

## York Local Plan Review

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### Task Overview

This note is a review of the future year York traffic model results provided by City of York Council on 3rd August 2018 to identify whether the model is showing any potential issues on the A64 and its junctions in the future that will require mitigation as a result of the York Local Plan.

### Forecasting Scenarios

York has produced a number of forecast year scenarios through discussion with SYSTRA in order to derive forecasts that best represent the impact of the Local Plan. These included:

- TEMPRO constrained
- Fully unconstrained
- Strategic sites unconstrained
- Modified
- Furnessed

A summary of the matrix totals is shown in Table 1. Table 2 shows the number of development trips to and from the zones representing two of the strategic sites in the vicinity of Grimston Bar, 'Land west of Elvington Lane' (zone 329) and the site at the University (zone 412) for each of the scenarios. Traffic from both sites has been loaded to the network at a new junction on the A64 between Hopgrove and Grimston Bar.

**Table 1 Matrix Totals**

Scenario	AM	PM
1. TEMPRO constrained	41,560	44,966
2. Fully unconstrained	39,479	43,127
3. ST Sites unconstrained	41,577	44,975
4. Modified	39,064	42,824
5. Furnessed	42,733	45,535

**Table 2 Strategic Site Arrival and Departure checks**

Zone / Peak / Direction		Forecast Trips	1. TEMPRO		2. Unconstrained		3. Strategic Trips Unconstrained		4. Modified		5. Furnessed	
			Model Flow	% of Forecast	Model Flow	% of Forecast	Model Flow	% of Forecast	Model Flow	% of Forecast	Model Flow	% of Forecast
329 AM	ArRs	432	287	66%	315	73%	287	66%	453	105%	470	109%
	DePs	1405	716	51%	931	66%	716	51%	1608	114%	1138	81%
329 PM	ArRs	980	548	56%	633	65%	548	56%	1212	124%	1011	103%
	DePs	479	336	70%	361	75%	336	70%	594	124%	423	88%
412 AM	ArRs	92	60	65%	62	68%	60	65%	115	125%	138	150%
	DePs	298	217	73%	236	79%	217	73%	379	127%	283	95%
412 PM	ArRs	208	159	77%	162	78%	159	77%	269	129%	221	106%
	DePs	102	84	83%	85	84%	83	82%	132	130%	99	98%

Table 2 shows that the first 3 scenarios under estimate the trips for the two strategic sites, represented by zones 329 and 412. The fourth scenario over estimates the trips for the two strategic sites. The fifth 'furnished' scenario provides the best representation of these zones, however, it under-represents departures from zone 329, particularly in the morning peak.

For the furnished scenario, assuming the same distribution of trips from zone 329 in the morning peak there could potentially be a further 170 trips on the A64 northbound north of Grimston Bar and 220 trips southbound on the A64 south of the new junction. In the evening peak there could potentially be a further 100 trips on the A64 northbound north of Grimston Bar and 126 trips southbound on the A64 south of the new junction. This needs to be taken into account when considering the volume to capacity ratios at each of the junctions.

## Results from Furnessed Scenario

This section set out the model results for the Furnessed scenario, which provides the most accurate forecasts for the two strategic sites in question.

### Queued Traffic

Figure 1 shows the trips which do not pass through the network in the modelled hour. As can be seen, this is significant, particularly in the evening peak where between 118 and 243 trips cannot get on to the A64 southbound as they are blocked at constraints on various parts of the network as shown in Figure 2.

Some of the constraints appear to be as a result of the capacities of the links and saturation flows at junctions. The values used in the base model are low compared with guidance given in the Highways England Regional Transport Model Coding Manual. However, some of these constraints suggest that an improvement may be required both on the strategic road network or the local road network. As the model has been calibrated and validated, it is not recommended changing capacities and saturation flows without checking that the base model still calibrates and validates. This will not be possible before the EiP. Therefore, the amount of queued flow at each junction has been taken into consideration when determining whether any mitigation is required.

Figure 1 Traffic that does not pass through the model (demand - actual)

