

# Uttlesford Transport Study

784-B029347

TAKELEY MODEL OUTPUTS



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# DOCUMENT CONTROL

<b>Document:</b>	TAKELEY MODEL OUTPUTS
<b>Project:</b>	Uttlesford Transport Study
<b>Client:</b>	Uttlesford District Council
<b>Project Number:</b>	784-B029347
<b>File Origin:</b>	

<b>Revision:</b>	1 <sup>st</sup> Draft	<b>Prepared by:</b>	Ben King
<b>Date:</b>	18 September 2023	<b>Checked by:</b>	Steve Boden
<b>Status:</b>		<b>Approved By:</b>	Alistair Gregory
<b>Description of Revision:</b>			

<b>Revision:</b>	2 <sup>nd</sup> Draft	<b>Prepared by:</b>	Ben King
<b>Date:</b>	28 September 2023	<b>Checked by:</b>	Steve Boden
<b>Status:</b>		<b>Approved By:</b>	Alistair Gregory
<b>Description of Revision:</b>			

<b>Revision:</b>	3 <sup>rd</sup> Draft	<b>Prepared by:</b>	Ben King
<b>Date:</b>	12 October 2023	<b>Checked by:</b>	Steve Boden
<b>Status:</b>		<b>Approved By:</b>	Alistair Gregory
<b>Description of Revision:</b>			

<b>Revision:</b>		<b>Prepared by:</b>	
<b>Date:</b>		<b>Checked by:</b>	
<b>Status:</b>		<b>Approved By:</b>	
<b>Description of Revision:</b>			

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## 1 | BACKGROUND

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## 1.0 BACKGROUND

### 1.1 OVERVIEW

- 1.1.1 This technical note examines the transport impacts of the proposed Uttlesford Local Plan allocation sites, together with the sustainable transport interventions and highway capacity improvements required to mitigate the increase in travel demand within the district due to the Local Plan.
- 1.1.2 It focuses on how the Local Plan site allocations will impact on the performance of the highway network within Takeley. It details the mitigation required to address the increased travel demand and the interventions through which to maximise the proportion of trips undertaken by sustainable modes.

### 1.2 DEVELOPMENT SITES MODELLED & PROPOSALS IN THE LOCAL PLAN

- 1.2.1 The following sites and quantum of housing were modelled and assessed in Takeley:
- Warish Hall Farm, Takeley.
  - Land at Parkers Farm Takeley.
  - Land at Warrens Farm, Little Canfield.
- 1.2.2 Together the sites can accommodate some 1,900 dwellings.
- 1.2.3 Following the conclusion of the assessment, Uttlesford District Council reconsidered the location and quantum of development to come forward within the village and wider A120 corridor.
- 1.2.4 A revised figure of 1,636 homes was subsequently included in the Regulation 18 Local Plan across the same sites, representing a 15% reduction on that modelled.
- 1.2.5 More broadly the quantum of housing included within the Local Plan is less than that modelled.
- 1.2.6 Changes in the reduced scale of growth proposed to come forward is partly off-set by the granting of planning permission for some 1,200 dwellings to the north-east of Takeley at 'Easton Park'. This is not captured in the assessment as planning permission wasn't granted prior to this technical note being produced.

### 1.3 SCENARIOS & FOCUS OF ASSESSMENT

- 1.3.1 The assessment of the impacts of the sites was undertaken using the A120 Corridor VISUM Model. Technical details of the model and the methodology applied in the network assessment are detailed in separate technical notes.
- 1.3.2 Five scenarios have been assessed within the town focusing upon:
- The performance of the network in the 2021 (Base Year) and 2040 (Reference Case).
  - The comparative performance of the network with Local Plan sites in place (in 2040).
  - Interventions to encourage sustainable travel and the impact on network performance.
  - Highway capacity improvements and the impact on network performance.
- 1.3.3 The assessment of the performance of the network was based upon the following metrics:
- The volume of traffic on the network in both the AM and PM peak periods.
  - Journey times on the network in both the AM and PM peak periods, and the associated speed of traffic.
  - Junction delays in both the AM and PM peak periods.

## 1.4 FURTHER READING

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1.4.1 This technical note focuses on the performance of the network in Takeley and near Stansted Airport. It should be read in conjunction with the following technical notes:

- TN110 | Uttlesford Transport Study Baseline Report
- TN401 | Strategic Impacts Technical Note
- TN402 | Saffron Walden Model Outputs Technical Note.
- TN403 | Great Dunmow Model Outputs Technical Note.
- TN405 | Stansted Mountfitchet Model Outputs Technical Note.
- TN406 | Thaxted & Newport Model Outputs Technical Note.
- TN407 | A120 Corridor Model Outputs Technical Note.

## 1.5 MORE INFORMATION

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1.5.1 For more information on the content of this technical note please contact:

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## 2 | PERFORMANCE IN THE BASE YEAR (2021)

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## 2.0 PERFORMANCE IN THE BASE YEAR (2021)

### 2.1 VOLUME OF TRAFFIC

2.1.1 The volume of traffic in the AM and PM peak periods in the 2021 Base Year Model is shown in **Figure 2-1** and **Figure 2-2**. They highlight that:

- The A120 carries the largest volume of traffic in the area, with almost 2,500 vehicles travelling westbound in the AM peak period south of Stansted Airport, increasing to an eastbound flow approaching 3,000 vehicles in the PM peak hour.
- The flow is very tidal. In the AM peak period westbound traffic travelling towards the M11 is around a third greater than the eastbound flow, a trend that is reversed in the PM peak period.
- The B1256 which runs parallel to the A120 carries less than 500 vehicles in each direction in both peaks, with a similar volume of traffic heading to and from the airport. In this respect the demand to access the airport may not fall within the typical AM and PM peak periods assessed within this report, and so such flows are likely to be greater at times of the day when the rest of the network is quieter.

### 2.2 JOURNEY TIMES

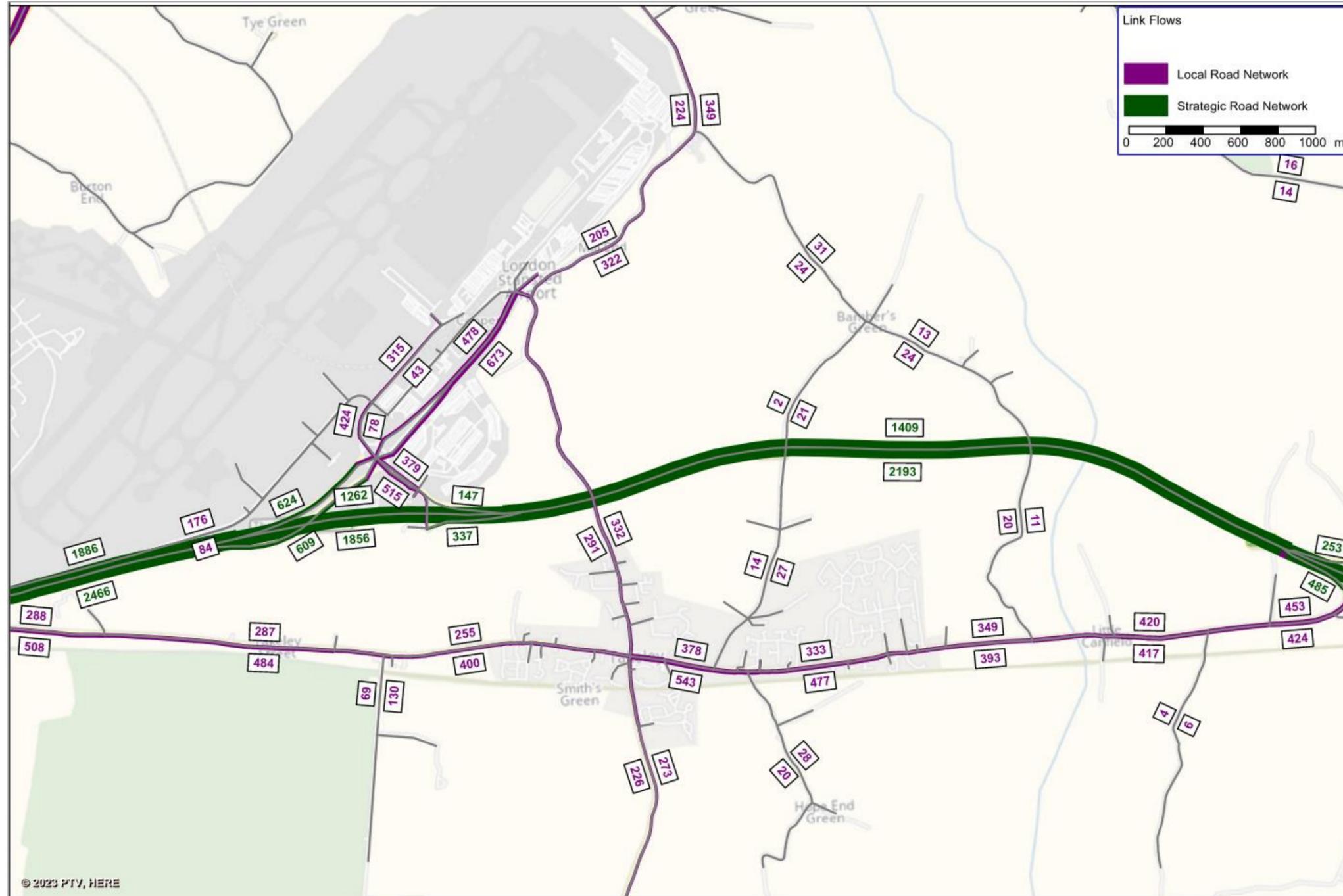
2.2.1 Selected journey times in the AM peak in the 2021 Base Year Model are shown in **Table 2-1**, alongside the comparative journey times for the PM peak period. The average speed of traffic on each route is shown in **Table 2-2**.

2.2.2 A map showing the location of the routes is shown in **Figure 2-3**. In each instance, the journey times are averaged over the peak hour and so it is acknowledged that traffic may be faster or slower at times within that period. Delays can be identified when comparing the journey times and average speeds between the direction of flow and the time of day. Traffic was not surveyed outside of the main peak periods.

**Table 2-1: Journey Time in the AM & PM Peak Periods**

Route (No.)	2.2.4 Direction	Distance (miles)	Journey Time (seconds)	
			2021 (AM Peak)	2021 (PM Peak)
(2) A120 Central Section - M11 J8 to Dunmow West	Eastbound	5.3	321	373
	Westbound	5.2	346	321
(7) Parsonage Road - Mole Hill Green	Northbound	3.5	377	377
	Southbound	3.5	414	405
(8) B1256 - Western Section - M11 J8 to B183	Eastbound	2.7	332	324
	Westbound	2.7	322	311
(9) B1256 - Central Section - B183 to Dunmow West	Eastbound	2.3	255	262
	Westbound	2.3	309	292

**Figure 2-1: Volume of Traffic (Link Flow) in the 2021 Base Year - AM**



**Notes:**

- Volume of traffic is presented in vehicles per hour.
- Weight of bar reflects size of flow.
- Purple represents links on the local road network.
- Green represents links on the Strategic Road Network (SRN)

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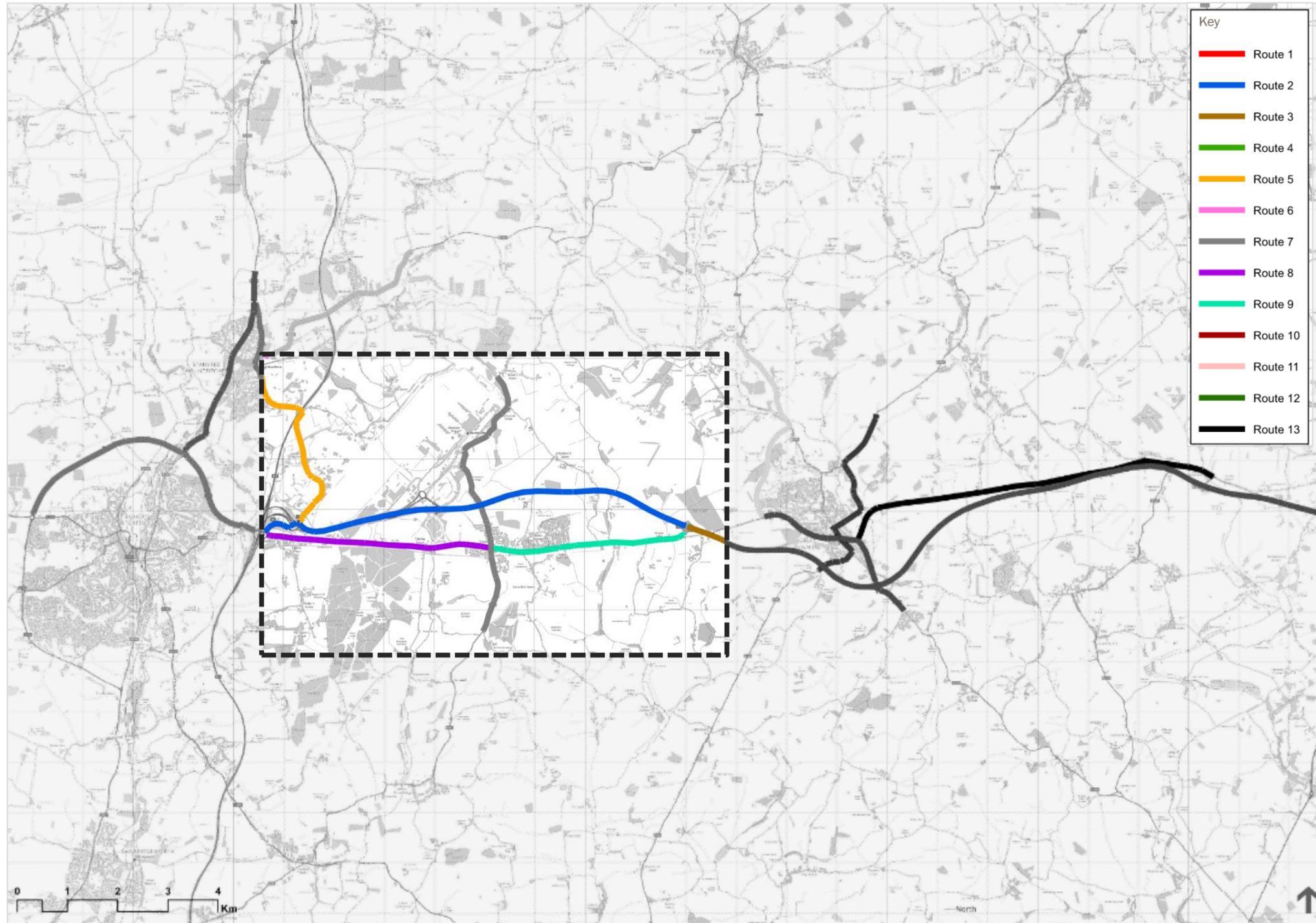
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**Figure 2-3: Journey Time Routes in Takeley**


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**Table 2-2: Average Vehicle Speeds in Takeley in the AM & PM Peak Periods**

Route (No.)	Direction	Distance (miles)	Average Speed in MPH	
			2021 (AM Peak)	2021 (PM Peak)
(2) A120 Central Section - M11 J8 to Dunmow West	Eastbound	5.3	<b>61.3</b>	<b>52.8</b>
	Westbound	5.2	<b>56.2</b>	<b>60.6</b>
(7) Parsonage Road - Mole Hill Green	Northbound	3.5	<b>34.4</b>	<b>34.4</b>
	Southbound	3.5	<b>31.3</b>	<b>32.0</b>
(8) B1256 - Western Section - M11 J8 to B183	Eastbound	2.7	<b>30.3</b>	<b>31.1</b>
	Westbound	2.7	<b>31.3</b>	<b>32.4</b>
(9) B1256 - Central Section - B183 to Dunmow West	Eastbound	2.3	<b>34.2</b>	<b>33.3</b>
	Westbound	2.3	<b>28.2</b>	<b>29.9</b>

2.2.9 The main findings of the journey time analysis are that:

- There is some variability of journey speeds on the A120, with around an 8mph difference between the AM and PM peak period for eastbound traffic. This reflects the higher volumes of traffic associated with the tidality of the corridor south of the airport and can see journey times increase by around 50 seconds on this stretch of the A120 alone.
- On the B1256, journey times and average speeds are relatively consistent on the western section, although there is more variability on the central section through Takeley itself. Speeds vary by as much as 6mph in the AM peak period, with traffic travelling towards the ‘Four Ashes’ junction noticeably slower than that travelling eastwards.
- Elsewhere journey times and average speeds are more consistent with little variation by direction of travel or time of day.

## 2.3 JUNCTION DELAYS

2.3.1 In seeking to understand the differences in journey times, an analysis of the performance of the junctions on the network was undertaken. **Figure 2-4** illustrates the level of delay associated with the worse performing arm/approach to each junction in the AM and PM peak periods.

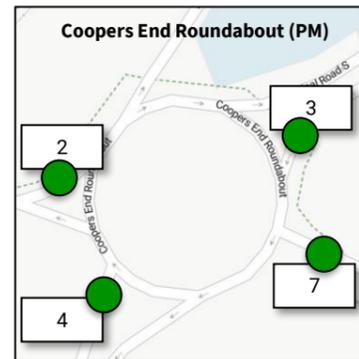
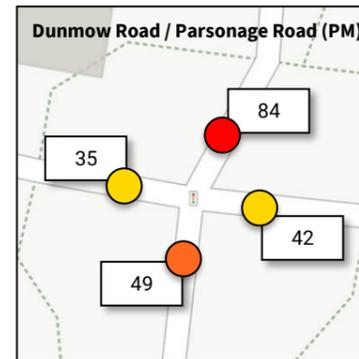
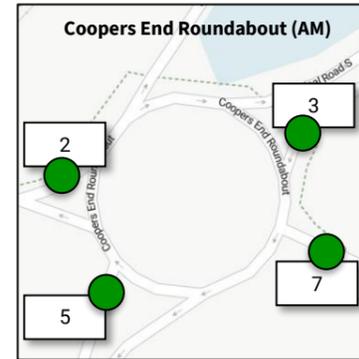
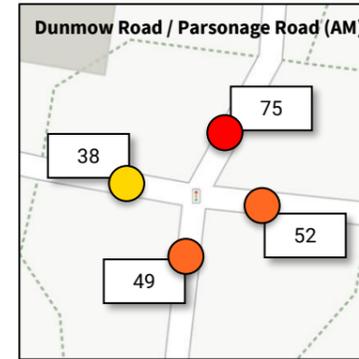
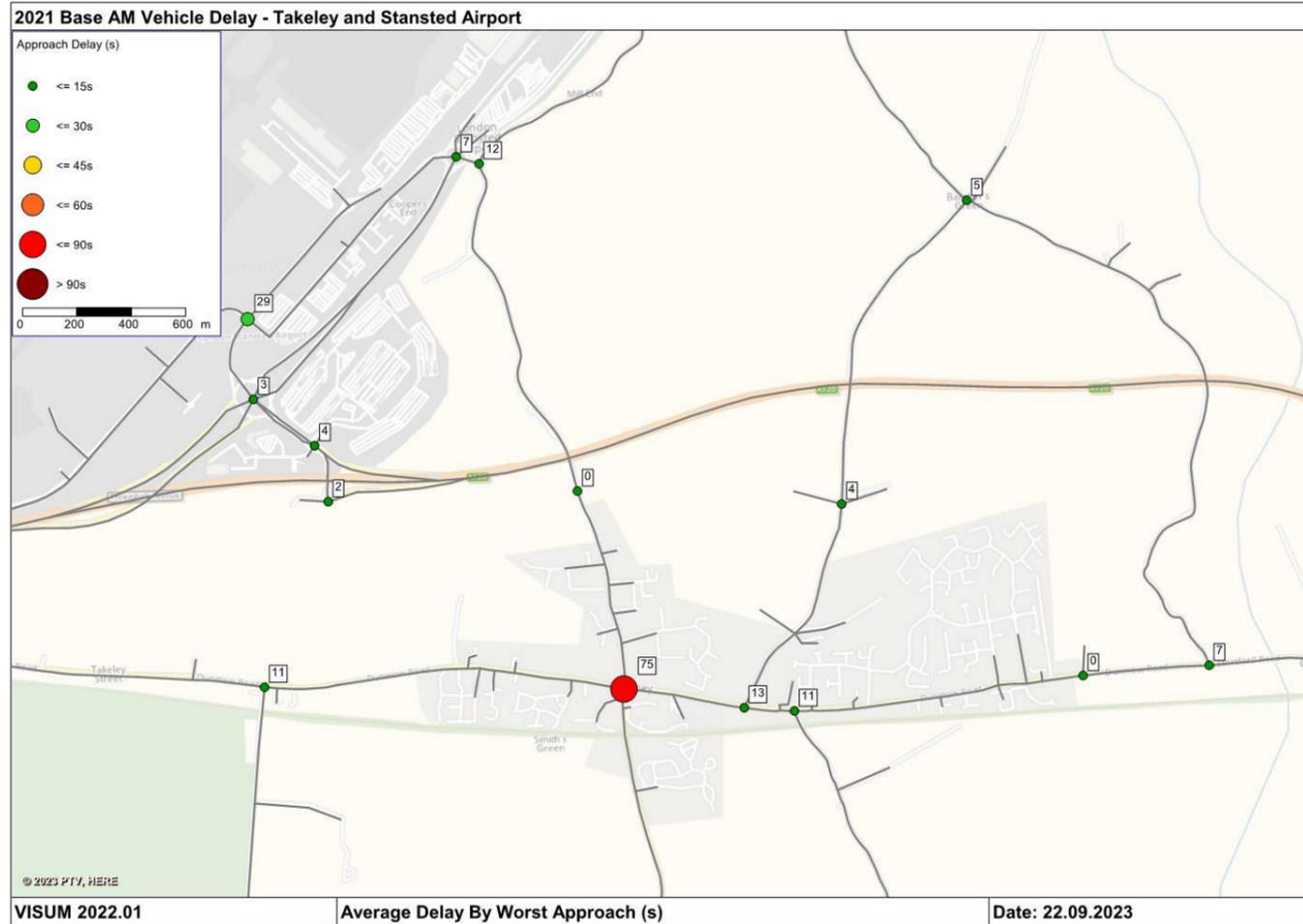
2.3.2 The key findings are that:

- The only junction with any tangible delay in the AM and PM peak periods is the ‘Four Ashes’ junction in the centre of the village, where the B1256 Dunmow Road intersects with the B183 Station Road / Parsonage Road. Delays would amount to 75 seconds in the AM peak, increasing to 84 seconds in the PM peak.
- No other junctions, including those in and around Stansted Airport, experience delays of any note.
- Further afield, delays are experienced in and around M11 J8 and these are discussed in more detail in both the TN405 | Stansted Mountfitchet Model Outputs Technical Note and the TN407 | A120 Corridor Model Outputs Technical Note.

