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PROOF OF EVIDENCE

Taylor Wimpey and Homes England

Pickering's Farm Planning Appeal

July 2022

LPA Ref: 07/2021/00886/ORM and 07/2021/00887/ORM
PINS Ref: APP/F2360/W/22/3295498

VN211918 Transport and Mobility Proof of Evidence
Volume 2: Appendices

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Appendices

Appendix MA-1

CBLR Criteria

CBLR Movement Corridor Criteria

The internal road network constructed to serve the initial 1,100 residential dwellings will be suitable to form the initial part of a future CBLR (Cross Borough Link Road), should a full link be deemed desirable by the Council in the future.

In order that the development masterplan is consistent with the aims of the CBLR and vice versa, the development will construct a significant length of a road, as part of the Spine Movement Corridor, which is capable of also fulfilling the function of the CBLR.

This sets out the criteria for that corridor. It is intended to be a flexible design tool and not a definite catalogue of standards. The main objective of the criteria is to enable a CBLR link whilst at the same time creating better places for people to live in, places which are safer, more convenient and more attractive than the historical suburban estate, in accordance with guidance on this matter.

The following key criteria will be applied to the design of the Spine Road:

1. Corridor for movement by all modes
2. Provision for peds, cyclists, and where appropriate equestrians, along its length (off carriageway) and across the carriageway (formal and informal), including segregated space for cycles and other micro-mobility which takes priority of movement over side roads
3. No single home private driveways
4. A carriageway width typically in the order of 6.5m with localised widening where necessary
5. Separate right turn storage facilities for side road access such that through movement is maintained
6. 30mph speed limit
7. No significant acute bends
8. Satisfactory forward visibility at junctions and along the corridor
9. Active frontages, well overlooked and with street trees where appropriate
10. Layout consistent with public realm which encourages activity at the pedestrian scale and provides a balance between movement and place functions
11. Inclusive design to best account for people with visual, mobility or other limitations to allow safe and confident use
12. A 40m wide swathe of land will be safeguarded to enable some flexibility in alignment to accommodate a corridor which is likely to fluctuate in width, but rarely extend more than 20m wide. Residual land within the safeguarded strip, once the detailed alignment and design of the corridor has been fixed, will accommodate development and frontage to the corridor

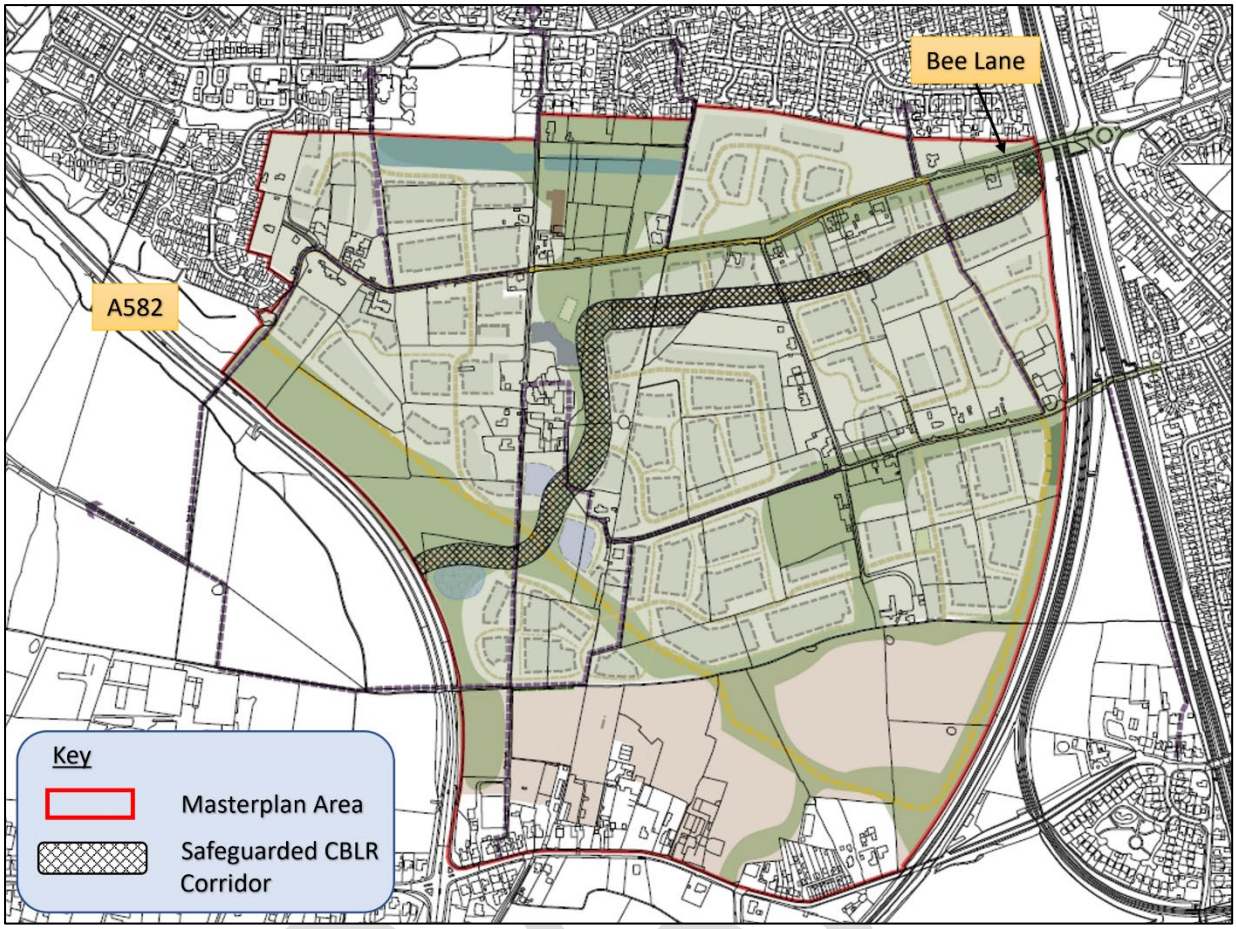

Image 1: Safeguarded Land for CBLR Movement Corridor

Appendix MA-2

Mobility: Monitor and Manage documents

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Proposed Residential Development, The Lanes, Penwortham

VN211918 – Mobility, Monitoring and Managing Strategy

Introduction

1. The Lanes Team, consisting of Taylor Wimpey, Homes England, Vectos (Transportation) and Avison Young (Planning) has engaged with South Ribble Borough Council (SRBC), Lancashire County Council (LCC), National Highways (NH) and their technical advisors WSP on transportation matters.

2. The Lanes Team has prepared this Mobility, Monitor and Manage Strategy to support and manage the climate, health and socially inclusive mobility measures proposed for, and included within the design of, this allocated site.

3. The purpose of the planning system is to contribute to the achievement of sustainable development. This means that the planning system has three overarching objectives; environmental, social and economic.

4. Gaining 'accessibility' is at the heart of all three of these overarching objectives. The effectiveness of infrastructure and measures brought forward by this development will vary in the context of each objective, by time and in the context of measures, trends and attitudes in the wider area.

5. Much of the infrastructure and measures are flexible in nature, enabling more of the same where they are working well, and less of the same where they are not.

6. In addition, there is a fast pace of change in terms of technology and attitudes in the context of accessibility. In accord with the guidance in the Framework, the vision for this development should anticipate and respond to long terms opportunities, meaning cognisance of this fast changing environment.

7. A Monitor and Manage approach is the monitoring of the characteristics that matter most, and adapting infrastructure and measures to maximise the benefits of the resources available in the context of the objectives. This is the effective way of best reacting to changing environments, attitudes and trends, and enabling a response to changing technology.

8. This document sets out the mobility principles, targets, phasing and a method of management via a Steering Group. It provides for the costs of surveys to be borne by the Developer and it defines and sets out the means by which a Flexible Transport Fund will be used in support of maximising the benefits.

9. The Lanes can be used as a catalyst for the introduction of sustainable schemes to Penwortham and Preston. However, as a starting point, initiatives that may in due course permeate to the wider area will be delivered on site either as infrastructure funded by the scheme, or as commercially viable measures.

10. This allows The Lanes and Penwortham the opportunity to work together to promote modern mobility, maximising sustainable and inclusive travel and minimise the reliance on less sustainable and less inclusive means (by that we mean single occupancy cars). This document summarises what these measures are and the benefits these can bring.

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11. The Lanes site is in a sustainable location on the edge of Penwortham. It is within easy walking, cycling and other micro-mobility (movement using lightweight vehicles such as bicycles and scooters, including electrically propelled) reach of the immediate surrounding areas, including Kingsfold, Tardy Gate and Lostock Hall. This provides access by active travel to a wide range of every day facilities for new residents, and to facilities within the site for residents and users of these existing communities.

12. It is a primarily residential development which also provides education, community facilities, open space, and recreation on site. There is scope to get to the wider communities north and east of the site, and local bus services and cycle routes provide connections to Preston city centre. This scope will be enhanced as part of The Lanes development. That is the reason why it is quite correctly allocated in the Local Plan as a key site to deliver a major portion of Penwortham's growth.

13. The Lanes planning application will deliver a new primary school, a local centre comprising a shop, community building, a range of playing fields, and recreational opportunities, Primary and Secondary mobility hubs, and significant green corridors comprising formal and informal open space.

14. As a result, the development offers significant opportunities for, and likelihood of, internalisation of trips and activity within the local communities of which it will form a part.

15. The proposed development supports and complies with national, regional, and local planning policy. It is located in a sustainable location and will provide residents with the opportunity to access facilities directly and via 'online' services. Where movement occurs, residents will also have the ability to undertake journeys via active and sustainable modes of travel including walking, cycling and shared transport including public transport.

16. Sustainability means many things to many people. The development is sustainable in the following ways:

- There is opportunity for, and likelihood of, internalisation of trips to schools (existing and proposed), community facilities, open space, sport, and recreation as these uses are contained within the site, and can be accessed easily and attractively by all modes, but particularly by active travel;
- Proximity to existing homes, jobs, services, facilities, and activities in the local area and to local bus services, easily accessible by sustainable modes;
- Providing an extensive path network through the site, which offers mental and physical health and wellbeing benefits;
- The Lanes will follow the TW Homes for Nature guidance, which includes providing wildlife attracting flower seeds as part of Home Welcome Packs, careful consideration of species planting to attract bees and birds, and many other cost effective yet hugely beneficial projects;
- Homes will be designed to meet tighter building standards, provide EV charging where appropriate and meet water consumption targets; and
- Infrastructure will also be designed to take cognisance of renewable and other future energy types.

17. Early access to facilities and sustainable living and mobility will give new residents the opportunity to form new lifestyles, as part of their overall change in living.

18. The 'by design' aims of the scheme are to create an environment where access to facilities is inclusive, and accords best with the objectives, whether by virtual (internet) or physical mobility. In doing so it is necessary to provide for a wide choice in means of accessibility, and at the same time prioritising so that the relative benefits or attractiveness of having access to a private car is minimised, and the interaction of people at a pedestrian scale within the community is maximised.

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Mobility – Proposal, Benefits and Further Opportunity for Enhancement

19. A summary of the mobility components is set out in Table 1 below. This explains what they are, the benefits they offer and how these can be managed by a Steering Group using a Flexible Transport Fund.

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Item and Description	Likely Benefits	Flexibility via the Monitor and Manage Approach
Mobility Hubs: A Primary Mobility Hub is a building in a central location which provides for all things community and mobility. A key element is the welcoming presence of a Community Concierge team. The facility incorporates, or is close to, a café. It includes 'fix your own bike' space, rental of bikes, cargo bikes, e-bikes, scooters and other micro-mobility. It provides information and bespoke advice on accessibility and travel. It includes internet access for shopping, and it is a micro-consolidation centre for deliveries. It is a place to pick up or drop off car share vehicles, and the management hub for shared travel (including buses) and car pooling (sharing private cars). A Secondary Mobility Hub is a location within the community where rental bikes, other micro-mobility and car share vehicles are located. It is unstaffed and open air.	Hubs for the community, which deliver: • A place to interact • Walking, cycling (active travel) and public transport maps, and public transport timetable information; • Bike hire; • Bike stop, offering tools and assistance with repairs and maintenance; • Coffee shop, as a social hub or meeting point for the community, including cyclists; • Car club and carpooling; • Electric vehicle charging points; • School Travel Planning (and encouraging means other than car drop off, with internalisation, and promotion of alternative schemes); • Close to local centre and retail assisting with commercial viability and footfall; • Mental and physical health benefits through community interaction • A tendency to localise some trips, and create virtual or active travel trips where otherwise these would have been made by motorised vehicle	• Adjustable Opening Times; • Intensification of Facilities depending on performance and changing needs; • Working with Partnerships and local support groups; • Flexible Bike Train and Walking route meeting points; • Flexible use of the facility as a meeting point; and, • Flexible provision of Secondary Mobility Hubs.

Community Concierge: The Community Concierge is an on site team providing cheerful community support, including management of accessibility and mobility measures.	• A human presence; • Maximise convenience in many ways; • Minimises the last mile of travel for deliveries (the least sustainable element of deliveries), including minimising the number of distribution vans travelling through estates; • Benefits to safety and convenience of vulnerable users; • Easy and secure location for resident convenience; and • Close to local centre and retail assisting with commercial viability and footfall.	• Flexible availability • Changes that maximise accessibility to services in the context of prevailing conditions; • The ability to react to changing technology; • Safer, and perceptibly safer, community; and • Wider remits, particularly in respect of school travel systems.
Car Club Scheme: A Car club is a, typically hourly, self-service car rental available to members. It is a scheme where residents (The Lanes and potentially wider community) pay a subscription and a per unit time cost for the use of a vehicle (car, van or pod) which they do not own.	• With access to car clubs readily available, this gives residents the choice not to be car owners, but to choose the car when necessary, and rely less on private car for other journeys; • Evidence-based climate benefits associated with the change in behaviour to a car club, for journeys where necessary; • Supports accessibility by internalisation and cycling and walking for other journeys; • Can become self-sustaining either at cost neutral or income generating; and, • Opportunity for sponsorship	• Funding ongoing commitment to, or expansion of, car club beyond additional start-up cost; • Opportunity to reduce hire costs to encourage use in initial periods; • Opportunity to act as a catalyst for the introduction of, or expansion of, a scheme into Penwortham and Preston as a whole; and, • Research into demographics of car club users forms part of specific targeting of surveys.

Bike Hire Scheme: A bike, e-bike, e-scooter or other micro-mobility hire scheme, where users, via an app or through the Community Concierge can gain 'pay by use' access to these. Opportunity to engage with SRBC to establish pods in town and railway station, or to introduce a dockless scheme with all hire equipment geo-tagged.	• Offers commitment and maintenance free access to bikes or scooters on demand; • Works in conjunction with car club for those who don't want to own transport; • Can form part of school travel plan, and encourage use of scooters; • Financial viability increased with scale, therefore readily expandable in local area; • Extensive Health Benefits; • Carbon emission minimisation; • Can become self-sustaining either at cost neutral or income generating; and, • Opportunity for sponsorship	• Opportunity to reduce hire costs to encourage use in initial periods; • Opportunity for both Mechanical and E bike (and further options subject to demand; and, • Opportunity to act as a catalyst for the introduction of a commercially viable scheme into Preston as a whole.

Shared Transport, including Public Transport: Improvements to public transport in the initial phase include two options for bus services within the site. The first option looks at providing Demand Responsive Transport (DRT) services that serve the site and Preston City Centre. This would allow residents to request a service similar to a private taxi or uber, with spin off benefits to other residents in the community. The second option would involve extending an existing bus route through the site or provision of a new service.	• Providing DRT within the site will allow a bespoke service to be developed which would connect residents to local employment areas and Preston city centre where existing services aren't available; • Bus service penetration into the scheme delivered in perpetuity. • The twice hourly service linking the site, to the local area and Preston city centre;	• It is recognised that the form of Public Transport may change over the course of the development. The on demand public transport service could supply additional capacity. This may be to meet short term capacity issues as noted with over supply associated with the success of the mobility programme; • Fund used to support / plug short term gaps; • This service allows the client (or the developer) to manage the number and times of trips and the size of bus to match supply with demand; • The service can have short contract durations; • Service can be used at times where capacity of larger bus is not necessary; • The service can use local operators, with capacity and does not rely on significant capital outlay; and, • The service is booked via an app.
Active Travel Routes	The scheme provides for the enhancement and creation of active travel corridors that provide direct and convenient links between Kingsfold, Tardy Gate and the central areas of the scheme. These are via direct construction and funding provided to the Highway Authority and are shown and explained in Appendix A.	Contingency to offer localised improvements on and off site, including wayfinding should demands and practical use demonstrate that these would be of benefit

Table 1: The Lanes Mobility Scheme, Benefits and Flexibilities

Programme

20. Accessibility, internalisation, and mobility are an integral part of the phasing strategy for the site as a whole. A phasing plan will be a reserved matter, and therefore the incorporation of landscaping, accessibility and movement will remain in the control of the Borough Council. Phasing takes account of delivery of homes in conjunction with the provision of open space, infrastructure and local facilities which will include the Mobility Hubs.

21. The intention is for the site to be developed from Penwortham Way with the development occurring from the west to the east with the objective to deliver up to c150 homes each year. Interim Mobility Hubs and associated facilities such as basic day to day food purchase, will be implemented in the early phases, which we anticipate could be provided in the vicinity of the sales centres.

22. Our current programme indicates that the local centre will be established around year 4/5. The local centre is located centrally and adjacent to the proposed school. This will be the location for the permanent Primary Mobility Hub.

Infrastructure Delivery Schedule and S106

23. The Section 106 Agreement is the means by which both the transport and mobility contributions, and the Monitor and Manage provisions will be secured.

24. The monitoring and management relies on a Steering Group (which would comprise SRBC, LCC and the Developer) and supplies them with the necessary supporting information (from surveys) to make informed decisions on the use of a fund set up to focus on achieving mobility objectives.

Infrastructure	Funding and Delivery Mechanism	Description and Indicative Delivery Programme
Village Centre and Mobility Hub Scheme	The Village Centre is an integral part of the Development and will be funded and delivered by the Developers. [Funding will be secured via a service charge from each property to ensure community engagement and provision of effective services in perpetuity. and/or Developer commitment to underwrite and provide services for a period of 15 years] It will be delivered in two stages:	The Interim Village Centre and Mobility Hub will be provided prior to first occupation of any Dwelling in the Development in accordance with Paragraph [ ] of Schedule [] of this Agreement. A scheme for the permanent Village Centre and Mobility Hub will be provided prior to the occupation of 200 Dwellings in accordance with paragraph [ ] of Schedule [] of this Agreement. Other non-residential uses will be provided on a phased basis as the development progresses, in line with need, market demand and commercial viability.

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	- an Interim Village Centre and Mobility Hub and subsequently - the Permanent Village Centre and Mobility Hub; For clarity, the both the interim and permanent Mobility Hubs will including a location for the Community Concierge, travel information boards, car club/car sharing infrastructure and third place working infrastructure.	
Vehicular access onto the A582 Penwortham Way	These works will be delivered by the Development in accordance with Paragraph [ ] of Schedule [ ] of this Agreement.	The vehicular access will be completed prior to the first occupation of any Dwelling which will rely on the junction with Penwortham Way for its access.
Vehicular access onto Bee Lane	These works will be delivered by the Development in accordance with Paragraph [ ] of Schedule [] of this Agreement	This vehicular access and improvements to Bee Lane bridge will be completed prior to the occupation of Development of any Dwellings on the land shaded [ ] on Plan [ ].
The Spine	The Development will deliver a new movement corridor, the Spine, for the site which will be delivered on a phased basis on land within the Site as part of the Development. The detailed design of the Spine will be secured by planning condition and subsequent Reserved Matters applications. Unless otherwise agreed in writing by the Council, the delivery of the Spine Road will accord with the following programme: - That part of the Spine Road shown shaded [ ] on Plan [ ] will be completed prior to occupation of [Phase [ ]/that part of the Development shaded [ ] on Plan [ ]] - That part of the Spine Road shown shaded [ ] on Plan [ ] will be completed	The construction of the Spine will be phased in line with progress of the overall development of the [Phases] of Development. Each future Reserved Matters application will include details of that part of the Spine which will be delivered in associated with that Phase. The route of the Spine (which could form part of the CBLR if it is promoted) will be safeguarded by the Development in accordance with Paragraph [ ] of Schedule [ ].

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	prior to occupation of [Phase [ ]/that part of the Development shaded [ ] on Plan [ ]] - That part of the Spine Road shown shaded [ ] on Plan [ ] will be completed prior to occupation of [Phase [ ]/that part of the Development shaded [ ] on Plan [ ]] The construction of the various parts of the Spine by the Development will amount to infrastructure in kind to be offset against CIL payments to be made in respect of the Development.	
Off-Site Highway Improvements to the Leyland Road/Bee Lane Roundabout Junction	These works will be carried out in accordance with Paragraph [ ] of Schedule [ ] of this Agreement.	These works will be completed prior to the occupation of 50th dwelling
Active Travel Infrastructure including Improvements to Public Rights of Way within the Site **£750,000**	Improvements to existing PRoW as described in the Public Rights of Way Strategy, as follows: • Principal route 1 to Kingsfold (via Moss Lane and 7-9-FP46) • Principal route 2 to Cloughfield (via 7-9-FP43) • Principal route 3 to Kingsfold (via 7-9-FP42) Contribution towards LCC desirable improvements as follows: • Footpath 7-9-FP4 link retained and surfaced to a minimum 2m width with lighting; • Footpath 7-9-FP54 link retained and surfaced to a minimum 2m width with lighting; • Footpath 7-9-FP56 link retained and surfaced to a minimum 2m width with lighting; and • Footpath 7-9-FP57 link retained and surfaced to a minimum 2m width with lighting.	The dwellings in each phase will not be occupied either until the relevant improvements have been complete in accordance with the approve scheme or until the necessary payment is made to the Council to contribute towards route improvements.

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Shared Travel Service **TBC**	Provision for shared travel is an integral part of the mobility strategy for the site. Developer commitment to underwrite and provide a shared travel service.	Bespoke service between the site and Preston city centre and/or demand responsive services.
Additional Shared Travel Contribution **TBC**	Funding for this measure will be delivered by the Development in accordance with Paragraph [ ] of Schedule [] of this Agreement	To be used as required if additional financial support is required for the bus service.
Off-Site Shared Travel Infrastructure **£75,000**	These works will be delivered by the Development in accordance with Paragraph [ ] of Schedule [] of this Agreement	Bus stop improvements on Kingsfold Drive and Leyland Road
Active Travel Payments to Households **£220,000**	Funding for this measure will be delivered by the Development in accordance with Paragraph [ ] of Schedule [] of this Agreement	Up to £200 per dwelling in the form of a travel voucher which residents can apply for.
Travel Plan Steering Group	A group consisting of the Council and County Council and the Developer.	Travel Plan Steering Group will coordinate surveys to monitor the degree to which various mobility measures are being taken up and agree any use of the Flexible Travel Fund to maximise mobility benefits of the development.
Travel Plan Steering Group Contributions **£125,000**	Funding for this measure will be delivered by the Development in accordance with Paragraph [ ] of Schedule [] of this Agreement	Five staged payments of up to £25,000 each time (i.e. occupation of 300 dwellings, 600 dwellings, 1100 dwellings, completion of all substantive development) to cover Council and County Council costs which are incurred as a direct result of participating in the Steering Group.
Flexible Travel Fund **£1,000,000**	Funding for this measure will be delivered by the Development in accordance with Paragraph [ ] of Schedule [] of this Agreement	To be used at the discretion of the Steering Group on agreed measures to best enhance mobility and minimise the use of private vehicle trips (i.e., enhanced services at mobility hub, additional car club funding, other shared travel subsidy, sustainable travel routes, etc).

Table 2: Infrastructure Delivery Schedule

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The Lanes Monitoring Strategy

1.0 Objective

An objective of The Lanes is to create a place for sustainable, healthy and climate friendly living.

The objective of the Monitoring Strategy is to measure how people gain access to facilities over time and to allow comparison with benchmark data which is set out in the Transport Assessment. This will inform targeted additional initiatives if they are necessary, aimed at managing and minimising the reliance on single occupancy cars as far as is practical.

The monitoring strategy therefore comprises *benchmarking*, *surveying*, and the implementation of further *interventions and enhancements based on the data gathered*.

Benchmarking: Basic triggers will be derived from parameters set out in the Transport Assessment. These parameters were set by the Transport Assessment for the purpose of traffic assessment and in support of the scheme. This will enable a broad assessment and comparison of the travel and mobility characteristics of the development as it builds out, and the uptake of the mobility measures already in place against the assumptions made.

Surveying: Surveys will be undertaken to measure the way in which people gain access to facilities within and beyond The Lanes. This will include measuring whether people travel, the number of trips that are generated, where they go and by what mode.

Intervention and Enhancing: Knowledge gained from surveys, combined with an understanding of local and regional mobility trends, will allow targeting of any further enhancements to mobility, which are to be financed by the Flexible Transport Fund, with the purpose of delivering measures which manage the impacts on the local transport network.

2.0 Definitions

A **Steering Group** will be established to instigate surveys, monitor, draw conclusions and determine actions.

In reaching its conclusions, the Steering Group will have regard to:

1. The work and forecasts contained within the Transport Assessment Report (TA). This is considered to be the benchmark.
2. Openness and transparency in the instigation, monitoring and access to data in relation to the survey specification.
3. The results from the Surveys
4. The aims and objectives with respect to climate, sustainability, social and economic matters set out by local and national Government
5. Planning policy

A **Flexible Transport Fund** will be secured under the terms of the s106. The purpose of the Flexible Transport Fund is to deliver measures which provide most mobility benefits as agreed by the Steering Group. This will target investment to the measures which will have the greatest beneficial effect in the context of the aims and the policies. The Steering Group will have the flexibility to expend this fund on measures which will provide the best outcome for supporting mobility and background modal shift, to minimise vehicle use to and from the development wherever possible. The interim benchmarks triggers are broadly in line, and the final benchmarks are in line with the trip generation as set out in the Transport Assessment Report.

The Flexible Transport Fund is for measures which create appropriate and proportional measures which are sustainable in perpetuity.

The **Basic Triggers** are defined in Section 3. Should the triggers not be exceeded, or should any proportional fund not be spent or committed following the final survey, the developer will be released of obligation.

3.0 Benchmarking

The Basic Triggers which are regarded as the benchmark data, have been derived from the assumptions in the TA. In this respect, the TA, sets out the Trip Generation Methodology. These tables consider trip rates, trip generation and internalisation across all land uses.

Intervals 2 and 3 set Basic Triggers for vehicle movement at 10% below what the external traffic flows would be at each interval derived from the assessment in the TA. This means that if the scheme only achieves what has been assessed in the TA in respect of minimising vehicle movement that the funding is triggered.

The following table sets out the trip generation figures for the development that makes up the Basic Triggers. These are daily flows (0700 – 1900).

Daily Flows	**Basic Triggers – External Vehicle Trips**				
	Total Vehicle Trips (Full Occupation)	**Interval 1 (300 dwellings)**	**Interval 2 (600 dwellings)**	**Interval 3 (900 dwellings)**	**Interval 4 (Full Build Out)**
Traffic Movement	3,457	967	1,935	2,902	3,457

A final interval is surveyed at the point where ALL land uses on site are fully completed and occupied. If the final development has not been completed 24 months after the last house, a final interval will be initiated.

Construction related traffic will be accounted for (and removed) when reconciling the vehicle trips generated by the development. The methodology for this will be agreed and where appropriate linked to the Construction and Environmental Management Plan.

The household interview and active mode surveys can be used by the Steering Group to quantify the take up of online and sustainable transport modes, and this information at each interval, should provide the Steering Group with a pointer towards how successful sustainable living measures have been taken up. This information should also provide the Steering Group with an indication of which measures covered by the Flexible Travel Fund can best influence travel behaviour.

The survey / measurements will be compared to the Benchmark Data. The Steering Group will have the use of the Flexible Transport Fund if the Basic Triggers have not been achieved. If the Basic Triggers are not breached, then the default position will be that no intervention and enhancement work is required at that time. This position would then be reviewed again at the next survey point.

4.0 Surveying

The complete survey specification is contained in **Appendix 1**, and will be designed to measure all aspects of accessibility, whether it be virtual mobility, physical mobility, or car trip movement. This should be regarded as a performance specification, with the general extent of survey and main principles set out, but with aspects of finer detail agreed by the Steering Group at the time of the survey.

The key components are

- Household interview surveys
- Automatic Number Plate Recognition/Bluetooth Surveys
- MCC and ATC surveys
- Camera surveys

The measurement survey will be triggered by the completion of 300, 600, 900 and the final completion and occupation of all development on The Lanes site.

5.0 Intervention and Enhancement

The aim of this sustainable urban extension is to promote active and socially inclusive living across the whole day every day.

Accessibility in this context includes virtual mobility, such as working or shopping from home, but not contacting friends on social media. It includes the use of all forms of physical travel, including walking, cycling, use of micro mobility, use of buses and other shared travel systems, and use of shared or single occupancy cars.

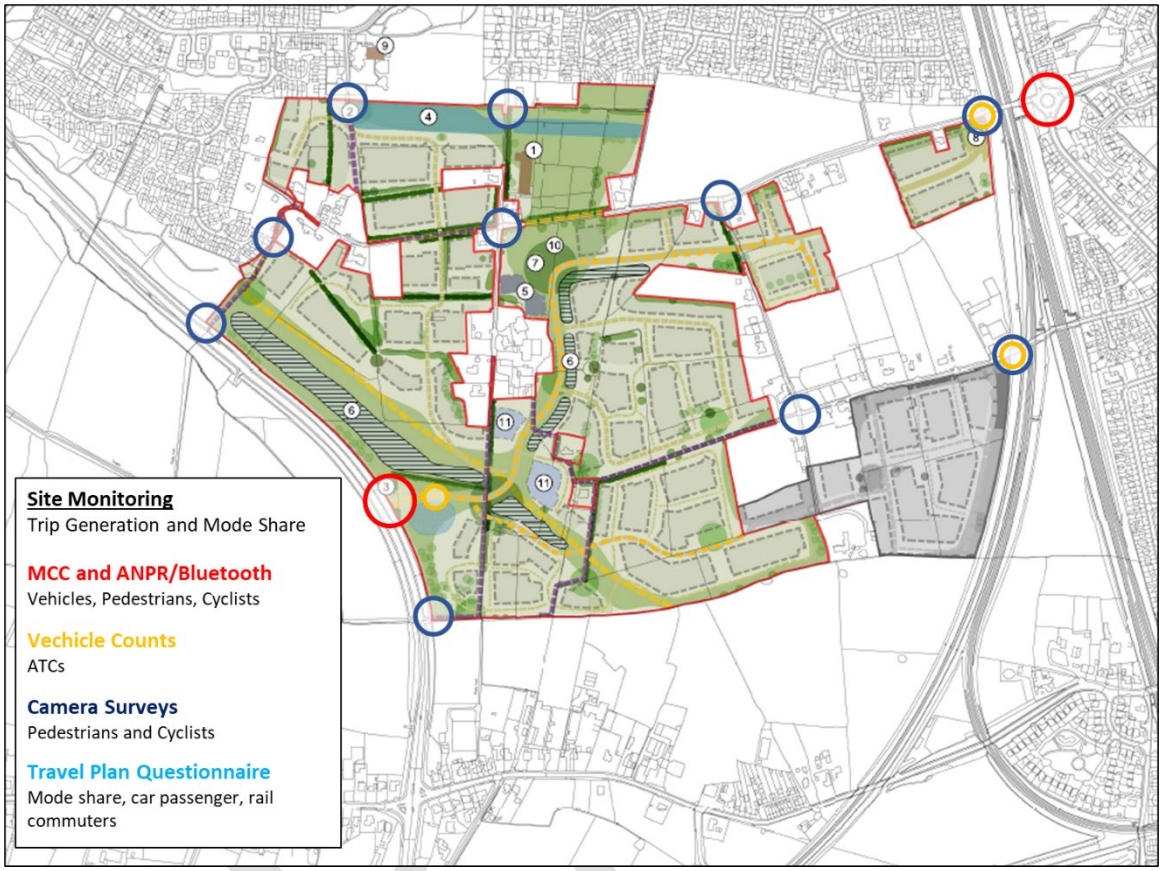
Armed with the survey data, and with the additional resources of the Flexible Transport Fund if any trigger has been exceeded, the Steering Group will determine the best interventions and ways in which to be able to enhance the characteristics of the development to achieve the then stated aims.

An early assessment has been undertaken in order to list potential interventions, the enhancements that these would bring (and to whom). Alongside this an appraisal has been undertaken of the cost and benefit of implementing such schemes. This information is set out as follows:

Appendix 1 Survey Specification

Introduction

This section sets out the in principle survey requirements. The following is illustrative at this stage and will be refined as the final site masterplan is produced.



Surveys and Monitoring

The surveys will be designed to measure all aspects of accessibility, including virtual mobility and physical mobility including traffic movement. The surveys will include:

- Household interview surveys – These will be designed to determine:
  - The degree of internalisation of accessibility, including virtual and physical mobility and by purpose
  - The mobility mode by purpose and destination
  - The degree to which journeys or the way facilities are accessed are typical (ie, regular or irregular commuting)
  - The use of the facilities on offer (for instance the microconsolidation facility)

- Automatic Number Plate Recognition / Bluetooth Surveys – This will be conducted at all vehicular entry and exit points within the development area to establish the amount of vehicle trips which are generated within the development and interact with the wider highway network.

- MCC, ATC and Camera surveys (or Vivacity style surveys)– These will be undertaken to understand the quantum of vehicular and non-vehicular movement at the points where the development connects into the local communities.

These methods of surveying conditions within the development will be implemented along with the household interview surveys to establish **quantum** of accessibility and mode share.

The final location/number of surveys should be agreed with the Steering Group ahead of them being undertaken at each Interval. The number of surveys may change as the scheme develops and more of the transport network is delivered.

Intervals

An Interval is the point at which the surveys will be undertaken.

Each precise survey specification will be determined at each interval. Each specification will be determined by the Steering Group along the principles set out above

The intervals are:

- Interval 1 – Upon occupation of 300 houses
- Interval 2 – Upon occupation of 600 houses
- Interval 3 – Upon occupation of 900 houses
- Interval 4 – The earlier of, completion of all substantive development or two years after completion of the last house.

The development starts as it means to go on. Therefore, the Basic Triggers apply to Intervals 2 and 3. The Basic Triggers have not been applied to Interval 1 to enable a critical mass to form. However, the surveys undertaken at Interval 1 will provide an initial baseline from which to measure the success of the emerging design and management.

Specification

All surveys will be collected under what is currently defined as 'normal' living and transport network conditions meaning free from incidents and events and undertaken during a sufficiently typical weekday, or "neutral period", as agreed by the Steering Group. This should be verified and accepted by the Steering Group ahead of any surveys being undertaken.

The survey company will ensure that when surveys are collected during a period that they are checked and the data is confirmed to be unaffected by road closures or works during the entirety of the survey period. If the Steering Group determines that road closures, works, or accidents on the transport network have had a significant impact on transport patterns, then these will be repeated.

It is envisaged that the Manual Classified Turn Counts (MCC) and ANPR/Bluetooth survey will be undertaken on the same day, and the Automatic Traffic Counts (ATC) will be collected for the full week long period that includes this day.

Video surveys for all junctions will be made available post analysis.

Multi-modal surveys are expected to be conducted in the form of camera surveys using AI vision based sensors.

Collection Period

The MCC and ANPR surveys will all cover daytime and evening, this being defined as **07:00 to 21:00**. The Steering Group will have regard to the recommendation that that these surveys are undertaken on a weekday.

The ATCs will capture at least a period of one week and cover the full 24 hours in each day.

The multi-modal surveys will cover the same daytime and evening period of **07:00 to 21:00**.

Data Collection & Presentation
Junction Turn Counts (MCC):
Turn counts are likely to be collected using mobile CCTV / video surveys and time and date stamped.
Turn count data will be presented at a minimum of 15 minute intervals
Turn count data will be classified as Car, LGV, OGV1, OGV2, PSV, MCL &; PCL as a minimum.

Automatic Traffic Counts (ATC):
Link counts will be collected using ATCs where applicable but on links where this is impractical, or where congestion will result in very slow moving traffic and therefore affect the ATC's ability to record accurately, video footage will be used.

Link count data will be presented at 15 minute intervals.

Link count data will be classified as Car, LGV, OGV1, OGV2, PSV, MCL &; PCL as a minimum. The flow in both directions will be provided.

Multi-Modal Surveys:
The camera surveys are likely to be collected using AI vision based sensors, the sensor will track each road user through the field of vison and convert these traces into classified counts by counting the number of each class of vehicles that crosses a "count line".

Location Details

The location map for these counts is included above alongside the introduction.

Travel Plan Questionnaires (Household Interview Surveys)
Household interview surveys will be completed at the same time as the observed survey data is collected. Consideration may also be given to the completion of workplace travel surveys to complement the residential surveys.

Reporting
Survey reports (standard Excel spreadsheets) for MCC, ATC, and multi-modal surveys are anticipated that will clearly present the data.

Appendix MA-3

Active Travel Connections

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Proposed Residential Development, The Lanes, Penwortham
Public Rights of Way Strategy

N:\Vectos Job Data\2021\VN211918 The Lanes, Penwortham\Docs\Reports\16. Inquiry Docs\5. MA PoE\Appendices\Appendix MA-8 - Active Travel Connections\VN211918 The Lanes, Penwortham - Public Rights of Way Strategy v3.docx

Background

1. There are currently a number of Public Rights of Way (PRoW) crossing or in the immediate vicinity of the site. These PRoW, combined with the existing adopted highway network along Bee Lane, Flag Lane, Lord's Lane and Moss Lane provide multiple points of existing connection between the sites and communities in Kingsfold and Tardy Gate.

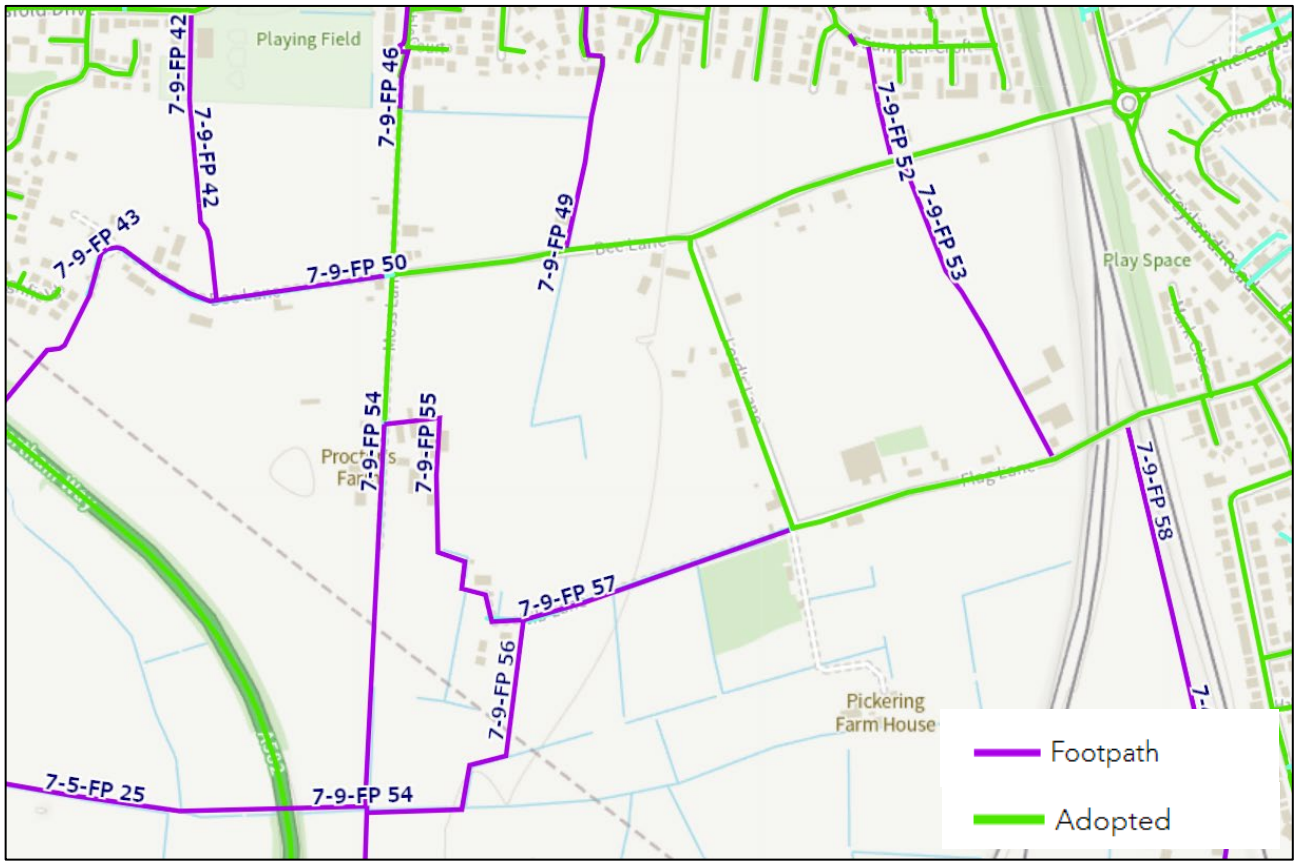

Figure 1: Existing PRoW and Adopted Highway

2. Footpath 7-9-FP42 provides a connection between Bee Lane and Kingsfold Drive, as does Moss Lane and Footpath 7-9-FP46, Footpath 7-9-FP49 and Footpath 7-9-FP-52.

3. Footpath 7-9-FP42 connects to Footpath 7-9-FP43 (via Footpath 7-9-FP50) by way of a short, paved section which then provides access to the Cloughfield residential area by way of a short alleyway. Onward journeys are then facilitated along quiet residential streets to controlled crossing facilities at the new A582 Penwortham Bypass roundabout to the west.

4. Improvements are proposed to three principal routes which will continue to form the active travel network used by the existing communities but also by the proposed development (further details provided in subsequent sections).

5. Where the improvement to the route lies within the site the improvements will be undertaken directly by the scheme.

6. Where the route to be improved lies outside the site boundary, Lancashire County Council (LCC) PRoW Officers have suggested that the rights of way are within the control of LCC (see consultation response dated 29th October 2021), and a contribution via a S106 document would provide a suitable mechanism for its delivery.

7. **Figure 2** shows where the improvements are to take place, and where these lie within the site and outside of the site.

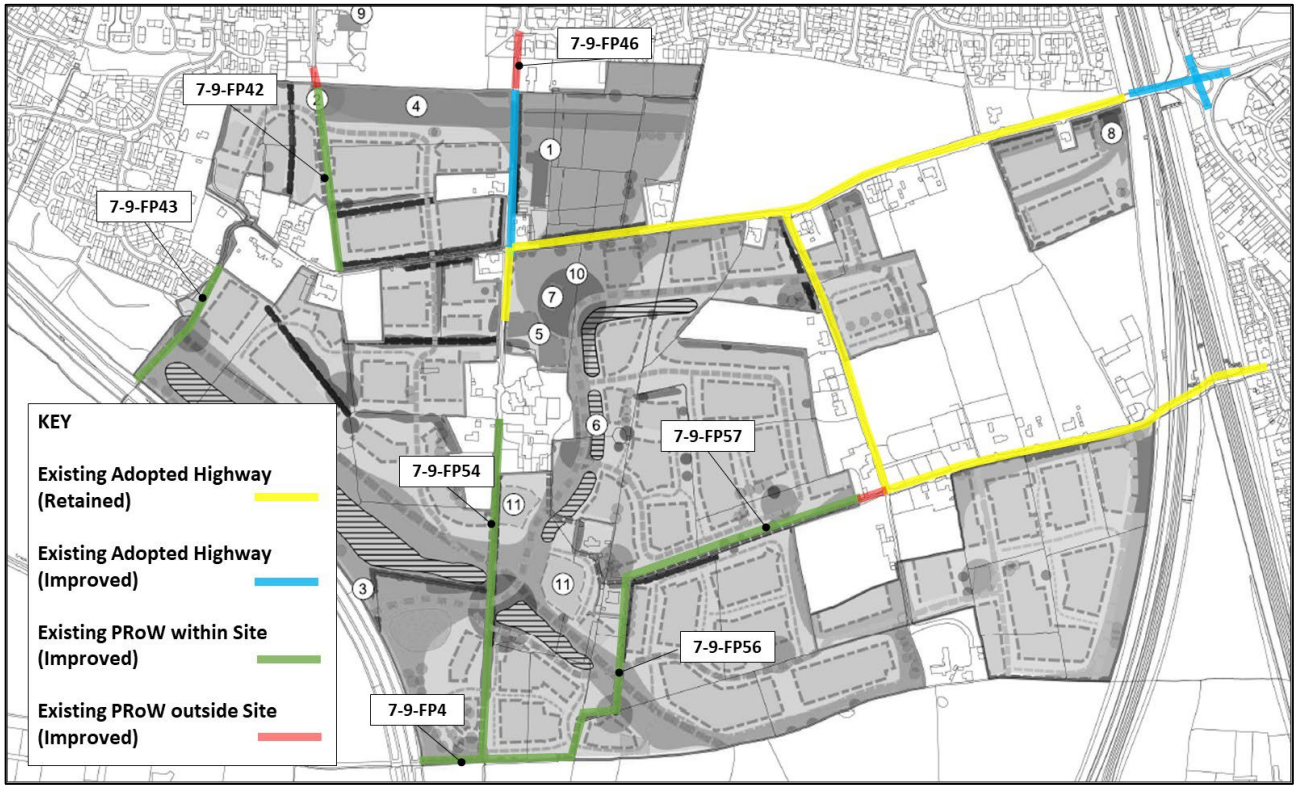

Figure 2: PRoW and Other Active Travel Infrastructure Improvements

8. In addition to the three principal routes, LCC have identified additional desirable improvements to a number of PRoW which are adjacent to the site. LCC have confirmed that the rights of way are within their control, and that a contribution via the S106 document is appropriate and would enable it to undertake the improvements (see consultation response dated 29th October 2021).

Principal Route 1 to Kingsfold (via Moss Lane and 7-9-FP46)

9. Moss Lane is existing adopted highway with a surfaced carriageway. At the northern end, footpath 7-9-FP46 provides the final leg of the connection between Moss Lane and Bramble Court and lies outside of the site red line boundary.

10. The existing width of surfaced carriageway at Moss Lane varies between 2.3m-3m and the width between boundaries is between 4m-6m. The existing surfaced width of footpath 7-9-FP46 varies between 1.9m-2.8m and the width between boundaries is between 4m-4.5m. The route is lit at either end and follows a relatively straight alignment with good forward visibility for the majority.

11. It is not necessary to improve this full route to facilitate access to Kingsfold for pedestrians. Existing infrastructure is good. Practically, cyclists have been observed to use the full route, but legally, use of the footpath 7-9-FP46 (approximately 65m length) is prohibited.

12. It is proposed to widen Moss Lane using existing verges within the adopted highway to provide a consistent width of at least 3.5m.

13. Footpath 7-9-FP46 sits on unregistered land which occupies a width of approximately 4m-4.5m. LCC PRoW have proposed that it be resurfaced to a minimum width of 3m. LCC PRoW has suggested that this right of way is within its control and it is able to improve with funding from the development. The development makes the commitment in the S106 document to fund this improvement, as requested by LCC PRoW.

Principal Route 2 to Cloughfield (via 7-9-FP43)

14. There is an existing link from the western end of Bee Lane to Cloughfield via an alley. The alley is adopted highway and provides a minimum width of 3m for a length of approximately 40m. The alley is lit.

15. Footpath 7-9-FP43 provides a link to and from the alley and then continues south towards the A582 Penwortham Way.

16. Within the site boundary, it is proposed to resurface the existing full length of footpath between the A582 Penwortham Way and the alley.

17. Adjacent to the improved length of footpath, it is proposed to provide a separate cycle path with reference to design guidance presented in LTN 1/20 providing a minimum width of 3.5m. The cycle path will be lit at regular intervals.

18. Improvements to 7-9-FP43 will facilitate links between the site and the alley to Cloughfield. If LCC's proposed dualling scheme for the A582 Penwortham Way is delivered, the improvement will provide a link to LCC's proposed foot/cycle path along the eastern side of the corridor.

Principal Route 3 to Kingsfold (via 7-9-FP42)

19. Footpath 7-9-FP42 provides a link from Bee Lane to the Kingsfold Community Centre Car Park (approximately 220m in length). It is currently unsurfaced with no lighting. It is used regularly for leisure trips. A wooden stile is positioned on the site boundary fence.

20. Within the site boundary, the proposal is to resurface a length of approximately 215m from Bee Lane to the site boundary. The resurfacing will provide a minimum width of 2m. Adjacent to the improved length of footpath, it is proposed to provide a separate cycle path with reference to design guidance presented in LTN 1/20 providing a minimum width of 3.5m. The cycle path will be lit at regular intervals.

21. Immediately north of the site boundary is a 5m length of verge which would require surfacing and removal of the stile to facilitate connections to Kingsfold. This land is owned by SRBC and is not within the control of the developer. The development makes the commitment via the S106 document to fund the improvement of this section of route as requested by LCC PRoW (see consultation response dated 29th October 2021).

22. The improvement delivers the route between Kingsfold and Bee Lane identified in the Penwortham Town Council Neighbourhood Plan (Policy 7).

