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M4 Corridor around Newport

Traffic Forecasting Report Supplement



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Traffic Forecasting Report -
Supplement

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1 Introduction

1.1 Scope of this Report Supplement

1.1.1 The Welsh Government's draft Orders and Environmental Statement for the M4 Corridor around Newport (M4CaN) were published in March 2016. Supplements and Modifications to the draft Orders have been developed by the Welsh Government to be published in September 2016 for the following reasons:

- a) Amendments to the details of parties in the Schedules to the Compulsory Purchase Order following receipt of further information on title holders, lessees and interested parties.
- b) Amendments to the project further to matters raised by responses received to the draft Orders.

1.1.2 Supplements to the Environmental Statement and Associated Reporting are also published to consider the changes as well as further information available since preparing the draft Orders, such as further ecological surveys.

1.1.3 The M4CaN transport model is used to understand current traffic conditions in the area, to provide evidence for the planning of changes to the transport network. Traffic forecasts have been produced to inform the operational, economic and environmental evaluations of the new section of motorway to the south of Newport.

1.1.4 The following scenarios have been tested:

- A 'Do Minimum' scenario, in which committed transport improvement schemes have been added to the base year network; and
- A 'Do Something' scenario, which includes the proposed new section of motorway to the south of Newport and reclassification of the existing M4 around Newport to an all-purpose road.

1.1.5 The purpose of this Traffic Forecasting Report Supplement is to document the highway design changes to the draft orders M4CaN Scheme and the resultant effect on the traffic forecasts that were presented in the March 2016 Traffic Forecasting Report.

1.2 Report Structure

1.2.1 Following this introduction the report is structured as follows:

- Chapter 2 provides details of the KS4 changes in Scheme design and how these have been taken into account in the traffic forecasting;
- Chapter 3 presents the revised traffic forecasts as a result of the Scheme changes; and
- Chapter 4 concludes how the Scheme changes have affected the traffic forecasts and the resulting Scheme appraisals.

2 Design Changes in the Traffic Forecasts

2.1 Summary of Changes

2.1.1 The following modifications have been considered as part of this supplement:

- 1 Docks Junction – revised horizontal and vertical alignment to lower the slip and link roads, remove the secondary roundabout and change the form of structure of the mainline viaduct (SBR-0885 Tom Lewis Way Viaduct). This also reduced the length and height of the retaining wall along Docks Link Road (SRW-0895 Docks Link Retaining Wall).
- 2 Glan Llyn Junction – providing access from Glan Llyn Link Road to the TATA owned land to the east.
- 3 Glan Llyn Junction – providing a retaining wall to minimise impact on existing pylon (SWR-1520 Pylon SE001Retaining Wall).
- 4 J23a to J23 Trunk Road – revised vertical alignment at the west tie-in to lower the trunk road, achieved by matching the headroom of the proposed extension to St Bride’s Road Bridge to the headroom of the existing St Bride’s Road Bridge.
- 5 Magor Interchange Roundabout (Junction 23) – reduction in earthworks required at the roundabout by realigning Bencroft Lane, remove the Bencroft Lane underpasses and providing an overbridge to the east over the M48 (SBR-2340 Windmill Hill Overbridge).
- 6 Magor Interchange (Junction 23) Roundabout – revised vertical alignment to lower part of the roundabout, achieved by realigning Bencroft Lane, removing Bencroft Lane underpasses and providing an overbridge to the east over the M48 (SBR-2340 Windmill Hill Overbridge).

2.1.2 Of the above list, items 3, 4 and 6 would have no bearing on the traffic forecasts as only changes that affect junction connectivity or link lengths would impact on traffic demand and patterns. Items 1, 2 and 5 and their impacts on the traffic forecasts are discussed in more detail below.

2.2 Docks Junction

2.2.1 At publication of draft Orders, March 2016, the Docks Junction was a grade-separated interchange with a double roundabout layout linked by a short dual 2-lane all-purpose carriageway, as shown in Figure 2.1.

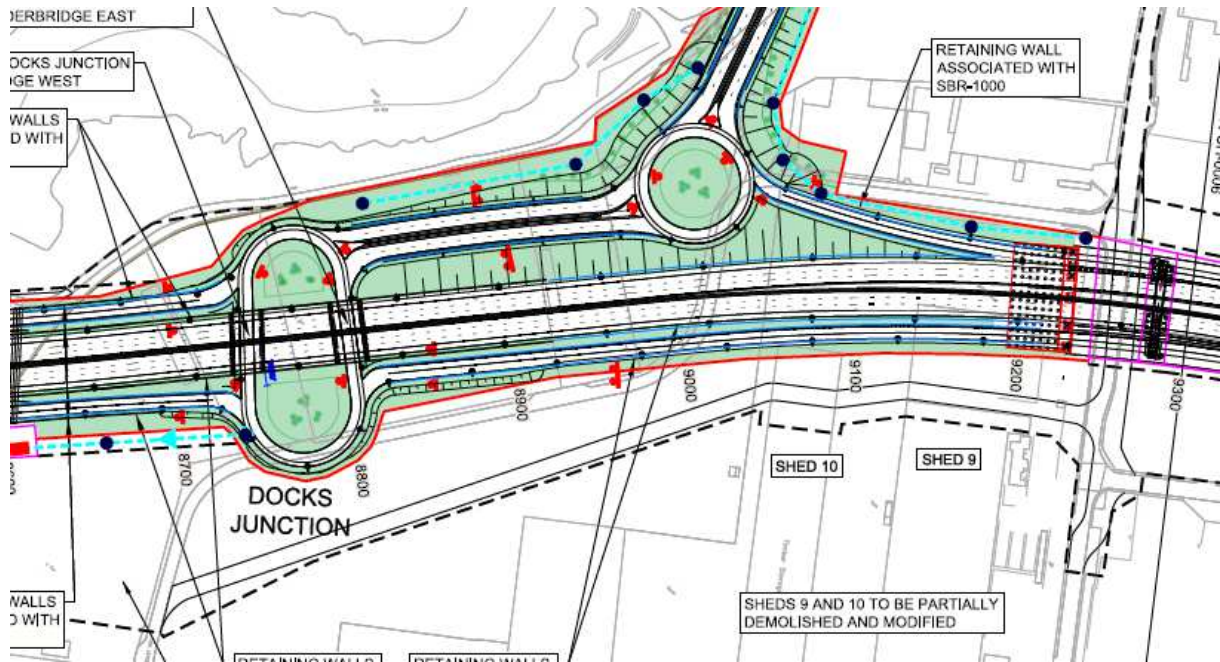


Figure 2.1: Docks Junction design, March 2016 draft Orders

2.2.2 The design of this junction has subsequently changed to be a grade-separated interchange with a single large gyratory and a dedicated lane for left-turn movements between the link road to the north and the M4 east. The revised layout is shown in Figure 2.2.

