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GALLOWAY COUNCIL

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Regional Traffic
Model Support*

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1 Introduction

1.1 Overview

- 1.1.1 MVA Consultancy was commissioned by Dumfries & Galloway Council (D&GC) in July 2012 to undertake strategic traffic modelling to assist in the assessment of emerging Dumfries Local Development Plan (LDP) Options. A range of LDP options are being considered by D&GC planning officers which focus on the area in and around Dumfries itself.
- 1.1.2 The Dumfries Regional Traffic Model (DRTM) has been used to undertake an assessment of key road transport network performance indicators for an agreed set of LDP options. These options have been compared against a Reference Case scenario.
- 1.1.3 This Report describes the results of the DRTM LDP option model tests.

1.2 Structure of This Report

- 1.2.1 Further to this Introduction Chapter, this report contains the following:
 - Chapter 2 provides an overview of the preparation of the LDP scenario options;
 - Chapter 3 provides an overview of the Dumfries Regional Traffic Model (DRTM);
 - Chapter 4 describes the DRTM travel demand forecasts;
 - Chapter 5 describes the DRTM network performance;
 - Chapter 6 describes the DRTM outputs for additional LDP 'Option 6' tests; and
 - Chapter 7 provides conclusions and recommendations.

2 Preparation of Scenario Options

2.1 Introduction

- 2.1.1 Information Note 2 (Version 2.1, MVA Consultancy, December 2012) outlines the methodology for preparing the DRTM LDP option model tests and should be read in conjunction with this Report. Following the circulation of Information Note 2 to both D&GC and Transport Scotland, general agreement on the modelling approach has been made prior to assessing the traffic impacts.

2.2 LDP Options

- 2.2.1 The following five LDP scenario options were prepared based on the original LDP option test definitions:

■ LDP1 - Option 1: 2018 Reference Case:

- **Planning Data:** Single LDP option for 2018. DGRI located at existing site.
- **Infrastructure:** Consistent with base year (2011).

■ LDP2 - Option 2: 2018 Consultation Case:

- **Planning Data:** 2018 with additional residential and commercial development as reported in the final consultation (2012). DGRI located at existing site.
- **Infrastructure:** Consistent with base year (2011).
- **Comment:** As agreed with planning officers this option includes all previously anticipated developments that were set to be in place by 2018 as reported in consultations during early 2012.

■ LDP3 - Option 3: 2023 Reference Case:

- **Planning Data:** Based on 2018 scenario with additional residential and commercial development. DGRI located at existing site.
- **Infrastructure:** Marchfield and Parkhead link roads.
- **Comment:** This scenario serves as the 'baseline' comparator for 2023 scenarios.

■ LDP4 - Option 4: 2023 DGRI Garroch Orientated Plan:

- **Planning Data:** Development Plan aligned to the DGRI being re-located to the Garroch Site.
- **Infrastructure:** Consistent with 2023 Reference Case with addition of Garroch mitigation measures.
- **Comment:** This includes consideration of the re-development of land at the vacated site of the existing DGRI.

■ LDP5 - Option 5: 2023 DGRI Summerfield Orientated Plan:

- **Planning Data:** Development Plan aligned to the DGRI being located to the Summerfield Site.
- **Infrastructure:** Consistent with 2023 Reference Case with addition of Summerfield mitigation measures.
- **Comment:** This includes consideration the re-development of land at the vacated site of the existing DGRI.

2 Preparation of Scenario Options

2.2.2 Following a Technical Note and presentation of the DRTM model test outputs for the above five option tests, D&GC then developed an additional Proposed Plan option (Option 6). Option 6 was also assessed using DRTM along with a sensitivity test which included the proposed relocation of the DGRI to Garroch (Option 6A). The definition of these Option 6 tests is as follows:

■ Option 6: 2023 Final Proposed Plan:

- **Planning Data:** Package of residential and commercial development sites as endorsed as a basis for consultation by Full Council. DGRI located at existing site.
- **Infrastructure:** Marchfield and Parkhead link roads.
- **Comment:** This scenario is similar to Option 3 but with the final site definitions. This includes long term sites (eg Catherinefield, Brownrigg) that are included in the Proposed Plan as long term options but do not form part of the DRTM testing as they are programmed beyond 2024.

■ Option 6A: 2023 Final Proposed Plan DGRI Garroch Orientated Sensitivity Test:

- **Planning Data:** As per Option 6 with development plan aligned to the DGRI being re-located to the Garroch Site.
- **Infrastructure:** Consistent with Option 6 with addition of Garroch mitigation measures.
- **Comment:** This excludes the re-development of land at the vacated site of the existing DGRI as D&GC consider that it is unlikely to be redeveloped in this LDP period.

2.2.3 As the Option 6 tests were undertaken after the main tranche of Options (1-5) were undertaken, the results are presented towards the end of this report.

2.3 Traffic Forecasts

2.3.1 Information Note 2 details the preparation of the traffic forecasts. In summary, the forecasts include the following key elements:

- background growth applied to traffic levels outwith Dumfries;
- LDP Traffic Generation based on LDP land-use data;
- for relevant options, the network infrastructure measures specified by D&GC;
- for relevant options, the DGRI traffic generation using the DGRI TA data; and
- for relevant options, the DGRI mitigation measures as specified during the DGRI TA process.

2.3.2 It should be noted that the methodology adopted for assessing the LDP scenarios options makes no allowance for displacement of land-use activities elsewhere in the modelled area of Dumfries and Galloway with the inclusion of the anticipated LDP development. Therefore, all new LDP land-use and associated travel demand considered is **in addition** to existing land-use and travel demand, with no reduction assumed elsewhere in the DRTM area. This is considered to represent a greater impact of the LDP scenarios being assessed as, in reality, it is likely that there would be a movement of population and jobs from existing locations to new LDP sites, eg through demolition and/or lower density use of existing developed land within the LDP area.

3 Dumfries Regional Traffic Model (DRTM)

3.1 Introduction

- 3.1.1 MVA developed the DRTM during 2010. The model includes road traffic assignment only (Car, LGV and HGV) for a base year of 2009. The model was updated during 2011 and 2012 as part of the Transport Assessment work undertaken for the proposed relocation of the Dumfries and Galloway Royal Infirmary (DGRI).
- 3.1.2 During the DGRI project, the DRTM was updated to a 2011 base year using observed traffic count data collected at key junction locations during 2011.

3.2 Application of DRTM

- 3.2.1 The quality of the calibration and validation of the DRTM was reported in: 20120113_DGRI_Relocation_Rebase_And_Forecasting_V1.6 DRAFT.pdf (MVA Consultancy, January 2012).
- 3.2.2 While the model was deemed fit for purpose for the DGRI project and for use in a comparison of road traffic KPI's for LDP options, it was also discussed that there were some areas of the traffic model that could be improved through additional data collection. These areas of improvement were documented in the Discussion Note: 20120201_DRTM11_Base_Count Comparisons_V1.2_Draft.doc, MVA February 2012. Such areas of improvement have not been undertaken and, while desirable to improve the robustness of the model are deemed not required for the purpose of this high level comparison assessment of LDP options.

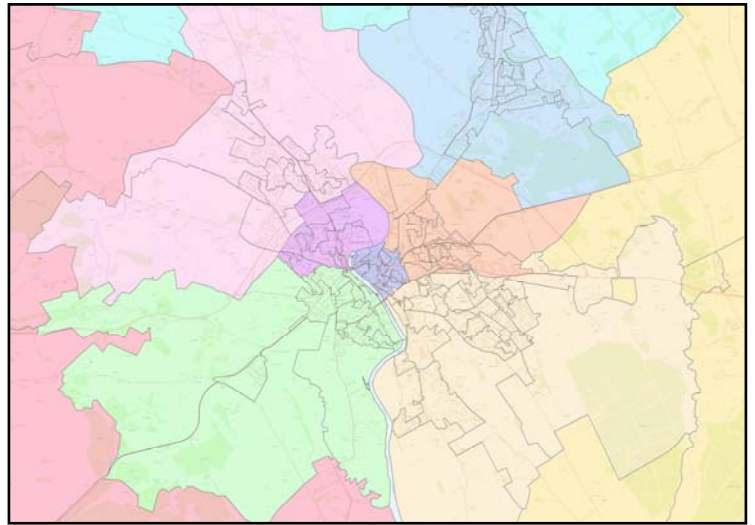
3.3 Model Dimensions

- 3.3.1 For the purposes of assessing the LDP option tests the following model time periods have been used:
- weekday morning peak hour: 0815 – 0915; and
 - weekday evening peak hour: 1630 – 1730.
- 3.3.2 The DRTM includes five assigned vehicle types and journey purposes as follows:
- Car In-Work;
 - Car Non-Work Commuter;
 - Car Non-Work Other;
 - LGV and;
 - HGV.

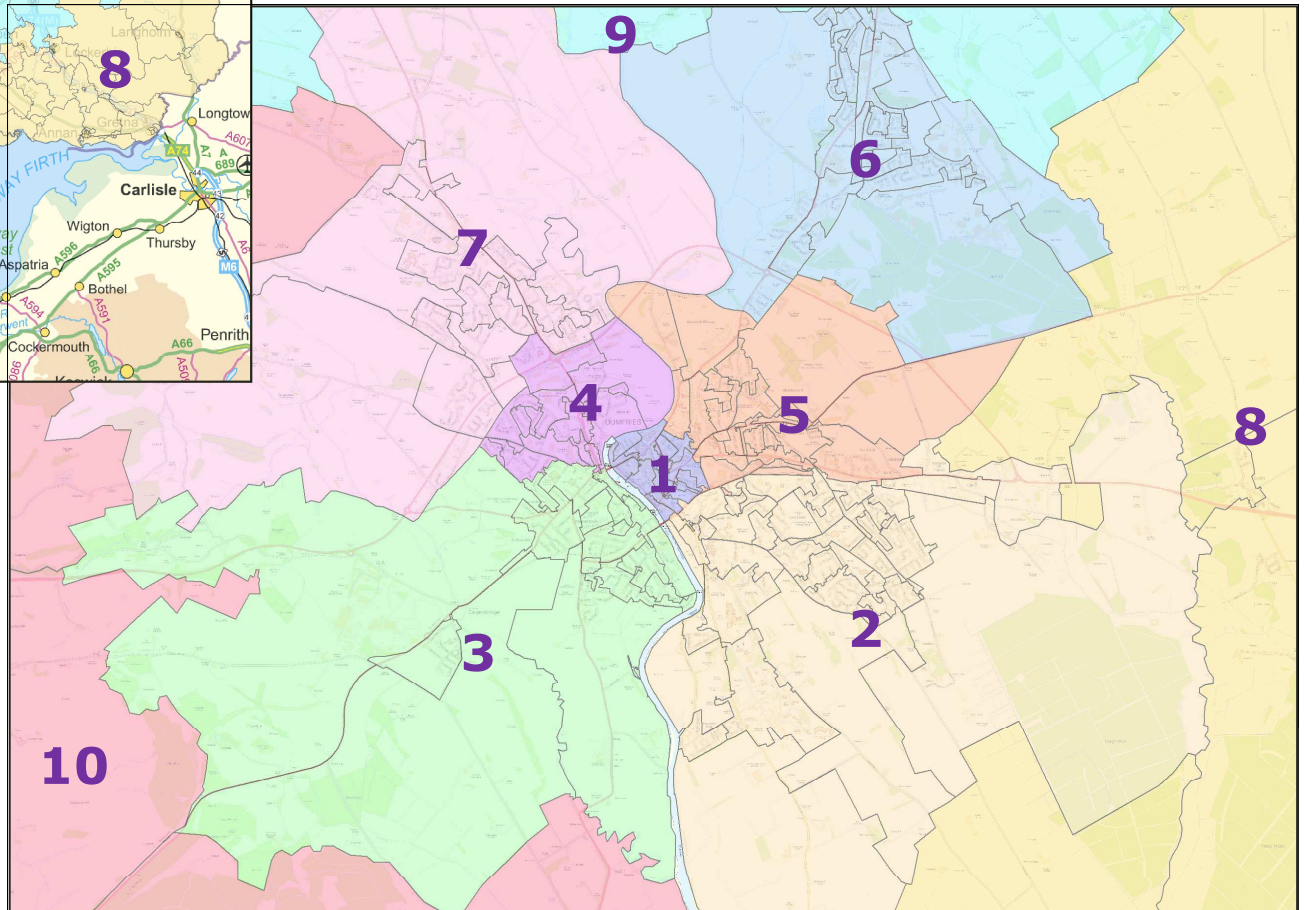
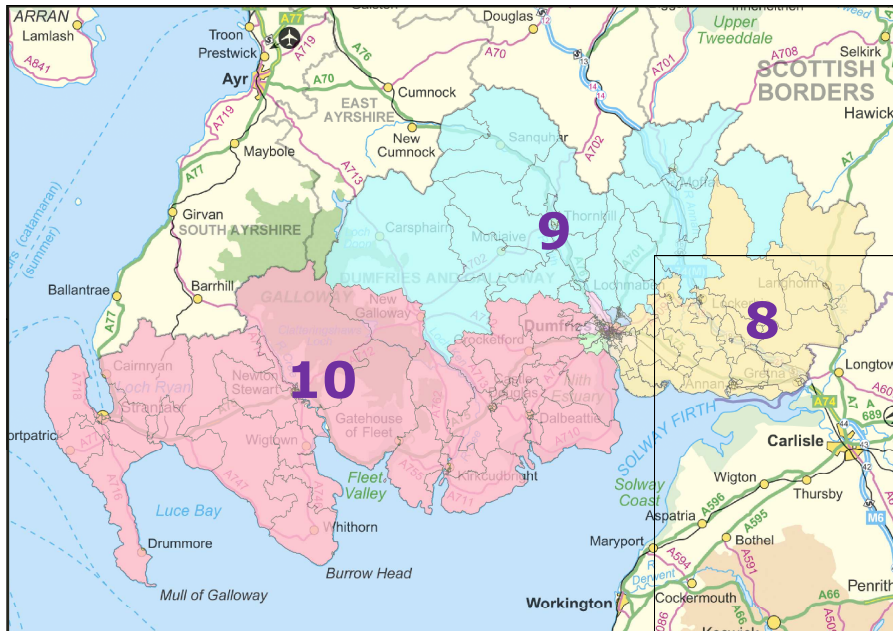
3 Dumfries Regional Traffic Model (DRTM)

3.3.3 For the purposes of preparing the LDP option tests in the DRTM and subsequent analysis of the model outputs, a sector system has been prepared, which is shown below and in Figure 3.1 (located at the end of this Chapter). The sector system aggregates the model zones into seven sectors in Dumfries and three sectors elsewhere in Dumfries and Galloway as follows:

- 1: Town Centre;
- 2: Town South East;
- 3: Town South West;
- 4: Town North West;
- 5: Town North East;
- 6: Heathhall & Locharbriggs;
- 7: Lochside & Lincluden;
- 8: Outer East;
- 9: Outer North; and
- 10: Outer West.



3.3.4 The three outer sectors also include the external zone connectors at the edge of the modelled network which connect Dumfries and Galloway to 'everywhere else'.



- Sectors**
- 1 Town Centre
 - 2 Town South East
 - 3 Town South West
 - 4 Town North West
 - 5 Town North East
 - 6 Heathhall and Locharbriggs
 - 7 Lochside and Lincluden
 - 8 Outer East
 - 9 Outer North
 - 10 Outer West

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Dumfries Regional Traffic Model Local Development Plan Tests

Prepared for Dumfries and Galloway Council
August 2012

Title
DRTM Zones Sector System for LDP Analysis

Project No.
101767

Figure
3.1

mvaconsultancy

4 Model Results - Travel Demand Forecasts

4.1 Introduction

4.1.1 This Chapter describes the forecast travel demand for each LDP scenario.

4.2 Trip Origins and Destinations

4.2.1 Trip origins refer to journeys originating from a defined area (or 'zone'). Trip destinations refer to journeys destinating at a defined zone. The values reported include all trips produced in the DRTM including 'external zones'. External zones are those zones which represent travel movements from outwith the modelled area (ie outwith Dumfries and Galloway).

4.2.2 Figures A.1 to A.20 in Appendix A present the change in trip origins and destinations in the DRTM at zonal level for each LDP option compared with the modelled base year for each time period. As noted above, the LDP scenario options include background traffic growth outwith Dumfries, travel demand associated with new LDP development and changes in travel patterns resulting from the relocation of the DGRI.

4.2.3 Tables A.1 to A.8 in Appendix A provide the trip origins and destinations for the LDP DRTM sector system for each modelled year and scenario and are summarised in Figures 4.1 and 4.2 below.

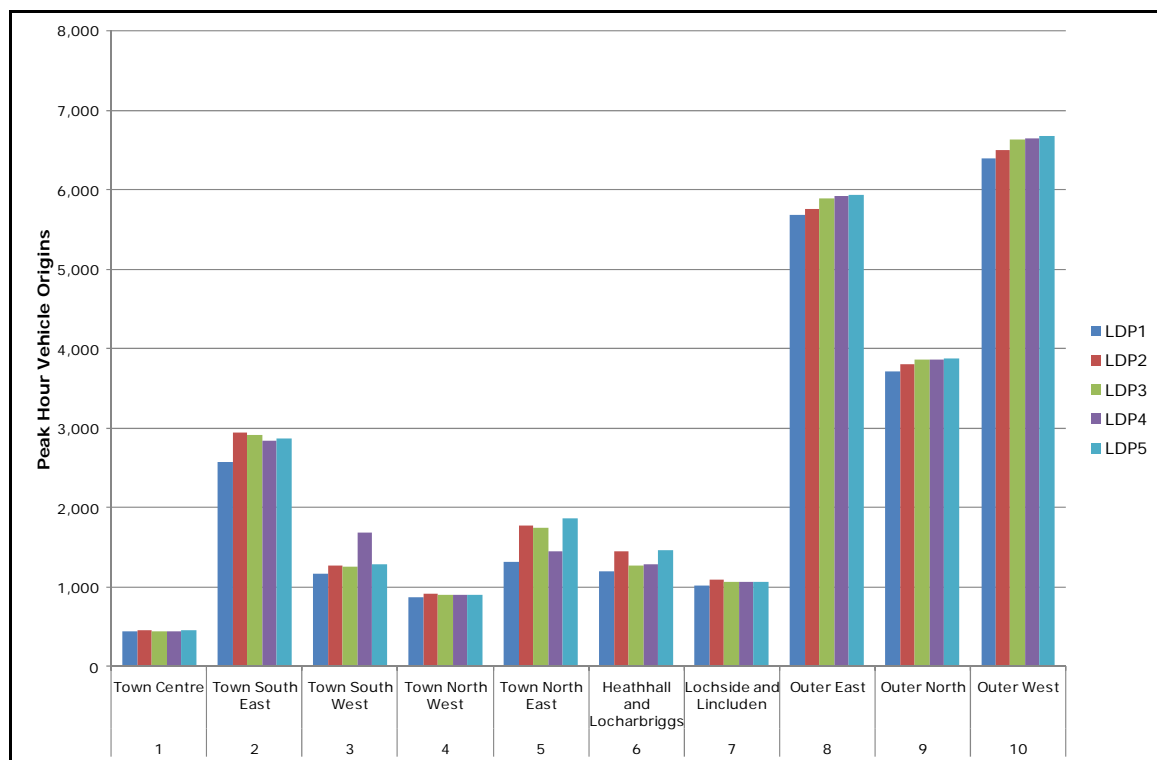


Figure 4.1 DRTM Trip Origins by Sector - AM Peak Hour

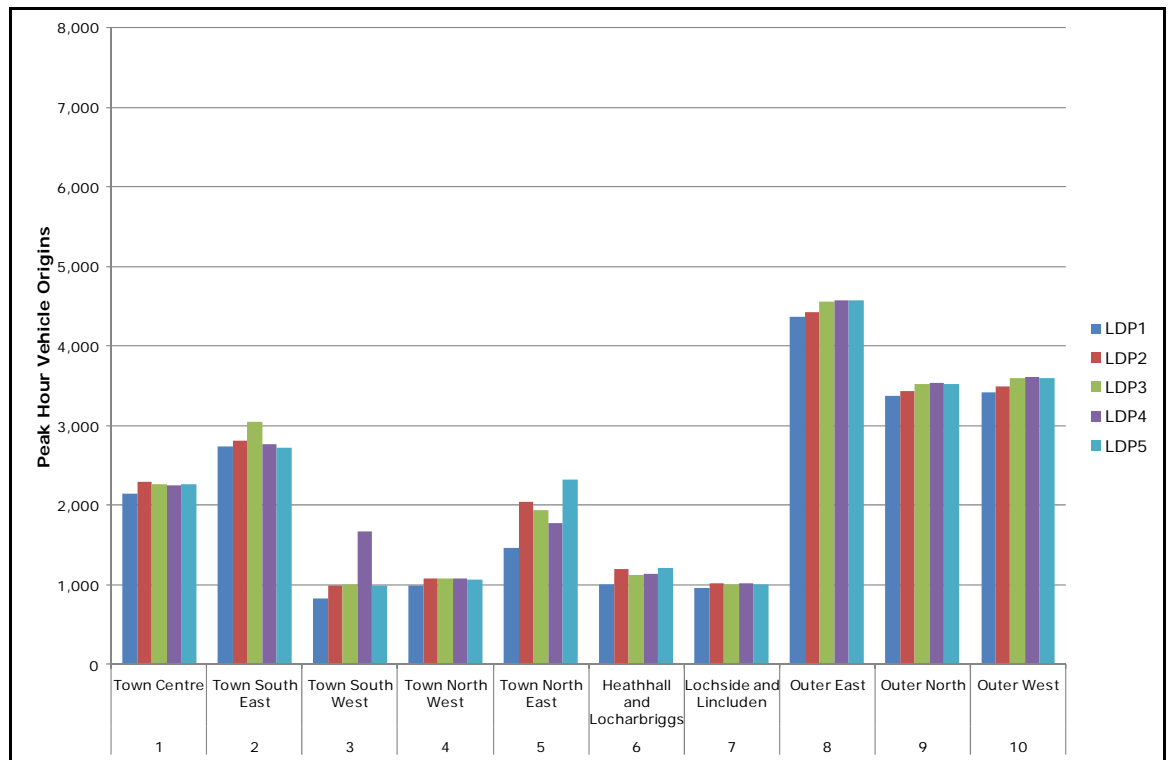


Figure 4.2 DRTM Trip Origins by Sector - PM Peak Hour

4.2.4 Inspection of the above figures and the data presented in Appendix A reveals the following key points for consideration:

- as expected, given the modelling methodology employed, traffic generation is directly linked to the location of anticipated LDP development sites (noting that, as explained earlier there is no displacement);
- LDP development sites are located across Dumfries with associated traffic origins and destinations in each option;
- the greater degree of LDP development in Option 2 compared with Option 1 in the 2018 forecast year results in greater traffic generation, particularly to the south-east of the town centre towards Crichton, to the south-west of the town around Garroch and to the north-east of the town at Brownrigg and Heathhall;
- the greater degree of LDP development in the 2023 forecast year compared with 2018, results in greater traffic generation, particularly to the south-east of the town centre towards Crichton, to the south-west of the town around Garroch and to the north-east of the town at Brownrigg and Heathhall;
- as per the LDP scenario option definition, the principal difference between the three options in the 2023 forecast year is the relocation of the Dumfries General Royal Infirmary (DGRI) and aligned development;
- comparing Option 4 with Option 3 demonstrates a predicted reduction in traffic generation to the south-east of the town centre at the existing DGRI site with an increase in traffic generation to the south-west of the town around Garroch. There is also a reduction in traffic generation predicted to the north-east of the town at Brownrigg where this LDP development is not included in Option 4; and

- comparing Option 5 with Option 3 shows a reduction in traffic generation to the south-east of the town centre at the existing DGRI site with an increase in traffic generation to the north-east of the town at Brownrigg and Heathhall.

4.3 Travel Demand on Network

- 4.3.1 Travel demand on the network refers to vehicles travelling on a modelled road at a defined point as a flow or within a defined area (ie the sector system in this instance) as aggregate vehicle distance or time, though not necessarily having an origin or destination there.
- 4.3.2 Figures B.1 to B.10 in Appendix B present the assigned peak hour total vehicle flows in the DRTM for each LDP option for each time period. Tables B.1 to B.4 in Appendix B present the total assigned peak hour vehicle flows for each modelled year and scenario at key locations across Dumfries as shown in Figure 4.3 below and Figure B.11 in Appendix B. Figures 4.4 and 4.5 below provide a summary of the 2-way total traffic flow at the key locations.

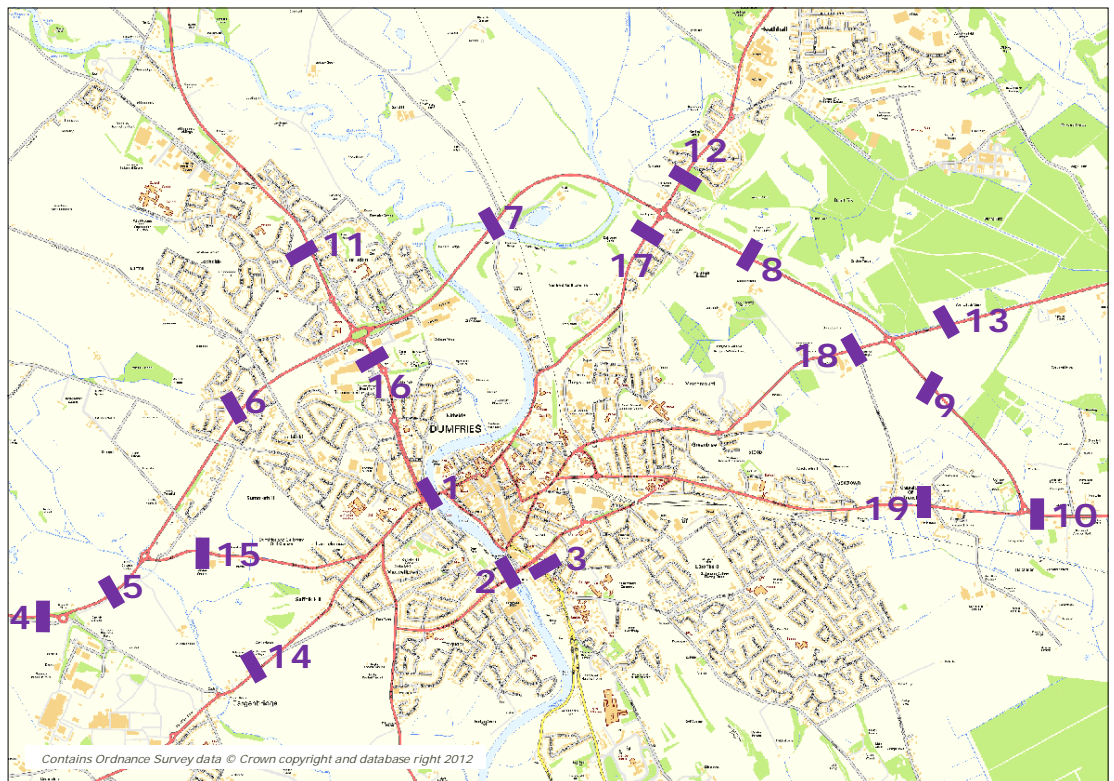


Figure 4.3 DRTM Vehicle Flow Key Locations

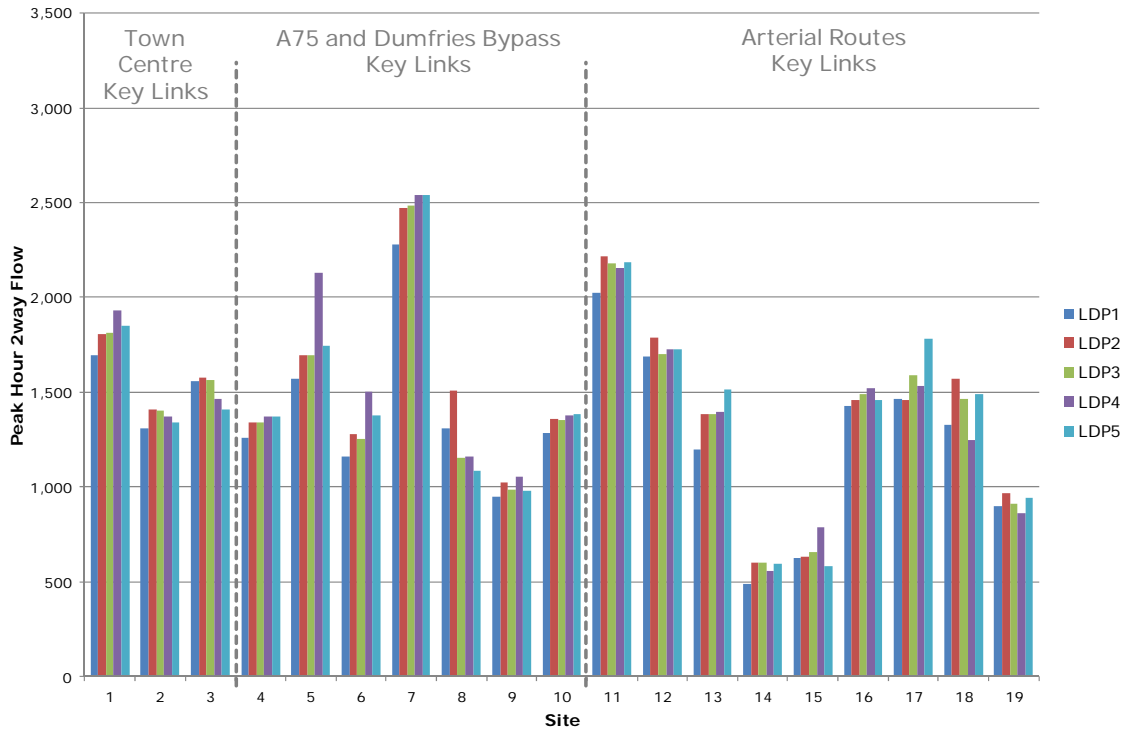


Figure 4.4 DRTM 2-way Vehicle Flows at Key Locations - AM Peak Hour

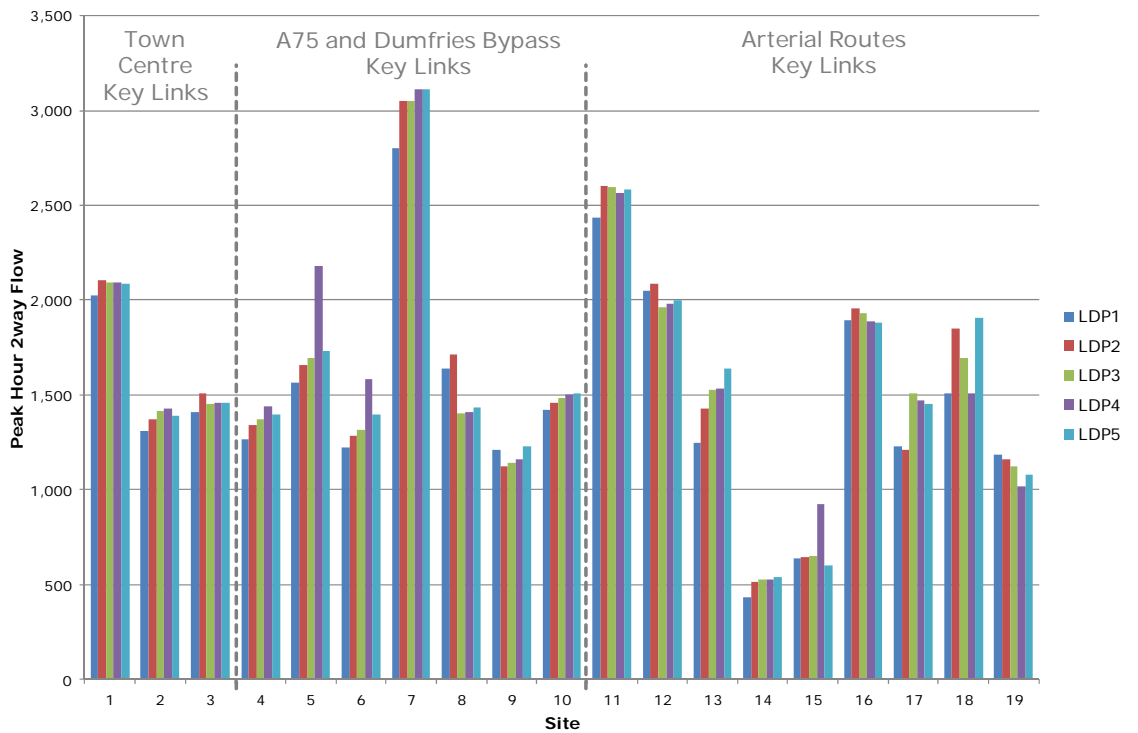


Figure 4.5 DRTM 2-way Vehicle Flows at Key Locations - PM Peak Hour

4.3.3 Tables B.5 to B.12 in Appendix B provide the total assigned vehicle kilometres (distance travelled on the road network) and hours (time spent on the road network) predicted by the DRTM for the LDP DRTM sector system and for each modelled year and scenario. These are summarised in Figures 4.6 to 4.9 below.

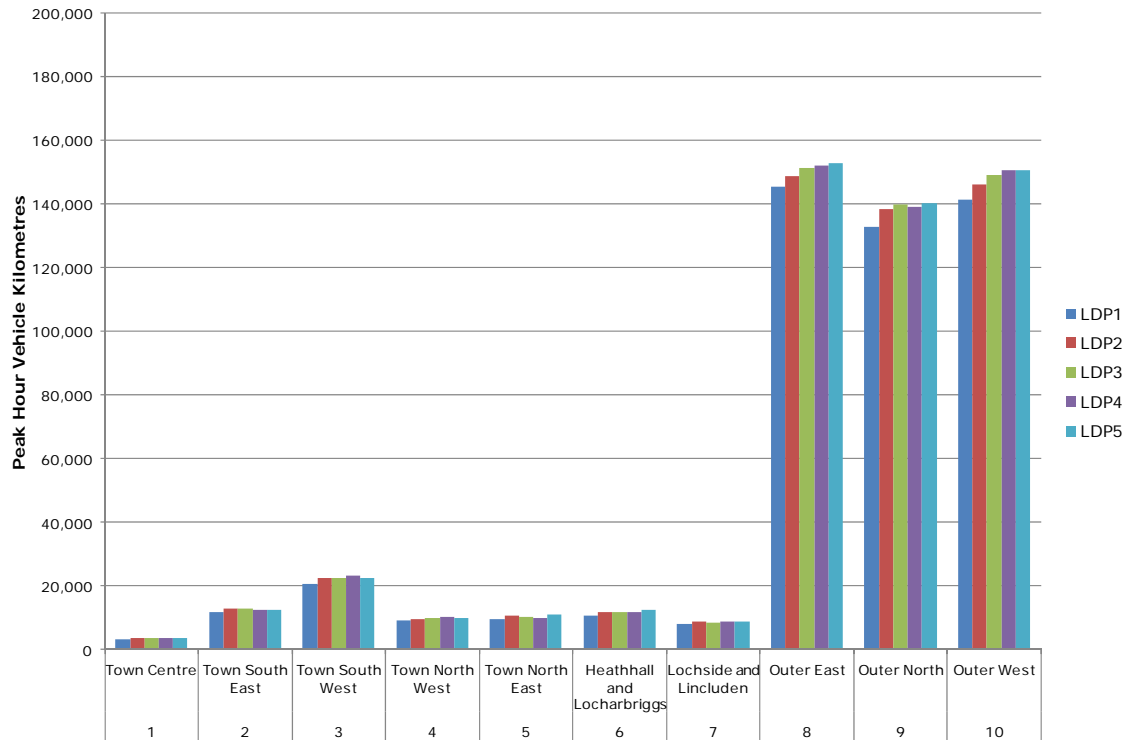


Figure 4.6 DRTM Vehicle Kilometres by Sector - AM Peak Hour

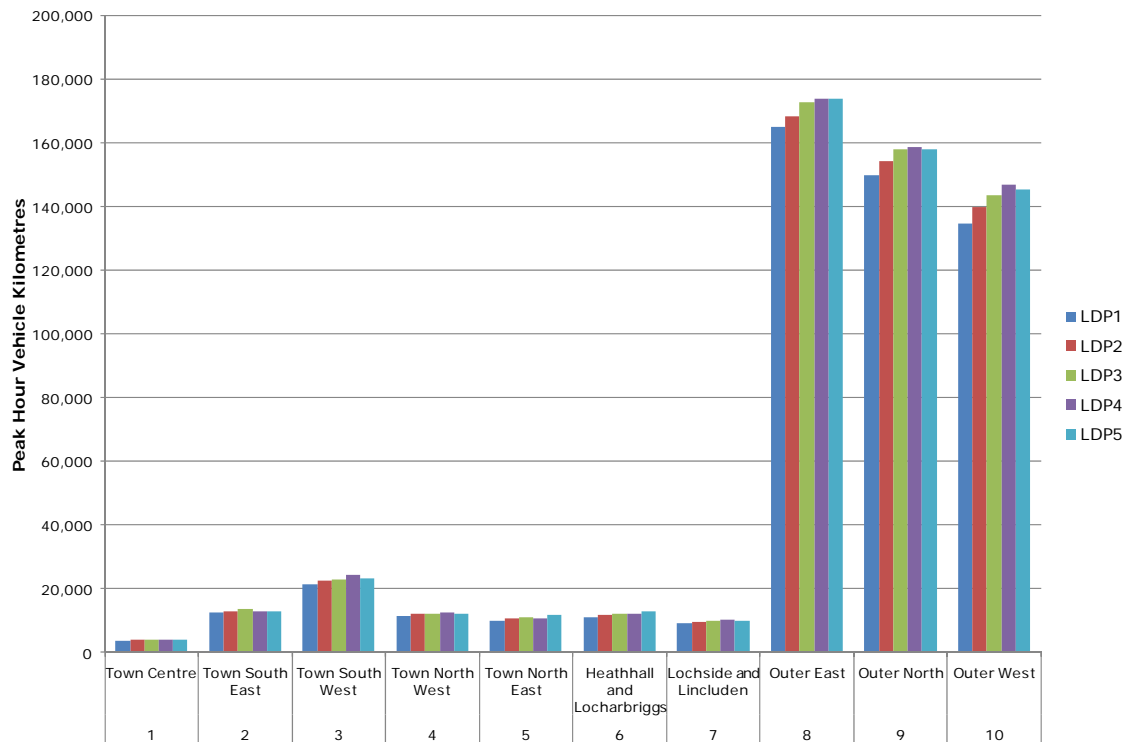


Figure 4.7 DRTM Vehicle Kilometres by Sector - PM Peak Hour

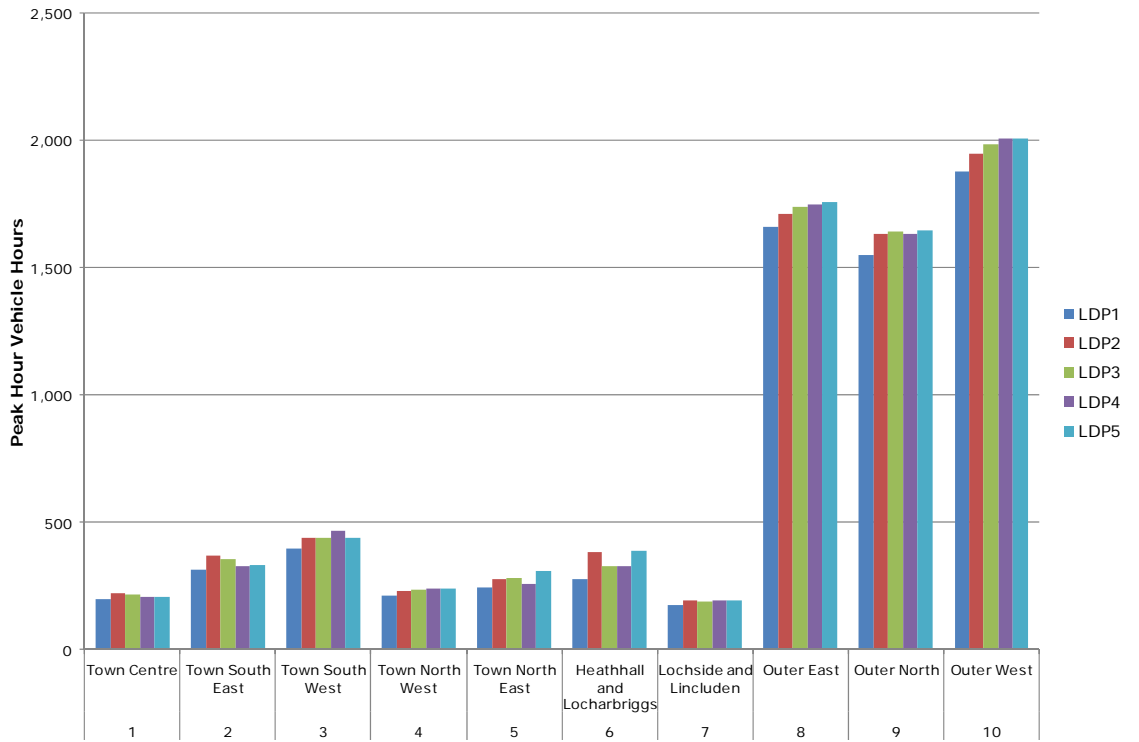


Figure 4.8 DRTM Vehicle Hours by Sector - AM Peak Hour

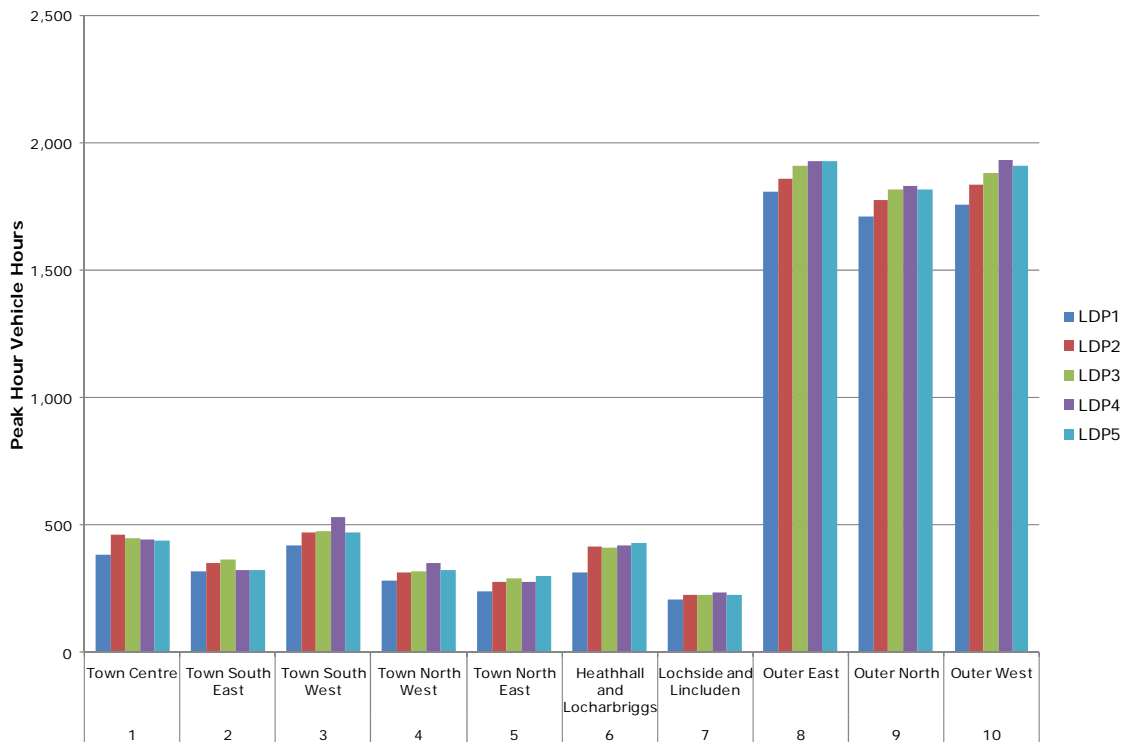


Figure 4.9 DRTM Vehicle Hours by Sector - PM Peak Hour

4.3.4 Inspection of the above figures and the data provided in Appendix B reveals the following key points for consideration:

- as expected, travel demand on the road network is directly linked to the degree of LDP development and the associated traffic generation with greater development resulting in higher levels of assigned traffic on the modelled network;
- the greater degree of LDP development in Option 2 compared with Option 1 in the 2018 forecast year, results in additional traffic across the entire network with an increase in vehicle distance and time in all sectors and on the majority of key links in both time periods. In particular, there is increased traffic in the town centre, to the south-east of the town centre towards Crichton, to the south-west of the town around Garroch and to the north-east of the town at Brownrigg and Heathhall;
- the greater degree of LDP development in the 2023 forecast year compared with 2018, results in additional traffic across the entire network with an increase in vehicle distance and time in all sectors and on the majority of key links in both time periods. In particular, there is increased traffic to the north-east of the town on the A709 north and south of the bypass and on the A701 south of the bypass;
- the addition of the new Marchfield and Parkhead link roads (Option 3) results in a reduction in traffic on the A75 Dumfries bypass in both directions between the A701 and the A709 in the 2023 forecast year compared with 2018 in both time periods;
- as per the LDP scenario option definition, the principal difference between the three options in the 2023 forecast year is the relocation of the Dumfries General Royal Infirmary (DGRI) and aligned development;
- comparing Option 4 with Option 3 shows a predicted reduction in assigned traffic in the south-east of the town centre towards the existing DGRI site, particularly in the morning peak. There is an increase in assigned traffic in the south-west of the town towards Garroch, particularly on the A75 bypass west of the A76, Garroch Loaning and Castle Douglas Road. There is also a reduction in assigned traffic to the north-east of the town towards Brownrigg on A709 where this LDP development is not included in Option 4; and
- comparing Option 5 with Option 3 demonstrates a reduction in assigned traffic in the south-east of the town centre towards the existing DGRI site, particularly in the morning peak. There is a predicted increase in assigned traffic in the north-east of the town towards Brownrigg and Heathhall on parts of the bypass, on the A701 south of the Bypass and on the A709 north of the bypass.

5 Model Results - Network Performance

5.1 Introduction

5.1.1 This Chapter describes the impact of the forecast travel demand on the road network for each LDP scenario.

5.2 Average Speeds and Journey Times

5.2.1 Tables C.1 to C.4 in Appendix C present the assigned average speed (in kph) on the modelled network for the LDP DRTM sector system for each modelled year and scenario and are summarised in Figures 5.1 and 5.2 below.

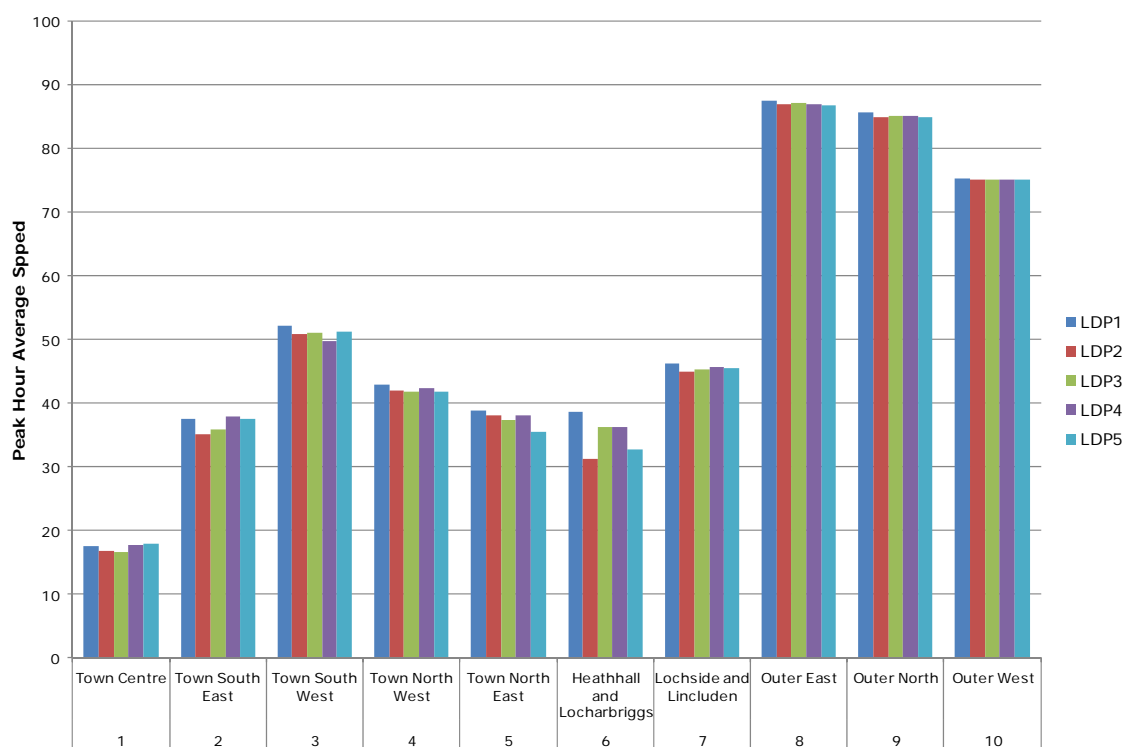


Figure 5.1 DRTM Average Vehicle Speed by Sector - AM Peak Hour

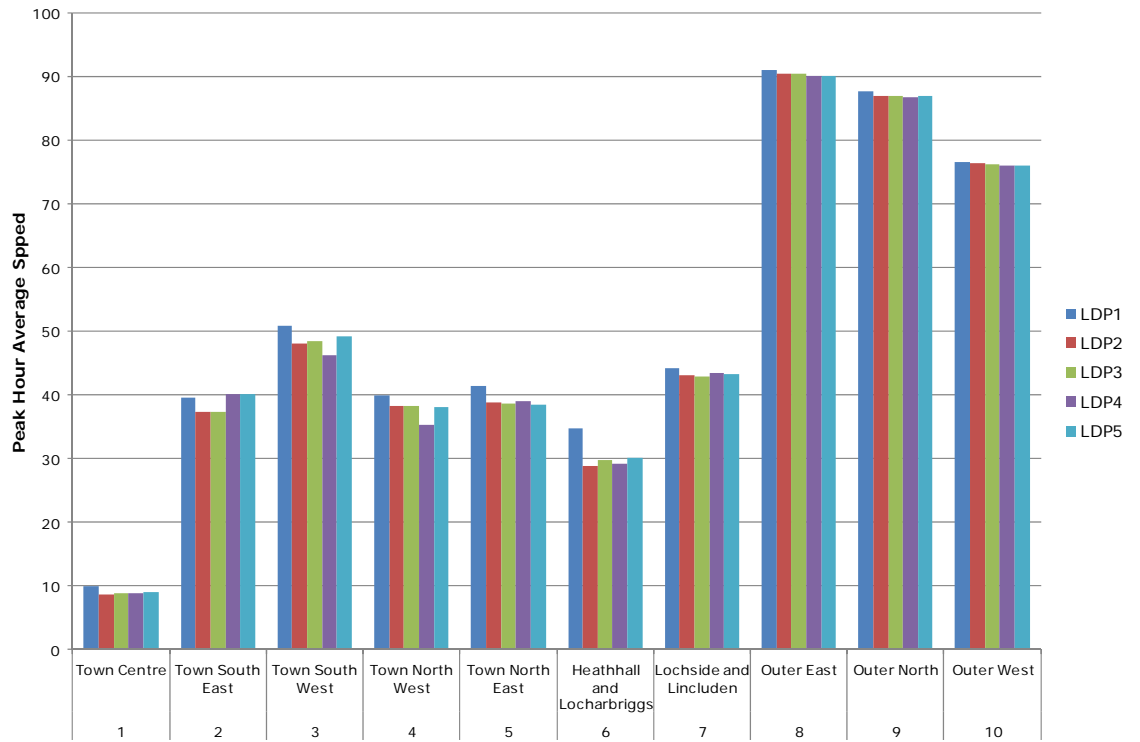


Figure 5.2 DRTM Average Vehicle Speed by Sector - PM Peak Hour

5.2.2 Tables C.5 to C.8 in Appendix B present the predicted peak hour average journey time for each modelled year and scenario for key journey time routes across Dumfries as shown in Figure 5.3 below and Figure C.1 in Appendix C. These routes are the same as the Dumfries town model development journey time validation with the addition of routes on the A75 and Dumfries Bypass. Figures 5.4 and 5.5 below provide a summary of the 2-way average journey time on the key routes.

