

**Proposed Development
Preston Street. Whitehaven
Supplementary Information**

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1. Introduction

- 1.1 The current planning application for a temporary car park on Preston Street in Whitehaven is supported by a Transport Statement dated July 2017.
- 1.2 The Highway Authority has requested additional information in relation to the proposed use.
- 1.3 In addition, since the issue of the last drawings showing the proposed layout of the car park and access arrangements, the proposed internal layout has been amended to retain more of the current grassed areas of the site, reducing the number of parking spaces to 81 general use spaces and 8 Disabled spaces. The proposed access to the site has been amended to a dropped kerb footway crossover access (similar to the existing access to be paved over) to give greater priority to pedestrians using the Preston Street footway. The amended proposed layout is shown on Drawing No: 17050103 Rev D, a copy of which is provided in the Drawings section of this Note.
- 1.4 The original proposed access indicated the edge of the carriageway of Preston Street would be moved slightly into the carriageway in order that a visibility splay measured 2.4m from the effective edge of the carriageway would lie beyond the existing boundary wall of the site (i.e. within the footway). At the request of the Highway Authority the boundary wall will be reduced in height to 1m. The visibility splay can therefore go over the wall and the movement of the give-way line will no longer be required.

2.0 Assessment of Effects of Development

- 2.1 The July Transport Assessment quantified the effects of the development in the am and pm peak periods, concluding that the effects would not be material. As a consequence, no detailed assessment of any junction was undertaken.
- 2.2 The Highway Authority has requested that the site access and the Preston Street / Coach Road junction be assessed under future traffic flows.
- 2.3 This Note therefore provides these assessments.

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- 2.4 The Preston Street / Coach Road and Asda (Cart Road) junctions were surveyed in November 2017. The traffic survey results are reproduced in Appendix A with the turning movements in the busiest 60 minute period shown in Figure 1
- 2.5 Current best practice, when assessing future situations on non-Trunk Road highways, is to assume a design year 5 years post the date of the planning application for the proposed development ($2017 + 5 = 2022$). To provide further robustness a design year of 2023 has been adopted for this assessment.
- 2.6 The site lies within Zone Copeland 005 in the National Trip End model. Preston Street to the north and Coach Road to the east, however, feed into Zone Copeland 002 (Whitehaven town centre). Traffic growth in both zones has therefore been considered and the greatest rate adopted as below:

Traffic Growth. Local Roads 2017 to 2023

Time	Copeland 002	Copeland 005
AM Peak Period	8.54 %	7.54 %
PM Peak Period	9.90 %	9.39 %

Figures used in Assessment

- 2.7 Base traffic flows for 2023 would therefore be as shown in Figure 2. It should be noted that the majority of the movements into and out of Cart Road are associated with the Asda store and as with all development sites, these would not be expected to increase in future years. The predicted traffic growth has, however, been applied to all movements to give a very robust base scenario.
- 2.8 The Highway Authority have suggested that a residential and a mining development in the Whitehaven area be allowed for in addition to the above traffic growth. Details of the effects of these developments are not in the public domain. The above growth rates allow for 174 new houses and 137 new jobs in the 2017 to 2023 period and should, therefore, allow for the two committed developments. Should the Authority provide details of the traffic flows that were agreed for these developments we would be happy to allow for them separately and adjust the background traffic growth accordingly.
- 2.9 The car park would be used for long stay commuter trips. It is therefore likely to receive its greatest arrivals in the AM peak period and greatest departures in the PM peak period. The peak periods in Whitehaven extend for more than the busiest 60 minute periods set out in Figures 1 and 2. For a very robust assessment it has been assumed that all 81 general spaces and 8 Disabled spaces fill in the busiest hour in the AM peak period and empty in the busiest hour in the PM peak period.

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- 2.10 To provide further robustness, the site access has been assessed assuming all traffic arrives / departs from / to the North, and all traffic arrives from / departs to the South.
- 2.11 In reality the car park will fill (assuming it is actually used to capacity with all Disabled bays used), over the general two hour peak periods and traffic will be split over the routes to the site from the North and South. The assessment test flows are not therefore the likely flows but a “worse than worst case set of design flows.
- 2.12 For the Cart and Coach Road junctions, the assessment flows have assumed all the trips to the car park arrive from / depart to the South and again the car park fills and empties over a single hour. At the Cart Road junction all development traffic is assumed to pass through the junction on Preston Street. At the Coach Road junction the development traffic has been split in proportion to the exiting traffic movements.
- 2.13 The above assumptions lead to the effects of the development shown in Figure 3.
- 2.14 2023 Design traffic Flows assuming all the development traffic arrives from / departs to the North are shown in Figure 4.
- 2.15 2023 Design traffic Flows assuming all the development traffic arrives from / departs to the South are shown in Figure 5.

i. Site Access

- 2.16 The site access has been assessed in its now proposed footway crossover form under the two test scenarios. using the Department of Transport’s Picady module of its Junctions Assessment suite of computer programs. The results are reproduced in Appendix B and summarised below.

Traffic Arrives From / Departs To the North

	AM Peak Hour		PM Peak Hour	
	RFC	Queue	RFC	Queue
Right Turn Into Site	n/a	n/a	n/a	n/a
Left / Right Turn Out of Site	n/a	n/a	45%	0.8 veh
RFC = Flow to Capacity Ratio				

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Traffic Arrives From / Departs To the South

	AM Peak Hour		PM Peak Hour	
	RFC	Queue	RFC	Queue
Right Turn Into Site	28%	0.7 veh	n/a	n/a
Left / Right Turn Out of Site	n/a	n/a	23%	0.3 veh

- 2.17 As can be seen the car park access would operate with considerable reserve capacity even under 2023 traffic flows and assuming the car park filled / emptied within a single hour, was used to capacity and all traffic arrived from / returned to the North or South. In reality the car park access would operate with significantly greater capacity.

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ii. Preston Street / Cart Road Junction

- 2.18 The Preston Street / Cart Road junction has been assessed in its current form with all the development traffic arriving from / returning to the South, and therefore passing through the junction on Preston Street, also using the Department of Transport's Picady module of its Junctions Assessment suite of computer programs. The results are reproduced in Appendix C and summarised below.

Traffic Arrives From / Departs To the South

	AM Peak Hour		PM Peak Hour	
	RFC	Queue	RFC	Queue
Right Turn Into Cart Road	7%	0.1 veh	11%	0.1 veh
Left Turn Out of Cart Road	5%	0 veh	7%	0.1 veh
Right Turn Out of Cart Road	10%	0.1 veh	26%	0.4 veh

- 2.19 As can be seen the junction would operate with considerable reserve capacity even under 2023 traffic flows and assuming all the development traffic passed through the junction in a single hour. In reality the development traffic would be less and the junction would operate with more reserve capacity.

iii. Preston Street / Coach Road Junction

- 2.20 The Preston Street / Coach Road junction has been assessed in its current form with all the development traffic arriving from / returning to the South, and therefore passing through this junction in proportion to the current turning movements, again using the Department of Transport's Picady module of its Junctions Assessment suite of computer programs. The results are reproduced in Appendix D and summarised below.

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Traffic Arrives From / Departs To the South

		AM Peak Hour		PM Peak Hour	
		RFC	Queue	RFC	Queue
Right Turn Into Coach Road		50%	1.6 veh	62%	2.9 veh
Left / Right Turn Out of Coach Road		52%	1.1 veh	45%	0.8 veh
2.21	As can be seen the junction would operate with reserve capacity even under 2023 traffic flows and assuming all the development traffic passed through the junction in a single hour. In reality the development traffic would be less and the junction would operate with more reserve capacity.				

3.0 Visibility At Site Access

- 3.1 To determine the appropriate minimum visibility splay required at the Car Park access traffic speed measurements have been undertaken.
- 3.2 The speed of traffic coming into the field of view of drivers to the north of the access was recorded at the exit to the mini-roundabout. The average speed in dry conditions was 27 mph. The 85th percentile speed was found to be 29 mph, the mini-roundabout having the effect of controlling all vehicle speeds to approximately the same level and therefore reducing the gap that would normally be expected between the average and 85th percentile speed.
- 3.3 With the Wet Weather adjustments the 85th percentile speed would be 26 to 27 mph. A 43 m visibility splay (suitable for 85th percentile wet weather speeds of 30mph) would therefore be more than adequate. With the boundary wall of the site reduced to 1m in excess of this visibility would be achievable to the north.
- 3.4 To the south traffic tends to speed up after passing the Coach Road junction but then reduces speed to pass through the chicane created by the refuge island at the Cart Road junction.
- 3.5 Traffic was recorded passing the refuge island with an average dry weather speed of 29mph and an 85th percentile speed of 31mph. With the Wet Weather adjustments the 85th percentile speed would be around 28 mph. Again, therefore, a 43 m visibility splay (suitable for 85th percentile wet weather speeds of 30 mph) would therefore be more than adequate.
- 3.6 The presence of the refuge island and requirement of all traffic to pass the on the left side of the bollard means that the visibility splay can be measured to the centre of the Preston Street carriageway, not the nearside edge. Measured to the nearside

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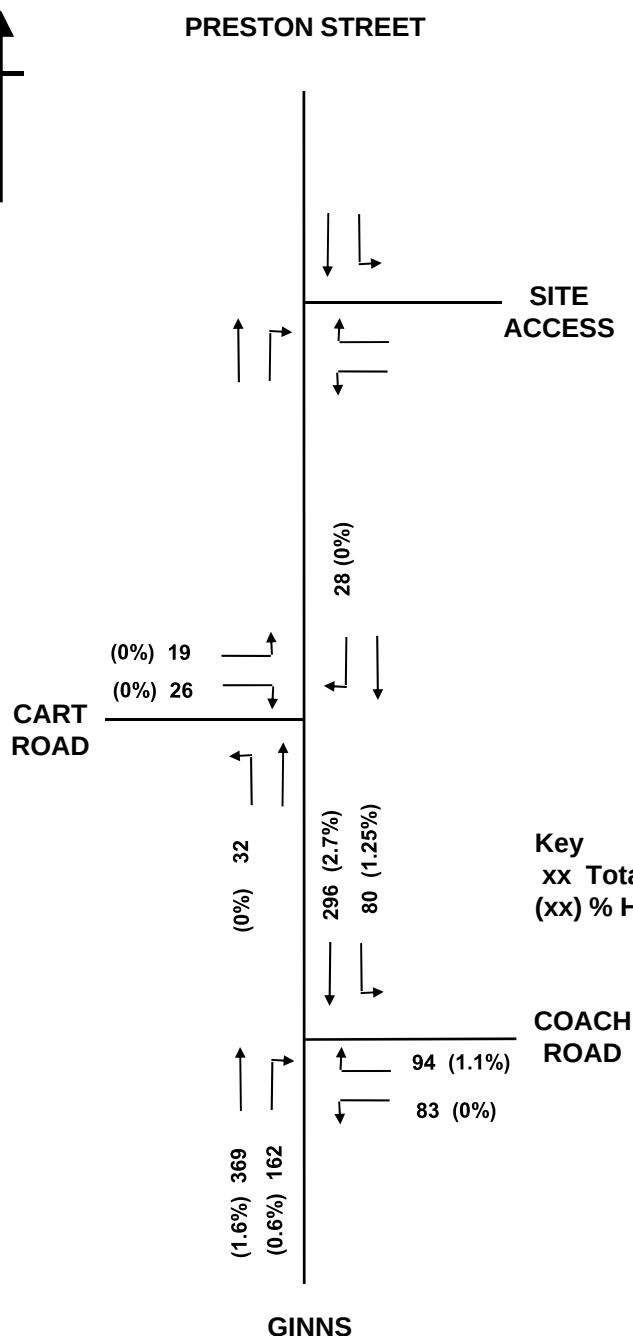
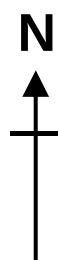
edge visibility in excess of 43m can be achieved. The visibility to the centre of Preston Street would be significantly greater.

- 3.7 On the proposed access arrangement drawing the visibility has been measured in accordance with current government advice in the Manual for Streets 2:

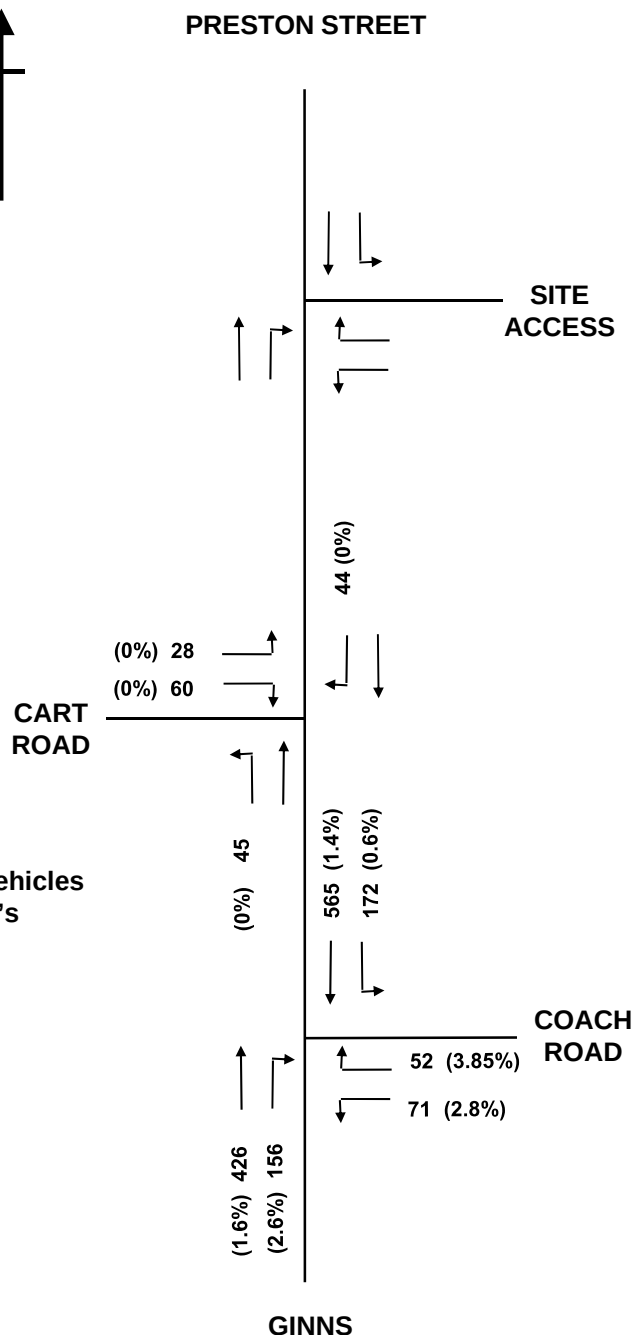
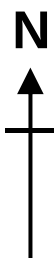
10.5.3 The Y distance represents the distance that a driver who is about to exit from the minor arm can see to the left and right along the main alignment. For simplicity it has previously been measured along the nearside kerb line of the main arm, although vehicles will normally be travelling at a distance from the kerb line. Therefore a more accurate assessment of visibility splay is made by measuring to the nearside edge of the vehicle track. The measurement is taken from the point where this line intersects the centreline of the minor arm (unless, as above, there is a splitter island in the minor arm).