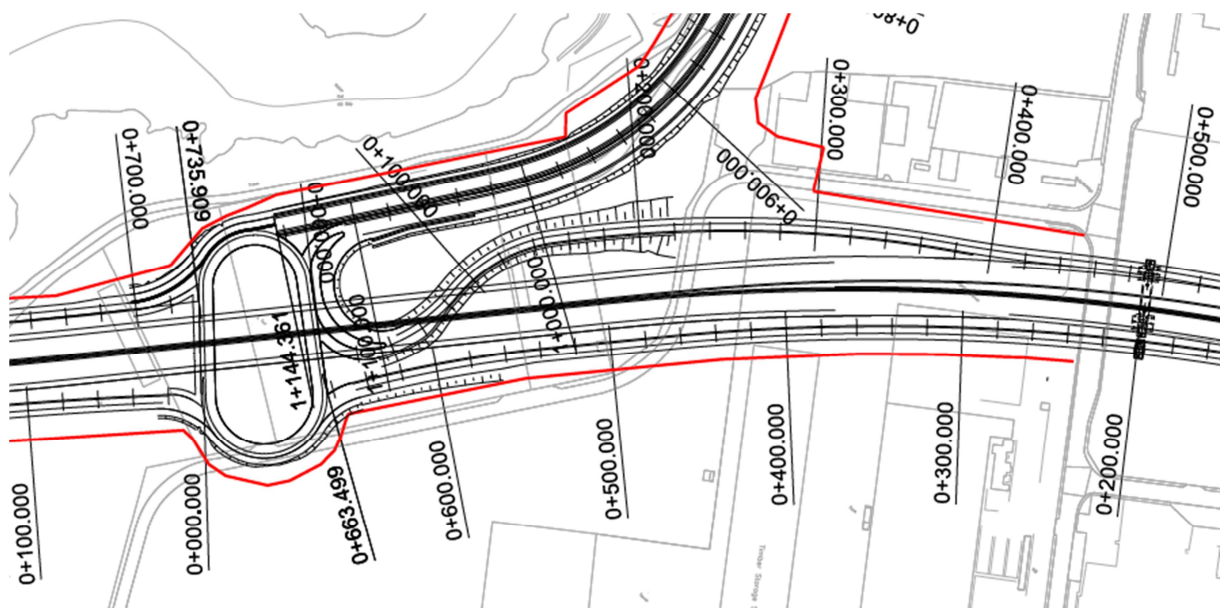


Figure 2.2: Revised Docks Junction design

2.2.3 The changes in junction design would not be expected to have a significant impact on the demand for the scheme, generated by the Variable Demand Model (VDM), or the traffic assignment. Provided the new junction arrangement would operate within capacity, as did the previous Docks Way junction arrangement, then the changes in forecast traffic flows would not be expected to be significant.

2.2.4 As such, the traffic assignments were re-run for the revised junction arrangement based on the demand that that was output from the VDM for the previous version

of the M4CaN scheme design, as reported in the March 2016 Traffic Forecasting Report.

2.3 Glan Llyn Link Road

2.3.1 The Glan Llyn junction is a grade-separated roundabout junction with a dual 2-lane all-purpose carriageway link to the A4810 Steelworks Access Road at the existing Monks Ditch roundabout. The Glan Llyn link road is shown in Figure 2.3.

