Appraisal Framework Module 4.
Surface Access: Freight Impacts Study

AIRPORTS COMMISSION

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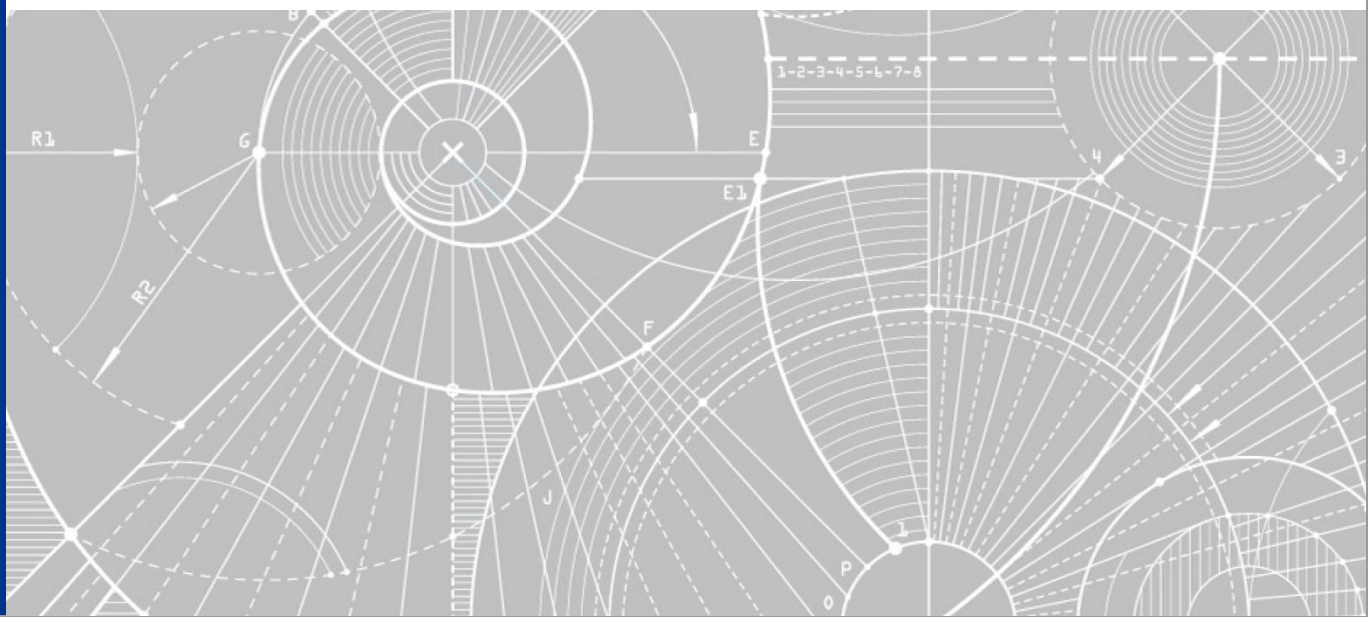

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Contents

1. Introduction

1.1 Background

1.1.1 The Airports Commission (AC) was established in 2012 by the UK Government to examine the need for additional UK airport capacity and to recommend how any additional capacity requirements can be met in the short, medium, and long-term. The AC is due to submit a Final Report to the UK Government by the summer of 2015, assessing the environmental, economic and social costs and benefits of various solutions to increase airport capacity, considering operational, commercial and technical viability.

1.1.2 Shortly after its inception, the AC issued tenders for support contracts to engage independent technical advice on a range of aspects of the Commission's work. Jacobs, together with sub-consultants Leigh Fisher and Bickerdike Allen Partners were appointed as the sole supplier on the Airport Operations, Logistics and Engineering Support Contract (ref: RM1082), which runs throughout the AC's lifespan up until the summer of 2015.

1.1.3 A key milestone in the Commission's operational life was the delivery in December 2013 of an Interim Report. Following a general call for evidence, the Interim Report detailed the results of analysis of the capacity implications of forecast growth in UK aviation demand and a preliminary appraisal on a long-list of proposals put forward by scheme promoters to address the UK's long-term aviation connectivity and capacity needs. The associated appraisal process identified three short-listed options, two focussed on expanding Heathrow Airport and one on expanding Gatwick. These options were then subsequently further developed and appraised as part of an assessment that was published for consultation in November 2014.

1.1.4 The pre-consultation assessment of surface access constituted a static appraisal using spreadsheet-based demand forecasting models, which were developed primarily to assess the surface transport capacity implications of each expansion option. Following feedback from the Commission's surface access stakeholders (the Department for Transport (DfT), the Highways Agency (HA), Network Rail (NR), and Transport for London (TfL)), further assessment of the surface access implications of the three expansion options was undertaken during the consultation period from November 2014 to January 2015.

1.1.5 This assessment focussed specifically on three key aims:

- Undertaking further sensitivity-testing of the spreadsheet-based models to determine the impact of key variables on airport-related surface access demand, notably incorporating trip distribution forecasts from the DfT's National Air Passenger Allocation Model (NAPAM);
- Providing a more detailed dynamic assessment using network-based models of the capacity and level-of-service implications of airport expansion associated with each short-listed option; and
- Providing traffic forecasts compatible with the requirements of the air quality assessment that will be undertaken as a part of a separate environmental work-stream.

1.1.6 The ultimate aim of the study was to provide further guidance to the Commission on the feasibility of, and likely surface transport issues associated with each expansion option. The findings of this analysis were reported to the AC at the end of January 2015.

1.2 Public Consultation

1.2.1 On the 3rd February 2015 the Phase 2 consultation ended after a period of 12 weeks. In this time the Commission received approximately 75,000 responses on the three short-listed options for expansion at Heathrow and Gatwick. The sources of the responses were wide-ranging and included (but were not limited to) members of the public, businesses, scheme promotors, local government and campaign

groups. The consultation covered a broad spectrum of issues relating to potential expansion at Heathrow and Gatwick, including surface access provision.

1.2.2 Following an initial review of the consultation responses by the Commission, Jacobs were provided with responses from the consultees listed in **Table 1-1**. The Commission's Secretariat considered that these responses raised issues whose technical complexity did not allow all of their points to be addressed without support from Jacobs. A review of the responses by Jacobs identified approximately 600 comments relating to surface access.

Table 1-1: Reviewed Consultee Responses

Consultee
Buckinghamshire County Council
Charlwood Parish Council
Crawley Borough Council
East Sussex County Council
easyJet
Fiona Mactaggart MP
Gatwick Area Conservation Campaign
Gatwick Airport Limited
Haywards Heath Town Council
Heathrow Airport Limited
Heathrow Hub Limited
Horsham District Council
Hounslow Council
Independent Transport Commission
Kent County Council
Mid Sussex District Council
Network Rail
Reigate & Banstead Borough Council
Richmond Heathrow Campaign
Royal Borough of Kensington & Chelsea
Royal Borough of Windsor & Maidenhead
Slough Borough Council
Surrey County Council
Tandridge District Council
Transport for London
Virgin Atlantic
West Sussex County Council

1.2.3 Each of the comments were recorded and categorised by their content. This approach allowed for the identification of recurring themes within the comments and made it possible to understand some of the key areas of concern held by the consultees. The approach informed the need for any additional analysis that would be required to support earlier phases of work such that the issues raised by the consultees could be suitably addressed.

1.2.4 Following an initial review of the surface access comments the AC identified four areas of additional analysis. These were as follows:

1. **Road Freight Impacts;**
2. Network Resilience;
3. Demand Management; and
4. Strategic & Local Road Impacts.

1.2.5 This report focuses on the first area of additional analysis and will provide advice to the Commission on the likely impact of additional freight traffic.

2. Freight modelling methodology

2.1.1 All analysis of freight impacts has been undertaken using the existing Transport for London (TfL) Saturn highway assignment models (HAM) of London which encompass Heathrow and Gatwick airports. These models, provided by TfL to Jacobs for use on this project, formed the basis of the post consultation highway access analysis.

2.1.2 Traffic demand within these models is segmented into user classes representing different trip purposes and vehicle types. Freight demand is segmented into two user classes:

- Light Good Vehicles (LGV);
- Other Good Vehicles (OGV).

2.1.3 For simplicity purposes, LGV and OGV user classes are considered as a single goods vehicle user class in all analysis.

2.1.4 Forecasting of freight demand is a challenging and complex task. The factors for which freight demand is sensitive to; industrial and commercial activity, placement of warehousing and distribution facilities and the operational strategies of transport companies are difficult to accurately predict in the medium and long term. As such, a first principles approach based on numerous assumptions with a high degree of uncertainty has not been adopted to forecast freight demand following airport expansion.

2.1.5 Rather, a method assuming growth in airport passenger traffic as a proxy for freight traffic growth has been adopted. Based on this assumption, 2030 airport expansion scenario good vehicle demand has been calculated by multiplying 2030 baseline airport freight demand (previously forecasted by TfL during development of the HAM models) by the relative increase in air passenger volume between baseline and expansion scenarios. No changes to the distribution of forecast freight demand have been made.

2.1.6 This simplified method is considered reasonable and robust for the following reasons:

- The TfL HAM models have been well calibrated to observed conditions and the forecast matrices developed based on the best information currently available regarding future development and infrastructure in the greater London area. As such, without a compelling basis, there is no reason to deviate from the HAM model 2030 freight distribution.
- Belly hold freight capacity at an airport is intrinsically linked to the volume of air traffic, which itself is dependent on passenger numbers. Therefore, it is reasonable assume that highway freight demand to and from a primarily commercial passenger airport will be linked to passenger activity at that airport.

2.1.7 At Gatwick, two alternative scenarios have been considered.

- Scenario (A) growth existing logistics (and cargo) freight demand increases by the increase in total mppa from current levels to 2030
- Scenario (B) growth existing logistics demand by the increase in total mppa from current levels to 2030 and growth future cargo demand taking into account the likely increase in long haul passenger forecasts in 2030.

Scenario (A) is consistent with the central case at Heathrow, where future freight growth is based on the increase in total passenger per annum. However, scenario (B) is considered to be more realistic and is based on the assumption that long haul routes (and underlying passenger demand) drive cargo growth.

3. Summary of consultation responses concerning freight

3.1.1 From all consultation response documents provided, Jacobs have identified a total of 15 comments specifically relating to the Airport Commissions analysis of highway freight. For reference, these comments have been included in their entirety in Appendix A.

3.1.2 Comments were received from TfL, Gatwick Airport Limited and a number of local councils surrounding Heathrow and Gatwick Airport.

3.1.3 In general, the most common comment across all responses was that the Airports Commission surface access assessment did not include sufficiently detailed analysis of freight demand and its likely impact to the road network surrounding Heathrow and Gatwick airports.

3.1.4 Additionally, two further common concerns have been identified:

1. Lorries waiting to access Heathrow Airport commonly wait overnight in undesignated areas on the A4 or surrounding residential streets in Slough resulting in anti-social behaviour.

2. The suggestion that freight demand to an expanded Gatwick airport is likely to be modest based on the level existing demand does not take into account the potential changes in the airports strategic role over the long term. An alternative scenario has been considered, where cargo is driven by growth in long haul passenger numbers, increasing total demand.

4. Definition of highway assignment model terms

4.1.1 Some key highway assignment modelling terms related to the HAM outputs and used in the following analysis are defined as follows:

- *Volume over capacity (V/C) ratios* – drawing from a large body of empirical research, the theoretical traffic capacity per lane for a particular stretch of road can be estimated based on the standard of design, speed limit and a number of additional environmental considerations. The capacities within the WeLHAM model are derived from TfL's coding manual, which take into account such criteria. V/C is a ratio representing the degree of saturation of a particular stretch of road, with values closer to 0 representing free flow conditions and values approaching or greater than 1 indicating high levels of congestion. Observations on many roads have shown that delay increases sharply at V/C ratios of above 0.85, and that severe delays occur at V/C ratios of above 1.00. Two V/C ratios can be output from the model: the *demand flow/capacity ratio*, which compares the unconstrained flow with the link capacity, and the *actual flow/capacity ratio*, which compares the traffic flow feasibly able to get through the link with the link capacity;
- *Select link* analysis[1] *(SLA)* - this is a useful modelling tool, which identifies the 'paths' of all trips using a particular link. Thus, for example, a SLA on the access roads to Heathrow Airport will identify not only the origins and destinations of trips using that link, but also the routing of those trips.

[1] Select link analysis provides insight into vehicle routing to and from a particular location by summing volumes along the travel route for all trips passing through the location.

5. Freight impact analysis – Heathrow North West Runway

5.1 Scheme freight improvements

5.1.1 Currently, available information on changes to freight infrastructure and operations proposed under the Heathrow North West Runway (HNWR) scheme is high level and largely conceptual. The bulk of information is provided in the report *Taking Britain Further* (Heathrow Airport Limited, 2014), with very limited information shown on the design plans.

5.1.2 As part of the HNWR scheme, the following improvements to freight infrastructure are proposed:

- Development of a new cargo consolidation centre, with a potential connection to the rail network. Other than a passing mention, no details of the consolidation centre are provided, for example its location, size and connection to the road network. (Taking Britain Further, Volume 1, p. 28);
- A modest expansion and re-planning of the existing cargo area located adjacent to the southern perimeter road (Taking Britain Further, Volume 1, p. 193); and
- Following terminal 4 reaching end of life, the existing cargo area would be further expanded into the land currently taken up by terminal 4. It is suggested by Heathrow Airport Limited that freight forwarding and warehousing facilities could be developed in this area, potentially removing goods vehicle movements for the local road network. However, no analysis is provided in support of this. Additionally, no timeframe is given for terminal 4 reaching end of life, though it is expected that it would be beyond the 2030 forecast year adopted for surface access analysis (Taking Britain Further, Volume 1, p. 202).

5.1.3 The following improvements to freight operations are proposed:

- Introduction of a vehicle booking system to support backfilling vehicles, allowing more vehicles carry loads in both directions (Taking Britain Further, Volume 1, p. 208);
- A reduction of freight shuttle trips due to increased airside cargo capacity (Taking Britain Further, Volume 1, p. 209);
- Re-timing of deliveries to take place during quieter periods (Taking Britain Further, Volume 1, p. 209);
- Developing agreed routing patterns with freight operators (Taking Britain Further, Volume 1, p. 224); and
- Potential introduction of a congestion charge for freight vehicles (Taking Britain Further, Volume 1, p. 224).

Assessment of likely scheme impacts

5.1.4 Due to the difficulty of accurately forecasting changes in freight demand due to infrastructure or operational changes and the limited detail provided by the scheme promoter, a quantitative analysis of the HNWR proposals relating to highway freight is beyond the scope of this document. However, a brief qualitative assessment of the likely outcome has been undertaken.

5.1.5 Based on the information available, it is considered most likely surface freight scenario for the HNWR scheme would be expansion of the existing cargo area into Terminal 4 and adoption of all proposed operational improvements. The following qualitative assessment has been undertaken on this basis.

5.1.6 Given that it is not proposed to move the existing Heathrow Airport cargo area or substantially alter its connection to the external road network, it is unlikely that the general pattern of freight movements to and from Heathrow will meaningfully change (aside from changes to local routing forced by new highway infrastructure) following expansion of the airport. An expanded cargo area could potentially reduce reliance on warehousing facilities external to Heathrow and in turn reduce the volume of freight shuttle trips. However, since exiting external warehouse facilities appear to be located in close proximity to the Heathrow Cargo area, the benefit of reduced shuttle trips would be limited to the local road network, particularly Bedfond Road and Stanwell Road.

5.1.7 Assuming there is currently a non-insignificant proportion of HGV's either arriving or departing Heathrow without a full load, it seems reasonable to conclude that the proposed operational changes aimed at increasing HGV load capacity utilisation (booking system, congestion charges) will result in a reduction of HGV trips per tonne of freight.

5.1.8 However, the level of freight traffic reduction these proposed operational changes can result in is ultimately limited by the maximum load capacity of heavy goods vehicles. As it is unlikely that longer heavy vehicles with increased gross mass limits will be allowed on UK roads within the foreseeable future, without a substantial mode shift to rail, once vehicle capacity utilisation reaches its feasible maximum, highway freight traffic to and from Heathrow Airport will grow in line with total freight tonnage.

5.1.9 Heathrow related goods vehicle trips contribute a substantial proportion to total traffic on the strategic road network surrounding the Airport. As such, if a delivery re-timing policy is able to move a share of peak period goods vehicle trips into the inter-peak and off-peak periods, it may be effective in mitigating some of the traffic capacity impacts arising from increased freight volumes. However, the strategic roads surrounding Heathrow Airport are among the busiest in the UK and with limited scope for mainline widening, it is likely that as travel demand increases, peak spreading will occur. This will reduce the duration of inter-peak and off peak periods and depending on freight scheduling requirements, may limit the extent to which operators can time deliveries outside of traffic peaks.

5.1.10 Agreed freight routing patterns which remove HGVs from inappropriate roads would be a positive development in terms of local area amenity impacts, and may address local council concerns regarding increased freight traffic volumes through their constituency.

Summary of assessment

5.1.11 In general, the infrastructure and operational approach proposed by Heathrow Airport Limited to manage highway freight activity at an expanded Heathrow Airport does not represent a large departure from the existing situation. The proposed cargo area expansion will likely result in reduced freight shuttle trips, though the benefit of this would largely be constrained to a small number of local roads.

5.1.12 Operational policies aimed at reducing freight trips and shifting freight activity outside of peak periods will likely go some way to mitigating the traffic impacts of increased freight tonnage at Heathrow Airport. However, the extent to which these policies can have the desired effect is limited and without a major shift in delivery mode, it is inevitable that past a certain point, freight traffic will increase in line with freight tonnage.

5.2 Forecast year freight demand

5.2.1 Goods vehicle demand growth between the HNWR and Extended Base Line (EBL) scenarios across all time periods is summarised in Table 5-1. Under the Carbon-Traded Global Growth passenger forecast scenario, passenger volume is forecast to grow by 37.7 mppa to 125.2 mppa between the EBL and HNWR scenarios. Due to growth in freight demand being directly linked to mppa, the percentage growth in goods vehicles is identical across all time periods and travel directions.

Table 5-1: Predicted 2030 goods vehicle demand (veh/hr), HNWR

User class	To Airport			From Airport		
	AM	IP	PM	AM	IP	PM
Extended Baseline						
OGV	387	224	127	269	297	162
LGV	755	598	599	551	544	751
Total	**1122**	**822**	**726**	**820**	**481**	**913**
Heathrow North West Runway						
OGV	554	321	182	385	425	232
LGV	1,080	855	858	789	779	1,075
Total	**1634**	**1176**	**1040**	**1174**	**1204**	**1307**
Difference						
OGV	+ 167	+ 97	+ 55	+ 116	+ 128	+ 70
LGV	+ 325	+ 257	+ 259	+ 238	+ 235	+ 324
Total	**+ 492**	**+ 354**	**+ 314**	**+ 354**	**+ 363**	**+ 394**
% Growth	**43%**					

5.3 Freight assignment and review of performance

5.3.1 Based on results from the WelHAM model runs previously completed as part of the post consultation surface access work, a detailed review of HNWR scheme impact on goods vehicle volumes and routing has been undertaken.

5.3.2 A full set of figures supporting this review, covering all time periods (AM peak, Interpeak and PM peak) are included in Appendix B, while AM peak period only figures are presented and discussed below. In general, the patterns observed for the AM peak are present across all time periods. These figures cover the following:

- Goods vehicle actual flow difference between EBL and HNWR scenarios;
- Difference in goods vehicle contribution to link v/c ratio between EBL and HRWR scenarios. These plots illustrate the actual capacity impact of changes to good vehicle volumes. For instance, an increase of goods vehicles on a large motorway may have negligible impact, whereas the same increase on a small local road could result in substantially worsened traffic conditions; and
- SLA routing of good vehicle traffic travelling to and from Heathrow Airport (HNWR scenario).

5.3.3 Figures for actual flow and v/c difference have each been split into two plots, separately showing strategic roads and local roads. For this purpose, strategic roads have been defined as Motorway and A roads, while local roads are all other roads.

5.3.4 **Figure 5-1 to Figure 5-6** below present actual flow difference, v/c ratio difference and select link analysis of goods vehicle traffic for the AM peak hour.

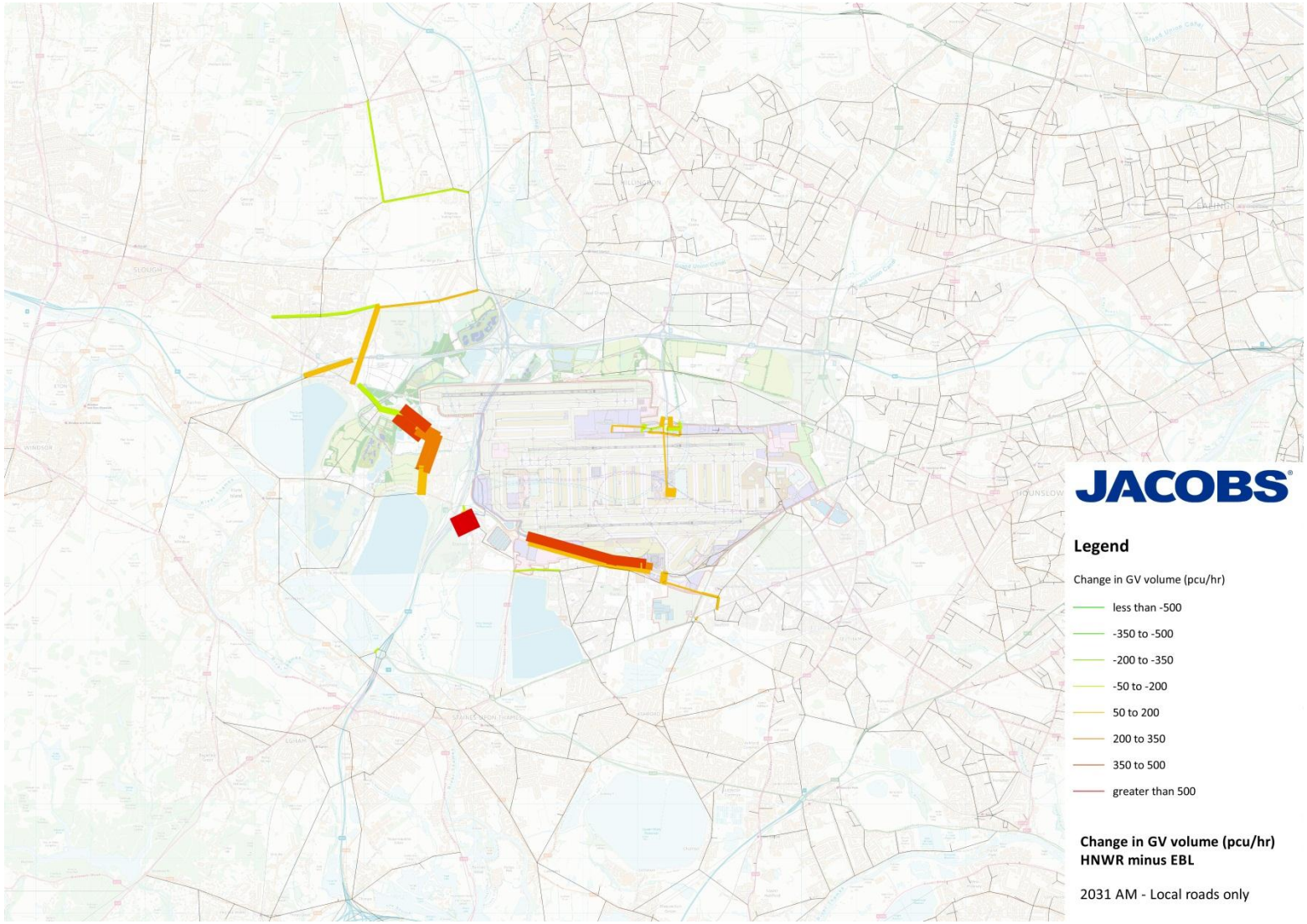


Figure 5-1: 2031 AM change in GV volume – local roads only

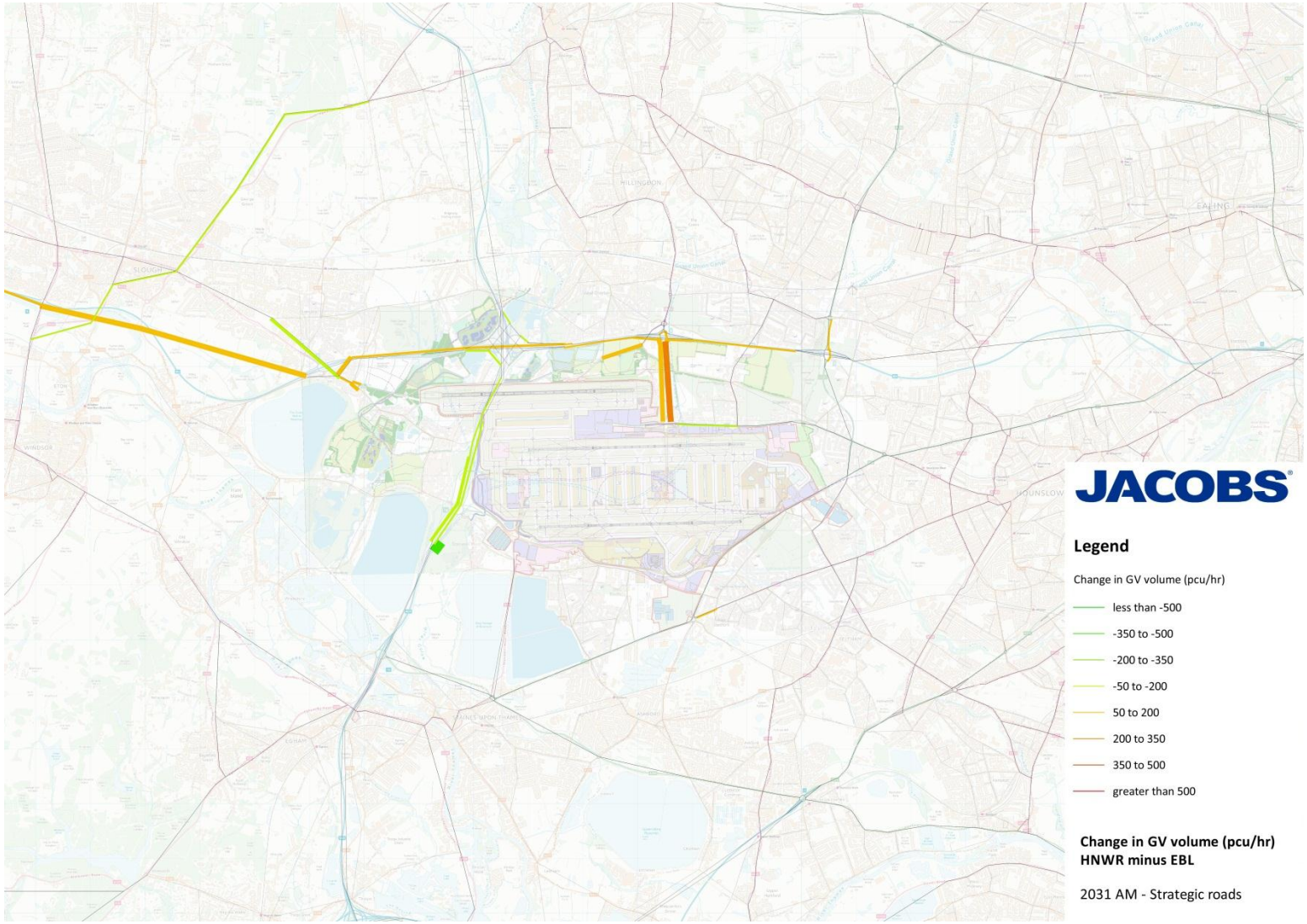


Figure 5-2: 2031 AM change in GV volume – strategic roads only

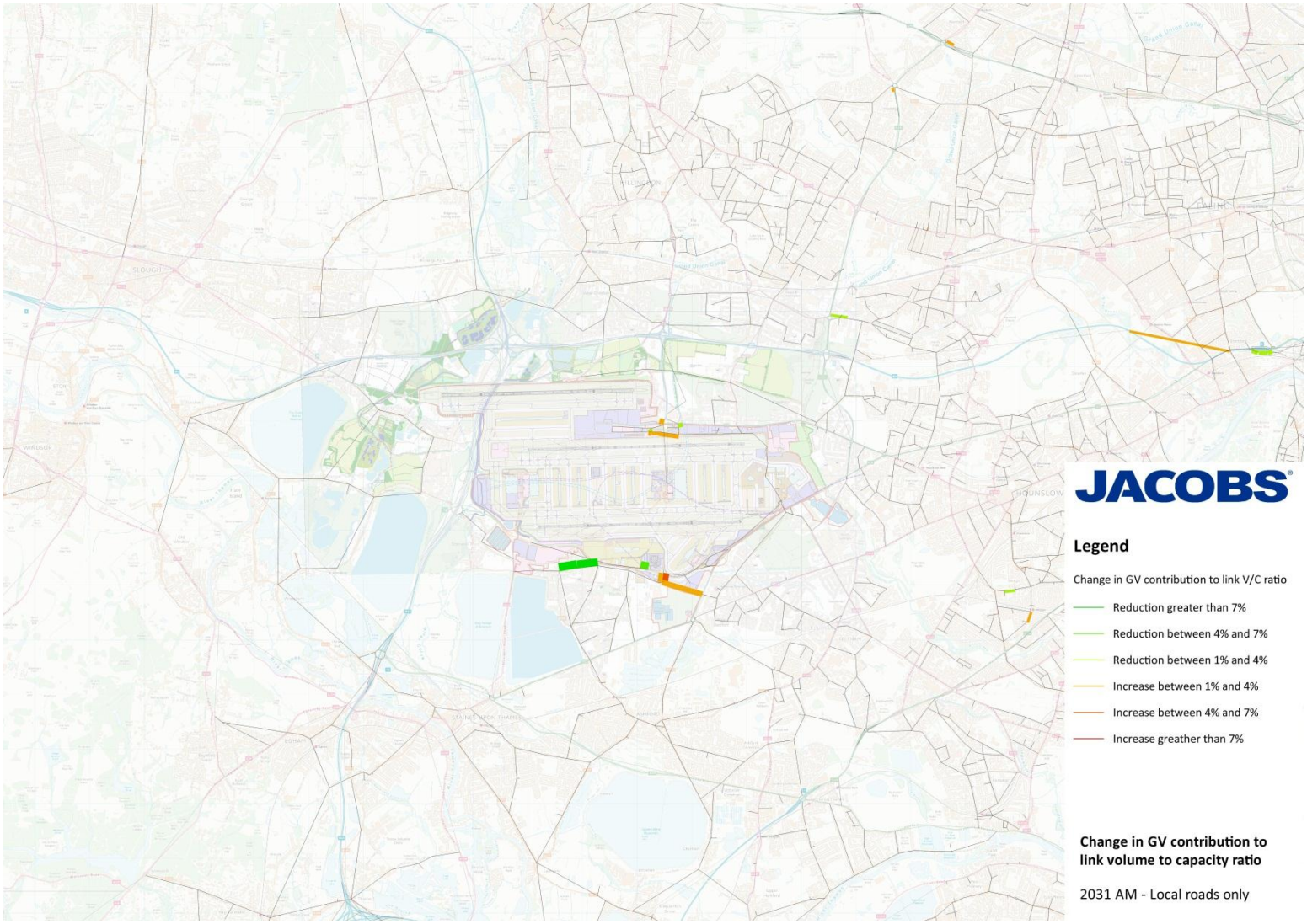


Figure 5-3: 2031 AM change GV contribution to capacity utilisation – local roads only

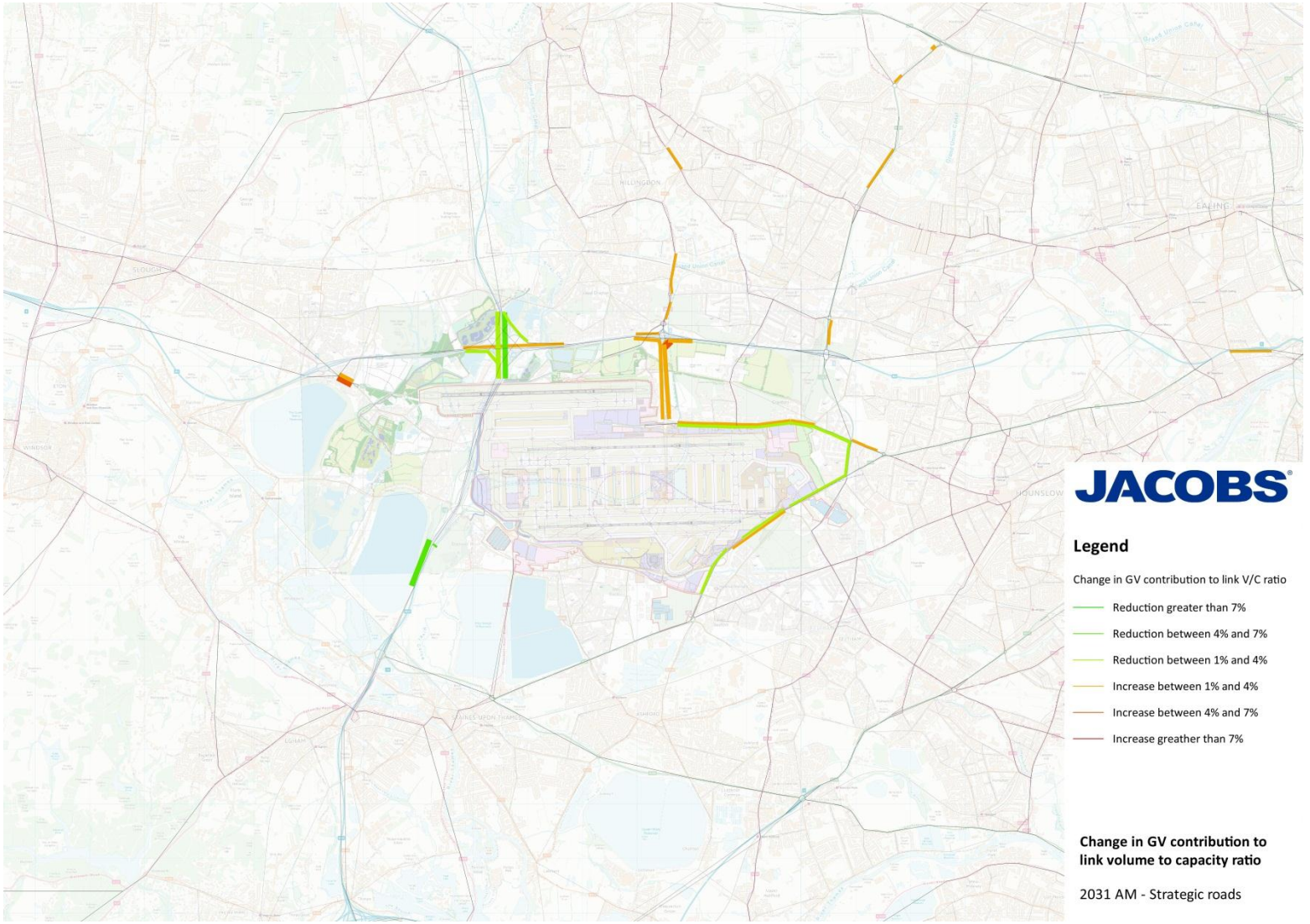


Figure 5-4: 2031 AM change GV contribution to capacity utilisation – strategic roads only

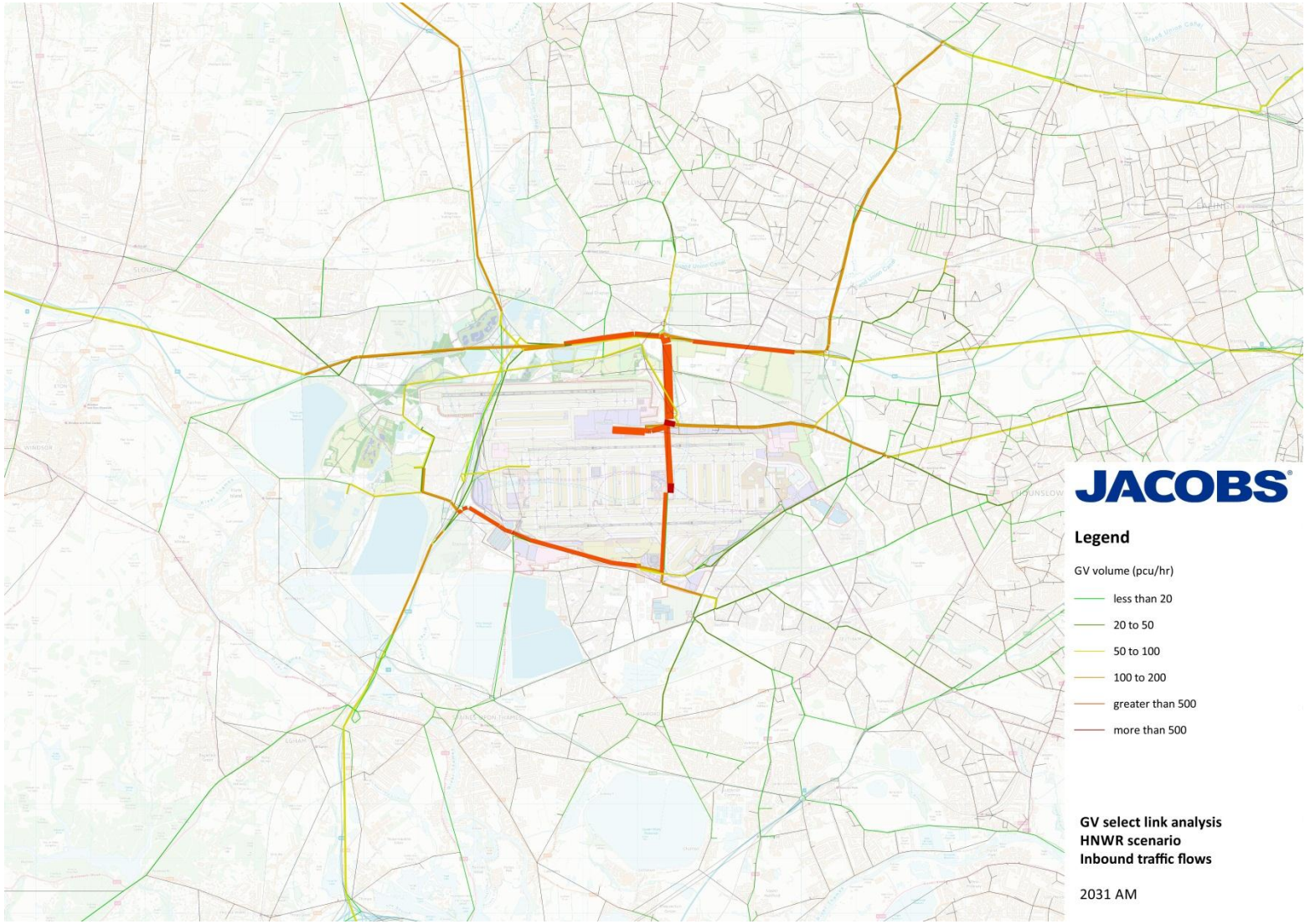


Figure 5-5: 2031 AM GV select link analysis – Airport inbound traffic

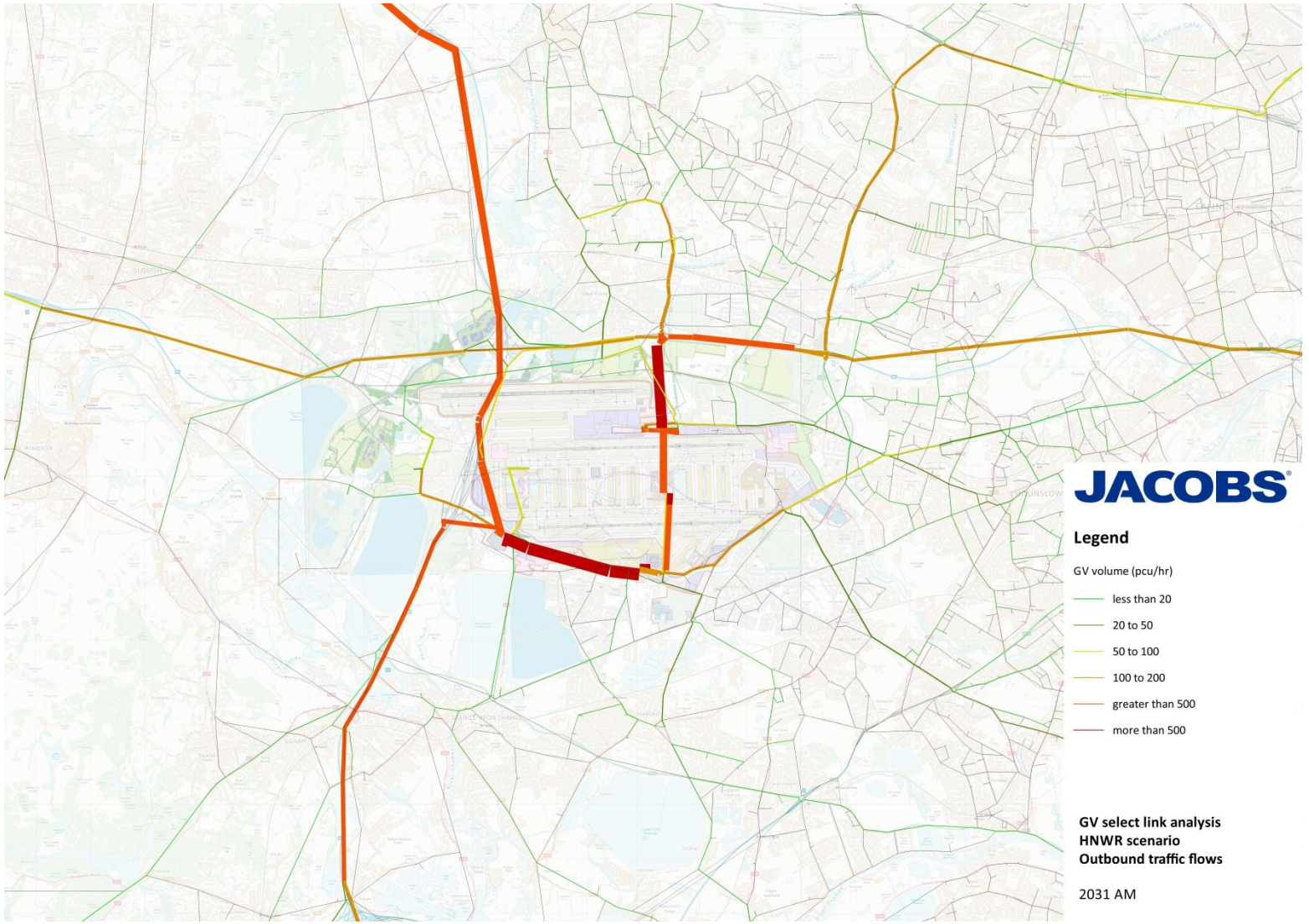


Figure 5-6: 2031 AM GV select link analysis – Airport outbound traffic

5.3.5 A summary of our analysis of these figures is as follows:

Change to goods vehicle flows:

5.3.6 On the local road network, there is a significant increase of good vehicle volumes on the Southern Perimeter Road and Poyle / Bath Road across all time periods (the large increase shown at M25 Junction 14 is a result of vehicles shifting from a small slip road removed as part of the HNWR works to the main junction gyratory). These increases can be attributed to additional connectivity provided by the central terminal area (CTA) southern access tunnel and realignment of the A4. As a result of the realignment, travel from the Poyle and Colnbrook areas to the CTA via the A4 is significantly lengthened, while construction of the southern tunnel provides a new direct route via Poyle / Bath Road and the Southern Perimeter Road. For goods vehicles accessing Heathrow from the south, again the southern tunnel provides a new access route via the southern perimeter road, resulting in further increased volumes on the road.

