



National Highways

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## **M5 Junction 14**

Stroud District Local Plan Capacity Assessment





National Highways

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# 1 Introduction

## 1.1 Background

This report has been prepared to detail the effective capacity of M5 Junction 14 (M5 J14) Falfield.

M5 J14 is located to the east of Falfield in South Gloucestershire. The junction connects the M5 motorway with the B4509 and provides access to Charfield, located 3 miles/5km to the east and, via the A38, to Thornbury 5 miles/8km to the southwest.

The motorway junction comprises an all-movement, grade separated roundabout with the motorway passing beneath the two overbridges forming the roundabout. The form of the junction is shown in Figure 1-1.

**Figure 1-1 – Form of M5 Junction 14 Falfield**



Traffic signals were installed at the junction of the slip roads and the B4509 in 2005. At the same time road markings were changed on the M5 overbridge (the B4509) to separate ahead and right turning traffic to the M5 in both directions. However, the operation of the traffic signals in the morning peak period led to notable queuing and delays such that the signals were turned off and vehicles pass through the junction under priority control. This remains the case during the morning peak period (07:00-10:00). Traffic signals are in use at all other times, including the PM peak period.

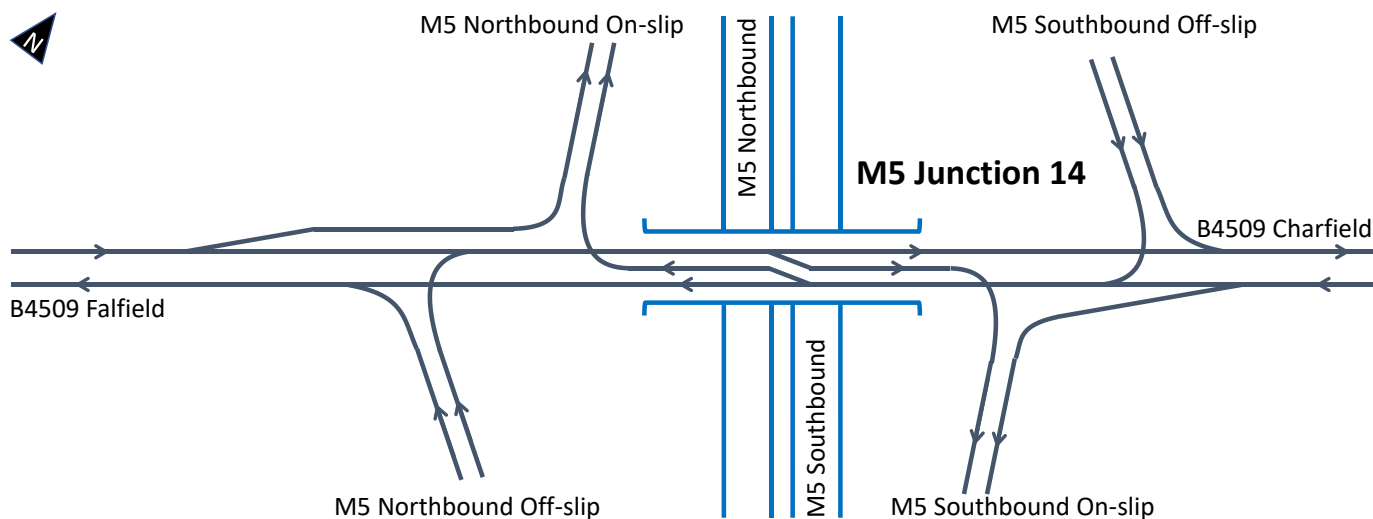
In 2008 traffic signals were installed at the A38/B4509 junction 400m to the west of M5 J14.

## 1.2 The Traffic Issue

The operation of the M5 J14 can result in the formation of queues on the B4509 eastbound from the A38, and extensive queues on the northbound off-slip in the morning peak period extending onto the mainline carriageway creating a safety issue (i.e. the mixing of stationary and high-speed traffic). In the evening peak period queues form eastbound and westbound on the B4509.

Road markings on the M5 motorway overbridge provide three traffic lanes. Shown schematically in Figure 1-2, lanes adjacent to the bridge parapets provide for the eastbound and westbound through movements on the B4509. The central lane is configured for right turning traffic from the B4509 to the M5 northbound and southbound. Each right turning lane is approximately 35m in length and can accommodate no more than five or six vehicles.

**Figure 1-2 - Traffic Lane arrangements at M5 Junction 14**

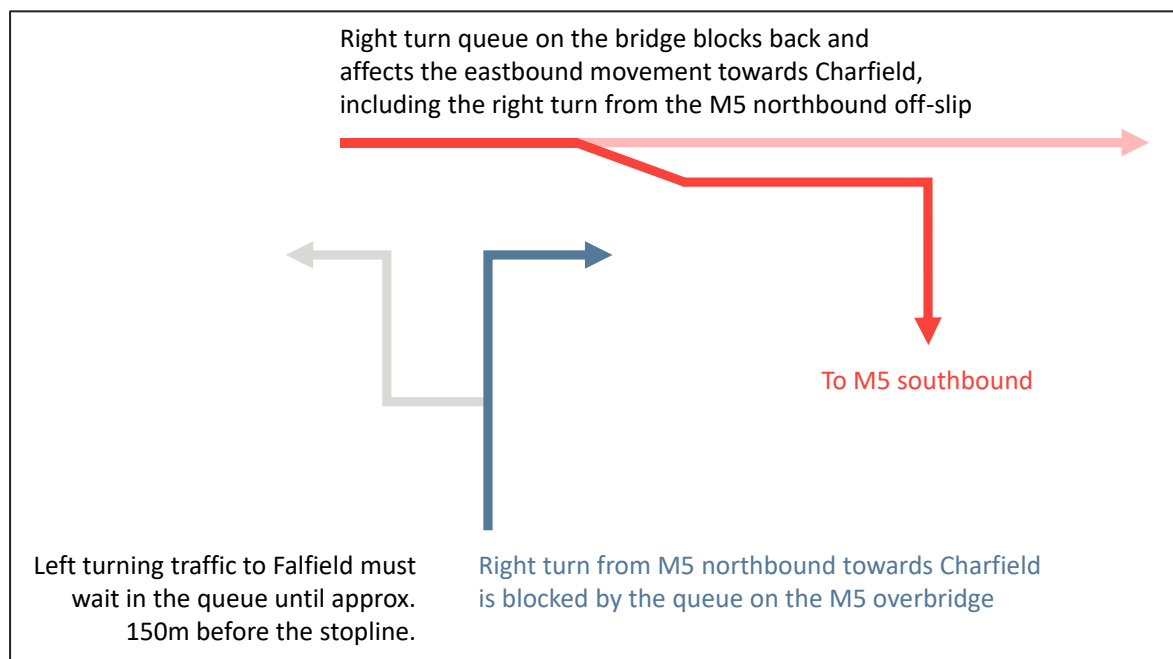




Traffic congestion at the junction is primarily caused when right turning traffic heading to the M5 southbound from the M5 overbridge affects the movement of eastbound traffic on the B4509 towards Charfield; right turning queues can extend beyond the queue storage lanes and then block through movements on the overbridge. In the AM peak and with the traffic signals turned off:

- the right turn movement to the M5 southbound has to give way to westbound traffic on the B4509.
- This causes a queue which can fill the right turn lane to the M5 southbound and which then blocks back into the eastbound traffic lane.
- When traffic heading towards Charfield is blocked, this prevents right turning traffic leaving the M5 northbound off-slip to the B4509.
- A queue then forms on the M5 northbound off-slip. The issue is summarised in Figure 1-3.

**Figure 1-3 - Indicative Diagram of the Traffic Issue at M5 J14**



Queues on the northbound off-slip are of particular concern to National Highways. The 350m-long northbound off-slip is formed as a taper diverge and is marked as a single lane until around 150m before the traffic signals' stop line. The nearside lane is used by traffic turning left towards the A38 and Falfield; this left turn lane is generally free-flowing over the last 150m towards the stopline at the top of the sliproad. However, during peak periods, the right turn queue can extend beyond the 350m length of the sliproad and onto the motorway mainline, with left turning traffic contributing to the same queue when it extends beyond the two lane section from the stopline. This queue of stationary traffic in Lane 1 of the motorway creates a safety issue and disrupts the mainline traffic flow.

### 1.3 Previous study

In response to queuing issues at M5 J14, a report was prepared by CH2M for Highways England in March 2017<sup>1</sup> that considered three options for capacity improvements at the junction and the likely congestion relief that may result. The report concluded that a dumbbell arrangement would provide a short-term improvement over the present layout. However, this would relocate most of the forecast congestion and queues onto the eastern arm of the B4509 from Charfield.

The modelling assessment concluded that only a grade separated junction would provide a long-term solution to traffic growth at M5 J14. It was the only option that provided a benefit over the current arrangements whilst appearing to have spare capacity to accommodate further traffic growth. However, the report acknowledged that this option would be expensive and difficult to deliver because of the need for a new motorway structure and large areas of land in private ownership.

### 1.4 Proposed Northbound Off-slip Improvement

A development to the north of Thornbury referred to as Land West of Park Farm (South Gloucestershire Planning Application Number PT18/6450/O) has an agreed mitigation scheme with National Highways to the M5 northbound off-slip that would lengthen the two-lane section approaching the B4509 from 150m to 350m back from the stop line. The mitigation was accepted by National Highways in its Planning Response (NHPR) dated 11 November 2020.

The scheme is currently being prepared by National Highways with an anticipated implementation date in late 2025.

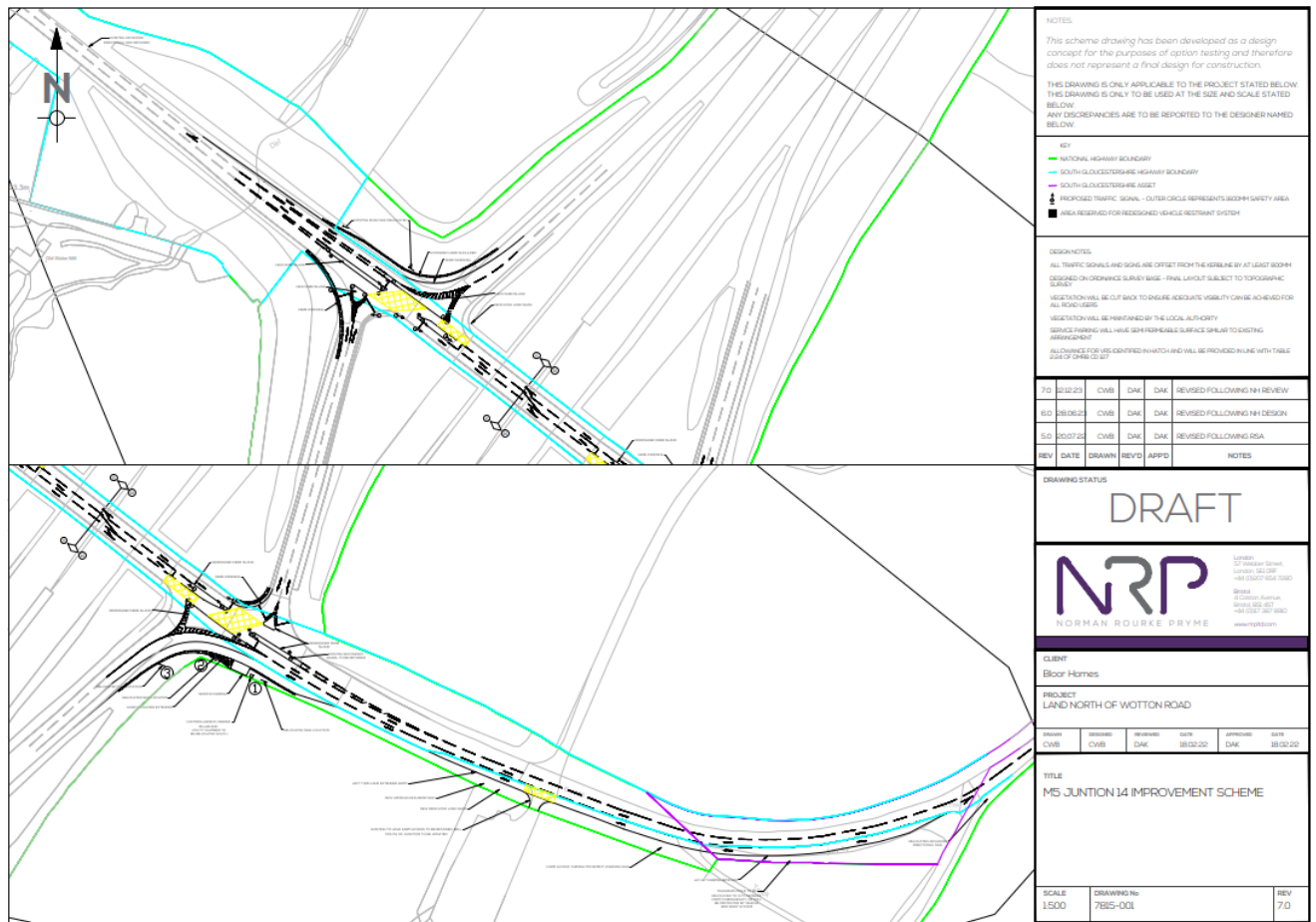
### 1.5 Interim Improvement proposed by Charfield Applicants

National Highways has agreed an interim improvement at M5 J14 that could accommodate up to 775 homes at two sites in Charfield, east of the motorway junction. The scheme is jointly promoted and provided by Land North of Wotton Road (P19/18237/O) and Land South of Charfield (P19/2452/O). Details of the proposed interim improvement scheme are identified and described on NRP Drawing No. 7815-001 Revision 7.0 dated, shown in Figure 1-4. The scheme is supported with an appropriate Stage 1 Road Safety Audit (RSA), GG104 Requirements for Safety Risk Assessment, Road Restraints Risk Assessment Process (RRRAP) and Walking, Cycling and Horse-riding Assessment (WCHAR), all completed to the satisfaction of National Highways.

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<sup>1</sup> M5 Junction 14 VISSIM Model: Improvement Option Testing, CH2M 9 March 2017

**Figure 1-4 - Agreed Interim Improvement at M5 J14 to enable development in Charfield**



This report uses the term Charfield to refer to both applications. The Charfield modelling used National Highways' traffic model to detail the cumulative traffic impact and mitigation at the junction arising from the proposed developments.

The scheme operation is detailed in the Norman Rourke Pryme (NRP) 'Charfield Developments Full Mitigation Scheme Assessment: M5 Junction 14' report Doc. Ref. 7815TN03 Rev 4.0, dated 5 February 2024. The report can be found on the documents listing for both Charfield applications via the South Gloucestershire Planning Portal.

National Highways' Planning Response (NHPR) of 30 July 2024 concluded that the highways mitigation scheme for Charfield is deliverable, and that the associated reporting is acceptable. The improvement scheme would need to be secured and delivered under a Section 278 which may follow a grant of planning permission.

This mitigation, shown above, is referred to as the M5 J14 Interim Scheme for the remainder of this report.

## 1.6 SDLPR Development at Cam and Sharpness

Planning applications have been submitted for SDLPR Policy Allocations PS36 New Settlement at Sharpness (Planning Application Ref. S.25/0417/OUT), and PS24 Cam North West (West of Draycott) (S.21/1875/OUT and S.21/1913/OUT).

National Highways stated in its most recent Planning Response for PS24 (NHPR, dated 6 June 2025) that no dwellings shall be occupied until the M5 Motorway Junction 14 Improvement Scheme identified in Figure 1-4 to support South Gloucestershire's Charfield applications has been completed and is fully operational. This is to ensure the safe and efficient operation of the M5, in accordance with DfT Circular 01/2022.

In the case of application S.25/0417/OUT (NHPR dated 16 April 2025) National Highways recommended that the application should not be approved for a period of 6 months from the date of the response to allow the applicant time to provide additional information, undertake appropriate traffic modelling, and sufficient time to review the further information and modelling.

## 2 Local Plans

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### 2.1 Emerging Stroud District Local Plan

The current Stroud District Local Plan was adopted in 2015 and provides the local policy guidance through to 2031.

The Stroud District Local Plan Review Pre-submission Draft Plan (Regulation 19 Consultation) May 2021 (SDLPR) will take that time horizon forward to 2040 and was proposed to include 12,600 new dwellings. The Plan was presented at an Examination in Public (EIP) in summer 2024. The Plan included proposed development allocations that would have a traffic impact at M5 J12. However, the Examination was delayed due to concerns regarding the transport evidence base, which included concerns raised by National Highways, in order to allow Stroud time to submit updated evidence.

