Central Lancashire Local Plan
Transport Evidence: Stage 2A

Version: 1.0

Lancashire County Council

Central Lancashire Local Plan

Central Lancashire Local Plan Transport Evidence: Stage 2A

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1. Executive Summary

Lancashire County Council (LCC) is currently undertaking a Local Plan Review, with the new Local Plan covering the period up to 2041. As part of this process, a Strategic Transport Assessment has been undertaken to examine the potential transport impacts of the proposed Local Plan, and to outline appropriate mitigation measures.

This Stage 2A report follows on from the Stage 1 report published in November 2024. The Stage 1 report provides details of the strategic models that are being used in the assessment process. It also provides an assessment of the potential development sites identified through the Housing and Economic Land Availability Assessment process, with comparisons made between 2041 Reference Forecast and 2041 Local Plan growth scenario.

Stage 1 modelling results indicated that there would not be whole swathes of the highway network congested in 2041, but did identify some junctions and links that would be affected by the proposed Local Plan growth. These were particularly focussed near to the proposed strategic sites, indicating delays and congestion occurring around key junctions along the associated corridor.

The Council is required to consult with National Highways (NH) regarding the potential impact of the Local Plan on the Strategic Road Network. The report outlines the impact of traffic growth on the motorway junctions covering the three districts. The results indicate that increases in congestion and delay are largely as a result of increase in traffic growth as opposed to being a result of Local Plan growth. The Local Plan Transport Assessment is an iterative process, and there will be further assessment work undertaken as the mitigation packages evolve. The need to develop non-highway measures to encourage more sustainable and smarter transport solutions has been given higher priority in line with Government and County Council's long term ambition to tackle Climate Emergency and reduce environment impacts. This is especially so when considering wider policy challenges such as responding to the need to reduce Carbon emissions and tackling climate change and to encourage healthy lifestyles. In addition, there is a need to recognise the impact of new technologies on people's lifestyle and transport choices.

This report provides a focus on the mitigations required for addressing the issues at key junctions and corridors as a result of the Local Plan allocations. This has included a review of the trip rates used in the modelling process, to account for the sustainable transport mitigations. Further modelling work will be undertaken to assess the impact of the highway mitigation on the local road network and the wider transport network, the results of which will be outlined in the next phase report.

This report sets out the modelling and analysis undertaken to support the Central Lancashire Local Plan update. A SATURN highway model and EMME Public Transport model has been developed, with the core model simulation network covering the three districts of Preston, Chorley and South Ribble.

A high-level assessment of the Central Lancashire Local Plan was undertaken to evaluate its impacts on safety, network performance, and carbon emissions. Historic accident data (STATS19) was analysed to identify safety hotspots, with most locations showing no significant impact once sustainable transport mitigations were considered, though a few residual impacts remain. Forecast traffic flows indicate that several Strategic Road Network (SRN) junctions will exceed design capacity by 2041 under the Reference Case; however, the Local Plan contributes only marginal additional traffic and does not cause new exceedances.

A high-level carbon impact assessment using Defra's Emissions Factor Toolkit (v13.1) revealed an initial rise in emissions due to development, which is expected to reduce with the implementation of sustainable mitigations. All conclusions are based on a worst-case scenario of unconstrained traffic growth, acknowledging that actual demand may vary due to behavioural changes and network congestion.

Mitigation strategies will require ongoing refinement in collaboration with LCC and NH with a strong emphasis on reducing travel demand and prioritising investment in active travel and public transport. A

'Monitor and Manage' approach is recommended to ensure sustainable outcomes as the Local Plan progresses.

2. Introduction

2.1 Background

Central Lancashire, encompassing the areas of Preston, Chorley, and South Ribble, operates as a unified local economy and commuting zone. The three Central Lancashire Planning Authorities - Preston City Council, South Ribble Borough Council, and Chorley Council - have decided to review the Joint Core Strategy and individual Local Plans and have formally agreed to work together to create a unified plan. Jacobs has been appointed by LCC to provide transport planning consultancy support to the Local Plan process.

In July 2012, the three councils adopted the Central Lancashire Core Strategy, the principal document within the statutory development plan for Central Lancashire. It outlines the strategic planning policies for the area and is supported by individual Local Plans, which were subsequently prepared by each council in 2015.

A review of the Core Strategy and the individual Local Plans commenced in 2018, aiming to produce a unified Central Lancashire Local Plan (henceforth 'CLLP' or 'the Local Plan'). The new Local Plan is intended to reflect both shared strategic policy objectives and more detailed non-strategic policies across the three councils.

Once adopted, the Central Lancashire Local Plan will replace the extant Central Lancashire Core Strategy (2012). The CLLP will address local housing needs, economic factors, environmental considerations including the climate emergency, community infrastructure, and strategic infrastructure needs, in a sustainable way.

The CLLP will also make site-specific strategic allocations to meet the identified development needs. Once the CLLP has completed all its formal statutory stages, it will be adopted as the development plan for all three councils and used to assess planning applications.

As part of the CLLP update, transport evidence needs to be developed by assessing the transport impacts and needs of the spatial growth options being considered. The methodology is based on the guidance included in the National Planning Policy Framework and DfT's guidance on Transport evidence 1bases in plan making and decision taking. It also takes into account DfT's circular2 focussing on SRN along with NH's feedback on the Central Lancashire Core Strategy (CLLP) Preferred Options – Part One Consultation (December 2022). The assessment is being undertaken in following three stages:

- Stage 0: This stage involved the assessment of site allocations to support the Core Strategy team in evaluating identified sites from a transportation perspective. Assessment criteria were defined to evaluate each site or development area in terms of current and future transport connectivity.
- Stage 1: This stage involved the development of a Transport Evidence Base (TEB), which brought together all available data on existing transport provision and movement across the three districts. It also assessed the cumulative traffic impacts of the proposed Local Plan allocations and identified key junctions and corridors within Central Lancashire likely to experience increased pressure as a result.
- Stage 2: This stage involves a more detailed analysis and transport modelling of development scenarios, including the testing of mitigation options. The outcomes will inform the first phase of the Strategic Transport Assessment for the Local Plan publication and examination. This phase will present the proposed site allocations, the mitigation strategy, and strategic model outputs incorporating sustainable transport measures. A subsequent Phase 2 report will include updates to

1.1.

[1] https://www.gov.uk/guidance/transport-evidence-bases-in-plan-making-and-decision-taking

[2] https://www.gov.uk/government/publications/strategic-road-network-and-the-delivery-of-sustainable-development/strategic-road-network-and-the-delivery-of-sustainable-development#the-role-of-this-document

the strategic model following the integration of highway mitigation measures, along with any additional assessments required.

This Stage 2 report follows on from the Stage 1 Transport Assessment report, produced in November 2024 to coincide with the Regulation 19 consultation. The Phase 2 report takes forward the issues identified by the outcome of the modelling work outlined in the Stage 1 report, looking into more detail the main locations identified and assesses the suitability of the potential mitigation measures that are likely to be required. The Local Plan Transport Assessment continues to be an iterative process, which will continue to evolve with further reports being produced in the run up to the Local Plan Inquiry.

2.2 Scope of Transport Evidence Base

Transport considerations play a critical role in ensuring the effectiveness and sustainability of Local Plans. Integrating transport-based evidence into Local Plan testing allows for a comprehensive assessment of transportation needs, impacts, and compatibility with existing infrastructure. LCC's new Local Plan covers the period between 2023 and 2041, which identifies the key sites which the council would allocate for development to meet housing and employment land targets. This report sets out the updated transport evidence base which will allow the selection of the most appropriate sites for development within the plan period during Stage 1 of the Transport Assessment process.

The purpose of this report is to evaluate the connectivity of existing settlements, identify the most sustainable options for future development in the district, and determine how infrastructure can be enhanced to better support the proposals in the emerging Local Plan. The assessment must consider several common themes within the reviewed policies:

- Reducing the need to travel through land use and development policies
- Enhancing active travel and public transport networks
- Decarbonising transport impacts through new technology for necessary road journeys
- Using traffic data and traffic models proportionately, shifting from predict and provide to decide and provide
- Developing a robust evidence base to explain current and future challenges and transport's role in addressing them

2.3 Stakeholder Collaboration

An active engagement and consultation with relevant stakeholders and consultees are being undertaken throughout the process to gather valuable insights and feedback. A Transport Strategy Working Group (TSWG) has been established specifically for this purpose, to address and manage the strategic transport issues and opportunities within the LP area.

The TSWG provides strategic management at project and work stream level. It provides assurance to the project that the key objectives are being met and that the project is performing within the boundaries set by the TSWG. The TSWG primarily consists of representatives from LCC and NH but also includes representatives from various organizations, including the three local authorities, Active Travel England, bus operators, and rail operators. Initially, only the Active Travel England representative is involved, with other consultees likely to join at later stages.

The remit of the TSWG is to oversee the development of a robust transport evidence base to support the LP, including transport modelling work and the development of an informed transport strategy to support the LP which satisfies the requirements of NPPF, DfT Circular 01/2022 The Strategic Road Network, Town and

Country Planning Development Management (Procedure) Order (England) 2015 (DMPO) and the Delivery of Sustainable Development ("the Circular) and National Planning Practice Guidance (NPPG).

2.4 Caveats

It is important to acknowledge that all models, including strategic models like the CLTM, have inherent limitations. These models are not designed to replicate every individual journey, mode, or route with precision, nor can they accurately simulate specific behaviours or vehicle interactions. Travel behaviour is influenced by numerous factors, and daily variations in congestion are often random and unpredictable.

While the model performs well at a strategic level and has been validated accordingly, its outputs should be interpreted with caution, especially when used for detailed junction assessments. Additional data collection may be necessary in such cases. The strategic scope of this model does not eliminate the need for site-specific transport assessments, which can uncover localised impacts (e.g., junction congestion) that may require mitigation. Understanding a model's limitations is essential to leveraging its strengths effectively. This model is best suited for estimating general patterns in route and mode choice, as well as average congestion levels.

3. Vision

Transport assessments have traditionally been firmly rooted around a traffic focused 'predict and provide' approach, whereby a prediction was made as to how many people would likely drive, an acceptable level of convenience was set for commuters during peak hours and the road network was designed to accommodate that. Since the publication of DfT's 'decarbonising transport' strategy, the focus for assessing transport has been shifting towards a 'vision' led approach which focusses more on providing genuine transport choice, including public transport and active travel. The aim of a vision-led approach is to decide on what we want to see in future and design accordingly so that the primary objective of decarbonisation is achieved.

This approach means a fundamental shift in both engagement with stakeholders and transport analysis. It means working more closely with relevant statutory stakeholders, including Highway Authorities and Active Travel England, to ensure the Local Plan strongly supports delivery of national and local transport policies and guidance. It also means changing how transport assessment is undertaken. This change is already present in some areas of planning policy and is just starting to find its way into the methodology of transport assessment, particularly in relation to site specific transport assessments, with several Highway Authorities adopting vision led, 'Decide and Provide' approaches. LCC has updated its guidance[3] on Transport Assessments to align with these approaches and now supports the use of a 'Decide and Provide' framework. This guidance is intended to assist both those preparing and reviewing Transport Statements and Assessments.

The model outputs will assist in identifying potential sustainable travel interventions aimed at mitigating the impacts of the proposed site allocations on the transport network. This analysis will be closely aligned with the related strategic objectives set out in the Central Lancashire Local Plan 2023–2041 (Publication Version):

- Strategic Objective 2 - Sustainable Patterns of Development

To focus development at sustainable locations accessible by active modes of travel. Making the best use of existing land, infrastructure, facilities, and services wherever possible, and ensuring that any necessary mitigation or improvements to meet future needs are identified, appropriately funded, and brought forward in a coordinated and timely manner.

- Strategic Objective 3 – Sustainable Communities

To create healthy, vibrant, safe, and sustainable communities with a diverse range of housing to meet future needs. Providing a scale and mix of housing types and sizes and a variety of tenures in a range of locations to meet economic aspirations and local housing needs.

- Strategic Objective 5 - Sustainable Transport

To encourage development in sustainable locations where the layout, and design of new development reduces the need to use a car and enables more walking, cycling, and public transport use. Prioritising active travel and public transport promotes the use of sustainable modes of transport (walking, cycling and public transport) ahead of the private car, especially for shorter journeys, and supports improved accessibility and connectivity.

- Strategic Objective 11 - Healthy Lifestyles

To help ensure that development contributes to the reduction of health inequalities, whilst improving social inclusion and equal opportunities for all. Promoting healthy lifestyles to maximise health and well-being to

1.1.

[3] transport-assessment-guidance.pdf

meet the needs of existing and future communities, including inclusive, active design and access to sport, leisure, recreation, and community facilities.

The approach to mitigation to address the transport impacts of the Local Plan growth has been developed in line with the vision and objectives set in the CLLP. This means that the transport interventions considered include a wider range of measures than simply relying on traditional highway capacity improvements.

4. Mitigation Approach

4.1 Introduction

Sustainable transport measures will form the main part of any mitigation required to provide additional mobility capacity within the transport system. Although the demand forecasts are unconstrained it is likely that in practice, other factors (new schemes outside the scope of the Local Plan mitigation) could affect the overall demand for and routing of travel on the network. It is recognised that providing additional highway capacity is only likely to provide a short-term benefit, that may be eroded as suppressed traffic demand is unlocked. Therefore, investment in providing alternatives that offer a genuine transport choice and viable alternatives to driving is essential to ensuring development is sustainable.

A mitigation strategy has been developed to reduce the impact of the proposed Local Plan development upon the local transport network. This includes mitigations through adoption of general policies and site-specific considerations to increase uptake of sustainable modes of transport, the provision of new amenities and trip destinations intended to reduce the need to travel and distances travelled, specifically identified active mode and public transport improvements, as well as potential highway schemes.

The mitigation strategy is based around a hierarchy aligned with the 'decide and provide' approach, shown in Figure 4-1 below. This strategy prioritises reducing and offsetting the impact of the Local Plan through first reducing the need to travel and distances travelled, then by improving alternatives to travel by private vehicle to reduce car use, and only introducing measures to accommodate increased traffic when needed to address residual impacts that cannot be mitigated by preferable means.

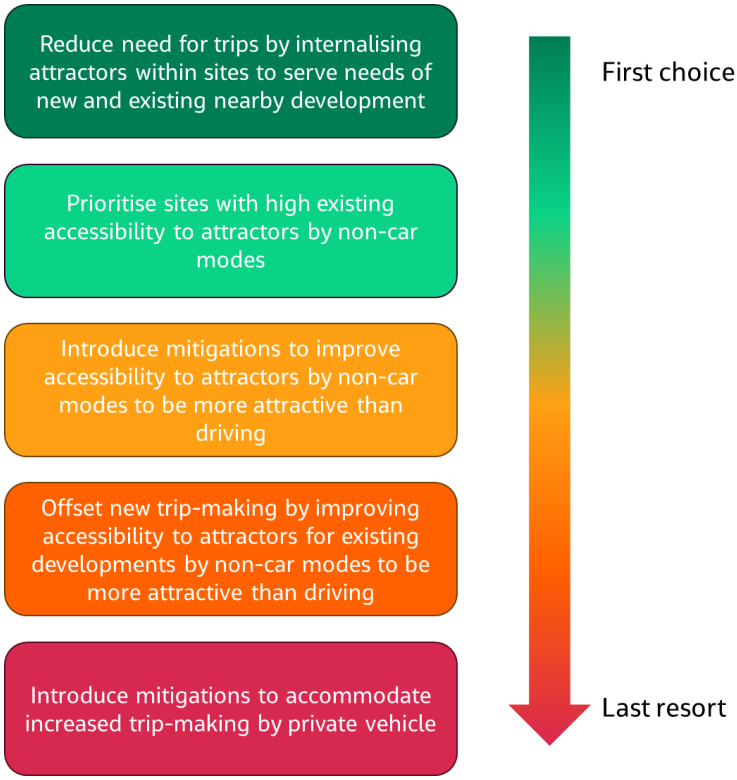


Figure 4-1: Hierarchy of transport mitigation measures

The resultant transport mitigations identified in the Infrastructure Delivery Plan represent a set of potential measures that could be introduced to mitigate the impact of the Local Plan. Due to the inherent uncertainty in the delivery and impact of policies and schemes intended to achieve modal shift on transport behaviour, (LCC) and the Central Lancashire district councils will work together to monitor the impact of the adopted policies and mitigations on a continual basis as the Local Plan is delivered to determine the need to introduce

further mitigations. In the event that sustainable transport improvements achieve the expected reduction in traffic demand, some of the identified highway mitigations may not be required. However, if the strategy achieves a lower level of modal shift, either further measures may be required to achieve the desired outcomes or the identified highway mitigations may need to be implemented to accommodate increased trip making.

4.2 Identifying longlist and shortlist mitigations

To identify mitigation measures to support the Local Plan, consideration has been given to a range of potential measures at different scales and across different types of mitigation, including provision of amenities, improvements to public transport provision, and active travel routes and highway infrastructure. The types of measures considered are illustrated in Figure 4-2 below.

		Amenity	Public Transport	Active Modes
Within Site (deliver directly)	General Policy	Inclusion of local shops, pubs, GPs, Schools etc where not locally available 15-minute city principles Public and private EV charging		Mesh of walking and cycling routes, permeability Modal filters and low traffic design
	Site Specific Policy	Creation of new local centres / high streets Creation of new parks, leisure centres	New bus route provision Bus stop/mobility hubs	LCWIP routes, greenways passing through site bounds
Near to Site (through S106)	Access/ immediate vicinity	Greenspace, pocket parks	Improvement or addition of bus stops / mobility hubs Bus gates, bus priority	Permeability to neighbouring land Cycle parking
	Local area	CIL, contribution to regeneration/ expansion of local amenities		Local accessibility improvements Core Walking Zones
Specifically identified interventions (S106 contributions split across sites)	Existing schemes /plans	Strategic Employment / Commercial sites	BSIP improvements Frequency improvements/ superbus	LCWIP Routes, greenways
	New schemes		New bus services	Strategic cycling routes
	Major infrastructure		New rail stations and rail upgrades	New bridges and flagship links

Figure 4-2: Illustrative mitigation optioneering themes for sustainable mitigations

As outlined in the hierarchy of mitigations measures in Figure 4-1 above, priority was given to identifying sustainable mitigation measures first, with highway mitigation measures to be identified based on the residual impacts once sustainable transport mitigations had been included.

To determine the mitigation measures, an initial review was conducted of previous local transport plans and strategies and feasibility and optioneering studies, including:

- Preston City Transport Plan (PCTP)
- The Lancashire Bus Service Improvement Plan (BSIP)
- The Lancashire Local Cycling and Walking Investment Plan (LCWIP)
- The Preston City Region Transforming Cities Fund (TCF) application
- Central and West Lancashire Rail Study Options (WSP, 2020)
- Lancashire Service Uplifts – Operational Feasibility and Demand Assessment (Northern Trains, 2023)

Following this, workshops were undertaken with key stakeholders to identify additional mitigation measures to support the Local Plan. These utilised a phased approach, shown below, reflecting the hierarchy of mitigation. Between the phases, sifting and shortlisting of the options was undertaken, followed by further assessments to identify the residual highway impacts once the shortlisted mitigations from the previous step were accounted for.

- Phase 1: focus on identifying sustainable transport improvements, including the requirement for new amenities to serve sites through site-specific considerations, active mode infrastructure improvements and public transport service enhancements.
- Phase 2: focus on reviewing the residual highway impacts, determining which of these impacts were acceptable and which would require further mitigation, and identifying potential highway infrastructure and technology improvements which could mitigate these.

To identify a shortlist representing a potential package of measures to mitigate the impacts of the Local Plan, The long list of mitigation options from both phases were sifted considering the following factors:

- Likely high-level cost
- Feasibility / Deliverability
- Public / Political Acceptability
- Affordability and funding

The shortlisted options are included in Appendix A, along with discounted longlist options and a summary of the rationale for their exclusion from the assessment at this stage.

4.3 Phase 1: Active Mode and Public Transport Enhancements

In March 2025, a series of collaborative workshops were held to support the development of the Central Lancashire Local Plan Transport Evidence Base. These sessions brought together representatives from Preston, South Ribble, and Chorley Councils, along with key officers from LCC, including specialists in bus development, and active travel, and members of the Transport Working Group including representatives from National Highways and the local Highway Authority. The workshops aimed to shape a unified transport vision focused on sustainability and prioritising active and sustainable travel modes, forming a foundation for the Stage 2 assessment of the evidence base.

Each workshop focused on a specific geographic area which were identified based on travel pattens, spatial distribution of settlements and Local Plan allocations. These areas were intentionally defined to incorporate cross-boundary movements between districts and with some overlap between the areas. The areas identified were north Preston, central Preston and northern South Ribble, and Leyland and Chorley.

Workshops were further split into sections focused on topics of Health and Education, Retail and Services, and Leisure and Hospitality and involved reviewing current and proposed provisions in the draft Local Plan. Discussions centred on identifying gaps in provisions, key destinations and movements and ensuring new developments were well connected to these via sustainable transport. Outcomes included new site-specific considerations, proposals for additional community facilities, and identification of mitigation measures to fill gaps in active travel and public transport networks, helping to enhance accessibility and support sustainable growth.

Following the workshops, the proposed interventions were reviewed against existing local transport plans and studies to identify overlaps as well as measures which may have been previously considered and discounted. This process ensured alignment with previously identified priorities.

4.4 Phase 2: Highway Transport Enhancements

Following from phase 1, further consideration was given to potential highway transport measures within the local area to assist in mitigating the remaining traffic impact of the Local Plan. Whilst encouraging modal shift and healthier choices was evidenced to achieve a reduction in car usage, uncertainty over the scale of this reduction coupled with the expectation of some residual traffic impacts led to the conclusion that highway mitigation measures should also be considered both to support sustainable transport improvements and

provide alternatives in the event that the reduction in car use achieved is towards the lower end of the range of potential modal shift.

The highway mitigation measures were developed based on the projected impact of Local Plan development traffic growth on both the local and strategic road networks. This assessment focused on sensitive junctions identified through outputs from the strategic model, supplemented by Google traffic congestion data and local knowledge. The highway improvements were identified through workshop sessions with the Transport Working Group including representatives from National Highways and the local Highway Authority and remain an ongoing exercise at the time of writing this report. A summary of the potential highway options is provided in Appendix A.

4.5 Transport improvements beyond the Local Plan horizon

In addition to the schemes identified above, there is a need to consider and safeguard transport schemes that would support the Central Lancashire area beyond the Local Plan. These include major transformational infrastructure projects whose delivery is likely to extend beyond the end of the Local Plan period due to the scale of investment and technical complexity. Planning and development of these schemes may begin during the current Local Plan period, and there is potential for their delivery to commence towards the end of the plan period, although the time horizons for their completion are subject to significant uncertainty. As a result, they have not been included in the identified mitigations to assess the impacts of the Local Plan.

One such scheme is the proposed 4th Ribble Crossing, which is a strategic infrastructure initiative aimed at addressing long-standing congestion issues across Central Lancashire, particularly around Preston and the M6 corridor. The concept involves constructing a new bridge over the River Ribble, potentially linking Penwortham to the Docks, to improve connectivity and resilience in the regional transport network. Although the project is not yet formally committed within the current Lancashire Growth Plan, it remains a key ambition for LCC. The crossing is seen as a vital component in supporting future growth, reducing pressure on existing routes, and enhancing access across the region. Recent infrastructure developments, including the Edith Rigby Way and improvements to the A582 corridor, have laid the groundwork for this initiative. However, the delivery of the 4th Ribble Crossing is contingent on securing significant government investment, as it exceeds the financial and delivery capacity of LCC.

Another scheme in this category is the Preston City Region integrated Future Transit proposed in the Preston City Transport Strategy. This is a longer-term ambition to introduce Mass Transit to Preston and South Ribble to complement and expand the existing rail network and drive modal shift, urban regeneration and densification and more sustainable transit-oriented development. At present, a high-level network of three potential lines has been identified, however more detailed feasibility work to establish the potential options for routes, technologies, systems and operating models has not been undertaken. A Future Transit system is seen as a key proposal to ensure the long-term sustainability of growth in the Preston City Region and prevent continual "sprawl". Given the timescales to deliver similar networks of this scale in other parts of the North of England, notably Manchester Metrolink and the upcoming West Yorkshire Mass Transit, it is unlikely that the network would be operational by the end of the new Local Plan period, although it may be possible to reach "spades in the ground" within this timescale. Additionally, as with the new Ribble Crossing, this project would be contingent on securing significant government funding.

5. Strategic Transport Assessment

5.1 Introduction

This section of the report describes the modelling carried out to analyse the cumulative impact of the preferred set of development sites to be carried forward into the Central Lancashire Local Plan.

LCCLCC maintains the Central Lancashire Traffic Model (CLTM), a local strategic model that has undergone numerous updates to support business case studies and local studies in Central Lancashire. In 2024, the base model was updated to support the Local Plan, following discussions with the Central Lancashire Local Plan Technical Working Group. This update includes additional traffic surveys to ensure comprehensive coverage of the Local Plan Study Area and accounts for current traffic levels, which have changed since the onset of Covid-19. Base models have developed by the standards and guidance provided by the DfT within Transport Analysis Guidance (TAG).

The overall purpose of the traffic modelling work presented in this report is to assess the impact of the emerging Local Plan site allocations on both the local and strategic road networks, and to articulate a long-term transport mitigation strategy within the Central Lancashire area. The modelling work is intended to provide a cumulative assessment of the traffic impacts associated with the Local Plan site allocations, rather than providing detailed modelling analyses of individual sites.

The traffic forecasting undertaken in relation to the emerging Local Plan has been developed using the updated CLTM 2024 base year traffic model. The forecast scenarios, are all developed from the base year model and account for proposed changes in traffic demand and supply in the modelled area. Using the variable demand model (VDM) functionality of the CLTM model, the forecast scenarios account for changes in demand resulting from variation in travel costs. The Local Plan forecast scenarios also include the additional travel demand associated with the proposed Local Plan allocation sites.

Future year models have been developed for forecast years 2031 and 2041 for a Reference Case, which includes forecast demand from all committed developments within the three districts, and includes all committed schemes in the highway network and a Local Plan scenario, which includes the Local Plan development sites in addition to developments in the Reference Case.

Forecast travel demand is generated using national, regional, and local data sets. Detailed planning data from Preston, South Ribble, and Chorley identified new development locations, sizes, and types. Future land use information is combined with national data from the National Trip End Model (NTEM 8.0) and local trip rate from TRICS to infer car and bus trip generation for the forecast years. The DfT's Exogenous Demand Growth Estimator (EDGE) database provided growth rates for background rail demand, while LGV and HGV trips are adjusted using National Road Traffic Projections (NRTP22) forecasts.

This transport model estimates future year transport demand and predicts changes in travel behaviour and patterns due to the Local Plan, including route choices, travel modes, and journey destinations and the evidence base will highlight necessary transport-related infrastructure to accommodate new development.

5.2 Modelling Scenarios for the Local Plan

Following model runs are proposed to assess the projected impact of the Local Plan growth:

- Scenario 1 – Reference, no Local Plan development except for committed sites and committed schemes (i.e. no future development beyond that already granted permission. It should be noted that this scenario does not reflect a future in which the Local Plan is not adopted, as without the Local Plan the NPPF assumption in favour of development would be activated and non-allocated sites would be expected to come forwards and be permitted in line with the mandatory housing targets set out in the NPPF).
- Scenario 2 – Local Plan No Mitigation, full Central Lancashire Local Plan development without transport mitigation/connectivity improvements. The Do Minimum scenario builds on the Reference with the addition of the full quantum of proposed development associated to the Central Lancashire Local Plan. Growth outside the Local Plan area is identical to the Reference. By comparing the outputs of the Do Minimum scenario with the Reference, the transport impacts resulting from the Local Plan proposals can be largely isolated.
- Scenario 3 – Local Plan with Sustainable Mitigation full Central Lancashire Local Plan development with sustainable transport mitigation/connectivity improvements. This includes the trip rate adjustment and network improvements such as bus lanes. The following two mode uplift scenarios have been tested within this scenario, reflecting both conservative and optimistic assumptions to capture the lower and upper bounds of the potential mode shift range:
    - 3a - Low Uptake Scenario: This uses the Government Target (Near Market) scenario from the Propensity to Cycle Tool (PCT) without applying a scaling factor. It represents a more conservative estimate of cycling uptake, with overall cycling levels slightly below the Medium uplift benchmark from the Active Travel Fund 5 (ATF5) tool, indicating a conservative outlook on potential modal shift.
    - 3b - High Uptake Scenario: This applies the PCT's Go Dutch scenario with a 50% scaling factor, representing users being half as willing to cycle as Dutch users for a given distance and hilliness. It represents a more optimistic but still realistic level of cycling uptake, with overall cycling levels slightly above the High uplift benchmark from the ATF5 tool. It however does not include the potential for widespread adoption of e-bikes to significantly increase the number of trips cycled between 5 and 15km, and so may still be plausibly exceeded.
- Scenario 4 – Local Plan with Sustainable and Highway Mitigation, full Central Lancashire Local Plan development with Scenario 3 updates and the highway transport mitigation improvements.

Scenarios 1 and 2 were completed as part of the Stage 1B Transport Assessment. This report presents updated model runs for both scenarios, incorporating the most recent information on Local Plan developments. It also includes the results for the mitigation scenario (Scenario 3). The outcomes for Scenario 4 will be provided in a separate report. This report focuses on the 2041 outcomes, as that year represents the point by which all Local Plan allocations are expected to be delivered, marking the end of the full Local Plan period.

5.3 Assessing Impact of Mitigation Measures on the Local Plan

To assess the mitigation measures on the Local Plan, several effects need to be accounted for:

- Measures to reduce trip rates and trip distances, and allocating development sites in more sustainable locations, will result in reduced trip making and more trips make locally by active modes (walking, wheeling and cycling);

- Improvements to provision for walking and wheeling will induce behaviour change from both existing residents and residents of new developments leading to increased levels of walking and especially cycling;
- Improvements to rail and bus service frequency, provision of new rail and bus services and stations, and bus priority measures will make public transport more attractive which will induce modal shift to public transport; and,
- Highway enhancements will result in improvements to highway journey times, which will result in redistribution of existing traffic to improved routes and unlocking of suppressed demand.

The mitigation assessment has been undertaken in two phases, as follows:

Phase 1: active mode and public transport mitigation, presented in this report; and

Phase 2: as Phase 1, together with a range of highway enhancements.

This approach is in line with the standard DfT hierarchical approach, which requires sustainable modes to be considered and modelled first.

5.4 Trip Rate Adjustments

Local Plan No Mitigation Scenario

In the Local Plan no mitigation scenario, 12-hour Origin-Destination (OD) person trip rates were extracted from TRICS for each defined land use category. Since the demand model operates on a 24-hour Production-Attraction (PA) format, these 12-hour OD trip rates were first converted to 24-hour OD rates using NTEM factors. Subsequently, the 24-hour OD rates were transformed into 24-hour PA trip rates using NTEM-derived conversion factors.

The PA trip rates were then segmented by trip purpose, using NTEM data specific to each year and district. This enabled the calculation of 24-hour PA and OD trips by time period for each development, based on the scale of development. Finally, the trip rates were adjusted using NTEM growth trends to reflect forecast year conditions.

A detailed technical note outlining the methodology used to derive trip rates for future housing and employment sites in Central Lancashire is provided in the Appendix C.

Local Plan with Sustainable Mitigation Scenario

To incorporate sustainable transport mitigations, a three-step process was applied:

Mitigations Incorporated in the Demand Model

1. Internal and Short-Distance Trips

Trips originating from allocated sites and destined for locations either:

- Within the same allocation boundary, or
- Representing short-distance journeys typically made by walking, wheeling, or cycling were estimated and excluded from trip generation in the variable demand model.

2. Mode Shift to Active Travel

Trips from both allocated sites and existing origins expected to shift to walking or cycling due to the implementation of a high-quality active travel network were estimated and removed from the OD trip matrices prior to assignment.

Mitigations Assessed in the Assignment Model

3. Network Enhancements

Public transport improvements and highway mitigation measures were coded into the respective networks. The remaining public transport and highway trips were then assigned to the network.

Due to the iterative nature of the VDM, steps 2 and 3 were repeated during each model iteration to ensure convergence and consistency. A detailed technical note outlining the methodology used to derive trip rates accounting sustainable mitigation is provided in the Appendix D.

5.5 Matrix Comparisons

Matrix comparisons with and without sustainable mitigation along with the Reference and Base year is shown for AM and PM peak for car, bus and rail mode for each district is shown in Figure 5-1 through Figure 5-6. Matrix totals for IP is included in Appendix E.

The matrix totals indicate that the Local Plan scenario with sustainable mitigation results in a reduction in car mode share across all three districts. This is accompanied by an increase in bus demand and a slight decline in rail usage. These outcomes are consistent with expectations, as adjustments were made to trip rates and mode share assumptions to better reflect the influence of active travel modes. The Local Plan scenario with High Uptake demonstrates a greater reduction in car mode share, driven by the higher levels of active mode usage assumed in this scenario.

