Regulation 18 Response - Initial Traffic Impact Assessment

Policy C6 & C7 - Merton Park and Hollow Lane, Canterbury

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Charles & Associates

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Contents

1 Introduction

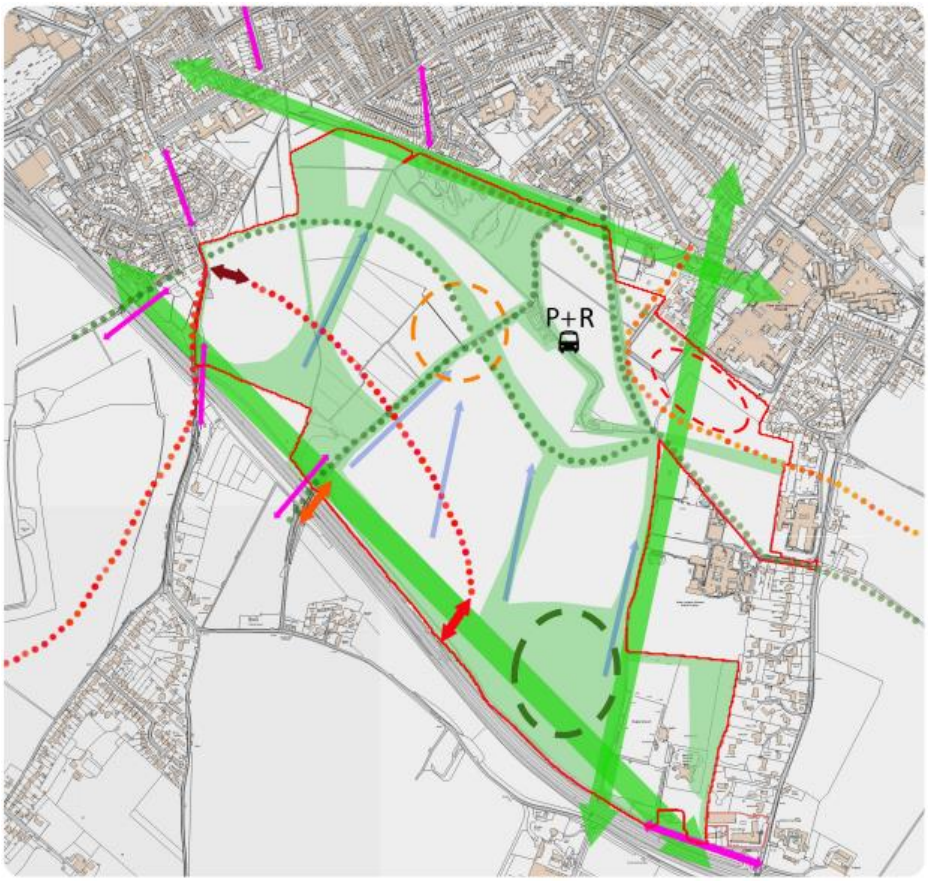
1.1 Overview

1.1.1 C&A have been appointed by Quinn Estates to provide transport and highways support for their site promotion activities associated with the emerging Canterbury City Council (CCC) Local Plan (2040).

1.1.2 Quinn Estates are promoting allocation two main allocations, currently identified as in draft Policies C6 and C7 and referred to as Merton Park and Land to the North of Hollow Lane respectively.

1.1.3 The draft allocation in Policy C6 is for approximately 2,250 dwellings, community facilities and associated transport services on a site between the A2 Dover Road and the Old Dover Road, as illustrated below.

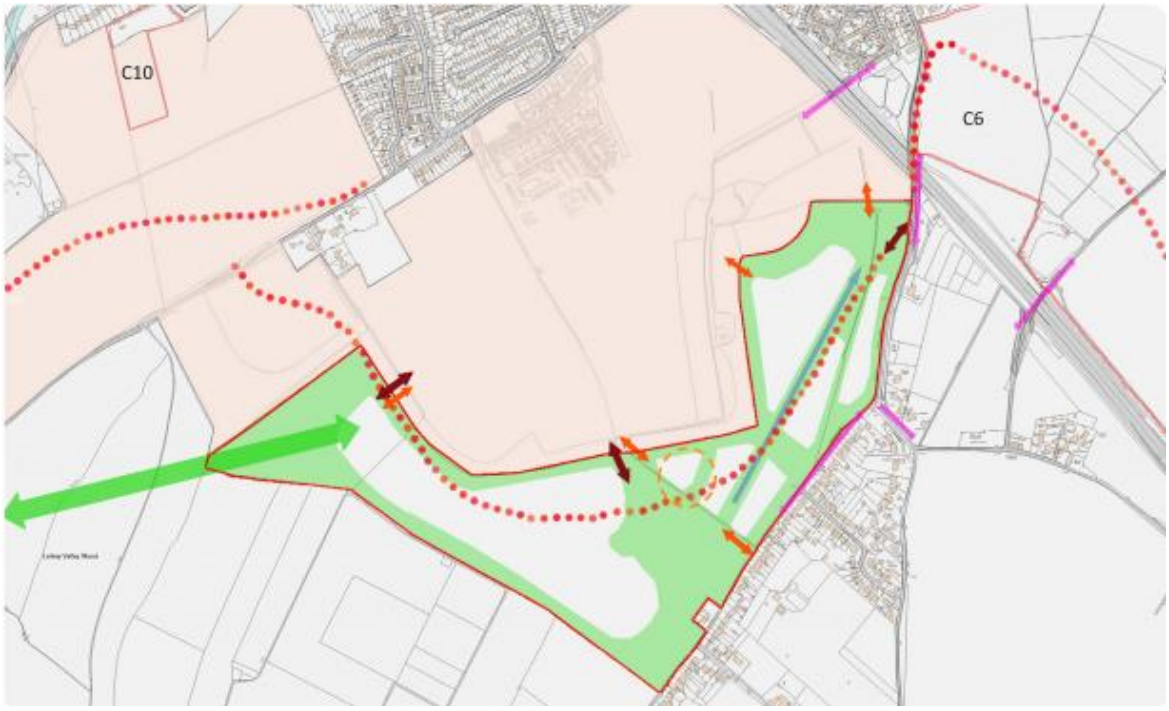
Figure 1.1 – Site C6 (Merton Park) Concept Masterplan



1.1.4 The proposed allocation of Merton Park within draft policy C6 is complemented by draft policy C11 - South West Canterbury Link Road, which is a component of the proposed transport strategy and elements of which would be delivered within the C6 allocation. Another allocation for development of Land at the North of Hollow Lane is similarly complemented by draft policy C11, giving rise to an association between all three policies.

1.1.5 Policy C7 is for approximately 800 dwellings, including affordable housing and other uses including a community hub within a local centre, a 2FE primary school and some commercial uses, illustrated below.

Figure 1.2 – Site C7 (Land at the North of Hollow Lane) Concept Masterplan



1.1.6 Given this association, Quinn Estates are promoting both C6 and C7 for allocation in the emerging Local Plan. In support of those promotions, C&A have prepared a suite of evidence on transport and highways matters. This includes the following:

- *Multimodal Access Principles* – This considers and reviews a wide range of technical matters pertaining to access strategy for the allocations of both C6 and C7.
- *Initial Traffic Impact Appraisal* – This summarises an assessment of traffic impact arising from the cumulative delivery of both C6 and C7 allocations, with particular focus placed on specific baseline context assumptions.

- *Site Specific Sustainable Transport Strategy* – Sets the vision for, and means to deliver, a strategy for sustainable travel maximising opportunities for future development occupiers to travel by active or public transport modes. This document is for policy C6. A similar strategy is to be prepared for C7 building on and consistent with the principles set out in this report.

1.2 Report Purpose

1.2.1 Draft policies C6 and C7 (alongside policy C11 for the South West Canterbury Link Road) have been developed through a comprehensive site selection process. In support of those allocations, a review has been undertaken of the deliverability and feasibility of the multimodal access principles (the aforementioned document). That document did not specific seek to promote or evidence a particular access strategy, instead focusing on principal components that could form a number of strategies, including those that may arise in earlier delivery. A fuller appraisal of the suitability of those access components necessarily requires that they not only be formed into a specific access strategy, but that they are assessed in an appropriate wider context, particularly with respect to assumptions which have a material bearing on the appraisal.

1.2.2 It is also important to note that contemporary approaches to assessing development transport impacts encourages the use of multiple scenario testing to reflect the inherent uncertainty in forecasting and as part of a broader approach to maximising efforts to deliver development that follow a vision led approach and avoiding a legacy approach to predicting and providing highway infrastructure.

1.2.3 Notwithstanding this, it remains appropriate that within those forecasting scenarios are evaluations of more pessimistic outcomes, in particular in the context of anticipated scope for sustainable travel uptake and thus, potentially, the need for and scale of highway interventions if such scenarios were to manifest. Early robust analysis can also be useful in ensuring that the underlying principles of development are not intrinsically flawed or undeliverable.

1.2.4 The purpose of this report is therefore to provide analysis of an assumed access strategy within an appropriate context, based on robust assumptions of development trip forecasting, to evidence the fundamental suitability of the proposed allocations and associated potential enabling infrastructure.

1.2.5 This should not be seen as a conclusive appraisal of the proposed allocations' access strategies. It represents an initial assessment, upon which further work will be built. It does not, for example, benefit from the measures and outcomes set out in the *Site-Specific Sustainable Transport Strategy,* in particular the significant inherent potential for reduced car-based trips being generated by the development. However, that Sustainable Transport Strategy is itself informed in part by this initial traffic appraisal. That strategy has adopted a novel approach to identifying development specific sustainable travel interventions which is based on a quantitative appraisal of mobility demand derived from this initial strategic forecasting exercise and thus this represents a building-block of that evidence base; albeit in a manner where the data extracted is agnostic of the specific scenario tested.

1.2.6 Further details of the assumptions underpinning the scenario tested in this report are summarised in section 2 of this report, but can be summarised as follows:

- Site allocations C6 and C7 are broadly consistent with the draft policy;
- The access strategy is consistent with the principles set out in draft policy, including delivery of policy C11 link road;
- Detailed assumptions of infrastructure consistent with the parameters set out in the accompanying *Multimodal Access Principles* document;
- Assumption that the fourth slip and P&R expansion at Wincheap would not take place and that alternative provision would be made at site C6.

1.2.7 Strategic transport modelling to support this work has been carried out by Jacobs on behalf of Kent County Council (KCC).

1.3 Report Structure

1.3.1 The structure for this report is outlined below.

- Section 1: Overview
- Section 2: Methodology and Assumptions
- Section 3: Assessment Outcome
- Section 4: Summary and Conclusions

2 Methodology

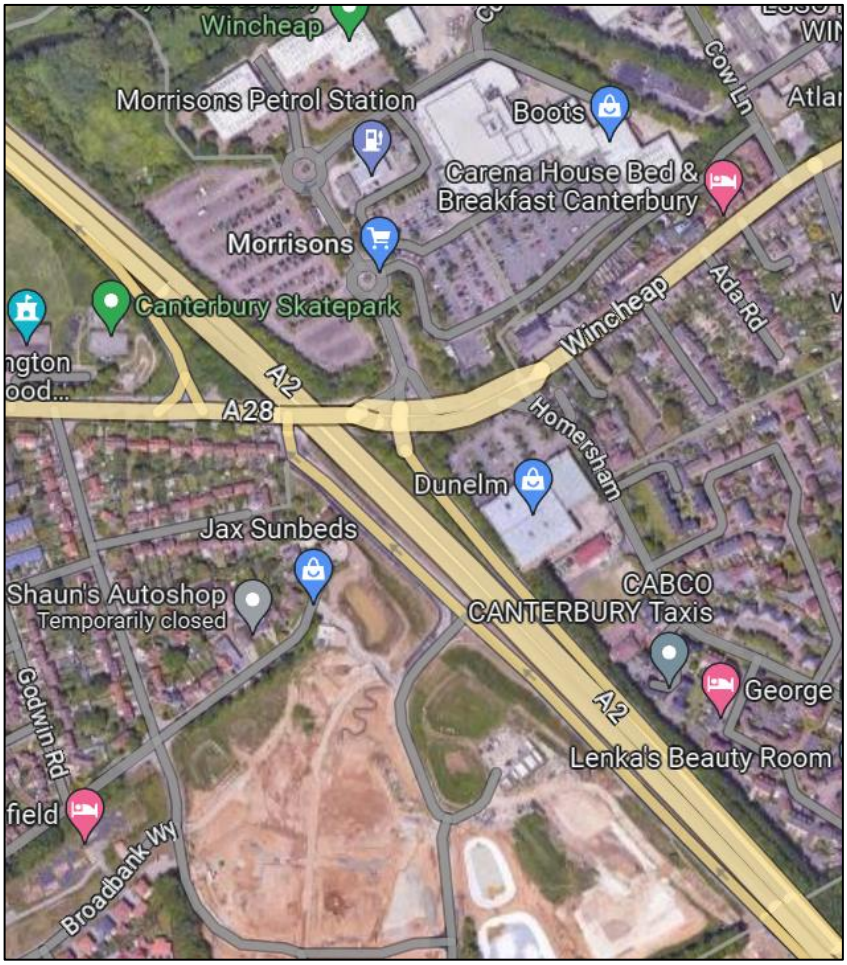
2.1 Context

2.1.1 As discussed above, the purpose of this report is to present an assessment of a scenario for the full build out of development on allocation C6 and C7, with access as per the draft policy and where neither the 4th slip nor P&R at Wincheap are delivered.

A2/A28 Junction

2.1.2 The way the local network connects to the A2 has the potential to affect both the travel patterns in the area and the proposed access strategy. As it stands, connection to the northbound A2 is provided to/from the A28 Thanington Road, while an on-slip from the A28 Wincheap Road accesses the A2 in the southbound direction, as shown in **Figure 2.1** below.

Figure 2.1: A2/A28 connection (Google Maps)



2.1.3 The southbound A2 off-slip at Wincheap has a complex planning history. The delivery of the slip road was initially associated with the delivery of the Wincheap Park and Ride (P&R) expansion but has been subsequently regarded as a planning obligation of the Saxon Fields development.

2.1.4 An initial design for the slip road had been approved by CCC in 2017 but did not materialise due to objections by National Highways, as the slip road would form part of the Strategic Road Network (SRN), for shortcomings in the design.

2.1.5 While an alternative local design for the slip road has been subject to a planning application and the Draft Canterbury Transport Strategy continues to envisage potential delivery of it, there remains some considerable uncertainty. It is also the assumption of this report that it is only realistic under a scenario where the fourth slip is not delivered at Wincheap that it would be necessary or practical to secure the alternative provision on site C6. Accordingly, a scenario that allows for the evaluation of those components of infrastructure in the draft policy necessarily requires the assumption of no fourth slip at Wincheap.

2.1.6 This scenario therefore assumes that the northbound connection to and from the A2 will remain unchanged, while the southbound on-slip will be closed and relocated, along with a newly introduced southbound off-slip, within the site boundaries of site C6 as part of the allocation. The scenario tested within this assessment makes no allowance for complementary connections between the A28 at the extinguished southbound on-slip and the A2, such that traffic routing to the A2 southbound via the relocated on-slip must make use of the existing access connectivity between site C6 and the wider network, including at Homersham. This represents a robust assumption and allows evaluation of the need, or otherwise, for further supporting infrastructure such as a connection directly from the A28 to site C6.

2.2 Methodology

2.2.1 As the proposed allocation forms part of the Draft Local Plan for Canterbury, it was acknowledged that the most appropriate tool for the assessment of the impact of the allocation on the network would be the Canterbury VISUM strategic traffic model.

2.2.2 Jacobs act as the custodian for the strategic model for Canterbury and they have assessed a number of Local Plan Option scenarios for the purposes of the Emerging Local Plan evidence gathering. Since the modelling scenario for this report was conducted, Jacobs have continued to update the reference case model and are understood to be working on emerging Local Plan wide scenario testing. This latter information was unavailable at the time of testing, therefore in order to undertake a robust cumulative appraisal a suitable equivalent model scenario was adopted. For this assessment the previous 2045 LPR Option 5V3 was considered the most appropriate to be adopted as a "Do Minimum" scenario of this assessment. This scenario represents the cumulative implications of the then emerging Local Plan allocations scenario and represents a robust cumulative baseline.

2.2.3 Appropriate adjustments were made in order to remove elements of the previous draft LP model scenario no longer relevant at the time of the assessment, such as the coding of the Canterbury Circulatory Plan (CCP). Equally, assumptions and vehicle demand involving the proposed allocations to be assessed here (C6 and C7) along with and assumed infrastructure were removed in order to form an appropriate "Do Minimum" scenario.

2.2.4 Along with the modelling outputs, Jacobs provided a Forecast Report (December 2023, **Appendix A**) with all assumptions and results discussed in detail.

