

APPENDIX F

JUNCTION CAPACITY SUPPLEMENTARY REPORT

1.0 Future Flows

SYSTRA were commissioned and have produced Future 2031 and base 2011 traffic flows from the LLITM network model. However, the LLITM model doesn't model every flow on each approach at every junction as minor or less critical approaches are not included the model. Where this has been the case the actual 2015 traffic count has been used.

No topographical surveys (with the exception of Northampton Road / Springfield Road & Welland Park Road), safety audits, underground utility enquiries, or public engagement have been undertaken at this time.

Differences between the LLITM flows and actual traffic count carried out in June 2015 were used to derive future traffic flows. Three sets of possible future flows have been developed as described below and shown in **Figures 2 – x**

- a) Percentage differences.
- b) Count differences.
- c) Taking the worst flows of each.

Table 2 represents a summary of each of the junction capacities. This table also outlines cost bands and provides alternative proposal(s) or tweaks to the options if results suggest further alterations would be required to accommodate future flows. Associated cost bandings have been changed to allow for further works.

Table 3 provides further detailed summary of the results.

Results have been provided for J7, which is Northamptonshire. Two results have been shown for 2031 capacities; the first is based on the lowest flows and second is based on the worst / highest flows calculated from LLITM flows.

2.0 One way options

Two potential one way systems have been proposed for consideration.

The first option makes St Mary's Road one way from The Square towards the Kettering Road / Clarence Street junction. Whilst this has highlighted that The Square / St Mary's Road junction would significantly benefit from the scheme, other junctions along Springfield Street may not cope with the additional traffic.

Another option proposes a partial one way on St Mary's from the main junction at the Square towards Adam & Eve Street (which is currently already one way). Traffic would eventually exit on the main street near the junction adjacent to the church at Church Square.

The junction of A4304 Main St and Church Square could be signalised with pedestrian facilities. The existing zebra crossing would be removed which could help co-ordinate this junction with the Square.

3.0 Traffic Management

The points raised in the previous stage 1 & 2 report still apply to this report and have been reproduced below.

The proposals creating a gyratory system would reduce the number of individual movements at each junction. This would help to alleviate congestion at some junctions.

However, any proposals to introduce SCOOT control would **not** add significant benefit to the area. This is due to the having staggered junctions at the Square and at the Northampton Road / Welland Park Road / Springfield Road junctions, these types of junctions are very difficult to run under SCOOT due having to co-ordinate the internal stop lines.

In these scenarios SCOOT will try to optimise the junctions by increasing green splits for the traffic that is held and could actually reduce the performance of the junctions. To get the junctions to work in SCOOT we would have to spend a lot of validation time looking at restricting maximum

stage lengths and then the benefit of an adaptive method of control becomes neutralised.

Around The Square, traffic patterns may not be consistent enough to get the best performance out of SCOOT. There may be too many external factors such as parking bays and pedestrians crossing that affect the rate of discharge over the stop lines that will make SCOOT modelling inaccurate.

Considering the proximity of some of the junctions, there are also factors that will limit the benefit that SCOOT coordination may be able to give. Principally, the junctions of Northampton Rd / The Square/ St Mary's Rd and St Marys Rd / Kettering Rd / Clarence St may be too far apart for accurate modelling of journey times. It would also be impossible to achieve coordination between St Marys Rd / Kettering Rd / Clarence St and Springfield Rd / Sainsbury's access due to the effects of the roundabout between the two junctions.

Installation of CCTV cameras would be beneficial and would cost approximately £20k per junction to install plus the annual revenue cost. Northampton Rd / The Square/ St Mary's Rd, St Marys Rd / Kettering Rd / Clarence St & Northampton Road / Welland Park Rd / Springfield St are likely to be the most important junctions in the study area to monitor.

An estimated cost for installation of a junction to UTC control is approximately £7k per site to install equipment and a BT line. However, there is probably little benefit from UTC control at the outlying sites.

4.0 Other Matters

The range of works and fee estimates (upper and lower limit) provided in this report are very 'broad-brush' and it is based on our experiences of similar schemes. The statutory undertaker's (SU) costs have not been included in the estimates. It is inaccurate to provide SU estimates because these costs depend to a large extent on whether the services need diverting or protecting.

