London Borough of Barnet DLP Reg18

Strategic Transport Assessment

CAPITA

Final Report June 2021

Quality Management

Job No	CS/100596		
Job Title	London Borough of Barnet DLP Reg18 Strategic Transport Assessment		
Report Title	Draft Report		
Document File Ref	100596-CPI-P04	Rev:	P04

Rev	Date	Description	Prepared	Checked	Authorised
P0		Internal	FM	JP	PJW
P01	09/03/2021	Issued for Comments	FM	JP	PJW
P02B	18/03/2021	Issued to Re for Comments	FM	JP	PJW
P02C	24/03/2021	Issued for circulation to LBB	FM	JP	PJW
P03	02/06/2021	Issued for circulation to LBB	FM	JP	PJW
P04	10/06/2021	Final Issue to LBB	FM	JP	PJW

Capita Property and Infrastructure Ltd, 65 Gresham Street, London, EC2V 7NQ
www.capita.co.uk/infrastructure

Contents

EXECUTIVE SUMMARY

1. INTRODUCTION 1

2. BACKGROUND TO THE ASSESSMENT 4

3. ASSESSMENT METHODOLOGY 24

4. ACTIVE TRAVEL AND TRAVEL DEMAND MANAGEMENT 26

5. PUBLIC TRANSPORT 47

6. HIGHWAYS, PARKING & FREIGHT 71

7. MODELLING ASSUMPTIONS. 83

8. STRATEGIC IMPACT ASSESSMENT 98

9. CONCLUSIONS 150

A. APPENDIX A 156

B. APPENDIX B 164

C. APPENDIX C 185

D. APPENDIX D 201

E. APPENDIX E 245

F. APPENDIX F 253

Index of Figures

Figure 2-1 TfL existing and proposed strategic cycle network (source: TfL's Mayor's Transport Strategy) 10

Figure 2-2 Barnet Development Plan 13

Figure 2-3 Conceptual Level of the Council's Overall Spatial Strategy 15

Figure 2-4 London Borough of Barnet LTTS strategic measures 19
Figure 2-5 Barnet Growth Strategy 2019-2030 Spatial Approach 22
Figure 4-1 Trends in motor vehicle travel mode in London 2000-2019 31
Figure 4-2 Trends in travel modes in London 2000-2019 32
Figure 4-3 Waltham Forest Case Study - effects of promoting and developing a car club 40
Figure 5-1 People standing per square metre 50
Figure 5-2 Buses from Edgware Community Hospital 52
Figure 5-3 Buses from Grahame Park and RAF Museum, Hendon 53
Figure 5-4 Buses from Brent Cross 54
Figure 5-5 Buses from Barnet Hospital 55
Figure 5-6 Buses from Golders Green 56
Figure 5-7 Buses from Barnet High Street 57
Figure 5-8 Buses from Cockfosters 58
Figure 5-9 Buses from Arnos Grove and New Southgate 59
Figure 5-10 Selected Orbital bus connections in Barnet 62
Figure 5-11 Selected Orbital and Radial bus connections in Barnet 63
Figure 5-12 West London Alliance proposed route 66
Figure 5-13 2031 AM Peak period, WLO 8tph scenario (old preferred option) change in forecast bus demand 69
Figure 5-14 2031 AM Peak period, WLO 8tph scenario (old preferred option) change in forecast rail and LU demand 70
Figure 6-1 2021 AM Peak Junction Traffic Volume (V) / Capacity (C) indicators (pre-Covid19 estimates) 72
Figure 6-2 2021 PM Peak Junction Traffic Volume (V) / Capacity (C) indicators (pre-Covid19 estimates) 73
Figure 6-3 Barnet Decision to join Camden Consolation Centre 78
Figure 6-4 London Freight Consolidation Study 79
Figure 7-1 Extent of the LTS model zones in Barnet 84
Figure 7-2 DLP Reg18 distribution of developments in 2036 in relation to Rail and LUL network (200m station's isochrones, up to 1km) 87

Figure 7-3 PT Mode share vs PTAL (from selection of developments in Barnet) 89

Figure 7-4 Estimated trip adjustment factors for 2036 (example) 95

Figure 8-1 London Borough Barnet Travel Time (Speed) Routes (LoHAM v4.2) 131

Figure 8-2 TfL's Covid19 alternative scenarios 139

Figure 8-3 2026 AM Peak Full development growth (Scenario 1) flow difference between 'Covid19 Hybrid' and non-Covid19 scenario 141

Figure 8-4 2036 AM Peak Full development growth (Scenario 1) flow difference between 'Covid19 Hybrid' and non-Covid19 scenario 141

Figure E-1 2026 AM Scenario 1 vs Scenario 2 SATURN Flow diagram 245

Figure E-2 2026 PM Scenario 1 vs Scenario 2 SATURN Flow diagram 246

Figure E-3 2036 AM Scenario 1 vs Scenario 2 SATURN Flow diagram 247

Figure E-4 2036 PM Scenario 1 vs Scenario 2 SATURN Flow diagram 248

Figure E-5 2026 AM Scenario 3 vs Scenario 1 SATURN Flow diagram 249

Figure E-6 2026 PM Scenario 3 vs Scenario 1 SATURN Flow diagram 250

Figure E-7 2036 AM Scenario 3 vs Scenario 1 SATURN Flow diagram 251

Figure E-8 2036 PM Scenario 3 vs Scenario 1 SATURN Flow diagram 252

Index of Tables

Table 2-1 Draft Local Plan Reg 18 Key Policies 16

Table 2-2 DLP Reg18 residential parking allocation decision parameters 18

Table 2-3 Barnet Growth Strategy 2019-2030 Key Strategies and Objectives 21

Table 2-4 Barnet Growth Strategy 2019-2030 Population Growth Estimates 23

Table 4-1 Typical mode share for primary schools in England (source: UK Gov) 36

Table 4-2 Estimation of the effect of a workplace parking levy 41

Table 4-3 Summary of the impact on road travel from LTTS initiatives 46

Table 5-1 Passengers demand at Network Rail stations 2019/20 47

Table 5-2 Passenger numbers at LUL station in Barnet and the current service levels 48

Table 5-3 Level of crowding at LUL station within Barnet 49

Table 5-4 Summary of the performance (service speed) of the bus network in the Barnet 60

Table 5-5 Bus Excess Waiting Time (EWT) 2015 and 2020/21 61
Table 5-6 Observed Bus Service characteristics vs car (2019) on selected routes 64
Table 5-7 Standard LTS-PT 2041 Refence Case 68
Table 6-1 committed highway schemes for inclusion into the LoHAM v4.2 SATURN Model 76
Table 6-2 Freight Action Plan 77
Table 6-3 TfL's 2019 London Freight Consolidation Feasibility Study Summary 82
Table 7-1 LBB comparison of job projections 85
Table 7-2 Growth indices for Households and Jobs in Barnet 86
Table 7-3 TfL PTAL Level applied to development 90
Table 7-4 Summary of the PTAL assumptions by specific Households development 90
Table 7-5 Estimated number of jobs created and resulting two-way person trips per job based on the 2014 consented Brent Cross development scheme 92
Table 7-6 TRICS v7.2 Person Trip Rates per job 92
Table 7-7 Directional split of the person trips for jobs 93
Table 8-1 Analysis of Stations and impact from Development Trips 104
Table 8-2 Persons standing per square metre 105
Table 8-3 Impact at Network Rail stations 106
Table 8-4 Development trip increases on Thameslink 107
Table 8-5 Bus Demand Growth Mayor's Transport Strategy 108
Table 8-6 Bus Demand Growth Indices by Area – AM Peak 108
Table 8-7 Bus Demand Growth Indices by Area – PM Peak 109
Table 8-8 Assumed bus service improvement measures 109
Table 8-9 Estimated summary of the end to end time savings per bus route 110
Table 8-10 Selected bus routes actual peak hours 111
Table 8-11 2016 Summary of LoHAM matrices relating to Barnet. 112
Table 8-12 The impact of soft measures on mode share 114
Table 8-13 Summary of the modelled scenarios 116
Table 8-14 Junction Capacity Negative Impact Severity Measures 117
Table 8-15 Junction Capacity Positive Impact Severity Measures 118

Table 8-16 2026 AM Peak Junction Capacity Analysis results 121

Table 8-17 2026 PM Peak Junction Capacity Analysis results..... 124

Table 8-18 2036 AM Peak Junction Capacity Analysis results 127

Table 8-19 2036 PM Peak Junction Capacity Analysis results..... 130

Table 8-20 London Borough of Barnet Travel Time (Speed) Routes (LoHAM v4.2) 132

Table 8-21 Barnet Modelled Speed Changes in SATURN (LoHAM v4.2)..... 132

Table 8-22 M1 J2 and J4 summary of 2026/2036 AM and PM peak flows..... 133

Table 8-23 EfT CO2 emission analysis assumptions..... 134

Table 8-24 Road Traffic CO2 annual emission estimates for Barnet 135

Table 8-25 Road Accident clusters analysis 138

Table 8-26 TfL's Covid19 Hybrid scenario highway demand adjustment factors for LoHAM v4.2 (2031 AM Peak hr) 140

Table 8-27 M1 J2 and J4 summary of 2026/2036 AM and PM peak flows..... 142

Table 8-28 2026 AM Peak Junction Capacity Analysis results (with Covid19 Hybrid demand growth scenario)..... 145

Table 8-29 2036 AM Peak Junction Capacity Analysis results (with Covid19 Hybrid demand growth scenario)..... 148

Table 8-30 2026 and 2036 AM peak road network statistics with vs without Covid19 Hybrid demand growth scenarios..... 149

Table 8-31 London Borough of Barnet AM peak hr forecast CO2 emissions with TfL's Covid19 Hybrid demand adjustment scenario 150

Table B-1 Draft Local Plan Reg18 Household Units Projections 179

Table B-2 LBB committed Household projections by LTS Zone 180

Table B-3 LBB Full Household projections by LTS Zone 182

Table B-4 LTS jobs projections by LTS Zone 184

Table F-1 2026 AM/PM Travel Route speeds analysis (SATURN) 254

Table F-2 2026 AM/PM Travel Route speeds analysis (SATURN) % changes 255

Table F-3 2036 AM/PM Travel Route speeds analysis (SATURN) 256

Table F-4 2036 AM/PM Travel Route speeds analysis (SATURN) % changes 257

Executive Summary

Introduction and background

Capita were appointed by the London Borough of Barnet (LBB) to undertake a Strategic Transport Assessment of the cumulative impact of the growth outlined within Barnet's Draft Local Plan Reg18 (DLP Reg18). The impacts to be assessed include those relating to the highway network (strategic and non strategic) and public transport (bus and rail). This has been undertaken in order to demonstrate that Barnet's Local Plan is sound in that it is justified, effective and consistent with national policy.

The Strategic Transport Assessment has been informed by National Planning Policy guidance which emphasises sustainable solutions. In addition, development of the Local Plan is in line with the Mayor's Transport Strategy. The Mayor's Transport Strategy focusses on a healthy streets approach "putting health and experience at the heart of planning the city". The Mayor's Transport Strategy objective is for 80% of all trips in London to be on foot, by cycle or public transport by 2041. For this to be achieved, the Mayor of London has set the target of increasing the proportion of trips made by walking, cycling and public transport in Barnet from 59% today to 72% in 2041. LBB supports these aims and objectives and has produced a Long-Term Transport Strategy (LTTS) to inform this process. In order to address these issues the LTTS determined a number of proposals aimed to reduce car dependency.
The proposals include a number of active and demand management measures including support to active travel including walking and cycling, applying initiatives to travel to school, low traffic neighbourhoods and measures to deal with car travel such as through car clubs. Other measures include improving public transport through better connections, improved bus services particularly orbital ones and improvements at rail stations/gateways.

Approach

In addressing the highway impacts we have used TfL's London Highway Assignment Model (LoHAM) which extends to cover the whole of London. The LoHAM model's growth assumptions relating to population and employment are linked to TfL's Multi-modal strategic transport model LTS. We obtained the population and employment assumptions embodied within the LTS model and the LoHAM models which covered the AM and PM peak hours for years 2016, 2021, 2026, 2031 and 2041.
The models from TfL and our assessment is based on a pre Covid19 world and assumes the restoration to this world in due course. It is noted though that a post Covid19 world is likely to be different with, in particular, higher levels of working from home which could impact upon peak hour commuter travel.
We have undertaken the Strategic Transport Assessment by:

- Undertaking an evidence-based assessment of the impacts of the active and demand management proposals within the LTTS which could not be modelled in a formal way.
- Reviewing the planning assumptions of the Local Plan and how these have been incorporated within LTS and the LoHAM.
- Adjusting LoHAM as required by this review and a trip generation analysis deriving appropriate trip rates in accordance with the geographical locations connectivity measured by TfL's Public Transport Accessibility Level (PTAL) tool.
- Testing the impact of the developments within the LoHAM model and how impacts could be mitigated by the proposed active and demand management measures discussed above.
- Undertaking separate modelling work to assess the capacity impact from developments upon the tube and rail network and for assessing the potential for improved orbital bus services.

Effect of Active and Demand Management measures

The LTTS proposals include a number of initiatives and we have determined evidence from research for the potential diversion from car based modes to these active and sustainable modes. For some initiatives there is relatively reasonable but at time variable evidence – including on healthy routes to schools, low traffic neighbourhoods, car clubs and workplace parking levy. On other initiatives such as on cycling whilst there is a considerable amount of data and interest the evidence relating to mode shift is less strong. We have had to make judgement calls based on reasonable assumptions in these cases. Our assessment of these initiatives and the impact on mode share is summarised below.

- Healthy Routes to School - Estimated to reduce the car mode share to schools from 36% to 25% and an overall car mode share reduction of 3.5% in the AM peak and 1.1% in the PM peak;
- Cycle Network - high levels of segregation and cycle route priorities could result in a mode share shift from car of 5%; lower mode share shifts would be expected where high levels of segregation and priority are not readily achievable. On balance we assumed a car mode share reduction of 2.5%;
- Workplace Parking Levy - This would reduce the number of available car parking spaces and result in a car mode share reduction of 1.8%;
- Low Traffic Neighbourhoods - Traffic within and to and from each LTN would reduce by 10% leading to a borough-wide car mode share reduction of 0.2%;
- Public realm enhancements at gateways would affect traffic to and from the gateway zones (19 stations) within Barnet. This leads to a car mode share reduction of 1.5%;

- Car Clubs - Car club members typically use a car some 10% less than non-club members resulting in a car mode share reduction of 3.5 % in the affected wards. Overall, this would lead to a car mode share reduction of 1.5% within the Borough of Barnet
- Express orbital bus services - These have been estimated to generate a +3% uplift in demand across the selected routes of which 1% would come from car. This would reduce the overall car mode share by approximately 0.2%;
- Demand responsive bus (DRB) services - Traffic would be affected to and from more remote areas and would lead to a car mode share reduction of 0.1%; and
- Local town centre consolidation centres would result in a reduction of LGV's traffic levels within Barnet of 5%.

Planning and modelling assumptions

The Draft Local Plan includes increases in population and jobs which have been assessed at LTS zoning system level to compare growth against the assumptions contained in TfL's LoHAM v4.2 SATURN highway assignment model. Job numbers are used as proxies for trip generation purposes in relation to deriving demand associated with employment and retail site land uses.

The review indicated that the DLP Reg18 growth assumptions are close to those contained within LTS in terms of overall growth. However, the distribution of the development trips was found to be different. Based on the differences in households and jobs between the LTS and LBB's DLP Reg 18 projections (committed and non committed) and the trip generation analysis, we have determined a series of trip growth adjustment factors to apply to the LoHAM matrices for each forecasting year.
The resultant changes showed that demand growth in the LoHAM model should be increased along the A5 corridor's growth areas as well as at Mill Hill East and that they should be reduced elsewhere in the Borough.

The review of the LoHAM v4.2 model against the Local Infrastructure Plan (LIP) indicated the need to include some limited network changes to incorporate committed proposals along the A5, including: the West Hendon Hub and the bridge (Midland Main Line overbridge) associated with the Brent Cross development. It should be noted that the Mayor's Ultra Low Emissions Zone (ULEZ) scheme extension is included in the LoHAM 2021 model and so is the modified M1/A406 North Circular interchange.

Post-Covid19 forecasting

Predicting the future is particularly difficult in the context of the ongoing Covid-19 pandemic. The actions taken by Government to introduce "lockdown" measures led to a significant reduction in travel on all

mechanised modes – car, bus and rail. The easing of lockdown in the summer of 2020 showed that car traffic reached pre pandemic levels but public transport use did not fully recover, no doubt due to the Government encouraging people to continue to work from home where possible. As we come out of lockdown during the spring and summer of 2021 travel levels will no doubt increase but whether and when these return to pre Covid19 levels remains to be seen.

Post Covid19 forecasts produced by other stakeholders confirm the level of uncertainty around what the post-pandemic world is going to look like; this is reflected in the wide ranges of outcomes where future public transport demand tends to be lower, for example commuting into London, than in a Pre-Covid19 scenario. From a planning and capacity design perspective, maintaining pre-Covid19 levels of demand growth has been considered more appropriate.

Highway performance

Three scenarios were created for the years 2026 and 2036 as follows:

- Scenario 1: Full DLP Reg 18 Households and Jobs growth;
- Scenario 2: (Baseline) DLP Reg18 committed developments only; and
- Scenario 3: as Scenario 1 + active and demand management measures.

It should be noted that analysis of the 2021 SATURN network has highlighted that a number of junctions, primarily those on the strategic road network in Barnet, operate above the desirable level of capacity represented by the Volume over Capacity (V/C) ratio of 85%. Above this value junctions may experience unstable flow conditions with delays and queues, the severity of which is dictated by how close the ratio is to the maximum theoretical capacity (V/C = 100%) or indeed whether this is exceeded.

The results of this assessment on the highway network is summarised below.
In 2026 AM peak scenario:

a. The majority of junctions operating at a V/C already higher than or just under a V/C value of 85% would see non-significant changes as a consequence of the full DLP Reg18 demand growth.
b. There is limited and very localised adverse impacts on the network's capacity of full DLP Reg18 demand growth and this could be offset by the demand management strategies; and
c. The modelling shows an impact at the M1 Junction 2 Southbound off-slip and the A1 but this is related to blocking back from a downstream junction. The demand management measures should result in the junction operating within capacity.

In the 2026 PM peak scenario:

d. The majority of junctions operating at V/C already higher than or just under a V/C value of 85% would see non-significant changes as a consequence of the full DLP Reg18 demand growth. Demand management measures would result in a range of Minor to Major improvements at these locations.
e. There is limited and very localised adverse impacts on the network's capacity of full DLP Reg18 demand growth and this could be offset by the demand management strategies; and
f. No specific adverse issues are reported in relation to the M1 junctions.

In the 2036 AM peak scenario:

g. There are some localised adverse impacts on the network's capacity associated with full DLP Reg18 demand growth. Impacts that are either Moderate or Major adverse are limited to four sites. In all instances these adverse effects could be offset by the demand management strategies;
h. The modelling shows an impact at the M1 Junction 2 Southbound off-slip and the A1 but this is related to blocking back from a downstream junction. The demand management measures should result in the junction operating within capacity.

In the 2036 PM peak scenario:

i. There are some localised adverse impacts on the network's capacity associated with full DLP Reg18 demand growth. Impacts that are Major adverse are limited to two sites. In all instances these adverse effects could be offset by the demand management strategies.
j. Merge at the M1 Junction 2 Southbound off-slip and the A1 does not show any issues.

Analysis of travel speeds indicates that the full DLP Reg18 growth would have additional detrimental effects around the network with speeds decreasing by one to four percentage points, approximately. However, the demand management measures would offset this negative impact by increasing speeds by eight to nine percentage points.

M1 junctions

As discussed earlier the LoHAM models include the revised M1 Junction1/A406 North Circular Road interchange from 2021. All tested scenarios show no particular issues at this junction under the tested years.

The DLP Reg18 full development scenario is predicted to have minimal impact on the traffic levels at junction 4 of the M1. However, moderate adverse capacity issues can be experienced from 2026 at the M1/A1 Junction 2 Southbound in the AM peak. This is due to right-turning traffic tailing back from the

junction between the A1 Great North Way and the B552 Holders Hill Road. However, the predicted reduction in demand associated with the demand management measures would be expected to significantly mitigate this issue.

Impact of TfL's Covid19 Hybrid scenario of transport

Since 2020 TfL have been working on a series highway and public transport forecasts aimed at estimating the potential impact on the London transport network of potentially lasting Covid19-related changes in personal mobility.

It should be noted that the impact of Covid19 has been tested only on the highway demand as TfL's as, in this case, forecasts predict a growth in demand against the reference No-Covid19 scenarios. Early assessments of public transport demand under a Covid19 scenarios have indicated that demand across London in 2031 could be 20% lower than predicted under the reference No-Covid19 scenarios. Again, this result should only be considered as indicative and a snapshot for what is otherwise a highly changeable situation.

'A best estimate' or Hybrid scenario was generated earlier in 2021 for assessing travel demand; the TfL's forecasting year being 2031. The 'Hybrid' Covid19 scenario takes its name from the fact that TfL have combined a series of assumptions from five alternative Covid19 scenarios, The forecasts provided by TfL related to the 2031 AM Peak hour highway assignment.

TfL's Covid19 Hybrid scenario estimates that overall demand for road-based travel in Barnet would be higher than in the no-Covid19 baseline situation. This is a 'snapshot view of the world' and that ongoing work is being undertaken by TfL on this subject. More specifically 'all vehicles' traffic demand within the Borough is assumed to be 15% higher under the hybrid Covid19 scenario in comparison to the baseline/reference scenario. This demand growth is primarily driven by light vehicles as heavy goods vehicles traffic is estimated to either fall slightly (-1%) within Barnet or remain unchanged to/from Barnet.

The impact of the additional demand under the Covid19 Hybrid scenario outstrips the benefits linked to the implementation of the combined demand management measures with average 2026 and 2036 network speeds under Scenario 1 (Full DLP Reg 18 Households and Jobs growth), at 20.9 and 20.1 kph being higher than under Scenario 3h (Scenario 1 + active and demand management measures with Covid19 Hybrid), at 19.5 and 18.7 kph.

Merge at the M1 Junction 2 SB off-slip and the A1 should be monitored as the combined demand management measures would only partially offset the demand growth linked to the Covid19 Hybrid scenario.
Diverge at the M1 junction 4 should be monitored as the combined demand management measures would only partially offset the demand growth linked to the Covid19 Hybrid scenario.

The higher traffic demand would also result in greater CO2 emissions of the Covid19 Hybrid scenario resulting in an overall increase of CO2 emissions in the borough of approximately +15%.

The current assessment of the Covid19 Hybrid scenario has clearly shown a series of incremental negative impacts on the wider road network in Barnet. This places a greater emphasis upon the importance of implementing the discussed mitigation measures, even though, these may only partially mitigate the negative effects associated with the predicted extra traffic growth. It should be noted that whilst such an outcome may indeed be possible, the travel scenarios under Covid19 are being continuously revised and updated; for this reason, regular updates of the Plan's policies may also be required.

Public Transport

On the rail network we undertook an analysis at each station and identified additional development trips onto the network. We have assessed the capacity of station elements against LUL's standards in Station Capacity Planning S1371 A7 and Network Rail's Station Planning Capacity Guidance, November 2016. The analysis can be considered to be an initial assessment as the distribution of passengers into and through stations requires additional detailed analysis and more information would also be required of particular dimensions of specific station elements such as passageways and stairs.
The analysis of the LUL network showed that the additional development trips would not result in elements at stations exceeding capacity except at

1) Colindale in terms of ticket hall and gateline provision,

2) Hendon Central where the existing stairway from the passageway to the island platform would be operating at capacity and an additional two gates are required

3) High Barnet where the bridge to platforms 2/3 would be at capacity, subject to passengers movements through the station, and

4) Finchley Central where the area between the gateline and the southbound stairway and the stairways to the southbound and northbound are at capacity. Additional gates would be required at Brent Cross and potentially at High Barnet, Finchley Central and East Finchley depending upon the split of passengers between entrances.

We note that the issue at Colindale would be resolved with the planned construction of a new station.

In terms of line loads both Northern Line branches terminate in Barnet at Edgware and Mill Hill East/High Barnet; therefore, crowding tends to occur south of Hendon and Finchley Central. The levels of crowding above one as measured by the number of people standing per square metre is shown below. Note that much of the network in Central London exceeds a value of 4.

	Persons standing per square metre		
Underground line section	**2018 Base**	**2036 Base**	**2036 with Full DLP Reg18 Development**
Hendon Central to Brent Cross	<1	1.4	2.4
Brent Cross to Golders Green	1.1	1.7	2.8
Golders Green to Hampstead	1.9	2.6	3.8
Finchley Central to East Finchley	1.0	1.6	2.2
East Finchley to Highgate	2.0	2.7	3.5

The borough is served by Thameslink services out of St Pancras and Great Northern services out of Moorgate and we have assessed the impact of development trips at stations within the borough.

1) At New Barnet an additional gate would be required on each platform to enable arriving passengers to clear within two minutes.

2) At Mill Hill Broadway the restrictive entrance from the bus station would be close to but within capacity depending upon the use of the two entrances to the station.

3) At Hendon the Northbound stairway would be at capacity in the PM to clear arrivals within two minutes. In addition, the street exit and the adjacent circulation area would be over capacity.

4) At Cricklewood station an additional gate would be required and the current station entrance would be over capacity. In addition to existing stations a new station at Brent Cross West is currently under construction and due to open in 2022. The station will serve the developments

in the area. The table below shows the impact from development trips on Thameslink services and the ratio of passengers to seats.

South of:	Increase in trips from Developments in 2036	Ratio of demand to seats
Mill Hill Broadway	10%	1.16
Hendon	18%	1.00
Cricklewood	16%	1.16

On the bus network we assessed improvements to orbital services as well as a couple of cross Borough radial services. From an analysis of existing Bus Origin Destination Survey (BODS) data and on the basis of improvement of 10% in bus journey times, applying appropriate elasticities and diversion factors from research we estimated that buses would receive a 3% uplift in passengers from all modes (excluding LUL) with 1% represented by demand abstracted from car. This uplift would only apply to car demand along the selected orbital/radial corridors so would only represent about 0.25% of car trips in Barnet. Analysis of the BODS data and resulting bus route loadings indicate no particularly severe capacity issues on the routes in 2036.

Emissions

With the DLP Reg18 full growth (Scenario 1), annual CO2 emissions would be expected to be marginally higher than with committed developments only, range of increase being around 1.5-2.0%. However, demand management measures would be expected to offset this increase by reducing CO2 emissions by approximately 4-5%.

Accidents

Accident clusters (defined as nine or more Personal Injury Accidents in a three-year-period) have been identified at 26 locations in Barnet between 2017 and 2019. A comparison between Scenario 1 (Full DLP Reg18 growth) against the Baseline Scenario (Scenario 2 or committed-only developments) indicates that at the junctions and on links described above flows would only typically increase within a range of +0% to +7% in 2036. We would therefore not expect a significant increase in the risk of accidents under the full growth scenario. Furthermore, again by 2036, the demand management scheme would reduce the flows within a range of 0% to -15%. The analysis shows that the demand management measures would contribute towards the Mayor's Vision Zero accidents by virtue of reducing traffic flows at those locations. Having identified the sites, future studies would be required look at specific measures to improve road safety but also monitor the impact of any implemented demand management measures.

1. INTRODUCTION

1.1 Capita were appointed by the London Borough of Barnet (LBB) to undertake a Strategic Transport Assessment of the cumulative impact of the growth outlined within Barnet's Draft Local Plan (Reg18) henceforth referred to as the Plan (or the DLP reg18). The impacts to be assessed include those relating to the highway network (strategic and non-strategic) and public transport (bus and rail). This is being undertaken in order to contribute towards the second stage of the consultation process (Reg19) of the Local Plan's development.

1.2 The Borough of Barnet is the most populous borough in London and it is expected to continue growing due to natural population increase and its popularity with families. The Plan expects that to accommodate the projected growth 46,000 new homes will be needed by 2036. This growth would lead to extra demand for travel and if not properly managed is likely to put under strain the local transport network including key roads and junctions and underground/rail stations. Also, congestion would be expected to make bus travel less attractive potentially resulting in loss of demand to car.

1.3 The Plan also includes targets for new employment and retail sites: 55,000m2 of new retail space at Brent Cross, 67,000m2 of new office space and 1,110,000m2 of new retail space across Barnet's town centres plus a new regional park, etc. The risk of reliance on car travel to access these employment/retail sites, especially from orbital areas across the Borough, would be high.

1.4 In transport terms the Borough of Barnet presents very good radial public transport connectivity into and out of Central London; although the LUL Northern Line could be put under further significant strain as a result of demand growth. Bus travel quality (speed and reliability) can be highly variable and, like for rail, orbital connections present the greatest challenge in terms of promoting connectivity and sustainable travel.

1.5 The DLP Reg18 recognises that sustainable growth is key in order to deliver its objectives. As reported by the Plan (paragraphs 2.6.3 and 11.4.3) and based on the London Travel Demand Survey (LTDS 2015/2016/2017), Barnet's residents make approximately 29% of journeys by Public Transport (PT), 31% on foot and 1% by bike; all sustainable modes amounting to approximately 61% of all trips.

1.6 In spite of being better than the average share for the Outer London Boroughs, it is still lower than Barnet's aspirational sustainable transport mode share of approximately 72% by around the year 2040.

1.7 As part of the Strategic Transport Assessment, we have reviewed Barnet's Growth Strategy which "sets out the key projects where the Council will direct its future investment".

1.8 The Barnet Draft Long Term Transport Strategy 2020-2041 (henceforth referred to as LTTS) describes a series of high level strategic transport measures aimed at promoting sustainable and accessible travel while improving connectivity, especially across an east west direction. The measures aim to improve safety and reduce congestion to benefit freight transport which passes through the Borough via critical strategic roads such as the M1, A1 and A406.

1.9 The measures described in the LTTS are strategic in nature and a detailed assessment would require some refinement in terms of their implementation such as specific route choice selection, junction design, etc. The approach in this study would therefore be to test generic improvements to the highway and public transport networks (e.g. improvements in journey times, PT service frequencies, etc) to broadly assess the required transport enhancements to meet and/or mitigate the impact of the Plan's growth objectives.

1.10 Not all of the listed measures can be readily assessed using standard transport models (e.g. impact of educational campaigns towards reduction in traffic, step free access improvements, cycle routes, low traffic neighbourhoods etc); however, their contribution towards traffic reduction can be input into TfL's HAM model suite (in SATURN) by reducing the existing background trips. In this regard we have researched the evidence regarding the likelihood of such soft measures impacting upon levels of trip making and transfer from car to active and sustainable modes.

1.11 This report has been prepared in 2020/2021, during the Covid19-19 pandemic. The pandemic has significantly affected travel levels in the UK by changing the way we work and by impacting upon many other social aspects of our lives. This report is effectively based on data and information in a pre Covid19 world and assumes a restoration of that world, with implied higher levels of demand for travel. We have had discussions on this situation with various bodies including TfL so the report provides commentary on this issue where relevant. It should be noted that from a planning and network capacity assessment point of view this represents a more conservative and therefore robust approach.

Report Structure

1.12 The report sets out the development of the policies and development strategies, describes existing transport networks, addresses the evidence relating to the impact from active and sustainable travel, reports on the impact from the Local Plan developments on the future transport networks. It is divided into eight Chapters as follows;

- Chapter 2 describes the background to the strategic assessment;
- Chapter 3 outlines the strategic assessment methodology;
- Chapter 4 reviews the evidence on the effects of developing active and sustainable modes on travel by car;
- Chapter 5 describes the existing public transport networks;
- Chapter 6 considers issues relating to the highway network;
- Chapter 7 details the modelling assumptions used in the analysis;
- Chapter 8 provides the strategic transport assessment of the public transport, highway networks and the effects of the improvements in active and sustainable modes.

1.13 Where necessary we have included details within a set of Appendices.

2. BACKGROUND TO THE ASSESSMENT

Context

London Borough of Barnet

2.1 The London Borough of Barnet is London's largest borough with a population of nearly 400,000. It is in outer London and is relatively well connected to the UK's strategic road network. In line with outer London boroughs generally it has a higher dependence on car travel than London as a whole reflecting a less comprehensive public transport network particularly for orbital trips. In addition, it has a local economy centred around a number of local town centres and less reliance upon Central London.

Transport Network.

2.2 The highway network is dominated by the M1, A1 and A41 strategic routes providing radial routes through the Borough and the A406 North Circular Road providing a key orbital London route. The A5 and A1000 provide accessibility to many of the Borough's town centres.

2.3 The Borough is served by the Edgware and High Barnet branches of the Northern Line both of which terminate within the Borough. In addition, there are Network Rail services on the Midland Main Line with Thameslink services running out of St Pancras to St Albans and beyond and on the Great Northern Line with services out of Moorgate to Welwyn Garden City.

2.4 There is a comprehensive bus network of 40 bus routes providing trunk services into the London area and local services connecting town centres and residential areas.

2.5 There is widespread off-street parking throughout the Borough in association with commercial and retail developments and the Council operates a number of car parks. There are also car parks at a number of the main line and underground stations. CPZ's are in operation in the vicinity of stations and town centres.

National Sustainable Transport Policies

2.6 The National Planning Policy Framework (NPPF), originally published in 2012 was updated in February 2019. The NPPF sets out the Government's planning policies for England and how

they are expected to be used[1].

2.7 The NPPF states that planning policies and decisions should play an active role in guiding development towards sustainable solutions, in doing so planning should take local circumstances into account to support needs and opportunities of each area. Chapter 2 'Achieving sustainable development' primarily explains that the purpose of the planning system is to achieve sustainable development. 'The objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs'. The planning system set out in the NPPF has three overarching objectives, which are economic, social and environmental.

2.8 Central to the NPPF is a "presumption in favour of sustainable development" (paragraph 11), which for decision-taking means that:

- Approving development proposals that accord with an up-to-date development plan without delay; or;
- Where there are no relevant development plan policies, or the policies which are most important for determining the application are out-to-date, granting permission, unless:
  - i. the application of policies in this Framework that protect areas or assets of particular importance provides a clear reason for refusing the development proposed; or
  - ii. "any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole".

2.9 Chapter 9 of the NPPF supports the notion that 'transport issues should be considered from the earliest possible stages of plan-making and development proposals.' The five main reasons behind this aim is so that:

- *"the potential impacts of development on transport networks can be addressed;*
- *opportunities from existing or proposed transport infrastructure, and changing transport technology and usage, are realised – for example in relation to the scale, location or density of development that can be accommodated;*
- *opportunities to promote walking, cycling and public transport use are identified and pursued;*

[1] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf

- *the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains; and*
- *patterns of movement, streets, parking and other transport considerations are integral to the design of schemes and contribute to making high quality places".*

2.10 Finally, Chapter 14 of the NPFF focuses on climate change, flooding and coastal changes. Paragraph 150 explains that new developments should be planned in a way that "help to reduce greenhouse gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards".

London Plan (March 2021)

2.11 The London Plan (March 2021) brings together the geographical and locational aspects of the Mayor's strategies, to ensure consistency between transport, environment, economic development, housing, culture and health. The London Plan (March 2021) is legally part of each of London's Local Planning Authorities' Development Plan and must be considered when planning decisions are taken in any part of Greater London.

2.12 Chapter 10 of the London Plan is centralised around transport and identifies a number of policies which are listed below:

- T1 Strategic approach to transport;
- T2 Healthy Streets;
- T3 Transport capacity, connectivity and safeguarding;
- T4 Assessing and mitigating transport impacts;
- T5 Cycling;
- T6 Car Parking;
- T7 Deliveries, servicing and construction;
- T8 Aviation; and
- T9 Funding transport infrastructure through planning.

2.13 All these policies aim to make transport more sustainable, more user friendly and to reduce the impact on the environment. The main aim is to reduce the reliance on private motor vehicles and increase the amount of people using more sustainable ways of travelling by active modes.

2.14 Policy T1 A states that *"the delivery of the Mayor's strategic target of 80% of all trips in London*

to be made by foot, cycle or public transport by 2041".

2.15 Policy T1 B draws on the fact that *"All development should make the most effective use of land, reflecting its connectivity and accessibility by existing and future public transport, walking and cycling routes, and ensure that any impacts on London's transport networks and supporting infrastructure are mitigated".*

2.16 Policy T3 A explains how growth plans should develop effective transport policies and projects to provide sustainable developments in London.

2.17 Section 0.0.18 of the Plan states that this plan has different philosophies to those that have come before; it is described as being more ambitious and focused. The concept of Good Growth is a key element of the Plan, this is growth that focuses on socially and economically inclusive and are environmentally sustainable. This underpins the London Plan (March 2021) and ensures that it focuses on sustainable development.

Transport Strategy 2018

2.18 The London Mayor's Transport Strategy published in 2018 sets out a vision for a period of 20 years; (https://www.london.gov.uk/sites/default/files/mayors-transport-strategy-2018.pdf).

2.19 The key objective of the Strategy is to: "change the transport mix across London, providing viable and attractive alternatives that will allow Londoners to reduce their dependence on cars."

2.20 The transport strategy highlights some significant issues, including:

- *"The dependency on car including short distance trips. This contributes to an inefficient use of road space, congestion, increasing freight/commercial transport costs and population health problems, including obesity in young children;*
- *traffic can make the street environment unpleasant for people that want to use it;*
- *motorised traffic is also overwhelmingly responsible for half of the main air pollutants, with cars contributing around 14% of nitrogen oxides (NOx) and 56% of particulate matter, less than 2.5 microns in diameter (PM2.5), emissions – some of the pollutants that are most harmful to human health;*
- *road danger is caused by the dominance of large, heavy, potentially dangerous vehicles that can move at high speeds in places where people want to be. Risk experienced by people who are walking and cycling remain unacceptably high; and*
- *some parts of London are being held back by a lack of any viable public transport options at all. While Central London is one of the world's best connected places, parts of outer London are*

cut off from the opportunities the rest of the city has to offer by poor Tube, rail and bus links. Poor transport connections compromise economic fairness by limiting access to jobs, education and training."

2.21 The strategy recognises that population growth in London, expected to increase from 8.7 million to 10.8 million people by 2041, will pose challenges in terms of transport, affordable housing and the need for quality and accessible jobs. An increasing ageing population will also require more accessible transport systems with significant reliance placed on public transport systems.

2.22 Policy 1 of the Mayor's Transport Strategy states:

"The Mayor, through TfL and the boroughs, and working with stakeholders, will reduce Londoners' dependency on cars in favour of active, efficient and sustainable modes of travel, with the central aim for 80 per cent of all trips in London to be made on foot, by cycle or using public transport by 2041."

2.23 It should be noted that the Mayor's Transport Strategy considers the term 'walking and cycling' as indication of a range of end-to-end fully active modes of travel.

2.24 Another key objective of the Mayor's Transport Strategy is to bring forward improvements in air quality through promoting the use of cleaner vehicles:

"The Mayor's aims are for all new taxis to be zero emission capable from 2018 and all new Private Hire Vehicles (PHVs) from 2023, all new buses to be zero emission from 2025, all new cars and vans from 2030 and all other vehicles from 2040. This would mean that all taxis and PHVs would be zero emission capable by 2033 at the latest, all buses would be zero emission by 2037 and London's entire transport system would be zero emission by 2050."

2.25 The Mayor's Transport Strategy aims to ensure that regeneration and new development schemes incorporate the Mayor's principles of Good Growth, based on:

- Good access to public transport
- High-density, mixed-use developments
- People choose to walk and cycle
- Car-free and car-light places
- Inclusive, accessible design
- Carbon-free travel

- Efficient freight

2.26 The Mayor's Transport Strategy also recognises issues which are specific to Outer London Boroughs such as:

- ***"Trips in this area tend to be longer and have many different start and end points, which makes it harder to provide efficient public transport services.***
- ***Walking is the first choice for short trips, and buses are important in providing access to town centres, but the car is used for most other travel.***
- ***Outer London high streets, town centres and communities are often traffic dominated, noisy and polluted.***
- ***Significant improvements to public transport services will be required to achieve this reduction in car dependency. At present, many people have no choice but to drive, particularly for trips around outer London, rather than into the city centre."***

2.27 The Mayor's Transport Strategy recognises that where traditional bus services cannot meet the flexibility of car-based travel alternative solutions can be offered in the form of new models such as 'demand-responsive' bus services. Nonetheless the Mayor's Transport Strategy also recognises that:

"The beauty of the bus network is that it is flexible – routes are relatively easy to add and remove compared to Tube and rail lines, so they can be much more responsive to changes in demand than other forms of public transport. This means that buses can be important in supporting regeneration and social integration – where there may not be the justification for investing in expensive, permanent rail infrastructure, new bus routes can be planned to connect new communities and support housing and jobs growth."

2.28 Figure 2-1, extracted from the Mayor's Transport Strategy, provides a snapshot of the future strategic cycle network in London for 2041. The image underneath provides a zoomed in version of the network in and around the London Borough of Barnet.

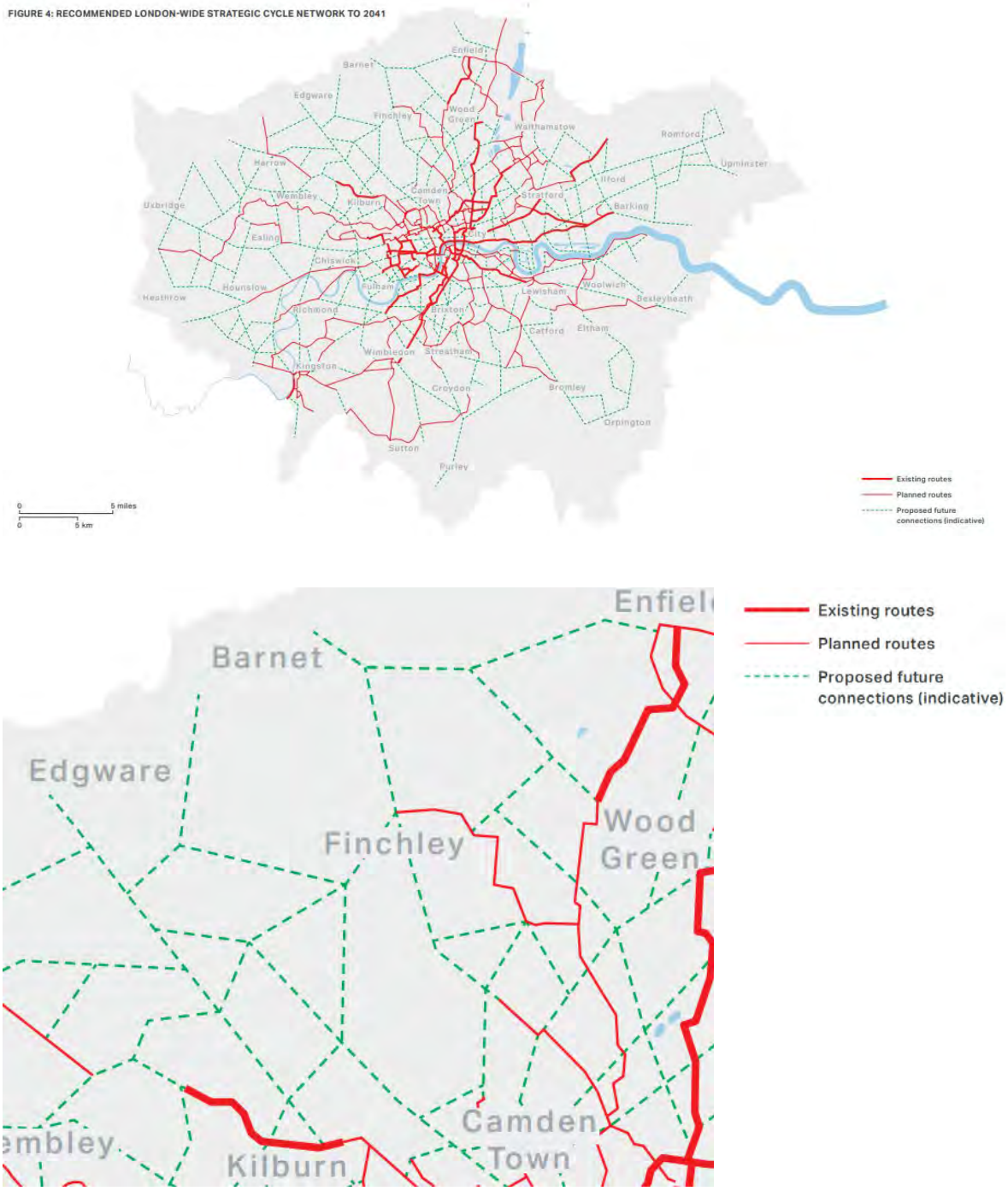


Figure 2-1 TfL existing and proposed strategic cycle network (source: TfL's Mayor's Transport Strategy)

2.29 Figure 2-1 above shows a number of routes which could provide improved cycle connectivity both across and to/from the borough of Barnet. These include along the A5 and A1000 corridors. Further routes and connections include those going from east to west through Finchley, for instance.

2.30 In terms of road safety the Mayor's Transport Strategy policy 3 states that:

"The Mayor, through TfL and the boroughs, and working with stakeholders, will adopt Vision Zero for road danger in London. The Mayor's aim is for no one to be killed in or by a London bus by 2030, and for all deaths and serious injuries from road collisions to be eliminated from London's streets by 2041."

2.31 In terms of further tackling road congestion the Mayor's Transport Strategy advocates the following key proposals:

- *"Proposal 16 : The Mayor, through TfL, and working with the boroughs and members of the Freight Forum, will improve the efficiency of freight and servicing by promoting: rail/waterways freight solutions and use of regional consolidation centres;*
- *Proposal 17: The Mayor, through TfL, working with the boroughs and the Freight Forum, will work with landlords and all parts of the supply chain, including the freight industry, Business Improvement Districts (BIDs) and individual businesses, to improve the efficiency of last mile deliveries and servicing.*
- *Proposal 19 : The Mayor, through TfL and the boroughs, will support the provision of car clubs for residents when paired with a reduction in the availability of private parking, to enable more Londoners to give up their cars while allowing for infrequent car travel in inner and outer London.*
- *Proposal 20 The Mayor, through TfL, will keep existing and planned road user charging schemes, including the Congestion Charge, Low Emission Zone, Ultra Low Emission Zone and the Silvertown Tunnel schemes, under review to ensure they prove effective in furthering or delivering the policies and proposals of this strategy.*
- *Proposal 21 The Mayor, through TfL, will investigate proposals for the next generation of road user charging systems. These could replace schemes such as the Congestion Charge, Low Emission Zone and Ultra Low Emission Zone. More sophisticated road user charging and/or workplace parking levy schemes could be used to contribute to the achievement of the policies and proposals in this strategy, including mode share, road danger reduction and environmental objectives. and*
- *Proposal 23 The Mayor, through TfL, will work with those boroughs who wish to develop and implement appropriate traffic demand management measures, for example local (TfL or borough) road user charging or workplace parking levy schemes, as part of traffic reduction strategies where they are consistent with the policies and proposals set out in this strategy."*

2.32 The policies, objectives and proposals discussed above support the measures considered as

part of this strategic assessment.

Barnet Draft Local Plan Reg18

2.33 The Council is producing a new Local Plan (currently Draft Local Plan Reg18). The existing Local Plan (comprising Core Strategy and Development Management Policies Development Plan Documents) was adopted in 2012. The new DLP reg18 needs to take account of new national planning policy in the form of the National Planning Policy Framework and the new London Plan (March 2021).

2.34 The DLP Reg18 establishes the Council's vision for growth and development in Barnet over a 15 year period (2021-2036). The Plan is the basis upon which planning applications will be determined unless there are material planning considerations that indicate other relevant issues. Together with the adopted documents shown in Figure 2-2 the DLP Reg18 forms the Development Plan for Barnet.

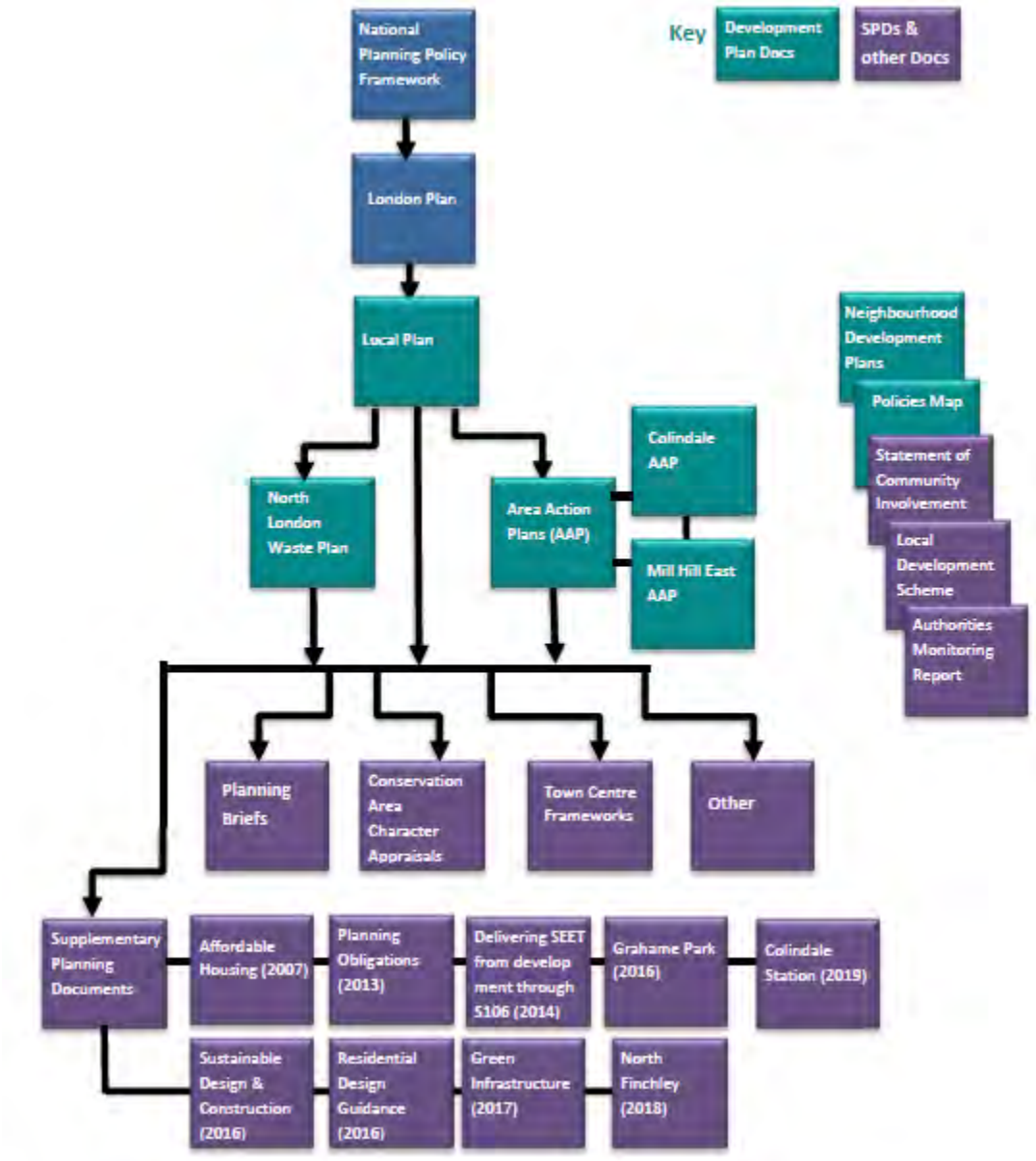


Figure 2-2 Barnet Development Plan

2.35 National Planning policy requires that Local Plans should be based on up-to-date and relevant evidence about economic, social and environmental characteristics. This report intends to provide that evidence in relation to the expected impact that population and employment growth will have on the transport network and how sustainable travel as well as infrastructure measures may help mitigate any adverse effects of such growth.

2.36 The DLP Reg 18 states that: *"Barnet's popularity means that it will continue to grow. Ensuring that the Borough retains the qualities that make it attractive while also accommodating the*

future needs for new homes, jobs and infrastructure is a role for the new Barnet Local Plan. This is a Plan that looks ahead to 2036.".

2.37 Over the Plan period to 2036, the Council seeks to create the conditions in the Borough that will deliver a minimum of 46,000 new homes. Barnet employment is also expected to grow by approximately 22% by 2036, generating an additional demand for office space of approximately 40,000 m2. It should be noted that growth has been directed into the most sustainable locations with good public transport and active travel choices. These include Brent Cross, Colindale, New Southgate and Mill Hill East as well as main town centres at Burnt Oak, Chipping Barnet, Cricklewood, Edgware, Finchley Central, Golders Green and North Finchley. Figure 2-3 shows the conceptual level of the Council's overall spatial strategy.

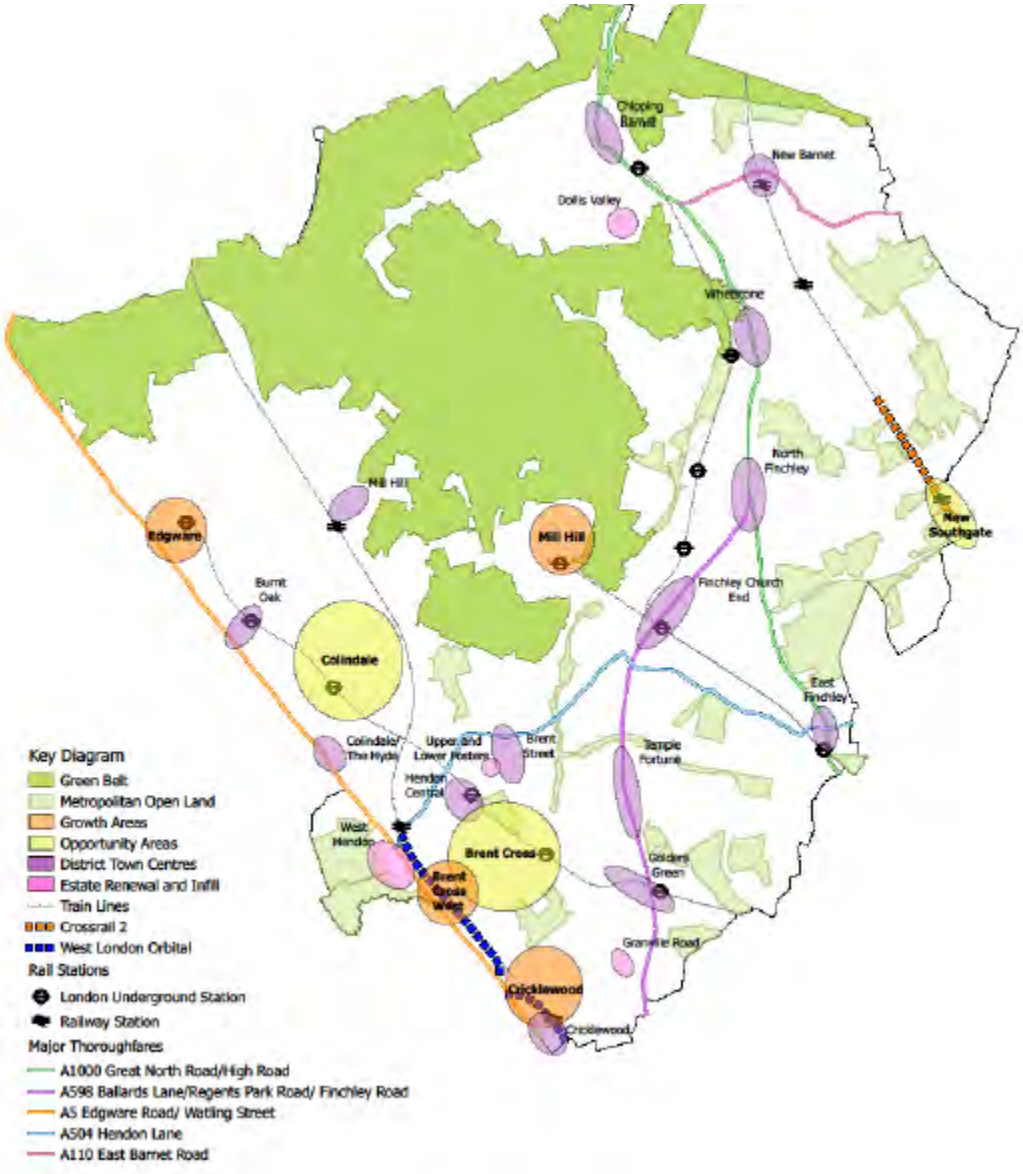


Figure 2-3 Conceptual Level of the Council's Overall Spatial Strategy

2.38 Barnet is well served by public transport for radial travel but orbital travel is more challenging. In addition to the underground and national rail services to central London, Barnet has a good network of bus services that provide a varied frequency of journeys depending on the route; however, bus journeys are affected by congestion as are cars and have longer journey times.

2.39 Traffic congestion is a significant challenge for Barnet, particularly along the major thoroughfares such as the A1, M1, A41 and A406, with a considerable number of trips originating outside Barnet.

2.40 The Borough's DLP Reg18 key transport policies, as well as other key policies relevant to this assessment, are summarised in Table 2-1 below. These are part of a broader set of policies which together would contribute to the objective of delivering *"a Borough with excellent schools, vibrant town centres, vast green spaces and diverse communities which all contribute to a popular place where people choose to live."*

Local Plan Strategic Policies	Relevant Local Plan Non Strategic Policies
Policy BSS01 Barnet's Spatial Strategy	**Policy TRC01 Sustainable and Active Travel**
Policy GSS01 Delivering Sustainable Growth	**Policy TRC02 Transport Infrastructure**
Policy GSS09 Existing & Major New Transport Infrastructure	**Policy TRC03 Parking management**
Policy GSS11 Major Thoroughfares	**Policy TRC04 Digital Communication and Connectivity**
Policy GSS12 Car Parks	Policy HOU02 Housing Mix
	Policy TOW01 Vibrant Town Centres
	Policy TOW03 Managing Clustering of Town Centre Uses
	Policy CHW02 Promoting health and wellbeing
	Policy ECY01 A Vibrant Local Economy
	Policy ECC01 Mitigating Climate Change
	Policy ECC04 Barnet's Parks and Open Spaces

Table 2-1 Draft Local Plan Reg 18 Key Policies

2.41 The DLP recognises the potential to improve sustainable mode share in several ways:

- *"With an extensive green infrastructure incorporating public rights of way, parks and gardens together with a comprehensive network of sports and recreational facilities, there is an opportunity to create more active environments;*
- *improved orbital connectivity and sustainable travel options including cycling and walking;*
- *undertake positive action to prevent any pupil parking, promoting car sharing and improved cycle parking facilities, encouraging more children to walk and cycle to and from school;*

- *Projects such as West London Orbital and Crossrail 2 have the potential to transform parts of the Borough. Public transport nodes such as London Underground and Network Rail stations also have a significant contribution to make to sustained growth.*
- *The new Brent Cross West station will provide a fundamental component of the integrated transport strategy;*
- *A new bus station north of the North Circular Road as part of the expansion of Brent Cross Shopping Centre (based on consented S73 developments), with associated improvements to the local bus infrastructure will further contribute to facilitate mode shift towards sustainable modes of travel;*
- *At Colindale LBB expects the delivery of an improved underground station with step-free access and sufficient gate-capacity for the growing population in the area;*
- *Public transport hubs with high levels of PTAL in Barnet offer significant potential for intensification and growth;*
- *Development of stations not linked to a town centre; these are expected to support development in the following areas: Woodside Park, Mill Hill East, New Southgate, Hendon and Brent Cross West (under construction);*
- *New and extended bus services are being pursued through the Brent Cross and Colindale regeneration schemes.*
- *Extension of Controlled Parking Zone (CPZ), such as at the Colindale Growth Area; and*
- *Provision of car parking in accordance to Policy TRC03;*
- *Encourage expansion of car clubs and consider appropriate parking ratios in areas with high PTAL values;*
- *restrict new occupiers from obtaining car parking permits through a legal agreement within existing and future CPZ;*
- *Cycle parking facilities to be delivered in line with the new London Plan (March 2021) Standards;*
- *Electric Vehicle charging points to be delivered in accordance with the new London Plan (March 2021) Standards; and*
- *Appropriate provision should be made for efficient deliveries and servicing."*

2.42 In allocating parking provision to residential uses LBB will take into account a number of factors such as:

• The overall public transport accessibility level (PTAL); • Orbital PTAL; • Parking stress including the level of on-street parking control; • Population density and parking ownership of surrounding areas; • Location (i.e. is it in a town centre); • Ease of access by cycling and walking; and • Other relevant planning or highways considerations, such as whether the proposal is a conversion of an existing use.

Table 2-2 DLP Reg18 residential parking allocation decision parameters

2.43 For non-residential uses the Council supports the application of the New London Plan (March 2021) car parking standards.

2.44 LBB has produced a Long Term Transport Strategy (LTTS) to inform the process to achieve these aims and objectives. In order to address these issues, the LTTS determined a number of proposals aimed at reducing car dependency. These strategic measures are shown on Figure 2-4 and, based on available published evidence on the impacts that such measures have on road based demand, have been tested and assessed in this Strategic Transport Assessment.

Figure 4.1: Proposals summary map

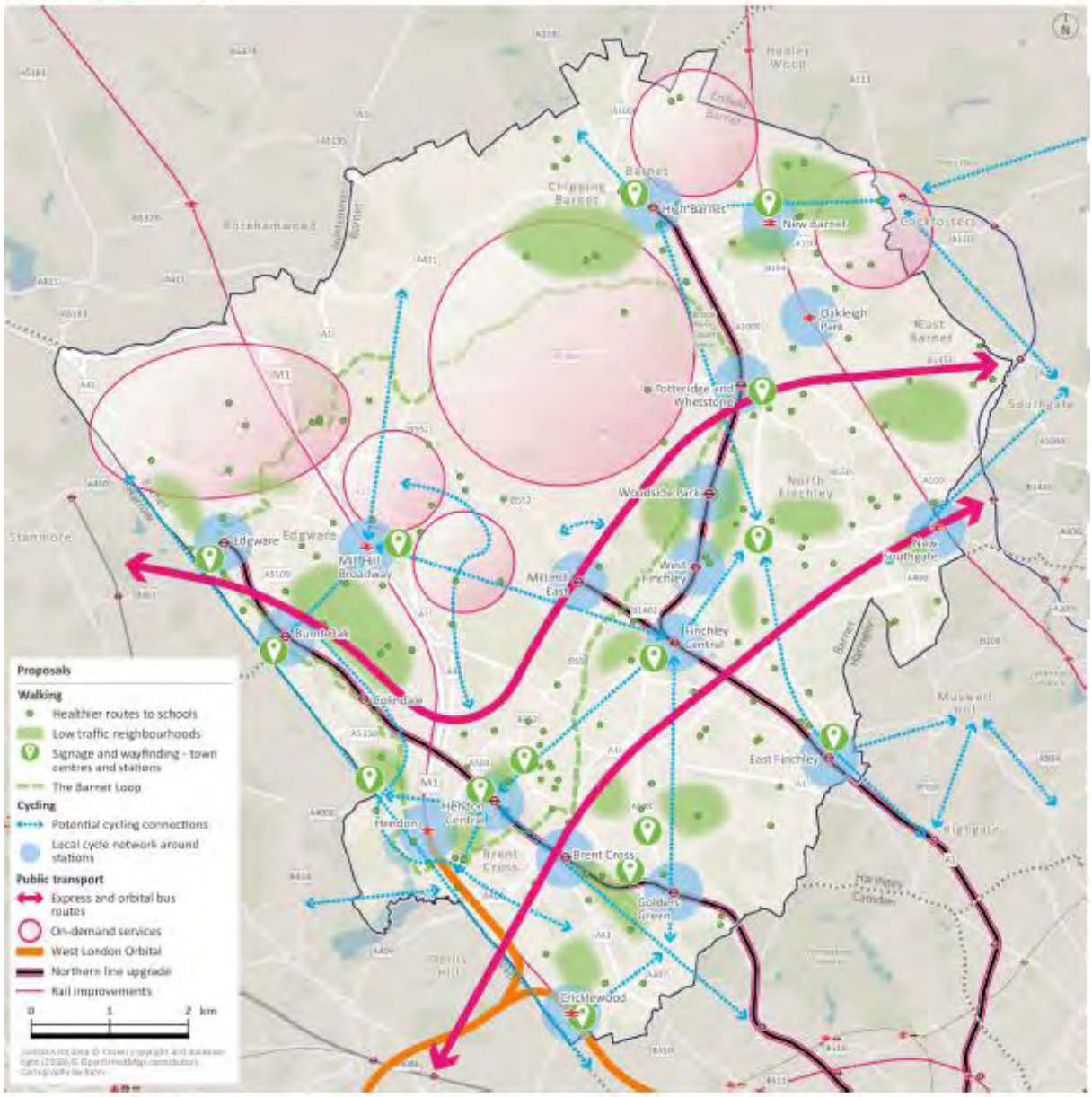


Figure 2-4 London Borough of Barnet LTTS strategic measures

2.45 The proposals include numerous active and demand management measures including support to active travel including walking and cycling, applying initiatives to travel to school, low traffic neighbourhoods and measures to deal with car travel such as through car clubs. Other measures include improving public transport through better connections, improved bus services particularly orbital ones and improvements at rail stations/gateways.

Barnet Growth Strategy 2019-2030

2.46 Barnet Growth Strategy 2019-2030 provides strategic responses in relation to expected growth trends such as: an increasing and increasingly aging population, changes in employment market, how people travel and environmental concerns. The Growth Strategy is aligned with the DLP Reg18, which is subject to this Strategic Transport Assessment. Relevant objectives of the Strategy directly relevant to the Strategic Transport Assessment are summarised in Table 2-3 below.

Key Principles and Objectives of the Growth Strategy	
Support local places -especially those in greater need of investment.	
Increasing supply of housing that people can afford and develop associated infrastructure	
Make Barnet a great place to live in	
Diversification and intensification of town centres	
Increase the supply of housing	with the delivery of most new homes to be in areas with better transport connections such as our town centres.
Enable new and enhanced public transport connections	improving orbital connectivity and interchange between rail lines, reducing congestion and improving transport accessibility.
Deliver healthier street design to support all forms of travel	responding to demographic and cultural changes to enhance travel choices, promote active travel and improve safety.
Deliver a cleaner, greener and more pleasant borough	reduce congestion and improve air quality, by encouraging the use of more sustainable forms of transport and supporting the transition to electric vehicles and other technologies as they emerge.
Support the strengthened identity and diversification of town centres	deliver an improved mix of town centre uses, including homes, workspace, leisure and community facilities.

Support joined-up service delivery across the council for healthier high streets	Ensuring LBB provide more coordinated services including street cleansing, waste collection and parking; ensuring that the high streets are designed to improve health and wellbeing of the residents and visitors.
Build on existing strengths to create a thriving evening economy	Maximise the creative potential from the growing leisure offer and evening economy to enhance the range and quality of local food and drink, heritage, culture and arts on offer
Deliver social infrastructure to support growth	Ensuring that schools and leisure, health and community facilities are delivered to support areas of growth and regeneration
Get the best out of the borough's green assets	Improving the quality of parks and open spaces and addressing deficiencies to support new homes and ways of living; to maximise the opportunity for improving health and wellbeing.
Establish Brent Cross as a destination	unlocking the potential of the area as a broader cultural and leisure destination of national significance.

Table 2-3 Barnet Growth Strategy 2019-2030 Key Strategies and Objectives

2.47 Spatially the Strategy clearly distinguishes between three Macro Areas as shown in Figure 2-4 and Table 2-4.

Figure 2-5 Barnet Growth Strategy 2019-2030 Spatial Approach

2.48 According to the strategy the Western area will provide the majority of the growth opportunities with approximately two thirds of the planned housing delivery shared across the growth areas of Edgware, Burnt Oak/Colindale, West Hendon, Brent Cross and Cricklewood. In this area, for example, a new rail station Brent Cross West Thameslink will provide access to the Brent Cross regeneration area. The Western area will require the strengthening of the public transport offer in order to deal not only with an increased resident population, part of which may commute into Central London, but also the envisaged employment/leisure demand that may come from other parts of the Borough and adjacent boroughs (orbital routes).

2.49 As Figure 2-5 above shows, the Strategy envisages improved orbital bus routes along the A406 corridor to the south (connecting the Western and Eastern Areas) and across the Central Area which is home to wellbeing/leisure destinations but with limited transport connectivity.

2.50 Growth indicators for the Borough, as indicated in the plan are summarised in Table 2-4 below.

Growth item	2018	2020	2025	2030	2036
Population	396,600	406,600	429,400	449,000	451,600
Working Population (20-64)	237,300	n/a	n/a	n/a	261,000
Young Population (0-19)	99,000	n/a	n/a	n/a	103,000
Elderly Population (65+)	63,900	n/a	n/a	n/a	87,600
Houses (increase)	-	-	-	-	+45,000
Flats as % of Housing Stock	45%			50%+	

Table 2-4 Barnet Growth Strategy 2019-2030 Population Growth Estimates

2.51 The Strategy estimates an increase of +10% in working population (aged 20 to 64) from approximately 237,300 to 261,000 and +4% of young people (aged 0 to 19). The growth in the older population is likely to directly lead to additional demand on the local bus network.

2.52 In 2013 55% of all journeys in Barnet were made using sustainable modes of travel, LBB's aspiration is to achieve a target of 72%. Currently sustainable modes account for 61% of all trips, this indicates a positive trend in line with the reported Strategy's objective.

3. ASSESSMENT METHODOLOGY

3.1 Assumptions relating to the assessment are discussed in Chapter 7 which have been instrumental in shaping the approach to this Strategic Transport Assessment. In summary the methodology we have used is to:

- Consider the transport issues/opportunities/proposals as currently identified within the Borough (consultation with LBB and other stakeholders such as Highways England, TfL and Network Rail) as well as review of DLP Reg18, Barnet Long Term Transport Strategy and other relevant documents, etc;

- Quantify the level of travel demand by AM/PM peak time period (for a typical weekday) and mode of travel for all DLP Reg18 housing, employment and commercial developments using information from pre-existing Planning Applications' Transport Assessment (TAs) as well as Census 2011 data;

- Assess the robustness of the existing TfL's LoHAM v4.2 SATURN highway assignment model in the Barnet area for the purpose of carrying out capacity assessments for specific forecasting years, namely: 2021, 2026 and 2036 (the end of the DLP Reg18 timeframe). Issues investigated included identification of any missing key highway schemes and confirmation of correct allocation of demand growth across the Borough;

- Assess the impacts from DLP Reg18 developments, through a combination of network modelling (TfL's SATURN LoHAM V4.2 model for highway capacity assessment), analysis of existing data (e.g. TfL's NUMBAT data for rail demand and BODS data for bus demand) and the use of evidence from other studies e.g. application of published demand elasticities to predict changes in bus demand and extraction of evidence, from published literature, of impacts on road based travel of demand/management or soft measures:

- Develop the nature of the measures which would be required to mitigate these impacts and test them using the relevant methodology for each mode of transport.

3.2 TfL's LTS model assumptions in terms of household/population and jobs growth in London drive the demand growth within models such as LoHAM v4.2; to this effect our analysis was based on the models and model data preceding the introduction, in late 2020, of TfL's new model suite referred to as MoTiON. A review of the household and jobs projections contained in LTS against those from DLP reg18 highlighted the need to revise the geographical distribution of the LTS assumed growth as discussed in depth in Chapter 7.

3.3 In assessing impacts:

- On the highway network we have used the TfL Highway Assignment Model LoHAM v4.2 (LTS based).

- On the rail network we have identified the stations within the Borough and stations near to the borough boundary. At LUL stations we have used NUMBAT data to identify passenger movements at stations and line loads. Applying appropriate growth factors and identifying increases in passengers due to Local Plan developments, we have undertaken an initial static (excel-based) analysis of station and line capacities. We have undertaken a similar analysis on the Network Rail network. This approach follows methodologies and standards developed by Network Rail and TfL for Stations' capacity assessment purposes.

- On the bus network we have used as baseline the 2018 Bus Origin Destination Surveys (BODS) demand data from TfL. Forecasts have been developed by applying demand growth at LTS zone level, taking into account DLP Reg18 growth projections and effects associated with potential service improvements such as: addition of express-type services (complementing the existing ones) and generic travel time improvements (representing measures such as new bus priority schemes on road links and/or junctions)

- A number of measures in Barnet's LTTS consider the promotion of active measures including healthy routes to school's initiatives, improvements to cycle routes and cycle parking etc. Also, there are considerations of parking controls, workplace parking levy and the potential to expand the use of car clubs to reduce traffic levels. To determine the effects of such measures we have reviewed the available research.

- On the freight side, we have considered the potential impact of Local Town Centre type consolidation centres, based on TfL's research. These have the potential to reduce Light Goods Vehicle (LGV) traffic as part of the re-organisation of the 'last-mile' distribution strategy.

3.4 Further details are provided in Chapters 4 to 7.

4. ACTIVE TRAVEL AND TRAVEL DEMAND MANAGEMENT

Context

4.1 The Mayor's Transport Strategy (MTS) seeks to reduce car dependency and increase active travel through walking and cycling. This has health benefits by both reducing noise and air pollution and by increasing levels of exercise. The draft LTTS adopts the Healthy Streets Approach which provides the framework for the MTS to reduce reliance on the car and increase the share of sustainable modes.

4.2 The success of such policies needs to be addressed both with the provision of improved active travel infrastructure and encouragement of its use and with the management of travel and the use of cars. Hence, on the one hand improvements need to be made to the cycle network, cycle parking, walking routes, improvements at Gateways such as town centres and stations for active modes. On the other hand, there needs to be complementary measures managing the road network, car parking, the ownership of cars and their use.

4.3 Many of these proposals, as shown on Figure 2-4, would work together to achieve an effective reduction in car use and increase in active travel. In particular, the development of Gateways at major hubs would work with cycle and walking routes, cycle parking facilities, integration with public transport and traffic control measures including parking.

4.4 This section considers proposals and initiatives to achieve such policies including:

- Travel Planning
- Gateways
- Cycling and cycle parking
- Walking and Healthier Routes to School
- Low Traffic Neighbourhoods
- Demand Responsive buses
- Managing car demand through parking, workplace parking levy and car clubs

4.5 The initiatives work together to provide the necessary infrastructure and controls to encourage more active travel and to control the use of travel by car. The estimates that we have made in terms of usage of active modes and transfer from car are for the end of the plan period, 2036, as many of these proposals will take many years before coming to full fruition.

Travel Planning

4.6 Travel Planning is seeking to change travel habits away from the car mode to more active travel modes or public transport. It is in part addressed through changes in behaviour by education / learning and by the provision of infrastructure e.g. cycle routes etc. Travel Planning works in combination with other initiatives including healthier routes to school, low traffic neighbourhoods, cycle and walk routes etc. The impact of these are discussed below.