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Figures



**Figure 1a Base Traffic Flows. 2017
Weekday AM Peak Hour
08.15 – 09.15**



**Figure 1b Base Traffic Flows. 2017
Weekday PM Peak Hour
16.15 – 17.15**

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Client

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Job Title
Proposed Development
Preston Street. Whitehaven

Drawing Title
Base Traffic Flows 2017

Scale N.T.S. **Date** Dec 2017 **Doc Sheet No.**

Drawn By J.L. **Checked** **Approved**

Job No. 170503 **Drg. No.** Figure 1 **Rev.**

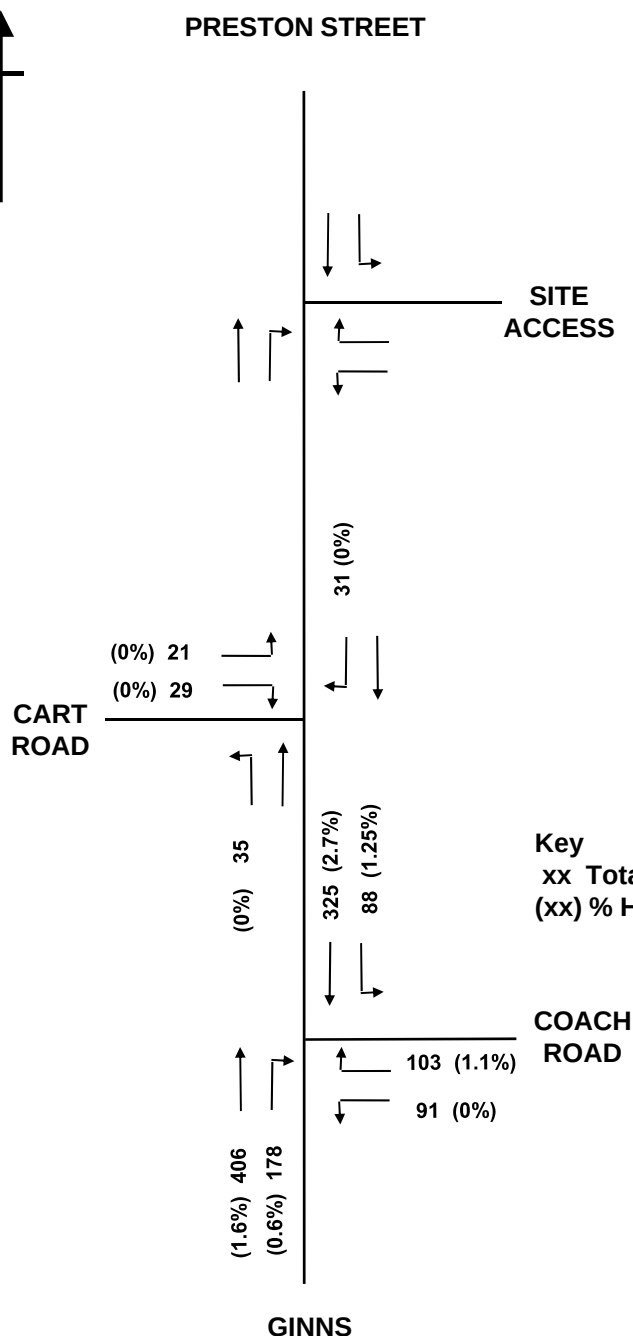
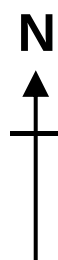


Figure 2a Base Traffic Flows. 2023
Weekday AM Peak Hour
08.15 – 09.15

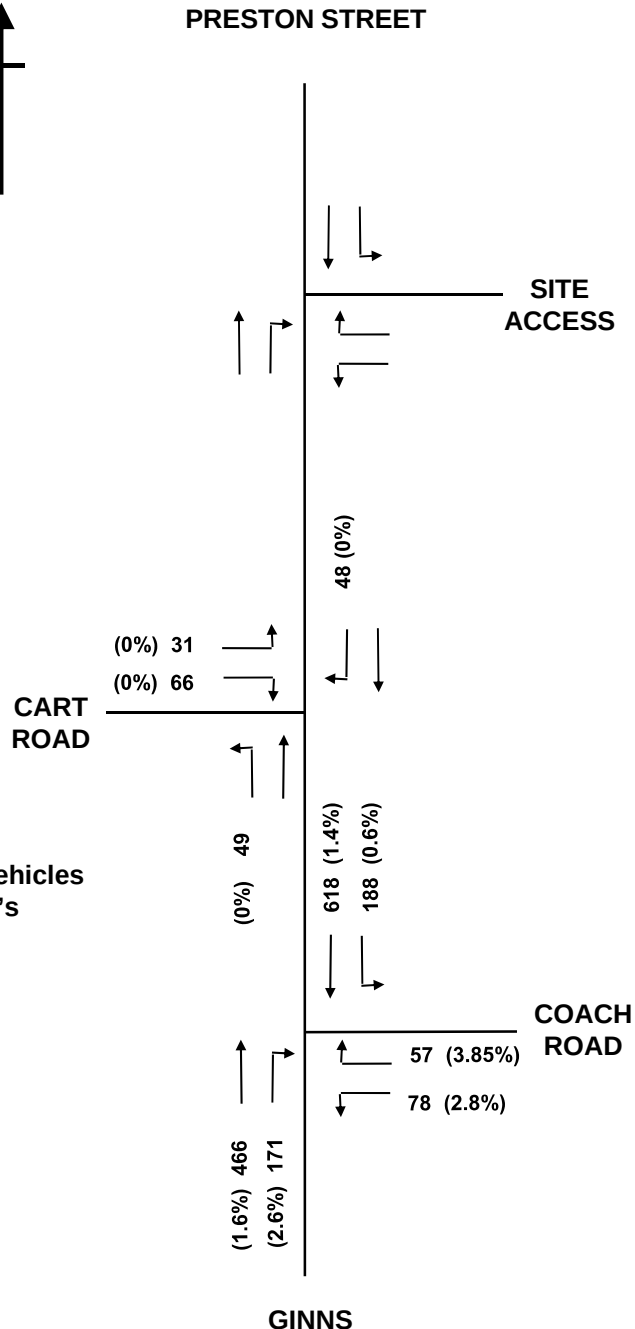
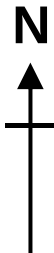


Figure 2b Base Traffic Flows. 2023
Weekday PM Peak Hour
16.15 – 17.15

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Job Title Proposed Development
Preston Street. Whitehaven

Drawing Title Base Traffic Flows 2023

Scale N.T.S. **Date** Dec 2017 **Doc Sheet No.**

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Job No. 170503 **Drg. No.** Figure 2 **Rev.**