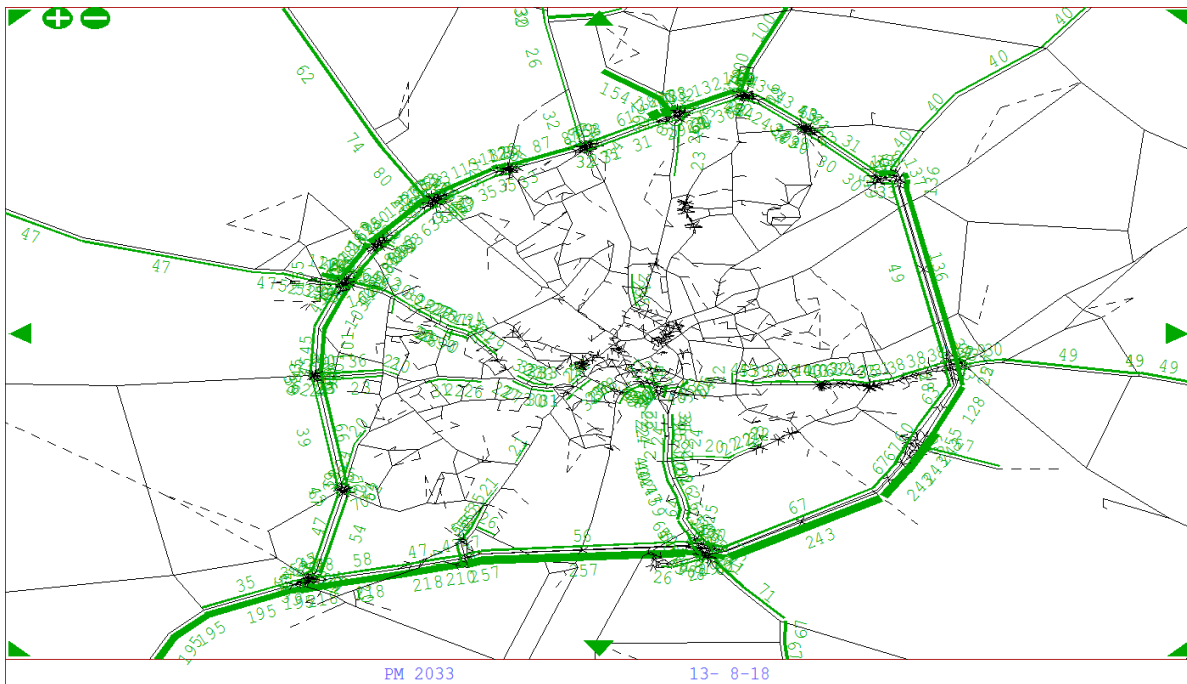
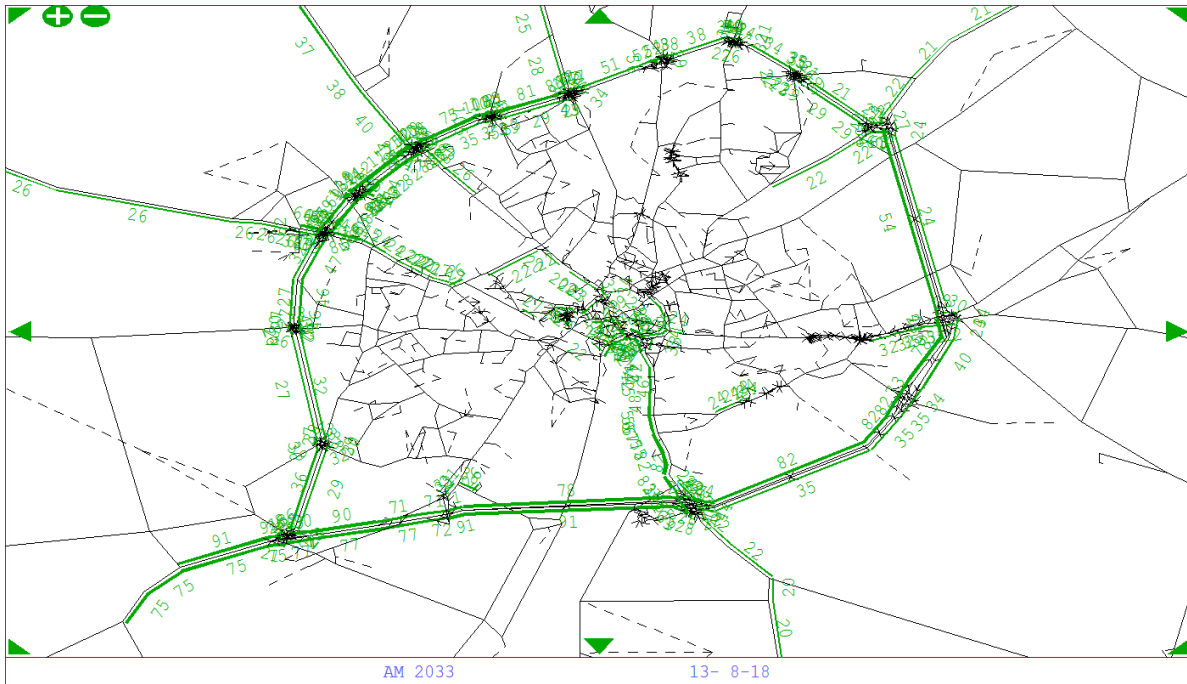
