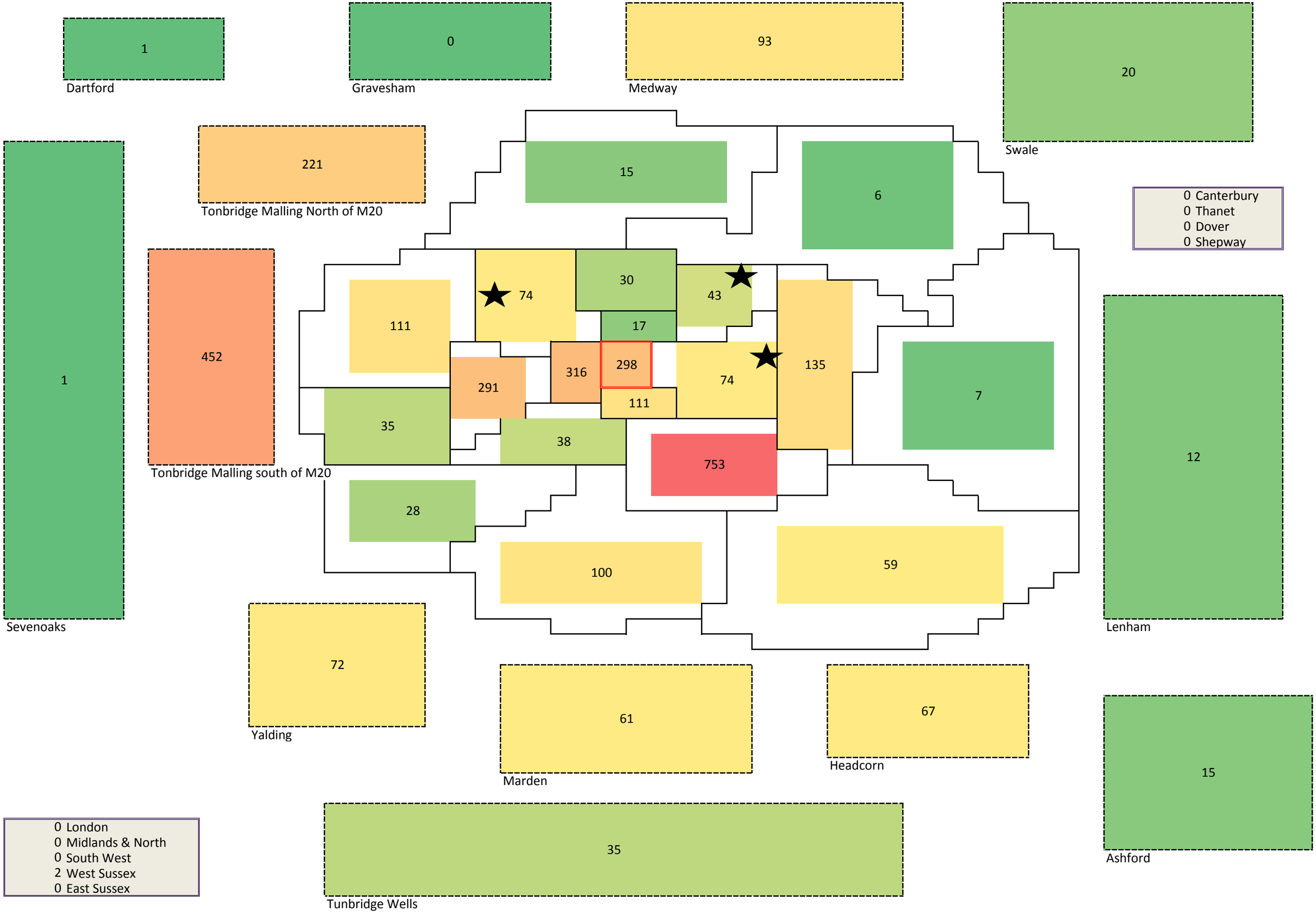
Option 1: Origin – Destination Mapping



Internal Model Zones

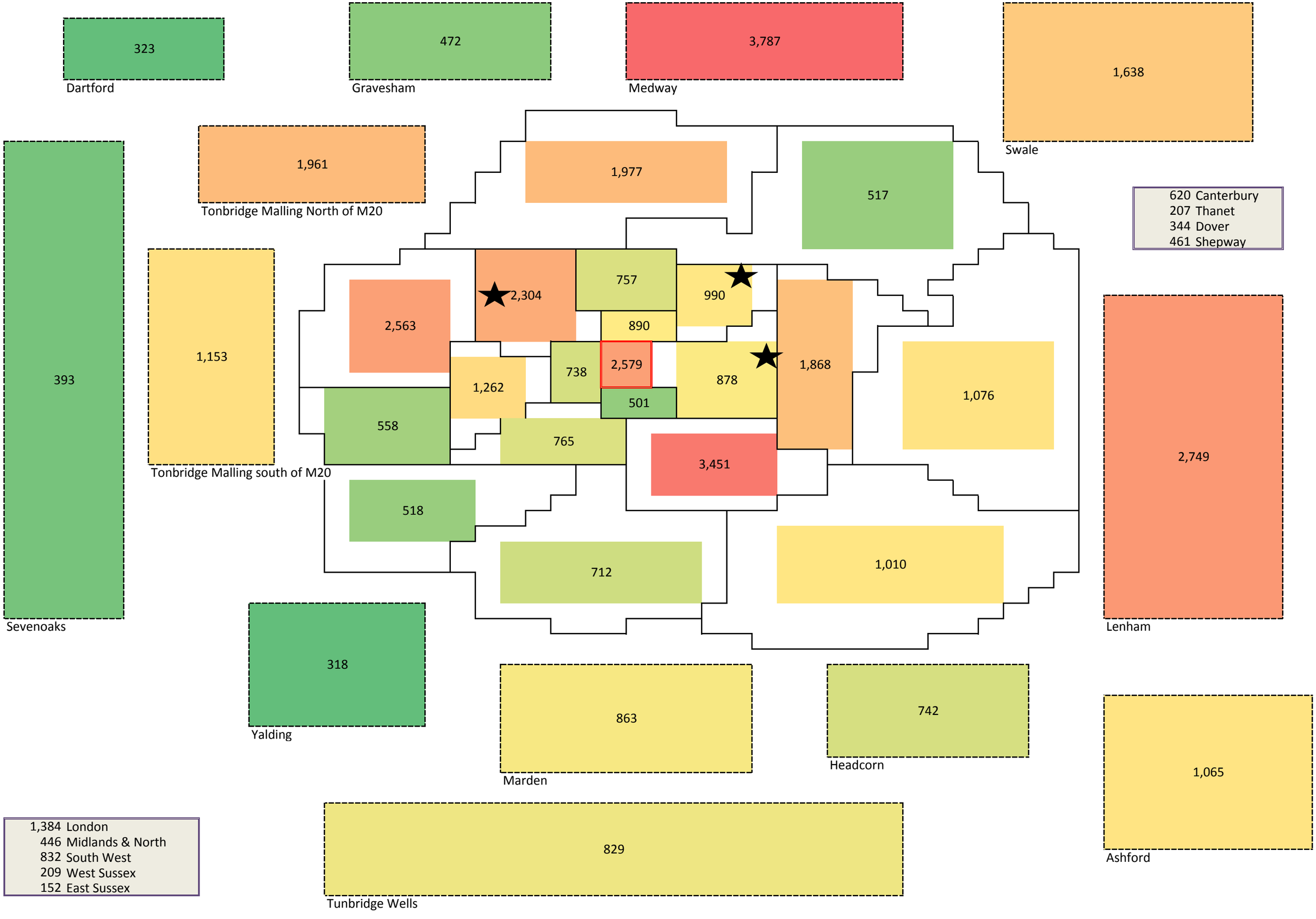
Figure 3.6

ORIGIN MAP - BUS (person trips) - OPTION 1 - AM

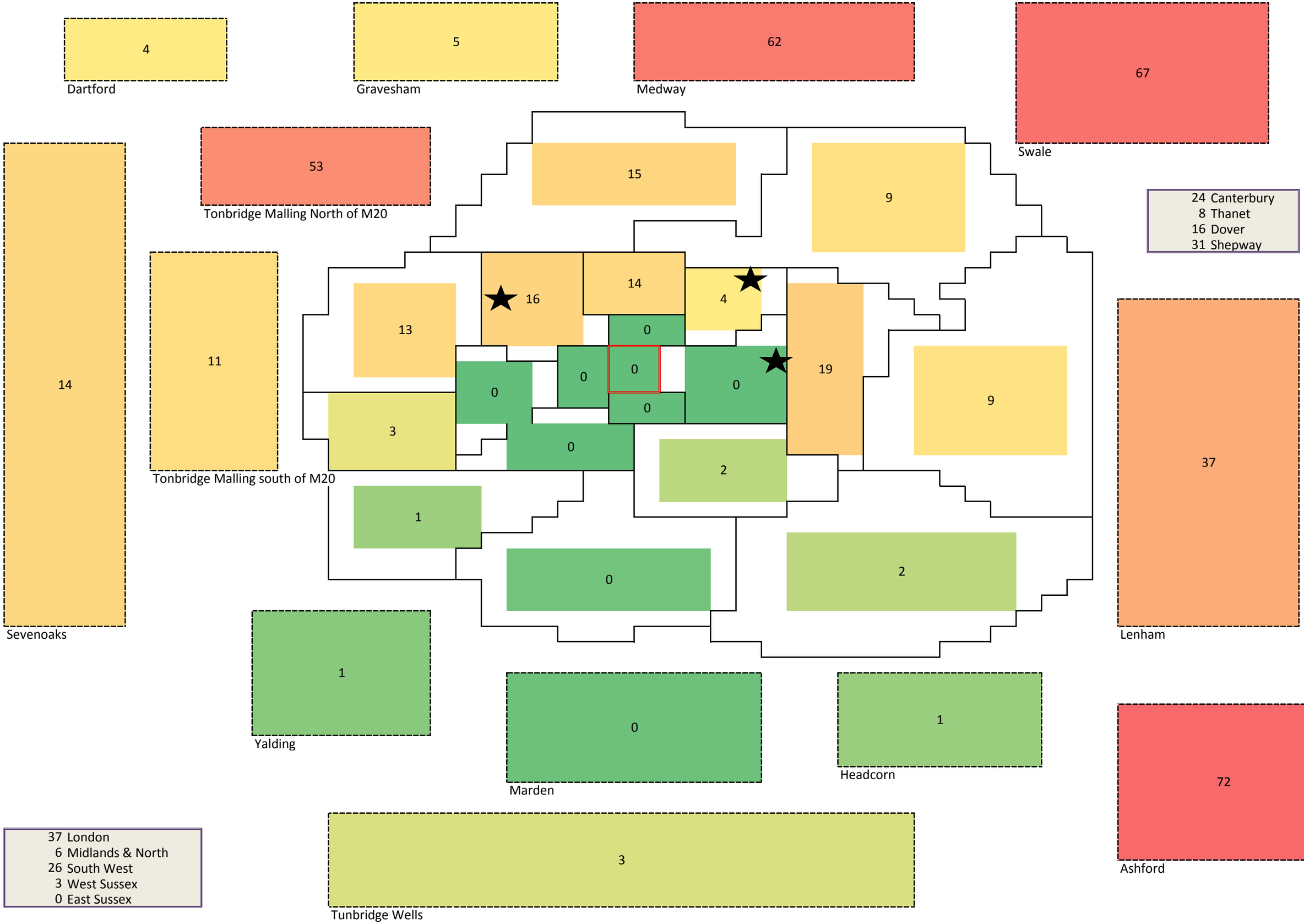


ORIGIN MAP - RAIL (person trips) - OPTION 1 - AM

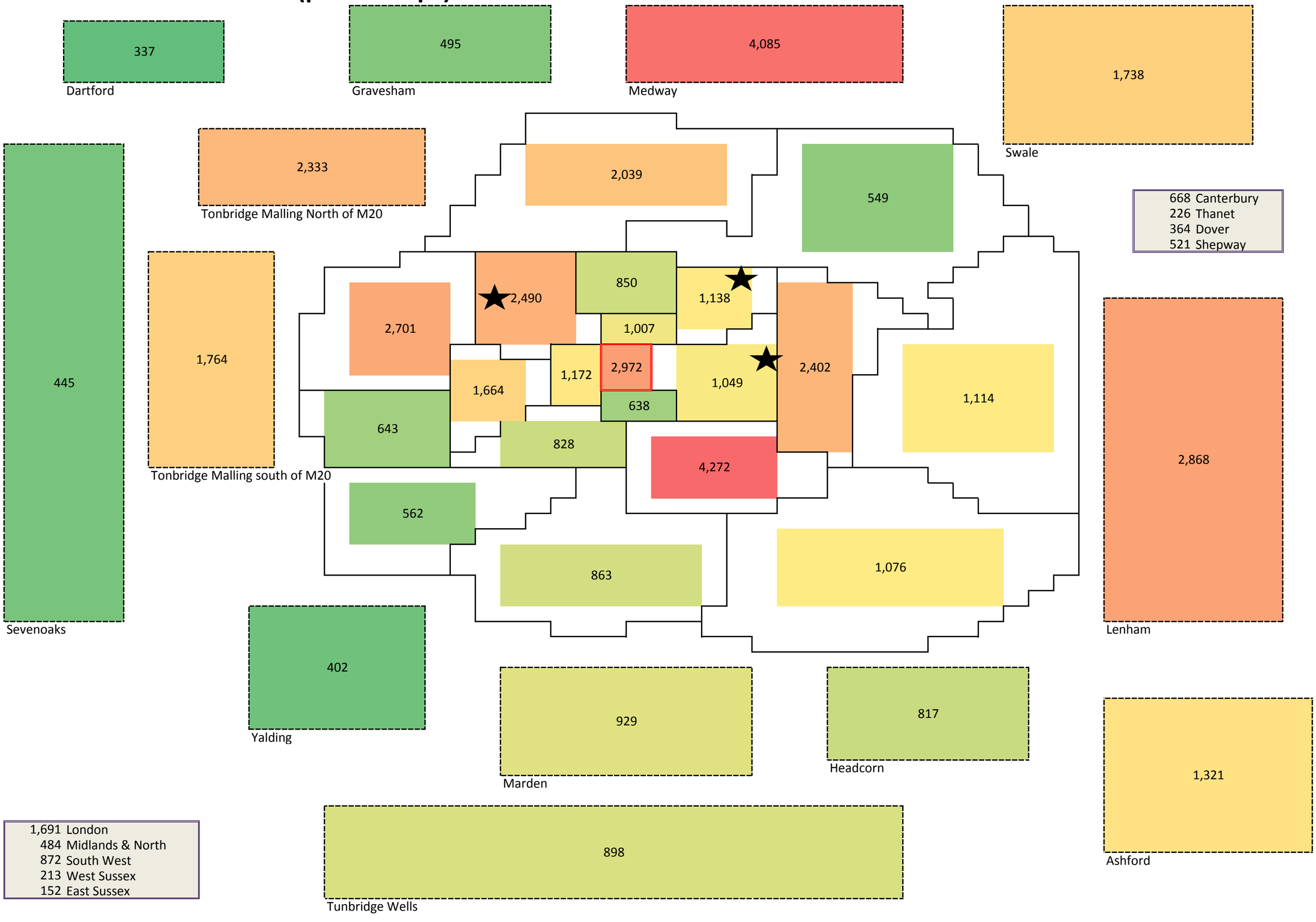
ORIGIN MAP - CAR (person trips) - OPTION 1 - AM