4.7 A Travel Plan is required to be produced by all significant developments and are therefore achieved through the planning process. Significant residential developments, according to planning guidance[2], are those greater than 80 units which typically require a Transport Assessment (TA) and a Travel Plan (TP). These are integral to the process of achieving active travel from developments and would normally include proposals such as improvements to the cycle and walk network, improvements to public transport and constraints on the provision of parking. The effects of such proposals are discussed below.

Gateways

4.8 The proposals include the establishments of Gateways at tube and rail stations. This could include measures both within and outside of the station. Step free access would be an issue to address within stations. Already eight of the 13 tube stations have step free access and two stations on Network Rail at Mill Hill and Cricklewood have step free access in the development phase. Priorities in the future could include Burnt Oak which is close to Edgware hospital and Brent Cross in association with the Brent Cross Development. The overall public realm would need to be addressed outside each station and how this integrates with the cycle and walking networks, cycle parking and the bus network. Development opportunities may enable delivery of improvements to this infrastructure and also provide integration with land uses. Parking control through CPZ's and off-road parking would also require consideration.

4.9 The impact of Gateways would come through the sum of its parts and with the successful development and integration of cycling, walking, public transport and parking control.

4.10 There are already controls on parking either through waiting restrictions or CPZ's, in the vicinity of tube and network rail stations. Hence some shift to other modes is likely to already have

[2] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/263054/guidance-transport-assessment.pdf

occurred. However, there is parking at several tube stations principally East Finchley (273 spaces), Finchley Central (269), High Barnet (159) and Totteridge and Whetstone (91). Barnet's Reg 18 policy (GSS09) is that these locations offer opportunities for redevelopment through utilising the high PTALs and other potential site characteristics such as town centre locations. There is also parking at Network Rail stations including New Barnet, Mill Hill Broadway and Hendon.

4.11 Analysis by TfL of the potential for cycling, see under cycling below, shows significant potential demand for cycling in Barnet and this could particularly arise in relation to interchanging at stations. This would require secure and accessible cycle parking which could reduce car trips to stations in the Borough by up to 5000 per day, as detailed below under cycle parking. In addition, the improvement in cycle provision to transport hubs could reduce car modes to these station zones by some 5%, as discussed below under cycling. These improvements would be complemented by parking control measures.

Cycling and Cycle Parking

4.12 Cycle use in London increased from 27,000 people cycling across the Central London cordon in 1977, to 162,000 in 2017. https://www.cyclinguk.org/statistics. Where there has been investment in cycling infrastructure growth has been particularly high. This is particularly where there has been development of the cycle network with segregation and reference is made to the good performance of the Green Lanes project in the London Borough of Enfield with the high growth in cycling and which has high levels of segregation and complementary measures in place to promote cycling, TFl Cycling Trends Update July 2019.

4.13 According to the 2011 census and using the mapping tool https://www.pct.bike/m/?r=london, the majority of Barnet has very low numbers of people who use bicycles to commute to work. Most areas are between 0 to 1% with some slightly higher at 2 to 3%. The trend throughout London shows that the closer to the centre the more likely people are to use bicycles to commute to work. The trends are the same with cycling to school and there are very low percentage of school children which cycle to school in Barnet.

4.14 Nevertheless, there is a large potential that many car trips could divert to other sustainable modes including cycling. There is significant potential for cycling among London residents and TfL have estimated that more than half of all trips made by residents using motorised modes could be cycled. From TfL's Analysis in the Mayor's Transport Strategy, page 47, it is estimated that three quarters of car journeys could be made by cycle. These estimates reflect the fact that the majority of journeys made by motorised vehicles are relatively local and of a short distance.

From TfL's analysis of cycling potential 2016, using LTDS (2012/13 – 2014/15) data, it is estimated that there was 8700 daily cycle trips within the borough but a total of 390,400 potentially cyclable trips.

4.15 Although there is clear quantification of the increase in cycling use and that some of this may have transferred from other modes (see TfL Cycling trends) there is less reliable data to be definitive of such a mode shift resulting from the provision of new cycle infrastructure. The elements of new, diverted and mode shift within the growth of cycling trips in London is not readily quantifiable. However, it seems reasonable to assume that investment in cycling infrastructure through segregation from traffic, cycle parking etc and priority to cyclists in the allocation of road space and junction control in favour of cycling at the expense of car traffic would lead to a modal shift from car to other modes including cycling.

4.16 The Sustrans Bike Life 2019 Report reported on the results of surveys of some 17,000 residents across 12 UK Cities (not London) and considered that "cycling takes 270,000 cars off the roads every day" – seemingly this applies to people who chose to cycle but could have used a car. The behavioural surveys also revealed that people perceived the benefits of cycling including health and the support for the green agenda, reducing emissions, CO2 etc.

4.17 One issue raised with regard to the use of cycles is the problem of secure parking. The Mayor's Transport Strategy Proposal 1 includes for more secure and accessible cycle parking particularly in residential areas, town centres, public transport interchanges and at key destinations. The lack of safe cycle parking stops people cycling: a third of victims of bike theft have stopped cycling and more than 50% of Londoners regard lack of cycle parking provision as a main obstacle to cycling. (Source: Transport for London 2019 Cycle Parking Implementation Plan)

4.18 TfL's Cycle Parking Implementation Plan, page 22, reported that whilst "Over 80,000 cycle trips are made to and from public transport stations in London each day, there is huge potential for more and it is estimated that an additional 1.5 million cycling trips could take place by improving integration with public transport. This reflects the fact that the majority of people live relatively close to a station and that potentially this could be easy to make by cycle. The report considers that "one in five passengers using Underground services in outer London accesses the station by car or taxi and our analysis revealed that up to 50,000 of these daily journeys could be cycled instead".

4.19 The current provision for cycle parking at stations varies significantly and is generally very low.

Those with the highest provision includes East Finchley and Finchley Central with 38 and 20 cycle parking spaces respectively. At most locations e.g. at East Finchley there are bike stands in the street and they would not be particularly secure. But where there is parking provision occupancy seems to be high at 80 to 100% (see Appendix Six - Dockless Bike Cycle Parking Location.

4.20 There is clearly a requirement for cycle parking and significant latent demand.

4.21 The latent demand is shown in Table 4.1 of TfL's Analysis of Cycling Potential 2016 and shows a potential for additional cycle trips for outer London at over five millions per day with some 390,000 in Barnet which represents 10% of the potentially cyclable trips in outer London. From the TfL analysis documented above 50,000 car trips could transfer to cycling to stations with proper integration including parking. Taking the 50,000 car trips as a long term and achievable estimate for outer London of transfer from car to cycle then 10% of these i.e. 5000 per day would arise within Barnet equating to 500 cycle trips to and from the 19 stations (LU and Network Rail) in Barnet during the peak hour.

4.22 The trends in travel by modes is evolving over time. Traffic has gradually decreased into Central London by some 20% over the last 15 years; in inner London it is roughly constant whilst in outer London it has slowly grown. This is shown below in Figure 4-1 taken from Travel in London Report No 13 which also shows the effect of the pandemic

Figure 2 All motor vehicle traffic flows by area, 13-period rolling average, 2008/09-2020/21.

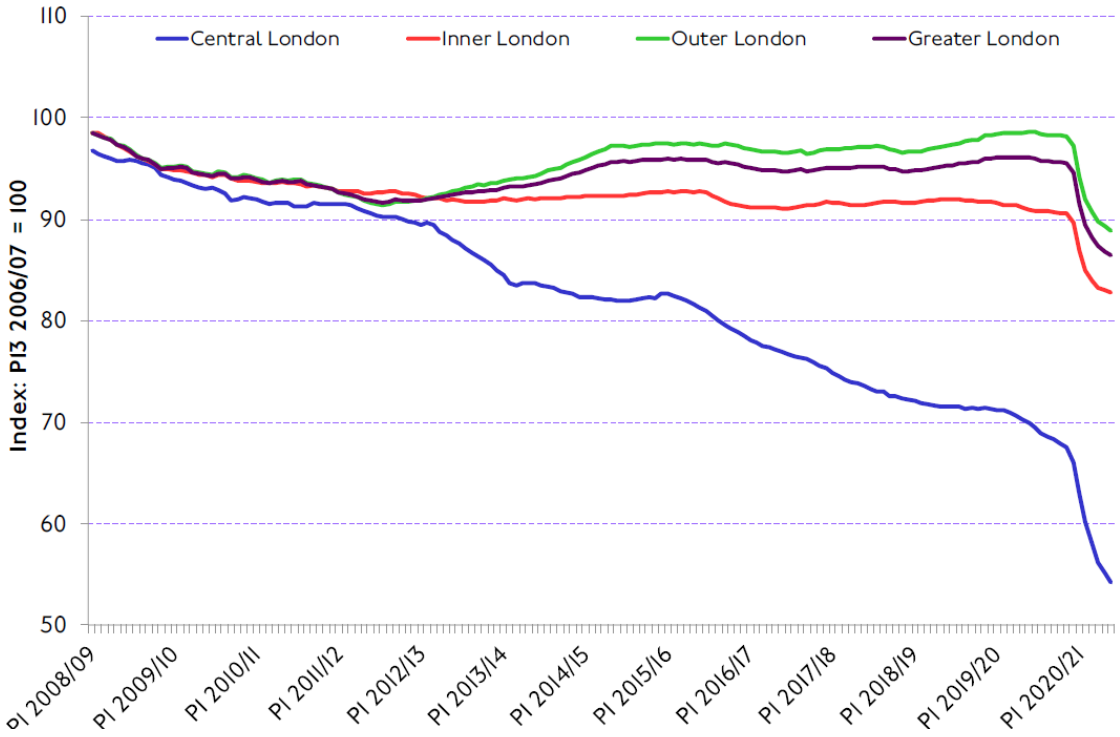


Figure 4-1 Trends in motor vehicle travel mode in London 2000-2019

4.23 There has been rapid growth in cycling albeit from a small base as shown in Figure 4-2, for London as a whole, taken from Travel in London Report No 13. It also shows the reduction in the number of car journeys.

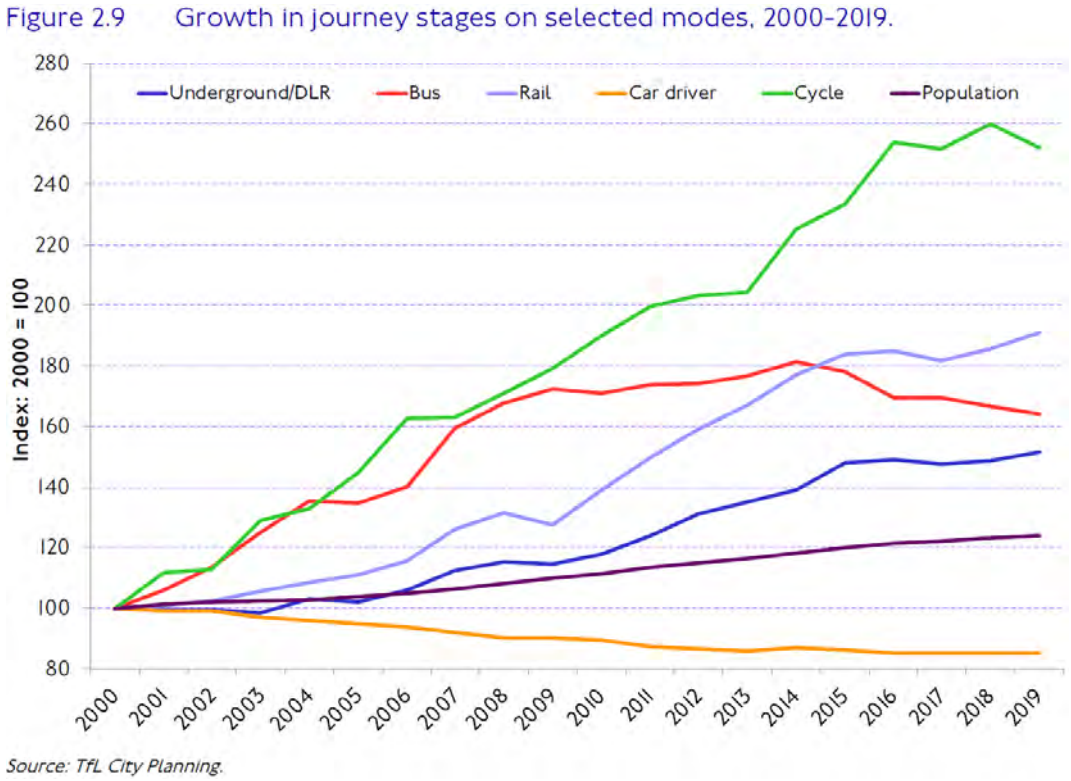


Figure 4-2 Trends in travel modes in London 2000-2019

4.24 There are high usages recorded on specific cycle routes e.g. 35,000kms on the East-West route from Parliament Square to Tower Hill and 17,000 kms on North-South route from Elephant & Castle to Stonecutter St. This represents a 54% increase in cycle flows since 2014 on the East to West route and 32% on this North to South route, (Source: TfL's Segregated Cycling Infrastructure Evidence Pack). From the same source it was noted that during the construction of the cycle superhighways travel times were increased for general traffic but this has now returned to normal. The restoration of journey times on the cycle superhighways for cars presumably reflects the fact that there is less traffic using the remaining available road space. These trends in modal use will be due to a number of reasons including congestion charging, parking restrictions, public transport improvements, improvements to active routes and socio economic and behavioural changes within London.

4.25 The cycle network within Barnet consists of a number of signed routes using a combination of on road and off route sections passing through parks and other open spaces. The on-road sections tend to use quiet roads or on busier roads they share with buses or pedestrians without significant priority or segregation. The main road network including A1, A41 and A406 which are part of the strategic road network and the A5 and A1000 have limited provision for cyclists

beyond sharing bus lanes and occasional cycle gates. We note though the recent introduction of the experimental cycle lanes on A1000 with increased levels of segregation from general traffic. There are significant gaps in the cycle network and these gaps require to be linked to provide a comprehensive network.

4.26 The network as proposed within the LTTS is compatible with the Recommended London Wide Strategic Cycle Network for 2041 as proposed in the Mayor's Transport Strategy, page 55, and as shown in Chapter 2, Figure 2-4. This consists of a network of cycle routes including along the A5 and A1000 radial corridors connecting the main transport and town centres with connections between the two corridors broadly linking the Brent Cross / Cricklewood area through Hendon and Golders Green to the Finchley area. In addition, the LTTS is looking to improve cycle routes and parking to serve the major hubs including the rail and tube stations and town centres and to connect routes across parks and along quiet streets

4.27 To estimate the effect of investment in cycle infrastructure we know from the above that significant growth can arise in cycling and this would follow investment in cycling infrastructure to provide segregation and priority over other road transport and a safer environment. This would inevitably lead to the reallocation of road space and capacity being given to cycling, walking but not at the compromise of bus transport. In this situation and in the context of what has been achieved in Central London then a mode shift away from car could result. If Central London has achieved a reduction of 20% in car journey since 2000 then schemes to rebalance the road space in a similar fashion could result in reduced use of cars.

4.28 Clearly reducing capacity for cars along the A5 for instance would not necessarily be in line with the development proposals along the corridor. However, there is variable capacities along the A5 from dual-two free flow to single lane through town centres There is also on-street parking in some areas and wider footpaths in others. An appropriate scheme which maintained capacities for cars but enhanced provision with significant segregation for cyclists would seem possible. There is no strong evidence to say that cycle lanes per se would reduce car use. But with a combination of other measures e.g. parking control, reallocation of road space then what has been achieved in Central London, i.e. a 20% reduction, could to an extent occur in outer London. To achieve such a high reduction would be optimistic for an outer London borough but where we have high levels of parking restrictions such as at gateways / stations and can provide good levels of segregation and priority to cyclists then a 5% reduction in car use would seem achievable and this has been assumed at station locations. However, across the borough as a whole to reflect the cycle infrastructure improvements along the key corridors, the provision of improved routes to and from employment centres and local improvements such as

connecting routes across parks and quiet streets we consider that it would be reasonable to assume a 2.5% reduction in car use on average by the end of the plan period 2036. In addition, the mode shift would reflect the sort of behavioural responses (e.g. reflecting people's attitudes to the green agenda, health initiatives etc) reported in the Sustrans report referred to above.

Walking Initiatives

4.29 In general initiatives to encourage walking also tend to provide better provision for cycling. This includes healthier routes to school and low traffic neighbourhoods; the impacts of these measures are discussed below.

Low Traffic Neighbourhoods

4.30 In 2014 TfL announced a £100 million investment in the provision of mini – Hollands or Low Traffic Neighbourhoods (LTNs). These can take a number of forms including restricting traffic by time of day or placement of physical barriers to prevent through traffic. In the last year and particularly with the advent of Covid19-19 and with the healthier routes to school initiative then there are many schools which now operate temporary road closures in the vicinity of schools.

4.31 From research undertaken by TfL in "Low Traffic Neighbourhoods, Car use and Active travel", 2020, it was shown that LTN's both increased the amount of walking and also decreased both the use of and ownership of cars. The findings from the research said that "There is a consistent trend towards people in the LTN area becoming less likely to own a car, with the point estimate growing larger and more statistically significant in each follow-up wave. By Wave 3, the rate ratio of 0.80 corresponds to a 20% decrease in the adjusted probability of car ownership". There was also evidence which showed that there was less time driven per week of between ten and 43 minutes but the results were not particularly significant.

4.32 The LTTS reported on the results of research into the Waltham Forest mini Holland schemes which showed that there had been a 19% and 28% increase in walking and cycling respectively and a corresponding decrease in traffic of 44% on affected roads[3,4]. The decrease is not surprising given that schemes typically include modal filters and through traffic is prevented.

[3] https://www.enjoywalthamforest.co.uk/wp-content/uploads/2019/01/Final-Walking-Cycling-Account-201718.pdf

[4] https://www.livingstreets.org.uk/media/3844/lcc021-low-traffic-neighbourhoods-detail-v9.pdf

There was no particular evidence to show that traffic levels increased on the surrounding major roads although being busier they may more easily be able to absorb some of the displaced traffic.

4.33 It is reasonable to assume from the above that a low traffic neighbourhood would result in lower traffic on the affected streets and not lead to displacement of all the affected traffic. This would imply less car trips being made and more cycling and walking. The research from TfL shows that car ownership could have reduced by 20% within an LTN. Such a level would seem appropriate in a relatively high-density neighbourhood with local shopping and other facilities. In other areas with lower densities it would seem more realistic to assume a lower impact than observed in the TfL research above and we have assumed that an LTN would result in 10% less car journeys (i.e. a mode shift to walk, cycle and other modes) to and from the affected areas. We would propose to apply such reductions on trip levels generated at a zonal level where LTN's are proposed; please refer to Figure 2-4.

Healthier Routes to School

4.34 The healthy streets approach proposed in the Mayor's Transport Strategy includes proposals to create walking routes and promote walking and cycling to schools. The healthier routes to school initiative have a number of aspects which can result in the reduction in car use. Firstly, the encouragement and facilitation of walking and cycling can result in increases in the share of these modes. Secondly, restrictions or encouragement not to drop off children by car and access restrictions outside of school could reduce levels of through traffic, with attendant improvement in air pollution. The knock-on effect of closing roads to through traffic outside of schools would be either to supress travel at that time or divert traffic to other roads.

4.35 Government data for England shows modal use to school for primary and secondary children across England, see Table 4-1 for 2014 and 2019. As shown walking is the predominant mode with nearly half of primary school children and a third of those at secondary school. Bus is also a predominant mode for secondary school children reflecting the greater distance they are likely to travel. Car is also used extensively particularly for primary school. Cycling has a low share at 3%.

School Type	Mode	2014	2019
Primary School	Walk	46%	47%
	Car	46%	45%
	Bus	5%	
	Cycle		3%
Secondary	Walk	38%	34%
	Car	23%	
	Bus	29%	31%
	Cycle		3%

Table 4-1 Typical mode share for primary schools in England (source: UK Gov)[5]

4.36 Using the Government data which provides annual data for trip purpose we have estimated that some 32% and 10% of car trips in the AM and PM peak respectively are education trips. (https://www.gov.uk/government/statistical-data-sets/tsgb01-modal-comparisons)

4.37 It can be shown that at locations where healthier routes to schools have been implemented there has been a reduction of car use and an increase in active trips. Some examples include:

i. In London Borough of Camden, report on Healthy School Streets, driven trips to school have fallen by 43%;
ii. In London Borough of Hackney cycling doubled and traffic reduced by 70% outside of schools;
iii. In London Borough of Barnet, Sustainable Modes of Travel strategy 2007, resulted in the use of more sustainable forms of transport with an average 12% increase in walking initiatives and an average 11% decrease in the use of cars; and
iv. The STARS initiative, https://www.modeshiftstars.org/education/ ', across 14000 schools in England, showed a decrease in the use of cars of 9% (all schools) and 22% for those with silver and gold standards.

4.38 Napier University, School Street Closure and Traffic Displacement Project, 2020, has undertaken a review of school street closures at 16 locations across the UK. It reviewed the impact of the schemes on active travel and vehicles levels and concluded that there is:

i. Medium strength evidence that in almost all cases the total number of motor vehicles across school closures and neighbouring streets reduce.

ii. Medium strength evidence that active travel levels increased at the schools with street closures.

5 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/906698/walking-and-cycling-statistics-england-2019.pdf

iii. Medium strength evidence that closures are supported by the majority of parents and residents living on the closed and neighbouring streets and that their support increases after any trial period.

4.39 The evidence shows that the healthier routes to school initiative even without road closures can have a significant impact. Road closures would add additionally to encouraging the use of active modes, assist in controlling parking and other positive effects including increased safety outside schools and reduced air pollution.

4.40 There is a range of results but it seems reasonable to assume that the initiative alone could result in a reduction in car trips to schools of between ten and 20% and, when supported by road closure schemes, this could result in a reduction of 50% in car trips. Overall we consider that with a mix of schemes and initiatives and that road closures may not be achievable in all cases then a 30% reduction (average of 10% and 50%) in car trips would be reasonable The most recent UK Government data, see Table 4-1, shows 45% primary school children use cars and secondary schools 23% (an average of 36%) and on the basis of the evidence it would seem reasonable to assume that a comprehensive plan for healthier routes to schools could reduce these mode shares for cars to 32% for primary ages and 16% for secondary ages (an average of 25%).

4.41 There were 62,000 pupils in Barnet (2015), excluding those at colleges and further education establishments of which 58% were at primary school up to year 6, attending 161 schools. As schools and pupils are distributed across the whole Borough then we would propose to reduce school trips to reflect the reduction in car use weighted in accordance with current trip making levels.

Active route – the Barnet loop

4.42 The Barnet Loop would provide a continuous loop of some 17 miles through connecting a number of existing routes (e.g. greenways) with some extensions and the use of the existing road network. It would be particularly attractive for recreational use and exercise. It would also be convenient to provide improved connections between residential areas and local schools and town centres. Whilst it would encourage walking and cycling as opposed to car use it is unlikely in itself to provide significant switch from cars. However, as part of a package of measures including gateways at major hubs, low traffic neighbourhoods and healthier routes to schools it would have a positive and complementary effect.

Demand Management

4.43 Demand management can take a number of forms including parking control, managing the supply of parking, providing information on parking availability and car clubs.

Car Parking

4.44 In Barnet in the vicinity of tube and network rail stations there are already controls on parking either through waiting restrictions or CPZ's. The LTTS recognises the fact the existing CPZ's have been introduced on a piecemeal basis and could be more effective if a more strategic borough wide approach was taken. This would seem to be a sensible and effective measure to take.

4.45 There is in also parking at a number of tube stations principally East Finchley (273 spaces), Finchley Central (269), High Barnet (159) and Totteridge and Whetstone (91). Reg 18 Barnet's policy is that these locations offer opportunities for redevelopment through utilising the high PTALs and other potential site characteristics such as town centre locations. In addition, there are some 21 car parks operated by Barnet throughout the borough and privately operated car parks related to workplaces, retail stores etc.

4.46 POLICY GSS08 Barnet's District Town Centres supports sustainable travel and seeks parking provision to be at the minimum required standard, including at zero provision where appropriate. In addition Barnet's town centres will pursue an approach that aligns with the Mayor's Healthy Streets initiative, promoting active modes of travel and good public transport provision. This approach, combined with the immediate accessibility of the town centre functions, should allow residential development with car free or low parking provision. Space previously intended for car parking can be used more efficiently to contribute to the overall quality of the development.

4.47 In order for other measures to be effective such as the improvement to public transport, the impact of cycling and walking measures, of gateways, healthy routes to schools etc then there needs to be complementary measures to control or reduce the parking opportunities at key destinations. The mode share away from cars by taking such complementary measures is subsumed within the other initiatives.

Car Clubs

4.48 It is recognised in the Mayor's Transport Strategy that car clubs could play a role in reducing car use and proposal 19 of the Mayor's Transport Strategy says "The Mayor will support the provision of car clubs for residents when paired with a reduction in the available of private parking". In May 2015 the Car Club Coalition of industry operators (endorsed by TfL) published

a “Car Club Strategy for London”, and aims to increase members from 165,000 to one million by 2025.

4.49 Analysis undertaken by WestTrans “Car Club Strategy”, December 2016, shows that car clubs work best where population density is high, where access to public transport is good, parking is controlled e.g. by a CPZ and where commuting by car to work is low. In addition, where there are large or strategic developments, there is greater potential for car clubs.

4.50 In 2015 there were 136,000 members of car clubs in London, from information provided by Carplus, with the majority at 63% living within Inner London Boroughs and 14% in the Outer London Boroughs. The average number of car club members in the Outer London Boroughs (those with an external GLA boundary) was 1500 with 2100 members in Barnet.

4.51 In the England & Wales Car Club Survey 2017-2018 by Steer analysis showed that car ownership reduced on membership of a club and remains lower than average with reduction in the purchase of new cars. In addition there was an estimated reduction in car mileage of 793 miles per year – approximately 10% of the 7800 estimated annual mileage (National Travel Survey 2017). The evidence shows that car club owners will use cars less by some 10% compared with other car owners.

4.52 A Waltham Forest Case Study shows the effect of promoting and developing a car club in a neighbouring borough, see Re Report in Barnet Car Parking Study 2019. Figure 4-3 from that report is reproduced below and shows that cycling and walking trips increased, and car driver trips decreased by 5%.

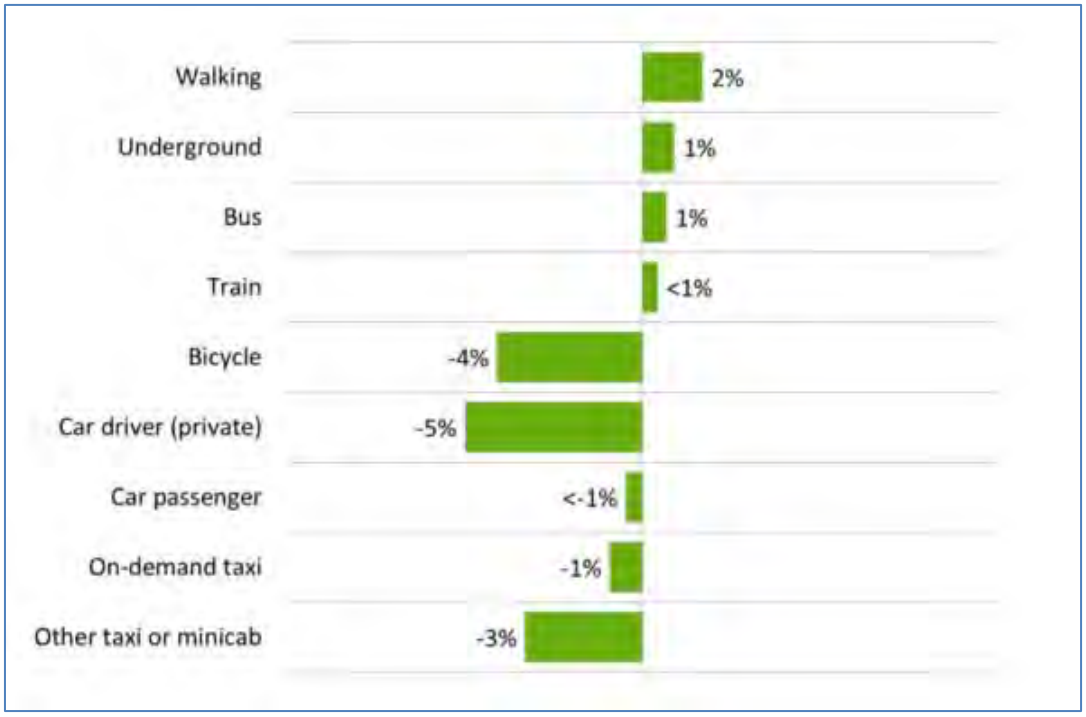


Figure 4-3 Waltham Forest Case Study - effects of promoting and developing a car club

4.53 We have identified wards within Barnet which have the highest population densities and would have the highest potential for successful implementation of car clubs. These wards tend to be on the west and south side of the borough including Burnt Oak, Colindale, Childs Hill, Cricklewood, West Hendon, Hendon, East and West Finchley, Woodhouse and Coppetts. We would estimate that if Barnet achieves their share of the one million car club member target for London, as defined within the car club strategy above, then this would reduce car traffic in these wards by some 3.5%. The wards account for 42% of travel within Barnet and the reduction in car use would be 1.5% across the Borough. We note that the estimate in West London from the WestTrans report, page 3, was for a reduction of 2.1%, presumably across the West London area as a whole.

4.54 To test the effect of Car Clubs we have reduced trips in zones in the above wards by 3.5%. Some of these trips will transfer to cycle, walk and public transport.

Workplace Parking Levy

4.55 Local authorities can apply a Workplace Parking Levy (WPL) on business car parking spaces and this was considered in the LTTS. To date this has only been applied in the UK in Nottingham where the scheme has been in place since 2012. The LTTS records that the effect of this

scheme has been to increase public transport use and decrease emissions. Although this would in part be due to the WPL the expansion of the tram system in Nottingham in 2015 would have been a major contributory factor. The Mayor's Transport Strategy at Proposal 21 considers that a WPL could be used to contribute to policies including mode share.

4.56 The impact of the Nottingham WPL was evaluated for its impact on congestion in research in Transport Policy " Evaluating the impact of a workplace parking levy on local traffic congestion: The case of Nottingham UK", 2017. This research studied a number of examples including in Perth, Sydney and Melbourne. In Perth in particular the introduction of a workspace parking levy reduced the number of parking spaces. In the same time period mode share to car decreased. But it was not possible to directly link the two effects due to other factors including strong growth within the city. Similarly in Melbourne the impact of the parking levy "appears to be positive in respect of mode share and decline in the supply of parking spaces".

4.57 The research in Nottingham did demonstrate the link between the WPL and congestion using Delay per Vehicle Mile (DVM) as the measure and which was estimated to be 1.22 (73 seconds) minutes on average prior to the introduction of the WPL. The introduction of the WPL reduced the number of available car parking spaces and for every 332 spaces reduced (about 1% of the total available spaces) the DVM reduced by 0.4 seconds (a reduction of the average delay by 0.54%). In Nottingham the number of parking spaces reduced by 5% from 44333 to 42235 and the DVM reduced by 3.5%.

4.58 Applying these results to Barnet from data within the LTTS page 36 the table below shows the employment levels, employment trips made within five km, as it is more likely to impact shorter rather than longer journeys, and those made by car. Assuming that the WPL is as successful as that in Nottingham i.e. it reduces parking levels by 5% and by implication traffic then we can estimate the number of work trips which transfer from car to other modes as shown in the final row of Table 4-2.

Year	2021	2026	2031	2036	2041
Employment in Barnet (from LTS)	146581	152072	158583	164994	170485
Employment trips up to 5 kms (30%)	43974	45622	47575	49498	51146
Trips by car (40%)	17590	18249	19030	19799	20458
Total Trips by Car 2 way	35179	36497	38060	39599	40916
Assume 5% car to work trips use other modes	1759	1825	1903	1980	2046

Table 4-2 Estimation of the effect of a workplace parking levy

4.59 The percentage reduction in trips is applied to the LoHAM matrix on a pro rata basis in

accordance with the size of the zone and applying to trips both within and to / from Barnet. These though would only apply to work commuter trips which are not defined with the LoHAM matrices. Using the Government data which provides annual data for trip purpose we have estimated that some 35% and 38% of car trips in the AM and PM peak respectively are work commuter trips. (https://www.gov.uk/government/statistical-data-sets/tsgb01-modal-comparisons)

Electric vehicle charging points

4.60 The Mayor's Transport Strategy at page 105 refers to the action required as part of its "Liveable Neighbourhood" programme which includes the implementation of vehicle charging infrastructure. To implement this would require the role out of such points by the Borough and ensure that such is achieved with developments through the planning process. The purpose of supporting vehicle charging infrastructure is to reduce vehicle emissions. There is no evidence to date that changing to electric vehicles would reduce car use and assist a mode share increase to sustainable modes. Whilst electric vehicle prices are high, charging points insufficient and vehicle range more limited than for petrol driven engines these are likely to change over time and electric vehicles become more competitive.

4.61 It is not clear that in the future that changing to electric driven cars that car ownership and use would reduce.

Road Safety

4.62 The Mayor's Transport Strategy at Policy 3 relates to "Vision Zero" which aims to eliminate deaths and injuries from road accidents by 2041. To achieve this a number of actions could be taken including lower speed limits and changes to the road network such as implementing low traffic neighbourhoods, reallocation of road space to other users e.g. cyclists. In itself the improvements in road safety and reduction in casualties is unlikely to decrease the use of cars.

Alternative fuels for freight

4.63 The Mayor's Transport Strategy proposal 81 supports electric vehicle use for deliveries and the LTTS principally relates this change to the use of vans for deliveries. The LTTS considers that charging points would be needed close to the strategic road network. There is no evidence to suggest that changing delivery vehicles from petrol / diesel to electric would reduce their use.

Demand Responsive Bus (DRB) Services

4.64 There are no demand responsive bus services in the London Borough of Barnet. It is identified as a proposal within the LTTS at locations in the north of the Borough which are not served by rail or high frequency bus routes and are of lower housing densities and across more scattered locations. The Mayor's Transport Strategy at proposals 92 and 104 considers that demand responsive services could have a role to play in providing connectivity and reducing car use (coupled with reduced parking provision) and proposed that these services should be trialled. Trials are currently underway in Sutton and Ealing but the results of these trails have yet to be reported upon.

4.65 In February 2019, Transport for London selected ViaVan to pilot a dynamically routed, on-demand shared ride service in Sutton, which was launched in May 2019 as GoSutton. ViaVan's website refers to a number of services, by ArrivaClick, in Liverpool, Leicester and Sittingbourne.

4.66 In Sittingbourne, 50 percent of ArrivaClick passengers have shifted from private modes of transport, and significant numbers use the service to connect to commuter train lines. In partnership with Go Ahead, ViaVan provides nearly 4,000 shared journeys a week in Oxford. ViaVan also launched a second UK consumer service in Milton Keynes in October 2018 that has provided more than 55,000 rides.

4.67 In the absence of statistically robust survey data it is not possible to determine the impact of such services on a mode shift away from car. However, it is likely that improved connectivity would arise from demand responsive services enabling the use of bus rather than car. We have assumed on the basis of the evidence available that demand responsive services could improve the PTAL level by one category. We have assessed the relationship between PTAL and public transport use which shows that moving from a PTAL of zero to one or from one to two results in between a 5% and 10% mode share increase to public transport, see Chapter 7, Figure 7-3, and we have assumed an average of 7.5%.

4.68 The LTTS defines a number of locations across the northern part of the Borough where demand responsive transport services could be provided. It is likely that such services would not only provide transport within these areas but across the northern part of the borough as a whole linking to major land uses such as rail and tube stations, the town centres of New Barnet, Chipping Barnet, Edgware, Mill Hill Broadway, hospitals at Barnet and Edgware and College campuses at High Barnet and Southgate. These DRB services would only serve the remoter areas and which account for about 2% of car trips within Barnet.

Summary of Effects

4.69 This chapter has provided estimates of the impact on the mode share from a number of measures to encourage use of active modes and public transport and the reduction in use of cars. As these initiatives will take many years to roll out the effects referred to would tend to apply towards the end of the plan period in 2036. In summary the findings are as shown in Table 4-3.

Initiative	Effects by 2036	Notes and Application
Travel Planning	The impact of travel planning is though the other initiatives in this table	
Gateways	Could reduce car trips (cars parking, drop off and pick up and taxis) to stations by 5000 per day through improved cycle parking on the basis of TfL research into cycling potential. This would amount to about 500 peak hour trips to and from the 19 stations and assumes the successful role out of cycle parking etc. In addition to parking control & improved cycle routes to stations, car trips would reduce by 5%	Apply the reduction pro rata the number of peak hour arrivals at stations and apply to zones adjacent to stations.
Cycle Network	It has been assumed that to reflect the increase in cycle use and the roll out of improvements for cyclists then car trips would reduce by 2.5%.	Apply to car trips across the borough to reflect the expanding local cycle network, links across parks and quiet streets and those along the strategic corridor of A5 and A1000 corridor and the east west corridor from Brent Cross to Finchley
Cycle Parking	To make gateways and the cycle network effective then comprehensive cycle parking is required. The effect could reduce car trips to stations by 5000 per day (500 per hour) as noted	The impact is assumed to have been taken effect in the cycle network and gateways initiatives.

Initiative	Effects by 2036	Notes and Application
	above under Gateways.	
Low traffic neighbourhoods	Reduce car trips by 10% within the neighbourhood	Apply to all zones adjacent to a LTN (see Figure 2-4) and to trips to and from that LTN zone
Healthier routes to school	Reduces the mode share for schools from 36% to 25%.	As pupils and schools are distributed across the borough then this reduction can be applied proportionate to existing car movements at a zonal level
Active Route – Barnet Loop	This will provide enhanced recreation and connections locally to schools and hubs	Effectively its impact is included within the Gateways and routes to school assessment
Demand Management and car parking	In order to be complementary to the other initiatives there will need to be a strategic review of the CPZ's and to seek to reduce parking supply by both on and off street.	The reduction and control of car parking will reduce car use but can be seen to be complementary to the other measures taken.
Car Clubs	Reduces car trips in affected wards by 3.5% covering about 42% of the Borough	Reduce trip ends in zones affected
Workplace Parking Levy	Reduces work trips by 5%	Distribute pro rata zone size
Electric vehicle charging points	In itself not expected to affect modal use	
Alternative fuels for freight	In itself not expected to affect modal use	
Road Safety	The impact of improvement of road safety on mode share is through the other initiatives in this table e.g. LTN's, road share to cyclists	
Demand Responsive bus services)	The effect is to reduce car use within the areas where services are provided by 7.5%. The areas affected only account for about 2% of car trips in the	The 7.5% reduction applies to affected zones (with typically low PTAL levels) and adjacent town centres and other key

Initiative	Effects by 2036	Notes and Application
	Borough	destinations.

Table 4-3 Summary of the impact on road travel from LTTS initiatives

5. PUBLIC TRANSPORT

Introduction

5.1 This Chapter assesses the current situation on the public transport networks including rail, underground and bus. We also address the future potential changes to the network.

Rail provision

5.2 The Borough is served by services out of London St Pancras principally by Thameslink services to St Albans and Luton and out of Moorgate by Great Northern services to Welwyn Garden City. Thameslink serves Mill Hill station with 8 trains an hour (four semi-fast and four slow) during peak hours, and the four slow services also stop at Hendon and Cricklewood. Thameslink services will also serve Brent Cross West station which is currently under construction and due to open in 2022. Great Northern services serve stations at New Barnet and Oakleigh with four trains an hour during peak hours. Table 5-1 below shows existing passenger data. The hourly flows are based on annual counts from the Office of Rail and Road factored by appropriate factors from LUL's Station Capacity Planning guidelines in S1371 A7.

	2019/2020 annual passengers (millions)	Estimated Hourly Flows (AM Peak)		Hourly Service
		Entry	Exit	
Mill Hill Broadway	2.034	691	235	8
Hendon	1.155	392	133	4
Cricklewood	1.025	348	118	4
New Barnet	1.393	473	161	4
Oakleigh Park	0.965	328	111	4

Table 5-1 Passengers demand at Network Rail stations 2019/20

5.3 To the south of the Borough, rail orbital services are provided by the London Underground linking Richmond and Clapham Junction to Stratford. Thameslink services connect to the London Underground at West Hampstead.

LUL provision

5.4 The borough is served by the Northern Line which has two branches north from Camden Town. The Edgware branch serves principally the west side of the borough with stations at Golders Green, Brent Cross, Hendon Central, Colindale, Burnt Oak and Edgware. The High Barnet

branch serves more the central area of the borough with stations at East Finchley and Finchley Central. From Finchley Central there is a branch to serve Mill Hill East with the main services continuing to West Finchley, Woodside Park, Totteridge & Whetstone and High Barnet. The busiest stations are Colindale, Golders Green, Finchley Central and East Finchley with between 7,000 and 8,000 passengers entering and exiting the station during the AM peak period (7AM to 10 AM). Table 5-2 shows passenger numbers at each station and the current service levels.

	2018 Peak Period (3 Hour flows)				Train Frequency per hour
	AM		PM		
	Entry	Exit	Entry	Exit	
Edgware	3,459	973	1,244	3,024	21
Burnt Oak	3,202	795	946	2,941	21
Colindale	5,133	2,232	2,127	3,690	21
Hendon Central	4,110	2,261	3,093	3,605	21
Brent Cross	1,596	515	714	1,490	21
Golders Green	4,916	2,207	2,497	4,204	21
High Barnet	3,359	1,126	1,185	2,217	18
Totteridge & Whetstone	2,245	416	620	1,427	18
Woodside Park	3,005	718	931	2,661	18
West Finchley	1,643	141	295	1,022	18
Finchley Central	6,112	1,953	2,666	4,942	23
East Finchley	5,870	1,356	1,710	4,063	23
Mill Hill East	1,750	937	678	1,205	5

Table 5-2 Passenger numbers at LUL station in Barnet and the current service levels

5.5 As the Northern Line terminates within the borough the level of crowding reduces from that which is experienced in the central London area. This can be expressed in terms of people standing per square metre. This can be seen in in Table 5-3 below and shows that seats exceed passengers except south of Colindale and West Finchley.

From	To	2018 AM Peak Period (3 Hours) Line Flows	People standing / sq metre in AM Peak (1 hour)
Edgware	Burnt Oak	3470	0
Burnt Oak	Colindale	6647	0
Colindale	Hendon Central	11487	0.1
Hendon Central	Brent Cross	14811	0.8
Brent Cross	Golders Green	16023	1.1
Golders Green	Hampstead	19834	1.9
High Barnet	Totteridge & Whetsto	3379	0
Totteridge & Whetstone	Woodside Park	5589	0
Woodside Park	West Finchley	8447	0
West Finchley	Finchley Central	10052	0.2
Mill Hill East	Finchley Central	1762	0
Finchley Central	East Finchley	17072	1.0

Table 5-3 Level of crowding at LUL station within Barnet

5.6 This crowding effect is also shown on Figure 5-1(source: The Mayor's Transport Strategy Figure 32). This is a forecast for 2041 and includes committed investments (excludes CrossRail 2). This shows that in Barnet there is limited crowding i.e. less than one person standing per square metre at the northern end of the lines. The levels of crowding do however increase south of Hendon Central and Finchley Central.

KEY	People Standing per square metre				
Grey	Green	Light Blue	Dark Blue	Red	Dark Red
<1	1-2	2-3	3-4	4-5	>5

Figure 5-1 People standing per square metre

5.7 We have developed an "initial" static analysis of the LUL network in Barnet at stations and lines using LUL's standards in Station Capacity Planning S1371 A7. The analysis can be considered to be an initial assessment as the distribution of passengers through stations, some of which have more than one entrance and a number of sets of stairs etc requires additional detailed analysis. Additional information would also be required of particular dimensions of specific station elements. In addition, whilst we have visited each station there have been very few passengers, due to the current Covid19 lockdown, so it has not been possible to view or experience any particular issues. The assessment would be improved by this additional information and dynamic analysis would also provide further refinement and could show different results at some of the station elements.

5.8 The analysis uses the existing 2018 station data and line loads. This includes station entry and exit flows, boarding and alighting movements and passenger flows between stations. Data have been used for a typical Monday to Thursday as the peak hours are higher than equivalent hours

on a Friday and greater than the highest flows on a Saturday. At stations both the AM and PM peak period flows have been assessed. The outcome of the analysis has been assessed against the provision of station elements determined from site visits.

Bus network

5.9 The London Borough of Barnet is served by an extensive network of just over 40 bus routes. The maps below (source: https://tfl.gov.uk/maps_/bus-spider-maps) provide an idea of the bus routes present at key bus connection hubs around the borough. It should be noted that some of the spider maps obtained online are not up to date; however, this does not impact the analysis of the orbital bus routes within the Borough as these have been identified through a sperate Geographical Information System (GIS) as shown in Figure 5-10 and Figure 5-11.

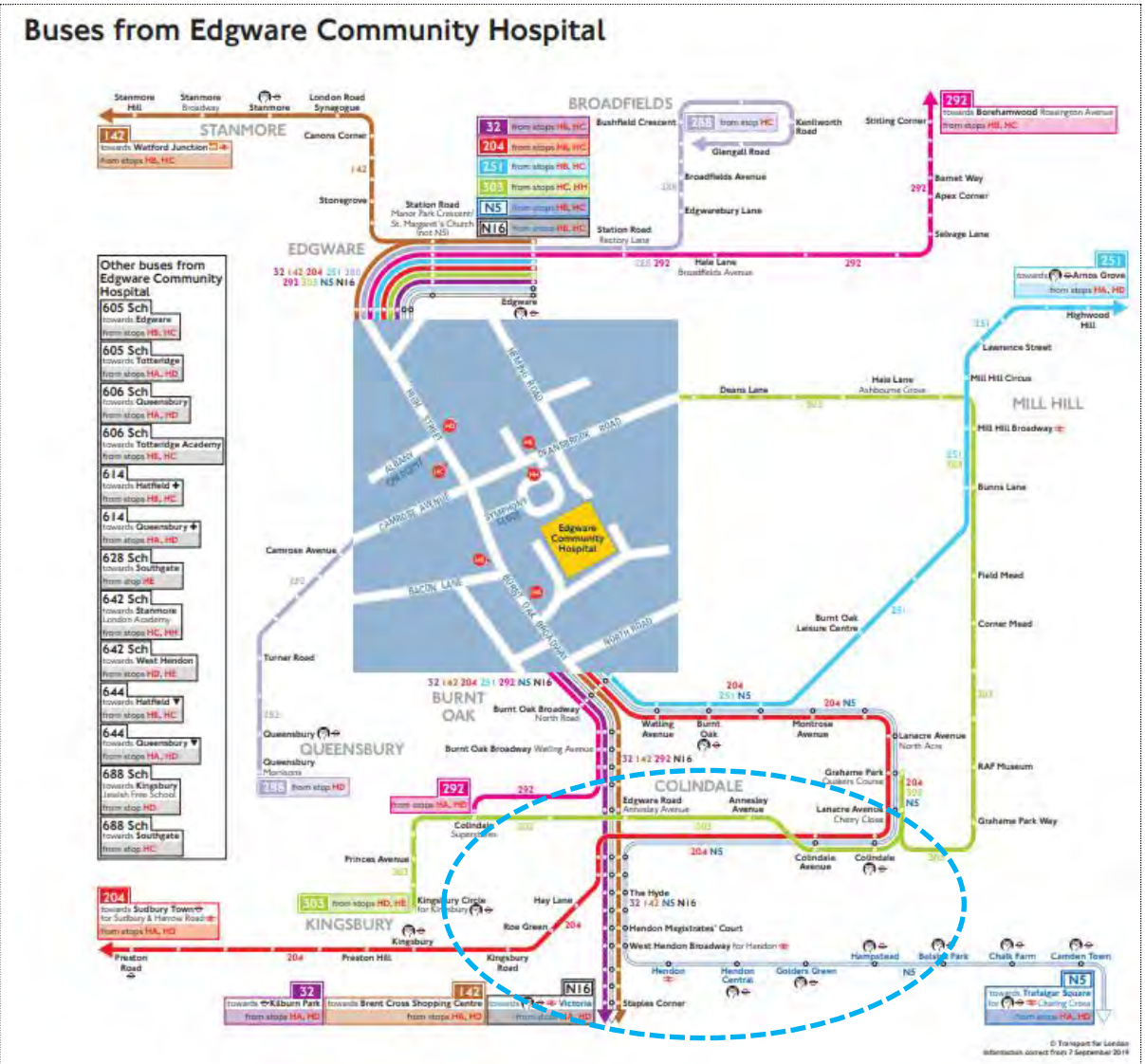


Figure 5-2 Buses from Edgware Community Hospital

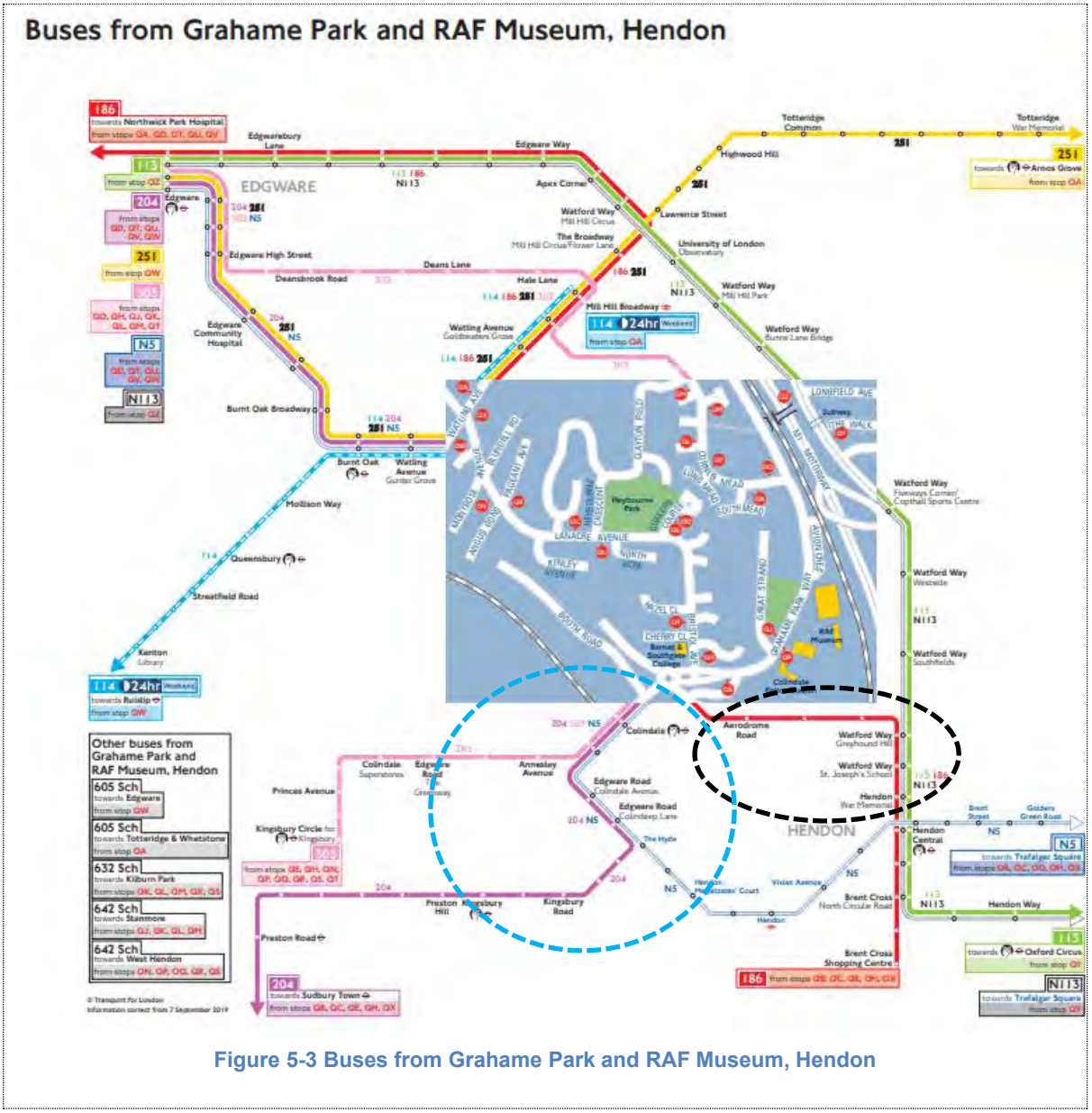


Figure 5-3 Buses from Grahame Park and RAF Museum, Hendon

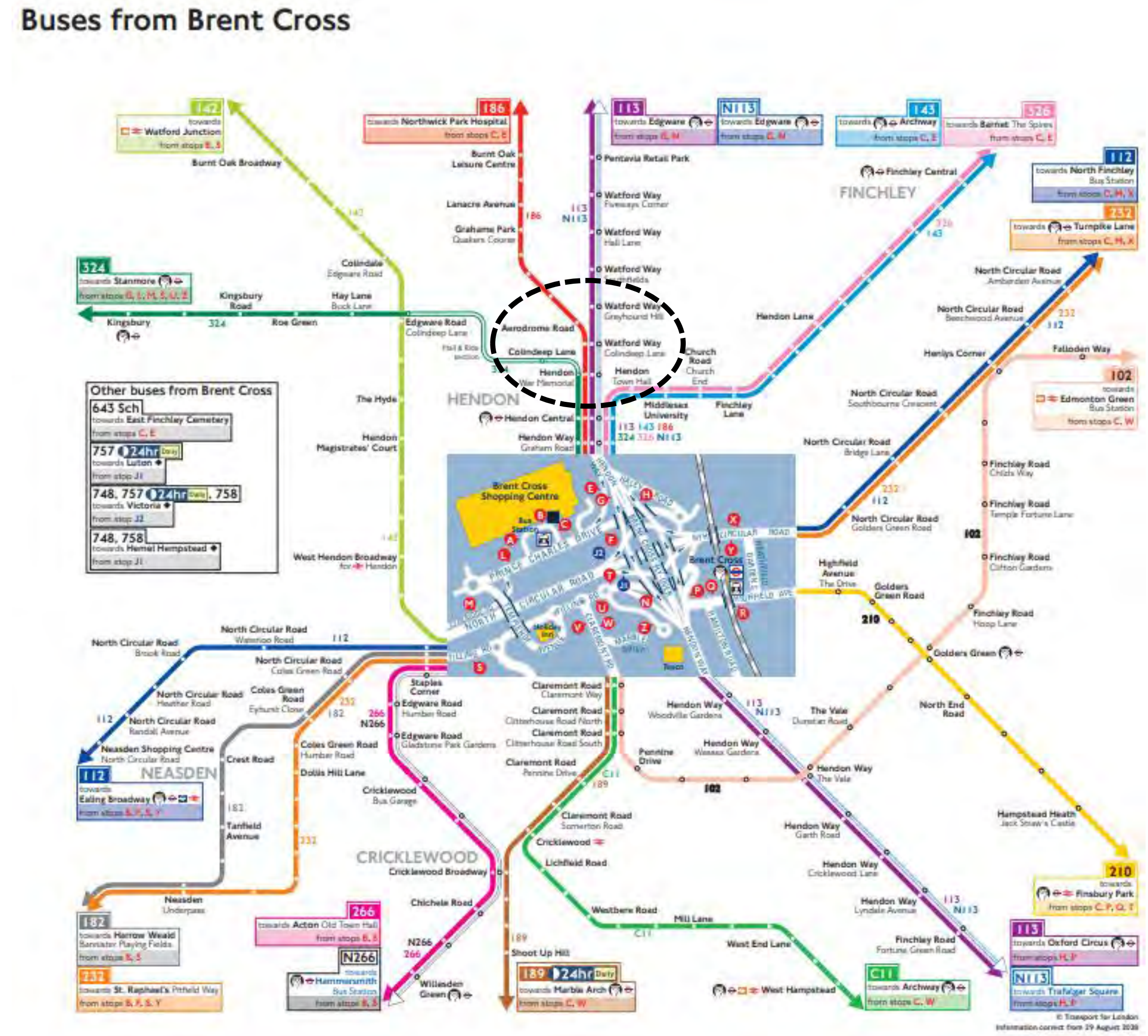


Figure 5-4 Buses from Brent Cross

Figure 5-5 Buses from Barnet Hospital

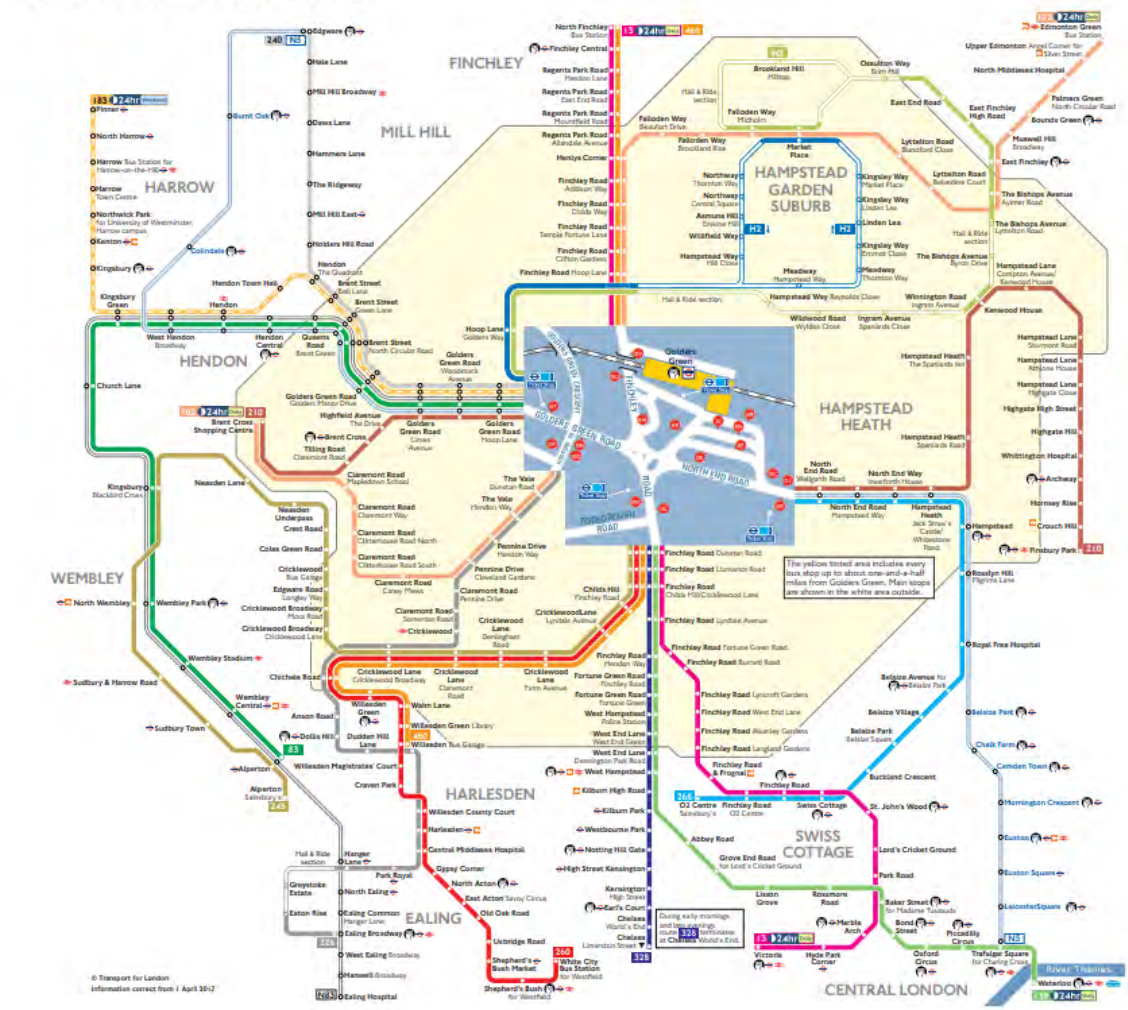


Figure 5-6 Buses from Golders Green

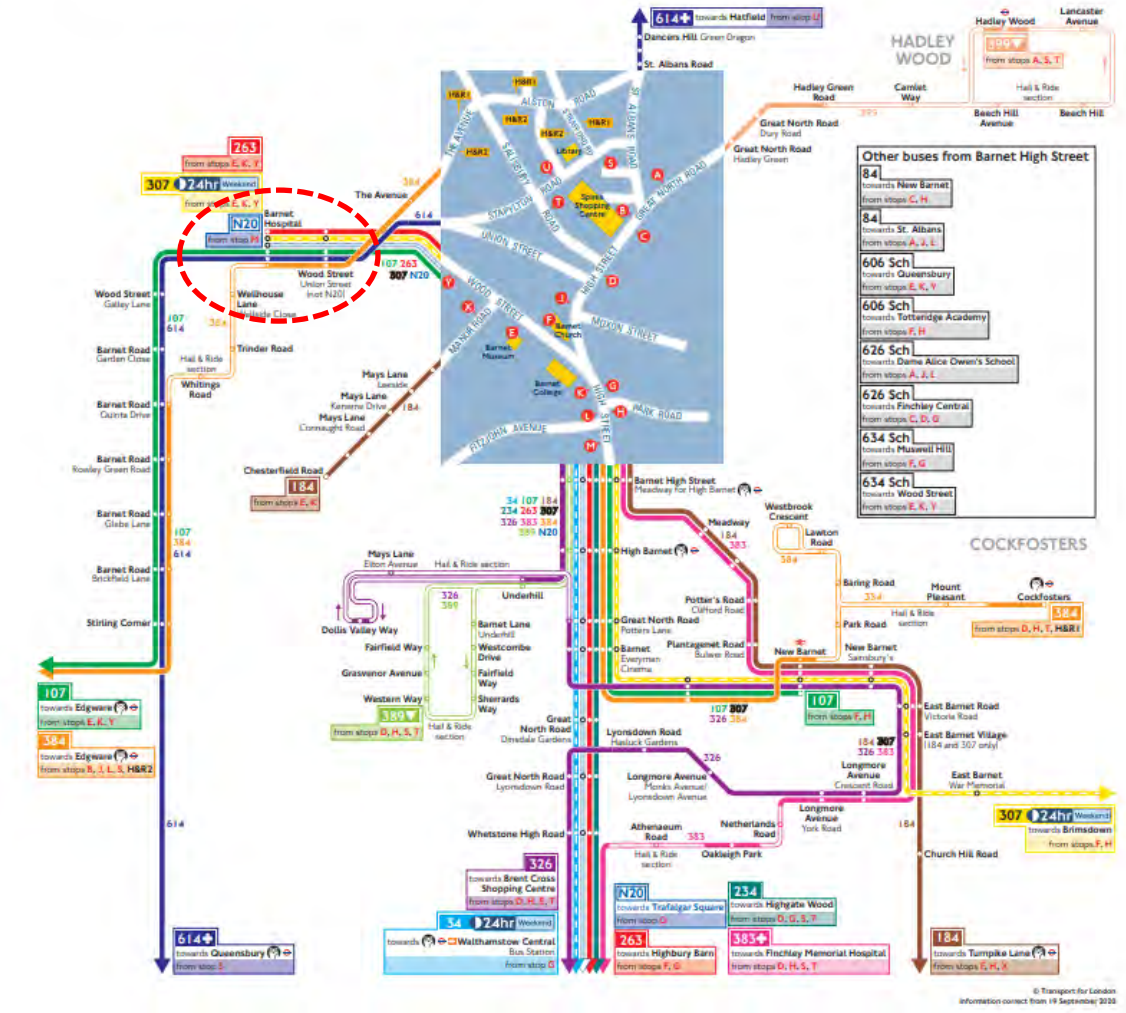


Figure 5-7 Buses from Barnet High Street

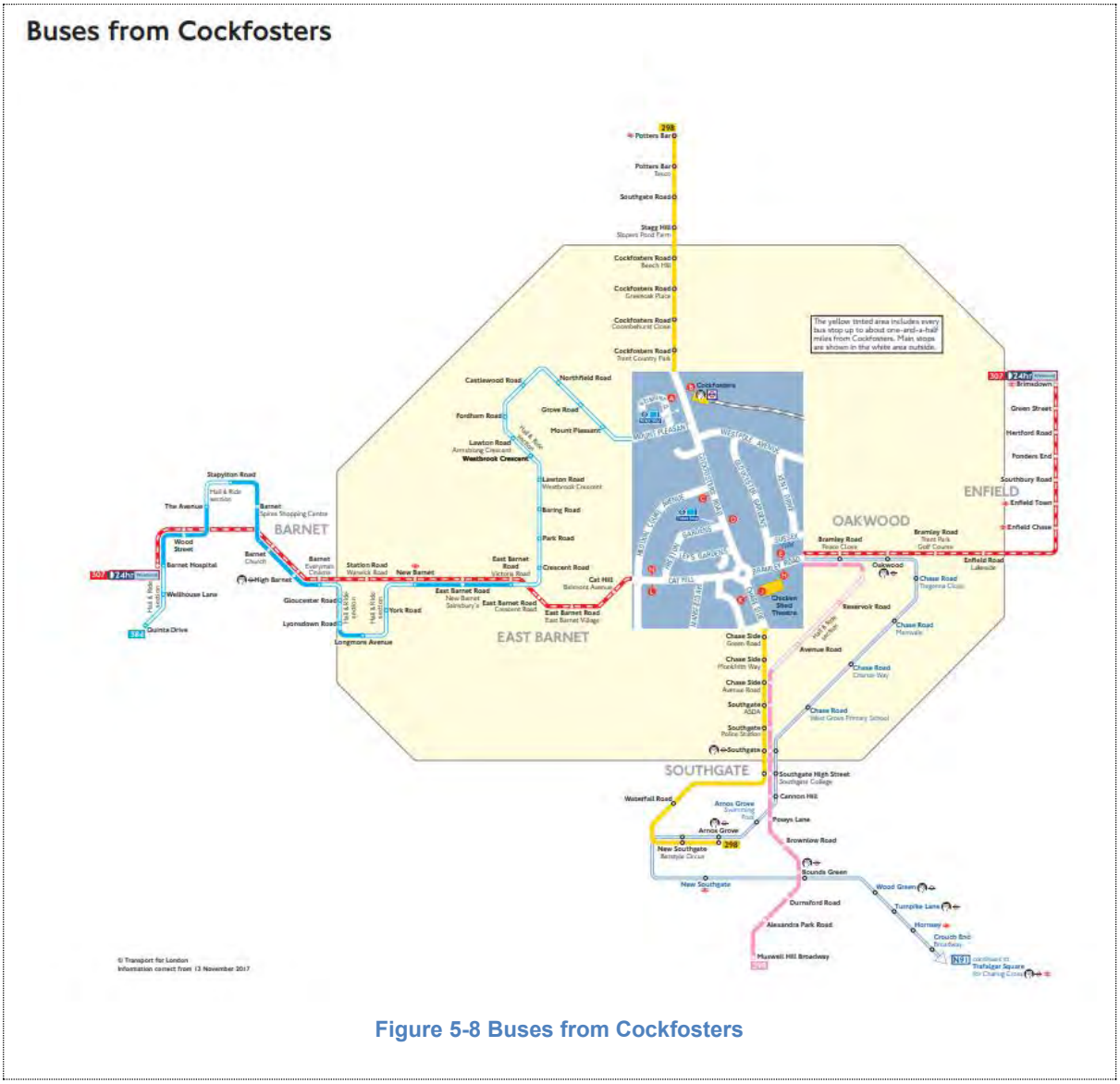


Figure 5-8 Buses from Cockfosters

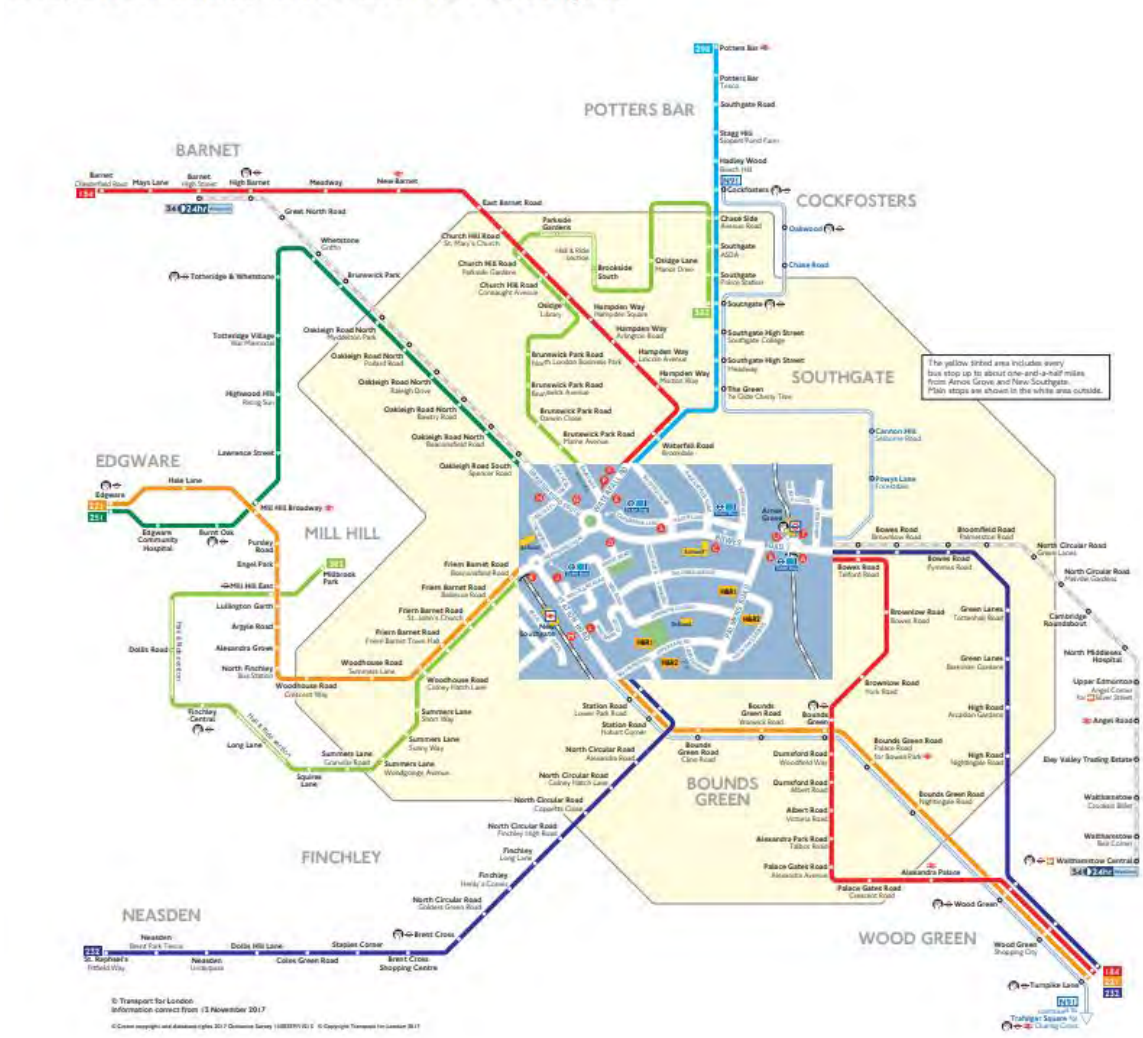


Figure 5-9 Buses from Arnos Grove and New Southgate

5.10 The Table 5-4 provides a summary of the performance of the bus network in the borough (analysis by Capita of TfL's data: https://tfl.gov.uk/corporate/publications-and-reports/buses-performance-data#on-this-page-4 and http://bus.data.tfl.gov.uk/). The tables provide a summary of recent historical changes in the Borough's bus network speeds and compares them to that of neighbouring boroughs as well as the whole of London. The standard deviation has also been included to provide a measure of the variability of travel times around the average. The higher the standard deviation the greater the variability of the observed speeds around the average speeds. It should be noted that the periods indicated below corresponds to TfL's monitoring periods which typically run from the start of April to end of March of the following year.

Bus Network Average Speed (Kph)	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
London Average	13.86	13.51	13.40	13.54	13.51	13.56	15.76
Barnet	15.40	15.05	15.09	14.98	14.91	15.01	17.42
Brent	13.85	13.57	13.56	13.54	13.72	13.61	15.50
Camden	10.61	10.32	10.12	10.26	9.90	10.07	11.82
Enfield	15.21	14.78	14.63	14.26	14.29	14.23	16.58
Haringey	13.07	12.63	12.67	13.07	12.81	12.84	14.29
Harrow	16.21	16.04	15.78	15.80	15.94	16.07	18.37

Bus Network Speed Standard Deviation (Mph)	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
London Average	0.49	0.47	0.50	0.46	0.48	0.52	2.06
Barnet	0.69	0.69	0.64	0.55	0.68	0.71	2.44
Brent	0.49	0.63	0.59	0.51	0.53	0.65	1.98
Camden	0.32	0.27	0.38	0.30	0.39	0.41	1.73
Enfield	0.62	0.68	0.82	0.77	0.79	0.81	2.29
Haringey	0.57	0.66	0.58	0.44	0.49	0.53	1.90
Harrow	0.66	0.65	0.69	0.63	0.67	0.69	2.43

Bus Network Average Speed Year on Year change	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
London Average		-2.6%	-0.8%	1.1%	-0.2%	0.4%	16.2%
Barnet		-2.2%	0.3%	-0.7%	-0.5%	0.7%	16.1%
Brent		-2.0%	-0.1%	-0.2%	1.3%	-0.8%	13.9%
Camden		-2.8%	-1.9%	1.3%	-3.4%	1.7%	17.4%
Enfield		-2.9%	-1.0%	-2.5%	0.2%	-0.4%	16.5%
Haringey		-3.4%	0.3%	3.1%	-2.0%	0.2%	11.3%
Harrow		-1.1%	-1.6%	0.1%	0.9%	0.8%	14.3%

Table 5-4 Summary of the performance (service speed) of the bus network in the Barnet

5.11 In summary, excluding any impacts related to Covid19, particularly in the 2020-20021 monitoring period, we note that although in Barnet bus speeds have deteriorated since 2014-2015, they were still comparatively better than in the neighbouring boroughs and in the case of the London average.

5.12 Bus speeds have clearly improved as a consequence of falling road traffic volumes, due to Covid19 travel restrictions. In the future, expected higher levels of home working are likely to result in lower growth rates for road traffic, especially at traditional peak times. This is against a background of already low (pre-Covid19) traffic growth forecasts contained in the Mayor's own transport strategy. So, whilst some of the gains observed in the 2020-2021 period will be

lost as travel demand returns, the rate at which the speeds will fall again may not be as severe/high as in the years leading up to 2020.