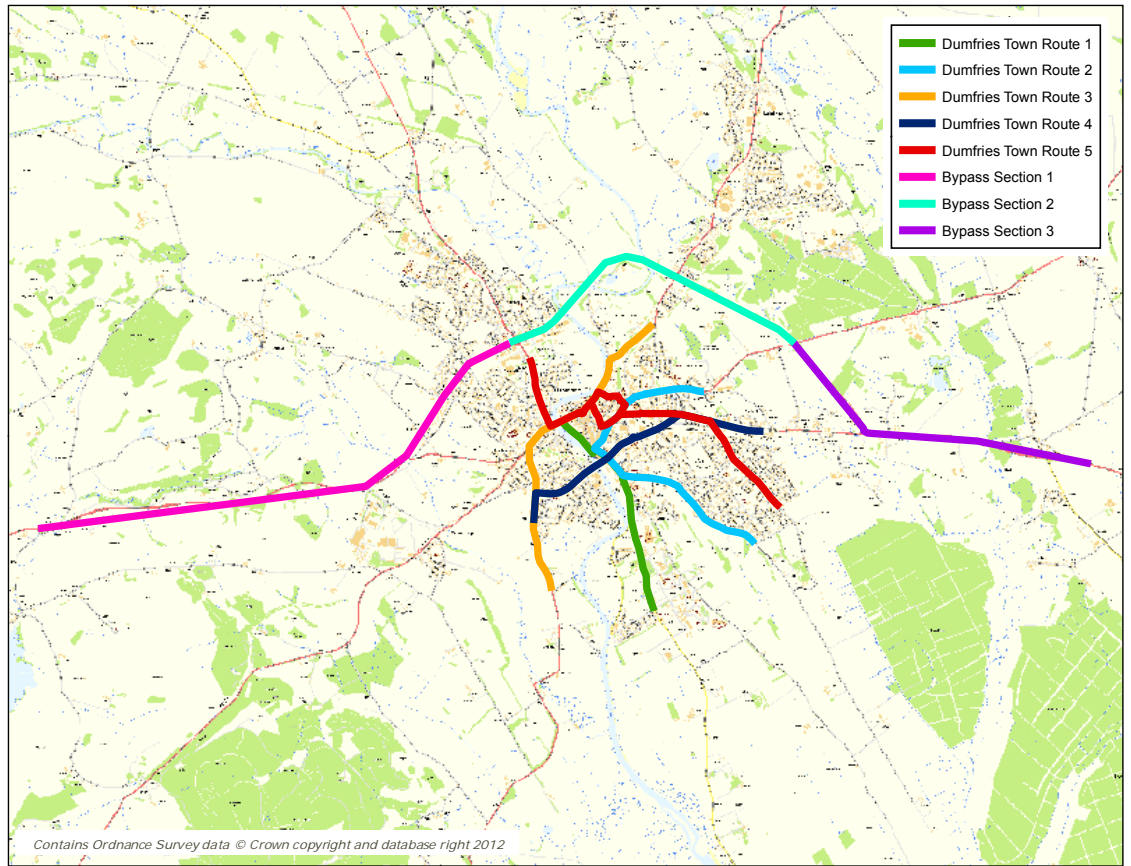


Figure 5.3 DRTM Key Journey Time Routes

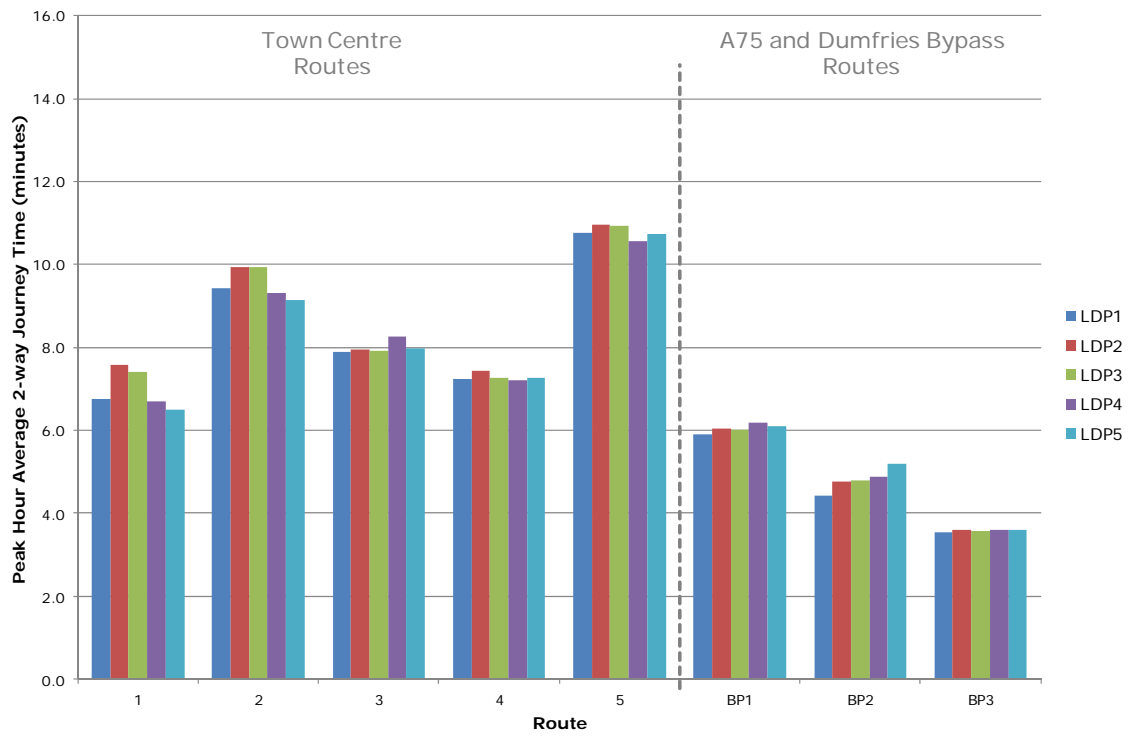


Figure 5.4 DRTM Average 2-way Journey Times - AM Peak Hour

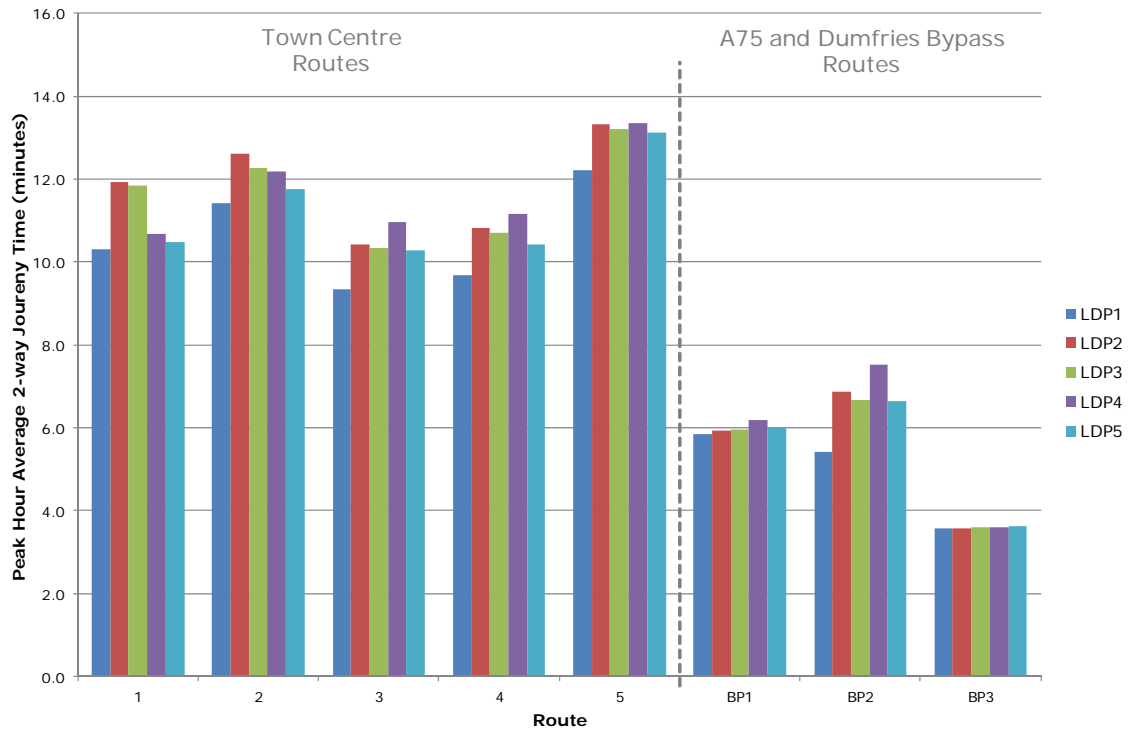


Figure 5.5 DRTM Average 2-way Journey Times - PM Peak Hour

5.2.3 Inspection of the above figures and the data presented in Appendix C reveals the following key points for consideration:

- as expected, changes in the road speeds and journey time are directly linked to the degree of LDP development and the associated traffic generation with greater development resulting in reduced speeds and longer journey times;
- the evening peak hour is generally more sensitive than the morning peak hour, with greater changes predicted in speeds and journey times, which reflects a greater degree of congestion in the evening peak road network in the DRTM;
- the greater degree of LDP development in Option 2 compared with Option 1 in the 2018 forecast year, results in additional delay across the entire network with a reduction in average speed in nearly all sectors and an increase in journey time on most routes in both time periods. In particular, there is a notable reduction in average speeds in Heathhall and Locharbriggs in both time periods. There is also a notable increase in journey times on section 2 of the bypass, between the A76 and A709, particularly in the PM peak hour;
- the greater degree of LDP development in the 2023 forecast year compared with 2018, results in additional delay across the entire network with a reduction in average speed in nearly all sectors and an increase in journey time on most routes in both time periods. In particular, there is a notable reduction in average speeds in Heathhall and Locharbriggs in the PM peak hour. There is also a notable increase in journey times on section 2 of the bypass, between the A76 and A709, particularly in the PM peak hour;
- as per the LDP scenario option definition, the chief difference between the three options in the 2023 forecast year is the relocation of the Dumfries General Royal Infirmary (DGRI) and aligned development;
- comparing Option 4 with Option 3 shows reduced delays in the south-east of the town centre towards the existing DGRI site with an increase in average speed and a reduction journey times on Dumfries town routes 1 and 2, which both include St Michael Street. There is an increase in delay in the south-west of the town towards Garroch with an increased journey time on Dumfries town route 3, which includes New Abbey Road. There is also an increase in travel times on parts of the A75 bypass, particularly west of the A76, though this is mitigated by the roundabout capacity improvements at Garroch; and
- comparing Option 5 with Option 3 shows a predicted reduction in delays in the south-east of the town centre towards the existing DGRI site with an increase in average speed and a reduction journey times on Dumfries town routes 1 and 2, which both include St Michael Street. There is an increase in delay in the north-east of the town towards Brownrigg and Heathhall with a reduction in average speeds in the morning peak though not the evening. There is also an increase in travel times on parts of the A75 bypass, particularly between the A76 and A709, though this is mitigated to some degree by the roundabout capacity improvements at the A709.

5.3 Road Congestion and Junction Delay

- 5.3.1 Figures D.1 to D.8 in Appendix D show the change in modelled peak hour traffic congestion in the DRTM comparing the LDP options for each forecast year and time period. Traffic congestion is measured as the total aggregated average delay on all DRTM links, which are split and assigned to a 100 metre grid system in GIS.

5.3.2 Figures D.9 to D.18 in Appendix D show the assigned peak hour average flow weighted delay at each modelled junction in the DRTM for each LDP option for each time period.

5.3.3 Inspection of the figures presented in Appendix D reveals the following key points for consideration:

- as expected, changes in the road network performance is directly linked to the degree of LDP development and the associated traffic generation with greater development resulting in additional delay and congestion;
- as expected, the identified trends of changes in congestion and delay broadly mirror those highlighted above when looking at the changes in average network speeds and journey times though the congestion mapping and junction figures do allow some closer scrutiny of the network delays;
- the greater degree of LDP development in Option 2 compared with Option 1 in the 2018 forecast year, results in additional delay throughout the network with an increase in congestion and individual junction delays in both time periods. There are particular pinchpoints in the town centre, to the south-east of the town centre towards Crichton, to the south-west of the town at Garroch and to the north-east of the town particularly on the A709 and on the bypass from the A76 to the A709;
- the greater degree of LDP development in the 2023 forecast year compared with 2018, results in additional delay throughout the network with an increase in congestion and individual junction delays in both time periods. There are particular pinchpoints in the town centre, to the south-east of the town centre towards Crichton, to the south-west of the town at Garroch and to the north-east of the town particularly on the A709, the A701 and on the bypass from the A76 to the A701;
- the addition of the new Marchfield and Parkhead link roads results in a limited reduction in congestion on the A75 Dumfries bypass in both directions between the A701 and the A709 in the 2023 forecast year compared with 2018 in both time periods, however, there is an increase in congestion at the bypass/A701 intersection;
- as per the LDP scenario option definition, the principal difference between the three options in the 2023 forecast year is the relocation of the Dumfries General Royal Infirmary (DGRI) and aligned development;
- comparing Option 4 with Option 3 shows a reduction in congestion in the town centre and south-east of the town centre towards the existing DGRI site, more-so in the morning peak. There is an increase in congestion in the south-west of the town towards Garroch, particularly on the A75 bypass west of the A709 though this is mitigated by the roundabout capacity improvements at Garroch. There is also a reduction in congestion in the north-east of the town, particularly towards Brownrigg on A709 where this LDP development is not included in Option 4; and
- comparing Option 5 with Option 3 shows a predicted reduction in congestion in the town centre and south-east of the town centre towards the existing DGRI site, more-so in the morning peak. There is an increase in congestion in the north-east of the town towards Brownrigg and Heathhall on parts of the bypass, though this is mitigated by the roundabout capacity improvements at the A709, on the A701 north and south of the Bypass and on the A709 towards the bypass.

5.4 Carbon Emissions

5.4.1 Appendix E presents the predicted annual vehicle carbon emissions for the LDP DRTM sector system for each LDP option. This data is also summarised in Figure 5.6. It should be noted that the emissions figures are for road based use only (ie car, LGV and HGV) and do not include bus, rail or motorbike.

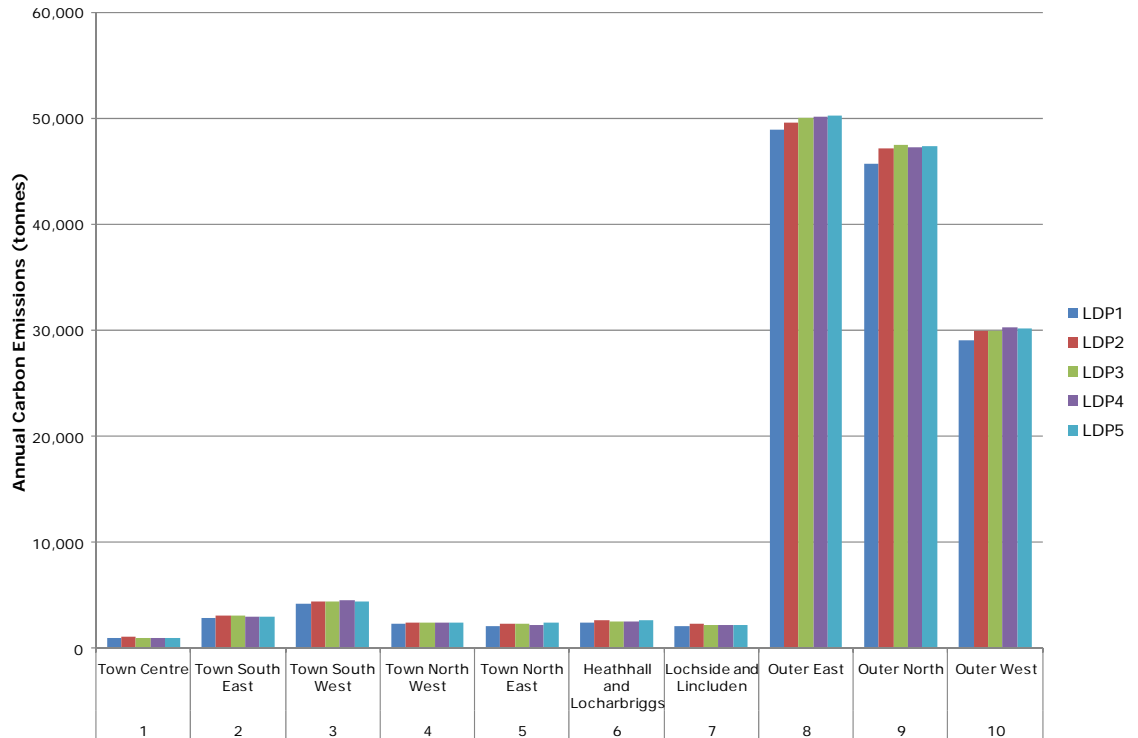


Figure 5.6 DRTM Annual Carbon Emissions

5.4.2 Inspection of Figure 5.6 and Appendix E reveals the carbon emissions broadly mirror the traffic and network performance as expected. There is a relatively small increase (~+3%) in carbon emissions in Option 2 compared with Option 1 in the 2018 forecast year, which reflects the greater degree of LDP development and associated traffic and congestion. There are also increased carbon emissions (~+3%) in the 2023 forecast year compared with 2018, again associated with the greater degree of LDP development and associated traffic and congestion. There is very little difference in the carbon emissions between the three options in the 2023 forecast year across the entire modelled area.

6 Additional Testing – Option 6

6.1 Introduction

6.1.1 Following a Technical Note and presentation of the DRTM model test outputs for the initial five option tests, D&GC then developed an additional Proposed Plan option (Option 6). Option 6 was also assessed using DRTM along with a sensitivity test which included the proposed relocation of the DGRI to Garroch (Option 6A).

6.1.2 This Chapter compares the travel demand and network performance for Option 6 with Option 6A. More detailed results and analysis are contained within Appendix F.

6.2 Travel Demand

Trip Origins and Destinations

6.2.1 Figures F.1 to F.8 in Appendix F presents the change in trip origins and destinations at zonal level for LDP Options 6 and 6A compared with the modelled base year for each time period. As noted above, the LDP scenario options include background traffic growth outwith Dumfries, travel demand associated with new LDP development and changes in travel patterns resulting from the relocation of the DGRI.

6.2.2 Tables F.1 to F.4 in Appendix F compares the trip origins and destinations for the LDP DRTM sector system for LDP Option 6 and Option 6A and this is summarised in Figures 6.1 and 6.2 below.

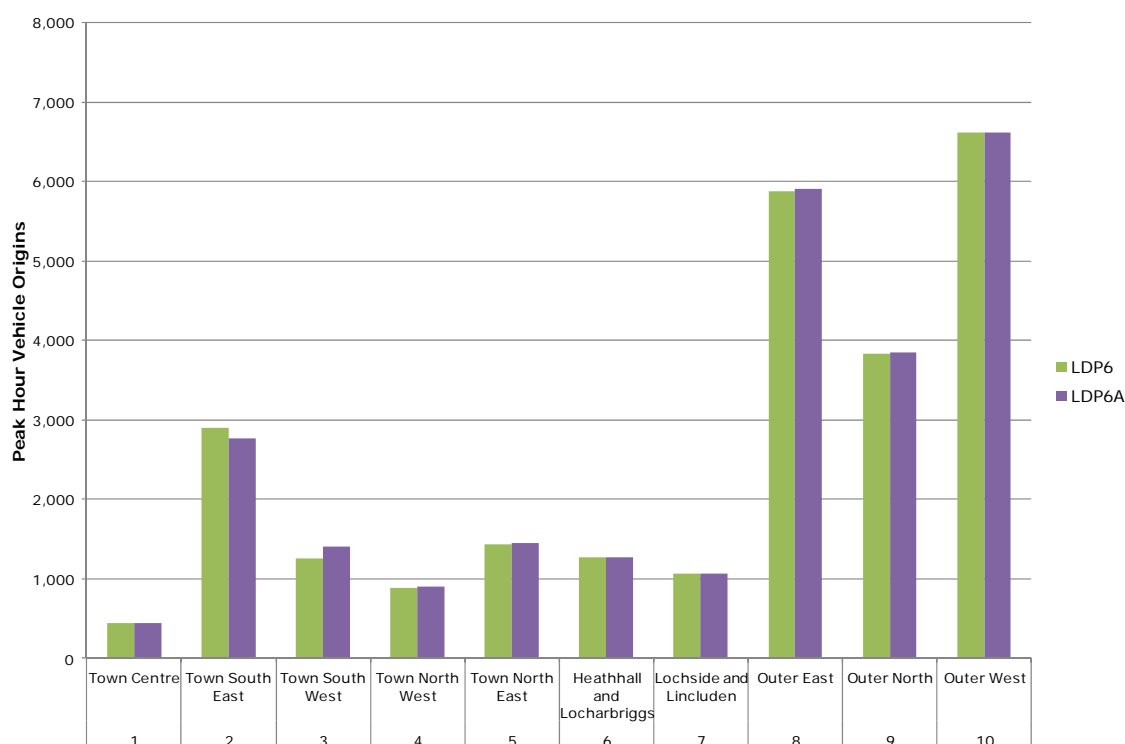


Figure 6.1 DRTM Trip Origins by Sector - AM Peak Hour

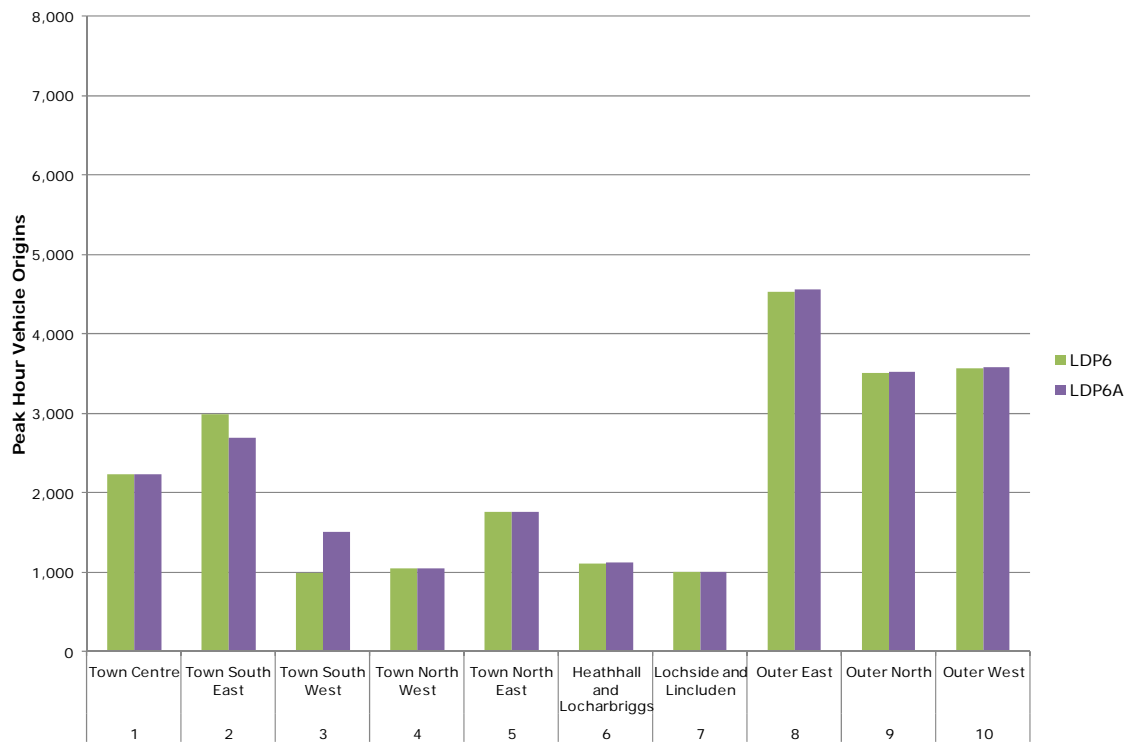


Figure 6.2 DRTM Trip Origins by Sector - PM Peak Hour

Travel Demand on Network

6.2.3 Figures F.9 to F.12 in Appendix F present the assigned peak hour total vehicle flows in the DRTM for each LDP option for each time period. Tables F.5 and F.6 in Appendix F present the total assigned peak hour vehicle flows for LDP Options 6 and 6A at the key locations across Dumfries as shown in Figure 4.3 and Figure B.11 in Appendix F. Figures 6.3 and 6.4 below provide a summary of the 2-way total traffic flow at the key locations.

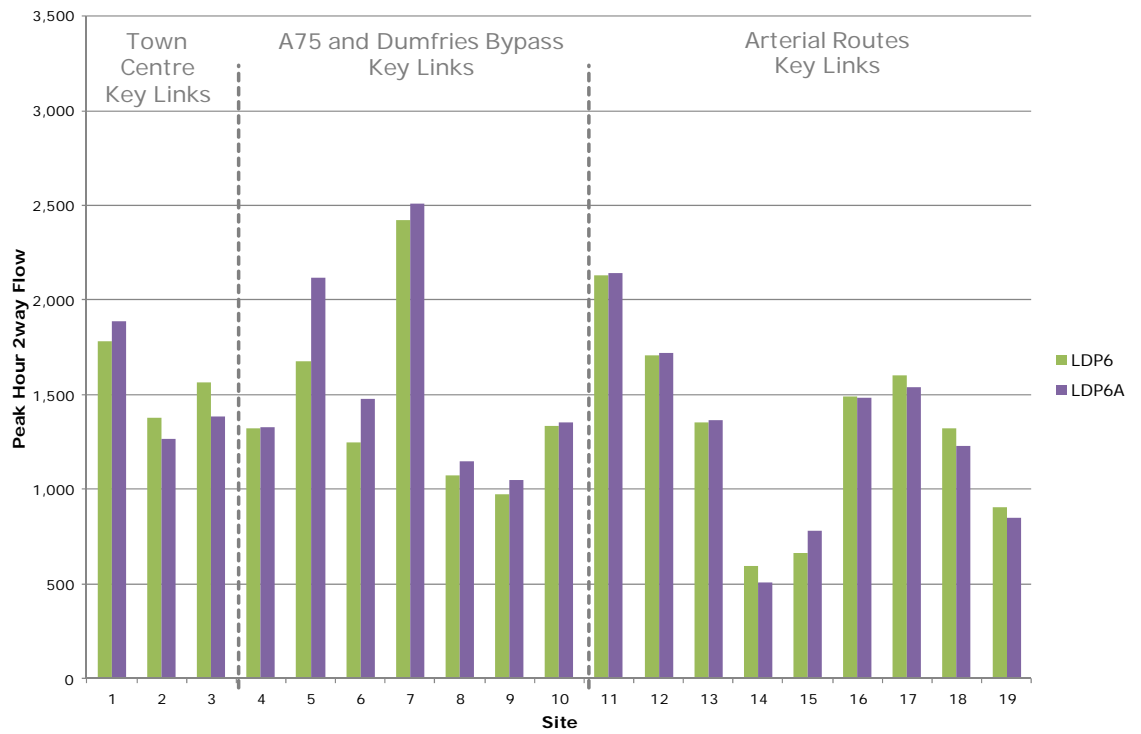


Figure 6.3 DRTM 2-way Vehicle Flows at Key Locations - AM Peak Hour

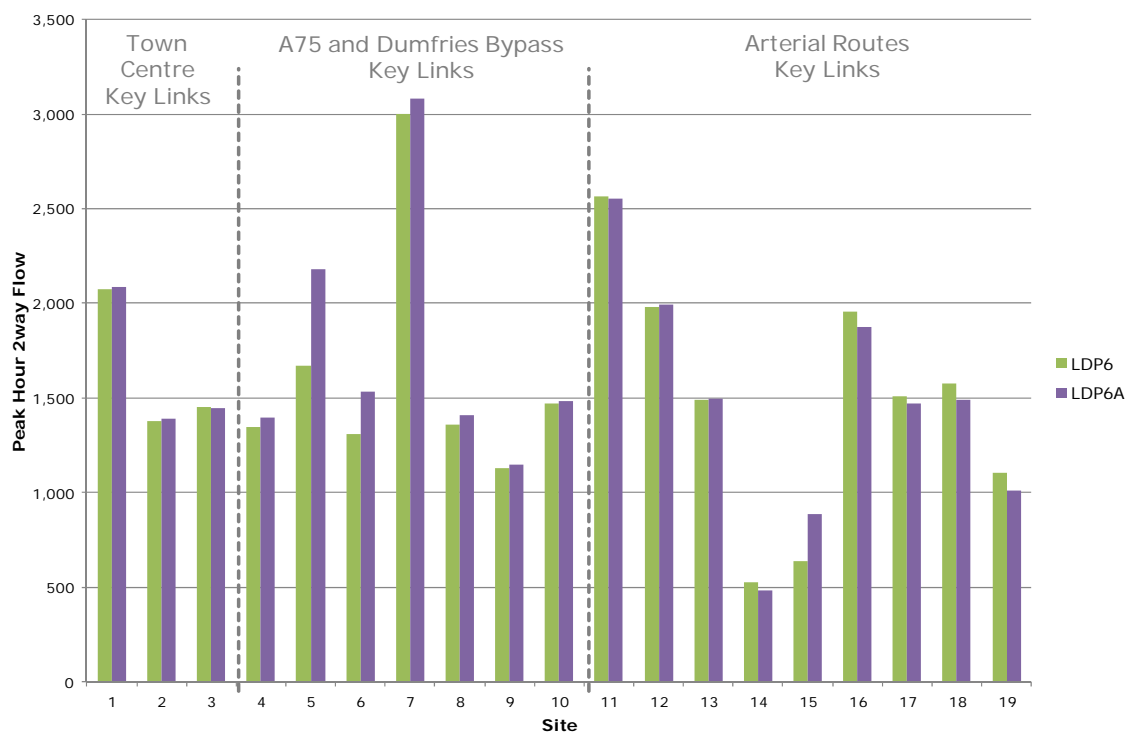


Figure 6.4 DRTM 2-way Vehicle Flows at Key Locations - PM Peak Hour

6.2.4 Tables F.7 to F.10 in Appendix F provide the total assigned vehicle kilometres (distance travelled on the road network) and hours (time spent on the road network) predicted by the DRTM for the LDP DRTM sector system and for LDP Options 6 and 6A. These are summarised in Figures 6.5 to 6.8 below.

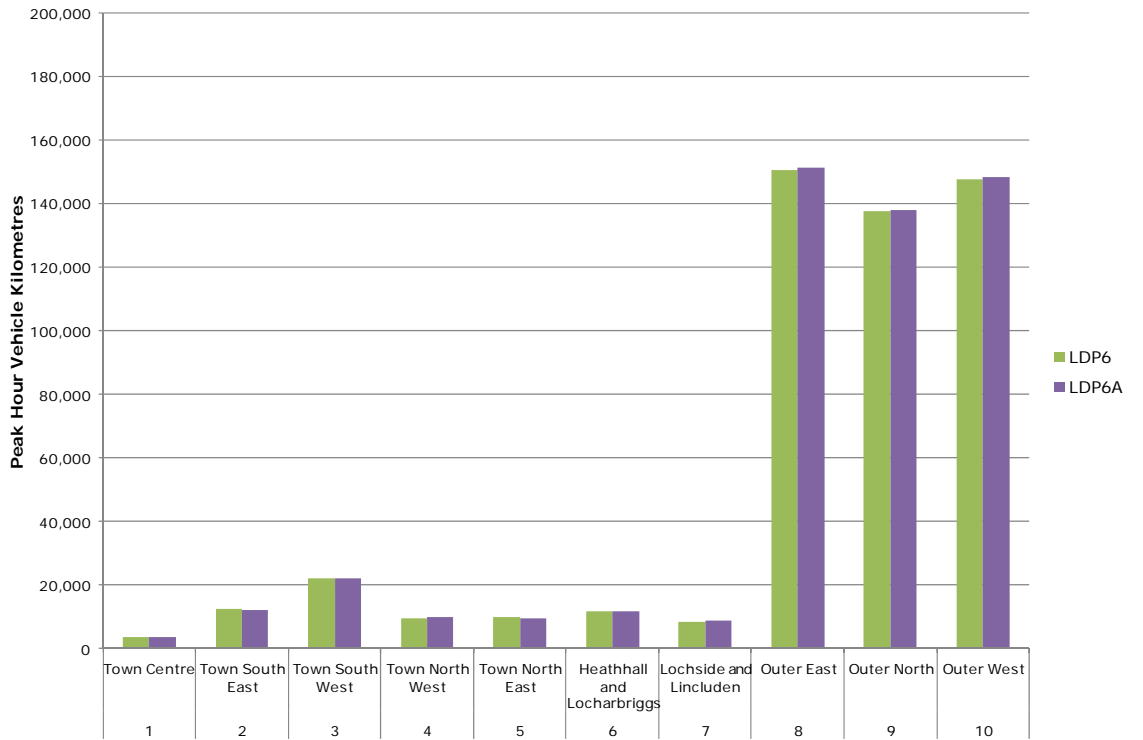


Figure 6.5 DRTM Vehicle Kilometres by Sector - AM Peak Hour

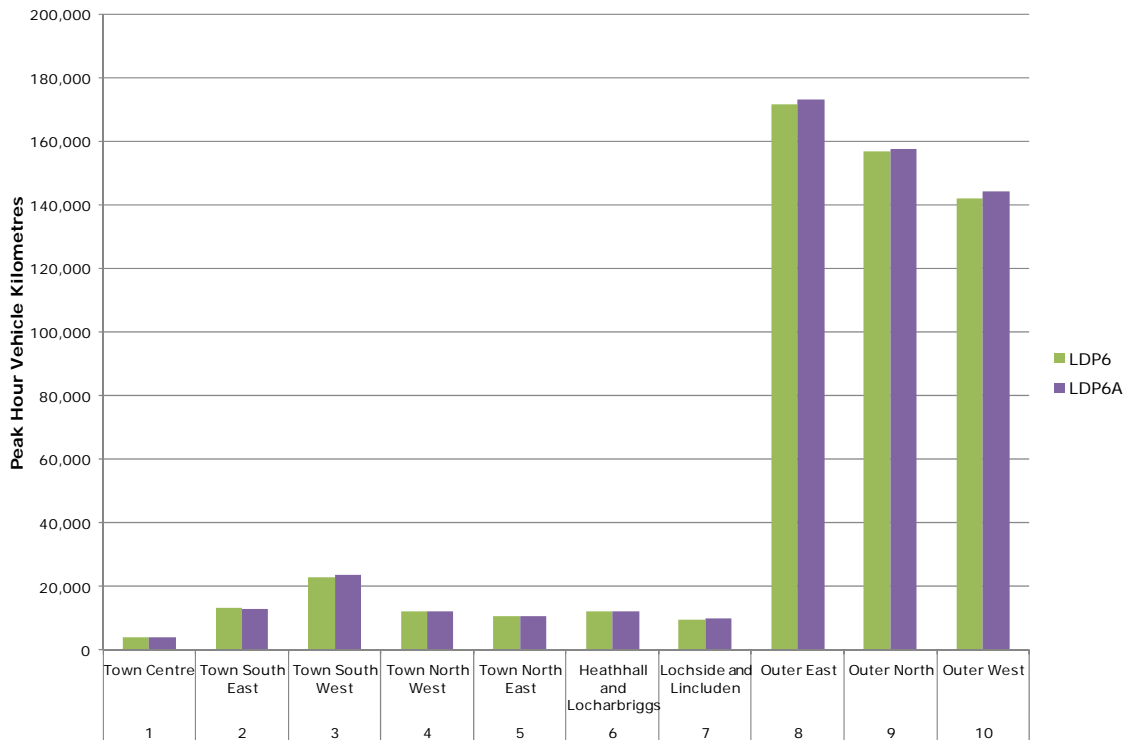


Figure 6.6 DRTM Vehicle Kilometres by Sector - PM Peak Hour

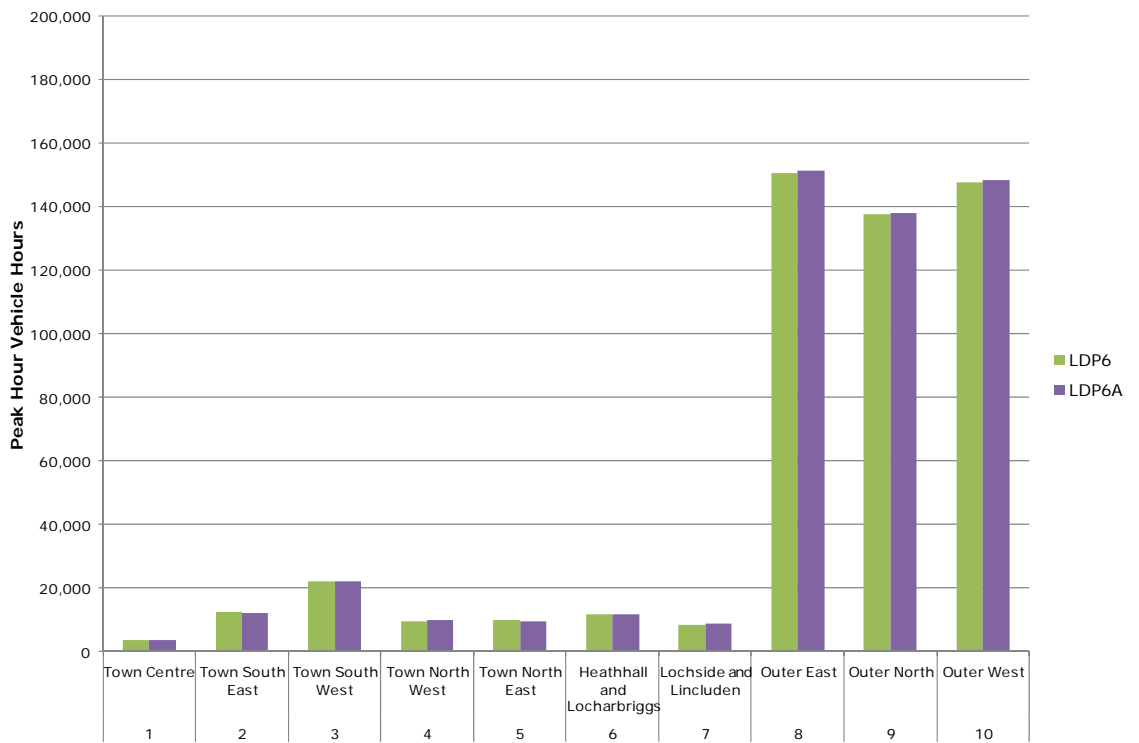


Figure 6.7 DRTM Vehicle Hours by Sector - AM Peak Hour

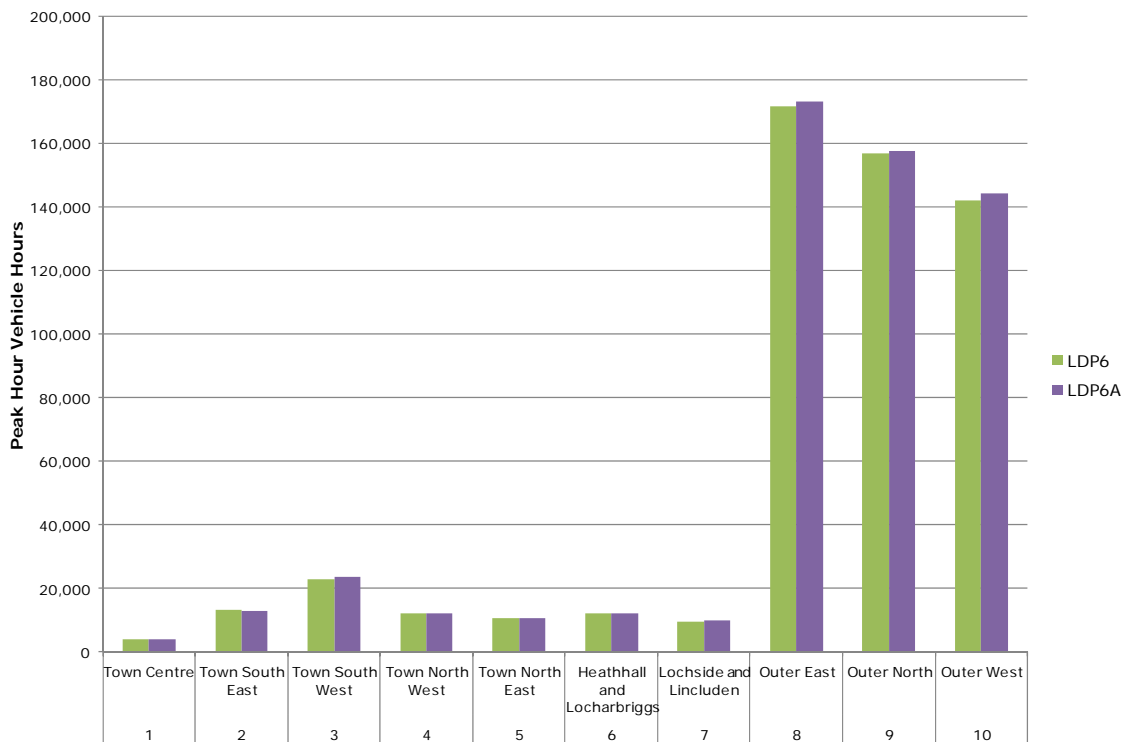


Figure 6.8 DRTM Vehicle Hours by Sector - PM Peak Hour

6.2.5 Inspection of the above and the data presented in Appendix F reveals the following key points for consideration:

- as expected, given the modelling methodology employed, traffic generation and travel demand on the road network is directly linked to the location of anticipated LDP development sites (noting that, as explained earlier there is no displacement, only addition) with greater development resulting in higher levels of assigned traffic on the modelled network;
- as per the LDP scenario option definition, the principal difference between Option 6 and Option 6A is the relocation of the Dumfries General Royal Infirmary (DGRI) and aligned development; and
- comparing Option 6A with Option 6 demonstrates a predicted reduction in traffic in the south-east of the town centre at the existing DGRI site, particularly in the morning peak. There is an increase in traffic to the south-west of the town towards Garroch, particularly on the A75 bypass west of the A76, Garroch Loaning and Castle Douglas Road.

6.3 Network Performance

Average Speeds and Journey Times

6.3.1 Tables F.11 and F.12 in Appendix F show the assigned average speed (in kph) on the modelled network for the LDP DRTM sector system for LDP Options 6 and 6A and are summarised in Figures 6.9 and 6.10 below.

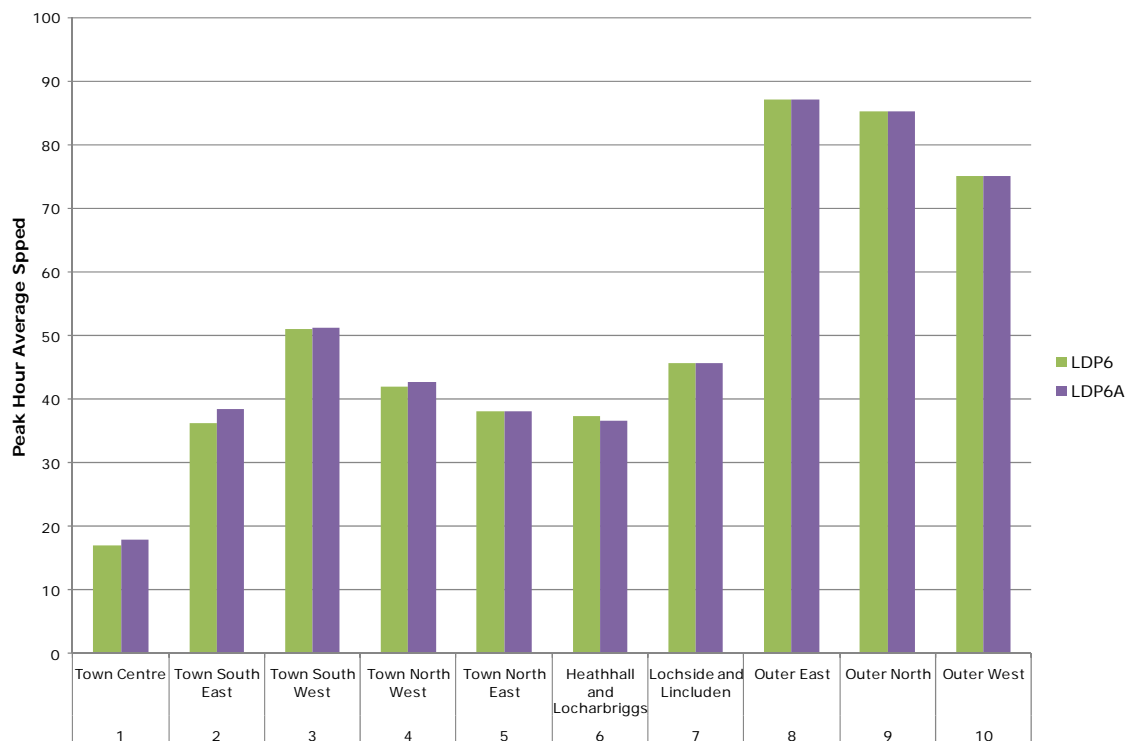


Figure 6.9 DRTM Average Vehicle Speed by Sector - AM Peak Hour

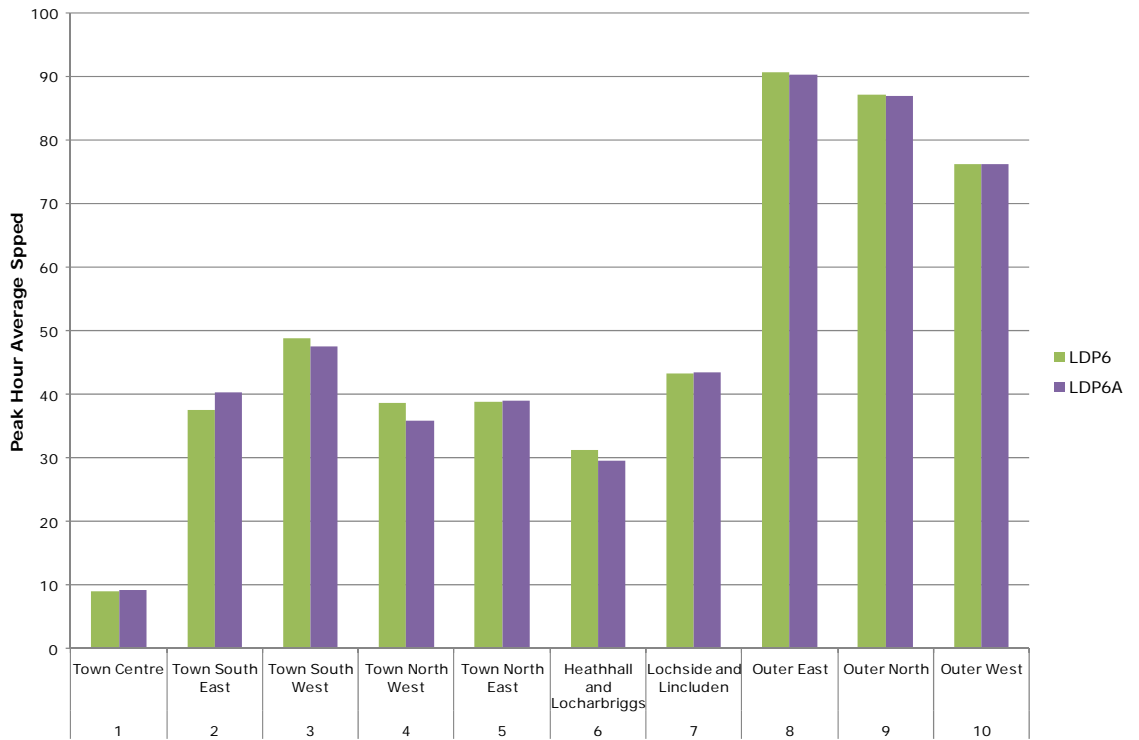


Figure 6.10 DRTM Average Vehicle Speed by Sector - PM Peak Hour

6.3.2 Tables F.13 and F.14 in Appendix F present the predicted peak hour average journey time for LDP Options 6 and 6A for key journey time routes across Dumfries as shown in Figure 5.3 and Figure C.1 in Appendix F. Figures 6.11 and 6.12 below provide a summary of the 2-way average journey time on the key routes.

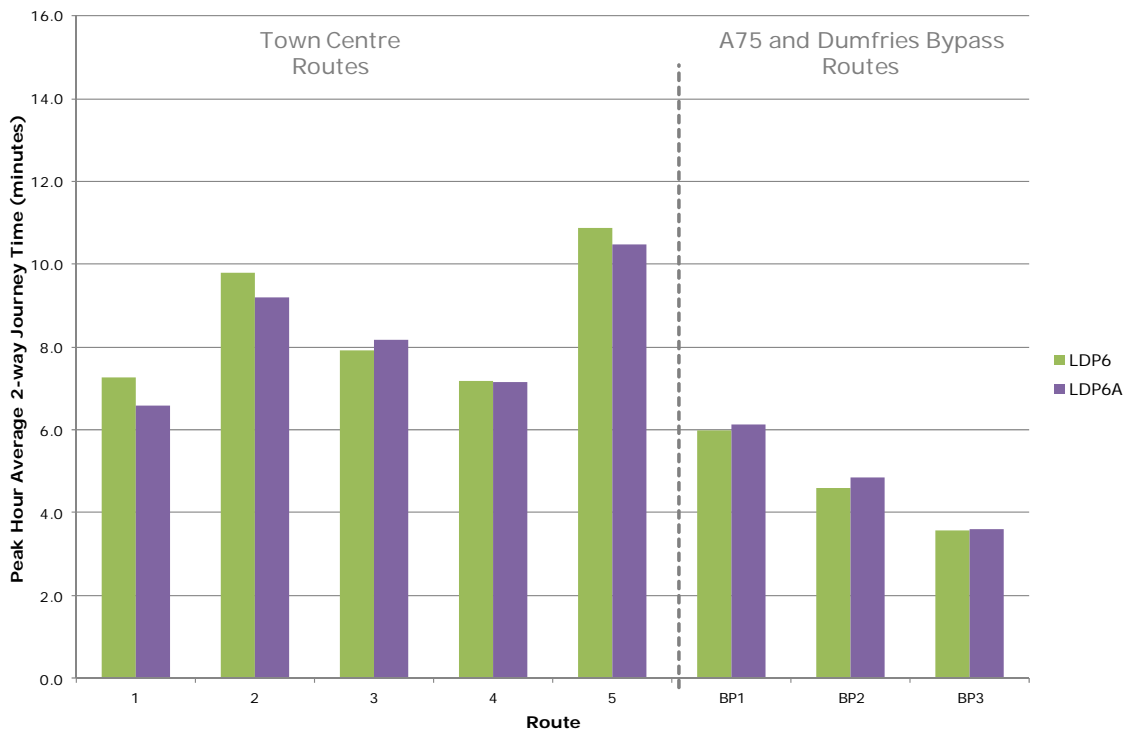


Figure 6.11 DRTM Average 2-way Journey Times - AM Peak Hour

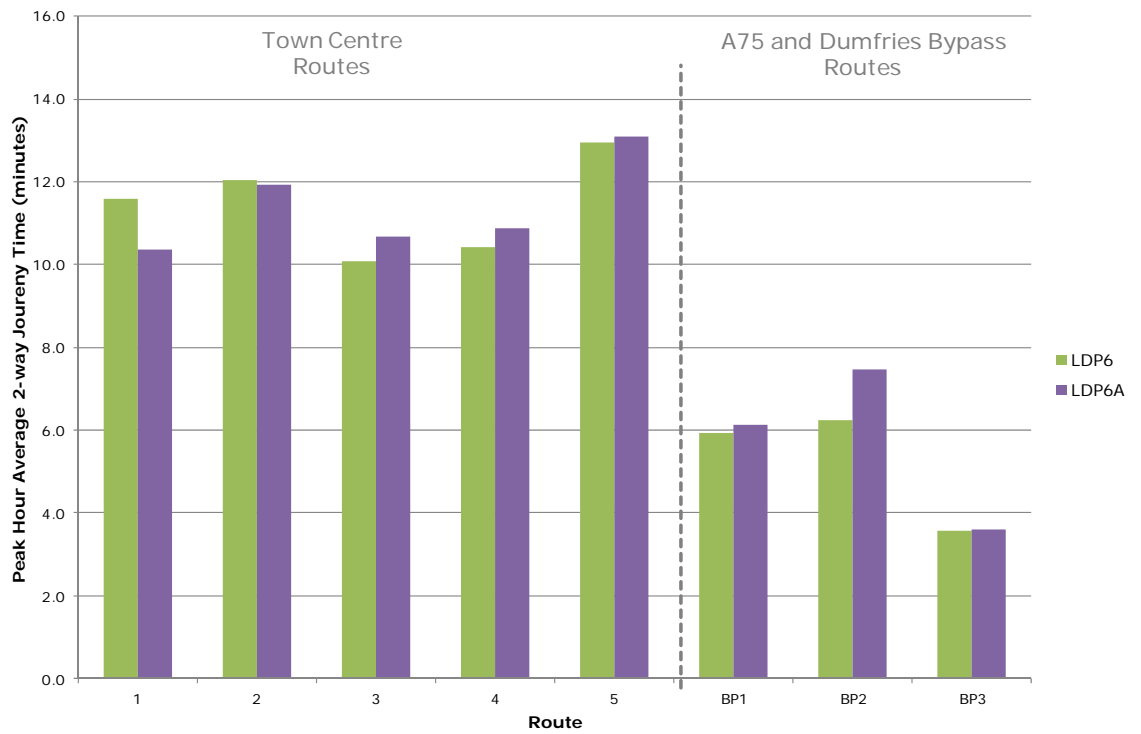


Figure 6.12 DRTM Average 2-way Journey Times - PM Peak Hour

Road Congestion and Junction Delay

- 6.3.3 Figures F.13 and F.14 in Appendix F show the change in modelled peak hour traffic congestion in the DRTM comparing LDP Option 6 with Option 6A for each time period. Traffic congestion is measured as the total aggregated average delay on all DRTM links, which are split and assigned to a 100 metre grid system in GIS.
- 6.3.4 Figures F.15 to F.18 in Appendix F show the assigned peak hour average flow weighted delay at each modelled junction in the DRTM for LDP Options 6 and 6A for each time period.

6.3.5 Inspection of the above and the data presented in Appendix F reveals the following key points for consideration:

- as expected, changes in the road network performance is directly linked to the degree of LDP development and the associated traffic generation with greater development resulting in additional delay and congestion;
- as per the earlier DRTM option tests, the evening peak hour is generally more sensitive than the morning peak hour, with greater changes predicted in speeds and journey times, which reflects a greater degree of congestion in the evening peak road network in the DRTM;
- as per the LDP scenario option definition, the principal difference between Option 6 and Option 6A is the relocation of the DGRI and aligned development; and
- comparing Option 6A with Option 6 broadly shows a reduction in delays and congestion to the south-east of the town centre towards the existing DGRI site with an increase in average speed and a reduction journey times on Dumfries town routes 1 and 2, which both include St Michael Street. There is also broadly a reduction in delays and congestion in the town centre, particularly in the morning peak hour, though there are specific locations where an increase in congestion is predicted.
- comparing Option 6A with Option 6 broadly shows an increase in delay and congestion in the south-west of the town towards Garroch with an increased journey time on Dumfries town route 3, which includes New Abbey Road. There is also an increase in travel times on parts of the A75 bypass, particularly west of the A76, though this is mitigated by the roundabout capacity improvements at Garroch. There is also an increase in predicted congestion predicted at the junction of the A75 bypass and the A701, particularly in the PM peak hour.

Carbon Emissions

6.3.6 Table F.15 in Appendix F compares the predicted annual vehicle carbon emissions for LDP Option 6 versus Option 6A in 2023 for the LDP DRTM sector system. This data is also summarised in Figure 6.13. As noted previously, the emissions figures are for road based use only (ie car, LGV and HGV) and do not include bus, rail or motorbike.

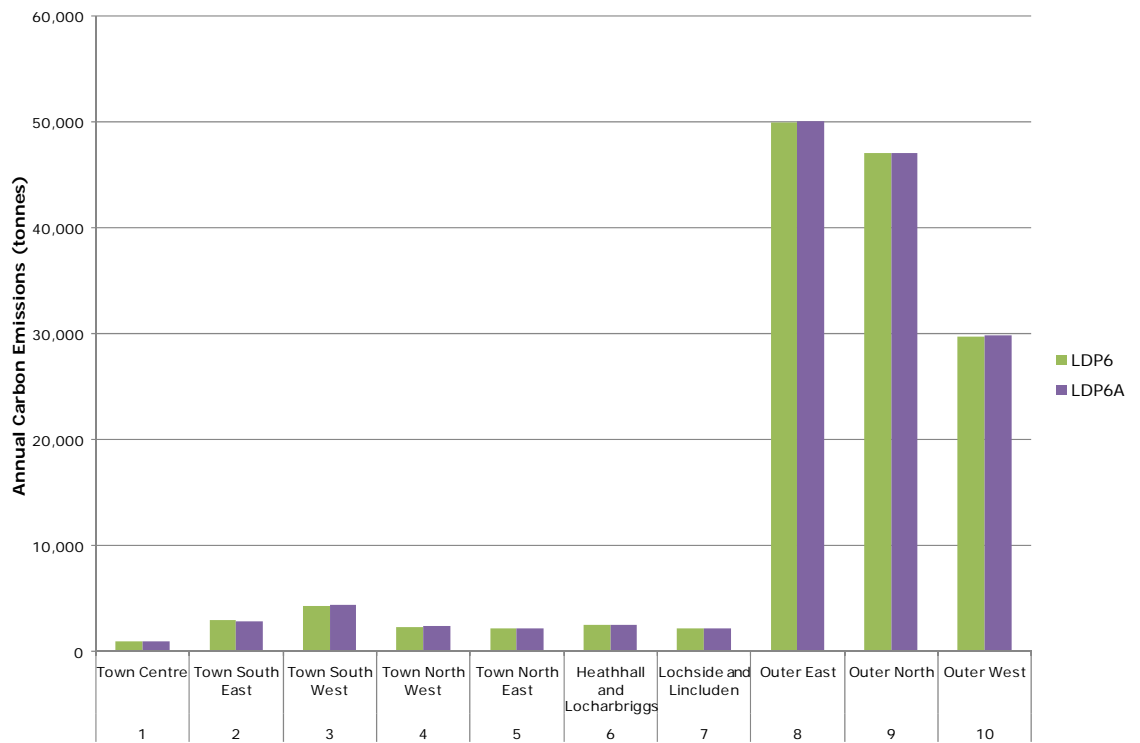


Figure 6.13 DRTM Annual Carbon Emissions

6.3.7 Inspection of Figure 6.13 and Appendix F reveals the carbon emissions broadly mirror the traffic and network performance as expected. At the aggregate DRTM level there is very little difference in the carbon emissions between options 6 and 6A in the 2023 forecast year across the entire modelled area. At the LDP sector level there is a relatively small decrease (~-4%) in forecast carbon emissions in Option 6A compared with Option 6 in the south-east of Dumfries, which reflects the DGRI relocation from Bankend Road to Garroch. There is also a slight increase in forecast carbon emissions (~+2%) in Option 6A compared with Option 6 in the west of Dumfries, again associated with the DGRI relocation.

7 Conclusions & Recommendations

7.1 Summary

- 7.1.1 This Report has presented the results of the DRTM LDP option model tests where five initial scenarios in two forecast years have been considered using the DRTM. Following presentation of those five scenarios to D&GC, an additional Option 6 test was developed and considered using the DRTM.
- 7.1.2 The Report has presented the travel demand forecast and resulting road network performance for each scenario including comparisons of the LDP options and forecast years.
- 7.1.3 It should be noted that whilst, the DRTM is considered suitable for this high level comparison assessment of LDP options that there some areas of the traffic model that could be improved through additional data collection to consequently improve the robustness of appraisal. This should be considered when reviewing the model results. In particular, care should be taken to avoid abstracting levels of detail that cannot be supported by the quality of the calibration and validation of the DRTM, which has been reported.
- 7.1.4 The methodology adopted for assessing the LDP scenarios options makes no allowance for displacement of land-use activities elsewhere in the modelled area of Dumfries and Galloway with the inclusion of the anticipated LDP development. Therefore, all new LDP land-use and associated travel demand considered is **in addition** to existing land-use and travel demand, with no reduction assumed elsewhere in the DRTM area. This is considered to represent a greater impact of the LDP scenarios being assessed as, in reality, it is likely that there would be a movement of population and jobs from existing locations to new LDP sites, eg through demolition and/or lower density use of existing developed land.

7.2 Initial Option Tests

- 7.2.1 The key findings from the initial 5 LDP option test definitions can be summarised as follows:
- LDP development sites are focussed around the town of Dumfries with associated traffic changes for each development in each option;
 - as expected, given the modelling methodology employed, traffic generation, assignment and the anticipated change in network performance is directly linked to the location of LDP development sites with greater development resulting in more congestion;
 - the evening peak hour is generally more sensitive than the morning with greater changes in speeds and journey times, which reflects the more congested nature of the evening road network in the DRTM;
 - the greater degree of LDP development in Option 2 compared with Option 1 in the 2018 forecast year, results in increased congestion throughout the network with particular pinchpoints in the town centre, to the south-east of the town centre towards Crichton, to the south-west of the town at Garroch and to the north-east of the town;
 - the greater degree of LDP development in the 2023 forecast year compared with 2018, results in increased congestion with particular pinchpoints in the town centre, to the

south-east of the town centre towards Crichton, to the south-west of the town at Garroch and to the north-east of the town;

- the addition of the new Marchfield and Parkhead link roads results in a limited reduction in congestion on the A75 Dumfries bypass in both directions between the A701 and the A709 in the 2023 forecast year compared with 2018 in both time periods;
- as per the LDP scenario option definition, the chief difference between the three options in the 2023 forecast year is the relocation of the Dumfries General Royal Infirmary (DGRI) and aligned development;
- comparing Option 4 with Option 3 shows a predicted reduction in congestion in the town centre and south-east of the town centre towards the existing DGRI site with an increase in congestion in the south-west of the town towards Garroch though this is mitigated by roundabout capacity improvements on the bypass at Garroch; and
- comparing Option 5 with Option 3 shows a predicted reduction in congestion in the town centre and south-east of the town centre towards the existing DGRI with an increase in congestion in the north-east of the town towards Brownrigg and Heathhall though this is mitigated by roundabout capacity improvements on the bypass at the A709.