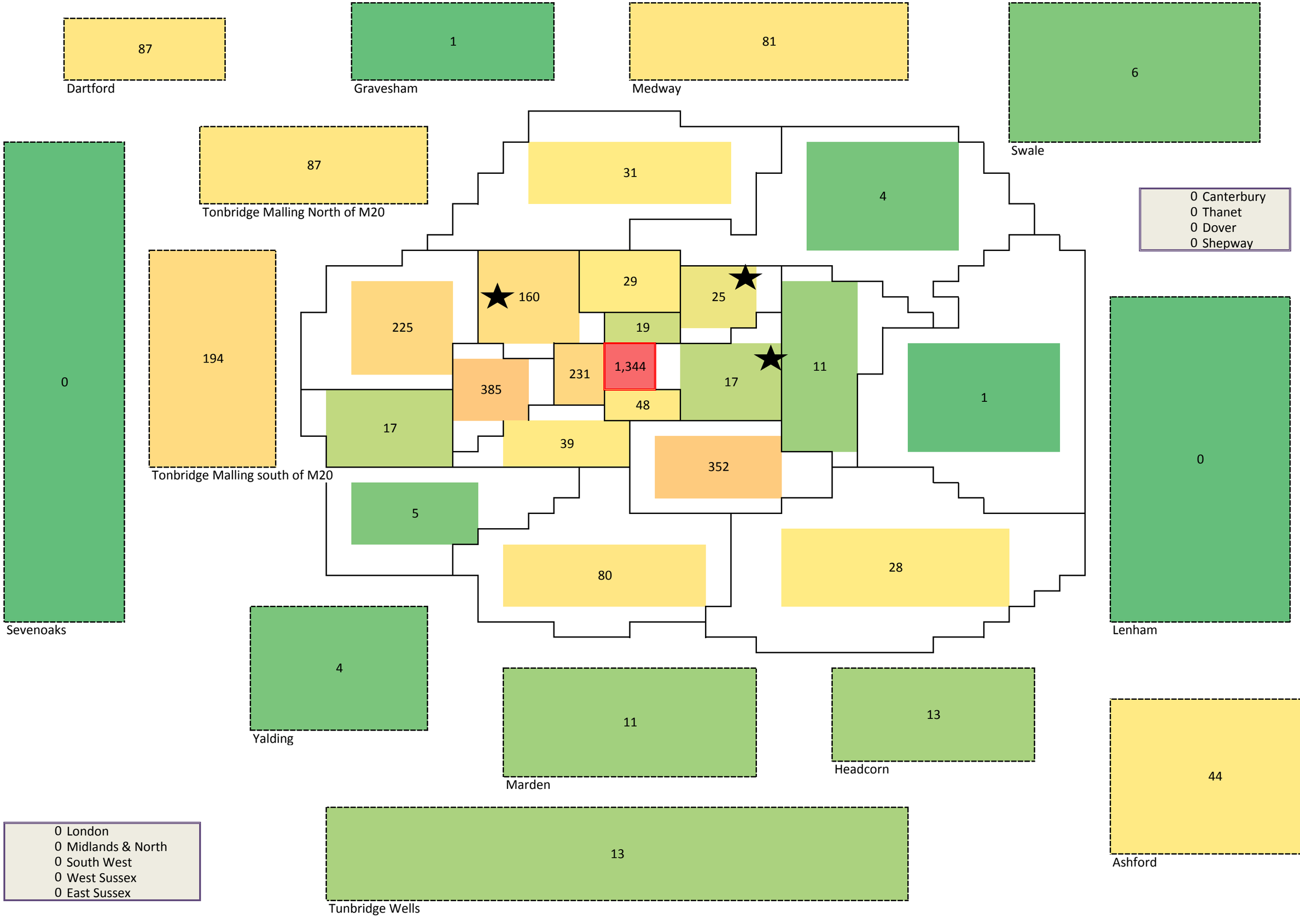
ORIGIN MAP - P&R CAR LEG (person trips) - OPTION 1 - AM



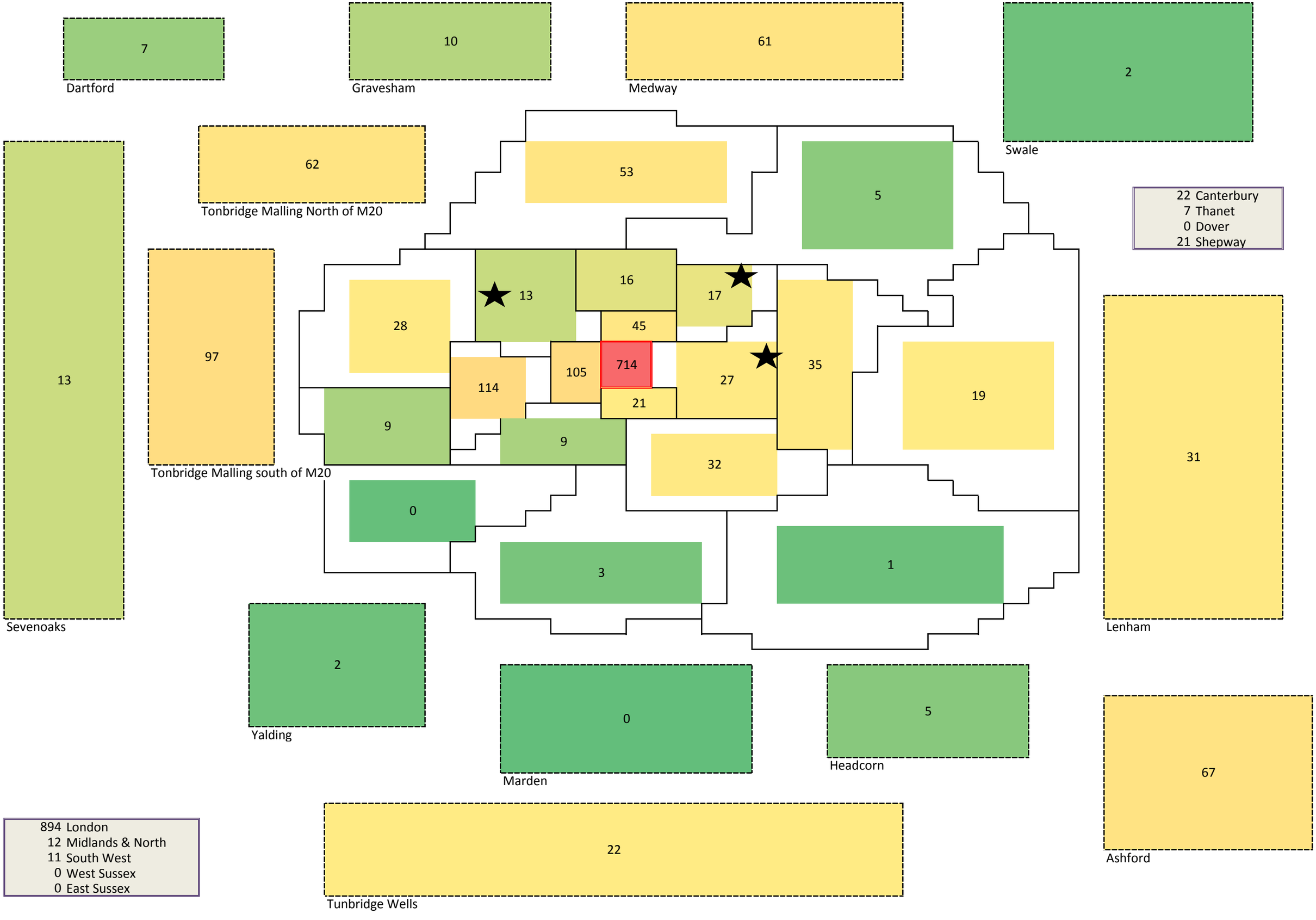
ORIGIN MAP - ALL MODES (person trips) - OPTION 1 - AM



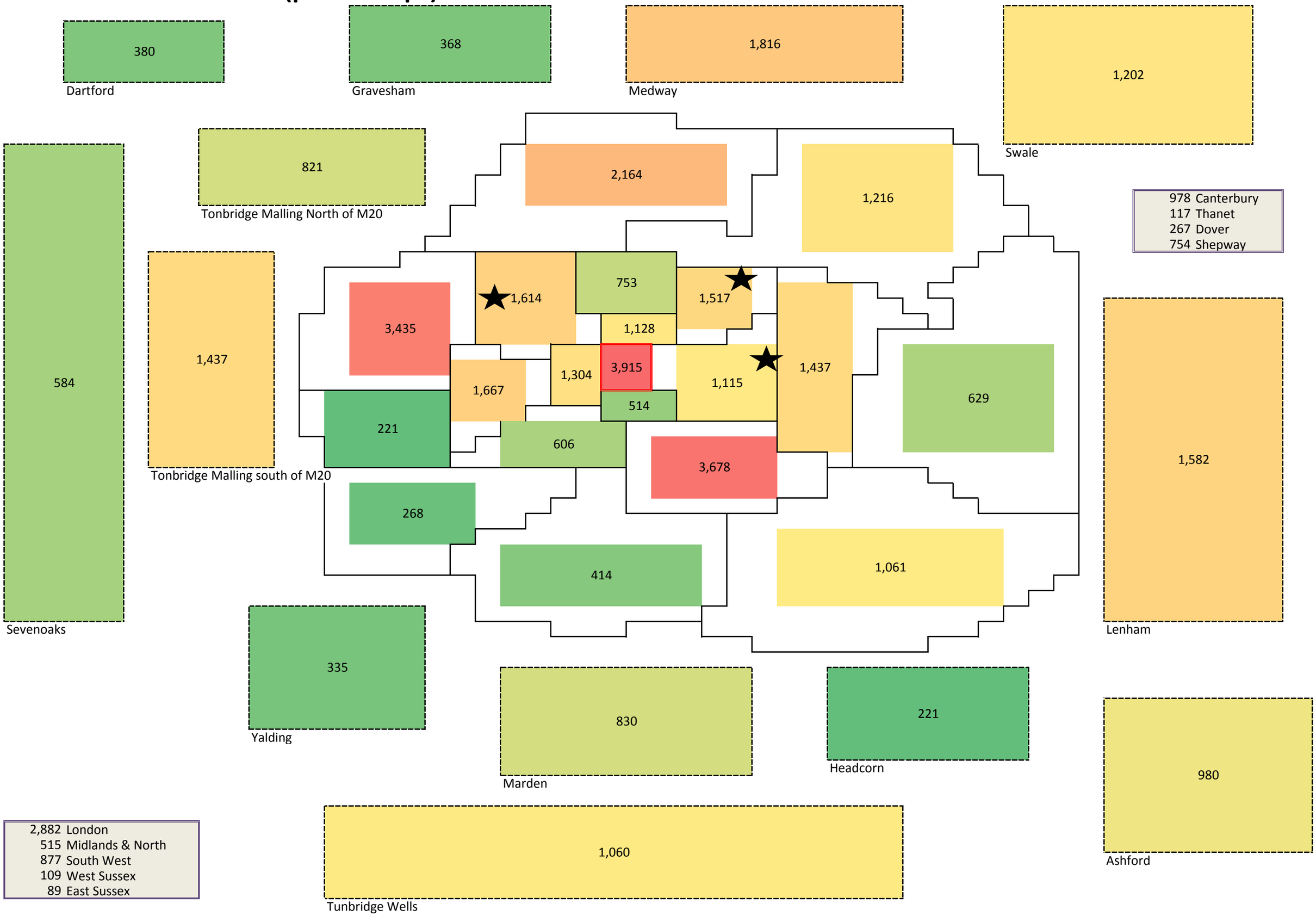
DESTINATION MAP - BUS (person trips) - OPTION 1 - AM



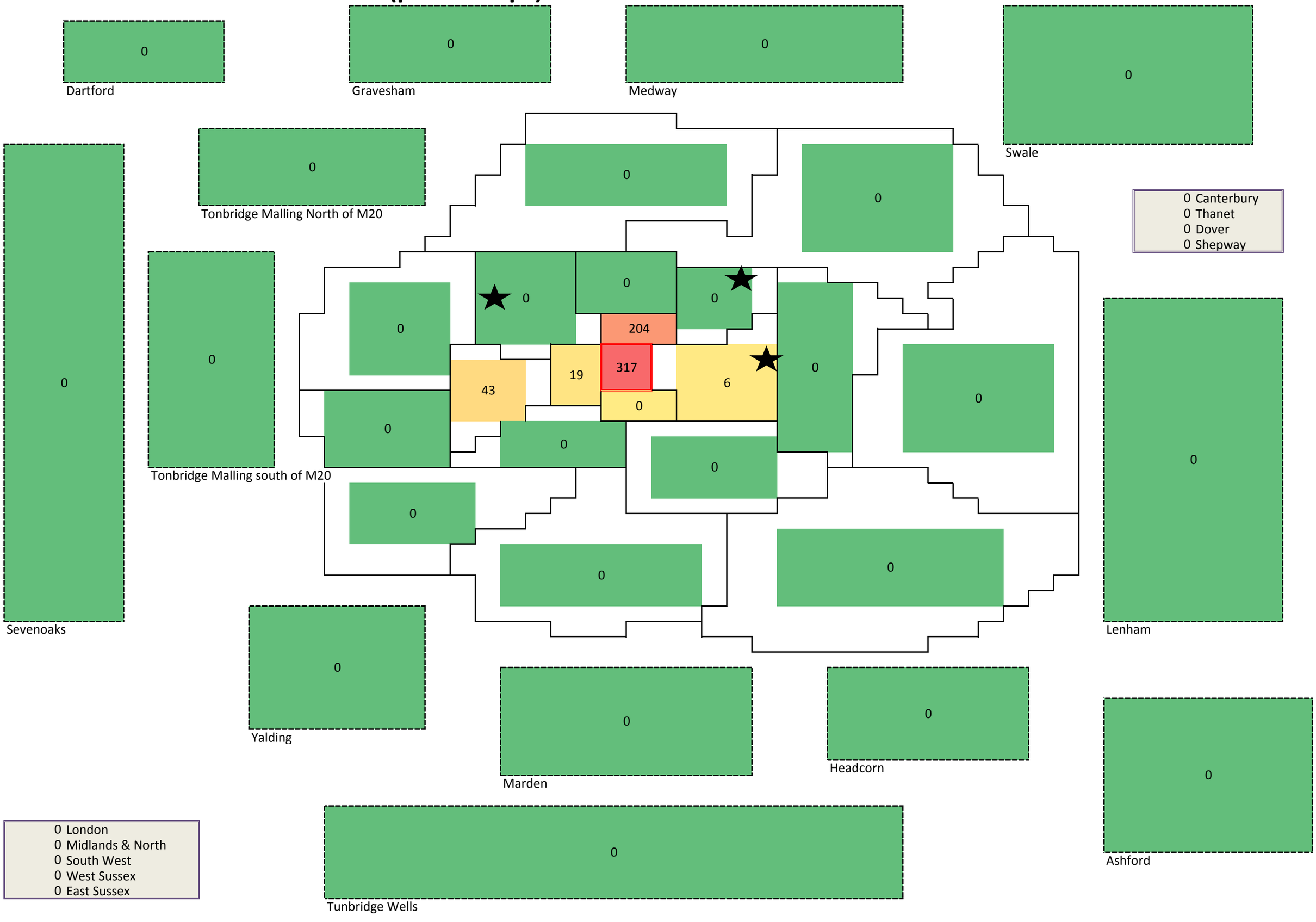
DESTINATION MAP - RAIL (person trips) - OPTION 1 - AM