5.3.7 On the strategic road network, changes in goods vehicle volumes are generally less pronounced. The reduction in volumes on the M25 between Junction 14 and 15 can be attributed to vehicles leaving the M25 at Junction 14 and accessing the airport via the new southern access tunnel. Increased volumes on the M4 spur can be attributed to overall increased goods vehicle demand as a result of the airport expansion. Elsewhere on the strategic network, changes in volume are generally minor and could be attributed to either increased demand, routing changes arising from the revised road network or model noise.

Change in road capacity utilisation due to goods vehicles

5.3.8 Across both the strategic and local road network, changes in goods vehicle contribution to road capacity utilisation generally does not reflect the changes in absolute vehicle volumes as would be intuitively expected. This is due to the differences in assumed capacity between the EBL and HNWR scenarios in a number of locations. Under the HNWR additional lanes were added in a number of locations to address congestion issues, including Poyle Road and the Southern Perimeter Road.

5.3.9 For the local road network, the capacity utilisation analysis shows a significant impact on Beacon Road and Stanwell Road resulting from increased goods vehicle volumes across all time periods. These roads provide a connection between offsite warehousing facilities and the Heathrow cargo area. As such, the increased volume is likely due to the simple increase in total goods vehicle demand.

5.3.10 On the strategic road network, change in capacity utilisation due to goods vehicles is generally minor (between -4% and 4%). This reflects the relatively small scale of goods vehicle volume fluctuations compared with the high capacity of the strategic road network.

Goods vehicle routing

5.3.11 In general, the SLA figures show that for travel to and from Heathrow Airport under the HNWR scheme, excluding airport distribution roads (Southern Perimeter, CTA access), goods vehicles largely use the motorway (M4, M25) and A road (A30, A312, A40, A408) network. On the local road network, goods vehicle flows are generally less than 20 pcu/hr. Notable exceptions to this are Poyle Road and Stanwell Road, where goods vehicle volumes are substantially higher, in the range of 100-200 pcu/hr.

5.4 Summary

5.4.1 Based on the HNWR scheme documentation available to Jacobs, it is expected that the most likely freight infrastructure and operational scenario under the scheme will involve expansion of the existing Heathrow cargo area and implementation of a number of policies aimed at improving freight vehicle utilisation and moving freight activity away from peak traffic periods. Under this scenario, it is expected that highway based freight activity will continue largely as existing, and while the proposed operational

policies will assist in reducing vehicle movements per freight tonne, once operational efficiency reaches a feasible maximum, highway freight traffic will continue to grow in line with freight tonnage.

5.4.2 Under the HNWR scenario, it is estimated that total goods vehicle traffic demand will be 43% larger, compared with this EBL scenario. This is based on the assumption that freight demand will grow linearly in line with airport passenger growth.

5.4.3 Using results from the WelHAM model runs completed as part of the post consultation surface access work, detailed analysis of traffic impact due to freight demand growth has been undertaken. In general, the analysis shows that under the HNWR scenario, goods vehicle traffic is largely contained to the strategic road network and the increased volume has minimal capacity impact (contributing only between 1% and 4% of road capacity utilisation in most cases). On the local road network, goods vehicle traffic is substantially increased in two key areas; Poyle / Bath Road and the Southern Perimeter Road. Due to additional road capacity introduced at these locations as part of the HNWR scheme, the increased goods vehicle traffic does not have a significant capacity impact. However, given the area through which Poyle and Bath Road run through is mostly residential, the increased goods vehicle volumes may have a significant amenity impact.

6. Freight impact analysis – Heathrow Extended Northern Runway

6.1 Scheme freight improvements

6.1.1 Information on planned freight infrastructure and operational changes under the Heathrow Extended Northern Runway (HENR) scheme is limited. No information relating to surface freight is provided on the concept design plans and only minimal information is presented in the surface access report.

6.1.2 Based on the documentation provided to Jacobs, it appears that the only proposed operational or infrastructure improvements relating to freight under the HENR scheme is the potential construction of an intermodal freight interchange making use of the existing Colnbrook branch railway line (Airports Commission HH/RIL Updated Scheme Design – Surface Access, p. 32).However, other than mentioning the interchange as a possibility, no further details or analysis is provided.

Assessment of likely scheme impacts

6.1.3 Due to the difficulty of accurately forecasting changes in freight demand due to infrastructure or operational changes and the limited detail provided by the scheme promoter, a quantitative analysis of the HENR proposals relating to freight is beyond the scope of this document. However, a brief qualitative assessment of the likely outcome has been undertaken.

6.1.4 Based on the information available, it is considered the most likely surface freight scenario under the HENR scheme would largely mirror the existing situation. Given the lack of detail supplied for the intermodal freight interchange and the major operational shift which would be required for it meaningfully impact road based freight, the facility is considered unlikely to be completed, except in the very long term.

6.1.5 Although not specifically described in the scheme documentation, there is no reason why the freight operations improvements proposed for the HNWR scheme could not be adopted for the HENR scheme. If the HENR scheme were to proceed, it is considered likely that similar operational policies would be adopted in order to mitigate the impact of increased freight tonnage. The following qualitative assessment has been undertaken on this basis.

6.1.6 Similar to the HNWR scheme, as it is not proposed to move the existing Heathrow Airport cargo area or substantially alter its connection to the external road network, it is unlikely that the general pattern of freight movements to and from Heathrow will meaningfully change (aside from changes to local routing forced by new highway infrastructure) following expansion of the airport.

6.1.7 Assuming the operational policies proposed for HNWR are adopted for HENR, it is expected their effect would be the same. Without a substantial mode shift, once vehicle loading efficiency reaches a practical maximum, freight traffic will grow in line with freight tonnage.

Summary of assessment

6.1.8 The HERN scheme documentation proposes very little in regards to surface freight. Based on this, it is considered that the most likely scenario is freight operations continue largely as existing, with a number of operational changes to improve operational efficiency and shift freight trips from peak periods. Following expansion of the airport, freight traffic will likely remain on existing travel routes and grow in line with increasing freight tonnage.

6.2 Forecast year freight demand

6.2.1 Goods vehicle demand growth between the HENR and EBL scenarios across all time periods is summarised in Table 5-1. Under the Carbon-Traded Global Growth passenger forecast scenario, passenger volume is forecast to grow by 35.7 mppa to 123.1 mppa between the EBL and HENR

scenarios. Due to growth in freight demand being directly linked to MPPA, the percentage growth in, goods vehicle is identical across all time periods and travel directions.

Table 6-1: Predicted 2030 goods vehicle demand (veh/hr), HENR

User class	To Airport			From Airport		
	AM	IP	PM	AM	IP	PM
Extended Baseline						
OGV	387	224	127	269	297	162
LGV	755	598	599	551	544	751
Total	1142	822	726	820	841	913
Northern Runway Extension						
OGV	545	316	179	378	418	228
LGV	1,063	842	844	776	766	1,058
Total	1608	1158	1023	1154	1184	1286
Difference						
OGV	+ 158	+ 92	+ 52	+ 109	+ 121	+ 66
LGV	+ 308	+ 244	+ 245	+ 225	+ 222	+ 307
Total	**+ 466**	**+ 336**	**+ 297**	**+ 334**	**+ 343**	**+ 373**
% Growth	**41%**					

6.3 Assignment and review of performance

6.3.1 Based on results from the WelHAM model runs previously completed as part of the post consultation surface access work, a detailed review of HENR scheme impact on goods vehicle volumes and routing has been undertaken.

6.3.2 A full set of figures supporting this review, covering all time periods (AM peak, Interpeak and PM peak) are included in Appendix B, while AM peak period only figures are presented and discussed below. In general, the patterns observed for the AM peak are present across all time periods. These figures cover the following:

- Goods vehicle actual flow difference between EBL and HENR scenarios;
- Difference in goods vehicle contribution to link v/c ratio between EBL and HENR scenarios. These plots illustrate the actual capacity impact of changes to good vehicle volumes. For instance, an increase of goods vehicles on a large motorway may have negligible impact, whereas the same increase on a small local road could result in substantially worsened traffic conditions; and
- SLA routing of good vehicle traffic travelling to and from Heathrow Airport (HENR scenario).

6.3.3 Figures for actual flow and v/c difference have each been split into two plots, separately showing strategic roads and local roads. For this purpose, strategic roads have been defined as Motorway and A roads, while local roads are all other roads.

6.3.4 **Figure 6-1 to Figure 6-6** below present actual flow difference, v/c ratio difference and select link analysis of goods vehicle traffic for the AM peak hour.

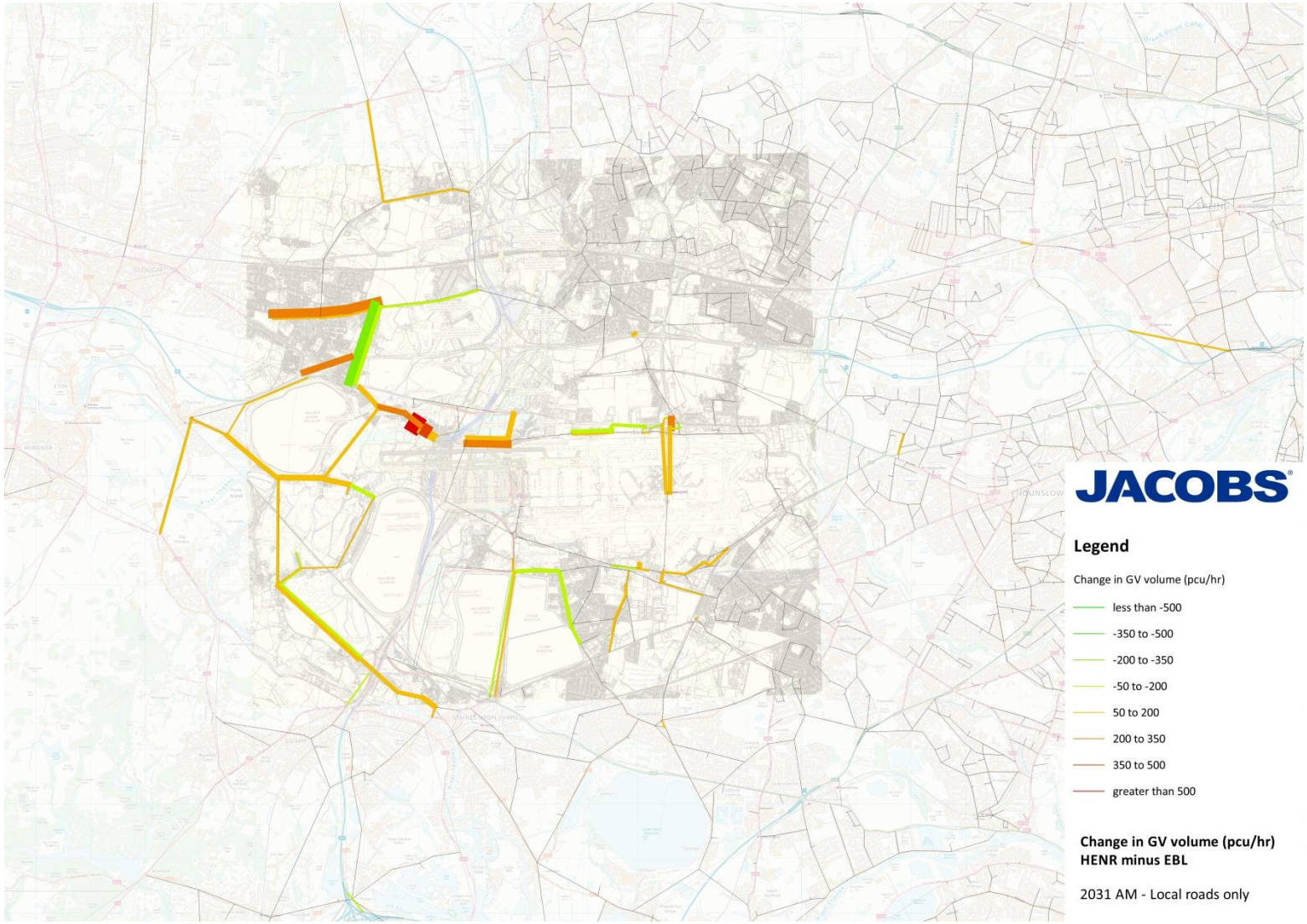


Figure 6-1: 2031 AM change in GV volume – local roads only

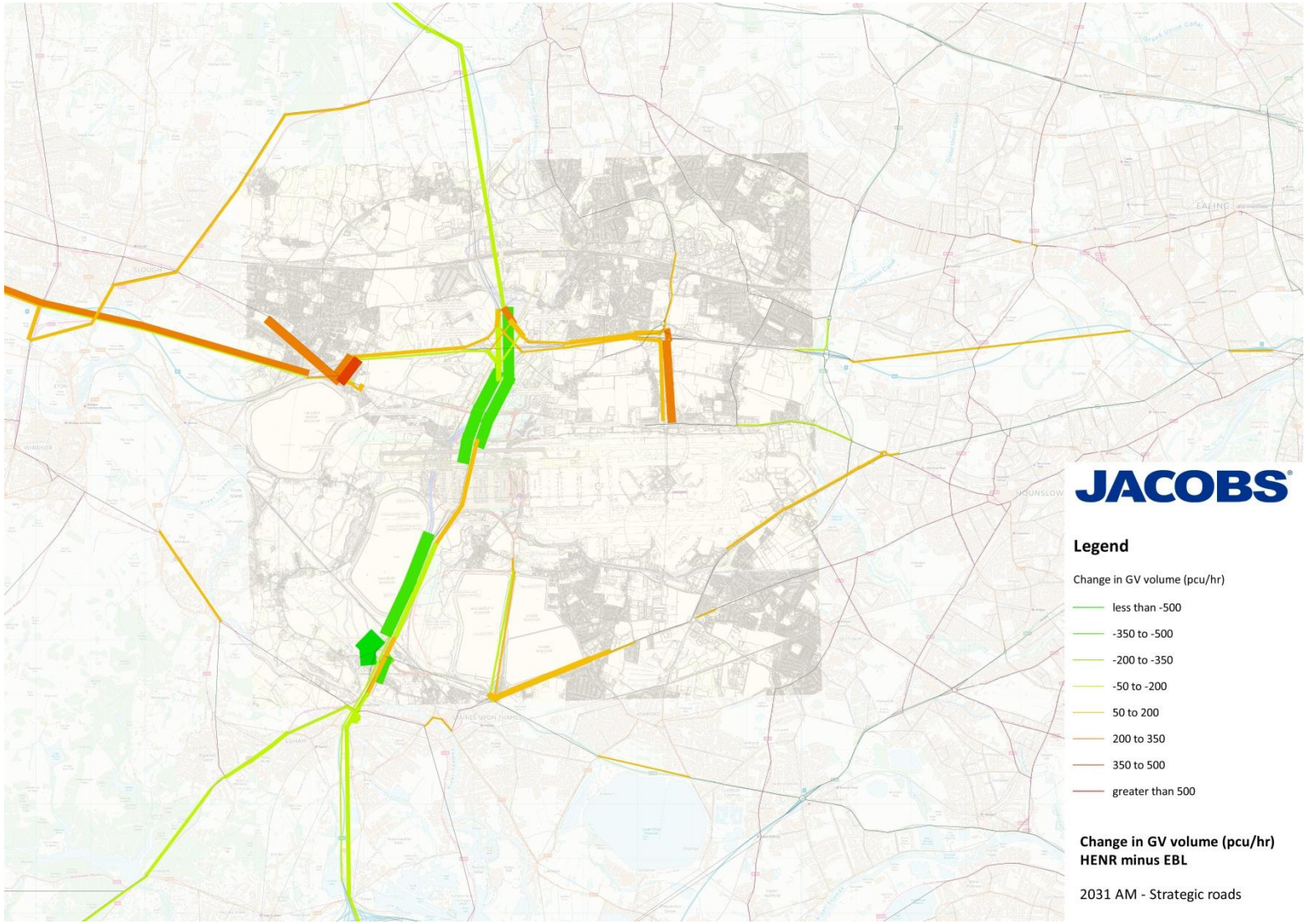


Figure 6-2: 2031 AM change in GV volume – strategic roads only

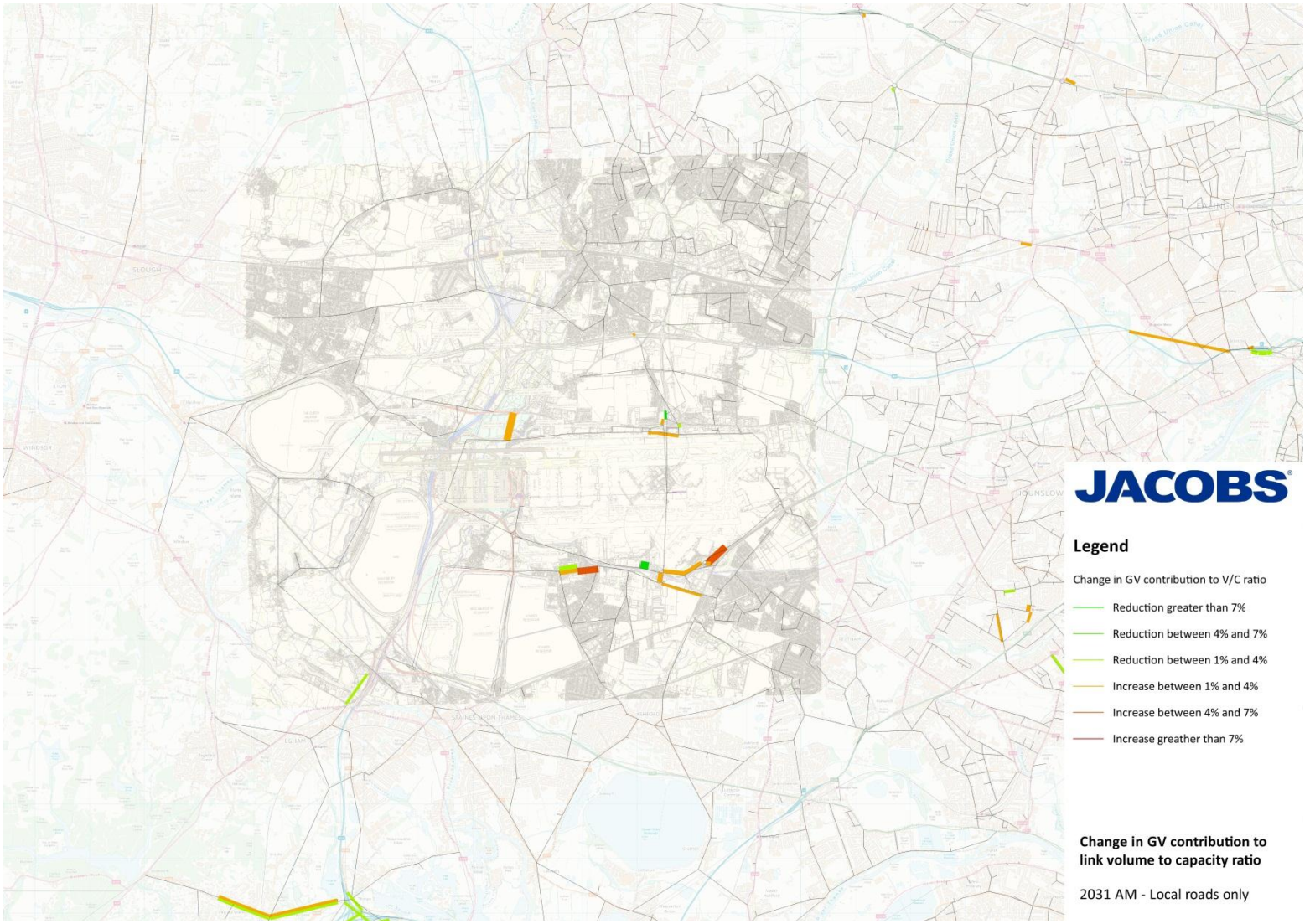


Figure 6-3: 2031 AM change GV contribution to capacity utilisation – local roads only

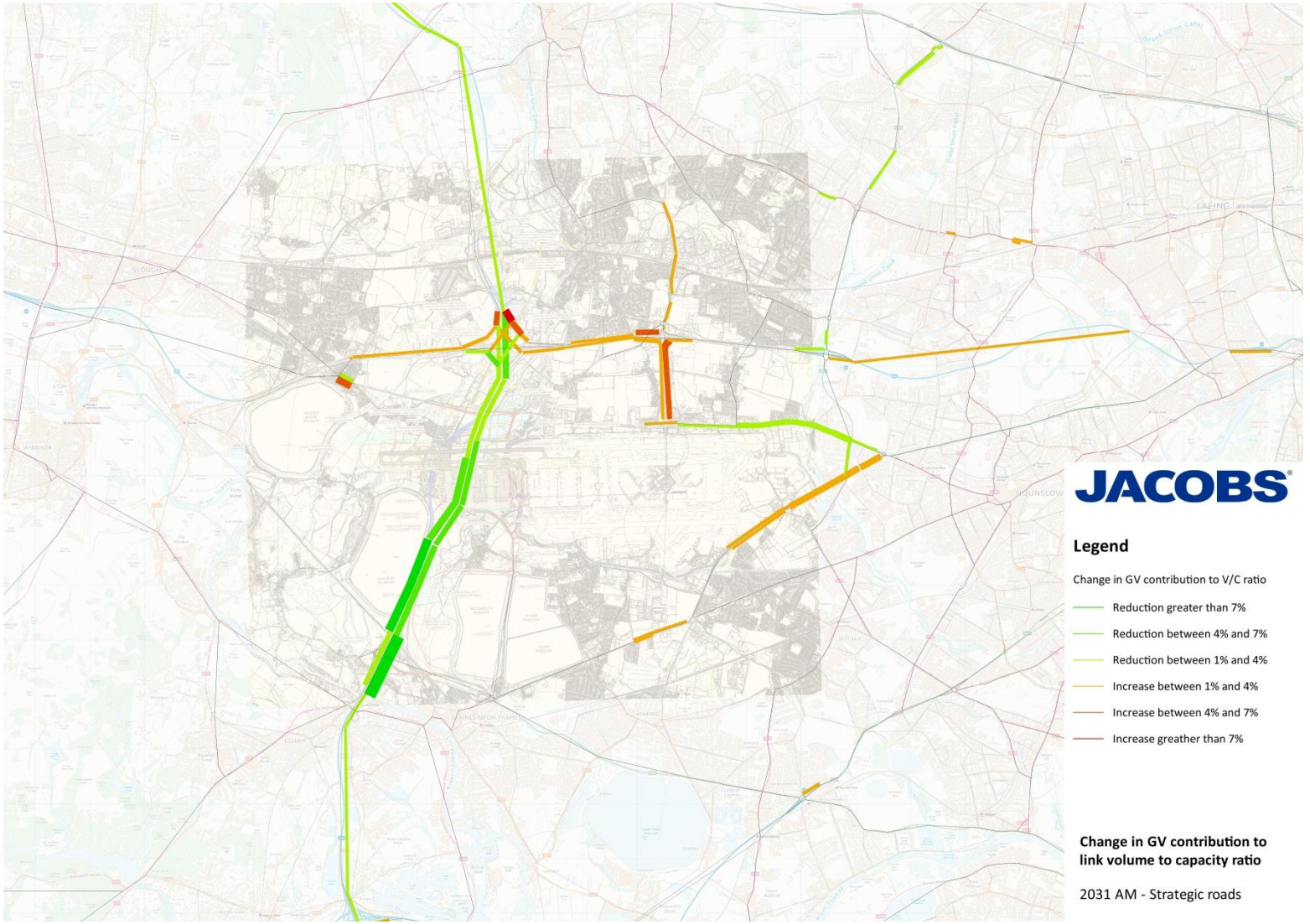


Figure 6-4: 2031 AM change GV contribution to capacity utilisation – strategic roads only

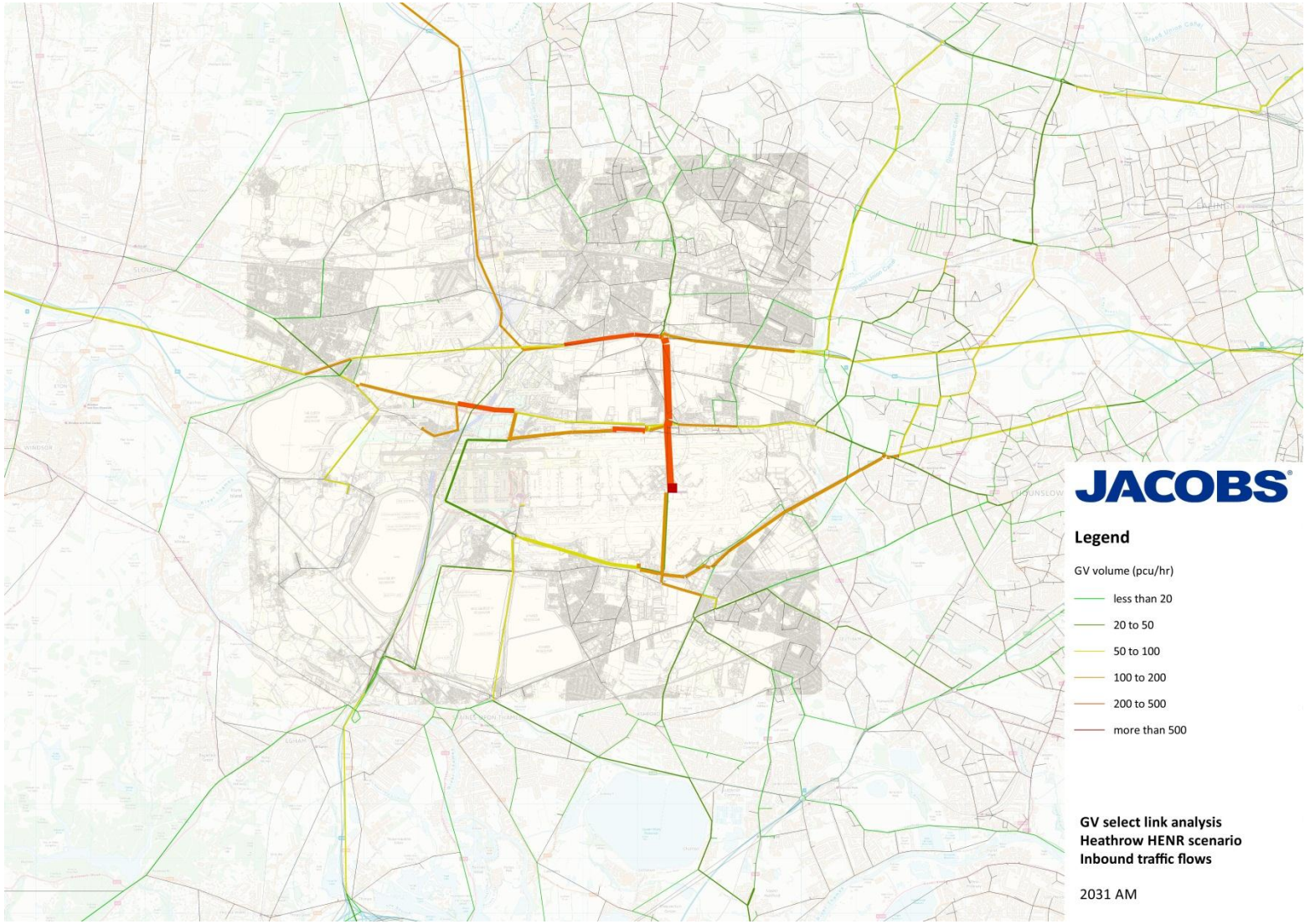


Figure 6-5: 2031 AM GV select link analysis – Airport inbound traffic

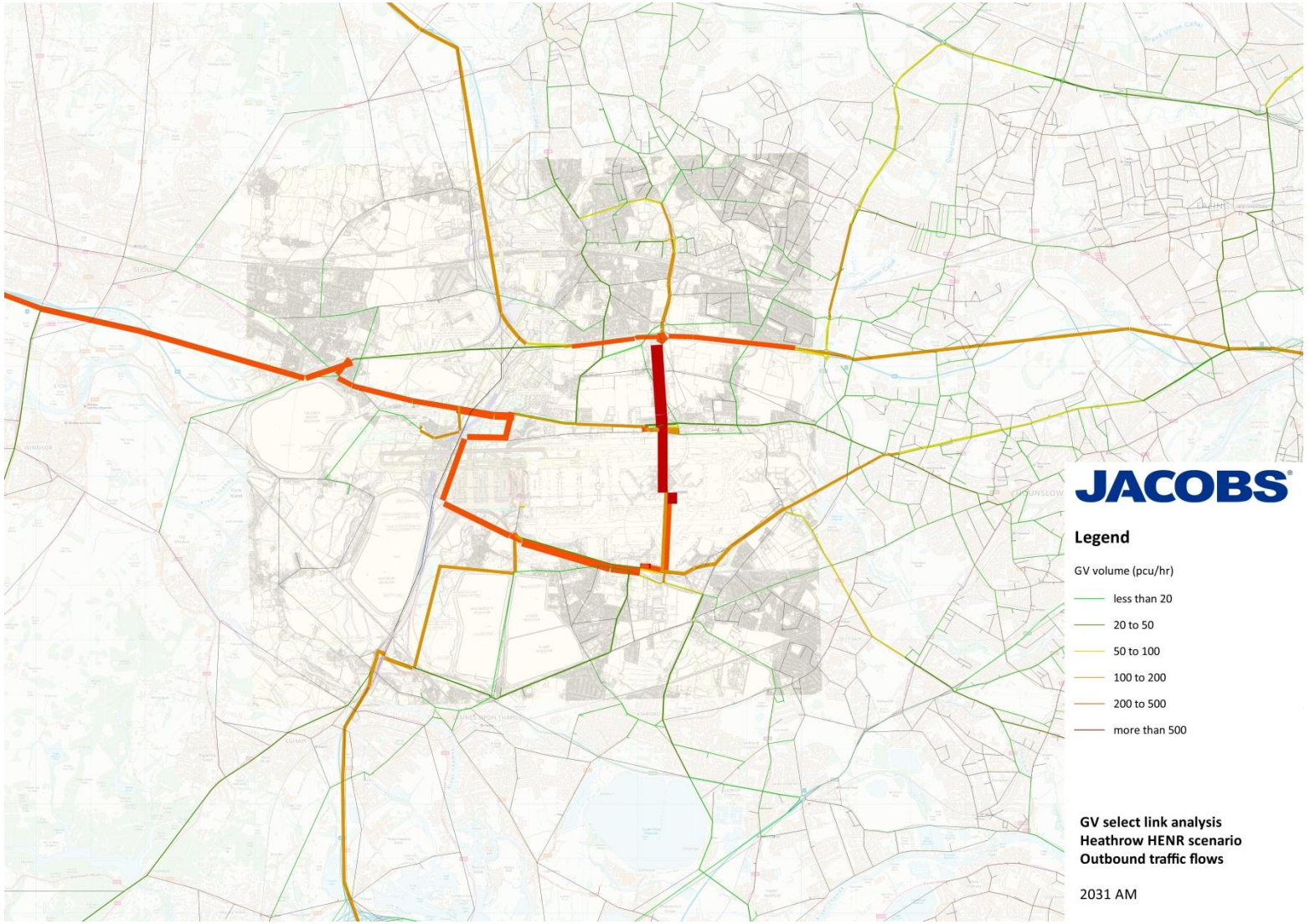


Figure 6-6: 2031 AM GV select link analysis – Airport outbound traffic

Change to goods vehicle flows:

6.3.5 On the local road network, the HENR scheme results in substantial changes to goods vehicle volumes at a number of locations:

- In the Colnbrok, Poyle, Horton area, goods vehicle volumes are substantially higher on most modelled roads, with the greatest increase being on Poyle Road. This due to the closure of M25 Junction 14 and 14a, forcing inbound and outbound traffic from these areas to travel further along the local road network to either M4 Junction 5 of M25 Junction 13;
- There is a reduction is goods vehicle volume on the A3044 and parallel Town Lane. This is due to traffic switching to the new link road between M25 Junction 13 and the A3044 north of King George VI Reservoir;
- Goods vehicle volumes are substantially increased on Stanwell Road and a number of surrounding local roads. A number of warehousing facilities related to Heathow Airport cargo operations are located in this area, and as such, the increase of goods vehicle volumes in the area is due to overall increased demand;
- Goods vehicle volumes are substantially increased on the central terminal area Northern access tunnel. As this road is the primary access to the CTA, increased volumes can be simply attributed to the overall increase in goods vehicle demand; and
- Elsewhere, changes in goods vehicle volumes are generally minor and could be attributed to either increased demand, routing changes arising from the revised road network or model noise.

6.3.6 Similarly, on the strategic road network, the HENR scheme again results in substantial changes to goods vehicle volumes at a number of locations:

- Goods vehicle volumes are generally substantially reduced on the M25 between junctions 13 and 15. This is due to removal of M25 Junction 14 and 14a, resulting in vehicles taking an alternative route to the airport, either via Junction 13 and the new link road, or via the M4 spur. The instance of a large volume increase during the PM period is due to removal of the Junction 14 on and off ramps. Previously, the M25 segment through Junction 14 would have lower volumes compared to upstream or downstream segments because of vehicles diverging and merging at the junction. With the junction no longer present, traffic cannot diverge and is forced to remain on the motorway, resulting in increased traffic volume on the segment; and
- Volumes are substantially increased on the M4 spur in both directions and across all time periods. This road serves as a major access point to Heathrow Airport from multiple directions and as such, the increase can be attributed to the overall increased goods vehicle demand.

Change in road capacity utilisation due to goods vehicles

6.3.7 Across both the strategic and local road network, changes in goods vehicle contribution to road capacity utilisation generally does not reflect the changes in absolute vehicle volumes as would be intuitively expected. This is due to the differences in assumed capacity between the EBL and HENR scenarios at a number of locations. Under the HENR additional lanes were added in a number of locations to address congestion issues, including Poyle Road and the Southern Perimeter Road.

6.3.8 On the local road network, the increased goods vehicle flows resulting from the HENR scheme causes a capacity impact in a number of locations:

- Along the Southern Perimeter Road adjacent to Terminal 4, additional goods vehicle traffic causes a moderate to minor increase in road capacity utilisation. This is due to the new

southern access tunnel providing a new route to the CTA via the A30 and Southern Perimeter Road, resulting in a number of vehicles re-routing from the M25;

- Capacity utilisation is moderately increased on Beacon Road and Stanwell Road across all time periods. These roads provide a connection between offsite warehousing facilities and the Heathrow cargo area. As such, increased capacity utilisation is due to the simple increase in total goods vehicle demand, rather than any re-routing effects;

- High Street between B378 and Clare Road will experience a substantial increase in capacity utilisation (greater than 7% of v/c) in the westbound direction across all time periods. Review of the SLA analysis shows that only a negligible proportion of Heathrow related trips use this road. As such, the capacity impact is likely due to the low capacity of the road making it sensitive to minor changes in traffic volume and the re-routing effect of new highway infrastructure on non-Heathrow traffic; and

- Elsewhere, local road capacity impacts due to scheme altered goods vehicle flows are largely negligible (± 0% to 1% capacity utilisation) or minor (± 1% to 4% capacity utilisation).

6.3.9 Similarly, on the strategic road network, changes to goods vehicle volumes and routing due to the HENR scheme results in significant capacity impacts at a number of locations:

- Goods vehicle contribution to capacity utilisation on the M25 between Junction 13 and 15 is significantly reduced. As previously discussed, this is due to removal of M25 Junction 14 and 14 a. A compensating increase elsewhere is not shown in the presented analysis as the traffic is largely re-routing to new roads, for which a comparative analysis is not possible;

- Capacity utilisation is moderately increased on the M4 spur across all time periods. This road provides a primary highway access to Heathrow Airport. As such, the capacity impact can be attributed to overall increased goods vehicle demand;

- Capacity utilisation is moderately reduced on the A4 between the M4 spur and the A30, with a compensating increase on the A30 between A4 and Southern Perimeter Road. This can be attributed to the southern access tunnel providing a new route to the CTA via the A30; and

- Elsewhere, local road capacity impacts due to scheme altered goods vehicle flows are largely negligible (± 0% to 1% capacity utilisation) or minor (± 1% to 4% capacity utilisation).

Goods vehicle routing

6.3.10 The SLA figures show that for travel to and from Heathrow Airport under the HNWR scheme, once clear of local Heathrow distributer network, goods vehicles largely keep to the motorway (M4, M25) and A road (A4, A30, A312, A40) network. On the local road network, goods vehicle flows are generally less than 50 pcu/hr.

6.4 Summary

6.4.1 The HENR scheme documentation proposes very little in regards to surface freight. Based on this, it is considered that the most likely freight scenario is operations continuing largely as existing, with a number of operational changes to improve operational efficiency and shift freight trips from peak periods. Following expansion of the airport, freight traffic will likely remain on existing travel routes and grow in line with increasing freight tonnage.

6.4.2 Under the HENR scenario, it is estimated that total goods vehicle traffic demand will be 41% larger, compared with this EBL scenario. This is based on the assumption that freight demand will grow linearly in line with airport passenger growth.

6.4.3 Using results from the WelHAM model runs completed as part of the post consultation surface access work, detailed analysis of traffic impact due to freight demand growth has been undertaken. In general, the analysis shows that under the HENR scenario, goods vehicle traffic is largely contained to the strategic road network and the increased volume has a moderate capacity impact (contributing between 1% and 7% of road capacity utilisation in most cases). On its own, increased freight traffic resulting from the HERN scheme is unlikely to significantly degrade travel conditions on the strategic road network surrounding Heathrow Airport.

6.4.4 On the local road network, goods vehicle traffic is significantly increased in a number of locations surrounding Heathrow Airport. Though the capacity impact of this increase generally moderate, the substantially increased goods vehicle volumes in the areas of Colnbrook, Poyle and Horton does raise some concern regarding impact to the amenity of residents in these areas.

7. Freight impact analysis – Gatwick

7.1 Scheme freight forecasts

7.1.1 Published information on changes to freight infrastructure and operations at Gatwick resulting from a second runway is largely conceptual.

7.1.2 A consolidated logistics centre (Gatwick Direct) was completed in 2013, centralising on airport freight movements. The development is located to the east of the existing cargo facilities, close to the north terminal. Approximately 87% percent of airport concessions now use the facility, simplifying 'final mile' deliveries.

7.1.3 It is forecast that centralised logistics capacity will expanded in line with future passenger forecasts and that air cargo will also grow to 2030 and beyond, with the existing air cargo area enlarged to accommodate demand. Plans include the provision of new hangers and an apron, with access via an improved North Terminal Roundabout and Longbridge roundabout.

Gatwick Airport assessment of likely scheme impacts

7.1.4 Limited information has been provided by the airport on the level and distribution of future logistics and cargo demand. In 2012, air cargo tonnage (including mail) was 101,000 tonnes. With a second runway, this is anticipated to reach 740,000 tonnes by 2040 and 950,000 tonnes by 2050.

7.1.5 The above forecasts have been used by Gatwick to calculate cargo related vehicles numbers per hour at the airport. Assuming a degree of consolidation, the promoters suggest peak hour cargo movements of 30 to 40 vehicles in 2040. Overall numbers are not considered significant by Gatwick Airport and they believe that these can easily be accommodated on the proposed road network.

Alternative assessment of likely scheme impacts

7.1.6 Two alternative assessments of future freight impacts have been considered for this report. These are:

- Scenario (A) existing logistics and cargo demand increases by the increase in total mppa from current levels to 2030. Note: this methodology is consistent with the central case at Heathrow, where future freight growth is based in the increase in total passenger per annum.
- Scenario (B) logistics demand increases in line with total mppa demand, with future cargo demand based on 2030 long haul passenger forecasts

This second test is considered to be more realistic and is based on the assumption that long haul routes (and underlying passenger demand) drive cargo growth.