Additional LCC PRoW Desirable Routes

23. LCC PRoW in their consultation response dated the 29th October 2021 has identified a number of additional desirable improvements to the PRoW network in the vicinity of the sites.

24. The development makes the commitment of £786,000 funding to improve the principal routes previously highlighted, but also the following routes through the PRoW Contribution outlined in the S106 document, as requested by LCC PRoW:

- Footpath 7-9-FP4 link retained and surfaced to a minimum 2m width with lighting;
- Footpath 7-9-FP54 link retained and surfaced to a minimum 2m width with lighting;
- Footpath 7-9-FP56 link retained and surfaced to a minimum 2m width with lighting; and
- Footpath 7-9-FP57 link retained and surfaced to a minimum 2m width with lighting.

25. The route improvements identified in this note relate to existing routes. In addition to the improvement of existing routes, the development will provide an interconnected network of residential roads within the site, of a suitable hierarchy for active travel acknowledging national design criteria.

Protecting the Existing Lanes

26. Local properties which require motor vehicle access via the existing lanes will retain access via the existing lanes.

27. No additional development motor vehicle traffic will be permitted to access the existing lanes with the exception of the small parcel to the north east adjacent to the Bee Lane bridge and the passage of public transport.

28. A bus gate at either Bee Lane or Lord's Lane will allow shared travel service priority, enhancing permeability with existing communities.

29. Within the site, there are three locations whereby the proposed new residential road network would be required to cross the existing lanes which provide vehicular access to local properties.

30. Where the new residential network is required to cross the existing lanes, careful consideration has been given to maintaining existing vehicular access whilst preventing development from accessing the existing lanes. This is achieved through physical infrastructure restricting turning movements to and from the lanes, whilst retaining ahead movements on the existing lanes (see **Figure 3** for an example).

Figure 3: Crossing Existing Lanes Example

Bee Lane and Flag Lane

31. The bridges over the West Coast Mainline Railway at Bee Lane and Flag Lane are adopted highway.

32. Improvements are proposed at the Bee Lane bridge for the benefit of active travel (see **Figure 4**). The option presented segregates the carriageway from the parapets and pedestrians, similar in character to the existing situation at the nearby Coote Lane bridge. A safety risk assessor has rated this option 'low risk' with the safety risk assessment label 'acceptable'.

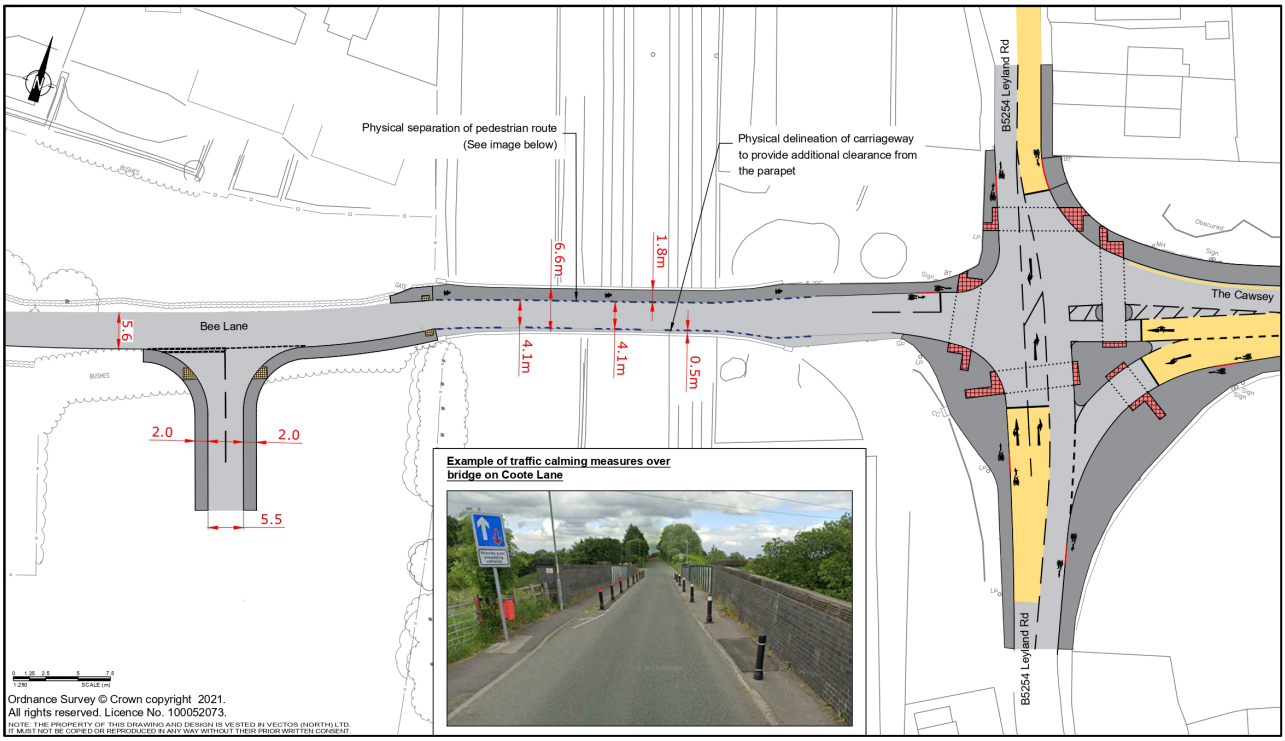

Figure 4: Bee Lane Bridge Improvement Option

33. Improvements are not proposed at the Flag Lane bridge.

Appendix MA-4

LCC and NH Comments Tracker

National Highways Comments (30/09/2021)	Vectos Response	Outstanding Action	Responsibility	Agreed/Resolved	WSP Commentry 10/03/22		Vectos Response July 2022
Recommend that PIC analysis is updated to include the M6/M65 interchange and the M6/A6/Church Road junction alongside the inclusion of a plan showing the location of any colliisions.			Vectos		Will be reviewed when additional infromation issued by Vectos	To be reviewed / agreed before full modelling review can be carried out	Accident data provided including location plan.
Local junction modelling is carried out for the proposed site accesses using industry standard software such as LinSig/Junctions 9 where appropriate.	Technical Note 03 includes individual junction modelling for the Site Access / A582 Penwortham Way; A582 Penwortham Way / Chain House Lane; and the A582 Penwortham Way / Pope Lane.	Needs reviewing by National Highways, but note that this is not part of the stratgic network	Vectos		WSP request that the model files be forwarded for completeness.		NH not in a position to provide a final view on the proposals. NH undertaking own analysis of traffic impacts on the SRN.
Further informaton is required on consultations with the local bus operators in regard to the public transport strategy for the site.	Discussions ongoing	Vectos to provide update.	Vectos		Will be reviewed when additional infromation issued by Vectos	To be reviewed / agreed before full modelling review can be carried out	Discussions progressing with two operators; Arriva Click and Stagecoach regarding shared travel opportunities
Request a high-level site plan for the development is provided for review in order for us to understand how the development traffic will distribute onto the network.	A high-level distribution drawing was provided to LCC, whoc then forwarded on to National Highways for information.	National Highways to review as part of overall modelling review.	Vectos		WSP understand that the Masterplan is currently being developed and have confirmed attendance at future meetings to discuss.	To be reviewed / agreed before full modelling review can be carried out	Masterplan documents submitted with the application.
Request that further information is provided regarding the assumptions made for the amount of internal trips and the proportions of trips to each school nearby.	Clarification to be provided with reference to letter provided to SRBC dated 12th November 2021	Vectos to circulate letter dated 12th with additional clarifications	Vectos		Further justification is required to underpin the assumption that 50% of all recreation and leisure trips will be made on site. Furthermore information is required to underpin the proportion of trips to each school nearby.	To be reviewed / agreed before full modelling review can be carried out	NH not in a position to provide a final view on the proposals. NH undertaking own analysis of traffic impacts on the SRN.
Recommended that more details on phasing and reasoning on late stage the school is opened is provided.	Phasing of the scheme has not been finialised at this stage of development.	Vectos to advise	Vectos		Will be reviewed when additional infromation issued by Vectos	To be reviewed / agreed before full modelling review can be carried out	Phasing details presented with the masterplan and being incorporated into s106/HoT
Recommended that the forecast two-way vehicular trips for this development in both the AM and PM peaks are compared to the approved development opposite the site (planning ref: 07/2020/00552/FUL). This exercise should be undertaken using the vehicle trips from the TRICS outputs for both the respective sites.	Technical Note 03 includes a sensitivity test which uplifts the trip generation presented witin the TA.	Needs reviewing by National Highways	National Highways/WSP		Noted. WSP will comment following a review of the trip rate sensitivty testing.	To be reviewed / agreed before full modelling review can be carried out	NH not in a position to provide a final view on the proposals. NH undertaking own analysis of traffic impacts on the SRN.
Further information is requested to justify the level of forecast non-car users expected to use the site.	Clarification to be provided with reference to letter provided to SRBC dated 12th November 2021	Vectos to circulate letter dated 12th with additional clarifications	Vectos		Will be reviewed when additional infromation issued by Vectos	To be reviewed / agreed before full modelling review can be carried out	NH not in a position to provide a final view on the proposals. NH undertaking own analysis of traffic impacts on the SRN.
Required to demonstrate that the April 2021 data is suitable as a baseline dataset. We have assessed the link counts on the end of the M65 and compared the modelled flows to the 2019 average.	Technical Note 03 provides a comparison between the 2018 survey data and the 2021 survey data.	Needs reviewing by National Highways	Vectos		WSP will review the supplied traffic data review, but note that no WebTris data has been provided as part of the Vectos information. WSP request that the raw traffic count data is supplied for the reviewing process.	To be reviewed / agreed before full modelling review can be carried out	NH not in a position to provide a final view on the proposals. NH undertaking own analysis of traffic impacts on the SRN.
Recommend that Vectos provide information on the data source for the SRN mainline traffic demands.	Additional information around this can be provided within the Model Development Report	Vectos to add to LMVR and re-issue as appropriate	Vectos		Will be reviewed when additional information issued by Vectos	To be reviewed / agreed before full modelling review can be carried out	Updated information provided in response to WSP Base Model audit (issued 25/05/22)
Need to view the base matrix development process in more detail to form a judgement on its suitability	Additional information on the base model has been provided to WSP to assist them in their review of the model.	WSP to review additional information provided	National Highways/WSP		WSP to complete traffic modelling review. We request that the model files (we do have base model files from November) and input and output spreadsheet are provided to support this process.		Updated information provided in response to WSP Base Model audit, along with offer to arrange a meeting to discuss this matrix development process in more detail
A full review on the suitability and application of the demand profiles will need to be carried out to judge the suitability of the model.	Additional information on the base model has been provided to WSP to assist them in their review of the model.	WSP to review additional information provided	National Highways/WSP		WSP to complete traffic modelling review. We request that the model files (we do have base model files from November) and input and output spreadsheet are provided to support this process.		Review undertaken by WSP as part of Base Model audit, with clarifications provided by Vectos in response as part of information package submitted following the model audit (issued 25/05/22)
Need to view the matrix and models assignment to comment fully on the suitability of the routeing around the SRN junctions.	Additional information on the base model has been provided to WSP to assist them in their review of the model.	WSP to review additional information provided	National Highways/WSP		WSP to complete traffic modelling review. We request that the model files (we do have base model files from November) and input and output spreadsheet are provided to support this process.		Updated information provided in response to WSP Base Model audit, along with offer to arrange a meeting to discuss this matrix development process in more detail
Further information is required about the TomTom data used to validate the model.	Additional information on the base model has been provided to WSP to assist them in their review of the model.	WSP to review additional information provided	National Highways/WSP		Noted. This will be included in the full model reviewing process.		Updated information provided on this matter in response to WSP Base Model audit (issued 25/05/22)
An independent model review on behalf of National Highways will be required to review the models coding around the SRN junctions. It is noted that the Systra review has already been carried out on behalf of the applicant and did not raise any concerns with the modelled data sources.	Additional information on the base model has been provided to WSP to assist them in their review of the model.	WSP to review additional information provided	National Highways/WSP		WSP to complete traffic modelling review. We request that the model files (we do have base model files from November) and input and output spreadsheet are provided to support this process.		Base model review completed by WSP with any comments addressed in the updated files issued by Vectos back to WSP (25/05/22)
Confirmation of the distributions used should be provided in more detail within the model reporting.	Additional information on the base model has been provided to WSP to assist them in their review of the model.	WSP to review additional information provided	National Highways/WSP		Noted. This will be included in the full model reviewing process.		Updated information provided in response to WSP Base Model audit (issued 25/05/22)
Further information is required to confirm if the occupied dwellings at the Gas Works and Croston Road, as of the date of the traffic surveys, have been accounted for in the process.	Additional information around this to be included within the Forecasting Report	Vectos	Vectos		Forecasting report has not been supplied to WSP.	To be reviewed / agreed before full modelling review can be carried out	Updated information provided in response to WSP Base Model audit (issued 25/05/22)
The Croston Road and Aston Way Test Track sites are outside of the modelled area and have been factored based on Travel to Work data from the 2011 census. This assumption will need to be reviewed for access to the SRN in mind.	Vectos await further comment from WSP on the suitability of this approach	WSP	National Highways/WSP		Noted. This will be included in the full model reviewing process.		No further comment received on this point as part of the latest review undertaken by WSP
The application of traffic growth will need to be reviewed in more detail. Whilst the committed development growth may exceed the projected South Ribble growth, in TEMPro, the external to external traffic growth should be reviewed against the forecast within NTM adjusted TEMPRo by road type and region. Following the review of the suitability of the base demands it might be that an uplift in base values will change this assumption.	Technical Note 03 includes a sensitivity test which considers a 20% uplift of the baseline traffic flows.	Needs reviewing by National Highways	National Highways/WSP		Noted. This will be included in the full model reviewing process.		Vectos have provided clarification on this in a note drafted in response to the intial WSP modelling review (issued 26/11/21). No further comments have been received on this query

The reporting does not discuss the application of growth for freight traffic. It would be expected that the model forecasts be reviewed against the freight forecast published by the DfT, the latest being RTF18.	Vectos have provided comment on this in the response to WSP model audit document	WSP to review additional information provided	National Highways/WSP		Noted. This will be included in the full model reviewing process.		Vectos have provided clarification on this in a note drafted in response to the intial WSP modelling review (issued 26/11/21). No further comments have been received on this query
The committed developments have been profiled based on the base model profiles for the adopted zones. Whilst this is a reasonable approach it will need to be reviewed in detail to judge suitability.	Additional information on the base model has been provided to WSP to assist them in their review of the model.	WSP to review additional information provided	National Highways/WSP		Noted. This will be included in the full model reviewing process.		Vectos have provided clarification on this in a note drafted in response to the intial WSP modelling review (issued 26/11/21). No further comments have been received on this query
Confirmation on the committed infrastructure included in the model should be provided, it is understood that the Cuerden development, as committed, includes network revisions. Confirmation on these revisions should be agreed with LCC as Highway Authority.	Additional information on the base model has been provided to WSP to assist them in their review of the model.	WSP to review additional information provided	National Highways/WSP		Noted. This will be included in the full model reviewing process.		No further comment received on this point as part of the latest review undertaken by WSP
Full model inputs and outputs, in spreadsheet form, should be supplied for interrogation. Along with the model files for a full review of the assessment work to be concluded.	Additional information on the base model has been provided to WSP to assist them in their review of the model.	WSP to review additional information provided	National Highways/WSP		WSP will review the modelled outputs once the base model and subsequently the forecasting modelling has been agreed		Provided as part of the submission of modelling files 08/04/22
This level of information provided for the impacts on the M6 and M65 mainline is not detailed enough to determine the impacts of the development proposals on the SRN. The tables should be expanded to include predicted flow changes by mainline link and slip roads. Further to this the predicted operation of the modelled SRN, and adjacent local road network, should be presented to demonstrate the predicted development impacts.	Vectos have provided comment on this in the response to WSP model audit document	WSP to review additional information provided	National Highways/WSP		Noted. This will be included in the full model reviewing process.		Vectos have provided a response on this point in a note drafted in response to the intial WSP modelling review (issued 26/11/21). No further comments have been received on this query
The reporting does not discuss the application of growth for freight traffic. It would be expected that the model forecasts be reviewed against the freight forecasts published by the Department for Transport, the latest being RTF18.			Vectos		Comment outstanding	To be reviewed / agreed before full modelling review can be carried out	Vectos have provided clarification on this in a note drafted in response to the intial WSP modelling review (issued 26/11/21). No further comments have been received on this query
Clarification of consultation carried out with SRBC and LCC sought regarding the proposed active travel route improvements			Vectos		Comment outstanding	To be reviewed / agreed before full modelling review can be carried out	Discussions with PRoW Officer to continue based in information presented in the TA and LCC PRoW consultation response.
It is not stated within the FTP what the 10% reduction is based on i.e. NTS levels shown in the TA or 10% below the levels stated in the baseline surveys. For clarity, any TP should contain details of what the 10% reduction is based upon.			Vectos		Comment outstanding		Framework TP at this stage. Targets to be set upon collection of baseline surveys and subject to a Mobility Monitor Manage strategy with Steering Group and Flexible Travel Fund.
LCC Comments (20/10/2021)	**Vectos Response**	**Outstanding Action**	**Responsibility**	**Agreed/Resolved**	**Agreed/Resolved**		**Vectos Response July 2022**
Masterplan - LCC Highways consider the masterlpan Principles and Mobility Strategy as presented does not demonstrate the delivery of the infrastructure necessary to support the scale of development proposed.		Awaiting comments on Masterplan	LCC				LCC undertaking separate analysis. Spreadsheet provided 22nd July.
Masterplan - The lack of masterplan and detail with the TA is a significant concern. If a Masterplan has been produced we would be more than happy to provide detailed statutory comments on that presented.	A masterplan was submitted with the planning application.	Awaiting comments on Masterplan	LCC				LCC undertaking separate analysis. Spreadsheet provided 22nd July.
Transport Assessment - The approach used in the TA is not agreed at this stage, as that presented is not an assessment of impact that can be scrutinised by all.	Further information regarding the modelling approach was provided in Technical Note 03, along with base model data and cover letter to SRBC dated 12th November.	LCC Review of submitted technical notes and modelling outputs required	LCC				LCC undertaking separate analysis. Spreadsheet provided 22nd July.
Vision and Validate' - the approach presented is aspirational. While LCC Highways support proposals that will deliver significant modal shift, these must be realisitic and deliver the necessary access to all modes of transport that will be required to support development proposals. Any vision must be evidence based.	Evidence base presented in cover letter to SRBC dated 12th November 2021.	Meeting with LCC beneficial to run through evidence base and seek agreement.	Vectos/LCC				LCC undertaking separate analysis. Spreadsheet provided 22nd July.
Not satisfied with the discounting as proposed against the private car. As a suggestion it would be more appropriated if these formed part of the travel plan targets.	Further information regarding the trip generation for the site was provided in Technical Note 03 with updated modelling completed with these uplifted flows.	LCC Review of submitted technical notes and modelling outputs	LCC				LCC undertaking separate analysis. Spreadsheet provided 22nd July.
The approach proposed whilst complex doesn't provide certainty and the consequences will likely result in greater impact and issues on the surrounding network in this case the A582	Further information regarding the trip generation for the site was provided in Technical Note 03 with updated modelling completed with these uplifted flows.	LCC Review of submitted technical notes and modelling outputs	LCC				LCC undertaking separate analysis. Spreadsheet provided 22nd July.
There are concerns with the approach for trip generation and that it underestimates the level of generation from the private car. These matter with a willing applicant could be overcome.	Further information regarding the trip generation for the site was provided in Technical Note 03 with updated modelling completed with these uplifted flows.	LCC Review of submitted technical notes and modelling outputs	LCC				LCC undertaking separate analysis. Spreadsheet provided 22nd July.
Whilst LCC appreciate and support impact per mode, in support they are looking into Vectos's trip rates by private car. However, this will take time, before LCC can conlude this.	Require further information from LCC regarding this point.	LCC to provide comments.	LCC				LCC undertaking separate analysis. Spreadsheet provided 22nd July.
With regard to Vectos's factoring not withstanding my concerns with car trip rates, if the original trip rates and were factored to represent the full development then compared to that produces additional trips.	No factoring has taken place as noted in cover letter to SRBC dated 12th November.	Vectos to provide furtehr clarity.	Vectos				LCC undertaking separate analysis. Spreadsheet provided 22nd July.
The collection and use of 2021 data is not acceptable, traffic levels are much lower than the historic. Data used in this assessment is not accepted and is a significant concern.	Further information regarding the validity of the 2021 survey flows was presented in Technical Note 03.	Needs reviewing by LCC.	LCC				LCC undertaking separate analysis. Spreadsheet provided 22nd July.
Microsimulation							
The use of microsimulation in isolation and as presented is not acceptable to LCC it does not identify the true impacts as highlights within the TA. Microsimulation models can be used to support the traditional approach of modelling individual junctions using traditional proprietry software. The modelling apprach unacceptable and a significant concerns.	Technical Note 03 includes individual junction modelling for the Site Access / A582 Penwortham Way; A582 Penwortham Way / Chain House Lane; and the A582 Penwortham Way / Pope Lane.	Needs reviewing by LCC.	LCC				LCC undertaking separate analysis. Spreadsheet provided 22nd July.

It is not clear what highway changes have been applied to the network of interest, when compared to the current layout.	Additional information around this can be provided within the Model Development Report	Vectos to add to LMVR and re-issue as appropriate	Vectos	Additional detail included in the updated LMVR circulated following the WSP audit (25/05/22). Also the Systra audit reviewed these parameters, and any comments addressed prior to the model runs for the Transport Assessment	LCC undertaking separate analysis. Spreadsheet provided 22nd July.
The modelled network excludes at least one key route in Kingsfold and other continuous highway links have been broken, this is a concern.	Additional information around this can be provided within the Model Development Report	Vectos to add to LMVR and re-issue as appropriate	Vectos	Additional detail provided around this issue in the latest LMVR issued 25/05/22	LCC undertaking separate analysis. Spreadsheet provided 22nd July.
It is a concern that standard parameters have been adjusted, LCC isn't sure in totality how many parameters have been change and to what effect this has had to model performance.	Additional information on the base model has been provided to assist them in their review of the model.	LCC to review additional information provided	LCC		LCC undertaking separate analysis. Spreadsheet provided 22nd July.
It is surprising and a concern that actual signal timings hav not been used in the base model, whether at signalised junctions or signalised roundabout.	Additional information on the base model has been provided to assist them in their review of the model.	LCC to review	LCC		LCC undertaking separate analysis. Spreadsheet provided 22nd July.
Notwithstanding these concerns, it is not possible to support a microsimulation model that LCC have not seen operate or have the opportunity to discuss the approch to develop the model. The printouts as presneted have limited use, in isolation. This is a significant concern.	Additional information on the base model has been provided to assist them in their review of the model.	LCC to review	LCC		LCC undertaking separate analysis. Spreadsheet provided 22nd July.
-					
Distribution of development traffic - no comment can be provided as I have concerns with the microsimulation model, however it is clear that 1060 units will exit onto the A582 and 40 exit onto Leyland Road.	Updated development distribution has been considered. Further updates to LCC can be provided.	Vectos to run model with alternative distribution or provide commentary as to why it would not result in any significant change	Vectos	A revised distribution test has been run and reported which showed no notable change in the modelled impacts compared with the original model outputs	LCC undertaking separate analysis. Spreadsheet provided 22nd July.
Traffic growth - no traffic growth has been included in the TA, with a reason being the % growth exceeds TEMPRO. No evidence is presented to support this assumption. However, the approach is not supported as it assumes there is no growth beyond the committed developments. The aproach adopted is not realistic or supported and a concern.	Further information is presented in Technical Note 03 which provides a sensitivity test with a 20% uplift in traffic flows. This review highlights that the mathematical results are not sensitive to quite large changes in demand flows in the order of 20%.	LCC to review additional information provided	LCC		LCC undertaking separate analysis. Spreadsheet provided 22nd July.
Modeling results - the modelling whilst flawed and results are not accepted to represent the network with development. It is noted that the models have not been verified by LCC or HE.	Additional information on the base model has been provided to LCC to assist them in their review of the model.	LCC to review additional information provided	LCC		LCC undertaking separate analysis. Spreadsheet provided 22nd July.
Bee Lane Access - Notwithstanding the additional vehicles and the increase in sustinable users the proposed of no change is not acceptable to the highway authority. In addition, the existing roundabout does not include suitable provision to satisfy future demand nor does the junction support that required for additional vehilces when design standards are considered.	Technical Note 04 provides a review of the access proposals along Bee Lane including proposed changes to the existing roundabout.	LCC to review additional information provided	LCC		Comments provided by LCC confirming original position on Bee Lane infrastructure. LCC undertaking separate analysis. Spreadsheet provided 22nd July.

Appendix MA-5

Traffic Modelling Correspondence

National Highways

PICKERINGS FARM

Base Model Review

NW 010
APRIL 2022

CONFIDENTIAL

National Highways

PICKERINGS FARM

Base Model Review

TYPE OF DOCUMENT (VERSION) CONFIDENTIAL

PROJECT NO. 70095637

OUR REF. NO. NW 010

DATE: APRIL 2022

WSP

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WSP.com

QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Remarks	Model Review	NH Comments	LCC Comments	
Date	29/04/2022	06/05/2022	12/05/2022	
Prepared by	MG	MG	MG	
Signature				
Checked by	ER	ER	ER	
Signature				
Authorised by	PW	PW	PW	
Signature				
Project number	70095637	70095637	70095637	
Report number	NW 010 v1	NW 010 v2	NW 010 v3	
File reference				

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INTRODUCTION

1 INTRODUCTION

1.1 PREAMBLE

1.1.1. National Highways have been appointed by the Secretary of State for Transport as a strategic highway company under the provisions of the Infrastructure Act 2015. National Highways are responsible for operating, maintaining and improving the Strategic Road Network (SRN) in England, in accordance with the Licence issued by the Secretary of State for Transport (April 2015) and Government policies and objectives.

1.1.2. The National Highways approach to engaging with the planning system is governed by the advice and guidance set out in:

1.1.3. **The Strategic Road Network Planning for the Future** – A guide to working with Highways England (the former name of National Highways) on planning matters (2015).

1.1.4. The document is written in the context of statutory responsibilities as set out in National Highway's Licence, and in the light of Government policy and regulation, including the:

- National Planning Policy Framework (NPPF);
- Town and Country Planning Development Management (Procedure) Order (England) 2015 (DMPO); and
- DfT Circular 02/2013 The Strategic Road Network and the delivery of sustainable development ('the Circular').

1.1.5. As a statutory consultee in the planning system, National Highways has a regulatory duty to co-operate. Consequently, National Highways are obliged to give consideration to all proposals received and to provide **appropriate, timely and substantive** responses.

1.1.6. National Highway's desire to be a proactive planning partner goes beyond this statutory role, but follows the spirit of the Licence which stipulates that National Highways should: "Support local and national economic growth and regeneration"

1.2 DEVELOPMENT OVERVIEW

1.2.1. Taylor Wimpey and Homes England are appealing their application for an outline planning application, with all matters reserved, except for the principal means of access, which was rejected at South Ribble Borough Council (SRBC) planning committee in November 2021. The proposed development is a residential-led mixed-use development in Penwortham, Lancashire. The proposed development is located on land to the east of Penwortham Way and part of a wider SRBC site allocation designated within the South Ribble Local Plan known locally as Pickering's Farm.

1.2.2. Vectos, the appointed transport consultants for the scheme, have completed transport evidence in support of the planning application in the form of a Transport Assessment (TA) and Framework Travel Plan (FTP). The TA includes a highway appraisal using a wide area Paramics Discovery model. National Highways has been consulted by SRBC and have subsequently commissioned WSP to review the transport submission for the development to ensure an appropriate assessment of the development traffic impacts of the SRN is undertaken with particular attention to the M6/M65 interchange and the M6/A6/Church Road junction.

1.2.3. National Highways provided comments on the TA and Travel Plan prior to the planning committee meeting but had not reached agreement on the suitability of the evidence provided. Vectos have provided some commentary on a number of outstanding concerns with the transport evidence following the November committee meeting, including some commentary on traffic modelling methods.

1.3 BACKGROUND

1.3.1. No pre-application scoping discussions were held between the transport consultants and National Highways prior to the submission of the planning application (Planning Reference: 07/2021/00887/FUL), although it should be noted that National Highways were consulted as part of consultation held for a previous application for the site (Planning Reference: 07/2020/00014/FUL).

1.3.2. A timeframe of the consultation held between Vectos (the applicants transport consultants), National Highways and WSP is shown below:

- 11th August 2021: TA submitted by Vectos (Planning Reference: 07/2021/00887/FUL)
- 10th September 2021: National Highways consulted on the planning application by SRBC;
- 28th September 2021: TA review issued by WSP
- 26th November 2021: WSP issued a Comments Tracker (File Name: 21.11.25 Comments Tracker) Recommending National Highways Implement a Holding Recommendation
- 29th November 2021: SRBC Planning Committee – Application Refused
- 24th January 2022: Updated Tracker (File Name: National Highways Comments Tracker 24.01.2022) Issued by Vectos
- 2nd March 2022: Meeting held between Vectos, National Highways and Lancashire County Council (LCC)
- 8th March 2022: WSP issued a revised Comments Tracker (File Name: LCC and NH Comment Tracker 02.03.22 (WSP Updated 100322)) providing further commentary.
- 24th March 2022: Appeal Submitted by the Applicant (Appeal Reference: APP/F2360/W/22/3295502)
- 23rd August 2022 Planning Inquiry Opening Date (scheduled to last four weeks)

1.3.3. This report looks to address the comments raised in the revised Comments Tracker (File Name: LCC and NH Comment Tracker 02.03.22 (WSP Updated 100322)) in particular the following comments:

- Recommend that Vectos provide information on the data source for the SRN mainline traffic demands.
- Need to view the base matrix development process in more detail to form a judgement on its suitability
- A full review on the suitability and application of the demand profiles will need to be carried out to judge the suitability of the model.
- Need to view the matrix and models assignment to comment fully on the suitability of the routeing around the SRN junctions.
- Further information is required about the TomTom data used to validate the model.
- An independent model review on behalf of National Highways will be required to review the models coding around the SRN junctions. It is noted that the Systra review has already been carried out on behalf of the applicant and did not raise any concerns with the modelled data sources.

1.4 THIS REPORT

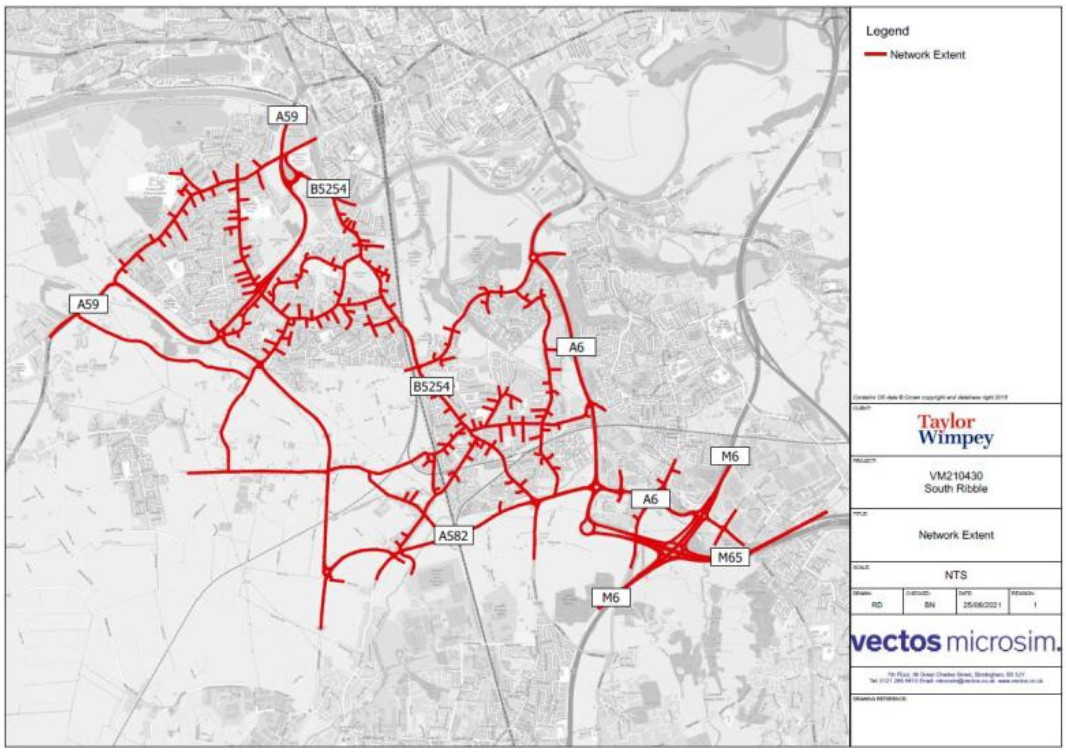
1.4.1. This report has been prepared to detail a review of the base year Paramics model developed as part of the evidence base only. This report does not provide any commentary on the traffic forecasting completed as part of the Vectos TA works, a view on the forecast can only be supplied once the base model is agreed to be a suitable base. The following information has been provided to WSP by Vectos to assist with the base model review:

- VM210430.M001. 2021 South Ribble Base Model – The base model files;
- VM210430.R002 LMVR ISSUE – The Local Model Validation Report (LMVR) for the supplied model;
- VM210430.Sp004 Calibration and Validation_ISSUE – Spreadsheet containing the model outputs for the base model including flow calibration and journey time validation;
- VN211918 TN03 Traffic and Modelling Review – Commentary from Vectos on various concerns raised over the transport evidence by LCC and National Highways. This review will only comment on those issues pertinent to the base Paramics model development.

1.4.2. The model has been developed to represent a 2021 base year in Paramics Discovery, with the purpose of the model being to support the assessment of highway network operation following the inclusion of the proposed 'The Lanes, Penwortham' residential led development adjacent to the A582 Penwortham Way.

1.4.3. The study area for the model includes Lower Penwortham and the Lostock Hall area, to the south of Penwortham. The network extent captures the A59, A582, A6, B5254 Leyland Road and M6 junction 29, in addition to local arterial routes identified within the study area. The model extents are shown in Figure 1.

Figure 1 – Model Extents



1.4.4. WSP has requested signal specifications from LCC and National Highways to undertake the review, with signal specifications provided for the following locations:

- M65 / M6 junction 29;
- A6 / Wigan Road;
- A6 / Cuerden Way / Craven Drive;
- A6 / A582 / M65;
- A582 / B5254 Watkin Lane / Stanifield Lane;
- Watkins Lane pedestrian crossing, next to the Co-op;
- Watkin Lane / Jubilee Road;
- Watkin Lane / Brownedge Road / Coote Lane;
- Brownedge Road / Todd Lane North
- A582 / B5253 (Tank roundabout);
- A582 / Chain House Lane;
- A582 / Pope Lane;
- A582 / John Horrocks Way;
- Cop Lane / A582 / Millbrook Way;
- Liverpool Road / Penwortham Tesco;
- Liverpool Road / Cop Lane;
- A59 Pedestrian crossing at Crookings Lane;
- A59 Pedestrian crossing at Central Drive;
- A59 / John Horrocks Way;
- Leyland Road Pedestrian crossing at Stricklands Lane;
- Leyland Road Pedestrian crossing at Brydeck Avenue;
- Leyland Road Pedestrian crossing at Pembury Avenue; and
- The Cawsey / Firs Drive.

1.4.5. Signal information has not been received for the following locations:

- A59 / Golden Way;
- A59 / Liverpool Road;
- A59 Pedestrian crossing at Queensway;

1.4.6. The focus of the review for National Highways is the SRN, however a full review has been undertaken of the model and the LMVR. As a result, this report has been split into the following subsections:

- **Chapter 2: LMVR Review** – A review of the provided LMVR
- **Chapter 3: Strategic Road Network Review** – A review of model coding and calibration/validation at the SRN junctions/mainline
- **Chapter 4: Full Model Review** – A review of the model coding throughout the rest of the network
- **Chapter 5: Summary & Conclusions** – A summary of the findings of the review and suggestions of next steps.

1.4.7. A supplementary spreadsheet named ‘Base Review Comment Log’ has been provided with the report to provide additional detail relating to the comments in the report.

2

LMVR REVIEW

2 LMVR REVIEW

2.1.1. WSP has undertaken a review of the provided LMVR, with comments provided in the following subsections.

2.2 OBSERVED DATA

MODEL CALIBRATION DATA

2.2.1. Traffic data was collected by Nationwide Data Collection (NDC) in April 2021 in support of the study. Vectos note in their LMVR that WebTRIS data was used from April 2021 for the M6 and M65 mainline, in response to the query from WSP regarding the source of the SRN mainline demands.

2.2.2. National Highways previously raised a concern of using April 2021 data being suitable as a baseline dataset as a result of certain coronavirus restrictions still being in place at this time. Whilst there are concerns regarding when the surveys were undertaken, the locations of the surveys appear reasonable to cover the main junctions within the study area.

2.2.3. Vectos has produced a technical note (TN03) to provide a comparison between 2018 and 2021 data, with a comparison of Manual Classified Count (MCC) traffic flows provided. It is noted that this table was provided using Passenger Car Units (PCUs), and therefore the percentage comparison presented may differ if the numbers were converted to vehicles and indeed to be disaggregated by vehicle type (albeit would still show a positive/negative as in the table). Following the provision of this information WSP have the following comments:

- The data has been provided as junction totals. A full by turn comparison is required to form a considered view of the changes between the data.
- It is noted that Vectos provide sensitivity model assignments with a blanket increase in demand of 20%, which are reported in increasing the base modelled delay by ~14% in the morning peak and ~20% in the evening peak. It is not clear what conclusions can be drawn from this presented information.
- There are infrastructure changes, the opening of the Cawsey Link Road and the Penwortham Bypass, to the network since 2018 which have had an impact on traffic routeing, and total junction throughputs between 2018 and 2021. It is therefore not possible to form a direct view on demand differences at all of the locations within the supplied data comparison.

2.2.4. Based on the information provided it is not possible to state that the April 2021 counts are suitable for development of an appraisal tool. The counts were conducted when coronavirus restrictions were in place and irrespective of their total values can not been deemed a reliable source of baseline traffic data. On this basis we would request that either strong further evidence is provided that the April 2021 counts are representative or that the modelling work is revisited with an alternative data source.

MODEL VALIDATION DATA

2.2.5. The LMVR states that observed journey times were extracted from the Streetwise TomTom dataset for a selection of key corridors across the study area. However, no information has been provided regarding the dates and times that the journey time data has been collected for, and therefore this information is requested.

2.2.6. The journey time routes (as shown in Figure 3 of the LMVR) appear reasonable to be used to validate the journey times within the model. Each of the journey time routes are split into subsections, which appears reasonable. It is noted that the subsections of these journey time routes sometimes pass through several junctions, and therefore clarification is sought over any potential discrepancy between what the model may be capturing and the data that the TomTom data may include. For example, for Route 6, Section 2, the route goes through several minor junctions. Within the model, vehicles entering the network from the minor arms of these junctions are not being picked up within the journey time analysis. Therefore, if the TomTom data is based upon individual link information rather than a full route, there may be discrepancies.

2.2.7. Paragraph 3.7 of the LMVR states that "it was determined that the M65/M6 junction should also be included to enable an assessment of any potential impact on the Strategic Road Network close to the development area." However, there has been no validation undertaken within this area and therefore is it unclear how the model will be used to assess the impact on the Strategic Road Network, and therefore this requires clarification.

2.3 BASE MODEL DEVELOPMENT

TIME PERIODS

2.3.1. The time periods used within the model appear reasonable. Clarification is sought over how the morning and evening peak hours used for assessment (0800-0900 and 1700-1800) were identified. We note that the previous application for this development location identified peak hours of 0800-0900 and 1630-1730, which were agreed with the local highway authority. It is recommended that the assessment periods are agreed prior to completing any further modelling work.

NETWORK EXTENT

2.3.2. The network extent of the model appears reasonable, covering the key junctions around the development site, in addition to the wider network including the M65/M6 junction.

VEHICLE TYPES

2.3.3. The methodology used to calculate the vehicle type proportions appears reasonable, with the presented values reflected within the modelling.

FAMILIARITY AND PERTURBATION

2.3.4. The familiarity and perturbation values specified within the LMVR appear reasonable and have been reflected within the modelling.

LINK TYPE

2.3.5. Figure 5 of the LMVR shows that the M6/M65 has the 'Highway' Link Type, which is reasonable given the nature of these roads. However, in the model these links have been coded as an 'Urban' Link Type. Clarification is sought regarding why the model has been coded with an 'Urban' Link type, and the contradiction with the LMVR.

LINK CLASSIFICATION

2.3.6. The classification of the major and minor links as shown in Figure 6 of the LMVR appears reasonable and have been applied to the model accordingly.

LINK CATEGORIES/SPEED LIMITS

2.3.7. The link categories shown in Figure 7 of the LMVR generally appear to be reasonable. However, further information is requested regarding the methodology used to take the TomTom data and apply free flow speeds to the network, including a map showing the differences in the modelled and on-street speed limits. This approach should be used with caution, as the model should be attempting to replicate delays from geometry, priorities, congestion in the network and signals. If the speed is manually reduced, the model may not be appropriately replicating conditions in these areas of the network, and such limitations should be noted within the LMVR.

2.3.8. Where possible, the model should try to replicate delays/areas where there is slow moving traffic without manually adjusting the speed. An example is Brownedge Road which is coded as 20mph rather than the on-street speed limit of 30mph. Along Brownedge Road there are three zebra crossings and speed humps which are likely to impact speed, and therefore it is recommended that these elements be included within the modelling rather than manually reducing the speed.

2.3.9. As mentioned, additional information is requested regarding the methodology and data used to determine these speeds, to allow the appropriateness of these manual changes to be determined. It is noted that there is a reduction between the A6/Brownedge Road and the A6/A582 from 60mph (speed limit) to 40mph (modelled) which is a substantial difference, and therefore we request the information to provide clarity on this, and other speed changes in the model.

2.3.10. There are some discrepancies between the speed limits in the LMVR and the modelled speed limits. For example, on Flensburg Way between the Flensburg Way/Penwortham Way roundabout (to the west) and the A583/Croston Road double roundabout (to the east), the model is coded as 60mph, but the figures suggest that a 30mph speed limit has been applied.

PUBLIC TRANSPORT

2.3.11. The LMVR states that a total of 40 routes have been defined within the model, which appears reasonable for a model of this geographical scope. Paragraph 3.33 states that a dwell time at bus stops has been set at 15 seconds. The model has a minimum dwell time of 10 seconds and a maximum dwell time of 15 seconds; therefore, it is recommended that the wording is updated within the LMVR. The local highway authority has provided WSP with advice that morning peak bus stop dwell times can be up to 30 seconds. We recommend that prior to any further modelling that Vectos agree bus dwell times with Lancashire County Council prior to proceeding.

SIGNPOSTING

2.3.12. A review of the signposting within the model has been undertaken in the Model Review sections of this report.

ZONE SYSTEM

2.3.13. The zone system and methodology of applying demand to zones generally appears reasonable.

ZONE PORTALS

2.3.14. In the absence of data from every junction within the network, the methodology of using land spread information to determine the percentage applied to each entry zone appears reasonable.

SIGNALS

2.3.15. The LMVR does not provide any information regarding the data/methodology used to code the signalised junctions/pedestrian crossings into the model. WSP request that this information is provided.

2.4 MATRIX DEVELOPMENT

2.4.1. As part of the initial comments provided by WSP to Vectos, WSP requested to view the base matrix development process in more detail to form a judgement on its suitability. Vectos responded stating that they would provide the relevant files for review, however these have not been supplied. WSP require the spreadsheets summarising the matrix build process to undertake this review.

2.4.2. Google journey route data has been used in the matrix development process to assign the 2011 Census data to the network, it is not clear when Google routeing data was obtained and it may not be reflective of typical peak conditions, furthermore it would be expected that the routeing choices might be different by time period, it is not clear if this has been completed. The matrix development process outlined in the modelling report does not appear to consider none work based trips, the model covers a large area with several supermarkets, large retail stores and schools. Information is requested regarding the dates and times the Google routeing data was used for, in addition to further information regarding the number of Google routes used (i.e. was it just the quickest route used).

2.5 NETWORK CALIBRATION

VISIBILITY

2.5.1. The visibility applied in the model has been set at either 0m or 30m, and further calibration does not appear to have been undertaken at locations where visibility may fall in between the two values. Guidance on the Paramics Microsimulation support portal ('Set Visibility on approach to junctions') states that "*A standard value of 30m is generally a good starting point for visibility and this can be refined in specific locations is necessary*". WSP suggest that consideration is made regarding the calibration of visibility values used in the model, to determine the appropriateness of using a 0m visibility or a 30m visibility with nothing in between.

GAP ACCEPTANCE

2.5.2. Gap acceptance changes are generally acceptable in the model, where observed behaviour is attempting to be replicated, however it is noted that there are some inconsistencies between the gap acceptance in the model and in the LMVR which should be rectified. A review of priority coding has been undertaken as part of the model review and does note some specific concerns where gap acceptance values have been edited from the default values.

HEADWAY

2.5.3. Headway factors have been included on different links within the network. The LMVR states that a headway factor of 1.5 has been applied along the A59 (approximately 2.25km in length) as "*this section of the network that accesses Central Preston is known to experience queueing on a regular basis alongside a number of interactions with side roads and large speed differentials meaning that vehicles are inclined to leave slightly larger gaps within this area*". WSP require clarification over the appropriateness of using a headway factor along the full corridor, and request evidence regarding

the congestion relating to the queueing on this corridor (perhaps by comparing free flow speeds to peak speeds along this corridor to understand where there is congestion). Observations of the model running do not suggest congestion issues at this location.

2.5.4. A headway factor of 1.75 has been coded along the full B5254 corridor (over 4km in length), with the LMVR stating "*the B5254 is understood to be relatively busy being a key access between Lower Penwortham and Lostock Hall*" and it has been applied to reflect on-street behaviour. WSP require clarification over the appropriateness of using a headway factor for the full corridor, and request evidence to support the use of headway factor across the corridor. The road goes through several different areas, with different vehicle behaviours likely to occur along the corridor. We note that part of this section, to the north of The Cawsey roundabout has reported on street parking delays which are not reflected within the model.

2.5.5. The LMVR does not provide justification for the 0.2 headway factor applied at the A582/Croston Road roundabout, and therefore this is requested.

LOOK THROUGH

2.5.6. WSP acknowledge that methodology of using look throughs at locations with short adjacent links as reasonable, although the use of less than 25m should be reviewed on a case-by-case basis depending on the vehicle behaviour at this location (i.e. there may be adjacent links greater than 25m which may require a look through applied based on higher vehicle speeds).

GIVE WAY TO ONCOMING TRAFFIC

2.5.7. The methodology of using the give way to oncoming traffic feature appears reasonable where there are directional priorities along a road, with the suitability of the coding commented on in the model review section of this report.

CLEAR EXIT ADHERENCE

2.5.8. The clear exit adherence parameter is used to let opposing vehicles out of a road when traffic is in a slow moving or queued state. This may also act to replicate yellow box behaviour. The LMVR states three locations where clear exit adherence has been applied (Figure 19) but the model only has two. It is recommended that this is rectified within the LMVR.

COST FACTORS

2.5.9. WSP acknowledge that in a model with route choice, cost factors can be used to influence route choice, with justification as is provided in the Vectos LMVR. It is noted that there is a discrepancy between the LMVR on the M65 westbound which suggests a cost factor of 0.8 has been applied but the model has a cost factor of 1. It is recommended that this is rectified within the LMVR.

VEHICLE RELEASE PROFILES

2.5.10. The LMVR states that wherever possible the profiles within the model have been derived directly from count data, with this approach being reliant on data sites being in close proximity to the zones and the data being disaggregated into, at least, 15 minute profiles. The model only has 11 profiles for light vehicles and 11 profiles for heavy vehicles, which is coarse given the extents of the model and the number of zones. More information is requested regarding the calculation of the profiles, including which count sites have been used to determine the profiles for which zones, in addition to the data from the counts sites which have been used (i.e. approach link, total junction flow, flow by

turn). WSP request that information is provided to show that the profiling at the SRN junctions (and SRN mainline) is appropriate compared to the observed data.

2.6 FLOW CALIBRATION

THE GEH STATISTICS

2.6.1. The GEH statistic has been used to assess the flow calibration of the model, which WSP welcome as an acceptable methodology. Paragraph 6.5 of the LMVR states that 10 morning peak and evening peak runs have been undertaken, with Figures 21/22 showing the variance in the number of vehicles in the model network in each individual run by time period. WSP request evidence of whether 10 runs are sufficient given the extents of the model and the potential route choice within the model, or whether further runs are required. Within the morning peak figure (Figure 21), there are some larger differences between the number of vehicles in the model. For example, between Run 1 and Run 10 at approximately 08:45, with there being approximately 2,600 vehicles in the network in Run 1 and 2,900 vehicles in the network in Run 10. In the evening peak, there are also some of these larger differences, for example between Run 1 and Run 7, with approximately 200-400 more vehicles in the network in Run 7 between 16:45 and 17:45. A review of model stability using journey times or vehicle delays opposed to total demand is requested.