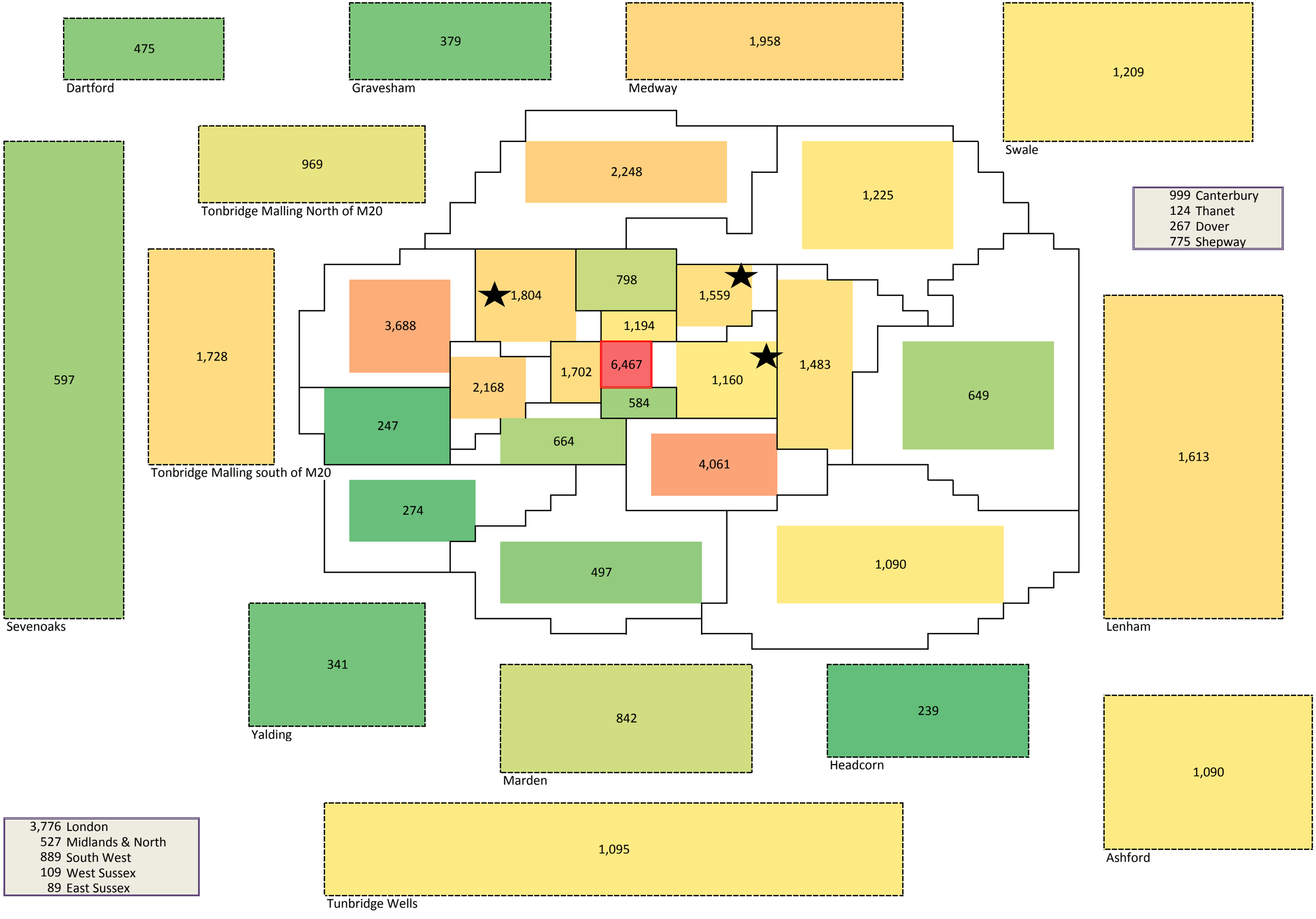
DESTINATION MAP - CAR (person trips) - OPTION 1 - AM