This is assessed by the utility company when a NRSWA notice is served on them to request the cost impact of any proposed changes. The turnaround on these notices is usually 6 to 8 weeks. The cost estimate range specified for the options does not include any statutory alterations or design fee's at this stage.

No allowance for the cost of additional land take fees have been made as part of the costing in table 2

Option drawings are still on an OS base (except for J3 Northampton Road / Welland Park Road / Springfield Street) and therefore may not reflect accurately the current layout of junctions. A detailed land survey will be required and further changes to the option layout may be required.

This study has only considered alterations to the pedestrian and walking facilities at Junction 3 as a result of comments / further feedback from the stage 1 & 2 report for this junction.

For J1 A6 / B6046 (rbt) the improvement (option1) has been previously been designed by the authority to help mitigate the impact from development.

Therefore, it may be possible to get funding from the developer to deliver this scheme.

5.0 Recommendations

Further investigations into both the partial and complete St Mary's one-way options are carried out in LLITM and a revised set of flows provided for existing and future flows.

The preferred schemes should be taken forward to preliminary design and issue NRSWA for budgetary cost estimate.

TABLE 2 –MARKET HARBOROUGH JUNCTION ASSESSMENT SUMMARY TABLE

JN. NO.	LOCATION	EXISTING CAPACITY (2015 Flows)		EXISTING CAPACITY (2031 Flows)		SUGGESTED PROPOSAL(S)						WHOLE SCHEME COST RANGE (exc. stats costs)	
		AM	PM	AM	PM	Option 1 (Do Minimum Proposal)	Option 1 CAPACITY (2031 Flows)		Option 2 (Maximum Scheme)	Option 2 CAPACITY (2031 Flows)		Option 1	Option 2
							AM	PM		AM	PM		
J1	A6 / B6046 (rbt)	0.63	0.64	0.92	0.89	Provide widening on the B6046 Nth approach. Part of mitigation measure for a development. 0.85 RFC normally the threshold for capacity. The mitigation measure only just tips the RFC over 0.85. Therefore, no future improvements are considered necessary.	0.82	0.89	N/A	N/A	N/A	Approx. £255k (excluding stats diversions.) Possible developer contribution	N/A
J2	The square / St Mary's Rd / Coventry Rd (jun)	-31%	-33%	-28%	-58%	Implementation of additional timing plans & increased cycle time for different times of day plus provision of short right turn lane on High Street. Also converting the existing zebra crossing on High Street to a Pelican crossing. 100 second cycle time.	-7.0%	-41%	Double Mini-Roundabouts with zebra crossings on all arms.	0.93	1.63	Approx. £30k - £70k including validation time etc.	Approx. £100k - £200k excluding stats diversions.
J3	Northampton Road / Springfield Rd / Welland Park Rd (jun)	-4%	-9%	-15%	-17%	The adjustment of signal timings no kerb line alterations. The staging and phasing changed to 2 streams and an all red pedestrian stage added to deal with blocking of the internal stop lines.	-20%	-37%	Additional lanes on both Northampton Road approaches. Additional islands on both Northampton Rd approaches to allow pedestrians to cross both side road whilst running Northampton Road ahead. Signal timings adjusted to link Welland Park Road & Springfield Road better and reduce blocking of internal stop lines	+11%	-5%	£40,000 to £60,000 (renewal)	£310,000 to £550,000 (excluding Stats & Fees & Land costs)

