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November 2021

Proposed Residential Development, The Lanes, Penwortham

Technical Note 03 – Traffic and Modelling Review

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Overview

1. Following submission of the planning applications, comments on the Transport Assessment prepared by Vectos were received from Lancashire County Council (LCC) and National Highways in September 2021.

2. The comments received from LCC, and National Highways, queried the use of 2021 traffic data when considering the impact of the development on the local highway network. Officers considered that due to the Covid-19 pandemic that the traffic flows would be significantly below those recorded on the network for the previous application for the site.

3. This note has been prepared to consider the fluctuations in recorded traffic on the local road network between the 2021 data and pre-pandemic survey data. The comparison has considered the differences between the 2021 and 2018 turning flows, the 2021 AADT flows and Department for Transport (DfT) count point data, and a comparison of TomTom journey time data and level of delay between 2021 and 2019.

Comparison of Turning Flows

4. Manual Classified Count (MCC) surveys were completed by Nationwide Data Collection on Wednesday 21st April 2021 between 07:00 and 19:00 for the local road network surrounding the site. These surveys were used to provide the baseline turning flows against which the impact of the development was assessed within the Transport Assessment.

5. For the previous application, MCC surveys were completed by Signal Surveys on Wednesday 12th September 2018 between 07:30 – 09:30 and 16:30 – 17:30 for the local road network surrounding the site. Intelligent Data Collection Limited also completed MCC surveys on Thursday 13th September 2018.

6. The 2021 and 2018 surveys have been correlated, with **Table 1.1** providing a comparison between the 2021 and 2018 surveyed flows for the junctions which have been surveyed in both years.

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Table 1.1: Comparison of MCC Traffic Flows 2021 – 2018 (PCUs)

Junction	AM Peak (08:00-09:00)				PM Peak (17:00-18:00)			
	2021	2018	Diff.		2021	2018	Diff.	
A59/Golden Way	4,042	3,502	540	15%	3,832	3,419	413	12%
B5254 Leyland Road/Marshalls Brow	1,891	1,667	224	13%	1,856	1,648	208	13%
A582 Penwortham Way/Pope Lane	2,852	3,128	-276	-9%	2,564	3,004	-440	-15%
B5254 Leyland Road/Bee Lane/The Cawsey	2,218	1,671	547	33%	2,275	1,672	603	36%
B5254 Leyland Road/Coote Lane	1,875	1,744	131	7%	1,938	1,990	-52	-3%
A6/A582	6,216	6,991	-775	-11%	6,724	7,178	-455	-6%
M6/M65	4,388	4,547	-159	-3%	4,316	5,312	-997	-19%
A582 Penwortham Way/Flensburg Way	2,906	3,114	-208	-7%	3,017	3,333	-316	-9%
A582 Penwortham Way/Chain House Lane	2,927	3,164	-237	-8%	2,845	3,234	-389	-12%

7. **Table 1.1** indicates that the during the AM peak period there is an increase in flows in 2021 at the A59/Golden Way junction, the B5254 Leyland Road/Marshalls Brow junction, the B5254 Leyland Road/Bee Lane/The Cawsey junction and the B5254 Leyland Road/Coote Lane junction.

8. The data also highlights that there is a reduction in trips at the A582 Penwortham Way/Pope Lane junction, the A6/A58 junction, the M6/M65 junction, the A582 Penwortham Way/Flensburg Way junction and the A582 Penwortham Way/Chain House Lane junction. A similar pattern is evident in the PM peak period apart from the B5254 Leyland Road/Coote Lane junction which experiences a reduction in flows.

9. **Table 1.1** highlights that for the majority of the junctions summarised, the change in flow in the peak hours between 2021 and 2018 is below 20%, with the majority being below 15%. Whilst there are some specific differences, the data comparison indicates that general levels of traffic in 2021 were similar to general levels of traffic in 2018.

Comparison of AADT Link Flows

10. Annual Average Daily Traffic (AADT) flows were collected by Nationwide Data Collection between Wednesday 21st April 2021 and Tuesday 27th April 2021. These surveys have been reviewed against the AADT information provided by the DfT on roads surrounding the site. There are three data collection points located near the 2021 survey locations which provide data for 2019 or 2018 prior to the Covid-19 pandemic. **Table 1.2** provides a summary of this information.