7.2 Forecast year logistics demand

7.2.1 Information on existing logistics airport demand supporting Gatwick Airport is limited as the operation has recently been centralised (see above). For this analysis, an assumption has been made that 80% of demand accesses the airport via the M23 spur. It is expected that logistics demand will increase in line with general mppa growth and that the distribution of demand will be similar to now.

7.2.2 Based on the above, forecast 2030 logistics trips are summarised in Table 7.1.

Table 7-1: 2030 Gatwick logistics demand – Linear growth based on mppa increase

	To Airport			From Airport		
	AM	IP	PM	AM	IP	PM
2009 - 32.4 mppa						
LGV	196	116	115	84	80	116
HGV	56	34	33	24	24	34
Total	253	150	148	108	104	150
2031 1 runway - 46 mppa						
LGV	279	165	163	119	114	165
HGV	80	48	46	34	34	48
Total	359	213	209	153	148	213
2031 2 runways - 65 mppa						
LGV	394	233	231	168	160	233
HGV	113	68	65	48	48	68
Total	507	301	296	216	208	301

7.3 Forecast year cargo demand

7.3.1 Surface access cargo movements at Gatwick are currently very low. Freight movements are approximately 4 vehicles per hour mainly in non-peak hours.

7.3.2 Limited information is available on cargo distribution to and from Gatwick Airport. In order to undertake this modelling analysis, a 2009 matrix of Heathrow freight has been adapted for use at Gatwick. The resulting assumption is that while the airport end of each freight trip is reassigned the origin / destination of the opposite end of the trip is unchanged. In essence, the wider freight distribution network remains unaltered. While this is clearly a significant assumption, it is not unreasonable given the limited availability of data.

Scenario (A) forecasts – Linear cargo increase - mppa from 2009 to 2030

7.3.3 Gatwick handled 32,361,000 passengers in 2009[2]. 2030 forecast numbers are 65,000,000[3]. The resulting factor from 2009 to 2030 is 2.00. Based on this simple analysis, we have assumed that forecast cargo freight numbers will double by 2030 with typically eight movements per hour, weighted towards non-peak hours. Heathrow freight demand matrices have been factored appropriately across each model period to derive Option 1 Gatwick demand.

Scenario (B) forecasts – Long haul cargo increase - mppa 2009 to 2030

7.3.4 Of the forecast 65 million Gatwick passengers in 2030, approximately 33%[4] are forecast to be long haul. This equates to 21,450,000 long haul passengers.

7.3.5 By contrast 87 million passengers are forecast to use Heathrow in 2030. Assuming the proportion of long haul passenger numbers at that airport remains similar to today, a forecast of 51,940,000 long haul passengers per annum results.

[2] 2009 CAA statistics
[3] Gatwick Airport Surface Access Report – Appendix Table 5.1
[4] Gatwick Airport Surface Access Report – Appendix Table 5.3 (2040 forecast)

7.3.6 Initial Heathrow freight matrices have been adjusted by the resulting factor of 0.41 to derive Option B Gatwick cargo demand.

Table 7.2: Scenario B Gatwick cargo demand factor

	mppa	Long haul mppa
Gatwick	65,000,000	21,450,000
Heathrow	87,000,000	51,940,000
Factor Heathrow to Gatwick freight demand		0.41

7.3.7 The resulting total freight trips (logistics and cargo) for each scenario are presented in Tables 7.3 and 7.4 below.

Table 7-3: 2030 Gatwick freight demand – Scenario A, linear cargo growth based on mppa

	To Airport			From Airport		
	AM	IP	PM	AM	IP	PM
1 runway						
LGV	279	165	163	119	114	165
HGV	80	48	46	34	34	48
Total	359	213	209	153	148	213
2 runway mppa growth						
LGV	400	239	235	169	166	236
HGV	115	74	67	50	52	69
Total	515	313	302	219	218	305
Difference						
LGV	+121	+74	+72	+50	+52	+71
HGV	+35	+26	+21	+16	+18	+21
Total	+156	+100	+93	+66	+70	+92

Table 7-4: 2030 Gatwick freight demand – Scenario B, cargo growth based on Long Haul mppa

	To Airport			From Airport		
	AM	IP	PM	AM	IP	PM
1 runway						
LGV	279	165	163	119	114	165
HGV	80	48	46	34	34	48
Total	359	213	209	153	148	213
2 runway mppa growth						
LGV	482	265	263	194	194	256
HGV	146	88	78	56	74	76
Total	628	353	341	250	268	332
Difference						
LGV	+203	+100	+100	+75	+80	+91
HGV	+66	+40	+32	+22	+40	+28
Total	+269	+140	+132	+97	+120	+119

7.4 Assignment and review of performance

7.4.1 Based on results from the Gatwick Airport Model (developed from SoLHAM) runs previously completed as part of the post consultation surface access work, a review of the potential impacts of a second runway on goods vehicle volumes and routing has been undertaken.

7.4.2 A full set of figures supporting this review, covering all time periods are included in Appendices D and E:

- AM (08:00-09:00)
- IP (average (10:00-16:00)
- PM (17:00-18:00)

7.4.3 These figures present the following data:

- Goods vehicle actual flow difference between 1 runway and 2 runway A and B scenarios;
- Difference in goods vehicle contribution to link v/c ratio between scenarios. These plots illustrate the actual capacity impact of changes to good vehicle volumes. For instance, an increase of goods vehicles on a large motorway may have negligible impact, whereas the same increase on a small local road could result in substantially worsened traffic conditions; and
- SLA routing of good vehicle traffic travelling to and from Gatwick Airport.

7.5 Freight impact analysis – Scenario A

7.5.1 For Scenario A, Figures 7-1 to 7-4 illustrate actual flow difference, V/C ratio difference and select link analysis of goods vehicle traffic for the morning peak hour.

Change to freight vehicle flows

7.5.2 A second runway at Gatwick will result in increased freight trips (primarily logistics support), as shown in Figure 7.1. Increases are primarily on the strategic network with the largest change, as expected, on the M23 north of Junction 9.

7.5.3 A significant increase in freight is shown westbound on M23 spur with a corresponding reduction on the M23 southbound to Junction 10 and the A2011 Crawley Avenue. This is a result of the provision of the new southbound elevated slip from the M23 to the airport which also improves access to north Crawley, via the A23.

Change in road capacity utilisation due to freight vehicles

7.5.4 The change in road capacity utilisation resulting from additional freight trips follows a similar pattern. The HGV contribution to link capacity increases on the M23 and M23 spur with associated reduction on the M23 south of Junction 9 and on the A2011 towards Crawley.

7.5.5 Proposed infrastructure improvements at Gatwick include:

- Doubling the capacity of the M23 Junction 9 including slip road widening and a new grade separated flyover;
- Increasing M23 Spur capacity to four lanes and five lanes in the eastbound and westbound directions respectively;

- Airport Way increased from two lanes in each direction to four (including constructing a new bridge over the railway lines);
- The A23 realigned to the east of the airport and provided as a dual carriageway with two lanes in each direction;

7.5.6 Consequently, the forecast increase in freight vehicles can be adequately accommodated. Local road capacity impacts due to scheme altered freight vehicle flows are largely negligible (± 0% to 1% capacity utilisation) or minor (± 1% to 4% capacity utilisation)

7.5.7 Key routes with minor increases in capacity utilisation are the

- A24 south of Dorking to the A264
- B2037 west of the A264
- Lowfield Heath Road / Ifield Green, and
- Balcombe Road

Freight vehicle routing

7.5.8 The select link analysis (Figures 7.3 and 7.4) show that for travel to and from Gatwick Airport, freight trips use the motorway and strategic road network.

7.5.9 No significant increase in freight trips is forecast on minor roads surrounding the airport.

Figure 7-1: Scenario A - 2031 AM change in GV volume

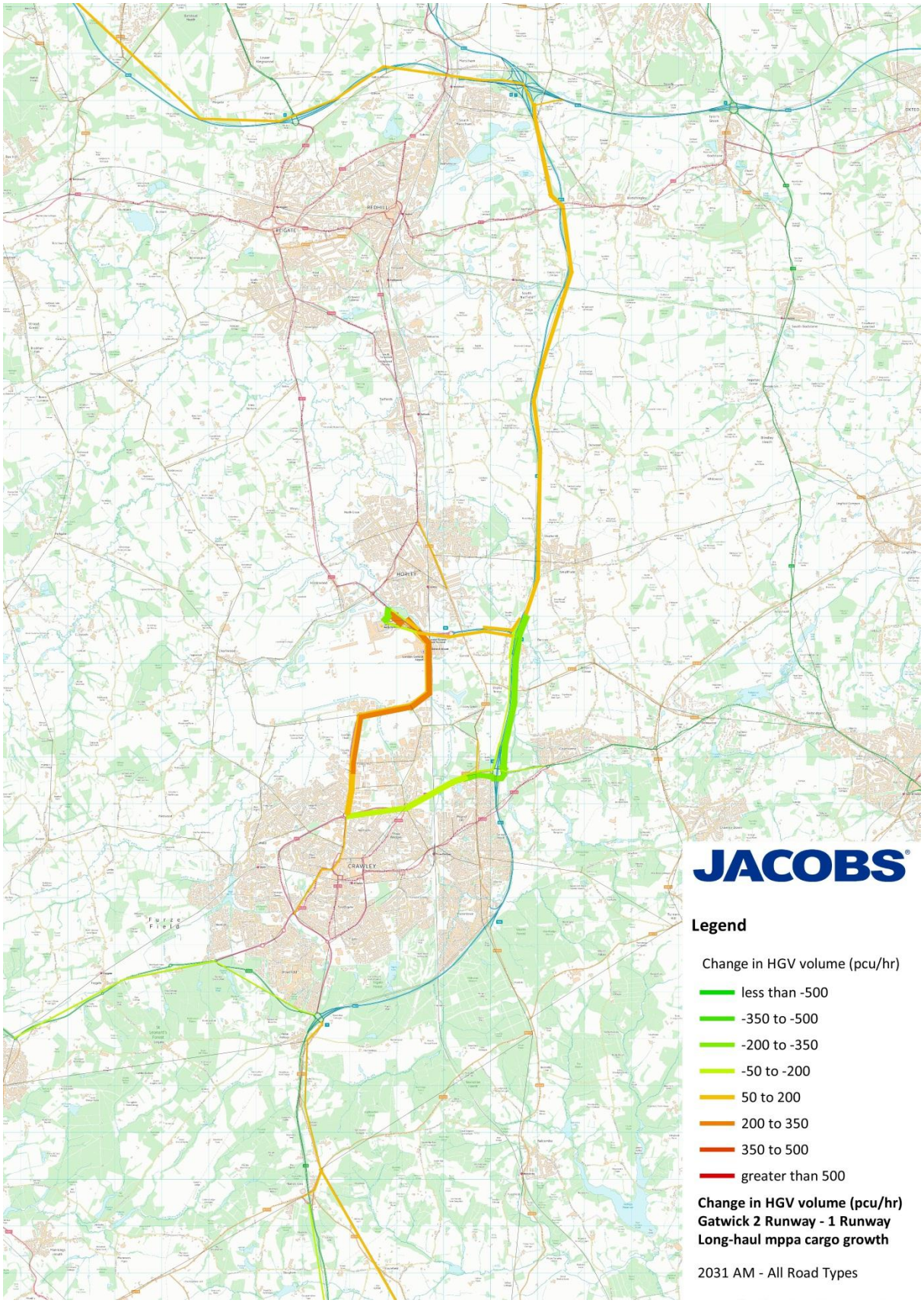


Figure 7.2 Scenario A - 2031 AM change in GV network demand contribution

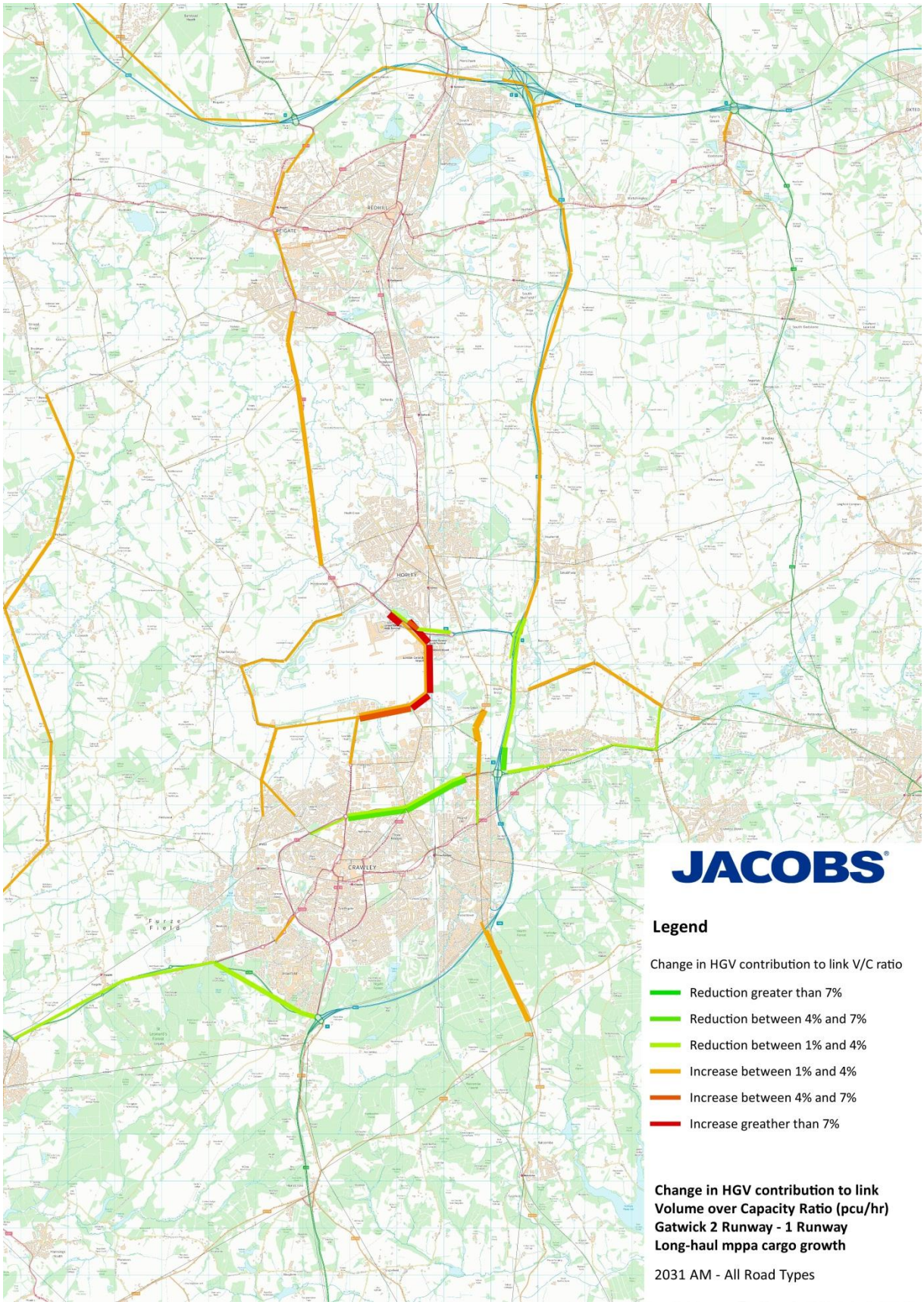


Figure 7.3: Scenario A - 2031 AM GV select link analysis – Airport inbound traffic

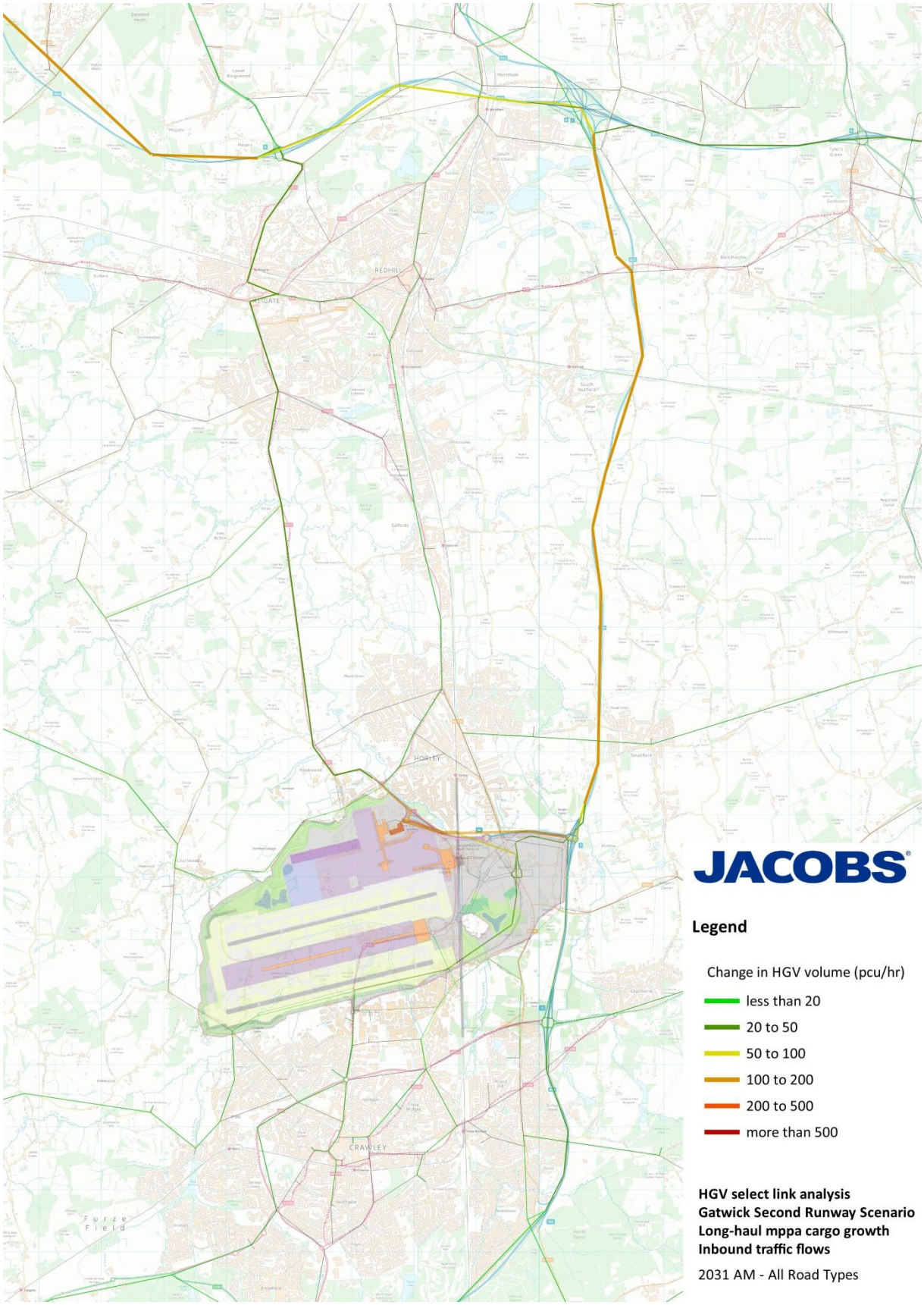
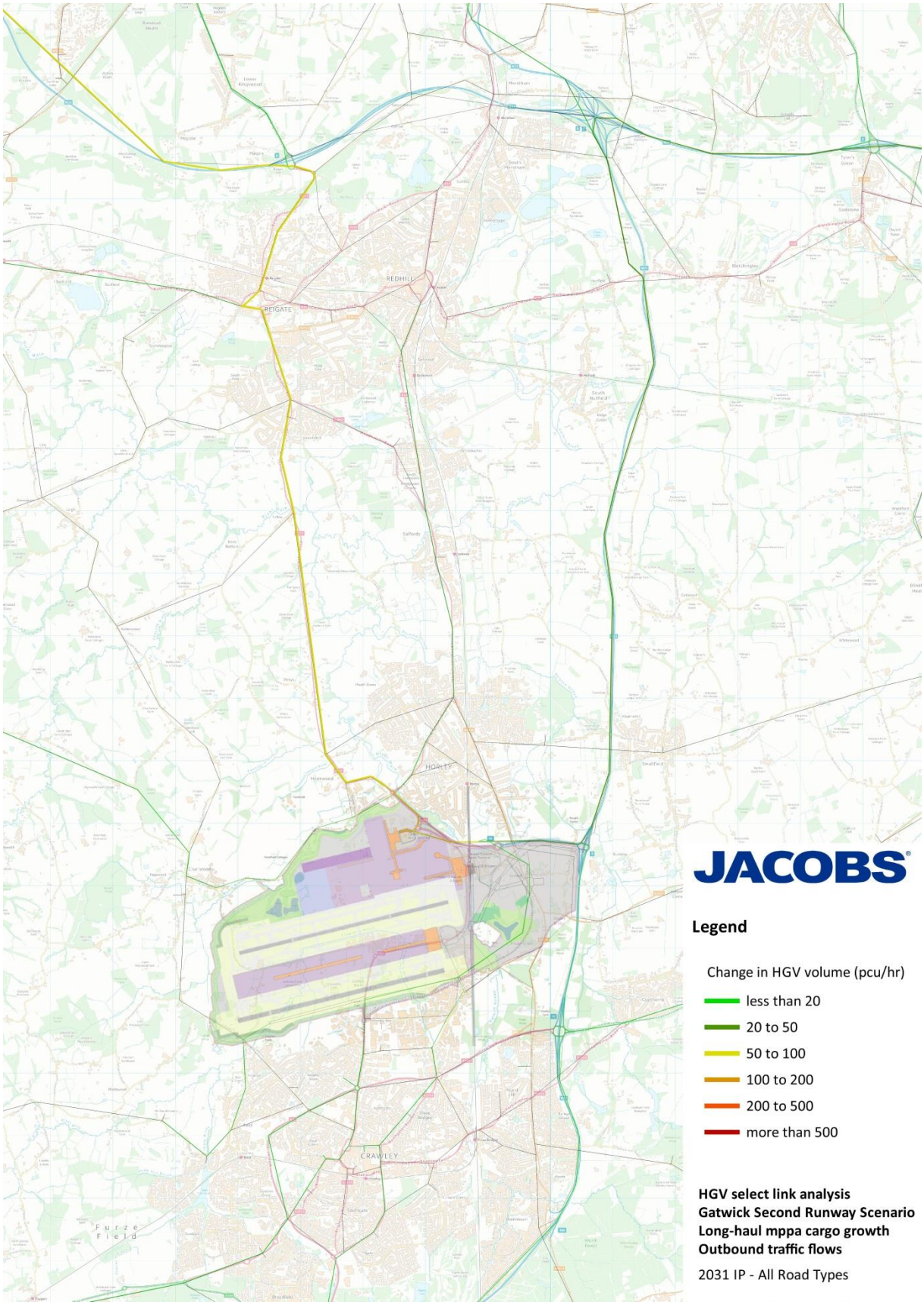


Figure 7.4: Scenario A - 2031 AM GV select link analysis – Airport outbound traffic



7.6 Freight impact analysis - Scenario B

Figures 7-5 to 7-8 illustrate Scenario B actual flow difference, V/C ratio difference and select link analysis of goods vehicle traffic for the morning peak hour. As expected, the results show a very similar pattern to Scenario A, with only the magnitude of the impacts slightly greater.

Change to freight vehicle flows

7.6.1 Assuming additional freight demand resulting from long haul passenger growth, a second runway at Gatwick will generate additional freight trips as shown in Figure 7.5. As with scenario A, the predicted increases are primarily on the strategic network with the largest change on the M23 north of Junction 9.

7.6.2 As before, a significant increase in freight is shown westbound on M23 spur with a corresponding reduction on the M23 southbound to Junction 10 and the A2011 Crawley Avenue. This is a result of the provision of the new southbound elevated slip from the M23 to the airport which also improves access to north Crawley, via the A23.

Change in road capacity utilisation due to freight vehicles

7.6.3 The change in road capacity utilisation resulting from additional freight trips follows a similar pattern. The HGV contribution to link capacity increases on the M23 and M23 spur with associated reduction on the M23 south of Junction 9 and on the A2011 towards Crawley.

7.6.4 The proposed infrastructure improvements at Gatwick include can adequately accommodate the forecast increase in freight vehicles. Local road capacity impacts due to scheme altered freight vehicle flows are largely negligible (± 0% to 1% capacity utilisation) or minor (± 1% to 4% capacity utilisation)

7.6.5 Key routes with minor increases in capacity utilisation are the

- A24 south of Dorking to the A264
- B2037 west of the A264
- Lowfield Heath Road / Ifield Green, and
- Balcombe Road

7.6.6 Compared with Scenario A, this analysis indicates a minor increase in capacity utilisation on the A23 between the M23 and the airport. On minor roads, capacity utilisation increases may be triggered by only one or two additional freight trips.

Freight vehicle routing

7.6.7 The select link analysis (Figures 7.7 and 7.8) show that for travel to and from Gatwick Airport, freight trips use the motorway and strategic road network.

7.6.8 No significant increase in freight trips is forecast on minor roads surrounding the airport.

Figure 7-5: 2031 AM change in GV volume

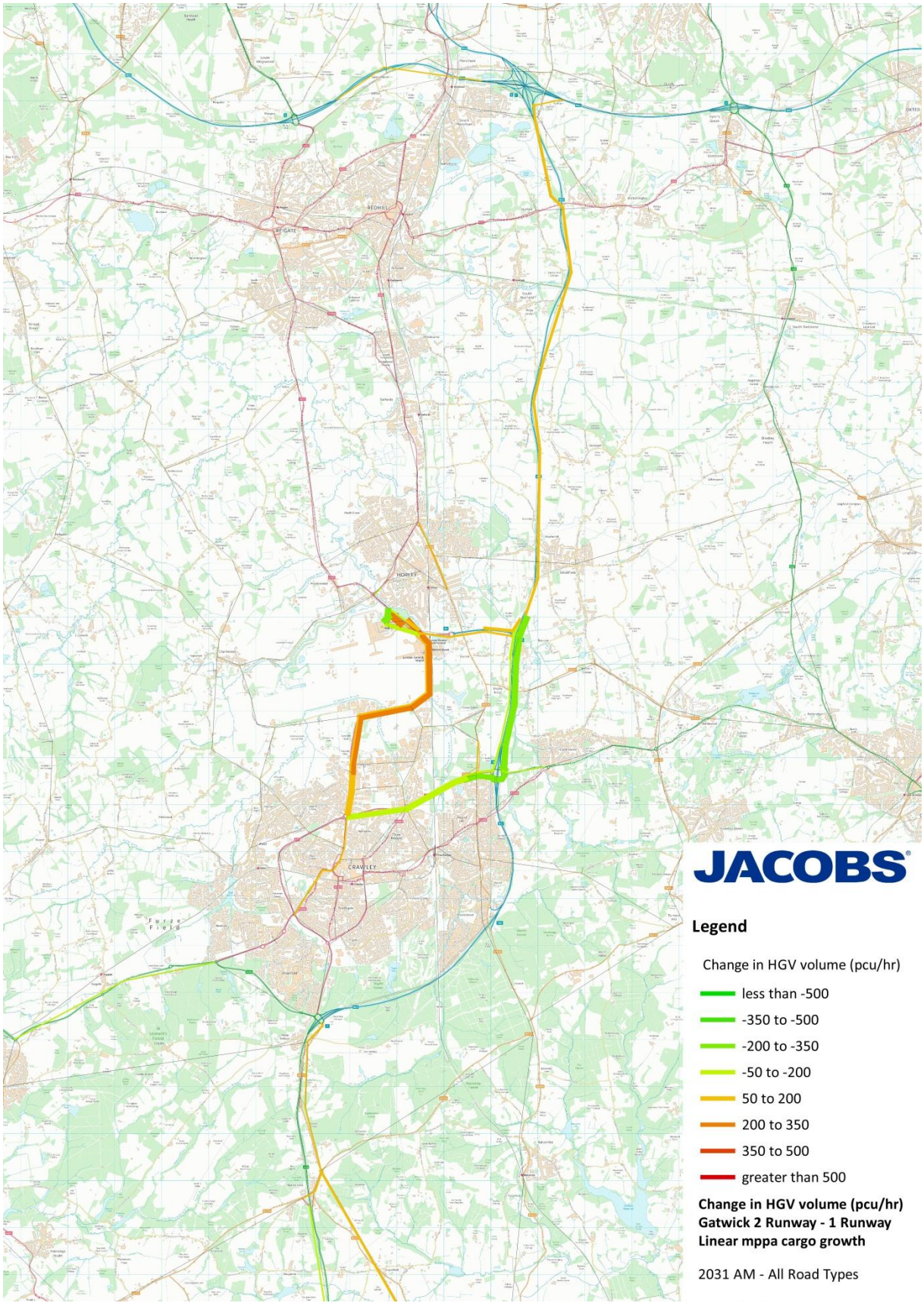


Figure 7.6: AM change in GV contribution to capacity

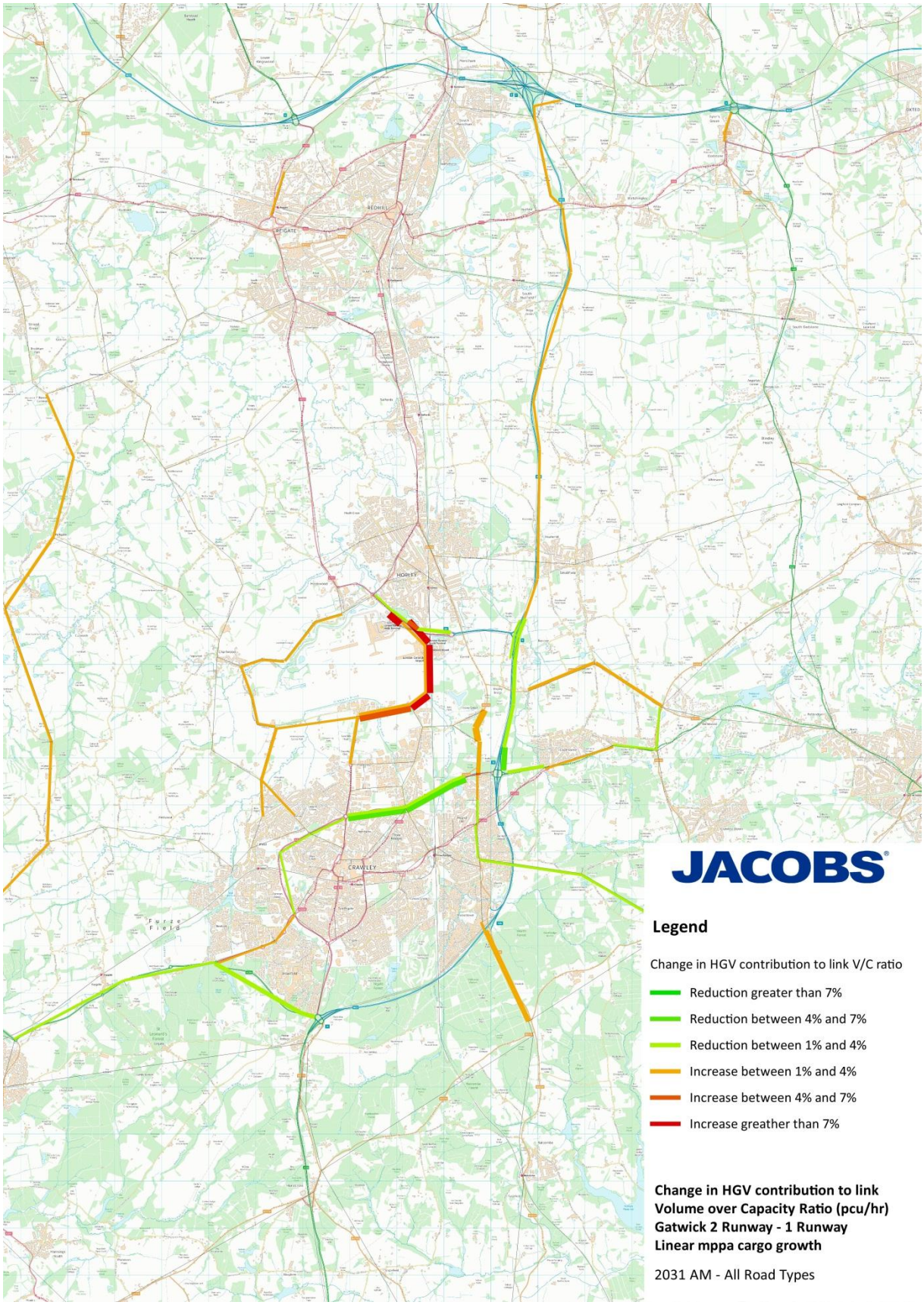


Figure 7.7: 2031 AM GV select link analysis – Airport inbound traffic

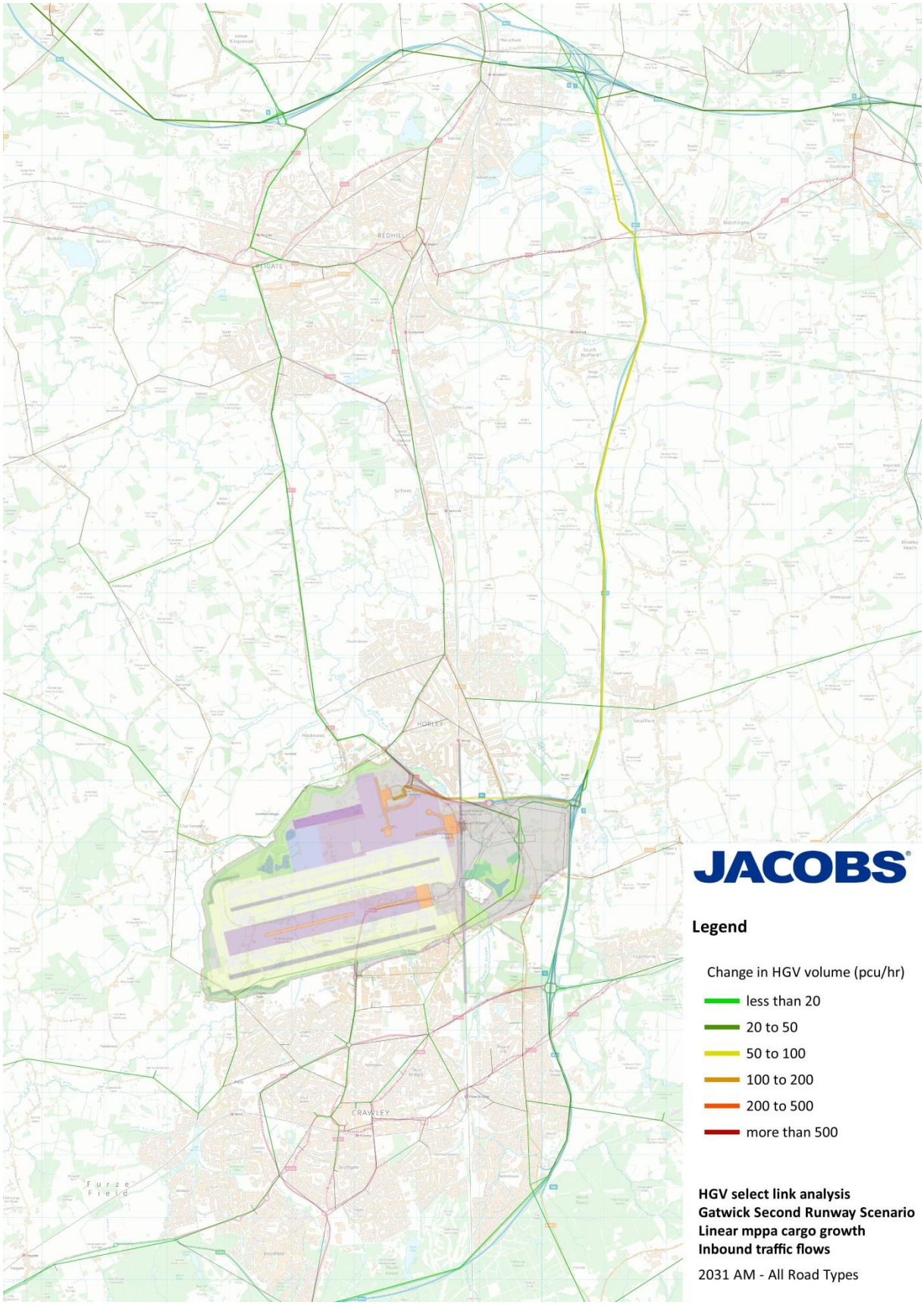
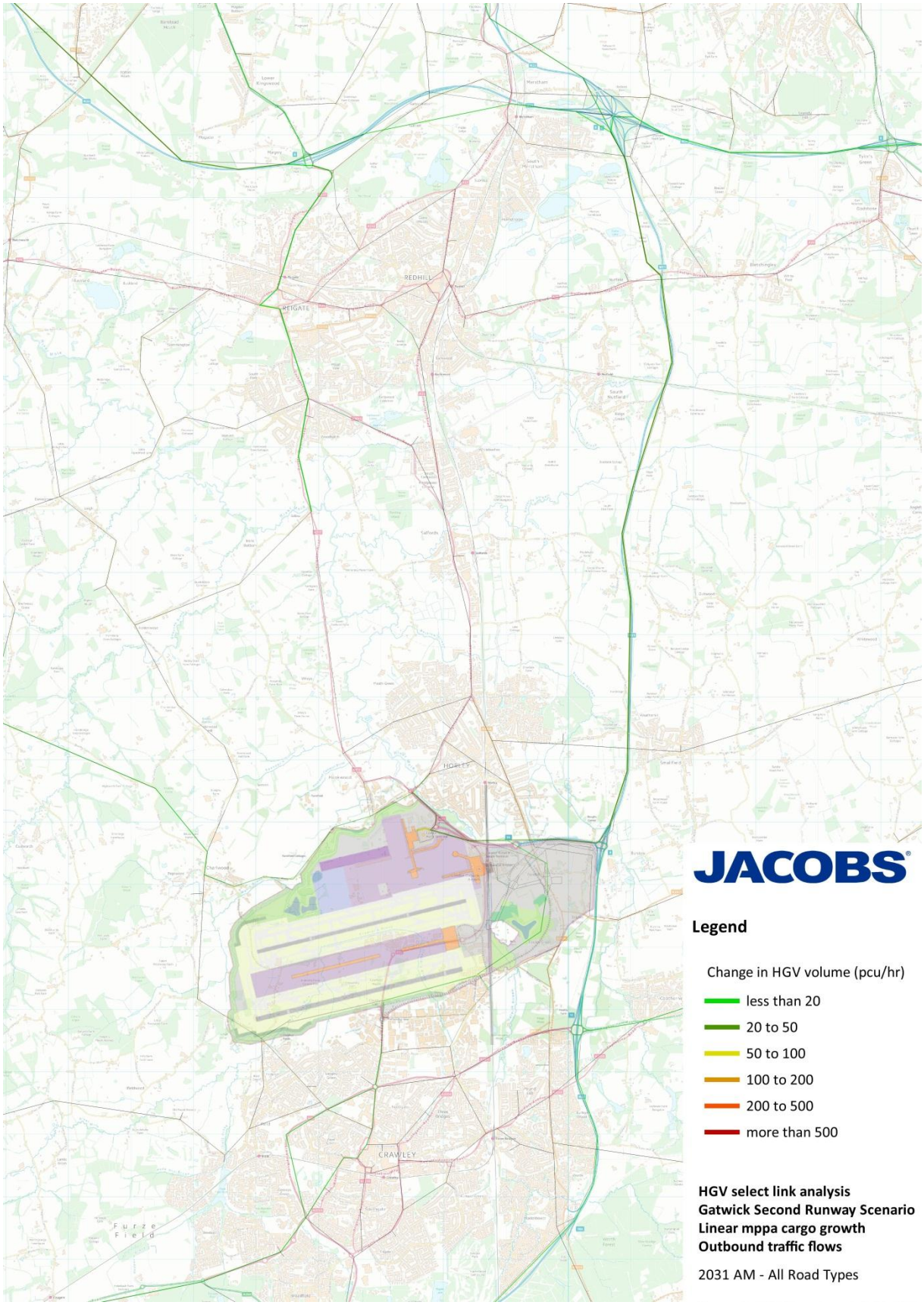


Figure 7.8: 2031 AM GV select link analysis – Airport outbound traffic



8. Summary

8.1 Freight Impact Analysis - Heathrow North West Runway

8.1.1 Based on the HNWR scheme documentation available to Jacobs, it is expected that the most likely freight infrastructure and operational scenario under the scheme will involve expansion of the existing Heathrow cargo area and implementation of a number of policies aimed at improving freight vehicle utilisation and moving freight activity away from peak traffic periods. Under this scenario, it is expected that highway based freight activity will continue largely as existing, and while the proposed operational policies will assist in reducing vehicle movements per freight tonne, once operational efficiency reaches a feasible maximum, highway freight traffic will continue to grow in line with freight tonnage.

8.1.2 Under the HNWR scenario, it is estimated that total goods vehicle traffic demand will be 43% larger, compared with this EBL scenario. This is based on the assumption that freight demand will grow linearly in line with airport passenger growth.

8.1.3 Using results from the WelHAM model runs completed as part of the post consultation surface access work, detailed analysis of traffic impact due to freight demand growth has been undertaken. In general, the analysis shows that under the HNWR scenario, goods vehicle traffic is largely contained to the strategic road network and the increased volume has minimal capacity impact (contributing only between 1% and 4% of road capacity utilisation in most cases).

8.1.4 On the local road network, goods vehicle traffic is substantially increased in two key areas; Poyle / Bath Road and the Southern Perimeter Road. Due to additional road capacity introduced at these locations as part of the HNWR scheme, the increased goods vehicle traffic does not have a significant capacity impact. However, given the area through which Poyle and Bath Road run through is mostly residential, the increased goods vehicle volumes may have a significant amenity impact.

8.2 Freight Impact Analysis - Heathrow Extended Northern Runway

8.2.1 The HENR scheme documentation proposes very little in regards to surface freight. Based on this, it is considered that the most likely freight scenario is operations continuing largely as existing, with a number of operational changes to improve operational efficiency and shift freight trips from peak periods. Following expansion of the airport, freight traffic will likely remain on existing travel routes and grow in line with increasing freight tonnage.

