
Decision Session
Executive Member for City Strategy

1st June 2010

Report of the Director of City Strategy

Water End Cycle Scheme Evaluation

Summary

1. To advise the Executive Member of the outcome of the monitoring of the Water End cycle scheme and consider the effectiveness of the scheme in encouraging increases in cycling levels. The report considers the purpose of the scheme, the initial modelling that was undertaken and the traffic and cycle data that was collected pre-implementation and compares that with the current situation. It also considers the impacts of the scheme on other parts of the highway network, specifically Westminster Road and The Avenue and reviews the option contained in a previous report to implement a road closure with reference to the draft recommendations from the Councillor Call for Action Task Group.
2. The cycle data shows significant increase in cycle usage since implementation of the scheme and traffic data reflects the pre-scheme monitoring predictions that there would be longer queues overall once a level of redistribution on the network had taken place. Redistribution has not had a material impact on other radial routes or the Outer Ring Road. It is observed that traffic flows on Westminster Road/The Avenue have increased from 900 to 1774 vehicles (average weekday flows) and partly contribute to the effective operation of the junction. Accident data records three injury accidents since the implementation of the scheme, all resulting from a right turn manoeuvre into Westminster Road, an issue that has been raised by residents.
3. Traffic flows on Westminster Road were reported previously and considered along with results from the residents survey on a point closure and other options available for reducing traffic volumes. Whilst there was overall support for a closure there was no agreement as to where that closure should be. A comparison of traffic flows on other residential roads shows that flows on Westminster Road are lower than many other roads.
4. Additional modelling was carried out to identify the impact on Clifton Green junction of a point closure on Westminster Road. Modelling shows that a closure without any mitigation measures at least doubles the existing average traffic queues and would be significantly worse than double at the height of the peaks. Mitigation was modelled in the form of a partial reinstatement of the

filter lane at Clifton Green, but it does not fully mitigate the increase in traffic queues or delay and the situation on Water End would be worse than currently experienced.

5. The scheme has been successful in delivering an increase in cycling and it was not considered appropriate to remove the cycle lane in order to reinstate a left turn filter. Options are considered within this report that would enable mitigation works to be undertaken whilst retaining the cycle lane. This involves considering how to increase the available carriageway width. The only remaining options for doing this are either the removal (or severe cutting back) of hedges of properties adjacent to the junction, removal of the cobbles or removal of part of the Clifton Green (which has village green status). All of these options were previously considered and rejected. The compromise lies between increased traffic queues and delay on Water End and the potential impact that has on other parts of the network, traffic flows on Westminster Road and removal of conservation features within a conservation area.

Recommendations

6. The Executive Member for City Strategy is recommended to:
 - a) Note the success of the scheme in achieving its main objective of delivering increased levels of cycling
 - b) Agree that additional increases in traffic queues and delay at the Clifton Green junction would significantly impact on the operation of the junction and other parts of the network
 - c) Instruct officers to give further consideration to altering the signal timings during the AM peak and weekend operation
 - d) Instruct officers to give further consideration to linking the crossing points to optimise traffic flow heading toward the Clifton Green junction.
 - e) Note the recommendations of the Scrutiny CCFA review to the Executive on 6 July.

Reason: To retain the benefits of the cycle scheme without causing additional delay to the network and to alter the signal timings in order to improve traffic flow travelling towards and through the junction, which is intended to reduce the amount of traffic diverting through Westminster Road and The Avenue.

Background

7. In October 2008 a report was presented to the Meeting of Executive Members for City Strategy and Advisory Panel setting out the results of consultation on proposals to introduce cycle facilities on Water End between Clifton Green traffic signals, over Clifton Bridge to the junction with Salisbury Road, and the detail of the proposals for the scheme.

8. The main elements of the scheme were to provide cycle paths on both sides of Water End, to move pedestrians to the south side of Water End between Salisbury Road and Government House Road and to remove the left turn filter lane at the Water End/Shipton Road junction to enable cyclists to be able to reach the junction in safety.
9. The scheme started on site in January 2009 and was substantially completed by April 2009. Further amendments to the scheme at Salisbury Road were necessary and an Officer in Consultation (OIC) report in May 2009 provided the detail of the amendment.
10. An undertaking was given to monitor the scheme once it had 'settled down' in order to assess whether it had achieved its objectives. Whilst the period required for the scheme to settle was not explicitly stated, other schemes are evaluated after a period of at least 12 months and officers considered this an appropriate amount of time in order to monitor the scheme and make an assessment.
11. Encouraging more people to cycle has been a long-standing priority for the Council, and this scheme formed part of the action plan to address existing gaps in connections and routes. The scheme forms part of an 'orbital cycle route' to help people get around the city, located in-between the inner and outer ring roads and providing safer and more convenient cycling links to many employment sites, schools, leisure facilities, healthcare and retail sites. The route and its connections were identified as part of the Cycling Scrutiny undertaken in 2003/4.
12. The cycle improvements for Water End provide a link with existing cycle facilities west of the Salisbury Road junction and with other cycle routes starting in the Clifton area. It also connects to the existing on-road cycle lanes along Clifton Road and Bootham.
13. The scheme was developed to promote mode shift from car to cycle and increase the number of journeys undertaken in the city by bicycle, by delivering another element of the strategic cycle network to join up residential areas with key trip attractors. In order to be effective in this objective it needed to overcome the following issues:
 - Water End was not very attractive for cyclists to use. The main problem being the relatively narrow carriageway width (7.3m) which cyclists shared with heavy traffic flows. The route is usually congested at peak periods, and often has fast moving traffic during the off-peak periods. As a result, many cyclists chose to ride on the footways, which created conflict with pedestrians.
 - A lack of facilities to help people cross Water End to access the riverside cycle/pedestrian route which passes under Clifton Bridge. Given the traffic conditions referred to above, this could be a difficult crossing movement to make whether on foot or on a bicycle.