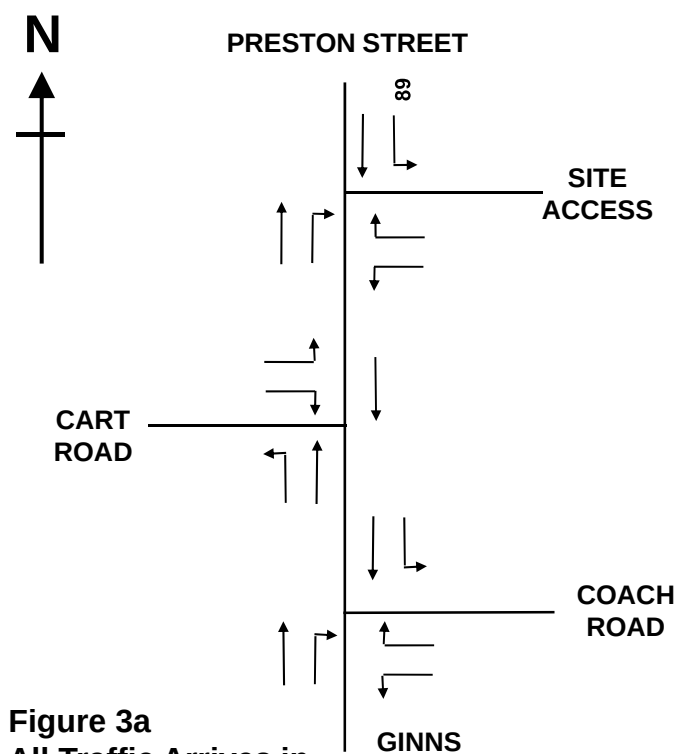


Figure 3a
All Traffic Arrives in
1 Hour in AM Peak
Period From North

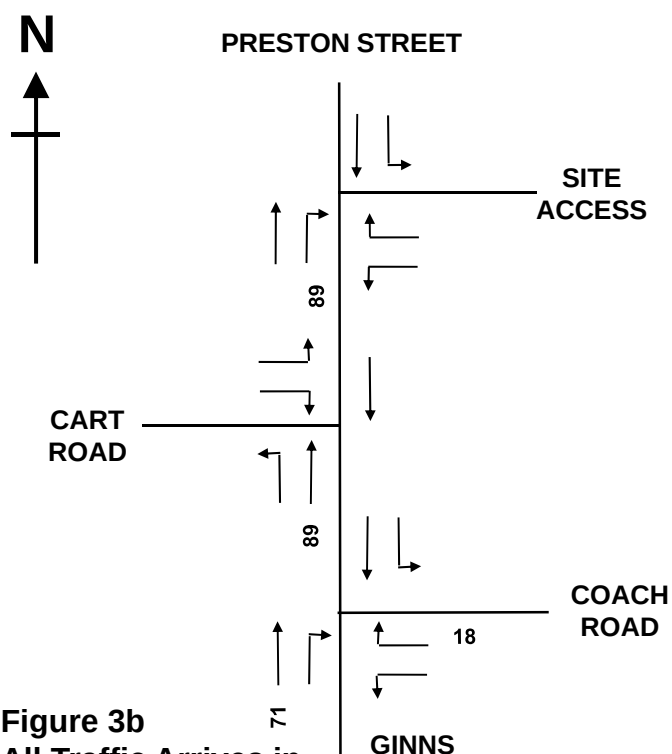


Figure 3b
All Traffic Arrives in
1 Hour in AM Peak
Period From South

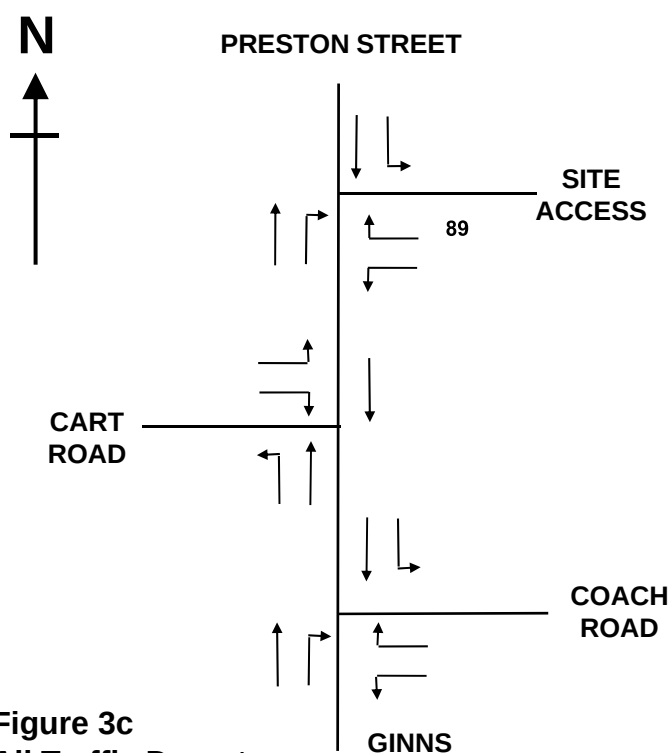


Figure 3c
All Traffic Departs
in 1 Hour in PM Peak
Period To North

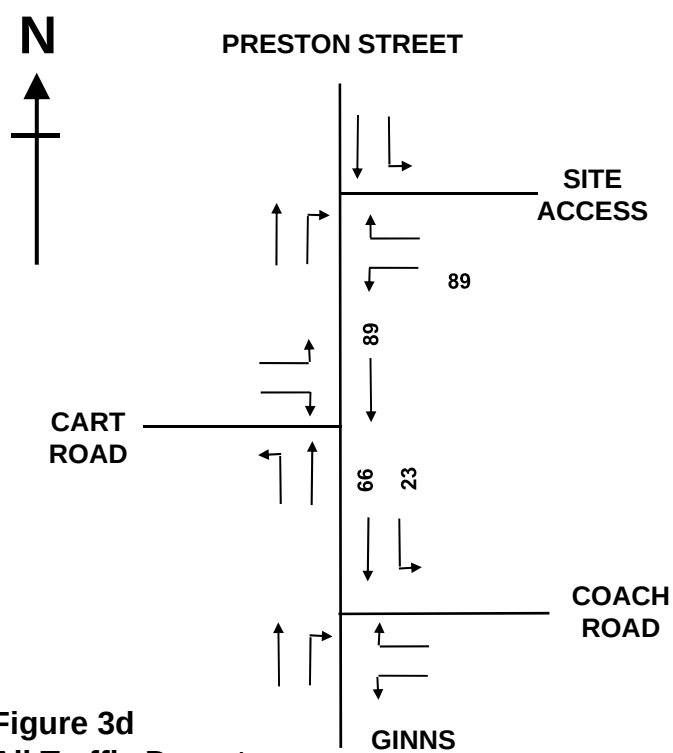


Figure 3d
All Traffic Departs
in 1 Hour in PM Peak
Period To South

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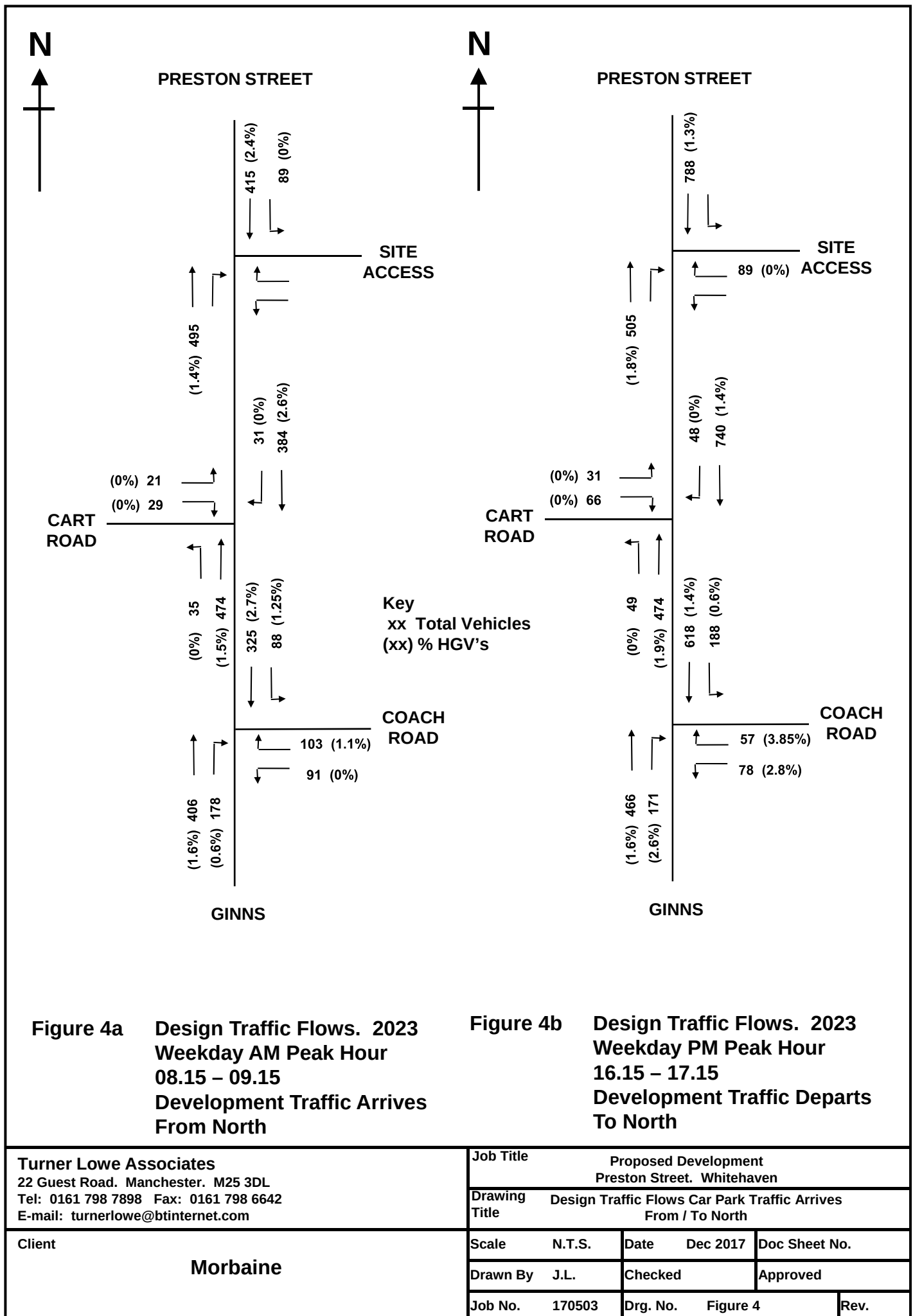
Job Title
Proposed Development
Preston Street. Whitehaven

Drawing
Title
Worst Case Effects of Development

Scale N.T.S. Date Dec 2017 Doc Sheet No.

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Job No. 170503 Drg. No. Figure 3 Rev.



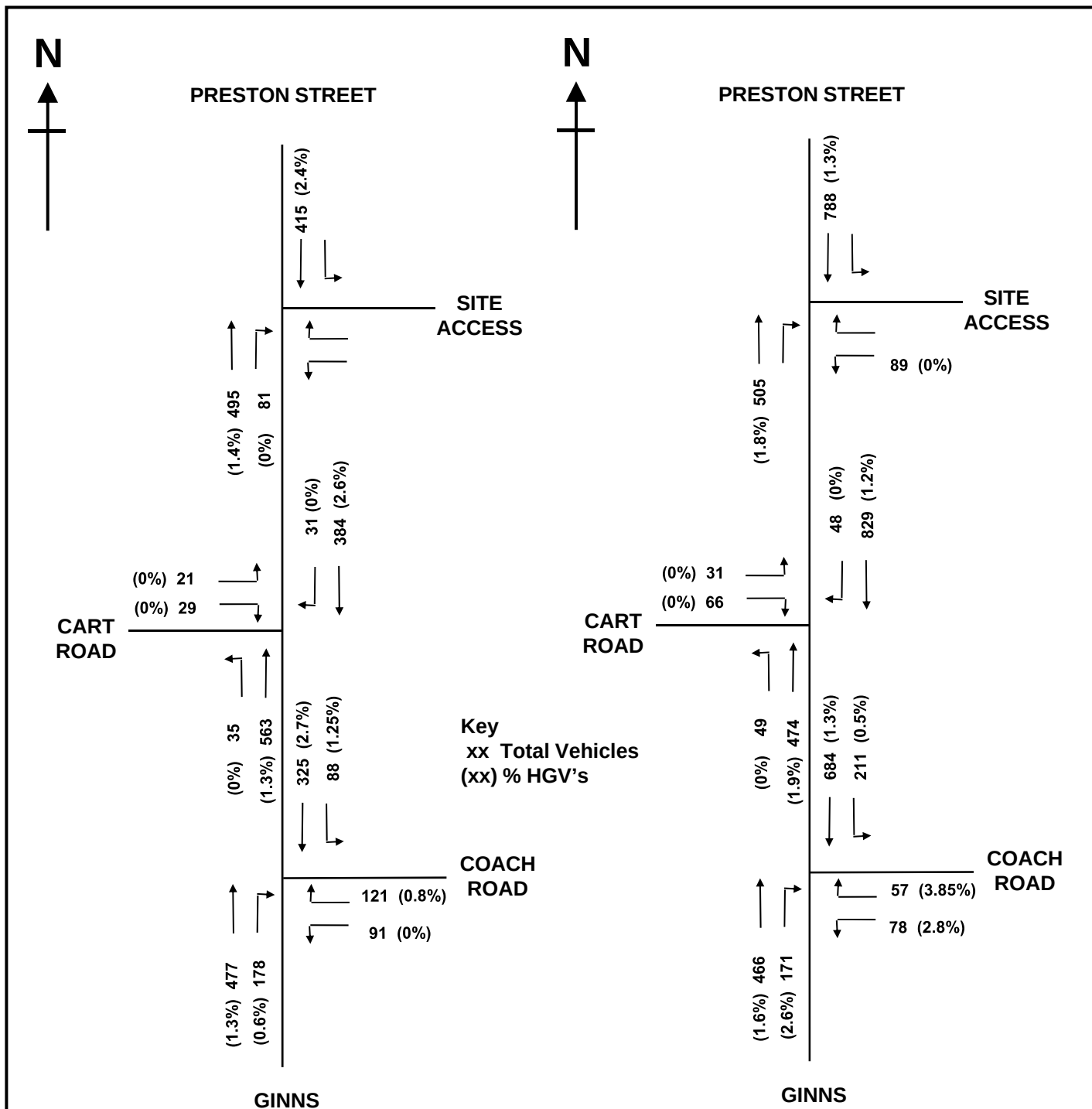


Figure 5a Design Traffic Flows. 2023
Weekday AM Peak Hour
08.15 – 09.15
Development Traffic Arrives
From South

Figure 5b Design Traffic Flows. 2023
Weekday PM Peak Hour
16.15 – 17.15
Development Traffic Departs
From South

Turner Lowe Associates 22 Guest Road. Manchester. M25 3DL Tel: 0161 798 7898 Fax: 0161 798 6642 E-mail: turnerlowe@btinternet.com	Job Title Proposed Development Preston Street. Whitehaven				
	Drawing Title Design Traffic Flows Car Park Traffic Arrives From / To South				
Client Morbaine	Scale	N.T.S.	Date	Dec 2017	Doc Sheet No.
	Drawn By	J.L.	Checked	Approved	
	Job No.	170503	Drg. No.	Figure 5	Rev.

Appendix A
Traffic Survey Results

Turner Lowe Associates Traffic Survey Summary

Survey Location

Preston St / Coach Rd / Cart Rd

Whitehaven

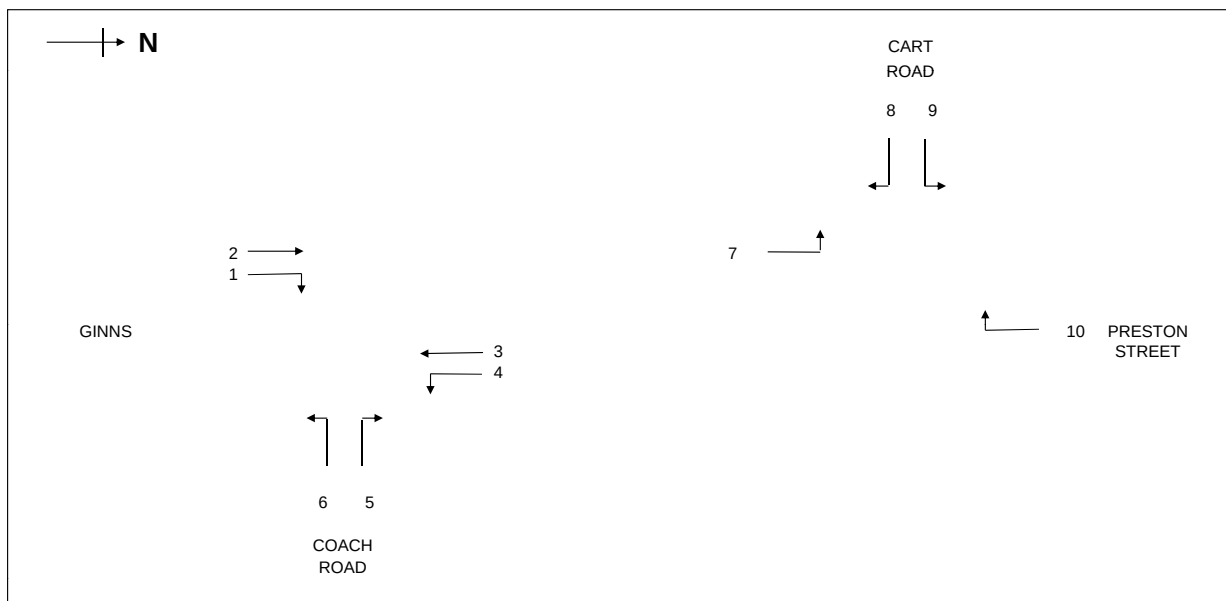
Date 14/11/17

Day

Tuesday

Weather

Fine



Movement 1 GINNS Right Turn to Coach Road

Inc. in peak 60 min. calc. Y/N

Y

Time	Vehicle Class						Totals		
	P. Cycle	M. Cycle	Car/Lt.Gds	Med.Gds	Hvy.Gds	P.S.V.	Vehicles	% OGVs	PCUs
07.30 - 07.45			19				19	0.00	19
07.45 - 08.00			34				34	0.00	34
08.00 - 08.15			28			2	30	6.67	32
08.15 - 08.30			42				42	0.00	42
08.30 - 08.45			39			1	40	2.50	41
08.45 - 09.00			44				44	0.00	44
09.00 - 09.15			36				36	0.00	36
09.15 - 09.30			31	1		2	34	8.82	37
Peak Hour Total	0	0	161	0	0	1	162	0.62	163

Peak Hour is: 08.15-09.15 Based on traffic flows selected for inclusion in Peak Period calculation