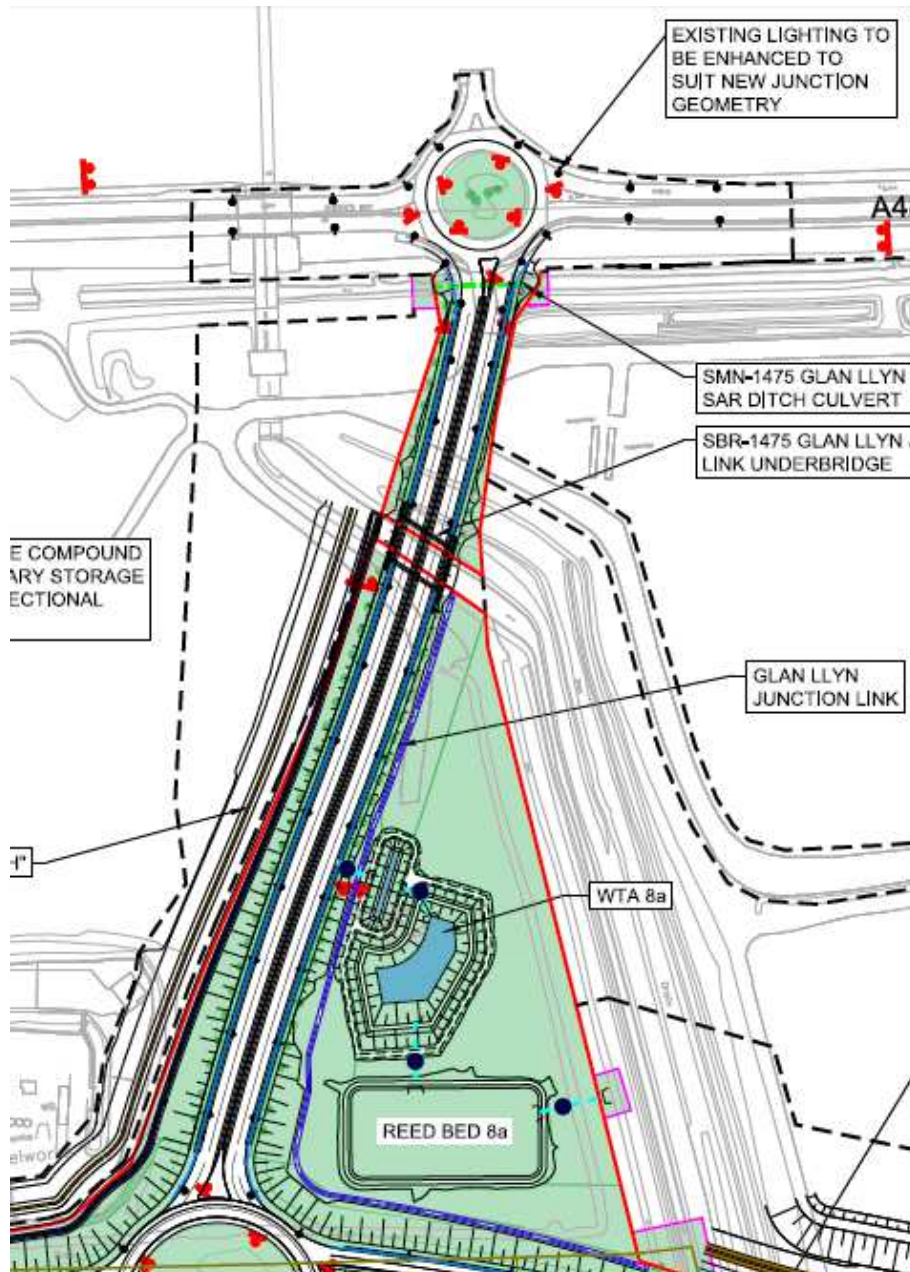


Figure 2.3: Glan Llyn Link road design, March 2016 draft Orders

2.3.2 A new left in-left out junction was proposed along this link road to provide access to Tata Steel land at the request of the landowner. This is shown in Figure 2.4.

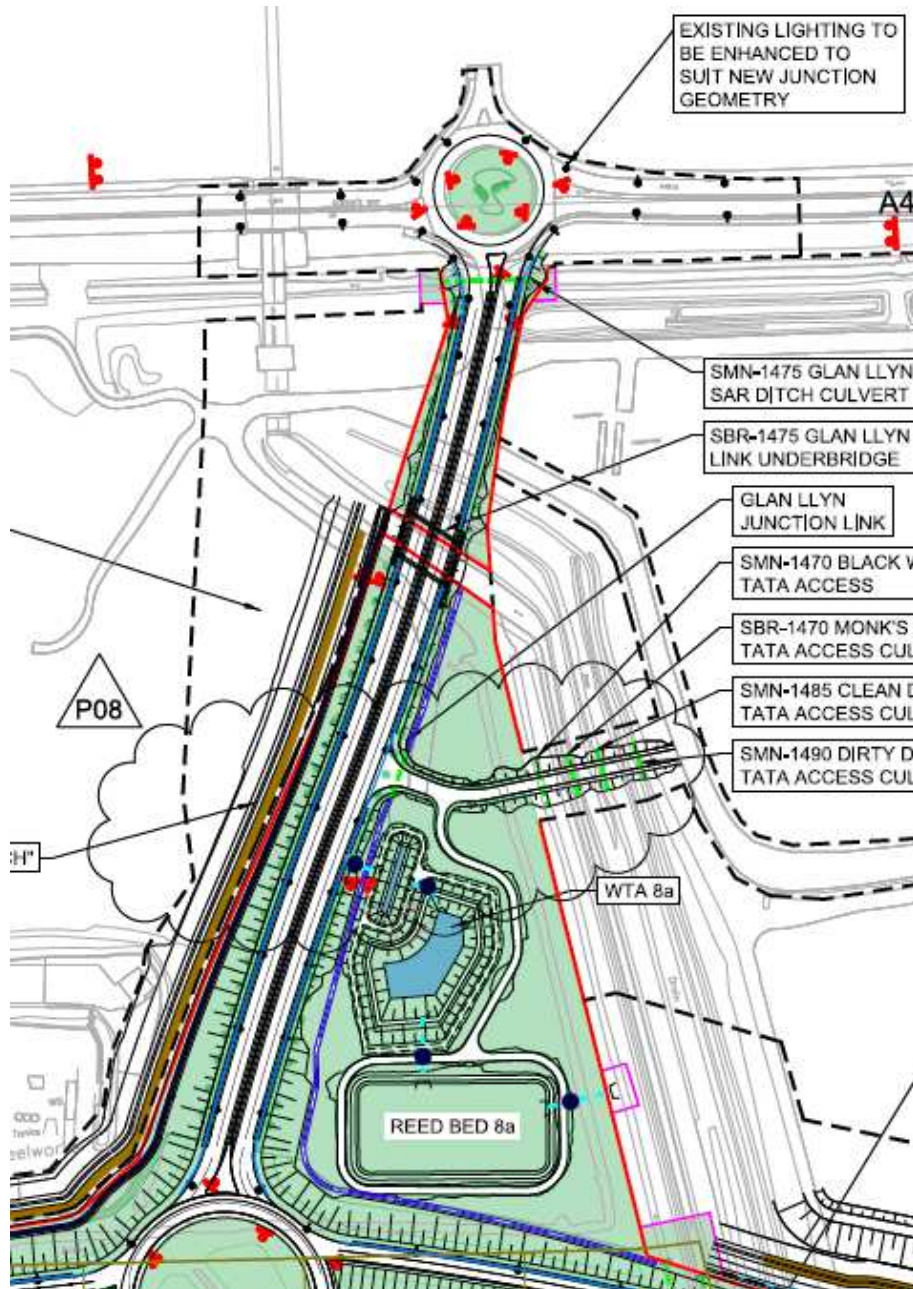


Figure 2.4: Revised Glan Llyn Link road design

2.3.3 This link would be a minor access to private land. The level of demand to use this junction is not known, however it is expected to be negligible compared to the traffic volumes travelling between the Steelworks Access Road and Glan Llyn Junction. As such, this new junction was not included in the traffic forecasting for the Scheme design changes.

2.4 Magor Interchange Realignment of Bencroft Lane

2.4.1 The proposed Junction 23 to the east of Magor and Undy, as per the March 2016 draft Orders, is located on the alignment of the existing M48, as shown in Figure 2.5. This comprises a large at-grade signal-controlled gyratory that connects the

3 Revised Traffic Forecasts

- 3.1.1** This chapter presents the effect of the update to the Core Scenario on traffic forecasts. Traffic forecasts for the central growth Core Scenario have been prepared for two future years, 2022 and 2037. These cover the three modelled periods of the AM peak hour, the average inter-peak hour and the PM peak hour.
- 3.1.2** The revised layout at the Docks Junction increases the travel distance for traffic accessing the new proposed motorway in an eastbound direction at the Docks junction by over 600 metres compared to the Core Scenario from March 2016. For a small number of trips starting their journey in West Newport and travelling eastbound beyond Magor this change is sufficient to alter their route choice in favour of using the motorway north of Newport instead of the proposed new motorway. The result is a slight decrease in eastbound forecast traffic volumes on the proposed new motorway and a corresponding increase of eastbound traffic on the existing motorway.
- 3.1.3** The Core Scenario traffic flows from the Traffic Forecasting Report (TFR) in March 2016 compared to the revised Core Scenario are presented in Figures 3.1 to 3.8 for the AM peak hour, inter-peak, PM peak hour and Annual Average Daily Traffic (AADT) in 2022 and 2037.
- 3.1.4** The AADT flows shown in Figures 3.4 and 3.8 indicate that, with the revisions to the Core Scenario outlined in this report, forecast traffic flows are only marginally affected by the changes in most locations around Newport. The largest change in traffic flow of -1,100 vehicles on an average weekday in 2037 occurs on the proposed new motorway crossing the river Usk in an eastbound direction. This is less than 3% lower than the Core Scenario quoted in the TFR from March 2016. The largest relative change in traffic flow of around 4% would occur on the existing motorway between Junction 23a and Junction 23 around Magor.