- Cyclists often had difficulty in riding past the queue of vehicles approaching the Clifton Green traffic signals, particularly at the 'pinch point' adjacent to property number 17 Clifton Green, and regularly resorted to riding along the narrow footway to bypass vehicles in order to reach the stop line. The pinch point was also a cause for concern regarding cyclist safety as motorists tried to overtake cyclists leaving minimal passing space in order to progress toward or through the signals. In addition, because of the restricted carriageway width cyclists experienced difficulties in reaching the sub-standard width central cycle feeder lane between the two narrow approach lanes.
14. The scheme had to meet strategic principles of increasing levels of cycling and improving safety for cyclists, whilst having no detrimental impact on the Park & Ride service.
 15. Since becoming a Cycling City, the Council has committed to promoting cycling infrastructure that will in some instances need to take priority over motor traffic. Cyclists are higher up the user hierarchy than motorists. The 'easy wins' to deliver cycle infrastructure have been undertaken and the Council is now seeking to deal with the more difficult parts of the cycle network where there are gaps in route connectivity. This is not to say that the needs of motorists should be ignored. However, after analysing the modelled situation at the Clifton Green traffic signals, it was considered that the benefits this route would provide for cyclists outweighed the disadvantages that motorists may face from increased delay.
 16. One of the effects of the scheme has been to increase the attractiveness of the traffic calmed route, Westminster Road and The Avenue as a route for through traffic. This has occurred for a number of reasons. Motorists identified it as a through route to Bootham avoiding the Clifton Green signals and therefore avoiding increased delay; during construction of the scheme a burst water main at the Clifton Green signals required an emergency diversion to be implemented along Westminster Road and The Avenue. At the same time the school (St. Peter's) was undertaking construction work which necessitated the temporary removal of the traffic calming (a planning condition), thus making the route more attractive to vehicles. In addition, subsequent press coverage reporting resident's concerns about increased volumes of through traffic along Westminster Road and The Avenue publicised this as a potential through route.
 17. The situation on Westminster Road and The Avenue is subject to a Councillor Call for Action. A Task group has been convened to consider the evidence and is due to make recommendations to the Economic and City Development Overview and Scrutiny Committee in a final report on 17th May 2010. The report will then be considered by the Executive, at a date still to be advised.
 18. Further evidence specifically regarding Westminster Road/The Avenue was presented at a Decision Session meeting in September 2009 and January

2010 regarding traffic surveys and petitions, and consultation with residents on closure options respectively.

Scheme Evaluation Data

Scheme Development Modelling

19. Modelling of the proposed scheme was undertaken, a technical note produced and a resume of the results were included in the October 2008 report explaining the impacts. The modelling predicted that in the morning peak average traffic queues and delay on Water End would increase initially to the railway bridge crossing followed by a period of redistribution on the network and consolidation, leaving the queue slightly shorter than the baseline situation but with increased delay at the junction due to the signal timings being left unaltered (so as not to impact on the park & ride service). In the evening peak, the queues also increased initially but after redistribution remained longer than the baseline position and with longer delay. A table containing the modelled baseline predictions and impacts on the junction if alterations to Westminster Road are implemented is included in paragraphs 52 and 53.
20. The impact of traffic redistribution scenarios were tested in the modelling and would require a reduction of approximately 250 vehicles in the morning peak and 150 vehicles in the evening peak in order that vehicles experienced similar levels of delay to the baseline. This still assumed acceptance of some increase in delay.
21. It is particularly difficult to measure traffic queues: where is the end of the queue to be calculated if slow moving traffic is constantly joining? Precise measurement of traffic queues are difficult to determine when flows tend to be constantly moving. The model has had to make assumptions about queuing traffic and uses distance between vehicles to determine the back of the queue. Traffic behaviour is observed to leave larger gaps between vehicles as the queues increase. Therefore, in order to consider whether the model predictions were correct, traffic speed has been used as a proxy. Trafficmaster data has been used, and the average traffic speeds in the AM and PM peaks, before and after the scheme, are shown in **Annex A**. It can be seen in the morning peak that average traffic speed below 10mph has extended to a point just beyond Salisbury Road since the introduction of the scheme, but all other arms of the junction are improved. This means that the slowest moving traffic extends to a point approximately 400 metres beyond the maximum predicted queue (after redistribution), although it should be noted that slow moving traffic does not equate directly to queuing traffic, as modelled. It can be seen that as a result of the difficulties in determining the end of a queue, the model has slightly underestimated the queue length when compared to the Trafficmaster data. It is interesting to note that there have been improvements to traffic speed at the Boroughbridge Road/Water End junction and on Leeman Road. These improvements are primarily as a result of a decrease in traffic in the area. In the PM peak traffic speeds have improved on all arms of the junction except Shipton Road. In relation to the modelling, the actual situation appears to be better than predicted. These reduced flows and increased traffic speeds

will assist in ensuring an attractive Park & Ride service from the planned A59 site at Poppleton.