Time	Vehicle Class						Totals		
	P. Cycle	M. Cycle	Car/Lt.Gds	Med.Gds	Hvy.Gds	P.S.V.	Vehicles	% OGVs	PCUs
16.00 - 16.15			39				39	0.00	39
16.15 - 16.30		1	50			1	52	1.92	52
16.30 - 16.45			34				34	0.00	34
16.45 - 17.00			35	1		1	37	5.41	39
17.00 - 17.15			32			1	33	3.03	34
17.15 - 17.30		1	31				32	0.00	31
17.30 - 17.45			33			1	34	2.94	35
17.45 - 18.00			28				28	0.00	28
Peak Hour Total	0	1	151	1	0	3	156	2.56	159

Peak Hour is: 16.15-17.15 Based on traffic flows selected for inclusion in Peak Period calculation

Movement 2 GINNS Straight Ahead to Preston Street

Inc. in peak 60 min. calc. Y/N

Y

Time	Vehicle Class						Totals		
	P. Cycle	M. Cycle	Car/Lt.Gds	Med.Gds	Hvy.Gds	P.S.V.	Vehicles	% OGVs	PCUs
07.30 - 07.45			49	1	1		51	3.92	53
07.45 - 08.00		1	58	1	1	1	62	4.84	64
08.00 - 08.15	1		67		1	1	70	2.86	72
08.15 - 08.30			81			1	82	1.22	83
08.30 - 08.45	1	1	89	1			92	1.09	91
08.45 - 09.00			97	1		1	99	2.02	101
09.00 - 09.15		1	93		1	1	96	2.08	98
09.15 - 09.30	1		78			1	80	1.25	80
Peak Hour Total	1	2	360	2	1	3	369	1.63	372

Peak Hour is: 08.15-09.15 Based on traffic flows selected for inclusion in Peak Period calculation

Time	Vehicle Class						Totals		
	P. Cycle	M. Cycle	Car/Lt.Gds	Med.Gds	Hvy.Gds	P.S.V.	Vehicles	% OGVs	PCUs
16.00 - 16.15			91				91	0.00	91
16.15 - 16.30			101			2	103	1.94	105
16.30 - 16.45		1	104			2	107	1.87	108
16.45 - 17.00			116				116	0.00	116
17.00 - 17.15			97		1	2	100	3.00	103
17.15 - 17.30			80			1	81	1.23	82
17.30 - 17.45			88				88	0.00	88
17.45 - 18.00			79			1	80	1.25	81
Peak Hour Total	0	1	418	0	1	6	426	1.64	433

Peak Hour is: 16.15-17.15 Based on traffic flows selected for inclusion in Peak Period calculation

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Turner Lowe Associates Traffic Survey Summary Continuation Sheet

Survey Location Preston St / Coach Rd / Cart Rd **Date** 14/11/17 **Day** Tuesday
Whitehaven **Weather** Fine

Movement 3 Preston Street Straight Ahead to Ginns **Inc. in peak 60 min. calc. Y/N** Y

Time	Vehicle Class						Totals		
	P. Cycle	M. Cycle	Car/Lt.Gds	Med.Gds	Hvy.Gds	P.S.V.	Vehicles	% OGVs	PCUs
07.30 - 07.45			41	1			42	2.38	43
07.45 - 08.00		1	45	1		2	49	6.12	51
08.00 - 08.15			59		3	1	63	6.35	68
08.15 - 08.30			61			3	64	4.69	67
08.30 - 08.45		1	68				69	0.00	68
08.45 - 09.00			81	1		2	84	3.57	87
09.00 - 09.15			77		2		79	2.53	82
09.15 - 09.30	1	1	58		1	1	62	3.23	63
Peak Hour Total	0	1	287	1	2	5	296	2.70	304

Peak Hour is: 08.15-09.15 Based on traffic flows selected for inclusion in Peak Period calculation

Time	Vehicle Class						Totals		
	P. Cycle	M. Cycle	Car/Lt.Gds	Med.Gds	Hvy.Gds	P.S.V.	Vehicles	% OGVs	PCUs
16.00 - 16.15			128		1		129	0.78	130
16.15 - 16.30			134			2	136	1.47	138
16.30 - 16.45			151			1	152	0.66	153
16.45 - 17.00		1	138	1	1	1	142	2.11	144
17.00 - 17.15			133		1	1	135	1.48	137
17.15 - 17.30			121			2	123	1.63	125
17.30 - 17.45			136				136	0.00	136
17.45 - 18.00			122			1	123	0.81	124
Peak Hour Total	0	1	556	1	2	5	565	1.42	573

Peak Hour is: 16.15-17.15 Based on traffic flows selected for inclusion in Peak Period calculation

Movement 4 Preston Street Left Turn to Coach Road **Inc. in peak 60 min. calc. Y/N** Y

Time	Vehicle Class						Totals		
	P. Cycle	M. Cycle	Car/Lt.Gds	Med.Gds	Hvy.Gds	P.S.V.	Vehicles	% OGVs	PCUs
07.30 - 07.45			6				6	0.00	6
07.45 - 08.00			9	1			10	10.00	11
08.00 - 08.15			8				8	0.00	8
08.15 - 08.30			15				15	0.00	15
08.30 - 08.45			27				27	0.00	27
08.45 - 09.00			18				18	0.00	18
09.00 - 09.15			19	1			20	5.00	21
09.15 - 09.30			11				11	0.00	11
Peak Hour Total	0	0	79	1	0	0	80	1.25	81

Peak Hour is: 08.15-09.15 Based on traffic flows selected for inclusion in Peak Period calculation

Time	Vehicle Class						Totals		
	P. Cycle	M. Cycle	Car/Lt.Gds	Med.Gds	Hvy.Gds	P.S.V.	Vehicles	% OGVs	PCUs
16.00 - 16.15			41				41	0.00	41
16.15 - 16.30	2		34				36	0.00	34
16.30 - 16.45			51	1			52	1.92	53
16.45 - 17.00			41				41	0.00	41
17.00 - 17.15			43				43	0.00	43
17.15 - 17.30			37				37	0.00	37
17.30 - 17.45			39				39	0.00	39
17.45 - 18.00			28				28	0.00	28
Peak Hour Total	2	0	169	1	0	0	172	0.58	171

Peak Hour is: 16.15-17.15 Based on traffic flows selected for inclusion in Peak Period calculation

Movement 5 Coach Road Right Turn to Preston Street **Inc. in peak 60 min. calc. Y/N** Y

Time	Vehicle Class						Totals		
	P. Cycle	M. Cycle	Car/Lt.Gds	Med.Gds	Hvy.Gds	P.S.V.	Vehicles	% OGVs	PCUs
07.30 - 07.45			2				2	0.00	2
07.45 - 08.00			4				4	0.00	4
08.00 - 08.15			12		1		13	7.69	14
08.15 - 08.30			24				24	0.00	24
08.30 - 08.45			23				23	0.00	23
08.45 - 09.00			25				25	0.00	25
09.00 - 09.15			21		1		22	4.55	23
09.15 - 09.30			18				18	0.00	18
Peak Hour Total	0	0	93	0	1	0	94	1.06	95

Peak Hour is: 08.15-09.15 Based on traffic flows selected for inclusion in Peak Period calculation

Time	Vehicle Class						Totals		
	P. Cycle	M. Cycle	Car/Lt.Gds	Med.Gds	Hvy.Gds	P.S.V.	Vehicles	% OGVs	PCUs
16.00 - 16.15			8				8	0.00	8
16.15 - 16.30			10		1		11	9.09	12
16.30 - 16.45		1	13				14	0.00	13
16.45 - 17.00			15				15	0.00	15
17.00 - 17.15			11		1		12	8.33	13
17.15 - 17.30			10				10	0.00	10
17.30 - 17.45			18	1			19	5.26	20
17.45 - 18.00			8				8	0.00	8
Peak Hour Total	0	1	49	0	2	0	52	3.85	54

Peak Hour is: 16.15-17.15 Based on traffic flows selected for inclusion in Peak Period calculation

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Turner Lowe Associates Traffic Survey Summary Continuation Sheet

Survey Location Preston St / Coach Rd / Cart Rd **Date** 14/11/17 **Day** Tuesday
Whitehaven **Weather** Fine

Movement 6 Coach Road Left Turn to Ginns **Inc. in peak 60 min. calc. Y/N** Y

Time	Vehicle Class						Totals		
	P. Cycle	M. Cycle	Car/Lt.Gds	Med.Gds	Hvy.Gds	P.S.V.	Vehicles	% OGVs	PCUs
07.30 - 07.45			5				5	0.00	5
07.45 - 08.00			9				9	0.00	9
08.00 - 08.15			12				12	0.00	12
08.15 - 08.30			17				17	0.00	17
08.30 - 08.45			21				21	0.00	21
08.45 - 09.00			20				20	0.00	20
09.00 - 09.15			25				25	0.00	25
09.15 - 09.30			21				21	0.00	21
Peak Hour Total	0	0	83	0	0	0	83	0.00	83

Peak Hour is: 08.15-09.15 Based on traffic flows selected for inclusion in Peak Period calculation

Time	Vehicle Class						Totals		
	P. Cycle	M. Cycle	Car/Lt.Gds	Med.Gds	Hvy.Gds	P.S.V.	Vehicles	% OGVs	PCUs
16.00 - 16.15			9				9	0.00	9
16.15 - 16.30		1	11				12	0.00	11
16.30 - 16.45			22				22	0.00	22
16.45 - 17.00		1	18		1		20	5.00	21
17.00 - 17.15		1	15	1			17	5.88	17
17.15 - 17.30			17				17	0.00	17
17.30 - 17.45			12				12	0.00	12
17.45 - 18.00			8				8	0.00	8
Peak Hour Total	0	3	66	1	1	0	71	2.82	71

Peak Hour is: 16.15-17.15 Based on traffic flows selected for inclusion in Peak Period calculation

Movement 7 Preston Street (south) Left Turn To Cart Road **Inc. in peak 60 min. calc. Y/N** N

Time	Vehicle Class						Totals		
	P. Cycle	M. Cycle	Car/Lt.Gds	Med.Gds	Hvy.Gds	P.S.V.	Vehicles	% OGVs	PCUs
07.30 - 07.45			0				0	0.00	0
07.45 - 08.00			3				3	0.00	3
08.00 - 08.15			3				3	0.00	3
08.15 - 08.30			3				3	0.00	3
08.30 - 08.45			6				6	0.00	6
08.45 - 09.00			12				12	0.00	12
09.00 - 09.15			11				11	0.00	11
09.15 - 09.30			12				12	0.00	12
Peak Hour Total	0	0	32	0	0	0	32	0.00	32

Peak Hour is: 08.15-09.15 Based on traffic flows selected for inclusion in Peak Period calculation

Time	Vehicle Class						Totals		
	P. Cycle	M. Cycle	Car/Lt.Gds	Med.Gds	Hvy.Gds	P.S.V.	Vehicles	% OGVs	PCUs
16.00 - 16.15			13				13	0.00	13
16.15 - 16.30			10				10	0.00	10
16.30 - 16.45			12				12	0.00	12
16.45 - 17.00			8				8	0.00	8
17.00 - 17.15			15				15	0.00	15
17.15 - 17.30			7				7	0.00	7
17.30 - 17.45			10				10	0.00	10
17.45 - 18.00			15				15	0.00	15
Peak Hour Total	0	0	45	0	0	0	45	0.00	45

Peak Hour is: 16.15-17.15 Based on traffic flows selected for inclusion in Peak Period calculation

Movement 8 Cart Road Right Turn To Preston Street (south) **Inc. in peak 60 min. calc. Y/N** N

Time	Vehicle Class						Totals		
	P. Cycle	M. Cycle	Car/Lt.Gds	Med.Gds	Hvy.Gds	P.S.V.	Vehicles	% OGVs	PCUs
07.30 - 07.45			0				0	0.00	0
07.45 - 08.00			5				5	0.00	5
08.00 - 08.15			2				2	0.00	2
08.15 - 08.30			6				6	0.00	6
08.30 - 08.45			8				8	0.00	8
08.45 - 09.00			5				5	0.00	5
09.00 - 09.15			7				7	0.00	7
09.15 - 09.30			11				11	0.00	11
Peak Hour Total	0	0	26	0	0	0	26	0.00	26

Peak Hour is: 08.15-09.15 Based on traffic flows selected for inclusion in Peak Period calculation

Time	Vehicle Class						Totals		
	P. Cycle	M. Cycle	Car/Lt.Gds	Med.Gds	Hvy.Gds	P.S.V.	Vehicles	% OGVs	PCUs
16.00 - 16.15			17				17	0.00	17
16.15 - 16.30			13				13	0.00	13
16.30 - 16.45			16				16	0.00	16
16.45 - 17.00		1	11				12	0.00	11
17.00 - 17.15			19				19	0.00	19
17.15 - 17.30			10				10	0.00	10
17.30 - 17.45			12				12	0.00	12
17.45 - 18.00			15				15	0.00	15
Peak Hour Total	0	1	59	0	0	0	60	0.00	59

Peak Hour is: 16.15-17.15 Based on traffic flows selected for inclusion in Peak Period calculation

22 Guest Road. Manchester M25 3DL.

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Turner Lowe Associates Traffic Survey Summary Continuation Sheet

Survey Location Preston St / Coach Rd / Cart Rd **Date** 14/11/17 **Day** Tuesday
 Whitehaven **Weather** Fine

Movement 9 Cart Road Left Turn To Preston Street (north) **Inc. in peak 60 min. calc. Y/N** Y