2.2.5 Outputs from the strategic model runs were provided in the form of flow bundles for all four scenarios, Do Minimum AM and PM and With Development AM and PM, showing the vehicle flows on the links of the modelled network, and flow difference plots demonstrating any increases or decreases between the Do Minimum and the With Development Scenarios.

3 'With Development' Scenario Assumptions

3.1 Overview

3.1.1 This section of the report presents the scenario assumptions that were adopted for the modelling of the 'With Development' Scenarios (for both weekday AM and PM peaks). This incorporates both the proposed land uses as well as the access strategy and the connectivity between the development and the wider network, as coded within the Strategic Model for Canterbury.

3.2 Development Assumptions

3.2.1 As a starting point for the assessment of this alternative scenario, a set of assumptions have been made regarding the development proposals as presented below:

- Scale of the Proposed Allocation (C6 Merton Park development) – although this has the potential to change in the future, for the purposes of this assessment the Merton Park part of the proposed allocation is assumed to bring forward:
  - 2075 residential units and 210 retirement homes;
  - A 2 FE Primary School and a 1 FE Special Education Needs Centre;
  - A Local Centre;
  - A football and a rugby club;
  - Park & Ride facility – the proposed Park & Ride impacts on the access strategy both in the way that it supplements the Wincheap Park & Ride site, drawing traffic away from it and the Wincheap junction, and affecting the traffic patterns in the area, as well as in the way bus connectivity is provided through the proposed allocation. As this facility would be supplementary to the existing one in Wincheap, its delivery needs to be agreed with CCC and a cost-benefit analysis undertaken. Nevertheless, it has been assumed that the Park & Ride can go forward as proposed.
- Scale of the Proposed Allocation (C7 Hollow Lane development): this allocation is proposed for 735 residential units and 75 retirement homes. Again, this is indicative at this stage of the planning process and could potentially change in the future.
- Expectations on Sustainability – Only moderate, generalised assumptions of sustainability and thus mode shift to non-car modes.

- Connectivity to the A2 – as the A2 forms part of the strategic road network, National Highways needs to be consulted upon any new connections. As already explained, this assessment assumes that the southbound off-slip (4th slip) will not come forward at the Wincheap Junction, but instead provision of a new southbound off-slip will be provided within the Merton Park site. As such, it is considered that the new connection will be viewed favourably – and thus it is assumed that a connection to the A2 can form part of the proposed access strategy.
- Extension to Cockering Road – for the purposes of this assessment it has been assumed that the connection to Cockering Road is delivered.

Access Strategy Assumptions

3.2.2 In terms of access strategy, this alternative scenario follows closely from the assumptions made within the core local plan allocation proposals. In summary, those include the following:

1. Hollow Lane – all modes
2. PROW line CC56 – ped/ cyclists only
3. CC52 – ped/ cyclists only
4. CC55 – ped/ cyclists only
5. Stuppington Lane – all modes exept cars
6. CC49 – ped/ cyclists only
7. South Canterbury Road – all modes exept cars
8. Nackington Road – all modes exept cars
9. A2 off-slip – car only
10. Stuppington Lane overbridge – ped/ cyclists only
11. Site C7 Hollow Lane – all modes
12. Cockering Road – all modes

3.2.3 **Appendix B** presents the points of access, as listed above, in the context of the proposed allocation and the surrounding area. This shows each possible connection point for each of the four main transport modes as indicated in the key below:

3.2.4 The core Local Plan scenario comprises all of the above elements regarding the development access, but also assumes the auxiliary lane in place.

4 Assessment Outcome

4.1 Overview

4.1.1 Both “Do Minimum” and “With Development” scenarios were run for the weekday AM and PM peaks in the Canterbury Strategic VISUM model. Flow plots and flow difference plots were output for all four scenarios to help understand the impact of the development under this alternative assessment.

4.1.2 As this represents only an initial assessment of an assumed access strategy it has been kept at a higher level, while stand-alone assessments at junction levels may be considered appropriate in due course, with the help of turning movement output from the model.

4.2 Impact of Development

4.2.1 **Figures 5.1** and **5.2** below show the flow differences between the Do Something and the Do Minimum scenarios, for both AM and PM respectively.

Figure 5.1: Do Something Vs Do Minimum Flow Difference - AM

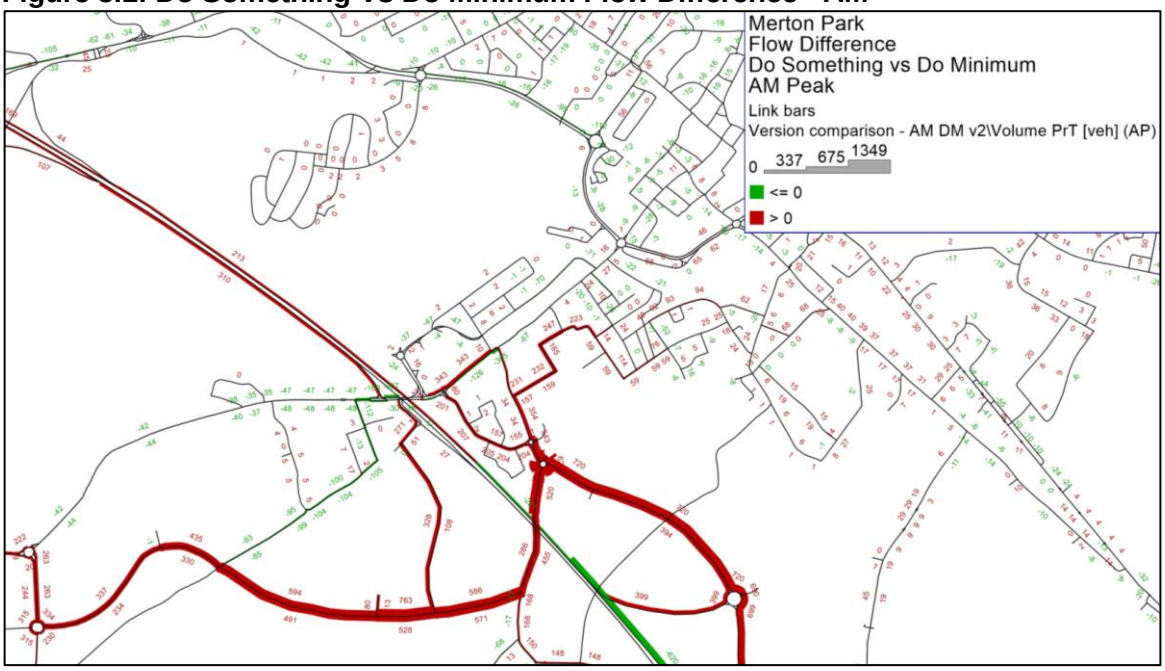
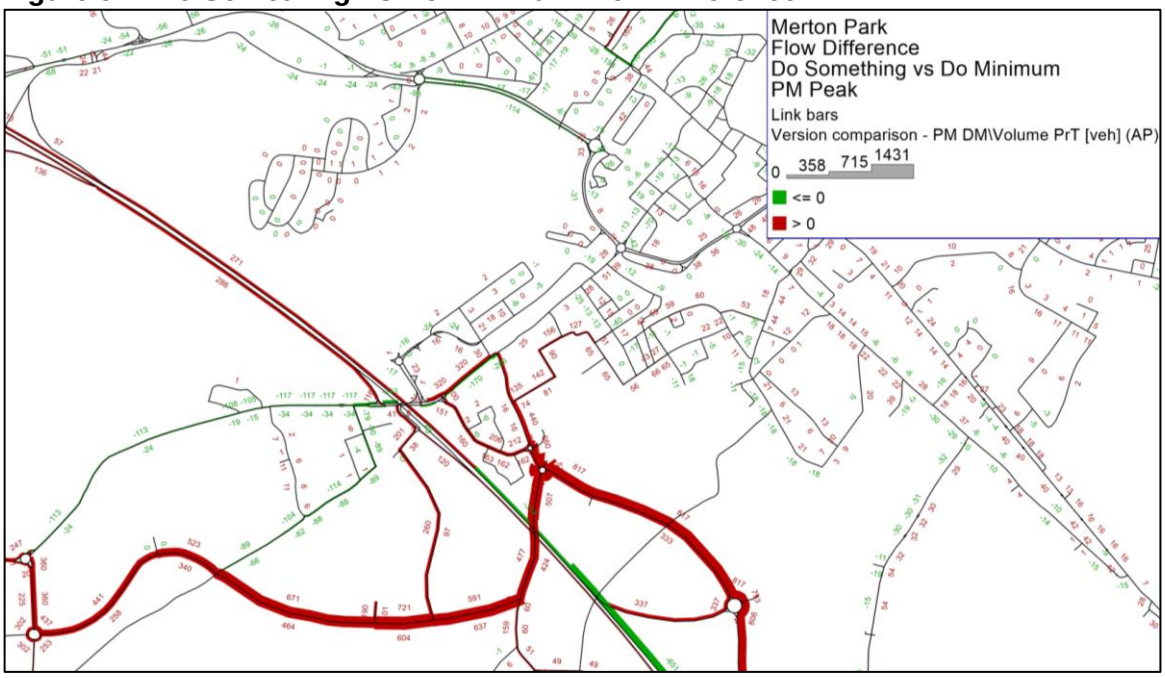


Figure 5.2: Do Something Vs Do Minimum Flow Difference - PM



4.2.2 In the above figures, links in red indicate flow increases in the With Development scenario, while links in green experience a decrease from the Do Minimum scenario. It is important to note that the most significantly highlighted increases are on entirely new elements of infrastructure where the increase is measured against a reference in the do-minimum where the flow is necessarily zero, as the links do not exist. The plots are more relevant for appraisal of net implications on existing parts of the network.

4.2.3 The model output indicates that proposed southbound slip roads, both the newly introduced off-slip as well as the existing on-slip transferred within the site, will experience moderate levels of traffic – flows along the off-slip are modelled to be around 350-400 vehicles per hour and on-slip around 700-800 vehicles per hour.

East-West Movement

4.2.4 The connection between sites C6 and C7 is well used – with flows of around 1,100 vehicles per hour two-way. This, along with the reductions shown on the A28 Thanington Road, indicate that there is demand for westbound trips, with the site C6 and Cockering Farm corridor providing an alternative to the congested A28.

4.2.5 Reduction on the eastbound A28 west of the Wincheap signals is considered beneficial to both the Wincheap signals and the A28 corridor.

4.2.6 Reductions are also observed on rural lanes like Bigbury Road and Howfield, as well as the A2050. Most likely this is due to traffic using the rural network to access the A2 southbound in the "With Development" scenario continuing along the A2 and utilising the slip roads within the development.

Connection from A28 to Site C6 and A2

4.2.7 The "With Development" scenario forecasts flow increases on Homersham, as anticipated due to both development traffic going to and from the site to the outer network as well as external traffic connecting to the A2 through the site. As discussed during the access strategy, Homersham is considered a link of high capacity that can accommodate adequately the additional forecast demand, subject to the changes suggested.

4.2.8 Nevertheless, concerns have previously been raised from Kent County Council (KCC) about the potential level of HGVs using this corridor to access the relocated A2 southbound on-slip in this scenario. To respond to this, HGV-only flow plots were provided from the strategic model (**Appendix C**) indicating that the level of HGVs through Homersham, in the absence of any alternative means to connect from the A28 to site C6 and the relocated slip road, would be sufficiently low. More precisely, the model indicated 10 HGVs in the AM and 5 in the PM, numbers that it is considered would not represent a severe impact on the Homersham corridor.

4.2.9 Increases on Hollow Lane and Hollowmede are also forecast in the "With Development" scenario – as was anticipated to be possible in appraisal of access options, hence earlier proposals for localised re-routing and calming. This demand is forecast to arise from traffic seeking to access the central areas of Canterbury from the development and the A2. It is acknowledged that these routes are more residential in nature and increases in traffic may be more problematic. An outcome of this exercise is therefore that further work is needed to evaluate how traffic can be managed to not severely impact these routes.

4.2.10 Nevertheless, this assessment provides a sensitivity test to the core assumptions adopted for the purposes of the Draft Local Plan, and as such, it is kept at a high level. Further assessment can be undertaken if it was proven necessary.

4.3 Mitigation of Residual Impact

4.3.1 It is currently beyond the scope of this report to fully consider off-site mitigation in support of the allocations. This is something to be considered later in the plan making process or, in full detail, at the planning application stage.

4.3.2 In summary however, the analysis suggests that when considered holistically this development and infrastructure strategy provides overall net betterment and is therefore unlikely to merit extensive off-site mitigation. This of course excludes the aforementioned enabling works to secure appropriate access routes, as well as other supporting works for the potentially proposed infrastructure. All other residual impact across the network is modest, as might be expected from a scenario with such significant infrastructure delivery.

4.4 Need for Infrastructure Delivery

4.4.1 The assessment of this scenario provides some evidential justification for the infrastructure delivery assumptions within Policies C6, C7 and C11 when considering the wider implications. Both development and through traffic is forecast to make some use of the new east-west link road connection and this provides some relief to the A28 corridor, with a resultant net reduction in traffic on that route.

4.4.2 However, a significant proportion of the benefit is derived from the relocation of both southbound slip roads away from the immediate A28 corridor, necessitating reassignment of trips on to the link road.

4.4.3 That reassignment does give rise to the aforementioned increases on some other roads facilitating access to the new infrastructure, albeit these are considered to be mitigatable to non-severe levels of impact.

4.4.4 It is less clear from this analysis that the infrastructure can be justified on the basis of being necessary to mitigate the impact of development. This assessment has been conducted on the basis of robust trip rates that, as is explained more fully in the *Site Specific Sustainable Transport Strategy* for site C6 in particular, forecasts a considerable number of trips taking place from the development on routes otherwise served by sustainable modes. This includes trips over distances of less than 1 mile to/from the City centre.

4.4.5 It is now widely accepted that encouraging use of such sustainable modes for these and other journeys is critically related to the relative attractiveness of alternatives to the car. Therefore, delivery of infrastructure that mitigates against robust forecasts of ‘potential’ impact has the potential to be counterproductive to the objective of encouraging sustainable travel. This is significantly compounded where infrastructure delivery is excessive and derived net benefits, even if through unnecessarily early delivery, constrains more sustainable travel trends being established.

4.4.6 In this case, and based on the analysis presented here, it could be argued that the infrastructure provision in this scenario is disproportionate to even the pessimistic forecast of traffic demand assessed here, given the net improvements noted on key corridors. There is a clear risk that such strategic highway infrastructure delivery would prejudice the almost unparalleled opportunity afforded by these allocation to delivery exemplar sustainable development.

4.4.7 Whilst it is beyond the scope of this report to assess this in detail, it may however be concluded that such infrastructure delivery is necessary to support the wider Transport Strategy or Plan Local objectives. It may be appropriate that this is considered separately, but this should be in a manner that ensures that an unrealistic agenda to 'fix' existing issues is not prejudicial to delivering the most appropriate, sustainable and effective development sites within the Local Plan.

5 Summary

5.1.1 This report provides an initial assessment of potential residual traffic impacts of sites C6 and C7 in the Canterbury Local Plan (2040), the associated infrastructure and the baseline context, based on pessimistic assumptions of traffic generation at the proposed allocations.

5.1.2 A suitably robust assessment methodology has been adopted using the KCC strategic transport model, but this does not reflect sustainable travel strategy measures.

5.1.3 Flow increases are shown on areas of the network providing access to new infrastructure. Modelling outputs indicate forecast vehicle trips on new infrastructure between the A28, sites C6 and C7 and the A2 corridor.

5.1.4 The outputs demonstrate a possible justification for new infrastructure, but primarily to address existing perceived issues; the benefits are likely to be disproportionate to the impact of the specific allocations considered, despite the pessimistic nature of the forecasting. It may be considered that the benefits of the infrastructure could be utilised to address either existing issues or to support the wider Local Plan growth.

5.1.5 However, it should be noted that there is a risk that this could contradict the wider objectives of delivering sustainable and vision-led growth in the draft Local Plan, which at end of page 3 notes:

"The revised draft plan now responds to the concerns raised by our communities by shifting the emphasis of the transport strategy away from road building and towards a public transport-led approach, advocated by national policy."

Appendix A Jacobs Forecast Report

Subject	Merton Park, Canterbury – Forecast Report
Attention	Alun Millard, Matthew Hogben, Athina Tsolaki
From	Katarzyna Mendocha, Cat Evans
Date	18/12/2023

1 Introduction

1.1 Introduction

Jacobs has been commissioned by Kent County Council (KCC) to undertake traffic modelling work in order to understand the highway network impact of trips associated with proposed allocation of the combined Merton Park and Thanington Phase 4 developments in Canterbury. As part of the commission of work, Jacobs have agreed to model the Merton Park and Thanington Phase 4 developments in the Canterbury VISUM strategic traffic model. Both AM peak and PM peak models have been developed to enable KCC to assess the impact of proposed developments in Canterbury using the Canterbury Local Plan model. This Technical Note sets out the assumptions and methodology used and the results of the analysis.