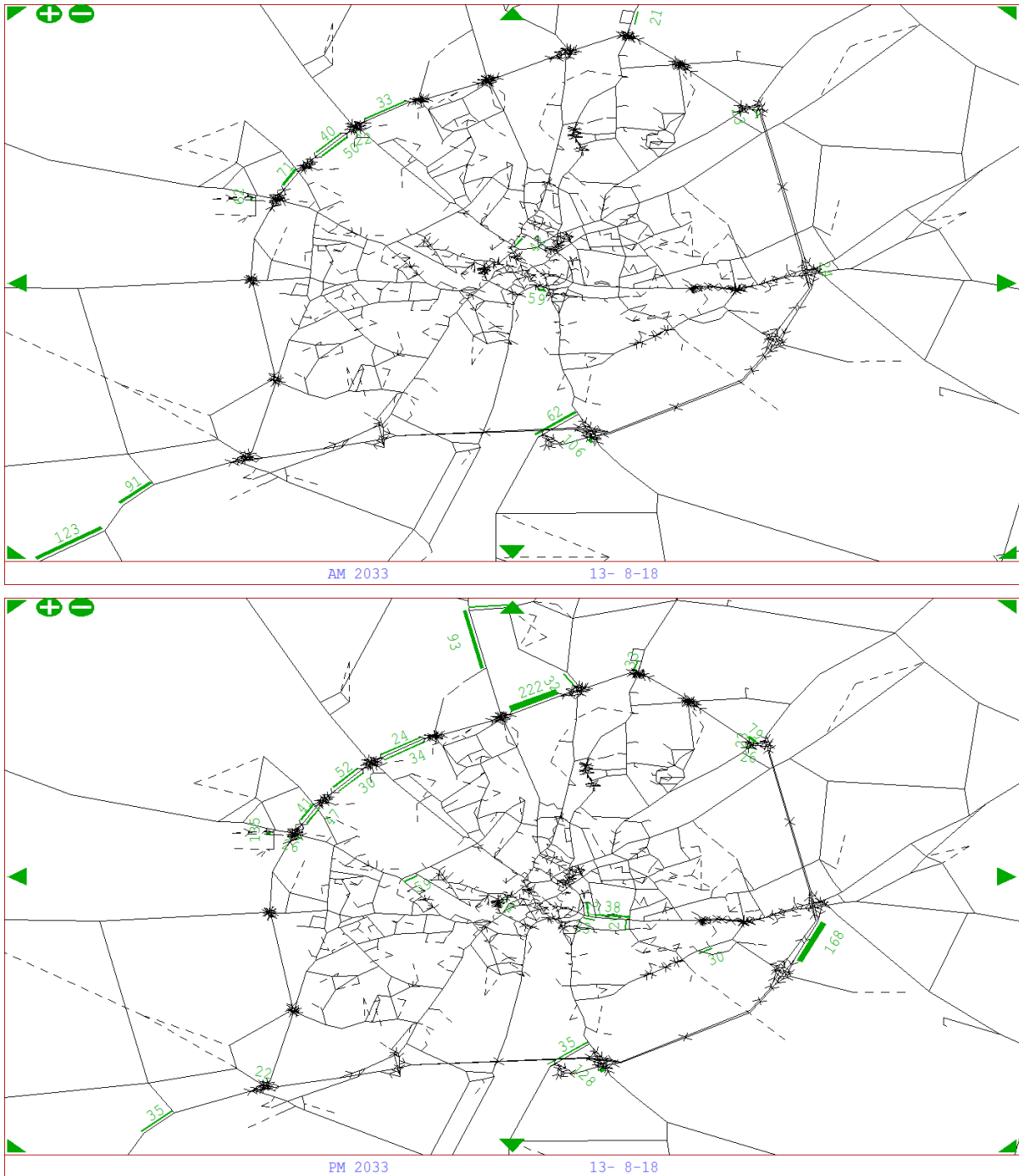