8.2.2 Under the HENR scenario, it is estimated that total goods vehicle traffic demand will be 41% larger, compared with this EBL scenario. This is based on the assumption that freight demand will grow linearly in line with airport passenger growth.

8.2.3 Using results from the WelHAM model runs completed as part of the post consultation surface access work, detailed analysis of traffic impact due to freight demand growth has been undertaken. In general, the analysis shows that under the HENR scenario, goods vehicle traffic is largely contained to the strategic road network and the increased volume has a moderate capacity impact (contributing between 1% and 7% of road capacity utilisation in most cases). On its own, increased freight traffic resulting from the HERN scheme is unlikely to significantly degrade travel conditions on the strategic road network surrounding Heathrow Airport.

8.2.4 On the local road network, goods vehicle traffic is significantly increased in a number of locations surrounding Heathrow Airport. Though the capacity impact of this increase generally moderate, the substantially increased goods vehicle volumes in the areas of Colnbrook, Poyle and Horton does raise some concern regarding impact to the amenity of residents in these areas.

8.3 Freight Impact Analysis – Gatwick Second Runway

8.3.1 Published information on changes to freight infrastructure and operations at Gatwick resulting from a second runway is largely conceptual. A consolidated logistics centre was completed in 2013, centralising on airport freight movements. The development is located to the east of the existing cargo facilities, close to the north terminal. Approximately 87% percent of airport concessions now use the facility, simplifying 'final mile' deliveries.

8.3.2 It is forecast that centralised logistics capacity will expanded in line with future passenger forecasts and that air cargo will also grow to 2030 and beyond, with the existing air cargo area enlarged to accommodate demand. Plans include the provision of new hangers and an apron, with access via an improved North Terminal Roundabout and Longbridge roundabout.

8.3.3 Two alternative assessments of future freight impacts have been considered for this report. These are:

- Scenario (A) existing logistics and cargo demand increases by the increase in total mppa from current levels to 2030. Note: this methodology is consistent with the central case at Heathrow, where future freight growth is based in the increase in total passenger per annum.

- Scenario (B) logistics demand increases in line with total mppa demand, with future cargo demand based on 2030 long haul passenger forecasts

8.3.4 This second test is considered to be more realistic and is based on the assumption that long haul routes (and underlying passenger demand) drive cargo growth.

8.3.5 Under Scenario (A), it is estimated that total goods vehicle traffic demand will be between 43%-47% larger (depending on time period), compared with this EBL scenario. This is based on the assumption that freight demand will grow linearly in line with airport passenger growth.

8.3.6 Under Scenario (B), it is estimated that total goods vehicle traffic demand will be between 56%-81% larger (depending on time period), compared with this EBL scenario. This is based on the assumption that freight logistics demand will grow linearly in line with airport passenger growth and freight cargo demand will grow in line with the predicted increase in long haul passenger forecasts. The following comments relate to the higher Scenario (B) freight forecasts.

8.3.7 Using results from the extended SoLHAM model runs completed as part of the post consultation surface access work, detailed analysis of traffic impact due to freight demand growth has been undertaken. In general, the analysis shows that goods vehicle traffic to/from Gatwick is largely contained to the strategic road network and the increased volume has minimal capacity impact (contributing only between 1% and 4% of road capacity utilisation in most cases).

8.3.8 The roads on the strategic road network with the predicted largest change are the M23 north of Junction 9 and westbound on M23 spur with a corresponding reduction on the M23 southbound to Junction 10 and the A2011 Crawley Avenue. This is a result of the provision of the new southbound elevated slip from the M23 to the airport which also improves access to north Crawley, via the A23.

8.3.9 Key routes with minor increases in capacity utilisation are the: A24 south of Dorking to the A264; B2037 west of the A264; Lowfield Heath Road / Ifield Green, and Balcombe Road.

8.3.10 No significant increase in freight trips is forecast on minor roads surrounding the airport.

Appendix A. Consultation comments relating to freight

Comment author	Comment
TfL	It is clear that the Commission has not taken proper account of freight demand, despite the envisaged increase in air freight reported in its economic case for airport expansion. Extra freight will add to pressure on the road network and have a disproportionate impact on air quality. Freight access will also rely on the aforementioned billions of pounds of highway upgrades not included in the Commission's surface access appraisal
Royal Borough of Kensington and Chelsea	Without a substantial shift from road to rail, congestion on major roads will increase. However, we note that, neither detailed modelling of the impacts on the strategic road network, such as the A4 through the Royal Borough has been carried out, nor the spillover effect onto local roads. Added to this we believe that the predicted increase in airfreight and its reliance on the road network has not been properly factored in, so that there is no forecast of Heathrow-related HGV traffic along the A4 corridor.
Gatwick Airport Limited	Freight – The Commission should include analysis of freight traffic as an important part of its overall assessment for surface access, as recognised in the Commission's consultant's report
Gatwick Airport Limited	**Issue:** No analysis has been undertaken on freight traffic by the Commission or its consultant despite it being explicitly raised in surface access Appraisal Objective 2. **Impact:** None of the three schemes can be fully assessed in terms of how much capacity exists to accommodate freight growth without reasonable assumptions regarding the amount and distribution of freight traffic. As shown by the Commission's own analysis, M23 Smart Motorways provides capacity for background growth and airport-related traffic out to 2030 at Gatwick, whilst "high levels of congestion" are forecast for the M4, M25 and M40 at Heathrow. **Recommendation:** The Commission should consider undertaking an assessment of freight traffic as this element is explicitly identified as being a requirement for meeting Objective 2. Otherwise the impact of freight traffic on the strategic and local roads network around each runway scheme will not be fairly and objectively assessed.
Gatwick Airport Limited	It is recommended that the Commission considers undertaking independent modelling of roads in the vicinity of the airport of all three airport schemes to ensure a robust comparison. This should include consideration of freight traffic and demand management or congestion charging proposals. Otherwise, the analysis presented by the Commission in terms of Air Quality, Carbon and Surface Noise, as well as Place, Community and Quality of Life implications, cannot be objectively assessed as these rely on the modelling of the local roads network.
Slough Borough Council	Both proposals for expansion at Heathrow would result in an increase in cargo but neither have details of how this would impact on Slough, both in terms of established freight businesses in the Borough and of related traffic movements (HGV and other commercial vehicles). More

	attention needs to be given to these aspects.
Slough Borough Council	Colnbrook already suffers from the impacts of HGV lorries waiting to access the airport. Anti-social behaviour is commonplace as lorry drivers stay overnight in lay-bys where there are no facilities. This problem must be addressed, regardless of expansion, but the pressure under expansion would be such that lorry parking and waiting facilities must be provided on airport to eliminate the blight currently experienced by these residents.
Slough Borough Council	A project of this size in such close proximity to Slough has the potential to exert significant impact on the town for a sustained period of time. It is essential that the Colnbrook freight rail line is retained and utilised to reduce HGV access to the site and that a detailed road traffic management strategy is put in place.
Crawley Borough Council	Freight: The Airports Commission suggests a limited growth of freight traffic through Gatwick, based on the comparatively modest level of freight traffic at present. However, the Gatwick area has sector strengths in pharmaceuticals and high-tech machinery, both noted to be heavily air freight dependent, and therefore it is considered the Commission should consider in more detail the potential for air freight growth at Gatwick in its assessments, and the implications this would have on local employment, land take and surface access.
Hounslow Council	Hounslow Council is concerned about the increase in potential additional freight movements identified by the scheme promoters, which will result in increased noise and worsening of the local air quality on the surrounding road network. The Heathrow NWR option proposes a reconfiguration of the local road network by introducing an additional link road, which could potentially put increased development pressure on Feltham. The Council would expect to see a full freight impact assessment of each proposal published and would welcome the opportunity to comment on this before recommendations are made.
Royal Borough of Windsor and Maidenhead	Expansion at Heathrow is likely to be highly beneficial to the air freight sector. The availability of more runway capacity provides the potential for enhanced freight capacity on existing freight routes, as well as the creation of new routes. Therefore, it is likely that there will be a significant increase in freight traffic associated with the airport. The impacts on the local road network and adjacent communities need to be fully assessed and mitigated.
Fiona Mactaggart MP	HGV lorries waiting to access the airport stay overnight in lay-bys on the A4 or residential streets in Slough where thre are no facilities. This problem must be addressed, regardless of expansion, but the pressure under expansion would be such that lorry parking and waiting facilities must be provided on-airport to eliminate the blight currently experienced by lack of appropriate lorry parking.
Mid Sussex District Council	Significant reliance is placed on the North-South corridor which contains the M23/A23 and the Brighton Main Line. There is currently only limited access from that corridor to the Airport and the alternative routes are also limited. The Commission should give more consideration to the impacts on other major links in the area and the need for their improvement, including the A264 and the A22, both of which are likely to experience further pressures, in their own right and as alternatives to the M23/A23 at times when this route is congested. The Commission should also review its assessment of the scale of freight which might pass through Gatwick, and the consequential implications for

	employment and transport, taking into account the potential changes in the character of the airport over a long period.
Horsham District Council	The Commission's cautious approach towards the potential growth of freight traffic through Gatwick, reflects the comparatively modest level of freight passing through it at present and the requirement for significant third party investment if further growth is to take place. By contrast, Heathrow with its strong existing role in the cargo sector is seen as well placed to grow. If Gatwick was to grow its freight traffic, the increased scale of cargo operations would have consequences for local employment, land and infrastructure and this is not addressed by the assessment.
Horsham District Council	The Council asks the Commission: • To extend its analysis of the 'strategic fit' of the three options to include an assessment of the impact of a new runway at Heathrow on Gatwick and the other airports in the South East. • To review its assessment of the scale of freight which might pass through Gatwick with a second runway, and the consequential implications for local employment and transport, taking into account the potential changes in the character of the airport over a long period. • To note that the scale and nature of growth associated with a new runway at Gatwick has not been factored into current economic and planning strategies and that a wider Gatwick sub regional plan taking into account all scenarios is needed if there is a second runway at Gatwick, given the significant adaptation that would be required locally.

Appendix B. Heathrow North West Runway analysis figures

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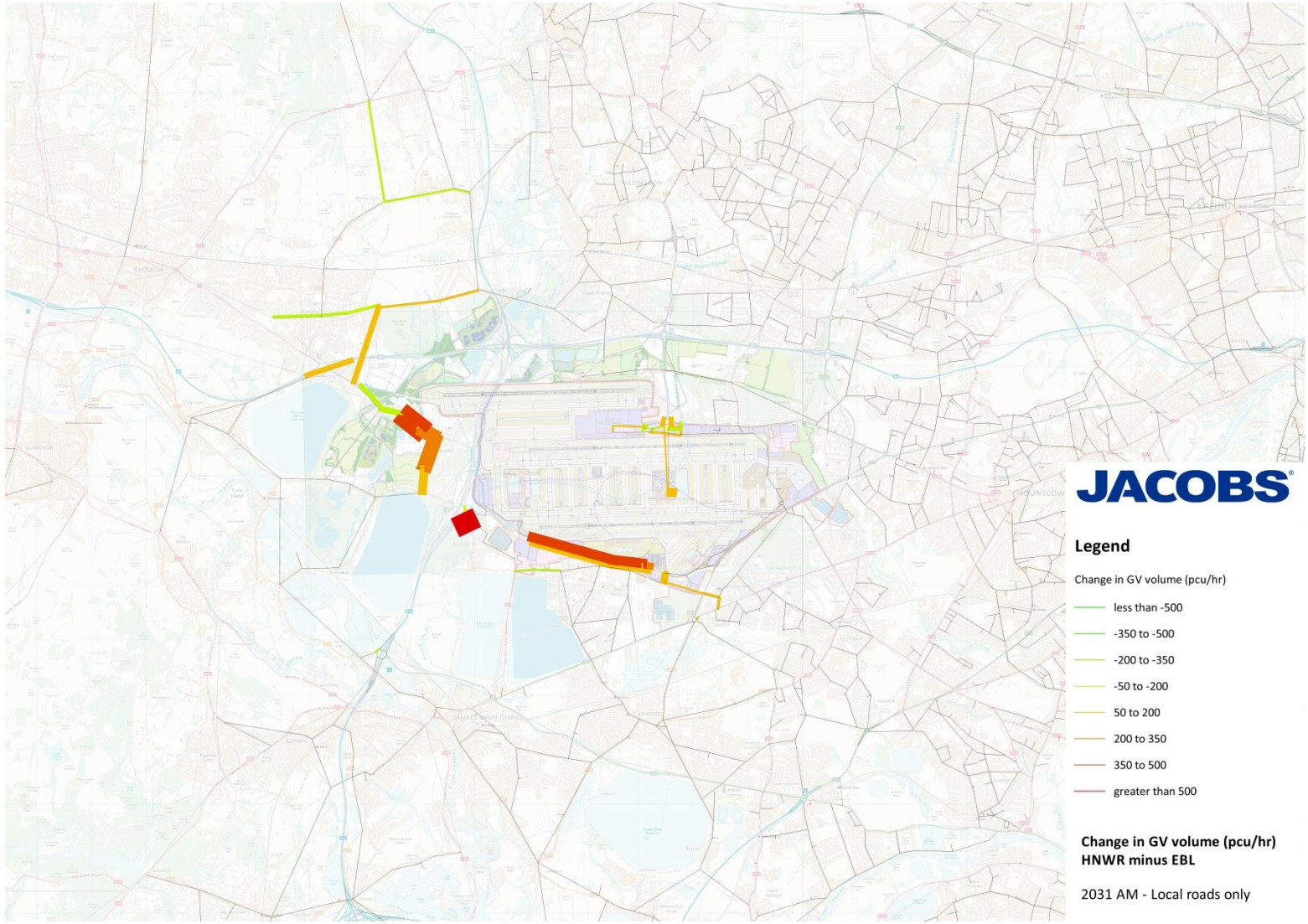
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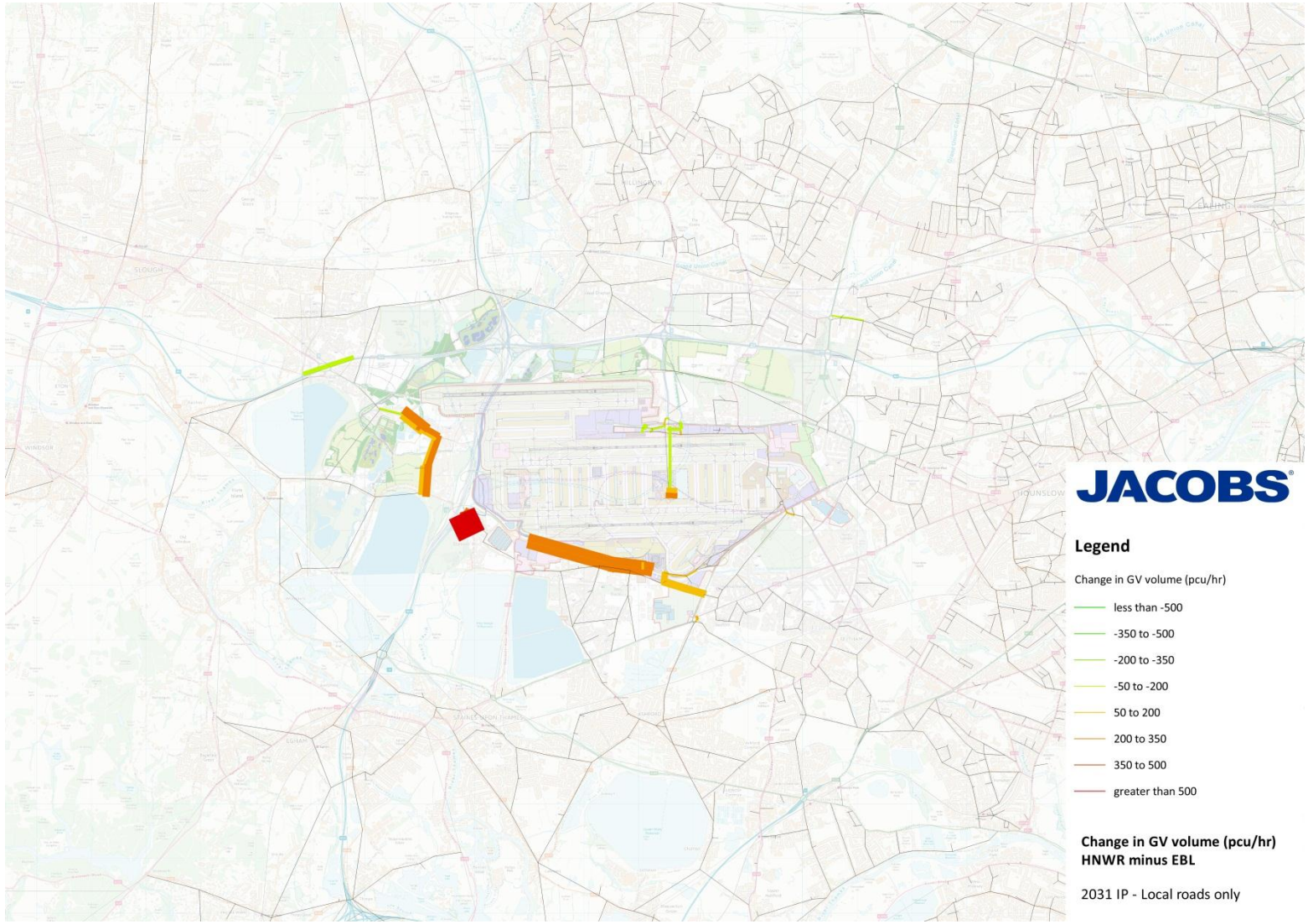
-200 to -350
-50 to -200
50 to 200
200 to 350
350 to 500
greater than 500
Change in GV volume (pcu/hr)
HNWR minus EBL
2031 AM - Local roads only

JACOBS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-200 to -350
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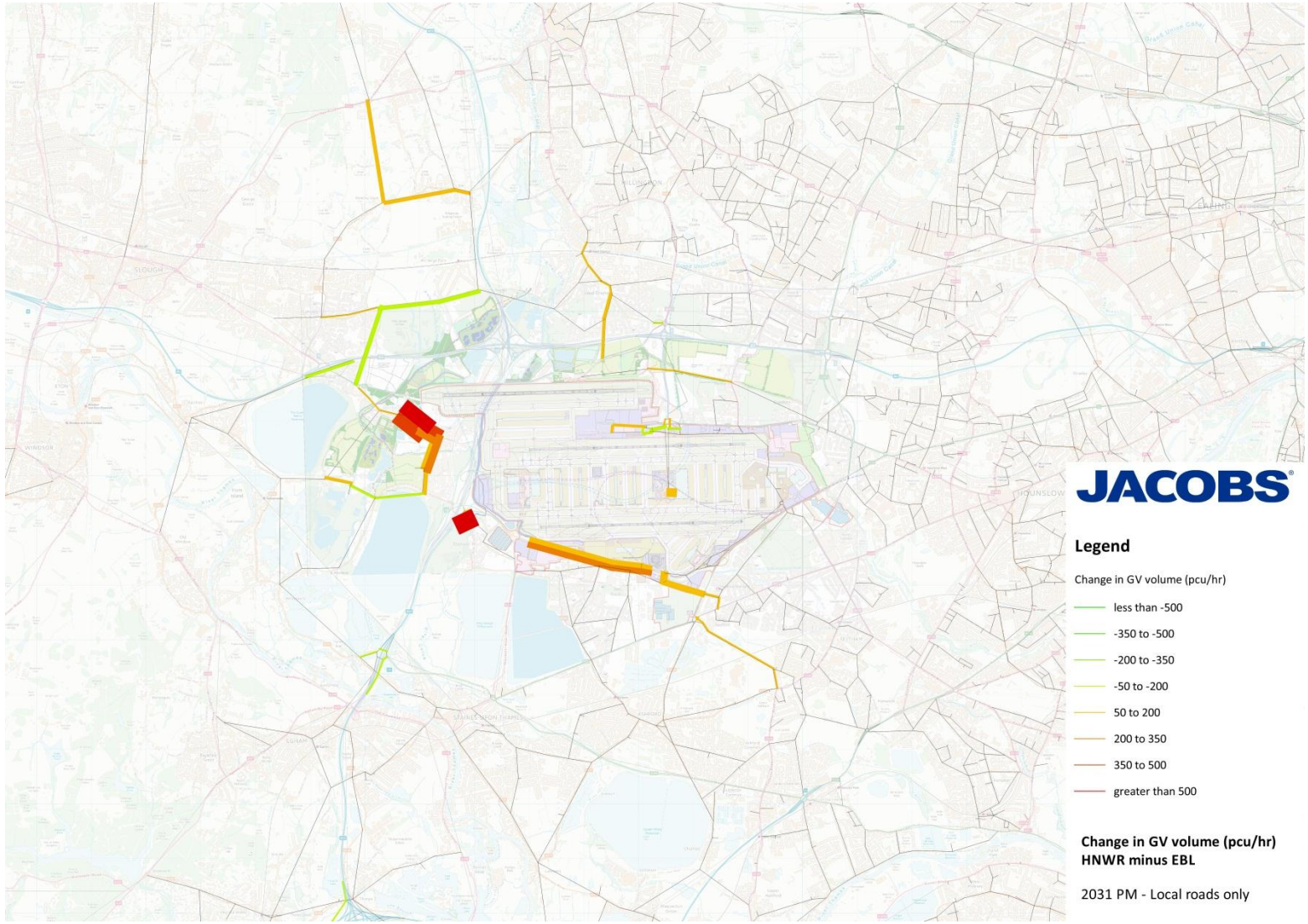
200 to 350
350 to 500
greater than 500
Change in GV volume (pcu/hr)
HNWR minus EBL
2031 IP - Local roads only

JACOBS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-200 to -350
-50 to -200
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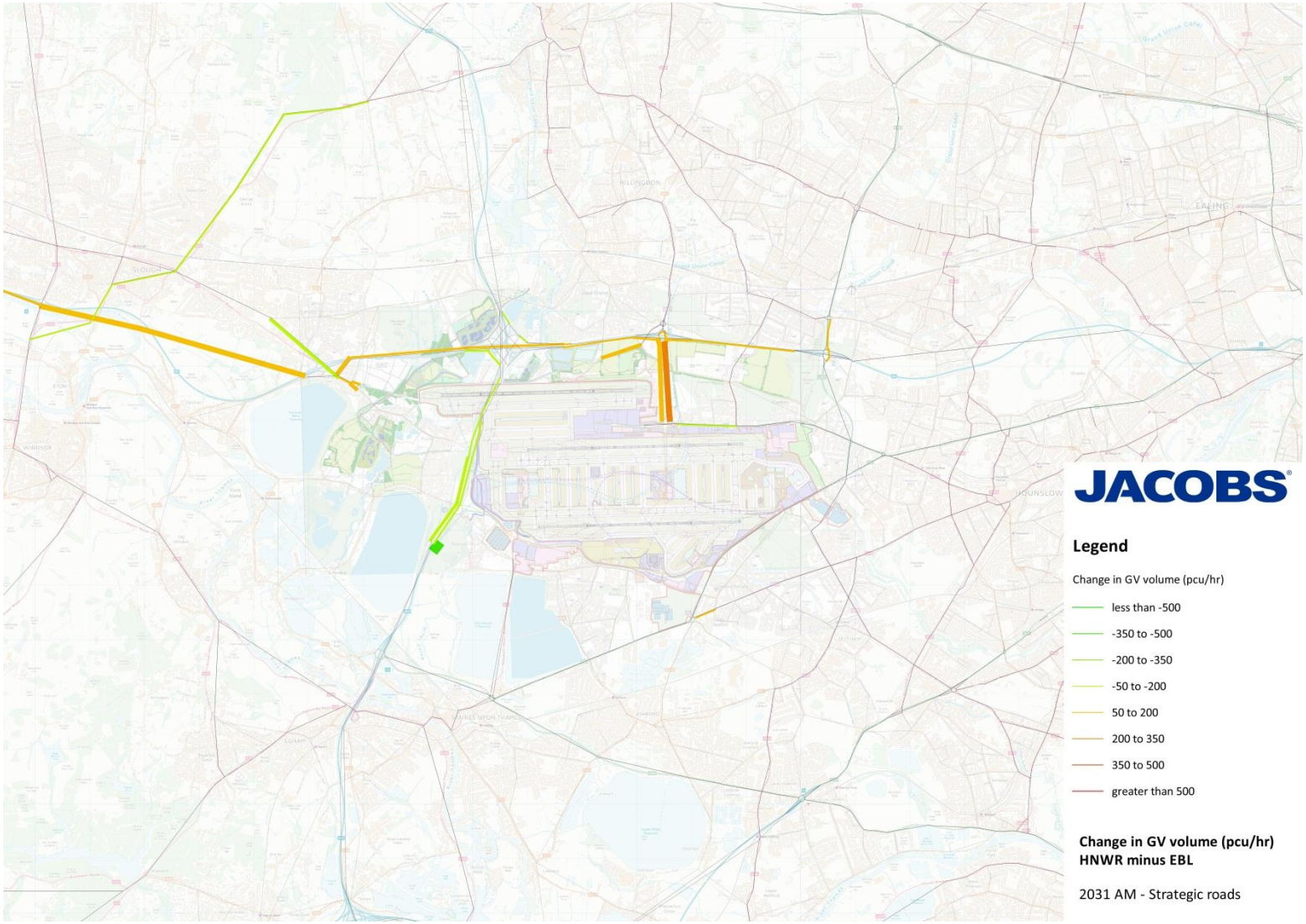
200 to 350
350 to 500
greater than 500
Change in GV volume (pcu/hr)
HNWR minus EBL
2031 PM - Local roads only

JACOBS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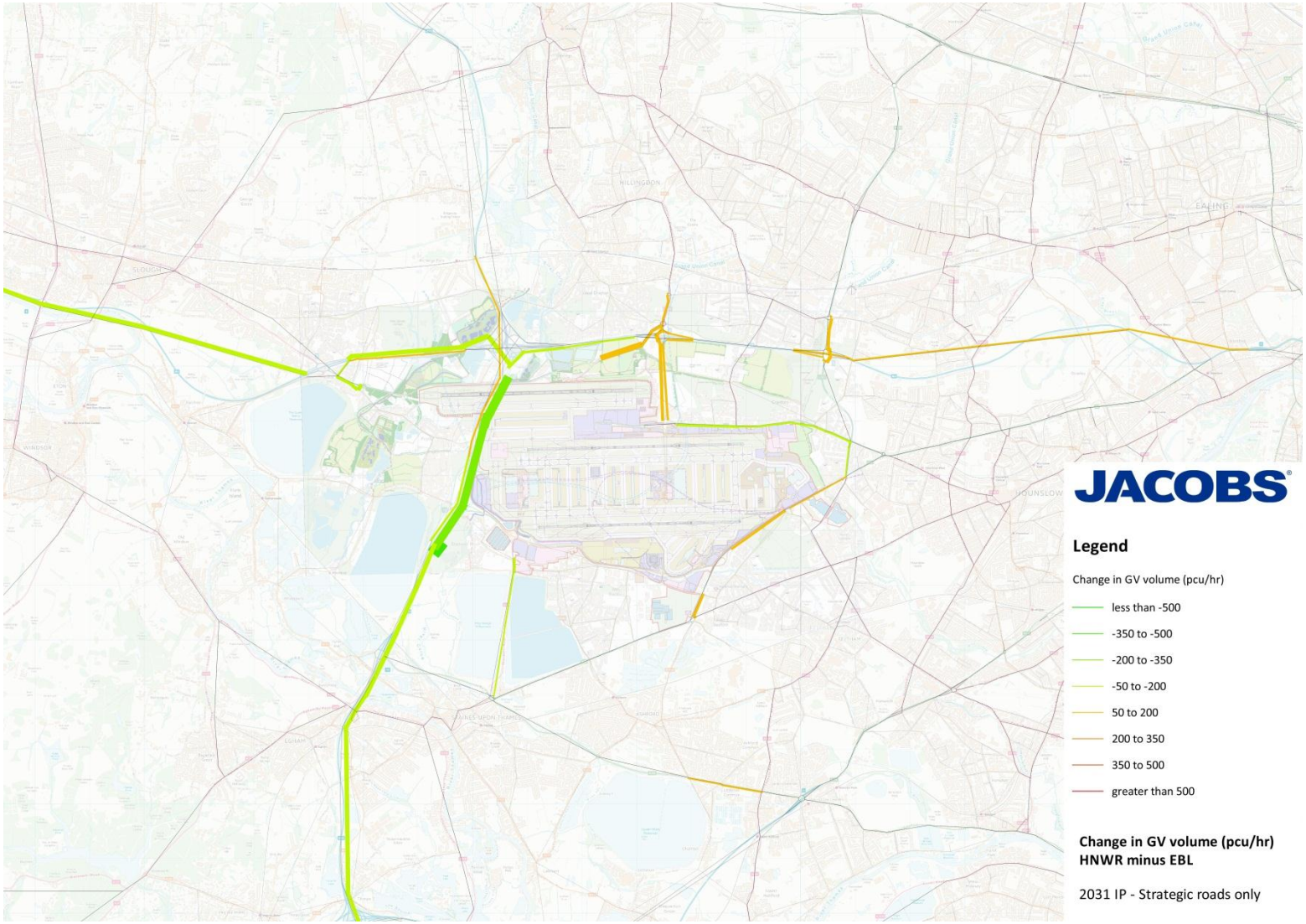
350 to 500
greater than 500
Change in GV volume (pcu/hr)
HNWR minus EBL
2031 AM - Strategic roads

JACOBS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greater than 500
Change in GV volume (pcu/hr)
HNWR minus EBL
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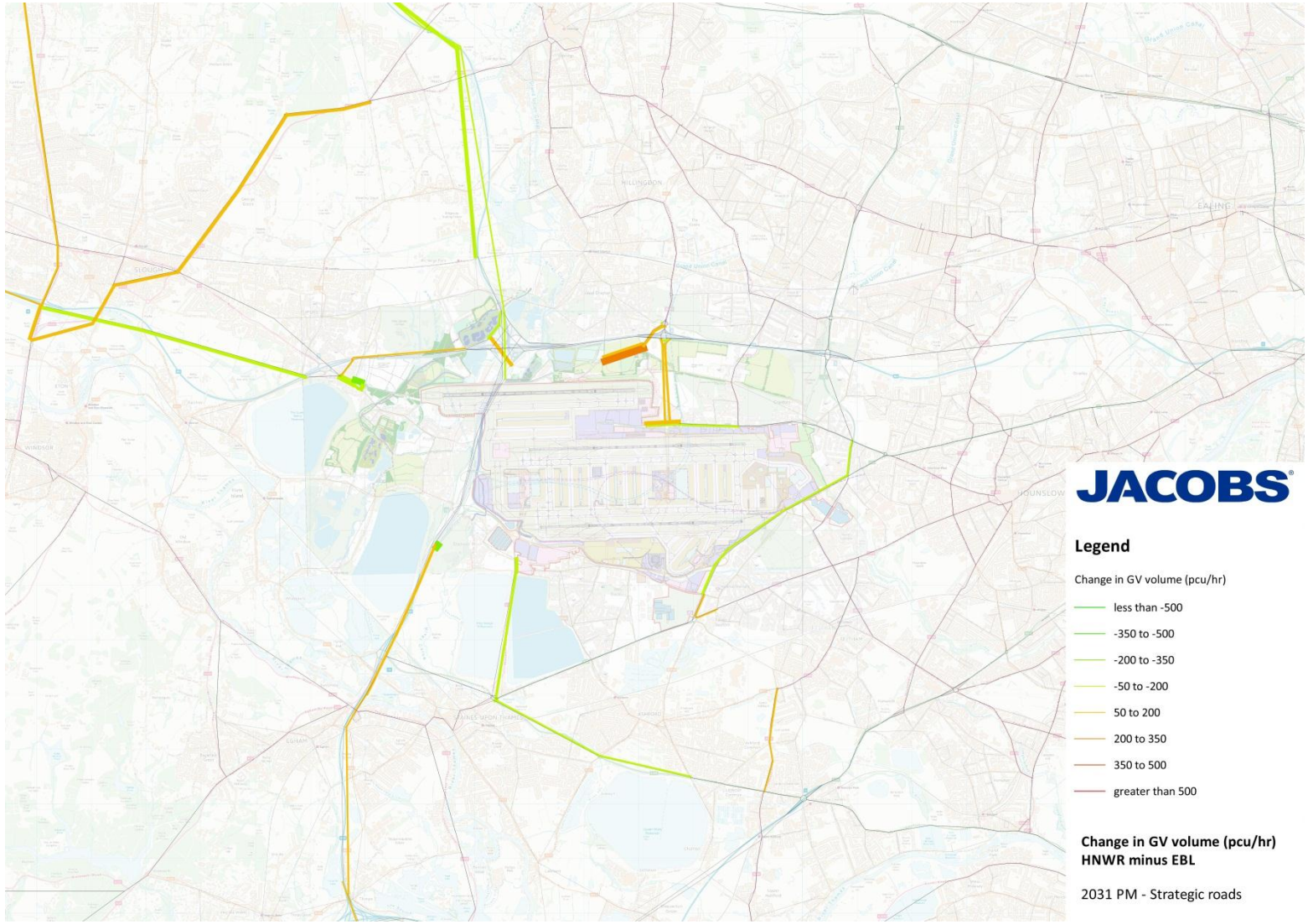
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greater than 500
Change in GV volume (pcu/hr)
HNWR minus EBL
2031 PM - Strategic roads

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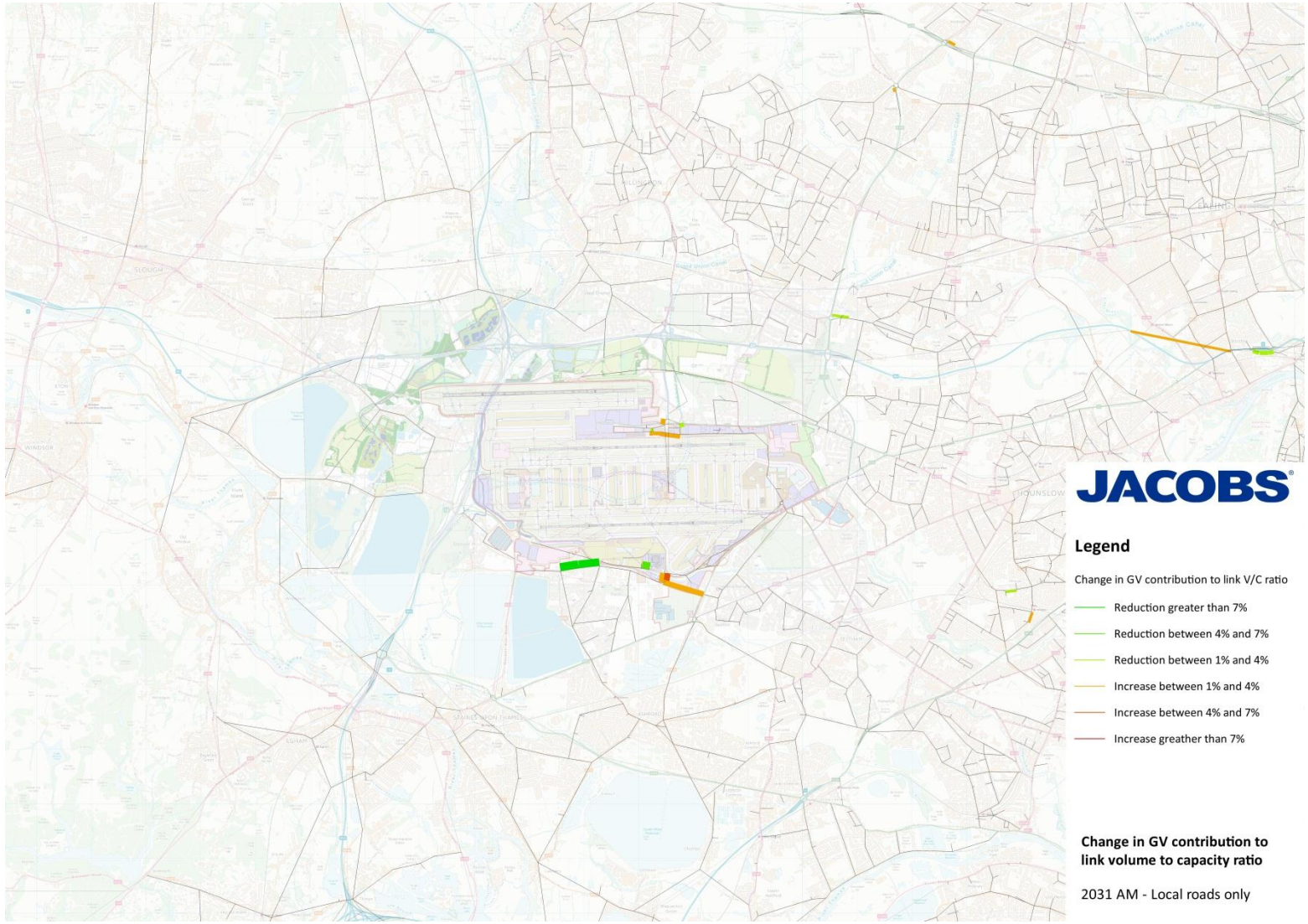
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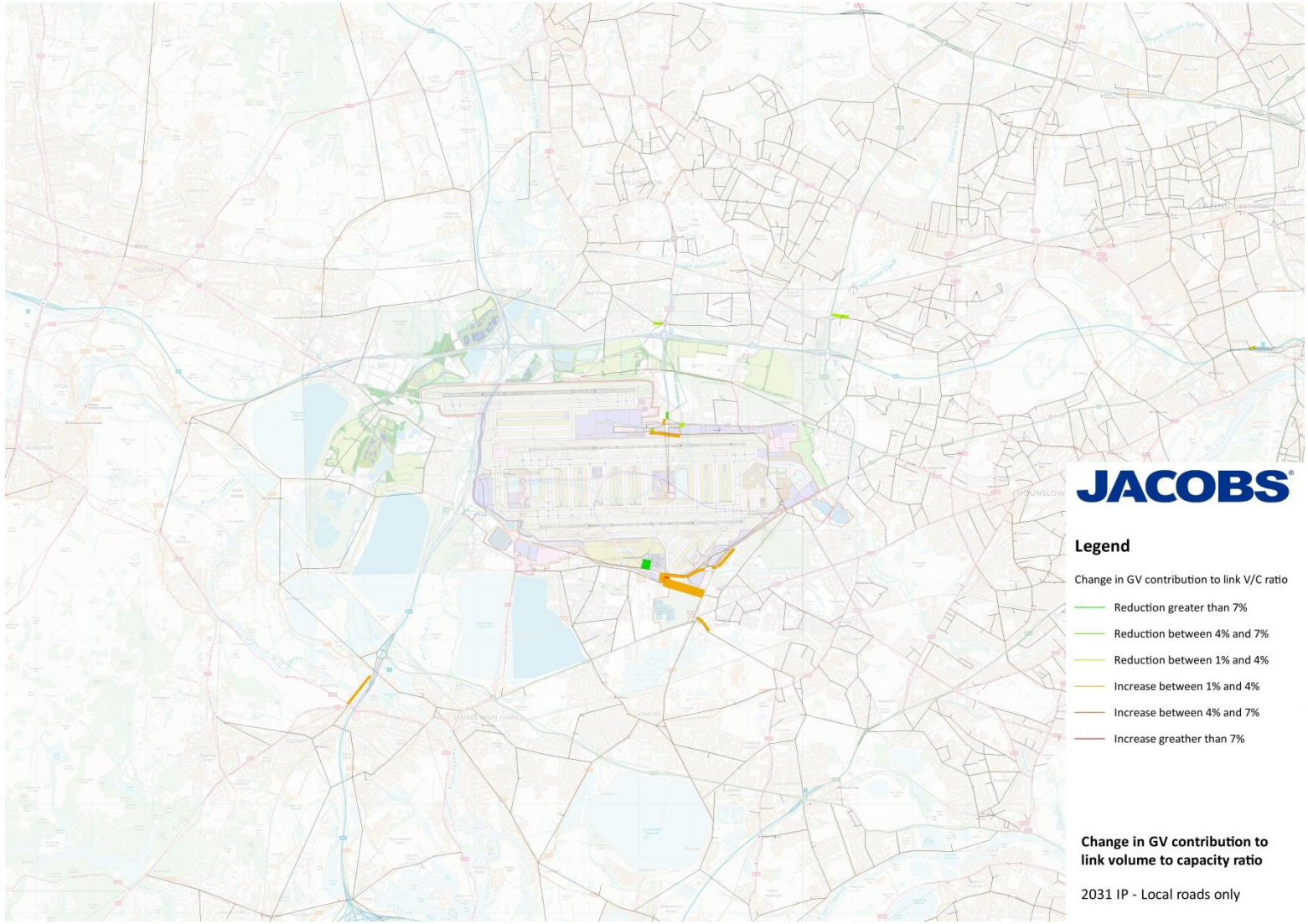
Increase between 4% and 7%
Increase greather than 7%
Change in GV contribution to link volume to capacity ratio
2031 AM - Local roads only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Reduction between 1% and 4%
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Increase between 4% and 7%
Increase greather than 7%
Change in GV contribution to link volume to capacity ratio
2031 IP - Local roads only