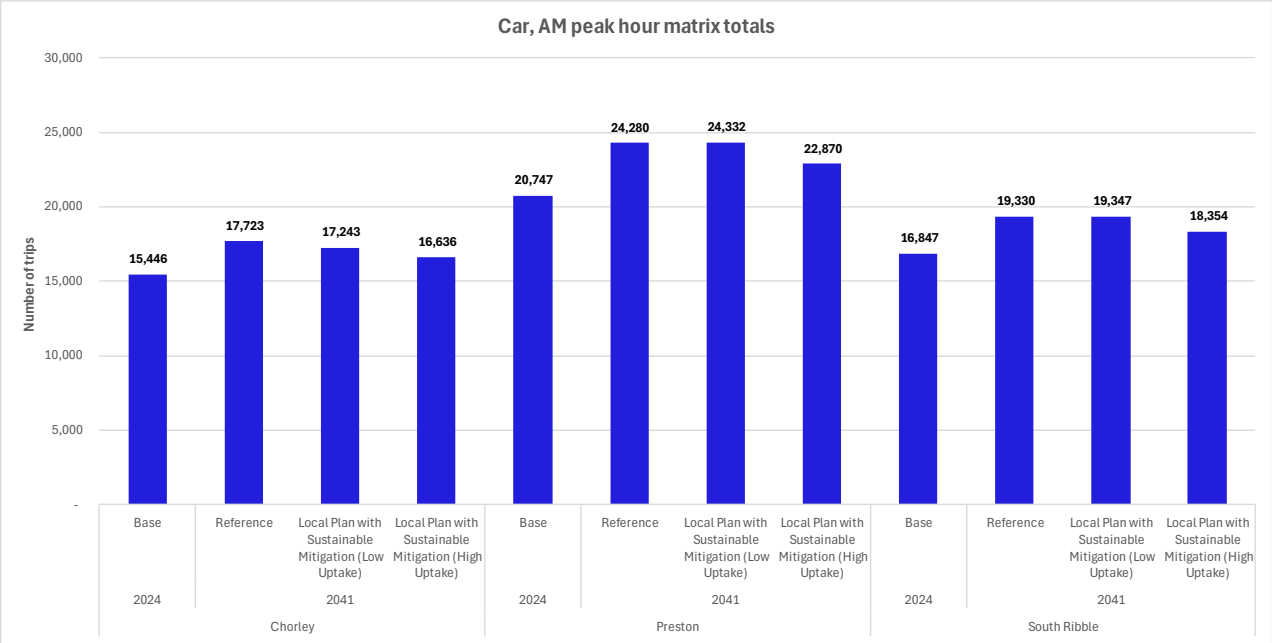


Figure 5-1 Car Matrix Totals – AM

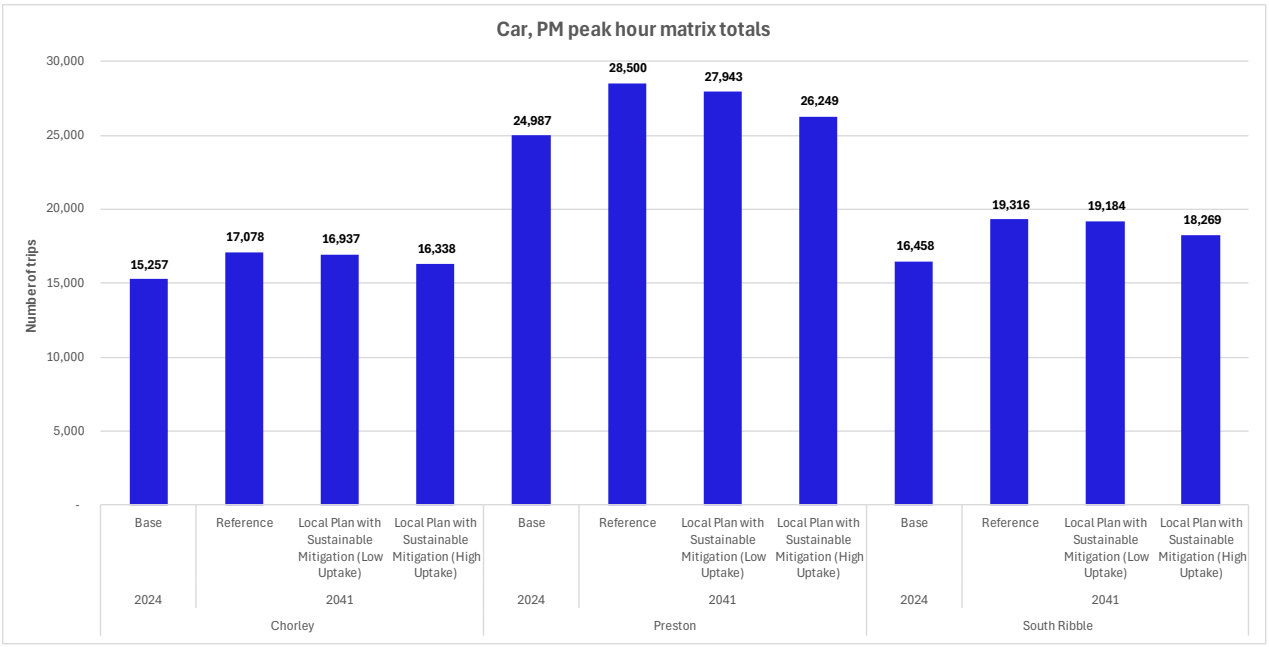


Figure 5-2 Car Matrix Totals – PM

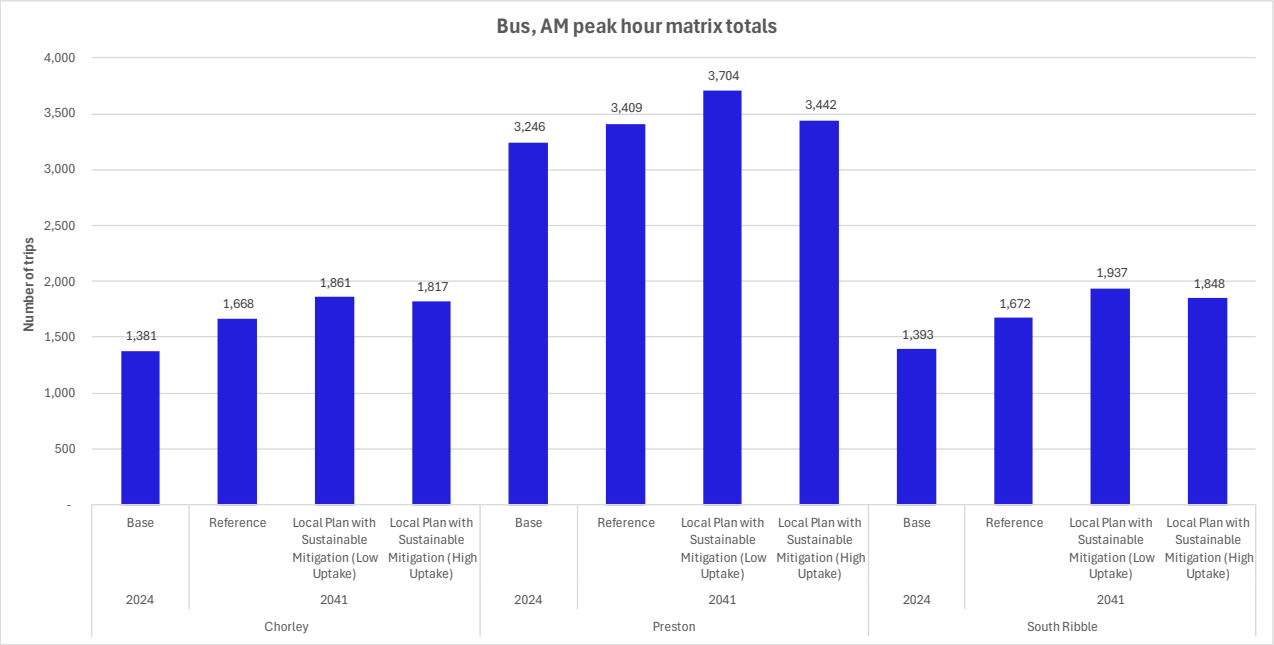


Figure 5-3 Bus Matrix Totals – AM

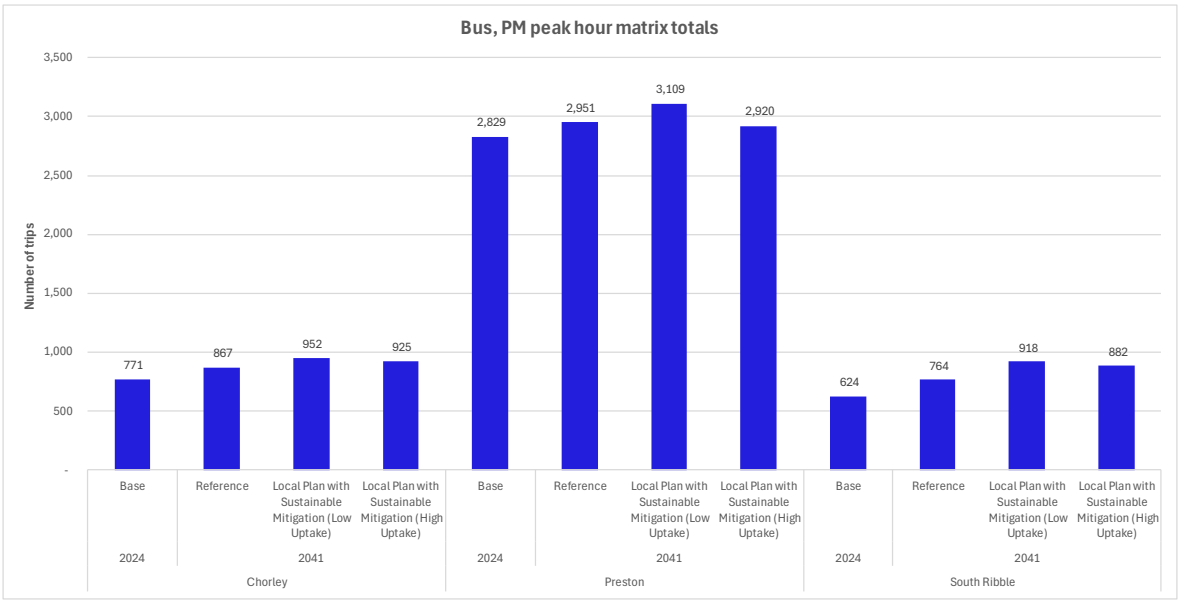


Figure 5-4 Bus Matrix Totals – PM

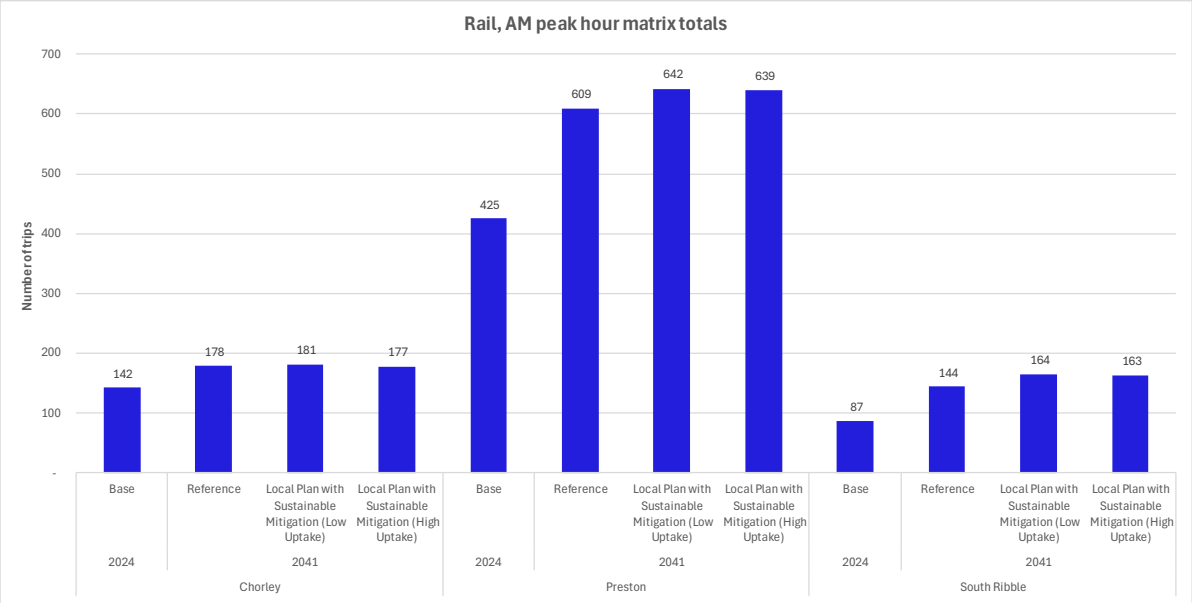


Figure 5-5 Rail Matrix Totals – AM

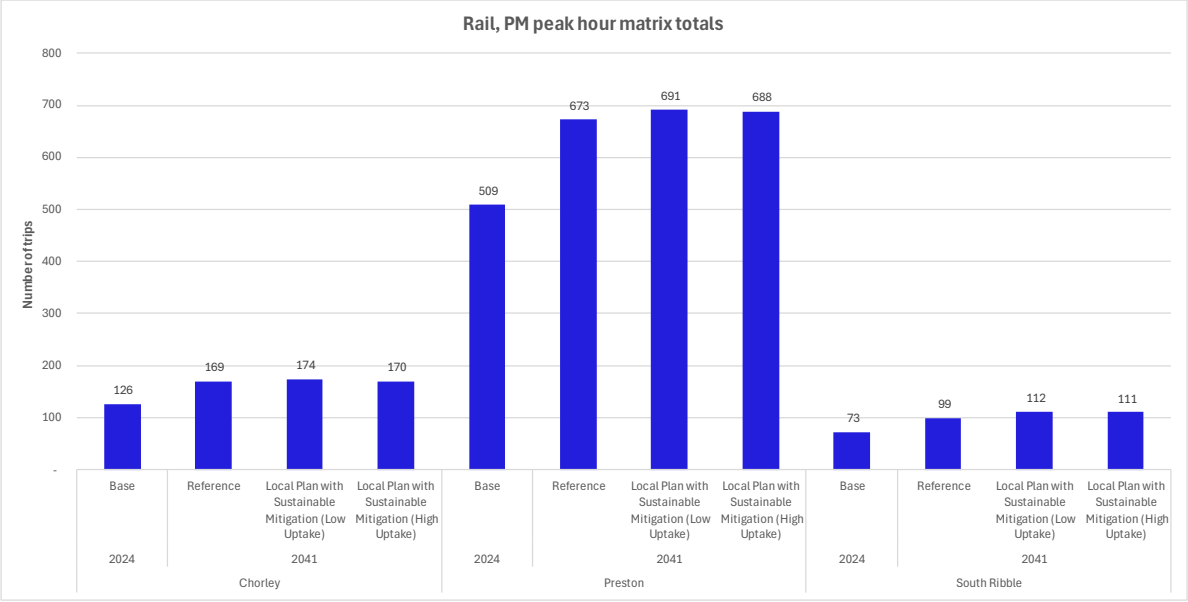


Figure 5-6 Rail Matrix Totals - PM

5.6 Sensitive junctions

An initial list of sensitive junctions were identified using any of the following criteria:

- Forecast year model - Local Plan without any mitigation scenario: V/C > 80 or Delay >60secs/vehicle on any arm
- INRIX speeds
- Google congestion (at least orange in any time period)

These are shown in Figure 5-7 through Figure 5-21 below along with the Local Plan and Committed developments in the respective area.