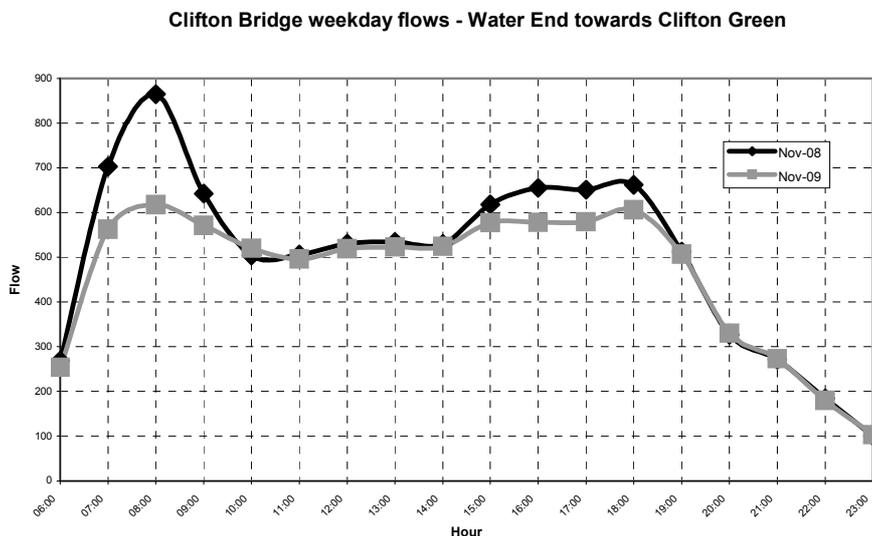
22. It is acknowledged that queuing on Water End varies according to school term time and the data provided in the paragraphs above refer to averages. Queues are longer in school term time (and are particularly affected by St Peter's school) and shorter in school holidays, as they are on most routes in York.
23. There was an expectation that there would be some modal shift from car to bicycle as a result of the improved infrastructure, together with the slight increase in delay during the morning and evening peak.
24. Of the redistributed traffic, it was predicted that 75% would use the A1237 Outer Ring Road bridge crossing, with the remaining 25% using the inner ring road, thus having a far reaching impact on the network.
25. Whilst there has been a decrease in traffic passing through the Water End junction, monitoring of the Automatic Traffic Counters (ATCs) has not revealed any particular routes or junctions where the traffic has diverted. Counts on the Outer Ring Road reveal marginal changes and the other radial routes into the city have not recorded increases of any significance. With respect to the predicted modelled outcomes relating to distribution on the network, these have not taken place. ATC data collected from Shipton Road reveals that there is little difference in traffic flows pre and post scheme implementation.
26. It was assumed that as Westminster Road and The Avenue were traffic calmed streets, they would not be attractive diversion routes and that it can often be difficult for vehicles to turn right onto the A19 (travelling inbound). This assumption was proved incorrect, and further information is set out in paragraphs 48 and 49 below.
27. The initial modelling did not include any alterations to the signal timings. However, as a result of queuing and increased delays on Water End immediately after scheme opening, the timing of the signals (PM peak only) were altered at the Water End/Shipton Road junction to provide more green time for Water End.
28. Alterations to the Clifton Green signal timings were made in three stages through April 2009 to ease traffic flow and delay on the Water End arm of the junction. Time was taken from the main north/south movements, the right turn into Water End from Shipton Road, and also from Water Lane. This time was added to the Water End arm, providing an extra 15 seconds of green time.
29. Additional traffic modelling work has been undertaken in relation to the impacts of a point closure on Westminster Road and is contained in **Annex B** and paragraph 52 and 53.
30. The predictions on queue lengths were reported to the Executive Member Advisory Panel in October 2008 when the scheme was agreed. The conclusions from the modelling work that has been undertaken in relation to

the scheme implementation are that the predictions regarding traffic queues immediately upon completion and after a period of redistribution were correct. However, it did require some alterations to the traffic signals to bring the queues down to the level predicted. The predictions regarding redistribution are unable to be confirmed, as significant changes in traffic flows have not been identified on any specific radial route or on the Outer Ring Road. Traffic queues are shorter than predicted, although it is acknowledged that a period of redistribution was required as well as some signal alterations. Traffic delay is also better than predicted, although again, it required some alteration to the traffic signals.

Vehicle Data

31. ATC data from Clifton Bridge shows that the changes that have occurred in the months since opening are that traffic has redistributed itself on the network in order to avoid the delays on Water End, and that some traffic is using Westminster Road and The Avenue to avoid the signals at Clifton Green. In terms of traffic volumes during the peaks, these are down 10%-15% on Clifton Bridge (see **Figure 1** below). It is interesting to note that the post AM peak traffic is up, which is perhaps an indication that people are changing their time of travel to avoid the delays. These results include the revised signal timings to take account of the new arrangement and flows. Similar reductions in traffic flows have not been identified at other key junctions around the city. November 2008 to November 2009 comparison has been used here, rather than the latest January data as the poor weather had an impact on traffic flows.

Figure 1



32. The data from the video camera surveys on Clifton Bridge (September 2008, September 2009 and November 2009) are 12-hour counts, 0700hours to 1900hours (included in **Annex C**). These surveys show a slight increase in the 12-hour traffic flows and are variable across the peaks in each direction. It is considered that the ATC data referred to in paragraph 31 above is a more accurate reflection of the previous and current situation, as the ATCs provide data 24 hours a day, all year round.

33. Vehicle turning count data (contained in **Annex D**) at the Water End/Salisbury Road junction shows that there is very little difference in traffic travelling westbound or turning left out of Salisbury Road. There is significant reduction in traffic turning right out of Salisbury Road (43% in the am peak and 10% over 12 hours), and a smaller reduction in traffic continuing eastbound through the junction from the A59 direction (15% in the am peak and 8% over 12 hours). There is a very slight increase in traffic turning right into Salisbury Road at certain times of the day after the scheme was implemented, and at other times there has been a decrease. There has been a decrease in traffic turning left into Salisbury Road.
34. Specific traffic count data for Westminster Road and The Avenue was not undertaken prior to scheme implementation. It has however been possible to use speed data collected prior to implementation to gain an understanding of the traffic flows. It would appear when compared to traffic flow data after implementation that there have been increases in traffic flows along both these roads (see paragraphs 48 and 49). There also appears to have been an increase in average weekday flows from 900 to 1774, and an increase in the AM peak of 123 vehicles.
35. The conclusion from the vehicle data analysis is that traffic flows in the area have reduced overall. There is some evidence that changes in travel times have taken place as the AM peak flows are spread over a longer period. Survey monitoring has not been carried out to understand whether some of the reduction is as a result of modal shift. Modelling and traffic data surveys prior to scheme implementation did not include Westminster Road/The Avenue, but there is an element of traffic that uses these roads to avoid delays at the signals. Indications are that traffic in the Westminster Road area has approximately doubled. It can also be expected that an element of the improved Clifton Green junction performance is due to traffic diversion along Westminster Road.

