Transport appraisal and modelling

West Lothian Local Development Plan: background paper

Contents

1 Introduction

1.1 The council has undertaken a sustainability assessment within the context of *Scottish Planning Policy* (SPP) and *National Planning Framework 2* (NPF2) which recognises the importance of transport as a key element in making development deliverable advising that *"the relationship between transport and land use has a strong influence on sustainable economic growth, and this should be taken into account when preparing development plans and in development management decisions".*

1.2 Transport modelling was undertaken to inform the *Strategic Development Plan* (SDP) however this was based on a different level of development and spatial strategy to that which will be set out in the proposed *West Lothian Local Development Plan* (LDP). The transport appraisal undertaken by Transport Scotland for the SDP modelled the development outlined in the proposed SDP.

1.3 To inform the West Lothian LDP the council commissioned consultants to undertake transport modelling to:

- provide evidence to the council and in turn Transport Scotland regarding impact of proposed developments on the motorway network through West Lothian;
- help plan future transport network improvements through identifying congested junctions and identifying solutions; and
- provide a mechanism to link the funding of potential improvements of the network to specific developments that are likely to generate additional traffic which will result in improvements being required to the network.

1.4 The SEStran Regional model was used as a base for the modelling work.

1.5 The Transport Appraisal and modelling have been published as a background paper to the *Main Issues Report* for the LDP which is supported by a series of appendices as follows:

- Appendix One: Existing and anticipated network constraints and infrastructure requirements;
- Appendix Two: Transportation Assessment - site assessment methodology and results
- Appendix Three: Transport Modelling

The transport modelling will inform the LDP as it progresses to proposed plan stage.

2 Transport Appraisal for the West Lothian LDP *Main Issues Report* (MIR)

2.1. The NPF2 takes forward the spatial aspects of the Scottish Government's policy commitments on sustainable economic growth and climate change. For transport infrastructure it promotes the key strategic outcomes set out in the *National Transport Strategy* and incorporates the recommendations of the *Strategic Transport Projects Review* (STPR), published in December 2008.

2.2 Transport Scotland's guidance: *Development Planning and Management Transport Appraisal Guidance* (DPMTAG), July 2011, recommends that transport appraisal of developments should be undertaken in the early stages of the development planning process, helping to shape and support the delivery of the spatial strategy. In doing so, Main Issues Reports should then be able to allow Transport Scotland to come to an informed understanding as to how the preferred spatial strategy and any alternatives are likely to impact on the strategic transport network.

2.3 The transport appraisal should provide a proportionate, robust objective led evidence base for the transport interventions needed to support the council's preferred spatial strategy and reasonable alternatives.

2.4 A range of transport infrastructure is required to be implemented to facilitate the strategic land allocations to be identified in the proposed LDP. A number of major transport infrastructure projects are under construction or at an advanced stage of planning which could have a significant role to play in the future development of the area e.g. the Queensferry Crossing.

3 West Lothian Transport Infrastructure

3.1 West Lothian is strategically placed on the motorway and rail networks. In terms of roads there are a number of pinch points on the network. There are five key road transport corridors which pass through and serve the area. Improved local bus services also play a vital role in providing local access and securing integrated sustainable developments. Policies within the West Lothian LDP will seek to secure good local bus accessibility.

3.2 The western approaches from West Lothian into Edinburgh along the A89/A8, M8, A71 and A70 suffer congestion at peak times. There is pressure for further park and ride facilities along the Edinburgh to Glasgow rail line particularly at Linlithgow. However, this station and train services are heavily congested. The council is working with the main agencies including Transport Scotland in understanding what the constraints to future development are. However, a significant proportion of development sites identified in the West Lothian MIR already benefit from planning permissions and therefore are beyond the point where the strategy could be influenced by traffic modelling.

3.3 The key road corridors are:

M8/A89 corridor

The existing rail link in this corridor is the Bathgate - Edinburgh line. The missing section from Bathgate to Airdrie was re-opened in 2011 and now provides a direct link to Glasgow Queen Street (lower level) and has new stations at Armadale, Bathgate and Blackridge, while the existing stations at Livingston North and Uphall Station have been improved. This corridor also provides for strategic bus based public transport links between Glasgow and Edinburgh using the M8 while bus links between Bathgate, Broxburn and Livingston use the A89. The M8 is the main strategic road. Both routes converge on Newbridge Roundabout which is identified as a key constraint to continuing growth along this corridor.

A71 corridor

This corridor provides a route that runs from Breich, through West Calder and the south side of Livingston and eastwards into Edinburgh. The Shotts Railway Line (Edinburgh to Glasgow Central) runs through this corridor and provides access at Addiewell, Breich, West Calder, Livingston South and Kirknewton. The council has a Quality Bus Partnership for the bus route 27/28 - Bathgate - Livingston – Edinburgh (via East and Mid Calder). These services access Edinburgh via the A71. The A71 is the main strategic road and is the key link for onward traffic to north and south Lanarkshire.

A899 corridor

The A899 corridor runs north/south through Livingston and then heads east through Broxburn towards Edinburgh. This link contains the Fastlink bus route which is the key bus based transport facility providing direct links to Livingston and its town centre for the nearby towns and villages. Fastlink also provides a direct link to Edinburgh, via routes along the A899. The route is also the main road based access link access from Livingston to the A71, M8 and the A89.

A801 corridor

In the west of West Lothian, the A801 corridor runs north to south between the M9 at Falkirk and the M8 near Whitburn. It is a key national and well used local route. A key improvement to this route would be the introduction of the long planned 'missing link' to replace the existing Avon Gorge at the northern end of the route. Planning permission and design work have been carried out and both West Lothian and Falkirk councils continue to seek the Scottish Government to recognise the need to fund this link between the M9 Grangemouth and M8 (junction 4).

Other transport infrastructure

3.4 Key committed national transport infrastructure projects impacting on West Lothian are the Queensferry Crossing – a designated national development under NPF2 and the Edinburgh – Glasgow Rail Improvements/ Electrification (EGIP) – this proposal will have the effect of shortening journey times from Linlithgow, Polmont and Falkirk High to Glasgow and Edinburgh. Improved capacity will be achieved on the route by platform lengthening and the use of longer trains.

3.5 As part of the *Managed Crossing Strategy* for the Queensferry Crossing, a *Public Transport Strategy* was developed by Transport Scotland in consultation with a number of partner organisations, including West Lothian Council, and was published in 2010. The strategy, which was refreshed in mid-2012, includes a number of traffic management proposals (ITS (Integrated Transport Systems), bus lanes on the M8 and M9, etc.) that may impact on or complement transport initiatives identified in the *West Lothian Local Plan* such as the new motorway junction at Winchburgh and identifies the key role of improvements at Newbridge to improve public transport access. It recognised that the scope of further assessment at Newbridge should be focused on improving public transport movement and not on any infrastructure improvements which would solely benefit general traffic.

3.5 The City of Edinburgh Council in partnership with West Lothian Council and Transport Scotland is setting up a study of the Newbridge roundabout to develop and test preliminary designs.

4 Strategic Development Plan Action Programme Projects

4.1 Key transport infrastructure projects highlighted in the Action Programme to the Strategic Development Plan which will require to be reflected in the West Lothian LDP are:

- new junction on the M9 (Winchburgh) (Action 106)
- new junction on the M9 (Junction 3, Linlithgow) (Action 107)
- A801 Avon Gorge (Action 108)
- public transport improvements to the A89 (Action 109)
- public transport improvements to the A71 (Action 110)
- park and ride schemes at east Broxburn, Kirknewton (rail station), Linlithgow (M9), West Calder (Gavieside), Whitburn and Winchburgh (Action 111)
- M8 Rapid Transit/Bus Lane (Action 112) - aspirational
- provide hard shoulder running on the M8 between Livingston and Edinburgh (Action 112) - aspirational
- M9 Bus Lane (Linlithgow and Winchburgh) (Action 113) - aspirational
- Winchburgh Rail Station (Action 114)
- service improvements to the Edinburgh to Glasgow Central rail line (Shotts Line) - part of EGIP programme of works (Action 115)
- bus priority and cycle/walking networks (Action 116)

5 Future Development Strategy and Transport Appraisal

5.1 A key principle in the preferred development strategy set out in the MIR for the West Lothian LDP is wherever possible to promote development in sustainable locations. This reflects the development strategy for West Lothian identified in the SDP.

5.2 Traffic modelling has been undertaken to inform the SDP and has indicated that the key bottlenecks in the road network are the M8 corridor, the A899 and M8 junction 3, Uphall/Dechmont and the A89/A8 approaches to Newbridge.

5.3 Further transport assessments may be required to assess the impact of proposed developments identified in the SDP on the road network and a range of transportation initiatives will be required to support the development strategy.

5.4 In the meantime, the preferred development strategy for the LDP identifies locations where there is capacity on the existing network or where there are major medium and long term strategic transport proposals which are identified in the previous development plan (*Edinburgh & the Lothians Structure Plan 2005)* and the *West Lothian Local Plan*, 2009 and the *Regional Transport Strategy*, 2006 produced by SEStran.

5.5 Some schemes identified will be funded mainly by the public sector. Other schemes are to be funded by developer contributions such as M8 and M9 junctions, Winchburgh rail halt, Winchburgh bus and rail park and ride, park and ride at West Calder rail station and park and ride at Kirknewton rail station.

5.6 In terms of public transport, investment through the rail industry and through Public Transport Fund allocation from the Scottish Government will impact on delivery. A number of initiatives have recently been put in place helping to increase accessibility to the rail network:

- lengthening of platforms at Uphall Station, Livingston North and Bathgate stations to accommodate longer trains;
- the introduction of extra parking at rail station car parks at Uphall Station, Livingston North, Livingston South and Bathgate providing more opportunities to access rail services;
- the completion of Phase 1 of Fastlink providing improved access to more direct strategic bus services to Edinburgh; and
- re-opening of the Airdrie to Bathgate rail line including the provision of parking at the new stations in Armadale and Blackridge.

6 Objectives

6.1 West Lothian Council published its *Local Transport Strategy* (WLLTS) in 2000. Although this has not been updated, the three key objectives running through the LTS remain pertinent:

- to maximise accessibility for all and minimise the need for travel, especially by car;
- to ensure adequate means of access, including by public transport, to existing and proposed strategic employment locations, major public attractions and key development sites; and
- to enhance the convenience and attractiveness of non-private car travel, whether by public transport, for cycling or on foot.

6.2 In addition, increasing sustainability through linking new development to existing and committed transport infrastructure and achieving more affordable public transport remain priorities.

7 Existing Spatial Strategy

7.1 Where possible, the current development plan strategy has aimed to link major developments to existing public transport networks and infrastructure, or promote areas which relate to, or help secure, new strategic transport proposals, new or expanded rail and bus park-and-ride sites, new rail stations, and longer term tram proposals extending from the west Edinburgh development initiatives close to Edinburgh Airport and other public transport initiatives. This strategy is set out in broad terms in the SDP which will in turn set the context for the emerging West Lothian LDP.

7.2 In this context, there are a number of sites which, if selected for inclusion in the LDP, will have the potential to impact upon the strategic transport network given the location, nature and scale of potential residential and employment sites presented.

8 Potential Strategic Transport Impacts of the Emerging Spatial Strategy

8.1 Potentially, as a result of the new housing and employment sites coming forward, the strategic pinch points on existing infrastructure are at Junctions 3 and 4 of the M8; and in a wider context sites located in the proximity of the M8, M9 and A89 corridors. Together, these sites have a potential cumulative effect at Junction 1 of the M9 at Newbridge. In addition, sites situated near to the A801 or which have the potential to impact upon the A801, also require to be assessed in relation to the role of the route as detailed within NPF2 and within the *Scottish Government's Strategic Transport Projects Review* (STPR) as part of Intervention 20 – "Grangemouth road and rail access upgrades". This includes the potential for carriageway improvements and a new viaduct.

8.2 Key strategic and local transportation constraints in West Lothian are identified in Appendix One and are consistent with the higher-level transportation modelling work undertaken as part of the SDP.

8.3 Elements of the wider transport network within West Lothian will reach capacity in the foreseeable future resulting in congestion and pollution. To prevent this situation, either significant modal shift or investment in transport infrastructure, or both, needs to happen in parallel with the implementation of the WLLP and the emerging LDP.

8.4 Additional transport infrastructure projects, including the A801 Avon Gorge improvements, a new railway station at Winchburgh, park and ride provision and bus priority on the M8, and other principal road corridors, will be required beyond existing committed development for further sustainable development patterns to be achieved. Therefore, it is vital that any further development is provided in locations that allow the delivery of the sustainable travel patterns required by SPP.

8.5 An assessment methodology has been developed to compare the accessibility and sustainability of the additional *'expression of interest'* sites put forward by the development industry and interested parties in 2011 for inclusion in the LDP to ensure maximum accessibility and the least impact on the transport network. This information is given in Appendix Two.

8.6 Generally, a concentration of the additional development in one or just a few locations is likely to put additional pressures on the key strategic infrastructure and could make such a strategy difficult to support.

8.7 However, some areas are particularly suitable in terms of accessibility and traffic impact, and could accommodate relatively large numbers of new houses. For example, vastly improved accessibility of Armadale and Blackridge as a result of the completion of the Edinburgh to Glasgow via Airdrie rail line potentially makes these areas, from a transportation perspective, suitable for future development. In addition, the new junction on the M8 at Heartlands improves accessibility at Whitburn and creates opportunities to build on the public transport interchange identified at the new junction. This could be further improved by the provision of new cycle and bus links to the new station at Armadale. With the exception of the latter, the above infrastructure is already in place or under construction and can be used immediately to support the increase in development in these areas.

8.8 Blackridge Station in particular is a key public transport resource that has the capacity to support several hundred new houses in its immediate vicinity. Unlike in other locations where new transport infrastructure is dependent on developer funding and contributions or has a significant negative impact on the transport network, locations such as Armadale and Blackridge and, with limitations, Heartlands by Whitburn and Breich could be developed without delay. This approach would also reduce the council's exposure to any risk that would result from the delay or omission of key infrastructure caused by a lack of developer funding.

8.9 However, it must be stressed that transport and accessibility are only two of a number of considerations which need to be taken into account in assessing potential development sites and locations.

8.10 A development approach that actively encourages sustainable travel patterns and modal shift could be achieved by locating new sites close to existing and proposed public transport interchanges and where there is capacity in the network. Any residual traffic growth and resulting impact on the network can be addressed by the provision of some or the entire key infrastructure identified in Appendix 1.

8.11 To meet development requirements as set out in the SDP, there will be a requirement to identify new sites for development. The majority of development sites identified in the *West Lothian Local Plan* will, however, be carried forward to the LDP by virtue of having a valid planning permission in place and development having commenced on site. Where no consent is in place an assessment will be undertaken to determine whether or not to roll the sites forward into the LDP. All WLLP sites have been the subject of previous transport assessment as part of the transport modelling undertaken for the *Edinburgh & the Lothians Structure Plan* and the SDP.

National Infrastructure Projects and Strategies

Edinburgh to Glasgow Improvement Project (EGIP)

8.12 The Edinburgh to Glasgow Improvement Project (EGIP) has been designed to increase capacity, reduce journey times and reduce carbon footprint on the Edinburgh-Glasgow via Falkirk High route. Improved connectivity between Scotland's two major cities is crucial to assisting in delivering economic growth.

8.13 In West Lothian the major works taking place as part of the revised EGIP programme will be electrification of the line from Newbridge junction to Linlithgow and Falkirk. The electrification of this route will improve connectivity and benefit the area. Transport Scotland has also, however, announced revisions to the scheme postponing the delivery of projects within EGIP including the Dalmeny Chord.

8.14 The inclusion of the Dalmeny Chord would provide a high speed route that connects the Winchburgh to Dalmeny line with the East Coast line and the wider rail network, improving connectivity to central Scotland and beyond. A new rail station at Winchburgh is supported in the WLLP and the SDP and is safeguarded in the approved master plan for the Winchburgh Core Development Area (CDA) development.

High Speed 2 Developments

8.15 In January 2013 the UK government announced detailed plans for extending the proposed High Speed 2 (HS2) rail link north from Birmingham to Manchester and Leeds. HS2 developments offer opportunities for new connections and services in West Lothian.

8.16 The full HS2 scheme is anticipated to open in 2032 with all intercity services to Scotland routed via the West Coast Main line (WCML) at Carstairs in South Lanarkshire. Services on the Edinburgh to Glasgow line via Carstairs call at Kirknewton Station, albeit that there are only three services per day. A stop at Kirknewton would be a minimum requirement for West Lothian rail access to a high speed rail hub at Carstairs. The WLLP safeguards a site at Kirknewton for a new Livingston Parkway station, which offers potential benefits both to provide connecting services to high speed rail and direct intercity services serving West Lothian and south west Edinburgh, the business case for which would be enhanced by improved rail services.

8.17 The Scottish Government has also announced consultation on new high speed rail routes within Scotland in advance of HS2. An improved Edinburgh to Glasgow service combined with links to HS2 south of the border has been mooted. It is possible that any route would travel through the southern section of West Lothian following the existing Kirknewton to Carstairs rail corridor although plans are unclear at present.

Appendix One: Existing and anticipated network constraints and infrastructure requirements

1. Table 1 provides information on existing and anticipated constraints that the West Lothian LDP will need to address in order to achieve more sustainable development patterns and allow the transport network to function efficiently and also identifies interventions.

2. Most of the transport interventions have already been identified in other plans and strategies such as the *Forth Replacement Crossing Refreshed Public Transport Strategy*, the *Regional Transport Strategy*, the SDP or the *Strategic Transport Projects Review*. Unlike the *West Lothian Local Plan*, the impact of any additional houses identified in the forthcoming LDP has not been modelled. Modelling has been undertaken for the SDP however, further modelling will be required as the LDP progresses. The assessment of constraints and interventions required to support the housing units required by the SDP is based on the local knowledge and expertise of the council's Roads and Transportation Service; it is therefore likely that further transport modelling will be required to establish more accurately the impact of any development brought forward in the LDP. The time period for the interventions has been assumed to be up to five years for short term interventions, five to 10 years for medium term interventions and over 10 years for long term interventions.

Table 1: West Lothian Transport Network and Suggested Interventions

Strategic Transport Corridors (ie. trunk roads and main district distributor roads throughout West Lothian)	**Constraints**	**Short term interventions**	**Medium term interventions**	**Long term interventions**
M9	Newbridge (Junction 1) A8, A89, M9 slips and M9 link slips	Bus lanes/hard-shoulder running for buses on the approaches to Newbridge roundabout.	Park and ride sites at Winchburgh and Winchburgh rail station	Bus lanes/hard-shoulder running for buses on the M9
M8	Link volumes Capacity constraints at Junction 1 (Hermiston)	Park and ride at Heartlands, Whitburn at new junction 4a.		Bus lanes/hard-shoulder running for buses on the M8 junction 3 to Newbridge roundabout. Livingston Park and Ride adjacent to junction 3.
A89	Boghall Roundabout, Bathgate. Kilpunt Roundabout, Broxburn. Newbridge Roundabout	Kilpunt roundabout improvements part of the WLLP infrastructure requirements for the Broxburn CDA. Bus lanes on the approach from Newbridge commencing at Kilpunt, East Broxburn.	Boghall roundabout improvements subject to further impact from developments. Delivery of park and ride site at Kilpunt.	

Strategic Transport Corridors (ie. trunk roads and main district distributor roads throughout West Lothian)	**Constraints**	**Short term interventions**	**Medium term interventions**	**Long term interventions**
A71	Link volumes Lizzie Brice Roundabout Wilkieston A71/B7030 junction	Improved park and ride at Kirknewton Station. Calderwood CDA requirement to alleviate capacity issues. Calderwood CDA requirement to alleviate capacity issues.	A71 supplementary planning guidance identifying medium term bus priority measures. Improved park and ride at West Calder rail station. Calderwood CDA requirement to provide west half of a northern Wilkieston bypass.	A71 supplementary planning guidance identifying longer term bus priority measures. Further impact depends on preferred site strategy and will need to be included in modelling work.
A899	Deer Park Roundabout, Livingston Lizzie Brice Roundabout, Livingston Dechmont Roundabout, Livingston	Some peak hour congestion. Further impact depends on the preferred site strategy for the LDP and will need to be included in modelling work. Roundabouts require to be assessed as part of any transport assessment for developments that affect them.		
A801	"Missing link" across the Avon Gorge		Identified in Strategic Transport Projects Review as Grangemouth Road & Rail access upgrade being promoted by Falkirk Council.	
A801	Link and corridor capacity from A706 to J4 M8. Junction capacity also relevant	WLLP requirement phase 1 upgrade M8 to J4M8 distribution access.	WLLP requirement of phase 2 upgrade J4M8 distribution access to Pottishaw roundabout.	
A706	Pottishaw Roundabout, Bathgate		Widening of approach lanes as part of the dualling of the A801 (see above) or through ongoing development at Southdale, Armadale.	
A705	Toll Rounadabout, Kirkton, Livingston A705 Simpson Parkway Junction, Livingston	Junctions require to be assessed as part of any transport assessment for developments that affect them.	Gavieside CDA infrastructure to support sustainable development.	Any improvements would be dependent upon traffic impacts from future developments.

Strategic Transport Corridors (ie. trunk roads and main district distributor roads throughout West Lothian)	**Constraints**	**Short term interventions**	**Medium term interventions**	**Long term interventions**
Strategic Transport Cycling Facilities Long distance routes Local routes Recreational routes	Lack of complete route, local routes and connections	Study into developing sustainable cycle transport in West Loithian including assessment of long-term cycle infrastructure – with rising costs some of the existing cycle infrastructure may reach capacity in the next 10-20 yrs.		
Continuous east – west connections	Existing gaps in network	Provision or completion of inter-urban routes in the A89, A71, A705 corridors.		
North-south connections	Lack of safe and/or convenient routes		Construction of routes between Linlithgow and Broxburn/ Livingston/Bathgate and onwards, e.g. Armadale to Whitburn and Blackburn to West Calder.	
Urban networks	Lack of safe and convenient and safe urban cycle networks	Improvements to the Union Canal towpath and its access points in Linlithgow and Broxburn and Winchburgh require progression.	Apart from Livingston, there are very few dedicated cycle paths in the district. A network of paths linking residential area, schools, shopping areas and other main destinations need to be provided to encourage cycling. These need to link to the inter-urban routes mentioned above.	