MARKET HARBOROUGH TRANSPORT STUDY STAGE 3

JN. NO.	LOCATION	EXISTING CAPACITY (2015 Flows)		EXISTING CAPACITY (2031 Flows)		SUGGESTED PROPOSAL(S)						WHOLE SCHEME COST RANGE (exc. stats costs)	
		AM	PM	AM	PM	Option 1 (Do Minimum Proposal)	Option 1 CAPACITY (2031 Flows)		Option 2 (Maximum Scheme)	Option 2 CAPACITY (2031 Flows)		Option 1	Option 2
							AM	PM		AM	PM		
J4	Springfield Rd / Kettering Rd Rbt (Lidl) (rbt)	0.36	0.50	0.49	0.80	NO MITIGATION MEASURES REQUIRED AS PREDICTED RFC VALUES LESS THAN 0.85	N/A	N/A	N/A	N/A	N/A	N/A	N/A
J5	St Mary's Rd / Kettering Rd / Clarence St (jun)	-6%	-16%	-7%	-18%	Validate MOVA to ensure optimum junction performance. Remove priority narrowing on Clarence Street and remove short length of parking (up to former Builders Yard).	4%	-10%	Validate MOVA to ensure optimum junction performance. Make Clarence Street One Way (Away from junction) and remove stage 3 from the sequence.	+14%	-3%	Approx £20-40k (without land purchase and provision of replacement parking area).	Approx £40-60k (Excluding any alterations to Great Bowden Road/Rockingham Road)
J6	Rockingham Rd / Gores Lane (jun)	-1%	-4%	-1%	-6%	Installation of on crossing pedestrian/cyclist detectors that will extend the intergreen period if required. This will allow the intergreen period to be reduced and only extended if necessary.	+7%	+2%	Extra lane added to Gores Lane with a pedestrian refuge in between the left and right turn movements. The crossing point on Gores lane East will also be moved to this island. All crossing points will have on crossing detection to reduce intergreen times.	+14%	+11%	£3k-£5k (£30k - £40k) (If the signals are required to be renewed and converted to LED)	£100k - £200k (not including stats or 3rd party land costs)

MARKET HARBOROUGH TRANSPORT STUDY STAGE 3

JN. NO.	LOCATION	EXISTING CAPACITY (2015 Flows)		EXISTING CAPACITY (2031 Flows)		SUGGESTED PROPOSAL(S)						WHOLE SCHEME COST RANGE (exc. stats costs)	
		AM	PM	AM (Worst)	PM (Worst)	Option 1 (Do Minimum Proposal)	Option 1 CAPACITY (2031 Flows)		Option 2 (Maximum Scheme)	Option 2 CAPACITY (2031 Flows)		Option 1	Option 2
							AM	PM		AM	PM		
J7	A6 – Harbro' Rd - Rockingham Rd - Dingley Rd (Rbt) (Northampton)	0.64	0.84	0.75 (0.90)	0.85 (1.05)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ATC Traffic Management						To provide CCTV coverage and remote UTC control. (excludes SCOOT)						£41k - £60k	
Total Estimated cost range (Excluding Stats & Fee's & Land Costs)											Lower £416K	Upper £1.35m	

