
*Portishead Branch Line
(MetroWest Phase 1)
Environmental Impact Assessment*

**Transport Assessment
Appendix Q: Ashton Vale Road
Level Crossing Options Report**

Prepared for
West of England Councils

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Document History

Portishead Branch Line DCO scheme (MetroWest Phase 1) Environmental Impact Assessment

Transport Assessment Appendix Q: Ashton Vale Road Level Crossing Options Report

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TECHNICAL MEMORANDUM

MetroWest Phase 1: Ashton Vale VISSIM Model – Ashton Vale Industrial Estate Access Option Testing

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1.0 Introduction

The MetroWest Phase 1 scheme proposes the re-introduction of passenger train services between Bristol and Portishead. The resulting increase in use of the existing section of the railway line at the level crossing on Ashton Vale Road has meant that the existing access to the industrial estate on Ashton Vale Road is likely to be unviable and that a new means of access is being considered, along with closure of the level crossing. A number of alternative access options have been devised shifting the access to the west with a new link road provided from the B3128.

CH2M has been commissioned by North Somerset Council (NSC) to develop a VISSIM microscopic-simulation traffic model of the A370 and local Long Ashton highway network in order to test these options in terms of their impact on operational conditions on the local highway network. The purpose of this Technical Note is to present the results of traffic modelling of the proposed options and provide recommendations following the assessment.

2.0 Proposed Options

Currently, there are three options to provide alternative access to the Ashton Vale Road industrial estate. These are shown in Drawing Numbers 674946.BD.29.01-OPA-01, 674946.BD.29.01-OPB-01 and 674946.BD.29.01-OPC-01 contained in **Appendix A**, and comprise:

- **Option A:** creation of a new link road extending from the Long Ashton Park and Ride access road, just south of the existing David Lloyd access, following Longmoor Brook and entering the industrial estate from the south and connecting to Ashton Vale Road near the heart of the estate;
- **Option B:** similar to Option A, but with a link road alignment that follows a route further north through existing properties before connecting to Ashton Vale Road; and
- **Option C:** creation of a new access along the alignment of the existing A370 westbound off-slip and entering the industrial estate across third party land from the north. As a consequence, the existing A370 westbound off-slips shifts west with a new westbound on-slip created west of the



B3128. A new four arm traffic signal controlled junction is proposed at the intersection of the B3128/A370 westbound off-slip and westbound on-slip.

Since Options A and B are largely identical in terms of their interaction with the existing local highway network, and differ only with respect to their alignment into the industrial estate, they have tested as a single option (Option A/B). There are some developments to the highway alignment of Option C which are not shown on the drawings in Appendix A, but do not affect the modelling.

3.0 Modelling Methodology

3.1 Modelling Approach

The options for providing alternative access to the Ashton Vale Road industrial estate have been tested using the Ashton Vale VISSIM model. This model covers the weekday morning (7:00-9:00am) and evening peak (4:00-6:00pm) peak periods and is calibrated and validated to 2016 traffic flows and conditions. Details of the model development and calibration and validation results can be found in the Local Model Validation Report (LMVR) dated November 2016.

3.2 Reference Case Scenario

The opening year for the assessment of the access options is 2021. The local highway network is expected to experience notable changes in traffic over the coming years associated, not only with general traffic growth, but also from the South Bristol Link, which opened in December 2016. To account for these, the change in traffic volumes and patterns between the base year (2013) and forecast year (2021) weekday AM and PM GBATS4¹ SATURN models was examined and applied to the VISSIM model matrices to establish the 2021 Reference Case AM and PM traffic demands.

In addition, CH2M were also advised that land to the south of David Lloyd could be expected to be developed subject to the West of England (WoE) Joint Spatial Strategy. Since such development would increase traffic loading in areas coincident with the revised Ashton Vale Road industrial estate access and share the same access from the B3128, it was considered necessary to account for this development within the assessment of the access options. A total of 319 dwelling were assumed based on a density of 30 dwellings on a site of 10.64 hectares with TRICS trip rates (houses privately owned) used to estimate traffic generation (approximately 150 two-way trips per hour) and 2011 Census Journey to Work information used to establish trip distribution.

The Reference Case highway network was also revised to account for committed works within the local area. Such changes included the introduction of the Ashton Vale to Temple Meads (AVTM) MetroBus link from the Long Ashton Park and Ride site. MetroBus services were also included operating along this link at a service frequency of every 10 minutes. It is also understood that Long Ashton Park and Ride services will also use the AVTM link so all modelled Park and Ride buses were re-routed in the model from the B3128 and A370 to the new alignment.

