



Canterbury Local Plan Evidence Volume 2 - Traffic Impact Assessment

Policy N1 - Merton Park, Canterbury

22-022-014 Rev A

October 2025

Document Control Sheet

Project Name:	Policy N1 - Merton Park, Canterbury
Project Number:	22-022
Report Title:	Canterbury Local Plan Evidence Volume 2 - Traffic Impact Assessment
Report Number:	014

Rev	Issue Purpose	Author	Checked	Reviewed	Approved	Date
-	Draft	AT/CG	SW	CG	JW	12/03/25
A	Local Plan Focused Consultation	CG	JW	CG	JW	21/10/25

C&A Consulting Engineers

Park House, Park Farm
 East Malling Trust Estate
 Bradbourne Lane
 Aylesford, Kent
 ME20 6SN
 Tel: 01732 448120

Landmark House
 Station Road
 Hook
 Hampshire
 RG27 9HA
 Tel: 01256 630420

enquiries@c-a.uk.com



Contents

1	Introduction	1
1.1	Overview	1
1.2	Report Purpose	2
2	Assessment Methodology	4
2.1	Overview	4
2.2	Uncertainty in Forecasting and Vision-Led Planning	4
2.3	Monitoring and Management	7
2.4	The Aspirational Scenario	7
2.5	Summary Methodology	8
3	Methodology Assumptions	10
3.1	Introduction	10
3.2	Source Demand Data	10
3.3	Propensity for Sustainable Travel	11
3.4	Realistic Targets	13
4	Proposed Access Strategy	15
4.1	Vehicle Access Strategy	15
4.2	Off-Site Access Enabling Works	16
4.3	Access Assessment	16
5	Impact on the wider network	18
5.1	Introduction	18
5.2	Impact of Stuppington Lane Filter	18
5.3	Wider Development Impact	22
5.4	Flows from Hollow Lane Access	23
5.5	Flows from Nackington Road Access	25
5.6	Summary of Net Impact	28
6	Next Steps and the Role of ‘Monitor and Manage’	29
6.1	Agreement on the Aspirational Forecast Scenario	29
6.2	Supporting Mitigation	29
6.3	Additional Scenario Testing	29
6.4	Monitor and Manage	32
Appendix A	Local Junction Assessments	33
Appendix B	Strategic Modelling	34

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 Local Plan (2040). This is Volume 2 of the evidence and should be read alongside Volume 1 - Sustainable Transport Strategy.
- 1.1.2 In 2025 CCC carried out a Regulation 18 consultation on the Local Plan (2040) which included the neighbouring sites C6 “Merton Park” and C7 “Land north of Hollow Lane”, both being promoted by Quinn Estates as a combined sustainable urban extension to Canterbury. It had been anticipated that CCC would move latterly to Regulation 19 stage and as part of this, the promoter had been actively engaged with both CCC and Kent County Council (KCC) in the preparation of transport evidence to support those draft allocations. However, in the summary of 2025 CCC instead reverted to Regulation 18 stage with a ‘focused consultation’ on a revised Local Plan strategy. This retained Merton Park, now referred to as Policy N1, but removed the Land north of Hollow Lane site. This change in strategy is understood to have been informed by concerns raised by KCC Highways – in particular with respect to perceived concerns regarding residual traffic impact when considered alongside the draft CCC Transport Strategy.
- 1.1.3 In this context, this report demonstrates the evidence for continuing allocation of Policy N1, but accompanying representations¹ show that there are opportunities for further sustainable development by reinstating the Land North of Hollow Lane site within the Local Plan strategy.
- 1.1.4 The latest draft Policy N1 is for approximately 1,930 dwellings, community facilities and associated transport services on a site between the A2 Dover Road and the Old Dover Road as illustrated below.

¹ C&A reports 22-022-015 and 22-022-016

1.2.3 An earlier C&A report² considered the implications of a more conventional, highway infrastructure led strategy more consistent with a legacy 'predict and provide' approach. This included proposed new slip-roads from the Policy N1 allocation (formerly Site C6) to the A2 and a South-West Canterbury Link Road connected to this. That assessment work identified that the infrastructure provision was disproportionate to impact arising from the development, despite the robust trip generation estimates. It identified an opportunity for the site to instead make a series of interventions to support sustainable travel, leveraging the unique locational opportunity at the site and to avoid a focus on highway infrastructure.

1.2.4 Since then, the National Planning Policy Framework has been updated to endorse the vision-led approach which has emerged in UK transport planning over the last few years. The NPPF as of February 2025 now states:

109. Transport issues should be considered from the earliest stages of plan-making and development proposals, using a vision-led approach to identify transport solutions that deliver well-designed, sustainable and popular places.

...

116. Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network, following mitigation, would be severe, taking into account all reasonable future scenarios.

1.2.5 This report therefore considers an assessment based on a vision-led approach. It focuses on a stand-alone assessment of the Merton Park (N1) policy allocation. This can be read alongside a separate assessment, submitted as part of representations to the Land at Hollow Lane site (previously site C7 superseded Reg 18 draft) considering the cumulative implications of both.

² June 2024 Reg 18 Evidence - Report 22-022-RPT-012

2 Assessment Methodology

2.1 Overview

2.1.1 As discussed above, the purpose of this report is to test the Merton Park development under a scenario more consistent with an aspirational vision for sustainable development, set out previously in the Sustainable Transport Strategy.

2.1.2 The assessment considers a Vision-led approach for the development that aims to maximise active travel and public transport use as much as possible. Although the concept of this approach is already discussed within the Sustainable Travel Strategy, that report focused on identifying the greatest potential for non-vehicle trips from the development based primarily on the site's location and the assumed travel patterns, along with the measures that could be implemented to maximises the use of such modes.

2.1.3 This assessment builds on that work to provide an evidenced forecast of residual traffic demand and impact; applying aspirational but nonetheless evidentially plausible assumptions of mode choice based on distance, route conditions and attractiveness over car.

2.2 Uncertainty in Forecasting and Vision-Led Planning

2.2.1 It is beyond the scope of this report to provide a comprehensive discussion on the importance uncertainty plays in forecasting of transport networks and critically within the vision-led approach to planning. For further information reference should be made to the following:

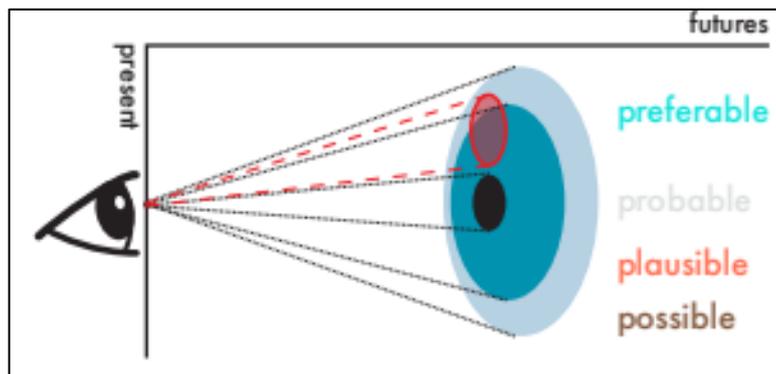
- Circular 01/2022 from DfT
- Transport Assessment Guidance (TAG) Uncertainty Toolkit from DfT
- Decide and Provide Guidance Summary from TRICS Consortium.

2.2.2 Uncertainty has always been a fundamental component of transport network modelling and forecasting – simply because the future is unknown, for a wide variety of reasons. The purpose of transport network modelling is to attempt to make a forecast of the influence certain changes in parameters may have on the network and to do so with appropriate awareness of the inherent uncertainties of doing so.

- 2.2.3 Whilst such uncertainty has always been inherent to forecasting, whether in transport network or any other system, there has historically been an overreliance on predictive abilities of such forecasts to present 'accurate' predictions of the future, against which to plan. This has increasingly led to a process known as 'predict and provide' – whereby forecast models are developed to make absolute 'predictions' of the future against which suitable 'provision' of infrastructure is made to accommodate this demand and derive a notional effective operational network. The prevalence of congested highway networks, where demand (particularly in peak periods) exceeds capacity, despite efforts to predict and provide, demonstrates the fallacy of this approach.
- 2.2.4 There are numerous reasons for these undesirable outcomes, including a misguided belief in the ability to predict the future, but also critically because of the concept of unintended consequences, most notably the propensity for provision of capacity to induce demand. A conventional response to this might be to seek to predict the induced demand (for instance making robust assumptions of growth and trip rates) – but this simply falls foul of the same issues.
- 2.2.5 The Initial Traffic Impact Appraisal report prepared for the development represents an example of the traditional 'predict and provide' approach. It makes robust forecasts of development trip generation, wider growth and assesses the impact in the context of a presumed need to manage this demand through comprehensive highway infrastructure. In isolation, this assessment would likely lead to the historical undesirable outcomes discussed above.
- 2.2.6 Vision-led planning represents a paradigm shift in the way forecasting is used to inform the decision-making process. Rather than seeking to forecast what might happen (predicting) and accordingly providing; it instead poses the question of what should be aspired to and forecasting on this basis. All prevailing and emerging national and local policy, most importantly those derived from the overarching objective of addressing the climate emergency, make clear that what should be aspired to is a maximisation of sustainable travel (active and public transport) and minimising of the use of unsustainable modes, in particular the private car.

- 2.2.7 Embracing uncertainty is critical to this process, but doing so does not mean abandoning forecasting. Forecasts of the future while uncertain, should continue to be bounded by the plausibility of the assumptions. It may be that the vision of a development or planning strategy is to maximise the use of active travel, and in this context, it would be technically 'possible' to assume that all trips would be conducted by active travel, resulting in no car-based trip generation. However, doing so would in many cases not represent a reasonable forecast assumption for decision making. Conversely, it would be possible to assume that there was no active travel demand at all. Conventionally, forecasting has looked to current or historical observations to inform a single assumption for such a parameter. This constrains the forecasting and the outcome to those historical trends and, when considered alongside the accepted implications of 'predict and provide', prevents progress towards the aspired outcome.
- 2.2.8 To embrace uncertainty means to accept the principle of multiple scenario testing, with each scenario being considered plausible. In this regard, 'plausible' means to be realistic and supported by reasonable evidence – but not singular – and should be contrasted with 'possible' as discussed above. As the future is not predetermined and is inherently unknowable, it would be flawed to assume that any one plausible outcome is more likely than another – so no one scenario is 'correct'.

Figure 2.1 – Extract from TRICS Decide and Provide



- 2.2.9 In the context of decision making, this uncertainty can be seen as a challenge. Conventionally there has been a deference to robustness; focusing on what 'could' happen and being constrained by the probable (based on historical trends). Fundamentally vision-led planning seeks to focus instead on what 'could' happen (the plausible) and furthermore, what 'should' happen (the aspiration).

2.3 Monitoring and Management

- 2.3.1 Given the uncertainty in trip rate forecasting, it is important to monitor transport conditions going forward, such as through annual surveys on key highway links, and then manage these with interventions only if these are required by the actual conditions, as opposed to implementing all potential measures at the start of the development and finding that some are ultimately not needed. This is endorsed in the TRICS Decide and Provide Guidance:

The traditional approach to TAs and TSs does not prescribe Monitoring & Evaluation (M&E). Yet M&E is key in being able to respond to uncertainty in a changing world. Strong planning should include design provision that allows for adaptation over time – in response to changing circumstances. Rather than designing for the ‘worst’, design instead is focused upon intending to achieve the ‘best’ while being prepared to respond, through the build-out period and ongoing changing behaviours, to what may further be required.

2.4 The Aspirational Scenario

- 2.4.1 In the context of the above discussion on uncertainty, the earlier *Initial Impact Traffic Appraisal* (As submitted in response to the previous Regulation 18 draft) remains a plausible forecast, but it is also one bound by historical trends, robust assumptions of development demand and most importantly, a presumption of the need to provide significant highway infrastructure for development of this scale.
- 2.4.2 That assessment was based on the draft Regulation 18 allocation for the development, which presumed a level of highway infrastructure and demonstrated that this could work. However, it also suggested that the infrastructure provision was likely disproportionate to the development requirements (even under robust forecasting assumptions) and risked being counterproductive to aspirations of maximising sustainable travel patterns.
- 2.4.3 This report moves on to consider another plausible scenario, one more aligned to that aspiration, building on the work set out in the Sustainable Transport Strategy. It remains however realistic and critically evidenced. It also reflects the current revised draft Regulation 18 Local Plan subject to consultation in October 2025.
- 2.4.4 As indicated earlier it important to note that this assessment is not presented as a replacement or alternative singular prediction of the future. It complements the initial traffic appraisal and will likely be complemented by further scenarios in due course to provide a comprehensive assessment to inform decision making. These next steps are discussed further towards the end of this report.

2.4.5 This 'aspirational scenario' is intended to inform decision making regarding the scope for development at Merton Park (N1) to maximise sustainable travel opportunities and reduce counter-productive highway infrastructure.

2.5 Summary Methodology

2.5.1 The methodology adopted for this assessment provides that evidence-led approach that seeks to quantifiably assess the travel demand context to allow forecasting of the aspirational mode split (and thus residual car trip rates) that can be plausibly anticipated as an outcome from the vision-led approach outlined in the relevant transport strategy.

2.5.2 Volume 1 - Sustainable Travel Strategy discussed the maximum potential travel sustainability for the development, providing a very optimistic scenario that sits on the very edge of the plausibility envelope.

2.5.3 By applying reasonable assumptions to the maximum potential, a more realistic scenario is produced that sits between the two extremes of ultra-sustainable and D&P approaches and has a higher level of plausibility.

2.5.4 By breaking down the assumptions, a higher level of confidence is provided as the variables are easier and more tangible to consider and estimate. The disaggregation of the assumptions also provides a tangible way to link interventions to anticipated outcomes. By breaking down the assumptions to subsets it is feasible to correlate cause with effect.

2.5.5 With reference back to earlier discussions on uncertainty in forecasting, it must be nonetheless accepted that these represent estimates, as are all assumptions in forecasting. However, in disaggregating the assumptions to smaller and more manageable parts, the uncertainty is reduced and more demonstrable.

2.5.6 In contrast a traditional approach to seeking to forecast changes in travel behaviour to account for improved sustainability would be a top slicing of all vehicle trip demand by a determined percentage. In simple terms, this represents one, large estimate, as compared to the approach in this report which makes a greater number of smaller, evidenced and tangible estimates.

2.5.7 It is reiterated here the importance of having a sound appreciation of the principle of uncertainty in forecasting when considering the merits of this method. This method does not seek to achieve certainty in forecasting – as to do so is logically impossible and can never be achieved in any forecasting on an unknown future. Rather it, seeks to provide more confidence in the estimates made, linking them back to local context, tangible evidence and pragmatic practical limitations.

- 2.5.8 At a more detailed level, the approach adopted for this assessment considers each origin-destination trip to/from the development separately. In this way, it is easier and more credible to make assumptions for trips to the city centre, based on existing conditions and the proposed sustainable measures, than generic assumptions regarding all trips.
- 2.5.9 The following section of this report sets out the approach taken to deriving the assumptions for the aspirational forecast scenario.

3 Methodology Assumptions

3.1 Introduction

- 3.1.1 Volume 1 - Sustainable Transport Strategy provides the maximum potential for the site in terms of eliminating car trips as much as possible. This remains constrained by practical reality – for instance it did not assume that people would consistently walk further than 2km to reach a destination – but it did assume that where destinations are within walking distance, everyone would do so. It is acknowledged that while this presents a ‘possible’ outcome, it falls outside of what most would consider ‘plausible’. Nevertheless, it is considered a valuable step in identifying the potential of the site based solely on its location and its proximity and connectivity to anticipated destinations.
- 3.1.2 Taking this further, a number of assumptions were adopted for each origin/destination (OD) pair to help establish the realistic target for sustainable travel to and from the site. Where the maximum potential considered only distance, for this exercise other factors like quality of the route and attractiveness over the car were taken into account – along with assumptions of general propensity to use such modes.

3.2 Source Demand Data

- 3.2.1 In order to identify travel patterns and attraction areas, OD matrices from the Strategic Model for Canterbury were interrogated, with focus on the trips to and from the development zone. It is accepted of course that the strategic model is itself a forecasting tool and includes its own inherent uncertainties. However, it represents a strong evidential basis upon which to start making assumptions on further mode shift (beyond those inherent in the model itself).
- 3.2.2 Examination of the OD matrices also helped identify the OD pairs and routes that could be more affected by interventions both in the form of improving the quality of walking and cycling routes as well as improving the travel time for PT (which for the purposes of this exercise translates as quality) – by means of bus service diversion or reduction of walking time as a result of the introduction of the fast bus service through the site.
- 3.2.3 Strategic models differentiate vehicle trips in user classes based on trip purpose. The user classes for cars, when excluding HGVs and LGVs are:
1. User Class 1 (UC1) – car commute,
 2. User Class 2 (UC2) – car employers business,
 3. User Class 3 (UC3) – car other.

3.2.4 It was considered that the trips that could be made by sustainable mode instead of car involved only User Classes 1 and 3, while trips under User Class 2 were more difficult to affect.

3.3 Propensity for Sustainable Travel

3.3.1 While the overall sustainability uptake of an OD pair is a combination of the two most attractive modes available for the specific pair/route, the sustainability uptake for each mode was calculated based on three parameters:

1. Distance:

- For walking and cycling the actual distance from the site to the destination was inversely proportional to the propensity to walk/cycle.
- For Public Transport, travel time was considered instead – both actual time on the service and walking time to/from PT stops/stations.

2. Route Quality:

- For walking and cycling, route quality was assessed based on walking and cycling audits undertaken on site, as shown in Chapter 3 of the Sustainable Transport Strategy. The audit scores were adjusted on routes where improvements are proposed within the STS.
- For Public Transport, the quality of the service was assessed based on the frequency of the service. For buses, 1 service per hour was considered sub-standard, 2 services per hour average, while 4 services per hour, either by a single bus or for destinations served by multiple bus lines, the quality was considered excellent. Connectivity to the city centre was also enhanced due to the proposed fast bus connection. For train services, 1 train per hour was considered average with 2 trains being assessed as good.

3. Attractiveness over Car Travel: this considered the levels of existing congestion on the network as well as available parking at the destinations. For example, walking was considered more attractive than car for destinations within the city centre as it would avoid congestion or parking charges - both important constraints against car trips to the city centre. Nevertheless, for trips to less congested areas closer to a mile (i.e. 21-22 minutes walking), where parking was not a constraint, car trips were faster than sustainable modes and thus more attractive.

3.3.2 For each sustainable mode the parameters were weighted differently as shown below. It is important to note that this weighting is applied in addition to the assumptions of distance limitations for active travel modes. While distance is generally considered a key factor for walking and cycling, in this case this has already been considered as such modes were only identified as an available travel option within their respective catchment areas, with walking destinations up to 1.6 km from the site and cycling from 1.6km to 5 km. No further weighting was applied within this, so a walking journey of 800m was considered to be equally attractive as one over 1600m. Introducing such weighting would have been particularly onerous to the complexity of the methodology and would be contrary to the aspirational principles which accept that walking should be primary mode for under 1600m trips.

3.3.3

Table 3.1: Parameter Weighting

	Distance	Quality	Attractiveness over car
Walking	20%	70%	10%
Cycling	10%	50%	40%
Public Transport	60%	10%	30%

3.3.4 For walking, the quality of the routes, as defined by the route audits template, was considered the key factor to weight against car trips, when considering that this involved trips of up to 1 mile.

3.3.5 For cycling, it was acknowledged that cyclists with different levels of confidence exist, so quality is very important, but equally not everyone would be convinced to cycle even under the best route conditions. Which is why the attractiveness over the car is almost equally important.

3.3.6 For Public Transport, it was considered that the travel time was the most crucial factor, and as travel time by PT interrelates with the attractiveness over car, although the attractiveness was considered a major factor, it got a lower weight as the two values were not mutually exclusive. Quality came last, as it wasn't considered as highly constraining a factor as the other two parameters.

3.3.7 When assessing the attractiveness of each sustainable mode, the site location as well as the proposed connectivity to the existing network was taken into account.

3.4 Realistic Targets

- 3.4.1 Building on the maximum potential of the site, as discussed above, more plausible assumptions are determined by considering the propensity for sustainable travel. For this exercise, up to two modes were assumed per OD pair.
- 3.4.2 For trips within 1 mile, cycling was not considered an attractive option as it was assumed that for short trips walking was a more likely option. Equally, for trips greater than 1 mile, walking was not accounted for, although in reality the ability to walk to one's destination is not constrained within the 1-mile catchment area. Nevertheless, cycling, for distances of up to 5 km, and PT, where applicable providing more likely alternatives.
- 3.4.3 For destinations where more than two options were available, a prioritisation was applied based on distance. Walking and cycling were the first option for destinations within their respective catchment areas, whereas for multiple PT options the alternatives with reduced walking distance to the corresponding PT stops/stations was applied (if both a bus and a train served the same route, whichever was most easily accessed was assumed preferable).
- 3.4.4 Each OD pair and the respective route between the site and the destination was assigned a percentage on the level of trips that are expected to be made sustainably. This is considered as the overall sustainability uptake of the route and was calculated as the sum of the uptake of the first mode and half of the uptake of the second mode. This approach was broadly adopted from the Transport for London (TfL) method for calculating Public Transport Accessibility Levels (PTAL).³
- 3.4.5 Although it is acknowledged that in the future year when the development comes forward traffic levels might be worse, existing traffic levels were considered for the attractiveness parameter. This approach avoided presenting a forecast dependent on the constraint of the wider network, beyond that already existing today.
- 3.4.6 These levels were also taken into account for bus services, making the buses equally unattractive to cars where congestion is concerned. It is understood that the Transport Strategy for Canterbury is looking to prioritise buses, but no specific plans have come forward at the time of this exercise, so it was not possible to reasonably forecast where buses might, in the future, have an advantage over cars (e.g. through bus lanes that do not yet exist).
- 3.4.7 The conclusion is that 40-45% of all peak hour trips to/from the development, previously assumed to be car based on in the strategic model, would now be made by sustainable modes

³ TfL <https://content.tfl.gov.uk/connectivity-assessment-guide.pdf>

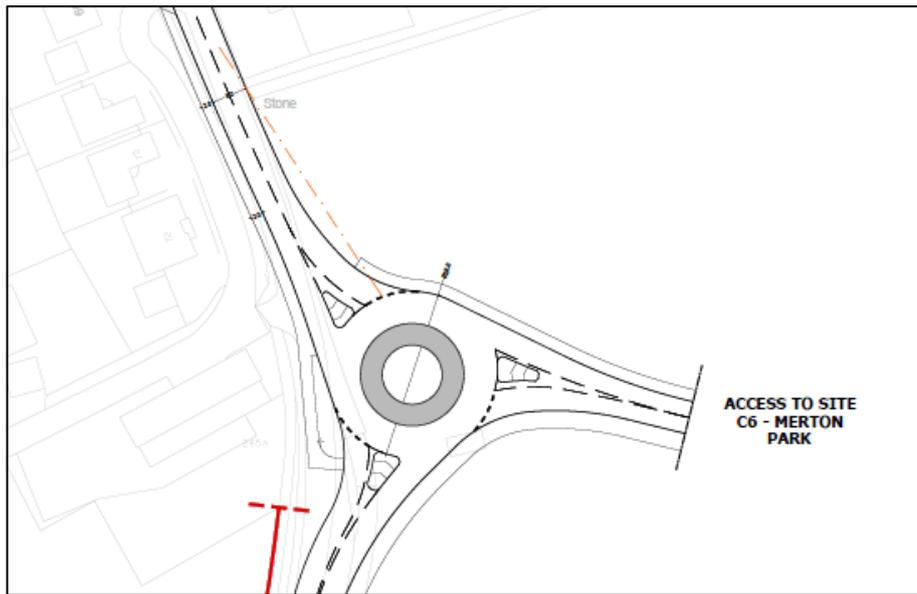
- 3.4.8 As can be seen; in applying this methodology, typical vehicle trip rates are not an input assumption to the exercise, but they can be extracted for comparison purposes. For a development of 2238 units, as discussed before, the resultant demand for the aspirational scenario, when removing the plausibly assumed sustainable travel modes from the prior vehicle trip matrix, result in net peak hour two-way vehicle trip rates of 0.18 and 0.21 vehicle trips per dwelling for the AM and PM peak hours respectively.
- 3.4.9 With reference back to the discussion on uncertainty; we can see that this aspirational scenario does not unrealistically assume that all person trips would be undertaken by sustainable modes (which would derive a vehicle trip rate of 0 per dwelling) or even that all trips that practically could be undertaken by sustainable modes would (as was set out at being some 70% of the prior vehicle trip matrix in the Sustainable Transport Strategy report). But neither does it seek to be constrained by historical trends whereby robust assumptions of what will happen in the future can only be estimated by what has happened in the past. Instead, this scenario represents a plausible, yet aspirational forecast of what should happen for a development in such a highly sustainable local, with the comprehensive suite of active and public transport interventions outlined in the previous report.
- 3.4.10 Those trips, along with the vehicular access and connectivity assumptions, were inserted again into the strategic model to allow a forecasting of the net residual consequences on the wider highway network.

4 Proposed Access Strategy

4.1 Vehicle Access Strategy

- 4.1.1 The development assumptions for this standalone assessment involve two all-modes site accesses connecting to the existing network as shown below. The first access would be a roundabout on Hollow Lane to the south of Brayesbrook Road.