**Figure 2-4: Junction Delays in Takeley in the 2021 Base Year**

**Notes:**

- Delays are in seconds per vehicle.
- Represents average queue time in the respective peak period.
- Delays on the worst approach shown in main figure.
- Delays on all approaches are shown on selected junctions show in the inserts.



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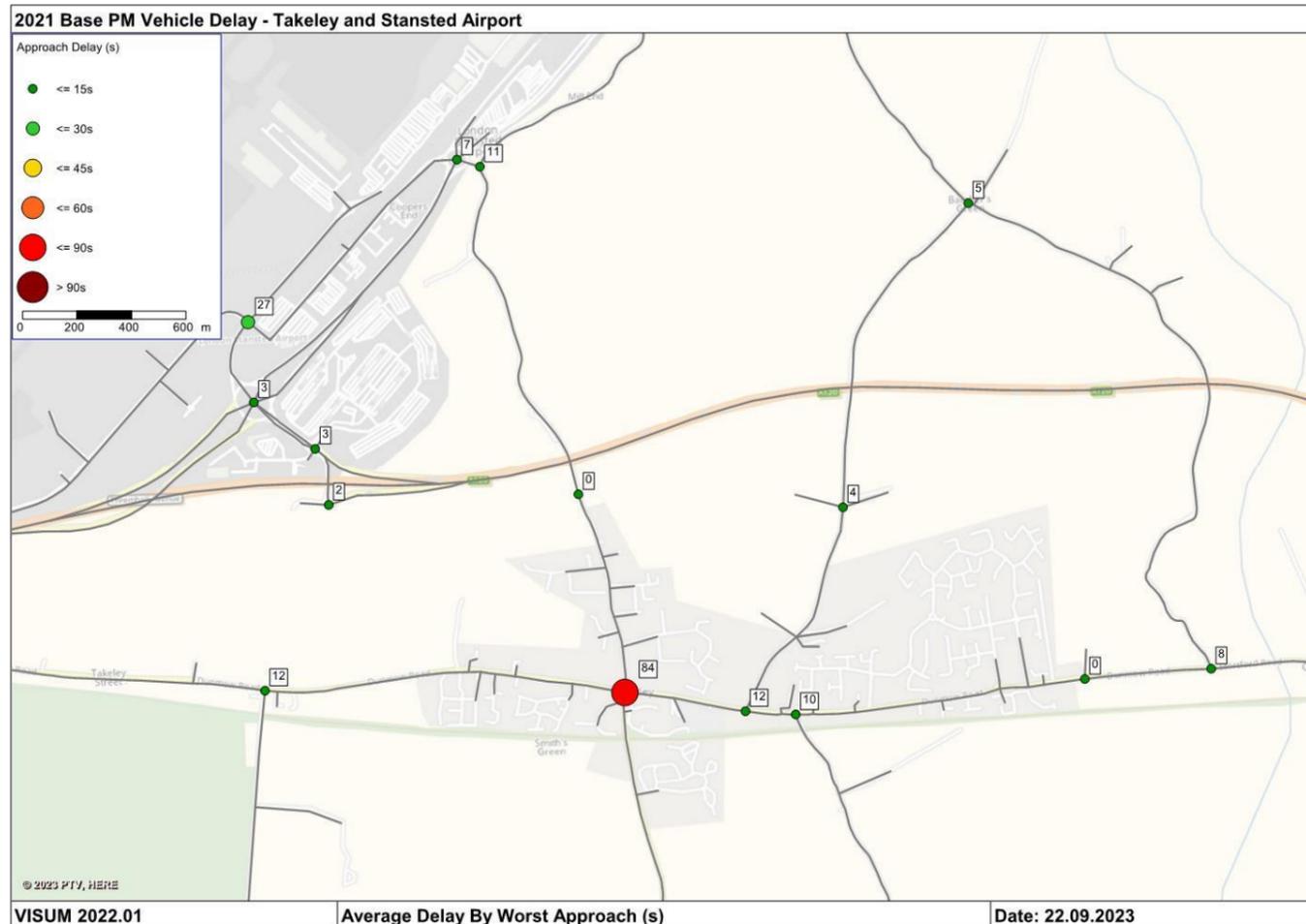
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## 2.4 SUMMARY

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- 2.4.1 The Base Year Model simulates the performance of the highway network in Takeley in typical present day (2021) conditions, across the morning and evening peak hours.
- 2.4.2 The analysis of the volume of traffic, the journey times and average speed of vehicles, together with the efficiency of operation of several junctions within the town points towards a local road network that generally operates efficiently, the centre of Takeley being the exception. The delays experienced at the 'Four Ashes' junction on the B1256 reflect a pinch point on the network at the heart of the village.
- 2.4.3 In terms of the strategic network, the volume of traffic on the A120 appears to impact on the efficiency with which it operates reflected in tangible differences in journey times on the corridor.



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### **3 | PERFORMANCE IN THE REFERENCE CASE (2040)**

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## 3.0 PERFORMANCE IN THE REFERENCE CASE (2040)

### 3.1 VOLUME OF TRAFFIC

- 3.1.1 The Reference Case highlights how the road network will perform in a future year (2040) with all committed planning and transport schemes taken into account. It does not include the Local Plan site allocations.
- 3.1.2 The changes in the volume of traffic between the Base Year (2021) and Reference Case (2040) are shown in **Figure 3-1** and **Figure 3-2** for the AM peak and the PM peak periods.
- 3.1.3 It highlights that:
- Increases in traffic in the Reference Case are largely confined to the A120, in both directions in both peak periods.
  - Between Stansted Airport and M11 J8 the volume of traffic will increase by around 1,000 vehicles in the AM peak period in both directions. This represents an increase of around a third for eastbound traffic and by around 50% for westbound traffic.
  - A large proportion of this traffic appears to be travelling between the M11 and Stansted Airport, reflected by an increase of over 500 vehicles on Thernhall Avenue.
  - The parallel route through Takeley, the B1256 will see smaller increases. However, westbound flows will increase by almost 170 vehicles as the route heads into the village from the east, a large proportion of which will then turn north onto Parsonage Road towards the airport.
  - In the PM peak period, a similar increase in eastbound traffic is apparent, with an additional 200 vehicles travelling towards the village from M11 J8.
  - The unclassified Elsenham Road will also experience noticeable increases in demand, associated with access to the airport from the north.

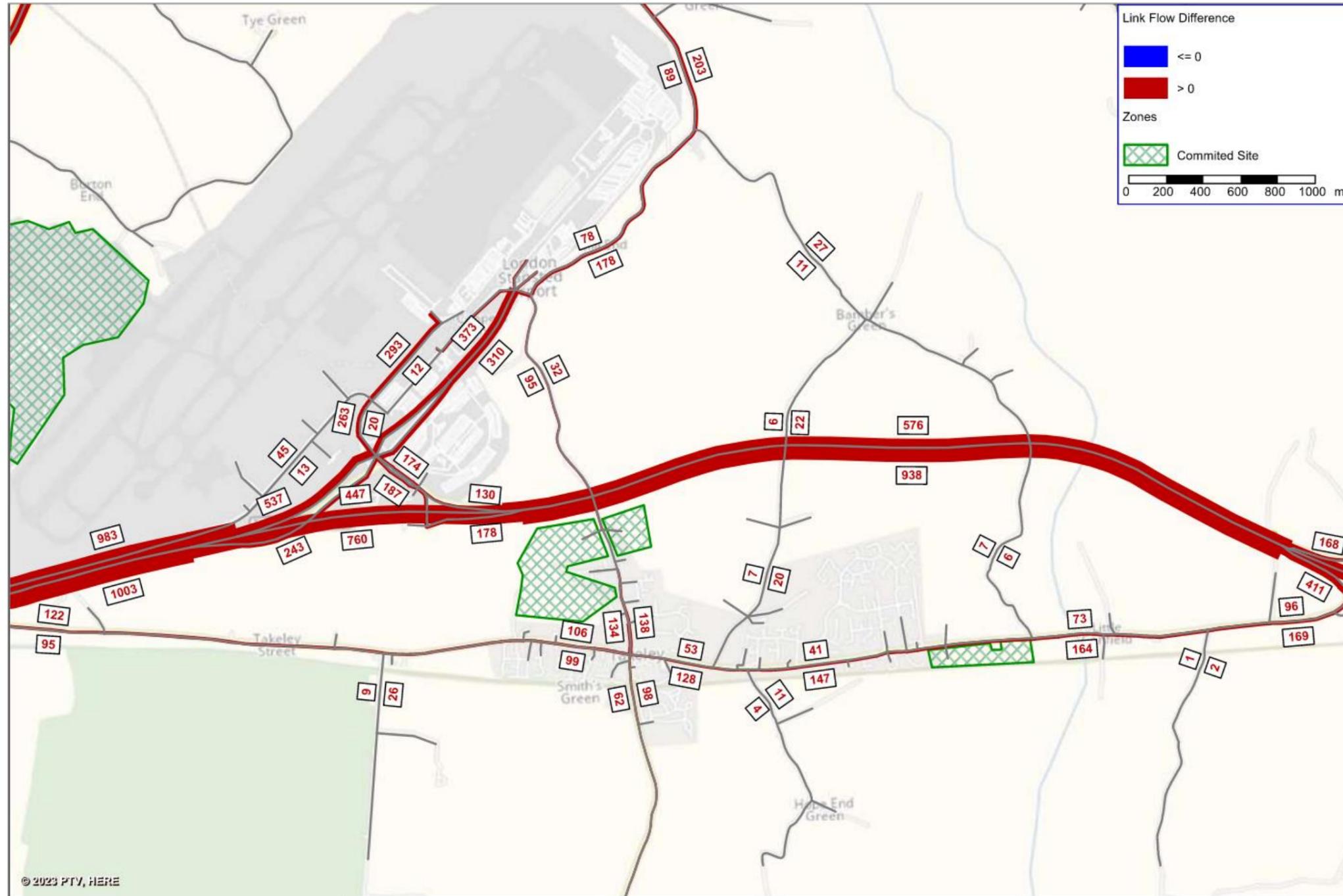
### 3.2 JOURNEY TIMES

- 3.2.1 The comparative journey times and average vehicle speed in the 2040 Reference Case are shown alongside those in the 2021 Base Year in **Table 3-1** and **Table 3-2** respectively.

**Table 3-1: Changes in Journey Times between Base Year (2021) and Reference Case (2040)**

Route	Direction	Journey Time (in seconds)					
		AM Peak			PM Peak		
		2021	2040	Change	2021	2040	Change
(2) A120 Central Section - M11 J8 to Dunmow West	Eastbound	321	<b>338</b>	+17	373	<b>503</b>	+130
	Westbound	346	<b>383</b>	+37	321	<b>328</b>	+7
(7) Parsonage Road - Mole Hill Green	Northbound	377	<b>408</b>	+31	377	<b>390</b>	+13
	Southbound	414	<b>438</b>	+24	405	<b>414</b>	+9
(8) B1256 - Western Section - M11 J8 to B183	Eastbound	332	<b>361</b>	+29	324	<b>362</b>	+38
	Westbound	322	<b>311</b>	-11	311	<b>304</b>	-7
(9) B1256 - Central Section - B183 to Dunmow West	Eastbound	255	<b>254</b>	-1	262	<b>268</b>	+6
	Westbound	309	<b>341</b>	+32	292	<b>304</b>	+12

**Figure 3-1: Change in Volume of Traffic between Base Year (2021) and Reference Case (2040) - AM**



**Notes:**

- Volume of traffic is presented in vehicles per hour.
- Weight of bar reflects size of flow.
- Red lines represent an increase in flow.
- Blue lines represent a decrease in flow.
- Green hatching represents Local Plan site allocations.

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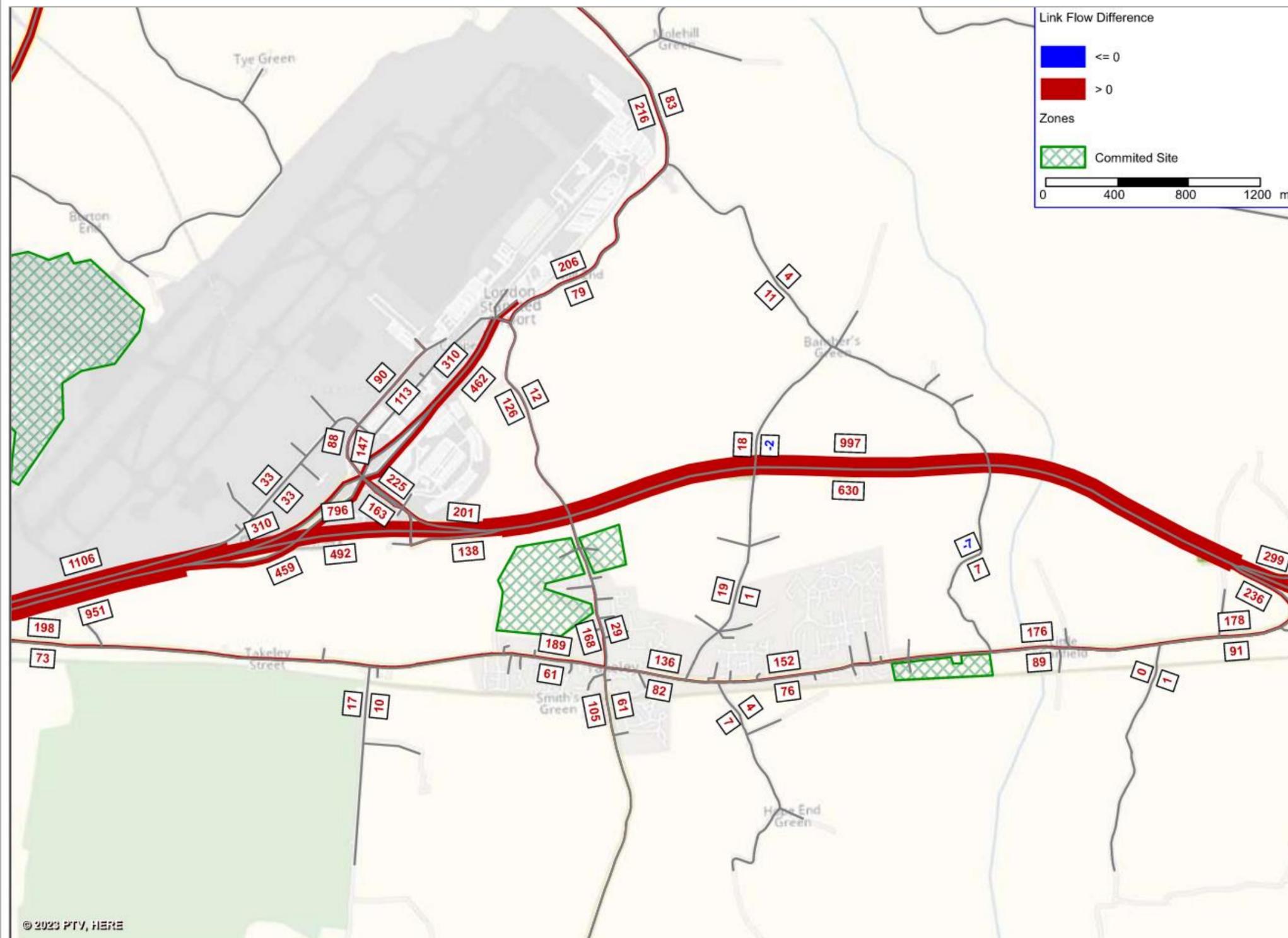
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**Figure 3-2: Change in Volume of Traffic between Base Year (2021) and Reference Case (2040) - PM**

**Notes:**

- Volume of traffic is presented in vehicles per hour.
- Weight of bar reflects size of flow.
- Red lines represent an increase in flow.
- Blue lines represent a decrease in flow.
- Green hatching represents Local Plan site allocations.



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**Table 3-2: Changes in Average Speeds between Base Year (2021) and Reference Case (2040)**

Route	Direction	Average Speed in MPH					
		AM Peak			PM Peak		
		2021	2040	Change	2021	2040	Change
(2) A120 Central Section - M11 J8 to Dunmow West	Eastbound	61.3	<b>58.2</b>	-3.1	52.8	<b>39.1</b>	-13.7
	Westbound	56.2	<b>50.8</b>	-5.4	60.6	<b>59.3</b>	-1.3
(7) Parsonage Road - Mole Hill Green	Northbound	34.4	<b>31.8</b>	-2.6	34.4	<b>33.3</b>	-1.1
	Southbound	31.3	<b>29.6</b>	-1.7	32.0	<b>31.3</b>	-0.7
(8) B1256 - Western Section - M11 J8 to B183	Eastbound	30.3	<b>27.9</b>	-2.4	31.1	<b>27.8</b>	-3.3
	Westbound	31.3	<b>32.4</b>	+1.1	32.4	<b>33.1</b>	+0.7
(9) B1256 - Central Section - B183 to Dunmow West	Eastbound	34.2	<b>34.3</b>	+0.1	33.3	<b>32.6</b>	-0.7
	Westbound	28.2	<b>25.6</b>	-2.6	29.9	<b>28.7</b>	-1.2

3.2.8 The tables highlight that:

- There will be significant increases in journey times on the A120 corridor for eastbound traffic in the PM peak period. Average speeds will reduce by over 13mph, almost 20mph slower than traffic travelling westbound.
- On the western section of the B1256, eastbound traffic speeds will reduce by around 2-3mph in both peak periods. Conversely, westbound traffic speeds will increase, suggesting improvements in the efficient of the link's operation. However, this is only experienced through the centre of the village on the approach to the 'Four Ashes' junction, with westbound traffic closer to M11 J8 seeing speeds reduce marginally in both peaks.

### 3.3 JUNCTION DELAYS

3.3.1 In seeking to understand the changes in journey times, an analysis of the performance of the junctions on the network was undertaken.

3.3.2 **Figure 3-3** illustrates the level of delay associated with the worse performing arm/approach to each junction in the AM peak period in the 2040 Reference Case, alongside the changes in delay when compared to the 2021 Base Year. The comparative illustrations for the PM peak period are provided in **Figure 3-4**.

3.3.3 The key findings are that:

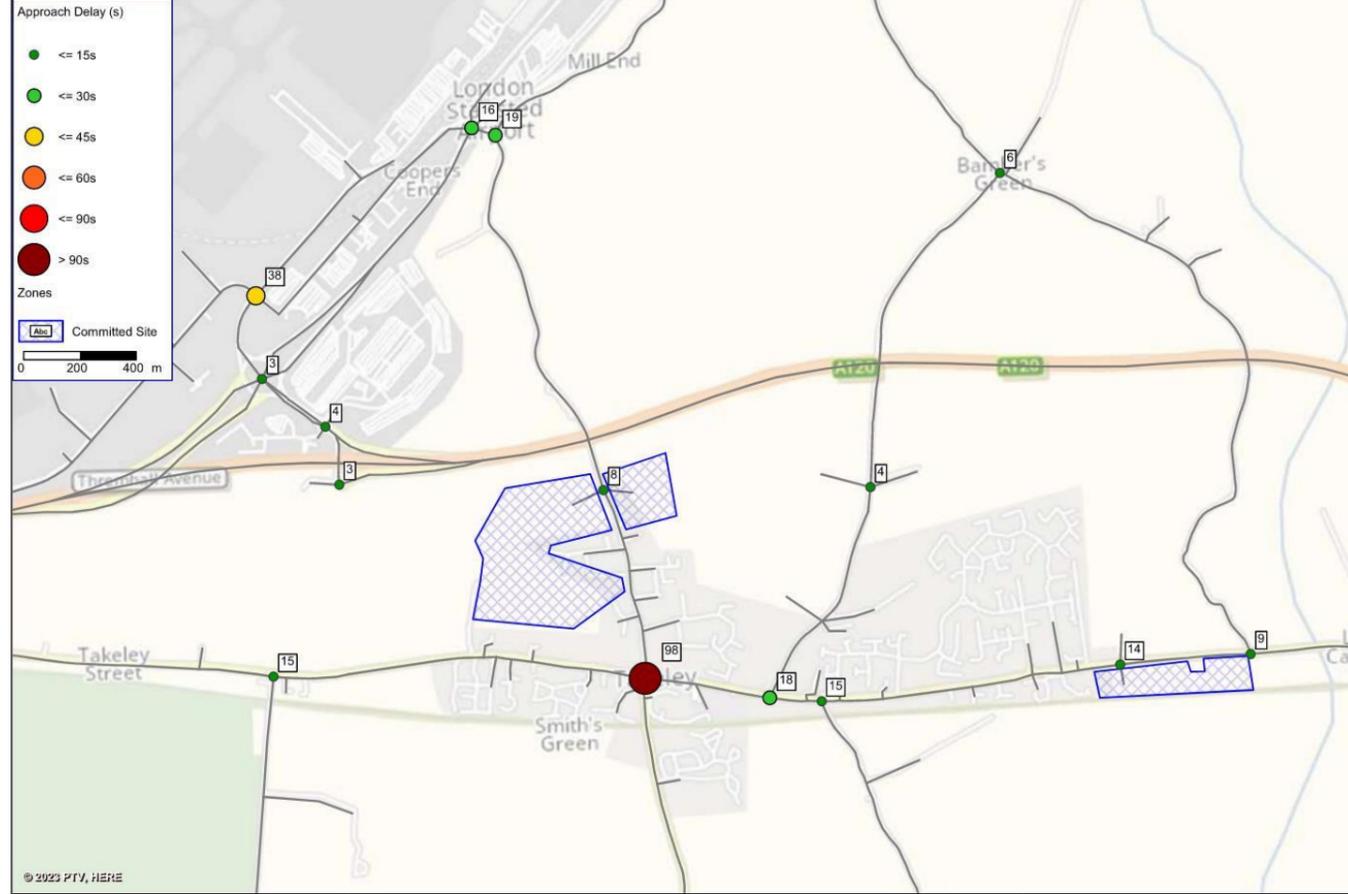
- Only one junction experienced delays in the Base Year assessment – the 'Four Ashes' junction in the centre of the village, where the B1256 Dunmow Road intersects with the B183 Station Road / Parsonage Road. A scheme to improve the signalisation of the junction is set to come forward in due course, associated with a committed development within the area, but this has not been captured as part of the assessment.
- Queues will increase in the Reference Case by around 25 seconds, taking the overall delay to over 90 seconds. A similar level of delay is apparent in the PM peak.
- The only other delays of note are on the B183 into Takeley from the south, where traffic from Takeley Park will have to queue for around 45 seconds in the PM peak.