Table 1.2: Comparison of AADT Flows 2021 – 2019/2018

Link	2021	2019	2018	Difference	
A582 Golden Way	26,844		23,159	3,685	16%
B5254 Leyland Road	18,091	17,910		181	1%
A6 Lostock Lane	18,969		22,505	-3,536	-15%

11. **Table 1.2** indicates that between 2021 and 2018 there was an increase in trips on the A582 Golden Way to the north of the site. There was also a slight increase in trips between 2021 and 2019 on the B5254 Leyland Road. **Table 1.2** also highlights that there was a decrease in trips on the A6 Lostock Lane between 2021 and 2019.

12. Again, whilst there are some specific differences, the data comparison indicates that general levels of traffic in 2021 were similar to general levels of traffic in 2018/19.

Comparison of Journey Times

13. In addition to comparing the difference in traffic flows on the local road network, a comparison of journey times between 2021 and 2019 has been completed using TomTom data. This review has considered the following links which were presented in the TA:

- Route 1: A582 Golden Way (from the John Horrocks Way roundabout) / A582 Penwortham Way;
- Route 2: Flensburg Way (from the A582 Penwortham Way roundabout) / A582 Farington Road / A6 Lostock Lane;
- Route 3: A6 London Road (between A6 Lostock Lane and Carwood Road); and,
- Route 4: B5254 Watkin Lane / B5254 Leyland Road.

14. A review of the recorded journey times along these links has been completed for the AM (08:00-09:00) and PM (17:00-18:00) peak periods as well as an early interpeak period (11:00-12:00) and an afternoon interpeak period (14:00-15:00).

Table 1.3: TomTom Journey Time Comparison AM Peak (08:00-09:00)

Link	Direction	Average Journey Times (mins)		
		2021	2019	Difference
Route 1	NB	6.25	6.97	-0.72
	SB	5.46	5.56	-0.10
Route 2	EB	7.94	9.46	-1.52
	WB	7.03	7.86	-0.83
Route 3	NB	2.11	2.26	-0.15
	SB	2.31	2.43	-0.12
Route 4	NB	9.82	11.26	-1.44
	SB	8.64	9.76	-1.12

Table 1.4: TomTom Journey Time Comparison Inter-Peak (11:00-12:00)

Link	Direction	Average Journey Times (mins)		
		2021	2019	Difference
Route 1	NB	6.53	5.30	1.24
	SB	5.35	5.34	0.00
Route 2	EB	8.18	6.88	1.30
	WB	7.69	6.78	0.91
Route 3	NB	2.34	2.06	0.28
	SB	2.31	2.34	-0.04
Route 4	NB	7.91	7.31	0.61
	SB	7.53	7.79	-0.26

Table 1.5: TomTom Journey Time Comparison Inter-Peak (14:00-15:00)

Link	Direction	Average Journey Times (mins)		
		2021	2019	Difference
Route 1	NB	7.73	5.20	2.54
	SB	5.47	5.38	0.09
Route 2	EB	7.51	6.98	0.53
	WB	7.22	6.94	0.29
Route 3	NB	2.75	2.06	0.70
	SB	2.34	2.34	0.01
Route 4	NB	8.71	7.38	1.33
	SB	8.33	8.26	0.07

Table 1.6: Journey Time Comparison PM Peak (17:00-18:00)

Link	Direction	Average Journey Times (mins)		
		2021	2019	Difference
Route 1	NB	6.09	5.48	0.61
	SB	5.53	5.65	-0.13
Route 2	EB	7.58	8.43	-0.84
	WB	8.52	10.48	-1.96
Route 3	NB	2.34	2.22	0.12
	SB	2.52	2.73	-0.21
Route 4	NB	8.55	9.39	-0.84
	SB	8.63	9.79	-1.15

15. Although some variations are observed for some of the routes between 2021 and 2019, it is considered that the overall change is negligible.