7.3 Option 6 Tests

7.3.1 A further Option 6 was developed and tested along with a sensitivity test which included the proposed relocation of the DGRI to Garroch (Option 6A). The key findings from the DRTM analysis are as follows:

- as expected and shown in the earlier DRTM LDP tests, given the modelling methodology employed, traffic generation, assignment and the anticipated change in network performance is directly linked to the location of LDP development sites with greater development resulting in more congestion;
- as shown in the earlier DRTM LDP tests, the evening peak hour is generally more sensitive than the morning with greater changes in speeds and journey times, which reflects the more congested nature of the evening road network in the DRTM;
- as per the LDP scenario option definition, the principal difference between Option 6 and Option 6A is the relocation of the (DGRI) and aligned development; and
- comparing Option 6A with Option 6 broadly shows a reduction congestion to the south-east of the town centre towards the existing DGRI site. There is also a less pronounced reduction in congestion in large parts of the town centre. There is an increase congestion in the south-west of the town towards Garroch and on parts of the A75 bypass, though this is mitigated by the roundabout capacity improvements at Garroch. There is also an increase in predicted congestion predicted at the junction of the A75 bypass and the A701.

7.4 Pressure Points

7.4.1 Figure 7.1 below provides a summary of the anticipated pressure points in the network for each LDP scenario option.

Option	Location							
	Town centre	South-east of town centre towards Crichton	South-west of town towards Garroch	North west of town towards Brownrigg and Locharbriggs	Bypass at Garroch	Bypass at A76	Bypass at A701	Bypass at A709
LDP1 - Option 1 2018 Reference Case	+	++	+	++	+	+	++	++
LDP2 - Option 2 2018 Consultation Case	+++	+++	++	+++	++	++	+++	++
LDP3 - Option 3 2023 Reference Case	+++	+++	++	+++	++	++	+++	++
LDP4 - Option 4 2023 DGRI Garroch Orientated Plan	++	++	++	++	++	++	++	++
LDP5 - Option 5 2023 DGRI Summerfield Orientated Plan	++	++	+	+++	+	++	+++	++
LDP6 - Option6 2023 Final Proposed Plan	+++	+++	++	+++	++	++	+++	++
LDP6 - Option6A 2023 Final Proposed Plan DGRI Garroch Orientated Sensitivity Test	++	++	++	+++	++	++	+++	++

Key

Some Congestion	+
Moderate Congestion	++
High Congestion	+++

Figure 7.1 Summary of Network Pressure Points

7.5 Recommendations

Mitigation

- 7.5.1 It is recommended that the findings of this Report are used to refine the LDP options and inform the anticipated impact of LDP development on the road network. If more detailed network analysis is required, eg to identify potential mitigation measures, it is recommended that further discussions are held to consider how best to improve the current modelling eg through more local modelling (individual junction assessments (eg Arcady, Transyt) and/or micro-simulation), improve current DRTM modelling and/or improving observed data as appropriate.

DGRI mitigation

- 7.5.2 Local road network mitigation associated with the DGRI is being refined and agreed in recent weeks. It may be prudent to code these transport network changes into any refined Option test scenario.

Appendix A - Trip Origins and Destinations

Table A.1 2018 Forecast Year AM Peak Hour Trip Origins (Vehicles)

Sector	LDP1 2018	LDP2 2018		LDP3 2023	
	Option 1	Option 2	Change	Option 3	Change
1 Town Centre	440	450	+10 +2%	450	+10 +2%
2 Town South East	2,570	2,950	+380 +15%	2,920	+350 +14%
3 Town South West	1,170	1,270	+100 +9%	1,260	+90 +8%
4 Town North West	870	920	+50 +6%	900	+30 +3%
5 Town North East	1,320	1,780	+460 +35%	1,750	+430 +33%
6 Heathhall and Locharbriggs	1,190	1,450	+260 +22%	1,280	+90 +8%
7 Lochside and Lincluden	1,020	1,100	+80 +8%	1,060	+40 +4%
8 Outer East	5,680	5,750	+70 +1%	5,890	+210 +4%
9 Outer North	3,710	3,800	+90 +2%	3,860	+150 +4%
10 Outer West	6,390	6,490	+100 +2%	6,640	+250 +4%

Table A.2 2018 Forecast Year PM Peak Hour Trip Origins (Vehicles)

Sector	LDP1 2018	LDP2 2018		LDP3 2023	
	Option 1	Option 2	Change	Option 3	Change
1 Town Centre	2,140	2,290	+150 +7%	2,270	+130 +6%
2 Town South East	2,740	2,810	+70 +3%	3,050	+310 +11%
3 Town South West	820	990	+170 +21%	1,000	+180 +22%
4 Town North West	1,000	1,080	+80 +8%	1,080	+80 +8%
5 Town North East	1,460	2,040	+580 +40%	1,940	+480 +33%
6 Heathhall and Locharbriggs	1,000	1,200	+200 +20%	1,130	+130 +13%
7 Lochside and Lincluden	970	1,020	+50 +5%	1,010	+40 +4%
8 Outer East	4,360	4,420	+60 +1%	4,560	+200 +5%
9 Outer North	3,370	3,430	+60 +2%	3,530	+160 +5%
10 Outer West	3,420	3,500	+80 +2%	3,590	+170 +5%

Table A.3 2023 Forecast Year AM Peak Hour Trip Origins (Vehicles)

Sector	LDP3 2023	LDP4 2023		LDP5 2023	
	Option 3	Option 4	Change	Option 5	Change
1 Town Centre	450	450	0 0%	450	0 0%
2 Town South East	2,920	2,840	-80 -3%	2,870	-50 -2%
3 Town South West	1,260	1,680	+420 +33%	1,280	+20 +2%
4 Town North West	900	900	0 0%	910	+10 +1%
5 Town North East	1,750	1,440	-310 -18%	1,860	+110 +6%
6 Heathhall and Locharbriggs	1,280	1,290	+10 +1%	1,460	+180 +14%
7 Lochside and Lincluden	1,060	1,060	0 0%	1,070	+10 +1%
8 Outer East	5,890	5,920	+30 +1%	5,930	+40 +1%
9 Outer North	3,860	3,860	0 0%	3,880	+20 +1%
10 Outer West	6,640	6,650	+10 +0%	6,670	+30 +0%

Table A.4 2023 Forecast Year PM Peak Hour Trip Origins (Vehicles)

Sector	LDP3 2023	LDP4 2023		LDP5 2023	
	Option 3	Option 4	Change	Option 5	Change
1 Town Centre	2,270	2,250	-20 -1%	2,270	0 0%
2 Town South East	3,050	2,770	-280 -9%	2,730	-320 -10%
3 Town South West	1,000	1,670	+670 +67%	990	-10 -1%
4 Town North West	1,080	1,090	+10 +1%	1,060	-20 -2%
5 Town North East	1,940	1,780	-160 -8%	2,320	+380 +20%
6 Heathhall and Locharbriggs	1,130	1,140	+10 +1%	1,220	+90 +8%
7 Lochside and Lincluden	1,010	1,020	+10 +1%	1,010	0 0%
8 Outer East	4,560	4,570	+10 +0%	4,570	+10 +0%
9 Outer North	3,530	3,540	+10 +0%	3,520	-10 -0%
10 Outer West	3,590	3,610	+20 +1%	3,590	0 0%

Table A.5 2018 Forecast Year AM Peak Hour Trip Destinations (Vehicles)

Sector		LDP1 2018				LDP2 2018				LDP3 2023			
		Option 1	Option 2	Change		Option 2	Change		Option 3	Change			
1	Town Centre	1,880	2,040	+160	+9%	2,000	+120	+6%					
2	Town South East	2,740	2,990	+250	+9%	2,990	+250	+9%					
3	Town South West	1,050	1,250	+200	+19%	1,240	+190	+18%					
4	Town North West	900	960	+60	+7%	940	+40	+4%					
5	Town North East	1,630	2,080	+450	+28%	1,920	+290	+18%					
6	Heathhall and Locharbriggs	840	1,050	+210	+25%	960	+120	+14%					
7	Lochside and Lincluden	850	900	+50	+6%	890	+40	+5%					
8	Outer East	5,110	5,170	+60	+1%	5,300	+190	+4%					
9	Outer North	3,520	3,620	+100	+3%	3,690	+170	+5%					
10	Outer West	5,850	5,920	+70	+1%	6,070	+220	+4%					

Table A.6 2018 Forecast Year PM Peak Hour Trip Destinations (Vehicles)

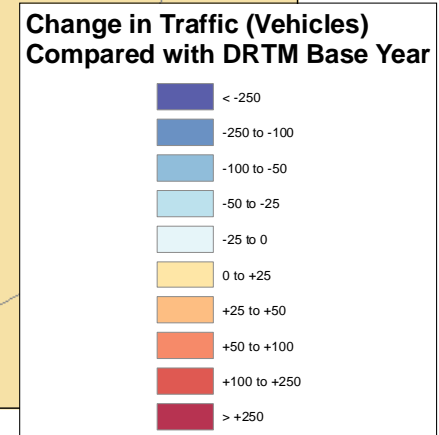
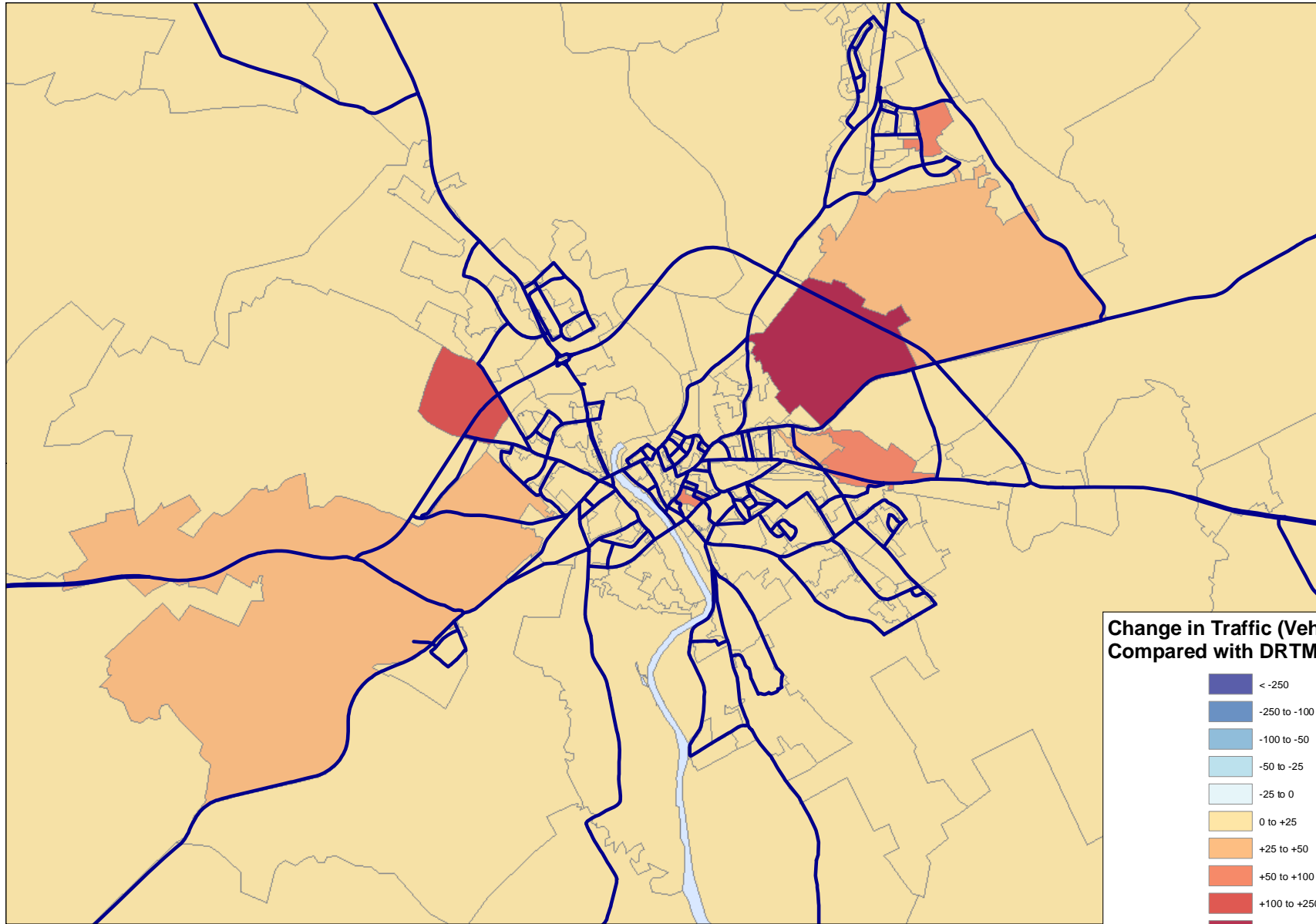
Sector		LDP1 2018				LDP2 2018				LDP3 2023			
		Option 1	Option 2	Change		Option 2	Change		Option 3	Change			
1	Town Centre	1,170	1,240	+70	+6%	1,230	+60	+5%					
2	Town South East	2,230	2,310	+80	+4%	2,560	+330	+15%					
3	Town South West	1,100	1,190	+90	+8%	1,200	+100	+9%					
4	Town North West	1,440	1,510	+70	+5%	1,510	+70	+5%					
5	Town North East	1,420	2,050	+630	+44%	2,060	+640	+45%					
6	Heathhall and Locharbriggs	1,030	1,240	+210	+20%	1,110	+80	+8%					
7	Lochside and Lincluden	910	990	+80	+9%	970	+60	+7%					
8	Outer East	4,590	4,670	+80	+2%	4,780	+190	+4%					
9	Outer North	3,540	3,630	+90	+3%	3,710	+170	+5%					
10	Outer West	3,860	3,950	+90	+2%	4,040	+180	+5%					

Table A.7 2023 Forecast Year AM Peak Hour Trip Destinations (Vehicles)

Sector		LDP3 2023				LDP4 2023				LDP5 2023			
		Option 3	Option 4	Change		Option 4	Change		Option 5	Change			
1	Town Centre	2,000	1,980	-20	-1%	2,020	+20	+1%					
2	Town South East	2,990	2,650	-340	-11%	2,660	-330	-11%					
3	Town South West	1,240	1,810	+570	+46%	1,260	+20	+2%					
4	Town North West	940	940	0	0%	950	+10	+1%					
5	Town North East	1,920	1,780	-140	-7%	2,440	+520	+27%					
6	Heathhall and Locharbriggs	960	970	+10	+1%	1,050	+90	+9%					
7	Lochside and Lincluden	890	880	-10	-1%	890	0	0%					
8	Outer East	5,300	5,320	+20	+0%	5,320	+20	+0%					
9	Outer North	3,690	3,680	-10	-0%	3,700	+10	+0%					
10	Outer West	6,070	6,100	+30	+0%	6,090	+20	+0%					

Table A.8 2023 Forecast Year PM Peak Hour Trip Destinations (Vehicles)

Sector		LDP3 2023				LDP4 2023				LDP5 2023			
		Option 3	Option 4	Change		Option 4	Change		Option 5	Change			
1	Town Centre	1,230	1,220	-10	-1%	1,210	-20	-2%					
2	Town South East	2,560	2,500	-60	-2%	2,480	-80	-3%					
3	Town South West	1,200	1,650	+450	+38%	1,220	+20	+2%					
4	Town North West	1,510	1,500	-10	-1%	1,510	0	0%					
5	Town North East	2,060	1,800	-260	-13%	1,990	-70	-3%					
6	Heathhall and Locharbriggs	1,110	1,120	+10	+1%	1,250	+140	+13%					
7	Lochside and Lincluden	970	980	+10	+1%	980	+10	+1%					
8	Outer East	4,780	4,840	+60	+1%	4,840	+60	+1%					
9	Outer North	3,710	3,730	+20	+1%	3,720	+10	+0%					
10	Outer West	4,040	4,100	+60	+1%	4,090	+50	+1%					



**Dumfries Regional Traffic Model
Local Development Plan Tests**

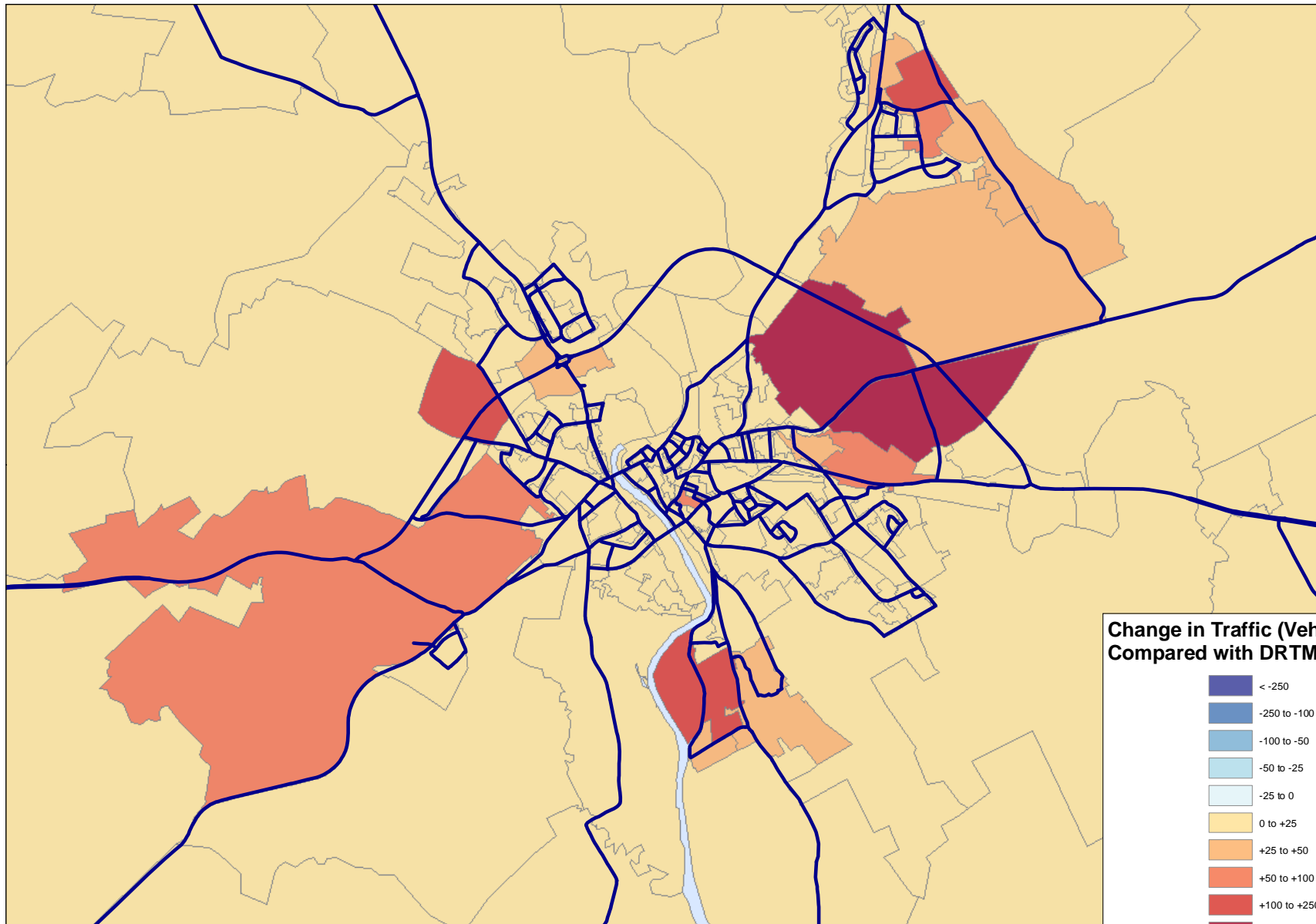
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Forecast Change in Trip Origins
AM Peak Hour – LDP Option 1**

Project No.
101767

Figure
A.1

mvaconsultancy



**Dumfries Regional Traffic Model
Local Development Plan Tests**

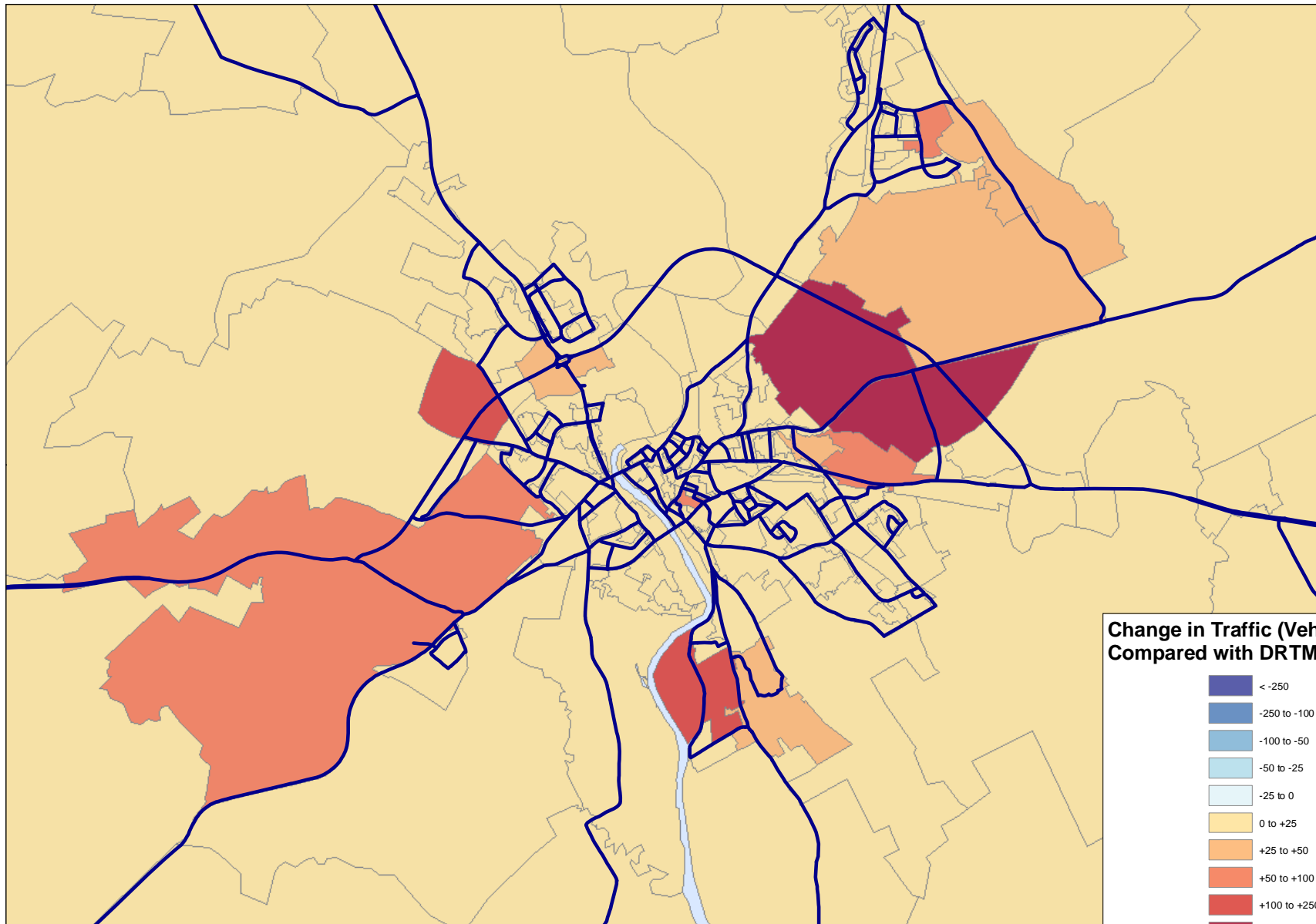
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Forecast Change in Trip Origins
AM Peak Hour – LDP Option 2**

Project No.
101767

Figure
A.2

mvaconsultancy



**Dumfries Regional Traffic Model
Local Development Plan Tests**

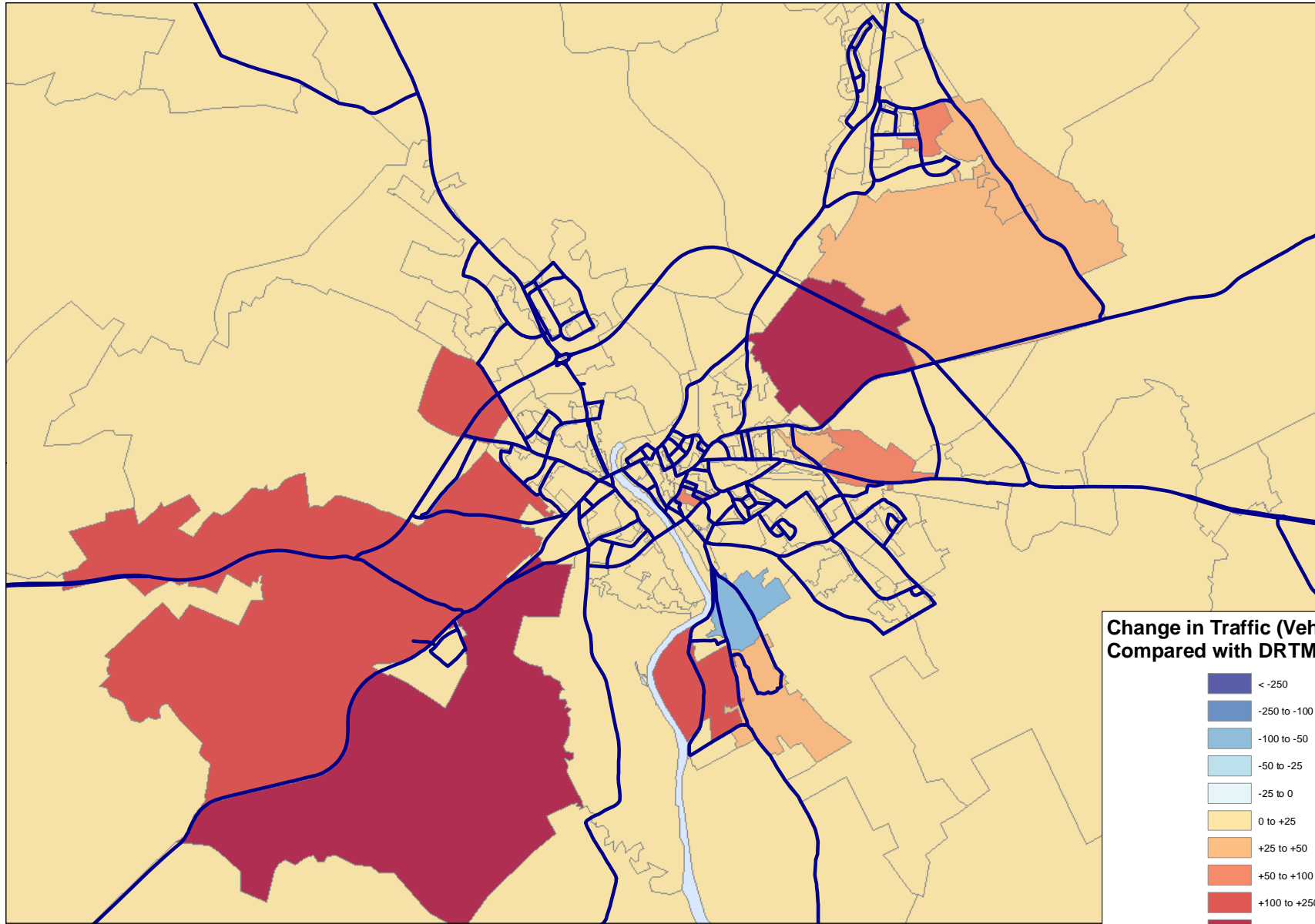
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Forecast Change in Trip Origins
AM Peak Hour – LDP Option 3**

Project No.
101767

Figure
A.3

mvaconsultancy



**Dumfries Regional Traffic Model
Local Development Plan Tests**

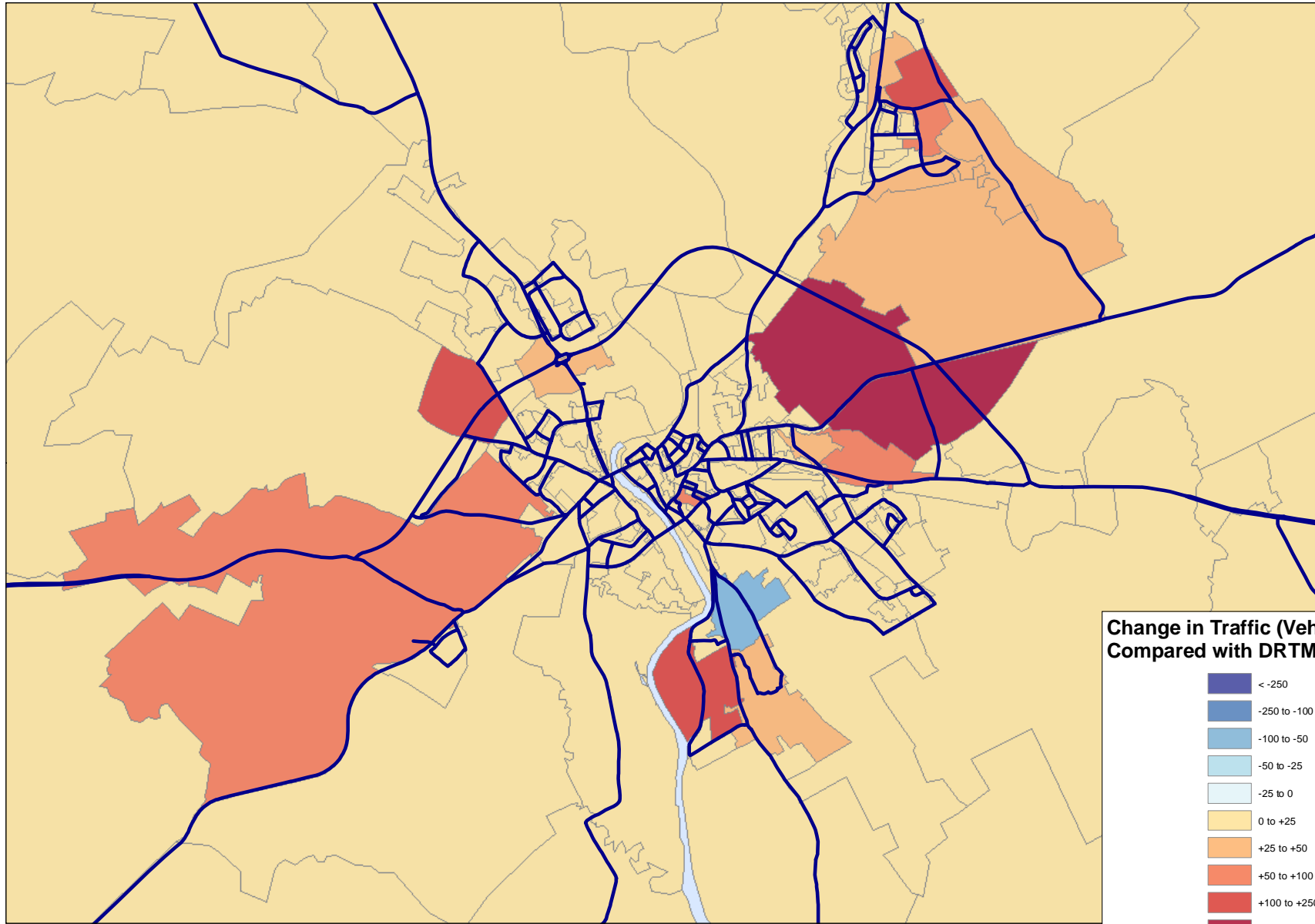
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Forecast Change in Trip Origins
AM Peak Hour – LDP Option 4**

Project No.
101767

Figure
A.4

mvaconsultancy



**Dumfries Regional Traffic Model
Local Development Plan Tests**

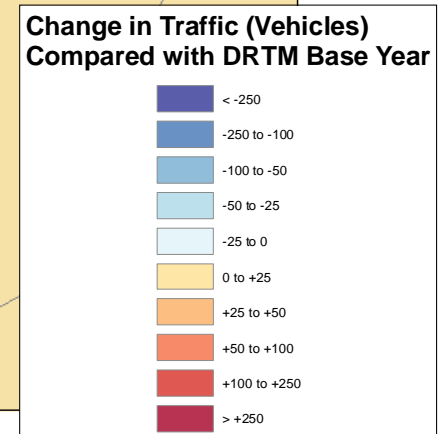
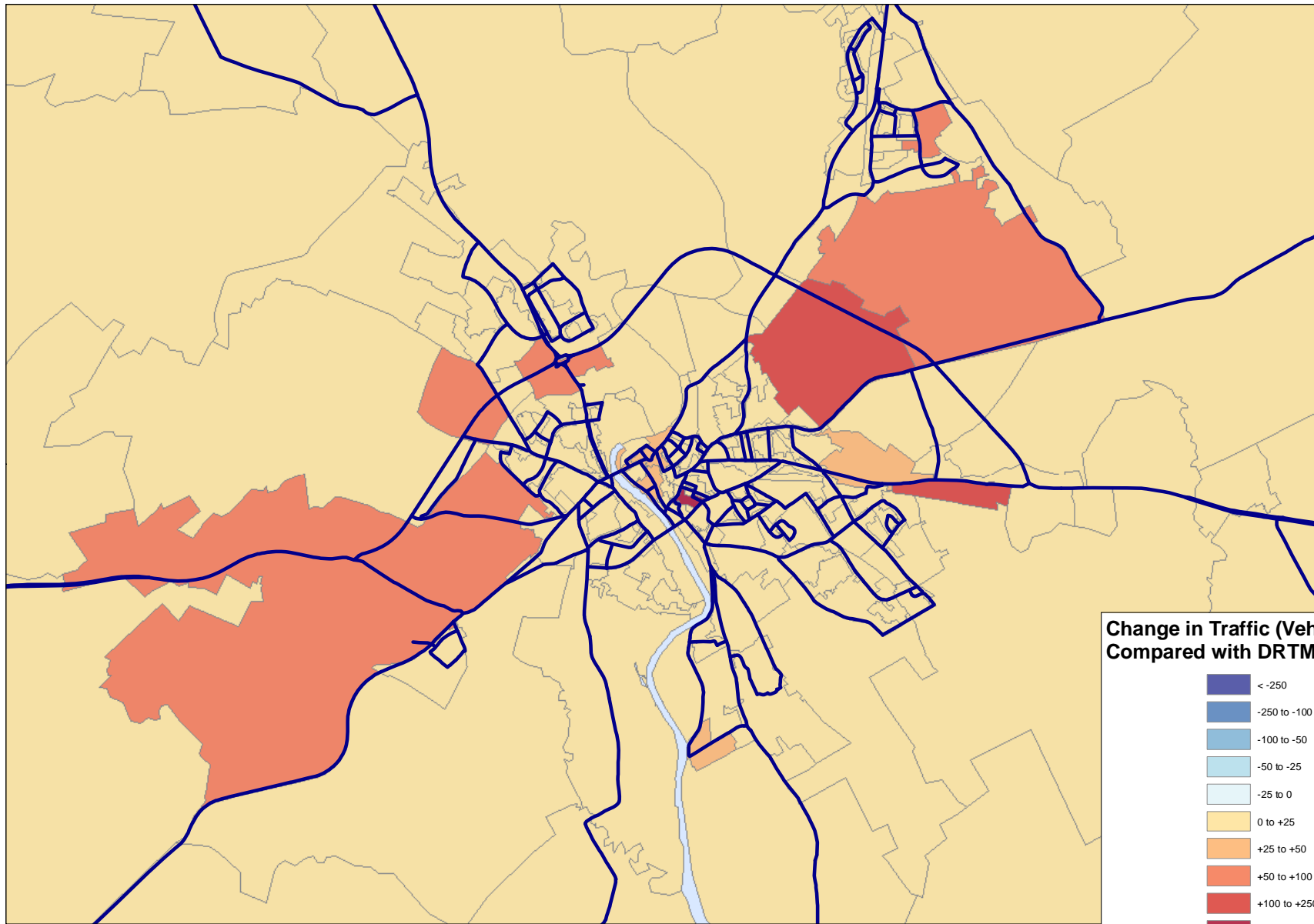
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Forecast Change in Trip Origins
AM Peak Hour – LDP Option 5**

Project No.
101767

Figure
A.5

mvaconsultancy



Dumfries Regional Traffic Model Local Development Plan Tests

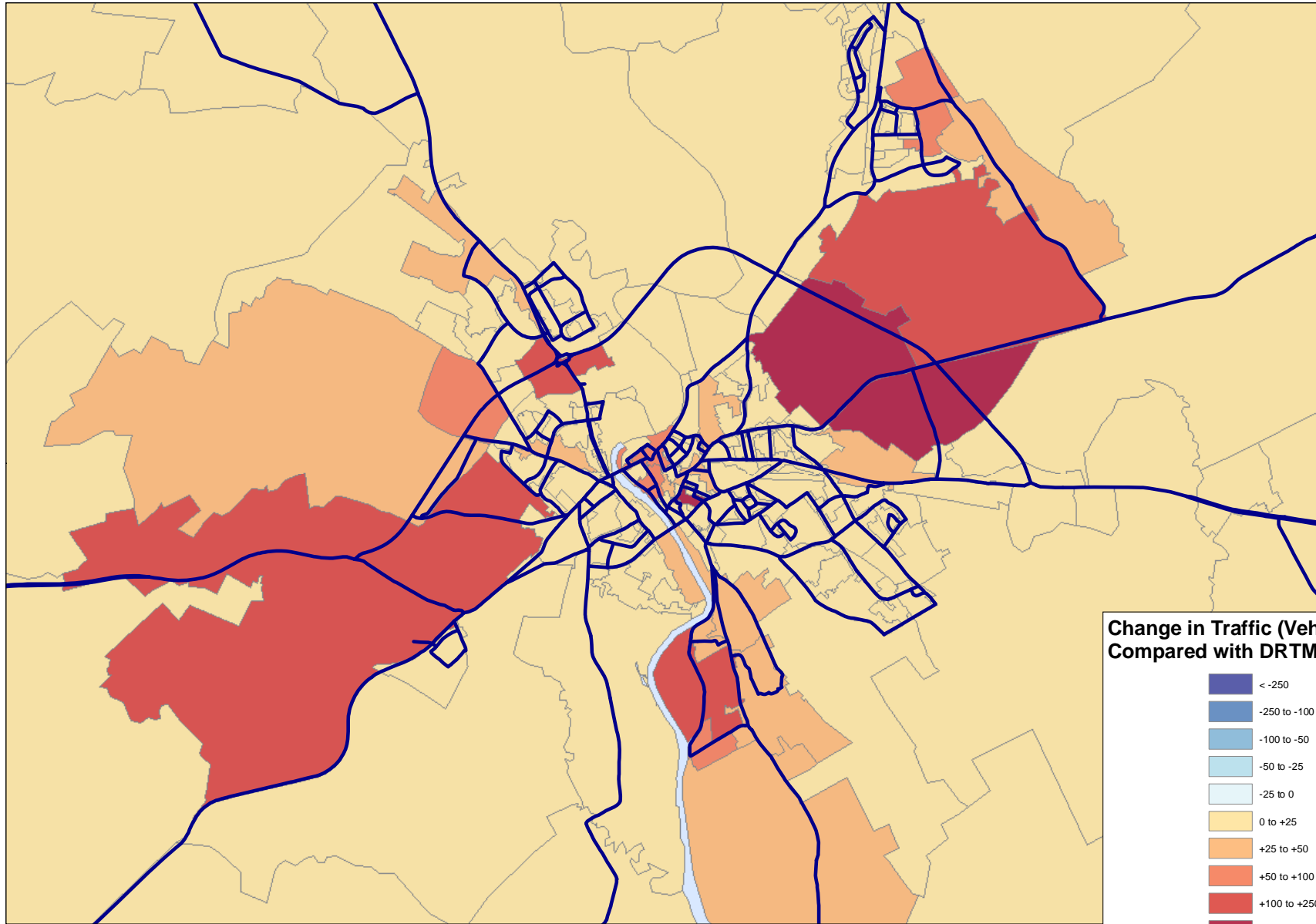
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Forecast Change in Trip Origins
PM Peak Hour – LDP Option 1**

Project No.
101767

Figure
A.6

mvaconsultancy



**Dumfries Regional Traffic Model
Local Development Plan Tests**

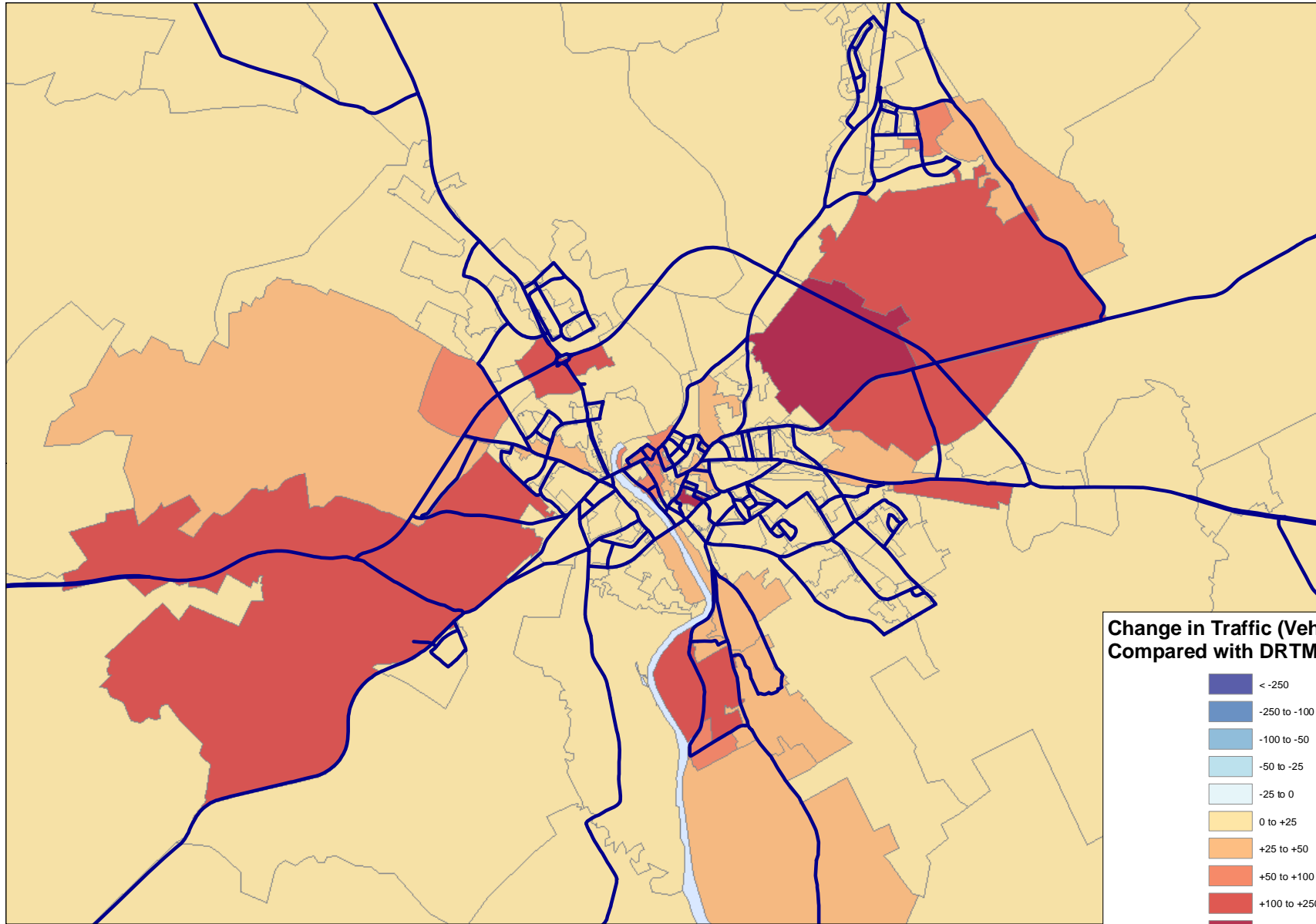
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Forecast Change in Trip Origins
PM Peak Hour – LDP Option 2**

Project No.
101767

Figure
A.7

mvaconsultancy



**Dumfries Regional Traffic Model
Local Development Plan Tests**

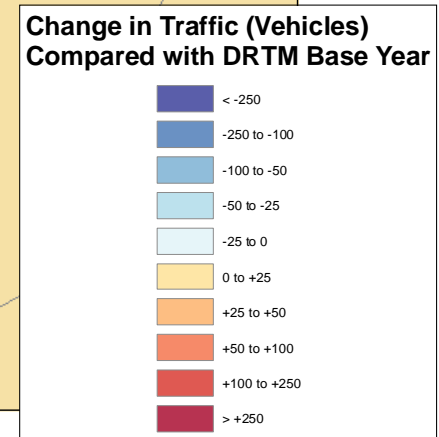
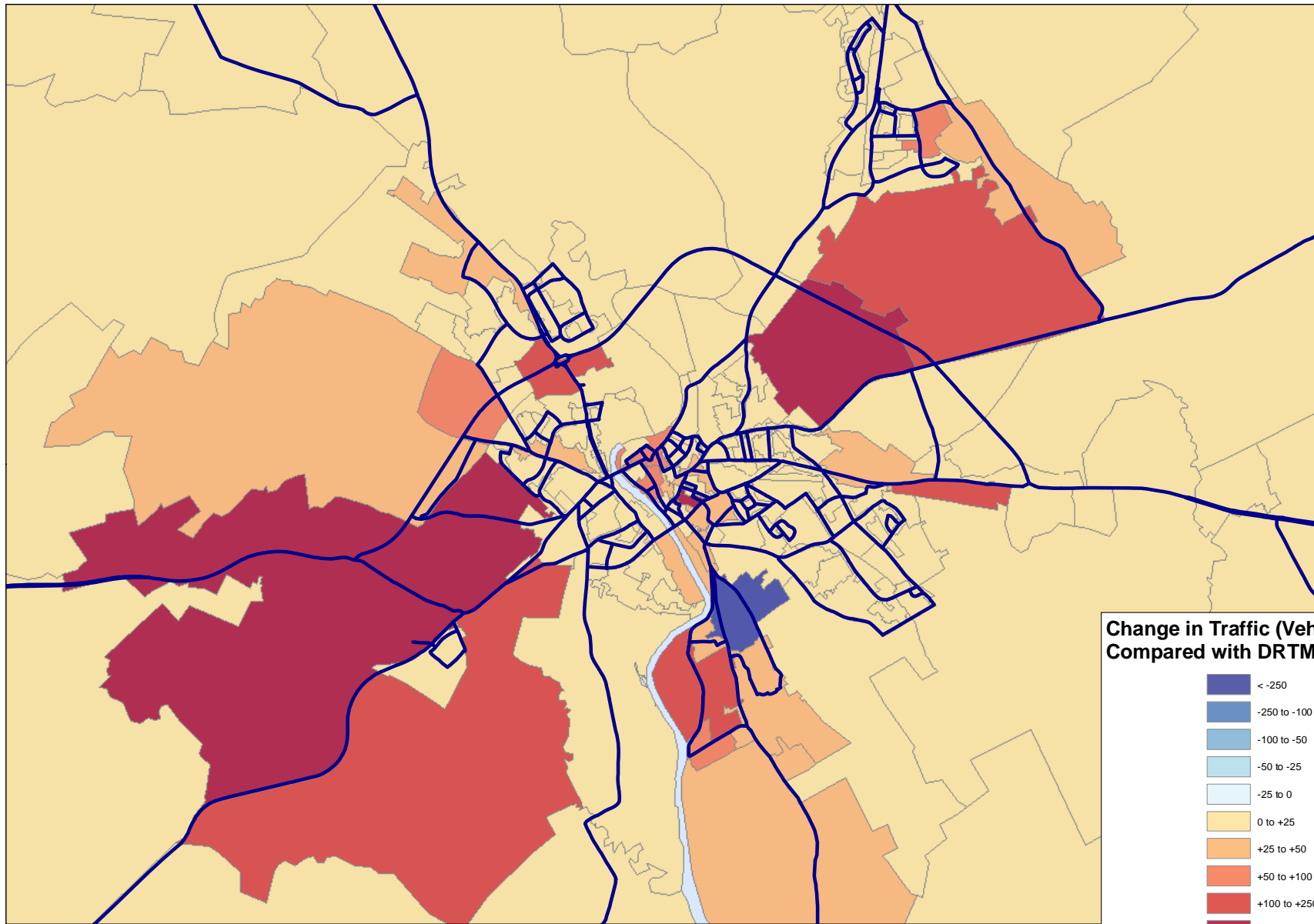
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Forecast Change in Trip Origins
PM Peak Hour – LDP Option 3**

Project No.
101767

Figure
A.8

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

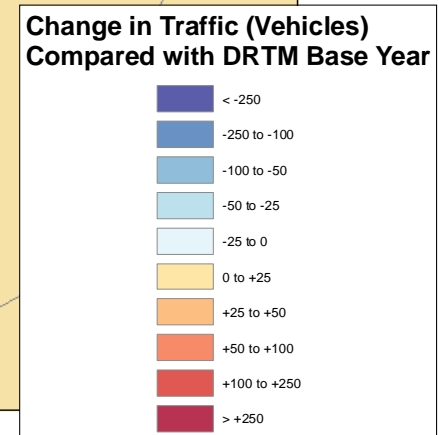
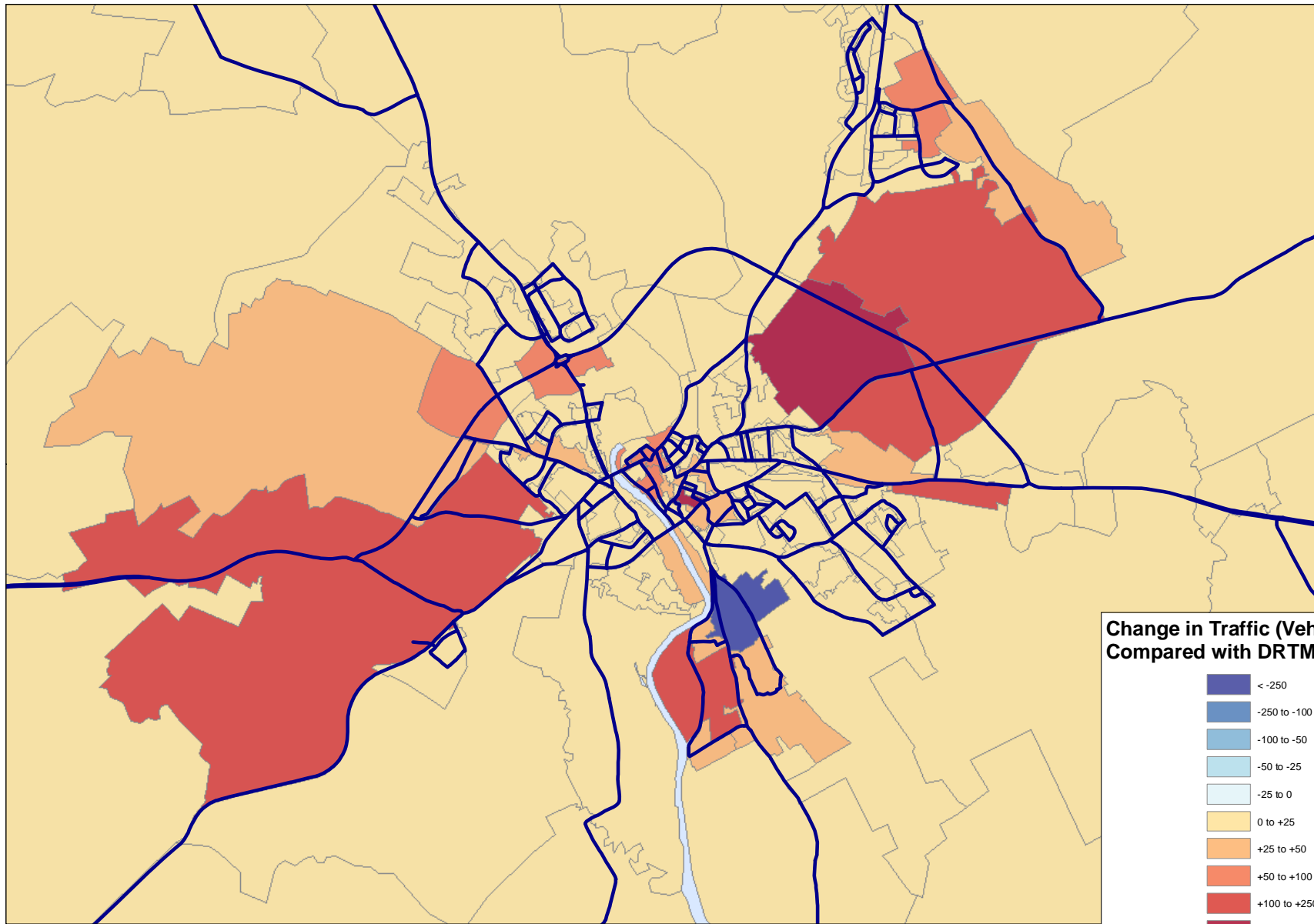
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Forecast Change in Trip Origins
PM Peak Hour – LDP Option 4**

Project No.
101767

Figure
A.9

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

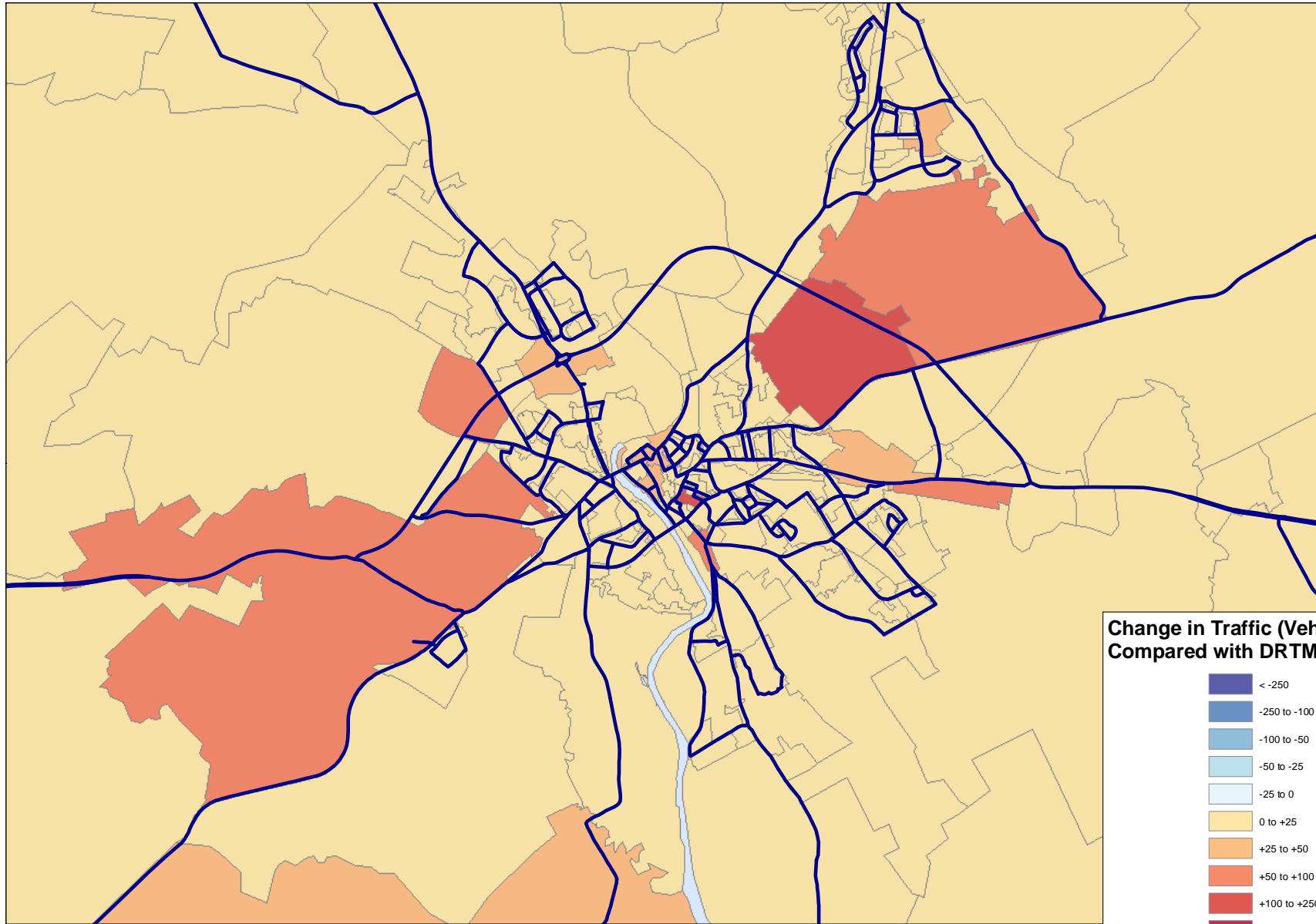
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Forecast Change in Trip Origins
PM Peak Hour – LDP Option 5**