3.3 Scheme Option Scenarios

Once the Reference Case was established, Options A/B and C were coded into the network. For Option A/B this involved minimal changes to the network coding and no changes to the signal operation at the Park and Ride or A370 eastbound off-slip/B3128 signals. For Option C, a new control strategy was devised with the new A370 westbound off-slip/B3128 signals incorporated within single controller stream with the A370 eastbound off-slip/B3128 signals. The Park and Ride signals stages were also revised to account for the fact that only industrial estate traffic would be served on its eastern arm.

¹ Greater Bristol Area Transport Model



The re-distribution of traffic associated with the relocation of the Ashton Vale Road industrial estate access was taken into account through modelling of the proposed options in the GBATS4 SATURN model. The changes between the Reference Case and Option GBATS model runs were compared applied to the relevant VISSIM model scenario matrices. Following this, the Reference Case, Option A/B and Option C models were run for 15 random seed runs with the model configured to output network performance statistics, route travel times, and queue lengths at intersections considered to be most affected by the proposals.

4.0 Modelling Assessment

4.1 Network Performance

Table 4.1 compares network performance statistics for the Reference Case, Option A/B and Option C scenarios for the AM and PM peak periods. The results show that in both periods the aggregate impact of both options on overall network operation is small, although any local operational issues will be ‘dampened’ by noise within the results from the wider modelled network. Option A/B appears to show a slight deterioration in network conditions, especially during the PM period, whilst Option C seems to show a small improvement.

Table 4.1: Network Performance Output Comparison

Measure	AM Peak Period			PM Peak Period		
	Ref Case	Op A/B	Op C	Ref Case	Op A/B	Op C
Total Time (hrs)	3,267,591	3,315,082	3,446,273	3,804,074	3,904,753	3,693,581
Avg Speed (mph)	21	21	24	28	27	29
Avg delay/veh (s)	174	177	171	141	155	125

4.2 Travel Times

Mean peak hour travel times have been compared for the Reference Case, Option A/B and Option C along eight routes criss-crossing the modelled network. These are shown in detail in **Appendix B**. Table 4.2 compares the travel time results for the AM peak hour with the same results presented graphically in Figure 4.1. Examination of the results suggest that there is no notable deterioration on any of the routes where travel times have been collected with either of the proposed alternative access options.



Table 4.2: Route Travel Time Comparison, AM Peak Hour

Route	Description	Ref	Op A/B	Op C
1	B3128 Long Ashton/Clarcken Coombe to Ashton Road/A370	320	332	322
2	A370 through modelled network (eastbound)	224	225	227
3	A370 through modelled network (westbound)	126	126	125
4	B3128 Clarcken Coombe to Long Ashton/Clarcken Coombe	605	638	593
5	Long Ashton Road to -Long Ashton/Clarcken Coombe	153	175	182
6	A370 westbound to -Long Ashton/Clarcken Coombe	143	143	153
7	A370 eastbound to Winterstoke road	183	174	104
8	Clanage Road to A370 slips/Clanage Road roundabout entry.	89	77	35