TABLE 3 –DETAILED MARKET HARBOROUGH JUNCTION CAPACITY ASSESSMENT SUMMARY TABLE

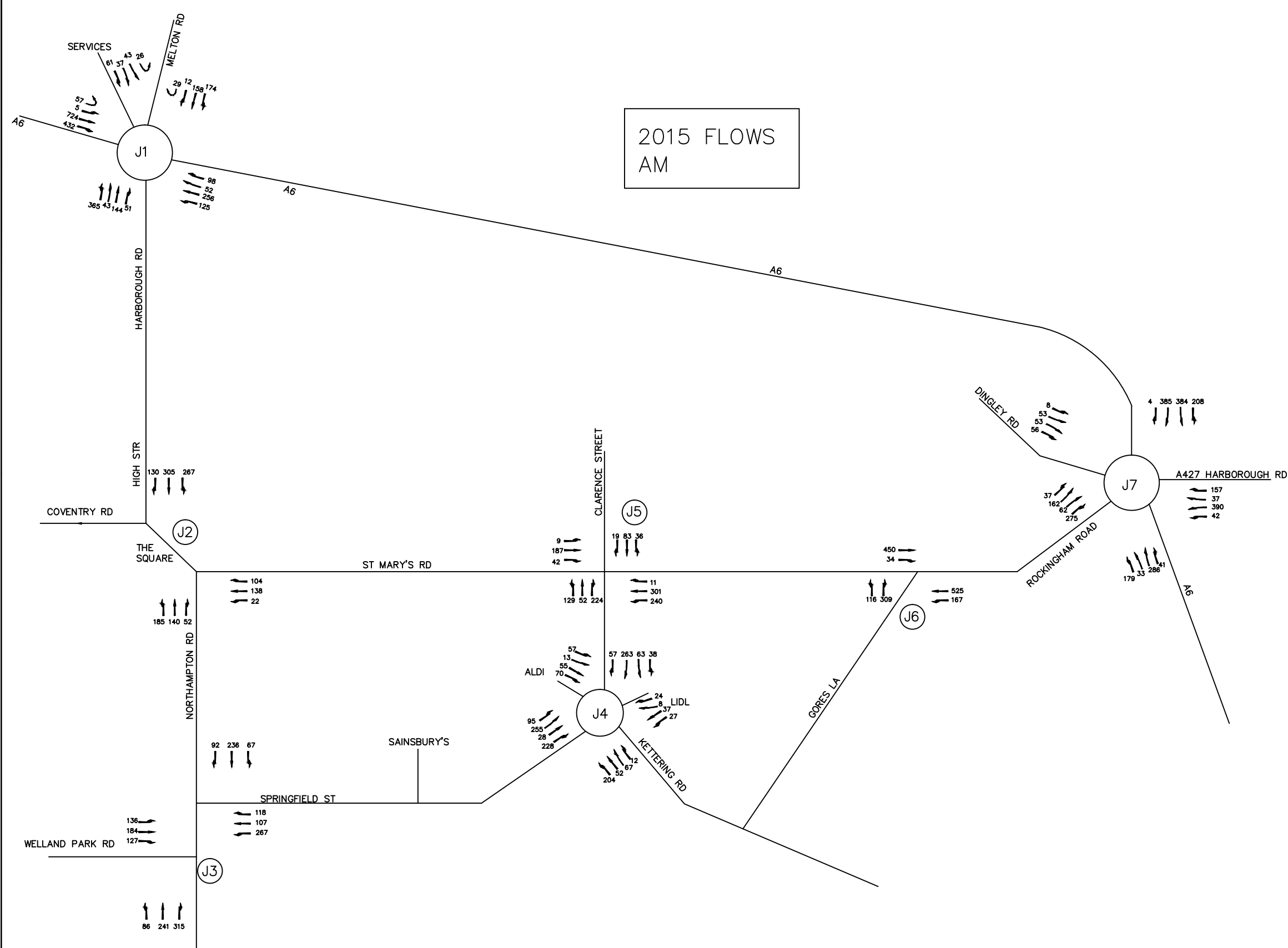
J1 – A6/B604 (Rbt)	Existing (No mitigation on B604 Nth)		Existing (With mitigation on B604 Nth)		Future (No mitigation on B604 Nth)		Future Existing (With mitigation on B604 Nth)	
	2015		2015		2031 (Worst)		2031 (Worst)	
Worst RFC (Threshold is 0.85)	AM	PM	AM	PM	AM	PM	AM	PM
	0.63	0.64	0.63	0.64	0.92	0.89	0.82	0.89
Worst ARM	A6 Harborough Road (West)	A6 Harborough Road (East)	A6 Harborough Road (West)	A6 Harborough Road (East)	Melton Road	B6047 Harborough Road (South)	A6 Harborough Road (West)	B6047 Harborough Road (South)
J2 – The Square – St Mary's Rd	Existing				Option 1 (Optimised Signal Timings and Minimal widening)		Option 2 Double Mini's	
	2015		2031 (Worst)		2031 (Worst)		2031	
Worst RFC (Threshold is 0.85)	AM	PM	AM	PM	PM	AM	AM	PM
	-31	-33	-28	-58	-7.0	-41	0.93	1.63
Worst ARM	Internal Stop line East Bound	St Mary's Road	St Mary's Road	St Mary's Road	St Mary's Road	St Mary's Road	High Street	Northampton Road
J3 – Northampton Rd / Springfield Rd/ Welland Park Rd	Existing				Option 1 (Optimised Timings and No widening)		Option 2 (With widening)	