On 7 February 2025 the Inspectors ([in id-018](#)) directed withdrawal of the SDLPR from Examination principally based on the lack of clarity of how M5 J12 and J14 schemes would be funded and delivered (both junctions had been identified for improvement to provide an all-movement grade separated roundabout junction similar to M5 J13). Without funding and delivery of capacity schemes, the inspectors concluded "...that a significant proportion of the Plan's allocated sites do not have a realistic or reasonable prospect of being delivered during the plan period."

The Council wrote to the Inspectors on 3 March 2025 asking them to reconsider their decision. The Inspectors on replied 9 April 2025 stating that they still considered that "...withdrawal of the Stroud District Local Plan Review from Examination is the most appropriate way forward."

Despite the request to withdraw the SDLPR, National Highways has continued with traffic modelling to inform the operation of M5 J12 with the SDLPR housing delivery. This modelling has been prepared with the support and cooperation of Stroud District Council (SDC).

### 2.2 A new Local Plan for South Gloucestershire

A new Local Plan for South Gloucestershire is undergoing Regulation 19 consultation between 28 February and 11 April 2025. The Plan is proposing 22,573 new homes in the period 2026 to 2041. Submitted as speculative sites when seeking and securing planning permission, the Charfield sites are now included in the Regulation 19 South Gloucestershire Local Plan for 775 homes.

At M5 J14, the South Gloucestershire Local Plan also assumes the Interim Scheme shown in Figure 1-4 and no grade separated junction.



## 2.3 SDLPR Mitigation at M5 J14

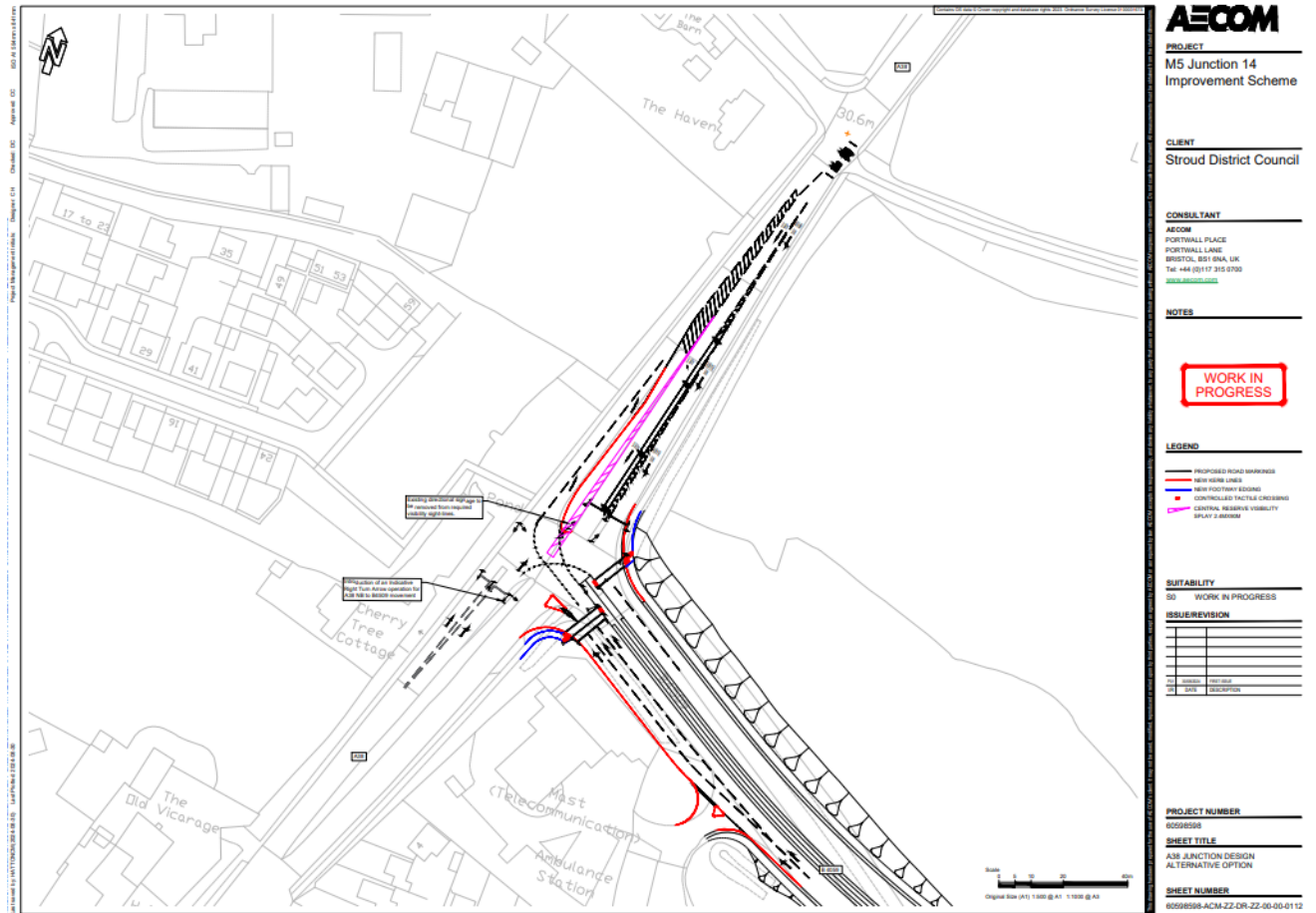
The SDLPR Infrastructure Delivery Plan (IDP, EIP Document Library Ref.110, pp.2-3) proposed an upgrade to M5 J13 with traffic signal control and widening of the A419 eastbound exit to enable and support delivery of the SDLPR draft allocations. The M5 Junction 14 Improvement Scheme report suggested the all-movement grade-separated roundabout shown in Figure 2-1 with an Order of Cost Estimate of c.£110m (including optimism bias). An improvement was also shown at the A38/B4509 junction, included here as Figure 2-2.

It is important to note that this report considers the operation of the *M5 J14 Interim Scheme* shown in Figure 1-4 to identify when the grade-separated scheme may be required. No changes to the interim scheme or at the A38/B4509 junction have been considered in this report or tested to address any local highway network capacity issues arising.

**Figure 2-1 – Suggested M5 J14 All-movement Grade-separated Roundabout**



Figure 2-2 – Suggested A38/B4509 Improvement



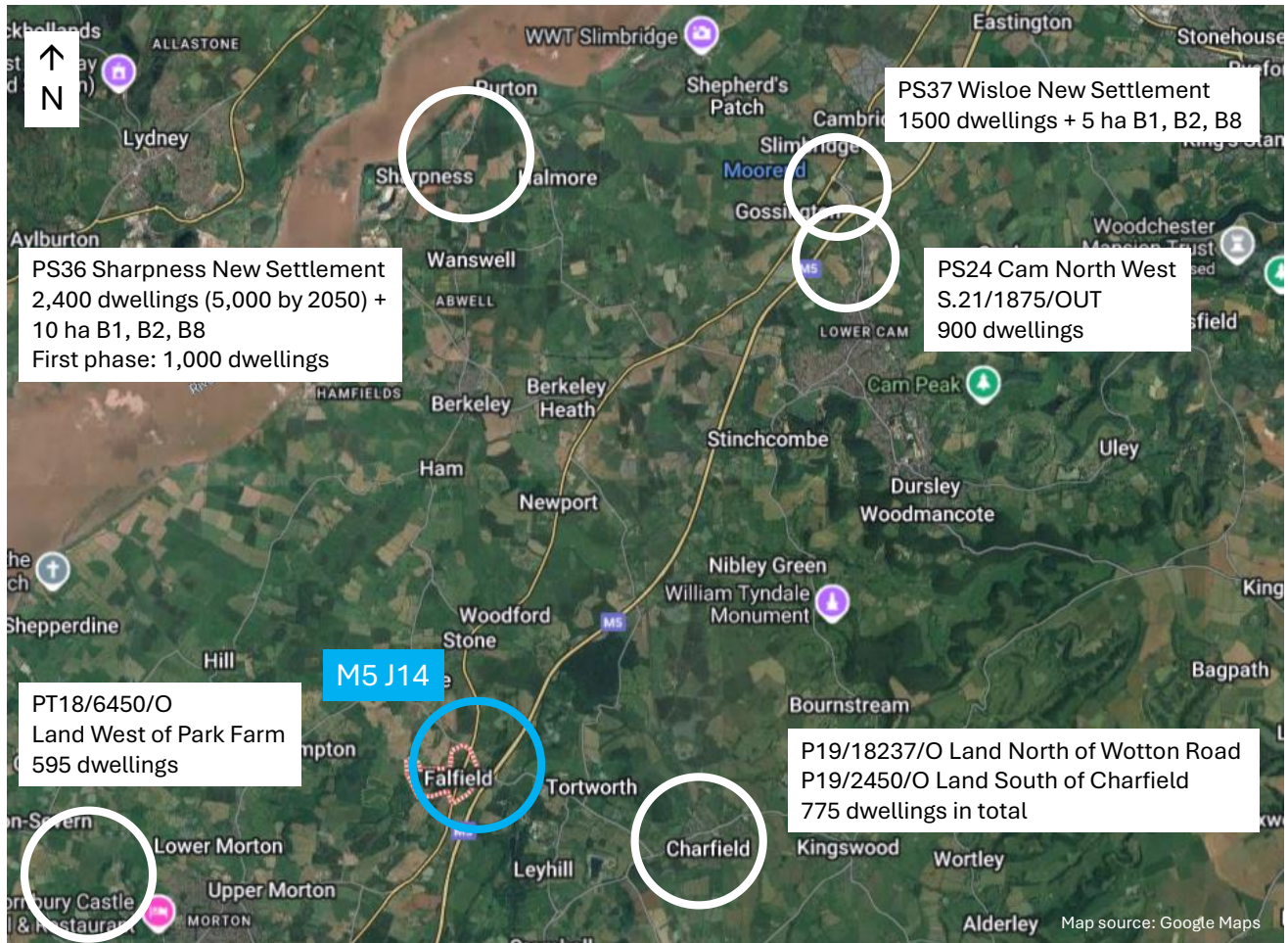


### 3 Proposed Development impacting M5 J14

#### 3.1 Development at M5 J14

SDLPR allocations and developments with current planning applications or consents most closely located to M5 J14 are shown in Figure 3-1.

**Figure 3-1 - Proposed Development impacting M5 J14**



Stroud District Council has provided traffic data from their strategic traffic modelling for these sites and other draft allocations and current planning applications that are considered to have an identifiable traffic impact at the junction. These developments are outlined below.

#### 3.2 SDLPR Draft Allocations Impacting at M5 Junction 14

The draft allocations in the SDLPR most significantly impacting M5 J14 are those at Cam North West, Sharpness and Wisloe:

- PS24 Cam North West (West of Draycott) (SDLPR pp.123-127) for approximately 900 dwellings.

- PS36 Sharpness New Settlement (SDLPR pp.175-180) for approximately 2,400 dwellings (5,000 by 2050 subject to Local Plan Review) and 10 hectares of B1, B2 and B8 employment land.
- PS37 Wisloe New Settlement (SDLPR pp.184-185) for approximately 1,500 dwellings and five hectares of office, B2 and B8 employment land.

The SDLPR EB135 Appendix 1 details housing delivery assumptions for the draft allocations and is contained in Appendix A to this report. This housing trajectory was not supported by any traffic modelling at EIP. National Highways identified the need for traffic modelling to identify the amount of reserve capacity prior to any mitigation being required at each of M5 J12, J13 and J14. In the absence of SDLPR modelling, National Highways has now agreed to undertake this modelling and this report provides this information for M5 J14.

## **PS24 Cam North West**

PS24 Cam North West (West of Draycott) is allocated for approximately 900 dwellings. A planning application was submitted in 2021 (S.21/1875/OUT ) and National Highways has been working with the developers to agree the impact of the development.

At a meeting with the applicant in October 2024 National Highways expressed a preference for the M5 J14 Interim Scheme to include the cumulative traffic forecasts of the Charfield, Cam and Sharpness developments. This is because the Interim Scheme has approvals from National Highways, and National Highways would prefer a single intervention at M5 J14 to provide additional capacity before a more significant improvement, i.e. National Highways would not want the interim or a similar scheme to be constructed that then required further modification to accommodate the other development traffic.

In December 2024 National Highways reported its own cumulative modelling results which concluded that the Interim Scheme had capacity to accommodate traffic from the three developments on the M5 J14 sliproads. National Highways stated in its Planning Response (NHPR) dated 6 June 2025 that no dwellings shall be occupied until the M5 Motorway Junction 14 Improvement Scheme identified in Figure 1-4 to support South Gloucestershire's Charfield applications has been completed and is fully operational. This is to ensure the safe and efficient operation of the M5, in accordance with DfT Circular 01/2022.

The interim scheme modelling shows significant congestion on the A38 and B4509 local highway network. The application site is in Stroud District, and M5 J14 is in South Gloucestershire. The applicant has indicated a proposed mitigation that provides widening to two eastbound lanes on the B4509 from the A38 towards the M5, and a small section of widening and re-lining on the A38. South Gloucestershire has stated that this is acceptable for the combined developments at Cam, provided it is in addition to the "interim" scheme proposed for the developments at Charfield (i.e. Figure 1-4).

## PS36 Sharpness New Settlement

The Policy PS36 draft allocation is for up to 2,400 dwellings by 2040 (which is expected to increase to 5,000 dwellings by 2050 as part of the next review of the Local Plan) and 10 hectares of employment land under use classes B1, B2 and B8 and ancillary land uses.

National Highways has been in discussion with the applicant for Sharpness New Settlement since July 2022, looking to agree the input parameters to determine development traffic impact and the required modelling.

In August 2024, the applicant presented modelling results to support proposed mitigation at M5 J14 for an initial development of 1,000 dwellings and 15,385m<sup>2</sup> of employment, which has been accepted by National Highways based on a slightly different scheme and modelling undertaken by National Highways.

In February 2025 a planning application (S.25/0417/OUT) was submitted to Stroud District Council for Sharpness New Community, referred to as Land at Sanigar Lane. The application is for up to 2,750 dwellings, a 10 ha business park, a primary and a secondary school, a local centre and ancillary land uses. The application includes proposed mitigation for the development impact of an initial phase of 1,000 new dwellings at M5 J14. National Highways issued its Planning Response (NHPR) dated 16 April 2025 recommending that the application should not be approved for a period of six months from the date of the response. This was to allow the applicant and its transport consultant time to provide additional information required by National Highways and to undertake appropriate traffic modelling once the input parameters have been agreed, and then to allow National Highways sufficient time to review this further information and modelling.

## PS37 Wisloe New Settlement

The PS37 Land at Wisloe draft allocation is located approximately 6.8 miles/10.9 km north of M5 J14, accessed from the A38. The draft allocation is for approximately 1,500 dwellings and five hectares of B1, B2 and B8 employment.

To date, no discussions have been held with National Highways regarding the proposed development.

### 3.3 Other Notable SDLPR Allocations impacting M5 J14

Stroud District Council has provided turning matrices at M5 J14 for other development proposed in the SDLPR. These are:

- PS25 Cam North East extension (180 dwellings);
- PS34 Sharpness Docks (up to 300 dwellings); and
- PS47 Renishaw New Mills (an extension to the existing employment site of 10ha for B1, B2 and B8 employment uses).

### **3.4 Other Development impacting M5 J14**

#### **Land West of Park Farm**

Planning application reference PT18/6450/O has permission to provide up to 595 new homes at a location north of Thornbury and 3.6 miles/5.8km west of M5 J14.

#### **Charfield**

Planning permission has been secured for up to 775 homes at two sites in Charfield, east of M5 J14. The developments are referred to as Land North of Wotton Road (P19/18237/O) and Land South of Charfield (P19/2452/O). This report uses the term Charfield to refer to both applications. Traffic from these developments would use the B4509 to the east of M5 J14.

## 4 National Highways M5 Junction 14 Traffic Model

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### 4.1 The Traffic Model

National Highways has developed a Vissim microsimulation model to support the understanding of network performance of M5 J14, and to enable future assessment of planned development and infrastructure improvements. The model utilises VISSIM 2021 as the micro-simulation package and PCMOVA3 for traffic signals operation.

The model has a validated 2021 AM and PM Base Year and a 2024 Do Minimum scenario, assuming Land West of Park Farm is built along with its associated mitigation. TEMPro and RTF18 traffic growth from 2021-24 is assumed. Cumulative Traffic Modelling

### 4.2 Assumed Junction Improvements and Mitigation

National Highways has carried out microsimulation modelling using the model files returned for the M5 J14 Interim Scheme and shown in Figure 1-4. National Highways' Planning Response (NHPR) of 30 July 2024 concluded that the highways mitigation scheme for Charfield is acceptable and deliverable.

As summarised earlier, National Highways had concluded on the basis of a Technical Note dated 2 December 2024 that the Interim Scheme had capacity to accommodate traffic from the Charfield, Cam and Sharpness developments, although it did result in significant traffic congestion on the A38 and B4509 local highway network. In its response to the planning application and technical note findings, South Gloucestershire Council (SGC) concluded that the mitigations within SGC are not acceptable to SGC as (adjacent) Local Highway Authority.