Figure 4.1: Hollow Lane access



- 4.1.2 The second access would be a priority junction on Nackington Road to the north of the A2 bridge.

Figure 4.2: Nackington Road access



4.1.3 Free assignment across both accesses was modelled to allow development traffic to choose the optimal path for each OD pair, instead of forcing a fixed assignment between the two accesses. This approach allowed the model to replicate the internal development road network that will give traffic the flexibility to distribute between Hollow Lane and Nackington Road.

4.1.4 The results indicate a stronger preference of the Hollow Lane access over the Nackington Road one, with a split of around 70-30. This is considered a reasonable outcome as the Hollow Lane access provides a connection to the A2 northbound as well as the A28 westbound.

4.2 Off-Site Access Enabling Works

4.2.1 The Draft Reg 18 Local Plan reflects requirements for the delivery of additional highway works to support the access strategy, as set in the Policy N1 (e) and requiring the provision of upgrades to Hollow lane including the creation of a one-way working between the junction with Wincheap and Hollowmede, and the upgrades to Homersham including creation of off-street parking bays. These works are retained as assumptions within this modelling exercise.

4.3 Access Assessment

4.3.1 Junction capacity assessments have been carried out for the above access points and the results are shown in **Appendix A**.

4.3.2 The Hollow Lane access experiences higher levels of traffic, based on the turning movement outputs from the Strategic Model. The results below indicate that the access design would operate well within capacity.

Table 4.1: Hollow Lane Access Assessment Results

	AM Peak Hour		PM Peak Hour	
	RFC	Queue (PCU)	RFC	Queue (PCU)
1 – Site Access	0.32	0.5	0.22	0.3
2 – Hollow Lane South	0.24	0.3	0.28	0.4
3 – Hollow Lane North	0.16	0.2	0.23	0.3

4.3.3 The Nackington Road access was also assessed using the turning movements taken from the Strategic Model. The model results below indicate that the junction would operate well within capacity.

Table 4.2: Nackington Road Access Assessment Results

	AM Peak Hour		PM Peak Hour	
	RFC	Queue (PCU)	RFC	Queue (PCU)
Site Access – Left out	0.03	0.0	0.05	0.1
Site Access – Right out	0.15	0.2	0.11	0.1
Nackington Road – Right in	0.21	0.3	0.18	0.2

- 4.3.4 This exercise demonstrates that development of Site N1, focused on maximising the use of sustainable modes of travel, can be appropriately accessed without the need for direct connections to the A2 or delivery of links to the west. The junctions perform well within capacity, indicating that even if changes to development trip assignment were to be applied, there is confidence that the access strategy would still be valid.
- 4.3.5 Ideally it might be considered that further constraint to these accesses should be applied, to further dissuade use of the private car. Such active constraint could be considered latter in the development process and could be readily achieved through design changes prior to determination. However, while such an approach would be consistent with the principle of proactively encouraging non-car use – it would need to be balanced against the requirements of the highway authority and the need to demonstrate safe and secure access in accordance with national policy.

5 Impact on the wider network

5.1 Introduction

- 5.1.1 Strategic modelling of the N1 allocation has been undertaken using the Kent Transport Model is shown in **Appendix A**.
- 5.1.2 The 2040 Do Minimum (DM) scenario includes traffic associated with committed developments and committed improvement schemes across the district, as well as a reflection of emerging Local Plan growth across the district. This modelling work was undertaken at the time of the previous Regulation 18 stage and thus reflect the wider Local Plan site allocation strategy at the time. For completeness, this was a model scenario referred to as LP Option 5V3.
- 5.1.3 While it is accepted that the current Regulation 18 plan reflects an alternative land use strategy, a version of the model reflecting this was not understood to be available in sufficiently timely manner to inform this work. Albeit that the site-specific allocations are different, the use of this LP Option 5V3 model has the distinct benefit of retaining the overall quantum of LP growth across the district and therefore ensure that the assessment is appropriate cumulative.
- 5.1.4 In the vicinity of assessment site, the committed schemes include the fourth slip road at the A2/A28 junction, the Wincheap Gyratory scheme and the Cockering Farm spine road as shown indicatively below.
- 5.1.5 The development has been assessed on the basis of circa 2,000 dwellings, retaining an element of robustness despite the slightly reduced numbers in the latest draft Policy N1.

5.2 Impact of Stuppington Lane Filter

- 5.2.1 As discussed earlier, the development proposals include the filtering of Stuppington Lane within Site N1 to promote active travel between the site and Canterbury city centre and prevent through motor traffic movements. This is shown in more detail in the Sustainable Transport Strategy report.⁴

⁴ Report 22-022-013 Rev B

Figure 5.1: Stuppington Lane

- 5.2.2 Interrogation of the model outputs for the Do Minimum scenario (therefore excluding the development) indicates two-way flows of around 200-300 vehicles along Stuppington Lane for both peak periods. This does not increase significantly with the development in place as the route is capacity constrained, but regardless it is considered undesirable due to the rural nature of the route. Therefore, irrespective of the development of Site N1, its filtering as an all-modes route is considered necessary in any growth scenario and assumed for the Do Something scenario in this modelling exercise as a development deliverable.

- 5.2.3 The filtering of Stuppington Lane is considered a beneficial measure, as it mitigates the high levels of traffic anticipated by the strategic model to go down Stuppington Lane, irrespective of the rural and low-capacity nature of the link. Nonetheless, this is not without its own potential residual impacts as traffic is forecast to be reassigned by the model to alternative routes. The approach taken in the model is to assume that the filtering of Stuppington Lane would result in all traffic continuing to make the same journey, but by reassignment on to alternative routes. This is a reasonable assumption but potentially rather robust. Firstly, it assumes that the practical capacity of Stuppington Lane in the base model was realistic and that the forecast Do Minimum demand could practically have been accommodated. Secondly – it assumes that without the benefit of this route, the vehicles will continue to attempt to make the journey. Both of these assumptions are robust but should be kept in mind when reviewing the results. When considering the overall net development impact, these impacts are blended with the development's own impact. It is therefore appropriate that some separate analysis is undertaken to separate out these impacts.
- 5.2.4 A sensitivity test was therefore undertaken within the strategic modelling platform, to help identify the impact of the Stuppington Lane filtering (termed the 'refined Do Something' scenario in **Appendix B**). The figures below show the flow differences with and without the link in place.

Figure 5.2: Impact of Stuppington Lane Filtering - AM Peak Hour

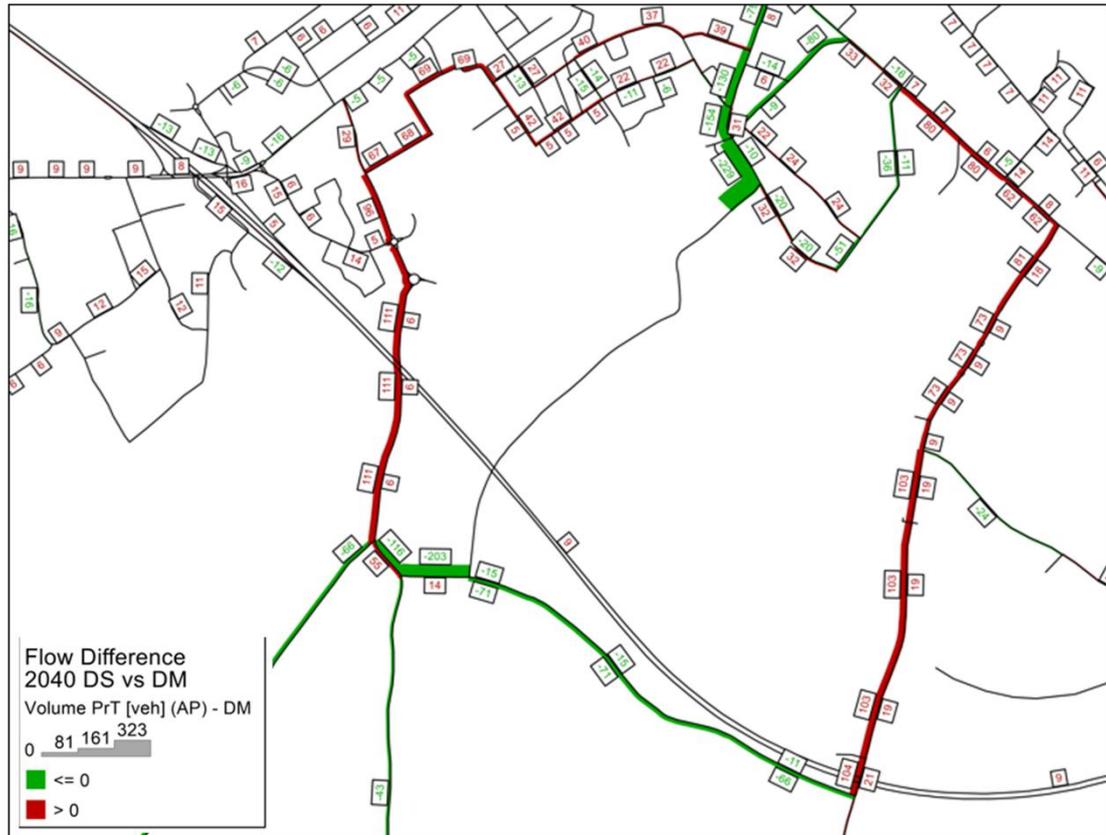
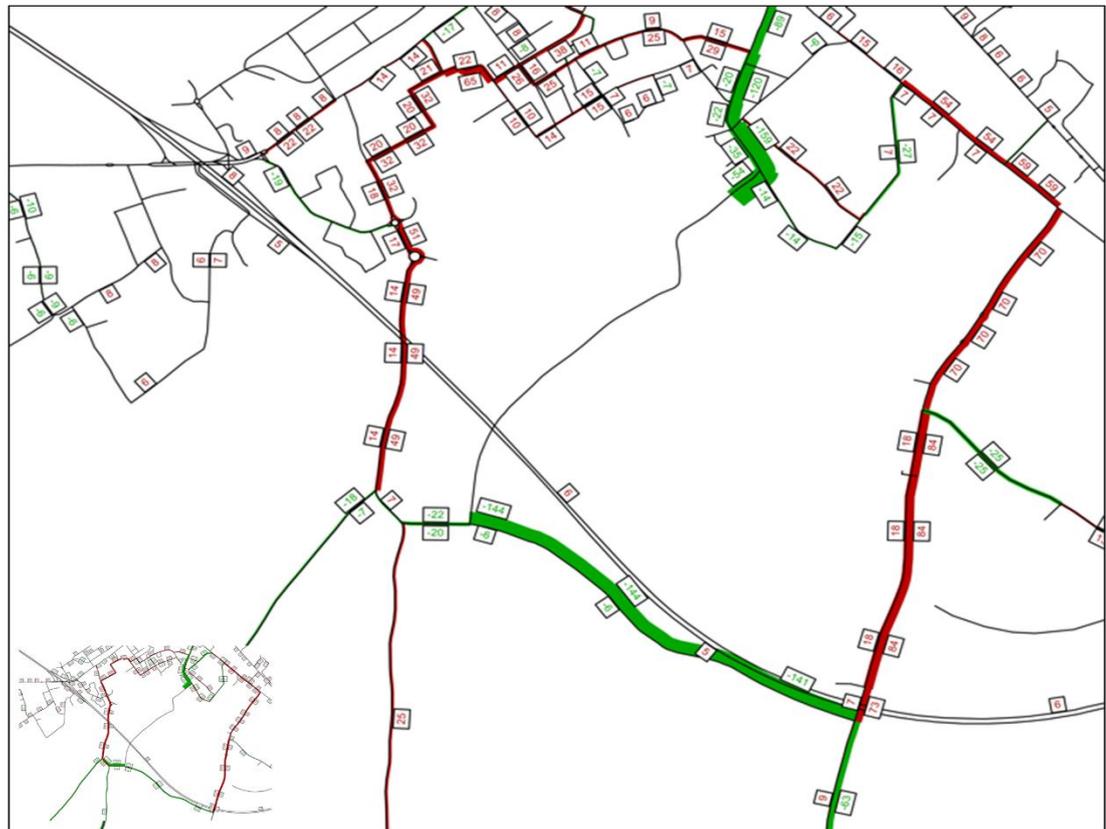


Figure 5.3: Impact of Stuppington Lane Filtering - PM Peak Hour



- 5.2.5 As anticipated, the greatest impact is on Hollow Lane and Nackington Road (with Hollow Lane experiencing around 120 vehicles 2-way net increase in the AM peak hour and 70 vehicles in the PM peak hour, with the same numbers for Nackington Road respectively being 120 and 100) as the flows on Stuppington Lane seek alternative routes with a north-south direction.
- 5.2.6 Flows through Nackington Road distribute into Old Dover Road (60 and 70 vehicles net increase in the AM and PM peak hours respectively) with a direction towards the city centre.
- 5.2.7 Although some of the reassigned traffic onto Hollow Lane is redirected onto the A28, the majority of the impact is on residential routes like Hollowmede and St Mildred's Place (a maximum net increase along the route of 70 and 90 two-way vehicles in AM and PM peak hours). This is understood to be due to the traffic that is destined to the residential area southeast of the A28 Wincheap. This area involves a significant number of dwellings as well as a number of schools that can be accessed from the southwest through either the A28 or the local network through Hollowmede and St Mildred's Place.
- 5.2.8 Although these results will be discussed in conjunction with the impact of the development, they should be taken into consideration when discussing the impact on the local network.

5.3 Wider Development Impact

- 5.3.1 The impact of the development, along with the filtering of Stuppington Lane, indicates an increase in flows along the main corridors, A28, A2 and Old Dover Road, with some impact on the more local network south of the A28.
- 5.3.2 As shown in **Appendix B**, the overall net impact of the development, including the filtering of Stuppington Lane, is generally well distributed across the network. The highest increases are noted on principal parts of the existing (or consented) road network, including the A2, Nackington Road, the link through Mountfield Park and the A28. Reductions in flows, generally related to the filtering of Stuppington Lane – as discussed above, also results in increases on some local roads west of Wincheap.
- 5.3.3 Increases in overall traffic should be considered modest for the scale of development and reflect the reduced trip rates applied based on the vision-led sustainable travel strategy and the scope for traffic to distribute. It is also of note that the development's distribution of this residual demand generates limited impact on the routes to/from the City Centre and to greater extent towards the key strategic routes elsewhere.
- 5.3.4 While it should be anticipated that some localised highway mitigation may be required; this is likely to remain limited to that which is necessary to facilitate effective access, as discussed below.

5.4 Flows from Hollow Lane Access

- 5.4.1 Homersham represents a key link from the Hollow Lane access, in particular to the A28. The highway here is a wide corridor with extensive verges and whilst most adjoining dwellings have off-street parking, on-street parking does occur. The model forecast in the Do Something is two-way flows of 570 and 429 in the AM and PM peak hours respectively. These fall well within the link flow capacity of the route – although the proposals would enhance capacity by removing on-street parking and placing this into dedicated parking bays.
- 5.4.2 The majority of development traffic routing through Homersham joins the A28 at the signalised junction, resulting in increases through this junction. Further analysis and potential mitigation will be explored to accommodate these increases. Beyond this point, flows along the A28 Thanington Road westbound show highest increases of 80 vehicles in the AM peak hour. Whilst it is acknowledged that the A28 is a congested corridor, the impact of the development is considered moderate when evaluated in the context of overall corridor demand – although impact on key junctions will need to be considered as part of a wider corridor study and possible localised mitigation.
- 5.4.3 A considerable proportion of development demand in this area routes to the A2 via the southbound on-slip (100 and 49 trips in the AM and PM peak hours respectively). The current A2 on-slip at Wincheap is comparatively under-utilised, with limited traffic volumes, likely resulting from a more direct route for most City Centre traffic via New Dover Road and the Bridge junction and therefore even with the development impact, it is well within the range of link flow capacity of the slip road.
- 5.4.4 As discussed above, the filtering of Stuppington Lane would result in traffic increases on Hollow Lane (N) and Hollowmede in the direction of the city centre. The increases occur in preference to use of the principal route of the A28, most likely due to slower journey times. However, such routing is undesirable and further interventions such as traffic calming or additional filters may be advisable to direct traffic back to the principal routes. Such interventions are best included in a ‘monitor and manage’ approach to ensure that they are not introduced unnecessarily.

5.4.5 In addition to localised traffic reassigning from Stuppington Lane, some residual traffic demand is forecast to route south on Hollow Lane into New House Lane, albeit this appears limited to the PM peak only. This increase represents significantly less than 1 vehicle per minute, but in relative terms may be considered more significant for this route. The traffic assignment is interpreted to be development traffic assigning towards Ashford that is avoiding the A28 – to the extent that localised interventions may be appropriate to dissuade such routing. Given the potential for such routing to not ultimately manifest, a similar monitor and manage approach should be adopted to help maintain flows on the corridor within an acceptable range and traffic calming measures will be considered when appropriate.

Figure 5.4: DS – DM Link Flow Differences, Hollow Lane Access - AM Peak Hour

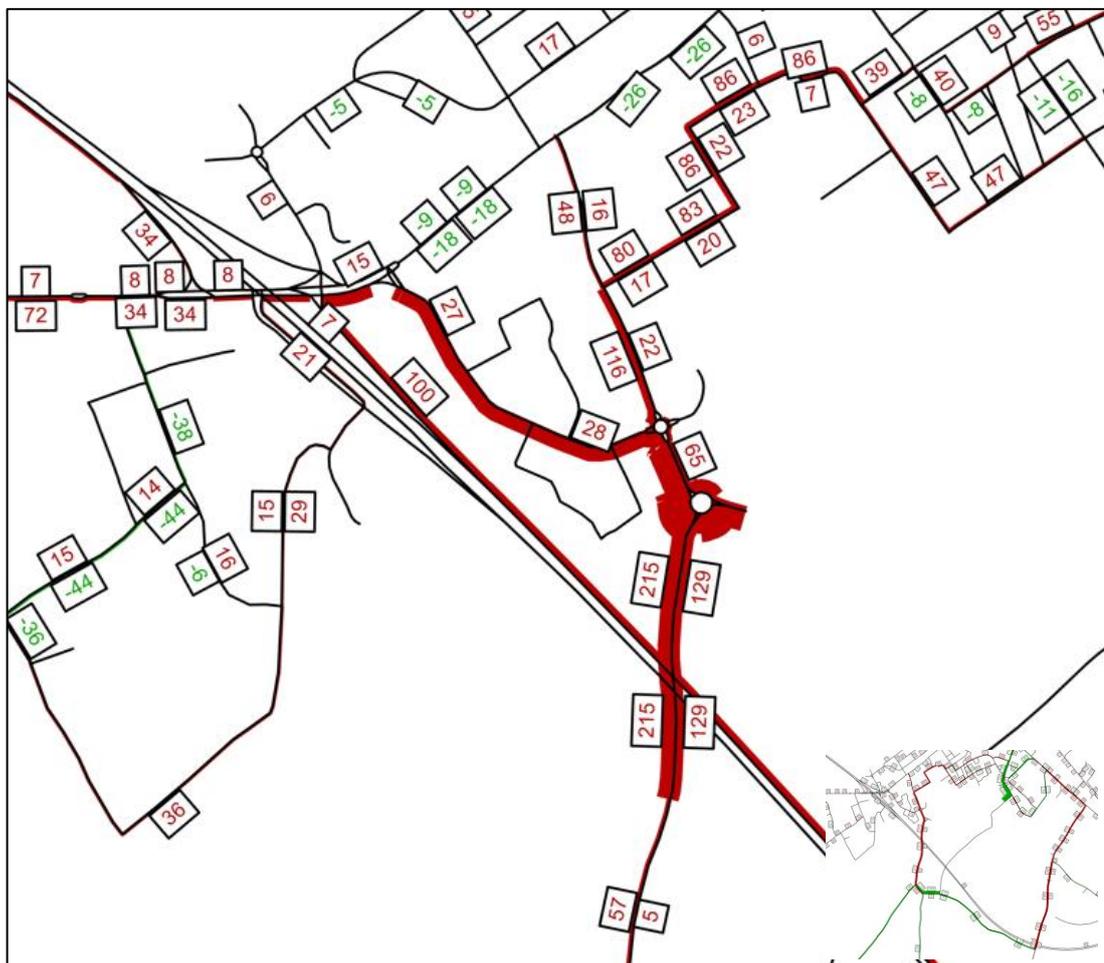
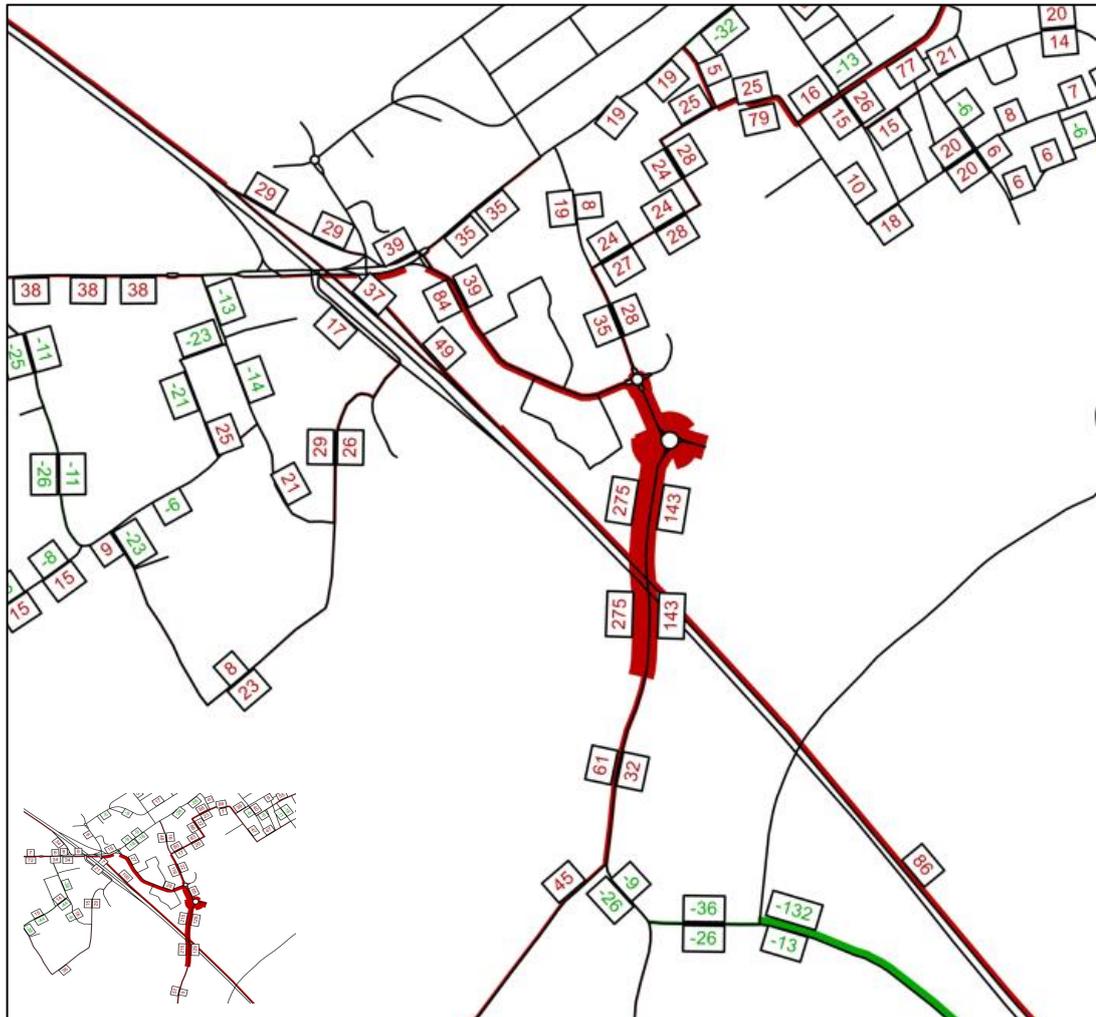


Figure 5.5: DS – DM Link Flow Differences, Hollow Lane Access - PM Peak Hour

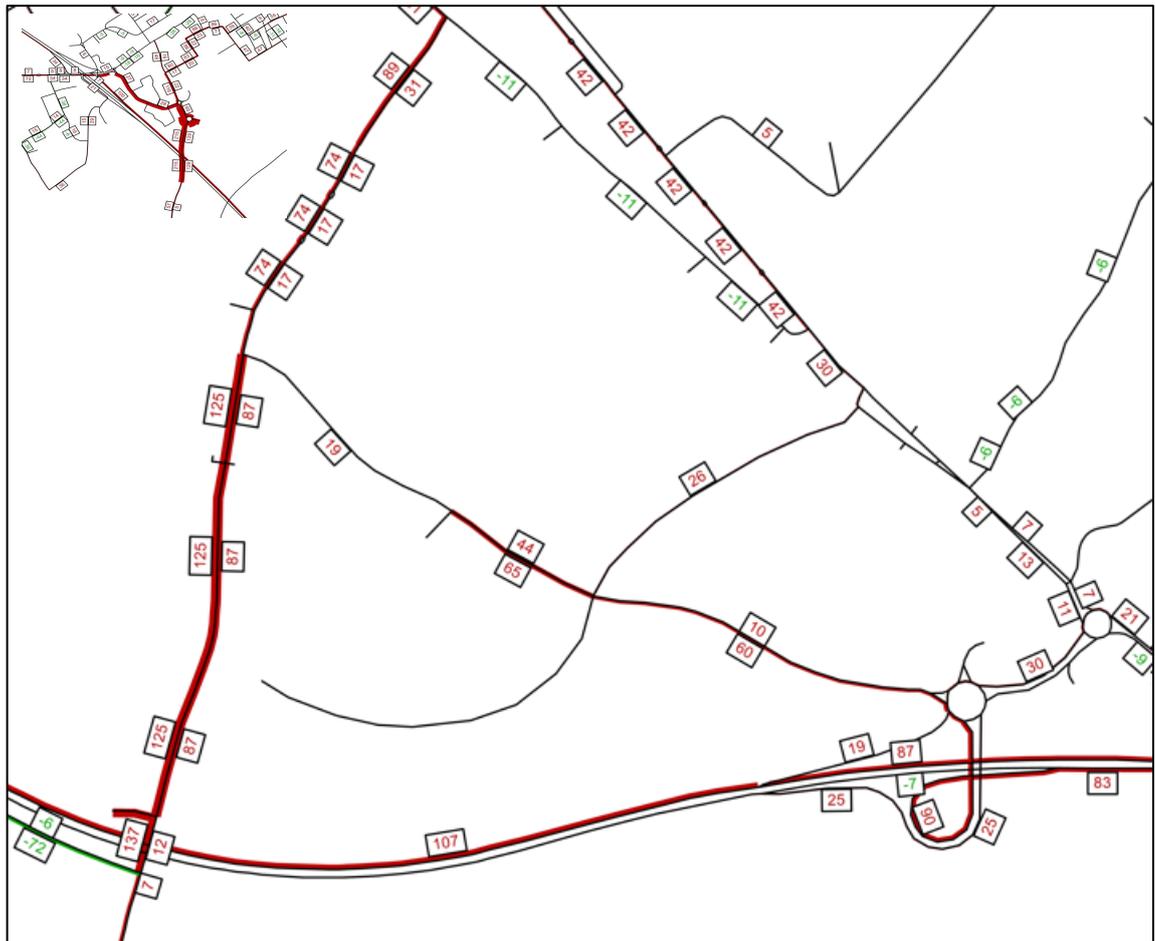


5.5 Flows from Nackington Road Access

- 5.5.1 The majority of development traffic forecast in the model to use Nackington Road access is doing so to more widely route via the Mountfield link to reach the A2. There are some flows on the more rural routes to the southeast of Canterbury, but this reflects reassignment of background trips on Stuppington Lane which will reroute once the route is filtered.
- 5.5.2 The maximum increase on Nackington Road occurs between the site access and the junction with the Mountfield Link, which experiences a maximum net impact of around 215 two-way vehicle movements in both peaks. Along this section, Nackington Road is a high quality, consistent route able to accommodate this demand. It is important to note that these notable net increases do not extend further south into the rural areas or to the north and the more constrained junction with Old Dover Road.