	2015		2031 (Worst)		2031 (Worst)		2031 (Worst)	
Worst PRC (Threshold is 0.90)	AM	PM	AM	PM	AM	PM	AM	PM
	-27%	-15%	-42%	-46%	-20%	-37%	+10%	-5%
Worst ARM	Internal Stop line STH Bound	Internal Stop line NTH Bound	Northampton Road NTH Bound	Internal Stop line STH Bound	Northampton Road NTH Bound	Northampton Road NTH Bound	Northampton Road NTH Bound	Springfield Rd (Left)
J4 – Springfield Rd / Kettering Rd (Lidi) Rbt	Existing				No Options Proposed as Roundabout is still within capacity based on predicted 2031 flows			
	2015		2031 (Worst)					
Worst RFC (Threshold is 0.85)	AM	PM	AM	PM				
	0.36	0.50	0.49	0.80				
Worst ARM	Springfield Street	Kettering Rd (Nth)	Kettering Rd (Nth)	Kettering Rd (Nth)				
J5 – St Mary's / Kettering Road / Clarence St	Existing				Option 1 (Extend Parking Restrictions Clarence St)		Option 2 (Clarence St One way)	
	2015		2031 (Worst)		2031 (Worst)		2031 (Worst)	
Worst PRC (Threshold is 0.90)	AM	PM	AM	PM	AM	PM	AM	PM
	-6%	-16%	-7%	-18%	4%	-10%	+14%	-3%
Worst ARM	Kettering Road	Clarence Street	St Mary's West & Kettering Road	Kettering Road	Kettering Road	St Mary's East	Kettering Road	St Mary's East