For the purposes of this report, no amendments have been made to the interim scheme in the cumulative modelling results detailed in this note. As such issues at the A38/B4509 junction would remain a concern for the local highway authority.

### 4.3 Development Turning Movements at M5 J14

#### Stroud District Local Plan Allocations

Stroud District Council has provided development turning matrices at M5 J14 for all of the proposed allocations listed in the SDLPR. These matrices are included in Appendix B.

The turning matrices of particular interest at M5 J14 are:

- PS24 Cam North West ;
- PS25 Cam North East;
- PS34 Sharpness Docks;
- PS36 Sharpness New Settlement .
- PS37 New Settlement at Wisloe; and



- PS47 Renishaw New Mills.

M5 J14 Matrices are also provided for background traffic and 'Local Site Allocations and Small Windfall' sites.

The matrices show traffic at M5 J14 for each local plan allocation, cumulatively for all other Local Plan allocations in a single 'Local Site Allocations and Small Windfall' matrix, and of background growth in the period 2023-2040.

WSP applied the housing trajectory in Appendix A to derive a demand matrix at M5 J13 for the SDLPR and other traffic growth impacts for every year in the period 2023 to 2040.

The matrices were then used in the model to test the point when the IDP M5 J14 Interim layout 'failed'. The primary consideration was to determine when the M5 J14 sliproad queues extended onto the motorway mainline, which is considered to be a safety and operational hazard caused by mixing stationary and fast-moving traffic.

The timing of any mitigation being required to be open to traffic is determined as the first interim year when any queue on either motorway off slip extends onto the motorway mainline carriageway.

It should be noted that no consideration has been given to the operation of the local highway network other than to ensure that it does not affect the robustness of the assessment of M5 J14.

## Other Developments

The Land West of Park Farm, Charfield, Sharpness and Cam development turning movements used in the modelling have been taken from their respective transport assessments, either included as part of their planning application or discussed with National Highways. At PS24 Cam North West and PS36 Sharpness New Settlement these applicant's turning data has been used in place of those movements included in Appendix B.

The turning movements for Land West of Park Farm and the Charfield developments at M5 J14 and the A38/B4509 junction to the west are included in Figure 4-1, and those for the Cam and Sharpness developments are shown in Figure 4-2.

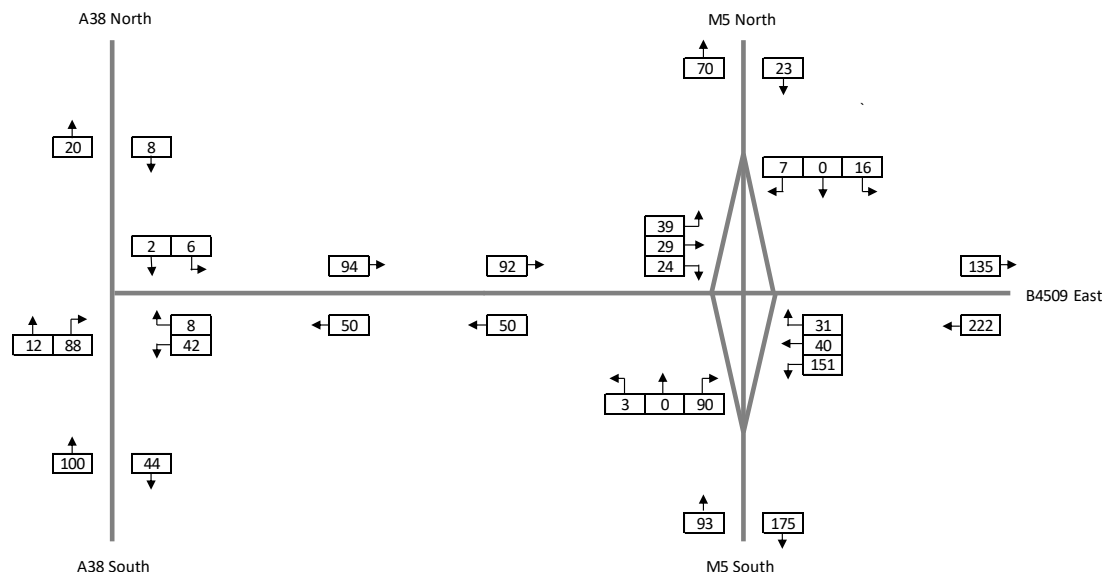
In the morning peak hour (0800-0900hrs and shown in Figure 4-1) an additional 222 vehicles arrive at M5 J14 westbound from the Charfield developments to the east, and 151 (68%) of these vehicles are indicated from the new developments turning left to the M5 southbound. In the same period, 92 vehicles arrive at the junction from Land West of Park Farm, but only 24 (26%) turn right to the M5 southbound; a greater demand (39 vehicles / 42%) is shown to use the M5 northbound and B4509 eastbound (29 / 32%). This is because traffic towards Bristol from Land West of Park Farm is more likely to use the A38 southbound to join the M5 at M5 J16 Aztec West rather than travelling north to M5 J14 then returning south towards the M4 at Almondsbury.

A total of 90 vehicles are added to the right turning demand from the northbound M5 off-slip and B4509 eastbound towards Charfield; only three additional vehicles turn left towards the A38 and Thornbury.

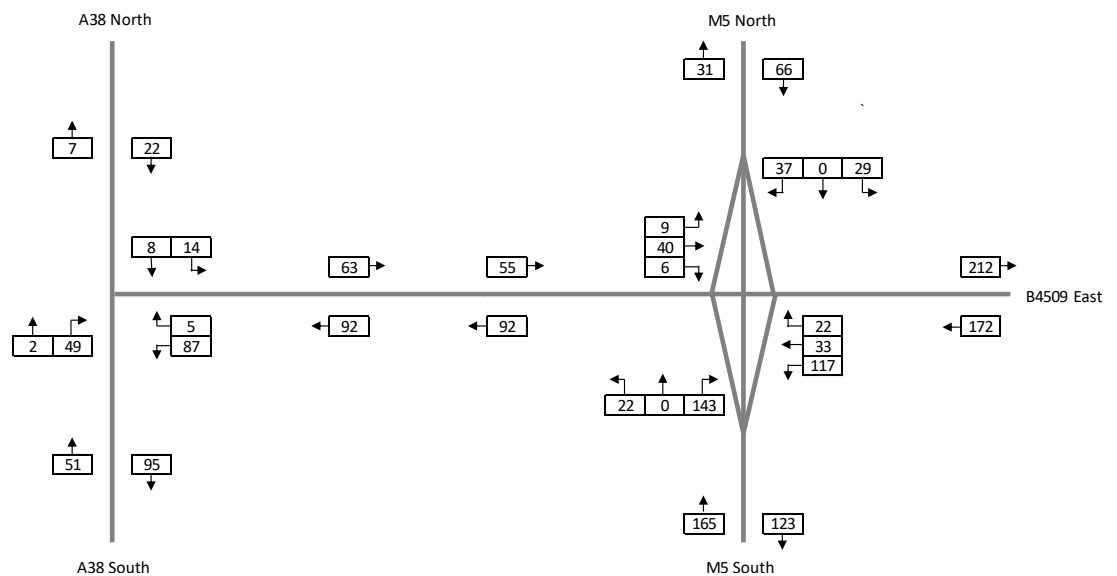
The developments contribute an additional 93 vehicles to the M5 Northbound off-slip, of which 90 are shown to turn right towards Charfield and just three to the west.

**Figure 4-1 - Assumed Traffic Turning Movements at M5 J14 from development at Land West of Park Farm and Charfield**

Cumulative  
AM Peak, 0800-0900hrs



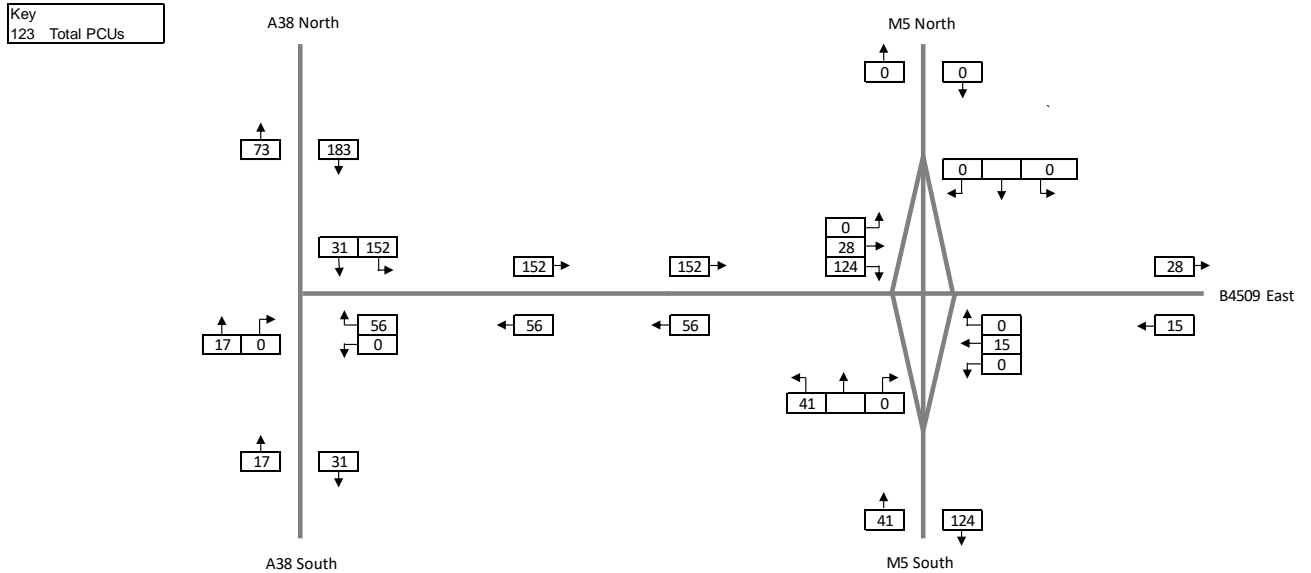
Cumulative  
PM Peak, 1700-1800hrs



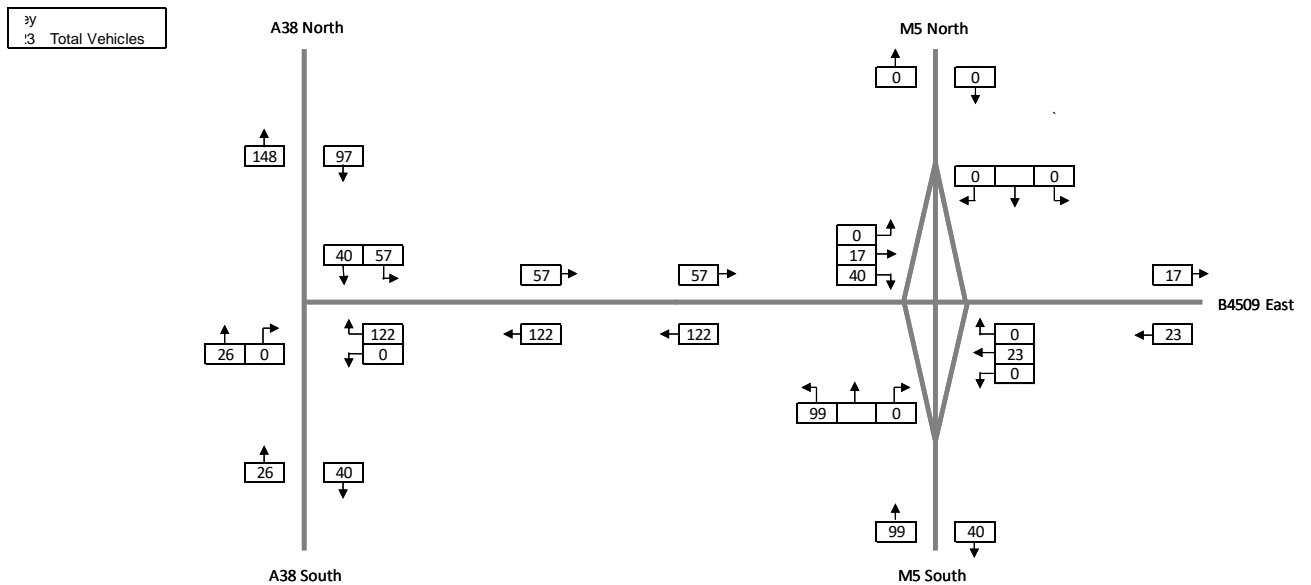


**Figure 4-2 - Assumed Traffic Turning Movements at M5 J14 from development at Sharpness and Cam West of Draycott**

Cumulative: Cam and Sharpness  
AM Peak



Cumulative: Cam and Sharpness  
PM Peak



In the evening peak hour (1700-1800 hrs) the right turn demand on the M5 northbound off-slip increases by 143 vehicles. In contrast the increase for the left turn from the M5 northbound off-slip towards the A38 is lower, indicated as 22 vehicles. There is also an additional 172 vehicles heading westbound towards the junction from Charfield, of which 117 turn left onto the M5 Southbound.

Shown in Figure 4-2, combined turning movements from the Sharpness and Cam developments are biased to and from the A38 north of Falfield. In the morning peak hour, 183 trips are shown southbound on the A38 from the Sharpness and Cam developments and 124 of those movements join the M5 southbound. The corresponding trip totals in the PM peak hour are 99 vehicles leaving the M5 northbound at M5 J14 and 148 in total using the A38 north of the B4509 junction.

## 4.4 Cumulative Traffic and Background Growth at M5 J12

Table 4-1 shows the traffic growth in traffic at M5 J14 assuming the full build out of all Local Plan policy sites, i.e.:

- Direct traffic totals are for those sites listed in Section 3 (PS24, PS25, PS34, PS36, PS37, PS47 and Charfield and Land West of Park Farm);
- Indirect traffic totals are for all other Local Plan policy sites included in Appendix B (PS19a, PS20, PS30, PS32, PS43, G1, G2);
- Local Site Allocations and Small Windfall sites; and
- Background traffic growth.

Table 4-1 shows traffic growth in the period 2021 to 2040 of 50% in the AM peak hour and 64% in the PM peak. If background growth is excluded, the data shows the SDLPR to increase traffic at M5 J14 by 37% and 39% respectively when compared with traffic volumes in 2021.