1.2 Study Area

The proposed Merton Park and Thanington Phase 4 site allocations are situated in Canterbury, Kent, south of the town centre and Canterbury East railway station. They lie south of the A28 Wincheap Road and both east and west of the A2. The proposed Merton Park development is placed northeast of the A2 Dover Road, while Thanington Phase 4 is located to the southwest. The Merton Park and Thanington Phase 4 Development study area is illustrated in **Figure 1.**

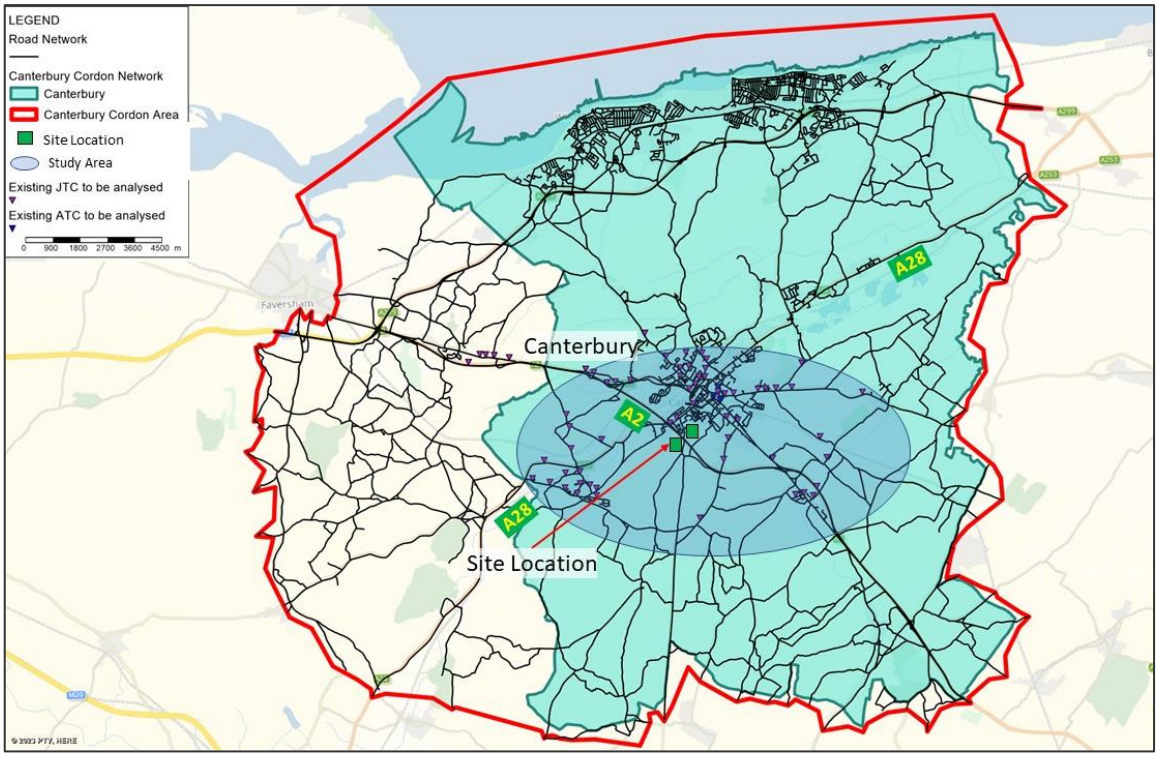


Figure 1: Merton Park and Thanington Phase 4 Developments in Canterbury Study Location

1.3 Base Model Update

The latest version of the Canterbury VISUM Base Model developed in 2020 to inform spatial assessments for early decision making on the Canterbury Local Plan Review (LPR), has been updated around the Canterbury area, specifically for this latest assessment. Details of the original base model can be found in the document: *"Stage 3 Canterbury LP – Local Model Validation Report"* issued in November 2022. The update was deemed necessary to ensure that model outputs obtained from outside the validated area of the model were sufficiently robust for use in subsequent local junction impact appraisal developer studies.

The current VISUM model has been checked and enhanced using 2017, 2018, 2019, 2021 and 2022 survey data to ensure its robustness for developing the Merton Park and Thanington Phase 4 developments specific forecast scenarios. A comparison of the updated Canterbury VISUM Model with observed data shows that the model enhancements and refinements have resulted in modelled traffic flow volumes and distribution patterns that reasonably match those observed near development site location and on key routes in the surrounding area, without impacting on the wider model calibration/validation.

For this reason, the updated version of the Canterbury VISUM Model is therefore considered to be of sufficient robustness to be used in the modelling of a forecast year scenario to assist in the appraisal of the proposed Merton Park and Thanington Phase 4 developments.

1.4 Relevant Reports

The following reports provide more detail on the Canterbury VISUM model base and forecast year development:

- *Stage 3 Canterbury LP – Local Model Validation Report, Kent County Council, January 2022.* This document describes development and validation of the base transport model to inform spatial assessments for early decision making on the Canterbury Local Plan Review (LPR). Canterbury City Council (CCC)'s Local Plan (LP) sets out the requirements for 16,000 new homes and 6,500 jobs by 2031 which have been included in the District Transport Strategy.

- *Stage 3 Canterbury LP – Forecast Report, Kent County Council, May 2021.* This report documents the development and infrastructure assumptions for Canterbury included in a single forecast year 2040. The forecast Baseline scenario includes a full identification of committed developments and transport schemes, while the forecast assessment has been based on the 'Highway assignment' only.

- *Canterbury Local Plan – Preferred Strategic Growth Local Plan Option, Kent County Council, July 2022.* This technical report describes the processes by which the 2045 Canterbury Local Plan demand forecasts have been carried out using the Canterbury Local Transport Model. Canterbury City Council identified a preferred strategic growth Local Plan option and has commissioned Jacobs to proceed with a modelling assessment in line with those completed for the previously completed options. This modelling work made use of the existing Canterbury cordoned model derived from the Countywide Model and previous "LPR Options 5v3 model" or "City with Ghent and relief roads" with updates considering the provided housing allocations and schemes.

2 Canterbury Model Overview

The Merton Park and Thanington Phase 4 development modelling study uses the latest version of the Canterbury VISUM model developed in 2020 to inform spatial assessments for early decision making on the Canterbury Local Plan Review (LPR). Canterbury City Council (CCC)'s Local Plan (LP) sets out the requirements for 16,000 new homes and 6,500 jobs by 2031 which have been included in the District Transport Strategy. The main aims of the District Transport Strategy are to improve travel choices within the area, reduce traffic congestion within the area, improve road safety, reduce travel demand, improve travel awareness, improve journey time reliability, and reduce greenhouse gas emissions as a result of traffic congestion.

2.1 Model Version

The model has been built using PTV VISUM software version 2020 (this is an upgraded version of the same software as used in the previous version of the Canterbury Model) and utilises the Intersection Capacity Analysis (ICA) module to enable detailed evaluation of junction performance and represent blocking back and queuing.

2.2 Study Area and Network Coverage

The network of the Canterbury Local Model has been developed based on the cordoned network from the Kent County Model with necessary updates to ensure that the local network replicates base

conditions. The Canterbury VISUM model has necessitated a relatively detailed model network in the urban centre of Canterbury but also sufficient detail at the regional level to capture more strategic traffic movements approaching Canterbury.

The location of the cordoned Canterbury Local Area Model (LAM) relative to the fully modelled area of the Kent Transport Model (KTM) is shown in **Figure 2**.

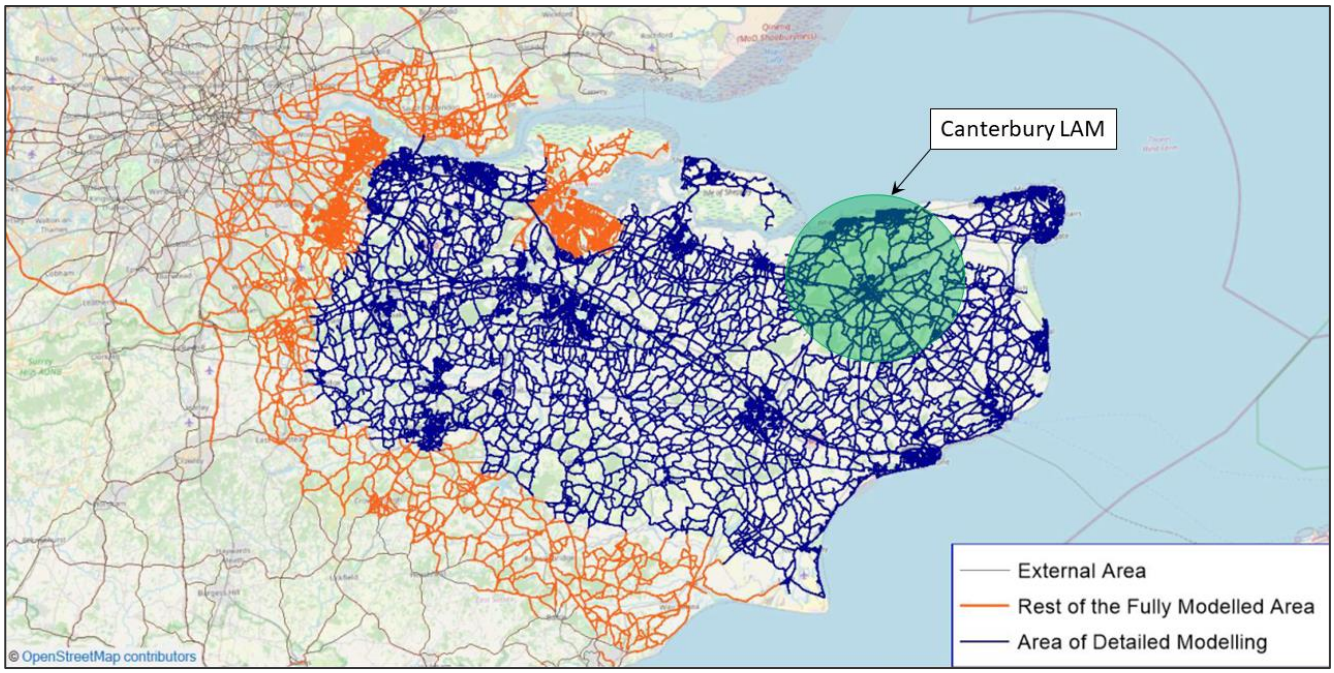


Figure 2: Kent Visum Model – Canterbury LAM location in Fully Modelled Area

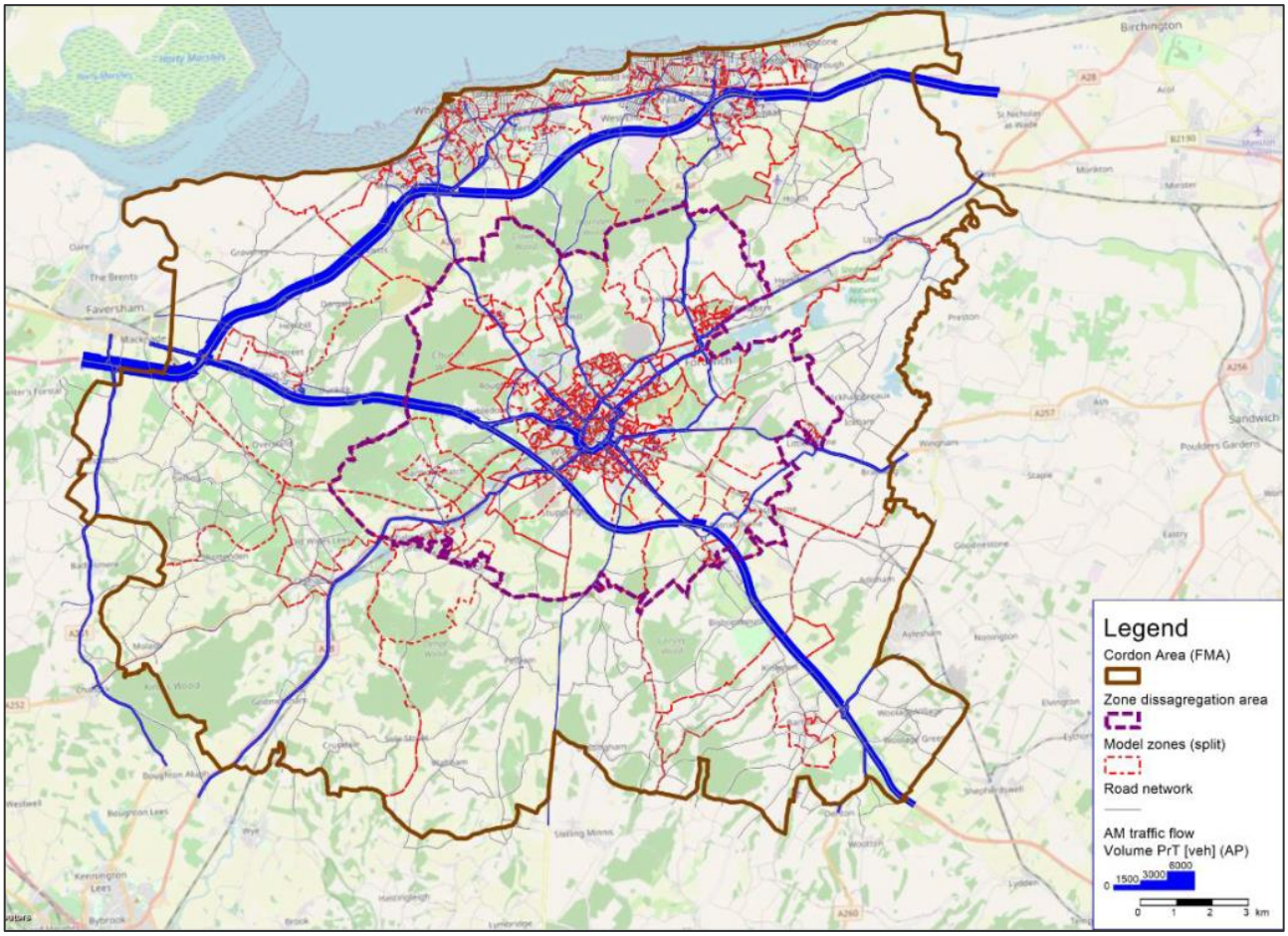


Figure 3: Canterbury Local Area Model – Cordon Area

As shown in **Figure 2**, the Canterbury administrative area is located within the Area of Detailed Modelling, which means that road links and junctions are modelled in more detail in terms of geometry and capacity, and with more granularity / depth of coverage. This detail increases further within the Canterbury urban area. At the same time, the zone system used is increasingly detailed / granular when closer to the Canterbury urban area, meaning that traffic is loaded onto the road network with greater precision which is shown in **Figure 3**.

The highway model represents an average weekday in 2019 at the morning peak hour and evening peak hour level. The demand of the local model is also obtained from the countywide KTM. The initial demand (prior to matrix estimation matrix) was cordoned from the KTM and a matrix estimation process was undertaken for the local model to produce highway peak hour vehicle matrices required for the assignment.

In terms of calibration and validation, the model is considered to be robustly representative of traffic flows and journey times in the Canterbury urban area and on key strategic routes into the city.

Figure 4 illustrates the traffic flow screenlines and links used in matrix estimation of the base year matrices.

Although not considered to be a limitation given its size, the strategic model is not validated to turning movements at junctions.