MARKET HARBOROUGH TRANSPORT STUDY STAGE 3

J6 – Rockingham Rd / Gores Lane	Existing				Option 1 (Do Minimum)		Option 2 (With widening)	
	2015		2031 (Worst)		2031 (Worst)		2031 (Worst)	
Worst PRC (Threshold is 0.90)	AM	PM	AM	PM	AM	PM	AM	PM
	-1%	-4%	-1%	-6%	+7%	+2%	+14%	+11%
Worst ARM	Rockingham Road East	Rockingham Road East	Rockingham Road East	Gores Lane	Gores Lane	Gores Lane	Gores Lane	Rockingham Road East

J7 – A6 / Harbro' Rd / Rockingham Rd -/Dingley Rd (Rbt)	Existing					
	2015		2031 (Low Growth)		2031 (Worst)	
Worst PRC (Threshold is 0.90)	AM	PM	AM	PM	AM	PM
	0.64	0.84	0.75	0.90	0.85	1.05
Worst ARM	A6 NTH	A4304 ROCKINGHAM RD	A427 HARBRO' RD	A4304 ROCKINGHAM RD	A427 HARBRO' RD	A4304 ROCKINGHAM RD

2015 FLOWS
AM



NOTES:

KEY TO JUNCTIONS:

- ① A6/HARBOROUGH RD/MELTON ROAD ROUNDABOUT
- ② ST MARY'S RD/THE SQUARE/HIGH ST TRAFFIC SIGNALS
- ③ NORTHAMPTON RD/SPRINGFIELD ST/WELLAND PARK RD SIGNALS
- ④ KETTERING RD/SPRINGFIELD ST/ALDI/LIDL ROUNDABOUT
- ⑤ ST MARY'S RD/KETTERING RD TRAFFIC SIGNALS
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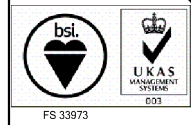
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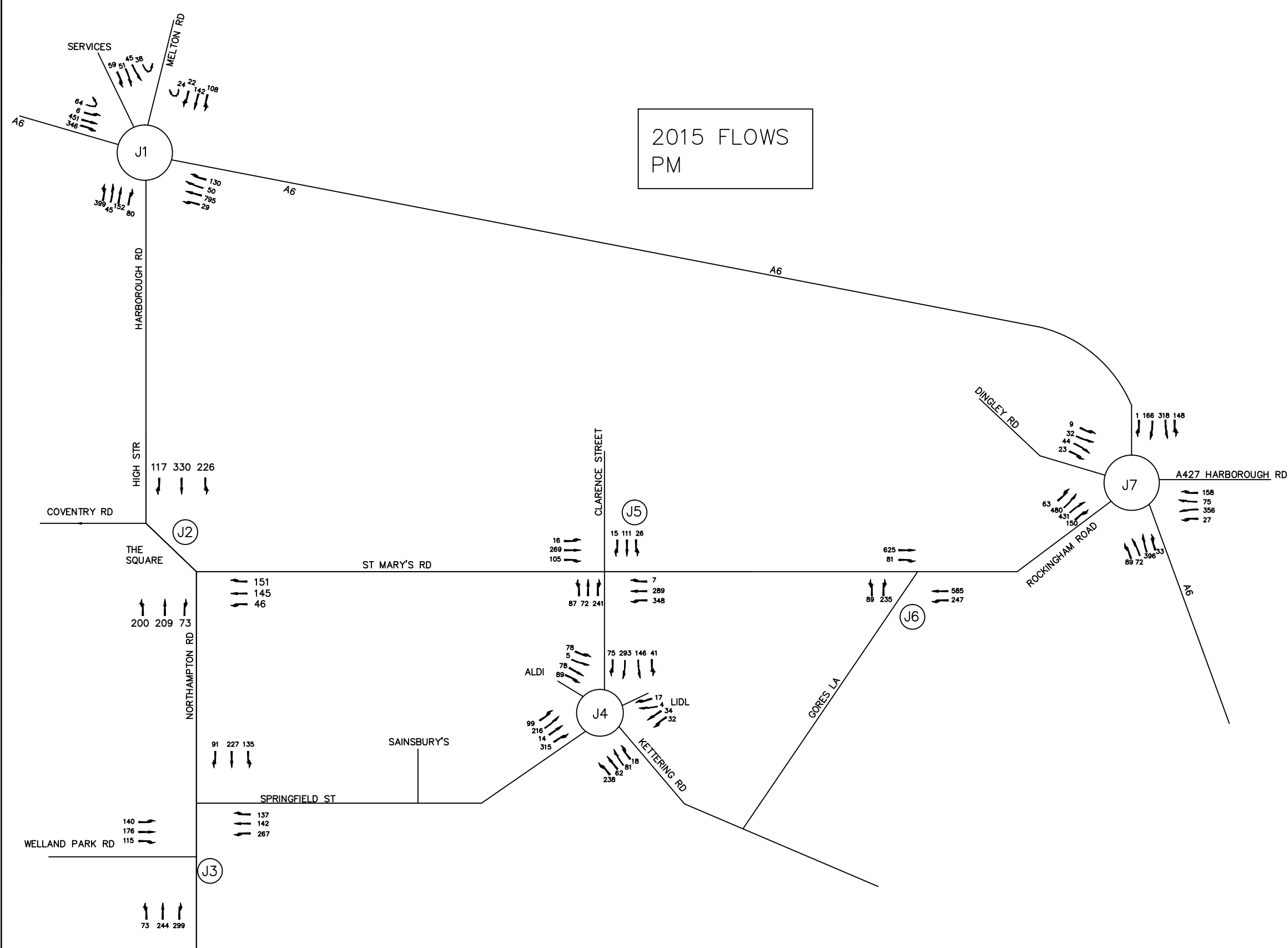
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2015 FLOWS
PM



NOTES:

KEY TO JUNCTIONS:

- ⑪ A6/HARBOROUGH RD/MELTON ROAD ROUNDABOUT
- ⑫ ST MARY'S RD/THE SQUARE/HIGH ST TRAFFIC SIGNALS
- ⑬ NORTHAMPTON RD/SPRINGFIELD ST/WELLAND PARK RD SIGNALS
- ⑭ KETTERING RD/SPRINGFIELD ST/ALDI/LIDL ROUNDABOUT
- ⑮ ST MARY'S RD/KETTERING RD TRAFFIC SIGNALS
- ⑯ GORES LA/ROCKINGHAM RD TRAFFIC SIGNALS
- ⑰ A6/ROCKINGHAM RD/DINGLEY RD ROUNDABOUT