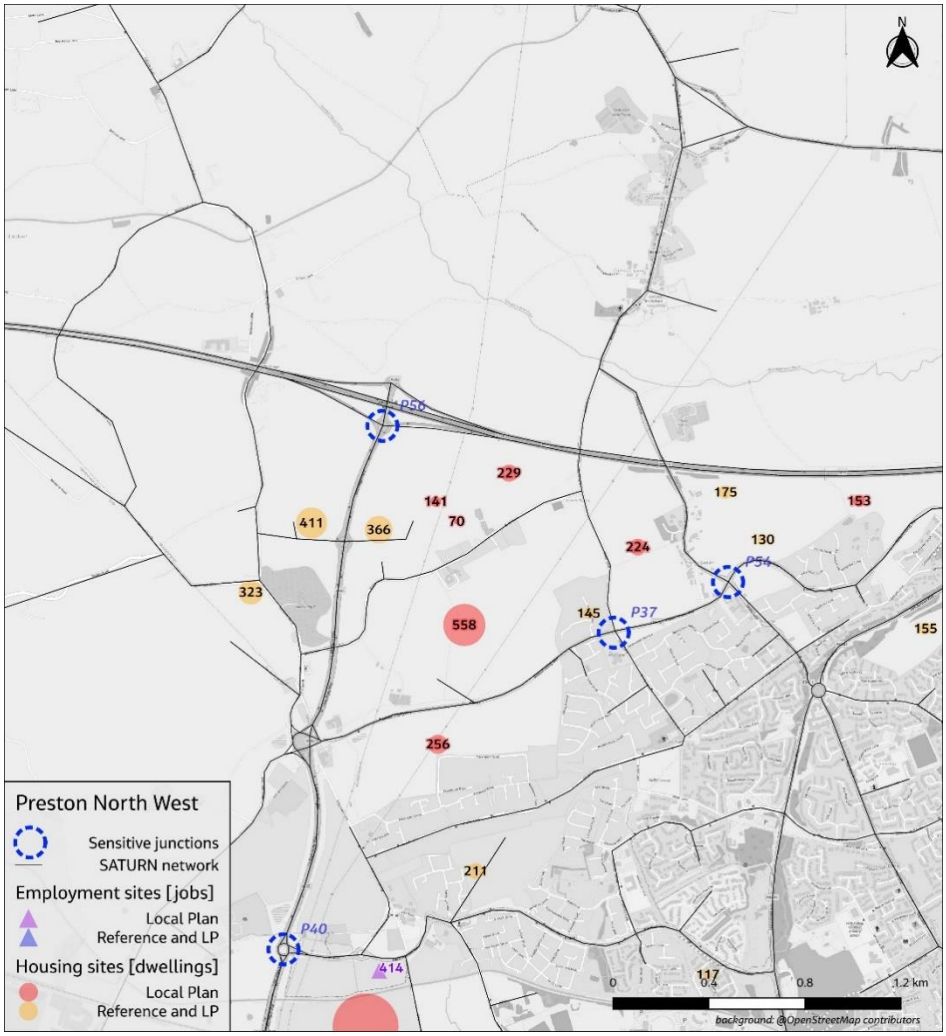


Figure 5-7 Preston North West

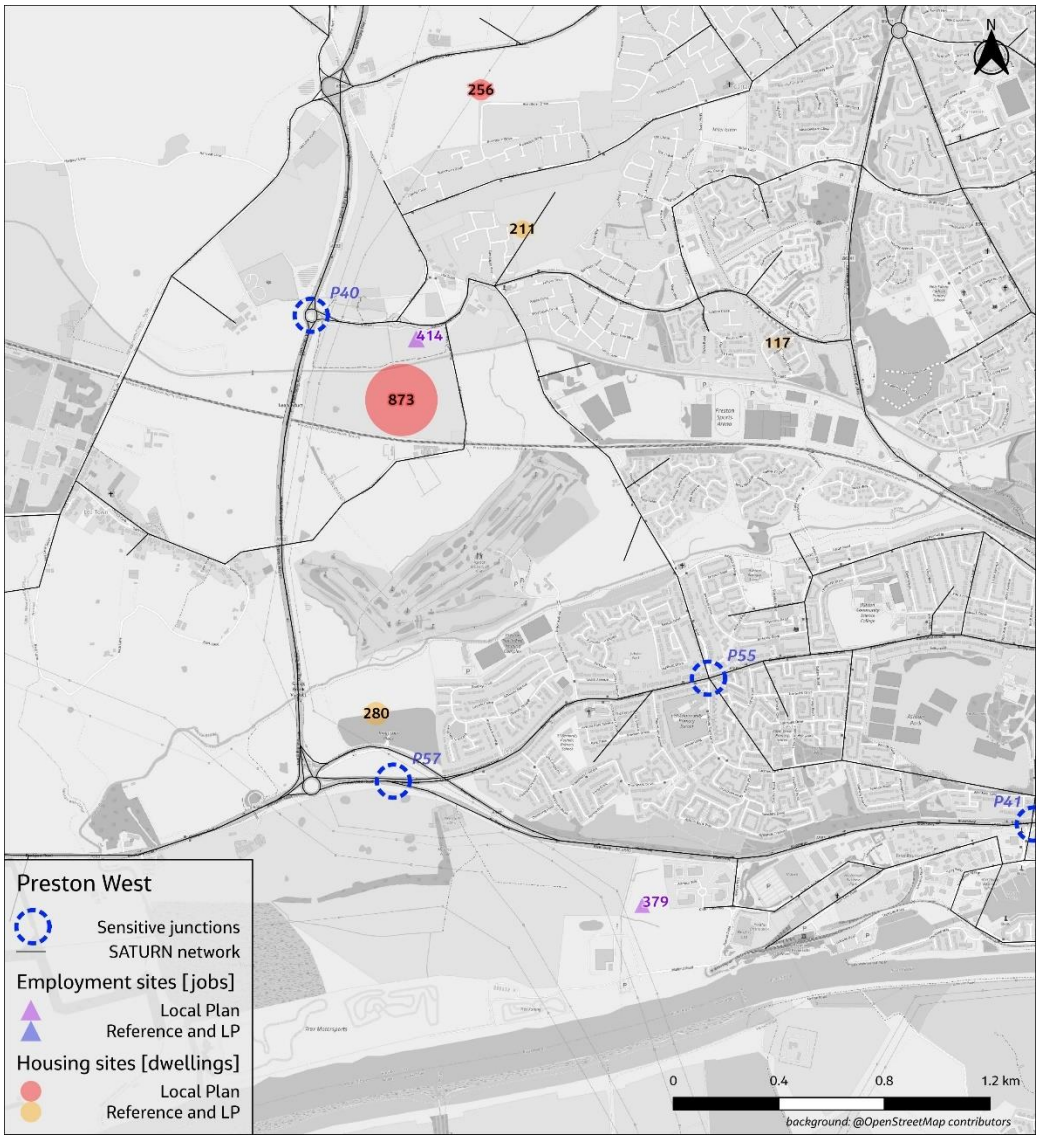


Figure 5-8 Preston West

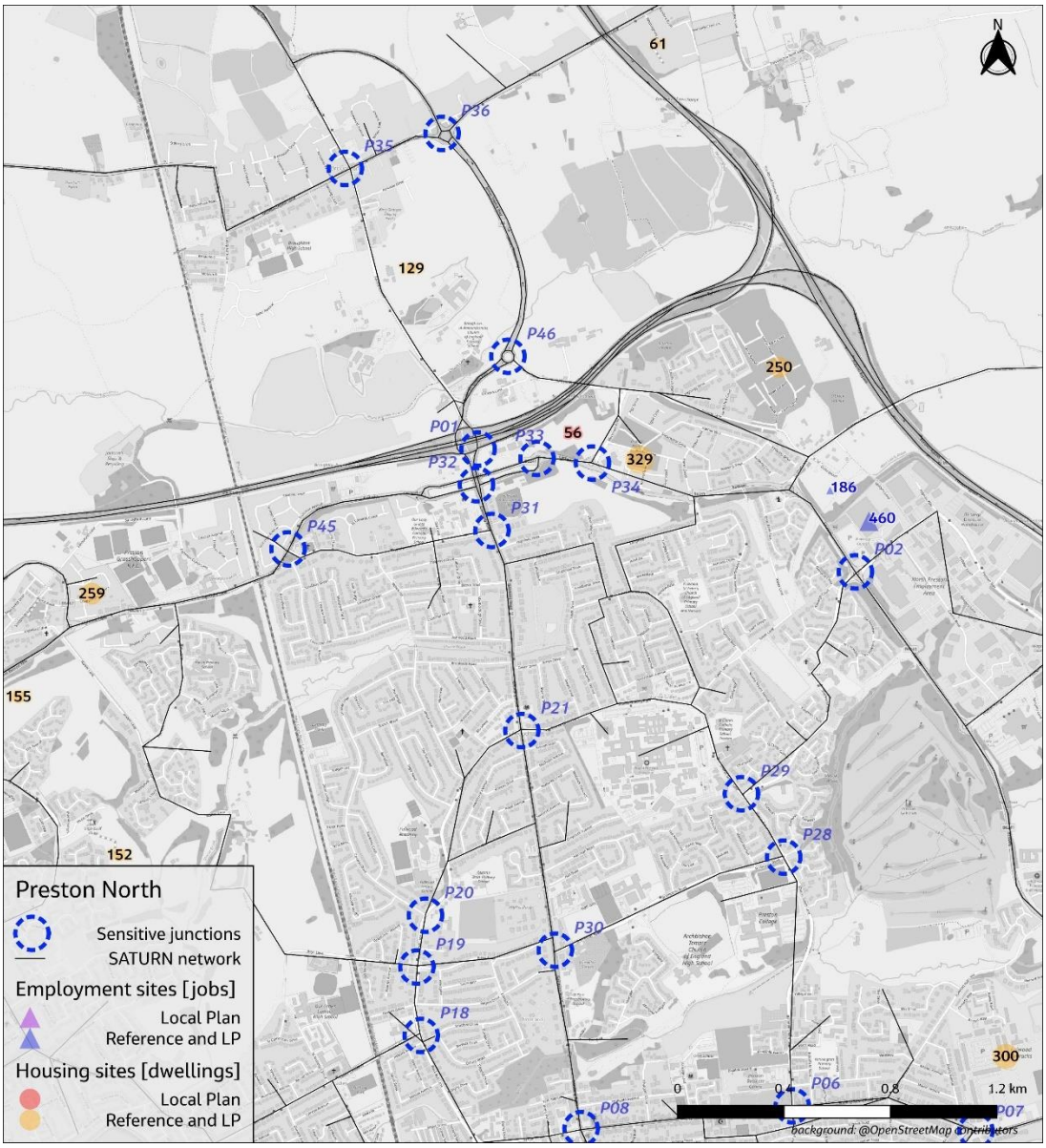


Figure 5-9 Preston North

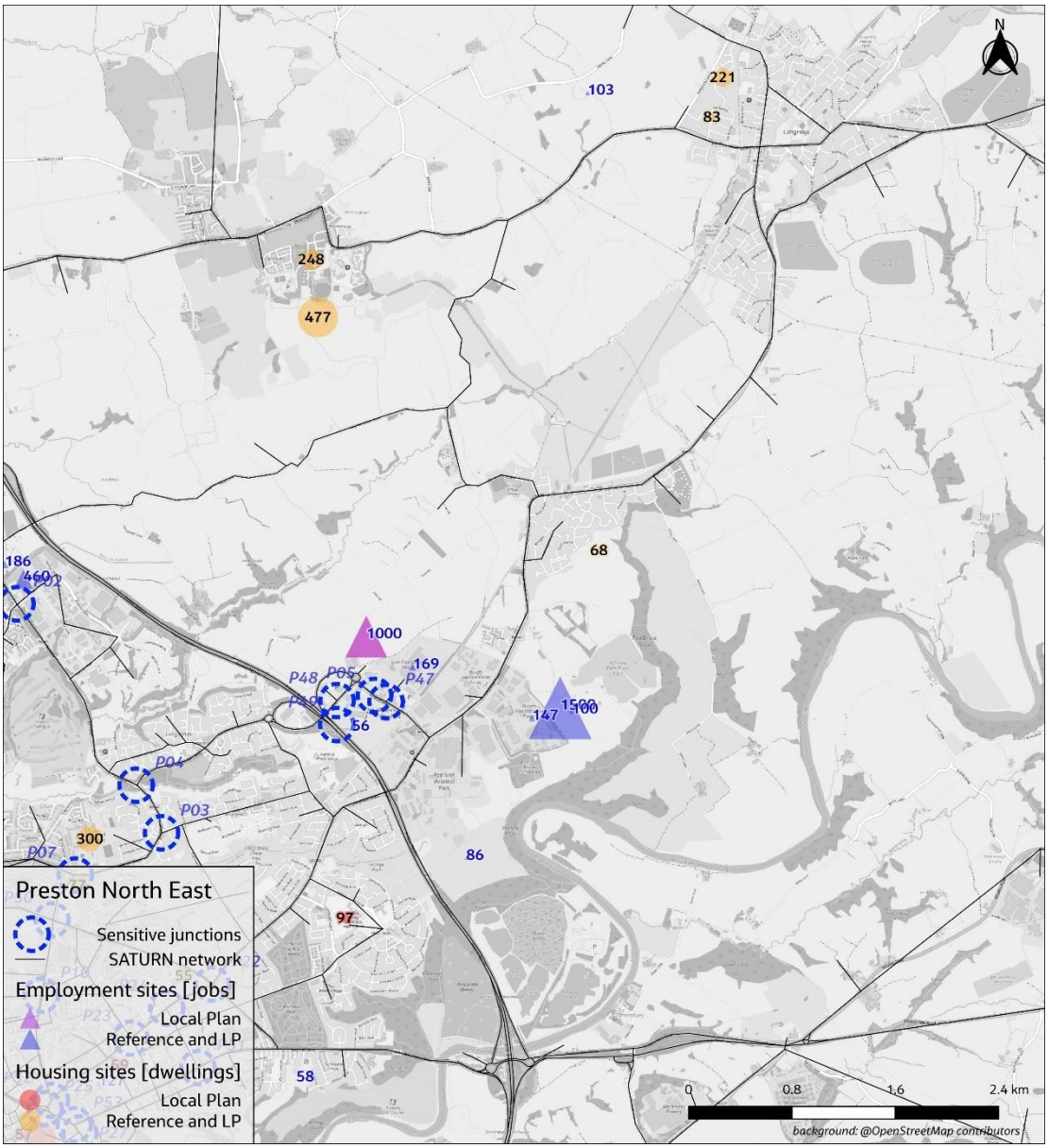


Figure 5-10 Preston North East

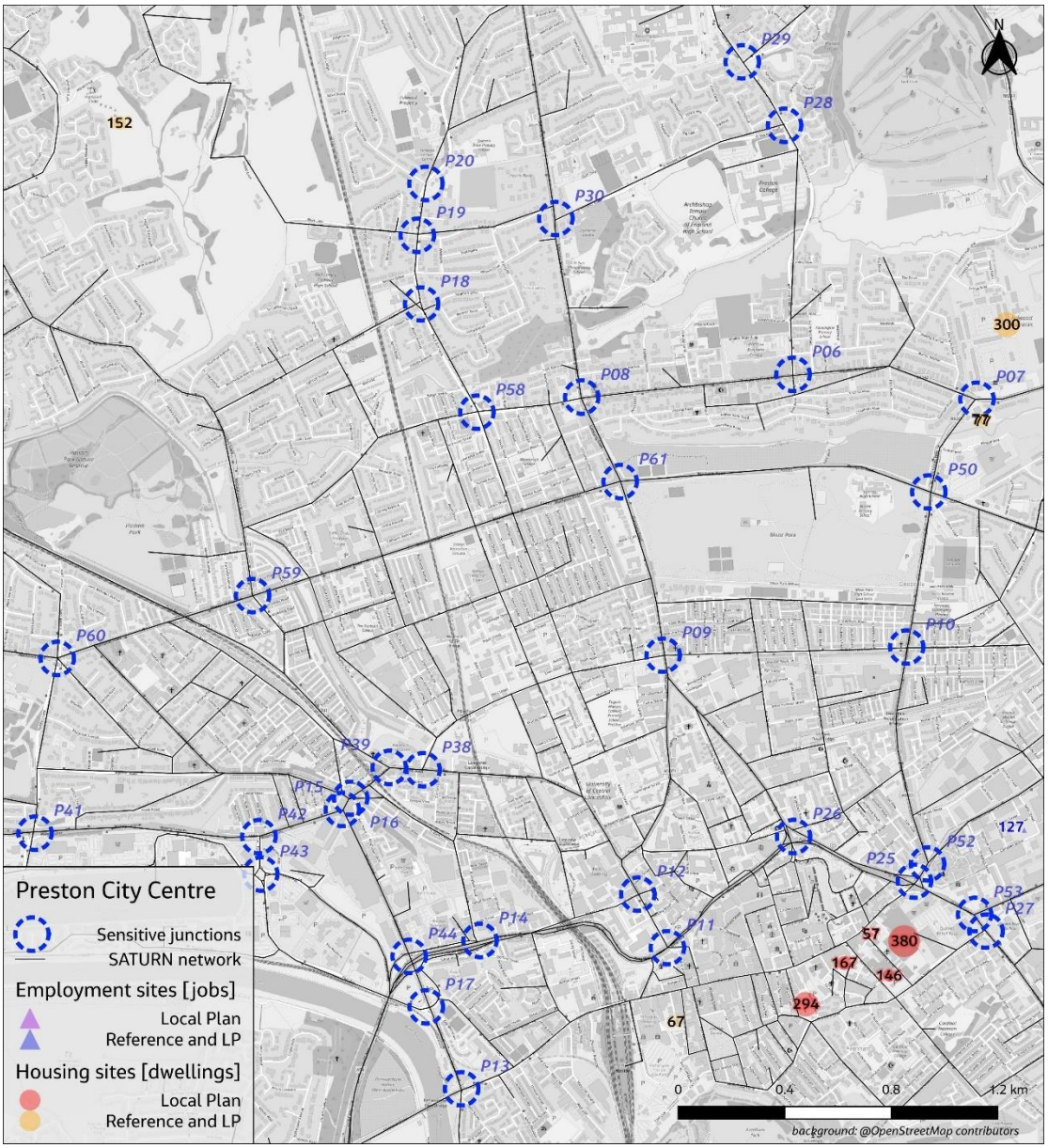


Figure 5-11 Preston City Centre

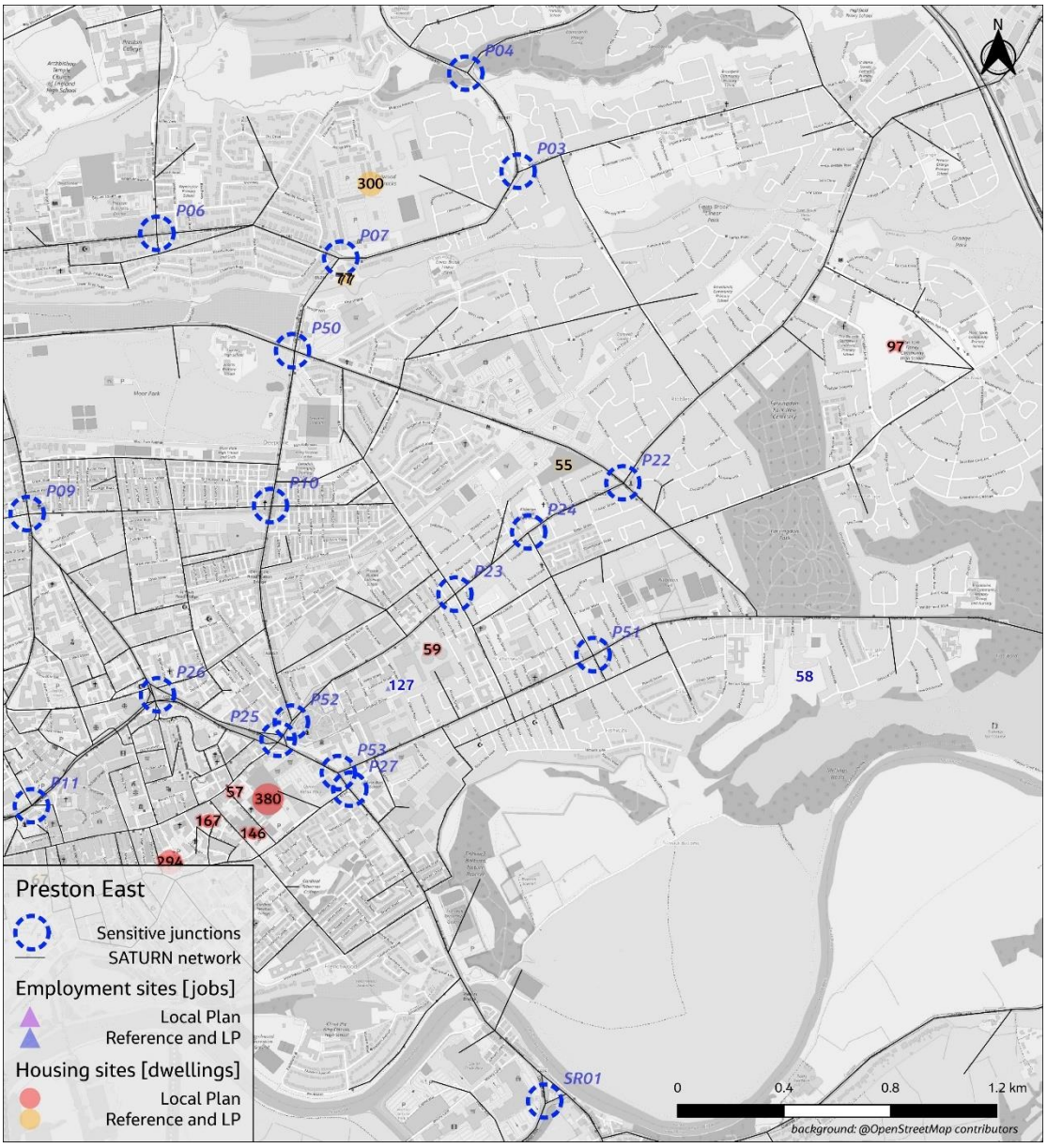


Figure 5-12 Preston East

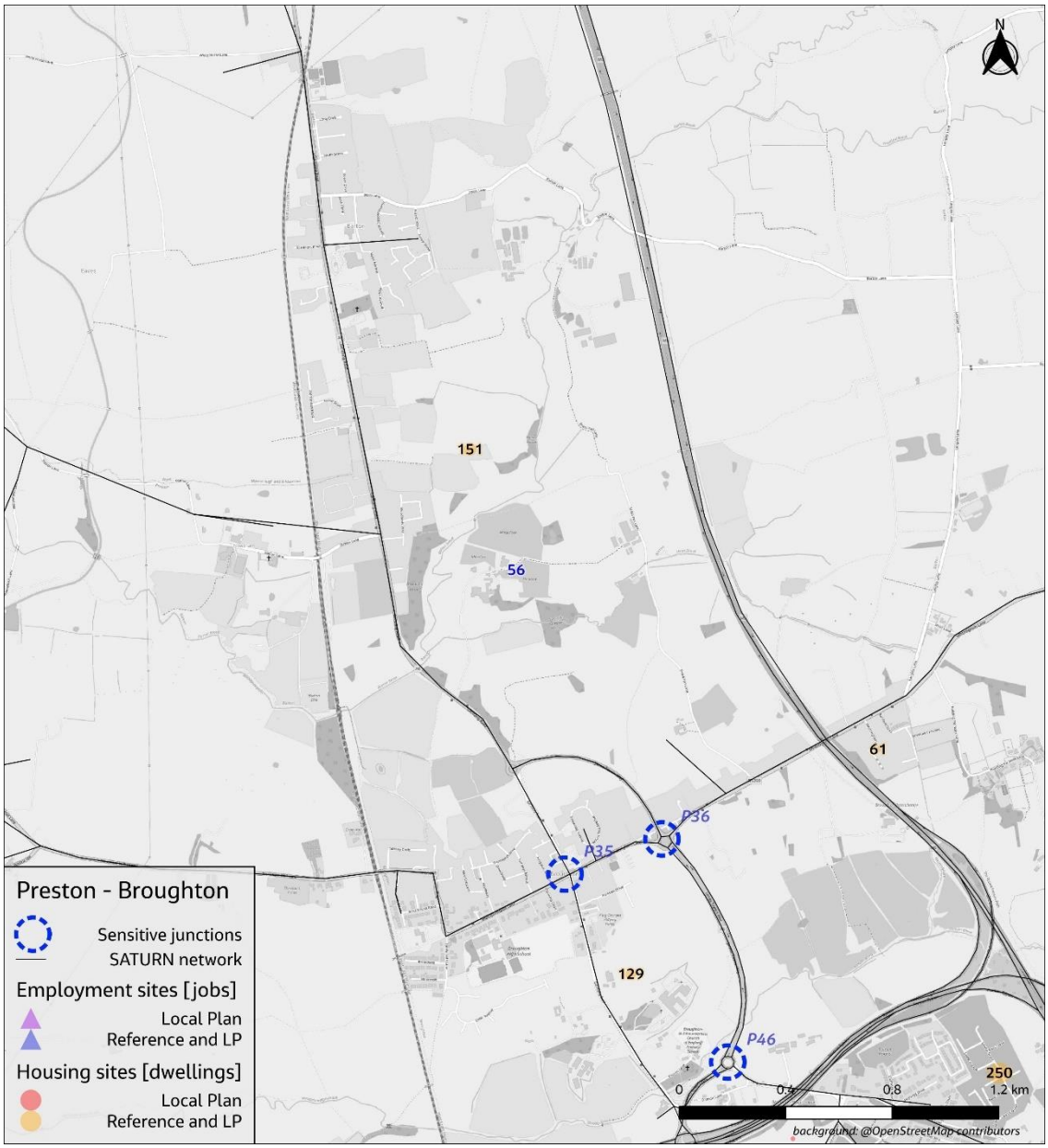


Figure 5-13Preston Broughton

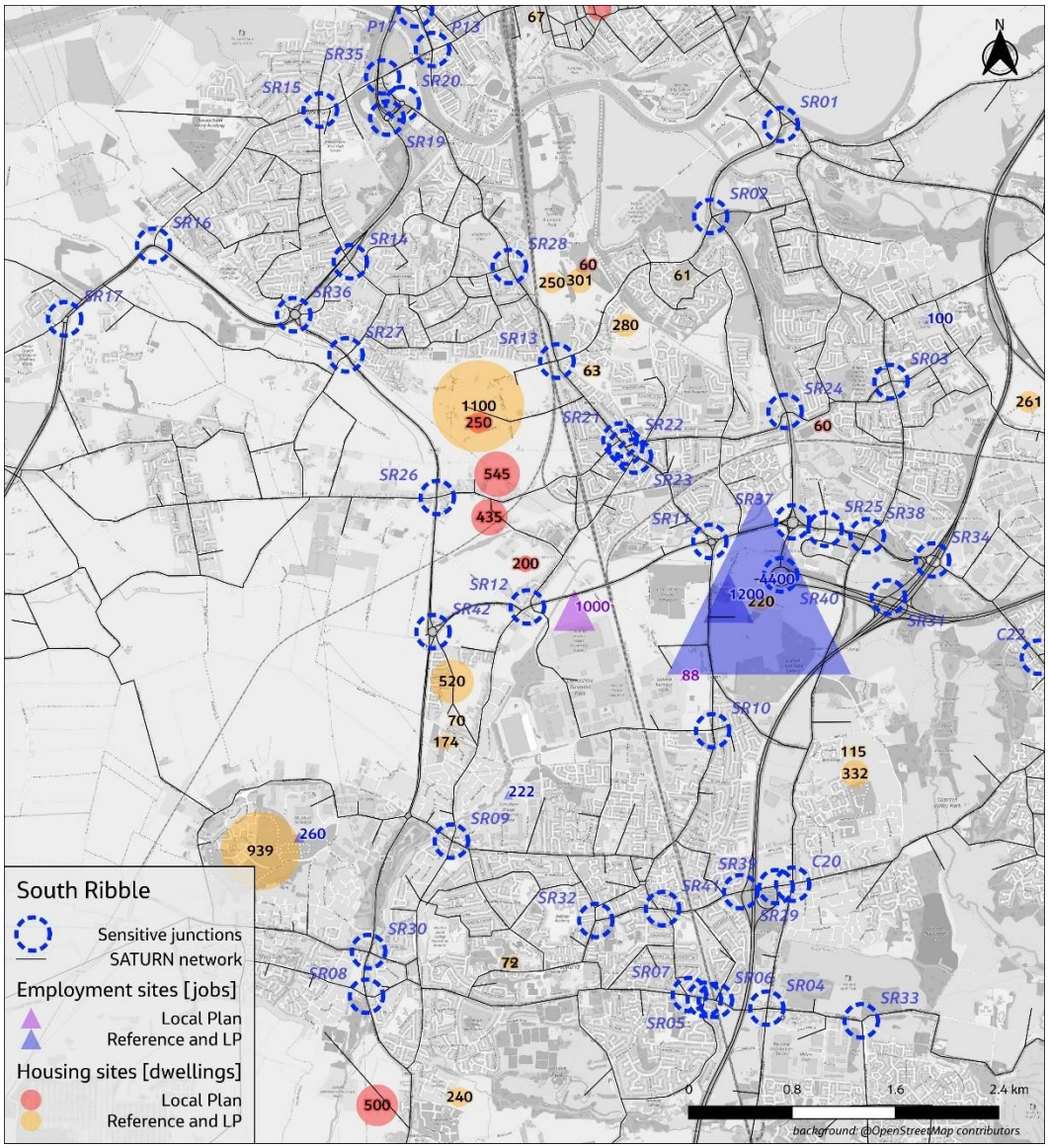


Figure 5-14 South Ribble

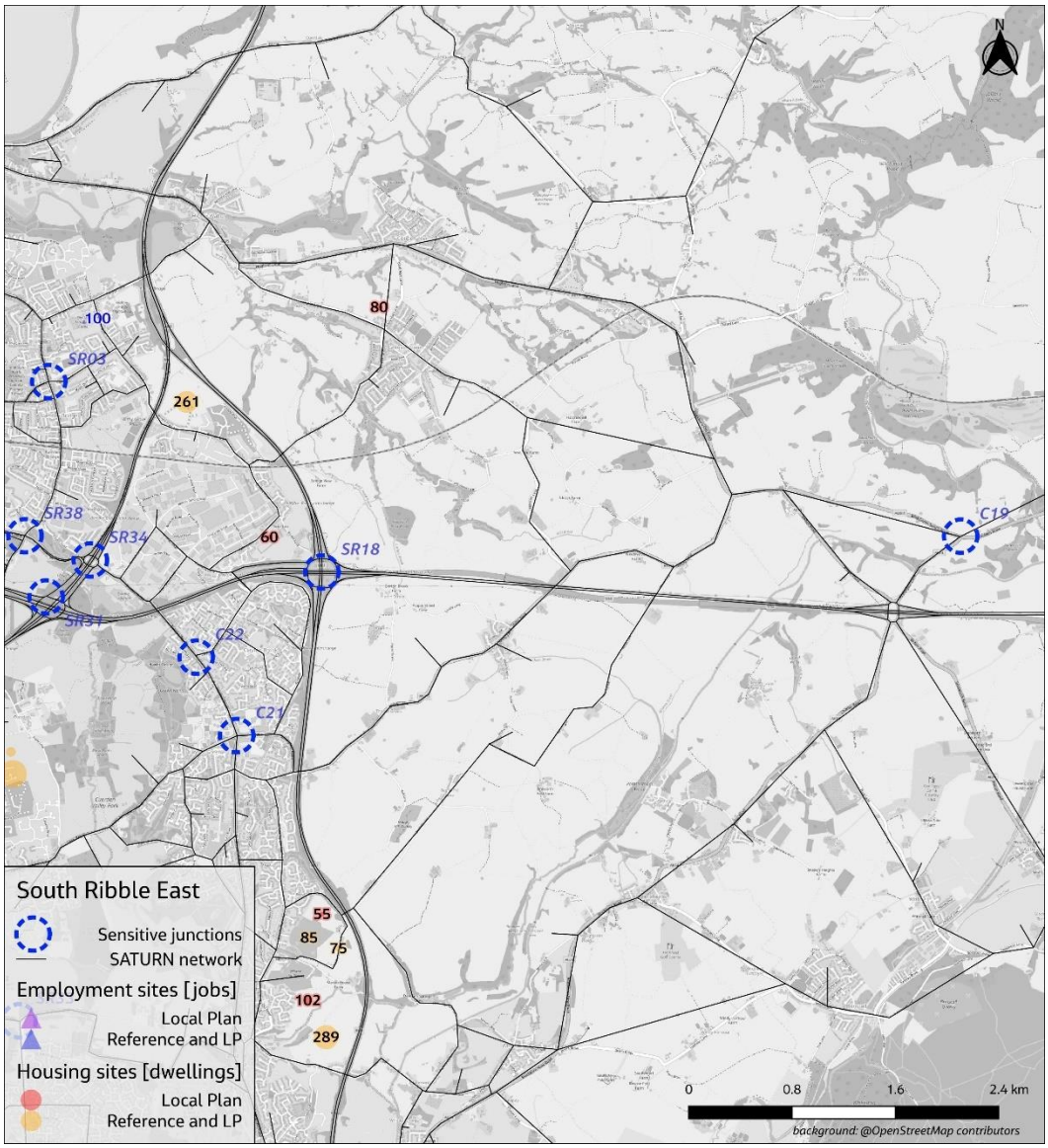


Figure 5-15 South Ribble East

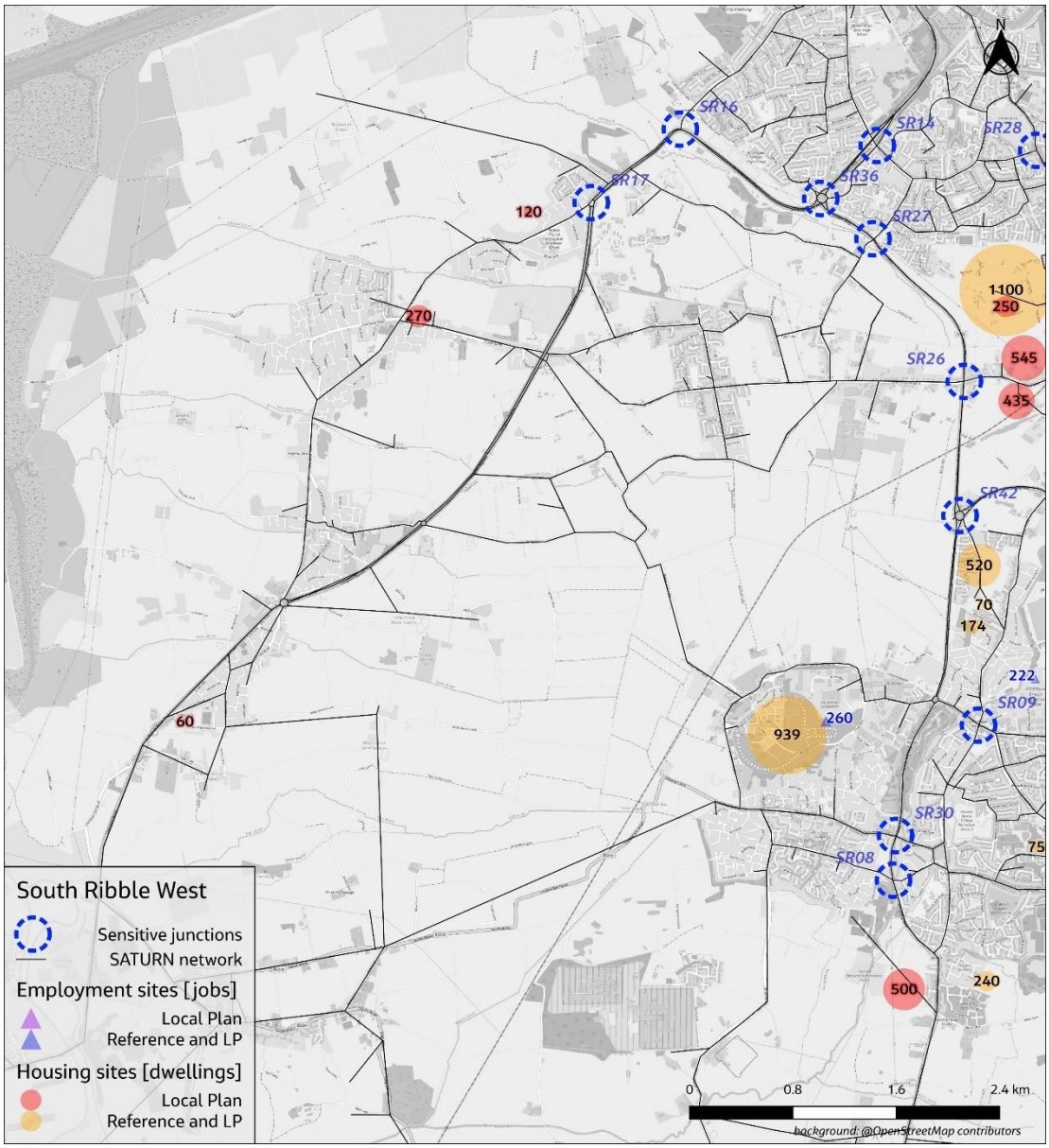


Figure 5-16 South Ribble West

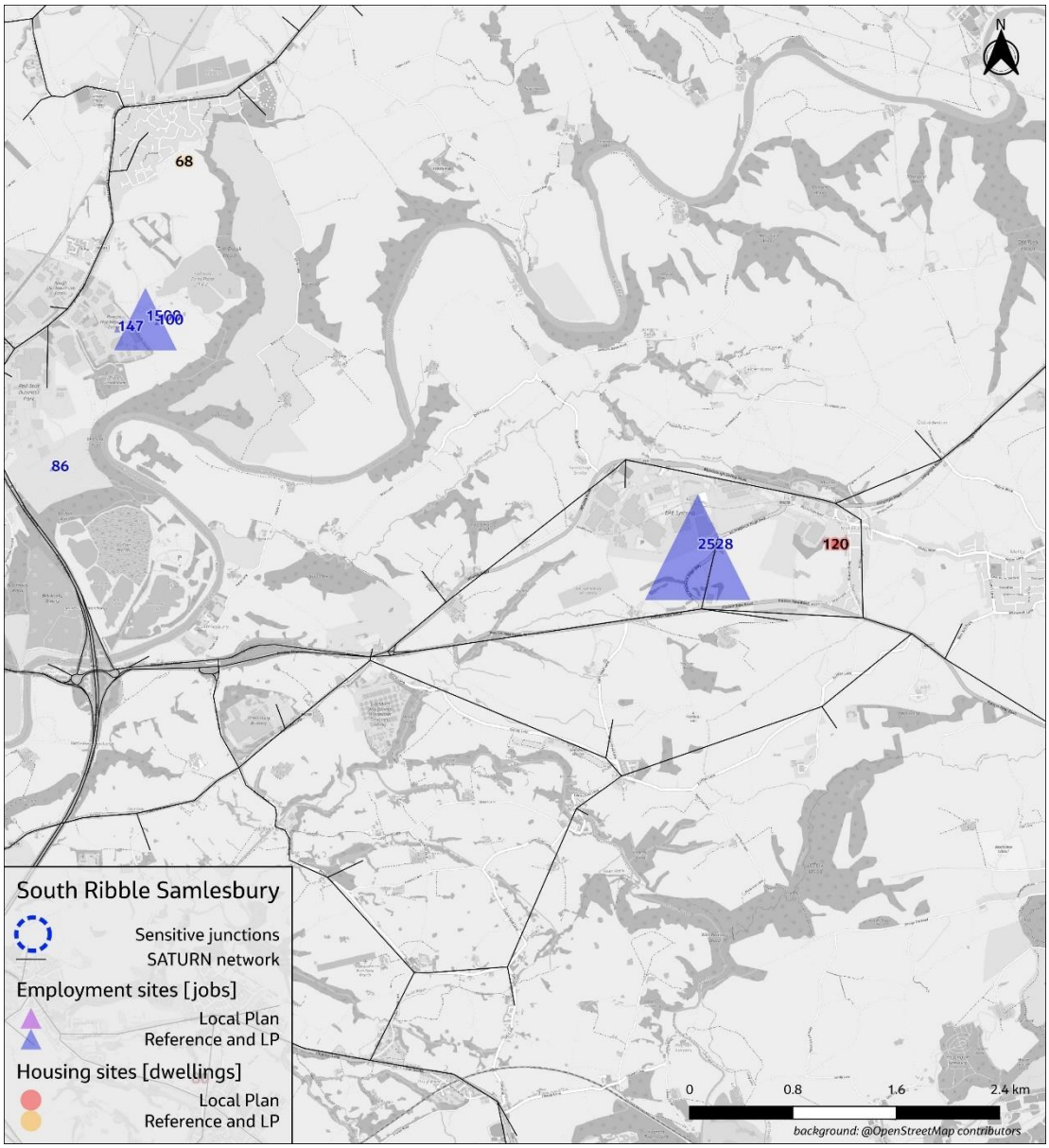


Figure 5-17 South Ribble Samlesbury

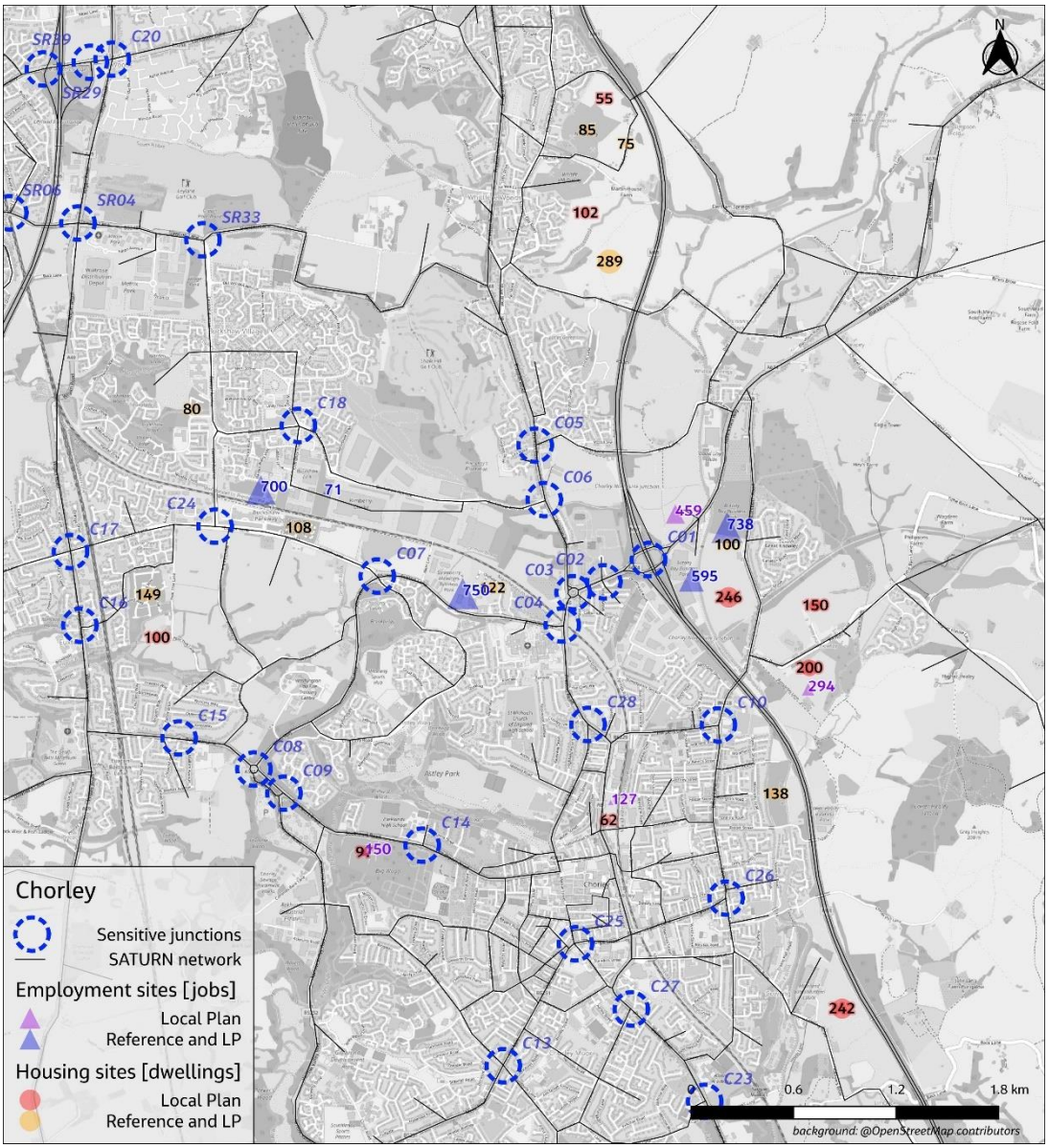


Figure 5-18 Chorley

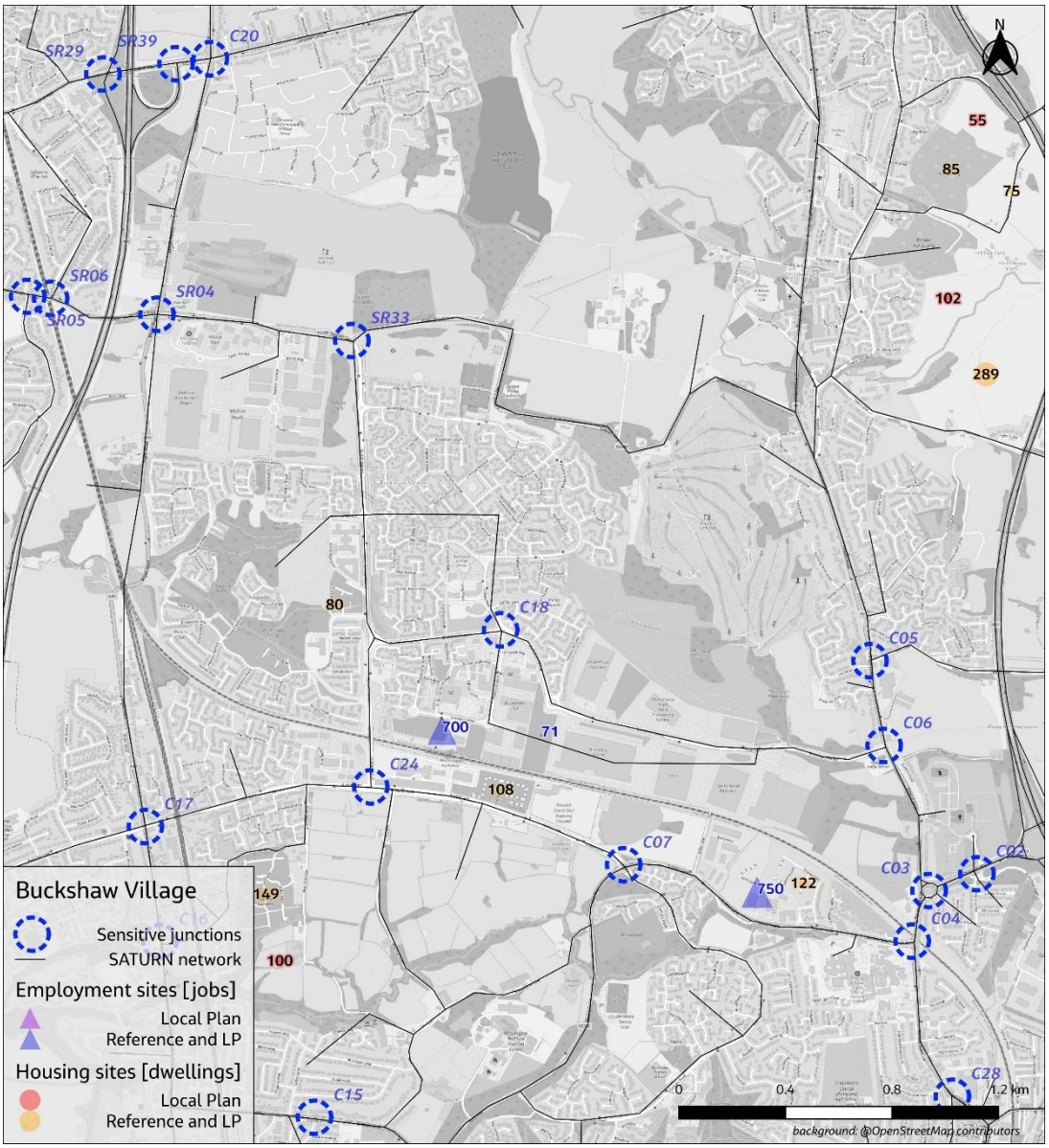


Figure 5-19 Buckshaw

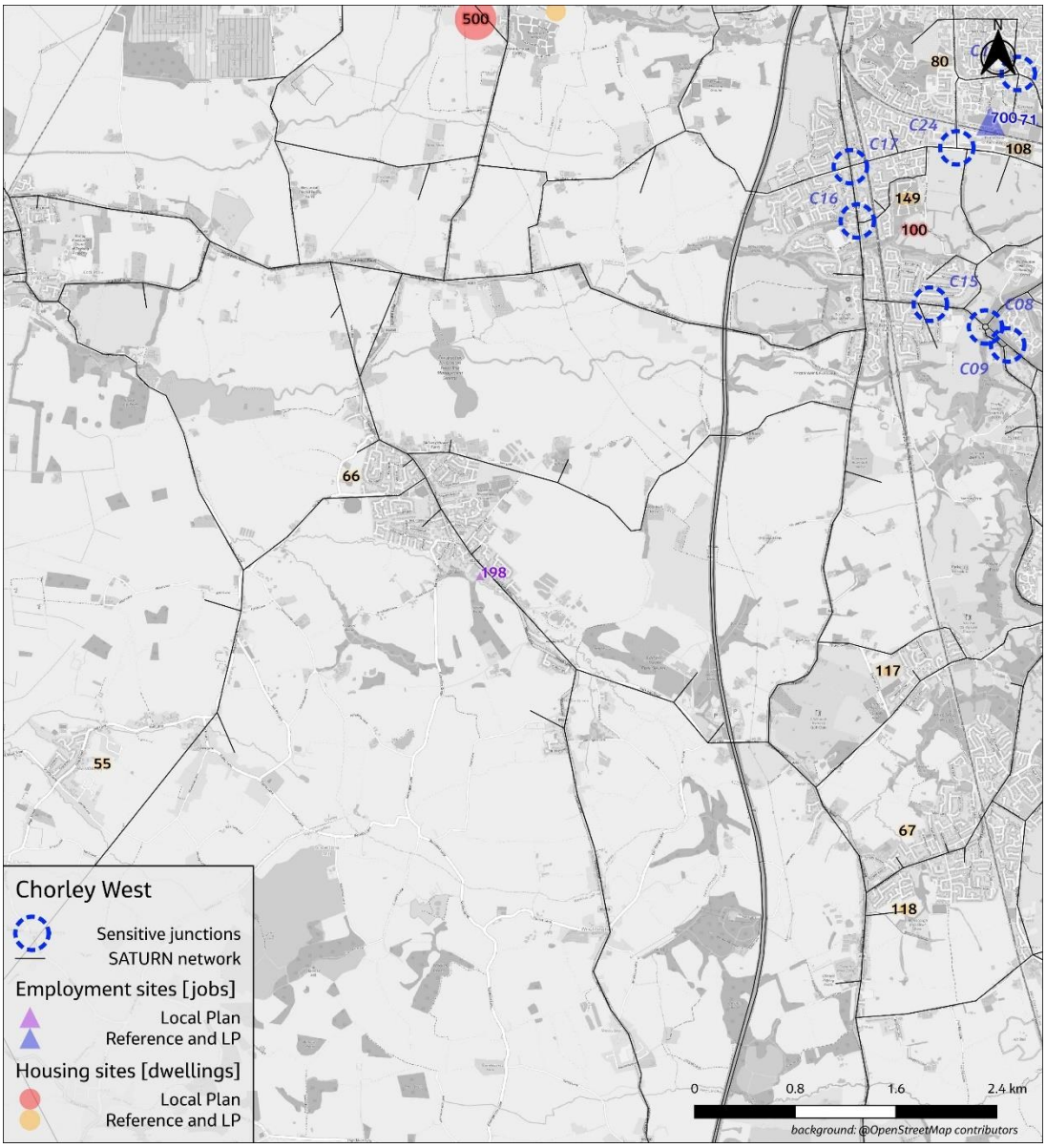


Figure 5-20 Chorley West

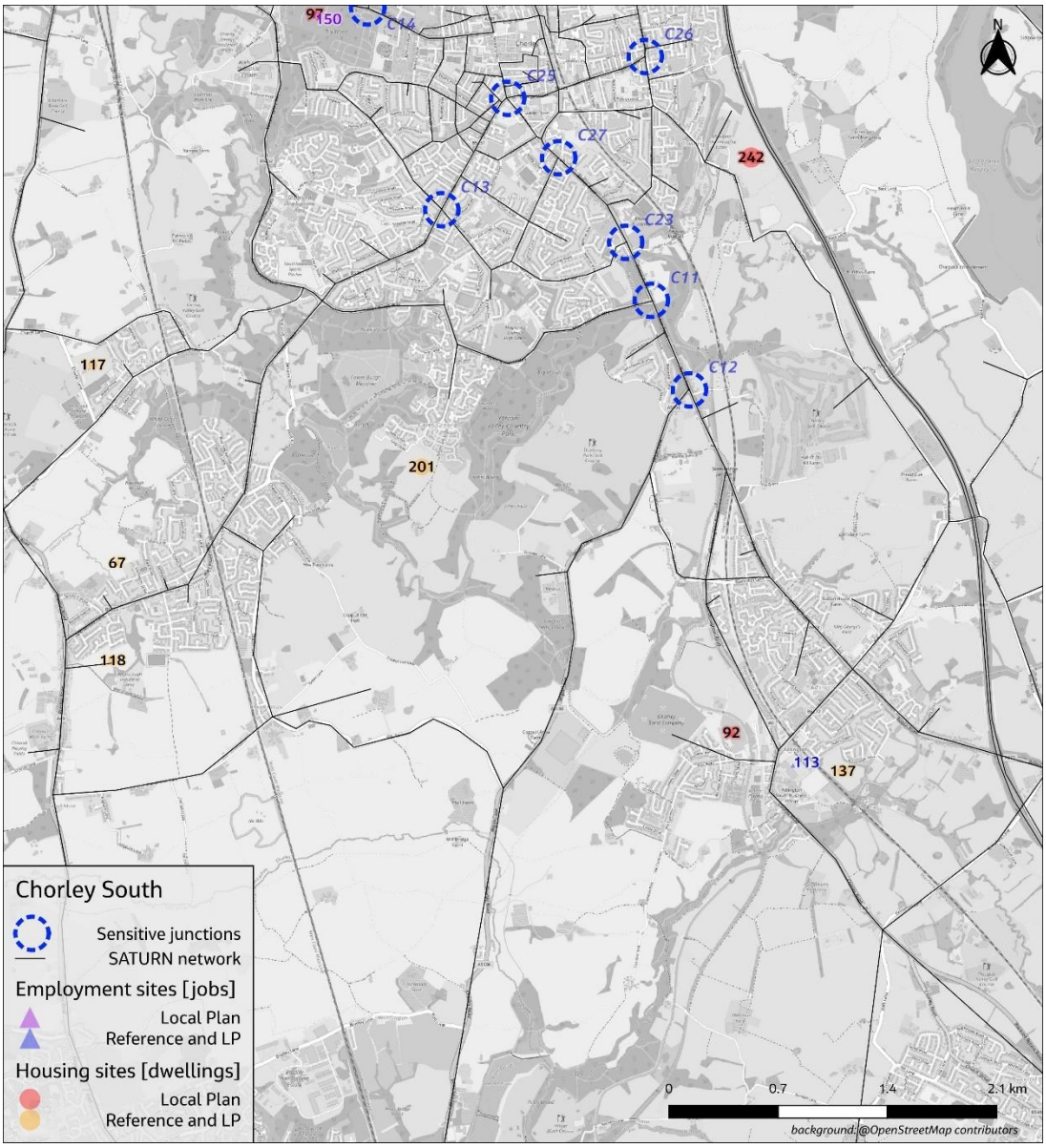


Figure 5-21 Chorley South

5.7 Modelling Results - Local Plan with Sustainable Mitigation Scenario

5.7.1 Introduction

This section summarises the model outputs following the incorporation of sustainable mitigation measures. These include adjustments to trip rates and mode shift assumptions, as outlined in in Section 4.3, along with updates to the highway and public transport networks, such as the introduction of bus lanes, changes to bus frequencies, and modifications to bus routes.

To provide a comparative assessment of the mitigation measures, the results of the Local Plan with sustainable mitigation have been compared those of the Reference scenario rather than against the Local Plan with no mitigation.

For each scenario a set of data and Key Performance Indicators (KPIs) have been produced, which enable easy and direct comparisons. The highway modelling outputs include:

- Plots showing flow changes within the network, comparing Local Plan with Sustainable Mitigation scenario with the Reference scenario

- Plots and tables showing junctions which are shown to be over capacity and where the newly generated traffic from the Local Plan sites is shown to have a detrimental impact.

Delay and v/c analysis has formed the main basis for identification of the impact of the Local Plan and to inform potential mitigation requirements at this stage of the study.

5.7.2 Traffic Flow Changes

The flow difference plots indicate a general increase in traffic volumes under the Local Plan scenario, reflecting the impact of additional developments. However, there are also areas where traffic reductions are observed, primarily due to re-routing effects from network assignment and the influence of the VDM. Notably, some reductions occur in specific sections as a direct result of the proposed sustainable transport mitigations.

Traffic flow plots are presented for both mode shift scenarios, Low Uptake and High Uptake. While the Low Uptake scenario forms the basis for identifying residual highway mitigation needs, it is important to note that neither scenario accounts for the potential impact of increasing e-bike adoption. As e-bikes can significantly enhance the feasibility of cycling longer distances and steeper routes, the High Uptake scenario may still underestimate the upper bound of active travel potential.

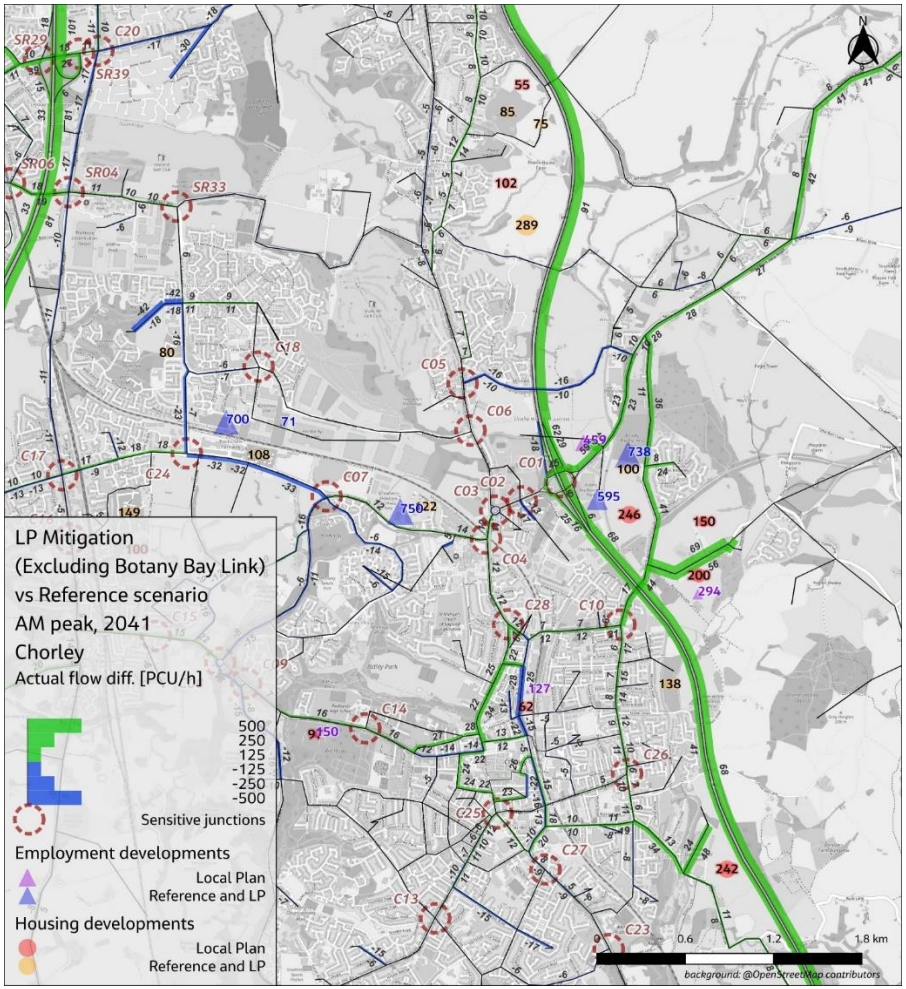
Chorley

The flow Difference plot between Reference and Local Plan with Sustainable Mitigation scenario for 2041 AM and PM peak for Chorley district is shown in Figure 5-28 and Figure 5-29. Flow difference plots for IP along with detailed zoomed-in plots for each district across all time periods, are provided in Appendix F (Scenario 3a) and Appendix G (Scenario 3b).