5.13 The bus route performance is monitored by TfL also in terms of indicators such as Excess Waiting Time (EWT), i.e. additional time spent waiting for services over and above the scheduled waiting time and the probability of waiting less than 10min or above; (http://content.tfl.gov.uk/uploads/forms/boroughreports/borough-n-network/barnet.pdf and https://tfl.gov.uk/forms/14144.aspx?borough=Barnet&nameid=barnet&boroughid=2).

5.14 Table 5-5 below compare published statistics collected in 2015 and more recently in 2020/21. As the table shows, there appears to have been a slight deterioration in the EWT from 0.87min to 1.2min; however, at the same time, the excessive delays greater than 10min appear to have reduced. However, these values are in line with London's averages of 1min of the EWT as reported also by the DfT.

Period	EWT (min) Average	EWT StDEV (min)	% Pax Waiting <10min (Average)	% Pax Waiting <10min (StDEV)
Jan15-Mar15	0.87	0.20	81.1	7.5
Sep20-Jan21	1.20	0.33	82.8	7.3

Table 5-5 Bus Excess Waiting Time (EWT) 2015 and 2020/21

5.15 LBB's DLP and LTTS both recognise that whilst radial bus connections are generally well developed and provide a high level of connectivity, e.g. along the growth areas such as the A5 corridor, the orbital routes tend to present more challenges in terms of providing fast and efficient longer-distance cross borough connectivity. These bus routes tend be geared towards local connectivity (high number of stops) rather than provide express orbital connections. We have analysed a number of orbital routes as shown in Figure 5-10 and Figure 5-11 and have also included, as part of the analysis, a couple of radial routes (240 and 326).

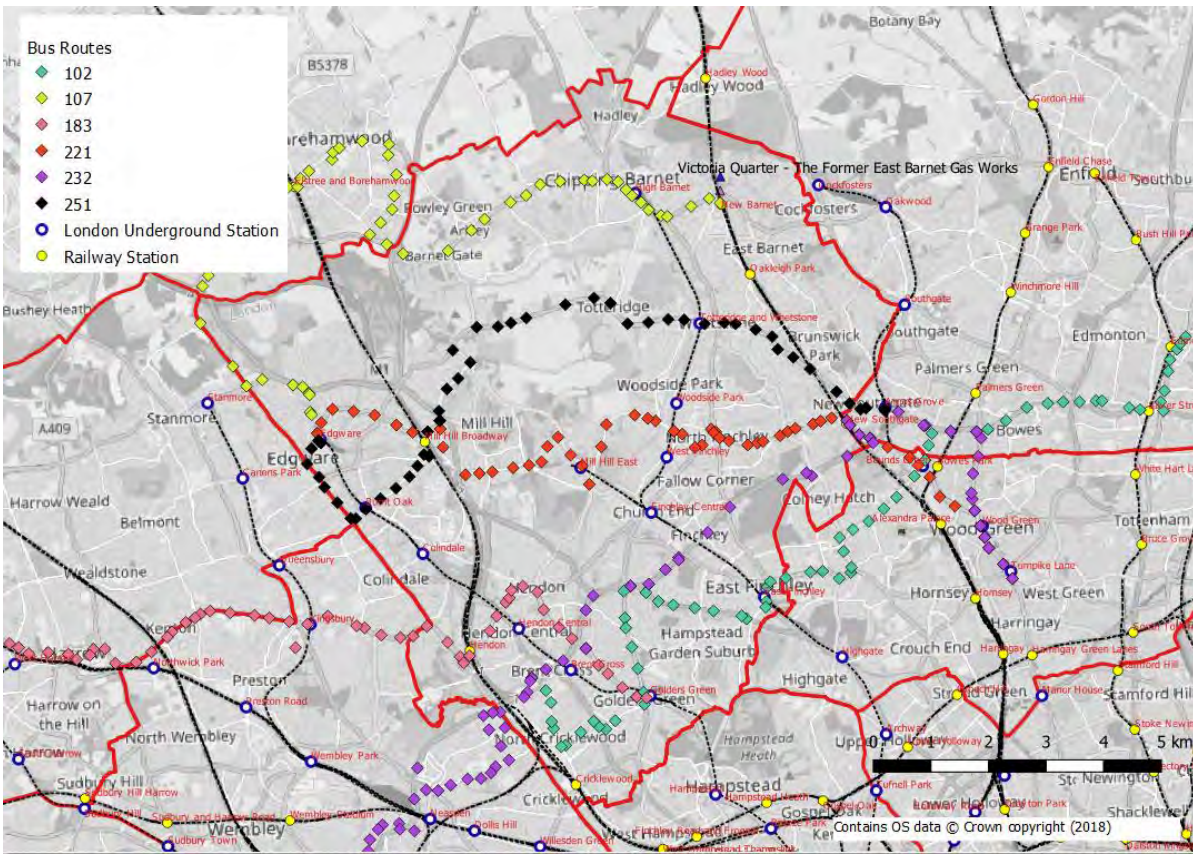


Figure 5-10 Selected Orbital bus connections in Barnet

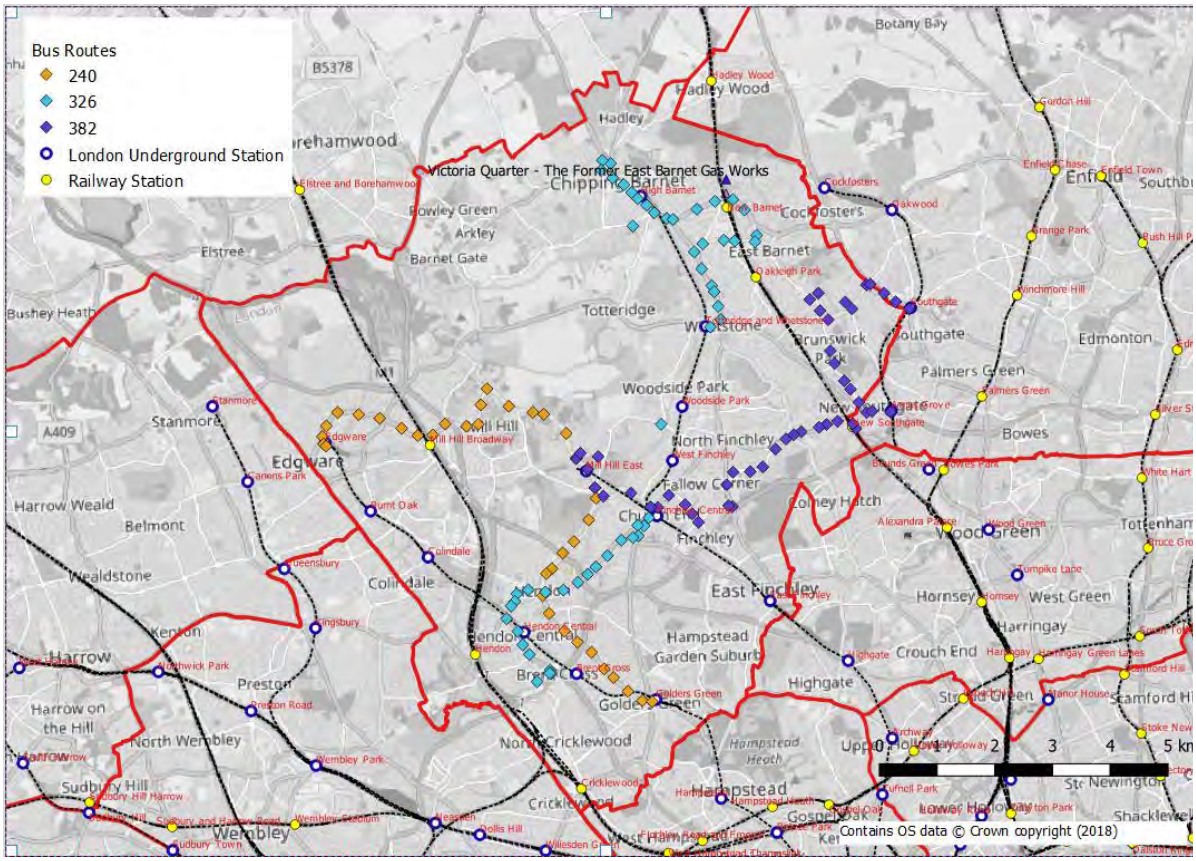


Figure 5-11 Selected Orbital and Radial bus connections in Barnet

5.16 Table 5-6 below provides a brief summary of the characteristics of the orbital and radial bus services of interest within Barnet (averages for AM/PM peak hour periods in a typical weekday) and compares the end-to-end travel times against a similar end-to-end car journey in the same period. Travel data were extracted for a typical weekday November 2019. It should be noted that, in real terms, bus journeys are expected to vary along any given route in terms of trip length and that end to end bus travel may actually be faster by changing bus routes. However, the table below focusses on the 'constraints' relating to strategic cross-borough trips that would be longer in length. As part of this assessment, we have looked at the potential impact on car travel of complementing existing services with additional express services which retain the route of the existing ones but improve on travel times by having a reduced stopping pattern and bus priority measures.

Bus Route and Time period	In-vehicle Time (min)	Distance (Km)	Service speed (kph)	Bus Stops	Buses per hour	Average Scheduled Wait Time (min)	Car Time (min)	Car Distance (Km)	Car Speed (kph)
102	Edmonton Green Bus Station - Brent Cross Shopping Centre								
Peak Times	92.0	19.3	12.6	75.0	7.0	4.3	32.5	14.7	27.1
107	Edgware Bus Station - New Barnet Station								
Peak Times	64.0	14.4	13.5	47.0	4.1	7.4	23	10.0	26.1
183	Pinner Station - Golders Green Station								
Peak Times	76.0	17.2	**13.6**	52.0	7.9	3.8	41.5	17.4	**25.2**
221	Turnpike Lane Bus Station - Edgware Station								
Peak Times	78.0	16.9	**13.0**	54.0	7.0	4.3	37.0	17.0	**27.6**
232	Mitchell Way - Turnpike Lane Station								
Peak Times	85.0	19.4	**13.7**	53.0	4.6	6.5	35.0	16.0	**27.4**
240	Edgware Bus Station - Golders Green Station								
Peak Times	50.0	11.8	**14.2**	36.0	3.8	7.9	23.0	11.0	**28.7**
251	Arnos Grove Station - Edgware Station								
Peak Times	55.0	14.7	**16.0**	43.0	6.0	5.0	27.5	14.5	**31.6**
326	The Spires - Brent Cross Shopping Centre								
Peak Times	70.0	15.5	**13.3**	43.0	5.1	5.9	30.0	18.0	**36.0**
382	Southgate Station - Millbrook Park								
Peak Times	57.0	12.4	**13.1**	40.0	4.1	7.4	22	8	**36**

Table 5-6 Observed Bus Service characteristics vs car (2019) on selected routes

5.17 As the table above shows the bus service speeds are considerably lower than typical journeys made by car, approximately 50% slower than car. If we add the fact that bus users may face additional wait time and walk time to a bus stop this clearly shows that the selected bus routes do not, in their current format, compete with car in terms of travel times, especially for longer distance cross borough orbital journeys.

5.18 An analysis of TfL's bus usage data from the 2018 Bus Origin Destination Surveys (BODS) has confirmed that there is spare capacity along the selected bus routes and that the issue is not overcrowding but improving services in order to attract trips from car.

Future Rail Networks

5.19 The Mayor's Transport Strategy includes placing emphasis on the development of the rail network in London including increasing line and station capacities. Relevant proposals include:

- Crossrail 2 which would run in a north south direction and connect to stations such as nearby New Southgate station.

- Northern line improvements which would enable frequency improvements up to 32 trains per hour.

5.20 Crossrail 2 has recently been mothballed and work on it currently suspended. The route though is safeguarded and so could be developed at some later date. It would not be delivered though within the Plan Period. Also, TfL advised to assume that investment in the Northern Line is unlikely within the Local Plan period.

5.21 On Network Rail there has been substantial investment in the development of the Thameslink network. At full capacity, the Thameslink 20/20 timetable will deliver increased peak period frequencies of up to 24tph per direction through the central core section at St Pancras in Central London. Of these 24tph, 16 would be using the Thameslink route to St Albans and eight would be on the Great Northern Route to Peterborough. On the Thameslink route there is a mix of eight and 12 car Class 700 train operations; the eight car trains tend to operate on the Wimbledon Loop route whilst the 12 car trains operate on the Kent and Brighton/East Grinstead routes..

5.22 In association with the development of the Brent Cross / Cricklewood area a new station is being developed at Brent Cross west in the vicinity of Dollis Hill. Existing Thameslink services will provide connections to St Pancras. The New Brent Cross Station will be designed to accommodate 12 car trains although the stopping pattern it is not yet known.

5.23 The West London Alliance (WLA) has been investigating ways of accommodating the additional passenger demand resulting from the growth of population and employment in the area and across London as a whole. This includes substantial additional housing planned along much of the corridor between Hounslow and West Hampstead/Hendon. An option to serve these developments in a sustainable way, consistent with the Mayor's Transport Strategy ambitions, is to restore rail passenger services on the Dudding Hill Line and the Kew – Acton link to provide a West London Orbital (WLO) rail service from Hounslow to West Hampstead and Hendon, the route can be seen in Figure 5-12 below.

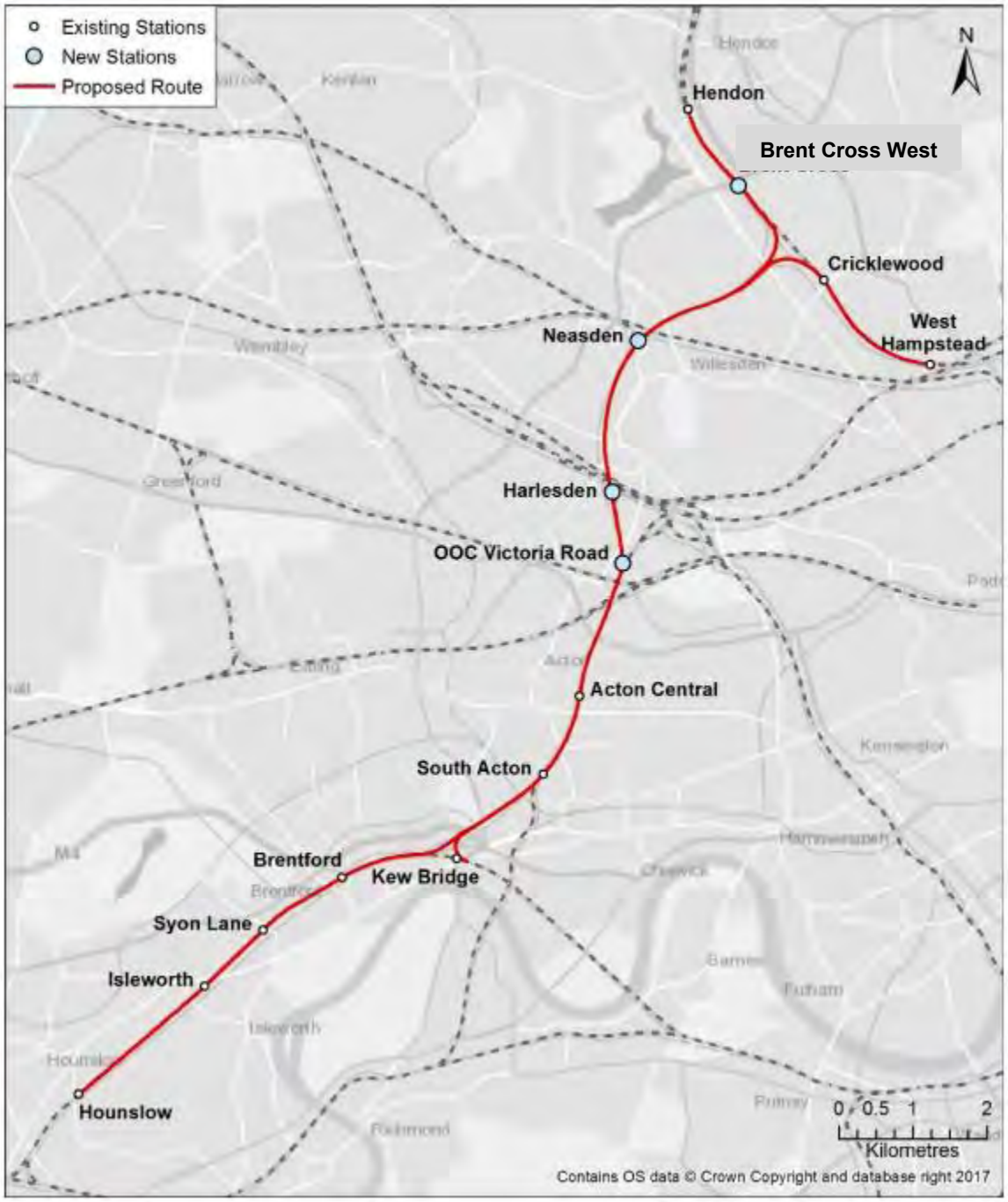


Figure 5-12 West London Alliance proposed route

Source: WLO Rail Technical Analysis and Conclusions report, October 2017

5.24 The WLO project is currently at an early stage of GRIP2 design work, focussing on service specification and design of some key infrastructure to identify the costs and benefits of alternative service options or to address pressing interface issues – including in Barnet Hendon

and Cricklewood platform design (other key locations are Acton Wells Junction and Old Oak Common and Neasden station designs). As such, it has not been possible to ascertain what impact the WLO is likely to have in the transport network in Barnet. Also, due to the project early stages, no assessment has yet been carried out about the impact that the scheme may have on car demand. Indicative timescales suggest an opening of the line by 2027/28; however, progress has been slowed by the Covid19 pandemic and timescale may have to be reassessed in light of the outcome of the current service option work.

5.25 In the past, the West London Alliance (WLA) had published a series of documents in relation to the business case for the West London Orbital scheme (https://wla.london/documents/). The WLO Rail Technical Analysis and Conclusions report (October 2017) (https://wla.london/wp-content/uploads/2020/07/2017-October-West-London-Orbital-Rail-Technical-Analysis-and-Conclusions.pdf) identified the preferred option from the findings of the demand and the operations and infrastructure analysis. The preferred option, Option 3, included:

Phase 1: four trains per hour from West Hampstead to Hounslow, calling at West Hampstead, Cricklewood, Neasden, Harlesden, Victoria Road (Park Royal), Acton Central, South Acton, Brentford, Syon Lane, Isleworth, Hounslow; and

Phase 2: additional four trains per hour from Hendon to Kew Bridge, calling at Hendon, Brent Cross West, Neasden, Harlesden, Victoria Road (Park Royal), Acton Central, South Acton, Kew Bridge.

5.26 The need to examine alternative service options means that this approach has to be revisited. The outcome of this work will inform any phased opening that might be required. However, indications are that the 8tph service pattern may need to be adjusted downwards. The previous Preferred scheme was expected to abstract demand from buses and LUL, reducing crowding as a consequence; however, the impact would be different along different sections of the route. The WLO technical report provides indications of the overall benefits by time period. see Table 5-7 below.

Baseline: Standard LTS-PT 2041 Reference Case (A141rc01a)

Mode	Peak	*Description*	*2041 TfL Ref Case*	*Dudding Hill Preferred Option*	*Difference*
		Scenario	**A141rc01a**	**A141DH07a**	**A141DH07a-A141rc01a**
Rail	AM	Passenger Kms	61,984,155	62,033,637	49,482
		Uncrowded Passenger Hrs	57,719,229	57,789,782	70,553
		Crowded Passenger Hrs	77,959,930	78,023,714	63,783
		Passenger Boardings	1,937,480	1,946,854	9,374
	PM	Passenger Kms	63,991,947	64,049,804	57,857
		Uncrowded Passenger Hrs	57,473,633	57,570,553	96,920
		Crowded Passenger Hrs	73,205,216	73,306,027	100,811
		Passenger Boardings	1,996,416	2,005,744	9,327
LUL	AM	Passenger Kms	16,267,356	16,207,276	-60,080
		Uncrowded Passenger Hrs	29,182,762	29,067,435	-115,327
		Crowded Passenger Hrs	43,191,304	42,944,197	-247,107
		Passenger Boardings	2,272,048	2,265,807	-6,241
	PM	Passenger Kms	16,552,743	16,491,977	-60,766
		Uncrowded Passenger Hrs	30,074,167	29,957,067	-117,100
		Crowded Passenger Hrs	41,269,408	41,031,203	-238,205
		Passenger Boardings	2,416,620	2,410,510	-6,110
Bus	AM	Passenger Kms	6,749,006	6,726,693	-22,313
		Uncrowded Passenger Hrs	26,478,568	26,383,592	-94,976
		Crowded Passenger Hrs	30,735,987	30,602,227	-133,759
		Passenger Boardings	1,852,325	1,847,392	-4,932
	PM	Passenger Kms	8,199,665	8,175,750	-23,915
		Uncrowded Passenger Hrs	30,291,568	30,192,596	-98,973
		Crowded Passenger Hrs	36,796,301	36,625,703	-170,598
		Passenger Boardings	2,177,500	2,172,396	-5,104

Table 5-7 Standard LTS-PT 2041 Refence Case

5.27 Based on the data above, the WLO preferred Route option would result in:

- an average reduction of bus passenger-km of 0.30% (AM peak) and 0.29% (PM peak);
- an average reduction in crowded bus passenger-hours of 0.43% (AM peak) and 0.46% (PM Peak);
- an average reduction in bus passenger boardings of 0.27% (AM peak) and 0.23% PM Peak.
- an average reduction of LUL passenger-km of 0.37% (AM peak) and 0.37% (PM peak);
- an average reduction in crowded LUL passenger-hours of 0.39% (AM peak) and 0.39% (PM Peak); and
- an average reduction in LUL passenger boardings of 0.27% (AM peak) and 0.25% PM Peak.

5.28 These savings would appear to be relatively modest. Furthermore, it should be noted that the scheme stops at the south western edge of the Borough and, as such, it does not provide an orbital connection within the Borough of Barnet itself. A review of demand difference plots

provided by the WLA/TfL for the entire 2031 AM peak period, confirms that the previous preferred scheme is unlikely to have a significant impacts on the public transport network within Barnet, especially the orbital bus routes within the Borough that have been assessed in this report; please refer to Figure 5-13 and Figure 5-14.

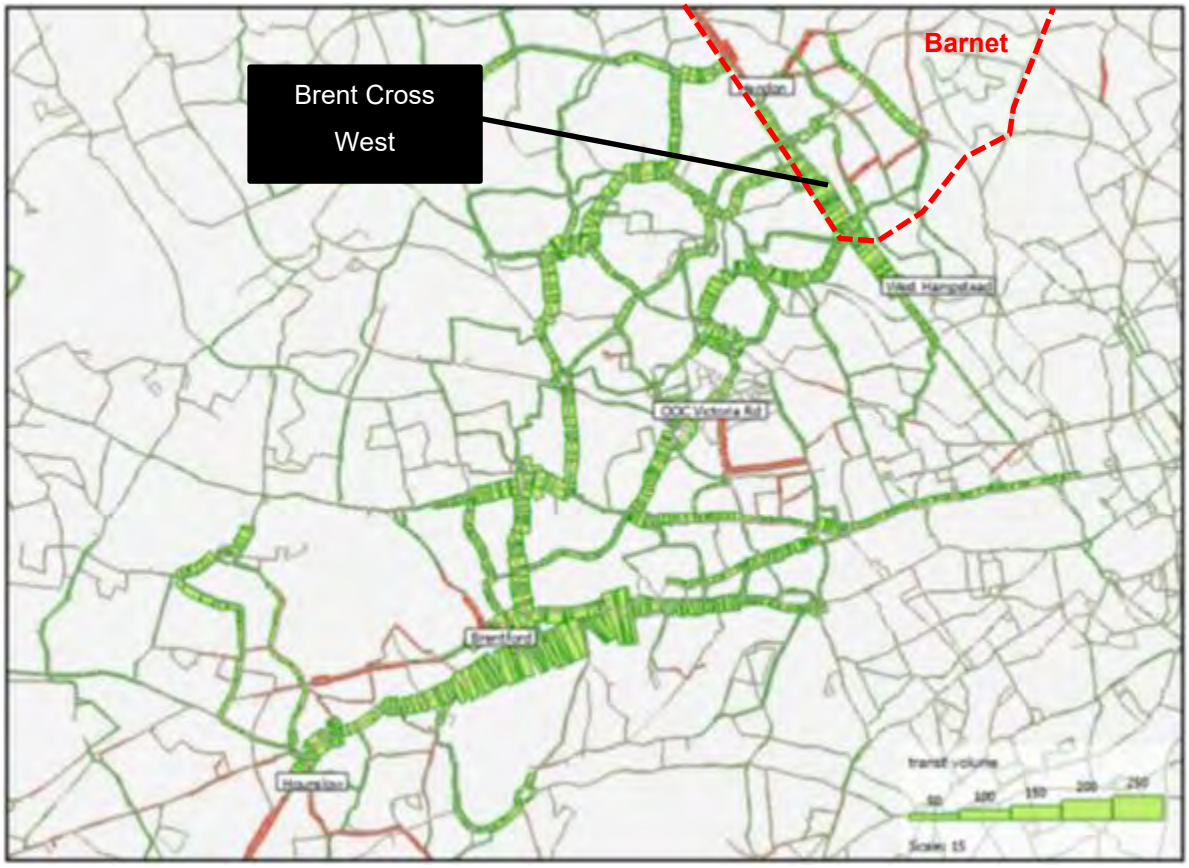


Figure 5-13 2031 AM Peak period, WLO 8tph scenario (old preferred option) change in forecast bus demand

Figure 5-14 2031 AM Peak period, WLO 8tph scenario (old preferred option) change in forecast rail and LU demand

5.29 Although it is possible that the WLO scheme could support further intensification around the stations at Cricklewood, Hendon and Brent Cross West, as stated in the DLP Reg18, an assessment of the impact of the demand could not be carried out for the reasons outlined above. However, based on the expected increase in home-working trends due to Covid as well as the potential for internalisation of home-to-work trips within the mixed developments, it would be plausible to expect a limited impact of any extra demand on the radial rail and LU lines as well as the orbital bus routes in Barnet; especially as some of this additional demand may indeed be generated along the remaining part of the WLO rail corridor.

6. HIGHWAYS, PARKING & FREIGHT

Highways

6.1 Figure 6-1 and Figure 6-2 provide a snapshot of the capacity of junctions in Barnet. Capacity is expressed in terms of traffic volumes over capacity ratios or V/C, as estimated by TfL's LoHAM v4.2 model in 2021. It should be noted that TfL's LoHAM v4.2 model assumes the reconfiguration of the M1/A406 junction from 2021 and that, for this reason, the V/C for this specific interchange cannot be considered as representative of current conditions. However, the model can be used for assessment purposes around the remining parts of the network. Also, these estimates are based on pre -Covid 19 traffic forecasts and 2021 traffic levels will be lower than those forecasted.

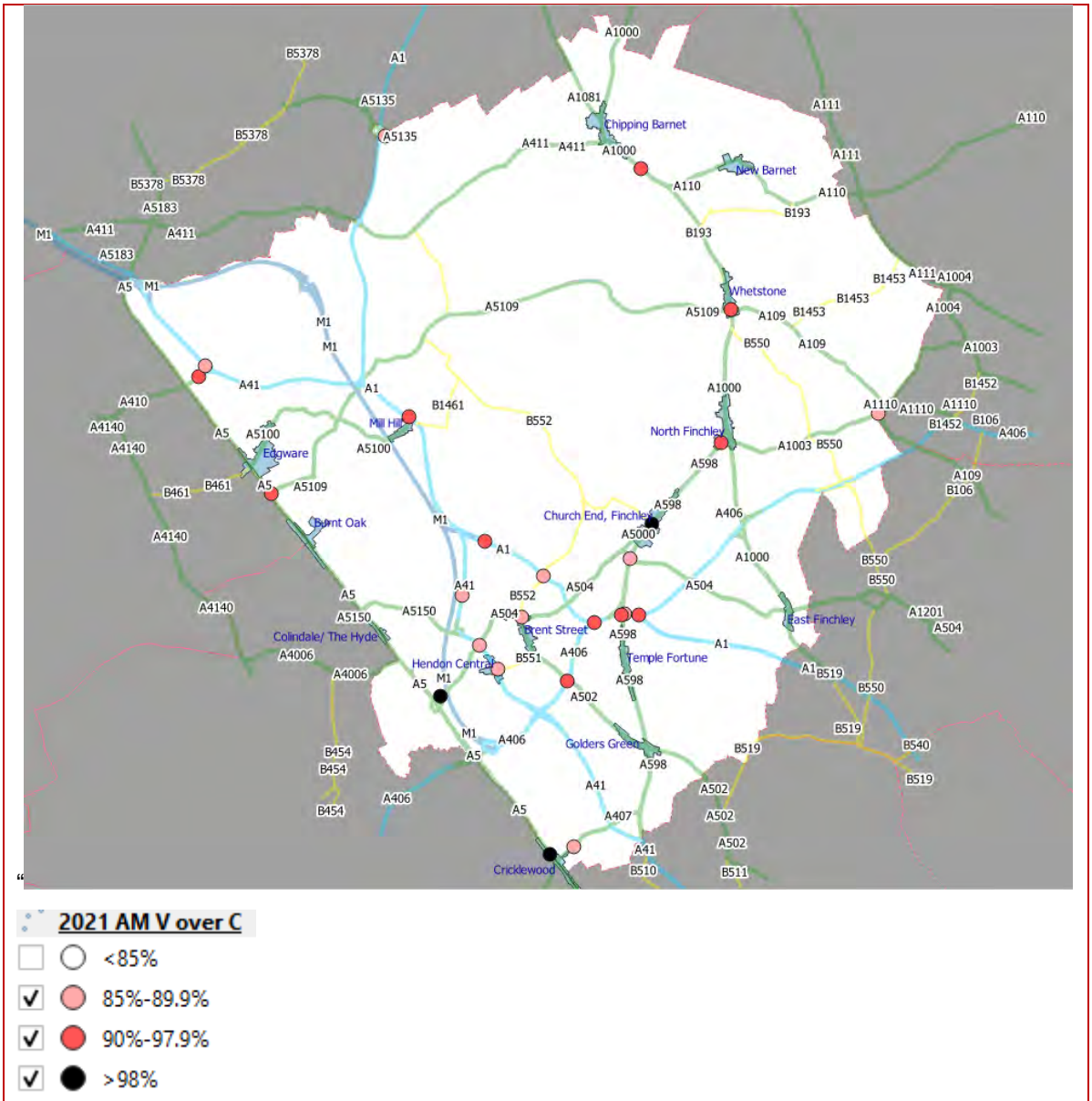


Figure 6-1 2021 AM Peak Junction Traffic Volume (V) / Capacity (C) indicators (pre-Covid19 estimates)

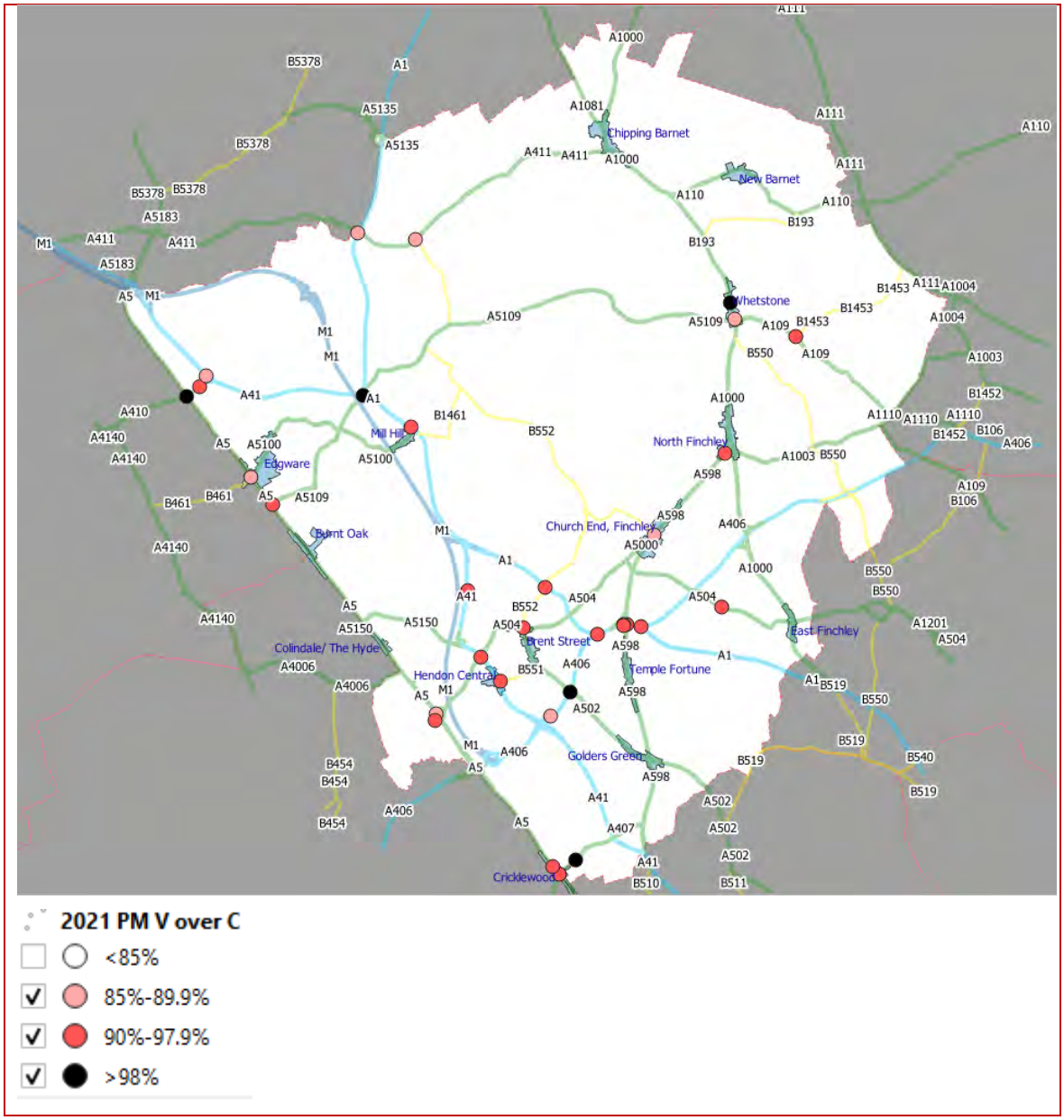


Figure 6-2 2021 PM Peak Junction Traffic Volume (V) / Capacity (C) indicators (pre-Covid19 estimates)

6.2 As Figure 6-1 and Figure 6-2 show, both in the 2021 AM and PM peak models there are junctions above the desirable V/C of 85%. At these junctions traffic conditions can be highly unstable with delays experienced on a frequent basis. In particular, we note a number of junctions operating at or above a V/C of 90% and between three and five junctions operating at or above a V/C of 98%, depending on the time period. It can be expected that, with demand growth, these junctions may further deteriorate in terms of performance. The assessment of the network performance under different forecasting scenarios is discussed in Chapter 8.

Committed Highway Schemes

6.3 Table 6-1 shows the committed highway schemes currently included in the LoHAM baseline model and those that have been added to the future year models to provide an improved network representation. In agreement with the LBB, some schemes contained in the most recent Local Infrastructure Plan (LIP), have not been included for the reasons set out below. Examples of scheme layouts are included in Appendix A.

Schemes Included in LoHAM	LIP Schemes not included in LoHAM	LIP scheme to be added to LoHAM (year)?
Brent Cross at North Circular junction with A5, M1, A41 Hendon Way and further local improvements	Brent Cross A5 junctions south of A406	TfL LoHAM baseline model does not include updates to A5 junctions south of the A406. Changes to this corridor would require the coding of the wider network, including BXS, in order to replicate route choices. At wider strategic level the model can still provide sensible indications of issues associated with localised traffic growth. Particular attention was devoted instead to ensuring the that LTS distribution of demand was adjusted to reflect the household and job projections associated with LBB's DLP Reg18.
Devonshire Road / Bittacy Rise - Priority to signal junction	A5 j/w Watling Avenue – junction improvement scheme and healthy streets improvements (say 500 overall)	No (no material impact due to scale of scheme)
	MML Bridge	The MML bridge, not present in the baseline LoHAM v4.2 model, has been added from 2031 in line with the approved planning application 20/0243/CON rephasing which expects the

Schemes Included in LoHAM	LIP Schemes not included in LoHAM	LIP scheme to be added to LoHAM (year)?
		Spine Road North, connecting to the bridge, to open in 2031)
	Finchley Central – "quick win" public realm and healthy streets improvements complementing the Station development and Town Centre Strategy	No (no material impact due to location of schemes, away from key growth areas on A5 corridor)
	West Hendon public realm works in advance of and complementing major development changes	Yes (infrastructure improvements likely to be completed by 2022/23, therefore modelled from 2026)
	Colney Hatch Lane pedestrian crossing facility/traffic calming	No (no material impact due to scale of scheme)
	Oakleigh Road South pedestrian crossing facility/improvements	No (no material impact due to scale of scheme)
	Church Hill Road/Cedar Avenue pedestrian crossing facility/improvements	No (no material impact due to scale of scheme)
	Alexandra Grove pedestrian crossing facility/improvement	No (no material impact due to scale of scheme)
	Pedestrian facilities at traffic signals: A5 j/w Station Road, Edgware	No (no material impact due to scale of scheme)
	Pedestrian facilities at traffic signals: Brent Street / Church Road / Parson Street	No (no material impact due to scale of scheme)
	Pedestrian facilities at traffic signals: A5 j/w Kingsbury Road	No (no material impact due to scale of scheme)
	Great North Road/The Bishops Avenue Accident Reduction scheme	No (no material impact due to scale of scheme)
	Chesterfield Road traffic calming scheme	No (no material impact due to scale of scheme)
	High Road j/w Totteridge Lane	No (no material impact due to scale of scheme)
	Junction Improvement scheme A5 junction with Spur Road	No (scheme dropped due to high costs)

Table 6-1 committed highway schemes for inclusion into the LoHAM v4.2 SATURN Model

Parking

6.4 The Barnet Parking Policy of November 2015 sets out the issues and controls available to meet road network requirements, support for businesses and to promote sustainable transport by controlling unwanted parking. There are some 21 car parks operated by Barnet throughout the Borough and privately operated car parks related to workplaces retail stores etc.

6.5 There are CPZ's covering areas around all stations and town centres. They are in part to deter commuters from parking at stations in residential and town centre areas. There are proposals to extend the coverage of CPZ's and these are likely to assist in reducing car use and encouraging more active travel.

6.6 There are a number of Barnet policies relating to parking including those included in the DLP Reg18:

- Policy GSS09 relates to locations at stations that offer opportunities for redevelopment through utilising the high PTALs and other potential site characteristics such as town centre locations.
- Policy GSS08 Barnet's District Town Centres supports sustainable travel and seeks parking provision at the minimum required standard

6.7 The pursuit of such policies would complement the active travel initiative and the use of sustainable modes.

Freight and Freight Key Routes

6.8 As recognised in the LTTS, the concentration of key national freight routes on roads through Barnet (M1, A1, A406 as well as the A5 and A41), that the Council does not control, makes meeting the Mayor of London's targets challenging, particularly for mode share (how people travel), road safety, air quality and parking standards. However, it should be noted that Barnet is part of the London Lorry Control Scheme, designed to reduce road danger from freight vehicles.

6.9 This strategic location means up to 25% of road traffic in Barnet is passing through, neither originating nor ending in the Borough. For the purpose of the Strategic Transport Assessment, it is assumed that as measures impacting this traffic are out of control of the LBB, interventions would be limited to traffic originating/terminating in the Borough. This would represent a robust assessment in road network capacity terms.

6.10 Where the LBB could take action, is in considering the implementation of Local Freight Consolidation centres. According to the LTTS consolidation centres could be implemented as described in Table 6-2 below.

Action plan

Table 4.6: Freight action plan

Reference	Proposal	Location	Estimated Cost (total excl. staff costs)	Timing	Potential Funding	Council Role	Key stakeholders
F1	Alternative fuels for freight	Consolidation centre; service stations	£50,000 per charger	2030-2041	OLEV funding, Council resources, private sector	Encourage installation	Service station operators, freight operators
F2	Consolidation	Town centres and areas of dense business and resident agglomeration	£1m - £10m	2020: identify drop and go locker sites 2025: introduce town centre consolidation centres 2030: examine opportunities for major consolidation centre	Private sector	Encourage private investment, potentially subsidise	Future BIDs, freight operators, businesses

Table 6-2 Freight Action Plan

6.11 TfL's report 'Evaluation of Freight Consolidation Demonstrator Projects October 2019' (https://content.tfl.gov.uk/steer-assessment-of-demos-report-oct-2019.pdf) recognised that *"Freight has an essential role in supporting economic activity. In London, freight is estimated to directly contribute £7.5bn to the city's economy. Ninety per cent of London's freight is transported on the road network and the number of LGV movements increased by 54 per cent between 1993 and 2017. Servicing and delivery vehicles contribute to congestion, poor air quality and road collisions. By 2041 it is estimated there will be an additional two million more people living in London, making an extra six million journeys every day. The Mayor's Transport Strategy published in March 2018 sets out a vision for a London that is not only home to more people, but is a better place to live, work and visit. The strategy sets a target of having 80 per cent of personal trips in London made on foot, by cycle or using public transport by 2041. To deliver this the experience for people using London's streets is to be improved. The Healthy Streets Approach provides a framework for delivering this improvement, through a focus on increasing priority for walking and cycling. The Freight and Servicing Action Plan is a subsidiary document to the Mayor's Transport Strategy and sets out the policies and actions required to support a safe, clean and efficient freight system. It recognises the importance of accommodating freight and servicing trips with adequate loading space and lower congestion, and at appropriate times. Partnership working and the involvement of the whole supply chain will also be essential to more efficient use of London's street network."*

6.12 It should be noted that the London Borough of Barnet has decided to adopt a different strategy by prioritising the rationalisation of its own procurement strategies rather than joining the first phase of the Camden Consolidation Centre scheme reviewed below, see Figure 6-3. It is possible that this option will be revisited in the future.

Demonstrator Projects

Code	Demonstrator	Approach being tested	Delivery Partners	Summary Description	Implementation experience	Viability of concept
ED8	Barnet Decision to Join Camden Consolidation Centre	Urban consolidation centre	London Borough of Barnet	Barnet Council considered joining the first phase of the Camden Consolidation Centre, making use of the centre when it was located nearby in Enfield. This project considered the factors that need to be in place within a large organisation before a consolidation centre can be utilised and its benefits realised.	Project did not get off the ground, although Barnet's decision not to join the centre was informative; they decided to implement cheaper, simpler measures first.	Decision not to join for Barnet suggests use of consolidation centres requires considerable preparation and is possible only after other factors such as procurement have been addressed first.

Figure 6-3 Barnet Decision to join Camden Consolation Centre

6.13 A review of the Camden Consolidation Centre's performance is reported in TfL's Case Study Report The London Boroughs Consolidation Centre – a freight consolidation success story (https://content.tfl.gov.uk/lbcc-case-study.pdf). According to the report the Camden Consolidation Centre has achieved:

- 46% reduction in the number of vehicle trips delivering to council sites; and
- 45% reduction in the total distance travelled by delivery vehicles, resulting in decreased emissions.

6.14 The adoption of consolidation centres for deliveries and construction has been shown to have positive impacts in reducing freight vehicle movements at peak times and to transfer deliveries to night time and promote a shift to green vehicles.

6.15 In 2019 TfL Commissioned a freight consolidation feasibility study for London (http://content.tfl.gov.uk/london-freight-consolidation-feasibility-study.pdf). As Figure 6-4 below shows, the study identified a series of locations for potential consolidation sites to serve London's Central Activities Zone. None of these are located in Barnet although it is clear that the M1/A5 corridor is part of the strategic supply routes.

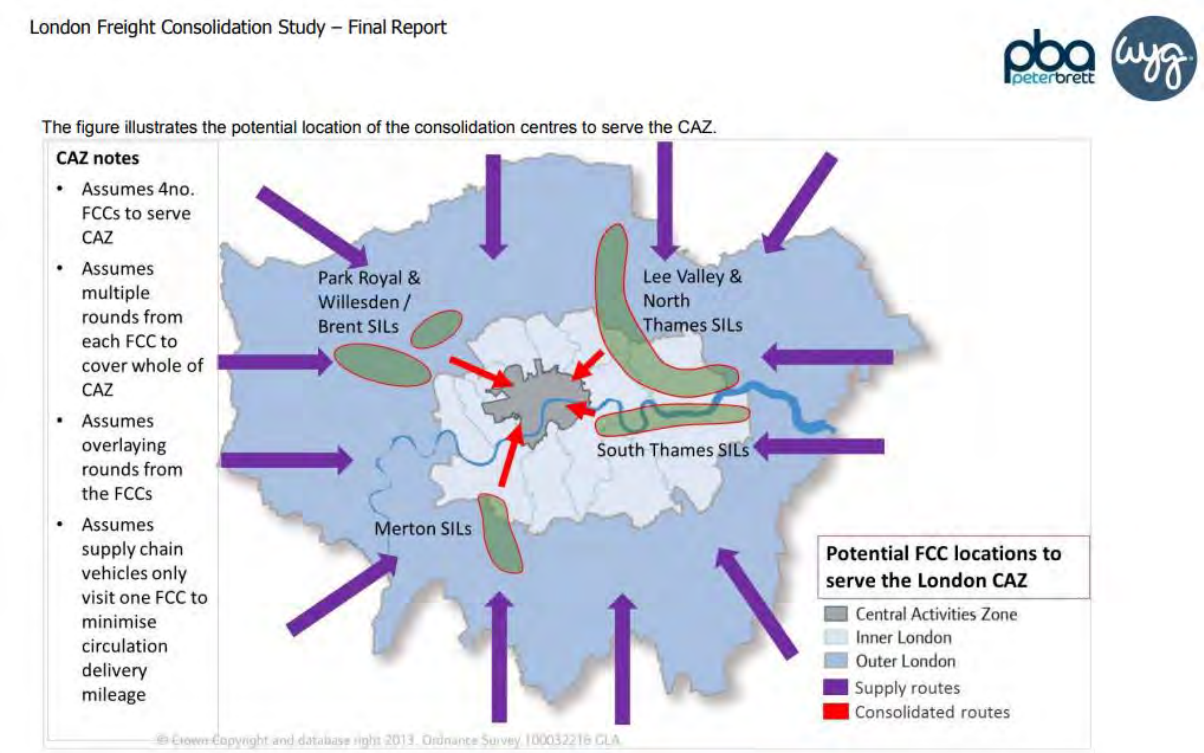


Figure 6-4 London Freight Consolidation Study

6.16 The TfL study estimated a series of significant benefits in terms of congestion reduction associated with different types of consolidation centres that could be implemented around London. These are summarised in Table 6-3 below and would be relevant in terms of their application within Barnet.

Type of Consolidation Centres	Area Coverage	Impact on Congestion	Recommendation
*"Focus on an **Opportunity Area (OA).** **This scenario envisages enforced participation** in consolidation by banning all other*	*Opportunity Area wide - i.e. serving a specific location, but one that encompasses many businesses, offices, residential properties,*	*Estimated that a **66%** reduction in delivery vehicle trips could occur compared to a baseline of no consolidation occurring.*	*The appraisal findings indicate strong potential impact for vehicle reductions. Whilst the political will required is high is it considered feasible with the area being new and therefore the ability to influence policy is easier. The financial support*

types of delivery or mandating use of a consolidation service.	*school, hospital etc.*		*required is also significant, but the mandatory participation means that with the right charging regime a break-even scenario should be possible.*
*Focus on an **Opportunity Area (OA) This scenario envisages voluntary participation in consolidation**. Participation can be encouraged through direct or inferred regulation such as road user charging, Safer Lorry Scheme, ULEZ, access restrictions by time of day and vehicle type, additional charges for certain delivery types e.g. same day.*	*Opportunity Area wide - i.e. serving a specific location, but one that encompasses many businesses, offices, residential properties, school, hospital etc.*	*An 'up to' **66%** reduction in delivery vehicle trips **could** occur. This is **likely to be lower** than the enforced participation estimate as the voluntary nature of the scheme would likely mean less businesses/organisations would participate.*	*The appraisal findings indicate reduced, but still strong potential impact for vehicle reductions compared to enforced participation. The political will required is considerably less due to the voluntary nature of the consolidation scheme. The financial support required is greater than the enforced model due to the consolidation scheme being reliant on participants seeing value in the scheme and subsequently agreeing to participate and pay for the service.*
***Preferred suppliers' approach** – area based, focussing on multi-tenanted buildings using planning conditions to enforce use of*	*Serving a specific location – City of London – one that encompasses a large number of end receivers. More suitable for*	*A trial at 22 Bishopsgate believe they can achieve a **50%** reduction in daily delivery trips*	*Now the precedent has been set by the City of London the concept should be easier to roll out as a planning condition to other similar developments. This should be applicable across all London Boroughs and*

preferred suppliers / consolidation centre for business supplies and personal deliveries.	*certain product types - i.e. ambient goods – parcels, packets, envelopes rather than bulky, heavy items and nonambient products.*		*should also be investigated as a retrospective action for appropriate developments. It is recommended that the preferred suppliers' model is pursued further.*
*Focus on **micro-consolidation and last mile logistics**. Consider systems such as 'Gnewt 2.0' with cycle logistics, UPS mobile solution etc. The City of London (CoL) was chosen as they are currently considering several locations for future use as a micro-consolidation centre.*	*Potential application across a range of locations - i.e. CAZ – potential for multiple operations, town centres across London, BID etc.*	*Estimated that an equivalent of 37 van trips into City of London would be removed at any one site. However, estimated that a higher combined number of cargo bike and e-vans would be required to undertake equivalent level of deliveries and collections.*	*The concept has been demonstrated to work effectively with both electric vans and cargo bikes – there is also scope for the Gnewt style Portering (see case study) to be incorporated in to the scheme. The biggest barrier to implementation is finding suitable premises and their subsequent cost. Therefore, TfL and the Boroughs should work to identify potential locations in particular non-traditional logistics facilities - i.e. car parks, undeveloped land etc that can be utilised even on a temporary basis for MC/LM operations.*
*Focus on **existing outer London town centres**. Retrofitting consolidation solutions.*	*Town centre wide, encompassing a large and eclectic number of retail outlets, hotels*	*In the order of **60%** reduction in delivery vehicle trips could occur. This figure would be dependent on the level of voluntary participation,*	

Consider locations such as metropolitan or major centre –	*and other businesses, offices (including local authority buildings) and residential properties.*	*but since a large area of central Croydon is due for redevelopment, planning conditions on developers could result in higher numbers of businesses/organisations participating".*	

Table 6-3 TfL's 2019 London Freight Consolidation Feasibility Study Summary

Source: TfL's 2019 London Freight Consolidation Feasibility Study

6.17 The impacts described above are in line with those reported in an earlier study (2017) by the Mayor of London on Multi-carrier central London micro-consolidation and final delivery via low carbon vehicles and multiple depots (https://www.london.gov.uk/sites/default/files/gla-agile1-finalreport-02.05.17.pdf). According to the study, compared to the situation before the business with electric vehicles and depot operations commenced, the total distance travelled, measured in kilometres per parcel, has been reduced by 52%.

6.18 Based on the LTTS suggested implementation plan the introduction of freight consolidation centres could result in a reduction in Light Goods Vehicle trips to and from Local Town Centre zones and opportunity areas in the order of 50% by the end of the assessment period. This reduction has been assumed as part of the demand management measures.

ULEZ Extension

6.19 It is currently expected that the Ultra-Low Emission Zone extension to the North and South Circulars in London will go ahead as planned by October of this year. This is likely to result in fleet changes both in terms of private and freight vehicles.

7. MODELLING ASSUMPTIONS.

Introduction

7.1 This chapter describes key modelling assumptions that have been adopted as part of the Barnet DLP Reg18 Strategic Transport Assessment. The assumptions are in part dictated by data availability and the nature of existing transport models made available by TfL Namely LoHAM. For example, the size of the zoning system in SATURN may restrict the ability of the modelled to test some type of schemes.

7.2 The assumptions relate to:

i. Profile of Households (Households) and Jobs in the LBB;
ii. Trip generation assumptions for Households trajectory and new jobs (the latter representing a proxy for employment/retail developments trip generation);
iii. Baseline mode share assumptions for new trips;
iv. Allocation of new PT trips to LUL/Rail stations;
v. Selection of orbital bus routes to be analysed and allocation of demand to the routes;
vi. ULEZ compliance of vehicles from LoHAM + (CO2 emission rates by class);
vii. PT schemes to be included in Baseline and Do-something; and
viii. Time periods for assessment AM and PM peak for a typical weekday, due to higher observed flows/demand on both the Highway and PT Network.

7.3 It should be noted that the methodology and approach to the study were discussed and agreed with TfL in October 2020. The approach, was considered suitable give the strategic nature of the study.

Housing and Jobs projections in Barnet

7.4 The LoHAM v4.2 model adopted for the study relies on socioeconomic forecasts based on LTS and therefore the Mayor's Draft London Plan.

7.5 Figure 7-1 below shows the extent of the LTS model zones in Barnet.

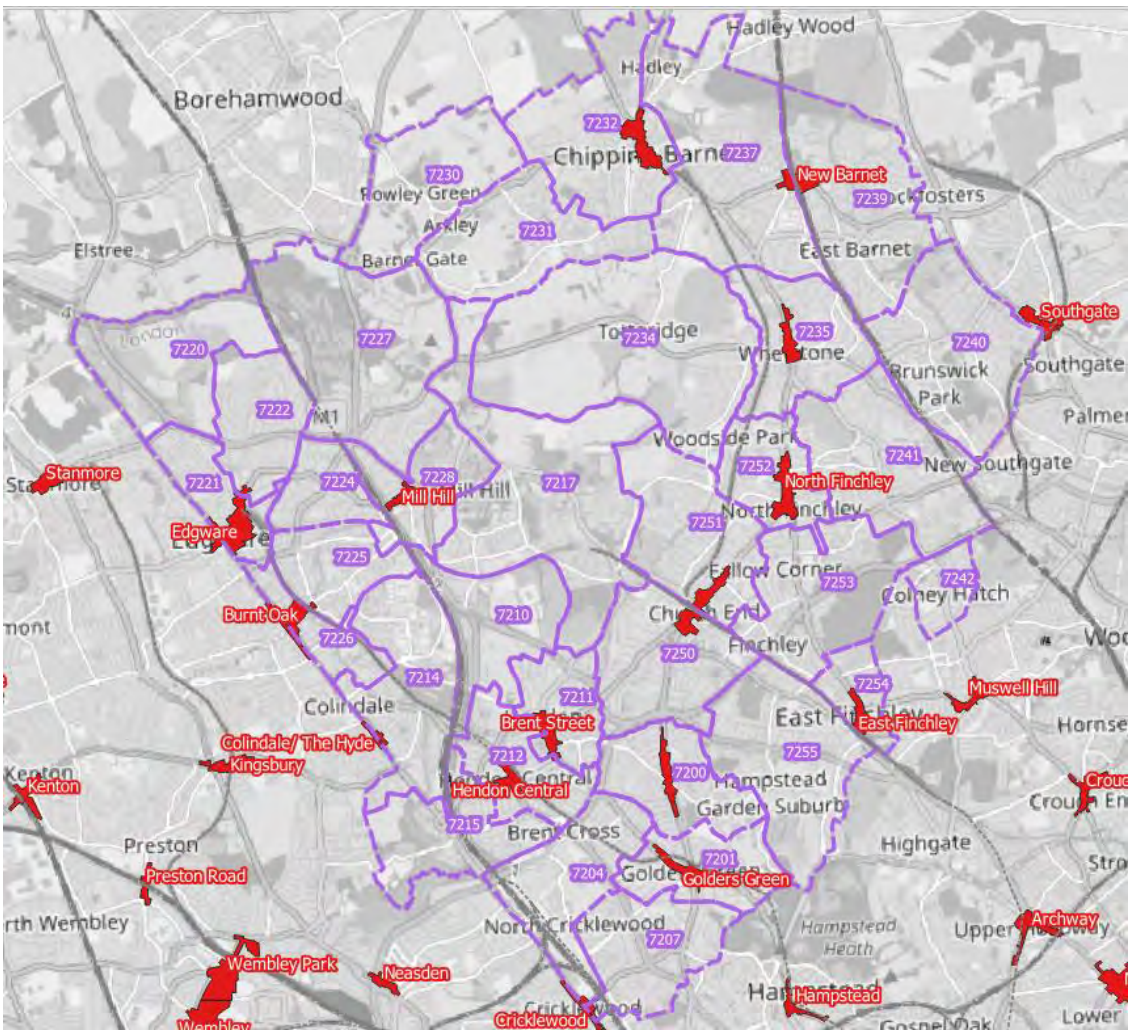


Figure 7-1 Extent of the LTS model zones in Barnet

7.6 In summary for this analysis:

- the growth assumptions for trip journeys external to Barnet (including through-trips) have been kept unchanged from TfL's LoHAM v4.2 model (based on LTS and Mayor's New London Plan March 2021);
- a review of the LTS growth assumptions for Households and Jobs against LBB's DLP Reg18 growth projections has highlighted some significant differences in the geographical distribution of growth around the borough. This has required the estimation of trip adjustment factors for the borough's LoHAM v4.2 trip matrices;
- in agreement with LBB, the total Households projections for the period 2019-2036 (+46,022) have been assumed to include +5,746 non-committed small units. It should be noted that these

small units are not included in TfL's LTS model; this explains the difference with LTS's 2019-2036 household projection of only +39,318 units;

- two separate LBB household projections have been developed in agreement with LBB and HE: committed developments only option and with all developments option;
- job growth projections data were derived from LBB's DLP Reg18 and after reviewing the LTS projections. On this basis It is therefore expected that the majority of new jobs by 2036 (approximately +24,700 out of +27,000) be allocated as follows:
    - +23,400 to LTS Zones 7204, 7212 and 7215 across the Brent Cross (BXC) area; and
    - +1,300 between Colindale and Mill Hill East (LTS Zones 7214 and 7217 respectively);
- the remaining +2,300 jobs have been split among the remaining LTS zones in line with the original LTS projections' proportions; and
- the number of jobs have been used as proxy to determine the trips generated by non-residential land uses across the borough.

7.7 Table 7-1 below compares the new job totals for the periods 2019-2036 under the three scenarios: LTS, full LBB Households projection and LBB committed Households projection. The new +27,000 jobs in Barnet are assumed to correspond to the full Households projection scenario. For the LBB committed-only schemes scenario we have adopted a downward adjustment to the number of jobs outside the BXC, Colindale and Mill Hill growth areas; this assumes that the provision of new commercial space is effectively linked to the housing developments.

Additional Jobs 2019-2036	BXC, Colindale, Mill Hill East LTS Zones only	ALL Barnet LTS Zones
LTS model	+12,300	+20,600
LBB (with full Households projections)	+24,700	+27,000
LBB (with committed-only Households projections)	+24,700	+25,800

Table 7-1 LBB comparison of job projections

7.8 In Appendix B we provide a summary of the assumed Households and Jobs growth assumptions, including forecasts from the LTS model by LTS zone system. Table 7-2 below provides a summary of the estimated growth in Households and Jobs in Barnet the under the different scenarios.

Item	Base 2019	Cumulative growth (2021)	Cumulative growth (2026)	Cumulative growth (2031)	Cumulative growth (2036)
Households - LTS model	1.00	1.03	1.11	1.19	1.25
Households - LBB (with full DLP projections)	1.00	1.03	1.13	1.21	1.29
Households - LBB (with committed-only Households projections)	1.00	1.03	1.09	1.13	1.16
Jobs - LTS model	1.00	1.01	1.06	1.10	1.14
Jobs - LBB (with full DLP projections)	1.00	1.02	1.08	1.14	1.18
Jobs - LBB (with committed-only Households projections)	1.00	1.02	1.08	1.13	1.17

Table 7-2 Growth indices for Households and Jobs in Barnet

7.9 It should be noted that the change in jobs between LBB full projection against committed-only is small due to the majority of jobs concentrated at locations with committed developments.

7.10 Figure 7-2 below shows the distribution of Households as assumed by the DLP Reg18 for the final year of 2036. As it can been seen from the map, a large proportion of these developments is located within 1km from a train or LUL station, or both. Isochrones are in (200m increments up to 1km).

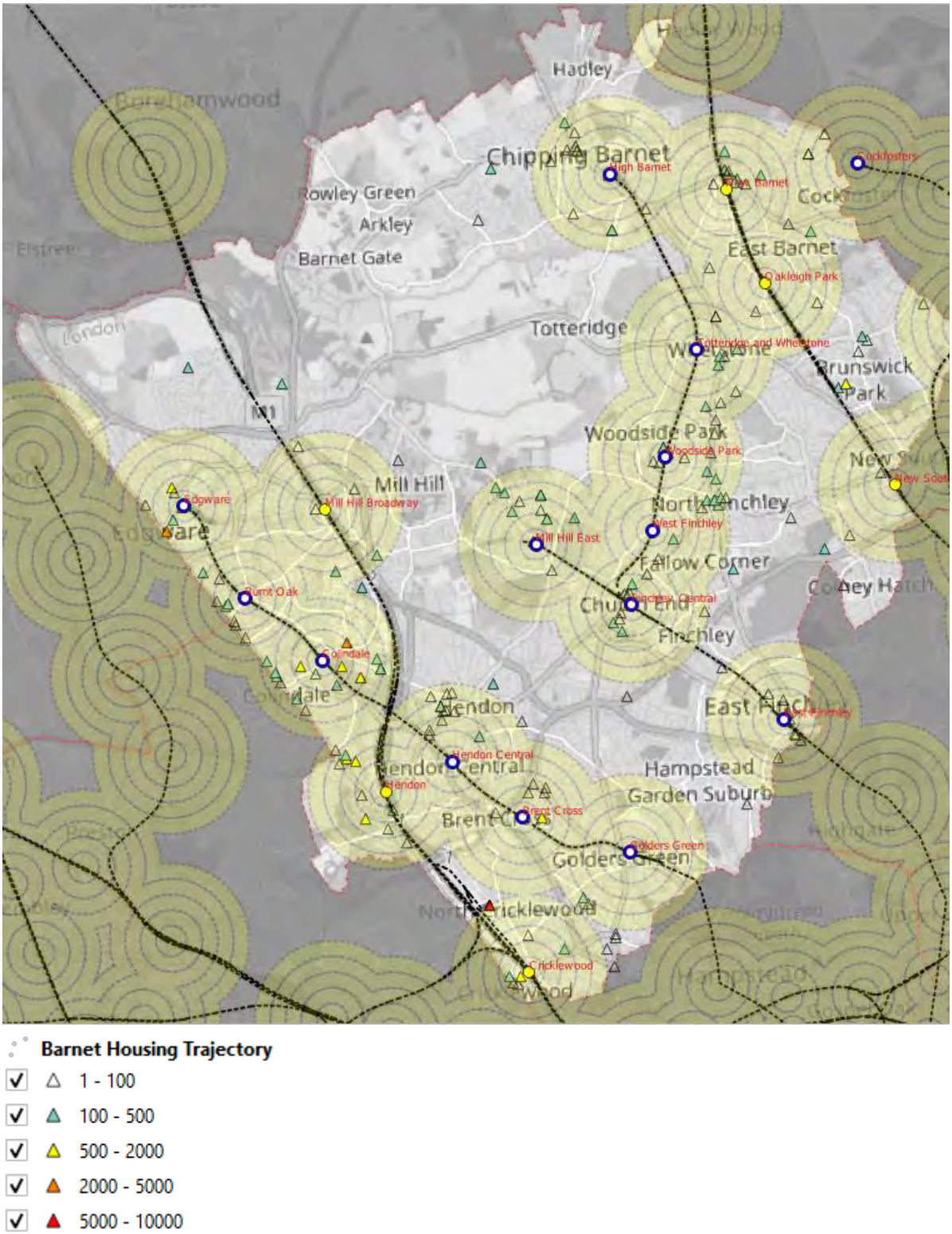


Figure 7-2 DLP Reg18 distribution of developments in 2036 in relation to Rail and LUL network (200m station's isochrones, up to 1km)

Households trip generation and Mode share estimates

7.11 The adopted household trip generation and modal share has been based on the review of a number of Transport Assessments (TAs) associated with schemes referred to within LBB's Households projections. The schemes have been selected to provide a range of PTAL values based on TfL's database by forecasting year (Baseline or 2015, 2021 and 2031). Appendix C provides a summary of the Household's person trip rates (all modes) obtained from the different TAs and the person trip rates applied to all Household's developments in LBB's projections.

7.12 From the same set of TAs we have extracted the expected mode shares. These data have been used to generate a proxy mode share model for all developments in the Borough as discussed briefly below.

7.13 TfL's PTAL estimates for 2021 and 2031 were mapped out in GIS and then allocated to the abovementioned individual developments by corresponding location. This has allowed us to calibrate a curve providing an estimate of the likely PT mode share per development based on the reported PTAL level. The curve is shown below in Figure 7-3. Using the same TAs, we have also generated a proxy model for private mode trips share versus PTAL levels.

Figure 7-3 PT Mode share vs PTAL (from selection of developments in Barnet)

7.14 For each development in LBB's Households projection, we have allocated a PTAL value by forecasting year as indicated in the table below. The curve above has been used to then estimate the likely PT share (average AM and PM peak hours) for each development. Note that the PTAL of 0 in the chart above represents PTAL value 1a whilst 1 represents PTAL value 1b.

7.15 In addition to allocating the PTAL values to each housing development according to its location, we have also applied variations in line with TfL predicted PTAL variations with time as shown on Table 7-3.

	PTAL 2015 (TfL) average	PTAL 2021 (TfL forecast)	PTAL 2031 (TfL forecast)
TfL PTAL Level applied to development by location of Households	n/a	Applied to forecast years 2021 and 2026	Applied to forecast years 2031, 2036 and 2041

Table 7-3 TfL PTAL Level applied to development

7.16 In Appendix C we have provided a summary of the PTAL assumptions by specific Households development and forecast year.

7.17 In order to avoid development-location-specific biases in terms of mode split at the lower level between bus, rail and LUL, it was decided that this breakdown be determined using 2011 census data for trips to work at Middle Layer Super Output Areas (MSOA) level. In GIS all developments have been allocated to a Census MSOA area and the sub-mode proportions have been assigned accordingly. Table 7-4 below provides a summary of the approach.

Households PT mode share	Households PT share allocation to Bus/Rail/LUL
Based on TAs review and estimation of prediction curves	Based on 2011 census trip to work data for residents of Barnet at MSOA level. This was done in order to avoid carrying over potential sub-mode share localised biases from the selected TAs. The only correction was made for the BXC development trips by using the TA mode share information.
Households Private modes share	
Based on TAs review and estimation in line with development's PTAL value	

Table 7-4 Summary of the PTAL assumptions by specific Households development

Allocation of Household person trips to Rail and LUL Station

7.18 Where PT demand is to be allocated to Rail and/or LUL station, allocation has been based on the closest station(s) to the Households development. Whilst this is a relatively simplistic approach, as trips would distribute on the network also according to their ultimate destination, any reallocation of a proportion of trips to other than the nearest station would 'balance out' or have relatively minor effects on the currently assumed distribution.

Non residential trip generation

7.19 In order to determine the amount of trips generated by non residential land uses, we have

developed an approach that estimates average trip rates per job. For this purpose we have used data from the 2014 Consented BXC TA as referenced in LBB's list of developments with associated planning applications.

7.20 Although the BXC scheme has been undergoing several revisions, such as the Rail Freight Facility and Waste Transfer Station now being authorised by separate planning permissions, the trip generation approach remains valid as it estimates typical 'trip rates per job' rather than the number of trips from the development's Gross Floor Areas. The trip rates per job are then applied to the number of jobs forecasted at LTS zone level as summarised in Appendix C. This analysis provides trip rates by type of job which we have later assumed would apply to other jobs created in the wider borough. Although this may be considered an oversimplification, we note two key analytical points:

- in the case of LoHAM highway model, the trip generation values are applied consistently to the LTS and LBB based projections to provide correction factors for the trip matrices and not absolute trip numbers; and
- for the PT trips, where demand estimates are generated directly; sensitivity tests can be carried out to determine whether the analysis results would be significantly affected by the applied trips rates or any alternative assumption.

7.21 Table 7-5 below provides summary of the estimated number of jobs created and the resulting two-way person trips per job based on the 2014 consented Brent Cross development scheme (BXC).

BXC Total Development (2014 S73 permissions)	**BXC m2 (GFA)**	**m2 per worker (GFA = GIAx1.25)***	**Estimated Jobs**	**Two-way trips AM Peak hr (from BXC 2014 TA)**	**Two-way Trips per Job AM Peak**	**Two-way Trips per 100m2 AM Peak hr**	**Two-way Trips PM Peak hr (from 2014 BXC TA)**	**Two-way Trips per Job PM Peak**	**Two-way Trips per 100m2 PM Peak hr**
Jobs Brent Cross Cricklewood (total)	**712,200**	**23.8**	**29,892**	**15,860**	**0.53**	**2.23**	**21,280**	**0.71**	**2.99**
Office	395,297	21.9	18,071	10,110	0.56	2.56	10,740	0.59	2.72
Retail & Leisure	141,197	27.0	5,230	1,870	0.36	1.32	8,680	1.66	6.15
Community (including Hospital, Rail/Bus Station and Petrol Filling Station)	53,128	21.9	2,429	2,940	1.21	5.53	1,180	0.49	2.22
Hotel	61,264	21.9	2,801	830	0.30	1.35	610	0.22	1.00

BXC Total Development (2014 S73 permissions)	BXC m2 (GFA)	m2 per worker (GFA = GIAx1.25)*	Estimated Jobs	Two-way trips AM Peak hr (from BXC 2014 TA)	Two-way Trips per Job AM Peak	Two-way Trips per 100m2 AM Peak hr	Two-way Trips PM Peak hr (from 2014 BXC TA)	Two-way Trips per Job PM Peak	Two-way Trips per 100m2 PM Peak hr
General Industrial + Storage/Distribution	61,314	45.0	1,363	110	0.08	0.18	70	0.05	0.11

Table 7-5 Estimated number of jobs created and resulting two-way person trips per job based on the 2014 consented Brent Cross development scheme

**Note: GIA data based on London Employment Sites Database 2017. GIA to GFA factor provided by Capita's architects*

7.22 From Table 7-5 for the BXC development area we have derived that on average a single job would generate 0.53 two-way person trips in the AM peak hour and 0.71 two-way person trips in the PM peak hour. The Strategic Transport Assessment assumes that for the remaining areas of Barnet, the applied trip rates per job are those relating to office workers: 0.56 two-way person trips per job (AM Peak hour) and 0.59 two-way person trips per job (PM peak hour).

7.23 An analysis of TRICS v7.2 trip rates for similar land uses (for the whole of England) has returned relatively similar average trip rates to those shown in the table above as shown in the Table 7-6 below. This suggests that the abovementioned BXC trip rate estimates can be considered appropriate in the light of potential differences in geographical settings between the London based site and the selected sites within TRICS.

TRICS 7.2 (whole of England) trip rates		AM (08.00-09.00)			PM (17.00-18.00)		
		In	Out	Two-way	In	Out	Two-way
Average (Community, Hotel, Industry, Office and Retail)	**Trips rate per job**	**0.303**	**0.163**	**0.466**	**0.333**	**0.556**	**0.888**
Average (Community, Hotel, Industry, Office and Retail)	**Trip directional share**	**65%**	**35%**	**100%**	**37%**	**63%**	**100%**

Table 7-6 TRICS v7.2 Person Trip Rates per job

7.24 The directional split of the person trips for Jobs originally assumed, as indicated in Table 7-7, has been retained on the basis of the TRICS database analysis results presented above.

Jobs person trips directional split (average)	IN	OUT
AM peak	70%	30%
PM Peak	40%	60%

Table 7-7 Directional split of the person trips for jobs

Jobs trip mode share

7.25 Jobs are allocated according to LTS zones. As a result, we have used TfL's PTAL forecasts for 2021 and 2031 and generated average PTALs values for each LTS zone in GIS. These are summarised in Appendix C. The Households PT share vs PTAL curve discussed earlier, has been used as a proxy to derive the PT and private mode shares by PTAL value for the jobs.

7.26 The PT mode share sub-allocation to Bus/Rail/LUL for each LTS zone is carried out in line with the most relevant 2011 Census MSOA area Bus/Rail/LUL split for trips to work. Unlike for Households, the mode share accounts for trips to work made by non-Barnet residents. The adopted approach although representing a simplification for specific individual developments it applies changes at a zoning system level (LTS model zones) so could not be expected to match exactly those of individual developments. By adopting the same methodology for the baseline conditions and future year scenarios, the model is expected to provide sensible macro demand changes across the Borough.

Allocation of Jobs person trips to Rail and LUL Station

7.27 Where PT demand is to be allocated to Rail and/or LUL station(s), allocation is based on the closest station(s) to the LTS zone centroid. However, the share itself is based on the PT share and MSOA bus/LUL/rail sub-shares discussed earlier. This means that if the base data shows a 0% mode share for a specific mode of transport, then no trips would be allocated to any station for that mode.

Trip Matrix Adjustments to LoHAM

7.28 Based on the differences in Households and Jobs between the LTS and LBB's DLP Reg 18 projections (committed and non-committed) and the trip generation analysis, we have determined a series of trip adjustment factors to apply to the LoHAM matrices for each forecasting year. These adjustment factors relate to the LTS trip distribution in the same year. Below we provide an example of the estimated trip adjustment factors for 2036. The adjustment factors relate to the SATURN zoning system (black boundaries) and these represent weighted values derived from the LTS zone adjustment factors based on the zoning system shown in pink.

7.29 The darker the shade of red the greater the required uplift factors. Also, areas shaded in white represent zones where, in comparison to the LTS model, trips must be factored down rather than up. Figure 7-4 shows the main differences in trip distribution against the LTS model and are on the A5 growth corridor: Edgware, Colindale and Brent Cross opportunity areas as well as in Mill Hill East. Some higher growth adjustments have also been estimated on the A1000 corridor between North Finchley and Whetstone. The adjustment factors smaller than one do not mean that there is no growth elsewhere but simply that the growth is not expected to be as high as assumed by LTS.