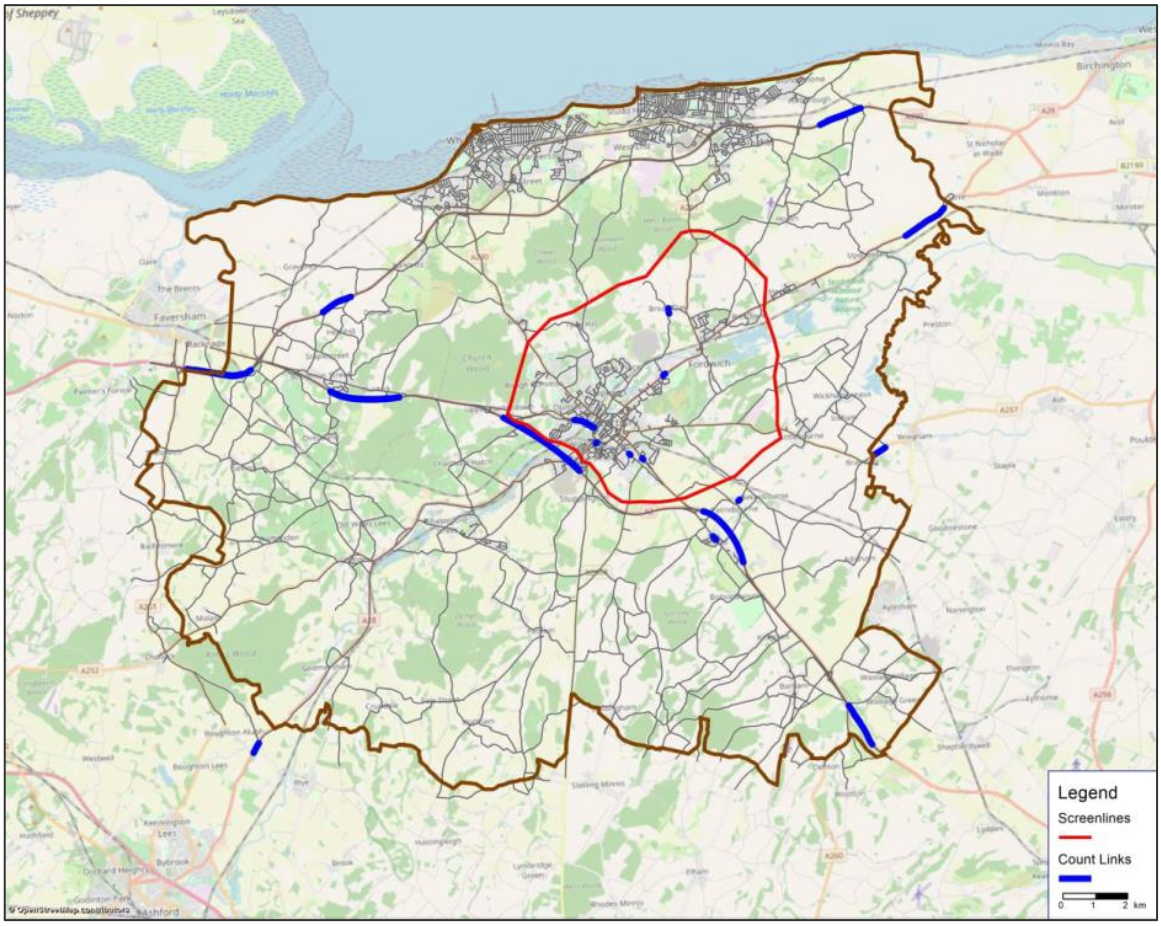


Figure 4: Canterbury Visum Model – Screenlines and Links used in Matrix Estimation

2.3 Time Periods

There was a need to provide assessment and forecasting capability to reflect the impact that the schemes have during the busiest parts of the day. Therefore, a morning peak and evening peak model have been developed to allow policy makers to understand local issues/impacts of developments, infrastructure improvements, and policy measures. The highway transport assignment model therefore represents an average 2019 weekday in the following two modelled time periods:

- AM peak hour (08:00 to 09:00); and
- PM peak hour (17:00 to 18:00).

2.4 Canterbury Visum Forecast Model Overview

A 2045 forecast year was modelled for the Canterbury LP assessment. A 2045 future year Canterbury LP Model has been prepared for the purposes of Local Canterbury Model forecasts. The network for the forecast year was based on the LPR Options 5v3 model, developed for the purpose of Stage 3 Canterbury LP – Forecast Report, and includes additional schemes that may be in place by the forecast year. This 2045 model includes Merton Park and Thanington Phase 4 developments as part of the forecast development schemes.

3 Merton Park and Thanington Phase 4 Development Modelling

This section focuses on the Merton Park and Thanington Phase 4 developments, describing their quantum, alongside their trip generation and trip distribution. The location of Merton Park and Thanington Phase 4 developments is illustrated in **Figure 5**.

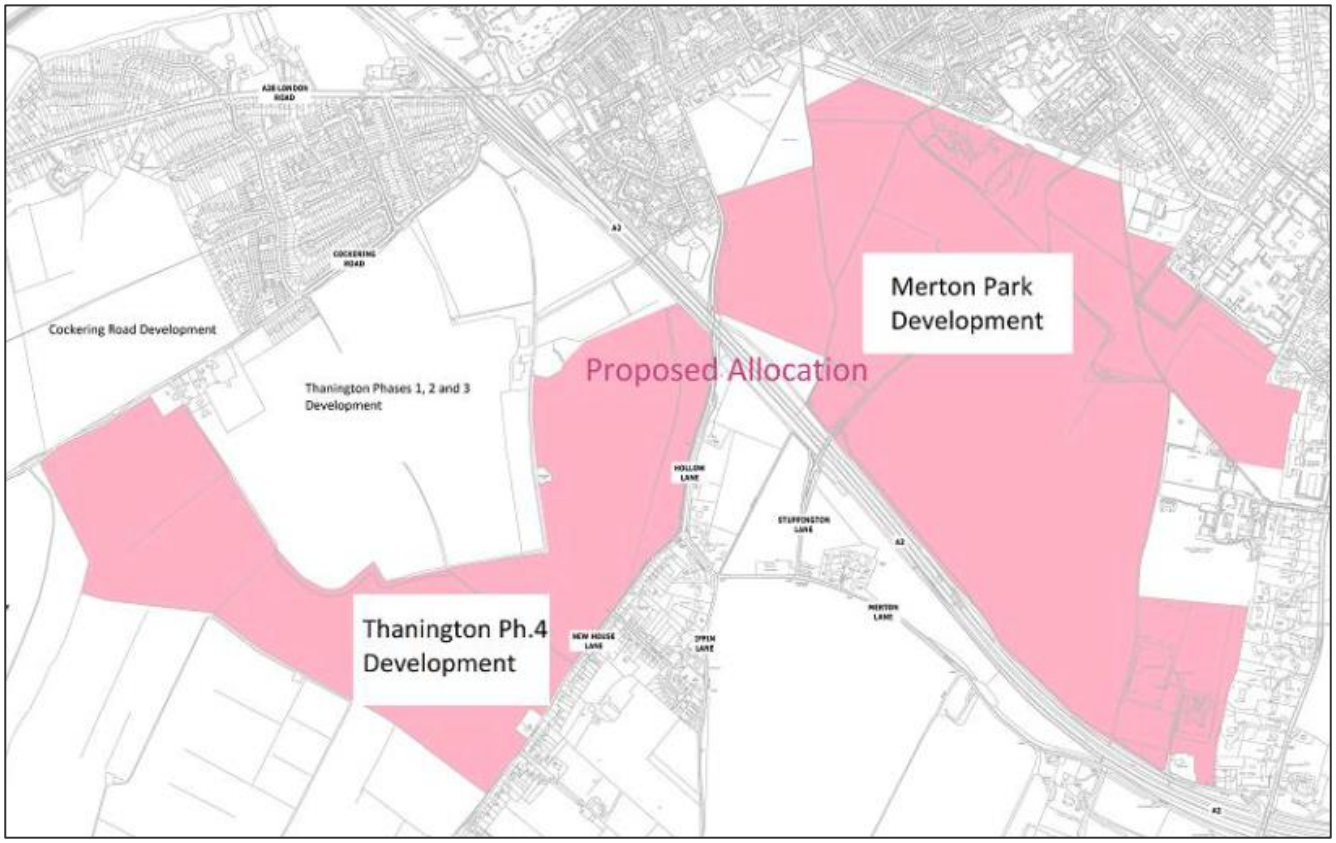


Figure 5: Merton Park and Thanington Phase 4 Developments Location Map

Base Model performance in the Merton Park modelled area has been enhanced using survey data, newly available since the initial base model development. Also, network coding around the proposed development location and the zoning system have been reviewed. Additional zone connectors, connectors weights and junctions have been added in the network where it was necessary to improve link count performance. Further details on the available count data and enhanced base performance can be found in the Merton Park Base Validation Technical Note (25th July 2023).

Two forecast modelling scenarios have been created for 2045 forecasting year for the purpose of the Merton Park and Thanington Phase 4 assessment, detailed as follows.

- **FY 2045 Do Minimum Scenario** represented by current 2045 LP Option 5V3 but with removed elements of the Canterbury Circulation Plan (CCP), without A2/Wincheap 4th slip and without Merton Park, Merton Park P&R and Thanington Phase 4 developments;
- **FY 2045 Do Something** represented by current 2045 LP Option 5V3 but with removed elements of the Canterbury Circulation Plan (CCP), without A2/Wincheap 4th slip but with Merton Park, Merton Park P&R and Thanington Phase 4 developments.

The primary difference between the Do Minimum and Do Something scenario is therefore the inclusion of demand and network changes associated with Merton Park (including the proposed P&R) and Thanington Phase 4 developments.

The 2045 DM and DS matrices are based on the 2045 LP Option 5V3 matrices but with modifications due to the enhancement of the Base Year (BY) Canterbury LAM. A delta matrix, as a result of comparing "original" BY Canterbury LAM matrices and updated BY Canterbury LAM matrices, was applied to the forecast year 2045 matrices.

3.1 Do Minimum

The Do Minimum network is based on the 2045 LP Option 5V3 but with elements of the Canterbury Circulation Plan (CCP) removed, removal of the Thanington Phase 4 link road infrastructure and removal of Merton Park proposed infrastructure changes, including the proposed A2 southbound off and on slips. The following 2045 CCP schemes were removed from the Do Minimum network:

- Realignment of the Eastern Movement Corridor (EMC);
- Modal filters on short cuts ("Blockers");
- Reallocation of road space for active travel;
- Speed restriction.

Figure 6 shows CCP Schemes removed from the 2045 Do Minimum network, in agreement with KCC.

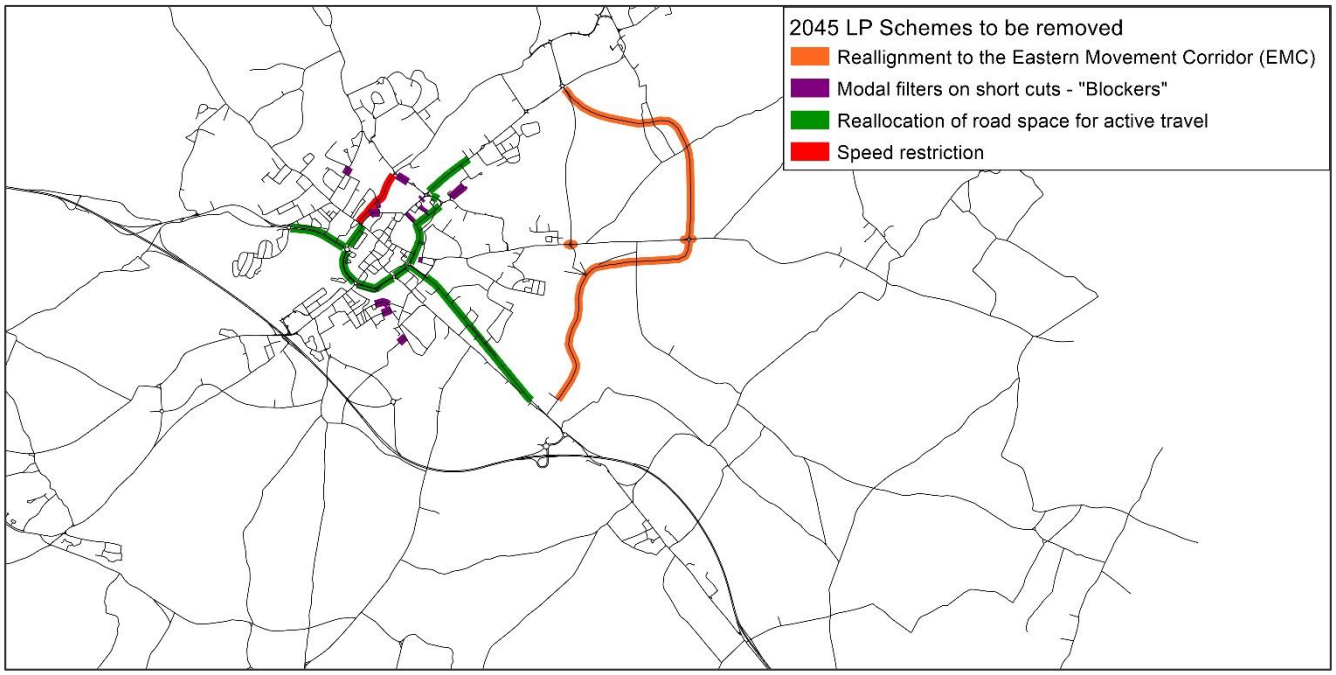


Figure 6: 2045 LP Schemes removed from DM network.

Additionally, in the DM scenario, the Merton Park P&R is assumed to not exist which means journeys are no longer going to the P&R site and, instead, are driving into the City Centre to park. To reflect this in the model, equally weighted connectors have been added from the P&R site to all zones in the City Centre. The origin and destination demand for zones related to Merton Park and Thanington Phase 4 are zero in the DM.

3.2 Do Something

The Do Something road network is based on the Do Minimum network described above with the addition of infrastructure schemes for the Thanington Phase 4 and Merton Park developments. Eleven schemes are presented in **Figure 7**.

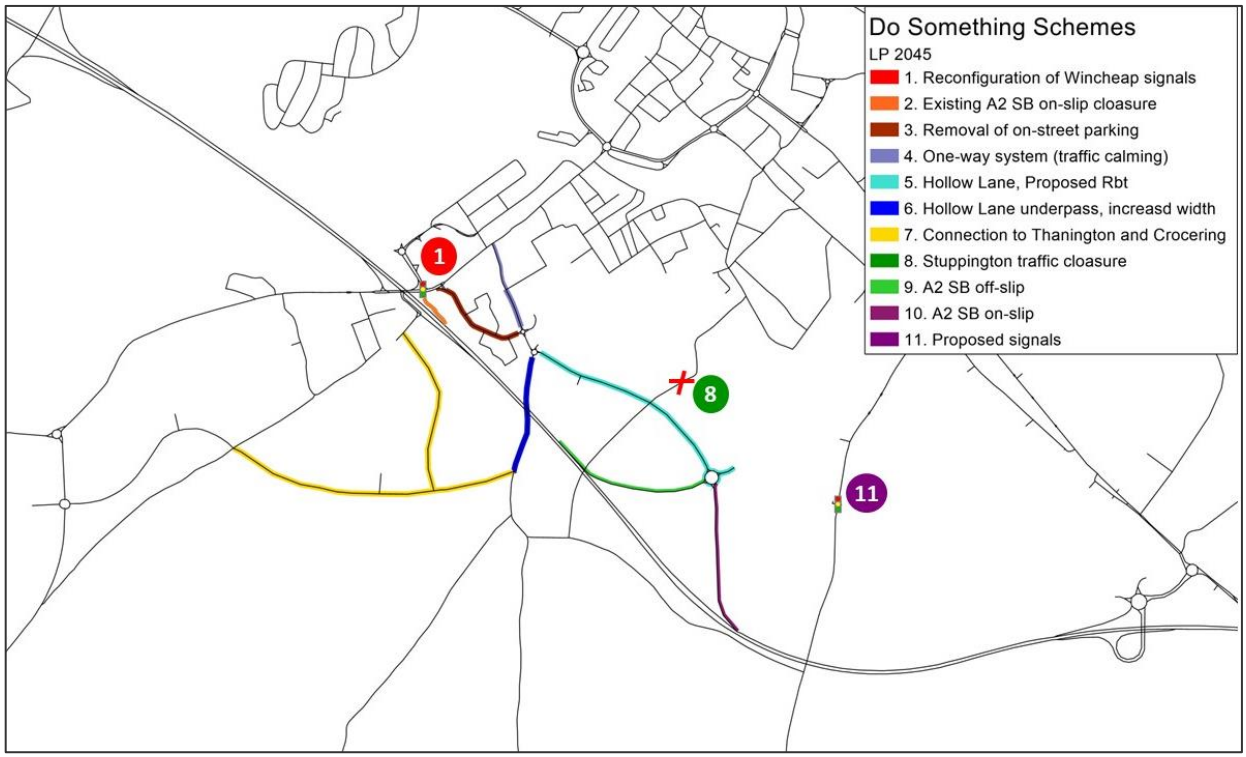


Figure 7: 2045 Do Something LP Schemes.

In the DS scenario, the Merton Park P&R is assumed to exist within the development itself. To reflect this in the model, private vehicle journeys are entering/exiting the network at the P&R site and users will transfer to public transport for access to the City Centre (not modelled within the Canterbury LAM). In the DM scenario the P&R zone has connectors to the City Centre (**Figure 8**) however in the DS there is a single connector to the proposed Hollow Lane roundabout only (**Figure 9**). Similarly, the Merton Park development is connected to the proposed Hollow Lane roundabout (**Figure 9**). Whilst Thanington Phase 4 is connected to Cockering-Thanington proposed connection road (**Figure 9**).