For the Low Uptake scenario, following observations can be made:

- In North Chorley, small reductions in traffic volumes were observed during both peak periods on Euxton Lane, Central Avenue, and the A6 through Chorley town centre. However, notable increases are noted on Blackburn Brow and the A674 east of M61 J8, reflecting the concentration of development in the north-east of Chorley.
- There is minimal traffic growth observed in the southern part of Chorley, primarily in rural areas, due to the limited number of new Local Plan allocations in that area.
- Traffic reductions are observed in areas where proposed sustainable mitigation measures are expected to encourage a shift from car use to active travel and bus modes, particularly from existing and committed developments.
- Overall, most junctions not adversely affected by Local Plan developments once sustainable mitigations are introduced.

The High Uptake scenario is expected to result in greater overall traffic reductions, particularly in areas with good access to the proposed active travel mitigation measures. Under this scenario, junctions currently experiencing severe congestion are expected to see improvements even without the need for additional highway mitigation measures.



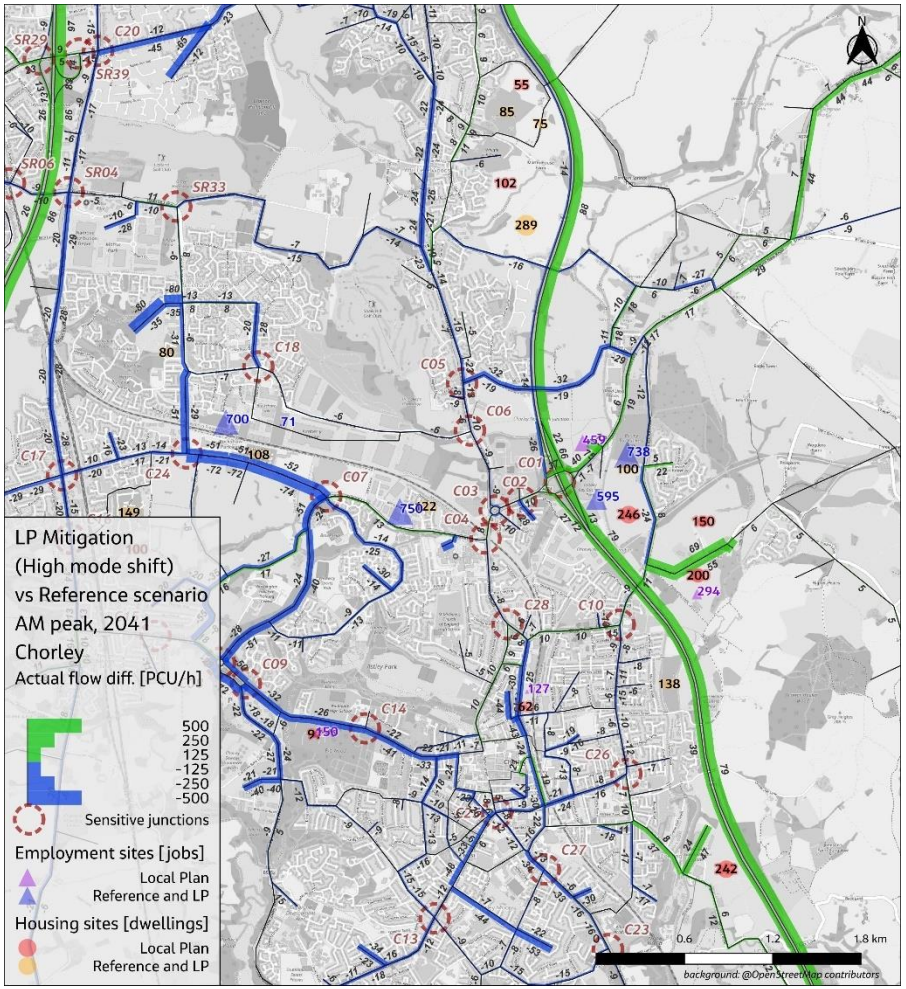


Figure 5-22 Flow Difference Plot – 2041 AM Local Plan with Sustainable Mitigation scenario (Low Uptake and High Uptake) Vs Reference Case – Chorley

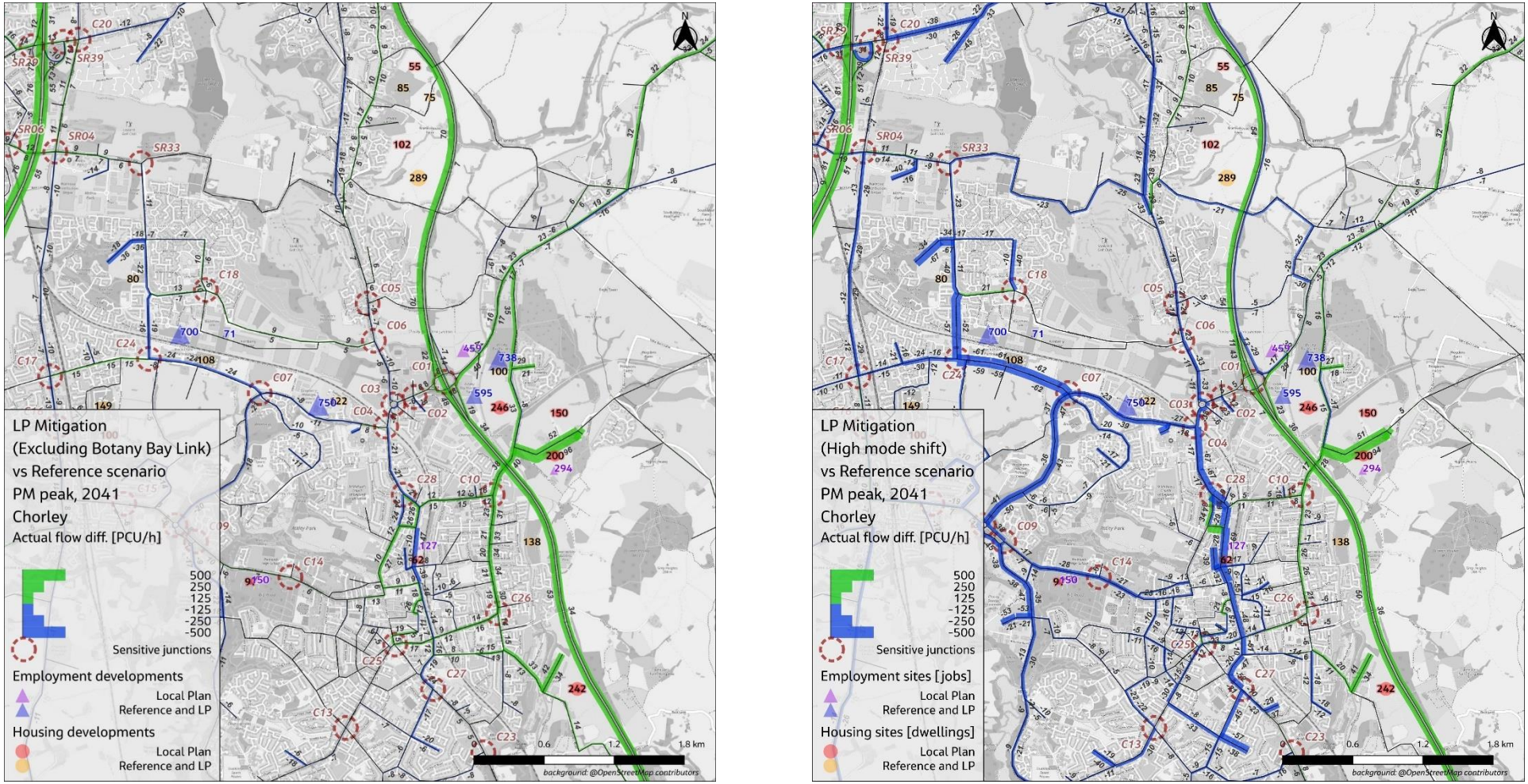


Figure 5-23 Flow Difference Plot – 2041 PM Local Plan with Sustainable Mitigation scenario (Low Uptake and High Uptake) Vs Reference Case – Chorley

Preston

The flow Difference plot between Reference and Local Plan with Sustainable Mitigation scenario for 2041 AM and PM peak for Preston district is shown in Figure 5-24 and Figure 5-25. Flow difference plots for IP along with detailed zoomed-in plots for each district across all time periods, are provided in the Appendix F (Scenario 3a) and Appendix G (Scenario 3b).

For the Low Uptake scenario, following observations can be made:

- In Preston, modest increases in traffic flow, primarily during the AM peak, are observed along the A6 between Eastway and Sharoe Green Lane, as well as on Eastway and Sharoe Green Lane themselves. Slight reductions are noted on James Tower Way and other parts of the city, particularly along the A6 corridor south of Sharoe Green Lane, Blackpool Road, and sections of the city centre. These reductions are attributed to the implementation of sustainable mitigation measures.
- In Northwest Preston, traffic increases are observed during both the AM and PM peak periods as a result of Local Plan developments. Notable increases occur on William Young Way, Edith Rigby Way, Lea Road, and Avice Pimblett Way. The majority of these developments utilise the newly opened Edith Rigby Way to access the M55 and Riversway/A583, as well as Tom Benson Way (B6241) and Tag Lane/Woodplumpton Road for travel toward the city centre areas where traffic growth is also evident. Only a small proportion of traffic from the Local Plan uses Eastway to access the A6, resulting in minor increases along that section.
- A limited number of housing developments are proposed within the City Centre, which will contribute additional traffic to the network. However, much of this impact is expected to be offset by sustainable transport improvements and the availability of existing public transport options. Additionally, traffic increases in the City Centre are also influenced by Local Plan development traffic originating from other districts, particularly South Ribble as commuters travel into the City Centre for employment purposes.
- Minor traffic reductions are anticipated along several already congested corridors, including Blackpool Road, New Hall Lane, and Ribbleton Lane, as a result of proposed sustainable mitigation measures. Additionally, the A6 (London Road) is expected to experience decreased traffic volumes in the northbound during the AM peak and southbound during the PM peak due to these interventions.
- Minor traffic increases are anticipated on the rural B5269 road northeast of Preston, though these are not expected to contribute to any congestion along the corridor.
- A major employment site proposed in the Local Plan (EC3.2 Preston East Junction 31A M6), expected to generate approximately 1,000 jobs, is located near Bluebell Way with direct access to the eastern Bluebell roundabout, which connects to the M6 at J31A. This development is anticipated to add traffic to an already congested junction, resulting in slight increases on the M6 slip roads. However, due to VDM and traffic assignment re-routing, this additional traffic is expected to reduce volumes along the B6242 corridor.
- Traffic increases have also been observed on the A59 east of M6 J31, primarily due to commuter traffic from new Local Plan developments travelling toward the Samlesbury area and Blackburn.

The High Uptake scenario is expected to result in greater overall traffic reductions, particularly in areas with good access to the proposed active travel mitigation measures. Under this scenario, junctions/corridors experiencing severe congestion are expected to see improvements even without the need for additional highway mitigation measures.

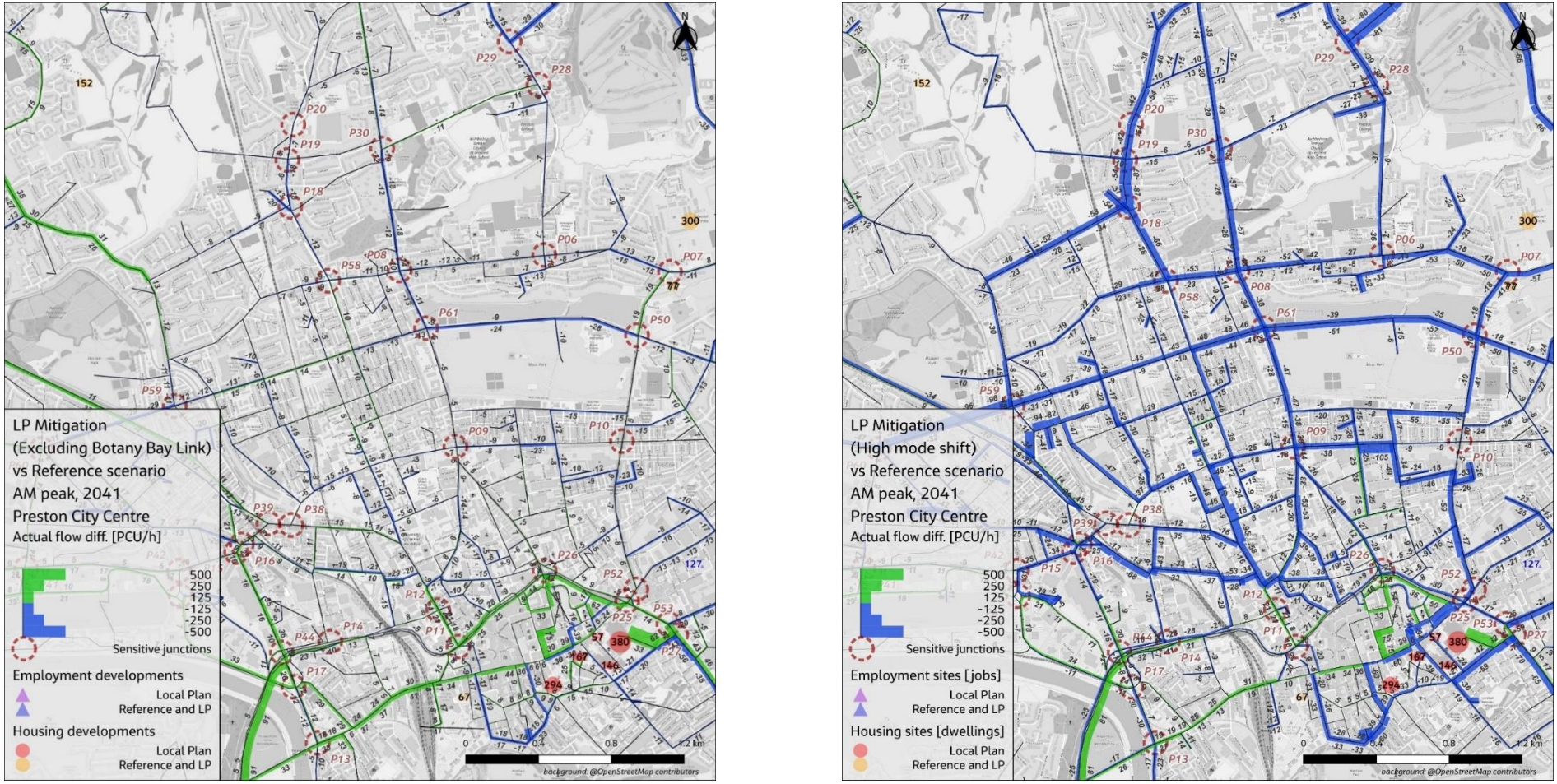


Figure 5-24 Flow Difference Plot – 2041 AM Local Plan with Sustainable Mitigation scenario (Low Uptake and High Uptake) Vs Reference Case – Preston City Centre

Figure 5-25 Flow Difference Plot – 2041 PM Local Plan with Sustainable Mitigation scenario (Low Uptake and High Uptake) Vs Reference Case – Preston City Centre

South Ribble

The flow Difference plot between Reference and Local Plan with Sustainable Mitigation scenario for 2041 AM and PM peak for South Ribble district is shown in Figure 5-26 and Figure 5-27. Flow difference plots for IP along with detailed zoomed-in plots for each district across all time periods, are provided in the Appendix F

For the Low Uptake scenario, following observations can be made:

- In South Ribble Traffic volumes are expected to increase during both AM and PM peaks on Golden Way, Penwortham Bypass, Coote Lane, Church Lane, and to a lesser extent on the B5254. These increases are primarily from the remaining plots at Pickering's Farm included in the Local Plan.
- A slight increase in southbound traffic is anticipated on the A6, while northbound flows are expected to decrease, as a result of the sustainable mitigation strategies.
- Traffic reductions are forecast on Flensburg Way near the Tank Roundabout, along with minor decreases along the A582 east-west corridor.
- New employment developments in Leyland will likely contribute additional traffic, particularly on Stanifield Lane and Golden Hill Lane, with a higher proportion of goods vehicles expected.
- The residential development at Land off Emnie Lane (500 dwellings) is projected to generate some additional traffic on Leyland Lane. However, it is not anticipated to significantly affect nearby junctions that are currently experiencing operational challenges.
- A582 SRWD (South Ribble Western Distributor) scheme is included in both Reference case and Local Plan scenarios, and the Local plan scenario assumes that the cross-borough link through Pickerings farm will be completed.

The High Uptake scenario is expected to result in greater overall traffic reductions, particularly in areas with good access to the proposed active travel mitigation measures. Under this scenario, junctions currently experiencing severe congestion are expected to see improvements even without the need for additional highway mitigation measures.

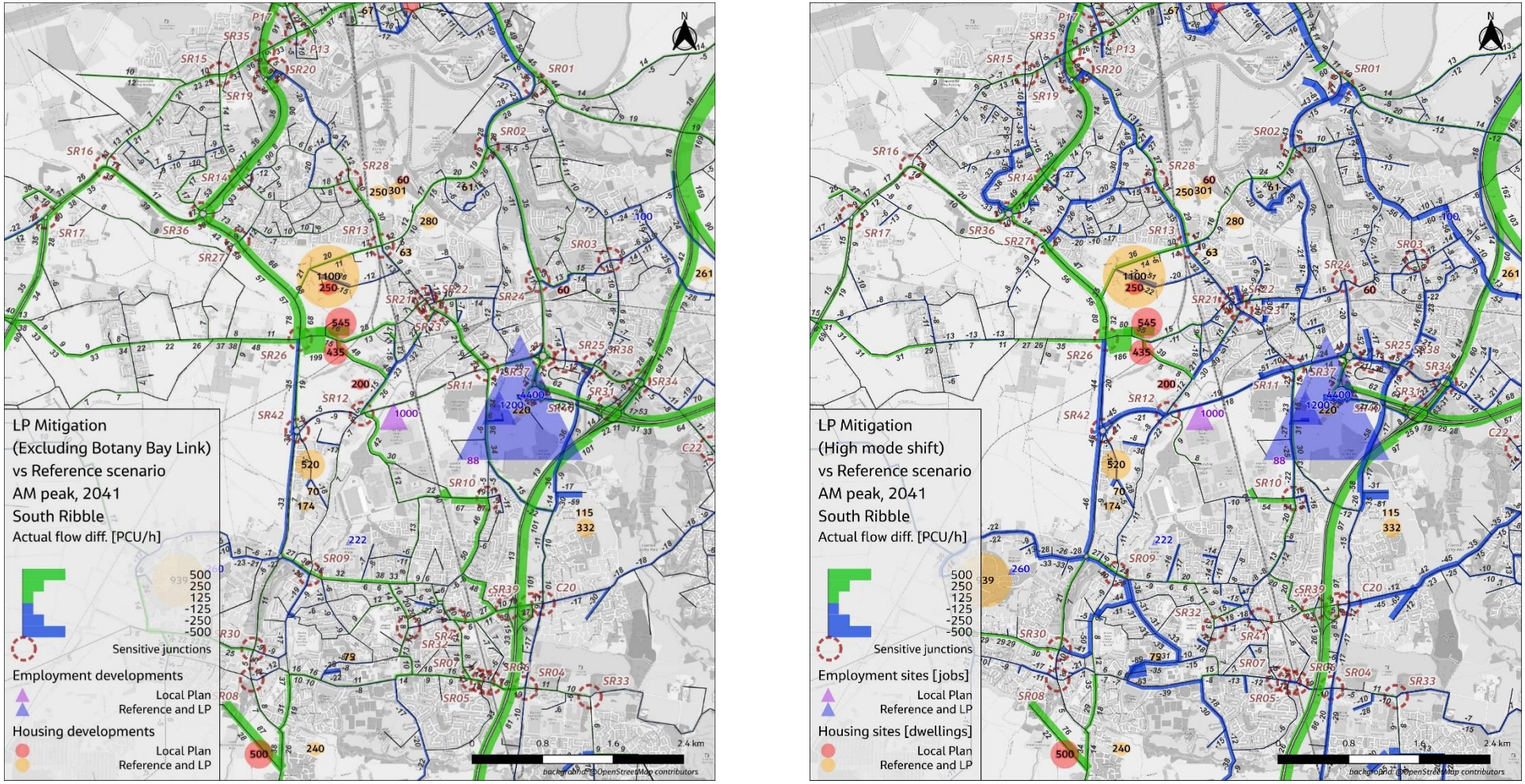


Figure 5-26 Flow Difference Plot – 2041 AM Local Plan with Sustainable Mitigation scenario (Low Uptake and High Uptake) Vs Reference Case – South Ribble

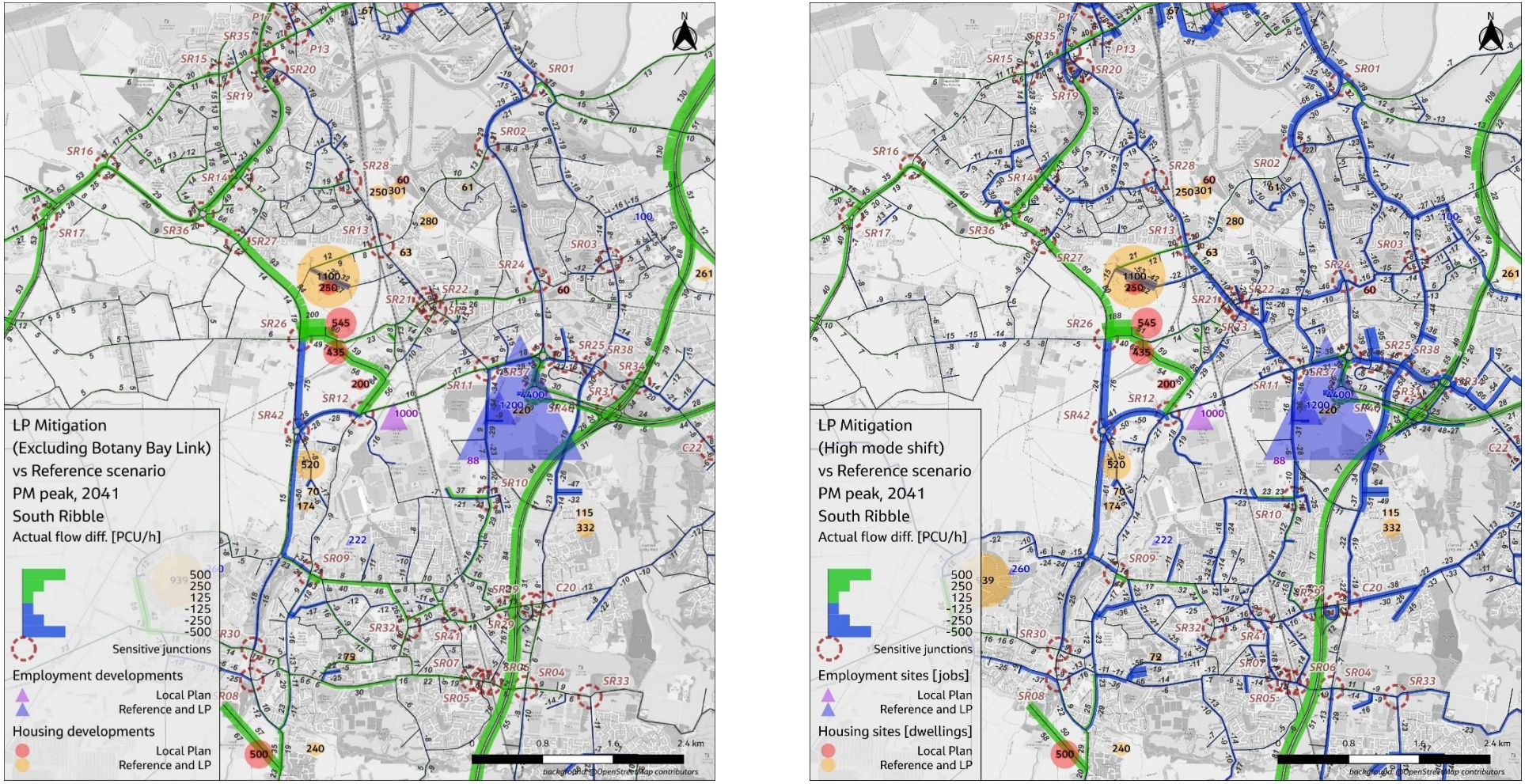


Figure 5-27 Flow Difference Plot – 2041 PM Local Plan with Sustainable Mitigation scenario (Low Uptake and High Uptake) Vs Reference Case – South Ribble

5.7.3 Volume to Capacity and Delays

In order to identify the areas in the model with significant congestion, the output from the modelling has been examined in terms of the ratio of volume over capacity (V/C). This compares the modelled traffic flow over an hour to the modelled capacity for an hour.

The V/C figures provide an indication how the Local Plan traffic with the sustainable mitigation measures have changed the V/C with respect to the Reference scenario. The change in V/C is shown in different colour bands representing the varying degree of congestion as defined below:

- Green: Decrease in V/C in the Local Plan scenario compared to the Reference scenario
- Grey: No change in V/C between scenarios
- Blue: Increase in V/C, but still below 80% in the Local Plan scenario
- Yellow: V/C increases from below 80% to the 80–85% range
- Orange: V/C increases within the 80–85% range
- Red: V/C increases from below 85% to above 85%
- Brown: V/C increases above 85% in the Local Plan scenario compared to the Reference scenario.

The following section provides a detailed discussion of network performance issues within each of the three districts, based on model outputs for both AM and PM peak periods in the 2041 Reference and Local Plan with Sustainable Mitigation scenario (Low Uptake). A separate chapter discusses the performance of the SRN within each district.

Chorley

V/C difference plot between Reference and Local Plan with Sustainable Mitigation scenario for 2041 AM and PM peak for Chorley district is shown in Figure 5-28 and Figure 5-29. Flow difference plots for IP along with detailed zoomed-in plots for each district across all time periods, are provided in the Appendix F.

Regarding the V/C comparison, the following observations can be made:

- Most areas experienced either a reduction or a slight increase in v/c, with values remaining below critical thresholds.
- No significant change was observed around Millennium Way and Euxton Lane.
- Central Chorley generally showed reductions in v/c, likely due to mode shift resulting from mitigation measures.
- A minor issue was noted on Pilling Lane, though v/c remained below 85%, indicating no material impact on delay.
- Deterioration in v/c was observed at the A6 Bolton Road / Wigan Lane junction, which may be addressed through signal optimisation.

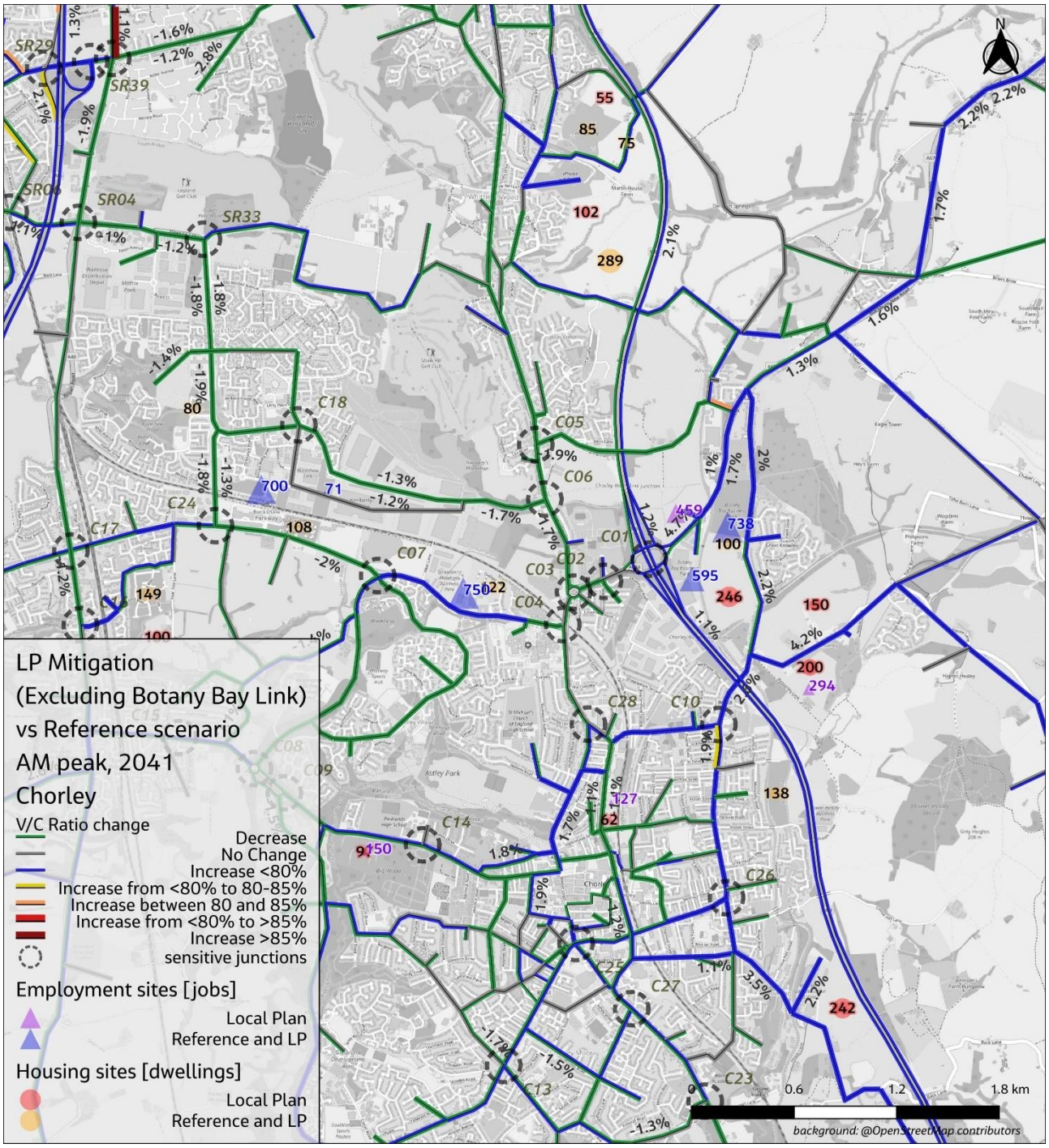


Figure 5-28 V/C Difference Plot – 2041 AM Local Plan with Sustainable Mitigation scenario (Low Uptake) Vs Reference Case – Chorley

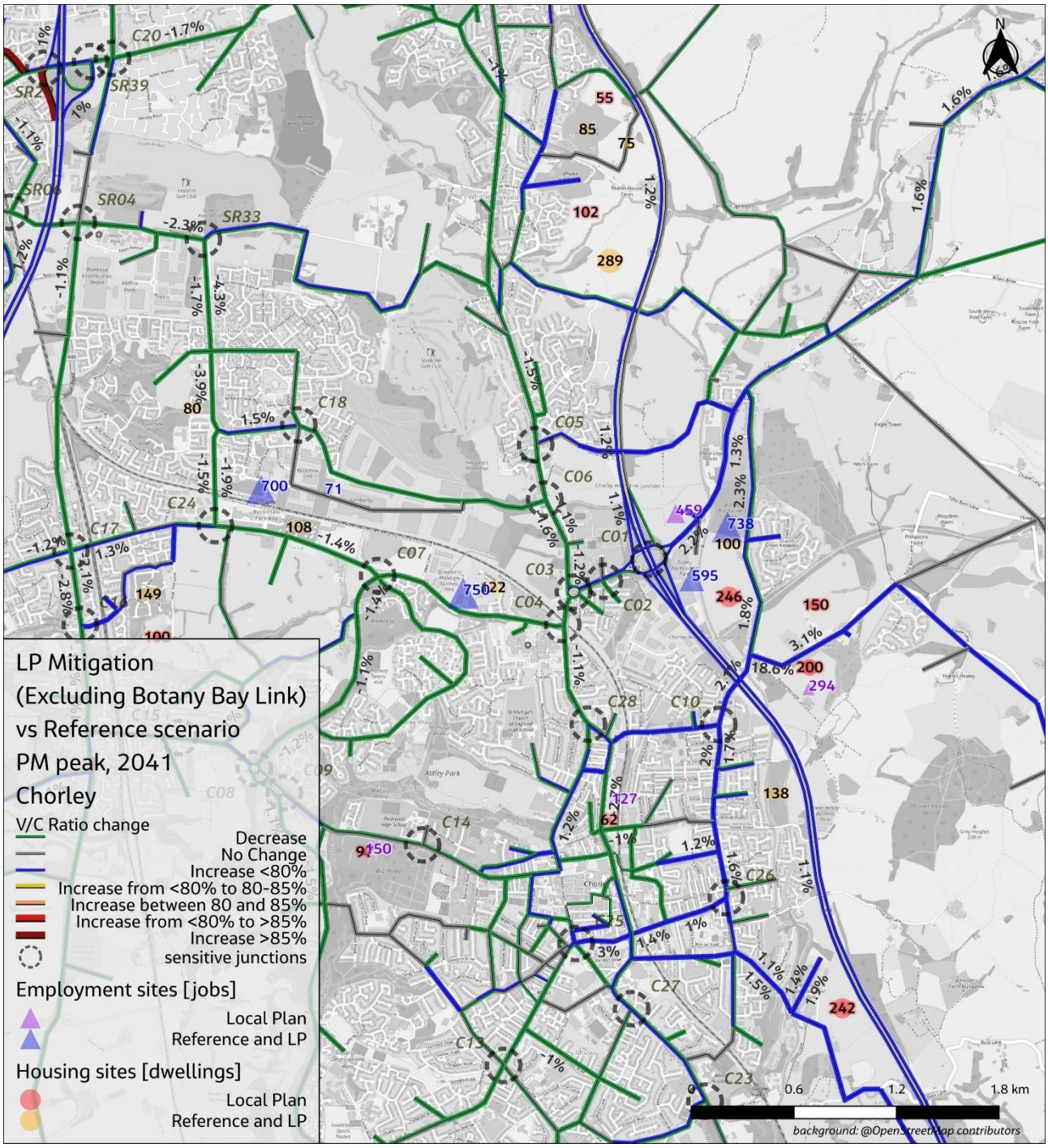


Figure 5-29 V/C Difference Plot – 2041 PM Local Plan with Sustainable Mitigation scenario (Low Uptake) Vs Reference Case – Chorley

The average delay per vehicle (weighted across all arms) at the identified sensitive junctions during the AM and PM peaks is summarised in Table 5-1 and

Table 5-2. Delay plots for all peaks and delay summary for IP peak is included in Appendix F.3. The delay changes indicate that, while there is an overall increase compared to the base scenario, delays relative to the Reference scenario do not show significant worsening at any junction. In fact, with the implementation of sustainable mitigation measures, some junctions are projected to experience reduced delays.