Figure 2: Queue at end of time period



### Junction Results

Each of the junctions on the SRN were examined in turn and the outputs are presented below. The first figure showing the volume to capacity ratio (v/c) % which indicates where the junctions are operating near or over capacity. V/c ratios over 85% represent junctions which are nearing capacity and mitigation may be required. However, v/c ratios over 70% have been plotted to take into account that there is queued flow which has not been able to reach the junctions in the modelled hour, as shown in the second set of figures for each junction. If this traffic were to reach these locations it could result in the junctions operating near or above capacity and hence require mitigation.

A1237 Hopgrove

Figure 3 – Volume to capacity ratio >70% - Hopgrove

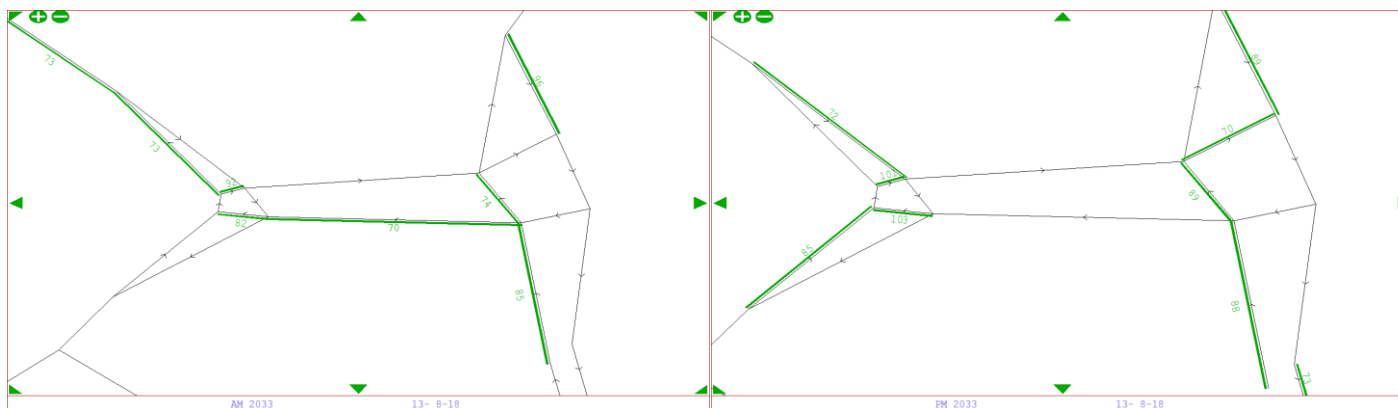


Figure 4 – Queued flow – Hopgrove

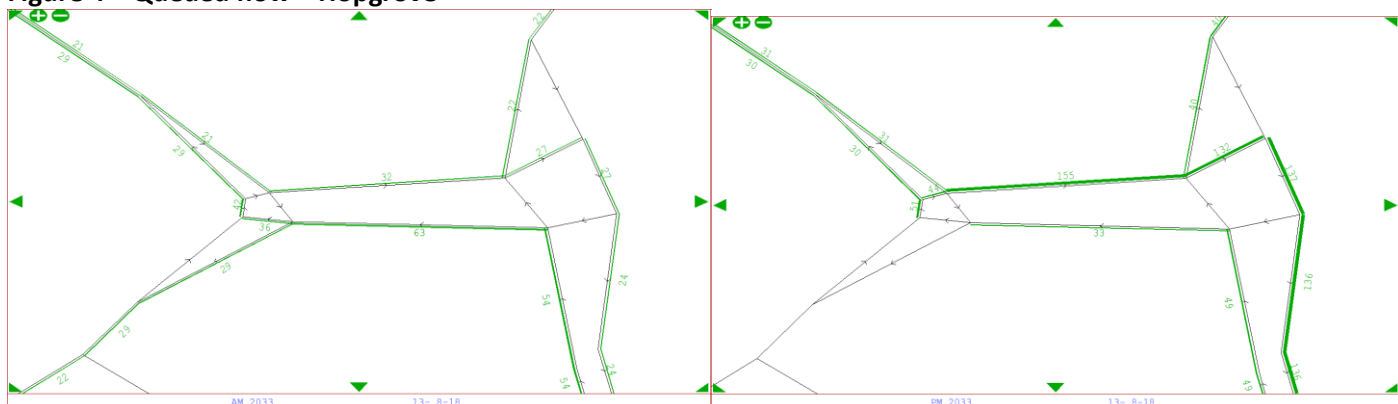


Figure 3 shows that the A64 southbound on approach to the roundabout is operating above 85% in both the morning and evening peak. In the evening peak the circulatory operates over 70%. In addition, in the evening peak Figure 4 shows that there is a significant amount of queued flow which would use the circulatory. Therefore, SYSTRA would recommend that this junction is tested in a local junction model using the demand flows to identify whether any mitigation is required.