TAG CRITERIA

2.6.2. WSP acknowledge the use of TAG criteria for undertaking the calibration/validation of the model. WSP note that for the modelled journey times, the criteria states that routes should be over 3km in length. Whilst not explicitly stated within the criteria, routes shorter than 3km should use the one-minute rule with caution, and models should aim to be closer to the 15% where possible.

TURN AND LINK CALIBRATION

2.6.3. The calibration of the morning and peak hours of 08:00-09:00 and 17:00-18:00 appears reasonable given the size of the model being calibrated, noting our wider concerns over the use of April 2021 calibration data. A review of the SRN calibration has been undertaken in the following section of this review.

2.7 VALIDATION

2.7.1. The journey time routes for the morning and evening peaks generally fall within 15%, with 12/14 (86%) and 14/14 (100%) falling within 15% in the morning and the evening peak respectively, meeting the criteria of more than 85% of routes falling within 15%.

2.7.2. With the disaggregation of the journey time routes into sections, 20/26 (77%) and 19/26 (73%) fall within 15% in the morning and evening peak hour respectively. The sections which do not fall within 15% include the following:

- Morning Peak
  - Route 1 Section 2 SB- 27s (17%) too slow in the model
  - Route 1 Section 2 NB- 23s (22%) too quick in the model
  - Route 2 Section 1 EB- 39s (16%) too slow in the model
  - Route 5 Section 2 SB- 44s (16%) too slow in the model
  - Route 7 EB- 26s (31%) too slow in the model
  - Route 7 WB- 15s (19%) too quick in the model

- Evening Peak
  - Route 1 Section 2 SB- 31s (20%) too slow in the model
  - Route 1 Section 3 NB- 28s (25%) too quick in the model
  - Route 2 Section 2 WB- 52s (18%) too slow in the model
  - Route 3 Section 1 NB- 17s (19%) too quick in the model
  - Route 3 Section 2 SB- 12s (17%) too quick in the model
  - Route 4 Section 1 SB- 106s (40%) too slow in the model
  - Route 4 Section 2 SB- 58s (23%) too quick in the model

2.7.3. All of the above journey time sections are classified as passing, with the exception of Route 4 Section 1 SB, as a result of these sections being within 1 minute. As mentioned, use of the 60 second rule should be used with caution for shorter routes, and therefore the section validation should be reviewed to improve the journey time closer to 15% where possible.

2.7.4. It is noted that Route 4 southbound meets criteria across the full route in the evening peak, however when looking at the sections separately, Section 1 is 106 seconds too slow and Section 2 is 58 seconds too quick. The discrepancies in the comparison between the modelled and observed journey time suggests the model may not be replicating the operation of the network within the individual subsections and therefore this should be revised.

2.7.5. There are sections which are consistently too slow or too quick in the model in both the morning and evening peak hour by over 15%, suggesting that the operation within the model may not be replicating the observed operation, including:

- Route 1 Section 2 SB (too slow in the model)
- Route 1 Section 3 NB (too quick in the model).

2.7.6. Other sections which are outside the 15% criteria in one time period and not the other, but are consistently too quick or too slow include:

- Route 2 Section 2 WB (too slow in the model)
- Route 3 Section 1 NB (too quick in the model)
- Route 7 WB (too quick in the model)

2.7.7. Sections which are consistently too quick or too slow across time periods suggests that the model may not be replicated observed behaviour in these locations. It is requested that a review of the journey time validation is undertaken, in line with the comments made as part of this review relating to the LMVR and model coding.

2.7.8. Upon review of the subsections in Appendix C, it is noted that the percentage differences and actual differences use opposite signs for if a difference is positive or negative. It is recommended that the LMVR is updated so the differences are consistent to avoid confusion.

3

STRATEGIC ROAD NETWORK REVIEW

3 STRATEGIC ROAD NETWORK REVIEW

3.1.1. This section of the report is split into two subsections:

1) A review of the model coding of the junctions which form part of the SRN, or are adjacent to, and of the modelled motorway mainline sections.

2) A review of the calibration/validation of the SRN junctions/motorway mainline.

3.2 SRN MODEL REVIEW

3.2.1. This subsection details review findings into the model coding of the junctions which form part of the SRN, and of the modelled motorway mainline sections. Namely:

- The M6 mainline (between the south of the M6 junction 29 and north of the M6/A6/Church Road) and the M65 mainline (between the east and west of junction 1);
- M6/A6/Church Road; and
- M6 junction 29/M65 junction 1.

3.2.2. It is noted that the A6/A582 has an arm from the M65. Comments for this junction are provided in the Full Model Review section. The model coding review has been supplemented with model observations undertaken for the morning and evening peak periods only.

3.2.3. We note that paragraph 3.7 of the LMVR it is stated that “it was determined that the M65/M6 junction should also be included to enable an assessment of any potential impact on the Strategic Road Network close to the development area.” Consequently, the model will be required to be of a sufficient detail and accuracy in this location.

3.2.4. The model review has been developed to provide a table of comments by comment type. A yellow, amber, red system has been used to categorise the comments by severity:

- Yellow- Minor Change
- Amber- Narrative required/review required within the model
- Red- Requires action.

M6 JUNCTION 29/M65 JUNCTION 1

3.2.5. The following comments are made regarding the M6 junction 29/M65 junction 1:

Table 1 – M6 Junction 29/M65 Junction 1 Comments

Coding Element	Comment	Severity
Overlay	The majority of links are coded in appropriate positions relative to the overlay, however there are locations where the links cross the kerb/island lines on the overlay including: • Link 108:1088 • Link 6:19 • Link 3:17 • Link 1080:1081	

Link Coding	The coding of how the free-flow left turn lanes develop has not been replicated in the model, with the model allowing vehicles to turn into this lane at the approximate location of the island. The lanes should widen to three lanes in advance of the free-flow left turn, which would allow this traffic to bypass queues from the circulatory.	
Link Coding	The model does not appear to consistently consider the actual length of links as shown in satellite imagery, and generally appears to be underestimating certain link lengths within the model. The overlay does not include lane markings/hatching, and the model generally has not taken these into account, instead coding based on the island/kerb locations. Examples include: • M65 eastbound off-slip (Link 64:18) - Two lane section in model is too short. • M65 westbound on-slip (Link 17:63) - Two lane section in model is too short. • M6 southbound on-slip (Link 23:1080) - Two lane section in model is too short. • M65 westbound off-slip (Link 65:22) - Two lane section in model is too short. • M6 southbound merge (Link 1081:1082) – Two lane section in model is too short.	
Link Coding-Diverges	The link coding of the M65 westbound diverge/off-slip and M6 northbound diverge/off-slip does not reflect satellite imagery. The model has the M65 westbound diverging just to the west of the A6 bridge (node 79), with vehicles unable to use the diverge after this point. In reality, vehicles can continue to move into the diverging lane up until the nose of the diverge (approx. 260m west of the bridge). The model has the M6 northbound off-slip diverging at node 46, with vehicles unable to use the diverge after this point. In reality, vehicles could still use the diverge up until the nose of the diverge.	
Link Coding-Merge	The southbound merge onto the M6 does not reflect satellite imagery. The model has a merging link of approximately 60m (1081:1082), however the merge in reality is upward of 150m.	
Link Coding-Merge	The M65 eastbound on-slip coding in the model does not reflect satellite imagery. • The distance of the three-lane link from the nose of the free-flow lane to the solid white line at the first merge point (Link 21:108) is longer in the model than satellite imagery • The first merge point has a distance of approximately 140m from the solid white line to the merge onto the M65, which the model does not replicate with Link 108:1088 having a length of 78m • The first merge onto the M65 (Link 1088:73) has a link length of 125m, compared to the measure length of less than 85m. It is acknowledged that the stopline positions have been changed in an attempt to reflect this, but model observations show vehicles using more than the available space to change lanes, potentially overestimating the capacity of this merge point.	

	• The two-lane section after the first merge point (Link 108:110) is coded as only 113m, however measurements suggest that the length is upwards of 240m • The length of the two links from the first merge to the lane gain (Link 108:110 and 110:111) is approximately 250m, whilst it should measure approximately 390m	
Roundabout Lanes	Lane markings indicate that two lanes can be used to undertake the movement from the M6 northbound off-slip to the M65 eastbound exit. The model has only been coded as one lane until after the eastbound approach (Link 5:6), where vehicles are allowed to use both lanes.	
Signal Coding	The signals at the eastbound approach/corresponding circulatory are coded as always being on green and without any give-way coding.	
Signal Coding	The intergreen values within the model have not explicitly been modelled. However, the model is coded with 5 seconds of all red between each stage, effectively implementing a 10 second intergreen between each stage. The signal specification suggests that the intergreen should be 5 seconds, meaning the model has 10 seconds of lost green time every cycle. This will only impact upon the model operation if the above comment is fixed.	
Look Through	No look through coding has been applied to the relevant circulatory links at the priority approaches to the roundabout, leading to some vehicle collisions (Links 16:2, 8:9 and 12:13).	
Gap Acceptance/Look Through	The Link 20:9 (southbound approach) has been coded with a lower gap acceptance than the default values. In combination with the no look through coding on Link 8:9, vehicles on this approach don't always appropriately give way and collide with the circulatory traffic.	
Headway Factors	Low headway factors of 0.4 have been applied on the M6 southbound on-slip and M65 southbound on-slip. The use of these low headway factors should be reviewed in line with the comments made regarding the coding of the slip roads.	
Signpost Distance	A signpost distance of 100m has been applied to Node 63, potentially allowing vehicles merging from Link 44:17 to move across to the right lane before having to move across to the left upon reaching the 100m distance. Signage shows that vehicles are told in advance of the merge point with the roundabout traffic that the two lanes will be reducing to one downstream.	
Visibility	Visibility values have been applied as 30m on all priority approaches with no calibration or consideration of visibility obstacles, meaning that the visibility may be overestimated on certain approaches.	
Model Observations	At node 23 vehicles from the free flow left turn are frequently observed to flow directly into the right lane on Link 23:1080, conflicting/colliding with traffic entering this link from the circulatory.	
Model Observations	At the southbound on-slip merge (Link 1081:1082), the lane changing of vehicles is causing collisions. This may be remedied by reviewing the coding of the on-slip and considering the use of ramp coding.	

Model Observations	Vehicles in the middle lane on Link 66:67 are moving into the right lane on Link 67:68 at node 67 instead of continuing in the same lane. These vehicles are observed to undertake this movement even if there is a vehicle in the right lane.	
Model Observations	Vehicles entering the M65 eastbound on-slip (Link 21:108) from the free-flow left turn immediately flow into the outside lane on Link 21:108, conflicting with other traffic exiting the roundabout. It would be expected that these vehicles remain in Lane 1 until they have a gap to move into Lane 2.	
Model Observations	Vehicles in the right lane on Link 21:108 are observed to change lanes, including at the end of the link, conflicting with other traffic.	

M6/A6/CHURCH ROAD

3.2.6. The following comments are made regarding the M6/A6/Church Road roundabout:

Table 2 – M6/A6/Church Road Comments

Coding Element	Comment	Severity
Roundabout Lanes	The movement from Church Road (Link 38:33) to Lostock Road (26:41) has been coded to allow two lanes to undertake this movement, despite lane marking suggesting that only the left lane can do this.	
Gap Acceptance/Look Through	Consideration of a look through for Link 30:31 is suggested given the shortness of the link and the observed collisions of some vehicles entering the roundabout. The low gap acceptance is also likely to be contributing to this.	
Visibility	Visibility values have been applied as 30m on all priority approaches with no calibration or consideration of visibility obstacles undertaken, meaning that the visibility may be overestimated on certain approaches.	
Model Observations	Some vehicles on Link 27:42 are aligning themselves in the right lane on approach to the roundabout, however cut across to the left lane upon entering the roundabout, cutting across those vehicles in the left lane.	

3.2.7. In addition to the comments made above, it is noted that the M6 and M65 have been coded as a 'Urban' Road Type rather than a 'Highway' Road Type. This is in contradiction to Figure 5 in the LMVR which suggests that these roads are coded as Highway Links. It is unclear why the model has been developed with Urban rather than Highway link types and therefore clarification is sought. Paragraph 3.17 of the LMVR states key features of a Highway Link, which appears reasonable to apply to these links.

3.3 SRN MODEL CALIBRATION REVIEW

3.3.1. WSP has undertaken a review of the calibration/validation undertaken in the model, relating to the SRN, based upon the information provided in the LMVR and the associated calibration/validation spreadsheets, noting the general concerns over the suitability of the April 2021 calibration data. WSP require clarification of how the model will be used to enable an assessment of any potential impact on the SRN if baseline validation has not been undertaken.

3.3.2. Turn flow calibration has been undertaken for the M6/M65 and the M6/A6/Church Road roundabouts, with link flow calibration also undertaken for each of the approaches to the roundabouts. WSP has used the information provided to calculate the flow calibration of the exit links to the junction. Link flow calibration has also been undertaken for the M65 and M6 through the M6/M65 junction.

3.3.3. The turn flow calibration for the M6/M65 and M6/A6/Church Road is summarised in Table 3.

Table 3 – SRN Turn Flow Calibration Summary

Junction	0700 - 0800	0800 - 0900	0900 - 1000	1000 - 1100	1100 - 1200	1200 - 1300	1300 - 1400	1400 - 1500	1500 - 1600	1600 - 1700	1700 - 1800	1800 - 1900
M6/A6/Church Road												
Count	12	12	12	12	12	12	12	12	12	12	12	12
GEH>=5	2	0	0	0	0	2	1	0	0	0	0	0
% GEH <5	83%	100%	100%	100%	100%	83%	92%	100%	100%	100%	100%	100%
M6/M65												
Count	10	10	10	10	10	10	10	10	10	10	10	10
GEH>=5	1	1	2	2	2	1	2	1	0	0	1	0
% GEH <5	90%	90%	80%	80%	80%	90%	80%	90%	100%	100%	90%	100%
Combined												
Count	22	22	22	22	22	22	22	22	22	22	22	22
GEH>=5	3	1	2	2	2	3	3	1	0	0	1	0
% GEH <5	86%	95%	91%	91%	91%	86%	86%	95%	100%	100%	95%	100%

3.3.4. The results show that for the majority of modelled time periods, the turn counts at the M6/M6/Church Road achieve 100% calibration. The Church Road to My Bypass SW movement did not calibrate across multiple time periods, with too few vehicles in model in the morning period and too many in the interpeak.

3.3.5. The results for the M6/M65 junction show that the majority of time periods have one or two turns not meeting the GEH criteria, with the turns from the M6 Preston Bypass NE to M65 (west), and M65 (West) to Preston Bypass NE frequently not meeting GEH criteria. The M6 Preston Bypass NE to M65 (west) movement generally have too many vehicles, whilst the M65 (West) to M6 Preston Bypass NE has too few vehicles (except 13:00-14:00), potentially suggesting routeing issues through the junction.

3.3.6. At the M6/M65 junction the morning peak hour of 08:00-09:00 experiences a GEH of 9 for the M65 west to M6 Preston Bypass NE, whilst the evening peak hour of 17:00-180:0 experiences a GEH of 10 for the Preston Bypass NE to M65 W. Clarification is sought regarding why these two turns do not meet criteria.

3.3.7. The combination of the results for the turn calibration show that all time periods have calibration above 85%.

3.3.8. A summary of the link flow calibration for the two junctions is summarised in Table 4.

Table 4 – SRN Link Flow Calibration Summary

Junction	0700 - 0800	0800 - 0900	0900 - 1000	1000 - 1100	1100 - 1200	1200 - 1300	1300 - 1400	1400 - 1500	1500 - 1600	1600 - 1700	1700 - 1800	1800 - 1900
Approach Links												
Count	12	12	12	12	12	12	12	12	12	12	12	12
GEH>=5	2	0	0	0	2	1	1	0	0	0	1	0
% GEH <5	83%	100%	100%	100%	83%	92%	92%	100%	100%	100%	92%	100%
Exit Links												
Count	8	8	8	8	8	8	8	8	8	8	8	8
GEH>=5	2	0	0	0	2	3	2	0	0	1	3	0
% GEH <5	75%	100%	100%	100%	75%	63%	75%	100%	100%	88%	63%	100%
Combined												
Count	20	20	20	20	20	20	20	20	20	20	20	20
GEH>=5	4	0	0	0	4	4	3	0	0	1	4	0
% GEH <5	80%	100%	100%	100%	80%	80%	85%	100%	100%	95%	80%	100%

3.3.9. The majority of time periods have 100% calibration for approach links. The flow on the M6 Preston Bypass NE was a location where the flow did not meet calibration criteria across multiple time periods.

3.3.10. . As with the approaches, the majority of time periods do have 100% calibration, albeit with 3 out of 8 exit links not meeting GEH criteria in the 17:00-18:00 evening peak hour. These links are the A6 Lostock Lane and M6 Preston Bypass SW exits at the M6/A6/Church Lane junction, and the M65 W exit at the M6/M65 junction. Clarification is sought regarding the reasoning behind the miscalibration in the evening peak hour.

3.3.11. A summary of the M65/M6 calibration against the WebTRIS data is summarised in Table 5.

Table 5 – M6/M65 Link Flow Calibration Summary

Junction	0700 - 0800	0800 - 0900	0900 - 1000	1000 - 1100	1100 - 1200	1200 - 1300	1300 - 1400	1400 - 1500	1500 - 1600	1600 - 1700	1700 - 1800	1800 - 1900
M65												
Count	2	2	2	2	2	2	2	2	2	2	2	2
GEH>=5	2	1	1	1	1	1	1	1	1	2	1	0
% GEH <5	0%	50%	50%	50%	50%	50%	50%	50%	50%	0%	50%	100%
M6												
Count	2	2	2	2	2	2	2	2	2	2	2	2
GEH>=5	0	0	0	1	1	2	2	1	0	0	0	1
% GEH <5	100%	100%	100%	50%	50%	0%	0%	50%	100%	100%	100%	50%
Combined												
Count	4	4	4	4	4	4	4	4	4	4	4	4
GEH>=5	2	1	1	2	2	3	3	2	1	2	1	1
% GEH <5	50%	75%	75%	50%	50%	25%	25%	50%	75%	50%	75%	75%

3.3.12. The results highlight that in the majority of time periods the flow on the M65 does not meet GEH criteria. In both the morning and evening peak periods, the flow is too low in the model compared against the observed data, in both the eastbound and westbound direction. The morning and evening peak periods generally meet criteria on the M6, with some mis-calibration in the evening peak. Clarification is sought regarding the reasoning behind the mis-calibration of the SRN.

3.3.13. With the two SRN junctions, and the SRN itself, being on the edges of the network the flow through these locations is largely controlled by the demand to/from the zones. It is noted that there is some route choice between the two junctions, however clarification is sought regarding the mis-calibration during the peak periods to understand whether the level of demand in this area of the network is appropriate and whether the routeing matches what the data suggest occurs.

4

FULL MODEL REVIEW

4 FULL MODEL REVIEW

4.1.1. Following the review of the coding, calibration and validation around the SRN a review has been undertaken of the wider model network. Given that there are some consistent comments for different locations around the model, the review has been undertaken by coding element rather than location. However, suggested locations have been provided of where this comment is applicable to for reference. Further details are provided in the 'Base Review Comment Log' spreadsheet.

4.1.2. The review covers the following coding elements/model observations:

- Overlay
- Link Coding
- Visibility
- Stopline Coding
- Lane Points
- Roundabout Lanes
- Signal Coding
- Standalone Pedestrian Crossings
- Signpost Distance
- Hazard Overrides
- Priority Coding
- Public Transport
- Model Observations.

4.1.3. The review uses the same yellow, amber, red rating system as was used as for the SRN review:

- Yellow- Minor Change
- Amber- Narrative required/review required within the model
- Red- Requires action.

4.2 OVERLAY

4.2.1. An overlay has been inserted into the model to allow for the model links to be drawn over the top, and to support the positioning of the stoplines within the model. The overlay gives an indication of the edges to the road but does not take into account hatching or road markings, which can make it more difficult to reflect where there are changes in the characteristics of the road (e.g. road widening). Satellite imagery should be used in conjunction with the overlay to ensure the building of the links in the network is accurate.

4.2.2. Comments regarding the coding on the model overlay are summarised in Table 6.

Table 6 – Overlay Comments

Comment	Location(s)	Severity
There are instances where the model links/stoplines are coded over islands/kerbs, and the vehicle trajectory would take the vehicles over the islands/kerbs. This may impact vehicle movements around the network.	• Old Lostock Lane (Link 170:171) • A582/Chain House Lane(Node 375) • A582/John Horrocks Way (Links 773:786, 789:776, 791:778, 780:1073) • A582/Cop Lane (Link 873:810) • Factory Lane (Link 1018:614) • Liverpool Road (Link 732:731 and 725:731) • A6/A582 (Link 216:101) • A6/B628 (Link 157:140, 140:141, 149:140)	

4.2.3. The locations highlighted are those on the key modelled links within the model, however it is noted that there are other locations on minor routes (e.g. Link 863:862) which also do not match the overlay but have not been provided in the table. The coding of the links/stoplines should be reviewed in the model against the overlay accordingly. Additional nodes/curvature of some links in the network, such as Link 863:862, would help better match the links to the overlay.

4.3 LINK CODING

4.3.1. Link coding has been undertaken on top of the overlay, as described in Section 4.2. When coding links in the model, a combination of the overlay, satellite imagery and street-view imagery should be used to ensure that the model has an appropriate link structure. The comments regarding the link coding in the model are summarised in Table 7.

Table 7 – Link Coding Comments

Comment	Location(s)	Severity
There are locations in the model where the number of lanes do not match the observed number of lanes	• A6/A582 (Link 100:101) • A582/Cop Lane (Link 813:810) • A6 Lostock Lane/B6258 (Link 159:158)	
The model has locations where the formation of a flare (from one to two, or two to three lanes, etc) differs in the model compared to satellite imagery	• The three-lane section on Cuerden Way (Link 183:184) • Eastbound approach to the A6/Cuerden Way junction (node 191) • Eastbound approach to the A6/A583 roundabout (Link 218:217) • A582 north-westbound approach to A582/Pope Lane (Link 1176:385) • Pope Lane north-eastbound approach to A582/Pope Lane (Node 823) • Pope Lane south-westbound approach to A582/Pope Lane (Node 836)	

Comment	Location(s)	Severity
	• A582 eastbound approach to Pope Lane (nodes 799 and 812) • A582 northbound approach to A59/A582 (Link 695:694) • Liverpool Road southbound approach to A59/Liverpool Road junction (Link 720:719) • A59 Liverpool Road south-westbound (Link 721:722) • A59 at A59/Lindle Lane (Link 902:903)	
The model coding at the A59/Cop Lane/Priory Lane, A59/Tesco and A59/Hill Road has not been updated to the current road layout. The current layout was implemented on-street in February 2021, prior to the model data collection, with temporary signals. The permanent signals were implemented in June 2021	• A59 Cop Lane/Priory Lane (node 732) • A59/Tesco (node 731) • A59/Hill Road (node 725)	
The model has been coded with right turn pockets that are longer than observed	• A59 Liverpool Road/Chesmere Drive (Link 747:749) • A59 Liverpool Road/Queensway (Link 957:739)	
Right turn pockets have been excluded from the model coding and should be included	• Handshaw Drive (Link 540:539) • Saxon Place (539:540) • Eagleton Way (536:537)	

4.4 VISIBILITY

4.4.1. The visibility in the model details how far back from a node drivers begin to assess gaps in opposing traffic. In Paramics, drivers will assess this gap when they reach the end of the link as a result of the visibility being 0m. In reality, drivers may be able to see if they can continue before they reach a junction and therefore a visibility greater than 0m can be added. The model includes a visibility value of 0m or 30m at all priority junctions within the network.

4.4.2. The comments regarding the coding of link visibility are summarised in Table 8.

Table 8 – Visibility Comments

Comment	Location(s)	Severity
Whilst it is acknowledged that some locations will have no visibility and therefore 0m is acceptable, and other locations have high visibility and therefore 30m is acceptable, there are locations which will have visibility in the region of 0-30m and this has not been taken into account of. Guidance on the Paramics Microsimulation support portal ('Set Visibility on approach to junctions') states that "A standard value of 30m is generally a good starting point for visibility and this can be refined in specific locations is necessary".	Across the full model. One example is Church Lane (Link 331:315) which has an obstructed view and therefore does not have 30m visibility but is coded with 30m.	

4.5 STOPLINE CODING

4.5.1. Stopline coding within the model impacts the trajectory of vehicles throughout the network, in addition to the position where vehicles will stop at signals/priority locations.

4.5.2. The comments regarding the stopline coding in the model are summarised in Table 9.

Table 9 – Stopline Coding Comments

Comment	Location(s)	Severity
The stopline positions at certain junctions do not take into account pedestrian crossings and therefore may be overestimating the capacity at these locations	• A6 Lostock Lane/B6258- northern (Link 157:140) and southern (Link 149:140) arms • A6/Cuerden Way (node 167)	
The stopline positions at certain junctions do not reflect the stopline positions in satellite imagery	• A582/Cop Lane (Links 810:813 and 873:810) • A59/A59 Liverpool Road (Link 716:717) • The Cawsey/Firs Drive (Link 1067:534) • Brownedge Road/Watkin Lane (Link 402:403)	
Stacking within the junction has not been considered for junctions where there is available space within the junction itself for vehicles to give way	• Brownedge Road/Todd Lane • Brownedge Road/Watkin Lane	

4.6 LANE POINTS

4.6.1. Lane points are used in the model to help determine which lanes may be used to proceed to the next lane (e.g. which lanes could be used at a diverge)

4.6.2. The comments regarding the lane point coding are summarised in Table 10.

Table 10 – Lane Point Coding Comments

Comment	Location(s)	Severity
For certain merges on exit, vehicles are allowed to use either lane at the merge down to one lane, rather than attempting to get into the required lane. This approach has been applied inconsistently in the model, with some locations coding the merge on exit with vehicles reducing down to one lane to reflect the on-street markings. The difference in approach may impact operation with increased levels of traffic and therefore should be considered.	• Link 827:799 • Link 363:364	
The model has locations where the right lane has been coded allowing ahead movements, when the right lane should be for right turners only.	• A59 Liverpool Road/Howick Moor Lane (Link 914:915) • A59 Liverpool Road/Howick Cross Lane (Link 918:916)	

4.7 ROUNDABOUT LANES

4.7.1. Roundabout lanes are used in Paramics to control the lanes which vehicles use on the approaches and circulatory to navigate a roundabout.

4.7.2. The comments regarding the roundabout lane coding in the model are summarised in Table 11.

Table 11 – Roundabout Lane Coding Comments

Comment	Location(s)	Severity
The model has incorrect lane usage at roundabouts in the model	• A6/A582 • A582/B5253 • Booths Roundabout (A582/John Horrocks Way) • A59/A582	

4.8 SIGNAL CODING

4.8.1. Signals are coded into Paramics Discovery using the signal editor function. The editor allows phasing and staging to be implemented, in addition to inputting intergreen values for checking the modelled intergreens. Phase delays/gains can also be modelled. The signal editor includes a review function to check the modelled information such as cycle time, stage length, and green time.

4.8.2. The comments regarding the signal coding in the model are summarised in Table 12.

Table 12 – Signal Coding Comments

Comment	Location(s)	Severity
No intergreens explicitly coded. Whilst this does not impact the coding of the signals, it doesn't allow checking of the intergreens to take place	• Penwortham Way/Chain House Lane (Node 375) • Tank Roundabout (nodes 350,343, 345,352,346) • A582/Cop Lane-northern section (node 813) • A6/A582 (nodes 101, 103, 97, 99, 225) • A6/Cuerden Way (nodes 167, 1076, 1077, 1078, 1079) • A6/Wigan Road (nodes 140, 164) • M65 eastbound off-slip (node 5) • Watkin Lane/Brownedge Road (node 403) • Leyland Road/Jubilee Road (node 259) • Leyland Road/Coote Lane (node 404) • Brownedge Lane/Todd Lane (node 435) • Lostock Lane/Farington Road Roundabout (nodes 234, 236, 243, 205, 203, 1319) • The Cawsey/Firs Drive (node 534)	
In some locations where intergreens have been coded in the model, there is a discrepancy between the intergreen hard-coded into the model, and the intergreen which the model will be running. For example at Booths Roundabout intergreens have been hard-coded as 7 seconds. However, an all-red of 5 seconds has been coded between each stage, effectively meaning that the model will be running a 10 second intergreen.	• Booths Roundabout (nodes 772, 774, 776, 778, 784) • Penwortham Bypass/A59 (node 890) • Penwortham Way/Pope Lane (nodes 838, 839, 1069, 1071, 1072, 1184) • A582/Cop Lane- southern section (node 810)	
There are locations where intergreens have not been hard-coded but an all-red of 5 seconds has been coded between each stage effectively meaning that the model will be running a 10 second intergreen. This appears to have been generically applied to locations throughout the network.	• Penwortham Way/Chain House Lane (Node 375) • Tank Roundabout (nodes 350,343, 345,352,346) • A582/Cop Lane-northern section (node 813)	

Comment	Location(s)	Severity
	• A6/Cuerden Way (nodes 167, 1076, 1077, 1078, 1079) • A6/Wigan Road (nodes 140, 164) • M65 eastbound off-slip (node 5) • Leyland Road/Coote Lane (node 404)	
Locations with phases running green times of less than 7 seconds have been noted, and should be reviewed/revised as required.	• Penwortham Way/Chain House Lane (Node 375) • Booths Roundabout (nodes 772, 774, 776, 778, 784) • Penwortham Bypass/A59 (node 890) • A582/Cop Lane (nodes 810, 813) • Leyland Road/Jubilee Road (node 259) • Leyland Road/Coote Lane (node 404) • Penwortham Way/Pope Lane (nodes 838, 839, 1069, 1071, 1072, 1184) • The Cawsey/Firs Drive (node 534)	
There are junctions with pedestrian crossing facilities which aren't taken into account in the staging.	• Leyland Road/Jubilee Road (node 259) • The Cawsey/Firs Drive (node 534) • A6/A582- second stopline (node 227) and northbound exit (node 226) • A582/B5252 (node 240)	
There are locations in the model where pedestrian crossings are taken into consideration, however the time allocated in the model may not be long enough to cover the intergreens/crossing times.	• Leyland Road/Coote Lane (node 404) • Brownedge Lane/Todd Lane (node 435)	
Inconsistent intergreen values were coded between the morning/evening peak and the interpeak.	• Leyland Road/Coote Lane (node 404)	
The signals at the A59/John Horrocks Way have changed since the model was built (towards the end of 2021). Therefore, the base model requires reflection of the old signal specification, with any forecasting representing the newer signal specification.	• Penwortham Bypass/A59 (node 890)	

Comment	Location(s)	Severity
Review of signal coding is required in accordance with signal specifications, as aspects of many of the signalised junctions do not match the specifications. Signal specifications should be obtained, if they have not been previously. The review for signals includes: • Phasing • Staging • Intergreens • Phase Delays/Gains • Green times • Pedestrian crossings (all reds/ensuring model has enough time allocated for intergreens + crossing time).	• Network Wide	

4.9 STANDALONE PEDESTRIAN CROSSING

4.9.1. There is a separate function to the signal editor within Paramics Discovery which can allow for standalone pedestrian crossings to be modelled. This function allows for variable timings to be implemented using a minimum/maximum pedestrian crossing duration and activation interval.

4.9.2. The comments regarding the signal coding in the model are summarised in Table 13.

Table 13 – Standalone Pedestrian Crossing Coding Comments

Comment	Location(s)	Severity
Signalised pedestrian crossings have been excluded from certain locations in the model.	• Carrwood Road (node 530) • Watkin Lane (Link 259:258) • Watkin Lane (Link 249:250) • A59 Liverpool Road southbound (node 904/1089)	
Zebra crossings in the model have not been included.	• Brownedge Road (node 631) • Brownedge Road (node 441) • Brownedge Road (node 438)	
The timings applied to pedestrian crossings is consistent across the network, with a minimum pedestrian crossing duration of 10s and maximum of 15s. Is the time allocated in the model sufficient to cover a preceding intergreen, the crossing time for pedestrians and a following intergreen? Where possible, signal specifications should be used.	• Network Wide	

4.10 SIGNPOST DISTANCE

4.10.1. The signpost distance informs vehicles in the network of an upcoming hazard (e.g. junction, diverge, road narrowing) downstream.

4.10.2. Comments regarding the signpost distances applied to nodes are summarised in Table 14.

Table 14 – Signpost Distance Coding Comments

Comment	Location(s)	Severity
The signpost distance has been coded at a length where vehicles may make multiple lane changes on approach to a junction, instead of getting straight into the correct lane as would be expected.	• A6/A582 (node 103)	
Locations in the model where there is a merge after the exit to a junction are generally coded with a 25m/50m/100m signpost distance. This may be appropriate for short term merge lengths, however, longer merge lengths may benefit from a larger signpost distance to prevent vehicles inappropriately changing lanes on the exit to a junction. Values should be applied on a case-by-case basis to prevent unnecessary/unrealistic lane changing.	• Network wide	

4.11 HAZARD OVERRIDES

4.11.1. Hazard overrides are used to help vehicles to get into an appropriate lane for a hazard downstream. An example may be a two-lane section of road, widening to four lanes on approach to a roundabout. Hazard overrides can be used to inform the driver to use the left lane of the two-lane section, to use the left two lanes of the four-lane section.

4.11.2. The comments regarding the hazard override coding in the model are summarised in Table 15.

Table 15 – Hazard Override Coding Comments

Comment	Hazard Override	Severity
Hazard overrides have been applied for locations where a hazard does not exist, and therefore the override does not work as intended.	• 173:167, 1-2, 134:135, 1-1 • 138:139, 1-2, 134:135, 1-1 • 138:148, 1-1, 134:135, 2-2	
Hazard overrides have been applied for movements that are controlled by roundabout lanes, and therefore the override is not working as intended.	• 349:358, 1-2, 356:357 • 341:314, 1-2, 368: 367, 1-1 • 349:358, 1-2, 314:341, 2-2 • 281:273, 2-2, 294:289 • 281:273, 2-2, 295:291 • 279:283, 1-1, 294:289, 1-1	

Comment	Hazard Override	Severity
Hazard override 817:839, 1-2, 816:817, 2-3 appears reasonable. However, vehicles don't use the right lane on link 1176:385, the middle lane on link 385:816, and the third lane on 816:817 to use lanes 1-2 on link 817:839.	• 817:839, 1-2, 816:817, 2-3	
Hazard overrides are not working as intended due to differences between the lane ranges applied in the model and those in the hazard override.	• 182:103, 2-2, 167:180, 1-1	
Hazard overrides not working due to the signpost distance not being long enough.	• 182:103, 1-1, 167:180, 1-1	
The hazard override coding requires review in the model to ensure that vehicles are getting into the correct lane on approach to junctions/roundabouts. Hazard overrides are beneficial when there is widening on approach to ensure vehicles are using the correct lanes.	• Network Wide	

4.12 PRIORITY CODING

4.12.1. There are several aspects of priority coding in Paramics including:

- Major/Medium/Minor Priority
- Gap acceptance
- Give Way to All/Give Way to offside.

4.12.2. The major/medium/minor priority function is used to tell a vehicle if they have to give way at a specific point. A major priority is where vehicles have the priority and aren't required to give way. A medium priority is generally used where vehicles have to give way to one lane of traffic at a priority junction (for example a right turn into a side road). A minor priority is generally used where vehicles have to give way to more than one lane at a priority junction (for example the right turn out of a side road). The model has generally coded the appropriate priority coding in terms of major/medium/minor at priority junctions within the network.

4.12.3. The comments regarding priority coding in the model are summarised in Table 16.

Table 16 – Priority Coding Comments

Comment	Location	Severity
Vehicles are not coded to give way to opposing traffic.	• A59/John Horrocks Way (node 890) • Coote Lane (Link 416:417)	
Coding of priorities at locations allowing unrealistic route choice. A medium priority at node 814, potentially allows vehicles to use the slip road intended for southbound right turners, instead of vehicles turning at node 813.	• A582/Cop Lane (node 813)	
A Give Way to All adherence of 70% has been used when this has been applied in the model. Clarification is sought why 70% has been used.		

4.13 PUBLIC TRANSPORT

4.13.1. Public transport routes are coded in the model separate to the demands for general traffic. The routes are assigned a schedule detailing the times the public transport enters the network, in addition to the stops it stops at. The public transport stops are coded in a model to reflect on street stops and have a minimum/maximum dwell time which buses stop for.

4.13.2. The comments regarding the public transport coding in the model are summarised in Table 17.

Table 17 – Public Transport Coding Comments

Comment	Location	Severity
The 109 Preston-Chorley does not have a schedule assigned to it.	Route: • 109 Preston-Chorley	
Public transport stops appear to have been excluded from the model.	• A59 Liverpool Road (Cop Lane junction and Horrocks Way junction)- node 890 to 732 • Cop Lane (between A59/Cop Lane and Cop Lane/A582)- node 732 to 813	
There are fewer public transport stops in the model than suggested on satellite imagery/mapping.	• B5254 • Todd Lane N • Brownedge Road • Croston Road	

4.14 MODEL OBSERVATIONS

4.14.1. The comments made from observing the model running are summarised in Table 18.

Table 18 – Model Observation Comments

Comment	Location	Severity
Vehicles are observed using potentially inappropriate lanes against the road markings.	• A6/Cuerden Way/Craven Drive-northbound left turn (Link 1077:1080) • A6/Brownedge Road • A6/Hennel Lane/Carrwood Road • A582/B582/A5083 • A582/B5253 • A582/Pope Lane (Link 1072:872) • Coote Lane/School Lane/Channock Moss (nose 412/623)	

5

SUMMARY & CONCLUSIONS

5 SUMMARY & CONCLUSIONS

5.1.1. WSP, on behalf of National Highways, has undertaken a review of the 2021 South Ribble Paramics Discovery Base model provided by Vectos Microsim, with particular emphasis on the SRN, albeit a full review of the model has been undertaken. The model has been developed with the purpose of supporting the assessment of highway network operation following the inclusion of the proposed 'The Lanes, Penwortham' residential led development adjacent to the A582 Penwortham Way. Paragraph 3.7 of the LMVR states that "it was determined that the M65/M6 junction should also be included to enable an assessment of any potential impact on the Strategic Road Network close to the development area."

5.1.2. The provided base model includes a 2021 network, with traffic survey data collected in April 2021. The model has been calibrated to this 2021 traffic flow data and validated to journey time data obtained from TomTom.

5.1.3. The review undertaken has focused on the following elements:

- A review of the information summarised within the provided LMVR;
- A review of the coding at the SRN junctions and SRN mainline;
- A review of the calibration/validation of the SRN;
- A review of the wider model extents.

5.1.4. Upon a review of the LMVR more information is requested regarding the following:

- Suitability of April 2021 data. Based on the information provided it is not possible to state that the April 2021 counts are suitable for development of an appraisal tool. The counts were conducted when coronavirus restrictions where in place and irrespective of their total values can not been deemed a reliable source of baseline traffic data. On this basis we would request that either strong further evidence is provided that the April 2021 counts are representative or that the modelling work is revisited with an alternative data source.
- The dates/times that the TomTom data has been collected for and that appropriate data is used to align with any traffic data source.
- The methodology of using the TomTom data, whether it is route based or link based, and if it is link based the potential for any discrepancies between the observed data and model results
- How the model will be used to enable an assessment of any potential impact on the SRN without validation undertaken in this location
- Differences between the modelled and on-street speed limits, including the methodology/data used to determine the modelled speed limit changes, noting that the model has been noted to not include a number of elements which would impact on traffic speeds, such as zebra crossings, speed cushions and parked cars.
- The dates and times the Google routeing data was used for, in addition to the number of routes used
- The appropriateness of applying a 0m or 30m visibility to all priority links, with no calibration undertaken
- The appropriateness of applying headway factors along the entirety of two long corridors. Evidence is requested to support the use of these headway factors along the entire length of the corridor

- The coarseness of vehicle release profiles, with only 11 profiles by vehicle type used in the model despite there being large network extents and a large number of zones. Information is requested to show that the profiling at the SRN junctions/mainline is appropriate
- Evidence that the number of runs undertaken (10) is suitable given the large network extents and possible route choice within the model
- Contradictions between LMVR figures and the model including:
  - The M6/M65 being designated as a 'Highway' link type in the LMVR but coded as an 'Urban' Link Type
  - Speed limits assigned to the model and those presented in the LMVR
  - Gap acceptance locations
  - Clear exit adherence locations
  - Cost factors.

5.1.5. The model review has used a yellow, amber, red system to categorise the comments by severity:

- Yellow- Minor Change
- Amber- Narrative required/review required within the model
- Red- Requires action.

5.1.6. The SRN review looked at the M6 junction 29/M65 junction 1, M6/A6/Church Road, and the M6/M65 mainlines. Table 19 summarises the number of yellow, amber and red comments for each coding element.

Table 19 – Coding Review Summary: SRN

Coding Element	Yellow	Amber	Red
M6 junction 29/M65 junction 1	1	6	12
M6/A6/Church Road	0	3	1
Total	*1*	*9*	*13*

5.1.7. The review of the SRN has indicated 13 'red' comments which require action in the model to ensure the model can accurately replicate the operation in this area. Comments include consideration of the actual link lengths from satellite imagery, which are generally underestimated in the model and may impact the model operation in this area, and the operation of the merges onto the M6/M65 mainline. The 9 'amber' comments require narrative or for these comments to be reviewed/revised in the model.

5.1.8. Given the comments raised during this review we cannot conclude that the model accurately reflects the SRN operation or is the model suitable for assessment use.

5.1.9. The model review has looked at the following coding elements across the model as a whole:

- Model Overlay
- Link Coding
- Visibility
- Stopline Coding

- Lane Points
- Roundabout Lanes
- Signal Coding
- Standalone Pedestrian Crossings
- Signpost Distance
- Hazard Overrides
- Priority Coding
- Public Transport
- Model Observations.

5.1.10. Table 20 summarises the number of yellow, amber and red comments for each coding element, noting that one yellow/amber/red comment may reflect several locations within the model extents.

Table 20 – Coding Review Summary

Coding Element	Yellow	Amber	Red
Model Overlay	0	1	0
Link Coding	0	2	3
Visibility	0	1	0
Stopline Coding	1	0	2
Lane Points	0	2	0
Roundabout Lanes	0	0	1
Signal Coding	2	3	4
Standalone Pedestrian Crossings	0	2	1
Signpost Distance	0	2	0
Hazard Overrides	0	6	0
Priority Coding	0	2	0
Public Transport	3	0	0
Model Observations	1	0	0
Total	*7*	*21*	*11*

5.1.11. The review has highlighted eleven ‘red’ issues within the model coding, with four of these relating to the signal coding within the model, and a further three ‘amber’ issues. Upon review of the signals in the model alongside the provided signal specifications, the signals in the model did not match the specifications and therefore require review/updating in the model.

5.1.12. Three ‘red’ comments and two ‘amber’ related to the link coding in the model, with locations where the on-street number of lanes did not match between the model and satellite imagery, and there are

locations where the development of flares in the model does not correlate with satellite imagery (the model likely under/overestimating capacities in different areas of the network).

5.1.13. Given the wide-ranging set of concerns raised during this review we cannot conclude that the model accurately reflects the operation of the network and therefore the model is not suitable for assessment use in its current form. We recommend that any revisions made to the modelling methodology or modelling process is agreed with National Highways and Lancashire County Council prior to commencement. Furthermore, any updates to the model will require further review before the modelling tool can be agreed as appropriate for forecasting appraisals.

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South Ribble Paramics Model
National Highways Model Audit Response

May 2022

Introduction

1. This Technical Note provides the Vectos response to the review undertaken by National Highways (NH), related to 'The Lanes' development assessment within the South Ribble Paramics model. The review undertaken by NH, and referred to throughout this note, is titled 'Pickerings Farm Base Model Review' and was received by Vectos on the 13th May 2022.

2. This note outlines a general response to the NH model review, with the updated model and supporting LMVR, plus the model comment audit log, indented to accompany the note, providing additional detail on the response.

Model Development and Audit Process

3. Vectos have been commissioned by Taylor Wimpy and Homes England to assess the impacts of the proposed development at 'The Lanes' using a microsimulation model. The Base Model developed will serve as the starting point from which the different assessment scenarios will be derived. Upon completion of the South Ribble Paramics modelling assessment in July 2021, Vectos have submitted the Base Model and supporting files to NH for consideration as part of the wider application.

4. The 2021 South Ribble Base Model has been developed to assess the impacts associated with the proposed development on the local highway network, with the majority of the network focusing on the A582, A59 and B5254 Leyland Road. However, a small section of the modelled network does include parts of the strategic road network around the M6/M65 junction and M6/A6 junction.

5. The development of the 2021 Base Model, inclusive of the SRN section of the network, has been based upon traffic surveys collected in May 2021, and validated to TomTom journey time data, also collected in May 2021. Vectos consider that the Base Model reflects a good level of peak hour turn count calibration at the SRN junctions included within the model, which is demonstrated within the supporting calibration/validation spreadsheet and LMVR. Journey time validation has also been specifically checked for the approaches to the M65/A582/A6 and M6/M65 junctions, which demonstrates a high level of validation achieved within the base model on each of these approaches.

6. This model was independently audited by Systra, in July 2021, with a series of comments on the model received, and subsequently addressed by Vectos, before a final version of the model was reviewed and an audit report received. The audit is attached to the LMVR accompanying the Base Model. The resulting audit concluded that subject to some minor issues being addressed, the model was deemed acceptable, and achieved a good level of calibration and validation against observed traffic data.

7. In addition to the original model audit response to Systra, this note now responds to each of the comments raised in the NH model audit. Responses comprise either application of the suggested changes to the model itself or providing further clarifications where necessary. The changes applied to the model are documented within the supporting model comments log issued alongside this note, whilst an updated version of the Base Model and supporting LMVR are also now available for further comment by NH.

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Updated Model Runs

8. Following the update to the model, as a result of receipt of the audit comments, the model itself has been re-run, and the resultant calibration/validation levels reported. Details of the model performance, relative to observed data, is documented within the supporting updated LMVR and calibration/validation spreadsheets. This is inclusive of journey time validation on approaches to the SRN junctions included within the modelled network. Further to this the headline validation results are appended to this note.

Files Issued

9. In addition to this note, and following the update to the model, the updated files listed below have been re-issued to NH:

- 2021 Base Model
- LMVR
- Calibration/Validation Spreadsheet
- Model Audit Log

10. Further to the above, and following a request from NH, the model demand builds (*VM210430.SP003 Prior Build*) has also been provided. Supporting text within paragraphs 4.8-4.42 of the updated LMVR should be considered when reviewing the prior matrix demands build spreadsheet provided.

