

Effects of Opening the Yew Tree Drive Bus Gate on the Local Highway Network

1. Introduction

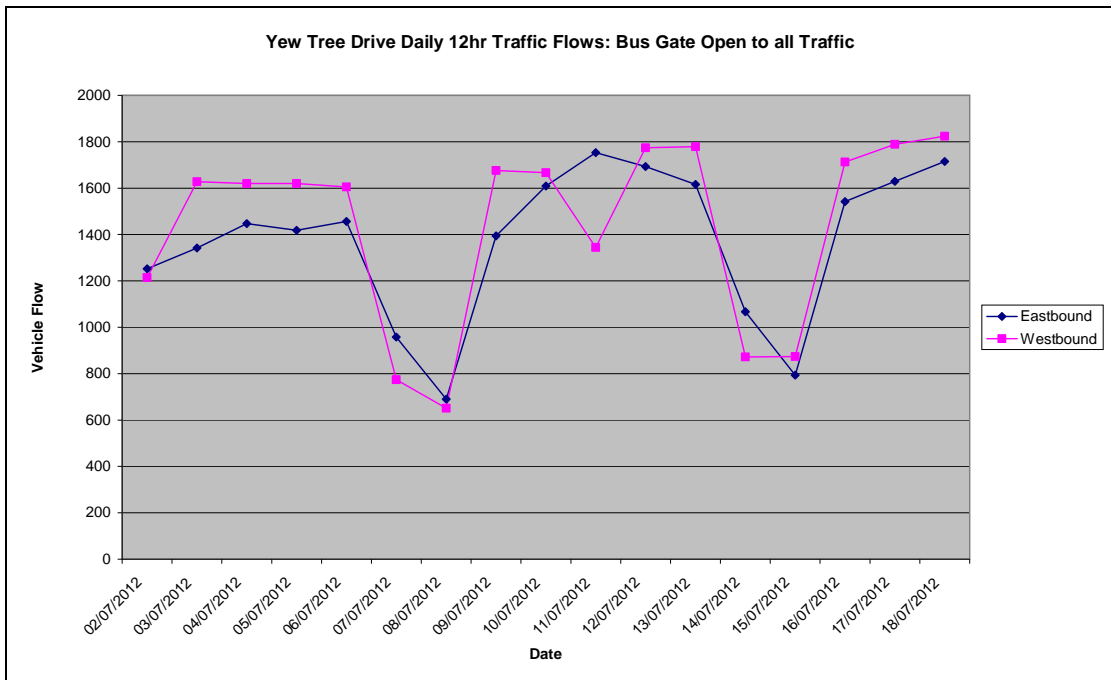
- 1.1 For a number of years consideration has been given to the opening of the bus gate at Yew Tree Drive (YTD) to all traffic. During the summer of 2012 the gate was open to all traffic for three weeks in July due to National Grid works. The County Council made use of the opportunity to survey the impacts of the gate being open during these periods. This report summarises the results of these traffic counts, and compares them with surveys carried out in May when the bus gate was in operation.
- 1.2 Automatic Traffic Counts (ATCs) were located at the seven main locations deemed most likely to be affected by the bus gate opening:
- Yew Tree Drive Bus Gate;
 - Botley Road, north of the Gate (south of Swanwick Lane);
 - Botley Road, south of the Gate;
 - Swanwick Lane;
 - Yew Tree Drive, near the school crossing patrol;
 - Leafy Lane, east of Whitley Way;
 - Whiteley Way north of M27 J 9, which is a permanent ATC site.
- 1.3 The locations of these counts and summary of the analysis are indicated on Figures 1-3.
- 1.4 Identifying changes in flow due specifically to the bus gate opening is complex as other factors will have an impact on traffic flows, such as the season, school holidays, road works and resultant congestion, and lack of awareness of the bus gate state. An example of the effect seasons play on traffic flows can be demonstrated through, the permanent traffic counter data at Whiteley Way. Four years worth of data were analysed comparing the July and May. This showed little consistency between years, with May being higher than July flows in some years and lower in others. Therefore the traffic flow data presented, especially the changes in flows, needs to be treated with caution due to the above considerations. It is also important to recognise that this monitoring can only provide a 'snapshot' of usage and any assessment based on it should reflect that fact.