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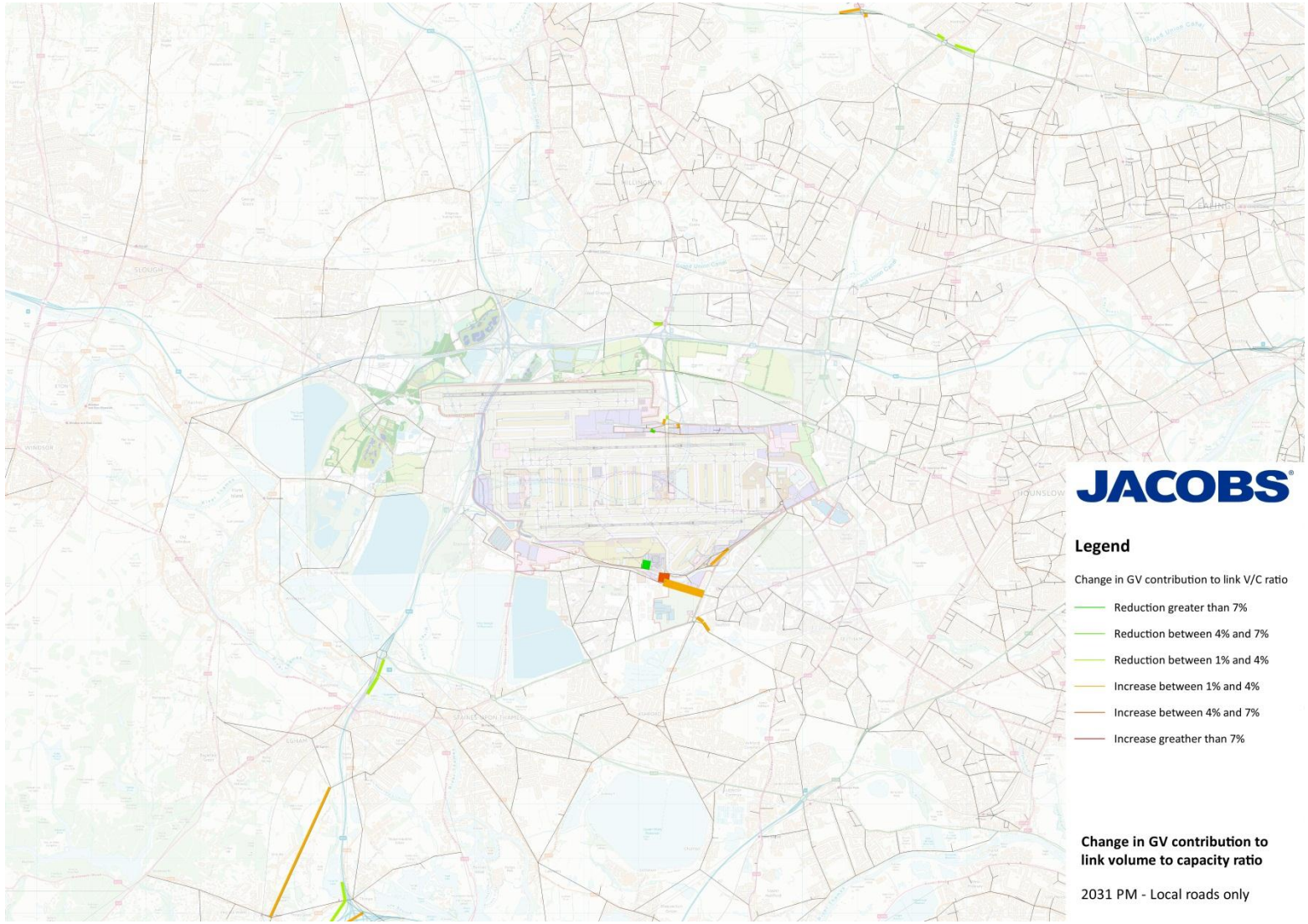
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Reduction between 4% and 7%
Reduction between 1% and 4%
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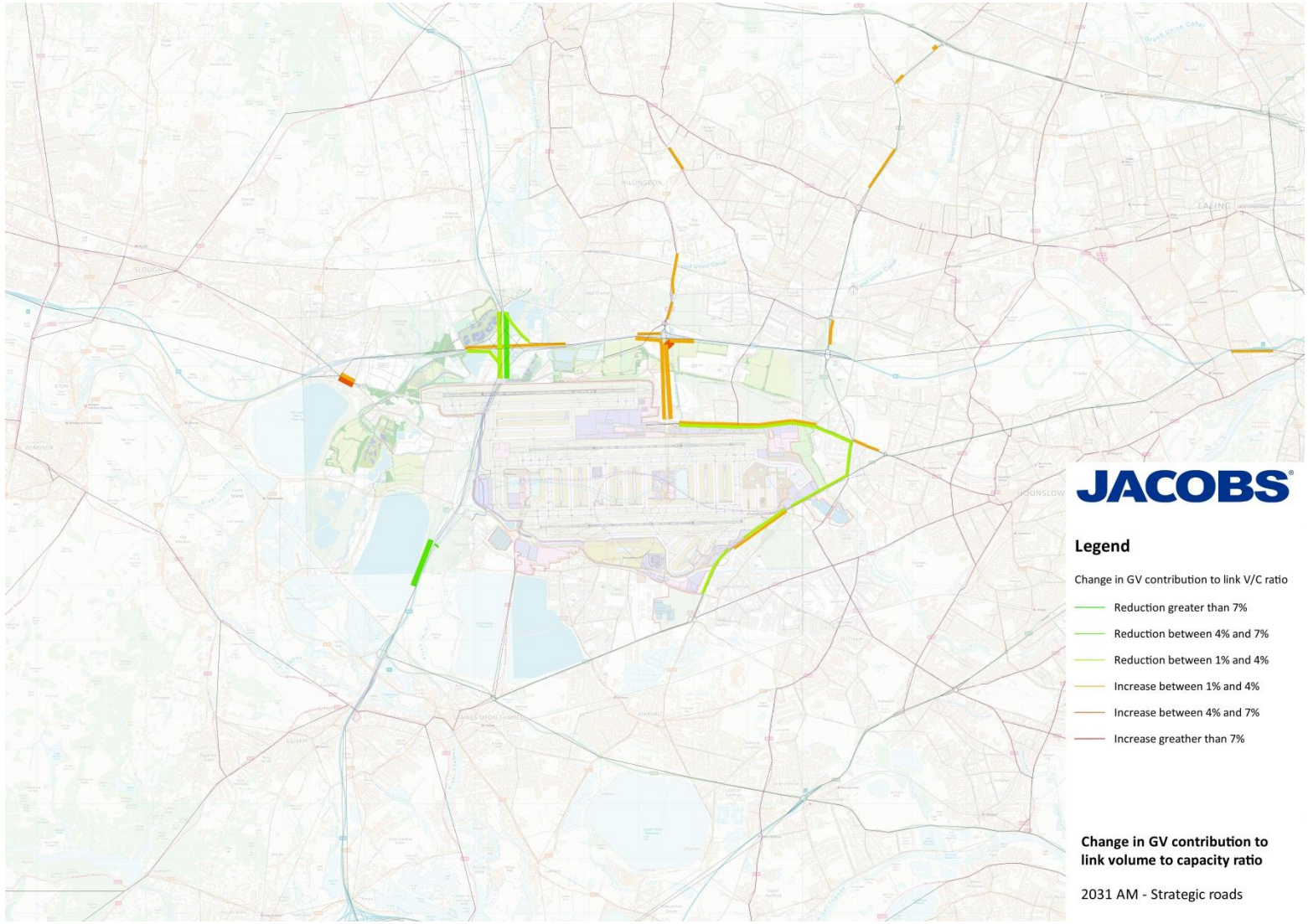
Increase between 4% and 7%
Increase greather than 7%
Change in GV contribution to link volume to capacity ratio
2031 PM - Local roads only

JACOBS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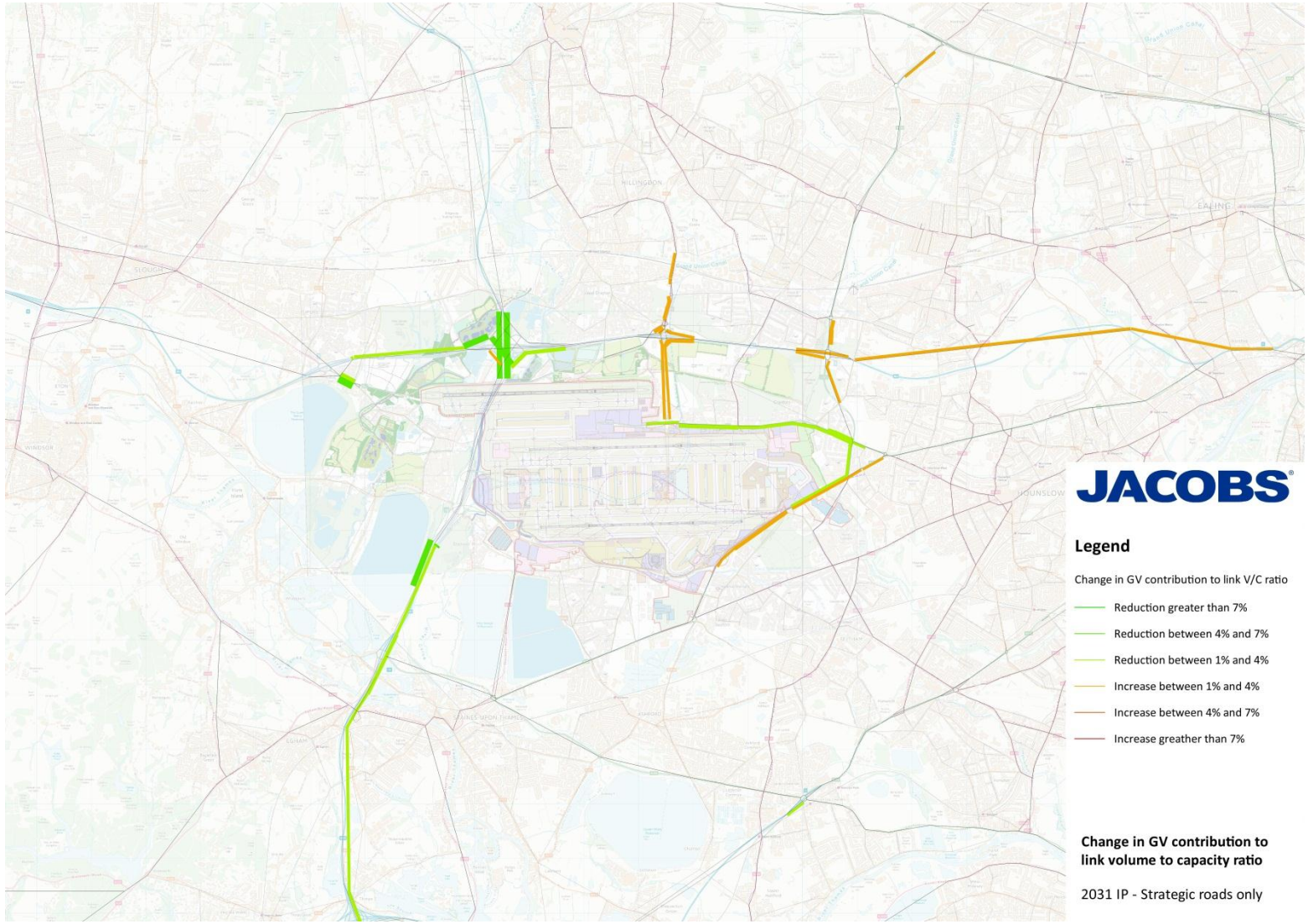
Change in GV contribution to link V/C ratio
Reduction greater than 7%
Reduction between 4% and 7%
Reduction between 1% and 4%
Increase between 1% and 4%
Increase between 4% and 7%
Increase greather than 7%
Change in GV contribution to link volume to capacity ratio
2031 AM - Strategic roads

JACOBS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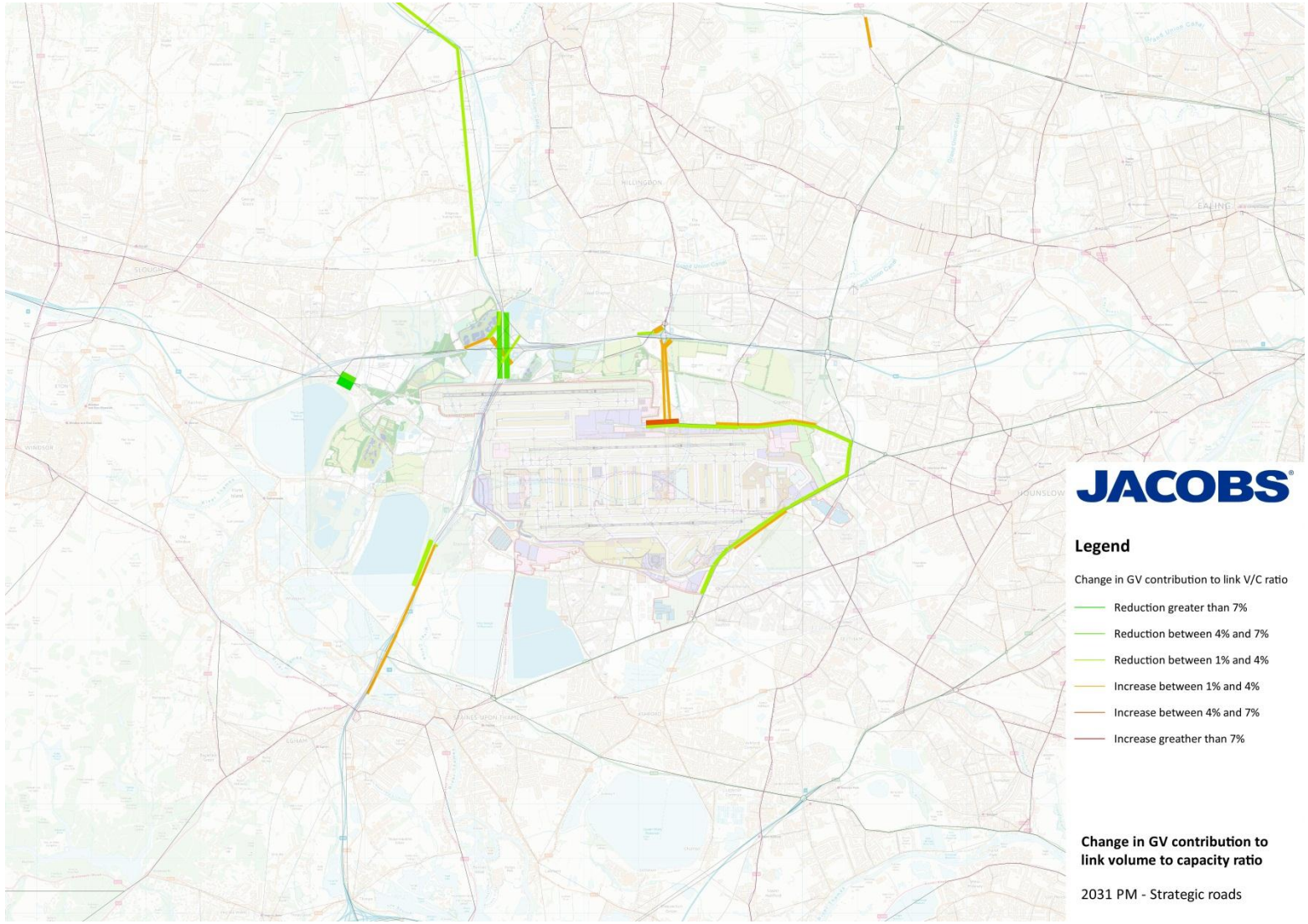
Increase between 4% and 7%
Increase greather than 7%
Change in GV contribution to link volume to capacity ratio
2031 IP - Strategic roads only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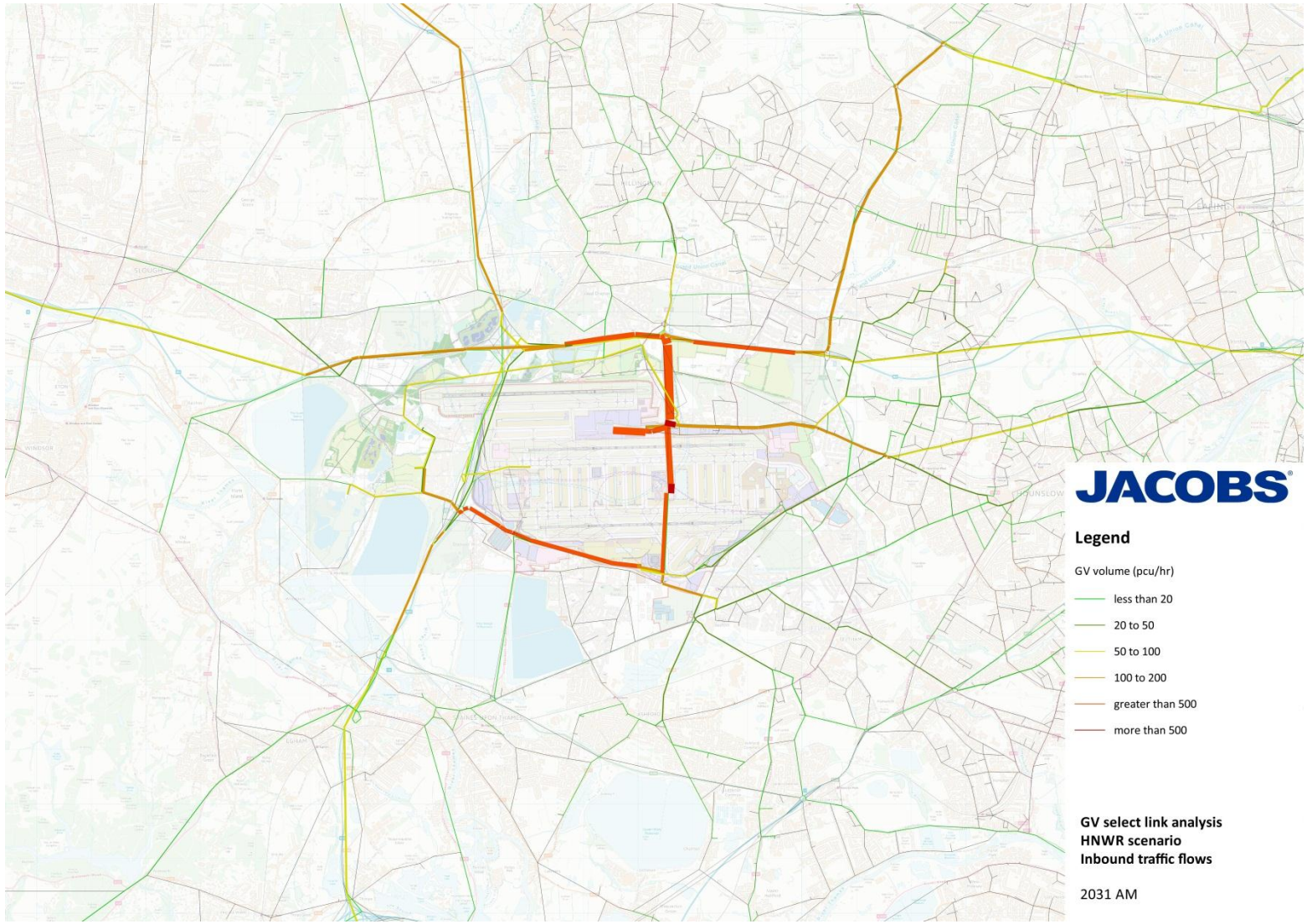
Change in GV contribution to link volume to capacity ratio
2031 PM - Strategic roads

JACOBS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more than 500
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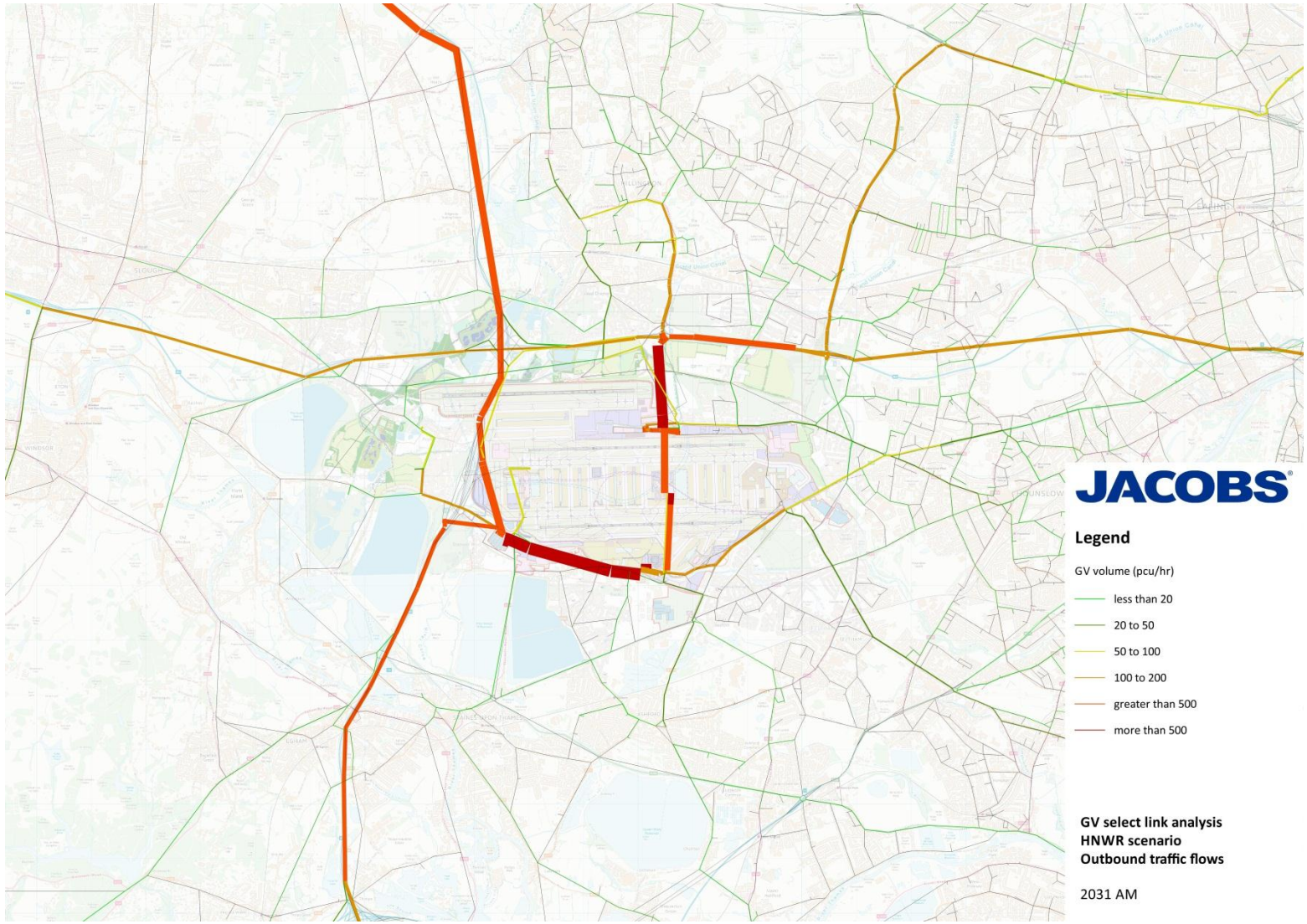
HNWR scenario
Inbound traffic flows
2031 AM

JACOBS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GV volume (pcu/hr)
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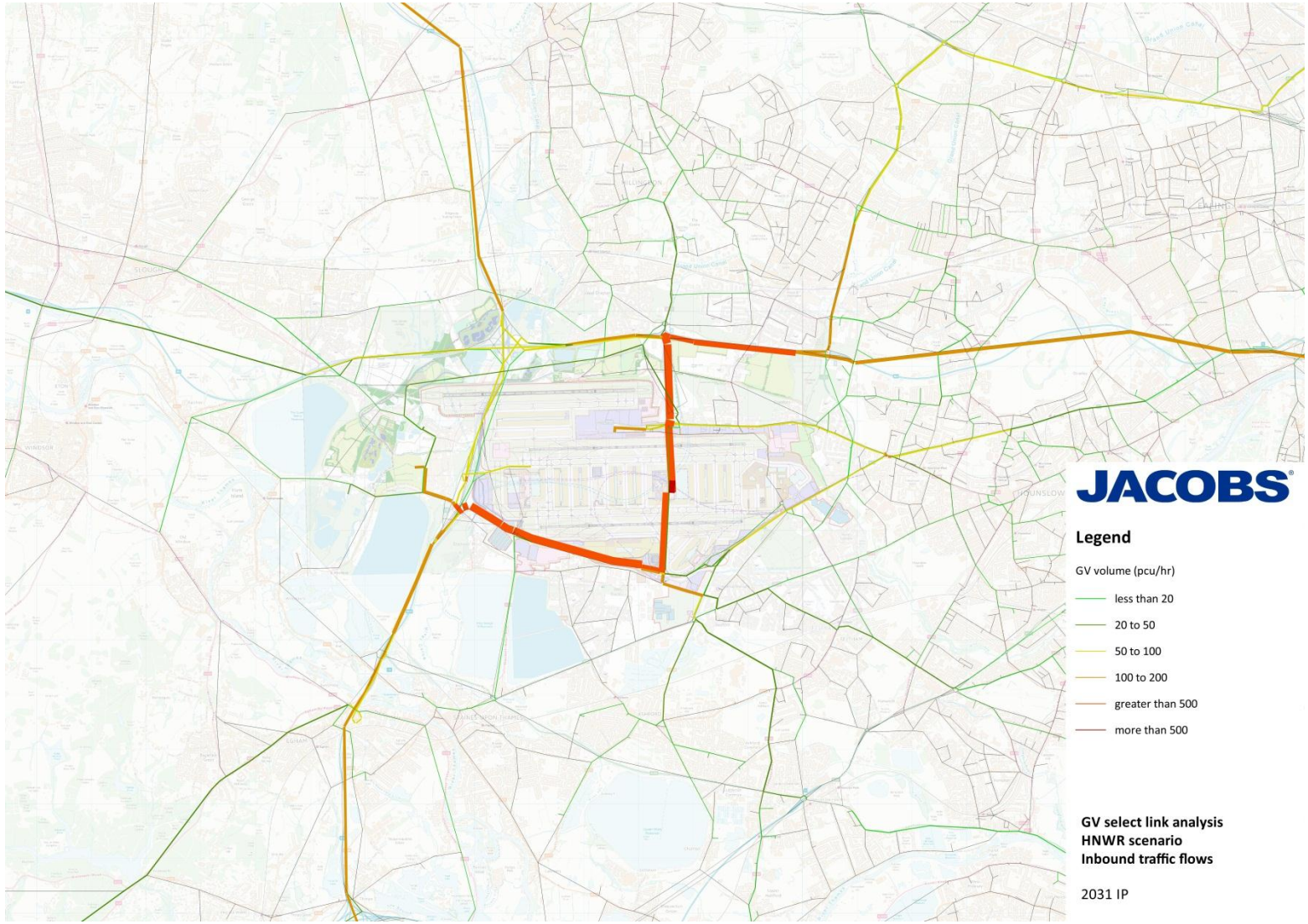
GV select link analysis
HNWR scenario
Outbound traffic flows
2031 AM

JACOBS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GV volume (pcu/hr)
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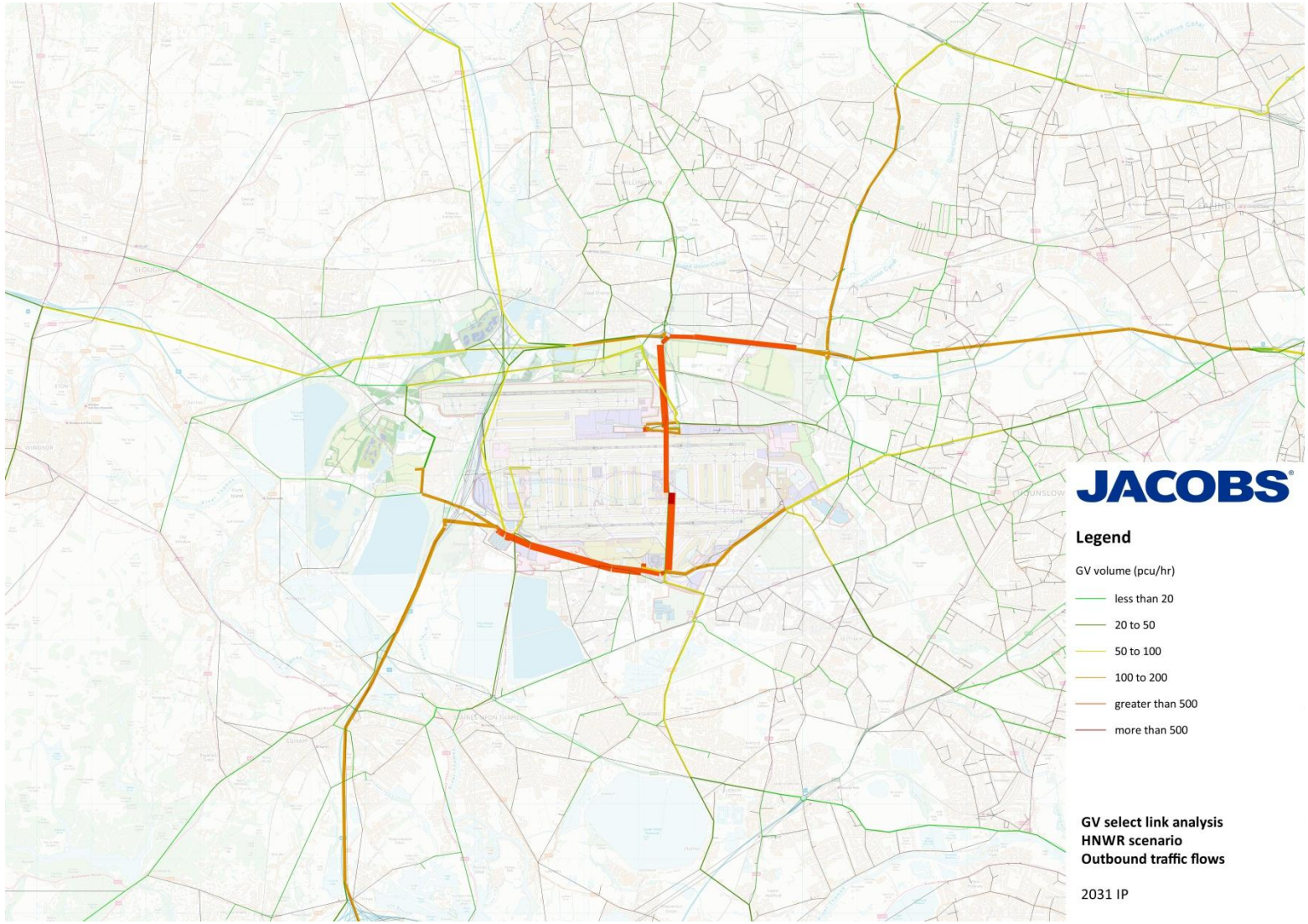
HNWR scenario
Inbound traffic flows
2031 IP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GV select link analysis
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Outbound traffic flows
2031 IP

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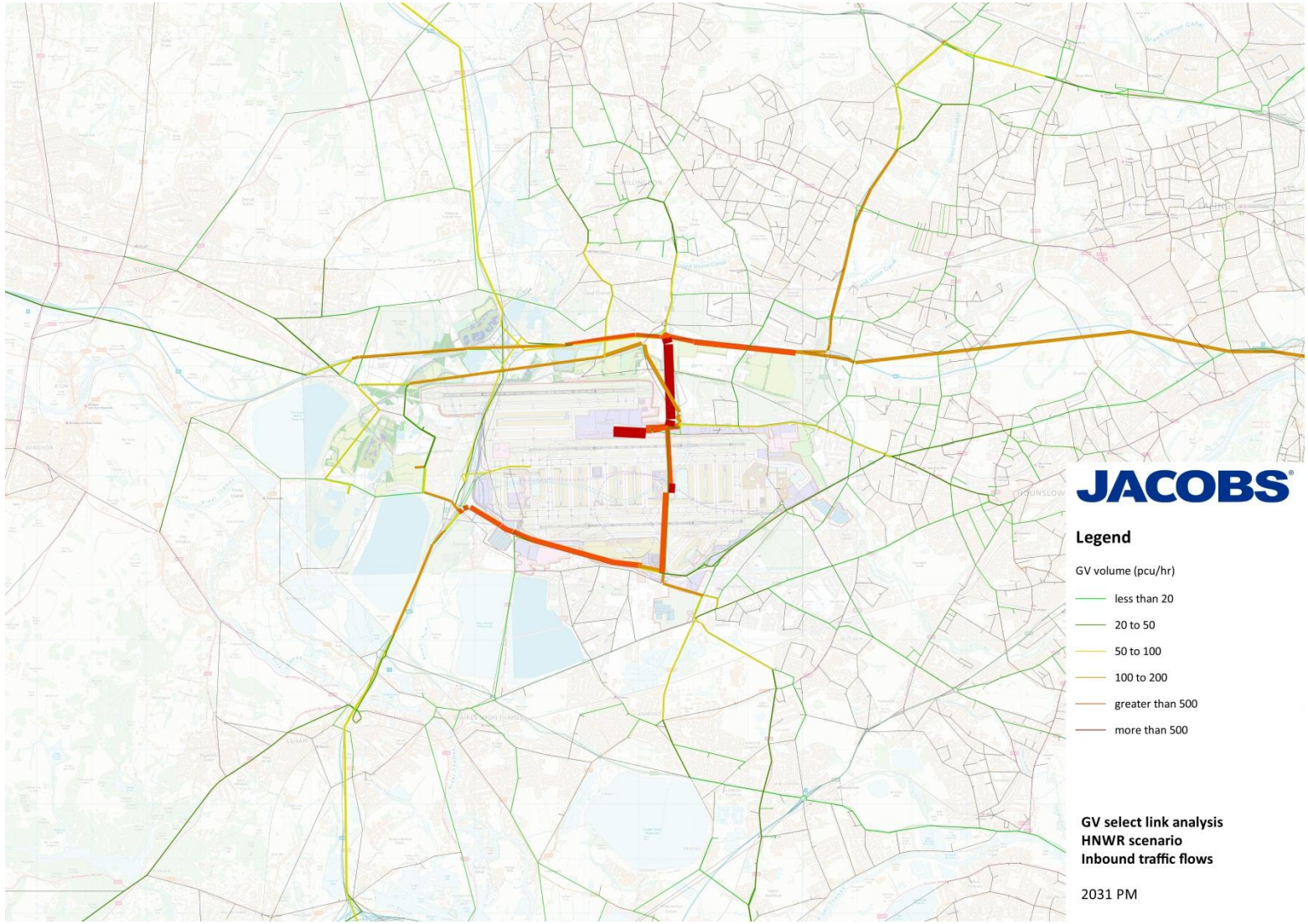
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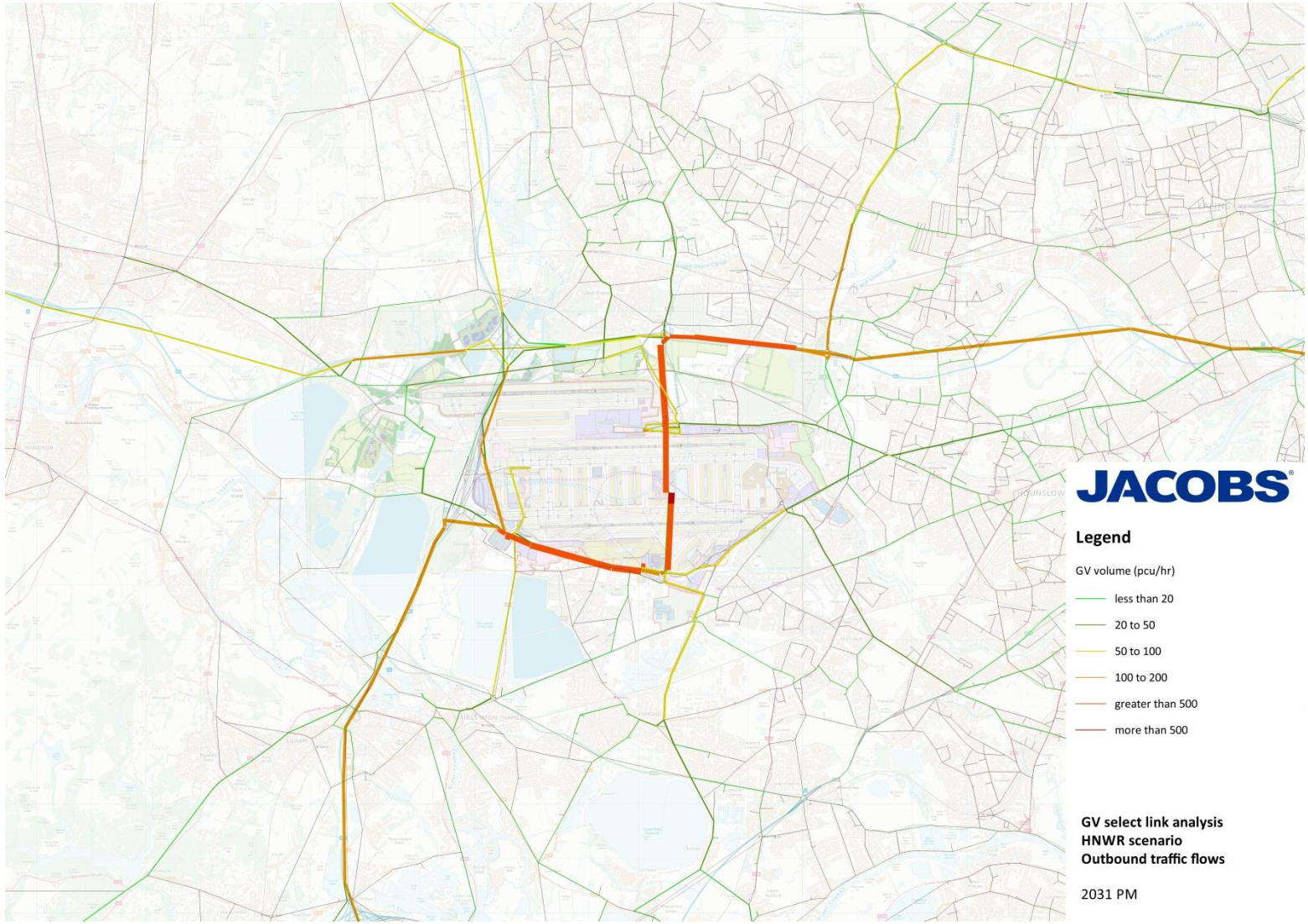
GV select link analysis
HNWR scenario
Inbound traffic flows
2031 PM

JACOBS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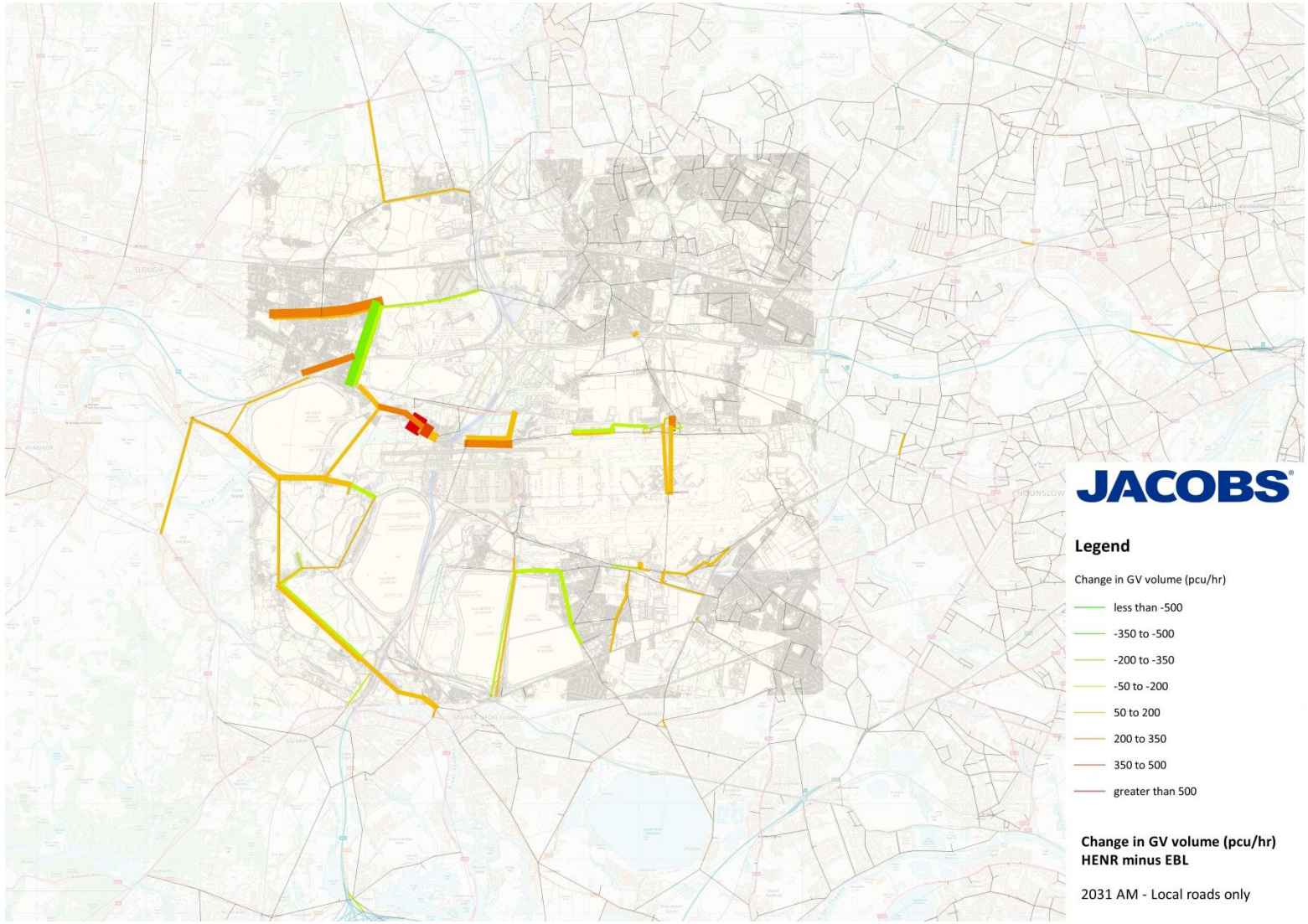
Outbound traffic flows
2031 PM

