

Technical note

Project:	Salisbury Transport	To:	Wiltshire Council
Subject:	Blue Boar Row Assessment	From:	Graham Bown
Date:	9/9/11	cc:	

1. Introduction

1. Salisbury Vision and Wiltshire Council commissioned Atkins to assess the impact of closing Blue Boar Row to general traffic; buses would still be allowed access. The commission included the following tasks:
 - Close Blue Boar Row to general traffic from 2008 base year SATURN model and run for three time periods;
 - Pass assignment to VISSIM and assess the impact of this change on the highway network for three time periods;
 - Produce the following data:
 - local flow in each time period;
 - local queues in each time period;
 - local journey time changes in each time period; and
 - Summarise impacts.
2. This technical note summarises the impact of the Blue Boar Row proposal and presents key modelling evaluation results.
3. The base year SATURN highway model represents 2008, but whilst changes between 2008 and 2011 are unknown, it is not anticipated that they would alter the findings of this analysis.

2. SATURN Base Year Assessment

4. The first stage of the assessment involved closing Blue Boar Row to general traffic in all three time periods of the base year SATURN highway models and re-assigning the base year demand. The forecast impact of this in the morning peak, inter peak and evening peak is shown in Figures 1 to 3 respectively and can be described as:
 - In the morning peak hour:
 - traffic is forecast to re-route locally via Scots Lane/Bedwin Street and St Edmunds Church Street, with some switching from Fisherton Street to Mill Road for traffic entering the southern end of the city centre;
 - traffic is forecast to increase along Scots Lane by approximately 80% (from approximately 220pcu to approximately 400pcu) and to approximately double along Bedwin Street (from approximately 80pcu to approximately 170pcu).
 - In the inter-peak hour, which has different travel patterns and less congestion than the morning peak hour:

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- traffic is forecast to route via Mill Stream to access the city centre or continue around the A36 to access other destinations;
- the largest change in traffic volume is along Scots Lane, where traffic is forecast to increase by approximately 60% (from approximately 190pcu to approximately 310pcu); and
- In the evening peak the forecast impact is much the same as the inter-peak, with:
 - traffic forecast to route via Mill Stream to access the city centre or continue around the A36 to access other destinations;
 - the largest change in traffic volume is along Scots Lane, where traffic is forecast to increase by approximately 75% (from approximately 190pcu to approximately 340pcu).

5. The forecast impact of the closure of Blue Boar Row to general traffic on city centre network-wide statistics is shown in Table 1. The overall impact is forecast to be negligible in all three time periods; indicating that the network should be able to accommodate this change with very little change in travel time and travel distance.

Table 1. City Centre Network Statistics

	Morning Peak Hour	Inter-Peak Hour	Evening Peak Hour
With Blue Boar Road Open to General Traffic			
Travel Time (pcu hr)	517	394	497
Travel Distance (pcu km)	14839	11824	13877
Speed (km/hr)	28.7	30.0	27.9
With Blue Boar Road Closed to General Traffic			
Travel Time (pcu hr)	517	393	499
Travel Distance (pcu km)	14848	11807	13921
Speed (km/hr)	28.7	30.0	27.9