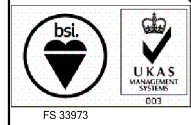
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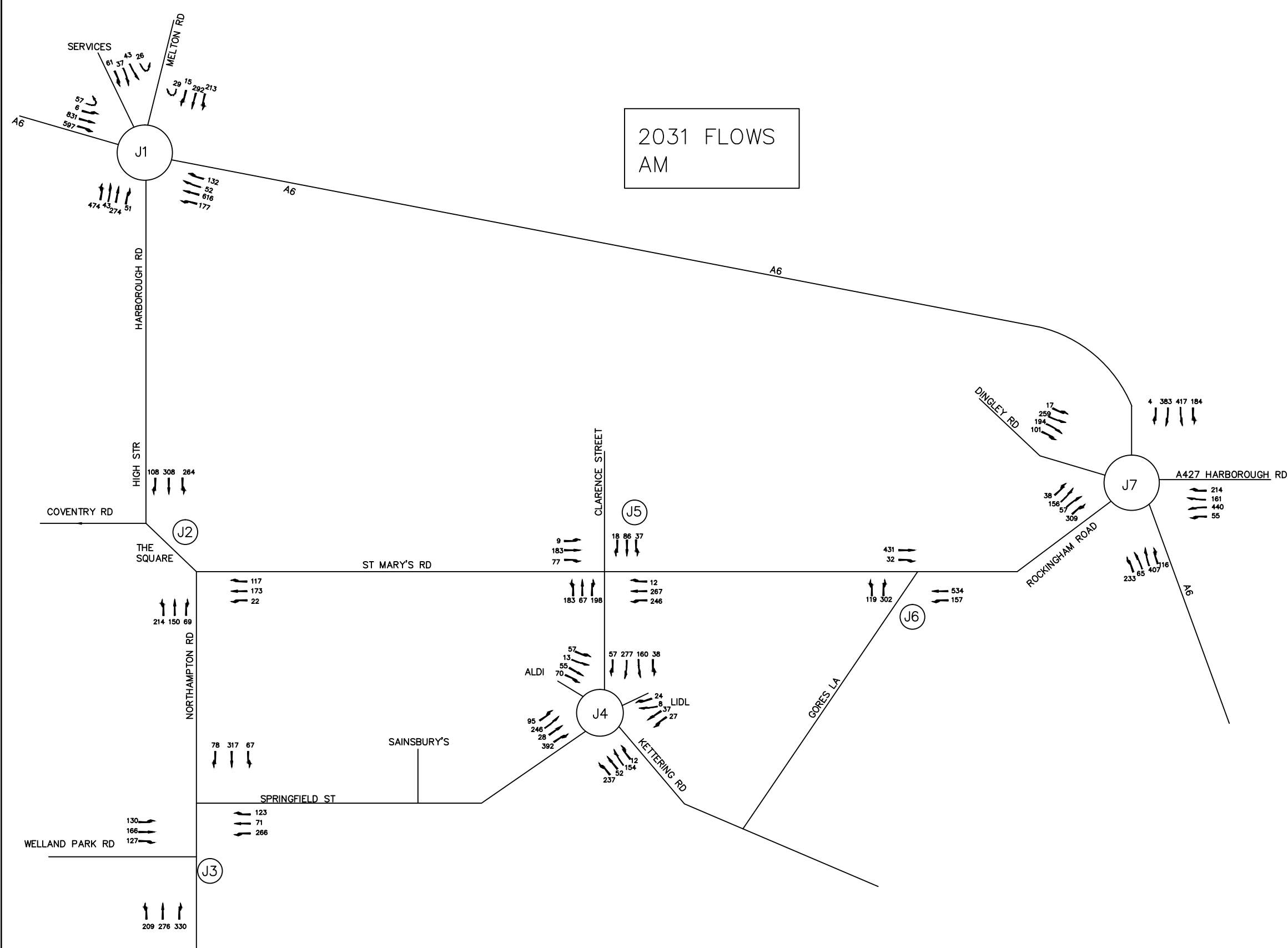
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2031 FLOWS
AM