Time	Vehicle Class						Totals		
	P. Cycle	M. Cycle	Car/Lt.Gds	Med.Gds	Hvy.Gds	P.S.V.	Vehicles	% OGVs	PCUs
07.30 - 07.45			1				1	0.00	1
07.45 - 08.00			3				3	0.00	3
08.00 - 08.15			1				1	0.00	1
08.15 - 08.30			0				0	0.00	0
08.30 - 08.45			4				4	0.00	4
08.45 - 09.00			6				6	0.00	6
09.00 - 09.15			9				9	0.00	9
09.15 - 09.30			8				8	0.00	8
Peak Hour Total	0	0	19	0	0	0	19	0.00	19

Peak Hour is: 08.15-09.15 Based on traffic flows selected for inclusion in Peak Period calculation

Time	Vehicle Class						Totals		
	P. Cycle	M. Cycle	Car/Lt.Gds	Med.Gds	Hvy.Gds	P.S.V.	Vehicles	% OGVs	PCUs
16.00 - 16.15			9				9	0.00	9
16.15 - 16.30			10				10	0.00	10
16.30 - 16.45			7				7	0.00	7
16.45 - 17.00			5				5	0.00	5
17.00 - 17.15			6				6	0.00	6
17.15 - 17.30			15				15	0.00	15
17.30 - 17.45			5				5	0.00	5
17.45 - 18.00			10				10	0.00	10
Peak Hour Total	0	0	28	0	0	0	28	0.00	28

Peak Hour is: 16.15-17.15 Based on traffic flows selected for inclusion in Peak Period calculation

Movement 10 Preston Street (north) Right Turn To Cart Road **Inc. in peak 60 min. calc. Y/N** Y

Time	Vehicle Class						Totals		
	P. Cycle	M. Cycle	Car/Lt.Gds	Med.Gds	Hvy.Gds	P.S.V.	Vehicles	% OGVs	PCUs
07.30 - 07.45			1				1	0.00	1
07.45 - 08.00			4				4	0.00	4
08.00 - 08.15			2				2	0.00	2
08.15 - 08.30			5				5	0.00	5
08.30 - 08.45			6				6	0.00	6
08.45 - 09.00			5				5	0.00	5
09.00 - 09.15			12				12	0.00	12
09.15 - 09.30			10				10	0.00	10
Peak Hour Total	0	0	28	0	0	0	28	0.00	28

Peak Hour is: 08.15-09.15 Based on traffic flows selected for inclusion in Peak Period calculation

Time	Vehicle Class						Totals		
	P. Cycle	M. Cycle	Car/Lt.Gds	Med.Gds	Hvy.Gds	P.S.V.	Vehicles	% OGVs	PCUs
16.00 - 16.15			8				8	0.00	8
16.15 - 16.30			10				10	0.00	10
16.30 - 16.45			11				11	0.00	11
16.45 - 17.00			13				13	0.00	13
17.00 - 17.15			10				10	0.00	10
17.15 - 17.30			11				11	0.00	11
17.30 - 17.45			13				13	0.00	13
17.45 - 18.00			8				8	0.00	8
Peak Hour Total	0	0	44	0	0	0	44	0.00	44

Peak Hour is: 16.15-17.15 Based on traffic flows selected for inclusion in Peak Period calculation

Movement 11 **Inc. in peak 60 min. calc. Y/N** N

Time	Vehicle Class						Totals		
	P. Cycle	M. Cycle	Car/Lt.Gds	Med.Gds	Hvy.Gds	P.S.V.	Vehicles	% OGVs	PCUs
07.30 - 07.45							0	0.00	0
07.45 - 08.00							0	0.00	0
08.00 - 08.15							0	0.00	0
08.15 - 08.30							0	0.00	0
08.30 - 08.45							0	0.00	0
08.45 - 09.00							0	0.00	0
09.00 - 09.15							0	0.00	0
09.15 - 09.30							0	0.00	0
Peak Hour Total	0	0	0	0	0	0	0	0.00	0

Peak Hour is: 08.15-09.15 Based on traffic flows selected for inclusion in Peak Period calculation

Time	Vehicle Class						Totals		
	P. Cycle	M. Cycle	Car/Lt.Gds	Med.Gds	Hvy.Gds	P.S.V.	Vehicles	% OGVs	PCUs
16.00 - 16.15							0	0.00	0
16.15 - 16.30							0	0.00	0
16.30 - 16.45							0	0.00	0
16.45 - 17.00							0	0.00	0
17.00 - 17.15							0	0.00	0
17.15 - 17.30							0	0.00	0
17.30 - 17.45							0	0.00	0
17.45 - 18.00							0	0.00	0
Peak Hour Total	0	0	0	0	0	0	0	0.00	0

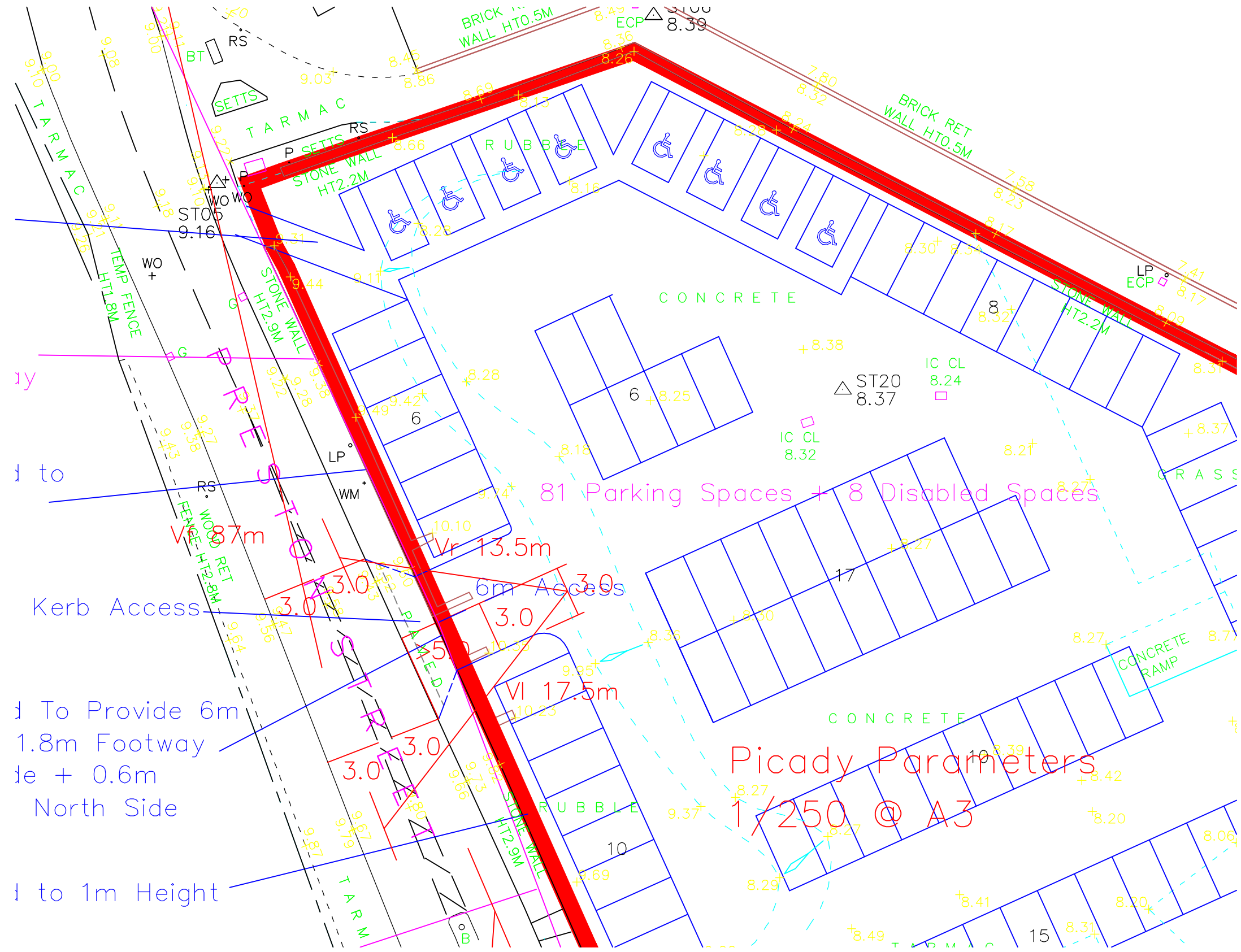
Peak Hour is: 16.15-17.15 Based on traffic flows selected for inclusion in Peak Period calculation

22 Guest Road. Manchester M25 3DL.

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Appendix B

Assessment of Site Access



Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.0.0.4211 []

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Filename: Preston Street - Temp Car Park Access.j9

Path: C:\Program Files\Junctions 9\Schemes\Whitehaven

Report generation date: 19/12/2017 12:20:18

»2023 Dev Traffic From North, AM

»2023 Dev Traffic To North, PM

»2023 Dev Traffic From South, AM

»2023 Dev Traffic To South, PM

Summary of junction performance

	AM					PM				
	Queue (Veh)	Delay (s)	RFC	LOS	Junction LOS	Queue (Veh)	Delay (s)	RFC	LOS	Junction LOS
	2023 Dev Traffic From North									
Stream B-AC	0.0	0.00	0.00	A	A					
Stream C-AB	0.0	0.00	0.00	A						
	2023 Dev Traffic To North									
Stream B-AC						0.8	29.47	0.45	D	A
Stream C-AB						0.0	0.00	0.00	A	
	2023 Dev Traffic From South									
Stream B-AC	0.0	0.00	0.00	A	A					
Stream C-AB	0.7	5.56	0.28	A						
	2023 Dev Traffic To South									
Stream B-AC						0.3	10.72	0.23	B	A
Stream C-AB						0.0	0.00	0.00	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

File summary

Title	Preston Street Temporary Car Park
Location	Preston Street. Whitehaven
Date	19/12/2017
Client	Morbaine
Jobnumber	170503
Enumerator	John Lowe
Description	Assumes Car Park Fills / Empties within 1 Hour With All Traffic Arriving/Departing From/To North or South

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
M	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
2023 Dev Traffic From North	AM	ONE HOUR	08:00	09:30	15	✓
2023 Dev Traffic To North	PM	ONE HOUR	16:00	17:30	15	✓
2023 Dev Traffic From South	AM	ONE HOUR	08:00	09:30	15	✓
2023 Dev Traffic To South	PM	ONE HOUR	16:00	17:30	15	✓

2023 Dev Traffic From North, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Preston Street - Temp Car Park Access	T-Junction	Two-way	0.00	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arm	Name	Description	Arm type
A	Preston Street North		Major
B	Temp Car Park Access		Minor
C	Preston Street South		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.00			87.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.40	18	14

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	509.570	0.093	0.235	0.148	0.335
1	B-C	657.762	0.101	0.255	-	-
1	C-B	624.346	0.242	0.242	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2023 Dev Traffic From North	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	504.00	100.000
B		ONE HOUR	✓	0.00	100.000
C		ONE HOUR	✓	495.00	100.000

Demand (Veh/hr)

	To			
		A	B	C
	A	0.000	89.000	415.000
	B	0.000	0.000	0.000
	C	495.000	0.000	0.000

Proportions

	To			
		A	B	C
	A	0.00	0.18	0.82
	B	0.33	0.33	0.33
	C	1.00	0.00	0.00

Heavy Vehicle proportion

	To			
		A	B	C
	A	0	0	2
	B	0	0	0
	C	1	0	0

Average PCU Per Veh

	To			
		A	B	C
	A	1.000	1.000	1.024
	B	1.000	1.000	1.000
	C	1.014	1.000	1.000

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.00	0.00	0.0	A	0.00	0.00
C-AB	0.00	0.00	0.0	A	0.00	0.00

Main Results for each time segment

Main results: (08:00-08:15)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	0.00	450.41	0.000	0.00	0.0	0.0	0.000	A
C-AB	0.00	0.00	0.00	0.00	527.05	0.000	0.00	0.0	0.0	0.000	A

Main results: (08:15-08:30)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	0.00	425.42	0.000	0.00	0.0	0.0	0.000	A
C-AB	0.00	0.00	0.00	0.00	509.01	0.000	0.00	0.0	0.0	0.000	A

Main results: (08:30-08:45)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	0.00	390.15	0.000	0.00	0.0	0.0	0.000	A
C-AB	0.00	0.00	0.00	0.00	484.07	0.000	0.00	0.0	0.0	0.000	A

Main results: (08:45-09:00)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	0.00	390.15	0.000	0.00	0.0	0.0	0.000	A
C-AB	0.00	0.00	0.00	0.00	484.07	0.000	0.00	0.0	0.0	0.000	A

Main results: (09:00-09:15)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	0.00	425.42	0.000	0.00	0.0	0.0	0.000	A
C-AB	0.00	0.00	0.00	0.00	509.01	0.000	0.00	0.0	0.0	0.000	A

Main results: (09:15-09:30)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	0.00	450.41	0.000	0.00	0.0	0.0	0.000	A
C-AB	0.00	0.00	0.00	0.00	527.05	0.000	0.00	0.0	0.0	0.000	A

2023 Dev Traffic To North, PM

Data Errors and Warnings*No errors or warnings***Analysis Set Details**

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Preston Street - Temp Car Park Access	T-Junction	Two-way	1.87	A

Junction Network Options

[same as above]

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2023 Dev Traffic To North	PM	ONE HOUR	16:00	17:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	788.00	100.000
B		ONE HOUR	✓	89.00	100.000
C		ONE HOUR	✓	505.00	100.000

Demand (Veh/hr)

From	To			
		A	B	C
	A	0.000	0.000	788.000
	B	89.000	0.000	0.000
	C	505.000	0.000	0.000