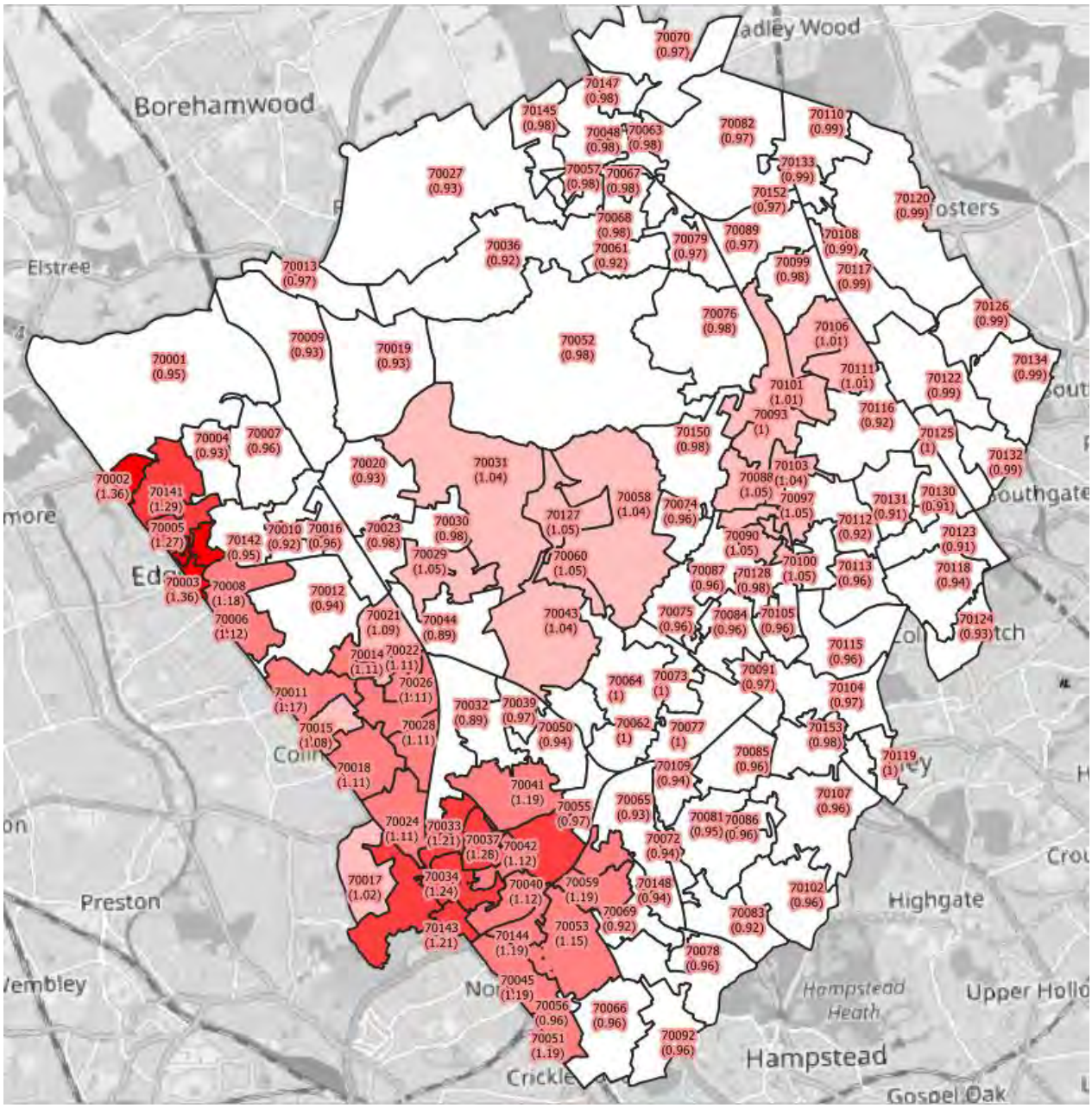


Figure 7-4 Estimated trip adjustment factors for 2036 (example)

Bus Route analysis

7.30 The analysis for demand on Bus routes focuses on travel across the Borough in an orbital direction. Bus ridership and capacity data provided by TfL provides OD information on the basis of bus loading points broadly representing bus stops along each route. On the selected orbital cross Borough routes the following process has been used:

i. TfL's bus OD points are allocated to individual LTS zones;
ii. 2018 Baseline OD matrices and resulting route loadings are estimated from TfL's bus data at LTS zone level;
iii. LTS zone based trip end growth factors are estimated on the basis of the projected new Households and Jobs related trips;
iv. forecast loadings are estimated on the basis of the matrices with the additional Households and jobs related bus trips; and
v. Further demand uplifts due to any improvements in journey time on the selected routes is estimated by the application of travel time elasticities and mode diversion factors. As we are dealing with orbital routes, it is assumed that demand would not be attracted from LUL/Rail.

7.31 Growth in demand is associated with new Households and Jobs that are used as proxies to estimate trips associated with non residential (employment and retail) land uses in the Borough. Demand analysis has focused on busiest demand periods which are weekday peak times.

7.32 The bus routes analysed include a sample as show below. Bus route maps are contained in Appendix D.

- Bus route 102
- Bus route 107
- Bus route 183
- Bus route 221
- Bus route 232
- Bus Route 240 (radial)
- Bus route 251
- Bus route 326 (radial)
- Bus route 382
- Bus Route 384 (not assessed due to incomplete BODS data)

Public Transport schemes

7.33 Based on discussion with TfL it has been assumed that:

- improvement to bus routes will be limited to generic travel time improvement tests on selected routes; and

- Crossrail2 is outside the timeframe for assessment;

- the impact of the West London Orbital WLO cannot be modelled at this stage as it is currently in the early stages of GRIP2 process (including service provision definition) and no highway demand impact assessment has been carried out. It should be noted that the previous WLO preferred option of 8tph was estimated not to have significant impacts on the public transport network in Barnet. Please refer to chapter 5 of this report for further details.

Modelling soft measures

7.34 Chapter 4 and 5 assessed the evidence relating to the impact from adopting certain "soft measures" including proposals to increase the use of active and sustainable travel, including cycling and walking, within initiatives such as healthy routes to school, low traffic neighbourhoods and the development of gateways. In addition, we have also considered managing traffic through car clubs and bus demand responsive services. These measures have been modelled in LoHAM SATURN by applying trip matrix adjustment factors as identified in Chapter 4, Table 4-3.

Use of LoHAM highway assignment traffic model

7.35 TfL's LoHAM baseline model does not include updates to A5 junctions south of the A406 nor the full zoning system. Changes to this corridor would require the coding of the wider network, including Brent Cross South (BXS), in order to replicate all route choices. Extending the model to incorporate all network changes introduced as part of the BXS development was beyond the scope of introducing reasonable key model adjustments. Particular attention was devoted instead to ensuring the that existing LTS distribution of demand was adjusted to reflect the household and job projections associated with LBB's DLP Reg18. Although we recognise this factor as a potential shortcoming of the study approach, it should be noted that the purpose of the strategic model is to provide high level indications of incremental impacts around the road network in the whole of Barnet and not to inform detailed design solutions.

7.36 Also, it should be noted that this STA provides a network-wide strategic assessment and its aim is not to assess specific projects or provide detailed solutions. As the developments are spread throughout the Borough an extensive revalidation exercise would be required to assess specific projects which would not be compatible within the constraints of this a strategic level study. As such the LoHAM models were used 'as given'.

.

8. STRATEGIC IMPACT ASSESSMENT

Overview

8.1 In Chapter 4 we have assessed the evidence relating to the potential impact from policies, proposals and initiatives (soft measures) regarding the increases in active modes including walk, cycle and bus. These were as outlined within the Draft LTTS and are in line with the Mayor's Transport Strategy. In Chapter 5 we have described the existing public transport network and the potential impact from any changes to this network including initiatives such as demand responsive bus services. Chapter 6 describes the highway network, parking controls and issues relating to freight.

8.2 This chapter assesses our evaluation of these impacts and how the existing transport networks are expected to be impacted by developments within Barnet. The assessment has been undertaken as follows:

- The public transport rail and underground networks have been assessed using an excel-based preliminary static capacity analysis to determine impact on the capacity of the network
- The public transport bus network has been analysed and in particular the provision of improved orbital routes. The impacts from these have been incorporated into the soft measures described below
- Soft measures can apply to: trips to / from and within Barnet (e.g. workplace parking levy); to trips wholly within but throughout Barnet (e.g. healthy routes to school) or to a limited number of zones e.g. gateway / low traffic neighbourhoods where the impact is specific to that locality. The impact of each soft measure has been determined from the evidence discussed in Chapter 4. Based on the extent of these initiatives we have determined their individual impact on the mode share within Barnet.
- The impact of the soft measures were also coded into the LoHAM model (by applying appropriate factors to matrices) in order to assess the overall impact on the network and the mitigation that such measures produce.
- A number, of highway-based scenarios using the LoHAM model are generated to assess developments in the borough and to determine their impact.

Trip Generation and Demand Growth

8.3 In Chapter 7 and related Appendices we have provided a summary of key assumptions relating to traffic and Public Transport demand estimation and growth; the only exception being the bus demand growth assumptions which are described under the bus assessment section in this chapter. In broad terms the scenarios tested for highway capacity purposes included: a full DLP Reg18 residential and employment/retail growth (Scenario 1), a committed-only DLP Reg18 residential and employment/retail growth (Scenario 2) and road-based demand management measures applied to Scenario 1 (Scenario 3). For public transport assessment purposes, we have only tested the full DLP Reg18 growth as it represents the more demanding scenario in capacity terms.

Covid-19

8.4 Predicting the future is particularly difficult in the context of the ongoing Covid-19 pandemic. The actions taken by Government to introduce “lockdown” measures led to a significant reduction in travel on all mechanised modes – car, bus and rail. The easing of lockdown in the summer of 2020 showed that car traffic reached pre pandemic levels but public transport use did not fully recover no doubt due to the discouragement of using bus and train and by the capacity restrictions on bus for instance and the need to wear masks etc. As we come out of lockdown during the spring of 2021 travel levels will no doubt increase but whether and when these return to pre-Covid19 levels remains to be seen.

8.5 One issue that seems likely is that there will be an increase in working from home particularly for office based workers and there has been a clear increase in the use of home deliveries which has and will likely continue to impact on the retail sector. The implications of such changes could be seen in overall levels of travel reducing or taking place at a different time or place (through for instance redistribution of destinations). The impacts are probably most likely to be seen in locations such as major City centres such as Central London and also, to a lesser extent, in regional and local centres. This could lead to lower levels of peak hour commuter travel both by car and public transport.

8.6 We have discussed these issues with a number of authorities and TfL are assessing a number of alternative scenarios. These range from a bounce back to normal scenario to a low carbon more sustainable London.

8.7 For example, discussions with Network Rail (NR) about expectations on impact of Covid-9 confirmed the level of uncertainty that there exists around the production of post-Covid-19

forecasts.

8.8 Rail usage forecasts recently produced by Network Rail, have been based on a number work-from-home scenarios, informed by travel surveys about behavioural changes (travel frequency/home working) but not different economic outlooks. Demand scenarios tested include low rail demand (white collar workers working from home 2.8 days per week, resulting in a 30% drop in demand) and medium rail demand loss scenario (white collar workers will work from home one day per week resulting in 15-20% drop in demand). NR stated that a reduction in demand would not necessarily result in a direct reduction in services. In addition, as some peak spreading has been observed, it is also unlikely that London services would be affected in terms of service frequency provision.

8.9 It should finally be noted that NR stated that these forecasting scenarios were primarily intended for 'business case purposes' and not necessarily for Planning application purpose. This means that in planning terms, maintaining growth assumptions closer to the pre-Covid-19 situation may be more appropriate in planning terms.

8.10 Based on the above discussion, the approach of testing pre-Covid-19 demand scenarios is considered to provide results which are more robust from a network capacity point of view and the Strategic Transport Assessment analysis has therefore focussed on this scenario.

Public Transport Capacity Assessment

Rail capacity Assessment

Overview

8.11 In terms of future growth, we have considered growth in association with Local Plan developments as described in Chapter 7 and the potential for background growth. In relation to background growth, the recent trends in the use of London Underground has seen a levelling off in demand since 2015 (see Figure 4 and Page 10 of Travel in London Report 12). Figure 6 of the report also shows a reduction in average trip rates. It is not clear why this would be the case but may relate to more home working (even in a pre-Covid19 world) and less shopping trips due to home deliveries. However, to allow for an increase in the use of sustainable modes including public transport and less reliance on cars reflecting the Mayor's and Borough policies then trips by Underground are likely to increase.

8.12 Policy 1 of the Mayor's Transport Strategy aims to increase the use of sustainable modes including the Underground by 27%, from 2015 to 2041, approximately a 0.9% growth per

annum. This growth rate has been applied in this assessment between 2018 (the base year for Underground trips) to 2036 the final year of the Plan period although this maybe on the high side given the levelling off in growth since 2015. In addition, further analysis by TfL at page 95 of the Mayor's Transport Strategy shows that "*People making shorter car journeys are most likely to have an alternative available, with short trips particularly prevalent in outer London*". This is more likely to result in greater use of walk, cycle and local bus rather than longer journeys using the Underground in outer London boroughs. Also, by applying the background growth assumption there is the potential for double counting of the growth from population and jobs which are separately accounted for. We do note that this is not particularly critical as we are assessing the incremental effects of the developments on the network and not the performance of stations and the network overall. It is also noted that growth assumed on the basis of the past, may well be affected by restoration to a new "normal" in a post-Covid19 world. In the situation where there is more home working then peak hour trips, particularly commuters into Central London, may well reduce or not be restored to pre-Covid19 levels.

8.13 To derive additional housing trips to stations we have determined trip rates and mode splits based on a review of significant planning applications. This has been linked to PTAL levels as illustrated in Figure 7-3. From this we have derived the share of trips by mode and then by rail. These rail trips are normally allocated to the nearest station. Whilst this is a relatively simplistic approach, as trips would distribute on the network also according to their ultimate destination, any reallocation of a proportion of trips to other than the nearest station would 'balance out' or have relatively minor effects on the currently assumed distribution. To derive additional employment trips to stations we have undertaken a similar analysis.

8.14 From the above we have assessed the impact of the developments on station elements including gate lines, passageways, stairs and platforms for situations without and with Local Plan developments. Across the stations most elements are within minimum requirements. The ticket halls on the Edgware branch are relatively spacious and currently meet all requirements. The High Barnet branch was an adopted railway from main line operations and ticket halls are far more modest reflecting a rural railway line. None of the ticket halls on the Barnet branch meet LU standards north of and including East Finchley. However, given that most ticket sales are now online and that ticket halls are not required for waiting purposes, as in a traditional concourse, then the increases in development trips is unlikely to create a significant impact on ticket halls at these locations. Table 8-1 below shows the increased level of trip making and where, as a consequence, station elements approach or exceed estimated capacities.

Station	% Increase in Passengers from Development Trips in 2036		Comments on station elements which exceed TfL defined capacities
	AM Peak Period	PM Peak Period	
Edgware	30%	32%	All station elements remain within capacity
Burnt Oak	7%	7%	All station elements remain within capacity. Passengers would benefit from the provision of step free access.
Colindale	28%	38%	The ticket hall would exceed capacity. An extra gate is currently required. The additional developments would require two extra gates to be provided. We understand that there are proposals to upgrade the station so no doubt these requirements would be satisfied.
Hendon Central	31%	41%	There is only one stairway down to the island platform and capacity would be exceeded with an additional one metre width required. In addition, an extra two gates would be required. An additional entrance utilising the existing emergency access to Queens Road would seem advisable.
Brent Cross	178%	170%	Although there is a large increase it is the least used LUL station in Barnet. The increases come from significant developments in the area. There is sufficient capacity except a requirement for an extra gate to accommodate the increase in passengers as most of these are in the counter peak direction reflecting the increase in employment in the area.
Golders Green	1%	1%	All station elements remain within capacity
High Barnet	14%	20%	The existing sub- standard ticket halls would require an additional seven square metres. In addition, an extra gate may be required at the town entrance depending on the split of passengers between this entrance and the car park entrance. The bridge to platforms 2/3 would also be at capacity although some relief may be offered by use of the ramp to Platform 1.
Totteridge & Whetstone	19%	27%	The existing sub-standard ticket hall would require an additional five square metres. The entrance from the street and between the gate

Station	% Increase in Passengers from Development Trips in 2036		Comments on station elements which exceed TfL defined capacities
	AM Peak Period	PM Peak Period	
			lines to the top of the stairs are the critical elements although they are within capacity with the development trips.
Woodside Park	14%	16%	The existing sub-standard ticket hall, used by passengers on the southbound platform, would require an additional six square metres. The entrance from the ticket hall to the gate line at about 1.2 metres is already over capacity and growth and development trips would exacerbate this. The entrance to the station ticket hall from the street is also critical but is within capacity. Users of the northbound platform have ungated access direct to street or via a public footbridge.
West Finchley	15%	22%	The existing sub-standard ticket hall would require an additional two square metres. Other station elements are within capacity. The critical restrictions would be the entrance from the street to the ticket hall, but this is within capacity.
Finchley Central	7%	7%	There is a critical area between the gate line on the east side and the stairway to the southbound platform and the stairway itself which would exceed capacity. The stairway to the northbound platform would also reach capacity in the PM. This is an existing problem and future growth would exacerbate this. There are also potential other issues here with the gateline, ticket hall capacities and station entrance but it has not been possible to determine the split of passengers between the east (gated) and west (ungated) entrances. This will need further work to determine the extent of the problem
East Finchley	5%	7%	Except for the existing sub-standard ticket hall all other station elements are within capacity. An extra gate may be required but this depends on the split of passengers between the east and west side
Mill Hill East	18%	28%	Except for the existing sub-standard ticket hall all other station elements are within capacity. The critical restriction would be the

Station	% Increase in Passengers from Development Trips in 2036		Comments on station elements which exceed TfL defined capacities
	AM Peak Period	PM Peak Period	
			station entrance itself, but this is within capacity. Increased usage of the station would occur with Saracens rugby home games which we assume is managed by staff as appropriate.

Table 8-1 Analysis of Stations and impact from Development Trips

8.15 Overall the significant impacts are at Colindale, Hendon Central and Finchley Central. At Colindale, the capacity of the ticket hall would be exceeded, and extra gates are required. At Hendon Central the existing stairway from the passageway to the island platform would be operating at capacity. At Finchley Central the station entrance on the east side is restrictive, the area between the gateline and the southbound stairway and both the northbound and southbound stairway are at or above capacity. Additional gates are identified as being required at a number of other stations. At some locations additional information is required to improve the assessment and further refinement would be achieved through dynamic analysis.

8.16 In terms of line loads, development trips have been allocated according to current boarding and alighting ratios. Table 8-2 below shows the number of people standing per square metre, during the AM peak hour on the tube network with and without development trips for 2018 and 2036.

	Persons Standing per Sq m		
Section of Line	2018	2036 Base	2036 with Development
Edgware to Burnt Oak	<1	<1	<1
Burnt Oak to Colindale	<1	<1	<1
Colindale to Hendon Central	<1	<1	<1
Hendon Central to Brent Cross	<1	1.4	2.4
Brent Cross to Golders Green	1.1	1.7	2.8
Golders Green to Hampstead	1.9	2.6	3.8
Hampstead to Belsize Park	2.1	2.9	4.1
High Barnet to Totteridge & Whetstone	<1	<1	<1
Totteridge & Whetstone to Woodside Park	<1	<1	<1
Woodside Park to West Finchley	<1	<1	<1
West Finchley to Finchley Central	<1	<1	<1
Mill Hill East to Finchley Central	<1	<1	<1
Finchley Central to East Finchley	1.0	1.6	2.2
East Finchley to Highgate	2.0	2.7	3.5

Table 8-2 Persons standing per square metre

8.17 As shown in the table above these levels of standing are lower than the maximum crowding conditions experienced on the network of up to six people standing per square metre. Nonetheless the increases will have an impact on the Northern Line as it approaches central London.

8.18 We have undertaken a similar analysis of Network Rail stations as shown in Table 8-3. This has been based on Network Rail's Station Planning Capacity Guidance, November 2016.

Rail Stations	% increase in trips (2036) from developments AM / PM	Comments
Mil Hill Broadway	36% / 42%	Analysis shows that all station elements are within capacity. The entrance to the rail station from the bus station at 1.5 metres is restrictive but within capacity. A

Rail Stations	% increase in trips (2036) from developments AM / PM	Comments
		total of five gates are required in future (there are two gates at the car park entrance and 3 at the bus station entrance) but further analysis of passenger movements is required to determine the use of these two entrances.
Hendon	100% / 172%	The majority of this increase is due to work trips arriving at the station and are therefore typically in the counter peak direction. The northbound stairway is at capacity in the PM peak to clear all arrivals within two minutes. The critical location though is between the stairway to the southbound platform and the exit to the street, at one metre width, or to and from the ticket hall. This circulation area and the exits and entrances to it would be over capacity in the PM.
Cricklewood	16% / 19%	An additional gate is required. The critical location is the station entrance with a limited width of one metre and this would be over capacity.
New Barnet	24% / 28%	An additional gate is required one on each platform to enable arriving passengers to clear within two minutes.
Oakleigh Park	26% / 30%	Access to the platforms is via a public footbridge. Although this would still be within capacity this excludes any public use of the footbridge and this would require further data and checks.

Table 8-3 Impact at Network Rail stations

8.19 Table 8-4 shows that improvement works would be required at entrances to both Hendon and Cricklewood stations.

8.20 From line load information we have on Thameslink the additional trips can be accommodated although seat capacities would be exceeded. We do not have similar data for the services through Barnet and Oakleigh Park.

South of:	Increase in trips from Developments in 2036	Ratio of demand to seats
Mill Hill Broadway	10%	1.16
Hendon	18%	1.00
Cricklewood	16%	1.16

Table 8-4 Development trip increases on Thameslink

Bus Measures

8.21 As discussed in Chapter 5, we have identified and assessed a number, of orbital and two radial bus routes. In this chapter we report the impact that potential route improvements could have in terms of abstracting demand from car and contributing towards increasing LBB's overall sustainable modes share growth for travel. As indicated in Chapter 5, the existing bus loading demand analysis concluded that the assessed routes do not present particular capacity problems.

8.22 Based on LBB's DLP Reg 18 household (proxy for population growth) and jobs (proxy for non-residential development trips) forecasts, we developed bus demand growth rates applicable at LTS zone level in Barnet. It should be noted that the growth scenario tested here refers to the full Households and Jobs projected scenario which is more demanding in bus capacity terms than the committed-only developments scenario. The growth rates were then applied to TfL's 2018 Bus Origin Destination Surveys demand data (BODS); depending on the relative location of the bus stops. Once again, we note that this assessment is based on pre-Covid-19 demand growth projections which do not account for increased levels of home working.

8.23 In terms of bus demand growth for zones outside Barnet, we have adopted growth rates extracted from the Mayor's Transport Strategy's background documentation (https://content.tfl.gov.uk/mts-challenges-and-opportunities-report.pdf), see also Table 8-5. According to the Transport Strategy under the reference scenario (or Option 1), bus demand growth in London is going to be in line with that of population and can therefore be expected to follow the trend indicated in the table immediately below. The baseline scenario was selected from the Mayor's Transport Strategy because it provides more conservative growth in PT travel estimates and therefore more robust highway capacity assessment scenarios. Furthermore, as previously discussed in Chapter 5 and subsequently below, the bus routes analysed in this

assessment are not expected to present capacity problems.

Bus Demand Growth Mayor Transport Strategy Option1 or reference Case	2015-2041 Growth	Annual Growth
Outer London	22%	0.77%
Inner London	11%	0.40%

Table 8-5 Bus Demand Growth Mayor's Transport Strategy

8.24 Based on the above we derived AM and PM peak demand growth indices which are summarised below in Table 8-6 and Table 8-7, respectively.

Bus Demand Growth Indices by Area – AM Peak	Bus growth 2018/19 (AM)	Bus Growth 2021 by LTS area (AM)	Bus Growth 2026 by LTS area (AM)	Bus Growth 2031 by LTS area (AM)	Bus Growth 2036 by LTS area (AM)
LBB (Average)	**1.00**	**1.02**	**1.09**	**1.16**	**1.22**
Haringey (Borough), Mayor's Transport Strategy-based	1.00	1.02	1.06	1.10	1.15
Enfield (Borough) , Mayor's Transport Strategy-based	1.00	1.02	1.06	1.10	1.15
Harrow Wealdstone (Borough) , Mayor's Transport Strategy-based	1.00	1.02	1.06	1.10	1.15
Hertsmere (Mayor's Transport Strategy-used as proxy)	1.00	1.02	1.06	1.10	1.15
Islington (Borough) , Mayor's Transport Strategy-based	1.00	1.01	1.03	1.05	1.07
Brent (Borough) , Mayor's Transport Strategy-based	1.00	1.02	1.06	1.10	1.15

Table 8-6 Bus Demand Growth Indices by Area – AM Peak

Bus Demand Growth Indices by Area – PM Peak	Bus growth 2018/19 (PM)	Bus Growth 2021 by LTS area (PM)	Bus Growth 2026 by LTS area (PM)	Bus Growth 2031 by LTS area (PM)	Bus Growth 2036 by LTS area (PM)
LBB (Average)	**1.00**	**1.03**	**1.10**	**1.19**	**1.25**
Haringey (Borough), Mayor's Transport Strategy based	1.00	1.02	1.06	1.10	1.15
Enfield (Borough), Mayor's Transport Strategy based	1.00	1.02	1.06	1.10	1.15
Harrow Wealdstone (Borough), Mayor's Transport Strategy based	1.00	1.02	1.06	1.10	1.15

Hertsmere (Mayor's Transport Strategy used as proxy)	1.00	1.02	1.06	1.10	1.15
Islington (Borough), Mayor's Transport Strategy based	1.00	1.01	1.03	1.05	1.07
Brent (Borough), Mayor's Transport Strategy based	1.00	1.02	1.06	1.10	1.15

Table 8-7 Bus Demand Growth Indices by Area – PM Peak

8.25 Having applied the demand growth rates shown above to the 2018 TfL's bus origin destination data, the analysis of the resulting bus loading still indicated no particular capacity problems within Barnet along the assessed orbital and radial routes. Further to this, we have assessed the introduction of improvements to the selected bus services. These improvements include:

Assumed bus service improvement measures
Generic bus priority route improvement schemes (bus priority measures at junctions, contra flow lanes, new bus lanes, etc) with the result of reducing In-Vehicle-Travel-Time (IVTT) by approximately 10% (excluding the impact of dwell times at stops). For end-to-end journeys of 60-90 minutes, this would represent a saving of approximately 6-9 minutes that could be realistically be achieved by a combination of interventions at junctions and other bottlenecks. This is accompanied by retention of the existing service frequencies as described in Table 5-6. It should be noted that the time savings have been applied to the IVTT netting out the time spent at each bus stop (15sec approximately for boarding time on average). Based on research on the subject this estimate can be considered to be on the conservative side (https://www.sciencedirect.com/science/article/pii/S2095756415305766).
Additional 4bph per direction per route of Express-type services benefitting from the bus measures discussed above and a reduced number of stops; allowing faster end to end travel times. These services would broadly follow the same route of the existing services. It should be noted that each removed stop has been assumed to contribute to a saving of 15sec (representing the average boarding time).

Table 8-8 Assumed bus service improvement measures

8.26 By implementing such improvements, we have estimated typical travel time savings for an end to and journey along a route. These are expressed in terms of savings in generalised travel minutes which are estimated as follows for each option: IVTT (min) x 1.0 + Walk Time to bus Stop (min) x 2.0 + Average Wait Time (min) x 2.0. Walk times and wait times are multiplied by 2.0 as people dislike 1min spent waiting or walking more than 1min spent in the vehicle travelling.

8.27 Table 8-9 below provides an estimated summary of the end to end savings per route. However, in order to allow for the fact that people would travel different distances and that they would

also have to pay a bus fare, in proportional terms the generalised time savings would be lower. For this reason, in order to maintain a robust approach, we have reduced the average expected time saving by 50%.

Bus Route and Time period	Current Generalised Travel Time (Min)	Improved Generalised Travel Time (Min)	Generalised Time variation
102	Edmonton Green Bus Station - Brent Cross Shopping Centre		
Peak Times (Weekday)	116.6	106.3	-8.8%
107	Edgware Bus Station - New Barnet Station		
Peak Times (Weekday)	78.8	69.6	-11.7%
183	Pinner Station - Golders Green Station		
Peak Times (Weekday)	83.6	76.3	-8.7%
221	Turnpike Lane Bus Station - Edgware Station		
Peak Times (Weekday)	86.6	78.7	-9.1%
232	Mitchell Way - Turnpike Lane Station		
Peak Times (Weekday)	98.0	87.3	-10.8%
240	Edgware Bus Station - Golders Green Station		
Peak Times (Weekday)	65.8	58.1	-11.7%
251	Arnos Grove Station - Edgware Station		
Peak Times (Weekday)	65.0	59.4	-8.7%
326	The Spires - Brent Cross Shopping Centre		
Peak Times (Weekday)	81.9	73.9	-9.8%
382	Southgate Station - Millbrook Park		
Peak Times (Weekday)	71.7	63.7	-11.2%
Average (ALL Routes)			
Peak Times (Weekday)			**-10%**
50% of average generalised travel time savings			**-5.0%**

Table 8-9 Estimated summary of the end to end time savings per bus route

8.28 Based on the 2018 report by RAND Europe on *Bus Fares and Journey Time Elasticities and diversion factors for all modes of travel – a rapid evidence assessment report* (report produced for the UK Department for Transport) , we have estimated the average bus demand uplift related to car abstraction as being equivalent to +1.0%. The bus demand uplift has been calculated as follows: Generalised Travel Time saving (-5%) x IVT elasticity (-0.6) x car diversion factor (0.3). The selected car diversion factor provides the proportion of the demand uplift associated with car users. In this particular case, the selected diversion factor represents the recommended

bus intervention abstraction value (from another mode) associated with the Metropolitan with No Light Rail (or LUL) competition scenario. This scenario was selected on the basis of the nature of the bus routes being assessed which are not in competition with LUL.

8.29 The bus demand uplift of 1%, demand abstracted from car, has been applied to the 2036 baseline bus demand forecasts. The resulting number of new bus users (previously car users) has been used to estimate trip matrix adjustment factors in LoHAM v4.2 highway assignment model. These factors have been applied to SATURN in terms of Origin Destination pairs and form part of the package of road-based travel management measures.

8.30 It should be noted that, although BODS data confirm that peak demand happens on all selected bus routes during working days, this demand peaks outside the 8.00-09.00 and 17.00-18.00 hours, which correspond to the typical highway assignment peak hours. In order to test the impact of the DLP Reg18 growth on bus capacity, we have identified the actual bus peak times using the BODS data. The table below shows when bus demand peaks by route, both in the morning and in the evening or afternoon. The table also provides the ratio between the bus demand at its actual peak vs the demand observed during the 08.00-09.00 and 17.00-18.00 hours.

Route	AM Peak hr (Highway demand)	AM Peak hr (Bus demand)	Bus Demand (Bus peak hr to highway peak hr demand ratio) AM	PM Peak hr (Highway demand)	PM Peak hr (Bus demand)	Bus Demand (Bus peak hr to highway peak hr demand ratio) PM
102	08.00-09.00	07.30-08.30	1.13	17.00-18.00	15.15-16.15	1.42
107		07.15-08.15	1.57		15.15-16.15	1.41
183		07.45-08.45	1.05		15.15-16.15	1.33
221		07.30-08.30	1.14		15.15-16.15	1.52
232		07.45-08.45	1.09		15.15-16.15	1.22
240		07.15-08.15	1.47		15.45-16.45	1.62
251		07.15-08.15	1.36		15.15-16.15	1.19
326		07.30-08.30	1.13		15.15-16.15	1.34
382		07.30-08.30	1.33		15.00-16.00	1.12

Table 8-10 Selected bus routes actual peak hours

8.31 In relation to the potential impact that the additional bus demand growth could have on the assessed services, the results are shown in the charts in Appendix D and demonstrate that there would not be particularly severe capacity problems in 2036.

Road Based and Demand management measures

8.32 The effects of the road based and demand management measures (soft measures) need to be seen in the context of overall road travel in Barnet. Table 8-11 below shows the peak hour trip movements within Barnet from the LoHAM 2016 matrices.

Trips to and from Barnet and those through the borough			
Areas	**AM**	**PM**	**Description**
Barnet	16589	16651	Trips internal to the Borough
Haringey	2538	2278	Trips to & from Haringey to Barnet
Enfield	4140	4079	Trips to & from Enfield to Barnet
Other areas	22124	23718	Trips from elsewhere to & from Barnet
Total	45390	46726	

Table 8-11 2016 Summary of LoHAM matrices relating to Barnet.

8.33 As shown about a third of all trips are movements within the borough. The remainder are trips which are going to and from other boroughs (Haringey and Enfield are shown as examples) and other areas. In addition, there are trips which are going through the borough including those travelling outside of London. Soft measures would only largely impact upon those trips being made within and some to / from Barnet and the majority of trips on the road network within the borough would be unaffected. However, although not tested in this Strategic Transport Assessment, it would be reasonable to assume that a future scenario could actually include a roll-out of similar measures in neighbouring boroughs. This would further contribute to traffic reduction on the overall road network.

8.34 In assessing the impact of many of the soft measures it is clear that measures to control the use of car would also be required. These would include extending the coverage of CPZ's, reducing the level of off-street parking for instance at stations and at other locations as discussed in Chapters 4 and 6. In addition, restricting parking availability would be achievable through the planning process.

8.35 The estimated impact of the soft measures in attracting trips from car to other modes is shown

below. Table 8-12 summarises the impact of soft measures on mode share estimated for the end of the Plan period, 2036.

Measure	Description	Impact in 2036
Healthy Routes to School	This initiative including encouraging active modes, restricting parking near schools and where possible introducing school streets.	We estimate that this could reduce the car mode share to schools from 36% to 25%. This 30% reduction would only apply to education trips (which account for about 32% and 10% of trips in the AM & PM peaks respectively) and reduce the car trips in and to and from Barnet, which amount some 40,000 per hour, by 3.5% in the AM peak and 1.1% in the PM.
Cycle Network	The cycle network strategy would focus on areas of high demand such as along the A5, A1000 corridors and east west connections. In addition, there will be local connections including across parks and quiet streets	We estimate that where there are high levels of segregation and cycle route priority then a mode share of 5% from car can be achieved. On other more local connections and where high levels of segregation and priority are not readily achievable then the mode shift would be reduced. We also believe that the use of bikes will increase reflecting the green and health agendas. On balance we assume a mode share of 2.5% from car
Workplace Parking Levy	A workplace parking levy introduced in the same way as is applied in Nottingham would reduce the number of available car parking spaces.	This would reduce work trips by car to work by 5%. As work trips only account for 35% and 38% of car trips in the AM and PM peaks respectively then the overall mode share from car would be approx.1.8%
Low Traffic Neighbourhoods	On the LTTS proposals map some 15 LTN's are proposed. Evidence shows that traffic levels in an LTN reduces by some 10%	Traffic within and to and from the LTN's are reduced by 10%. The LTN's would only cover 2% of zonal movements in Barnet and hence would lead to a mode share from car of approx. 0.2%.

Measure	Description	Impact in 2036
Gateways	Gateways at stations are proposed improving the public realm and interchange between active modes and bus. It would need to include increased parking for cyclists, improved cycle routes to stations and increased car parking controls where appropriate.	Traffic would be affected to and from the gateway zones only – mainly the 19 stations within Barnet. This leads to a mode share from car of 1.5% from a combination of a significant increase in secure parking and from improved cycle connections.
Car Clubs	The evidence is that car clubs are cost effective where population densities are highest. These tend to be on the west and south of the borough and appropriate wards have been identified.	A car club member would typically use a car some 10% less than a non-member resulting in a 3.5 % reduction in car use in the affected wards which cover 42% of zones in Barnet. Overall, this would reduce trips within Barnet by some 1.5%.
Express orbital bus services	We have identified several routes where express services could be provided and could be expected to reduce bus journey times by some 10% and attract a 1% uplift from cars	These would be on selected routes and overall would reduce the overall mode share to car by 0.2%
Demand responsive bus (DRB) services	The LTTS identified several locations to the North of the borough with low connectivity and where DRB services may benefit. These would provide services from these areas to local centres.	Traffic would be affected to and from these areas to the north of the borough to local centres. This would lead to a mode share from car of 0.1%.
Local Town Centre Consolidation Centres	Potential for implementation of Local Town Centre Consolidation Centres for last mile operations	LGV traffic to/from the Local Town centres would be reduced by 50%. This is not a network wide impact but one focussing on specific trips. This would lead to an overall reduction of 5% of LGV trips in Barnet in 2036.

Table 8-12 The impact of soft measures on mode share

8.36 Those measures which apply more widely across the Borough e.g. Healthy Routes to School, the Workplace Parking Levy, Car Clubs and the provision of a comprehensive cycling network linked to Gateways would have the highest impact. Those which are more specific to areas such as Low Traffic Neighbourhoods and Demand Responsive bus services would be expected to have a lower overall impact. The impacts described above have also been incorporated and tested in the LoHAM model and the effect on the highway network is discussed below.

Highway Capacity Assessment

Overview

8.37 The highway capacity assessment was carried out using TfL's LoHAM v4.2 highway assignment model for London, based on the industry standard SATURN software.

8.38 LoHAM v4.2 highway assignment model covers the whole of London and allows the impact of infrastructure and travel demand changes to the highway network to be tested. As discussed in the assumptions chapter 7, the review of LoHAM's v4.2 LTS-based traffic model indicated the need to revise the distribution of demand growth within the borough and to include a small number of infrastructure schemes which are considered as committed. In Table 8-13 below we provide a summary of the modelled scenarios developed for this assessment following this review. It should be noted that the LoHAM's v4.2 LTS-based traffic model for 2021 was used to check how well the models predict recent (pre-Covid19) levels of congestion in Barnet.

Scenario	2021	2026	2036
TfL's Original LTS-based Model	**Yes**	**Replaced by new baseline or Scenario 2**	**Replaced by new baseline or Scenario 2**
Scenario 1 (Full DLP Growth)	n/a	Full LBB's Households+Jobs growth in Barnet + ULEZ extension + West Hendon public realm changes	Full LBB's Households+Jobs growth in Barnet + All ULEZ compliant vehicles + West Hendon public realm changes + MML bridge off A5 at Brent Cross

Scenario	2021	2026	2036
TfL's Original LTS-based Model	**Yes**	**Replaced by new baseline or Scenario 2**	**Replaced by new baseline or Scenario 2**
Scenario 2 (Baseline Scenario or Committed Developments only)	n/a	Committed LBB's Households+Jobs growth in Barnet + ULEZ extension + West Hendon public realm changes	Committed LBB's Households+Jobs growth in Barnet + All ULEZ compliant vehicles + West Hendon public realm changes + MML bridge off A5 at Brent Cross
Scenario 3 (Full DLP Growth + Demand management)	n/a	Scenario 1 + Highway Demand management strategies	Scenario 1 + Highway Demand management strategies

Table 8-13 Summary of the modelled scenarios

8.39 It should be noted that by 2036, all vehicles are assumed to be ULEZ compliant in the LoHAM v4.2 model. This is in line with the Mayor's Transport Strategy as discussed previously. Also, it is worth noting again that whilst the Brent Cross Cricklewood Area Indicative Construction Phasing (ICP) of January 2020 estimates the completion of the Midland Mainline Bridge in 2026, the LoHAM model for the same year did not include the scheme nor did highlight any issues with the local A5 network. As such the omission from 2026 of the MML bridge is not considered to have a material impact on the assignment results.

Traffic Growth

8.40 As indicated in Chapter 7, a review of TfL's LoHAM 4.2 model has required an adjustment of the future trip matrices due to, primarily, differences in the spatial allocation of growth around the borough. A comparison of the LTS and LBB's DLP Reg18 full growth scenarios indicated in fact that whilst the quantum of new households was broadly similar, the latter proportioned more growth along the A5 corridor from Edgware to Brent cross. A comparison of the households and jobs growth rates is included in Table 7-2.

V/C analysis at junctions – network performance

8.41 The SATURN model determines a number of attributes including traffic flows, queue lengths, total junction delay, level of saturation, congestion (delay PCU/hrs). The model determines the levels of congestion based on the volume / capacity ratio at junctions. It is assumed that when the V/C is at or less than 85%, equivalent to the practical capacity, then the network is performing at an acceptable level.

8.42 Our analysis below has assessed the impact that the Full DLP Reg18 growth would have on the network and what demand management measures could achieve in terms of reducing capacity issues on the network. The impact of the full demand growth has been assessed against the committed or baseline growth. Also, no non committed infrastructure schemes have been tested as part of our analysis.

8.43 When comparing scenarios, where there are increases on the network beyond 85% then the following impact significance criteria have been defined as shown in Table 8-14.

Level of Negative Impact	***Resulting V/C <85%***	***Resulting V/C 85%-89.99%***	***Resulting V/C 90%-97.99%***	***Resulting V/C >=98%***
V/C increasing by <2% points	*Not Significant*	*Not Significant*	*Not Significant*	*Not Significant*
V/C increasing by 2-4.99% points	*Not Significant*	*Minor*	*Minor*	*Moderate*
V/C increasing by 5-9.99% points	*Not Significant*	*Minor*	*Moderate*	*Major*
V/C increasing by > 10% points	*Not Significant*	*Minor*	*Major*	*Major*

Table 8-14 Junction Capacity Negative Impact Severity Measures

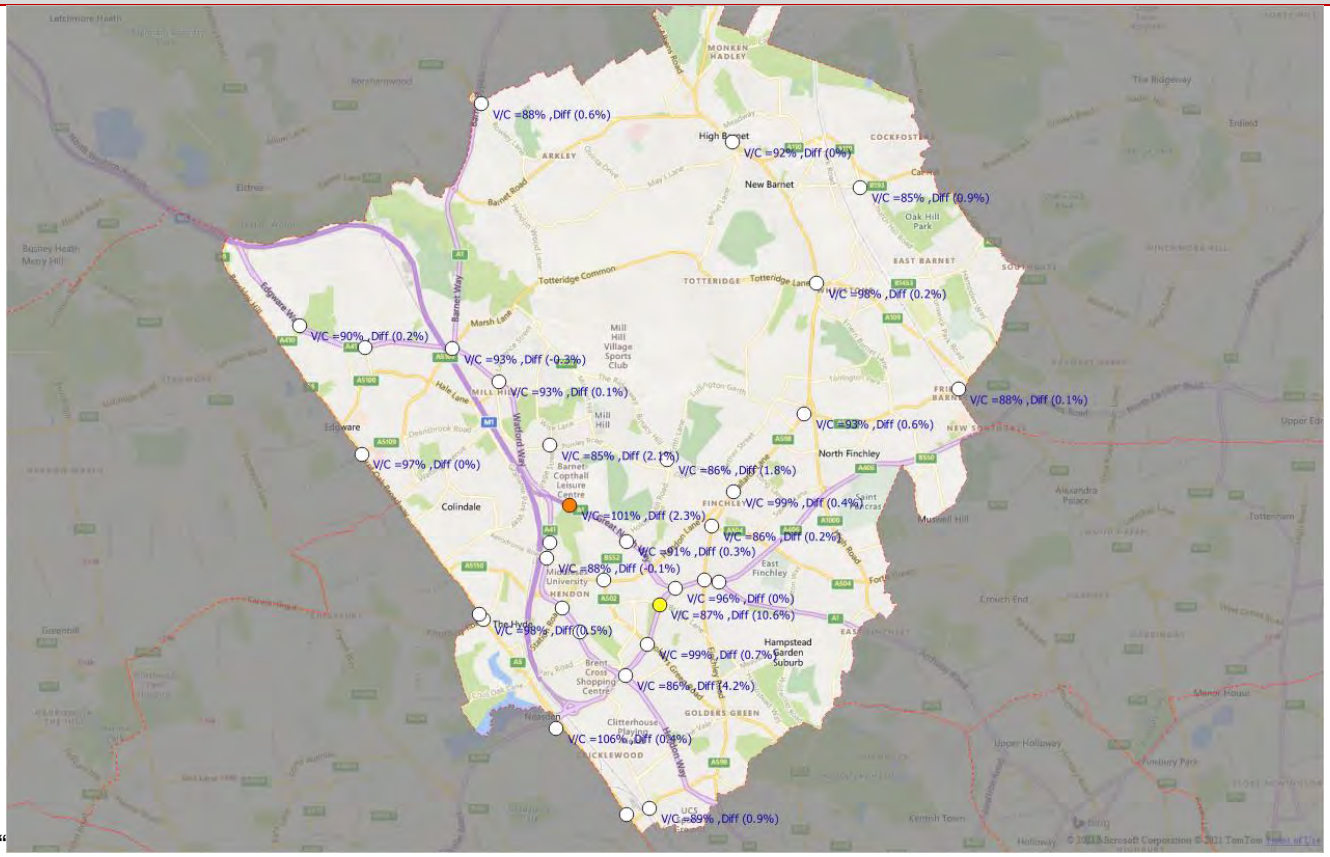
8.44 Where infrastructure improvement or road-based demand management measures are implemented we would expect to observe improvements in network performance. These have been classified yet again in terms of changes in V/C levels as indicated in Table 8-15 below.

Level of Positive Impact	***Starting V/C <85%***	***Starting V/C 85%-89.99%***	***Starting V/C 90%-97.99%***	***Starting V/C >=98%***
V/C decreasing by <2% points	*Not Significant*	*Not Significant*	*Not Significant*	*Not Significant*
V/C decreasing by 2-4.99% points	*Not Significant*	*Minor*	*Minor*	*Moderate*
V/C decreasing by 5-9.99% points	*Not Significant*	*Minor*	*Moderate*	*Major*
V/C decreasing by > 10% points	*Not Significant*	*Minor*	*Major*	*Major*

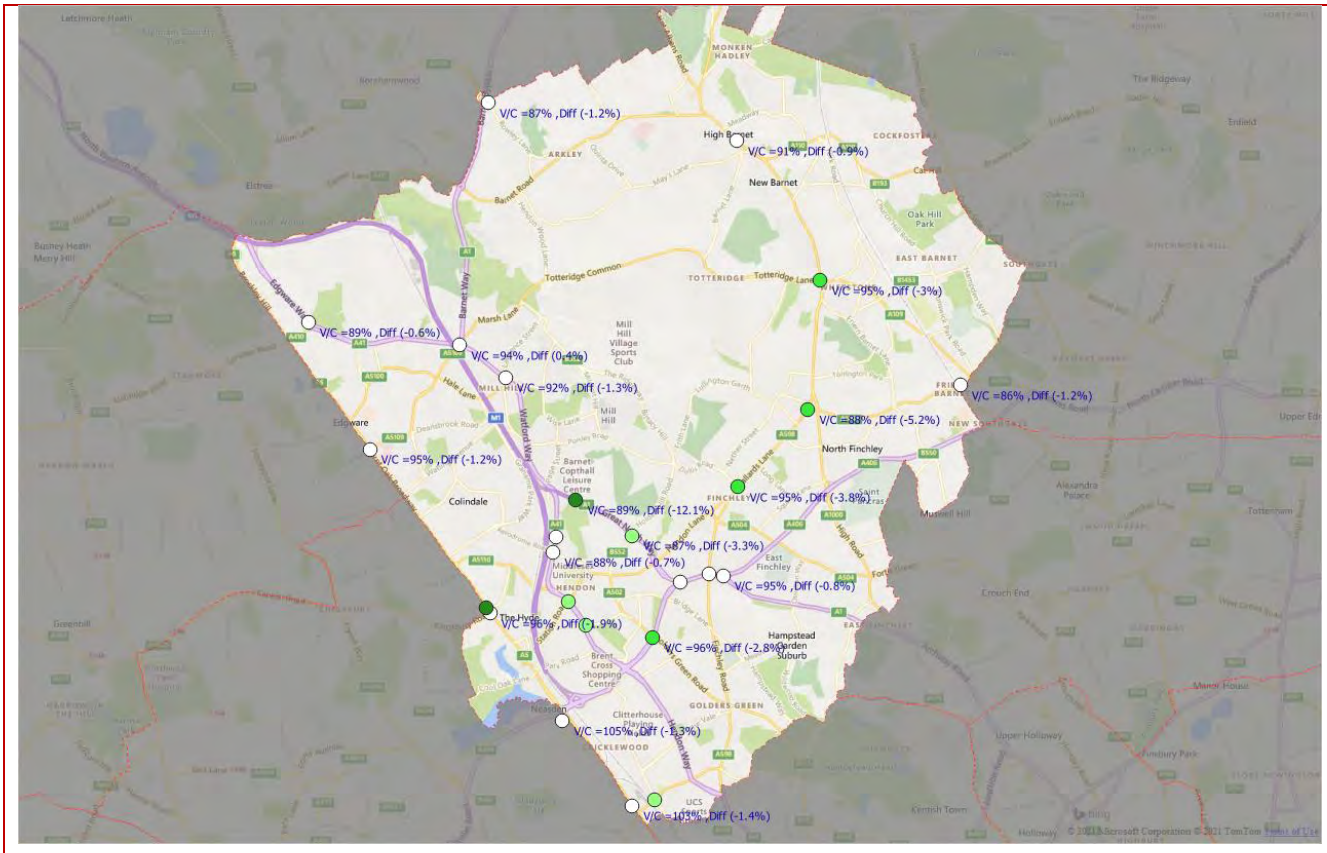
Table 8-15 Junction Capacity Positive Impact Severity Measures

8.45 In Table 8-16 and Table 8-17 below we compare the 2026 AM and PM peak impacts of the DLP Reg18 full development growth (Scenario 1) against the Baseline (committed) development growth (Scenario 2) and then the impact of the Highway Demand Management measures with the full DLP Reg18 demand growth situation (Scenario 3) against Scenario 1. It should be noted that whilst the colour codes of the impacts reflect those from the impacts scoring tables described above, the diagrams always report the V/C of the scenario being assessed and not that of the reference scenario.

2026 AM Peak Impact of Full DLP reg 18 Development on junction Capacity (Sc 1 vs Sc 2)



2026 AM Peak Impact of Highway Demand Management Measures on junction Capacity (Sc 3 vs Sc 1)



Results from the diagrams above show that in the AM peak in 2026:

- Even with the full DLP Reg18 Households and Jobs projections a number of junctions, in the majority of instances already showing V/C values greater than 0.85, would show only a Non-Significant impact. Furthermore, the combined demand management measures would result in a Moderate positive impact at junctions along the A598 Ballards Lane.
- At the junction between Bell Lane and the A406 North Circular Road, the full DLP Reg 18 growth would result in a Minor adverse impact with an increase of V/C by 10% to V/C 87%. However, the combined demand management measures would reduce the V/C to levels below 85%.
- At the merge between the M1 SB off slip and the A1, the Full DLP Reg18 growth would result in a Moderate adverse impact with an increase in V/C of 2.3% points to 101%. However, the combined demand management measures would result in a Major positive impact by reducing the V/C down to 89%, i.e. below baseline levels.

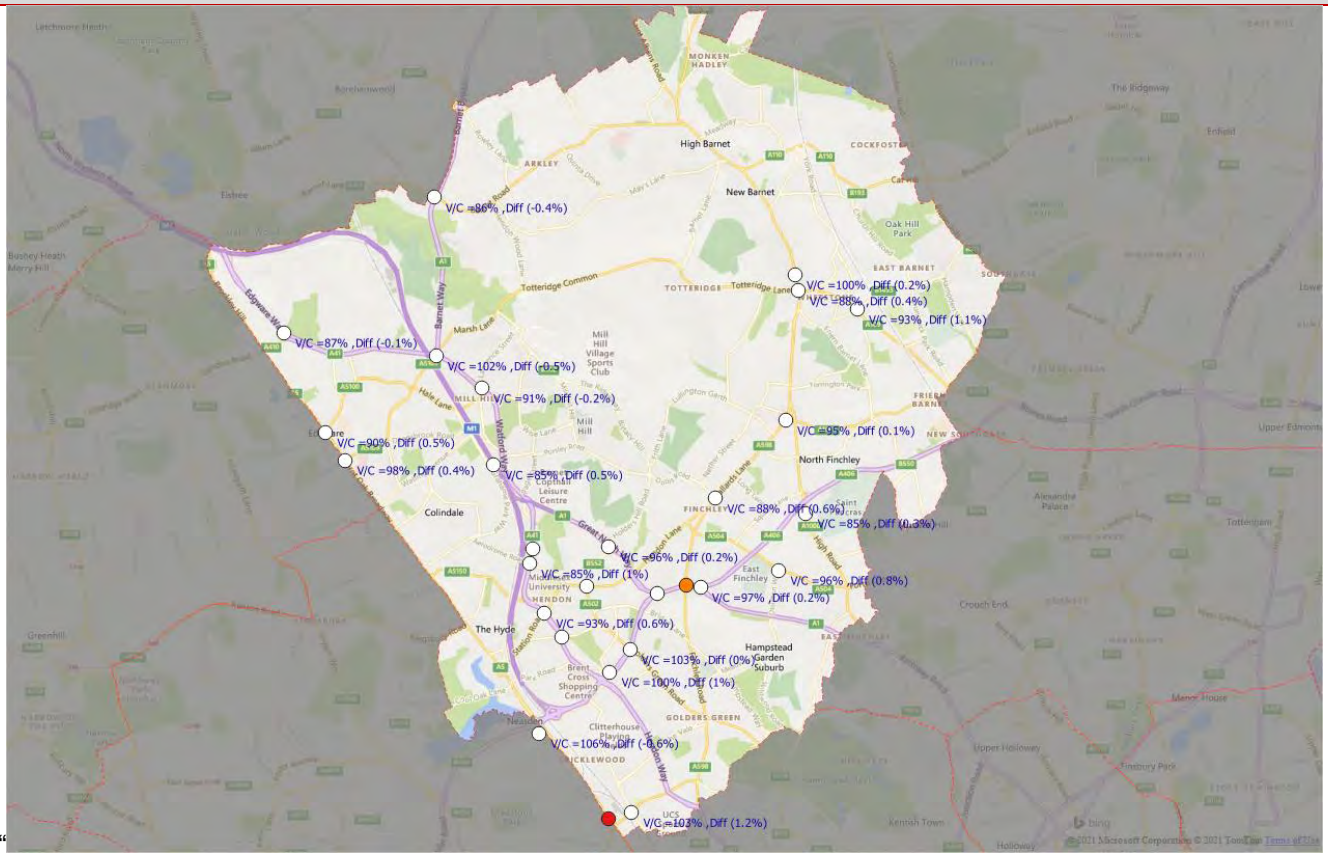
Summary:

- The majority of junctions operating at V/C already higher than or just under a V/C value of 85% would see Non-Significant changes as a consequence of the full DLP Reg18 demand growth.

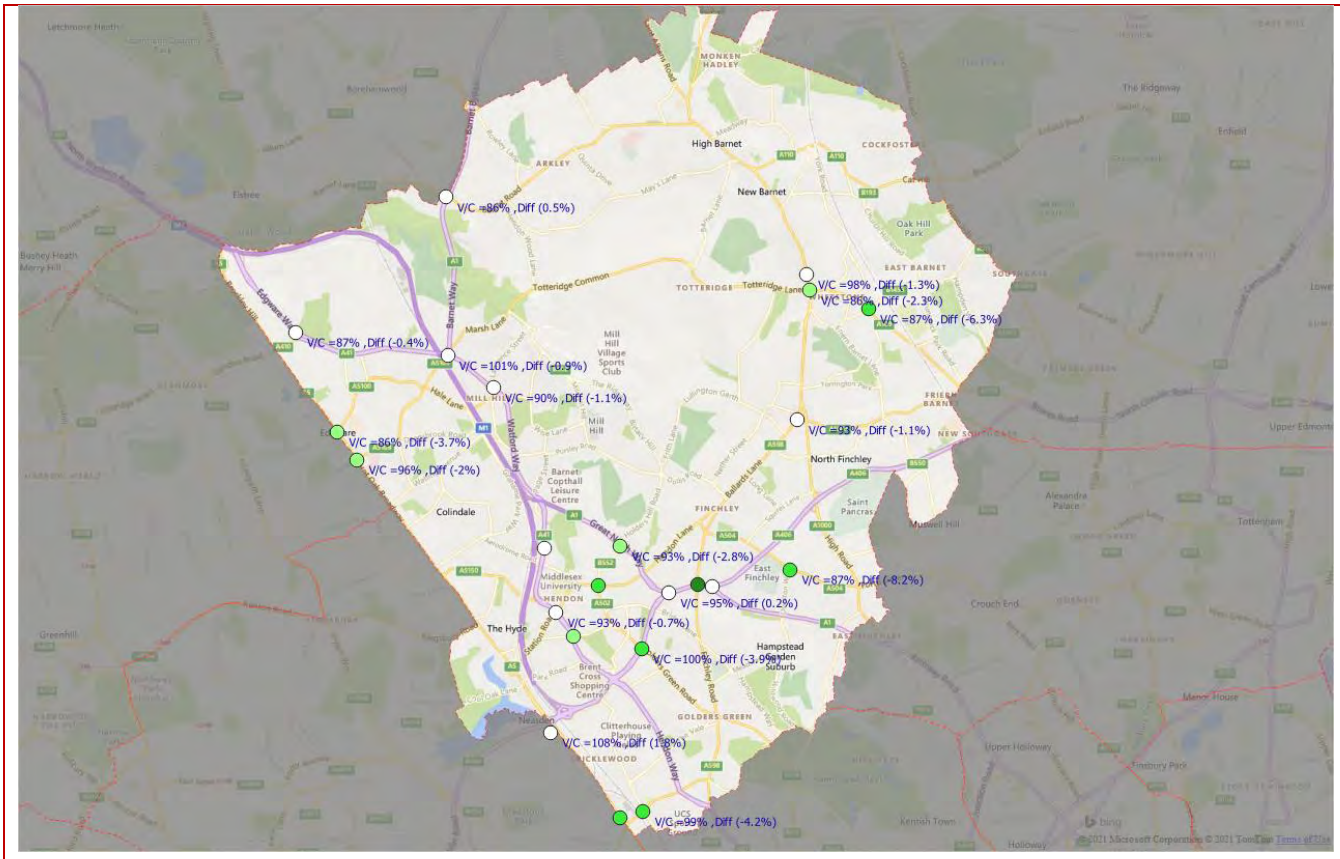
- Limited and very localised adverse impacts on the network's capacity from the full DLP Reg18 demand growth can be offset by the combined demand management strategies.
- Merge at the M1 Junction 2 SB off-slip and the A1 should be assessed but the combined demand management measures should result in the merge operating within capacity.

Table 8-16 2026 AM Peak Junction Capacity Analysis results

2026 PM Peak Impact of Full DLP reg 18 Development on junction Capacity (Sc 1 vs Sc 2)



2026 PM Peak Impact of Highway Demand Management Measures on junction Capacity (Sc 3 vs Sc 1)



Results from the diagrams above show that in the PM peak in 2026:

- Even with the full DLP Reg18 Households and Jobs projections a number of junctions, in the majority of instances already showing V/C values greater than 0.85, would show only a Non-Significant impact. Furthermore, the combined demand management measures would be expected to result in general improvements around the network ranging from Minor to Moderate positive impacts.
- At the junction between the A598 Regent's Park Road and the A406 North Circular Road, the full DLP Reg 18 growth would result in a Moderate adverse impact with an increase of V/C by 4% points to 99%. However, the combined demand management measures would result in a Major positive impact by reducing the V/C by 7% points to 92%.
- At the junction between Ashford Road/Depot Road and the A5, the full DLP Reg 18 growth would result in a Major adverse impact with an increase in V/C of 5% points to 104%. However, the combined demand management measures would result in a Moderate positive impact by reducing the V/C by 4% down to 100%.

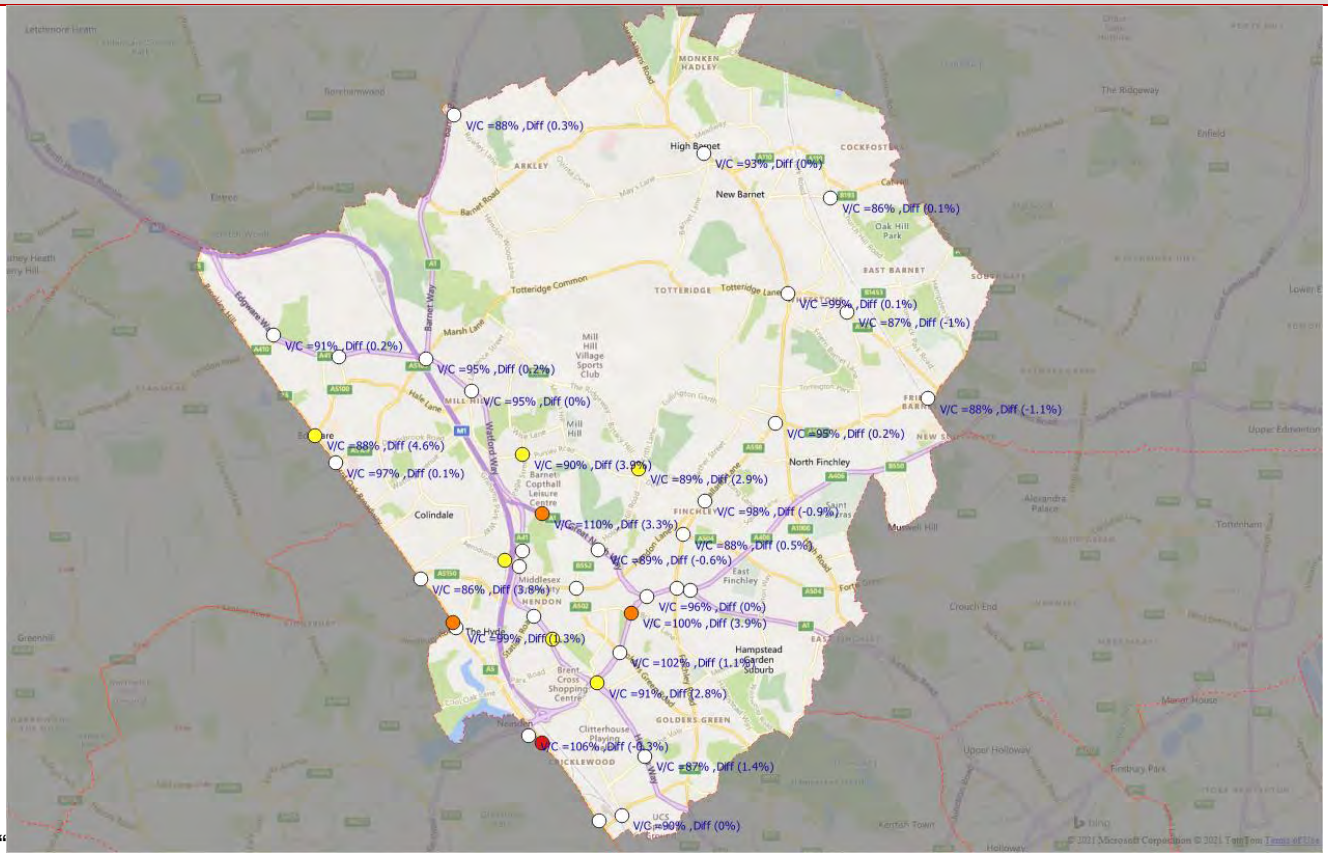
Summary:

- The majority of junctions operating at just under or higher than a V/C value of 85% would see non-significant changes as a consequence of the full DLP Reg18 demand growth. The combined demand management measures would result in a range of Minor to Major improvements at these locations.
- Limited and very localised adverse impacts on the network's capacity of full DLP Reg18 demand growth can be offset by the demand management proposals;
- There are no specific adverse issues to be reported in relation to the M1 junctions.

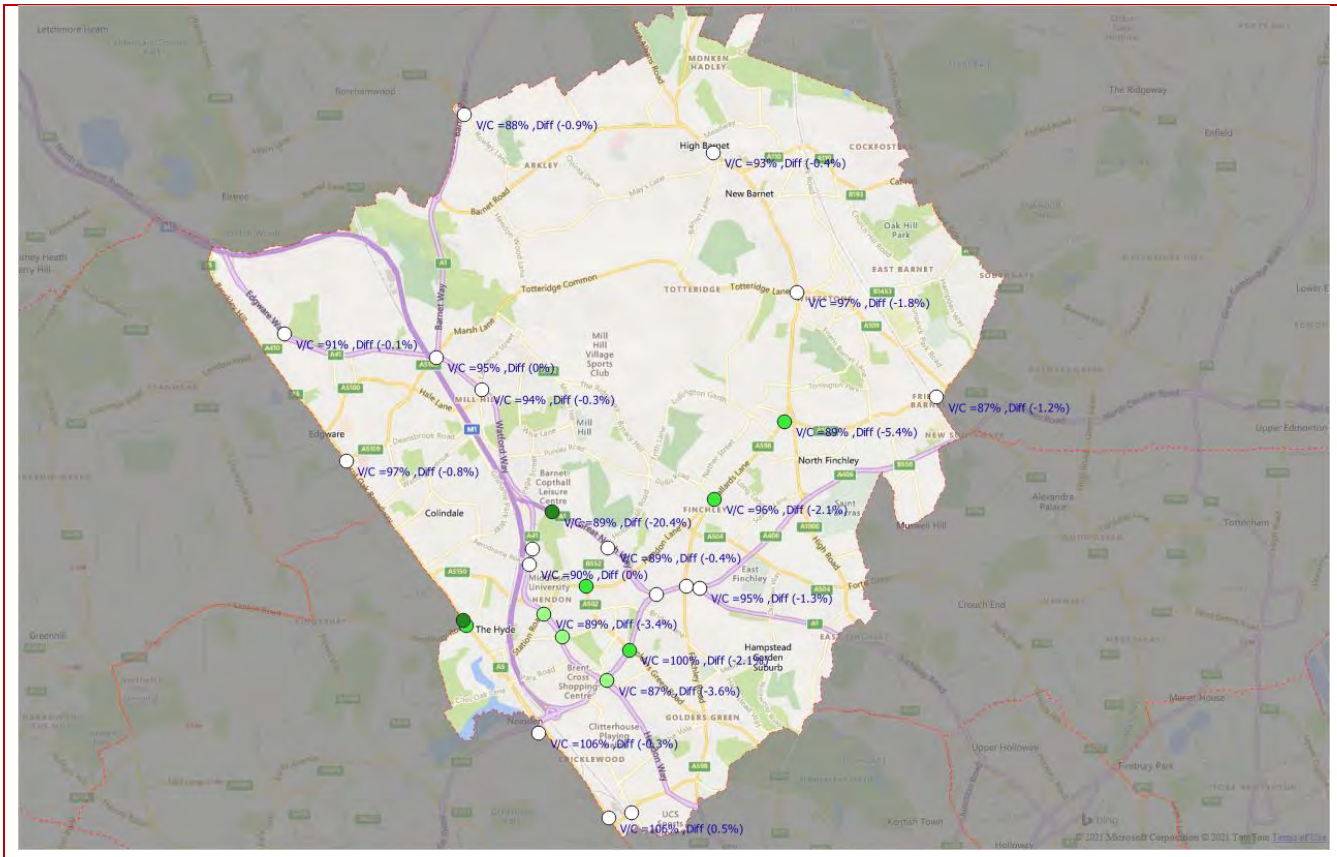
Table 8-17 2026 PM Peak Junction Capacity Analysis results

8.46 Table 8-18 and Table 8-19 below compare the 2036 AM and PM peak impacts of the DLP Reg18 full development scenario (Scenario 1) against the Baseline Scenario (Scenario 2) and then the impact of the Highway Demand Management measures under full DLP Reg18 demand growth situation (Scenario 3) against the unmitigated Scenario 1. It should be noted that whilst the colour codes of the impacts reflect those from the impacts scoring tables described above, the diagrams always report the V/C of the scenario being assessed and not that of the reference scenario.

2036 AM Peak Impact of Full DLP reg 18 Development on junction Capacity (Sc 1 vs Sc 2)



2036 AM Peak Impact of Highway Demand Management Measures on junction Capacity (Sc 3 vs Sc 1)



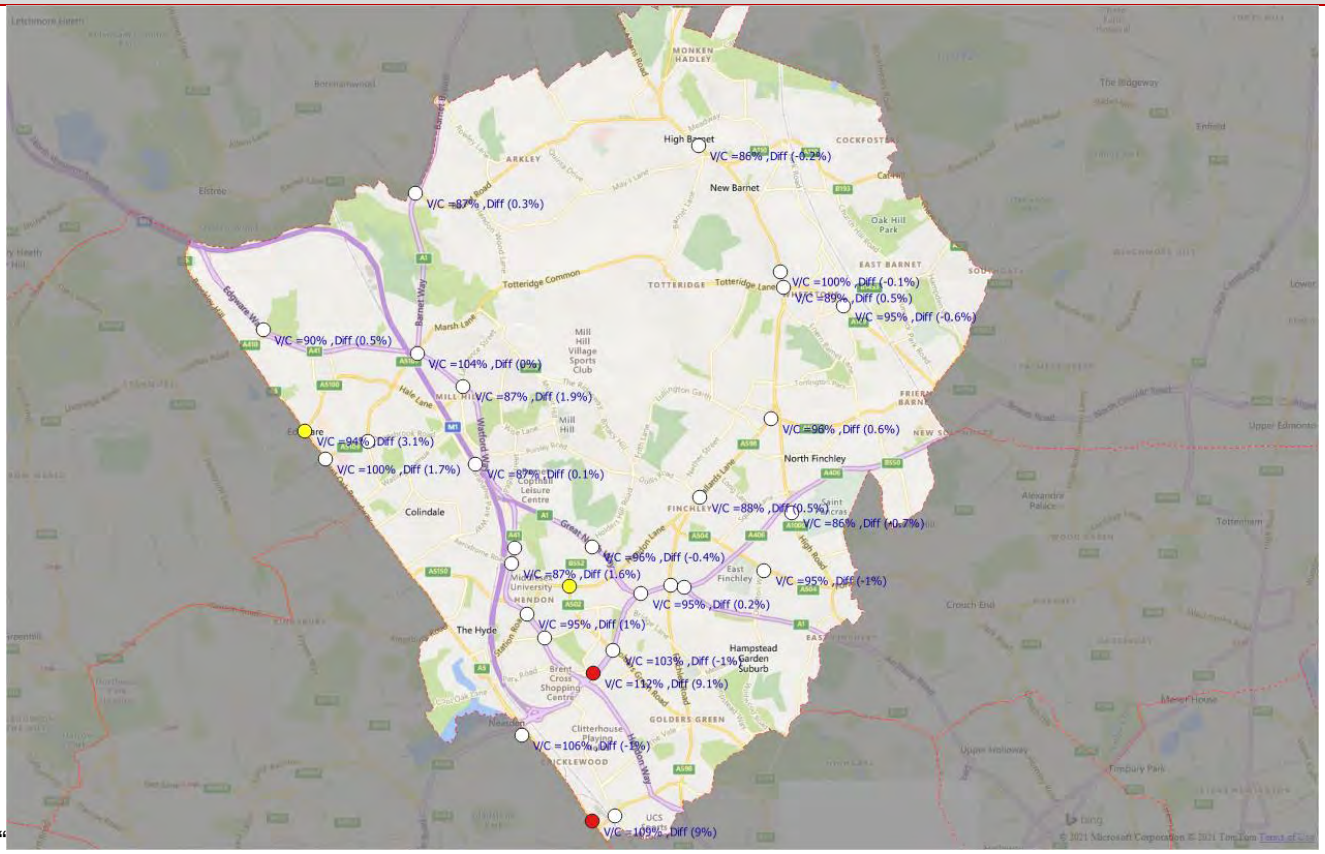
Results from the diagrams above show that in the AM peak in 2036:

- With the full DLP Reg18growth around 28 junctions with V/C greater than 85% would see no significant changes. However, the demand management measures would lower the V/C below 85% at some of these junctions whilst improving on the V/C at others
- With the full DLP Reg18 full growth Minor adverse impacts would be observed at the following junctions : A41 Hendon Way/B551 Queen's Road, A5 Edgware Road High Street/A5100 Station Road, Brentfield Gardens/Oakfield Court, Aerodrome Road/Rowan Drive, B552 Bittacy Hill/Frith Lane, Bunn's Lane/Page Street. At these junctions the combined demand management measures would either reduce the V/C below 85% or result in Minor positive impacts.
- With the full DLP Reg18 growth Moderate adverse impacts would be observed at the following junctions: A406 North Circular Road/Bell Lane (V/C=100%, +4% points) and A5 Edgware Road/Rushgrove Avenue (V/C=101%, +3% points). The combined demand management measures would have a Major positive impact at these junctions by reducing the V/C below 85% at the first location and down to 95% at the second.
- With the full DLP Reg18 growth Major adverse impacts would be observed at the junction between the A5 Edgware Road and Oxgate Lane (V/C=103%, +36% points). The combined demand management measures would have a Major positive impact at this junction by reducing the V/C below 85%. This result

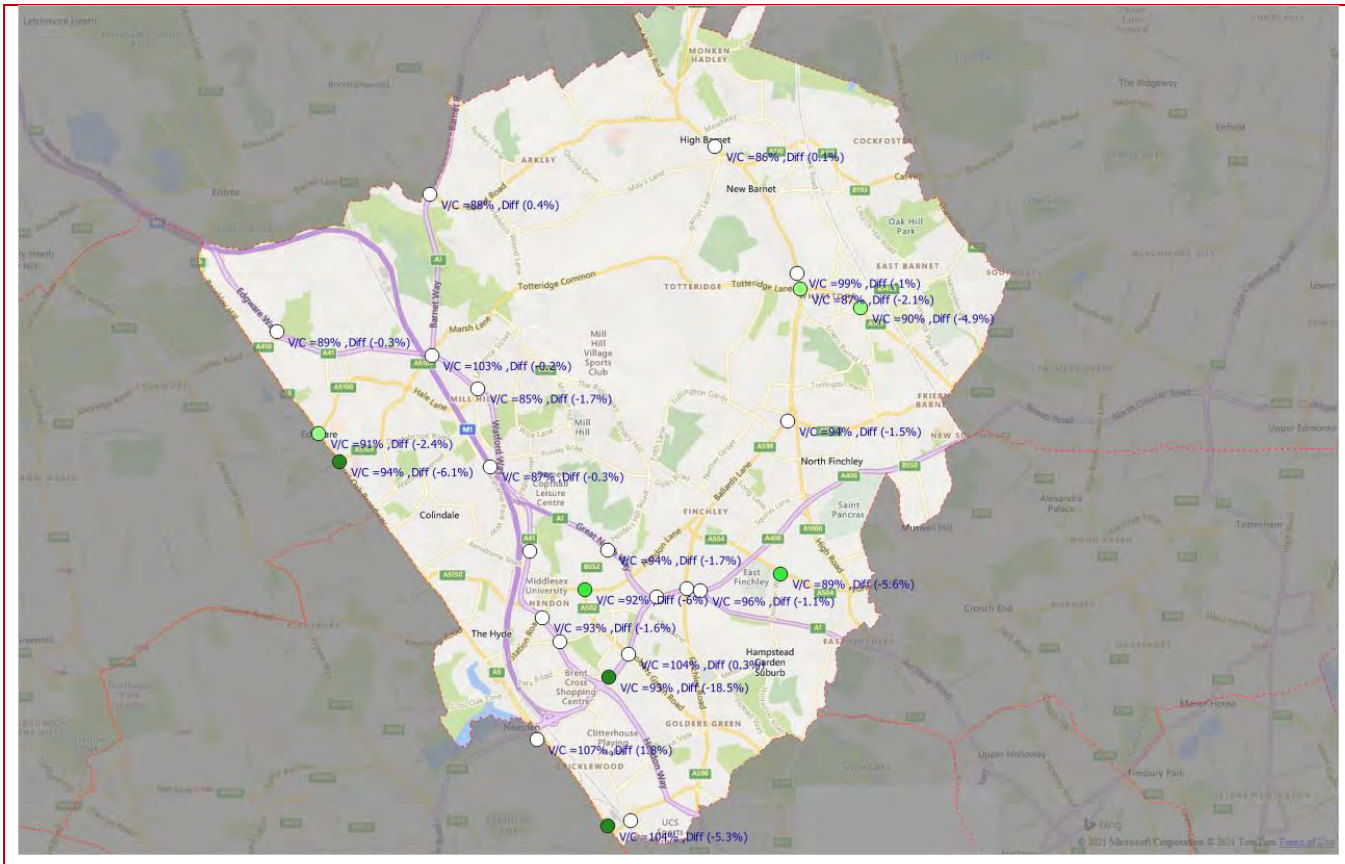
whether showing an adverse impact or an improvement should be accepted with some caution due to the coarseness of the nearby road network. • At the merge between the M1 Southbound off slip and the A1, the full DLP Reg18 demand growth would result in a Moderate adverse impact with an increase in V/C of 3.3% points to 110%. However, the combined demand management measures would result in a Major positive impact by reducing the V/C down to 89%, i.e. below baseline levels. It should be noted that the poor performance of the M1 Junction 2 southbound off-slip and the A1 merge is attributable to blocking back from a downstream junction. As stated previously, the demand management measures should result in the junction operating within capacity.
Summary: • Some localised adverse impacts on the network's capacity associated with full DLP Reg18 demand growth. Impacts that are either Moderate or Major adverse are limited to four sites. In all instances these adverse effects can be offset by the combined demand management strategies. • Merge at the M1 Junction 2 Southbound off-slip and the A1 may need to be monitored but the combined demand management measures should result in the merge to operate well within capacity.