DESTINATION MAP - P&R BUS LEG (person trips) - OPTION 1 - AM

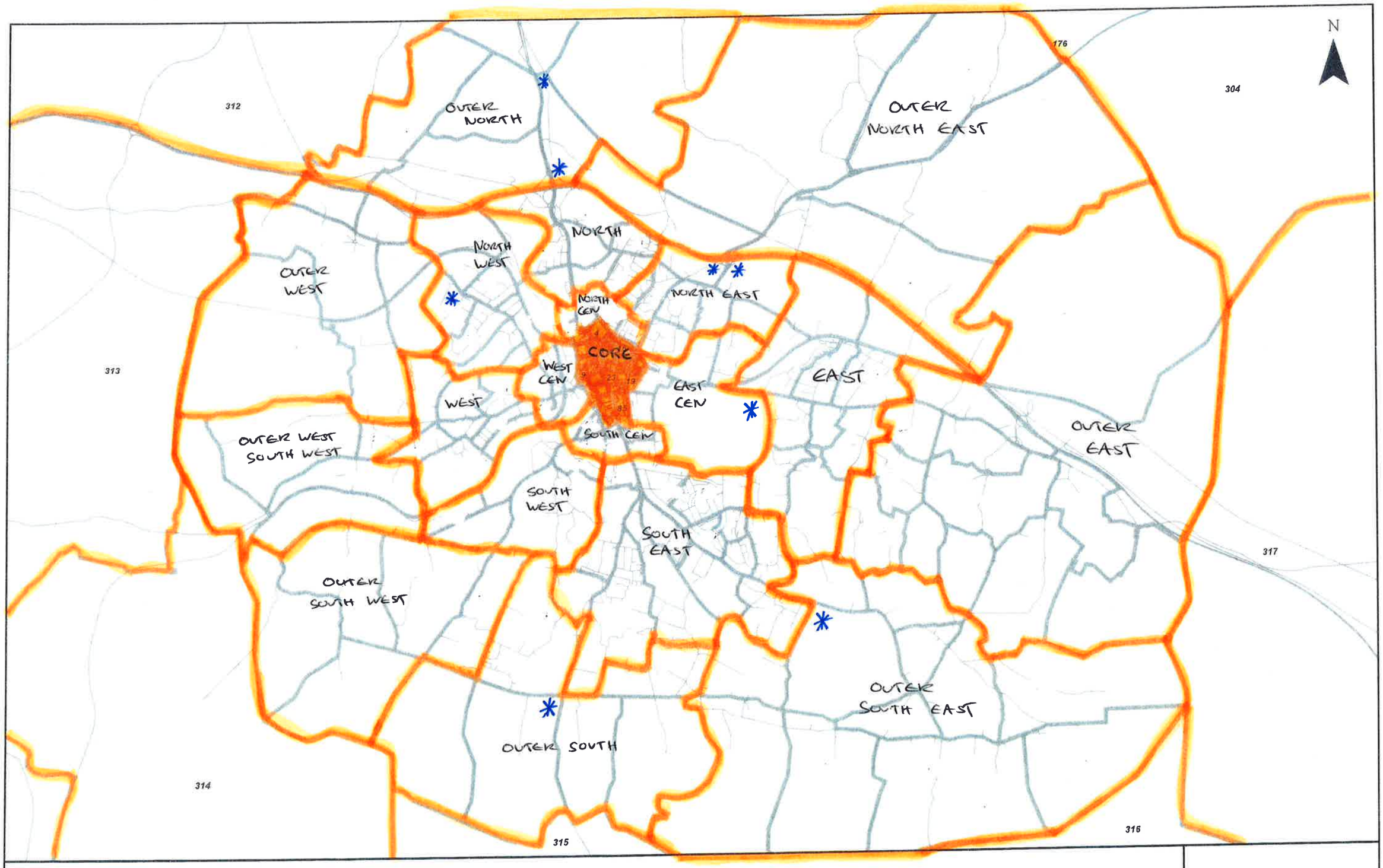


DESTINATION MAP - ALL MODES (person trips) - OPTION 1 - AM



Appendix D

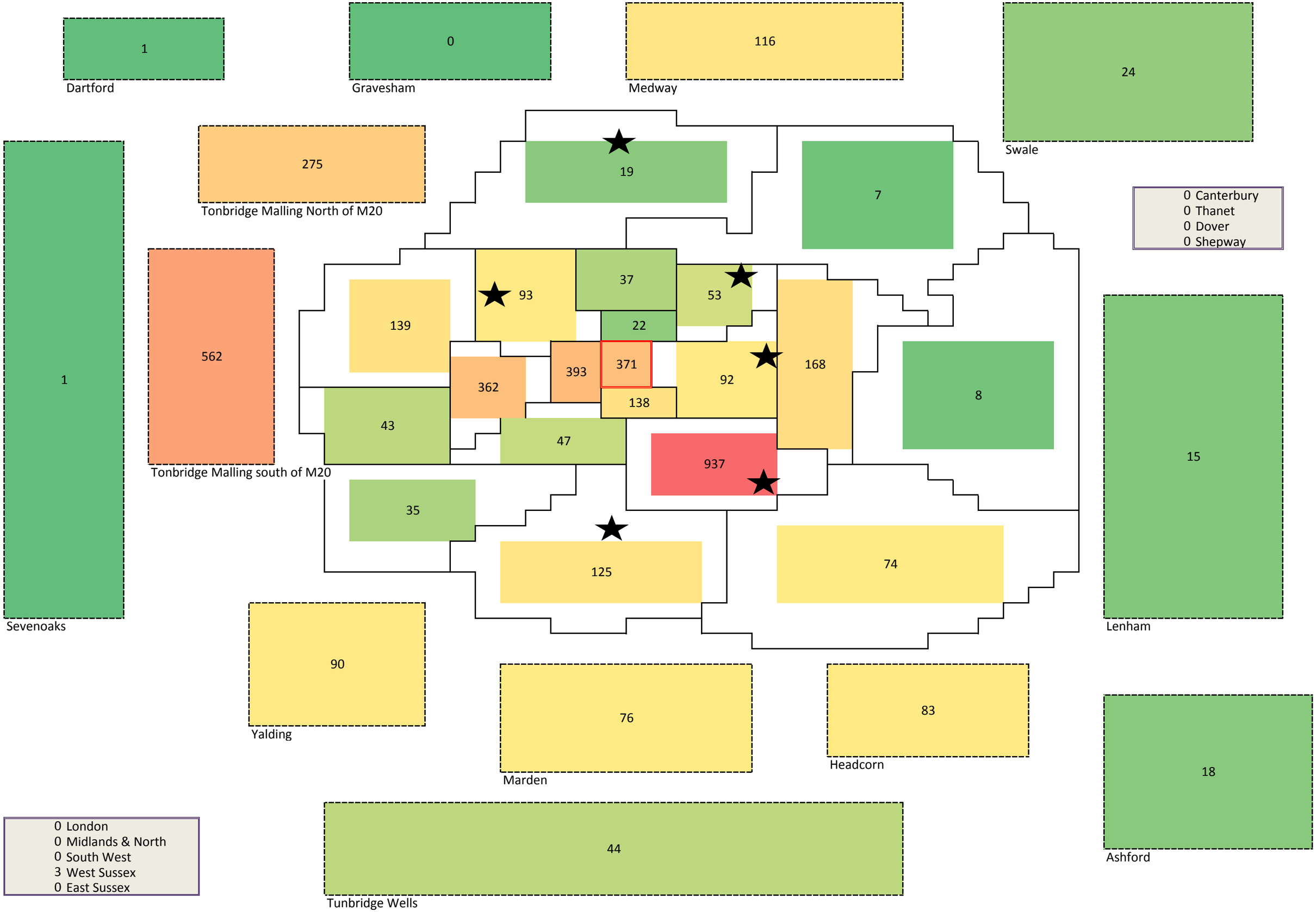
Option 2: Origin – Destination Mapping



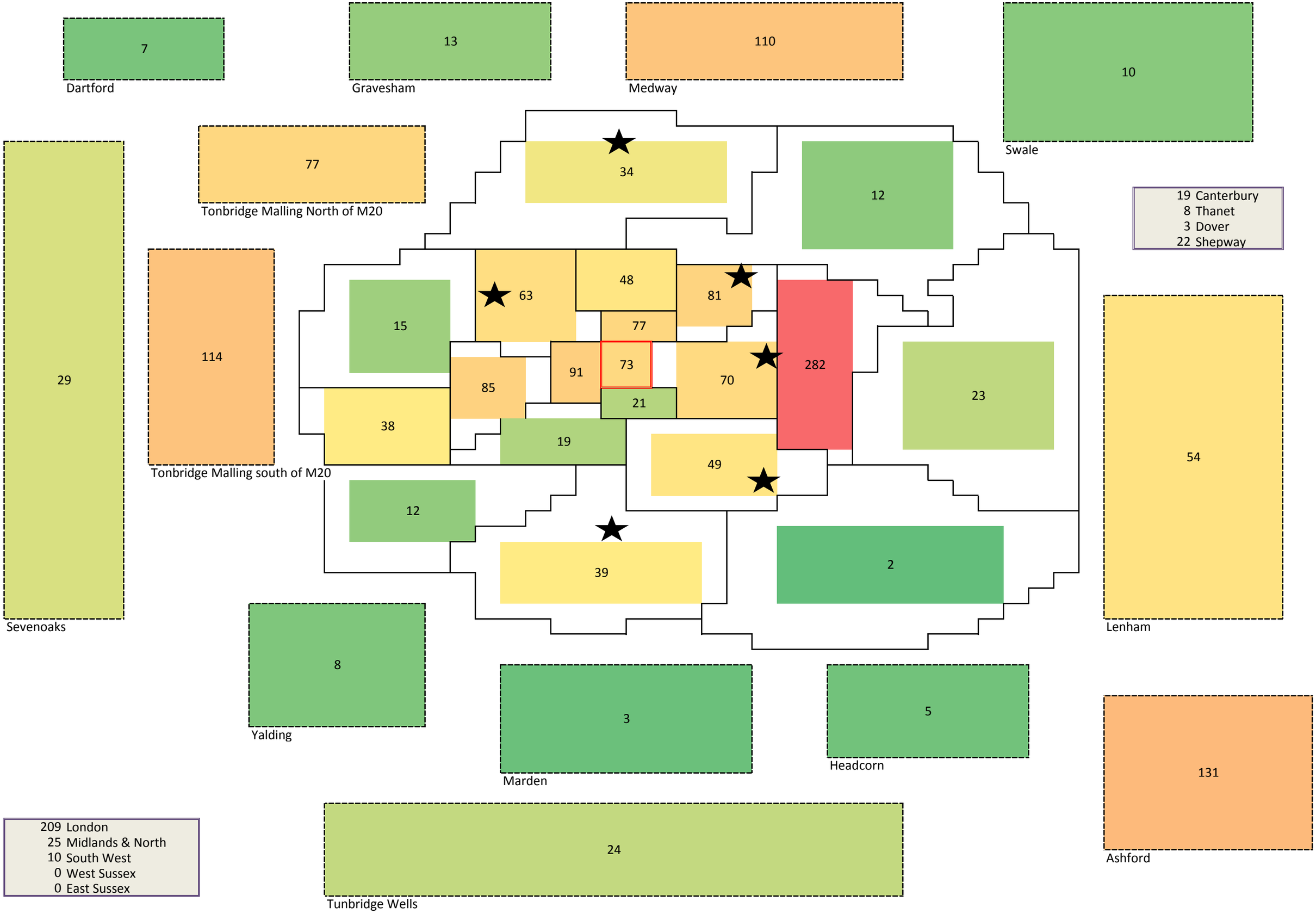
Internal Model Zones

Figure 3.6

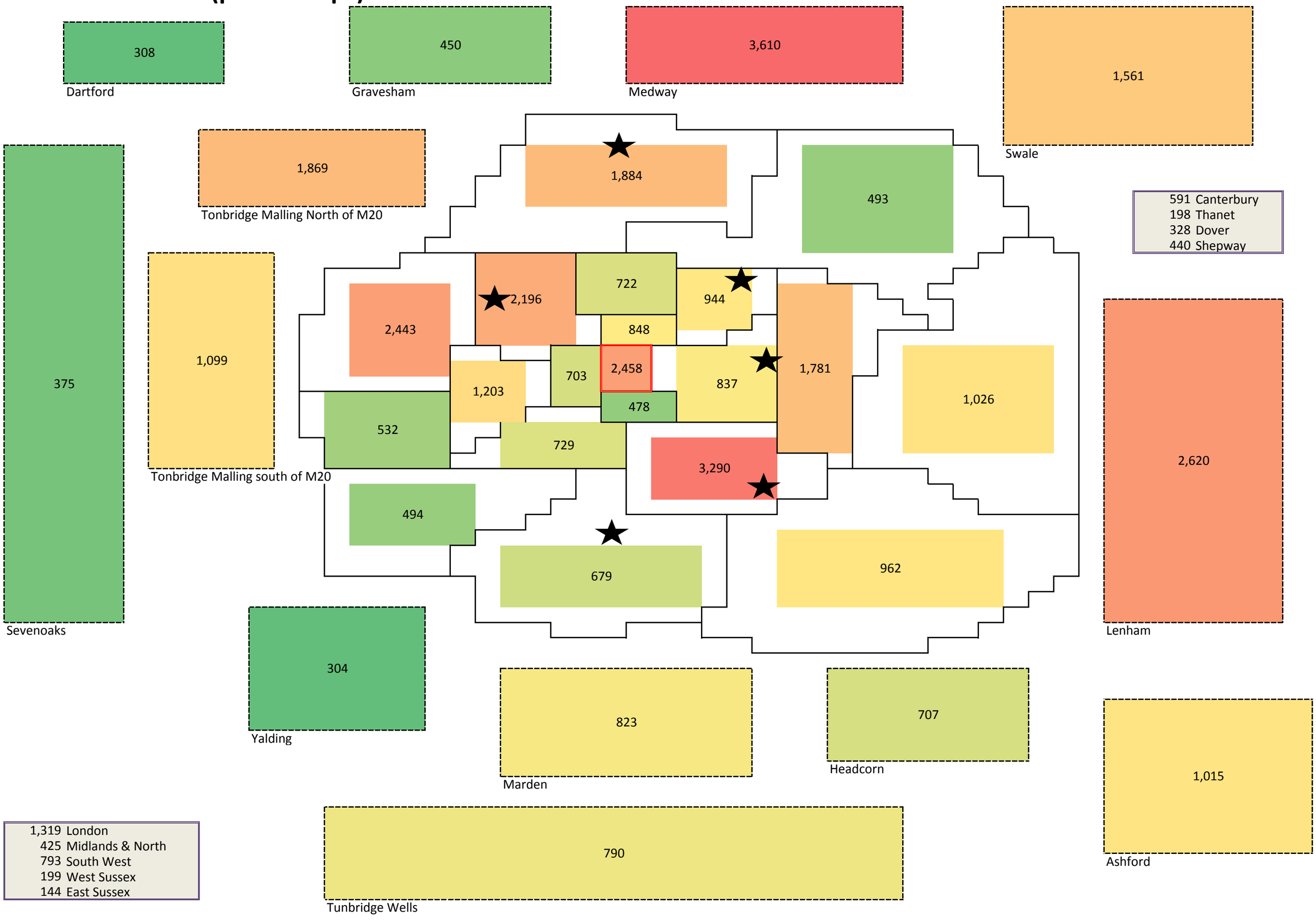
ORIGIN MAP - BUS (person trips) - OPTION 2 - AM



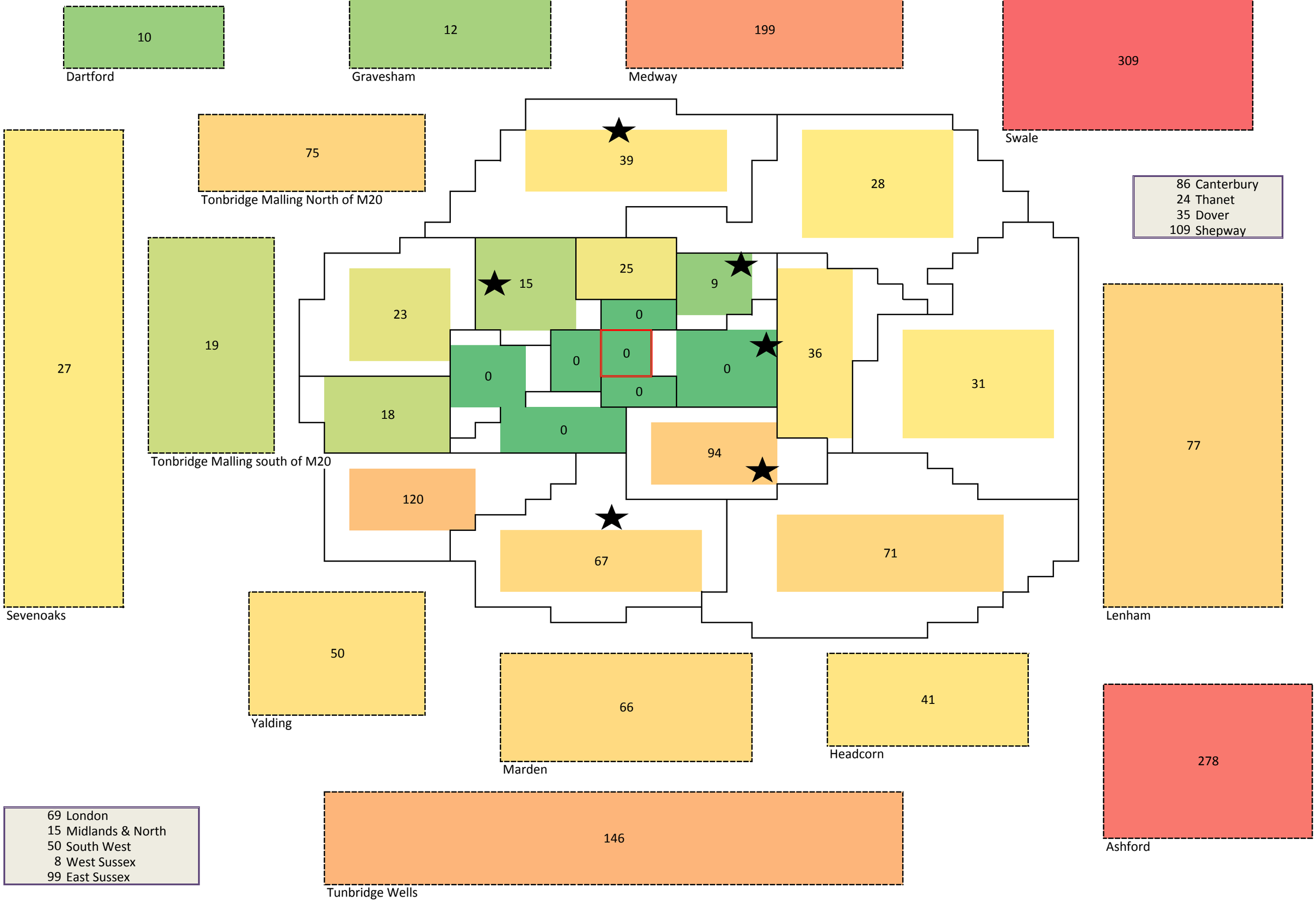
ORIGIN MAP - RAIL (person trips) - OPTION 2 - AM



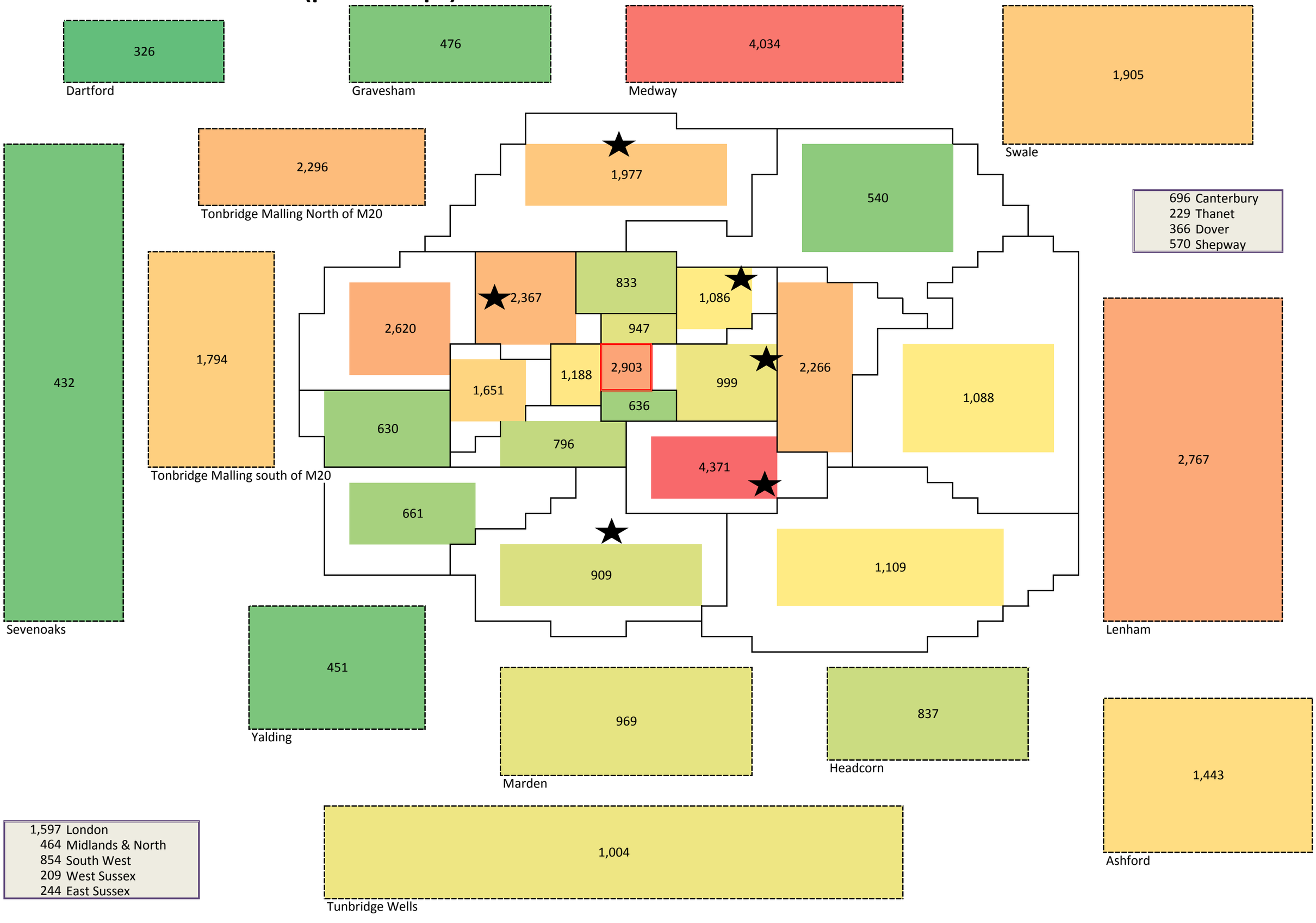
ORIGIN MAP - CAR (person trips) - OPTION 2 - AM