Project No.
101767

Figure
A.10

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

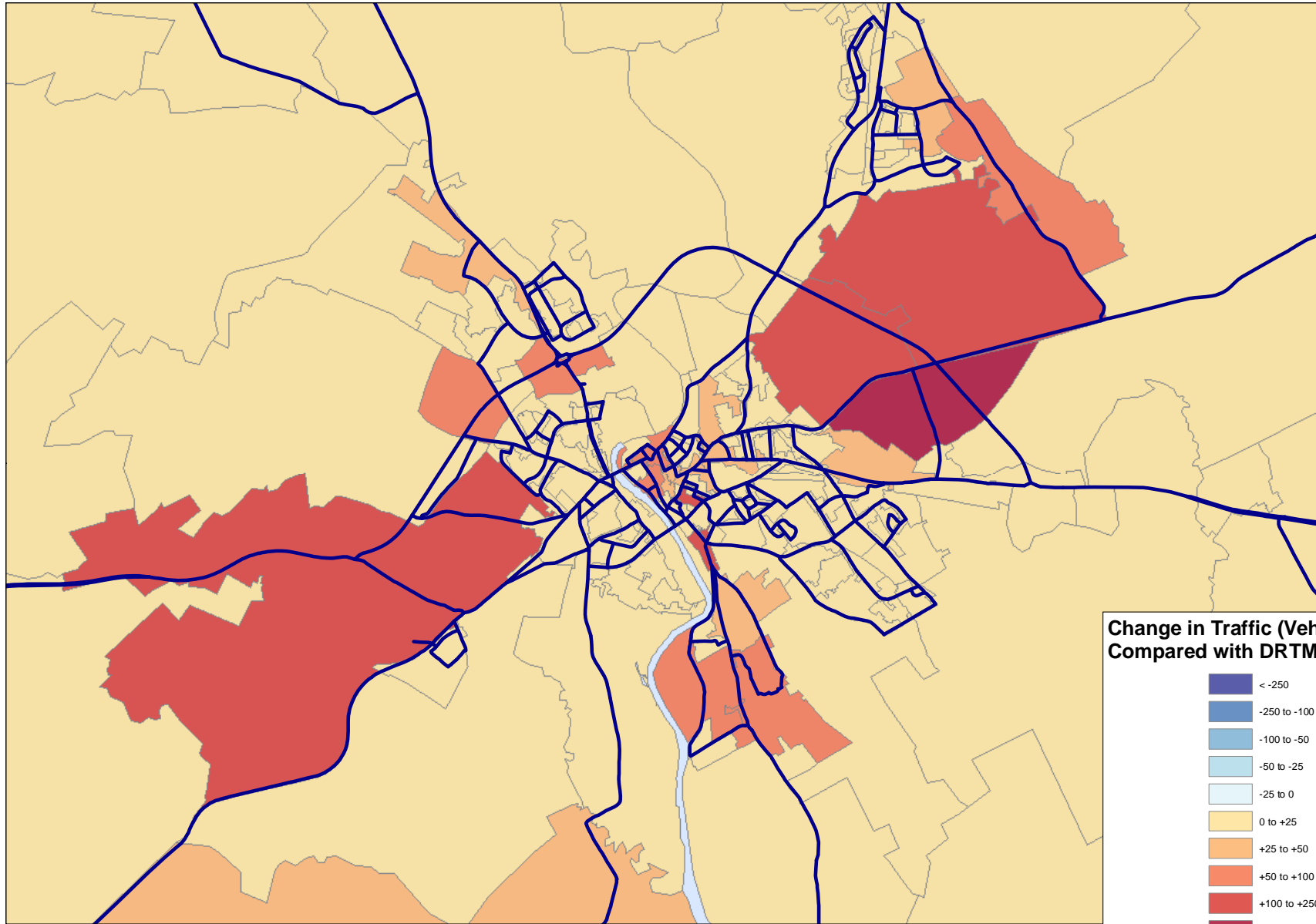
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Forecast Change in Trip Destinations
AM Peak Hour – LDP Option 1**

Project No.
101767

Figure
A.11

mvaconsultancy



**Dumfries Regional Traffic Model
Local Development Plan Tests**

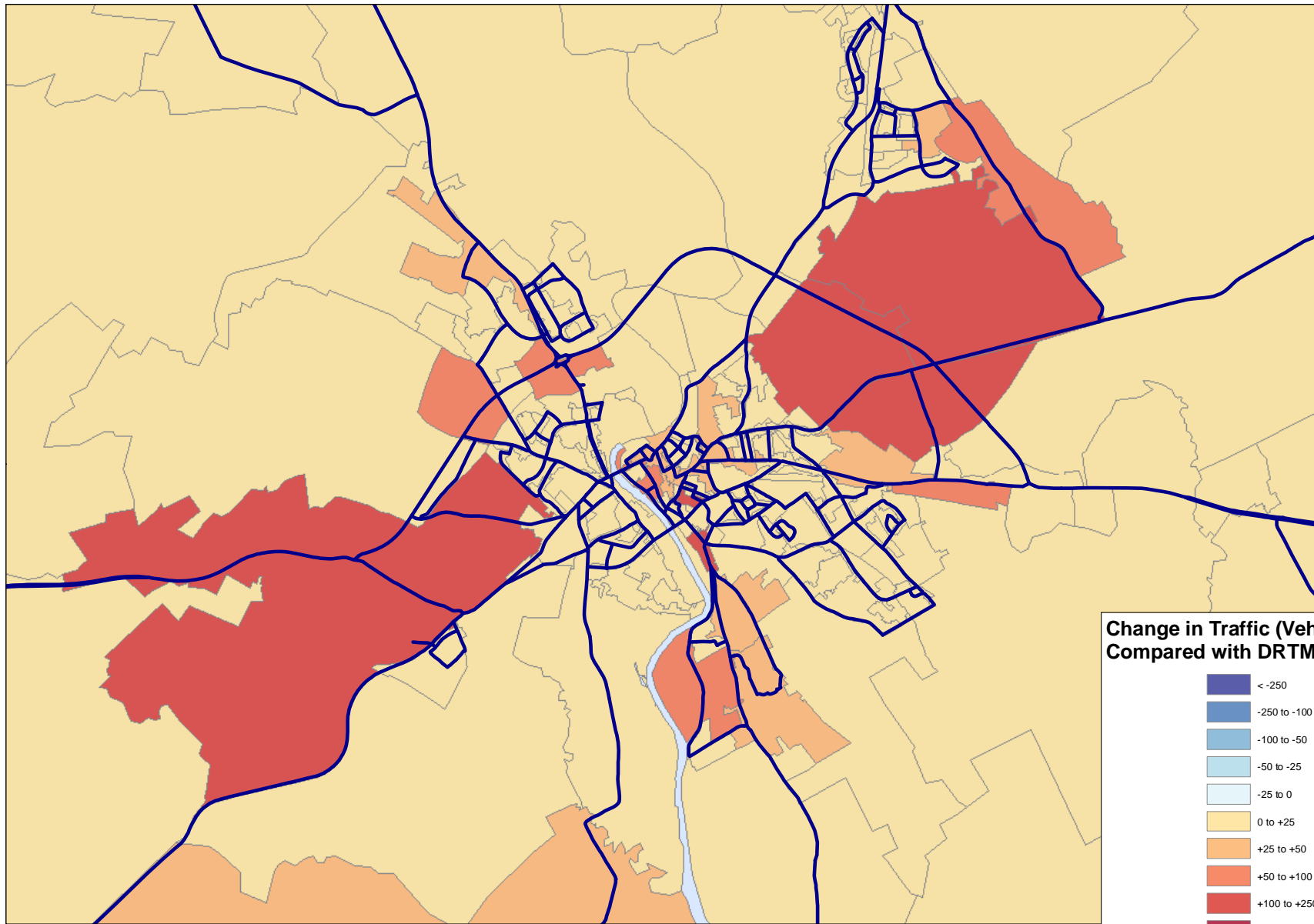
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Forecast Change in Trip Destinations
AM Peak Hour – LDP Option 2**

Project No.
101767

Figure
A.12

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

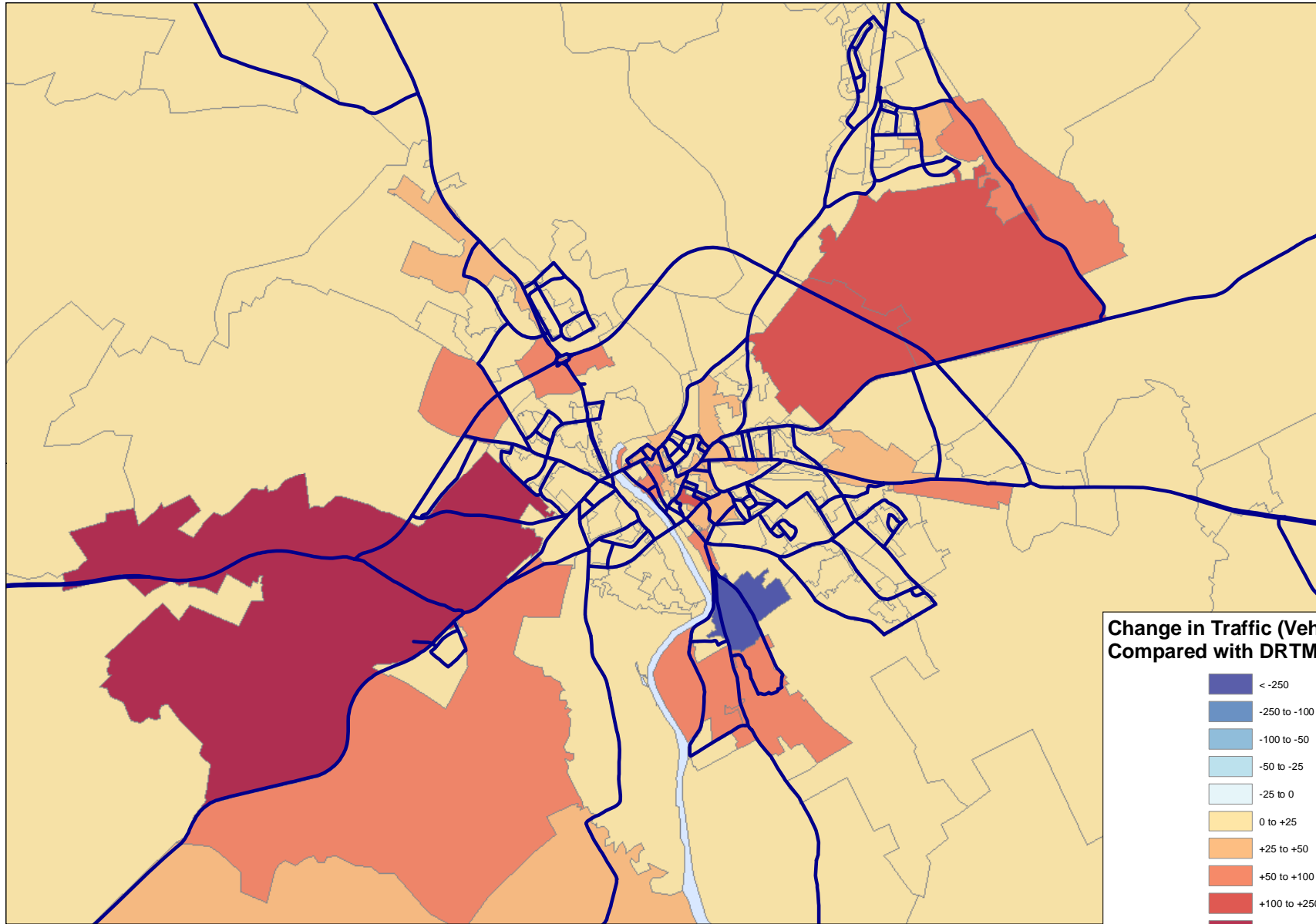
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Forecast Change in Trip Destinations
AM Peak Hour – LDP Option 3**

Project No.
101767

Figure
A.13

mvaconsultancy



**Dumfries Regional Traffic Model
Local Development Plan Tests**

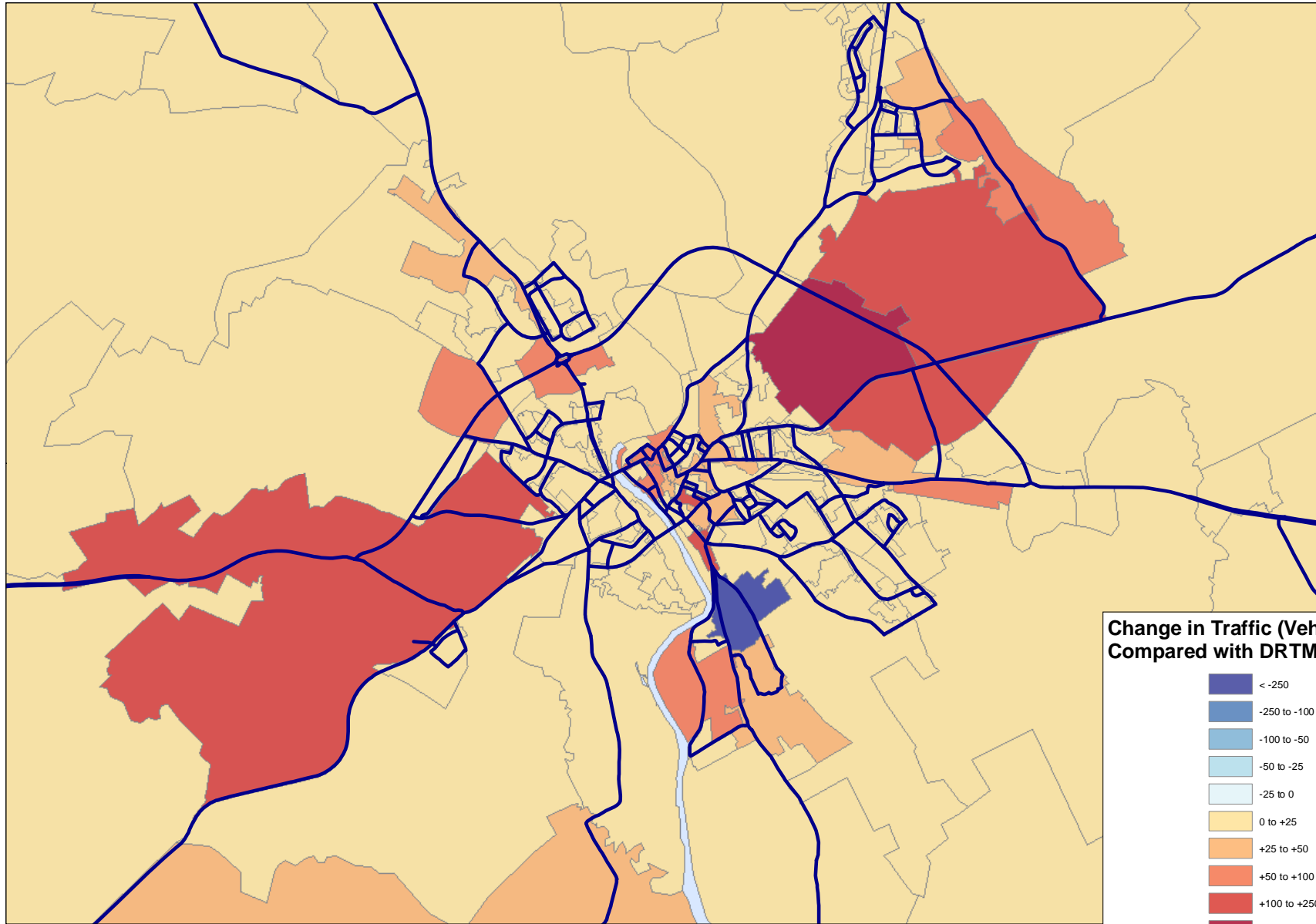
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Forecast Change in Trip Destinations
AM Peak Hour – LDP Option 4**

Project No.
101767

Figure
A.14

mvaconsultancy



Dumfries Regional Traffic Model Local Development Plan Tests

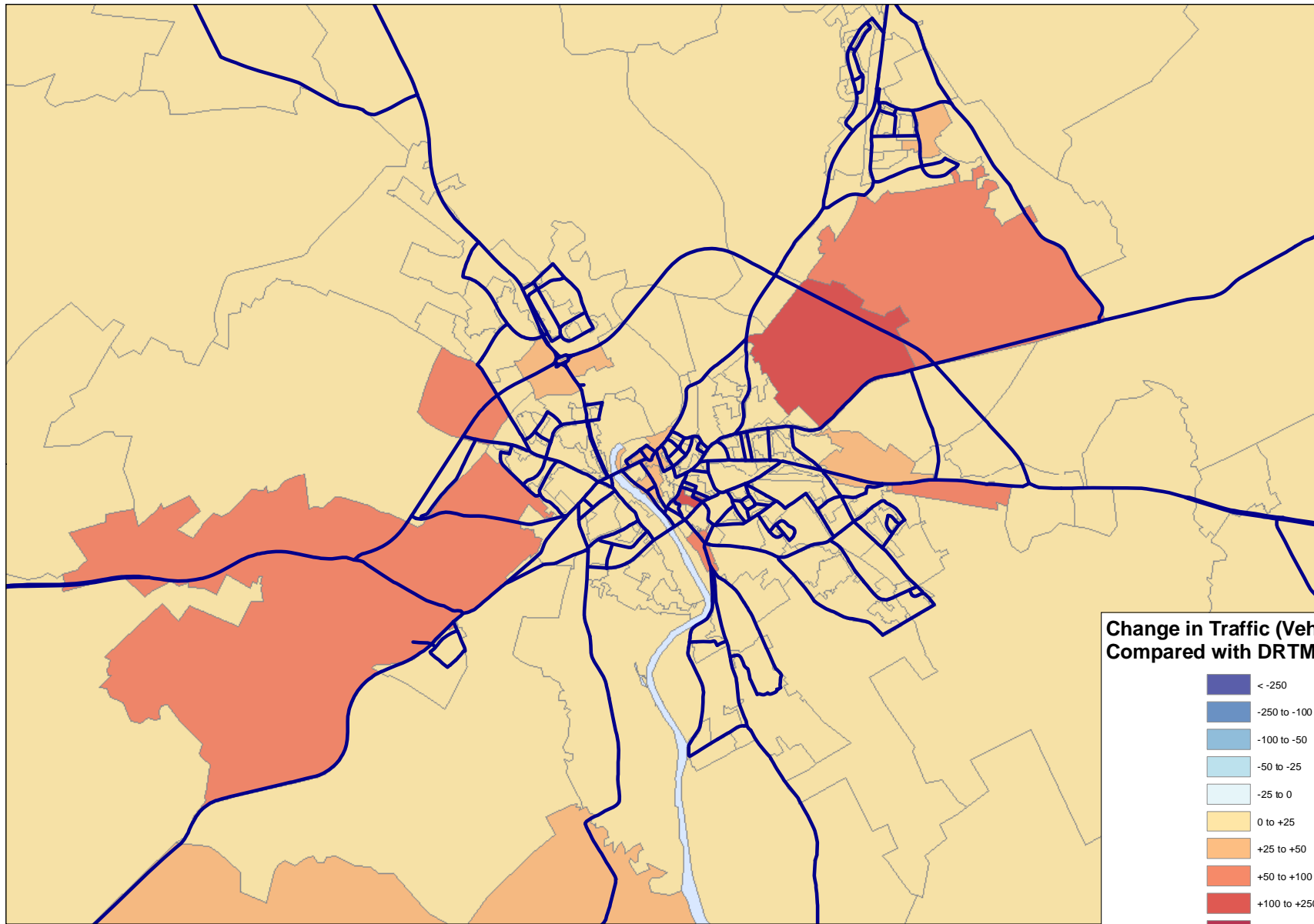
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Forecast Change in Trip Destinations
AM Peak Hour – LDP Option 5**

Project No.
101767

Figure
A.15

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

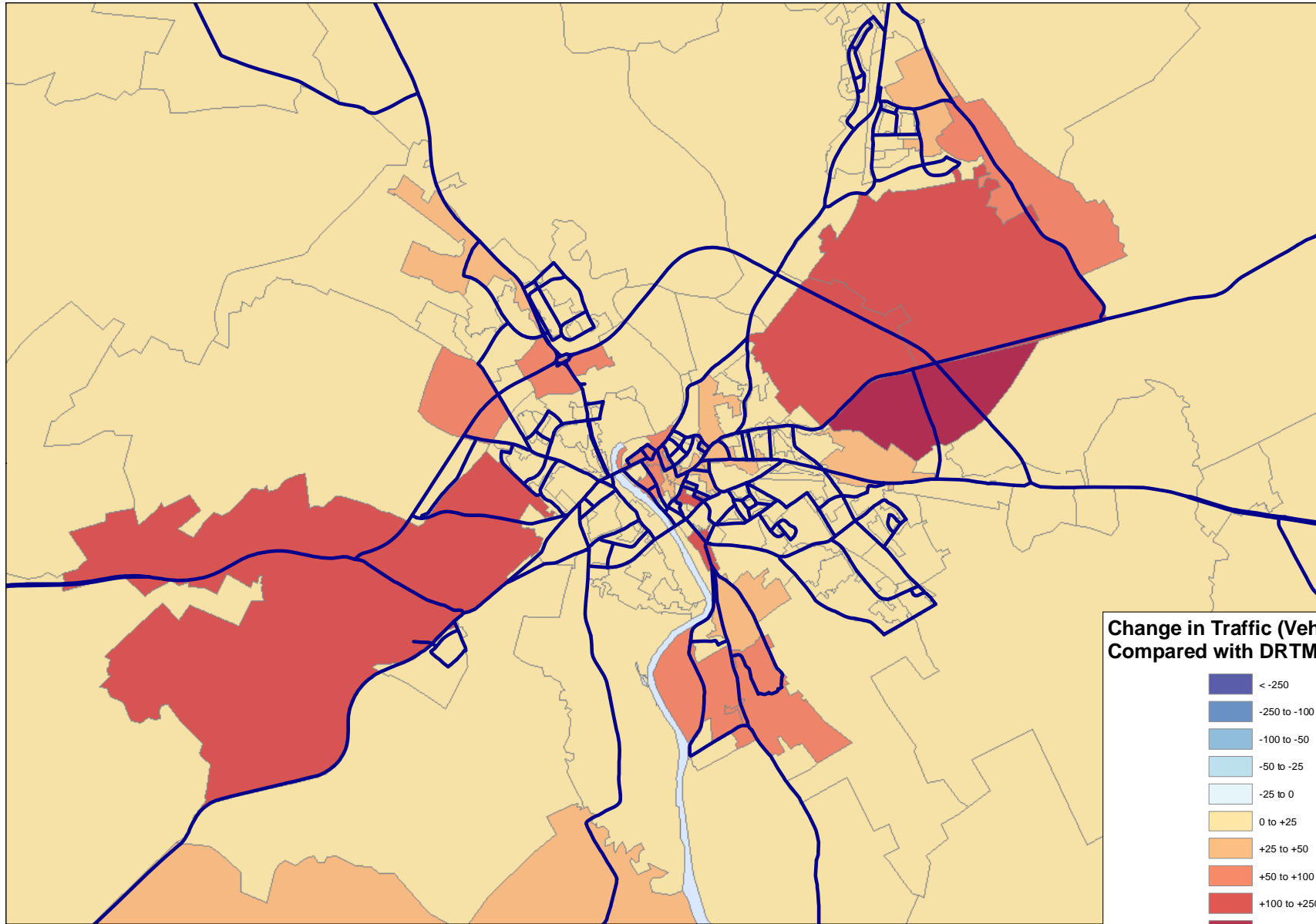
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Forecast Change in Trip Destinations
PM Peak Hour – LDP Option 1**

Project No.
101767

Figure
A.16

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Dumfries Regional Traffic Model Local Development Plan Tests

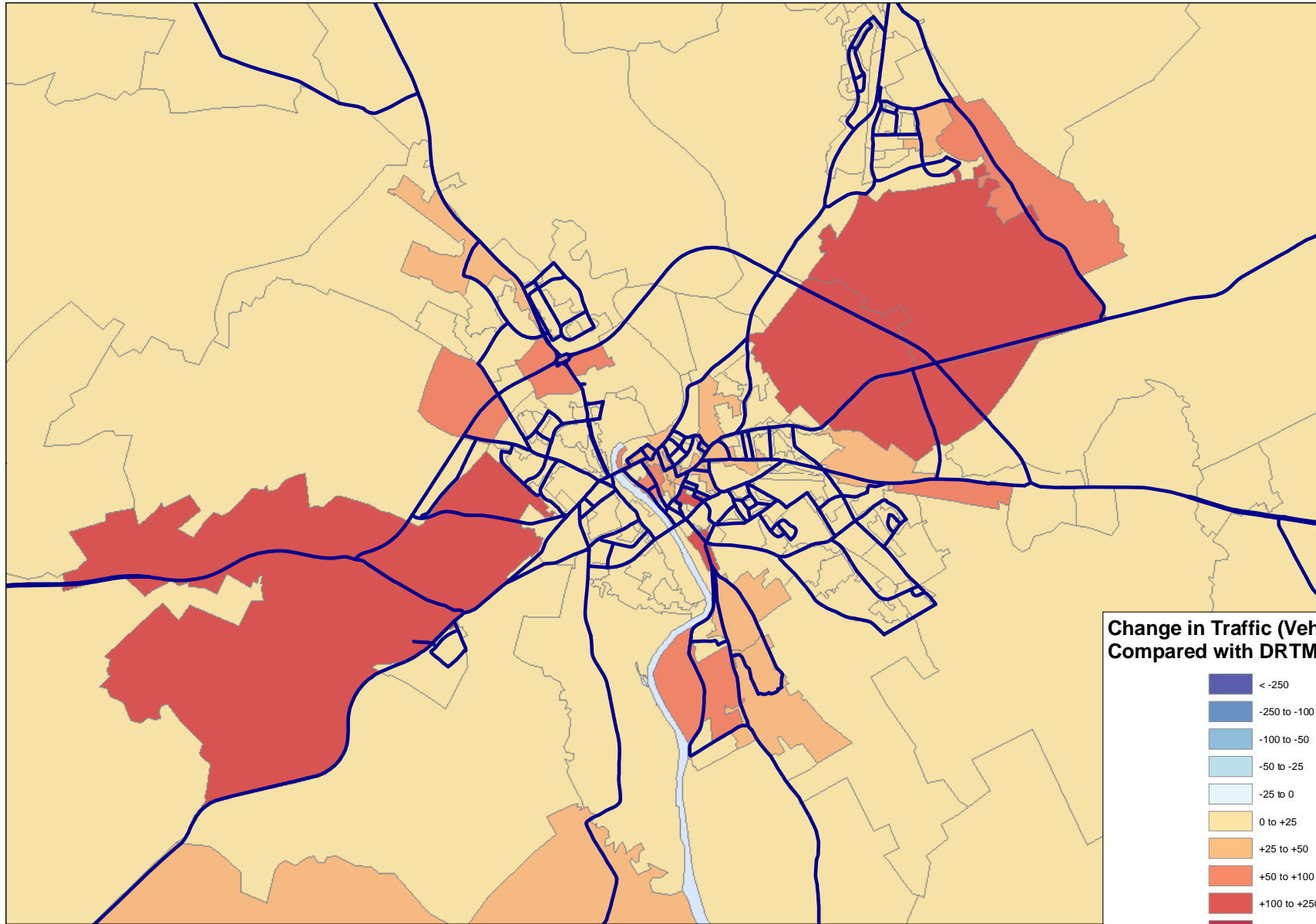
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Forecast Change in Trip Destinations
PM Peak Hour – LDP Option 2**

Project No.
101767

Figure
A.17

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

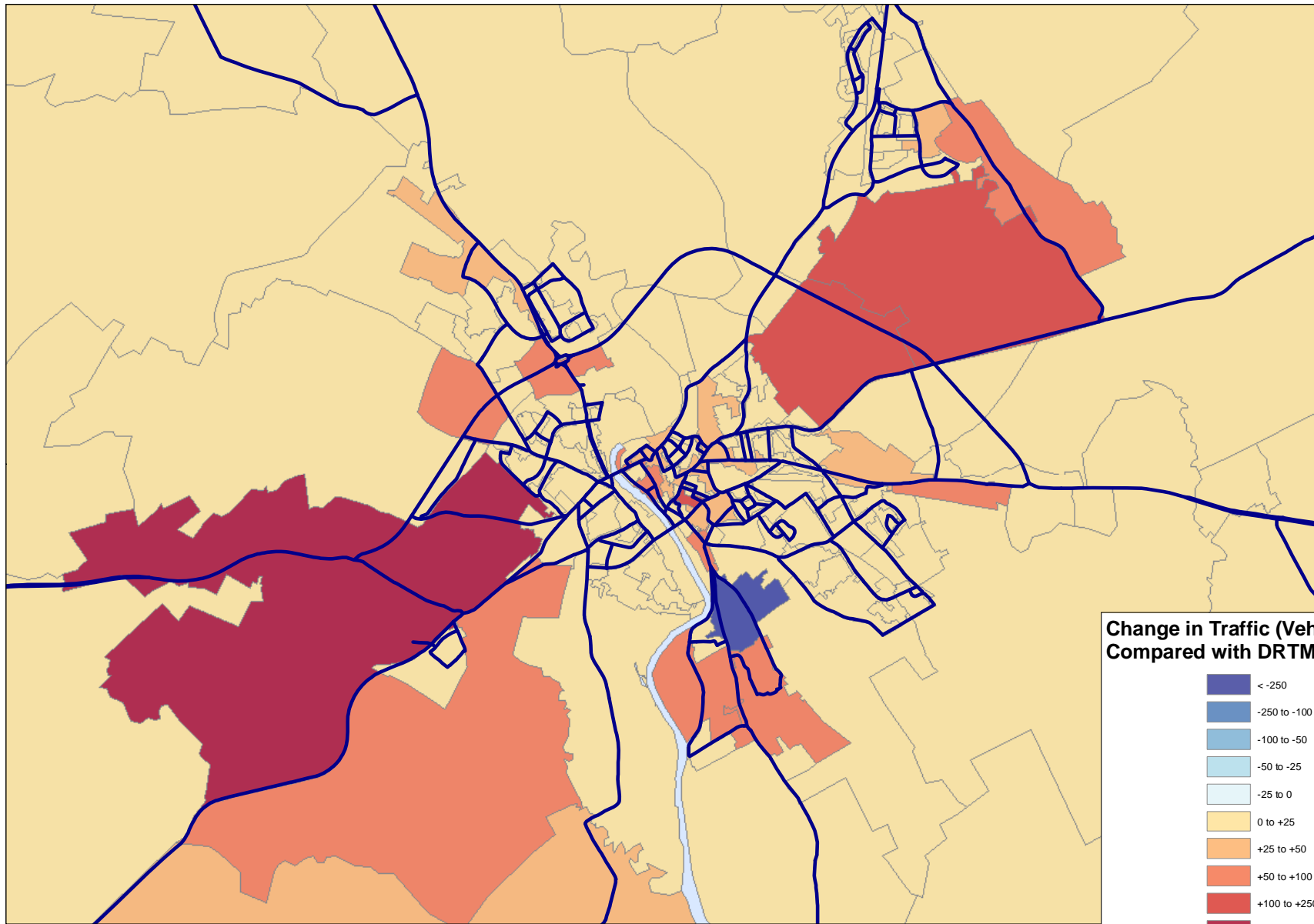
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Forecast Change in Trip Destinations
PM Peak Hour – LDP Option 3**

Project No.
101767

Figure
A.18

mvaconsultancy



**Dumfries Regional Traffic Model
Local Development Plan Tests**

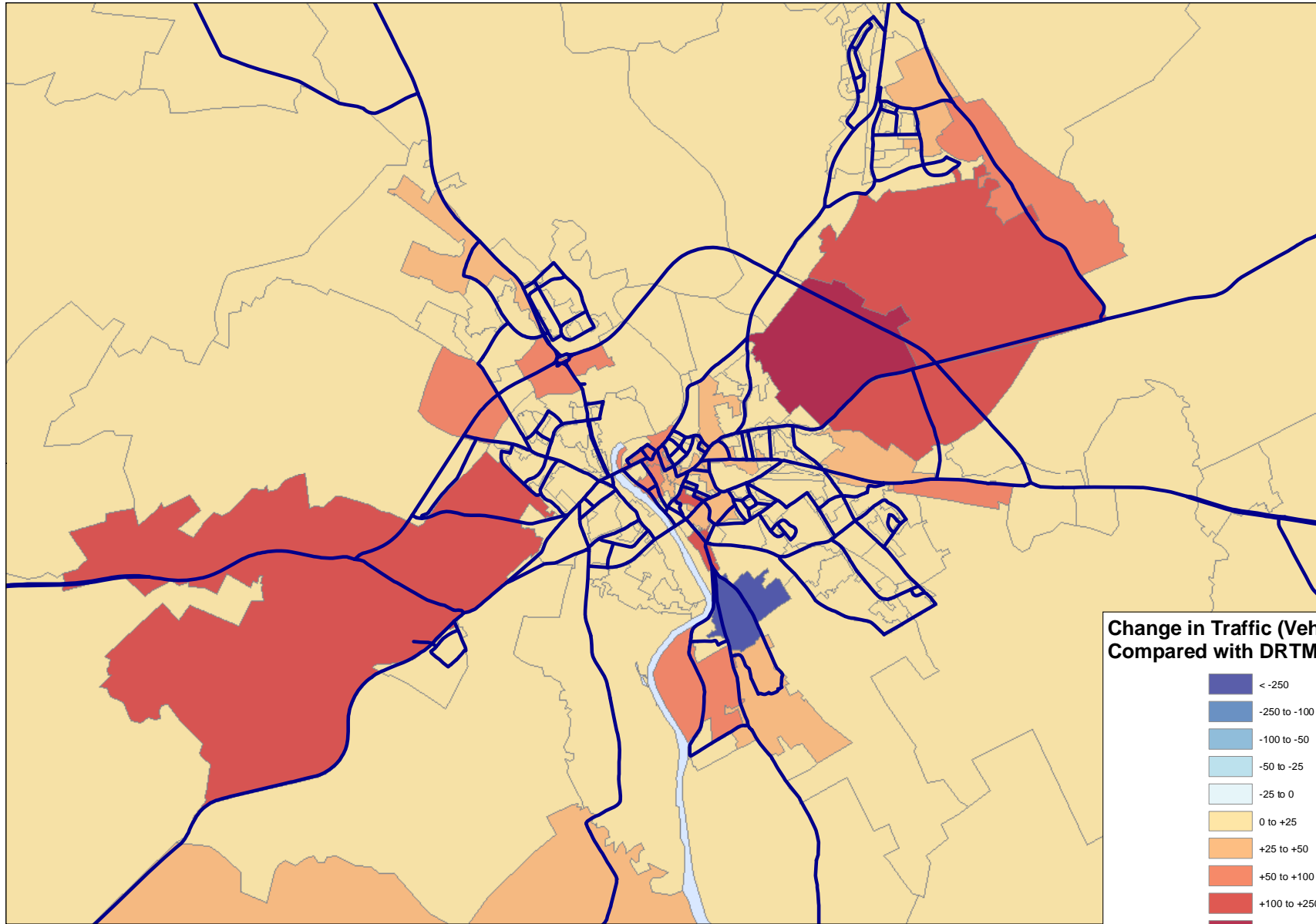
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Forecast Change in Trip Destinations
PM Peak Hour – LDP Option 4**

Project No.
101767

Figure
A.19

mvaconsultancy



**Dumfries Regional Traffic Model
Local Development Plan Tests**

Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Forecast Change in Trip Destinations
PM Peak Hour – LDP Option 5**

Project No.
101767

Figure
A.20

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Appendix B - Travel Demand on Network

Table B.1 2018 Forecast Year AM Peak Hour Total Vehicle Flows at Key Locations

ID	Road	Dir.	Location	LDP1	LDP2			LDP3		
				2018	2018	Change	Change	2023	Change	Change
				Option 1	Option 2			Option 3		
1A	New Bridge	EB	West of Whitesands	1,010	1,030	+20	+2%	1,020	+10	+1%
1B	New Bridge	WB	West of Whitesands	690	780	+90	+13%	800	+110	+16%
2A	A756 St Micheal's Bridge Road	EB	West of Dockhead	840	900	+60	+7%	900	+60	+7%
2B	A756 St Micheal's Bridge Road	WB	West of Dockhead	470	510	+40	+9%	510	+40	+9%
3A	B725 St Micheal's Street	SB	South of St Michael's Bridge Road	1,010	1,060	+50	+5%	1,040	+30	+3%
3B	B725 St Micheal's Street	NB	South of St Michael's Bridge Road	550	520	-30	-5%	530	-20	-4%
4A	A75	EB	West of Garroch Roundabout	830	900	+70	+8%	890	+60	+7%
4B	A75	WB	West of Garroch Roundabout	430	450	+20	+5%	460	+30	+7%
5A	A75 Dumfries Bypass	EB	Between Garroch Roundabout and A780	920	990	+70	+8%	980	+60	+7%
5B	A75 Dumfries Bypass	WB	Between Garroch Roundabout and A780	640	710	+70	+11%	720	+80	+13%
6A	A75 Dumfries Bypass	EB	Between A780 and A76	630	690	+60	+10%	660	+30	+5%
6B	A75 Dumfries Bypass	WB	Between A780 and A76	530	590	+60	+11%	600	+70	+13%
7A	A75 Dumfries Bypass	EB	Between A76 and A701	1,240	1,380	+140	+11%	1,350	+110	+9%
7B	A75 Dumfries Bypass	WB	Between A76 and A701	1,050	1,100	+50	+5%	1,140	+90	+9%
8A	A75 Dumfries Bypass	EB	Between A701 and A709	660	750	+90	+14%	540	-120	-18%
8B	A75 Dumfries Bypass	WB	Between A701 and A709	650	760	+110	+17%	620	-30	-5%
9A	A75 Dumfries Bypass	EB	Between A709 and A780	490	500	+10	+2%	520	+30	+6%
9B	A75 Dumfries Bypass	WB	Between A709 and A780	460	520	+60	+13%	470	+10	+2%
10A	A75	EB	East of A780 Roundabout (e)	520	540	+20	+4%	560	+40	+8%
10B	A75	WB	East of A780 Roundabout (e)	760	820	+60	+8%	800	+40	+5%
11A	A76 Glasgow Road	SB	North of A75 Bypass	1,100	1,220	+120	+11%	1,180	+80	+7%
11B	A76 Glasgow Road	NB	North of A75 Bypass	930	1,000	+70	+8%	1,000	+70	+8%
12A	A701	SB	North of A75 Bypass	1,000	1,030	+30	+3%	960	-40	-4%
12B	A701	NB	North of A75 Bypass	700	750	+50	+7%	740	+40	+6%
13A	A709	SB	North of A75 Bypass	790	920	+130	+16%	910	+120	+15%
13B	A709	NB	North of A75 Bypass	410	460	+50	+12%	480	+70	+17%
14A	A711 Dalbeattie Road	NB	South of Park Road	250	290	+40	+16%	290	+40	+16%
14B	A711 Dalbeattie Road	SB	South of Park Road	240	310	+70	+29%	310	+70	+29%
15A	A780 Castle Douglas Road	EB	East of A75 Bypass	400	410	+10	+3%	430	+30	+8%
15B	A780 Castle Douglas Road	WB	East of A75 Bypass	220	220	0	0%	230	+10	+5%
16A	A76 Glasgow Road	SB	South of A75 Bypass	620	620	0	0%	630	+10	+2%
16B	A76 Glasgow Road	NB	South of A75 Bypass	800	840	+40	+5%	860	+60	+8%
17A	A701 Edinburgh Road	SB	South of A75 Bypass	960	930	-30	-3%	1,010	+50	+5%
17B	A701 Edinburgh Road	NB	South of A75 Bypass	500	530	+30	+6%	580	+80	+16%
18A	A709 Lockerbie Road	SB	South of A75 Bypass	840	990	+150	+18%	890	+50	+6%
18B	A709 Lockerbie Road	NB	South of A75 Bypass	490	580	+90	+18%	580	+90	+18%
19A	A780 Annan Road	WB	West of A75	590	610	+20	+3%	600	+10	+2%
19B	A780 Annan Road	EB	West of A75	310	360	+50	+16%	310	0	0%

Table B.2 2018 Forecast Year PM Peak Hour Total Vehicle Flows at Key Locations

ID	Road	Dir.	Location	LDP1	LDP2			LDP3		
				2018	2018	Change	Change	2023	Change	Change
				Option 1	Option 2			Option 3		
1A	New Bridge	EB	West of Whitesands	820	900	+80	+10%	890	+70	+9%
1B	New Bridge	WB	West of Whitesands	1,200	1,200	0	0%	1,200	0	0%
2A	A756 St Micheal's Bridge Road	EB	West of Dockhead	440	480	+40	+9%	500	+60	+14%
2B	A756 St Micheal's Bridge Road	WB	West of Dockhead	860	890	+30	+3%	920	+60	+7%
3A	B725 St Micheal's Street	SB	South of St Michael's Bridge Road	370	420	+50	+14%	410	+40	+11%
3B	B725 St Micheal's Street	NB	South of St Michael's Bridge Road	1,050	1,090	+40	+4%	1,050	0	0%
4A	A75	EB	West of Garroch Roundabout	530	570	+40	+8%	590	+60	+11%
4B	A75	WB	West of Garroch Roundabout	730	770	+40	+5%	780	+50	+7%
5A	A75 Dumfries Bypass	EB	Between Garroch Roundabout and A780	770	840	+70	+9%	870	+100	+13%
5B	A75 Dumfries Bypass	WB	Between Garroch Roundabout and A780	790	810	+20	+3%	820	+30	+4%
6A	A75 Dumfries Bypass	EB	Between A780 and A76	570	610	+40	+7%	630	+60	+11%
6B	A75 Dumfries Bypass	WB	Between A780 and A76	660	680	+20	+3%	680	+20	+3%
7A	A75 Dumfries Bypass	EB	Between A76 and A701	1,340	1,520	+180	+13%	1,540	+200	+15%
7B	A75 Dumfries Bypass	WB	Between A76 and A701	1,460	1,540	+80	+5%	1,520	+60	+4%
8A	A75 Dumfries Bypass	EB	Between A701 and A709	780	800	+20	+3%	640	-140	-18%
8B	A75 Dumfries Bypass	WB	Between A701 and A709	860	920	+60	+7%	760	-100	-12%
9A	A75 Dumfries Bypass	EB	Between A709 and A780	590	500	-90	-15%	520	-70	-12%
9B	A75 Dumfries Bypass	WB	Between A709 and A780	620	630	+10	+2%	620	0	0%
10A	A75	EB	East of A780 Roundabout (e)	810	810	0	0%	830	+20	+2%
10B	A75	WB	East of A780 Roundabout (e)	610	640	+30	+5%	660	+50	+8%
11A	A76 Glasgow Road	SB	North of A75 Bypass	1,180	1,260	+80	+7%	1,260	+80	+7%
11B	A76 Glasgow Road	NB	North of A75 Bypass	1,250	1,340	+90	+7%	1,330	+80	+6%
12A	A701	SB	North of A75 Bypass	1,040	1,090	+50	+5%	1,040	0	0%
12B	A701	NB	North of A75 Bypass	1,010	990	-20	-2%	920	-90	-9%
13A	A709	SB	North of A75 Bypass	580	700	+120	+21%	750	+170	+29%
13B	A709	NB	North of A75 Bypass	670	730	+60	+9%	780	+110	+16%
14A	A711 Dalbeattie Road	NB	South of Park Road	150	230	+80	+53%	220	+70	+47%
14B	A711 Dalbeattie Road	SB	South of Park Road	280	290	+10	+4%	310	+30	+11%
15A	A780 Castle Douglas Road	EB	East of A75 Bypass	350	370	+20	+6%	370	+20	+6%
15B	A780 Castle Douglas Road	WB	East of A75 Bypass	280	270	-10	-4%	280	0	0%
16A	A76 Glasgow Road	SB	South of A75 Bypass	1,000	1,020	+20	+2%	1,000	0	0%
16B	A76 Glasgow Road	NB	South of A75 Bypass	890	940	+50	+6%	940	+50	+6%
17A	A701 Edinburgh Road	SB	South of A75 Bypass	560	530	-30	-5%	720	+160	+29%
17B	A701 Edinburgh Road	NB	South of A75 Bypass	670	680	+10	+1%	790	+120	+18%
18A	A709 Lockerbie Road	SB	South of A75 Bypass	690	920	+230	+33%	820	+130	+19%
18B	A709 Lockerbie Road	NB	South of A75 Bypass	820	930	+110	+13%	880	+60	+7%
19A	A780 Annan Road	WB	West of A75	470	430	-40	-9%	430	-40	-9%
19B	A780 Annan Road	EB	West of A75	710	730	+20	+3%	690	-20	-3%

Table B.3 2023 Forecast Year AM Peak Hour Total Vehicle Flows at Key Locations

ID	Road	Dir.	Location	LDP3	LDP4			LDP5		
				2023	2023	Change	Change	2023	Change	Change
				Option 3	Option 4			Option 5		
1A	New Bridge	EB	West of Whitesands	1,020	1,060	+40	+4%	1,060	+40	+4%
1B	New Bridge	WB	West of Whitesands	800	870	+70	+9%	780	-20	-3%
2A	A756 St Micheal's Bridge Road	EB	West of Dockhead	900	850	-50	-6%	810	-90	-10%
2B	A756 St Micheal's Bridge Road	WB	West of Dockhead	510	520	+10	+2%	530	+20	+4%
3A	B725 St Micheal's Street	SB	South of St Michael's Bridge Road	1,040	950	-90	-9%	870	-170	-16%
3B	B725 St Micheal's Street	NB	South of St Michael's Bridge Road	530	520	-10	-2%	540	+10	+2%
4A	A75	EB	West of Garroch Roundabout	890	900	+10	+1%	910	+20	+2%
4B	A75	WB	West of Garroch Roundabout	460	480	+20	+4%	460	0	0%
5A	A75 Dumfries Bypass	EB	Between Garroch Roundabout and A780	980	1,050	+70	+7%	1,030	+50	+5%
5B	A75 Dumfries Bypass	WB	Between Garroch Roundabout and A780	720	1,090	+370	+51%	720	0	0%
6A	A75 Dumfries Bypass	EB	Between A780 and A76	660	740	+80	+12%	760	+100	+15%
6B	A75 Dumfries Bypass	WB	Between A780 and A76	600	760	+160	+27%	620	+20	+3%
7A	A75 Dumfries Bypass	EB	Between A76 and A701	1,350	1,350	0	0%	1,430	+80	+6%
7B	A75 Dumfries Bypass	WB	Between A76 and A701	1,140	1,190	+50	+4%	1,110	-30	-3%
8A	A75 Dumfries Bypass	EB	Between A701 and A709	540	530	-10	-2%	500	-40	-7%
8B	A75 Dumfries Bypass	WB	Between A701 and A709	620	630	+10	+2%	590	-30	-5%
9A	A75 Dumfries Bypass	EB	Between A709 and A780	520	520	0	0%	520	0	0%
9B	A75 Dumfries Bypass	WB	Between A709 and A780	470	540	+70	+15%	460	-10	-2%
10A	A75	EB	East of A780 Roundabout (e)	560	560	0	0%	560	0	0%
10B	A75	WB	East of A780 Roundabout (e)	800	810	+10	+1%	830	+30	+4%
11A	A76 Glasgow Road	SB	North of A75 Bypass	1,180	1,170	-10	-1%	1,190	+10	+1%
11B	A76 Glasgow Road	NB	North of A75 Bypass	1,000	990	-10	-1%	1,000	0	0%
12A	A701	SB	North of A75 Bypass	960	980	+20	+2%	980	+20	+2%
12B	A701	NB	North of A75 Bypass	740	740	0	0%	750	+10	+1%
13A	A709	SB	North of A75 Bypass	910	910	0	0%	1,020	+110	+12%
13B	A709	NB	North of A75 Bypass	480	490	+10	+2%	500	+20	+4%
14A	A711 Dalbeattie Road	NB	South of Park Road	290	260	-30	-10%	270	-20	-7%
14B	A711 Dalbeattie Road	SB	South of Park Road	310	300	-10	-3%	320	+10	+3%
15A	A780 Castle Douglas Road	EB	East of A75 Bypass	430	380	-50	-12%	370	-60	-14%
15B	A780 Castle Douglas Road	WB	East of A75 Bypass	230	410	+180	+78%	210	-20	-9%
16A	A76 Glasgow Road	SB	South of A75 Bypass	630	640	+10	+2%	600	-30	-5%
16B	A76 Glasgow Road	NB	South of A75 Bypass	860	890	+30	+3%	860	0	0%
17A	A701 Edinburgh Road	SB	South of A75 Bypass	1,010	970	-40	-4%	1,120	+110	+11%
17B	A701 Edinburgh Road	NB	South of A75 Bypass	580	560	-20	-3%	660	+80	+14%
18A	A709 Lockerbie Road	SB	South of A75 Bypass	890	800	-90	-10%	930	+40	+4%
18B	A709 Lockerbie Road	NB	South of A75 Bypass	580	450	-130	-22%	560	-20	-3%
19A	A780 Annan Road	WB	West of A75	600	550	-50	-8%	630	+30	+5%
19B	A780 Annan Road	EB	West of A75	310	310	0	0%	310	0	0%

Table B.4 2023 Forecast Year PM Peak Hour Total Vehicle Flows at Key Locations

ID	Road	Dir.	Location	LDP3	LDP4		LDP5		Change	Change
				2023	2023	2023	Option 3	Option 4		
1A	New Bridge	EB	West of Whitesands	890	890	0	0%	880	-10	-1%
1B	New Bridge	WB	West of Whitesands	1,200	1,200	0	0%	1,200	0	0%
2A	A756 St Micheal's Bridge Road	EB	West of Dockhead	500	530	+30	+6%	480	-20	-4%
2B	A756 St Micheal's Bridge Road	WB	West of Dockhead	920	890	-30	-3%	900	-20	-2%
3A	B725 St Micheal's Street	SB	South of St Michael's Bridge Road	410	390	-20	-5%	400	-10	-2%
3B	B725 St Micheal's Street	NB	South of St Michael's Bridge Road	1,050	1,070	+20	+2%	1,060	+10	+1%
4A	A75	EB	West of Garroch Roundabout	590	610	+20	+3%	590	0	0%
4B	A75	WB	West of Garroch Roundabout	780	830	+50	+6%	800	+20	+3%
5A	A75 Dumfries Bypass	EB	Between Garroch Roundabout and A780	870	1,250	+380	+44%	880	+10	+1%
5B	A75 Dumfries Bypass	WB	Between Garroch Roundabout and A780	820	930	+110	+13%	850	+30	+4%
6A	A75 Dumfries Bypass	EB	Between A780 and A76	630	790	+160	+25%	660	+30	+5%
6B	A75 Dumfries Bypass	WB	Between A780 and A76	680	790	+110	+16%	730	+50	+7%
7A	A75 Dumfries Bypass	EB	Between A76 and A701	1,540	1,580	+40	+3%	1,550	+10	+1%
7B	A75 Dumfries Bypass	WB	Between A76 and A701	1,520	1,530	+10	+1%	1,570	+50	+3%
8A	A75 Dumfries Bypass	EB	Between A701 and A709	640	650	+10	+2%	650	+10	+2%
8B	A75 Dumfries Bypass	WB	Between A701 and A709	760	760	0	0%	780	+20	+3%
9A	A75 Dumfries Bypass	EB	Between A709 and A780	520	550	+30	+6%	580	+60	+12%
9B	A75 Dumfries Bypass	WB	Between A709 and A780	620	610	-10	-2%	650	+30	+5%
10A	A75	EB	East of A780 Roundabout (e)	830	830	0	0%	850	+20	+2%
10B	A75	WB	East of A780 Roundabout (e)	660	670	+10	+2%	660	0	0%
11A	A76 Glasgow Road	SB	North of A75 Bypass	1,260	1,280	+20	+2%	1,260	0	0%
11B	A76 Glasgow Road	NB	North of A75 Bypass	1,330	1,290	-40	-3%	1,330	0	0%
12A	A701	SB	North of A75 Bypass	1,040	1,060	+20	+2%	1,070	+30	+3%
12B	A701	NB	North of A75 Bypass	920	920	0	0%	930	+10	+1%
13A	A709	SB	North of A75 Bypass	750	750	0	0%	780	+30	+4%
13B	A709	NB	North of A75 Bypass	780	790	+10	+1%	860	+80	+10%
14A	A711 Dalbeattie Road	NB	South of Park Road	220	210	-10	-5%	210	-10	-5%
14B	A711 Dalbeattie Road	SB	South of Park Road	310	310	0	0%	330	+20	+6%
15A	A780 Castle Douglas Road	EB	East of A75 Bypass	370	630	+260	+70%	360	-10	-3%
15B	A780 Castle Douglas Road	WB	East of A75 Bypass	280	300	+20	+7%	240	-40	-14%
16A	A76 Glasgow Road	SB	South of A75 Bypass	1,000	970	-30	-3%	970	-30	-3%
16B	A76 Glasgow Road	NB	South of A75 Bypass	940	920	-20	-2%	910	-30	-3%
17A	A701 Edinburgh Road	SB	South of A75 Bypass	720	710	-10	-1%	680	-40	-6%
17B	A701 Edinburgh Road	NB	South of A75 Bypass	790	770	-20	-3%	780	-10	-1%
18A	A709 Lockerbie Road	SB	South of A75 Bypass	820	710	-110	-13%	880	+60	+7%
18B	A709 Lockerbie Road	NB	South of A75 Bypass	880	800	-80	-9%	1,020	+140	+16%
19A	A780 Annan Road	WB	West of A75	430	400	-30	-7%	410	-20	-5%
19B	A780 Annan Road	EB	West of A75	690	620	-70	-10%	670	-20	-3%

Table B.5 2018 Forecast Year AM Peak Hour Vehicle Kilometres

Sector	LDP1 2018				LDP2 2018				LDP3 2023			
	Option 1	Option 2	Change		Option 2	Change		Option 3	Change		Change	
1 Town Centre	3,500	3,700	+200	+6%	3,700	+200	+6%	3,700	+200	+6%		
2 Town South East	11,800	13,100	+1,300	+11%	12,800	+1,000	+8%	12,800	+1,000	+8%		
3 Town South West	20,900	22,400	+1,500	+7%	22,500	+1,600	+8%	22,500	+1,600	+8%		
4 Town North West	9,100	9,700	+600	+7%	9,800	+700	+8%	9,800	+700	+8%		
5 Town North East	9,500	10,600	+1,100	+12%	10,500	+1,000	+11%	10,500	+1,000	+11%		
6 Heathhall and Locharbriggs	10,700	12,000	+1,300	+12%	11,900	+1,200	+11%	11,900	+1,200	+11%		
7 Lochside and Lincluden	8,100	8,700	+600	+7%	8,600	+500	+6%	8,600	+500	+6%		
8 Outer East	145,500	148,700	+3,200	+2%	151,500	+6,000	+4%	151,500	+6,000	+4%		
9 Outer North	132,900	138,500	+5,600	+4%	139,800	+6,900	+5%	139,800	+6,900	+5%		
10 Outer West	141,500	146,200	+4,700	+3%	149,000	+7,500	+5%	149,000	+7,500	+5%		

Table B.6 2018 Forecast Year PM Peak Hour Vehicle Kilometres

Sector	LDP1 2018				LDP2 2018				LDP3 2023			
	Option 1	Option 2	Change		Option 2	Change		Option 3	Change		Change	
1 Town Centre	3,800	4,000	+200	+5%	4,000	+200	+5%	4,000	+200	+5%		
2 Town South East	12,600	13,100	+500	+4%	13,600	+1,000	+8%	13,600	+1,000	+8%		
3 Town South West	21,500	22,600	+1,100	+5%	23,000	+1,500	+7%	23,000	+1,500	+7%		
4 Town North West	11,400	12,100	+700	+6%	12,200	+800	+7%	12,200	+800	+7%		
5 Town North East	9,900	10,900	+1,000	+10%	11,300	+1,400	+14%	11,300	+1,400	+14%		
6 Heathhall and Locharbriggs	10,900	12,000	+1,100	+10%	12,300	+1,400	+13%	12,300	+1,400	+13%		
7 Lochside and Lincluden	9,200	9,700	+500	+5%	9,800	+600	+7%	9,800	+600	+7%		
8 Outer East	165,000	168,400	+3,400	+2%	172,700	+7,700	+5%	172,700	+7,700	+5%		
9 Outer North	150,000	154,500	+4,500	+3%	158,100	+8,100	+5%	158,100	+8,100	+5%		
10 Outer West	134,700	140,100	+5,400	+4%	143,500	+8,800	+7%	143,500	+8,800	+7%		

Table B.7 2023 Forecast Year AM Peak Hour Vehicle Kilometres

Sector	LDP3 2023				LDP4 2023				LDP5 2023			
	Option 3	Option 4	Change		Option 4	Change		Option 5	Change		Change	
1 Town Centre	3,700	3,700	0	0%	3,700	0	0%	3,700	0	0%		
2 Town South East	12,800	12,500	-300	-2%	12,500	-300	-2%	12,500	-300	-2%		
3 Town South West	22,500	23,200	+700	+3%	22,600	+100	+0%	22,600	+100	+0%		
4 Town North West	9,800	10,200	+400	+4%	10,000	+200	+2%	10,000	+200	+2%		
5 Town North East	10,500	9,800	-700	-7%	11,000	+500	+5%	11,000	+500	+5%		
6 Heathhall and Locharbriggs	11,900	11,900	0	0%	12,700	+800	+7%	12,700	+800	+7%		
7 Lochside and Lincluden	8,600	9,000	+400	+5%	8,800	+200	+2%	8,800	+200	+2%		
8 Outer East	151,500	152,200	+700	+0%	152,700	+1,200	+1%	152,700	+1,200	+1%		
9 Outer North	139,800	139,100	-700	-1%	140,200	+400	+0%	140,200	+400	+0%		
10 Outer West	149,000	150,800	+1,800	+1%	150,700	+1,700	+1%	150,700	+1,700	+1%		