Table 8-18 2036 AM Peak Junction Capacity Analysis results

2036 PM Peak Impact of Full DLP reg 18 Development on junction Capacity (Sc 1 vs Sc 2)



2036 PM Peak Impact of Highway Demand Management Measures on junction Capacity (Sc 3 vs Sc 1)



Results from the diagrams above show that in the PM peak in 2036:

- With the full DLP Reg18 growth around 26 junctions with V/C greater than 85% would result in no significant impacts. However, the combined demand management measures would lower the V/C resulting in positive impacts (ranging from minor to major) albeit that some junctions remain with a V/C above 85%.
- With the full DLP Reg18 growth Minor adverse impacts would be observed at the junction between the A504 Church Road and A502 Brent Street (V/C = 98%, +3%) and at the junction between the A5 Edgware Road High Street and the A5100 Station Road. The combined demand management measures would result in a Moderate positive impact at the first junction (reducing the V/C to 92%) and a Minor positive impact at the second junction (reducing the V/C to 94%).
- With the full DLP Reg18 growth Major adverse impacts would be observed:
    - at the junction between the A5 Cricklewood Broadway and Ashford Road (V/C=109%, +9% points). The combined demand management measures would have a Major positive impact at these junctions by reducing the V/C down to 104%. This junction may require interim assessment between 2026 and 2036. This result, whether showing an adverse impact or an improvement, should be accepted with some caution due to the coarseness of the nearby road network.

o At the merge between the A406 North Circular Road and the A41 E/B On slip (V/C = 112%, +9% points). The combined demand management measures would have a Major positive impact at these junctions by reducing the V/C down to 93%. This junction may require interim assessment between 2026 and 2036. • At the merge between the M1 Southbound off slip and the A1, there are no issues to report under this scenario.
Summary: • Some localised adverse impacts on the network's capacity associated with full DLP Reg18 demand growth. Impacts that are Major adverse are limited to two sites. In all instances these adverse effects can be offset by the combined demand management strategies. • Merge at the M1 Junction 2 Southbound off-slip and the A1 does not show any issues.

Table 8-19 2036 PM Peak Junction Capacity Analysis results

8.47 Finally, the figures in Appendix D provide an indication of traffic flow changes on Barnet's road network under the different scenario comparison: Scenario 1 vs Scenario 2 and Scenario 3 vs Scenario 1. The lines' thickness provides an indication of the magnitude of the change (the thicker the line the higher the flow difference). Results are directional and the green colour represents section of carriageway with an increase in traffic whilst the blue colour represents sections of carriageway with a fall in traffic. As expected, Scenario 1 vs Scenario 2 results in an overall increase in traffic flows on the links (green lines) whilst Scenario 3 vs Scenario 1 shows an overall fall in traffic. Some local traffic reassignment issues can occur where traffic increases or falls contrary to the overall demand trend.

Travel Time Comparisons

8.48 Figure 8-1 and Table 8-20 below describe the travel time routes in Barnet as coded in the LoHAM SATURN model. The routes are identified by a Route Identification (ID) number.

Figure 8-1 London Borough Barnet Travel Time (Speed) Routes (LoHAM v4.2)

Route Number	Route	Direction
3	**A110/A1000/A411**	Eastbound
4	**A110/A1000/A411**	Westbound
7	**A406 NC Rd**	Eastbound
8	**A406 NC Rd**	Westbound
11	**A504**	Eastbound
12	**A504**	Westbound
13	**A5 Edgware Road**	Northbound
14	**A5 Edgware Road**	Southbound
17	**A502**	Northbound
18	**A502**	Southbound
29	**A1**	Northbound
30	**A1**	Southbound
37	**A598/A1000**	Northbound
38	**A598/A1000**	Southbound

Route Number	Route	Direction
39	A598	Northbound
40	A598	Southbound
61	A41	Northbound
62	A41	Southbound
63	A1	Northbound
64	A1	Southbound

Table 8-20 London Borough of Barnet Travel Time (Speed) Routes (LoHAM v4.2)

8.49 Travel speed data by SATURN route, refer to Appendix F and Table 8-21 below, confirm that the full DLP Reg18 would have a slight negative impact on network speeds but that the demand management measures would contribute to offset this negative impact by reducing traffic on the road network. As before scenarios being compared include: Scenario 1 (Full DLP Reg18 growth), Scenario 2 (Baseline or committed growth) and Scenario 3 (Scenario 1+Demand management measures).

Change in Travel Speeds across the Borough routes	2026 AM			2026 PM		
Scenario being compared	Sc1 v Sc2	Sc3 v Sc1	-	Sc1 v Sc2	Sc3 v Sc1	-
Average route speed change	-1.2%	+7.9%	-	-4.1%	+9.0%	-
	2036 AM			2036 PM		
Scenario being compared	Sc1 v Sc2	Sc3 v Sc1		Sc1 v Sc2	Sc3 v Sc1	
Average	-4.5%	+9.1%	-	-3.9%	+8.2%	-

Table 8-21 Barnet Modelled Speed Changes in SATURN (LoHAM v4.2)

8.50 Based on the table above, the analysis suggests that the benefits derived from the combined demand management measures would offset the negative changes imposed by the full DLP Reg18 demand related growth.

M1 Junction 2 and 4 issues

8.51 Highways England were concerned about the potential impact on the merge and diverge capacities at M1 Junctions 2 and 4. Table 8-22 summarises the impact, in terms of changes in peak period hourly traffic flows, for the three scenarios tested described above. It should be noted that the M1 Junction 1, as modelled in LoHAM v4.2, already includes the improved interchange design developed as part of the Brent Cross Cricklewood development area. As the previous analysis shows, no issues are expected at this location.

J2 Merge	2036 AM Peak hr		2036 PM peak hr	
	Main Line	Slip On	Main Line	Slip On
Scenario 1	2526	1094	2336	1307

Scenario 2	2461	1090	2308	1306
Scenario 3	2489	1101	2297	1307
J2 Diverge	2036 AM		2036 PM	
	Main Line	Slip Off	Main Line	Slip Off
Scenario 1	4129	1603	3793	1457
Scenario 2	4011	1550	3748	1441
Scenario 3	3958	1468	3736	1439
J4 Merge	2036 AM		2036 PM	
	Main Line	Slip On	Main Line	Slip On
Scenario 1	3280	987	4511	1049
Scenario 2	3281	955	4489	1040
Scenario 3	3331	946	4503	1037
J4 Diverge	2036 AM		2036 PM	
	Main Line	Slip Off	Main Line	Slip Off
Scenario 1	4874	745	4782	989
Scenario 2	4766	755	4720	972
Scenario 3	4711	753	4707	971

Table 8-22 M1 J2 and J4 summary of 2026/2036 AM and PM peak flows

8.52 This shows that the developments have minimal impact on the traffic levels at junctions 2 and 4 of the M1. However, with the full DLP Reg18 growth, moderate adverse capacity issues can be experienced from 2026 at the merge between the M1 and A1 southbound. This is due to right-turning traffic tailing back from the junction between the A1 Great North Way and the B552 Holders Hill Road. However, the predicted reduction in demand associated with the demand management measures would be expected to significantly mitigate this issue.

CO2 Emissions changes

8.53 In order to estimate the contribution of various transport measures to 'Diminishing Contribution to Climate Change' we have used the Emission Factors Toolkit v10. The EfT requires model inputs from SATURN in the form of: total traffic flow, % of Heavy Goods Vehicles (HGV), speed, road length by link and the definition of the geographical aera. The latter is relevant as the EfT contains underlying assumptions about vehicles' fleet composition (environmental Euro Classes).

8.54 The EfT v10 is based on pre-Covid19 fleet forecasts (conservative approach) and it predicts changes only up to 2030. It should be noted that changes in vehicle fleet composition in London

differentiate between Central London (where Ultra Low Emission Zone or ULEZ applies) as well as Inner, Outer and Motorway.

8.55 The LoHAM models assume the ULEZ extension to the North Circular from 2021 and therefore in the forecast years 2026, 2031 and 2041. It can therefore be assumed that the ULEZ extension will impact the vehicle fleet composition in Barnet and nearby boroughs in line with what is forecast for Central London. The CO2 emissions in the borough are estimated in accordance to the approach set out in Table 8-23:

LoHAM Forecast Year	EfT forecast year (emission curves)	EfT area (emission curves)	Time periods
2021	2021	Outer London	AM/PM peak hours
2026	2026	Central London (to reflect ULEZ extension impact)	AM/PM peak hours
2036	2030 (model limit)	Central London (to reflect ULEZ extension impact)	AM/PM peak hours

Table 8-23 EfT CO2 emission analysis assumptions

8.56 Results in Table 8-24 provide indication of absolute and % changes of CO2 emissions on the Borough of Barnet road network.

Tonnes CO2 p.a.	AM Peak			PM Peak		
Year	Sc1 (Full DLP Reg18 Dev.)	Sc2 (committed DLP reg18 Dev.)	Sc3 (Sc1+Demand Management)	Sc1 (Full DLP Reg18 Dev.)	Sc2 (committed DLP reg18 Dev.)	Sc3 (Sc1+Demand Management)
2021		1,656,445			1,600,010	
2026	1,588,749	1,580,603	1,507,360	1,542,833	1,521,244	1,476,393
2036	1,645,821	1,615,804	1,558,972	1,587,622	1,564,191	1,523,306
% Diff	Sc1 vs Sc2	n/a	Sc3 vs Sc1	Sc1 vs Sc2	n/a	Sc3 vs Sc1
2026	0.5%	n/a	-5.1%	1.4%	n/a	-4.3%
2036	1.9%	n/a	-5.3%	1.5%	n/a	-4.1%

Table 8-24 Road Traffic CO2 annual emission estimates for Barnet

8.57 As Table 8-24 shows, CO2 annual emissions in Barnet have been estimated to fall in comparison to 2021 levels under all scenarios. This is despite traffic growth and due to the fact that vehicle fleets are assumed to become more efficient/greener.

8.58 With the DLP Reg18 full growth (Scenario 1), annual CO2 emissions would be expected to be marginally higher than with committed developments only, range of increase being around 1.5-2.0%. However, demand management measures would be expected to offset this increase by reducing CO2 emissions by approximately 4-5%.

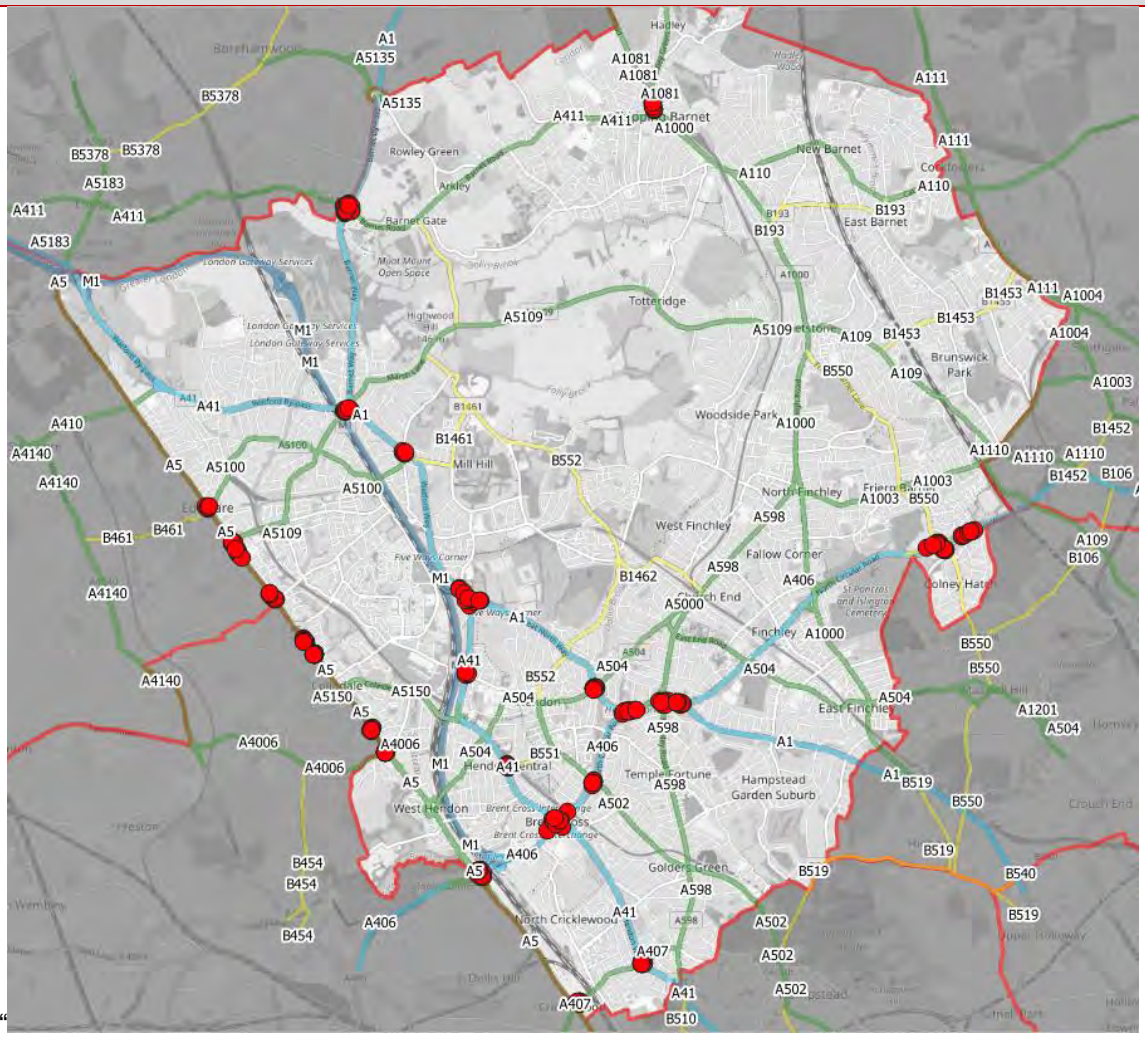
Road Accidents

8.59 As part of the assessment, we have identified Personal Injury Accident (PIA) clusters in Barnet. These are defined as locations where nine or more Personal Injury Accidents have occurred in a three-year period; in this case between 2017 and 2019, inclusive. The Personal Injury Accidents have been classified by level of severity: Slight, Serious and Fatal. More specifically, cluster locations have been identified being defined as follows:

- Junction Personal Injury Accidents, happening within 20m of an at grade junction;
- Junction Personal Injury Accidents at grade-separated junctions, including Personal Injury Accidents within 150m of the Stop/Give way line on slip roads; and
- Link clusters, Personal Injury Accidents happening within 150m road sections potentially unaffected by junctions. In an urban environment an element of professional judgement is required in this sense; also, a detailed analysis of the accident typology and causes is outside the scope of this assessment.

8.60 Table 8-25 below provides a descriptive and visual summary of where these clusters have occurred in the borough. Any increase or decrease in traffic at these locations may increase or decrease the risk of accidents. This assessment intends to provide an indication as to whether the full DLP Reg18 development growth (Scenario 1) would increase the risk of accidents in comparison to the future Baseline scenario (Scenario 2) and whether the demand management measures (Scenario 3) would mitigate the impact of the full growth.

Road Accident clusters analysis and DLP Reg18 Impact Assessment



Junction clusters in the three-year period 2017-2019 have been observed at the following locations:

- A406 North Circular/A5 Edgware Road (16 Personal Injury Accidents all Slight);
- A406 North Circular/A41 Hendon Way (15 Personal Injury Accidents of which one was serious and the remaining 14 Slight);
- A406 North Circular/A1 Great North Way (12 Personal Injury Accidents all Slight);

- A406 North Circular/A598 Finchley Road (16 Personal Injury Accidents of which one Serious and the remaining 15 Slight);
- A406 North Circular/A1 Falloden Way (12 Personal Injury Accidents of which one Serious and the remaining 11 Slight);
- A406 North Circular/B550 Colney Hatch Lane (16 Personal Injury Accidents of which one Serious and the remaining 15 Slight);
- A41 Watford Way/A1 Great North Way (14 Personal Injury Accidents all Slight);
- A407 Cricklewood Lane/A41 Hendon Way (12 Personal Injury Accidents of which two were serious and the remaining ten Slight);
- A406 North Circular Road/A502 Golders Green Road (ten Personal Injury Accidents of which one Serious and the remaining nine Slight);
- A41 Hendon Way/B551 Queen's Road (12 Personal Injury Accidents all Slight);
- A41 Great North Way/A504 Hendon Lane (16 Personal Injury Accidents of which three Serious and the remaining 13 Slight);
- A41 Watford Way/Aerodrome Road (nine Personal Injury Accidents all Slight)
- A5 The Hyde/A4006 Kingsbury Road (12 Personal Injury Accidents of which three Serious and the remaining nine Slight);
- A5 The Hyde/Woodfield Avenue (nine Personal Injury Accidents of which one Serious and the remaining nine Slight);
- A5 Edgware Road/Capitol Way (13 Personal Injury Accidents of which four Serious and the remaining nine Slight);
- A5 Edgware Road/Carlisle Road (ten Personal Injury Accidents of which one Serious and the remaining nine Slight);
- A1 Watford Way/A5100 The Broadway (nine Personal Injury Accidents of which one Serious and the remaining eight Slight);
- A1 Watford Way/A41 Edgware Way (14 Personal Injury Accidents of which one serious and the remaining 13 Slight);
- A5 Burnt Oak Brodway/A5109 Deansbrook Road (ten Personal Injury Accidents two of which Serious and the remaining eight Slight);
- A5 Stone Grove High Street/A5100 (19 Personal Injury Accidents of which one serious and the remaining 18 Slight); and
- A1 Barnet Way/A411 Barnet Lane (17 Personal Injury Accidents of which one Serious and the remaining 16 Slight).

Link clusters have been observed at the following locations:

• A407 Cricklewood Lane, just east of the A5 Cricklewood Broadway (11 Personal Injury Accidents of which two were serious and nine Slight); • A5 Burnt Oak Broadway north of Watling Avenue (11 Personal Injury Accidents of which three were serious and the remaining eight Slight); • A5 Burnt Oak Broadway at the level of Edgware Community Hospital (nine Personal Injury Accidents of which two were Serious and the remaining seven Slight); • A406 North Circular E/B on slip from on B550 Colney Hatch Lane (nine Personal Injury Accidents of which one Serious and the remaining eight Slight); and • A1000 High Barnet High Street, approximately between Salisbury Road and Union Street), (12 Personal Injury Accidents of which one Serious and the remaining 11 Slight).
Summary: • Accident clusters have been found to occur, primarily, along the A406 North Circular on the Western side of the borough. The A5 Corridor on the Western side of the Borough is where most of the DLP Reg18 growth is expected to occur, along the growth Areas of Hendon, Colindale and Brent Cross; • No fatal accidents have been reported at these sites in the three years between 2017 and 2019. This is probably linked to the slow speed of traffic at these locations; • A comparison between Scenario 1 (Full DLP Reg18 growth) against the Baseline Scenario (Scenario 2 or committed developments only) indicates that at the junctions and on links described above flows would only typically increase within a range of +0% to +7% in 2036. We would therefore not expect a significant increase in the risk of accidents under the full growth scenario. Furthermore, again by 2036, the combined demand management scheme would reduce the flows within a range of 0% to -15%.

Table 8-25 Road Accident clusters analysis

8.61 The analysis shows that the demand management measures would contribute towards the Mayor's Vision Zero accidents by virtue of reducing traffic flows at those locations. Having identified the sites, future studies would be required to look at specific measures to improve road safety but also monitor the impact of any implemented demand management measures.

Impact of TfL's Covid19 Hybrid scenario on highway performance

8.62 It should be noted that the impact of Covid19 has been tested only on the highway demand as TfL's forecasts predict a growth in demand against the reference Non-Covid19 scenarios. Early assessments of PT demand across London under a Covid19 scenarios have indicated that demand across London in 2031 could be 20% lower than predicted under the reference Non-

Covid19 scenario. Again, this result should only be considered as indicative and a snapshot for what is otherwise a highly changeable situation.

8.63 Since last year, TfL have been developing a series of scenarios aimed at providing an understanding of the likely impact of Covid19 on personal mobility. 'A best estimate' or Hybrid scenario was generated earlier in 2021 for assessing travel demand; the forecasting year being 2031. The 'Hybrid' Covid19 scenario takes its name from the fact that TfL have combined a series of assumptions from five alternative Covid19 scenarios, as illustrated in the diagram below. It is worth noting that TfL are continuously re-assessing the assumptions behind these scenarios and that the assessment that follows is therefore based on a 'snapshot view of the world'.

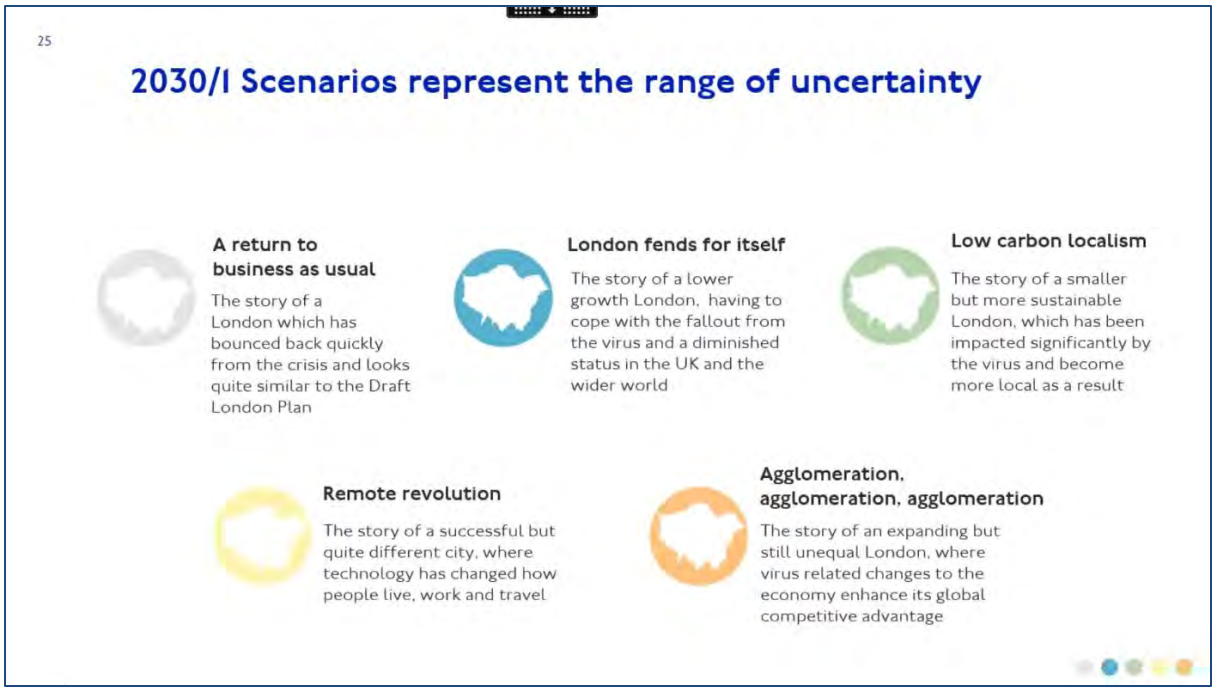


Figure 8-2 TfL's Covid19 alternative scenarios

8.64 The table below provides a summary of TfL's estimated Covid19 demand growth adjustment factors for the SATURN LoHAM model and in particular for the 2031 AM peak hr scenario. Values greater than one indicate that traffic demand is expected to be higher in comparison to the reference case or baseline scenario in the same year.

TfL's LoHAM v4.2 Covid19 Hybrid Scenario vs Baseline: Demand adjustment factors - All Vehicles (2031 AM Peak hr)	To

From/To	Barnet	London (Excl. Barnet) + Rest of UK
Barnet	1.15	1.11
London (Excl. Barnet) + Rest of UK	1.10	1.04
TfL's LoHAM v4.2 Covid19 Hybrid Scenario vs Baseline: Demand adjustment factors – Heavy Goods Vehicles (2031 AM Peak hr)	**To**	
From/To	**Barnet**	**London (Excl. Barnet) + Rest of UK**
Barnet	0.99	1.01
London (Excl. Barnet) + Rest of UK	0.98	0.95

Table 8-26 TfL's Covid19 Hybrid scenario highway demand adjustment factors for LoHAM v4.2 (2031 AM Peak hr)

8.65 As Table 8-26 shows, TfL's Covid19 Hybrid scenario estimates that overall demand for road-based travel in Barnet be higher than in the no-Covid19 baseline situation. Note that this is a 'snapshot view of the world' and that ongoing work is being undertaken by TfL on this subject. More specifically 'all vehicles' traffic demand within the Borough is assumed to be 15% higher under the hybrid Covid19 scenario in comparison to the baseline/reference No-Covid19 scenario. This demand growth is primarily driven by demand growth in light vehicles as heavy goods vehicles are estimated to either fall slightly (-1%) within Barnet or remain unchanged to/from Barnet. This growth can be considered fairly significant when compared to an overall demand growth across the LoHAM model of just 4%.

8.66 Under the Covid19 Hybrid scenario traffic generated/attracted by the Borough as a whole is forecast to be approximately 12-13% higher than under baseline conditions. Again, this growth is driven by light vehicles as heavy goods vehicles are predicted to remain at the same levels of the baseline/reference scenario.

8.67 It should also be noted that under the hybrid Covid19 scenario the growth in light vehicles demand is primarily linked to light goods vehicles and cars in out-of-work-time (e.g. commuting, shopping, visiting friends/family, other) whereas in-work time car trips (business travel) are forecast to fall as are taxi and heavy goods vehicle trips.

8.68 In the figures below we provide a visual assessment of the estimated traffic flow differences in 2026 and 2036 around the road network in Barnet when comparing the Covid19 Hybrid scenario to the non-Covid19 scenario

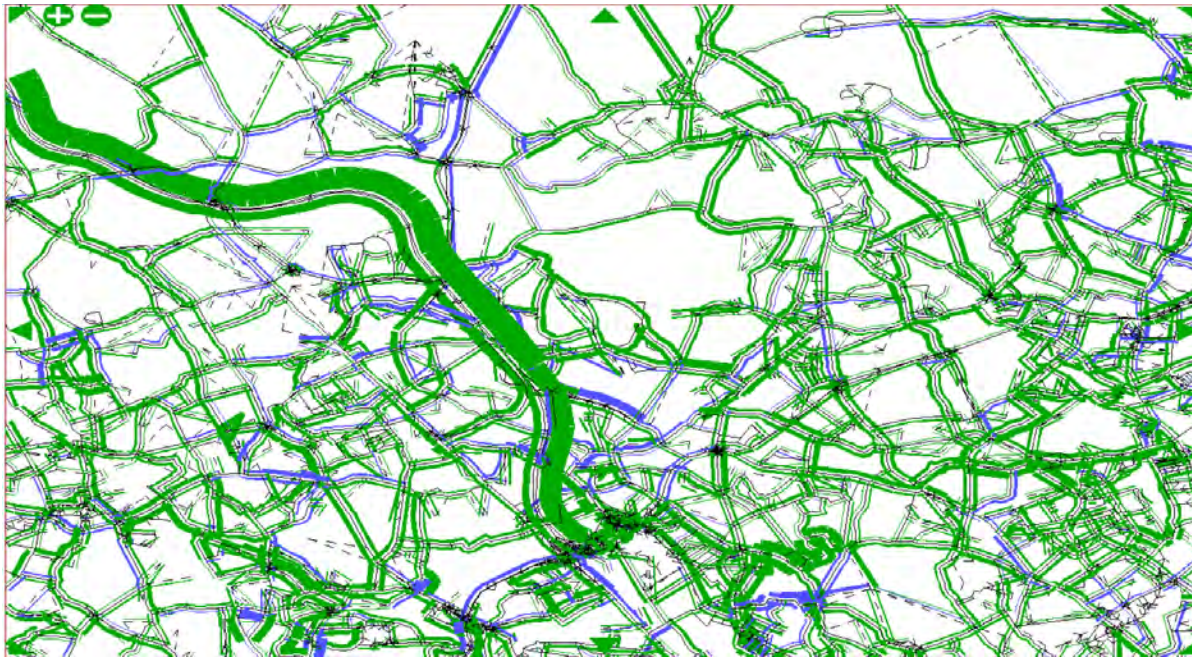


Figure 8-3 2026 AM Peak Full development growth (Scenario 1) flow difference between 'Covid19 Hybrid' and non-Covid19 scenario

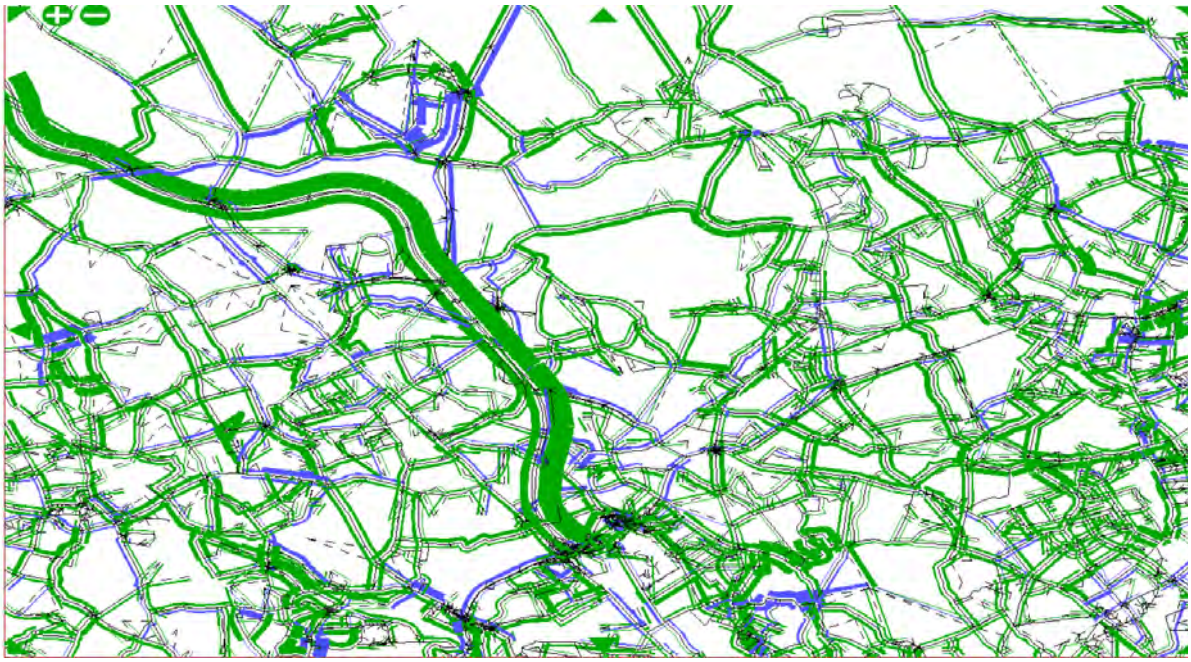


Figure 8-4 2036 AM Peak Full development growth (Scenario 1) flow difference between 'Covid19 Hybrid' and non-Covid19 scenario

8.69 As the figures above show, under the Covid19 Hybrid scenario, traffic growth (green lines) tends to occur uniformly across the borough but also more markedly along the M1 corridor. Some localised traffic reductions (blue lines) are also present around the network, most likely due to traffic reassignment.

8.70 Table 8-27 shows the traffic flows on M1 and Junctions 2 and 4 for the AM peak hour in 2036 for the original modelled scenarios pre Covid19 compared with the Covid19 hybrid scenario. Table 8-22 above which assessed the main line and slip road flows and showed that the full DLP Reg18 developments had minimal impact upon traffic flows on M1.

	2036 AM peak hr			
J2 Merge	Pre-Covid19 World		Covid19 Hybrid scenario	
	Main Line	Slip On	Main Line	Slip On
Scenario 1	2526	1094	3118	1179
Scenario 2	2461	1090	2999	1191
Scenario 3	2489	1101	2908	1208
J2 Diverge	Pre-Covid19 World		Covid19 Hybrid scenario	
	Main Line	Slip Off	Main Line	Slip Off
Scenario 1	4129	1603	4669	1551
Scenario 2	4011	1550	4535	1536
Scenario 3	3958	1468	4493	1585
J4 Merge	Pre-Covid19 World		Covid19 Hybrid scenario	
	Main Line	Slip On	Main Line	Slip On
Scenario 1	3280	987	3573	973
Scenario 2	3281	955	3580	989
Scenario 3	3331	946	3710	939
J4 Diverge	Pre-Covid19 World		Covid19 Hybrid scenario	
	Main Line	Slip Off	Main Line	Slip Off
Scenario 1	4874	745	5381	712
Scenario 2	4766	755	5268	733
Scenario 3	4711	753	5209	716

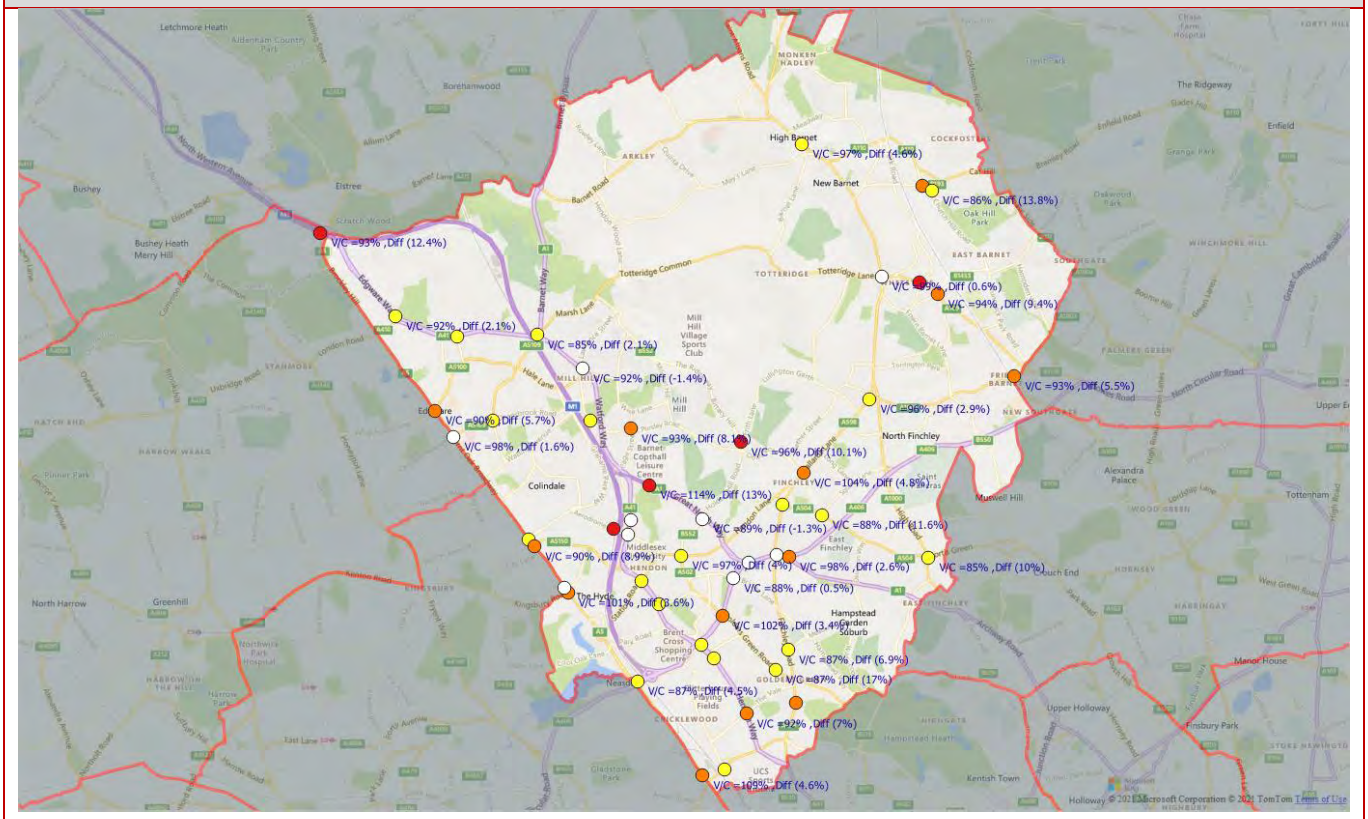
Table 8-27 M1 J2 and J4 summary of 2026/2036 AM and PM peak flows

8.71 Table 8-27 shows that traffic on the main line increases by up to 500 pcu's per hour. Traffic on the slip roads are largely unaffected and therefore the main increases are joining the M1 at the A406 North Circular Road. The increases on the M1 reflect the matrix changes in the Covid19

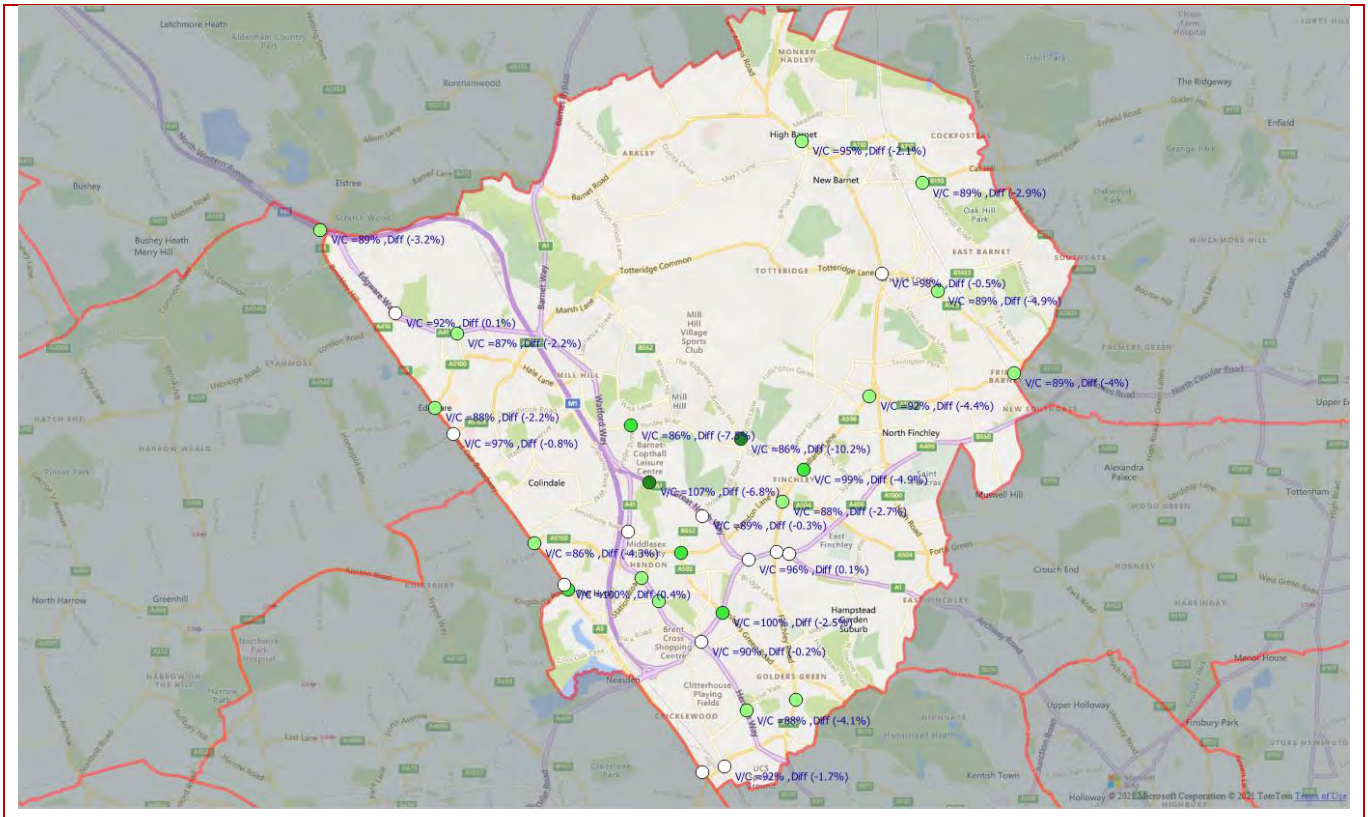
hybrid scenario shown in Table 8-26.

8.72 Table 8-28 and Table 8-29 compare the 2026 and 2036 AM peak junction capacity impacts of the DLP Reg18 full development scenario plus TfL's Covid19 hybrid demand growth assumptions (Scenario 1h) against the original DLP Reg18 full development Scenario (Scenario 1) and then the impact of the Highway Demand Management measures under TfL's Covid19 demand growth assumptions (Scenario 3h) against Scenario 1h (also with Covid19 demand growth assumptions). It should be noted that whilst the colour codes those from the impacts scoring tables described above in Tables 8-14 and 8-15, the diagrams always report the V/C of the scenario being assessed and not that of the reference scenario.

2026 AM Peak - Impact of Covid19 Hybrid demand growth scenario with Full DLP reg 18 Development on junction Capacity (Sc 1h vs Sc 1)



2026 AM Peak - Impact of Highway Demand Management Measures on junction Capacity with Covid19 hybrid demand growth (Sc 3h vs Sc 1h)



Results from the diagrams above show that in the AM peak in 2026:

- Under the full DLP Reg18 Households and Jobs projections scenario, the Covid19 hybrid demand growth scenario (Scenario 1h) would result in capacity impacts at 39 junctions. Of these 39 junctions with resulting V/C values greater than 0.85, 21 would be subject to Minor adverse impacts, 13 to Moderate adverse impacts and the remaining five to Major Adverse impacts. The combined demand management measures would result in capacity improvements at 21 junctions. Of these 21 junctions, 14 would benefit from Minor positive impacts, five from Moderate positive impacts and the remaining two from Major Positive impacts.
- The Covid19 hybrid demand growth scenario, would result in a Major adverse impact at the following three minor junctions: Aerodrome Road/Rowan Drive (v/c 104%, +42%); B1462 Bittacy Hill/Frith Lane (V/C 96%, +10.1%) and A109 Oakleigh Road North/Oakleigh Park South (V/C 90%, +13.2%). The combined demand management measures (Scenario 3h) are expected to result in a major capacity improvement at B1462 Bittacy Hill/Frith Lane (v/c 86%, -10.2%) but have no impact on the remaining two junctions.
- At the merge between the M1 SB off slip and the A1, the Covid19 Hybrid scenario demand growth (Scenario 1h) would result in a Major adverse impact with an increase in V/C of 13% points to 114%. However, the combined demand management measures would result in a Major positive impact by reducing the V/C down to 107%, although this V/C would still be higher than the expected no-Covid19

levels. It should be noted that the poor performance of the M1 Junction 2 southbound off-slip and the A1 merge is attributable to blocking back from a downstream junction.

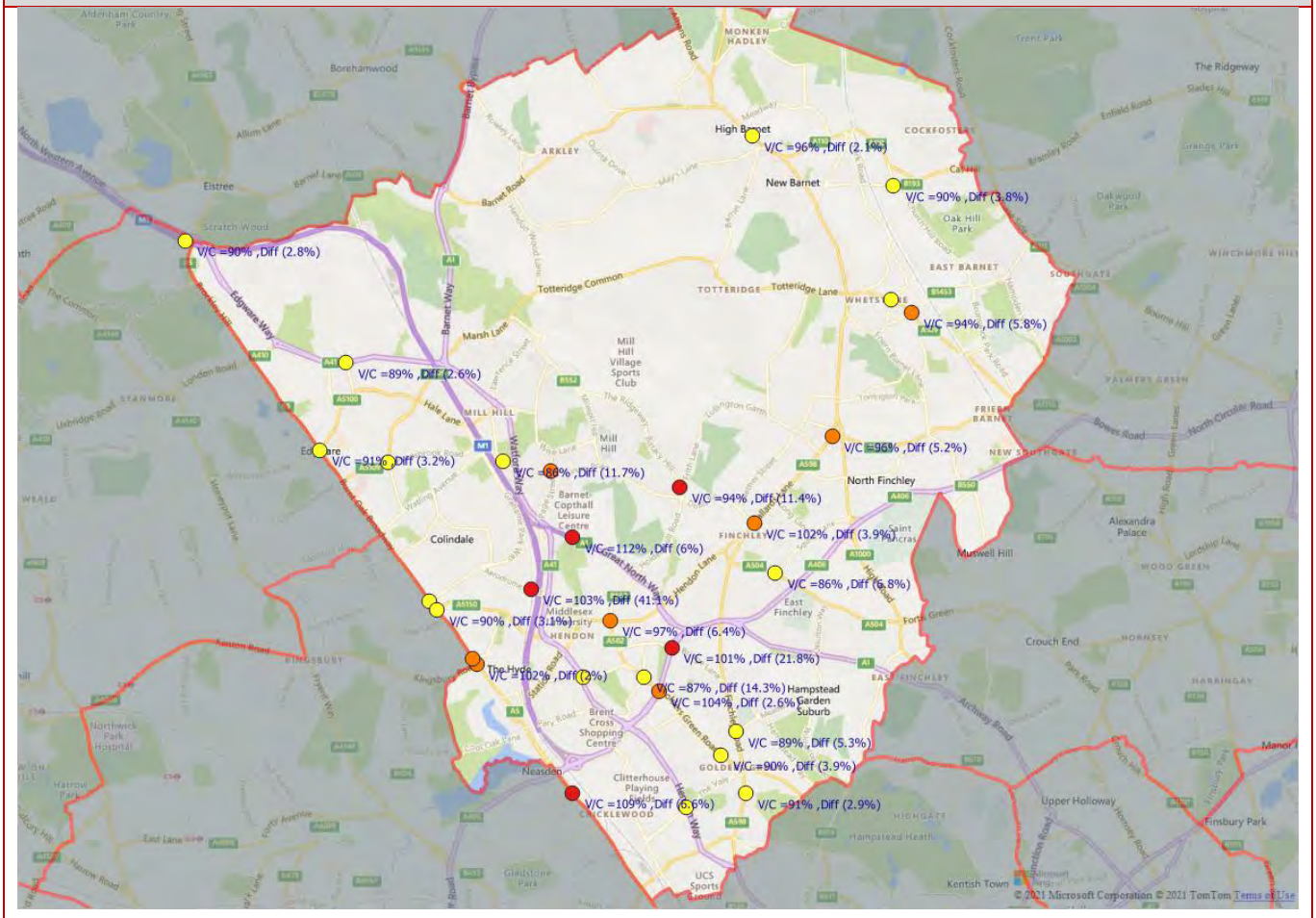
- A the M1 junction 4 SB off-slip, the Covid19 Hybrid scenario demand growth (Scenario 1h) would result in a Major adverse impact with an increase in V/C of 12.4% points to 93%. However, the combined demand management measures would result in a Minor positive impact by reducing the V/C down to 89%, although this V/C would still be higher than the expected non-Covid19 levels.

Summary:

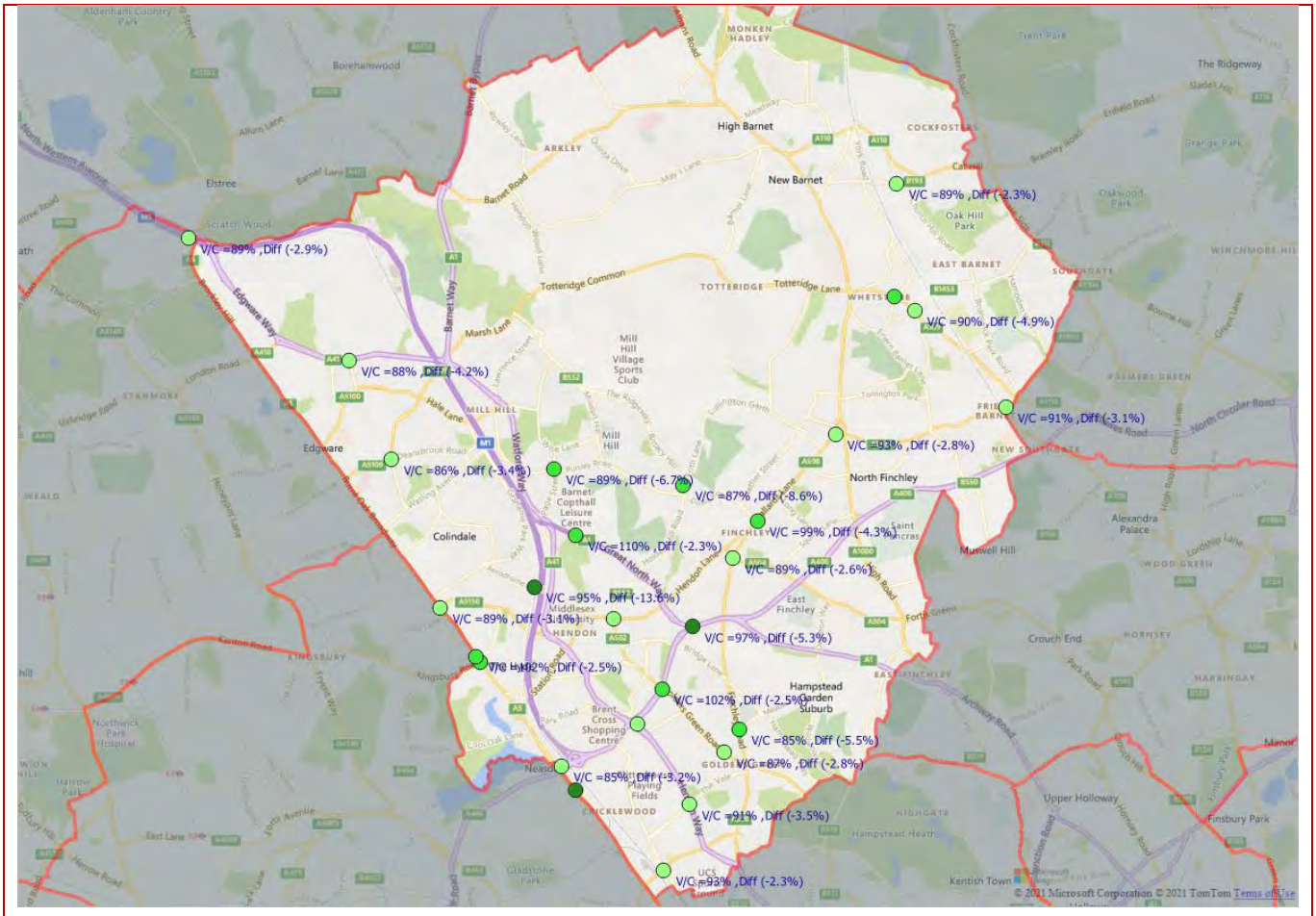
- The predicted demand growth linked to the Covid19 Hybrid scenario is expected to result in a general deterioration of the performance of the wider road network. In this instance, the positive impact of the combined demand management measures, although still geographically widespread, is not sufficient to offset the potential additional demand associated with the Covid19 Hybrid scenario.
- Merge at the M1 Junction 2 SB off-slip and the A1 should be monitored as the combined demand management measures would only partially offset the demand growth linked to the Covid19 Hybrid scenario.
- Diverge at the M1 junction 4 should be monitored as the combined demand management measures would only partially offset the demand growth linked to the Covid19 Hybrid scenario.

Table 8-28 2026 AM Peak Junction Capacity Analysis results (with Covid19 Hybrid demand growth scenario)

2036 AM Peak - Impact of Covid19 Hybrid demand growth scenario with Full DLP reg 18 Development on junction Capacity (Sc 1h vs Sc 1)



2036 AM Peak - Impact of Highway Demand Management Measures on junction Capacity with Covid19 hybrid demand growth (Sc 3h vs Sc 1h)



Results from the diagrams above show that in the AM peak in 2036:

- Under the full DLP Reg18 Households and Jobs projections scenario, the Covid19 hybrid demand growth scenario (Scenario 1h) would result in capacity impact at 30 junctions. Of these 30 junctions with resulting V/C values greater than 0.85, 17 would be subject to Minor adverse impacts, eight to Moderate adverse impacts and the remaining five to Major Adverse impacts. The combined demand management measures would on the other hand result in capacity improvements at 27 junctions. Of these 27 junctions, 15 would benefit from Minor positive impacts, nine from Moderate positive impacts and the remaining three from Major Positive impacts.
- The Covid19 hybrid demand growth scenario would result in a Major adverse impact at the following four junctions: A5 Edgware Road/A406 SB off slip (V/C 109%, +6.6%); Aerodrome Road/Rowan Drive (V/C 103%, +41%); B1462 Bittacy Hill/Frith Lane (V/C 94%, +11.4%) and A406 North Circular/Bridge Lane (V/C 101%, +21.8%). The combined demand management measures (Scenario 3h) are expected to result in a major positive impact at the Aerodrome Road/Rowan Drive junction (V/C 95%, -13.6%) and the A406 North Circular/Bridge Lane junction (V/C 97%, -5.3%); in a Moderate positive impact at the B1462 Bittacy

Hill/Frith Lane junction (V/C 87%, -8.6%) but have no impact at the A406 North Circular/Bridge Lane junction.

- At the merge between the M1 SB off slip and the A1, Junction 2, the Covid19 Hybrid scenario demand growth (Scenario 1h) would result in a Major adverse impact with an increase in V/C of 6% points to 112%. However, the combined demand management measures would result in a Moderate positive impact by reducing the V/C down to 110%, although this V/C would still higher than the expected no-Covid19 levels. It should be noted that the poor performance of the M1 Junction 2 southbound off-slip and the A1 merge is attributable to blocking back from a downstream junction.
- A the M1 junction 4 SB off-slip, the Covid19 Hybrid scenario demand growth (Scenario 1h) would result in a Minor adverse impact with an increase in V/C of 2.8% points to 90%. However, the combined demand management measures would result in a Minor positive impact by reducing the V/C down to 89%, although this V/C would still be higher than the expected non-Covid19 levels.

Summary:

- The predicted demand growth linked to the Covid19 Hybrid scenario is expected to result in a general deterioration of the performance of the wider road network. In this instance, the positive impact of the combined demand management measures, although still geographically widespread, is not sufficient to offset the potential additional demand associated with the Covid19 Hybrid scenario.
- The merge at the M1 Junction 2 SB off-slip and the A1 should be monitored as the combined demand management measures would only partially offset the demand growth linked to the Covid19 Hybrid scenario.
- Diverge at the M1 junction 4 should be monitored as the combined demand management measures would only partially offset the demand growth linked to the Covid19 Hybrid scenario.

Table 8-29 2036 AM Peak Junction Capacity Analysis results (with Covid19 Hybrid demand growth scenario)

8.73 Table 8-30 compares the road network statistics for the Borough of Barnet for the 2026 and 2036 AM peak scenarios, under the following scenarios: full DLP Reg18 development (Scenario 1), full DLP Reg18 development + Covid19 Hybrid demand growth (Scenario 1h) and demand management measures applied to Scenario 1h (Scenario 3h).

Veh-hrs	AM				
Year	Sc1	Sc1h (Covid19 Hybrid)	Sc1h vs Sc1 % Diff	Sc3h (Covid19 Hybrid)	Sc3h vs Sc1h % Diff
2026	36,246	43,995	21.38%	41,226	-6.29%
2036	38,684	46,517	20.25%	43,759	-5.93%
Veh-km	AM				

Year	Sc1	Sc1h (Covid19 Hybrid)	% Diff	Sc3h (Covid19 Hybrid)	% Diff
2026	757,636	817,592	7.91%	801,890	-1.92%
2036	778,993	832,827	6.91%	819,569	-1.59%
Speed (Kph)	AM				
Year	Sc1	Sc1h (Covid19 Hybrid)	% Diff	Sc3h (Covid19 Hybrid)	% Diff
2026	20.9	18.6	-11.09%	19.5	4.67%
2036	20.1	17.9	-11.09%	18.7	4.61%

Table 8-30 2026 and 2036 AM peak road network statistics with vs without Covid19 Hybrid demand growth scenarios

8.74 As Table 8-30 shows, the impact of the additional demand under the Covid19 Hybrid scenario outstrips the benefits linked to the implementation of the combined demand management measures with average network speeds under Scenario 3h (19.5 and 18.7 kph) being lower than those of Scenario 1 (20.9 and 20.1 kph).

8.75 In the table below we provide a comparison of the estimated Covid19 Hybrid scenario AM peak hr CO2 emissions in the London Borough of Barnet for the three development scenarios, discussed earlier in this report.

Tonnes CO2 p.a.	AM Peak (no-Covid)			AM Peak (with TfL's Covid Hybrid scenario demand adjusted)		
Year	Sc1 (Full DLP Reg18 Dev.)	Sc2 (committed DLP reg18 Dev.)	Sc3 (Sc1+Demand Management)	Sc1h (Full DLP Reg18 Dev.)	Sc2h (committed DLP reg18 Dev.)	Sc3h (Sc1+Demand Management)
2021		1,656,445				
2026	1,588,749	1,580,603	1,507,360	1,833,402	1,826,925	1,746,784
2036	1,645,821	1,615,804	1,558,972	1,883,785	1,858,930	1,799,770
% Diff	Sc1 vs Sc2	n/a	Sc3 vs Sc1	Sc 1 Hybrid vs Baseline	Sc 2 Hybrid vs Baseline	Sc 3 Hybrid vs Baseline
2026	0.5%	n/a	-5.1%	15%	16%	16%
2036	1.9%	n/a	-5.3%	14%	15%	15%

Table 8-31 London Borough of Barnet AM peak hr forecast CO2 emissions with TfL's Covid19 Hybrid demand adjustment scenario

8.76 As Table 8-31 shows, if realised, the growth in car travel demand associated with TfL's Covid19 Hybrid scenario would result in an overall increase of CO2 emissions in the borough of approximately +15%.

8.77 Although the Covid19 Hybrid scenario is being re-assessed on an ongoing basis by TfL, these findings demonstrate the importance of actively pursuing demand management measures in the Borough.

9. CONCLUSIONS

9.1 This chapter provides a summary of the Strategic Transport Assessment's conclusions in relation to the cumulative impact of the projected population and jobs growth outlined within Barnet's Draft Local Plan Reg18 (DLP Reg18). The assessed impacts, using an evidence based approach, include those on the highway and public transport network and intend to demonstrate that Barnet's Local Plan is sound and justified. The Local Plan's proposals have been assessed against national, London and local planning policies and, in particular, the Mayor's Transport Strategy and its healthy streets approach with its objective that, by 2041, 80% of all trips in London should be on foot, by bicycle or public transport. For this to be achieved, the Mayor of London has set the target of increasing the proportion of trips made by walking, cycling and public transport in Barnet from 59% today to 72% in 2041.

Study Approach

9.2 The Strategic Transport Assessment involved:

i. Research for evidence to determine the effect of promoting active travel (e.g. walking and cycling initiatives) as well as other traffic management measures aimed at reducing car dependency;
ii. Modelling the impact of the effects of providing improved orbital bus services within the Borough;
iii. Determining the level of trip making from the Local Plan's projected population/jobs growth, including the appropriate distribution of this demand in comparison to the assumptions within TfL's LTS model. As a result of this approach, the resultant modified trip distribution was used to adjust the matrices within TfL's LoHAM v4.2 models, providing indications of the likely impacts of the associated traffic growth on the highway network; and
iv. The analysis of line and stations' capacity performance on the rail and underground networks within the Borough of Barnet. The adopted static (excel-based) capacity assessment, useful for identifying possible 'problem areas' would nonetheless benefit from further refinements in the form of dynamic modelling assessment as this could show different results at some of the station elements.

Demand management measures

9.3 From this analysis our conclusions are set out below.

9.4 The assessment of active or demand management measures shows that widespread interventions across the Borough have the most impact on reducing car use. These measures are summarised below together with the estimated AM Peak mode shift from car:

i. Healthy Routes to School (3.5%);
ii. Workplace Parking Levy (1.8%);
iii. Car Clubs (1.5%);
iv. Provision of a comprehensive cycling network (2.5%); and
v. Development of active links and parking controls (public realm enhancements) at Gateways (1.5%).

9.5 Those measures which are more specific to areas such as Low Traffic Neighbourhoods and Demand Responsive bus services would be expected to have a lower overall impact.

9.6 As part of the demand management assessment express orbital bus services were also

assessed. These have been estimated to generate a +3% uplift in demand across the selected routes of which 1% would come from car. This would reduce the overall car mode share by approximately 0.2%.

9.7 In addition to measures aimed at reducing car travel, we also assed the potential impact of Local Town Centre freight consolidation centres, based on TfL's research. These freight schemes have the potential to reduce Light Goods Vehicle (LGV) traffic as part of the re-organisation of the 'last-mile' distribution strategy. It has been estimated that their implementation would result in a reduction of LGV's traffic levels within Barnet of 5%.

9.8 The effects of these demand management measures were incorporated and tested using the LoHAM v4.2 models.

Public transport networks assessment

9.9 The analysis of station on the LUL network showed that the additional development trips would not result in elements at stations exceeding capacity except at Colindale, Hendon Central, High Barnet and Finchley Central. In particular:

i. At Colindale the ticket hall and gateline provision would be over capacity although we would expect these issues to be resolved by the proposed station modernisation plan;
ii. At Hendon Central the existing stairway from the passageway to the island platform would be operating at capacity and an additional two gates are required;
iii. At High Barnet the bridge to platforms 2/3 would be at capacity, subject to passenger movements through the station;
iv. At Finchley Central the area between the gateline and the southbound stairway and the stairways to the southbound and northbound are at capacity; and
v. Additional gates would also be required at Brent Cross and potentially at High Barnet, Finchley Central and East Finchley, depending upon the split of passengers between entrances.

9.10 Analysis of the demand on the selected orbital (nine) and radial (two) bus routes was based on the most demanding scenario, corresponding to a Non-Covid19 situation plus full DLP Reg18 demand growth. Bus demand growth, applied to the 2018 Bus Origin Destination Survey (BODS) data, was estimated at around 22-25% between 2018 and 2036. In the same period, bus demand in neighbouring boroughs is expected to vary between 7% and 15%. Furthermore, a 1% demand uplift (abstraction form car users) was estimated to occur as a consequence of potential service improvement along the selected bus routes, in particular through the introduction of reduced stop express services. The analysis confirmed that by 2036 the assessed bus routes would still not face any particularly severe capacity problems.

9.11 It should be noted that the impact of Covid19 has been tested only on the highway demand as, in this case, TfL's forecasts predict a growth in demand against the reference No-Covid19 scenarios. Early assessments of public transport demand under a Covid19 scenarios have indicated that demand across London in 2031 could be 20% lower than predicted under the reference No-Covid19 scenarios. Again, this result should only be considered as indicative and a snapshot for what is otherwise a highly changeable situation.

Highway network assessment

9.12 In assessing the impact on the road network, three scenarios were created for the years 2026 and 2036 using TfL's LoHAM v4.2 traffic model:

- Scenario 1: Full DLP Reg 18 Households and Jobs projected growth;
- Scenario 2 (Baseline) DLP Reg18 committed developments only; and
- Scenario 3 as Scenario 1 + active and demand management measures.

9.13 The results of this assessment on the highway network is summarised below.

i. In 2026 AM peak scenario the majority of junctions operating at a V/C already higher than or just under a V/C value of 85% would see non-significant changes as a consequence of the full DLP Reg18 demand growth. There is limited and very localised adverse impacts on the network's capacity of full DLP Reg18 demand growth and this could be offset by the demand management strategies.

ii. In the 2026 PM peak scenario the majority of junctions operating at V/C already higher than or just under a V/C value of 85% would see non-significant changes as a consequence of the full DLP Reg18 demand growth. Demand management measures would result in a range of Minor to Major improvements at these locations. There is limited and very localised adverse impacts on the network's capacity of full DLP Reg18 demand growth and this could be offset by the demand management strategies.

iii. In the 2036 AM peak scenario there are some localised adverse impacts on the network's capacity associated with full DLP Reg18 demand growth. Impacts that are either Moderate or Major adverse are limited to four sites at A406 North Circular Road/Bell Lane, A5 Edgware Road/Rushgrove Avenue, A5 Edgware Road and Oxgate Lane and M1 Southbound off slip and the A1. The latter is caused by the blocking back from the downstream junction. In all instances these adverse effects could be offset by the demand management strategies.

iv. In the 2036 PM peak scenario there are some localised adverse impacts on the network's capacity associated with full DLP Reg18 demand growth. Impacts that are Major adverse are limited to two sites; at the junction between the A5 Cricklewood Broadway and Ashford Road

and at the merge between the A406 North Circular Road and the A41 E/B On slip. In all instances these adverse effects could be offset by the implementation of the assessed demand management strategies.

9.14 Analysis of modelled travel speeds shows that the full DLP Reg18 demand growth would result in the overall network speeds to decrease by one to four percentage points, approximately. However, the demand management measures would offset this negative impact by increasing speeds by eight-nine percentage points. Furthermore, whilst under the full DLP Reg18 demand growth scenario the CO2 emissions in the Borough are expected to increase by approximately 0.5-2.0%, the demand management measures would result in reductions of approximately 4.0-5.0%; offsetting the negative impacts of the additional demand growth.

9.15 The LoHAM models include the revised M1 Junction1/A406 North Circular Road interchange from 2021. All tested scenarios show no particular issues at this junction under the tested years.

9.16 The DLP Reg18 full development scenario is predicted to have minimal impact on the traffic levels at junction 4 of the M1. However, moderate adverse capacity issues can be experienced from 2026 at the M1/A1 Junction 2 Southbound in the AM peak. This is due to right-turning traffic tailing back from the junction between the A1 Great North Way and the B552 Holders Hill Road. However, the predicted reduction in demand associated with the demand management measures would be expected to significantly mitigate this issue.

Highway network assessment with Covid19

9.17 In the context of Covid19, TfL have been developing a number of future scenarios which impact upon travel demand within London. These scenarios represent tests which are subject to ongoing revisions as the impact from Covid19 on London's socio-economic make-up and personal travel characteristics become better known.

9.18 TfL's Covid19 Hybrid scenario, which combines a series of assumptions from five alternative scenarios, estimates that overall demand for road-based travel in Barnet could be 15% higher than in the no-Covid19 baseline situation; this is primarily linked to growth in car travel and LGVs. The impact of this assumption has been tested using data from TfL's 2031 AM Peak LoHAM model results. Assuming that such demand uplift applies equally to the 2026 and 2036 forecasting years, results from this analysis show an overall deterioration of the performance of the wider road network and that the disbenefits linked to the additional demand outweigh the benefits achieved by the demand management measures. In particular, Junctions 2 and Junction 4 of M1 will require monitoring as the demand management measures would only partially offset the demand growth linked to the Covid19 Hybrid scenario.

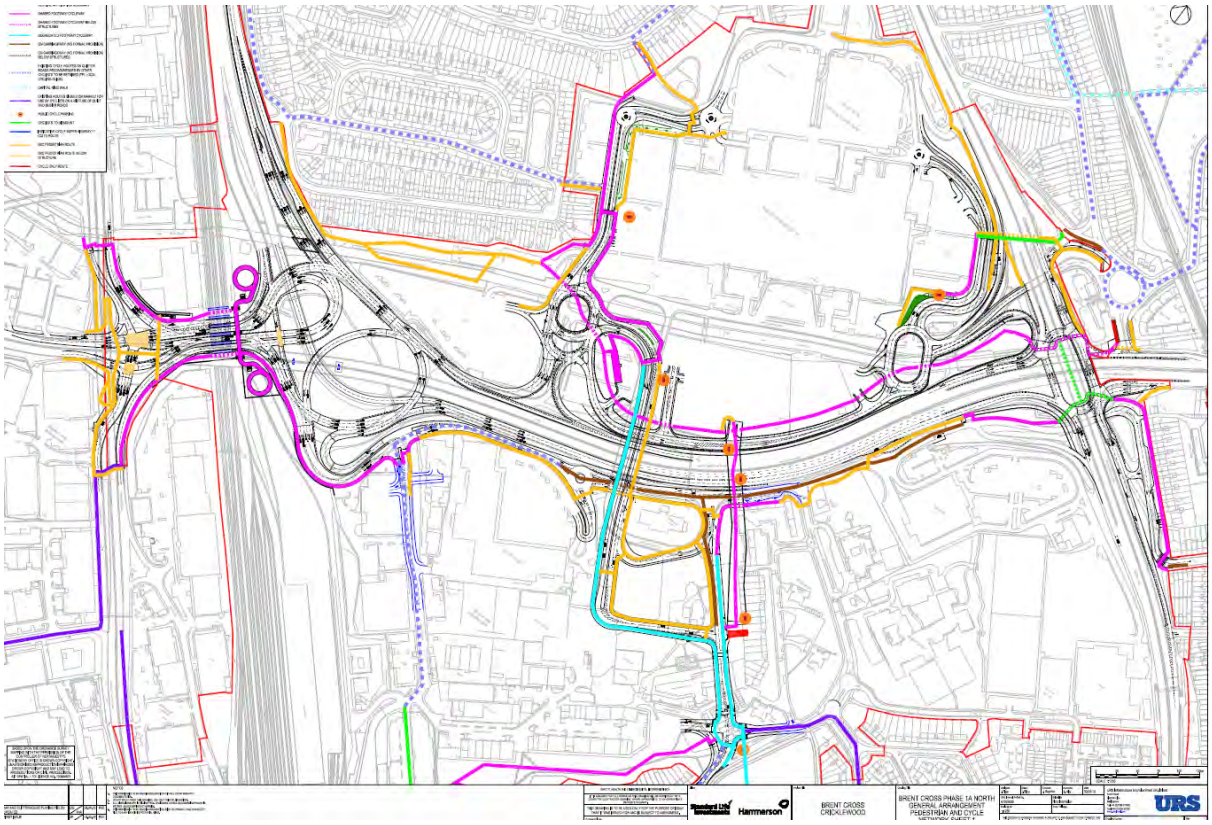
9.19 In overall terms, in order to deliver the development quantum envisaged within the Plan in a sustainable manner, the Borough of Barnet should actively pursue the implementation of the demand management measures discussed in this transport assessment as they have been shown to significantly mitigate the impact from the additional traffic demand imposed by the full DLP Reg18 planned growth.

9.20 Finally, the current assessment of the Covid19 Hybrid scenario has clearly shown a series of incremental negative impacts on the wider road network in Barnet. This places a greater emphasis upon the importance of implementing the discussed mitigation measures, even though, these may only partially mitigate the negative effects associated with the predicted extra traffic growth. It should be noted that whilst such an outcome may indeed be possible, the travel scenarios under Covid19 are being continuously revised and updated; for this reason, regular updates of the Plan's policies may also be required.