2 Open Bus Gate Traffic Flows

- 2.1 The graph below shows the traffic flow through the YTD bus gate whilst it was opened to all traffic. The troughs represent the two weekends. The general increase in flows over the period is likely to be attributable

to motorists becoming aware of the gate being opened to all traffic. Therefore the data during the latter stages of the opening is likely to be more representative of the true demand when open. The average 12 hour two way flows over the 17 day period with the gate was open was 2,800 vehicles per day (vpd). However, as an estimate of expected usage the average of the last two days observed flows of 3,500 vpd is used.

- 2.2 Peak hour estimated flows are 490 vph in the AM peak (08-09), with 260vph eastbound and 230 westbound. In the PM peak hour (17-18) the flows are lower at 450 vph with 190 eastbound and 280 westbound. There seems to be a greater tidality during the PM peak hour.
- 2.3 Forecast usage of the gate could be expected to increase further than the 3,500 vpd recorded due to:
- Increased awareness of the bus gate being open to all traffic;
 - Increased congestion on the M27 around junction 9 making the bus gate a more attractive option for a number journeys.
- 2.4 The longer term effects as suggested above are difficult to estimate and this means that there must be considerable uncertainty over the forecast traffic volumes.



3 Daily Traffic Effects

3.1 A summary of the traffic effects over the day are indicated on Figure 1. The main changes to daily two way flows between May and July were:

- YTD Bus Gate: +3300
- Botley Road, north: +1600 +18%
- Botley Road, south: +1700, +20%
- Swanwick Lane: +300 +7%
- YTD east: +400 5%
- Leafy Lane: no change
- Whiteley Way: -2500, -11%

3.2 Whiteley Way north of M27 J9 benefits with a reduction in flow by 2500 which is 11% of the daily flow. Leafy Lane is unchanged. Yew Tree Drive increases by a modest 400 vpd at the eastern end, which equates to plus 5%.

3.3 Of the 3300 vpd additional travelling through the gate onto Botley Road 48% travelled north and 52% south. Of the 48% travelling north 9% travel on Swanwick Lane leaving 39% northwards towards Botley. Both north and south went up by similar volumes of about 1600-1700 vpd equating to an 18-20% increase. Swanwick Lane increases by 300 vpd, some 7%.

3.4 There is a modest increase in flow along Yew Tree Drive towards the eastern end suggesting the gate is being well used by local residents and most of the additional through traffic (travelling between Whiteley Way and Botley Road) is almost compensated for. It is likely that there are savings in vehicle kms with more direct routes available to local residents.

4 AM Peak Effects

4.1 4.1 The AM Peak period (08:00 to 09:00) movements on the bus gate are estimated at 520 vph in total with 280 vph eastbound towards Whiteley and 240 vph westbound outwards. A summary of the traffic effects over the AM peak hour are indicated on Figure 2 and the main changes to the AM peak flows by direction were:

- YTD Bus Gate: +260 e'bd and + 230 w'bd, two way +490;
- Botley Road, north: +120 n'bd (+23%) and +80 s'bd (+16%), two way +200 (+20%);
- Botley Road, south: +110 n'bd (+22%) and +80 s'bd (+15%), two way +190 (+19%);
- Swanwick Lane: +10 e'bd and +40 w'bd, two way +50 (+11%);

- YTD east: +30 e'bd and +50 w'bd, two way +80 (+10%);
- Leafy Lane: + 20 w'bd and no change e'bd;
- Whiteley Way: -350 n'bd (-15%) and -60 s'bd (-7%), two way -410 (-13%).

4.2 Botley Road north and south of the Bus Gate take a similar volume of traffic and are estimated to add about 20% to the AM peak flows. There is some tidality with a greater change to northbound flows both north and south of the gate. It should be noted that about 100 additional vehicles seem to be lost between the 490vph at the gate and the 390 on Botley Road (200 to north and 190 to south) and this is probably due to traffic count and monthly variations.