Table B.8 2023 Forecast Year PM Peak Hour Vehicle Kilometres

Sector	LDP3 2023				LDP4 2023				LDP5 2023			
	Option 3	Option 4	Change		Option 4	Change		Option 5	Change		Change	
1 Town Centre	4,000	4,000	0	0%	4,000	0	0%	4,000	0	0%		
2 Town South East	13,600	13,000	-600	-4%	13,100	-500	-4%	13,100	-500	-4%		
3 Town South West	23,000	24,500	+1,500	+7%	23,300	+300	+1%	23,300	+300	+1%		
4 Town North West	12,200	12,500	+300	+2%	12,300	+100	+1%	12,300	+100	+1%		
5 Town North East	11,300	10,800	-500	-4%	11,700	+400	+4%	11,700	+400	+4%		
6 Heathhall and Locharbriggs	12,300	12,300	0	0%	13,000	+700	+6%	13,000	+700	+6%		
7 Lochside and Lincluden	9,800	10,200	+400	+4%	9,900	+100	+1%	9,900	+100	+1%		
8 Outer East	172,700	174,000	+1,300	+1%	173,900	+1,200	+1%	173,900	+1,200	+1%		
9 Outer North	158,100	159,000	+900	+1%	158,200	+100	+0%	158,200	+100	+0%		
10 Outer West	143,500	147,000	+3,500	+2%	145,400	+1,900	+1%	145,400	+1,900	+1%		

Table B.9 2018 Forecast Year AM Peak Hour Vehicle Hours

Sector	LDP1 2018				LDP2 2018				LDP3 2023			
	Option 1	Option 2	Change		Option 2	Change		Option 3	Change			
1 Town Centre	200	220	+20	+10%	220	+20	+10%	220	+20	+10%		
2 Town South East	310	370	+60	+19%	360	+50	+16%	360	+50	+16%		
3 Town South West	400	440	+40	+10%	440	+40	+10%	440	+40	+10%		
4 Town North West	210	230	+20	+10%	230	+20	+10%	230	+20	+10%		
5 Town North East	240	280	+40	+17%	280	+40	+17%	280	+40	+17%		
6 Heathhall and Locharbriggs	280	380	+100	+36%	330	+50	+18%	330	+50	+18%		
7 Lochside and Lincluden	170	190	+20	+12%	190	+20	+12%	190	+20	+12%		
8 Outer East	1,660	1,710	+50	+3%	1,740	+80	+5%	1,740	+80	+5%		
9 Outer North	1,550	1,630	+80	+5%	1,640	+90	+6%	1,640	+90	+6%		
10 Outer West	1,880	1,950	+70	+4%	1,980	+100	+5%	1,980	+100	+5%		

Table B.10 2018 Forecast Year PM Peak Hour Vehicle Hours

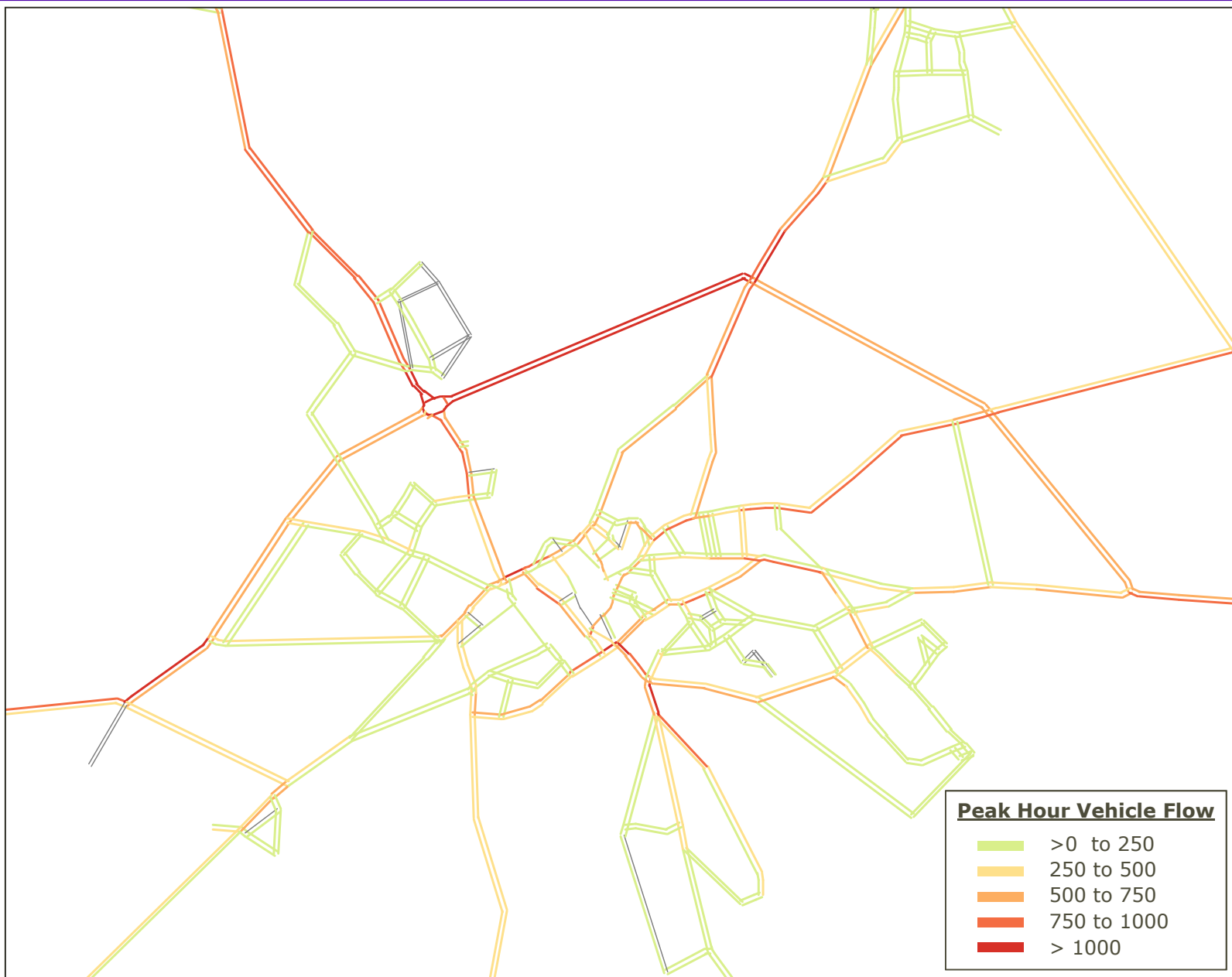
Sector	LDP1 2018				LDP2 2018				LDP3 2023			
	Option 1	Option 2	Change		Option 2	Change		Option 3	Change			
1 Town Centre	380	460	+80	+21%	450	+70	+18%	450	+70	+18%		
2 Town South East	320	350	+30	+9%	370	+50	+16%	370	+50	+16%		
3 Town South West	420	470	+50	+12%	480	+60	+14%	480	+60	+14%		
4 Town North West	280	320	+40	+14%	320	+40	+14%	320	+40	+14%		
5 Town North East	240	280	+40	+17%	290	+50	+21%	290	+50	+21%		
6 Heathhall and Locharbriggs	310	410	+100	+32%	410	+100	+32%	410	+100	+32%		
7 Lochside and Lincluden	210	230	+20	+10%	230	+20	+10%	230	+20	+10%		
8 Outer East	1,810	1,860	+50	+3%	1,910	+100	+6%	1,910	+100	+6%		
9 Outer North	1,710	1,780	+70	+4%	1,820	+110	+6%	1,820	+110	+6%		
10 Outer West	1,760	1,830	+70	+4%	1,880	+120	+7%	1,880	+120	+7%		

Table B.11 2023 Forecast Year AM Peak Hour Vehicle Hours

Sector	LDP3 2023				LDP4 2023				LDP5 2023			
	Option 3	Option 4	Change		Option 4	Change		Option 5	Change			
1 Town Centre	220	210	-10	-5%	210	-10	-5%	210	-10	-5%		
2 Town South East	360	330	-30	-8%	330	-30	-8%	330	-30	-8%		
3 Town South West	440	470	+30	+7%	440	0	0%	440	0	0%		
4 Town North West	230	240	+10	+4%	240	+10	+4%	240	+10	+4%		
5 Town North East	280	260	-20	-7%	310	+30	+11%	310	+30	+11%		
6 Heathhall and Locharbriggs	330	330	0	0%	390	+60	+18%	390	+60	+18%		
7 Lochside and Lincluden	190	200	+10	+5%	190	0	0%	190	0	0%		
8 Outer East	1,740	1,750	+10	+1%	1,760	+20	+1%	1,760	+20	+1%		
9 Outer North	1,640	1,630	-10	-1%	1,650	+10	+1%	1,650	+10	+1%		
10 Outer West	1,980	2,010	+30	+2%	2,010	+30	+2%	2,010	+30	+2%		

Table B.12 2023 Forecast Year PM Peak Hour Vehicle Hours

Sector	LDP3 2023				LDP4 2023				LDP5 2023			
	Option 3	Option 4	Change		Option 4	Change		Option 5	Change			
1 Town Centre	450	440	-10	-2%	440	-10	-2%	440	-10	-2%		
2 Town South East	370	320	-50	-14%	330	-40	-11%	330	-40	-11%		
3 Town South West	480	530	+50	+10%	470	-10	-2%	470	-10	-2%		
4 Town North West	320	350	+30	+9%	320	0	0%	320	0	0%		
5 Town North East	290	280	-10	-3%	300	+10	+3%	300	+10	+3%		
6 Heathhall and Locharbriggs	410	420	+10	+2%	430	+20	+5%	430	+20	+5%		
7 Lochside and Lincluden	230	230	0	0%	230	0	0%	230	0	0%		
8 Outer East	1,910	1,930	+20	+1%	1,930	+20	+1%	1,930	+20	+1%		
9 Outer North	1,820	1,830	+10	+1%	1,820	0	0%	1,820	0	0%		
10 Outer West	1,880	1,930	+50	+3%	1,910	+30	+2%	1,910	+30	+2%		



Dumfries Regional Traffic Model Local Development Plan Tests

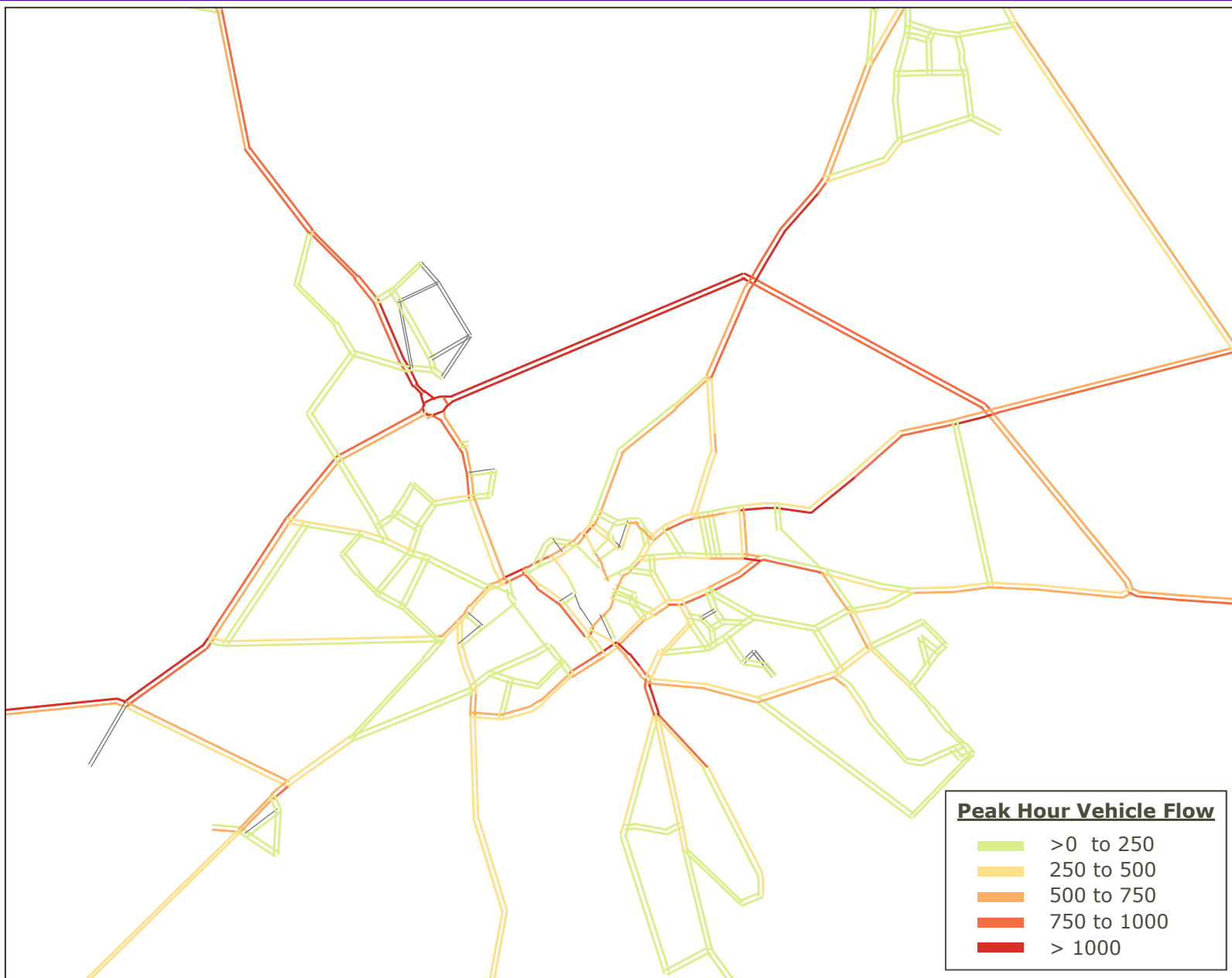
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Traffic Flow
AM Peak Hour – LDP Option 1**

Project No.
101767

Figure
B.1

mvaconsultancy



**Dumfries Regional Traffic Model
Local Development Plan Tests**

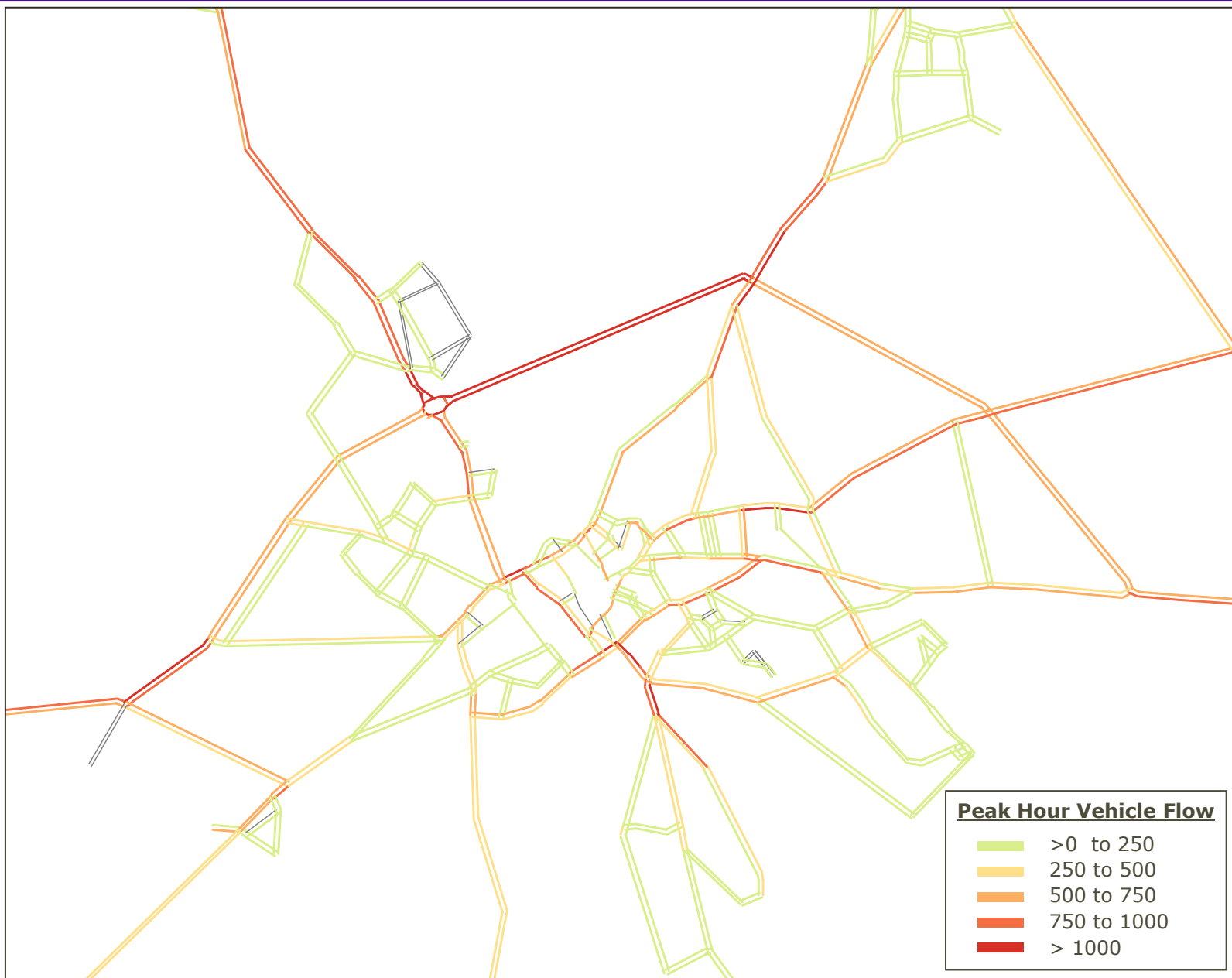
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Traffic Flow
AM Peak Hour – LDP Option 2**

Project No.
101767

Figure
B.2

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

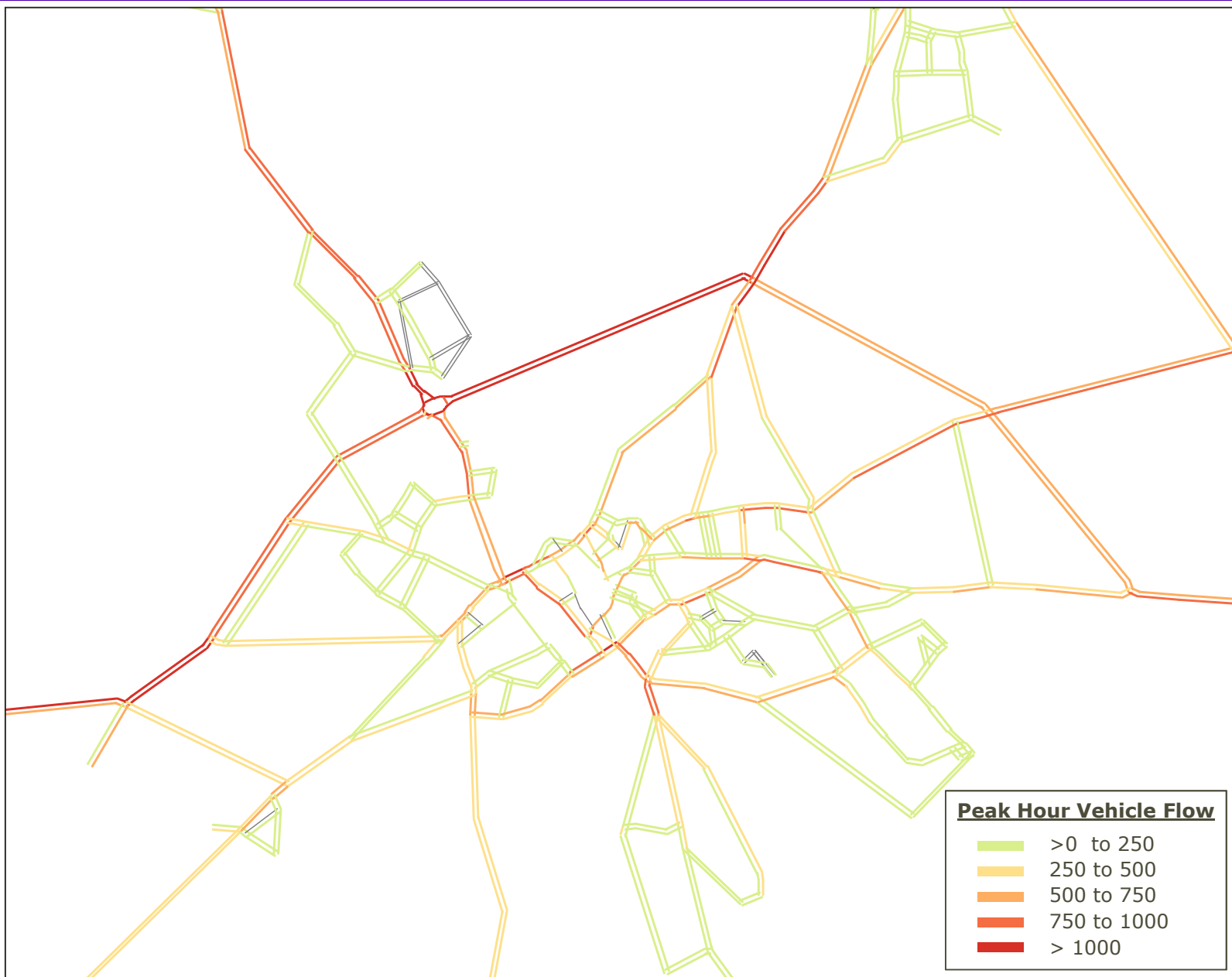
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Traffic Flow
AM Peak Hour – LDP Option 3**

Project No.
101767

Figure
B.3

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

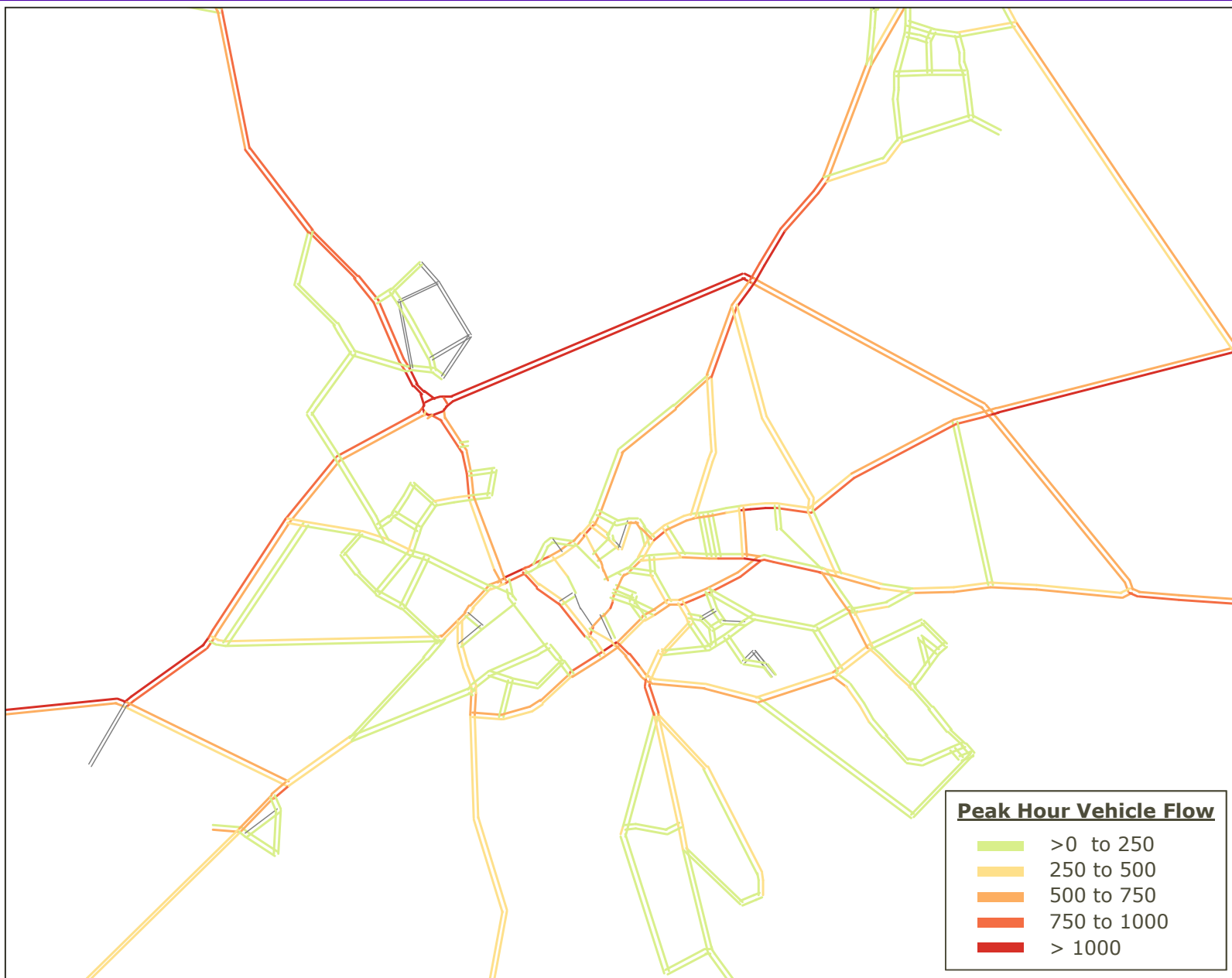
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Traffic Flow
AM Peak Hour – LDP Option 4**

Project No.
101767

Figure
B.4

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

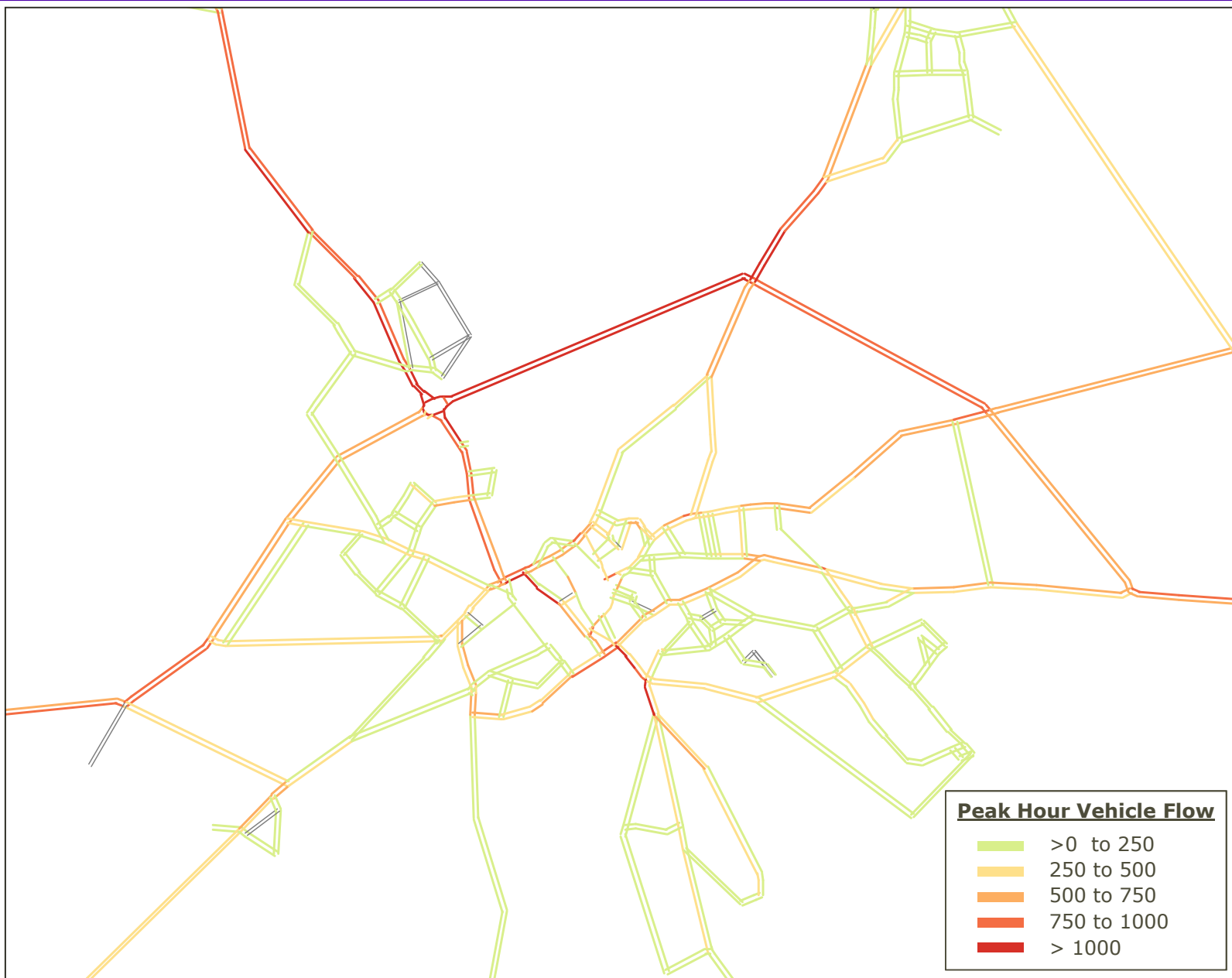
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Traffic Flow
AM Peak Hour – LDP Option 5**

Project No.
101767

Figure
B.5

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

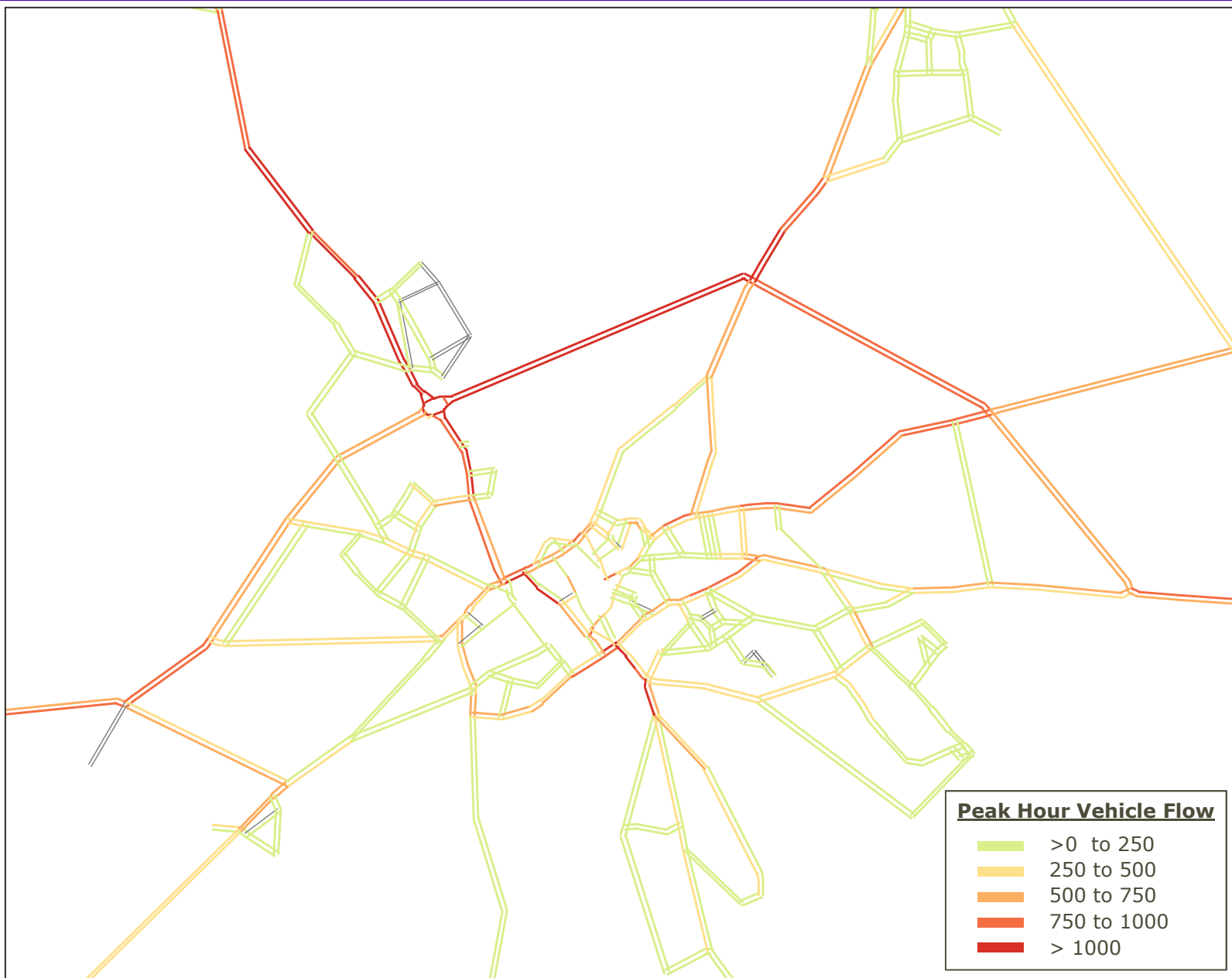
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Traffic Flow
PM Peak Hour – LDP Option 1**

Project No.
101767

Figure
B.6

mvaconsultancy



**Dumfries Regional Traffic Model
Local Development Plan Tests**

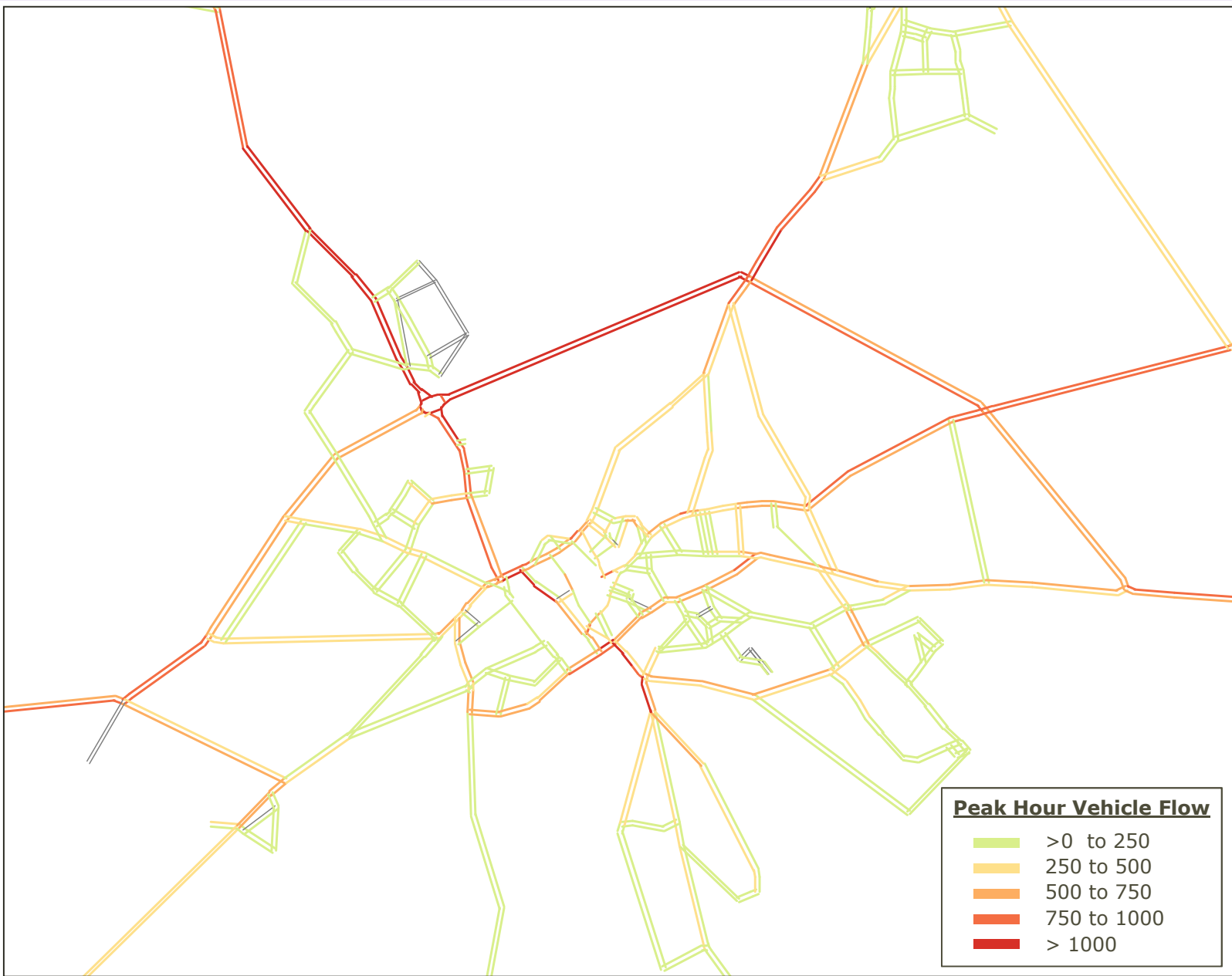
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Traffic Flow
PM Peak Hour – LDP Option 2**

Project No.
101767

Figure
B.7

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

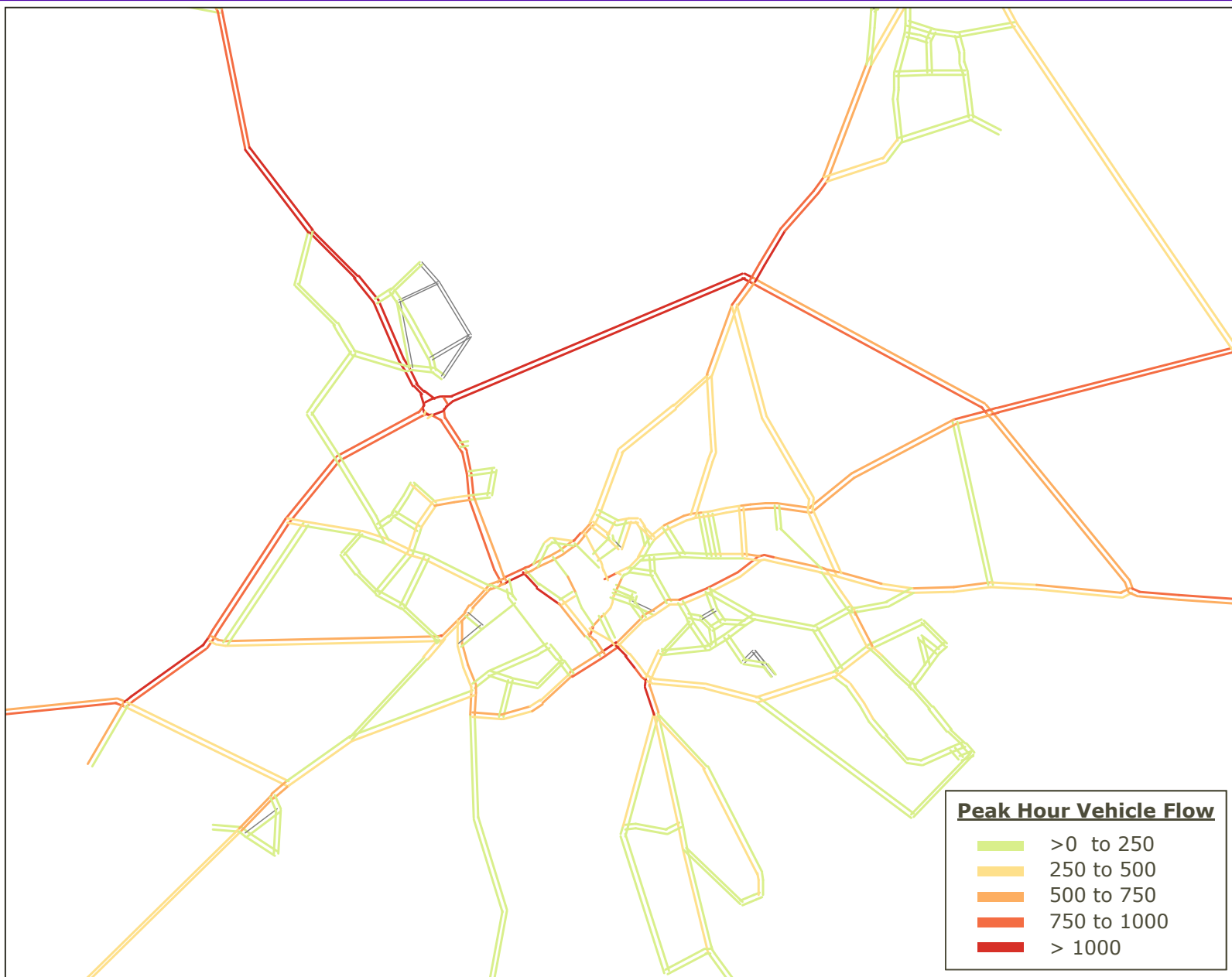
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Traffic Flow
PM Peak Hour – LDP Option 3**

Project No.
101767

Figure
B.8

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

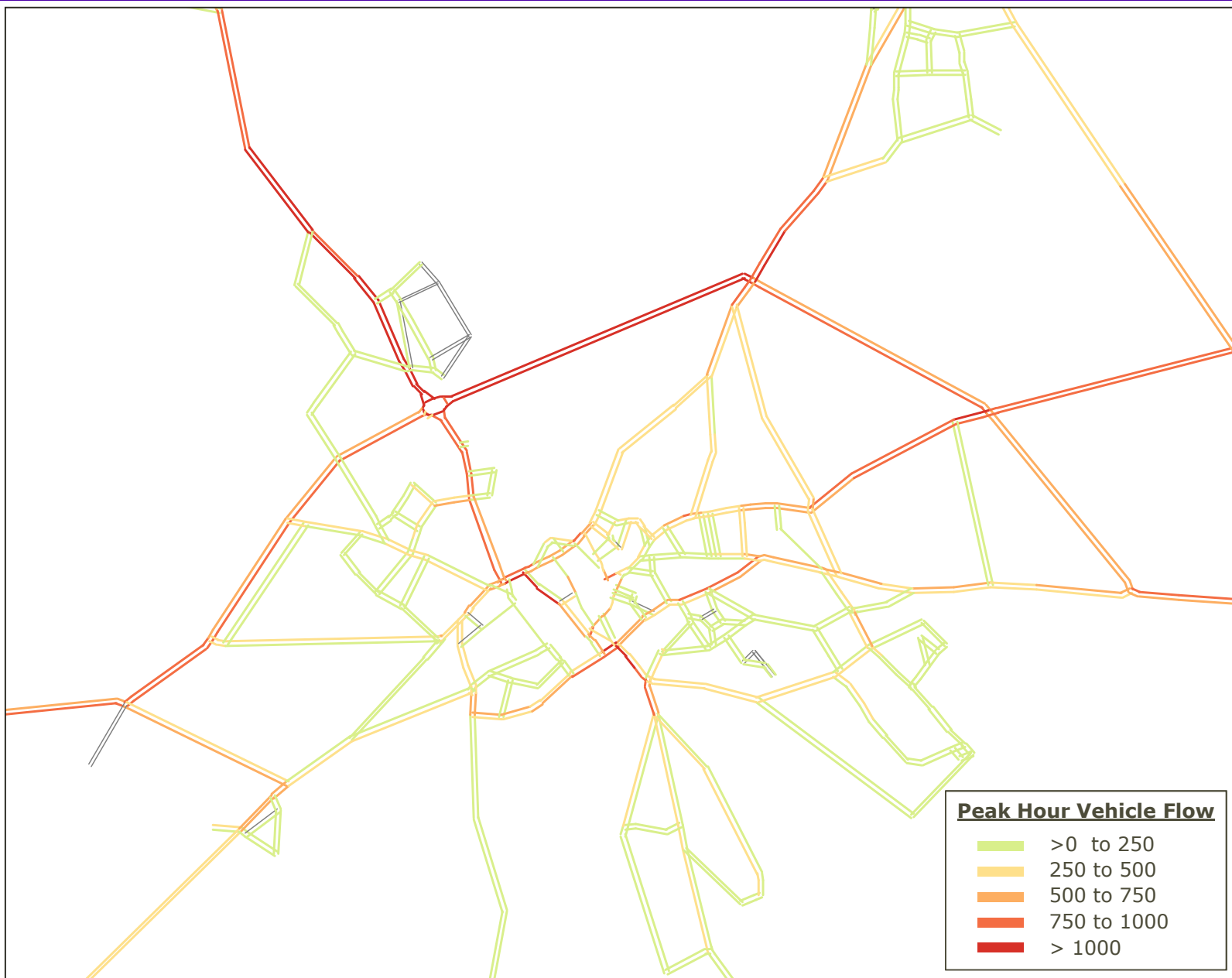
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Traffic Flow
PM Peak Hour – LDP Option 4**

Project No.
101767

Figure
B.9

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

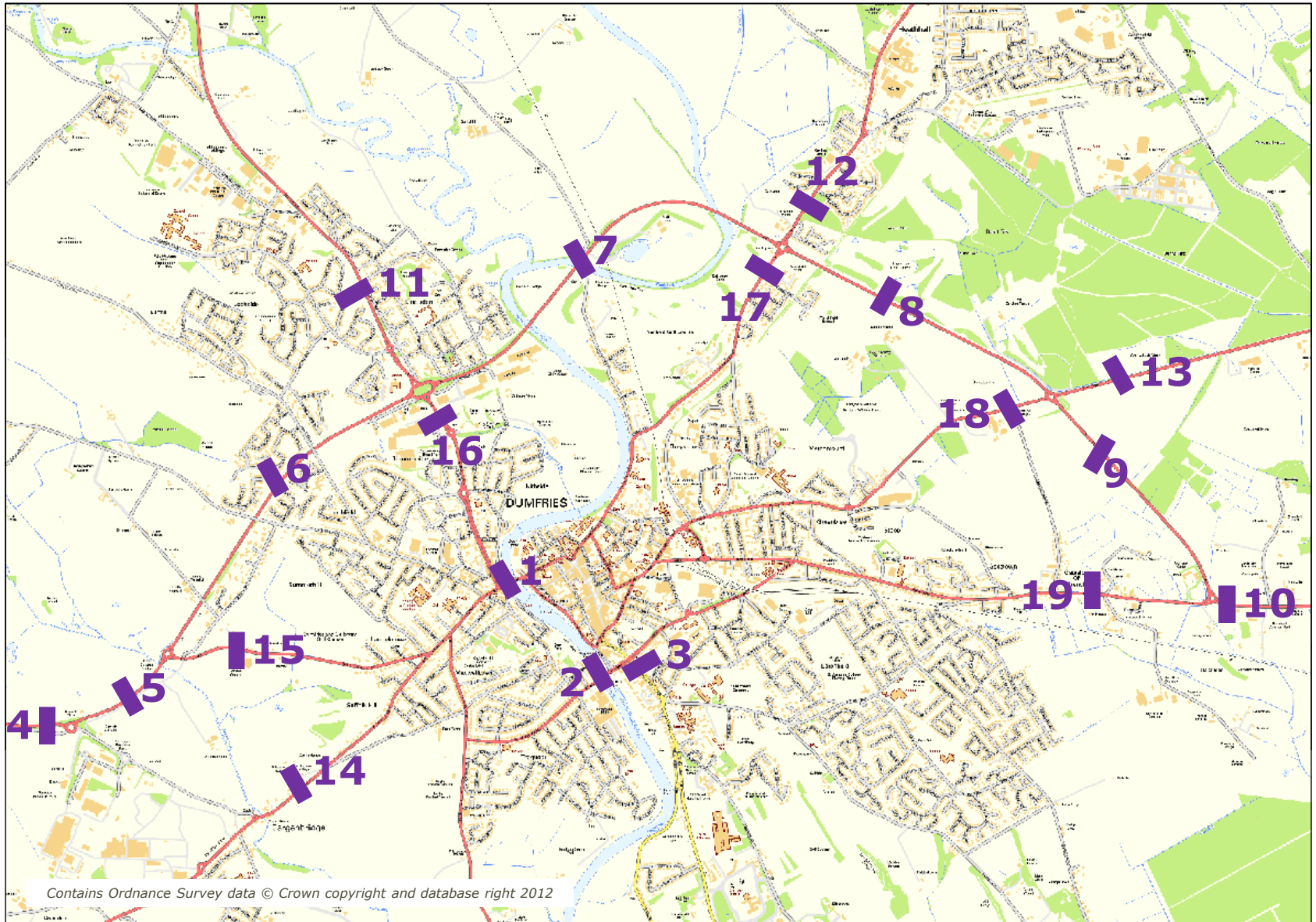
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Traffic Flow
PM Peak Hour – LDP Option 5**

Project No.
101767

Figure
B.10

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Dumfries Regional Traffic Model Local Development Plan Tests

Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Key Link Locations for Flow Comparisons**

Project No.
101767

Figure
B.11

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Appendix C - Average Speeds and Journey Times

Table C.1 2018 Forecast Year AM Peak Hour Average Vehicle Speed

Sector	LDP1 2018	LDP2 2018		LDP3 2023	
	Option 1	Option 2	Change	Option 3	Change
1 Town Centre	18	17	-1 -6%	17	-1 -6%
2 Town South East	38	35	-3 -8%	36	-2 -5%
3 Town South West	52	51	-1 -2%	51	-1 -2%
4 Town North West	43	42	-1 -2%	42	-1 -2%
5 Town North East	39	38	-1 -3%	37	-2 -5%
6 Heathhall and Locharbriggs	39	31	-8 -21%	36	-3 -8%
7 Lochside and Lincluden	46	45	-1 -2%	45	-1 -2%
8 Outer East	88	87	-1 -1%	87	-1 -1%
9 Outer North	86	85	-1 -1%	85	-1 -1%
10 Outer West	75	75	0 0%	75	0 0%

Table C.2 2018 Forecast Year PM Peak Hour Average Vehicle Speed

Sector	LDP1 2018	LDP2 2018		LDP3 2023	
	Option 1	Option 2	Change	Option 3	Change
1 Town Centre	10	9	-1 -10%	9	-1 -10%
2 Town South East	40	37	-3 -8%	37	-3 -8%
3 Town South West	51	48	-3 -6%	48	-3 -6%
4 Town North West	40	38	-2 -5%	38	-2 -5%
5 Town North East	41	39	-2 -5%	39	-2 -5%
6 Heathhall and Locharbriggs	35	29	-6 -17%	30	-5 -14%
7 Lochside and Lincluden	44	43	-1 -2%	43	-1 -2%
8 Outer East	91	90	-1 -1%	90	-1 -1%
9 Outer North	88	87	-1 -1%	87	-1 -1%
10 Outer West	77	76	-1 -1%	76	-1 -1%

Table C.3 2023 Forecast Year AM Peak Hour Average Vehicle Speed

Sector	LDP3 2023	LDP4 2023		LDP5 2023	
	Option 3	Option 4	Change	Option 5	Change
1 Town Centre	17	18	+1 +6%	18	+1 +6%
2 Town South East	36	38	+2 +6%	38	+2 +6%
3 Town South West	51	50	-1 -2%	51	0 0%
4 Town North West	42	42	0 0%	42	0 0%
5 Town North East	37	38	+1 +3%	35	-2 -5%
6 Heathhall and Locharbriggs	36	36	0 0%	33	-3 -8%
7 Lochside and Lincluden	45	46	+1 +2%	45	0 0%
8 Outer East	87	87	0 0%	87	0 0%
9 Outer North	85	85	0 0%	85	0 0%
10 Outer West	75	75	0 0%	75	0 0%

Table C.4 2023 Forecast Year PM Peak Hour Average Vehicle Speed

Sector	LDP3 2023	LDP4 2023		LDP5 2023	
	Option 3	Option 4	Change	Option 5	Change
1 Town Centre	9	9	0 0%	9	0 0%
2 Town South East	37	40	+3 +8%	40	+3 +8%
3 Town South West	48	46	-2 -4%	49	+1 +2%
4 Town North West	38	35	-3 -8%	38	0 0%
5 Town North East	39	39	0 0%	39	0 0%
6 Heathhall and Locharbriggs	30	29	-1 -3%	30	0 0%
7 Lochside and Lincluden	43	43	0 0%	43	0 0%
8 Outer East	90	90	0 0%	90	0 0%
9 Outer North	87	87	0 0%	87	0 0%
10 Outer West	76	76	0 0%	76	0 0%

Table C.5 2018 Forecast Year AM Peak Hour Modelled Journey Times (minutes) on Defined Routes

ID	Route	LDP1	LDP2			LDP3		
		2018	2018	2018		2023	2023	
		Option 1	Option 2	Change		Option 3	Change	
1S	Dumfries Town Route 1 Southbound Total	6.9	7.3	0.4	+6%	7.3	0.4	+6%
1N	Dumfries Town Route 1 Northbound Total	6.7	7.9	1.2	+18%	7.6	0.9	+13%
2S	Dumfries Town Route 2 Southbound Total	10.1	10.6	0.5	+5%	10.7	0.6	+6%
2N	Dumfries Town Route 2 Northbound Total	8.7	9.3	0.6	+7%	9.3	0.6	+7%
3S	Dumfries Town Route 3 Southbound Total	7.9	8.0	0.1	+1%	7.9	0.0	0%
3N	Dumfries Town Route 3 Northbound Total	7.9	7.9	0.0	0%	7.9	0.0	0%
4W	Dumfries Town Route 4 Westbound Total	6.9	7.2	0.3	+4%	7.1	0.2	+3%
4E	Dumfries Town Route 4 Eastbound Total	7.6	7.7	0.1	+1%	7.5	-0.1	-1%
5E	Dumfries Town Route 5 Eastbound Total	9.0	9.0	0.0	0%	9.1	0.1	+1%
5W	Dumfries Town Route 5 Westbound Total	12.5	12.9	0.4	+3%	12.8	0.3	+2%
BPE_1	Bypass Section 1 (Eastbound) - From Drummors Rbt to A76	6.2	6.4	0.2	+3%	6.3	0.1	+2%
BPE_2	Bypass Section 2 (Eastbound) - From A76 to A709	4.5	4.9	0.4	+9%	4.7	0.2	+4%
BPE_3	Bypass Section 3 (Eastbound) - From A709 to Collin	3.4	3.4	0.0	0%	3.4	0.0	0%
BPW_1	Bypass Section 1 (Westbound) - From A76 to Drummors Rbt	5.7	5.7	0.0	0%	5.7	0.0	0%
BPW_2	Bypass Section 2 (Westbound) - From A709 to A76	4.4	4.7	0.3	+7%	5.0	0.6	+14%
BPW_3	Bypass Section 3 (Westbound) - From Collin to A709	3.7	3.8	0.1	+3%	3.8	0.1	+3%

Table C.6 2018 Forecast Year PM Peak Hour Modelled Journey Times (minutes) on Defined Routes

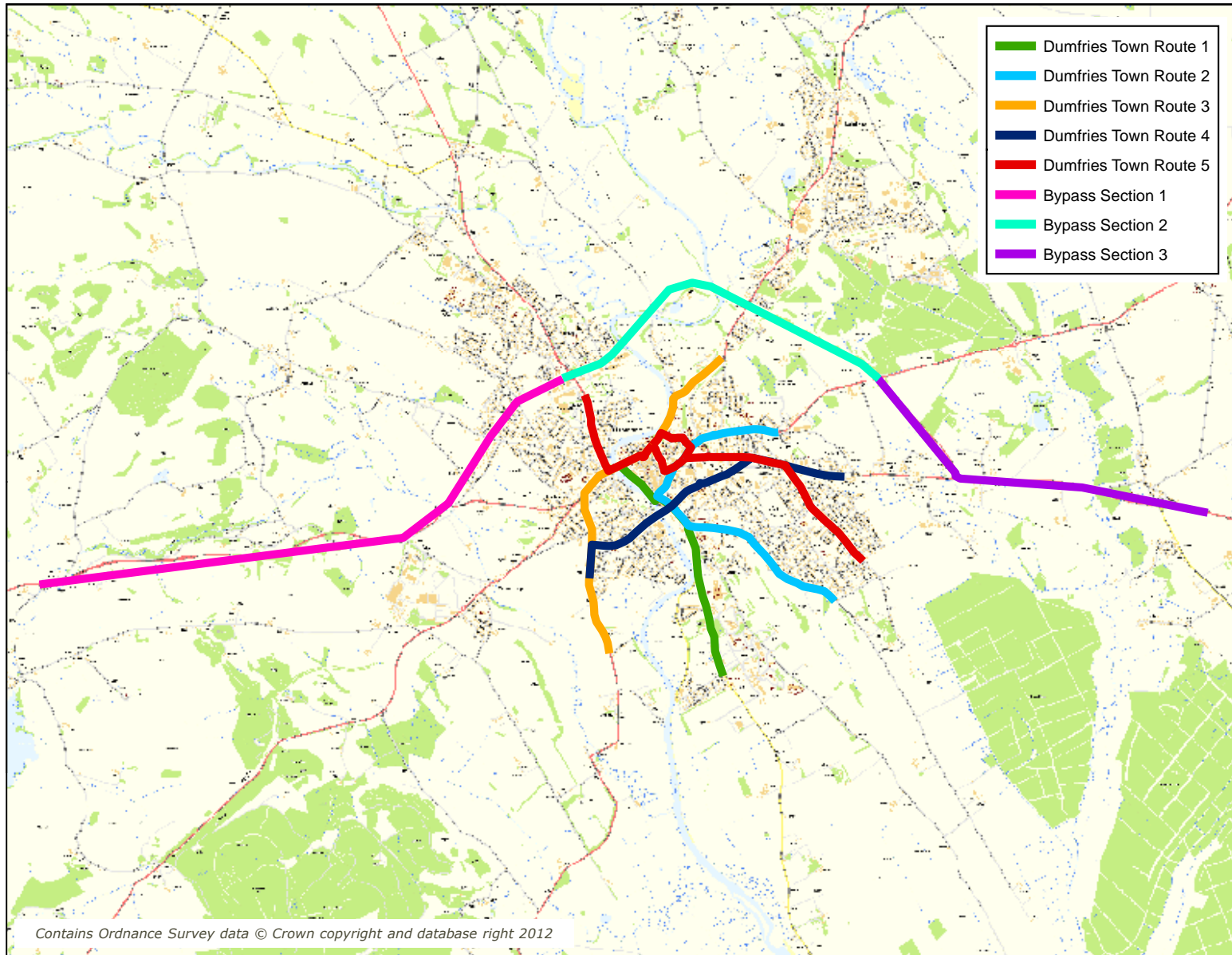
ID	Route	LDP1	LDP2			LDP3		
		2018	2018	2018		2023	2023	
		Option 1	Option 2	Change		Option 3	Change	
1S	Dumfries Town Route 1 Southbound Total	12.1	13.9	1.8	+15%	14.0	1.9	+16%
1N	Dumfries Town Route 1 Northbound Total	8.5	9.9	1.4	+16%	9.7	1.2	+14%
2S	Dumfries Town Route 2 Southbound Total	14.4	16.0	1.6	+11%	16.0	1.6	+11%
2N	Dumfries Town Route 2 Northbound Total	8.5	9.3	0.8	+9%	8.6	0.1	+1%
3S	Dumfries Town Route 3 Southbound Total	9.0	9.5	0.5	+6%	9.6	0.6	+7%
3N	Dumfries Town Route 3 Northbound Total	9.7	11.3	1.6	+16%	11.1	1.4	+14%
4W	Dumfries Town Route 4 Westbound Total	8.7	9.3	0.6	+7%	9.2	0.5	+6%
4E	Dumfries Town Route 4 Eastbound Total	10.7	12.4	1.7	+16%	12.2	1.5	+14%
5E	Dumfries Town Route 5 Eastbound Total	10.4	11.9	1.5	+14%	11.8	1.4	+13%
5W	Dumfries Town Route 5 Westbound Total	14.1	14.7	0.6	+4%	14.6	0.5	+4%
BPE_1	Bypass Section 1 (Eastbound) - From Drummors Rbt to A76	5.6	5.7	0.1	+2%	5.7	0.1	+2%
BPE_2	Bypass Section 2 (Eastbound) - From A76 to A709	5.6	7.6	2.0	+36%	7.4	1.8	+32%
BPE_3	Bypass Section 3 (Eastbound) - From A709 to Collin	3.6	3.6	0.0	0%	3.6	0.0	0%
BPW_1	Bypass Section 1 (Westbound) - From A76 to Drummors Rbt	6.1	6.2	0.1	+2%	6.2	0.1	+2%
BPW_2	Bypass Section 2 (Westbound) - From A709 to A76	5.2	6.2	1.0	+19%	5.9	0.7	+13%
BPW_3	Bypass Section 3 (Westbound) - From Collin to A709	3.6	3.6	0.0	0%	3.6	0.0	0%