Proportions

From	To			
		A	B	C
	A	0.00	0.00	1.00
	B	1.00	0.00	0.00
	C	1.00	0.00	0.00

Heavy Vehicle proportion

From	To			
		A	B	C
	A	0	0	1
	B	0	0	0
	C	2	0	0

Average PCU Per Veh

From	To			
		A	B	C
	A	1.000	1.000	1.013
	B	1.000	1.000	1.000
	C	1.018	1.000	1.000

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.45	29.47	0.8	D	81.67	122.50
C-AB	0.00	0.00	0.0	A	0.00	0.00

Main Results for each time segment

Main results: (16:00-16:15)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	67.00	67.00	16.75	0.00	311.47	0.215	65.93	0.0	0.3	14.601	B
C-AB	0.00	0.00	0.00	0.00	474.70	0.000	0.00	0.0	0.0	0.000	A

Main results: (16:15-16:30)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	80.01	80.01	20.00	0.00	273.02	0.293	79.47	0.3	0.4	18.545	C
C-AB	0.00	0.00	0.00	0.00	446.73	0.000	0.00	0.0	0.0	0.000	A

Main results: (16:30-16:45)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	97.99	97.99	24.50	0.00	219.86	0.446	96.56	0.4	0.8	28.866	D
C-AB	0.00	0.00	0.00	0.00	408.07	0.000	0.00	0.0	0.0	0.000	A

Main results: (16:45-17:00)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	97.99	97.99	24.50	0.00	219.86	0.446	97.91	0.8	0.8	29.467	D
C-AB	0.00	0.00	0.00	0.00	408.07	0.000	0.00	0.0	0.0	0.000	A

Main results: (17:00-17:15)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	80.01	80.01	20.00	0.00	273.02	0.293	81.43	0.8	0.4	18.925	C
C-AB	0.00	0.00	0.00	0.00	446.73	0.000	0.00	0.0	0.0	0.000	A

Main results: (17:15-17:30)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	67.00	67.00	16.75	0.00	311.47	0.215	67.59	0.4	0.3	14.795	B
C-AB	0.00	0.00	0.00	0.00	474.70	0.000	0.00	0.0	0.0	0.000	A

2023 Dev Traffic From South, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Preston Street - Temp Car Park Access	T-Junction	Two-way	1.08	A

Junction Network Options

[same as above]

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2023 Dev Traffic From South	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	415.00	100.000
B		ONE HOUR	✓	0.00	100.000
C		ONE HOUR	✓	584.00	100.000

Demand (Veh/hr)

	To			
From		A	B	C
	A	0.000	0.000	415.000
	B	0.000	0.000	0.000
	C	495.000	89.000	0.000

Proportions

	To			
From		A	B	C
	A	0.00	0.00	1.00
	B	0.33	0.33	0.33
	C	0.85	0.15	0.00

Heavy Vehicle proportion

	To			
		A	B	C
	A	0	0	2
	B	0	0	0
	C	1	0	0

Average PCU Per Veh

	To			
		A	B	C
	A	1.000	1.000	1.024
	B	1.000	1.000	1.000
	C	1.014	1.000	1.000

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.00	0.00	0.0	A	0.00	0.00
C-AB	0.28	5.56	0.7	A	179.44	269.17

Main Results for each time segment

Main results: (08:00-08:15)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	0.00	440.32	0.000	0.00	0.0	0.0	0.000	A
C-AB	123.35	123.35	30.84	0.00	802.94	0.154	122.08	0.0	0.3	5.286	A

Main results: (08:15-08:30)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	0.00	412.39	0.000	0.00	0.0	0.0	0.000	A
C-AB	166.72	166.72	41.68	0.00	840.33	0.198	166.17	0.3	0.5	5.347	A

Main results: (08:30-08:45)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	0.00	372.71	0.000	0.00	0.0	0.0	0.000	A
C-AB	247.31	247.31	61.83	0.00	897.51	0.276	246.17	0.5	0.7	5.539	A

Main results: (08:45-09:00)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	0.00	372.52	0.000	0.00	0.0	0.0	0.000	A
C-AB	247.85	247.85	61.96	0.00	898.08	0.276	247.81	0.7	0.7	5.559	A

Main results: (09:00-09:15)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	0.00	412.11	0.000	0.00	0.0	0.0	0.000	A
C-AB	167.30	167.30	41.83	0.00	841.11	0.199	168.40	0.7	0.5	5.380	A

Main results: (09:15-09:30)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	0.00	439.98	0.000	0.00	0.0	0.0	0.000	A
C-AB	124.14	124.14	31.03	0.00	803.57	0.154	124.71	0.5	0.3	5.320	A

2023 Dev Traffic To South, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Preston Street - Temp Car Park Access	T-Junction	Two-way	0.68	A

Junction Network Options

[same as above]

Arms

[same as above]

Major Arm Geometry
[same as above]

Minor Arm Geometry
[same as above]

Slope / Intercept / Capacity
[same as above]

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2023 Dev Traffic To South	PM	ONE HOUR	16:00	17:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	788.00	100.000
B		ONE HOUR	✓	89.00	100.000
C		ONE HOUR	✓	505.00	100.000

Demand (Veh/hr)

--

	To			
From		A	B	C
	A	0.000	0.000	788.000
	B	0.000	0.000	89.000
	C	505.000	0.000	0.000

Proportions

	To			
From		A	B	C
	A	0.00	0.00	1.00
	B	0.00	0.00	1.00
	C	1.00	0.00	0.00

Heavy Vehicle proportion

	To			
		A	B	C
	A	0	0	1
	B	0	0	0
	C	2	0	0

Average PCU Per Veh

	To			
		A	B	C
	A	1.000	1.000	1.013
	B	1.000	1.000	1.000
	C	1.018	1.000	1.000

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.23	10.72	0.3	B	81.67	122.50
C-AB	0.00	0.00	0.0	A	0.00	0.00

Main Results for each time segment

Main results: (16:00-16:15)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	67.00	67.00	16.75	0.00	504.61	0.133	66.40	0.0	0.2	8.206	A
C-AB	0.00	0.00	0.00	0.00	474.70	0.000	0.00	0.0	0.0	0.000	A

Main results: (16:15-16:30)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	80.01	80.01	20.00	0.00	474.88	0.168	79.81	0.2	0.2	9.107	A
C-AB	0.00	0.00	0.00	0.00	446.73	0.000	0.00	0.0	0.0	0.000	A

Main results: (16:30-16:45)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	97.99	97.99	24.50	0.00	433.78	0.226	97.64	0.2	0.3	10.699	B
C-AB	0.00	0.00	0.00	0.00	408.07	0.000	0.00	0.0	0.0	0.000	A

Main results: (16:45-17:00)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	97.99	97.99	24.50	0.00	433.78	0.226	97.98	0.3	0.3	10.720	B
C-AB	0.00	0.00	0.00	0.00	408.07	0.000	0.00	0.0	0.0	0.000	A

Main results: (17:00-17:15)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	80.01	80.01	20.00	0.00	474.88	0.168	80.35	0.3	0.2	9.132	A
C-AB	0.00	0.00	0.00	0.00	446.73	0.000	0.00	0.0	0.0	0.000	A

Main results: (17:15-17:30)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	67.00	67.00	16.75	0.00	504.61	0.133	67.21	0.2	0.2	8.235	A
C-AB	0.00	0.00	0.00	0.00	474.70	0.000	0.00	0.0	0.0	0.000	A

Appendix C

Assessment of Preston Street / Cart Road Junction

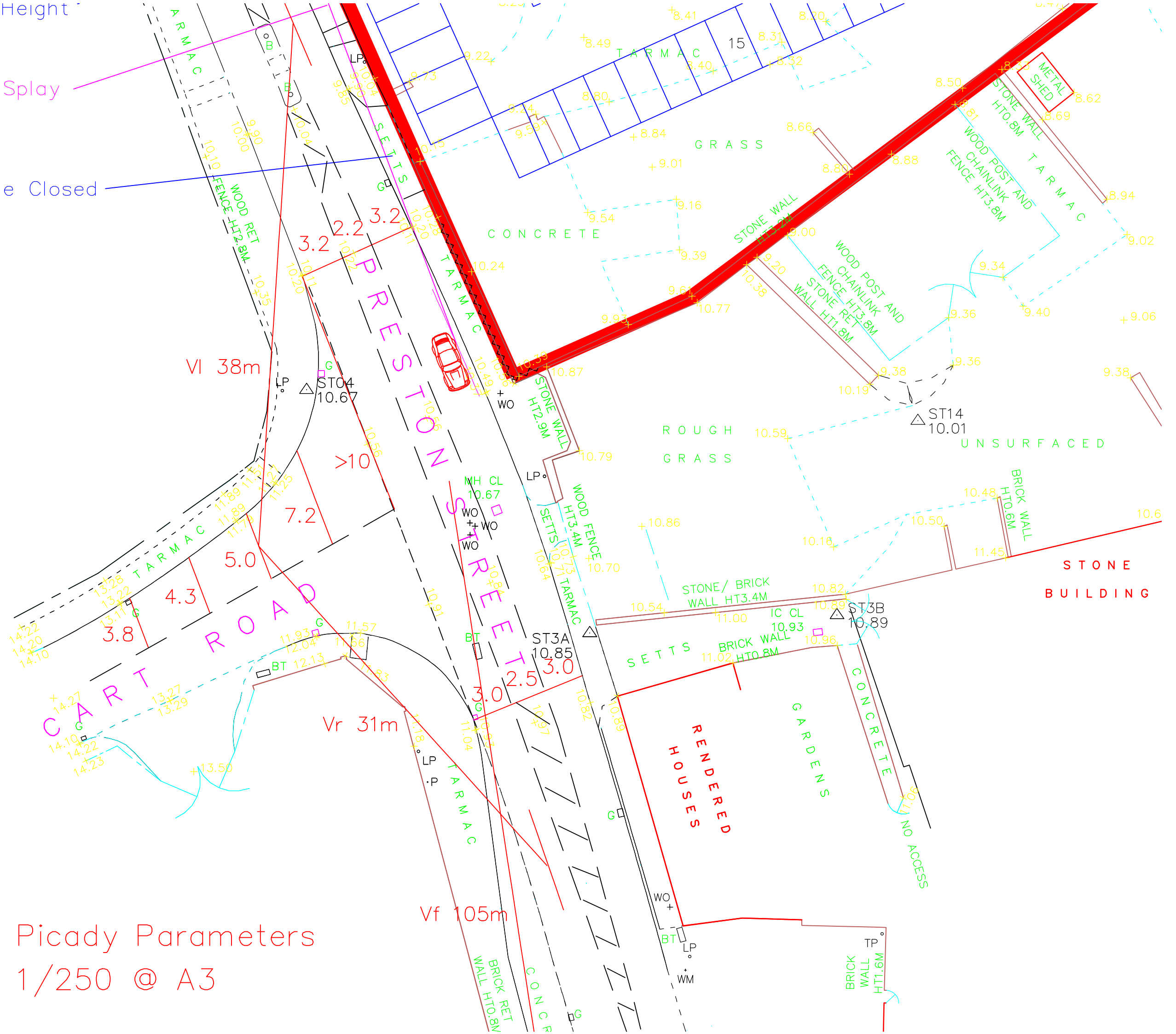
g Access To Be Closed

Vr 31m

$V_f = 105 \text{ m/s}$

Picady Parameters

1/250 @ A3



Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.0.0.4211

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Filename: Preston Street - Cart Road.j9

Path: C:\Program Files\Junctions 9\Schemes\Whitehaven

Report generation date: 19/12/2017 11:52:32

»2023 Dev Traffic From South, AM

»2023 Dev Traffic To South, PM

Summary of junction performance

	AM					PM				
	Queue (Veh)	Delay (s)	RFC	LOS	Junction LOS	Queue (Veh)	Delay (s)	RFC	LOS	Junction LOS
	2023 Dev Traffic From South									
Stream B-C	0.0	7.34	0.05	A	A					
Stream B-A	0.1	11.86	0.10	B						
Stream C-AB	0.1	7.67	0.07	A						
	2023 Dev Traffic To South									
Stream B-C						0.1	8.28	0.07	A	A
Stream B-A						0.4	17.79	0.26	C	
Stream C-AB						0.1	8.04	0.11	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

File Description

Title	Preston Street / Cart Road With Temporary Car Park
Location	Preston Street / Cart Road. Whitehaven
Date	19/12/2017
Client	Morbaine
Jobnumber	170503
Enumerator	John Lowe
Notes	Assumes Car Park Fills / Empties within 1 Hour with all Traffic Passing Through Junction

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
2023 Dev Traffic From South	AM	ONE HOUR	08:00	09:30	15	✓
2023 Dev Traffic To South	PM	ONE HOUR	16:00	17:30	15	✓

2023 Dev Traffic From South, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Preston Street - Cart Road	T-Junction	Two-way	0.74	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arm	Name	Description	Arm type
A	Preston Street South		Major
B	Cart Road		Minor
C	Preston Street North		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Width for right turn (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.20		✓	2.40	100.0	✓	4.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B	One lane plus flare	10.00	7.20	5.00	4.30	3.80		2.00	38	31

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	557.000	0.101	0.254	0.160	0.363
1	B-C	667.588	0.101	0.256	-	-
1	C-B	645.628	0.248	0.248	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2023 Dev Traffic From South	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	509.00	100.000
B		ONE HOUR	✓	50.00	100.000
C		ONE HOUR	✓	415.00	100.000

Demand (Veh/hr)

From	To			
		A	B	C
	A	0.000	35.000	474.000
	B	29.000	0.000	21.000
	C	384.000	31.000	0.000