5.5.3 With reference to the earlier separate forecasting of impact from the Stuppington Lane filtering, the majority of the increase at the junction with Old Dover Road does not result from development traffic – but instead from background traffic reassignment. Nonetheless, it may be necessary for further consideration to be given to localised mitigation here.

Figure 5.6: DS – DM Link Flow Differences, Nackington Road Access – AM Peak Hour



5.6 Summary of Net Impact

5.6.1 The table below summarises the net development traffic impact on key routes on the network.

Table 5.1: Link flow changes

Link	Do Minimum		Flow Difference with Development	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
A28 Thanington Road	567	397	80	38
Hollow Lane South	282	325	62	93
New House Lane	173	145	-63	45
Merton Lane	162	229	-92	-145
Stuppington Lane*	277	229	-277	-229
Hollowmede	386	392	103	52
Homersham	340	306	230	123
A2 Southbound on-slip	487	665	100	49
Nackington Rd (North of A2) - Mountfield Link	827	734	212	219
Old Dover Road	1076	1159	79	58
Mountfield Park South Slips	1030	1115	212	219
Mountfield Park North Slips	1364	1190	40	0

*This link will be filtered as part of the development.

6 Next Steps and the Role of 'Monitor and Manage'

6.1 Agreement on the Aspirational Forecast Scenario

6.1.1 A critical next step is to reach agreement with key stakeholders on the appropriateness of this aspirational scenario as a valid and plausible forecast of outcome from a vision-led development at Site N1. This is anticipated to be a distinct exercise from a wider appraisal of the development proposals.

6.2 Supporting Mitigation

6.2.1 While the aspirational scenario set out in this report seeks to focus on sustainable travel measures, it forecasts some residual traffic generation that will impact on the wider network. The extent of this is discussed above and while the impact is generally manageable, it is accepted that some further highway mitigation may be appropriate, particularly locally to the site accesses, referred to as access enabling infrastructure in the earlier report.

6.2.2 There is a need to discuss the extent and nature of this mitigation with the relevant authorities and this is likely to include the need for more detailed, localised modelling. It will also be important to appraise and develop any such mitigation in the context of the wider Local Plan strategy and importantly in the Transport Strategy.

6.2.3 For example – it is understood that CCC are likely to advance a Transport Strategy which focuses on active and public transport modes within and through the City Centre network. This is very consistent with the overall transport objective of this site and accordingly the draft policy identifies, under N1 4) a) v) the potential for active travel improvements to key City Centre Ring Road junctions. These measures will need to be considered in the context of the wider transport strategy.

6.3 Additional Scenario Testing

6.3.1 Earlier in this report the purpose of this aspirational forecasting scenario was set out; namely that it is intended to form part of a wider suite of evidence, including other forecasting scenarios to inform decision making.

6.3.2 In accordance with the principles of vision-led planning, the development of this aspirational forecast scenario sets out to demonstrate a plausible outcome from vision-led development that focuses on supporting and prioritising sustainable travel in a manner that is not dependent on the delivery of large-scale highway infrastructure that is inconsistent with the wider policy objectives.

- 6.3.3 The outcome of this scenario represents what could and should happen as an outcome of vision-led planning. It is a plausible and well-evidenced forecast, but nonetheless remains subject to the inherent uncertainties in any forecasting. Whilst the earlier Initial Traffic Impact Appraisal contributes to this, it is likely to be appropriate for further forecast scenarios be undertaken to more broadly account for the uncertainty and inform the decision-making process. Critically, such forecasting will also inform the structure of an appropriate 'monitor and manage' programme for development implementation.
- 6.3.4 It is however important to understand how it is envisaged that those other scenarios will be applied. Such scenarios are likely to include more pessimistic forecasts of outcomes, with a lower uptake of sustainable modes of travel and greater vehicle trips. While tempting, it would be incorrect to treat such pessimistic scenarios as benchmarks to develop mitigation strategies against – as to do so would be to entirely undermine the aim of vision-led planning.
- 6.3.5 The latest NPPF paragraph 116 as drafted makes clear that development should only be refused where residual cumulative impact on the road network would be severe in all reasonable future scenarios. This clearly endorses multiple scenario testing where uncertainty is embraced, but it also provides clarity on how the outcomes of the scenarios should be applied.
- 6.3.6 This confirms that even if one or more plausible forecast scenarios of development impact do give rise to a severe impact; that would be insufficient to merit refusal as long as at least one plausible outcome does not have a severe impact. In practice, this is the only reasonable way to apply the principles of vision-led planning within the decision-making process and thereafter the purpose of other, more pessimistic forecasts.
- 6.3.7 As indicated above, conventional wisdom might lead to temptation to treat the pessimistic forecast scenarios as 'what-ifs?' for which answers need to be provided in the form of mitigation, to a level of non-severe impact. Evidently the latest NPPF does not require this. And more importantly - to do so would entirely undermine vision-led planning.

- 6.3.8 In the case of Merton Park, it represents an opportunity for highly sustainable development, arguably one of the most sustainable of its scale in the County, given its proximity to the great city centre of Canterbury. With this comes the inherent challenges on the highway network, to be expected in a constrained urban environment. It is entirely possible that a plausible yet pessimistic forecast of development demand, that applies robust assumptions of vehicular trips rates constrained to historical trends, would give rise to a perceived severe highway impact. It is also possible that, given the constraints, such impact might not be readily mitigated to a level that can be considered not severe by all parties. If this outcome were to be deterministic on the decision-making process (contrary to the latest NPPF) – then it might be concluded that the development should not progress in this location and instead growth be directed elsewhere in the District. This growth would necessarily have to be in a location where constraints are less and mitigation more achievable – but also necessarily in a location less inherently sustainable. The net result of the alternative growth strategy, with development in a less sustainable location and facilitating car use through network mitigation, would be higher overall vehicle trip rates and a failure in the vision of delivering sustainable development.
- 6.3.9 It is for these reasons that fundamentally vision-led planning and decision-making cannot continue the historical flawed and misguided approach to being informed by ‘robust’ evidence that poses and is bound to answer the ‘what-ifs?’
- 6.3.10 Notwithstanding this, it may be more pessimistic forecast scenarios continue to have an important role to play in the decision-making process. They provide a useful indication of the outcome of not pursuing the vision-led approach and reinforce the need to focus investment on sustainable alternatives – while ensuring that decision-making is appropriately informed. It is also a critically important part of embracing and being transparent about uncertainty, avoiding simply falling back into unwarranted confidence in single/core forecasting scenarios.

6.4 Monitor and Manage

- 6.4.1 In addition to the above, having multiple scenarios allows benchmarks to be set within a subsequent monitor and manage framework during and after implementation of development. Monitoring will need to assess the performance of the development against targets of sustainable travel and thus vehicle trip rates. The 'management' will be a process of response that includes adjusting the trigger points for delivering mitigation measures. For example, if the development is exceeding targets on sustainable travel mode share and trip rates, mitigation to support this might be pushed back or ultimately deemed unnecessary – as to do so otherwise would be contrary to the wider vision objectives. Conversely, higher than aspirational trip rates might require mitigation to be brought forward sooner and for a redoubling of efforts to promote sustainable travel.
- 6.4.2 By extension of the earlier point, the Monitor and Manage strategy is not intended to be a 'predict and provide' approach with respect to mitigation, where any and all demand and impact outcomes would need to be mitigated.

Appendix A Local Junction Assessments

Junctions 9
ARCADY 9 - Roundabout Module
Version: 9.5.1.7462 © Copyright TRL Limited, 2019
For sales and distribution information, program advice and maintenance, contact TRL: +44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk
The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution

Filename: 22-022-ARC-003 Rev B Hollow Lane Site Access - CE Turning Flows.j9
 Path: Z:\Shared\Projects\22-022 Merton Park Canterbury\Trans\Arcady
 Report generation date: 11/09/2024 09:27:29

- »DS Actual, AM
- »DS Actual, PM
- »DS Demand, AM
- »DS Demand, PM

Summary of junction performance

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
DS Actual										
1 - Site Access	D1	0.5	4.92	0.32	A	D2	0.3	4.31	0.22	A
2 - Hollow Lane S		0.3	5.14	0.24	A		0.4	4.83	0.28	A
3 - Hollow Lane N		0.2	3.52	0.16	A		0.3	3.73	0.22	A
DS Demand										
1 - Site Access	D3	0.5	4.93	0.32	A	D4	0.3	4.31	0.22	A
2 - Hollow Lane S		0.3	5.14	0.24	A		0.4	4.83	0.28	A
3 - Hollow Lane N		0.2	3.53	0.16	A		0.3	3.74	0.23	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

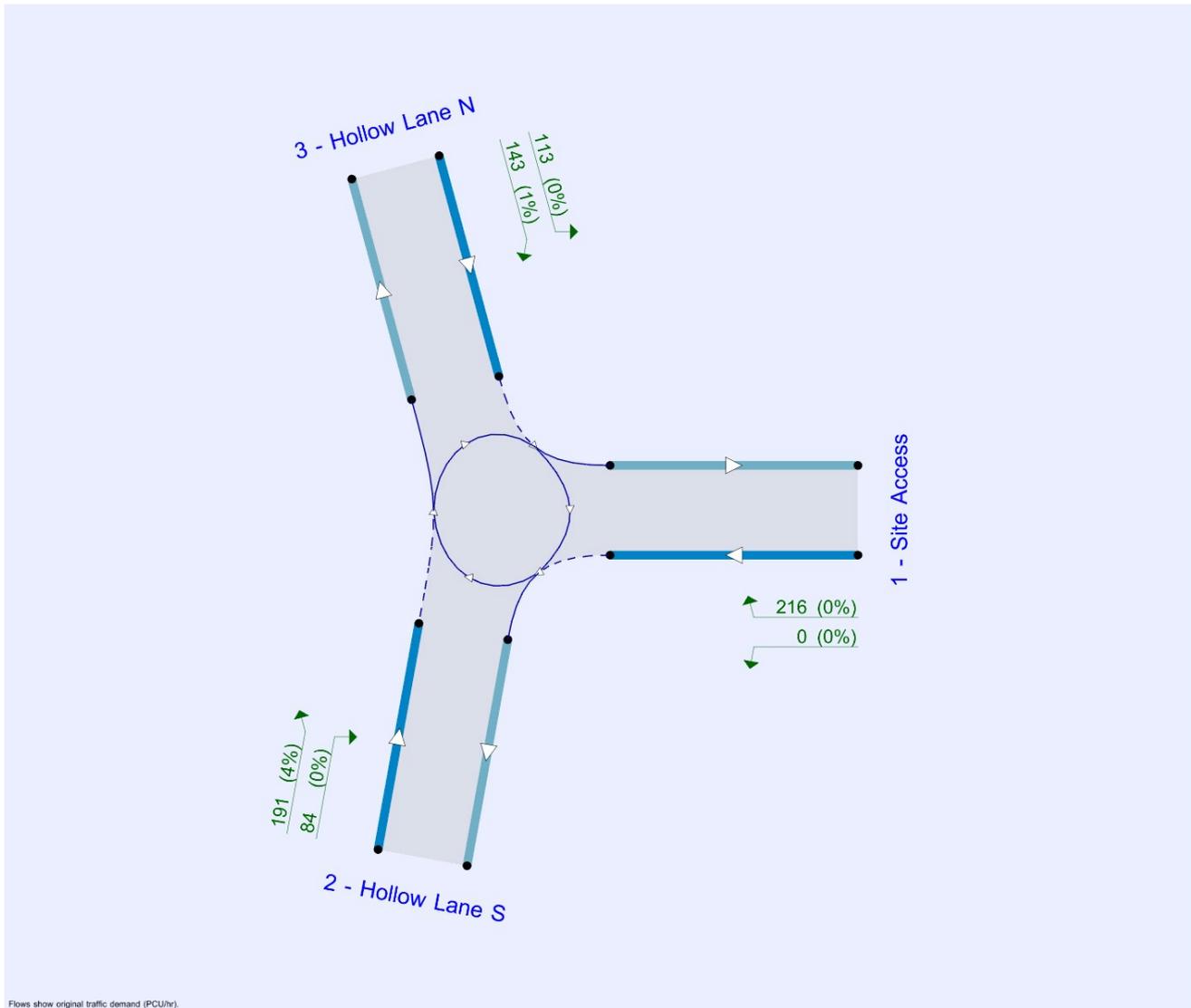
File summary

File Description

Title	22-022-003 Hollow Lane Site Access
Location	
Site number	
Date	11/09/2024
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	22-022
Enumerator	CA-LTP01\DA
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin



Flows show original traffic demand (PCU/hr).
The junction diagram reflects the last run of Junctions.

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	DS Actual	AM	ONE HOUR	00:00	01:30	15
D2	DS Actual	PM	ONE HOUR	00:00	01:30	15
D3	DS Demand	AM	ONE HOUR	00:00	01:30	15
D4	DS Demand	PM	ONE HOUR	00:00	01:30	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

DS Actual, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	4.62	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	Site Access	
2	Hollow Lane S	
3	Hollow Lane N	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - Site Access	2.75	4.67	9.6	20.0	28.0	37.0	
2 - Hollow Lane S	3.25	4.23	7.9	20.0	28.0	29.0	
3 - Hollow Lane N	3.00	4.59	15.8	20.0	28.0	23.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Site Access	0.541	1159
2 - Hollow Lane S	0.559	1202
3 - Hollow Lane N	0.586	1304

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	DS Actual	AM	ONE HOUR	00:00	01:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Site Access		✓	318	100.000
2 - Hollow Lane S		✓	215	100.000
3 - Hollow Lane N		✓	188	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1 - Site Access	2 - Hollow Lane S	3 - Hollow Lane N
From	1 - Site Access	0	0.22	318
	2 - Hollow Lane S	20	0	196
	3 - Hollow Lane N	61	127	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - Site Access	2 - Hollow Lane S	3 - Hollow Lane N
From	1 - Site Access	0	0	0
	2 - Hollow Lane S	0	0	11
	3 - Hollow Lane N	0	9	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - Site Access	0.32	4.92	0.5	A
2 - Hollow Lane S	0.24	5.14	0.3	A
3 - Hollow Lane N	0.16	3.52	0.2	A

Main Results for each time segment

00:00 - 00:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	240	96	1107	0.217	239	0.3	4.141	A
2 - Hollow Lane S	162	238	1069	0.152	161	0.2	4.357	A
3 - Hollow Lane N	142	15	1296	0.109	141	0.1	3.300	A

00:15 - 00:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	286	115	1097	0.261	286	0.4	4.440	A
2 - Hollow Lane S	194	286	1042	0.186	193	0.2	4.659	A
3 - Hollow Lane N	169	18	1294	0.131	169	0.2	3.389	A

00:30 - 00:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	350	140	1083	0.324	350	0.5	4.910	A
2 - Hollow Lane S	237	350	1006	0.236	237	0.3	5.138	A
3 - Hollow Lane N	207	22	1292	0.160	207	0.2	3.515	A

00:45 - 01:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	350	140	1083	0.324	350	0.5	4.916	A
2 - Hollow Lane S	237	350	1006	0.236	237	0.3	5.143	A
3 - Hollow Lane N	207	22	1292	0.160	207	0.2	3.515	A

01:00 - 01:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	286	115	1096	0.261	287	0.4	4.449	A
2 - Hollow Lane S	194	286	1042	0.186	194	0.3	4.667	A
3 - Hollow Lane N	169	18	1294	0.131	169	0.2	3.390	A

01:15 - 01:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	240	96	1107	0.217	240	0.3	4.156	A
2 - Hollow Lane S	162	240	1068	0.152	162	0.2	4.371	A
3 - Hollow Lane N	142	15	1296	0.109	142	0.1	3.304	A

DS Actual, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	4.30	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	DS Actual	PM	ONE HOUR	00:00	01:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Site Access		✓	216	100.000
2 - Hollow Lane S		✓	275	100.000
3 - Hollow Lane N		✓	254	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1 - Site Access	2 - Hollow Lane S	3 - Hollow Lane N
From	1 - Site Access	0	0.21	216
	2 - Hollow Lane S	84	0	191
	3 - Hollow Lane N	112	142	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - Site Access	2 - Hollow Lane S	3 - Hollow Lane N
From	1 - Site Access	0	0	0
	2 - Hollow Lane S	0	0	4
	3 - Hollow Lane N	0	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - Site Access	0.22	4.31	0.3	A
2 - Hollow Lane S	0.28	4.83	0.4	A
3 - Hollow Lane N	0.22	3.73	0.3	A

Main Results for each time segment

00:00 - 00:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	163	106	1101	0.148	162	0.2	3.833	A
2 - Hollow Lane S	207	162	1111	0.186	206	0.2	4.082	A
3 - Hollow Lane N	191	63	1268	0.151	190	0.2	3.358	A

00:15 - 00:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	194	128	1090	0.178	194	0.2	4.019	A
2 - Hollow Lane S	247	194	1093	0.226	247	0.3	4.369	A
3 - Hollow Lane N	228	75	1260	0.181	228	0.2	3.505	A

00:30 - 00:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	238	156	1074	0.222	238	0.3	4.304	A
2 - Hollow Lane S	303	238	1069	0.283	302	0.4	4.823	A
3 - Hollow Lane N	279	92	1250	0.223	279	0.3	3.726	A

00:45 - 01:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	238	156	1074	0.222	238	0.3	4.306	A
2 - Hollow Lane S	303	238	1069	0.283	303	0.4	4.827	A
3 - Hollow Lane N	279	92	1250	0.223	279	0.3	3.726	A

01:00 - 01:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	194	128	1089	0.178	195	0.2	4.024	A
2 - Hollow Lane S	247	195	1093	0.226	248	0.3	4.376	A
3 - Hollow Lane N	228	75	1260	0.181	228	0.2	3.510	A

01:15 - 01:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	163	107	1101	0.148	163	0.2	3.841	A
2 - Hollow Lane S	207	163	1111	0.186	207	0.2	4.096	A
3 - Hollow Lane N	191	63	1267	0.151	191	0.2	3.365	A

DS Demand, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	4.62	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	DS Demand	AM	ONE HOUR	00:00	01:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Site Access		✓	318	100.000
2 - Hollow Lane S		✓	215	100.000
3 - Hollow Lane N		✓	192	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1 - Site Access	2 - Hollow Lane S	3 - Hollow Lane N
From	1 - Site Access	0	0.22	318
	2 - Hollow Lane S	20	0	196
	3 - Hollow Lane N	62	130	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - Site Access	2 - Hollow Lane S	3 - Hollow Lane N
From	1 - Site Access	0	0	0
	2 - Hollow Lane S	0	0	11
	3 - Hollow Lane N	0	9	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - Site Access	0.32	4.93	0.5	A
2 - Hollow Lane S	0.24	5.14	0.3	A
3 - Hollow Lane N	0.16	3.53	0.2	A

Main Results for each time segment

00:00 - 00:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	240	97	1106	0.217	239	0.3	4.146	A
2 - Hollow Lane S	162	238	1069	0.152	161	0.2	4.357	A
3 - Hollow Lane N	144	15	1296	0.111	144	0.1	3.308	A

00:15 - 00:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	286	117	1095	0.261	286	0.4	4.447	A
2 - Hollow Lane S	194	286	1042	0.186	194	0.2	4.660	A
3 - Hollow Lane N	172	18	1294	0.133	172	0.2	3.399	A

00:30 - 00:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	350	143	1081	0.324	350	0.5	4.920	A
2 - Hollow Lane S	237	350	1006	0.236	237	0.3	5.138	A
3 - Hollow Lane N	211	22	1292	0.164	211	0.2	3.528	A

00:45 - 01:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	350	143	1081	0.324	350	0.5	4.926	A
2 - Hollow Lane S	237	350	1006	0.236	237	0.3	5.144	A
3 - Hollow Lane N	211	22	1292	0.164	211	0.2	3.528	A

01:00 - 01:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	286	117	1095	0.261	287	0.4	4.454	A
2 - Hollow Lane S	194	286	1042	0.186	194	0.3	4.668	A
3 - Hollow Lane N	172	18	1294	0.133	173	0.2	3.402	A

01:15 - 01:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	240	98	1106	0.217	240	0.3	4.161	A
2 - Hollow Lane S	162	240	1068	0.152	162	0.2	4.371	A
3 - Hollow Lane N	144	15	1296	0.111	145	0.1	3.312	A

DS Demand, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	4.30	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	DS Demand	PM	ONE HOUR	00:00	01:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Site Access		✓	216	100.000
2 - Hollow Lane S		✓	275	100.000
3 - Hollow Lane N		✓	256	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1 - Site Access	2 - Hollow Lane S	3 - Hollow Lane N
From	1 - Site Access	0	0.21	216
	2 - Hollow Lane S	84	0	191
	3 - Hollow Lane N	113	143	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - Site Access	2 - Hollow Lane S	3 - Hollow Lane N
From	1 - Site Access	0	0	0
	2 - Hollow Lane S	0	0	4
	3 - Hollow Lane N	0	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - Site Access	0.22	4.31	0.3	A
2 - Hollow Lane S	0.28	4.83	0.4	A
3 - Hollow Lane N	0.23	3.74	0.3	A

Main Results for each time segment

00:00 - 00:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	163	108	1100	0.148	162	0.2	3.835	A
2 - Hollow Lane S	207	162	1111	0.186	206	0.2	4.082	A
3 - Hollow Lane N	193	63	1268	0.152	192	0.2	3.364	A

00:15 - 00:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	194	129	1089	0.179	194	0.2	4.023	A
2 - Hollow Lane S	247	194	1093	0.226	247	0.3	4.369	A
3 - Hollow Lane N	230	75	1260	0.183	230	0.2	3.513	A

00:30 - 00:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	238	158	1073	0.222	238	0.3	4.309	A
2 - Hollow Lane S	303	238	1069	0.283	302	0.4	4.823	A
3 - Hollow Lane N	282	92	1250	0.226	282	0.3	3.737	A

00:45 - 01:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	238	158	1073	0.222	238	0.3	4.311	A
2 - Hollow Lane S	303	238	1069	0.283	303	0.4	4.827	A
3 - Hollow Lane N	282	92	1250	0.226	282	0.3	3.737	A

01:00 - 01:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	194	129	1089	0.179	195	0.2	4.027	A
2 - Hollow Lane S	247	195	1093	0.226	248	0.3	4.376	A
3 - Hollow Lane N	230	75	1260	0.183	231	0.2	3.518	A