Cycle Data

36. Cycle counts were undertaken on Clifton Bridge in September 2008, September 2009 and November 2009 using a video camera. The results of the counts are shown in **Annex E**. A summary of percentage difference against the baseline (2008) is provided in the tables below:

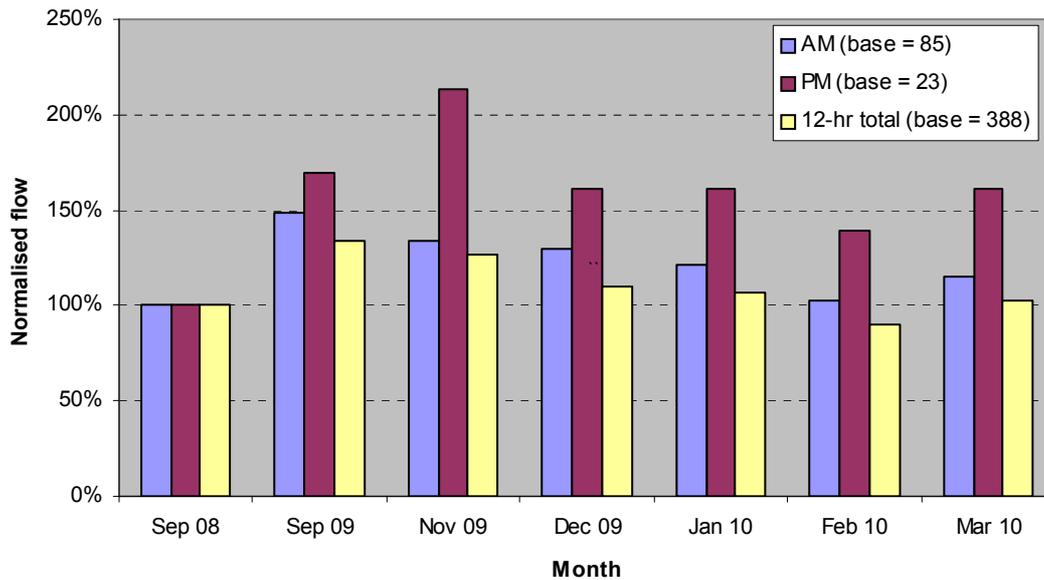
Eastbound	Percentage change September 2009	Percentage change November 2009
AM peak	+ 48%	+34%
PM peak	+69.5%	+113%
12 hour	+34%	+26.5%

Westbound	Percentage change September 2009	Percentage change November 2009
AM peak	+50%	+31.5%

PM peak	+6.5%	+28%
12 hour	+22%	+32%

37. An element of caution to consider in relation to the data is that it is susceptible to seasonal fluctuations, and the smaller flows are subject to random fluctuations. The poor weather from December through to February will have impacted on the numbers and flows may be slightly elevated due to the River path being closed between 19th October 2009 and 29th January 2010.
38. Cycle turning counts were also taken at the Water End/Shipton Road junction and the Salisbury Road/Water End junction. This data is provided at **Annex E**, and a summary is provided in paragraphs 39 and 40 below. It should be noted that the turning count data was not taken on the same day that the video surveys were conducted.
39. A partial turning count was undertaken at the Water End junction. The number of cyclists travelling westbound increased substantially in both the AM and PM peaks. Over a 12-hour period, cyclists turning right out of Water End remained fairly static, except in the morning peak, which increased by 40%. The number of cyclists turning left out of Water End also increased, except in the AM peak, which saw a 13% decline (3 cyclists).
40. At the Salisbury Road/Water End junction, all cycle movements increased at all times of day, except for the right turn into Salisbury Road in the PM peak, and the straight ahead, eastbound movement, also in the PM peak. There is a large increase in cyclists heading towards Clifton Bridge. It should be noted that the 'before data' was collected in May 2008 and the 'after data' in November 2009, a period when cycle monitoring would normally record lower numbers of cyclists due to the seasonal weather conditions.
41. Cycle data is particularly susceptible to seasonal variations and as such a more accurate picture will be available once a full year of data has been collected from the Automatic Cycle Counter (ACC) located on Clifton Bridge. The ACC was installed as part of the scheme and has been in place since November 2009.
42. Current data from the ACC on Clifton Bridge is shown below. The chart shows the observed change in cycle flow on Clifton Bridge, compared to a base month in September 2008. The base flows are shown in brackets on the key. Apart from February 2010, cycle flows have consistently been above the September 2008 baseline.

Cycle flow - Clifton Bridge to Clifton Green



43. Conclusions from the cycle data are that the scheme has met its objective of increasing cycle numbers at this location. Whilst an increase in absolute numbers may be small for some monitoring periods, e.g. PM peaks, the purpose of the scheme was to encourage more journeys to be made by sustainable modes. The turning count data shows significant increases in cyclists upon completion of the scheme compared to the previous summer. The scheme forms part of the orbital cycle route, which is due to be completed during 2010/11. Once the orbital route is complete (programmed towards March 2011) it is anticipated that the scheme would attract additional cyclists.

Westminster Road/The Avenue

44. Following the implementation of the Water End cycle scheme, two petitions were received concerning the apparent increase in the volume of through traffic on Westminster Road/The Avenue. In direct response to these petitions and comments submitted from Clifton Ward Committee, an 'Origin and Destination' survey was undertaken before the school summer holidays in 2009. The results of this survey were reported to the Executive Member's Decision Session on 1st September 2009, along with several other options for consideration in light of the change in traffic conditions on Westminster Road. At this meeting it was resolved that additional surveys should be undertaken (once road humps that had been temporarily removed from Westminster Road had been replaced). Consultation with residents was also to be undertaken to identify the differing levels of support of the options being considered for reducing the volume of through traffic.
45. The results of resident's consultation and the additional surveys were reported to the Decision Session on 5th January 2010. At this meeting it was resolved to note the outcome of the surveys and questionnaire, but take no further action at this time regarding a point closure on Westminster Road. The survey and

consultation results were to be taken into consideration as part of the evaluation of the Water End Cycle Scheme presented in this report. This decision was confirmed by the Scrutiny Management Committee on 25th January 2010 following it's "calling in".