4 Conclusions

- 4.1.1** The M4CaN Scheme design modifications have been incorporated into revised traffic forecasts for the Scheme. These show that the impact on traffic volumes in the Core scenario would be minor with maximum changes of around 4%.
- 4.1.2** The largest forecast decrease in traffic volumes occurs on the proposed new motorway between the Docks Junction and the Glan Llyn Junction. The largest forecast increase occurs on the current M4 corridor north of Newport between Junctions 23a and 23 in an eastbound direction. These changes in traffic volumes are the result of an increase in travel distance for traffic accessing the new proposed motorway in an eastbound direction at the Docks Junction arising from the design changes.

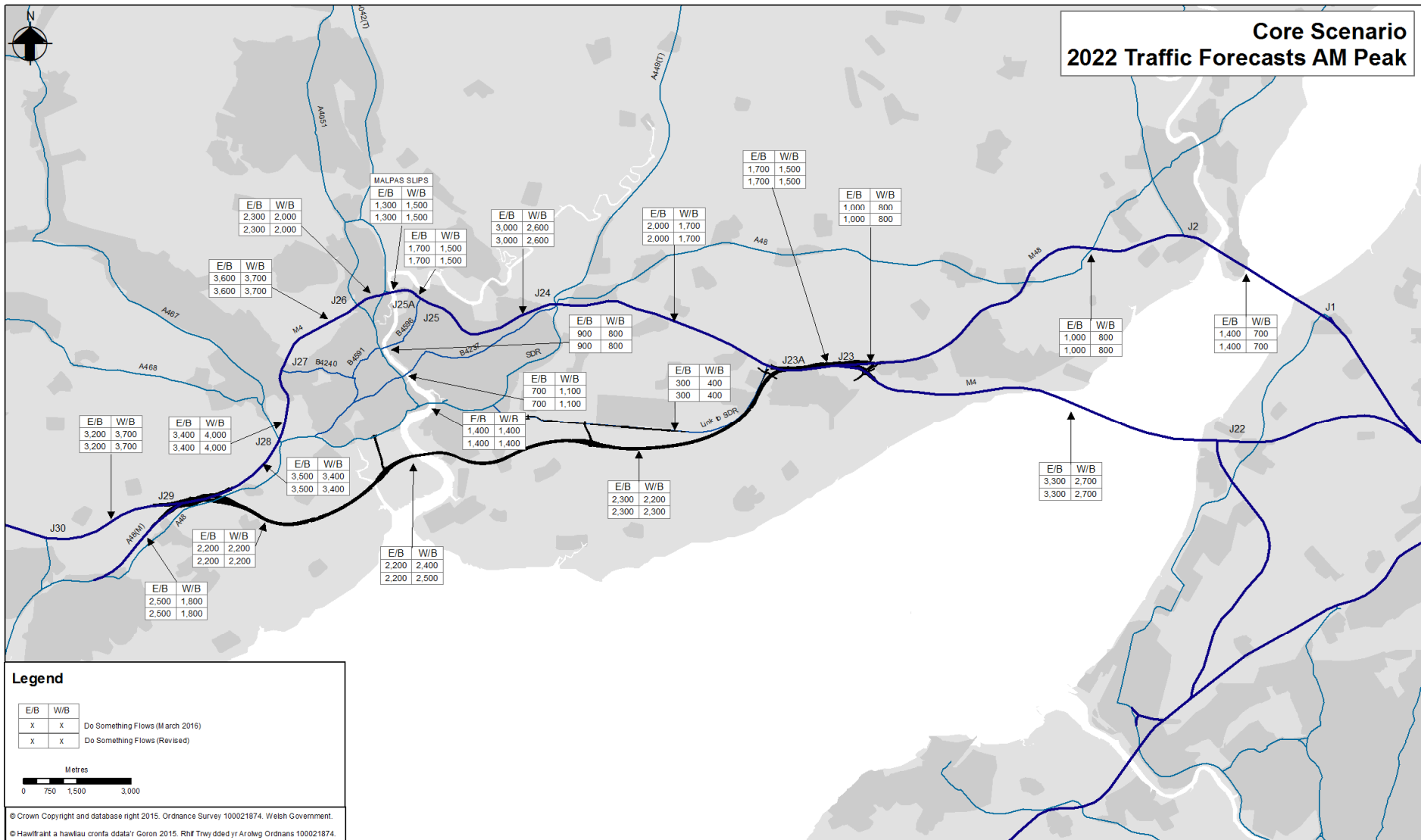


Figure 3.1: 2022 Forecast AM Peak Hour Traffic Flows, Core Scenario

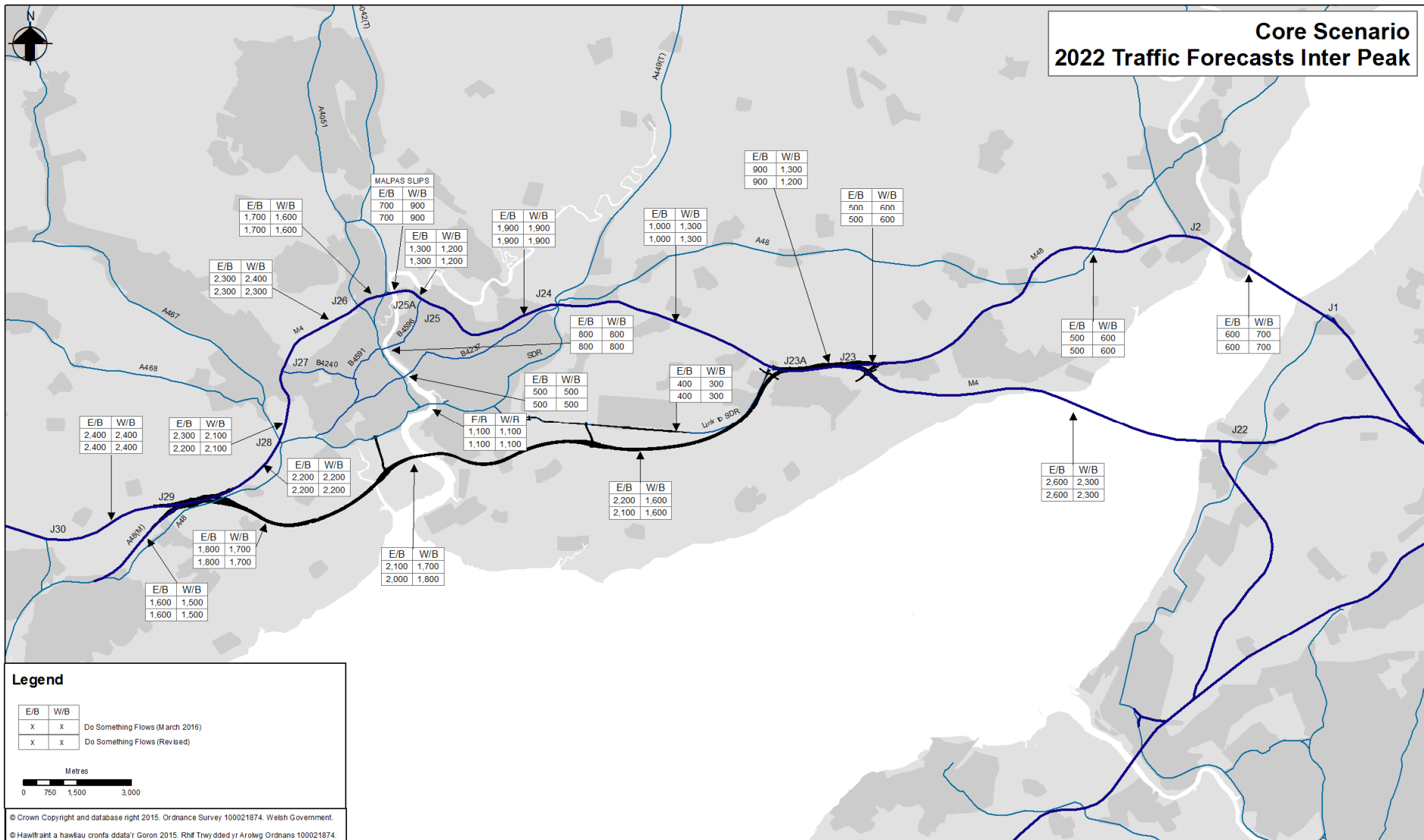


Figure 3.2: 2022 Forecast Inter-peak Hour Traffic Flows, Core Scenario

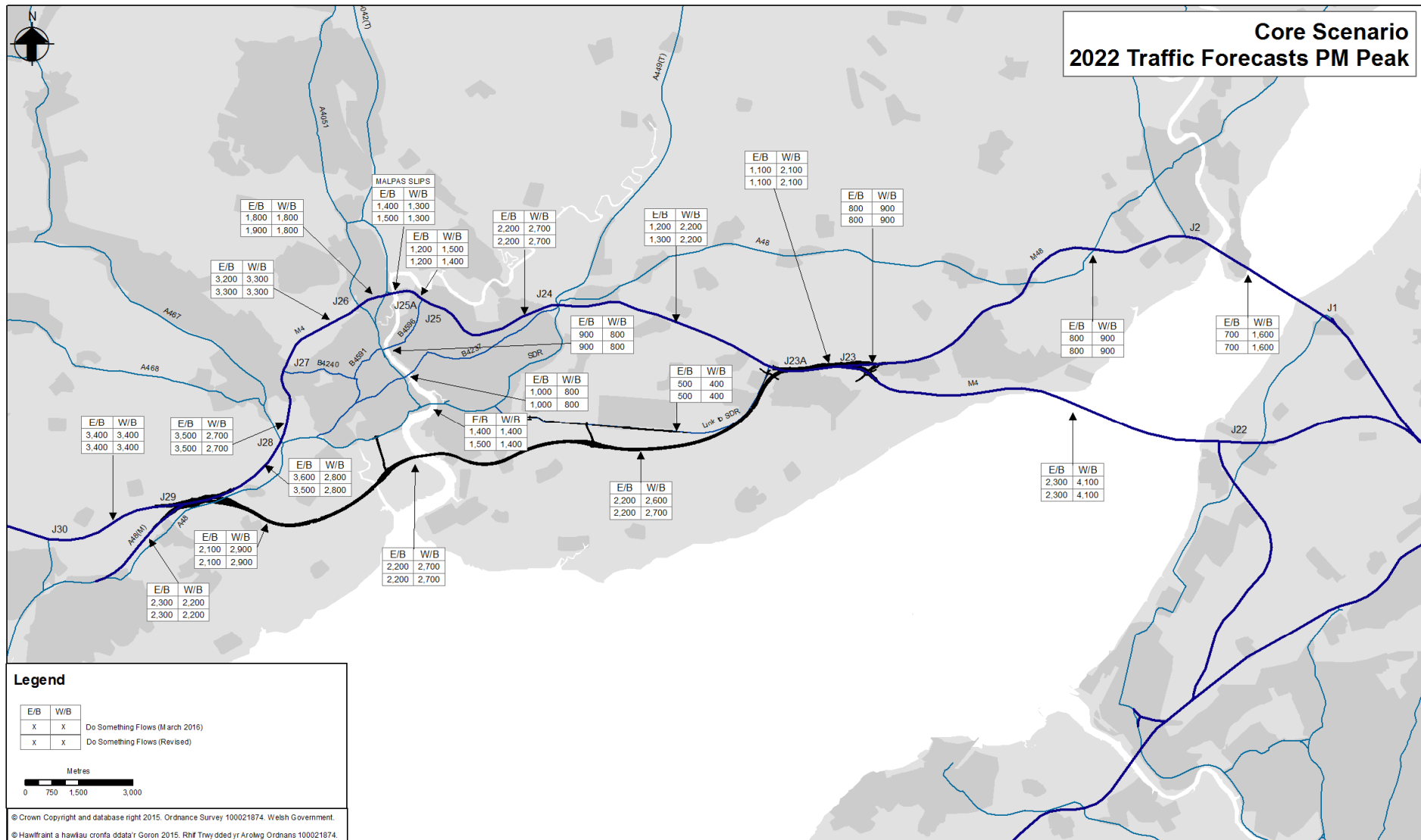