Proportions

From	To			
		A	B	C
	A	0.00	0.07	0.93
	B	0.58	0.00	0.42
	C	0.93	0.07	0.00

Heavy Vehicle proportion

From	To			
		A	B	C
	A	0	0	2
	B	0	0	0
	C	3	0	0

Average PCU Per Veh

From	To			
		A	B	C
	A	1.000	1.000	1.024
	B	1.000	1.000	1.000
	C	1.026	1.000	1.000

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-C	0.05	7.34	0.0	A	19.27	28.90
B-A	0.10	11.86	0.1	B	26.61	39.92
C-AB	0.07	7.67	0.1	A	28.45	42.67

Main Results for each time segment

Main results: (08:00-08:15)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	15.81	15.81	3.95	0.00	563.53	0.028	15.70	0.0	0.0	6.569	A
B-A	21.83	21.83	5.46	0.00	405.55	0.054	21.61	0.0	0.1	9.373	A
C-AB	23.34	23.34	5.83	0.00	548.48	0.043	23.16	0.0	0.0	6.851	A

Main results: (08:15-08:30)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	18.88	18.88	4.72	0.00	542.72	0.035	18.85	0.0	0.0	6.871	A
B-A	26.07	26.07	6.52	0.00	376.18	0.069	26.00	0.1	0.1	10.276	B
C-AB	27.87	27.87	6.97	0.00	529.63	0.053	27.82	0.0	0.1	7.173	A

Main results: (08:30-08:45)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	23.12	23.12	5.78	0.00	513.83	0.045	23.08	0.0	0.0	7.335	A
B-A	31.93	31.93	7.98	0.00	335.52	0.095	31.81	0.1	0.1	11.847	B
C-AB	34.13	34.13	8.53	0.00	503.56	0.068	34.06	0.1	0.1	7.667	A

Main results: (08:45-09:00)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	23.12	23.12	5.78	0.00	513.69	0.045	23.12	0.0	0.0	7.337	A
B-A	31.93	31.93	7.98	0.00	335.56	0.095	31.93	0.1	0.1	11.856	B
C-AB	34.13	34.13	8.53	0.00	503.56	0.068	34.13	0.1	0.1	7.667	A

Main results: (09:00-09:15)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	18.88	18.88	4.72	0.00	542.47	0.035	18.92	0.0	0.0	6.878	A
B-A	26.07	26.07	6.52	0.00	376.26	0.069	26.19	0.1	0.1	10.286	B
C-AB	27.87	27.87	6.97	0.00	529.63	0.053	27.93	0.1	0.1	7.175	A

Main results: (09:15-09:30)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	15.81	15.81	3.95	0.00	563.18	0.028	15.84	0.0	0.0	6.576	A
B-A	21.83	21.83	5.46	0.00	405.64	0.054	21.90	0.1	0.1	9.384	A
C-AB	23.34	23.34	5.83	0.00	548.48	0.043	23.38	0.1	0.0	6.855	A

2023 Dev Traffic To South, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Preston Street - Cart Road	T-Junction	Two-way	1.27	A

Junction Network Options

[same as above]

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2023 Dev Traffic To South	PM	ONE HOUR	16:00	17:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	523.00	100.000
B		ONE HOUR	✓	97.00	100.000
C		ONE HOUR	✓	788.00	100.000

Demand (Veh/hr)

	To			
		A	B	C
	A	0.000	49.000	474.000
	B	66.000	0.000	31.000
	C	740.000	48.000	0.000

Proportions

	To			
		A	B	C
	A	0.00	0.09	0.91
	B	0.68	0.00	0.32
	C	0.94	0.06	0.00

Heavy Vehicle proportion

	To			
		A	B	C
	A	0	0	2
	B	0	0	0
	C	1	0	0

Average PCU Per Veh

	To			
		A	B	C
	A	1.000	1.000	1.019
	B	1.000	1.000	1.000
	C	1.014	1.000	1.000

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-C	0.07	8.28	0.1	A	28.45	42.67
B-A	0.26	17.79	0.4	C	60.56	90.84
C-AB	0.11	8.04	0.1	A	44.05	66.08

Main Results for each time segment

Main results: (16:00-16:15)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	23.34	23.34	5.83	0.00	529.63	0.044	23.16	0.0	0.0	7.106	A
B-A	49.69	49.69	12.42	0.00	370.64	0.134	49.08	0.0	0.2	11.174	B
C-AB	36.14	36.14	9.03	0.00	546.32	0.066	35.86	0.0	0.1	7.049	A

Main results: (16:15-16:30)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	27.87	27.87	6.97	0.00	505.42	0.055	27.82	0.0	0.1	7.537	A
B-A	59.33	59.33	14.83	0.00	330.45	0.180	59.08	0.2	0.2	13.254	B
C-AB	43.15	43.15	10.79	0.00	527.06	0.082	43.08	0.1	0.1	7.438	A

Main results: (16:30-16:45)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	34.13	34.13	8.53	0.00	469.19	0.073	34.05	0.1	0.1	8.273	A
B-A	72.67	72.67	18.17	0.00	274.86	0.264	72.13	0.2	0.4	17.708	C
C-AB	52.86	52.86	13.21	0.00	500.48	0.106	52.75	0.1	0.1	8.039	A

Main results: (16:45-17:00)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	34.13	34.13	8.53	0.00	468.68	0.073	34.13	0.1	0.1	8.284	A
B-A	72.67	72.67	18.17	0.00	274.93	0.264	72.65	0.4	0.4	17.793	C
C-AB	52.86	52.86	13.21	0.00	500.48	0.106	52.86	0.1	0.1	8.042	A

Main results: (17:00-17:15)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	27.87	27.87	6.97	0.00	504.70	0.055	27.95	0.1	0.1	7.551	A
B-A	59.33	59.33	14.83	0.00	330.60	0.179	59.86	0.4	0.2	13.321	B
C-AB	43.15	43.15	10.79	0.00	527.06	0.082	43.26	0.1	0.1	7.444	A

Main results: (17:15-17:30)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	23.34	23.34	5.83	0.00	528.93	0.044	23.39	0.1	0.0	7.123	A
B-A	49.69	49.69	12.42	0.00	370.73	0.134	49.95	0.2	0.2	11.233	B
C-AB	36.14	36.14	9.03	0.00	546.32	0.066	36.21	0.1	0.1	7.060	A

Appendix D

Assessment of Preston Street / Coach Road Junction

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.0.0.4211

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Filename: Preston Street - Coach Road.j9

Path: C:\Program Files\Junctions 9\Schemes\Whitehaven

Report generation date: 19/12/2017 11:25:30

»2023 Dev Traffic From South, AM

»2023 Dev Traffic To South, PM

Summary of junction performance

	AM					PM				
	Queue (Veh)	Delay (s)	RFC	LOS	Junction LOS	Queue (Veh)	Delay (s)	RFC	LOS	Junction LOS
	2023 Dev Traffic From South									
Stream B-AC	1.1	18.09	0.52	C	A					
Stream C-AB	1.6	8.57	0.50	A						
	2023 Dev Traffic To South									
Stream B-AC						0.8	19.50	0.45	C	A
Stream C-AB						2.9	12.01	0.62	B	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

File Description

Title	Preston Street / Coach Road With Temporary Car Park
Location	Preston Street / Coach Road Whitehaven
Date	19/12/2017
Client	Morbaine
Jobnumber	170503
Enumerator	John Lowe
Notes	Assumes Car Park Fills / Empties within 1 Hour with all Traffic Passing Through Junction

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
2023 Dev Traffic From South	AM	ONE HOUR	08:00	09:30	15	✓
2023 Dev Traffic To South	PM	ONE HOUR	16:00	17:30	15	✓

2023 Dev Traffic From South, AM

Data Errors and Warnings

No errors or warnings

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Preston Street - Coach Road	T-Junction	Two-way	5.35	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arm	Name	Description	Arm type
A	Preston Street North		Major
B	Coach Road		Minor
C	Preston Street South - Ginns		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	8.80			100.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.90	20	24

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	540.558	0.086	0.219	0.137	0.312
1	B-C	696.627	0.094	0.237	-	-
1	C-B	631.874	0.215	0.215	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2023 Dev Traffic From South	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	413.00	100.000
B		ONE HOUR	✓	194.00	100.000
C		ONE HOUR	✓	584.00	100.000

Demand (Veh/hr)

	To			
		A	B	C
	A	0.000	88.000	325.000
	B	103.000	0.000	91.000
	C	406.000	178.000	0.000

Proportions

	To			
		A	B	C
	A	0.00	0.21	0.79
	B	0.53	0.00	0.47
	C	0.70	0.30	0.00

Heavy Vehicle proportion

	To			
		A	B	C
	A	0	1	3
	B	1	0	0
	C	2	1	0

Average PCU Per Veh

	To			
		A	B	C
	A	1.000	1.013	1.027
	B	1.011	1.000	1.000
	C	1.016	1.006	1.000

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.52	18.09	1.1	C	178.02	267.03
C-AB	0.50	8.57	1.6	A	312.02	468.02

Main Results for each time segment

Main results: (08:00-08:15)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	146.05	146.05	36.51	0.00	475.66	0.307	144.31	0.0	0.4	10.810	B
C-AB	221.00	221.00	55.25	0.00	768.23	0.288	218.67	0.0	0.6	6.541	A

Main results: (08:15-08:30)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	174.40	174.40	43.60	0.00	449.51	0.388	173.66	0.4	0.6	13.009	B
C-AB	295.13	295.13	73.78	0.00	799.45	0.369	293.98	0.6	0.9	7.134	A

Main results: (08:30-08:45)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	213.60	213.60	53.40	0.00	412.69	0.518	211.95	0.6	1.0	17.783	C
C-AB	417.84	417.84	104.46	0.00	842.40	0.496	415.25	0.9	1.5	8.457	A

Main results: (08:45-09:00)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	213.60	213.60	53.40	0.00	412.24	0.518	213.51	1.0	1.1	18.094	C
C-AB	419.17	419.17	104.79	0.00	843.53	0.497	419.06	1.5	1.5	8.567	A

Main results: (09:00-09:15)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	174.40	174.40	43.60	0.00	448.87	0.389	176.02	1.1	0.6	13.269	B
C-AB	296.59	296.59	74.15	0.00	801.07	0.370	299.13	1.5	0.9	7.250	A

Main results: (09:15-09:30)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	146.05	146.05	36.51	0.00	474.99	0.307	146.85	0.6	0.5	10.996	B
C-AB	222.36	222.36	55.59	0.00	769.34	0.289	223.60	0.9	0.6	6.632	A

2023 Dev Traffic To South, PM

Data Errors and Warnings

No errors or warnings

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Preston Street - Coach Road	T-Junction	Two-way	4.73	A

Junction Network Options

[same as above]

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2023 Dev Traffic To South	PM	ONE HOUR	16:00	17:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	806.00	100.000
B		ONE HOUR	✓	135.00	100.000
C		ONE HOUR	✓	637.00	100.000

Demand (Veh/hr)

	To			
		A	B	C
	A	0.000	188.000	618.000
	B	57.000	0.000	78.000
From	C	466.000	171.000	0.000

Proportions

	To			
		A	B	C
	A	0.00	0.23	0.77
	B	0.42	0.00	0.58
From	C	0.73	0.27	0.00

Heavy Vehicle proportion

	To			
		A	B	C
	A	0	1	1
	B	4	0	3
From	C	2	3	0

Average PCU Per Veh

	To			
		A	B	C
	A	1.000	1.006	1.014
	B	1.039	1.000	1.028
From	C	1.016	1.026	1.000

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.45	19.50	0.8	C	123.88	185.82
C-AB	0.62	12.01	2.9	B	365.10	547.64

Main results: (16:00-16:15)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	101.64	101.64	25.41	0.00	425.78	0.239	100.40	0.0	0.3	11.023	B
C-AB	243.86	243.86	60.96	0.00	741.20	0.329	240.81	0.0	0.8	7.183	A

Main results: (16:15-16:30)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	121.36	121.36	30.34	0.00	388.26	0.313	120.81	0.3	0.4	13.432	B
C-AB	336.91	336.91	84.23	0.00	772.13	0.436	334.94	0.8	1.3	8.273	A

Main results: (16:30-16:45)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	148.64	148.64	37.16	0.00	334.04	0.445	147.33	0.4	0.8	19.143	C
C-AB	509.38	509.38	127.34	0.00	818.37	0.622	503.33	1.3	2.8	11.551	B

Main results: (16:45-17:00)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	148.64	148.64	37.16	0.00	333.03	0.446	148.57	0.8	0.8	19.498	C
C-AB	513.46	513.46	128.36	0.00	821.57	0.625	513.05	2.8	2.9	12.006	B

Main results: (17:00-17:15)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	121.36	121.36	30.34	0.00	387.00	0.314	122.66	0.8	0.5	13.685	B
C-AB	340.71	340.71	85.18	0.00	776.43	0.439	346.82	2.9	1.3	8.574	A

Main results: (17:15-17:30)

Stream	Total Demand (Veh/hr)	Junction demand (Veh/hr)	Junction Arrivals (Veh)	Bypass demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-AC	101.64	101.64	25.41	0.00	424.93	0.239	102.22	0.5	0.3	11.177	B
C-AB	246.26	246.26	61.56	0.00	743.36	0.331	248.42	1.3	0.8	7.334	A