ORIGIN MAP - P&R CAR LEG (person trips) - OPTION 2 - AM

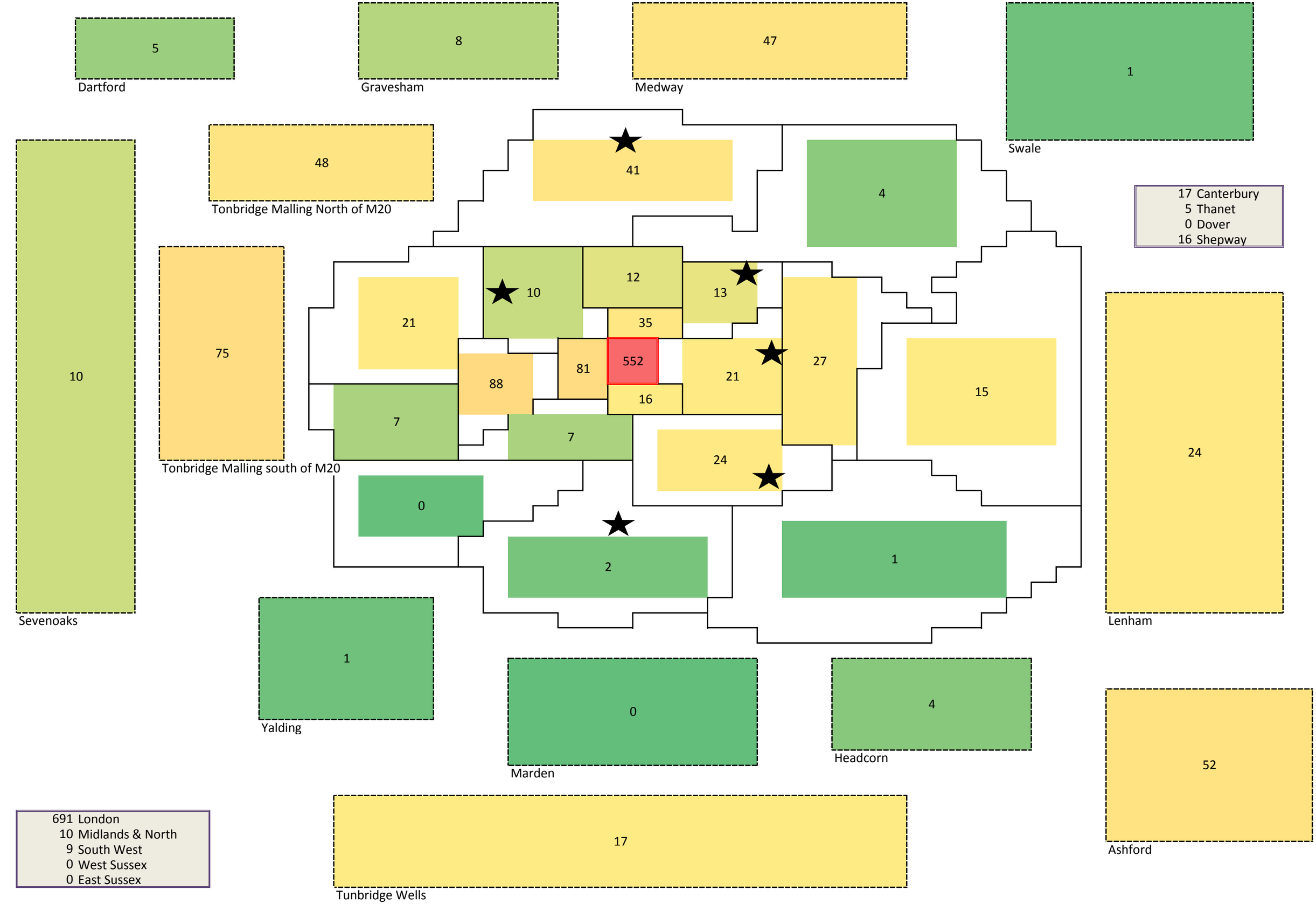


ORIGIN MAP - ALL MODES (person trips) - OPTION 2 - AM

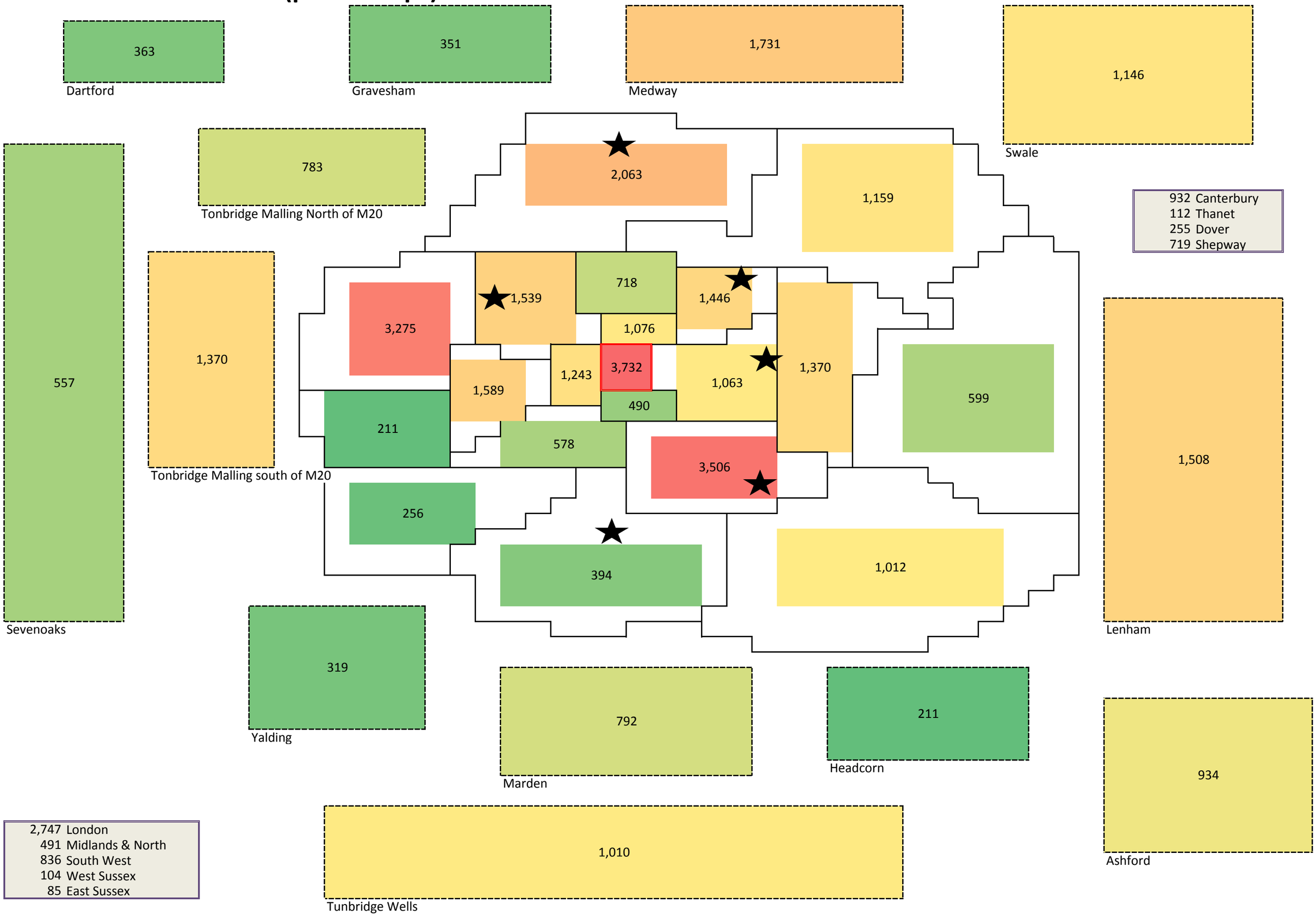


DESTINATION MAP - BUS (person trips) - OPTION 2 - AM

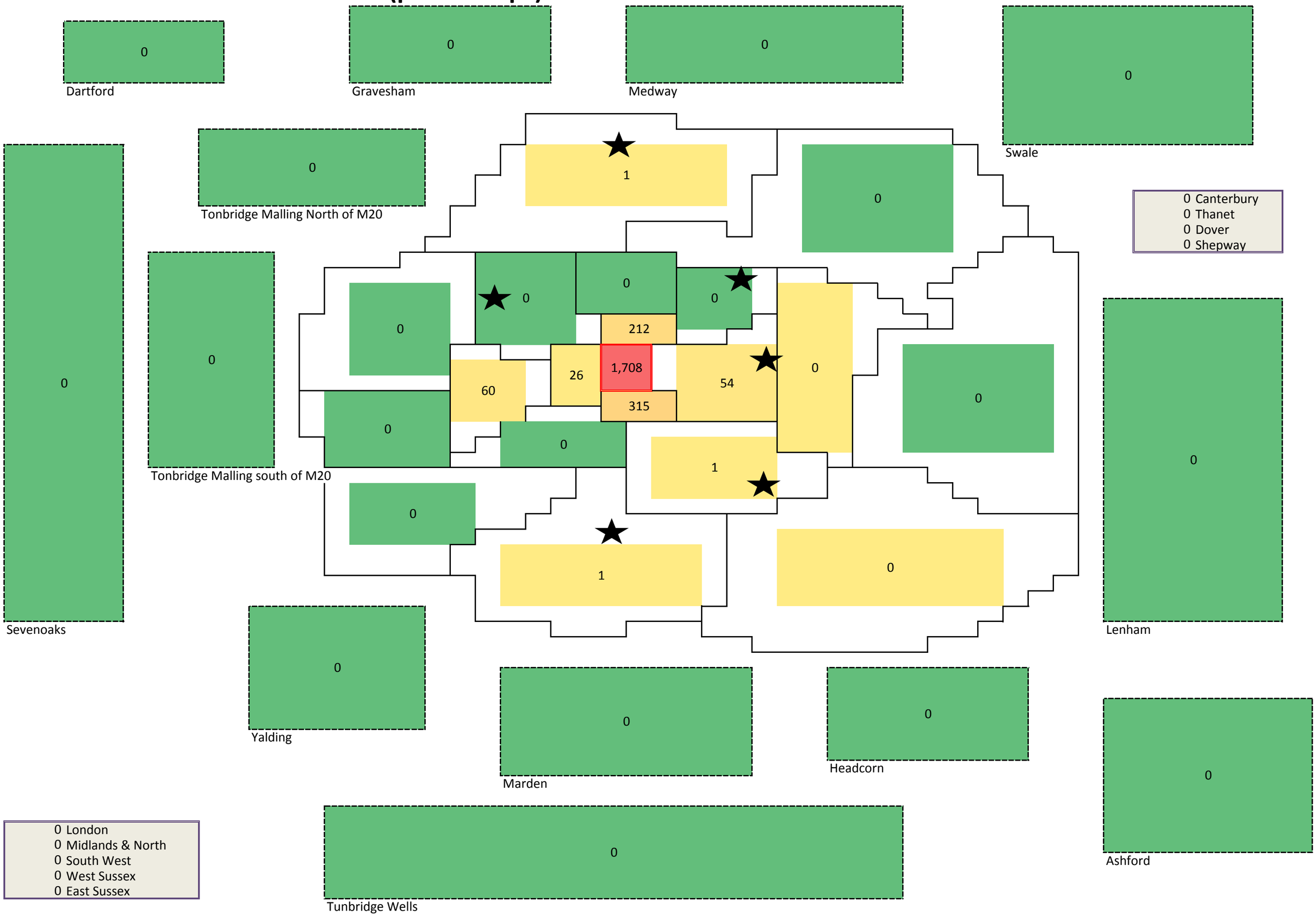
DESTINATION MAP - RAIL (person trips) - OPTION 2 - AM



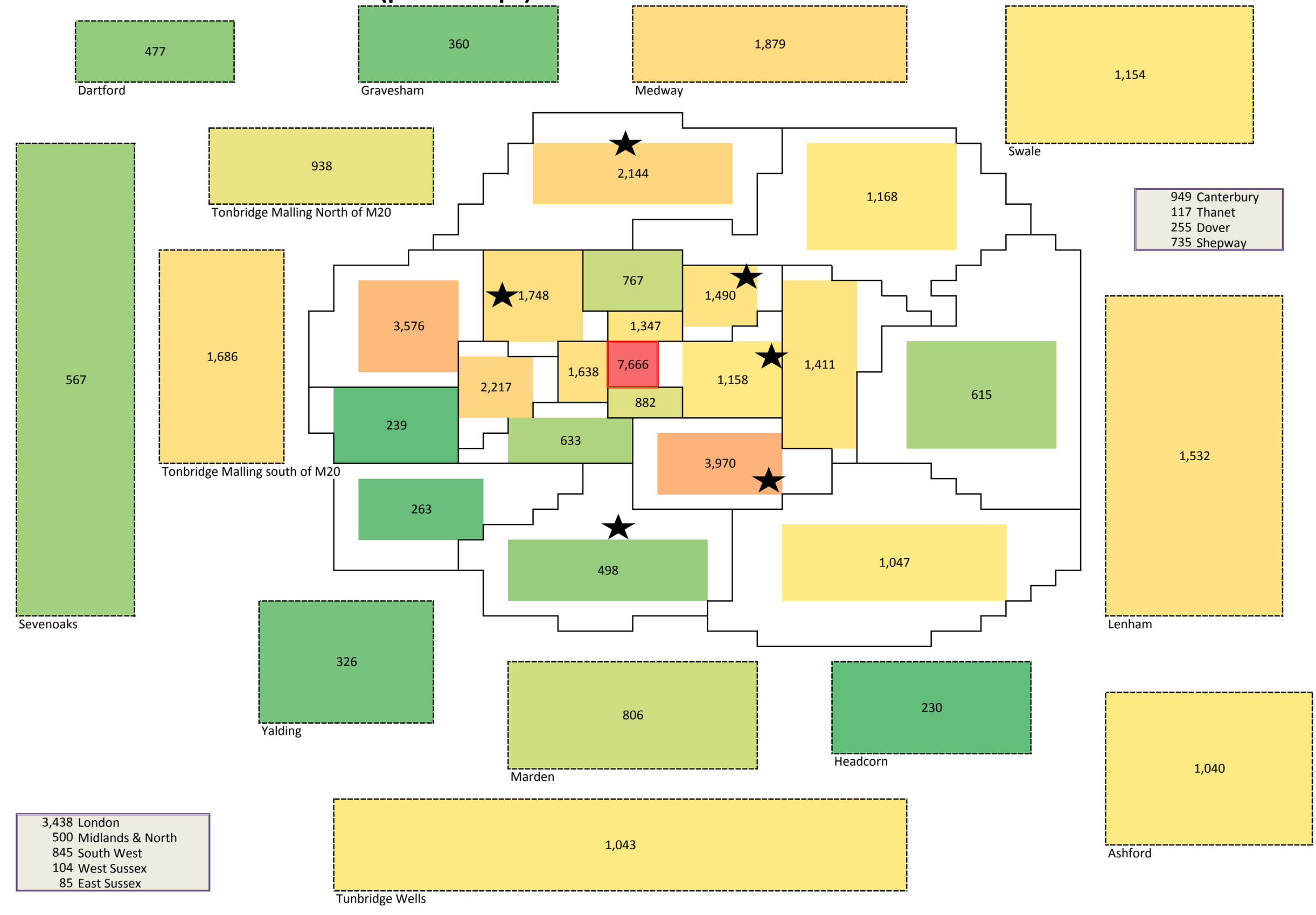
DESTINATION MAP - CAR (person trips) - OPTION 2 - AM