Table 5-1. Average seconds delay/vehicle (weighted across all arms), AM Peak, Chorley

Junction ID	Junction	Base	Reference	Local Plan Mitigation (Low Uptake)	LP impact vs Reference	Change from Base
C03	A6 Preston Rd / A674 Millenium Way	19	20	20	0	1
C04	A6 Preston Rd / B5252 Euxton Lane	29	32	33	0	4
C06	A6 Preston Rd / Buckshaw Avenue	48	55	52	-2	4
C07	B5252 West Way / Euxton Lane	20	22	21	0	1
C08	A582 Southport Road / B5252 Westway Rbt	7	8	8	0	1
C09	A581 Southport Road / B5252 Foxhole Road	4	4	4	0	1
C10	B6228 Eaves Lane / B6229 Harpers Lane	14	17	17	1	3
C11	A6 Bolton Road / B5252 Myles Standish Way	31	30	30	0	-1
C12	A6 Bolton Rd / A5106 Wigan Ln	136	134	136	2	-1
C13	B5251 Pall Mall / Weldbank Lane	46	49	49	0	4
C16	A49 Wigan Road / Bank Lane (Euxton)	29	35	35	0	6
C17	A49 Wigan Road / Euxton Lane	34	36	36	0	2
C19	A674 Finnington Lane / Moulden Brow A6061	46	44	44	0	-2
C20	A49 Wigan Road / Leyland Way	28	36	38	1	10
C21	A6 Preston Road / B5256 Westwood Road	14	17	17	0	2
C22	A6 Preston Road / Clayton Brook Road	11	18	17	-1	6
C25	B5251 / Market Street	30	31	31	0	1
C27	A6 Bolton Road / Pilling Lane	29	30	29	0	0
C28	A6 Preston Street / Park Rd	3	4	4	0	1

Table 5-2. Average seconds delay/vehicle (weighted across all arms), PM Peak, Chorley

Junction ID	Junction	Base	Reference	Local Plan Mitigation (Low Uptake)	LP impact vs Reference	Change from Base
C03	A6 Preston Rd / A674 Millenium Way	26	26	27	0	1
C04	A6 Preston Rd / B5252 Euxton Lane	25	26	26	0	1
C06	A6 Preston Rd / Buckshaw Avenue	35	39	37	-1	2
C07	B5252 West Way / Euxton Lane	24	27	27	0	2
C08	A582 Southport Road / B5252 Westway Rbt	7	8	8	0	1
C09	A581 Southport Road / B5252 Foxhole Road	3	4	4	0	0
C10	B6228 Eaves Lane / B6229 Harpers Lane	13	14	15	0	1
C11	A6 Bolton Road / B5252 Myles Standish Way	47	48	48	-1	0
C12	A6 Bolton Rd / A5106 Wigan Ln	159	162	162	1	3
C13	B5251 Pall Mall / Weldbank Lane	68	70	70	0	2
C16	A49 Wigan Road / Bank Lane (Euxton)	58	60	60	1	2
C17	A49 Wigan Road / Euxton Lane	32	34	34	0	2
C19	A674 Finnington Lane / Moulden Brow A6061	44	44	44	1	1
C20	A49 Wigan Road / Leyland Way	22	23	23	0	1
C21	A6 Preston Road / B5256 Westwood Road	14	15	15	0	1
C22	A6 Preston Road / Clayton Brook Road	14	16	16	0	2
C25	B5251 / Market Street	33	33	33	1	0
C27	A6 Bolton Road / Pilling Lane	30	31	31	0	1
C28	A6 Preston Street / Park Rd	2	2	2	0	0

Preston

V/C difference plot between Reference and Local Plan with Sustainable Mitigation scenario for 2041 AM and PM peak for Preston district is shown in Figure 5-30 and Figure 5-31. Flow difference plots for IP along with detailed zoomed-in plots for each district across all time periods, are provided in the Appendix F

In Preston, several junctions already experience delays in the Reference scenario and are expected to face congestion regardless of Local Plan impacts. Sustainable transport mitigations contribute to reduced pressure in certain areas through mode shift.

In northwest Preston, minor increases and decreases in traffic across the network are noted, with most V/C ratios staying below 80%. Notable increases are observed at Eastway (Aldeburgh Drive, Lightfoot Lane, Olivers Place) and Parklands Drive, though A6 remains largely unaffected.

Aqueduct Street shows increases in V/C in the AM peak. Ringway experiences moderate increases, but no significant overall impact. Ribbleton shows minimal impact in terms of flow changes toward central Preston.

Strand Road and Fishergate Hill face additional delays, especially in the PM peak, due to pressure from Local Plan site trips targeting the city centre.

Garstang Road and Blackpool Road show little impact, with some improvements attributed to mode shift toward active travel.

In eastern Preston, Bluebell Way is expected to see increased V/C and delays due to new employment site. This site would also cause increases on the M6 on-slip during the PM peak.

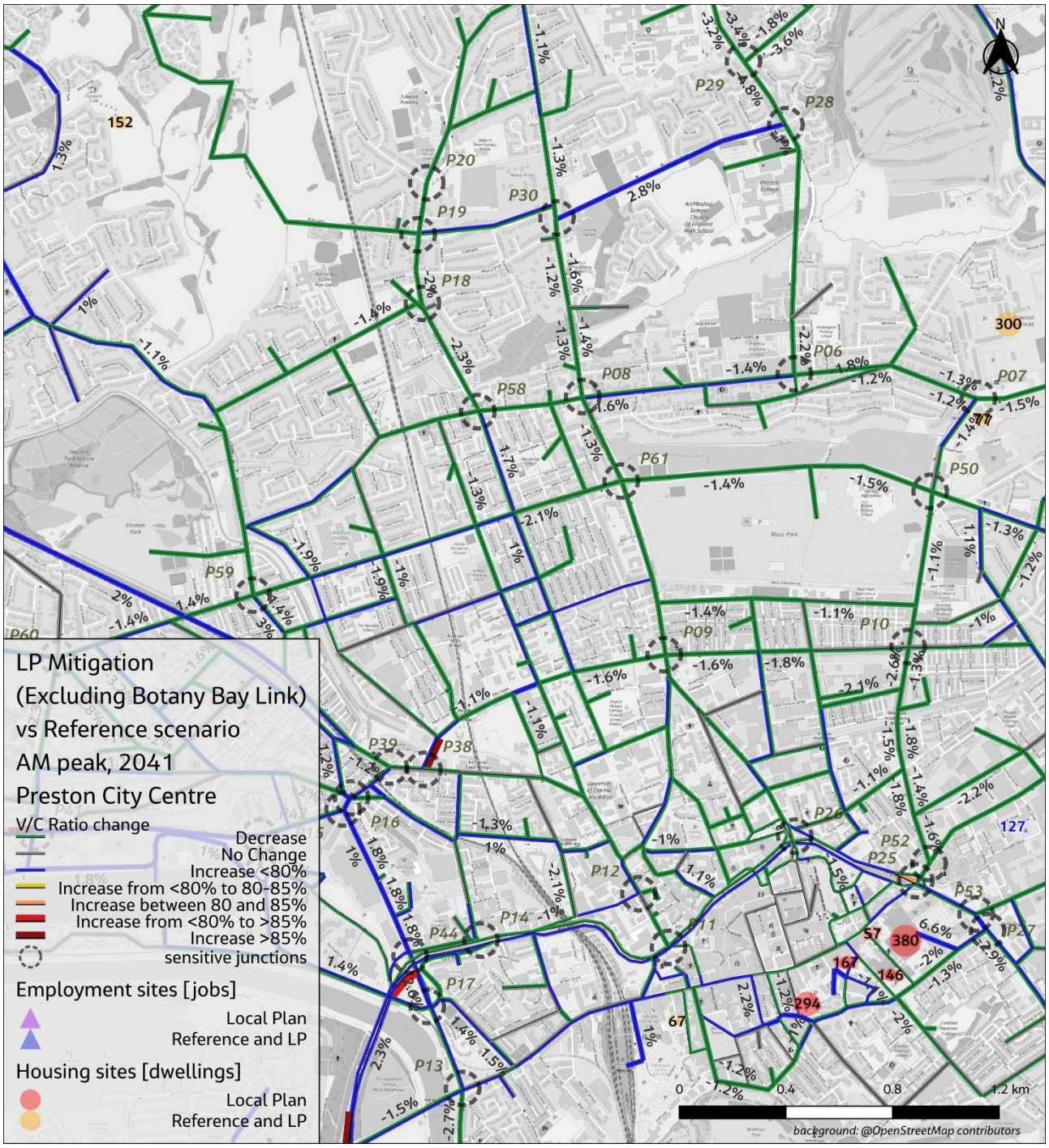


Figure 5-30 V/C Difference Plot – 2041 AM Local Plan with Sustainable Mitigation scenario (Low Uptake) Vs Reference Case – Preston City Centre

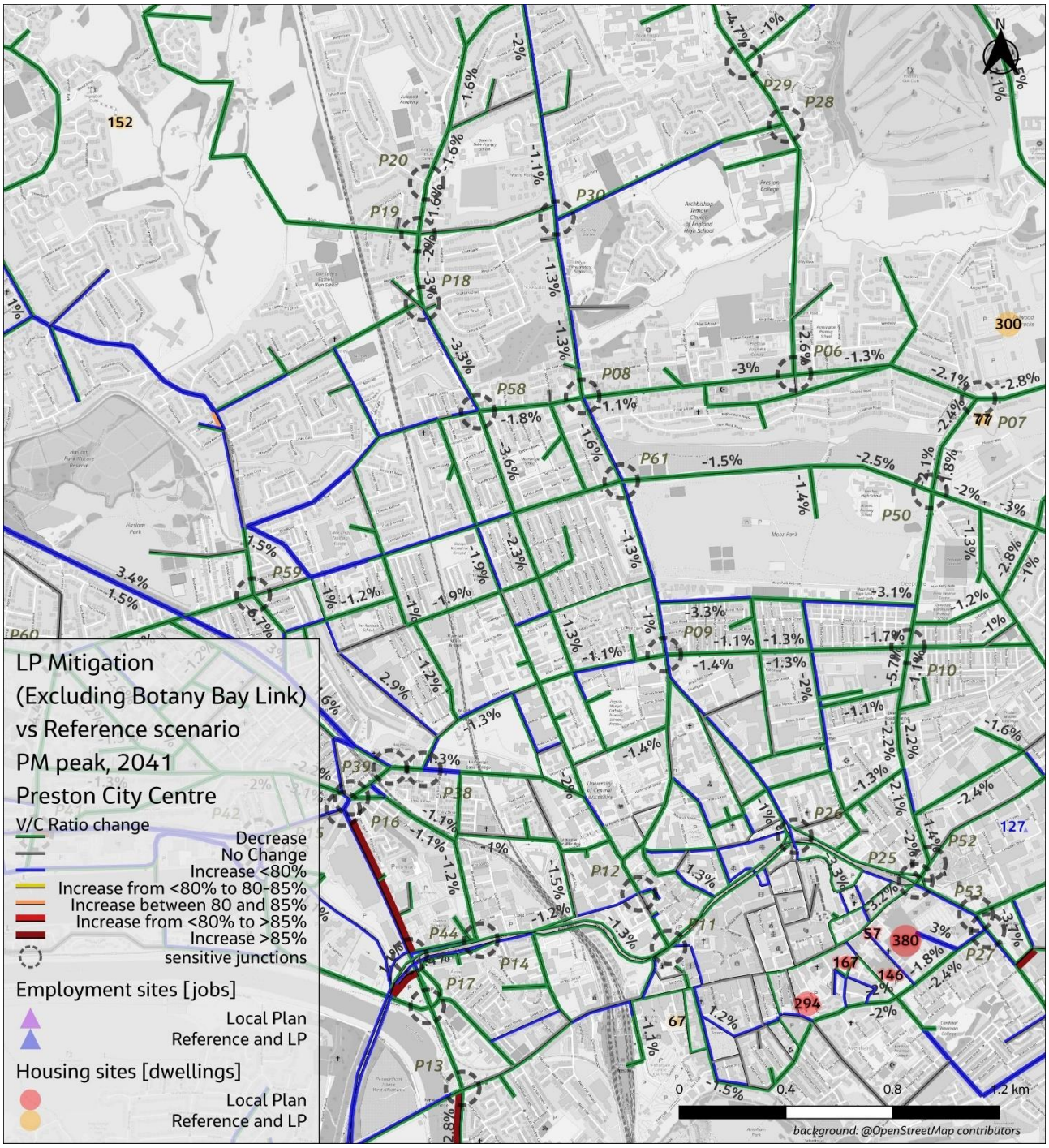


Figure 5-31 V/C Difference Plot – 2041 PM Local Plan with Sustainable Mitigation scenario (Low Uptake) Vs Reference Case – Preston City Centre

The average delay per vehicle (weighted across all arms) at the identified sensitive junctions during the AM and PM peaks is summarised in Table 5-3 and Table 5-4. Delay plots for all peaks and delay summary for IP peak is included in Appendix F.3. The delay changes indicate that, while there is an overall increase compared to the base scenario, delays relative to the Reference scenario do not show significant worsening for most of the junctions. And in some instances, with the implementation of sustainable mitigation measures, some junctions are projected to experience reduced delays.

The two junctions which are projected to experience an increase in delay of more than 5 seconds in the Local Plan scenario with sustainable mitigation are B5254 Strand Road / Fishergate Hill and B6242 Bluebell Way / M6 J31A. The increase at Strand Road is attributed to higher demand resulting from Local Plan allocation traffic in the Preston and South Ribble districts accessing Preston City Centre. At Bluebell Way / M6 J31A, increased traffic flows and congestion are anticipated, particularly at the eastern roundabout, which serves as a direct access point to a Local Plan employment allocation (EC3.2 Preston East Junction 31A M6).

Table 5-3. Average seconds delay/vehicle (weighted across all arms), AM Peak, Preston

Junction ID	Junction	Base	Reference	Local Plan Mitigation (Low Uptake)	LP impact vs Reference	Change from Base
-	A59 Ring Way / Bow Lane	84	131	130	-1	46
P02	B6241 Eastway / Oliver's Place	19	23	23	0	4
P03	B6241 Eastway / Watling Street Rd	33	35	34	0	1
P04	B6241 Eastway / Andertons Way	27	31	31	0	4
P06	B6242 Watling Street Road / Sharoe Green Lane	53	57	57	-1	4
P07	B6241 Watling Street Road / Sir Tom Finneys Way	42	44	43	-1	1
P09	A6 Garstang Road / St. George's Rd	58	58	58	0	0
P10	A6063 Deepdale Rd/ St George's Road	62	65	66	1	3
P11	A59 Ring Way / Corporation Street	43	52	56	3	13
P12	A5071 Corporation Street / Marsh Lane	43	37	36	-1	-6
P13	B5254 Strand Rd / A59 Guild Way Junction North	42	37	37	0	-5
P13	B5254 Strand Rd / A59 Guild Way Junction South	24	16	16	0	-8
P13	B5254 Strand Rd / Fishergate Hill	133	137	146	9	13
P15	A583 Watery Lane / A5072 West Strand	28	28	28	0	1
P16	B6241/ Tulketh Brow	22	20	21	0	-1
P16	A583 Watery Lane / Tulketh Brow	25	31	33	2	7
P17	B5254 Strand Rd / Port Way	39	45	46	1	6
P21	A6 Garstang Rd / Sharoe Green Ln	52	57	58	0	5
P22	A5085 Blackpool Rd / B6243	68	75	77	2	9
P23	B6243 Ribbleton Lane / Skeffington Rd	38	37	37	0	-1
P24	B6243 Ribbleton Lane / Acregate Lane	29	30	30	0	0
P25	A59 Ring Way / Church Street / Ribbleton Lane	43	45	46	1	3
P26	A59 Ring Way / A6 North Road	73	72	72	0	-1
P27	A59 London Road / Queens Street	36	35	34	-1	-2
P28	Sharoe Green Lane / St. Vincents Road	9	10	10	0	0
P29	Sharoe Green Lane / Sherwood Way	12	15	13	-1	1
P30	A6 Garstang Rd / St Vincents Rd	5	6	6	0	1
P31	A6 / Parklands Drive	36	44	48	5	12
P32	A6 / Eastway	26	30	31	1	5
P34	B6241 Eastway / Mericourt Road	15	18	18	0	3
P36	A59 Broughton Bypass / Whittingham Lane	10	12	12	0	2

Junction ID	Junction	Base	Reference	Local Plan Mitigation (Low Uptake)	LP impact vs Reference	Change from Base
P38	A583 Fylde Rd / Aqueduct St.	75	86	85	-1	11
P39	B6241 / A583 Watery Ln	47	66	65	-1	18
P40	A582 PWD / B5468 Avice Pimblett Way	15	16	17	1	2
P42	A583 Riversway / Pedders Road	33	39	41	2	8
P42	A583 Riversway / Port Way	22	23	23	0	1
P45	B6241 Lightfoot Lane / Eastway	29	43	47	4	18
P47	B6242 Bluebell Way / Lancashire Way	31	37	33	-4	2
P48	B6242 Bluebell Way M6 J31a / Premier Inn Car Park	35	55	88	33	54
P50	A5085 Blackpool Rd / B6241	41	44	44	0	2
P51	A59 New Hall Lane / Skeffington Road	37	41	41	0	4
P53	A59 London Road / New Hall Lane	28	32	33	1	5
P54	B5467 William Young Way / B5411 Tabley Lane	26	30	32	2	6
P55	A5085 Blackpool Road / Lea Road	20	22	22	0	2
P57	A583 Blackpool Rd / A582 PWD	15	15	15	0	1
P59	Blackpool Road / Tulketh Brow	45	45	46	1	1
P60	A5085 / Pedders Lane / Cottam Lane	54	62	63	1	9
P61	A5085 Blackpool Rd / A6 Garstang Rd	48	50	49	0	1

Table 5-4. Average seconds delay/vehicle (weighted across all arms), PM Peak, Preston

Junction ID	Junction	Base	Reference	Local Plan Mitigation (Low Uptake)	LP impact vs Reference	Change from Base
-	A59 Ring Way / Bow Lane	87	110	109	-1	22
P02	B6241 Eastway / Oliver's Place	17	20	20	0	3
P03	B6241 Eastway / Watling Street Rd	32	31	32	1	0
P04	B6241 Eastway / Andertons Way	20	22	22	0	2
P06	B6242 Watling Street Road / Sharoe Green Lane	53	55	55	-1	2
P07	B6241 Watling Street Road / Sir Tom Finneys Way	51	55	54	-1	2
P09	A6 Garstang Road / St. George's Rd	56	58	58	-1	1
P10	A6063 Deepdale Rd/ St George's Road	68	73	71	-2	3
P11	A59 Ring Way / Corporation Street	54	70	68	-1	14
P12	A5071 Corporation Street / Marsh Lane	33	33	33	-1	-1
P13	B5254 Strand Rd / A59 Guild Way Junction North	58	61	61	0	4
P13	B5254 Strand Rd / A59 Guild Way Junction South	33	18	18	0	-15
P13	B5254 Strand Rd / Fishergate Hill	169	204	210	7	41
P15	A583 Watery Lane / A5072 West Strand	34	32	33	1	-1
P16	B6241/ Tulketh Brow	15	15	15	0	0

Junction ID	Junction	Base	Reference	Local Plan Mitigation (Low Uptake)	LP impact vs Reference	Change from Base
P16	A583 Watery Lane / Tulketh Brow	23	28	28	0	5
P17	B5254 Strand Rd / Port Way	55	62	62	0	6
P21	A6 Garstang Rd / Sharoe Green Ln	78	89	90	1	12
P22	A5085 Blackpool Rd / B6243	55	65	63	-2	9
P23	B6243 Ribbleton Lane / Skeffington Rd	44	52	43	-9	0
P24	B6243 Ribbleton Lane / Acregate Lane	38	42	40	-1	2
P25	A59 Ring Way / Church Street / Ribbleton Lane	44	45	45	0	1
P26	A59 Ring Way / A6 North Road	68	71	70	-2	1
P27	A59 London Road / Queens Street	28	30	30	0	2
P28	Sharoe Green Lane / St. Vincents Road	9	10	10	0	1
P29	Sharoe Green Lane / Sherwood Way	10	11	11	0	1
P30	A6 Garstang Rd / St Vincents Rd	4	6	6	0	2
P31	A6 / Parklands Drive	27	31	31	0	4
P32	A6 / Eastway	24	24	23	-1	-1
P34	B6241 Eastway / Mericourt Road	20	26	27	1	7
P36	A59 Broughton Bypass / Whittingham Lane	9	12	12	0	2
P38	A583 Fylde Rd / Aqueduct St.	60	60	60	0	0
P39	B6241 / A583 Watery Ln	39	51	50	-1	11
P40	A582 PWD / B5468 Avice Pimblett Way	10	11	12	1	2
P42	A583 Riversway / Pedders Road	80	86	81	-5	1
P42	A583 Riversway / Port Way	43	46	45	-1	2
P45	B6241 Lightfoot Lane / Eastway	26	39	41	1	15
P47	B6242 Bluebell Way / Lancashire Way	20	22	22	0	2
P48	B6242 Bluebell Way M6 J31a / Premier Inn Car Park	33	39	39	-1	6
P50	A5085 Blackpool Rd / B6241	48	51	51	0	2
P51	A59 New Hall Lane / Skeffington Road	24	26	26	0	2
P53	A59 London Road / New Hall Lane	30	39	38	-1	8
P54	B5467 William Young Way / B5411 Tabley Lane	26	26	27	1	1
P55	A5085 Blackpool Road / Lea Road	20	21	22	1	2
P57	A583 Blackpool Rd / A582 PWD	12	13	13	0	1
P59	Blackpool Road / Tulketh Brow	49	51	51	-1	2
P60	A5085 / Pedders Lane / Cottam Lane	66	63	62	-1	-4
P61	A5085 Blackpool Rd / A6 Garstang Rd	48	49	49	0	1

South Ribble

V/C difference plot between Reference and Local Plan with Sustainable Mitigation scenario for 2041 AM and PM peak for South Ribble district is shown in and. Flow difference plots for IP along with detailed zoomed-in plots for each district across all time periods are provided in the Appendix F

Regarding the V/C comparison, the following observations can be made:

- Overall, there are minor increases and decreases across the network, with most v/c remaining below 80%.
- The B5254 corridor will experience slight increases in traffic, pushing the v/c ratio to just above the 85% threshold.
- Bee Lane and Chain House Lane will also see modest increases, particularly at the B5254 and A582/Penwortham Way.
- The Croston Road is expected to experience small increases in traffic, resulting in the v/c ratio reaching just over the 85% threshold.

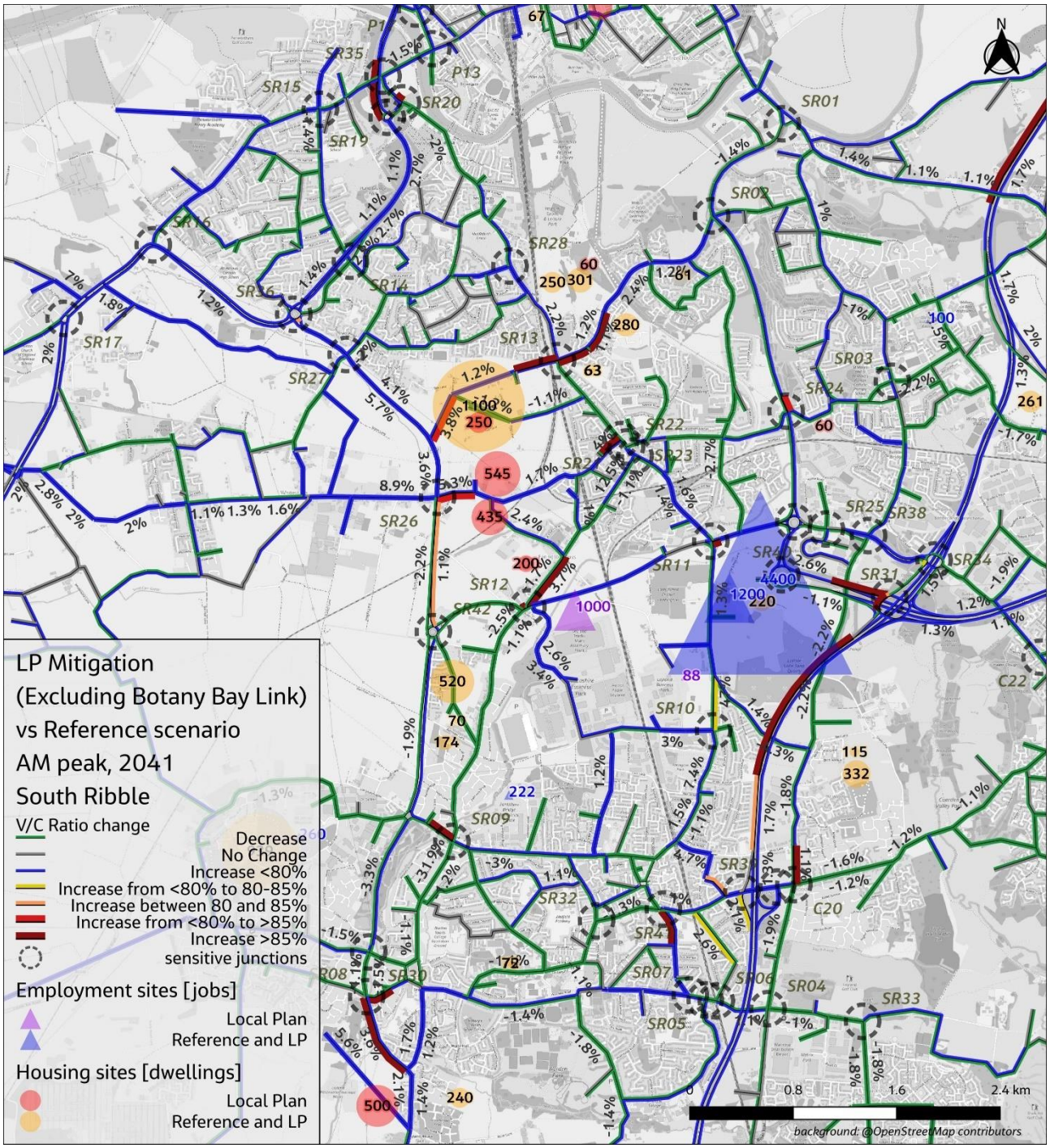


Figure 5-32 V/C Difference Plot – 2041 AM Local Plan with Sustainable Mitigation scenario (Low Uptake) Vs Reference Case – South Ribble

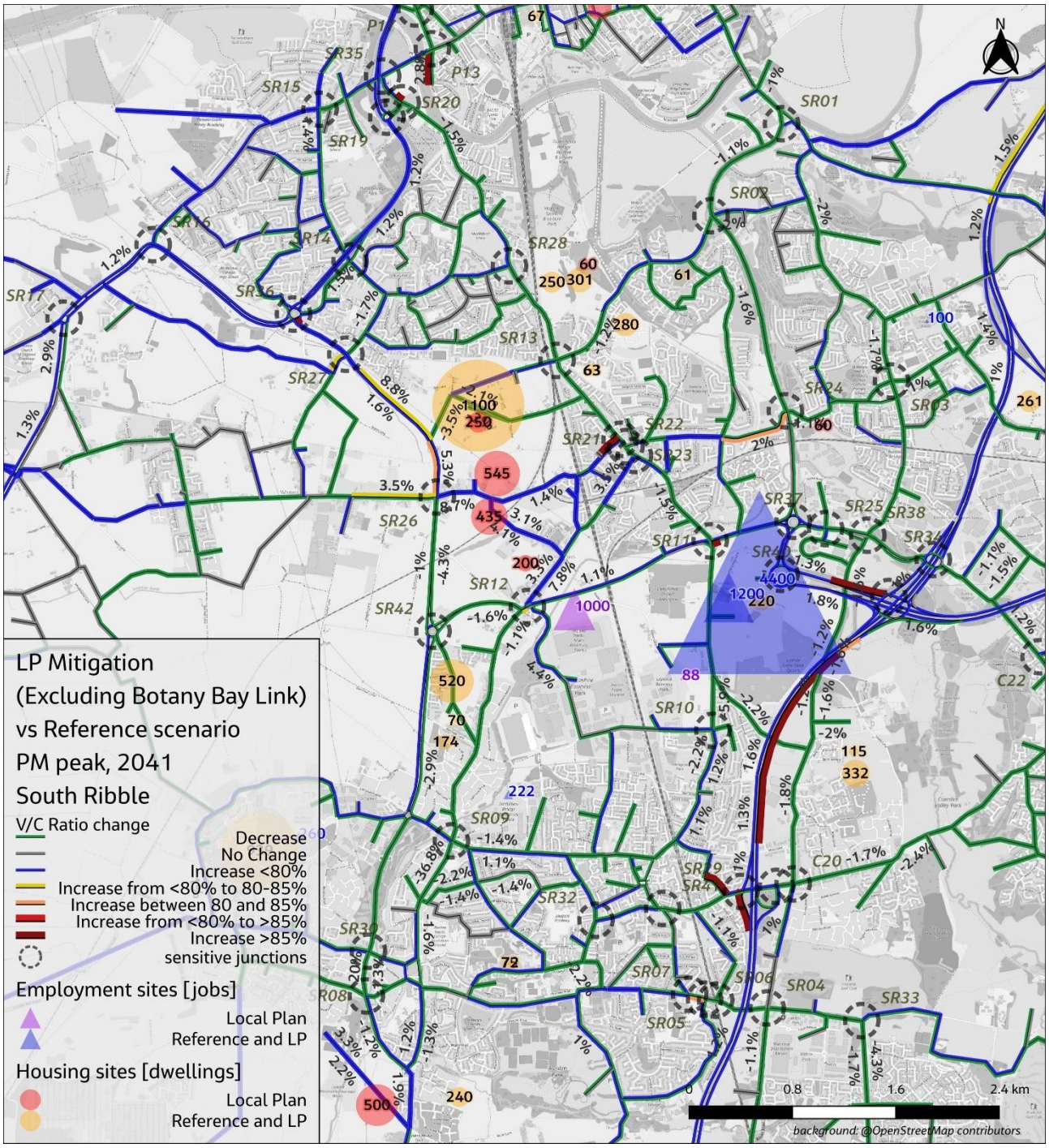


Figure 5-33 V/C Difference Plot – 2041 PM Local Plan with Sustainable Mitigation scenario (Low Uptake) Vs Reference Case – South Ribble

The average delay per vehicle (weighted across all arms) at the identified sensitive junctions during the AM and PM peaks is summarised in Table 5-5 and

Table 5-6. Delay plots for all peaks and delay summary for IP peak is included in Appendix F.3. The delay changes indicate that, while there is an overall increase compared to the base scenario, delays relative to the reference scenario do not show significant worsening for most of the junctions. In some instances, with the

implementation of sustainable mitigation measures, some junctions are projected to experience reduced delays.

Junctions which are projected to experience an increase in delay of more than 5 seconds in either peak in the Local Plan scenario with sustainable mitigation are Stanifield junction, Chain House Ln/A582, B5254 Leyland Road / Liverpool Road and B5253 / Slater Lane junction.

Table 5-5. Average seconds delay/vehicle (weighted across all arms), AM Peak, South Ribble

Junction ID	Junction	Base	Reference	Local Plan Mitigation (Low Uptake)	LP impact vs Reference	Change from Base
-	A582 Bee Lane	0	20	23	3	22
SR01	A6 London Way / Victoria Road (S)	25	28	27	0	2
SR01	A6 London Way / Victoria Road (N)	9	11	12	1	3
SR02	A6 / Carwood Rd Roundabout	40	63	63	0	23
SR04	A49 Wigan Road / B5248 Dawson Lane	30	33	34	1	3
SR06	B5248 Church Road / Bent Lane	12	13	13	0	1
SR08	B5253 / Slater Lane Signals	48	45	56	11	7
SR09	B5256 Longmeanygate/ Leyland Lane	43	67	64	-3	21
SR10	B5254 Stanifield Lane / Centurion Way	46	48	58	10	12
SR11	A582 Stanifield Lane	22	65	66	1	44
SR12	A582 Croston Junction	18	36	38	3	21
SR14	A59 Golden Way / Cop Lane Junction	78	60	61	1	-17
SR16	A59 John Horrocks Way / Liverpool Road	37	42	44	2	8
SR17	A59 Liverpool Road / Longton Bypass	10	11	12	0	1
SR19	A582 Golden Way / Guild Way	17	17	17	0	0
SR20	Golden Way / B5254 Leyland Road	7	48	48	0	41
SR21	B5254 Liverpool Road / Coote Lane	20	29	31	2	11
SR22	B5254 Liverpool Road / B5257 Brownedge Road	29	26	26	0	-3
SR23	B5254 Liverpool Road / Jubilee Road	27	12	13	1	-14
SR24	A6 / Brownedge Rd Roundabout	33	69	64	-4	31
SR25	A6 Lostock Lane / Cuerden Way	37	44	44	0	7
SR26	A582 Chain House Lane	43	44	50	6	7
SR27	A582 Pope Lane	50	44	45	1	-5
SR30	B5253 / Dunkirk Lane Roundabout	52	88	74	-14	21
SR32	B5254 King Street / Towngate	70	79	82	3	12
SR33	Central Ave / B5248 Dawson Ln	49	48	49	1	0
SR35	B5254 Leyland Road / Bee Lane	20	27	27	0	7
SR35	B5254 Leyland Road / Liverpool Road	33	29	30	1	-3
SR36	A582 Golden Way	15	15	15	0	0
SR37	A582 / A6 Roundabout	14	16	16	0	2
SR38	A6 / Wigan Rd Roundabout	47	45	45	0	-2
SR41	Turpin Green / Canberra Rd Rbt	11	16	17	2	6
SR42	A582 Flensburg Way	31	24	24	0	-7

Table 5-6. Average seconds delay/vehicle (weighted across all arms), PM Peak, South Ribble

Junction ID	Junction	Base	Reference	Local Plan Mitigation (Low Uptake)	LP impact vs Reference	Change from Base
-	A582 Bee Lane	0	23	24	1	24
SR01	A6 London Way / Victoria Road (S)	22	22	22	0	0
SR01	A6 London Way / Victoria Road (N)	6	7	7	0	1
SR02	A6 / Carwood Rd Roundabout	37	52	49	-3	12
SR04	A49 Wigan Road / B5248 Dawson Lane	29	30	30	0	1
SR06	B5248 Church Road / Bent Lane	15	17	18	0	2
SR08	B5253 / Slater Lane Signals	39	42	42	-1	3
SR09	B5256 Longmeanygate/ Leyland Lane	44	56	52	-5	8
SR10	B5254 Stanifield Lane / Centurion Way	50	51	51	0	1
SR11	A582 Stanifield Lane	22	72	74	2	51
SR12	A582 Croston Junction	18	31	33	1	14
SR14	A59 Golden Way / Cop Lane Junction	42	58	59	1	17
SR16	A59 John Horrocks Way / Liverpool Road	41	57	57	0	16
SR17	A59 Liverpool Road / Longton Bypass	7	7	8	0	1
SR19	A582 Golden Way / Guild Way	11	14	14	0	3
SR20	Golden Way / B5254 Leyland Road	6	110	113	3	107
SR21	B5254 Liverpool Road / Coote Lane	21	31	31	0	10
SR22	B5254 Liverpool Road / B5257 Brownedge Road	31	28	29	0	-3
SR23	B5254 Liverpool Road / Jubilee Road	53	13	14	1	-40
SR24	A6 / Brownedge Rd Roundabout	42	64	64	0	21
SR25	A6 Lostock Lane / Cuerden Way	175	70	59	-10	-116
SR26	A582 Chain House Lane	43	46	46	0	3
SR27	A582 Pope Lane	40	46	47	1	7
SR30	B5253 / Dunkirk Lane Roundabout	54	62	57	-5	3
SR32	B5254 King Street / Towngate	51	52	53	1	2
SR33	Central Ave / B5248 Dawson Ln	49	54	54	-1	5
SR35	B5254 Leyland Road / Bee Lane	34	30	28	-1	-6
SR35	B5254 Leyland Road / Liverpool Road	21	62	66	5	45
SR36	A582 Golden Way	11	13	14	0	3
SR37	A582 / A6 Roundabout	15	16	16	0	1
SR38	A6 / Wigan Rd Roundabout	46	52	52	0	5
SR41	Turpin Green / Canberra Rd Rbt	10	12	12	1	2
SR42	A582 Flensburg Way	25	19	18	-1	-7

5.7.4 Highway Network Performance

The highway traffic growth within the CLTM model, resulting from the inclusion of Local Plan allocations, leads to a projected increase in total vehicle kilometres travelled during both the AM and PM peak periods, approximately 3% in Preston and South Ribble, and 2% in Chorley. Although average speeds across all three districts remain largely unchanged between scenarios, these results suggest that the highway network in Central Lancashire is accommodating a higher volume of trips and experiencing modest increase in congestion.