01:15 - 01:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Site Access	163	108	1100	0.148	163	0.2	3.842	A
2 - Hollow Lane S	207	163	1111	0.186	207	0.2	4.096	A
3 - Hollow Lane N	193	63	1267	0.152	193	0.2	3.371	A

Junctions 9
PICADY 9 - Priority Intersection Module
Version: 9.5.1.7462 © Copyright TRL Limited, 2019
For sales and distribution information, program advice and maintenance, contact TRL: +44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk
The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution

Filename: 22-022-PIC-002-A Nackington Rd Priority Junction - CE Turning Flows.j9
Path: Z:\Shared\Projects\22-022 Merton Park Canterbury\Trans\Picady
Report generation date: 11/09/2024 09:48:45

- »DS Actual, AM
- »DS Actual, PM
- »DS Demand, AM
- »DS Demand, PM

Summary of junction performance

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
DS Actual										
Stream B-C	D1	0.0	7.32	0.03	A	D2	0.1	6.49	0.05	A
Stream B-A		0.2	16.28	0.15	C		0.1	13.56	0.11	B
Stream C-B		0.3	7.73	0.21	A		0.2	6.62	0.18	A
DS Demand										
Stream B-C	D3	0.0	7.32	0.03	A	D4	0.1	6.49	0.05	A
Stream B-A		0.2	16.30	0.15	C		0.1	13.57	0.11	B
Stream C-B		0.3	7.73	0.21	A		0.2	6.62	0.18	A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

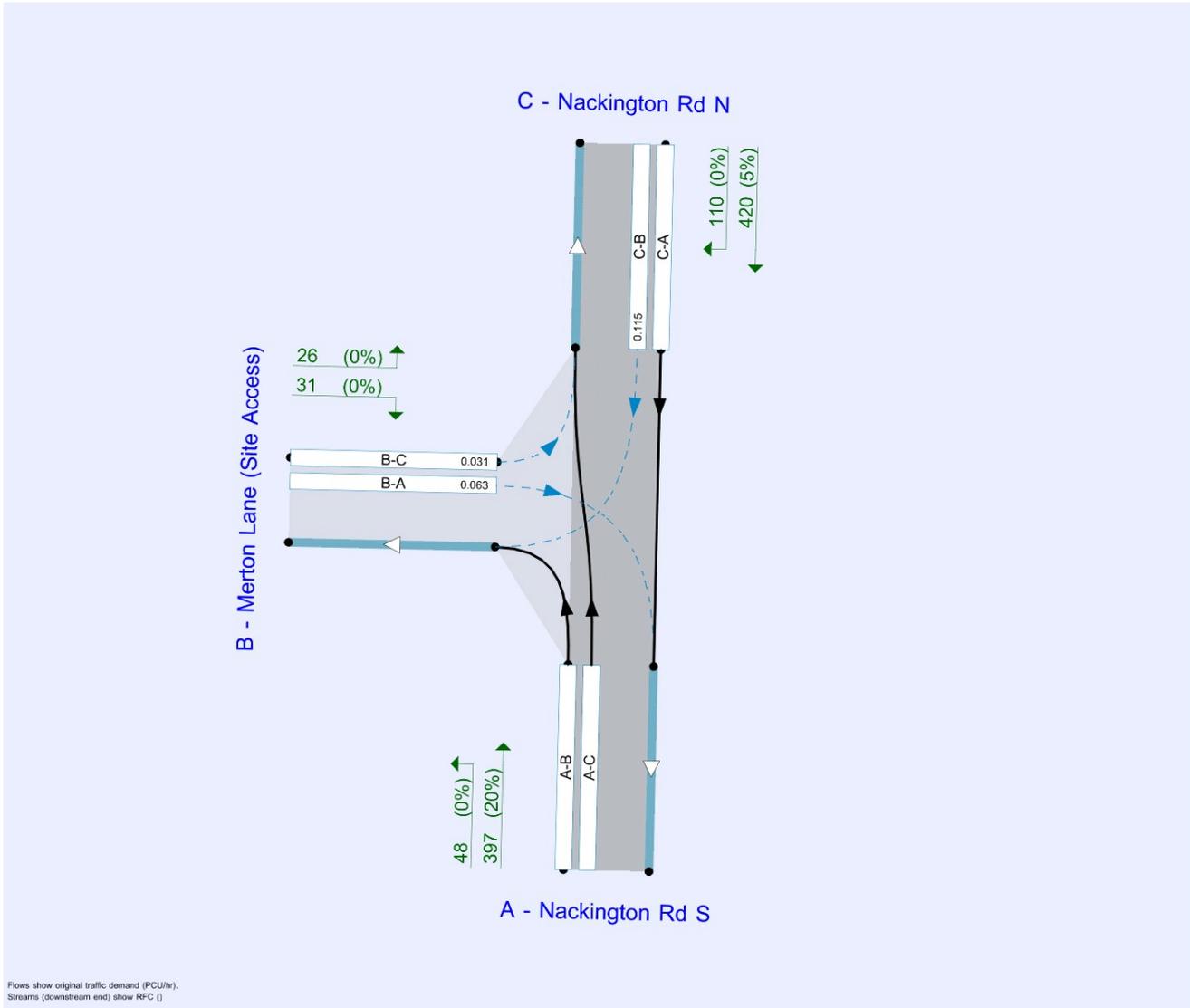
File summary

File Description

Title	22-022-PIC-002 Nackington Rd Priority Junction - CE Turning Flows
Location	
Site number	
Date	11/09/2024
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	22-022
Enumerator	CA-LTP01\DA
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	DS Actual	AM	ONE HOUR	00:00	01:30	15
D2	DS Actual	PM	ONE HOUR	00:00	01:30	15
D3	DS Demand	AM	ONE HOUR	00:00	01:30	15
D4	DS Demand	PM	ONE HOUR	00:00	01:30	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

DS Actual, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Major arm width	C - Nackington Rd N - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.40	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Nackington Rd S		Major
B	Merton Lane (Site Access)		Minor
C	Nackington Rd N		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Width for right turn (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - Nackington Rd N	5.50		✓	5.00	100.0		-

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B - Merton Lane (Site Access)	One lane plus flare	9.55	3.97	2.99	2.99	2.99		1.00	42	19

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	530	0.099	0.249	0.157	0.356
B-C	734	0.115	0.291	-	-
C-B	824	0.326	0.326	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	DS Actual	AM	ONE HOUR	00:00	01:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Nackington Rd S		✓	658	100.000
B - Merton Lane (Site Access)		✓	50	100.000
C - Nackington Rd N		✓	395	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Nackington Rd S	B - Merton Lane (Site Access)	C - Nackington Rd N
From	A - Nackington Rd S	0	26	632
	B - Merton Lane (Site Access)	36	0	14
	C - Nackington Rd N	284	111	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Nackington Rd S	B - Merton Lane (Site Access)	C - Nackington Rd N
From	A - Nackington Rd S	0	0	1
	B - Merton Lane (Site Access)	0	0	0
	C - Nackington Rd N	2	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.03	7.32	0.0	A
B-A	0.15	16.28	0.2	C
C-A				
C-B	0.21	7.73	0.3	A
A-B				
A-C				

Main Results for each time segment

00:00 - 00:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	10	582	0.018	10	0.0	6.295	A
B-A	27	346	0.078	27	0.1	11.261	B
C-A	213			213			
C-B	84	663	0.126	83	0.1	6.201	A
A-B	19			19			
A-C	476			476			

00:15 - 00:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	12	551	0.022	12	0.0	6.679	A
B-A	32	310	0.104	32	0.1	12.943	B
C-A	255			255			
C-B	100	631	0.158	100	0.2	6.767	A
A-B	23			23			
A-C	568			568			

00:30 - 00:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	15	507	0.029	15	0.0	7.316	A
B-A	40	261	0.152	39	0.2	16.236	C
C-A	312			312			
C-B	122	588	0.208	122	0.3	7.717	A
A-B	29			29			
A-C	696			696			

00:45 - 01:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	15	507	0.029	15	0.0	7.319	A
B-A	40	261	0.152	40	0.2	16.277	C
C-A	312			312			
C-B	122	588	0.208	122	0.3	7.726	A
A-B	29			29			
A-C	696			696			

01:00 - 01:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	12	551	0.022	12	0.0	6.682	A
B-A	32	310	0.104	33	0.1	12.983	B
C-A	255			255			
C-B	100	631	0.158	100	0.2	6.777	A
A-B	23			23			
A-C	568			568			

01:15 - 01:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	10	582	0.018	10	0.0	6.298	A
B-A	27	346	0.078	27	0.1	11.302	B
C-A	213			213			
C-B	84	663	0.126	84	0.1	6.220	A
A-B	19			19			
A-C	476			476			

DS Actual , PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Major arm width	C - Nackington Rd N - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.28	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	DS Actual	PM	ONE HOUR	00:00	01:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Nackington Rd S		✓	445	100.000
B - Merton Lane (Site Access)		✓	57	100.000
C - Nackington Rd N		✓	530	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Nackington Rd S	B - Merton Lane (Site Access)	C - Nackington Rd N
From	A - Nackington Rd S	0	48	397
	B - Merton Lane (Site Access)	31	0	26
	C - Nackington Rd N	420	110	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Nackington Rd S	B - Merton Lane (Site Access)	C - Nackington Rd N
From	A - Nackington Rd S	0	0	20
	B - Merton Lane (Site Access)	0	0	0
	C - Nackington Rd N	5	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.05	6.49	0.1	A
B-A	0.11	13.56	0.1	B
C-A				
C-B	0.18	6.62	0.2	A
A-B				
A-C				

Main Results for each time segment

00:00 - 00:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	19	633	0.031	19	0.0	5.862	A
B-A	24	373	0.063	23	0.1	10.292	B
C-A	317			317			
C-B	83	715	0.115	82	0.1	5.681	A
A-B	36			36			
A-C	299			299			

00:15 - 00:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	23	612	0.038	23	0.0	6.108	A
B-A	28	342	0.082	28	0.1	11.459	B
C-A	378			378			
C-B	99	694	0.142	98	0.2	6.043	A
A-B	43			43			
A-C	357			357			

00:30 - 00:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	28	583	0.049	28	0.1	6.488	A
B-A	34	300	0.115	34	0.1	13.543	B
C-A	463			463			
C-B	121	665	0.182	121	0.2	6.613	A
A-B	53			53			
A-C	437			437			

00:45 - 01:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	28	583	0.049	28	0.1	6.490	A
B-A	34	300	0.115	34	0.1	13.563	B
C-A	463			463			
C-B	121	665	0.182	121	0.2	6.618	A
A-B	53			53			
A-C	437			437			

01:00 - 01:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	23	612	0.038	23	0.0	6.112	A
B-A	28	342	0.082	28	0.1	11.481	B
C-A	378			378			
C-B	99	694	0.142	99	0.2	6.050	A
A-B	43			43			
A-C	357			357			

01:15 - 01:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	19	633	0.031	19	0.0	5.869	A
B-A	24	373	0.063	24	0.1	10.321	B
C-A	317			317			
C-B	83	715	0.115	83	0.1	5.692	A
A-B	36			36			
A-C	299			299			

DS Demand, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Major arm width	C - Nackington Rd N - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.40	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	DS Demand	AM	ONE HOUR	00:00	01:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Nackington Rd S		✓	659	100.000
B - Merton Lane (Site Access)		✓	50	100.000
C - Nackington Rd N		✓	395	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Nackington Rd S	B - Merton Lane (Site Access)	C - Nackington Rd N
From	A - Nackington Rd S	0	26	633
	B - Merton Lane (Site Access)	36	0	14
	C - Nackington Rd N	284	111	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Nackington Rd S	B - Merton Lane (Site Access)	C - Nackington Rd N
From	A - Nackington Rd S	0	0	1
	B - Merton Lane (Site Access)	0	0	0
	C - Nackington Rd N	2	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.03	7.32	0.0	A
B-A	0.15	16.30	0.2	C
C-A				
C-B	0.21	7.73	0.3	A
A-B				
A-C				

Main Results for each time segment

00:00 - 00:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	10	582	0.018	10	0.0	6.297	A
B-A	27	346	0.078	27	0.1	11.269	B
C-A	214			214			
C-B	84	663	0.126	83	0.1	6.203	A
A-B	19			19			
A-C	476			476			

00:15 - 00:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	12	551	0.022	12	0.0	6.682	A
B-A	32	310	0.104	32	0.1	12.955	B
C-A	255			255			
C-B	100	631	0.158	100	0.2	6.770	A
A-B	23			23			
A-C	569			569			

00:30 - 00:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	15	507	0.030	15	0.0	7.320	A
B-A	40	261	0.152	39	0.2	16.258	C
C-A	313			313			
C-B	122	588	0.208	122	0.3	7.722	A
A-B	29			29			
A-C	697			697			

00:45 - 01:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	15	506	0.030	15	0.0	7.323	A
B-A	40	260	0.152	40	0.2	16.299	C
C-A	313			313			
C-B	122	588	0.208	122	0.3	7.731	A
A-B	29			29			
A-C	697			697			

01:00 - 01:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	12	551	0.022	12	0.0	6.685	A
B-A	32	310	0.104	33	0.1	12.995	B
C-A	255			255			
C-B	100	631	0.158	100	0.2	6.782	A
A-B	23			23			
A-C	569			569			

01:15 - 01:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	10	582	0.018	10	0.0	6.302	A
B-A	27	346	0.078	27	0.1	11.310	B
C-A	214			214			
C-B	84	663	0.126	84	0.1	6.222	A
A-B	19			19			
A-C	476			476			

DS Demand, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Major arm width	C - Nackington Rd N - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.28	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	DS Demand	PM	ONE HOUR	00:00	01:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Nackington Rd S		✓	445	100.000
B - Merton Lane (Site Access)		✓	57	100.000
C - Nackington Rd N		✓	530	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Nackington Rd S	B - Merton Lane (Site Access)	C - Nackington Rd N
From	A - Nackington Rd S	0	48	397
	B - Merton Lane (Site Access)	31	0	26
	C - Nackington Rd N	420	110	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Nackington Rd S	B - Merton Lane (Site Access)	C - Nackington Rd N
From	A - Nackington Rd S	0	0	20
	B - Merton Lane (Site Access)	0	0	0
	C - Nackington Rd N	5	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.05	6.49	0.1	A
B-A	0.11	13.57	0.1	B
C-A				
C-B	0.18	6.62	0.2	A
A-B				
A-C				

Main Results for each time segment

00:00 - 00:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	19	633	0.031	19	0.0	5.863	A
B-A	24	373	0.063	23	0.1	10.294	B
C-A	317			317			
C-B	83	715	0.115	82	0.1	5.682	A
A-B	36			36			
A-C	299			299			

00:15 - 00:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	23	612	0.038	23	0.0	6.109	A
B-A	28	342	0.082	28	0.1	11.461	B
C-A	378			378			
C-B	99	694	0.142	98	0.2	6.044	A
A-B	43			43			
A-C	357			357			

00:30 - 00:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	28	583	0.049	28	0.1	6.490	A
B-A	34	300	0.115	34	0.1	13.547	B
C-A	463			463			
C-B	121	664	0.182	121	0.2	6.614	A
A-B	53			53			
A-C	437			437			

00:45 - 01:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	28	583	0.049	28	0.1	6.491	A
B-A	34	300	0.115	34	0.1	13.567	B
C-A	463			463			
C-B	121	664	0.182	121	0.2	6.620	A
A-B	53			53			
A-C	437			437			

01:00 - 01:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	23	612	0.038	23	0.0	6.111	A
B-A	28	342	0.082	28	0.1	11.481	B
C-A	378			378			
C-B	99	694	0.142	99	0.2	6.051	A
A-B	43			43			
A-C	357			357			

01:15 - 01:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	19	633	0.031	19	0.0	5.870	A
B-A	24	372	0.063	24	0.1	10.320	B
C-A	317			317			
C-B	83	715	0.115	83	0.1	5.693	A
A-B	36			36			
A-C	299			299			

Appendix B Strategic Modelling

Subject Merton Park, Canterbury – Forecast Report

Attention Alun Millard, Matthew Hogben, Athina Tsolaki

From Sadie Langdon, Katarzyna Mendocha, Tomasz Kaczor, Charlotte Saunders

Date 04/09/2024

1 Introduction

1.1 Introduction

Jacobs have been commissioned by Kent County Council (KCC) to undertake traffic modelling work in order to understand the highway network impact of trips associated with the proposed allocation of the Merton Park development in Canterbury. As part of the commission of work, Jacobs have agreed to model the Merton Park development 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 development in Canterbury using the revised Canterbury Local Plan (LP) 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 site allocation is located in Canterbury, Kent. It is situated south-west of the town centre and Canterbury East railway station, south of A28 Wincheap Road and both east and west of A2 Dover Road. The study area of the Merton Park development is illustrated in Figure 1-1.

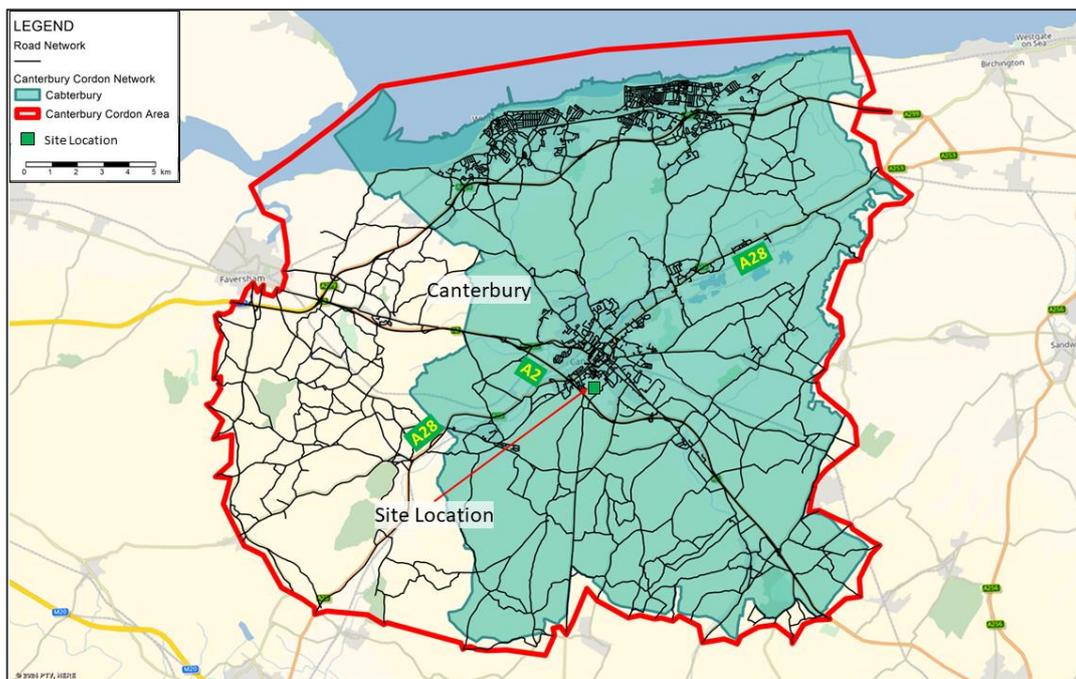


Figure 1-1: Location of Merton Park Development in Canterbury Model Area

1.3 Relevant Reports

The following reports provide more detail on the Canterbury VISUM model base and forecast year development, as well as previous work done by Jacobs for the Merton Park development modelling:

- *Stage 3 Canterbury LP – Local Model Validation Report, KCC, 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 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.
- *Merton Park, Canterbury – Base Model Validation Check, September 2023* – this technical note describes previously commissioned work by KCC of the process of recalibration and validation of the Canterbury Base Year model. This included the area surrounding Merton Park Development to match traffic count data which has since been made available.
- *Merton Park, Canterbury – Forecasting Report, December 2023* – this technical note describes the process by which the traffic modelling work completed in order to understand the highway network impact of trips associated with proposed allocation of the Merton Park development in Canterbury, based on the previous forecast 2045 Canterbury LP model.
- *Canterbury Forecasting Report, draft version in progress* - Jacobs have been commissioned to develop the required strategic modelling necessary to assess the impact of the revised Canterbury LP and provide an evidence base to support decision making of the Bus Strategy for CCC. This commission made use of the 2019 Canterbury Transport Base Model which is based on a parent model, namely the Kent Transport Model (KTM). The 2019 Canterbury Base Transport model has been used as the basis for developing a 2040 Future Baseline ('Do Minimum' (DM) – e.g. without the LP) in which committed developments and infrastructure were modelled, in addition to adjusted background growth. Subsequently a 2040 'Do-Something' (DS) model (e.g. with the LP option) has been developed to assess the proposed LP allocations. A further two 2040 'Do-Something' scenarios will be also developed; one that tests the Canterbury Bus Strategy alongside the LP and another that tests the LP with increased modal shift following modal shift analysis.

2 Canterbury Model Overview

Jacobs was previously 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 that commission of work, traffic models were developed using a version of the Canterbury VISUM model developed in 2020 which was to inform spatial assessments for early decision making on the Canterbury Local Plan Review (LPR).

Recently, a new Future Baseline Canterbury model has been developed for the assessment of the impact of updated Canterbury Local Plan. The model is still in draft and subject to the approval from KCC, CCC and National Highways but it is considered to be a suitable tool to assess the impact of the Merton Park development.

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 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 Model relative to the fully modelled area of the Kent Transport Model (KTM) is shown in Figure 2-1 and Figure 2-2.

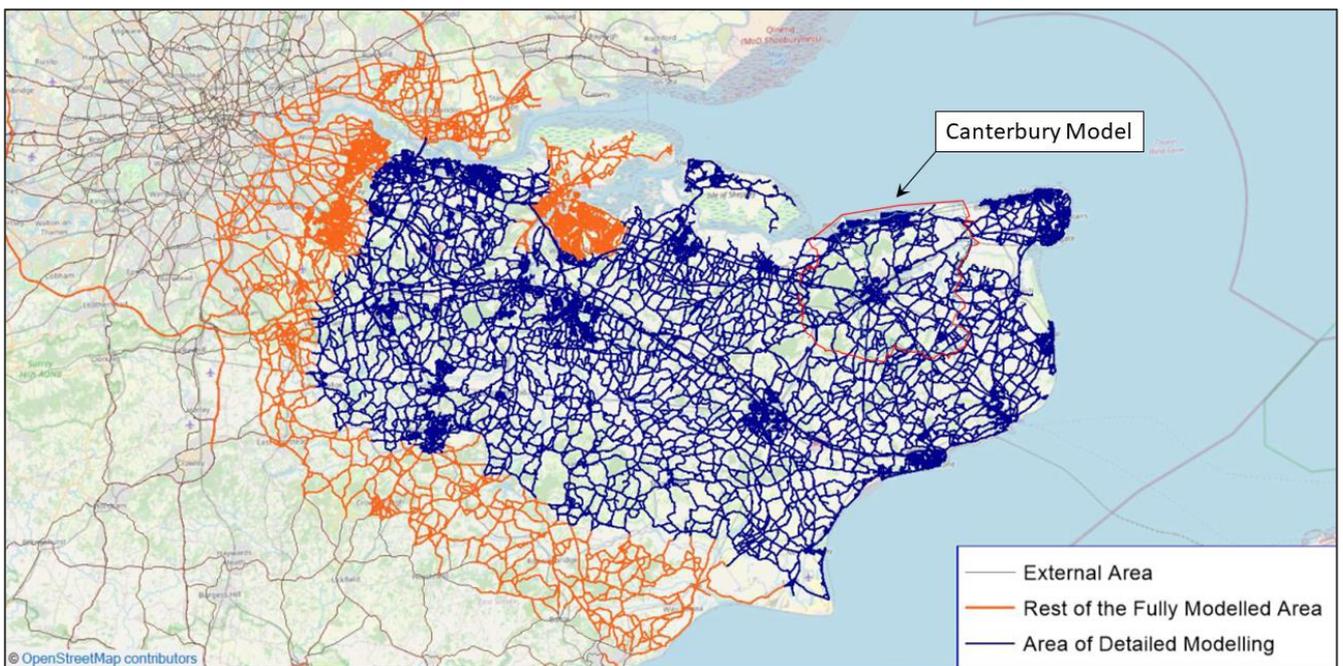


Figure 2-1: Kent Visum Model – Canterbury Model location in Fully Modelled Area of KTM

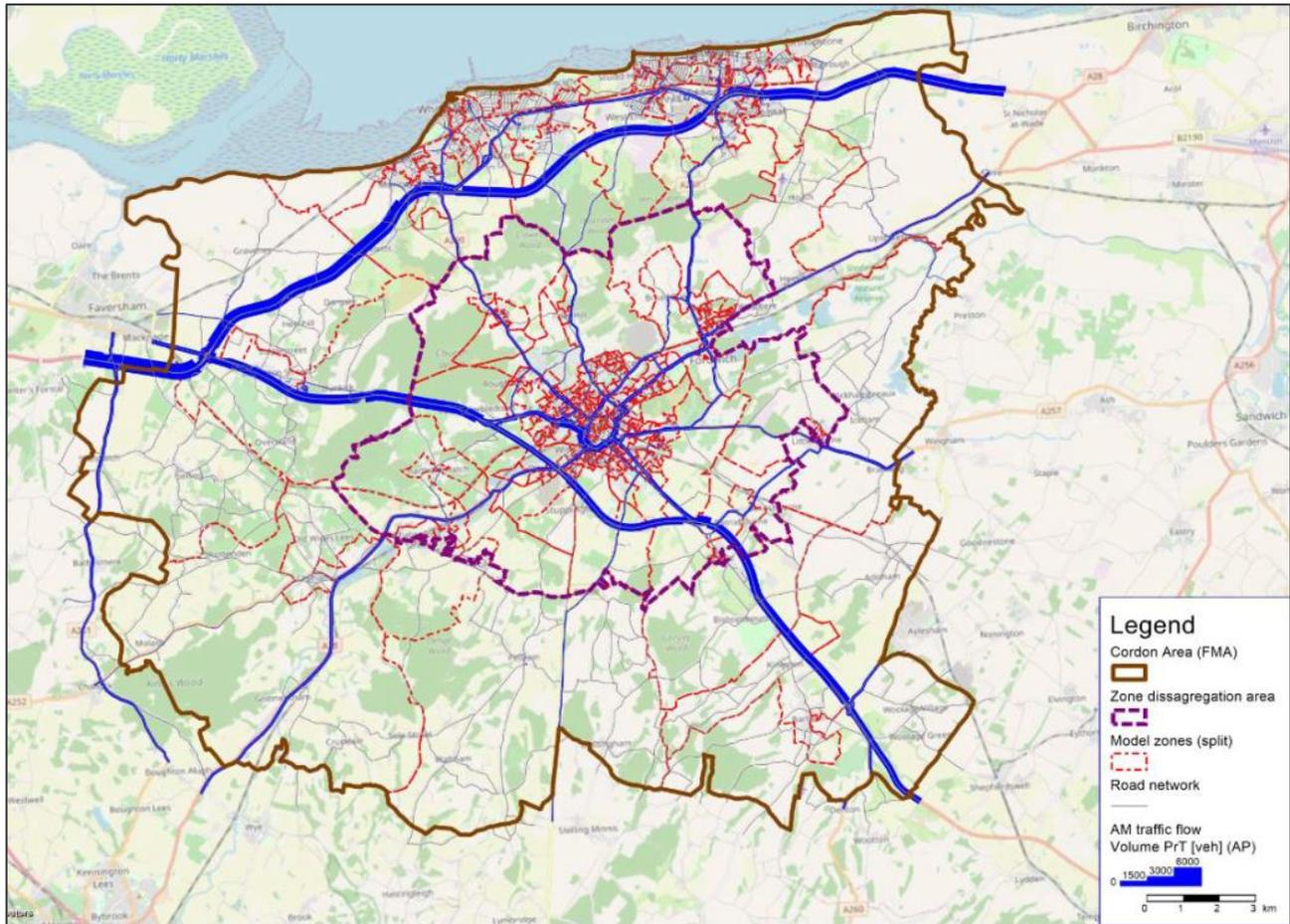


Figure 2-2: Canterbury Local Area Model – Cordon Area from KTM

As shown in Figure 2-1, the Canterbury administrative area is located within the Area of Detailed Modelling (AODM), 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 2-2.