Strategic Transport Corridors - rail	Constraints	Short term interventions	Medium term interventions	Long term interventions
Edinburgh to Glasgow Queen Street via Linlithgow	Lack of capacity at peak times Length of platforms	EGIP is underway to improve journey times and increase passenger capacity. Delivery of Winchburgh rail station to co-ordinate with EGIP works at Winchburgh tunnel.		
Edinburgh to Glasgow Central via Shotts	Kirknewton level crossing delays	Phased delivery of Kirknewton park and ride improvements. Network Rail has abandoned the plan for a new underbridge. Full barriers will be installed instead. The impact of the new measure on traffic is unknown at this point in time.	Phased delivery of Kirknewton park and ride improvements. Phased delivery of park and ride improvements at West Calder station.	Phased delivery of Kirknewton park and ride improvements. Phased delivery of park and ride improvements at West Calder station.
Public Transport				
North-south connections	Lack of frequent and convenient bus services, particularly at weekends and in the evening	Work with bus operators to identify viable services or provide more subsidised services.		

Source: West Lothian Council Roads and Transportation Services

Appendix Two: Transportation Assessment - site assessment methodology and results

1. The council's Transportation officers have carried out a high-level assessment of all sites submitted to the council through the LDP *Call for Sites* exercise in 2011. The main emphasis lies on the integration of transport and land-use planning as set out in the Transport and Accessibility section of the MIR, i.e. more sustainable travel and transport patterns and reduced car dependency.

2. Two scoring mechanisms to assess the accessibility of sites have been developed to reflect the different demands placed on the road network arising from different land uses. Table 1 reflects scoring of sites for proposed residential use. Table 2 reflects scoring of sites for proposed business use. The land uses against which the scoring has been made reflects the terms of the submissions received to the *Call for Sites* excercise (EOIs) made by interested parties and preferred use of urban capacity sites. Table 3 lists *Call for Sites* submissions which have not been scored as they relate to policy matters, are not site specific, no site plan was provided or the submission related to proposals which would not impact on the transport network.

3. Each of the sites where housing development is proposed have been assessed on an individual basis with their effect scored on the basis of existing infrastructure in 2012. The scoring is based on the ethos contained in Scottish Planning Policy (SPP) where development sites should be located such that they reduce the need to travel due to the close proximity to local services and facilities and where most of the needs of the population can be provided. The sites should also facilitate easy travel by public transport by bus or train. The better the site can provide for walking, cycling and access to public transport, the higher the score and therefore the easier the site is to be supported in transportation terms.

4. Accessibility scoring is based on the distance from the site to local services and what level of provision these facilities have. The scoring then compares the site to its proximity to existing bus, rail and cycle facilities. The bus network is further defined by the level of service provision.

5. Any residential development may have an impact on the school roll therefore each site is scored based on its proximity to schools and possible spare capacity in available school transport.

6. It is recognised that use of the car will not stop regardless of where the site is located and it is something that the council would not advocate to cease. The car has a role in today's society which we have to accommodate, therefore the scoring for car use includes the impact of the site in terms of its size and location to main routes.

TABLE 3: TRANSPORTATION ASSESSMENT for CALL FOR SITES (EOI) SUBMISSIONS FOR RESIDENTIAL USE

Note - scores are out of a maximum of 40

Part 1: Accessibility by non-car modes of transport

1.1 Accessibility to local services like schools, local shops, libraries, health centres, etc.	
5	Good access to comprehensive range of facilities within good walking or cycling distance of the proposed development site
4	Good access to good range of facilities within reasonable walking/cycling distance or reasonable access to comprehensive range of facilities
3	Reasonable access to good range of facilities or poor access to comprehensive range of facilities
2	Reasonable access to core services or poor access to good range of facilities
1	Poor access to core services or either good or reasonable access to some facilities
0	No facilities within a reasonable walking or cycling distance of the proposed development site

Good accessibility: up to 800m (easy walking and cycling distance)

Reasonable accessibility: 800m to 1,600m (manageable on foot and within easy cycle distance)

Poor accessibility: 1,600m to 5km (outwith normal walking but within reasonable cycling distance), inaccessible on foot and by bicycle: over 5km

All distances are measured from centre of proposed development

Core facilities: convenience store + primary school +basic health care (access to GP) + access to some public transport

Good range of facilities: 1) + financial services + variety of shops + health centre + community centre + library

Comprehensive range of facilities: 2) + leisure/entertainment facilities + wider range of health services like dentist + secondary school + supermarket + restaurants

Some facilities: fewer than core facilities

1.2 Access to existing public transport services and facilities - bus	
1.2.1 Existing Bus Services 1.2.1.1 Distance to bus network Distance from nearest accessible point on development site to bus network	
2	Less than 400m
1	400m to 800m
0	Over 800m
1.2.1.2 Minimum Daytime Bus Service Level Less than 800m walk to bus network with the following combined service levels	
5	High frequency daytime service to a choice of at least 2 destinations plus at least moderate frequency daytime service to another destination
4	High frequency daytime service to a choice of at least 2 destinations
3	Moderate frequency daytime service to a choice of at least 2 destinations OR High frequency daytime service to 1 destination
2	Moderate frequency daytime service to a choice of at least 2 destinations
1	Less than 2-5 services
0	No service
1.2.1.3 Minimum Evening Bus Service	
3	High frequency evening service

Bus network taken as at June 2012

- The distance from each development site to the nearest point on the bus network has been used regardless of site size or current stop placations.
- Only direct services to town centre destinations within than 60 minutes journey time are used in minimum daytime service level analysis.
- Minimum frequency of 30 minutes/ 2 buses per hour is defined as high frequency. Minimum frequency of 60 minutes/ 1 service per hour is defined as moderate frequency.
- Town centres defined as Armadale, Bathgate, Broxburn, Linlithgow, Livingston, West Calder and Whitburn plus Dunfermline, Edinburgh and Falkirk.
- School transport minimal impact defined as estimated cost of provision less than £20,000 per annum, moderate cost defined as £20,001-£45,000 per annum, high cost defined as £45,000 and over.

2	Moderate frequency evening service
1	Less than 2 or 3 services
0	No service
1.2.1.4 Minimum Sunday Bus Service	
3	High frequency Sunday service
2	Moderate frequency Sunday service
1	Less than 2 or 3 services
0	No service

1.3 Access to existing public transport services and facilities - rail	
5	Good access to nearest rail facilities (up to 800m)
4	Reasonable access to nearest rail facilities (between 800m and 1,600m)
3	Poor access to nearest rail facilities (walking distance outwith 1,600m but within 5km cycling distance)
2	Nearest rail facilities outwith reasonable walking distance but may still be accessible by bicycle
1	Nearest rail facilities outwith reasonable walking distance but some access by public transport
0	Nearest rail facilities can only be accessed by car

1.4 Walking and cycling access	
2	The proposed development is within 800m of the National Cycle Network or other traffic-free walking and cycling routes (Routes 75 and 76 cross West Lothian)
0	No traffic-free walking and cycling facilities in the vicinity of the proposed development

1.5 Impact on school transport	
Minimal cost per development: Less than £20,000 per annum. Moderate cost: £20,001-£45,000 per annum. High cost: £45,000 and over.	
3	No school transport impact
2	Most new demand can be absorbed within existing provision at minimal cost
1	Some new school transport services needed at moderate cost
0	Large scale new school transport services needed at high cost

Part 2: Impact on existing infrastructure

2.1 Impact on station parking	
5	No significant impact - no mitigation required
4	Minimal impact - additional car parking may be required
3	Moderate impact - additional car parking will be required
2	Major impact - additional car parking will be required as a result of future developments
1	Major impact - existing car parking issues that will require additional car parking to be provided
0	Major impact on Strategic Rail where no additional car parking can be provided.

2.2 Impact on local road network	
5	No significant impact on road capacity - no improvements required
4	Minimal impact on road capacity - no or minor improvements required
3	Moderate impact on road capacity - minor improvements required (e.g. localised widening of junctions)
2	Major impact on road capacity - major improvements will be required (e.g. new junctions localised widening etc.)
1	Major impact on road capacity where large scale improvements will be required (e.g. new road infrastructure required e.g. bypass roads etc.)
0	Major impact on road capacity where no improvements can be implemented

2.3 Impact on trunk road network	
5	No significant impact on road capacity
4	Minimal impact on road capacity
3	Moderate impact on road capacity
2	Major impact on road capacity
1	Major impact on road capacity where large scale improvements will be required
0	Major impact on road capacity where no improvements can be implemented

TABLE 1: TRANSPORTATION ASSESSMENT for CALL FOR SITES (EOI) SUBMISSIONS FOR RESIDENTIAL USE

NB *colour coding of submissions is provided for ease of reference and to assist in cross-referencing with Settlement Statements*

Preferred Alternative Not Preferred * in part ■ withdrawn by Council Executive

EOI ref	Site	Town	Access to local services	Bus service provision	Access to rail services	Walking and cycling access	Impact on school transport	Impact on station parking	Impact on local road network	Impact on strategic road network	Impact on town centre parking	Total score
* 0001	Heartlands	Whitburn	3	4	3	0	1	2	1	2	2	**18**
0002	Kirkton Business Centre	Livingston	4	4	3	2	3	5	5	5	5	**36**
0003	Hoghill/ Oakbank	East Calder	3	3	3	0	3	3	3	5	4	**27**
0004	Windyknowe	Bathgate	4	5	3	2	2	3	3	5	4	**31**
0005	Site to south of South Logiebrae	Westfield	1	3	2	0	2	4	3	5	3	**23**
0006	East Mains of Ballencrieff Farm	Bathgate	3	2	3	0	2	5	5	5	5	**30**
0009	West of Seafield	Seafield	3	5	3	2	2	2	2	4	3	**26**
0010	Land adjacent to Bridgend Golf Club	Bridgend	1	4	2	0	2	4	5	5	4	**27**
0011	Land adjacent to Willowdean	Bridgend	1	4	2	0	3	4	5	5	4	**28**
0012	Land at Cousland Farm north	Livingston	3	5	3	2	2	3	3	4	5	**30**
0015 (ELI2)	Springfield South/Boghall	Linlithgow	3	3	3	2	3	3	4	4	3	**28**
0016	Springfield West	Linlithgow	4	2	4	2	3	4	4	4	3	**30**
0017	Forkneuk, north Uphall	Uphall	2	4	3	2	1	2	1	2	2	**19**
0018	Oakbank Farm	East Calder	3	2	3	0	3	3	3	5	4	**26**
0019	Dixon Terrace	Whitburn	4	3	3	2	3	4	4	5	4	**32**
0021	North east field	Uphall Station	3	4	5	2	2	5	1	5	5	**32**
0023	Land south of Armadale	Armadale	3	4	4	2	3	2	1	2	2	**23**
0024 (ELv28)	Eliburn Office Park	Livingston	3	4	3	2	3	4	4	5	5	**33**
0026	Station Road	Addiewell	2	4	5	0	3	5	5	5	4	**33**
0027	Crofthead Farm	Fauldhouse	2	5	3	2	3	3	2	4	3	**27**
0028	Back o Moss Farm, site A	Longridge	2	1	3	2	3	4	5	5	4	**29**
0029	Back o Moss Farm, site B	Longridge	2	2	3	2	3	4	5	5	4	**30**
0030 (HLv59)	Site at Murieston Road	Livingston	3	2	4	2	3	4	4	5	5	**32**
0031	Site to west of West Calder cemetery	West Calder	4	4	4	0	3	5	5	5	5	**35**
0032	Site west of Curling Pond Lane	Longridge	2	4	3	0	3	4	5	5	4	**30**
0033	Houston Farm Riding School	Uphall	2	4	3	2	2	3	3	4	4	**27**

EOI ref	Site	Town	Access to local services	Bus service provision	Access to rail services	Walking and cycling access	Impact on school transport	Impact on station parking	Impact on local road network	Impact on strategic road network	Impact on town centre parking	Total score
0034	Bangour Village Hospital	Dechmont	3	4	3	2	2	1	2	3	3	**23**
0035	Pumpherston Farm	Pumpherston	3	4	3	2	3	2	2	3	3	**25**
0037	Site at Harwood Farm	West Calder	3	1	4	0	3	2	2	5	2	**22**
0038	Site at Seafield Farm	Seafield	2	5	3	2	2	2	2	4	3	**25**
0039	Site at Langside Farm	Polbeth	3	3	3	2	2	3	1	5	3	**25**
0040	Site at Easter Breich Farm	Seafield	2	1	3	0	2	3	3	5	4	**23**
0041	Site at Hermand Farm	West Calder	3	1	3	0	2	2	2	5	2	**20**
0042	Site at Hartwood Road	West Calder	4	3	5	0	2	5	5	5	5	**34**
0043	Kirkton Business Centre	Livingston	4	4	3	2	3	5	5	5	5	**36**
0044	Land at Ecclesmachan Glebe	Ecclesmachan	2	2	3	0	2	5	5	5	4	**28**
0045	Land East of Manse Road	Linlithgow	4	1	4	2	2	3	4	5	3	**28**
0046	Land NE of Bridgecastle	Armadale	3	3	3	0	2	4	4	5	4	**28**
0047	Land at Middlerigg	Armadale	3	4	3	2	2	4	1	4	3	**26**
0048	Land at Standhill Farm	Armadale	3	4	3	0	2	3	1	4	2	**22**
0049	Land at Cathlaw Lane	Torphichen	3	3	2	0	2	5	5	5	4	**29**
0050	Riccarton Farm, Porterside	Linlithgow	3	5	4	2	2	4	3	5	3	**31**
* 0051	Site at Wellhead Farm	Livingston	3	2	4	2	2	4	4	5	5	**31**
0054	Kettlestoun Mains	Linlithgow	3	2	3	2	2	1	0	3	1	**17**
* 0055	Site at Wellhead Farm	Livingston	3	2	4	2	3	2	2	4	3	**25**
0056	Mid Street	Bathgate	5	5	5	2	3	5	5	5	5	**40**
0058	The Stables, Deer Park	Livingston	3	2	4	2	3	4	4	4	5	**31**
0059	Central Park/ Deer Park	Livingston	3	4	4	2	3	4	4	4	5	**33**
0060	Dechmont Law	Livingston	3	3	4	2	3	3	3	3	4	**28**
0062	Site at Edinburgh Road	Linlithgow	5	4	5	2	2	5	4	5	3	**35**
0063	Site to south of Craiginn Terrace	Blackridge	5	4	5	2	2	5	5	5	4	**37**
0064	Greendykes House, Greendykes Road	Broxburn	4	3	3	2	2	4	4	5	5	**32**
0065	Land at Bridgend Farm	Bridgend	1	5	2	0	2	4	5	5	4	**28**

EOI ref	Site	Town	Access to local services	Bus service provision	Access to rail services	Walking and cycling access	Impact on school transport	Impact on station parking	Impact on local road network	Impact on strategic road network	Impact on town centre parking	Total score
0066	50 Hartwood Road	West Calder	4	3	5	0	3	5	5	5	5	**35**
0068	Land east of Woodside Place	Bridgend	1	5	2	0	3	3	4	5	3	**26**
0070	Land east of B8046	Ecclesmachan	2	2	3	0	2	5	5	5	4	**28**
0072	Land at Gallow Hill	Newton	2	1	0	0	1	4	2	3	3	**16**
0074	Land south of B8028	Philpstoun	1	3	3	2	2	4	3	5	3	**26**
0075	Land at Redhouse Cottages	Threemiletown	1	5	1	0	1	3	3	4	3	**21**
0076 (HWk1)	Housing allocation	Wilkieston	2	4	3	0	2	3	3	5	4	**26**
0077	Land at site 1 SWB	Wilkieston	2	4	3	0	2	3	3	5	4	26
0078	Land at site 2 SWB	Wilkieston	2	4	3	0	2	3	3	5	4	**26**
0079	Land at site 3 SWB	Wilkieston	2	4	3	0	2	3	3	5	4	**26**
0080	Land at Drumcross Road	Bathgate	4	1	3	0	2	3	3	5	3	**24**
0081	Land extending east from Torphichen Road	Bathgate	4	3	3	0	2	3	3	5	3	**26**
0083	Blaeberryhill Road	Whitburn	3	4	3	2	2	4	4	5	4	**31**
0084	Foulshiels Road	Stoneyburn	2	3	3	0	3	2	3	5	3	**24**
0085 (HUB18)	Hillview Avenue	Broxburn	4	5	3	2	2	4	4	5	4	**33**
0086	Kirkhill North 1	Broxburn	3	3	3	2	2	4	3	4	3	**27**
0087	Kirkhill North 2	Broxburn	3	3	3	2	2	3	2	4	2	**24**
0090 (HKn10)	Station Road, south extension	Kirknewton	2	4	5	0	3	5	5	5	5	**34**
0091	Belevedere Wood	Bathgate	4	2	3	0	2	3	3	5	4	**26**
0092	Crosshill Drive east	Bathgate	4	2	5	0	2	4	4	5	3	**29**
0093	Veteran's Cottage, Wallace Road	Bathgate	5	2	5	2	2	5	5	5	4	**35**
0094	Waverley Street	Bathgate	5	5	4	2	2	5	5	5	5	**38**
0095 (HBb5)	Redhouse West	Blackburn	4	5	3	2	2	4	3	4	4	**31**
0096	Harrysmuir Gardens	Pumpherston	3	4	4	3	2	4	4	5	5	**34**
0098	North of Teviot Drive	Livingston	4	2	5	2	3	5	5	5	5	**36**
0099 (ELv54)	Linhouse	Livingston	3	2	5	2	3	4	1	4	3	**27**

EOI ref	Site	Town	Access to local services	Bus service provision	Access to rail services	Walking and cycling access	Impact on school transport	Impact on station parking	Impact on local road network	Impact on strategic road network	Impact on town centre parking	Total score
* 0100 (HLv94)	Murieston Land at south	Livingston	3	2	4	2	2	4	4	5	5	**31**
0103	Burghmuir	Linlithgow	3	2	3	0	2	1	0	3	1	**15**
0104	Oakbank Village	East Calder	3	2	3	0	3	3	3	4	5	**26**
0105	Land at Falkirk Road	Linlithgow	4	4	4	2	3	4	5	5	4	**35**
0108	Polkemmet Business Centre	Whitburn	3	1	3	2	3	5	5	5	5	**32**
0110	Murieston Castle Farm	Livingston	3	2	3	2	3	3	1	4	3	**24**
0111	Balgreen Farm	Livingston	3	2	3	2	2	3	1	4	3	**23**
0112	Land adjacent to Roman Camp	Uphall Station	3	2	5	2	3	5	1	4	4	**29**
0113	Land adjacent to Langton Road	East Calder	3	4	4	2	3	3	4	5	5	**33**
* 0114	Wilcoxholm Farm	Linlithgow	3	5	4	2	3	3	3	4	2	**29**
0115	Cadzow Estate, Kilpunt	Broxburn	2	4	2	2	1	3	2	4	2	**22**
0117	Kirkton Business Centre	Livingston	4	4	3	2	2	5	5	5	5	**35**
0118	North of Bentswood Inn	Stoneyburn	2	3	3	0	2	2	3	5	3	**23**
0119	South of Lighton Terrace	Stoneyburn	2	3	3	0	2	2	4	5	4	**25**
0120	BackoMoss/ Main Street	Longridge	2	1	3	2	2	4	5	5	4	28
0121	Former Golf Course, Bridgecastle	Armadale	3	3	3	0	2	4	4	5	4	**28**
0122	Site adjacent to Fir Park/Craig Court	Torphichen	3	3	2	0	2	5	5	5	5	**30**
0123	South of Blaeberryhill Road	Whitburn	3	4	3	2	2	2	2	3	2	**23**
* 0124	Land on NE boundary of Fauldhouse	Fauldhouse	2	5	3	2	3	3	3	4	3	**28**
0125	Land NE of Sunnyside Cottage	Bathgate	4	3	3	0	2	4	4	5	4	**29**
0126	Dykeside Farm	Bathgate	4	3	3	0	2	1	2	3	2	**20**
0127	Sites east and west of A801	Bathgate	3	3	3	2	2	1	1	3	2	**20**
0128	Braehead	Linlithgow	5	5	4	2	3	4	5	5	4	**37**
0129	Doomsdale	Linlithgow	4	4	4	0	3	3	3	5	4	**30**
0130	Greendykes North	Broxburn	3	3	3	2	2	3	3	5	3	**27**
0131 (COU7)	Mill Road	Linlithgow	4	2	3	0	3	3	4	5	3	**27**
0132	Stankards Road	Uphall	2	4	5	2	2	5	4	5	3	**32**
0133	Greendykes West	Broxburn	3	3	3	2	2	3	3	5	3	**27**

EOI ref	Site	Town	Access to local services	Bus service provision	Access to rail services	Walking and cycling access	Impact on school transport	Impact on station parking	Impact on local road network	Impact on strategic road network	Impact on town centre parking	Total score
0134	Land at Drumshoreland Uphall Station	3	4	5	2	2	5	5	5	5	36	
0135	Hens Nest Road	Whitburn	3	4	3	2	2	4	2	4	3	**27**
0136	Land at Redhouse	Blackburn	3	5	3	2	2	2	2	3	2	**24**
0137	Sheephousehill	Fauldhouse	2	4	3	2	3	3	2	4	3	**26**
* 0138	Land at Strathbrock Estate	Broxburn	3	3	3	2	2	2	1	3	2	**21**
* 0139	Drove Road	Armadale	4	4	3	0	1	4	1	5	3	**25**
0140	Beechwood Road	Blackburn	4	2	3	2	3	4	4	4	4	**30**
0141	Crosshill Drive	Bathgate	4	5	5	2	2	5	3	4	3	**33**
0142	Crosshill Drive	Bathgate	4	5	5	2	2	4	2	3	3	**30**
0143	Kirkhill North	Broxburn	3	3	3	2	2	2	1	3	2	**21**
0144	Kirkhill North	Broxburn	2	3	3	2	2	3	1	4	2	**22**
0145	Stankards Road	Uphall	2	4	5	2	2	5	4	5	3	**32**
■ 0146	Foremer travelling persons site	Bathgate	4	3	3	2	3	4	4	5	3	**31**
0147	North of Hermand	West Calder	3	3	5	2	3	5	3	5	3	**32**
0148	Blaeberry	Whitburn	3	4	3	2	3	4	4	5	4	**32**
0149	Dunn Place	Winchburgh	2	4	0	2	2	4	5	5	4	**28**
■ 0150	Former travelling persons site	Bathgate	4	5	3	2	3	4	4	5	3	**33**
0151	Hunter Grove	Whitburn	4	4	3	2	3	4	4	5	4	**33**
0153	Guildiehaugh Depot	Bathgate	4	5	5	2	3	5	4	4	3	**35**
0158	Junction site east of Howden South Road	Livingston	5	5	3	2	3	4	4	5	5	**36**
0161	Freeport	West Calder	3	1	3	0	3	4	4	5	4	**27**
0162	Meadow Park 13-15 Glasgow Road	Bathgate	5	5	4	2	3	4	4	5	5	**37**
0163 (HBg24)	Napier Avenue	Bathgate	4	2	5	0	2	5	5	5	4	**32**
0165	Land at Kingsfield	Linlithgow	3	1	3	0	3	1	0	3	1	**15**
* 0166	Land at Main Street	Dechmont	2	4	3	2	2	4	3	4	4	**28**
0167	Land at Clapperton	Pumpherston	3	1	3	2	3	2	2	3	3	**22**
* 0168	Land at Preston Farm	Linlithgow	4	2	3	2	3	1	2	4	2	**23**
0169	Land adjacent to Pumpherston Road	Mid Calder	3	5	3	2	3	4	4	5	5	**34**
0170	East Coxydene Farm	Wilkieston	2	4	3	0	2	3	2	4	4	**24**
0170A	Coxydene	Wilkieston	2	4	3	0	2	2	1	4	3	**21**