Table C.7 2023 Forecast Year AM Peak Hour Modelled Journey Times (minutes) on Defined Routes

ID	Route	LDP3	LDP4		LDP5			
		2023 Option 3	2023 Option 4	Change	2023 Option 5	Change		
1S	Dumfries Town Route 1 Southbound Total	7.3	6.1	-1.2	-16%	6.2	-1.1	-15%
1N	Dumfries Town Route 1 Northbound Total	7.6	7.3	-0.3	-4%	6.9	-0.7	-9%
2S	Dumfries Town Route 2 Southbound Total	10.7	9.4	-1.3	-12%	9.5	-1.2	-11%
2N	Dumfries Town Route 2 Northbound Total	9.3	9.2	-0.1	-1%	8.8	-0.5	-5%
3S	Dumfries Town Route 3 Southbound Total	7.9	8.2	0.3	+4%	7.9	0.0	0%
3N	Dumfries Town Route 3 Northbound Total	7.9	8.4	0.5	+6%	8.0	0.1	+1%
4W	Dumfries Town Route 4 Westbound Total	7.1	7.0	-0.1	-1%	7.1	0.0	0%
4E	Dumfries Town Route 4 Eastbound Total	7.5	7.4	-0.1	-1%	7.5	0.0	0%
5E	Dumfries Town Route 5 Eastbound Total	9.1	8.5	-0.6	-7%	8.8	-0.3	-3%
5W	Dumfries Town Route 5 Westbound Total	12.8	12.6	-0.2	-2%	12.7	-0.1	-1%
BPE_1	Bypass Section 1 (Eastbound) - From Drummors Rbt to A76	6.3	6.4	0.1	+2%	6.5	0.2	+3%
BPE_2	Bypass Section 2 (Eastbound) - From A76 to A709	4.7	4.7	0.0	0%	5.1	0.4	+9%
BPE_3	Bypass Section 3 (Eastbound) - From A709 to Collin	3.4	3.4	0.0	0%	3.4	0.0	0%
BPW_1	Bypass Section 1 (Westbound) - From A76 to Drummors Rbt	5.7	6.0	0.3	+5%	5.8	0.1	+2%
BPW_2	Bypass Section 2 (Westbound) - From A709 to A76	5.0	5.1	0.1	+2%	5.3	0.3	+6%
BPW_3	Bypass Section 3 (Westbound) - From Collin to A709	3.8	3.8	0.0	0%	3.8	0.0	0%

Table C.8 2023 Forecast Year PM Peak Hour Modelled Journey Times (minutes) on Defined Routes

ID	Route	LDP1	LDP2		LDP2			
		2018 Option 3	2018 Option 4	Change	2018 Option 5	Change		
1S	Dumfries Town Route 1 Southbound Total	14.0	12.1	-1.9	-14%	11.6	-2.4	-17%
1N	Dumfries Town Route 1 Northbound Total	9.7	9.2	-0.5	-5%	9.4	-0.3	-3%
2S	Dumfries Town Route 2 Southbound Total	16.0	15.9	-0.1	-1%	15.3	-0.7	-4%
2N	Dumfries Town Route 2 Northbound Total	8.6	8.5	-0.1	-1%	8.3	-0.3	-3%
3S	Dumfries Town Route 3 Southbound Total	9.6	9.6	0.0	0%	10.0	0.4	+4%
3N	Dumfries Town Route 3 Northbound Total	11.1	12.4	1.3	+12%	10.6	-0.5	-5%
4W	Dumfries Town Route 4 Westbound Total	9.2	9.1	-0.1	-1%	9.2	0.0	0%
4E	Dumfries Town Route 4 Eastbound Total	12.2	13.3	1.1	+9%	11.6	-0.6	-5%
5E	Dumfries Town Route 5 Eastbound Total	11.8	12.4	0.6	+5%	11.4	-0.4	-3%
5W	Dumfries Town Route 5 Westbound Total	14.6	14.3	-0.3	-2%	14.9	0.3	+2%
BPE_1	Bypass Section 1 (Eastbound) - From Drummors Rbt to A76	5.7	6.0	0.3	+5%	5.7	0.0	0%
BPE_2	Bypass Section 2 (Eastbound) - From A76 to A709	7.4	9.1	1.7	+23%	7.2	-0.2	-3%
BPE_3	Bypass Section 3 (Eastbound) - From A709 to Collin	3.6	3.6	0.0	0%	3.6	0.0	0%
BPW_1	Bypass Section 1 (Westbound) - From A76 to Drummors Rbt	6.2	6.4	0.2	+3%	6.3	0.1	+2%
BPW_2	Bypass Section 2 (Westbound) - From A709 to A76	5.9	5.9	0.0	0%	6.2	0.3	+5%
BPW_3	Bypass Section 3 (Westbound) - From Collin to A709	3.6	3.6	0.0	0%	3.7	0.1	+3%



Dumfries Regional Traffic Model Local Development Plan Tests

Prepared for Dumfries and Galloway Council
October 2012

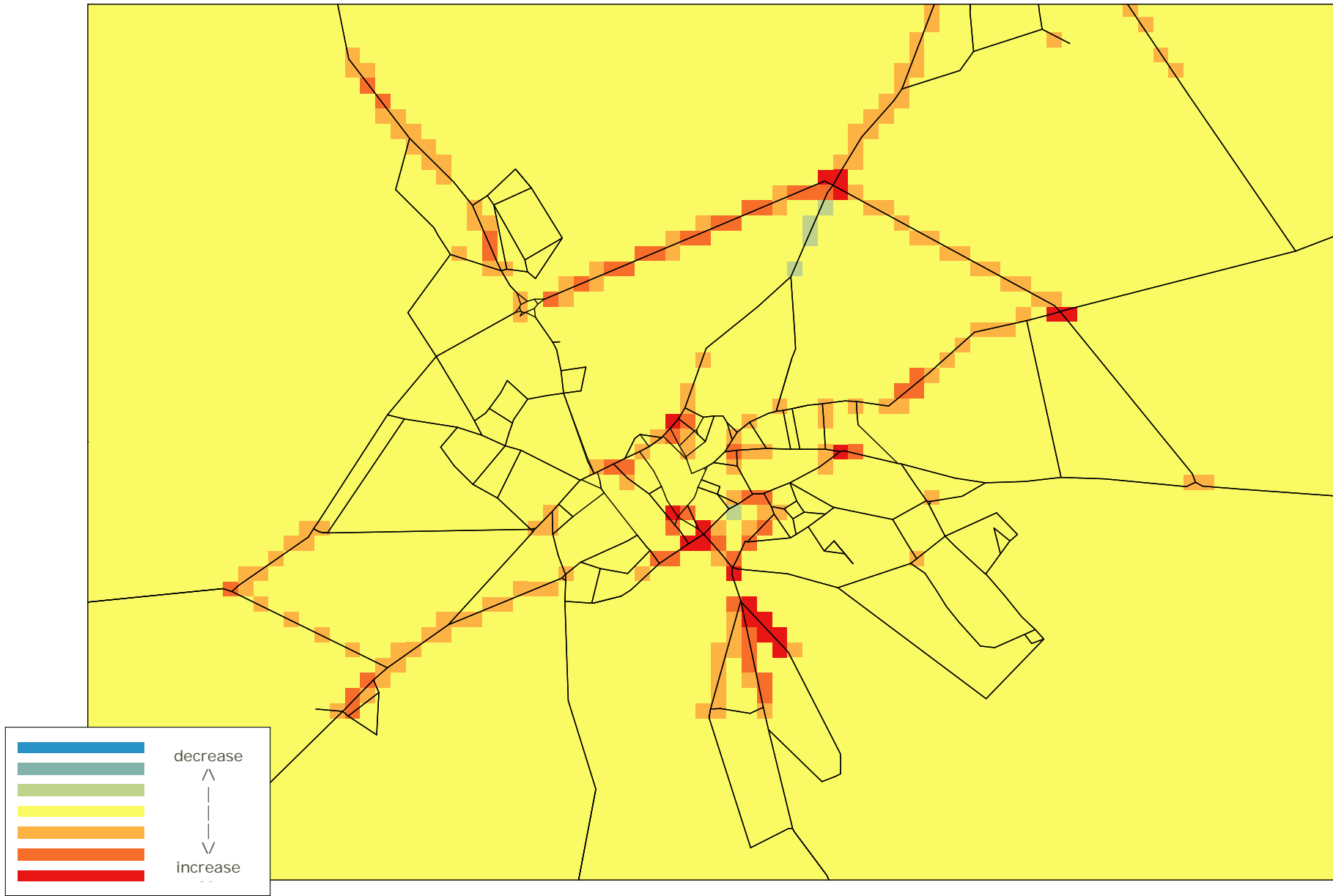
Title **DRTM Key Link Locations for Flow Comparisons**

Project No.
101767

Figure
C.1

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Appendix D - Road Congestion and Junction Delay



**Dumfries Regional Traffic Model
Local Development Plan Tests**

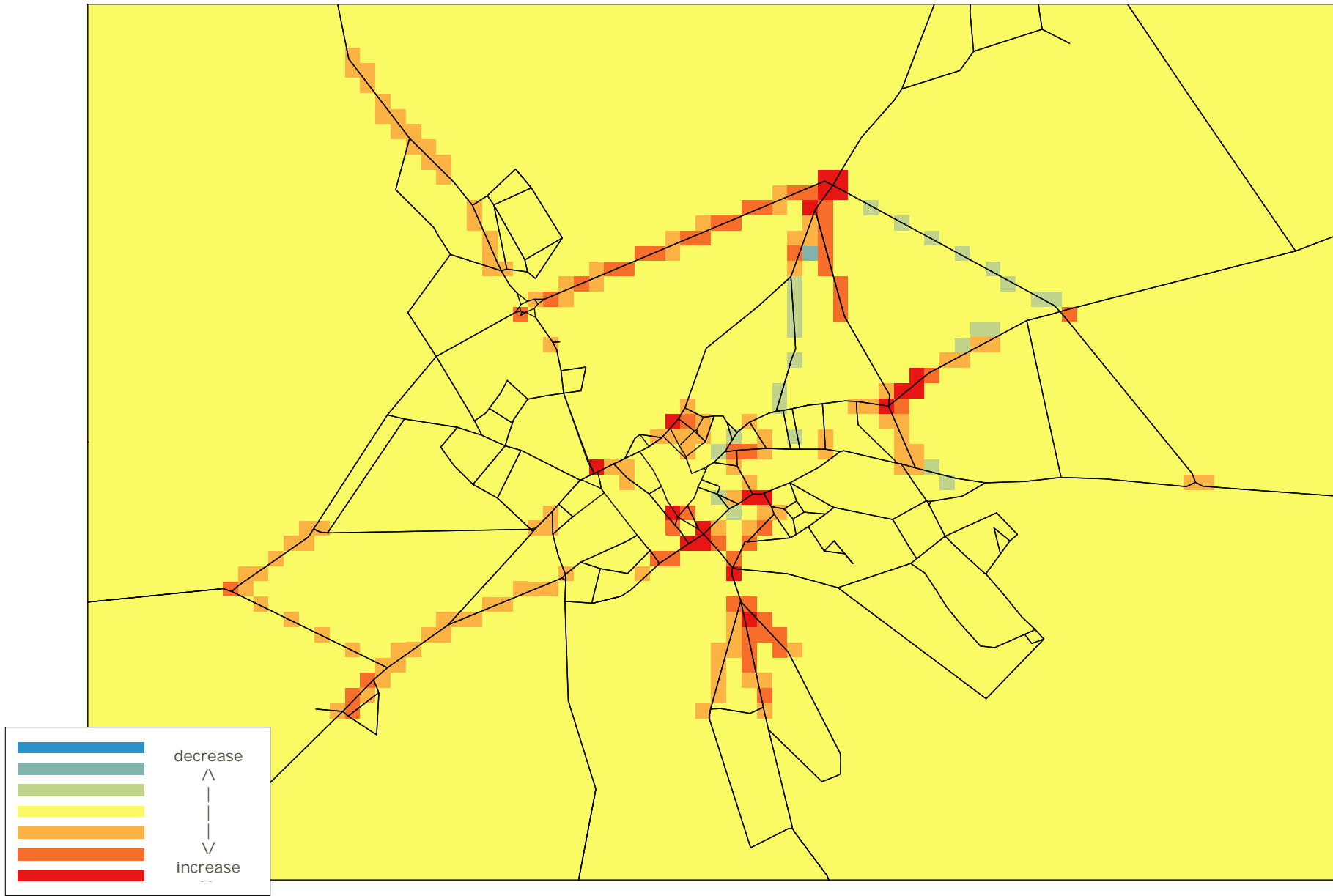
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Traffic Congestion
AM Peak Hour – LDP Option 2 vs Option 1**

Project No.
101767

Figure
D.1

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

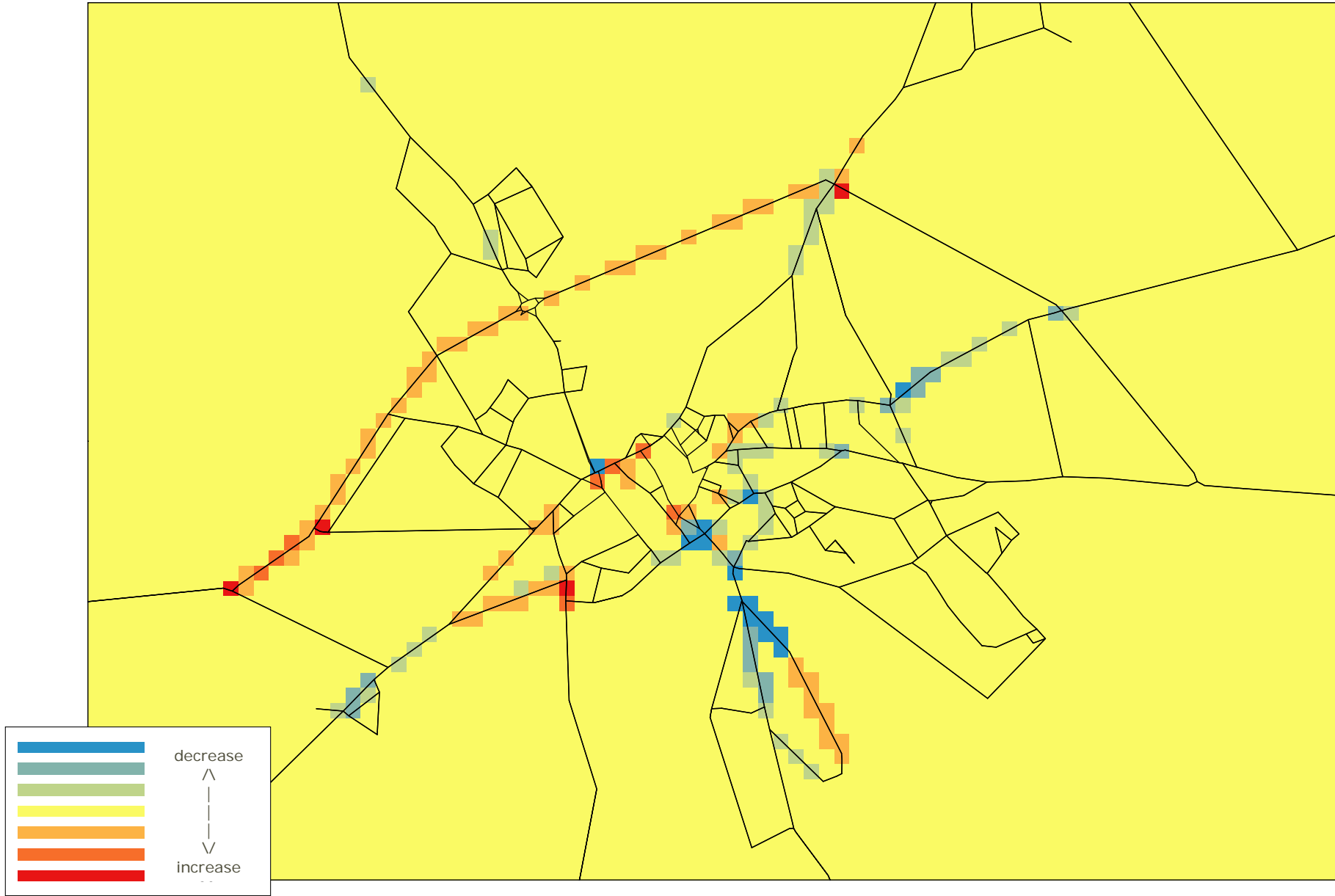
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Traffic Congestion
AM Peak Hour – LDP Option 3 vs Option 1**

Project No.
101767

Figure
D.2

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Dumfries Regional Traffic Model Local Development Plan Tests

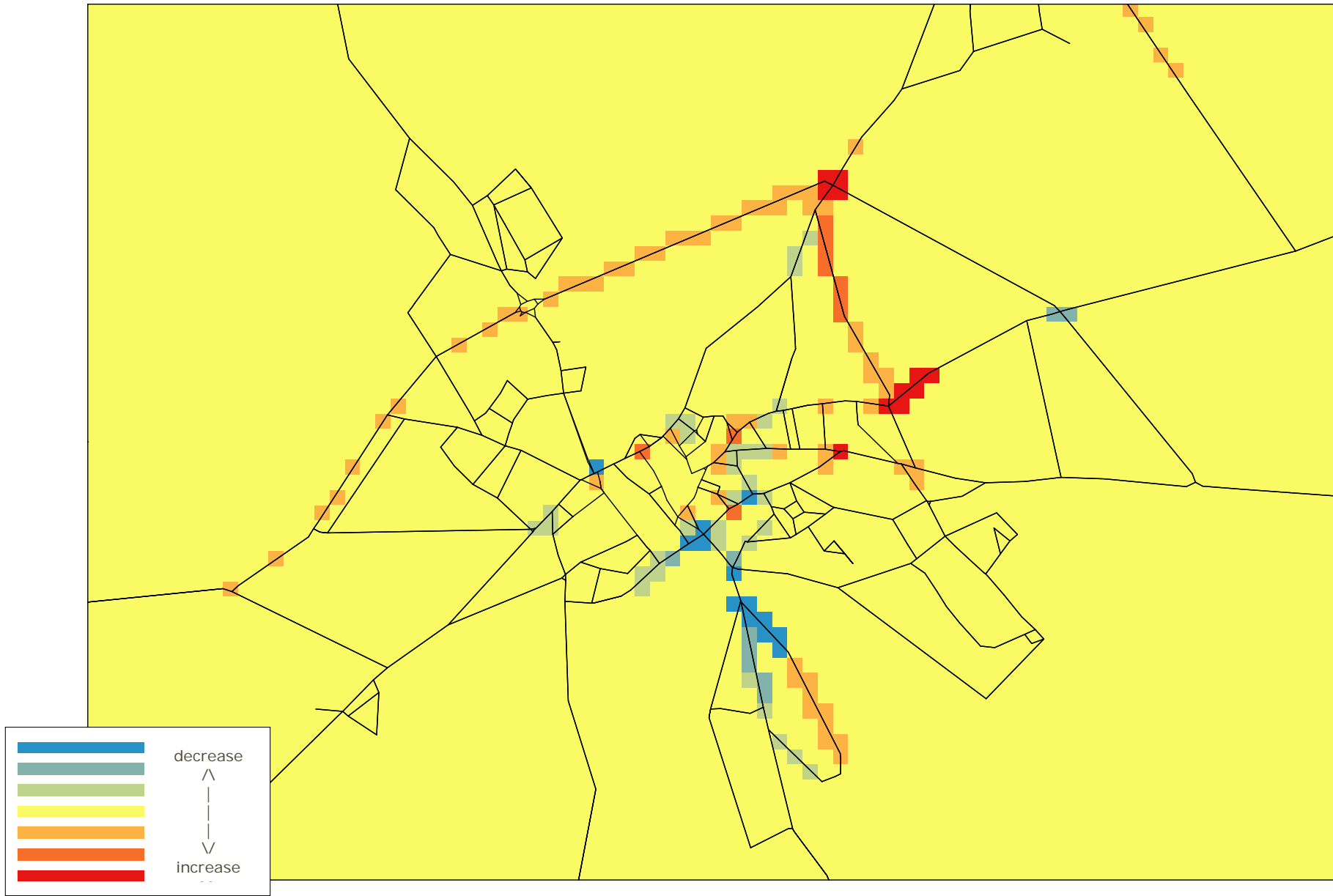
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Traffic Congestion**
AM Peak Hour – LDP Option 4 vs Option 3

Project No.
101767

Figure
D.3

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

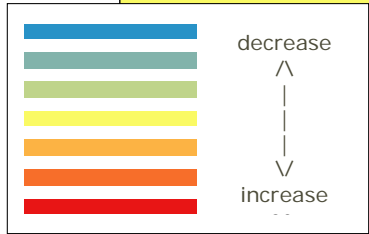
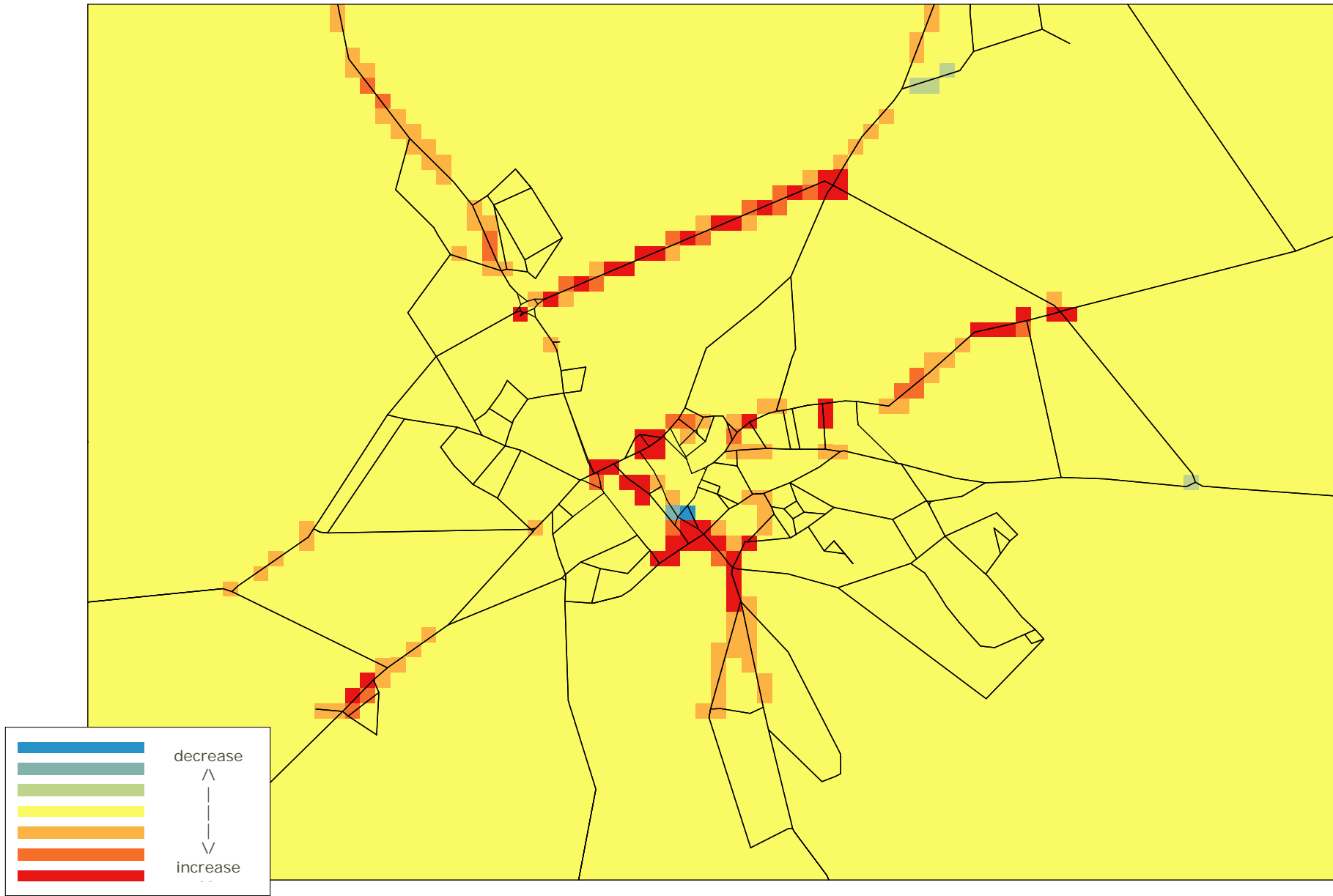
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Traffic Congestion
AM Peak Hour – LDP Option 5 vs Option 3**

Project No.
101767

Figure
D.4

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

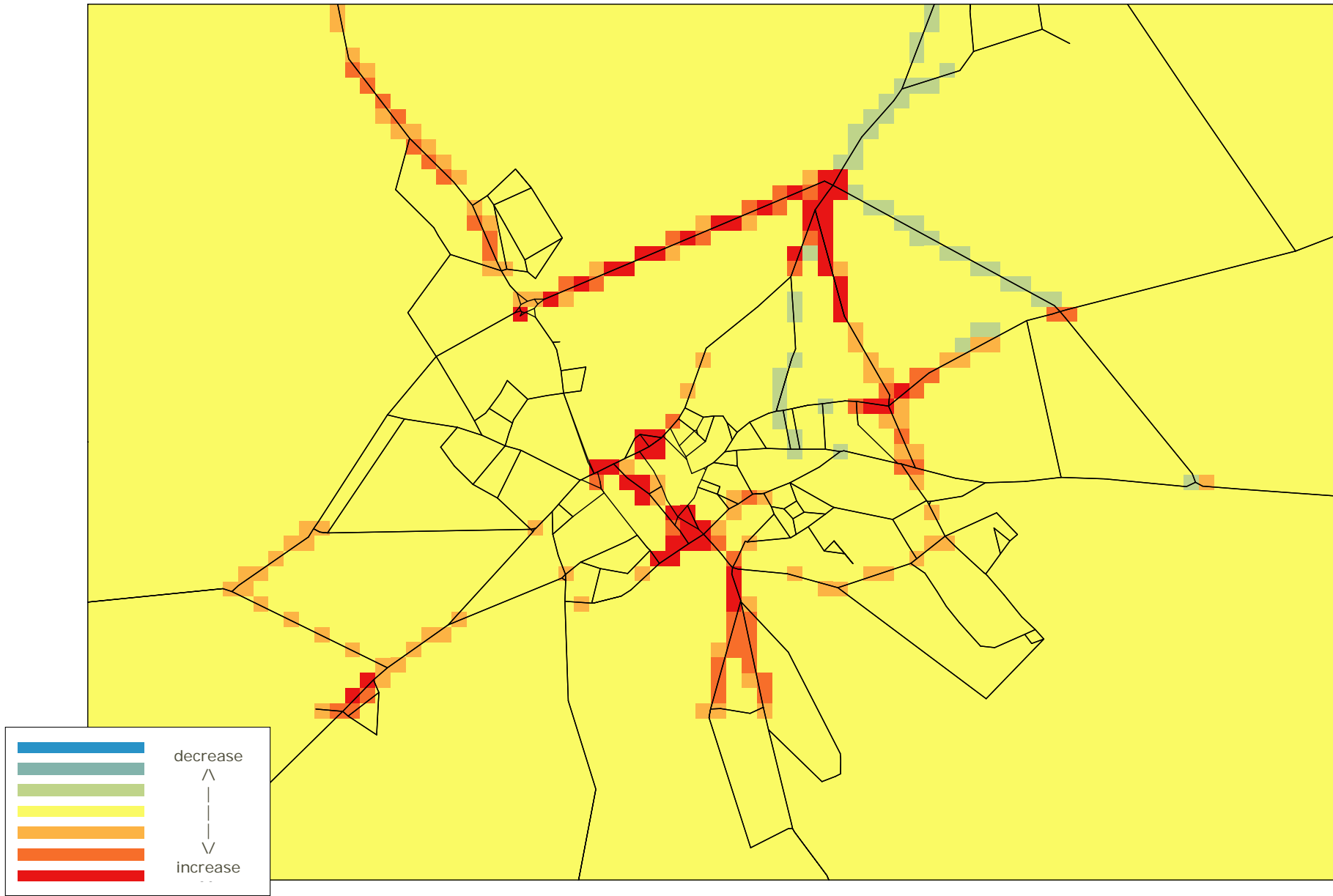
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Traffic Congestion
PM Peak Hour – LDP Option 2 vs Option 1**

Project No.
101767

Figure
D.5

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

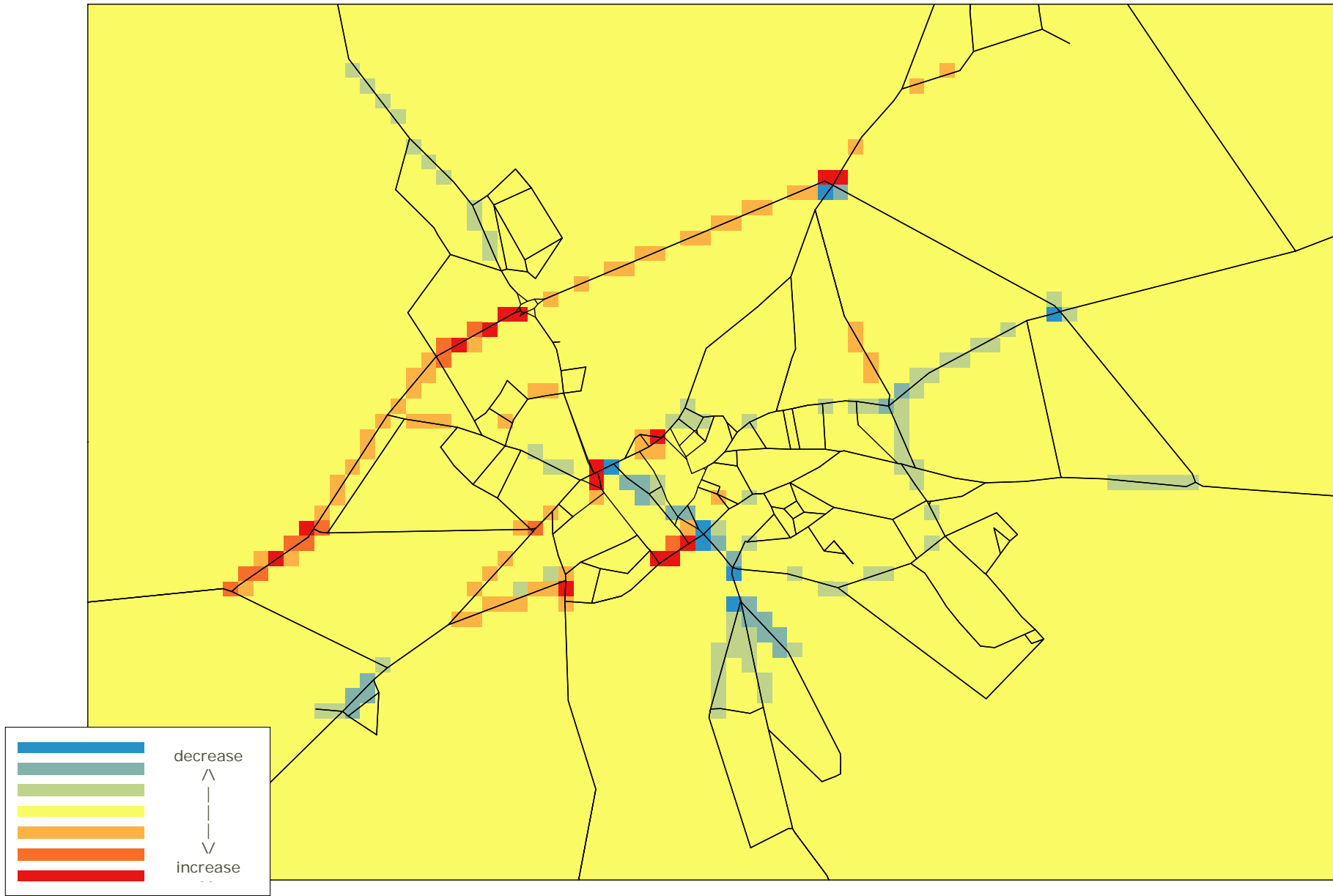
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Traffic Congestion
PM Peak Hour – LDP Option 3 vs Option 1**

Project No.
101767

Figure
D.6

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Dumfries Regional Traffic Model Local Development Plan Tests

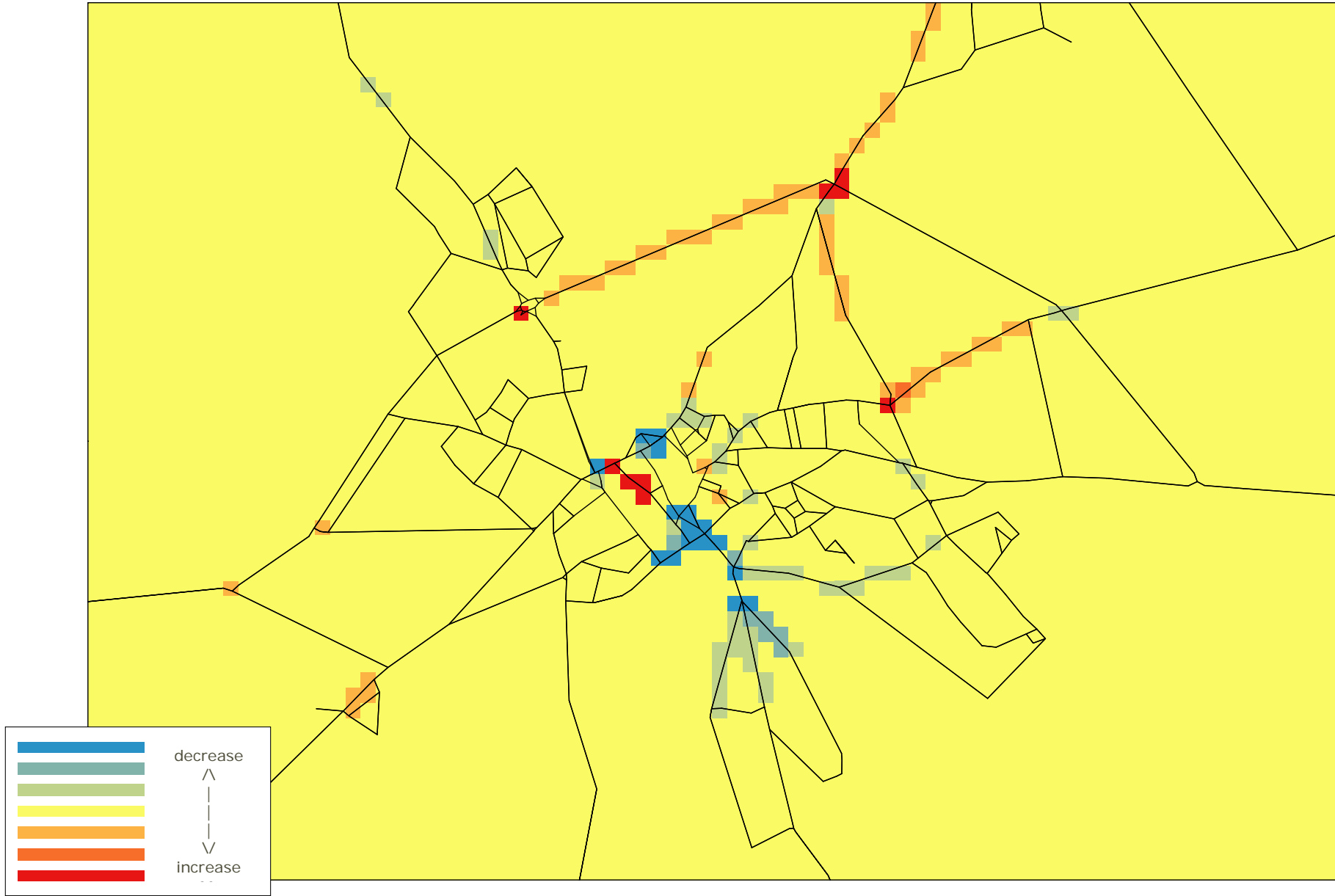
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Traffic Congestion
PM Peak Hour – LDP Option 4 vs Option 3**

Project No.
101767

Figure
D.7

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

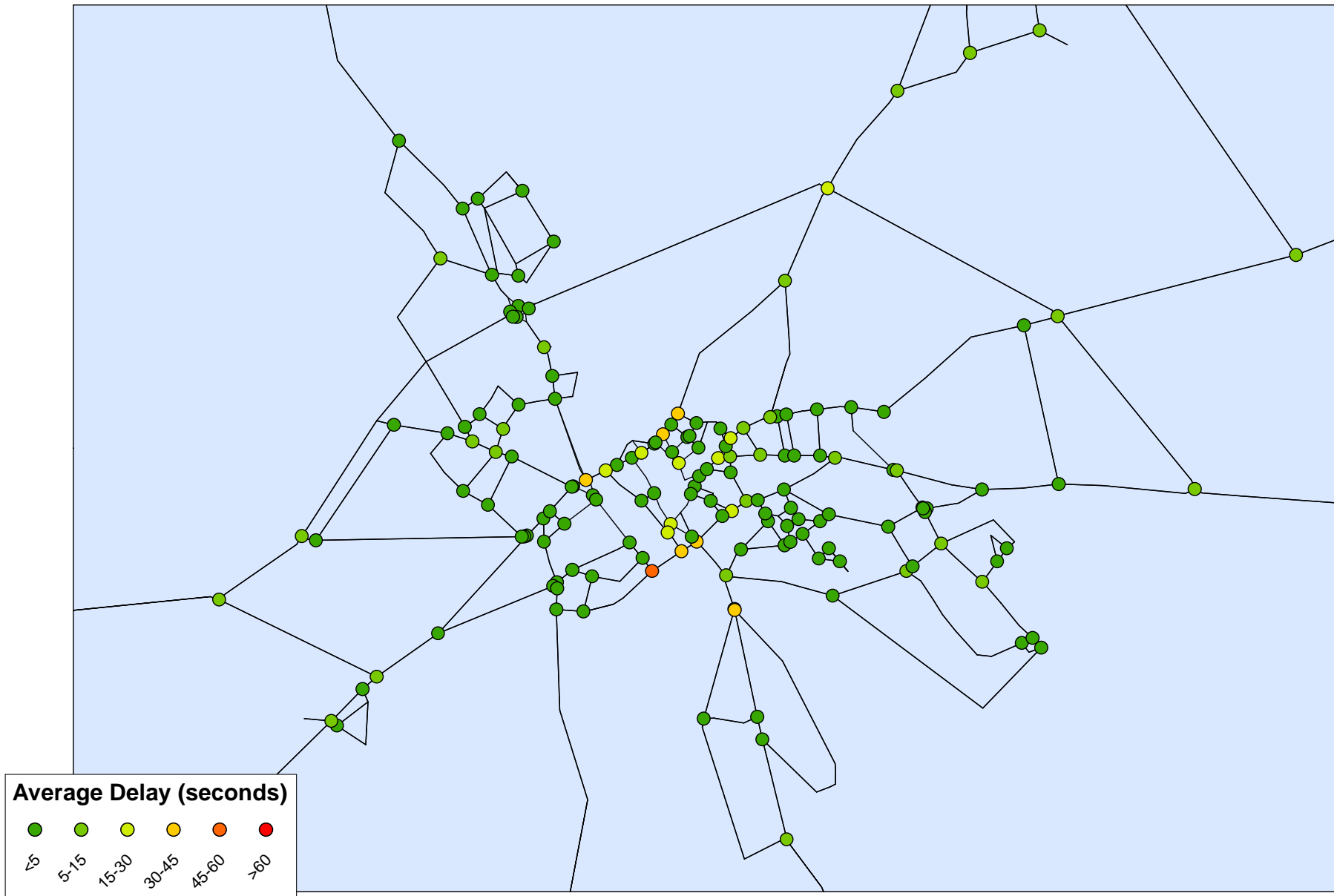
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Traffic Congestion
PM Peak Hour – LDP Option 5 vs Option 3**

Project No.
101767

Figure
D.8

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Dumfries Regional Traffic Model Local Development Plan Tests

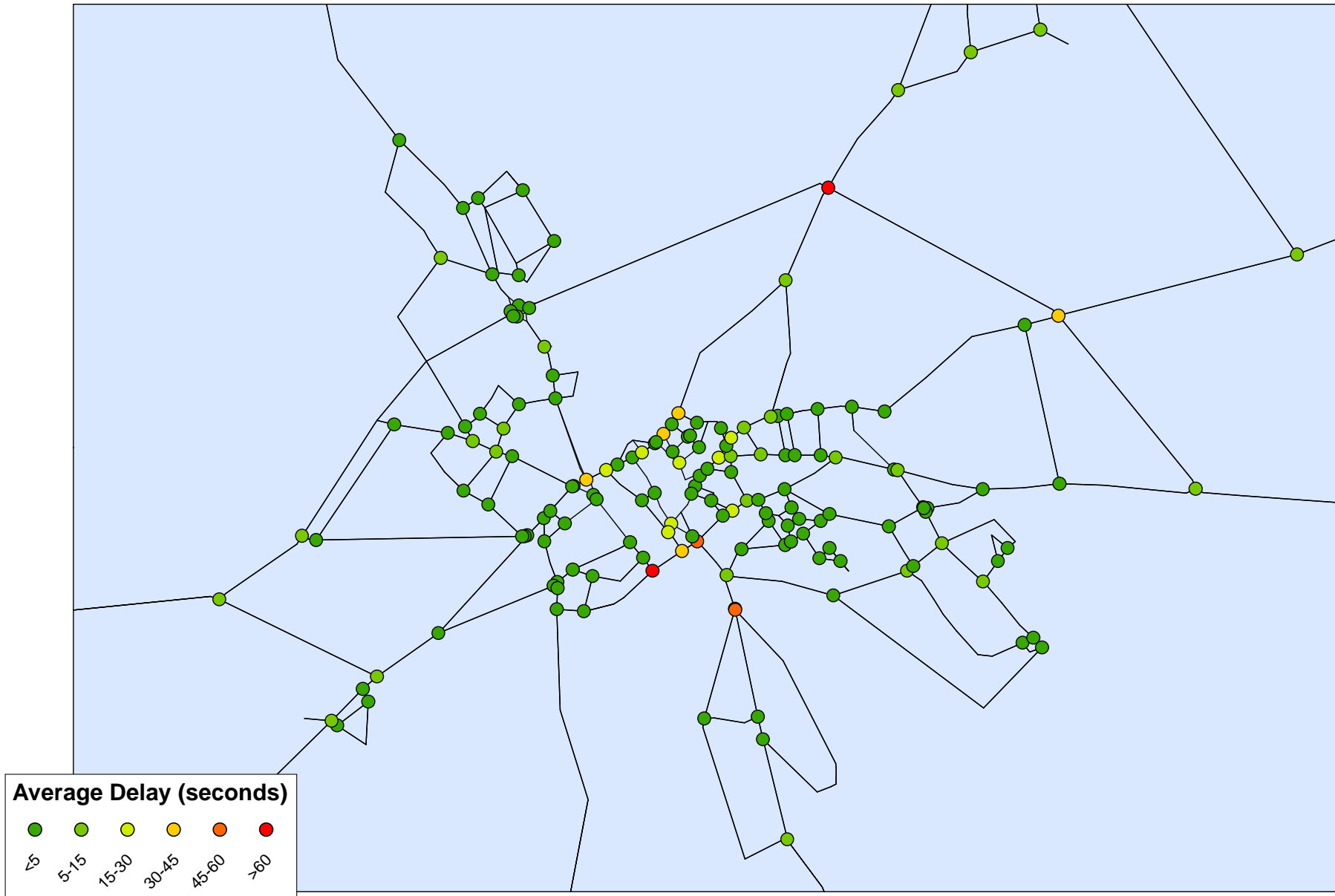
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Junction Delay
AM Peak Hour – LDP Option 1**

Project No.
101767

Figure
D.9

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Dumfries Regional Traffic Model Local Development Plan Tests

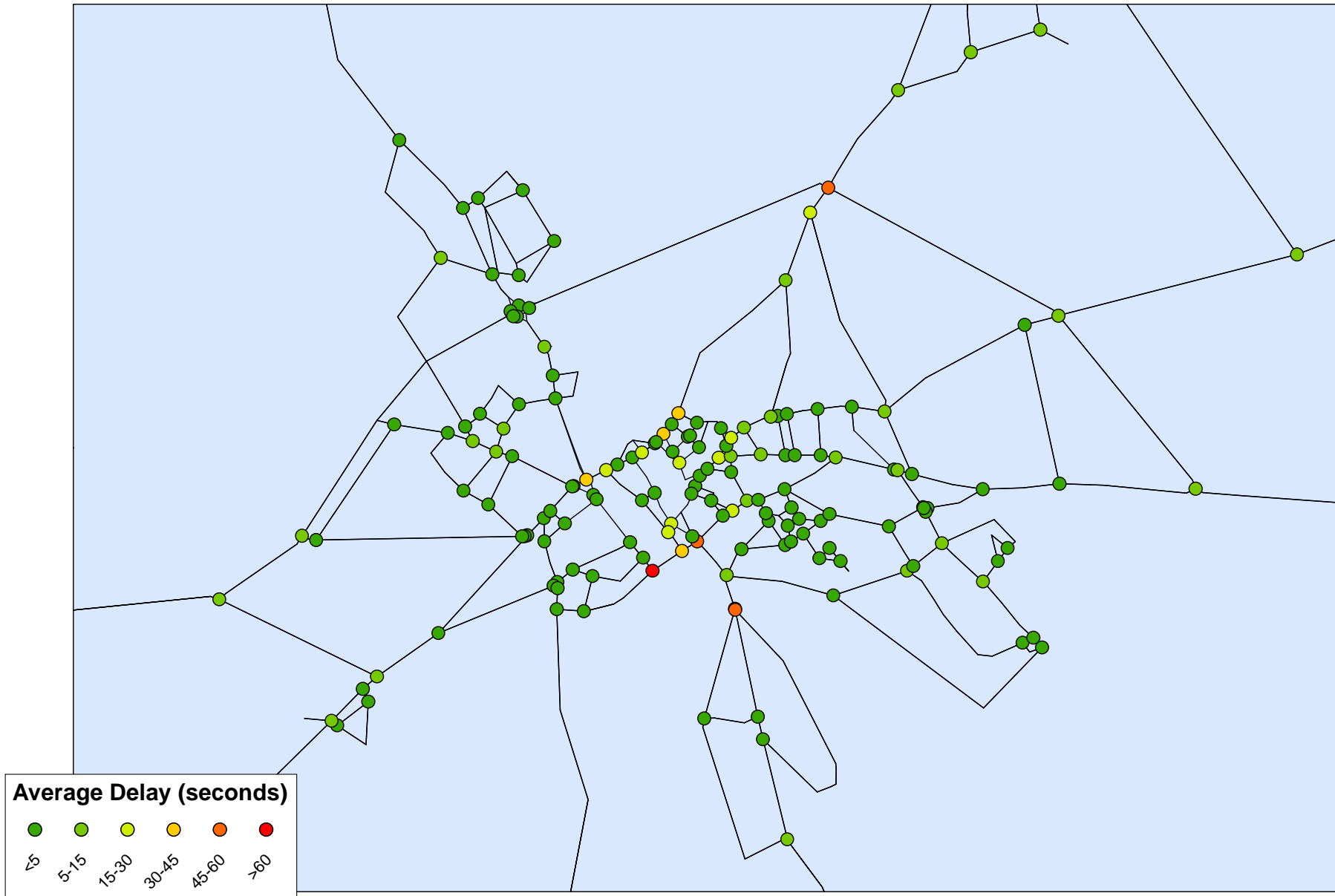
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Junction Delay
AM Peak Hour – LDP Option 2**

Project No.
101767

Figure
D.10

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Dumfries Regional Traffic Model Local Development Plan Tests

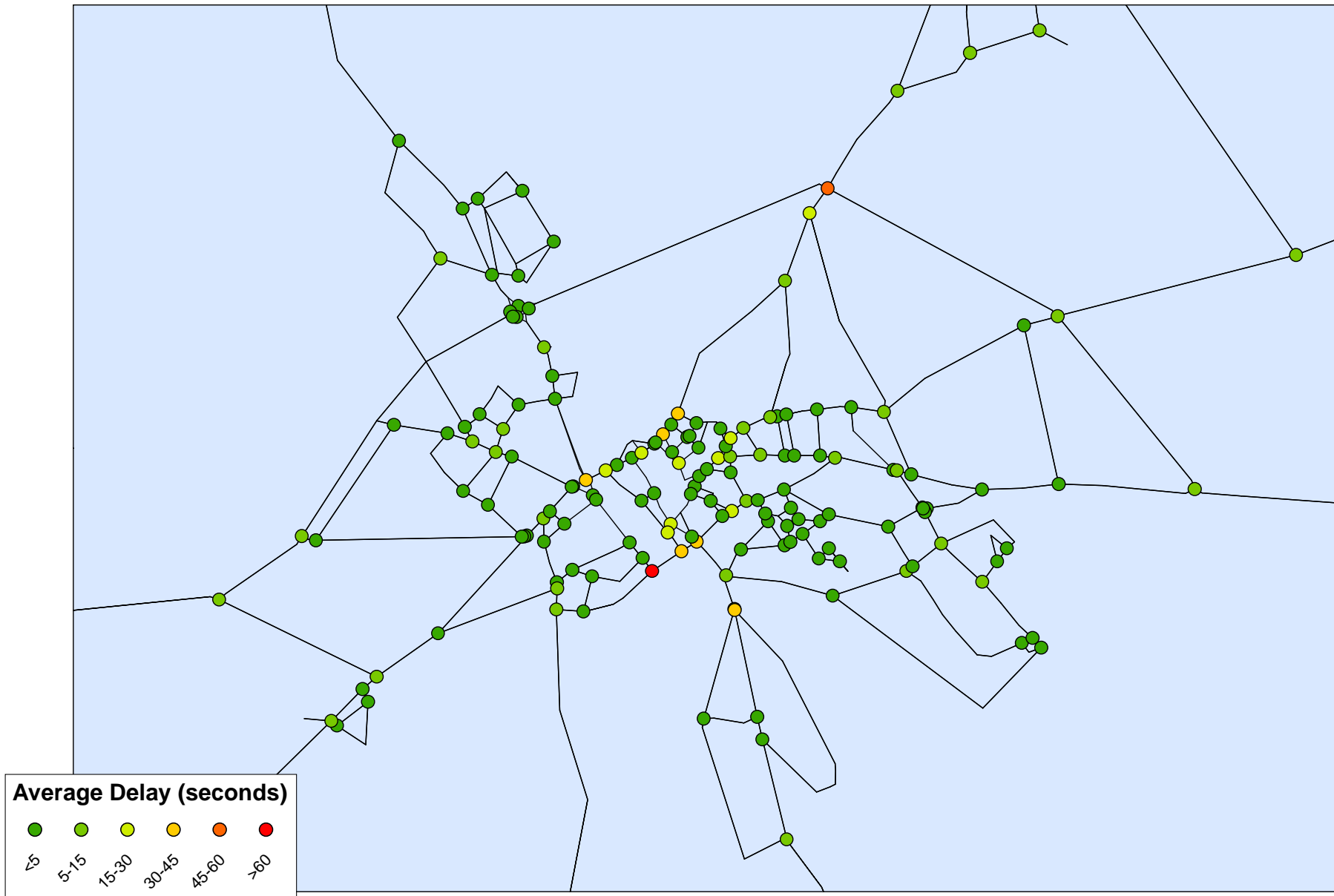
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Junction Delay
AM Peak Hour – LDP Option 3**

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101767

Figure
D.11

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Dumfries Regional Traffic Model Local Development Plan Tests

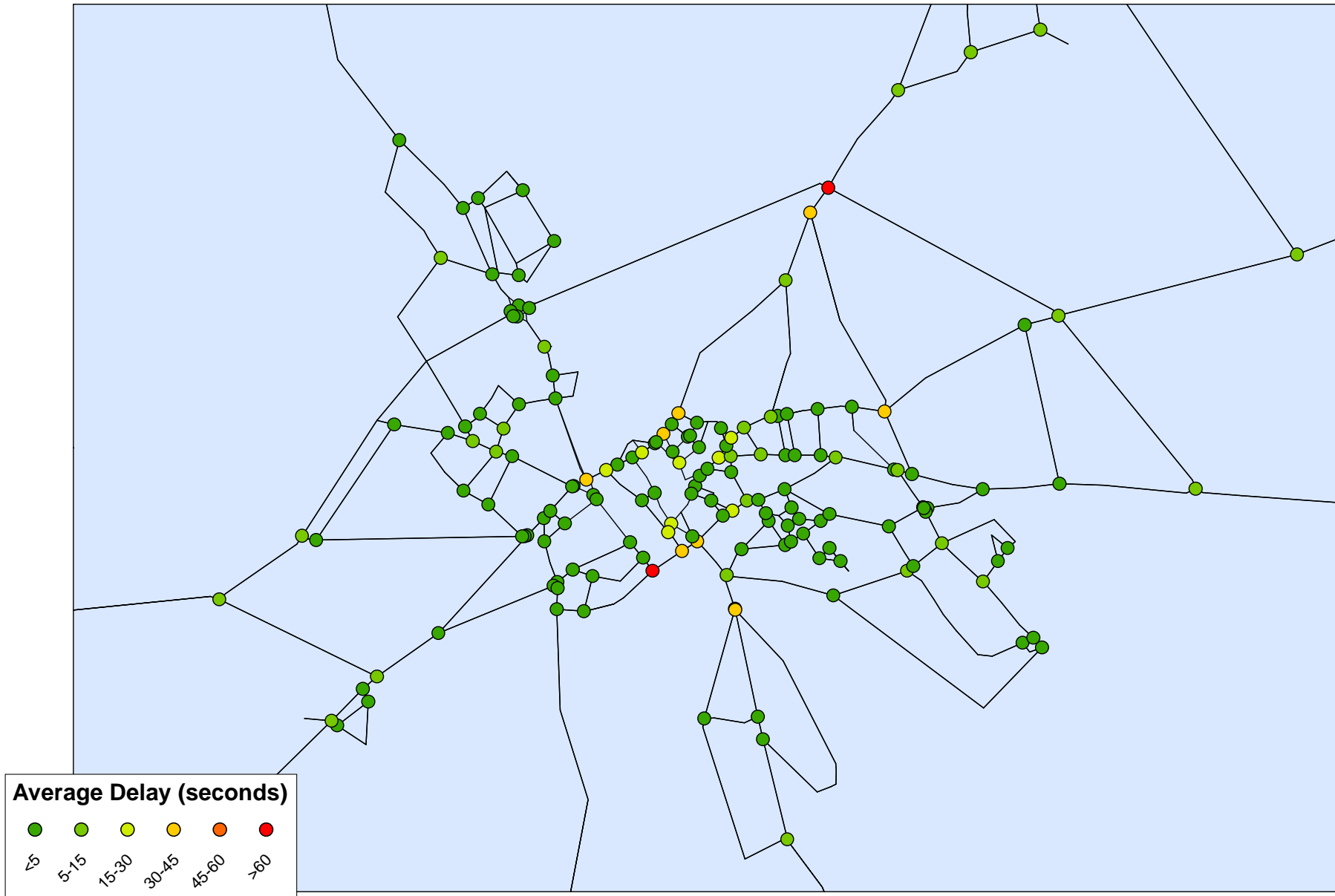
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Junction Delay
AM Peak Hour – LDP Option 4**