Changes in Traffic Demand

16. When considering reasons for the specific differences, there are many, including daily variation, seasonal variation, weather, new infrastructure (i.e. Penwortham Bypass and The Cawsey Link), changing travel habits and potential Covid-19 impacts. There are also many pre-Covid-19 trends for change (i.e. working from home) which have been accelerated due to Covid-19 and are now likely to form part of the future baseline.

17. As one example, due to the introduction of the Cawsey link road in the intervening period, the B5254 Leyland Road/Bee Lane/The Cawsey experiences a 33% increase in the AM peak period and 36% increase in the PM peak period.

18. The peak hour reduction in flows at the A6/M65, the B5254 Leyland Road south of the Cawsey and the M65/M6 junctions could also be attributed to the introduction of the Cawsey link road given that this link now provides a new east/west connections north of Brownedge Road and the A582 to the A6 therefore allowing vehicles to use this link without travelling through Tardy Gate.

19. Both of these observations point to new infrastructure being a factor in some of the differences observed.

20. As another example, the data highlights that there are some junctions located closer to the Strategic Road Network (SRN) which have experienced a reduction in trips in the traditional peak hours, but there have been other local roads within the study area which have experienced an increase. This suggests that while fewer journeys may have occurred on the SRN network in 2021, there was an increase in trips on the local road network with people swapping longer car journeys for shorter more localised trips. This is evident in the AADT data which looks at trips across the whole day and not just specific hours within the day.

21. Overall, the comparisons between the MCC and AADT flows presented in **Table 1.1** and **Table 1.2** suggest that for the majority of the junctions summarised, the change in flow between 2021 and 2018/19 is below 20% with the majority being below 15%.

22. This comparison highlights that while on some links, traffic flows have reduced, on other links traffic flows have increased. However, when viewed as a whole for travel across the day, general levels of traffic in 2021 were similar to general levels of traffic in 2018/19 and as such are suitable for use in the modelling assessments and allow a judgement to be made.

Traffic Model Base 2021 Uplift

23. Notwithstanding the above, and to investigate the sensitivity of the mathematical modelling to changes in input data, the 2021 background flows have been increased globally by 20%. **Table 1.7** provides a summary of the network mean delay for all scenarios presented in the TA, the uplifted development flows and the change in network mean delay.

Table 1.7: Comparison of Network Mean Delay(s)

Network Mean Delay (s)	2021 Base	Base + Com Dev	Base + Com Dev + Dev (1100)	Base + Com Dev + Dev (1350)
Network Mean Delay (s) presented in TA*				
AM (0700 to 1000)	254	258	268	271
PM (1600 to 1900)	263	388	455	487
Network Mean Delay (s) Uplifted Flows				
AM (0700 to 1000)	290	294	312	314
PM (1600 to 1900)	315	479	599	614
Difference in Network Mean Delay (s)				
AM (0700 to 1000)	36	36	44	43
PM (1600 to 1900)	52	91	144	127

** TA results have been updated to allow for suitable comparison due to model coding changes triggered by the sensitivity tests*

24. This review suggests that when the development trips are uplifted by 20% there is a negligible increase in journey times during the AM period and a slight increase during the PM peak period. This supplementary review does not alter the conclusions drawn from the previous assessment work, remembering the fact that the modelling has not been conducted as an accurate forecast of future reality, but as a useful tool from which judgements can be made.

Traffic Model Uplifted Development Trips

25. In addition, the comments received from LCC and National Highways suggested that the development trips outlined within the TA were below the levels they would anticipate for a development of this scale. These comments suggested that a revised trip generation exercise be considered which utilised TRICS vehicle trip rates.

26. Vectos feel that the trip generation methodology is acceptable as it uses existing travel information for the local and regional area to consider the mode split and mode choice for new residents. Notwithstanding this, consideration has been given to uplifting the development trips generated to consider if this would alter the micro-simulation assessment presented within the TA.

27. To consider the uplift profile for these trips, consideration was given to the difference between the vehicle trip rate presented in the TA and the TRICS vehicle trip rate presented in the previous application. **Table 1.8** provides a summary of the uplift percentages used for all time periods.