**Figure 3-3: AM Peak Junction Delays in the Reference Case (2040)**

**Notes:**

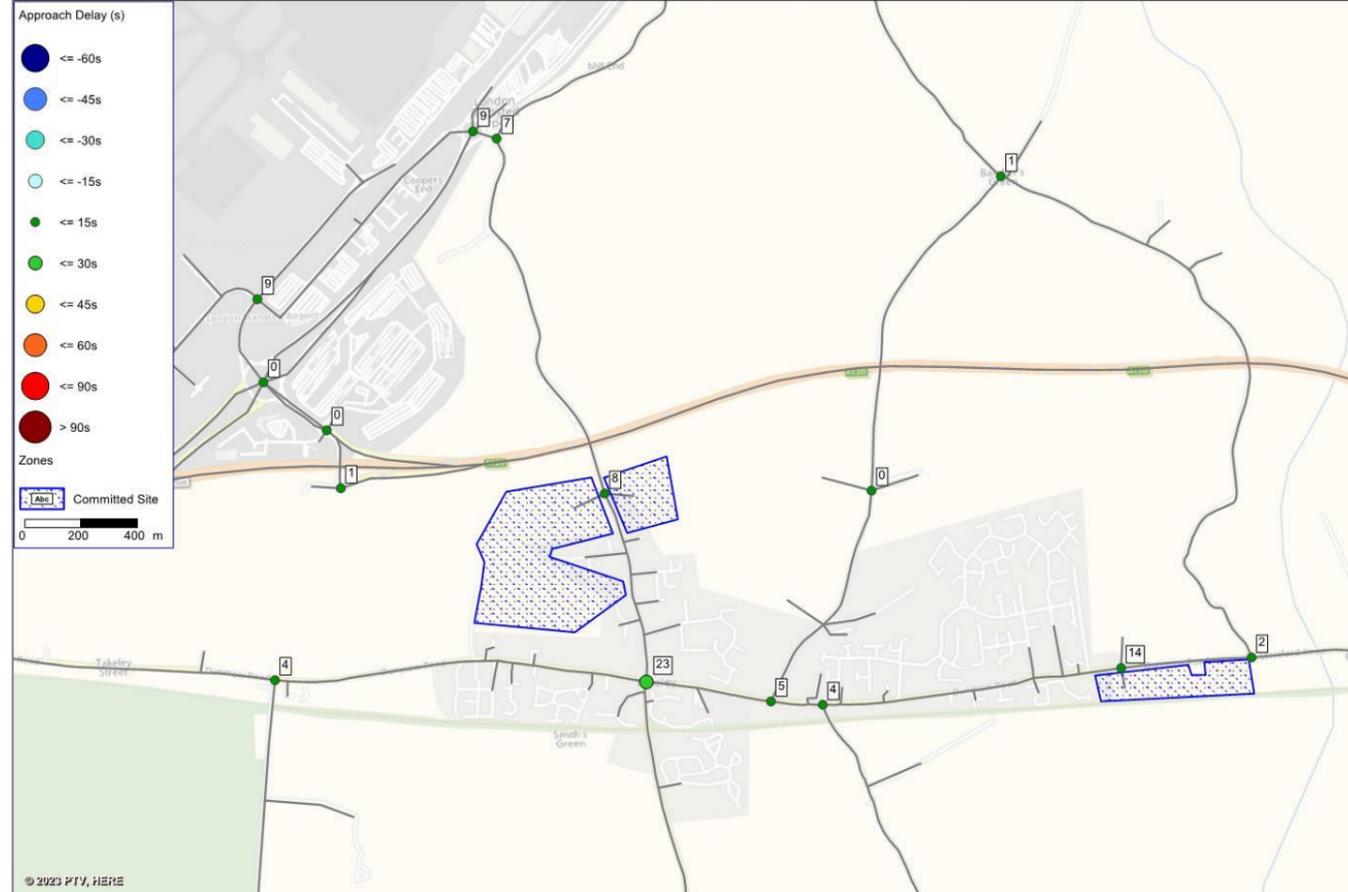
- Delays are in seconds per vehicle.
- Represents average queue time in the respective peak period.
- Delays on the worst approach shown in main figure.
- Delays on all approaches are shown on selected junctions show in the inserts.

**2040 Reference Case AM Vehicle Delay - Takeley and Stansted Airport**

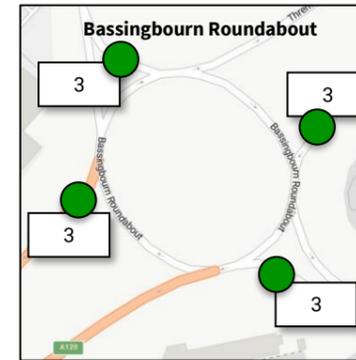
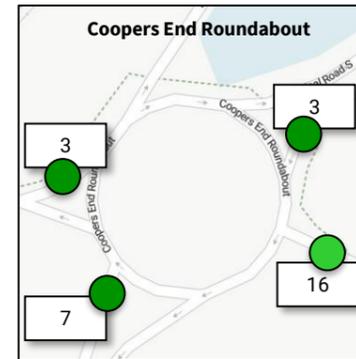
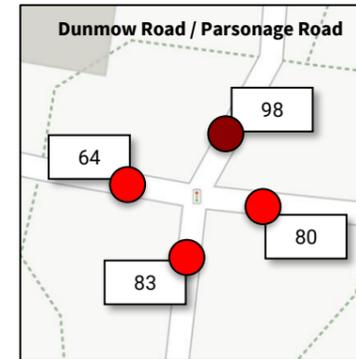


VISUM 2022.01 | Average Delay By Worst Approach (s) | Date: 21.09.2023

**Difference between 2040 Reference Case AM and 2021 Base AM Vehicle Delay - Takeley and Stansted Airport**



VISUM 2022.01 | Average Delay By Worst Approach (s) | Date: 22.09.2023



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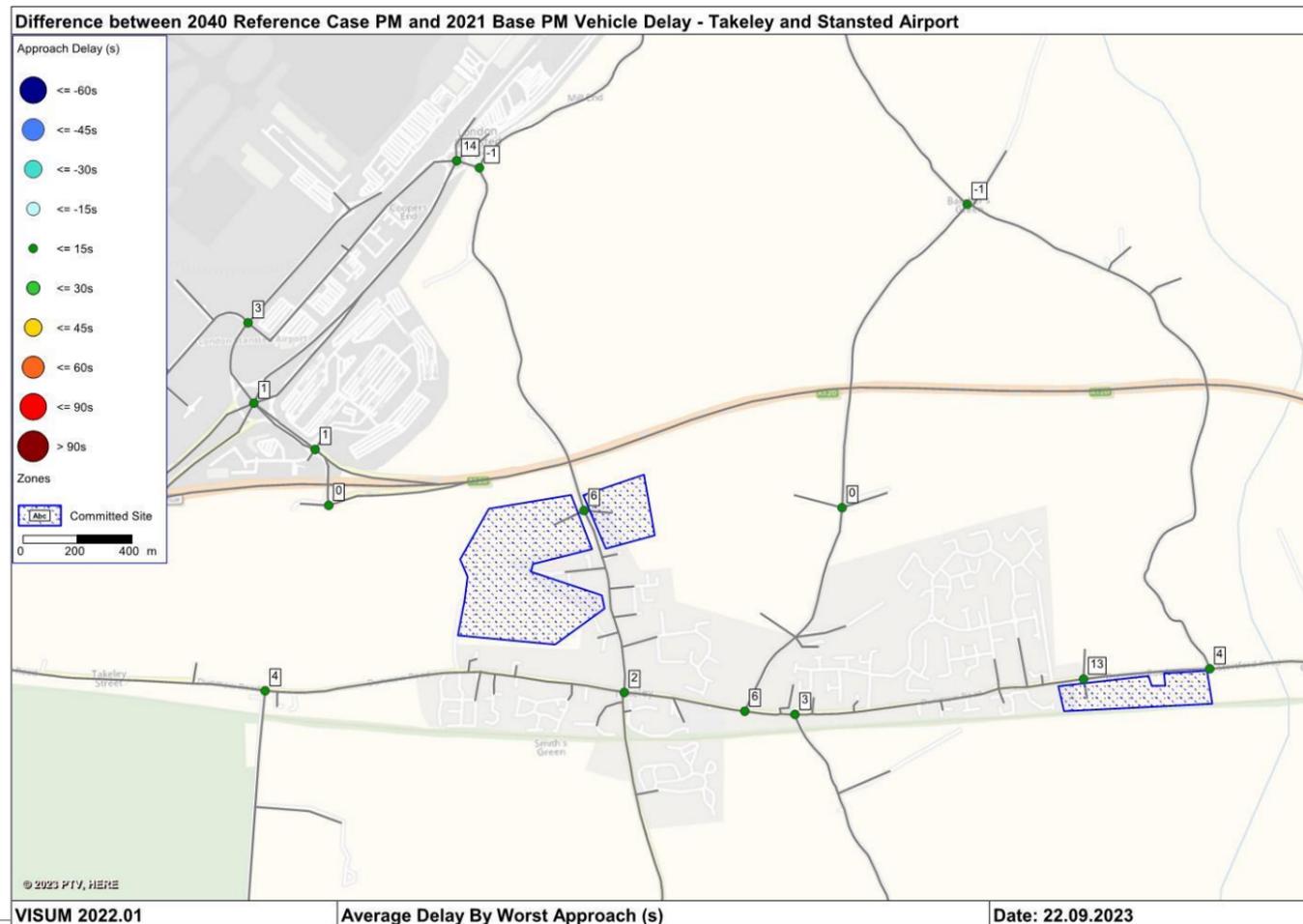
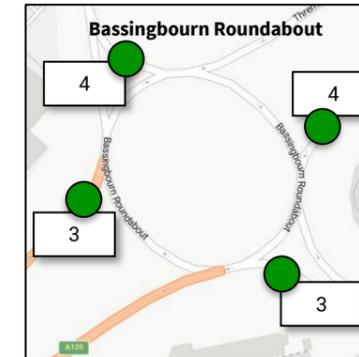
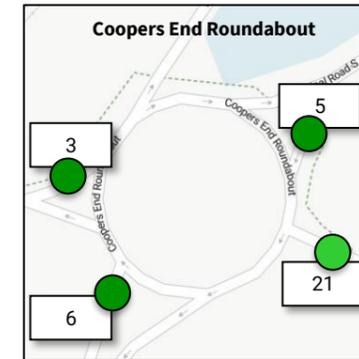
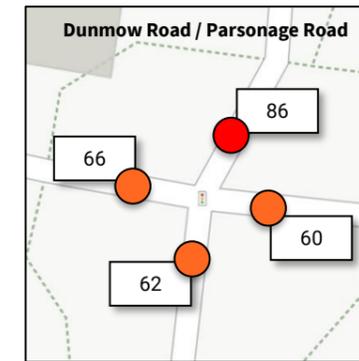
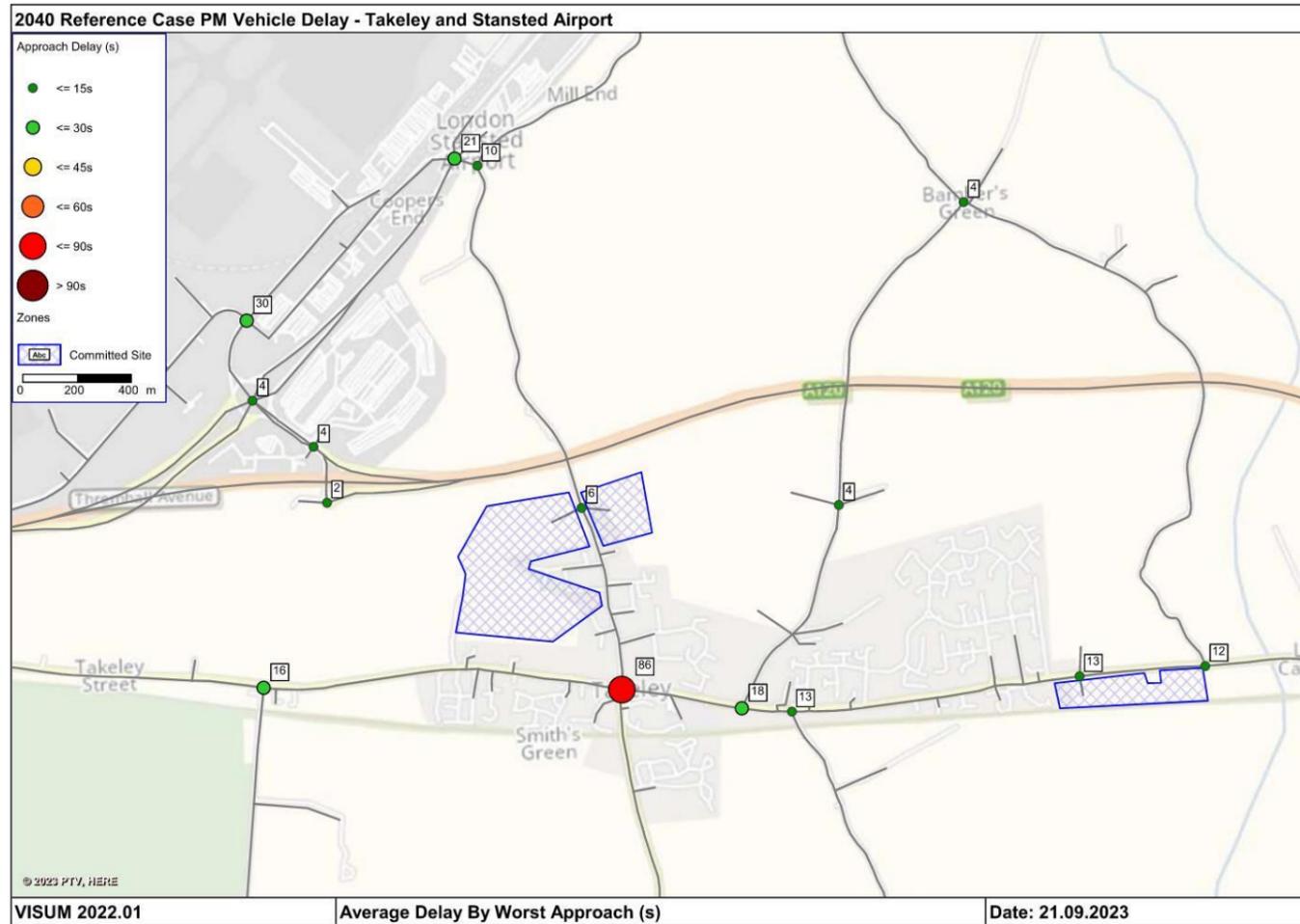
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**Figure 3-4: PM Peak Junction Delays in the Reference Case (2040)**

**Notes:**

- Delays are in seconds per vehicle.
- Represents average queue time in the respective peak period.
- Delays on the worst approach shown in main figure.
- Delays on all approaches are shown on selected junctions in the inserts.



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### 3.4 SUMMARY

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- 3.4.1 The Reference Case identifies how the highway network in Takeley will perform in 2040 before Local Plan related growth is taken into account. It demonstrates that committed developments set to come forward in the intervening period will have a significant impact on the operation of the A120 with large increases in journey times for eastbound traffic looking to access Stansted Airport. The impact on the local network is more marginal with no tangible changes in its operation.



## **4 | PERFORMANCE IN THE LOCAL PLAN GROWTH SCENARIO (2040)**

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## 4.0 PERFORMANCE IN THE LOCAL PLAN GROWTH SCENARIO (2040)

### 4.1 VOLUME OF TRAFFIC

4.1.1 The Local Plan Growth Scenario highlights how the road network will perform in a future year (2040) with all Local Plan site allocations in place (see **Figure 4-1**). To understand the impacts of the sites, comparisons are drawn with the performance of the network in the Reference Case.

4.1.2 The changes in the volume of traffic between the Reference Case and Local Plan Growth Scenario are shown in **Figure 4-2** and **Figure 4-3** for both the AM and PM peak periods. **Figure 4-4** illustrates where traffic from the site allocations will disperse across the network.

4.1.3 It highlights that:

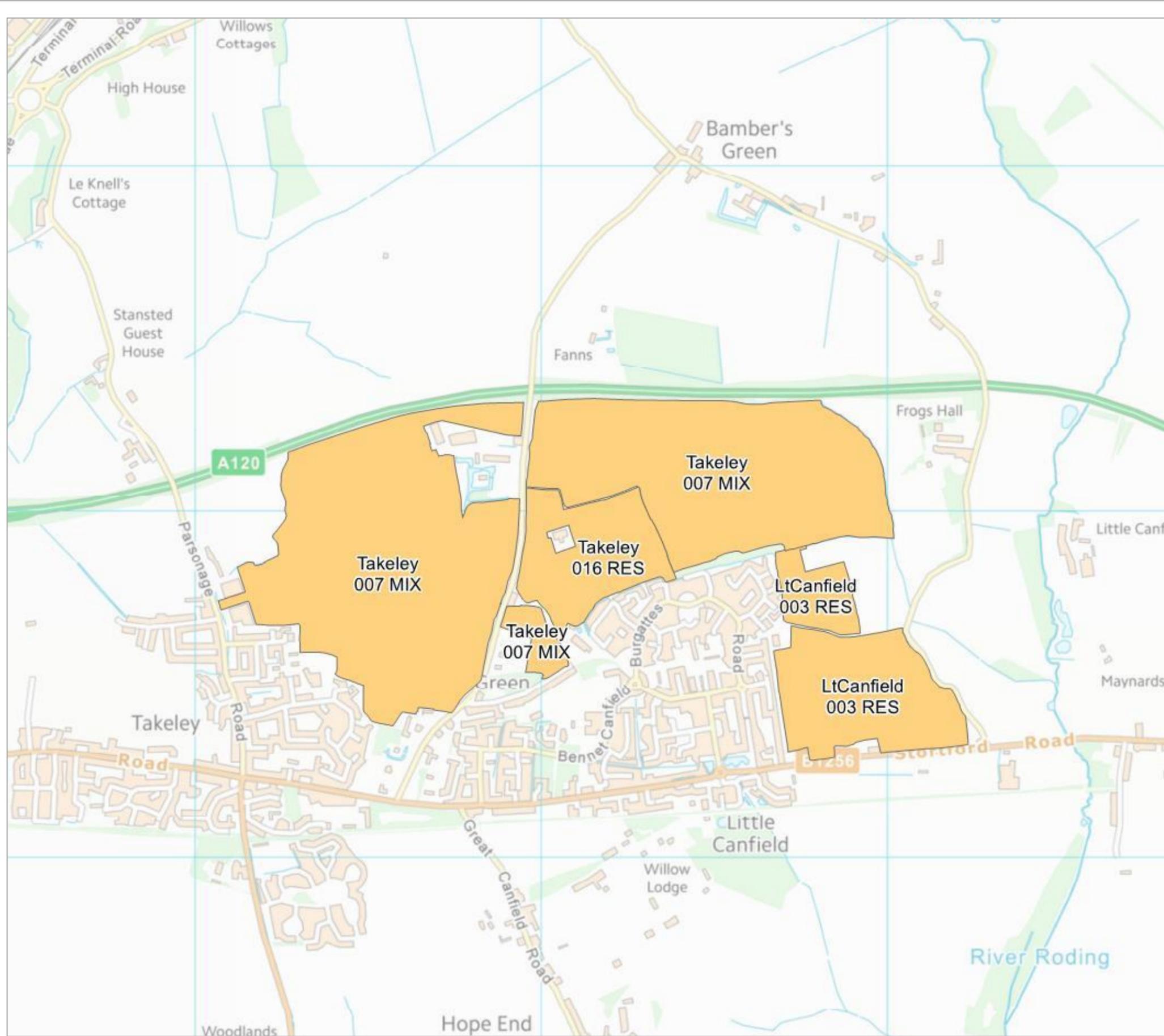
- In the AM peak period, there is a further increase in demand on the A120, over and above that in the Reference Case. Westbound trips will increase by almost 250 vehicles in the AM peak period. Conversely there will be no increase in westbound traffic on the corridor.
- Parsonage Road will see both north and southbound trips increase by over 150 vehicles.
- The B1256 to the west of the village will see westbound flows increase by almost 300 vehicles – with most looking to access the A120 at the Dunmow West Interchange.
- In the PM peak period, increases will also be experienced across the network. Whilst increases on the strategic and local road network will be similar, they will represent proportionately bigger impacts on the B1256 and B183 where background flows are lower.
- In terms of the distribution of trips, very few remain internal to Takeley. The largest proportion travel westbound towards the M11 and Bishop’s Stortford (two thirds of which are accommodated on the A120, and one third on the B1256). In total this represents over 240 trips in the AM peak period.
- By contrast flows north towards the airport, east towards Braintree and Great Dunmow, and south towards Hatfield Heath are considerably smaller varying between 100 and 130 vehicles per hour.