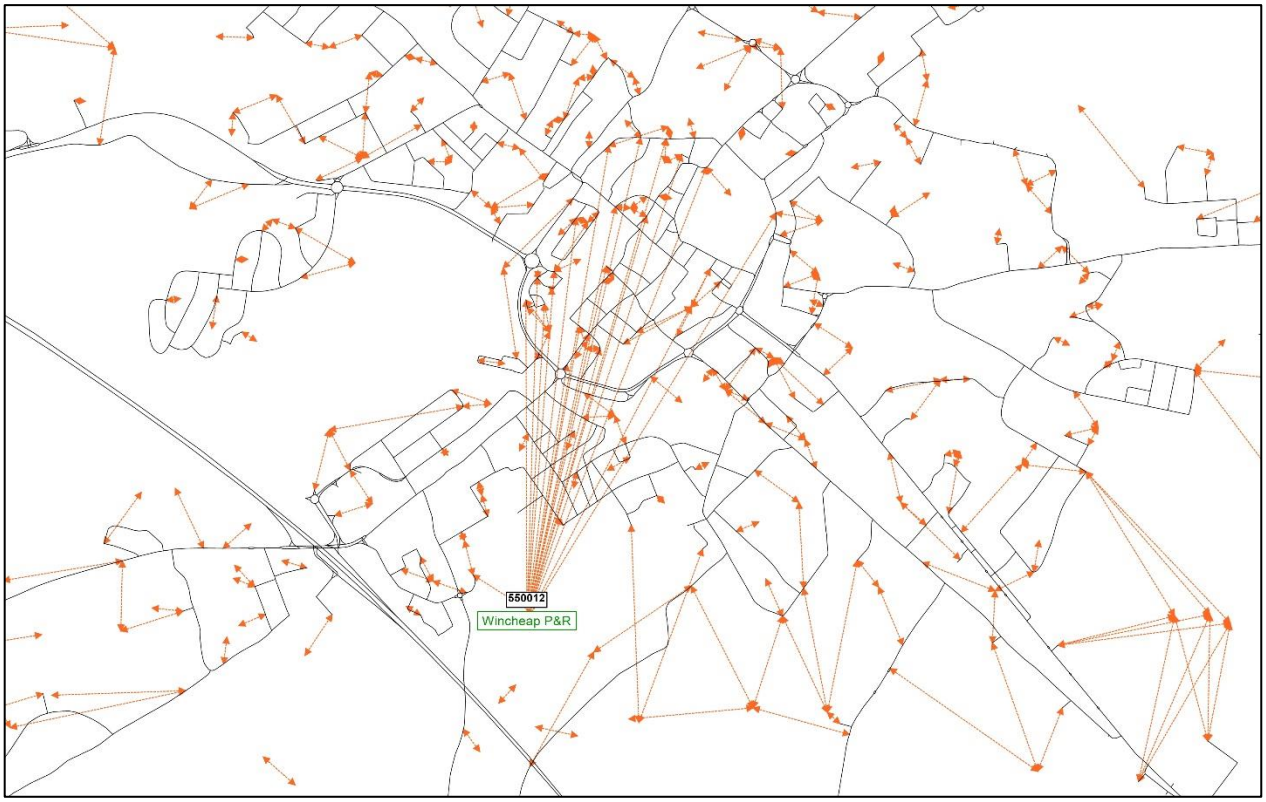


Figure 8: DM connectors

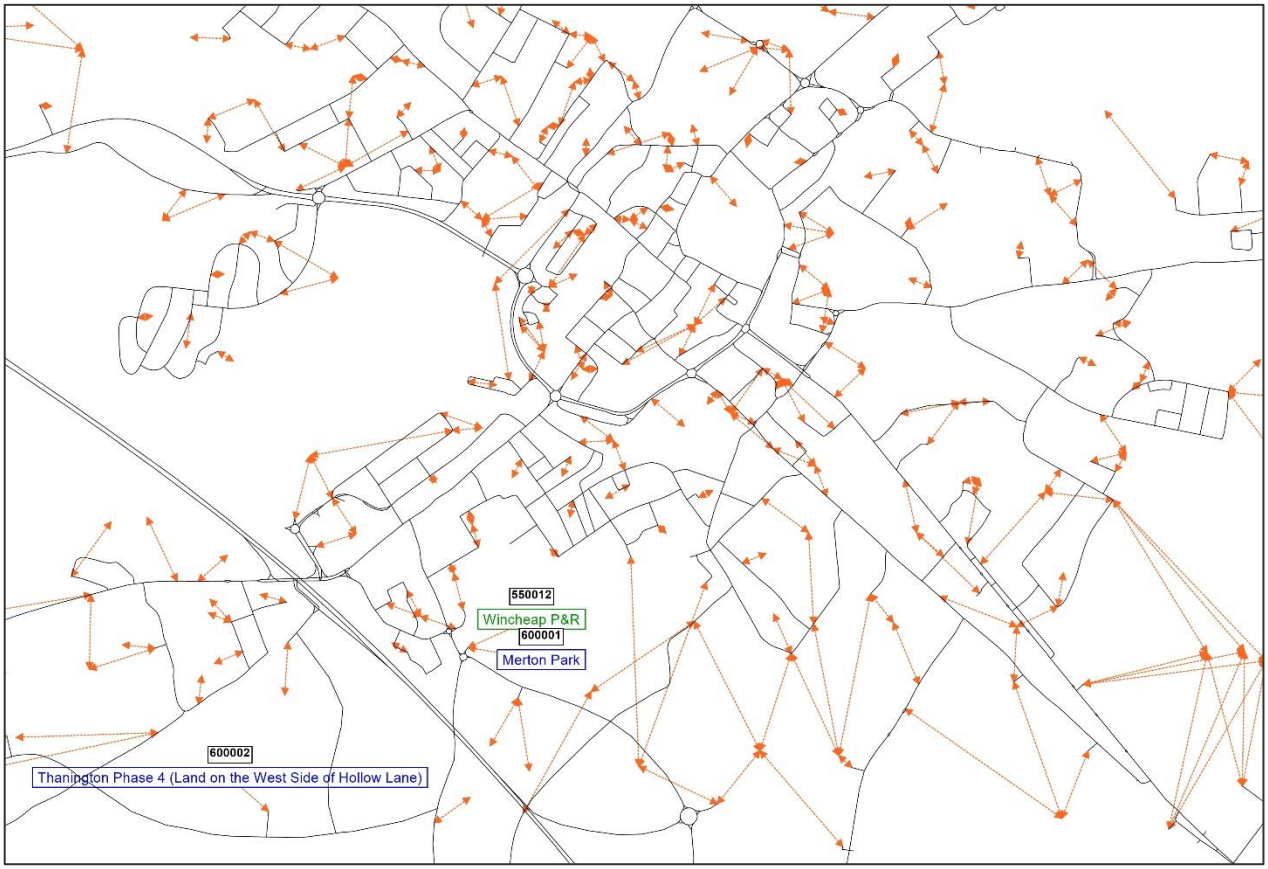


Figure 9: DS connectors

3.3 Development Quantum and Trip Generation

In order to calculate the number of trips generated by the Merton Park and Thanington Phase 4 developments, the same trip rates accepted for use in calculating development trips in the earlier 2045 Canterbury forecast models were used. There were no other land uses or employment included within the trip generation for the Do Something. The generated trips were reduced by 5% for sustainable travel, furthermore Merton Park had a 5% internalisation reduction. A potential for cycle mode share reduction, PCT, was also applied. This is consistent with the methodology used for the development of the 2045 LP Option 5V3. The final number of arrivals and departures for residential land use that were generated for AM and PM Peak periods are shown in **Table 1**.

Table 1: Arrivals and Departures from Merton Park and Thanington Phase 4 Developments

	Development Type	*Development Quantum*	*TOTAL*			
			AM		*PM*	
			Departures	*Arrival*	*Departures*	*Arrival*
Merton Park	Residential Units (30% of which affordable)	2,075	**536**	**268**	**359**	**495**
	Retirement Homes	210				
Thanington Phase 4	Residential Units (30% of which affordable)	735	**213**	**82**	**101**	**196**
	Retirement Homes	75				

3.4 Development Trip Distribution

For each new development zone, a donor zone from the base year was chosen to duplicate its trip pattern. As far as possible, the selected donor zone was the one that shared the same land use as the development zone, and it was located in reasonable proximity to the zone. This process was undertaken in order to accurately replicate the trip distribution of the developments' zones.

For the Merton Park development trip distribution, a donor zone 118790, which is located in close proximity to the proposed development location, was used to synthesize the pattern of trips to/from the development.

For the Thanington Phase 4 development trip distribution, a donor zone 162916, which is located in close proximity to the proposed development location, was used to synthesize the pattern of trips to/from the development.

Flow bundle plots for the Merton Park and Thanington Phase 4 developments have been produced to demonstrate the distribution of both origins and destination trips from and to the Merton Park and Thanington Phase 4 zones in both peaks. These are shown in

Figure 10 to **Figure 17** respectively.

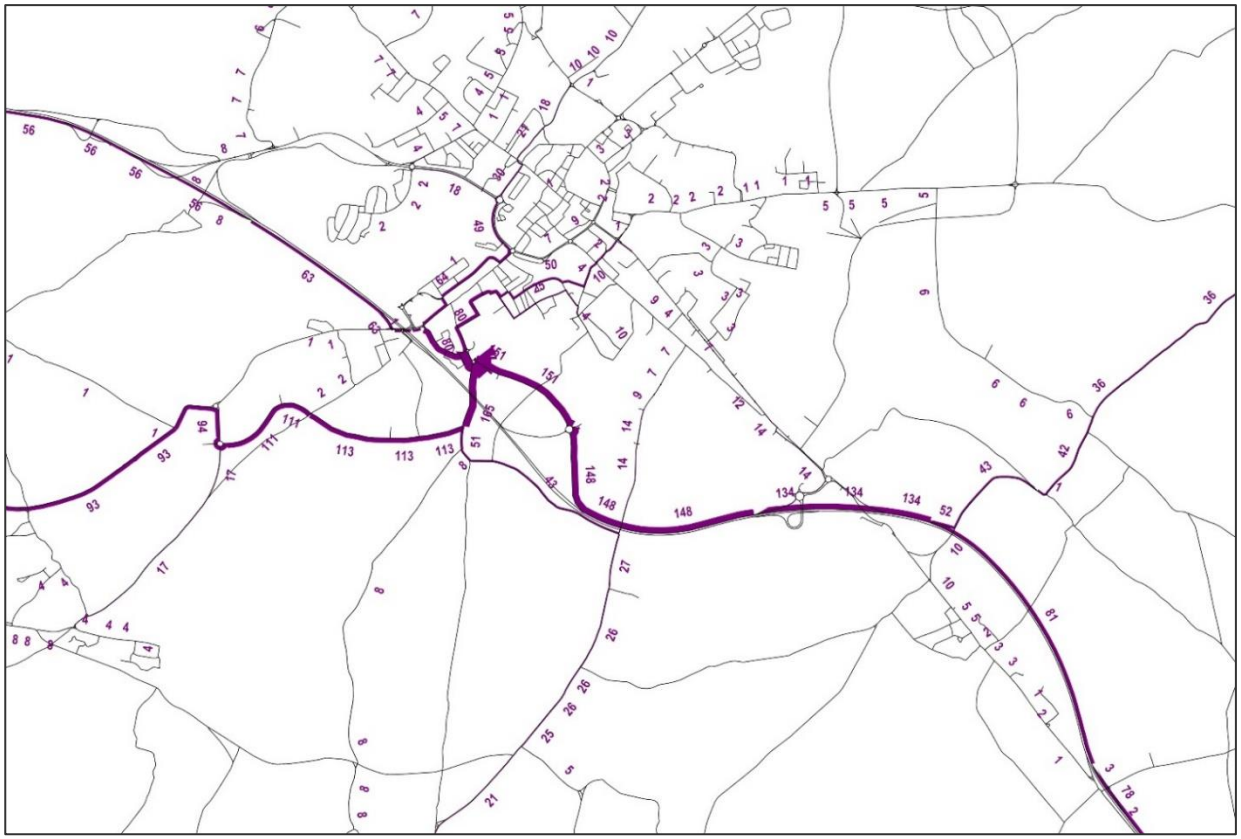


Figure 10: AM Origin Flow Bundle from Merton Park development (DS)

Figure 11: AM Destination Flow Bundle to Merton Park development (DS)

In the AM peak, modelled trips originating from the Merton Park development travel approximately 28% towards destinations to the east along the A2, 18% towards the south-west (along A28) and 15% to Canterbury City centre. Trips arriving at the development travel approximately 51% from the east along A2 (then via Homersham and Hollow Lane from Wincheap), 8% from Canterbury City Centre, 11% from the south-west (along A28) and 12% from the west along A2.

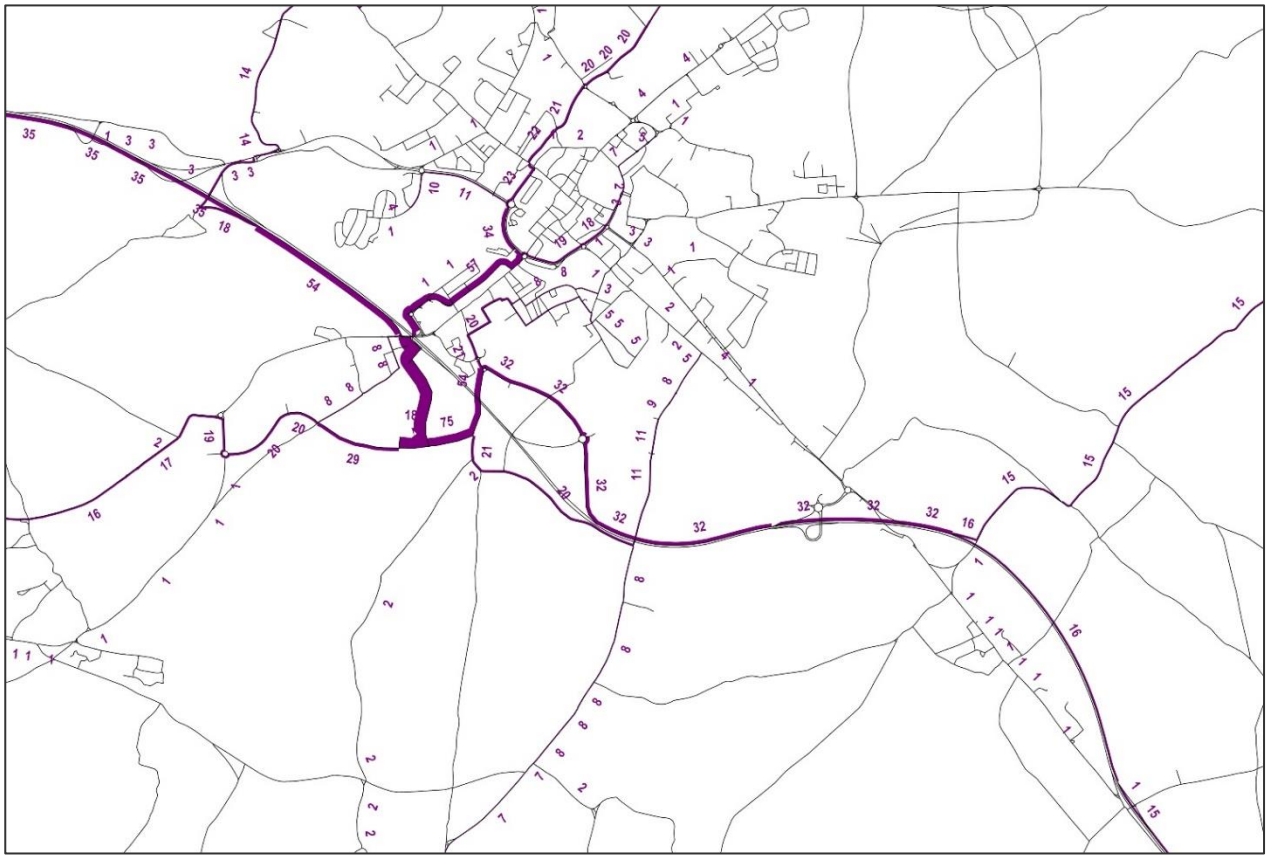


Figure 12: AM Origin Flow Bundle from Thanington Phase 4 development (DS)