The impact on the wider core model area is considered minimal, as land use changes between scenarios are concentrated solely within the Central Lancashire districts.

Table 5-7. Model Network Statistics by District 2041

Network Statistics by district		AM		IP		PM	
		Reference	Local Plan Mitigation	Reference	Local Plan Mitigation	Reference	Local Plan Mitigation
Total vehicle kilometres	Chorley	485,716	491,445	397,166	401,280	485,632	490,334
	Preston	473,981	481,208	406,147	410,870	461,063	467,861
	South Ribble	318,201	322,756	245,729	249,346	306,064	309,795
Total vehicle hours	Chorley	8,156	8,251	5,986	6,045	7,986	8,066
	Preston	9,751	9,932	7,424	7,490	9,418	9,541
	South Ribble	7,088	7,222	4,683	4,761	6,714	6,791
Average speed	Chorley	41.01	40.96	42.52	42.51	41.27	41.23
	Preston	30.94	30.87	31.77	31.74	31.10	31.04
	South Ribble	36.34	36.25	37.83	37.79	36.65	36.61

5.7.5 Public Transport Model outputs

This section presents a comparison of bus and rail passenger flows across the three districts to assess projected increases in public transport (PT) demand in the Local Plan with Sustainable Mitigation scenario. The rise in PT demand in the Local Plan with Sustainable Mitigation scenario is driven by both the proposed enhancements to public transport services and the additional demand generated by Local Plan developments. While the VDM results in a slight increase in bus usage, it also reflects a reduction in rail demand due to anticipated fare increases in future years.

Bus passenger flow comparisons for the Local Plan with Sustainable Mitigation scenario (Low Uptake) with Reference scenario for AM and PM for 2041 is provided in Figure 5-34 through Figure 5-39. An increase in bus flows is observed across all three districts as a result of the Local Plan allocations.

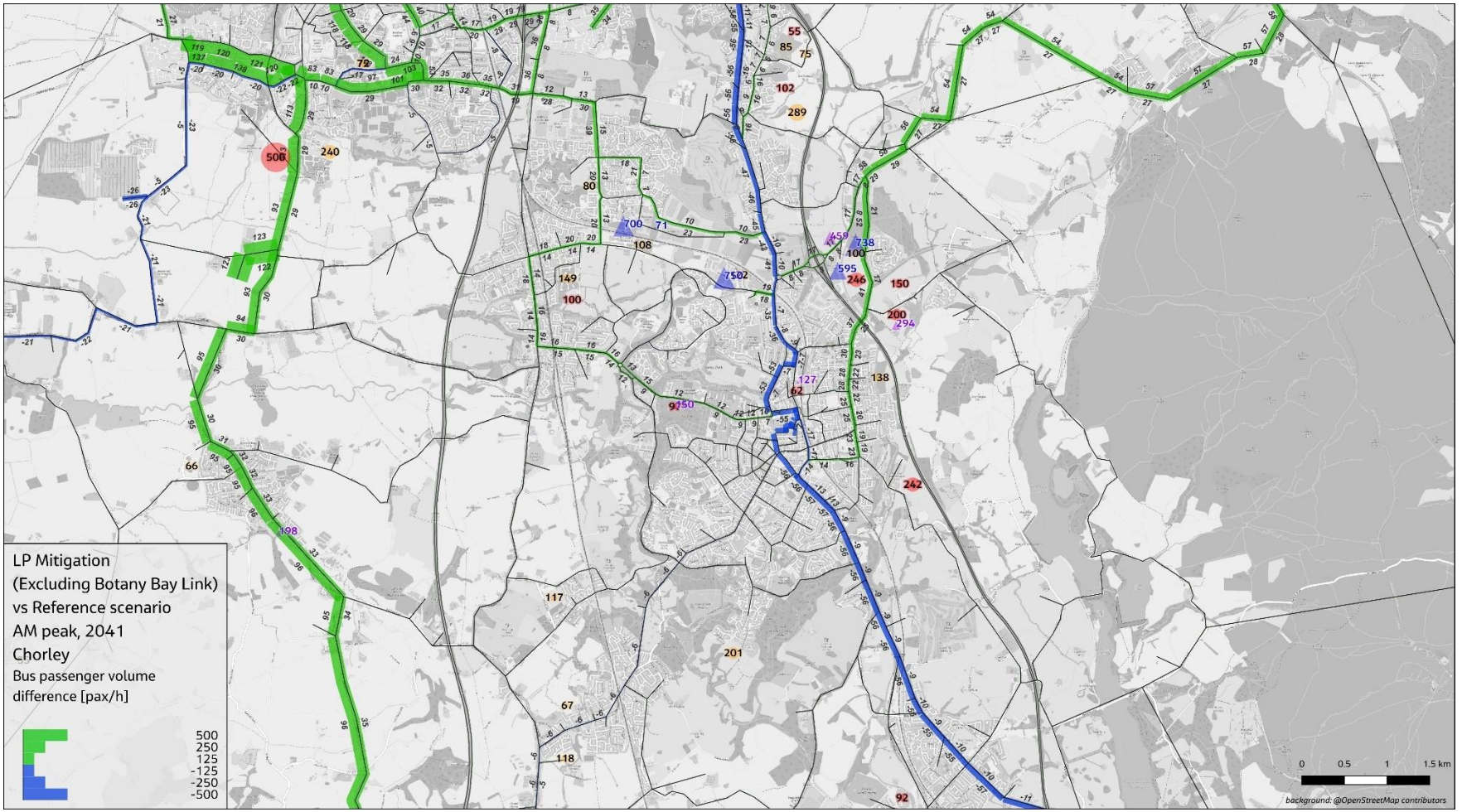


Figure 5-34 Bus Passenger Flow Comparisons – 2041 AM Local Plan with Sustainable Mitigation scenario (Low Uptake) with Reference – Chorley

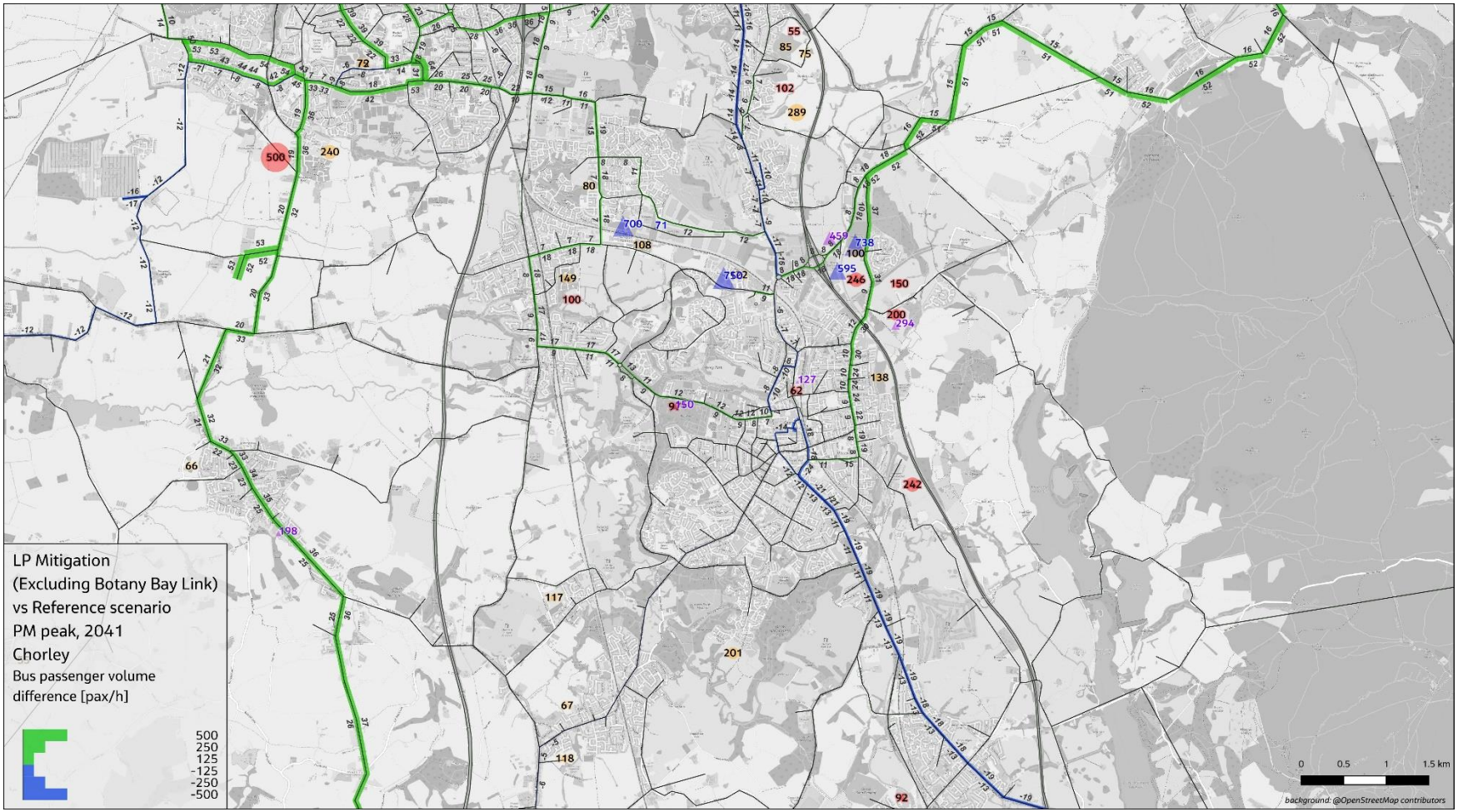


Figure 5-35 Bus Passenger Flow Comparisons – 2041 PM Local Plan with Sustainable Mitigation scenario (Low Uptake) with Reference – Chorley

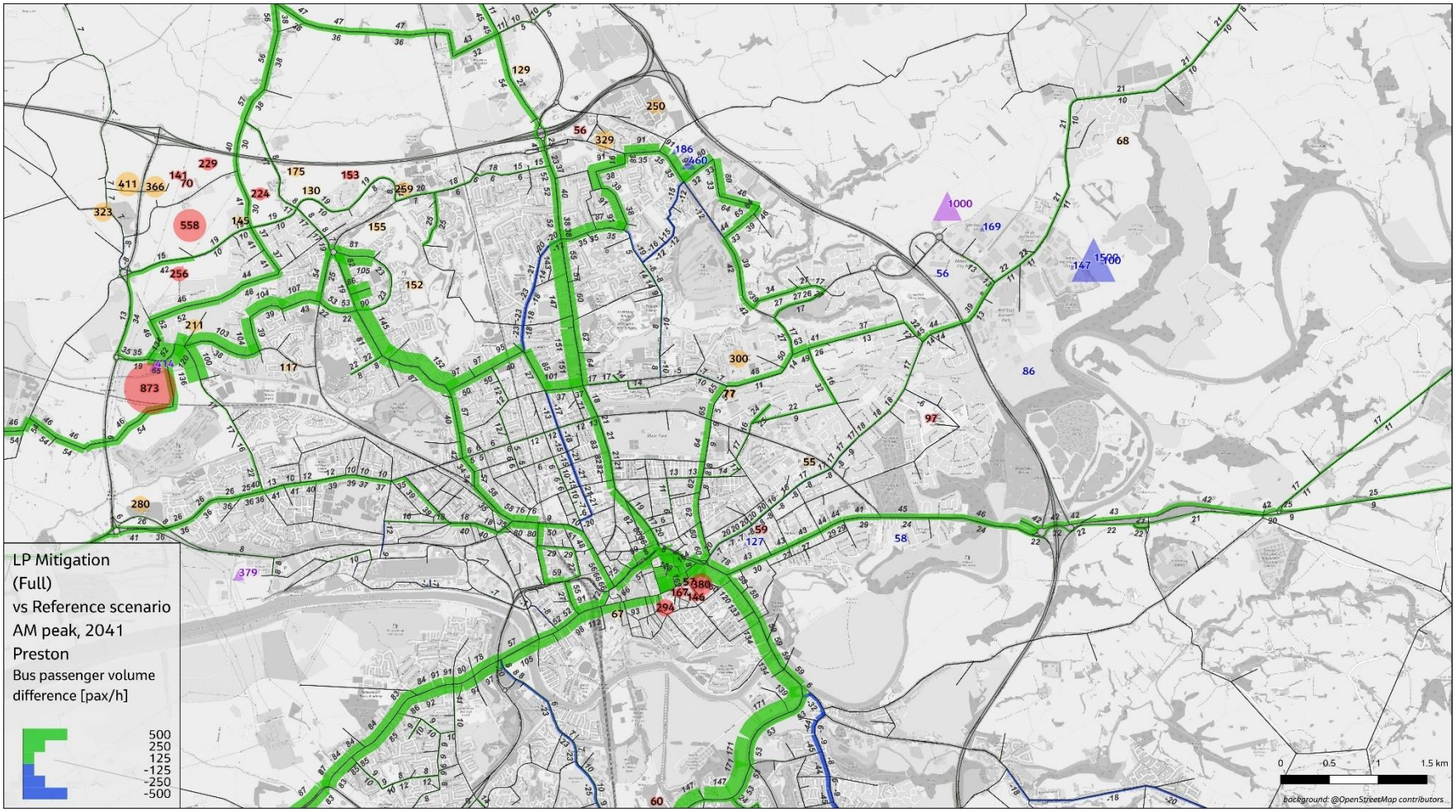


Figure 5-36 Bus Passenger Flow Comparisons – 2041 AM Local Plan with Sustainable Mitigation scenario (Low Uptake) with Reference – Preston

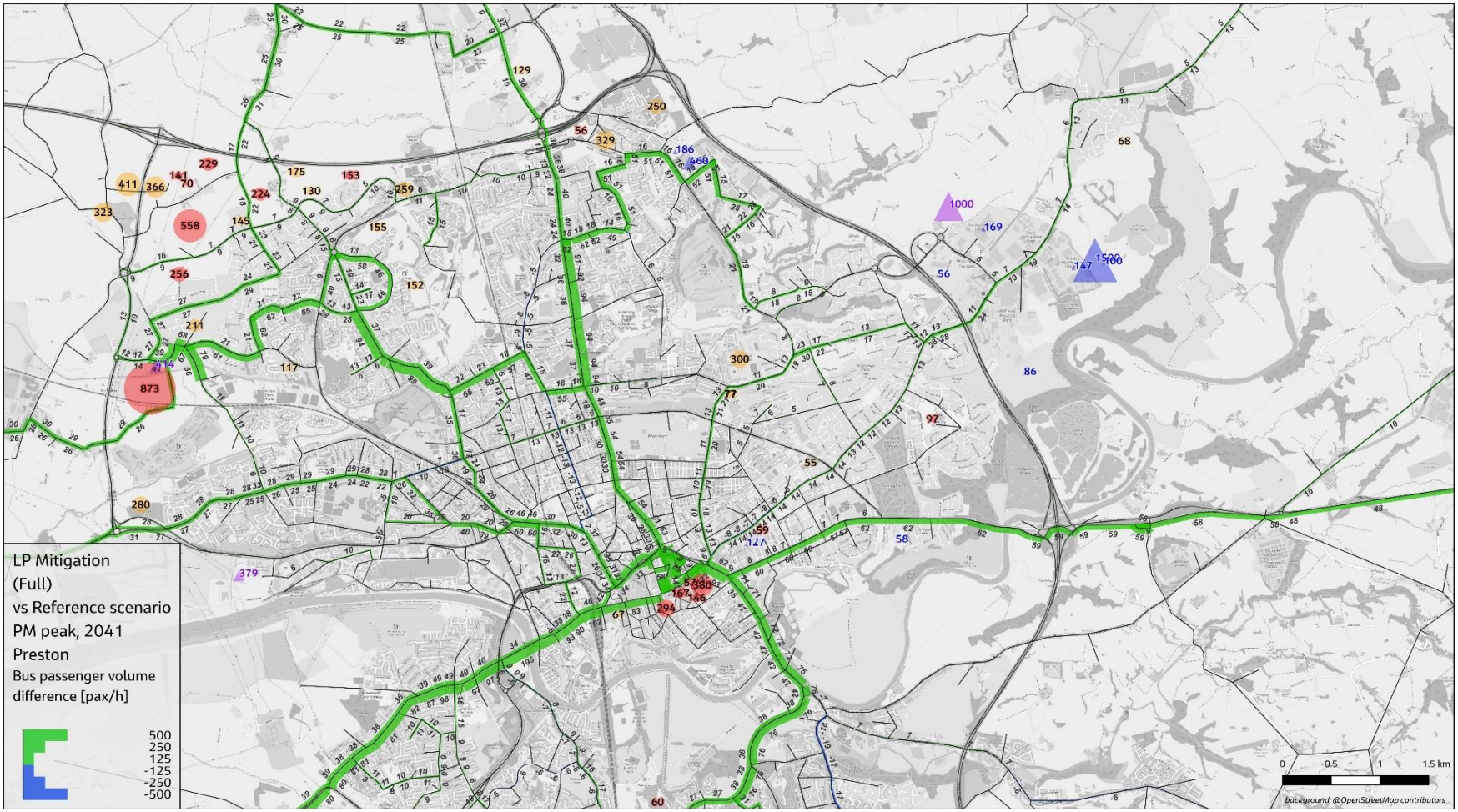


Figure 5-37 Bus Passenger Flow Comparisons – 2041 PM Local Plan with Sustainable Mitigation scenario (Low Uptake) with Reference – Preston

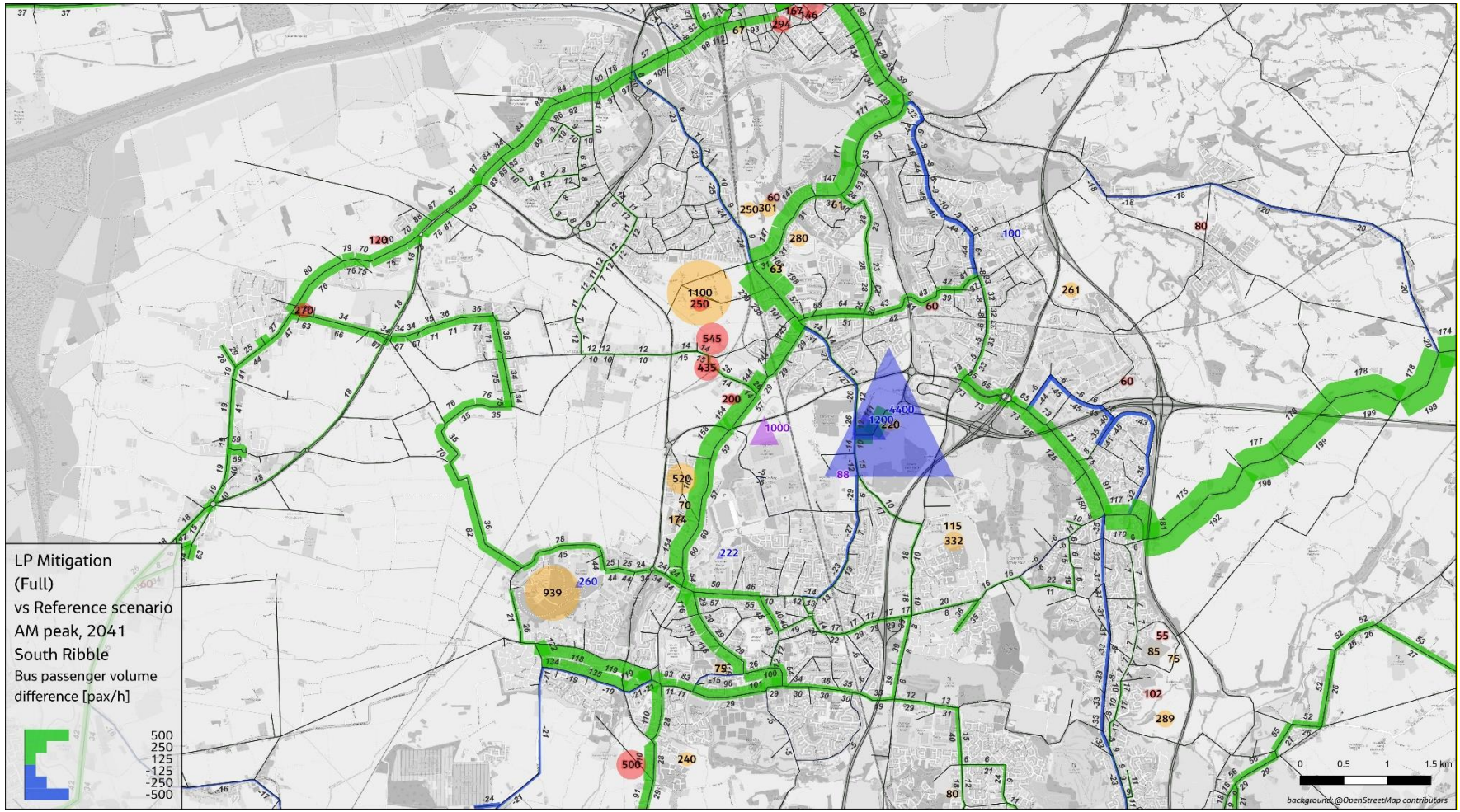


Figure 5-38 Bus Passenger Flow Comparisons – 2041 AM Local Plan with Sustainable Mitigation scenario (Low Uptake) with Reference – South Ribble

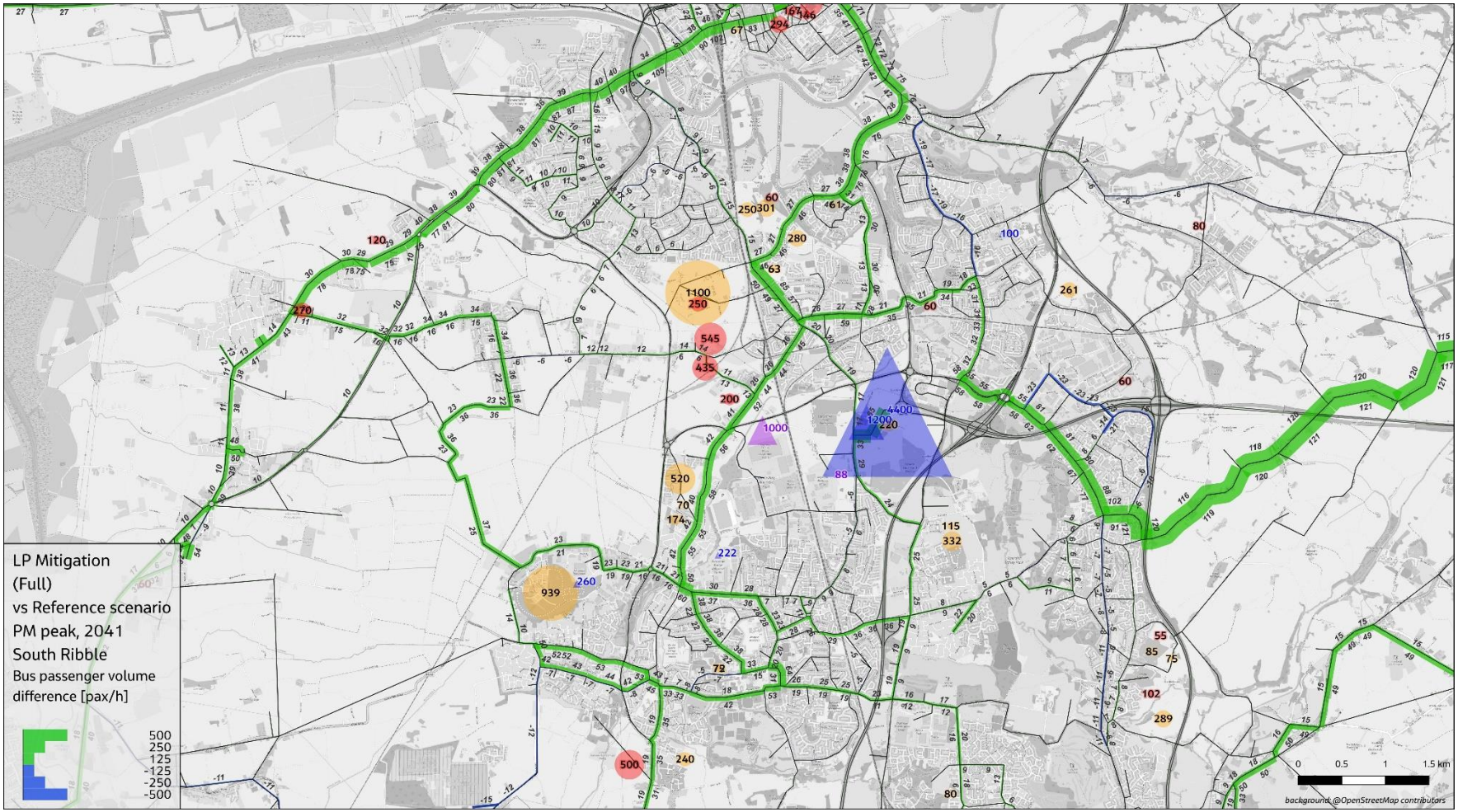


Figure 5-39 Bus Passenger Flow Comparisons – 2041 PM Local Plan with Sustainable Mitigation scenario (Low Uptake) with Reference – South Ribble

Figure 5-40 and Figure 5-41 present rail passenger flow comparisons between the Reference scenario and the Local Plan with Sustainable Mitigation scenario for the 2041 AM and PM peak. The results show a modest decline in rail usage in the Local Plan scenario, primarily due to a shift of shorter inter-district trips to bus and active travel modes. This represents an expected outcome given the planned enhancements to bus and active travel infrastructure. However, a slight increase in rail demand is observed at the proposed new Midge all station.

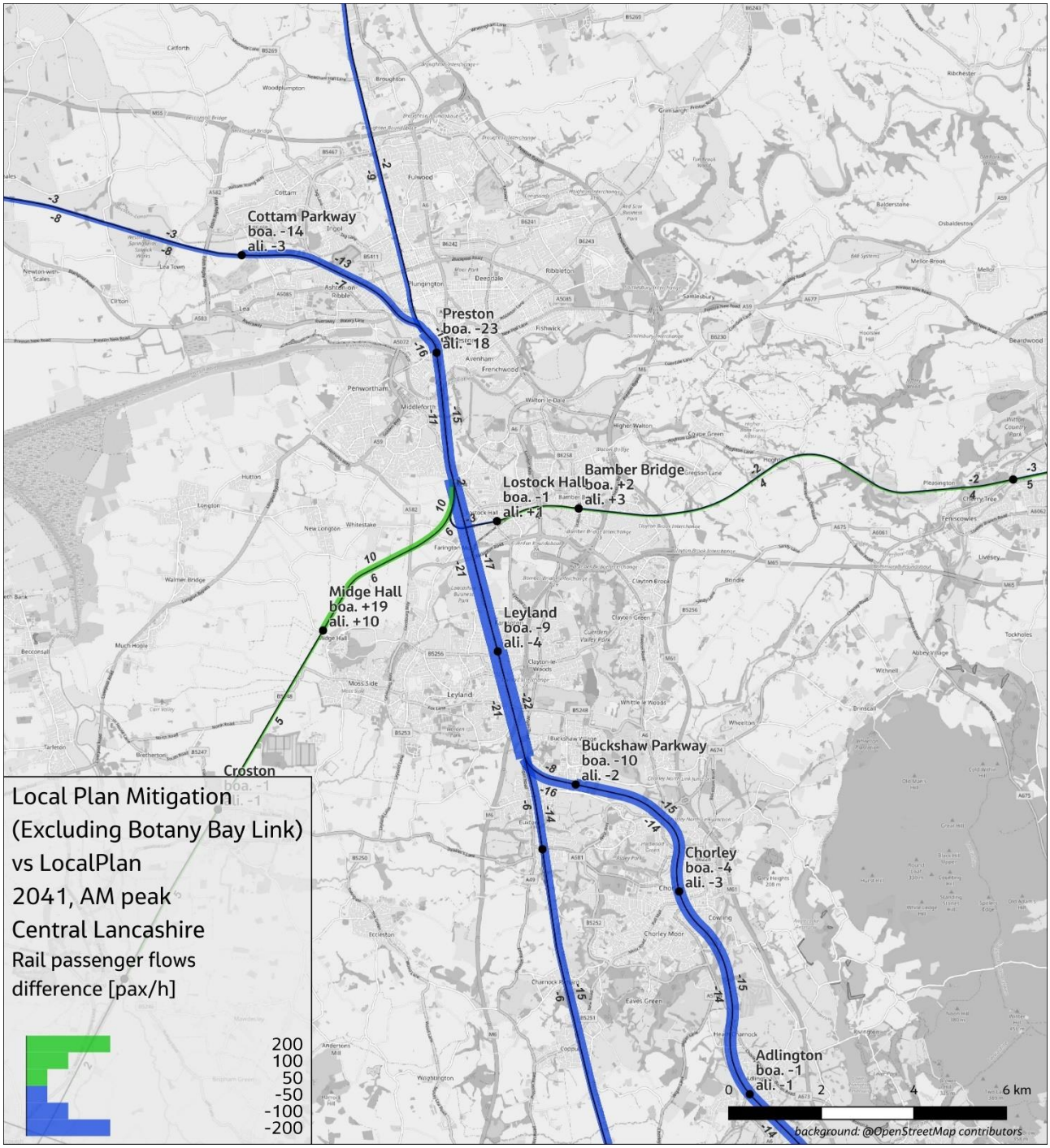


Figure 5-40 Rail Passenger Flow Comparisons – 2041 AM Local Plan with Sustainable Mitigation scenario (Low Uptake) with Reference – Central Lancashire

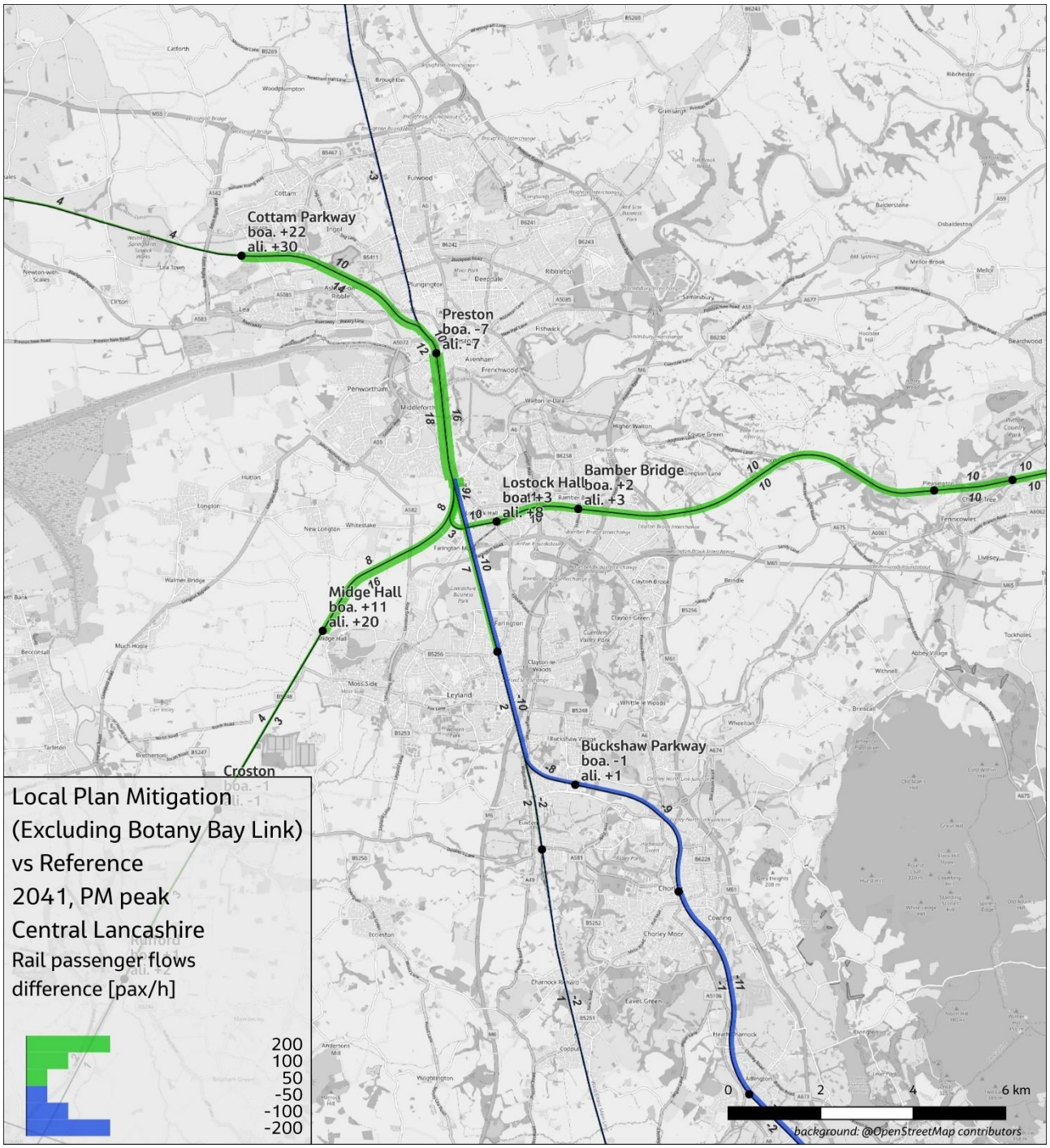


Figure 5-41 Rail Passenger Flow Comparisons – 2041 PM Local Plan with Sustainable Mitigation scenario (Low Uptake) with Reference – Central Lancashire

5.8 Assessment of Strategic Road Network

This section compares predicted congestion levels between the future year Reference scenario and the Local Plan with Sustainable Mitigation scenario, focusing on key locations along the SRN and major junctions within the Central Lancashire area.

To identify areas likely to experience significant congestion due to proposed Local Plan developments, the modelling outputs were assessed in terms of changes in traffic flow, volume-to-capacity ratios, and delays. Additional assessments, including Design Manual for Road and Bridges (DMRB) merge/diverge analysis and flow/theoretical capacity evaluations using histograms are also conducted.

The modelling highlights several SRN locations that are already operating well over capacity in the Reference Case, largely due to increased long-distance background traffic growth. In earlier stages, a comparison between the Base Year, Reference, and Local Plan without mitigation scenarios was undertaken to determine whether high V/C values were pre-existing or significantly worsened in the forecast year due to increased traffic volumes.

This analysis has been supplemented with local knowledge to validate and interpret the model outputs more accurately.

Appendix F.1.4 presents zoomed-in traffic flow difference plots for each individual SRN junction. Appendix F.2.4 contains zoomed in V/C difference plots for the individual SRN junctions. Appendix H includes histogram plots illustrating traffic flow variability across the SRN. Appendix I provides the detailed merge/diverge analysis for the relevant SRN segments.

M55

M6 J32 Broughton Interchange and M55 J1

Flow Difference plot between Reference and Local Plan with Sustainable Mitigation scenario for M55 study area corridor for 2041 AM and PM peak is shown in Figure 5-42 and Figure 5-43 Flow difference plots for IP along with detailed zoomed-in plots for each district across all time periods, are provided in the Appendix F.

There are no significant Local Plan developments in the immediate vicinity of these SRN junctions. The only nearby development is a residential scheme comprising 50 dwellings, which is not anticipated to have a material impact on M55 J1. The projected traffic increases at M55 J1 under the Local Plan with Sustainable Mitigation scenario are primarily attributed to housing developments in northwest Preston, which access M55 J1 via Eastway, and to other areas of Preston accessing it via the A6. In both the AM and PM peaks, traffic volumes remain below 50 PCUs. The sustainable mitigation measures have notably reduced traffic volumes on the A6 and at the J1 itself. Overall, the Local Plan traffic is expected to have minimal impact on either M6 J32 or M55 J1.

To further assess motorway capacity under projected traffic flows, a histogram analysis was conducted using NH TRIS traffic count data. This analysis helps illustrate the variability in traffic volumes. A sample histogram is presented in Figure 5-44 and Figure 5-45, with additional histograms for other motorway sections provided in Appendix H. The results show that AM modelled peak flows exceed current maximum levels but remain well within theoretical capacity, while PM modelled peak flows stay within the range of typical daily variation.