### 4.2 JOURNEY TIMES

4.2.1 The comparative journey times and average speed of traffic in the 2040 Local Plan Growth Scenario are shown alongside those in the Reference Case in **Table 4-1** and **Table 4-2** respectively.

**Table 4-1: Changes in Journey Times between the Reference Case and Local Plan Growth Scenario**

Route	Direction	Journey Time (in seconds)					
		AM Peak			PM Peak		
		Ref Case	LP	Change	Ref Case	LP	Change
(2) A120 Central Section - M11 J8 to Dunmow West	Eastbound	338	<b>383</b>	+45	503	<b>508</b>	+5
	Westbound	383	<b>396</b>	+13	328	<b>329</b>	+1
(7) Parsonage Road - Mole Hill Green	Northbound	408	<b>519</b>	+111	390	<b>502</b>	+112
	Southbound	438	<b>501</b>	+63	414	<b>456</b>	+42
(8) B1256 - Western Section - M11 J8 to B183	Eastbound	361	<b>384</b>	+23	362	<b>459</b>	+97
	Westbound	311	<b>316</b>	+5	304	<b>305</b>	+1
(9) B1256 - Central Section - B183 to Dunmow West	Eastbound	254	<b>279</b>	+20	268	<b>306</b>	+28
	Westbound	341	<b>487</b>	+139	304	<b>359</b>	+48

**Figure 4-1: Takeley Local Plan Site Allocations**


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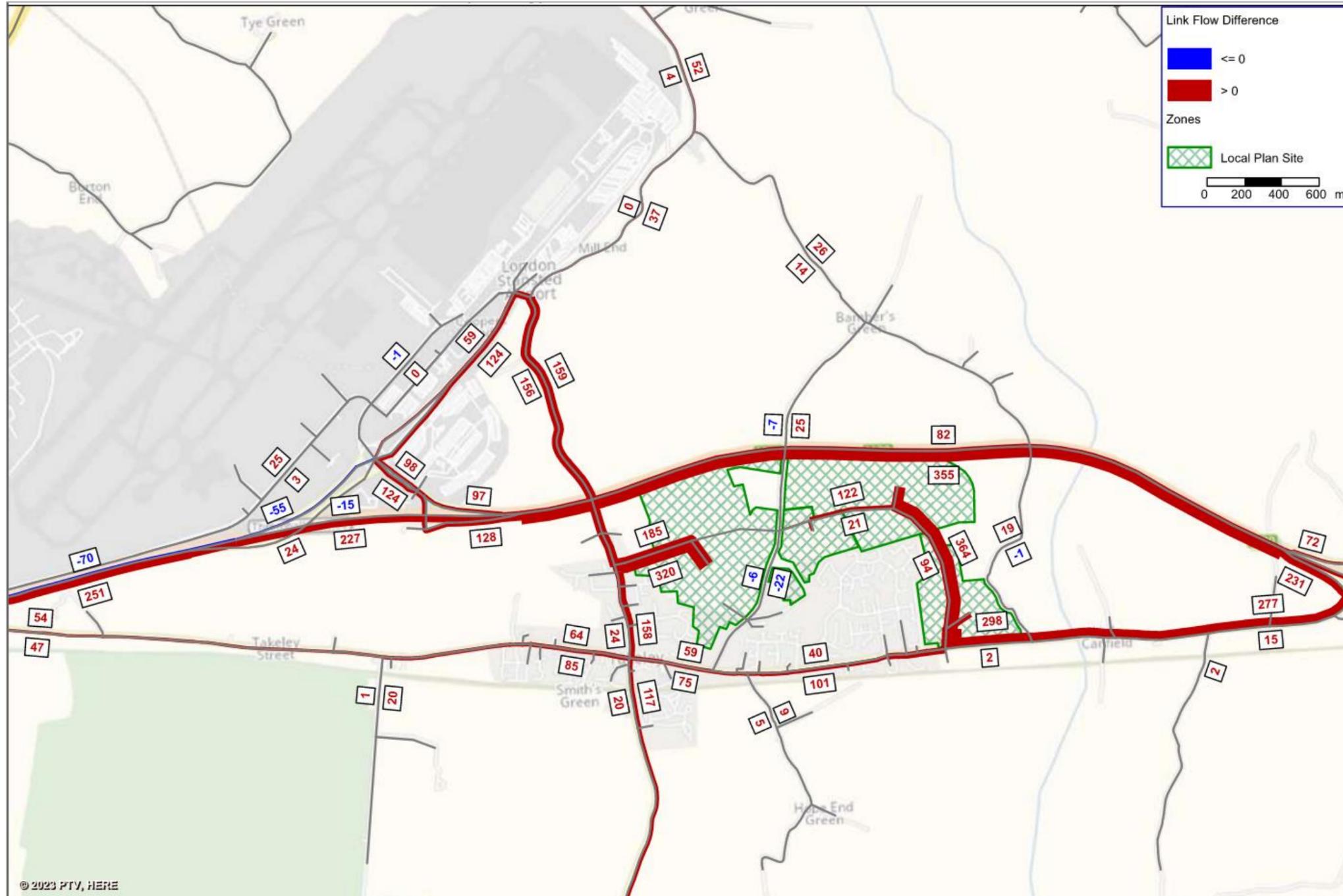


North

**Figure 4-2: Change in Volume of Traffic between the Reference Case and Local Plan Growth Scenario - AM**

**Notes:**

- Volume of traffic is presented in vehicles per hour.
- Weight of bar reflects size of flow.
- Red lines represent an increase in flow.
- Blue lines represent a decrease in flow.
- Green hatching represents Local Plan site allocations.



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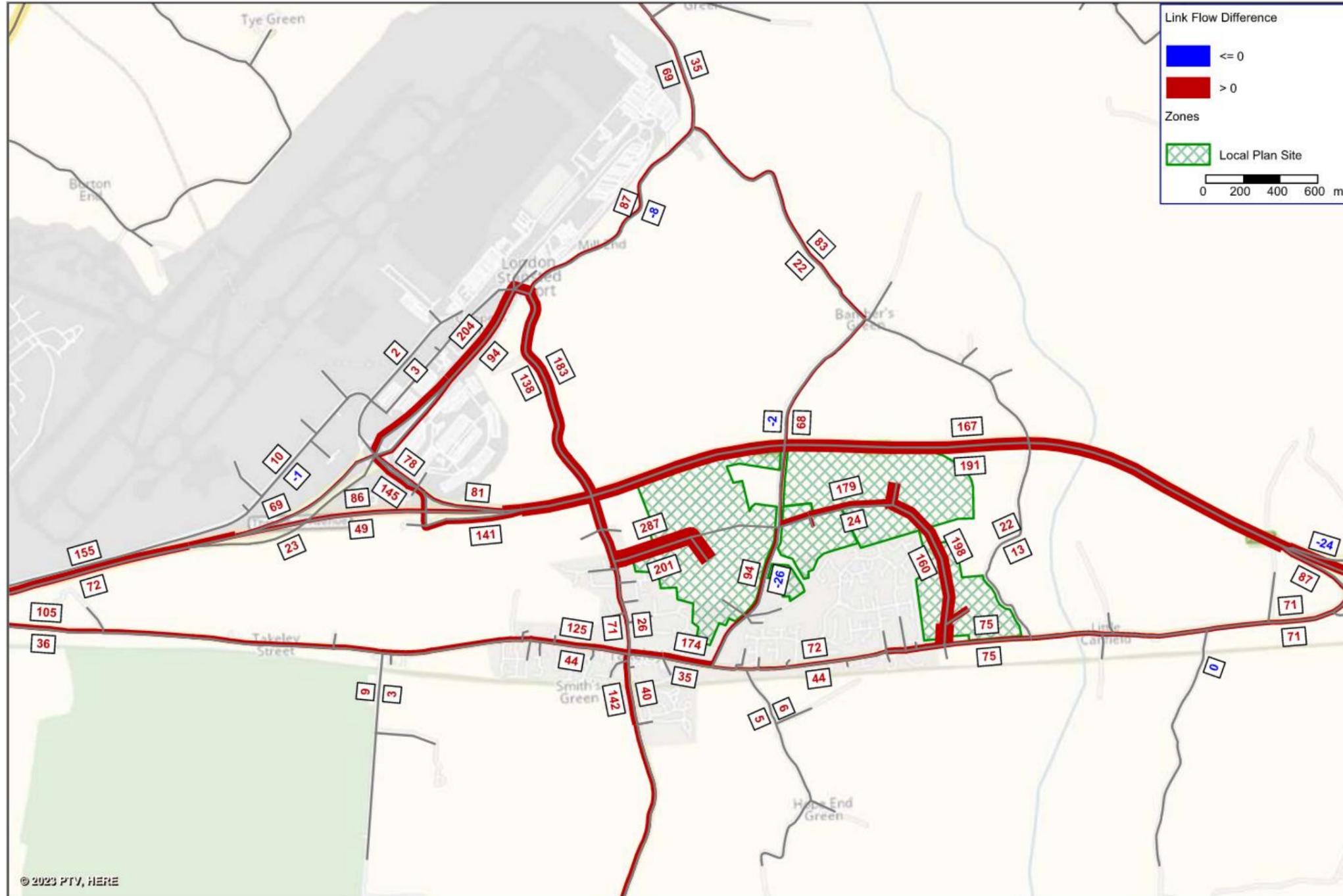
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**Figure 4-3: Change in Volume of Traffic between the Reference Case and Local Plan Growth Scenario - PM**

**Notes:**

- Volume of traffic is presented in vehicles per hour.
- Weight of bar reflects size of flow.
- Red lines represent an increase in flow.
- Blue lines represent a decrease in flow.
- Green hatching represents Local Plan site allocations.

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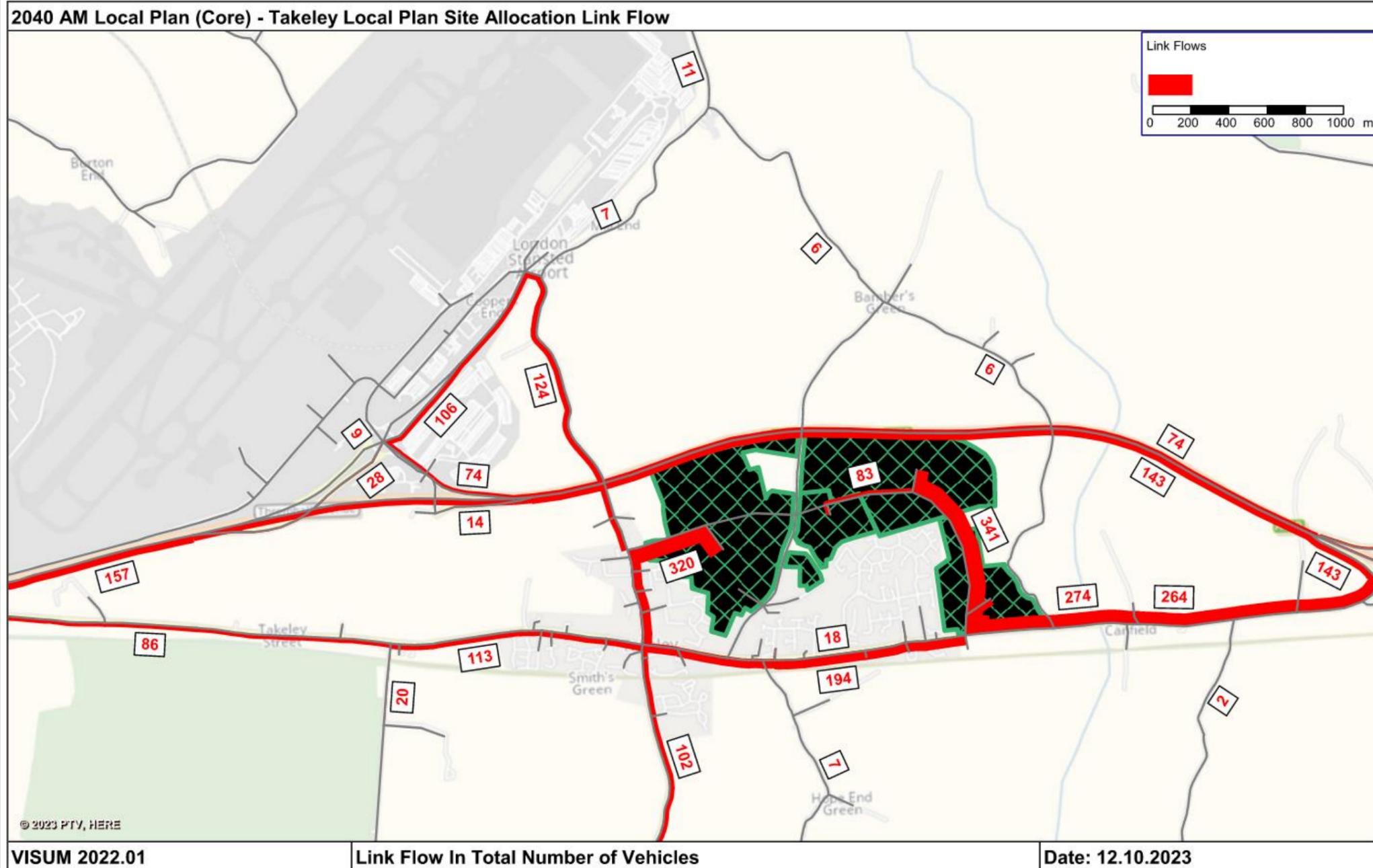
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**Figure 4-4: Distribution of Demand from Site Allocations in Takeley**



**Notes:**

- Volume of traffic is presented in vehicles per hour.
- Weight of bar reflects size of flow.
- Red lines represent an increase in flow.
- Black hatching represents Local Plan site allocations.

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**Table 4-2: Changes in Average Speeds between the Reference Case and Local Plan Growth Scenario**

Route	Direction	Average Speed in MPH					
		AM Peak			PM Peak		
		Ref. Case	Local Plan	Change	Ref. Case	Local Plan	Change
(2) A120 Central Section - M11 J8 to Dunmow West	Eastbound	58.2	<b>51.3</b>	-6.9	39.1	<b>38.8</b>	-0.4
	Westbound	50.8	<b>49.1</b>	-1.7	59.3	<b>59.1</b>	-0.2
(7) Parsonage Road - Mole Hill Green	Northbound	31.8	<b>25.0</b>	-6.8	33.3	<b>25.8</b>	-7.4
	Southbound	29.6	<b>25.9</b>	-3.7	31.3	<b>28.4</b>	-2.9
(8) B1256 - Western Section - M11 J8 to B183	Eastbound	27.9	<b>26.2</b>	-1.7	27.8	<b>21.9</b>	-5.9
	Westbound	32.4	<b>31.9</b>	-0.5	33.1	<b>33.0</b>	-0.1
(9) B1256 - Central Section - B183 to Dunmow West	Eastbound	34.3	<b>31.3</b>	-2.4	32.6	<b>28.5</b>	-2.9
	Westbound	25.6	<b>17.9</b>	-7.2	28.7	<b>24.3</b>	-3.7

4.2.8 The tables highlight that:

- The speed of traffic will reduce on all routes as a consequence of Local Plan related growth. This will be felt most prominently on Parsonage Road and the B1245 through Takeley, reflecting the increases in demand and direct access onto the corridor from the site allocations directly to the north.

### 4.3 JUNCTION DELAYS

4.3.1 In seeking to understand the changes in journey times, an analysis of the performance of the junctions on the network was undertaken. **Figure 4-5** illustrates the level of delay associated with the worse performing arm/approach to each junction in the AM peak period in the Local Plan Growth Scenario, alongside the changes in delay when compared to the 2040 Reference Case. The comparative illustrations for the PM peak period are provided in **Figure 4-6**.

4.3.2 It should be noted that as part of the site allocations an access road would be provided between Parsonage Road and Dunmow Road to the east of the village. Whilst general traffic could access the route at either end, there would be no through route, with a modal filter on Smiths Green Lane enabling access for buses, pedestrians and cyclists only.

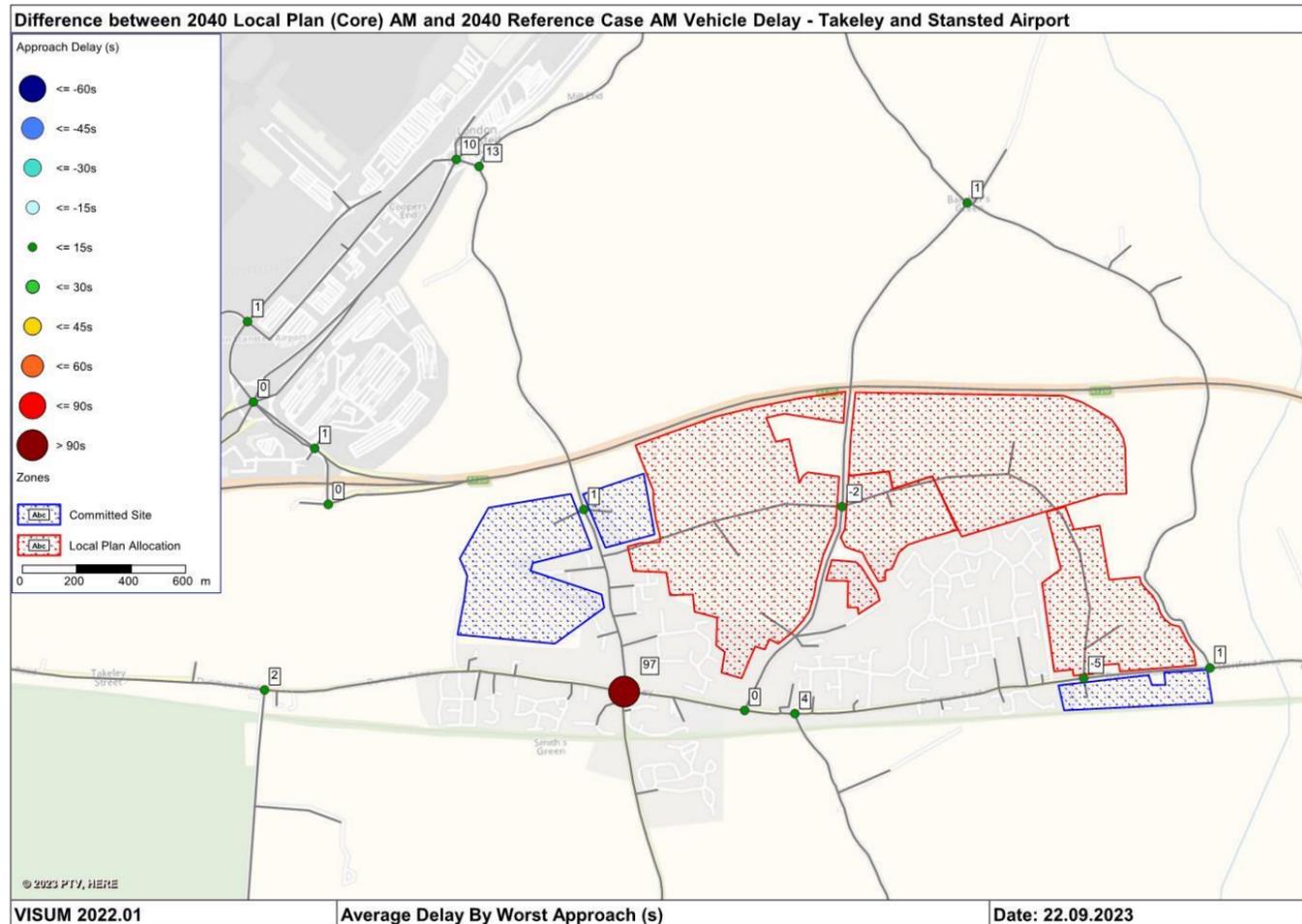
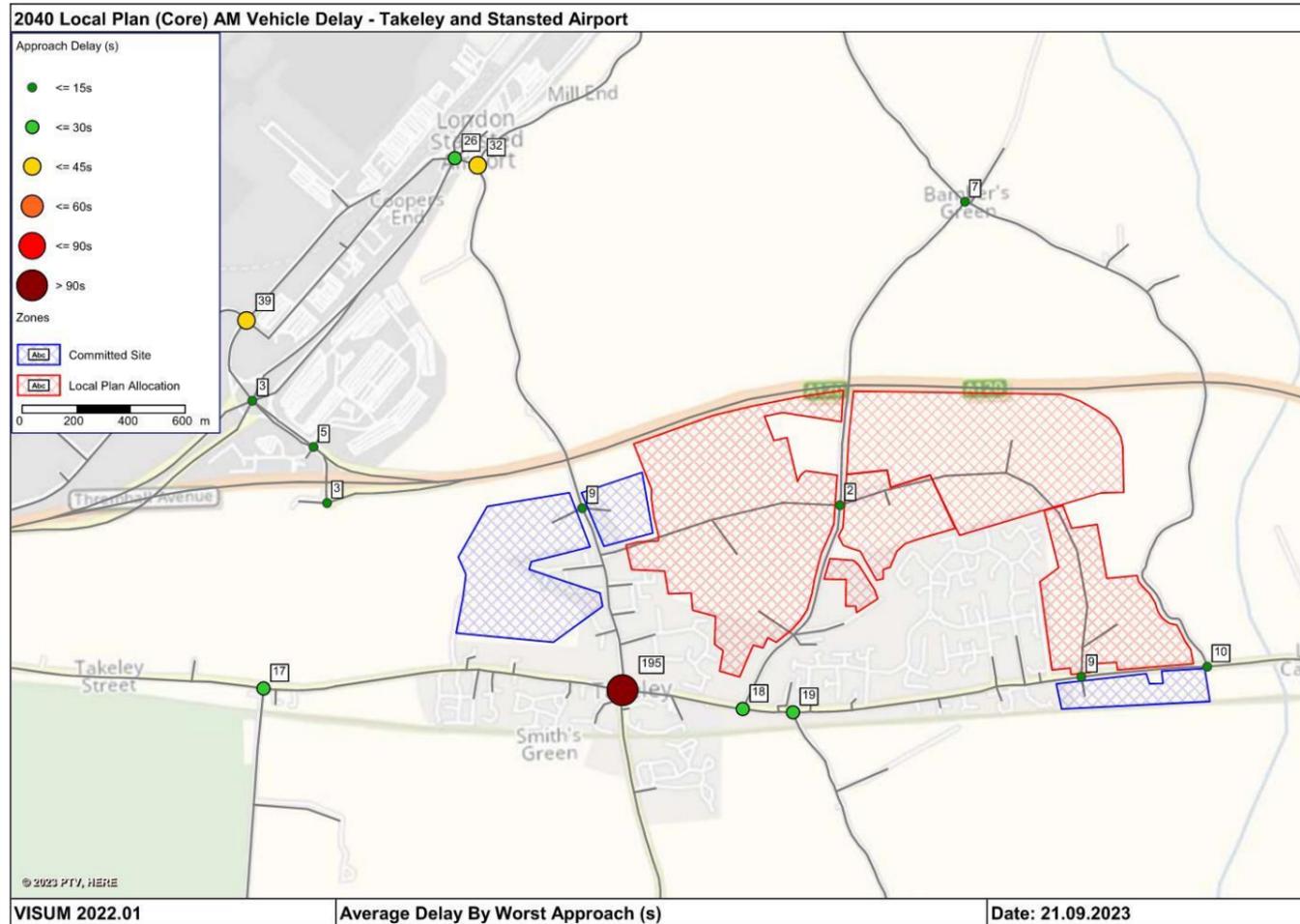
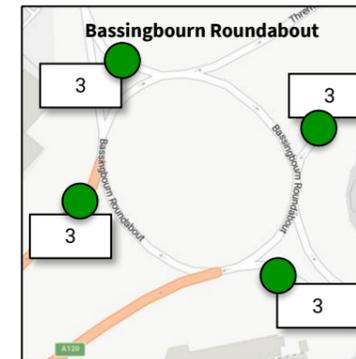
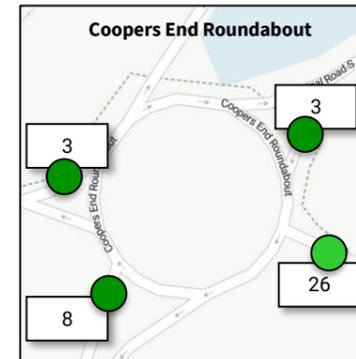
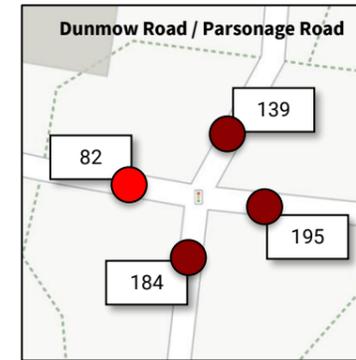
4.3.3 This has implications for the performance of the junctions within this model notably:

- The Local Plan will accentuate delays at the junction of the B1256 Dunmow Road and B183 Station Road / Parsonage Road (the 'Four Ashes') with traffic experiencing queues of over three minutes, of which around one and a half minutes is attributable to the impact of the site allocations in the morning peak period.
- In the PM peak period, the Four Ashes junction will continue to experience delays over two minutes, whilst to the south of the village at the junction of Station Road and Takeley Park will also be subject to a degree of delay.

**Figure 4-5: AM Peak Junction Delays in the Local Plan Growth Scenario**

**Notes:**

- Delays are in seconds per vehicle.
- Represents average queue time in the respective peak period.
- Delays on the worst approach shown in main figure.
- Delays on all approaches are shown on selected junctions in the inserts.



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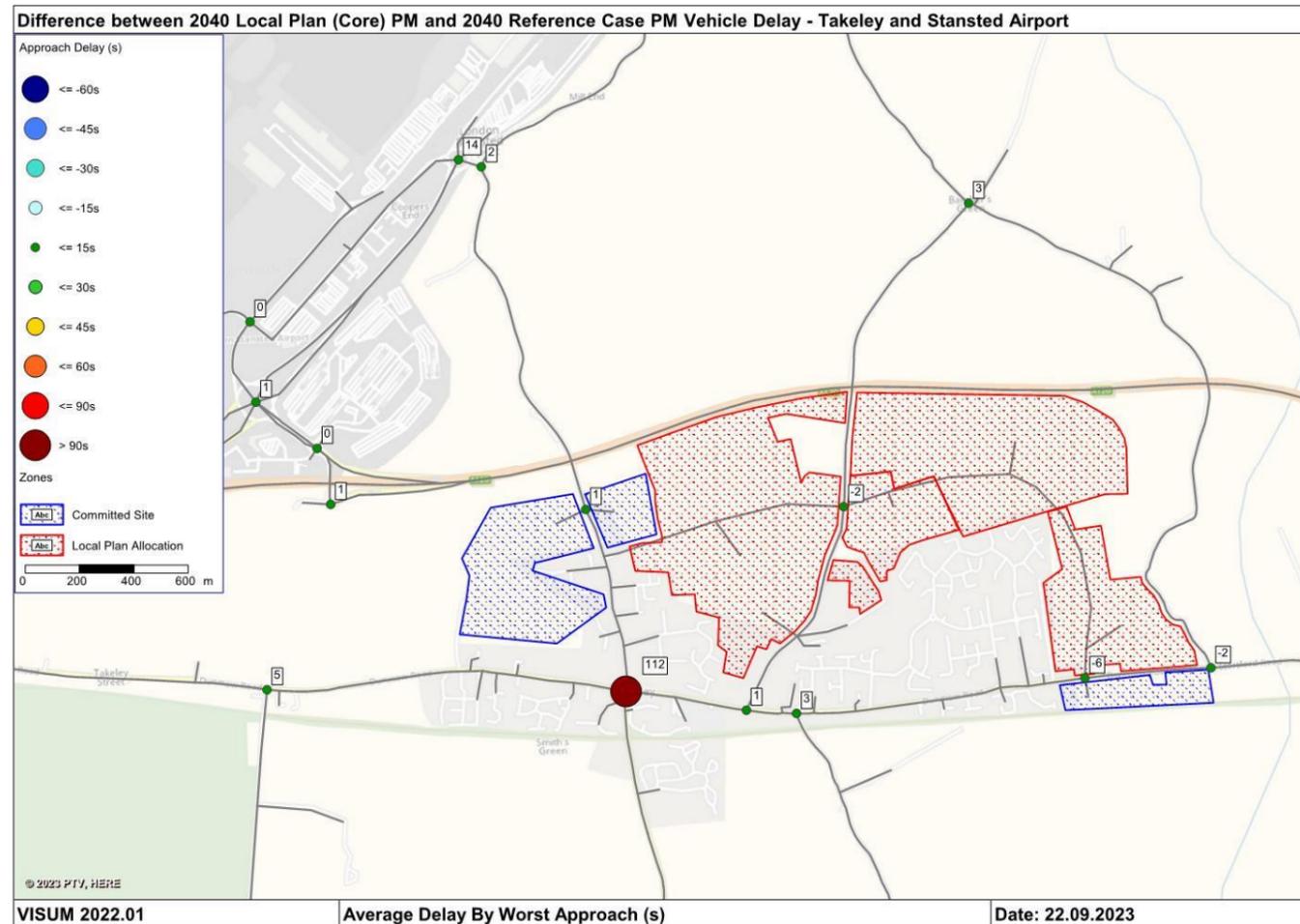
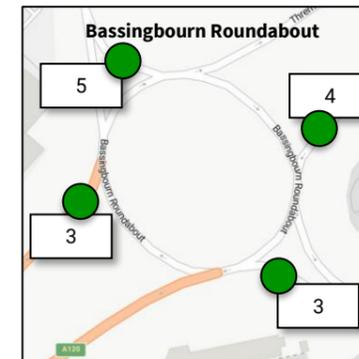
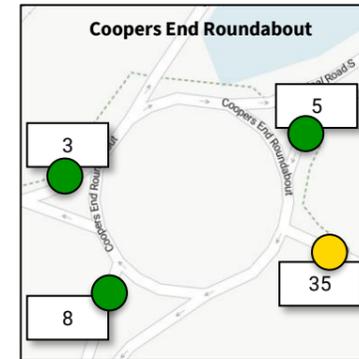
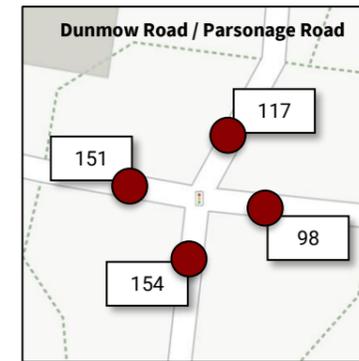
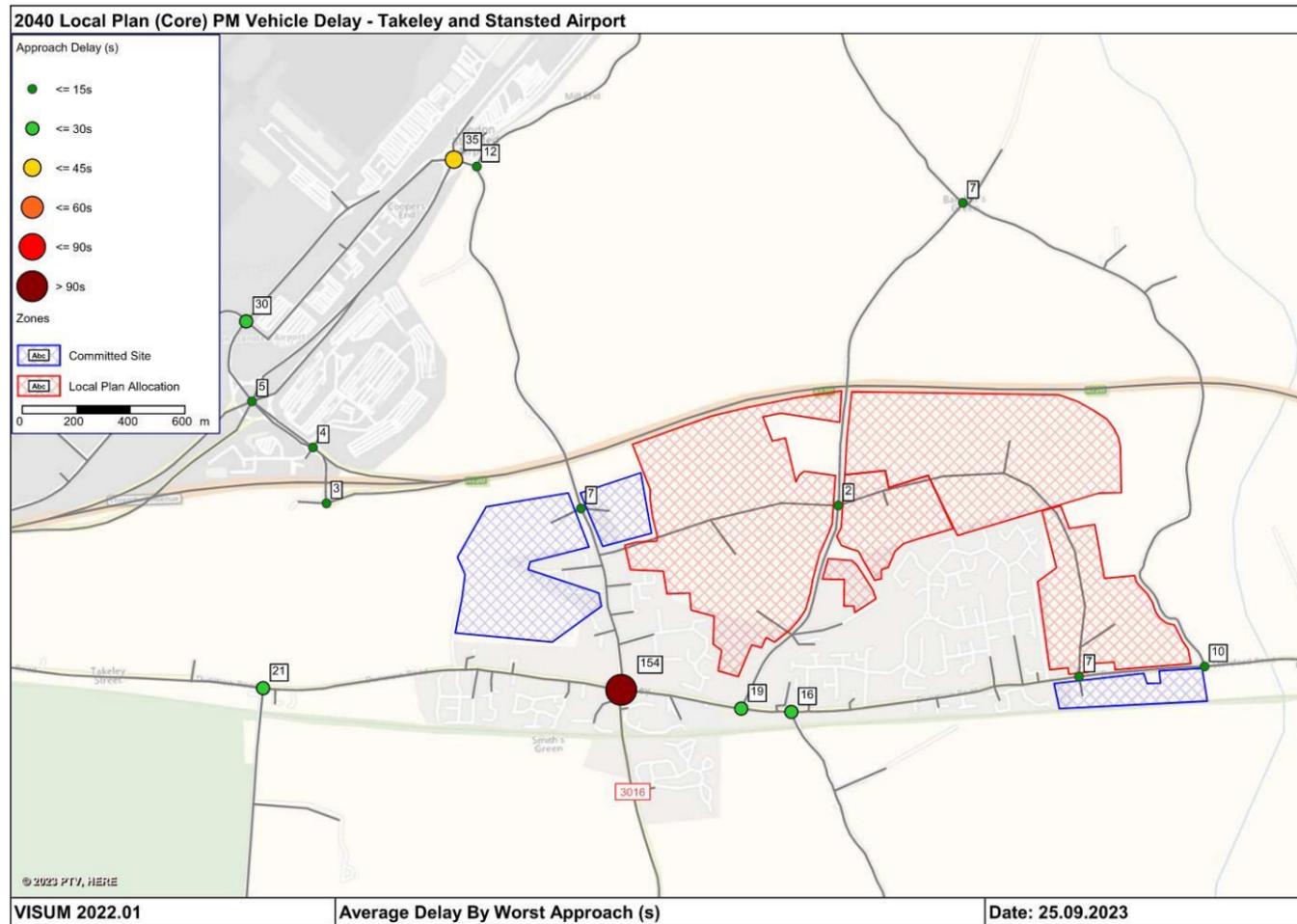
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**Figure 4-6: PM Peak Junction Delays in the Local Plan Growth Scenario**

**Notes:**

- Delays are in seconds per vehicle.
- Represents average queue time in the respective peak period.
- Delays on the worst approach shown in main figure.
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## 4.4 SUMMARY

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- 4.4.1 The Local Plan Growth Scenario will result in more traffic on the network, as is to be expected with the delivery of around 1,900 new dwellings within the village. The impacts will be most pronounced on the local road network, and in particular in the centre of Takeley, where without intervention delays will be experienced in both peak periods.
- 4.4.2 Despite the proximity of the new housing to the road network around the airport, minimal increases in demand are expected and all accesses will continue to operate efficiently.



TETRA TECH

## **5 | MITIGATION PACKAGE 1 – SUSTAINABLE TRANSPORT**

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## 5.0 MITIGATION: PACKAGE 1 – SUSTAINABLE TRANSPORT

### 5.1 INTERVENTIONS

- 5.1.1 Following the identification of the impacts of the Local Plan Growth Scenario on the highway network, a package of interventions to accommodate the increased travel demand within the town was identified focused on the delivery of sustainable travel improvements.
- 5.1.2 The adverse effects of an increase in traffic associated with new development aren't limited to additional queuing and journey times for vehicles but extend to:
- Undermining the availability of more sustainable travel choices.
  - Emissions and air quality, particularly in residential areas.
  - Severance and the dominance of traffic on the public realm.
  - Healthy lifestyles and the quality of life for residents.
- 5.1.3 In this context, merely focusing on the provision of additional highway capacity will fail to address many of the wider implications of increased travel demand within the village. Furthermore, the existing quality of the sustainable transport offer is limited – with infrequent bus services and a lack of dedicated cycle provision (see TN110 – Uttlesford Transport Study Baseline Report, for more details).
- 5.1.4 Subsequently, and in line with the overarching vision for the future of transport detailed within the Local Plan, a package of multi-modal sustainable transport interventions was identified. A summary of the individual measures and the rationale for their implementation are highlighted in **Table 5-1**.

**Table 5-1: Sustainable Transport Interventions in Takeley**

Ref	Scheme
<b>Public Transport</b>	
<b>PT.01</b>	Increase the frequency of services, particularly those to Stansted Airport and Bishop's Stortford.
<b>PT.02</b>	New bus service between the development site and Stansted Airport.
<b>PT.03</b>	Provide Real Time Information at all stops.
<b>PT.04</b>	Offer free bus travel to all new residents for 12 months.
<b>PT.05</b>	Offer discounted rail travel to all new residents for 12 months.
<b>PT.06</b>	Provision of a 'mobility hub' multi-modal transport interchange.
<b>Walking &amp; Cycling</b>	
<b>WC.01</b>	Provision of a new e-bike for every household.
<b>WC.02</b>	Local connections onto the NCN plus: <ul style="list-style-type: none"> <li>- Improvements to the Flich Way.</li> <li>- LTN 1/20 compliant route between Takeley and Stansted Airport.</li> </ul>
<b>WC.03</b>	Introduce a modal filter on Smiths Green so that it doesn't compromise the safety of cyclists when it is surrounded by development on both sides.

- 5.1.5 Based upon the above schemes coming forward, assumptions were made relating to the extent to which modal shift could be achieved both from within the site allocations themselves and elsewhere within the village, as a result of indirect benefits beyond the sites themselves (such as through the provision of a more frequent bus service for example).
- 5.1.6 A high level of modal shift was applied to reflect the nature and scale of investment that would be provided. Given the bespoke package of interventions and the specific locations in question, it is difficult to find directly comparable case studies upon which to base any mode shift assumptions.
- 5.1.7 However, following a literature review of the available evidence, the reductions applied to the number of trips undertaken by vehicles within Takeley are set out in **Table 5-2**.

**Table 5-2: Mode Shift Assumptions**

Origin & Destination Pairs	Vehicle Trip Reduction Applied
Site Allocations to Town Centre	15% to 25% reduction
Between Local Plan allocations within Takeley	25% to 50% reduction (up to 90% to neighbouring zones).
Site Allocations to Stansted Airport	15% reduction

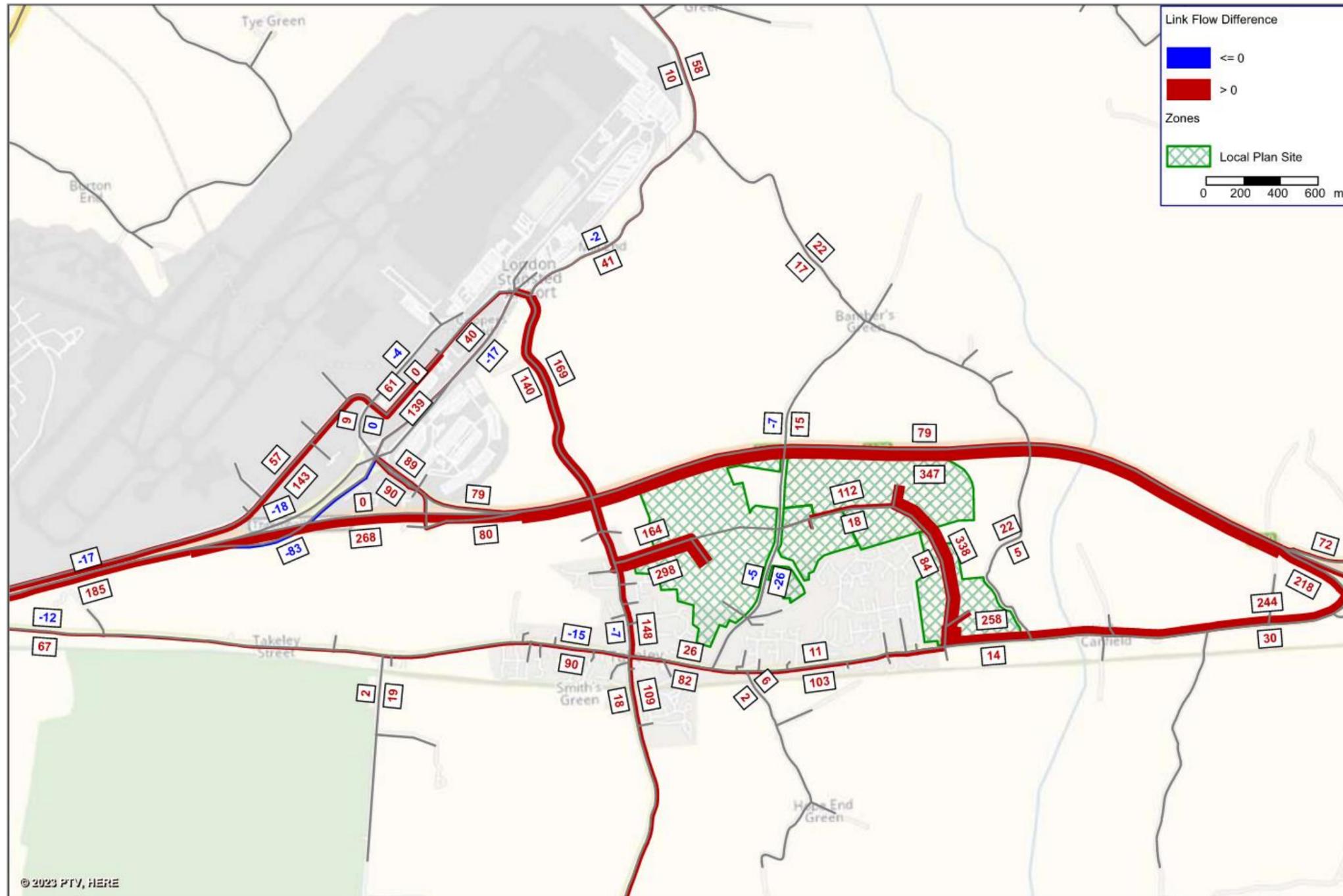
- 5.1.8 The impacts on the performance of these measures on the highway network are presented herein.