A1079 Grimston Bar

Figure 5 – Volume to capacity ratio >70% - Grimston Bar

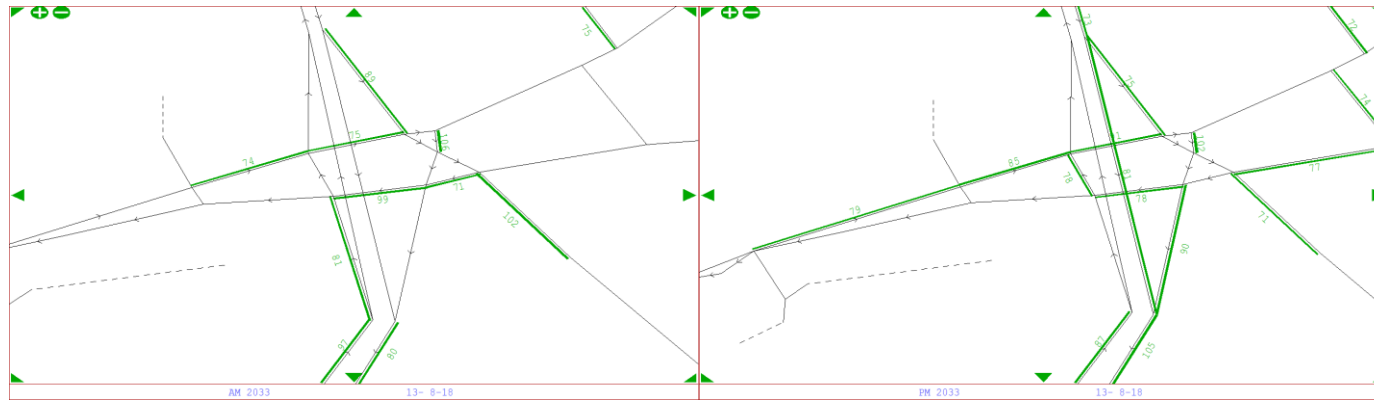


Figure 6 – Queued flow – Grimston Bar

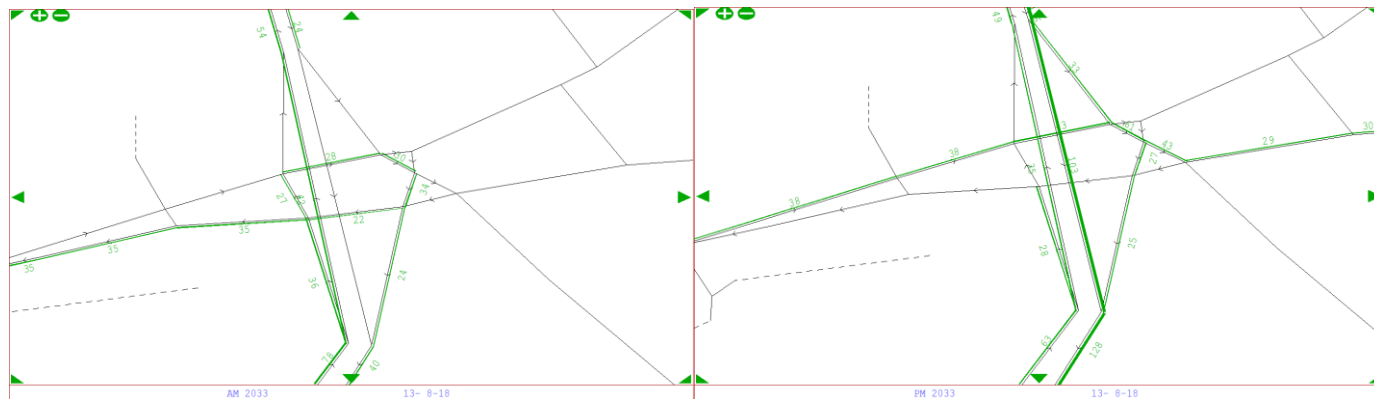


Figure 5 shows that both off slip approaches and the corresponding circulatory lanes are operating near to capacity in the morning peak. In the evening peak the southbound off slip and the corresponding circulatory are operating over capacity. Figure 6 shows that there is queued flow at these locations. Therefore, SYSTRA would recommend that this junction is tested in a local junction model using the difference in demand flows applied to observed base traffic flows to identify whether any mitigation is required.

Figure 6 also shows that there are potential capacity issues with the northbound diverge in the morning peak and the southbound diverge in the evening peak. Therefore, SYSTRA would recommend that the merges and diverges are assessed in accordance with DMRB using the difference in future year demand flows applied to observed base traffic flows to identify whether any mitigation is required.

New Junction on A64

Figure 7 – Volume over Capacity Ratio >70% - New junction on A64

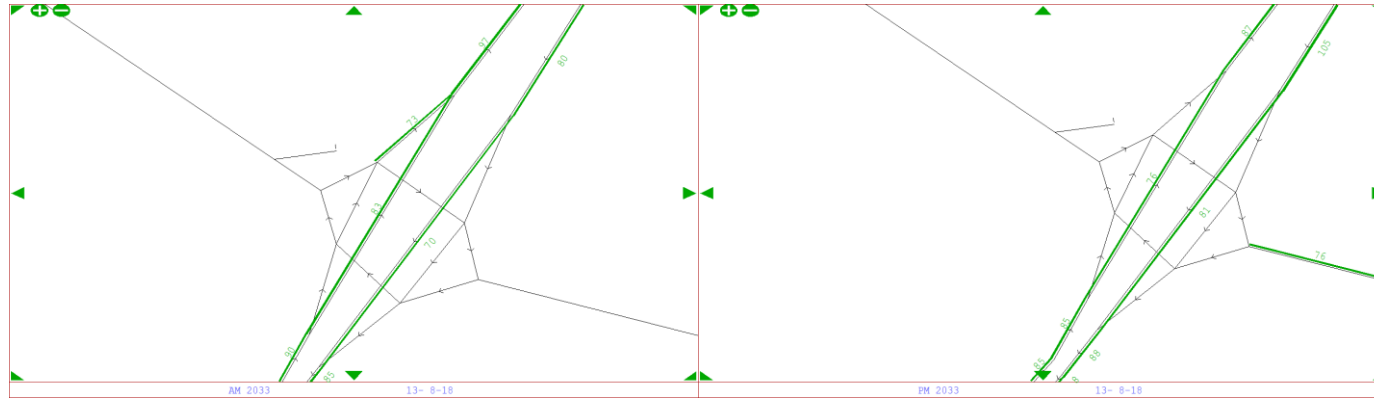
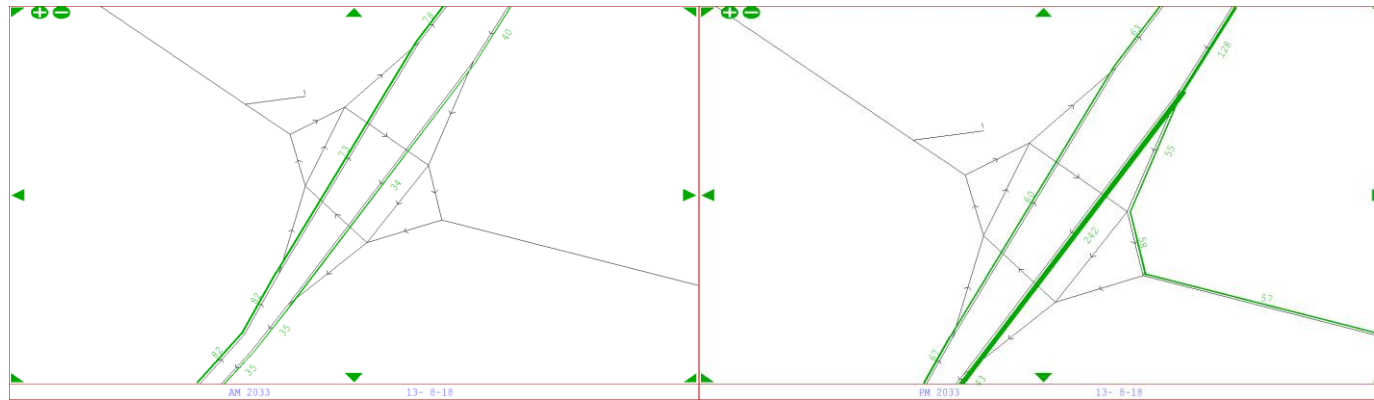