**Table 4-1 –Traffic Growth from 2021 to 2040 at M5 J12 (excluding the motorway mainline)**

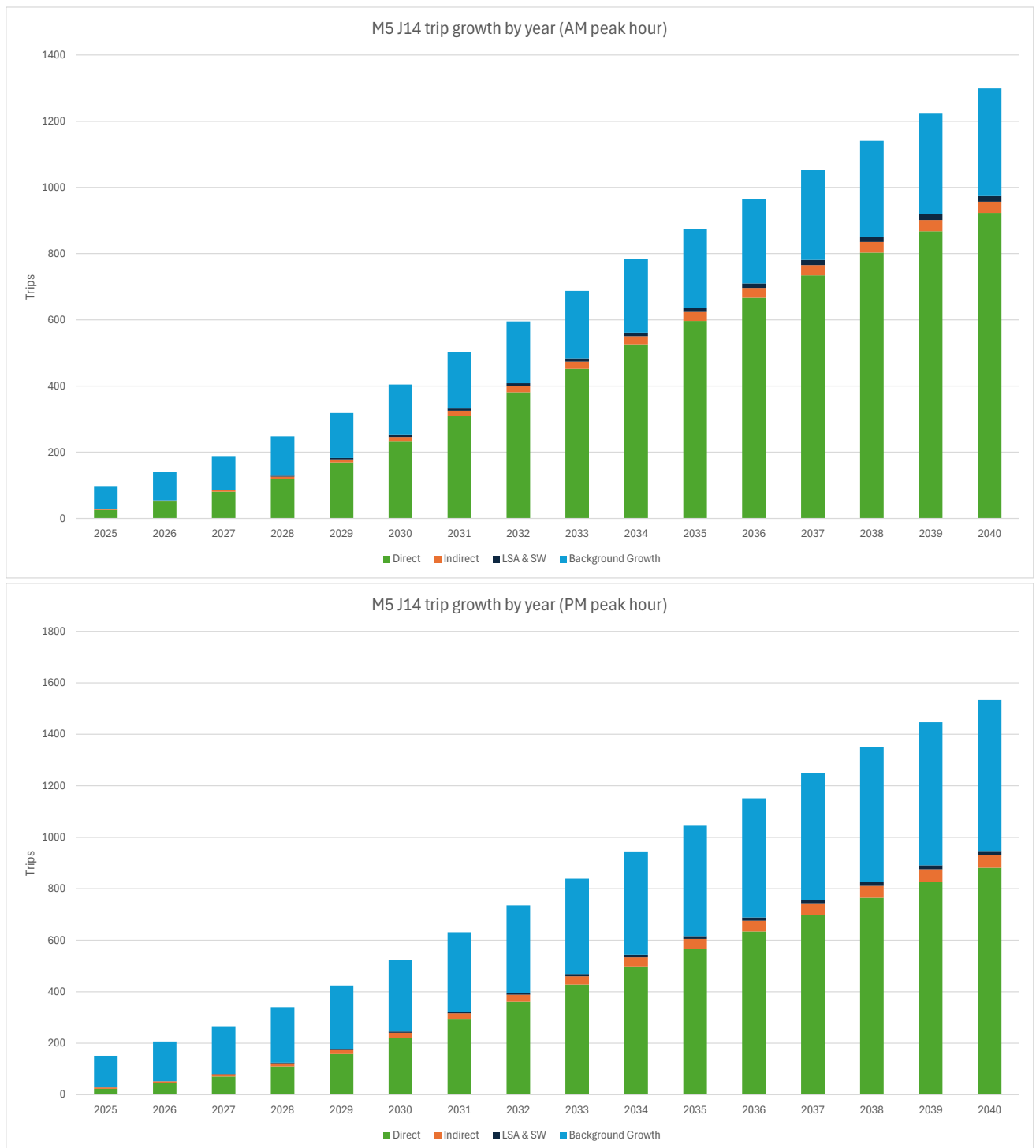
Data	AM Peak Hour	PM Peak Hour
<b>2021</b>	<b>2,610</b>	<b>2,403</b>
Direct Development traffic (PS24, PS25, PS34, PS36, PS37, PS47 and Charfield and Land West of Park Farm);	923	881
Indirect Development traffic (PS19a, PS20, PS30, PS32, PS43, G1, G2)	34	48
Local Site Allocations and Small Windfall traffic	19	17
<b>Total Development Traffic in 2040</b>	<b>976</b>	<b>946</b>
<b>Cumulative 2021 + Development Traffic in 2040</b>	<b>3,586</b>	<b>3,349</b>
<b><i>Change from 2021</i></b>	<b>+37%</b>	<b>+39%</b>
Background traffic growth 2021-2040	321	582
<b>Total in 2040 including background traffic</b>	<b>3,907</b>	<b>3,931</b>
<b><i>Change from 2021</i></b>	<b>+50%</b>	<b>+64%</b>

Figure 4-3 indicates traffic growth year at M5 J14 by year from 2025. This has been derived using the development delivery profiles provided in Appendix A and working back from the 2040 turning movements at M5 J14 included in Appendix B for each of the Local Plan policy sites, additional developments and background traffic:

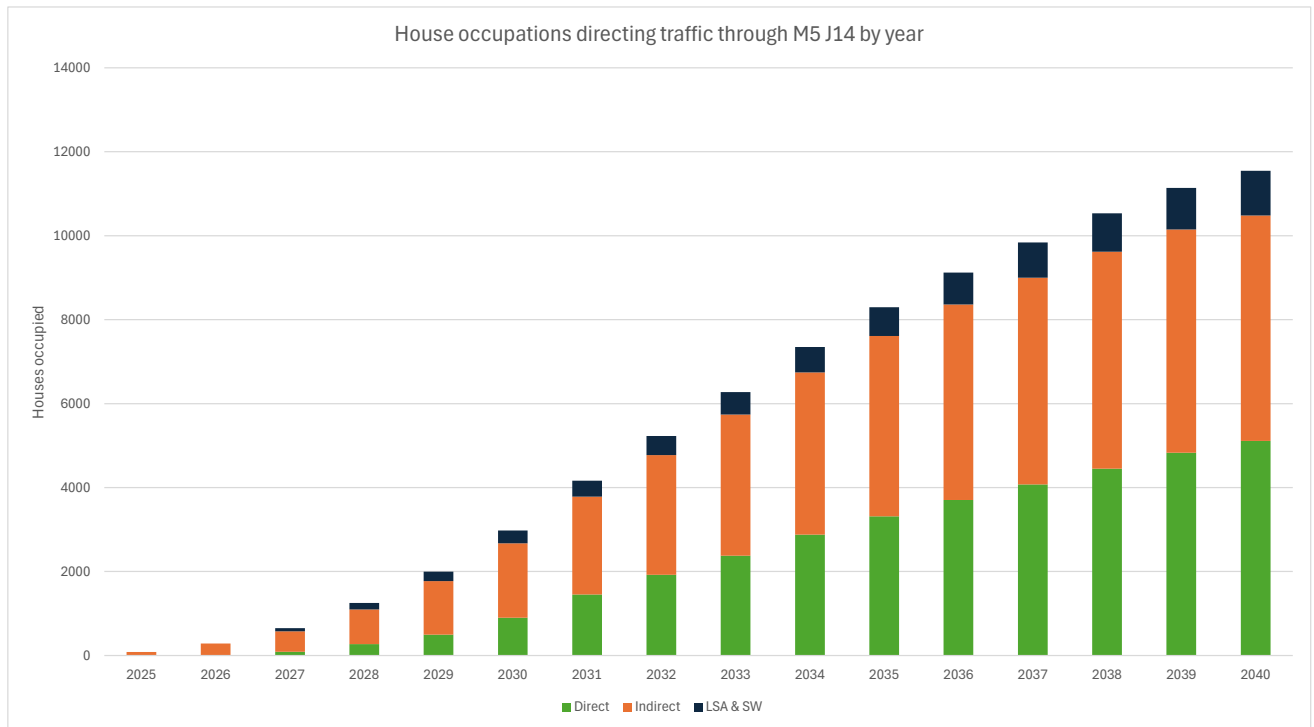
The graphs show that Local Plan development, if adopted and secured planning permission, would start to impact M5 J14 from 2025. As expected, it shows that the occupations of housing closest to the junction have the greater traffic impact by volume at M5 J14. Cumulatively, around 400-500 vehicles are then added at the junction in both peak periods by 2030 (including background traffic growth), and 900-1,100 vehicles by 2035. By 2040 up to 1,500 additional vehicles could be using M5 J14 during weekday peak periods.

Figure 4-4 shows the cumulative housing numbers from the SDLPR with traffic impacting M5 J14 by year.

**Figure 4-3 – Cumulative Traffic Growth Year by Year at M5 J14, AM and PM Peak Hour**



**Figure 4-4 – Cumulative House Occupations by Year affecting M5 J14**



## 5 Traffic Modelling Results

### 5.1 Introduction

It is important to note that the findings of this report are based on the traffic scenario provided by Stroud District Council for the SDLPR, which is derived from the traffic evidence presented at EIP. Changes in the rate of development delivery (Appendix A) and effective traffic management and active travel plans singularly and cumulatively may result in a different outcome.

The M5 J14 operational tests were completed with and without background growth.

National Highways' main concern is whether junction queues extend beyond the motorway slip roads and onto the motorway mainline, causing safety issues by mixing slow-moving and stationary traffic with high speed traffic.

### 5.2 Forecast Operation at M5 J14

The queues on the north- and southbound off-slip roads are well managed and do not extend to the 350m length of each slip road when using the MOVA program designed as part of the Interim Scheme at M5 J14. This is shown in Figure 5-1 for the 2040 AM peak hour.

**Figure 5-1 – M5 J14 Model Extract for the 2040 AM Peak Hour 0715-0815**

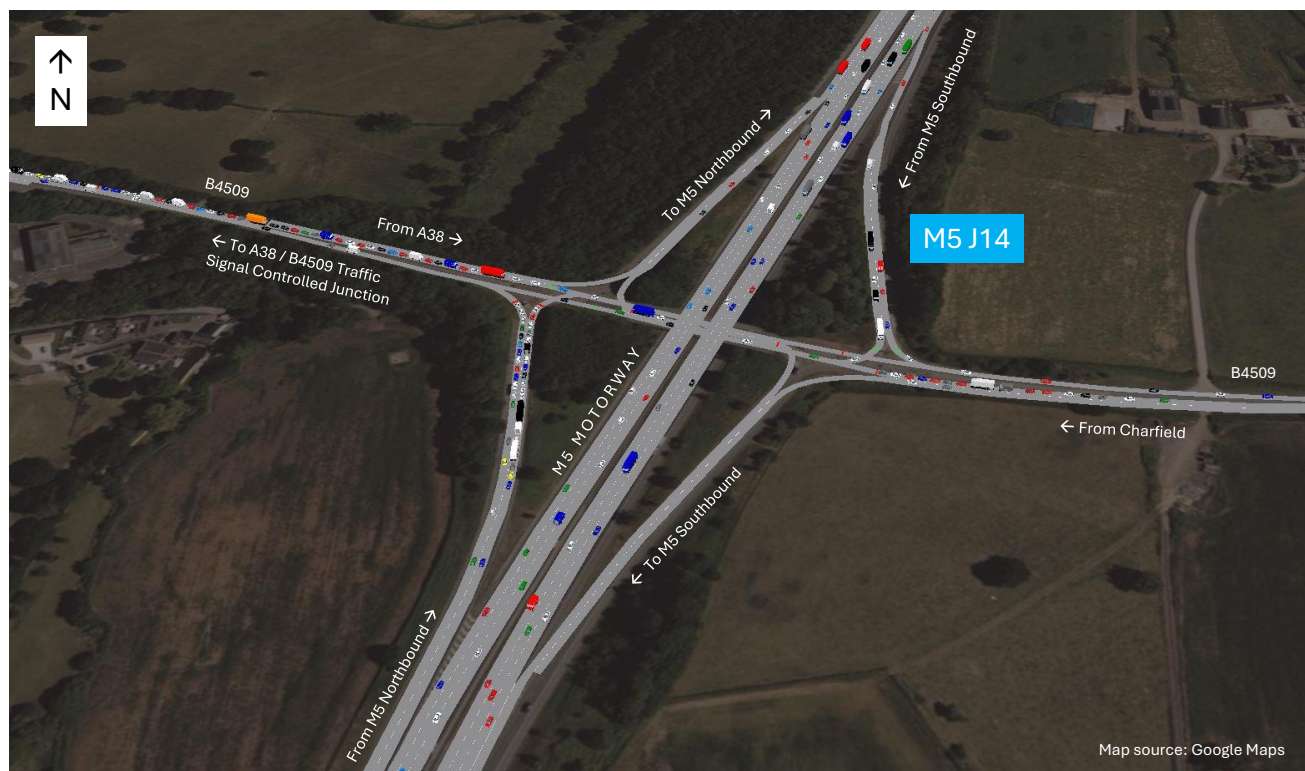
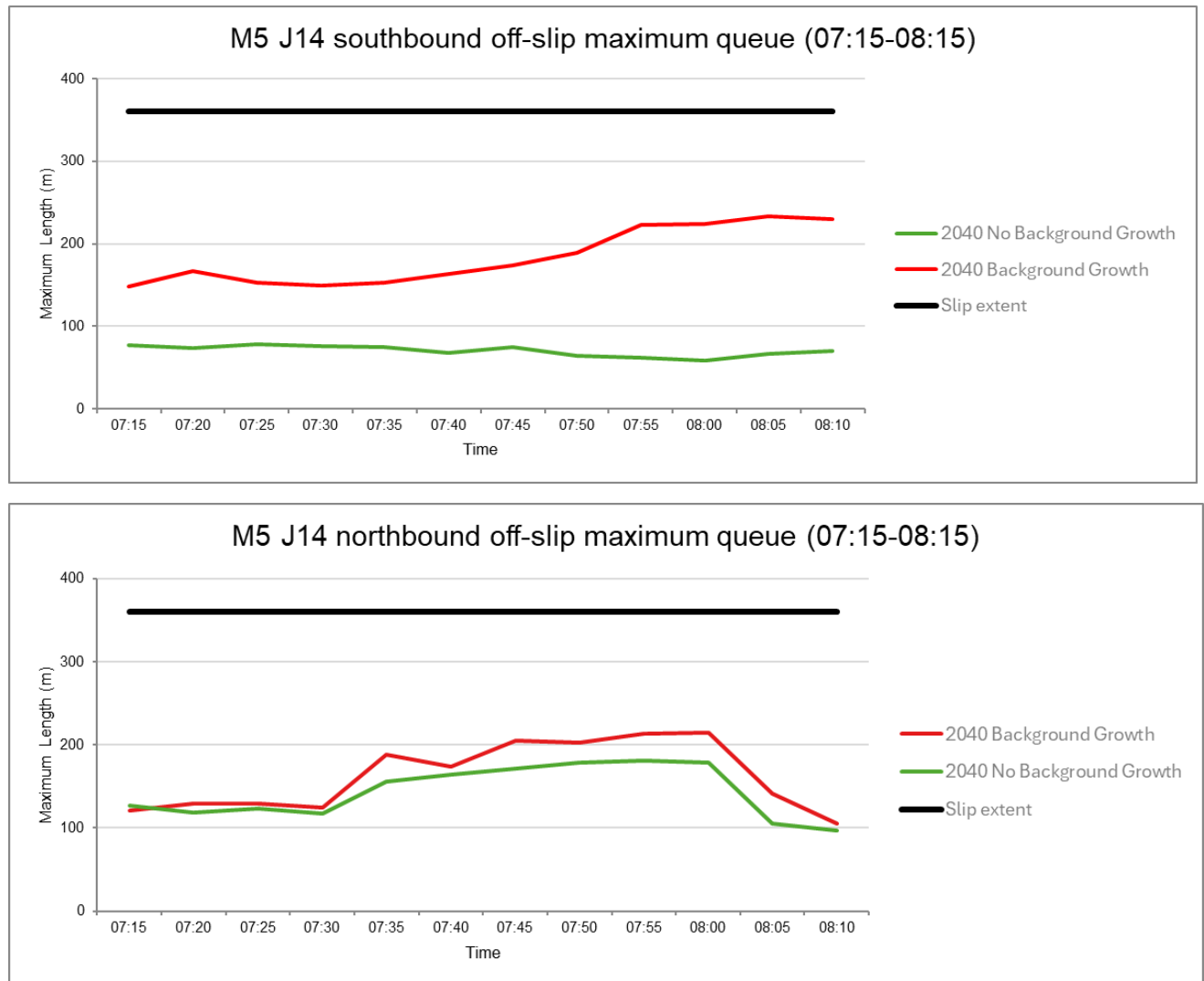


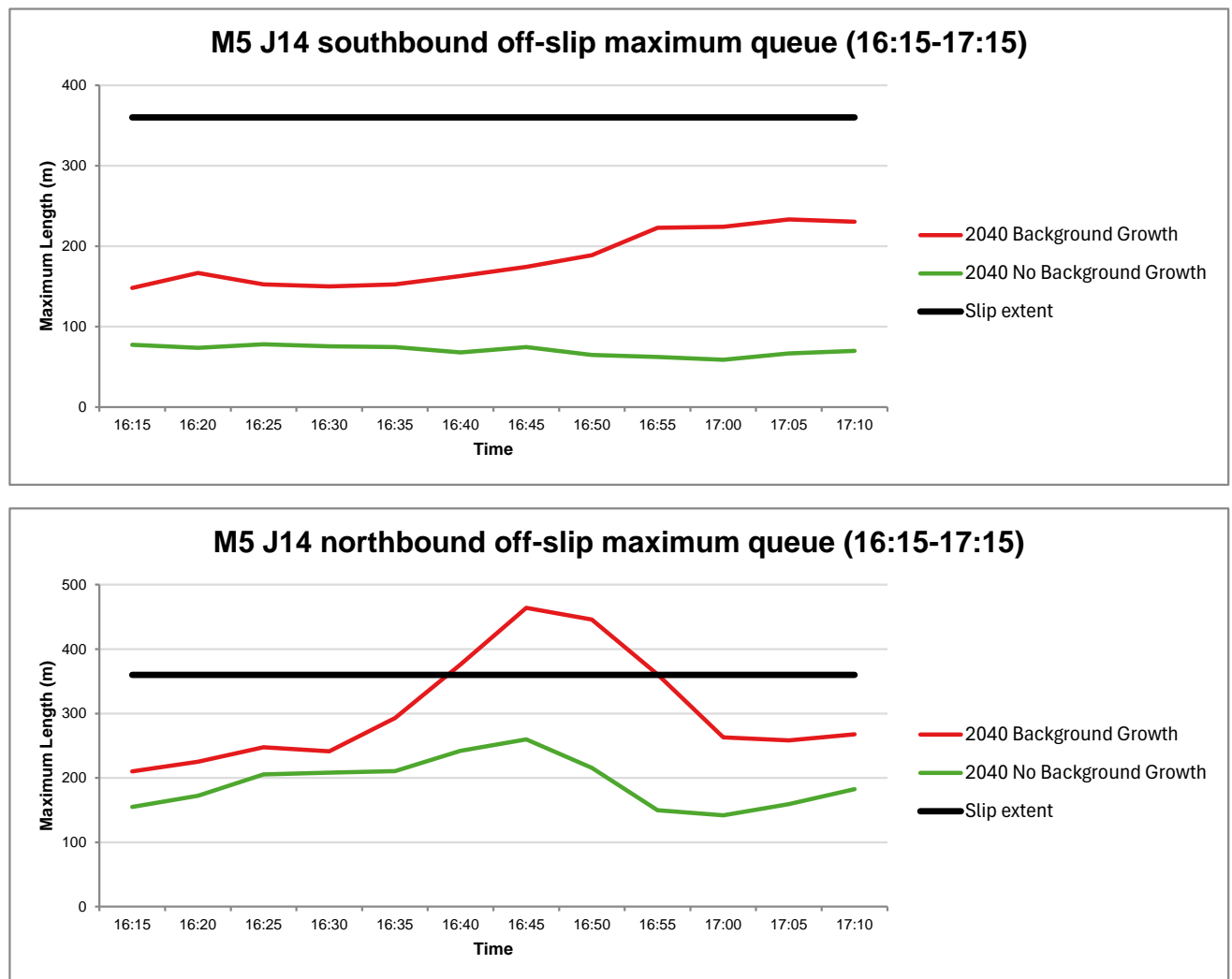
Figure 5-2 shows modelled queue lengths in the 2040 AM peak and Figure 5-3 in the PM Peak on the M5 J14 southbound and northbound off-slips. These show the average maximum queues remaining within the extent of the slip roads in both directions and in both peaks when background growth is not included. However, Figure 5-3 shows the queues extending onto the M5 northbound mainline carriageway for a period with the PM peak if the SDLPR background growth included in the modelling is achieved.