DESTINATION MAP - P&R BUS LEG (person trips) - OPTION 2 - AM

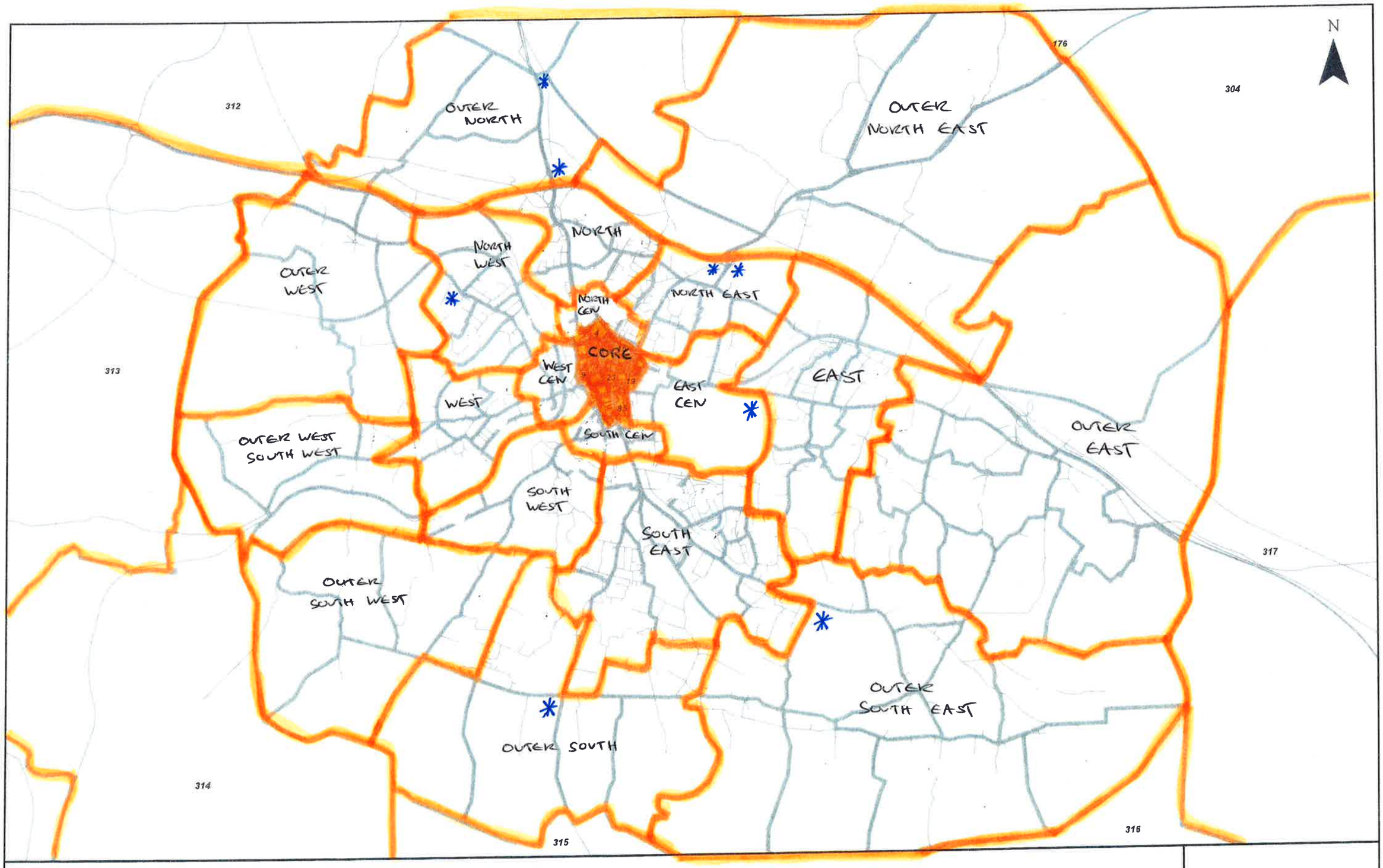


DESTINATION MAP - ALL MODES (person trips) - OPTION 2 - AM



Appendix E

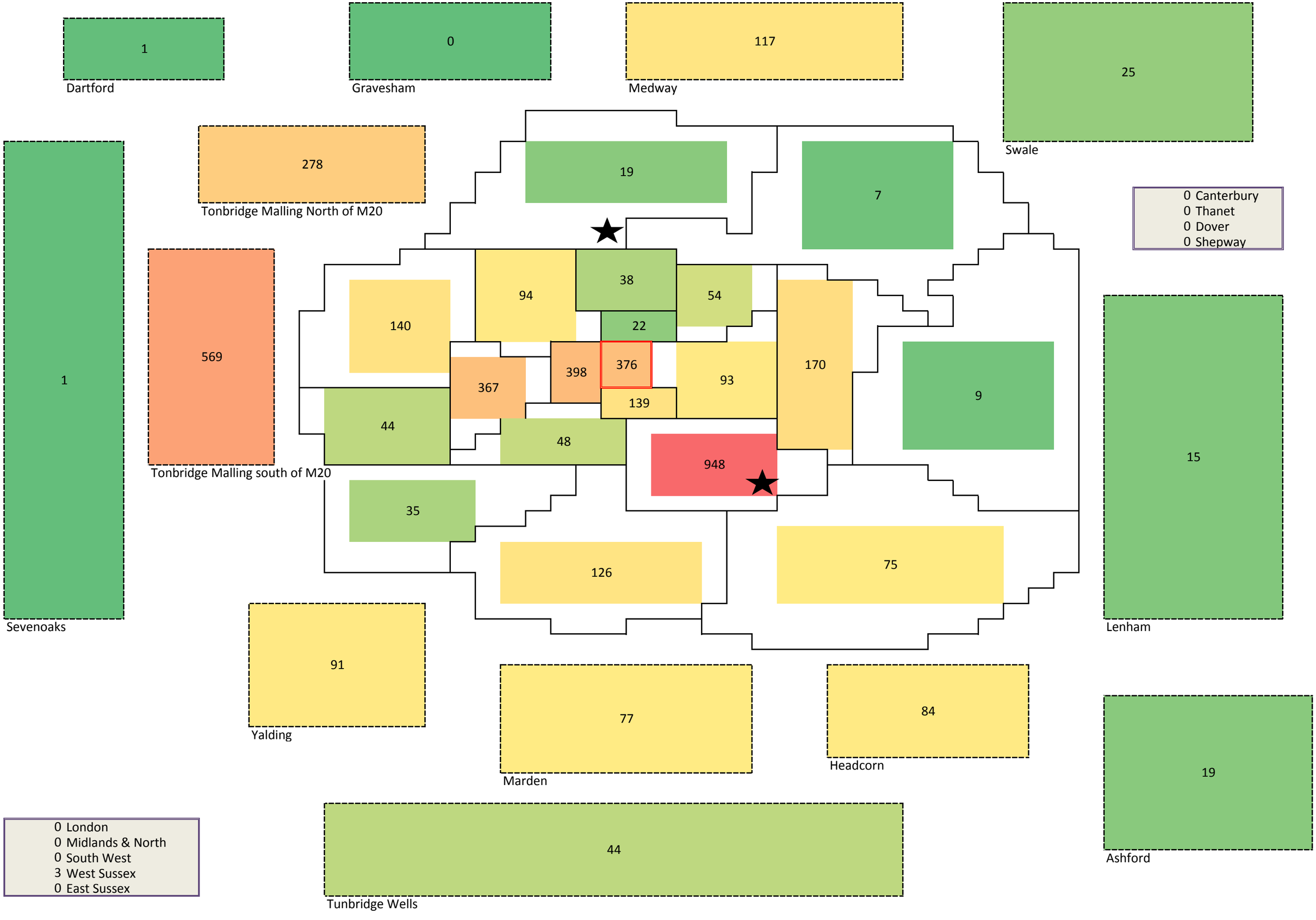
Option 3: Origin – Destination Mapping



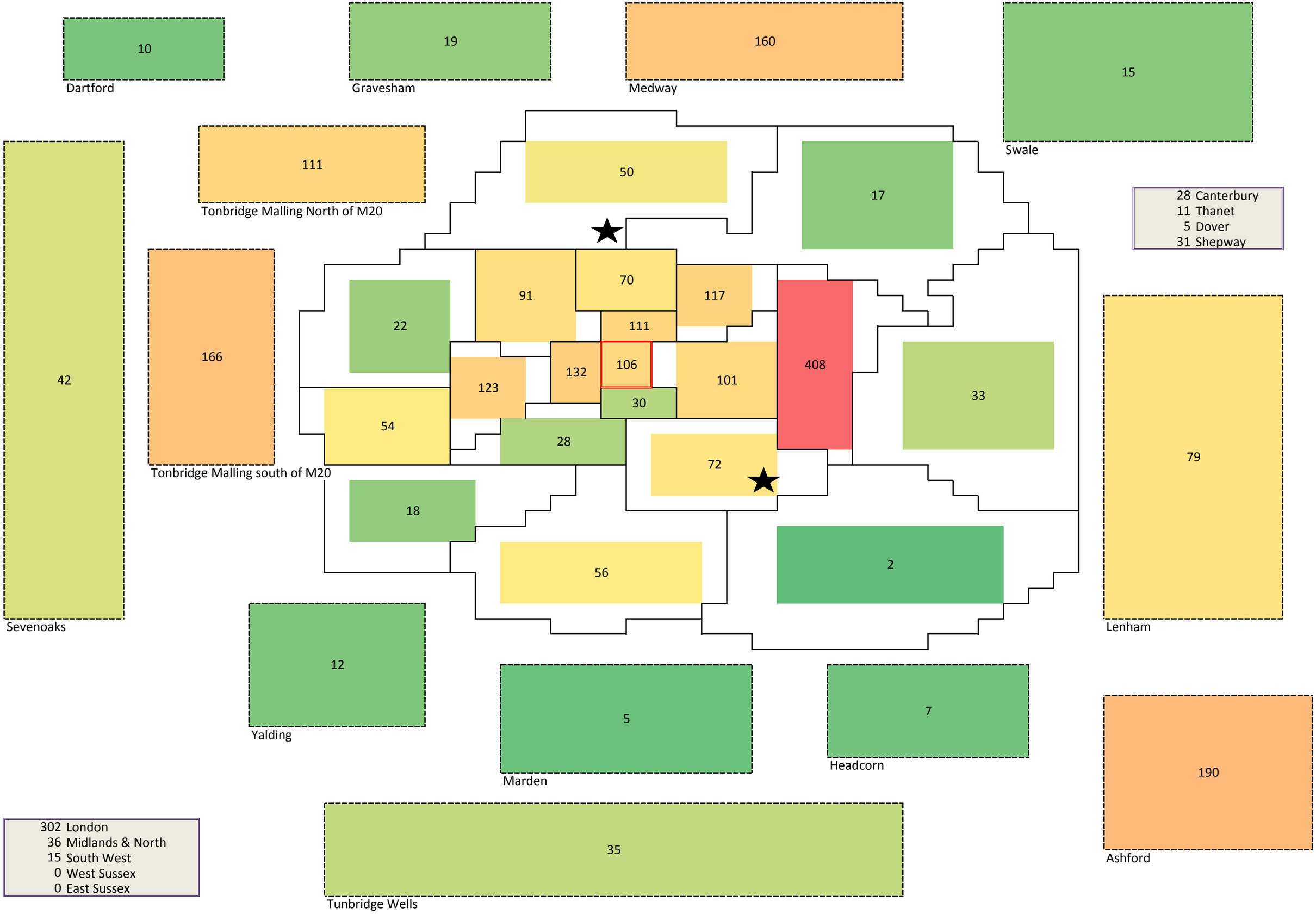
Internal Model Zones

Figure 3.6

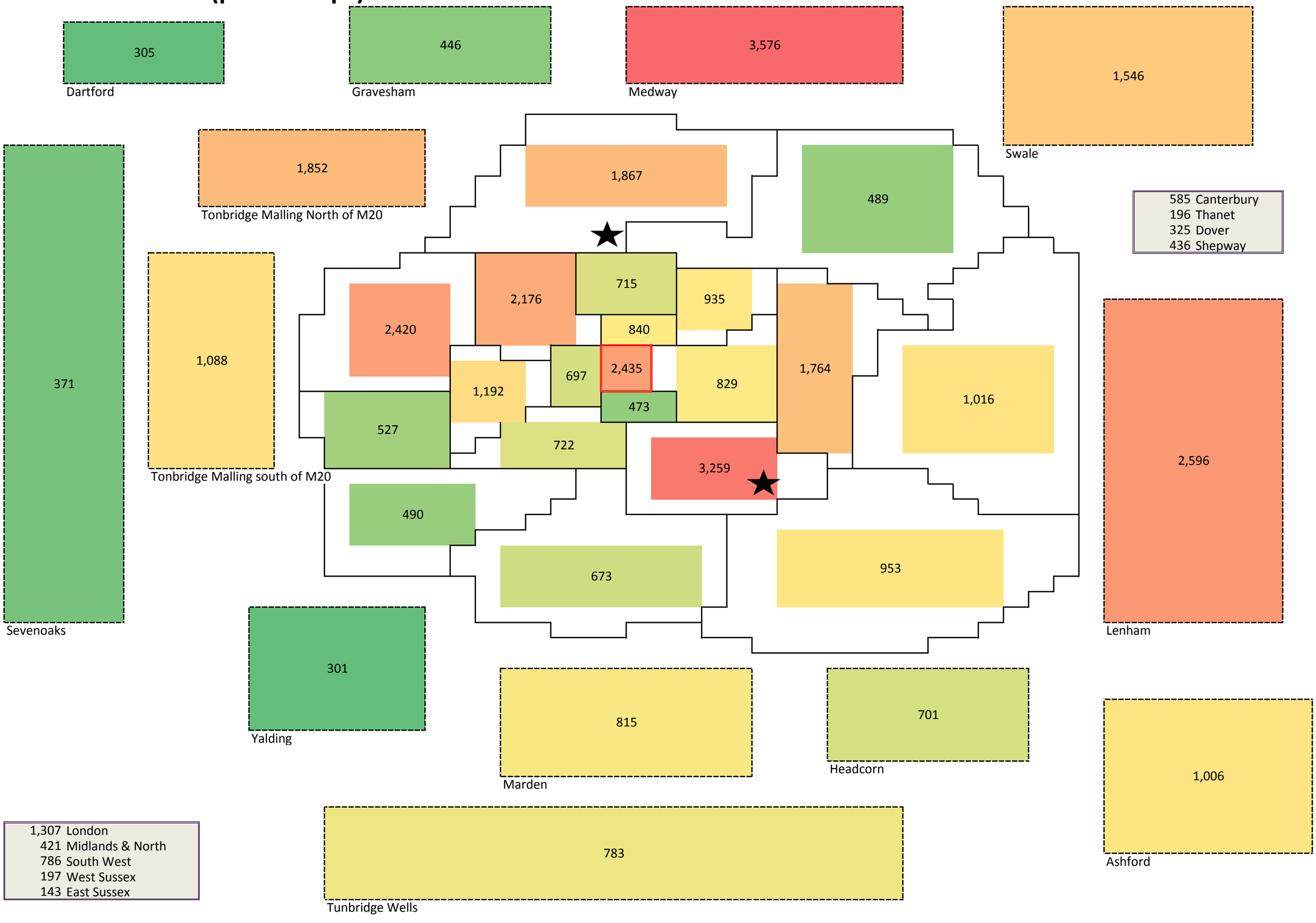
ORIGIN MAP - BUS (person trips) - OPTION 3 - AM



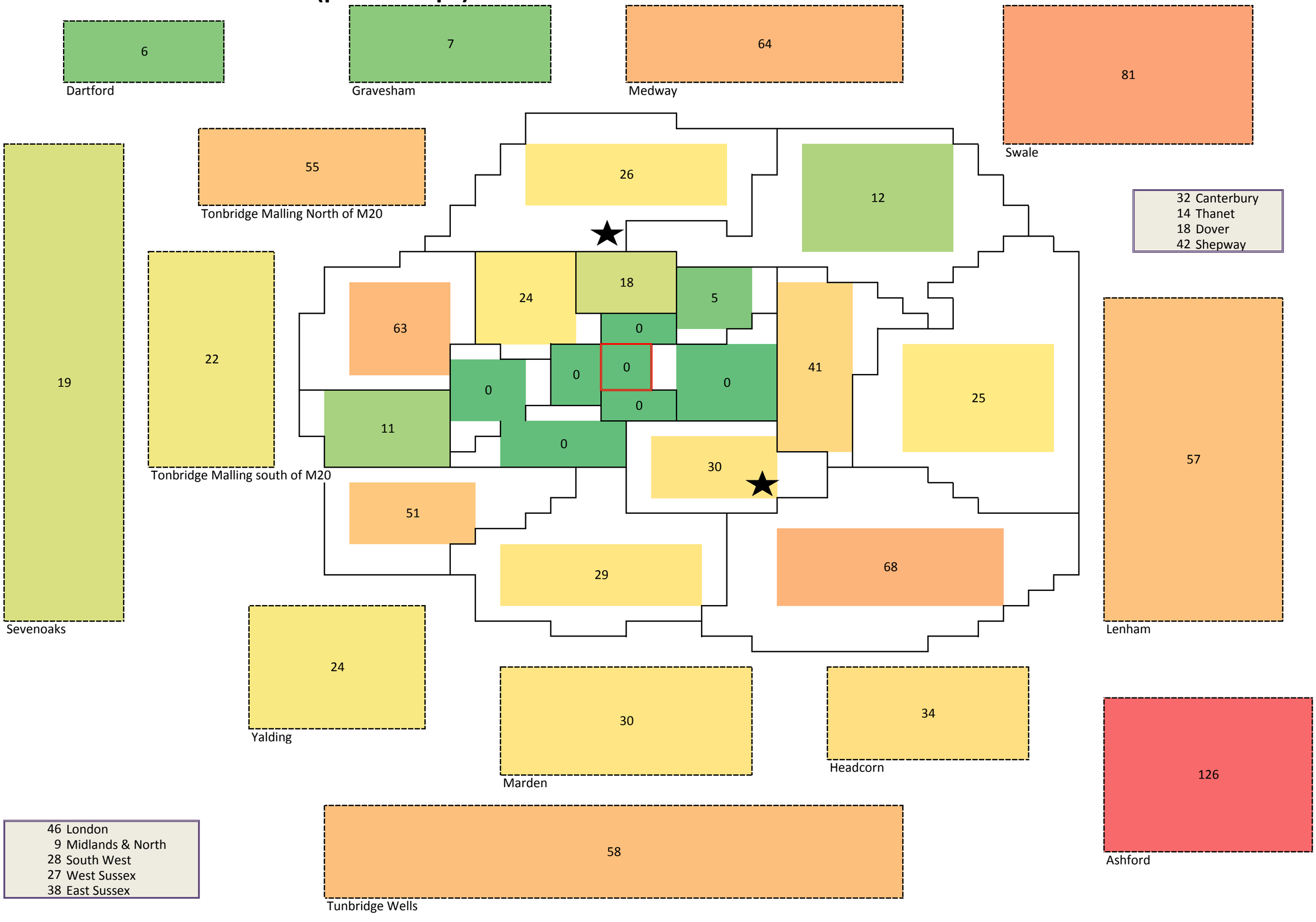
ORIGIN MAP - RAIL (person trips) - OPTION 3 - AM