4.3 Yew Tree Drive east sees a 10% increase (+80vph), but the majority of this is westbound, 50 vph.

4.4 There seems to be evidence that Whiteley Way has a significant reduction in flow most notably northbound by about 350 vph (15%). The total reduction in flow corresponds fairly well with the bus gate flow increase, with Whiteley Way reducing by 410 vph and the bus gate increasing by 490 vph.

5 PM Peak Effects

5.1 The PM Peak period (17:00-18:00) bus gate flows are estimated at 470 vph, in total with 190 vph eastbound towards Whiteley and 280 vph westbound. These flows are generally slightly lower than the AM peak and tidality reverses. A summary of the traffic effects over the PM peak hour are indicated on Figure 3 and the main changes to the PM peak flows by direction were:

- YTD Bus Gate: +180 e'bd and + 270 w'bd, two way +450;
- Botley Road, north: +120 n'bd (+27%) and +30 s'bd (+5%), two way +150 (+14%);
- Botley Road, south: +80 n'bd (+19%) and +130 s'bd (+22%), two way +210 (+21%);
- Swanwick Lane: +60 e'bd and +50 w'bd, two way +110 (+29%);
- YTD east: +30 e'bd and +100 w'bd, two way +130 (+15%);
- Leafy Lane: + 20 e'bd and no change w'bd;
- Whiteley Way: -170 n'bd (-18%) and -210 s'bd (-11%), two way - 380 (-13%).

5.2 Botley Road south takes more flow than the north with 210vph compared to 150vph north. Some 110 additional flows are added on Swanwick Lane, suggesting only an extra 40 vph north towards Botley in the PM peak. Not also that there seems to be about 100vph lost

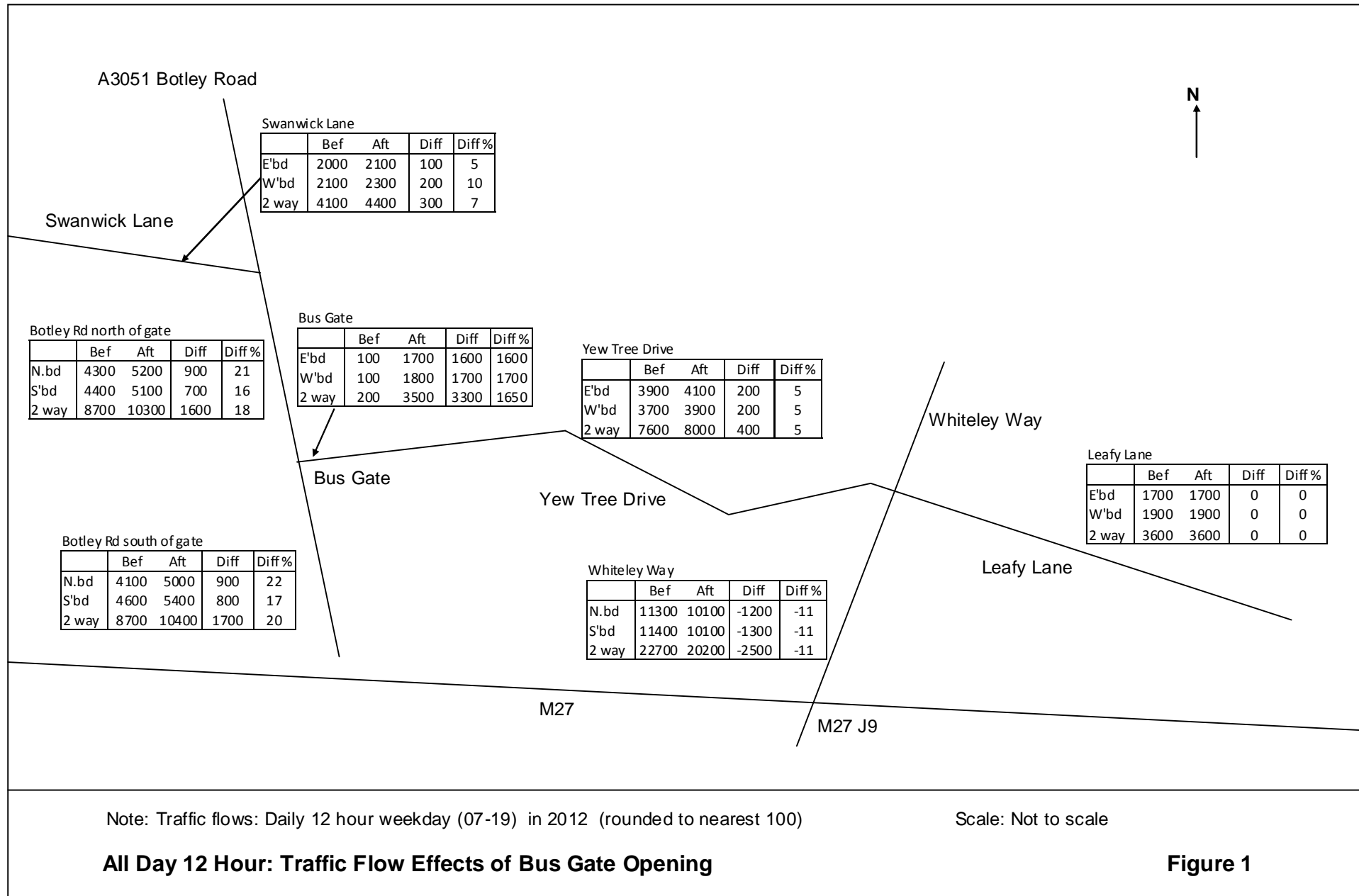
between the gate and the Botley Road north and south and again this must be caused by monthly flow differences and/or counting problems.

