

Staplehurst, Maidstone Cuckolds Corner Junction Review

Technical Note: Further junction capacity
assessment results

February 2016

Maidstone Borough Council

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Maidstone House
King Street
Maidstone
ME15 6JQ

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1 Introduction

1.1 Overview

Mott MacDonald was commissioned by Maidstone Borough Council (MBC) to update the junction assessments carried out in November and December 2015. The previous assessments were documented in a Technical Note dated December 2015 (344395/ITD/TPS/007/A).

As a result of the resolution agreed at the meeting of the Maidstone Joint Transportation Board held on 7 December 2015 and SPS&T Committee held on 14 December 2015 which resulted in the VISUM Strategic Model presently being re-run with its base adjusted to 2022, it was considered appropriate to test the junction of Cuckolds Corner with 2022 base data.

1.2 Scope of works

The following scope of works has been undertaken:

- Run TEMPRO for 2022 taking out any additional housing growth within Staplehurst leaving background growth only;
- Revise the base flows to 2022;
- Add development to the above base flows to create “with development” flows;
- Check base flows and with development flows;
- Re run the November 2015 Linsig models (AM / PM, with / without development, and with development flows reduced by 10% which is considered achievable through Travel Plan measures); and
- The results were then checked and summarised in this technical note.

2 Revised Base Flows

2.1 TEMPRO Growth to 2022

Future growth from 2014-2022 identifies an increase in housing of 201 households, which is a total increase of 9%. By adding the development traffic of approximately 900 units, the 200 units included in TEMPRO are double counted.

TEMPRO has therefore been adjusted to no household growth, just leaving the general background growth. This results in the following growth factors:

Table 2.1: Tempro growth rates for Staplehurst –2014-2022

Time period	Factor
AM peak	1.060773235
PM peak	1.060508571

2.2 Revised 2022 flows

Based on the above factors, the 2022 base flows were calculated. They are shown in the figures below.

Figure 2.1: 2022 AM Base Flows

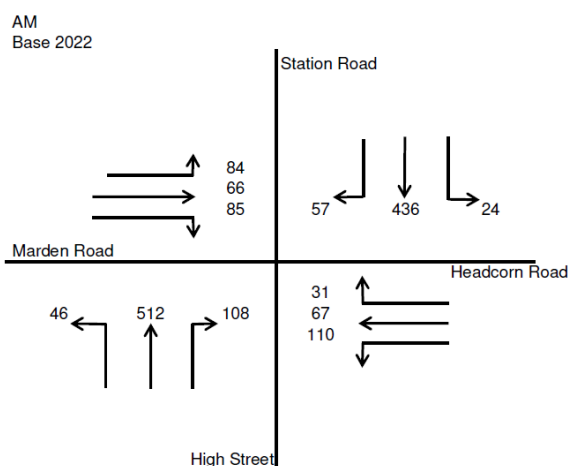
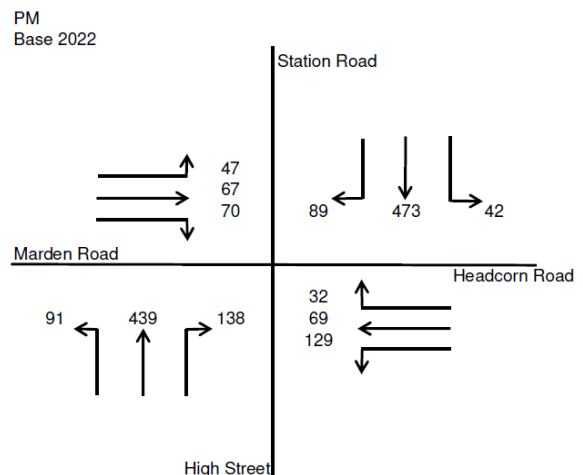


Figure 2.2: 2022 PM Base Flows



2.3 Revised 'with development' flows

The development flows were added to the 2022 Base flows as shown in Section 2.2. The revised 'with development' flows are shown below.

Figure 2.3: 2022 AM 'with development' flows

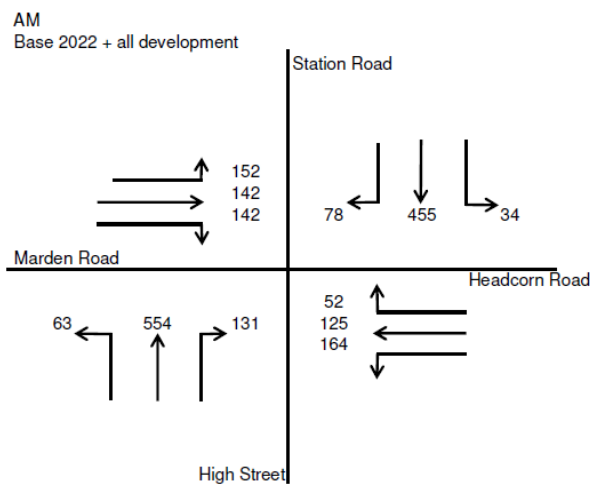
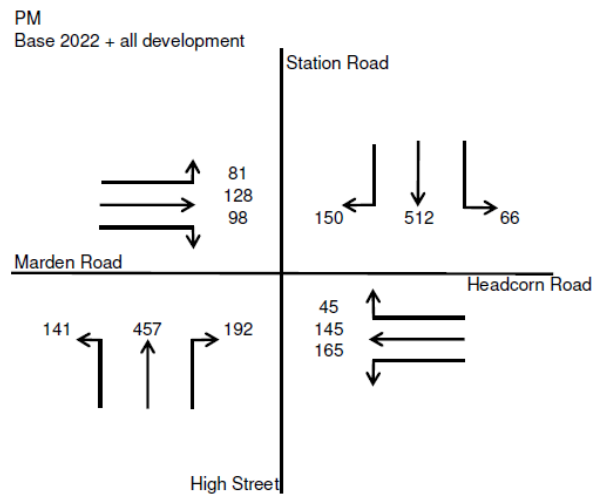


Figure 2.4: 2022 PM 'with development' flows



2.4 Revised 'with development -10%' flows

The development flows were then reduced by 10% to reflect any Travel Plan measures. The revised 'with development -10%' flows are shown below.