46. In respect to the option of introducing a point closure along Westminster Road/ The Avenue, the following results from the residents' consultation were reported at the meeting on 5th January 2010. All 170 properties were consulted and 111 responses were received. Of the 111 responses 39% (43) were opposed to a road closure and 61% (68) were in favour. From the 61% (68) in favour, opinions from residents was divided as to where a point closure should be located: 38% (41) at Water End / Westminster Road; 22% (25) at Westminster Road / The Avenue; and 1% (1) at The Avenue / Clifton Road.
47. There have been three known injury accidents reported in the area since the implementation of the Water End scheme (up to December 2009). They all involved vehicles colliding whilst making a right turn into Westminster Road. Driver behaviour at this junction has been reported by a number of local residents as a concern due to some drivers overtaking the queue of traffic on Water End for some distance before turning right into Westminster Road. This practise can result in the driver being poorly positioned as they negotiate the junction, cutting across the centre line of Westminster Road
48. Traffic surveys were carried out and are contained in **Annex F** and are referred to in detail in previous Decision Session reports (September 2009 and January 2010). It can be seen that overall traffic levels appear to have increased by around 97% from an average weekday flow of 900 vehicles to 1,774. The AM peak has seen an increase of 92% (an extra 123 vehicles) and in the PM peak 49% (an extra 97 vehicles). To reiterate previous reports, the before data is taken from a speed survey and does not differentiate between through traffic, residential or school run traffic.
49. The results of the traffic survey carried out in September 2009 are shown in **Annex F** and the headline figure is that 89% of the traffic from the Water End direction and 85% of traffic from the Clifton direction is through traffic (school traffic is not included as part of the through traffic). This represents 1,259 vehicles per day out of a total of 1,440 vehicles recorded between 7am and 7pm. The table in **Annex F** gives details of the volume and percentage of through traffic during the peak hours of 8am to 10am, and 4pm to 6pm. This shows that nearly 770 vehicles of the through traffic occurs during the 4 peak hours of the survey (or an average of around 190/hour) and for the remaining 8 hours, the volume of through traffic is just under 500 vehicles (or an average of around 60 to 65/hour).
50. Whilst there has always been an element of through traffic on this route, it is difficult to accurately determine the extent to which through traffic has increased. However, the increase is likely to be concentrated over peak periods as the advantage to using this route during off peak is limited.

50. As advised in the January 2010 report, the issue of side roads being used to avoid main road signalised junctions is not uncommon and there are at least 10 other streets in York where through traffic adjacent to signalised junctions is a concern to residents. However, removing the through traffic invariably also places significant limitations on the local community. Further survey work would be required to directly quantify the levels of through traffic to residential traffic at other locations to be able to compare with Westminster Road. The table below gives the total traffic flows at a number of sites across the city, which demonstrates that the traffic flows experienced on Westminster Road are comparable to other similar sites in the city.

Comparative Traffic Volumes

Link	Date	12-hour 2-way flow
Clifton Bridge	Sep-08	14,795
A19 Clifton	2008 average	10,363
Beckfield Lane	Jun-08	6,121
Grantham Drive	Sep-07	2,176
Navigation Road	Sep-08	2,050
Highbrook Road	Jun-08	1,874
Elmfield Avenue	Jun-08	1,690
Westminster Road / The Avenue	Sept-09	1,440

51. In considering whether a closure of Westminster Road should be pursued, further modelling was undertaken to consider the impacts on the junction with Water End and Shipton Road. The key piece of information is attached as **Annex B** in relation to the junction analysis modelling of the Clifton Green junction, if Westminster Road / The Avenue were to be closed to through traffic. The main table considering the impact on the junction should a closure of Westminster Road take place, with or without a partial reinstatement of the left turn filter lane, is included below.
52. The partial reinstatement of a left turn filter lane was considered for an eight vehicle filter length, although it would not always be available for eight vehicles to enter. A partial filter lane reinstatement was modelled, as there would be considerable cost and difficulties in removing the cycle route over the water main. The queues and delays in the table are averages - what is actually experienced on the ground can therefore be double the average shown in the table below. Where a junction is over capacity (as is the case with Clifton Green), the queue will build through the peak as the traffic cannot dissipate

quickly enough through the signals. (PCUs refers to 'passenger car units' and is a measure of the length of vehicle, e.g. a bus = 2.5, a car = 1).

Scenario:	Practical Reserve Capacity	Total delay (pcu hr)	Water End average delay per pcu (mins)	Water End Mean Queue (pcus)	Water End Mean Queue (meters)
AM pre scheme situation	-18.3%	47.4	1	33.6	201.6
1. AM at opening (April 2009)	-111%	270	16.9	263	1576
2. AM peak post scheme (Nov 2009)	-20%	58	3.8	42	253
3. AM peak post scheme + closure	-42%	121	5.7	77	460
4. AM peak post scheme + 8 veh filter	-8%	35	1.0	19	111
5. AM peak post scheme + 8 veh filter + closure	-27%	82	5.0	69	413
PM pre scheme situation	-12.6%	45.4	2.1	16.2	97
6. PM at opening (April 2009)	-94%	195	15.4	186	1115
7. PM peak post scheme (Nov 2009)	-15%	51	2.6	38	230
8. PM peak post scheme + closure	-31%	93	6.1	82	490
9. PM peak post scheme + 8 veh filter	-14%	34	0.9	21	125
10. PM peak post scheme +8 veh filter +closure	-14%	42	1.5	32	191

53. It should be noted that the modelling assumed a 'worst case' scenario in that all the traffic that would have turned right into Westminster Road must pass through the signalised junction. Options 1 and 6 refer to the situation prior to traffic redistributing itself on the network. Options 4 and 9 refer to the situation before traffic is attracted back to the junction, because it has become easier to travel through and represents a best case scenario. The modelling concluded the following:

- A point closure has a significant adverse effect on the highway, compared to the current position;
- A point closure could be partially mitigated by the reinstatement of a shorter (than previous) filter lane, although the morning peak would still be worse than currently experienced;
- If a closure were to take place, and it were decided to reinstate a partial left turn filter lane, then these two actions should be implemented at the same time;
- If a partial reinstatement of the filter lane were introduced by itself, traffic would be attracted back to the junction and is not recommended;
- A further review of signal timings should take place to determine whether any further improvements can be made to junction capacity at other times of day or weekends.

54. The modelling indicates that with only a closure (and no filter lane reinstatement) that the level of congestion (queues and delays) at Clifton Green almost doubles in the morning peak, and also more than doubles in the

PM peak. As a consequence, it is likely that there would be a further spreading of the peaks.