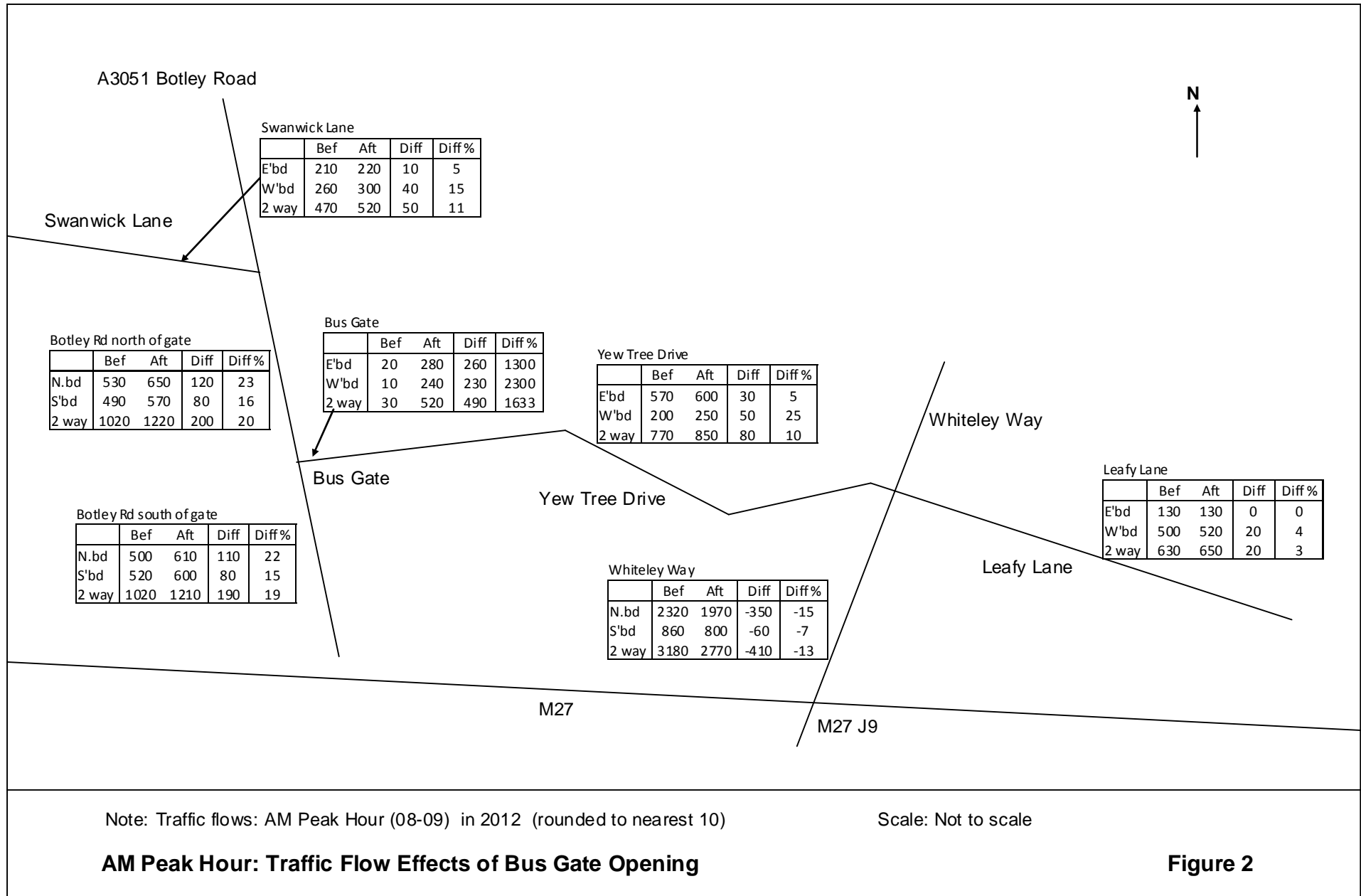
- 5.3 Yew Tree Drive east increases more in the PM peak than in the AM peak hour. Overall it goes up by about 15% with the main increase westbound of an extra 100 vph.
- 5.4 Whiteley Way also reduces significantly, by 210 vph southbound in the main tidal flow direction. Overall there is an estimated 13% reduction in flow which is same as the AM peak.