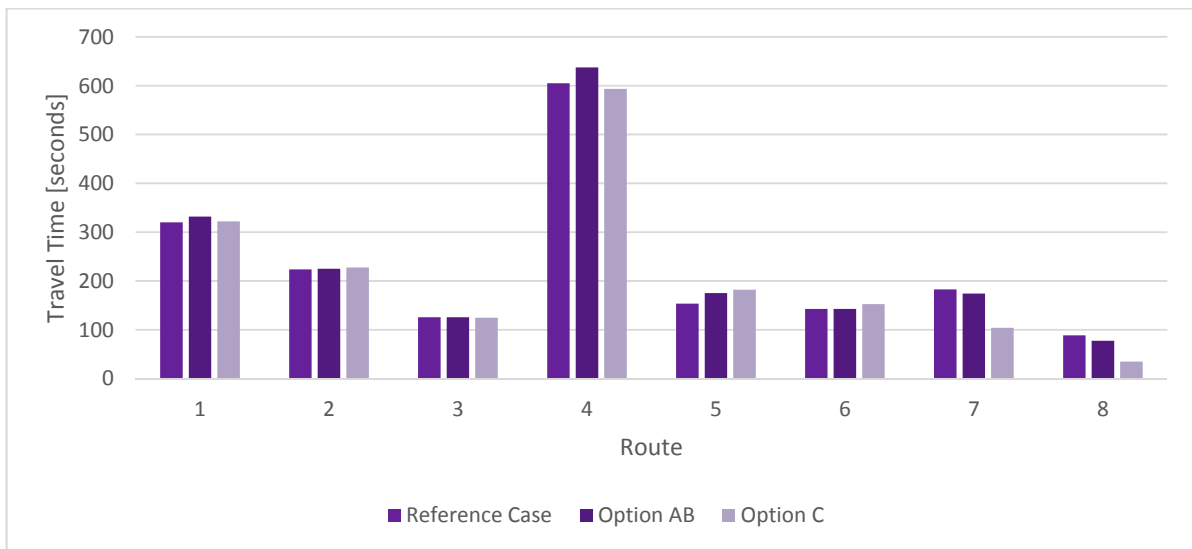


Figure 4.1: Route Travel Time Comparison, AM Peak Hour

Table 4.3 compares the route travel time results for the PM peak hour. The results for Option A/B highlight a notable increase in the travel time on the B3128 to A370 from 68 seconds in the Reference Case to 188 seconds under this option. The other results appear to be similar. This notable increase may be associated with general forecast traffic growth coupled with an increase in traffic volume at the A370 merge associated with traffic leaving the industrial estate during the PM and heading back into Bristol. Option C shows a small increase on this route with little change elsewhere.



Table 4.3 Route Travel Time Comparison, PM Peak Hour

Route	Description	Ref	Op A/B	Op C
1	B3128 Long Ashton/Clarcken Coombe to Ashton Road/A370	68	188	95
2	A370 through modelled network (eastbound)	144	143	150
3	A370 through modelled network (westbound)	187	183	180
4	B3128 Clarcken Coombe to Long Ashton/Clarcken Coombe	112	116	113
5	Long Ashton Road to -Long Ashton/Clarcken Coombe	31	31	32
6	A370 westbound to -Long Ashton/Clarcken Coombe	198	218	204
7	A370 eastbound to Winterstoke road	217	211	231
8	Clanage Road to A370 slips/Clanage Road roundabout entry.	76	71	90

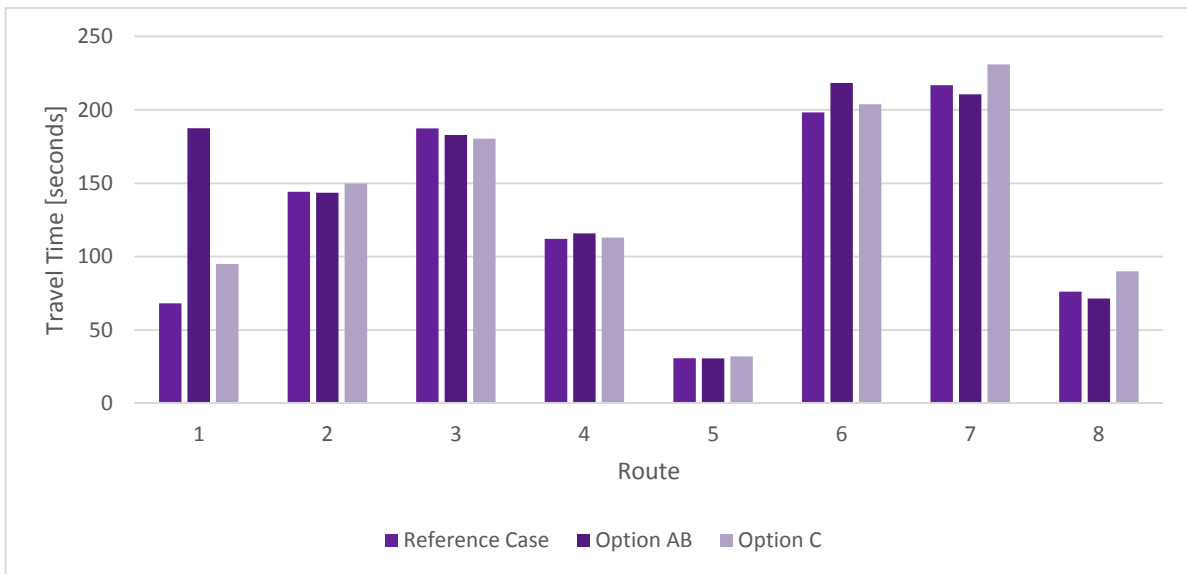


Figure 4.2: Route Travel Time Comparison, PM Peak Hour



4.3 Queue Lengths

Modelled queue lengths were recorded throughout the networks where some change in queuing was expected as a result of the forecast redistribution of traffic and/or new highway layout. Figure 4.3 shows the location where queue lengths have been compared across the Reference Case and Option models. Table 4.4 compares the mean maximum queue lengths for the AM and PM peak hours.