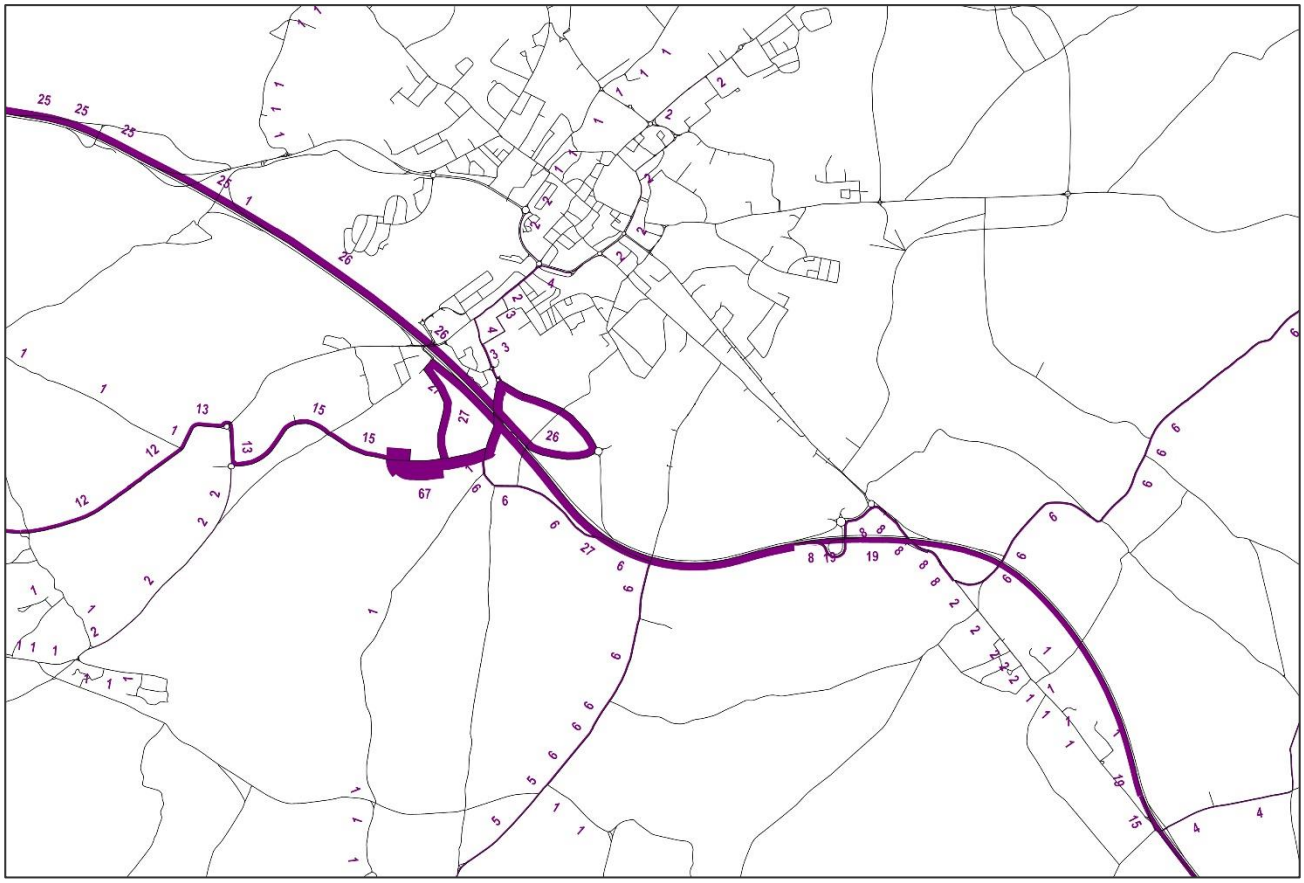


Figure 13: AM Destination Flow Bundle to Thanington Phase 4 development (DS)

In the AM peak, modelled trips originating from the Thanington Phase 4 development travel approximately 27% towards Canterbury City Centre direction, 25% towards west along A2,15% to the east direction along the A2 and 9% to the south-west (along A28). Trips arriving at the development travel approximately 32% from the west along A2, 33% from the east along A2 and 16% from south-west.

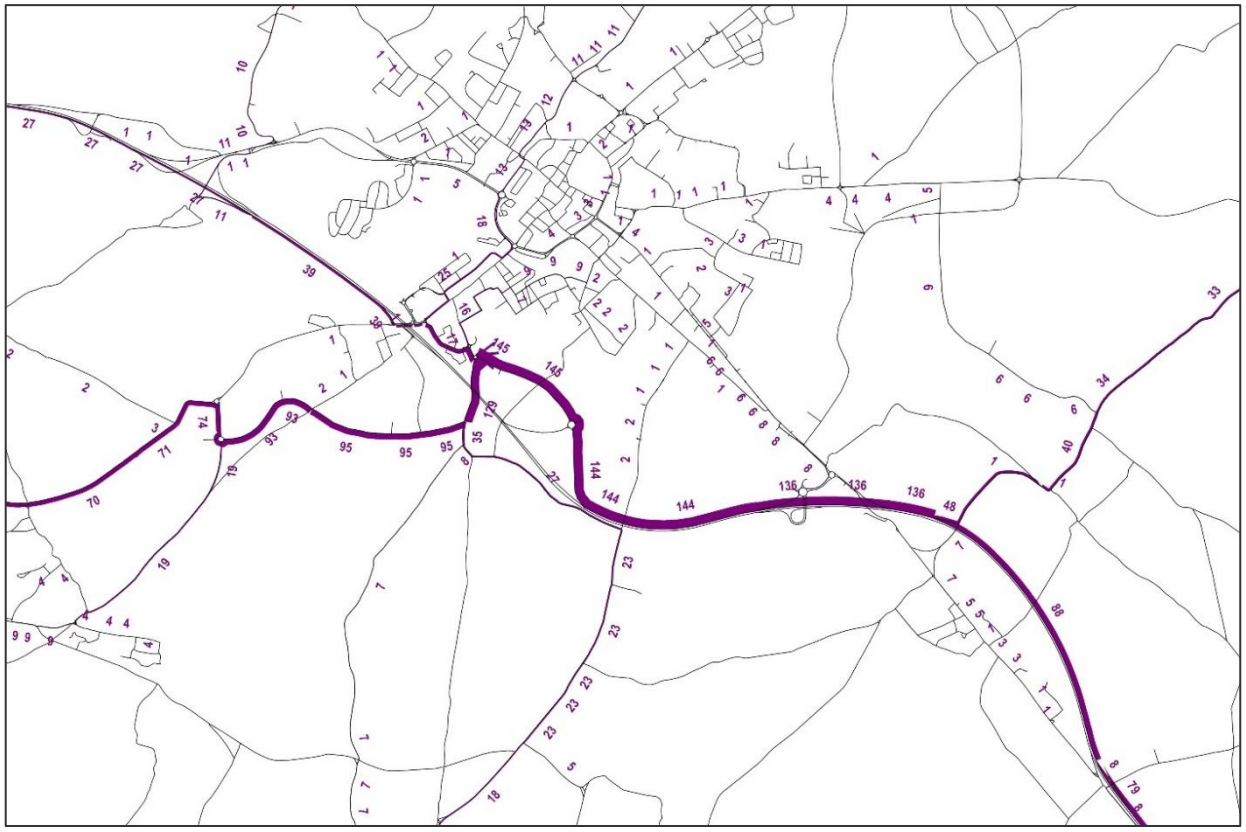


Figure 14: PM Origin Flow Bundle from Merton Park development (DS)

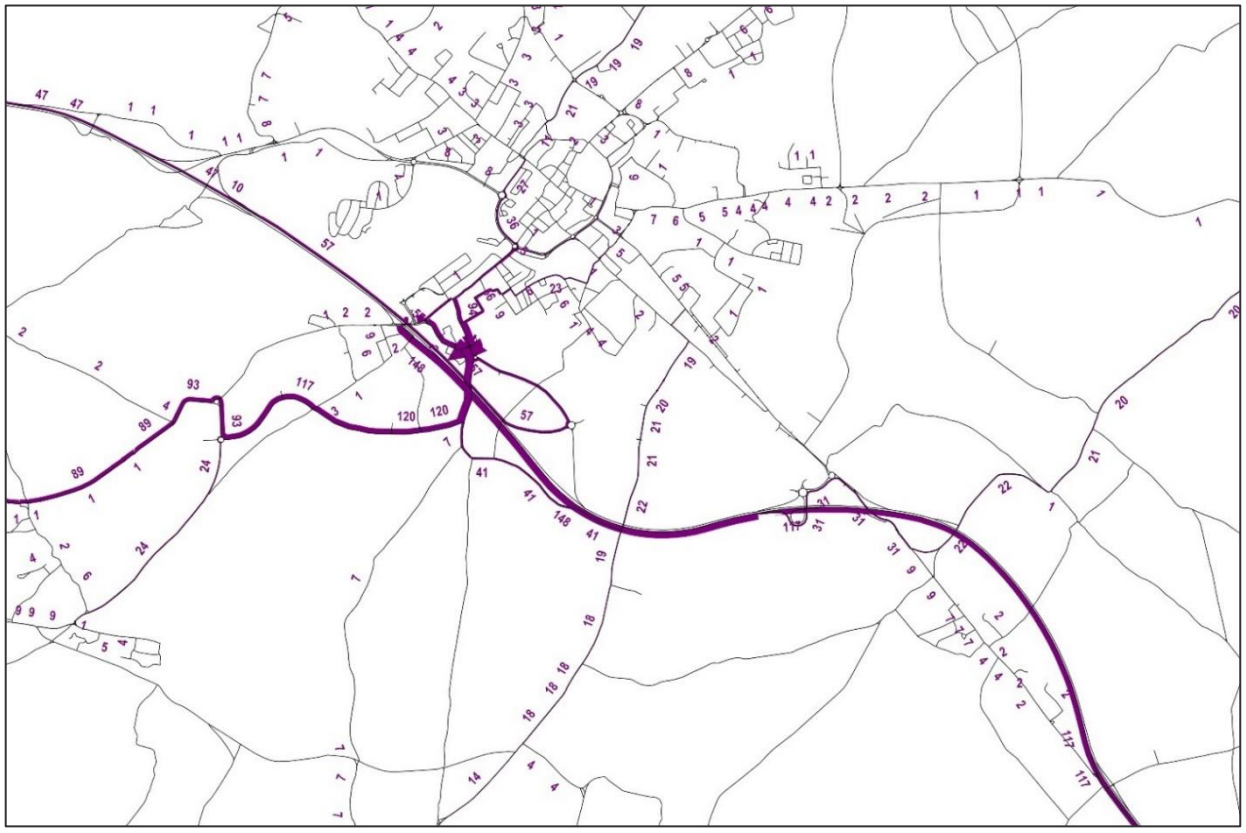


Figure 15: PM Destination Flow Bundle to Merton Park development (DS)

In the PM peak, modelled trips originating from the Merton Park development travel approximately 40% towards destinations to the east along A2 and 21% towards the south-west. Modelled trips arriving at the development travel approximately 19% from the south-west, 30% from the east and 12% from west along A2.

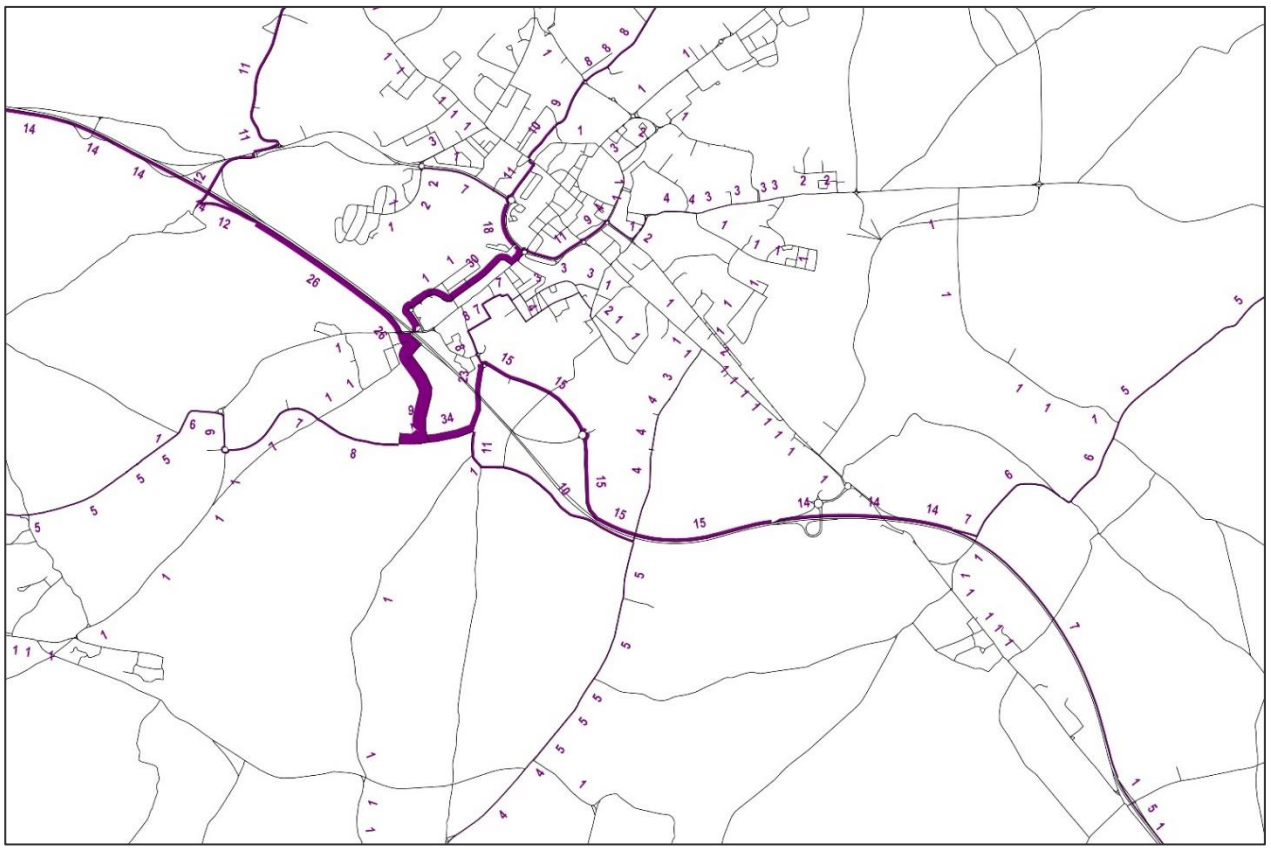


Figure 16: PM Origin Flow Bundle from Thanington Phase 4 development (DS)

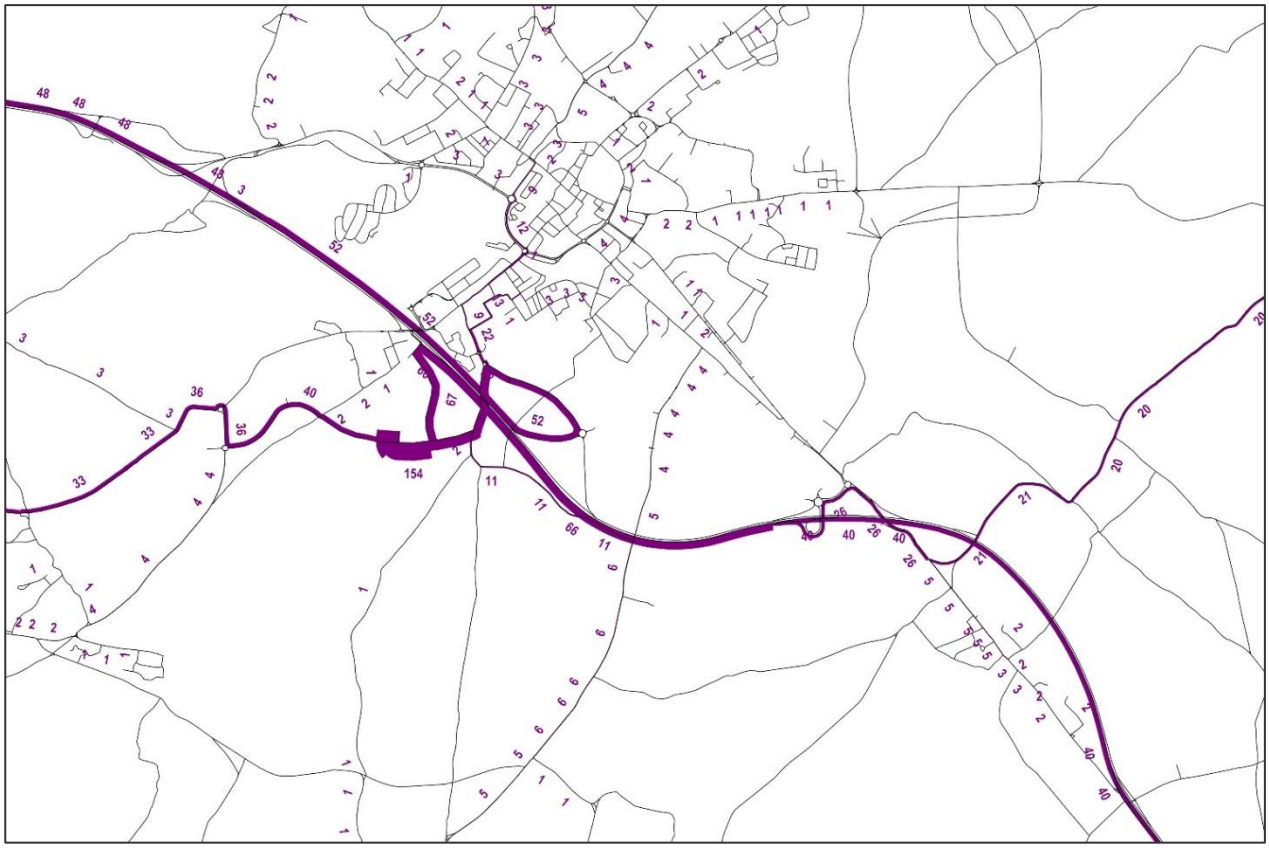


Figure 17: PM Destination Flow Bundle to Thanington Phase 4 development (DS)

In the PM peak, modelled trips originating from the Thanington Phase 4 development travel approximately 30% towards Canterbury City centre, 26% towards the west along the A2 and 15% to the east along A2. Modelled trips arriving at the development travel approximately 27% from the west along A2, 34% from the east along A2 and 18% from south-west.