EOI ref	Site	Town	Access to local services	Bus service provision	Access to rail services	Walking and cycling access	Impact on school transport	Impact on station parking	Impact on local road network	Impact on strategic road network	Impact on town centre parking	Total score
0172 (COU25)	Former Lammermuir House	Livingston	5	5	4	2	3	4	4	5	5	**37**
0173	Toll Roundabout	Livingston	3	5	3	2	3	3	3	4	5	**31**
0175	Carledubs	Uphall	3	2	3	2	2	4	3	5	3	**27**
0176	East of Glen Road junction	Livingston	3	5	5	2	2	5	5	5	5	**37**
0177	Field east of Former Travelling People's site	Bathgate	4	3	3	2	2	4	4	5	3	**30**
0178	Former Travelling People's site	Bathgate	4	3	3	2	2	4	4	5	3	**30**
0180	Rear of New Deans House	Livingston	3	5	4	2	2	4	5	5	5	**35**
0182	Wester Inch	Bathgate	4	3	4	2	3	4	4	5	4	**33**
0183	Beechwood Road	Blackburn	4	2	3	2	3	4	4	4	4	**30**
0184	Clarendon Houe, Manse Road	Linlithgow	4	2	5	2	3	5	4	5	4	**34**
0185	Community Centre	Blackburn	4	5	3	2	2	5	4	5	5	**35**
0186	Parkhead	West Calder	3	3	5	2	2	5	3	5	3	**31**
0187	Trindleyknowe, Whitehill Road	Blackburn	4	4	3	2	2	5	5	5	5	**35**
0188	24 Royal Terrace	Linlithgow	5	5	5	2	3	5	5	5	5	**40**
0189 /AV008	Site at Almondvale Stadium	Livingston	5	5	3	2	2	1	2	4	5	**29**
0190a (west)	Land surrounding Breich south	Breich	2	1	5	0	3	5	3	5	3	**27**
0190b (east)	Land surround ing Breich	Breich	1	1	4	0	3	1	3	5	3	**21**
0191	Land north of Blackridge Heights Road	Blackridge	2	4	4	2	2	4	4	5	3	**30**
0192	Site at Wynford Brae	Philpstoun	1	2	3	2	3	4	5	5	4	**29**
0193	Site west of Glendevon & south of Lampinsdub	Winchburgh	1	5	0	0	2	3	1	4	2	**18**
0194	Site east of Waterstone Farm	Winchburgh	1	1	0	0	2	4	1	5	3	**17**
0195	Trinlaymire Farm East	Threemiletown	1	5	1	0	2	3	3	4	3	**22**
0196	Site at Fawnspark	Winchburgh	1	0	0	2	2	3	1	4	3	**16**
0198	Site west of Ross Plantation	Winchburgh	2	4	0	0	2	5	3	5	3	**24**

EOI ref	Site	Town	Access to local services	Bus service provision	Access to rail services	Walking and cycling access	Impact on school transport	Impact on station parking	Impact on local road network	Impact on strategic road network	Impact on town centre parking	Total score
0199	Land at Niddry Mains Golf Club	Winchburgh	2	3	0	2	2	3	1	4	2	**19**
0200	Site at Niddry Mains Bing	Winchburgh	2	5	0	2	2	3	1	4	2	**21**
0201	Site north of Niddry Castle	Winchburgh	2	5	0	2	2	4	1	5	3	**24**
0202	Site at sewage works	Winchburgh	2	5	0	2	2	4	1	5	3	**24**
0203	Site north of Niddry Farm Cottages	Winchburgh	2	3	0	2	2	4	1	5	3	**22**
0204	Site south of Niddry Farm Cottages	Winchburgh	2	3	0	2	2	4	1	5	3	**22**
0205	Site south of Faucheldean	Winchburgh	2	3	0	0	2	4	3	5	3	**22**
0206	Site south of The Den	Winchburgh	1	5	0	2	2	3	4	4	3	**24**
0208	Buchanan House	Livingston	4	5	3	2	2	3	3	5	5	**32**
0209	Buchanan House	Livingston	4	5	3	2	2	3	3	5	5	**32**
* 0210	Clarendon Farm	Linlithgow	4	5	5	2	2	5	3	5	4	**35**
* 0215	Blackhill Farm	Breich	2	1	5	0	3	5	3	5	3	**27**
0217	Muirend Moorings*	Broxburn	2	3	2	2	1	2	2	3	1	**18**
0218	Recreation Park to the rear of Woodmuir Place	Breich	1	1	4	0	2	1	3	5	3	**20**
0219	Rashiehill Terrace site A	Breich	1	1	4	0	2	1	3	5	3	20
0220	Rashiehill Terrace Site B	Breich	2	1	5	0	2	5	5	5	4	29
0221 (ELV24)	Houstoun Road North (ELv 24)	Livingston	3	2	4	2	3	3	4	4	4	**29**
0225	Wester Torrance Farm	Blackridge	2	4	5	2	1	5	2	4	1	**26**
ATE - L0001	Land at Stonerigg Farm	Armadale	3	4	4	2	3	5	5	5	4	**35**
L0003	Wester Torrance Farm	Blackridge	2	4	4	2	3	4	4	5	3	**31**
L0004	Land north of Breich	Breich	2	1	5	0	3	5	3	5	3	**27**
L0005	North of Harthill Road	Fauldhouse	2	5	4	0	3	3	3	5	3	**28**
L0006	Land north of Breich	Breich	2	1	5	0	2	5	5	5	5	**30**
L0007	Land at Blackburn Road	Bathgate	4	5	5	2	2	5	4	5	4	**36**
L0008	West of Loganlea	Addiewell	1	3	3	0	2	5	5	5	5	**29**
L0009	Land south of West Calder	West Calder	4	3	5	0	2	5	5	5	5	**34**

EOI ref	Site	Town	Access to local services	Bus service provision	Access to rail services	Walking and cycling access	Impact on school transport	Impact on station parking	Impact on local road network	Impact on strategic road network	Impact on town centre parking	Total score
L012	Land to rear of Craigrigg Cottage	Bridgehouse	1	3	0	1	0	5	5	5	4	**24**
L014	Abattoir, Whitburn Road	Bathgate	3	3	3	2	2	3	4	4	3	**27**
PJ001	Whitrigg	East Whitburn	2	3	2	0	2	4	3	5	4	**25**
PJ002	Foulshiels Road	Stoneyburn	3	3	4	0	2	4	4	5	5	**30**
PJ003	Station Road	Addiewell	3	3	5	0	2	5	4	5	4	**31**
PJ004	Murraysgate Industrial Park	Whitburn	4	5	2	0	3	5	4	5	3	**31**
PJ005	Eagle Brae Depot	Livingston	2	5	4	2	3	4	4	5	4	**33**
PJ006	Burnhouse	Dechmont	2	3	3	2	2	2	3	3	2	**22**
PJ007	Croftfoot Farm	Fauldhouse	2	4	3	2	3	4	4	5	4	**31**
PJ008	Former Vion Factory	Broxburn	4	3	1	2	2	4	4	5	4	**29**
RH	Raw Holdings	East Calder	4	5	4	2	3	4	5	5	5	**37**
BRO31	Old School Site	Broxburn	5	5	3	2	2	4	5	5	5	**36**
HLv136	Deans South	Livingston	3	5	5	2	2	5	5	5	5	**37**
COU23/ 2340	Community Centre	Bathgate	5	2	5	0	2	5	5	5	5	**34**
FAU 12	Part of Eastfield	Fauldhouse	3	5	3	2	3	4	4	4	4	**32**
COU36	Bowling Club	Philpstoun	1	2	3	2	3	4	5	5	4	**29**
COU28	Former Pumpherston & Uphall Station Community Primary School	Pumpherston	3	4	4	3	2	4	5	5	5	**35**
COU3	Auldhill	Bridgend	1	4	2	0	2	4	5	5	4	**27**
BLA7	Health Centre	Blackburn	4	5	3	2	2	5	5	5	5	**36**
BLA31	Ex Adult Training Centre, Main Street	Blackburn	4	5	3	0	2	5	5	5	5	**34**
BRO6 (HUb21)	Church Street Depot	Broxburn	5	5	3	2	3	5	5	5	5	**38**
BRO3 (COU21)	West Main Street, Former Primary School	Broxburn	5	5	3	2	3	5	5	5	5	**38**
BRO4 (HUb16)	Bridge Place	Broxburn	5	5	3	2	3	5	5	5	5	**38**
FAU4	Eldrick Avenue (Former Bowling Club Site)	Fauldhouse	3	5	5	2	1	5	5	5	5	**36**
FAU11	Main Street South Side, Former Cinema	Fauldhouse	3	5	5	2	1	5	5	5	5	**36**
LIV12	Deans South	Livingston	3	5	4	2	3	5	5	5	5	**37**
COU35	Site at James Young High School	Livingston	5	5	3	2	3	4	4	5	5	**36**
LON1	School Road	Longridge	3	3	3	0	1	4	5	5	5	**29**

EOI ref	Site	Town	Access to local services	Bus service provision	Access to rail services	Walking and cycling access	Impact on school transport	Impact on station parking	Impact on local road network	Impact on strategic road network	Impact on town centre parking	Total score
WIN1	Former Beatlie Scool/ Winchburgh Day Centre	Winchburgh	3	4	1	2	1	5	5	5	4	30

Source: West Lothian Council Roads and Transportation Service

In transportation terms the sites that have scored 10 or 9 could be supported as opportunity sites for the new LDP. Those sites that have scored 8 or 7 may be considered, in transportation terms, to be acceptable. Those with a score of 6 or less should not be recommended in transportation terms as sites suitable for development unless there are other over-riding circumstances / considerations which could allow for development to be supported.

TABLE 2: TRANSPORTATION ASSESSMENT for CALL FOR SITES (EOI) SUBMISSIONS FOR OTHER USES

NB *colour coding of submissions is provided for ease of reference and to assist in cross-referencing with Settlement Statements*

Preferred Alternative Not Preferred

The provision of additional business units tend to be located either in new business parks or added to existing industrial estates. The industrial uses tend to be located outwith town centres and housing areas. However, SPP recognises that sites should be sustainable and accessible to all types of travel. With this policy in mind the council has proposed, in transportation terms, to assess each site against only three criteria. Each site has been assessed on its own in relation to the existing infrastructure available at January 2013. The accessibility and sustainability of each site is based on ease of access by walking, cycling and public transport. The proximity to an A class road is important as it allows incoming and departing goods and services easy access usually without affecting residential areas too much. The constraints of the site are more to do with the location and its possible impact on the existing road network.

Note: *scores are out of a maximum of 10*

EOI reference	Address	Town	Sustainability	A Class Road Access	Constraints	Score
0007	Sibbald Training Centre	Blackridge	3	3	4	10
0008	Sibbald Training Centre	Blackridge	3	3	4	10
0013	Land at Cousland Farm south of A705	Livingston	3	3	3	9
0014 (ELI8)	Springfield North	Linlithgow	2	3	4	9
0020	Springfield south / Boghall east	Linlithgow	3	3	4	10
0022	Station Road	Uphall	3	3	2	8
0036	Site at McIntosh Road, Kirkton Campus	Livingston	2	3	4	9
0052	Hartwood Road	West Calder	1	1	3	5
0053 (EBg7)	Site at J4M8 Storage & Distribution Park, Pottishaw	Bathgate	2	3	3	8
0057	Deer Park Avenue	Livingston	1	2	2	5
0067	Site at Binns Mill	East Philpstoun	1	3	1	5
0069	Land to south east of East Philpstoun at Craigton Quarry	Philpstoun	1	2	3	6
0071	Site west of Newton at Whitequarries	Newton	1	3	3	7
0073	Philpstoun North Bing	Philpstoun	1	2	2	5
0089 (ELV66 & ELv67)	Land at Almondvale Business Park	Livingston	3	3	4	10
0101	Livingston South Station	Livingston	3	3	3	9
0106	Car Park 2, Almondvale Road	Livingston	3	3	3	9
0107	The Centre	Livingston	3	3	3	9

EOI reference	Address	Town	Sustainability	A Class Road Access	Constraints	Score
0109	Former West Lothian House, Almondvale Boulevard	Livingston	3	3	3	9
0116	Cadzow Estate, Muirend	Broxburn	2	2	3	7
0152	Lister Road/Kirkton south	Livingston	3	3	2	8
0153	Guildiehaugh Depot	Bathgate	3	3	3	9
0155	Crofthead Centre, Craigshill	Livingston	3	3	2	8
0127	Land east and west of A801	Bathgate	1	3	4	8
0164 (EWc4)	Five Sisters Business Park, Westwood	West Calder	1	1	3	5
0171	Milrig Holdings	Kirknewton	3	3	3	9
0173	Toll Roundabout	Livingston	3	3	3	9
0179	North of Deans Community High School	Livingston	3	3	2	8
0181 (ELv39)	Rosebank, Kirkton Campus	Livingston	2	3	4	9
0197	Site south of M9	Winchburgh	2	2	4	8
0207	Site at Auld Cathie Landfill site	Winchburgh	2	2	4	8
0212	Site north of Almondell Terrace	East Calder	3	2	3	8
0213	Site east of Almond Grove	East Calder	3	2	3	8
0216	Land at Uphall Industrial Estate	Uphall	3	3	3	9
0222 (ELv25)	Appleton Parkway East (ELv25)	Livingston	3	3	3	9
0223 (ELv26)	Appleton Parkway South (ELv26)	Livingston	3	3	3	9
0224	Land north of allocation (ELv27)	Livingston	3	3	3	9
L0010	Land at Houston Mains Holdings	Uphall	3	3	3	9
L0011	Land at 8 Houston Mains Holdings	Uphall	3	3	4	10
TCU 11	Almondvale South West roundabout, Charlesfield Road	Livingston	3	3	3	9
BLA3	West Main Street	Blackburn	3	3	3	9

Source: West Lothian Council Roads and Transportation Service

In transportation terms the sites that have scored 10 or 9 could be supported as opportunity sites for the new LDP. Those sites that have scored 8 or 7 may be considered, in transportation terms, to be acceptable. Those with a score of 6 or less should not be recommended in transportation terms as sites suitable for development unless there are other over-riding circumstances / considerations which could allow for development to be supported.

The following EOI submissions have not been scored as or the submissions related to policy matters affecting the LDP and or were not site specific.

TECHNICAL NOTE LOCAL DEVELOPMENT PLAN ASSESSMENT

MODELLING RESULTS

IDENTIFICATION TABLE	
Client/Project owner	West Lothian Council
Project	Local Development Plan Assessment
Title of Document	Modelling Results
Type of Document	Technical Note
Date	16/05/2014
Reference number	102529
Number of pages	16

TABLE OF CONTENTS

1. SUMMARY

West Lothian Council appointed MVA Consultancy to undertake a transport modelling exercise with respect to the emerging West Lothian Local Development Plan. This exercise was undertaken using the version of the SEStran Regional Transport Model (SRM) developed previously for the assessment of the SESplan Strategic Development Plan (SDP) and latterly used for analysis of the Supplementary Guidance to the SDP. The SRM is designed to represent strategic traffic (ie town to town) within the SEStran area (and between SEStran and the rest of Scotland), rather than being concerned with detailed traffic movements within towns.

The housing allocation data in the existing SRM for West Lothian was updated with more recent, and spatially detailed data supplied by West Lothian Council in the form of a Base Case (ie committed development only) and three different development Scenarios representing new housing allocations of increasing volumes. These three Scenarios do however represent relatively modest increases in housing over the Base Case. For the purposes of this exercise, occupiers of these new developments are assumed to be additional to West Lothian. Employment patterns are assumed to be unchanged in the four scenarios modelled. The Base Case plus the three scenarios were coded into the SRM and run for a 2024 forecast year. The incremental impact of the three scenarios in terms of traffic and congestion on the road network was then analysed with respect to the Base Case forecast.

At the aggregate local authority level, the impact of the additional traffic associated with these new housing developments is small at around 0.5%. However there are more significant impacts locally where these developments feed onto the strategic network. Also, in a heavily congested network, as is the case with the 2024 Base Case, small increases in traffic can lead to disproportionate increases in congestion.

At the network level, analysis has been undertaken which shows:

- Forecasts of where AM peak hour traffic will increase with each of the three scenarios;
- Forecasts of the impact of this additional traffic on link and junction based delays in the AM peak hour for each scenario; and
- The forecast routing of traffic from selected major development zones through the road network.

In overview, for Scenario 1 the results show:

- M8 Junction 3 Deer Park: more queuing at the A899 / M8 merge eastbound, due to increased through, and merging traffic
- Increased queuing on the Barnton junction A90 approach from Queensferry: due to increased traffic on the B8090 from Kirkliston to the A90
- M8 Claylands: increased queuing on the merge from Newbridge to eastbound M8 – additional traffic on both the main M8 and the link from Newbridge
- Lanark Road / B701 Junction – due to increased eastbound traffic

In addition, Scenario 2 sees additional issues at:

- Linlithgow High Street / B9080 / A803 roundabout: increased queuing from Linlithgow direction, associated with the extra Linlithgow housing;

- increased delays at the M8 J3 eastbound merge; and
- slight reduction in delays on the A71 at Murieston and also Lanark Road / B701. This is likely to be due to the redistribution of commuting trips noted above.

Finally, in Scenario 3, other issues emerge with:

- Further deterioration at M8 J3;
- Further congestion at Barnton junction A90 approach from Queensferry due to increased traffic on the B8090 from Kirkliston to the A90, some of this is attributed to the additional housing at Winchburgh;
- A71 Wilkieston / B7030 signals: eastbound increased delay due to additional A71 traffic

The analysis has therefore identified some key pressure points on the network where problems have been identified associated with the three development scenarios. This could be taken as a starting point for further more detailed assessment, or for the development of mitigation measures on the strategic network.

2. INTRODUCTION

2.1.1 This note provides a report on the traffic modelling undertaken by MVA with respect to the emerging West Lothian Local Development Plan.

2.1.2 This work has been undertaken using the SEStran Regional transport Model (SRM). This model was re-run in September 2013 to represent the SESplan Supplementary Guidance (SG) housing data. For areas outwith West Lothian the housing data used in this application of the model mirrors that used in this SG run, so the data is as up to date as possible.

2.1.3 Within West Lothian, the housing data has been revised to reflect the Base Case (committed) housing provided by WLC, plus three LDP Scenarios which comprise additional allocations to the Base Case for 2024.

3. SESTRAN REGIONAL MODEL ZONING

3.1.1 The SRM zone system in the West Lothian area is shown in Figure 1 below.

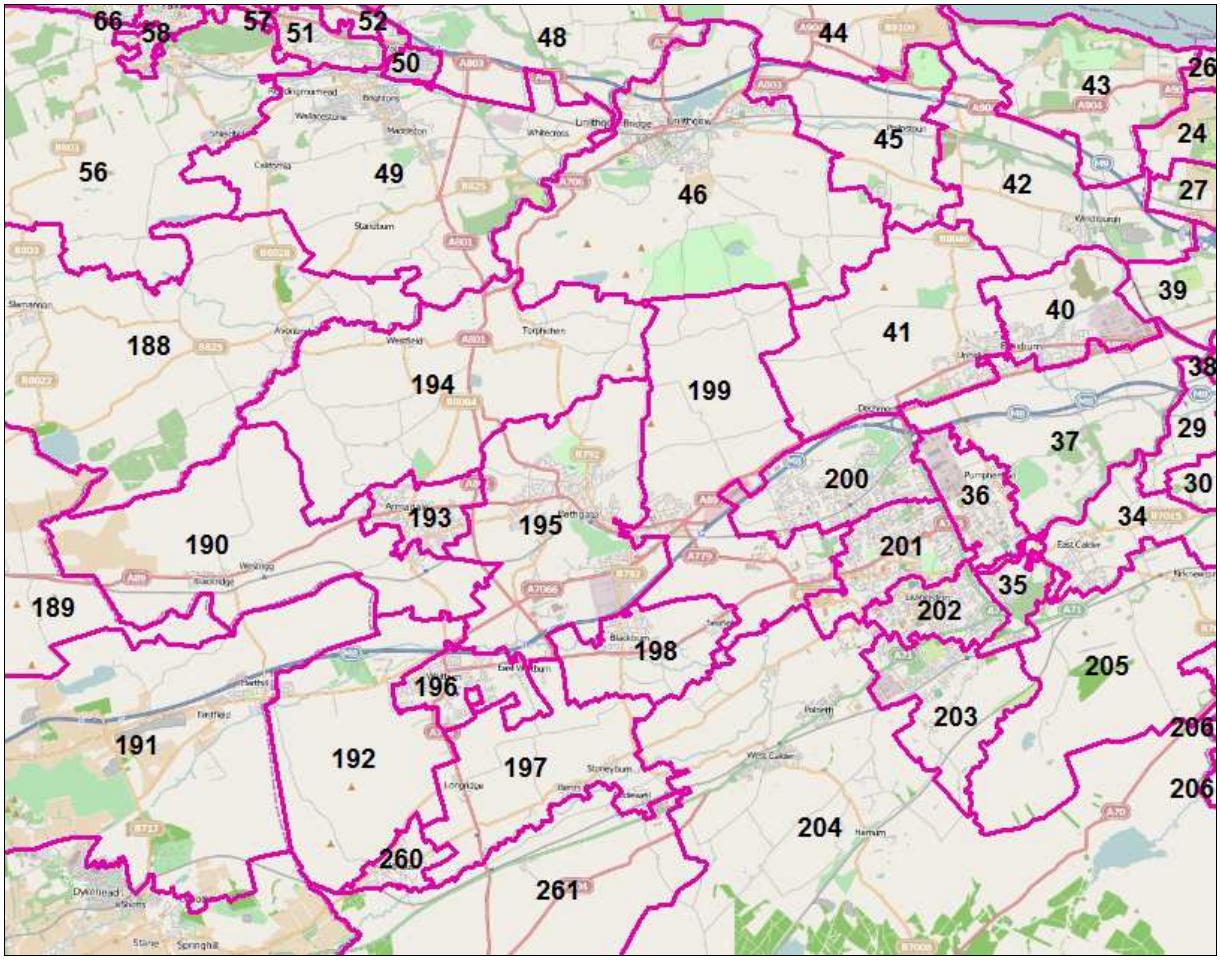


Figure 1. Current SRM Zone System in West Lothian

3.1.2 The West Lothian SRM zones are listed by zone number and name in Table 1 below, together with the corresponding TELMoS zones (from which the original demographic and economic data is taken).