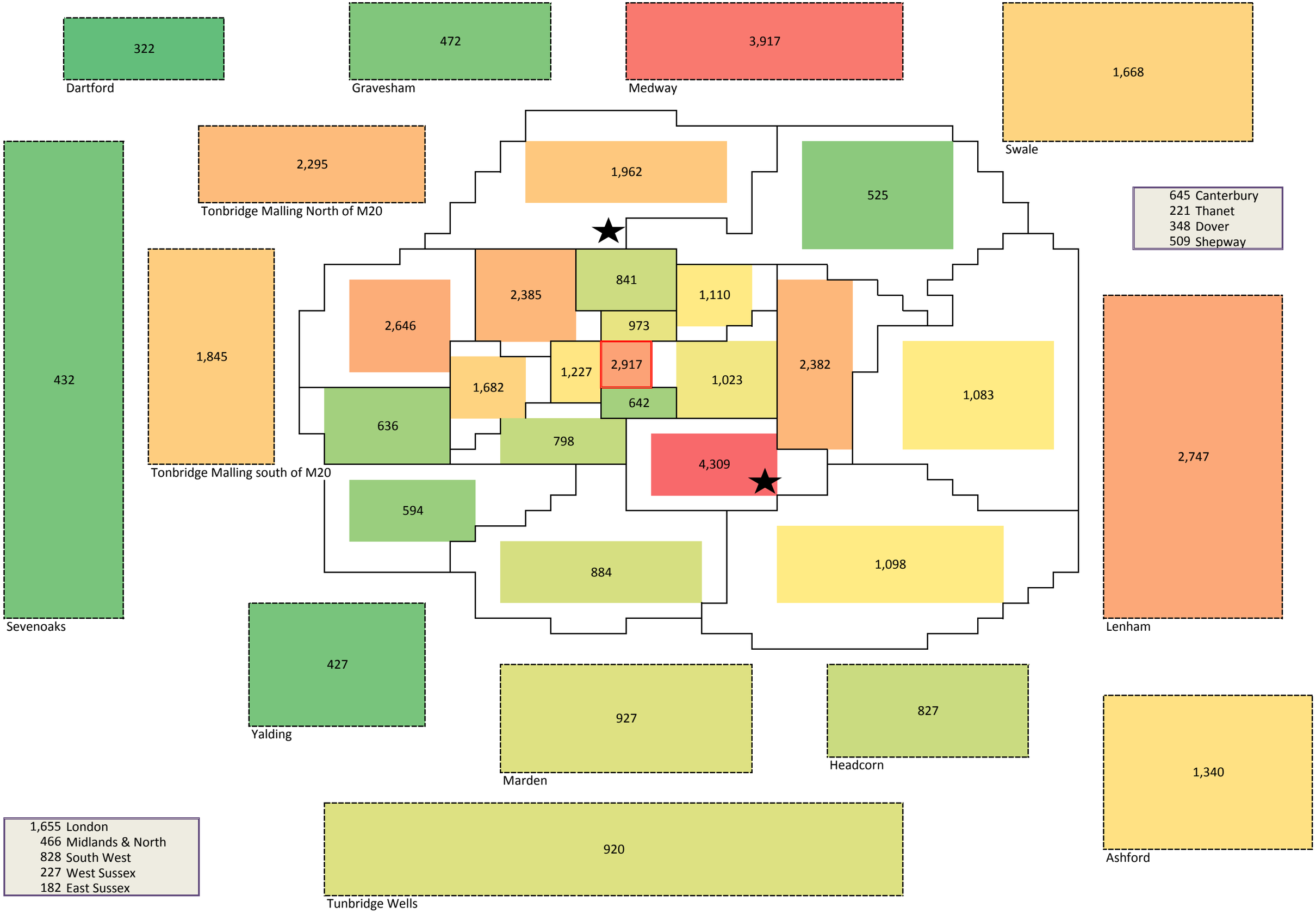
ORIGIN MAP - CAR (person trips) - OPTION 3 - AM



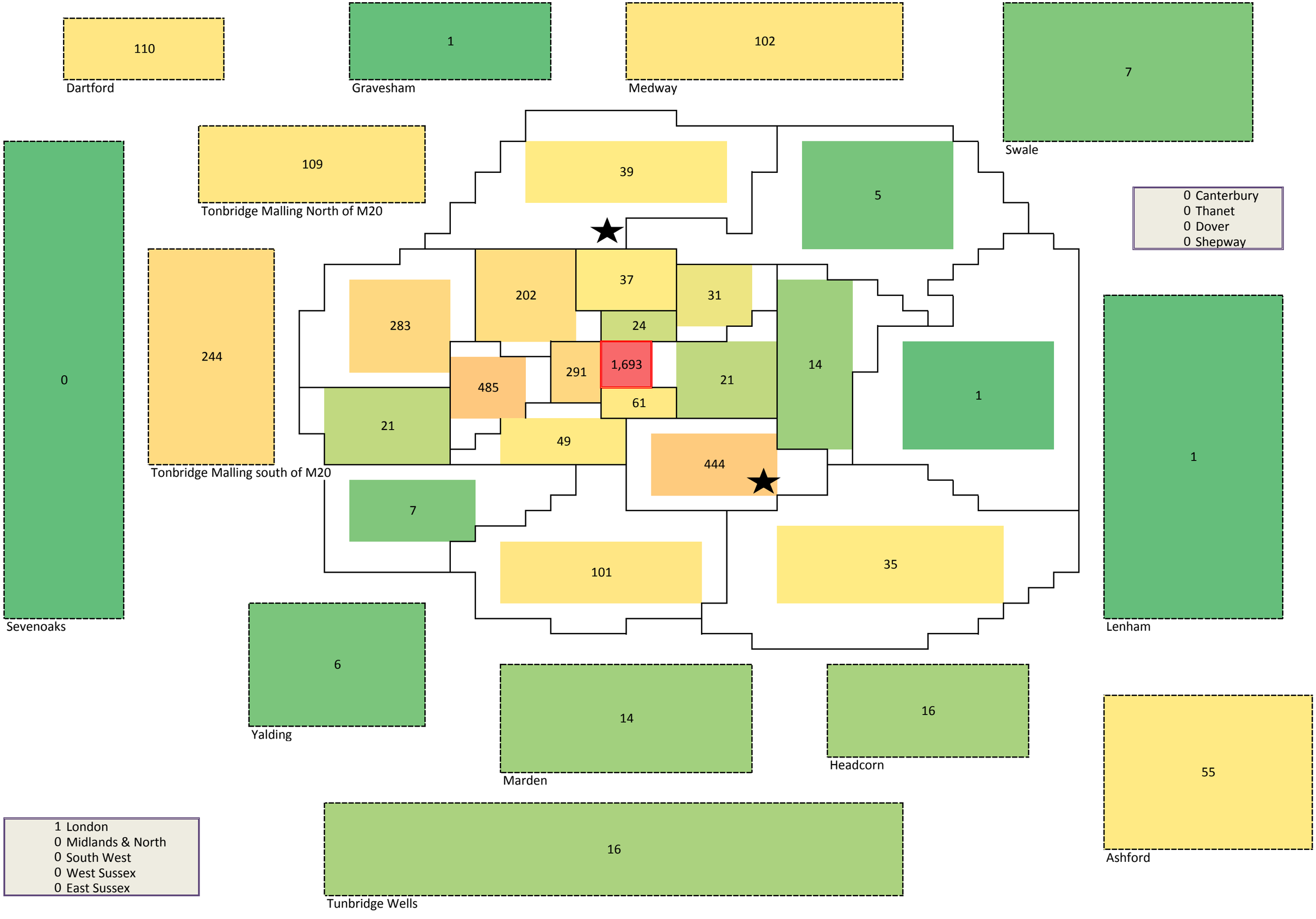
ORIGIN MAP - P&R CAR LEG (person trips) - OPTION 3 - AM



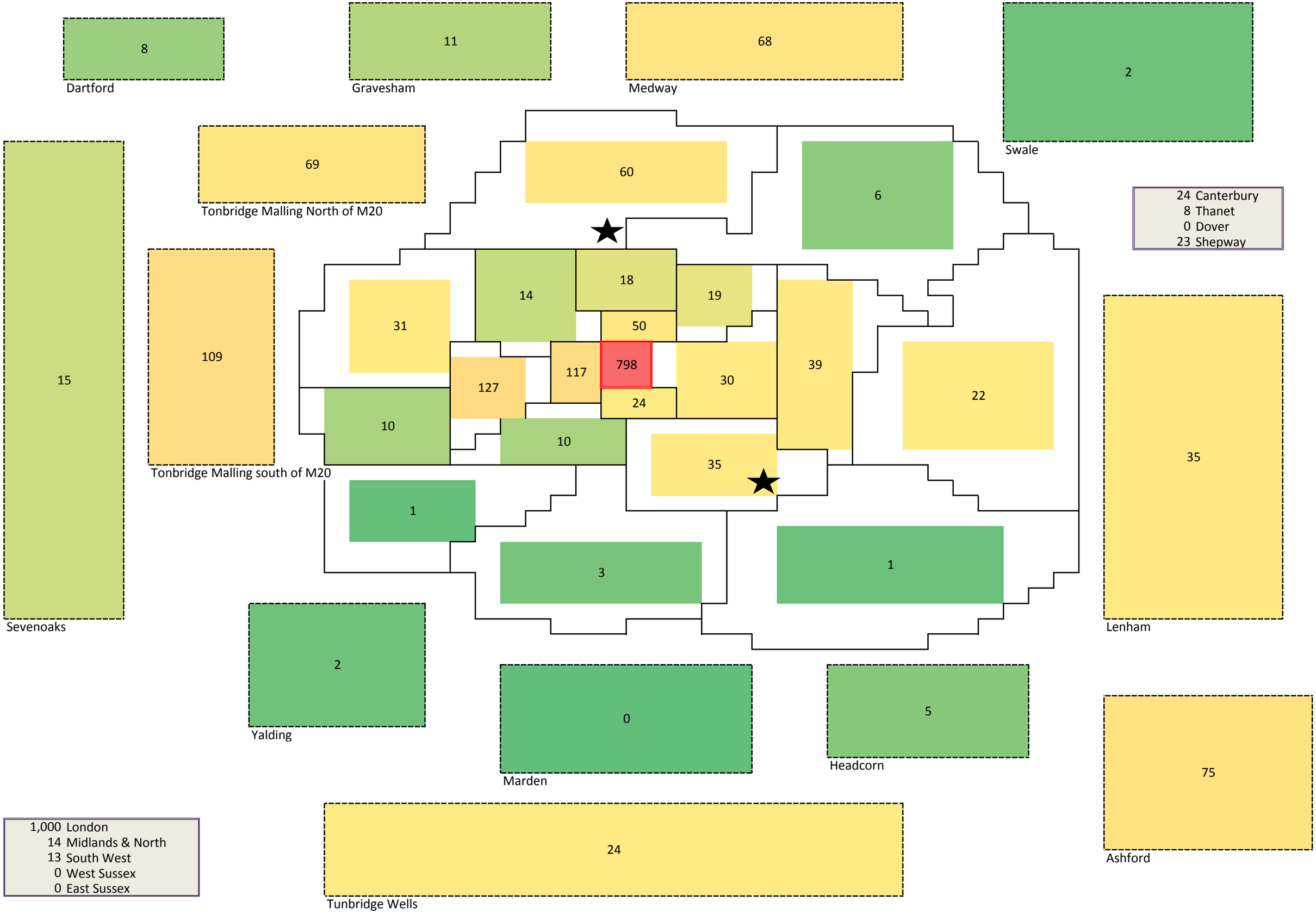
ORIGIN MAP - ALL MODES (person trips) - OPTION 3 - AM