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 demand was cordoned from the KTM and a matrix estimation process was undertaken for the Canterbury 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. The strategic model is not validated at a junction turning movement level, however, this is not considered to be a limitation given its size.

Figure 2-3 illustrates the traffic flow screenlines and links used in matrix estimation of the base year matrices.

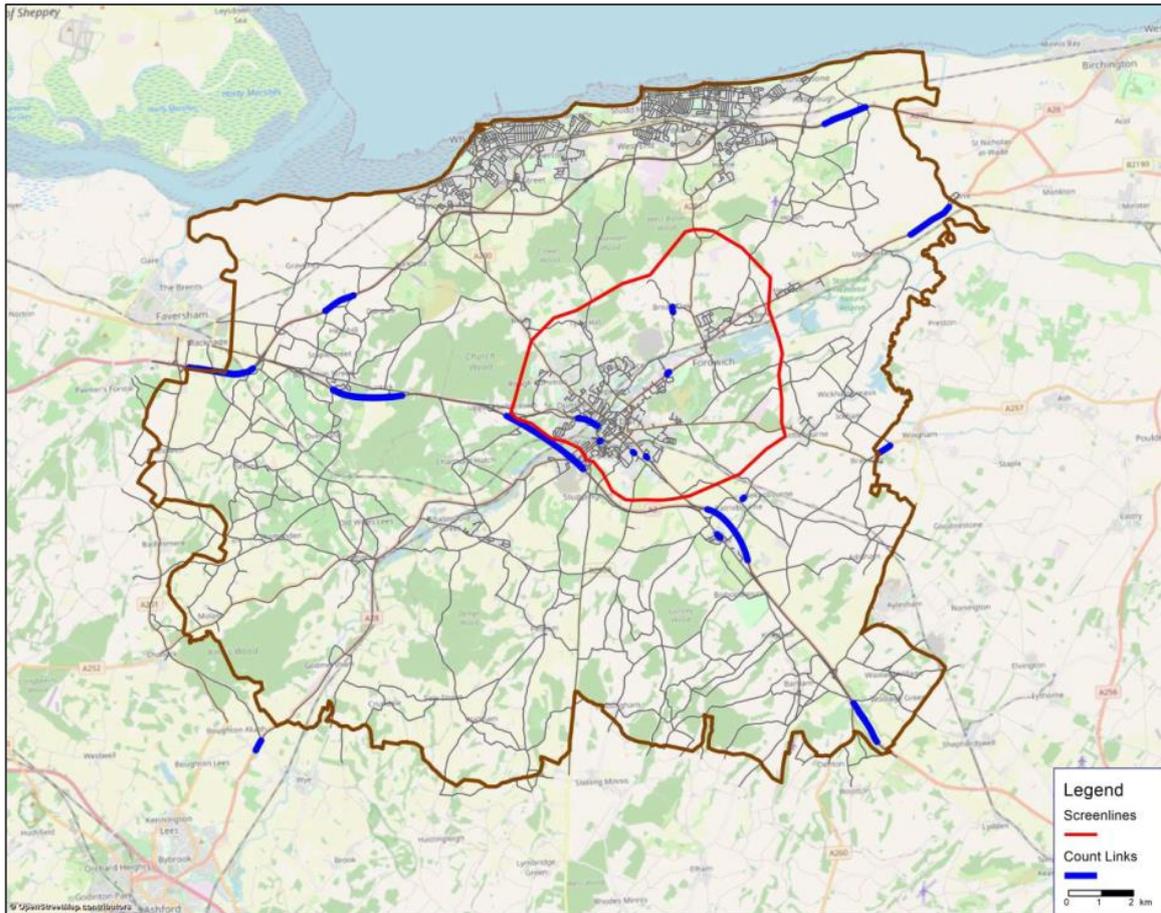


Figure 2-3: Canterbury Visum Model – Screenlines and Links used in Matrix Estimation

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).

3 Canterbury Future Baseline Model Overview

As Kent Transport Model Custodian to KCC, Jacobs have been recently commissioned to develop a strategic modelling necessary to assess the impact of the revised Canterbury LP and provide an evidence base to support decision making of the Bus Strategy for CCC. This commission made use of the 2019 Canterbury Transport Base Model which is based on the KTM.

The 2040 forecast Baseline model have been developed to represent the 2040 forecast road network with the inclusion of committed developments and infrastructure between 2019 and 2040.

3.1 Forecast Demand

The Canterbury Base Transport Model was used as the basis for developing a 2040 Future Baseline in which committed developments and infrastructure were modelled, in addition to adjusted background growth.

The uncertainty log, provided by CCC, was analysed to understand the expected growth of housing and employment between 2019 model base year and the 2040 forecast year within the Canterbury boundary. The uncertainty log was prepared in accordance with TAG Unit M4. For the development of the Canterbury forecast models, all 'near Certain' and key strategic 'more than likely' developments and infrastructure schemes in Canterbury were included. Outside of the Canterbury boundary, growth came solely from TEMPro. Good vehicle growth from RTF was applied everywhere. Using the information provided in the uncertainty log it was assumed there would be 15,729 dwellings and 204,580sqm of employment floorspace completed between the 2019 Base Year and the 2040 Future Baseline.

The final increase of dwellings and jobs between 2019 and 2040 is shown in Table 1; this represents the latest available information at the time of model development.

Table 1: Uncertainty Log (2019-2040), Canterbury

Growth	Dwellings	Jobs	Floorspace (sqm)
Future Baseline Total	15,729	8,695	204,580

Housing and employment sites classified as 'near certain' within the uncertainty log (those with planning permission), have been included within the committed development trip generation calculation as well as key strategic 'more than likely' developments (those expected to obtain planning permission imminently).

It was agreed with CCC that developments that meet or exceed certain thresholds should be explicitly modelled, meaning that the trip generation associated with a single specific site was added to a new zone. This allows the more specific impacts of these sites to be determined, and their specific access arrangements coded into the forecast networks. **Table 2** below shows the explicitly modelled developments in Future Baseline Model.

Table 2: Explicitly Modelled Developments, Canterbury

Development Name	Planning Status	HHs	Jobs	Floorspace (sqm)
Broad Oak	Near Certain	456	33	829
Cockering Farm	Near Certain	400	338	3,716
Duncan Down	Near Certain	400	0	0

Development Name	Planning Status	HHs	Jobs	Floorspace (sqm)
Greenhill Lidl	Near Certain	0	121	2,125
Grasmere Gardens	Near Certain	300	318	3,500
Greenhill	Near Certain	450	0	0
Herne Bay Golf Club	Near Certain	572	137	4,800
Hoplands Farm	Near Certain	250	278	8,420
Howe Barracks	Near Certain	500	0	
South Canterbury	Near Certain	4060	5692	128,100
Sturry	Near Certain	650	0	0
Hillborough	Near Certain	955	796	27,800
Thanington Park	Near Certain	750	406	11,000
Strode Farm	Near Certain	731	334	3,916
Hersden	More than Likely	800	241	10,000
Land to the South of Island Road (A28), former Chislet Colliery, Hersden	Near Certain	370	0	0
Land to the South of Church Lane, Saltwater, Whitstable	Near Certain	220	0	0

3.2 Future Baseline Network

Forecast networks were developed using the Base Model with the addition of completed schemes as well as the committed developments and infrastructure schemes defined by CCC as having 'near certain' certainty status. Key Strategic 'more than likely' sites have also been included.

The 2040 Future Baseline network incorporates the following:

- Any infrastructure changes between 2019 and October 2023;
- Any committed infrastructure forecast to be delivered before the 2040 forecast year.
- Explicit model zones for any developments within the Canterbury boundary which exceed the certain thresholds, which can be found in Table 3.2 of the "Canterbury Forecasting Report".

- Behavioural parameters such as values of time and vehicle operating costs have also been derived for the 2040 Forecast Year using data provided in the TAG Databook.

Figure 3-1 and Figure 3-2 presents road network schemes modelled for the Canterbury Future Baseline in Canterbury local area and the city centre, respectively.

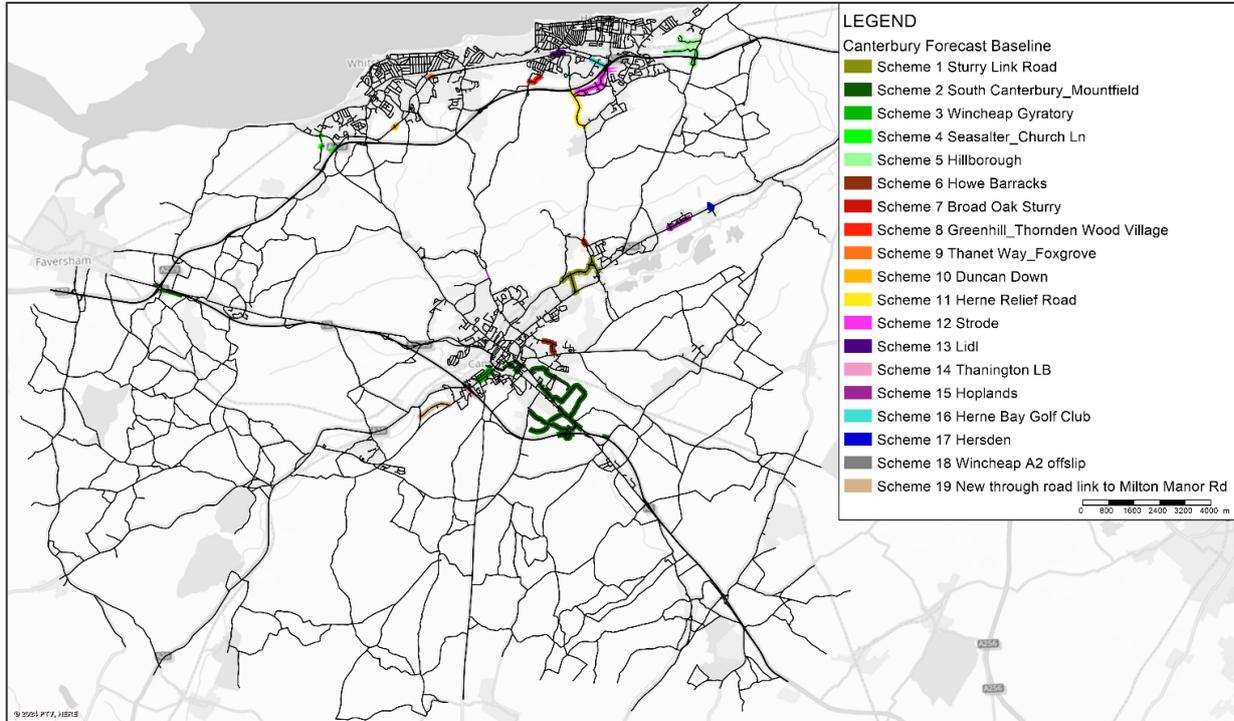


Figure 3-1: Canterbury Future Baseline Model – Schemes in Canterbury Local Area

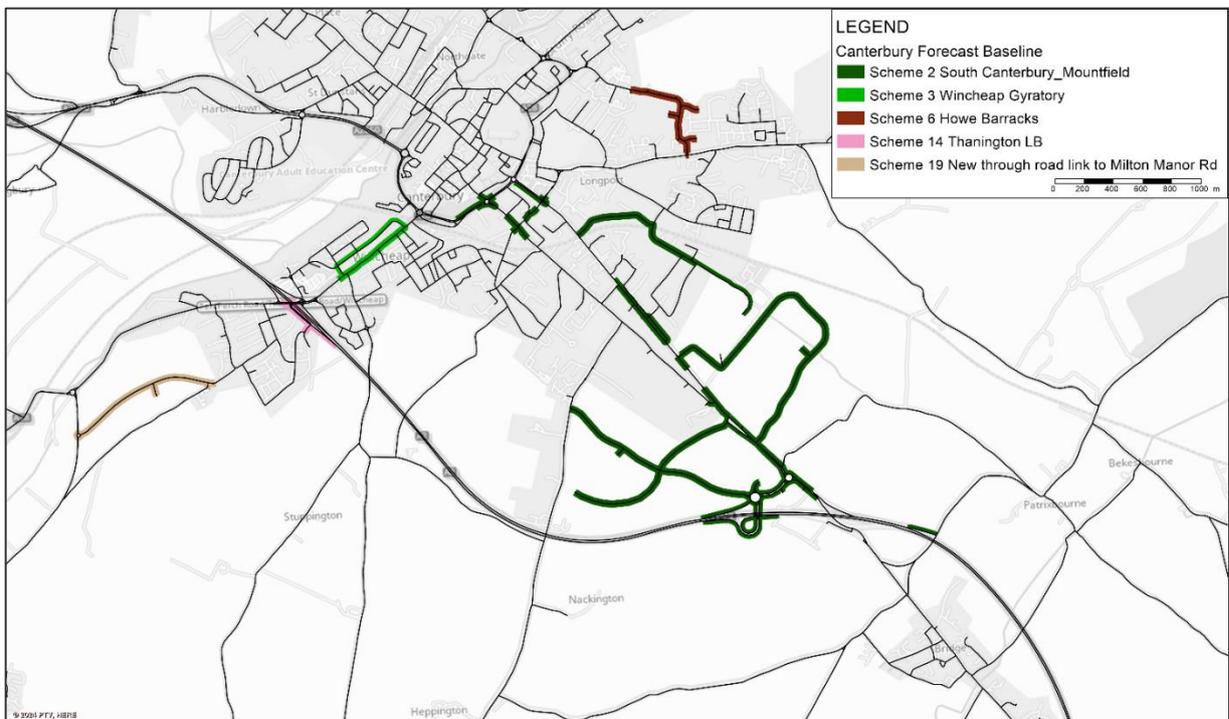


Figure 3-2: Canterbury Future Baseline Model – Canterbury City Schemes

4 Merton Park Development Modelling

This section focuses on the Merton Park development, including; the quantum, trip generation and trip distribution. The location of Merton Park is illustrated in Figure 4-1.

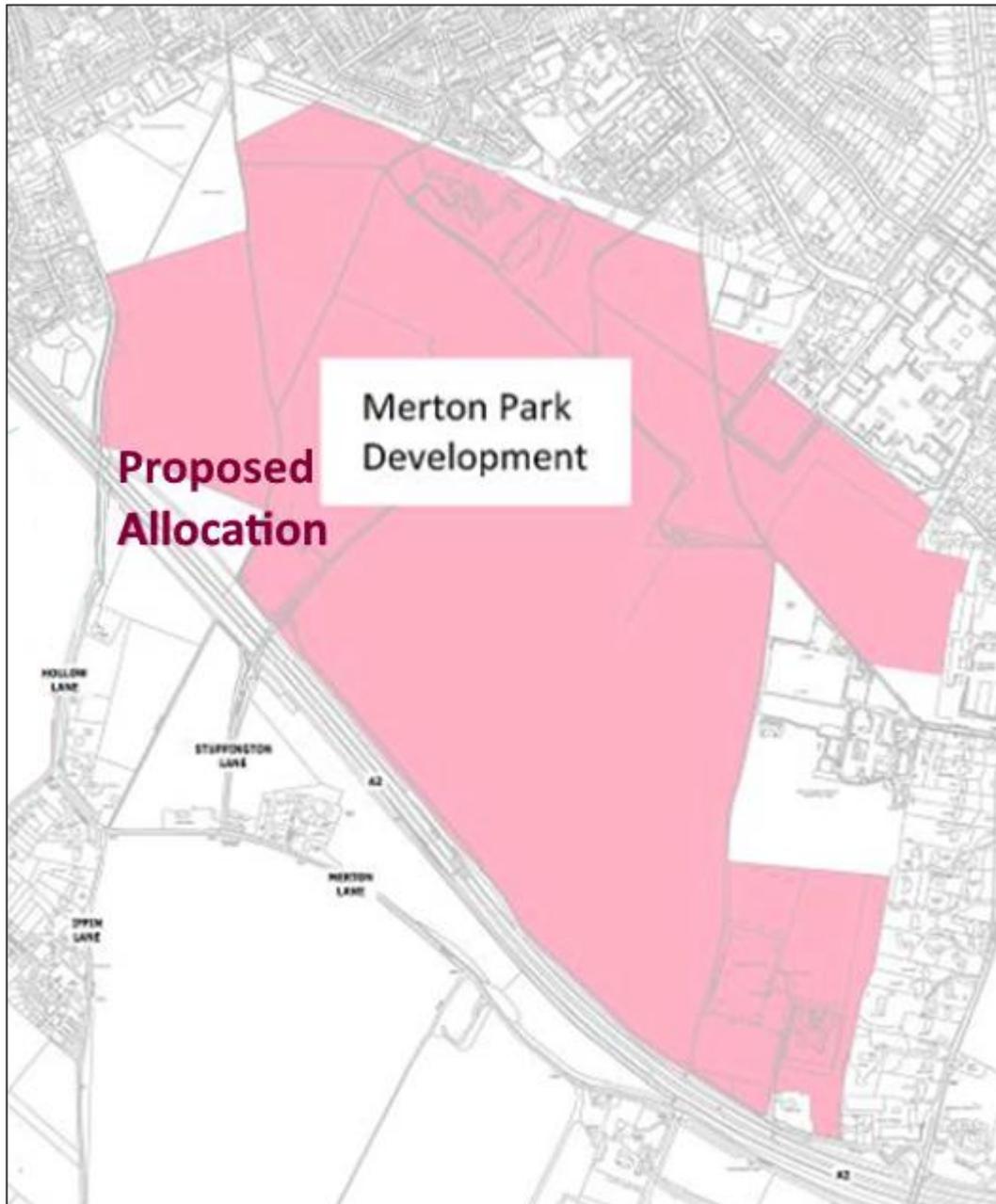


Figure 4-1: Merton Park Development Location Map

Three forecast modelling scenarios have been created for the 2040 Forecasting Year for the purpose of the revised Merton Park assessment, detailed as follows:

- **2040 Do Minimum (DM) Scenario** represents the latest Canterbury Future Baseline model;
- **2040 Do Something (DS) Scenario** – the latest Canterbury Future Baseline with Merton Park demand (split equally across the development access points) and network changes corresponding to the development access points.
- **2040 refined Do Something (rDS) Scenario** – the DS Scenario with Stuppington Lane closure between Merton Lane and Juniper Close and free assignment across the two access points.

The primary difference between the DM and DS scenario is therefore the inclusion of demand and network changes associated with Merton Park development, in line with assumptions provided to Jacobs by C&A. The primary difference between the DS and rDS scenario is the closure of Stuppington Lane and free assignment of development trips across the two access points.

4.1 Do Minimum

The DM network represents the revised 2040 Future Baseline Model without any changes to the network or demand.

4.2 Do Something

The DS network is built upon the DM network with the addition of infrastructure associated with the Merton Park development. The network changes implemented in the DS scenario are presented in Figure 4-2.



Figure 4-2: 2040 Do-Something Merton Park Network Changes

The Merton Park development can be accessed by car from Hollow Lane (north-east direction) (1) and from Nackington Road (south-east direction) (3), while bus access is also provided in through a signalised junction at Nackington Road / Langton Lane (2). Figure 4-3 shows the details of the access points. The rest of the network remains the same as in the DM Scenario.



Figure 4-3: Site Access Details – (1), (2), (3)

4.3 Refined Do Something

The rDS network builds upon the DS network with the addition of the closure of Stuppington Lane between Merton Lane and Juniper Close (Figure 4-4) and free assignment across the two access points (Figure 4-5). It should be noted that whilst the connectors appear to be different lengths in Figure 4-5, their lengths have been manually overwritten to ensure they are equally attractive.



Figure 4-4: Stuppington Lane Closure



Figure 4-5: Connectors for Merton Park Zone

4.4 Development Quantum and Trip Generation

Trip generation for Merton Park was calculated by using the same trip rates as the previous developed 2045 Canterbury Forecast Models. There were no other land uses or employment included within the trip generation for the DS scenario. The generated trips were reduced by 5% for sustainable travel, furthermore Merton Park had a 5% internalisation reduction. A potential reduction for cycle mode share, Propensity to Cycle Tool (PCT), was also applied. This is consistent with the methodology used for the development of the 2045 LP Option 5V3. The number of arrivals and departures for residential land use that were generated for AM and PM peak periods are shown in Table 3 below.

Table 3: Arrivals and Departures from Merton Park Development – Initial Trip Generation

Development Type	Development Quantum	Total				
		AM		PM		
		Dep	Arr	Dep	Arr	
Merton Park	Residential units (30% of which affordable)	2,075	536	268	359	495
	Retirement homes	210				

Additionally, C&A Consulting assumed further reduction in the vehicular trip generation for *Commute* and *Other* trip purpose to reflect higher usage of sustainable means of transport and/or active travel. Jacobs was not involved in the calculation of the revised trip generation and as such will not provide

any evidence to support the reduction. The final number of trips generated by Merton Park Development are presented in Table 4.

Table 4: Arrivals and Departures from Merton Park and Development – Final Trip Generation

	Development Type	Development Quantum	Total			
			AM		PM	
			Dep	Arr	Dep	Arr
Merton Park	Residential units (30% of which affordable)	2,075	368	219	273	354
	Retirement homes	210				

4.5 Development Trip Distribution

The trip distribution of the development zone is obtained by selecting a donor zone, which has similar land use and sits in the vicinity of the development, from the base year model. This process was undertaken in order to accurately replicate the trip distribution of the development zone.

For the Merton Park development trip distribution, a donor zone 162916 (located near the proposed development location), was used to synthesize the pattern of trips to/from the development.

Flow bundle figures for the Merton Park development have been produced to demonstrate the distribution of both origin and destination trips to and from Merton Park. These are shown in Figure 4-6 to Figure 4-9Error! Reference source not found..