## 5.2 VOLUME OF TRAFFIC

- 5.2.1 Sustainable Transport Mitigation Package 1 highlights how the road network will perform in a future year (2040) with all Local Plan site allocations and sustainable transport mitigation in place. To understand the effectiveness of the interventions to be delivered as part of the package, comparisons are drawn with the performance of the network in the Reference Case.
- 5.2.2 The changes in the volume of traffic between the Reference Case and Mitigation Package 1 are shown in **Figure 5-1** and **Figure 5-2** for the AM peak and the PM peak periods.
- 5.2.3 It highlights that:
- Investment in sustainable transport measures has the potential to negate some of the adverse effects of the travel demand associated with the Local Plan site allocations.
  - However, despite the provision of more attractive walking, cycling and public transport options, there will remain additional traffic on the network, particularly on the A120 and B1256 towards the A120 at the Dunmow West Interchange.

## 5.3 JOURNEY TIMES

- 5.3.1 The comparative journey times and average speed of traffic in the Mitigation Package 1 scenario and the Reference Case are shown in **Table 5-3** and **Table 5-4** respectively.



**Figure 5-1: Change in Volume of Traffic between the Reference Case and Mitigation Package 1 - AM**

**Notes:**

- Volume of traffic is presented in vehicles per hour.
- Weight of bar reflects size of flow.
- Red lines represent an increase in flow.
- Blue lines represent a decrease in flow.
- Green hatching represents Local Plan site allocations.

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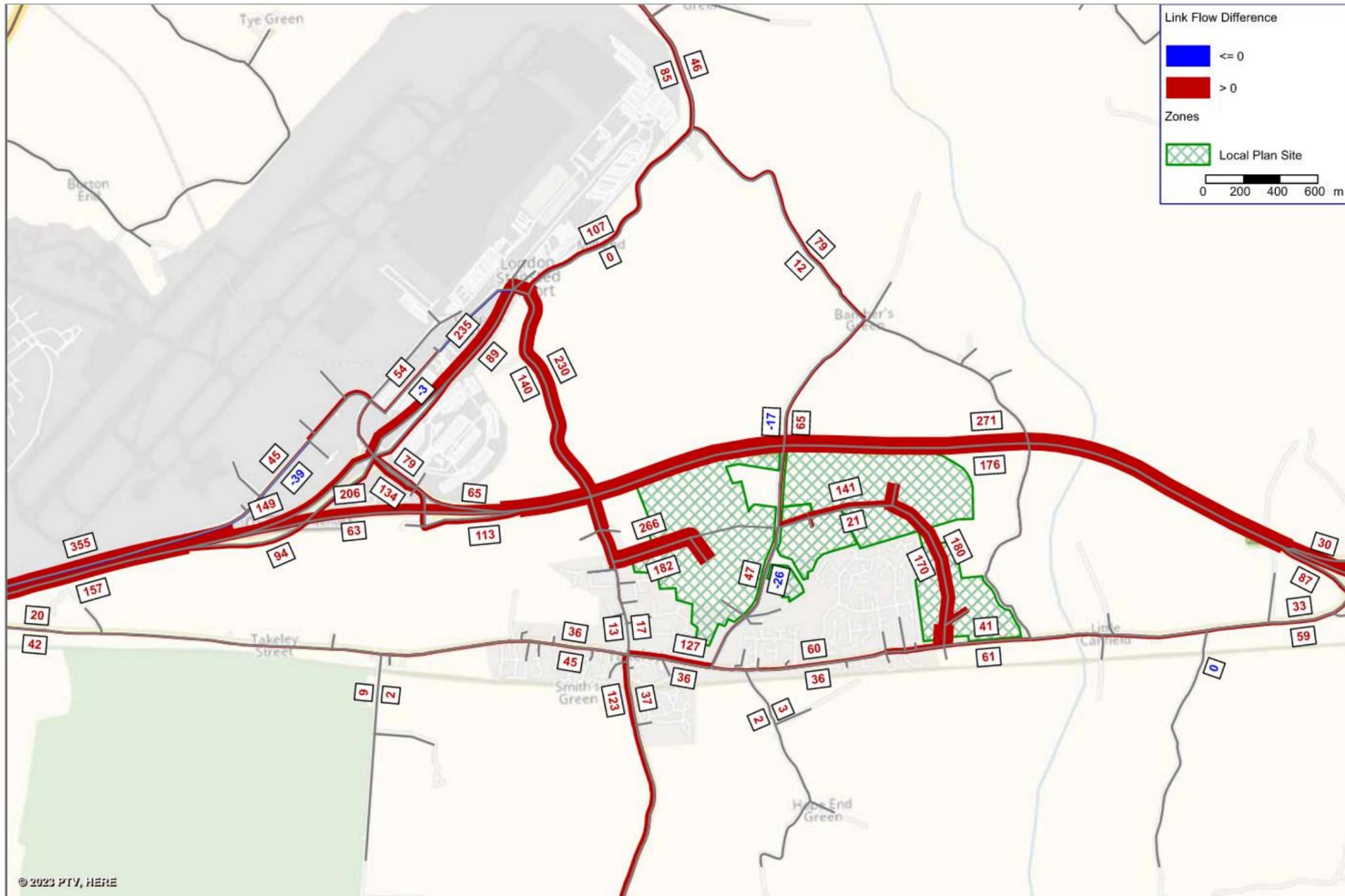
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**Figure 5-2: Change in Volume of Traffic between the Reference Case and Mitigation Package 1 - PM**

**Notes:**

- Volume of traffic is presented in vehicles per hour.
- Weight of bar reflects size of flow.
- Red lines represent an increase in flow.
- Blue lines represent a decrease in flow.
- Green hatching represents Local Plan site allocations.



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**Table 5-3: Changes in Journey Times between the Reference Case and Sustainable Transport Mitigation Package 1 (MP1)**

Route	Direction	Journey Time (in seconds)					
		AM Peak			PM Peak		
		Ref. Case	MP 1	Change	Ref. Case	MP 1	Change
(2) A120 Central Section - M11 J8 to Dunmow West	Eastbound	338	<b>345</b>	+7	503	<b>497</b>	-6
	Westbound	383	<b>416</b>	+33	328	<b>334</b>	+6
(7) Parsonage Road - Mole Hill Green	Northbound	408	<b>514</b>	+106	390	<b>436</b>	+46
	Southbound	438	<b>489</b>	+51	414	<b>447</b>	+33
(8) B1256 - Western Section - M11 J8 to B183	Eastbound	361	<b>360</b>	-1	362	<b>408</b>	+46
	Westbound	311	<b>318</b>	+7	304	<b>305</b>	+1
(9) B1256 - Central Section - B183 to Dunmow West	Eastbound	254	<b>275</b>	+16	278	<b>300</b>	+22
	Westbound	341	<b>454</b>	+106	311	<b>341</b>	+30

**Table 5-4: Changes in Average Speed between the Reference Case and Sustainable Transport Package Scenario**

Route	Direction	Average Speed (in MPH)					
		AM Peak			PM Peak		
		Ref. Case	MP 1	Change	Ref. Case	MP 1	Change
(2) A120 Central Section - M11 J8 to Dunmow West	Eastbound	58.2	<b>57.1</b>	-1.2	39.1	<b>39.6</b>	+0.4
	Westbound	50.8	<b>46.7</b>	-4.1	59.3	<b>58.3</b>	-1.0
(7) Parsonage Road - Mole Hill Green	Northbound	31.8	<b>25.3</b>	-6.5	33.3	<b>29.8</b>	-3.5
	Southbound	29.6	<b>26.5</b>	-3.1	31.3	<b>29.0</b>	-2.3
(8) B1256 - Western Section - M11 J8 to B183	Eastbound	27.9	<b>27.9</b>	-	27.8	<b>24.7</b>	-3.1
	Westbound	32.4	<b>31.7</b>	-0.7	33.1	<b>33.0</b>	-0.1
(9) B1256 - Central Section - B183 to Dunmow West	Eastbound	34.3	<b>31.7</b>	-1.9	31.4	<b>29.1</b>	-2.3
	Westbound	25.6	<b>19.2</b>	-5.8	28.1	<b>25.6</b>	-2.5

5.3.6 The tables highlight that:

- The introduction of sustainable transport measures reduces journey times for general traffic to levels commensurate to the Reference Case.
- The reduction in demand to travel by car due to the availability of more attractive alternatives, will enable the residual traffic to use the road network more efficiently, albeit at slightly slower speeds than the Reference Case.

## 5.4 JUNCTION DELAYS

5.4.1 In seeking to understand the changes in journey times, an analysis of the performance of the junctions on the network was undertaken. **Figure 5-3** illustrates the level of delay associated with the worse performing arm/approach to each junction in the AM peak period in the Sustainable Transport Mitigation Package,

alongside the changes in delay when compared to the 2040 Reference Case. The comparative illustrations for the PM peak period are provided in **Figure 5-4**.

5.4.2 The key findings are that:

- Sustainable transport measures will help to reduce the level of delays experienced at junctions on both the B1256 and B183 within Takeley.
- They will not see conditions return to Reference Case levels but will still have a substantial impact on the efficiency of the network.
- Supported by junction specific improvements, the impacts of the site allocations could be fully mitigated.

## 5.5 SUMMARY

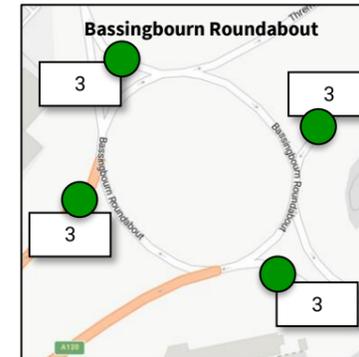
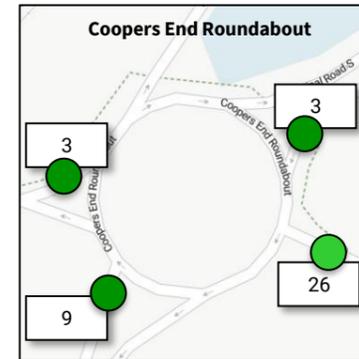
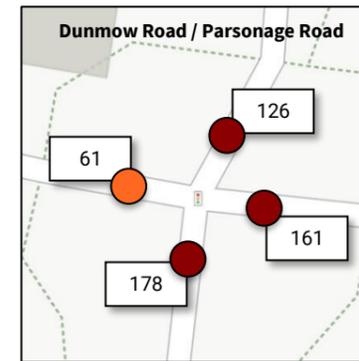
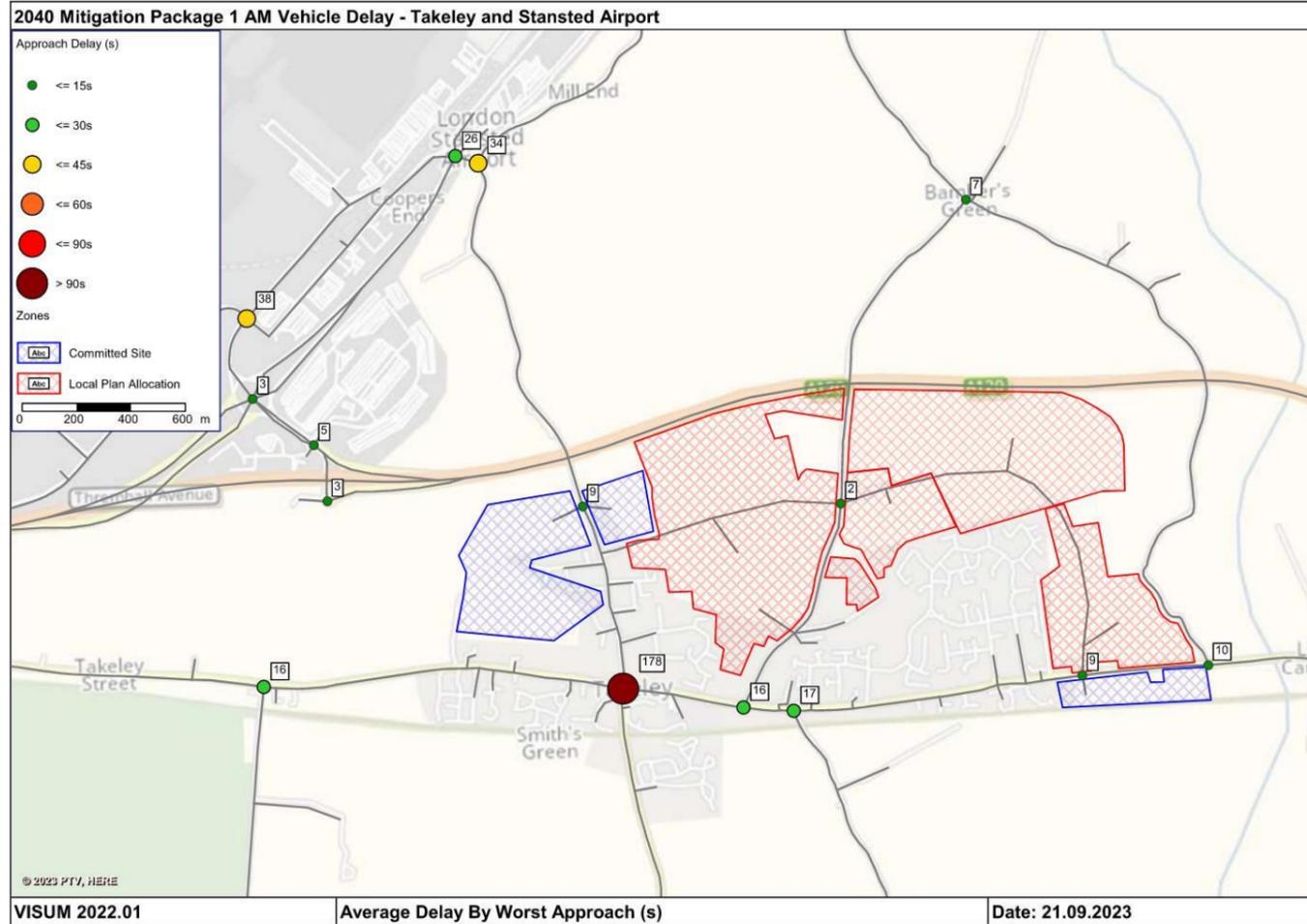
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5.5.1 Providing a package of intervention to mitigate the impacts of the Local Plan site allocations which focuses on the provision of attractive sustainable travel options which provides realistic alternatives to the car will provide many benefits to the travel offering in the town, beyond the performance of the highway network.

5.5.2 Making walking and cycling safer and more convenient, and public transport more frequent and accessible will support wider ambitions to improve the health and well-being of residents, support moves to address the climate emergency, and cater for all sections of society, particularly those without access to a car.

5.5.3 Notwithstanding the wider benefits of focusing mitigation on sustainable travel, its ability to reduce demand to travel by car will benefit the performance of the highway network itself. If a high degree of modal shift can be achieved, the majority of the network will perform as effectively as within the Reference Case, despite the additional 1,900 dwellings within the village.

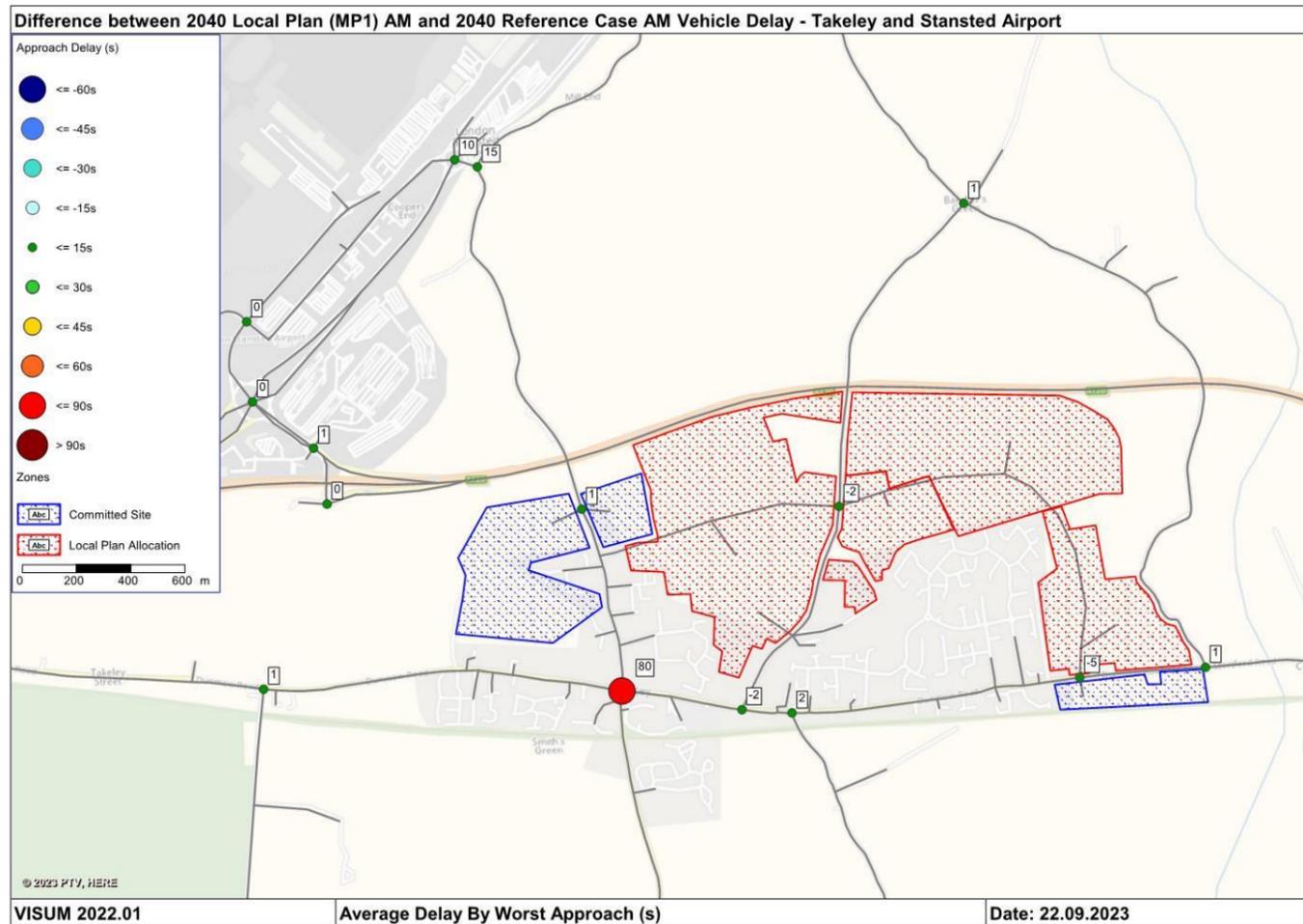
5.5.4 Where capacity issues and delays will persist on the network, local junction enhancements schemes are likely to be required to help regulate demand and maximise the efficiency of their operation.



**Figure 5-3: AM Peak Junction Delays in Mitigation Package 1**

**Notes:**

- Delays are in seconds per vehicle.
- Represents average queue time in the respective peak period.
- Delays on the worst approach shown in main figure.
- Delays on all approaches are shown on selected junctions in the inserts.