Figure 7 shows that there are no capacity issues with the junction. However, there are capacity issues with the merges and diverges. Therefore, SYSTRA would recommend that the merges and diverges are assessed in accordance with DMRB using the difference in future year demand flows applied to observed base traffic flows to identify whether any mitigation is required.

Figure 8 – Queued Flow – New junction on A64



A19 Fulford Road junction

Figure 9 – Volume over Capacity Ratio >70% - Fulford Road junction

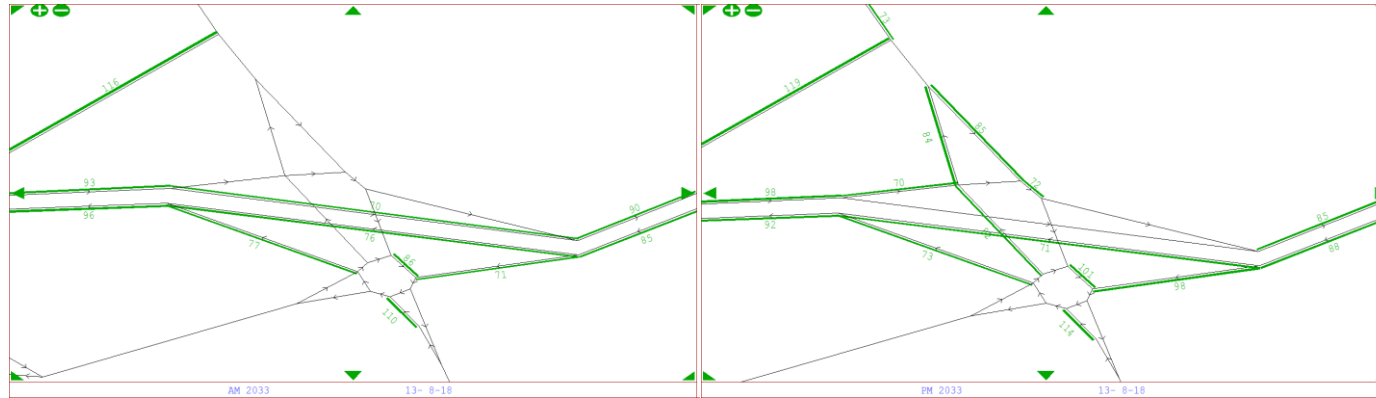


Figure 10 – Queued Flow – Fulford Road junction

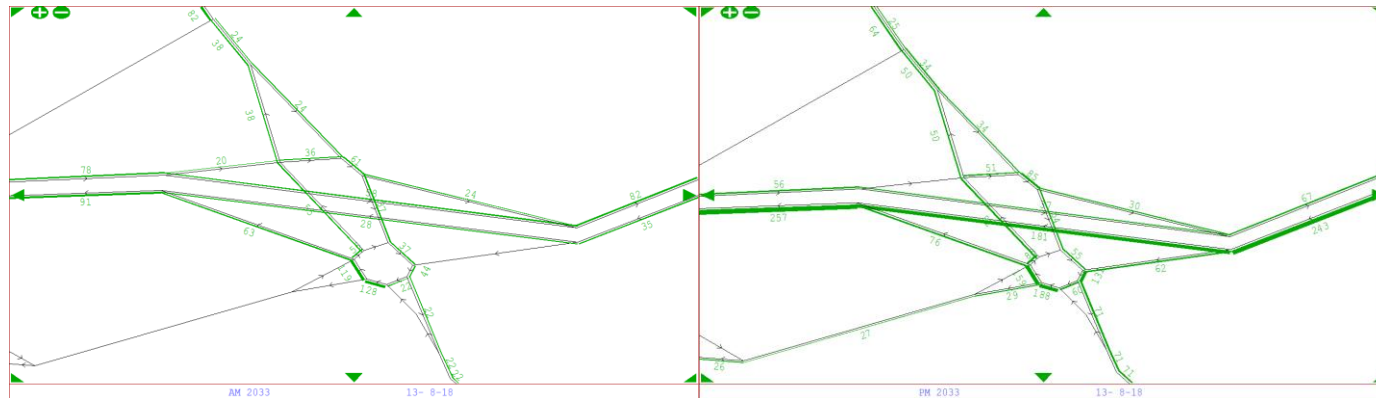


Figure 9 shows potential capacity issues on the roundabout south of the A64 in both the morning and evening peaks. In addition, Figure 10 shows that there is queued flow which would increase the demand at this junction in both peak hours. There are also potential capacity issues to the north of the A64. Again, there is the potential of queued flow increasing the demand at this roundabout in both peak hours. Therefore, SYSTRA would recommend that the junction should be tested using a local junction model using the difference in demand flows applied to observed base traffic flows to identify whether any mitigation is required.

