

1 The Square, Temple Quay
2nd Floor
Bristol, BS1 6DG
United Kingdom
T +44 (0)117 910 2580
F +44 (0)117 910 2581
www.iacobs.com

Subject	Development Testing at M5 J14 ADDENDUM	Project Name	M5 J14 VISSIM Model
Attention	Highways England	Project No.	679475CH.DP.GC.AF
From	Lee Templeman/ George Nock		
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Copies to	Rachel Sandy, Nigel Gorski		

1. Introduction

In support of planning application PT18/6450/0, known as Land West of Park Farm - 595 residential dwellings, a neighbourhood hub (local centre) comprising up to 700m² retail and community land uses, and a primary school - Stantec undertook a 2021 'opening year' capacity assessment of the development proposals at the M5 J14, utilising Highways England's VISSIM model, which is the approved platform for testing development impact at the junction.

The modelling assessment demonstrated that on the sensitive northbound off-slip, the development proposals would result in a vehicle queue increase of 3m from 1,184m to 1,187m (less than one car length) during the morning peak period compared to the 'without development' scenario.

Since this work was undertaken by Stantec there have been material changes to the committed developments used as part of the forecast assessment.

This Technical Note presents the findings of further VISSIM modelling assessing the impact of development, specifically the Land West of Park Farm (WoPF) site, on the M5 J14 interchange for a 2021 forecast year. This is to ensure consistency with likely year of opening for this site.

2. Methodology

2.1 Modelling Approach

As before, the assessment has been carried out using the Highways England M5 J14 VISSIM 2016 model. This model simulates the weekday AM peak period from 7:00-9:00am and the PM peak period from 4:00-6:00pm. Further details can be found in the Local Model Validation Report (March 2017).

2.2 Committed Development

The model assessment year is 2021, which incorporates planning data provided by Stroud District Council and South Gloucestershire District Council. This data is presented in the M5 J14 Development Tracker. Since the previous analysis undertaken by Stantec, using V3 of the Development Tracker, there have been changes in the planning assumptions based upon information provided by relevant local Planning Authorities. The latest version of the Development Tracker is V5.6.

The Development Tracker is a live document which continues to be updated as the planning situation changes.

2.3 Background Growth

In addition to committed development growth, an allowance for general traffic growth from 2016 to 2021 has been made using TEMPro (v7.2) factors. This has been adjusted to prevent double counting of committed development. The TEMPro factors used in the model are shown in **Table 2.2**.

Table 2.2: TEMPro Growth Factors to 2021 (Stroud/South Gloucestershire)

Period	TEMPro Factor
AM Peak	1.051
PM Peak	1.056

2.4 Improvement Scheme

The WoPF site includes a proposed mitigation scheme at M5 J14 involving a 350m extension of the two-lane section on the M5 northbound off-slip. This is shown in SKM Drawing 39209-5501-SK31. This mitigation has been assessed as a mitigation scenario.

2.5 Scenarios Modelled

The scenarios assessed for 2021 and presented in this Technical Note comprise the following:

- 2021 'Reference Case' – comprised of committed development and TEMPro growth;
- 2021 'Development Case' – the Reference Case plus WoPF site traffic; and
- 2021 'Mitigation Case' – the Development Case but including the proposed mitigation (see 2.4).

Since the forecast operational issues relating to the M5 northbound off-slip occur only during the weekday AM peak, the assessment has been carried out for the AM peak period only.

2.6 Seed Runs

To ensure statistically robust outputs, and taking into account the variability in modelled conditions, in particular the difference between each seed run in queuing on the M5 northbound off-slip, the models were run for 80 seed runs.

3. Assessment

The focus of the assessment is on the impact of the WoPF site on queue lengths on the M5 northbound off-slip approach, and the reduction brought about by the proposed mitigation.

Table 3.1 compares the modelled average maximum AM peak hour (8:00-9:00am) across the three scenarios modelled.