Appendix C. Heathrow Extended Northern Runway analysis figures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50 to 200
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350 to 500
greater than 500
Change in GV volume (pcu/hr)
HENR minus EBL
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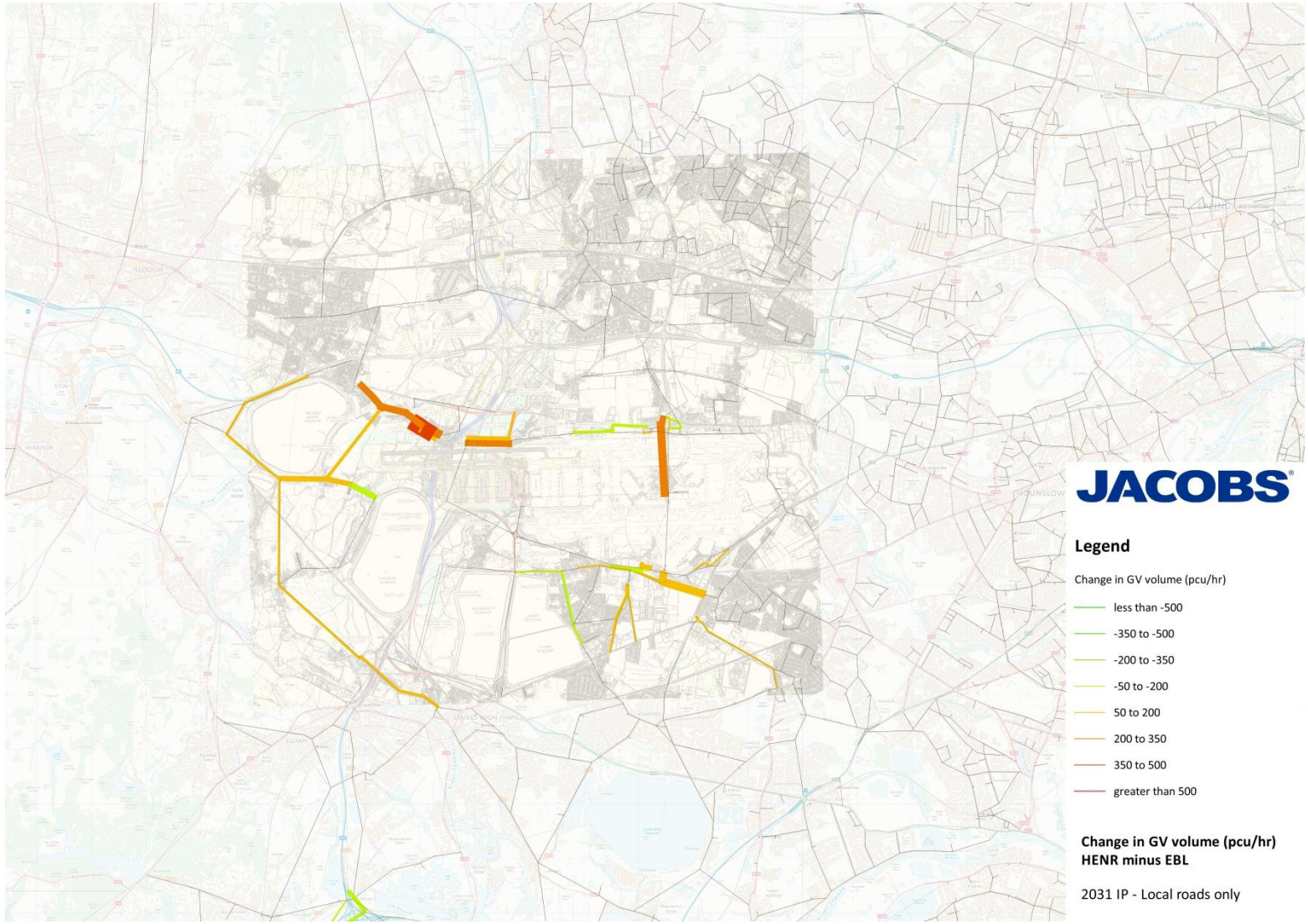
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HENR minus EBL
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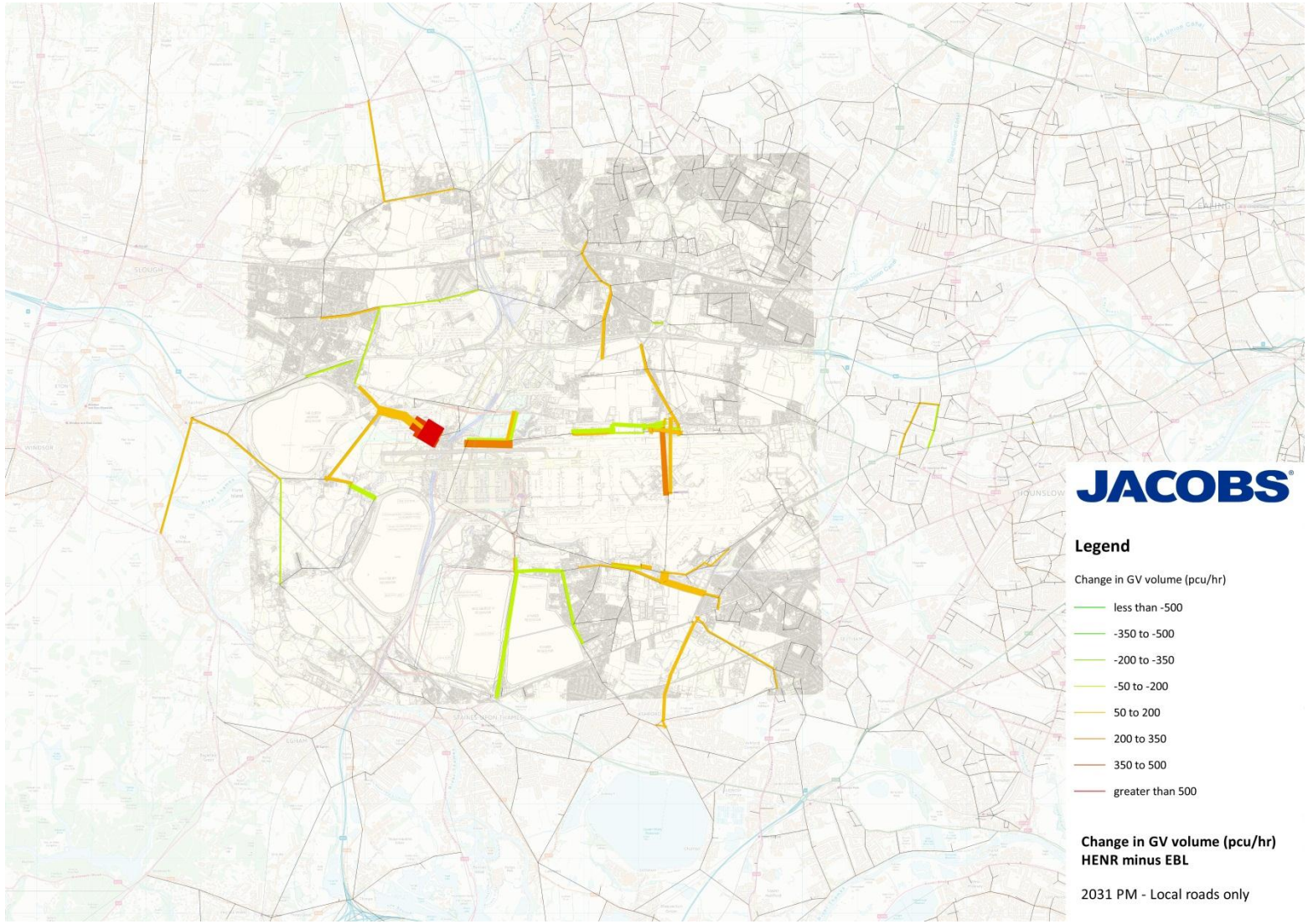
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Change in GV volume (pcu/hr)
HENR minus EBL
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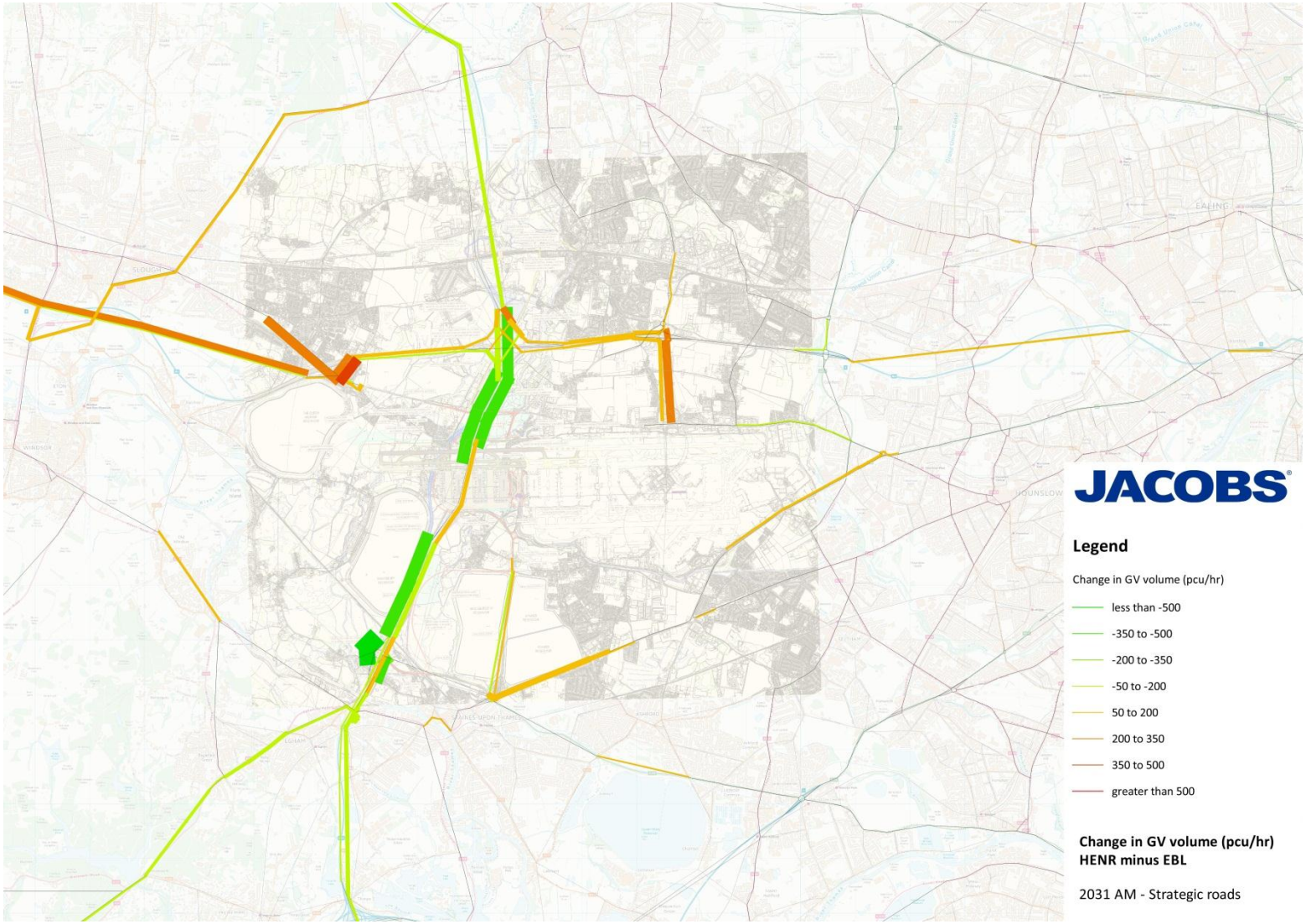
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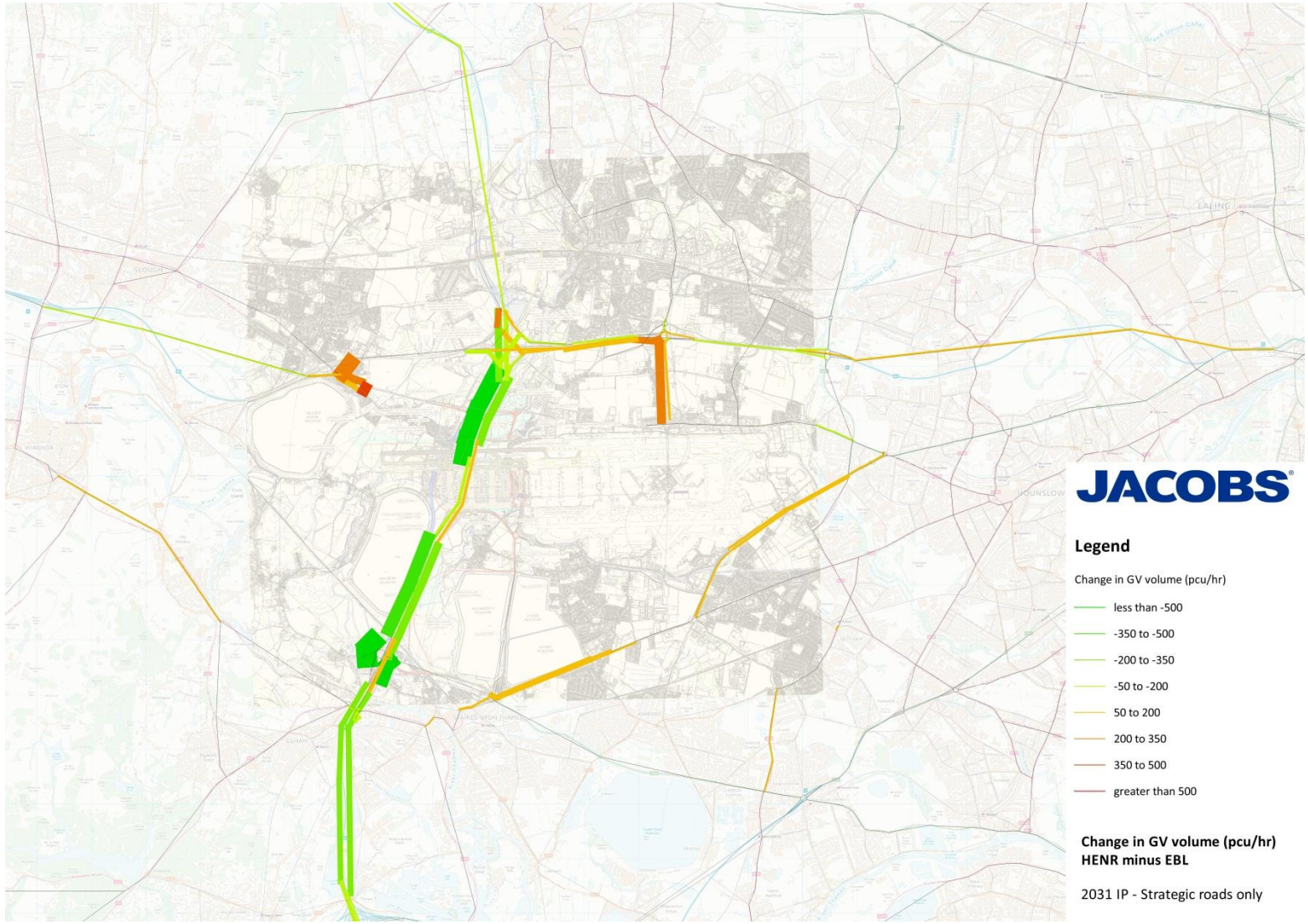
200 to 350
350 to 500
greater than 500
Change in GV volume (pcu/hr)
HENR minus EBL
2031 AM - Strategic roads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Change in GV volume (pcu/hr)
HENR minus EBL
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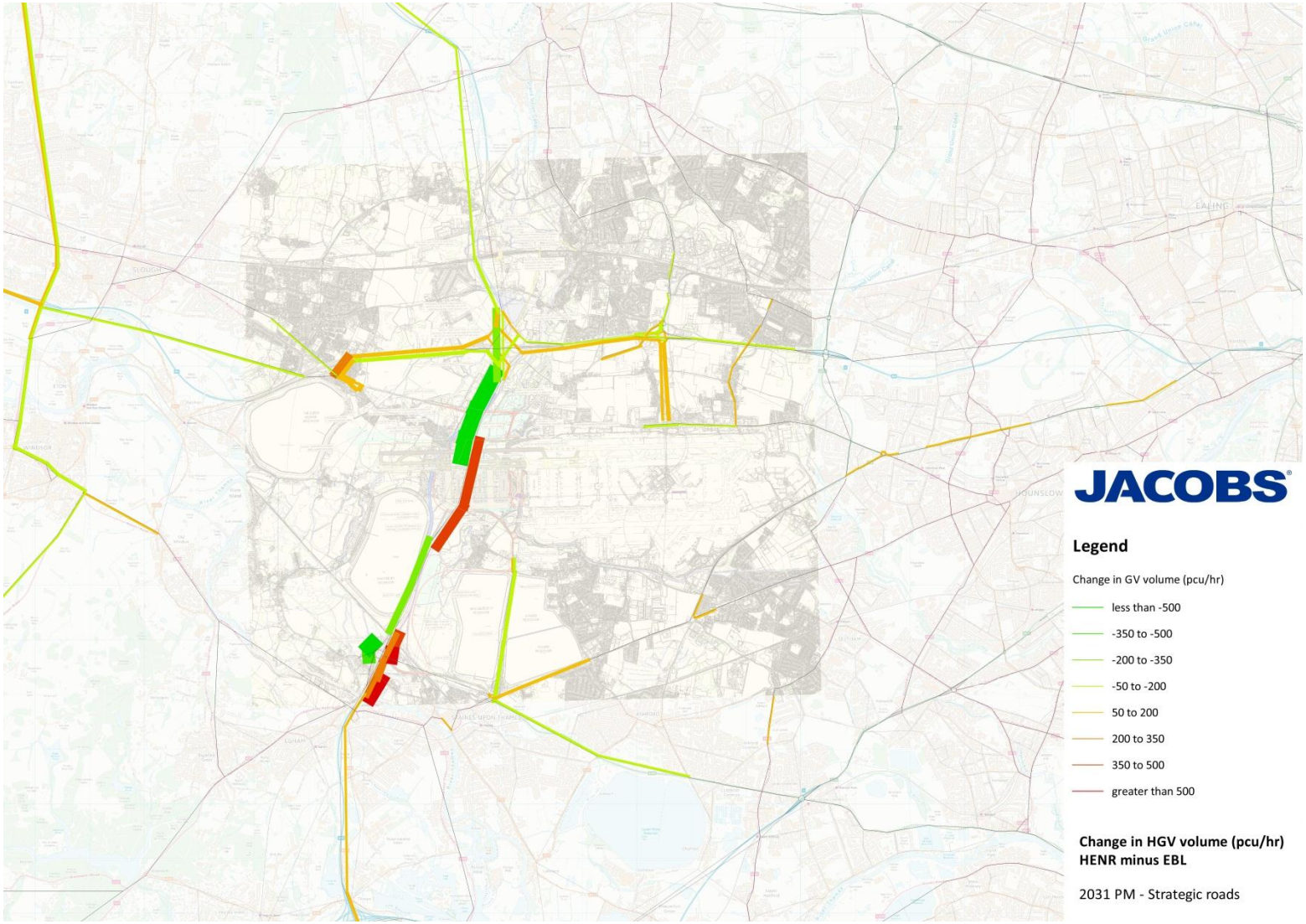
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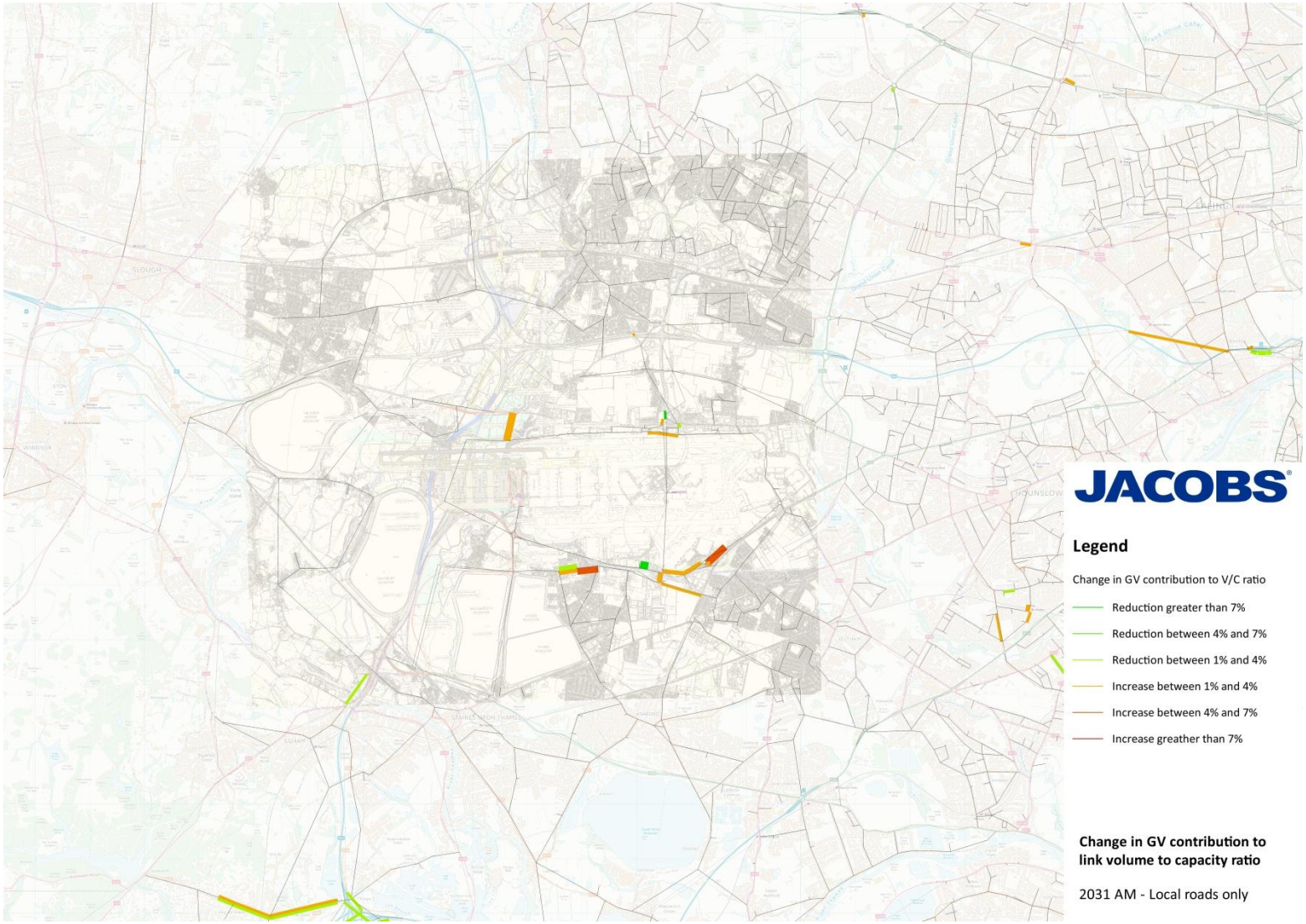
350 to 500
greater than 500
Change in HGV volume (pcu/hr)
HENR minus EBL
2031 PM - Strategic roads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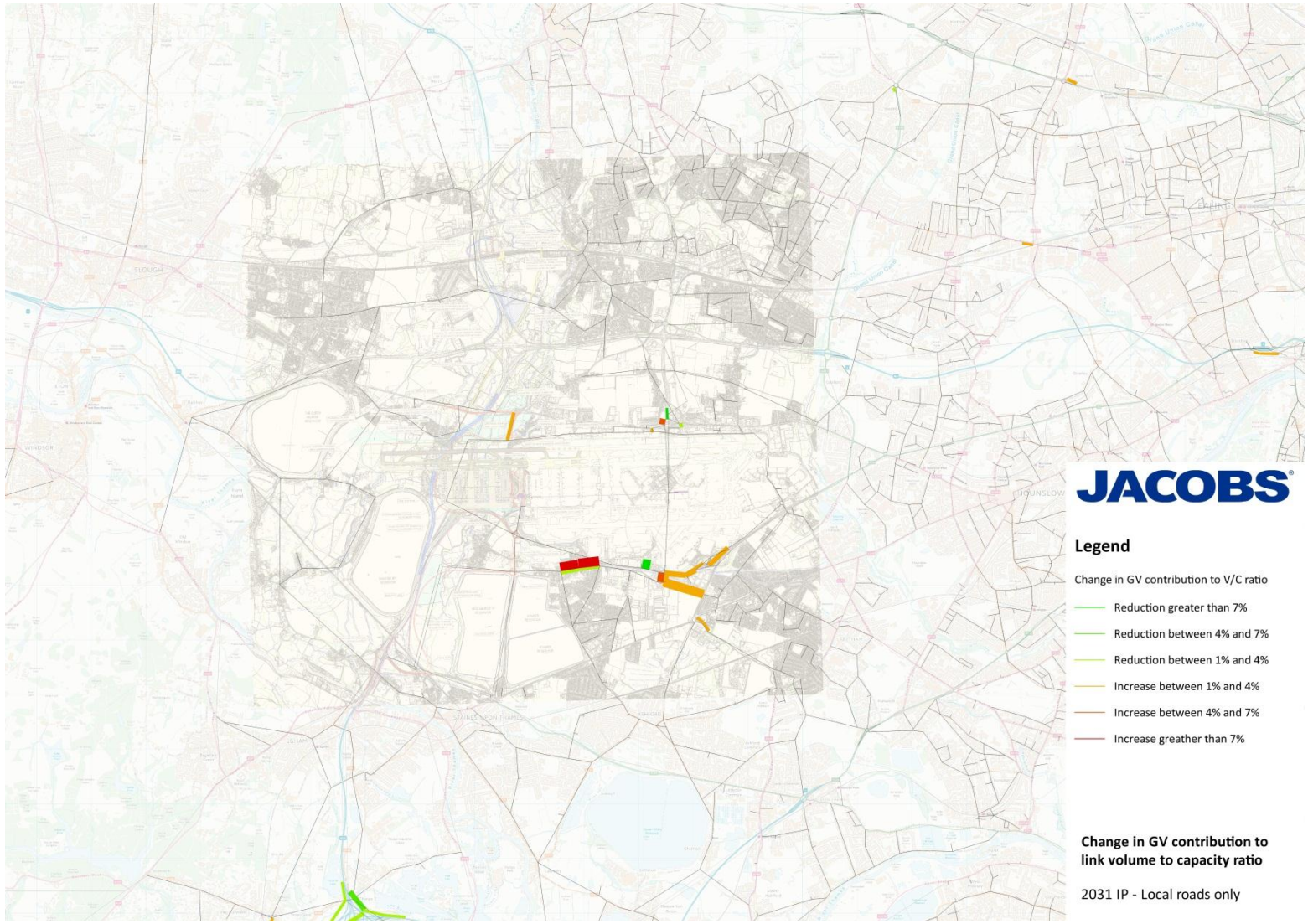
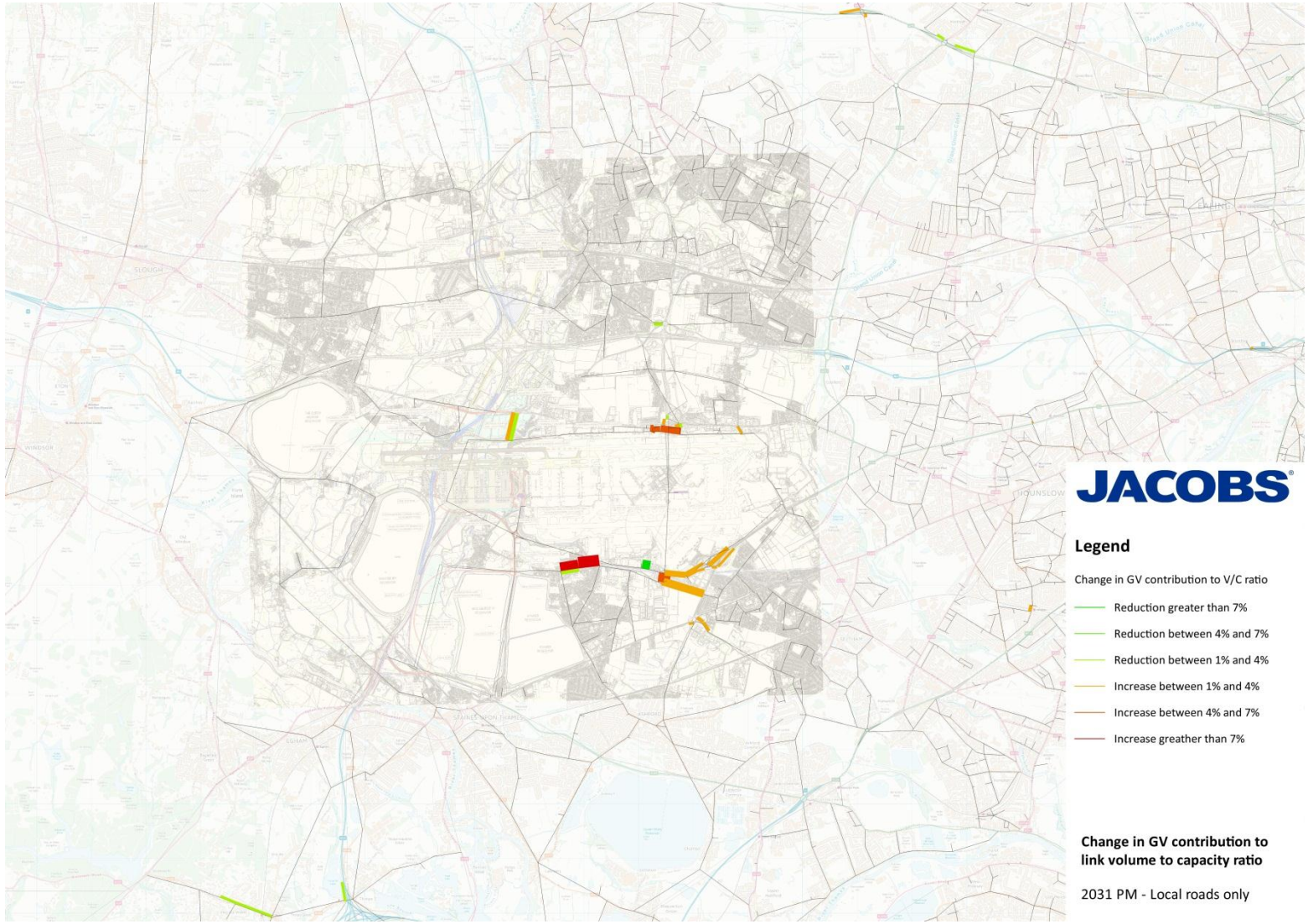
Change in GV contribution to V/C ratio
Reduction greater than 7%
Reduction between 4% and 7%
Reduction between 1% and 4%
Increase between 1% and 4%
Increase between 4% and 7%
Increase greather than 7%
Change in GV contribution to link volume to capacity ratio
2031 AM - Local roads only

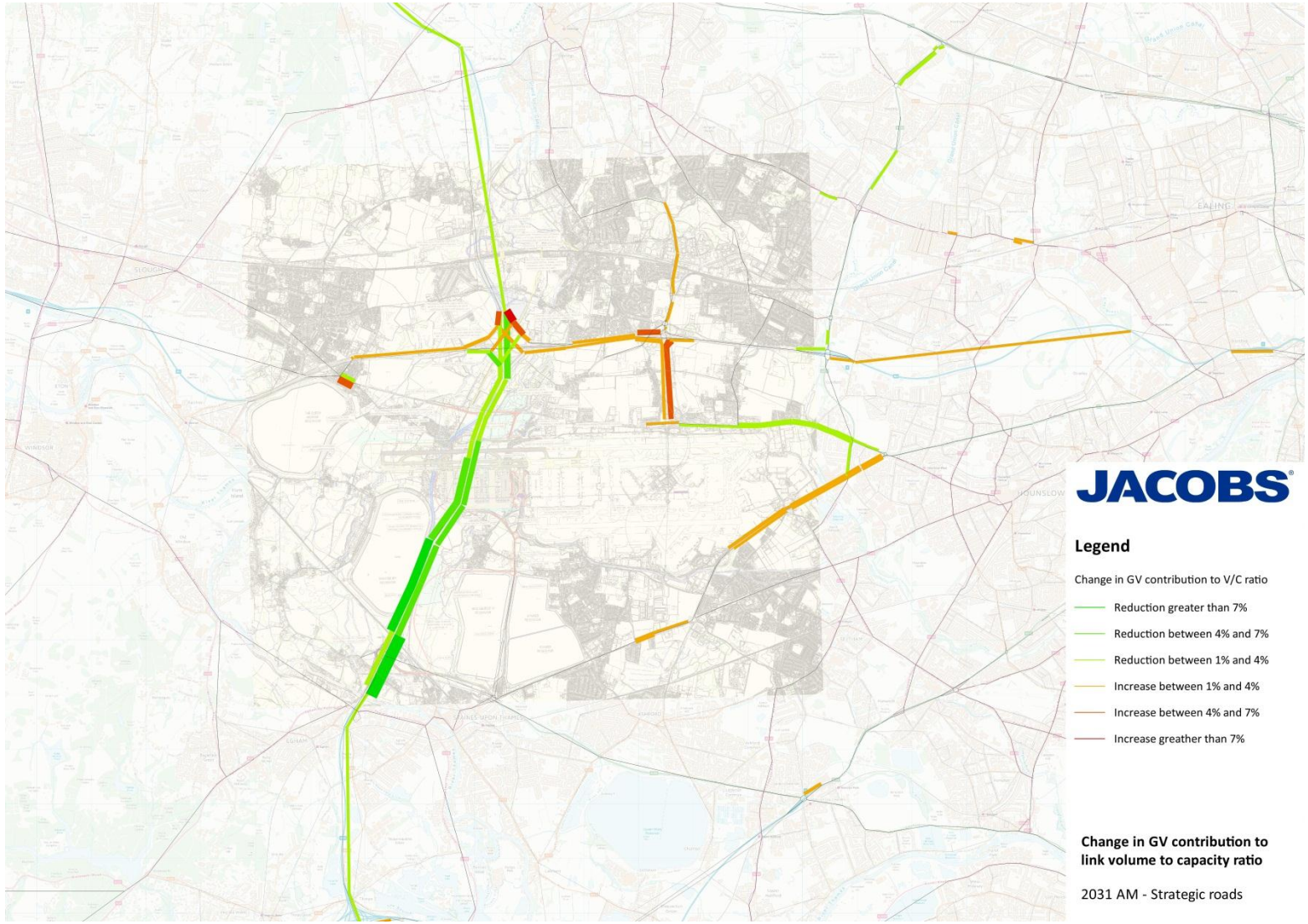
JACOBS

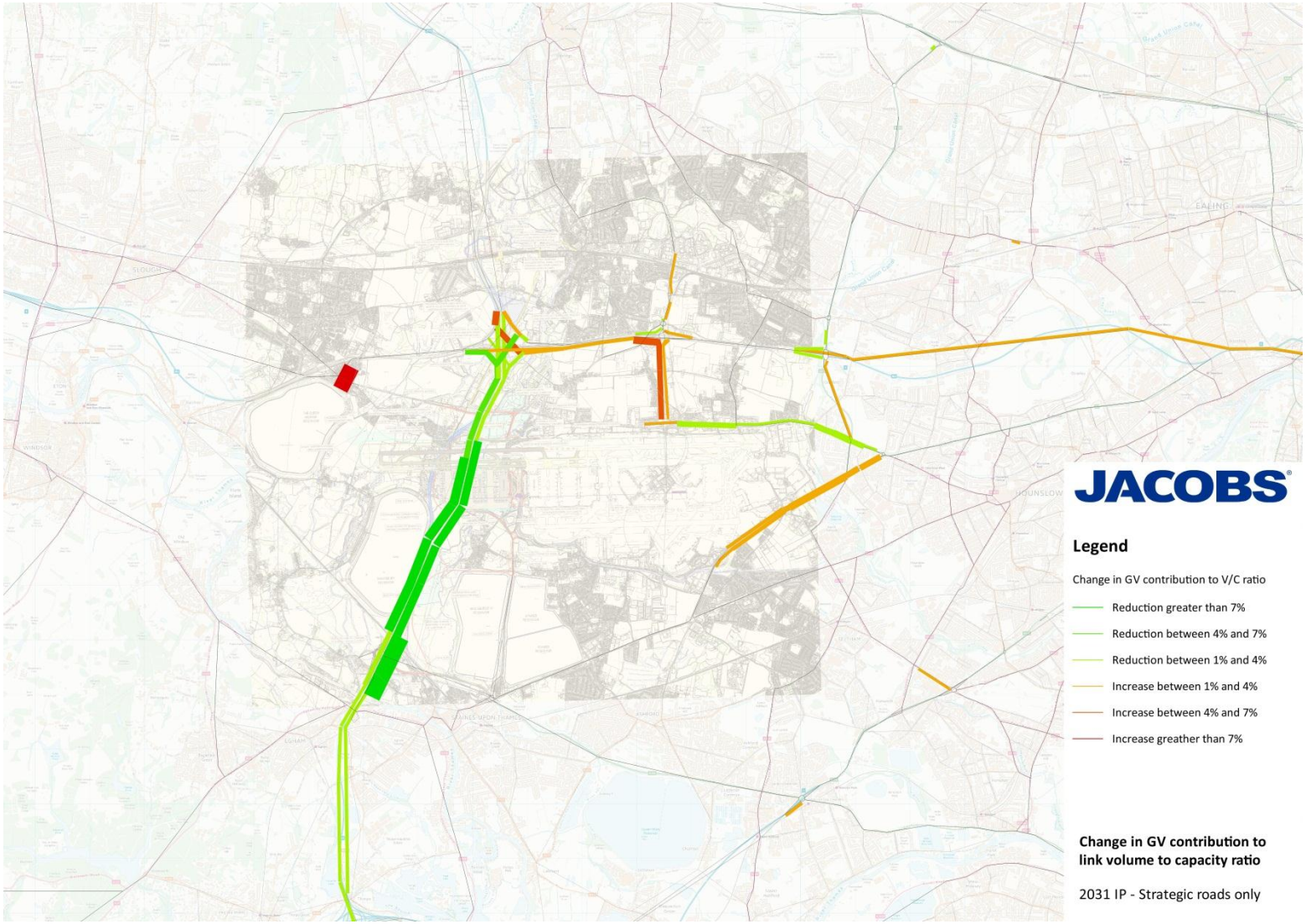

JACOBS
Legend
Change in GV contribution to V/C ratio
Reduction greater than 7%
Reduction between 4% and 7%
Reduction between 1% and 4%
Increase between 1% and 4%
Increase between 4% and 7%
Increase greather than 7%
Change in GV contribution to link volume to capacity ratio
2031 IP - Local roads only

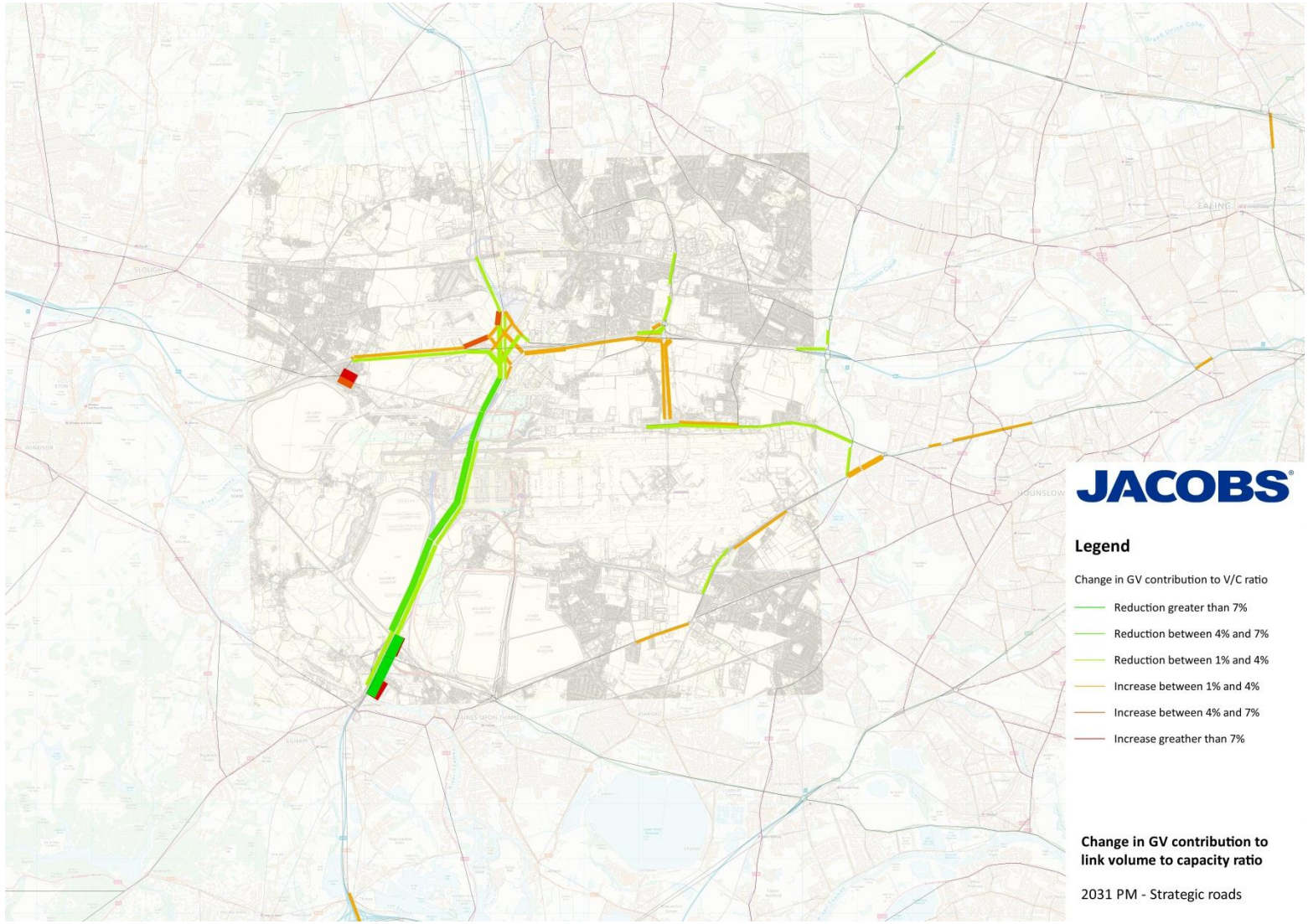
JACOBS


JACOBS
Legend
Change in GV contribution to V/C ratio
Reduction greater than 7%
Reduction between 4% and 7%
Reduction between 1% and 4%
Increase between 1% and 4%
Increase between 4% and 7%
Increase greather than 7%
Change in GV contribution to link volume to capacity ratio
2031 PM - Local roads only