Figure 3.3: 2022 Forecast PM Peak Hour Traffic Flows, Core Scenario

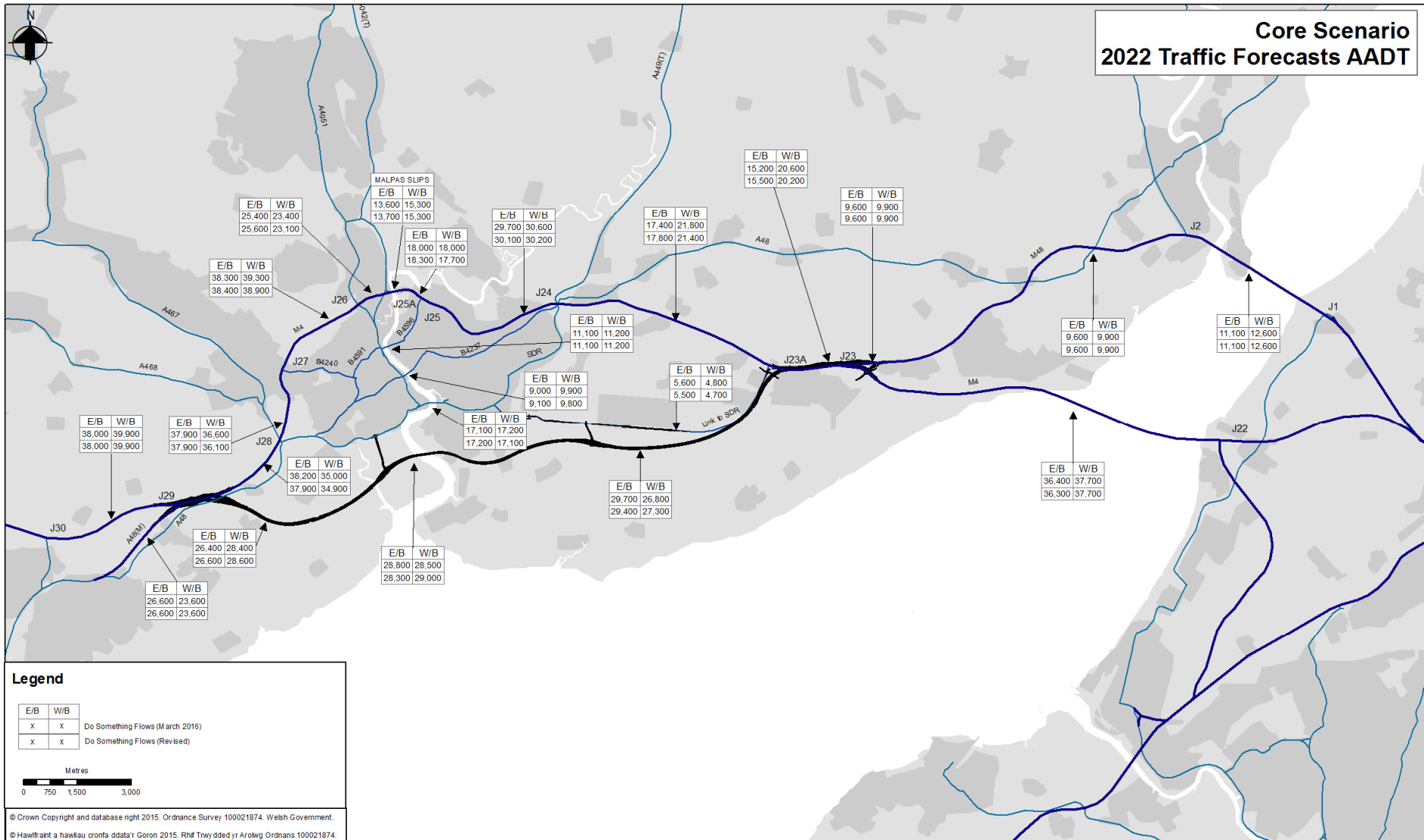


Figure 3.4: 2022 Forecast Annual Average Daily Traffic Flows, Core Scenario

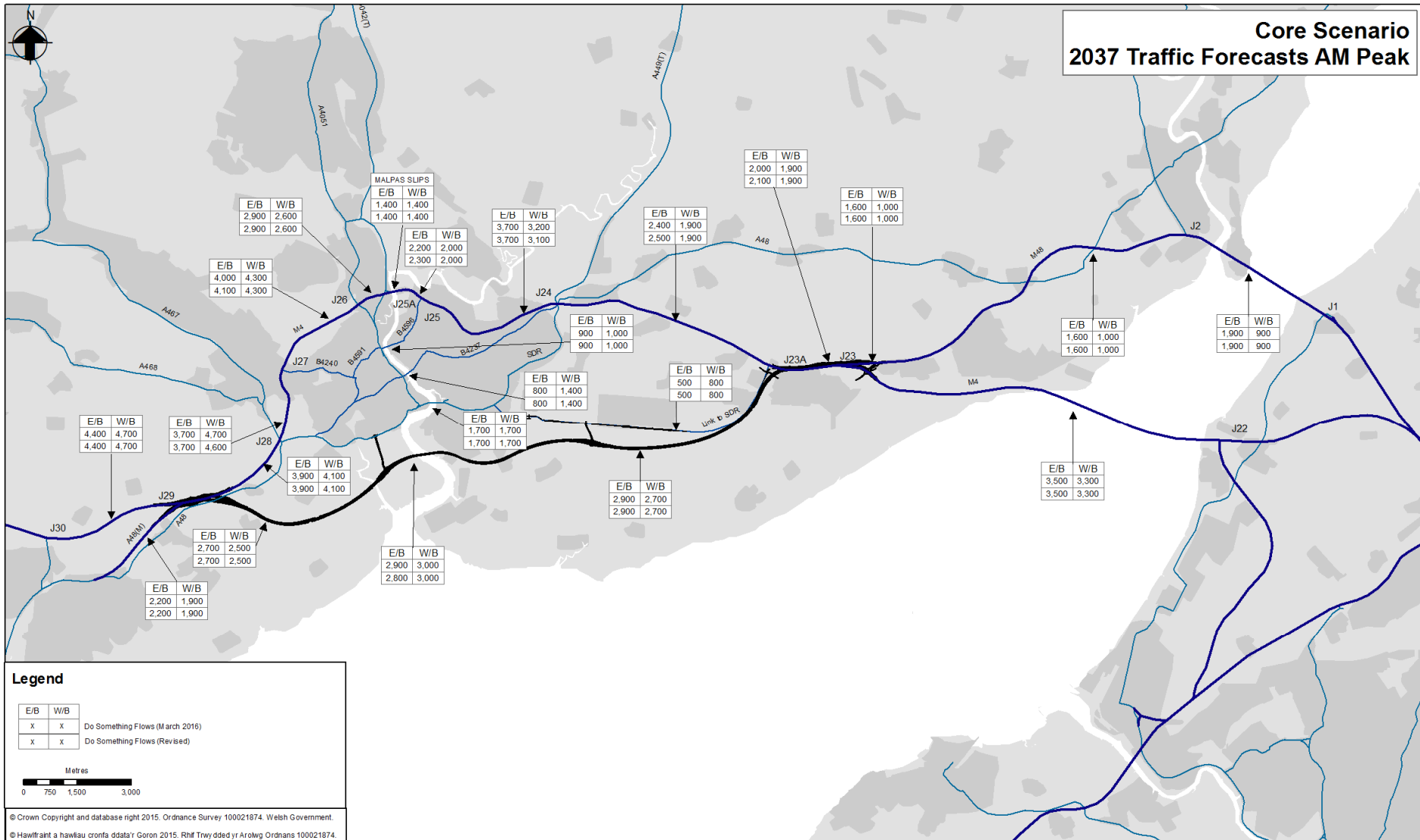


Figure 3.5: 2037 Forecast AM Peak Hour Traffic Flows, Core Scenario