**Figure 5-2 - 2040 Trigger Test maximum queue lengths: AM Peak 0715-0815**





**Figure 5-3 - 2040 Trigger Test maximum queue lengths: PM Peak 1615-1715**



## 5.3 Local Road Network

Traffic issues are observed with the operation of the local road network. Significant congestion is noted on the local highway network to the west of M5 J14. This is a consequence of the single over bridge at M5 J14:

- Queues for traffic travelling on the B4509 eastbound extend back from M5 J14 into the A38 / B4509 junction for the entirety of the AM and PM peak hours. This is shown in Figure 5-4 approaching M5 J14.
- This has a substantial knock-on effect to the A38, as shown in Table 5-1. A38 traffic queues from the north are substantial and are even longer than modelled in the AM peak as the model extent is reached 1,103m from of the junction. It is estimated to take around six minutes to travel between entering the traffic model on the A38 southbound and exiting M5 J14 in both the AM and PM peak.

**Figure 5-4 – M5 J14 Model Extract of the A38/B4509 Junction in the 2040 AM Peak Hour 0715-0815**



**Table 5-1 – A38 Queue Extent approaching the A38/B4509 Junction**

Junction arm	AM Peak		PM Peak	
	Average (m)	Maximum (m)	Average (m)	Maximum (m)
A38 southbound	751	1,103	511	776
A38 northbound	239	331	583	831

As with the earlier modelling of only the Charfield, Cam and Sharpness developments with the Interim Scheme, the findings of this study with the additional demand from the SDLPR Local Plan sites in the Forecast Year 2040 and assuming no other background growth shows that the Interim Scheme has capacity to satisfy National Highways interests and that it could accommodate traffic from the SDLPR. It does, however, result in significant adverse impact on the A38 and B4509 local highway network. In its response to the earlier modelling with the Interim Scheme, South Gloucestershire Council (SGC) concluded that the mitigation alone is not acceptable to SGC as Local Highway Authority.

## 5.4 Traffic Demand in 2040

Traffic congestion on the local road network is indicated in the 2040 traffic models. Looking only at traffic growth in the period 2021 to 2040, Table 5-2 provides a comparison of the forecast traffic growth (the 'demand' flow) at M5 J14 and the flow noted as passing through the junction in the traffic model (the 'actual' flow) in the AM and PM peak hours. The actual flow shown in the model (Table 5-2) is lower than the demand flow (Table 4-1) because of congestion caused by the lack of capacity on the local road network.

**Table 5-2 – Comparisons between growth in actual flows and demand flow at M5 J14 2021-2040**

Junction arm	AM Peak, pcus/hr		PM Peak, pcus/hr	
	Demand flow	Actual flow	Demand flow	Actual flow
M5 southbound	180	165	339	327
B4509 westbound	513	466	417	205
M5 northbound	289	266	461	450
B4509 eastbound	317	105	316	39
<b>Total</b>	<b>1,299</b>	<b>1,001</b>	<b>1,533</b>	<b>1,022</b>

The comparison shows that actual and demand flows are comparable on the M5 sliproads, whereas actual flows on the B4509 are lower - significantly so eastbound into M5 J14 during the PM peak where only 39 of 316 pcus are shown to pass through the traffic model network as a consequence of the traffic restriction caused by the M5 J14 single lane overbridge.

## 6 Housing Supply Delivery before IDP improvements at M5 Junctions 12 and 14

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### 6.1 Background

The Stroud District Local Plan Review (SDLPR) Pre-submission Draft Plan (Regulation 19 Consultation), published in May 2021, outlines the allocation of 12,600 new dwellings by 2040.

In response to post-hearing action points (EIP Ref. SLP-AP-002), Stroud District Council submitted Appendix 2 AC6 (see Appendix C) in May 2023, estimating that 8,632 dwellings—approximately 70% of the total housing need—could be delivered without triggering the need for mitigation at M5 Junctions 12 and 14. However, this estimate lacked supporting traffic modelling. The sites excluded were those developments which had been identified in the IDP to fund the respective SRN improvement:

- At M5 J12, the excluded developments are G1 South of Hardwicke, G2 Land at Whaddon, and PS30 Hunts Grove Extension.
- At M5 J14, the excluded developments are PS34 Sharpness Docks, PS36 New Settlement at Sharpness and PS37 New Settlement at Wisloe.

National Highways raised concerns in June 2023 regarding the methodology and assumptions behind the Council's submission. In October 2023, the Inspectors requested further evidence to demonstrate that the proposed developments would not adversely impact the Strategic Road Network (SRN). Stroud District Council responded with a Technical Note and supplementary information, maintaining that the developments would not materially affect the SRN.

Despite this, National Highways concluded in November 2023 that the rationale remained unsubstantiated given that no new modelling had been conducted to assess the cumulative impact of non-IDP site allocations. National Highways committed to undertake this modelling as an extension of this study.

### 6.2 Traffic Modelling for Appendix 2 AC6

Given that modelling at M5 J14 shows full SDLP development (i.e. 12,600 dwellings) can be accommodated in 2040 with an interim scheme improvement, no tests of Appendix 2 AC6 were required or completed at M5 J14. A similar conclusion was made for M5 J13.

National Highways did complete its own assessment at M5 Junction 12 in line with Appendix 2 AC6 (i.e. excluding SDLPR allocations G1, G2 and PS30). In this scenario, the modelling showed that traffic queues with the existing junction are retained within the 400m-length of each sliproad in 2040 indicating no disruption to the motorway mainline traffic flow.

On this basis it can be concluded that the quantum of development included in Appendix 2 AC6 can be accommodated at M5 Junctions 12, 13 and 14 if SDLP Policy Allocations G1



South of Hardwicke, G2 Land at Whaddon, and PS30 Hunts Grove Extension are not permitted to build out before a grade separated roundabout at M5 J12 is open to traffic.

This conclusion also requires an interim scheme at M5 J14 and the IDP improvement at M5 J13 are open to traffic.

## 7 Summary

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This report has been prepared to detail the effective reserve capacity (if any) at M5 Junction 14 (M5 J14) Falfield in the period to 2040, and the timing of a proposed upgrade to provide a grade-separated roundabout to enable and support delivery of the draft SDLPR allocations.

The existing junction suffers from congestion at peak times. The operation of the junction can result in the formation of queues on the B4509 eastbound from the A38, and extensive queues on the northbound off-slip in the morning peak period (creating a safety issue on the motorway mainline). In the evening peak period queues form eastbound and westbound on the B4509.

The Stroud District Local Plan Review (SDLPR) would provide 12,600 new homes in the period to 2040. The SDLPR includes several large housing and housing led mixed-use allocations that would have a material traffic impact at M5 J14.

National Highways' microsimulation model of M5 J14 was used to test the operation of junction for the 2040 AM and PM peak periods. The modelling included background growth from the strategic model, traffic demands for the SDLPR draft allocations and from consented development applications in the vicinity of the junction. This results in significant traffic growth on all arms, with total traffic through the junction for the period 2021-2040 increasing by around 38% in both the AM and PM peak periods with SDLPR development alone, and between 50% and 64% if background growth is included.

National Highways' main concern is whether the modelling of M5 J14 indicates sliproad queues would extend onto the motorway mainline at any time over the assessment period. Queues extending onto the motorway mainline would result in an unacceptable safety impact arising from conflict between slow-moving (i.e. queueing) and high-speed traffic.

National Highways has agreed an interim improvement at M5 J14. The scheme is supported with an appropriate Stage 1 Road Safety Audit (RSA), GG104 Requirements for Safety Risk Assessment, Road Restraints Risk Assessment Process (RRRAP) and Walking, Cycling and Horse-riding Assessment (WCHAR), all completed to the satisfaction of National Highways. The modelling has assumed that the Interim Scheme is implemented and open to traffic in all scenarios.

In addition, National Highways will implement in late 2025 an agreed mitigation scheme to the M5 northbound off-slip that will lengthen the two-lane section approaching the B4509 from 150m to 350m back from the stop line.

The Interim Scheme was tested in 2040 assuming SDLPR traffic demands at M5 J14 and the inclusion of development-specific turning demands arising from development in Charfield (775 homes), Cam (900 homes) and Sharpness (1,000 homes).

Assuming no other background growth and with the Interim Scheme, the results show that the average maximum queues are contained well within the 350m-length of each slip road

in the AM and PM peak period, extending for no more than 250m. However the queue extends beyond the length of the northbound off-slip for a period within the PM peak hour if background growth is included in the model run.

The modelling therefore indicates that the Interim Scheme at M5 J14 could accommodate traffic growth to 2040 with effective development policy controls (e.g. vision and validate and monitor and management policies).

It is also concluded that the quantum of development included in Appendix 2 AC6 (8,632 dwellings—approximately 70% of the total SDLPR housing need) could be delivered with the Interim Scheme at M5 J14 implemented and open to traffic.

Significant congestion is noted on the local highway network to the west of M5 on the A38 and B4509 local highway network.

It may be a requirement of National Highways that the operation of M5 J14 is considered in every planning application where a significant proportion of its traffic will use the junction. Where necessary this will require use of its M5 J14 traffic model and reported in any supporting transport assessment or similar supporting document.



# Appendix A

## **SDLPR Housing Delivery Assumptions**

Supply Completions and commitments	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34	34/35	35/36	36/37	37/38	38/39	39/40	40/41	41/42	Not likely to be built	Total built
<b>Completions 01/04/2020 - 31/03/2023</b>	<b>745</b>	<b>771</b>	<b>632</b>																					2,148
Large site commitments/S106 at <b>01/10/2023</b>				469	514	591	641	240	154	120	40	40	16	0	0	0	0	0	0	0				2,825
Small site commitments at <b>01/10/2023 (Discounted by 22%)</b>				112	112	112																		336
<b>Strategic Site Allocations</b>																								
PS19a Stonehouse North West - Robert Hitchins	0	0	0	0	0	0	0	30	75	75	75	75	75	75	75	80								635
PS19a Stonehouse North West - GCC	0	0	0	0	0	0	0	0	0	0	65													65
PS24 Cam North West (W. of Draycott) - Robert Hitchins	0	0	0	0	0	0	35	50	50	50	50													235
PS24 Cam North West (W. of Draycott) - Persimmon	0	0	0	0	0	0	27	80	80	80	80	80	80	80	80									667
PS25 Cam North East Extension (E. of River Cam)	0	0	0	0	0	0	0	0	0	0	50	50	50	50	30									180
PS30 Hunts Grove Extension - Crest	0	0	0	0	0	0		50	50	100	100	120	120	80										620
PS30 Hunts Grove Extension - CFL														20	40	40	30							130
G1 South of Hardwicke	0	0	0	0	0	0	0	60	120	120	120	120	120	120	120	120	120	120	90					1,350
PS34 Sharpness Docks								45	35	30	30	30	30	30	30	30	20	20						300
PS36 Sharpness new settlement	0	0	0	0	0	0	0	0	0	155	220	220	220	220	220	248	248	248	248	153				2,400
PS37 Wisloe new settlement	0	0	0	0	0	0	25	50	50	85	121	92	74	144	106	108	102	110	130	130	148	25		1,500
<b>Local Site Allocations</b>																								
PS01 Brimscombe Mill	0	0	0	0	0	0	0	0	0	0	40													40
PS02 Brimscombe Port	0	0	0	0	0	0	50	50	50															150
PS05 East of Tobacconist Road, Minchinhampton	0	0	0	0	0	30	50																	80
PS06 The New Lawn, Nailsworth	0	0	0	0	0	0	0	0	40	50														90
PS10 Cheapside, Stroud	0	0	0	0	0	0	0	0	35	40														75
PS11 Merrywalks Arches, Stroud	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25									25
PS12 Police Station/Magistrates Court, Stroud	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45				45
STR065 Land at Beeches Green, Stroud	0	0	0	0	0	0	0	0	10	10														20
PS16 South of Leonard Stanley Primary School	0	0	0	0	0	10	15																	25
PS42 Land off Dozule Close, Leonard Stanley	0	0	0	0	0	13																		13
PS17 Magpies site, Oldends Lane, Stonehouse	0	0	0	0	0	0	0	0	0	0	10													10
PS28 Land off Prospect Place, Dursley	0	0	0	0	0	0	0	10																10
HAR017 Land at Sellars Road, Hardwicke	0	0	0	0	0	10																		10
BER016/ 017 Land at Lynch Road, Berkeley	0	0	0	0	0	30	30																	60
PS35 Land at Focus School, Wanswell	0	0	0	0	0	0	0	50	20															70
PS44 Northwest of Whitminster Lane, Frampton	0	0	0	0	0	0	0	20	10															30
PS45 Land west of Upton's Gardens, Whitminster	0	0	0	0	11																			11
PS46 Land west of School Lane, Whitminster	0	0	0	0	0	45																		45
PS38 South of Wickwar Road, Kingswood	0	0	0	0	0	0	14	39																53
PS41 Washwell Fields, Painswick	0	0	0	0	0	0	0	0	0	0	20													20
Small sites windfall	0	0	0	0	0	0	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76			1,064
<b>TOTAL</b>	<b>745</b>	<b>771</b>	<b>632</b>	<b>581</b>	<b>637</b>	<b>841</b>	<b>963</b>	<b>805</b>	<b>865</b>	<b>996</b>	<b>1097</b>	<b>903</b>	<b>861</b>	<b>875</b>	<b>772</b>	<b>702</b>	<b>596</b>	<b>574</b>	<b>544</b>	<b>404</b>	<b>148</b>	<b>25</b>	<b>0</b>	<b>15,337</b>
<b>Plan Period 2020 - 2040</b>																								
<b>Five year period from adoption</b>																								

# **Appendix B**

## **Turning Movements at M5 J14**

# Turning Movements at M5 J14

The following turning movements were provided by Stroud District Council. All were derived from its Stroud District Local Plan Do Something model for 2040.

The turning movements are from a network assuming a full grade separated roundabout is open to traffic in at M5 J14.

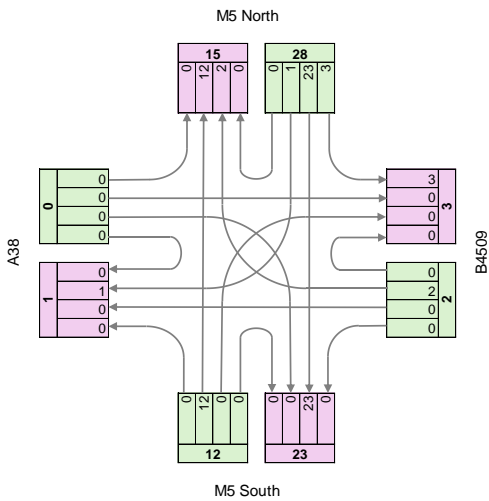
All data is PCUs/hr.

Site allocation references are those in the Stroud District Local Plan.