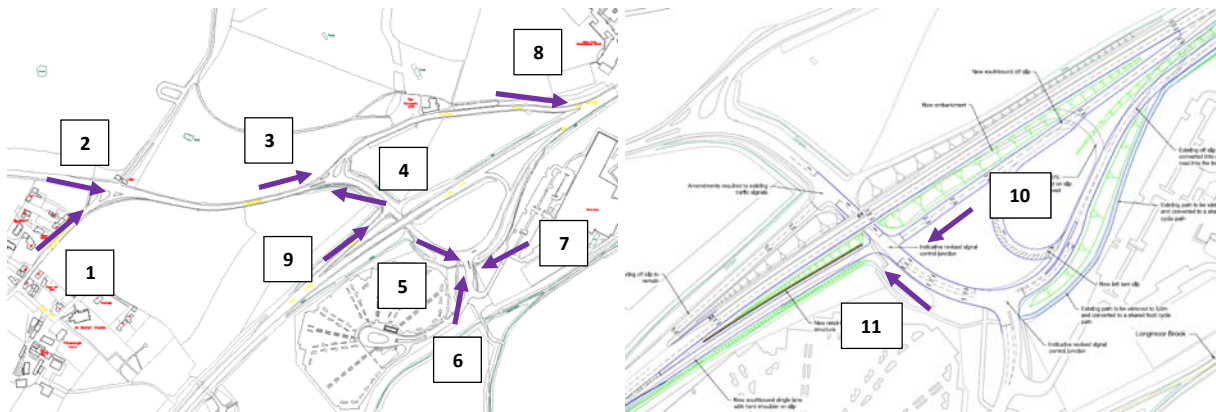


Figure 4.3: Queue Counter Locations (All Scenarios – Left and Additional Option C - Right)

Table 4.4: Mean Maximum Queue Length (m) Comparison

Location	AM Peak			PM Peak		
	Ref	Op A/B	Op C	Ref	Op A/B	Op C
1. Long Ashton Rd app to B3128/Long Ashton Rd jct	183	193	227	9	8	10
2. Clarken Combe app to B3128/Long Ashton Rd jct	505	505	504	0	12	5
3. B3128 e/b left turn to Ashton Road	411	412	412	14	111	27
4. B3128 w/b right turn to Ashton Road	47	61	97	37	128	97
5. B3128 e/b app to Long Ashton Park and Ride jct	26	27	83	13	15	46
6. Park and Ride app to Long Ashton Park and Ride jct	22	25	15	63	114	127
7. B3128 w/b app to Long Ashton Park and Ride jct	55	61	6	133	179	18
8. Ashton Rd northbound app to A370 merge	506	506	502	83	283	159
9. A370 northbound off-slip app to B3128 jct	32	32	59	17	18	25
10. A370 southbound off-slip app to B3128 jct (Op C)	-	-	70	-	-	157
11. B3128 w/b app to A370 southbound off-slip jct (Op C)	-	-	45	-	-	94

Examination of the results show that there is no significant increase in the mean maximum queue lengths compared to the Reference Case under either of the Options modelled during the AM peak period. For the PM peak hour, the results highlight an increase in mean maximum queue lengths on the Ashton Road approach to the A370 merge junction with the increase much more notable under Option A/B. This leads to an increase in upstream queuing at location feeding this link, namely on the B3128 left and right turn approaches to the B3128/Ashton Road junction. The results also show an increase in



queuing on the exit from the Long Ashton Park and Ride site access signals, presumably, in the case of Option A/B, associated with increased loading on this arm from traffic leaving the industrial estate during the PM period. For Option C, this increase in queuing from the Park and Ride site appears to be associated with queuing and exit blocking from the adjacent proposed A370 southbound off-slip/B3128 signal junction.

5.0 Summary and Conclusions

This Technical Note has presented the results from traffic modelling of proposed options to provide alternative access to the Ashton Vale Road industrial estate. These options are being explored because of the likely closure of the existing access crossing the Ashton Vale Road level crossing as part of the MetroWest Phase 1 proposals to re-introduce passenger train services between Bristol and Portishead. Three options have been devised shifting the point of access to the estate to the west. These have been assessed in terms of their impact on the local highway network using the Ashton Vale VISSIM model.