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3. VISSIM Assessment

3.1. Blue Boar Row Network Development

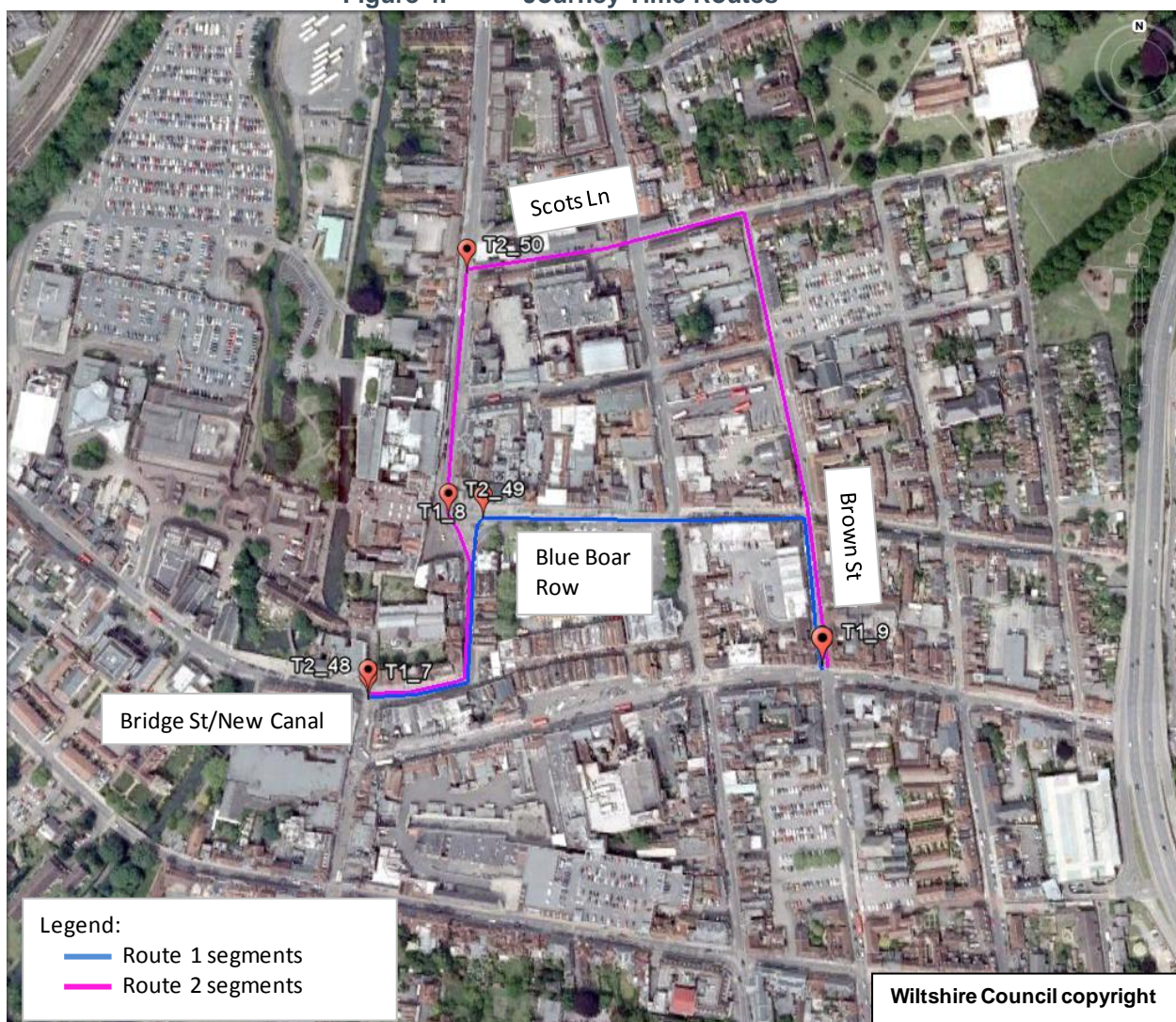
6. The Salisbury VISSIM model has been adopted to test the closure of Blue Boar Row to general traffic. The Blue Boar Row SATURN assignment was used to derive VISSIM demand and the existing VISSIM network used for micro-simulation.

3.2. VISSIM Evaluation Results

7. The VISSIM model was developed and run according to Highway Agency guidelines for micro-simulation models to obtain suitable results.

8. Journey time routes are shown in Figure 4, with the model timing points highlighted (T2_50 etc). Table 2 describes the forecast average journey times for morning, evening and inter-peak hours with and without the closure of Blue Boar Row to general traffic.

Figure 4. Journey Time Routes



9. The journey time impacts can be described as:

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- The forecast redistribution of the general traffic away from Blue Boar Row in the morning peak results in small journey time increases of 12 seconds (5%) along Route 2 whilst traffic travelling along Blue Boar Row could expect a quicker journey;
- In the inter-peak and evening peak the wider redistribution of traffic means that the journey time changes along both routes are negligible, with small journey time decreases along Blue Boar Row and small journey time increases from Bridge St to Brown St via Castle Street and Scots Lane.

10. It may be that during busy times some journey times increase beyond the average shown here, but the average journey time changes are small in absolute and proportional terms. The small journey time improvements along Blue Boar Row will benefit buses.

Table 2. Journey Time Comparisons

Route Segment	Salisbury Base Journey Time (Sec)	Closure of Blue Boar Row Journey Time (Sec)	Difference (%)
Morning Peak Hour			
R1- Bridge St/New Canal to Brown St via Blue Boar Row	82	72	-12.2%
R2- Bridge St to Brown St via Castle Street and Scots Lane	231	243	5.1%
Inter-Peak Hour			
R1- Bridge St/New Canal to Brown St via Blue Boar Row	96	92	-4.2%
R2- Bridge St to Brown St via Castle Street and Scots Lane	247	256	3.3%
Evening Peak Hour			
R1- Bridge St/New Canal to Brown St via Blue Boar Row	96	94	-2.1%
R2- Bridge St to Brown St via Castle Street and Scots Lane	293	294	0.3%

11. Tables 3 and 4 describe average queue lengths for with and without Blue Boar Row closed for the general traffic scenarios in the morning peak, inter-peak hour and evening peak hour. The average queue length has been derived from a number of VISSIM model runs, as is standard practice for micro-simulation modelling, and reflects a combination of vehicle sizes: ranging from 3m to 5m for cars and is 11.5m for buses and 10m HGVs. It is not possible to convert the queue lengths directly back to vehicles as the queue lengths are averages of ten micro-simulation runs rather than actual vehicles.