Figure 2.5: 2022 AM 'with development -10%' flows

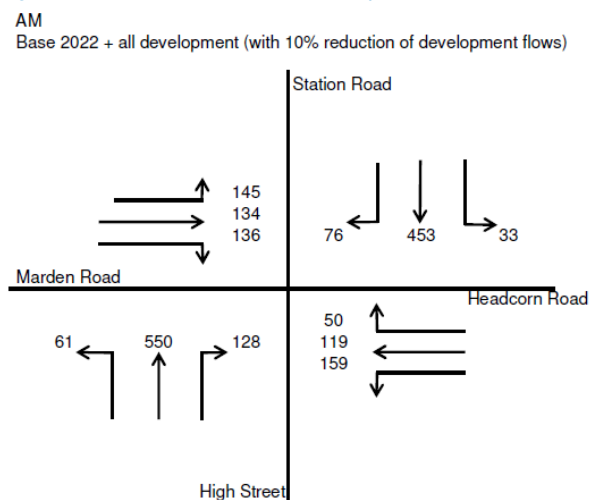
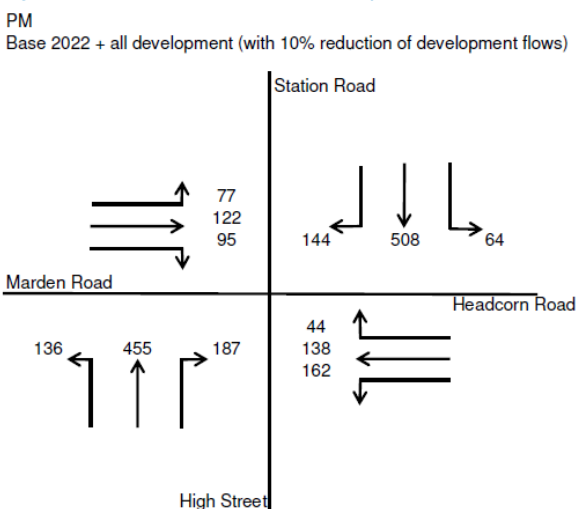


Figure 2.6: 2022 PM 'with development -10%' flows



3 Revised LinSig Testing

3.1 LinSig Results

The results of the re-modelling for 2022 are shown in the tables below. These include TEMPRO adjustments to include no additional residential development for Staplehurst, just background growth.

Table 3.1: Base 2022 – Existing Layout

Movement	AM		PM	
	DoS (%)	Mean Max Queue (PCU)	DoS (%)	Mean Max Queue (PCU)
A229 Station Road	56.7	13	68.8	16
Headcorn Road	78.4	13	84.4	15
A229 High Street	79.5	22	82.7	26
Marden Road	80.8	15	81.3	12
Practical Reserve Capacity (PRC) ~ over all lanes		11.3%		6.7%

Table 3.2: 2022 + Development - Improved Layout

Movement	AM		PM	
	DoS (%)	Mean Max Queue (PCU)	DoS (%)	Mean Max Queue (PCU)
A229 Station Road	97.5	18	79.6	20
Headcorn Road	97.9	25	103.9	34
A229 High Street	98.4	32	103.1	22
Marden Road	98.3	30	128.4	63
Practical Reserve Capacity (PRC) ~ over all lanes		-9.3%		-17.4%

Table 3.3: 2022 + Development (10% reduction in development flows) – Improved Layout

Movement	AM		PM	
	DoS (%)	Mean Max Queue (PCU)	DoS (%)	Mean Max Queue (PCU)
A229 Station Road	85.0	17	78.9	20
Headcorn Road	94.2	21	100.8	29
A229 High Street	94.7	27	99.8	18
Marden Road	93.7	26	98.2	24
Practical Reserve Capacity (PRC) ~ over all lanes		-5.2%		-12.0%

3.2 Conclusion

The re-modelling shows that the junction performs within desirable capacity in the Base in 2022 with the existing layout with all arms below 90% saturation in both the AM and PM peak.

In the 2022 'with development' scenario, all arms are within the theoretical capacity of the junction (under 100% saturated) in the AM peak, with three arms exceeding theoretical capacity in the PM peak. When compared with the base, queues increase significantly on the side roads, and increase to a much lesser extent on the A229 approaches.

A third scenario has been tested reducing the development flows by 10%. It is usually accepted that a strong travel plan can achieve such reductions. In this scenario, all arms are within theoretical capacity in the AM peak with one arm being within desirable capacity (below 85%). In the PM peak, only one arm exceeds theoretical capacity very slightly with all other arms operating below 100% saturation. Queues increase slightly on the A229 approaches (except for A229 NB in the PM peak which reduces relative to the base). It is accepted however, that they nearly double on the side road approaches, however they are not significantly greater than the overall maximum queues in the Base scenario, e.g. maximum queue in PM Base is 26PCU on A229 NB and maximum queue in PM with Development (-10%) is 29PCU on Headcorn Road.

The improved layout would allow the junction to perform almost entirely within its theoretical capacity in 2022 with development traffic as long as a reduction of 10% (of the development traffic) is achievable through travel planning measures. Queuing would be of a similar level to that in the base. The impact of the development is not considered severe although the proposed junction layout does not entirely mitigate the impact of all the development in Staplehurst.