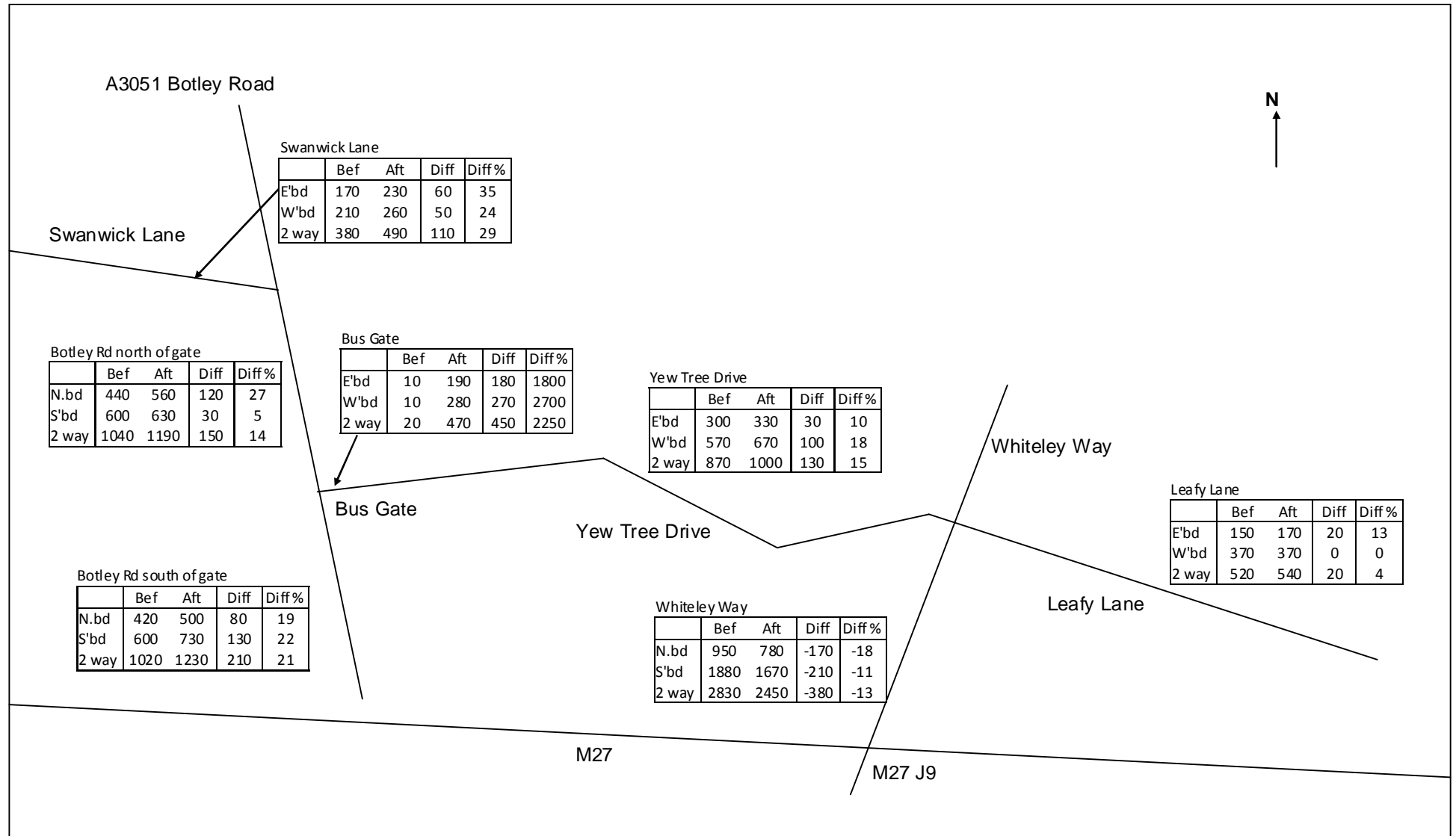
6 Summary

- 6.1 Traffic counts have been carried out in May when the bus gate was in force, and July when the bus gate was open to all traffic due to road works within the area. These were undertaken on seven links around Whiteley to establish the potential impacts of opening the Yew Tree Drive bus gate to all traffic.
- 6.2 Bus gate peak hour estimated flows are 520 vph in the AM peak (08-09), with 280vph eastbound and 240 vph westbound. In the PM peak hour (17-18) the flows are lower at 470 vph with 190 vph eastbound and 280 vph westbound.
- 6.3 Figures 1, 2 and 3 summarise the changes in flows and the main effects, which include:
- On Botley Road, a fairly even split north and south of the additional 3,500 vehicles, with some of the northern flows transferring to Swanwick Lane. Flows generally increase in both direction by about 20%;
 - Yew Tree Drive east seems to be relatively unaffected, with an increase of about 5% over the whole day, but around 10-15% in the peak hours. This suggests that local residents west of Whiteley are using the bus gate instead of travelling via Whiteley Way and the M27 J9 and would therefore be reducing their vehicle kms;
 - Leafy lane is little affected;
 - Whiteley Way north of the M27 J9 reduces in flow by about 11% over the whole day and 13% in the peak hours. Significantly the main tidal flows of the AM peak northbound and PM peak southbound have the largest reductions of 350 vph and 210 vph respectively.
- 6.4 It should also be noted that there are problems associated with the comparison of the counts, mainly due to monthly variations, so some of the flow changes should be treated with some caution.
- 6.5 Finally, although traffic flows through the open bus gate over the 21 day period in July averaged 2,800 vehicles, flows increased

significantly over the period and as an estimate of expected usage the average of the last two days observed flows of 3,500 vpd is used. However, should the bus gate be open for a longer period, this figure may further increase as new journey patterns become established.







Note: Traffic flows: AM Peak Hour (17-18) in 2012 (rounded to nearest 10)

Scale: Not to scale

PM Peak Hour: Traffic Flow Effects of Bus Gate Opening

Figure 3