4 Assignment Results

A set of output plots and tables has been produced to show actual flows, flow differences and Level of Service (LoS) in order to help identify key areas of constraint arising from the development and the associated infrastructure.

4.1 Actual Flow Plots

Actual flow plots for the 2045 Do Minimum (DM) are presented in **Figure 18** and **Figure 19**.

Figure 18: 2045 AM Actual Flow – Do-Minimum Scenario

Figure 19: 2045 PM Actual Flow – Do-Minimum Scenario

In the AM, the highest traffic flows in the closest vicinity of the proposed developments are modelled along the A2 with approximately 2,150 and 2,650 vehicles travelling to the east and west respectively. Traffic flows along A28 are approximately 500 vehicles travelling to the north and 600 vehicles travelling to the south. Traffic flows along Nackington Road are approximately 750 vehicles traveling to the north and 350 vehicles travelling to the south.

In the PM, about 2,350 vehicles travelling to the east and 2,100 to the west are observed along the A2. On A28, approximately 500 and 550 vehicles are moving in the northbound and southbound direction respectively. The flows on the Nackington Road shows northbound traffic of approximately 400 and 450 vehicles in the northbound and southbound direction respectively.

Actual flow plots for the 2045 Do Something (DS) scenario are presented in **Figure 20** and **Figure 21**.

Figure 20: 2045 AM Actual Flow – Do-Something Scenario

Figure 21: 2045 PM Actual Flow – Do-Something Scenario

4.2 Flow Difference Plots

Flow difference plots for the 2045 Do Something (DS) Scenario are presented in **Figure 22** and **Figure 23**.

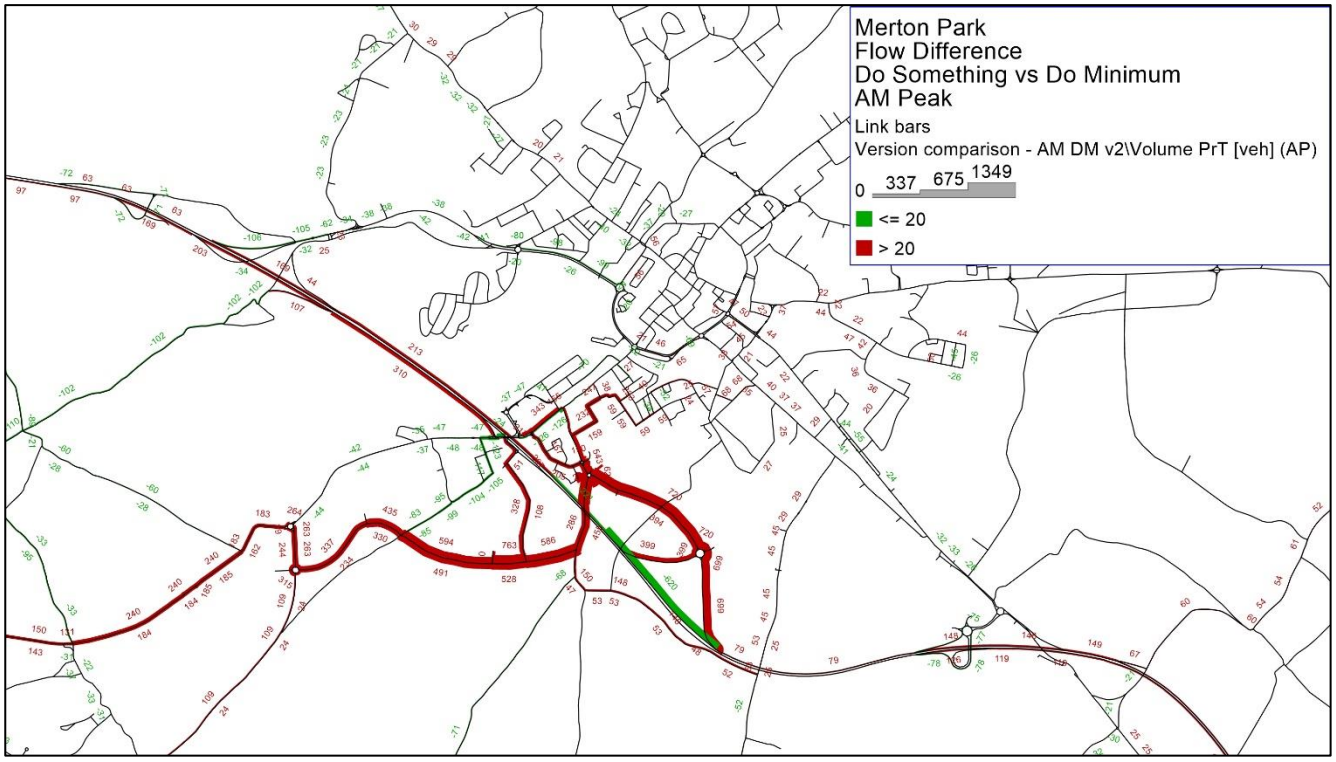


Figure 22: 2045 AM Traffic Flow Difference (DS vs DM)

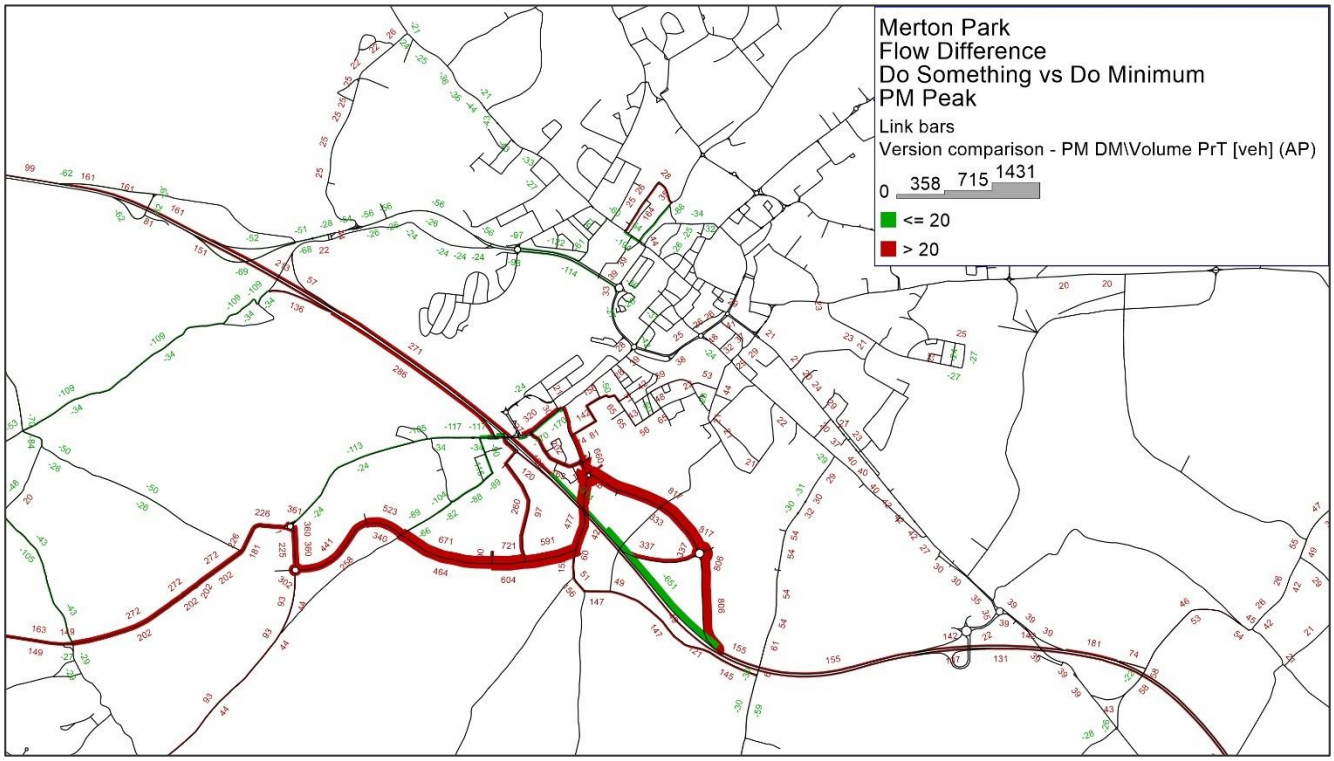


Figure 23: 2045 PM Traffic Flow Difference (DS vs DM)

It is predicted that during the AM and PM peaks, modelled traffic flows eastbound on the A2 between Wincheap and the proposed A2 on-slip at Merton Park will decrease in the Do Something scenario when

compared with the Do Minimum, this is consistent with the A2 on-slip being relocated from the A28 to Merton Park. The Thanington and Cockering link road has flows from the south-west which are accessing the A2 from the Merton Park on slip. In the AM and PM peak there is increased flows eastbound after Merton Park.

There are predicted increases along the A2 in both directions north of Wincheap and Ashford Road west of the Thanington and Cockering link road some of this traffic is demand to or from the proposed developments whilst some of this is reassignment. There are also predicted increases along Homersham, Hollow Lane and local roads from Hollowmede; whilst a majority of these increases are accessing Merton Park development or P&R some are using these routes to access the A2 eastbound (approximately 175 vehicles in the AM and 230 vehicles in the PM). The other vehicles accessing the new A2 on- slip eastbound from Stuppington Lane from the new Cockering-Thanington link road (approximately 350 vehicles in the AM and 400 in the PM) or from the Merton Park development or P&R (approximately 175 vehicles in the AM and 200 in the PM).

4.3 Junction Level of Service and Link Volume vs Capacity plots

PTV VISUM defines the LOS based on the mean delay experienced by each vehicle. The outputs provided show the lowest Level of Service at each node, displaying levels B to F. The descriptions for each Level of Service the LOS from level A to level F are in Table 2.The outputs provided indicate where there could be delay, and could be investigated with local junction models (e.g. LinSig).

Table 2: Level of Service Descriptions

LoS	Description
A	Level A represents the best quality of traffic where the driver has the freedom to drive with free flow speed.
B	Level B represents good traffic quality where driver can reasonably maintain free flow speed and manoeuvrability within the traffic stream is slightly restricted.
C	Level C represents stable traffic flows, at or near free flow. Ability to manoeuvre through lanes is noticeably restricted and requires awareness.
D	Level D represents almost unstable traffic flows. Speeds slightly decrease as traffic volume slightly increase. On this level driver comfort decreases.
E	Level E represents unstable traffic flows, operating at capacity. Driver's level of comfort becomes poor.
F	Level F represents the worst traffic quality with forced or breakdown traffic flows. Travel time cannot be predicted, with generally more demand than capacity.

Junction Turn Level of Service, Volume Capacity Ratio and Queue plots for the 2045 Do Minimum and Do Something AM Peak Scenarios are presented in **Figure 24** and **Figure 25**.

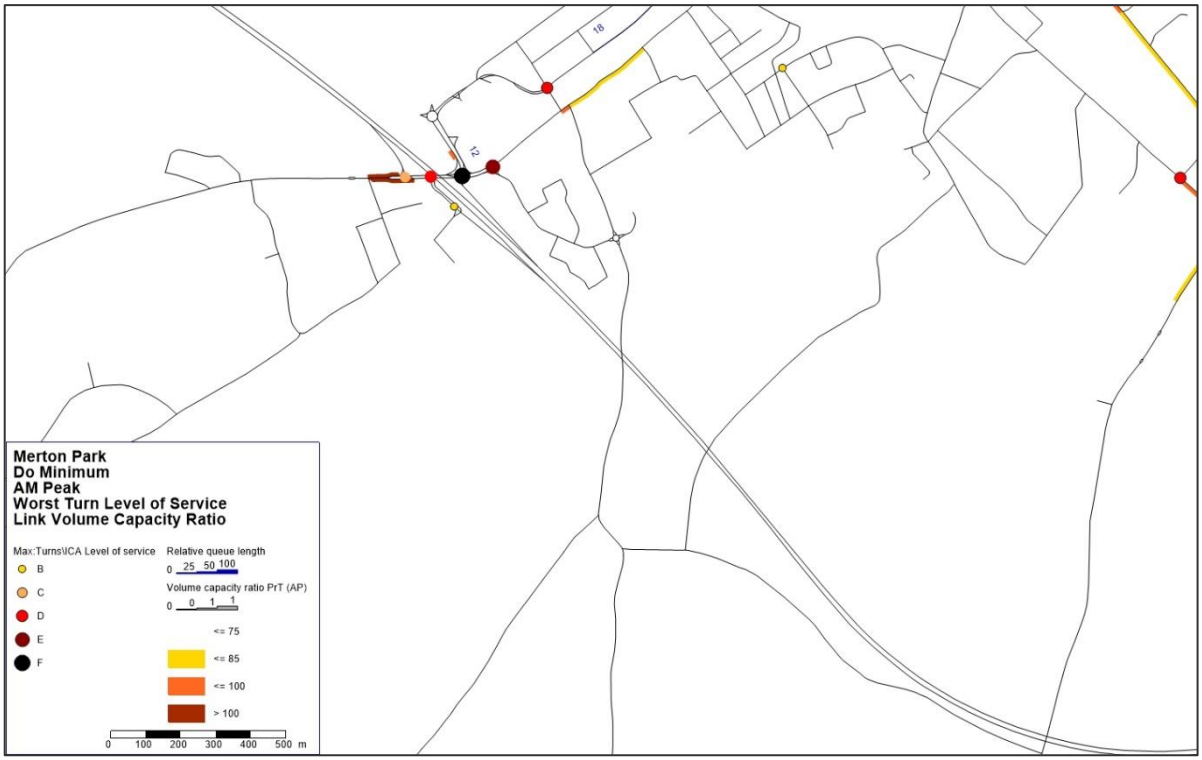


Figure 24: 2045 AM LoS – Do Minimum

Figure 25: 2045 AM LoS – Do Something

Junction turn Level of Service, Volume Capacity Ratio and Queue plots for the 2045 Do Minimum and Do Something PM Peak Scenarios are presented in **Figure 26** and **Figure 27**.