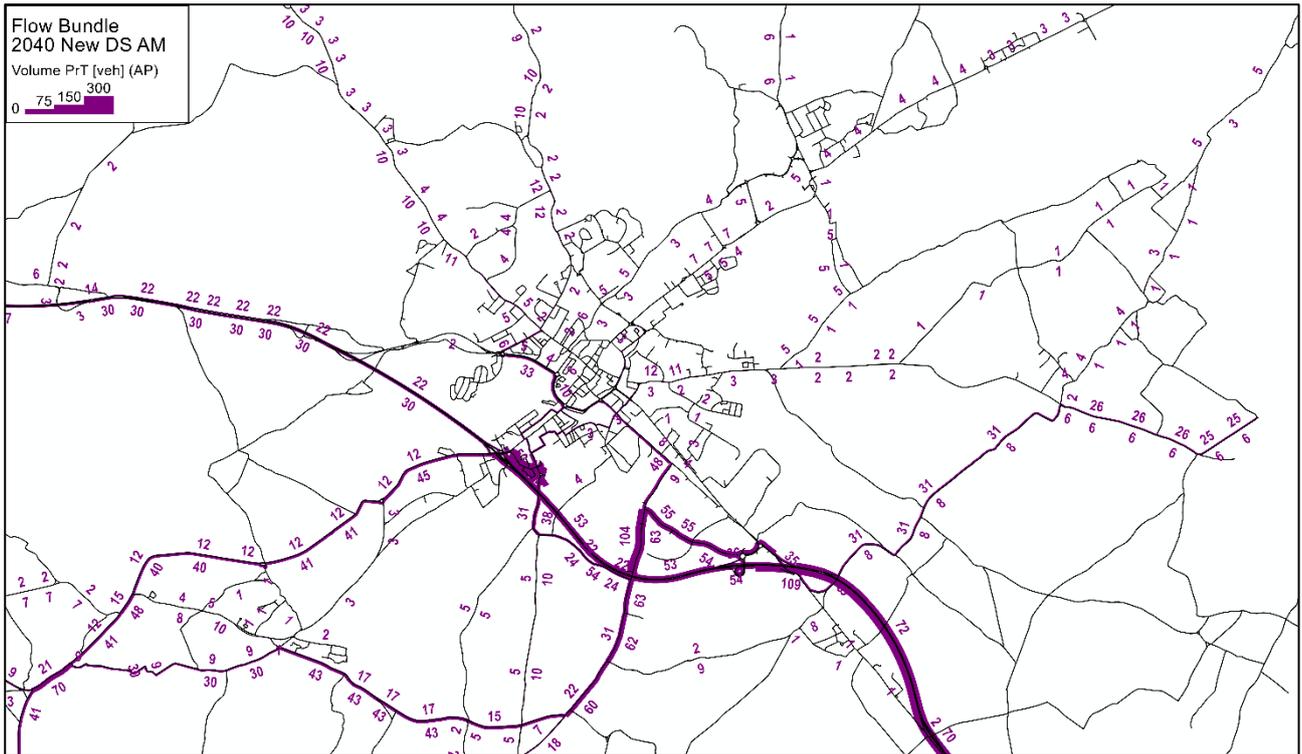


Figure 4-6: Flow Bundle, DS AM, Wide Extent

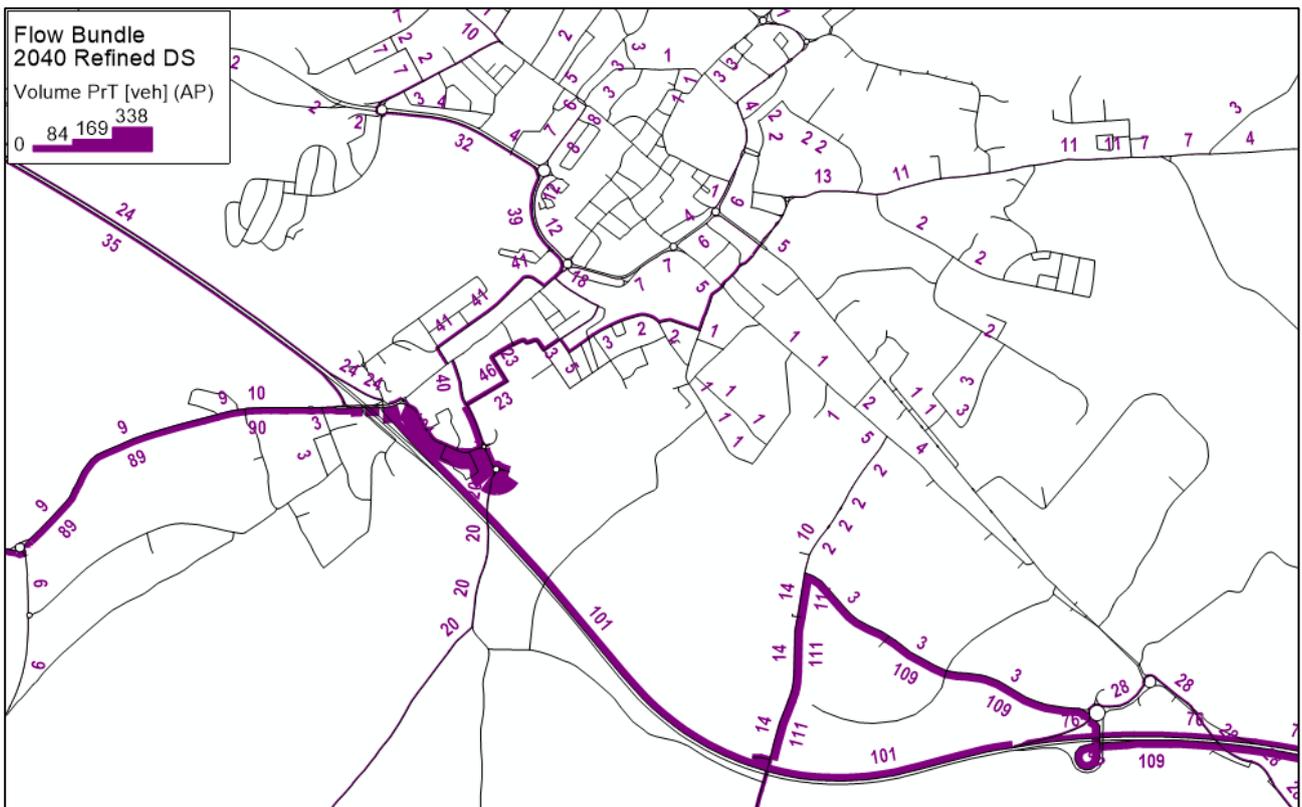


Figure 4-7: Flow Bundle, DS AM, Close Extent

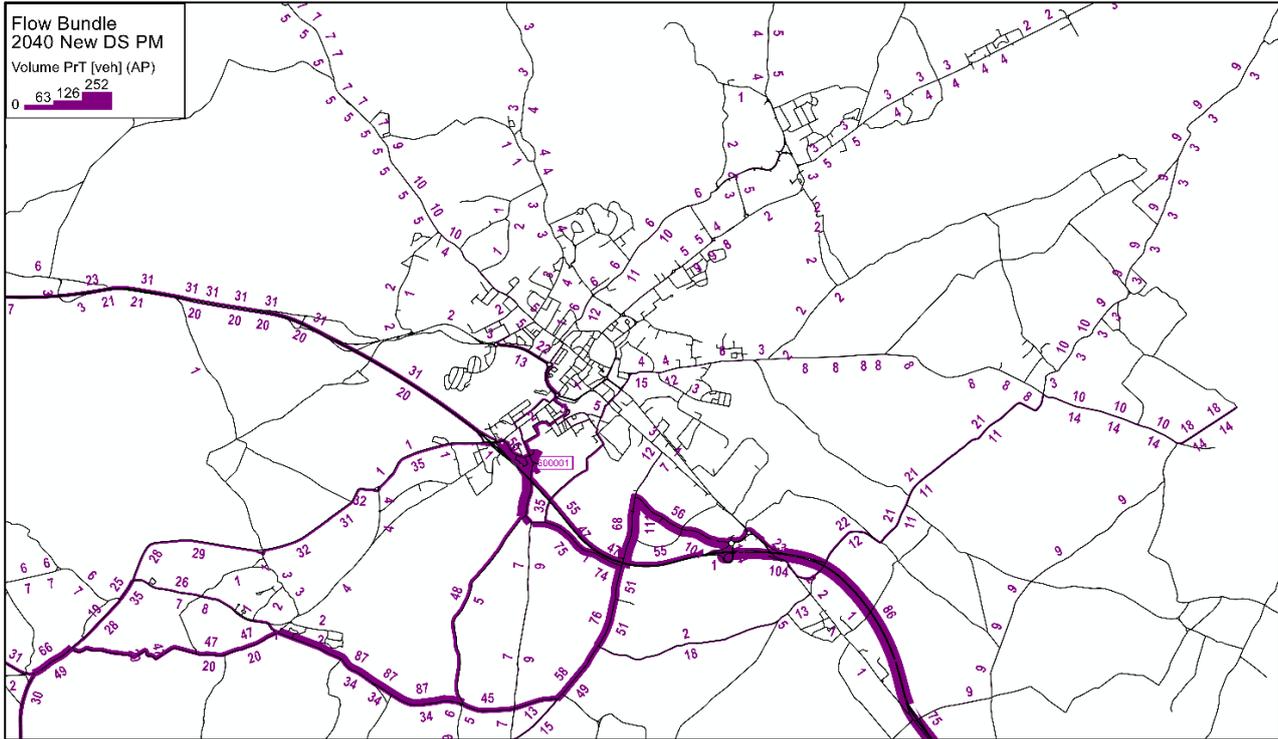


Figure 4-8: Flow Bundle, DS PM, Wide Extent

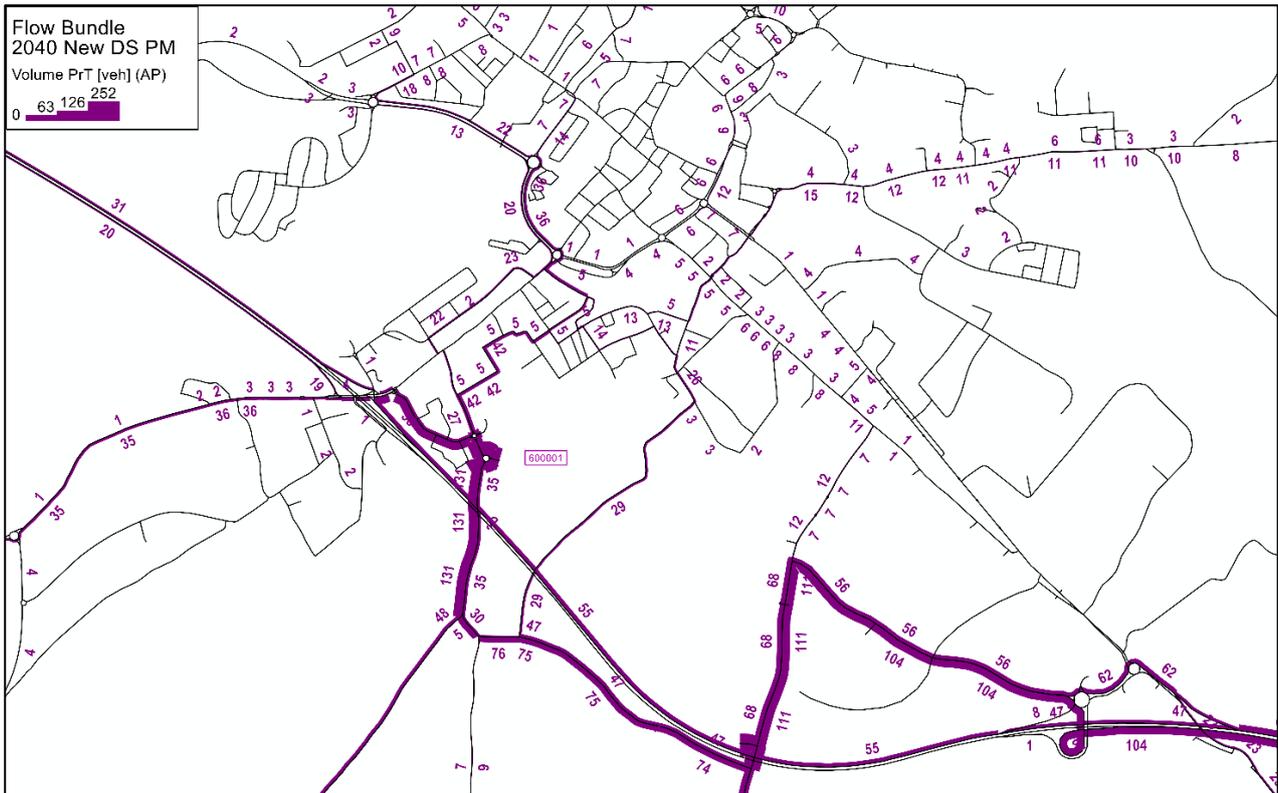


Figure 4-9: Flow Bundle, DS PM, Close Extent

In the AM peak (Figure 4-6 and Figure 4-7), approximately 20% of modelled trips originating from the Merton Park development travel along the A2 towards destinations to the east, 17% travel south-west along A28 and 25% travel to Canterbury city centre. Approximately 50% of trips arriving at the development originate from the east via A2 (half of which are from Mountfield Roundabout and the other half from Wincheap), 8% from Canterbury City Centre, 15% from the south-west along A28 and 10% from the west along A2.

In the PM peak, (Figure 4-8 and **Error! Reference source not found.**) approximately 31% of modelled trips originating from the Merton Park development travel towards destinations to the east along the A2, 19% towards the south-west via A28 and Nackington Road, and 10% to Canterbury city centre. Approximately 29% of trips arriving at the development travel from the east via A2, 22% from Canterbury city centre, 25% from the south-west along A28 and Nackington Road and 9% from the west via A2.

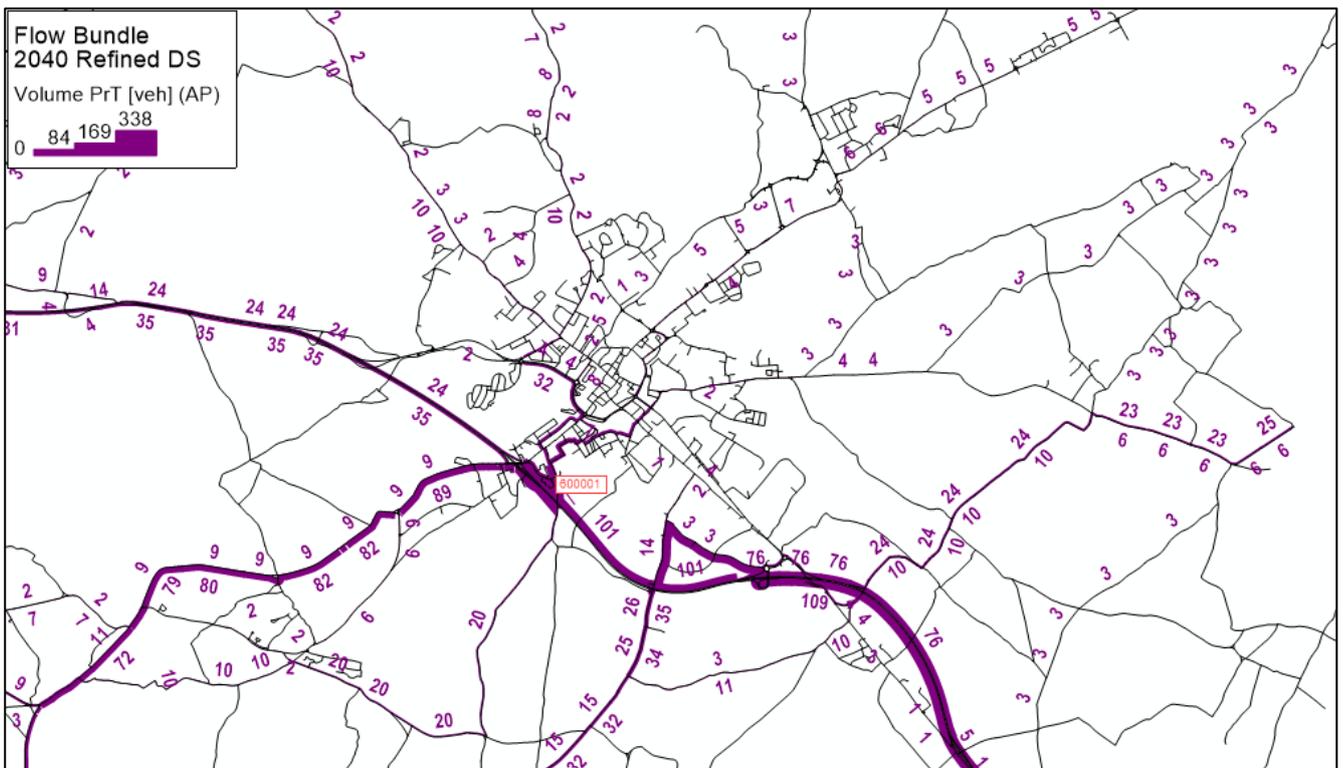


Figure 4-10: Flow Bundle, rDS AM, Wide Extent

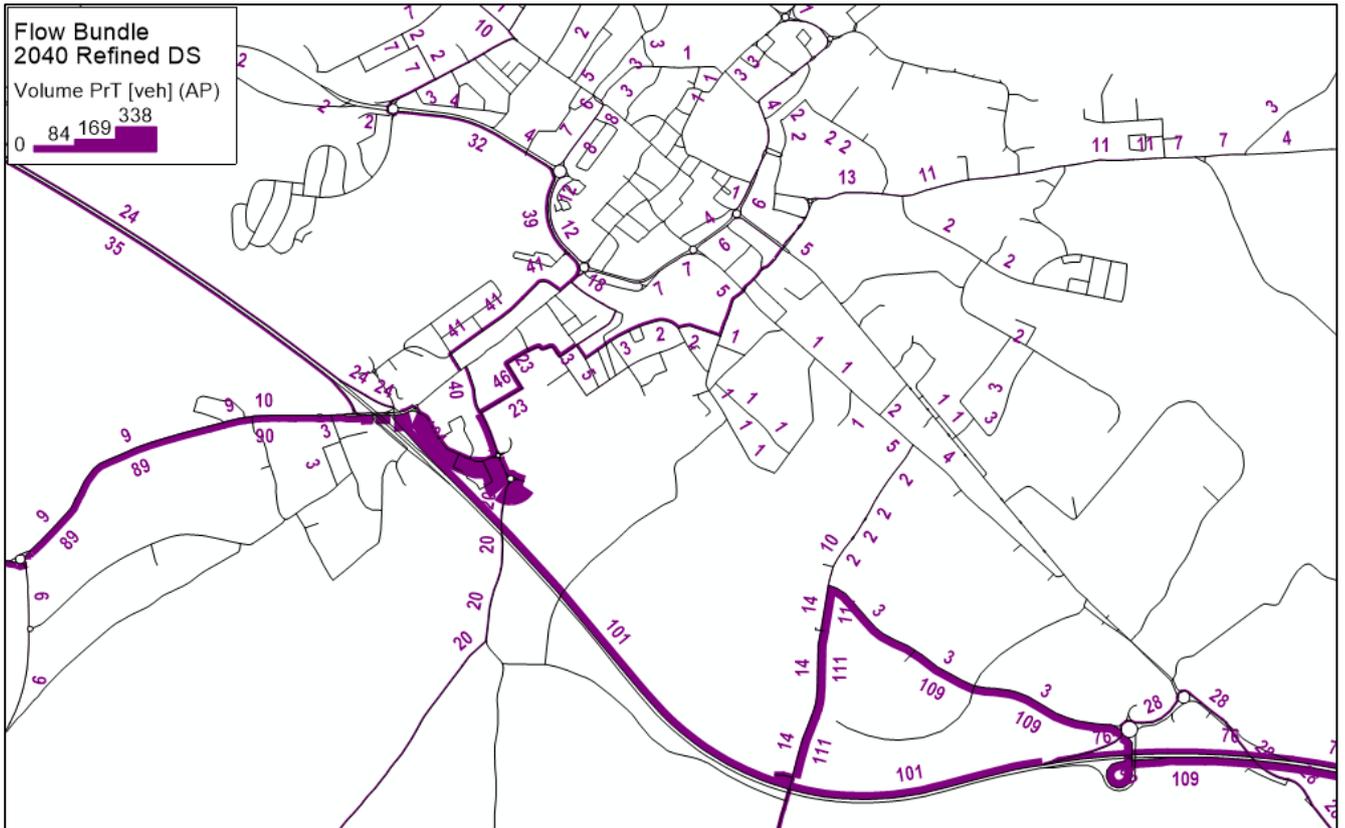


Figure 4-11: Flow Bundle, rDS AM, Close Extent

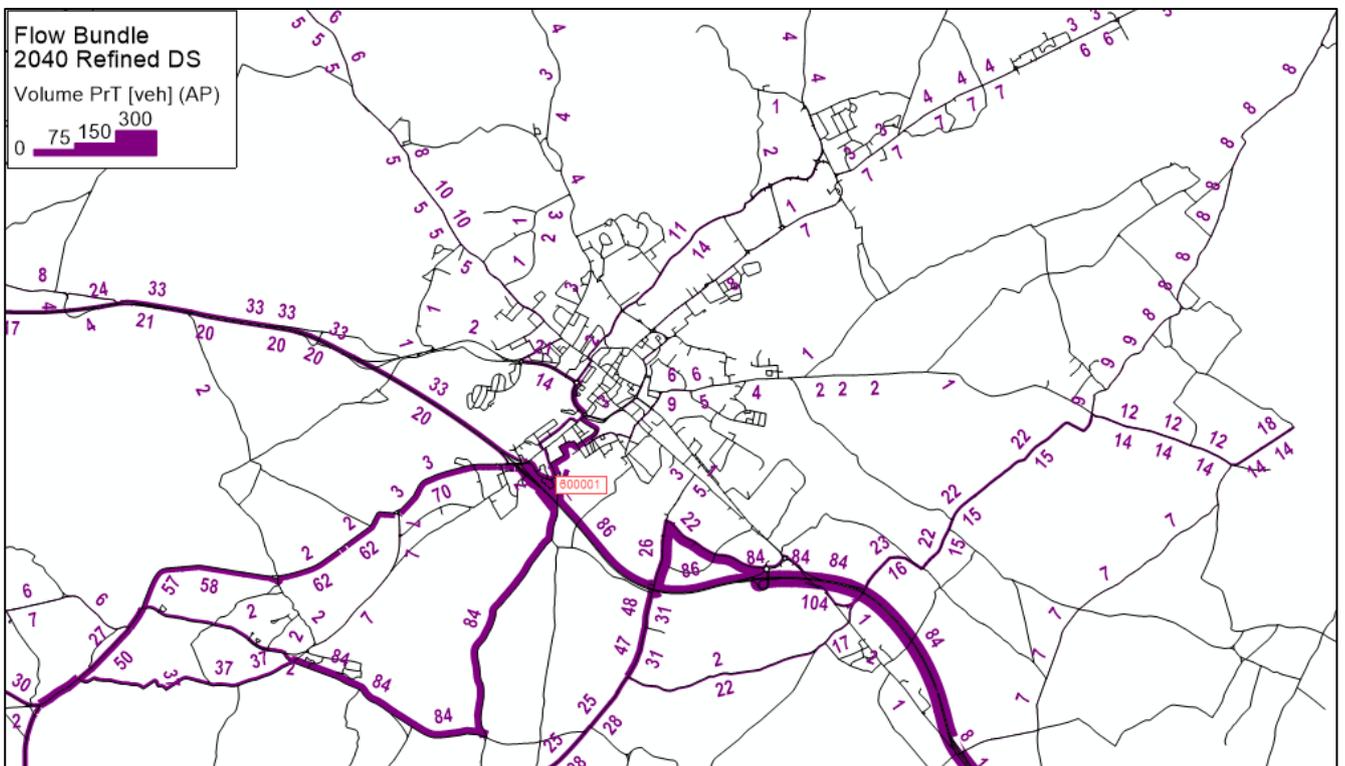


Figure 4-12: Flow Bundle, rDS PM, Wide Extent

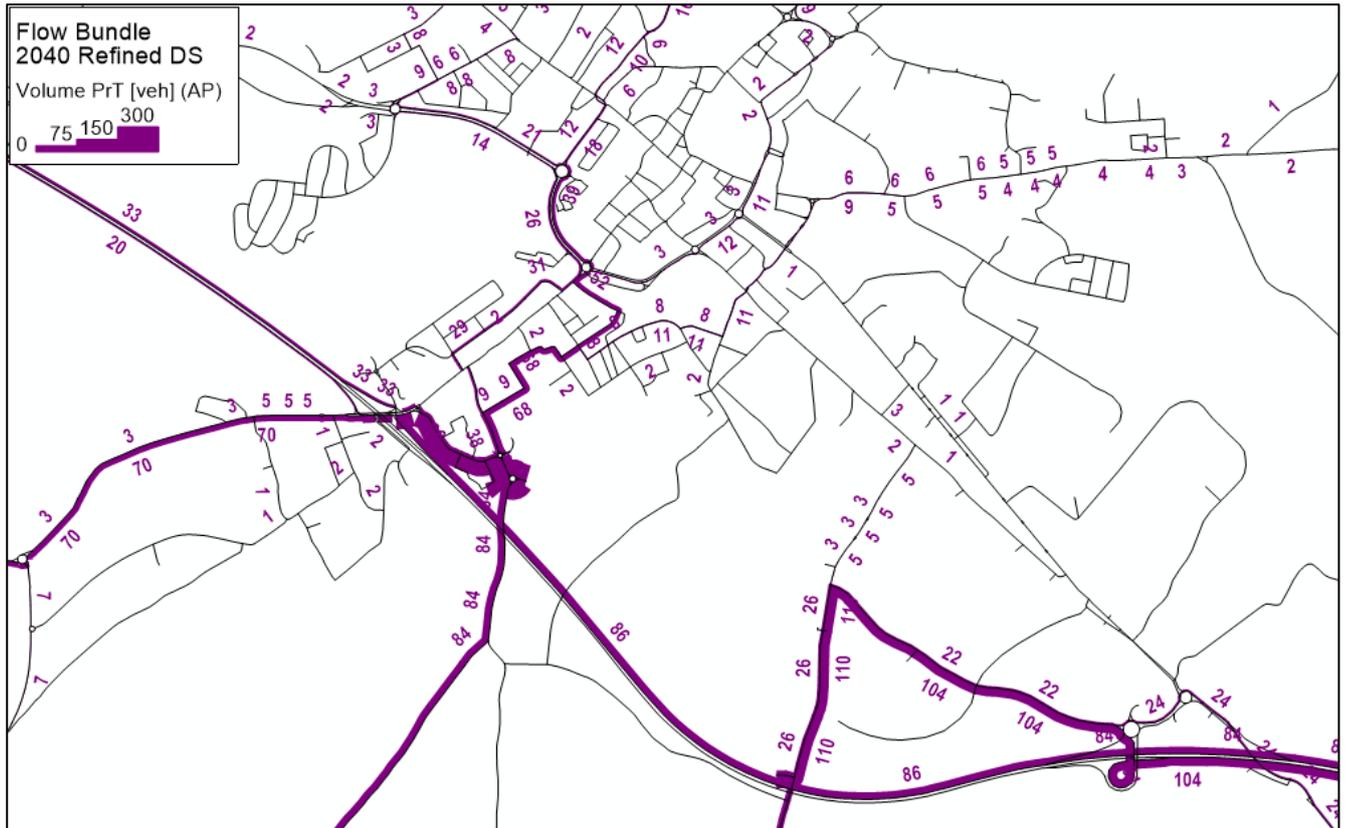


Figure 4-13: Flow Bundle, rDS PM, Close Extent

In the AM peak (Figure 4-10 and Figure 4-11), 368 vehicles originate from the development zone and 219 trips arrive at the zone (unchanged from the DS). Of the trips originating from the zone, 86% exit onto Hollow Lane / Site Access roundabout and of those, 32% continue onto the A2 eastbound towards Dover, 29% travel westbound along A28 towards Ashford, 11% join the A2 westbound towards Faversham and 27% travel along local roads towards the city centre. 14% of total trips originating from the development zone enter the road network onto Nackington Road where most vehicles travel southbound towards villages to the south of the city. Of the trips arriving at the zone, 63% arrive from Nackington Road access with 80% of those trips arriving from A2 westbound via Mountfield Roundabout. Of the trips arriving at the site from the Hollow Lane / Site Access roundabout, 30% originate from A2 eastbound and 28% arrive from the city centre via local roads.