The modelling has shown that both options appear to be operationally viable during the weekday AM peak period with little change on overall network performance, travel times or queue lengths. During the PM peak period, traffic leaving the Ashton Vale Road industrial estate appears to increase pressure on the Ashton Road merge onto the A370, as well as the Long Ashton Park and Ride junction. Option C appears to have less of an impact on the Ashton Road merge. This appears to be because of the ramp-metering effect of the new signal controlled layout and operation catering for both the A370 off-slip arms.

Based on the results presented in this Technical Note, it seems unlikely that Option A/B could progress without works to mitigate the predicted impact on the Ashton Road merge onto the A370. The modelling suggests that Option C, on the other hand, could be delivered without any severe detriment to the operation of the local highway network, although it results in increased queuing during the PM peak period on the exit from Long Ashton Park and Ride.

There may be opportunities to improve the performance of Option C, such as realigning the A370 southbound off-slip arm to form a four-arm junction with the Park and Ride exit. If the B3128 right turn onto the new A370 southbound on-slip could be left uncontrolled, this would reduce the number of traffic signal controlled intersections and simplify the overall control along this section of the B3128. Further modelling would be required to assess whether this would be operationally viable. However, there is some concern that any notable improvement in operation in this location could lead to increased queuing and delay at the Ashton Road merge onto the A370 during the PM peak.

It should also be noted that the assessment presented in this Technical Note assumes forecast traffic volumes including movements associated with an estimated 319 dwellings on land to the south of David Lloyd. This housing does not form part of MetroWest Phase 1 proposals and it will be for the developer of this site to undertake appropriate mitigations in order to ensure that their development does not have a detrimental impact on the local highway network. Consequently, the modelling assessment over-states the potential traffic impact arising solely from the MetroWest Phase 1 proposals.



Appendix A: Proposed Option Layout Drawings



Appendix B: Travel Time Routes

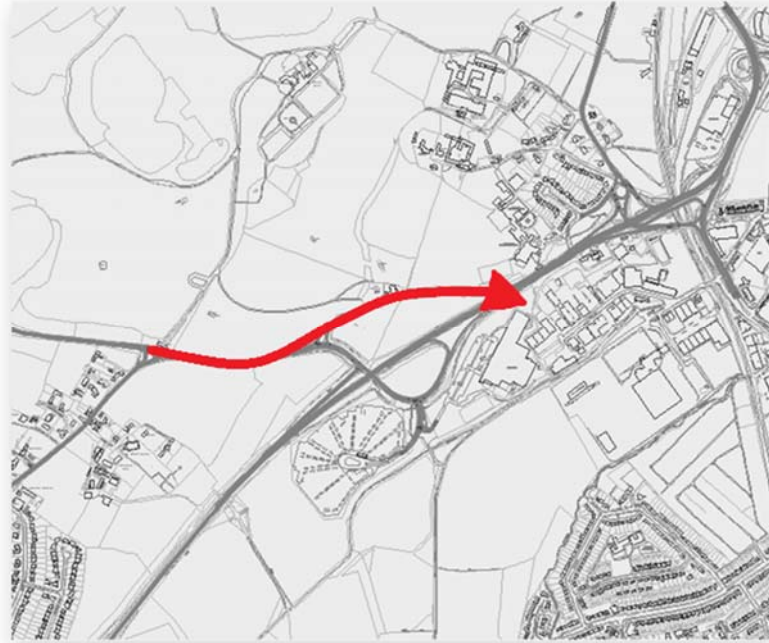


Figure B1: Travel Time Validation Route 1, B3128 Long Ashton/Clarcken Coombe to Ashton Road/A370



Figure B2: Travel Time Validation Route 2, A370 West - A370 East



Figure B3: Travel Time Validation Route 3, A370 East - A370 West



Figure B4: Travel Time Validation Route 4, B3128 Clarken Coombe to Long Ashton/Clarken Coombe



Figure B5: Travel Time Validation Route 5, Long Ashton Road to Long Ashton/Clarken Coombe



Figure B6: Travel Time Validation Route 6, A370 East to Long Ashton/Clarken Coombe



Figure B7: Travel Time Validation Route 7, A370 to Winterstoke road



Figure B8: Travel Time Validation Route 8, Clanage Road to Roundabout