Figure 5-42 Flow Difference Plot – 2041 AM Local Plan with Sustainable Mitigation scenario (Low Uptake) Vs Reference Case – M55

Figure 5-43 Flow Difference Plot – 2041 AM Local Plan with Sustainable Mitigation scenario Vs Reference Case – M55

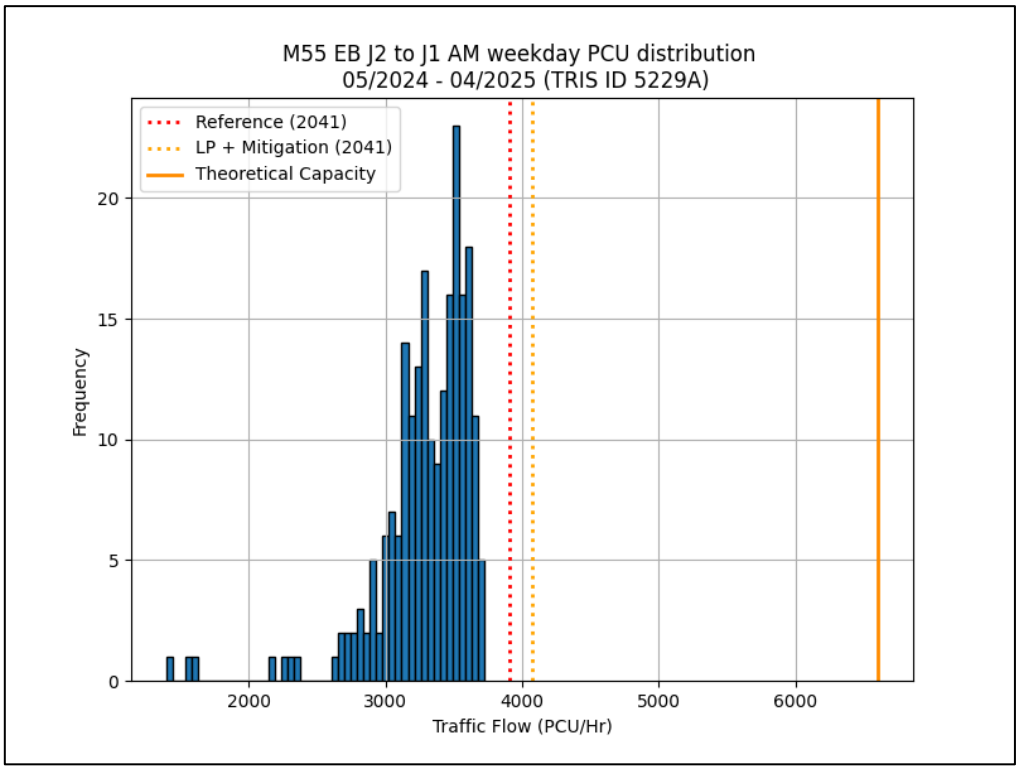


Figure 5-44 Traffic Flow Histogram – M55 J2 – J1 AM Peak

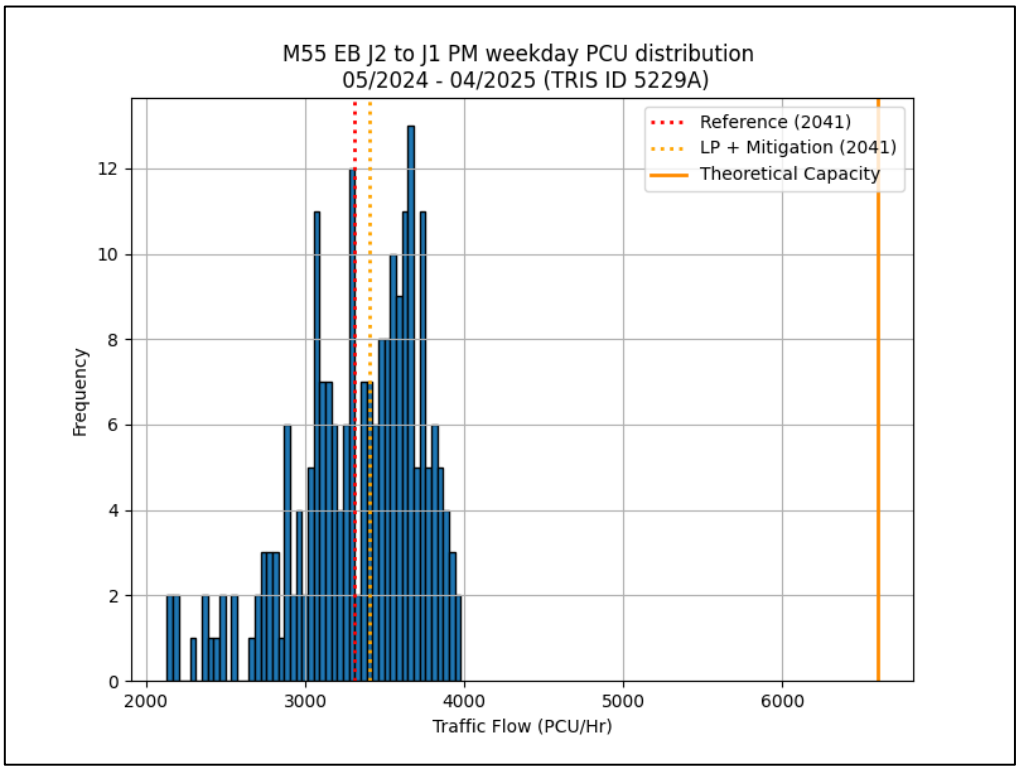


Figure 5-45 Traffic Flow Histogram – M55 J2 – J1 PM Peak

Additionally, a merge/diverge assessment was undertaken for the M6 and M55 interchange using DMRB methodology. The analysis identified an existing issue with excessive weaving, primarily due to the short

distance between the eastbound merge at M55 J1 and the diverge for M6 J32. However, traffic flows remain well within the indicated capacity. The Local Plan allocations contribute only a minor increase in traffic, the majority of which remains on the mainline and continues southbound on the M6. As such, the additional traffic is unlikely to exacerbate the existing weaving issue.

The merge/diverge assessment of M6 J32 reveals that the current upstream configuration is a three-lane Type E layout (lane gain with ghost island offside merge). Although the Local Plan traffic does not materially alter the design requirements, the Reference Case flows (which include background growth and committed developments) would be more suitably accommodated by a two-lane upstream Type F layout (two-lane gain). Downstream capacity is sufficient to accommodate the forecast traffic volumes.

M55 J2

The new interchange serves as the primary access point to the SRN for Local Plan allocations in northwest Preston. The increase in traffic volumes as a result of these allocations will result in the northbound overpass and the Edith Rigby Way approach both reaching between 80% and 85% of their capacity. While this may not result in material delay at the junction, as the junction was completed in 2023, detailed assessment of its as-built operation has not yet been undertaken, and the practical capacity may not be as high as predicted. As such, it may be necessary to widen the northbound overpass and northern roundabout to two lanes, which the structure has adequate width to accommodate.

Histogram analysis of traffic flows, based on NH TRIS count data, indicates that future AM peak flows exceed current maximum levels but remain well within theoretical capacity. PM peak flows, meanwhile, fall within the range of typical daily variability.

Merge/Diverge analysis at J2 indicates that the desirable layout of the westbound off-slip and eastbound on-slip is a 1-lane drop/1-lane gain respectively with 2 lanes on the mainline through the junction, however the junction has been built to an auxiliary lane diverge/merge with 3 lanes on the mainline. This is not likely to represent a significant issue, as the existing mainline is over the required design standard, and mainline flows are relatively modest and so conflict with the higher volumes of merging/diverging traffic will not be severe.

M6

Flow Difference plot between Reference and Local Plan with Sustainable Mitigation scenario for M6 study area corridor for 2041 AM and PM peak is shown in Figure 5-46 through Figure 5-51. Flow difference plots for IP along with detailed zoomed-in plots for each district across all time periods, are provided in the Appendix F.

M6 J28 – Leyland

There are no major Local Plan allocations adjacent to this SRN junction. A slight increase in trips exiting J28 towards Leyland Business Park is observed, with traffic flows remaining below 50 PCUs in all peak periods. However, the junction currently experiences queuing delays at the signalised junction, which can extend back to the slip road and potentially impact the northbound mainline.

Under the Local Plan with Sustainable Mitigation scenario, delays are expected to slightly increase on the northbound off-slip during both AM and PM peaks. To address this, improvements are recommended, including enhanced signage, revised lane designations, and coordination of traffic signals to improve discharge flow from the motorway.

M6 J29 – Bamber Bridge Interchange

There are no new Local Plan allocations in the immediate area. However, modest traffic flow increases are noted in both AM and PM peaks, primarily due to cumulative traffic from key housing developments such as Pickerings Farm and Farington.

Sustainable mitigation measures result in delay reductions at the junction terminus. It is also noted that improvements at M6 J29 are included as part of the A582 South Ribble Western Distributor (SRWD) scheme, which is incorporated into the future network scenarios as a committed scheme. Further improvements may include enhanced signage, revised lane markings, and signal updates including coordination to improve roundabout throughput.

M6 J31 – Samlesbury Interchange

No new Local Plan allocations are located in the immediate vicinity of this junction. Modest traffic increases are observed on the roundabout, with some reductions on certain arms due to sustainable mitigation. Overall, a slight increase in V/C is noted, but the junction is expected to continue operating within acceptable limits.

Histogram analysis for M6 J31–J30 southbound and J30–J31 northbound shows that AM peak flows under the Local Plan with sustainable mitigation exceed current maximums (primarily due to committed development), while PM peak increases remain modest and within current variability. Although Local Plan allocations do not materially impact the SRN, Reference Case flows will place additional pressure on the network.

M6 J31a

Traffic increases are observed on the eastern side of the roundabout due to a Local Plan employment allocation (approx. 1,000 jobs) with direct access to the junction. Sustainable mitigation, combined with VDM and assignment routing, results in a net reduction in traffic on this already congested corridor compared to the no-mitigation scenario.

Merge/diverge analysis indicates potential issues during the PM peak, primarily due to background growth and committed development. However, Local Plan allocations are not a significant contributing factor.

M6 J30

This junction is expected to experience traffic increases on both the M6 and M61, particularly on the M61 in the AM Peak in the southbound and in the northbound in the PM peak. These increases are likely to raise V/C, especially at the northbound merge onto the M6. Nonetheless, the junction is expected to continue operating within acceptable capacity thresholds.

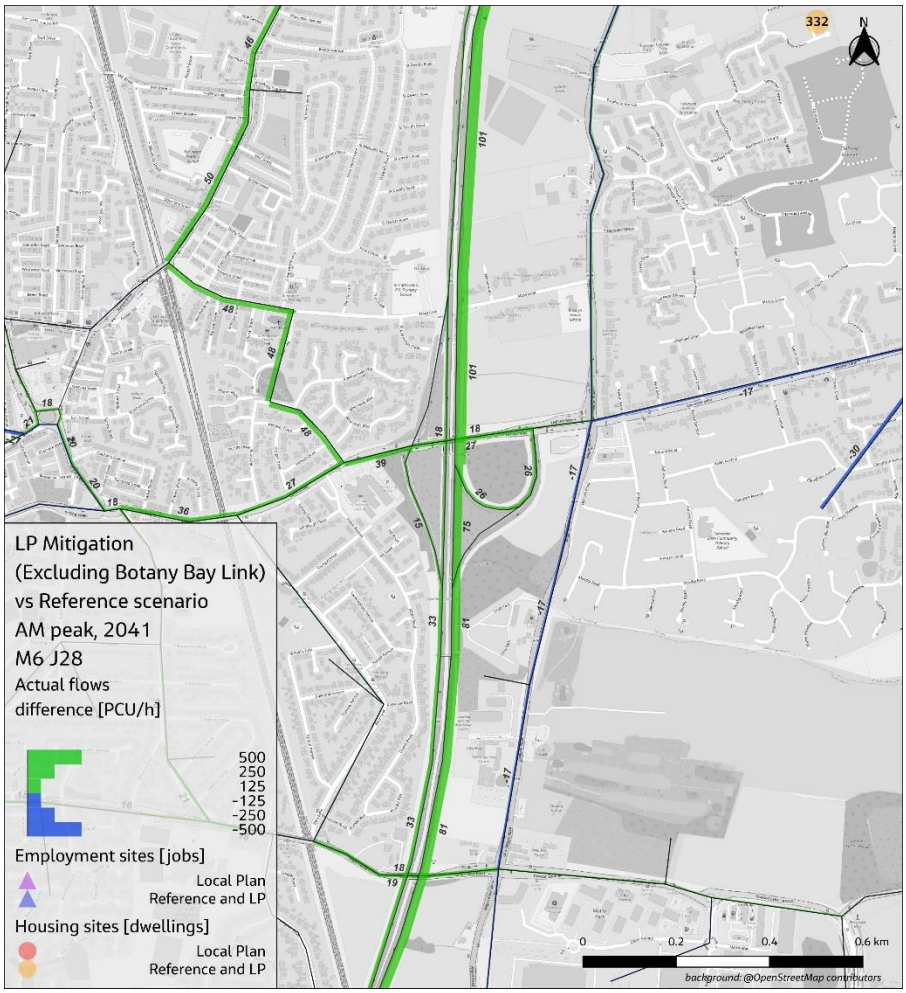


Figure 5-46 Flow Difference Plot – 2041 AM Local Plan with Sustainable Mitigation scenario Vs Reference Case – M6 J28

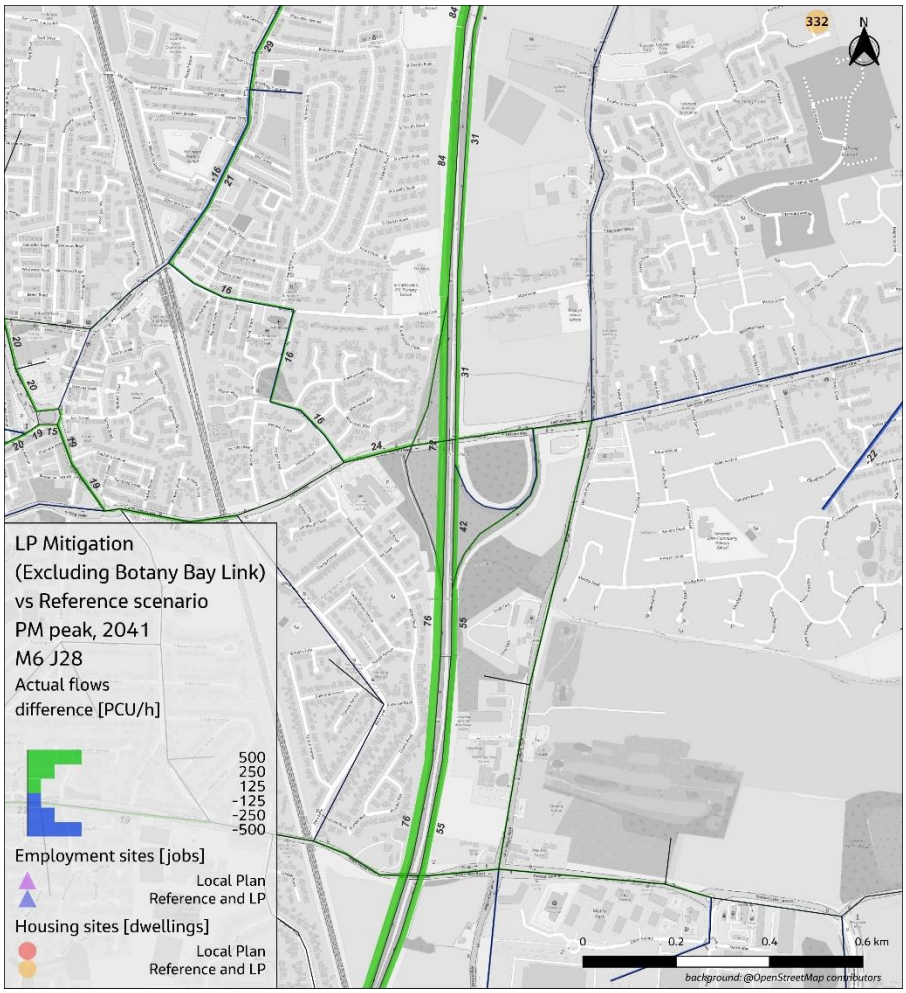


Figure 5-47 Flow Difference Plot – 2041 PM Local Plan with Sustainable Mitigation scenario Vs Reference Case – M6 J28

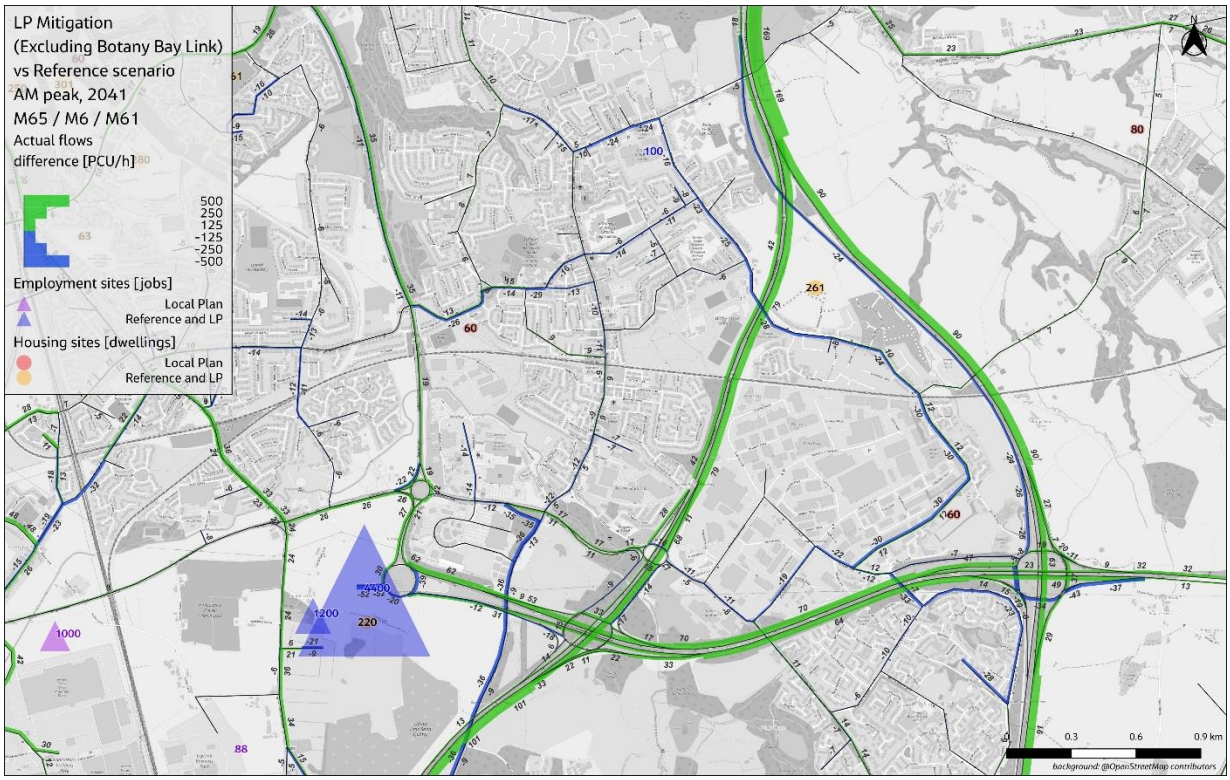


Figure 5-48 Flow Difference Plot – 2041 AM Local Plan with Sustainable Mitigation scenario Vs Reference Case – M6 J29/M6 J30/M61 J2

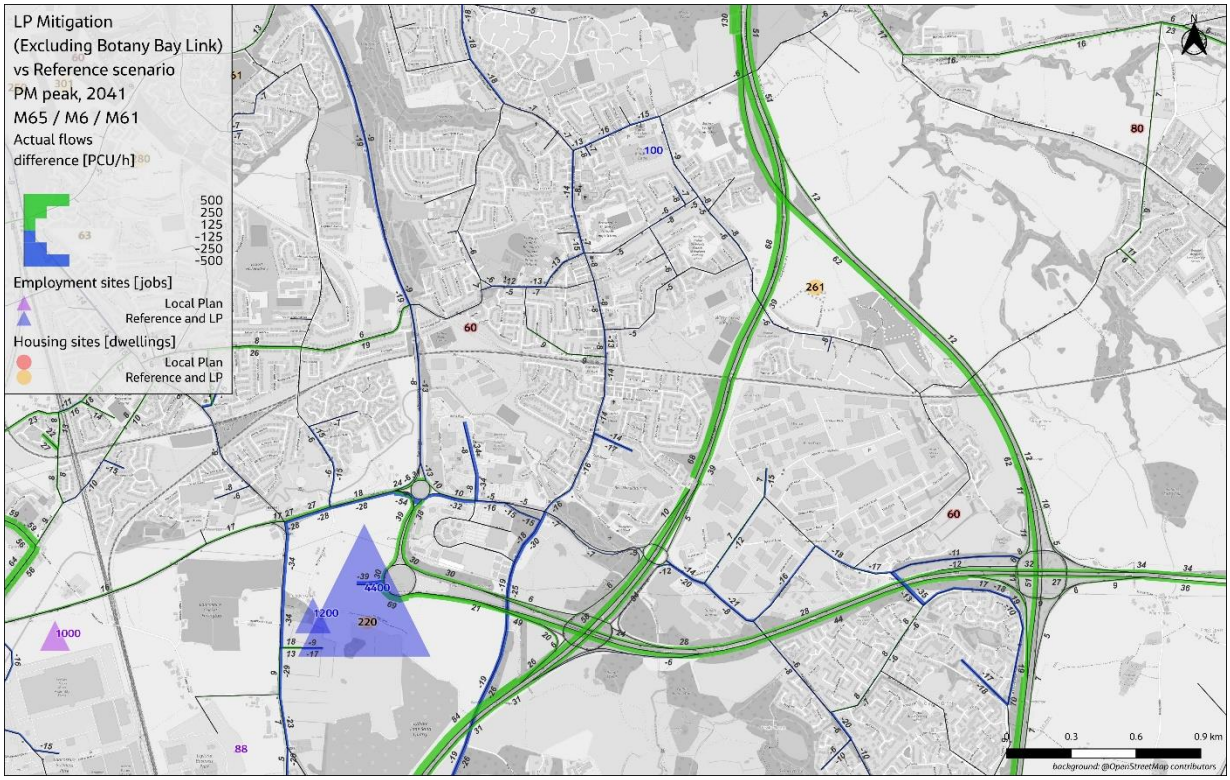


Figure 5-49 Flow Difference Plot – 2041 PM Local Plan with Sustainable Mitigation scenario Vs Reference Case – M6 J29/M6 J30/M61 J9

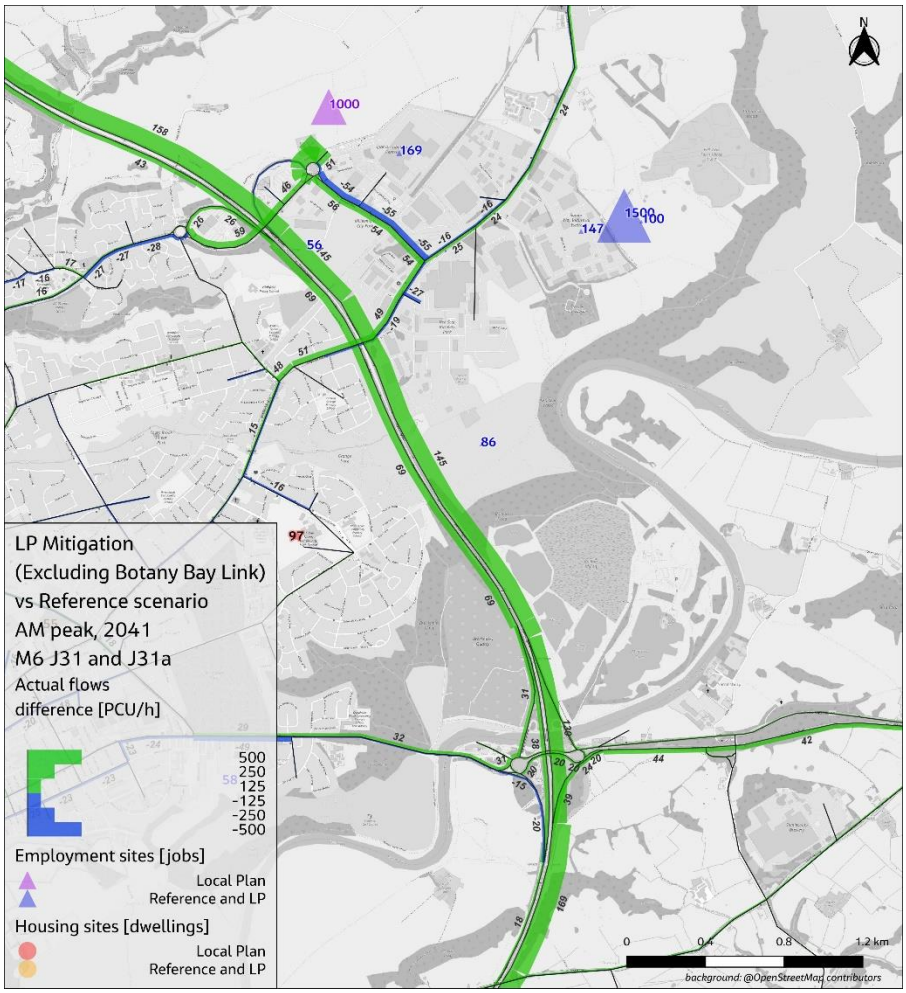


Figure 5-50 Flow Difference Plot – 2041 AM Local Plan with Sustainable Mitigation scenario Vs Reference Case – M6 J31/M6 J31A

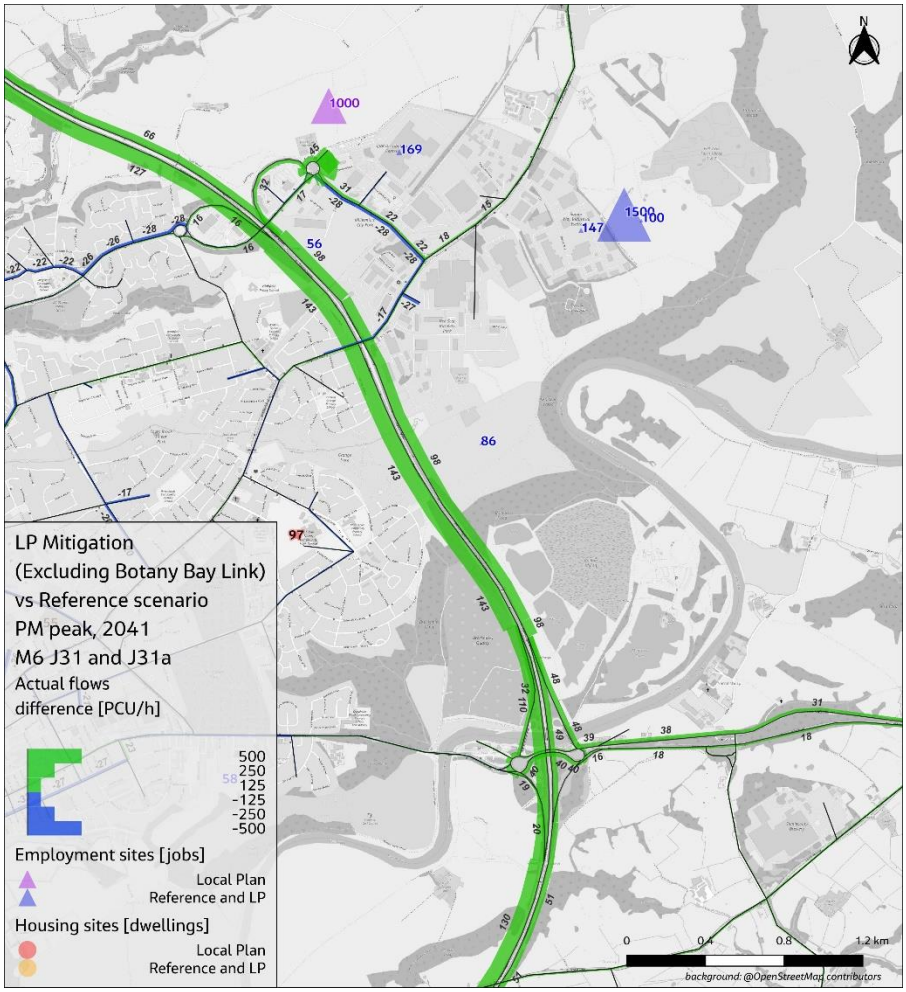


Figure 5-51 Flow Difference Plot – 2041 PM Local Plan with Sustainable Mitigation scenario Vs Reference Case – M6 J31/M6 J31A

M61

M61/M65 J9

No new Local Plan allocations are located nearby. Modest traffic increases are observed on the mainline and junction approaches, with some reductions on specific arms due to sustainable mitigation measures.

Traffic flow histogram undertaken for each direction indicate that in both the northbound and southbound direction, there is little or no impact from the Local Plan allocations in the AM peak with slight increases in the PM peak. In both peaks, the traffic is well within the theoretical capacity and at upper end of the present distribution.

Merge diverge analysis indicate minimal impact from Local Plan allocations, but the NB diverge may experience issues due to committed development/background growth in the Reference scenario.

M61 J8

Flow Difference plot between Reference and Local Plan with Sustainable Mitigation scenario for the M61 study area corridor for 2041 AM and PM peak is shown in Figure 5-52 and Figure 5-53.

This junction is already heavily congested in the existing scenario, with queues from Hartwood Roundabout backing up onto the M61 during peak periods. New Local Plan allocations east of the junction will add traffic to the eastern arm of the A674 and the slip roads.

With sustainable mitigation in place, no significant increase in traffic is expected at Hartwood Roundabout. Development traffic is likely to reroute via Blackburn Brow/Botany Brow to access Chorley. While improvements are proposed for Hartwood Roundabout as part of the Botany Bay development, these are not included in the future year model due to the absence of confirmed final designs.

The merge diverge analysis indicated no material impact from the Local Plan allocations with the sustainable mitigation measures included. All merges and mainline is expected to operate within capacity.

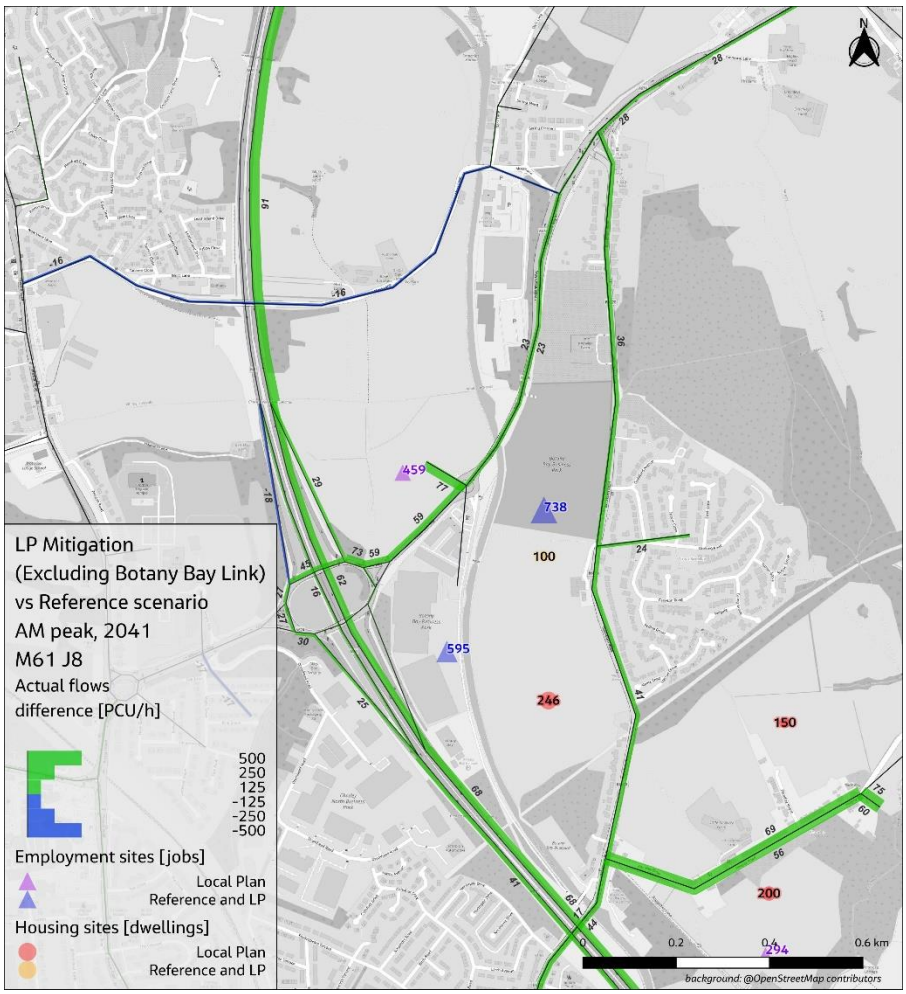


Figure 5-52 Flow Difference Plot – 2041 AM Local Plan with Sustainable Mitigation scenario Vs Reference Case – M61 J8

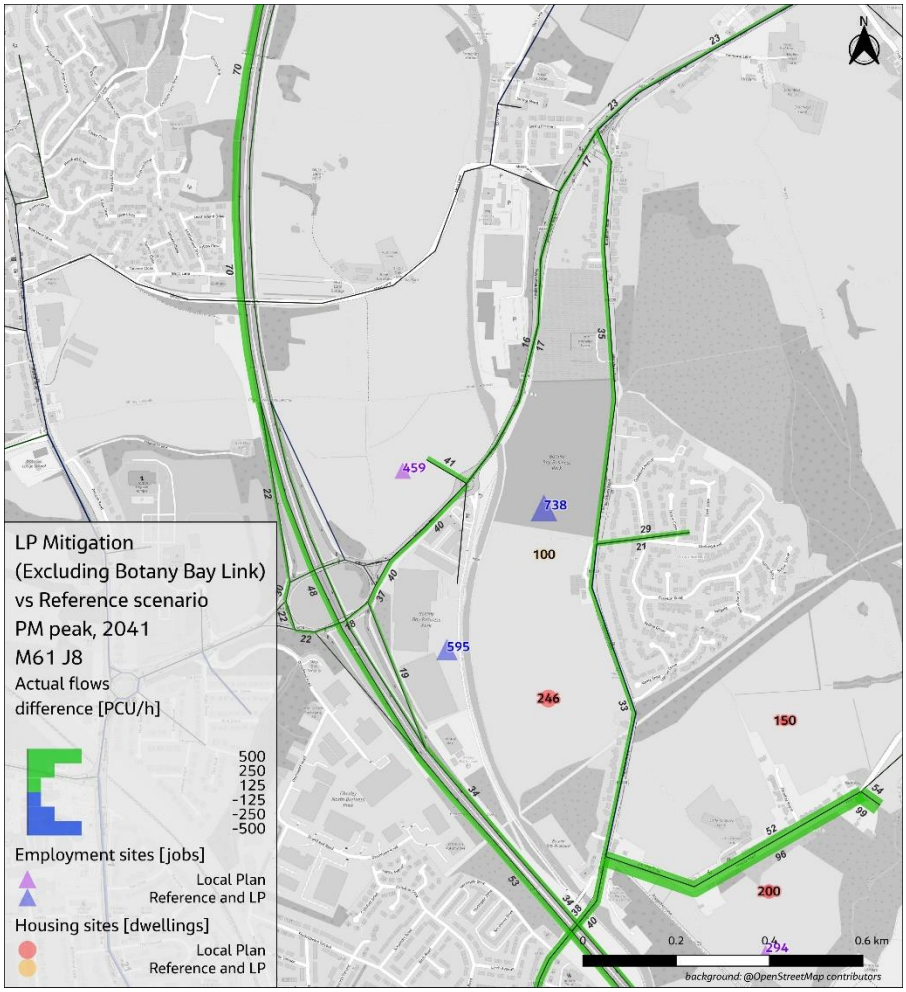


Figure 5-53 Flow Difference Plot – 2041 PM Local Plan with Sustainable Mitigation scenario Vs Reference Case – M61 J8

6. Safety Assessment

6.1 Identifying safety-sensitive areas

To determine safety impacts from the Local Plan, historic accident records (DfT Road Safety Data, also known as STATS19) across the three Central Lancashire districts have been analysed to identify sensitive areas with concentrations of historic accidents. These "hotspots" were identified based on the density of historic accidents, weighted by their severity and the number of casualties involved. The weightings used are the same as those used to assess the safety considerations of individual sites in the Stage 0 assessment. While Stage 0 analysis assessed individual sites based on their proximity to clusters of historic accidents to identify the potential for trips from specific sites to adversely affect road safety, this analysis assesses the cumulative impact of all allocations in the Local Plan together with mitigation measures.