Table 1. West Lothian Zones

SRM ZONE	*ORIGINAL TELMOS ZONE NO*	SRM ZONE	*ORIGINAL TELMOS ZONE NO*
34 - WILKIESTON & EAST CALDER	*142*	195 – BATHGATE	*127*
35 - MID CALDER	*138*	196 – WHITBURN	*124*
36 – PUMPHERSTON	*139 - UPHALL STATION & PUMPHERSTON*	197 – ADDIEWELL / STONEYBURN	*126*
37 – UPHALL STATION	*139 - UPHALL STATION & PUMPHERSTON*	198 – BLACKBURN	*128*
40 – BROXBURN	*140*	199 – BOGHALL	*130*
41 – UPHALL	*133*	200 – DEANS	*131*

SRM ZONE	*ORIGINAL TELMOS ZONE NO*	SRM ZONE	*ORIGINAL TELMOS ZONE NO*
42 – WINCHBURGH VILLAGE area	*137 – WINCHBURGH*	201 – LIVINGSTON	*132*
43 – NEWTON area	*137 – WINCHBURGH*	202 - DEDRIDGE & ALMONDVALE	*135*
45 – PHILPSTOUN area	*137 – WINCHBURGH*	203 – MURIESTON	*136*
46 – LINLITHGOW	*129*	204 - WEST CALDER	*134*
190 – BLACKRIDGE	*119*	205 – KIRKNEWTON	*141*
192 – POLKEMMET / HEARTLANDS	*120*	260 – FAULDHOUSE	*121*
193 – ARMADALE	*122*	261 – BREICH	*125*
194 – TORPHICHEN	*123*		

4. MODELLED SCENARIOS

4.1 Housing

4.1.1 West Lothian Council provided details of four planning scenarios for 2024 as follows:

- Base Case to 2024: 14,367 housing completions
- Scenario 1: Base Case + 2,147 houses (WLT1)
- Scenario 2: Base Case + 2,678 houses (WLT2)
- Scenario 3: Base Case + 3,492 houses (note that this figure refers to 2032, but as Scenario 3 figures to 2024 were identical to those of Scenario 2, this figure was used for the purposes of this exercise) (WLT3)

4.1.2 Table 2 below shows the housing data at the SRM zone level as implemented in this series of tests.

Table 2. Housing Data Tested – Additional Housing

SRM ZONE	*BASE CASE 2024*	*2024 SCENARIO 1, BASE CASE +*	*2024 SCENARIO 2, BASE CASE +*	*2024 SCENARIO 3, BASE CASE +*
34 - WILKIESTON & EAST CALDER	1,618	91	91	491
35 - MID CALDER	59	0	0	0
36 – PUMPHERSTON	1,043	21	-39	-69

SRM ZONE	BASE CASE 2024	2024 SCENARIO 1, BASE CASE +	2024 SCENARIO 2, BASE CASE +	2024 SCENARIO 3, BASE CASE +
37 – UPHALL STATION	-	23	0	0
40 – BROXBURN	1,534	73	67	99
41 – UPHALL	413	530	650	660
42 – WINCHBURGH VILLAGE area	2,218	55	55	455
43 – NEWTON area	-	0	0	0
45 – PHILPSTOUN area	48	30	30	24
46 – LINLITHGOW	76	140	640	640
190 – BLACKRIDGE	385	0	0	0
192 – POLKEMMET / HEARTLANDS	852	0	0	0
193 – ARMADALE	2,035	0	0	0
194 – TORPHICHEN	368	30	30	38
195 – BATHGATE	2,144	55	55	55
196 – WHITBURN	0	0	0	0
197 – ADDIEWELL / STONEYBURN	295	40	40	-90
198 – BLACKBURN	166	74	74	54
199 – BOGHALL	53	0	0	0
200 – DEANS	94	202	202	462
201 – LIVINGSTON	248	155	155	155
202 - DEDRIDGE & ALMONDVALE	388	70	70	55
203 – MURIESTON	251	400	400	400
204 - WEST CALDER	1,636	85	85	85
205 – KIRKNEWTON	168	0	0	-5
260 – FAULDHOUSE	527	43	43	-47

SRM ZONE	BASE CASE 2024	2024 SCENARIO 1, BASE CASE +	2024 SCENARIO 2, BASE CASE +	2024 SCENARIO 3, BASE CASE +
261 – BREICH	161	30	30	30
TOTAL	16,782	2,147	2,678	3,492

4.1.3 For reference, Table 3 below contains a summary of a number of household and population forecasts which have been produced over time with respect to West Lothian. The four 2024 scenarios developed here are shown in bold at the bottom of this table, with the % change from the Base Case also indicated. Note that for the purposes of this exercise, the occupants of the new housing in West Lothian are assumed to be **entirely additional to the model**. As such, this represents a 'worst case' as in practice many occupants of new properties will have moved within West Lothian. In addition to inward migration to an area, new households can also be formed from existing households, for example as a result of separation / divorce, or offspring leaving home.

Table 3. Household and Population Forecasts

SRM ZONE	HOUSEHOLDS	POPULATION
2007 Base	71,169	156,341
2024 SESplan Proposed Plan	94,648	199,216
2024 SG (ELS plus Additional Allowances)	90,678	189,772
2024 GROS 2010 based	85,810	192,046
2024 WLC Base Case	**87,951**	**184,250**
2024 WLC Scenario 1	**90,098 (+2.4%)**	**188,843 (+2.5%)**
2024 WLC Scenario 2	**90,629 (+3.0%)**	**189,970 (+3.1%)**
2024 WLC Scenario 3	**91,443 (+4.0%)**	**191,689 (+4.0%)**

4.1.4 It can therefore be seen that these new households and population represent a very modest increase of 2%-4% over total 2024 housing stock / population in West Lothian.

4.1.5 These developments can however still have impacts on the strategic road network, given the forecast congested state of the network in 2024.

4.2 Employment

4.2.1 Unlike residential land allocation, there is generally an over-supply of employment land allocations in the data provided to TELMoS by the local authorities through the APPI process. Typically only around 25% of office / industrial land allocations are modelled as being taken up and built out in TELMoS. As such TELMoS is forecasting where

commercial land allocations are built out to a much greater degree than is the case with residential land allocations.

4.2.2 The resulting employment forecasts for West Lothian are shown in Table 4 below. Note that these figures relate to the location of jobs rather than the place of residence of employed adults. Note these forecasts have been assumed to remain unchanged in each of the modelled scenarios here.

Table 4. SRM Employment Data

SRM ZONE	EMPLOYMENT 2007	EMPLOYMENT 2024
34 - WILKIESTON & EAST CALDER	932	966
35 - MID CALDER	796	580
36 – PUMPHERSTON	4,710	3,978
37 – UPHALL STATION	897	758
40 – BROXBURN	3,899	2,964
41 – UPHALL	1,702	1,458
42 – WINCHBURGH VILLAGE area	331	262
43 – NEWTON area	552	437
45 – PHILPSTOUN area	1,325	1,048
46 – LINLITHGOW	3,615	3,828
190 – BLACKRIDGE	348	4,940
192 – POLKEMMET / HEARTLANDS	218	474
193 – ARMADALE	1,581	2,346
194 – TORPHICHEN	482	493
195 – BATHGATE	11,118	11,766
196 – WHITBURN	2,016	1,683
197 – ADDIEWELL / STONEYBURN	1,003	1,521
198 – BLACKBURN	2,274	1,988
199 – BOGHALL	4,128	2,791

SRM ZONE	EMPLOYMENT 2007	EMPLOYMENT 2024
200 – DEANS	7,314	10,171
201 – LIVINGSTON	11,448	9,107
202 - DEDRIDGE & ALMONDVALE	6,306	4,823
203 – MURIESTON	3,046	2,523
204 - WEST CALDER	5,121	4,574
205 – KIRKNEWTON	724	383
260 – FAULDHOUSE	634	489
261 – BREICH	149	219
TOTAL	76,673	76,571

4.2.3 It can therefore be seen that changes in employment over time are of a much lower order of magnitude compared to population and household changes. Overall employment in West Lothian is forecast to remain stable over this period.

4.2.4 In the SEStran area, the main growth in employment is forecast to be within the City of Edinburgh area.

5. MODELLING RESULTS

5.1.1 The section reports the forecast impact of these new households / population firstly at the aggregate local authority level and secondly in terms of impacts at specific locations on the network.

5.2 Local Authority Level

5.2.1 Figure 2 shows the forecast change in traffic levels over the 2024 Base Case at the local authority level as a result of the additional households / population for each of the three scenarios.

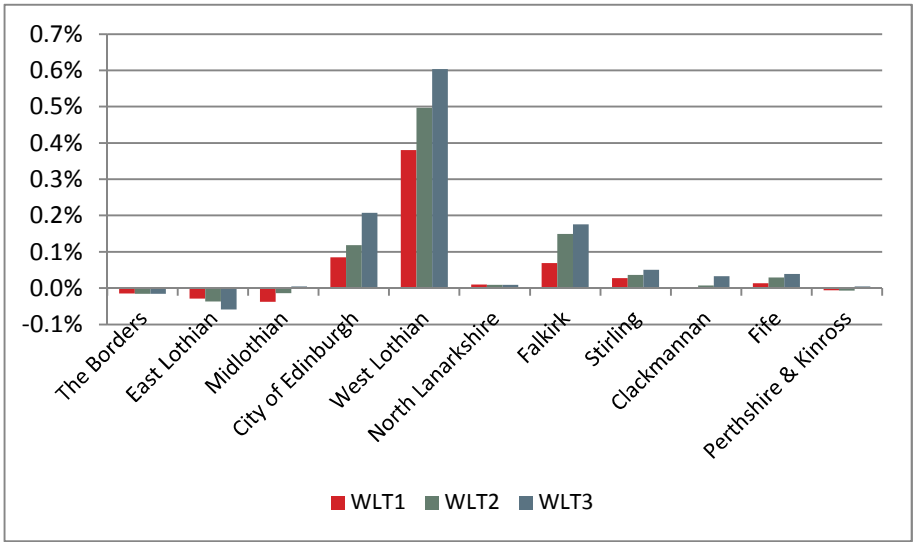


Figure 2. % Change in Vehicle KM v Base Case, 2024 (annualised)

5.2.2 The overall impact of these changes is therefore small, adding around 0.5% to annual traffic at the West Lothian level. Note that a simple pro-rata increase (in line with population) in traffic levels in West Lothian would not be expected given the high level of through traffic in West Lothian.

5.2.3 Note also that some local authorities see a minor reduction in traffic. This is a result of the way in which the model reconciles total employment with working age adults across the model.

5.2.4 A small change in traffic can have a larger impact on congestion on a congested network though and this is shown in Figure 3 below.

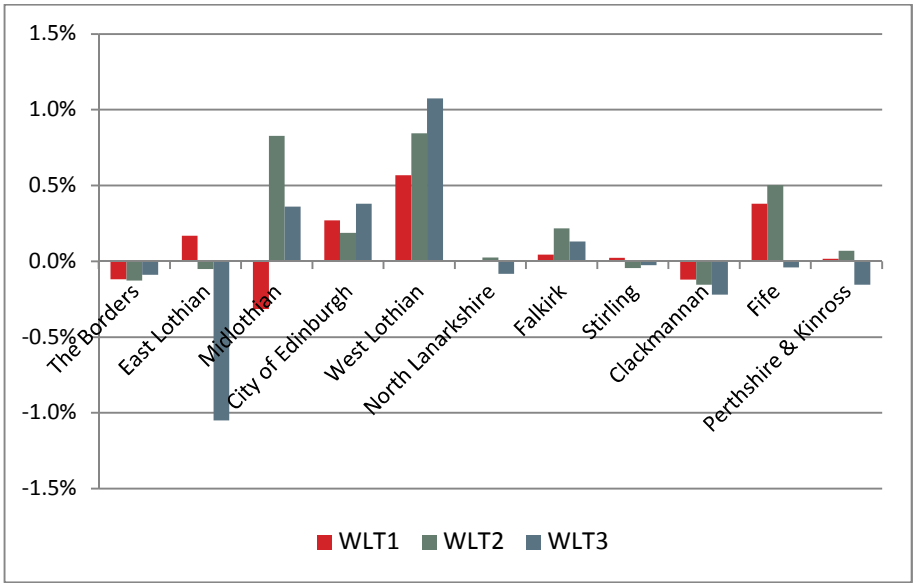


Figure 3. % Change in Congestion (Vehicle Hrs) v Base Case, 2024 (AM Peak)

5.2.5 The impact in terms of modelled congestion is therefore somewhat larger, with an increase of up to 1% across West Lothian. However impacts at this aggregate level remain small.

5.3 Network Level Impacts

5.3.1 The accompanying powerpoint includes a number of network based graphics. These are focussed on the incremental impact of each of the three scenario tests over the 2024 Base Case.

5.3.2 Slides 3-5 show where AM peak hour traffic is forecast to increase as a result of the new housing in each case using a colour coding. The AM peak forecasts have been used as the most significant traffic impacts tend to be seen during this period.

5.3.3 Slides 6-17 then show the forecast impact of this additional traffic in terms of (i) delays at junctions (in terms of total vehicle hours, then percentage change) and (ii) queuing on the network (number of vehicles), in each test scenario compared to the Base Case.

5.3.4 For these latter indicators, zoomed in images are provided for the M8 / A8 / A71 corridor and the M8 junction at Deer Park, where particular issues are noted.

5.3.5 Note that flows on the A706 northbound into Whitburn reduce in Scenario 3 compared to Scenario 1. This is primarily due to a reduced allocation in the Stoneyburn / Addiewell zone in Scenario 3 (Zone 197).

Scenario 1

5.3.6 Scenario 1 comprises an additional 2,137 homes. The main locations for this are Uphall (530, zone 41), Murieston (400, zone 203), Deans (202, zone 200), Livingston (155, zone 201) and Linlithgow (140, zone 46).

5.3.7 Figures 4 and 5 respectively below show the forecast distribution of all AM peak traffic originating in the two main development zones in this scenario, Uphall (z41) and Murieston (z203).

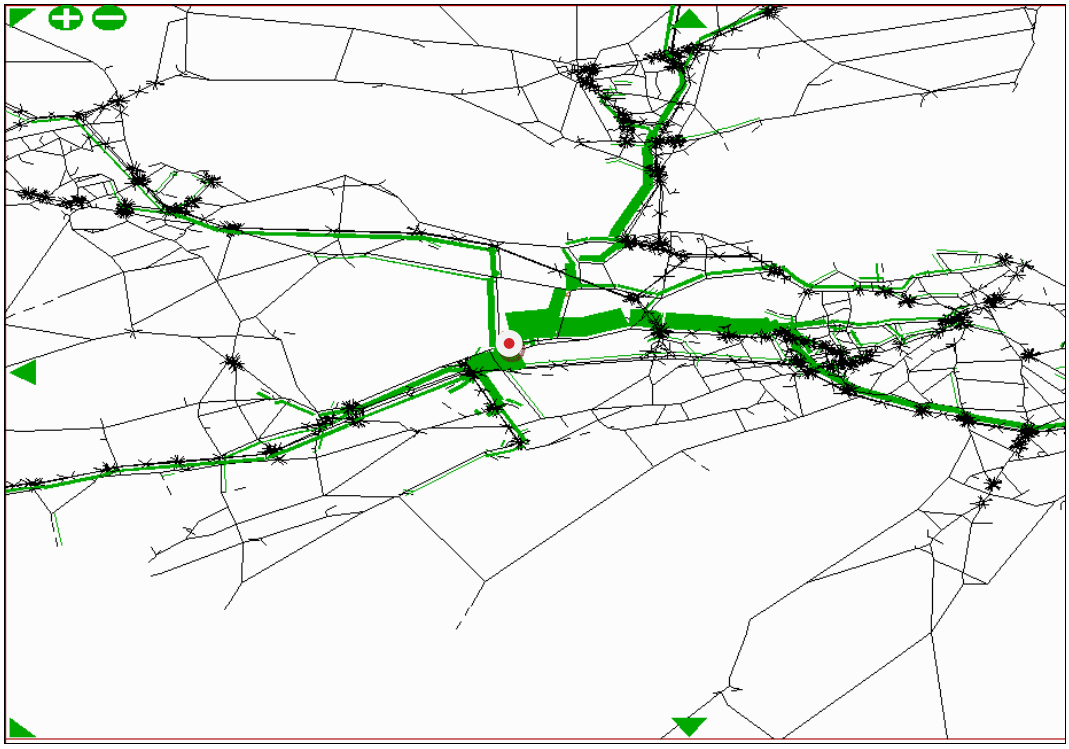


Figure 4. 2024 AM Peak forecast traffic originating in z41 Uphall (Scenario 1)

5.3.8 Traffic from Uphall is seen to access the M9 westbound via the B8046, the Queensferry Crossing via Winchburgh and the A904. The A720 is accessed via the A8 with very little impact on the M8.

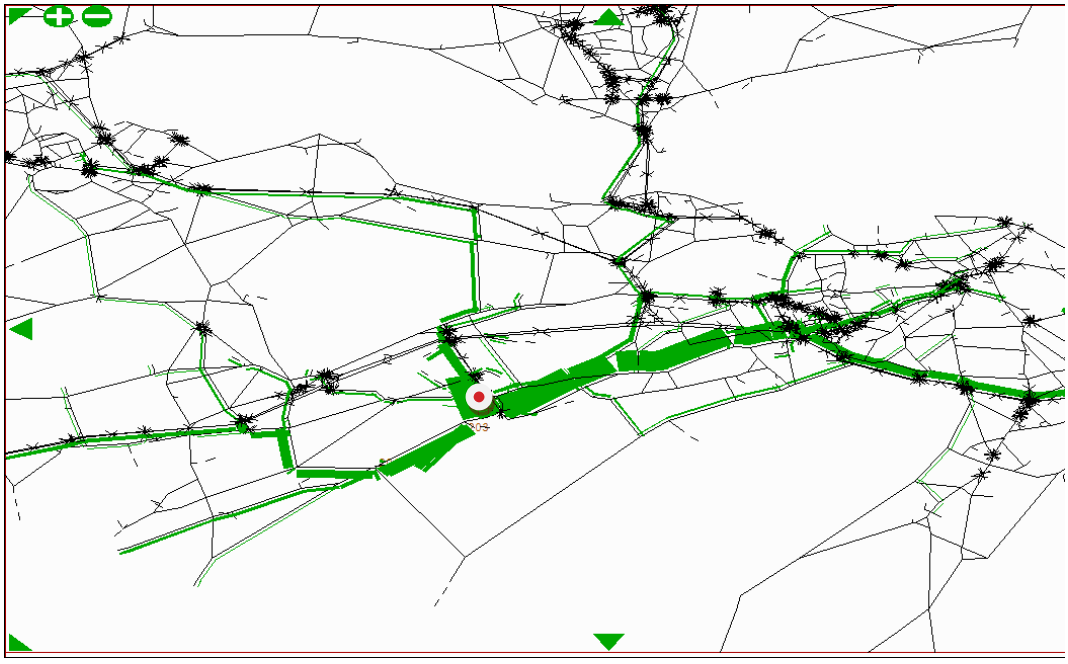


Figure 5. 2024 AM Peak forecast traffic originating in z203 Murieston (Scenario 1)

5.3.9 Traffic from the Murieston area is much more concentrated on the A71 corridor. Smaller amounts of traffic head north across the Forth, and west on the M8 and M9.

5.3.10 The impact of the additional traffic associated with these developments can be seen in

Slide 3. These developments result in traffic increases across the strategic network although the absolute increase in traffic is low. Additional flow is seen on the M8 eastbound, the Queensferry Crossing northbound, the A8, the A71, the A70 and the A720 Edinburgh City Bypass.

5.3.11 In terms of queues and junction delays (Slides 6 & 7), junctions where local issues emerge (where total absolute hourly delay increases by more than five hours (ie summed across all vehicles), yellow and orange dots on slide 6) are:

- M8 Junction 3 Deer Park: increased queuing at the A899 / M8 merge eastbound, due to increased through and merging traffic
- A71 at Murieston: this delay is associated with a zone loading point, so can be discounted although it is indicative of increased traffic in this general area
- Barnton junction A90 approach from Queensferry: due to increased traffic on the B8090 from Kirkliston to the A90
- M8 Claylands: increased queuing on merge from Newbridge to eastbound M8 – additional traffic on both the main M8 and the link from Newbridge
- Lanark Road / B701 Junction – due to increased eastbound traffic

Scenario 2

5.3.12 Scenario 2 includes a further 530 houses with significant additional housing at Uphall (+120), Linlithgow (+500).

5.3.13 Figure 6 shows the forecast routing of traffic from Linlithgow in the AM peak hour.

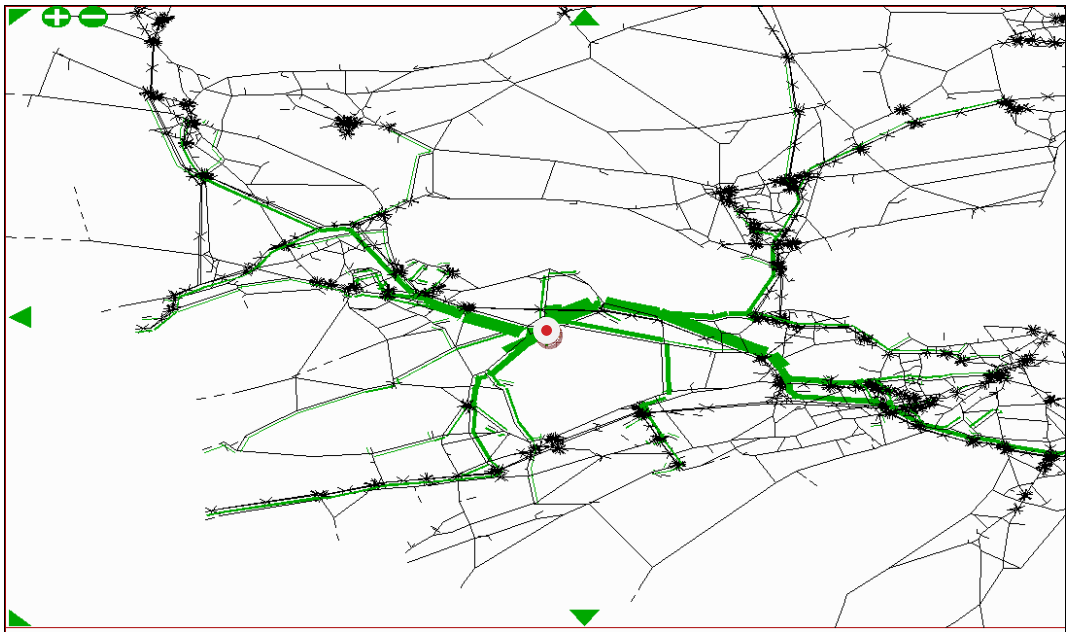


Figure 6. 2024 AM Peak forecast traffic originating in z46 Linlithgow (Scenario 2)

5.3.14 The M9 is clearly the main focus of Linlithgow related traffic. Both the A8 and M8 are used from Newbridge eastwards depending on the ultimate destination of this traffic.