## G1 South of Hardwicke

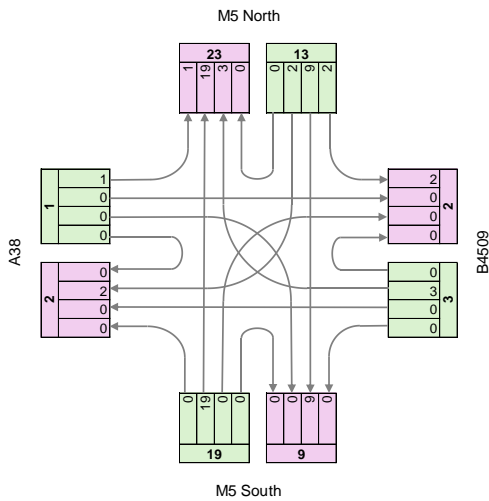
M5 J14 Turning Matrix  
G1 South of Hardwicke  
AM Peak  
PCUs

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	3	23	1	28
B4509	2	0	0	0	2
M5 South	12	0	0	0	12
A38	0	0	0	0	0
Total	15	3	23	1	43



M5 J14 Turning Matrix  
G1 South of Hardwicke  
PM Peak  
PCUs

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	2	9	2	13
B4509	3	0	0	0	3
M5 South	19	0	0	0	19
A38	1	0	0	0	1
Total	23	2	9	2	36



## G2 Land at Whaddon

### M5 J14 Turning Matrix

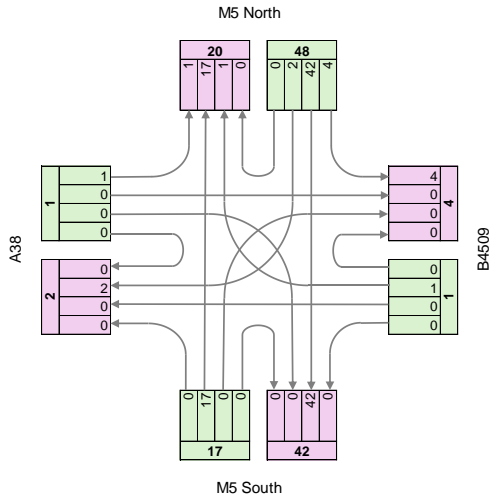
G2 Land at Whaddon

AM Peak

PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	4	42	2	48
B4509	1	0	0	0	1
M5 South	17	0	0	0	17
A38	1	0	0	0	1
Total	20	4	42	2	67



### M5 J14 Turning Matrix

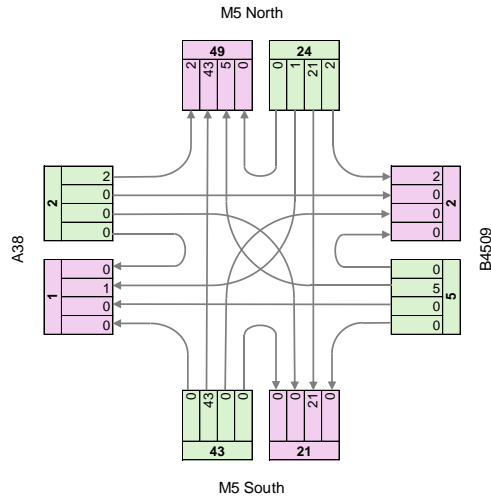
G2 Land at Whaddon

PM Peak

PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	2	21	1	24
B4509	5	0	0	0	5
M5 South	43	0	0	0	43
A38	2	0	0	0	2
Total	49	2	21	1	73



## PS19a Land Northwest of Stonehouse

### M5 J14 Turning Matrix

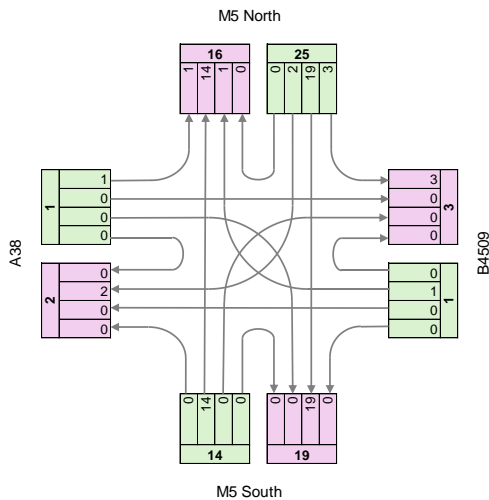
PS19a Land Northwest of Stonehouse (Total Allocation)

AM Peak

PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	3	19	2	25
B4509	1	0	0	0	1
M5 South	14	0	0	0	14
A38	1	0	0	0	1
Total	16	3	19	2	40



### M5 J14 Turning Matrix

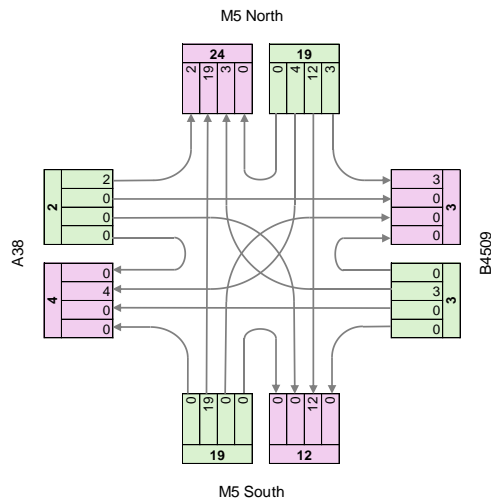
PS19a Land Northwest of Stonehouse (Total Allocation)

PM Peak

PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	3	12	4	19
B4509	3	0	0	0	3
M5 South	19	0	0	0	19
A38	2	0	0	0	2
Total	24	3	12	4	43



## PS20 M5 J13 Eco Park

### M5 J14 Turning Matrix

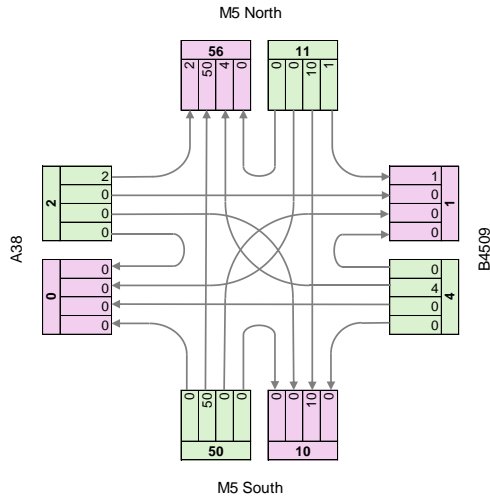
PS20 M5 J13 Eco Park

AM Peak

PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	1	10	0	11
B4509	4	0	0	0	4
M5 South	50	0	0	0	50
A38	2	0	0	0	2
Total	56	1	10	0	67



### M5 J14 Turning Matrix

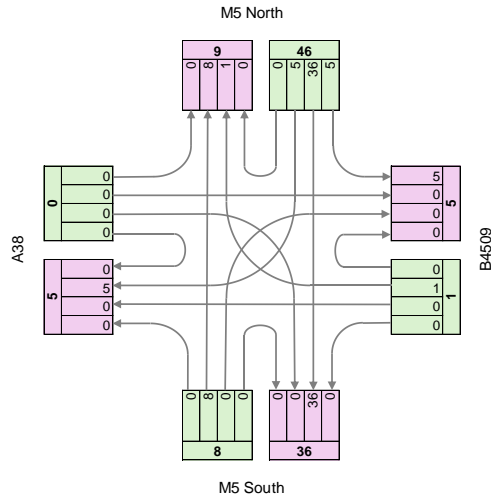
PS20 M5 J13 Eco Park

PM Peak

PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	5	36	5	46
B4509	1	0	0	0	1
M5 South	8	0	0	0	8
A38	0	0	0	0	0
Total	9	5	36	5	55



## PS24 Cam North West (West of Draycott)

### M5 J14 Turning Matrix

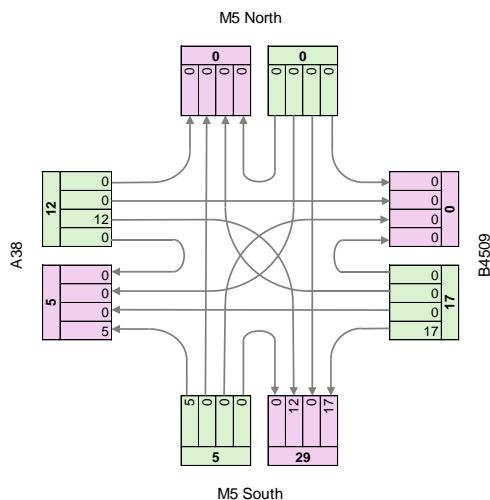
PS24 Cam North West (W. of Draycott)

AM Peak

PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	0	0	0	0
B4509	0	0	17	0	17
M5 South	0	0	0	5	5
A38	0	0	12	0	12
Total	0	0	29	5	34



### M5 J14 Turning Matrix

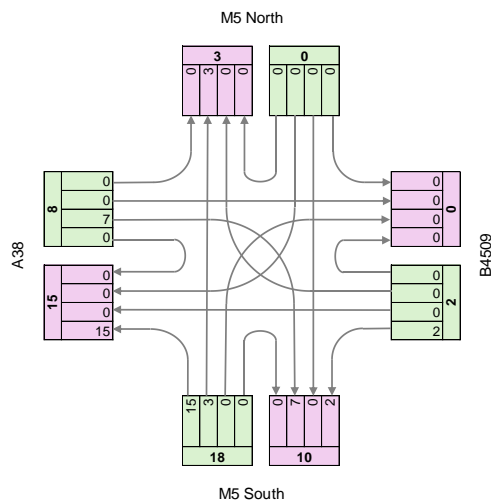
PS24 Cam North West (W. of Draycott)

PM Peak

PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	0	0	0	0
B4509	0	0	2	0	2
M5 South	3	0	0	15	18
A38	0	0	7	0	7
Total	3	0	10	15	28





## PS25 Cam North East Extension (East of River Cam)

### M5 J14 Turning Matrix

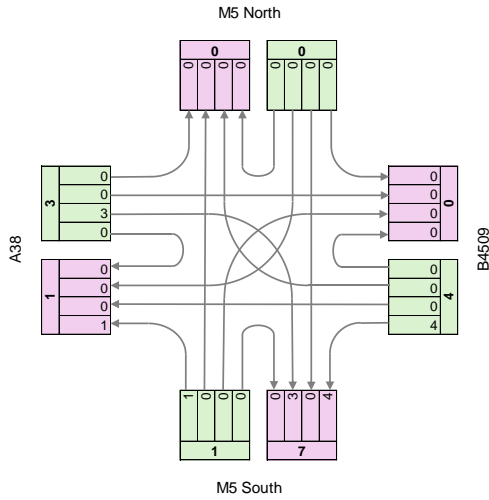
PS25 Cam North East Extension (E. of River Cam)

AM Peak

PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	0	0	0	0
B4509	0	0	4	0	4
M5 South	0	0	0	1	1
A38	0	0	3	0	3
Total	0	0	7	1	9



### M5 J14 Turning Matrix

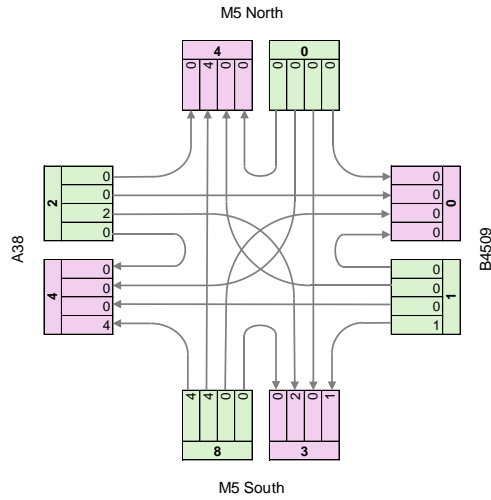
PS25 Cam North East Extension (E. of River Cam)

PM Peak

PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	0	0	0	0
B4509	0	0	1	0	1
M5 South	4	0	0	4	8
A38	0	0	2	0	2
Total	4	0	3	4	11



## PS30 Hunts Grove Extension

### M5 J14 Turning Matrix

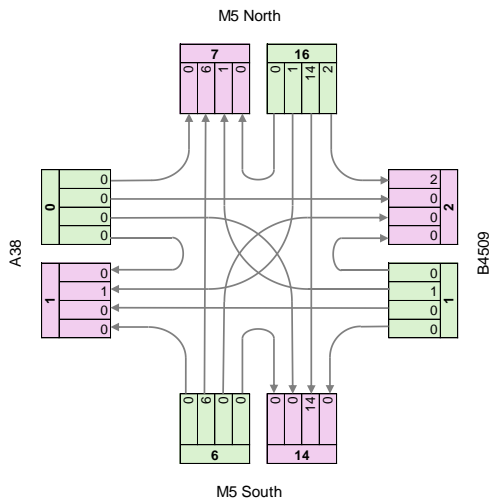
PS30 Hunts Grove Extension

AM Peak

PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	2	14	1	16
B4509	1	0	0	0	1
M5 South	6	0	0	0	6
A38	0	0	0	0	0
Total	7	2	14	1	23



### M5 J14 Turning Matrix

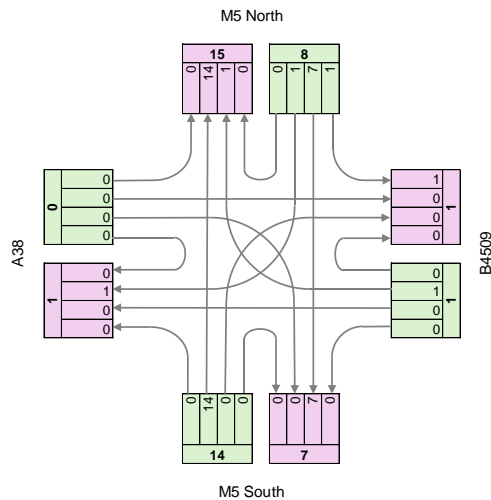
PS30 Hunts Grove Extension

PM Peak

PCUs

Arriving flow  
Exiting flow

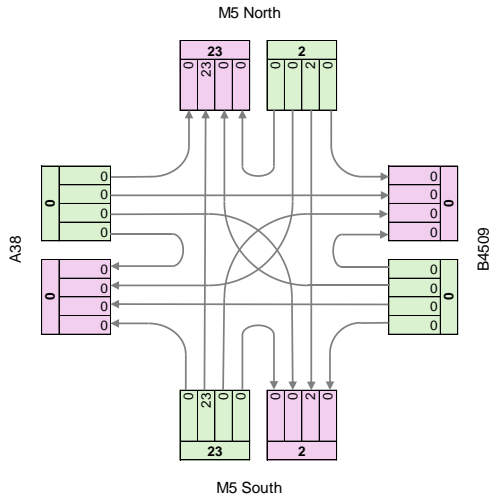
AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	1	7	1	8
B4509	1	0	0	0	1
M5 South	14	0	0	0	14
A38	0	0	0	0	0
Total	15	1	7	1	24



## PS32 Quedgeley East Extension

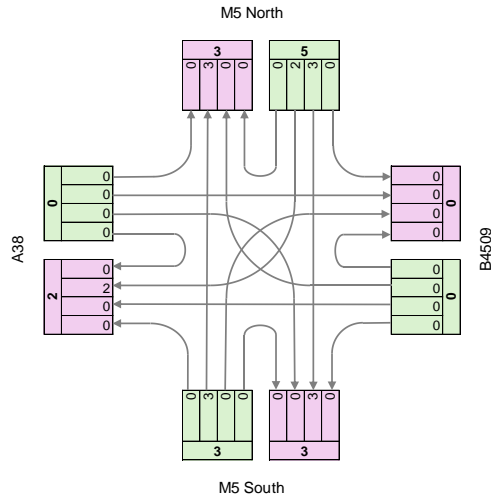
**M5 J14 Turning Matrix**  
PS32 Quedgeley East Extension  
AM Peak  
PCUs

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	0	2	0	2
B4509	0	0	0	0	0
M5 South	23	0	0	0	23
A38	0	0	0	0	0
<b>Total</b>	<b>23</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>25</b>



**M5 J14 Turning Matrix**  
PS32 Quedgeley East Extension  
PM Peak  
PCUs

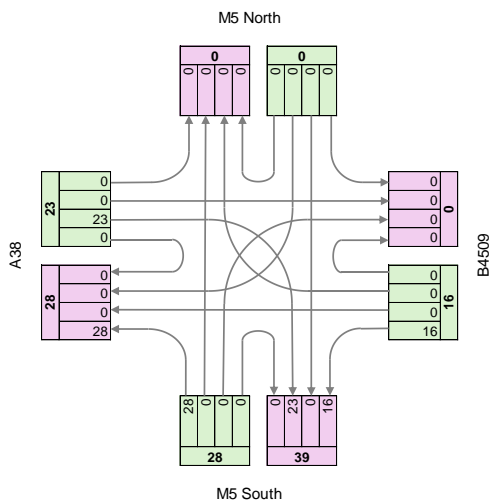
AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	0	3	2	5
B4509	0	0	0	0	0
M5 South	3	0	0	0	3
A38	0	0	0	0	0
<b>Total</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>2</b>	<b>8</b>