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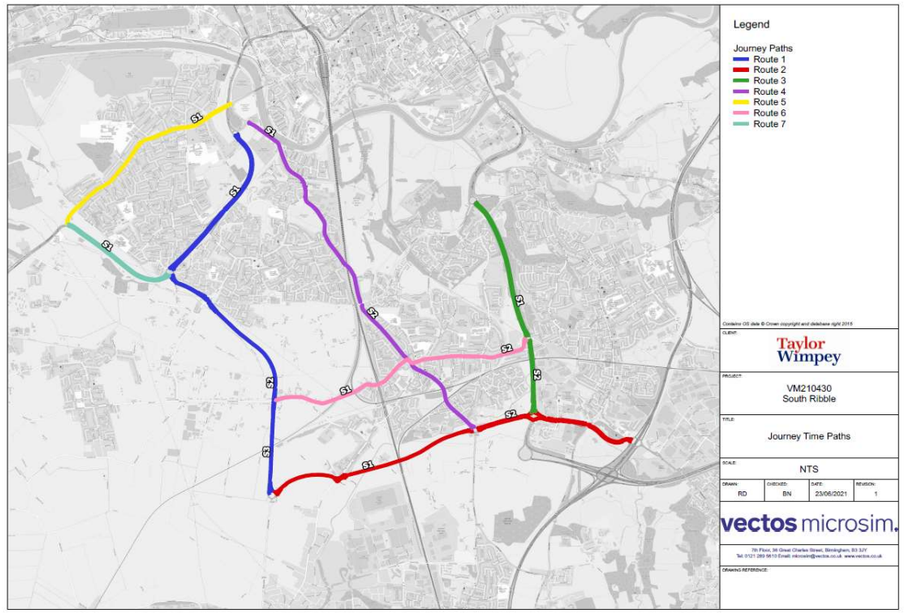
AM Average journey time (s)					
08:00:00					
	OBS	MOD	Diff (s)	Diff (%)	Pass/Fail
Route 1 NB	375	334	-41	-11%	PASS
Route 1 SB	328	345	17	5%	PASS
Route 2 EB	476	472	-4	-1%	PASS
Route 2 WB	422	455	33	8%	PASS
Route 3 NB	127	120	-7	-5%	PASS
Route 3 SB	138	135	-4	-3%	PASS
Route 4 NB	589	654	64	11%	PASS
Route 4 SB	518	579	61	12%	PASS
Route 5 NB	334	339	5	1%	PASS
Route 5 SB	356	365	9	2%	PASS
Route 6 EB	456	387	-69	-15%	PASS
Route 6 WB	395	391	-4	-1%	PASS
Route 7 EB	86	86	0	0%	PASS
Route 7 WB	79	66	-13	-17%	PASS
				Count	14
				PASS	100%
				FAIL	0%

PM Average journey time (s)					
17:00:00					
	OBS	MOD	Diff (s)	Diff (%)	Pass/Fail
Route 1 NB	365	338	-28	-8%	PASS
Route 1 SB	332	349	17	5%	PASS
Route 2 EB	455	472	17	4%	PASS
Route 2 WB	511	527	16	3%	PASS
Route 3 NB	140	125	-15	-11%	PASS
Route 3 SB	151	133	-18	-12%	PASS
Route 4 NB	513	573	60	12%	PASS
Route 4 SB	518	562	44	8%	PASS
Route 5 NB	300	311	11	4%	PASS
Route 5 SB	302	310	8	3%	PASS
Route 6 EB	432	394	-38	-9%	PASS
Route 6 WB	423	463	40	9%	PASS
Route 7 EB	80	69	-11	-14%	PASS
Route 7 WB	71	65	-6	-9%	PASS
				Count	14
				PASS	100%
				FAIL	0%

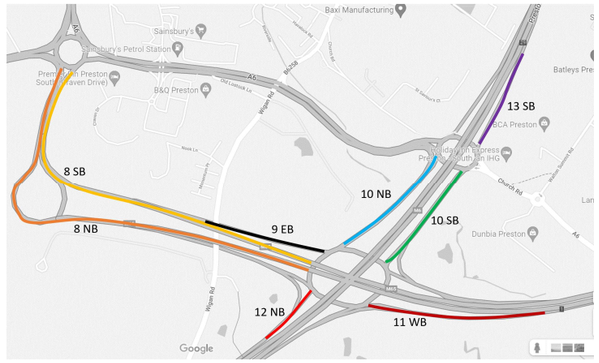
Inter Peak Average journey time (s)					
12:00:00					
	OBS	MOD	Diff (s)	Diff (%)	Pass/Fail
Route 1 NB	366	314	-52	-14%	PASS
Route 1 SB	325	334	9	3%	PASS
Route 2 EB	423	411	-12	-3%	PASS
Route 2 WB	494	407	-86	-17%	FAIL
Route 3 NB	158	117	-41	-26%	PASS
Route 3 SB	140	131	-9	-6%	PASS
Route 4 NB	426	420	-6	-1%	PASS
Route 4 SB	456	418	-39	-8%	PASS
Route 5 NB	439	374	-65	-15%	PASS
Route 5 SB	305	279	-26	-8%	PASS
Route 6 EB	352	329	-23	-6%	PASS
Route 6 WB	393	381	-11	-3%	PASS
Route 7 EB	84	72	-12	-14%	PASS
Route 7 WB	72	62	-10	-14%	PASS
				Count	14
				PASS	93%
				FAIL	7%



AM Average journey time (s)					
08:00:00					
	OBS	MOD	Diff (s)	Diff (%)	Pass/Fail
1-1-NB Route 1 Section 1 NB	101	101	0	0%	PASS
1-1-SB Route 1 Section 1 SB	105	97	-8	-7%	PASS
1-2-NB Route 1 Section 2 NB	168	151	-16	-10%	PASS
1-2-SB Route 1 Section 2 SB	151	182	30	20%	PASS
1-3-NB Route 1 Section 3 NB	106	82	-24	-23%	PASS
1-3-SB Route 1 Section 3 SB	71	66	-5	-7%	PASS
2-1-EB Route 2 Section 1 EB	242	261	18	8%	PASS
2-1-WB Route 2 Section 1 WB	188	222	34	18%	PASS
2-2-EB Route 2 Section 2 EB	234	211	-23	-10%	PASS
2-2-WB Route 2 Section 2 WB	234	233	-1	-1%	PASS
3-1-NB Route 3 Section 1 NB	77	70	-8	-10%	PASS
3-1-SB Route 3 Section 1 SB	79	70	-9	-12%	PASS
3-2-NB Route 3 Section 2 NB	49	50	1	2%	PASS
3-2-SB Route 3 Section 2 SB	60	65	5	9%	PASS
4-1-NB Route 4 Section 1 NB	302	329	27	9%	PASS
4-1-SB Route 4 Section 1 SB	248	277	28	11%	PASS
4-2-NB Route 4 Section 2 NB	288	325	37	13%	PASS
4-2-SB Route 4 Section 2 SB	270	302	32	12%	PASS
5-1-NB Route 5 NB	334	339	5	1%	PASS
5-1-SB Route 5 SB	356	365	9	2%	PASS
6-1-EB Route 6 Section 1 EB	229	162	-67	-29%	FAIL
6-1-WB Route 6 Section 1 WB	195	189	-6	-3%	PASS
6-2-EB Route 6 Section 2 EB	227	225	-3	-1%	PASS
6-2-WB Route 6 Section 2 WB	200	202	2	1%	PASS
7-1-EB Route 7 EB	86	86	0	0%	PASS
7-1-WB Route 7 WB	79	66	-13	-17%	PASS
				Count	26
				PASS	96%
				FAIL	4%

PM Average journey time (s)					
17:00:00					
	OBS	MOD	Diff (s)	Diff (%)	Pass/Fail
Route 1 Section 1 NB	97	97	0	0%	PASS
Route 1 Section 1 SB	107	99	-9	-8%	PASS
Route 1 Section 2 NB	158	159	1	1%	PASS
Route 1 Section 2 SB	153	184	31	20%	PASS
Route 1 Section 3 NB	111	82	-29	-26%	PASS
Route 1 Section 3 SB	71	67	-5	-6%	PASS
Route 2 Section 1 EB	210	246	36	17%	PASS
Route 2 Section 1 WB	217	277	59	27%	PASS
Route 2 Section 2 EB	245	225	-19	-8%	PASS
Route 2 Section 2 WB	294	250	-43	-15%	PASS
Route 3 Section 1 NB	88	72	-17	-19%	PASS
Route 3 Section 1 SB	80	74	-5	-7%	PASS
Route 3 Section 2 NB	52	54	1	3%	PASS
Route 3 Section 2 SB	71	59	-12	-17%	PASS
Route 4 Section 1 NB	241	291	49	20%	PASS
Route 4 Section 1 SB	263	341	78	30%	FAIL
Route 4 Section 2 NB	272	282	10	4%	PASS
Route 4 Section 2 SB	255	221	-34	-14%	PASS
Route 5 NB	300	311	11	4%	PASS
Route 5 SB	302	310	8	3%	PASS
Route 6 Section 1 EB	233	191	-42	-18%	PASS
Route 6 Section 1 WB	204	215	11	5%	PASS
Route 6 Section 2 EB	198	203	4	2%	PASS
Route 6 Section 2 WB	219	248	28	13%	PASS
Route 7 EB	80	69	-11	-14%	PASS
Route 7 WB	71	65	-6	-9%	PASS
				Count	26
				PASS	96%
				FAIL	4%

Interpeak Average journey time (s)					
12:00:00					
	OBS	MOD	Diff (s)	Diff (%)	Pass/Fail
Route 1 Section 1 NB	89	95	-6	7%	PASS
Route 1 Section 1 SB	106	95	11	-10%	PASS
Route 1 Section 2 NB	176	141	35	-20%	PASS
Route 1 Section 2 SB	148	176	-28	19%	PASS
Route 1 Section 3 NB	101	78	23	-23%	PASS
Route 1 Section 3 SB	71	64	7	-11%	PASS
Route 2 Section 1 EB	195	212	-18	9%	PASS
Route 2 Section 1 WB	210	165	45	-21%	PASS
Route 2 Section 2 EB	228	199	29	-13%	PASS
Route 2 Section 2 WB	284	242	42	-15%	PASS
Route 3 Section 1 NB	107	70	38	-35%	PASS
Route 3 Section 1 SB	79	68	11	-14%	PASS
Route 3 Section 2 NB	50	47	3	-6%	PASS
Route 3 Section 2 SB	60	62	-2	3%	PASS
Route 4 Section 1 NB	232	241	-9	4%	PASS
Route 4 Section 1 SB	228	214	14	-6%	PASS
Route 4 Section 2 NB	194	178	15	-8%	PASS
Route 4 Section 2 SB	228	203	25	-11%	PASS
Route 5 NB	439	374	65	-15%	PASS
Route 5 SB	305	279	26	-8%	PASS
Route 6 Section 1 EB	181	144	37	-20%	PASS
Route 6 Section 1 WB	185	177	9	-5%	PASS
Route 6 Section 2 EB	171	185	-14	8%	PASS
Route 6 Section 2 WB	207	205	3	-1%	PASS
Route 7 EB	84	72	12	-14%	PASS
Route 7 WB	72	62	10	-14%	PASS
				Count	26
				PASS	100%
				FAIL	0%



AM Average journey time (s)					
08:00:00					
	OBS	MOD	Diff (s)	Diff (%)	Pass/Fail
Route 8 NB	89	122	-33	37%	PASS
Route 8 SB	59	62	-3	5%	PASS
Route 9 EB	36	35	2	-5%	PASS
Route 10 NB	39	37	2	-4%	PASS
Route 10 SB	32	29	4	-11%	PASS
Route 11 WB	25	20	5	-20%	PASS
Route 12 NB	14	14	0	0%	PASS

PM Average journey time (s)					
17:00:00					
	OBS	MOD	Diff (s)	Diff (%)	Pass/Fail
Route 8 NB	126	105	21	-17%	PASS
Route 8 SB	58	61	-3	5%	PASS
Route 9 EB	34	35	-1	4%	PASS
Route 10 NB	38	34	4	-12%	PASS
Route 10 SB	32	32	1	-2%	PASS
Route 11 WB	26	22	4	-17%	PASS
Route 12 NB	15	15	0	-2%	PASS

IP Average journey time (s)					
12:00:00					
	OBS	MOD	Diff (s)	Diff (%)	Pass/Fail
Route 8 NB	98	104	-6	6%	PASS
Route 8 SB	60	61	-1	2%	PASS
Route 9 EB	33	33	0	0%	PASS
Route 10 NB	55	31	24	-44%	PASS
Route 10 SB	27	26	1	-2%	PASS
Route 11 WB	25	19	6	-24%	PASS
Route 12 NB	12	13	-1	8%	PASS

Appendix MA-6

Road Safety Audits and Risk Assessments

The Lanes, Bee Lane, Penwortham

Stage 1 Road Safety Audit

Vectos (North) Ltd

26 November 2021

Grange Transport Consulting

The Lanes, Bee Lane, Penwortham
Stage 1 Road Safety Audit

November 2021

Client: Vectos (North) Ltd

Rev	Report Reference	Date	Issue Status	Prepared	Checked
-	261121_J190016_Bee Lane RSA1.docx	26.11.21	Final	WL	IM

CONTENTS

1. Introduction

1.1 General

1.1.1 This report results from a Stage 1 Road Safety Audit (RSA) carried out on Tuesday 23 November 2021. The audit was undertaken on behalf of Vectos (North) Ltd.

1.1.2 The audit was carried out in response to a brief supplied by Paul Whitaker of Vectos (North) Ltd and agreed with the audit team.

1.1.3 The Road Safety Audit team comprised of the following individuals:

Wing Lee BEng(Hons), PGCert, HE CoC, MCHIT, MIHE

Audit Team Leader

Ian Medd MCHIT, FSoRSA

Audit Team Member

1.1.4 A site visit was undertaken by the Audit Team on Tuesday 23 November 2021, between the hours of 12:30 and 13:30. The weather was dry and cloudy, and the road surface was dry. Traffic was minimal and moderate pedestrians and cyclists were observed passing the site.

1.1.5 Bee Lane routes from the B5254 in an west-to-east alignment and is located along the northern extent of the proposals site. It is a cul-de-sac and serves a small number of residential dwellings and commercial units. In the vicinity of the proposed access junction no street lighting, footways, or kerbing is provided along the road. Bee Lane is subject to a 30mph speed limit and has varying carriageway widths, with an average of circa 4.8m. Trees and hedges line both sides of the carriageway for the majority of the length of Bee Lane.

1.1.6 The terms of reference of the Road Safety Audit are as described in the Design Manuals for Roads and Bridges (DMRB) standard - GG119 Road Safety Audit.

1.1.7 The Audit Team has examined and reported only on the road safety implications of the scheme as presented by Vectos and has not examined or verified the compliance of the designs to any other criteria. However, to clearly explain a safety problem or the recommendation to resolve a problem the Audit Team may, on occasion, have referred to design standards without touching on technical audit.

1.1.8 A residential-led development is proposed on land to the west of Leyland Road for up to 1,350 dwellings with associated community infrastructure. The primary vehicular access is proposed via a new access on the A582 Penwortham Way. A secondary access is proposed on Bee Lane to serve 40 dwellings only. Existing properties accessed via Bee Lane will be retained.

1.1.9 The proposals submitted for Stage 1 RSA relate to the provision of a new simple priority controlled T-junction site access onto Bee Lane (Site 3), and includes a footway along the southern side of Bee Lane (between the access junction and railway bridge).

1.1.10 A list of the documents and drawings submitted for this Stage 1 RSA can be found at Appendix B.

1.1.11 The submitted design drawings have been annotated to show the location of problems identified during this Stage 1 Road Safety Audit. These plans are shown at Appendix C.

1.1.12 The recommendations offered within this report should not be regarded as prescriptive. Whilst recommendations have been made with this report, there may be equally satisfactory or superior alternative solutions to the identified problems. The Audit Team will be pleased to consider any alternatives if required.

1.2 Departures from Standards

1.2.1 The Audit Team has not been informed of any departures from standards relating to the designs submitted for audit.

2. Problems identified from this audit

2.1 Bee Lane

2.1.1 The following provides details of the problems identified during this Stage 1 Road Safety Audit.

Problem 1	
Location	Site access
Summary	Limited visibility for pedestrians crossing
The pedestrian crossing facility on the site access road is set back into the development and visibility to turning traffic may be limited, resulting in pedestrians stepping into the path of traffic turning into the site.	
Recommendation	It is recommended that an appropriate visibility envelope is provided to allow pedestrians to cross safely.

Problem 2	
Location	Eastern extent of footway on Bee Lane
Summary	Carriageway alignment may lead to vehicles striking kerb

The alignment of the proposed southern kerb results in the end of the footway intruding into the carriageway where it may be struck by westbound vehicles, resulting in loss of control and increasing the risk of pedestrians being struck.

Recommendation	It is recommended that, in the absence of footway facilities on the bridge, the footway is terminated further to the west to provide a smooth transition into the existing alignment.

Problem 3	
Location	Site access
Summary	Refuse vehicles may strike vehicles approaching junction on the site access
The swept path of a refuse vehicle intrudes into the opposing carriageway and if insufficient intervisibility is not provided both approaching drivers may fail to avoid collision.	
Recommendation	It is recommended that sufficient intervisibility is provided to allow approaching drivers to permit safe passage.

Problem 4	
Location	Gated field access
Summary	Extent of carriageway may lead to vehicles striking kerb

The provision of kerbing on the northern side of the carriageway extends up to and in front of the existing gate for the field. Vehicles turning right out of the field may collide with the new kerbing, resulting in loss of control.

Recommendation	It is recommended that the new kerbing is terminated further to the west of the gated access to ensure vehicles can turn out safely.

3. Audit Team Statement

3.1.1 We certify that the drawings listed at **Appendix B** have been examined, and that this Audit has been carried out in accordance with the requirements of GG119, with the sole purpose of identifying road safety matters to be addressed in order to improve the safety of the scheme.

Road Safety Audit Team Leader

Signed: 

Name: Wing Lee

Date: 26.11.21

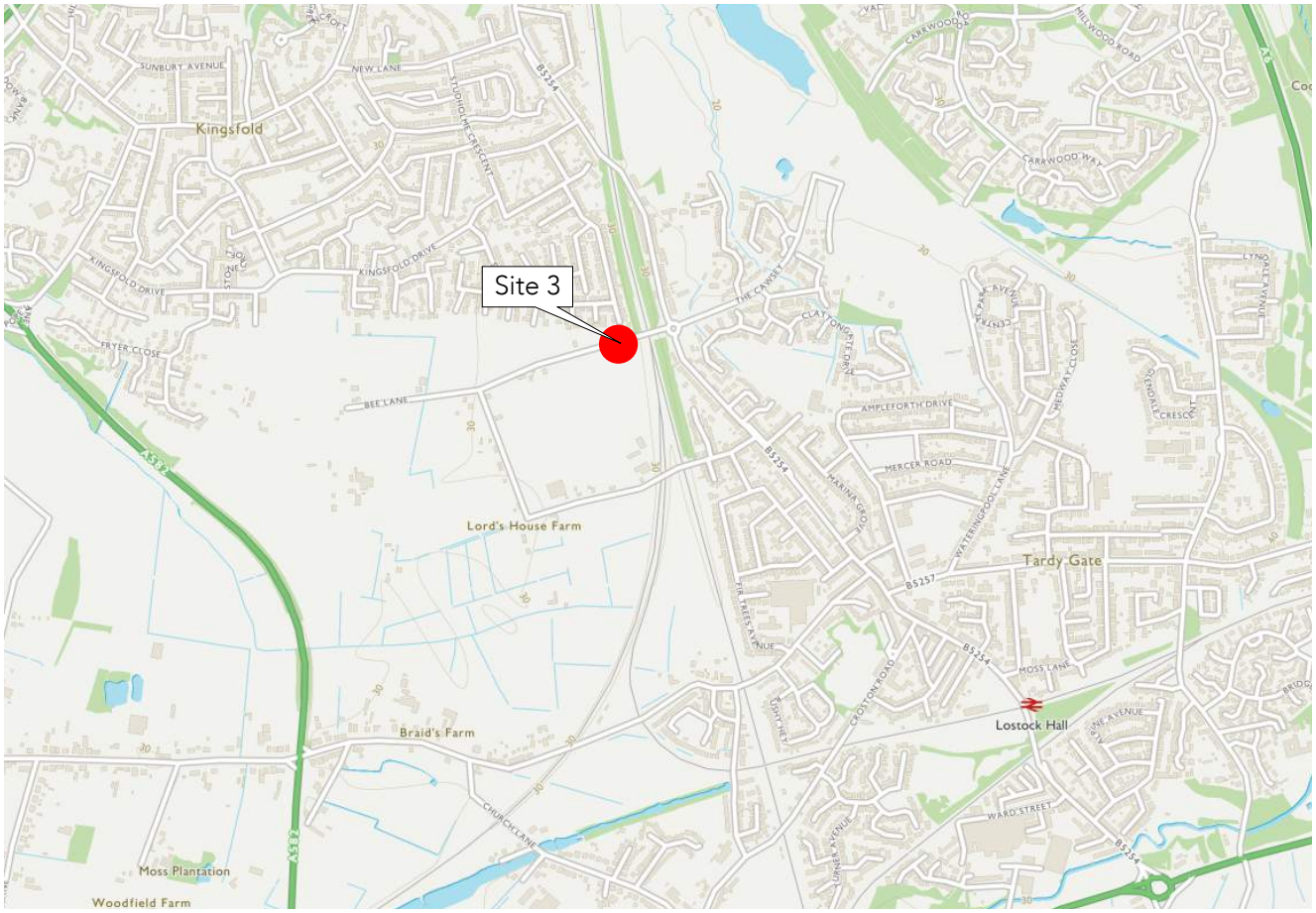
Road Safety Audit Team Member

Signed: 

Name: Ian Medd

Date: 26.11.21

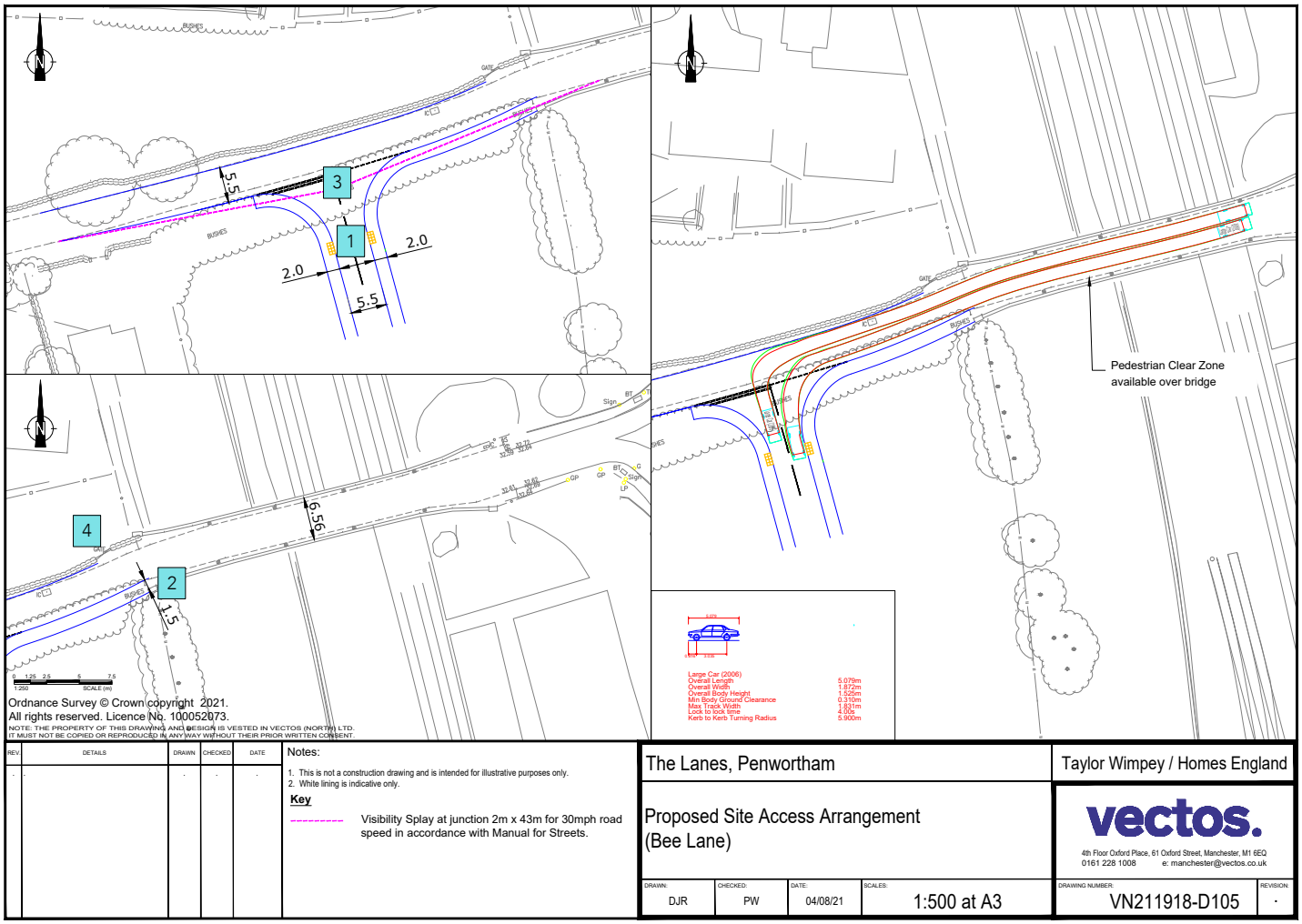
Appendix A - Site Location Plan



Appendix B - Documents provided for Audit

- VN211918-G110
- VN211918 TN04 Bee Lane Access Review
- VN211918-D105 Bee Lane
- VN211918-TR106 Bee Lane - Refuse
- VN211918 The Lanes, Penwortham - Transport Assessment_01a
- RSA1 Brief – The Lanes, Penwortham – New Bee Lane Priority Junction

Appendix C - Problem Location Plan



Location:	Bee Lane - Priority Controlled Site Access Junction
Date:	12-May-22

Severity of Outcome – (S)	Rating Given	Likelihood – (L)	Rating Given	
Minor Harm; Minor damage or loss no injury.	1	Very Unlikely	1	**Rating will apply to both likelihood and severity multiplied to give hazard risk rating**
Moderate Harm; Slight injury or illness, moderate damage or loss.	2	Unlikely	2	
Serious Harm; Serious injury or illness, substantial damage or loss.	3	May Happen	3	
Major Harm; Fatal injury, major damage or loss.	4	Likely	4	
Extreme Harm; Multiple fatalities extreme loss or damage.	5	Almost Certain	5	

Hazard	Risk	S	L	R	Control Measures	S	L	R	Further Action Required	By Whom
RSAS1 Problem 1. Proposed uncontrolled crossing at the priority controlled site access junction are set too far into the minor arm.	Location of the proposed uncontrolled crossing facility may lead to collisions between pedestrians and oncoming traffic due to reduced visibility.	3	3	**9**	Relocate uncontrolled crossing closer to Bee Lane and ensure that the required visibility is achieved between vehicles and pedestrians.See attached plan D105A and overview D111.	3	2	**6**	Proposed highway amendments to be subject to Stages 2 – 3 Road Safety Audit to GG119 Standards. (Stage 1 RSA Already undertaken for proposed site access junction)	Local Authority and Road Safety Audit Team
RSAS1 Problem 2. Proposed footway to the east of the proposed junction protrudes into existing carriagway with substandard existing onward provision.	Pedestrians exposed to collisions with vehicular traffic at the point where the proposed scheme meets the existing footway on the southern side of Bee Lane.	3	3	**9**	Amend the design to remove NMU provisions to the east of the junction on the southern side of Bee Lane. Provide a crossing facility from the proposed junction to the north of Bee Lane. Provide a pedestrian route to tie into the existing facility to the east.	3	2	**6**	Proposed highway amendments to be subject to Stages 2 – 3 Road Safety Audit to GG119 Standards. (Stage 1 RSA Already undertaken for proposed site access junction)	Local Authority and Road Safety Audit Team
RSAS1 Problem 3. Swept path of refuse vehicle overruns opposing carriageway lane of the proposed access junction.	Potential for collisions between vehicles due to visibility between accessing and egressing vehicles.	3	3	**9**	The low frequency of refuse collections reduces the likelihood of a collision occurring. Overrunning of lanes by large vehicles is not an uncommon occurrence. The appropriate junction visibility must be provided.	3	2	**6**	Proposed highway amendments to be subject to Stages 2 – 3 Road Safety Audit to GG119 Standards. (Stage 1 RSA Already undertaken for proposed site access junction)	Local Authority and Road Safety Audit Team
RSAS1 Problem 4. Proposed northern kerb is misaligned with existing field access and may be overrun.	Vehicles egressing the field to the north of the side turning right may strike the kerb leading to loss of control type collisions.	2	2	**4**	None Required	2	2	**4**	Proposed highway amendments to be subject to Stages 2 – 3 Road Safety Audit to GG119 Standards. (Stage 1 RSA Already undertaken for proposed site access junction)	Local Authority and Road Safety Audit Team

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VECTOS (NORTH) LIMITED

Road Safety Audit Designer's Response Report

1 Project Summary

Report Title	New Bee Lane Priority Junction
Date	17th November 2021
Document Reference and Revision:	Bee Lane Access Designer's Response_01
Prepared by:	Daniel Reid
On behalf of:	N/A
AUTHORISATION SHEET	
Project:	The Lanes, Penwortham
Report Title	Bee Lane Bridge Priority
PREPARED BY	
Name:	Daniel Reid / Paul Whitaker
Signed:	
Organisation:	Vectos (North) Ltd
Date:	17th November 2021

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2 Introduction

GENERAL DETAILS:				
Highway scheme name and road number:	**Bee Lane Access on Bee Lane, Penwortham**			
Date:	17th November 2021			
Type of scheme:	New Bee Lane Priority Junction			
RSA Stage:	☒ Stage 1	☐ Stage 2	☐ Stage 3	☒ Stage 4
	Interim			
Road Safety Audit Reference:	261121_J190016_Bee Lane RSA1			
Designer's Response prepared by:	Daniel Reid			
Design organisation details:	Vectos (North) Ltd			

3 Key Personnel

Overseeing Organisation:	Vectos (North) Ltd
RSA Team:	Grange Transport Consulting
Design Organisation:	Vectos (North) Ltd

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4 Road Safety Audit Decision Log

RSA Problem	RSA Recommendation	Design Organisation Response	Overseeing Organisation Response	Agreed RSA Action
1	It is recommended that an appropriate visibility envelope is provided to allow pedestrians to cross safely.	Accepted. Tactile crossing has been moved closer to the junction to ensure appropriate visibility (as shown in updated Drawing No. VN211918-D105 Rev A)		
2	It is recommended that, in the absence of footway facilities on the bridge, the footway is terminated further to the west to provide a smooth transition into the existing alignment.	Accepted. In light of the comments, the design has been amended with the removal of NMU provisions east of the junction on the southern side of Bee Lane, and the introduction of bollards to provide some physical separation from the parapet. This results in a smoother transition such that the path of a vehicle travelling westbound will not strike the footway at the access (as shown in Drawing No. VN211918-D105 Rev A)		
3	It is recommended that sufficient intervisibility is provided to allow approaching drivers to permit safe passage.	Accepted. Sufficient intervisibility will be provided although it should be noted that the low frequency of refuse collections reduces the likelihood of collisions.		

4	It is recommended that the new kerbing is terminated further to the west of the gated access to ensure vehicles can turn out safely.	Accepted. The northern kerb has been removed from the amended design (as shown in Drawing No. VN211918-D105 Rev A).		

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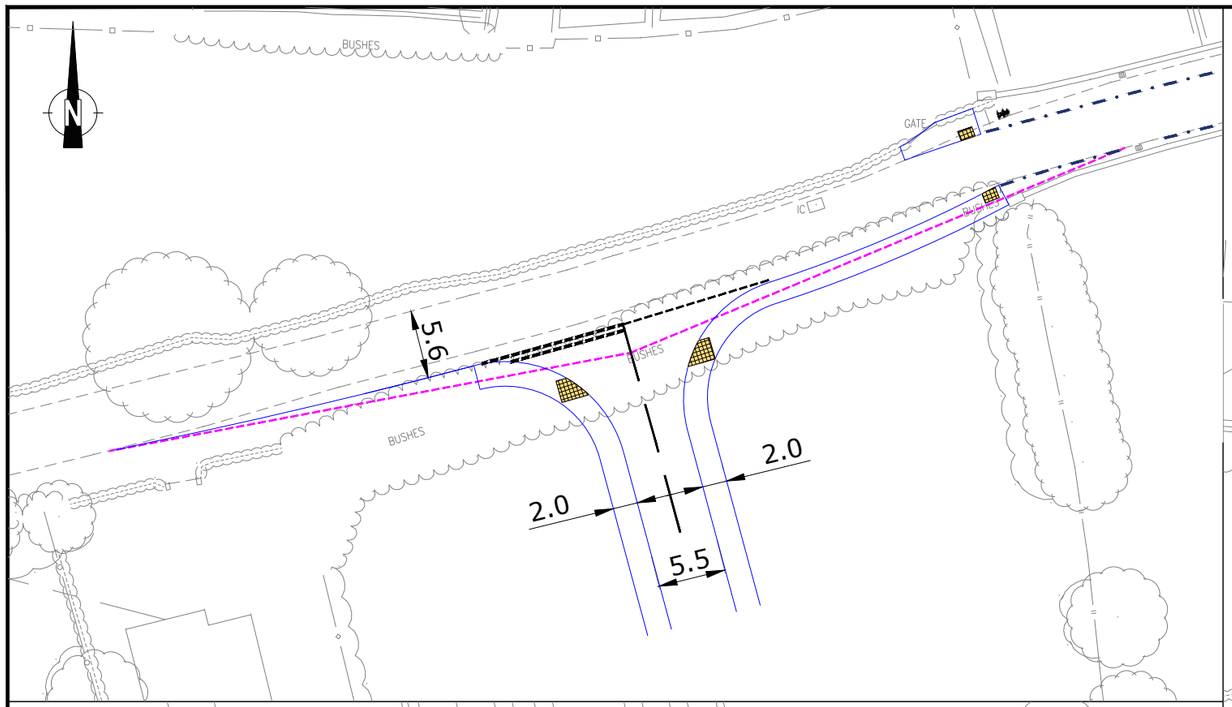
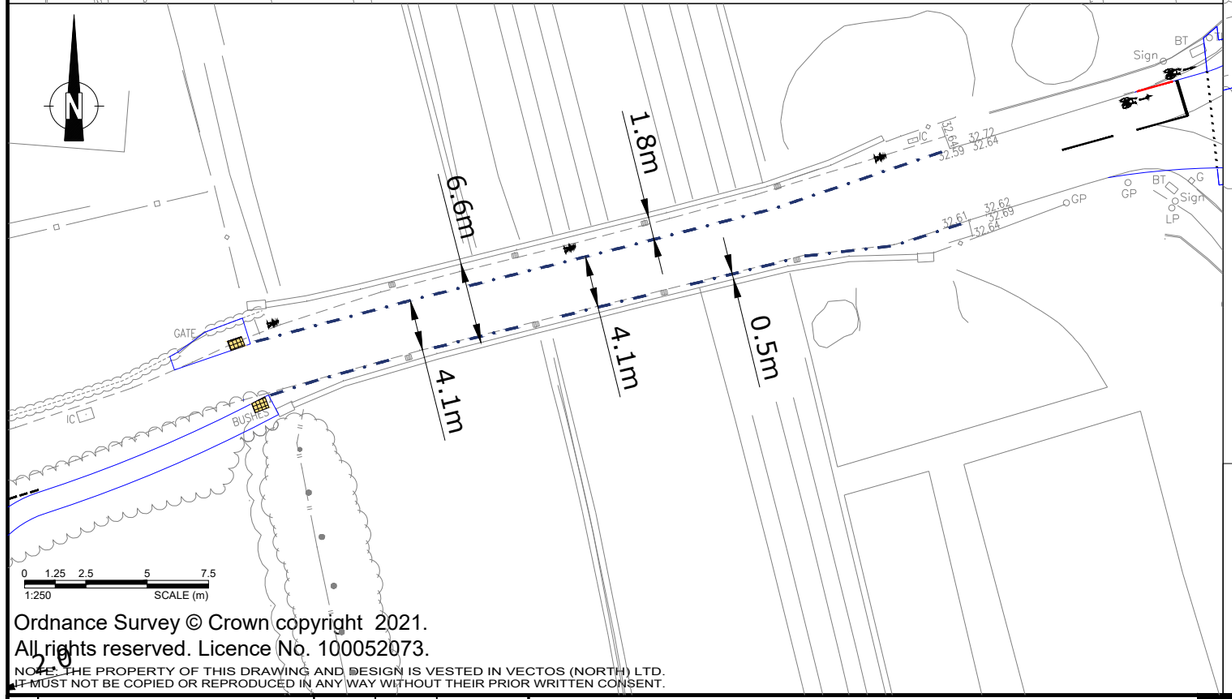
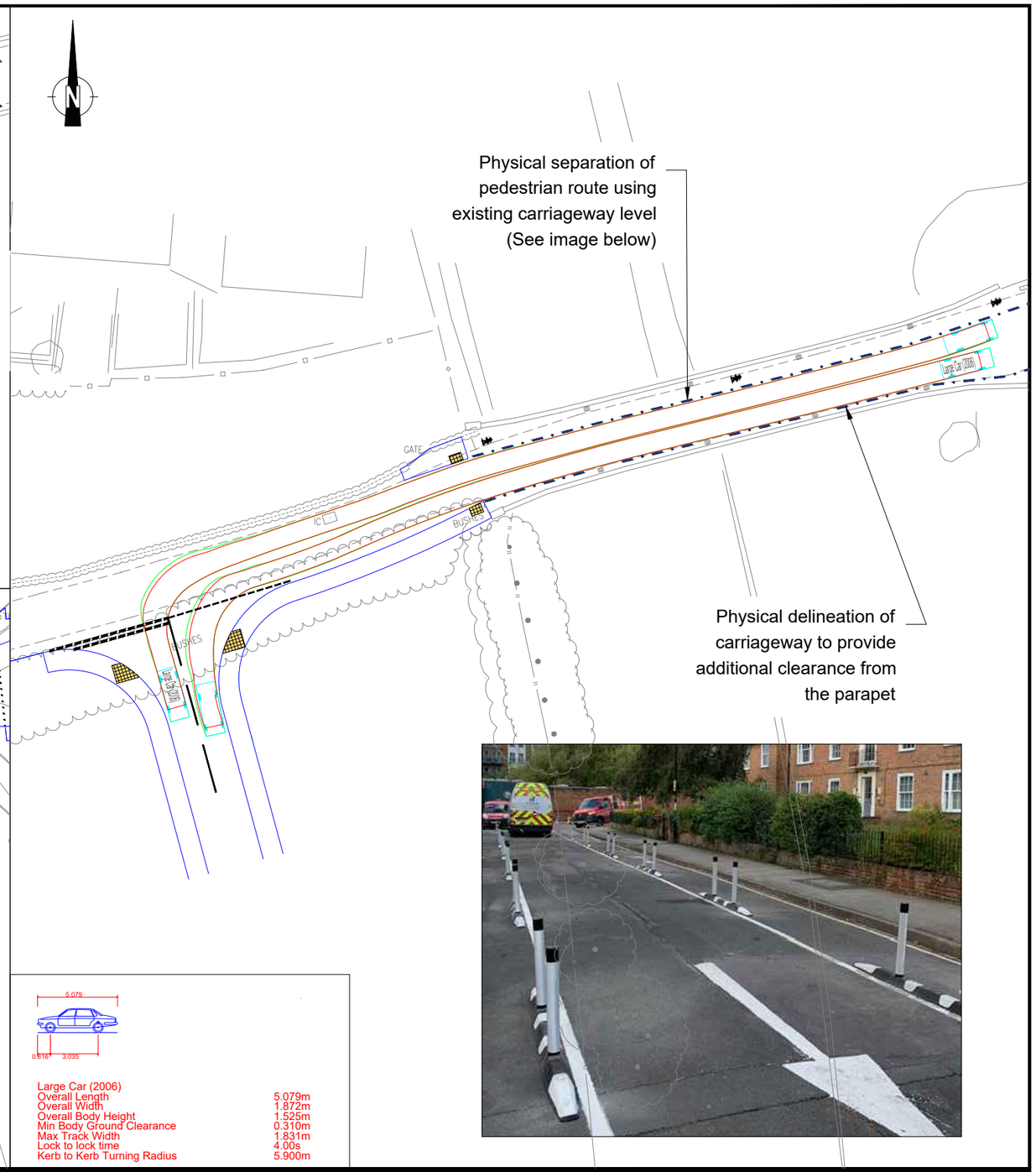
5 Design Organisation and Overseeing Organisation Statements

On behalf of the Design Organisation I certify that: The RSA actions identified in response to the road safety audit problems in the road safety audit have been discussed and agreed with the Overseeing Organisation.	
Name	Paul Whitaker
Signed	
Position	Associate Director
Organisation	Vectos (North) Ltd
Date	01.03.2022

On behalf of the Overseeing Organisation I certify that: The RSA actions identified in response to the road safety audit problems in the road safety audit have been discussed and agreed with the design organisation; and The agreed RSA actions will be progressed.	
Name	Neil Stevens
Signed	
Position	Highway Development Control Manager
Organisation	Lancashire County Council
Date	







Large Car (2006)	
Overall Length	5.079m
Overall Width	1.872m
Overall Body Height	1.525m
Min Body Ground Clearance	0.310m
Max Track Width	1.831m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	5.900m

REV.	DETAILS	DRAWN	CHECKED	DATE
A	Amendments to Alignment	DJR	PW	29.03.22

Notes:

1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.
3. This drawing is to be read in conjunction with the following drawings:

- VN211918-D107-B Proposed Bee Lane Improvements (Signalised Junction Option)
- VN211918-D111 Overview Plan

Key

---------- Visibility Splay at junction 2m x 43m for 30mph road speed in accordance with Manual for Streets.

The Lanes, Penwortham

Taylor Wimpey / Homes England

Proposed Site Access Arrangement (Bee Lane)

vectos.
4th Floor Oxford Place, 61 Oxford Street, Manchester, M1 6EQ
0161 228 1008 e: manchester@vectos.co.uk

DRAWN:	CHECKED:	DATE:	SCALES:	DRAWING NUMBER:	REVISION:
DJR	PW	04/08/21	1:500 at A3	VN211918-D105	A

The Lanes, B5254 Leyland Road / The Cawsey / Bee Lane, Penwortham

Stage 1 Road Safety Audit

Vectos (North) Ltd

26 November 2021

Grange Transport Consulting

The Lanes, B5254 Leyland Road / The Cawsey / Bee Lane, Penwortham

Stage 1 Road Safety Audit

November 2021

Client: Vectos (North) Ltd

Rev	Report Reference	Date	Issue Status	Prepared	Checked
-	261121_J190016_B5254 Leyland Road RSA1.docx	26.10.21	Final	WL	IM

CONTENTS

1. Introduction

1.1 General

1.1.1 This report results from a Stage 1 Road Safety Audit (RSA) carried out on Tuesday 23 November 2021. The audit was undertaken on behalf of Vectos (North) Ltd.

1.1.2 The audit was carried out in response to a brief supplied by Paul Whitaker of Vectos (North) Ltd and agreed with the audit team.

1.1.3 The Road Safety Audit team comprised of the following individuals:

Wing Lee BEng(Hons), PGCert, HE CoC, MCHIT, MIHE

Audit Team Leader

Ian Medd MCHIT, FSoRSA

Audit Team Member

1.1.4 A site visit was undertaken by the Audit Team on Tuesday 23 November 2021, between the hours of 13:30 and 15:00. The weather was dry and cloudy and the road surface was dry. Traffic was moderate and moderate levels of pedestrians were observed.

1.1.5 The B5254 is a single carriageway distributor road that connects the A582 in the south and the A59 to the north. This section of the B5254 predominently serves residential properties on both sides and is subject to a 30mph speed limit in the vicinity of the proposed junction site. The B5254 serves as a two-way bus route.

1.1.6 The Cawsey connects with the A6 to the east and predominently serves residential dwellings. Footway/cycleways are provided on both side of The Cawsey, which is subject to a 30mph speed limit and has street lighting.

1.1.7 Bee Lane routes from the B5254 in an west-to-east alignment. It is a cul-de-sac and serves a small number of residential dwellings and commercial units. In the vicinity of the proposed access junction short sections of footways are provided on both sides upto a railway bridge. Bee Lane is subject to a 30mph speed limit and has varying carriageway widths, with an average of circa 4.8m.

1.1.8 The terms of reference of the Road Safety Audit are as described in the Design Manuals for Roads and Bridges (DMRB) standard - GG119 Road Safety Audit.

1.1.9 The Audit Team has examined and reported only on the road safety implications of the scheme as presented by Vectos and has not examined or verified the compliance of the designs to any other criteria. However, to clearly explain a safety problem or the recommendation to resolve a problem the Audit Team may, on occasion, have referred to design standards without touching on technical audit.

1.1.10 A residential-led development is proposed on land to the west of Leyland Road for up to 1,350 dwellings with associated community infrastructure. The primary vehicular access is proposed via a new junciton on the A582 Penwortham Way. A secondary access is proposed on Bee Lane, along with off-site junction improvement schemes.

1.1.11 The proposals submitted for Stage 1 RSA relate to the provision of a signal controlled junction to replace the existing 4-arm roundabout at the B5254 Leyland Road / The Cawsey / Bee Lane junction (Site 2). The proposals include controlled pedestrian crossing facilities across all arms of the junction.

1.1.12 A list of the documents and drawings submitted for this Stage 1 RSA can be found at Appendix B.

1.1.13 The submitted design drawings have been annotated to show the location of problems identified during this Stage 1 Road Safety Audit. These plans are shown at Appendix C.

1.1.14 The recommendations offered within this report should not be regarded as prescriptive. Whilst recommendations have been made with this report, there may be equally satisfactory or superior alternative solutions to the identified problems. The Audit Team will be pleased to consider any alternatives if required.

1.2 Departures from Standards

1.2.1 The Audit Team has not been informed of any departures from standards relating to the designs submitted for audit.

2. Problems identified from this audit

2.1 The B5254 Leyland Road / The Cawsey / Bee Lane junction

2.1.1 The following provides details of the problems identified during this Stage 1 Road Safety Audit.

Problem 1	
Location	B5254 - Southbound stop line
Summary	Risk of vehicles emerging onto stop line from access

A dropped kerb and "grasscrete" access emerges onto the B5254 at a point where it appears to straddle the southbound stop line. This may lead to driver confusion and injudicious manoeuvres, increasing the risk of collisions with emerging traffic.

Recommendation	It is recommended that the stop line is relocated to avoid this access

Problem 2	
Location	The Cawsey - Narrow pedestrian refuge/traffic island
Summary	Refuge/island too narrow to safely accommodate waiting pedestrians
The narrow island on the westbound approach to the junction from The Cawsey appears too narrow to safely accommodate waiting pedestrians and cyclists, and may not be wide enough to protect any proposed traffic signal heads. This may result in passing vehicles striking pedestrians or street furniture.	
Recommendation	It is recommended that the refuge is enlarged to a width appropriate to safely accommodate pedestrians and cyclists

Problem 3	
Location	The Cawsey junction
Summary	No facilities to access the shared-use facilities on The Cawsey
It was noted during the site inspection that The Cawsey has shared cycle/footway provision on both sides of the carriageway. However, no facilities have been proposed to allow cyclists to leave or enter these routes at the junction. This may result in cyclists attempting to join or leave these facilities over full height kerbs risking loss of control and collision with passing traffic.	
Recommendation	It is recommended that facilities are provided to allow cyclists to enter and leave the shared-use routes safely

Problem 4	
Location	The Cawsey
Summary	Parked vehicles in the vicinity of the junction

It was observed during the site inspection that a number of cars park on the carriageway to the east of the proposed junction/kerbing alignment. This may lead to passing vehicles approaching the junction to use the opposite lane in order to 'race the lights', resulting in head-on collisions.

Recommendation	It is recommended that parking controls are implemented in order to prevent vehicles obstruction the junction

Problem 5	
Location	Bee Lane – southern side
Summary	Southern footway too narrow for pedestrians

The southern footway on the Bee Lane approach to the junction appears to be narrower than the existing alignment, which is approximately 800mm wide. Consequently, pedestrians will be forced into the carriageway where they may be struck by traffic turning into Bee Lane.

Recommendation	It is recommended that safe pedestrian provision is provided into Bee Lane

Problem 6	
Location	Bee Lane – southern side
Summary	Proximity of southern kerbing close to existing fencing

The southern carriageway on the Bee Lane approach to the junction appears to run close to the fencing for a compound on the southern side of the road. This may lead to westbound vehicles colliding with the fencing or swerving into the opposite lane to avoid the fencing.

Recommendation	Provide sufficient clearance between the kerb and existing fencing.

Problem 7	
Location	Bee Lane - Northern footway
Summary	Footway alignment may be struck by vehicles

The proposed footway/carriageway terminates abruptly. The alignment of the kerbing is such that is may be struck by eastbound vehicles, causing loss of control.

Recommendation	Provide measures to direct vehicles away from striking the kerb.

3. Audit Team Statement

3.1.1 We certify that the drawings listed at **Appendix B** have been examined, and that this Audit has been carried out in accordance with the requirements of GG119, with the sole purpose of identifying road safety matters to be addressed in order to improve the safety of the scheme.