In the PM peak, (Figure 4-12 and Figure 4-13) 273 trips originate from the development zone and 355 trips arrive at the development zone. Of the trips originating from the development zone, 79% exit onto the Hollow Lane / Site Access roundabout and of those trips, 40% of vehicles continue onto A2 eastbound towards Dover and 32% travel westbound along A28 towards Ashford. The remaining 21% of trips exit the zone onto Nackington Road. Of those, 54% travel southbound towards villages to the south of the city and 39% of trips join the A2050 eastbound and travel towards villages to the east of the city. Of the trips arriving at the zone in the PM peak, 55% arrive via Hollow Lane / Site Access roundabout; 43% of those vehicles originate from the Chartham area via Hollow Lane, 35% arrive from the city centre and 17% arrive from A2 eastbound. Of the 45% of trips arriving to the zone via Nackington Road, 66% of them arrive from the A2 westbound via Mountfield Roundabout and 30% arrive from villages to the south via Nackington Road.

5 Assignment Results

A set of output figures and tables has been produced to show actual flows and flow differences in order to help identify key areas of constraint arising from the development and the associated infrastructure.

5.1 Actual Flow

5.1.1 Do Minimum

Actual flow figures for the 2040 DM are presented in Figure 5-1 and Figure 5-2 for the AM and PM Peak, respectively.

In the AM, the highest traffic flows are noted along the A2 with approximately 1,850 and 1,950 vehicles travelling to the east and west, respectively. Along A28, approximately 500 vehicles travel northbound and 600 vehicles travel southbound. Along Nackington Road north of A2, approximately 520 vehicles travel northbound and 300 vehicles travel southbound.

In the PM, approximately 1,840 vehicles are noted travelling eastbound along the A2 and 1,730 vehicles in the opposite direction. On A28, approximately 320 and 660 vehicles are moving in the northbound and southbound direction, respectively. Nackington Road shows flow levels of around 365 vehicles in each direction.

5.1.2 Do Something

Actual flow figures for 2040 DS scenario are presented in Figure 5-3 and Figure 5-4.

In the AM, the highest traffic flows are noted along the A2 with up to 2,750 and 2,200 vehicles travelling to the east and west, respectively. Along A28, up to 700 vehicles travel in both the northbound and southbound directions. Along Nackington Road north of A2, approximately 600 vehicles travel northbound and 335 vehicles travel southbound.

In the PM, up to 2,250 vehicles are noted travelling eastbound along the A2 and up to 2,300 vehicles in the opposite direction. On A28, up to 680 and 630 vehicles are moving in the northbound and southbound direction, respectively. Nackington Road shows flow levels of around 440 vehicles in each direction.

5.1.3 Refined Do Something

Actual flow figures for 2040 rDS scenario are presented in Figure 5-5 and Figure 5-6.

In the AM, the highest traffic flows are noted along the A2 with up to 2,770 and 2,300 vehicles travelling eastbound towards Dover and westbound towards Faversham, respectively. Along A28, up to 680 vehicles travel northbound towards Canterbury and 670 vehicles travel southbound towards Ashford. Along Nackington Road north of A2, up to 675 vehicles travel northbound towards the city centre and up to 485 vehicles travel southbound. Stuppington Lane is closed to vehicles therefore there is no flow in either direction.

In the PM, up to 2,250 vehicles are noted travelling eastbound along the A2 and up to 2,270 vehicles in the opposite direction. On A28, up to 680 and 630 vehicles are travelling in the northbound and southbound direction, respectively. Nackington Road shows flow levels of up to 430 northbound and up to 710 southbound north of the A2.

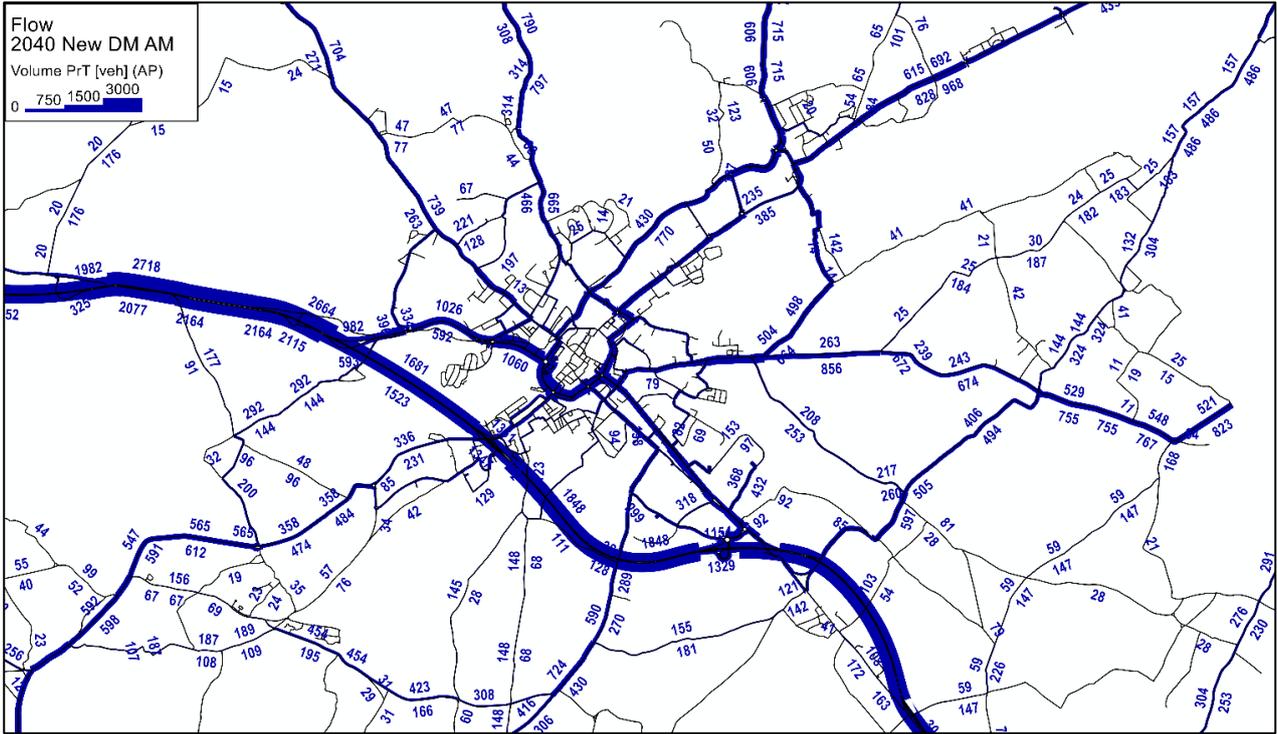


Figure 5-1 Total Flow, DM, AM

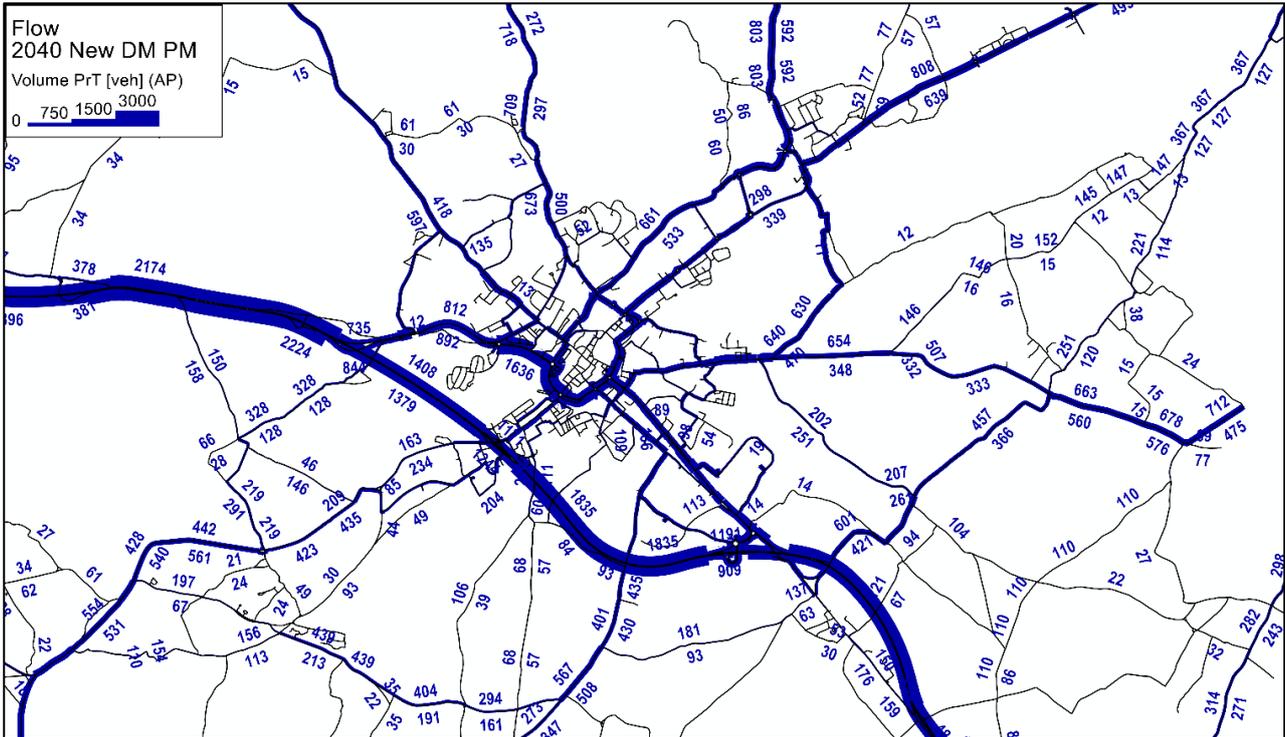


Figure 5-2 Total Flow, DM, PM

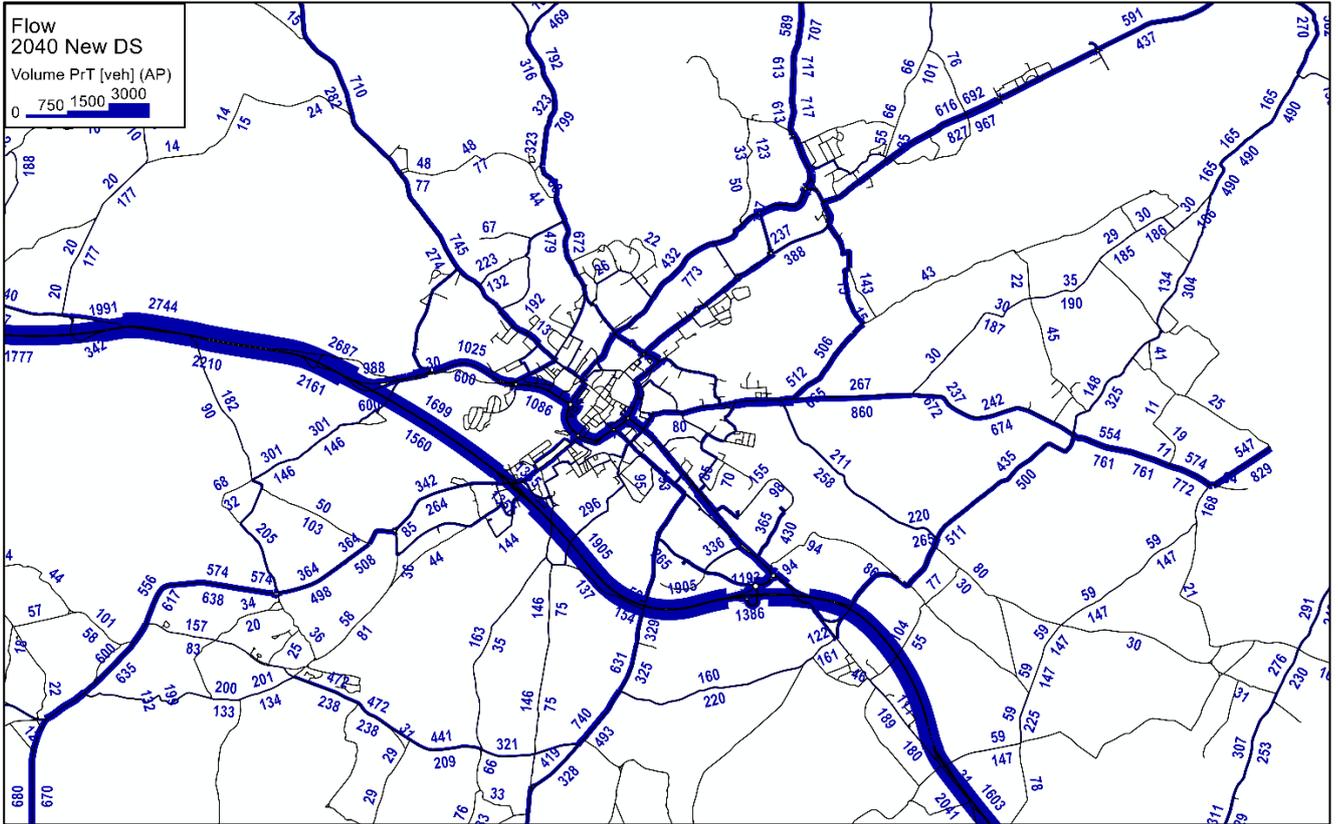


Figure 5-3 Total Flow, DS, AM

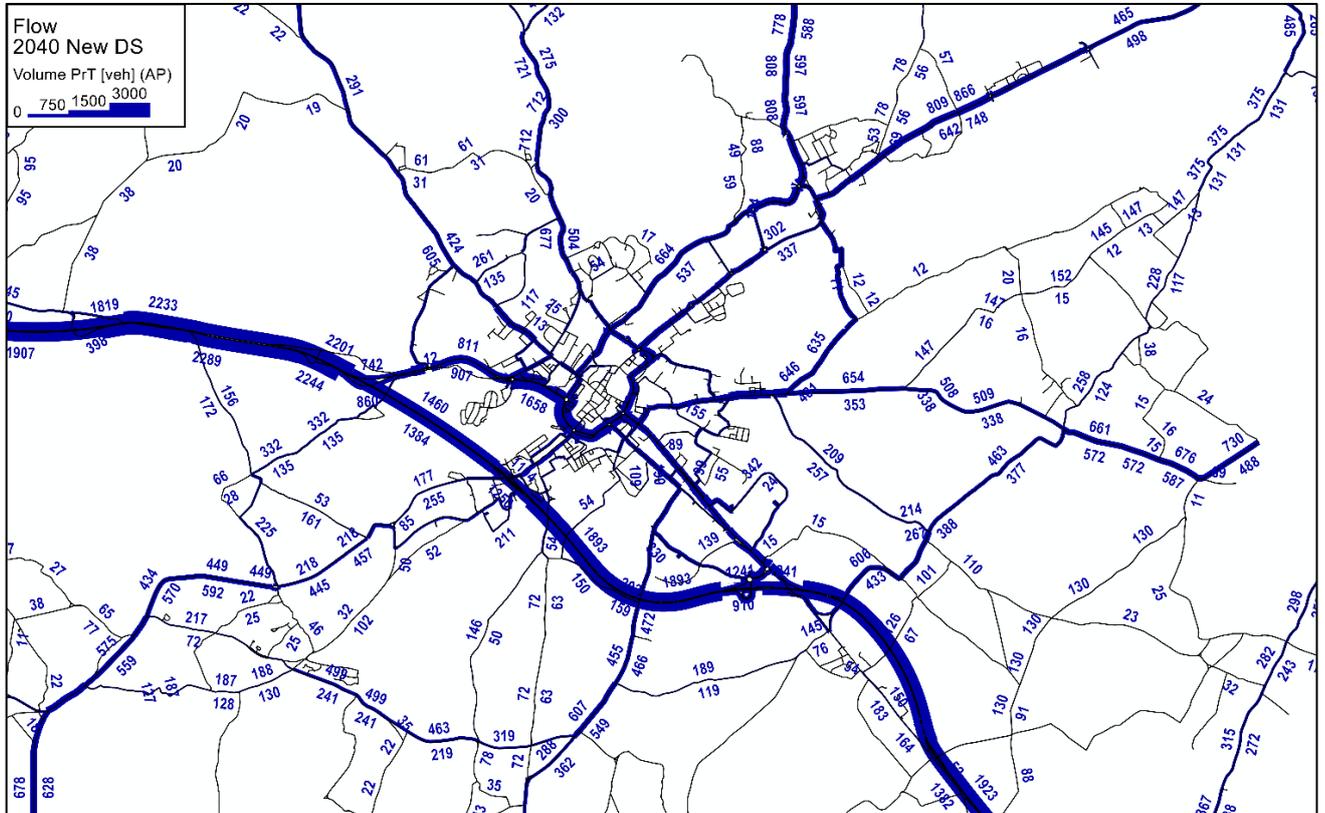


Figure 5-4: Total Flow, DS, PM

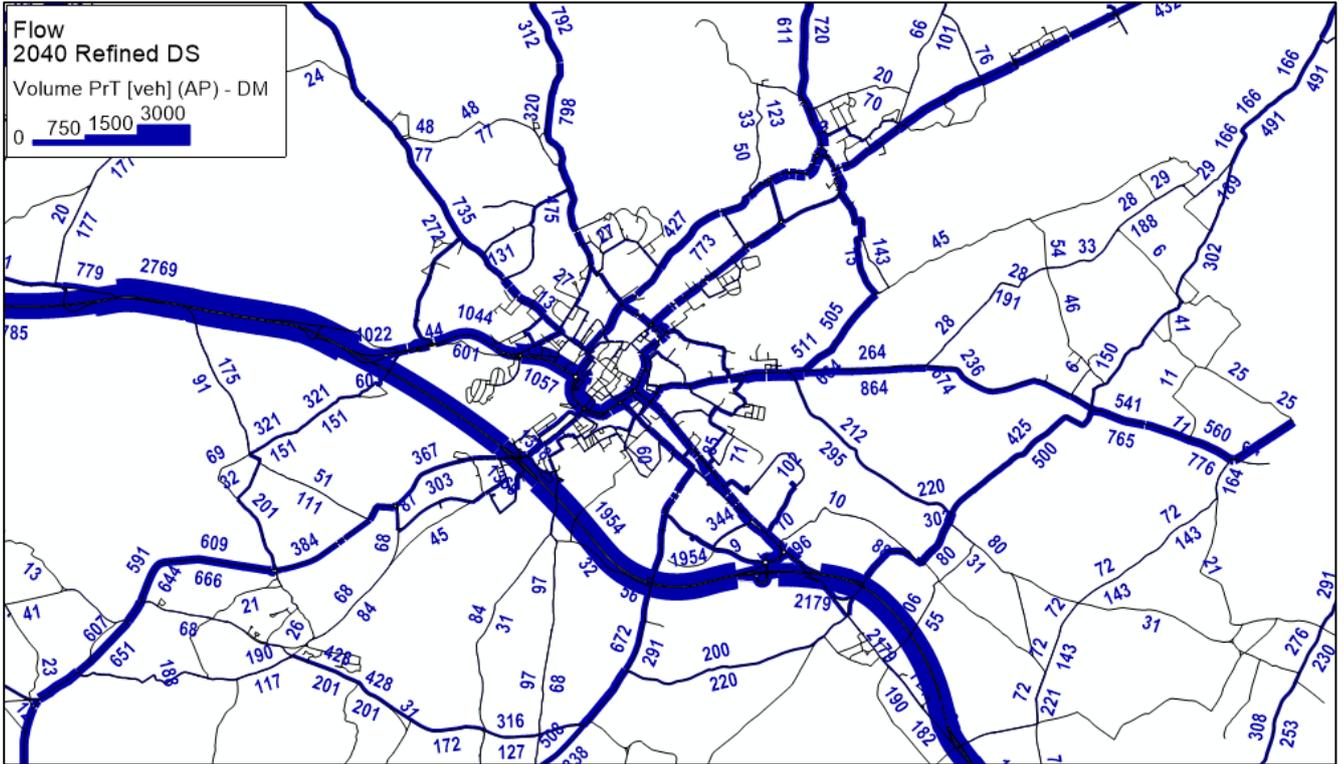


Figure 5-5: Total Flow, rDS, AM

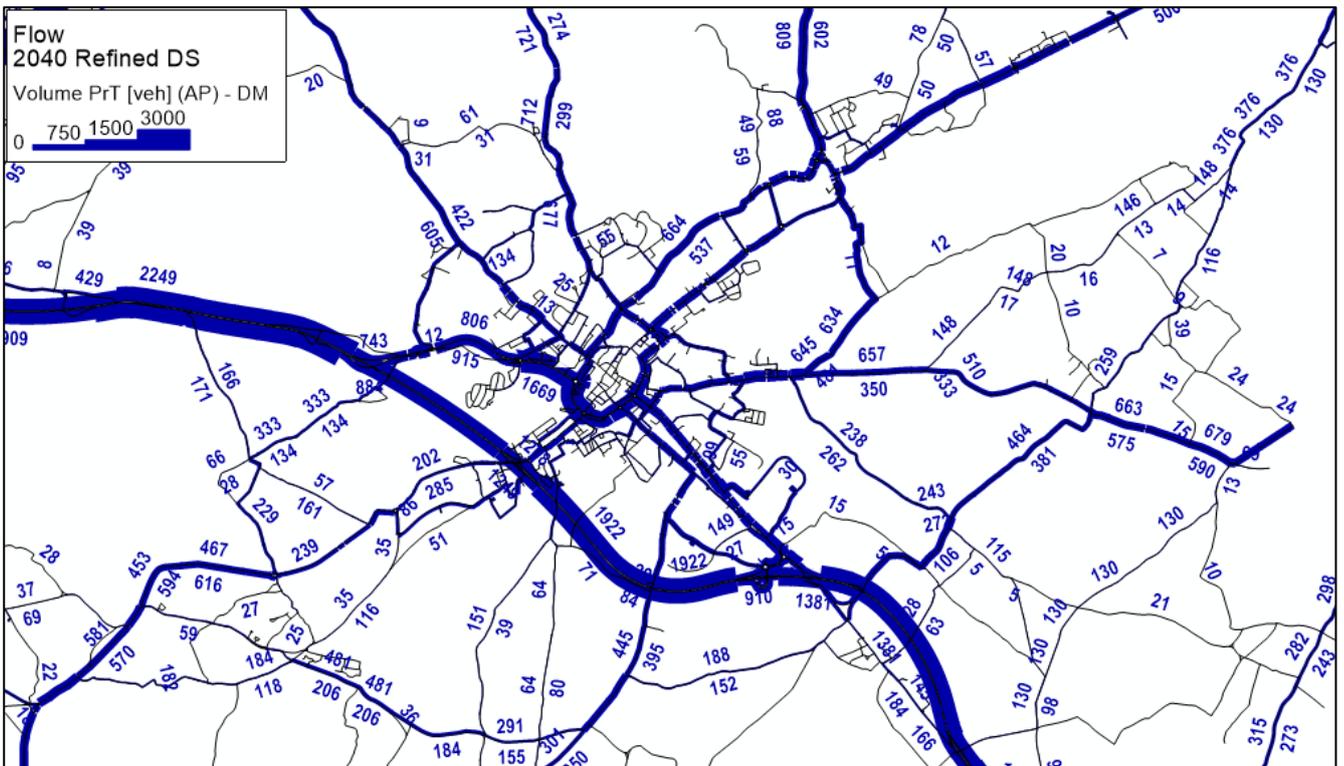


Figure 5-6: Total Flow, rDS, PM

5.2 Flow Difference

Flow difference figures for the 2040 DS scenario are presented in Figure 5-7 and Figure 5-8.