32 Hotspot locations have been identified, shown in Figure 6-1 below and Table 6-1.

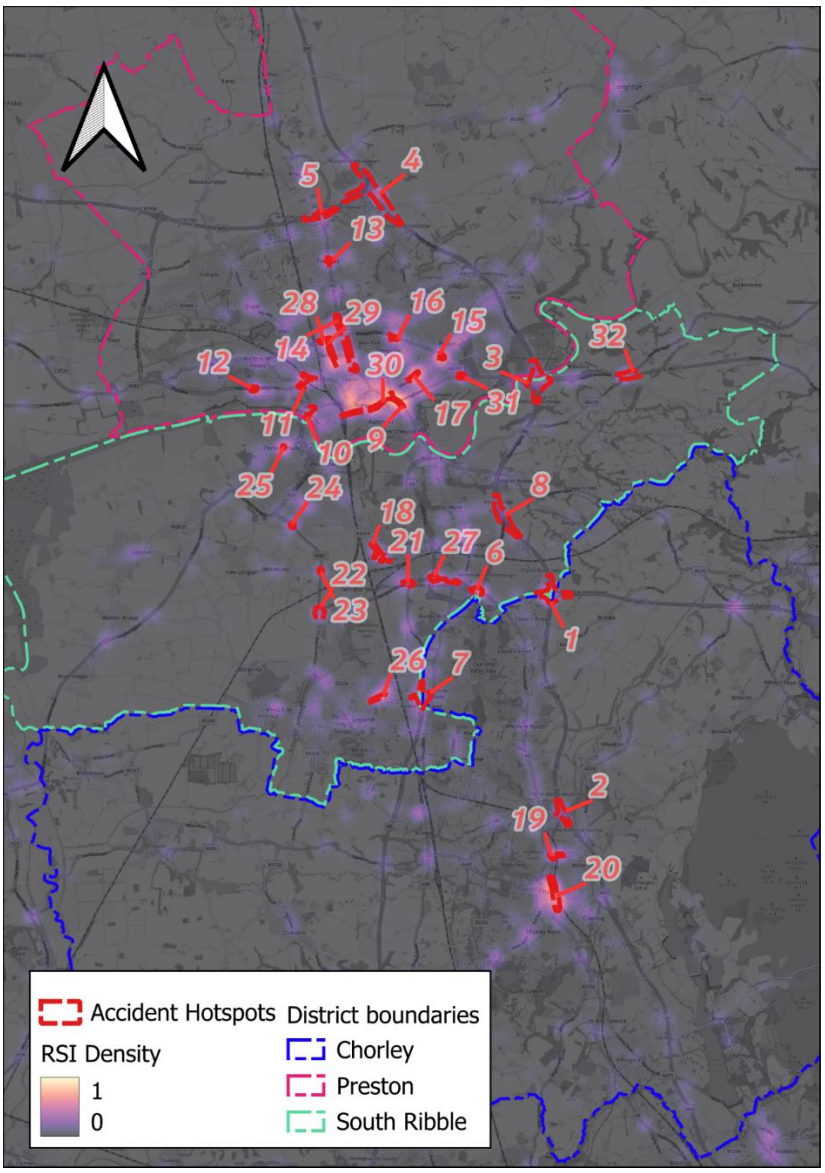


Figure 6-1: Hotspot locations

Table 6-1: Accident Hotspot Locations

Hotspot	Name	Road	On SRN	All Casualties	Of which Fatal	Of which Serious	Pedestrian and Cycle casualties	Of which Fatal/Serious
1	Clayton Brook Interchange	M61/M65	Yes	101	0	8	0	0
2	M61 J8	M61	Yes	29	1	2	2	0
3	M6 J31 Samlesbury Interchange	M6	Yes	90	1	4	1	0
4	M6 J32 Broughton Interchange	M6/M55	Yes	74	0	18	0	0
5	M55 J1 Broughton Roundabout	M55	Yes	41	0	3	0	0
6	M6 J29 Bamber Bridge Interchange	M6	Yes	33	0	7	1	1
7	M6 J28 Leyland Interchange	M6	Yes	54	2	11	1	0
8	M6 J60 / M61 Blacow Bridge	M6 / M61	Yes	47	1	6	1	1
9	Ringway East Church St to Queen St	A59 Ringway	No	56	0	16	15	9
10	Guildway / Strand Rd	A59 Guildway / Strand Rd	No	32	0	5	3	0
11	Strand Rd / Watery Ln / Fylde Rd	Water Lane	No	43	0	9	9	3
12	Riversway / Pedders lane	A583 Riversway	No	18	1	3	4	2
13	A6 Garstang Rd / Sharoe Green Lane	A6 Garstang Rd	No	18	0	5	5	3
14	A6 Watling Street Road to North Road	A6 Garstang Road	No	108	0	17	20	9
15	Blackpool Road / Ribbleton Avenue	A5085 Blackpool Road	No	33	0	4	5	2
16	Blackpool Road / Sir Tom Finney Way	A5085 Blackpool Road	No	30	0	3	4	0
17	B6243 Ribbleton Lane	B6243 Ribbleton Lane	No	34	0	7	21	6
18	Lostock Hall	B5254 Leyland Rd	No	30	2	5	14	4

Hotspot	Name	Road	On SRN	All Casualties	Of which Fatal	Of which Serious	Pedestrian and Cycle casualties	Of which Fatal/Serious
19	A6 Preston Street / Harpers Lane	A6 Preston Street	No	18	0	6	9	5
20	A6 Central Chorley	A6	No	75	1	17	21	11
21	A582 / Stanifield Lane	A582	No	18	0	2	0	0
22	A582 Tank Roundabout	A582	No	25	0	4	0	0
23	A582 / Chain House Lane	A582	No	18	0	2	0	0
24	A582 / Pope Lane	A582	No	19	0	2	7	2
25	Liverpool Rd / Cop Lane	Liverpool Rd	No	20	0	5	9	4
26	Hough Lane Leyland	Hough Lane	No	14	0	5	8	5
27	A6 Lostock Lane / A582	A6 Lostock Lane	No	48	0	6	4	1
28	Blackpool Road / Plungington Road	A5085 Blackpool Road	No	43	0	4	8	1
29	Plunington Road	Plunington Road	No	42	0	7	15	6
30	Church St Preston	Church Street	No	57	0	13	38	10
31	A59 New Hall Lane / Blackpool Road	A59 New Hall Lane	No	23	0	2	3	1
32	A59 Preston New Rd Samlesbury	A59 Preston New Rd	No	31	1	3	2	1

6.2 Assessing Impacts on Road Safety

There are a number of risk factors which affect the likelihood of road safety incidents and casualties occurring. Some of these are situational such as traffic speeds and conflicts, some are environmental such as weather conditions and lighting, some are systematic such as risk factors created by road layout and design, signage and operation, and others are coincidental causations such as medical incidents. The frequency with which accidents occur is related to all these risk factors and the frequency with which road users are exposed to these risks. Generally, for any given risk factor, the greater the level of traffic the greater the likelihood that an incident will occur. In addition, worsening traffic conditions such as congestion and queuing can itself create additional risk factors that would not otherwise be present.

Aside from the immediate vicinity of site accesses where development will result in changes to road layout, the impact of the Local Plan on road safety will be limited to the impact caused by the additional trips made on the road network, and whether these result in new contributory factors arising from the potential of increased traffic flows and associated congestion to give rise to novel traffic / driver behaviours . To assess these impacts, two assessments were conducted;

1. The change in Annual Average Daily Traffic (AADT) at each hotspot was calculated and these AADT changes compared to the location of accident records within the hotspot, noting any patterns in the specific locations of accidents and their severities. The potential impact from these AADT changes was assessed qualitatively

2. Th changes in peak hour flows at merges and diverges of the SRN were assessed against the desired mainline and merging/diverging flows for different merge/diverge layouts as identified in *DMRB CD 122: Geometric design of Grade Separated Junctions*. This assessment determined whether peak hour flows would fall outside the designed flows for existing merge/diverge layouts and whether the additional traffic generated by Local Plan sites in particular would result in a change in the desired layout to ensure safe operation.

These assessments were made comparing the Scenario 1 – Reference Case to Scenario 3 – Local Plan with Sustainable Mitigation to assess the residual impacts from the Local Plan allocations accounting for any reduction in traffic associated with the introduction of sustainable transport measures.

6.2.1 Accident hotspot analysis results

The change in AADT at each hotspot has been determined and compared with individual accident records within the hotspot. Changes have been compared in both absolute vehicles and as a percentage of the reference flow. An example of this analysis is shown in Figure 6-2 below, with the analysis for all hotspots contained in Appendix J.

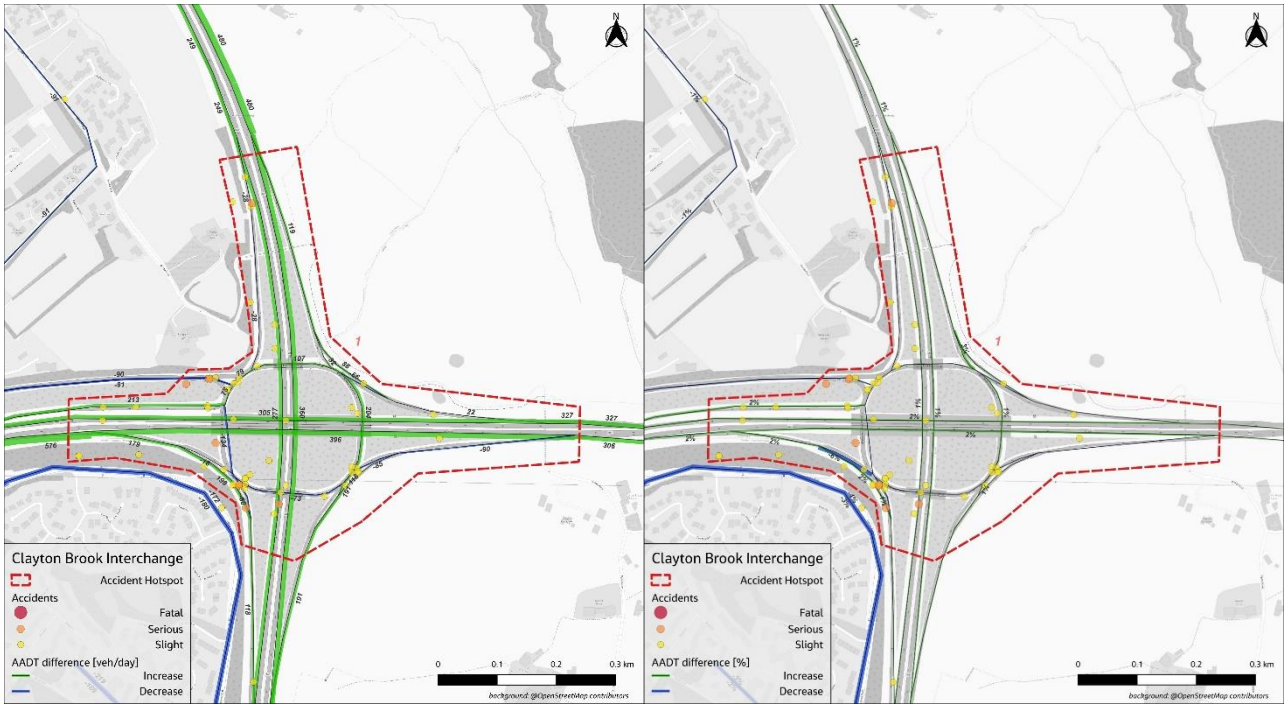


Figure 6-2: Analysis of AADT change at accident hotspots (Hotspot 1 – Clayton Brook Interchange)

A qualitative assessment has been undertaken of the impacts at each hotspot, rating the impacts on a scale from "no impact/improvement" to "significant impact". This assessment is shown in Table 6-2 overleaf.

The majority of hotspots were assessed to not experience a material impact from the Local Plan allocations, once the traffic reduction associated with sustainable mitigations was accounted for. Several hotspots were assessed to still experience residual impacts.

Of these, 10 were assessed as experiencing a "small impact", meaning that the increases in AADT at locations with historic accidents were limited, or increases occurred at parts of the hotspot where historic accident records did not indicate a particular associated safety concern (with accidents being limited and typically only "slight" severity).

Two hotspots were assessed as experiencing a "moderate impact", meaning that the increases in AADT were modest but could contribute to an observable increase in Road Safety Incidents, or increases were concentrated at locations in the hotspot which had historically experienced a high proportion of the accidents locally or higher severity casualties. Thes locations are;

- Hotspot 23 – A582 / Chain House Lane
- Hotspot 32 – A59 Preston New Rd Samlesbury

No hotspots were assessed as experiencing a "severe impact"

Table 6-2: Accidents hotspot qualitative impact assessment

Hotspot	Name	Assessment	Local Plan Impact
1	Clayton Brook Interchange	There are slight increases in AADT on the M65 Eastbound off-slip, which has a few slight accidents, and the M61 nb to M65 wb slip lane, as well as on the M61 and M65 mainlines in both directions. However, the most significant concentrations of accidents at the south-western corner of the gyratory, where the M61 nb off-slip meets the M61 wb on-slip, and at the Tramway Lane arm, do not see changes in AADT. Overall the impact is not expected to be significant.	Small Impact
2	M61 J8	Modest increases in traffic will occur on M61 J8 using the eastern arm to Botany Bay roundabout. There is no increase in traffic using the western arm (Millenium Way) which is present the busiest arm. Improvements at the roundabout will be delivered by the developer of Botany Bay (FI Real Estate) may be sufficient to mitigate any safety issues, however this would need to be confirmed by detailed transport assessment for the new employment site allocation north of Botany Bay. There are only small increase on the M61 mainline which is where the most severe accidents occurred historically.	Small Impact
3	M6 J31 Samlesbury Interchange	There are small increase in AADT (1-3%) on the M6 mainline and all arms of the interchange, which will tend to lead to a small increase in the frequency of incidents. However the interchange will not experience significant operations impacts and additional congestion during peak hours that might present more significant issues.	Small Impact
4	M6 J32 Broughton Interchange	There is a modest increate in AADT (3%) on the M55 joining/leaving the M6. The M55 has a known weaving issue between J1 and the M6 due to the close proximity of the slip roads, however the vast majority of new trips from developments will be on the M55 mainline and continue onto the M6 southbound, and so will not contribute to increased weaving. Similarly most new trips from the M6 to the M55 will come from the south and continue to M55 J2 and so will not contribute to weaving on the J1 exit. The increase in traffic joining the M6 south bound may result in more conflict at the southbound merge, although this is less significant as this merge includes a lane gain and the distance to the next off-slip is over 3 miles.	Small Impact
5	M55 J1 Broughton Roundabout	There is a small increase in AADT on the M55 mainline, but no increase on the J1 gyratory or off-slips where the majority of incidents have occurred.	No Impact/Improvement
6	M6 J29 Bamber Bridge Interchange	There are small decreases in AADT on the gyratory of the Bamber Bridge interchange and on the A6, where the majority of historic incidents occurred, due to mode shift exceeding trips from new Local Plan developments in this area.	No Impact/Improvement
7	M6 J28 Leyland Interchange	There are small increases in traffic at the Leyland interchange (up to 2%), on the M6 mainline and on Brow Brook Road (up to 4%), which may result in small impacts. However there is negligible change in traffic on the overpass of the interchange where the majority of accidents occurred.	Small Impact
8	M6 J60 / M61 Blacow Bridge	There will be small increase (1%) in AADT on the M6 and M61 at Balcow Bridge. This is not likely to cause any significant safety impact, and is within present day-to-day variability. The largest increase in trips from the Local Plan development is remaining on the M6 in each direction.	No Impact/Improvement

Hotspot	Name	Assessment	Local Plan Impact
9	Ringway East Church St to Queen St	Modest decreases in AADT are predicted on Ringway, which is sufficient to offset additional trips from new developments in Preston city centre. Additionally, policies adopted will encourage these sites to come forwards as largely car-free developments, which would significantly reduce trips from these developments. As a result, safety at this location is likely to improve	No Impact/Improvement
10	Guildway / Strand Rd	There will be small increases in AADT on A59 Guildway exiting Preston and on the entry from Strand Road, but these are not likely to have a significant impact on safety as few accidents have occurred on this slip-road entry. The A582 MRN scheme will make improvements to this slip road which may resolve historic safety risks at this junction.	No Impact/Improvement
11	Strand Rd / Watery Ln / Fylde Rd	There is a small increase in AADT on Strand Road, which may result in a slight impact. There are not appreciable changes in AADT at the junctions of Watery Lane and Fylde Road. As a result, safety at these locations is not likely to be materially impacted.	Small Impact
12	Riversway / Pedders lane	There are modest increases on Riversway travelling straight ahead, however turning movements are not affected. These movements are separately signal controlled from turning movements, and as such this increase is not likely to materially increase conflict or safety. However the eastbound straight ahead movement, which sees the largest increase (3%), has historically had a fatal accident which indicates there may be an underlying issue here.	Small Impact
13	A6 Garstang Rd / Sharoe Green Lane	Modal shift to active modes and public transport is greater than additional trips from the Local Plan, resulting in slight decreases in AADT on all arms. Safety at this location may improve further if some NHS services are relocated from Royal Preston Hospital, which is a significant attractor of trips in this area.	No Impact/Improvement
14	A6 Watling Street Road to North Road	Modal shift to active modes and public transport is greater than additional trips from the Local Plan, resulting in slight decreases in AADT on roads in this area, which will reduce conflict and improve safety throughout the affected area.	No Impact/Improvement
15	Blackpool Road / Ribbleton Avenue	Modal shift to active modes and public transport is greater than additional trips from the Local Plan, resulting in slight decreases in AADT on Ribbleton Road, which will reduce conflict and improve safety throughout the affected area.	No Impact/Improvement
16	Blackpool Road / Sir Tom Finney Way	Modal shift to active modes and public transport is greater than additional trips from the Local Plan, resulting in small decreases in AADT at the junction, which will reduce conflict and improve safety at this junction.	No Impact/Improvement
17	B6243 Ribbleton Lane	Modal shift to active modes and public transport is greater than additional trips from the Local Plan, resulting in slight decreases in AADT on Ribbleton Lane, which will reduce conflict and improve safety throughout the affected area.	No Impact/Improvement

Hotspot	Name	Assessment	Local Plan Impact
18	Lostock Hall	Modal shift to active modes and public transport will exceed new trips from Local Plan sites on the B5254, where the majority of incidents in this area have occurred, resulting in modest decreases in AADT which will tend to improve safety for vulnerable users in the local centre. However there are small increases in AADT on Coote Lane and Croston Road. Coote Lane in particular has had a fatal incident. The scale of the increase (180 vehicles 2-way AADT) may result in small detrimental impacts, although these roads will remain lightly trafficked compared to the B5254.	Small Impact
19	A6 Preston Street / Harpers Lane	There is no material change in AADT on the A6 from the Local Plan, but small increases (2%) occur on Harpers lane where several severe accidents have occurred. The level of increase is small not likely to have a significant effect on safety on this road.	Small Impact
20	A6 Central Chorley	Slight decreases in traffic volumes occur on the A6 and side roads. The Station Approach roundabout, where the only fatal accident occurred, sees the most significant decrease in AADT. The Brooke St roundabout sees slight AADT increases (2% increase) on Brooke St but decrease on the A6 arm, likely leading to a net neutral impact.	No Impact/Improvement
21	A582 / Stanifield Lane	Modal shift to active modes and public transport is greater than additional trips from the Local Plan, resulting in no increases in AADT on the A582, and slight decreases on Stanifield Lane , which will reduce conflict and improve safety at this junction.	No Impact/Improvement
22	A582 Tank Roundabout	Modal shift to active modes and public transport is greater than additional trips from the Local Plan, resulting in small decreases in AADT at the junction, which will reduce conflict and improve safety at this junction.	No Impact/Improvement
23	A582 / Chain House Lane	New allocations and the completion of the southern section of Pickering's Farm will lead to a significant increase in traffic on Chain House Lane to the east and small increases on the A582 to the north of the junction. The majority of accidents at this location occur on the western arm, which only sees a modest increase in traffic. There is potential for increases on conflicting movements, particularly vehicles turning right from Chain House Lane to A582 north, which may cause some safety impact. Improvements will be made to this junction through the A582 MRN scheme which may offset these impacts, however there is potential for a moderate impact which may require additional localised mitigation.	Moderate Impact
24	A582 / Pope Lane	There are small increases in traffic on the A582 through the junction, however there is no increase in turning vehicles. The current layout of the junction ensures that straight ahead movements on the A582 do not conflict with any turning movements as right-turning traffic is separately staged. As such, no impact on safety is expected.	No Impact/Improvement
25	Liverpool Rd / Cop Lane	There will be small increases in AADT on Priory Lane (2%) which has experienced two severe accidents, and increased turning movements through the junction may result in increased conflict. However the overall volume of increase is very small (70 vehicles AADT) as Priory Lane is the least busy arm of the junction.	Small Impact
26	Hough Lane Leyland	Modal shift to active modes and public transport is greater than additional trips from the Local Plan, resulting in modest decreases in AADT on Hough Lane, which will reduce conflict and improve safety throughout the affected area.	No Impact/Improvement

Hotspot	Name	Assessment	Local Plan Impact
27	A6 Lostock Lane / A582	A mixture of small decreases and increases in AADT on different arms of the A6 / A582 roundabout will likely have a minimal net impact. Modest decreases in traffic on Wigan Rd will reduce conflict at its junction with the A6. The committed A582 MRN scheme will make improvements to junction layouts in this area which should reduce historic risks.	No Impact/Improvement
28	Blackpool Road / Plungington Road	Modal shift to active modes and public transport is greater than additional trips from the Local Plan, resulting in slight decreases in AADT on roads in this area, in particular Plungington Road. This will reduce conflict with users on Blackpool Road and improve safety in this area.	No Impact/Improvement
29	Plunington Road	Modal shift to active modes and public transport is greater than additional trips from the Local Plan, resulting in slight decreases in AADT on roads in this area, in particular Plungington Road. This will reduce conflict and improve safety for residents in this area.	No Impact/Improvement
30	Church St Preston	Modal shift to active modes and public transport is greater than additional trips new developments, resulting in modest decreases in AADT on Church Street. There may be some localised impacts from the new development sites on parts of Fishergate which should be investigated in greater local detail as part of a transport assessment for these sites, especially as Fishergate is highly sensitive and is extensively used by pedestrians and vulnerable users. However, policies adopted will encourage these sites to come forwards as largely car-free developments, which would eliminate potential negative impacts. As a result, the overall impact in this area is expected to be beneficial to safety.	No Impact/Improvement
31	A59 New Hall Lane / Blackpool Road	Negligible change in AADT occurs at this junction, so no impact on safety is anticipated.	No Impact/Improvement
32	A59 Preston New Rd Samlesbury	There are modest increases in traffic at this area, in particular on the A677 turning north to the A59 (14% increase). This may have a small impact on safety at the junction, although only slight accidents have occurred here. Changes in AADT are lower (2% increase) on the A59 Preston New Road and Cuerdale Lane where the severe and fatal accidents have occurred. Overall the impact is expected to be small, but if further development at BAE systems comes forwards which could attract additional traffic a more detailed assessment of any safety risks at this location and specific mitigation measures would be merited.	Moderate Impact

6.2.2 Strategic Road Network Merge/Diverge analysis

At junctions on the SRN, lane-changing and weaving are significant contributors to road safety incidents. As the number of vehicles on the mainline and exiting/joining increases, the level of conflict increases and consequently the risk of accidents rises. Accidents caused by weaving and lane-changing on the SRN are statistically likely to be higher severity and may involve more casualties than accidents off the SRN due to the higher speeds involved, in addition to causing potential widespread disruption.

The *Design Manual for Roads and Bridges* (*DMRB*) *CD 122: Geometric design of Grade Separated Junctions* sets out a range of different desirable layouts of merges and diverges to ensure safe operation at different traffic levels. The minimum standard of motorway merge and diverge to be provided, for the worst-case peak flow, is set out in CD122 Figure 3.12b and Figure 3.26b. These set out minimum standards for new merges and diverges based on their design flows, however they can be used to assess the impact of growth on safety. Where traffic growth results in traffic on an existing merge or diverge increasing beyond the design capacity for that layout, the risk of road safety incidents increases significantly.

An assessment of the forecast AM/PM peak hour flows on each merge and diverge in the study area has been undertaken against CD122 Figure 3.12b and Figure 3.26b. the 2041 Reference Case and Local Pan with Sustainable Mitigation scenarios have been used, along with the Base Year flows, to assess whether any merges or diverges would be expected to exceed their design capacity, and the extent to which Local Plan allocations contribute to this. These assessments are included in Appendix I, with an example shown in Figure 6-3 below.

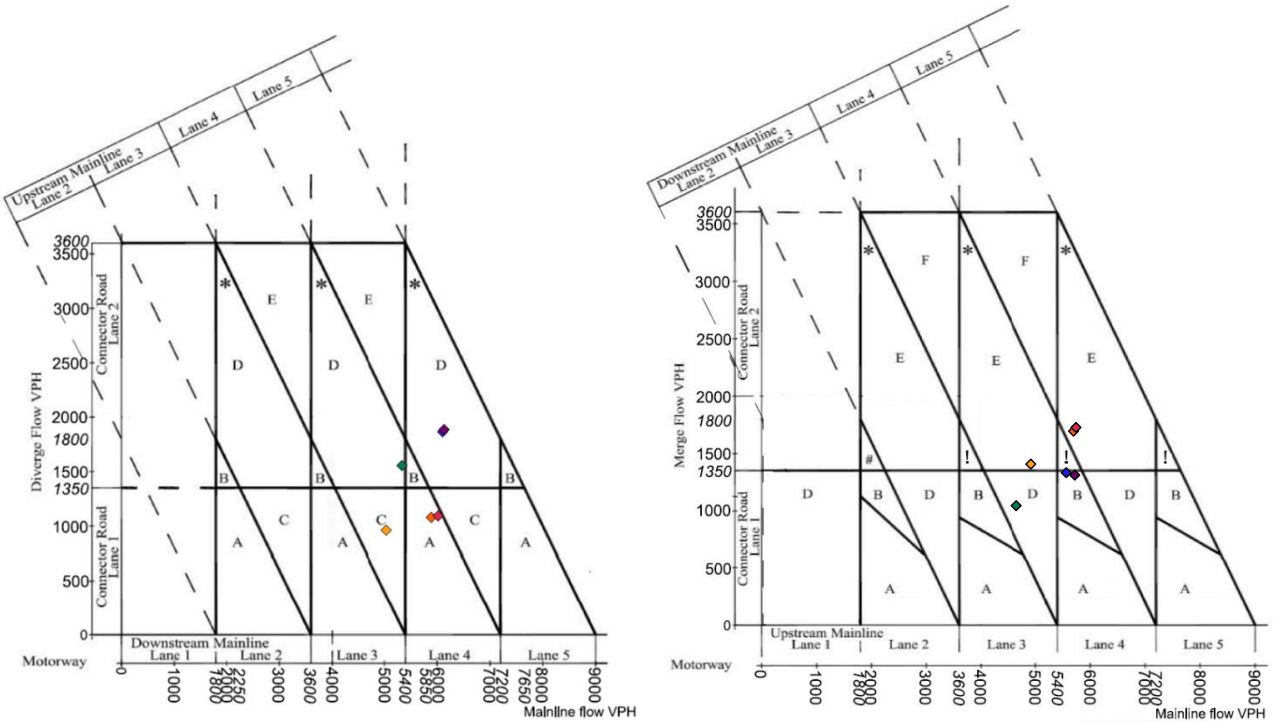


Figure 6-3: M6 J31A Merge/Diverge analysis showing Northbound diverge (left) and Southbound merge (right)

The analysis shows that several SRN junctions will be operating beyond their design capacity in the Reference scenario in 2041, and the Local Plan allocations do contribute a small amount of additional traffic to these junctions. However, none of the SRN merges or diverges will see their design capacity exceeded due to the cumulative traffic growth from the Local Plan where it was not already exceeding this in the Reference

scenario, and the additional traffic contributed by the Local Plan allocations is small relative to the degree of exceedance.

In conducting this analysis, known issues on the SRN where junctions are in close proximity were also investigated. In particular, M55 J1 and M6 J32 are in very close proximity, and there is a known issue with weaving between these junctions. The traffic growth from Local Plan allocations at this location is almost entirely on the M55 mainline through J1 (mostly from allocations in North West Preston, Cottam and Bartle), with negligible additional traffic using J1 during peak hours. This traffic predominantly uses the M6 southbound, and therefore will not contribute materially to the weaving issue as it will not need to change lanes.

7. Carbon Assessment

To assess the carbon impacts from the Local Plan, peak period, interpeak and off-peak hourly traffic flows, percentage heavy vehicles, link lengths and speeds were fed into Defra's Emissions Factor Toolkit (v13.1) on a link-by-link basis for the study area to generate the "annualised emissions" for each period assuming each period occurred for all hours of the year. These "annualised emissions" were then adjusted based on the number of hours the traffic flows were representative of to generate total emissions per year:

- the morning and evening peak periods were assumed to last for 3 hours per day;
- the interpeak for 6 hours per day; and
- the off-peak for 12 hours a day.

Peak period average hourly flows were estimated from Peak hour flows using factors derived from traffic count data used to calibrate the base models, while Off-peak flows were estimated from modelled Inter-peak flows.

This assessment was undertaken for the Reference Case (Scenario 1) and Local Plan scenarios with and without mitigation measures (Scenarios 2 and 3). Emissions are calculated in tonnes of CO2 equivalent units (tCO_2e). The resulting annualised emissions for each scenario are shown in Table 7-1

Overall annualised emissions were calculated alongside the emissions which occur in each district. The breakdown by district is based on which district each link in the network predominantly falls within, and as such does not reflect solely the impact of the Local Plan allocations in that district – eg trips originating in allocations in South Ribble can contribute to emissions in Preston when it crosses the border between the districts.

Table 7-1: Annualised Greenhouse Gas emissions by district and for total study area

Year	Scenario	Annualised Emissions (tCO_2e)			
		Preston	Chorley	South Ribble	Total
2031	Reference Case	306380	311908.5	191354.9	809643.7
2041	Reference Case	225551	234897	143474	603922
	Local Plan without mitigation	230464	238722	147076	616262
	Local Plan with Sustainable Mitigation	227900	237201	145174	610275
	Local Plan impact (without mitigation)	4913	3825	3603	12340
		+2.2%	+1.6%	+2.5%	+2.0%
	Local Plan impact (with sustainable mitigation Low Uplift)	2349	2304	1701	6354
		+1.0%	+1.0%	+1.2%	+1.1%

8. Monitor & Manage

It should be acknowledged that the above conclusions were drawn based on unconstrained traffic growth to 2041 to reflect a worst-case scenario. It is entirely possible that some of the forecasted demand may not materialise in the modelled time periods due to travellers avoiding congestion by altering their route, travelling at a different time of day ('peak-spreading') or choosing to travel to/from a different location.

In addition, the assessment considers all travel demand that intends to go through individual junctions and assumes all this travel demand can reach the specific junction during the modelled time period. It is commonly recognised that some of the travel demand may not materialise in the modelled hours due to congestion elsewhere in the network, which leads to lower actual flows that arrive during a given period.

The mitigation suggested in this Strategic Transport Assessment will therefore require further refinement or investigation in close liaison with LCC and NH when developments in the Local Plan come forward in the future. The preference before highway mitigation is considered will be to maximise measures to reduce the need to travel and increase active modes and public transport use. Whilst suggestions have been made in this Strategic Transport Assessment, the final design and implementation of mitigation measures will be determined by LCC as the Highway Authority as part of any review of Transport Assessments to be submitted in support of planning applications.

Specifically, and as detailed previously, although this Strategic Transport Assessment has relied on the CLTM strategic traffic model to assess the cumulative impact of the CLLP, a 'Monitor and Manage' approach will need to be taken to mitigation in order to encourage investment into public transport and active travel first, and to only consider new highway capacity, when no other options are available and when the increase in capacity would not negatively impact on other modes. This will require the Local Planning and highway authorities to work together in responding to planning application submissions to ensure that these developments first seek to reduce travel demand, and secure investment in active travel and public transport infrastructure linked to Travel Plan monitoring of targets.

9. Summary and Next Steps

To support the housing and employment growth proposed in the CLLP, a comprehensive Strategic Transport Assessment has been undertaken. This aligns with national guidance and the LCC's Local Transport Plan, which promotes sustainable development by reducing the need to travel and integrating land use with transport planning.

The STA has been developed in stages. Stage 1 assessed the cumulative traffic impacts of emerging site allocations on local and strategic road networks across Preston, South Ribble, and Chorley. It included a Reference Case (with committed developments and schemes) and a Local Plan scenario without mitigation. Stage 2 updated these models following the Regulation 19 consultation, incorporating revised site allocations and using the Central Lancashire Transport Model (CLTM) suite, including SATURN and EMME components, to forecast travel demand for 2031 and 2041.

Forecasts are based on national and local datasets, including NTEM, TRICS, EDGE, and NRTP22, to estimate future travel behaviour, mode choice, and trip generation. The modelling identified areas of potential congestion using V/C ratios and highlighted that while some network delays are due to Local Plan growth, most are driven by general traffic increases over time.

This transport model estimates future year transport demand and predicts changes in travel behaviour and patterns due to the Local Plan, including route choices, travel modes, and journey destinations and the evidence base will highlight necessary transport-related infrastructure to accommodate new development.

A mitigation strategy has been developed, prioritising sustainable transport measures such as active travel and public transport improvements, supported by site-specific and policy-based interventions. While some targeted highway improvements are included, the strategy recognises that expanding road capacity offers only short-term relief and emphasises the need for long-term, sustainable alternatives.

Funding for mitigation will be secured through mechanisms such as Section 106 contributions, proportionate to the impact of individual developments and informed by site-specific Transport Assessments. The evidence base will also inform a monitoring framework to track progress against the strategic objectives of the CLLP.

To assess the safety impacts of the Local Plan, historic accident data (STATS19) across Central Lancashire was analysed to identify accident hotspots based on severity and casualty numbers. This analysis evaluates the cumulative safety impact of all proposed allocations, alongside mitigation measures. A qualitative assessment was carried out at each identified accident hotspot, rating impacts from "no impact/improvement" to "significant impact." Most hotspots were found to experience no material impact from Local Plan allocations once sustainable transport mitigations were considered. However, a few locations were still assessed to have residual impacts.

Additionally, an assessment of forecast AM and PM peak hour flows at merge and diverge points in the study area, based on CD122 design standards, found that several SRN junctions are expected to exceed their design capacity by 2041 in the Reference Case. While the Local Plan with Sustainable Mitigation contributes a small amount of additional traffic, it does not cause any new exceedances. The impact of Local Plan traffic is minor relative to the overall congestion. The analysis also addressed known weaving issues between M55 J1 and M6 J32, concluding that Local Plan traffic, primarily from North West Preston, Cottam, and Bartle flows through the M55 mainline and continues southbound on the M6, thus not significantly worsening the weaving problem.

A high-level assessment was carried out to estimate the carbon impacts of the Local Plan. This analysis used traffic flow data, vehicle classifications, link lengths, and speed information, applying Defra's Emissions Factor Toolkit (v13.1) on a link-by-link basis across the study area. The assessment produced annualised emissions estimates for each time period, with results broken down by district according to the predominant location of each network link. Findings indicated that carbon emissions are expected to rise as a result of the Local Plan

developments. However, these impacts are projected to diminish once sustainable mitigation measures are implemented.

The conclusions of the assessment are based on a worst-case scenario assuming unconstrained traffic growth to 2041, though actual demand may be different due to behavioural adaptations like route changes, peak spreading, or congestion elsewhere in the network. The modelling assumes all forecast demand reaches specific junctions within the modelled period, which may not reflect real-world conditions. As such, the proposed mitigation measures will need further refinement in collaboration with LCC and NH as Local Plan developments progress. Priority will be given to reducing travel demand and promoting active travel and public transport before considering highway capacity enhancements. A 'Monitor and Manage' approach is recommended, ensuring that any future mitigation aligns with sustainable transport goals and is guided by ongoing coordination between planning and highway authorities.