Appendix E
Speed Survey Results

Turner Lowe Associates Vehicle Speed Assessment

Location Preston Street. Whitehaven

Type of Road Single Carriageway

Speed Limit 30 mph

Direction Southbound Exit from Mini-Roundabout

Date of Survey 14/11/17

Weather Conditions Dry

Time of Survey Off-Peak

No. of Readings 200

Type of Survey Radar ✓

Vascar

As Recorded (Speeds in Km / Hr)										Speeds in Descending Order (Speeds in Km / Hr)									
Reading	Speed	Reading	Speed	Reading	Speed	Reading	Speed	Reading	Speed	Reading	Speed	Reading	Speed	Reading	Speed	Reading	Speed	Reading	Speed
1	42	51	39	101	43	151	44	201		1	49	51	46	101	43	151	40	201	
2	43	52	39	102	44	152	47	202		2	49	52	46	102	43	152	40	202	
3	43	53	42	103	43	153	39	203		3	49	53	46	103	43	153	40	203	
4	40	54	48	104	42	154	48	204		4	49	54	44	104	43	154	40	204	
5	42	55	43	105	44	155	39	205		5	49	55	44	105	43	155	40	205	
6	49	56	48	106	44	156	42	206		6	49	56	44	106	43	156	40	206	
7	48	57	42	107	43	157	47	207		7	48	57	44	107	43	157	40	207	
8	40	58	39	108	46	158	48	208		8	48	58	44	108	43	158	40	208	
9	49	59	40	109	42	159	48	209		9	48	59	44	109	43	159	40	209	
10	39	60	40	110	43	160	38	210		10	48	60	44	110	43	160	40	210	
11	42	61	44	111	40	161	43	211		11	48	61	44	111	43	161	40	211	
12	49	62	39	112	39	162	46	212		12	48	62	44	112	43	162	40	212	
13	48	63	43	113	42	163	43	213		13	48	63	44	113	43	163	40	213	
14	40	64	47	114	42	164	42	214		14	48	64	44	114	42	164	40	214	
15	49	65	40	115	43	165	43	215		15	48	65	44	115	42	165	40	215	
16	40	66	46	116	44	166	44	216		16	48	66	44	116	42	166	40	216	
17	42	67	39	117	40	167	43	217		17	48	67	44	117	42	167	40	217	
18	49	65	46	118	42	168	43	218		18	48	65	44	118	42	168	40	218	
19	48	69	39	119	39	169	40	219		19	48	69	44	119	42	169	40	219	
20	42	70	39	120	39	170	40	220		20	48	70	44	120	42	170	39	220	
21	49	71	40	121	44	171	42	221		21	48	71	44	121	42	171	39	221	
22	40	72	48	122	42	172	44	222		22	48	72	44	122	42	172	39	222	
23	44	73	43	123	44	173	47	223		23	48	73	44	123	42	173	39	223	
24	48	74	48	124	43	174	40	224		24	48	74	44	124	42	174	39	224	
25	42	75	43	125	42	175	39	225		25	48	75	44	125	42	175	39	225	
26	40	76	40	126	47	176	47	226		26	48	76	43	126	42	176	39	226	
27	43	77	46	127	42	177	40	227		27	48	77	43	127	42	177	39	227	
28	43	78	39	128	42	178	44	228		28	48	78	43	128	42	178	39	228	
29	44	79	48	129	46	179	42	229		29	47	79	43	129	42	179	39	229	
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49	39	99	42	149	38	199	42	249		49	46	99	43	149	40	199	38	249	
50	46	100	46	150	39	200	38	250		50	46	100	43	150	40	200	38	250	

Average Speed	KPH	MPH
	43.1	26.8
Ranked 85th Percentile Dry Weather Speed (for Speed Limit Assessment)	46.8	29.1
Statistical 85th Percentile Dry Weather Speed (for Speed Limit Assessment)	46.2	28.7
Ranked 85th Percentile Wet Weather Speed (for Highway Design / Visibility Splay Assessment)	43	26.6
Calculated 85th Percentile Wet Weather Speed (for Highway Design / Visibility Splay Assessment)	42.2	26.2
Statistical 85th Percentile Speed / Average Speed (Target Range for Reliability 1.1 - 1.25)	1.1	

Turner Lowe Associates

22 Guest Road. Manchester M25 3DL. Tel. 0161 798 7898 Fax. 0161 798 6422

Turner Lowe Associates Vehicle Speed Assessment

Location Preston Street Whitehaven

Date of Survey 14/11/17

Type of Survey Radar ✓

Type of Road Single Carriageway

Weather Conditions Dry

Vascar

Speed Limit 30 mph

Time of Survey Off-Peak

Direction Northbound at Cart Road Refuge Island

No. of Readings 200

As Recorded (Speeds in Km / Hr)										Speeds in Descending Order (Speeds in Km / Hr)									
Reading	Speed	Reading	Speed	Reading	Speed	Reading	Speed	Reading	Speed	Reading	Speed	Reading	Speed	Reading	Speed	Reading	Speed	Reading	Speed
1	46	51	45	101	46	151	44	201		1	52	51	47	101	46	151	44	201	
2	46	52	41	102	46	152	44	202		2	52	52	47	102	46	152	44	202	
3	46	53	44	103	46	153	52	203		3	52	53	47	103	46	153	44	203	
4	44	54	47	104	43	154	47	204		4	52	54	47	104	46	154	44	204	
5	45	55	46	105	45	155	44	205		5	52	55	47	105	46	155	44	205	
6	52	56	47	106	51	156	44	206		6	52	56	47	106	46	156	44	206	
7	47	57	47	107	47	157	50	207		7	52	57	47	107	46	157	44	207	
8	44	58	41	108	44	158	47	208		8	52	58	47	108	46	158	44	208	
9	52	59	43	109	48	159	46	209		9	52	59	47	109	46	159	44	209	
10	42	60	45	110	46	160	41	210		10	52	60	47	110	46	160	44	210	
11	45	61	52	111	44	161	45	211		11	52	61	47	111	45	161	44	211	
12	44	62	43	112	41	162	49	212		12	52	62	47	112	45	162	44	212	
13	45	63	44	113	45	163	46	213		13	52	63	47	113	45	163	44	213	
14	52	64	46	114	44	164	46	214		14	52	64	47	114	45	164	44	214	
15	47	65	43	115	46	165	46	215		15	52	65	47	115	45	165	44	215	
16	44	66	48	116	48	166	48	216		16	52	66	47	116	45	166	44	216	
17	45	67	42	117	43	167	47	217		17	52	67	47	117	45	167	44	217	
18	52	65	49	118	47	168	46	218		18	51	65	47	118	45	168	44	218	
19	45	69	41	119	44	169	44	219		19	51	69	47	119	45	169	43	219	
20	52	70	41	120	45	170	44	220		20	51	70	47	120	45	170	43	220	
21	47	71	44	121	52	171	46	221		21	51	71	47	121	45	171	43	221	
22	44	72	46	122	51	172	46	222		22	51	72	47	122	45	172	43	222	
23	52	73	52	123	44	173	50	223		23	51	73	47	123	45	173	43	223	
24	42	74	50	124	47	174	44	224		24	51	74	46	124	45	174	43	224	
25	45	75	44	125	45	175	44	225		25	50	75	46	125	45	175	43	225	
26	52	76	43	126	49	176	45	226		26	50	76	46	126	45	176	43	226	
27	47	77	48	127	44	177	48	227		27	50	77	46	127	45	177	43	227	
28	44	78	40	128	47	178	46	228		28	50	78	46	128	45	178	43	228	
29	51	79	47	129	48	179	47	229		29	50	79	46	129	45	179	43	229	
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31	47	81	46	131	47	181	46	231		31	50	81	46	131	45	181	43	231	
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35	45	85	52	135	45	185	48	235		35	49	85	46	135	44	185	42	235	
36	41	86	51	136	52	186	46	236		36	49	86	46	136	44	186	42	236	
37	47	87	44	137	50	187	46	237		37	48	87	46	137	44	187	41	237	
38	46	88	46	138	46	188	50	238		38	48	88	46	138	44	188	41	238	
39	43	89	46	139	44	189	44	239		39	48	89	46	139	44	189	41	239	
40	45	90	44	140	46	190	41	240		40	48	90	46	140	44	190	41	240	
41	52	91	45	141	50	191	47	241		41	48	91	46	141	44	191	41	241	
42	51	92	52	142	46	192	45	242		42	48	92	46	142	44	192	41	242	
43	45	92	43	143	43	193	47	243		43	48	92	46	143	44	193	41	243	
44	47	94	44	144	44	194	44	244		44	48	94	46	144	44	194	41	244	
45	44	95	50	145	46	195	40	245		45	48	95	46	145	44	195	41	245	
46	46	96	47	146	48	196	44	246		46	48	96	46	146	44	196	41	246	
47	46	97	43	147	43	197	41	247		47	48	97	46	147	44	197	40	247	
48	43	98	46	148	47	198	47	248		48	48	98	46	148	44	198	40	248	
49	52	99	44	149	40	199	44	249		49	47	99	46	149	44	199	40	249	
50	51	100	48	150	42	200	40	250		50	47	100	46	150	44	200	40	250	

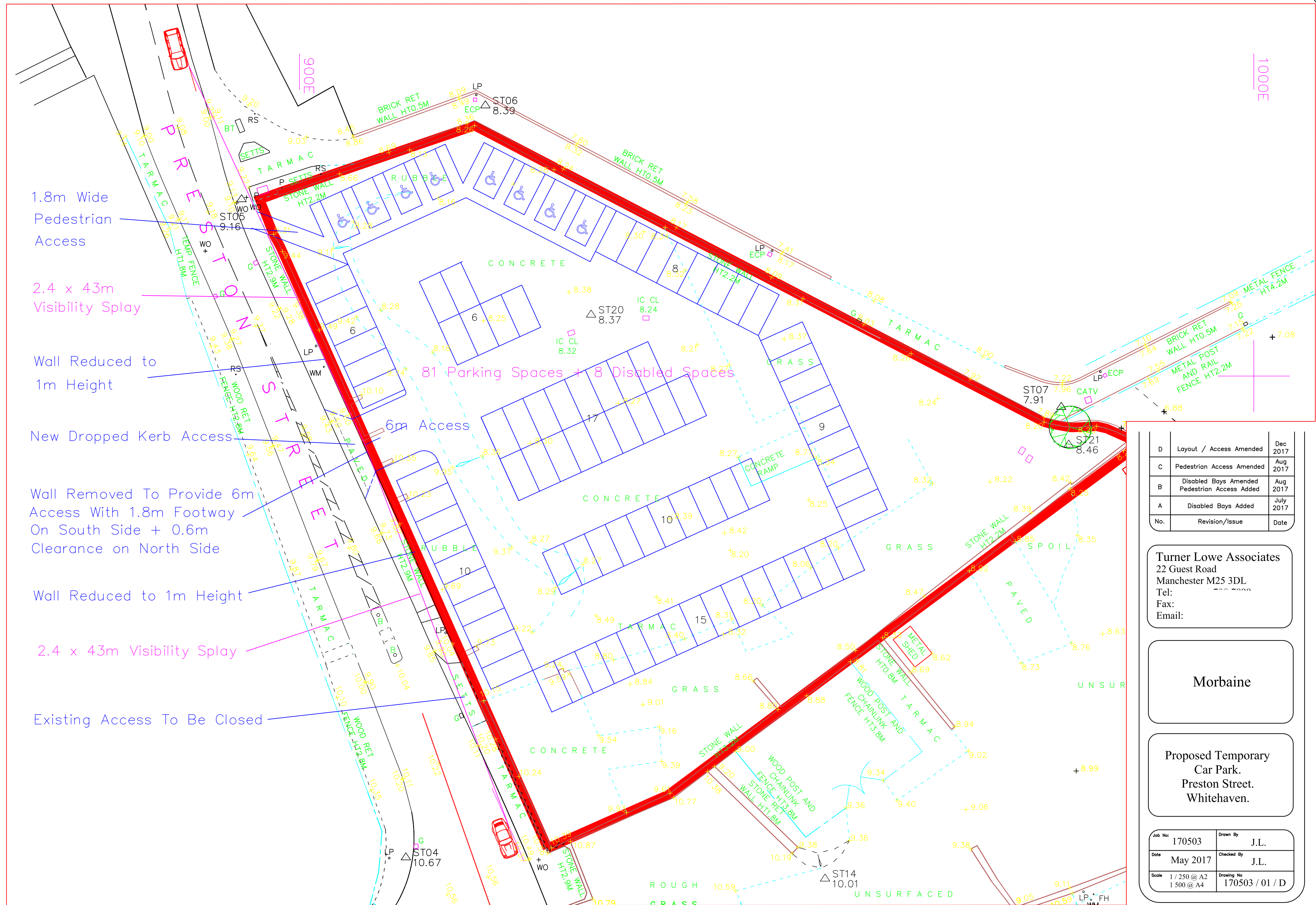
Average Speed	KPH	MPH
	46.0	28.6
Ranked 85th Percentile Dry Weather Speed (for Speed Limit Assessment)	49.6	30.9
Statistical 85th Percentile Dry Weather Speed (for Speed Limit Assessment)	48.9	30.4
Ranked 85th Percentile Wet Weather Speed (for Highway Design / Visibility Splay Assessment)	45.6	28.4
Calculated 85th Percentile Wet Weather Speed (for Highway Design / Visibility Splay Assessment)	44.9	27.9
Statistical 85th Percentile Speed / Average Speed (Target Range for Reliability 1.1 - 1.25)	1.1	

Turner Lowe Associates

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**Proposed Development
Preston Street. Whitehaven
Supplementary Information**

Drawings



D	Layout / Access Amended	Dec 2017
C	Pedestrian Access Amended	Aug 2017
B	Disabled Bays Amended Pedestrian Access Added	Aug 2017
A	Disabled Bays Added	July 2017
No.	Revision/Issue	Date

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Morbaine

Proposed Temporary
Car Park.
Preston Street.
Whitehaven.

Job No:	170503	Drawn By:	J.L.
Date:	May 2017	Checked By:	J.L.
Scale:	1 / 250 @ A2 1 / 500 @ A4	Drawing No:	170503 / 01 / D