Table 3.1: M5 J14 northbound off-slip modelled average maximum queues (metres), 8:00-9:00am

Parameter	Ref Case	Devt Case	Mit Case
Mean max queue	1,241	1,265	1,046

The results show that the introduction of the WoPF site increases average maximum queue length on the northbound off-slip by 24 metres. The proposed mitigation is expected to reduce queue lengths to below Reference Case levels.

Figure 3.1 compares the modelled maximum queue length profile on the M5 northbound off-slip for the three scenarios modelled. As before, it shows progressively increasing queue lengths with the proposed mitigation showing an overall reduced extent of queueing.

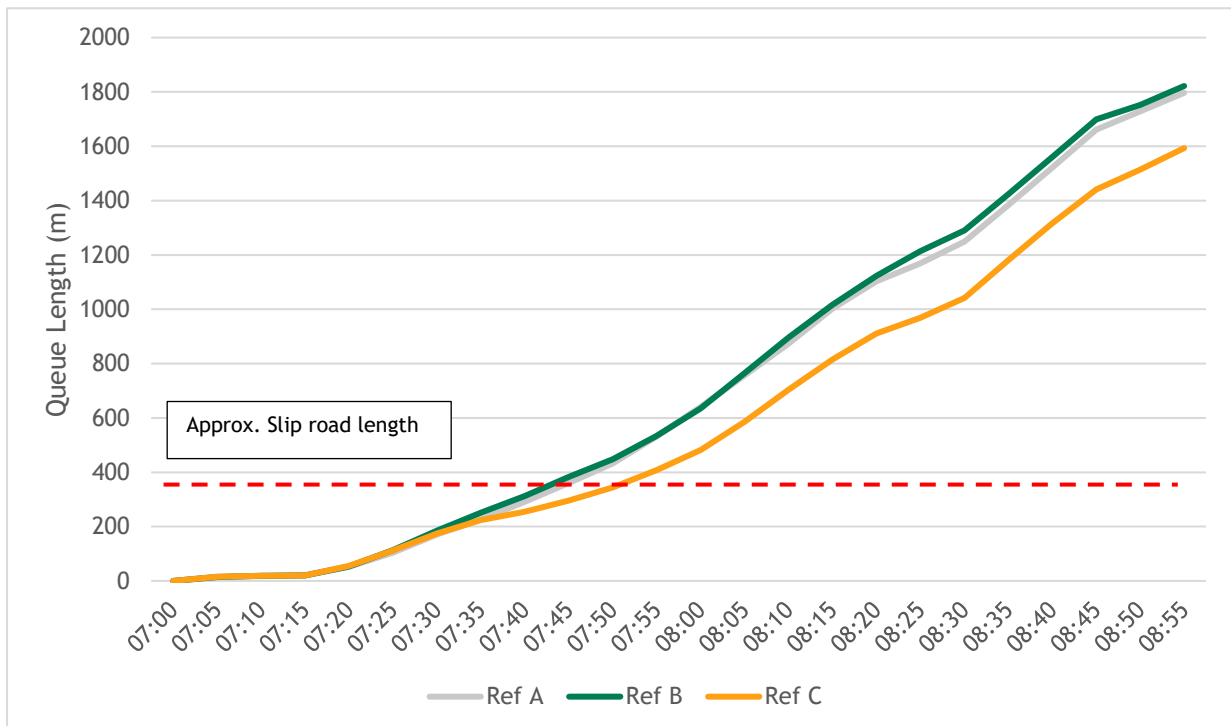


Figure 3.1: M5 northbound off-slip maximum queue profile, AM

4. Summary

This Technical Note has presented the results of further VISSIM modelling work looking at the impact of the WoPF site on the M5 J14 interchange. This work has been carried out for a 2021 opening year.

The focus of the assessment has been on the safety critical impact of the development on the northbound off-slip which is expected to suffer from mainline queuing during the weekday AM peak. A total of 80 seed runs have been carried out to ensure a statistically robust set of results.

The results show that the WoPF site is expected to increase queuing on the northbound off-slip by 24m.

The assessment also shows, as before, that the proposed mitigation scheme to increase the two lane section of the northbound off-slip by some 350m does provide a reduction in queuing throughout the modelled AM period.