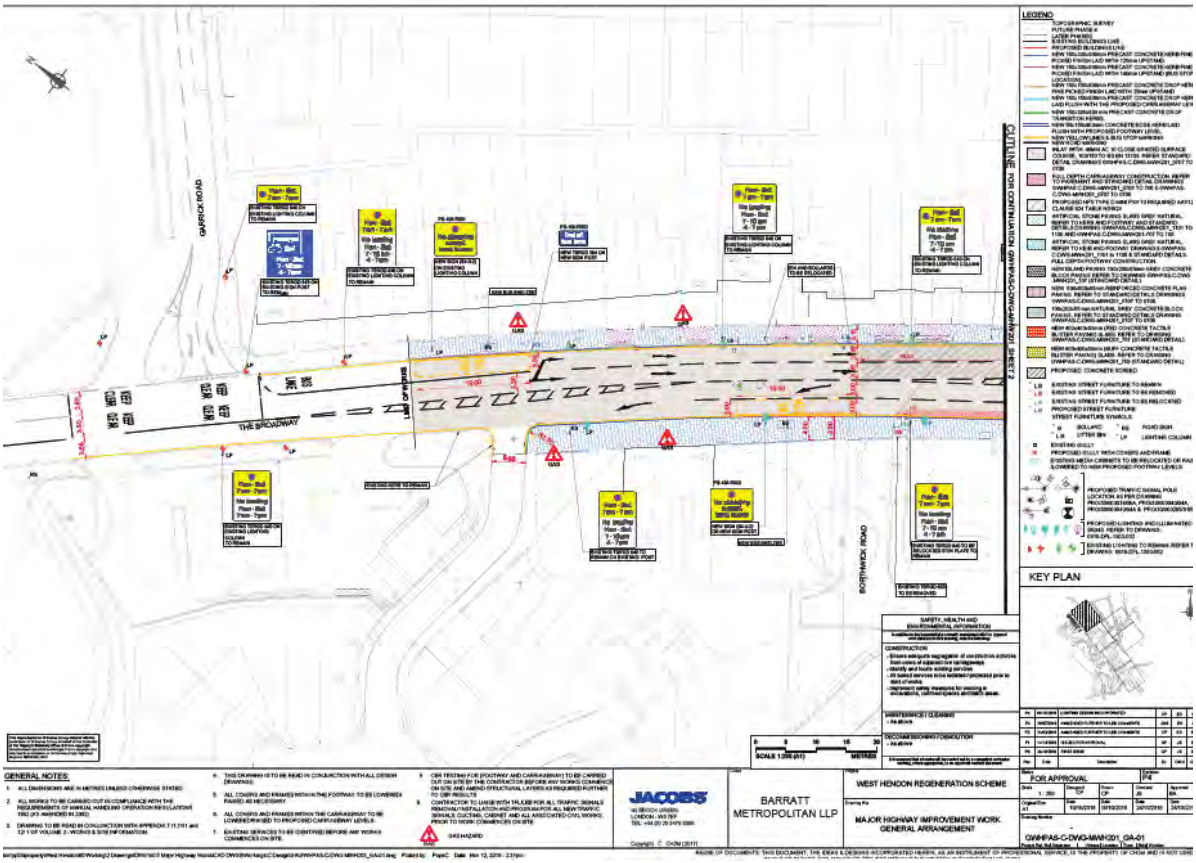
A. APPENDIX A

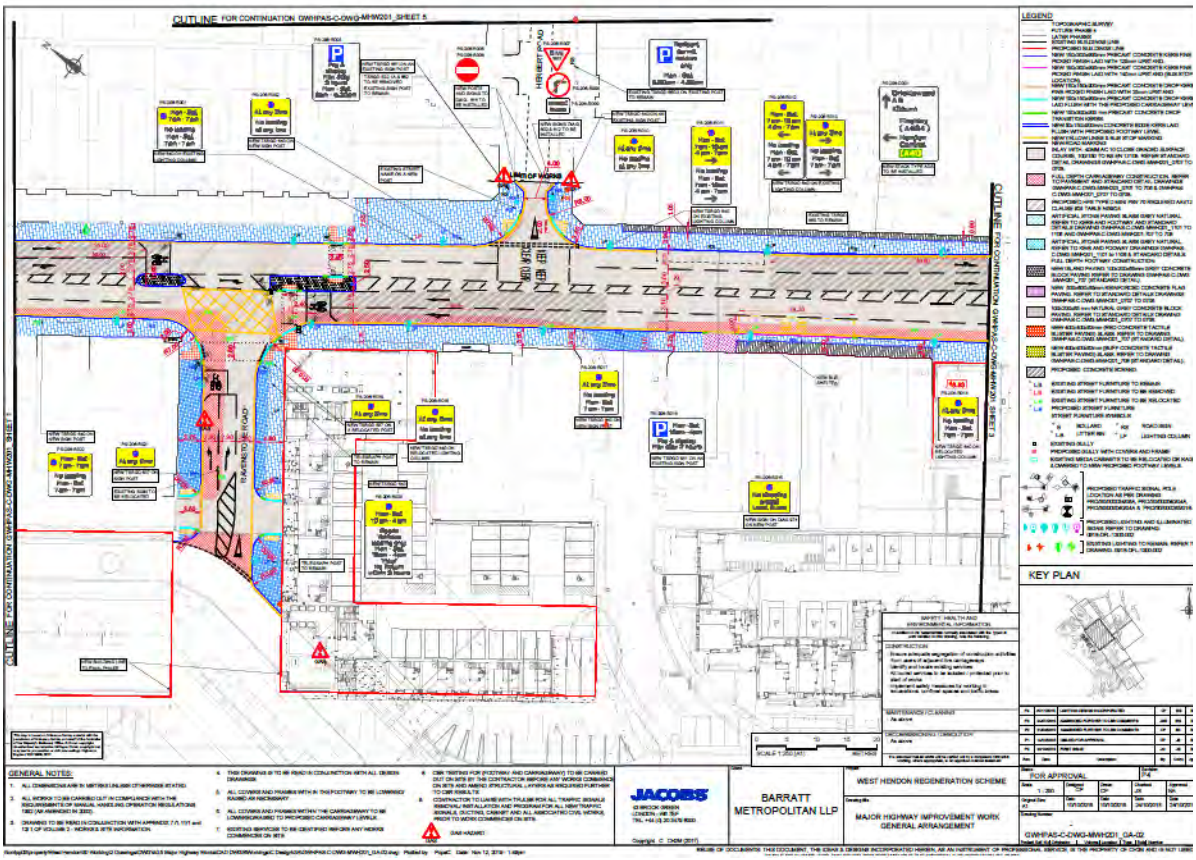
committed Highway Scheme Layouts

A406 North Circular/A5 Edgware Road/M1 Junction 1 and A406 North Circular.A41 Hendon Way interchanges

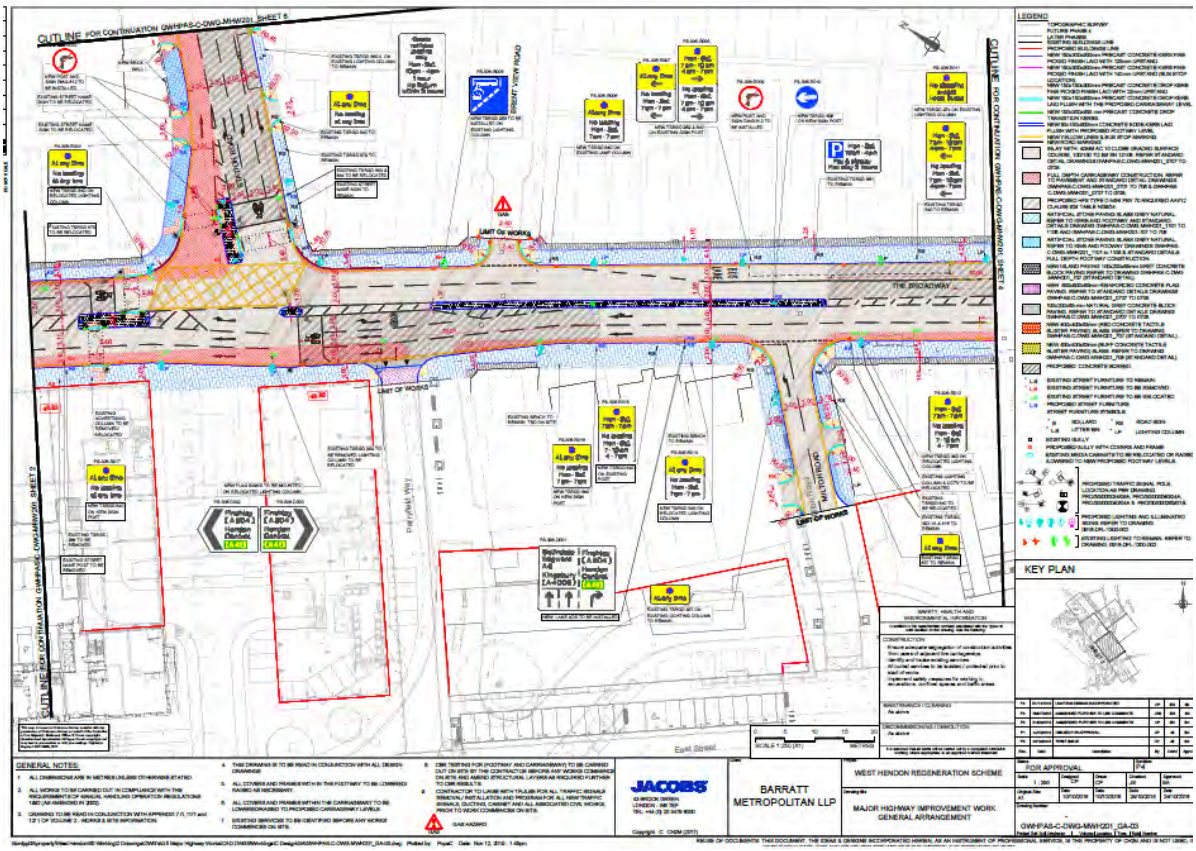


West Hendon public realm highway schemes

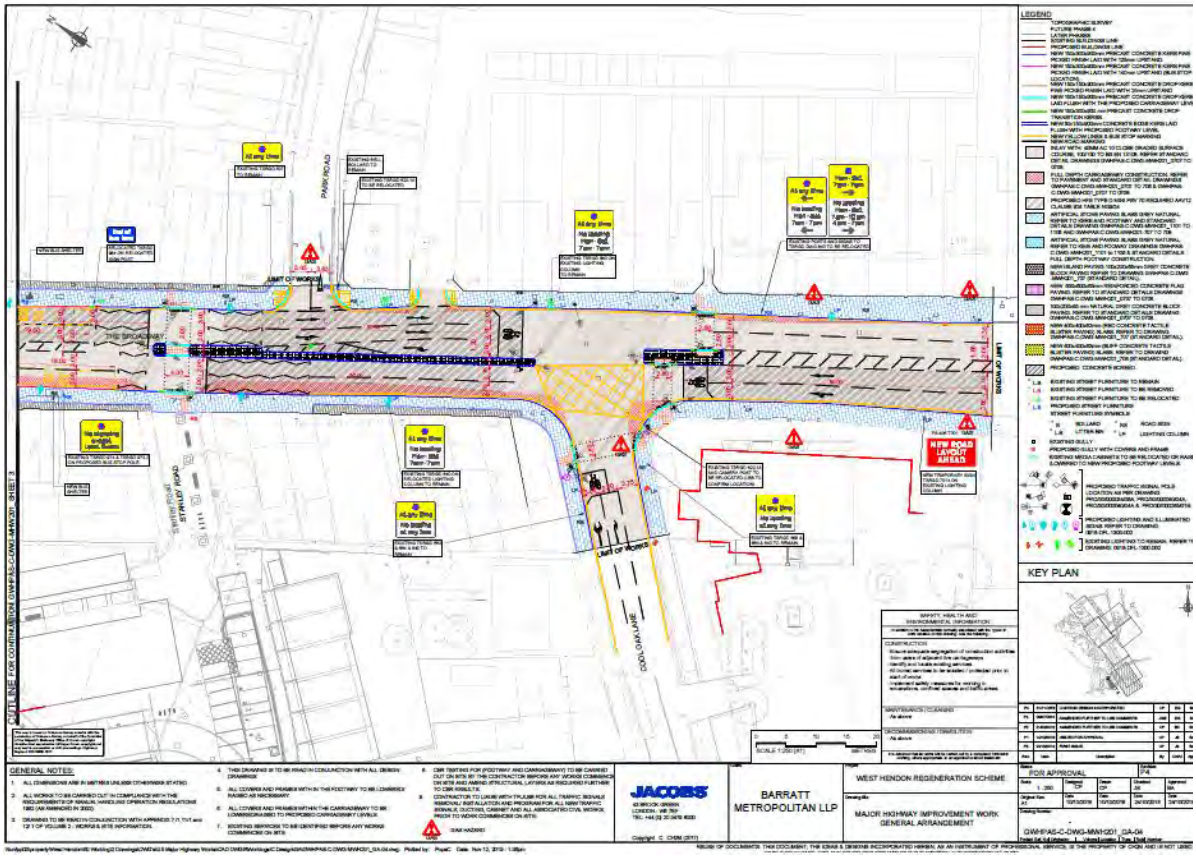


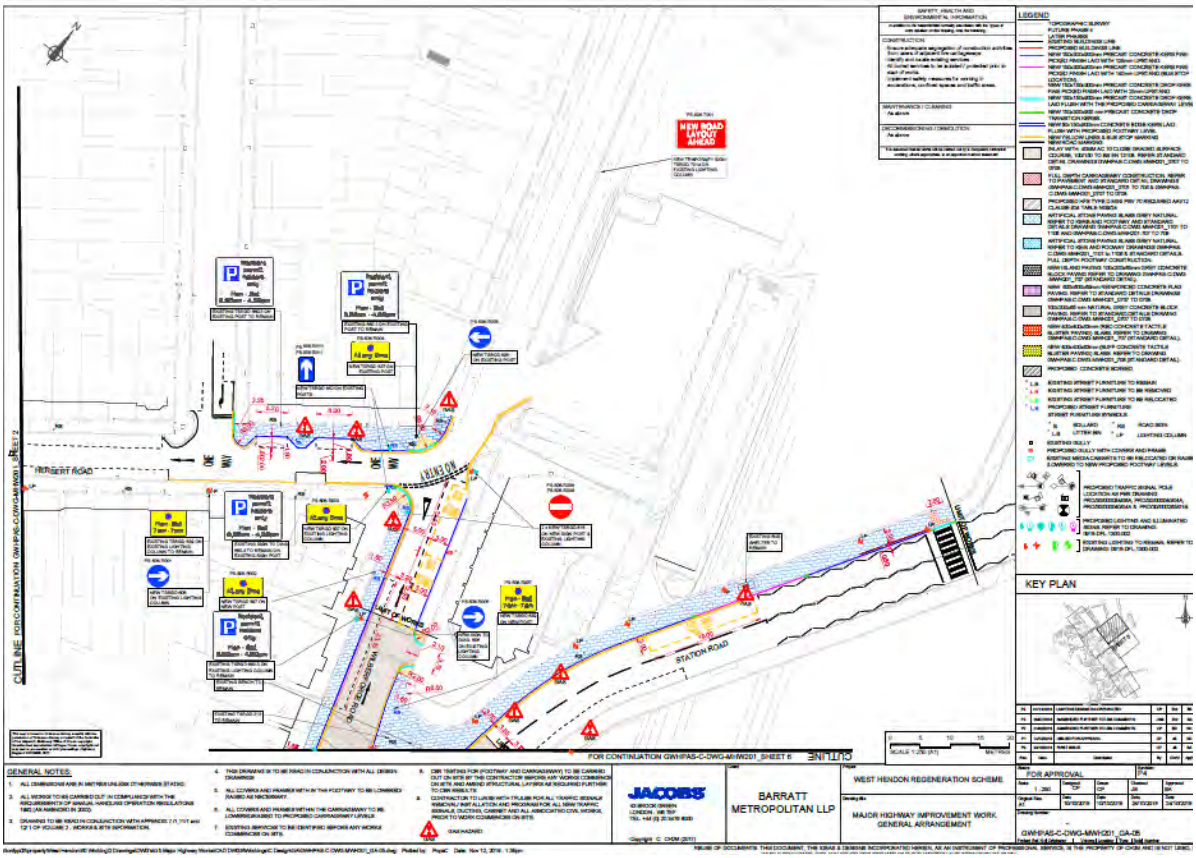

CUTLINE FOR CONTINUATION GWHPAS-C-DWG-MHW201_SHEET 5
CUTLINE FOR CONTINUATION GWHPAS-C-DWG-MHW201_SHEET 7
HENDON WAY
DOLLIS HILL AVENUE
KEY PLAN
GENERAL NOTES:
JACOBS
BARRATT METROPOLITAN LLP
WEST HENDON REGENERATION SCHEME
MAJOR HIGHWAY IMPROVEMENT WORK GENERAL ARRANGEMENT
FOR APPROVAL
GWHPAS-C-DWG-MHW201_GA-02

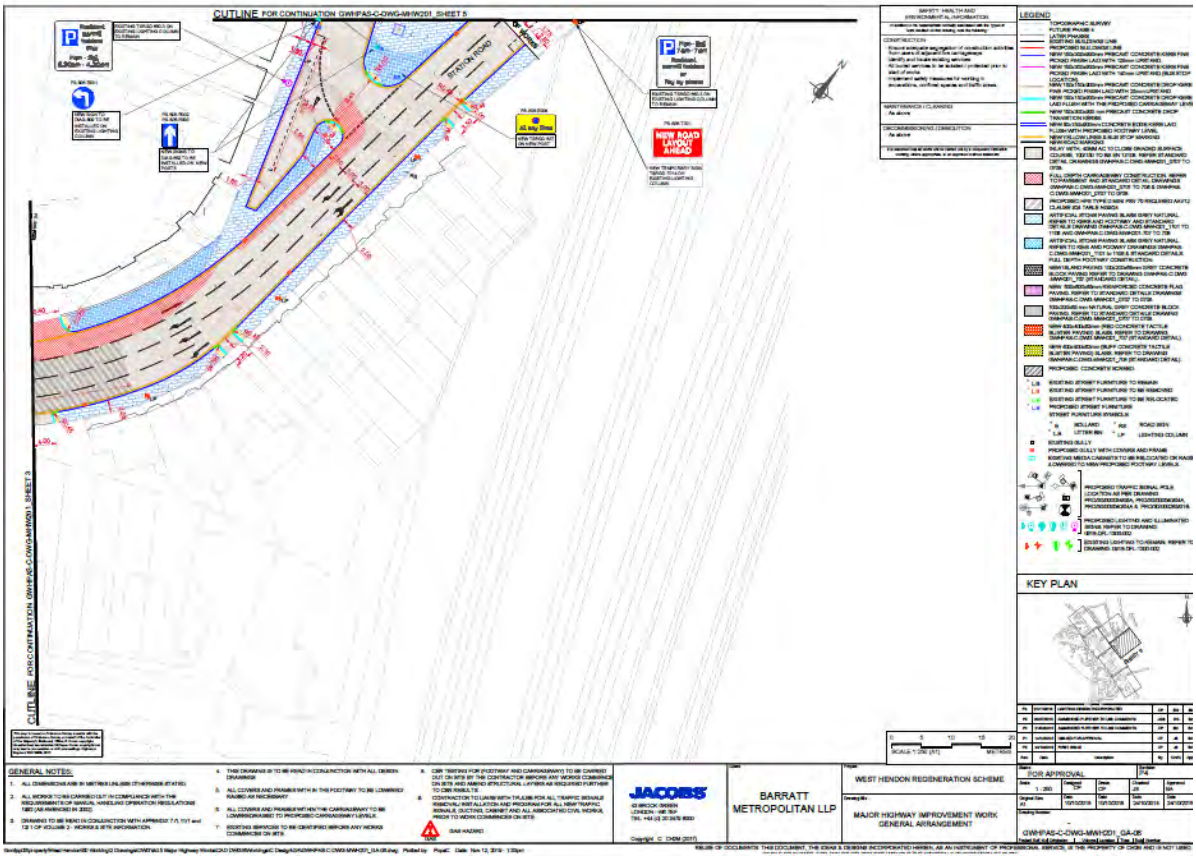
Appendix A


LEGEND
KEY PLAN
GENERAL NOTES
JACOBS
BARRATT METROPOLITAN LLP
WEST HENDON REGENERATION SCHEME
MAJOR HIGHWAY IMPROVEMENT WORK GENERAL ARRANGEMENT
FOR APPROVAL
OUTLINE FOR CONTINUATION GWHPAS-C-DWG-MWH201_SHEET 6
OUTLINE FOR CONTINUATION GWHPAS-C-DWG-MWH201_SHEET 2
OUTLINE FOR CONTINUATION GWHPAS-C-DWG-MWH201_SHEET 4
THE BROADWAY
BRENT VIEW ROAD
LIMIT OF WORKS
East Street

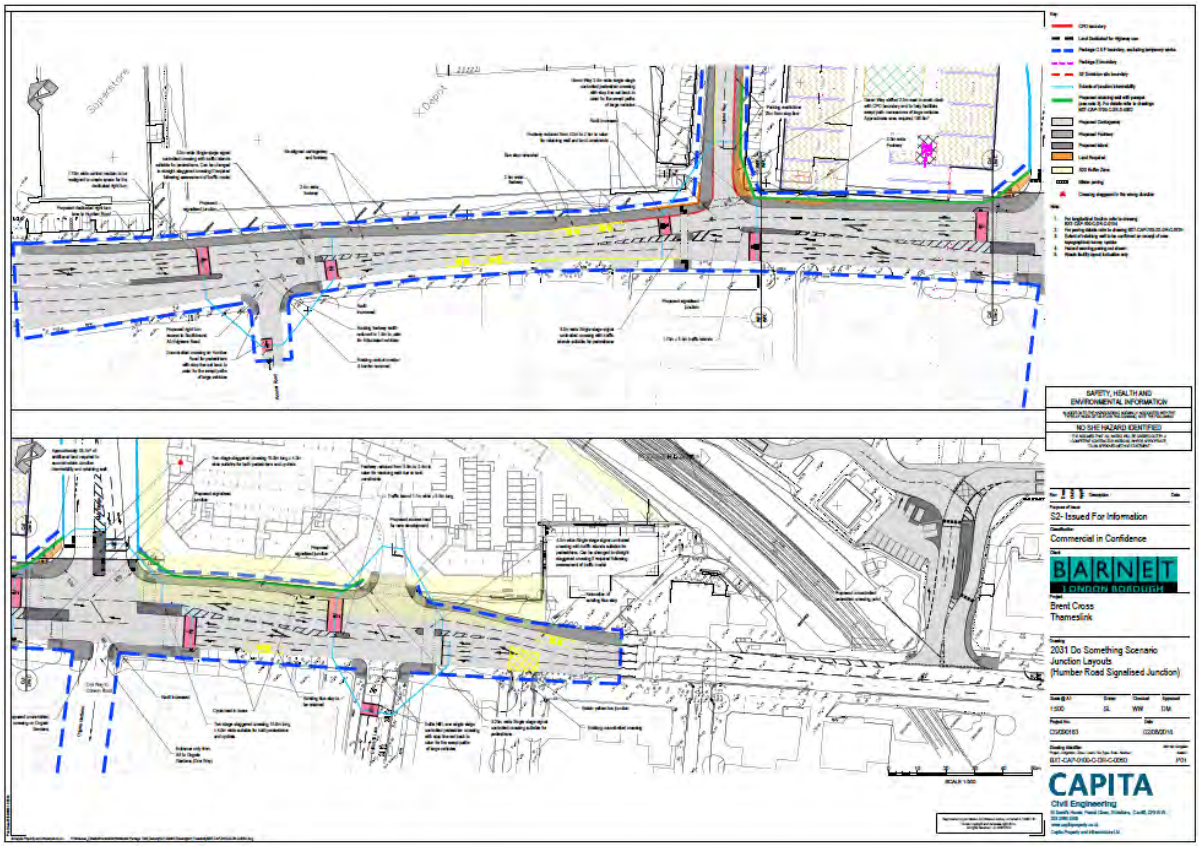
Appendix A


PARK ROAD
STANLEY ROAD
DOG OAK LANE
LIMIT OF WORKS
NEW ROAD LAYOUT AHEAD
KEY PLAN
GENERAL NOTES:
JACOBS
BARRATT METROPOLITAN LLP
WEST HENDON REGENERATION SCHEME
MAJOR HIGHWAY IMPROVEMENT WORK GENERAL ARRANGEMENT
FOR APPROVAL
GWHPIAS-C-DWG-MW1-001_GA-04


NEW ROAD LAYOUT AHEAD
HENDON WAY
STATION ROAD
KEY PLAN
GENERAL NOTES:
JACOBS
BARRATT METROPOLITAN LLP
WEST HENDON REGENERATION SCHEME
MAJOR HIGHWAY IMPROVEMENT WORK
GENERAL ARRANGEMENT
FOR APPROVAL


CUTLINE FOR CONTINUATION GWHPAS-C-DWG-MWK001_SHEET 5
STATION ROAD
NEW ROAD LAYOUT AHEAD
LEGEND
KEY PLAN
GENERAL NOTES:
JACOBS
BARRATT METROPOLITAN LLP
WEST HENDON REGENERATION SCHEME
MAJOR HIGHWAY IMPROVEMENT WORK GENERAL ARRANGEMENT
FOR APPROVAL
GWHPAS-C-DWG-MWK001_SHEET 3

Brent Cross Development Area – Midlands Mainline Bridge



B. APPENDIX B

Households and Jobs projections in Barnet

LTS Households projections

The following table provides summary of the LTS Households projections. The numbers represent new dwelling provided by LTS zone in each modelled year.

LTZ Zone	New Households 2016 (LTS)	New Households 2019 (LTS)	New Households 2021 (LTS)	New Households 2026 (LTS)	New Households 2031 (LTS)	New Households 2036 (LTS)	New Households 2041 (LTS)
7200	-	101	67	180	155	115	151
7201	-	109	73	175	119	87	85
7204	-	632	422	1,889	3,338	2,509	2,259
7207	-	236	157	302	220	156	166
7210	-	165	110	279	87	71	73
7211	-	94	63	225	296	205	123
7212	-	87	58	156	157	166	105
7214	-	2,050	1,367	2,032	1,566	722	408
7215	-	386	257	387	343	115	105
7217	-	862	575	943	215	165	193
7220	-	7	4	11	10	7	7
7221	-	261	174	359	382	423	1,102
7222	-	128	86	223	153	107	110
7224	-	59	39	123	128	63	58
7225	-	108	72	196	172	131	138
7226	-	100	66	208	281	433	226

LTZ Zone	New Households 2016 (LTS)	New Households 2019 (LTS)	New Households 2021 (LTS)	New Households 2026 (LTS)	New Households 2031 (LTS)	New Households 2036 (LTS)	New Households 2041 (LTS)
7227	-	78	52	132	80	64	70
7228	-	73	48	78	76	92	124
7230	-	7	4	14	13	8	6
7231	-	142	94	139	104	73	65
7232	-	109	73	235	285	315	172
7234	-	45	30	77	65	45	51
7235	-	394	263	398	537	284	85
7237	-	298	199	414	459	197	170
7239	-	246	164	457	363	418	152
7240	-	128	85	363	679	844	738
7241	-	169	112	326	434	658	263
7242	-	51	34	99	83	58	49
7250	-	183	122	293	285	178	283
7251	-	121	81	273	363	328	145
7252	-	176	118	245	204	201	212
7253	-	140	94	347	434	241	589
7254	-	58	39	129	135	76	69
7255	-	137	91	230	175	135	131
Total	**-**	**7,939**	**5,293**	**11,939**	**12,395**	**9,691**	**8,685**
Cumulative (from 2016)		**7,939**	**13,231**	**25,170**	**37,565**	**47,257**	**55,942**
Cumulative from 2019			**5,293**	**17,231**	**29,627**	**39,318***	**48,003**

LBB Households projections

Status	Site Address	Ward	Source	Likelihood	Units 2019-2020 to 2020-2021	Units 2019-2020 to 2025-2026	Units 2019-2020 to 2030-2031	Units 2019-2020 to 2035-2036
PROPOSAL	Church Farm Leisure Centre	Brunswick Park	**REG 18 PROPOSAL**	**Non committed**	0	0	12	12
CONSENT	North London Business Park	Brunswick Park	**CONSENT**	**committed**	0	1150	1350	1350
PROPOSAL	Osidge Lane Community Halls, N14 5DU	Brunswick Park	**REG 18 PROPOSAL**	**Non committed**	0	0	16	16
PROPOSAL	Osidge Library and Health Centre, N11 1EY	Brunswick Park	**REG 18 PROPOSAL**	**Non committed**	0	0	16	16
COMPLETED	Sir Thomas Lipton Memorial Hospital, 151 Chase Side, N14 5HE	Brunswick Park	**CONSENT**	**committed**	30	30	30	30
CONSENT	100 Burnt Oak Broadway, Edgware, HA8 0BE	Burnt Oak	**CONSENT**	**committed**	0	100	100	100
CONSENT	Colesworth House, Crokesley House, Curtlington House, Clare House and Kedyngton House, Burnt Oak Broadway, HA8	Burnt Oak	**CONSENT**	**committed**	0	18	18	18
PROPOSAL	Edgware Hospital	Burnt Oak	**REG 18 PROPOSAL**	**Non committed**	0	0	0	366
ALLOCATION	Watling Avenue Carpark & Market, HA8 0AY	Burnt Oak	**EXISTING ALLOCATION**	**Non committed**	0	0	229	229
COMPLETED	Burnt Oak Registry Office	Burnt Oak	**CONSENT**	**committed**	30	30	30	30
UNDER CONSTRUCTION	The Croft, North Road	Burnt Oak	**CONSENT**	**committed**	33	33	33	33
CONSENT	Stag House	Burnt Oak	**CONSENT**	**committed**	0	51	51	51
COMPLETED	130 - 134 Granville Road, NW2 2LD	Childs Hill	**CONSENT**	**committed**	11	11	11	11
CONSENT SUBJECT S106	194 - 196 Cricklewood Broadway, NW2 3EB	Childs Hill	**CONSENT**	**committed**	0	96	96	96

Status	Site Address	Ward	Source	Likelihood	Units 2019-2020 to 2020-2021	Units 2019-2020 to 2025-2026	Units 2019-2020 to 2030-2031	Units 2019-2020 to 2035-2036
CONSENT	Hermitage Lane	Childs Hill	**CONSENT**	**committed**	0	52	52	52
CONSENT	220 The Vale, NW11 8SR	Childs Hill	**PRIOR APPROVAL**	**committed**	14	14	14	14
COMPLETED	452 Finchley Road, NW11 8DG	Childs Hill	**CONSENT**	**committed**	13	13	13	13
PROPOSAL	Beacon Bingo	Childs Hill	**REG 18 PROPOSAL**	**Non committed**	0	132	132	132
PROPOSAL	Broadway Retail Park, NW2 1ES	Childs Hill	**REG 18 PROPOSAL**	**Non committed**	0	1007	1007	1007
COMPLETED	Church Walk House, Church Walk, NW2 2TJ	Childs Hill	**CONSENT**	**committed**	35	35	35	35
CONSENT	First & Second Floor, Britannia Business Centre, Cricklewood Lane, NW2 1DZ	Childs Hill	**PRIOR APPROVAL**	**committed**	18	18	18	18
UNDER CONSTRUCTION	Granville Road	Childs Hill	**CONSENT**	**committed**	37	111	111	111
CONSENT SUBJECT S106	Tower Service Station 617 Finchley Road London NW3 7BS	Childs Hill	**CONSENT**	**committed**	0	28	28	28
UNDER CONSTRUCTION	126 Colindale Avenue (former Colindale business centre), NW9 5HD	Colindale	**CONSENT**	**committed**	35	35	35	35
COMPLETED	Beaufort Park REMAINING Phases (Blocks C7 C8 C9 and C10)	Colindale	**CONSENT**	**committed**	177	177	177	177
CONSENT	Beaufort Park REMAINING Phases (Blocks D1-D7)	Colindale	**CONSENT**	**committed**	0	379	379	379
UNDER CONSTRUCTION	Beaufort Park REMAINING Phases (Blocks F1, F2, F8, F9)	Colindale	**CONSENT**	**committed**	373	373	373	373

Status	Site Address	Ward	Source	Likelihood	Units 2019-2020 to 2020-2021	Units 2019-2020 to 2025-2026	Units 2019-2020 to 2030-2031	Units 2019-2020 to 2035-2036
CONSENT	Colindale Station Colindale Avenue NW9 5HR	Colindale	**CONSENT**	**committed**	0	303	303	303
CONSENT SUBJECT S106	Colindale Telephone Exchange The Hyde, NW9 6LB	Colindale	**CONSENT**	**committed**	0	505	505	505
ALLOCATION	Colindeep Lane, NW9 6RY	Colindale	**REG 18 PROPOSAL**	**Non committed**	0	0	0	138
ALLOCATION	Douglas Bader Park Estate, Clayton Field, NW9 5SE	Colindale	**REG 18 PROPOSAL**	**Non committed**	0	0	400	400
CONSENT	Grahame Park	Colindale	**EXISTING ALLOCATION**	**committed**	0	0	1500	2088
COMPLETED	Hyde House, Rushgrove Avenue, London, NW9 6LH	Colindale	**PRIOR APPROVAL**	**committed**	40	40	40	40
CONSENT	Imperial House, the Hyde, NW9 5AL	Colindale	**CONSENT**	**committed**	0	102	102	102
ALLOCATION	KFC/ Burger King, NW9 5EB	Colindale	**EXISTING ALLOCATION**	**Non committed**	0	162	162	162
ALLOCATION	Kwik Fit - The Hyde (adj Kidstop)	Colindale	**EXISTING ALLOCATION**	**Non committed**	0	60	60	60
ALLOCATION	Mcdonalds Site, 157 Colindeep Lane, NW9 6BD	Colindale	**EXISTING ALLOCATION**	**Non committed**	0	175	175	175
ALLOCATION	Merit House, Edgware Road, NW9 5AB	Colindale	**EXISTING ALLOCATION**	**Non committed**	0	180	180	180
ALLOCATION	Middlesex University Halls	Colindale	**EXISTING ALLOCATION**	**Non committed**	0	190	190	190
COMPLETED	Peel Centre Development Stage 1	Colindale	**CONSENT**	**committed**	400	400	400	400
UNDER CONSTRUCTION	Peel centre Development Stage 2 and 3	Colindale	**CONSENT**	**committed**	199	1659	1949	1949

Status	Site Address	Ward	Source	Likelihood	Units 2019-2020 to 2020-2021	Units 2019-2020 to 2025-2026	Units 2019-2020 to 2030-2031	Units 2019-2020 to 2035-2036
ALLOCATION	Public Health England NW9 5EQ	Colindale	**REG 18 PROPOSAL**	**Non committed**	0	0	0	1020
CONSENT	Sainsburys The Hyde NW9 6JX	Colindale	**CONSENT**	**committed**	0	1309	1309	1309
COMPLETED	THE RUSHGROVES' Homebase, Rookery Way, London, NW9 6SS	Colindale	**CONSENT**	**committed**	193	193	193	193
COMPLETED	Trinity Square' Barnet College, Grahame Park Way	Colindale	**CONSENT**	**committed**	197	197	197	197
UNDER CONSTRUCTION	Sheaveshill Court	Colindale	**CONSENT**	**committed**	34	34	34	34
CONSENT	Land Adjacent To 114 Coppetts Road And To The Rear Of 102-114 Coppetts Road, And Land Between Coppetts Wood Primary School And Allotment Gardens London N10 1JS	Coppetts	**CONSENT**	**committed**	12	12	12	12
PROPOSAL	Tesco Coppetts Centre Colney Hatch Lane N12 0SH	Coppetts	**REG 18 PROPOSAL**	**Non committed**	0	0	397	397
CONSENT	45-47 Friern Barnet Road, N11 3EG	Coppetts	**CONSENT**	**committed**	0	22	22	22
PROPOSAL	45-69 East Barnet Rd, EN4 8RN	East Barnet	**REG 18 PROPOSAL**	**Non committed**	0	0	0	110
PROPOSAL	Danegrove Playing Field, Park Rd & Cat Hill EN4 8UD	East Barnet	**REG 18 PROPOSAL**	**Non committed**	0	148	148	148
PROPOSAL	East Barnet Library, EN4 8SG	East Barnet	**REG 18 PROPOSAL**	**Non committed**	0	12	12	12
PROPOSAL	East Barnet Shooting Club Victoria Rd EN4 9SH	East Barnet	**REG 18 PROPOSAL**	**Non committed**	0	43	43	43
PROPOSAL	Fayer's Building Yard & Church EN4 9NR	East Barnet	**REG 18 PROPOSAL**	**Non committed**	0	0	0	25

Status	Site Address	Ward	Source	Likelihood	Units 2019-2020 to 2020-2021	Units 2019-2020 to 2025-2026	Units 2019-2020 to 2030-2031	Units 2019-2020 to 2035-2036
CONSENT SUBJECT S106	Gateway - The Former East Barnet Gas Works	East Barnet	**CONSENT**	committed	0	91	91	91
UNDER CONSTRUCTION	Land Adjacent To 106 -128 Mount Pleasant And 27-37 Langford Road, EN4 9HG	East Barnet	**CONSENT**	committed	12	12	12	12
PROPOSAL	New Barnet Gasholder, EN4 9SH	East Barnet	**REG 18 PROPOSAL**	Non committed	0	0	0	190
PROPOSAL	Sainsbury's, East Barnet Road	East Barnet	**REG 18 PROPOSAL**	Non committed	0	0	199	199
UNDER CONSTRUCTION	Victoria Quarter - The Former East Barnet Gas Works	East Barnet	**CONSENT**	committed	150	303	303	303
CONSENT	Woodgate House and Studio Games Road EN5 9HN	East Barnet	**PRIOR APPROVAL**	committed	12	12	12	12
UNDER CONSTRUCTION	Mount Pleasant Flats	East Barnet	**CONSENT**	committed	12	12	12	12
CONSENT	Salvation Army Hall, Albert Road, EN4 9SH	East Barnet	**CONSENT**	committed	0	39	39	39
CONSENT	12 - 18 High Road, N2 9PJ	East Finchley	**CONSENT**	committed	0	24	24	24
PROPOSAL	Bobath Centre 250 East End Rd N2 8AU	East Finchley	**REG 18 PROPOSAL**	Non committed	0	25	25	25
PROPOSAL	East Finchley Station Carpark N2 0NW	East Finchley	**REG 18 PROPOSAL**	Non committed	0	0	0	135
PROPOSAL	East Finchley Substation N2 0NL	East Finchley	**REG 18 PROPOSAL**	Non committed	0	31	31	31
PROPOSAL	Park House 16 High Rd N2 9PJ	East Finchley	**REG 18 PROPOSAL**	Non committed	0	44	44	44
UNDER CONSTRUCTION	Prospect Ring	East Finchley	**CONSENT**	committed	0	50	50	50

Status	Site Address	Ward	Source	Likelihood	Units 2019-2020 to 2020-2021	Units 2019-2020 to 2025-2026	Units 2019-2020 to 2030-2031	Units 2019-2020 to 2035-2036
CONSENT	186 High Street, HA8 7EX	Edgware	**CONSENT**	committed	0	20	20	20
PROPOSAL	Edgware Town Centre	Edgware	**REG 18 PROPOSAL**	Non committed	0	0	952	2380
PROPOSAL	Edgware Underground & Bus Stations, HA8 7AW	Edgware	**REG 18 PROPOSAL**	Non committed	0	0	2317	2317
CONSENT	Land At Broadfields Primary School Roseberry Drive, Edgware, HA8 8JP	Edgware	**CONSENT**	committed	50	112	112	112
CONSENT	Land at the Rectory, Rectory Lane, HA8 7LG	Edgware	**CONSENT**	committed	0	51	51	51
UNDER CONSTRUCTION	Premier Place, 102-124 Station Road And Car Park To Rear, HA8 7BJ	Edgware	**CONSENT**	committed	60	122	122	122
CONSENT	298 - 304 Regents Park Road, N3 2SZ	Finchley Church End	**PRIOR APPROVAL**	committed	130	130	130	130
CONSENT	2A Lichfield Grove N3 2JP	Finchley Church End	**PRIOR APPROVAL**	committed	12	12	12	12
CONSENT	Dove House, Gadd House And Cooper House, Arcadia Avenue, N3 2JU	Finchley Church End	**PRIOR APPROVAL**	committed	88	88	88	88
PROPOSAL	Finchley Central Station N3 2RY	Finchley Church End	**REG 18 PROPOSAL**	Non committed	0	0	556	556
CONSENT	Land West of Beechwood Avenue N3 3BA	Finchley Church End	**CONSENT**	committed	0	87	87	87
CONSENT	94-96 Great North Road N2 0NL	Garden Suburb	**PRIOR APPROVAL**	committed	16	16	16	16
COMPLETED	Hammerson House 50A The Bishops Avenue London N2 0BE	Garden Suburb	**NON CONVENTIONAL SUPPLY CONSENT**	Non committed	48	48	48	48
CONSENT	Harrison Varma House, 98 Great North Road, N2 0NL	Garden Suburb	**PRIOR APPROVAL**	committed	10	10	10	10
CONSENT SUBJECT S106	1-5 Princes Parade, Golders Green Road and 1-3 Heather Gardens NW11 9HS	Golders Green	**CONSENT**	committed	0	29	29	29

Status	Site Address	Ward	Source	Likelihood	Units 2019-2020 to 2020-2021	Units 2019-2020 to 2025-2026	Units 2019-2020 to 2030-2031	Units 2019-2020 to 2035-2036
UNDER CONSTRUCTION	290-294 Golders Green Road, NW11 9PY	Golders Green	**CONSENT**	**committed**	60	60	60	60
CONSENT	Brent Cross Cricklewood	Golders Green	**CONSENT**	**committed**	0	600	3800	7500
PROPOSAL	Brentmead Close 1-6 Brentmead Close NW11 9JG	Golders Green	**REG 18 PROPOSAL**	**Non committed**	0	0	46	46
PROPOSAL	Manor Park Road Car Park 72-76 Manor Park Rd N2 0SJ	Golders Green	**ALLOCATION**	**Non committed**	0	7	7	7
CONSENT	Yamor House 285 Golders Green Road NW11 9JE	Golders Green	**CONSENT**	**committed**	0	15	15	15
PROPOSAL	Bunns Lane Carpark Bunns Lane NW7 2AA	Hale	**REG 18 PROPOSAL**	**Non committed**	0	0	43	43
CONSENT	Land Adjacent Northway And Fairway Primary School The Fairway Mill Hill London NW7 3HS	Hale	**CONSENT**	**committed**	60	120	120	120
PROPOSAL	Burroughs Gardens Carpark The Burroughs NW4 4AU	Hendon	**REG 18 PROPOSAL**	**Non committed**	0	0	9	9
PROPOSAL	Egerton Gardens Carpark The Burroughs NW4 8BD	Hendon	**REG 18 PROPOSAL**	**Non committed**	0	0	23	23
PROPOSAL	Fenella The Burroughs NW4 4BS	Hendon	**REG 18 PROPOSAL**	**Non committed**	0	0	60	60
CONSENT	Fosters Estate, NW4 2DL	Hendon	**CONSENT**	**committed**	0	217	217	217
PROPOSAL	Meritage Centre, NW4 4JT	Hendon	**REG 18 PROPOSAL**	**Non committed**	0	0	36	36
PROPOSAL	Middlesex University Carpark Greyhound Hill NW4 4BT	Hendon	**REG 18 PROPOSAL**	**Non committed**	0	0	0	70
PROPOSAL	PDSA, NW4 4JU	Hendon	**REG 18 PROPOSAL**	**Non committed**	0	0	16	16

Status	Site Address	Ward	Source	Likelihood	Units 2019-2020 to 2020-2021	Units 2019-2020 to 2025-2026	Units 2019-2020 to 2030-2031	Units 2019-2020 to 2035-2036
PROPOSAL	Ravensfield House The Burroughs NW4 4BT	Hendon	**REG 18 PROPOSAL**	**Non committed**	0	0	84	84
UNDER CONSTRUCTION	Spectrum House, Hillview Gardens, London, NW4 2JQ	Hendon	**CONSENT**	**committed**	33	33	33	33
PROPOSAL	The Burroughs Carpark NW4 4AR	Hendon	**REG 18 PROPOSAL**	**Non committed**	0	0	21	21
PROPOSAL	Usher Hall The Burroughs NW4 4HE	Hendon	**REG 18 PROPOSAL**	**Non committed**	0	0	0	39
CONSENT	Westhorpe Gardens and Mills Grove NW4 2TU	Hendon	**CONSENT**	**committed**	0	149	149	149
COMPLETED	74 - 78 High Street, EN5 5SN	High Barnet	**CONSENT**	**committed**	10	10	10	10
PROPOSAL	Army Reserve Depot	High Barnet	**REG 18 PROPOSAL**	**Non committed**	0	0	0	193
CONSENT	Brake Shear House 164 High Street Barnet EN5 5XP	High Barnet	**CONSENT**	**committed**	0	58	58	58
PROPOSAL	High Barnet Station Carpark Great North Road EN5 5RP	High Barnet	**REG 18 PROPOSAL**	**Non committed**	0	0	292	292
UNDER CONSTRUCTION	Land At 1-7 Moxon Street And At 44 Tapster Street Including Land To The Rear Of 1-11 Moxon Street And Opposite The Old Printworks Barnet EN5 5TY	High Barnet	**CONSENT**	**committed**	12	12	12	12
CONSENT	Moxon Street Garage, EN5 5TY	High Barnet	**CONSENT**	**committed**	0	10	10	10
PROPOSAL	Whalebones Park EN5 4BZ	High Barnet	**REG 18 PROPOSAL**	**Non committed**	0	149	149	149
CONSENT	11-19 Ballards Lane and 6 Albert Place N3 1QB	Mill Hill	**PRIOR APPROVAL**	**committed**	24	24	24	24

Status	Site Address	Ward	Source	Likelihood	Units 2019-2020 to 2020-2021	Units 2019-2020 to 2025-2026	Units 2019-2020 to 2030-2031	Units 2019-2020 to 2035-2036
CONSENT	141-143 Dollis Road NW7 1JX	Mill Hill	**CONSENT**	**committed**	0	23	23	23
PROPOSAL	IBSA House The Ridgeway NW7 1RN	Mill Hill	**REG 18 PROPOSAL**	**Non committed**	0	0	125	125
CONSENT	Marshall Hall, Marshall Estate, Hammers Lane, NW7 4DQ	Mill Hill	**CONSENT**	**committed**	0	10	10	10
CONSENT	Mill Hill East (Millbrook Park) Phase 10	Mill Hill	**CONSENT**	**committed**	60	110	110	110
COMPLETED	Mill Hill East (Millbrook Park) Phase 4b	Mill Hill	**CONSENT**	**committed**	148	148	148	148
COMPLETED	Mill Hill East (Millbrook Park) Phase 4c	Mill Hill	**CONSENT**	**committed**	89	89	89	89
UNDER CONSTRUCTION	Mill Hill East (Millbrook Park) Phase 5	Mill Hill	**CONSENT**	**committed**	160	188	188	188
CONSENT	Mill Hill East (Millbrook Park) Phase 6	Mill Hill	**CONSENT**	**committed**	60	310	310	310
CONSENT	Mill Hill East (Millbrook Park) Phase 6b	Mill Hill	**CONSENT**	**committed**	0	66	66	66
CONSENT	Mill Hill East (Millbrook Park) Phase 7	Mill Hill	**CONSENT**	**committed**	0	166	166	166
CONSENT	Mill Hill East (Millbrook Park) Phase 8	Mill Hill	**CONSENT**	**committed**	0	164	164	164
CONSENT	Mill Hill East (Millbrook Park) Phase 9	Mill Hill	**CONSENT**	**committed**	100	355	355	355
PROPOSAL	Mill Hill East Station NW7 1BS	Mill Hill	**REG 18 PROPOSAL**	**Non committed**	0	0	0	127
PROPOSAL	Mill Hill Library	Mill Hill	**REG 18 PROPOSAL**	**Non committed**	0	0	19	19
COMPLETED	National Institute of Medical Research	Mill Hill	**CONSENT**	**committed**	462	462	462	462
PROPOSAL	Watchtower House & Kingdom Hall	Mill Hill	**REG 18 PROPOSAL**	**Non committed**	0	0	0	219

Status	Site Address	Ward	Source	Likelihood	Units 2019-2020 to 2020-2021	Units 2019-2020 to 2025-2026	Units 2019-2020 to 2030-2031	Units 2019-2020 to 2035-2036
	The Ridgeway NW7 1RS							
PROPOSAL	Watford Way & Bunns Lane NW7 2EX	Mill Hill	**REG 18 PROPOSAL**	**Non committed**	0	0	0	105
COMPLETED	Brook Point 1412-1420 High Road, Turnberry House & Euro House 1394-1410 High Road, London, N20 9BH	Oakleigh	**PRIOR APPROVAL**	**committed**	67	67	67	67
COMPLETED	Car Wash 1420 - 1428 High Road, London, N20 9BH	Oakleigh	**CONSENT**	**committed**	22	22	22	22
PROPOSAL	Great North Road Local Centre EN5 1AB	Oakleigh	**REG 18 PROPOSAL**	**Non committed**	0	0	0	84
CONSENT	Kingmaker House, 15 Station Road, Barnet, Herts, EN5 1NZ	Oakleigh	**PRIOR APPROVAL**	**committed**	0	61	61	61
COMPLETED	Springdene Nursing Home, 55, Oakleigh Park Road, N20 9NH	Oakleigh	CONSENT	**committed**	27	27	27	27
COMPLETED	1060A to 1072 High Road, Whetstone, London N20 0QP	Totteridge	**CONSENT**	**committed**	56	56	56	56
CONSENT	70-84 and Land R/O Oakleigh Road North, N20 9EZ	Totteridge	**CONSENT**	**committed**	0	107	107	107
PROPOSAL	Allum Way Totteridge & Whetstone station/High Rd/Download Close/Allum Way N20	Totteridge	**REG 18 PROPOSAL**	**Non committed**	0	0	0	888
CONSENT	Barnet House, 1255 High Road, N20 0EJ	Totteridge	**REG 18 PROPOSAL**	**Non committed**	0	139	139	139
COMPLETED	Brookdene Holden Road London N12 7DR	Totteridge	**CONSENT**	**committed**	34	34	34	34
CONSENT	Edelman House 1238 High Road N20 0LH	Totteridge	**PRIOR APPROVAL**	**committed**	0	26	26	26

Status	Site Address	Ward	Source	Likelihood	Units 2019-2020 to 2020-2021	Units 2019-2020 to 2025-2026	Units 2019-2020 to 2030-2031	Units 2019-2020 to 2035-2036
COMPLETED	Land between Sweets Way and Oakleigh Road North, N20	Totteridge	**CONSENT**	committed	288	288	288	288
COMPLETED	St Barnabas Church, 42 Holden Road, Woodside Park N12 7DN	Totteridge	**CONSENT**	committed	30	30	30	30
COMPLETED	Totteridge Place' 1201 High Road, London, N20 0PD	Totteridge	CONSENT	committed	124	124	124	124
PROPOSAL	Woodside Park Station East N12 8RT	Totteridge	**REG 18 PROPOSAL**	Non committed	0	0	95	95
PROPOSAL	Woodside Park Station West N12 8RT	Totteridge	**REG 18 PROPOSAL**	Non committed	0	270	270	270
CONSENT	Woodside Park Underground Station, N12 8SE	Totteridge	**CONSENT**	committed	0	86	86	86
UNDER CONSTRUCTION	Friern Court	Totteridge	**CONSENT**	committed	0	11	11	11
CONSENT	66 Woodside Park Road, N12 8RY	Totteridge	**CONSENT**	committed	0	13	13	13
CONSENT	Dollis Valley - Phase 3	Underhill	**CONSENT**	committed	0	117	117	117
CONSENT	Dollis Valley - Phase 4	Underhill	**CONSENT**	committed	0	125	125	125
CONSENT	Dollis Valley - Phase 5	Underhill	**CONSENT**	committed	0	123	123	123
CONSENT	Land Adjacent To Whitings Hill Primary School Whitings Road Barnet EN5 2QY	Underhill	**CONSENT**	committed	33	33	33	33
UNDER CONSTRUCTION	Marie Foster Home, Wood Street, EN5 4BS	Underhill	**CONSENT**	committed	33	33	33	33
UNDER CONSTRUCTION	105A Ballards Lane N3 1XY	West Finchley	**CONSENT**	committed	10	10	10	10
ALLOCATION	309-319 Ballard's Lane North Finchley N12 8LY	West Finchley	**EXISTING ALLOCATION**	Non committed	0	0	0	130

Status	Site Address	Ward	Source	Likelihood	Units 2019-2020 to 2020-2021	Units 2019-2020 to 2025-2026	Units 2019-2020 to 2030-2031	Units 2019-2020 to 2035-2036
COMPLETED	401 - 405 Nether Street, London N3 1QG (Adastra House)	West Finchley	**CONSENT**	**committed**	34	34	34	34
ALLOCATION	811 High Rd North Finchley & Lodge Lane carpark N12 8JT	West Finchley	**EXISTING ALLOCATION**	**Non committed**	0	0	132	132
CONSENT	Central House and 1-9 Ballards Lane	West Finchley	**PRIOR APPROVAL**	**committed**	0	48	48	48
ALLOCATION	Finchley House, High Rd & Kingsway North Finchley N12 0BT	West Finchley	**EXISTING ALLOCATION**	**Non committed**	0	202	202	202
CONSENT	Former Police Station 193-195 Ballards Lane N3 1LZ	West Finchley	**CONSENT**	**committed**	0	41	41	41
CONSENT	Rowlandson House, 289-293 Ballards Lane, N12 8NP	West Finchley	**PRIOR APPROVAL**	**committed**	0	47	47	47
ALLOCATION	Tally Ho Triangle, High Rd, Ballards Lane & Kingsway, North Finchley N12 0GA/0BP	West Finchley	**EXISTING ALLOCATION**	**Non committed**	0	0	0	281
PROPOSAL	Tesco, 21-29 Ballards Lane N3 1XP	West Finchley	**REG 18 PROPOSAL**	**Non committed**	0	0	0	170
CONSENT	1,3,4 and 5 The Exchange, Brent Cross Gardens, NW4 3RJ	West Hendon	**PRIOR APPROVAL**	**committed**	0	89	89	89
COMPLETED	117-125 West Hendon Broadway, London NW9 7BP	West Hendon	**CONSENT**	**committed**	43	43	43	43
CONSENT SUBJECT S106	60 West Hendon Broadway	West Hendon	**CONSENT**	**committed**	0	53	53	53
CONSENT	63-65 The Hyde, NW9 6LE	West Hendon	**CONSENT**	**committed**	18	18	18	18
ALLOCATION	Philex House 110-124 West Hendon Broadway NW9 7DW	West Hendon	**ALLOCATION**	**Non committed**	0	48	48	48

Status	Site Address	Ward	Source	Likelihood	Units 2019-2020 to 2020-2021	Units 2019-2020 to 2025-2026	Units 2019-2020 to 2030-2031	Units 2019-2020 to 2035-2036
UNDER CONSTRUCTION	West Hendon Estate	West Hendon	**CONSENT**	committed	0	641	1156	1156
ALLOCATION	744-776 High Rd North Finchley N12 9QG/9QS	Woodhouse	**EXISTING ALLOCATION**	Non committed	0	0	0	175
CONSENT	869 High Road, N12 8QA	Woodhouse	**PRIOR APPROVAL**	committed	10	10	10	10
CONSENT	912-920 High Road N12 9RW	Woodhouse	**CONSENT**	committed	24	24	24	24
ALLOCATION	East Wing, 672-708 High Rd North Finchley N12 9PT/9QL	Woodhouse	**EXISTING ALLOCATION**	Non committed	0	0	0	125
PROPOSAL	Former Barnet Mortuary, N3 2EU	Woodhouse	**REG 18 PROPOSAL**	Non committed	0	20	20	20
PROPOSAL	Great North Leisure Park N12 0GL	Woodhouse	**REG 18 PROPOSAL**	Non committed	0	0	0	352
CONSENT	Summers Lane	Woodhouse	**CONSENT**	committed	0	14	14	14
CONSENT	Britannia House, 960 High Road, N12 9RY	Woodhouse	**CONSENT**	committed	0	23	23	23
SMALL SITE	n/a	Brunswick Park	**PROPOSAL**	Non committed	32	113	193	274
SMALL SITE	n/a	Burnt Oak	**PROPOSAL**	Non committed	32	113	193	274
SMALL SITE	n/a	Childs Hill	**PROPOSAL**	Non committed	32	113	193	274
SMALL SITE	n/a	Colindale	**PROPOSAL**	Non committed	32	113	193	274
SMALL SITE	n/a	Coppetts	**PROPOSAL**	Non committed	32	113	193	274
SMALL SITE	n/a	East Barnet	**PROPOSAL**	Non committed	32	113	193	274
SMALL SITE	n/a	East Finchley	**PROPOSAL**	Non committed	32	113	193	274
SMALL SITE	n/a	Edgware	**PROPOSAL**	Non committed	32	113	193	274
SMALL SITE	n/a	Finchley Church End	**PROPOSAL**	Non committed	32	113	193	274
SMALL SITE	n/a	Garden Suburb	**PROPOSAL**	Non committed	32	113	193	274
SMALL SITE	n/a	Golders Green	**PROPOSAL**	Non committed	32	113	193	274
SMALL SITE	n/a	Hale	**PROPOSAL**	Non committed	32	113	193	274
SMALL SITE	n/a	Hendon	**PROPOSAL**	Non committed	32	113	193	274
SMALL SITE	n/a	High Barnet	**PROPOSAL**	Non committed	32	113	193	274
SMALL SITE	n/a	Mill Hill	**PROPOSAL**	Non committed	32	113	193	274

Status	Site Address	Ward	Source	Likelihood	Units 2019-2020 to 2020-2021	Units 2019-2020 to 2025-2026	Units 2019-2020 to 2030-2031	Units 2019-2020 to 2035-2036
SMALL SITE	n/a	Oakleigh	PROPOSAL	Non committed	32	113	193	274
SMALL SITE	n/a	Totteridge	PROPOSAL	Non committed	32	113	193	274
SMALL SITE	n/a	Underhill	PROPOSAL	Non committed	32	113	193	274
SMALL SITE	n/a	West Finchley	PROPOSAL	Non committed	32	113	193	274
SMALL SITE	n/a	West Hendon	PROPOSAL	Non committed	32	113	193	274
SMALL SITE	n/a	Woodhouse	PROPOSAL	Non committed	32	113	193	274

Table B-1 Draft Local Plan Reg18 Household Units Projections

LBB's committed Households. The numbers represent new dwelling provided by LTS zone in each future year. The Households have been allocated in GIS to the relevant LTS zone. It should be noted that the 2041 forecasts have not been provided by LBB but represent a trend continuation assumption. The LTS zones 7204, 7212 and 7215 represent the area which is associated with the Brent Cross (BXC) Redevelopment Area.

LTS Zone (LBB committed Households)	New Households 2016 (LBB committed)	New Households 2019 (LBB committed)	New Households 2021 (LBB committed)	New Households 2026 (LBB committed)	New Households 2031 (LBB committed)	New Households 2036 (LBB committed)	New Households 2041 (LBB committed)
7200	-	101	-	-	-	-	-
7201	-	109	-	-	-	-	-
7204	-	632	177	740	3,200	3,700	116
7207	-	236	110	154	-	-	97
7210	-	165	-	-	-	-	-
7211	-	94	33	366	-	-	146
7212	-	87	-	89	-	-	33
7214	-	2,050	1,489	3,653	1,790	588	2,758
7215	-	386	43	694	515	-	459
7217	-	862	931	1,002	-	-	709
7220	-	7	-	-	-	-	-
7221	-	261	60	133	-	-	71
7222	-	128	50	62	-	-	41
7224	-	59	-	-	-	-	-
7225	-	108	-	-	-	-	-

LTS Zone (LBB committed Households)	New Households 2016 (LBB committed)	New Households 2019 (LBB committed)	New Households 2021 (LBB committed)	New Households 2026 (LBB committed)	New Households 2031 (LBB committed)	New Households 2036 (LBB committed)	New Households 2041 (LBB committed)
7226	-	100	63	574	-	-	234
7227	-	78	60	60	-	-	44
7228	-	73	-	10	-	-	4
7230	-	7	-	-	-	-	-
7231	-	142	33	-	-	-	12
7232	-	109	55	68	-	-	45
7234	-	45	177	-	-	-	65
7235	-	394	296	133	-	-	157
7237	-	298	-	426	-	-	156
7239	-	246	186	283	-	-	172
7240	-	128	318	1,150	200	-	612
7241	-	169	-	33	-	-	12
7242	-	51	12	-	-	-	4
7250	-	183	230	87	-	-	116
7251	-	121	216	89	-	-	112
7252	-	176	98	169	-	-	98
7253	-	140	-	14	-	-	5
7254	-	58	-	74	-	-	27
7255	-	137	26	-	-	-	10
Total	**-**	**7,939**	**4,663**	**10,063**	**5,705**	**4,288**	**6,314**
Cumulative (from 2016)	-	**7,939**	**12,602**	**22,665**	**28,370**	**32,658**	**38,972**
Cumulative from 2019			**4,663**	**14,726**	**20,431**	**24,719**	**31,033**

Table B-2 LBB committed Household projections by LTS Zone

The following table provides summary of LBB's total projected Households. The numbers represent new dwelling provided by LTS zone in each modelled year. It should be noted that the 2041 forecasts have not been provided by LBB but represent a trend continuation assumption.

LTS Zone (LBB Total Households)	New Households 2016 (LBB Total)	New Households 2019 (LBB Total)	New Households 2021 (LBB Total)	New Households 2026 (LBB Total)	New Households 2031 (LBB Total)	New Households 2036 (LBB Total)	New Households 2041 (LBB Total)
7200	-	101	-	-	-	-	-
7201	-	109	-	-	-	-	-
7204	-	632	209	1,959	3,326	3,780	651
7207	-	236	142	234	80	80	197
7210	-	165	-	-	52	-	19
7211	-	94	33	366	-	-	146
7212	-	87	32	359	277	189	315
7214	-	2,050	1,521	4,310	2,270	806	3,267
7215	-	386	75	822	595	80	577
7217	-	862	963	1,082	205	531	1,020
7220	-	7	-	-	-	-	-
7221	-	261	92	213	3,349	1,508	1,893
7222	-	128	50	62	-	-	41
7224	-	59	-	-	43	-	16
7225	-	108	-	-	-	-	-
7226	-	100	95	654	309	1,466	926
7227	-	78	60	60	-	-	44
7228	-	73	32	90	99	80	111
7230	-	7	-	-	-	-	-
7231	-	142	33	-	-	-	12
7232	-	109	119	378	161	354	371
7234	-	45	177	-	-	-	65

LTS Zone (LBB Total Households)	New Households 2016 (LBB Total)	New Households 2019 (LBB Total)	New Households 2021 (LBB Total)	New Households 2026 (LBB Total)	New Households 2031 (LBB Total)	New Households 2036 (LBB Total)	New Households 2041 (LBB Total)
7235	-	394	328	352	80	968	634
7237	-	298	32	506	372	164	394
7239	-	246	218	566	291	405	543
7240	-	128	350	1,230	312	80	724
7241	-	169	32	113	80	80	112
7242	-	51	12	-	-	-	4
7250	-	183	262	167	636	80	420
7251	-	121	248	169	80	250	275
7252	-	176	130	721	307	791	715
7253	-	140	-	34	397	352	287
7254	-	58	32	223	80	215	202
7255	-	137	106	118	80	80	141
Total	**-**	**7,939**	**5,387**	**14,797**	**13,490**	**12,348**	**14,126**
Cumulative (from 2016)	-	**7,939**	**13,326**	**28,123**	**41,613**	**53,961**	**68,087**
Cumulative from 2019			**5,387**	**20,184**	**33,674**	**46,022***	**60,148**

Table B-3 LBB Full Household projections by LTS Zone

*Note: It should be noted that in discussion with Re, in the case of LBB's total Households projections the 2019-2036 number of +46,022 includes +5,746 Householdss relating to non-committed small developments. These are not included in the LTS model and go towards explaining the difference with LTS's 2019-2036 projection of +39,318. By removing the small dwellings, LBB's total projection would amount to +40,276 which is more comparable to LTS's based projections.

However, a comparison of the three tables above clearly show a difference in distribution of the Householdss which requires an adjustment of the LoHAM matrices for the purposes of this Strategic Transport Assessment.

LTS job projections

The following table provides summary of the LTS jobs projections which drive growth also in the LoHAM and Raiplan models. The numbers represent new jobs by LTS zone in each modelled year; i.e. the reported values are not cumulative.

LTS Zone	New JOBS 2016 (LTS)	New JOBS 2019 (LTS)	New JOBS 2021 (LTS)	New JOBS 2026 (LTS)	New JOBS 2031 (LTS)	New JOBS 2036 (LTS)	New JOBS 2041 (LTS)
7200	-	-8	-6	33	81	82	55
7201	-	3	2	76	117	112	78
7204	-	3,029	2,019	4,517	2,866	2,041	1,422
7207	-	7	4	52	112	113	79
7210	-	3	2	20	44	46	33
7211	-	10	7	60	129	135	99
7212	-	5	4	54	134	141	95
7214	-	88	59	218	277	234	142
7215	-	25	17	166	180	160	96
7217	-	29	19	263	204	159	108
7220	-	-0	-0	1	2	2	1
7221	-	-9	-6	53	129	109	70
7222	-	-4	-2	18	51	53	36
7224	-	3	2	22	45	46	34
7225	-	4	3	25	57	61	43
7226	-	3	2	67	110	109	73
7227	-	4	2	18	39	41	30
7228	-	60	40	33	76	79	55
7230	-	-1	-1	4	11	11	7
7231	-	11	7	26	57	61	45
7232	-	12	8	106	280	270	188
7234	-	-1	-0	9	25	26	17
7235	-	0	0	51	116	120	82
7237	-	1	0	58	132	136	94
7239	-	0	0	46	89	91	64

7240	-	-26	-17	37	98	99	56
7241	-	-3	-2	40	101	104	71
7242	-	-4	-3	11	33	35	23
7250	-	18	12	104	158	150	103
7251	-	5	3	71	139	139	98
7252	-	12	8	98	204	206	148
7253	-	10	7	63	134	136	100
7254	-	8	5	52	102	103	78
7255	-	1	0	36	78	80	56
Total	**-**	**3,295**	**2,197**	**6,511**	**6,411**	**5,491**	**3,779**
Cumulative (from 2016)	-	**3,295**	**5,491**	**12,002**	**18,413**	**23,904**	**27,683**
Cumulative from 2019			**2,197**	**8,708**	**15,118**	**20,610**	**24,388**

Table B-4 LTS jobs projections by LTS Zone

C. APPENDIX C

Trip Generation Assumptions

The table below provides a summary of the Households person trip rates (all modes) obtained from the different TAs and the person trip rates applied to all Households developments in LBB's projections.