Project No.
101767

Figure
D.12

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Dumfries Regional Traffic Model Local Development Plan Tests

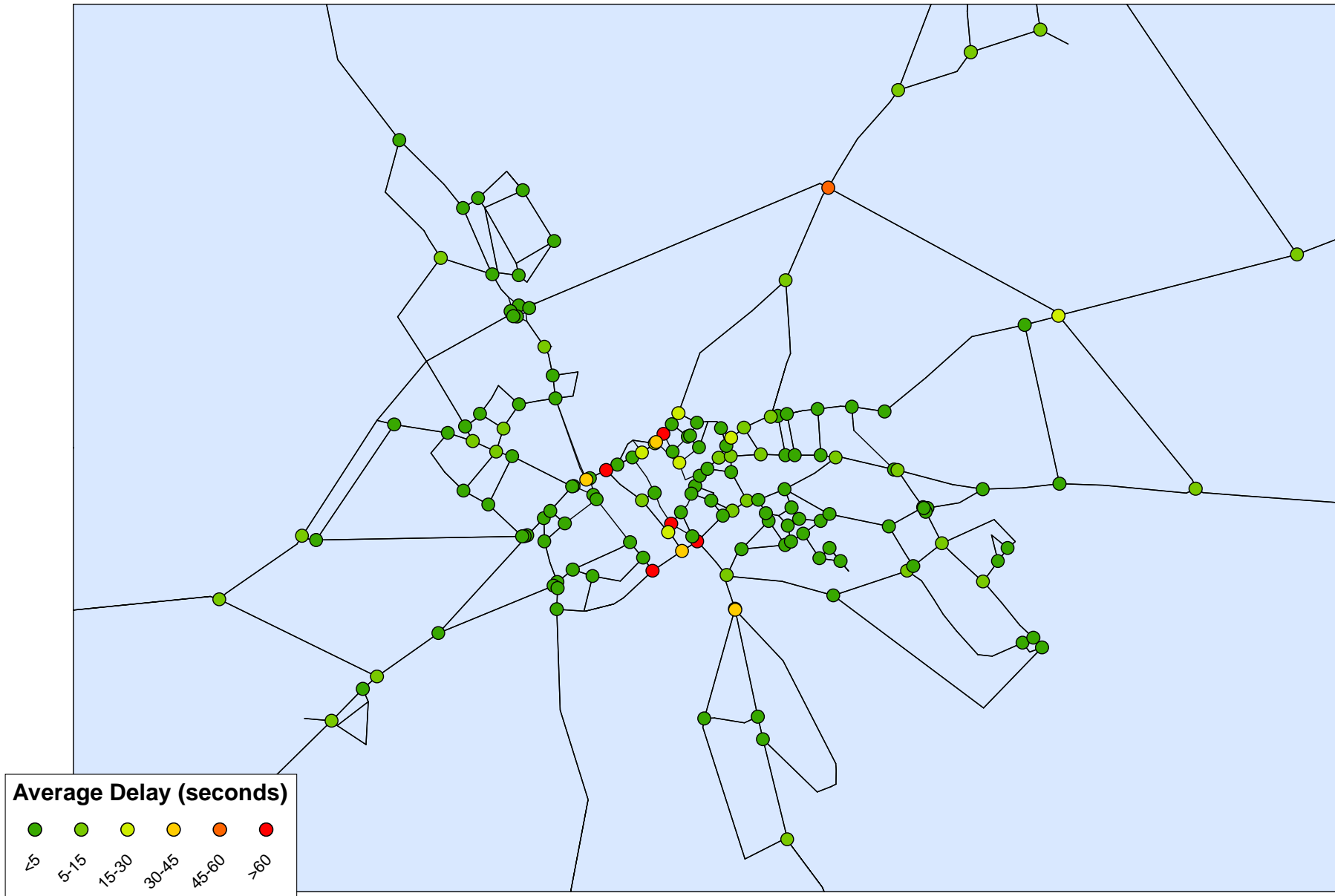
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Junction Delay
AM Peak Hour – LDP Option 5**

Project No.
101767

Figure
D.13

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Dumfries Regional Traffic Model Local Development Plan Tests

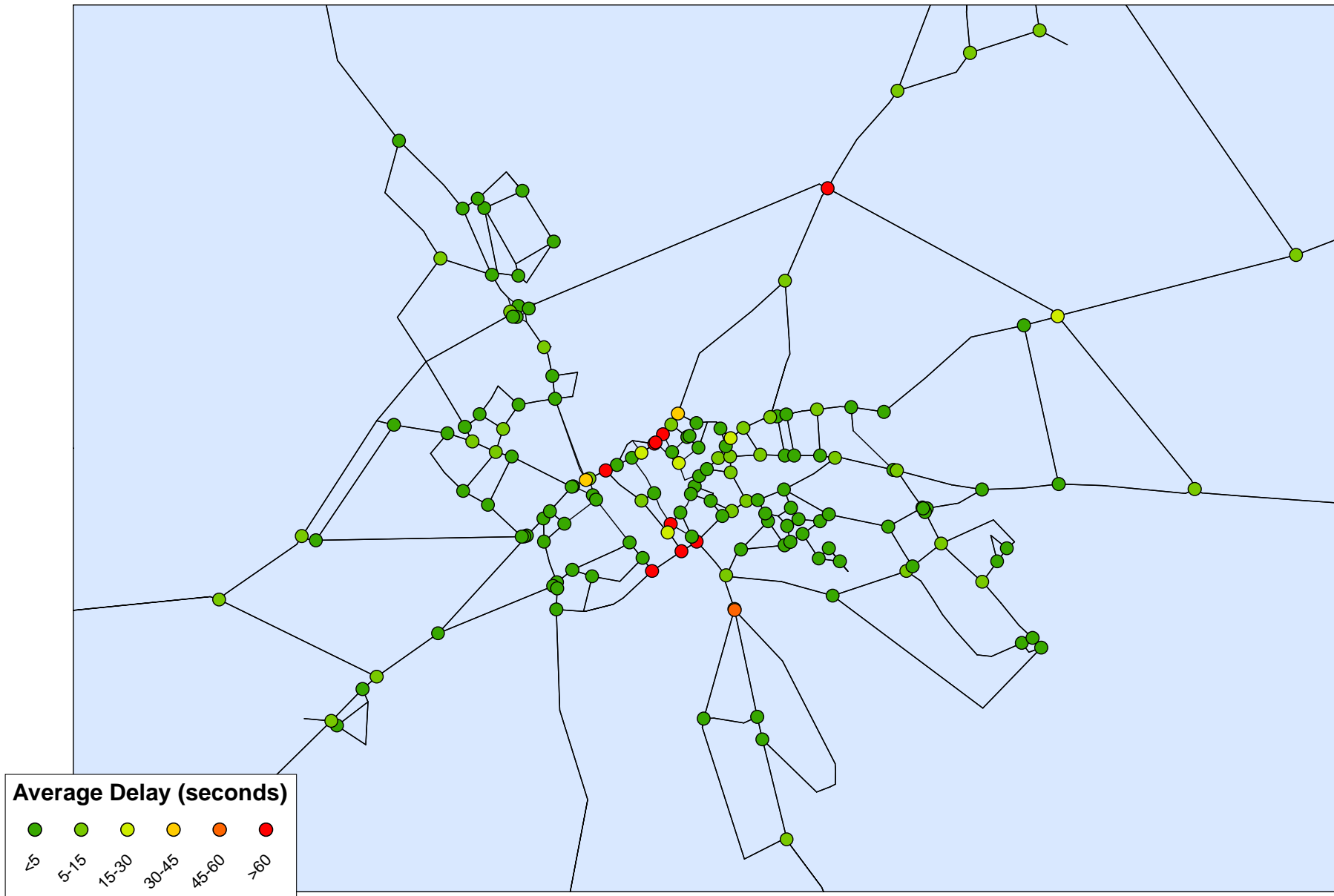
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Junction Delay
PM Peak Hour – LDP Option 1**

Project No.
101767

Figure
D.14

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Dumfries Regional Traffic Model Local Development Plan Tests

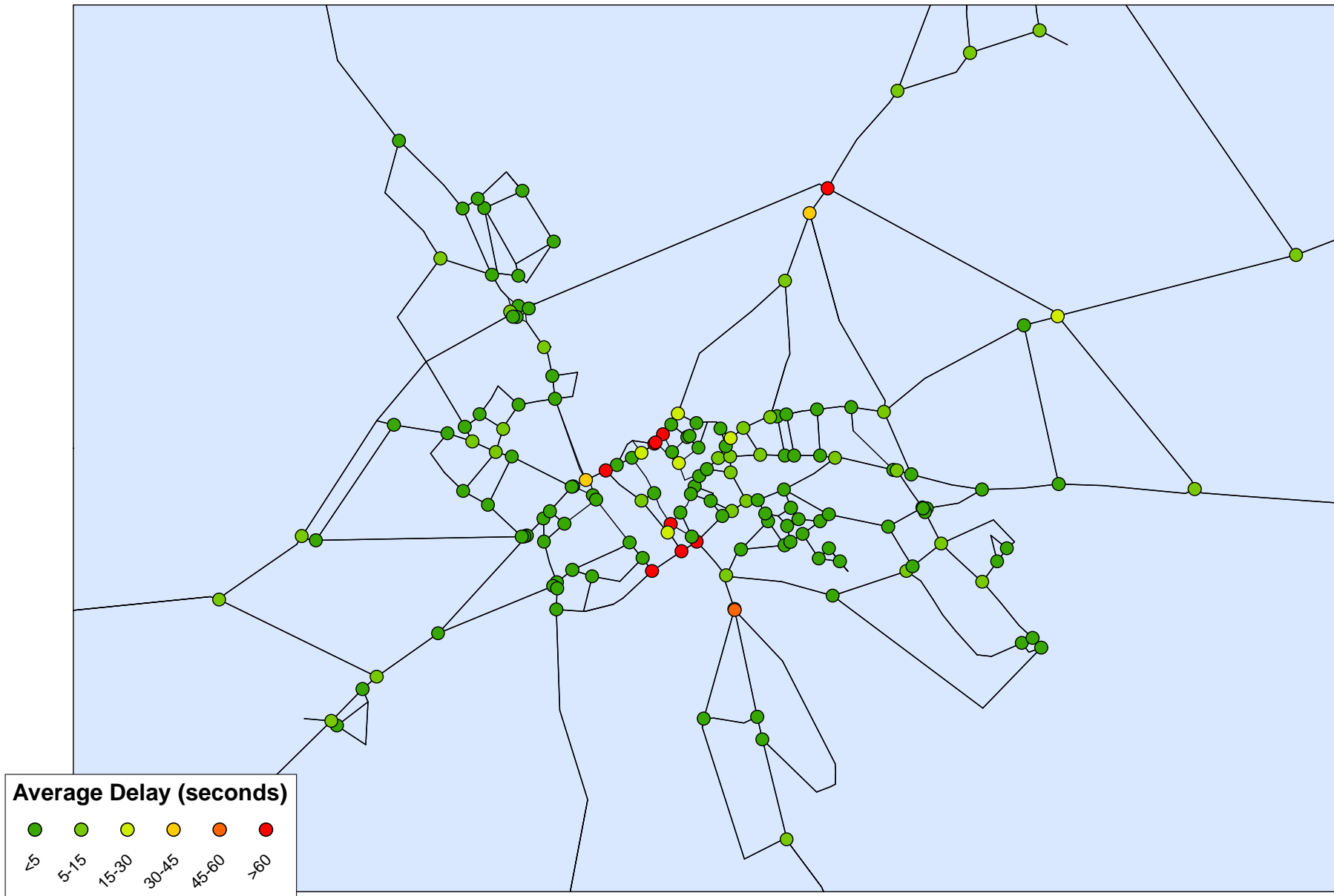
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Junction Delay
PM Peak Hour – LDP Option 2**

Project No.
101767

Figure
D.15

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Dumfries Regional Traffic Model Local Development Plan Tests

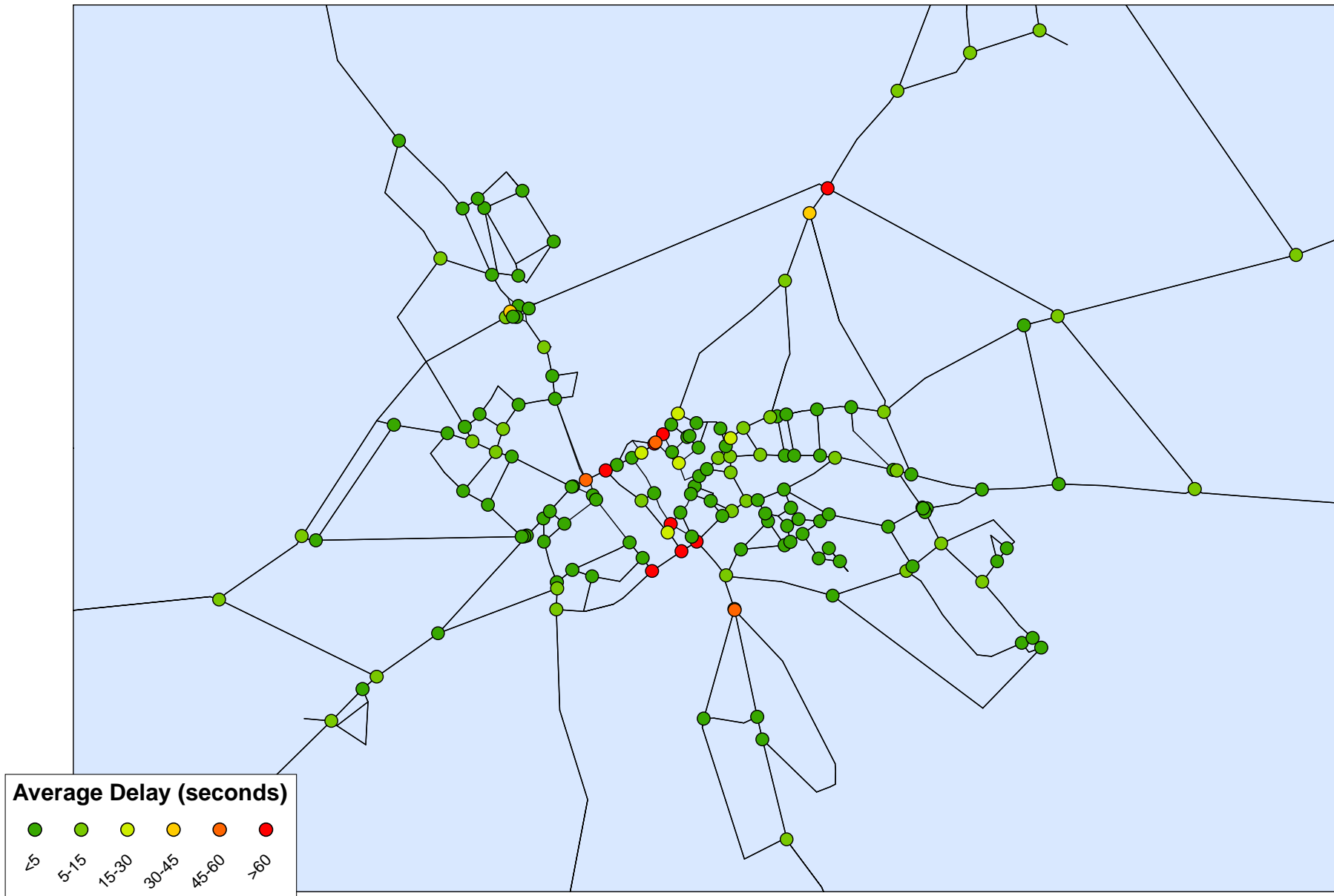
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Junction Delay
PM Peak Hour – LDP Option 3**

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Figure
D.16

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Dumfries Regional Traffic Model Local Development Plan Tests

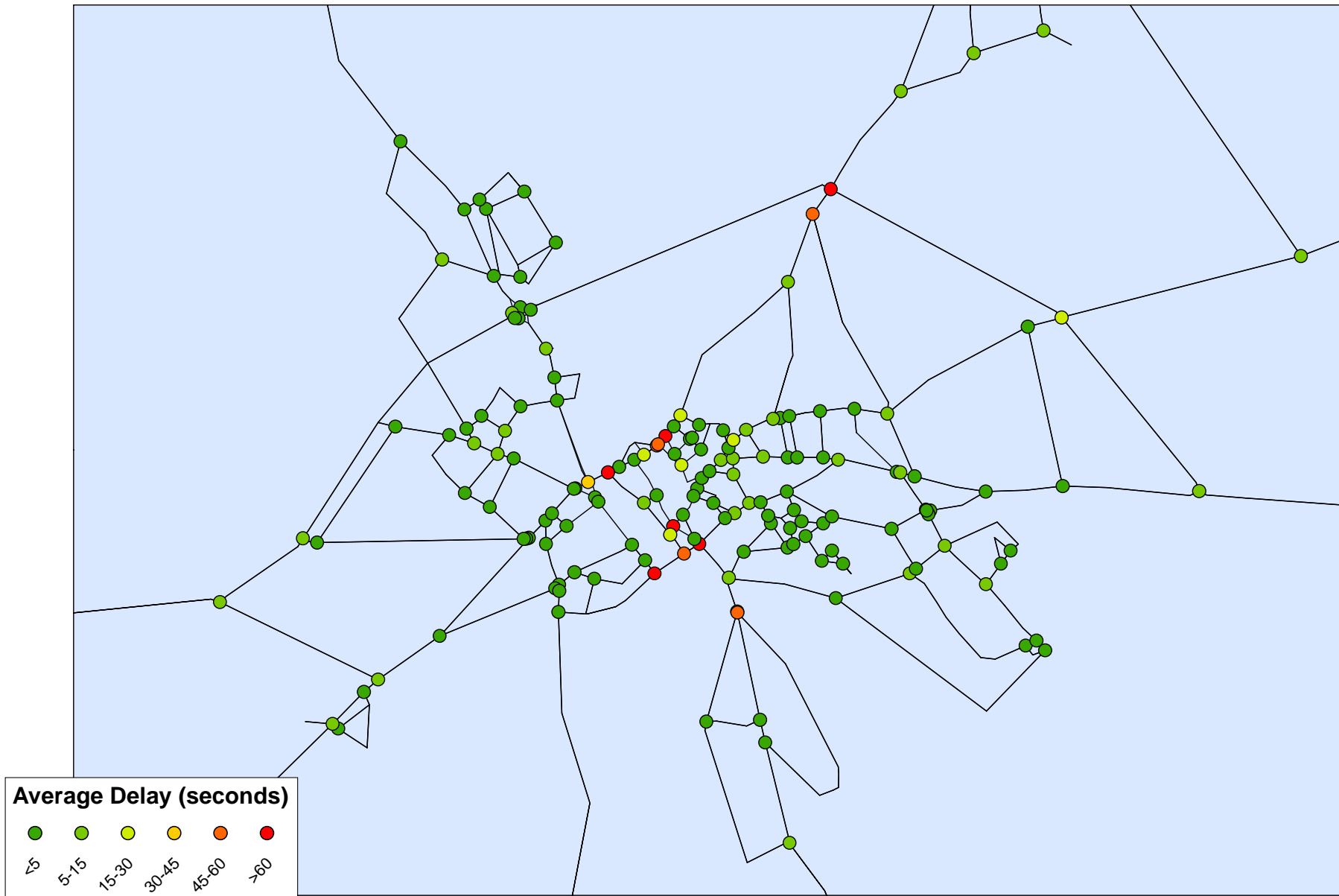
Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Junction Delay
PM Peak Hour – LDP Option 4**

Project No.
101767

Figure
D.17

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Dumfries Regional Traffic Model Local Development Plan Tests

Prepared for Dumfries and Galloway Council
October 2012

Title **DRTM Predicted Junction Delay
PM Peak Hour – LDP Option 5**

Project No.
101767

Figure
D.18

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Appendix E - Carbon Emissions

Table E.1 2018 Forecast Year Forecast Annual Carbon Emissions (tonnes)

Sector		LDP1 2018	LDP2 2018			LDP3 2023	Change	
		Option 1	Option 2	Change	Option 3	Change		
1	Town Centre	990	1,070	+80	+8%	1,030	+40	+4%
2	Town South East	2,890	3,090	+200	+7%	3,090	+200	+7%
3	Town South West	4,240	4,460	+220	+5%	4,420	+180	+4%
4	Town North West	2,280	2,420	+140	+6%	2,400	+120	+5%
5	Town North East	2,130	2,330	+200	+9%	2,350	+220	+10%
6	Heathhall and Locharbriggs	2,410	2,610	+200	+8%	2,570	+160	+7%
7	Lochside and Lincluden	2,150	2,290	+140	+7%	2,270	+120	+6%
8	Outer East	48,920	49,580	+660	+1%	50,120	+1,200	+2%
9	Outer North	45,790	47,160	+1,370	+3%	47,530	+1,740	+4%
10	Outer West	29,110	29,980	+870	+3%	30,000	+890	+3%
DRTM Area		140,910	144,990	+4,080	+3%	145,780	+4,870	+3%

Table E.2 2023 Forecast Year Forecast Annual Carbon Emissions (tonnes)

Sector		LDP3 2023	LDP4 2023			LDP5 2023	Change	
		Option 3	Option 4	Change	Option 5	Change		
1	Town Centre	1,030	1,010	-20	-2%	1,030	0	0%
2	Town South East	3,090	2,950	-140	-5%	2,970	-120	-4%
3	Town South West	4,420	4,590	+170	+4%	4,440	+20	+0%
4	Town North West	2,400	2,440	+40	+2%	2,400	0	0%
5	Town North East	2,350	2,210	-140	-6%	2,430	+80	+3%
6	Heathhall and Locharbriggs	2,570	2,570	0	0%	2,690	+120	+5%
7	Lochside and Lincluden	2,270	2,270	0	0%	2,250	-20	-1%
8	Outer East	50,120	50,210	+90	+0%	50,290	+170	+0%
9	Outer North	47,530	47,340	-190	-0%	47,460	-70	-0%
10	Outer West	30,000	30,290	+290	+1%	30,160	+160	+1%
DRTM Area		145,780	145,880	+100	+0%	146,120	+340	+0%

Appendix F - Option 6 DRTM Outputs

Trip Origins and Destinations

Table F.1 2023 Forecast Year AM Peak Hour Trip Origins (Vehicles)

Sector		LDP4 2023 Option 6	LDP6A 2023		
			Option 6A	Change	
1	Town Centre	450	450	0	0%
2	Town South East	2,900	2,770	-130	-4%
3	Town South West	1,260	1,410	+150	+12%
4	Town North West	890	900	+10	+1%
5	Town North East	1,440	1,440	0	0%
6	Heathhall and Locharbriggs	1,270	1,280	+10	+1%
7	Lochside and Lincluden	1,060	1,070	+10	+1%
8	Outer East	5,880	5,900	+20	+0%
9	Outer North	3,840	3,850	+10	+0%
10	Outer West	6,620	6,620	0	0%
DRTM Total		25,610	25,690	+80	+0%

Table F.2 2023 Forecast Year PM Peak Hour Trip Origins (Vehicles)

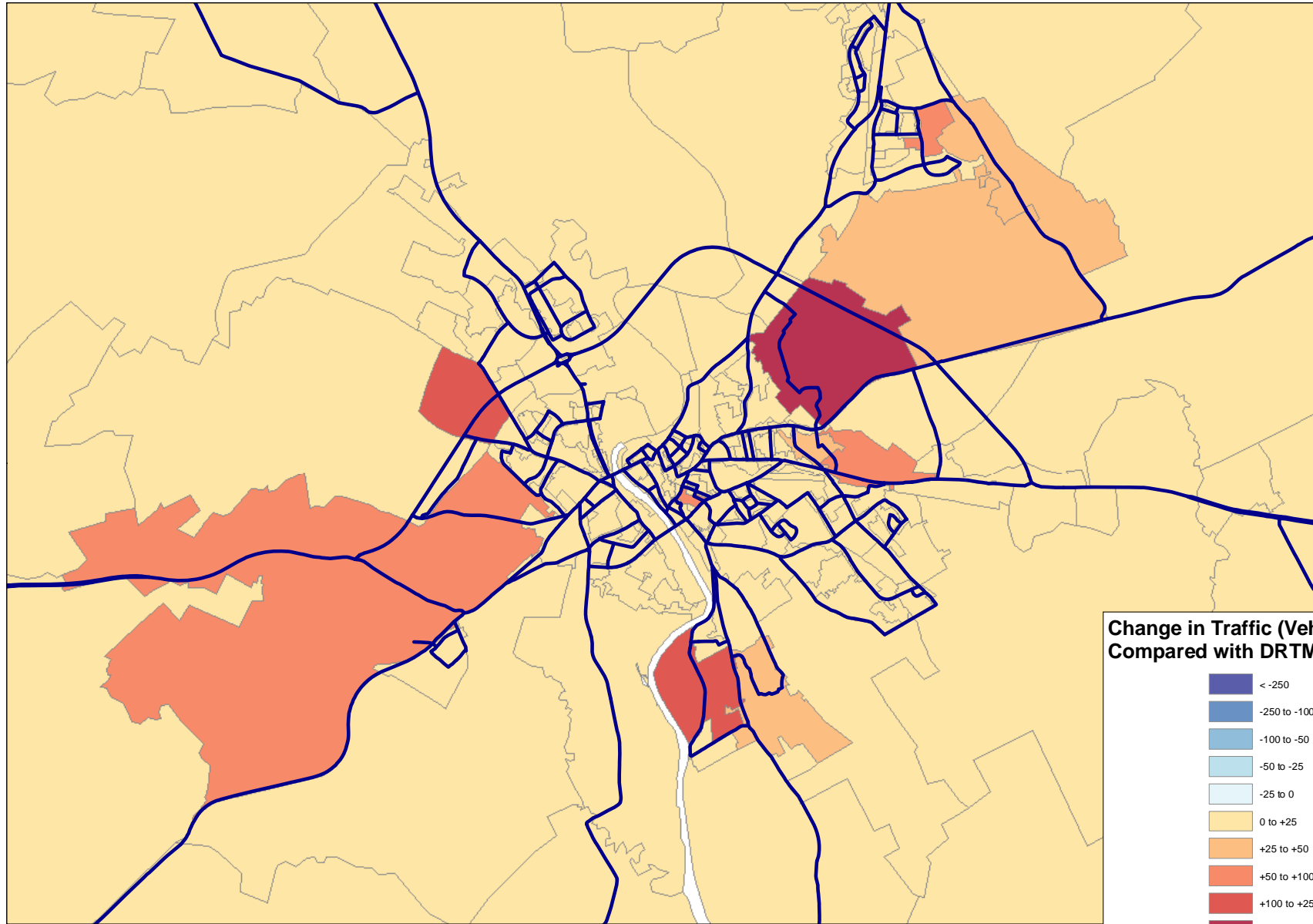
Sector		LDP4 2023 Option 6	LDP6A 2023		
			Option 6A	Change	
1	Town Centre	2,230	2,230	0	0%
2	Town South East	2,990	2,690	-300	-10%
3	Town South West	980	1,510	+530	+54%
4	Town North West	1,060	1,050	-10	-1%
5	Town North East	1,760	1,770	+10	+1%
6	Heathhall and Locharbriggs	1,120	1,120	0	0%
7	Lochside and Lincluden	1,000	1,010	+10	+1%
8	Outer East	4,540	4,560	+20	+0%
9	Outer North	3,500	3,520	+20	+1%
10	Outer West	3,560	3,590	+30	+1%
DRTM Total		22,740	23,050	+310	+1%

Table F.3 2023 Forecast Year AM Peak Hour Trip Destinations (Vehicles)

Sector		LDP4 2023 Option 6	LDP6A 2023		
			Option 6A	Change	
1	Town Centre	450	450	0	0%
2	Town South East	2,900	2,770	-130	-4%
3	Town South West	1,260	1,410	+150	+12%
4	Town North West	890	900	+10	+1%
5	Town North East	1,440	1,440	0	0%
6	Heathhall and Locharbriggs	1,270	1,280	+10	+1%
7	Lochside and Lincluden	1,060	1,070	+10	+1%
8	Outer East	5,880	5,900	+20	+0%
9	Outer North	3,840	3,850	+10	+0%
10	Outer West	6,620	6,620	0	0%
DRTM Total		25,610	25,690	+80	+0%

Table F.4 2023 Forecast Year PM Peak Hour Trip Destinations (Vehicles)

Sector		LDP4 2023 Option 6	LDP6A 2023		
			Option 6A	Change	
1	Town Centre	2,230	2,230	0	0%
2	Town South East	2,990	2,690	-300	-10%
3	Town South West	980	1,510	+530	+54%
4	Town North West	1,060	1,050	-10	-1%
5	Town North East	1,760	1,770	+10	+1%
6	Heathhall and Locharbriggs	1,120	1,120	0	0%
7	Lochside and Lincluden	1,000	1,010	+10	+1%
8	Outer East	4,540	4,560	+20	+0%
9	Outer North	3,500	3,520	+20	+1%
10	Outer West	3,560	3,590	+30	+1%
DRTM Total		22,740	23,050	+310	+1%



**Dumfries Regional Traffic Model
Local Development Plan Tests**

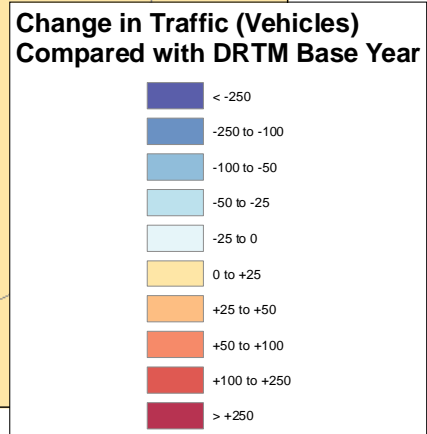
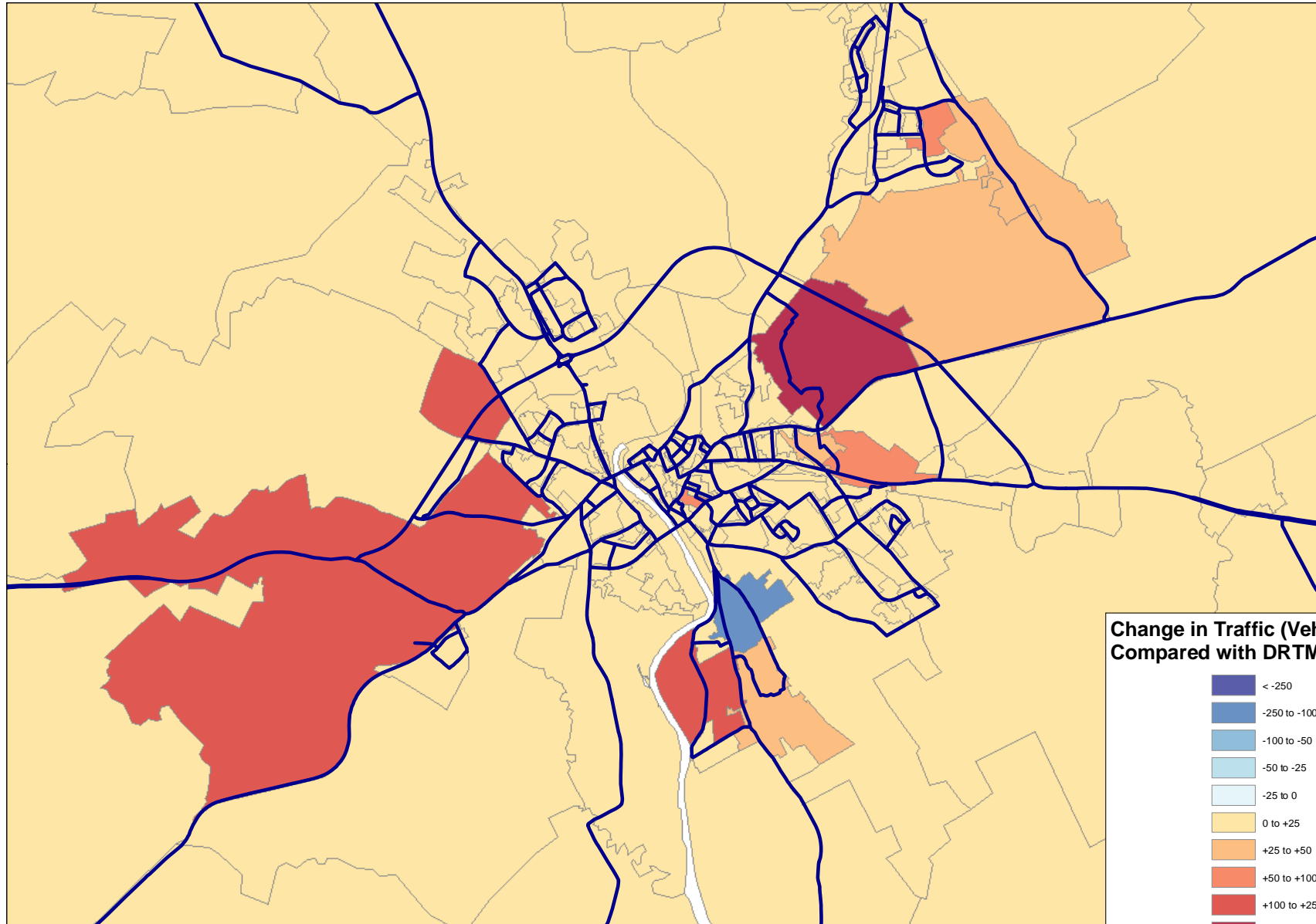
Prepared for Dumfries and Galloway Council
December 2012

Title **DRTM Forecast Change in Trip Origins
AM Peak Hour – LDP Option 6**

Project No.
101767

Figure
F.1

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

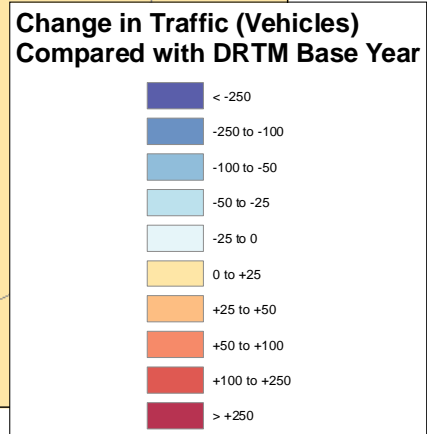
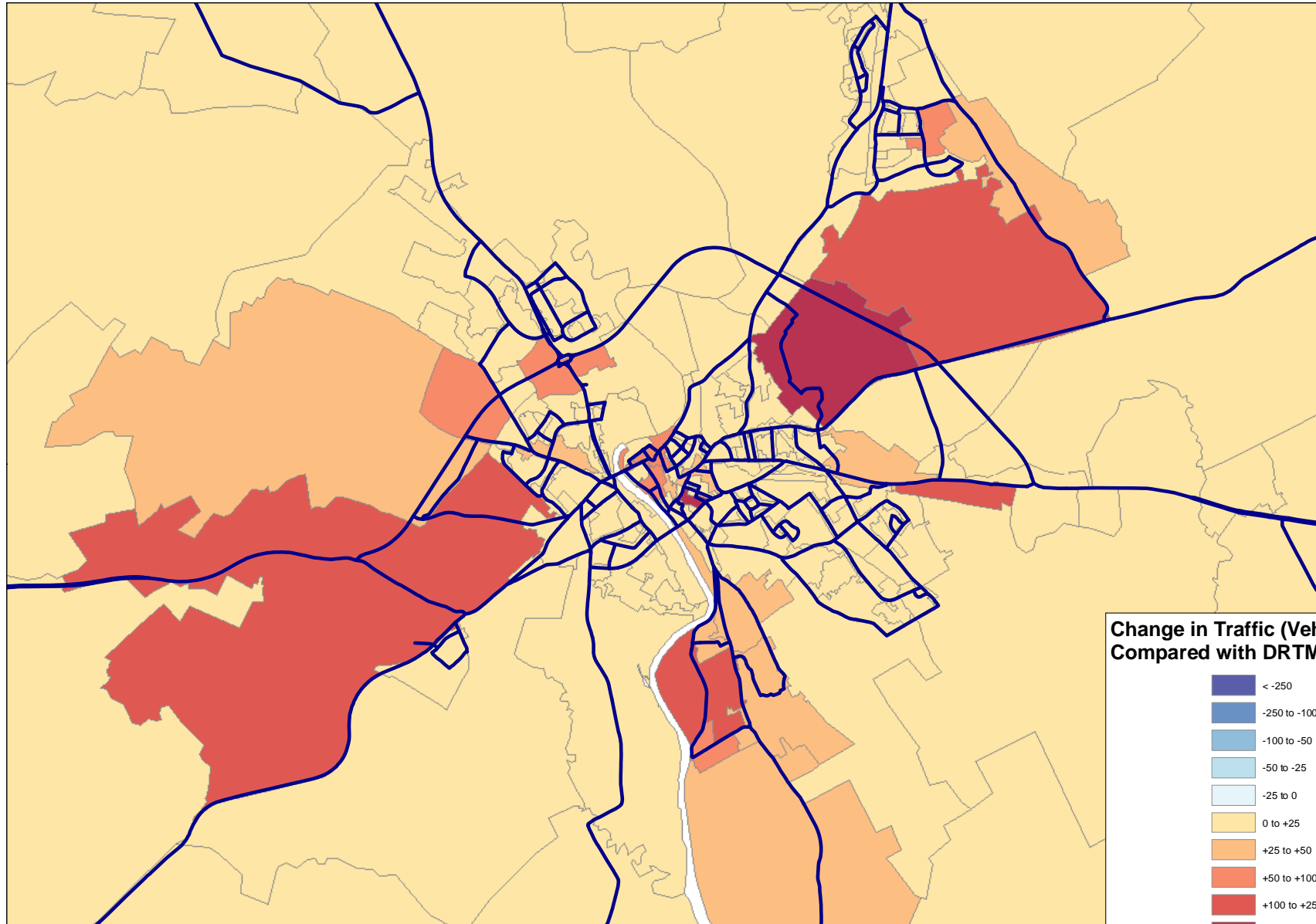
Prepared for Dumfries and Galloway Council
December 2012

Title **DRTM Forecast Change in Trip Origins
AM Peak Hour – LDP Option 6A**

Project No.
101767

Figure
F.2

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

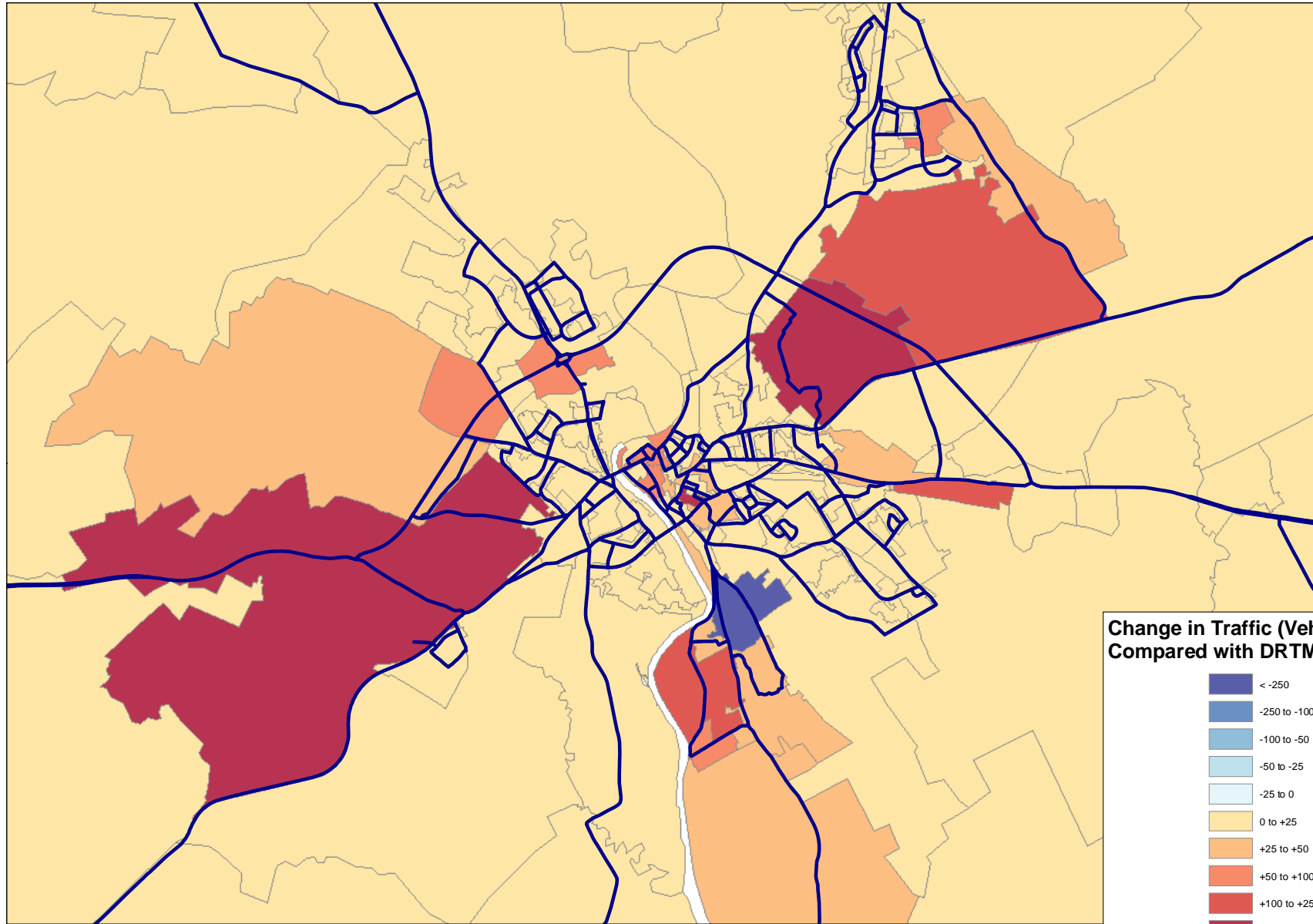
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December 2012

Title **DRTM Forecast Change in Trip Origins
PM Peak Hour – LDP Option 6**

Project No.
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**Dumfries Regional Traffic Model
Local Development Plan Tests**

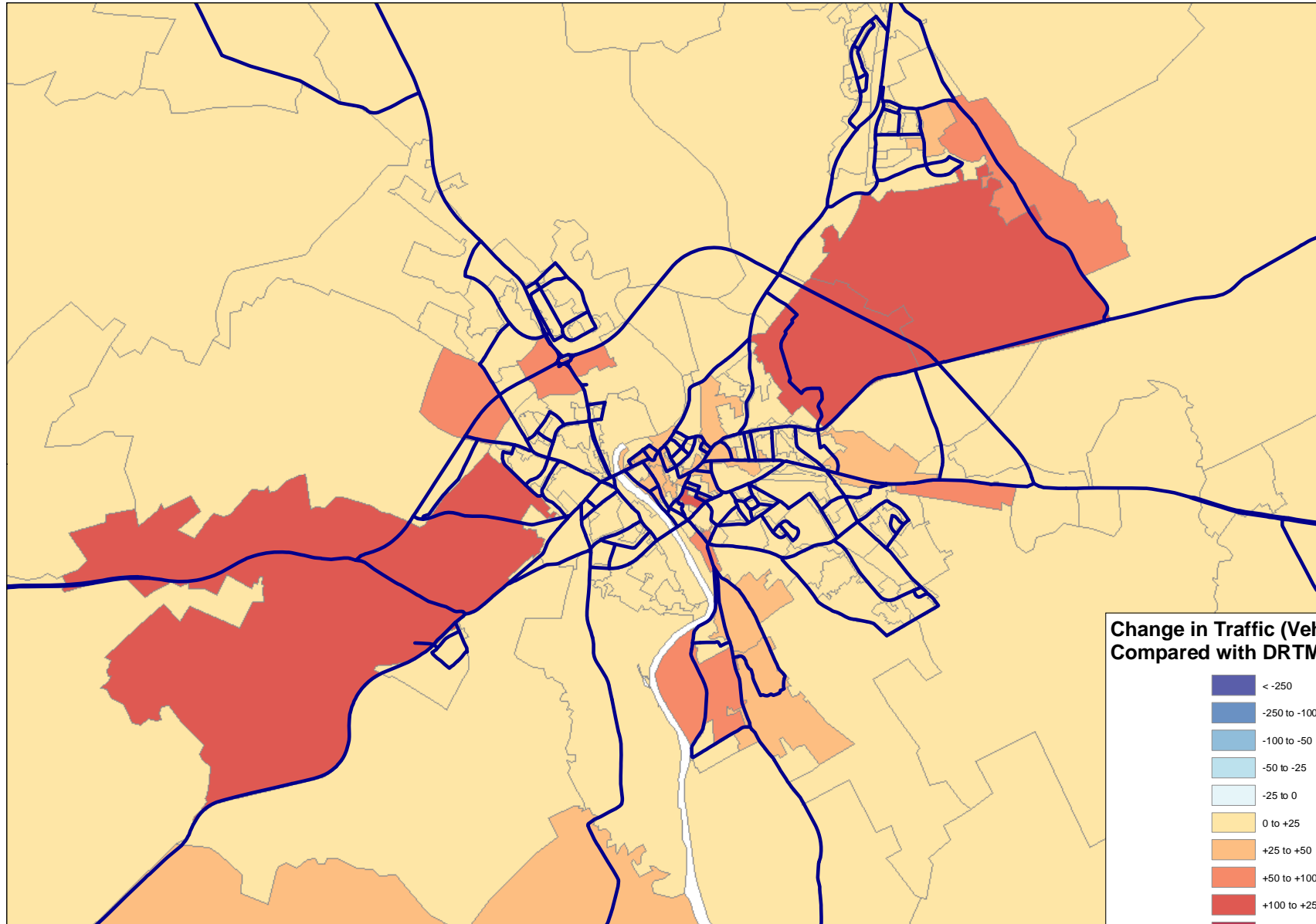
Prepared for Dumfries and Galloway Council
December 2012

Title **DRTM Forecast Change in Trip Origins
PM Peak Hour – LDP Option 6A**

Project No.
101767

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F.4

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Dumfries Regional Traffic Model Local Development Plan Tests

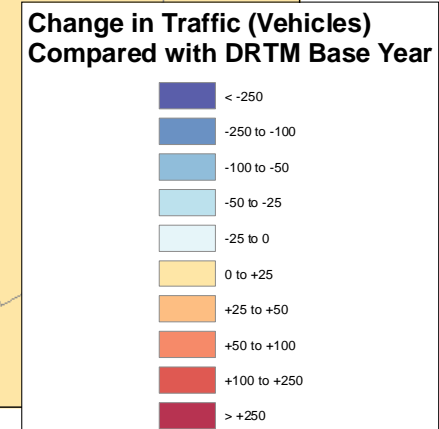
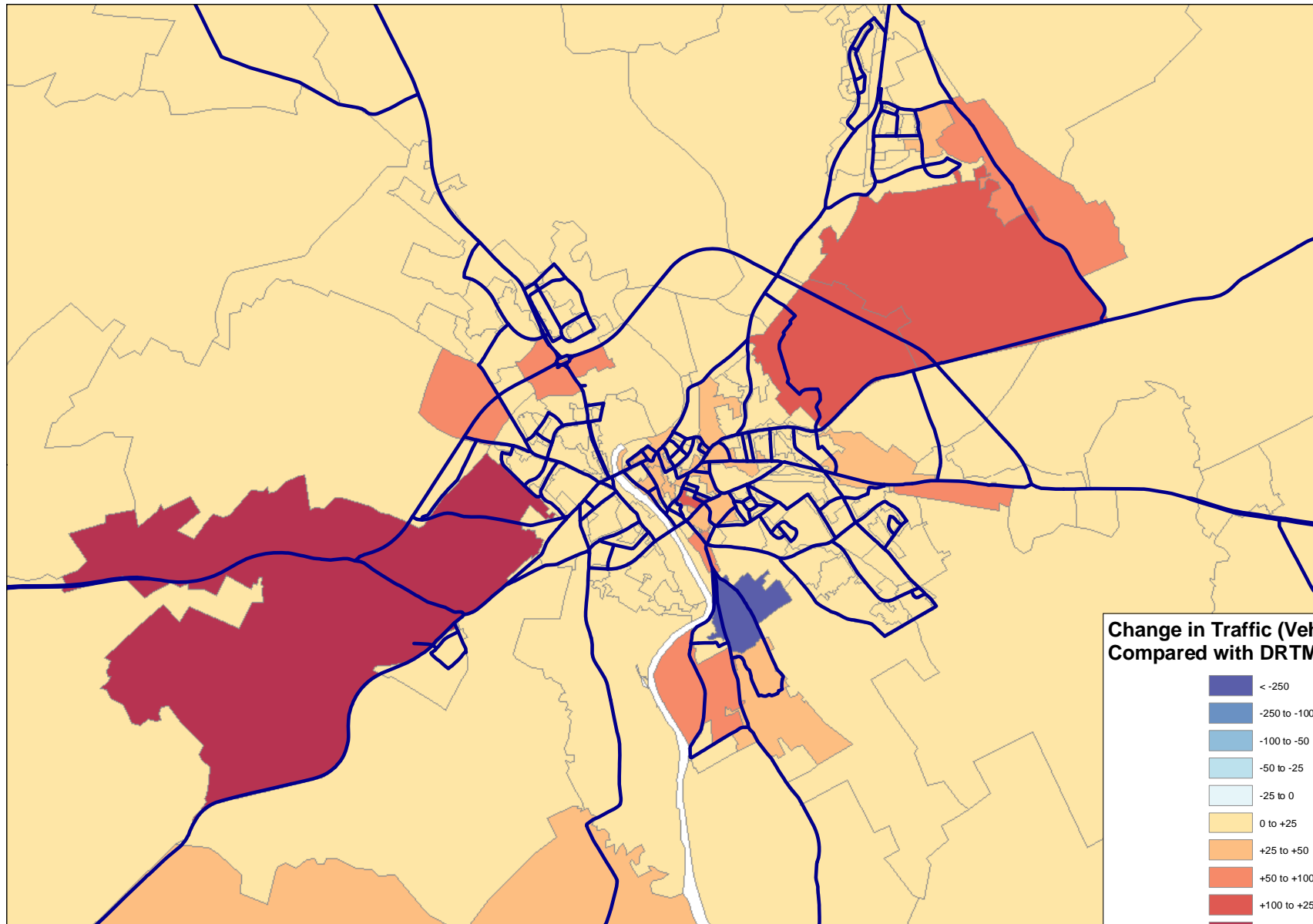
Prepared for Dumfries and Galloway Council
December 2012

Title **DRTM Forecast Change in Trip Destinations
AM Peak Hour – LDP Option 6**

Project No.
101767

Figure
F.5

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

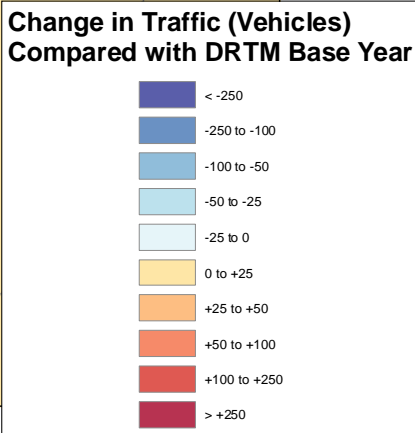
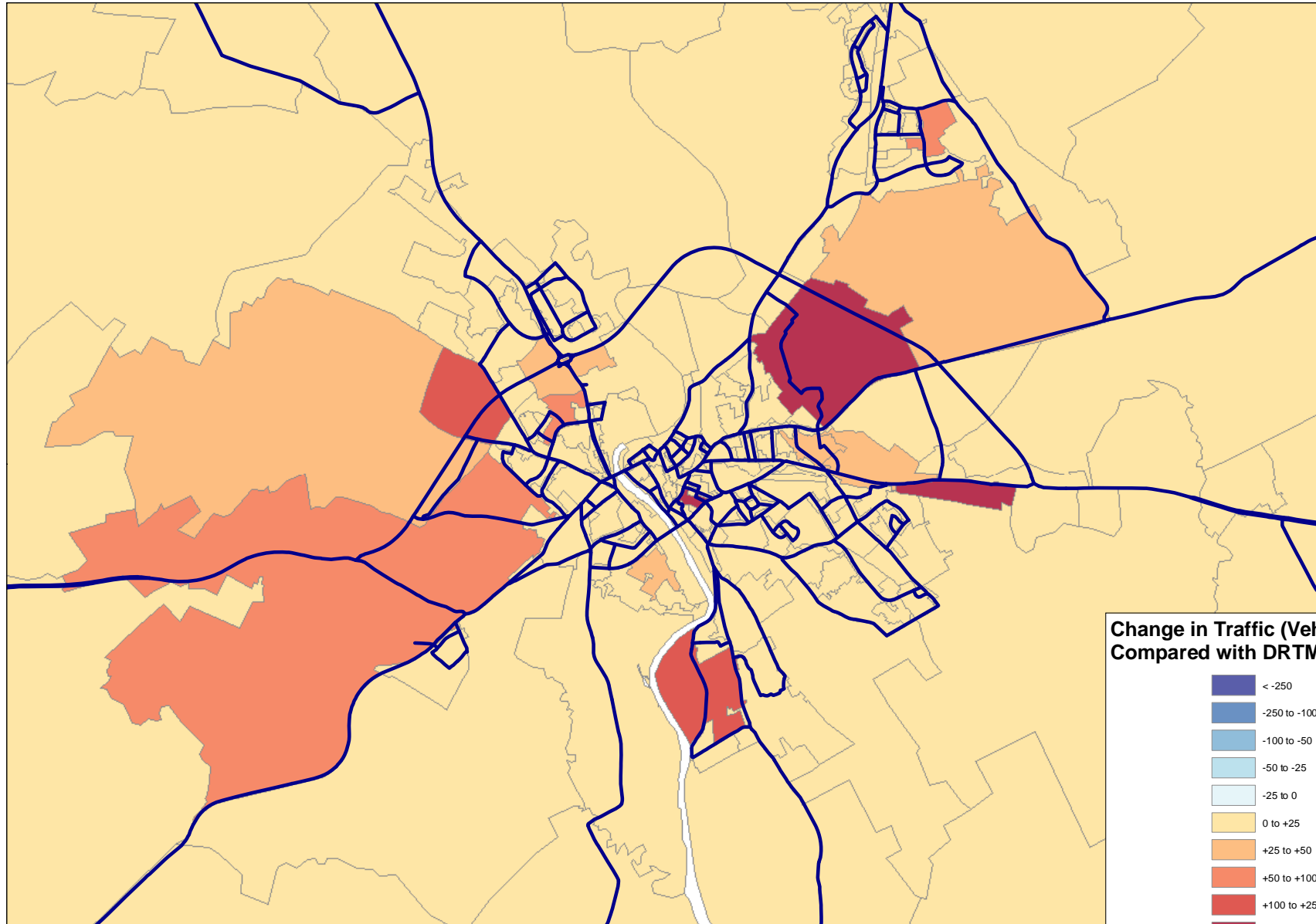
Prepared for Dumfries and Galloway Council
December 2012

Title **DRTM Forecast Change in Trip Destinations
AM Peak Hour – LDP Option 6A**

Project No.
101767

Figure
F.6

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

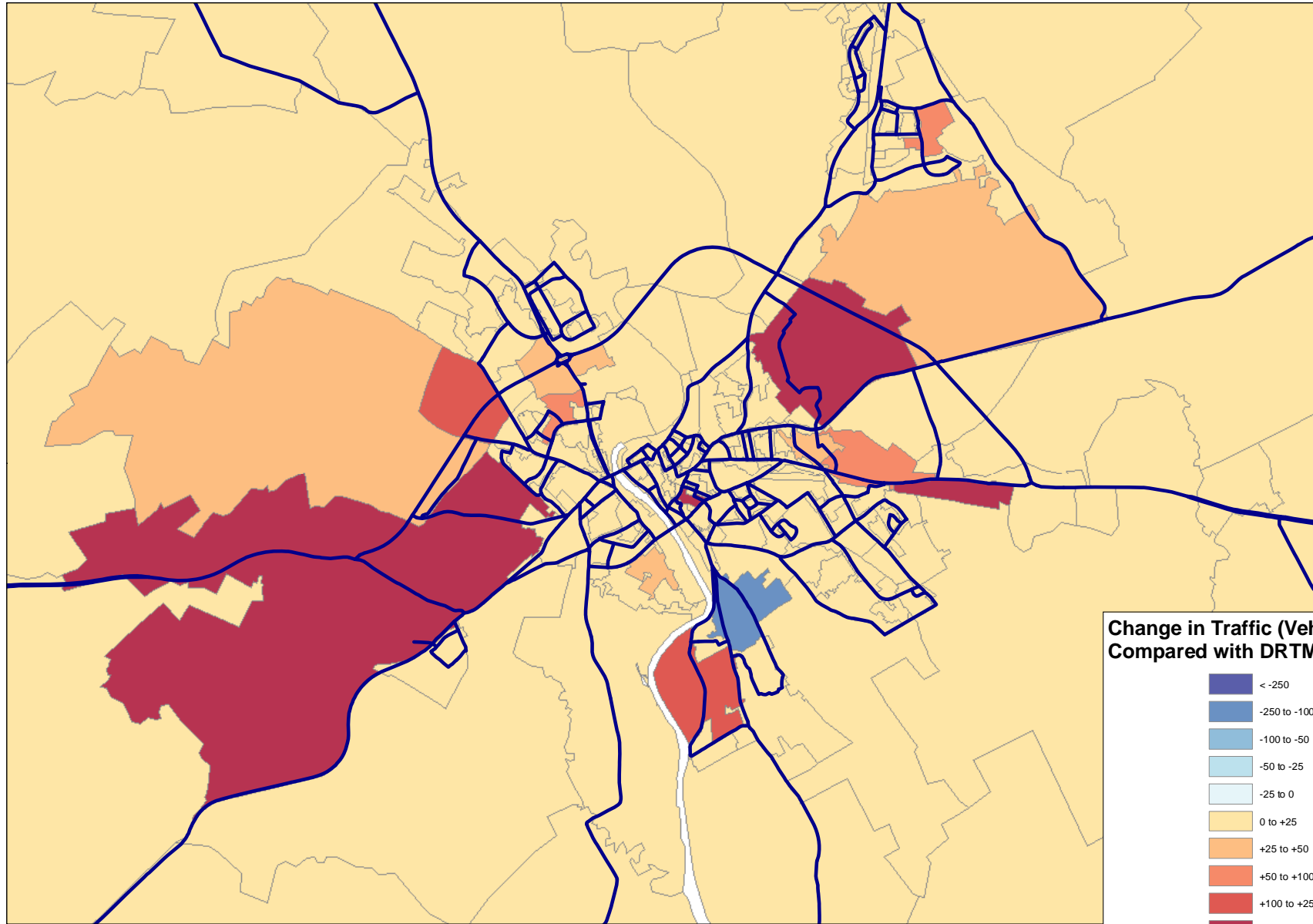
Prepared for Dumfries and Galloway Council
December 2012