5.3.15 The impact of these additional houses at Linlithgow is clearly seen with increases traffic relative to Scenario 1 on the M9, M8, and A8 (see Slide 4).

5.3.16 In terms of junction delays / queues the main impacts are as follows (relative to Scenario

1):

- Linlithgow High Street / B9080 / A803 roundabout: increased queuing from Linlithgow direction, associated with the extra Linlithgow housing;
- increased delays at the M8 J3 eastbound merge; and
- slight reduction in delays on the A71 at Murieston and also Lanark Road / B701. This is likely to be due to the redistribution of commuting trips noted above.

Scenario 3

5.3.17 Scenario 3 adds a further 800 net new houses. The main focus of this is Wilkieston and East Calder (z34) with a further 400 and Winchburgh (z42) which also has an additional 400 houses compared to Scenarios 1 and 2. Figures 7 and 8 show the forecast distribution of traffic from these zones in the AM peak hour.

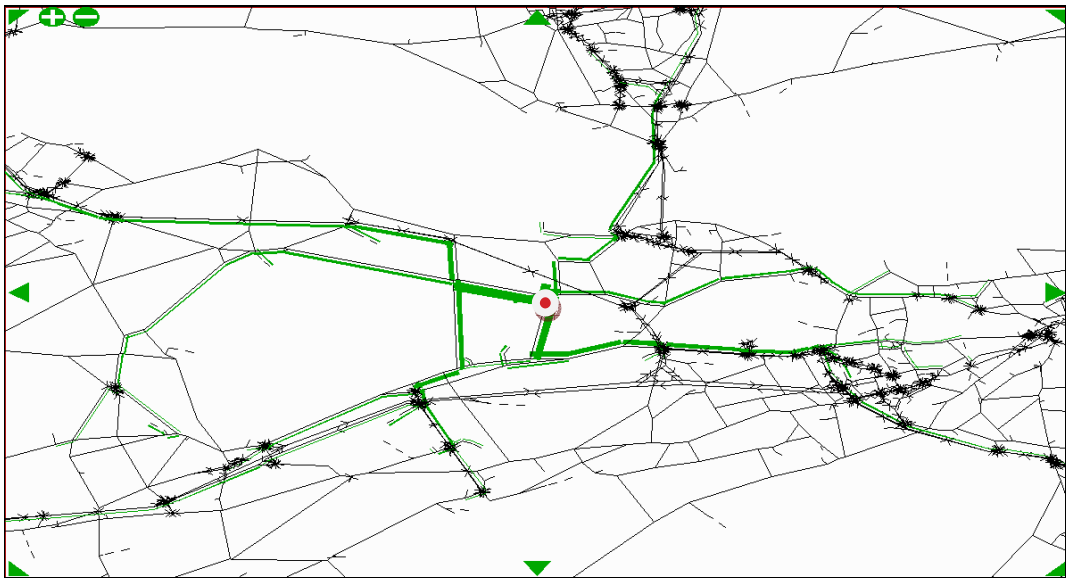


Figure 7. 2024 AM Peak forecast traffic originating in z42 Winchburgh (Scenario 3)

5.3.18 Note that no bespoke junction for Winchburgh has been coded at present. Traffic is therefore routing via the B9020 and B9080 to access the A89 and A90.

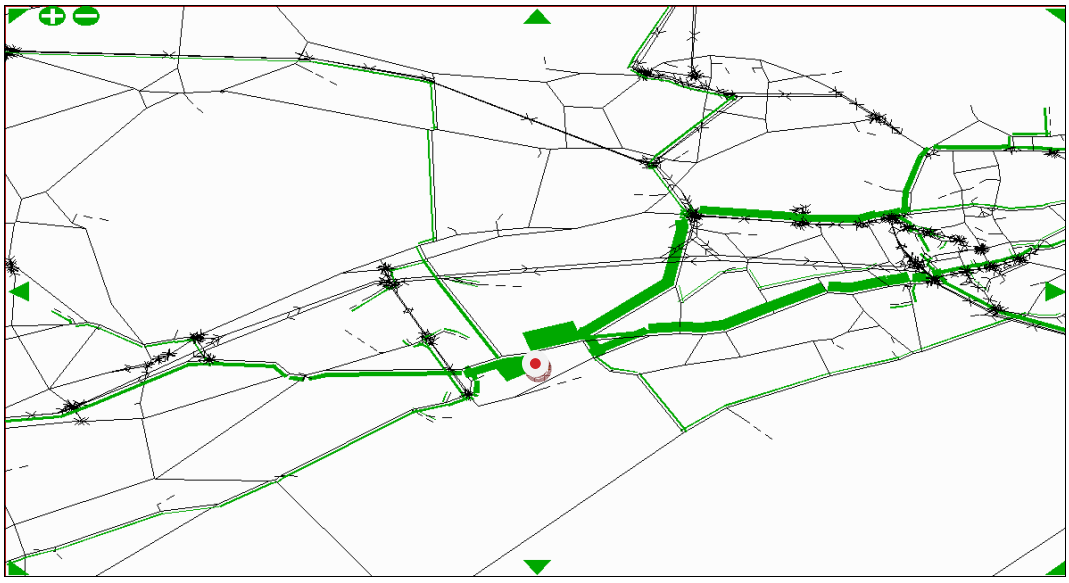


Figure 8. 2024 AM Peak forecast traffic originating in z34 Wilkieston & East Calder (Scenario 3)

5.3.19 Most traffic from this area is routing via the A71. The B7030 is used to provide access to Newbridge and then A8 / M9 / M90.

5.3.20 Compared to Scenario 2, the main locations where issues emerge are:

- Further deterioration at M8 J3;
- Further congestion at Barnton junction A90 approach from Queensferry due to increased traffic on the B8090 from Kirkliston to the A90, some of this is attributed to the additional housing at Winchburgh;
- A71 Wilkieston / B7030 signals: eastbound increased delay due to additional A71 traffic

5.4 Key Development Sites - Select Link Analysis

5.4.1 Slides 18-22 show how the traffic from the major development zones (shown above) is forecast to dissipate across the network as a proportion of general traffic. This 'select link' analysis shows the percentage of forecast traffic on each link which has its origin in each of the five major development zones discussed previously above. We have adjusted this analysis so that only the *additional* traffic in the zone (ie attributable to the additional development) is accounted for in the graphics. The graphics show a colour coding based on these percentages.

5.4.2 The following zones have been analysed using an AM Peak run of Scenario 3 as a 'worst case' for illustrative purposes. The five zones considered are:

- Zone 34 (Wilkieston & East Calder);
- Zone 41 (Uphall);
- Zone 42 (Winchburgh);
- Zone 46 (Linlithgow); and
- Zone 203 (Murieston).

5.4.3 From these graphics, it can be seen how the share of traffic associated with each development rapidly diminishes as you move away from the zone.

5.4.4 The green shades show where development traffic is forecast to be <1%, 1%-5%, and 5%-10% of total traffic. In general, it can be seen that the traffic associated with these developments forms a very low share of trunk roads in particular.

APPROVAL

Version	Name		Position	Date	Modifications
1	Author	Scott Leitham	Managing Consultant	29/11/2013	
	Checked by			DD/MM/YY	
	Approved by			DD/MM/YY	
2	Author	Scott Leitham	Managing Consultant	06/12/2013	
	Checked by			DD/MM/YY	
	Approved by			DD/MM/YY	
3	Author	Scott Leitham	Managing Consultant	24/03/14	Additional select link analysis added
	Checked by				
	Approved by				

West Lothian Council
Local Development Plan Modelling, 2024 Forecasts

MVA
SYSTRA GROUP

Contents

Flow increase images

- Test 1 v Committed Scenario
- Test 2 v Committed Scenario
- Test 3 v Committed Scenario
  - Increase in demand flow (PCUS)

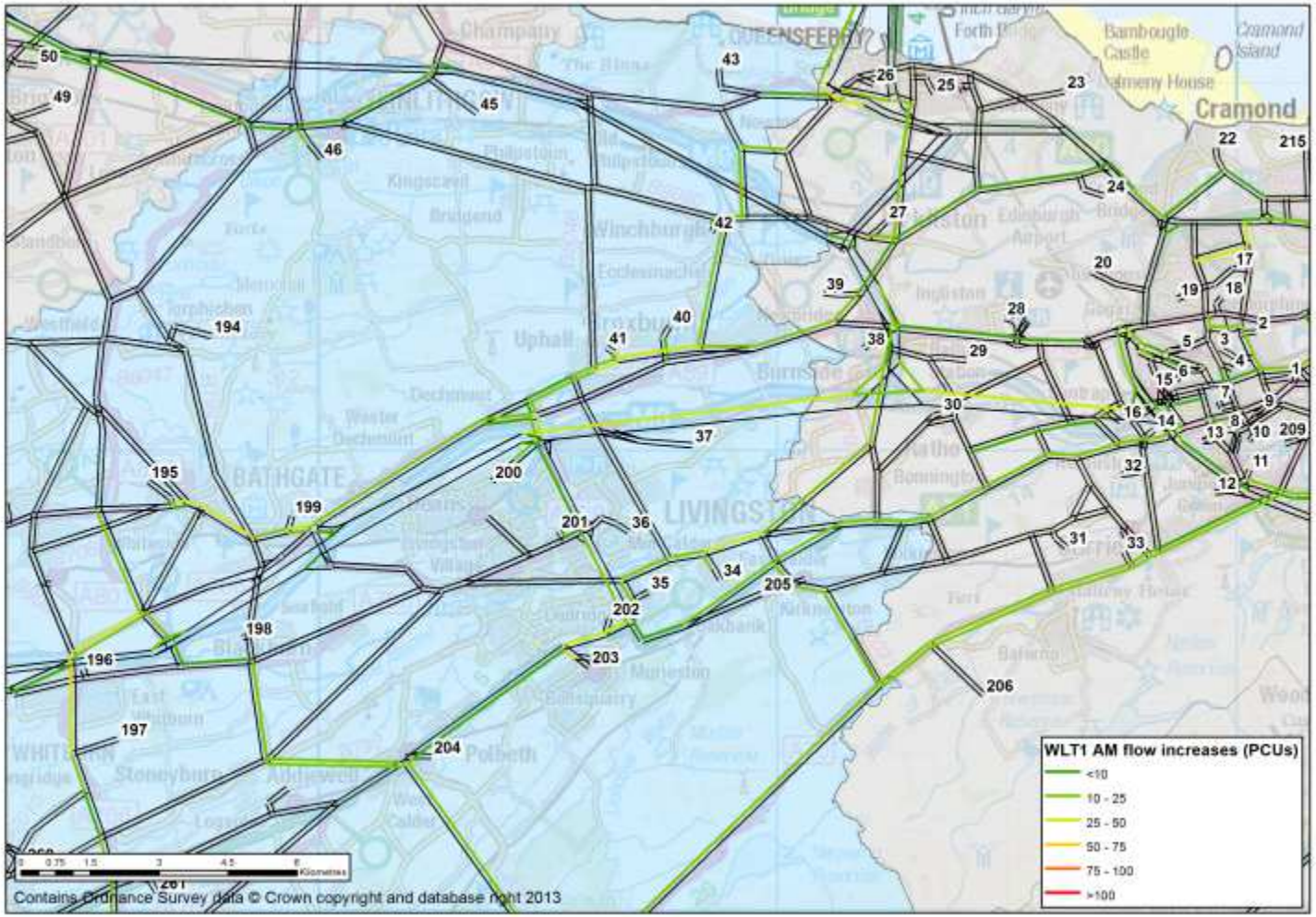
Delay and queue images

- Test 1 v Committed Scenario
- Test 2 v Committed Scenario
- Test 3 v Committed Scenario
  - Change in junction delay (hours)
  - Change in average queue length (PCUs)
  - Change in junction delay (%)

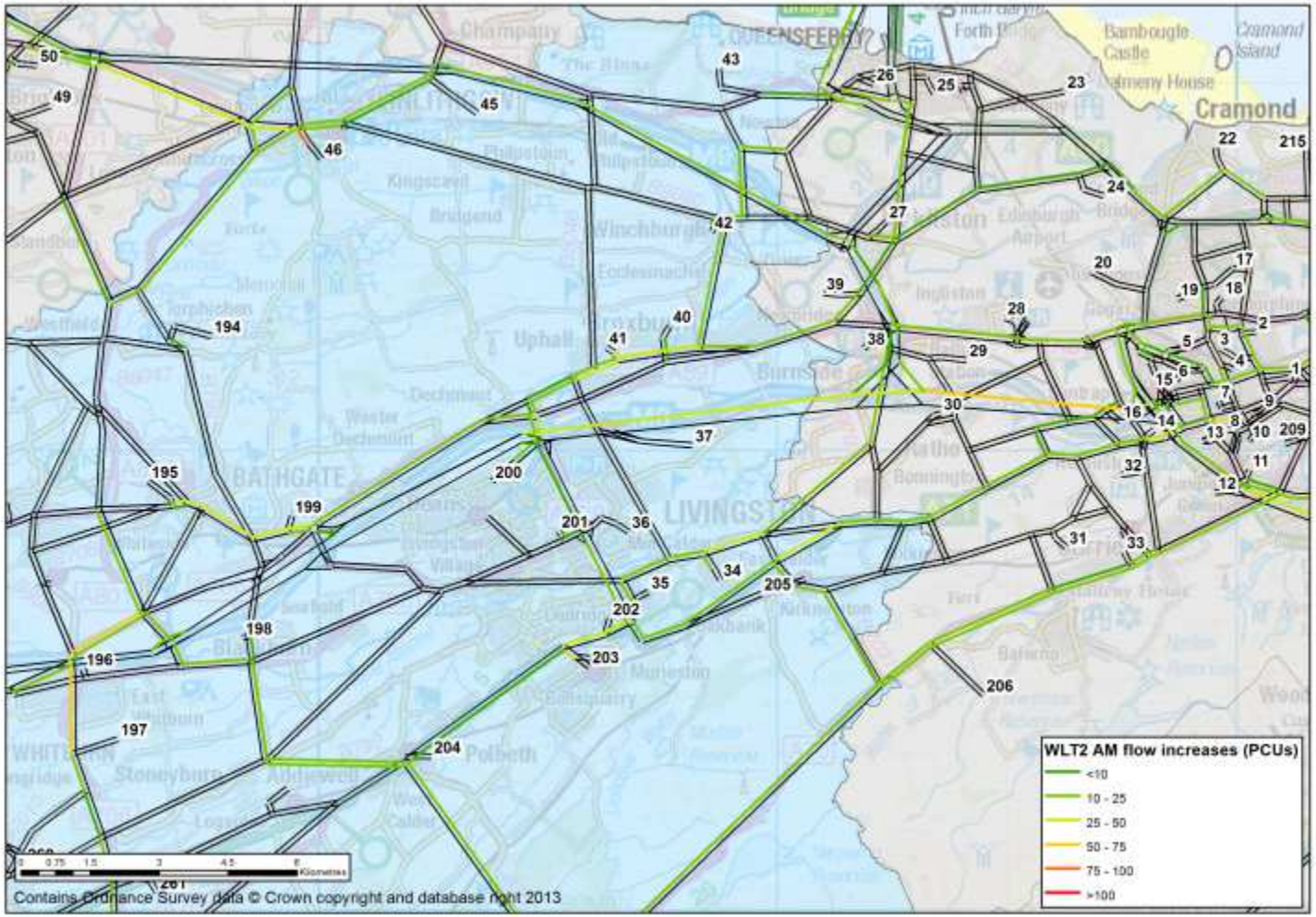
'Select Link' Analysis on Key Development Zones

- Test 3: Zones 34 (Wilkieston & East Calder), 41 (Uphall), 42 (Winchburgh), 46 (Linlithgow), 203 (Murieston)

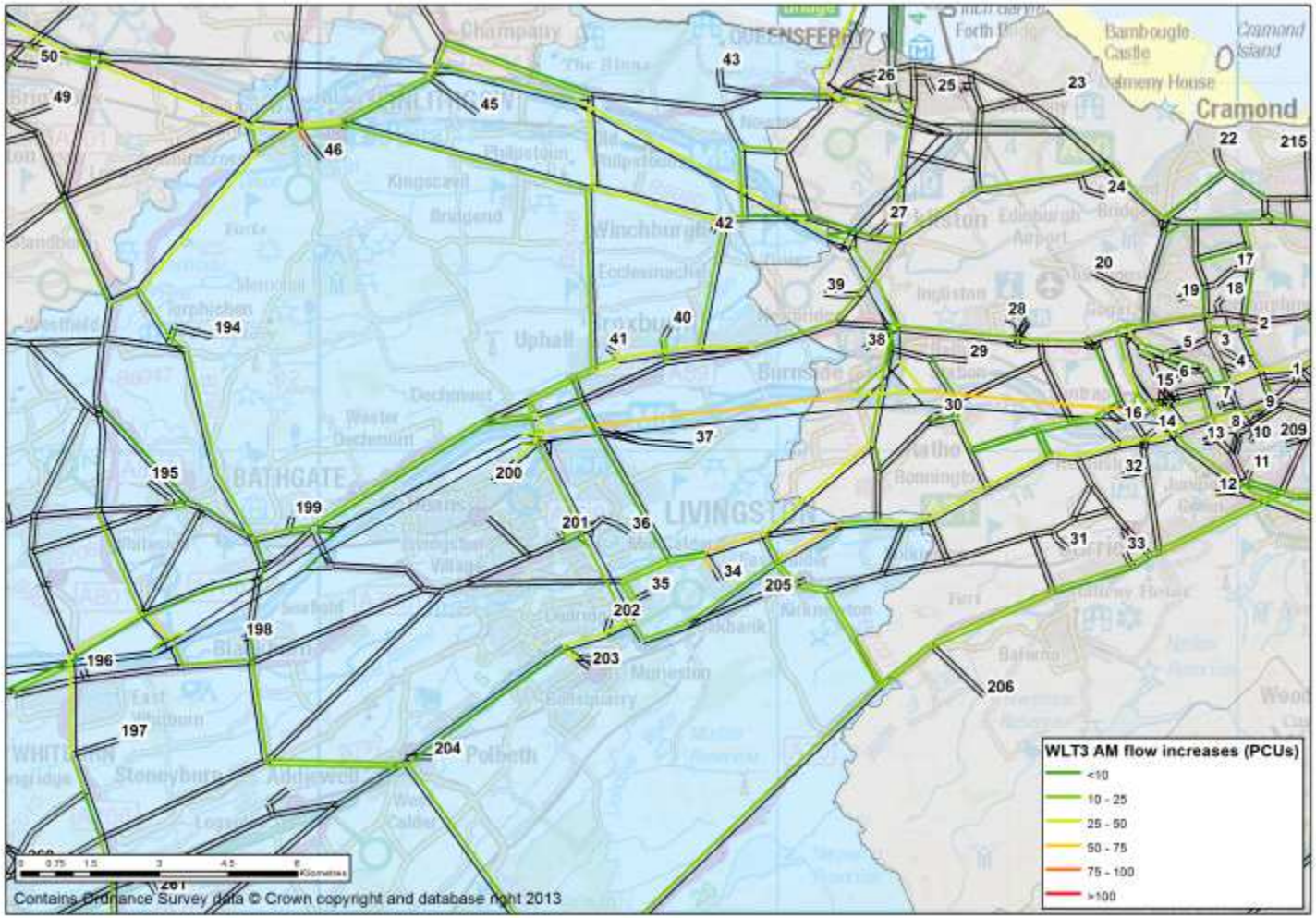
LDP Test Scenario 1 v Committed Scenario – flow increases



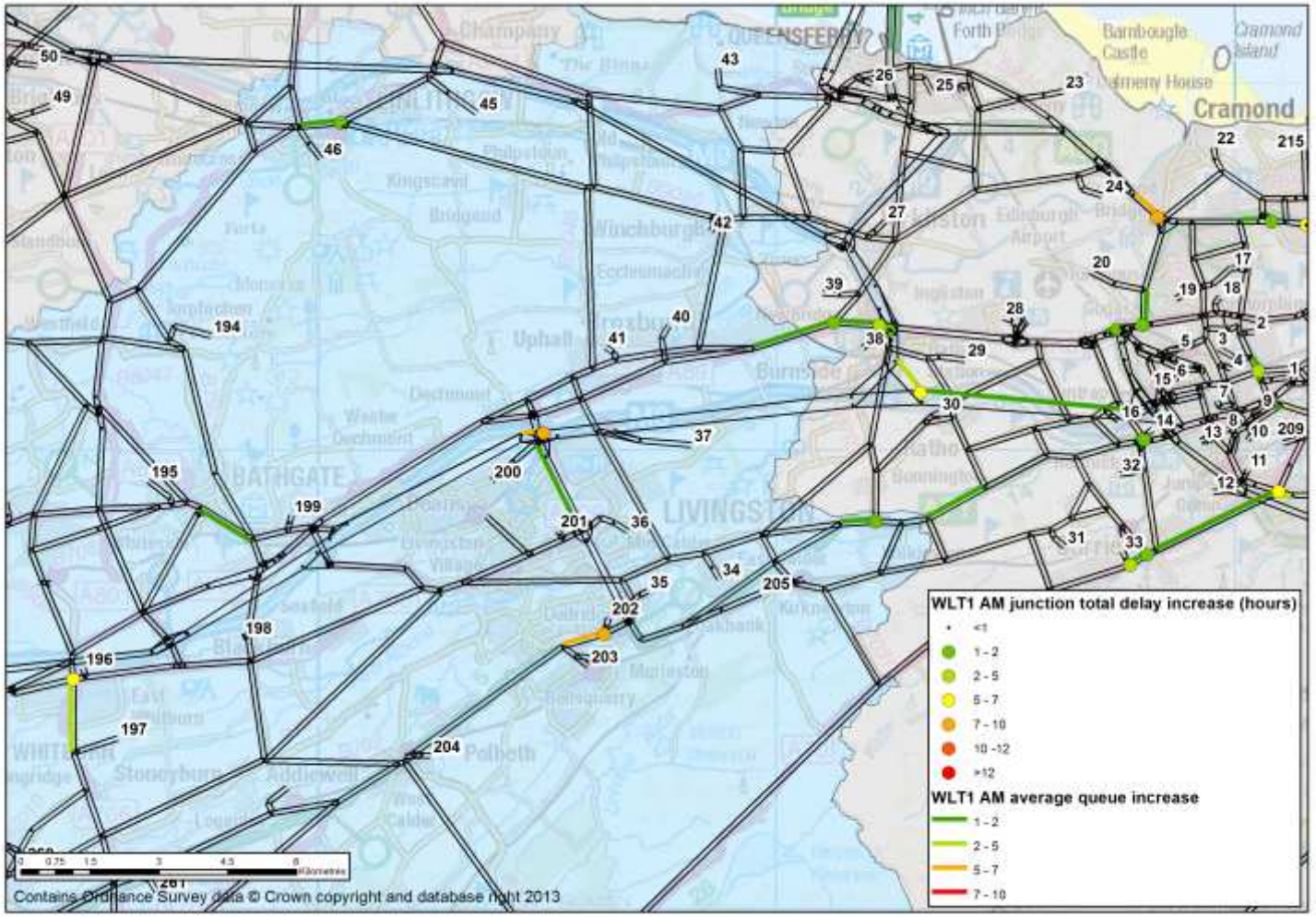
LDP Test Scenario 2 v Committed Scenario – flow increases