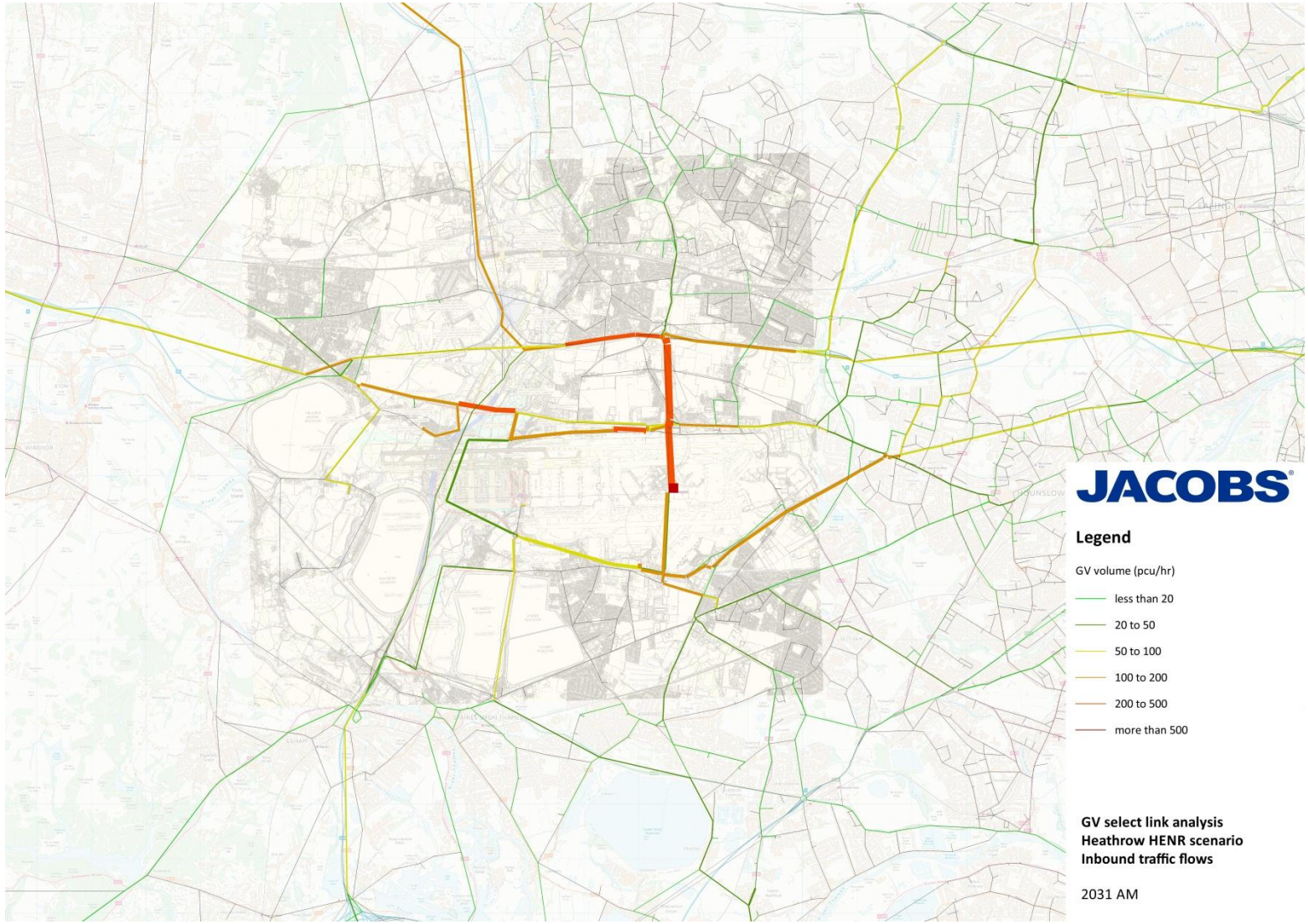
JACOBS


JACOBS
Legend
Change in GV contribution to V/C ratio
Reduction greater than 7%
Reduction between 4% and 7%
Reduction between 1% and 4%
Increase between 1% and 4%
Increase between 4% and 7%
Increase greather than 7%
Change in GV contribution to link volume to capacity ratio
2031 AM - Strategic roads

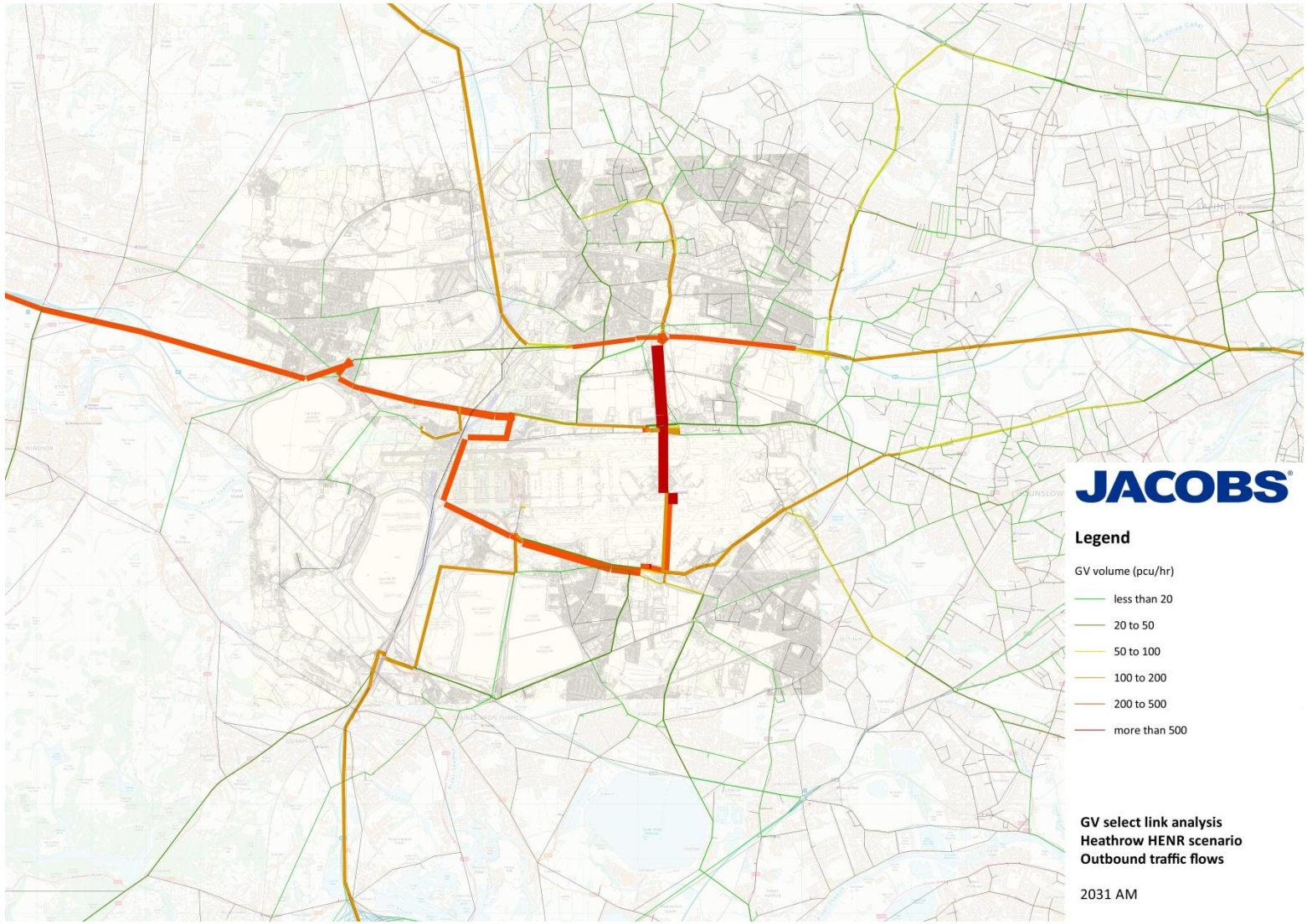

JACOBS
Legend
Change in GV contribution to V/C ratio
Reduction greater than 7%
Reduction between 4% and 7%
Reduction between 1% and 4%
Increase between 1% and 4%
Increase between 4% and 7%
Increase greather than 7%
Change in GV contribution to link volume to capacity ratio
2031 IP - Strategic roads only


JACOBS
Legend
Change in GV contribution to V/C ratio
Reduction greater than 7%
Reduction between 4% and 7%
Reduction between 1% and 4%
Increase between 1% and 4%
Increase between 4% and 7%
Increase greather than 7%
Change in GV contribution to link volume to capacity ratio
2031 PM - Strategic roads

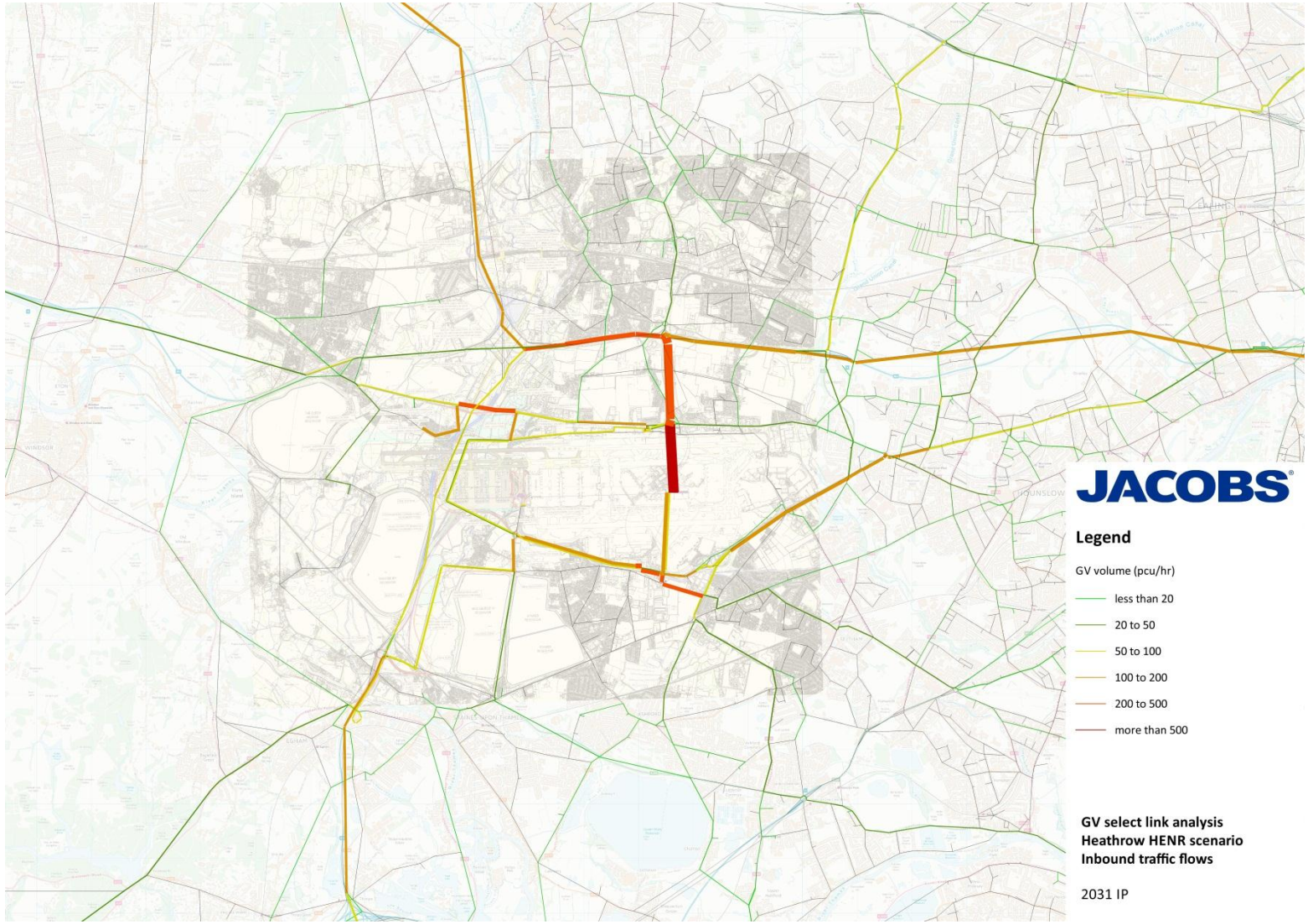
JACOBS

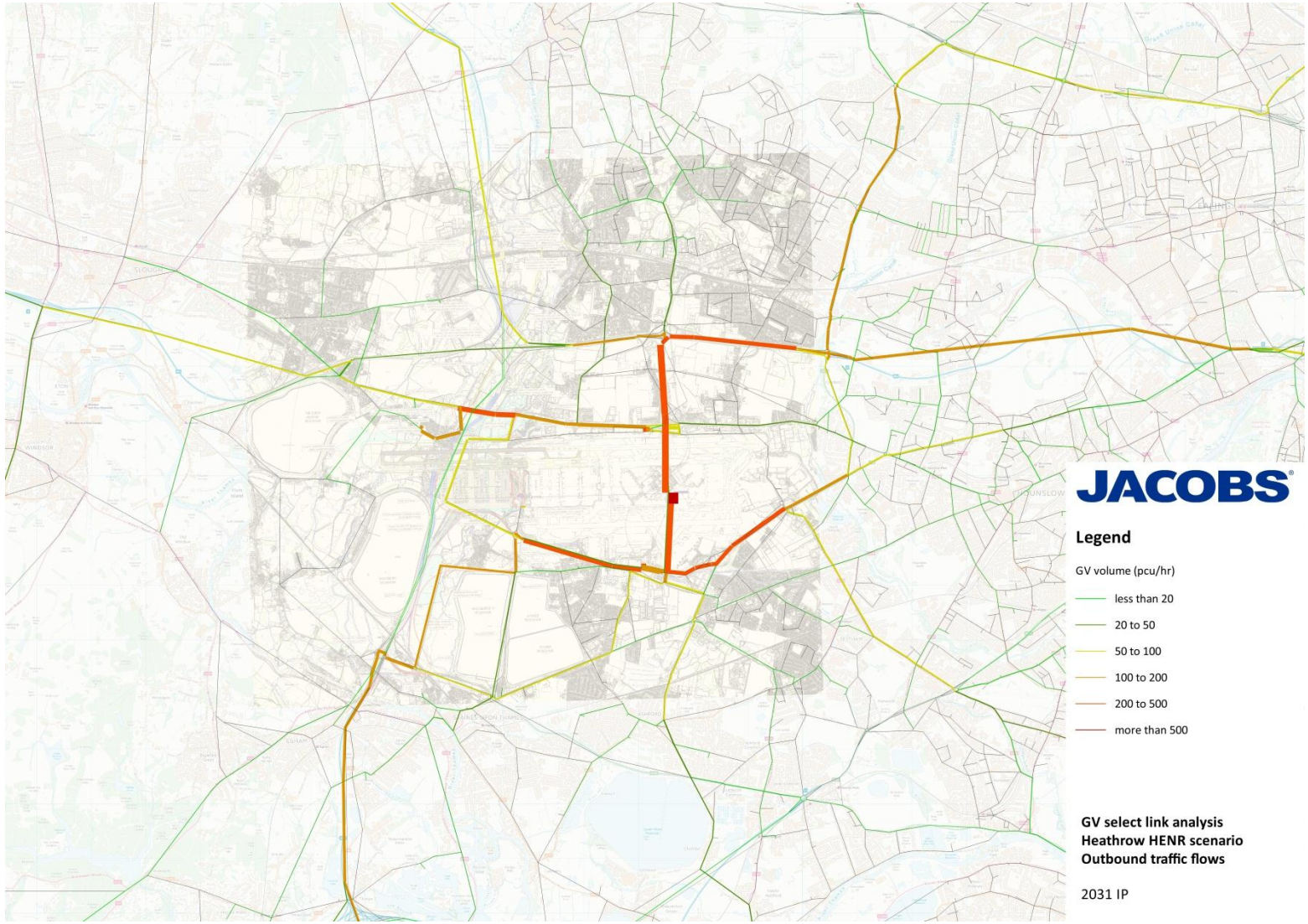

JACOBS
Legend
GV volume (pcu/hr)
less than 20
20 to 50
50 to 100
100 to 200
200 to 500
more than 500
GV select link analysis
Heathrow HENR scenario
Inbound traffic flows
2031 AM

JACOBS

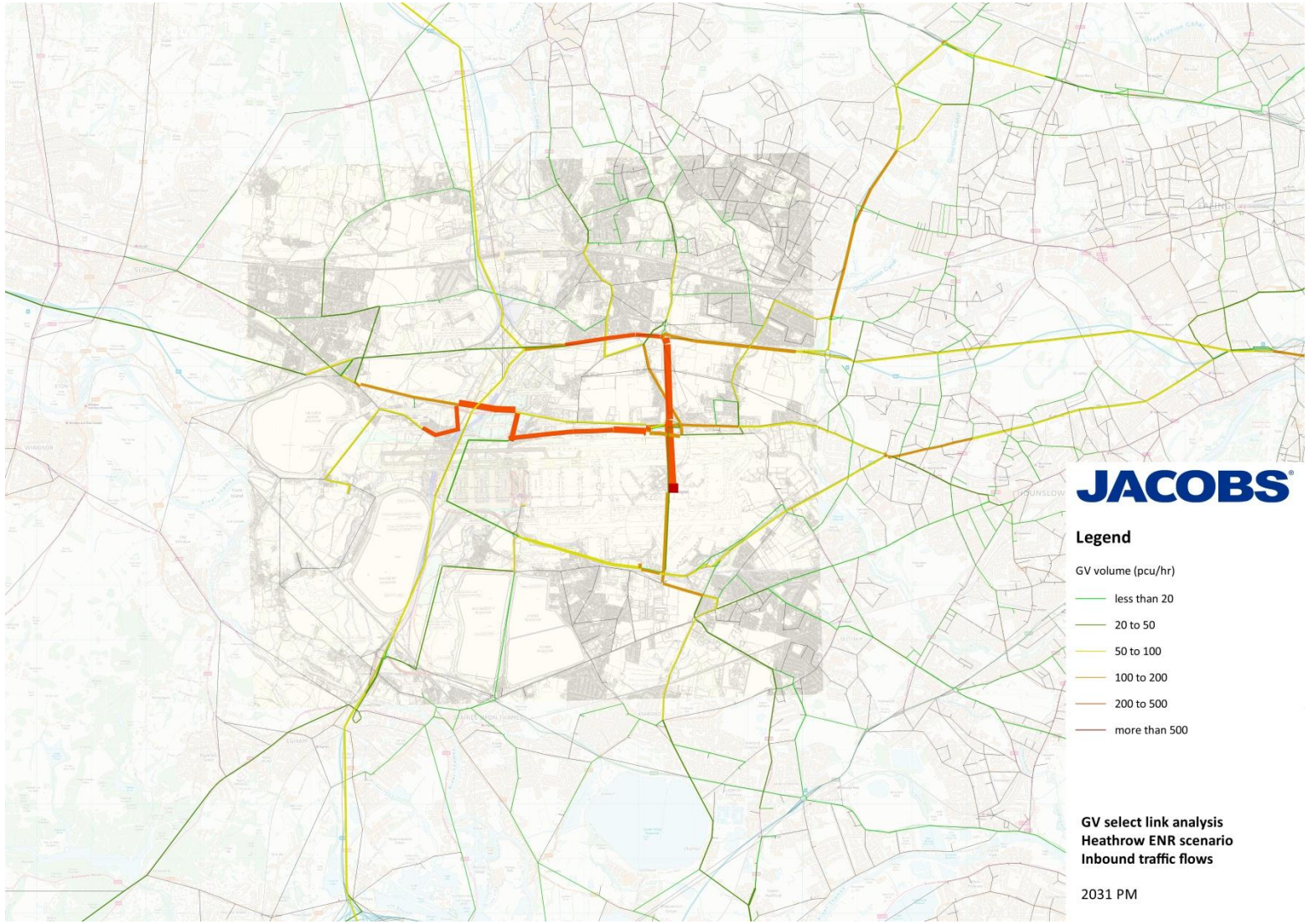

JACOBS
Legend
GV volume (pcu/hr)
less than 20
20 to 50
50 to 100
100 to 200
200 to 500
more than 500
GV select link analysis
Heathrow HENR scenario
Outbound traffic flows
2031 AM

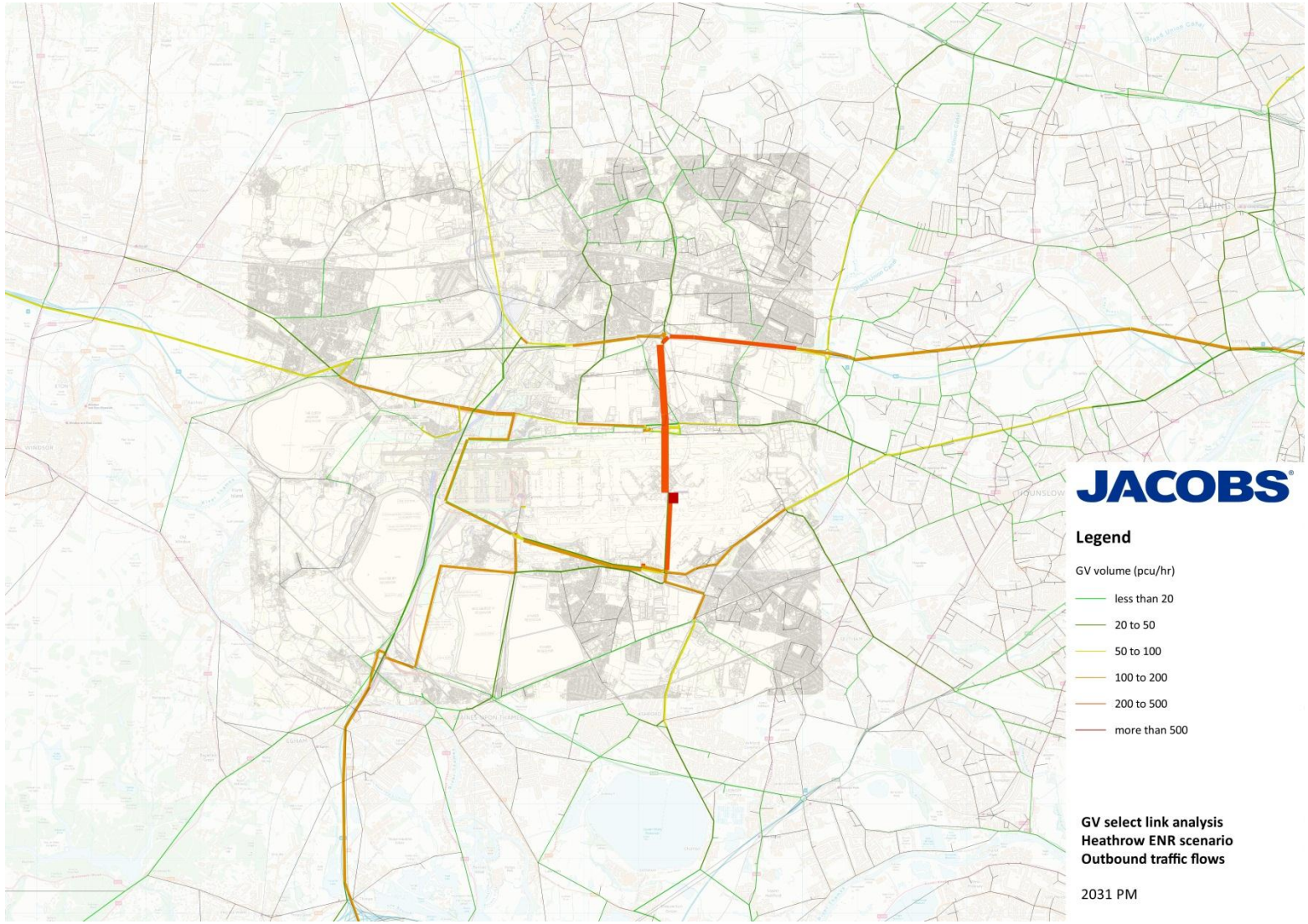
JACOBS


JACOBS
Legend
GV volume (pcu/hr)
less than 20
20 to 50
50 to 100
100 to 200
200 to 500
more than 500
GV select link analysis
Heathrow HENR scenario
Inbound traffic flows
2031 IP


JACOBS
Legend
GV volume (pcu/hr)
less than 20
20 to 50
50 to 100
100 to 200
200 to 500
more than 500
GV select link analysis
Heathrow HENR scenario
Outbound traffic flows
2031 IP

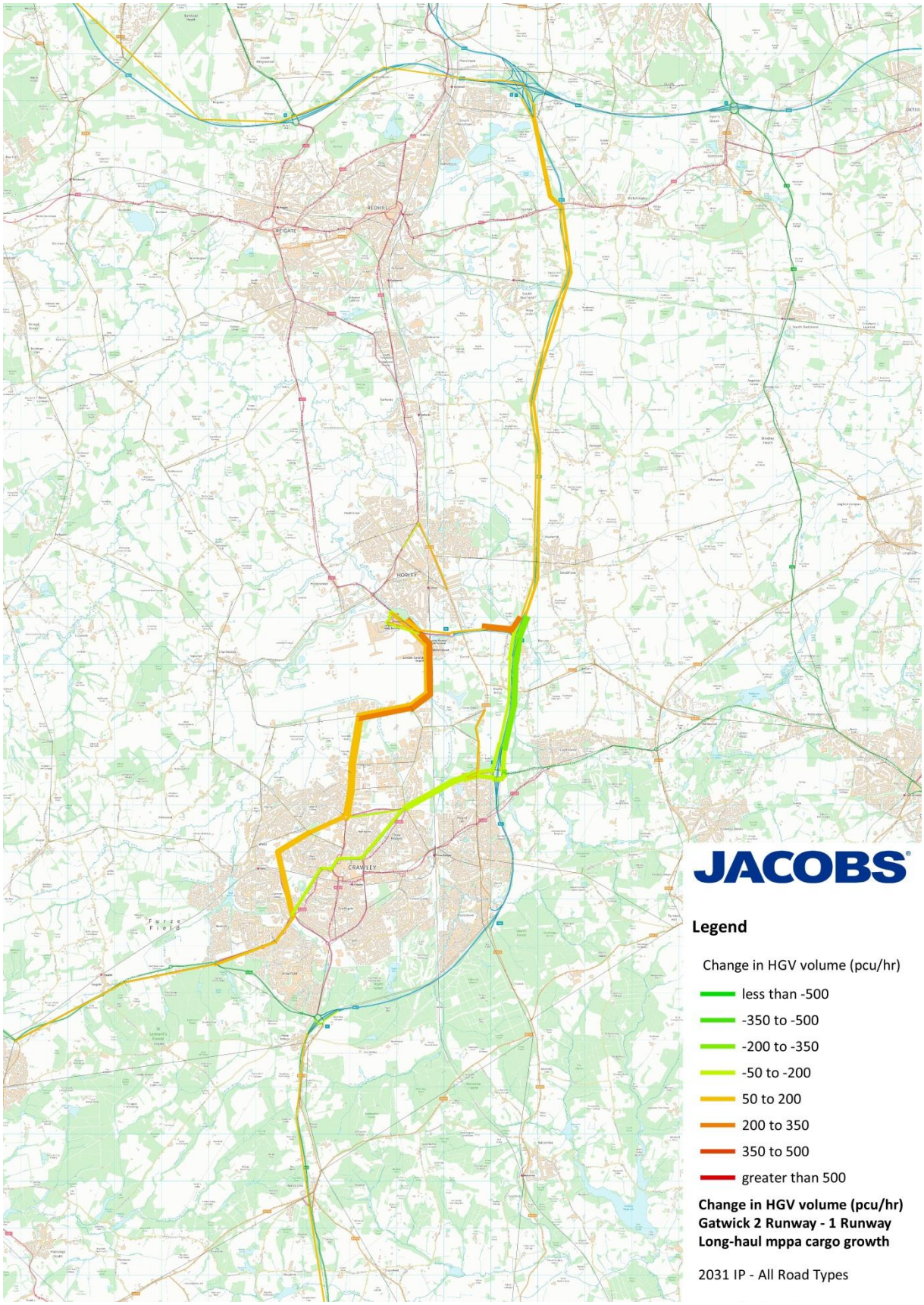
JACOBS


JACOBS
Legend
GV volume (pcu/hr)
less than 20
20 to 50
50 to 100
100 to 200
200 to 500
more than 500
GV select link analysis
Heathrow ENR scenario
Inbound traffic flows
2031 PM

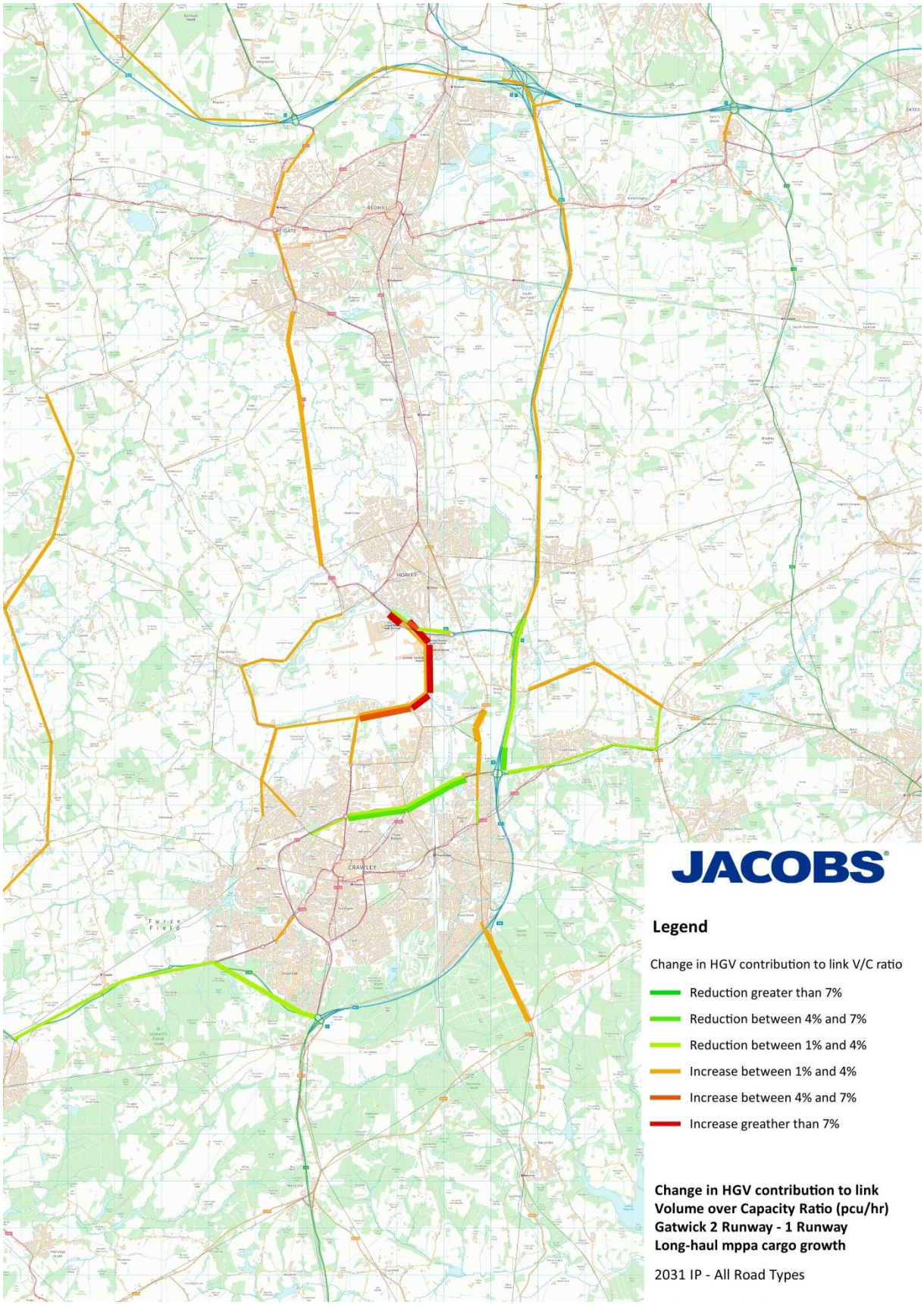

JACOBS
Legend
GV volume (pcu/hr)
less than 20
20 to 50
50 to 100
100 to 200
200 to 500
more than 500
GV select link analysis
Heathrow ENR scenario
Outbound traffic flows
2031 PM

Appendix D. Gatwick Scenario A – linear mppa increase in logistics and cargo freight trips

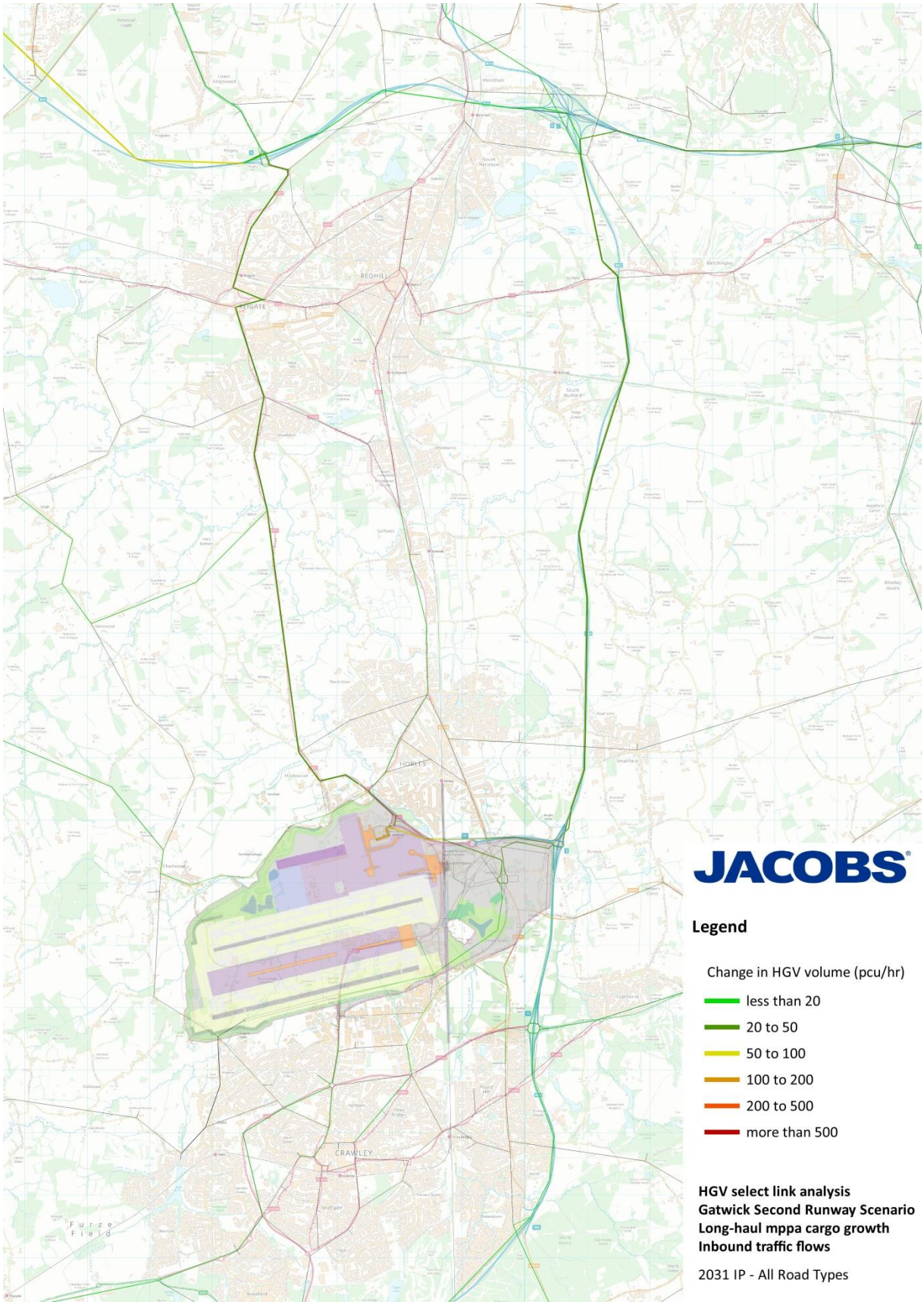
Scenario A: 2031 IP change in GV volume



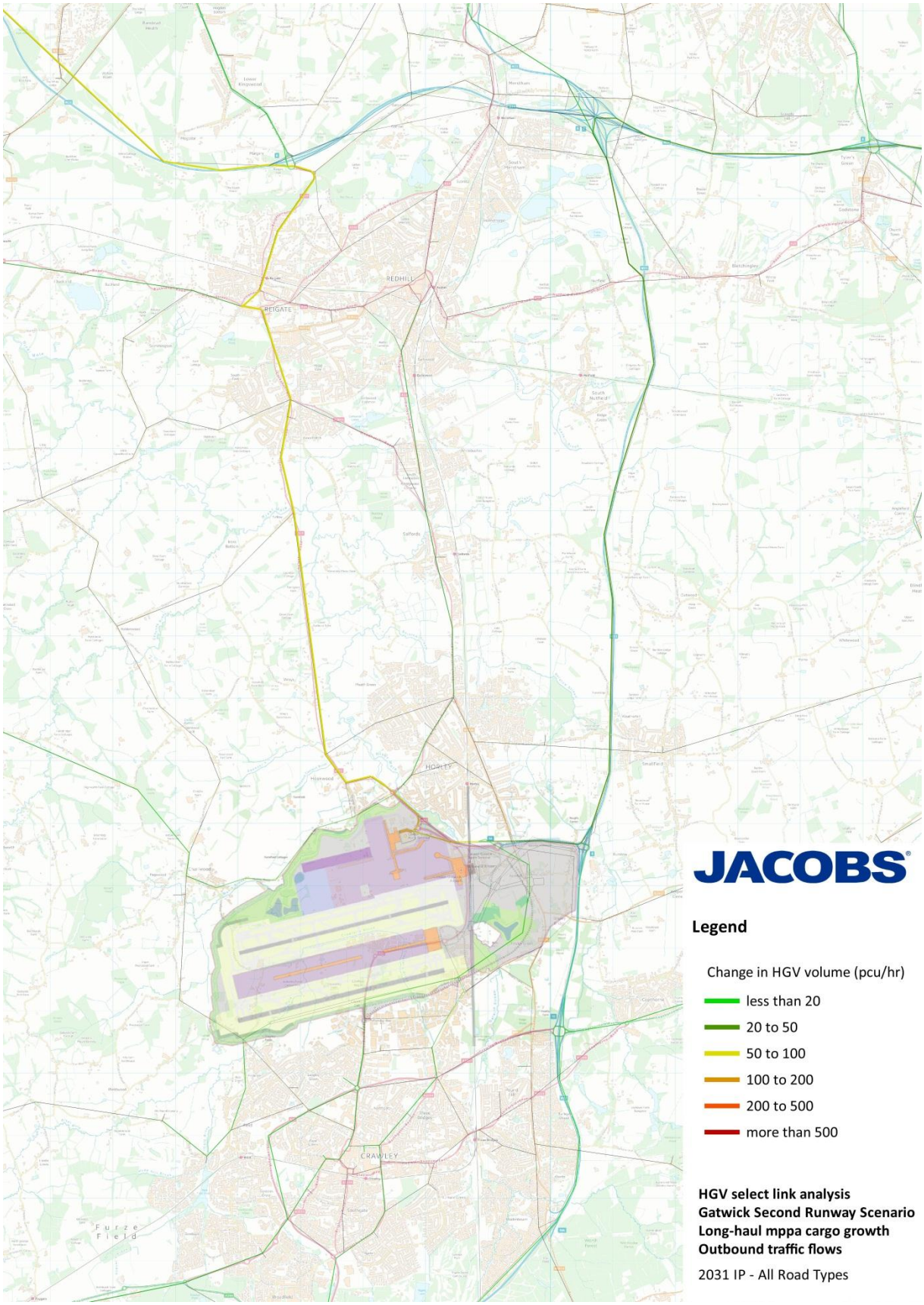
Scenario A: 2031 IP change in GV network demand contribution