12. In urban areas the queues are generated from delays at junctions and pedestrian crossings along the link – both of which apply in this instance. Figure 5 presents the queue counter locations.

13. The average queue length assessment is summarised as:

- In the morning peak hour the average queues are forecast to decrease along Castle Street and Winchester Street with negligible increases along Minster Street and Rolleston Street;
- In the inter-peak hour average queue lengths are forecast to increase at Minster Street (ahead lane); but would not result in an adverse impact on junction capacity. A corresponding decrease in queue length is forecast in the right turn lane on Minster Street and very little change elsewhere;
- In the evening peak hour the forecast average queue lengths are similar to the inter-peak hour; generally showing very little change.

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Figure 5. Queue Counter Locations

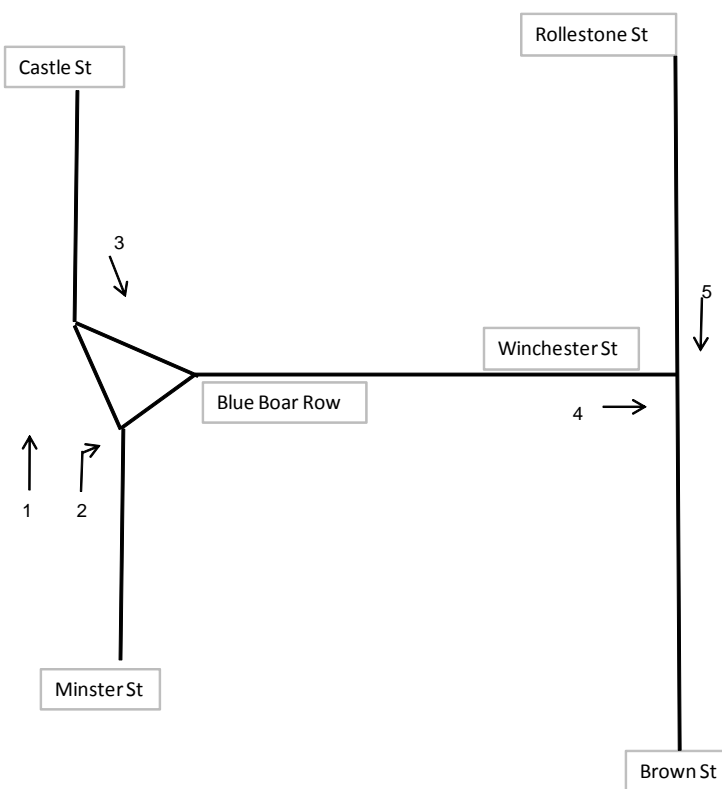


Table 3. Modelled Queue Lengths (Metres) Without Closing Blue Boar Row to General Traffic

Queue Counter Location		Morning Peak Hour Queue Lengths (m)	Inter-Peak Hour Queue Lengths (m)	Evening Peak Hour Queue Lengths (m)
Blue Boar Row/Minster St	1. Minster Street (ahead lane)	3	10	13
	2. Minster Street (right lane)	7	36	18
	3. Castle Street	10	19	10
Rollestone St/Winchester St	4. Winchester Street	12	18	21
	5. Rollestone Street	9	10	12

Table 4. Modelled Queue Lengths (Metres) With Closing Blue Boar Row to General Traffic

Queue Counter Location		Morning Peak Hour Queue Lengths (m)	Inter-Peak Hour Queue Lengths (m)	Evening Peak Hour Queue Lengths (m)
Blue Boar Row/Minster St	1. Minster Street (ahead lane)	5	27	21
	2. Minster Street (right lane)	0	18	14
	3. Castle Street	6	17	9
Rollestone St/Winchester St	4. Winchester Street	4	9	10
	5. Rollestone Street	11	12	12

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4. Summary

14. Atkins has assessed the impact of closing Blue Boar Row to general vehicle traffic using the 2008 Salisbury SATURN highway model and the Salisbury VISSIM micro-simulation model.
15. The forecast impact is negligible; with some local re-distribution of traffic in the morning peak hour and wider redistribution of traffic in the inter-peak and evening peaks. The models forecast only small changes in journey time and queues.