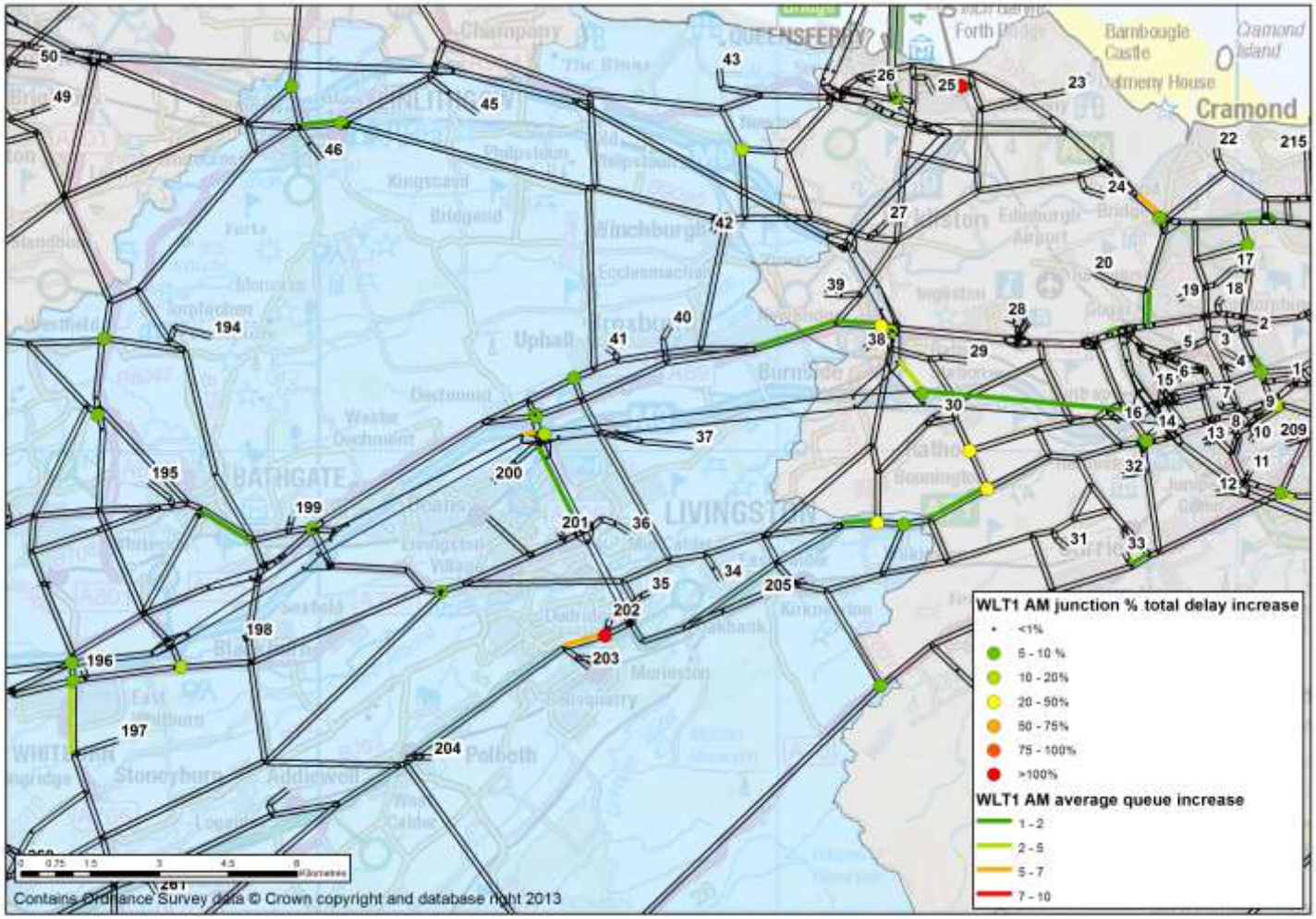
LDP Test Scenario 3 v Committed Scenario – flow increases



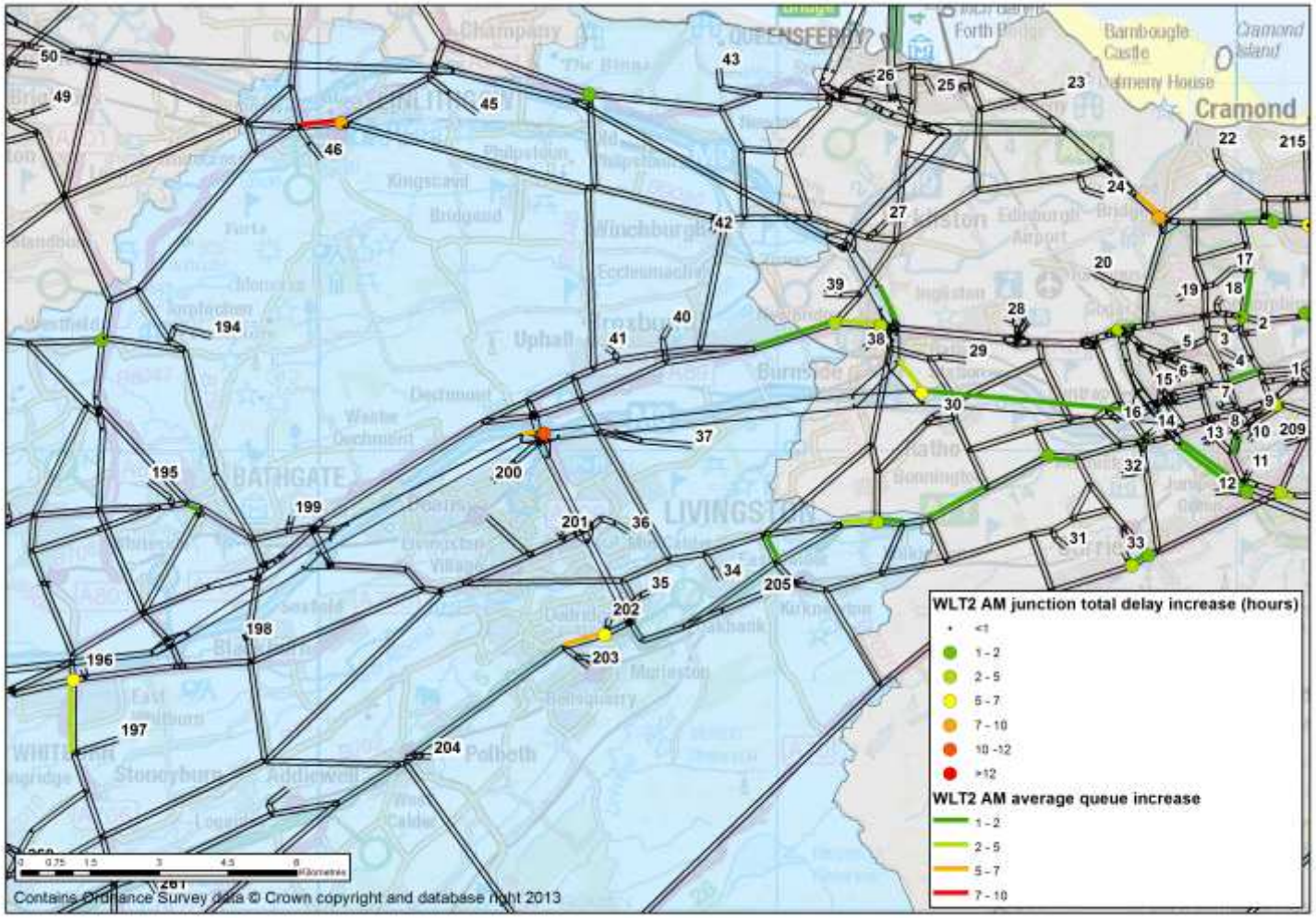
LDP Test Scenario 1 v Committed Scenario – delays and queues



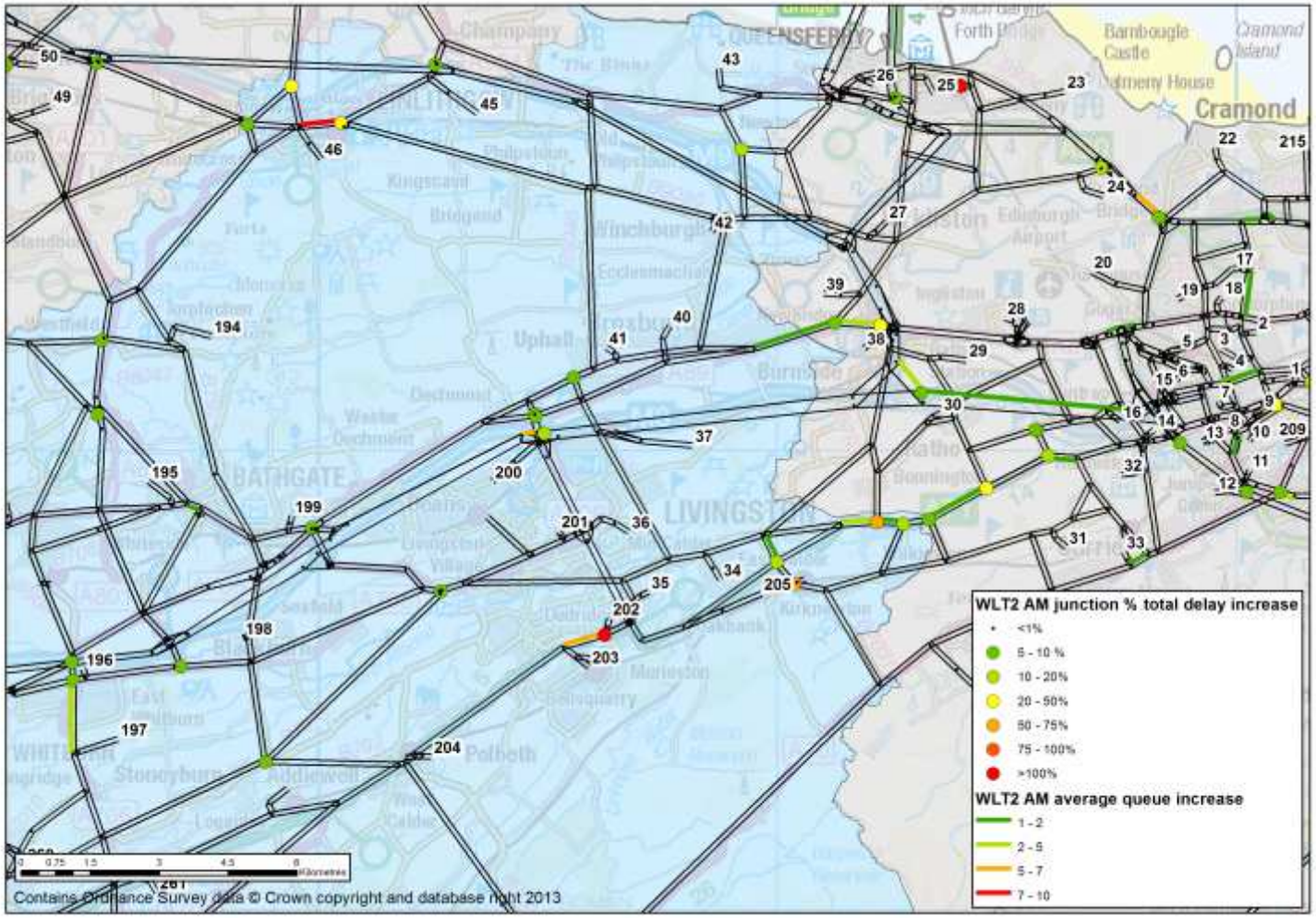
LDP Test Scenario 1 v Committed Scenario – %delays and queues



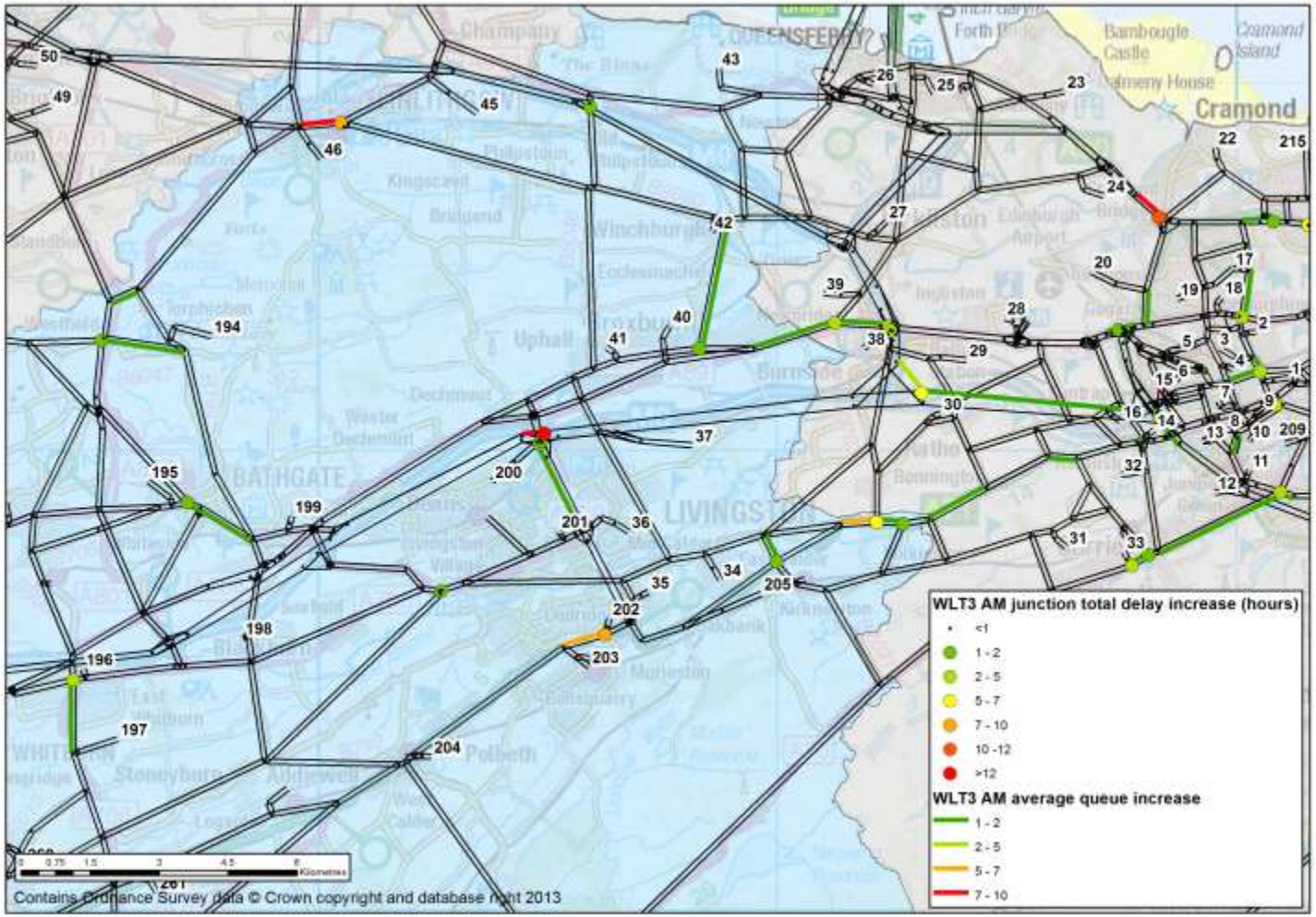
LDP Test Scenario 2 v Committed Scenario – delays and queues



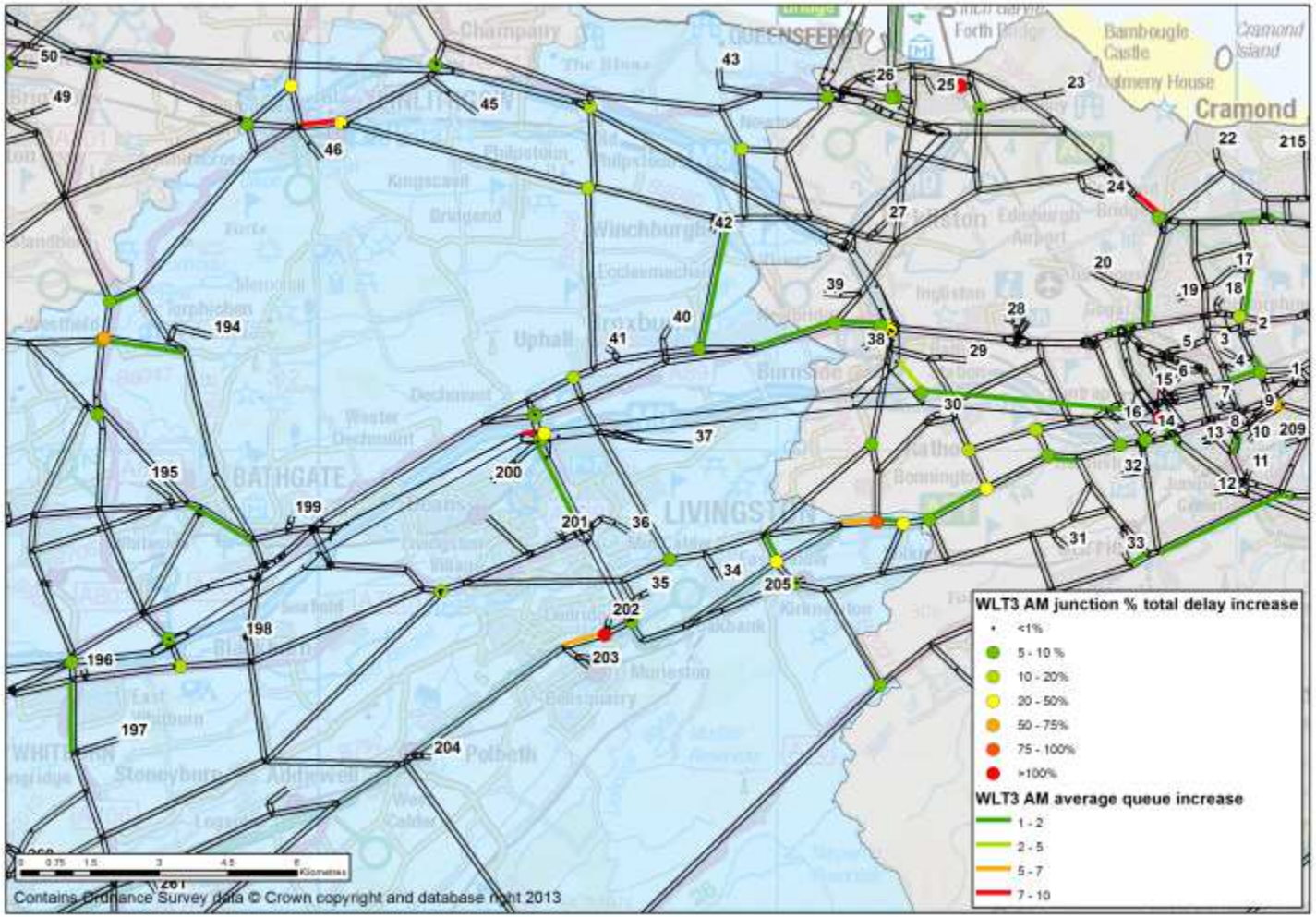
LDP Test Scenario 2 v Committed Scenario – %delays and queues