Figure 10 also shows that there are potential capacity issues with the northbound diverge in the morning peak and the southbound diverge in the evening peak. Therefore, SYSTRA would recommend that the merges and diverges are assessed in accordance with DMRB using the difference in future year demand flows applied to observed base traffic flows to identify whether any mitigation is required.



A1036 Tadcaster Road junction

Figure 11 – Volume over Capacity Ratio >70% - Tadcaster Road junction

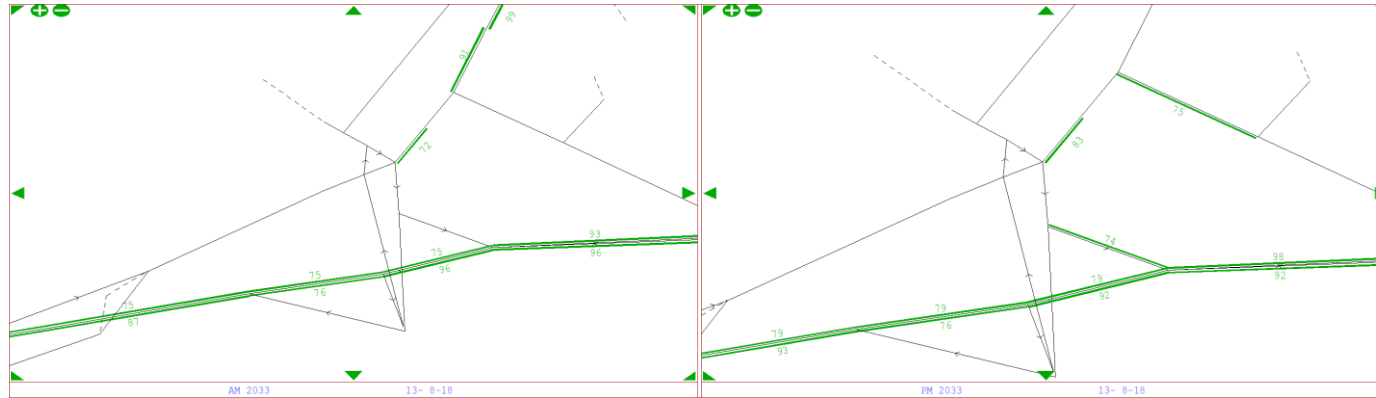


Figure 12 – Queued Flow – Tadcaster Road junction

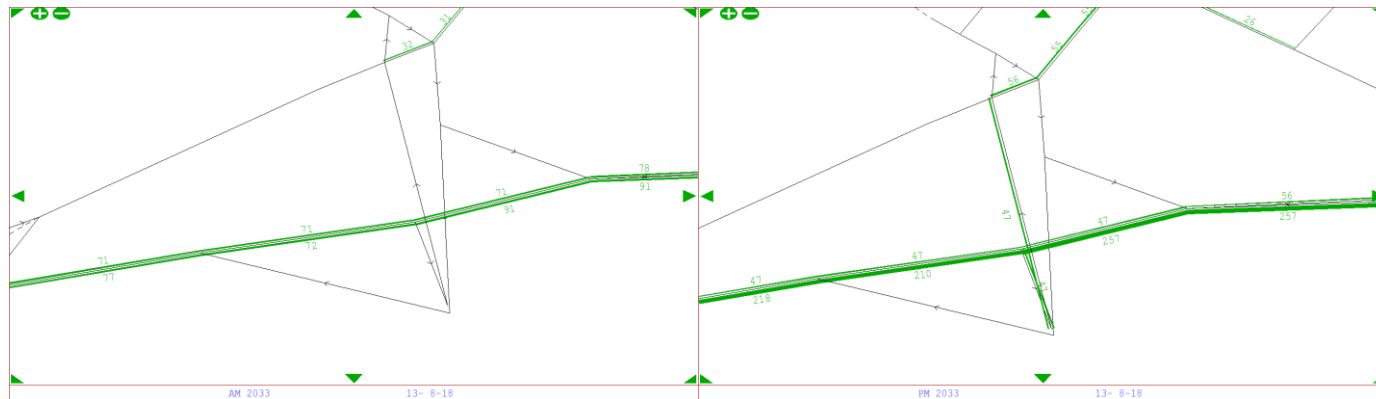


Figure 11 shows that the signalised junction to the north of the A64 is operating near capacity, however, this is only on the local road approaches to the junction. As the strategic road network approaches are acceptable SYSTRA would recommend that Highways England would not require this junction to be tested using a local junction model.

However, Figure 11 shows that there are potential capacity issues with the mainline, merges and diverges in both the morning peak and evening peaks. Therefore, SYSTRA would recommend that the merges and diverges are assessed in accordance with DMRB using the difference in future year demand flows applied to observed base traffic flows to identify whether any mitigation is required.