## PS34 Sharpness Docks

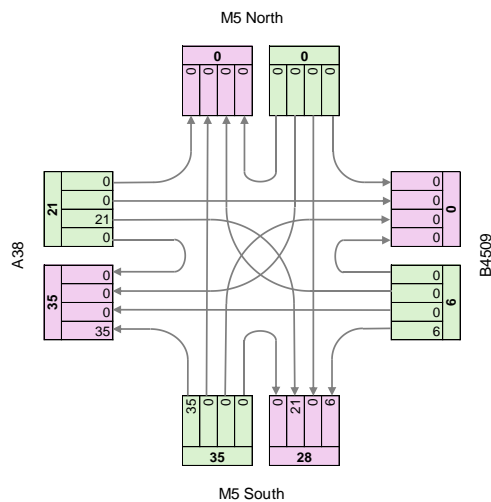
**M5 J14 Turning Matrix**  
PS34 Sharpness Docks  
AM Peak  
PCUs

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	0	0	0	0
B4509	0	0	16	0	16
M5 South	0	0	0	28	28
A38	0	0	23	0	23
<b>Total</b>	<b>0</b>	<b>0</b>	<b>39</b>	<b>28</b>	<b>67</b>



**M5 J14 Turning Matrix**  
PS34 Sharpness Docks  
PM Peak  
PCUs

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	0	0	0	0
B4509	0	0	6	0	6
M5 South	0	0	0	35	35
A38	0	0	21	0	21
<b>Total</b>	<b>0</b>	<b>0</b>	<b>28</b>	<b>35</b>	<b>62</b>



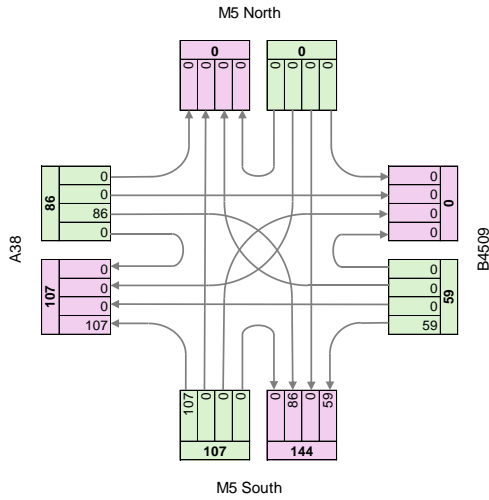
## PS36 New Settlement at Sharpness

### M5 J14 Turning Matrix

PS36 New settlement at Sharpness  
AM Peak  
PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	0	0	0	0
B4509	0	0	59	0	59
M5 South	0	0	0	107	107
A38	0	0	86	0	86
Total	0	0	144	107	251

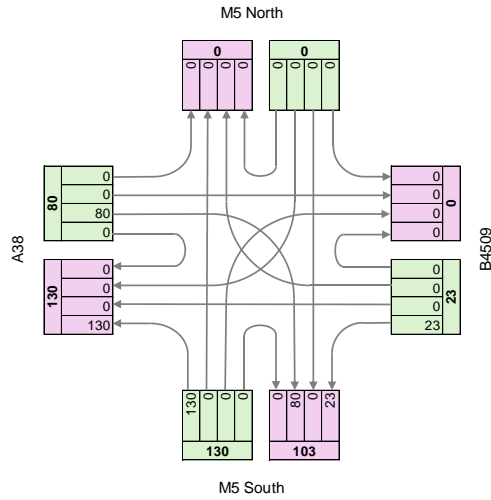


### M5 J14 Turning Matrix

PS36 New settlement at Sharpness  
PM Peak  
PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	0	0	0	0
B4509	0	0	23	0	23
M5 South	0	0	0	130	130
A38	0	0	80	0	80
Total	0	0	103	130	233



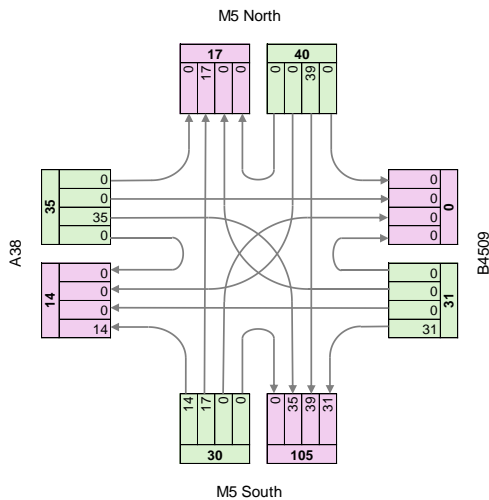
## PS37 New Settlement at Wisloe

### M5 J14 Turning Matrix

PS37 New settlement at Wisloe  
AM Peak  
PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	0	39	0	40
B4509	0	0	31	0	31
M5 South	17	0	0	14	30
A38	0	0	35	0	35
Total	17	0	105	14	136

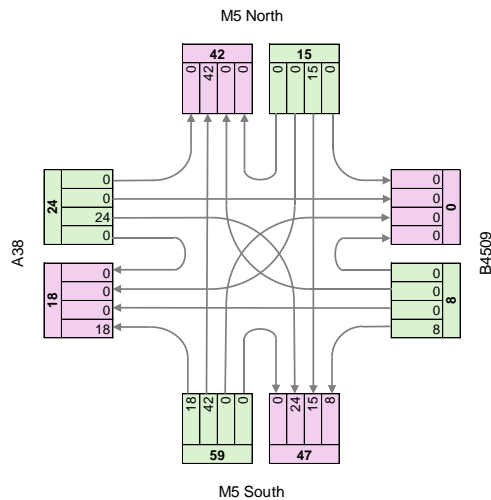


### M5 J14 Turning Matrix

PS37 New settlement at Wisloe  
PM Peak  
PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	0	15	0	15
B4509	0	0	8	0	8
M5 South	42	0	0	18	59
A38	0	0	24	0	24
Total	42	0	47	18	107



## PS43 Javelin Park

### M5 J14 Turning Matrix

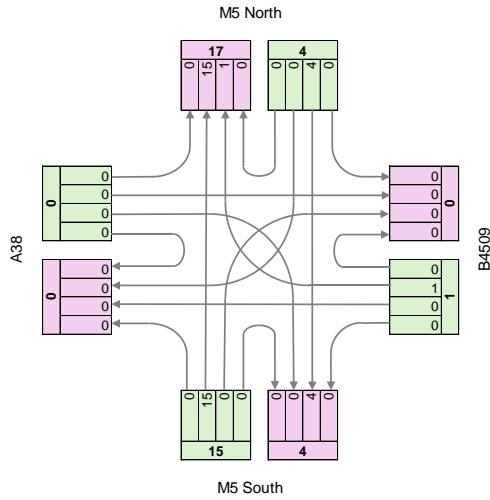
PS43 Javelin Park

AM Peak

PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	0	4	0	4
B4509	1	0	0	0	1
M5 South	15	0	0	0	15
A38	0	0	0	0	0
Total	17	0	4	0	21



### M5 J14 Turning Matrix

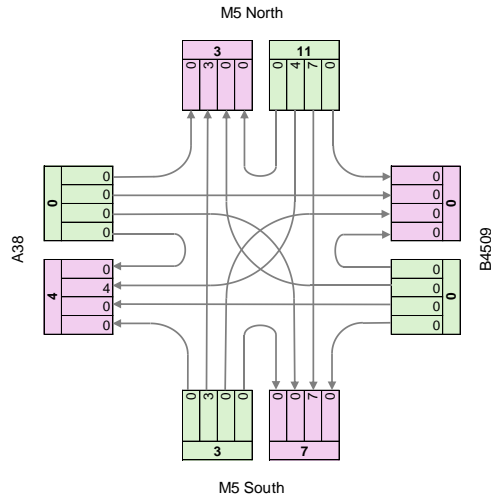
PS43 Javelin Park

PM Peak

PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	0	7	4	11
B4509	0	0	0	0	0
M5 South	3	0	0	0	3
A38	0	0	0	0	0
Total	3	0	7	4	14



## PS47 Renishaw New Mills

### M5 J14 Turning Matrix

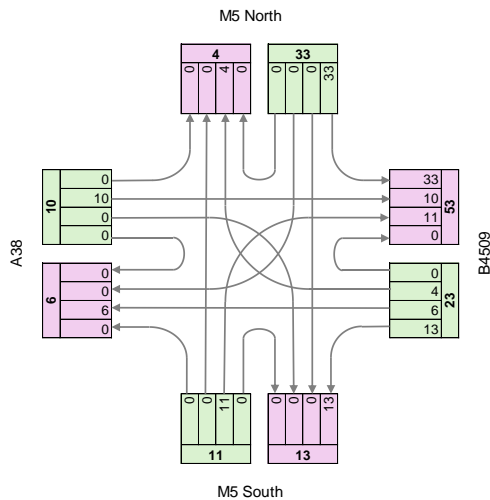
PS47 Renishaw New Mills

AM Peak

PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	33	0	0	33
B4509	4	0	13	6	23
M5 South	0	11	0	0	11
A38	0	10	0	0	10
Total	4	53	13	6	77



### M5 J14 Turning Matrix

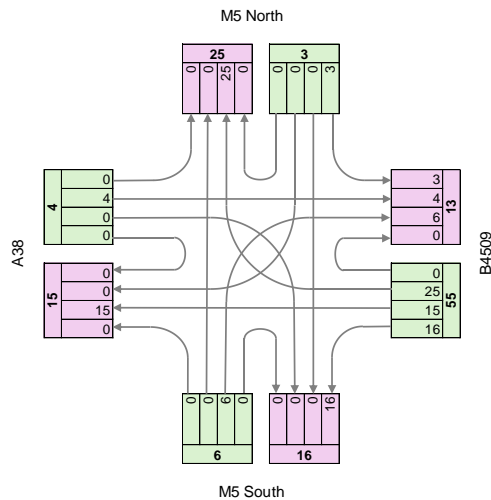
PS47 Renishaw New Mills

PM Peak

PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	3	0	0	3
B4509	25	0	16	15	55
M5 South	0	6	0	0	6
A38	0	4	0	0	4
Total	25	13	16	15	68



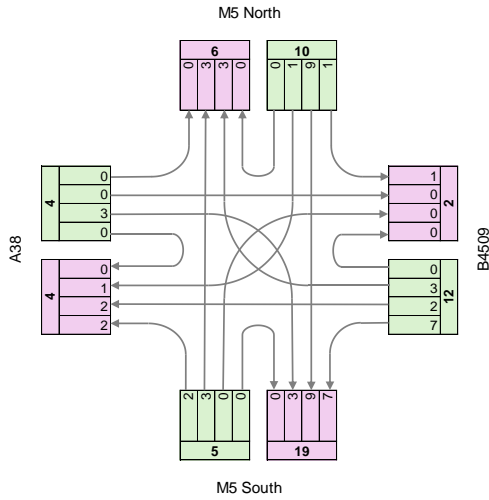
## Local Site Allocations and Small Windfall

### M5 J14 Turning Matrix

Local Site Allocations and Small Windfall  
AM Peak  
PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	1	9	1	10
B4509	3	0	7	2	12
M5 South	3	0	0	2	5
A38	0	0	3	0	4
Total	6	2	19	4	31

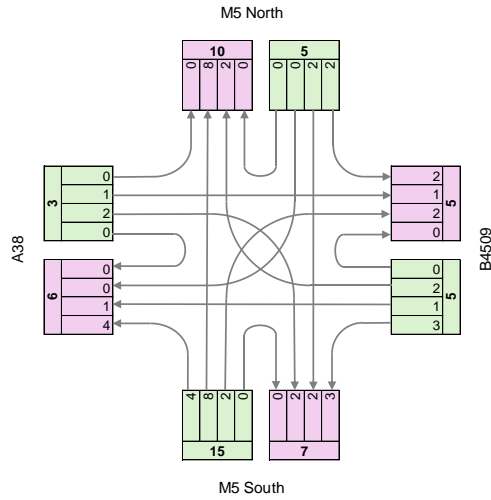


### M5 J14 Turning Matrix

Local Site Allocations and Small Windfall  
PM Peak  
PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	2	2	0	5
B4509	2	0	3	1	5
M5 South	8	2	0	4	15
A38	0	1	2	0	3
Total	10	5	7	6	28



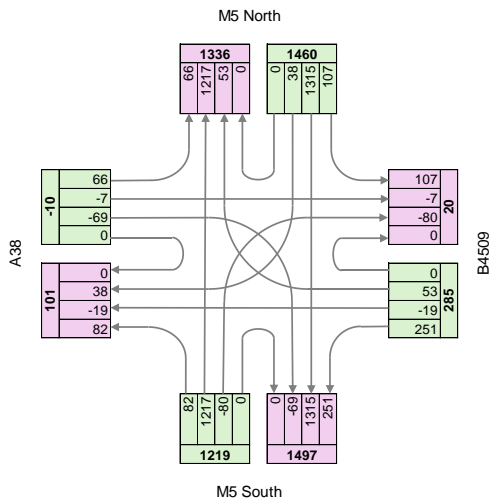
## Background Growth

### M5 J14 Turning Matrix

Background Growth  
AM Peak  
PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	107	1315	38	1460
B4509	53	0	251	-19	285
M5 South	1217	-80	0	82	1219
A38	66	-7	-69	0	-10
Total	1336	20	1497	101	2954

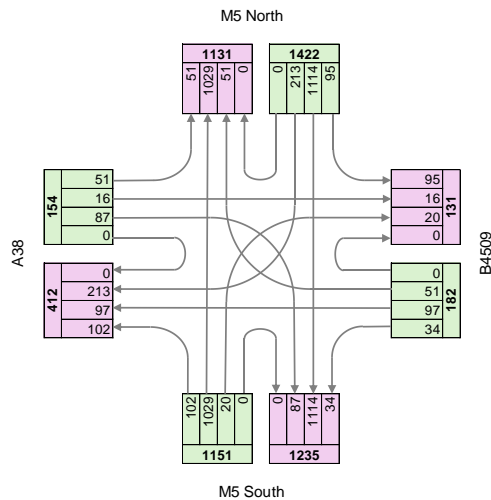


### M5 J14 Turning Matrix

Background Growth  
PM Peak  
PCUs

Arriving flow  
Exiting flow

AM Peak	M5N	B4509	M5S	A38	Total
M5 North	0	95	1114	213	1422
B4509	51	0	34	97	182
M5 South	1029	20	0	102	1151
A38	51	16	87	0	154
Total	1131	131	1235	412	2909



# Appendix C

**Housing Supply Delivery before  
improvements at M5 J12 and J14  
(Appendix 2 AC6)**



12<sup>th</sup> May 2023

## **Note on housing supply which could be delivered before impacts on M5 J12 and J14 would require mitigation**

### **Introduction**

At the Stroud District Local Plan Hearing Session held on 23 March 2023, the Inspector asked the District Council to prepare a short note setting out the expected housing supply which could be delivered before the highway capacity constraints currently existing at the M5 motorway junctions 12 and 14 would require mitigation to be delivered. The note should also set out which sites in the housing trajectory would impact and where.

### **Housing sites which will impact on Junctions 12 and 14**

The Infrastructure Delivery Plan Addendum EB110) sets out those draft Local Plan allocations which are expected to contribute to mitigation schemes at junctions 12 and 14. These are:

#### Housing sites affecting Junction 12

G1 - South of Hardwicke

G2 - Land at Whaddon

PS30 - Hunts Grove Expansion

#### Housing sites affecting Junction 14

PS34 - Sharpness Docks

PS36 - New Settlement at Sharpness

PS37 - New Settlement at Wisloe

### **Housing trajectory for housing sites affecting Junctions 12 and 14**

The following tables set out the projected housing supply to be delivered from the above sites, using data from the housing trajectory compiled in December 2022 and submitted by the Council at the MIQ stage in February 2022 (see District Council Appendix 1 to MIQs).