Considerations relating to Westminster Road/The Avenue options

55. Some traffic chose to divert along Westminster Road prior to scheme implementation, although the exact number is unknown. Additional traffic now uses Westminster Road as a diversion since the scheme was introduced.
56. A point closure at Westminster Road/Water End (as modelled) would require all traffic to pass through the Clifton Green junction. That includes all existing through traffic, all residential traffic and all school traffic. The impact of this would be to increase traffic flows, queue length and delay, and not just on Water End. Any traffic previously turning left out of Westminster Road would then have to use The Avenue, turn left onto the A19 Clifton, and then use the slip road at Clifton Green to turn left onto Water End, potentially increasing queues on Clifton and Bootham. There would be a doubling of some traffic movements on The Avenue, as any school or residential traffic would need to exit the same way it entered, and in addition, queuing on The Avenue would increase as vehicles attempt to exit onto the A19. The increase in traffic flows could potentially impact on the Park & Ride service and increase delay. One of the strategic principles of the scheme was that there should be no impact on the Park & Ride; this has already been slightly compromised by altering the traffic signal timings. Further alterations could be made to the signals as part of a point closure, but this would compromise the Park & Ride service. There is also the potential for Greencliffe Drive to become a through route if traffic continues to look for alternative routes.
57. A point closure at the junction of Westminster Road / The Avenue would result in only a slight reduction of the impacts noted above. Only residential traffic on Westminster Road that would have previously turned right, would potentially be removed from the Clifton Green junction. Residents on Westminster Road would benefit from reduced traffic flows, residents on The Avenue would receive less benefit as school traffic would need to enter and leave through The Avenue, and any residential traffic previously exiting via Westminster Road would also need to exit via The Avenue. Some school traffic could potentially use Westminster Road as a drop off point. The right turn out of Westminster Road would become more difficult than at present, due to an increase in queuing traffic.
58. Any point closure could potentially require a turning head, particularly to accommodate refuse collection vehicles. Whilst it would be possible to install a turning head at the end of Westminster Road and at the junction of Westminster Road / The Avenue, it would necessitate some removal of parking provision.
59. As mentioned in paragraph 46 above, residents were consulted on a point closure. Whilst there was overall support for a closure (60%), the opinion on where that closure should be was split, meaning that percentage support for not closing the road was higher than support for any of the three locations

suggested (Water End / Westminster Road, Westminster Road / The Avenue and The Avenue / A19 Clifton).

60. Alternative options other than a point closure were also consulted upon (see **Annex C** in the January 2009 Decision Session report), e.g. width reductions, chicanes, or banned turning movements. However, these alternatives were either not recommended by officers, or were not supported by residents.
61. If a point closure is not considered appropriate because of the additional traffic queuing and delay that would arise on the network, then another option would be to re-consider previously dismissed options for traffic management to reduce traffic flows, i.e. chicanes, and then survey residents once again. However, traffic flows are heavily weighted from Water End towards The Avenue, and officers' opinion is that chicanes would not work well in reducing traffic flow, because there would be insufficient traffic travelling in the opposite direction to cause sufficient delay.
62. Consideration has been given to the option of an experimental point closure that would allow a trial period to be examined, both in terms of the extra delay caused at the junction and at different locations, in order to test resident preference. However, the modelling has shown that any point closure would at least double the existing average queue on the Clifton Bridge approach and cause delays at the junction. What motorists would experience would be an extension of the slow moving traffic on Water End well beyond Salisbury Road.
63. An extensive options analysis process was undertaken prior to the scheme being implemented. Options considered included removal of the cobbles to create more carriageway width (dismissed for conservation reasons), removal of part of Clifton Green to create more carriageway width (dismissed as the Green is protected under legislation), cyclists off-road on both sides (dismissed due to increased conflict at private pedestrian accesses to properties and conflict with pedestrians on what would be a sub-standard facility), retaining the two traffic lanes and not marking a cycle lane, but leaving cyclists to find their own way through the traffic (dismissed as not giving cyclists assistance at the point where cyclists experience the most difficulties and consequently an increased likelihood of conflict with traffic), and a cycle lane between traffic lanes (insufficient carriageway width available).
64. Given the increase in traffic queues and delay if a point closure were to take place, mitigation works would have to be undertaken in order to allow that to happen, which would mean having to create additional carriageway width. The only means of providing additional carriageway width is to either, remove the cobbles and require properties adjacent to the junction to cut back hedges (the Council has the power to enforce or undertake the work and recharge the cost) or to use part of Clifton Green, or a combination of both. Both these options would have a detrimental effect on the conservation features in the area and it is important to maintain an attractive environment in order to encourage people to walk and cycle. Village green status is a protection through legislation, meaning that certain restrictions are placed on its use and prevents development of any kind taking place. Promoting the use of the Green could

take years of legal negotiation and may never come to fruition. The cobbles, as part of the highway are not formally protected, although the duty under the 1990 Planning Act to preserve and enhance the special character of conservation areas does extend to highway schemes. As such, The Local Authority has a legal duty to preserve or enhance the character and appearance of conservation areas.