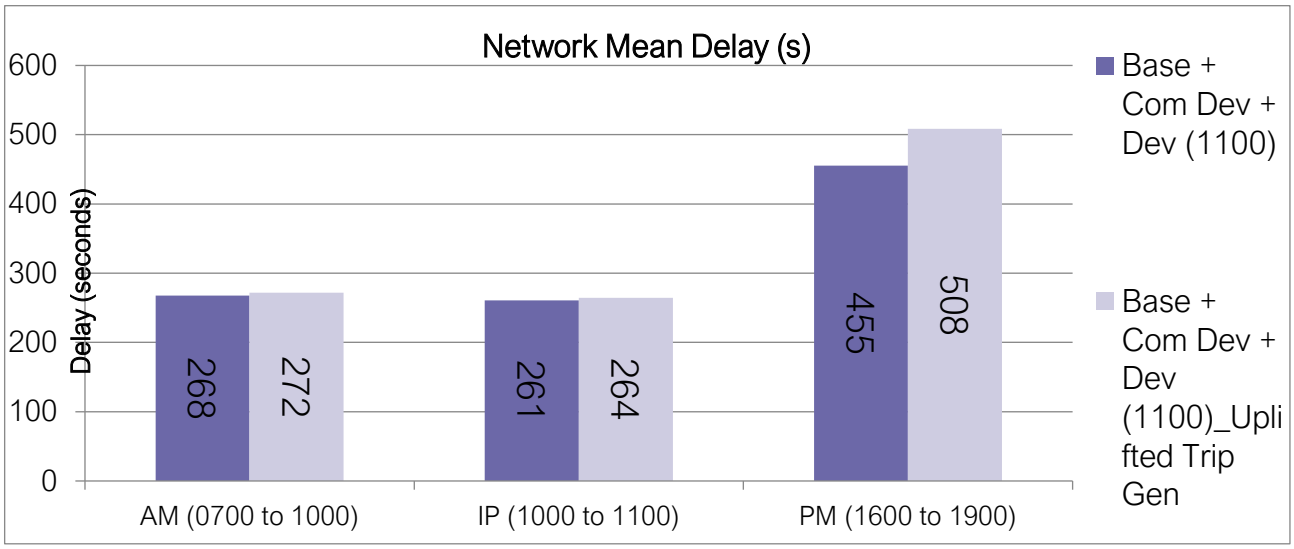
Table 1.8: Development Trip Generation Uplift by Hour

Time Period	Difference
07:00 – 08:00	28%
08:00 – 09:00	38%
09:00 – 10:00	61%
10:00 – 11:00	75%
11:00 – 12:00	92%
12:00 – 13:00	82%
13:00 – 14:00	79%
14:00 – 15:00	75%
15:00 – 16:00	60%
16:00 – 17:00	41%
17:00 – 18:00	40%
18:00 – 19:00	64%

28. The results of the Base plus Committed Development plus Development 1100 unit and 1350 unit scenarios are presented in the following paragraphs.

Base plus Committed Development plus Development (1,100 units)

29. **Figure 1.1** provides a summary of the network mean delay for the Base plus Committed Development plus Development of 1,100 unit scenario.