DESTINATION MAP - BUS (person trips) - OPTION 3 - AM



DESTINATION MAP - RAIL (person trips) - OPTION 3 - AM



DESTINATION MAP - CAR (person trips) - OPTION 3 - AM

359
Dartford

347
Gravesham

1,715
Medway

1,135
Swale

775
Tonbridge Malling North of M20

2,043

1,148

923 Canterbury
111 Thanet
252 Dover
712 Shepway

552

1,357

711

1,524

1,433

3,244

1,066

1,357

1,232

3,697

1,053

1,574

485

209

572

594

3,473

1,494

Tonbridge Malling south of M20

253

391

1,002

Sevenoaks

316
Yalding

784
Marden

209
Headcorn

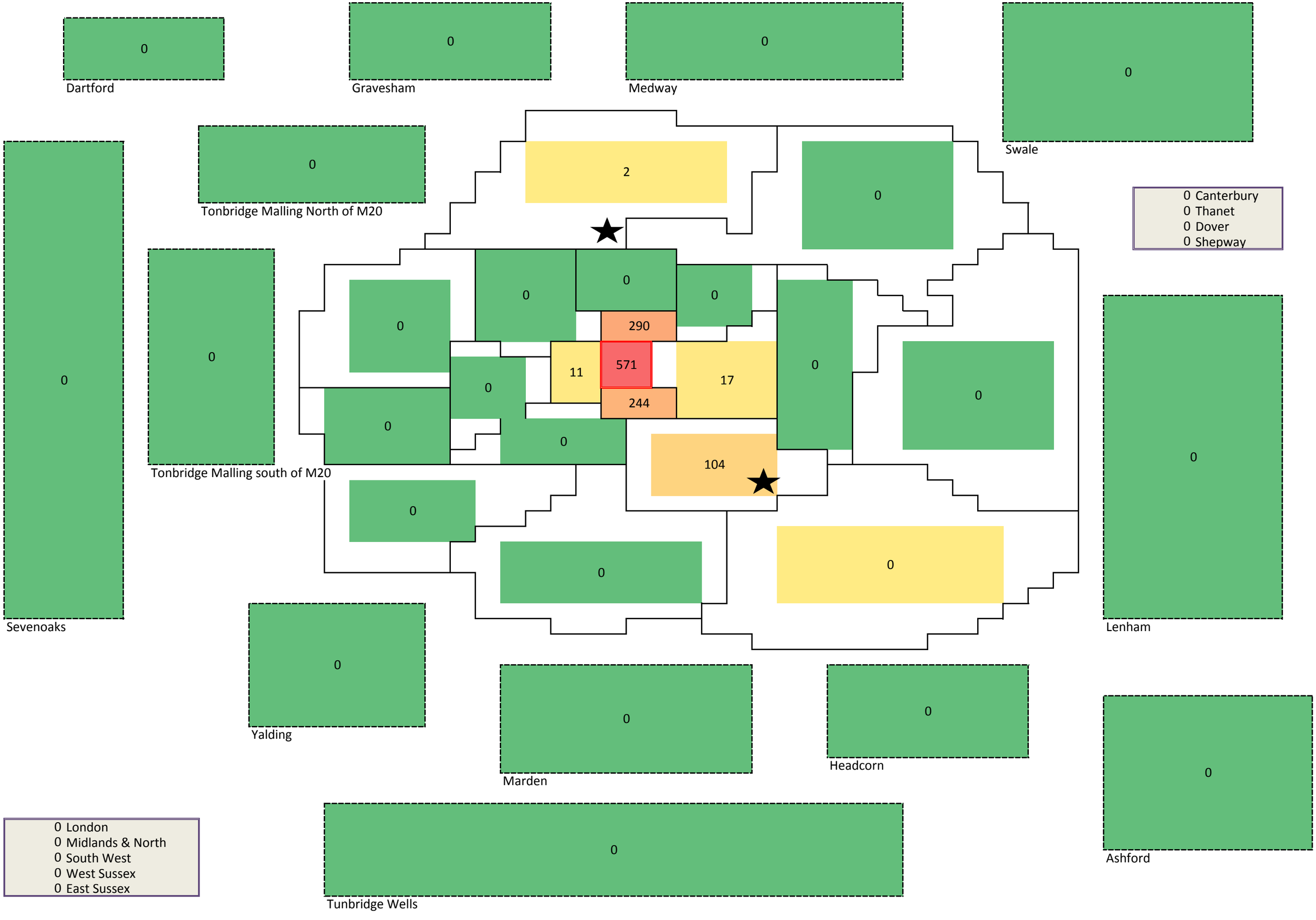
Lenham

925
Ashford

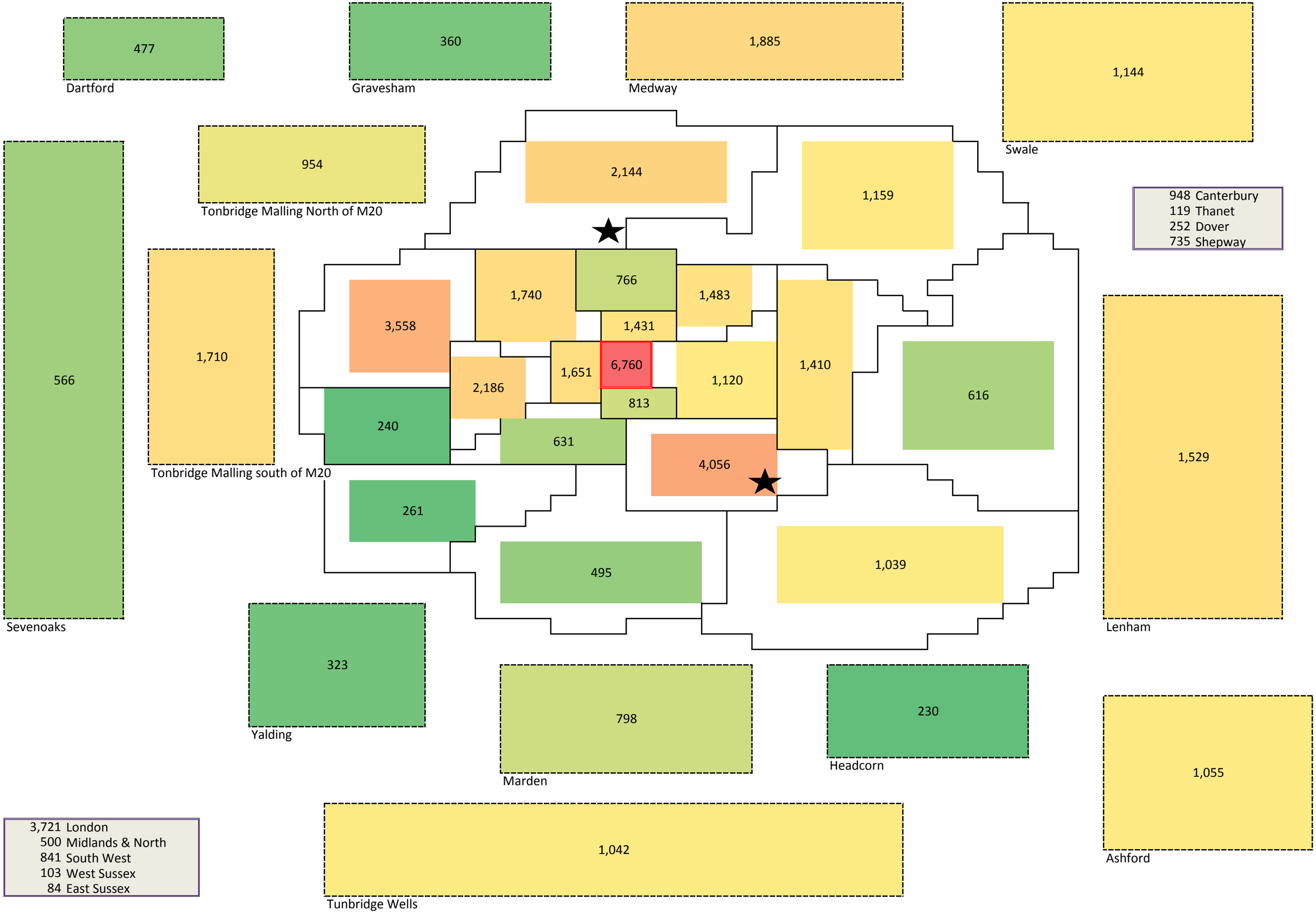
2,721 London
486 Midlands & North
829 South West
103 West Sussex
84 East Sussex

1,001
Tunbridge Wells

DESTINATION MAP - P&R BUS LEG (person trips) - OPTION 3 - AM



DESTINATION MAP - ALL MODES (person trips) - OPTION 3 - AM



Appendix F

Approach to forecasting SEMSL demand

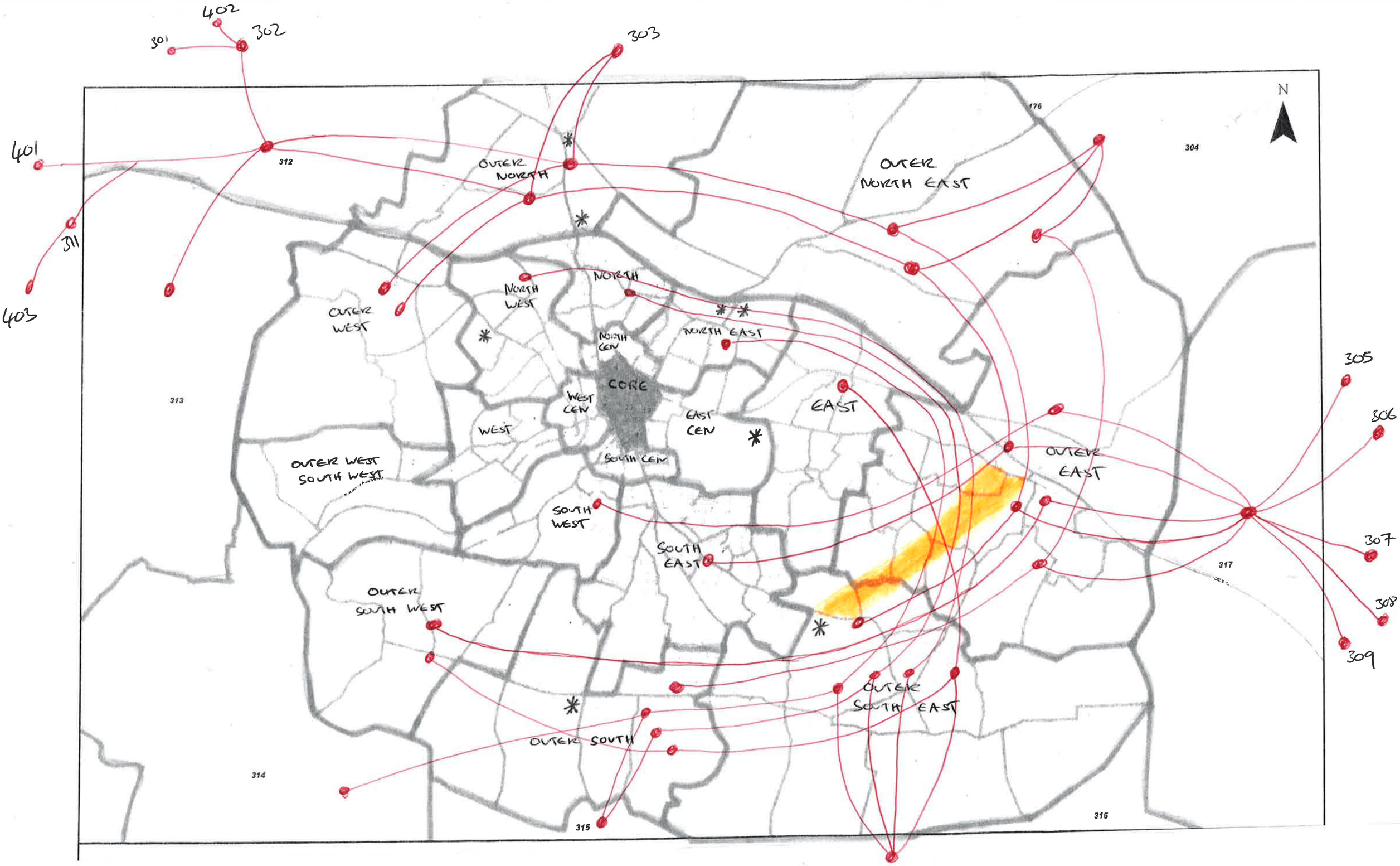
File Note

Date	10 April 2012
Job No/ Name	ST12118
Subject	Approach to forecasting SEMSL Demand

1. The absence of a run of the Maidstone Visum Model for the SEMSL scheme option with the latest Core Strategy development proposals meant that a separate assessment of potential demand for the scheme has been required
2. The 2026 Option 1 Visum Model Outputs have been used to assess the potential demand for the SEMSL scheme.
3. The origin - destination pairs for which travellers could potentially decide to use SEMSL were identified. These are summarised in the table below and presented visually in the accompanying diagram. Note: the origin – destination pairs should treated as two-way flows in either direction.

Origin (and Destination)	**Destination** (and Origin)
North East	Outer South East / Outer South / Yalding / Marden / Headcorn
North	Outer South East / Outer South / Marden / Headcorn
North West	Outer South East / Headcorn
South West	Outer East / Canterbury / Thanet / Dover / Shepway / Ashford / Lenham
South East	Outer East / Outer North East / Outer North / Outer West / Dartford / Gravesham / Medway / Swale / Canterbury / Thanet / Dover / Shepway / Ashford / Sevenoaks / Tonbridge and Malling / Lenham / London and beyond
East	Outer South East / Outer South West / Outer South
Outer South East	Outer East / Outer North East / Outer North / Outer West / Dartford / Gravesham / Medway / Swale / Canterbury / Thanet / Dover / Shepway / Ashford / Sevenoaks / Tonbridge and Malling / Lenham / London and beyond
Outer East	Outer South East / Outer South West / Outer South / Yalding / Marden / Headcorn
Outer North East	Outer South East / Outer South West / Outer South / Yalding / Marden / Headcorn
Outer North	Outer South East / Marden / Headcorn
Outer West	Outer South East / Headcorn
Outer South West	Outer East / Lenham
Outer South	Outer East / Outer North East / Swale / Canterbury / Thanet / Dover / Shepway / Ashford / Lenham
Yalding	Swale / Canterbury / Thanet / Dover / Shepway / Ashford
Marden	Dartford / Gravesham / Medway / Swale / Tonbridge and Malling / Lenham / London and beyond
Headcorn	Dartford / Gravesham / Medway / Swale Sevenoaks / Tonbridge and Malling / Lenham / London and beyond

4. The flows from the 2026 Option 1 model were then extracted for the flows highlighted above.
5. The results indicated that a maximum of around 5,360 two-way movements may use SEMSL in an AM peak hour. This breaks down into 2,585 movements in a south-westerly direction and 2,775 in a north-easterly direction.


N
401
402
301
302
303
311
403
312
176
304
OUTER NORTH
OUTER NORTH EAST
NORTH WEST
NORTH
NORTH EAST
OUTER WEST
NORTH CEN
CORE
WEST CEN
EAST
EAST CEN
WEST
313
OUTER WEST SOUTH WEST
SOUTH CEN
SOUTH WEST
SOUTH EAST
OUTER EAST
305
306
307
308
309
317
OUTER SOUTH WEST
OUTER SOUTH
OUTER SOUTH EAST
314
315
316

Appendix G

Approach to estimating park & ride capacity requirements

File Note

Date	10 April 2012
Job No/ Name	ST12118
Subject	Approach to estimating park & ride site capacity requirements

1. This note provides a summary of the approach undertaken to estimate the potential park & ride site capacity requirements. It starts by discussing the approach to assessing demand for park & ride and then translates this into a capacity requirement for car parking.

AM Peak Demand

2. The Maidstone Visum Model was utilised to determine an AM peak hour forecast of person trips at each park & ride site under each option scenario. These are presented in Table 1.

TableError! No text of specified style in document. **1 Maidstone Visum Model AM Peak Hour Demand Forecasts (person trips)**

P&R Site	Option 1	Option 2	Option 3
London Road	69	90	
Sittingbourne Road	508		
Willington Street	13	1,203	
Newnham Court		77	
Bluebell Hill		329	
Linton Corner		551	
Sutton Road		130	473
Cobtree			766
Total	**590**	**2,380**	**1,239**

3. The AM peak hour demand forecast was factored up to an AM peak period forecast utilising a factor of 1.85 relating to all demand up to 9.30am. The factor 1.85 is considered to be relatively conservative and is based upon the assumption that the peak period is relatively short. Table 2 presents the AM peak period forecasts of person trips.

Table 2 AM Peak Period Demand Forecasts (person trips)

P&R Site	Option 1	Option 2	Option 3
London Road	127	167	
Sittingbourne Road	940		
Willington Street	24	2,225	
Newnham Court		143	
Bluebell Hill		610	
Linton Corner		1,019	
Sutton Road		240	874
Cobtree			1,418
Total	**1,091**	**4,403**	**2,292**

Inter-peak Period Demand

4. The assessment of inter-peak demand has been based upon ticket sales data and the existing observed demand at London Road, Sittingbourne Road, and Willington Street. The interpeak period has been assumed to be from 9.30am through to 4.30pm (6 hours).

5. An inter-peak growth factor from TEMPRO, of 1.164, has been applied to estimate the growth in inter-peak demand that will occur by 2026. This provides the basis for the inter-peak demand forecasts for London Road, Sittingbourne Road, and Willington Street in Option 1.
6. The Option 2 inter-peak forecasts for London Road, Newnham Court, and Willington Street have utilised the same data as Option 1; however, the forecasts for London Road and Willington Street were factored by 1.1 to reflect the enhanced level of park & ride service, whilst the forecast for Newnham Court were factored by 1.25.
7. The absence of existing data for the inter-peak forecasts for Sutton Road, Linton Corner and Bluebell Hill meant that a separate qualitative assessment of potential demand was required. This took into account the location of the sites relative to the residential areas of Maidstone that were seen as the main driver of inter-peak demand at London Road and Willington Street. It was concluded that inter-peak demand at these sites would be much lower and so small nominal levels of demand were attributed to these stites.
8. The option 3 inter-peak demand applied the same demand forecasts for Option 2 and assumed that various proportions from the six option 2 sites would be redistributed between the two sites in option 3. Overall this concluded that there would be 50% less inter-peak demand for Option 3 than Option 2.

Table 3 Inter-peak Period Demand Forecasts (person trips)

P&R Site	Option 1	Option 2	Option 3
London Road	1,024	1,126	
Sittingbourne Road	776		
Willington Street	1,041	1,145	
Newnham Court		970	
Bluebell Hill		325	
Linton Corner		550	
Sutton Road		350	625
Cobtree			1,619
Total	**2,841**	**4,446**	**2,244**

PM Peak Period Demand

9. No additional demand is assumed to be generated in the PM peak period, beyond 4.30pm, with the majority of passengers on the return leg of their journey to the park & ride site.

Car Park Capacity Requirements

10. Having determined the overall levels of demand for each park and ride service an assessment of the required car parking capacities was undertaken through an assessment of car occupancies and turnover.
11. The AM peak and inter-peak period forecasts of person trips are translated into a forecast of vehicle trips using a car occupancy value of 1.15. This value was based conservatively upon the AM peak vehicle occupancy data recorded in the Jacobs Report.
12. The baseline 2011 ticket sales data and the utilisation surveys have been used to assess turnover of vehicles across the day.
13. It has been assumed that the majority of vehicle trips arriving at a park & ride site in the AM peak are commuter-based, or long-stay, and so the conservative assumption has been taken that all these vehicles will remain at the park & ride site until mid-afternoon, at the earliest.
14. It is assumed that there is a much higher turnover of inter-peak vehicles. A ratio between the overall inter-peak demand for park & ride and the maximum observed car park utilisation (generated from the utilisation surveys) provides a basic factor with which to estimate turnover. Table 4 presents this data and the inter-peak turnover factors generated.

Table 4 Existing (Nov 2011) Inter-peak Period Demand Forecasts (person trips)

P&R Site	Inter-peak demand (2011)	Inter-peak Occupation (2011)	Inter-peak Turnover Factor
London Road	880	184	4.8
Sittingbourne Road	667	215	3.1
Willington Street	894	167	5.3
Total / Average	**2,441**	**568**	**4.3**

15. The factors presented appear to be relatively high, specifically for London Road and Willington Street; however, it is known that both these sites are used by local residents and have a high proportion of OAP trips. It is considered that the application of these factors to other site may underestimate the required number of spaces. This has been taken into account in the final calculations.

16. To generate the assessment of parking capacity required at each site, under each option scenario, the following equation has been applied:

    *Capacity = (peak period vehicle demand + (Inter-peak vehicle demand * turnover factor)) * 1.1*

17. An additional 10% capacity has been added to take into account the issue raised with the inter-peak capacity requirement, but also to ensure that the car park is not operating at 100% capacity as this will be to the detriment of the park & ride operation.

Table 5 Park & Ride Site Estimated Car Park Capacity Requirements

P&R Site	Option 1	Option 2	Option 3
London Road	325	375	
Sittingbourne Road	1,150		
Willington Street	200	350	
Newnham Court		2,425	
Bluebell Hill		650	
Linton Corner		1,100	
Sutton Road		300	975
Cobtree			1,725
Total	**1,675**	**5,200**	**2,700**

Distribution	MBC
Name/ Signed	Jon Bunney