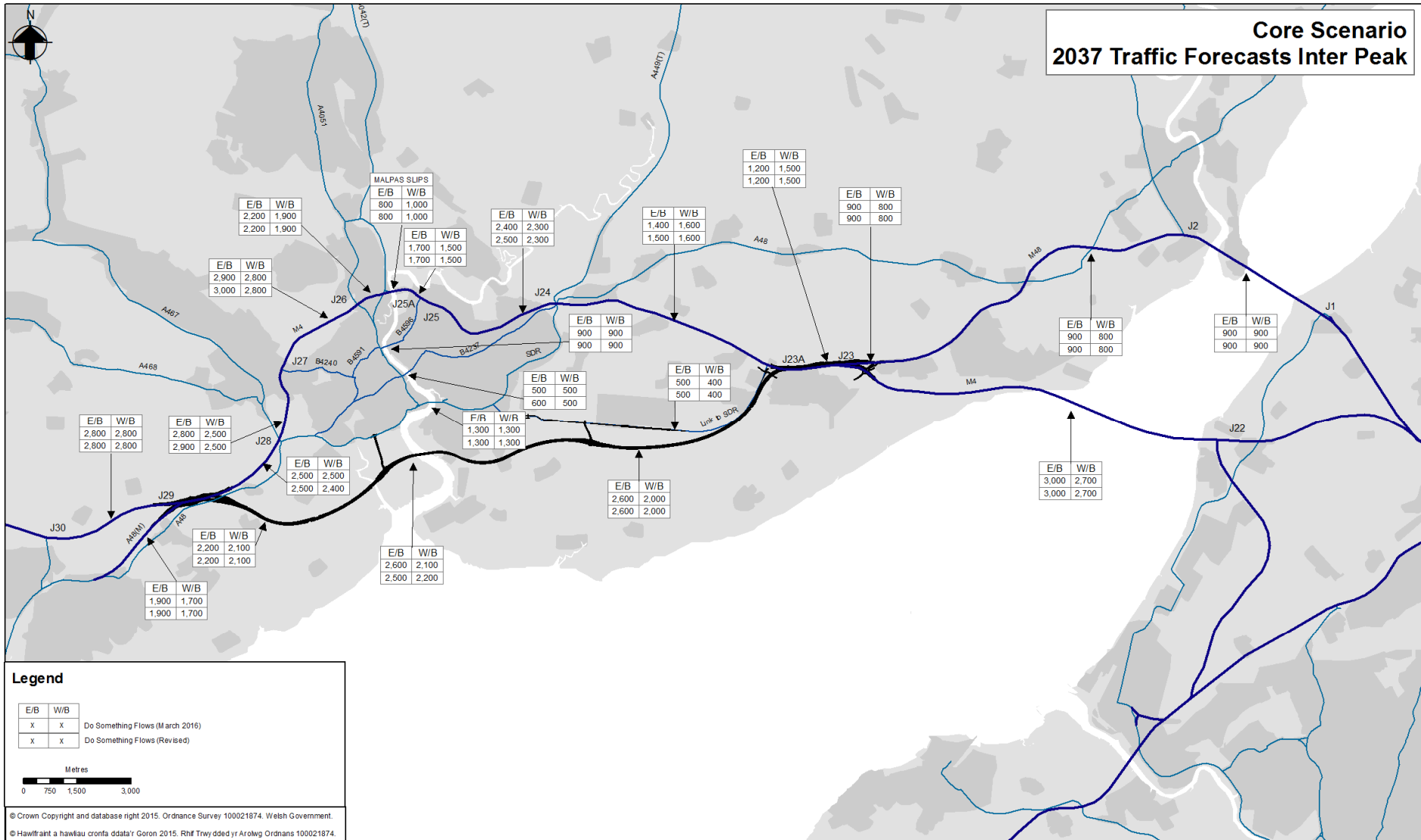


Figure 3.6: 2037 Forecast Inter-Peak Hour Traffic Flows, Core Scenario

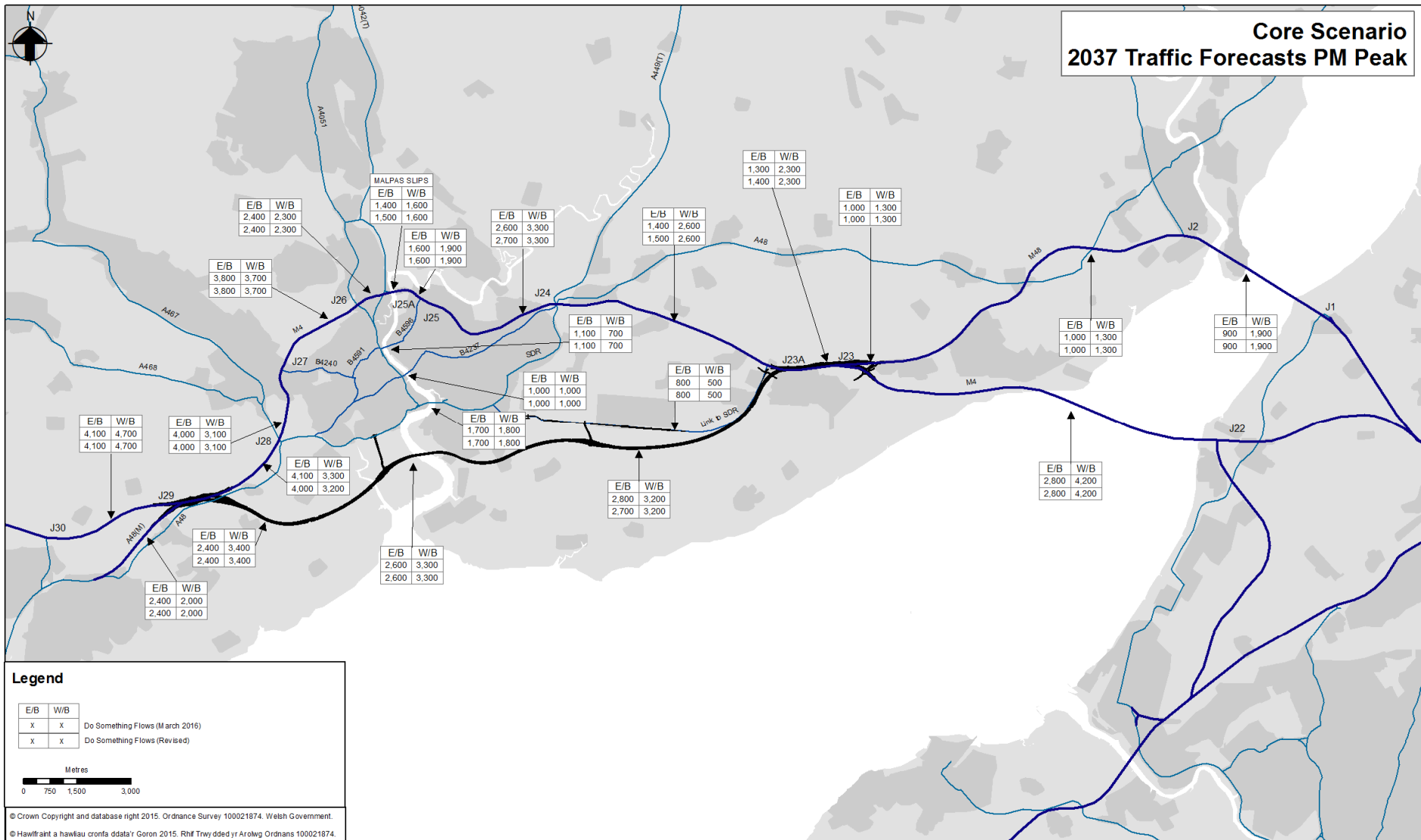


Figure 3.7: 2037 Forecast PM Peak Hour Traffic Flows, Core Scenario

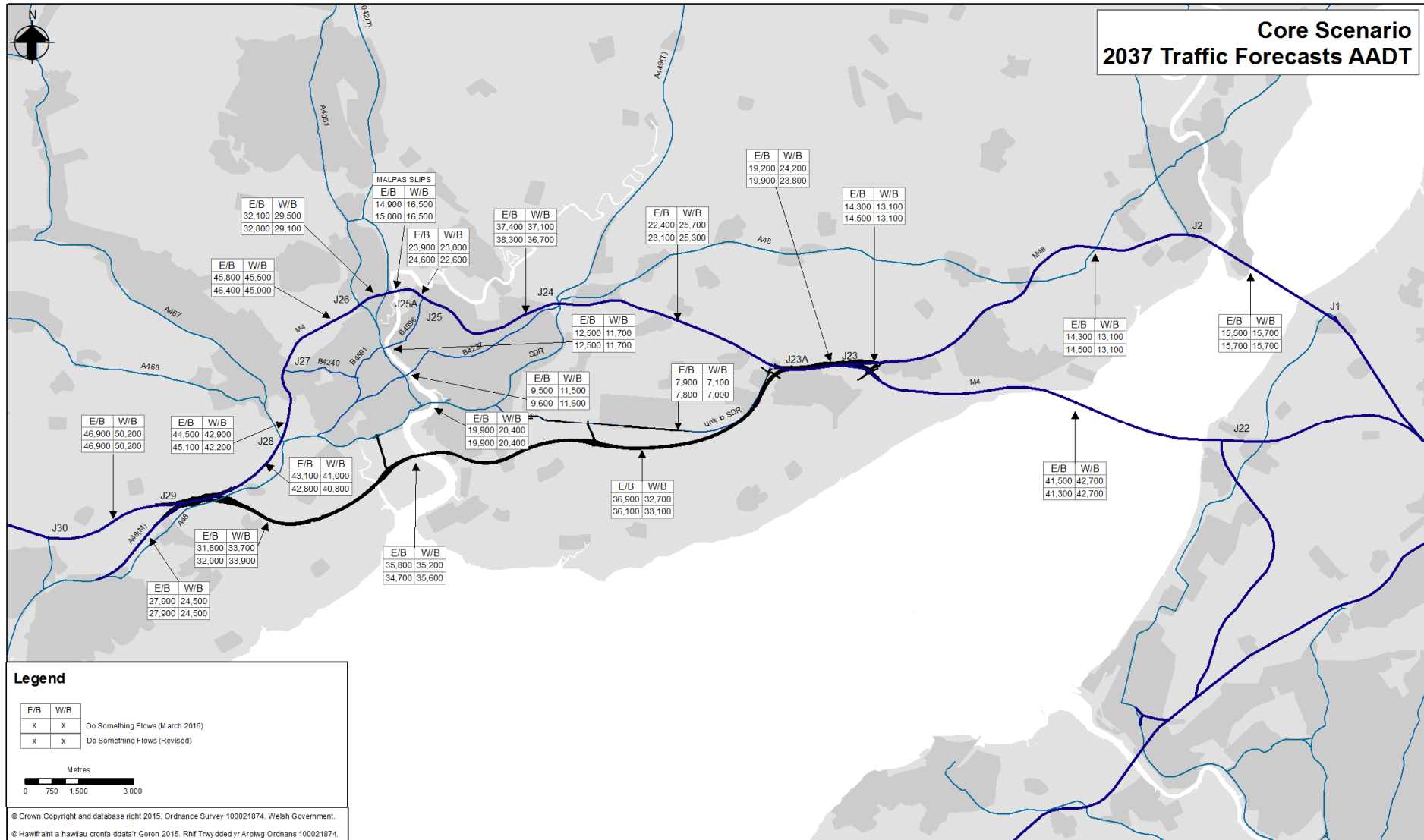


Figure 3.8: 2037 Forecast Annual Average Daily Traffic Flows, Core Scenario