Status	Site Address	AM peak Hr Arrivals (person trips, all modes)	AM Peak Hr Departures (person trips, all modes)	PM Peak Hr Arrivals (person trips, all modes)	PM Peak Hr Departures (person trips, all modes)
CONSENT	North London Business Park	0.165	0.439	0.279	0.177
CONSENT	Colindale Station Colindale Avenue NW9 5HR	0.089	0.442	0.495	0.096
CONSENT SUBJECT S106	Colindale Telephone Exchange The Hyde, NW9 6LB	0.081	0.440	0.360	0.125
CONSENT	Sainsburys The Hyde NW9 6JX	0.057	0.395	0.268	0.123
COMPLETED	Land between Sweets Way and Oakleigh Road North, N20	0.140	0.540	0.680	0.310
COMPLETED	Totteridge Place' 1201 High Road, London, N20 0PD	0.137	0.540	0.290	0.210
UNDER CONSTRUCTION	West Hendon Estate	0.159	0.144	0.181	0.213
EXISTING ALLOCATION	Grahame Park	0.057	0.355	0.233	0.150

CONSENT	Peel centre Development Stage 1, 2 and 3	0.145	0.581	0.435	0.265
CONSENT	Premier Place, 102-124 Station Road And Car Park To Rear, HA8 7BJ	0.114	0.410	0.303	0.164
PRIOR APPROVAL	298 - 304 Regents Park Road, N3 2SZ	0.092	0.462	0.308	0.185
CONSENT	Brent Cross Cricklewood	0.128	0.460	0.271	0.147
Average per Households (All modes)		**0.119**	**0.437**	**0.297**	**0.170**

Household Development Site Address	Ward	TfL PTAL 2015	TfL PTAL 2021	TfL PTAL 2031
Applied to Forecasting Years	**n/a**	**n/a**	**2021, 2026**	**2031, 236 and 2041**
Church Farm Leisure Centre	Brunswick Park	2	2	2
North London Business Park	Brunswick Park	1a	1a	1a
Osidge Lane Community Halls, N14 5DU	Brunswick Park	2	2	2
Osidge Library and Health Centre, N11 1EY	Brunswick Park	2	2	2
Sir Thomas Lipton Memorial Hospital, 151 Chase Side, N14 5HE	Brunswick Park	3	3	3
100 Burnt Oak Broadway, Edgware, HA8 0BE	Burnt Oak	5	5	5
Colesworth House, Crokesley House, Curtlington House, Clare House and Kedyngton House, Burnt Oak Broadway, HA8	Burnt Oak	3	3	3
Edgware Hospital	Burnt Oak	3	3	3
Watling Avenue Carpark & Market, HA8 0AY	Burnt Oak	5	5	5
Burnt Oak Registry Office	Burnt Oak	3	3	3
The Croft, North Road	Burnt Oak	3	3	3
Stag House	Burnt Oak	4	4	4
130 - 134 Granville Road, NW2 2LD	Childs Hill	2	2	2
194 - 196 Cricklewood Broadway, NW2 3EB	Childs Hill	5	6a	6a
Hermitage Lane	Childs Hill	4	4	4
220 The Vale, NW11 8SR	Childs Hill	3	3	3
452 Finchley Road, NW11 8DG	Childs Hill	4	4	4

Household Development Site Address	Ward	TfL PTAL 2015	TfL PTAL 2021	TfL PTAL 2031
Applied to Forecasting Years	**n/a**	**n/a**	**2021, 2026**	**2031, 236 and 2041**
Beacon Bingo	Childs Hill	5	6a	6a
Broadway Retail Park, NW2 1ES	Childs Hill	5	5	5
Church Walk House, Church Walk, NW2 2TJ	Childs Hill	3	3	3
First & Second Floor, Britannia Business Centre, Cricklewood Lane, NW2 1DZ	Childs Hill	6a	6a	6a
Granville Road	Childs Hill	2	2	2
Tower Service Station 617 Finchley Road London NW3 7BS	Childs Hill	3	3	3
126 Colindale Avenue (former Colindale business centre), NW9 5HD	Colindale	2	2	2
Beaufort Park REMAINING Phases (Blocks C7 C8 C9 and C10)	Colindale	2	2	2
Beaufort Park REMAINING Phases (Blocks D1-D7)	Colindale	2	2	2
Beaufort Park REMAINING Phases (Blocks F1, F2, F8, F9)	Colindale	2	2	2
Colindale Station Colindale Avenue NW9 5HR	Colindale	5	6a	6a
Colindale Telephone Exchange The Hyde, NW9 6LB	Colindale	2	2	2
Colindeep Lane, NW9 6RY	Colindale	1a	1a	1a
Douglas Bader Park Estate, Clayton Field, NW9 5SE	Colindale	2	2	2
Grahame Park	Colindale	3	3	3

Household Development Site Address	Ward	TfL PTAL 2015	TfL PTAL 2021	TfL PTAL 2031
Applied to Forecasting Years	**n/a**	**n/a**	**2021, 2026**	**2031, 236 and 2041**
Hyde House, Rushgrove Avenue, London, NW9 6LH	Colindale	2	2	2
Imperial House, the Hyde, NW9 5AL	Colindale	3	3	3
KFC/ Burger King, NW9 5EB	Colindale	3	3	3
Kwik Fit - The Hyde (adj Kidstop)	Colindale	4	4	4
Mcdonalds Site, 157 Colindeep Lane, NW9 6BD	Colindale	3	3	3
Merit House, Edgware Road, NW9 5AB	Colindale	2	2	2
Middlesex University Halls	Colindale	4	4	4
Peel Centre Development Stage 1	Colindale	2	2	2
Peel centre Development Stage 2 and 3	Colindale	2	2	2
Public Health England NW9 5EQ	Colindale	3	3	3
Sainsburys The Hyde NW9 6JX	Colindale	2	2	2
THE RUSHGROVES' Homebase, Rookery Way, London, NW9 6SS	Colindale	2	2	2
Trinity Square' Barnet College, Grahame Park Way	Colindale	1a	1a	1a
Sheaveshill Court	Colindale	2	2	2
Land Adjacent To 114 Coppetts Road And To The Rear Of 102-114 Coppetts Road, And Land Between Coppetts Wood Primary	Coppetts	2	2	2

Household Development Site Address	Ward	TfL PTAL 2015	TfL PTAL 2021	TfL PTAL 2031
Applied to Forecasting Years	**n/a**	**n/a**	**2021, 2026**	**2031, 236 and 2041**
School And Allotment Gardens London N10 1JS				
Tesco Coppetts Centre Colney Hatch Lane N12 0SH	Coppetts	2	2	2
45-47 Friern Barnet Road, N11 3EG	Coppetts	4	4	4
45-69 East Barnet Rd, EN4 8RN	East Barnet	3	4	4
Danegrove Playing Field, Park Rd & Cat Hill EN4 8UD	East Barnet	1b	1b	1b
East Barnet Library, EN4 8SG	East Barnet	2	2	2
East Barnet Shooting Club Victoria Rd EN4 9SH	East Barnet	3	3	3
Fayer's Building Yard & Church EN4 9NR	East Barnet	3	3	3
Gateway - The Former East Barnet Gas Works	East Barnet	3	3	3
Land Adjacent To 106 -128 Mount Pleasant And 27-37 Langford Road, EN4 9HG	East Barnet	2	2	2
New Barnet Gasholder, EN4 9SH	East Barnet	3	3	3
Sainsbury's, East Barnet Road	East Barnet	3	4	4
Victoria Quarter - The Former East Barnet Gas Works	East Barnet	1a	1a	1a
Woodgate House and Studio Games Road EN5 9HN	East Barnet	2	2	2
Mount Pleasant Flats	East Barnet	2	2	2
Salvation Army Hall, Albert Road, EN4 9SH	East Barnet	3	3	3
12 - 18 High Road, N2 9PJ	East Finchley	4	5	5

Household Development Site Address	Ward	TfL PTAL 2015	TfL PTAL 2021	TfL PTAL 2031
Applied to Forecasting Years	**n/a**	**n/a**	**2021, 2026**	**2031, 236 and 2041**
Bobath Centre 250 East End Rd N2 8AU	East Finchley	4	4	4
East Finchley Station Carpark N2 0NW	East Finchley	5	5	5
East Finchley Substation N2 0NL	East Finchley	4	4	4
Park House 16 High Rd N2 9PJ	East Finchley	5	5	5
Prospect Ring	East Finchley	3	3	3
186 High Street, HA8 7EX	Edgware	4	4	4
Edgware Town Centre	Edgware	6a	6a	6a
Edgware Underground & Bus Stations, HA8 7AW	Edgware	6a	6a	6a
Land At Broadfields Primary School Roseberry Drive, Edgware, HA8 8JP	Edgware	1b	1b	1b
Land at the Rectory, Rectory Lane, HA8 7LG	Edgware	6a	6a	6a
Premier Place, 102-124 Station Road And Car Park To Rear, HA8 7BJ	Edgware	6a	6a	6a
298 - 304 Regents Park Road, N3 2SZ	Finchley Church End	5	5	5
2A Lichfield Grove N3 2JP	Finchley Church End	4	4	4
Dove House, Gadd House And Cooper House, Arcadia Avenue, N3 2JU	Finchley Church End	4	4	4
Finchley Central Station N3 2RY	Finchley Church End	5	5	5
Land West of Beechwood Avenue N3 3BA	Finchley Church End	2	2	2
94-96 Great North Road N2 0NL	Garden Suburb	4	4	4

Household Development Site Address	Ward	TfL PTAL 2015	TfL PTAL 2021	TfL PTAL 2031
Applied to Forecasting Years	**n/a**	**n/a**	**2021, 2026**	**2031, 236 and 2041**
Hammerson House 50A The Bishops Avenue London N2 0BE	Garden Suburb	0	0	0
Harrison Varma House, 98 Great North Road, N2 0NL	Garden Suburb	4	4	4
1-5 Princes Parade, Golders Green Road and 1-3 Heather Gardens NW11 9HS	Golders Green	3	3	3
290-294 Golders Green Road, NW11 9PY	Golders Green	3	3	3
Brent Cross Cricklewood	Golders Green	1b	3	5
Brentmead Close 1-6 Brentmead Close NW11 9JG	Golders Green	3	3	3
Manor Park Road Car Park 72-76 Manor Park Rd N2 0SJ	Golders Green	1a	1b	1b
Yamor House 285 Golders Green Road NW11 9JE	Golders Green	3	3	3
Bunns Lane Carpark Bunns Lane NW7 2AA	Hale	4	5	5
Land Adjacent Northway And Fairway Primary School The Fairway Mill Hill London NW7 3HS	Hale	0	0	0
Burroughs Gardens Carpark The Burroughs NW4 4AU	Hendon	4	4	4
Egerton Gardens Carpark The Burroughs NW4 8BD	Hendon	4	4	4
Fenella The Burroughs NW4 4BS	Hendon	4	4	4
Fosters Estate, NW4 2DL	Hendon	3	3	3
Meritage Centre, NW4 4JT	Hendon	2	2	2
Middlesex University Carpark Greyhound Hill NW4 4BT	Hendon	2	2	2
PDSA, NW4 4JU	Hendon	2	2	2
Ravensfield House The Burroughs NW4 4BT	Hendon	4	4	4

Household Development Site Address	Ward	TfL PTAL 2015	TfL PTAL 2021	TfL PTAL 2031
Applied to Forecasting Years	**n/a**	**n/a**	**2021, 2026**	**2031, 236 and 2041**
Spectrum House, Hillview Gardens, London, NW4 2JQ	Hendon	2	2	2
The Burroughs Carpark NW4 4AR	Hendon	5	5	5
Usher Hall The Burroughs NW4 4HE	Hendon	3	3	3
Westhorpe Gardens and Mills Grove NW4 2TU	Hendon	2	2	2
74 - 78 High Street, EN5 5SN	High Barnet	5	5	5
Army Reserve Depot	High Barnet	3	3	3
Brake Shear House 164 High Street Barnet EN5 5XP	High Barnet	3	3	3
High Barnet Station Carpark Great North Road EN5 5RP	High Barnet	5	6a	6a
Land At 1-7 Moxon Street And At 44 Tapster Street Including Land To The Rear Of 1-11 Moxon Street And Opposite The Old Printworks Barnet EN5 5TY	High Barnet	4	4	4
Moxon Street Garage, EN5 5TY	High Barnet	4	4	4
Whalebones Park EN5 4BZ	High Barnet	2	2	2
11-19 Ballards Lane and 6 Albert Place N3 1QB	Mill Hill	5	5	5
141-143 Dollis Road NW7 1JX	Mill Hill	2	2	2
IBSA House The Ridgeway NW7 1RN	Mill Hill	1b	1b	1b
Marshall Hall, Marshall Estate, Hammers Lane, NW7 4DQ	Mill Hill	1b	1b	1b

Household Development Site Address	Ward	TfL PTAL 2015	TfL PTAL 2021	TfL PTAL 2031
Applied to Forecasting Years	**n/a**	**n/a**	**2021, 2026**	**2031, 236 and 2041**
Mill Hill East (Millbrook Park) Phase 10	Mill Hill	2	2	2
Mill Hill East (Millbrook Park) Phase 4b	Mill Hill	2	2	2
Mill Hill East (Millbrook Park) Phase 4c	Mill Hill	2	2	2
Mill Hill East (Millbrook Park) Phase 5	Mill Hill	1b	1b	1b
Mill Hill East (Millbrook Park) Phase 6	Mill Hill	1b	1b	1b
Mill Hill East (Millbrook Park) Phase 6b	Mill Hill	2	2	2
Mill Hill East (Millbrook Park) Phase 7	Mill Hill	1b	1b	1b
Mill Hill East (Millbrook Park) Phase 8	Mill Hill	1b	1b	1b
Mill Hill East (Millbrook Park) Phase 9	Mill Hill	2	2	2
Mill Hill East Station NW7 1BS	Mill Hill	3	3	3
Mill Hill Library	Mill Hill	4	4	4
National Institute of Medical Research	Mill Hill	1b	1b	1b
Watchtower House & Kingdom Hall The Ridgeway NW7 1RS	Mill Hill	2	2	2
Watford Way & Bunns Lane NW7 2EX	Mill Hill	2	2	2
Brook Point 1412-1420 High Road, Turnberry House & Euro House 1394-1410 High Road, London, N20 9BH	Oakleigh	4	4	4
Car Wash 1420 - 1428 High Road, London, N20 9BH	Oakleigh	4	4	4
Great North Road Local Centre EN5 1AB	Oakleigh	4	4	4

Household Development Site Address	Ward	TfL PTAL 2015	TfL PTAL 2021	TfL PTAL 2031
Applied to Forecasting Years	**n/a**	**n/a**	**2021, 2026**	**2031, 236 and 2041**
Kingmaker House, 15 Station Road, Barnet, Herts, EN5 1NZ	Oakleigh	3	3	3
Springdene Nursing Home, 55, Oakleigh Park Road, N20 9NH	Oakleigh	2	2	2
1060A to 1072 High Road, Whetstone, London N20 0QP	Totteridge	1b	1b	1b
70-84 and Land R/O Oakleigh Road North, N20 9EZ	Totteridge	4	4	4
Allum Way Totteridge & Whetstone station/High Rd/Download Close/Allum Way N20	Totteridge	4	4	4
Barnet House, 1255 High Road, N20 0EJ	Totteridge	4	4	4
Brookdene Holden Road London N12 7DR	Totteridge	3	3	3
Edelman House 1238 High Road N20 0LH	Totteridge	4	4	4
Land between Sweets Way and Oakleigh Road North, N20	Totteridge	1b	1b	1b
St Barnabas Church, 42 Holden Road, Woodside Park N12 7DN	Totteridge	3	3	3
Totteridge Place' 1201 High Road, London, N20 0PD	Totteridge	4	4	4
Woodside Park Station East N12 8RT	Totteridge	3	3	3
Woodside Park Station West N12 8RT	Totteridge	2	3	3
Woodside Park Underground Station, N12 8SE	Totteridge	2	3	3
Friern Court	Totteridge	2	2	2
66 Woodside Park Road, N12 8RY	Totteridge	3	3	3
Dollis Valley - Phase 3	Underhill	3	3	3
Dollis Valley - Phase 4	Underhill	3	3	3

Household Development Site Address	Ward	TfL PTAL 2015	TfL PTAL 2021	TfL PTAL 2031
Applied to Forecasting Years	**n/a**	**n/a**	**2021, 2026**	**2031, 236 and 2041**
Dollis Valley - Phase 5	Underhill	3	3	3
Land Adjacent To Whitings Hill Primary School Whitings Road Barnet EN5 2QY	Underhill	1b	1b	1b
Marie Foster Home, Wood Street, EN5 4BS	Underhill	3	3	3
105A Ballards Lane N3 1XY	West Finchley	4	4	4
309-319 Ballard's Lane North Finchley N12 8LY	West Finchley	3	3	3
401 - 405 Nether Street, London N3 1QG (Adastra House)	West Finchley	5	5	5
811 High Rd North Finchley & Lodge Lane carpark N12 8JT	West Finchley	3	3	3
Central House and 1-9 Ballards Lane	West Finchley	6a	6a	6a
Finchley House, High Rd & Kingsway North Finchley N12 0BT	West Finchley	3	3	3
Former Police Station 193-195 Ballards Lane N3 1LZ	West Finchley	4	4	4
Rowlandson House, 289-293 Ballards Lane, N12 8NP	West Finchley	3	3	3
Tally Ho Triangle, High Rd, Ballards Lane & Kingsway, North Finchley N12 0GA/0BP	West Finchley	4	4	4
Tesco, 21-29 Ballards Lane N3 1XP	West Finchley	4	4	4
1,3,4 and 5 The Exchange, Brent Cross Gardens, NW4 3RJ	West Hendon	6a	6a	6a
117-125 West Hendon Broadway, London NW9 7BP	West Hendon	3	3	3

Household Development Site Address	Ward	TfL PTAL 2015	TfL PTAL 2021	TfL PTAL 2031
Applied to Forecasting Years	**n/a**	**n/a**	**2021, 2026**	**2031, 236 and 2041**
60 West Hendon Broadway	West Hendon	3	3	3
63-65 The Hyde, NW9 6LE	West Hendon	2	2	2
Philex House 110-124 West Hendon Broadway NW9 7DW	West Hendon	3	3	3
West Hendon Estate	West Hendon	3	3	3
744-776 High Rd North Finchley N12 9QG/9QS	Woodhouse	4	4	4
869 High Road, N12 8QA	Woodhouse	3	3	3
912-920 High Road N12 9RW	Woodhouse	2	2	2
East Wing, 672-708 High Rd North Finchley N12 9PT/9QL	Woodhouse	3	4	4
Former Barnet Mortuary, N3 2EU	Woodhouse	1b	1b	1b
Great North Leisure Park N12 0GL	Woodhouse	2	2	2
Summers Lane	Woodhouse	2	2	2
Britannia House, 960 High Road, N12 9RY	Woodhouse	2	2	2
n/a	Brunswick Park	3	3	3
n/a	Burnt Oak	3	3	3
n/a	Childs Hill	3	3	3
n/a	Colindale	3	3	3
n/a	Coppetts	3	3	3
n/a	East Barnet	3	3	3
n/a	East Finchley	3	3	3
n/a	Edgware	3	3	3
n/a	Finchley Church End	3	3	3
n/a	Garden Suburb	3	3	3
n/a	Golders Green	3	3	3
n/a	Hale	3	3	3
n/a	Hendon	3	3	3
n/a	High Barnet	3	3	3

Household Development Site Address	Ward	TfL PTAL 2015	TfL PTAL 2021	TfL PTAL 2031
Applied to Forecasting Years	**n/a**	**n/a**	**2021, 2026**	**2031, 236 and 2041**
n/a	Mill Hill	3	3	3
n/a	Oakleigh	3	3	3
n/a	Totteridge	3	3	3
n/a	Underhill	3	3	3
n/a	West Finchley	3	3	3
n/a	West Hendon	3	3	3
n/a	Woodhouse	3	3	3

Jobs are allocated according to LTS zones. As a result, we have used TfL's PTAL forecasts for 2021 and 2031 and generated average PTALs values for each LTS zone in GIS. These are summarised below.

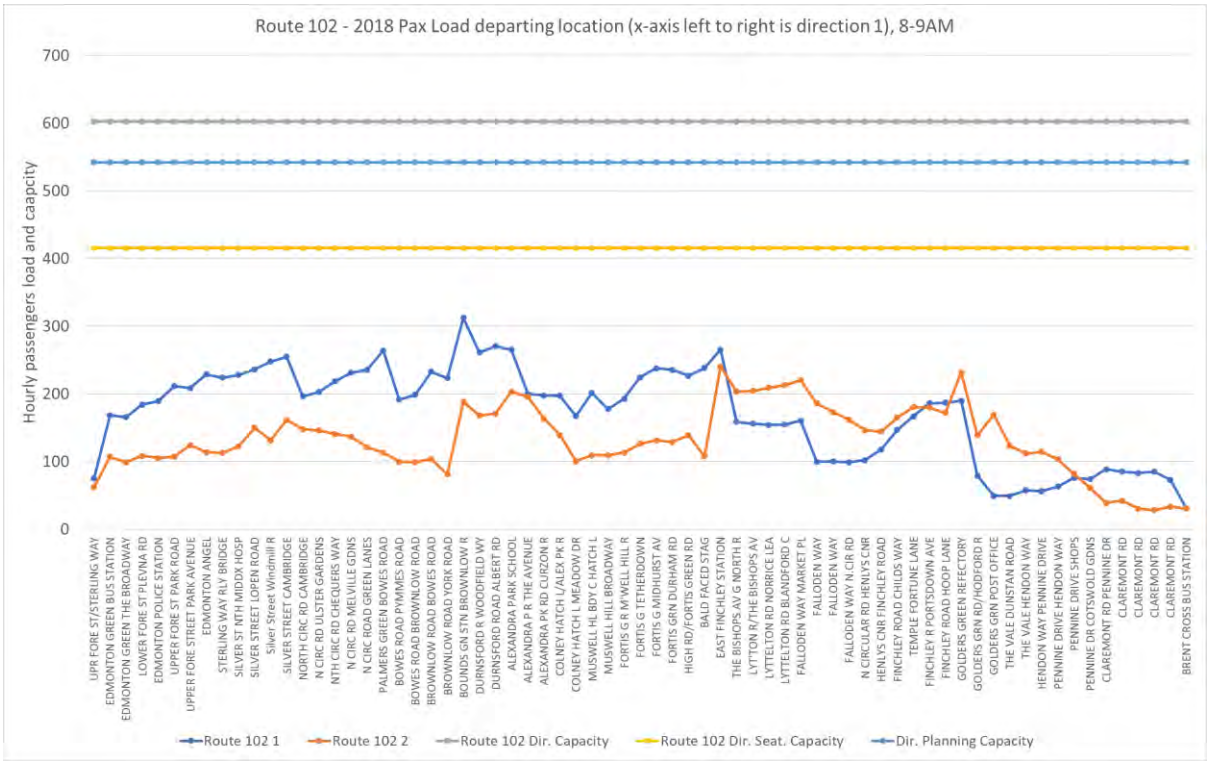
LTS Zone	PTAL 2015 (TfL) average	PTAL 2021 (TfL) average	PTAL 2031 (TfL) average
PTAL Level applied to forecasting years…	**n/a**	**2021 and 2026**	**2031, 2036 and 2041**
7200	2	2	2
7201	3	3	3
7204	3	3	5
7207	3	3	3
7210	1b	1b	1b
7211	2	2	2
7212	3	3	4
7214	2	2	2
7215	2	2	4
7217	1b	1b	1b
7220	1a	1a	1a
7221	3	3	3
7222	2	2	2
7224	2	2	2
7225	3	3	3
7226	3	3	3
7227	1a	1a	1a
7228	2	2	2
7230	1a	1a	1a
7231	1a	1a	1a
7232	2	2	2
7234	1b	1b	1b
7235	2	2	2

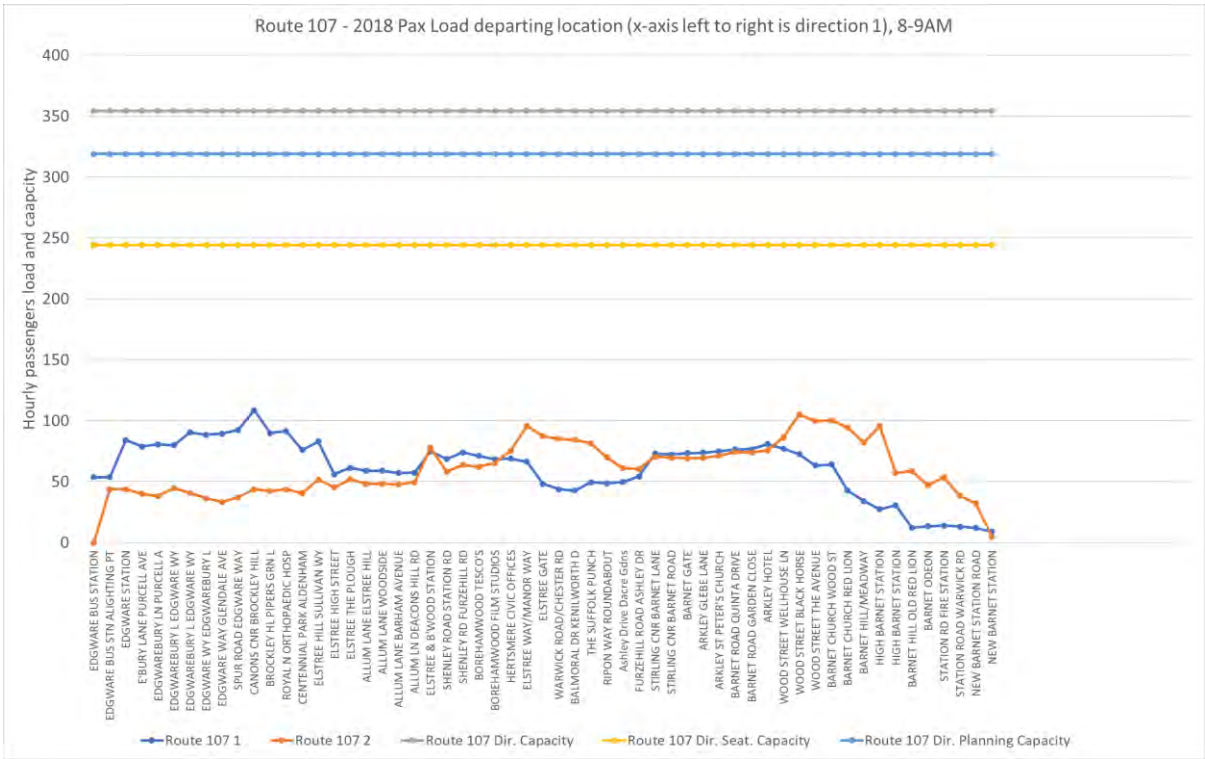
LTS Zone	PTAL 2015 (TfL) average	PTAL 2021 (TfL) average	PTAL 2031 (TfL) average
PTAL Level applied to forecasting years…	**n/a**	**2021 and 2026**	**2031, 2036 and 2041**
7237	2	2	2
7239	2	2	2
7240	2	2	2
7241	2	2	2
7242	2	2	2
7250	2	2	2
7251	2	2	2
7252	3	3	3
7253	1b	1b	1b
7254	3	2	2
7255	1b	1b	1b

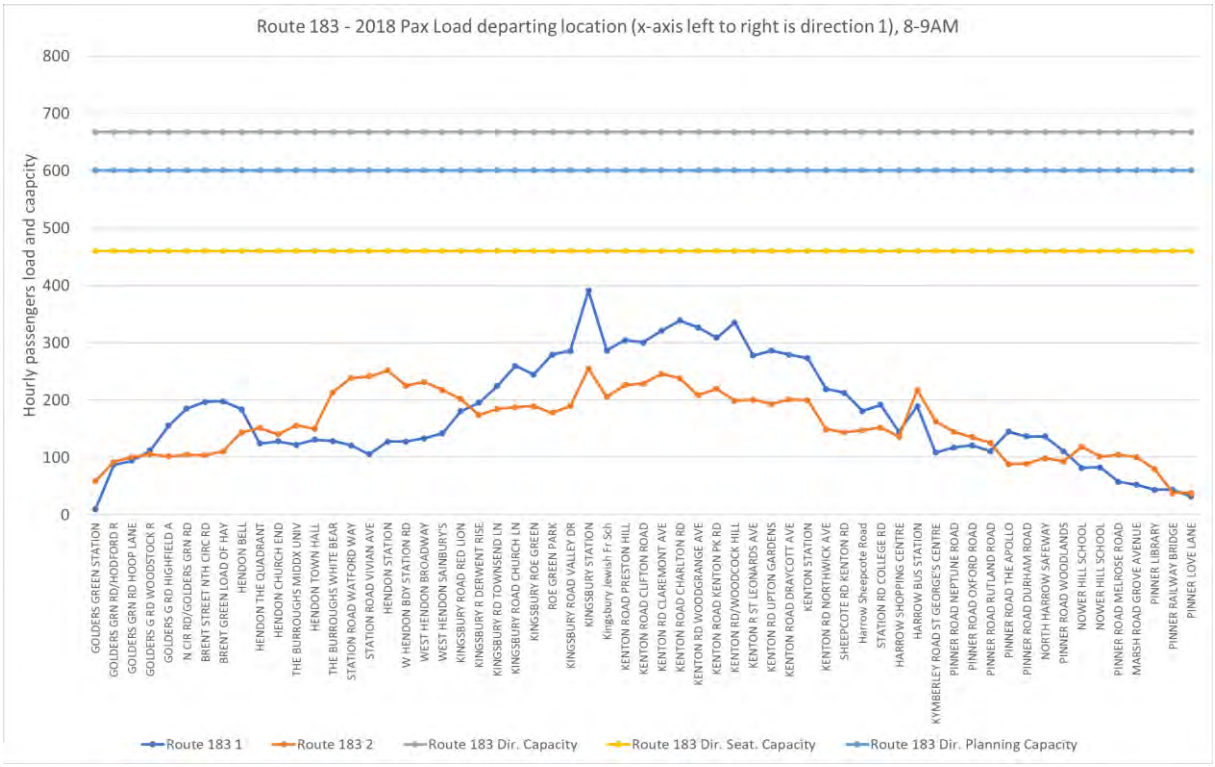
D. APPENDIX D

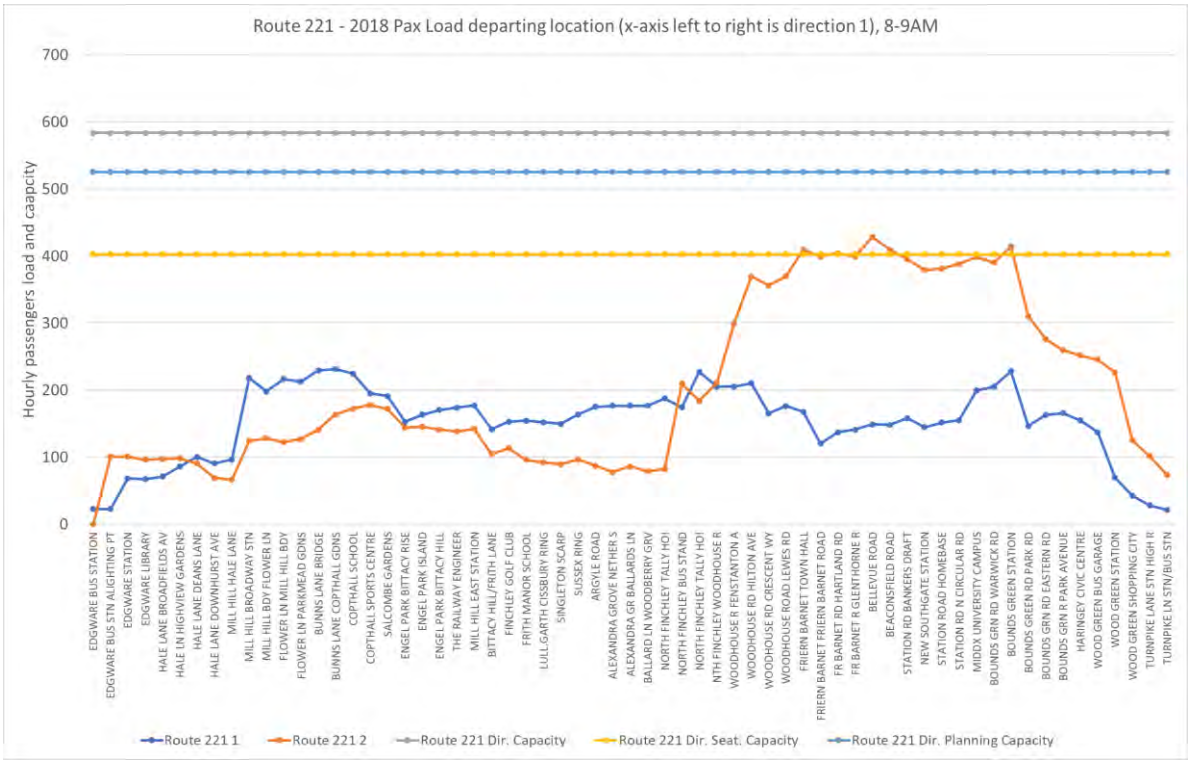
Analysis of TfL's 2018 Bus Route Demand Data (BODS)

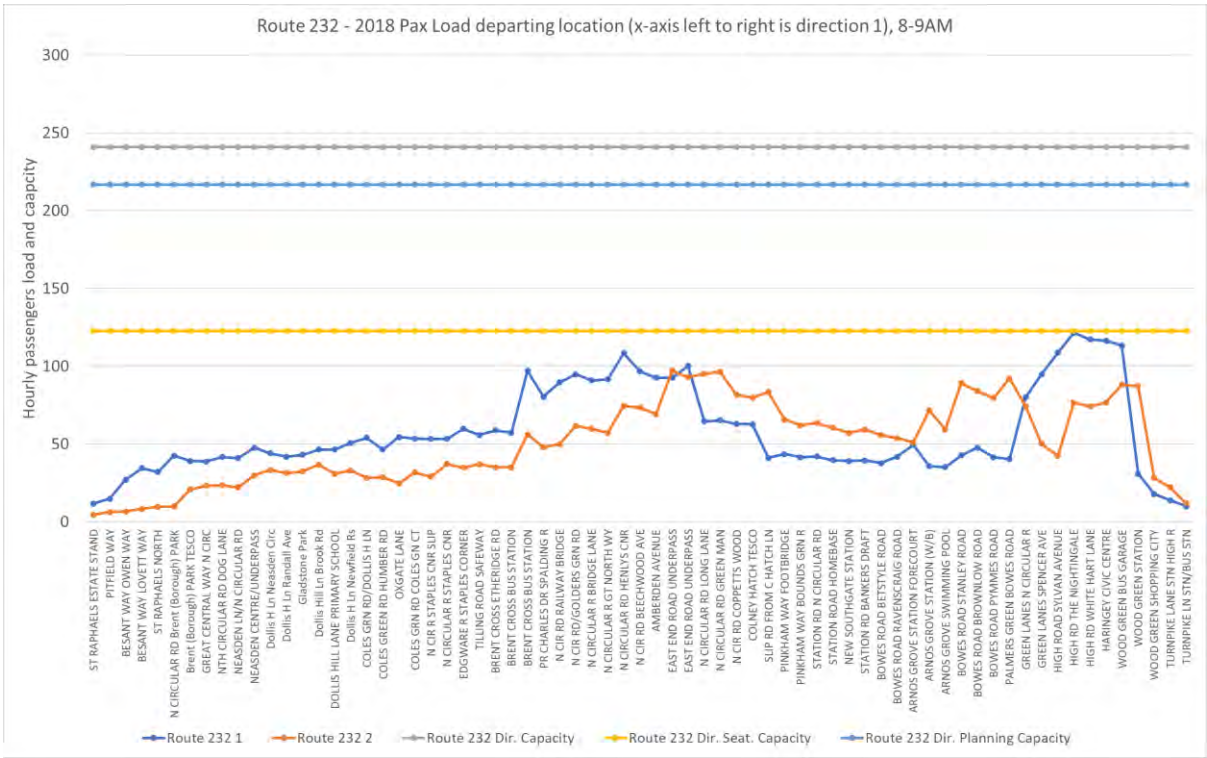
Route Demand loadings by direction of travel vs capacity – 2018 AM Highway Peak hr

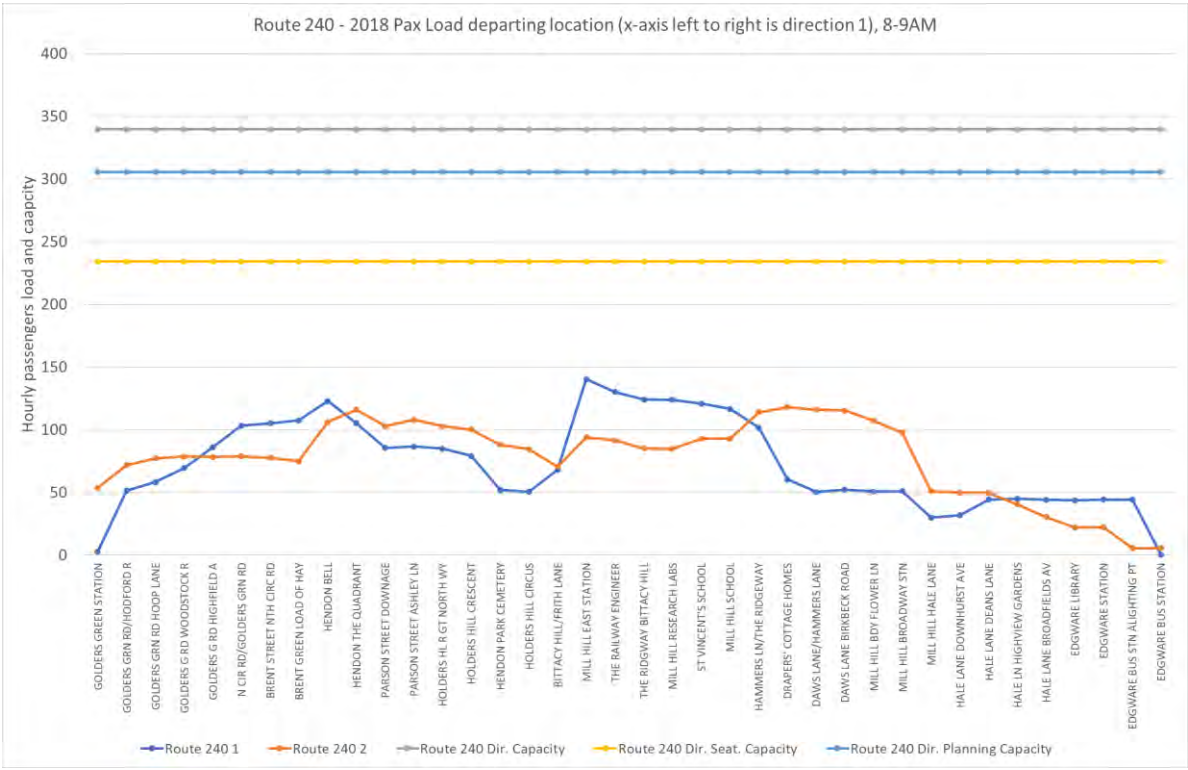

Route 102 - 2018 Pax Load departing location (x-axis left to right is direction 1), 8-9AM
Hourly passengers load and caapcity
700
600
500
400
300
200
100
0
UPR FORE ST/STERLING WAY
EDMONTON GREEN BUS STATION
EDMONTON GREEN THE BROADWAY
LOWER FORE ST PLEVNA RD
EDMONTON POLICE STATION
UPPER FORE ST PARK ROAD
UPPER FORE STREET PARK AVENUE
EDMONTON ANGEL
STERLING WAY RLY BRIDGE
SILVER ST NTH MIDDX HOSP
SILVER STREET LOPEN ROAD
Silver Street Windmill R
SILVER STREET CAMBRIDGE
NORTH CIRC RD CAMBRIDGE
N CIRC RD ULSTER GARDENS
NTH CIRC RD CHEQUERS WAY
N CIRC RD MELVILLE GDNS
N CIRC ROAD GREEN LANES
PALMERS GREEN BOWES ROAD
BOWES ROAD PYMMES ROAD
BOWES ROAD BROWNLOW ROAD
BROWNLOW ROAD BOWES ROAD
BROWNLOW ROAD YORK ROAD
BOUNDS GN STN BROWNLOW R
DURNSFORD R WOODFIELD WY
DURNSFORD ROAD ALBERT RD
ALEXANDRA PARK SCHOOL
ALEXANDRA P R THE AVENUE
ALEXANDRA PK RD CURZON R
COLNEY HATCH L/ALEX PK R
COLNEY HATCH L MEADOW DR
MUSWELL HL BDY C HATCH L
MUSWELL HILL BROADWAY
FORTIS G R M WELL HILL R
FORTIS G TETHERDOWN
FORTIS G MIDHURST AV
FORTIS GRN DURHAM RD
HIGH RD/FORTIS GREEN RD
BALD FACED STAG
EAST FINCHLEY STATION
THE BISHOPS AV G NORTH R
LYTTON R/THE BISHOPS AV
LYTTELTON RD NORRICE LEA
LYTTELTON RD BLANDFORD C
FALLODEN WAY MARKET PL
FALLODEN WAY
FALLODEN WAY
FALLODEN WAY N CIR RD
N CIRCULAR RD HENLYS CNR
FINCHLEY ROAD CHILDS WAY
TEMPLE FORTUNE LANE
FINCHLEY N PORTSDOWN AVE
FINCHLEY ROAD HOOP LANE
GOLDERS GREEN REFECTORY
GOLDERS GRN RD/HODFORD R
GOLDERS GRN POST OFFICE
THE VALE DUNSTAN ROAD
THE VALE HENDON WAY
HENDON WAY PENNINE DRIVE
PENNINE DRIVE HENDON WAY
PENNINE DRIVE SHOPS
PENNINE DR COTSWOLD GDNS
CLAREMONT RD PENNINE DR
CLAREMONT RD
CLAREMONT RD
CLAREMONT RD
CLAREMONT RD
BRENT CROSS BUS STATION
Route 102 1
Route 102 2
Route 102 Dir. Capacity
Route 102 Dir. Seat. Capacity
Dir. Planning Capacity

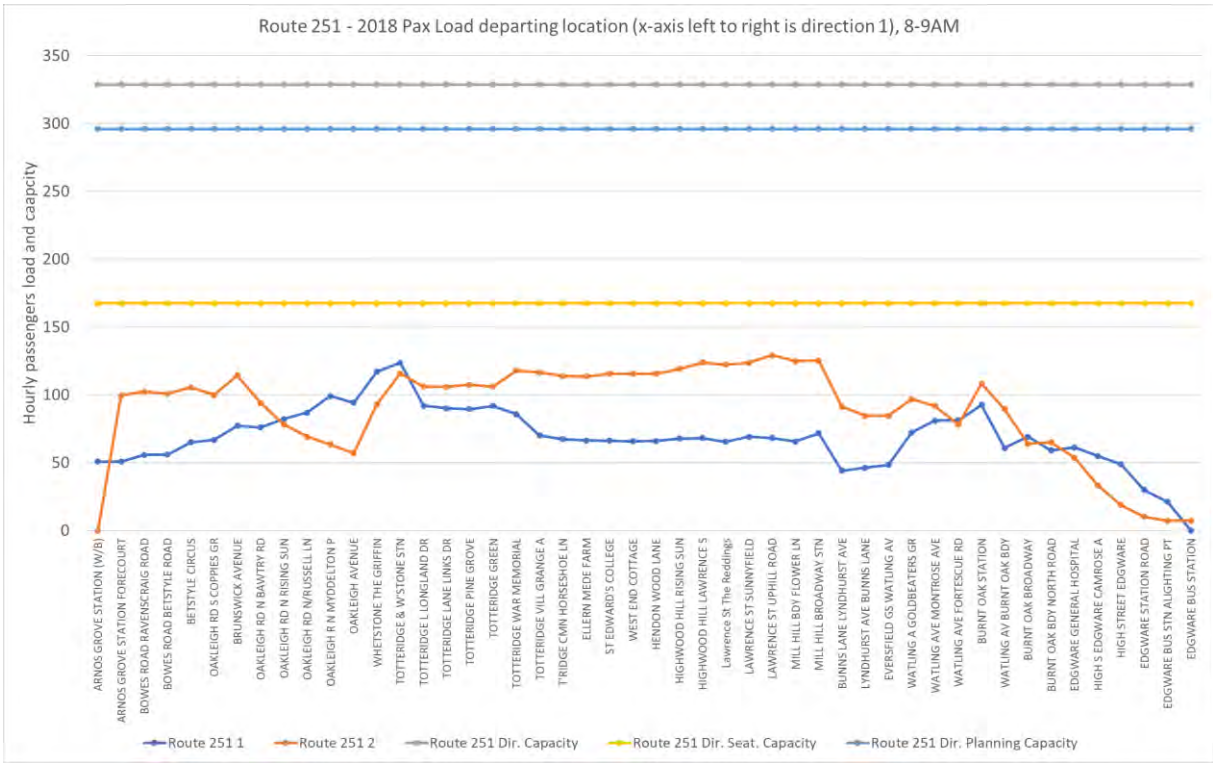

Route 107 - 2018 Pax Load departing location (x-axis left to right is direction 1), 8-9AM
Hourly passengers load and caapcity
400
350
300
250
200
150
100
50
0
EDGWARE BUS STATION
EDGWARE BUS STN ALIGHTING PT
EDGWARE STATION
E'BURY LANE PURCELL AVE
EDGWAREBURY LN PURCELL A
EDGWAREBURY L EDGWARE WY
EDGWAREBURY L EDGWARE WY
EDGWARE WY EDGWAREBURY L
EDGWARE WAY GLENDALE AVE
SPUR ROAD EDGWARE WAY
CANONS CNR BROCKLEY HILL
BROCKLEY HL PIPERS GRN L
ROYAL N ORTHOPAEDIC HOSP
CENTENNIAL PARK ALDENHAM
ELSTREE HILL SULLIVAN WY
ELSTREE HIGH STREET
ELSTREE THE PLOUGH
ALLUM LANE ELSTREE HILL
ALLUM LANE WOODSIDE
ALLUM LANE BARHAM AVENUE
ALLUM LN DEACONS HILL RD
ELSTREE & B'WOOD STATION
SHENLEY ROAD STATION RD
SHENLEY RD FURZEHILL RD
BOREHAMWOOD TESCO'S
BOREHAMWOOD FILM STUDIOS
HERTSMERE CIVIC OFFICES
ELSTREE WAY/MANOR WAY
ELSTREE GATE
WARWICK ROAD/CHESTER RD
BALMORAL DR KENILWORTH D
THE SUFFOLK PUNCH
RIPON WAY ROUNDABOUT
Ashley Drive Dacre Gdns
FURZEHILL ROAD ASHLEY DR
STIRLING CNR BARNET LANE
STIRLING CNR BARNET ROAD
BARNET GATE
ARKLEY GLEBE LANE
ARKLEY ST PETER'S CHURCH
BARNET ROAD QUINTA DRIVE
BARNET ROAD GARDEN CLOSE
ARKLEY HOTEL
WOOD STREET WELLHOUSE LN
WOOD STREET BLACK HORSE
WOOD STREET THE AVENUE
BARNET CHURCH WOOD ST
BARNET CHURCH RED LION
BARNET HILL/MEADWAY
HIGH BARNET STATION
HIGH BARNET STATION
BARNET HILL OLD RED LION
BARNET ODEON
STATION RD FIRE STATION
STATION ROAD WARWICK RD
NEW BARNET STATION ROAD
NEW BARNET STATION
Route 107 1
Route 107 2
Route 107 Dir. Capacity
Route 107 Dir. Seat. Capacity
Route 107 Dir. Planning Capacity

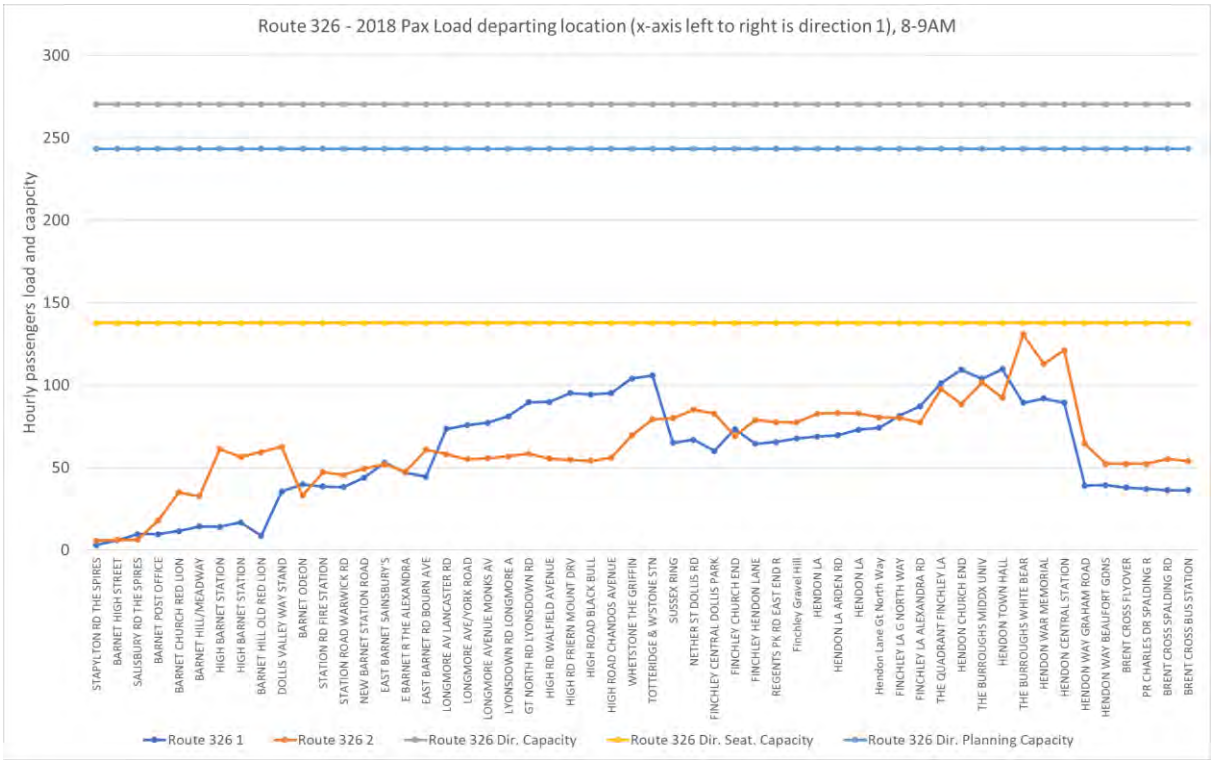

Route 183 - 2018 Pax Load departing location (x-axis left to right is direction 1), 8-9AM
Hourly passengers load and caapcity
800
700
600
500
400
300
200
100
0
GOLDERS GREEN STATION
GOLDERS GRN RD/HODFORD R
GOLDERS GRN RD HOOP LANE
GOLDERS G RD WOODSTOCK R
GOLDERS G RD HIGHFIELD A
N CIR RD/GOLDERS GRN RD
BRENT STREET NTH CIRC RD
BRENT GREEN LOAD OF HAY
HENDON BELL
HENDON THE QUADRANT
HENDON CHURCH END
THE BURROUGHS MIDDX UNIV
HENDON TOWN HALL
THE BURROUGHS WHITE BEAR
STATION ROAD WATFORD WAY
STATION ROAD VIVIAN AVE
HENDON STATION
W HENDON BDY STATION RD
WEST HENDON BROADWAY
WEST HENDON SAINBURY'S
KINGSBURY ROAD RED LION
KINGSBURY R DERWENT RISE
KINGSBURY RD TOWNSEND LN
KINGSBURY ROAD CHURCH LN
KINGSBURY ROE GREEN
ROE GREEN PARK
KINGSBURY ROAD VALLEY DR
KINGSBURY STATION
Kingsbury Jewish Fr Sch
KENTON ROAD PRESTON HILL
KENTON ROAD CLIFTON ROAD
KENTON RD CLAREMONT AVE
KENTON ROAD CHARLTON RD
KENTON RD WOODGRANGE AVE
KENTON ROAD KENTON PK RD
KENTON RD/WOODCOCK HILL
KENTON R ST LEONARDS AVE
KENTON RD UPTON GARDENS
KENTON ROAD DRAYCOTT AVE
KENTON STATION
KENTON RD NORTHWICK AVE
SHEEPCOTE RD KENTON RD
Harrow Sheepcote Road
STATION RD COLLEGE RD
HARROW SHOPPING CENTRE
HARROW BUS STATION
KYMBERLEY ROAD ST GEORGE'S CENTRE
PINNER ROAD NEPTUNE ROAD
PINNER ROAD OXFORD ROAD
PINNER ROAD RUTLAND ROAD
PINNER ROAD THE APOLLO
PINNER ROAD DURHAM ROAD
NORTH HARROW SAFEWAY
PINNER ROAD WOODLANDS
NOWER HILL SCHOOL
NOWER HILL SCHOOL
PINNER ROAD MELROSE ROAD
MARSH ROAD GROVE AVENUE
PINNER LIBRARY
PINNER RAILWAY BRIDGE
PINNER LOVE LANE
Route 183 1
Route 183 2
Route 183 Dir. Capacity
Route 183 Dir. Seat. Capacity
Route 183 Dir. Planning Capacity

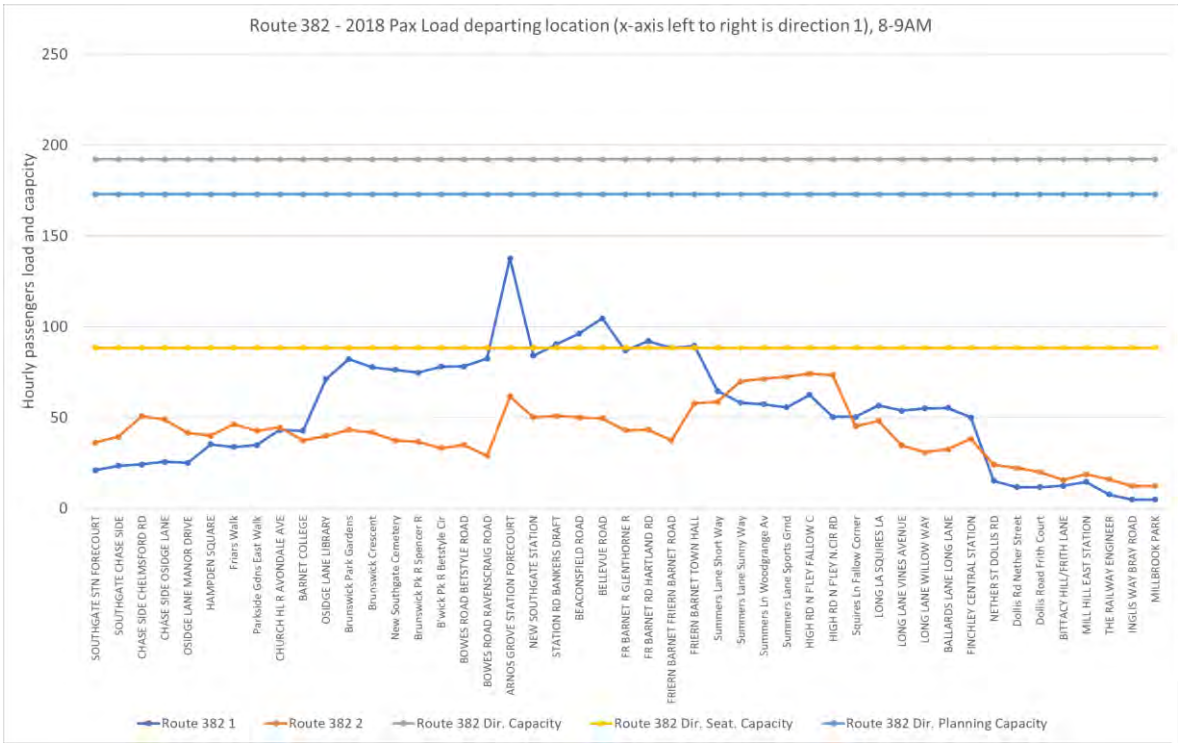

Route 221 - 2018 Pax Load departing location (x-axis left to right is direction 1), 8-9AM
Hourly passengers load and caapcity
700
600
500
400
300
200
100
0
EDGWARE BUS STATION
EDGWARE BUS STN ALIGHTING PT
EDGWARE STATION
EDGWARE LIBRARY
HALE LANE BROADFIELDS AV
HALE LN HIGHVIEW GARDENS
HALE LANE DEANS LANE
HALE LANE DOWNHURST AVE
MILL HILL HALE LANE
MILL HILL BROADWAY STN
MILL HILL BDY FLOWER LN
FLOWER LN MILL HILL BDY
FLOWER LN PARKMEAD GDNS
BUNNS LANE BRIDGE
BUNNS LANE COPTHALL GDNS
COPTHALL SCHOOL
COPTHALL SPORTS CENTRE
SALCOMBE GARDENS
ENGEL PARK BITTACY RISE
ENGEL PARK ISLAND
ENGEL PARK BITTACY HILL
THE RAILWAY ENGINEER
MILL HILL EAST STATION
BITTACY HILL/FRITH LANE
FINCHLEY GOLF CLUB
FRITH MANOR SCHOOL
LULL-GARTH CISSBURY RING
SINGLETON SCARP
SUSSEX RING
ARGYLE ROAD
ALEXANDRA GROVE NETHER S
ALEXANDRA GR BALLARDS LN
BALLARD LN WOODBERRY GRV
NORTH FINCHLEY TALLY HOI
NORTH FINCHLEY BUS STAND
NORTH FINCHLEY TALLY HOI
NTH FINCHLEY WOODHOUSE R
WOODHOUSE R FENSTANTON A
WOODHOUSE RD HILTON AVE
WOODHOUSE RD CRESCENT WY
WOODHOUSE ROAD LEWES RD
FRIERN BARNET TOWN HALL
FRIERN BARNET FRIERN BARNET ROAD
FR BARNET RD HARTLAND RD
FR BARNET R GLENTHORNE R
BELLEVUE ROAD
BEACONSFIELD ROAD
STATION RD BANKERS DRAFT
NEW SOUTHGATE STATION
STATION ROAD HOMEBASE
STATION RD N CIRCULAR RD
MIDDX UNIVERSITY CAMPUS
BOUNDS GRN RD WARWICK RD
BOUNDS GREEN STATION
BOUNDS GREEN RD PARK RD
BOUNDS GRN RD EASTERN RD
BOUNDS GRN R PARK AVENUE
HARINGEY CIVIC CENTRE
WOOD GREEN BUS GARAGE
WOOD GREEN STATION
WOOD GREEN SHOPPING CITY
TURNPIKE LANE STN HIGH R
TURNPIKE LN STN/BUS STN
Route 221 1
Route 221 2
Route 221 Dir. Capacity
Route 221 Dir. Seat. Capacity
Route 221 Dir. Planning Capacity


Route 232 - 2018 Pax Load departing location (x-axis left to right is direction 1), 8-9AM
Hourly passengers load and caapcity
300
250
200
150
100
50
0
ST RAPHAELS ESTATE STAND
PITFIELD WAY
BESANT WAY OWEN WAY
BESANT WAY LOVETT WAY
ST RAPHAELS NORTH
N CIRCULAR RD Brent (Borough) PARK
Brent (Borough) PARK TESCO
GREAT CENTRAL WAY N CIRC
NTH CIRCULAR RD DOG LANE
NEASDEN LN/N CIRCULAR RD
NEASDEN CENTRE/UNDERPASS
Dollis H Ln Neasden Circ
Dollis H Ln Randall Ave
Gladstone Park
Dollis Hill Ln Brook Rd
DOLLIS HILL LANE PRIMARY SCHOOL
Dollis H Ln Newfield Rs
COLES GRN RD/DOLLIS H LN
COLES GREEN RD HUMBER RD
OXGATE LANE
COLES GRN RD COLES GN CT
N CIR R STAPLES CNR SUP
N CIRCULAR R STAPLES CNR
EDGWARE R STAPLES CORNER
TILLING ROAD SAFEWAY
BRENT CROSS ETHERIDGE RD
BRENT CROSS BUS STATION
BRENT CROSS BUS STATION
PR CHARLES DR SPALDING R
N CIR RD RAILWAY BRIDGE
N CIR RD/GOLDERS GRN RD
N CIRCULAR R BRIDGE LANE
N CIRCULAR R GT NORTH WY
N CIRCULAR RD HENLYS CNR
N CIR RD BEECHWOOD AVE
AMBERDEN AVENUE
EAST END ROAD UNDERPASS
EAST END ROAD UNDERPASS
N CIRCULAR RD LONG LANE
N CIRCULAR RD GREEN MAN
N CIR RD COPPETTS WOOD
COLNEY HATCH TESCO
SUP RD FROM C HATCH LN
PINKHAM WAY FOOTBRIDGE
PINKHAM WAY BOUNDS GRN R
STATION RD N CIRCULAR RD
STATION ROAD HOMEBASE
NEW SOUTHGATE STATION
STATION RD BANKERS DRAFT
BOWES ROAD BETSTYLE ROAD
BOWES ROAD RAVENSCRAIG ROAD
ARNOS GROVE STATION FORECOURT
ARNOS GROVE STATION (W/B)
ARNOS GROVE SWIMMING POOL
BOWES ROAD STANLEY ROAD
BOWES ROAD BROWNLOW ROAD
BOWES ROAD PYMMES ROAD
PALMERS GREEN BOWES ROAD
GREEN LANES N CIRCULAR R
GREEN LANES SPENCER AVE
HIGH ROAD SYLVAN AVENUE
HIGH RD THE NIGHTINGALE
HIGH RD WHITE HART LANE
HARINGEY CIVIC CENTRE
WOOD GREEN BUS GARAGE
WOOD GREEN STATION
WOOD GREEN SHOPPING CITY
TURNPIKE LANE STN HIGH R
TURNPIKE LN STN/BUS STN
Route 232 1
Route 232 2
Route 232 Dir. Capacity
Route 232 Dir. Seat. Capacity
Route 232 Dir. Planning Capacity


Route 240 - 2018 Pax Load departing location (x-axis left to right is direction 1), 8-9AM
Hourly passengers load and caapcity
400
350
300
250
200
150
100
50
0
GOLDERS GREEN STATION
GOLDERS GRN RD/HODFORD R
GOLDERS GRN RD HOOP LANE
GOLDERS G RD WOODSTOCK R
GOLDERS G RD HIGHFIELD A
N CIR RD/GOLDERS GRN RD
BRENT STREET NTH CIRC RD
BRENT GREEN LOAD OF HAY
HENDON BELL
HENDON THE QUADRANT
PARSON STREET DOWNAGE
PARSON STREET ASHLEY LN
HOLDERS HL R GT NORTH WY
HOLDERS HILL CRESCENT
HENDON PARK CEMETERY
HOLDERS HILL CIRCUS
BITTACY HILL/FRITH LANE
MILL HILL EAST STATION
THE RAILWAY ENGINEER
THE RIDGWAY BITTACY HILL
MILL HILL RESEARCH LABS
ST VINCENT'S SCHOOL
MILL HILL SCHOOL
HAMMERS LN/THE RIDGEWAY
DRAPERS' COTTAGE HOMES
DAWS LANE/HAMMERS LANE
DAWS LANE BIRKBECK ROAD
MILL HILL BDY FLOWER LN
MILL HILL BROADWAY STN
MILL HILL HALE LANE
HALE LANE DOWNHURST AVE
HALE LANE DEANS LANE
HALE LN HIGHVIEW GARDENS
HALE LANE BROADFIELDS AV
EDGWARE LIBRARY
EDGWARE STATION
EDGWARE BUS STN ALIGHTING PT
EDGWARE BUS STATION
Route 240 1
Route 240 2
Route 240 Dir. Capacity
Route 240 Dir. Seat. Capacity
Route 240 Dir. Planning Capacity

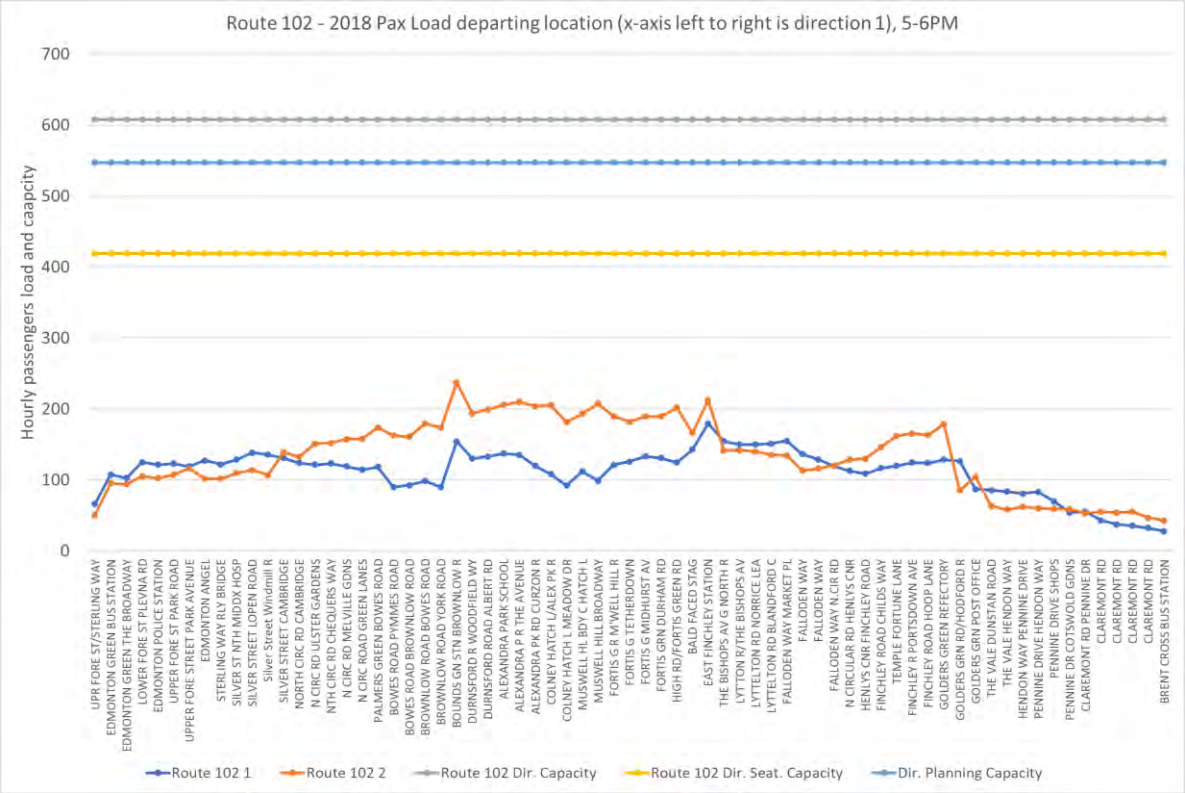

Route 251 - 2018 Pax Load departing location (x-axis left to right is direction 1), 8-9AM
Hourly passengers load and caapcity
350
300
250
200
150
100
50
0
ARNOS GROVE STATION (W/B)
ARNOS GROVE STATION FORECOURT
BOWES ROAD RAVENSCRAIG ROAD
BOWES ROAD BETSTYLE ROAD
BETSTYLE CIRCUS
OAKLEIGH RD S COPPIES GR
BRUNSWICK AVENUE
OAKLEIGH RD N BAWTRY RD
OAKLEIGH RD N RISING SUN
OAKLEIGH RD N/RUSSELL LN
OAKLEIGH R N MYDDELTON P
OAKLEIGH AVENUE
WHETSTONE THE GRIFFIN
TOTTERIDGE & W'STONE STN
TOTTERIDGE L LONGLAND DR
TOTTERIDGE LANE LINKS DR
TOTTERIDGE PINE GROVE
TOTTERIDGE GREEN
TOTTERIDGE WAR MEMORIAL
TOTTERIDGE VILL GRANGE A
T'RIDGE CMN HORSESHOE LN
ELLERN MEDE FARM
ST EDWARD'S COLLEGE
WEST END COTTAGE
HENDON WOOD LANE
HIGHWOOD HILL RISING SUN
HIGHWOOD HILL LAWRENCE S
Lawrence St The Reddings
LAWRENCE ST SUNNYFIELD
LAWRENCE ST UPHILL ROAD
MILL HILL BDY FLOWER LN
MILL HILL BROADWAY STN
BUNNS LANE LYNDHURST AVE
LYNDHURST AVE BUNNS LANE
EVERSFIELD GS WATLING AV
WATLING A GOLDBEATERS GR
WATLING AVE MONTROSE AVE
WATLING AVE FORTESCUE RD
BURNT OAK STATION
WATLING AV BURNT OAK BDY
BURNT OAK BROADWAY
BURNT OAK BDY NORTH ROAD
EDGWARE GENERAL HOSPITAL
HIGH S EDGWARE CAMROSE A
HIGH STREET EDGWARE
EDGWARE STATION ROAD
EDGWARE BUS STN ALIGHTING PT
EDGWARE BUS STATION
Route 251 1
Route 251 2
Route 251 Dir. Capacity
Route 251 Dir. Seat. Capacity
Route 251 Dir. Planning Capacity

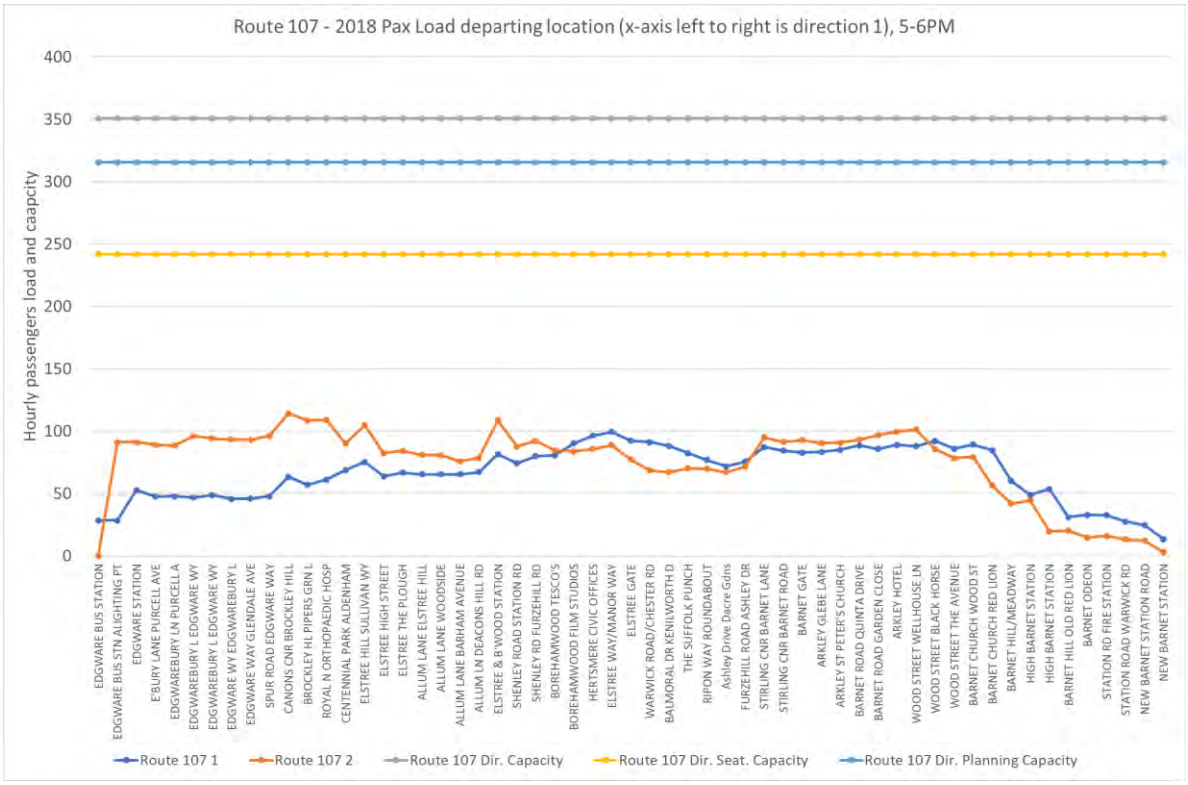

Route 326 - 2018 Pax Load departing location (x-axis left to right is direction 1), 8-9AM
Hourly passengers load and caapcity
300
250
200
150
100
50
0
STAPYLTON RD THE SPIRES
BARNET HIGH STREET
SALISBURY RD THE SPIRES
BARNET POST OFFICE
BARNET CHURCH RED LION
BARNET HILL/MEADWAY
HIGH BARNET STATION
HIGH BARNET STATION
BARNET HILL OLD RED LION
DOLLIS VALLEY WAY STAND
BARNET ODEON
STATION RD FIRE STATION
STATION ROAD WARWICK RD
NEW BARNET STATION ROAD
EAST BARNET SAINSBURY'S
E BARNET R THE ALEXANDRA
EAST BARNET RD BOURN AVE
LONGMORE AV LANCASTER RD
LONGMORE AVE/YORK ROAD
LONGMORE AVENUE MONKS AV
LYONSDOWN RD LONGMORE A
GT NORTH RD LYONSDOWN RD
HIGH RD WALFIELD AVENUE
HIGH RD FRIERN MOUNT DRV
HIGH ROAD BLACK BULL
HIGH ROAD CHANDOS AVENUE
WHETSTONE THE GRIFFIN
TOTTERIDGE & W'STONE STN
SUSSEX RING
NETHER ST DOLLIS RD
FINCHLEY CENTRAL DOLLIS PARK
FINCHLEY CHURCH END
FINCHLEY HENDON LANE
REGENTS PK RD EAST END R
Finchley Gravel Hill
HENDON LA
HENDON LA ARDEN RD
HENDON LA
Hendon Lane Gt North Way
FINCHLEY LA G NORTH WAY
FINCHLEY LA ALEXANDRA RD
THE QUADRANT FINCHLEY LA
HENDON CHURCH END
THE BURROUGHS MIDDX UNIV
HENDON TOWN HALL
THE BURROUGHS WHITE BEAR
HENDON WAR MEMORIAL
HENDON CENTRAL STATION
HENDON WAY GRAHAM ROAD
HENDON WAY BEAUFORT GDNS
BRENT CROSS FLYOVER
PR CHARLES DR SPALDING R
BRENT CROSS SPALDING RD
BRENT CROSS BUS STATION
Route 326 1
Route 326 2
Route 326 Dir. Capacity
Route 326 Dir. Seat. Capacity
Route 326 Dir. Planning Capacity

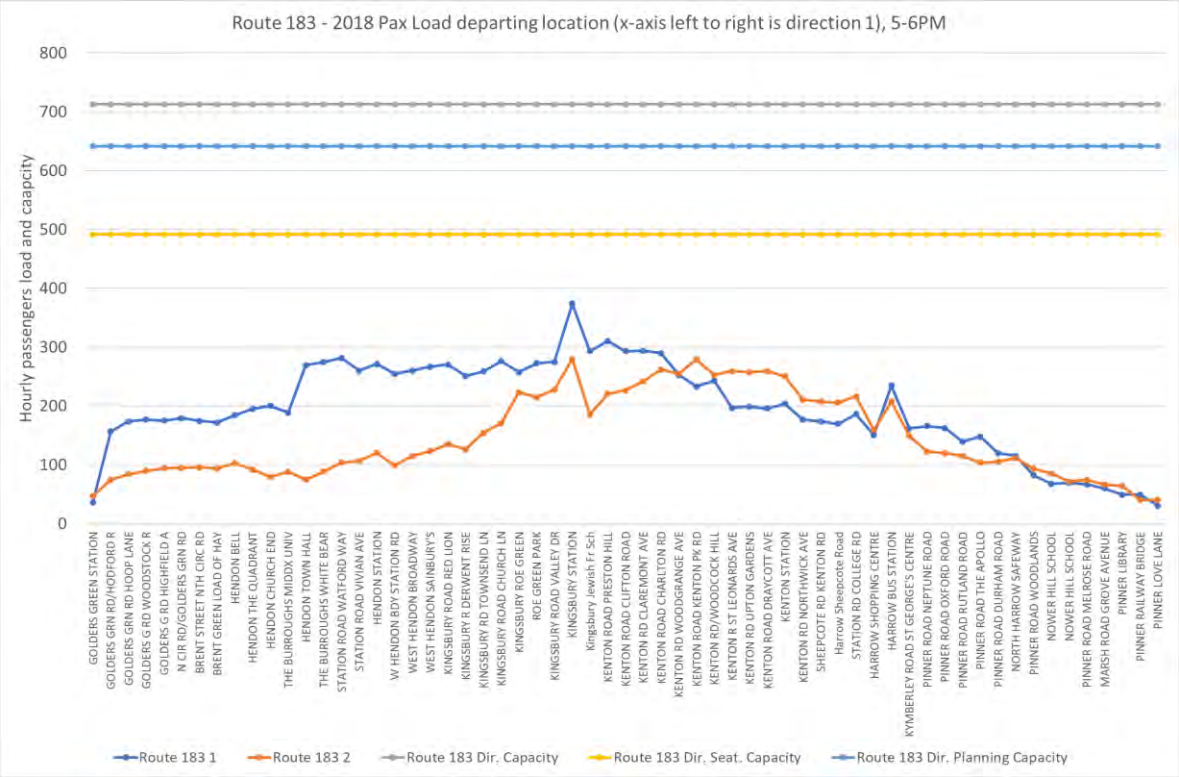

Route 382 - 2018 Pax Load departing location (x-axis left to right is direction 1), 8-9AM
Hourly passengers load and caapcity
250
200
150
100
50
0
SOUTHGATE STN FORECOURT
SOUTHGATE CHASE SIDE
CHASE SIDE CHELMSFORD RD
CHASE SIDE OSIDGE LANE
OSIDGE LANE MANOR DRIVE
HAMPDEN SQUARE
Friars Walk
Parkside Gdns East Walk
CHURCH HL R AVONDALE AVE
BARNET COLLEGE
OSIDGE LANE LIBRARY
Brunswick Park Gardens
Brunswick Crescent
New Southgate Cemetery
Brunswick Pk R Spencer R
B'wick Pk R Betstyle Cir
BOWES ROAD BETSTYLE ROAD
BOWES ROAD RAVENSCRAIG ROAD
ARNOS GROVE STATION FORECOURT
NEW SOUTHGATE STATION
STATION RD BANKERS DRAFT
BEACONSFIELD ROAD
BELLEVUE ROAD
FR BARNET R GLENTHORNE R
FR BARNET RD HARTLAND RD
FRIERN BARNET FRIERN BARNET ROAD
FRIERN BARNET TOWN HALL
Summers Lane Short Way
Summers Lane Sunny Way
Summers Ln Woodgrange Av
Summers Lane Sports Grnd
HIGH RD N F'LEY FALLOW C
HIGH RD N F'LEY N.CIR RD
Squires Ln Fallow Corner
LONG LA SQUIRES LA
LONG LANE VINES AVENUE
LONG LANE WILLOW WAY
BALLARDS LANE LONG LANE
FINCHLEY CENTRAL STATION
NETHER ST DOLLIS RD
Dollis Rd Nether Street
Dollis Road Frith Court
BITTACY HILL/FRITH LANE
MILL HILL EAST STATION
THE RAILWAY ENGINEER
INGLIS WAY BRAY ROAD
MILLBROOK PARK
Route 382 1
Route 382 2
Route 382 Dir. Capacity
Route 382 Dir. Seat. Capacity
Route 382 Dir. Planning Capacity

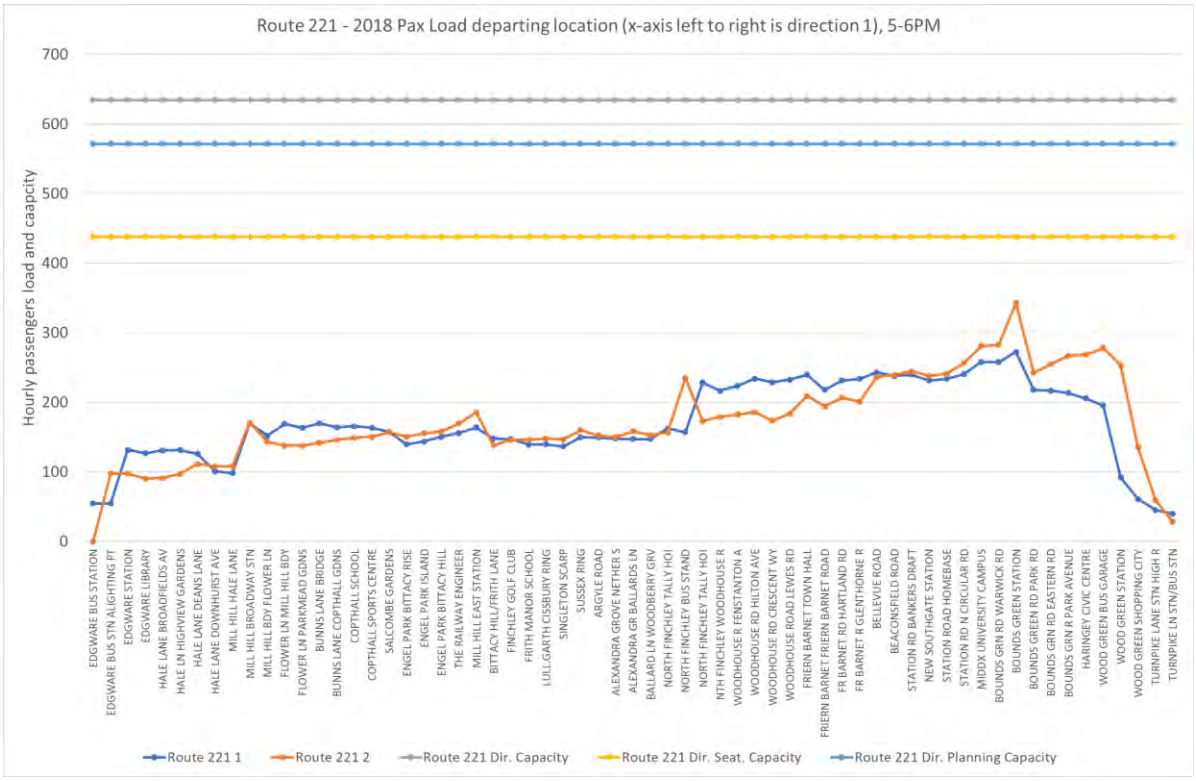
APPENDIX D

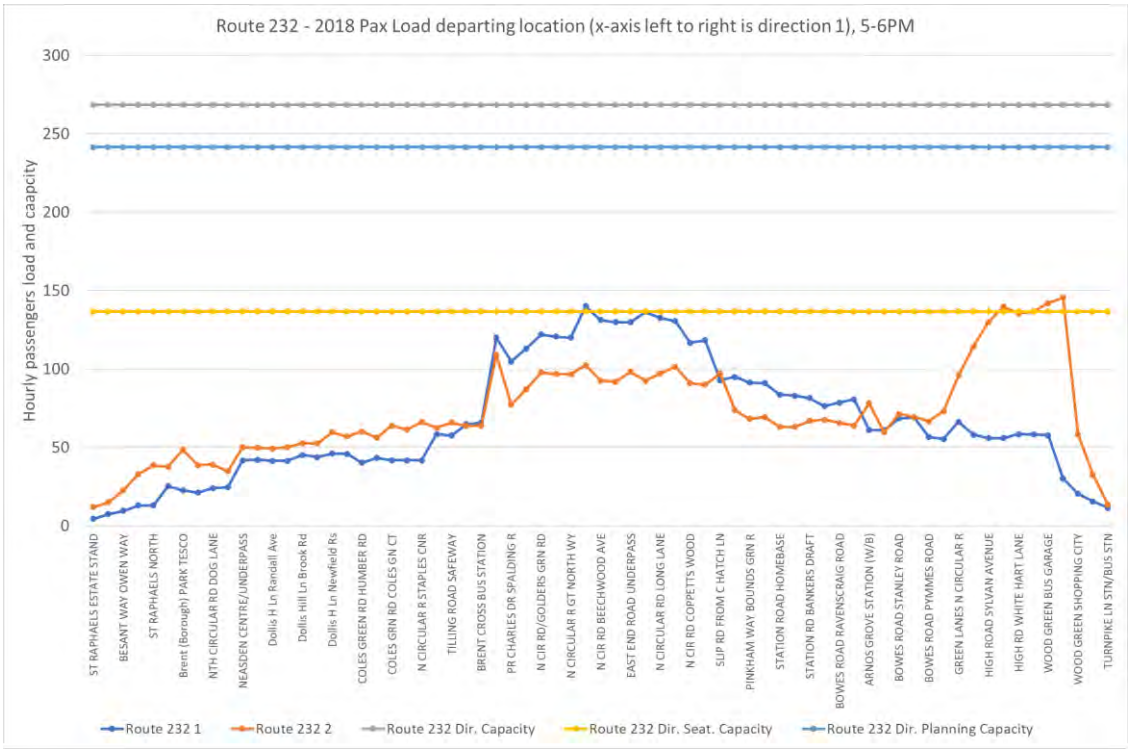
Route Demand loadings by direction of travel vs capacity – 2018 PM Highway Peak hr