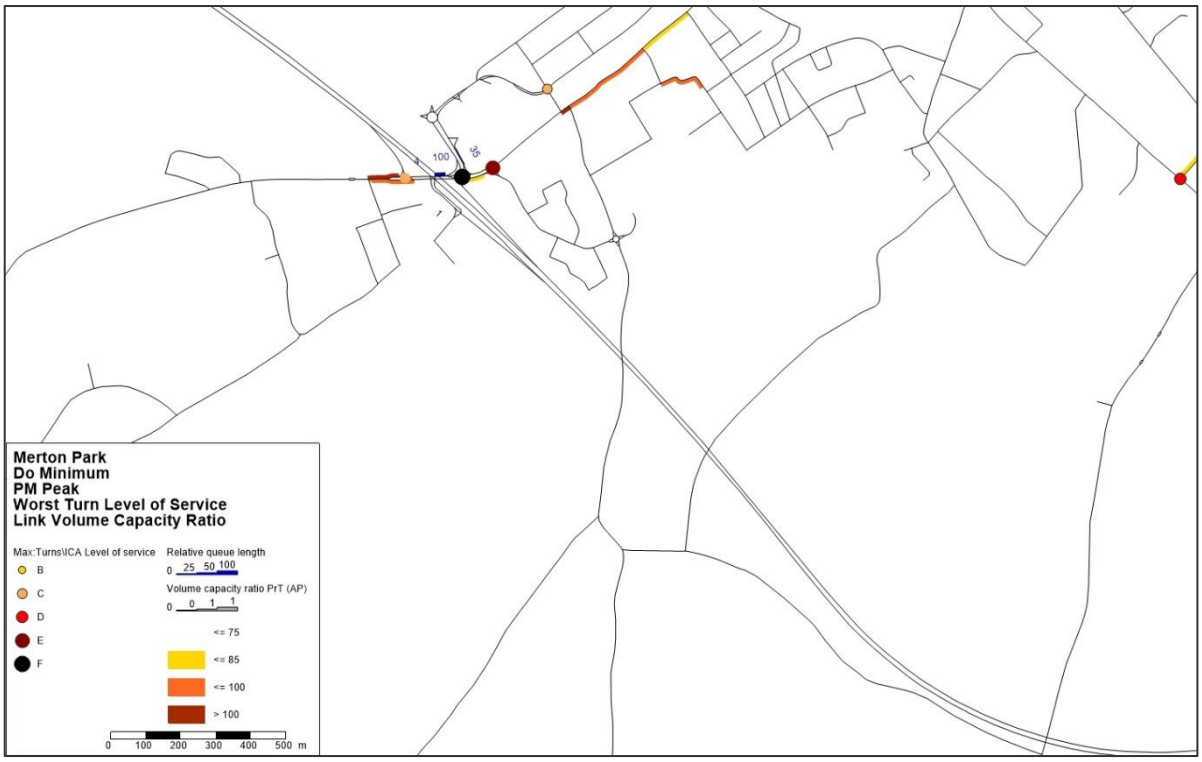


Figure 26: 2045 PM LoS – Do Minimum

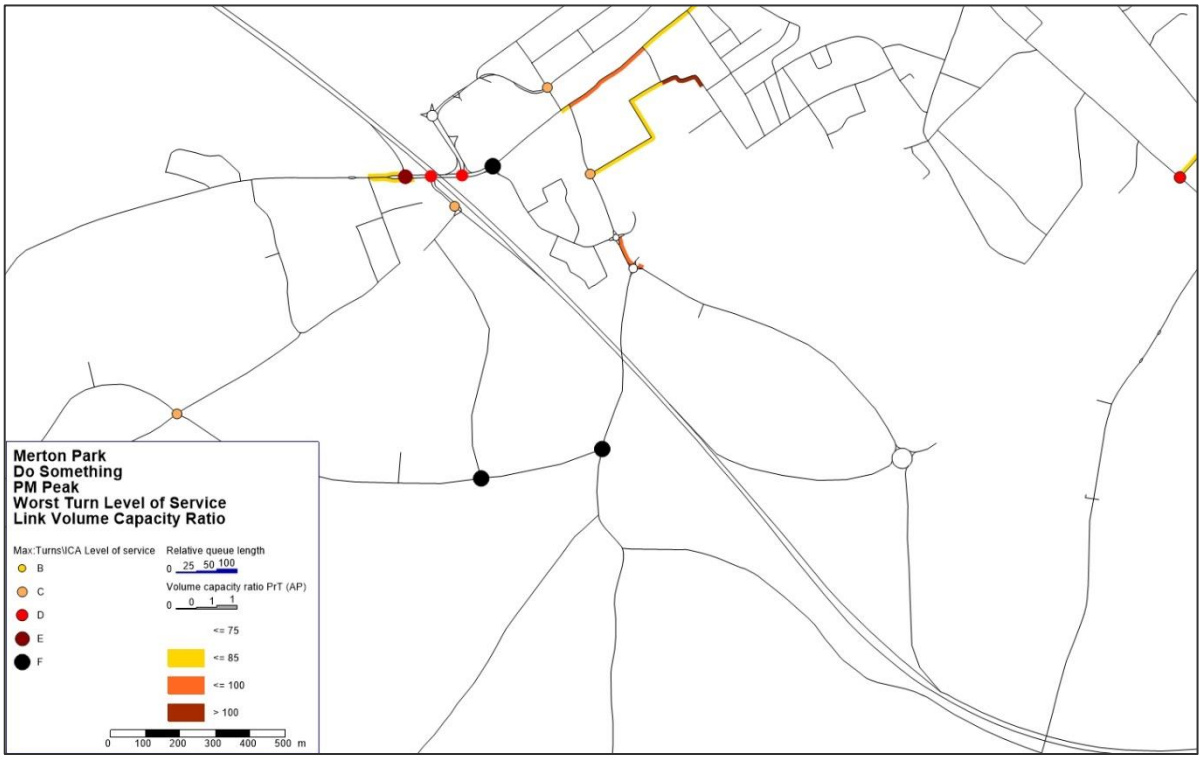


Figure 27: 2045 PM LoS – Do Something

There is predicted delay on the new Thanington/Cockering link road for approaches giving way. The approaches giving way are Loverose Way to Thanington/Cockering link road, both turning left, and right are LoS level F (both peaks); and Thanington/Cockering gives way onto Hollow Lane, both the left and the right turn are predicted to be LoS E/F (both peaks). This indicates that giving way traffic incurs a delay, this could indicate that heavier traffic than anticipated is using these routes and alternative designs could be advantageous such as a roundabout or a change of priorities. This could be explored through local junction modelling.

There is also a predicted increase in delay from Wincheap turning right into Homersham (deterioration in LoS in the AM peak from D to E and in the PM peak from D to F) and turning out of Homersham (deterioration LoS in the AM peak from D to F and in the PM peak from D to E turning right from Homersham), this is consistent with the increase in the volume of vehicle using these turns as routes to and from Merton Park and the A2. The left turn from Homersham to the A28 was already LoS E in both peaks in the Do Minimum and remained this LoS in the Do Something. Local junction modelling of this signalised junction could be beneficial.

There is also predicted delay to turn right onto the A2 westbound from Wincheap (deterioration in LoS in AM peak from C to E and PM peak from C to E) due to an increase in traffic flow on this movement (of which the majority originates at Merton Park or Thanington Phase 4); this signalised junction could benefit from local junction modelling and potentially a signal review to optimise this approach. Noting the LoS for the eastbound A28 approach at this junction in both peaks has improved from LoS C to B, due to a reduction in flow for this movement.

In both peaks, but with greater delay and lower LoS in the AM (deterioration from LoS B to LoS E in the AM peak with a deterioration of from A to C in the PM peak), there are predicted increased delays turning left from Loverose Way onto the westbound A2 off slip. This increase in delay is consistent with the predicted increase in flow with vehicles using the new route from the Thanington/Cockering link road. In the AM peak there is also a predicted deterioration for vehicles turning from the A2 off slip onto A28 Wincheap; the left turn is predicted to be LoS E (decrease from LoS A) and the right turn is predicted to remain as LoS D. There is predicted to be a queue on this approach. There is deterioration for other approaches at this junction too. In the PM peak, most of the approaches are predicted to deteriorate at this junction with the lowest LoS on the ahead westbound A28 movement with LoS deteriorating from A to D. Local junction modelling could be beneficial for these junctions.

There is a predicted deterioration in level of service for Hatch Lane ahead movement to Station Road (AM LoS from D to E and PM LoS from D to F) at the Hatch/Lane / Ashford Road/Station Road junction, as this movement is now predicted to give way to more opposing flow on Ashford Road in both directions; some of this flow with destination at Thanington Phase 4 or Merton Park, whilst other flow is reassignment from other routes.

Some roads near the Merton Park development such as Hollowmede and Hollow Lane are predicted to have a high volume compared to the capacity, this may cause some delay.

There is also a predicted increase in the number of vehicles that are predicted to be in the queue on Simmonds Road to Canterbury City Centre in the AM, predicting that Simmonds Road will be mostly queued to Cushman Road.

5 Summary of Findings

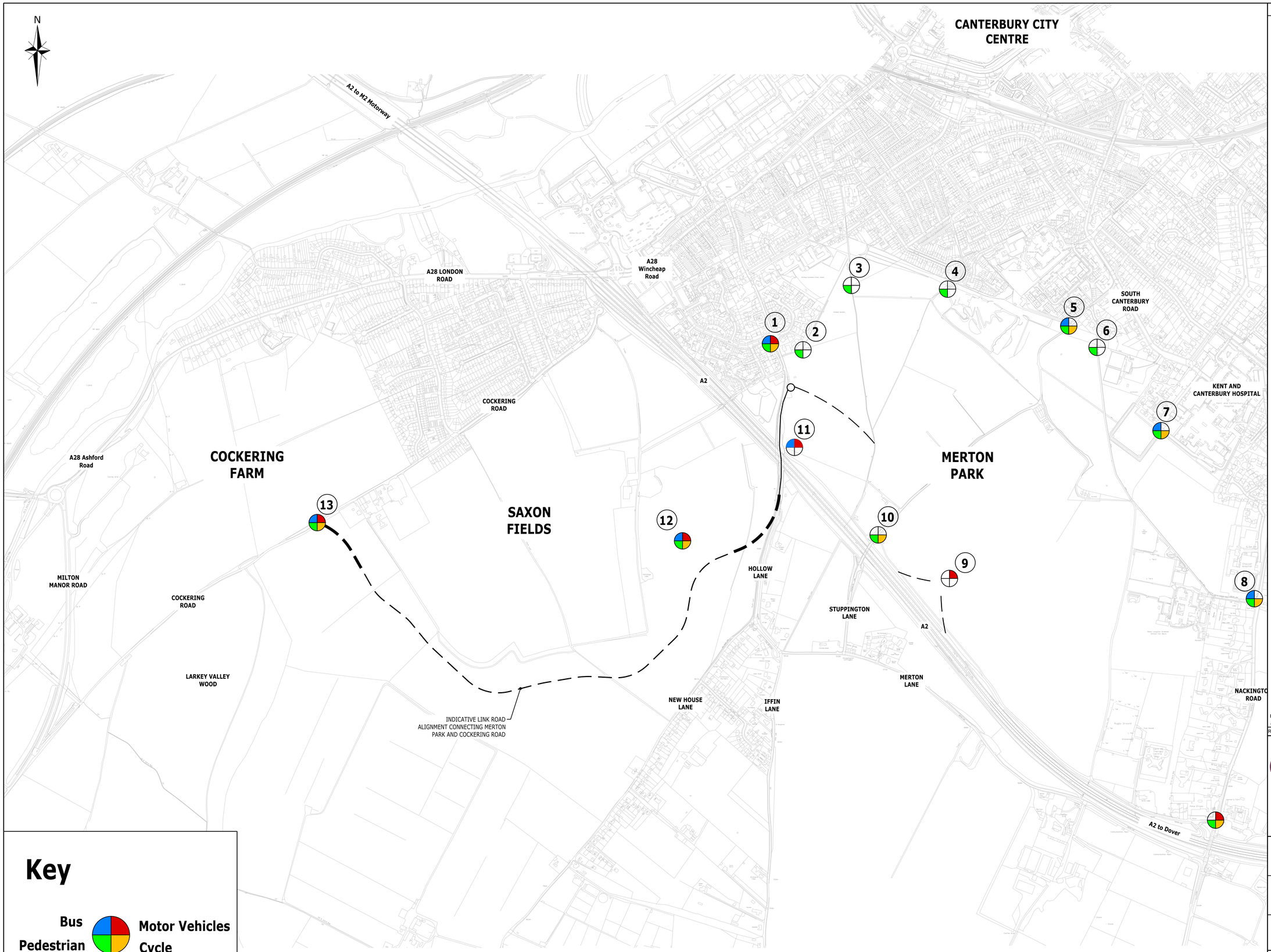
This Technical Note documents the modelling approach and assumptions used in the strategic modelling of the latest development proposals for the proposed 2,075 residential units and 210 retirement homes on Merton Park development and 735 residential units and 75 retirement homes on Thanington Phase 4 development. It provides supporting material on the Canterbury VISUM Model build and provides an illustration of future network performance with which to provide confidence in the robustness of the model and its outputs.

For this study, 2045 Local Plan model was used, incorporating the latest developer assumptions around development quantum, infrastructure and Merton Park P&R. Traffic growth and trip rate assumptions have been taken from the current forecast model and are therefore consistent with other strategic modelling studies in Canterbury.

The flow bundle plots presented in this report demonstrate that the modelled distribution of trips arriving and departing from the Merton Park and Thanington Phase 4 developments in the AM and PM peak periods are reasonable, with no undue bias or illogical routing identified. The illustrated link flow plots demonstrate the robust assignment of trips in the model commensurate with the road hierarchy.

There are predicted increases on various routes to and from the proposed developments, including sections of the A2 and A28 in both directions, as well as local roads in Wincheap and routes including the new Thanington/Cockering link road. As a result, there are turns at junctions which are predicted to experience delays and could be reviewed with local junction modelling, these include A28 Wincheap/Homersham, A28 Wincheap/A2 on-slip, A28 Wincheap/A2 off-slip, Loverose Way/ A2 off slip, and give way approaches on the Thanington/Cockering link road.

Appendix B Site Access Points



Key

Bus
Pedestrian
Motor Vehicles
Cycle

0m 100m 200m 300m
Scale 1:5000

NOTES

Rev	Amendments	Drn	Chk	App	Date
B	Updated the labels and drawing title	DA	CG	JW	May 24
A	Updated to suite latest design	GW	AT	JW	May 23

Charles & Associates

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01732 448120

enquiries@c-a.uk.com
www.c-a.uk.com

Job Title
Merton Park, Canterbury

Drawing Title
Multimodal Access

Client
Quinn Estates

Scale	Date	Designed
1:5000 @ A1	March 2023	DA
Drawn	Checked	Approved
DA	SW	JW
Job No	Drawing No	Rev
22-022	22-022/015	B

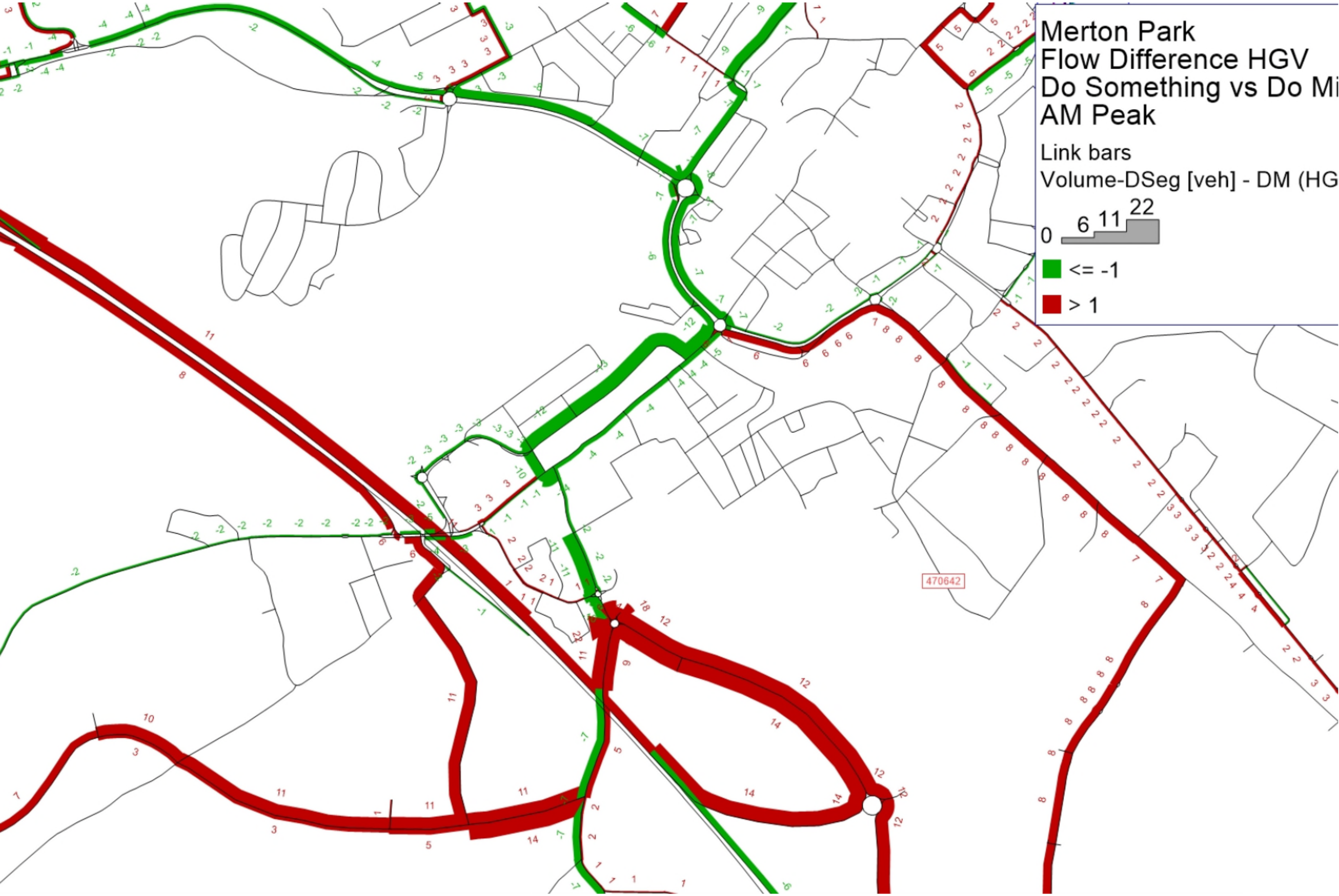
Appendix C HGV Flow Plots

Merton Park
Do Something
AM Peak

Link bars
Volume-DSeg [veh]

0 89 177 354


Merton Park
Do Something
PM Peak
Link bars
Volume-DSeg [veh]
0 59 117 235


Merton Park
Flow Difference HGV
Do Something vs Do Mi
AM Peak
Link bars
Volume-DSeg [veh] - DM (HG
0
6
11
22
<= -1
> 1
470642

Merton Park
Flow Difference HGV
Do Something vs Do Mi
PM Peak

Link bars
Volume-DSeg [veh] - DM (HG

0 3 6 11

<= -1

> 1