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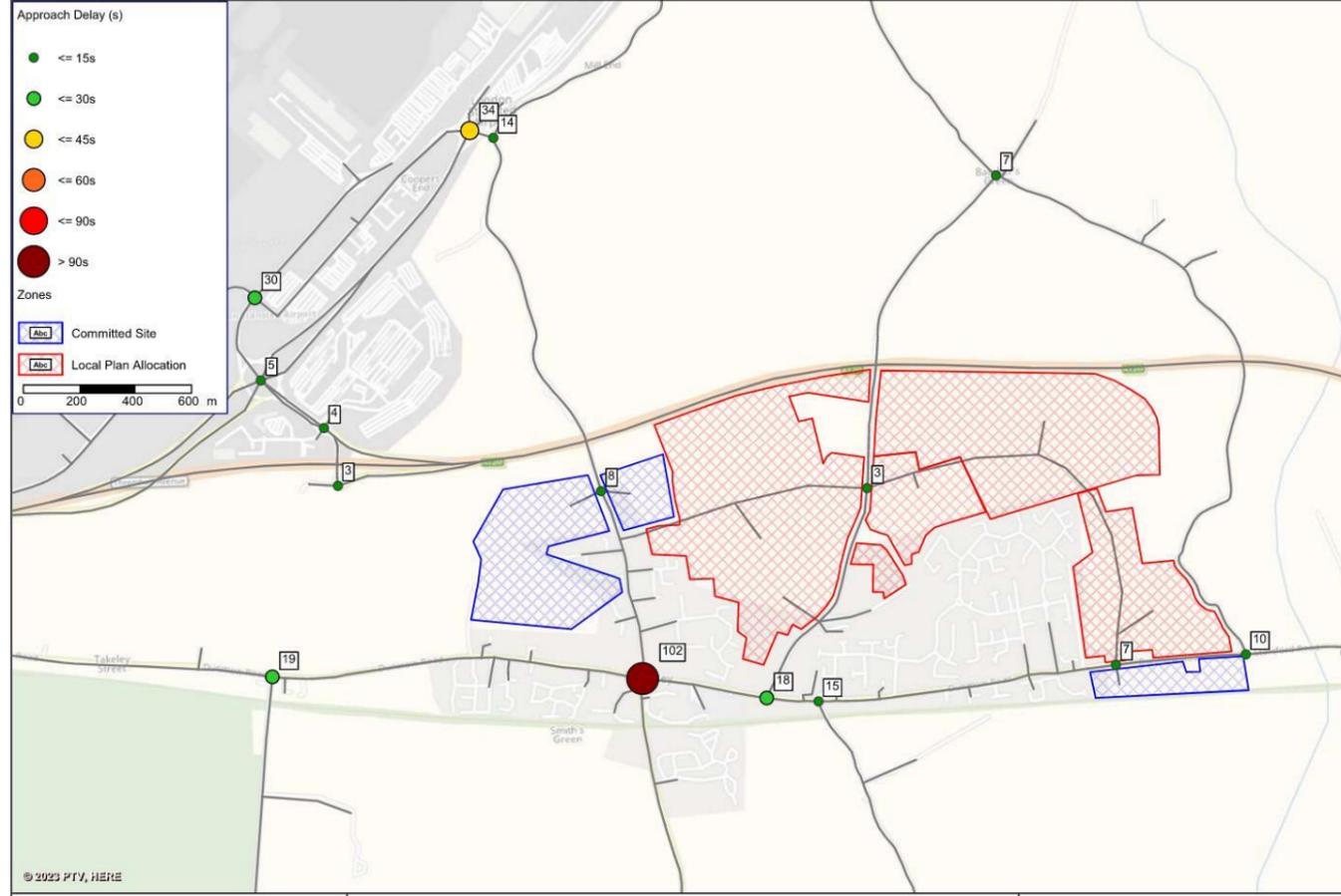
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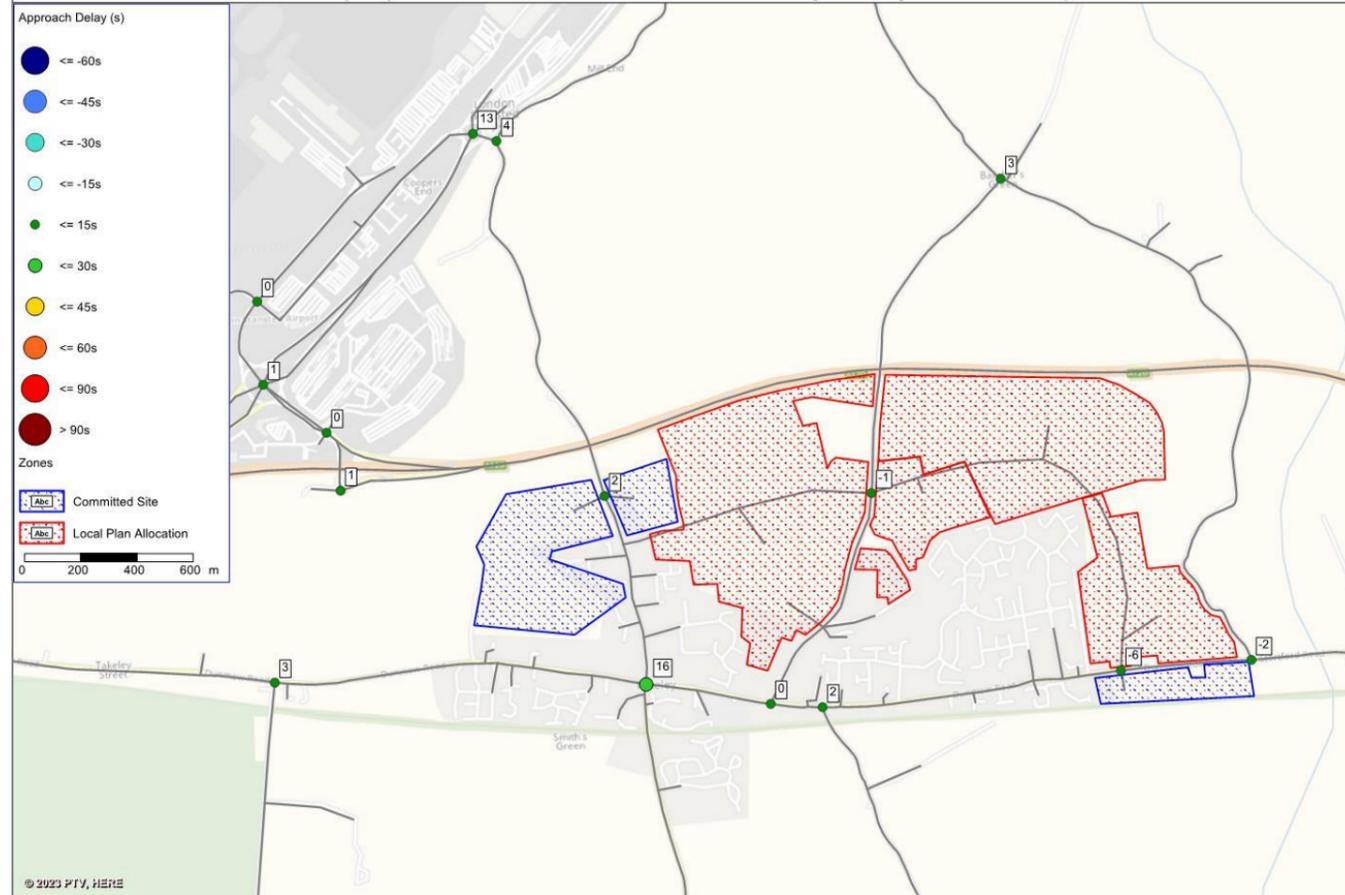


**2040 Mitigation Package 1 PM Vehicle Delay - Takeley and Stansted Airport**

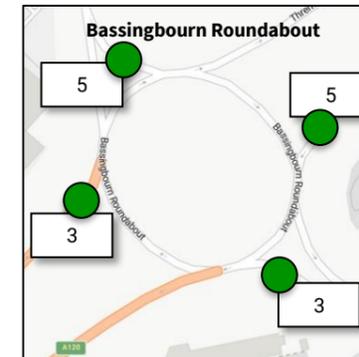
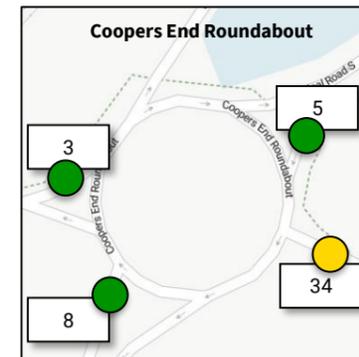
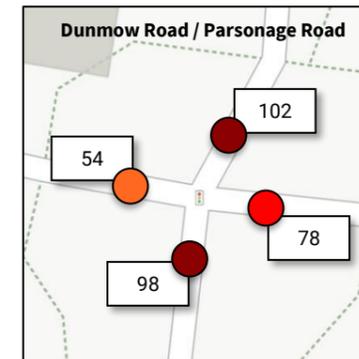


VISUM 2022.01 Average Delay By Worst Approach (s) Date: 25.09.2023

**Difference between 2040 Local Plan (MP1) PM and 2040 Reference Case PM Vehicle Delay - Takeley and Stansted Airport**



VISUM 2022.01 Average Delay By Worst Approach (s) Date: 22.09.2023



**Figure 5-4: PM Peak Junction Delays in Mitigation Package 1**

**Notes:**

- Delays are in seconds per vehicle.
- Represents average queue time in the respective peak period.
- Delays on the worst approach shown in main figure.
- Delays on all approaches are shown on selected junctions in the inserts.

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## 6 | MITIGATION PACKAGE 2 – HIGHWAY CAPACITY

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## 6.0 MITIGATION: PACKAGE 2 – HIGHWAY CAPACITY

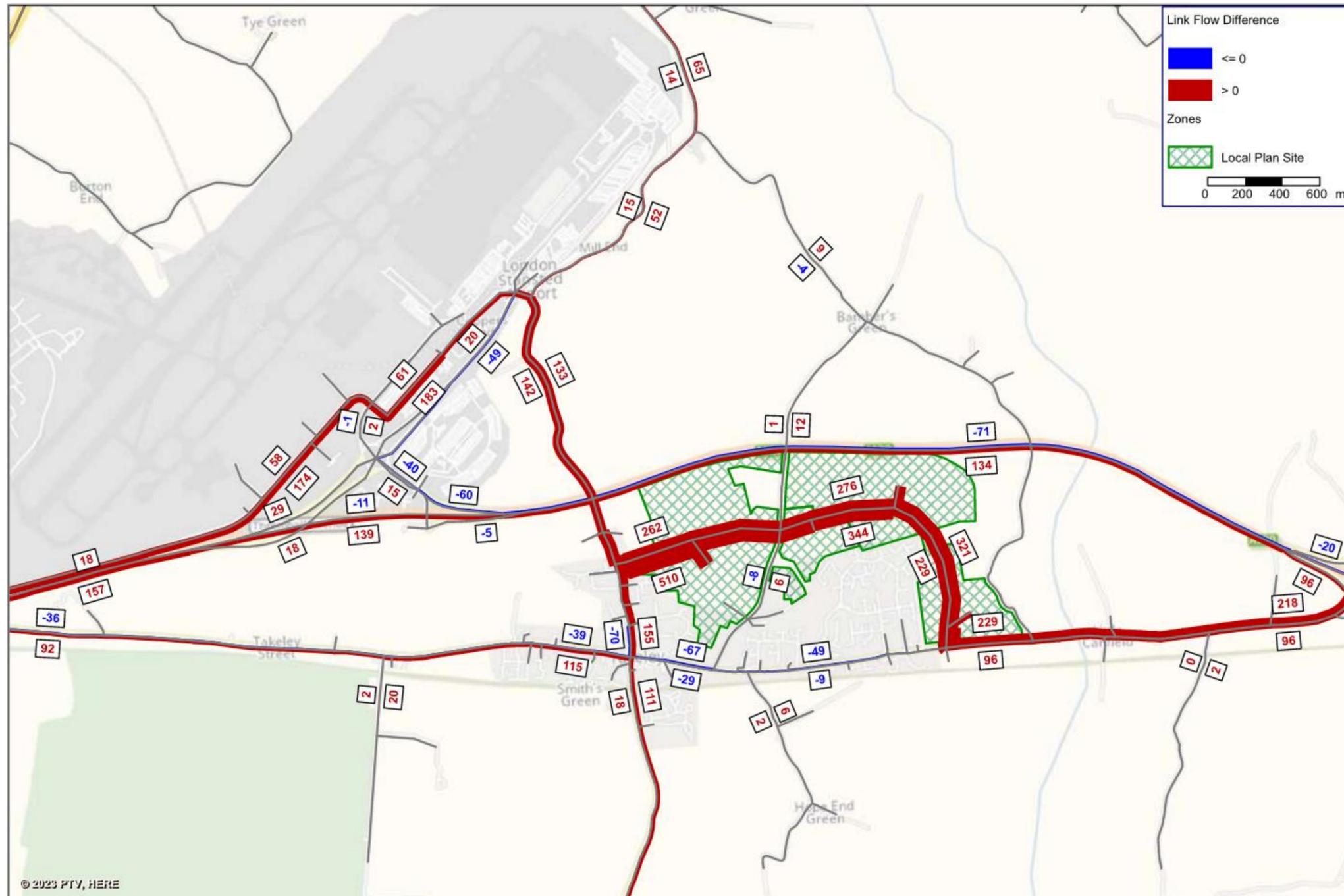
### 6.1 INTERVENTIONS

- 6.1.1 In addition to potential sustainable transport interventions to be taken forward, the impacts of a highway capacity scheme were also considered in Takeley.
- 6.1.2 The sites in Takeley were proposed to be served by a link road between Parsonage Road and Dunmow Road, but a modal filter would be provided at the junction with Smiths Green Lane to prevent its use by general traffic.
- 6.1.3 However, in seeking to identify a proportionate highway capacity based solution to the delays identified in the centre of the village, it was determined that it should be tested how the network would perform if the link road would provide a continuous route for general traffic alongside the provision for sustainable modes.
- 6.1.4 The scheme would be provided over and above the sustainable transport interventions identified in Package 1.

### 6.2 VOLUME OF TRAFFIC

- 6.2.1 To understand the effectiveness of the through route, comparisons are drawn with the performance of the network in the Reference Case. The changes in the volume of traffic between the Reference Case and Mitigation Package 2 are shown in **Figure 6-1** and **Figure 6-2** for both the AM peak and the PM peak periods.
- 6.2.2 It highlights that:
- Enabling traffic to use the full link between Parsonage Road and Dunmow Road will see a significant change in the distribution of trips within Takeley from both that detailed within the Local Plan scenario without access permitted, and the Reference Case.
  - Use of the link will ensure that there is no increase in traffic on the B1256 Dunmow Road through the centre of the village, east of the 'Four Ashes' junction.
  - However, in the AM peak it is apparent that some vehicles will be inclined to re-route from the A120. This introduction of through traffic into a new community is something that should be avoided. Consideration will have to be given to this and the wider benefit to the centre of the village, in the design specification and user priorities on the route.

**Figure 6-1: Change in Volume of Traffic between the Reference Case and Mitigation Package 2 - AM**



**Notes:**

- Volume of traffic is presented in vehicles per hour.
- Weight of bar reflects size of flow.
- Red lines represent an increase in flow.
- Blue lines represent a decrease in flow.
- Green hatching represents Local Plan site allocations.

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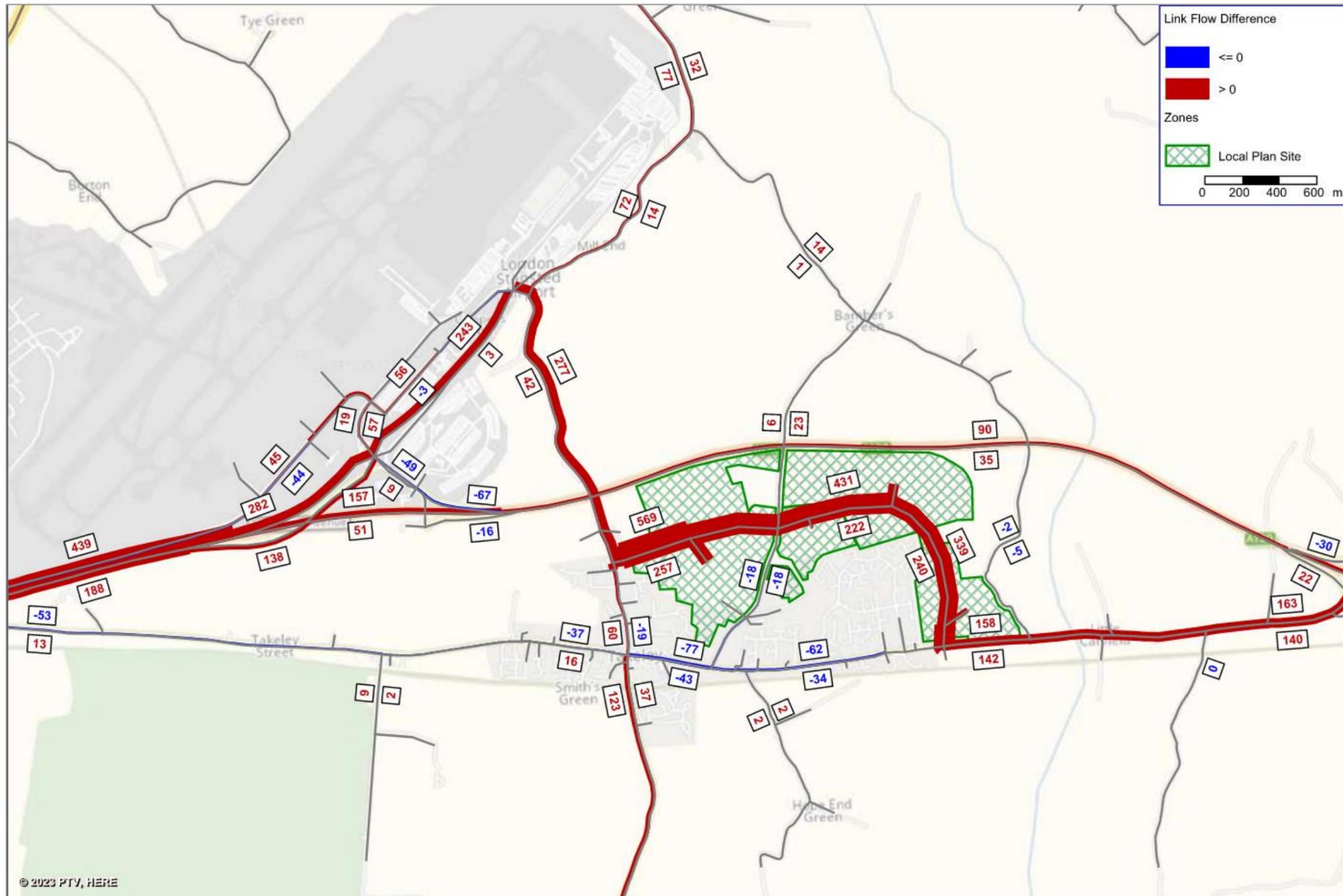
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**Figure 6-2: Change in Volume of Traffic between the Reference Case and Mitigation Package 2 - PM**



**Notes:**

- Volume of traffic is presented in vehicles per hour.
- Weight of bar reflects size of flow.
- Red lines represent an increase in flow.
- Blue lines represent a decrease in flow.
- Green hatching represents Local Plan site allocations.

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## 6.3 JOURNEY TIMES

6.3.1 The comparative journey times and average speed of traffic in the Mitigation Package 2 scenario and the Reference Case are shown in **Table 6-1** and **Table 6-2** respectively.

**Table 6-1: Changes in Journey Times between the Reference Case and Mitigation Package 2 (MP2)**

Route	Direction	Journey Times (in seconds)					
		AM Peak			PM Peak		
		Ref. Case	MP 2	Change	Ref. Case	MP 2	Change
(2) A120 Central Section - M11 J8 to Dunmow West	Eastbound	338	<b>344</b>	+6	503	<b>389</b>	-114
	Westbound	383	<b>401</b>	+18	328	<b>337</b>	+9
(7) Parsonage Road - Mole Hill Green	Northbound	408	<b>492</b>	+84	390	<b>432</b>	+42
	Southbound	438	<b>470</b>	+32	414	<b>419</b>	+5
(8) B1256 - Western Section - M11 J8 to B183	Eastbound	361	<b>359</b>	-2	362	<b>342</b>	-20
	Westbound	311	<b>332</b>	+21	304	<b>312</b>	+8
(9) B1256 - Central Section - B183 to Dunmow West	Eastbound	259	<b>272</b>	+13	278	<b>285</b>	+7
	Westbound	348	<b>364</b>	+16	311	<b>304</b>	-7

**Table 6-2: Changes in Average Speeds between the Reference Case and Mitigation Package 2 (MP 2)**

Route	Direction	Average Speed (in MPH)					
		AM Peak			PM Peak		
		Ref. Case	MP 2	Change	Ref. Case	MP 2	Change
(2) A120 Central Section - M11 J8 to Dunmow West	Eastbound	58.2	<b>57.2</b>	-1.0	39.1	<b>50.6</b>	+11.5
	Westbound	50.8	<b>48.5</b>	-2.3	59.3	<b>57.7</b>	-1.6
(7) Parsonage Road - Mole Hill Green	Northbound	31.8	<b>26.4</b>	-5.4	33.3	<b>30.0</b>	-3.2
	Southbound	29.6	<b>27.6</b>	-2.0	31.3	<b>31.0</b>	-0.4
(8) B1256 - Western Section - M11 J8 to B183	Eastbound	27.9	<b>28.0</b>	+0.2	27.8	<b>29.4</b>	+1.6
	Westbound	32.4	<b>30.3</b>	-2.0	33.1	<b>32.3</b>	-0.8
(9) B1256 - Central Section - B183 to Dunmow West	Eastbound	33.7	<b>32.1</b>	-1.6	31.4	<b>30.6</b>	-0.8
	Westbound	25.1	<b>24.0</b>	-1.1	28.1	<b>28.7</b>	+0.6

6.3.6 The tables highlight that:

- Journeys times will be reduced to similar levels to the Reference Case with negligible increases and decreased in average journey speeds on all routes.
- The exception to this is the central section of the A120 (Route 2) where the speed of traffic will increase by over 11mph in the PM peak period. Elsewhere in this technical note, reduced journey times have been reported positively in reflecting the benefits of the proposed mitigation. In this instance however, it is a reflected of strategic traffic reassigning on the network to utilise the new access through the proposed site allocations. This could have implications for place making within the new community and would need to be managed carefully.

## 6.4 JUNCTION DELAYS

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- 6.4.1 In seeking to understand the changes in journey times, an analysis of the performance of the junctions on the network was undertaken. **Figure 6-3** illustrates the level of delay associated with the worse performing arm/approach to each junction in the AM peak period in Mitigation Package 2, alongside the changes in delay when compared to the 2040 Reference Case. The comparative illustrations for the PM peak period are provided in **Figure 6-4**.
- 6.4.2 The key findings are that:
- The only junction subject to any tangible delay in the AM peak period is the Four Ashes junction at the intersection of the B1256 and Parsonage Road in the centre of Takeley. Delays will amount to around two and a half minutes, of which around a minute is attributable to the site allocations.
  - In the PM peak, the junction remains subject to delay, but it will be around half that in the morning peak.