Road Safety Audit Team Leader

Signed: 

Name: Wing Lee

Date: 26.11.21

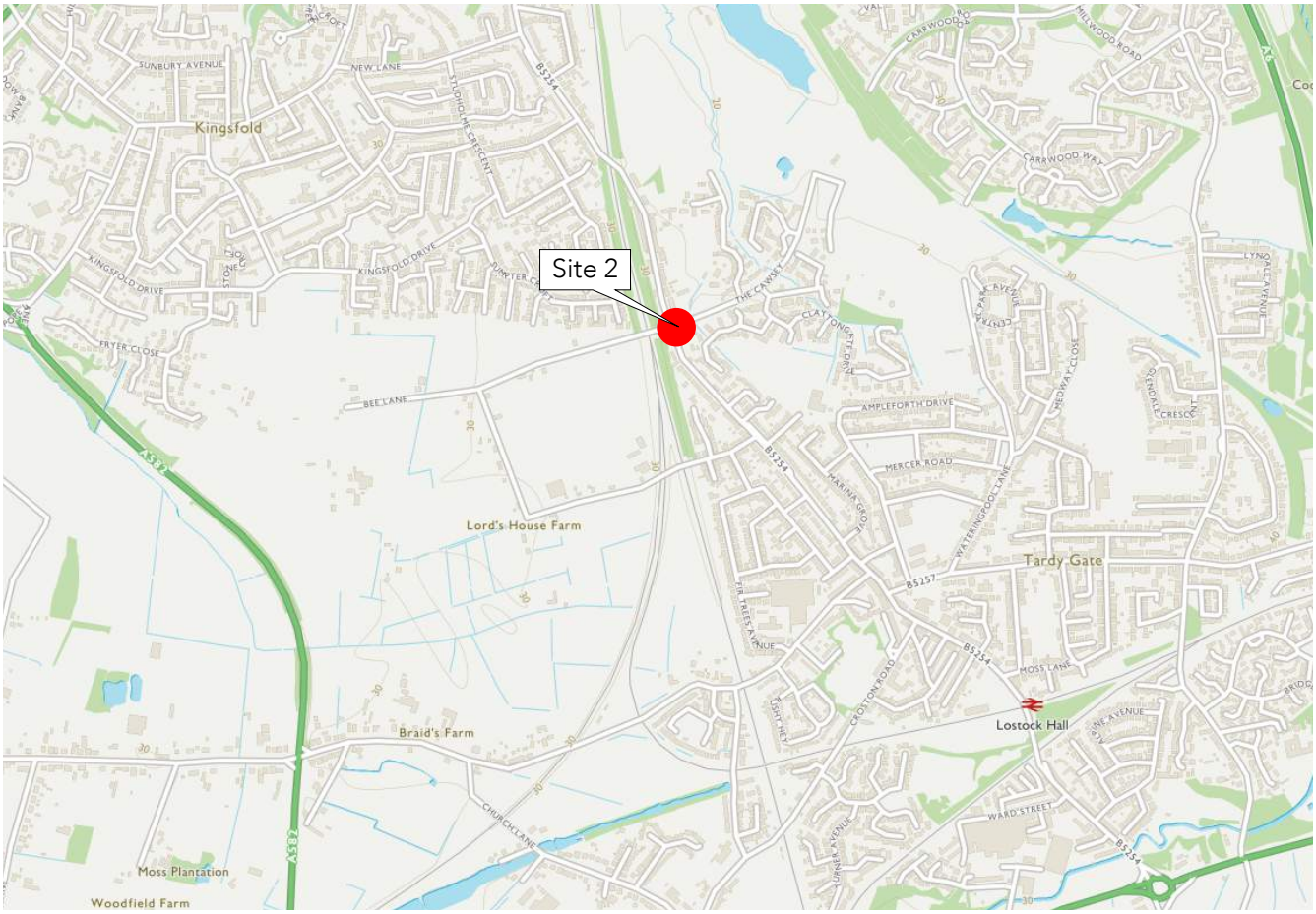
Road Safety Audit Team Member

Signed: 

Name: Ian Medd

Date: 26.11.21

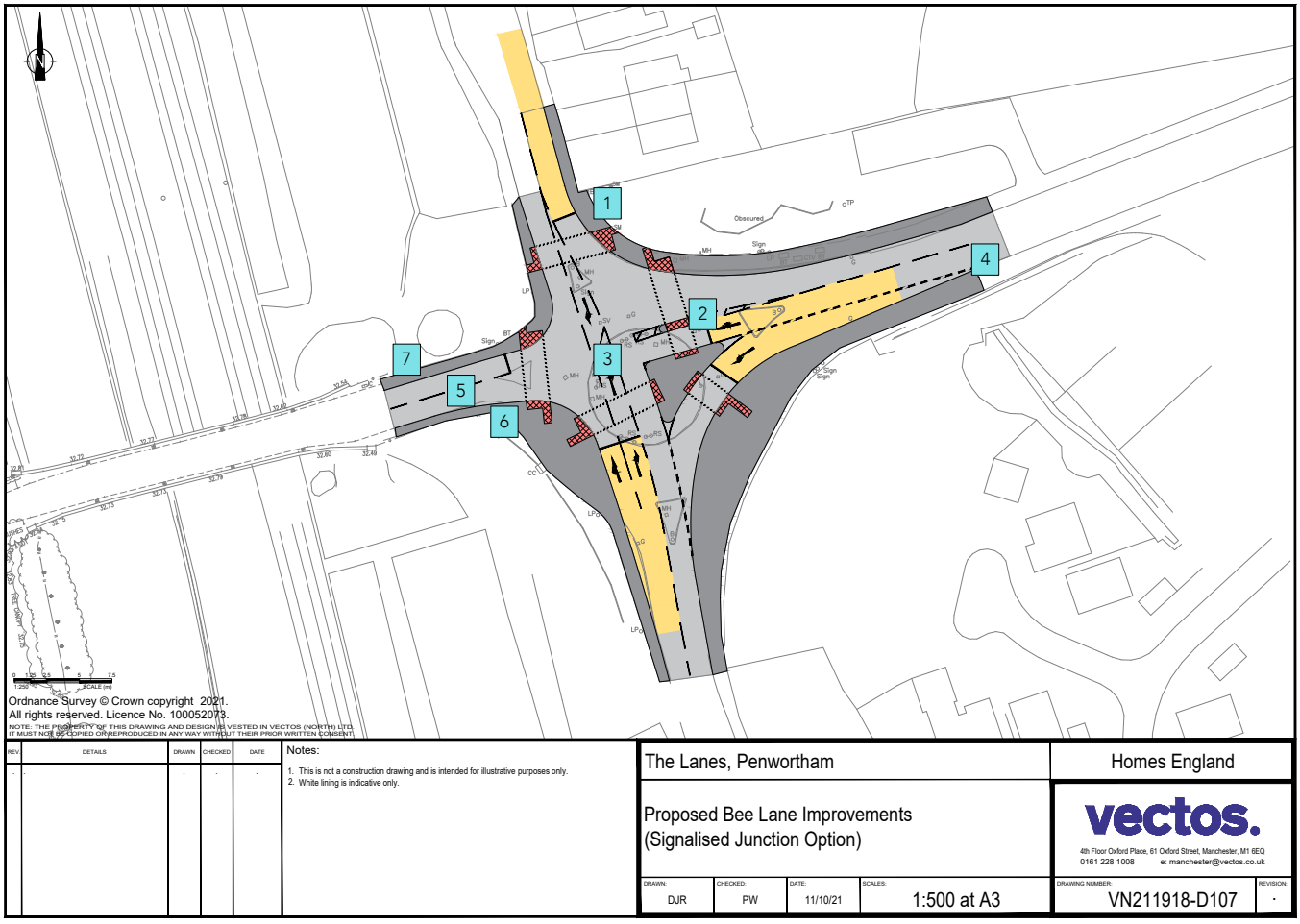
Appendix A - Site Location Plan



Appendix B - Documents provided for Audit

- VN211918-G110
- VN211918 TN04 Bee Lane Access Review
- VN211918-D107 Bee Lane Signalised Junction
- VN211918-TR102 11.5m Refuse Vehicle
- VN211918-TR103 Max Legal
- VN211918 The Lanes, Penwortham - Transport Assessment_01a
- RSA1 Brief – The Lanes, Penwortham – New Leyland Road-Bee Lane Signal Junction

Appendix C - Problem Location Plan



Location:	Leyland Road / The Cawsey / Bee Lane - Signal Controlled Junction
Date:	12-May-22

Severity of Outcome – (S)	Rating Given	Likelihood – (L)	Rating Given	
Minor Harm; Minor damage or loss no injury.	1	Very Unlikely	1	**Rating will apply to both likelihood and severity multiplied to give hazard risk rating**
Moderate Harm; Slight injury or illness, moderate damage or loss.	2	Unlikely	2	
Serious Harm; Serious injury or illness, substantial damage or loss.	3	May Happen	3	
Major Harm; Fatal injury, major damage or loss.	4	Likely	4	
Extreme Harm; Multiple fatalities extreme loss or damage.	5	Almost Certain	5	

Hazard	Risk	S	L	R	Control Measures	S	L	R	Further Action Required	By Whom
RSAS1 Problem 1. Dropped kerb and grasscrete existing access to the east of the proposed northern arm stop line.	Drivers egressing the existing crossover arrangement will be unable to see the new signal head and make safe entry to the carriageway leading to side swipe type collisions.	2	3	**6**	Proposed southbound stop line will be relocated such that the grasscrete crossover has visibility to appropriate signal heads. See attached plan D107B and D111 overview	2	1	**2**	Proposed highway amendments to be subject to Stages 2 – 3 Road Safety Audit to GG119 Standards. (Stage 1 RSA Already undertaken for proposed site access junction)	Local Authority and Road Safety Audit Team
RSAS1 Problem 2. Narrow traffic island to the east of the proposed junction may lead to overhanging signal equipment. Traffic island does not provide enough width for crossing NMU's.	The narrow width of the traffic island may lead to vehicles striking the signal head or pedestrians waiting.	3	3	**9**	Enlarge or remove traffic island.	3	1	**3**	Proposed highway amendments to be subject to Stages 2 – 3 Road Safety Audit to GG119 Standards. (Stage 1 RSA Already undertaken for proposed site access junction)	Local Authority and Road Safety Audit Team
RSAS1 Problem 3. Shared use cycleway on the Cawsey has no means for cyclists to enter / leave the vehicular carriageway.	Lack of means for cyclists to access / leave the carriageway may lead to collisions between NMU's and vehicular traffic or loss of control type collisions to cyclists.	3	3	**9**	Ensure provision for cyclists to access / egress the shared use facility is provided.	3	1	**3**	Proposed highway amendments to be subject to Stages 2 – 3 Road Safety Audit to GG119 Standards. (Stage 1 RSA Already undertaken for proposed site access junction)	Local Authority and Road Safety Audit Team
RSAS1 Problem 4. Existing parked cars on The Cawsey	Parked cars may lead to vehicles approaching the junction straddling the oncoming lane potentially leading to head on collisions.	3	2	**6**	Ensure parking prohibition is included as part of the junction design.	3	1	**3**	Proposed highway amendments to be subject to Stages 2 – 3 Road Safety Audit to GG119 Standards. (Stage 1 RSA Already undertaken for proposed site access junction)	Local Authority and Road Safety Audit Team

Table continued below

Table (continued)

Hazard	Risk	S	L	R	Control Measures	S	L	R	Further Action Required	By Whom

vectos.

VECTOS (NORTH) LIMITED

Road Safety Audit Designer's Response Report

1 Project Summary

Report Title	New Leyland Road-Bee Lane Signal Junction
Date	17th November 2021
Document Reference and Revision:	Leyland Road Bee Lane Designer's Response_01a
Prepared by:	Daniel Reid
On behalf of:	Vectos (North) Ltd
AUTHORISATION SHEET	
Project:	The Lanes, Penwortham
Report Title	New Leyland Road-Bee Lane Signal Junction
PREPARED BY	
Name:	Daniel Reid / Paul Whitaker
Signed:	
Organisation:	Vectos (North) Ltd
Date:	17th November 2021

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2 Introduction

GENERAL DETAILS:				
Highway scheme name and road number:	**Bee Lane Access on Bee Lane, Penwortham**			
Date:	17th November 2021			
Type of scheme:	New Leyland Road-Bee Lane Signal Junction			
RSA Stage:	☒ Stage 1	☐ Stage 2	☐ Stage 3	☒ Stage 4
	Interim			
Road Safety Audit Reference:	261121_J190016_B5254 Leyland Road RSA1			
Designer's Response prepared by:	Daniel Reid			
Design organisation details:	Vectos (North) Ltd			

3 Key Personnel

Overseeing Organisation:	Vectos (North) Ltd
RSA Team:	Grange Transport Consulting
Design Organisation:	Vectos (North) Ltd

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4 Road Safety Audit Decision Log

RSA Problem	RSA Recommendation	Design Organisation Response	Overseeing Organisation Response	Agreed RSA Action
1	It is recommended that the stop line is relocated to avoid this access.	Accepted. The stop line has now been moved south away from the access/dropped kerb (as shown in Drawing No. VN211918-D107 Rev B). Suitable sight of the signal head will be available and swept path analysis has been carried out using a 7.5t panel van – the manoeuvre works without effecting the proposed junction or oncoming lanes.		
2	It is recommended that the refuge is enlarged to a width appropriate to safely accommodate pedestrians and cyclists.	Accepted. Although the refuge was not intended to break up the crossing into two movements, and therefore pedestrians and cyclists would not be caught mid-crossing, the refuge island has been widened to 2.5m and the previously shown tactile paving on the refuge has been removed (as shown in Drawing No. VN211918-D107 Rev B).		
3	It is recommended that facilities are provided to allow cyclists to enter and leave the shared-use routes safely.	Accepted. Dropped kerbs and cycle markings have been added at each arm to denote where cyclists will be encouraged to enter and exit the shared use facilities safely (as shown in Drawing No. VN211918-D107 Rev B).		

4	It is recommended that parking controls are implemented in order to prevent vehicles obstruction the junction.	Accepted. Parking restrictions have been included on the Cawsey to prevent vehicles from blocking the carriageway and shared-use facilities (as shown in Drawing No. VN211918-D107 Rev B).		
5	It is recommended that safe pedestrian provision is provided into Bee Lane.	Accepted. The design has been amended so that the southern footway terminates and pedestrians are encouraged to use the signalled crossing and defined pedestrian route on the northern side of the carriageway.		
6	Provide sufficient clearance between the kerb and existing fencing.	Accepted. Sufficient clearance is provided with the proposed kerb line providing a smoother transition onto the Bee Lane approach which gives vehicles more time to get into the required position. Vehicle tracking highlights that there is sufficient clearance (as shown in Drawing No. VN211918-TR103).		
7	Provide measures to direct vehicles away from striking the kerb.	Accepted. The amended design shown in Drawing No. VN211918-D107 Rev B now includes a continuous pedestrian route along the norther side of the carriageway such that vehicles will be directed away from striking the kerb.		

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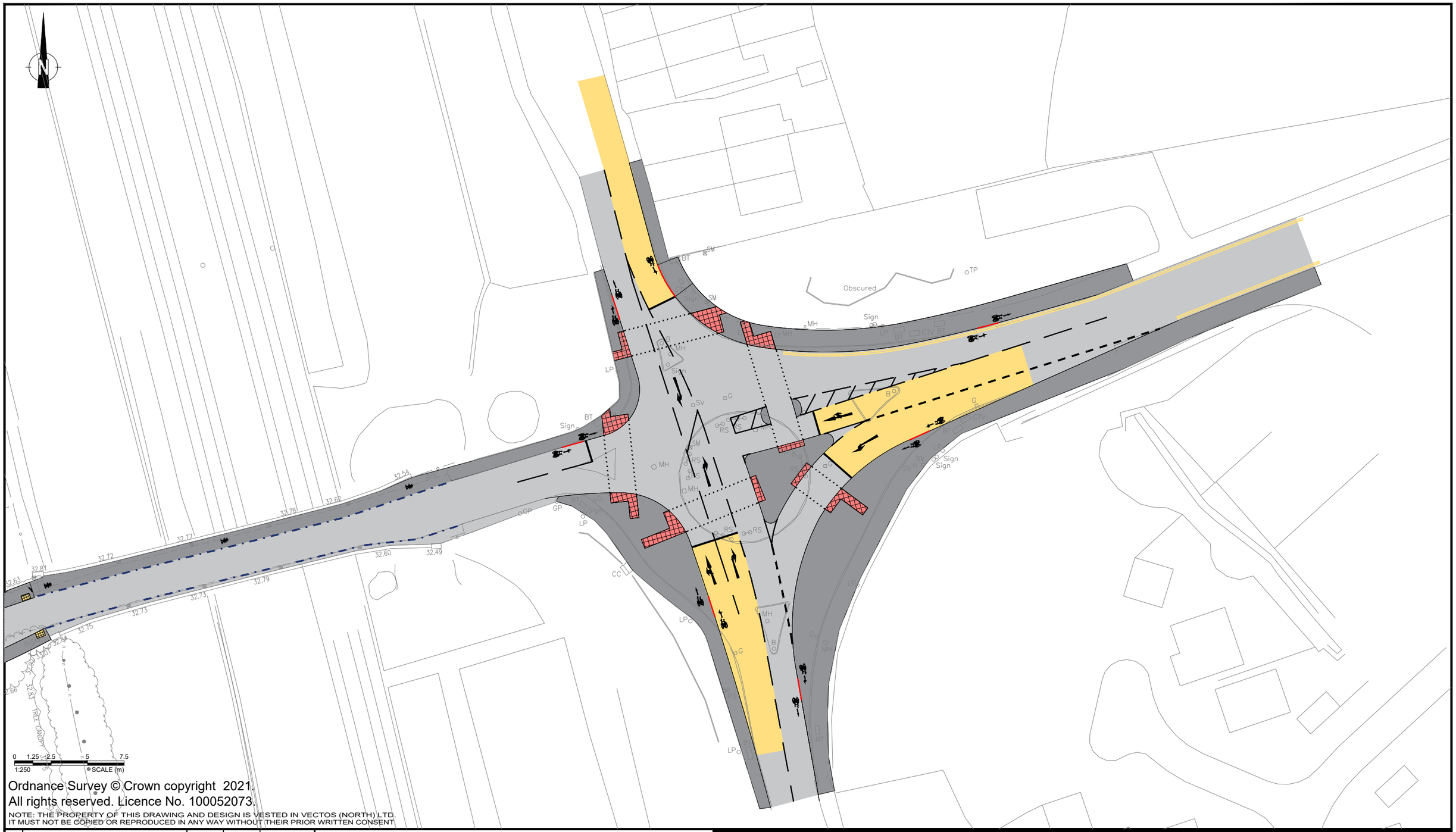
5 Design Organisation and Overseeing Organisation Statements

On behalf of the Design Organisation I certify that: The RSA actions identified in response to the road safety audit problems in the road safety audit have been discussed and agreed with the Overseeing Organisation.	
Name	Paul Whitaker
Signed	
Position	Associate Director
Organisation	Vectos (North) Ltd
Date	01.03.2022

On behalf of the Overseeing Organisation I certify that: The RSA actions identified in response to the road safety audit problems in the road safety audit have been discussed and agreed with the design organisation; and The agreed RSA actions will be progressed.	
Name	Neil Stevens
Signed	
Position	Highway Development Control Manager
Organisation	Lancashire County Council
Date	



REV.	DETAILS	DRAWN	CHECKED	DATE
A	Updated Alignment	DJR	PW	16.12.21
B	Updated Alignment	DJR	PW	14.03.22

Notes:

1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.
3. This drawing is to be read in conjunction with the following drawings:

- VN211918-D105-A Proposed Site Access Arrangement (Bee Lane)
- VN211918-D111 Overview Plan

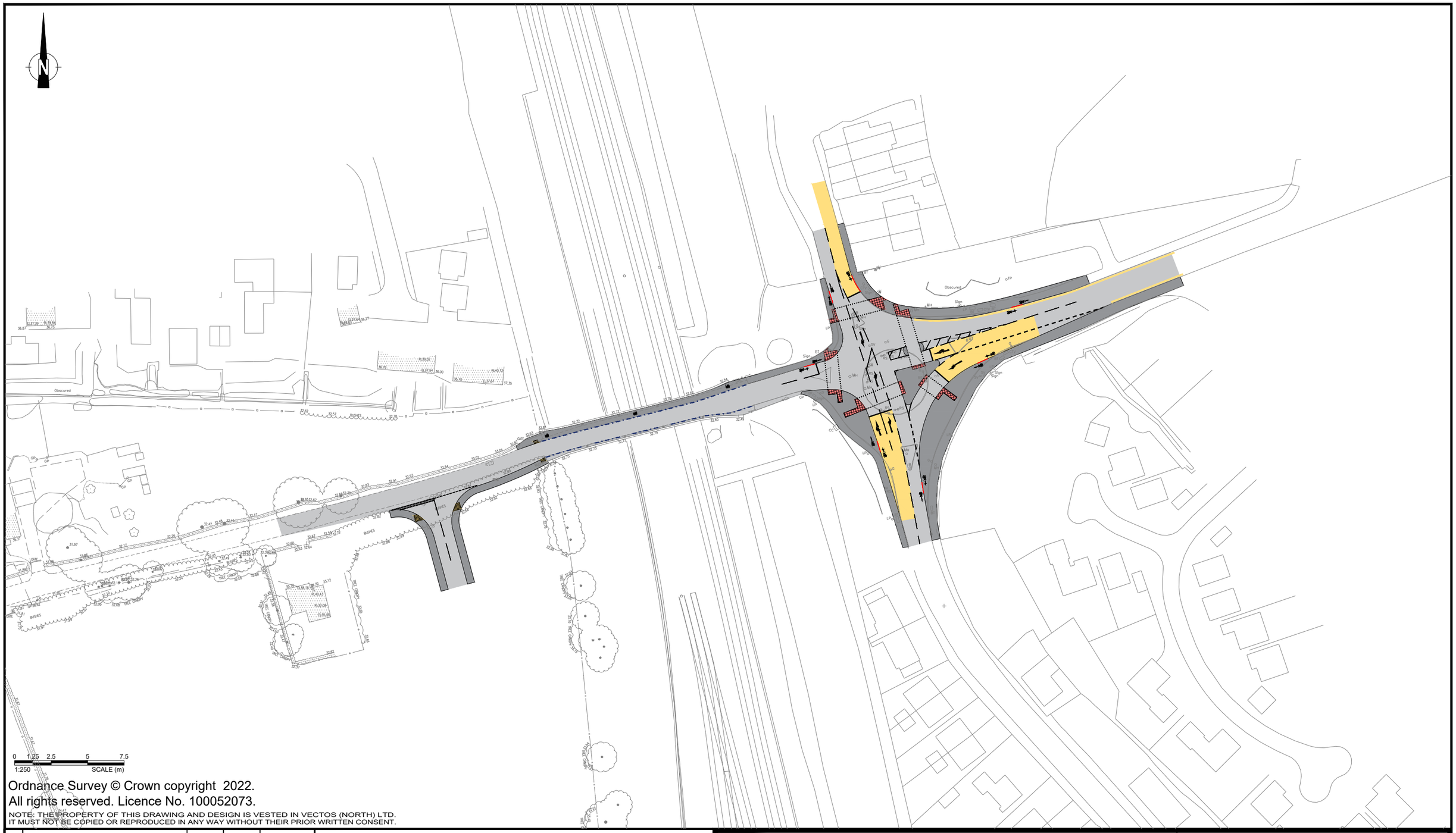
The Lanes, Penwortham

Proposed Bee Lane Improvements (Signalised Junction Option)

Homes England

vectos.
4th Floor Oxford Place, 61 Oxford Street, Manchester, M1 6EQ
0161 228 1008 e: manchester@vectos.co.uk

DRAWN:	CHECKED:	DATE:	SCALES:	DRAWING NUMBER:	REVISION:
DJR	PW	11/10/21	1:500 at A3	VN211918-D107	B



REV.	DETAILS	DRAWN	CHECKED	DATE

Notes:

1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.
3. For more detailed information, please refer to the following drawings:

- VN211918-D105-A Proposed Site Access Arrangement (Bee Lane)
- VN211918-D107-B Proposed Bee Lane Improvements (Signalised Junction Option)

The Lanes, Penwortham

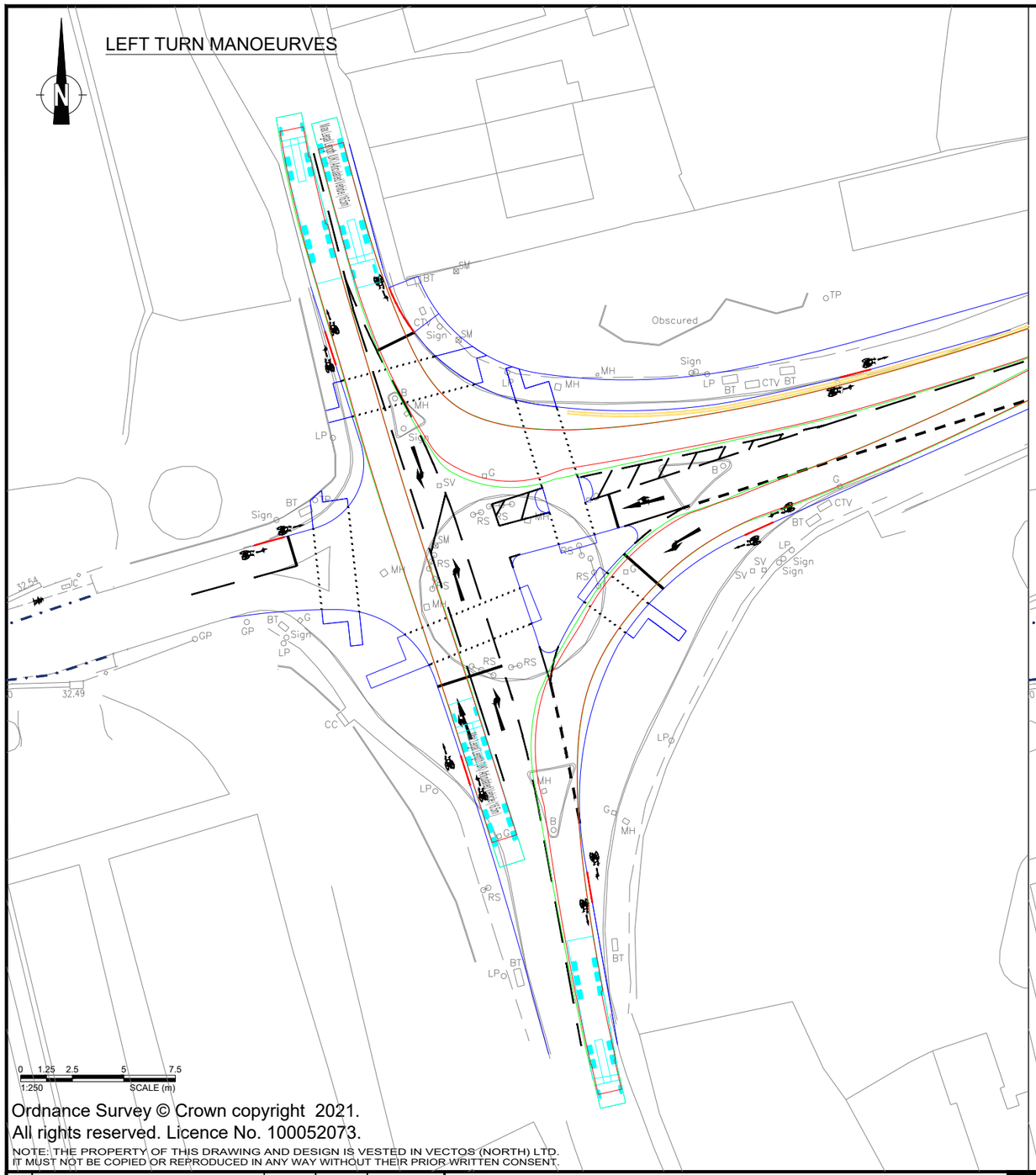
Homes England

Proposed Bee Lane Improvements (Overview)

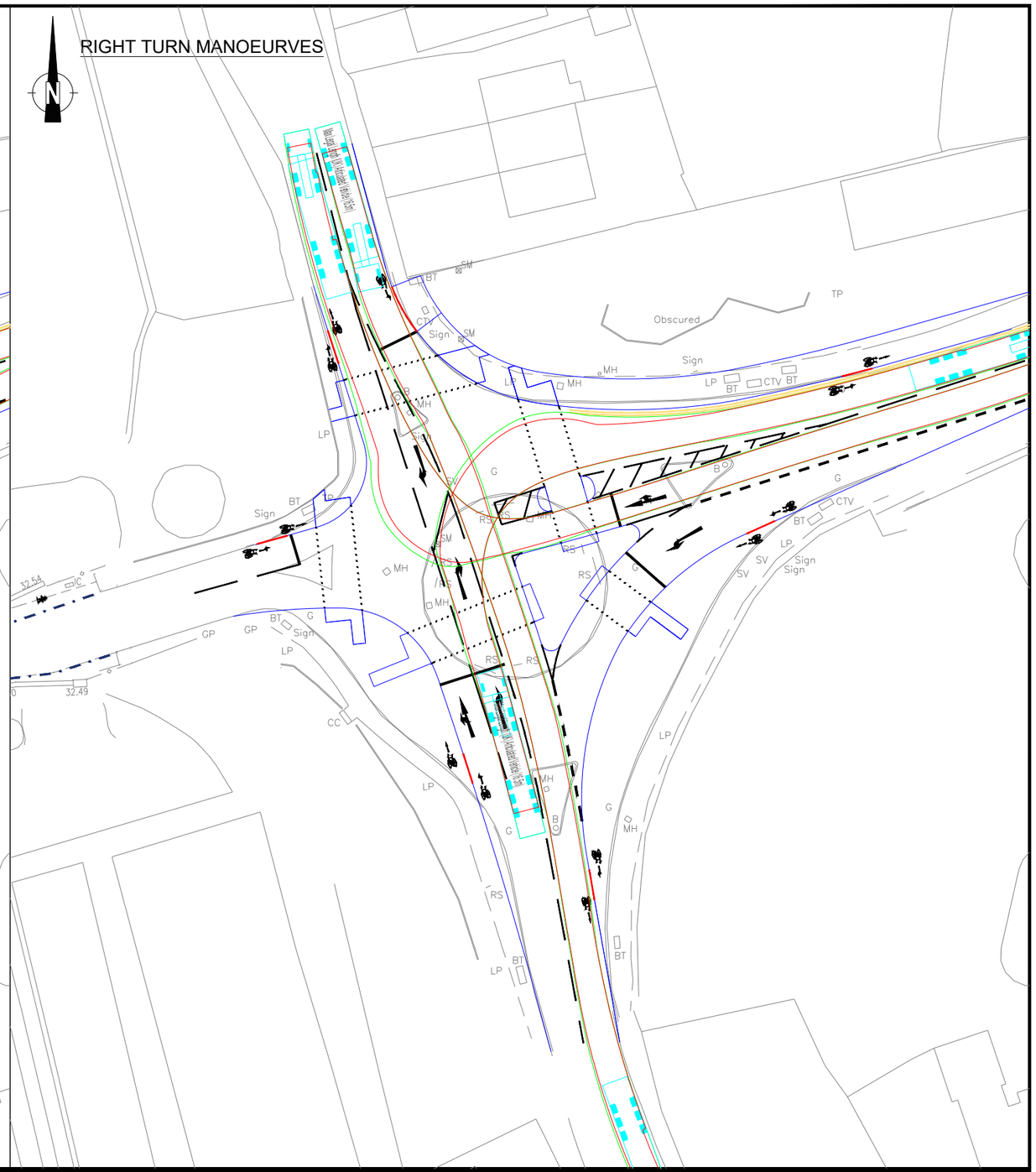
vectos.
4th Floor Oxford Place, 61 Oxford Street, Manchester, M1 6EQ
0161 228 1008 e: manchester@vectos.co.uk

DRAWN:	CHECKED:	DATE:	SCALES:	DRAWING NUMBER:	REVISION:
DJR	PW	14/03/22	1:1000 at A3	VN211918-D111	

LEFT TURN MANOEURVES



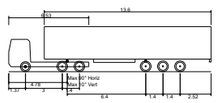
RIGHT TURN MANOEURVES



REV.	DETAILS	DRAWN	CHECKED	DATE
A	Updated Site Layout	DJR	PW	30.03.22

Notes:

1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.



Max Legal Length (UK) Articulated Vehicle (16.5m)

Overall Length	16.500m
Overall Width	2.550m
Overall Body Height	3.681m
Min Body Ground Clearance	0.411m
Max Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	7.200m

The Lanes, Penwortham

Homes England

Swept Path Analysis - 16.5m Articulated Vehicle

vectos.
4th Floor Oxford Place, 61 Oxford Street, Manchester, M1 6EQ
0161 228 1008 e: manchester@vectos.co.uk

DRAWN:	CHECKED:	DATE:	SCALES:	DRAWING NUMBER:	REVISION:
DJR	PW	11/10/21	1:500 at A3	VN211918-TR103	A

The Lanes, A582 Penwortham Way, Penwortham

Stage 1 Road Safety Audit

Vectos (North) Ltd

26 November 2021

Grange Transport Consulting

The Lanes, A582 Penwortham Way, Penwortham
Stage 1 Road Safety Audit

November 2021

Client: Vectos (North) Ltd

Rev	Report Reference	Date	Issue Status	Prepared	Checked
-	261121_J190016_Penwortham Way RSA1.docx	26.10.21	Final	WL	IM

CONTENTS

1. Introduction

1.1 General

1.1.1 This report results from a Stage 1 Road Safety Audit (RSA) carried out on Tuesday 23 November 2021. The audit was undertaken on behalf of Vectos (North) Ltd.

1.1.2 The audit was carried out in response to a brief supplied by Paul Whitaker of Vectos (North) Ltd and agreed with the audit team.

1.1.3 The Road Safety Audit team comprised of the following individuals:

Wing Lee BEng(Hons), PGCert, HE CoC, MCHIT, MIHE

Audit Team Leader

Ian Medd MCHIT, FSoRSA

Audit Team Member

1.1.4 A site visit was undertaken by the Audit Team on Tuesday 23 November 2021, between the hours of 15:00 and 16:00. The weather was wet and windy and the road surface was slightly damp. Traffic was moderate and no pedestrians nor cyclists were observed passing the site.

1.1.5 The A582 Penwortham Way is a single carriageway distributor road, subject to a 50mph speed limit. Street lighting is present and central hatching is provided for the majority of the section between Pope Lane and Chain House Lane. Fields are located on both sides of the A582 and separated from the carriageway by verges, trees and embankments.

1.1.6 The terms of reference of the Road Safety Audit are as described in the Design Manuals for Roads and Bridges (DMRB) standard - GG119 Road Safety Audit.

1.1.7 The Audit Team has examined and reported only on the road safety implications of the scheme as presented by Vectos and has not examined or verified the compliance of the designs to any other criteria. However, to clearly explain a safety problem or the recommendation to resolve a problem the Audit Team may, on occasion, have referred to design standards without touching on technical audit.

1.1.8 A residential-led development is proposed on land to the west of Leyland Road for up to 1,350 dwellings with associated community infrastructure. The primary vehicular access is proposed via a new access on the A582 Penwortham Way. A secondary access is proposed on Bee Lane to serve 40 dwellings only. Existing properties accessed via Bee Lane will be retained.

1.1.9 The proposals submitted for Stage 1 RSA relate to the provision of a new signal controlled junction site access onto the A582 Penwortham Way (Site 1). The Single Carriageway Approach option offers hatch markings between the northbound and southbound lanes of the A582. The Dualled Approach option proposes physical kerbing between northbound and southbound lanes of the A582, and includes a shared footway along the eastern side of Penwortham Way in order to tie into the County Council highway scheme.

1.1.10 A list of the documents and drawings submitted for this Stage 1 RSA can be found at Appendix B.

1.1.11 The submitted design drawings have been annotated to show the location of problems identified during this Stage 1 Road Safety Audit. These plans are shown at Appendix C.

1.1.12 The recommendations offered within this report should not be regarded as prescriptive. Whilst recommendations have been made with this report, there may be equally satisfactory or superior alternative solutions to the identified problems. The Audit Team will be pleased to consider any alternatives if required.

1.2 Departures from Standards

1.2.1 The Audit Team has not been informed of any departures from standards relating to the designs submitted for audit.

2. Problems identified from this audit

2.1 A582 Penwortham Way (Single Carriageway)

2.1.1 The following provides details of the problems identified during this Stage 1 Road Safety Audit.

Problem 2.1	
Location	Site access
Summary	Footways encourage pedestrians on to unsafe verges
The proposed footways from the site access may encourage pedestrians to walk along the verges of the A582 where they may be at risk of being struck by passing traffic.	
Recommendation	It is recommended that the footways are terminated at an appropriate location within the development.

Problem 2.2	
Location	Site access
Summary	Steep gradient may create difficulties for drivers pulling away from the site access stop line
The A582 is set on a large embankment which will require an uphill gradient on the site access approach to the proposed junction. Excessive gradient at the stop line may cause difficulties for drivers, particularly of large vehicles, pulling away from the stop line resulting in rear-end shunt type collisions.	
Recommendation	It is recommended that appropriate gradients are provided on the site access approach to the signals in order to allow drivers to pull away safely

Problem 2.3	
Location	Site access
Summary	Vertical alignment may interfere with junction inter-visibility envelope
The A582 is set on a large embankment which will require an uphill gradient on the site access approach to the proposed junction, where dense and extensive vegetation is present. The embankments and vegetation may interfere with the junction inter-visibility envelope, leading to collisions with through-traffic in the event that the signals are faulty. This will be exacerbated given that the speed limit on the westbound approach is 50mph.	
Recommendation	It is recommended that vegetation and earthworks are removed from the intervisibility envelope in both horizontal and vertical alignments

Problem 2.4	
Location	A582 – south of junction
Summary	Eastern kerb alignment may cause vehicles to swerve into oncoming lane
The tie-in for the eastern kerb line does not provide a smooth transition onto the main carriageway. This may cause drivers entering onto the A582 to swerve onto the opposite lane and into oncoming traffic.	
Recommendation	It is recommended that the tie-in to the A582 is amended to provide a smooth transition for drivers

3. Problems identified from this audit

3.1 A582 Penwortham Way (Dualled Approach)

3.1.1 The following provides details of the problems identified during this Stage 1 Road Safety Audit.

Problem 3.1	
Location	Site access
Summary	Steep gradient may create difficulties for drivers pulling away from the site access stop line
The A582 is set on a large embankment which will require an uphill gradient on the site access approach to the proposed junction. Excessive gradient at the stop line may cause difficulties for drivers, particularly of large vehicles, pulling away from the stop line resulting in rear-end shunt type collisions.	
Recommendation	It is recommended that appropriate gradients are provided on the site access approach to the signals in order to allow drivers to pull away safely

Problem 3.2	
Location	A582 Penwortham Way
Summary	Steep gradient adjacent to footway/cycleway
It appears that steep gradients will be provided directly adjacent to the footway/cycleway along the A582 in both directions. Pedestrians may fall down the slopes, should they wander from the shared-use surface.	
Recommendation	It is recommended that an appropriate level surface is provided between the shared-used path and the slopes or barriers are provided

Problem 3.3	
Location	Site access
Summary	Position of splitter islands may cause collisions
The splitter islands on the site access approach arm are located close to the near-side through-lane of the A582. These islands are likely to be struck by passing vehicles at high speed.	
Recommendation	It is recommended that the splitter islands are amended to be set back from the carriageway lanes

4. Audit Team Statement

4.1.1 We certify that the drawings listed at **Appendix B** have been examined, and that this Audit has been carried out in accordance with the requirements of GG119, with the sole purpose of identifying road safety matters to be addressed in order to improve the safety of the scheme.

Road Safety Audit Team Leader

Signed: 

Name: Wing Lee

Date: 26.11.21

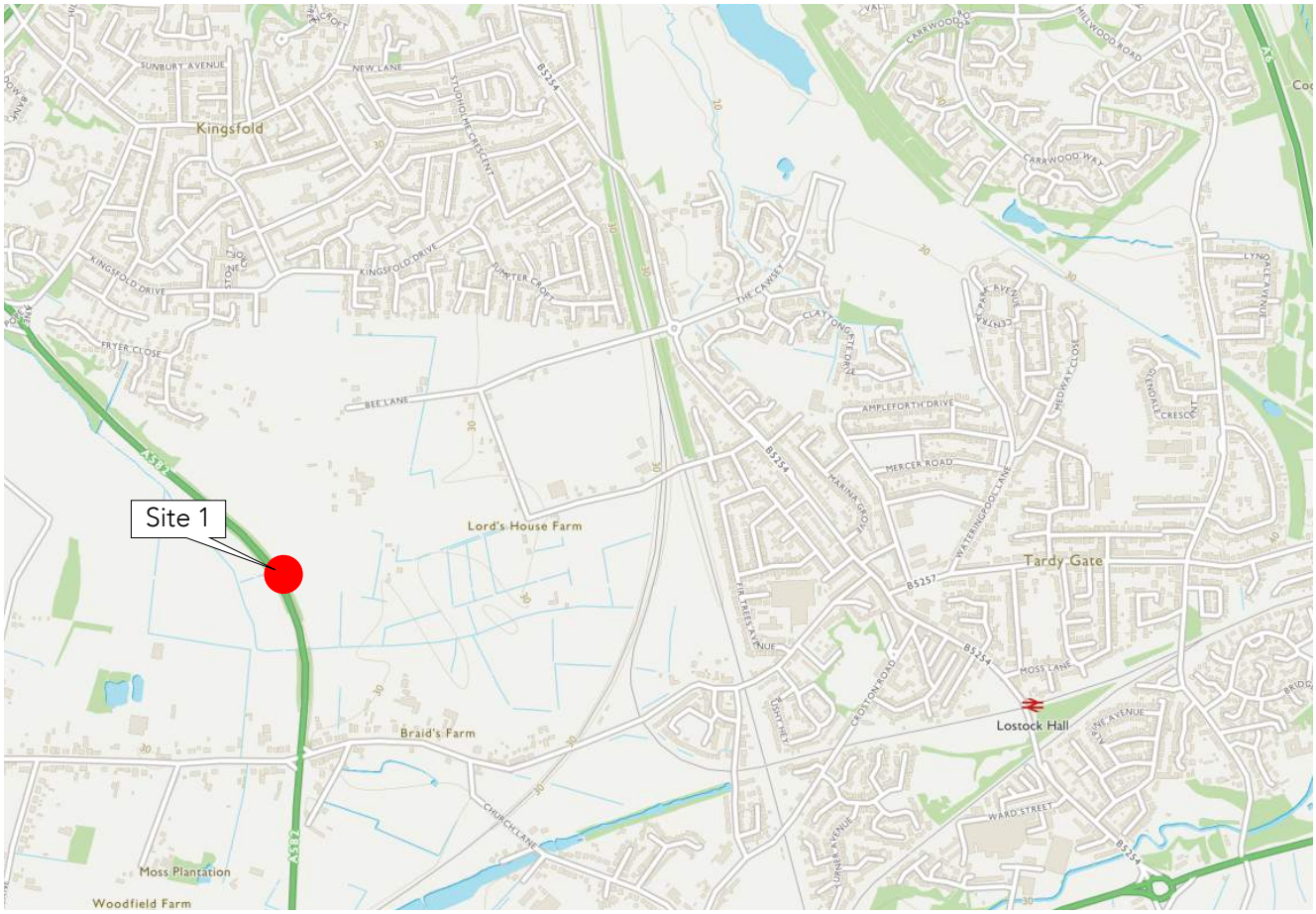
Road Safety Audit Team Member

Signed: 

Name: Ian Medd

Date: 26.11.21

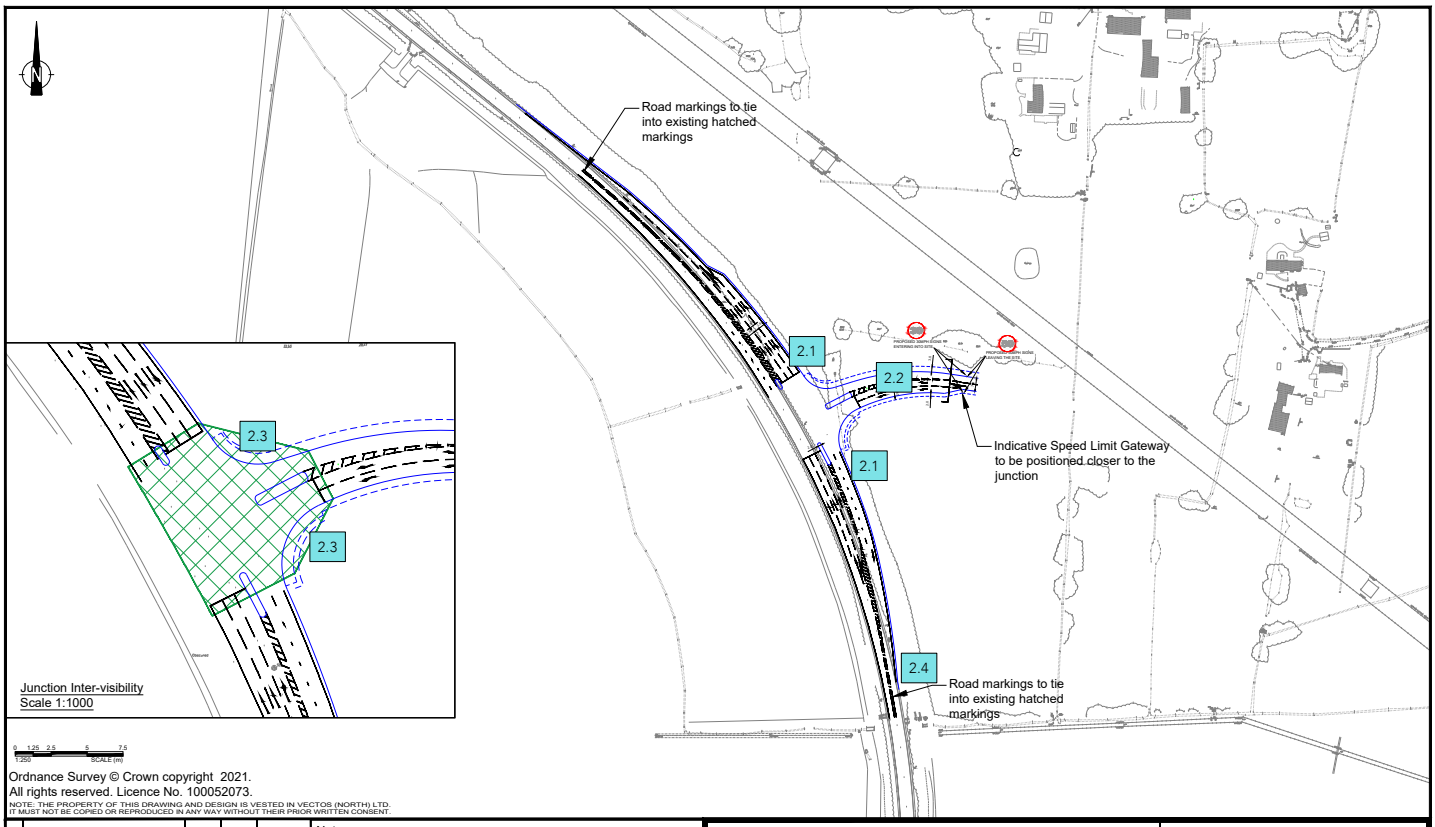
Appendix A - Site Location Plan



Appendix B - Documents provided for Audit

- VN211918-G110
- VN211918-D103 Single Carriageway
- VN211918-TR100 Single Carriageway
- VN211918-TR104 Single Lane - Refuse
- VN211918-D104 Dualling
- VN211918-TR001 Dualling
- VN211918-TR105 Dualling - Refuse
- VN211918-D109 RSA Wider Plan – Single Lane
- app-a-a582-masterplan
- 003-pickerings-to-lodge-lane-brook-lane
- 004-lodge-lane-brook-lane-to-farrington-recycling-centre
- VN211918 The Lanes, Penwortham - Transport Assessment_01a
- RSA1 Brief – The Lanes, Penwortham – New A582 Signal Junction

Appendix C - Problem Location Plan



REV	DETAILS	DRAWN	CHECKED	DATE
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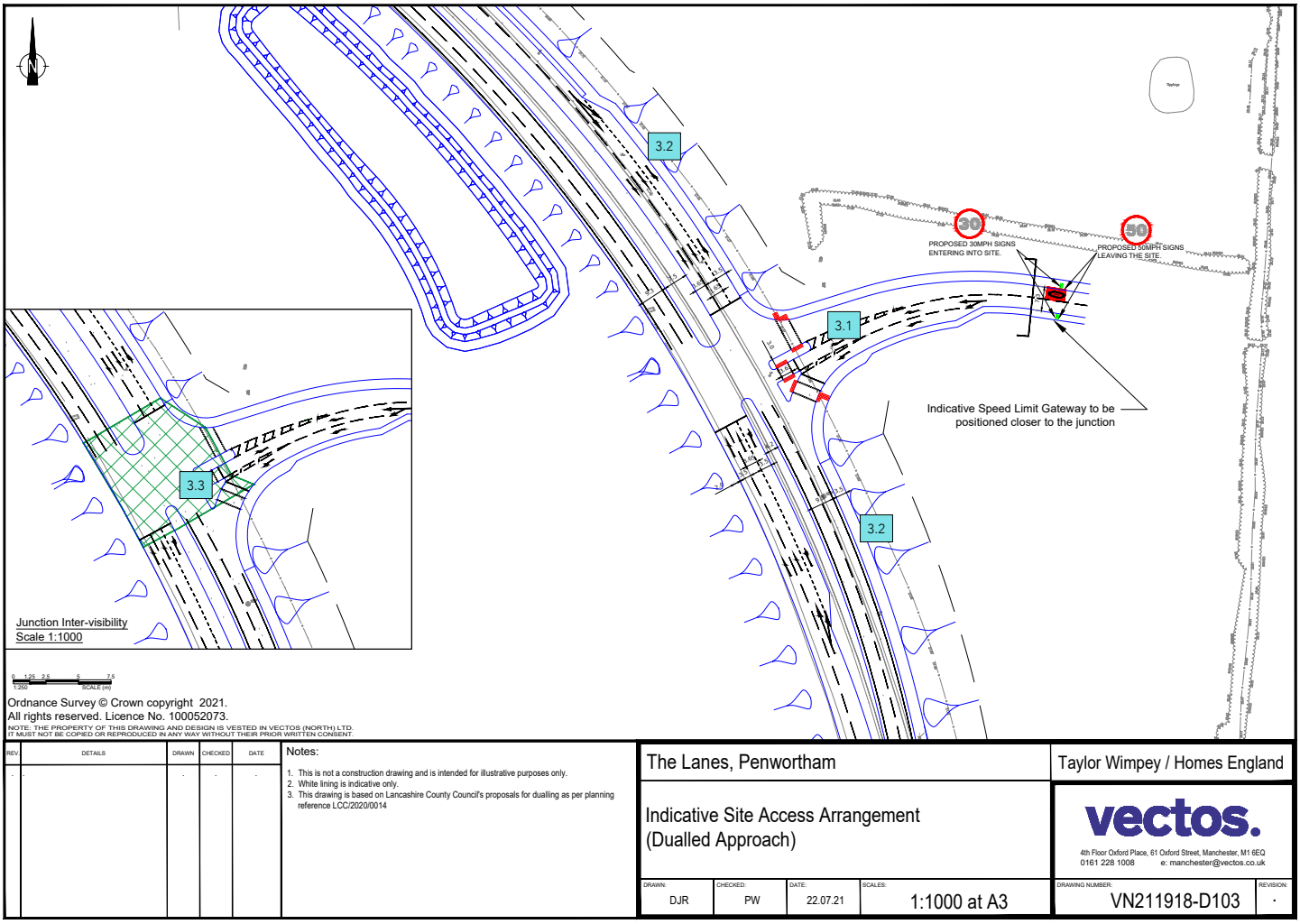
Notes:
1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.