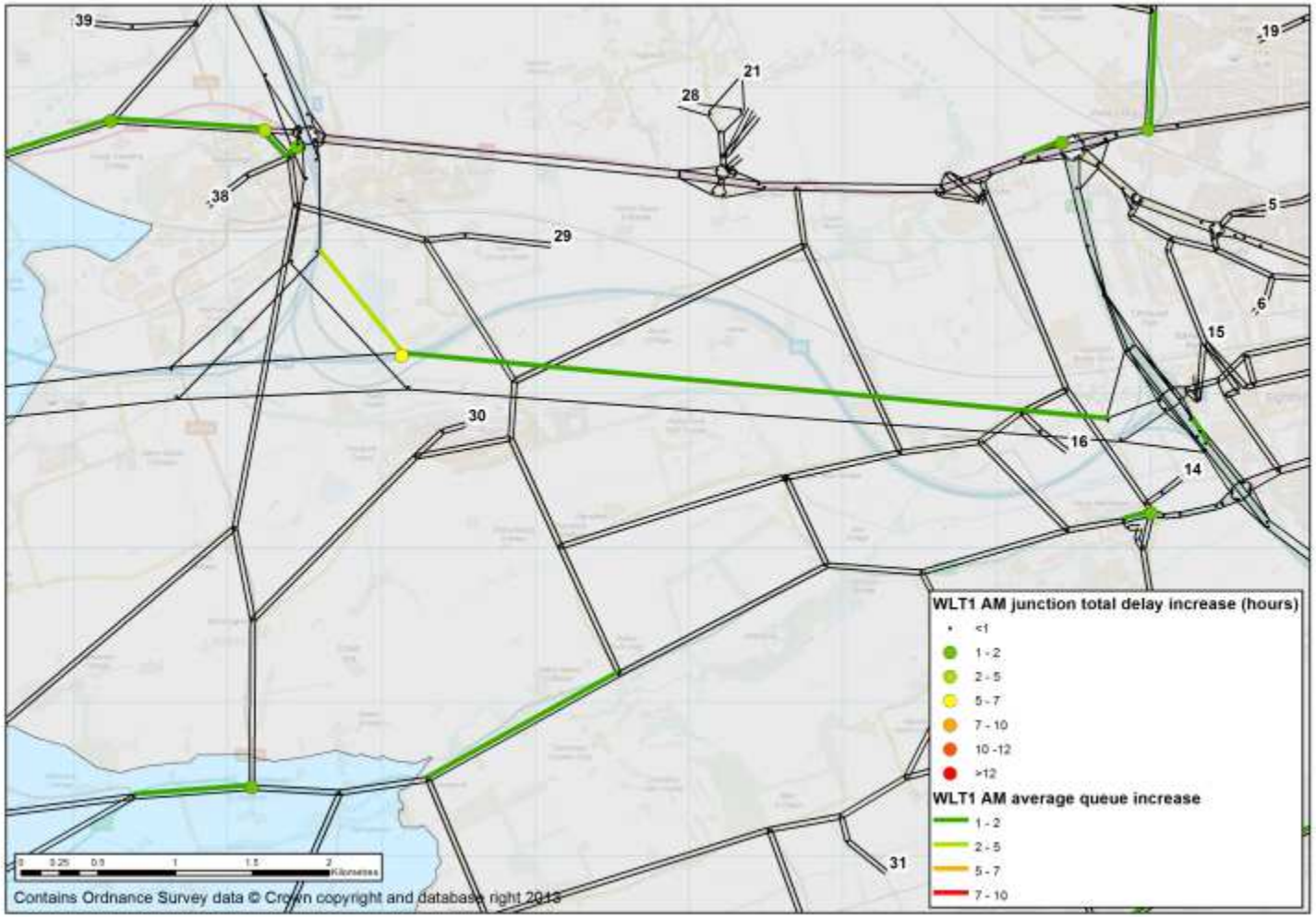
LDP Test Scenario 3 v Committed Scenario – delays and queues



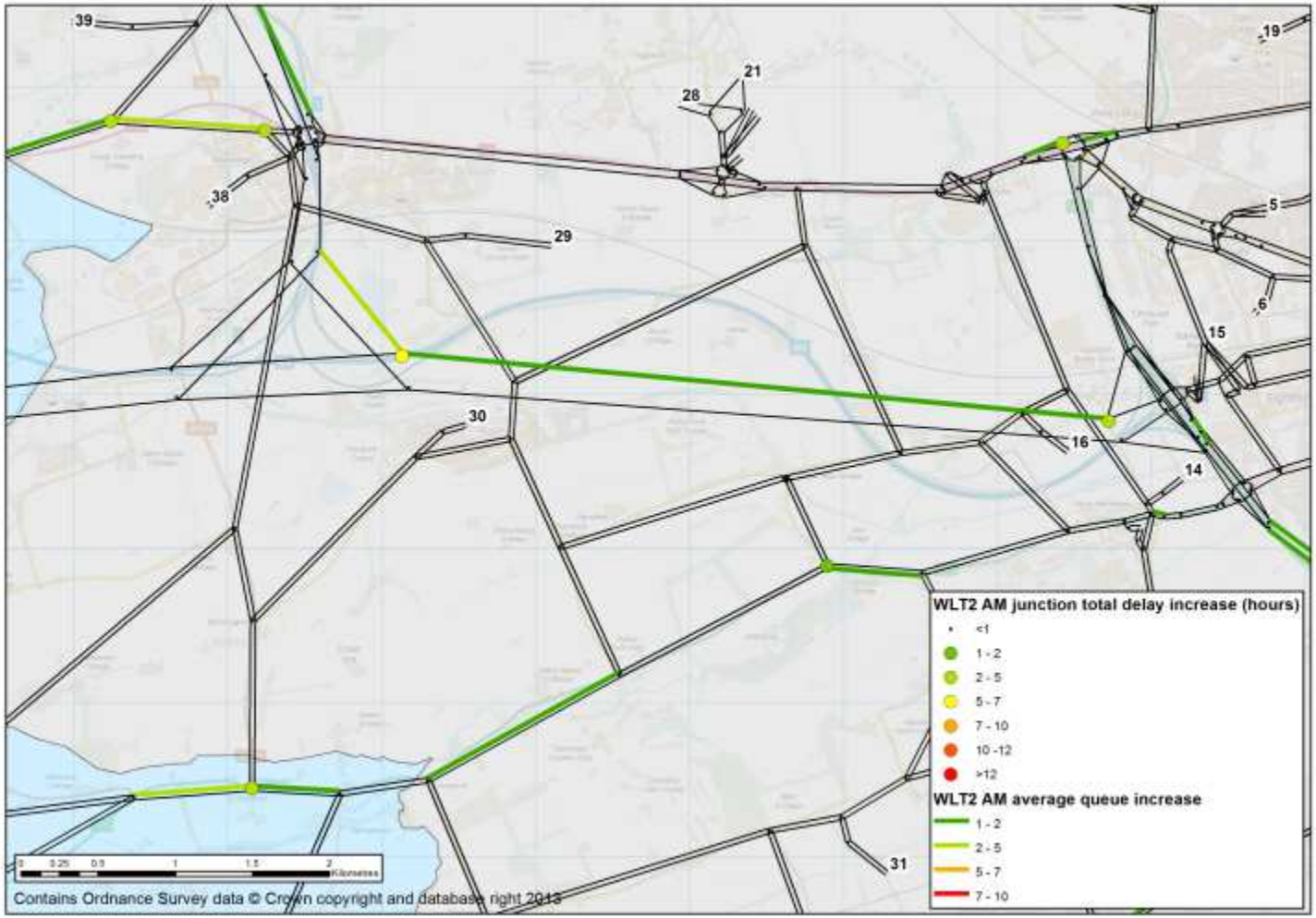
LDP Test Scenario 3 v Committed Scenario – %delays and queues



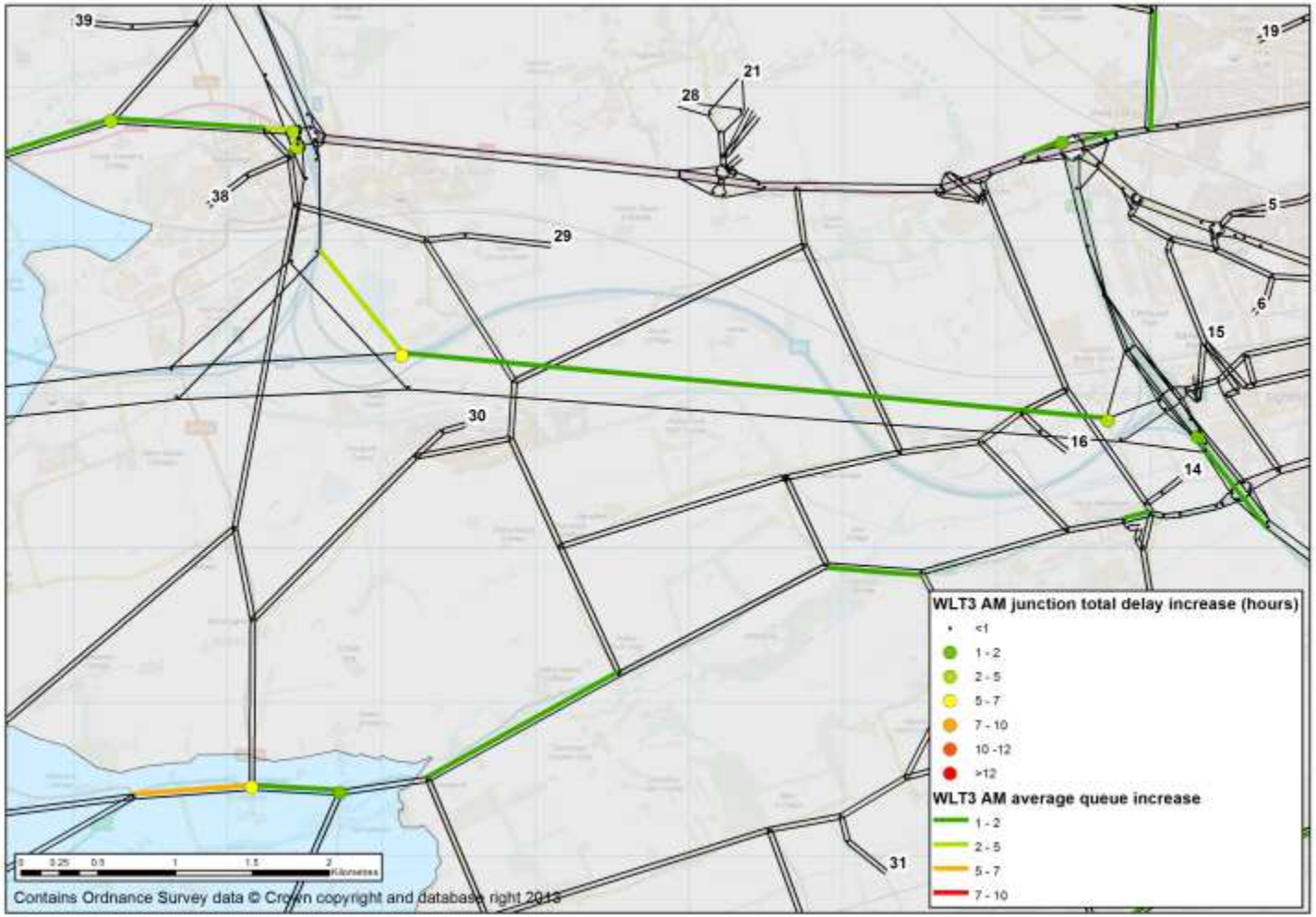
LDP Test Scenario 1 v Committed Scenario – delays and queues between Newbridge and Hermiston



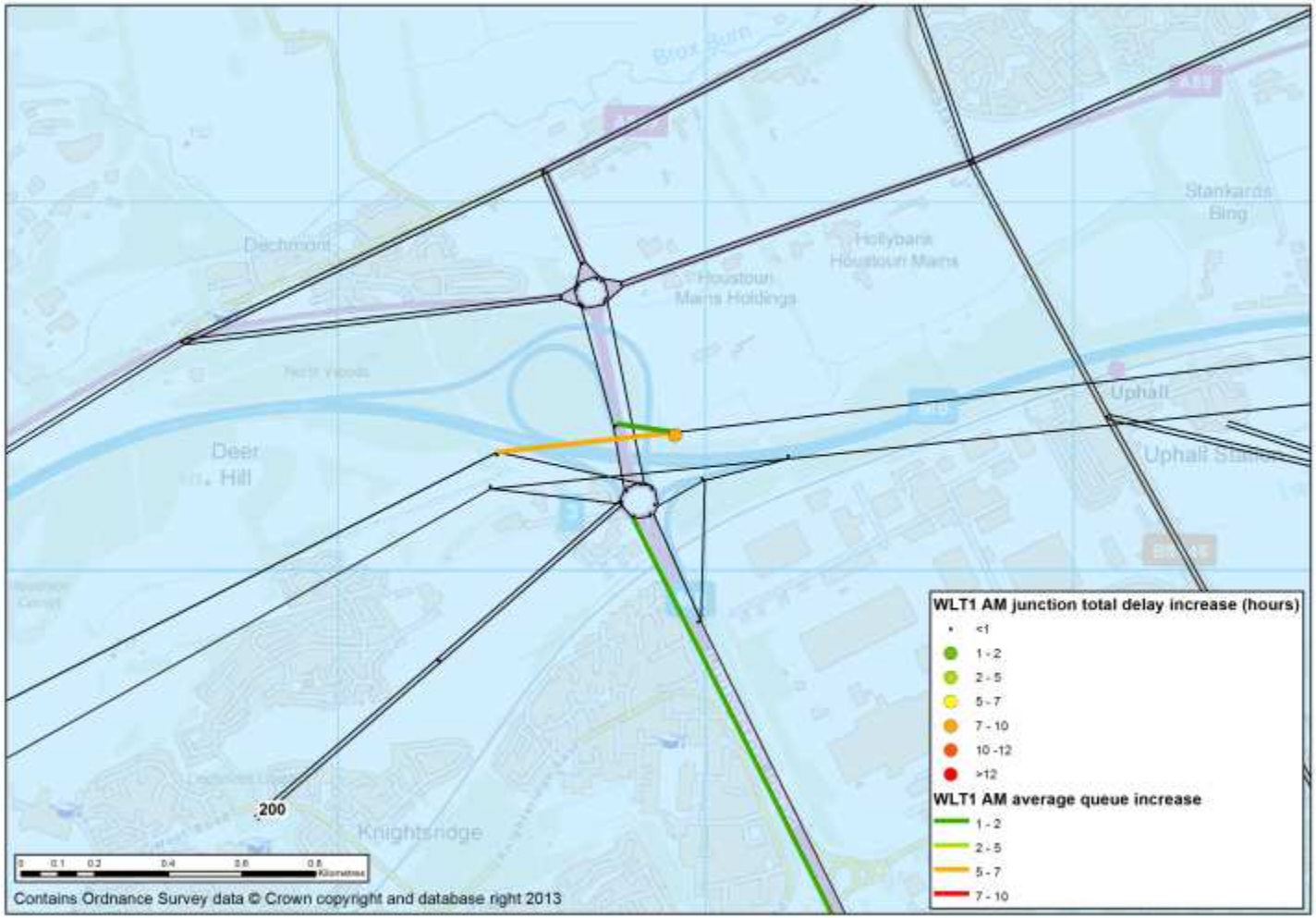
LDP Test Scenario 2 v Committed Scenario – delays and queues between Newbridge and Hermiston



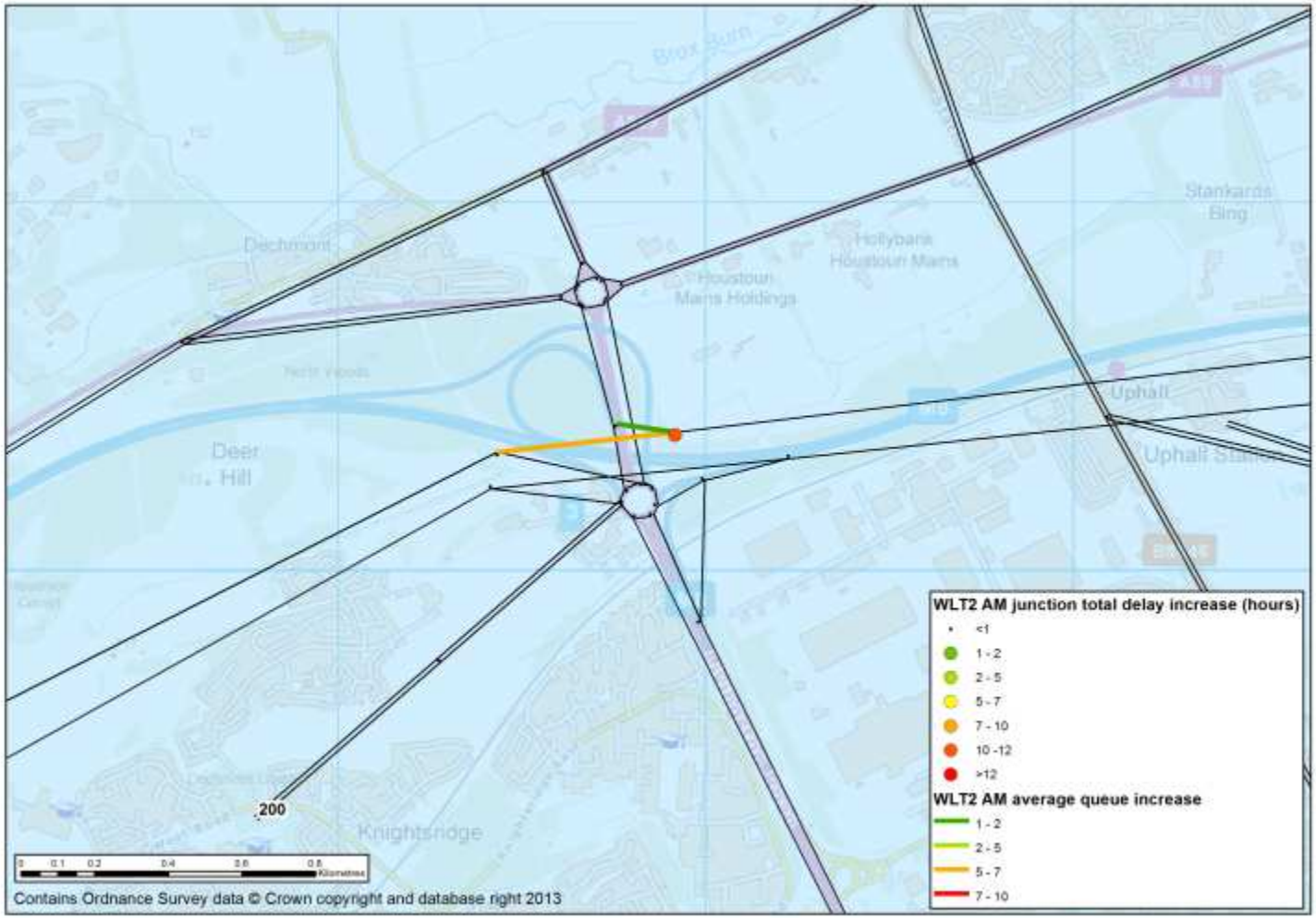
LDP Test Scenario 3 v Committed Scenario – delays and queues between Newbridge and Hermiston



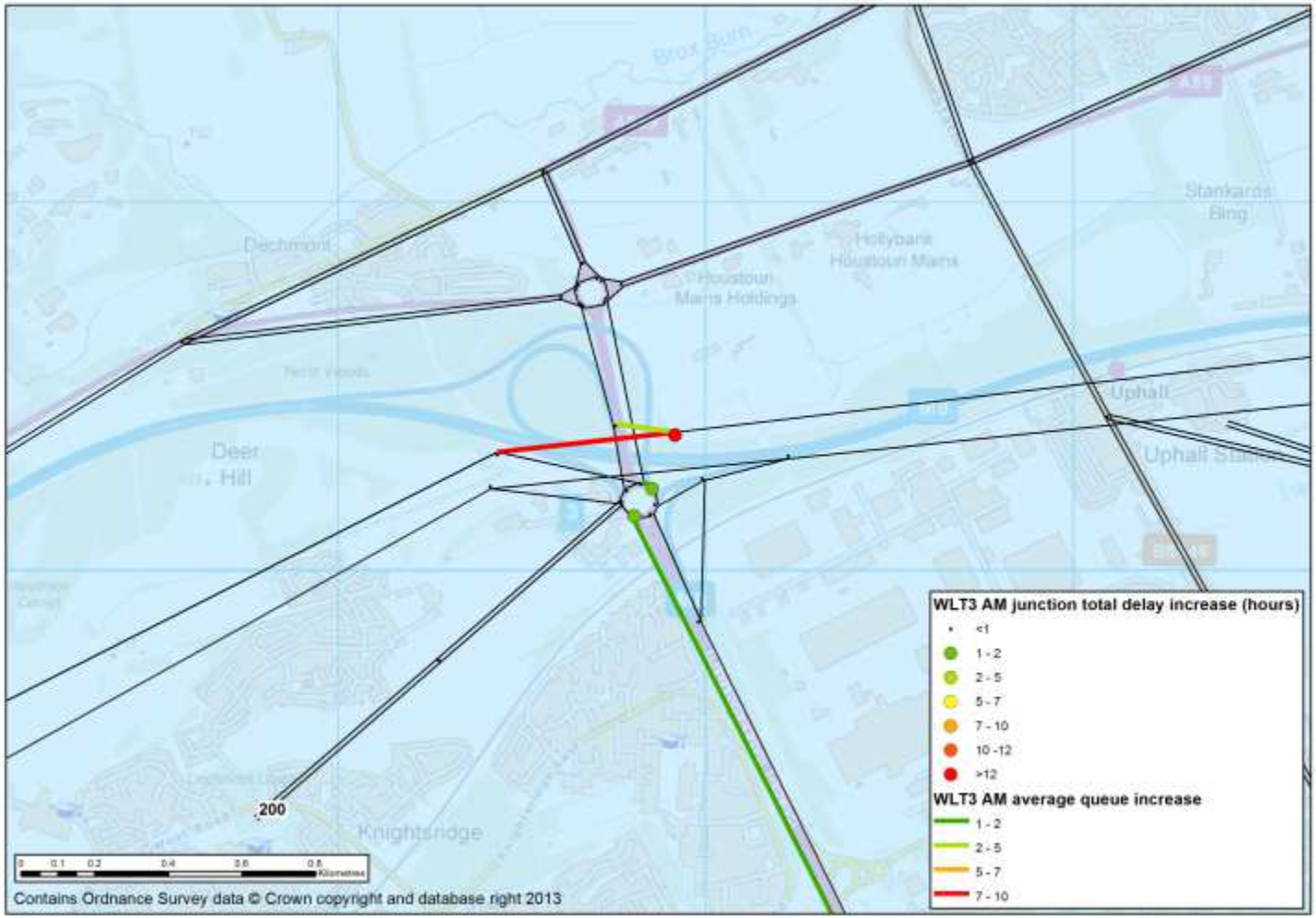
LDP Test Scenario 1 v Committed Scenario – delays and queues at Deer Park/M8 J3