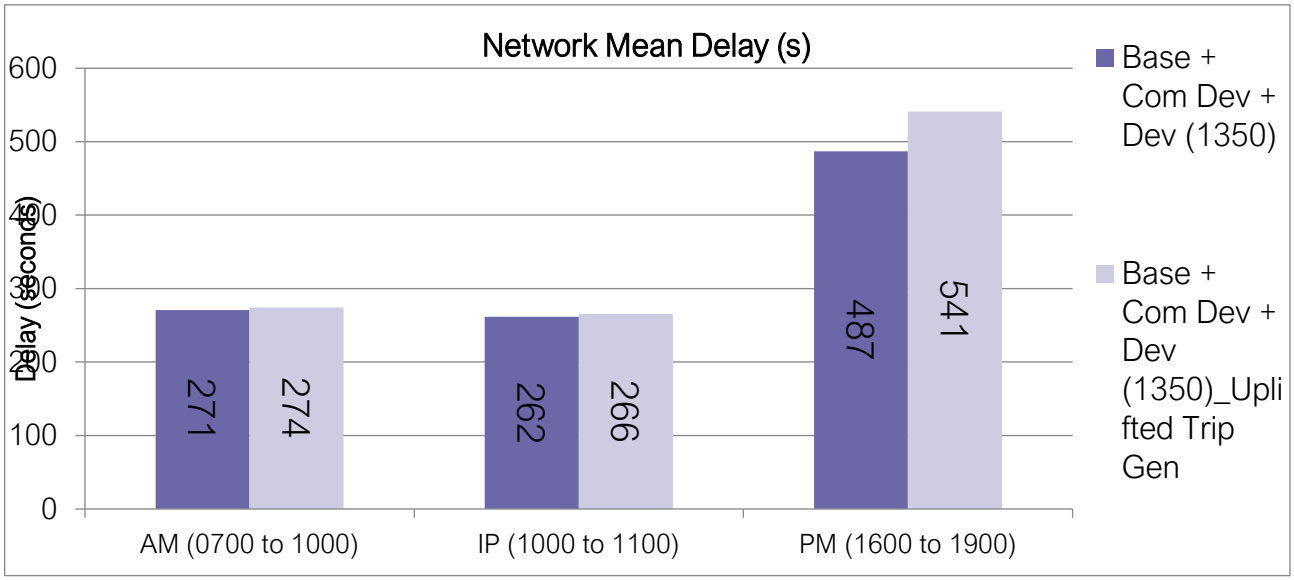
** TA results have been updated to allow for suitable comparison due to model coding changes triggered by the sensitivity tests*

Figure 1.1: Base plus Committed Development pus Development (1,100 units)

30. **Figure 1.1** highlights that the network mean delay increases by 4 seconds during the AM Peak, 3 seconds during the inter-peak period and 53 seconds during the PM peak period. This review suggests that when the development trips are uplifted, there is a negligible change during the AM and interpeak period, and a slight increase during the PM peak period forecast by the mathematical model before any other effects (that cannot be identified by the model) are considered.

Base plus Committed Development plus Development (1,350 units)

31. **Figure 1.2** provides a summary of the network mean delay for the Base plus Committed Development plus Development of 1,350 unit scenario.



** TA results have been updated to allow for suitable comparison due to model coding changes triggered by the sensitivity tests*

Figure 1.2: Base plus Committed Development pus Development (1,350 units)

32. **Figure 1.2** highlights that the network mean delay increase by 3 seconds during the AM Peak, 4 seconds during the inter-peak period and 54 seconds during the PM peak period. This review suggests that when the development trips are uplifted there is a negligible increase during the AM, interpeak, and PM peak period.

Individual Junction Modelling

33. In addition to the information provided within the micro-simulation model, LCC also requested that some individual junction models were carried out on junctions near the site. While Vectos feel that the micro-simulation model is sufficient in assessing the impact of the development on the local road network, individual junction models have been completed at the following junctions using LinSIG:

- Site Access / A582 Penwortham Way;
- A582 Penwortham Way / Chain House Lane; and
- A582 Penwortham Way / Pope Lane.

34. The turning flows at each junction have been extracted with the following scenarios considered:

- 2021 South Ribble Base Model;
- 2021 South Ribble Base Model plus Committed Development;
- 2021 South Ribble Base Model plus Committed Development plus 1,100 unit development; and
- 2021 South Ribble Base Model plus Committed Development plus 1,350 unit development.

Site Access / A582 Penwortham Way

35. **Table 1.6** provides a summary of the LinSIG modelling results for the Site Access / A582 Penwortham Way junction.

Table 1.6: Site Access / Penwortham Way LinSIG Model Results

Link	AM Peak		PM Peak	
	DoS	MMQ	DoS	MMQ
2021 Base + Committed Development + Development 1,100				
Penwortham Way (North)	39.8	7	46.1	6
Site Access	47.3	5	42.5	2
Penwortham Way (South)	47.3	8	36.3	4
2021 Base + Committed Development + Development 1,350				
Penwortham Way (North)	41.6	7	47.3	6
Site Access	48.8	5	45.3	2
Penwortham Way (South)	49.4	8	37.6	5

A582 Penwortham Way / Chain House Lane

36. **Table 1.7** provides a summary of the LinSIG modelling results for the A582 Penwortham Way / Chain House Lane junction.