The Lanes, Penwortham	Taylor Wimpey / Homes England
Proposed Site Access Arrangement - Wider Plan (Single Carriageway Approach)	vectos. 4th Floor Oxford Place, 61 Oxford Street, Manchester, M1 6EQ 0161 228 1008 e: manchester@vectos.co.uk

DRAWN:	CHECKED:	DATE:	SCALES:	DRAWING NUMBER:	REVISION:
DJR	PW	24.11.21	1:2000 at A3	VN211918-D109	·



REV.	DETAILS	DRAWN	CHECKED	DATE
-	-	-	-	-

Notes:
1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.
3. This drawing is based on Lancashire County Council's proposals for dualling as per planning reference LCC/2020/0014

The Lanes, Penwortham

Taylor Wimpey / Homes England

Indicative Site Access Arrangement (Dualled Approach)

vectos.
4th Floor Oxford Place, 61 Oxford Street, Manchester, M1 6EQ
0161 228 1008 e: manchester@vectos.co.uk

DRAWN:	CHECKED:	DATE:	SCALES:	DRAWING NUMBER:	REVISION:
DJR	PW	22.07.21	1:1000 at A3	VN211918-D103	-

Location:	Penwortham Way - Signal Controlled Site Access Junction
Date:	12-May-22

Severity of Outcome – (S)	Rating Given	Likelihood – (L)	Rating Given	
Minor Harm; Minor damage or loss no injury.	1	Very Unlikely	1	**Rating will apply to both likelihood and severity multiplied to give hazard risk rating**
Moderate Harm; Slight injury or illness, moderate damage or loss.	2	Unlikely	2	
Serious Harm; Serious injury or illness, substantial damage or loss.	3	May Happen	3	
Major Harm; Fatal injury, major damage or loss.	4	Likely	4	
Extreme Harm; Multiple fatalities extreme loss or damage.	5	Almost Certain	5	

Hazard	Risk	S	L	R	Control Measures	S	L	R	Further Action Required	By Whom
RSAS1 Problem 2.1 Proposed footways from proposed access junction terminate with no onward NMU provision on Penwortham Way.	Lack of onward NMU provision may lead to NMU's travelling on Penwortham Way at risk of collision with vehicular traffic.	4	3	**12**	Terminate footway provision prior to Penwortham Way to ensure NMU's aren't lead to locations with no onward provision. See attached plan D109	4	1	**4**	Proposed highway amendments to be subject to Stages 2 – 3 Road Safety Audit to GG119 Standards. (Stage 1 RSA Already undertaken for proposed site access junction)	Local Authority and Road Safety Audit Team
RSAS1 Problem 2.2. Excessive gradient at junction stop lines may create difficulties for drivers pulling away from the stop lines.	Excessive gradient may result in shunt or restart type collisions between vehicles.	2	3	**6**	Ensure that gradients at the signalised junction are constructed in accordance with design regulations.	2	1	**2**	Proposed highway amendments to be subject to Stages 2 – 3 Road Safety Audit to GG119 Standards. (Stage 1 RSA Already undertaken for proposed site access junction)	Local Authority and Road Safety Audit Team
RSAS1 Problem 2.3. Existing dense vegetation and embankments may obscure junction intervisibility between Penwortham Way and the site arm.	Obstructions to junction intervisibility may lead to side swipe collisions between vehicles in the event of a signal failure.	4	3	**12**	Ensure that earthworks are profiled such that embankments do not restrict junction intervisibility and ensure that all vegetation within intervisibility splays is removed.	4	1	**4**	Proposed highway amendments to be subject to Stages 2 – 3 Road Safety Audit to GG119 Standards. (Stage 1 RSA Already undertaken for proposed site access junction)	Local Authority and Road Safety Audit Team
RSAS1 Problem 2.4. Abrupt alignment to the south of the signalised junction tying into the A582 Drivers may be required to change direction suddenly.	Drivers entering the A582 travelling southbound may be required to change direction suddenly to avoid overrunning the opposing carriageway lane potentially leading to head on collisions between north and southbound vehicles.	4	3	**12**	Alignment at the point where the new junction ties into the A582 to the south should be created with a longer transition to remove the need for sudden changes of direction.	3	1	**3**	Proposed highway amendments to be subject to Stages 2 – 3 Road Safety Audit to GG119 Standards. (Stage 1 RSA Already undertaken for proposed site access junction)	Local Authority and Road Safety Audit Team

Table continued below

Table (continued)

Hazard	Risk	S	L	R	Control Measures	S	L	R	Further Action Required	By Whom

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VECTOS (NORTH) LIMITED

Road Safety Audit Designer's Response Report

1 Project Summary

Report Title	New A582 Signal Junction
Date	17th November 2021
Document Reference and Revision:	A582 Access Designer's Response_01a
Prepared by:	Daniel Reid
On behalf of:	N/A
AUTHORISATION SHEET	
Project:	The Lanes, Penwortham
Report Title	New A582 Signal Junction
PREPARED BY	
Name:	Daniel Reid / Paul Whitaker
Signed:	
Organisation:	Vectos (North) Ltd
Date:	17th November 2021

vectos.

2 Introduction

GENERAL DETAILS:				
Highway scheme name and road number:	**New Signal Junction on A582 Penwortham Way**			
Date:	17th November 2021			
Type of scheme:	New Traffic Signal Control Junction			
RSA Stage:	☒ Stage 1	☐ Stage 2	☐ Stage 3	☐ Stage 4
	Interim			
Road Safety Audit Reference:	261121_J190016_Penwortham Way RSA1			
Designer's Response prepared by:	Daniel Reid			
Design organisation details:	Vectos (North) Ltd			

3 Key Personnel

Overseeing Organisation:	Vectos (North) Ltd
RSA Team:	Grange Transport Consulting
Design Organisation:	Vectos (North) Ltd

vectos.

4 Road Safety Audit Decision Log

RSA Problem	RSA Recommendation	Design Organisation Response	Overseeing Organisation Response	Agreed RSA Action
2.1	It is recommended that the footways are terminated at an appropriate location within the development.	Accepted. For clarity, the dashed line does not represent a proposed footway. It is shown as a verge/ buffer offset from the proposed kerb line. Footways will be terminated at an appropriate location within the development with no onward provision.		
2.2	It is recommended that appropriate gradients are provided on the site access approach to the signals to allow drivers to pull away safely.	Accepted. Gradients on the site access approach to the signals will be designed in accordance with relevant highway design criteria to allow drivers to pull away safely. Further vertical design will be coordinated during detailed design.		
2.3	It is recommended that vegetation and earthworks are removed from the intervisibility envelope in both horizontal and vertical alignments.	Accepted. Where possible, vegetation and earthworks will be removed from the intervisibility envelope. Further vertical design will be coordinated during detailed design.		
2.4	It is recommended that the tie-in to the A582 is amended to provide a smooth transition for drivers.	Accepted. The alignment has been amended to allow for a larger radius to provide a smoother transition for drivers (as shown in updated Drawing No. VN211918-D109).		

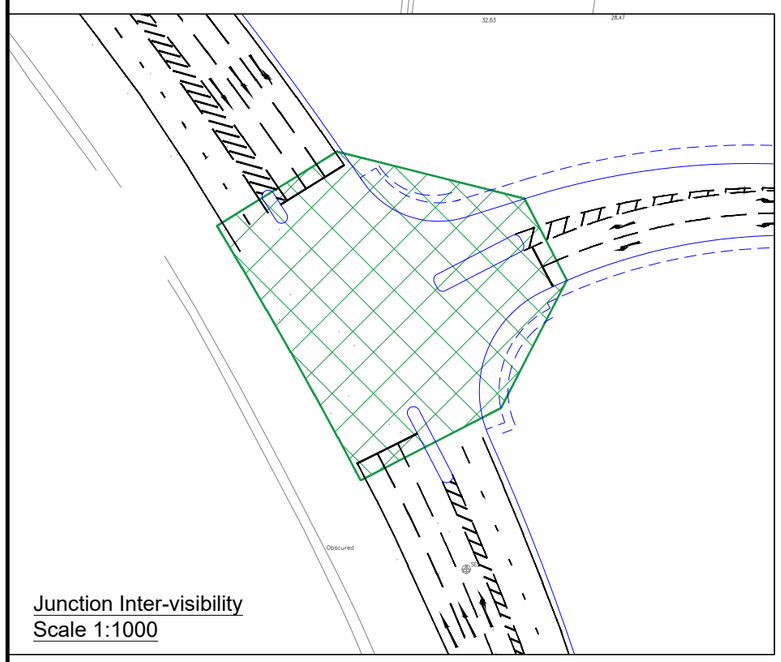
RSA Problem	RSA Recommendation	Design Organisation Response	Overseeing Organisation Response	Agreed RSA Action
3.1	It is recommended that appropriate gradients are provided on the site access approach to the signals in order to allow drivers to pull away safely	Accepted. Gradients on the site access approach to the signals will be design in accordance with relevant highway design criteria to allow drivers to pull away safely. Further vertical design will be coordinated during detailed design.		
3.2	It is recommended that an appropriate level surface is provided between the shared-used path and the slopes or barriers are provided	Accepted. An appropriate level surface and clearance will be provided between the shared-used path and the slopes Further details to be provided during detailed design.		
3.3	It is recommended that the splitter islands are amended to be set back from the carriageway lanes	Accepted. The alignment has been updated and the splitter islands have been offset 1.5m to prevent vehicles striking them at high speeds (as shown in Drawing No. VN211918-D110).		

vectos.

5 Design Organisation and Overseeing Organisation Statements

On behalf of the Design Organisation I certify that: The RSA actions identified in response to the road safety audit problems in the road safety audit have been discussed and agreed with the Overseeing Organisation.	
Name	Paul Whitaker
Signed	
Position	Associate Director
Organisation	Vectos (North) Ltd
Date	01.03.2022

On behalf of the Overseeing Organisation I certify that: The RSA actions identified in response to the road safety audit problems in the road safety audit have been discussed and agreed with the design organisation; and The agreed RSA actions will be progressed.	
Name	Neil Stevens
Signed	
Position	Highway Development Control Manager
Organisation	Lancashire County Council
Date	



Junction Inter-visibility
Scale 1:1000

Road markings to tie into existing hatched markings

PROPOSED 30MPH SIGNS ENTERING INTO SITE

PROPOSED 30MPH SIGNS LEAVING THE SITE

Indicative Speed Limit Gateway to be positioned closer to the junction

Road markings to tie into existing hatched markings

0 1.25 2.5 5 7.5
1:250 SCALE (m)

REV.	DETAILS	DRAWN	CHECKED	DATE
.	.	.	.	.

Notes:

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2. White lining is indicative only.

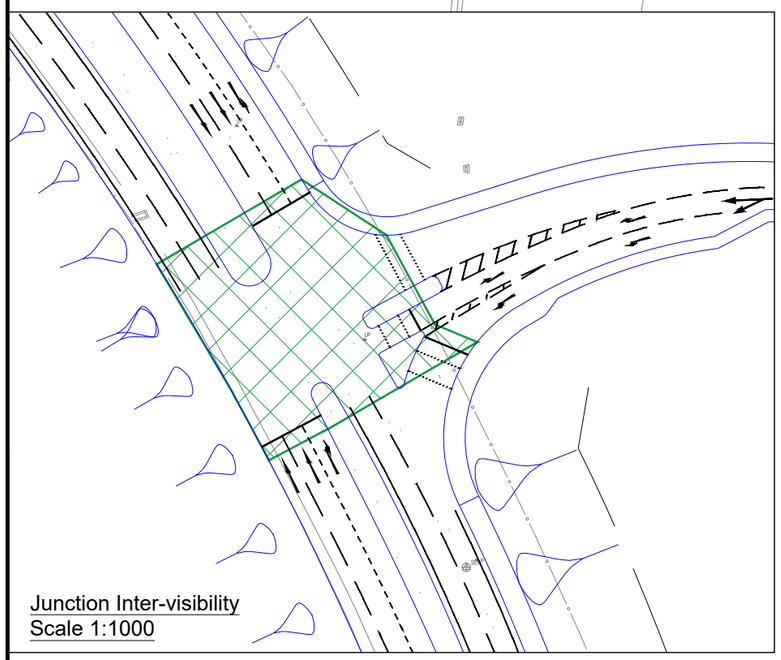
The Lanes, Penwortham

Proposed Site Access Arrangement - Wider Plan (Single Carriageway Approach)

Taylor Wimpey / Homes England

vectos.
4th Floor Oxford Place, 61 Oxford Street, Manchester, M1 6EQ
0161 228 1008 e: manchester@vectos.co.uk

DRAWN:	CHECKED:	DATE:	SCALES:	DRAWING NUMBER:	REVISION:
DJR	PW	24.11.21	1:2000 at A3	VN211918-D109	·



Junction Inter-visibility
Scale 1:1000

0 1.25 2.5 5 7.5
1:250 SCALE (m)

PROPOSED 30MPH SIGNS ENTERING INTO SITE.

PROPOSED EXMPH SIGNS LEAVING THE SITE.

Indicative Speed Limit Gateway to be positioned closer to the junction

REV.	DETAILS	DRAWN	CHECKED	DATE
.	.	.	.	.

Notes:

1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.
3. This drawing is based on Lancashire County Council's proposals for dualling as per planning reference LCC/2020/0014

The Lanes, Penwortham

Taylor Wimpey / Homes England

Indicative Site Access Arrangement - Wider Plan (Dualled Approach)

vectos.
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DRAWN:	CHECKED:	DATE:	SCALES:	DRAWING NUMBER:	REVISION:
DJR	PW	22.07.21	1:2000 at A3	VN211918-D110	·

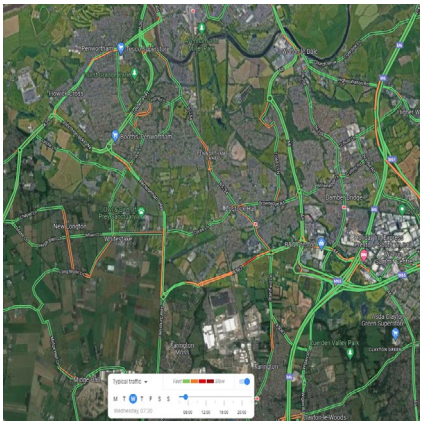
Appendix MA-7

Google Maps Traffic Thumbnails

Thumbnail Traffic Flows

07:00

07:30



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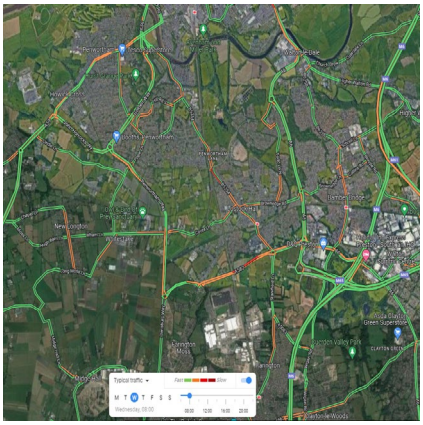

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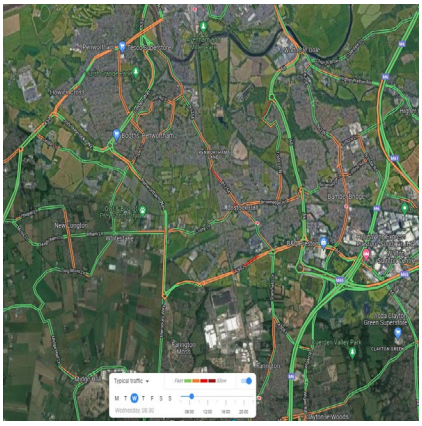

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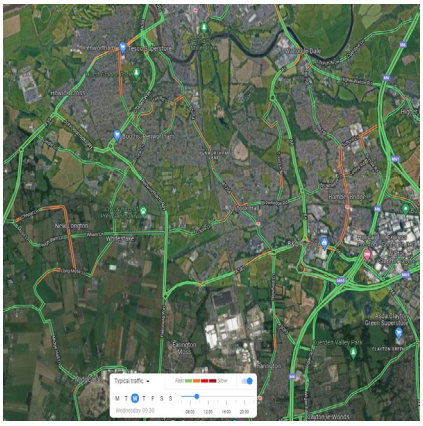

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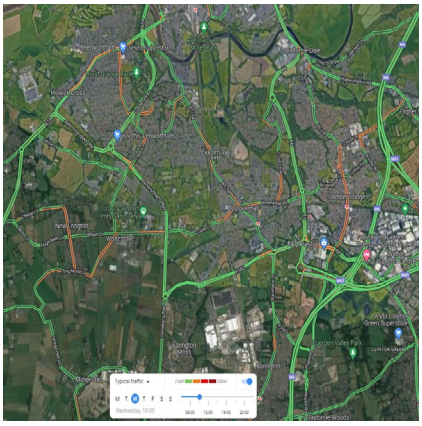

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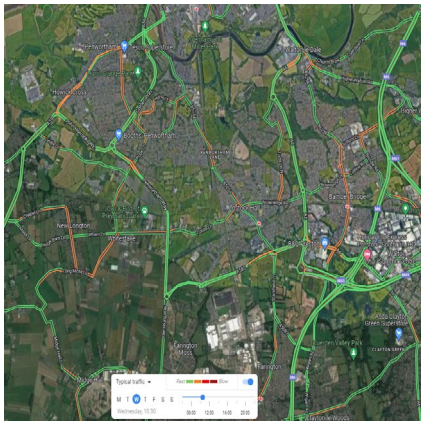

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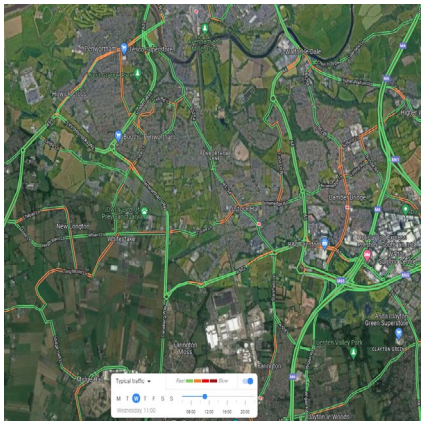

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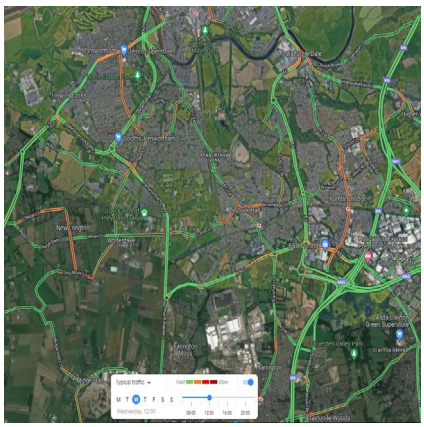

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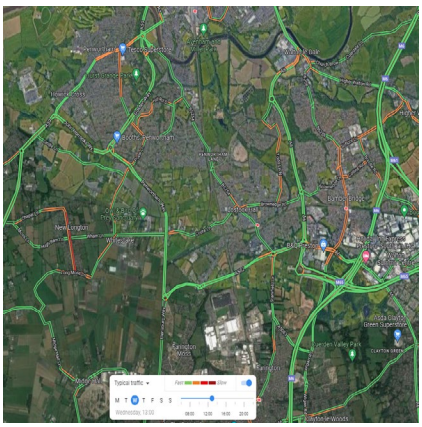

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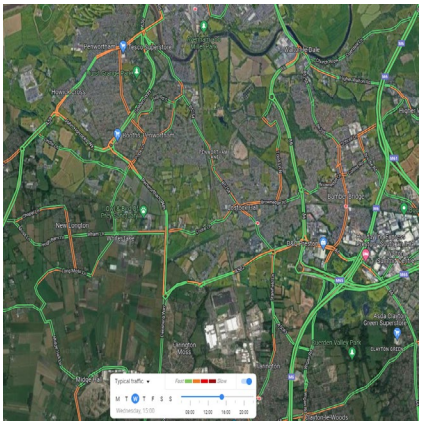

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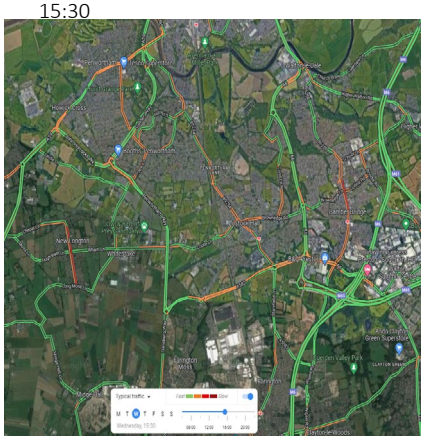

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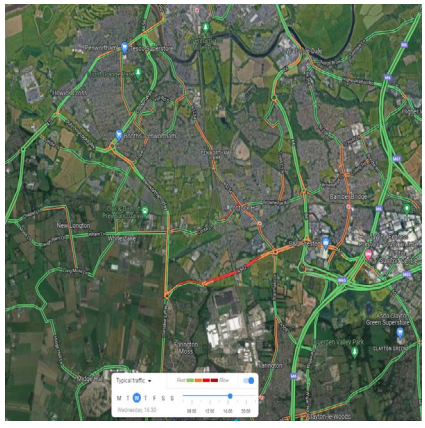

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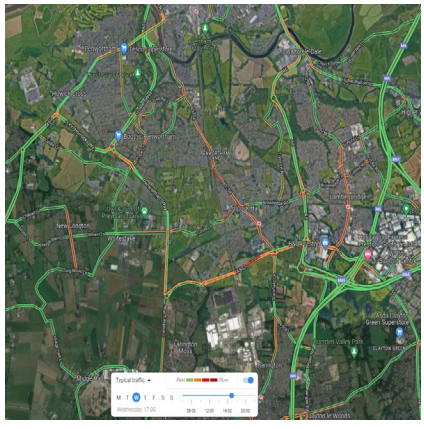

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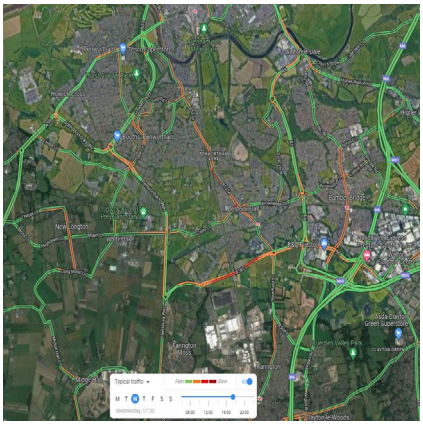

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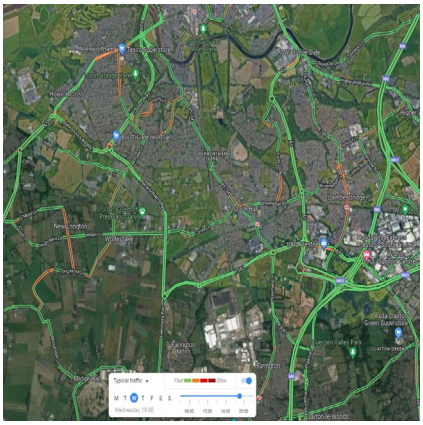
19:00


Typical traffic
Fast
Slow
M T W T F S S
Wednesday 19:00
08:00
12:00
16:00
20:00

Appendix MA-8

Traffic Modelling Note – CLTM and Paramics

South Ribble CLTM vs. Paramics Details

VM210430.TN013 South Ribble Microsim

Introduction

1. Traffic models have been used to inform judgements on the operation of the transport network under different circumstances both when considering the Pickerings Farm proposals as well as the A582 dualling scheme.

2. Lancashire County Council (LCC) has adopted a strategic modelling approach to assess the effect of dualling the A582.

3. We have adopted a microsimulation modelling approach to assess the effect of the Pickerings Farm development proposals. Both of these approaches are discussed in detail within this note and outputs from both models have been relied upon to inform judgements around effect and network operational matters inclusive of Pickerings Farm.

4. The LCC modelling is presented within the A582 business case, and supporting modelling reports, it is not clear the level of scrutiny which has been afforded to LCCs modelling in terms of the audit and review process. The models are not available to interrogate at this stage, only the existing reports.

5. The Vectos model has been audited independently by the specialist modelling team in Systra as part of the model build process and has subsequently been audited by WSPs traffic modellers on behalf of National Highways. Although WSP were reviewing the model on behalf of National Highways their comments were all encompassing rather than being restrained simply to those focus on the strategic road network

LCC Modelling Summary

6. The LCC modelling made available is focussed on supporting the business case for the delivery of the A582 proposals inclusive of the dualling in close proximity to Pickerings Farm.

7. LCC has assessed the A582 proposals within the Central Lancashire Traffic Model (CLTM) which a SATURN strategic transport model. The 2013 year Base Model has been forecast to 2022 and 2037 future years. The following scenarios have then been assessed:

    1. Do Minimum (DM) Opening Year (2022);

    2. Do Something 1 (DS1) Opening Year (2022) – with the A582 proposals and Pickerings Farm Link Road
    3. DM Design Year (2037);
    4. DS1 Design Year (2037) as DS1 (2022)
    5. DS2 Design Year (2037) as DS1 2037 without Pickering's Farm Link Road (i.e. no through connection to Bee Lane)

8. The model forecast report sets out how traffic growth has been estimated within the model. Within South Ribble, 5,425 homes are assumed to have been delivered by 2037 at specific development locations. Pickerings Farm is omitted from this figure as LCC has stated that Pickerings Farm is dependent upon the A582 works.

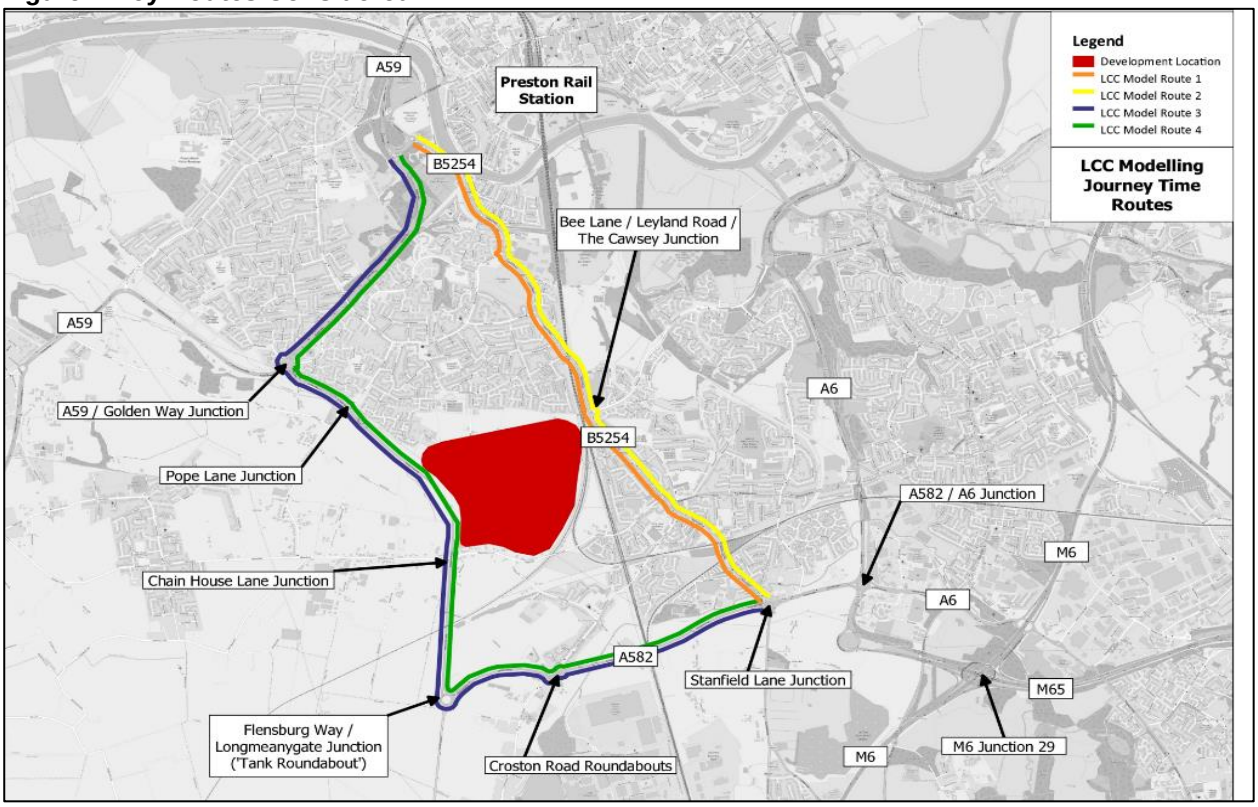
9. The model relies on TEMPRO to provide a forecast for Background growth to 2037. TEMPRO assumed 8,256 homes will be delivered by 2037.

10. This means that 2,831 homes are accounted for within the model forecasts but, due to the uncertainty around delivery, this is applied proportionally across the area.

11. This growth represents a housing level which exceeds that which will be delivered by the Pickerings Farm allocation. Thus, it can be argued that the level of proposed traffic growth is accounted for within the modelling across the area even if it is not specifically applied at the development proposals.

12. The transport assessment for the A582 proposals focusses on the impact on journey times along a series of key routes defined within the model. These comprise the A582 corridor, running between the A59/A582 Golden Way junction and A582/Stanifield Lane/Watkin Lane junction and the B5254 Leyland Road corridor, running between the same two junctions. These routes reflect the two key north-south routes across the study area.

Figure 1 Key Routes Considered



13. From the analysis presented with the Transport Assessment we have been able to discern the following peak hour journey times on the routes which are close to Pickerings Farm:

Figure 2 CLTM Journey Time Analysis - AM Peak Hour

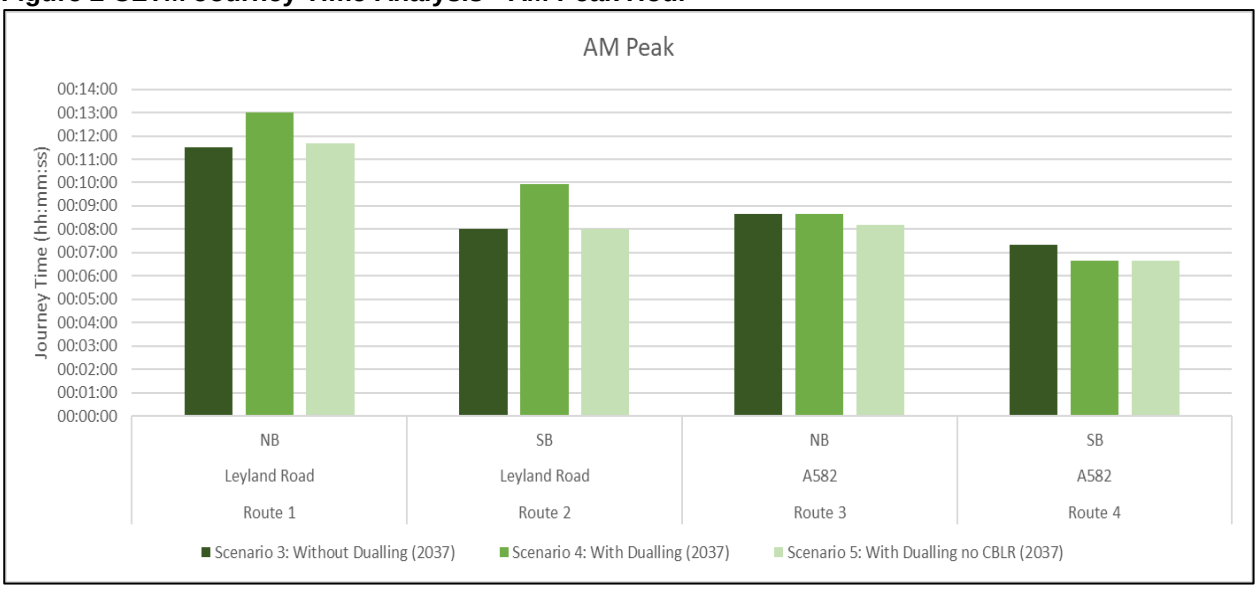
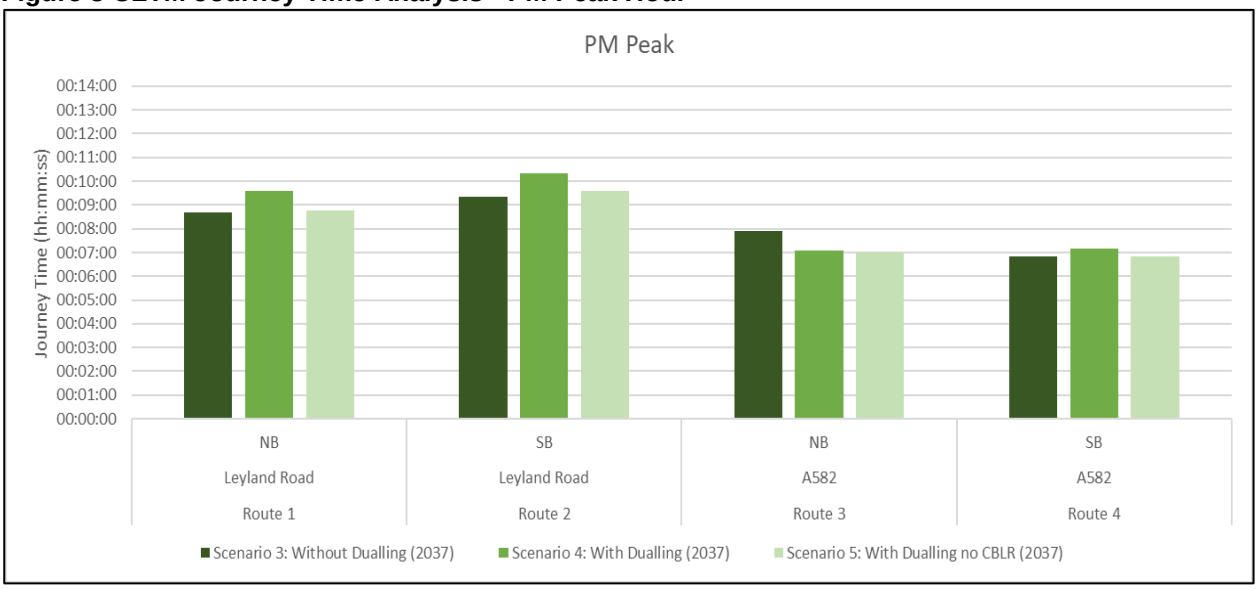


Figure 3 CLTM Journey Time Analysis - PM Peak Hour



14. Analysis of these journey times is limited insofar as it is constrained to just the AM and PM peak hours, this reveals very little difference in journey times between each of the scenarios. Furthermore, it demonstrates that the inclusion of Pickerings Farm Link Road actually increases journey times within the area.

15. Given that LCC is happy to accept the increases in journey times which are present within Scenario 4 and Scenario 5 on Routes 1 and 2 it is reasonable to conclude that LCC is happy with some inconvenience being introduced within the area. Furthermore, as LCC is favouring the results within Scenario 4, which generally produces higher journey times, one can conclude that the Scenario 3 journey times are also acceptable and are borne from a scenario which contains sufficient housing to encompass the Pickerings Farm development within the forecasts.

16. The changes in journey times between scenarios does not seem to be significant and all scenarios contain growth which is at least comparable to the level which would be induced following the delivery of Pickerings Farm. This demonstrates that LCC considers housing levels in excess of those likely to occur inclusive of Pickerings Farm will not cause a severe adverse impact on the network.

Vectos Modelling Summary

17. We have developed a microsimulation model of the local area which we have used to assess the operational effect of the development proposals on the highway network. We have previously responded to queries from LCC around the use of the microsimulation model in the context of this assessment.

18. We should highlight that whilst isolated junction modelling is useful in terms of understanding the junction specific impacts, it is not necessary, and if it is used it should be used as complementary microsimulation modelling. It is often used in a complementary sense to determine specific and practical signal settings at the times of implementation.

19. There are several key benefits associated with the microsimulation modelling approach adopted, including the fact that the model allows for temporal routing reassignment, within the hours, in response to queueing and congestion within the period assessed (i.e. traffic will be more likely to avoid an area in busier periods than when the network is quiet). Fundamentally, it allows for an assessment of effect on a corridor basis, cognisant of the effects of interaction between junctions.

20. Queue propagation from one junction to another will influence, and at times impede, the operation of the network. Isolated junction modelling cannot capture any impact caused by junctions up or down stream from the junction being assessed. The relationship between traffic flow and junction operation along a corridor is ignored in favour of focusing on a single junction in isolation. As such, isolated junction modelling may provide an oversimplified interpretation of how a network can accommodate traffic flows or how traffic flows will respond to changes in network conditions.

21. Vectos have demonstrated through the supporting documentation that the microsimulation model has exceeded the levels of calibration and validation to a good standard. Subsequently the model has been independently audited and approved by Systra, before being audited by WSP (on behalf of NH), with a number of comments raised that Vectos have addressed. On this basis, Vectos see no reason that the modelling tool itself be deemed unacceptable.

22. The Paramics Base model has been developed to reflect current on-street layout. The model captures all key junctions on the local highway network. Junctions where this traffic would feed onto the wider highway network (e.g. B5254/New Lane, A582/Pope Lane and Pope Lane/Cop Lane) have been explicitly surveyed and included within the model.

23. We have developed a model to encompass the full 12-hour period and allows the network operation to be assessed outside of the peak hours.

24. We have developed our model for the following scenarios:

- 2021 Base
- Reference Case – *Base model + committed development traffic*
- Development Case – *Base Model + committed development traffic + Pickerings Farm Development (1100 dwellings)*

25. To ensure that we are only dealing with growth which can be considered certain, we have not applied any background adjustments to account for growth informed via TEMPRO. We have not constrained our model to TEMPRO either, were we to do so then the overall traffic forecasts within our model would be constrained to around 8% but instead we are testing 9.5% growth (prior to including our development trips). This increases to around 13% when Pickerings Farm is included and so is well in excess of TEMPRO projections.

Comparison of Model Outputs

26. For comparison with the LCC modelling work we have replicated the analysis of LCC's Routes 1 to 4 which can be defined across a similar area within our model. This is set out within the following tables and graphs. The first five scenarios in the graph are the LCC scenarios, and scenarios 6 to 8 are the microsimulation model scenarios:

Table 1 Microsimulation Modelling Journey Time Analysis – Key Routes – AM and PM Peak

	AM Peak 0800-0900			PM Peak 1700-1800		
Route	Base	Reference	Development (1100)	Base	Reference	Development (1100)
Route 1	00:08:55	00:08:38	00:09:29	00:08:08	00:10:27	00:13:48
Route 2	00:08:39	00:07:50	00:08:31	00:09:04	00:12:51	00:16:32
Route 3	00:08:07	00:08:44	00:09:50	00:08:18	00:13:18	00:14:15
Route 4	00:09:07	00:09:29	00:10:18	00:08:15	00:11:39	00:13:02

Table 2 Microsimulation Modelling Journey Time Analysis – Key Routes – 12 Hour Average

	AM Peak 0800-0900			PM Peak 1700-1800		
Route	Base	Reference	Development (1100)	Base	Reference	Development (1100)
Route 1	00:08:55	00:08:38	00:09:29	00:08:08	00:10:27	00:13:48
Route 2	00:08:39	00:07:50	00:08:31	00:09:04	00:12:51	00:16:32
Route 3	00:08:07	00:08:44	00:09:50	00:08:18	00:13:18	00:14:15
Route 4	00:09:07	00:09:29	00:10:18	00:08:15	00:11:39	00:13:02

Figure 4 Journey Time Comparisons – AM Peak

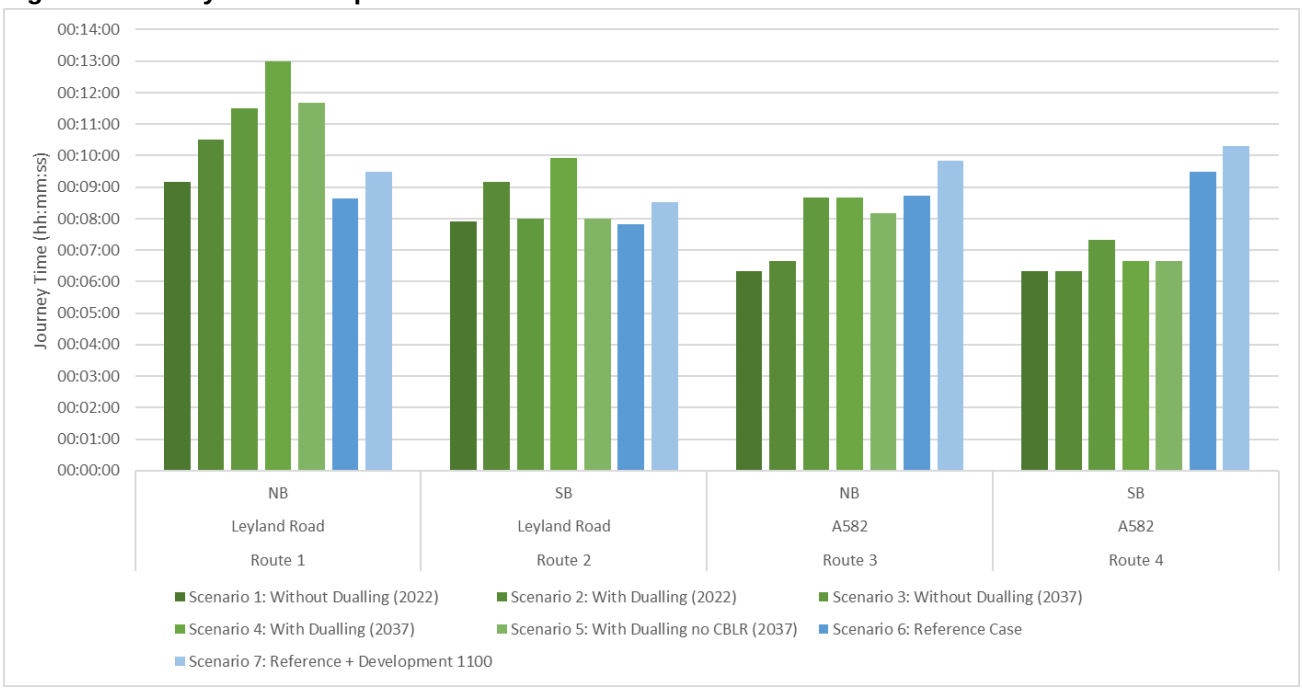
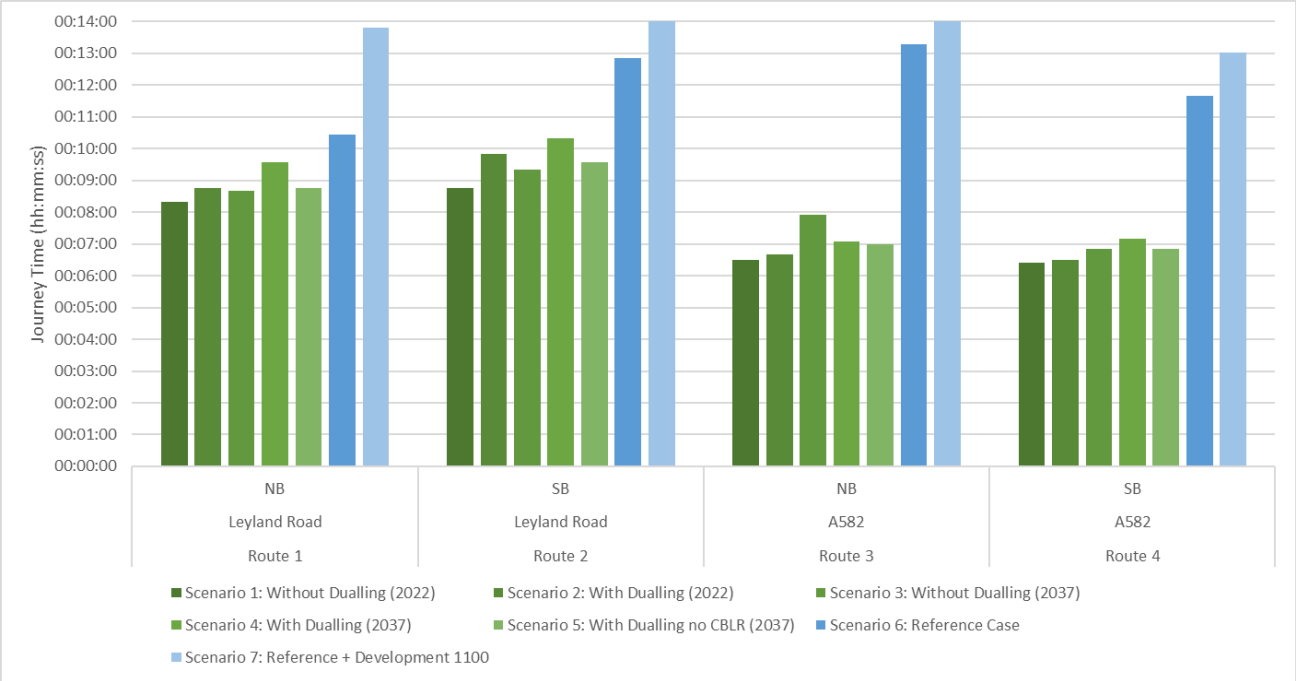


Figure 4 Journey Time Comparisons – PM Peak



27. Journey times within our model will inevitably differ from those within the CLTM. In part this is because our model contains more detail within the network we are testing. For example, local minor roads and associated junctions are modelled in detail. Buses route through the network, stopping at key stops and inducing delay as a result. Finer details such as pedestrian crossings and other features are included. All of these may induce higher levels of travel time than would be expected within forecast journey times derived from a strategic model such as the LCC model.

28. Note that the differences are not a function of the development. They are a function of using a different type of model, indicating the uncertainties associated with modelling and the care that neds to be taking when making judgements using modelling as a tool.

29. Further to the above, journey times from the microsimulation modelling have been reported across the 12 hour modelled period for the key routes identified within the LCC modelling work. These outputs demonstrate that when averaged over the day, the differences in journey times are negligible between the Reference Case (no development) and the Development Case, with the % variation being similar to those in the LCC CLTM modelling.