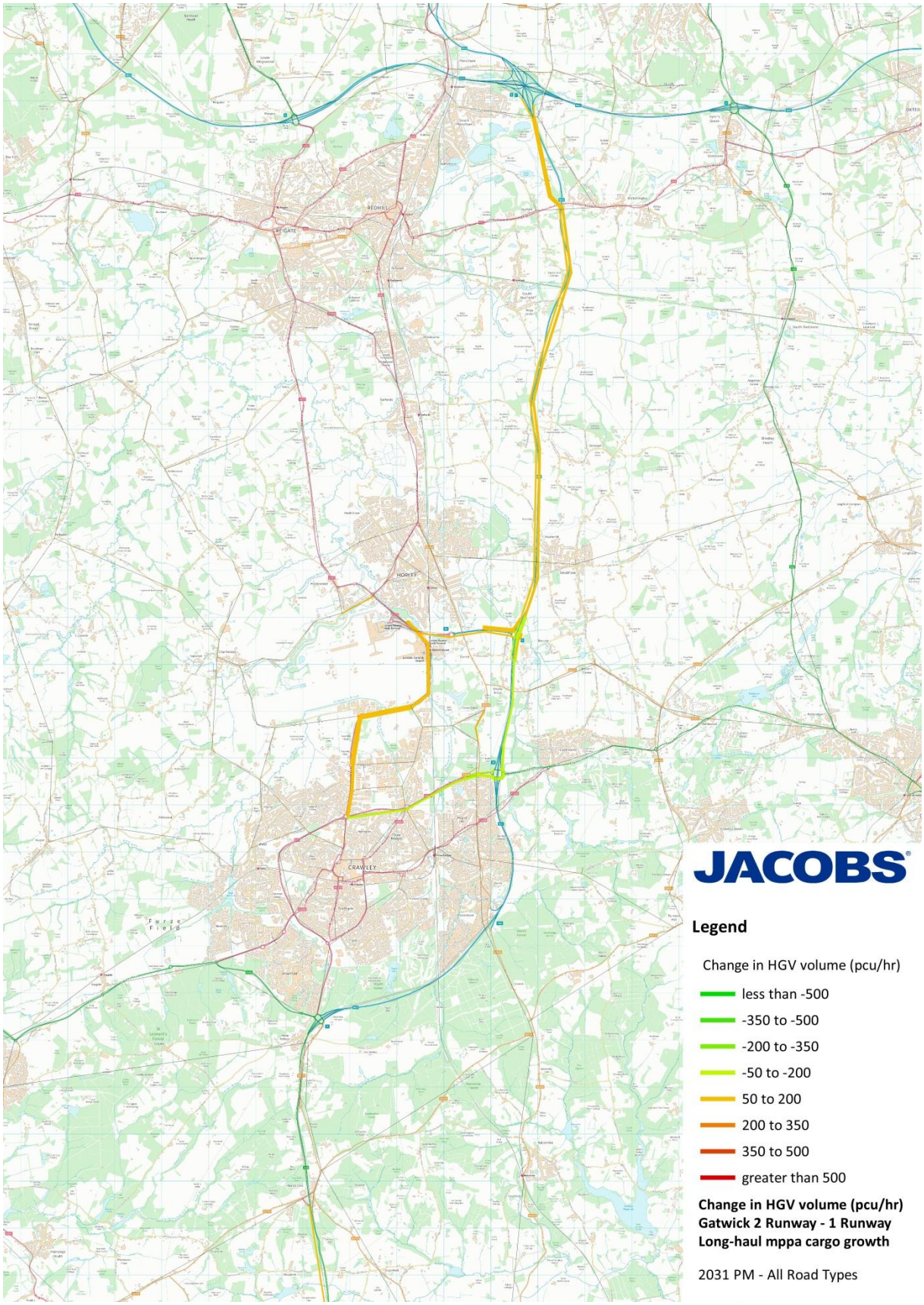
Scenario A: 2031 IP GV select link analysis – Airport inbound traffic



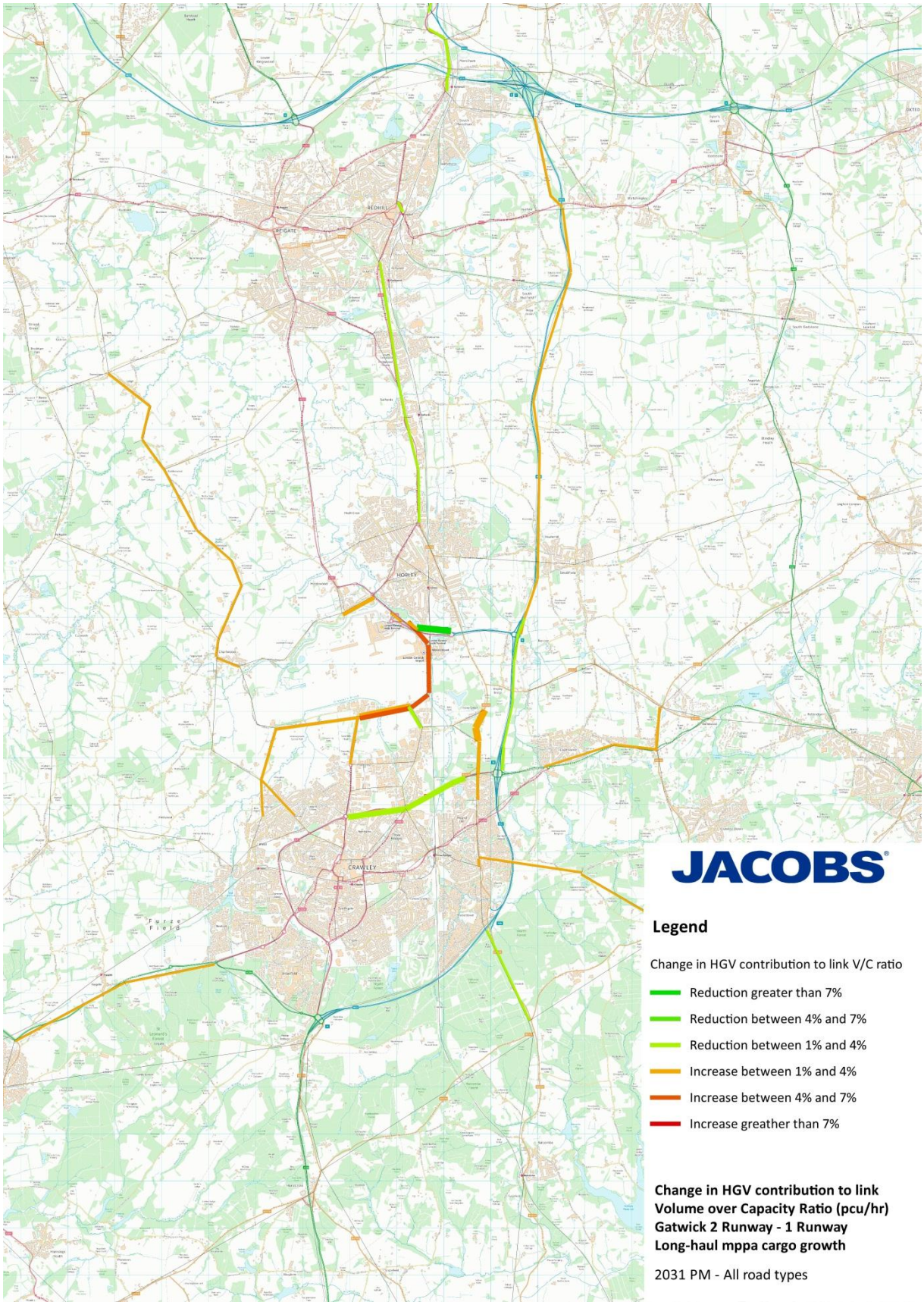
Scenario A: 2031 IP GV select link analysis – Airport outbound traffic



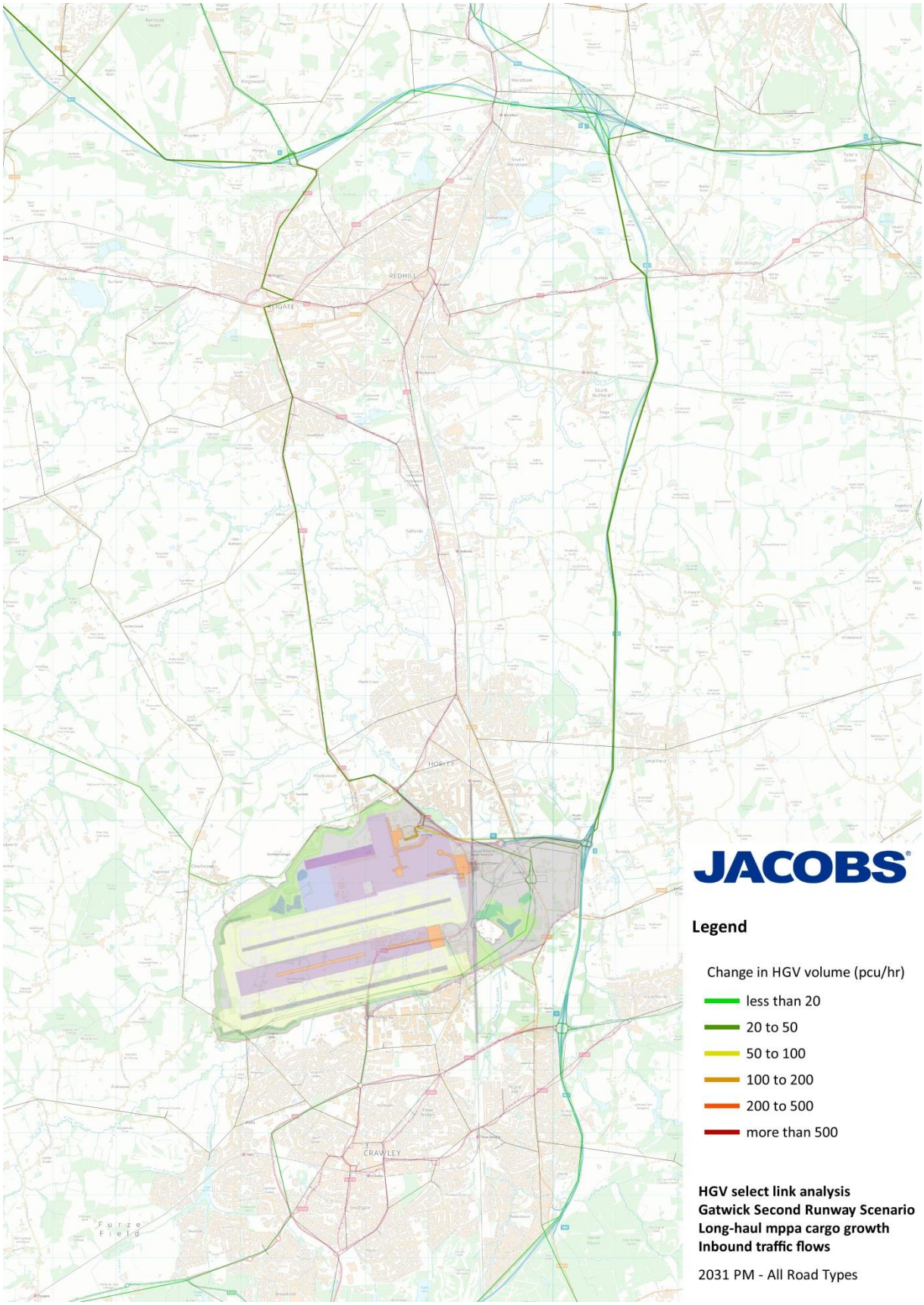
Scenario A: 2031 PM change in GV volume



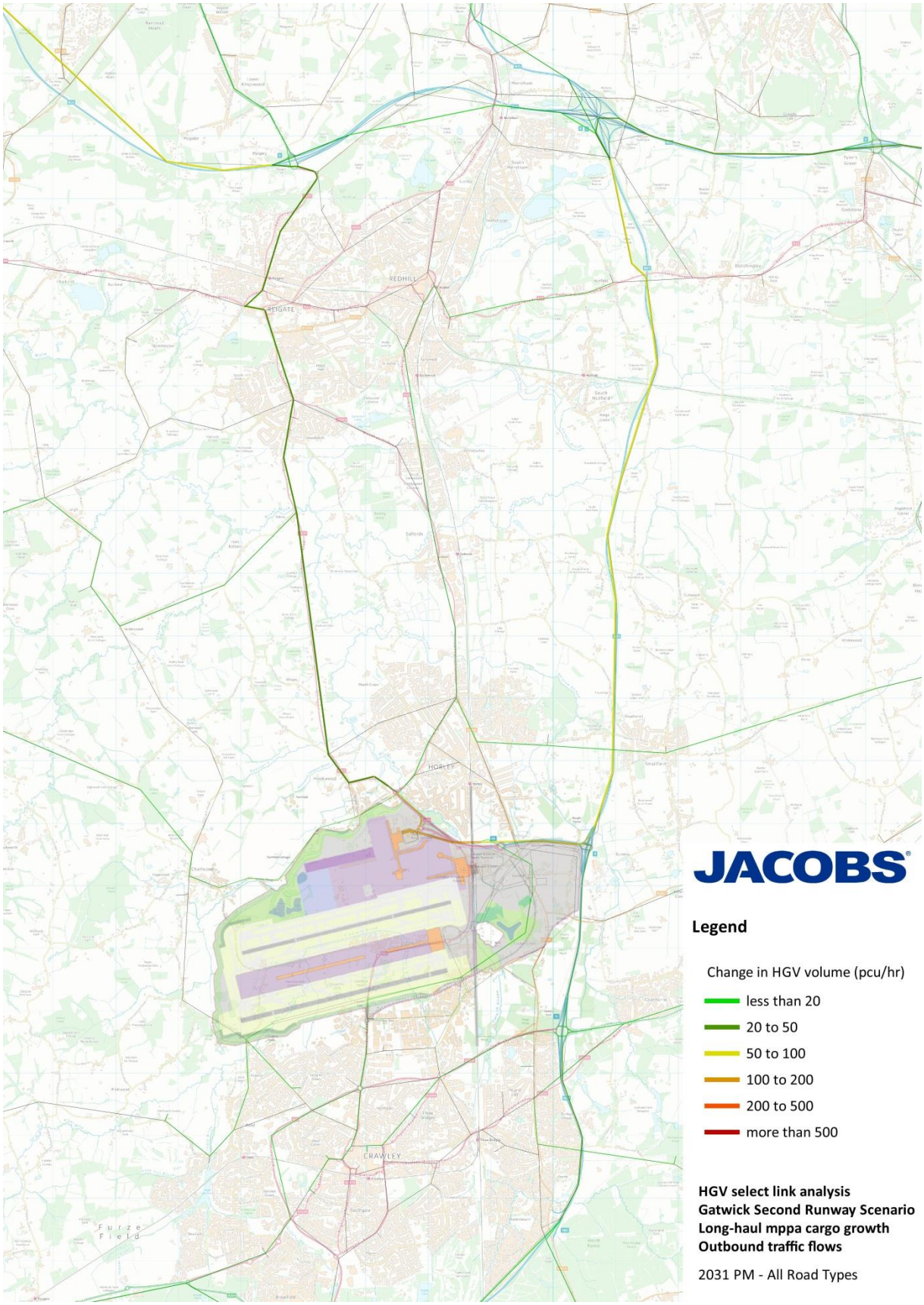
Scenario A: 2031 PM change in GV network demand contribution



Scenario A: 2031 PM GV select link analysis – Airport inbound traffic

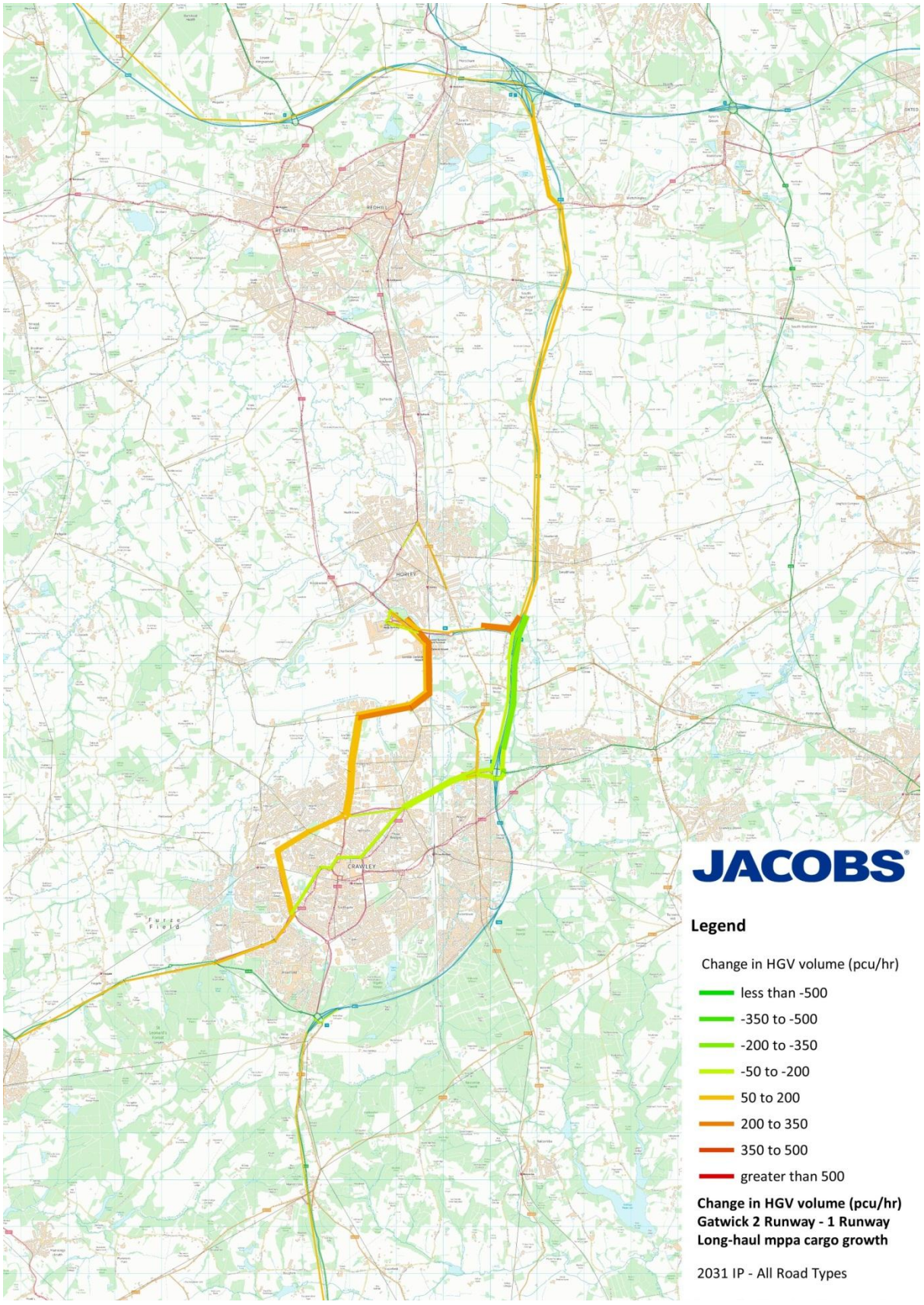


Scenario A: 2031 PM GV select link analysis – Airport outbound traffic

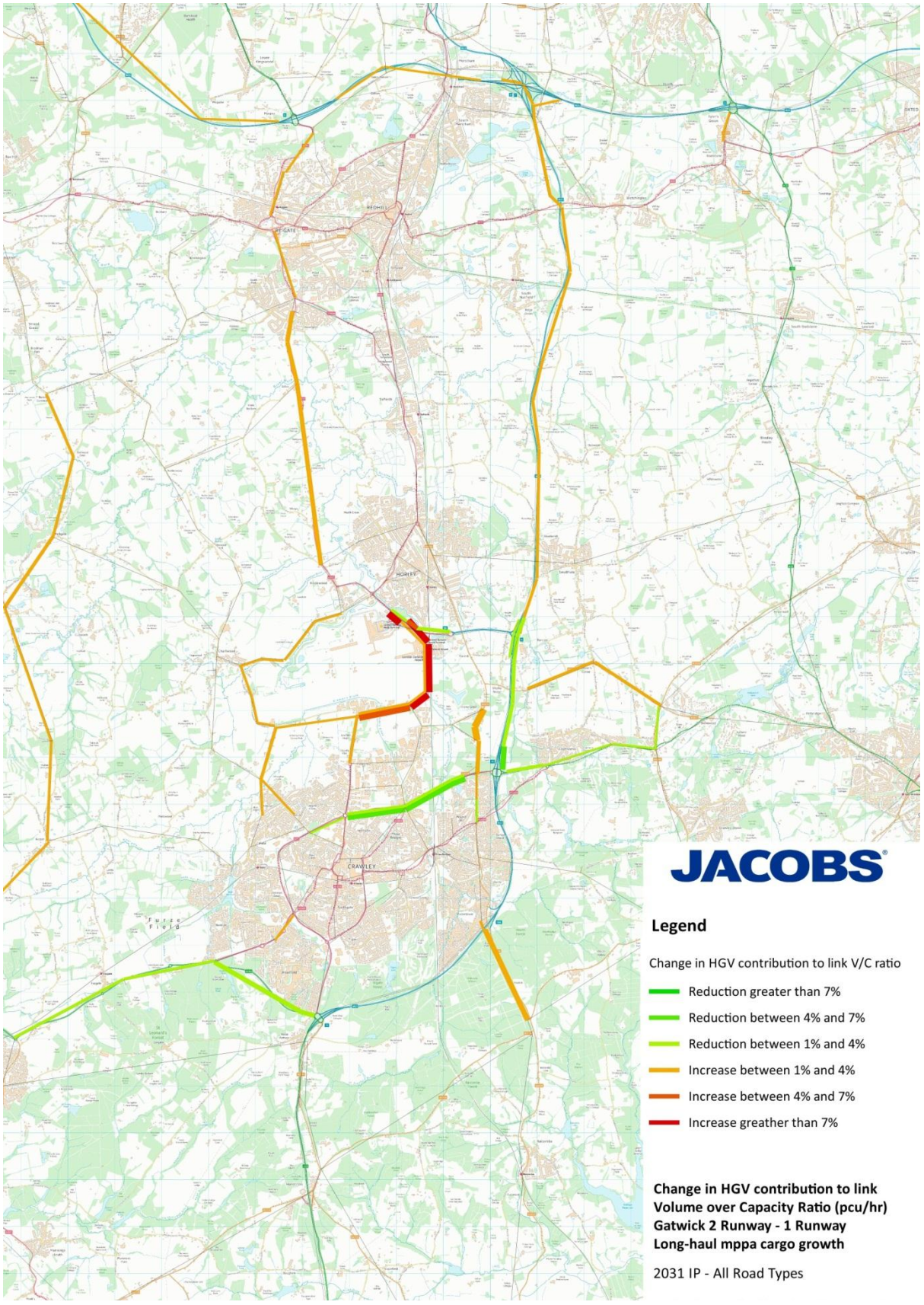


Appendix E. Gatwick Scenario B – linear increase in logistics freight trips and long haul based increase in cargo freight trips

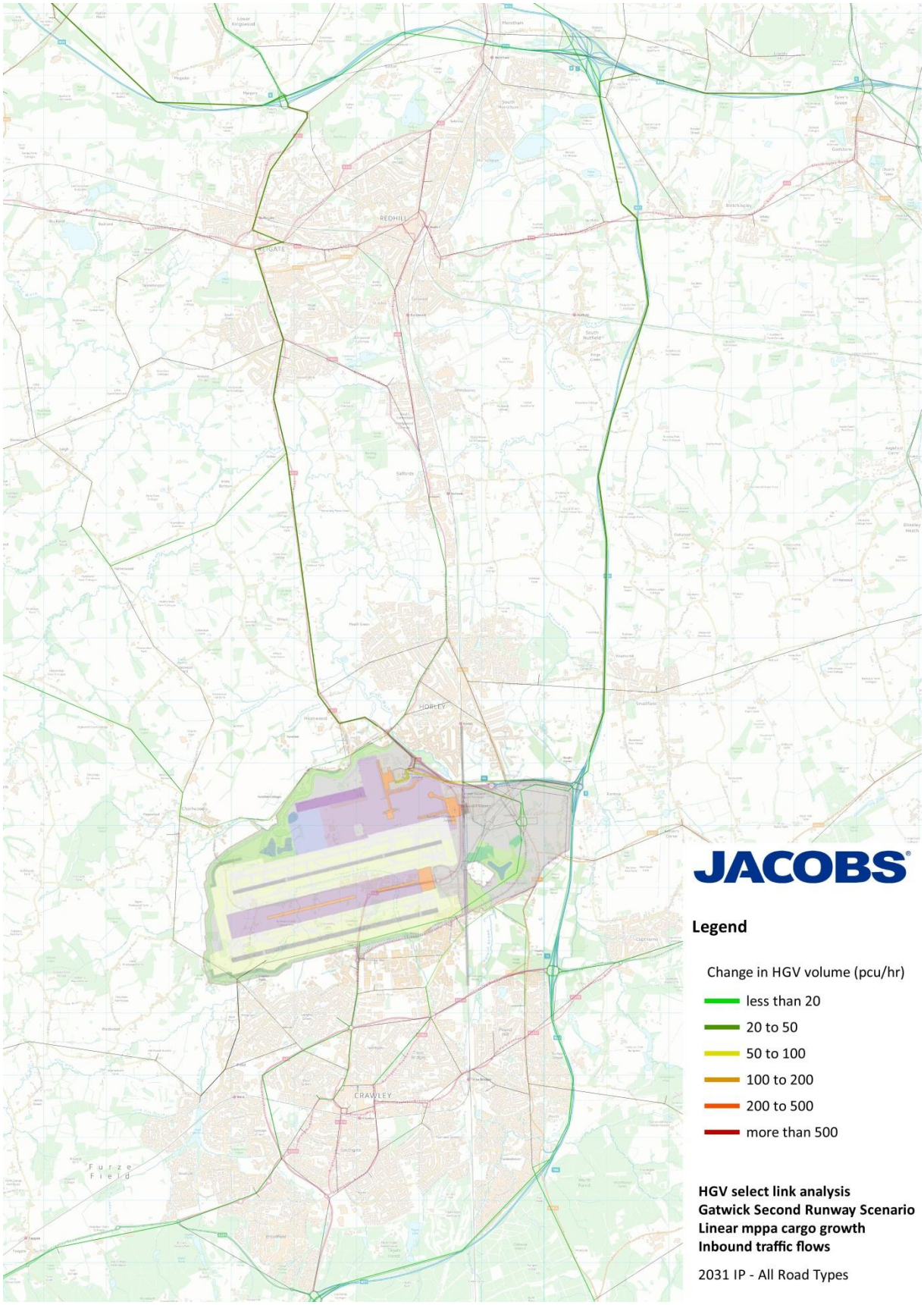
Scenario B: 2031 IP change in GV volume



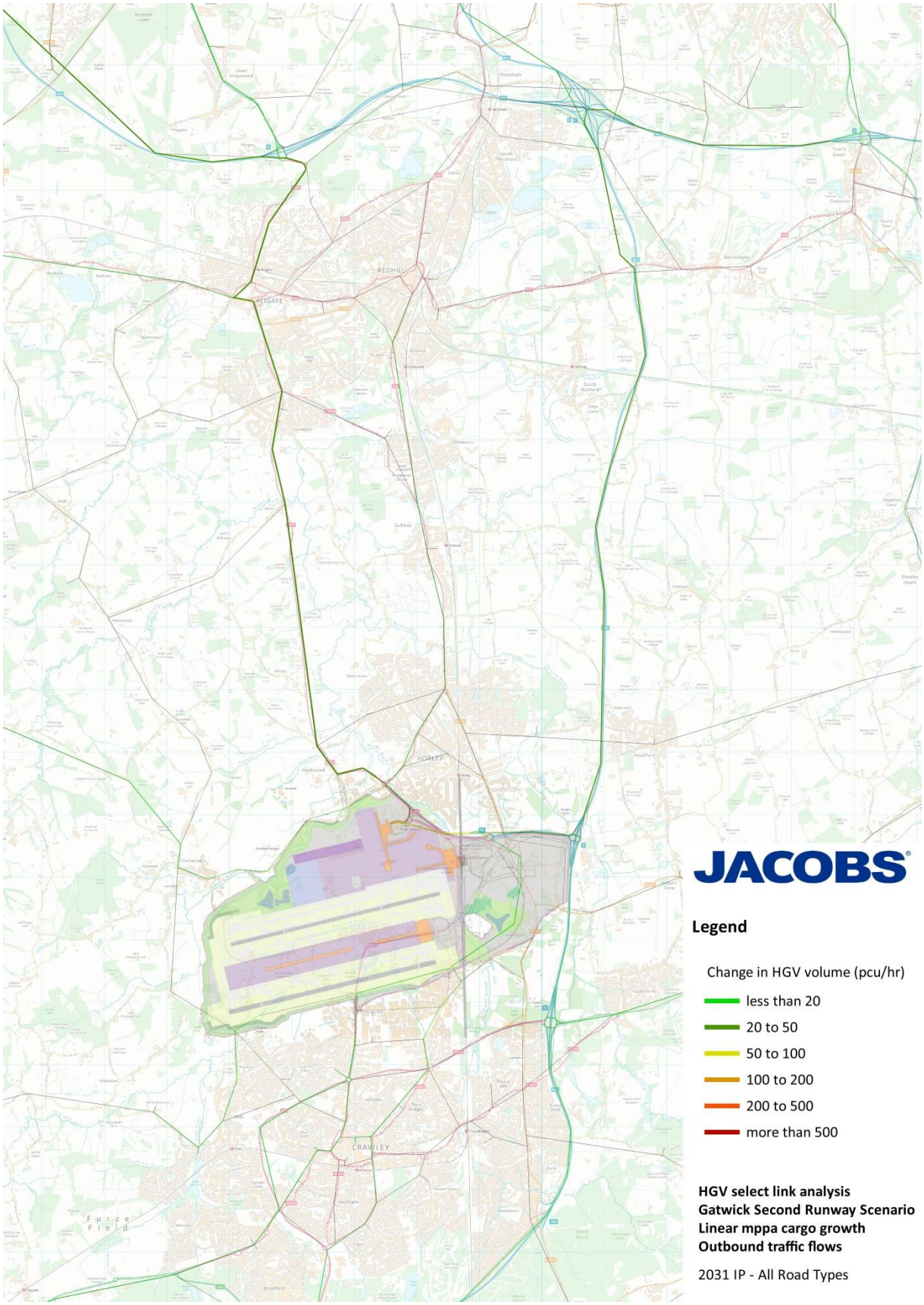
Scenario B: 2031 IP change in GV network demand contribution



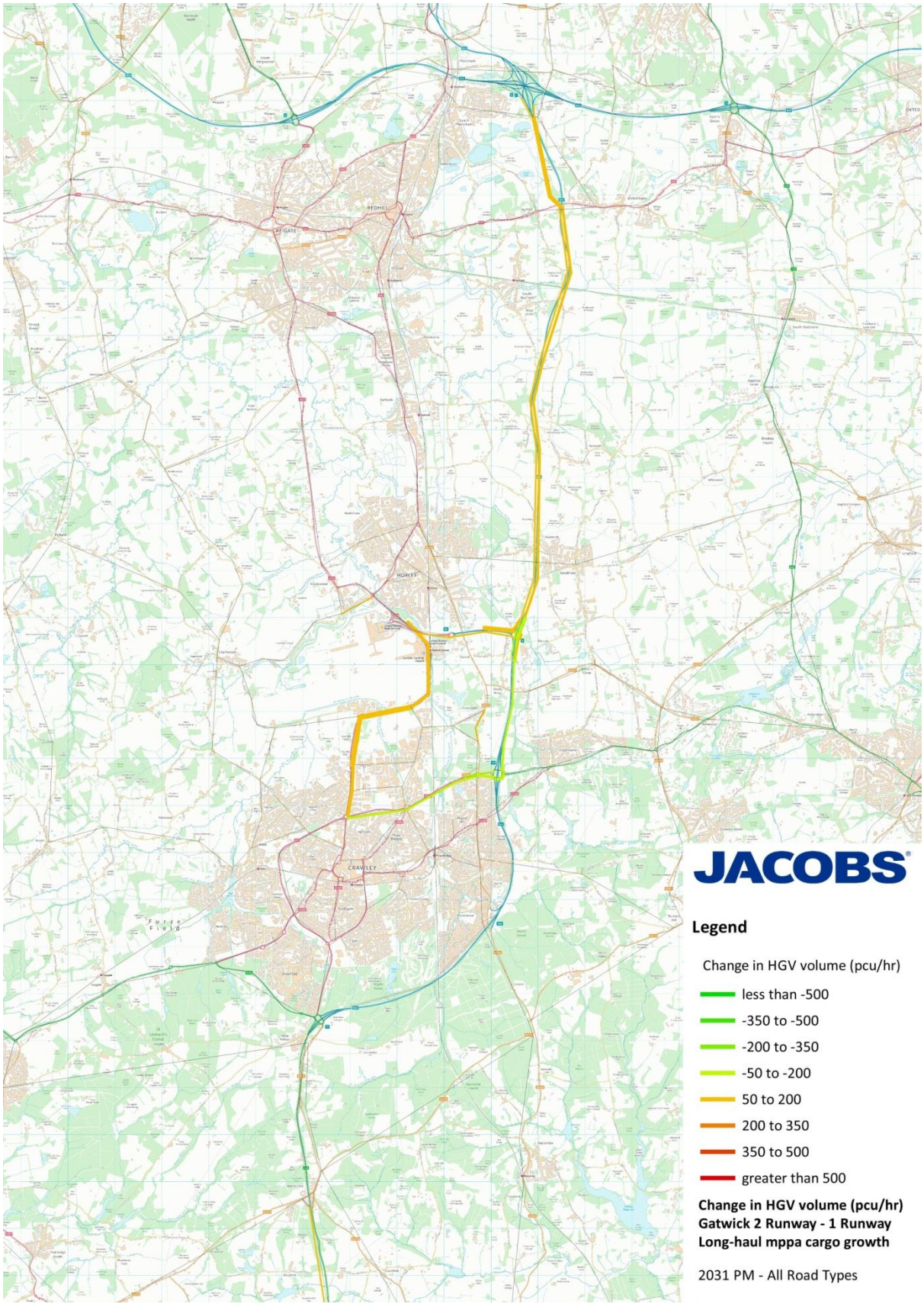
Scenario B: 2031 IP GV select link analysis – Airport inbound traffic



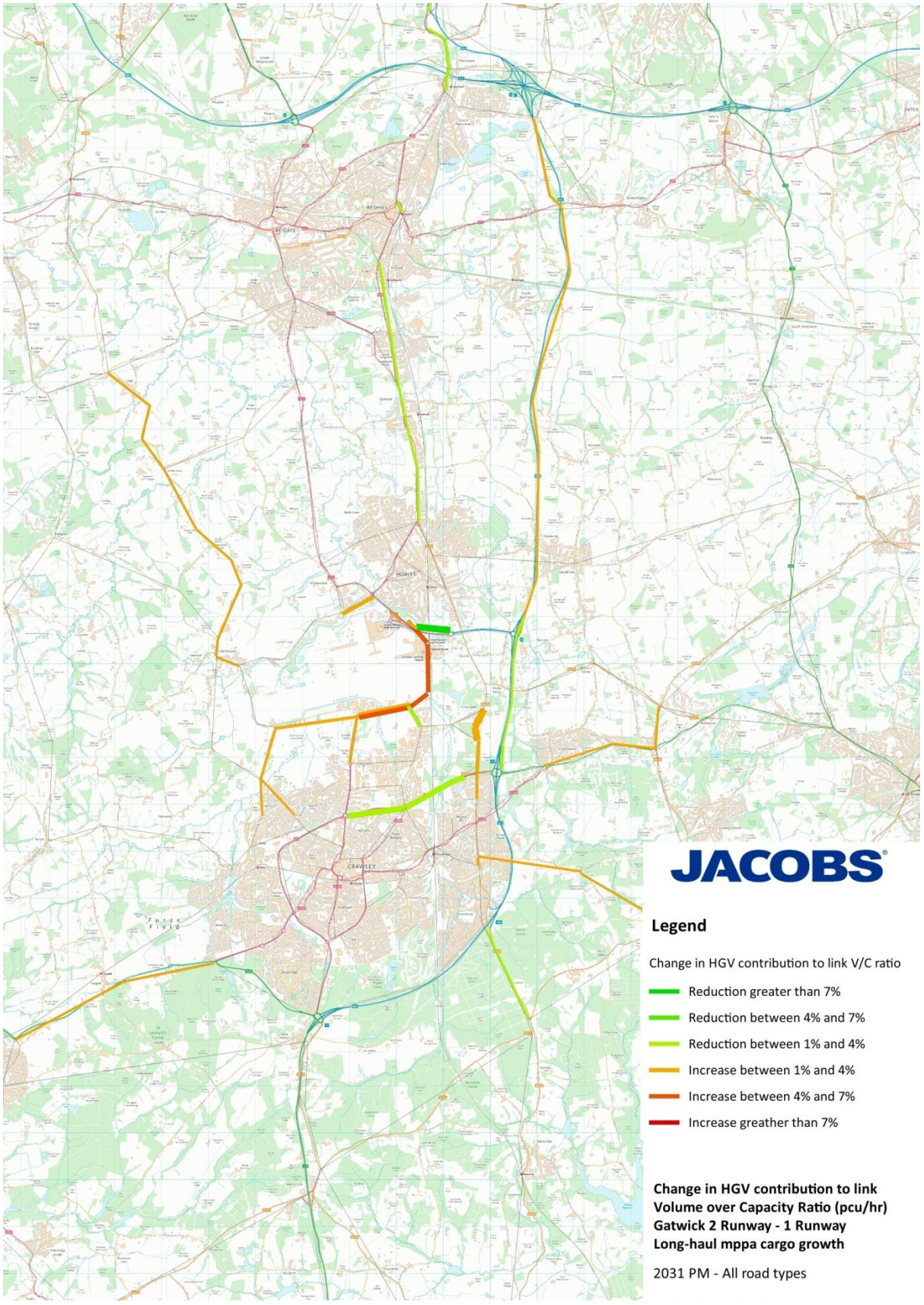
Scenario B: 2031 IP GV select link analysis – Airport outbound traffic



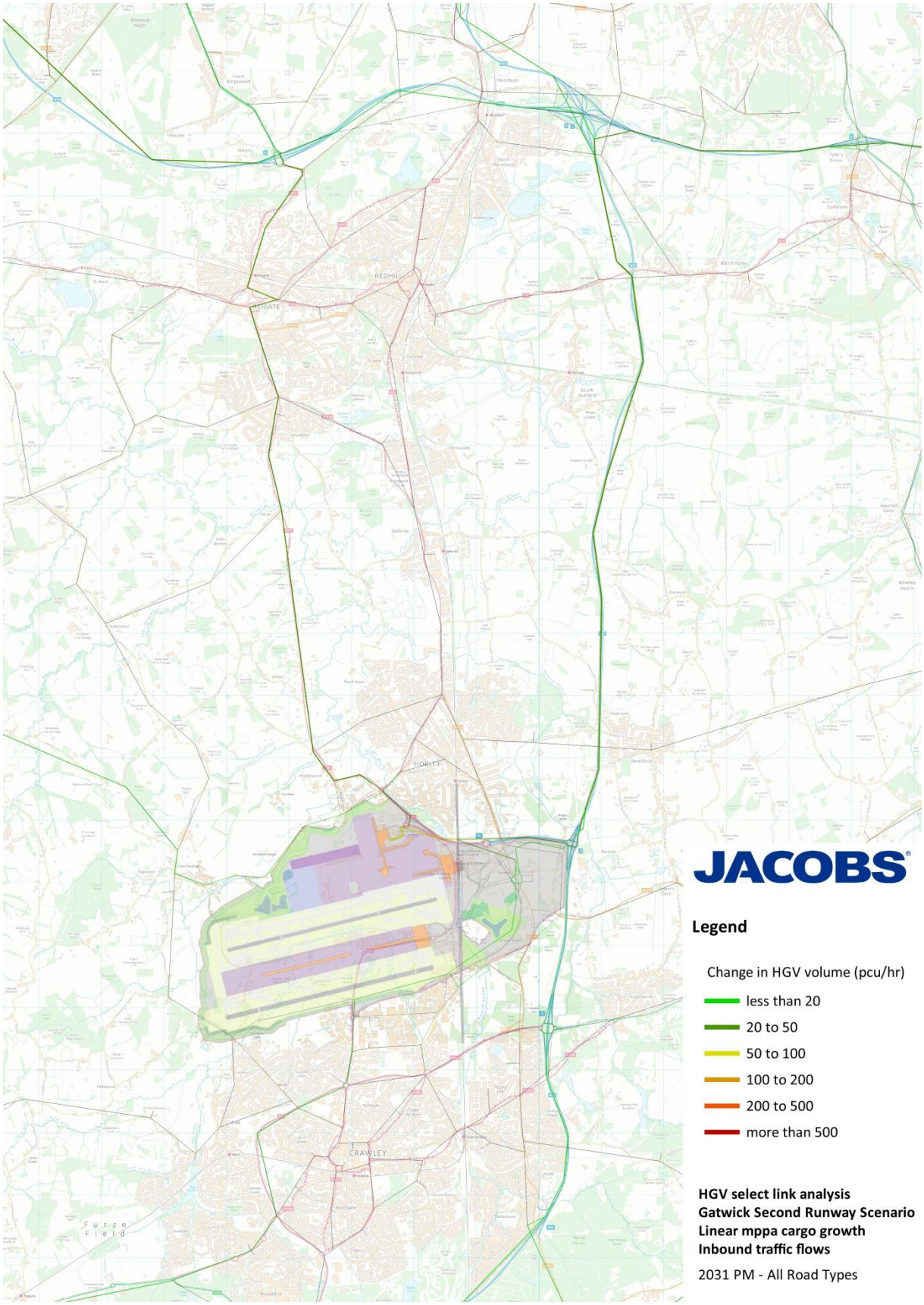
Scenario B: 2031 PM change in GV volume



Scenario B: 2031 PM change in GV network demand contribution



Scenario B: 2031 PM GV select link analysis – Airport inbound traffic



Scenario B: 2031 PM GV select link analysis – Airport outbound traffic