## 6.5 SUMMARY

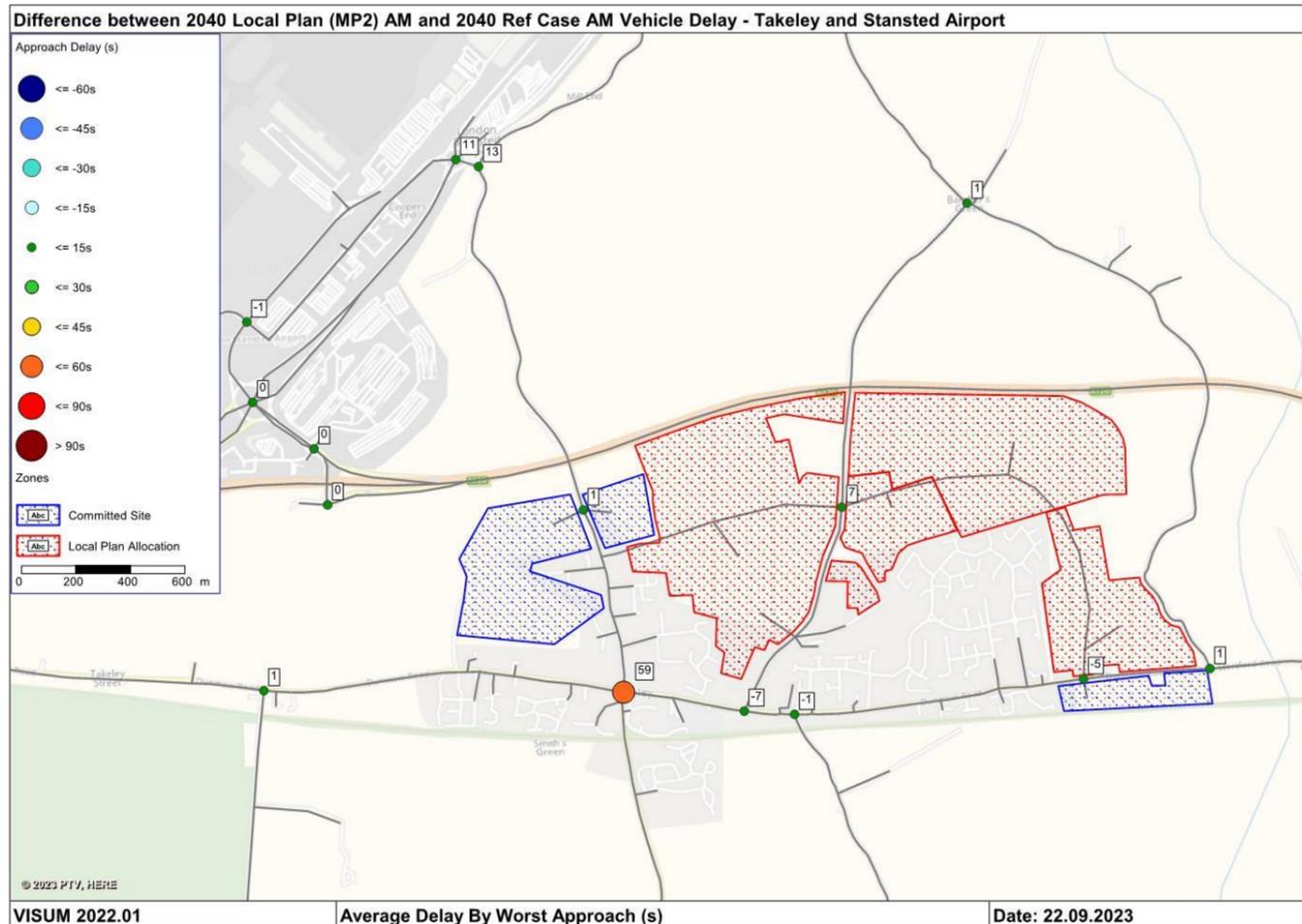
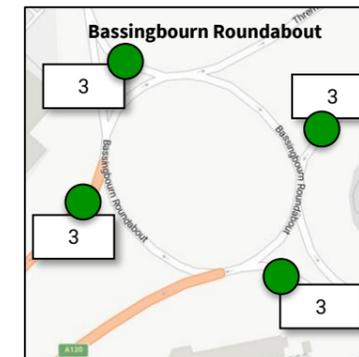
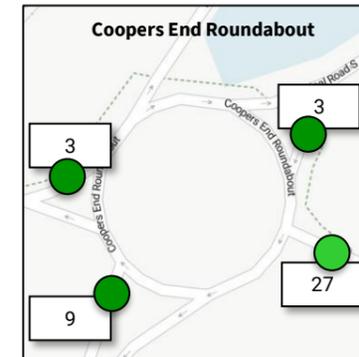
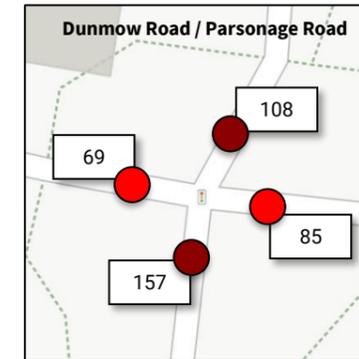
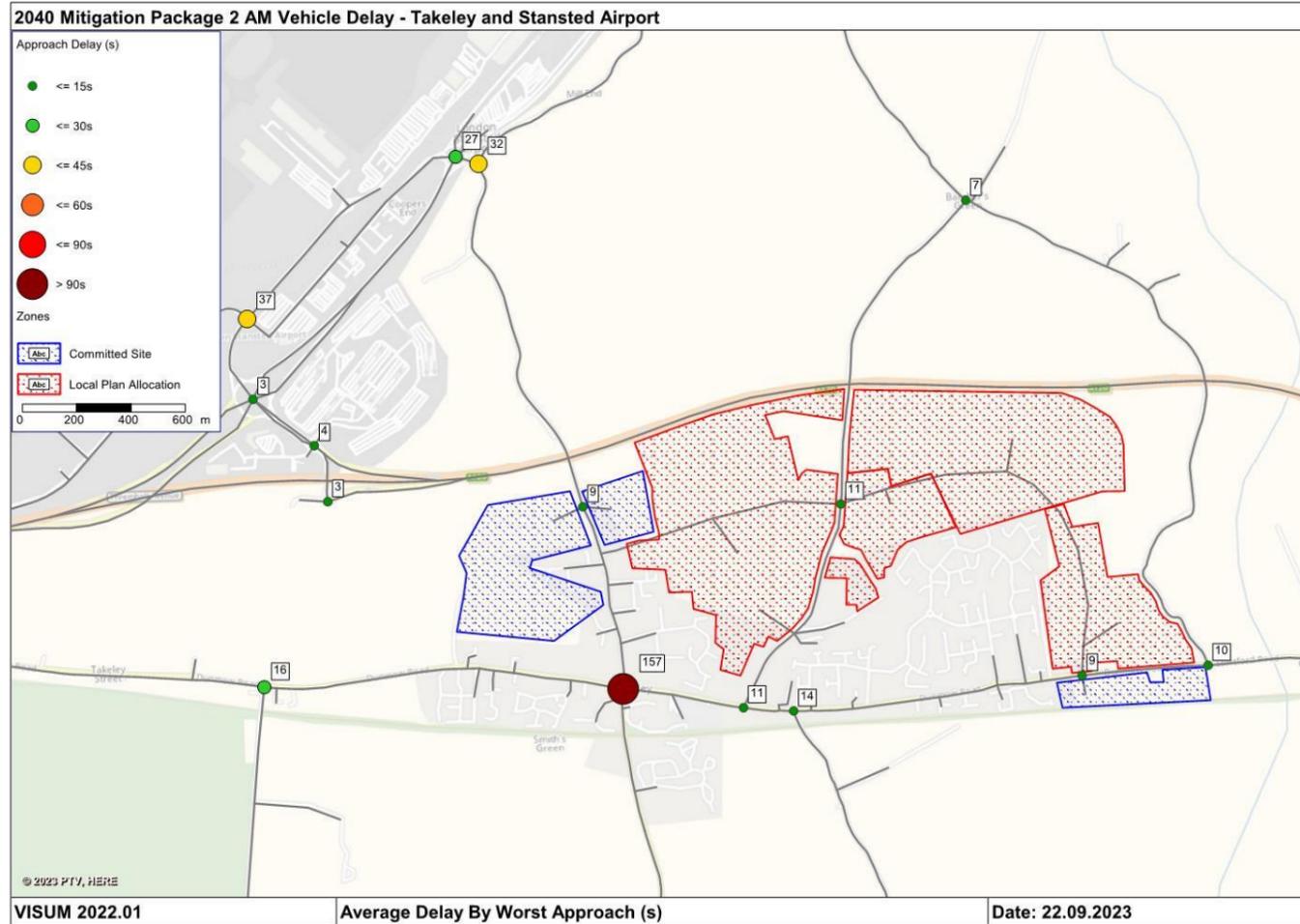
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- 6.5.1 Enabling traffic to utilise the new access road to be provided as part of the site allocations coming forward as a through route will provide benefits to the centre of the village, and in particular, reduce pressure on the Four Ashes junction on the B1256.
- 6.5.2 The attractiveness of the through route would see an element of strategic traffic re-route off the A120. This is something that would have benefits to the operation of the A120 itself, but could have negative connotations in terms of the place making dimensions of the allocations. Careful consideration would be required to minimise its attractiveness for rat-running and in terms of its design specification, in seeking to prioritise active travel and public transport use within the new community.
- 6.5.3 As the route would be integral to the sites coming forward, there are no concerns regarding the viability of the intervention. In this respect it could enable an increased focus on sustainable transport measures and higher levels of mode shift to be achieved.

**Figure 6-3: AM Peak Junction Delays in Mitigation Package 2**

**Notes:**

- Delays are in seconds per vehicle.
- Represents average queue time in the respective peak period.
- Delays on the worst approach shown in main figure.
- Delays on all approaches are shown on selected junctions in the inserts.



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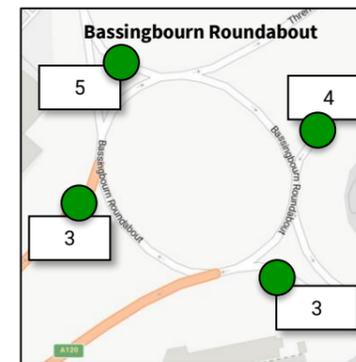
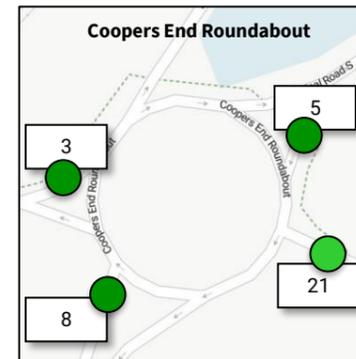
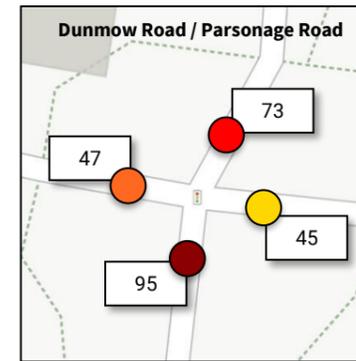
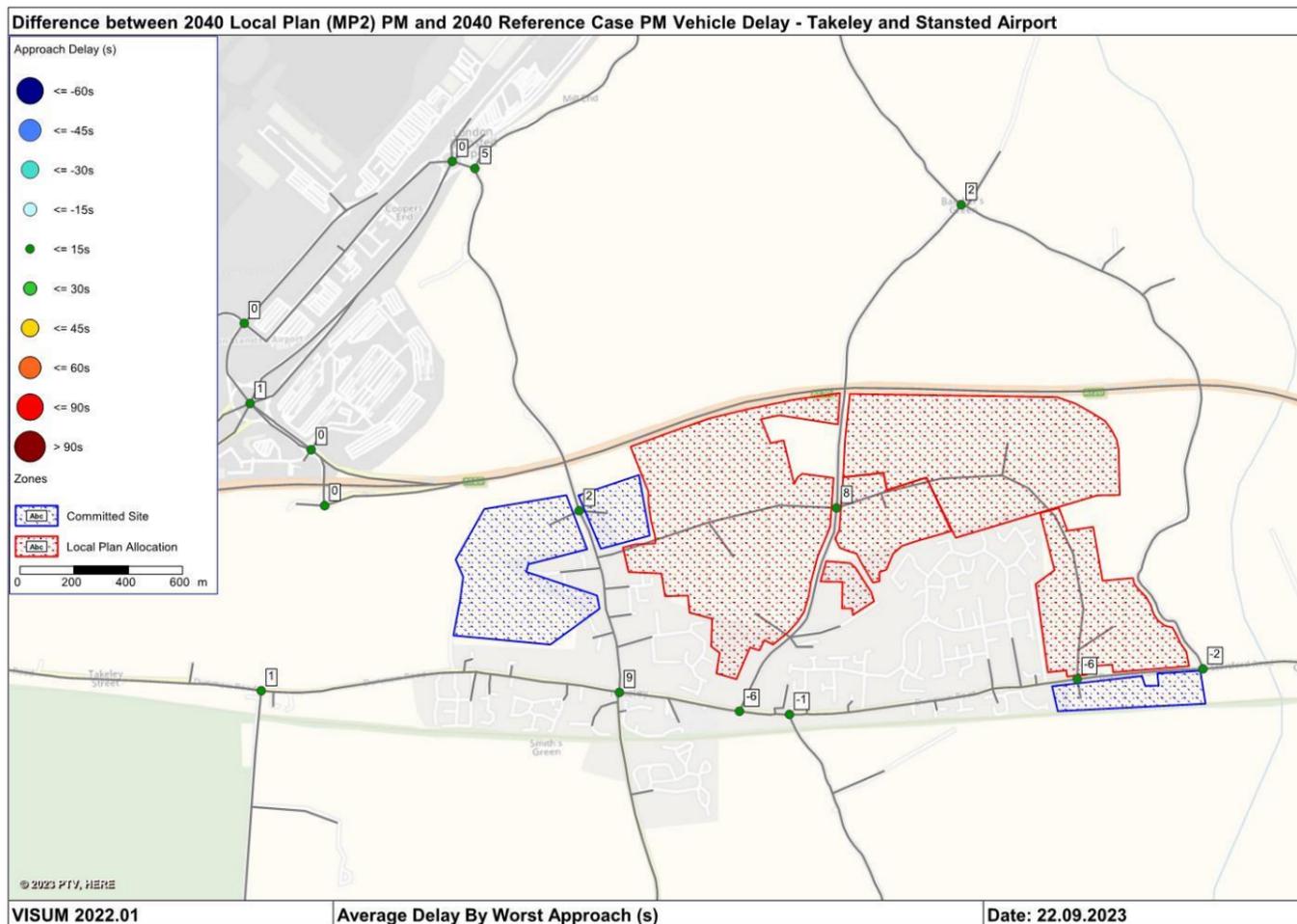
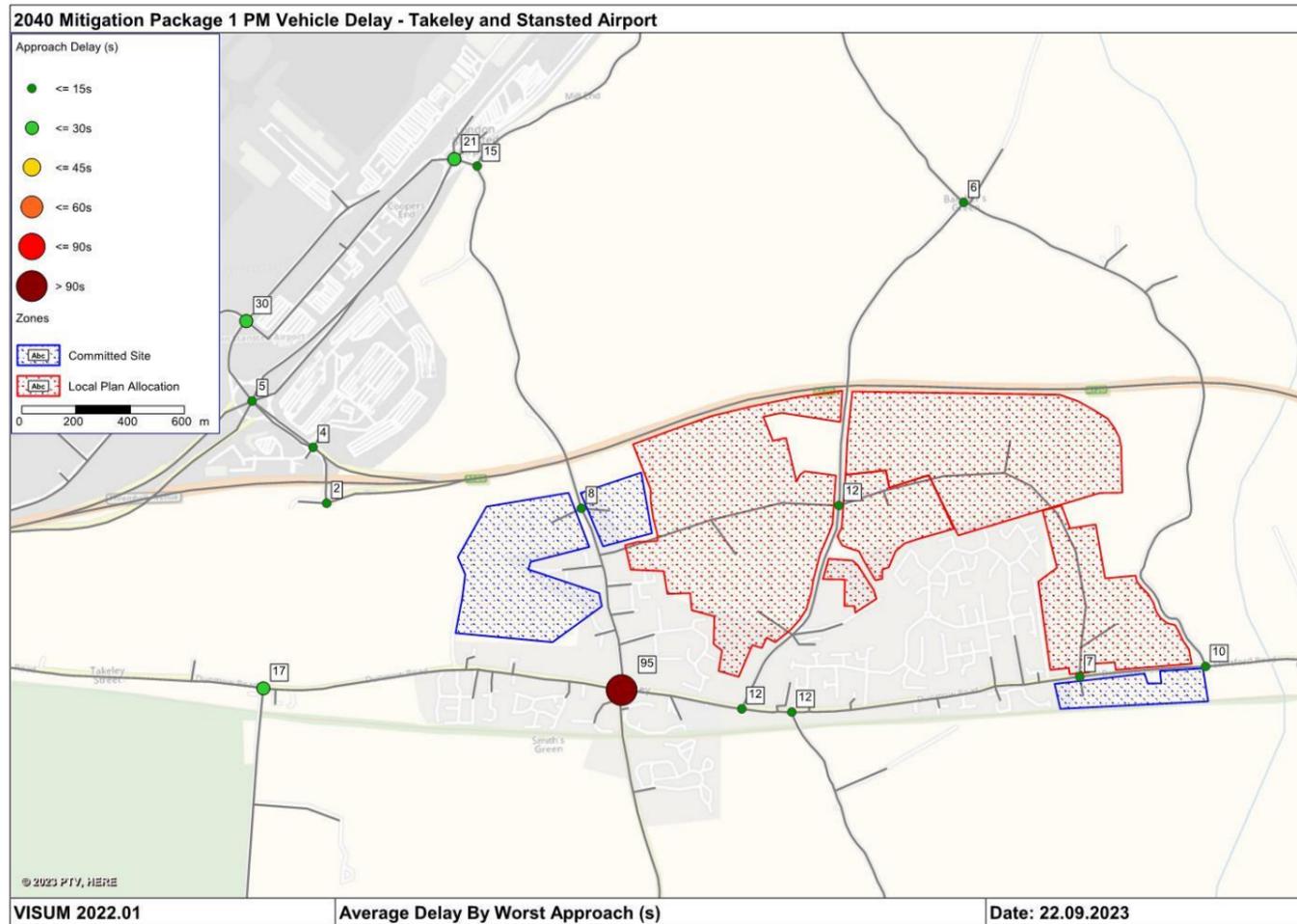
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**Figure 6-4: PM Peak Junction Delays in the Mitigation Package 2**

**Notes:**

- Delays are in seconds per vehicle.
- Represents average queue time in the respective peak period.
- Delays on the worst approach shown in main figure.
- Delays on all approaches are shown on selected junctions in the inserts.



**PRELIMINARY ISSUE**

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Rev	Description	Date	Dwn	Chk	App

**Uttlesford Transport Study**  
Uttlesford District Council

TTE Proj No	Drwn by	Date	Ch'ked by	Date	Appr'd by	Date	Scale @ A3	Suitability
B029347	BK	Jul 21	SB	Jul 21	ASG	Jul 21	n/a	S1
Client Proj No	Origin	Vol/System	Level/Location	Type/Code	Role	Drawing No	Revision	
-	TTE	00	XX	MP	0	002	-	

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## 7 | SUMMARY

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## 7.0 SUMMARY

### 7.1 OVERVIEW

- 7.1.1 This technical note has detailed the performance of the highway network in Takeley and drawn comparisons in its operation with and without Local Plan site allocations coming forward, and the relative effectiveness of alternative packages of mitigation.
- 7.1.2 It is clear from the analysis that the road network will be significantly busier in 2040 than is it today, even before Local Plan related growth is considered. This is due to the impact of committed development sites coming forward in the village and surrounding area, together with background growth in traffic.
- 7.1.3 The delivery of a package of sustainable transport related interventions will go some way towards mitigating the impacts of the allocations. However, the provision of an access road through the new community will improve route choice and reduce the pressure on the B1256 in the centre of the village. The design of such a link and the priorities given to different road users will have a significant impact on the place making function of the road and will require further detailed analysis before coming forward.

### 7.2 RECOMMENDED INTERVENTIONS

- 7.2.1 Following the assessment of the Local Plan sites and the conclusions drawn within this technical note, the schemes recommended to be taken forward through the Local Plan are set out in **Table 7-1** below, together with a high level estimate as to their associated costs.

**Table 7-1: List of Recommended Interventions & Indicative Costs**

Ref	Scheme	Cost	Notes
<b>Highway Capacity</b>			
<b>HW.01</b>	Link road between Parsonage Road and Dunmow Road, to the east of Takeley.	£0.	Integral to the site allocations with no additional cost.
<b>Public Transport</b>			
<b>PT.01</b>	Increase the frequency of services, particularly those to Stansted Airport and Bishop's Stortford.	£500,000	Suggested annual capital funding contribution towards subsidy of increased service provision. Cost does not take into account revenue generation.
<b>PT.02</b>	New bus service between the development site and Stansted Airport.	tbc	<i>Details contained in Jacobs A120 Public Transport Corridor Study.</i>
<b>PT.03</b>	Provide Real Time Information at all stops.	£90,000	Based upon 30 bus stops (including additional for new developments) at a cost of £3,000 per stop.

Ref	Scheme	Cost	Notes
<b>PT.04</b>	Offer free bus travel to all new residents for 12 months.	£4,000,000	Based upon one Stagecoach daily travel pass per new household at £8 per/day for working days only.
<b>PT.05</b>	Offer discounted rail travel to all new residents for 12 months.	£1,900,000	Based upon £1,000 rail season ticket discount for one year.
<b>PT.06</b>	Provision of a 'mobility hub' multi-modal transport interchange.	£100,000 - £2,000,000	Scale and scope to be determined.
<b>Walking &amp; Cycling</b>			
<b>WC.01</b>	Provision of a new e-bike for every household.	£1,900,000	Based upon one bike per household at a cost of £1,000 per bike.
<b>WC.02</b>	Local connections onto the NCN plus: <ul style="list-style-type: none"> <li>- Improvements to the Fritch Way.</li> <li>- LTN 1/20 compliant route between Takeley and Stansted Airport.</li> </ul>	£1,500,000 - £2,000,000	Assumed to be 1.5km to 2.0km of new cycle infrastructure at a cost of £1,000,000 per km.
<b>WC.03</b>	Introduce a modal filter on Smiths Green so that it doesn't compromise the safety of cyclists when it is surrounded by development on both sides.	n/a	To be provided as an integral part of the development of the sites.

Note: It should be noted that these costs are preliminary estimations and subject to more detailed design.

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