Figure 5 Route 1 (Leyland Road Northbound) – 12 hour Journey Times

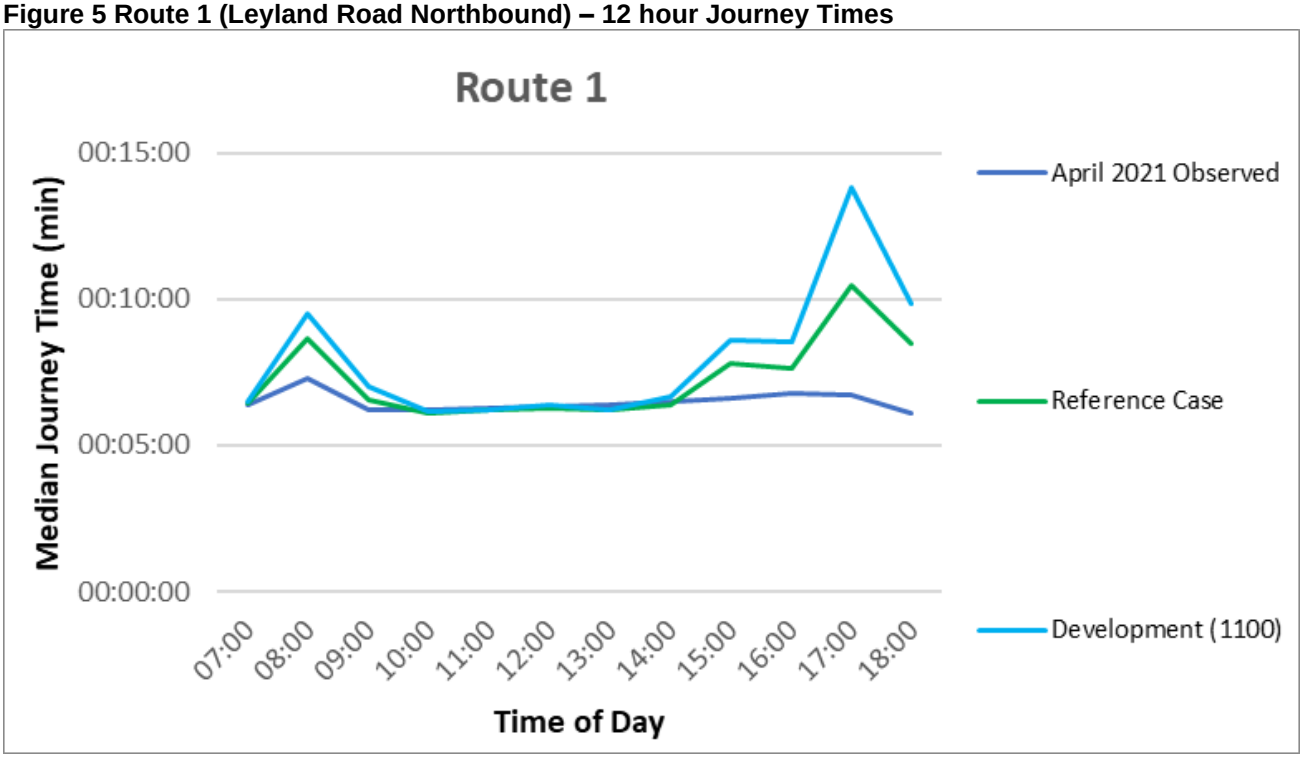


Figure 6 Route 2 (Leyland Road Southbound) – 12 hour Journey Times

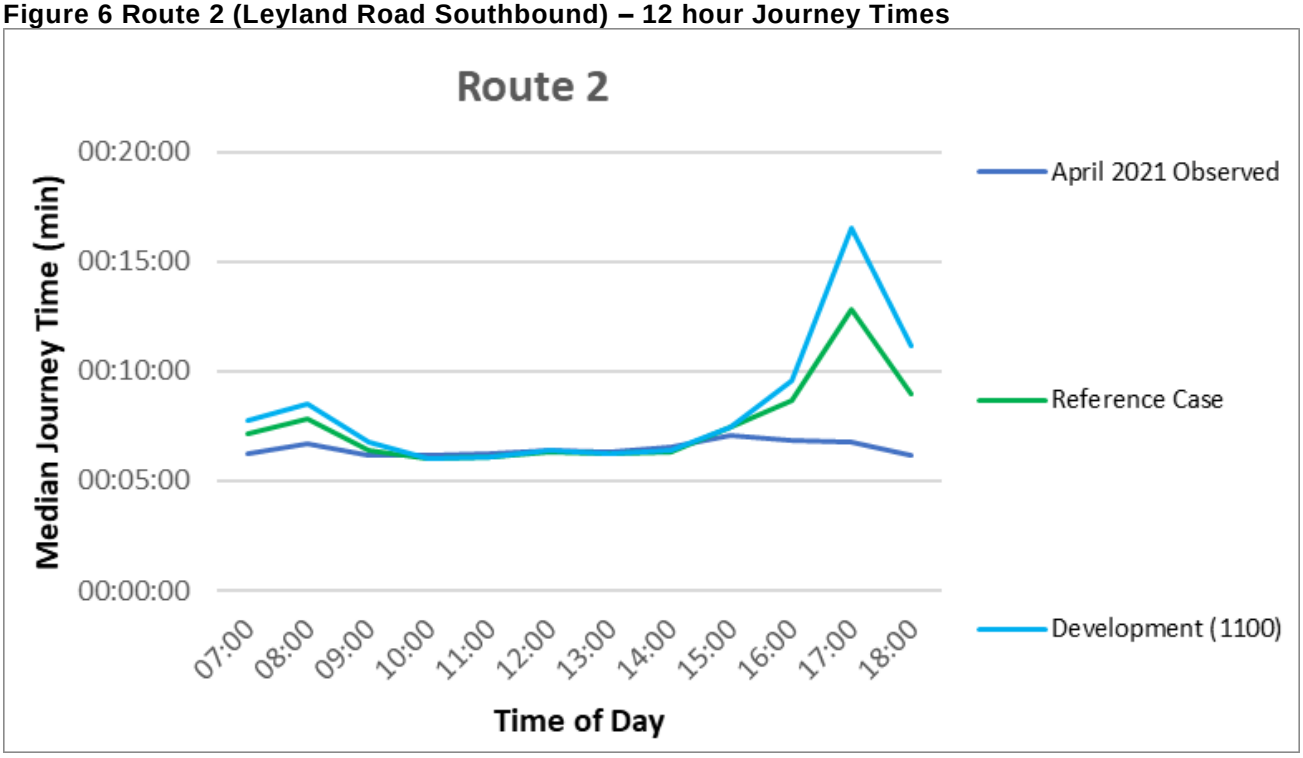


Figure 7 Route 3 (A582 Northbound) – 12 hour Journey Times

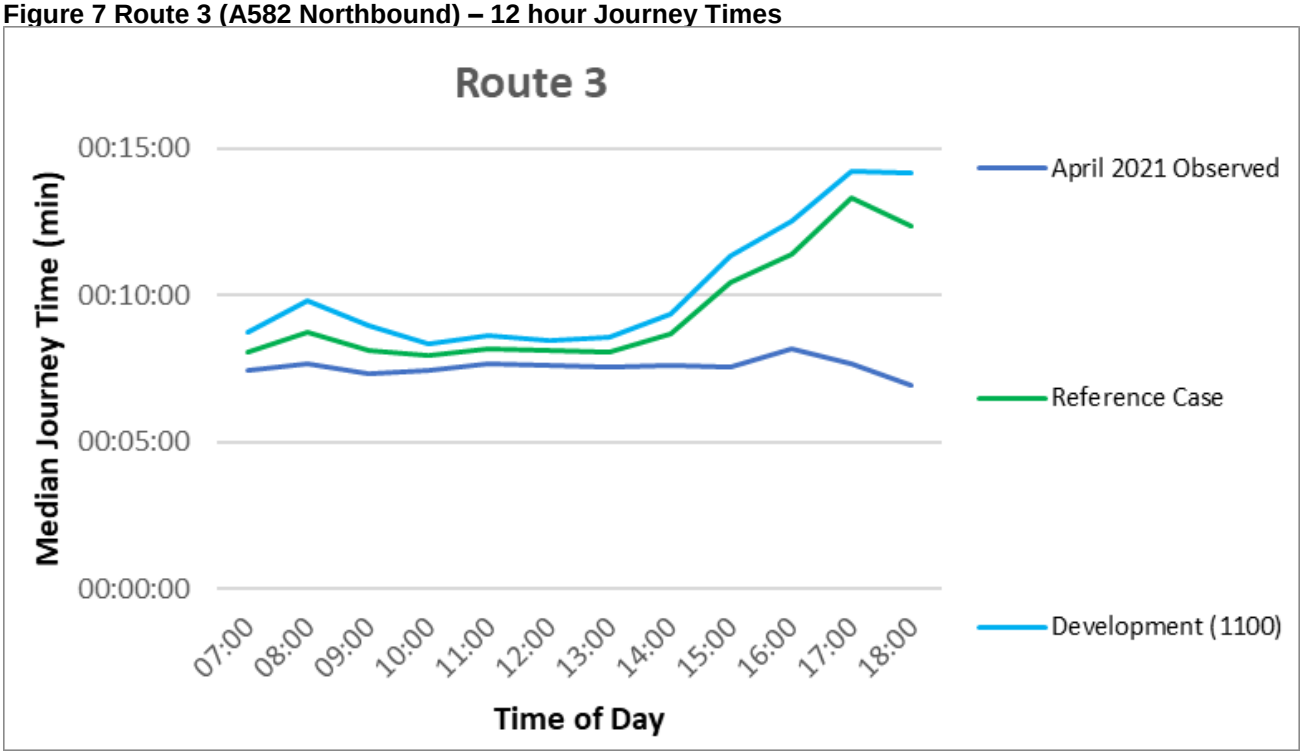
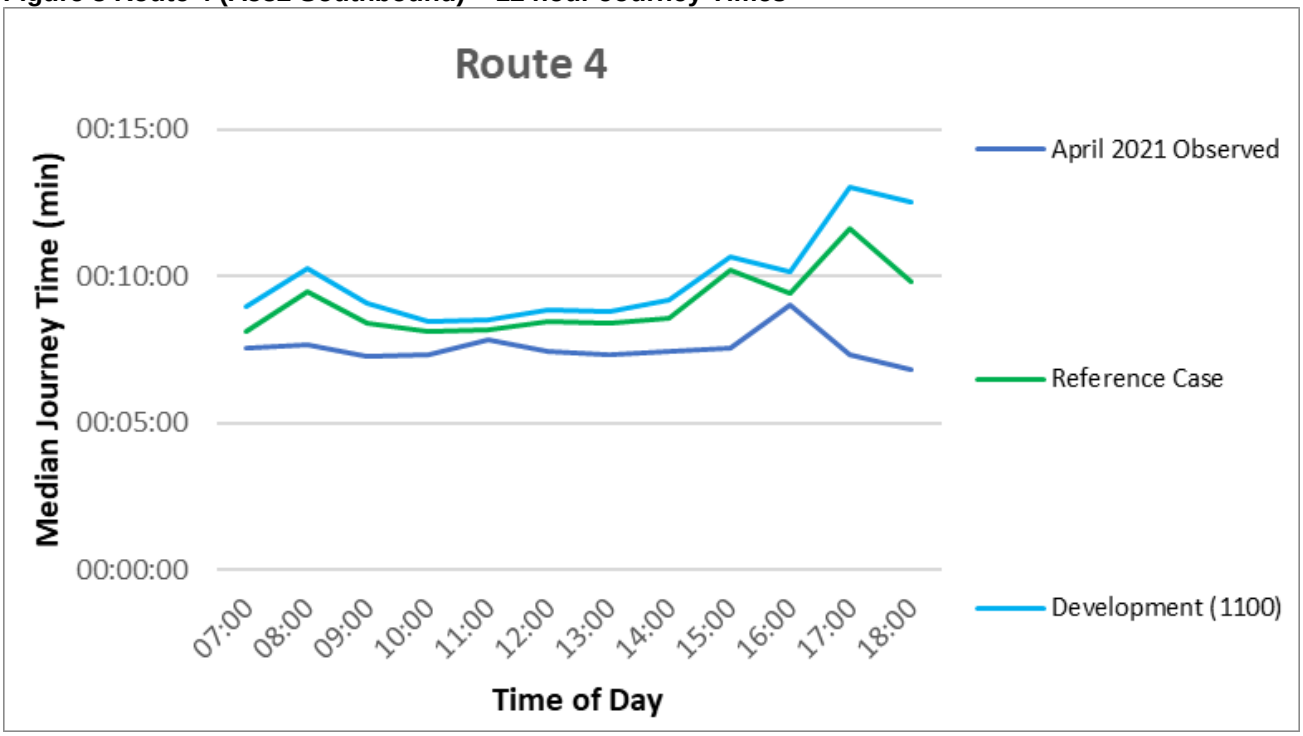


Figure 8 Route 4 (A582 Southbound) – 12 hour Journey Times



30. The previous analysis of journey times demonstrates that the development will not severely impact the A582 corridor or Leyland Road corridor.

31. We are also able to establish how the network conditions change in terms of overall travel times. We can do this by assessing the time it takes every trip to complete within every modelled hour. These provide us with total journey times for all users within the model. We can consider this across the day or within the peaks. This information is presented within the following table:

Table 3 Network Wide Delay Statistics

	Network Mean Delay (s)		Diff (s)
Time Period	Reference Case	Reference + Development (1100)	
AM (0700 to 1000)	258	268	+10
IP (1000 to 1600)	261	262	+1
PM (1600 to 1900)	388	455	+67
12 Hour	302	328	+26

32. Again this supports the conclusion that, in the round, the development impacts will not be severe when all road users are considered within the analysis.

Croston Road Sensitivity Test

33. Further to the analysis presented above, we have undertaken an additional stage of sensitivity testing the reports on the impact on journey times along the A582 corridor (Route 3 and Route 4), should the proposed LCC scheme at the A582/Croston Road roundabouts be delivered. We understand that a scheme at this location is proposed as part of the wider dualling of the corridor, with the scheme likely to take the form of replacing the existing roundabouts with a signalisation scheme.

34. A scheme of this nature has been included within a version of the Development Case model, and the associated impacts on the A582 corridor journey times reported within the following two figures. These journey times highlighted that should the scheme be delivered alongside the Pickerings Farm development proposals, the impact on the network is reduced relative to the Reference Case conditions across all modelled hours.

Figure 9 Route 3 (A582 Northbound) – 12 hour Journey Times – Including Signal Scheme

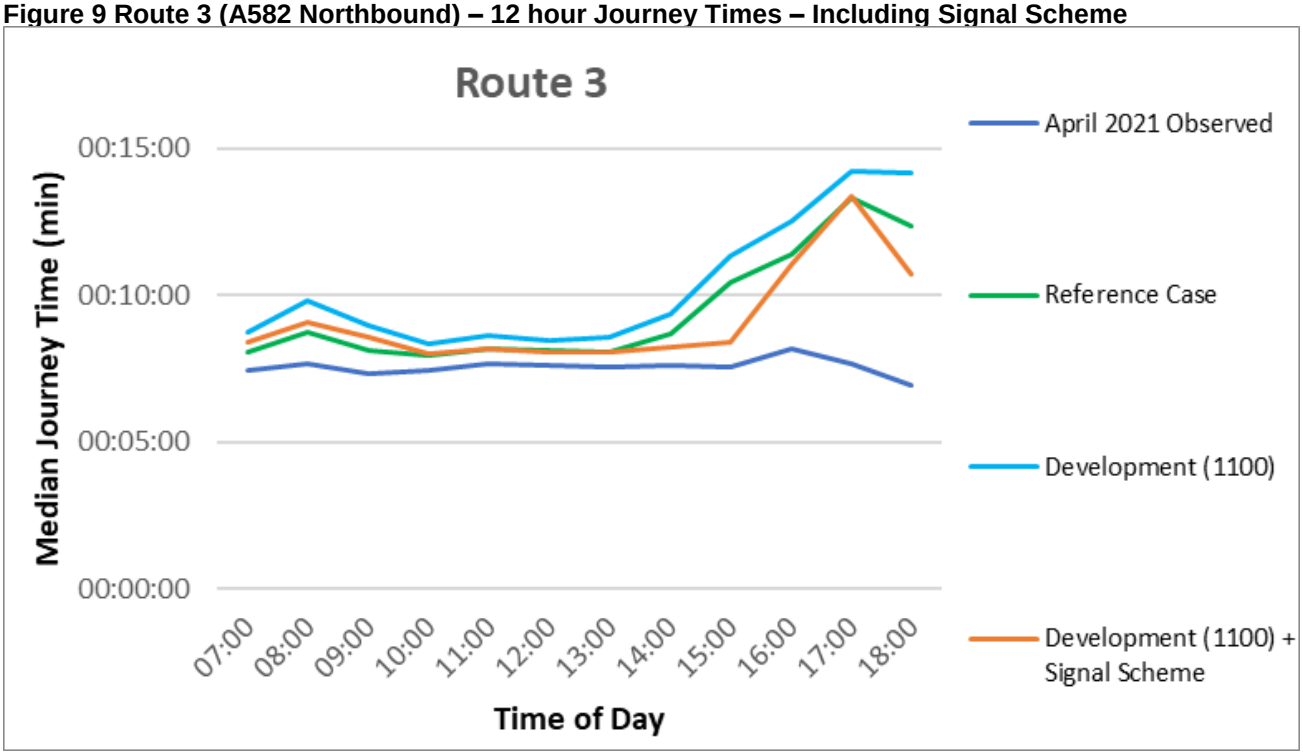
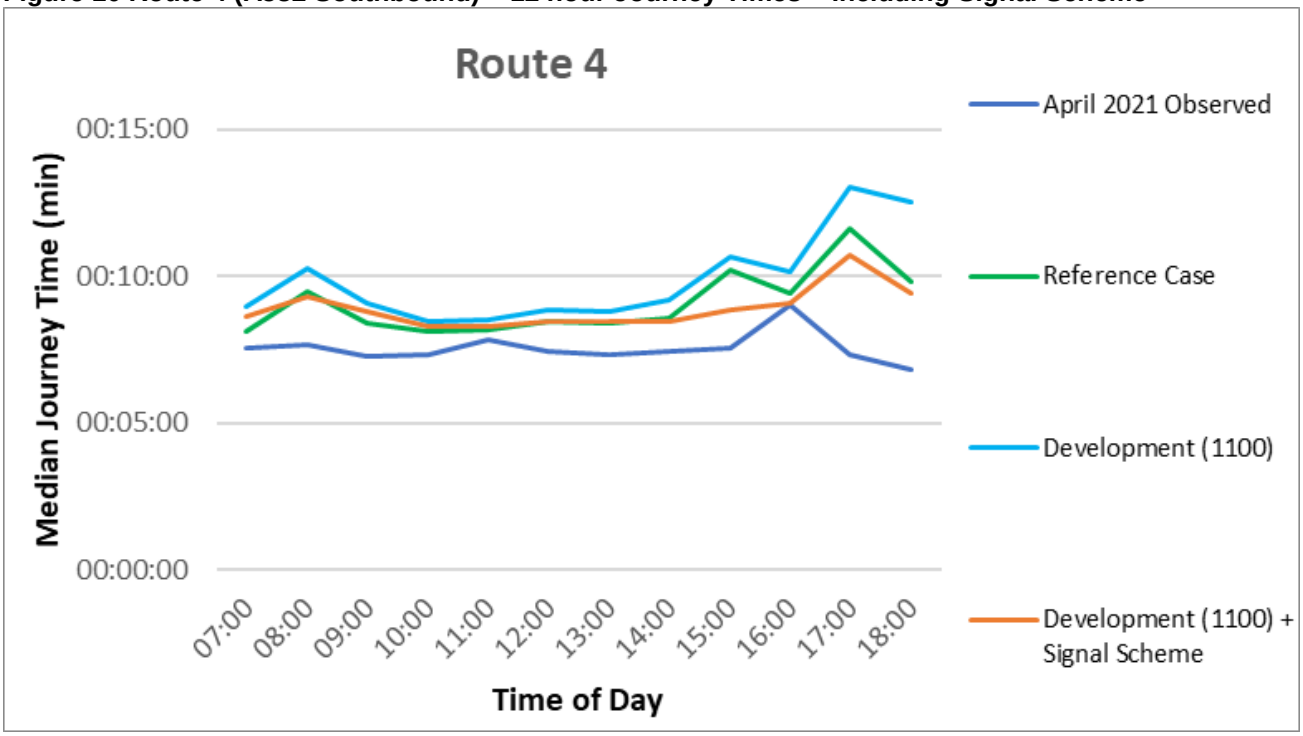


Figure 10 Route 4 (A582 Southbound) – 12 hour Journey Times – Including Signal Scheme



Summary

35. This note summarises the different approaches to modelling adopted by LCC and Vectos and the outcomes therefrom.

36. LCC strategic modelling contains a level of housing in excess of that which will occur if all consented developments and Pickerings Farm come forward. This model demonstrates that the A582 proposals will create higher journey times within the local area. LCC consider these changes to be acceptable and so it can be inferred that the initial scenario conditions are also acceptable (since journey times are lower within that scenario). This initial scenario contains housing growth that exceeds the Pickerings Farm levels and so it is contradictory for LCC to determine that Pickerings Farm will have a severe adverse impact on network operation given its position on the outcome of the A582 modelling.

37. The Vectos modelling has been completed within microsimulation modelling software Paramics. It encompasses a smaller area but is coded to a higher level of detail. The model also records journey times across the 12 hour period between 0700-1900. The results from this modelling indicate that some increases in journey times may occur as a result of the development proposals being delivered. However those changes are not sufficient to be classified as adverse and severe and, furthermore, the changes outside of the peak hours are minimal.

38. A sensitivity test undertaken within the Vectos model to consider the influence of delivering LCCs proposed scheme at the Croston Road junction. This indicated that broadly conditions would be improved but by a small margin within the peak hours, particularly the PM peak.

39. Analysis of both the LCC and Vectos models reveals no instances of severe journey time impacts predicted to arise through the inclusion of the development via either modelling approach.

Appendix MA-9

November 2021 Submission Documents

vectos.

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12th November 2021

(FAO Janice Crook)
South Ribble Borough Council
Civic Centre
West Paddock, Leyland,
Lancashire, PR25 1DH

Ref: 211112_SRBCLET_PWJC_VN211918

Dear Janice,

Pickering's Farm Site, Penwortham (Land East of Penwortham Way and West of Leyland Road)

Following the submission of the planning applications (Ref: 07/2021/00886/ORM and 07/2021/00887/ORM), and our previous letter dated 14th October 2021, we have the further comments provided by LCC Highways on the 20th October 2021 and the National Highways response dated the 30th September 2021. We have also considered the responses recently received from LCC PRoW dated the 29th October 2021 and Network Rail dated the 9th November 2021.

This letter provides a response to items raised, either providing additional clarity, highlighting the presence of relevant information already included in the Transport Assessment (TA) or supplementing the original assessment with additional information, design and sensitivity assessments based on the requests from both LCC Highways and National Highways.

Where possible, we use the corresponding headings from the LCC Highways letter of the 20th October 2021, and note where these align with points also referenced by National Highways, LCC PRoW and Network Rail.

Masterplan

LCC Highways was not aware of the submitted masterplan at the time at which it drafted its comments. It raised the lack of a masterplan as a significant concern, but highlighted that if a masterplan has been produced, they would be more than happy to provide detailed statutory comments.

This matter was discussed with LCC Highways at a meeting on the 28th October 2021 when it was highlighted that a masterplan document had been produced and submitted alongside each of the planning applications. Additionally, a copy of the full masterplan was provided to LCC Highways by Avison Young on the 28th October 2021.

For clarity, the masterplan identifies a proposed design to support the overall scale of development on the allocated site. The TA identifies specific mobility, transport and highways relevant infrastructure within the local community and the masterplan (i.e. land use types and open space within the masterplan and surrounding community, active travel networks throughout the site, active travel access points providing permeability and connectivity with the neighbouring communities and further afield, primary vehicular access on Penwortham Way, all modes access via Bee Lane, management by Community Concierge, Primary and Secondary Mobility Hubs incorporating micro-consolidation and community facilities, Third Place working and shared travel systems including a new bus service etc.) that will be delivered as part of the scheme.

The commitment to the infrastructure will be through conditions and obligations, providing certainty to the Council that the infrastructure can and will be delivered in a timely manner.

Proposed Penwortham Way Primary Vehicular Access

With regards to the primary vehicular access on Penwortham Way, which we feel is an appropriate and reasonable option, LCC Highways has indicated that it supports the proposed layout which provides dedicated turning lanes into and out of the site to facilitate movement. It does not, however, agree with the principle of a single vehicular access for in excess of 1,000 homes. It suggests that in the interest of connectivity by all modes, a second vehicular access should be provided (i.e. a vehicular link to Kingsfold Drive).

There is no evidence for judging that a single vehicular access for in excess of 1,000 homes is inappropriate, and there is no evidence for judging that a vehicular access into the residential streets of Kingsfold makes a material difference to the performance of the Penwortham Way junction, or for the effect of traffic on the residential streets of Kingsfold.

The evidence that does exist is contained within the TA, with additional modelling evidence set out below. The mathematical analysis, including through micro-simulation and stand-alone junction modelling, leads to a sound conclusion that the proposed methods of vehicular access are appropriate and reasonable.

In addition, it is noted in the TA, and has been in subsequent meetings, that a vehicular Kingsfold link cannot be delivered by the scheme due to land ownership constraints. Active travel connectivity with Kingsfold, a higher priority form of connectivity in terms of sustainability, health and social interaction, is good, with five points of access, upgraded from their existing footpath status to accommodate walkers, cyclists and micro-mobility.

LCC Highways has queried why there is no sustainable travel infrastructure proposed at the primary vehicular site access on the existing A582. Within the TA, the junction option with the existing A582 does not include active travel infrastructure. The junction option with the proposed dualled A582 does include active travel infrastructure. The reason for the former is that the existing A582 does not have active travel infrastructure at this point, and so there is no such infrastructure to tie into. The A582 is not a strong active travel desire line to major destinations, and in the absence of facilities along the A582, and the existence of more attractive alternative routes, an active travel connection was not proposed. The reason for the latter is that, as part of the dualling scheme, the A582 will have active travel infrastructure, and so active travel infrastructure has been included within the scheme to tie into this. Of course, it should be noted that shared travel vehicular infrastructure can and will use this junction and in this respect, both layouts include for sustainable travel.

Given LCC Highways' comment, an offer is made to provide for active travel infrastructure in all junction layouts, secured through legal agreement if necessary, with the detail being determined at detailed junction layout design stage. This is already included in one option, and it makes no difference to the traffic performance analysis associated with the other.

As requested by LCC Highways, an isolated junction model using LinSIG has been produced for the site access on Penwortham Way. Traffic flows have been extracted from the micro-simulation model. The results are presented in a supplementary Technical Note 03 – Traffic Data and Modelling which is attached to this letter. It would be unusual to expect two traffic models assessing the same situation to lead to different conclusions, and that is the case here. The original micro-simulation model is the more sophisticated model, and the stand alone LinSIG model corroborates the judgements from the former. In neither case have the modellers considered it necessary to apply the additional modelling step associated with a guidance compliant 'Vision and Validate' approach to assessment compared with the historic 'Predict and Provide' approach. We explain this further below.

Proposed Bee Lane Access

LCC Highways has indicated that it is very concerned about the proposals to retain the existing carriageway over the Bee Lane bridge without suitable sustainable provision to satisfy future demand.

Technical Note 04 – Bee Lane is attached to this letter and explains the current shared surface and mixed mode use of the bridge, including the low vehicular flows. It explains the change that is likely as a result of the scheme, judging that vehicular flows will remain low.

These low flows, and observations recorded of all movements along the existing bridge, led to the judgement that the existing carriageway would remain suitable as a shared surface to accommodate the future predicted use by all modes, where no single form of transport is afforded priority. There have been no recorded accidents on the Bee Lane bridge (or the Flag Lane bridge further south) in the last 15 years.

Whilst this remains, in our view, a reasonable option, we are cognisant of the fact that Network Rail perceive there to be an increased risk of vehicles striking the structure as a result of collision avoidance action. We have therefore taken the opportunity, as an option, to consider the more formal delineation of a route for active travel purposes, and the creation of a give-way priority working for motor vehicles. This is the principle adopted at the Flag Lane bridge and at the Coote Lane bridge. A possible, but not necessarily unique, layout is presented in Technical Note 04 – Bee Lane.

In addition to the carriageway over the bridge, LCC Highways has indicated that the junction of Bee Lane/Leyland Road does not include suitable sustainable provision to satisfy future demand. It was acknowledged in the TA that consideration could be given to an improvement at this location to improve crossing movements for active travel modes.

In light of the County's comments, an improvement option to provide controlled crossings is presented in Technical Note 04 – Bee Lane with the aim of improving active travel connections to and from the east, including links to the Old Tram Line providing active travel access to Preston city centre and Preston railway station.

The improvement will provide controlled crossings at the Bee Lane/Leyland Road junction and would not only assist with active travel movements at the junction, but a better balancing of traffic movements on the highway. This is set out in Technical Note 04 – Bee Lane , along with an analysis of traffic performance which shows no change for most of the day, and a marginal difference in the traditional commuter peak.

Flag Lane and Other Access

The TA highlights that there will be no access to the development by vehicles from the existing 'lanes', with the exception of 40 homes served by vehicle across Bee Lane bridge. As such, no changes are proposed to the existing Flag Lane bridge which will continue to accommodate existing vehicular demands, and future active travel demands.

In addition, whilst many of the comments provided by LCC Highways relate to the development connecting to existing shops, services and amenities in adjacent communities, it should also be emphasised that existing residents of these communities will have the benefit of accessibility to more facilities and services by active travel and shared travel as a result of the development.

A series of plans are presented in the TA highlighting the good connectivity with the neighbouring communities, and onward connectivity to higher order locations, such as Preston centre and the railway station.

Public Transport

A commitment will be made, and delivered through obligations, to provide a new 30 minutes bus service accessing the site via Penwortham Way. It should be noted that in making this commitment, the risk lies with the developer to ensure that the service (or alternative) remains available, remembering that travel by bus is only one form of shared travel. This is in addition to the existing bus facilities that are accessible within Kingsfold and Leyland Road and The Cawsey, that are accessible from the community.

LCC Highways comments that existing use of public transport for commuting is low within the existing communities and that a bus service which is less frequent than existing services would offer little by way of an attractive alternative to the private car. Shared travel services, including buses, perform many functions, and it is not their sole purpose to persuade people using cars not to use cars. They provide for choice and for social inclusion. In sustainability terms they are also a benefit in comparison to single occupancy car use. The propensity to divert people onto buses that would otherwise use cars is also a function of the wider transport strategy, including provision of road capacity for private cars, parking policies, pricing structures and peer attitudes.

We do not agree with LCC Highways, if that is the implication, that providing this service is not a valuable addition to the sustainable travel network, to choice, to social inclusion and in providing alternatives to those looking for alternatives to the private car for some trips.

We note that it is not only the frequency of service that influences attractiveness but also destinations served, journey time to destinations and infrastructure at stops. In addition, the information presented by LCC Highways only considers journeys to work, which is one journey purpose and not necessarily the most prevalent when considered across the whole day. As such, the provision of a new, direct service between the site and Preston city centre, when considered along with the existing choice of services available, will contribute to a good level of accessibility for future residents and the existing communities.

It is also important to note that bus travel is only one form of shared travel and many opportunities exist to consider more innovative measures that draw on established technology (i.e. car sharing, car pooling, micro-mobility, demand responsive travel, Mobility as a Service). Opportunities exist to promote a range of shared travel options, to a range of destinations, and for a range of journey purposes, via the Mobility Hub and Community Concierge team, which forms part of the overall development proposals.

Parking

A query has been raised by LCC Highways in relation to parking proposed as part of the development and whether the provision of parking in accordance with local guidance has the potential to undermine the proposed access strategy which emphasises the opportunities to travel by non-car modes.

We are keen to discuss the detail of parking with LCC Highways further such that the masterplan continues to provide the best layout and facilities to provide for local and sustainable living. For example, we would welcome discussing reducing parking provision below the historical provisions for the new development in the area, and the balance between residential on and off plot parking. We would welcome a discussion on parking at the school and community centre, and the potential for limited parking based on a hybrid approach derived in the context of local sustainability and the Mobility Hub network.

Cycling and Walking

The TA highlights the commitment to upgrade the existing rights of way that run through the site and provide excellent opportunities to connect with the existing communities of Kingsfold, Penwortham, Tardy Gate and Lostock Hall, enabling one community and local living. Individual routes are identified along with consideration of what additional infrastructure would enhance these routes to assist with the promotion of active travel (i.e. improved width, surfacing, lighting etc). Many of the routes identified for upgrade in the TA are referenced in the response provided by LCC PRoW, and we would welcome the opportunity to discuss the technical detail of improvements to these routes with LCC.

LCC has expressed concern about the use of single distance measurements from the site centre as a means of making judgements about accessibility. The TA includes distance measurements to amenities from a variety of locations around the site, including, but not only, the distance measurements from the centre of the site that LCC references. Therefore, we note that the TA does not rely upon single distance measurements.

LCC has also queried whether distances are crow fly distances. We confirm that they are not. The TA includes three figures (Figure 2.2, Figure 2.3 and Figure 2.4) highlighting 1km and 2km catchments where the distance measurements have been made along specific and practical routes, and from the range of starting points within the site. Our view is that the information presented allows an informed judgement to be made about distance accessibility.

LCC has queried the appropriateness of active travel infrastructure beyond the site and within the existing communities. With respect to existing active travel infrastructure within the communities of Kingsfold and Tardy Gate, it is our view that these communities have a good provision for active travel movement. Further afield, we say that active travel connectivity is excellent, including the Old Tram Line network of active travel infrastructure connecting with many locations, including Preston city centre, Avenham Park and the railway station, and the various road space reallocations that the authorities have implemented in the area to provide dedicated cycle lanes.

If LCC does not agree that the existing communities are well served by active travel provision, we would be delighted to speak with LCC Highways further about any specific opportunities (i.e. dropped kerbs, tactile paving, crossing provision, signage etc.) that could be explored further, linked reasonably to the proposed development. In light of the LCC Highways comments, one such opportunity that we have identified is an additional controlled crossing on Leyland Road to better provide for active travel access to Moor Hey School. This is a commitment that the scheme offers to make, subject to detailed agreement, and through either conditions or obligations.

Access to employment has been queried in the LCC Highways response. Whilst it is not clear at this stage the exact context of the comment, it is important to note that employment includes those people working in local shops, schools and medical centres (to name a few), as well as more significant employment districts in Leyland, Bamber Bridge and Preston city centre. The catchments presented in the TA demonstrate that there are a range of employment opportunities available within the various active travel and shared travel catchments. In addition to existing opportunities, the development proposes a Third Place working facility for occasional ‘home working’, which also serves as an anchor enabling other trips to be contained locally. The current guidance and comment from the ONS suggests that post Covid-19, there is an expectation that home working, including Third Place working will constitute in the order of 30% - 40% of working at any specific time in the week.

LCC has queried the distances that people will walk in the future. As noted in the TA, reference is made to guidance and research relating to how far people walk and cycle. One such source prepared by WYG references data from the National Travel Survey to derive 85th percentile walking distances for a range of journey purposes. This provides a useful guide as to how far people were walking at the time of the surveys, but as noted in the TA, propensity to walk is not exclusively a function of distance with it also being related to journey purpose, the quality of the local environment, peer culture and convenience. With all of this in mind, and in the context of emerging trends that were prevalent before Covid-19, it is reasonable to assume that the use of active travel modes will become more prevalent for a range of journey purposes.

Overall, we agree with LCC Highways' view that the site is well positioned on the periphery of the built environment, and welcome LCC Highways' support for sustainable development.

Discounting and 'Vision and Validate'

LCC Highways makes reference to the fact that it is not satisfied with the discounting of private car trips within the modelling assessments.

It appears that there may be some confusion with regards to perceived trip discounting and the adoption of a 'Vision and Validate' approach. The trip forecasts have not been discounted from standard industry database data and the observed effects reported by that data. The trip forecasts reflect historical travel patterns, and it is our view that as these were changing pre-Covid-19, and have accelerated as a result of the pandemic, that they are likely to be overestimates of longer distance and less discretional travel.

We wonder whether there is also some confusion over the guidance compliant 'Vision and Validate' approach. The term 'Vision and Validate' is used to differentiate itself from the previously adopted 'Predict and Provide' approach which, as outlined in the TA and our letter dated 14th October 2021, is no longer deemed appropriate for use. This is referenced by the CIHT, TCPA, TRICS, TfN and the DfT. By starting with the policy compliant 'Vision and Validate' approach, the TA is able to make judgements about the 'likely' impacts of development, as required by Paragraph 113 of the NPPF.

For clarity, there has been no trip discounting associated with aspirational modal shift, as has been suggested by LCC Highways.

As noted in the TA, person trip rates have been extracted from the TRICS database for a 12-hour period which have then been split by journey purpose, and then mode splits for each journey purpose. The journey purposes and mode splits have been sourced from the National Travel Survey and Census data, and as such are evidence based. Three distribution patterns have been derived for the different journey purposes which are then combined to provide an overall demand matrix for use in the subsequent modelling.

An allowance has been made for an increased number of people working from home or a Third Place compared with pre-Covid-19. The site design and facilities allow for and encourage this. This is documented in the TA as being 5% and seeks to account in some way for the trend prevalent before the Covid-19 pandemic, but which has now become mainstream for many. In addition, an allowance has been made for a proportion of recreation and leisure trips to be contained within the community, including the site and the surrounding community, those being walking the dog, visiting friends, day to day shopping, other shopping and personal business. This is documented in the TA as being 50%.

Finally, as noted in the TA, the assessment of the applications assumes that there is no school provided on the site and therefore all education trips occur off-site, including car trips. This is likely to be an overestimation. It is only for the full 1,350 masterplan scenario that some account is made for a school being present on site, as noted in the TA.

Combined, these are the only factors applied to the assessment which LCC Highways seem to be referring to as discounting, but which we say are a reasonable expectation of traditional living and have been included in the assessments to account for a likely scenario.

One of the differences between the 'Vision and Validate' and 'Predict and Provide' approaches is an additional step in the mathematical analysis. This step is the reallocation of forecast demand temporally and modally, in addition to the reallocation that many mathematical models already employ in route decision making. These temporal and modal reallocations aren't capable of being undertaken by mathematical models, but do reflect real life, as evidenced and reported on by a variety of reports including Noland (2001), Noland and Lem (2002) and Milam et. al. (2017) to reference but a few.

This additional step element is only triggered following the initial assessment as outlined above, and reflects what many call the fundamental law of traffic (i.e. traffic flow is increasingly a function of the available road space in increasingly congested networks). In such instances, when inconvenience on the network increases, some of the initial unfettered traffic forecast will seek to reallocate itself either by time of travel, not travelling at all or by modal shift. This references real life and is an extrapolation of generalised cost theory which is used in traffic models to allocate traffic to least cost routes but is also a process we all engage with when deciding how and when to travel by particular modes. This is a way of taking account of well understood phenomena such as 'peak spreading' for instance.

This step has not been triggered in the assessments (including the sensitivity assessments presented in Technical Note 03 – Traffic Data and Modelling) to date, as the forecast inconvenience associated with travelling on the network has not reached a point at which we consider this is likely to happen in a substantial way.

We welcome the position of LCC Highways that aspirational modes splits should be encouraged through the Travel Plan and inclusion of a Mobility Hub within the development, and we will seek to explore this further in due course. This would result in lower traffic flow forecasts in the wider area than those applied in the TA for the purpose of those assessments.

Base Data and Trip Rates

LCC Highways and National Highways have queried the use of data collected in April 2021 which has informed the creation of a base model for use in the assessments. To assist in demonstrating that the traffic data is suitable for use, reference should be made to the attached Technical Note 03 -Traffic Data and Modelling. In this note, a comparison of traffic data is presented including:

- 2021 peak hour data v 2018 peak hour data;
- 2021 AADT v 2018/19 AADT to consider trips across the day; and
- 2021 journey time data v 2018/19 journey time data.

The data comparison indicates that general levels of traffic in 2021 were similar to general levels of traffic in 2018. There are however some specific differences.

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 actually 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. As such, it remains our position that just because counts were collected in 2021, this should not render them unsuitable for use when considered as a whole for travel across a 12-hour period and given the purpose of assessment.

We have conducted some further modelling to see how sensitive the network might be to changes in traffic flow. Technical Note 03 - Traffic Data and Modelling presents two sensitivity tests which:

- Increase base flows by 20%; and
- Increase forecast trip demands.

The results indicate that the network is not sensitive to changes in mathematical demand flows of these magnitudes and that the additional 'Vision and Validate' step is still unlikely to be triggered in any substantial way. On that basis the conclusions of the TA remain.

Micro-Simulation Modelling

It has been suggested by LCC Highways that the modelling approach is unacceptable and that individual junction models should be presented as part of the main assessment, which should then be the primary information upon which to form a judgement of development impacts, supplemented by micro-simulation modelling. We do not consider that this is the appropriate or best approach when considering travel across the network and across the whole day. However, we have undertaken the stand-alone traditional commuter peak modelling as suggested by LCC, and this is reported in Technical Note 03 – Traffic Data and Modelling.

There are several key benefits associated with the micro-simulation modelling approach including that the model allows for routing reassignment in response to queueing and congestion. Fundamentally, it allows for an assessment of effect on a corridor basis, cognisant of the effects of interaction between junctions and queue propagation from one junction to another which can affect the operation of the network. Isolated junction modelling cannot capture any impact that upstream network function is inducing and, as such, can provide an oversimplified interpretation of how a network can accommodate traffic flows. One would not expect to rely on individual junction models within this development study area in isolation, as they would not allow for suitable judgements to be made with regards the effect along an entire corridor which, itself, is more important to the overall user experience than the operation of a single junction.

Whilst isolated junction modelling can be useful in terms of understanding the operation of a single junction, in relation to a specific set of traffic flows, we consider that it is actually the case that isolated junction modelling should be seen as complementary to the micro-simulation modelling rather than, as is being suggested, the two being used the other way around. As such, following a series of discussions with LCC Highways, a number of individual junction models and results have been presented in Technical Note 03 – Traffic Data and Modelling to supplement the micro-simulation modelling presented in the TA. As we have consistently noted throughout the TA, although we are happy to assist with the provision of individual junction models, theoretical capacity per se is not a pass/fail trigger for a planning proposal and all results should be viewed in this context.

Although LCC Highways does not comment in any detail regarding the micro-simulation model, we would highlight that the micro-simulation model has been developed in line with standard micro-simulation modelling guidelines with calibration parameters adjusted to ensure that the model reflects the observed data. Signal staging and timings have been sourced from the previous applications, including signal plans and junction models, supplemented by observations recorded on site to confirm their suitability. The base model has been calibrated and validated in line with standard guidelines, to ensure that the model network is reflective of the observed data used in the model build, with a high level of calibration and validation achieved which is documented within the supporting LMVR which is included in the TA.

In addition, we would note that the model has been subject to an independent audit which found it fit for purpose. A copy of the audit report is also included as an appendix within the original TA.

Traffic Distribution
Discussions have been ongoing with LCC Highways regarding the development distribution. As noted in the TA, there are three distribution patterns which have been derived from a range of sources including the location of certain amenities (i.e. schools, retail centres, employment sites) along with Census journey to work data. Information regarding the methodology have been presented to LCC Highways in both the TA and supplementary emails.

Committed Development and Traffic Growth
Committed developments have been included and LCC Highways do not disagree with the sites that have been included. Additional detail regarding the model forecasting process is included in a Model Forecasting Note which is an appendix within the TA.

It is noted in the TA that the inclusion of site-specific committed developments, of which a number are also Local Plan allocations, provides an increase in traffic on the network greater than would be achieved by simply applying a global TEMPro growth factor to the demand matrices. Whilst guidance does note that the use of TEMPRo for traffic forecasts is an appropriate tool, the guidance also highlights that any such approach should be reviewed prior to application to ensure that modelling does not simply reinforce historic travel patterns. The forecasting procedure adopted within the modelling does incorporate a review of TEMPro with the conclusion reached that the adjustments to future year demands are justified.

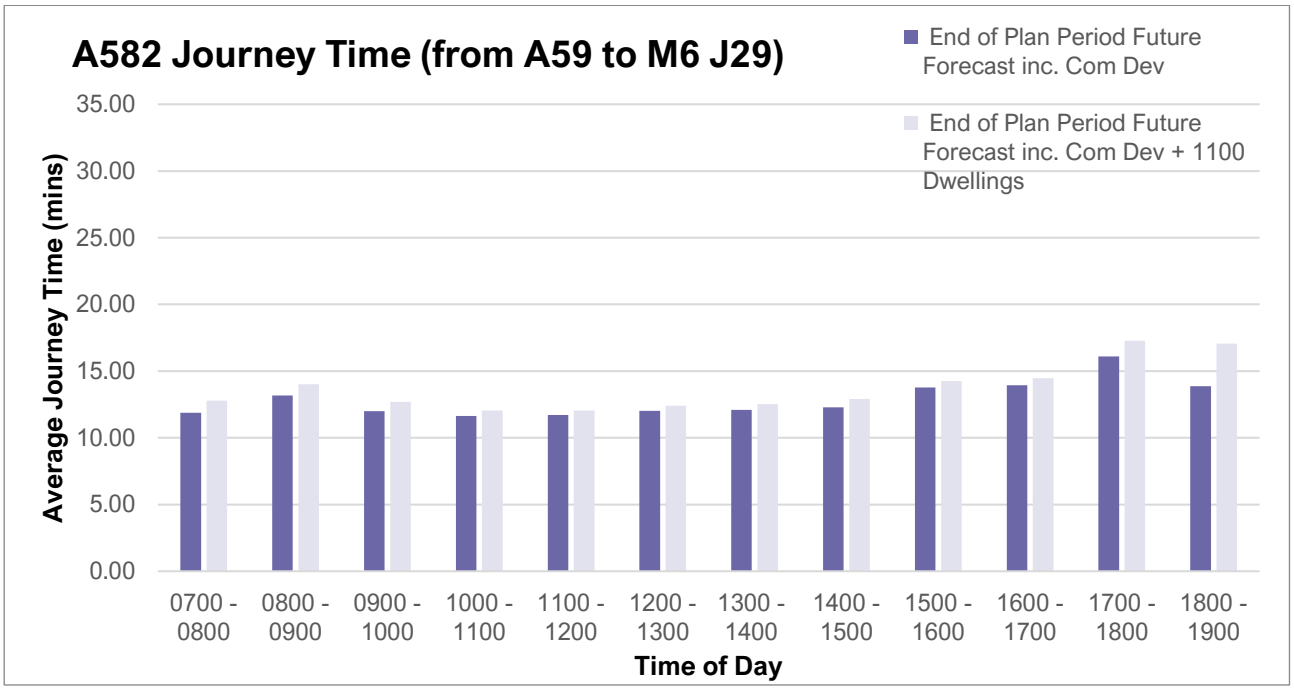
Modelling Results
It has been noted by LCC Highways that the results of the modelling, due to what it considers a flawed modelling approach, are not accepted. Additional information has been requested regarding queue lengths on the network.

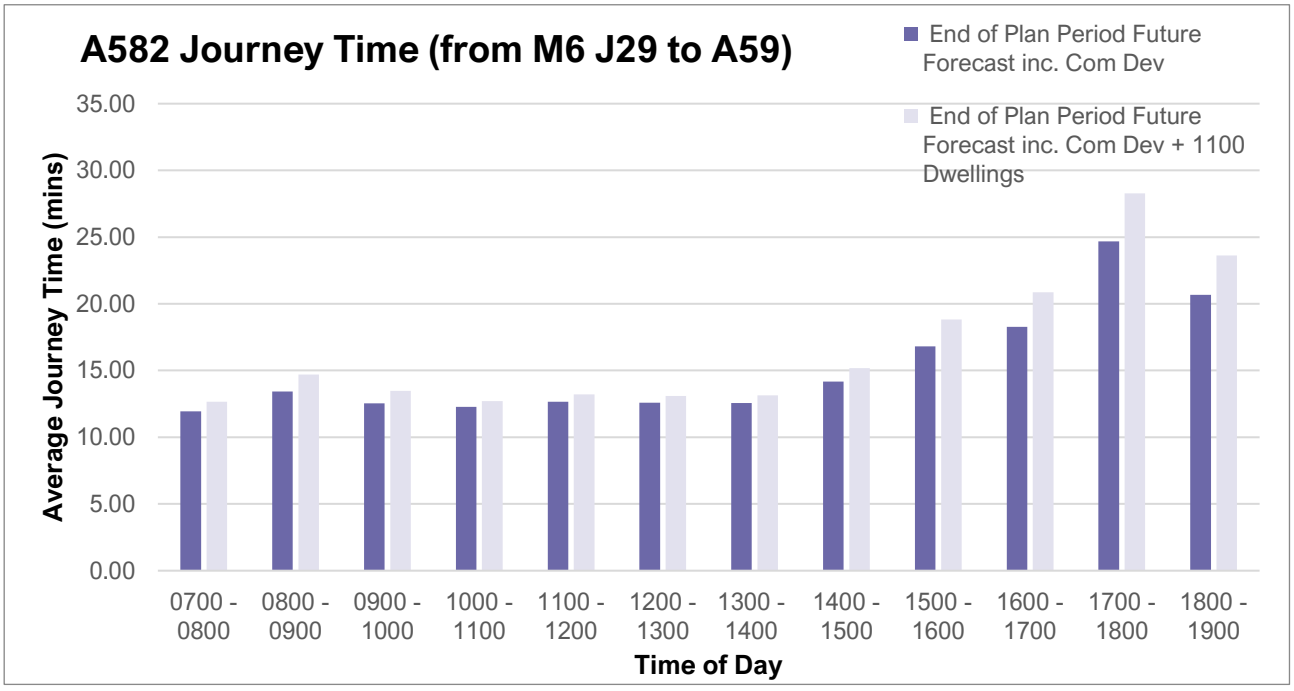
The TA includes the key elements for review, and highlighted that further specific information can be made available on request. Given the request, additional model results for the scenarios presented in the TA are attached within Technical Note 03 – Traffic Data and Modelling.

LCC Highways do question some of the traffic levels reported for certain parts of the network, particularly around the Strategic Road Network. However, it should be noted that the reported traffic flows will account for dynamic traffic rerouting in response to increases in congestion and inconvenience on the network. As such, it is not correct to simply assume that if traffic flows reduce on a certain part of the network that this demonstrates a flaw. In fact, this is where the use of micro-simulation as a more sophisticated traffic modelling tool allows for a more informed judgement to me made rather than relying on individual junction models.

Further Comments and Thoughts
In LCC Highways' concluding remarks, it notes that there are several pinch points on the network where queueing extends for several hundred metres. This points to the fact that, in providing comments, the focus remains solely on the historic commuter peak period, and we note that a reasonable interpretation of policy is that it is not to protect the convenience of the car commuter.

We expect that there will be pinch points on the network and that there will be queuing, some of which might increase at times of the day. However, the modelling which informs the TA makes forecasts of the everyday tangible metric of journey times which allows us to look at movement and the convenience of movement in the context of the whole day. A summary of average journey times per hour, for the through route along the A582 are included below.





These graphs show the mathematical results before making any judgements about a redistribution of unfettered demand either by time, mode or lifestyle change that would follow under a 'Vision and Validate' approach.

Convenience of vehicle movement across the day are relatively consistent in both directions with little variation. The variation is only evident for short periods and in the traditional commuter peak hours, in this case in the evening, when congestion and inconvenience increases. For the through route corridor between the A59 and the M6 Junction 29, a typical journey time southbound is in the order of 16-17 minutes without development, and 17-18 minutes with the development. For the northbound movement this is 24-25 minutes without development, and 28-29 minutes with the development. There is inevitably an increase in typical journey time as a result of accessing this allocated site from the A582 as it introduces a new signal-controlled junction to the network.

When considering this in the context of journey purposes across the day, the NTS identifies that business trips (which are often viewed as contributing most to the overall economy) are most prevalent between 0900-1700hrs and less so in the times at which general convenience of travelling by road is least. Placing this in context, based on NTS data, business trips between 0700 and 1700, where convenience is broadly flat, makes up about 78% of daily business trips, and business trips at the time where inconvenience peaks, although still at a low level between 1700 and 1900, makes up about 11% of daily business trips.

Other Comments

The purpose of the planning system is to contribute to the achievement of sustainable development, and there are three strands to this set out in the NPPF; economy, social and environmental.