Title **DRTM Forecast Change in Trip Destinations
PM Peak Hour – LDP Option 6**

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F.7

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

Prepared for Dumfries and Galloway Council
December 2012

Title **DRTM Forecast Change in Trip Destinations
PM Peak Hour – LDP Option 6A**

Project No.
101767

Figure
F.8

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Travel Demand on Network

Table F.5 2023 Forecast Year AM Peak Hour Total Vehicle Flows at Key Locations

ID	Road	Dir.	Location	LDP6 2023	LDP6A	Change	
				Option 6	Option 6A		
1A	New Bridge	EB	West of Whitesands	1,020	1,040	+20	+2%
1B	New Bridge	WB	West of Whitesands	760	850	+90	+12%
2A	A756 St Micheal's Bridge Road	EB	West of Dockhead	880	770	-110	-13%
2B	A756 St Micheal's Bridge Road	WB	West of Dockhead	500	500	0	0%
3A	B725 St Micheal's Street	SB	South of St Michael's Bridge Road	1,040	870	-170	-16%
3B	B725 St Micheal's Street	NB	South of St Michael's Bridge Road	530	510	-20	-4%
4A	A75	EB	West of Garroch Roundabout	880	880	0	0%
4B	A75	WB	West of Garroch Roundabout	450	450	0	0%
5A	A75 Dumfries Bypass	EB	Between Garroch Roundabout and A780	970	1,040	+70	+7%
5B	A75 Dumfries Bypass	WB	Between Garroch Roundabout and A780	710	1,080	+370	+52%
6A	A75 Dumfries Bypass	EB	Between A780 and A76	660	720	+60	+9%
6B	A75 Dumfries Bypass	WB	Between A780 and A76	590	760	+170	+29%
7A	A75 Dumfries Bypass	EB	Between A76 and A701	1,310	1,320	+10	+1%
7B	A75 Dumfries Bypass	WB	Between A76 and A701	1,110	1,190	+80	+7%
8A	A75 Dumfries Bypass	EB	Between A701 and A709	500	520	+20	+4%
8B	A75 Dumfries Bypass	WB	Between A701 and A709	570	620	+50	+9%
9A	A75 Dumfries Bypass	EB	Between A709 and A780	500	510	+10	+2%
9B	A75 Dumfries Bypass	WB	Between A709 and A780	470	530	+60	+13%
10A	A75	EB	East of A780 Roundabout (e)	540	550	+10	+2%
10B	A75	WB	East of A780 Roundabout (e)	790	810	+20	+3%
11A	A76 Glasgow Road	SB	North of A75 Bypass	1,160	1,170	+10	+1%
11B	A76 Glasgow Road	NB	North of A75 Bypass	970	970	0	0%
12A	A701	SB	North of A75 Bypass	970	990	+20	+2%
12B	A701	NB	North of A75 Bypass	740	730	-10	-1%
13A	A709	SB	North of A75 Bypass	890	890	0	0%
13B	A709	NB	North of A75 Bypass	460	480	+20	+4%
14A	A711 Dalbeattie Road	NB	South of Park Road	280	250	-30	-11%
14B	A711 Dalbeattie Road	SB	South of Park Road	310	270	-40	-13%
15A	A780 Castle Douglas Road	EB	East of A75 Bypass	430	390	-40	-9%
15B	A780 Castle Douglas Road	WB	East of A75 Bypass	240	390	+150	+63%
16A	A76 Glasgow Road	SB	South of A75 Bypass	650	630	-20	-3%
16B	A76 Glasgow Road	NB	South of A75 Bypass	840	850	+10	+1%
17A	A701 Edinburgh Road	SB	South of A75 Bypass	1,030	980	-50	-5%
17B	A701 Edinburgh Road	NB	South of A75 Bypass	570	560	-10	-2%
18A	A709 Lockerbie Road	SB	South of A75 Bypass	820	790	-30	-4%
18B	A709 Lockerbie Road	NB	South of A75 Bypass	500	450	-50	-10%
19A	A780 Annan Road	WB	West of A75	590	550	-40	-7%
19B	A780 Annan Road	EB	West of A75	310	300	-10	-3%

Table F.6 2023 Forecast Year PM Peak Hour Total Vehicle Flows at Key Locations

ID	Road	Dir.	Location	LDP6 2023	LDP6A	Change	
				Option 6	2023 Option 6A		
1A	New Bridge	EB	West of Whitesands	870	890	+20	+2%
1B	New Bridge	WB	West of Whitesands	1,200	1,200	0	0%
2A	A756 St Micheal's Bridge Road	EB	West of Dockhead	480	520	+40	+8%
2B	A756 St Micheal's Bridge Road	WB	West of Dockhead	900	870	-30	-3%
3A	B725 St Micheal's Street	SB	South of St Michael's Bridge Road	410	390	-20	-5%
3B	B725 St Micheal's Street	NB	South of St Michael's Bridge Road	1,040	1,060	+20	+2%
4A	A75	EB	West of Garroch Roundabout	570	590	+20	+4%
4B	A75	WB	West of Garroch Roundabout	770	810	+40	+5%
5A	A75 Dumfries Bypass	EB	Between Garroch Roundabout and A780	850	1,250	+400	+47%
5B	A75 Dumfries Bypass	WB	Between Garroch Roundabout and A780	820	940	+120	+15%
6A	A75 Dumfries Bypass	EB	Between A780 and A76	620	780	+160	+26%
6B	A75 Dumfries Bypass	WB	Between A780 and A76	690	750	+60	+9%
7A	A75 Dumfries Bypass	EB	Between A76 and A701	1,490	1,560	+70	+5%
7B	A75 Dumfries Bypass	WB	Between A76 and A701	1,510	1,520	+10	+1%
8A	A75 Dumfries Bypass	EB	Between A701 and A709	620	650	+30	+5%
8B	A75 Dumfries Bypass	WB	Between A701 and A709	740	760	+20	+3%
9A	A75 Dumfries Bypass	EB	Between A709 and A780	540	550	+10	+2%
9B	A75 Dumfries Bypass	WB	Between A709 and A780	590	600	+10	+2%
10A	A75	EB	East of A780 Roundabout (e)	830	830	0	0%
10B	A75	WB	East of A780 Roundabout (e)	650	660	+10	+2%
11A	A76 Glasgow Road	SB	North of A75 Bypass	1,250	1,250	0	0%
11B	A76 Glasgow Road	NB	North of A75 Bypass	1,320	1,300	-20	-2%
12A	A701	SB	North of A75 Bypass	1,050	1,050	0	0%
12B	A701	NB	North of A75 Bypass	930	940	+10	+1%
13A	A709	SB	North of A75 Bypass	720	730	+10	+1%
13B	A709	NB	North of A75 Bypass	770	770	0	0%
14A	A711 Dalbeattie Road	NB	South of Park Road	220	200	-20	-9%
14B	A711 Dalbeattie Road	SB	South of Park Road	310	280	-30	-10%
15A	A780 Castle Douglas Road	EB	East of A75 Bypass	370	580	+210	+57%
15B	A780 Castle Douglas Road	WB	East of A75 Bypass	270	310	+40	+15%
16A	A76 Glasgow Road	SB	South of A75 Bypass	1,010	960	-50	-5%
16B	A76 Glasgow Road	NB	South of A75 Bypass	940	910	-30	-3%
17A	A701 Edinburgh Road	SB	South of A75 Bypass	730	700	-30	-4%
17B	A701 Edinburgh Road	NB	South of A75 Bypass	780	760	-20	-3%
18A	A709 Lockerbie Road	SB	South of A75 Bypass	730	700	-30	-4%
18B	A709 Lockerbie Road	NB	South of A75 Bypass	850	790	-60	-7%
19A	A780 Annan Road	WB	West of A75	440	390	-50	-11%
19B	A780 Annan Road	EB	West of A75	670	620	-50	-7%

Table F.7 2023 Forecast Year AM Peak Hour Vehicle Kilometres

Sector		LDP6 2023 Option 6	LDP6A 2023		
			Option 6A	Change	
1	Town Centre	3,600	3,600	0	0%
2	Town South East	12,600	12,200	-400	-3%
3	Town South West	22,300	22,300	0	0%
4	Town North West	9,600	10,000	+400	+4%
5	Town North East	9,800	9,800	0	0%
6	Heathhall and Locharbriggs	11,700	11,800	+100	+1%
7	Lochside and Lincluden	8,500	8,900	+400	+5%
8	Outer East	150,700	151,400	+700	+0%
9	Outer North	137,800	138,100	+300	+0%
10	Outer West	147,800	148,300	+500	+0%
DRTM Total		514,400	516,400	+2,000	+0%

Table F.8 2023 Forecast Year PM Peak Hour Vehicle Kilometres

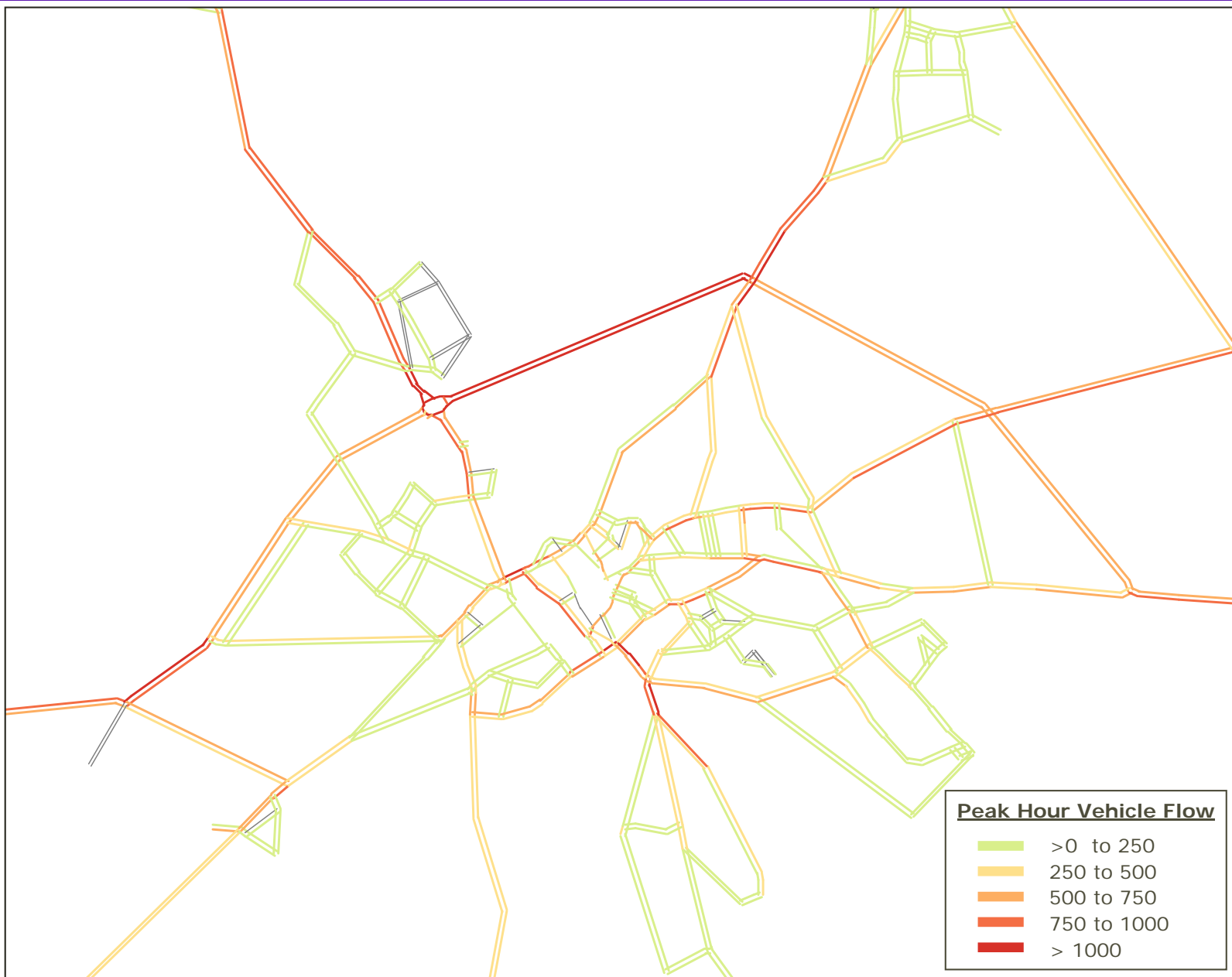
Sector		LDP6 2023 Option 6	LDP6A 2023		
			Option 6A	Change	
1	Town Centre	4,000	3,900	-100	-3%
2	Town South East	13,400	12,800	-600	-4%
3	Town South West	22,800	23,800	+1,000	+4%
4	Town North West	12,000	12,400	+400	+3%
5	Town North East	10,800	10,800	0	0%
6	Heathhall and Locharbriggs	12,100	12,100	0	0%
7	Lochside and Lincluden	9,700	10,100	+400	+4%
8	Outer East	171,800	173,300	+1,500	+1%
9	Outer North	156,800	157,600	+800	+1%
10	Outer West	142,200	144,200	+2,000	+1%
DRTM Total		555,600	561,000	+5,400	+1%

Table F.9 2023 Forecast Year AM Peak Hour Vehicle Hours

Sector		LDP6 2023 Option 6	LDP6A 2023		Change	
			Option 6A			
1	Town Centre	3,600	3,640	+40	+1%	
2	Town South East	12,610	12,210	-400	-3%	
3	Town South West	22,270	22,320	+50	+0%	
4	Town North West	9,590	10,000	+410	+4%	
5	Town North East	9,810	9,760	-50	-1%	
6	Heathhall and Locharbriggs	11,690	11,780	+90	+1%	
7	Lochside and Lincluden	8,480	8,880	+400	+5%	
8	Outer East	150,750	151,380	+630	+0%	
9	Outer North	137,800	138,070	+270	+0%	
10	Outer West	147,780	148,270	+490	+0%	
DRTM Total		514,380	516,310	+1,930	+0%	

Table F.10 2023 Forecast Year PM Peak Hour Vehicle Hours

Sector		LDP6 2023 Option 6	LDP6A 2023		Change	
			Option 6A			
1	Town Centre	3,960	3,930	-30	-1%	
2	Town South East	13,410	12,820	-590	-4%	
3	Town South West	22,810	23,780	+970	+4%	
4	Town North West	12,020	12,350	+330	+3%	
5	Town North East	10,840	10,760	-80	-1%	
6	Heathhall and Locharbriggs	12,090	12,110	+20	+0%	
7	Lochside and Lincluden	9,690	10,070	+380	+4%	
8	Outer East	171,850	173,300	+1,450	+1%	
9	Outer North	156,770	157,590	+820	+1%	
10	Outer West	142,160	144,220	+2,060	+1%	
DRTM Total		555,600	560,930	+5,330	+1%	



**Dumfries Regional Traffic Model
Local Development Plan Tests**

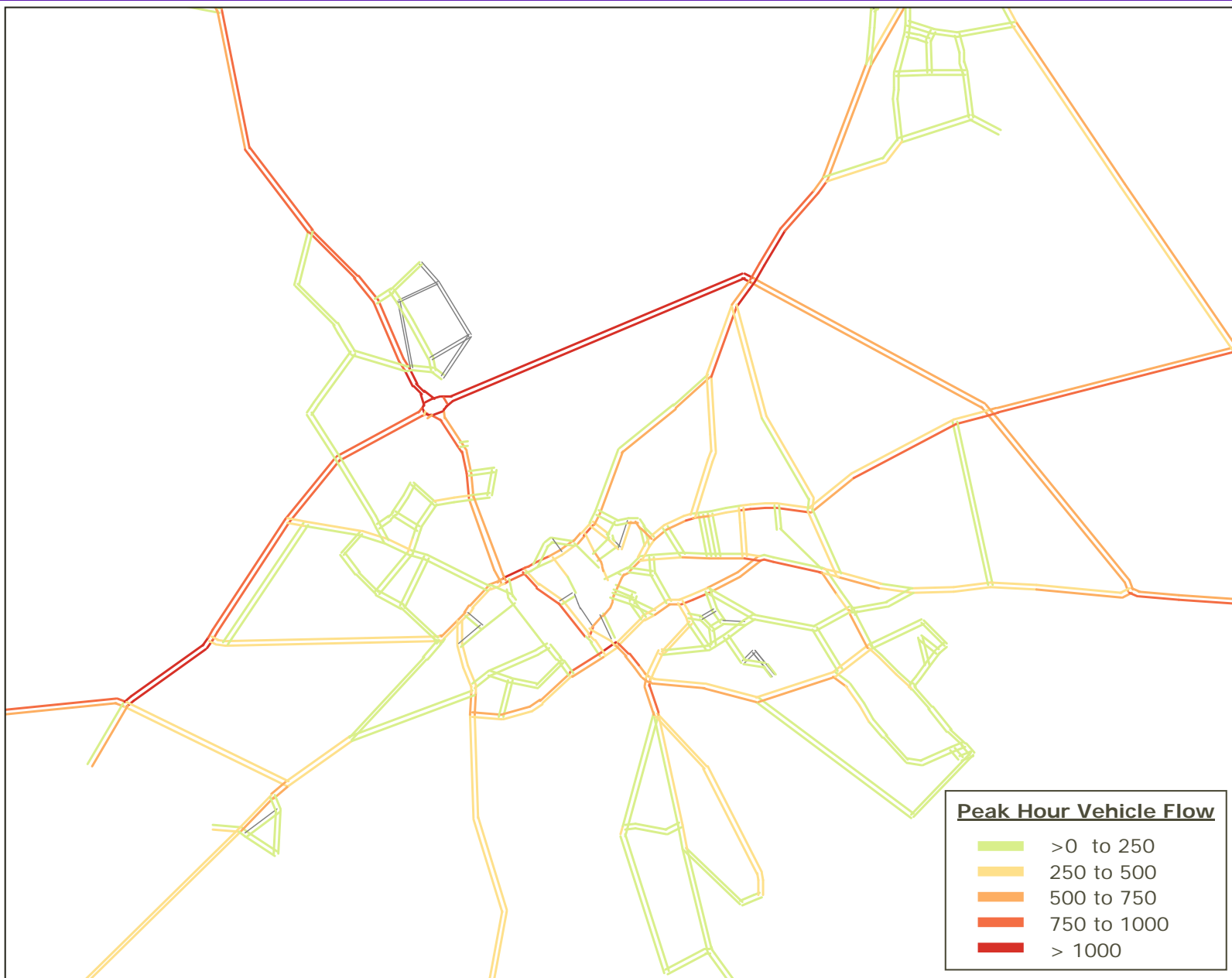
Prepared for Dumfries and Galloway Council
December 2012

Title **DRTM Predicted Traffic Flow
AM Peak Hour – LDP Option 6**

Project No.
101767

Figure
F.9

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

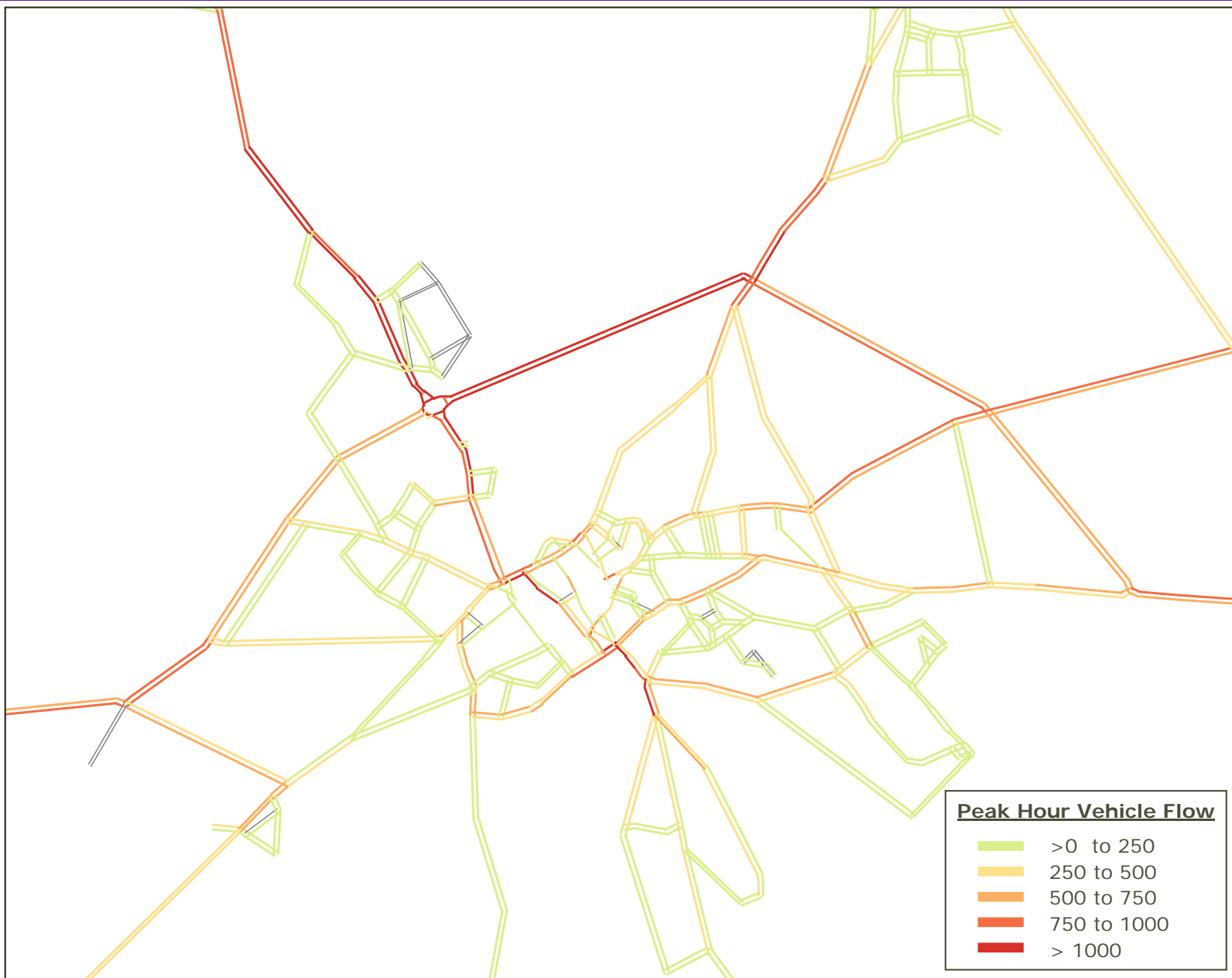
Prepared for Dumfries and Galloway Council
December 2012

Title **DRTM Predicted Traffic Flow
AM Peak Hour – LDP Option 6A**

Project No.
101767

Figure
F.10

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**Dumfries Regional Traffic Model
Local Development Plan Tests**

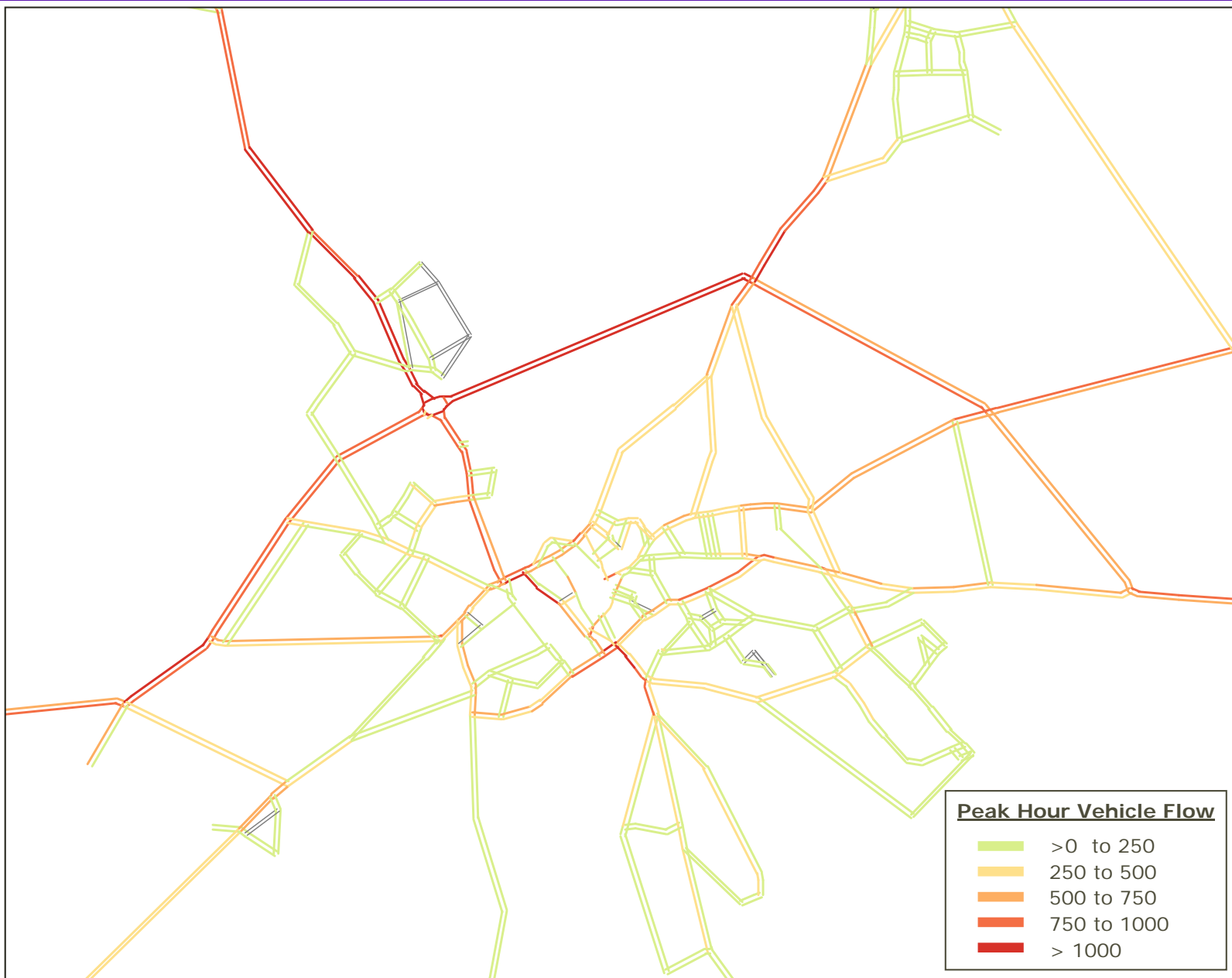
Prepared for Dumfries and Galloway Council
December 2012

Title **DRTM Predicted Traffic Flow
PM Peak Hour – LDP Option 6**

Project No.
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**Dumfries Regional Traffic Model
Local Development Plan Tests**

Prepared for Dumfries and Galloway Council
December 2012

Title **DRTM Predicted Traffic Flow
PM Peak Hour – LDP Option 6A**

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Average Speeds and Journey Times

Table F.11 2023 Forecast Year AM Peak Hour Average Vehicle Speed (kph)

Sector	LDP6 2023 Option 6	LDP6A 2023		Change	
		Option 6A	Change		
1 Town Centre	17	18	+1	+6%	
2 Town South East	36	38	+2	+6%	
3 Town South West	51	51	0	0%	
4 Town North West	42	43	+1	+2%	
5 Town North East	38	38	0	0%	
6 Heathhall and Locharbriggs	37	37	0	0%	
7 Lochside and Lincluden	46	46	0	0%	
8 Outer East	87	87	0	0%	
9 Outer North	85	85	0	0%	
10 Outer West	75	75	0	0%	
DRTM Average	71	71	0	0%	

Table F.12 2023 Forecast Year PM Peak Hour Average Vehicle Speed (kph)

Sector	LDP6 2023 Option 6	LDP6A 2023		Change	
		Option 6A	Change		
1 Town Centre	9	9	0	0%	
2 Town South East	37	40	+3	+8%	
3 Town South West	49	48	-1	-2%	
4 Town North West	39	36	-3	-8%	
5 Town North East	39	39	0	0%	
6 Heathhall and Locharbriggs	31	30	-1	-3%	
7 Lochside and Lincluden	43	43	0	0%	
8 Outer East	91	90	-1	-1%	
9 Outer North	87	87	0	0%	
10 Outer West	76	76	0	0%	
DRTM Average	69	69	0	0%	

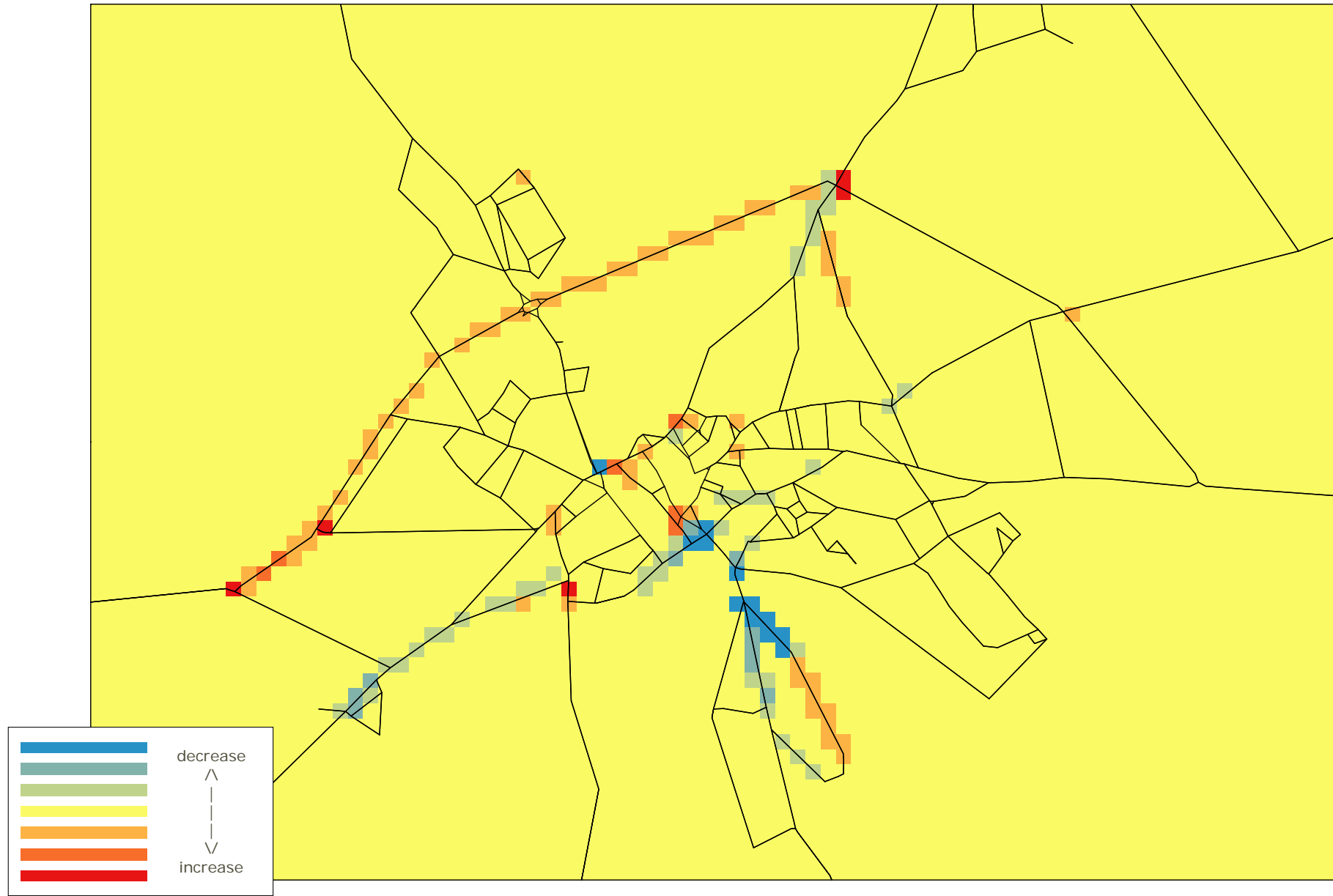
Table F.13 2023 Forecast Year AM Peak Hour Modelled Journey Times (minutes) on Defined Routes

ID	Route	LDP4 2023	LDP6A	2023	
		Option 6	Option 6A	Change	
1S	Dumfries Town Route 1 Southbound Total	7.2	6.0	-1.2	-17%
1N	Dumfries Town Route 1 Northbound Total	7.3	7.1	-0.2	-3%
2S	Dumfries Town Route 2 Southbound Total	10.5	9.4	-1.1	-10%
2N	Dumfries Town Route 2 Northbound Total	9.1	9.0	-0.1	-1%
3S	Dumfries Town Route 3 Southbound Total	7.9	8.1	0.2	+3%
3N	Dumfries Town Route 3 Northbound Total	7.9	8.2	0.3	+4%
4W	Dumfries Town Route 4 Westbound Total	6.9	7.0	0.1	+1%
4E	Dumfries Town Route 4 Eastbound Total	7.5	7.4	-0.1	-1%
5E	Dumfries Town Route 5 Eastbound Total	9.2	8.4	-0.8	-9%
5W	Dumfries Town Route 5 Westbound Total	12.6	12.6	0.0	0%
BPE_1	Bypass Section 1 (Eastbound) - From Drummore Rbt to A76	6.3	6.4	0.1	+2%
BPE_2	Bypass Section 2 (Eastbound) - From A76 to A709	4.6	4.6	0.0	0%
BPE_3	Bypass Section 3 (Eastbound) - From A709 to Collin	3.4	3.4	0.0	0%
BPW_1	Bypass Section 1 (Westbound) - From A76 to Drummore Rbt	5.7	5.9	0.2	+4%
BPW_2	Bypass Section 2 (Westbound) - From A709 to A76	4.6	5.1	0.5	+11%
BPW_3	Bypass Section 3 (Westbound) - From Collin to A709	3.8	3.8	0.0	0%

Table F.14 2023 Forecast Year PM Peak Hour Modelled Journey Times (minutes) on Defined Routes

ID	Route	LDP4 2023	LDP6A	2023	
		Option 6	Option 6A	Change	
1S	Dumfries Town Route 1 Southbound Total	13.7	12.0	-1.7	-12%
1N	Dumfries Town Route 1 Northbound Total	9.6	8.7	-0.9	-9%
2S	Dumfries Town Route 2 Southbound Total	15.5	15.6	0.1	+1%
2N	Dumfries Town Route 2 Northbound Total	8.6	8.3	-0.3	-3%
3S	Dumfries Town Route 3 Southbound Total	9.6	9.3	-0.3	-3%
3N	Dumfries Town Route 3 Northbound Total	10.6	12.1	1.5	+14%
4W	Dumfries Town Route 4 Westbound Total	9.3	8.9	-0.4	-4%
4E	Dumfries Town Route 4 Eastbound Total	11.6	12.9	1.3	+11%
5E	Dumfries Town Route 5 Eastbound Total	11.3	12.2	0.9	+8%
5W	Dumfries Town Route 5 Westbound Total	14.6	14.0	-0.6	-4%
BPE_1	Bypass Section 1 (Eastbound) - From Drummore Rbt to A76	5.7	5.9	0.2	+4%
BPE_2	Bypass Section 2 (Eastbound) - From A76 to A709	6.8	9.1	2.3	+34%
BPE_3	Bypass Section 3 (Eastbound) - From A709 to Collin	3.6	3.6	0.0	0%
BPW_1	Bypass Section 1 (Westbound) - From A76 to Drummore Rbt	6.2	6.4	0.2	+3%
BPW_2	Bypass Section 2 (Westbound) - From A709 to A76	5.7	5.8	0.1	+2%
BPW_3	Bypass Section 3 (Westbound) - From Collin to A709	3.6	3.6	0.0	0%

Road Congestion and Junction Delay



Dumfries Regional Traffic Model Local Development Plan Tests

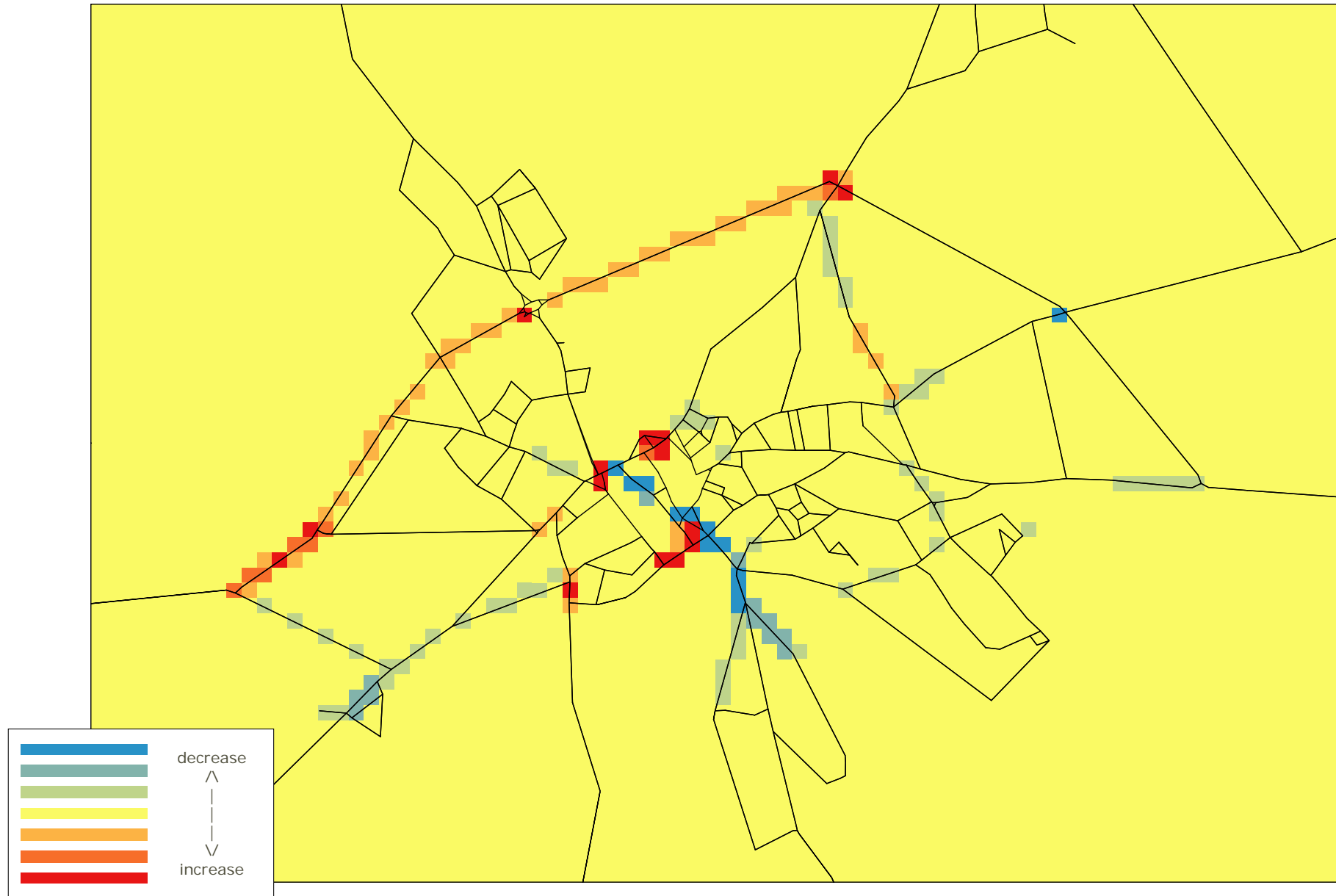
Prepared for Dumfries and Galloway Council
December 2012

Title **DRTM Predicted Traffic Congestion**
AM Peak Hour – LDP Option 6A vs Option 6

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Dumfries Regional Traffic Model Local Development Plan Tests

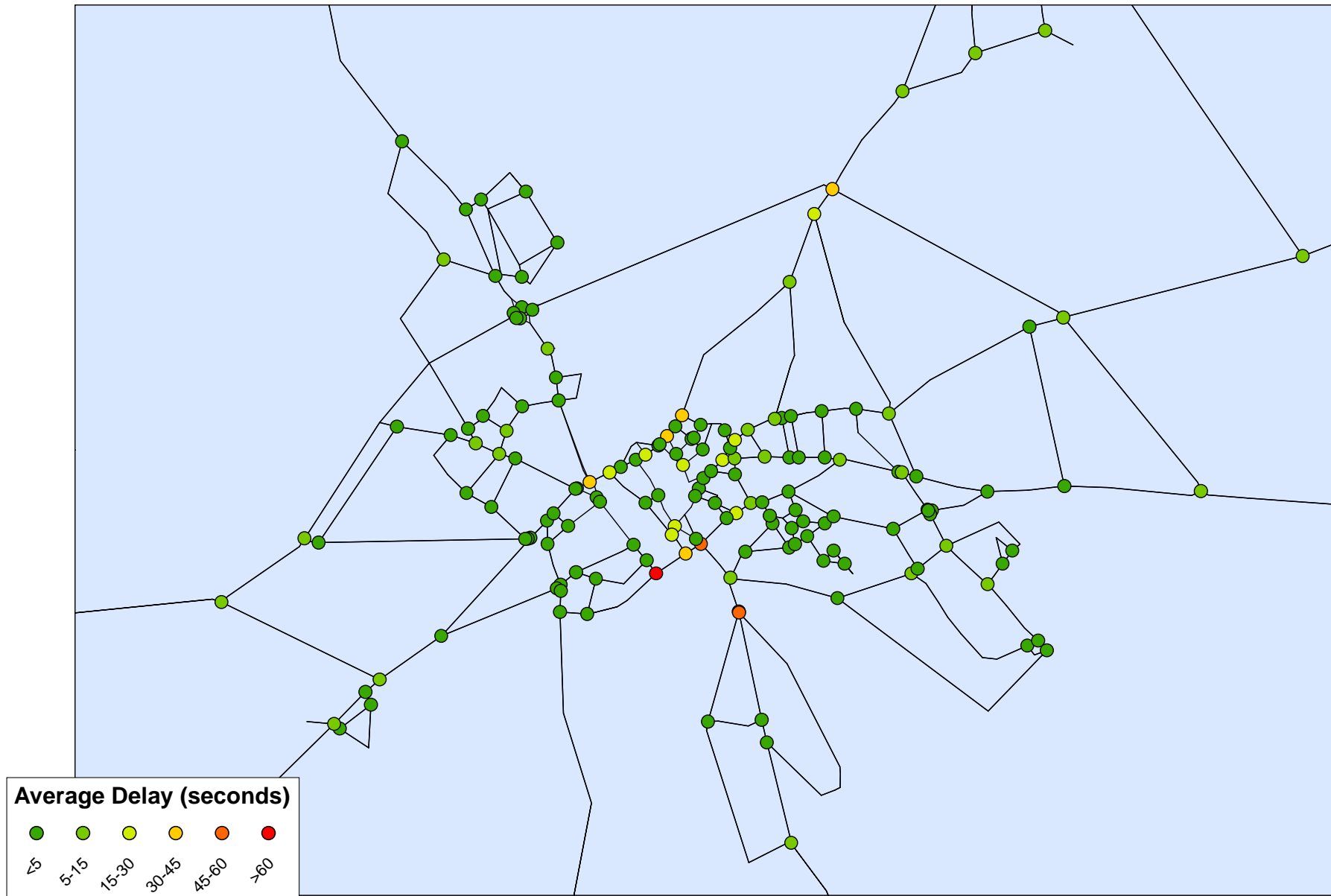
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Title **DRTM Predicted Traffic Congestion**
PM Peak Hour – LDP Option 6A vs Option 6

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Dumfries Regional Traffic Model Local Development Plan Tests

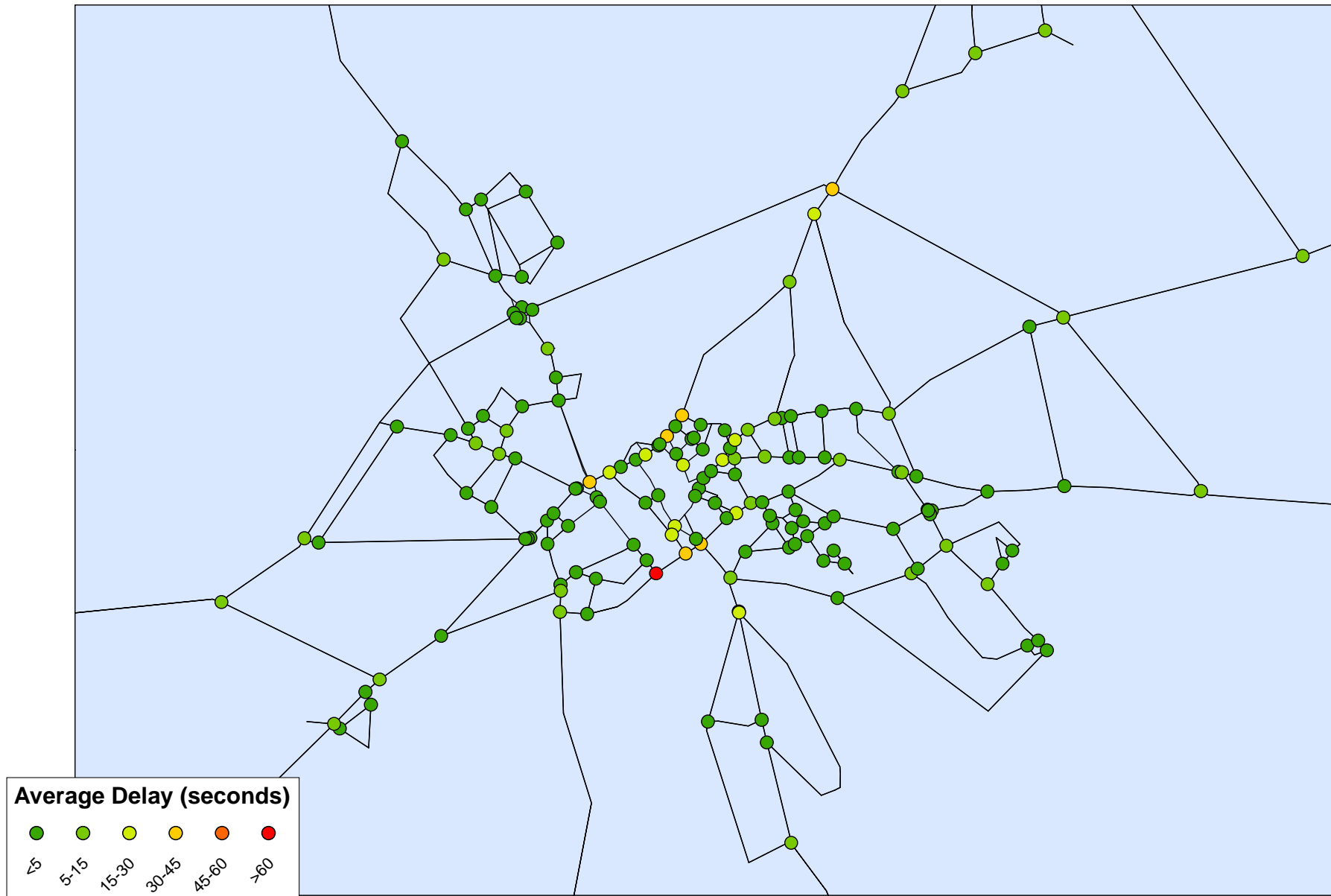
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Title **DRTM Predicted Junction Delay
AM Peak Hour – LDP Option 6**

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Dumfries Regional Traffic Model Local Development Plan Tests

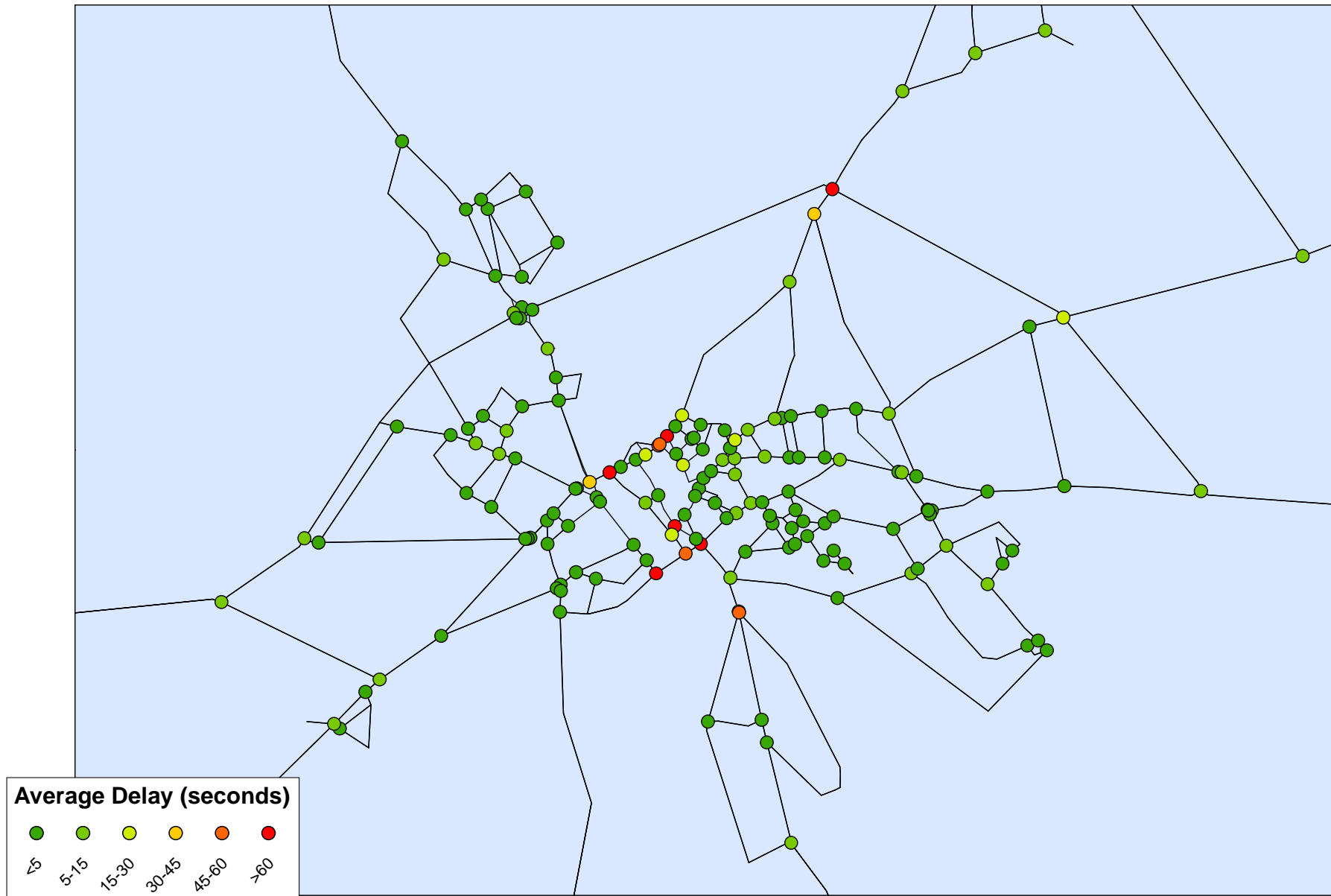
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Title **DRTM Predicted Junction Delay
AM Peak Hour – LDP Option 6A**

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Dumfries Regional Traffic Model Local Development Plan Tests

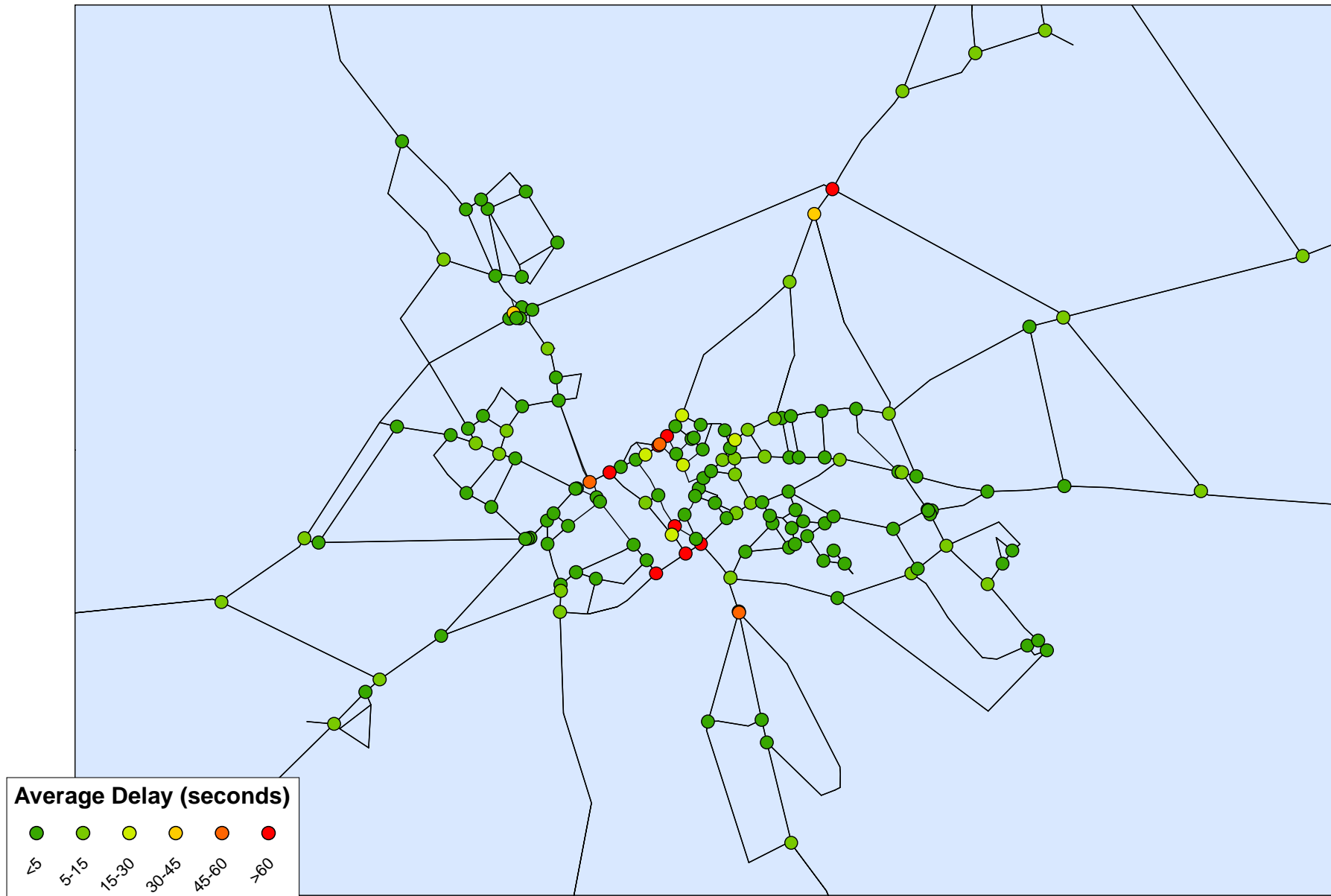
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Title **DRTM Predicted Junction Delay
PM Peak Hour – LDP Option 6**

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Title **DRTM Predicted Junction Delay
PM Peak Hour – LDP Option 6A**

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Carbon Emissions

Table F.15 2023 Forecast Year Forecast Annual Carbon Emissions (tonnes)

Sector		LDP6 2023 Option 6	LDP6A 2023		
			Option 6A	Change	
1	Town Centre	1,010	1,010	0	0%
2	Town South East	3,020	2,890	-130	-4%
3	Town South West	4,380	4,450	+70	+2%
4	Town North West	2,360	2,400	+40	+2%
5	Town North East	2,230	2,210	-20	-1%
6	Heathhall and Locharbriggs	2,550	2,550	0	0%
7	Lochside and Lincluden	2,210	2,250	+40	+2%
8	Outer East	49,950	50,070	+120	+0%
9	Outer North	47,070	47,070	0	0%
10	Outer West	29,760	29,890	+130	+0%
DRTM Area		144,540	144,790	+250	+0%

MVA Consultancy provides advice on transport, to central, regional and local government, agencies, developers, operators and financiers.
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