Site affecting J12	2023 /24	2024 /25	2025 /26	2026 /27	2027 /28	2028 /29	2029 /30	2030 /31	2031 /32	2032 /33	2033 /34	2034 /35	2035 /36	2036 /37	2037 /38	2038 /39	2039 /40
G1 - South of Hardwicke	0	0	120	120	120	120	120	120	120	120	120	120	120	30	0	0	0
G2 - Land at Whaddon	0	80	200	200	200	200	200	200	200	200	200	200	200	200	200	200	120
PS30 - Hunts Grove Expansion	0	110	110	75	75	75	75	75	75	80	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>0</b>	<b>190</b>	<b>430</b>	<b>395</b>	<b>395</b>	<b>395</b>	<b>395</b>	<b>395</b>	<b>395</b>	<b>400</b>	<b>320</b>	<b>320</b>	<b>320</b>	<b>230</b>	<b>200</b>	<b>200</b>	<b>120</b>
<b>Cumulative TOTAL</b>	<b>0</b>	<b>190</b>	<b>620</b>	<b>1015</b>	<b>1410</b>	<b>1805</b>	<b>2200</b>	<b>2595</b>	<b>2990</b>	<b>3390</b>	<b>3710</b>	<b>4030</b>	<b>4350</b>	<b>4580</b>	<b>4780</b>	<b>4980</b>	<b>5100</b>

Site affecting J14	2023 /24	2024 /25	2025 /26	2026 /27	2027 /28	2028 /29	2029 /30	2030 /31	2031 /32	2032 /33	2033 /34	2034 /35	2035 /36	2036 /37	2037 /38	2038 /39	2039 /40
PS34 - Sharpness Docks	0	0	45	35	30	30	30	30	30	30	20	20	0	0	0	0	0
PS36 - New Settlement at Sharpness	0	0	0	0	0	50	150	150	200	200	250	250	250	250	250	250	150
PS37 - New Settlement at Wisloe	0	0	50	50	50	85	121	92	74	144	106	108	102	110	130	130	148
<b>TOTAL</b>	<b>0</b>	<b>0</b>	<b>95</b>	<b>85</b>	<b>80</b>	<b>165</b>	<b>301</b>	<b>272</b>	<b>304</b>	<b>374</b>	<b>376</b>	<b>378</b>	<b>352</b>	<b>360</b>	<b>380</b>	<b>380</b>	<b>298</b>
<b>Cumulative TOTAL</b>	<b>0</b>	<b>0</b>	<b>95</b>	<b>180</b>	<b>260</b>	<b>425</b>	<b>726</b>	<b>998</b>	<b>1302</b>	<b>1676</b>	<b>2052</b>	<b>2430</b>	<b>2782</b>	<b>3142</b>	<b>3522</b>	<b>3902</b>	<b>4200</b>

## Housing supply which could be delivered without sites impacting upon M5 Junctions 12 or 14

The final table below summarises the projected housing supply from all sources excluding the above sites, as an indication of the housing supply unaffected by the highway constraints at M5 Junctions 12 or 14.

Housing supply	20 /21	21 /22	22 /23	23 /24	24 /25	25 /26	26 /27	27 /28	28 /29	29 /30	30 /31	31 /32	32 /33	33 /34	34 /35	35 /36	36 /37	37 /38	38 /39	39 /40
Total supply	745	771	779	1117	869	963	814	460	395	311	230	230	228	135	165	75	75	75	75	120
<b>Cumulative TOTAL</b>	<b>745</b>	<b>1516</b>	<b>2295</b>	<b>3412</b>	<b>4281</b>	<b>5244</b>	<b>6058</b>	<b>6518</b>	<b>6913</b>	<b>7224</b>	<b>7454</b>	<b>7684</b>	<b>7912</b>	<b>8047</b>	<b>8212</b>	<b>8287</b>	<b>8362</b>	<b>8437</b>	<b>8512</b>	<b>8632</b>

\*The table includes 317 dwellings from commitments unlikely to be built

## M5 Junction 12 Network

### AM Peak Hour - Two-Way Trips

#### Do Minimum

Link Name	J12 IDP Sites			J14 IDP Sites					Employment Sites			Other LP Allocations			Misc. Sites	Total Sites
	G1	G2	PS30	PS34	PS36	PS37a	PS37b	PS37c	PS20	PS47	PS43	PS19a	PS24	PS25		
A430 Northbound flow North of M5 J12 (away from M5)	273	0	0	0	0	0	0	0	0	5	48	77	0	0	2710	3113
A430 Southbound flow North of M5 J12 (towards M5)	238	0	0	0	0	0	0	0	0	1	129	0	0	0	2647	3015
B4008 Northbound flow South of M5 J12	38	0	0	0	0	0	0	1	0	0	98	1	1	1	777	917
B4008 Southbound flow towards Cross Keys roundabout	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B4008 Southbound flow South of M5 J12	17	0	0	0	1	0	0	0	0	0	351	3	3	1	895	1271
M5 J12 Northbound offslip	61	0	0	0	1	0	0	0	0	5	44	81	3	1	1356	1552
M5 J12 Northbound onslip	192	0	0	0	0	0	0	0	0	0	43	0	0	0	1616	1851
M5 J12 Southbound offslip	173	0	0	0	0	0	0	0	0	0	177	0	0	0	1515	1865
M5 J12 Southbound onslip	28	0	0	0	0	0	0	1	0	1	7	1	1	1	1069	1109
<b>Average</b>	<b>113</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>100</b>	<b>18</b>	<b>1</b>	<b>0</b>	<b>1398</b>	<b>1633</b>

#### Do Something

Link Name	J12 IDP Sites			J14 IDP Sites					Employment Sites			Other LP Allocations			Misc. Sites	Total Sites
	G1	G2	PS30	PS34	PS36	PS37a	PS37b	PS37c	PS20	PS47	PS43	PS19a	PS24	PS25		
A430 Northbound flow North of M5 J12 (away from M5)	324	0	49	0	0	0	0	0	19	6	119	100	0	0	2407	3024
A430 Southbound flow North of M5 J12 (towards M5)	470	0	132	0	0	0	0	0	19	13	339	0	0	0	2850	3823
B4008 Northbound flow South of M5 J12	51	60	5	0	1	0	0	0	8	1	262	0	0	0	772	1160
B4008 Southbound flow towards Cross Keys roundabout	0	18	156	3	4	0	2	1	1	0	3	3	3	3	281	477
B4008 Southbound flow South of M5 J12	27	79	2	0	0	0	0	0	2	0	852	5	0	0	1483	2450
M5 J12 Northbound offslip	90	26	13	0	0	0	0	0	22	6	82	106	0	0	1359	1704
M5 J12 Northbound onslip	375	0	113	0	0	0	0	0	0	0	111	0	0	0	1776	2375
M5 J12 Southbound offslip	184	53	33	0	0	0	0	0	0	0	431	0	0	0	1605	2306
M5 J12 Southbound onslip	67	61	19	0	1	0	0	0	26	13	33	0	0	0	902	1122
<b>Average</b>	<b>176</b>	<b>33</b>	<b>58</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>4</b>	<b>248</b>	<b>24</b>	<b>0</b>	<b>0</b>	<b>1493</b>	<b>2049</b>

#### Difference / Impact

Link Name	J12 IDP Sites			J14 IDP Sites					Employment Sites			Other LP Allocations			Misc. Sites	Total Sites
	G1	G2	PS30	PS34	PS36	PS37a	PS37b	PS37c	PS20	PS47	PS43	PS19a	PS24	PS25		
A430 Northbound flow North of M5 J12 (away from M5)	51	0	49	0	0	0	0	0	19	1	71	23	0	0	-303	-69
A430 Southbound flow North of M5 J12 (towards M5)	232	0	132	0	0	0	0	0	19	12	209	0	0	0	204	808
B4008 Northbound flow South of M5 J12	13	60	5	0	1	0	0	-1	8	1	164	-1	-1	-1	-5	243
B4008 Southbound flow towards Cross Keys roundabout	0	18	156	3	4	0	2	1	1	0	3	3	3	3	281	477
B4008 Southbound flow South of M5 J12	10	79	2	0	-1	0	0	0	2	0	501	2	-3	-1	588	1179
M5 J12 Northbound offslip	29	26	13	0	-1	0	0	0	22	1	39	25	-3	-1	2	152
M5 J12 Northbound onslip	183	0	113	0	0	0	0	0	0	0	68	0	0	0	160	524
M5 J12 Southbound offslip	11	53	33	0	0	0	0	0	0	0	254	0	0	0	90	441
M5 J12 Southbound onslip	39	61	19	0	1	0	0	-1	26	12	26	-1	-1	-1	-167	13
<b>Average</b>	<b>63</b>	<b>33</b>	<b>58</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>3</b>	<b>148</b>	<b>6</b>	<b>-1</b>	<b>0</b>	<b>94</b>	<b>416</b>

## Summary

### Do Minimum

Link Name	IDP Sites				Employment Sites	Miscellaneous Sites	Total Sites
	G1	G2	PS30	Total			
A430 Northbound flow North of M5 J12 (away from M5)	273	0	0	273	53	2787	3113
A430 Southbound flow North of M5 J12 (towards M5)	238	0	0	238	130	2647	3015
B4008 Northbound flow South of M5 J12	38	0	0	38	98	781	917
B4008 Southbound flow towards Cross Keys roundabout	0	0	0	0	0	0	0
B4008 Southbound flow South of M5 J12	17	0	0	17	351	903	1271
M5 J12 Northbound offslip	61	0	0	61	49	1442	1552
M5 J12 Northbound onslip	192	0	0	192	43	1616	1851
M5 J12 Southbound offslip	173	0	0	173	177	1515	1865
M5 J12 Southbound onslip	28	0	0	28	8	1073	1109
<b>Average</b>	<b>113</b>	<b>0</b>	<b>0</b>	<b>113</b>	<b>101</b>	<b>1418</b>	<b>1633</b>

### Do Something

Link Name	IDP Sites				Employment Sites	Miscellaneous Sites	Total Sites
	G1	G2	PS30	Total			
A430 Northbound flow North of M5 J12 (away from M5)	324	0	49	373	144	2507	3024
A430 Southbound flow North of M5 J12 (towards M5)	470	0	132	602	371	2850	3823
B4008 Northbound flow South of M5 J12	51	60	5	116	271	773	1160
B4008 Southbound flow towards Cross Keys roundabout	0	18	156	174	4	299	477
B4008 Southbound flow South of M5 J12	27	79	2	108	854	1488	2450
M5 J12 Northbound offslip	90	26	13	129	110	1465	1704
M5 J12 Northbound onslip	375	0	113	488	111	1776	2375
M5 J12 Southbound offslip	184	53	33	270	431	1605	2306
M5 J12 Southbound onslip	67	61	19	147	72	903	1122
<b>Average</b>	<b>176</b>	<b>33</b>	<b>58</b>	<b>267</b>	<b>263</b>	<b>1518</b>	<b>2049</b>

### Difference / Impact

Link Name	IDP Sites				Employment Sites	Miscellaneous Sites	Total Sites
	G1	G2	PS30	Total			
A430 Northbound flow North of M5 J12 (away from M5)	51	0	49	100	91	-280	-89
A430 Southbound flow North of M5 J12 (towards M5)	232	0	132	364	240	204	808
B4008 Northbound flow South of M5 J12	13	60	5	78	173	-8	243
B4008 Southbound flow towards Cross Keys roundabout	0	18	156	174	4	299	477
B4008 Southbound flow South of M5 J12	10	79	2	91	503	585	1179
M5 J12 Northbound offslip	29	26	13	68	62	22	152
M5 J12 Northbound onslip	183	0	113	296	68	160	524
M5 J12 Southbound offslip	11	53	33	97	254	90	441
M5 J12 Southbound onslip	39	61	19	119	64	-170	13
<b>Average</b>	<b>63</b>	<b>33</b>	<b>58</b>	<b>154</b>	<b>162</b>	<b>100</b>	<b>416</b>

### Impact Summary

IDP Sites + Employment Sites	316	76%
Miscellaneous Sites	100	24%
<b>Total Sites</b>	<b>416</b>	<b>100%</b>

## M5 Junction 14 Network

### AM Peak Hour - Two-Way Trips

#### Do Minimum

Link Name	J12 IDP Sites			J14 IDP Sites					Employment Sites			Other LP Allocations			Misc. Sites	Total Sites
	G1	G2	PS30	PS34	PS36	PS37a	PS37b	PS37c	PS20	PS47	PS43	PS19a	PS24	PS25		
M5 J14 Northbound offslip	0	0	0	0	0	0	0	0	0	0	0	0	0	0	482	482
M5 J14 Northbound onslip	0	0	0	0	0	0	0	0	0	26	0	0	0	0	882	908
M5 J14 Southbound offslip	8	0	0	0	0	0	0	0	0	0	0	18	0	0	760	786
M5 J14 Southbound onslip	0	0	0	8	66	0	0	8	0	172	0	0	53	14	1328	1648
<b>Average</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>50</b>	<b>0</b>	<b>5</b>	<b>13</b>	<b>3</b>	<b>863</b>	<b>956</b>

#### Do Something

Link Name	J12 IDP Sites			J14 IDP Sites					Employment Sites			Other LP Allocations			Misc. Sites	Total Sites
	G1	G2	PS30	PS34	PS36	PS37a	PS37b	PS37c	PS20	PS47	PS43	PS19a	PS24	PS25		
M5 J14 Northbound offslip	0	0	0	0	0	0	0	0	0	0	0	0	0	0	600	600
M5 J14 Northbound onslip	0	0	0	0	0	0	0	0	0	44	0	0	0	0	860	904
M5 J14 Southbound offslip	18	10	4	0	0	0	0	0	4	0	2	24	0	0	760	822
M5 J14 Southbound onslip	0	0	0	48	388	68	74	0	0	162	0	0	113	29	1242	2124
<b>Average</b>	<b>5</b>	<b>3</b>	<b>1</b>	<b>12</b>	<b>97</b>	<b>17</b>	<b>19</b>	<b>0</b>	<b>1</b>	<b>52</b>	<b>1</b>	<b>6</b>	<b>28</b>	<b>7</b>	<b>866</b>	<b>1113</b>

#### Difference / Impact

Link Name	J12 IDP Sites			J14 IDP Sites					Employment Sites			Other LP Allocations			Misc. Sites	Total Sites
	G1	G2	PS30	PS34	PS36	PS37a	PS37b	PS37c	PS20	PS47	PS43	PS19a	PS24	PS25		
M5 J14 Northbound offslip	0	0	0	0	0	0	0	0	0	0	0	0	0	0	118	118
M5 J14 Northbound onslip	0	0	0	0	0	0	0	0	0	18	0	0	0	0	-22	-4
M5 J14 Southbound offslip	10	10	4	0	0	0	0	0	4	0	2	6	0	0	0	36
M5 J14 Southbound onslip	0	0	0	40	322	68	74	-8	0	-10	0	0	60	16	-86	476
<b>Average</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>10</b>	<b>80</b>	<b>17</b>	<b>19</b>	<b>-2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>15</b>	<b>4</b>	<b>3</b>	<b>157</b>

### Summary

#### Do Minimum

Link Name	IDP Sites						Employment Sites	Miscellaneous Sites	Total Sites
	PS34	PS36	PS37a	PS37b	PS37c	Total			
A430 Northbound flow North of M5 J12 (away from M5)	0	0	0	0	0	0	0	482	482
A430 Southbound flow North of M5 J12 (towards M5)	0	0	0	0	0	0	26	882	908
B4008 Northbound flow South of M5 J12	0	0	0	0	0	0	0	786	786
B4008 Southbound flow towards Cross Keys roundabout	8	66	0	0	8	82	172	1394	1648
<b>Average</b>	<b>2</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>21</b>	<b>50</b>	<b>886</b>	<b>956</b>

#### Do Something

Link Name	IDP Sites						Employment Sites	Miscellaneous Sites	Total Sites
	PS34	PS36	PS37a	PS37b	PS37c	Total			
A430 Northbound flow North of M5 J12 (away from M5)	0	0	0	0	0	0	0	600	600
A430 Southbound flow North of M5 J12 (towards M5)	0	0	0	0	0	0	44	860	904
B4008 Northbound flow South of M5 J12	0	0	0	0	0	0	6	816	822
B4008 Southbound flow towards Cross Keys roundabout	48	388	68	74	0	578	162	1384	2124
<b>Average</b>	<b>12</b>	<b>97</b>	<b>17</b>	<b>19</b>	<b>0</b>	<b>145</b>	<b>53</b>	<b>915</b>	<b>1113</b>

#### Difference / Impact

Link Name	IDP Sites						Employment Sites	Miscellaneous Sites	Total Sites
	PS34	PS36	PS37a	PS37b	PS37c	Total			
A430 Northbound flow North of M5 J12 (away from M5)	0	0	0	0	0	0	0	118	118
A430 Southbound flow North of M5 J12 (towards M5)	0	0	0	0	0	0	18	-22	-4
B4008 Northbound flow South of M5 J12	0	0	0	0	0	0	6	30	36
B4008 Southbound flow towards Cross Keys roundabout	40	322	68	74	-8	496	-10	-10	476
<b>Average</b>	<b>10</b>	<b>80</b>	<b>17</b>	<b>19</b>	<b>-2</b>	<b>124</b>	<b>4</b>	<b>29</b>	<b>157</b>

### Impact Summary

IDP Sites + Employment Sites	128	81%
Miscellaneous Sites	29	19%
<b>Total Sites</b>	<b>157</b>	<b>100%</b>



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