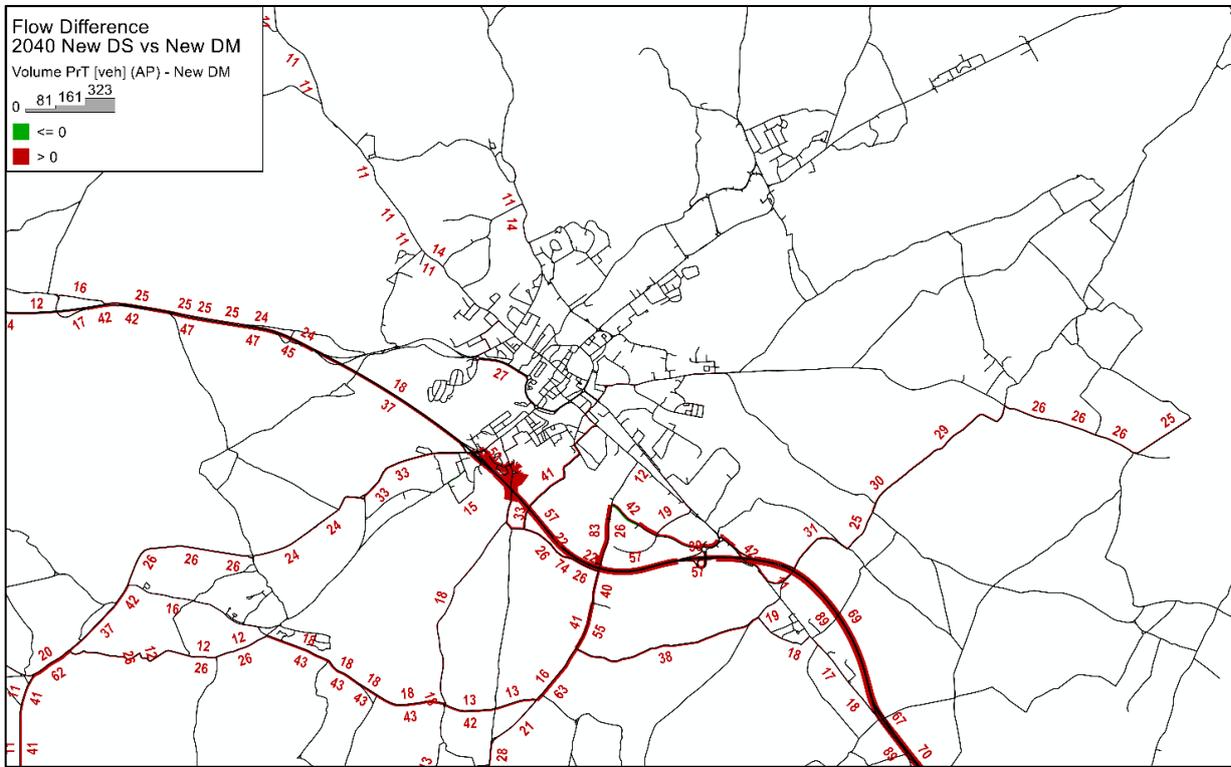


Figure 5-7: Flow Difference, DS vs DM, AM

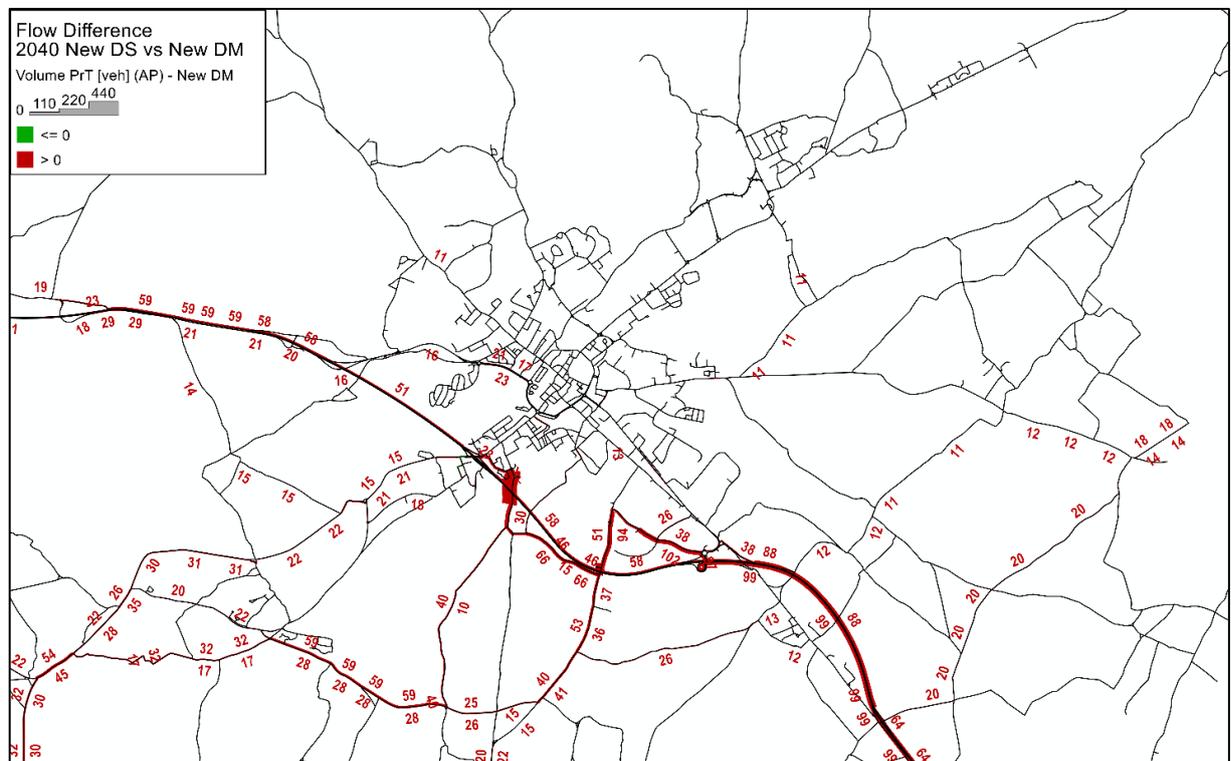


Figure 5-8: Flow Difference, DS vs DM, PM

From Figure 5-7 and Figure 5-8, it is noted that the highest increase of traffic flows is in both directions of the A2 to the east of Mountfield roundabout in both time periods. An increase of flow can be also seen along A2 to the west of A28 Wincheap, along Nackington Road to the south of the new link road), along the new link road to the west of Mountfield Roundabout, Chartham Down Road, Homersham, Hollow Lane and A28 to the south of A28 Wincheap in both AM and PM Peak.

Actual flow difference figures for the 2040 rDS scenario compared to the DM scenario are presented in Figure 5-9 and Figure 5-10. The difference in flow is a result of the Merton Park development demand, Stuppington Lane closure and free assignment across the two access points.

From Figure 5-9 and Figure 5-10, increases in flow are seen in both directions of the A2, A28 and Nackington Road, similar to Figure 5-7 and Figure 5-8. In the AM peak, the Hollow Lane / Site Access roundabout experiences significant increases of flow with 188 more vehicles approaching from the north, 318 more vehicles approaching the roundabout from the site and 215 more vehicles approaching from the south. There is an increase of 355 vehicles approaching the Hollow Lane / Homersham roundabout from the south and this increase in vehicles continues westbound along Homersham (224) and the A2 eastbound on-slip from the A28 (100). The A28 sees increases in westbound flow of up to 72 vehicles west of the A28 / A2 junction.

In the AM peak, there is evidence of localised rerouting as a result of the network changes surrounding Stuppington Lane. Vehicles travelling northbound along Stuppington Lane in DS originate from villages south of Canterbury via local roads such as Chartham Downs Road, New House Lane, Iffin Lane and Merton Lane. Due to the closure of Stuppington Lane in rDS, these vehicles reroute onto other strategic roads such as A28, Hollow Lane and Nackington Road. This is also reflected in the reduced flow along local roads near the Kent and Canterbury Hospital.

There are similar patterns in the PM peak with increases in flow seen along the A2 (up to 100 in each direction) and A28 (up to 60 in each direction). The largest increases are seen around the site access roundabout near Hollow Lane with an increase of 254 approaching from the north, 216 from the east and 275 from the south. There is a significant increase of 180 vehicles travelling southbound along Nackington Road approaching the site access. Of the total flow along this road, 63% originates from the city centre and the remaining flow originates from A2 eastbound. The increased flow seen along this road is likely due to a larger demand on the network as well as vehicles from the city centre rerouting due to the closure of Stuppington Lane. There is a reduction of 132 vehicles travelling eastbound along Merton Lane between Stuppington Lane and Nackington Road which is due to vehicles rerouting onto strategic roads to avoid the Stuppington Lane closure.

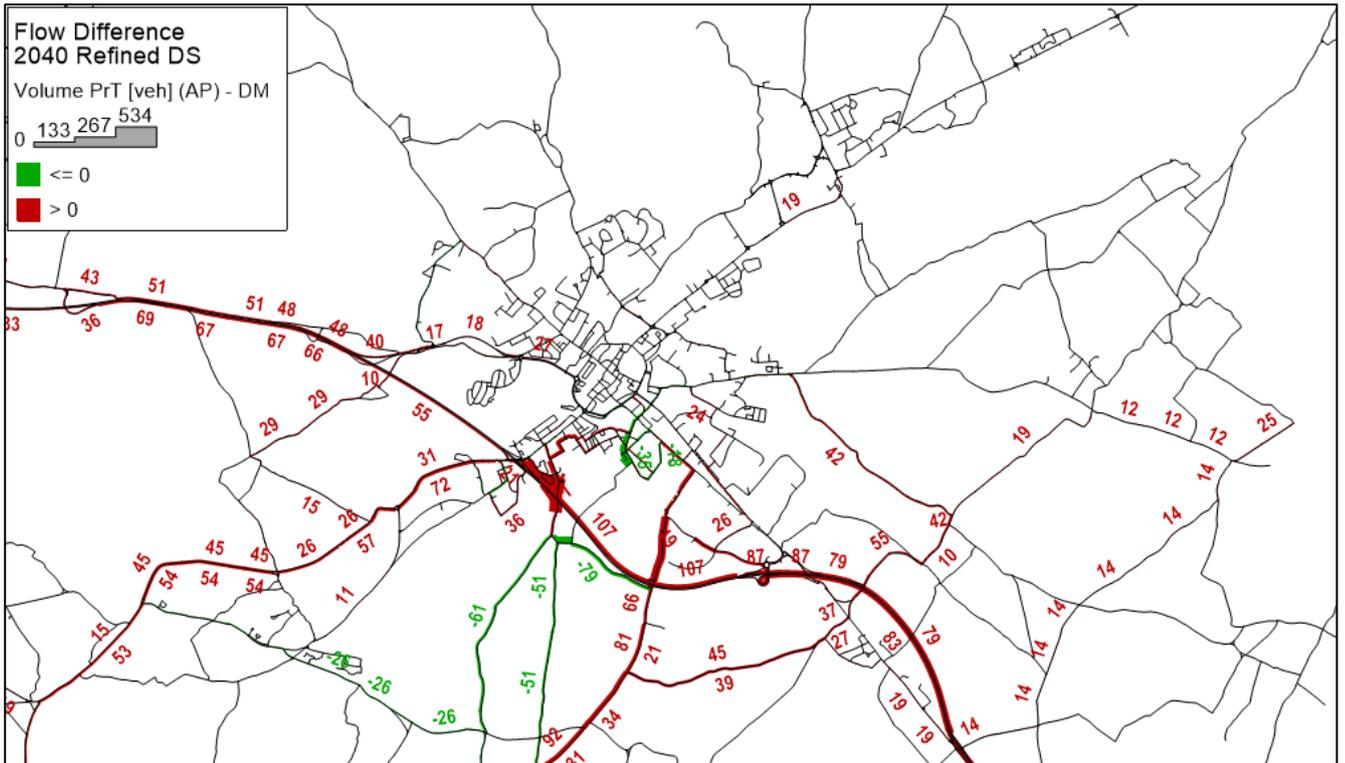


Figure 5-9: Flow Difference, rDS vs DM, AM

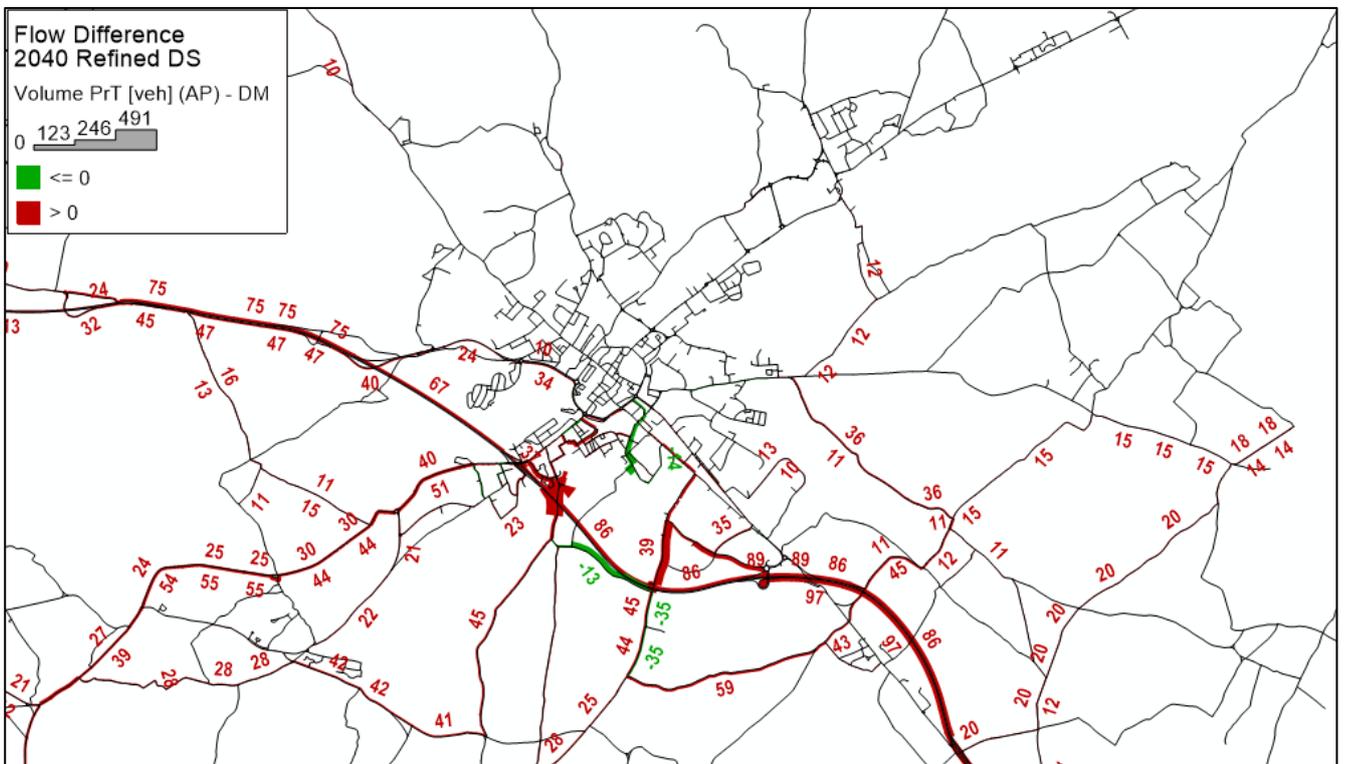


Figure 5-10: Flow Difference, rDS vs DM, PM

Actual flow difference figures for the 2040 rDS scenario compared to the DS scenario are presented in Figure 5-11 and Figure 5-12. The difference in flow is a result of the Stuppington Lane closure and the free assignment across the two access points.

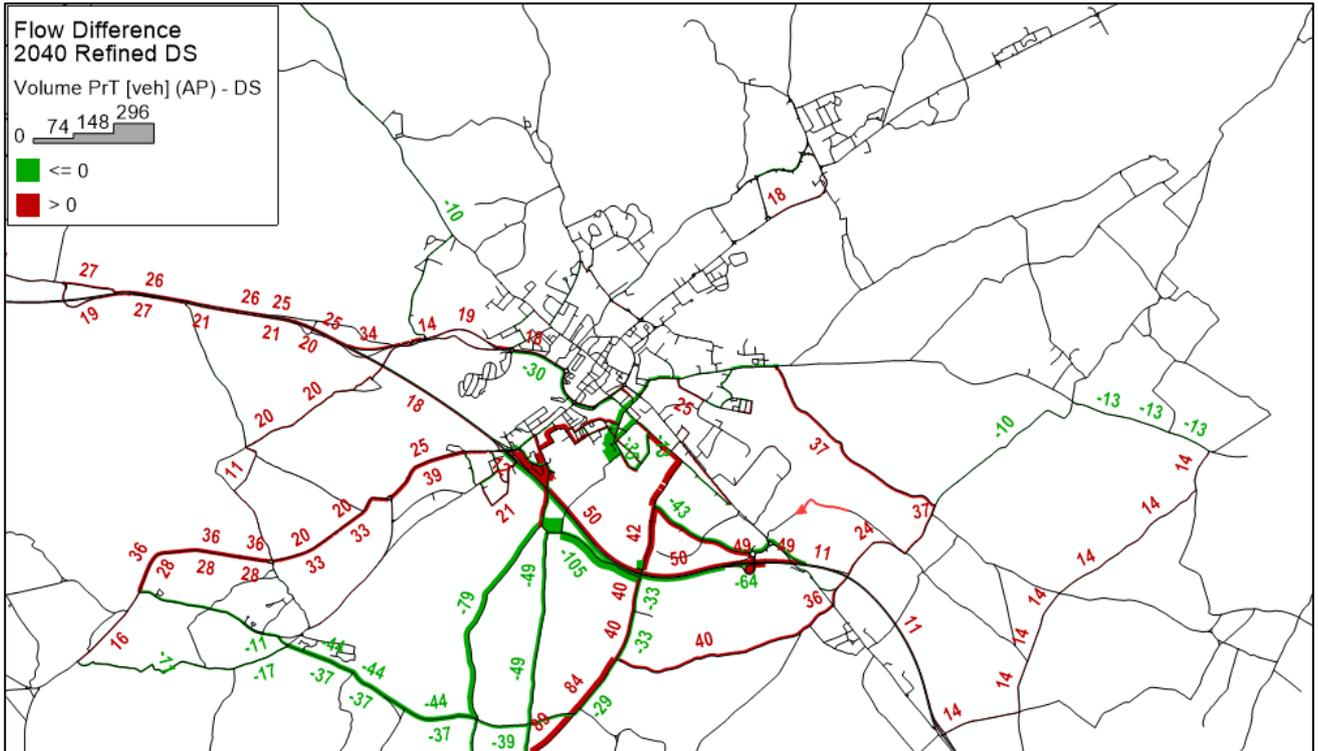


Figure 5-11: Flow Difference, rDS vs DS, AM

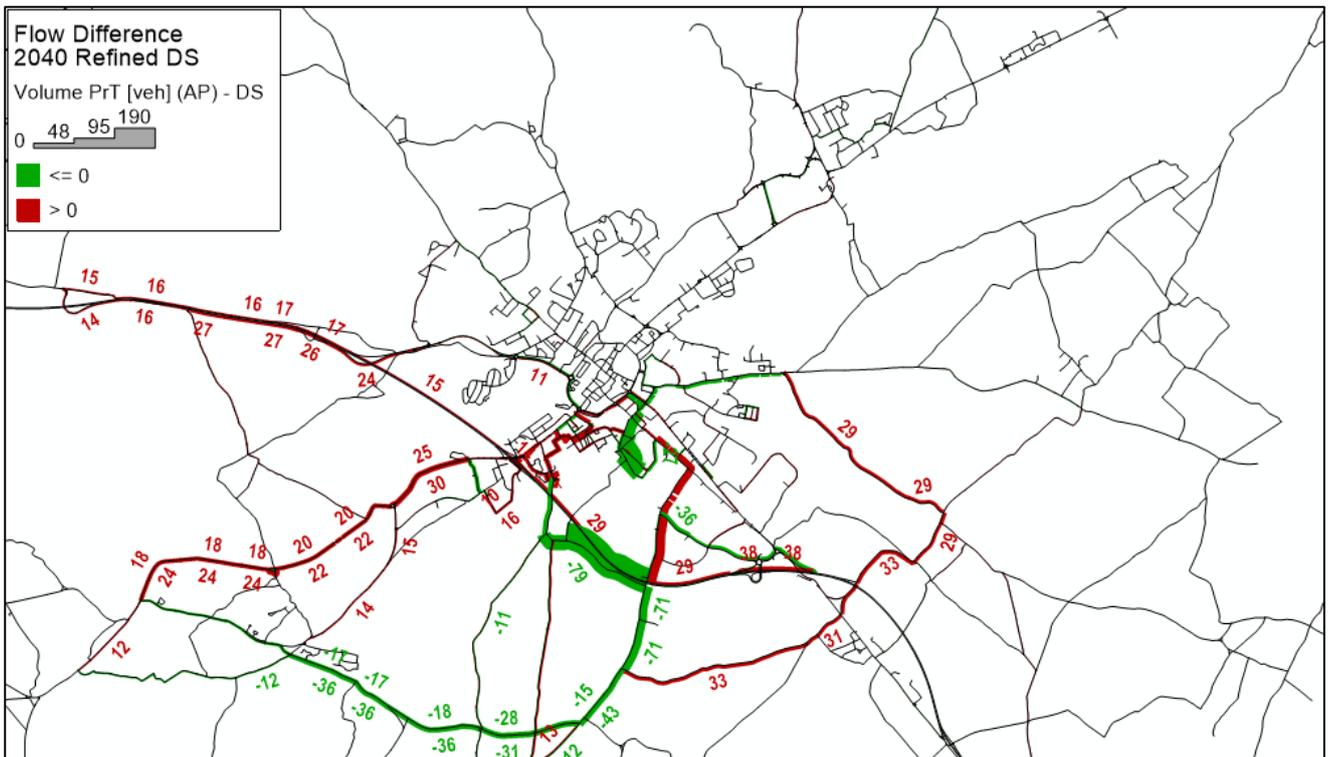


Figure 5-12: Flow Difference, rDS vs DS, PM

The difference shown in Figure 5-11 are similar to those shown in Figure 5-9; there is evidence of localised rerouting; significant reductions in flow are seen along Chartham Downs Road (-44 eastbound and -37 westbound), New House Lane (-79 northbound), Iffin Lane (-49 northbound) and Merton Lane (-105 westbound and -35 eastbound) and increases in flow are concentrated along strategic roads such as Nackington Road (+40 northbound approaching the site access) and A28 (+25 eastbound and +39 westbound). The free assignment across the two access points has resulted in differences in where vehicles access the site; the Nackington Road access point sees more vehicles entering (+28) and fewer vehicles exiting (-134) whereas the Hollow Lane access point notes fewer vehicles entering (-19) and more vehicles exiting (+134).

In the PM peak (Figure 5-12), there are fewer vehicles using the Nackington Road site access (-80 exiting and -19 entering) and more vehicles using the Hollow Lane / site access roundabout (+80 exiting and +19 entering) which is due to drivers rerouting from Stuppington Lane and also from the free assignment across the two access points. Travel flows across the local area are similar to the AM peak with increases in flow concentrating along strategic roads such as A28 (+20 eastbound and +30 westbound) and Nackington Road (+85 southbound approaching the site access). There are significant reductions in flow along local roads such as Merton Lane (-178 eastbound and -79 westbound), Chartham Downs Road (-28 eastbound and -31 westbound) and Nackington Road south of the A2 (-15 northbound and -43 southbound).

6 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. It provides supporting material on the Canterbury VISUM Model build and it illustrates future network performance with which to provide confidence in the robustness of the model and its outputs.

For this study, the revisited 2040 Forecast Baseline Model was used, incorporating the latest developer assumptions around development quantum and infrastructure, excluding Merton Park P&R. The traffic demand was provided by C&A to reflect an assumption of sustainable/active travel and therefore a reduction in the vehicular trip generation.

The flow bundle figures presented in this report demonstrate that the modelled distribution of trips arriving and departing from the Merton Park in both peak periods are reasonable with no undue bias or illogical routing identified. The illustrated link flow figures 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 development, including sections of the A2 and A28 in both directions, as well as local roads in Wincheap and the new Mountfield roundabout.