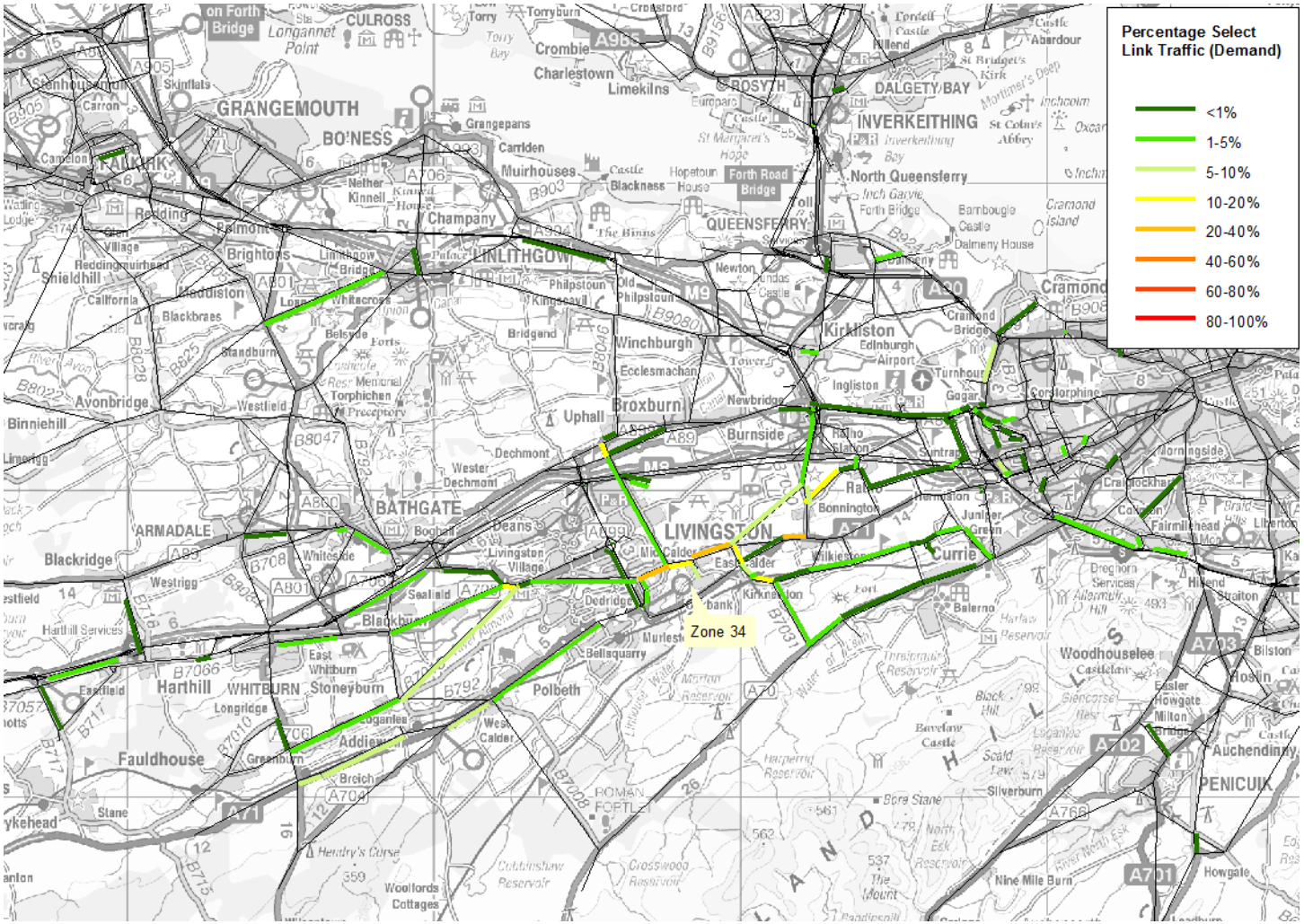
LDP Test Scenario 2 v Committed Scenario – delays and queues at Deer Park/M8 J3



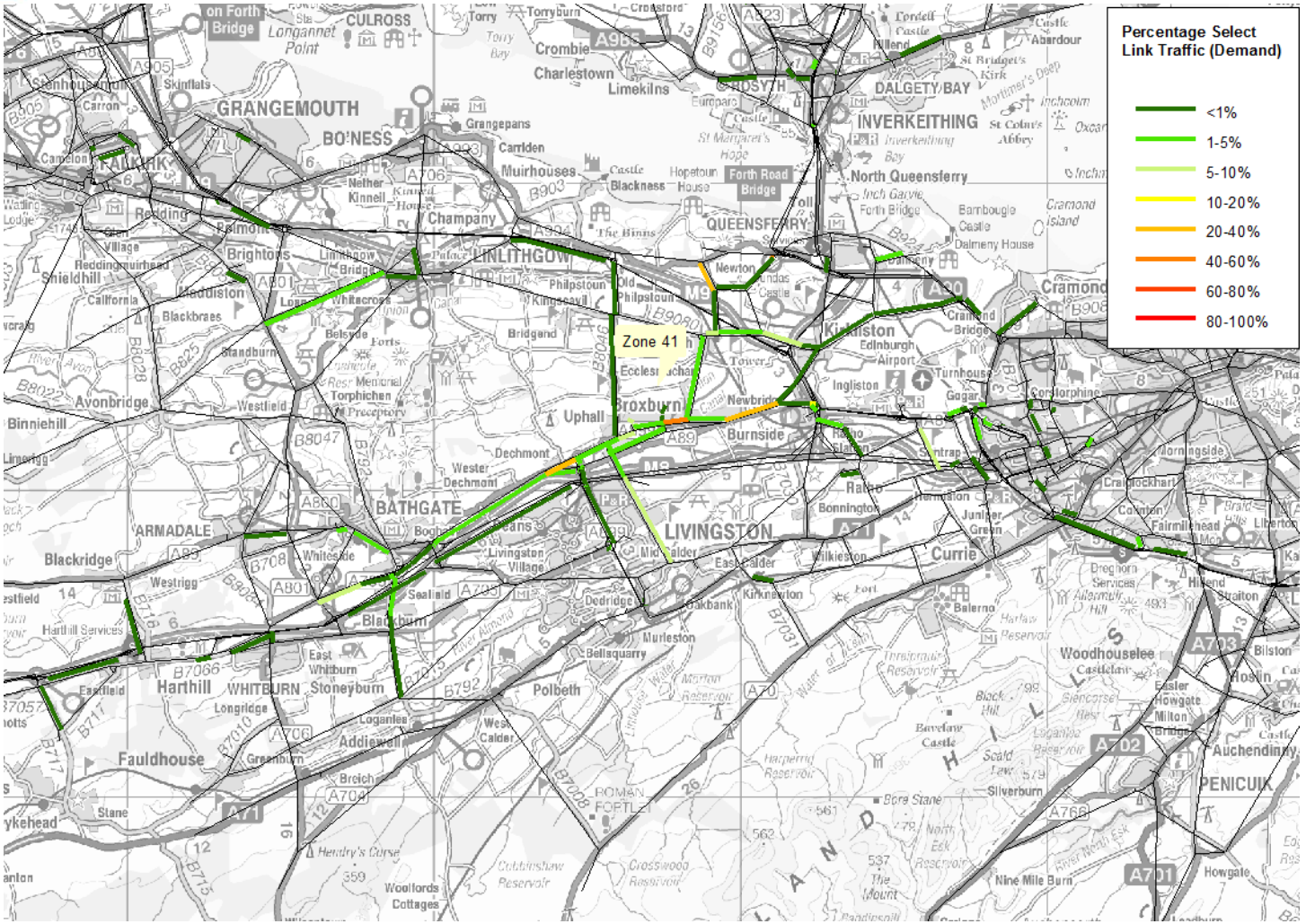
LDP Test Scenario 3 v Committed Scenario – delays and queues at Deer Park/M8 J3



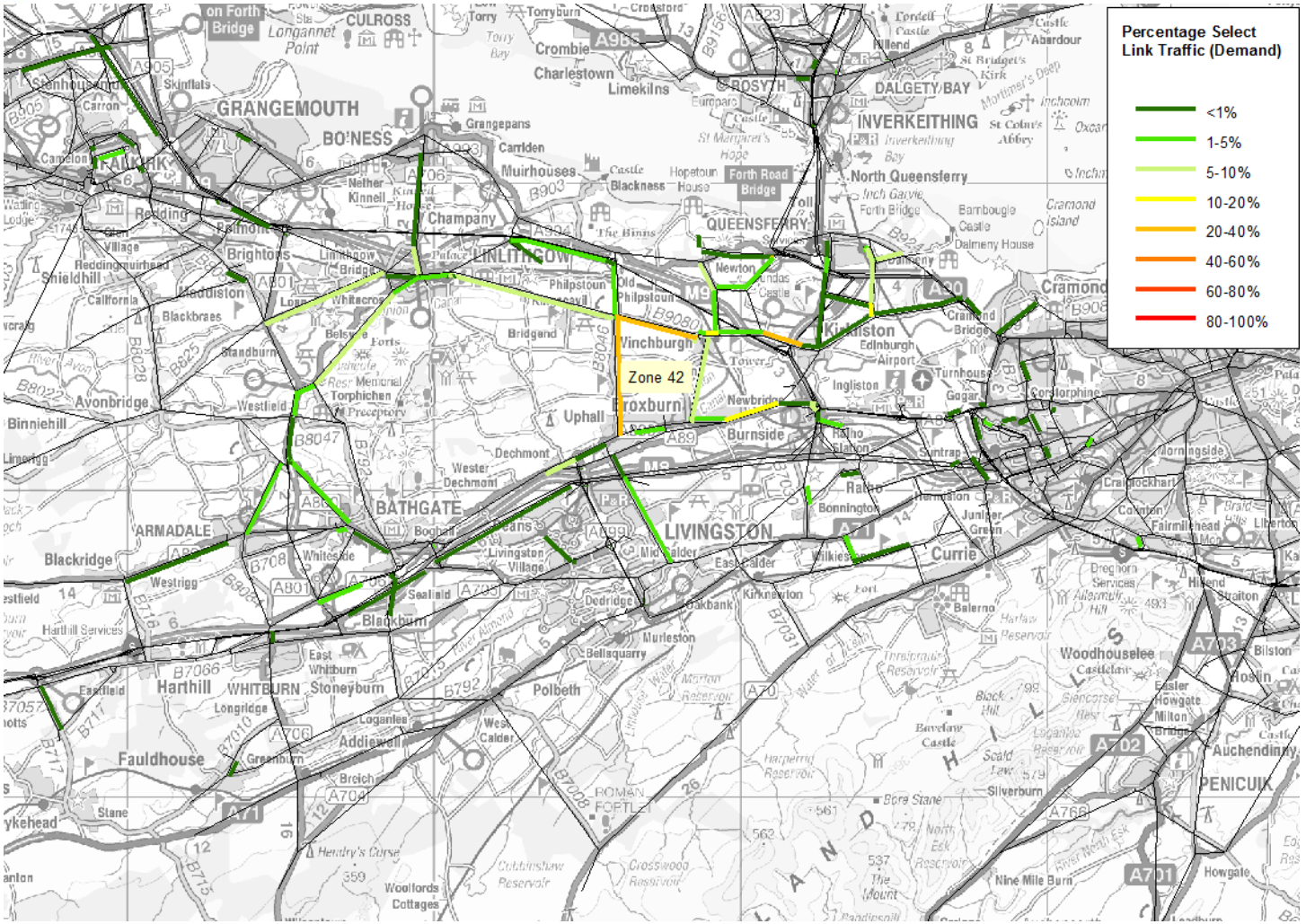
Zone 34 Wilkieston / East Calder, AM Peak Select Link Analysis, Test Scenario 3



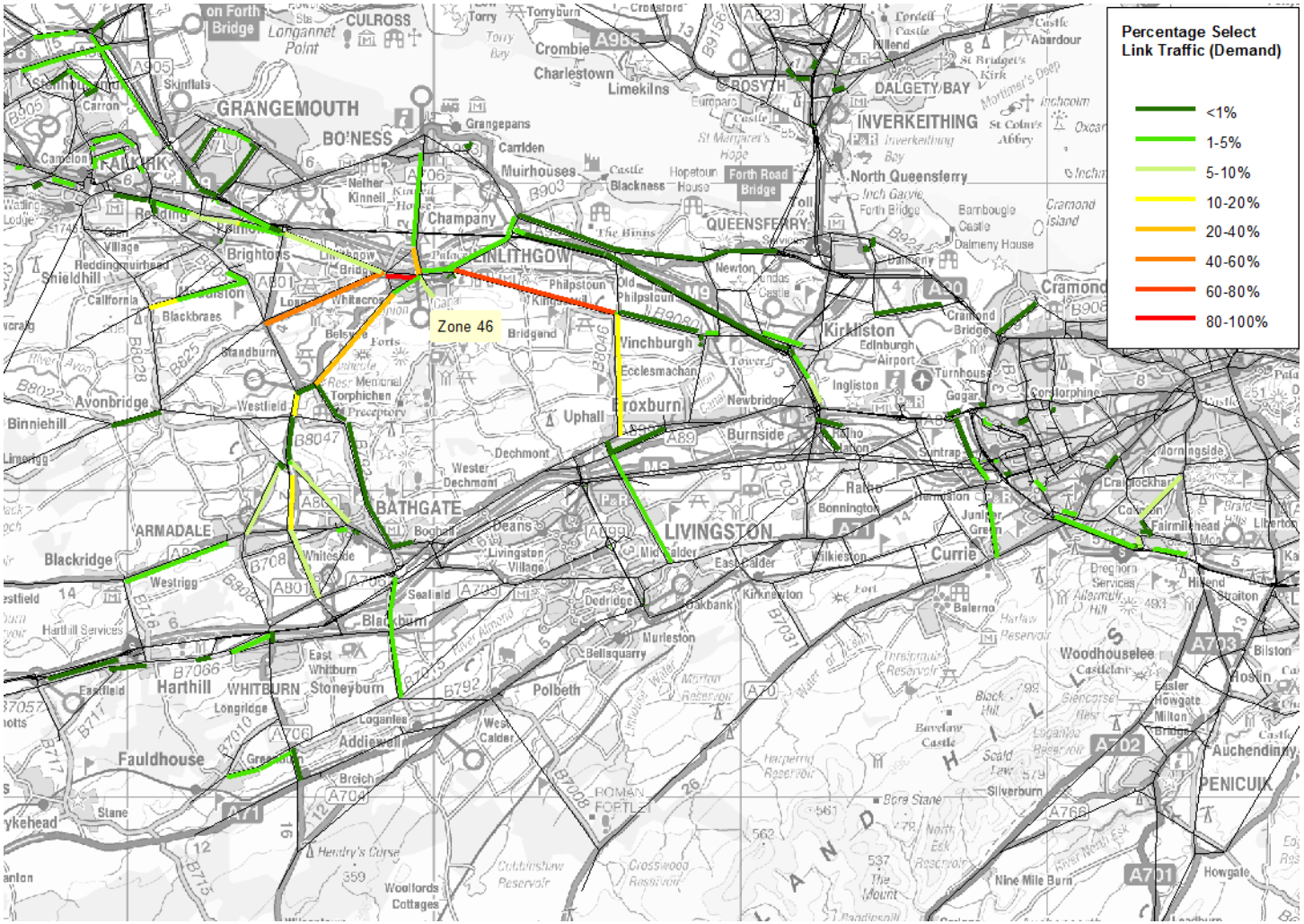
Zone 41 (Uphall) AM Peak Select Link Analysis, Test Scenario 3



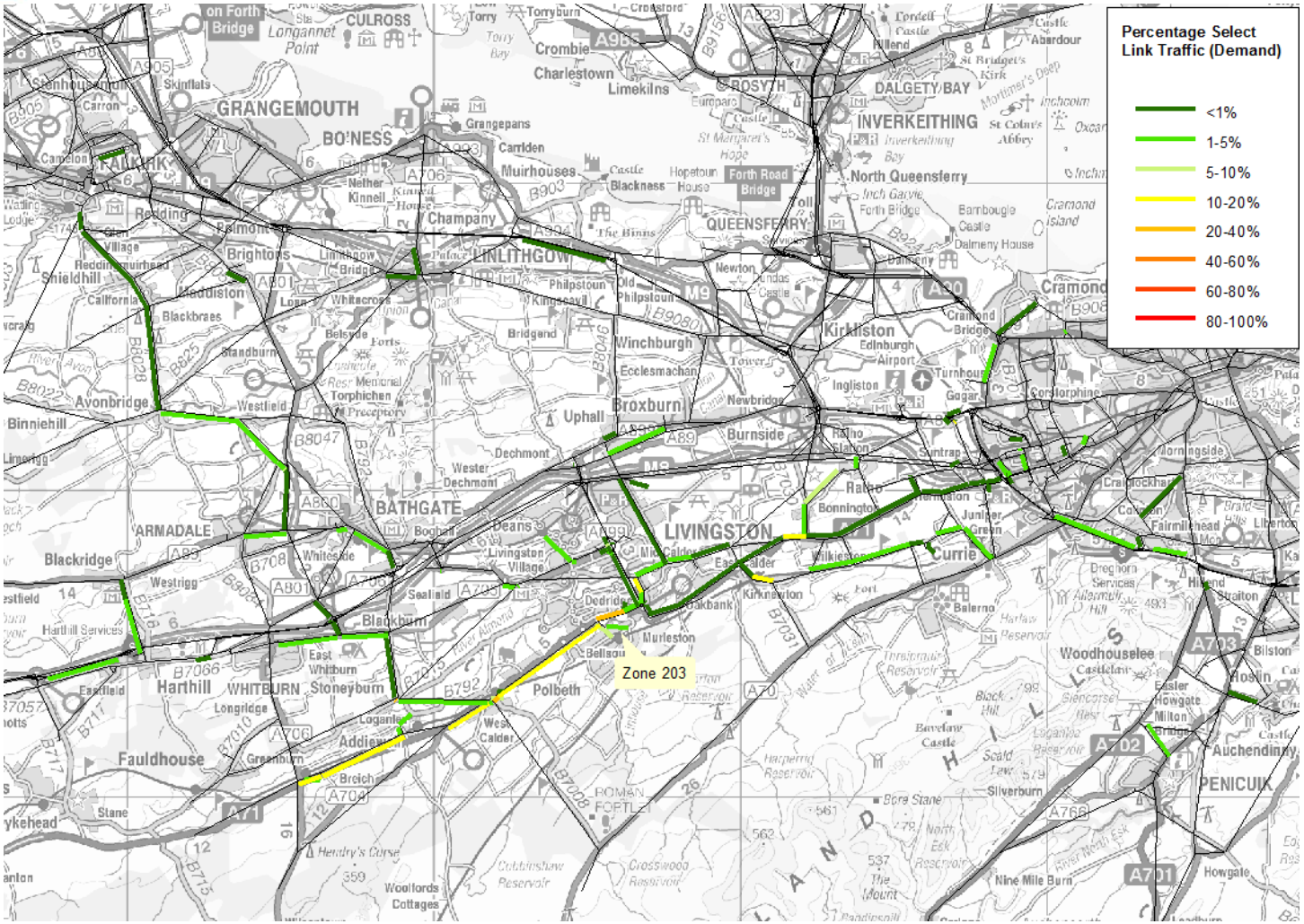
Zone 42 (Winchburgh) AM Peak Select Link Analysis, Test Scenario 3



Zone 46 (Linlithgow) AM Peak Select Link Analysis, Test Scenario 3



Zone 203 (Murieston) AM Peak Select Link Analysis, Test Scenario 3



Impact of additional sites on modelling exercise previously carried out

This note is to accompany the Transport Background Paper to the West Lothian Local Development Plan (LDP) assessment modelling results.

West Lothian Council appointed the Systra consultancy group to undertake a transport modelling exercise with respect to the emerging LDP. Systra tested three development scenarios based on sites identified as of 25 October 2013. However, since that time discussions within the council have led to alternative or additional sites being identified which now form part of the preferred sites for the LDP. These sites are set out in following table.

The attached summary sheet shows the sites not included in the original modelling work and a commentary is now included to identify the impacts of these additional sites. The towns most affected by the additional sites are Broxburn, Linlithgow and Winchburgh. The commentary is based on the effects increasing the preferred number of sites will have against the scenario 2 test run.

The additional Broxburn allocation (PJ-0008) of 250 housing units will have a significant impact on an already congested network; however the surrounding junctions between the site and the City of Edinburgh Council boundary can be improved to accommodate the development. The A89 route study carried out jointly between West Lothian and Edinburgh councils back in 2007 identified measures that would address predicted traffic increases from developments and normal background growth. Currently Edinburgh Council in conjunction with Transport Scotland and West Lothian Council are looking at public transport improvements to the Newbridge roundabout.

The Linlithgow sites have been included in the scenario 2 testing. There is a maximum number of units permissible in the area due to education restraints. Within the model the Linlithgow area is all one zone meaning no individual site is identified. Currently a separate assessment is being carried out which will identify the most appropriate locations for allocating sites in the Linlithgow area.

The Winchburgh sites were originally included in the existing Local Plan as employment land. The additional location (EOI-0197) refines the Local Plan allocation. The other 2 sites are alternative locations to the preferred choice. The effects on the modelling are that there would be no change as allocations already included in the model.

The remaining sites tested have very few units on them and due to their locations they will have no significant impact on the network. If the additional sites were included, it is unlikely that the traffic model would show any delays due to the low trip numbers.

This note has demonstrated that although not all the sites currently being proposed have been included in the modelling exercise the impact of those missing as shown on the attached sheet have no major impact on the network with the exception of one of the sites.

Additional sites not assessed by MVA as part of Strategic Modelling
Current Print Version 1 - 23 April 2014
Brown Field

Reference	Location	Town	Impact on Network
EOI-0139	Drove Road	Armadale	Little impact would only be local not enough to show in the model.
EOI-0153	Guildiehaugh Depot	Bathgate	flows no worse than present therefore model unlikely to show any impact
EOI-0094	Waverley Street	Bathgate	No impact on model results
LATE-0007	Blackburn Road	Bathgate	Little impact would only be local not enough to show in the model.
EOI-0187	Trindleyknowe	Blackburn	No impact on model results
BLA3	West Main Street	Blackburn	commited neighborhood centre
BLA7	Ash Grove Health	Blackburn	committed retail
EOI-0190	Land south of A71	Breich	No impact on model results
MUB1	Woodmuir Hall	Breich	No impact on model results
MUB2	Former Primary School	Breich	No impact on model results
EOI-0065	Farm	Bridgend	Little impact would only be local not enough to show in the model.
PJ-0008	Former Vion	Broxburn	Major impact needs included in A89 improvements and other road works as part of the CDA
EOI-0124	Northeast of town	Fauldhouse	No impact on model results
EOI-0114	Wilcoxholm Farm	Linlithgow	No impact as all in same zone and only an increase in numbers was tested
EOI-0168	Preston Farm	Linlithgow	No impact as all in same zone and only an increase in numbers was tested
EOI-0210	Clarendon Farm	Linlithgow	No impact as all in same zone and only an increase in numbers was tested
EOI-0100	Muiriston south R1	Livingston	No impact on model results
LON1	Park	Longridge	No impact on model results
EOI-0029	Back O Moss Farm B	Longridge	Little impact would only be local not enough to show in the model.
EOI-0031	west of cemetery	West Calder	Included in Scenario 3
PJ-0004	Murraysgate	Whitburn	No impact in model only localised issues
EOI-0077	Site 1 war blinded	Wilkieston	Local impact on a congested network model unlikely to change
EOI-0197	south of Duntarvie Castle	Winchburgh	No impact on model results
EOI-0198	west of Ross's plantation	Winchburgh	Alternative site so same as above.
EOI-0201	north of Niddry Castle	Winchburgh	Alternative site so same as above.