A1237 Copmanthorpe junction

Figure 13 – Volume over Capacity Ratio >70% -A1237 Copmanthorpe junction

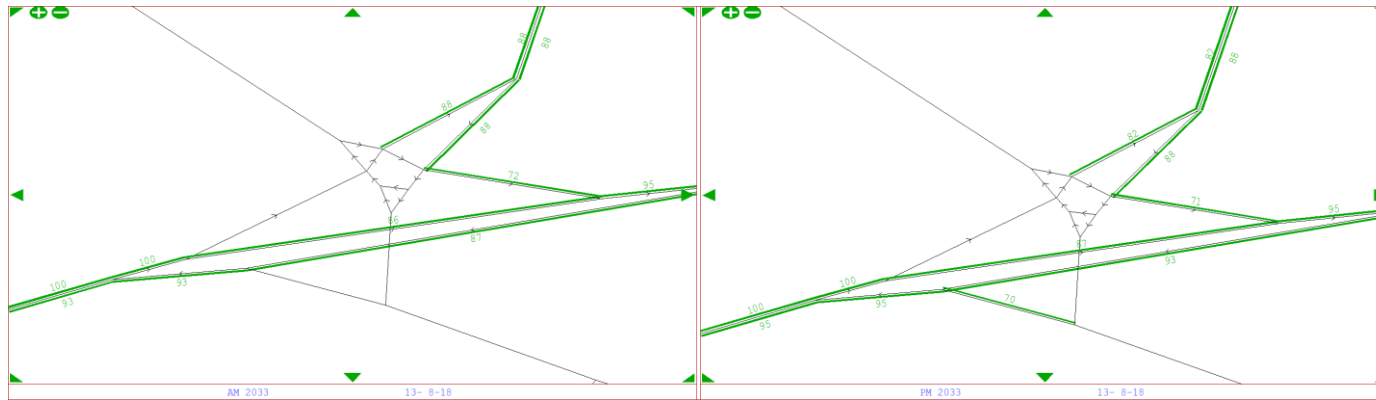


Figure 14 – Queued Flow – A1237 Copmanthorpe junction

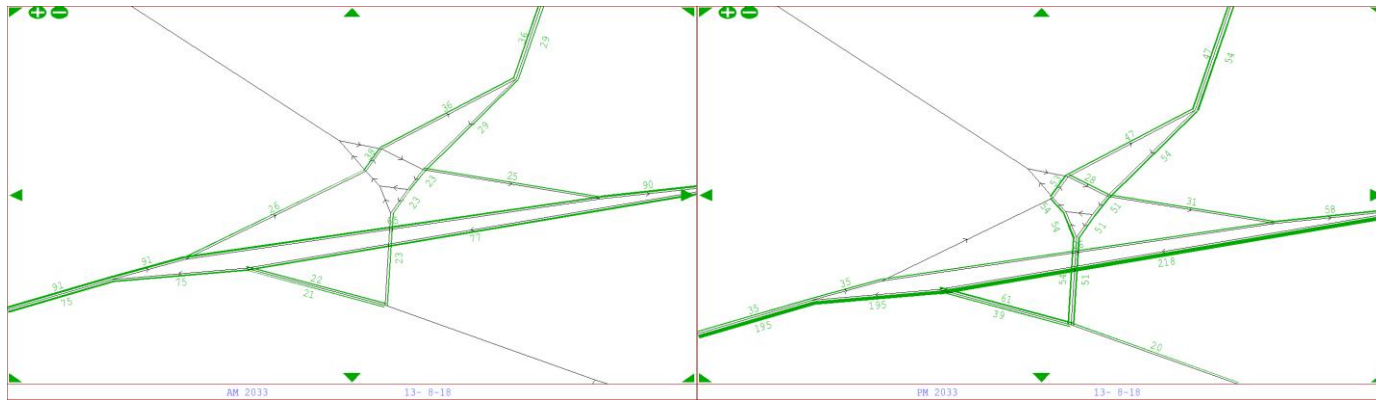


Figure 13 shows that the roundabout to the north of the A64 is operating near to capacity with Figure 14 showing that there is queued flow unable to reach the junction. However, the over capacity approaches are on the local road network. As the strategic road network approaches are acceptable SYSTRA would recommend that Highways England would not require this junction to be tested using a local junction model.

Figure 13 also shows that there are potential capacity issues with the mainline, merges and diverges in both the morning peak and evening peaks. Therefore, SYSTRA would recommend that the merges and diverges are assessed in accordance with DMRB using the difference in future year demand flows applied to observed base traffic flows to identify whether any mitigation is required.

## Summary

SYSTRA would recommend that all of the merges and diverges are assessed against DMRB using the demand flows as this will account for the traffic which is not getting through in the modelled hour due to a constraint in the network. Where possible HATRIS data should be used as the base and the difference in flow between the base and forecast year model added to the observed traffic flows to give the forecast year flows.

Considering the SATURN model results and the level of queued flow, SYSTRA recommends that the following junctions are tested using local junction models to confirm whether any mitigation is required and, if so, the level of mitigation that is required:

- Hopgrove
- Grimston Bar
- A19 Fulford Road

It is recommended, the base assessments should use recent manual traffic turning counts and queue length surveys. The difference in flow between the base and forecast year model should be added to the observed traffic flows to produce the forecast year traffic flows.