65. It is considered that removal of the cycle lane is inappropriate, as it would have a detrimental effect upon current cycling levels, which thus far have been increasing as a result of introducing the cycle measures. In discussion, members of the Task Group considering the CCfA also agreed that the cycle lane should not be removed. Therefore, the only means of improving the junction and retaining the cycle lane is to increase the available carriageway width, which would require the removal of conservation features. Options to remove conservation features have previously been considered and rejected, although further clarification will be required from Members of the Scrutiny Committee as to whether removal of these features would be an acceptable compromise in order to make amendments to the Clifton Green junction, but the limitations in doing so should be recognised.
66. Another option for consideration could include the hedges being cut back and removal of the cobbles to retain off-road cycle lane to the signals, but this would create a number of issues and is not recommended. Firstly, there is limited width available to accommodate pedestrians and cyclists, which would create conflict between these users. Secondly, there would be significant safety concerns regarding any layout that creates conflict points with vehicles as cyclists try to re-join the carriageway from the end of the cycle track ramp at a point where traffic would diverge and turn left across their path. Thirdly, cyclists would be positioned incorrectly for any manoeuvre other than a left turn at the junction.
67. Another option for consideration is removal of the cobbles, cutting back of the hedges and retaining an on-road cycle lane. This option was considered as part of the options analysis but was rejected by officers on the grounds of safety. The cycle feeder lane would need to be located between the two traffic lanes in order to ensure that cyclists were not in conflict with left-turning vehicles. This would require cyclists crossing a vehicle lane in order to move into the central cycle lane at a point where traffic is diverging into two lanes. An extended feeder lane back to the end of the cycle lane has also been considered, however, although this layout may work in other locations in the city e.g. Clarence Street it is not thought to be appropriate in this location due to the constrained width available to create two vehicle lanes. Cyclists would expect it to be kept clear for their use and it is anticipated that there would be an increased likelihood of conflict between cyclists and vehicles. The removal of cobbles and hedges and provision of a 1.5m cycle lane would leave extremely narrow vehicle lanes and a significantly reduced pedestrian footway (see plans in **Annex G** which sets out various options that have been considered and rejected primarily on safety grounds). This means that vehicles would be closer to the kerb and pedestrians could feel intimidated by the traffic, and cyclists would be squeezed between very narrow traffic lanes. Provision of

a cycle lane less than 1.5m is not considered safe, as vehicle lanes are already narrow and vehicles would be likely to encroach. The pre-scheme cycle feeder lane was approximately 0.7m, and was consequently almost unusable by cyclists and it is considered a retrograde step to reintroduce a facility that neither worked previously, nor was considered to be safe for cyclists.

68. As part of the engineering works to refurbish the Pelican facility at the Homestead into a Puffin crossing, and provide the new Toucan crossing at Government House Road, a duct and cable was installed linking these two locations with the signal controller cabinet at Clifton Green. This cable offers the further potential (yet to be brought into use), to moderate the flow of traffic up to the main stop line at Water End / Clifton Green by controlling when in the operating cycle of the Clifton Green signals the Puffin and Toucan crossings are allowed to operate. This facility could be used to reduce 'platooning' of traffic approaching Clifton Green along Water End, and thus reduce the likelihood of traffic speeding towards the stop line. It could also increase the amount of traffic that is able to exit the Water End approach by removing the large gaps in approaching traffic that are caused by the crossings triggering when the green signal for the Water End arm of the junction is in operation.

Councillor Call for Action

69. Simultaneous with the Water End Scheme, a Scrutiny Task Group was set up to consider a registered Councillor Call for Action (CCfA) in relation to traffic issues at the junction of Water End and Clifton Green, Westminster Road, The Avenue and Clifton Green.
70. In agreeing to review the topic, the main aim of the review was agreed as: 'to determine the best solution for the problems local residents are experiencing and to look at what lessons can be learnt in order to inform the implementation of similar scheme in the city'.

The key objectives were agreed as;

- i) To establish whether local concerns still exist in light of the executive Member's decision
 - ii) To explore whether further improvements can be made to address the current traffic issues
 - iii) From experience to date, identify those measures or actions that can be taken to assist in the smooth implementation of similar scheme in the city
 - iv) To understand the context of the Land Compensation Act 1973 in relation to the CCfA.
71. After a series of meetings, consultative and information gathering sessions, the Task Group has produced the following recommendations which were subsequently endorsed by its parent Committee, Economic & City Development Scrutiny Board on 17 May:
 - i. That Council Officers urgently develop new, comprehensive proposals for the Water End junctions to improve the current junction and reduce greatly traffic flows in Westminster Road/The Avenue

- ii. That the Council should, in future, use traffic models which incorporate side streets when assessing and designing junction improvements
 - iii. That the present policy of reviewing new highway schemes only after a period of twelve months should be modified to enable a review after three months when unforeseen consequences have arisen and when Ward Members request.
72. For completeness and the information of the Executive Member, the final scrutiny report is attached as **Annex H**. The Executive will now consider this report and recommendations made at its meeting on 6 July 2010.

Consultation for this report

73. Councillor D'Agorne advised that his view when considering the junction options was that there is a clear choice, if the point closure were to go ahead: If the capacity of Water End is to be increased to compensate for the extra vehicle movements by reinstating the left turn lane (albeit the substandard width that was there before), a section of the cobbles would have to go, along with whatever minimal widening could be achieved on the Green side without removing trees or post fencing that surrounds it. He also thought that pedestrian access to The Green should be provided across the junction. The cycle 'feeder' lane (which might have to either overlap with the left lane or be less than 1.5m) could be laid as at the station junction with Leeman Road, so that left turning traffic is encouraged to give priority to cyclists seeking to access the advanced stop area. He made it clear that he did not consider removal of the cycle lane to be an option, since the media profile of this scheme has become symbolic of the council's overall commitment or otherwise to the Cycling City programme. He further suggested that Members of the task group might want to sound out their respective groups on this in order to try to identify a solution that meets expectations of residents, could work, and achieve a result and provide solutions to the wider electorate and the city as a whole.
74. Councillor D'Agorne added that the scrutiny task group had heard that the left turn lane would be needed if there was a closure of the rat run, but there is not space for this together with a cycle lane, unless (as he thought could be the solution) the cobbles were removed for a section at the junction. He added that 'We could reinstate some cobbles somewhere else around the Green, but there's no way we should just put back the left turn lane without replacing something for this key part of the 'orbital cycle route'. The draft scrutiny report recommends action that will 'substantially reduce the traffic on Westminster Rd -The Avenue' I think closure is the only option, and we will have to live with the consequences of peak spread on the main roads'.
75. Councillor Gillies advised that he would like the opportunity to see the report and recommendations before commenting on a definitive basis. However, his inclination was for the reinstatement of the left turning lane as paramount. He advised that he would also be against the closure of Westminster Road. However, he did understand the need for the safety of cyclists and awaited the detail in the report.