The social, environmental and economic credentials and benefits of development of this site have already been determined by its allocation in the Local Plan. The design of this site, as explained in the planning applications and above, accentuates those social and environmental benefits, and reinforces the conclusion that this is the best location and way in which to deliver this growth.

In the context of the principle that the purpose of planning policy is to deliver sustainable development, and it is specifically not the purpose of planning policy to protect the convenience of the car commuter, the modelling work leads reasonably to a conclusion that there is no substantial disbenefit as a result of either including an additional junction on the network, or the additional traffic demands on the transport networks.

Through regular communications with LCC Highways, National Highways and Network Rail, we have sought to continue our discussions regarding the development proposals which started prior to the submission of the applications. Where requests for additional information or clarity have been expressed either in writing or during the various meetings, we have sought to understand the purpose of these requests and have then assisted with the provision of information in an expedient manner.

Whilst there are still some discussions ongoing with LCC Highways and National Highways regarding the comments made to date, we do hope that the information contained within this letter, and associated technical attachments, will assist in allowing SRBC to positively determine the planning applications. However, should you have any comments, questions or queries at this time, please do not hesitate to contact us and we look forward to speaking with you further at our next meeting in the coming week.

Yours sincerely

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Enc. Technical Note 03 – Traffic Data and Modelling
Technical Note 04 – Bee Lane

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%

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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.

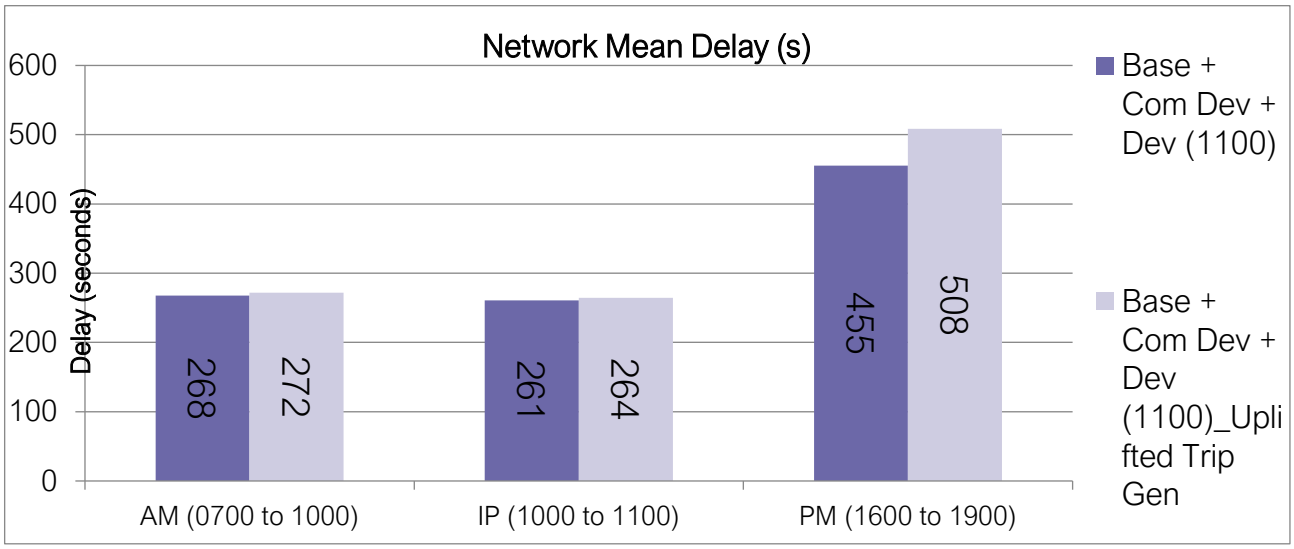
Table 1.8: Development Trip Generation Uplift by Hour

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.



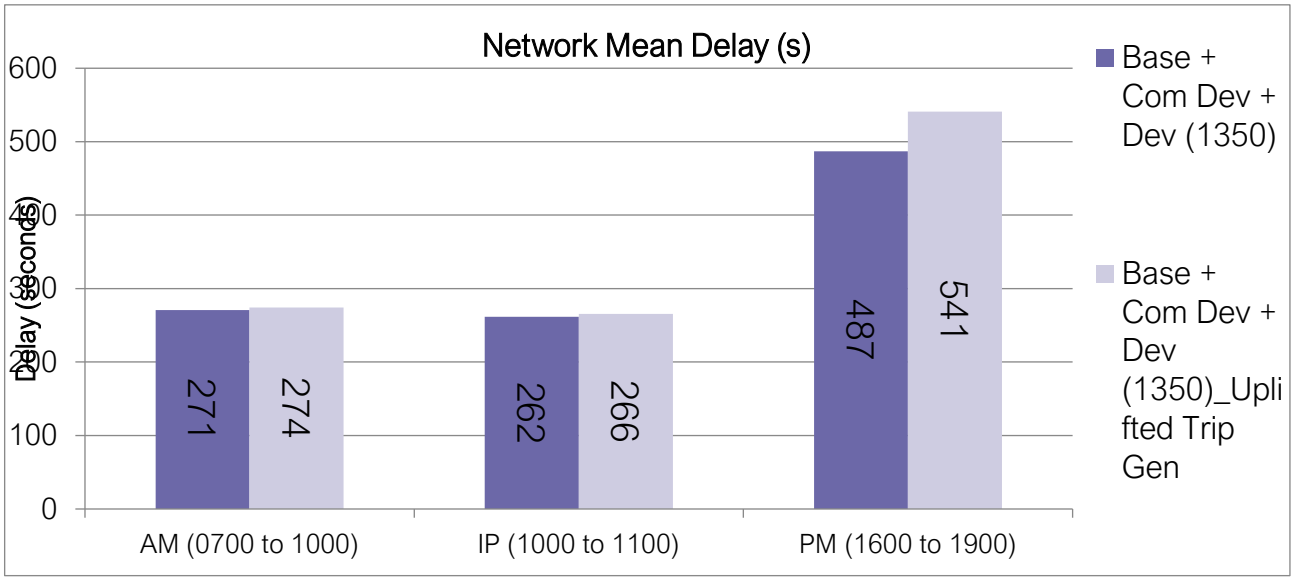
** TA results have been updated to allow for suitable comparison due to model coding changes triggered by the sensitivity tests*

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.

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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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Proposed Residential Development, The Lanes, Penwortham

Technical Note 04 – Bee Lane Access Review

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Overview

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

2. The planning application proposed access from Bee Lane for approximately 40 dwellings to the north-east of the site, as well as active travel access for the wider scheme. The comments received from LCC and Network Rail queried the use of Bee Lane in its current form (i.e. a pedestrian prioritised street) to accommodate an increase in movements by all modes.

3. This note has been prepared to further consider the existing traffic and infrastructure at Bee Lane, the proposed increase in trip movements and the options available to accommodate all road users in a safe and efficient manner.

Existing Traffic Flows

4. Manual Classified Count (MCC) surveys were completed at the Bee Lane / B5254 Leyland Road / The Cawsey junction by Nationwide Data Collection on Wednesday 21st April between 07:00 – 19:00 and by Signal Surveys on Wednesday 12th September 2018 between 07:30 – 09:30 and 16:30 – 17:30.

5. **Figure 1.1** and **Figure 1.2** provide a summary of these vehicle flows. The turning movements at this junction have been used to consider the link flows along Bee Lane.

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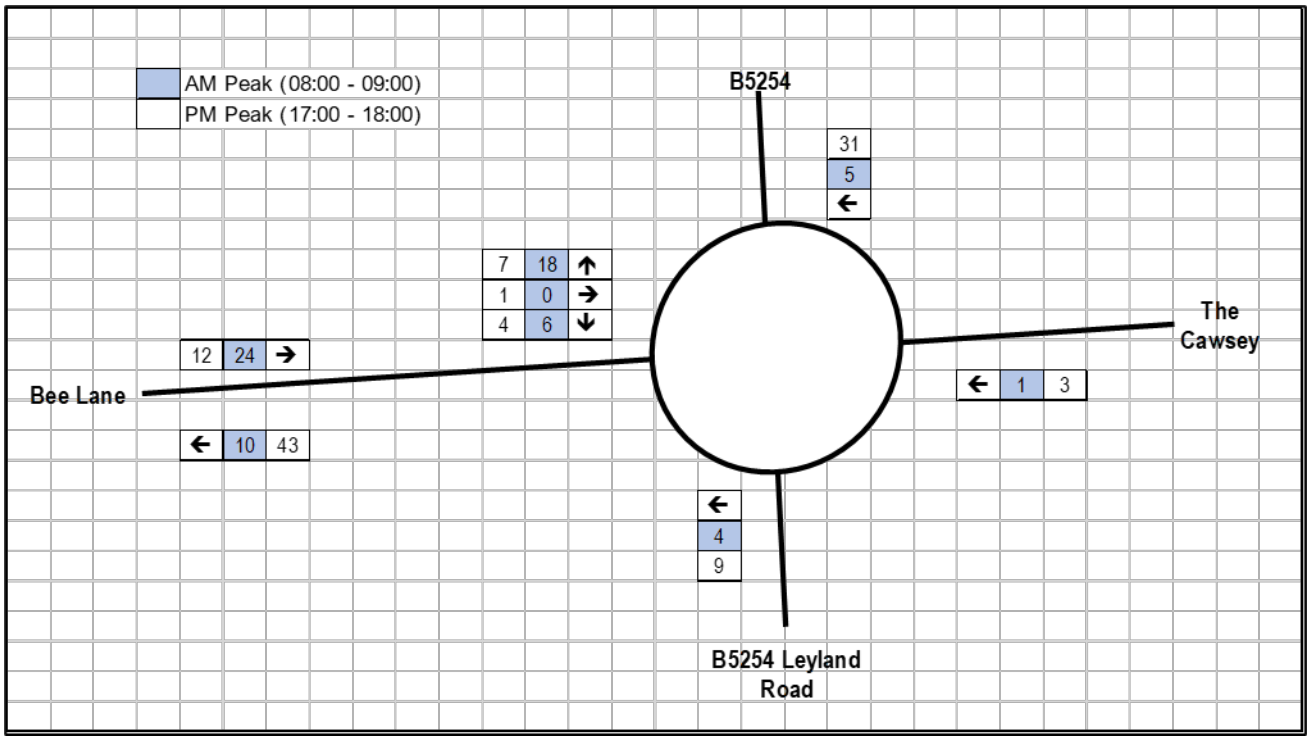

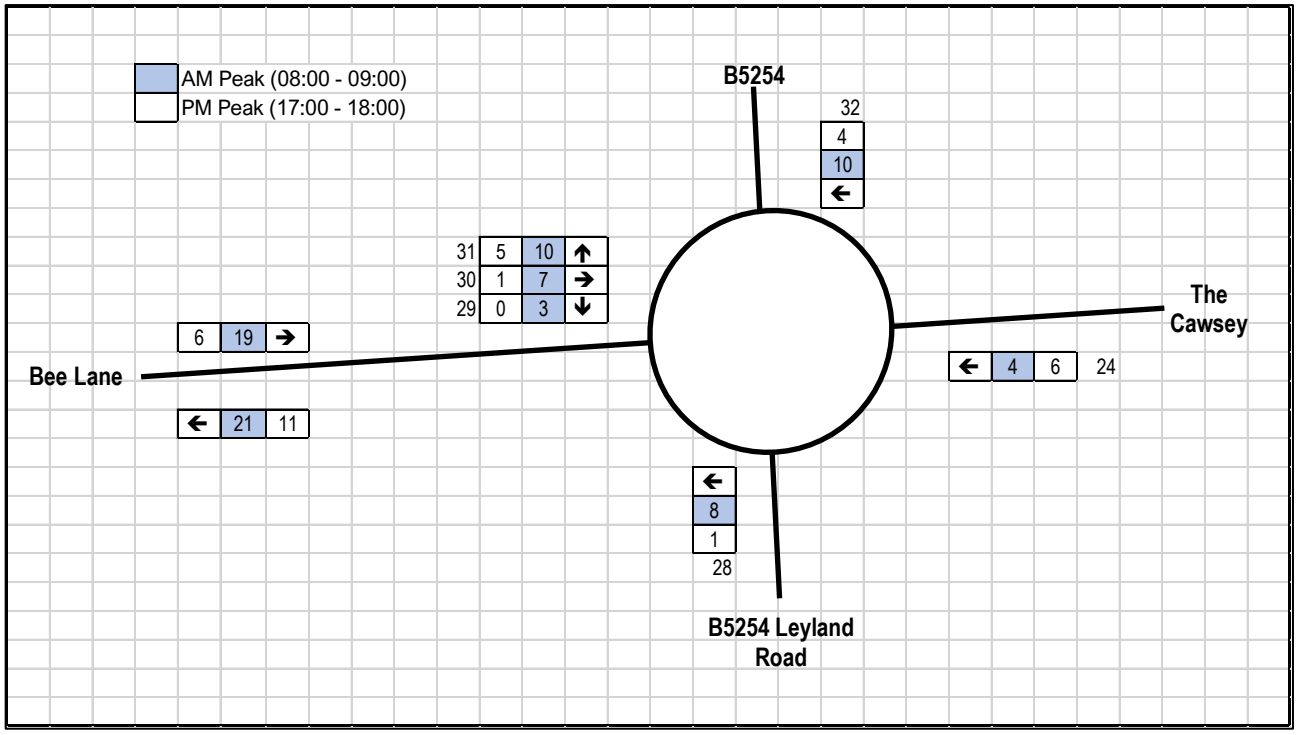

Figure 1.2: 2021 Traffic Flows

6. **Figure 1.1** indicates that when the 2018 surveys were undertaken there were 34 two-way trips along Bee Lane during the AM peak period and 55 two-way trips during the PM peak period. **Figure 1.2** highlights that the 2021 surveys are not dissimilar to the 2018 flows across the bridge with 40 two-way trips during the AM peak and 17 trips during the PM peak. Flows throughout the day remain low with few observed conflicts.

Proposed Traffic Generation

7. In order to consider the potential increase in vehicular trips along Bee Lane for a development scale of 40 dwellings, the same trip generation methodology as set out within the TA has been utilised. This assessment considers the typical AM and PM peak periods and utilises the existing turning manoeuvres at the Bee Lane / B5254 Leyland Road / The Cawsey junction to consider the trip distribution of these trips. **Figure 1.3** provides a summary of this information.

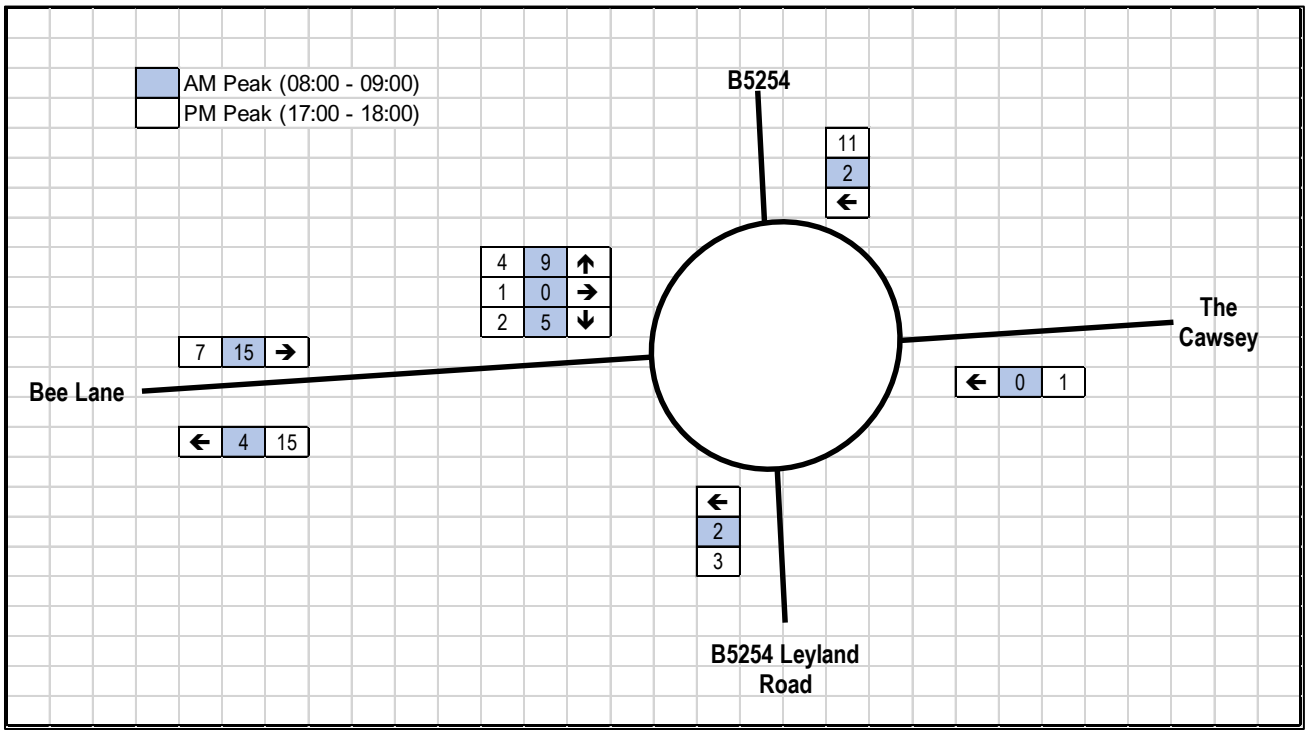

Figure 1.3: Proposed Development Trip Generation (40 dwellings)

8. **Figure 1.3** highlights that if 40 dwellings were accessed off Bee Lane there could be an additional 19 two-way vehicle trips during the AM peak period and 22 two-way vehicle trips during the PM peak period using Bee Lane.

Bee Lane Access Arrangements

9. Pedestrian and cycle access is currently provided along Bee Lane, along with access to a number of existing properties which will be retained as part of the development proposals. As outlined in **Figure 1.1** and **Figure 1.2**, this route is currently lightly trafficked with low vehicle speeds which facilitates active travel use with minimal conflict.

10. The proposed new vehicular access from Bee Lane will be provided from the existing adopted highway and will take the form of a simple priority junction. The simple priority junction will provide a width of 5.5 metres with 2 metre-wide footways around each radii. Visibility splays of 2.4 metres by 43 metres can be provided in both directions, and as shown in **Figure 1.1**, vehicle flows have been observed to be low in the vicinity of this proposed access.

11. As highlighted in **Figure 1.3** there would be 15 departures from the site during the AM peak period and 4 arrivals. During the PM peak period there would be 15 arrivals and 7 departures during the PM peak period. These trips once distributed across the peak hour would equate to a new vehicle trip every 3 minutes during the AM and PM peak period.

12. As noted in the TA, the Bee Lane bridge over the West Coast Mainline has a width between the parapets of approximately 6.5 metres and the route at this point is straight with good forward visibility. Given the observed low vehicle flows and speeds at present, and the fact that all users have good visibility of each other, the design within the TA to accommodate the predicted use of this bridge (including pedestrians, cyclists, micro-mobility users, cars and delivery vehicles, all in relatively low volumes) assumes a pedestrian prioritised street arrangement, where vehicles are perceived as ‘guests’ in this environment.

13. The low flows, and observations recorded of all movements along the existing bridge, led to the judgement that the existing carriageway would remain suitable as a shared surface to accommodate the future predicted use by all modes, where no single form of transport is afforded priority. There have been no recorded accidents on the Bee Lane bridge in the last 15 years.

14. Whilst this remains a reasonable option, it is acknowledged that Network Rail perceive there to be an increased risk of vehicles striking the structure as a result of collision avoidance action. To assist in providing options which demonstrate that perceived risks can be managed and minimised, consideration has been given to the more formal delineation of a route for active travel purposes, and the creation of a give-way priority working for motor vehicles. This is the principle adopted at the Flag Lane bridge and at the Coote Lane bridge. A possible, but not necessarily unique, layout is presented in **Figure 1.4**.

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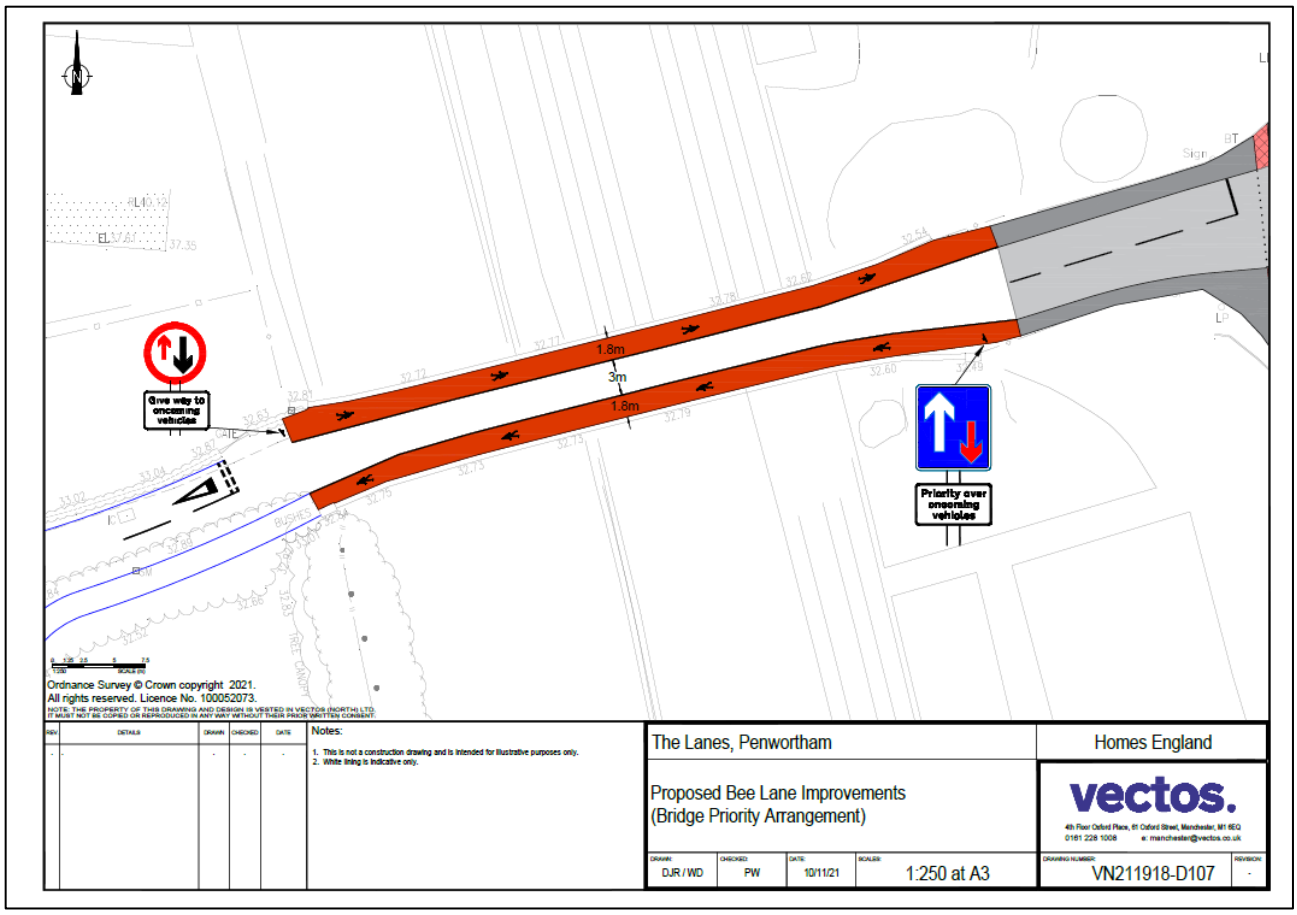

Figure 1.4: Possible Option for Delineation of Bee Lane Bridge

B5254 Leyland Road / Bee Lane / The Cawsey Junction Improvements

15. As part of the planning submission, active travel infrastructure improvements to the Bee Lane / B5254 Leyland Road / The Cawsey junction were suggested, building upon initial comments provided by LCC Highways in July 2021.

16. An improvement option to provide controlled crossings is presented **Figure 1.5** with the aim of improving active travel connections to and from the east, including links to the Old Tram Line providing active travel access to Preston city centre and Preston railway station. All works are contained within the adopted highway.

17. The improvement will provide controlled crossings at the Bee Lane / B5254 Leyland Road / The Cawsey junction and would not only assist with active travel movements at the junction, but a better balancing of traffic movements on the highway.

18. Space is provided within the layout to best accommodate turning movements through the provision of a right turning lane at the B5254 Leyland Road northbound stop line, separate right and left turning lanes at The Cawsey stop line and space within the junction to allow right turning vehicles to sit without blocking the ahead movements on the B5254 Leyland Road corridor.

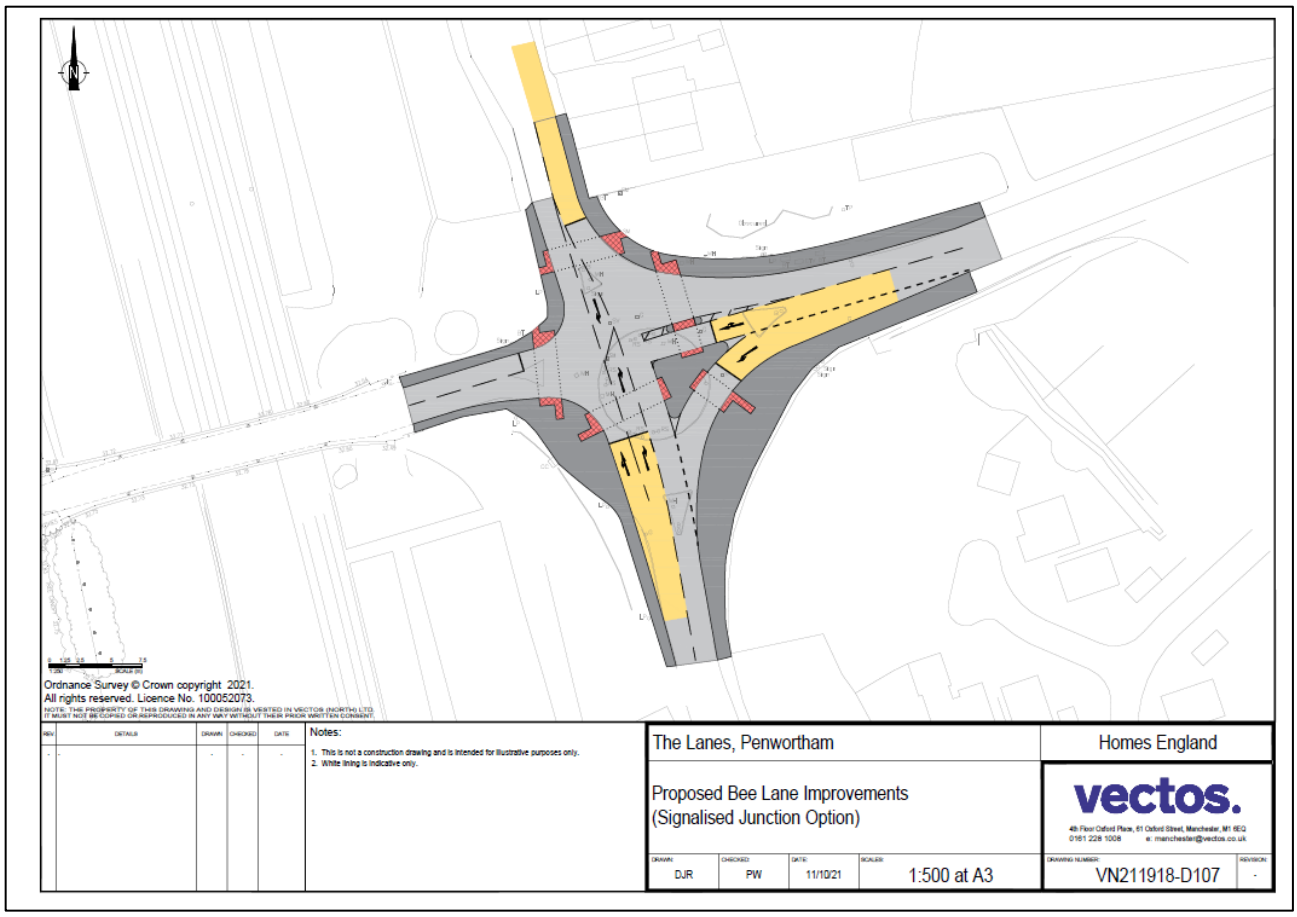

Figure 1.5: Bee Lane/B5254 Leyland Road/The Cawsey Active Travel Improvement Option

19. The new junction arrangement has been modelled as part of this review and a comparison completed between the existing layout and proposed layout.

20. In the existing roundabout layout scenario (in the 1,350 unit development test), queueing is predominantly focussed on the B5254 Leyland Road northbound approach to the roundabout and The Cawsey approach.

21. With the roundabout upgraded to a signal controlled junction, the queues become more evenly spread across the junction. In this scenario, queues increase on the B5254 Leyland Road southbound approach, but reduce on the B5254 Leyland Road northbound approach.

22. The impact on journey times is that there are some increases in journey times on the B5254 Leyland Road southbound, whilst journey times on the northbound route reduce. The change in journey time along the B5254 Leyland Road is presented in **Figure 1.6** for a period between 0700 – 1000 and **Figure 1.7** for a period between 1600 – 1900.

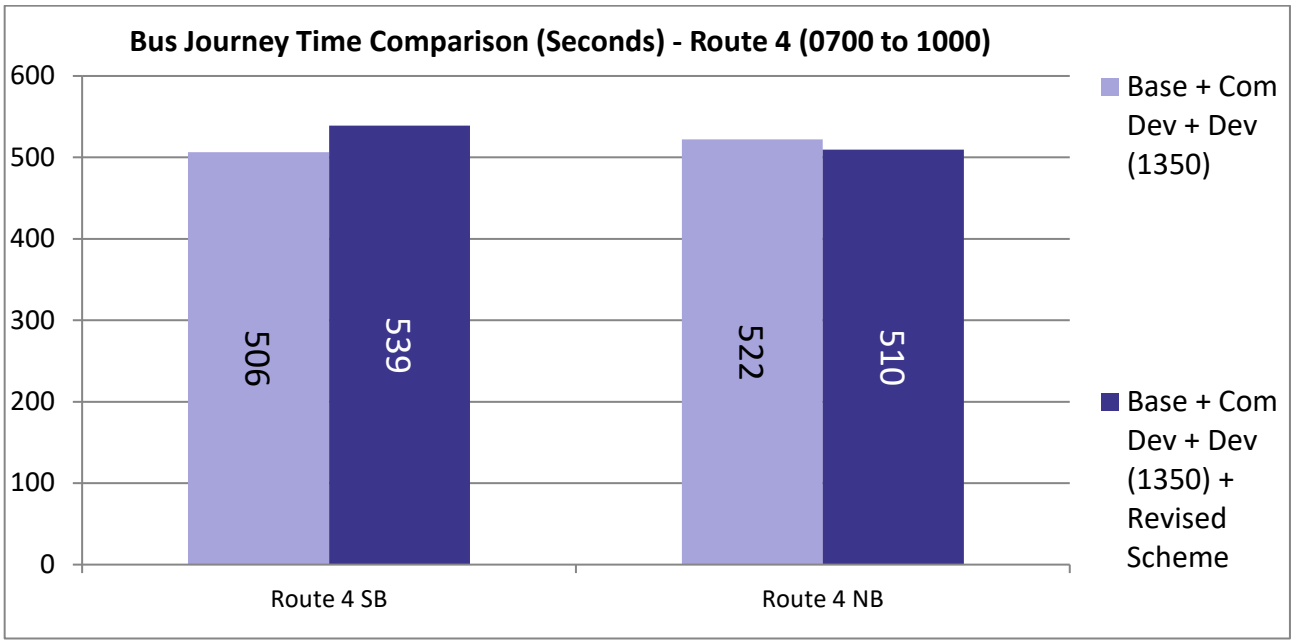

Figure 1.6: Journey Time Comparison B5254 Leyland Road / Bee Lane / The Cawsey Junction (0700 – 1000)

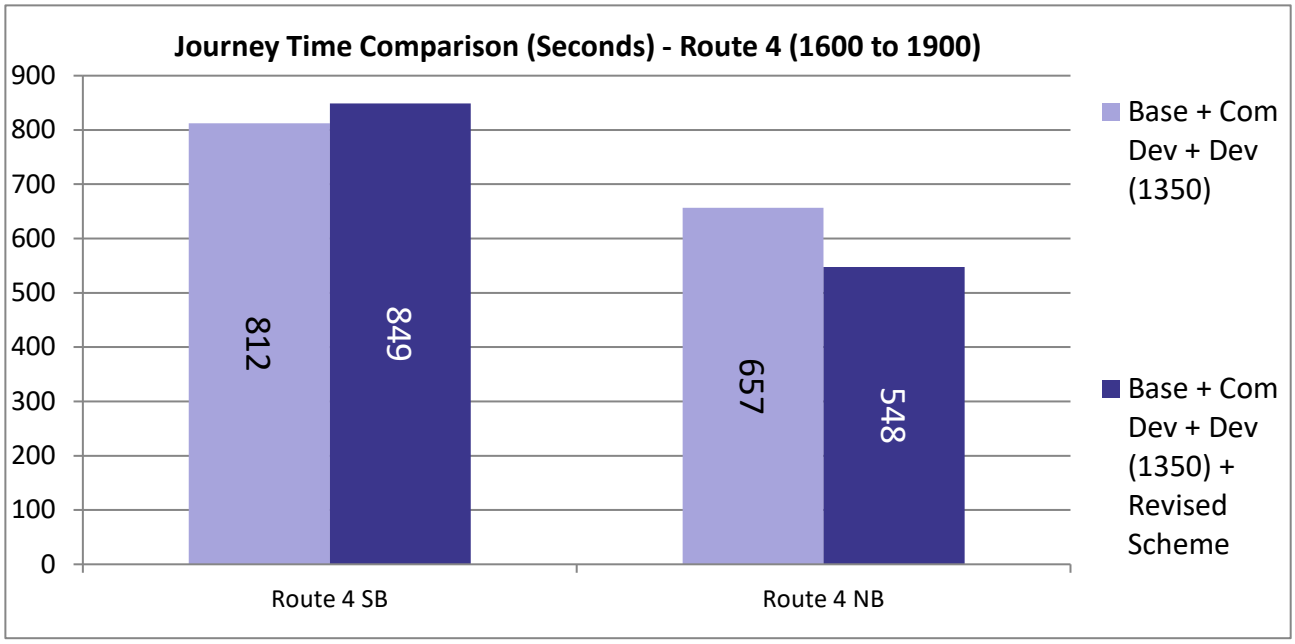

Figure 1.7: Journey Time Comparison B5254 Leyland Road / Bee Lane / The Cawsey Junction 1600 – 1900

23. Overall, it can be concluded that the improvement will provide controlled crossings at the Bee Lane / B5254 Leyland Road / The Cawsey junction and would not only assist with active travel movements at the junction, but a better balancing of traffic movements on the highway.

24. There is substantial advantage for active travel users and for control of the network, and so this is a case of providing betterment for walkers and cyclists, with marginal disbenefit for road users in the commuter peak periods, and no noticeable disbenefit at other times.

Summary

25. This note has been prepared to consider the existing traffic using Bee Lane and the proposed increase in trips with vehicular access for 40 dwellings provided from this location.

26. The 2018 and 2021 surveys indicate that traffic flows on Bee Lane are currently very low, with low speeds and no record of accidents in the last 15 years.

27. The review of the existing access arrangements along Bee Lane suggests that all users have good visibility of each other with the design presented within the TA assuming the retention of the pedestrian prioritised street arrangement, where vehicles are perceived as 'guests' in this environment, as is currently the case.

28. As only a small number of additional vehicle trips would use this link to access the proposed development, this arrangement is still reasonable. However, to assist in providing options which would also be capable of accommodating all road users as a result of the development proposals, consideration has been given to the more formal delineation of a route for active travel purposes, and the creation of a give-way priority working for motor vehicles. This is the principle adopted at the Flag Lane bridge and at the Coote Lane bridge and is not necessarily unique.

29. In addition to the review of movements across the Bee Lane bridge, a further review of the operation of the Bee Lane / B5254 Leyland Road / The Cawsey junction highlights that with the introduction of controlled crossings, there is a substantial advantage for active travel users and for control of the network, with only marginal disbenefit for road users in the commuter peak periods.

30. Based on this review, it can be concluded that Bee Lane is able to accommodate the proposed development without having a significant impact on the operation of the network or road safety.

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Appendix MA-10

Modelling Response to Reasons for Refusal

South Ribble Paramics Model
Reasons for Refusal Response – Modelling Methodology

June 2022

Introduction

1. This Technical Note provides the Vectos response to the 'Reason for Refusal' decision notices issued following the Planning Committee on 29th November 2021, based upon comments from Lancashire County Council (LCC) and National Highways (NH). This note provides the Vectos response, specifically to the 'Reason for Refusal' related to the traffic modelling methodology.

2. The specific 'Reason for Refusal' comment concerned is provided as follows:

   It has not been demonstrated that the modelling methodology applied within the submitted Transport Assessment is acceptable. As such it has not been demonstrated that the proposed development would not have a severe adverse impact on the local highway network. The proposal is therefore contrary to the requirements of para. 111 of the NPPF, Policy 17 of the Core Strategy and PolicyG17 of the South Ribble Local Plan

3. This note specifically attempt to respond to this query, to provide clarity on the Vectos position related to the modelling undertaken in support of this application, and outline why it is considered that the modelling methodology adopted is robust and defensible.

Modelling Methodology

4. Vectos have previously responded to queries from LCC around the use of the microsimulation model in the context of this assessment, and it is understood that this continues to form the main concern with the assessment methodology adopted. LCC have previously stated that "*the use of the microsimulation in isolation as presented is not acceptable to LCC it does not identify the true impacts as highlighted within the TA. Microsimulation models can be used to support a traditional approach of modelling individual junctions using traditional proprietary software. All base models need to be validated first to fully represent the junction/area (including queuing). The modelling approach unacceptable and a significant concern*".

5. Vectos would highlight that whilst isolated junction modelling is useful in terms of understanding the operation of a single junction, in relation to a specific set of traffic flows, Vectos consider that it is actually the case that isolated junction modelling should be seen as complimentary to the microsimulation modelling in this instance, rather than, as is being suggested, the two being used the other way around.

6. There are several key benefits associated with the microsimulation modelling approach adopted, including the fact that the model allows for temporal reassignment in response to queueing and congestion (i.e. traffic will be more likely to avoid an area in busier periods than when the network is quiet) and fundamentally, it allows for an assessment of effect on a corridor basis, cognisant of the effects of interaction between junctions.

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7. Queue propagation from one junction to another will influence and at times impede the operation of the network. Isolated junction modelling cannot capture any impact caused by junctions up or down stream from the junction being assessed. The relationship between traffic flow and junction operation along a corridor is ignored in favour of focusing on a single junction in isolation. As such, isolated junction modelling may provide an oversimplified interpretation of how a network can accommodate traffic flows or how traffic flows will respond to changes in network conditions.

8. A key strength of isolated junction modelling is the ability to check the geometrical effect of any proposals and, furthermore, the ability to identify an optimum signal control strategy where a new junction is proposed, or where traffic flows are likely to change substantially. It is possible to validate the performance of the signal junctions through checks derived from flows which, in turn, are extracted from the microsimulation modelling, but this would be seen as a way of validating the conclusions.

9. One would not expect to rely on the LinSig models in isolation as they would not allow for judgements to be made with regards the effect along an entire corridor which, itself, is more important to the overall user experience than the operation of a single junction.

10. Vectos have demonstrated through the supporting documentation that the microsimulation model has exceeded the levels of calibration and validation outlined as required in WebTAG guidance.

11. Subsequent to this the model has been independently audited and approved as fit for purpose by Systra, before being audited by WSP (on behalf of NH), with a number of comments raised that Vectos have addressed. On this basis, Vectos see no reason that the modelling tool itself be deemed unacceptable.

12. The Paramics Base model has been developed to reflect current on-street layout. Any changes from the current layout have been applied in the Committed Development scenarios, whereby any infrastructure associated with permitted sites have been included within the model (e.g. site access junctions). Detail on this is provided in the supporting Forecasting Report.

13. The model captures all key junctions on the local highway network, and whilst some more minor routes such as Kingsfold Drive are not explicitly modelled, junctions where this traffic would feed onto the wider highway network (e.g. B5254/New Lane, A582/Pope Lane and Pope Lane/Cop Lane) have been explicitly surveyed and included within the model.

14. The base model used to support this application has been developed in line with standard microsimulation modelling guidelines, and has been independently audited by Systra, which has confirmed that the model is fit for purpose. Calibration parameters within the model have been adjusted to ensure that the model reflects the observed data (turn and link counts and journey times), which has been reported within the supporting LMVR.

15. Signal staging and phasing information included within the modelling are based upon signal controller specs received from the previous applicant. Where this was not available, the staging/timings have been input into the Paramics model based upon the LinSig models used in the previous application.

Use of Microsim Elsewhere

16. Our team has adopted the use of microsimulation elsewhere on numerous applications to support developments which are similar or larger than those being considered within this application. Recent

examples include the adoption of this approach to support the planning application for Land at Perryfields Road Bromsgrove (Appeal Ref: APP/P1805/W/20/3265948). The same approach was adopted for Rugby Borough Council through the form of their Strategic Transport Assessment (STA)[1] which was completed without any isolated junction modelling and adopted in June 2019 with transport evidence predominantly based on a microsimulation approach.

Model Forecasting Methodology

17. Vectos have provided a forecasting methodology note which has been shared previously. The note details the inclusion of committed developments within the model and how this compares to TEMPro specific growth.

18. In summary, the inclusion of traffic growth within the modelling is based upon the previously discussed 'vision and validate' approach. The latest guidance around evidence led plan making does not stipulate that the assessment must fully conform to TAG. It does note that the use of TEMPro for traffic forecasts is appropriate, but that this approach should be reviewed to ensure that the modelling does not simply enforce historical travel patterns.

19. In this instance, the application of TEMPro forecasts, without interventionwould create an unrealistic scenario that which will never occur in reality as driver responses will kick in to mitigate the perceived issues (re-timing of trips, increase working from home, change of modes).

20. On this basis, the forecasting adopted in this assessment does not work on the assumption that the model must demonstrate continued capacity for future traffic growth to be included on an exponential basis. The forecasting procedure does involve a review of TEMPro growth factor in order to ensure that the model demands do not exceed this factor.

21. TAG specifically warns against adhering strictly to the guidelines in the event of unrealistic or implausible traffic forecasts and it is on this basis that Vectos believe that the proposed adjustments to the demands are justified.

Model Audit Process

22. Upon completion of the South Ribble Base Model, the model itself was independently audited by Systra, in June 2021, with a series of comments on the model received, and subsequently addressed by Vectos, before a final version of the model was reviewed and an audit report received. The resulting audit concluded that subject to some minor issues being addressed, the model was deemed acceptable, and achieved a good level of calibration and validation against observed traffic data.

23. Following this, and the completion of the modelling assessment, Vectos submitted the Base Model and supporting files to National Highways (NH) for consideration as part of the wider application.

24. The 2021 South Ribble Base Model has been developed to assess the impacts associated with the proposed development on the local highway network, with the majority of the network focusing on the A582, A59 and B5254 Leyland Road. However, a small section of the modelled network does include

[1] https://www.rugby.gov.uk/download/downloads/id/1184/local_plan_-_publication_draft_strategic_transport_assessment.pdf

parts of the strategic road network around the M6/M65 junction and M6/A6 junction, and it was anticipated that NH and their consultants would focus upon this part of the network in any review.

25. NH and their consultants subsequently provided a detailed model audit, of the entire model network, to Vectos in May 2022, which consisted of 72 comments graded from Red (Requires Action) to Yellow (Minor Clarification Required).

26. Vectos subsequently addressed each of these comments, and re-issued the model and supporting files to NH for further comment, which as of yet has not been received. Further to this Vectos have sought to offer further opportunities to discuss the modelling methodology, particularly around the model matrix development process, which has included the provision of additional files to NH. To date this has not been responded to by NH and their consultants.

27. Following the update to the model to address the comments received from NH, Vectos have undertaken model runs to highlight how the model performance, and therefore conclusions from the modelling would change as a result of the changes applied to the model to address the audit comments raised by WSP.

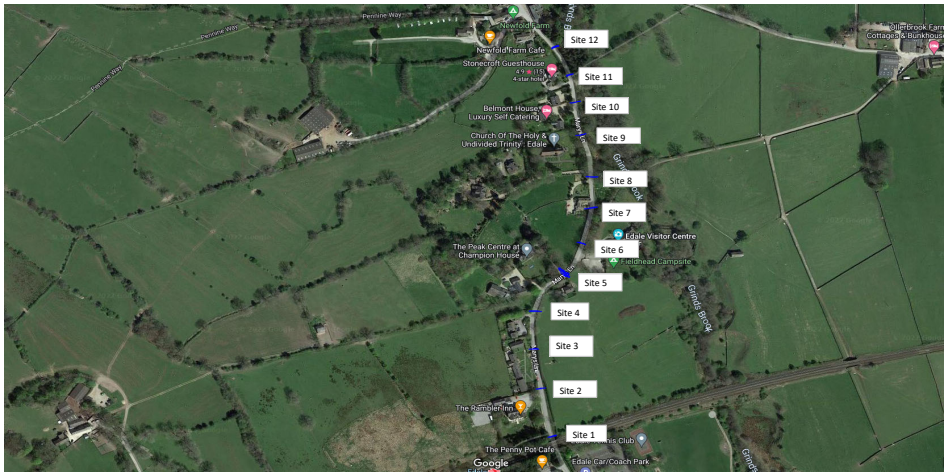
28. This exercise has demonstrate how the Base model continues to calibrate and validate well following the changes applied, and largely the model performance has been marginally improved, indicating that any conclusions drawn to date on the models themselves should be considered robust and remain relevant.

29. two audits have been undertaken on this model, independently, and each set of comments has been addressed. WSP comments were addressed even after the Systra audit had concluded that the model showed a good level of calibration and validation. As such the model and modelling approach is considered appropriate for the purposes of this assessment.

Appendix MA-11

Edale Shared Road Example

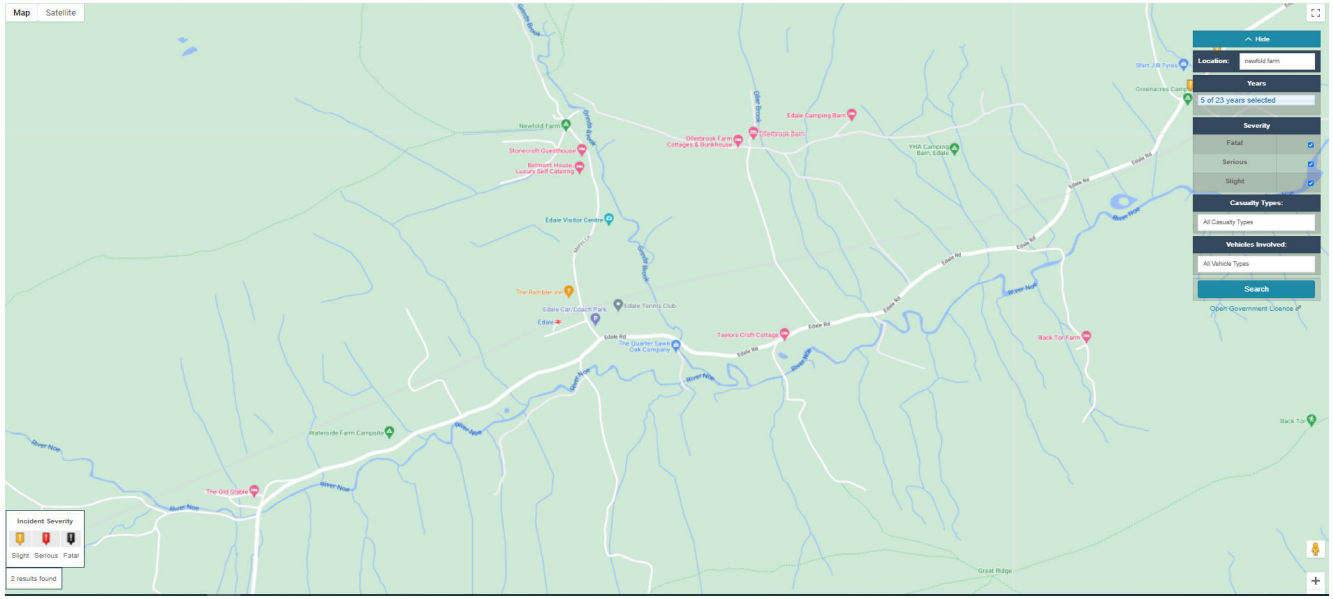
Marys Lane Road Widths



Site	Road Widths	Notes
1	4.78m	
2	4.76m	
3	4.16m	**This section stays at this distance for 25m**
4	4.38m	
5	4.31m	
6	3.9m	**This section stays around this distance for 51m**
7	4.8m	
8	4.72m	
9	5m	
10	4.67m	
11	3.77m	**This section stays around this distance or less for 74m**
12	3.97m	

Crashmap Extract - Marys Lane, Edale, S33 7ZD

Latest 5 Year Period (2017 - 2021)
No accidents recorded



Images of Marys Lane

Site 5

Site 6

Site 7

Site 8

Site 9

Site 10

Site 11

Site 12

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