Table 1.7: A582 Penwortham Way / Chain House Lane LinSIG Model Results

Link	AM Peak		PM Peak	
	DoS	MMQ	DoS	MMQ
2021 Base				
Penwortham Way (North)	60.7	7	70.7	8
Chain House Lane (East)	30.4	3	31.6	4
Penwortham Way (South)	64.9	12	69.7	12
Chain House Lane (West)	65.8	6	69.1	7
2021 Base + Committed Development				
Penwortham Way (North)	67.6	8	83.9	12
Chain House Lane (East)	30.2	3	20.6	2
Penwortham Way (South)	79.2	15	71.6	13
Chain House Lane (West)	77.9	8	83.6	10
2021 Base + Committed Development + Development 1,100 units				
Penwortham Way (North)	74.7	10	85.1	13
Chain House Lane (East)	30.7	3	21.2	2
Penwortham Way (South)	79.4	16	74.1	14
Chain House Lane (West)	77.9	7	83.7	10
2021 Base + Committed Development + Development 1,350 units				
Penwortham Way (North)	76.0	10	85.2	13
Chain House Lane (East)	31.4	3	21.5	2
Penwortham Way (South)	79.3	16	74.6	15
Chain House Lane (West)	77.8	8	82.9	10

A582 Penwortham Way / Pope Lane

37. **Table 1.8** provides a summary of the LinSIG modelling results for the A582 Penwortham Way / Pope Lane junction.

Table 1.8: A582 Penwortham Way / Pope Lane LinSIG Model Results

Link	AM Peak		PM Peak	
	DoS	MMQ	DoS	MMQ
2021 Base				
Penwortham Way (North)	42.1	6	53.2	8
Pope Lane (East)	57.6	4	58.0	4
Penwortham Way (South)	59.0	10	56.3	9
Pope Lane (West)	59.8	4	43.9	3
2021 Base + Committed Development				
Penwortham Way (North)	51.4	8	74.5	13
Pope Lane (East)	57.2	5	76.1	6
Penwortham Way (South)	72.1	13	65.0	10
Pope Lane (West)	67.5	5	30.8	2
2021 Base + Committed Development + Development 1,100 units				
Penwortham Way (North)	51.4	8	84.3	16
Pope Lane (East)	75.9	6	80.0	8
Penwortham Way (South)	77.9	14	67.1	11
Pope Lane (West)	67.9	5	29.4	2
2021 Base + Committed Development + Development 1,350 units				
Penwortham Way (North)	51.9	8	85.6	17
Pope Lane (East)	75.1	6	83.3	8
Penwortham Way (South)	79.0	15	68.4	12
Pope Lane (West)	66.6	4	30.3	2

Summary

38. This note has considered the changes in recorded traffic on the local road network between the 2021 data and pre-pandemic survey data. The comparison has considered the differences between the 2021 and 2018 turning flows, the 2021 AADT flows and Department for Transport (DfT) count point data, and a comparison of the journey time data and level of delay between 2021 and 2019. Judgements regarding the assessments can be made cognisant of these differences.

39. This review highlights that the changes in background traffic flows cannot be wholly attributed to the impacts of the Covid-19 pandemic on traffic flows. These fluctuations can also be attributed to a variety of interventions, including temporary or permanent changes in attitudes, and the introduction of the Cawsey link road as the difference between the 2021 and 2018 flows is greater on the links near this junction.

40. In light of this review, we feel that the 2021 traffic flows provide a satisfactory baseline for mathematically assessing the proposed development from which judgements are made, cognisant of all factors and national policy aims and requirements.

41. This review also highlights that the mathematical results are not sensitive to quite large changes in demand flows, in the order of 20%, and before the effects of a guidance and policy compliant 'Vision and Validate' approach is taken to the judgements.

42. The isolated junction model results do not change these conclusions or judgements.

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