Options

76. Option one – support the findings of the evaluation data and agree that the projected increase in traffic queuing and delay at the Clifton Green junction resulting from physical alterations to the junction or changes to access in the Westminster Road area would not be acceptable.
77. Option two – support the findings of the evaluation data, but decide that the projected increase in traffic queuing and delay (over the existing situation) resulting from changes to the junction and access alterations in the Westminster Road area would be acceptable. Authorise the consideration of measures to reduce traffic flows on Westminster Road (this does not necessarily have to mean a point closure) with a reconsideration of possible options at the Clifton Green junction, which retained a cycle lane.

Analysis

78. **Option One** – The data shows that the implementation of the cycle scheme has significantly increased cycling levels, particularly heading eastbound toward the city centre, and there is an expectation that levels will increase further over the summer and when the orbital route has been completed.
79. Traffic queues have increased, even though traffic flows have decreased as junction delay has been increased as a result of the loss of capacity. Some time has been re-gained on the Water End arm by altering the green time available at the traffic signals (PM peak only).
80. Traffic flows over Clifton Bridge have decreased as traffic has dispersed over the network to avoid the junction delay. The dispersed traffic has not caused difficulties that have been identified elsewhere on the network.
81. Modelling indicates that if a point closure were to be implemented on Westminster Road, that queues and delay would at least double over the existing situation (average queues) and would be worse at the height of the peak when queues are longer than average, and would also be worse than pre-scheme operation. If all the through traffic currently using Westminster Road has to pass through the junction, the level of additional delay on the network would severely compromise the junction and have impact on other junctions as traffic queued back. Whilst the modelling predicts that the average queues would not be as long as when the scheme was first implemented, comparison with the Trafficmaster data suggests that the model has slightly underestimated queue length and that slow moving traffic would extend back further than predicted by the model (because the model does not consider vehicles more than a certain distance apart to be queuing). The impact on the network of the additional queuing and delay is not considered to be reasonable.
82. Within this option it would be possible to consider further alterations to the traffic signals to alter the timings of the AM peak and weekend operation. There would be some impact on the Park & Ride service, but this could be minimised whilst still providing some relief to the junction.

83. In addition, it is possible that more effective use of the existing link between the crossing points and the junction could reduce the platooning of traffic arriving at the junction and improve the capacity, thus reducing the level of delay and queuing.
84. **Option Two** – The data evaluation is as option one above. The modelling suggests that some of the additional delay of a point closure could be mitigated by a partial reinstatement of the filter lane.
85. Residents could be re-surveyed on options for reducing traffic flow that did not include a point closure, but the imbalance in traffic flows make some traffic calming (e.g. chicanes) less likely to be effective.
86. An experimental closure could be trialed to understand the impact of additional traffic flows through the junction and impacts on residents. However, a trial would severely compromise the operation of the junction and is not recommended without some mitigation at the junction.
87. As the scheme has been successful in delivering an increase in cycling, it is not recommended that the cycle lane be removed to reinstate a filter lane (supported by the draft report of the Task Group). This means that the only option to retaining the cycle lane and mitigating the traffic delay is to increase the available carriageway width.
88. Removal of hedges and cobbles could be considered, but even if the carriageway was widened and the hedge cut back, the widths would not be considered sufficient for safe operation of the junction.
89. The options available for increasing carriageway width have previously been considered, but not recommended due to the detrimental impact on conservation features and the protracted legal procedure required to use the Green.
90. There is a compromise to be made, between maintaining existing levels of traffic queues and delay on Water End, reducing the traffic flow on Westminster Road and retention of conservation features in a conservation area.

Corporate Objectives

91. Implementing the existing cycle scheme has improved accessibility and safety for sustainable cyclists and reduced traffic flows in the area and will contribute to the delivery of the corporate strategy specifically through the following themes:

Sustainable city – the council is committed to improve the quality of the local environment and the condition of the York's streets and open spaces. It is committed to transform York in to a 'Cycling City' through investment of the successful £3.7m bid to improve cycling infrastructure and improve opportunities to cycle.

Healthy City – investing in cycling infrastructure will encourage more people to choose active travel modes which will improve general health and wellbeing.

Implications

Financial

92. Option One – There are no financial implications associated with this option.
Option two – Costs would arise if this option was pursued in relation to re-surveying residents, implementing a Traffic Regulation Order to close the road or implementing other traffic calming measures and engineering measures at the junction, none of which have been costed as they are subject to further clarification by the Economic & City Development Overview & Scrutiny Committee and consideration by the Executive.

Legal

93. Legal implications occur if the option of considering use of Clifton Green to create extra highway width is pursued as the Green is currently protected under village green status and therefore has statutory protection under the Inclosure Act 1857 (Section 12) and the Commons Act 1876 (Section 29). The relevant sections of these acts have not been repealed by the Commons Act 2006.

HR

94. None

Other

95. None

Crime and Disorder

96. None

Risk Management

97. The main risk associated with the report is reputational and has been assessed as 16, which requires an action plan to be developed to monitor and mitigate. The task group report is being considered by the Scrutiny Committee on 17th May and will subsequently be considered by Executive who will direct officers. A monitoring programme for traffic flows and cycle flows on Clifton Bridge is in place and the signal operation will be monitored to ensure effective operation.

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Report Approved

Date 21 May 2010

Specialist Implications Officer(s) *List information for all*

Financial

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Wards Affected: Clifton

All

For further information please contact the author of the report

Background Papers:

- EMAP report, 20th October 2008 – Water End Proposed Improvements for Cyclists
- Decision Session report, 1st September 2009 – Westminster Road Petitions
- Decision Session Report, 5th January 2010 – Westminster Road Area Consultation and Survey Results
- PDF plan of pre-scheme carriageway widths

Annex A - Trafficmaster data for traffic speeds

Annex B – Junction analysis modelling of Clifton Green, as presented to the Task Group

Annex C – video camera survey data on Clifton Bridge

Annex D – Motorised vehicles turning count data

Annex E – Cycle turning count data

Annex F – Westminster Road traffic surveys

Annex G – Plans of option retaining centre cycle feeder lane at Clifton Green junction

Annex H – Economic & City Development Overview & Scrutiny Committee – Water End Councillor Call for Action, Draft Final Report