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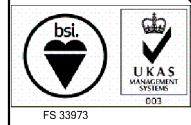
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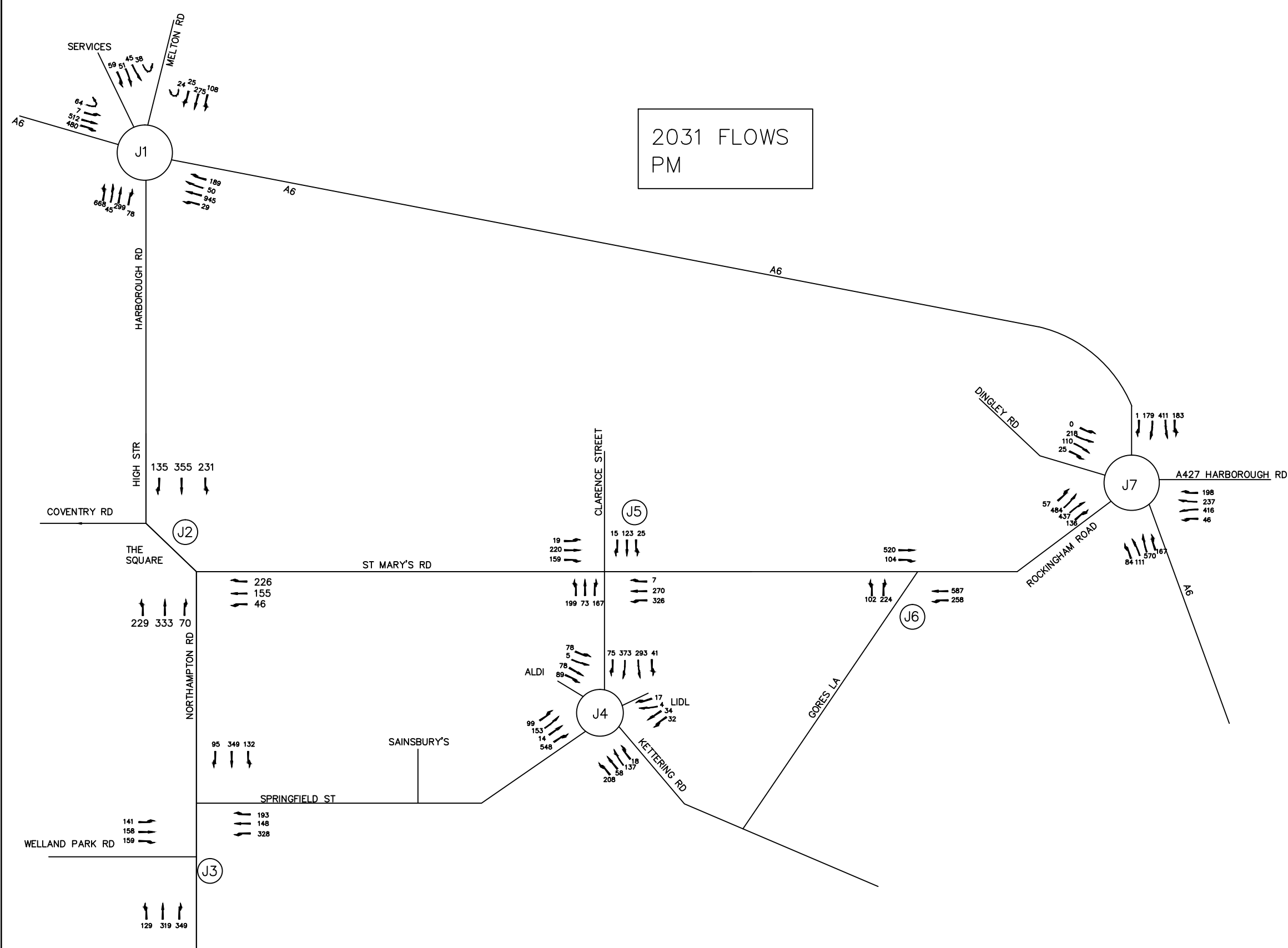
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2031 FLOWS
PM



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