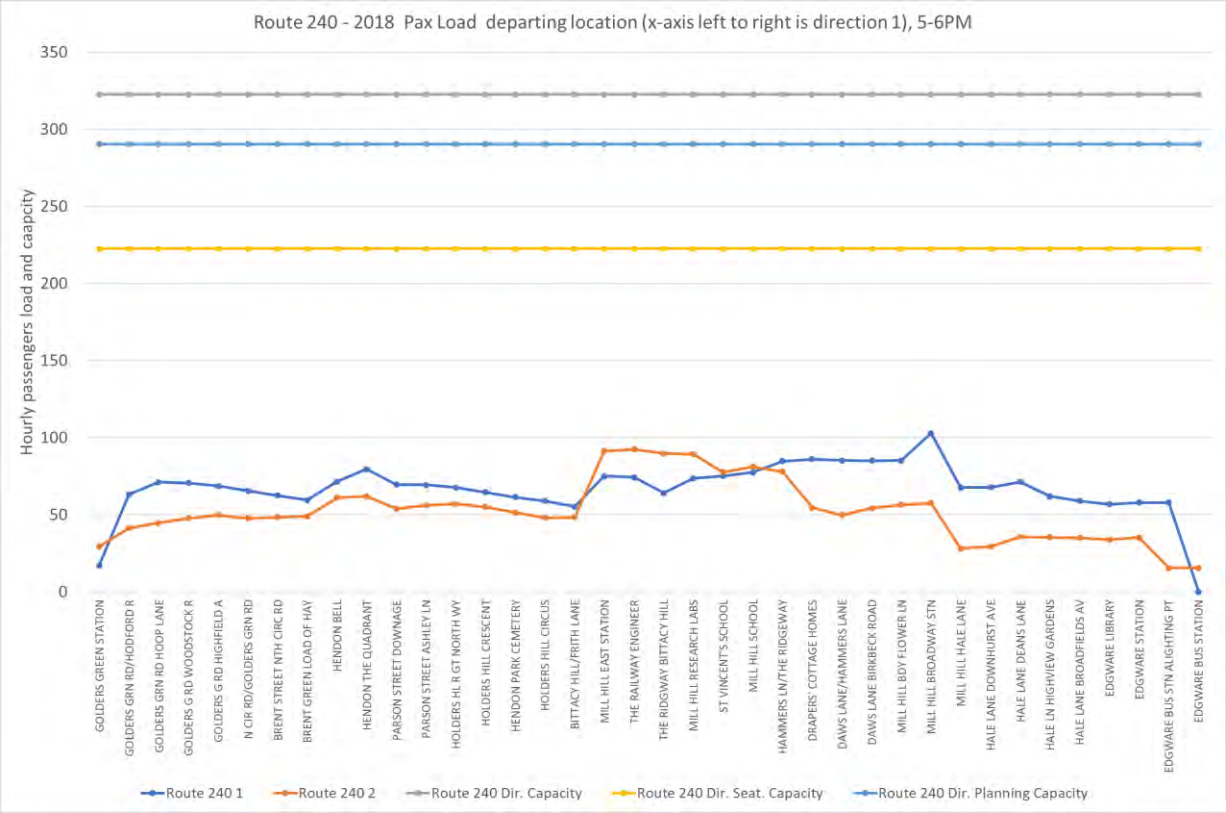

Route 102 - 2018 Pax Load departing location (x-axis left to right is direction 1), 5-6PM
Hourly passengers load and caapcity
700
600
500
400
300
200
100
0
UPR FORE ST/STERLING WAY
EDMONTON GREEN BUS STATION
EDMONTON GREEN THE BROADWAY
LOWER FORE ST PLEVNA RD
EDMONTON POLICE STATION
UPPER FORE ST PARK ROAD
UPPER FORE STREET PARK AVENUE
EDMONTON ANGEL
STERLING WAY RLY BRIDGE
SILVER ST NTH MIDDX HOSP
SILVER STREET LOPEN ROAD
Silver Street Windmill R
SILVER STREET CAMBRIDGE
NORTH CIRC RD CAMBRIDGE
N CIRC RD ULSTER GARDENS
NTH CIRC RD CHEQUERS WAY
N CIRC RD MELVILLE GDNS
N CIRC ROAD GREEN LANES
PALMERS GREEN BOWES ROAD
BOWES ROAD PYMMES ROAD
BOWES ROAD BROWNLOW ROAD
BROWNLOW ROAD BOWES ROAD
BROWNLOW ROAD YORK ROAD
BOUNDS GN STN BROWNLOW R
DURNSFORD R WOODFIELD WY
DURNSFORD ROAD ALBERT RD
ALEXANDRA PARK SCHOOL
ALEXANDRA P R THE AVENUE
ALEXANDRA PK RD CURZON R
COLNEY HATCH L/ALEX PK R
COLNEY HATCH L MEADOW DR
MUSWELL HL BDY C HATCH L
MUSWELL HILL BROADWAY
FORTIS G R M'WELL HILL R
FORTIS G TETHERDOWN
FORTIS G MIDHURST AV
FORTIS GRN DURHAM RD
HIGH RD/FORTIS GREEN RD
BALD FACED STAG
EAST FINCHLEY STATION
THE BISHOPS AV G NORTH R
LYTTON R/THE BISHOPS AV
LYTTELTON RD NORRICE LEA
LYTTELTON RD BLANDFORD C
FALLODEN WAY MARKET PL
FALLODEN WAY
FALLODEN WAY
FALLODEN WAY N CIR RD
N CIRCULAR RD HENLYS CNR
HENLYS CNR FINCHLEY ROAD
FINCHLEY ROAD CHILDS WAY
TEMPLE FORTUNE LANE
FINCHLEY R PORTSDOWN AVE
FINCHLEY ROAD HOOP LANE
GOLDERS GREEN REFECTORY
GOLDERS GRN RD/HODFORD R
GOLDERS GRN POST OFFICE
THE VALE DUNSTAN ROAD
THE VALE HENDON WAY
HENDON WAY PENNINE DRIVE
PENNINE DRIVE HENDON WAY
PENNINE DRIVE SHOPS
PENNINE DR COTSWOLD GDNS
CLAREMONT RD PENNINE DR
CLAREMONT RD
CLAREMONT RD
CLAREMONT RD
CLAREMONT RD
BRENT CROSS BUS STATION
Route 102 1
Route 102 2
Route 102 Dir. Capacity
Route 102 Dir. Seat. Capacity
Dir. Planning Capacity

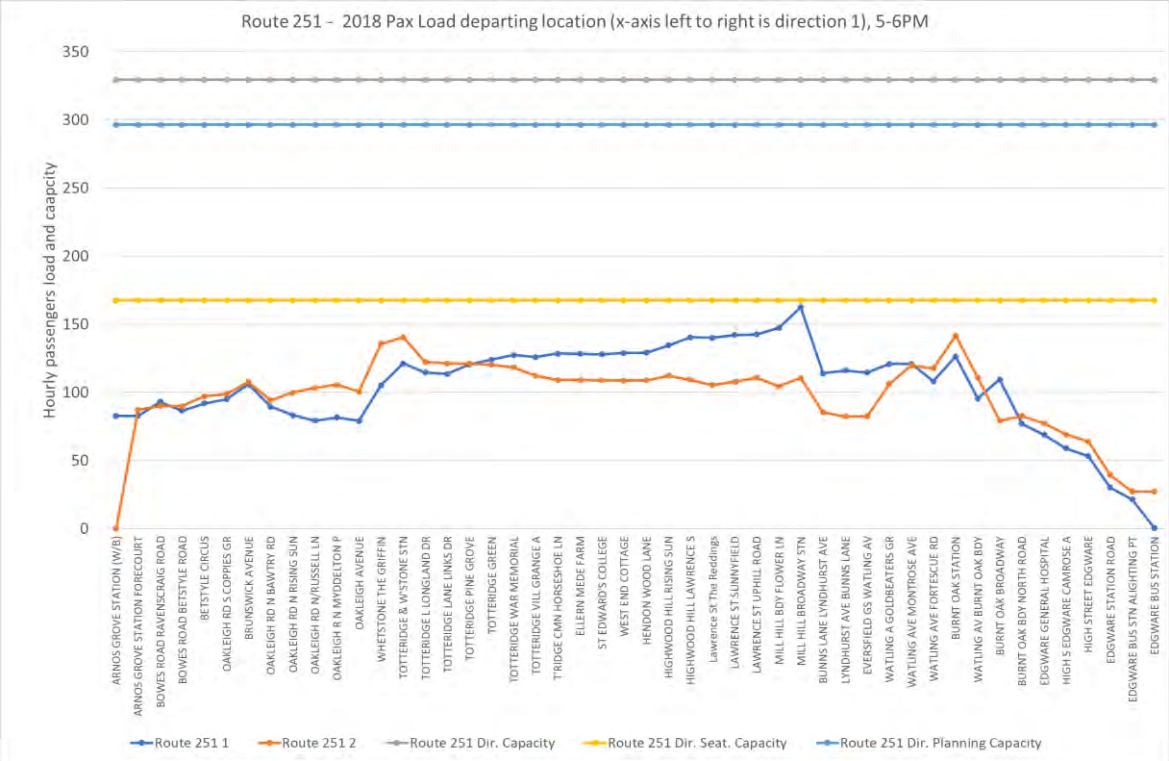

Route 107 - 2018 Pax Load departing location (x-axis left to right is direction 1), 5-6PM
Hourly passengers load and caapcity
400
350
300
250
200
150
100
50
0
EDGWARE BUS STATION
EDGWARE BUS STN ALIGHTING PT
EDGWARE STATION
E'BURY LANE PURCELL AVE
EDGWAREBURY LN PURCELL A
EDGWAREBURY L EDGWARE WY
EDGWAREBURY L EDGWARE WY
EDGWARE WY EDGWAREBURY L
EDGWARE WAY GLENDALE AVE
SPUR ROAD EDGWARE WAY
CANONS CNR BROCKLEY HILL
BROCKLEY HL PIPERS GRN L
ROYAL N ORTHOPAEDIC HOSP
CENTENNIAL PARK ALDENHAM
ELSTREE HILL SULLIVAN WY
ELSTREE HIGH STREET
ELSTREE THE PLOUGH
ALLUM LANE ELSTREE HILL
ALLUM LANE WOODSIDE
ALLUM LANE BARHAM AVENUE
ALLUM LN DEACONS HILL RD
ELSTREE & B'WOOD STATION
SHENLEY ROAD STATION RD
SHENLEY RD FURZEHILL RD
BOREHAMWOOD TESCO'S
BOREHAMWOOD FILM STUDIOS
HERTSMERE CIVIC OFFICES
ELSTREE WAY/MANOR WAY
ELSTREE GATE
WARWICK ROAD/CHESTER RD
BALMORAL DR KENILWORTH D
THE SUFFOLK PUNCH
RIPON WAY ROUNDABOUT
Ashley Drive Dacre Gdns
FURZEHILL ROAD ASHLEY DR
STIRLING CNR BARNET LANE
STIRLING CNR BARNET ROAD
BARNET GATE
ARKLEY GLEBE LANE
ARKLEY ST PETER'S CHURCH
BARNET ROAD QUINTA DRIVE
BARNET ROAD GARDEN CLOSE
ARKLEY HOTEL
WOOD STREET WELLHOUSE LN
WOOD STREET BLACK HORSE
WOOD STREET THE AVENUE
BARNET CHURCH WOOD ST
BARNET CHURCH RED LION
BARNET HILL/MEADWAY
HIGH BARNET STATION
HIGH BARNET STATION
BARNET HILL OLD RED LION
BARNET ODEON
STATION RD FIRE STATION
STATION ROAD WARWICK RD
NEW BARNET STATION ROAD
NEW BARNET STATION
Route 107 1
Route 107 2
Route 107 Dir. Capacity
Route 107 Dir. Seat. Capacity
Route 107 Dir. Planning Capacity

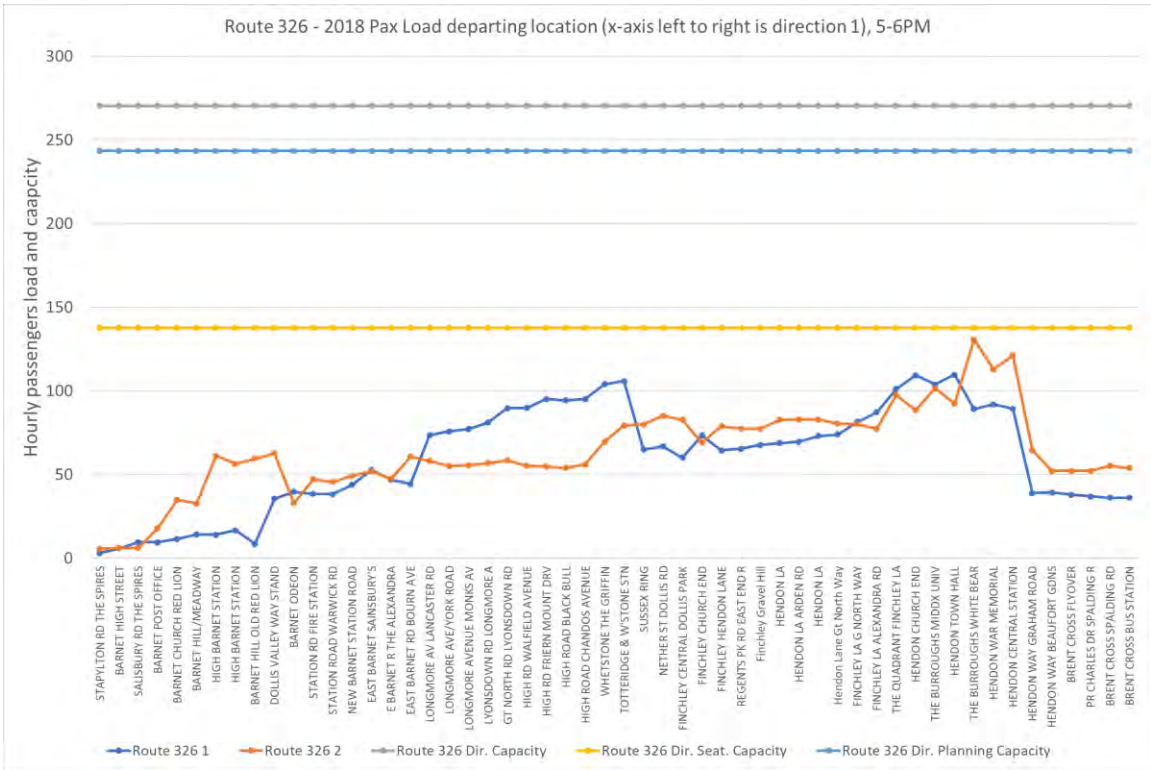

Route 183 - 2018 Pax Load departing location (x-axis left to right is direction 1), 5-6PM
Hourly passengers load and caapcity
800
700
600
500
400
300
200
100
0
GOLDERS GREEN STATION
GOLDERS GRN RD/HODFORD R
GOLDERS GRN RD HOOP LANE
GOLDERS G RD WOODSTOCK R
GOLDERS G RD HIGHFIELD A
N CIR RD/GOLDERS GRN RD
BRENT STREET N TH CIRC RD
BRENT GREEN LOAD OF HAY
HENDON BELL
HENDON THE QUADRANT
HENDON CHURCH END
THE BURROUGHS MIDDX UNIV
HENDON TOWN HALL
THE BURROUGHS WHITE BEAR
STATION ROAD WATFORD WAY
STATION ROAD VIVIAN AVE
HENDON STATION
W HENDON BDY STATION RD
WEST HENDON BROADWAY
WEST HENDON SAINBURY'S
KINGSBURY ROAD RED LION
KINGSBURY R DERWENT RISE
KINGSBURY RD TOWNSEND LN
KINGSBURY ROAD CHURCH LN
KINGSBURY ROE GREEN
ROE GREEN PARK
KINGSBURY ROAD VALLEY DR
KINGSBURY STATION
Kingsbury Jewish Fr Sch
KENTON ROAD PRESTON HILL
KENTON ROAD CLIFTON ROAD
KENTON RD CLAREMONT AVE
KENTON ROAD CHARLTON RD
KENTON RD WOODGRANGE AVE
KENTON ROAD KENTON PK RD
KENTON RD/WOODCOCK HILL
KENTON R ST LEONARDS AVE
KENTON RD UPTON GARDENS
KENTON ROAD DRAYCOTT AVE
KENTON STATION
KENTON RD NORTHWICK AVE
SHEEPCOTE RD KENTON RD
Harrow Sheepcote Road
STATION RD COLLEGE RD
HARROW SHOPPING CENTRE
HARROW BUS STATION
KYMBERLEY ROAD ST GEORGE'S CENTRE
PINNER ROAD NEPTUNE ROAD
PINNER ROAD OXFORD ROAD
PINNER ROAD RUTLAND ROAD
PINNER ROAD THE APOLLO
PINNER ROAD DURHAM ROAD
NORTH HARROW SAFEWAY
PINNER ROAD WOODLANDS
NOWER HILL SCHOOL
NOWER HILL SCHOOL
PINNER ROAD MELROSE ROAD
MARSH ROAD GROVE AVENUE
PINNER LIBRARY
PINNER RAILWAY BRIDGE
PINNER LOVE LANE
Route 183 1
Route 183 2
Route 183 Dir. Capacity
Route 183 Dir. Seat. Capacity
Route 183 Dir. Planning Capacity

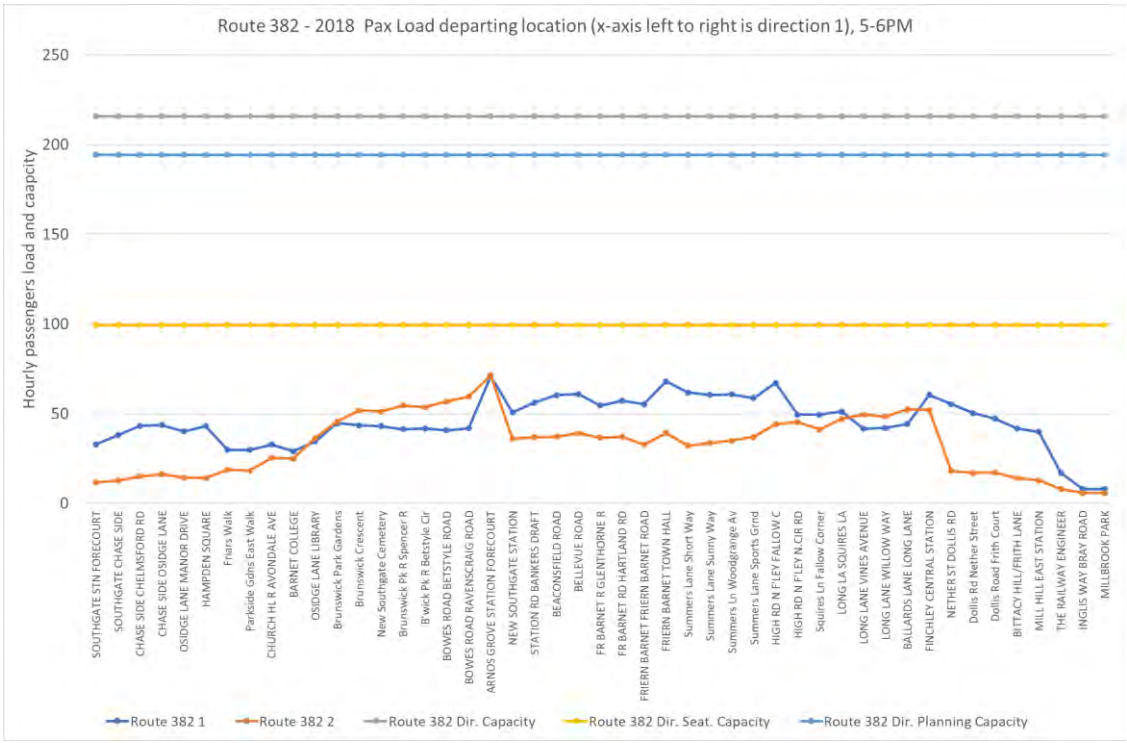

Route 221 - 2018 Pax Load departing location (x-axis left to right is direction 1), 5-6PM
Hourly passengers load and caapcity
0
100
200
300
400
500
600
700
EDGWARE BUS STN
EDGWARE BUS STN ALIGHTING PT
EDGWARE STATION
EDGWARE LIBRARY
HALE LANE BROADFIELDS AV
HALE LN HIGHVIEW GARDENS
HALE LANE DEANS LANE
HALE LANE DOWNHURST AVE
MILL HILL HALE LANE
MILL HILL BROADWAY STN
MILL HILL BDY FLOWER LN
FLOWER LN MILL HILL BDY
FLOWER LN PARKMEAD GDNS
BUNNS LANE BRIDGE
BUNNS LANE COPTHALL GDNS
COPTHALL SCHOOL
COPTHALL SPORTS CENTRE
SALCOMBE GARDENS
ENGEL PARK BITTACY RISE
ENGEL PARK ISLAND
ENGEL PARK BITTACY HILL
THE RAILWAY ENGINEER
MILL HILL EAST STATION
BITTACY HILL/FRITH LANE
FINCHLEY GOLF CLUB
FRITH MANOR SCHOOL
LULLGARTH CISSBURY RING
SINGLETON SCARP
SUSSEX RING
ARGYLE ROAD
ALEXANDRA GROVE NETHER S
ALEXANDRA GR BALLARDS LN
BALLARD LN WOODBERRY GRV
NORTH FINCHLEY TALLY HOI
NORTH FINCHLEY BUS STAND
NTH FINCHLEY TALLY HOI
NTH FINCHLEY WOODHOUSE R
WOODHOUSE R FENSTANTON A
WOODHOUSE RD HILTON AVE
WOODHOUSE RD CRESCENT WY
WOODHOUSE ROAD LEWES RD
FRIERN BARNET TOWN HALL
FRIERN BARNET FRIERN BARNET ROAD
FR BARNET RD HARTLAND RD
FR BARNET R GLENTHORNE R
BELLEVUE ROAD
BEACONSFIELD ROAD
STATION RD BANKERS DRAFT
NEW SOUTHGATE STATION
STATION ROAD HOMEBASE
STATION RD N CIRCULAR RD
MIDDX UNIVERSITY CAMPUS
BOUNDS GRN RD WARWICK RD
BOUNDS GREEN STATION
BOUNDS GREEN RD PARK RD
BOUNDS GRN RD EASTERN RD
BOUNDS GRN R PARK AVENUE
HARINGEY CIVIC CENTRE
WOOD GREEN BUS GARAGE
WOOD GREEN STATION
WOOD GREEN SHOPPING CITY
TURNPIKE LANE STN HIGH R
TURNPIKE LN STN/BUS STN
Route 221 1
Route 221 2
Route 221 Dir. Capacity
Route 221 Dir. Seat. Capacity
Route 221 Dir. Planning Capacity


Route 232 - 2018 Pax Load departing location (x-axis left to right is direction 1), 5-6PM
Hourly passengers load and caapcity
0
50
100
150
200
250
300
ST RAPHAELS ESTATE STAND
BESANT WAY OWEN WAY
ST RAPHAELS NORTH
Brent (Borough) PARK TESCO
NTH CIRCULAR RD DOG LANE
NEASDEN CENTRE/UNDERPASS
Dollis H Ln Randall Ave
Dollis Hill Ln Brook Rd
Dollis H Ln Newfield Rs
COLES GREEN RD HUMBER RD
COLES GRN RD COLES GN CT
N CIRCULAR R STAPLES CNR
TILLING ROAD SAFEWAY
BRENT CROSS BUS STATION
PR CHARLES DR SPALDING R
N CIR RD/GOLDERS GRN RD
N CIRCULAR R GT NORTH WY
N CIR RD BEECHWOOD AVE
EAST END ROAD UNDERPASS
N CIRCULAR RD LONG LANE
N CIR RD COPPETTS WOOD
SUP RD FROM C HATCH LN
PINKHAM WAY BOUNDS GRN R
STATION ROAD HOMEBASE
STATION RD BANKERS DRAFT
BOWES ROAD RAVENSCRAIG ROAD
ARNOS GROVE STATION (W/B)
BOWES ROAD STANLEY ROAD
BOWES ROAD PYMMES ROAD
GREEN LANES N CIRCULAR R
HIGH ROAD SYLVAN AVENUE
HIGH RD WHITE HART LANE
WOOD GREEN BUS GARAGE
WOOD GREEN SHOPPING CITY
TURNPIKE LN STN/BUS STN
Route 232 1
Route 232 2
Route 232 Dir. Capacity
Route 232 Dir. Seat. Capacity
Route 232 Dir. Planning Capacity


Route 240 - 2018 Pax Load departing location (x-axis left to right is direction 1), 5-6PM
Hourly passengers load and caapcity
350
300
250
200
150
100
50
0
GOLDERS GREEN STATION
GOLDERS GRN RD/HODFORD R
GOLDERS GRN RD HOOP LANE
GOLDERS G RD WOODSTOCK R
GOLDERS G RD HIGHFIELD A
N CIR RD/GOLDERS GRN RD
BRENT STREET NTH CIRC RD
BRENT GREEN LOAD OF HAY
HENDON BELL
HENDON THE QUADRANT
PARSON STREET DOWNAGE
PARSON STREET ASHLEY LN
HOLDERS HL R GT NORTH WY
HOLDERS HILL CRESCENT
HENDON PARK CEMETERY
HOLDERS HILL CIRCUS
BITTACY HILL/FRITH LANE
MILL HILL EAST STATION
THE RAILWAY ENGINEER
THE RIDGWAY BITTACY HILL
MILL HILL RESEARCH LABS
ST VINCENT'S SCHOOL
MILL HILL SCHOOL
HAMMERS LN/THE RIDGEWAY
DRAPERS' COTTAGE HOMES
DAWS LANE/HAMMERS LANE
DAWS LANE BIRKBECK ROAD
MILL HILL BDY FLOWER LN
MILL HILL BROADWAY STN
MILL HILL HALE LANE
HALE LANE DOWNHURST AVE
HALE LANE DEANS LANE
HALE LN HIGHVIEW GARDENS
HALE LANE BROADFIELDS AV
EDGWARE LIBRARY
EDGWARE STATION
EDGWARE BUS STN ALIGHTING PT
EDGWARE BUS STATION
Route 240 1
Route 240 2
Route 240 Dir. Capacity
Route 240 Dir. Seat. Capacity
Route 240 Dir. Planning Capacity

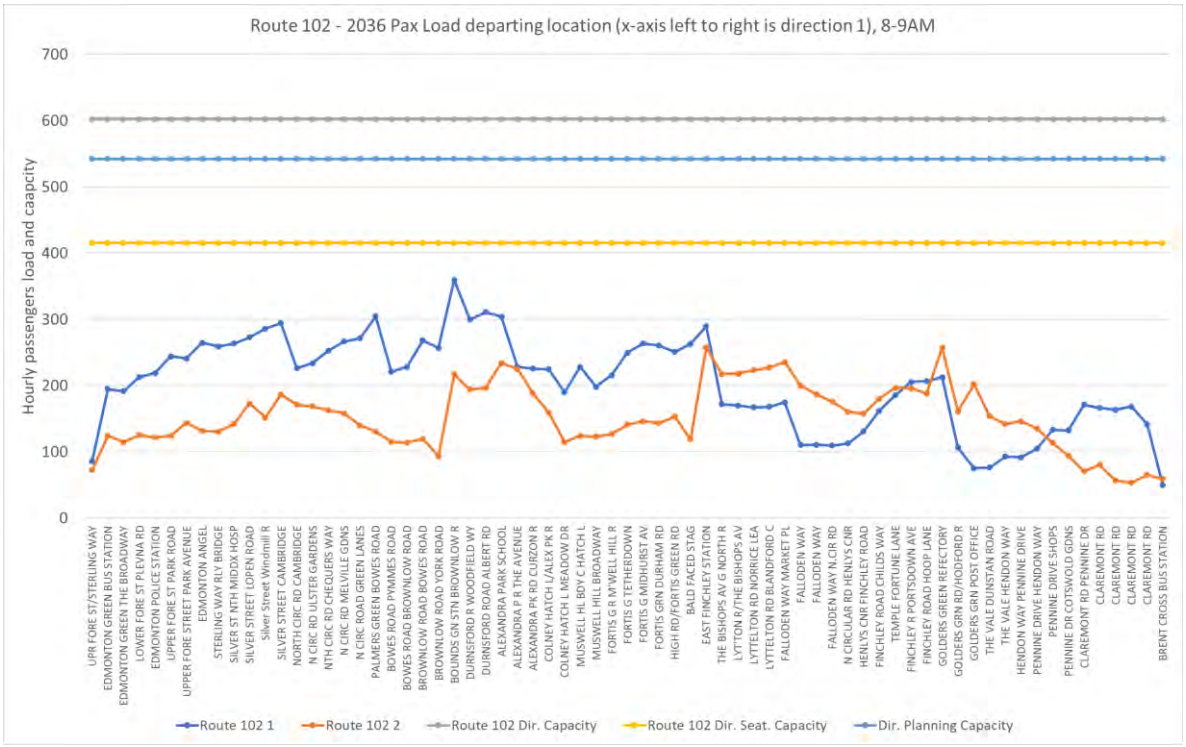

Route 251 - 2018 Pax Load departing location (x-axis left to right is direction 1), 5-6PM
Hourly passengers load and caapcity
350
300
250
200
150
100
50
0
ARNOS GROVE STATION (W/B)
ARNOS GROVE STATION FORECOURT
BOWES ROAD RAVENSCRAIG ROAD
BOWES ROAD BETSTYLE ROAD
BETSTYLE CIRCUS
OAKLEIGH RD S COPPICE GR
BRUNSWICK AVENUE
OAKLEIGH RD N BAWTRY RD
OAKLEIGH RD N RISING SUN
OAKLEIGH RD N/RUSSELL LN
OAKLEIGH R N MYDDELTON P
OAKLEIGH AVENUE
WHETSTONE THE GRIFFIN
TOTTERIDGE & W'STONE STN
TOTTERIDGE L LONGLAND DR
TOTTERIDGE LANE LINKS DR
TOTTERIDGE PINE GROVE
TOTTERIDGE GREEN
TOTTERIDGE WAR MEMORIAL
TOTTERIDGE VILL GRANGE A
TTRIDGE CMN HORSESHOE LN
ELLERN MEDE FARM
ST EDWARD'S COLLEGE
WEST END COTTAGE
HENDON WOOD LANE
HIGHWOOD HILL RISING SUN
HIGHWOOD HILL LAWRENCE S
Lawrence St The Reddings
LAWRENCE ST SUNNYFIELD
LAWRENCE ST UPHILL ROAD
MILL HILL BDY FLOWER LN
MILL HILL BROADWAY STN
BUNNS LANE LYNDHURST AVE
LYNDHURST AVE BUNNS LANE
EVERSFIELD GS WATLING AV
WATLING A GOLDBEATERS GR
WATLING AVE MONTROSE AVE
WATLING AVE FORTESCUE RD
BURNT OAK STATION
WATLING AV BURNT OAK BDY
BURNT OAK BROADWAY
BURNT OAK BDY NORTH ROAD
EDGWARE GENERAL HOSPITAL
HIGH S EDGWARE CAMROSE A
HIGH STREET EDGWARE
EDGWARE STATION ROAD
EDGWARE BUS STN ALIGHTING PT
EDGWARE BUS STATION
Route 251 1
Route 251 2
Route 251 Dir. Capacity
Route 251 Dir. Seat. Capacity
Route 251 Dir. Planning Capacity

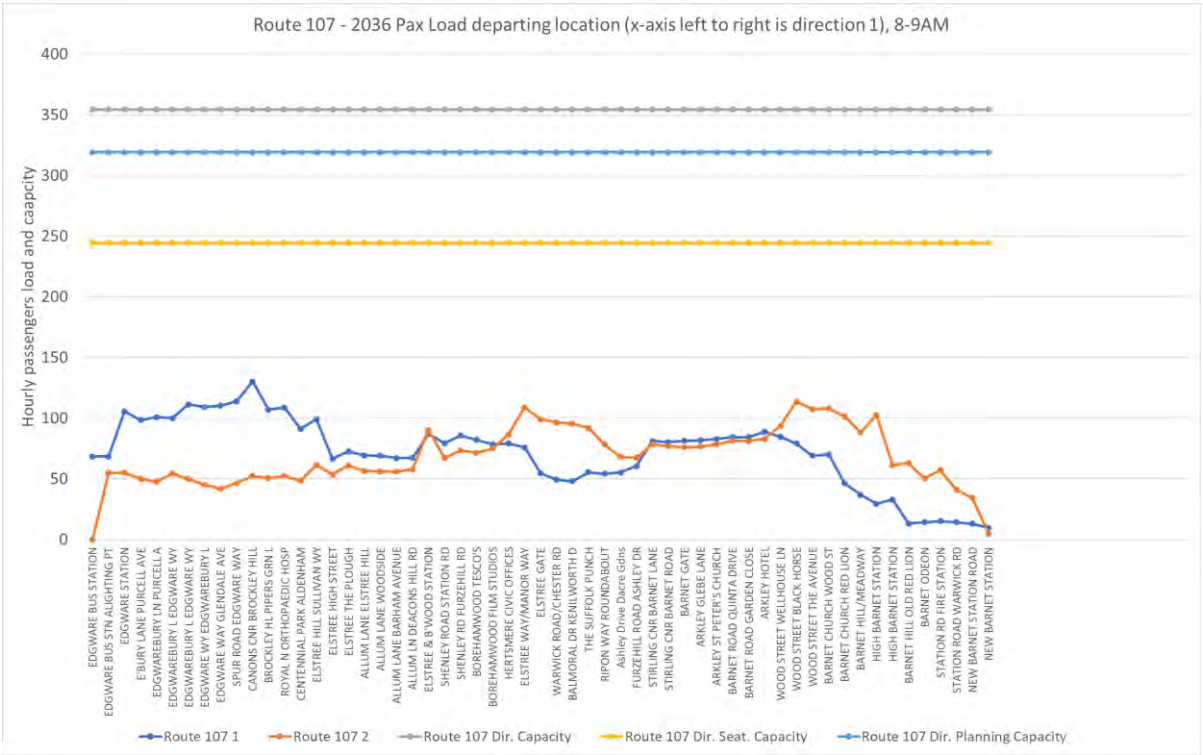

Route 326 - 2018 Pax Load departing location (x-axis left to right is direction 1), 5-6PM
Hourly passengers load and caapcity
300
250
200
150
100
50
0
STAPYLTON RD THE SPIRES
BARNET HIGH STREET
SALISBURY RD THE SPIRES
BARNET POST OFFICE
BARNET CHURCH RED LION
BARNET HILL/MEADWAY
HIGH BARNET STATION
HIGH BARNET STATION
BARNET HILL OLD RED LION
DOLLIS VALLEY WAY STAND
BARNET ODEON
STATION RD FIRE STATION
STATION ROAD WARWICK RD
NEW BARNET STATION ROAD
EAST BARNET SAINSBURY'S
E BARNET R THE ALEXANDRA
EAST BARNET RD BOURN AVE
LONGMORE AV LANCASTER RD
LONGMORE AVE/YORK ROAD
LONGMORE AVENUE MONKS AV
LYONSDOWN RD LONGMORE A
GT NORTH RD LYONSDOWN RD
HIGH RD WALFIELD AVENUE
HIGH RD FRIERN MOUNT DRV
HIGH ROAD BLACK BULL
HIGH ROAD CHANDOS AVENUE
WHETSTONE THE GRIFFIN
TOTTERIDGE & W'STONE STN
SUSSEX RING
NETHER ST DOLLIS RD
FINCHLEY CENTRAL DOLLIS PARK
FINCHLEY CHURCH END
FINCHLEY HENDON LANE
REGENTS PK RD EAST END R
Finchley Gravel Hill
HENDON LA
HENDON LA ARDEN RD
HENDON LA
Hendon Lane Gt North Way
FINCHLEY LA G NORTH WAY
FINCHLEY LA ALEXANDRA RD
THE QUADRANT FINCHLEY LA
HENDON CHURCH END
THE BURROUGHS MIDDX UNIV
HENDON TOWN HALL
THE BURROUGHS WHITE BEAR
HENDON WAR MEMORIAL
HENDON CENTRAL STATION
HENDON WAY GRAHAM ROAD
HENDON WAY BEAUFORT GDNS
BRENT CROSS FLYOVER
PR CHARLES DR SPALDING R
BRENT CROSS SPALDING RD
BRENT CROSS BUS STATION
Route 326 1
Route 326 2
Route 326 Dir. Capacity
Route 326 Dir. Seat. Capacity
Route 326 Dir. Planning Capacity

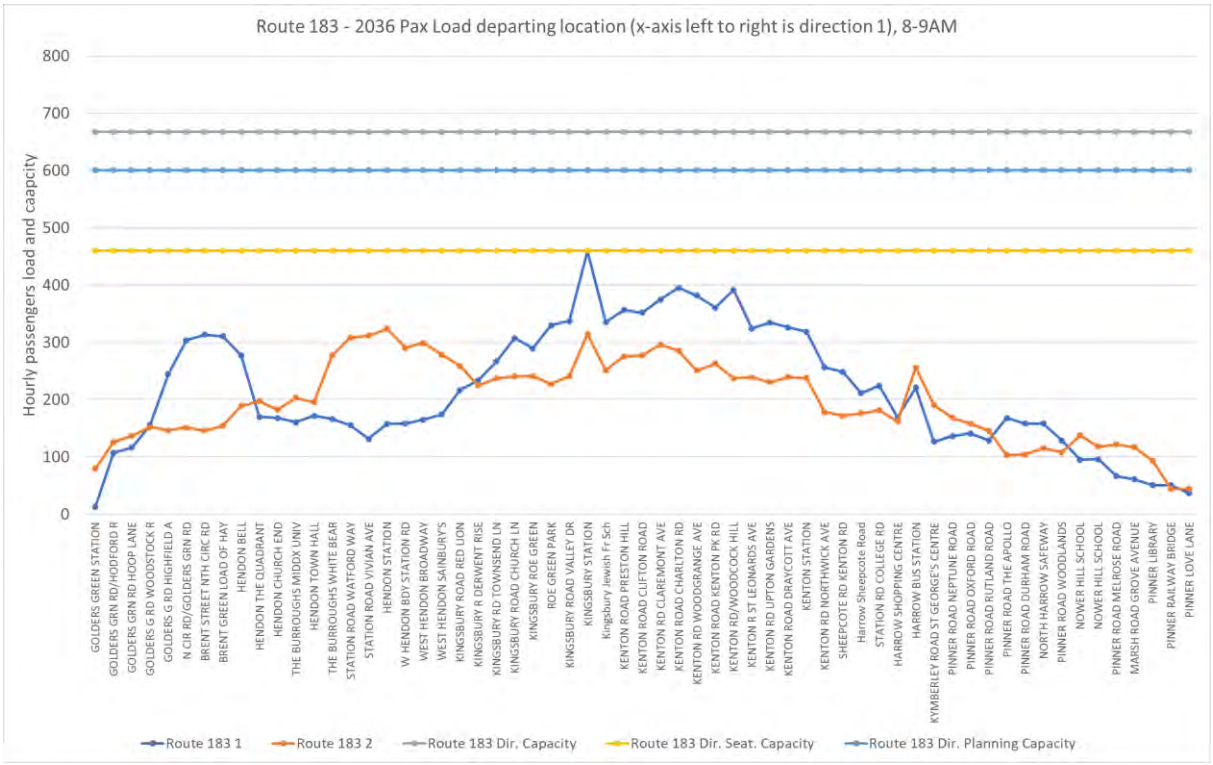

Route 382 - 2018 Pax Load departing location (x-axis left to right is direction 1), 5-6PM
Hourly passengers load and caapcity
250
200
150
100
50
0
SOUTHGATE STN FORECOURT
SOUTHGATE CHASE SIDE
CHASE SIDE CHELMSFORD RD
CHASE SIDE OSIDGE LANE
OSIDGE LANE MANOR DRIVE
HAMPDEN SQUARE
Friars Walk
Parkside Gdns East Walk
CHURCH HL R AVONDALE AVE
BARNET COLLEGE
OSIDGE LANE LIBRARY
Brunswick Park Gardens
Brunswick Crescent
New Southgate Cemetery
Brunswick Pk R Spencer R
B'wick Pk R Betstyle Cir
BOWES ROAD BETSTYLE ROAD
BOWES ROAD RAVENSCRAIG ROAD
ARNOS GROVE STATION FORECOURT
NEW SOUTHGATE STATION
STATION RD BANKERS DRAFT
BEACONSFIELD ROAD
BELLEVUE ROAD
FR BARNET R GLENTHORNE R
FR BARNET RD HARTLAND RD
FRIERN BARNET FRIERN BARNET ROAD
FRIERN BARNET TOWN HALL
Summers Lane Short Way
Summers Lane Sunny Way
Summers Ln Woodgrange Av
Summers Lane Sports Grnd
HIGH RD N FLEY FALLOW C
HIGH RD N FLEY N.CIR RD
Squires Ln Fallow Corner
LONG LA SQUIRES LA
LONG LANE VINES AVENUE
LONG LANE WILLOW WAY
BALLARDS LANE LONG LANE
FINCHLEY CENTRAL STATION
NETHER ST DOLLIS RD
Dollis Rd Nether Street
Dollis Road Frith Court
BITTACY HILL/FRITH LANE
MILL HILL EAST STATION
THE RAILWAY ENGINEER
INGLIS WAY BRAY ROAD
MILLBROOK PARK
Route 382 1
Route 382 2
Route 382 Dir. Capacity
Route 382 Dir. Seat. Capacity
Route 382 Dir. Planning Capacity

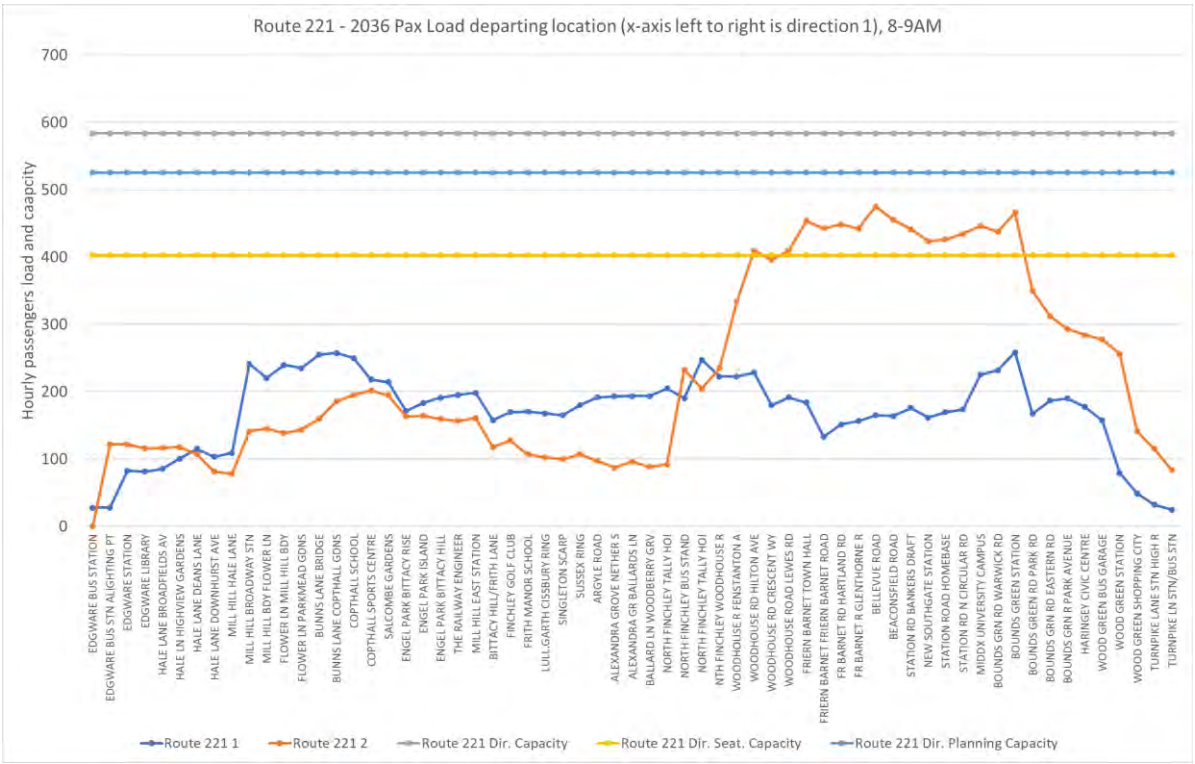
APPENDIX D

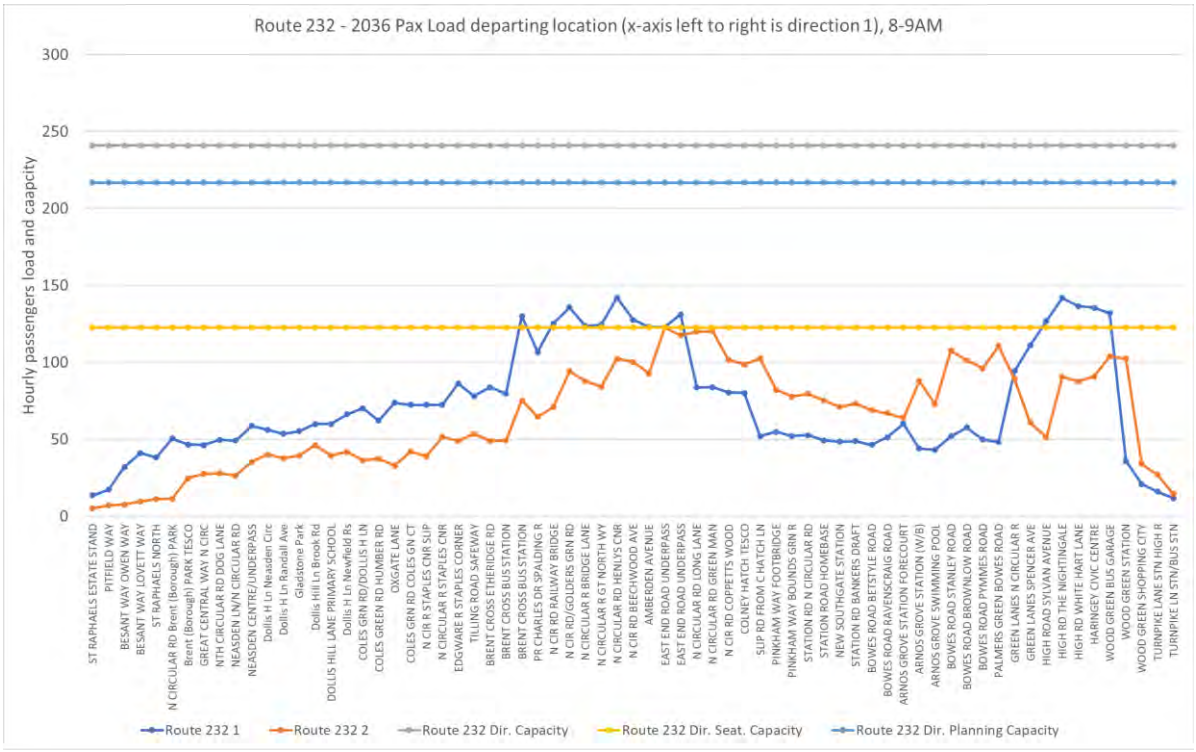
Route Demand loadings by direction of travel vs capacity – 2036 AM Highway Peak hr (+ demand uplift due to services improvement)

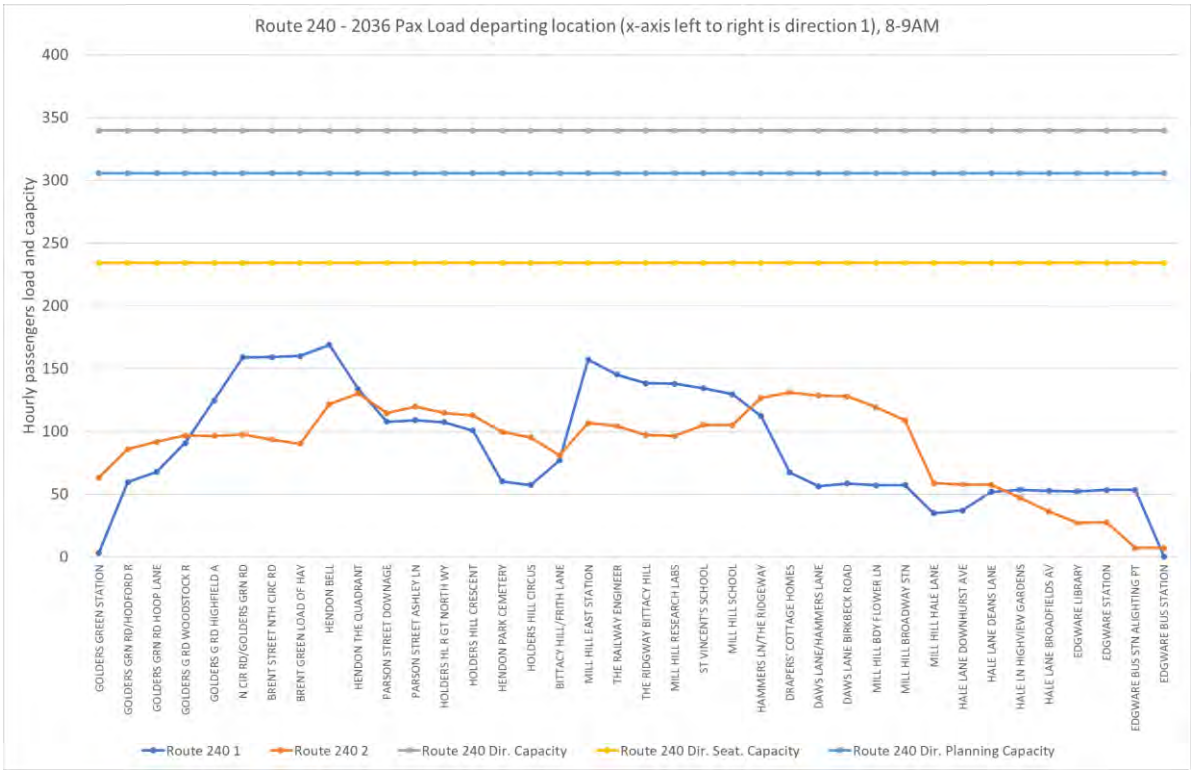

Route 102 - 2036 Pax Load departing location (x-axis left to right is direction 1), 8-9AM
Hourly passengers load and caapcity
700
600
500
400
300
200
100
0
UPR FORE ST/STERLING WAY
EDMONTON GREEN BUS STATION
EDMONTON GREEN THE BROADWAY
LOWER FORE ST PLEVNA RD
EDMONTON POLICE STATION
UPPER FORE ST PARK ROAD
UPPER FORE STREET PARK AVENUE
EDMONTON ANGEL
STERLING WAY RLY BRIDGE
SILVER ST NTH MIDDX HOSP
SILVER STREET LOPEN ROAD
Silver Street Windmill R
SILVER STREET CAMBRIDGE
NORTH CIRC RD CAMBRIDGE
N CIRC RD ULSTER GARDENS
NTH CIRC RD CHEQUERS WAY
N CIRC RD MELVILLE GDNS
N CIRC ROAD GREEN LANES
PALMERS GREEN BOWES ROAD
BOWES ROAD PYMMES ROAD
BOWES ROAD BROWNLOW ROAD
BROWNLOW ROAD BOWES ROAD
BROWNLOW ROAD YORK ROAD
BOUNDS GN STN BROWNLOW R
DURNSFORD R WOODFIELD WY
DURNSFORD ROAD ALBERT RD
ALEXANDRA PARK SCHOOL
ALEXANDRA P R THE AVENUE
ALEXANDRA PK RD CURZON R
COLNEY HATCH L/ALEX PK R
COLNEY HATCH L MEADOW DR
MUSWELL HL BDY C HATCH L
MUSWELL HILL BROADWAY
FORTIS G R M'WELL HILL R
FORTIS G TETHERDOWN
FORTIS G MIDHURST AV
FORTIS GRN DURHAM RD
HIGH RD/FORTIS GREEN RD
BALD FACED STAG
EAST FINCHLEY STATION
THE BISHOPS AV G NORTH R
LYTTON R/THE BISHOPS AV
LYTTELTON RD NORRICE LEA
LYTTELTON RD BLANDFORD C
FALLODEN WAY MARKET PL
FALLODEN WAY
FALLODEN WAY
FALLODEN WAY N.CIR RD
N CIRCULAR RD HENLYS CNR
HENLYS CNR FINCHLEY ROAD
FINCHLEY ROAD CHILDS WAY
TEMPLE FORTUNE LANE
FINCHLEY R PORTSDOWN AVE
FINCHLEY ROAD HOOP LANE
GOLDERS GREEN REFECTORY
GOLDERS GRN RD/HODFORD R
GOLDERS GRN POST OFFICE
THE VALE DUNSTAN ROAD
THE VALE HENDON WAY
HENDON WAY PENNINE DRIVE
PENNINE DRIVE HENDON WAY
PENNINE DRIVE SHOPS
PENNINE DR COTSWOLD GDNS
CLAREMONT RD PENNINE DR
CLAREMONT RD
CLAREMONT RD
CLAREMONT RD
CLAREMONT RD
BRENT CROSS BUS STATION
Route 102 1
Route 102 2
Route 102 Dir. Capacity
Route 102 Dir. Seat. Capacity
Dir. Planning Capacity

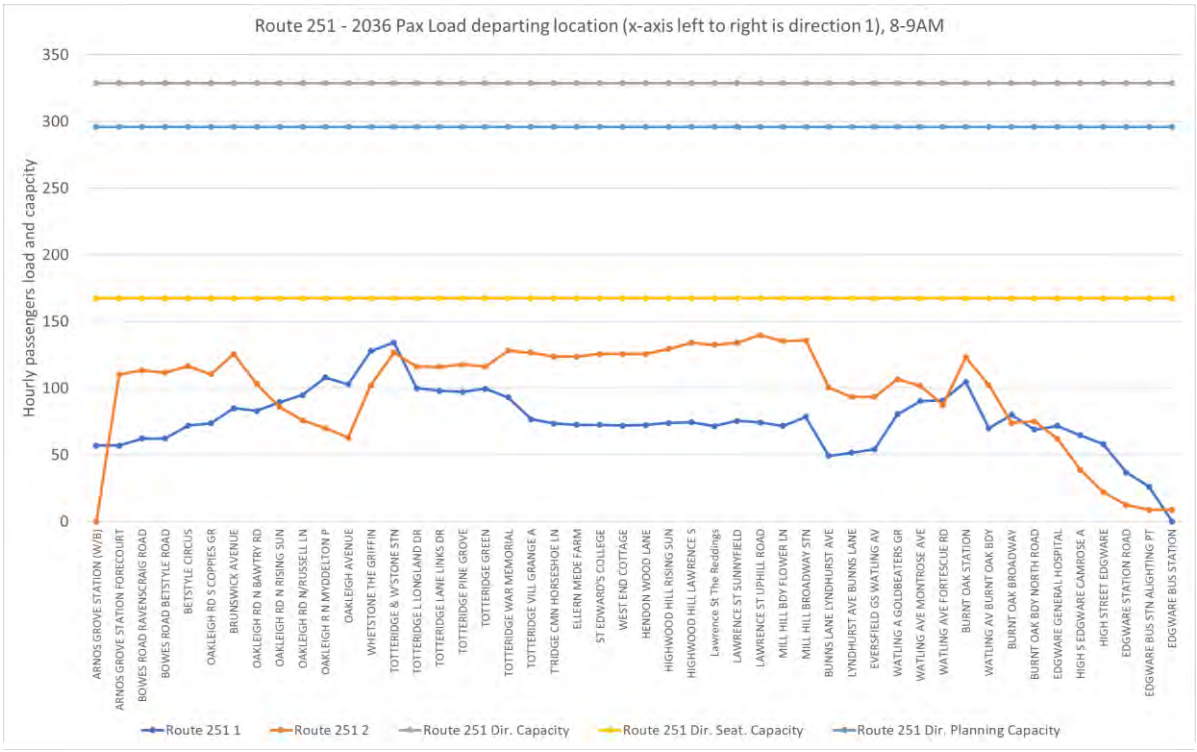

Route 107 - 2036 Pax Load departing location (x-axis left to right is direction 1), 8-9AM
Hourly passengers load and caapcity
400
350
300
250
200
150
100
50
0
EDGWARE BUS STATION
EDGWARE BUS STN ALIGHTING PT
EDGWARE STATION
E'BURY LANE PURCELL AVE
EDGWAREBURY L EDGWARE WY
EDGWAREBURY L EDGWARE WY
EDGWAREBURY L EDGWARE WY
EDGWARE WY EDGWAREBURY L
EDGWARE WAY GLENDALE AVE
SPUR ROAD EDGWARE WAY
CANONS CNR BROCKLEY HILL
BROCKLEY HL PIPERS GRN L
ROYAL N ORTHOPAEDIC HOSP
CENTENNIAL PARK ALDENHAM
ELSTREE HILL SULLIVAN WY
ELSTREE HIGH STREET
ELSTREE THE PLOUGH
ALLUM LANE ELSTREE HILL
ALLUM LANE WOODSIDE
ALLUM LANE BARHAM AVENUE
ALLUM LN DEACONS HILL RD
ELSTREE & B'WOOD STATION
SHENLEY ROAD STATION RD
SHENLEY RD FURZEHILL RD
BOREHAMWOOD TESCO'S
BOREHAMWOOD FILM STUDIOS
HERTSMERE CIVIC OFFICES
ELSTREE WAY/MANOR WAY
ELSTREE GATE
WARWICK ROAD/CHESTER RD
BALMORAL DR KENILWORTH D
THE SUFFOLK PUNCH
RIPON WAY ROUNDABOUT
Ashley Drive Dacre Gdns
FURZEHILL ROAD ASHLEY DR
STIRLING CNR BARNET LANE
STIRLING CNR BARNET ROAD
BARNET GATE
ARKLEY GLEBE LANE
ARKLEY ST PETER'S CHURCH
BARNET ROAD QUINTA DRIVE
BARNET ROAD GARDEN CLOSE
ARKLEY HOTEL
WOOD STREET WELLHOUSE LN
WOOD STREET BLACK HORSE
WOOD STREET THE AVENUE
BARNET CHURCH WOOD ST
BARNET CHURCH RED LION
BARNET HILL/MEADWAY
HIGH BARNET STATION
HIGH BARNET STATION
BARNET HILL OLD RED LION
BARNET ODEON
STATION RD FIRE STATION
STATION ROAD WARWICK RD
NEW BARNET STATION ROAD
NEW BARNET STATION
Route 107 1
Route 107 2
Route 107 Dir. Capacity
Route 107 Dir. Seat. Capacity
Route 107 Dir. Planning Capacity

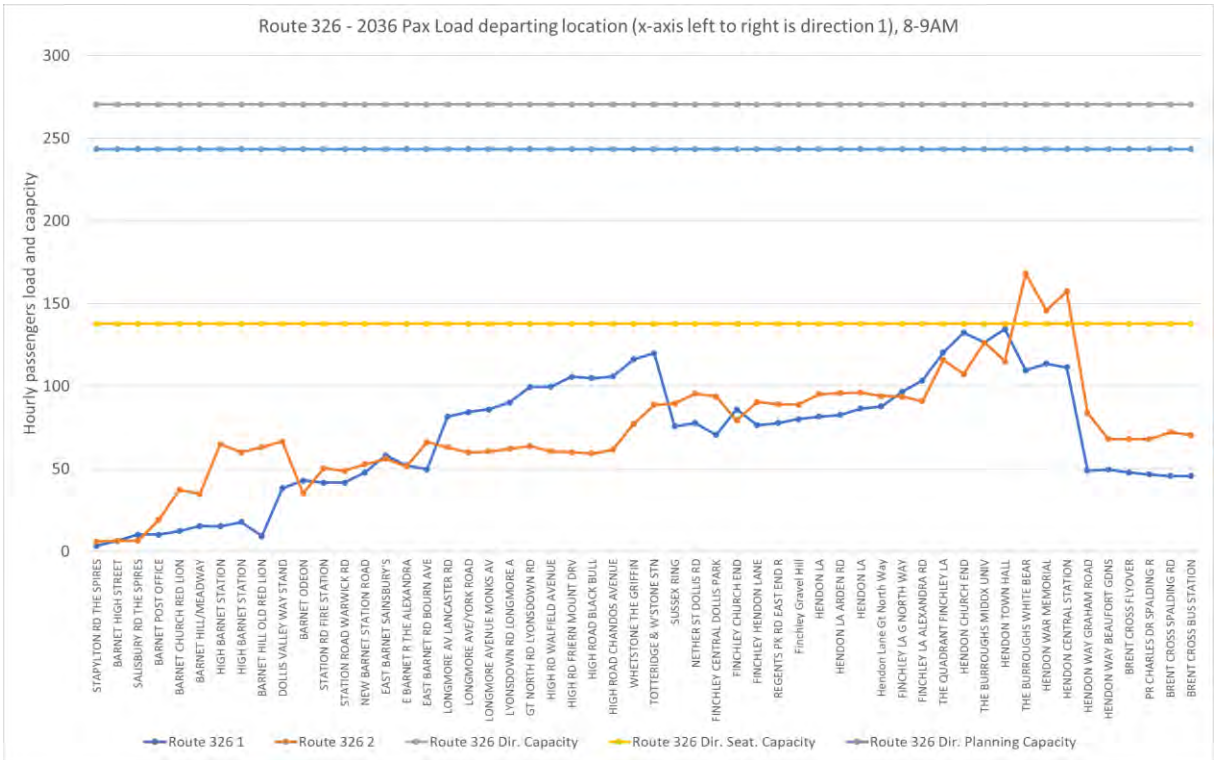

Route 183 - 2036 Pax Load departing location (x-axis left to right is direction 1), 8-9AM
Hourly passengers load and caapcity
800
700
600
500
400
300
200
100
0
GOLDERS GREEN STATION
GOLDERS GRN RD/HODFORD R
GOLDERS GRN RD HOOP LANE
GOLDERS G RD WOODSTOCK R
GOLDERS G RD HIGHFIELD A
N CIR RD/GOLDERS GRN RD
BRENT STREET NTH CIRC RD
BRENT GREEN LOAD OF HAY
HENDON BELL
HENDON THE QUADRANT
HENDON CHURCH END
THE BURROUGHS MIDDX UNIV
HENDON TOWN HALL
THE BURROUGHS WHITE BEAR
STATION ROAD WATFORD WAY
STATION ROAD VIVIAN AVE
HENDON STATION
W HENDON BDY STATION RD
WEST HENDON BROADWAY
WEST HENDON SAINBURY'S
KINGSBURY ROAD RED LION
KINGSBURY R DERWENT RISE
KINGSBURY RD TOWNSEND LN
KINGSBURY ROAD CHURCH LN
KINGSBURY ROE GREEN
ROE GREEN PARK
KINGSBURY ROAD VALLEY DR
KINGSBURY STATION
Kingsbury Jewish Fr Sch
KENTON ROAD PRESTON HILL
KENTON ROAD CLIFTON ROAD
KENTON RD CLAREMONT AVE
KENTON ROAD CHARLTON RD
KENTON RD WOODGRANGE AVE
KENTON ROAD KENTON PK RD
KENTON RD/WOODCOCK HILL
KENTON R ST LEONARDS AVE
KENTON RD UPTON GARDENS
KENTON ROAD DRAYCOTT AVE
KENTON STATION
KENTON RD NORTHWICK AVE
SHEEPCOTE RD KENTON RD
Harrow Sheepcote Road
STATION RD COLLEGE RD
HARROW SHOPPING CENTRE
HARROW BUS STATION
KYMBERLEY ROAD ST GEORGE'S CENTRE
PINNER ROAD NEPTUNE ROAD
PINNER ROAD OXFORD ROAD
PINNER ROAD RUTLAND ROAD
PINNER ROAD THE APOLLO
PINNER ROAD DURHAM ROAD
NORTH HARROW SAFEWAY
PINNER ROAD WOODLANDS
NOWER HILL SCHOOL
NOWER HILL SCHOOL
PINNER ROAD MELROSE ROAD
MARSH ROAD GROVE AVENUE
PINNER LIBRARY
PINNER RAILWAY BRIDGE
PINNER LOVE LANE
Route 183 1
Route 183 2
Route 183 Dir. Capacity
Route 183 Dir. Seat. Capacity
Route 183 Dir. Planning Capacity

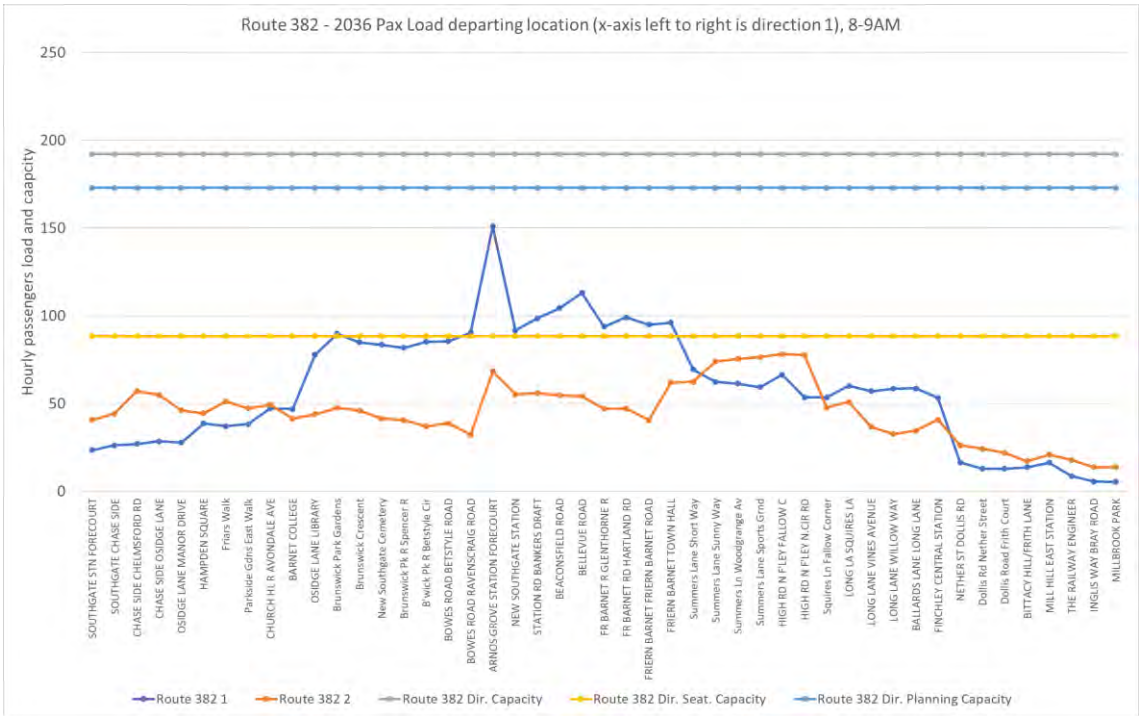

Route 221 - 2036 Pax Load departing location (x-axis left to right is direction 1), 8-9AM
Hourly passengers load and caapcity
700
600
500
400
300
200
100
0
EDGWARE BUS STATION
EDGWARE BUS STN ALIGHTING PT
EDGWARE STATION
EDGWARE LIBRARY
HALE LANE BROADFIELDS AV
HALE LN HIGHVIEW GARDENS
HALE LANE DEANS LANE
HALE LANE DOWNHURST AVE
MILL HILL HALE LANE
MILL HILL BROADWAY STN
MILL HILL BDY FLOWER LN
FLOWER LN MILL HILL BDY
FLOWER LN PARKMEAD GDNS
BUNNS LANE BRIDGE
BUNNS LANE COPTHALL GDNS
COPTHALL SCHOOL
COPTHALL SPORTS CENTRE
SALCOMBE GARDENS
ENGEL PARK BITTACY RISE
ENGEL PARK ISLAND
ENGEL PARK BITTACY HILL
THE RAILWAY ENGINEER
MILL HILL EAST STATION
BITTACY HILL/FRITH LANE
FINCHLEY GOLF CLUB
FRITH MANOR SCHOOL
LULLGARTH CISSBURY RING
SINGLETON SCARP
SUSSEX RING
ARGYLE ROAD
ALEXANDRA GROVE NETHER S
ALEXANDRA GR BALLARDS LN
BALLARD LN WOODBERRY GRV
NORTH FINCHLEY TALLY HOI
NORTH FINCHLEY BUS STAND
NORTH FINCHLEY TALLY HOI
NTH FINCHLEY WOODHOUSE R
WOODHOUSE R FENSTANTON A
WOODHOUSE RD HILTON AVE
WOODHOUSE RD CRESCENT WY
WOODHOUSE ROAD LEWES RD
FRIERN BARNET TOWN HALL
FRIERN BARNET FRIERN BARNET ROAD
FR BARNET RD HARTLAND RD
FR BARNET R GLENTHORNE R
BELLEVUE ROAD
BEACONSFIELD ROAD
STATION RD BANKERS DRAFT
NEW SOUTHGATE STATION
STATION ROAD HOMEBASE
STATION RD N CIRCULAR RD
MIDDX UNIVERSITY CAMPUS
BOUNDS GRN RD WARWICK RD
BOUNDS GREEN STATION
BOUNDS GREEN RD PARK RD
BOUNDS GRN RD EASTERN RD
BOUNDS GRN R PARK AVENUE
HARINGEY CIVIC CENTRE
WOOD GREEN BUS GARAGE
WOOD GREEN STATION
WOOD GREEN SHOPPING CITY
TURNPIKE LANE STN HIGH R
TURNPIKE LN STN/BUS STN
Route 221 1
Route 221 2
Route 221 Dir. Capacity
Route 221 Dir. Seat. Capacity
Route 221 Dir. Planning Capacity


Route 232 - 2036 Pax Load departing location (x-axis left to right is direction 1), 8-9AM
Hourly passengers load and caapcity
300
250
200
150
100
50
0
ST RAPHAELS ESTATE STAND
PITFIELD WAY
BESANT WAY OWEN WAY
BESANT WAY LOVETT WAY
ST RAPHAELS NORTH
N CIRCULAR RD Brent (Borough) PARK
Brent (Borough) PARK TESCO
GREAT CENTRAL WAY N CIRC
NTH CIRCULAR RD DOG LANE
NEASDEN LN/N CIRCULAR RD
NEASDEN CENTRE/UNDERPASS
Dollis H Ln Neasden Circ
Dollis H Ln Randall Ave
Gladstone Park
Dollis Hill Ln Brook Rd
DOLLIS HILL LANE PRIMARY SCHOOL
Dollis H Ln Newfield Rs
COLES GRN RD/DOLLIS H LN
COLES GREEN RD HUMBER RD
OXGATE LANE
COLES GRN RD COLES GN CT
N CIR R STAPLES CNR SLIP
N CIRCULAR R STAPLES CNR
EDGWARE R STAPLES CORNER
TILLING ROAD SAFEWAY
BRENT CROSS ETHERIDGE RD
BRENT CROSS BUS STATION
BRENT CROSS BUS STATION
PR CHARLES DR SPALDING R
N CIR RD RAILWAY BRIDGE
N CIR RD/GOLDERS GRN RD
N CIRCULAR R BRIDGE LANE
N CIRCULAR R GT NORTH WY
N CIRCULAR RD HENLYS CNR
N CIR RD BEECHWOOD AVE
AMBEROEN AVENUE
EAST END ROAD UNDERPASS
EAST END ROAD UNDERPASS
N CIRCULAR RD LONG LANE
N CIRCULAR RD GREEN MAN
N CIR RD COPPETTS WOOD
COLNEY HATCH TESCO
SLIP RD FROM C HATCH LN
PINKHAM WAY FOOTBRIDGE
PINKHAM WAY BOUNDS GRN R
STATION RD N CIRCULAR RD
STATION ROAD HOMEBASE
NEW SOUTHGATE STATION
STATION RD BANNERS DRAFT
BOWES ROAD BETSTYLE ROAD
BOWES ROAD RAVENSCRAIG ROAD
ARNOS GROVE STATION FORECOURT
ARNOS GROVE STATION (W/B)
ARNOS GROVE SWIMMING POOL
BOWES ROAD STANLEY ROAD
BOWES ROAD BROWNLOW ROAD
BOWES ROAD PYMMES ROAD
PALMERS GREEN BOWES ROAD
GREEN LANES N CIRCULAR R
GREEN LANES SPENCER AVE
HIGH ROAD SYLVAN AVENUE
HIGH RD THE NIGHTINGALE
HIGH RD WHITE HART LANE
HARINGEY CIVIC CENTRE
WOOD GREEN BUS GARAGE
WOOD GREEN STATION
WOOD GREEN SHOPPING CITY
TURNPIKE LANE STN HIGH R
TURNPIKE LN STN/BUS STN
Route 232 1
Route 232 2
Route 232 Dir. Capacity
Route 232 Dir. Seat. Capacity
Route 232 Dir. Planning Capacity


Route 240 - 2036 Pax Load departing location (x-axis left to right is direction 1), 8-9AM
Hourly passengers load and caapcity
400
350
300
250
200
150
100
50
0
GOLDERS GREEN STATION
GOLDERS GRN RD/HODFORD R
GOLDERS GRN RD HOOP LANE
GOLDERS G RD WOODSTOCK R
GOLDERS G RD HIGHFIELD A
N CIR RD/GOLDERS GRN RD
BRENT STREET NTH CIRC RD
BRENT GREEN LOAD OF HAY
HENDON BELL
HENDON THE QUADRANT
PARSON STREET DOWNAGE
PARSON STREET ASHLEY LN
HOLDERS HL R GT NORTH WY
HOLDERS HILL CRESCENT
HENDON PARK CEMETERY
HOLDERS HILL CIRCUS
BITTACY HILL/FRITH LANE
MILL HILL EAST STATION
THE RAILWAY ENGINEER
THE RIDGWAY BITTACY HILL
MILL HILL RESEARCH LABS
ST VINCENTS SCHOOL
MILL HILL SCHOOL
HAMMERS LN/THE RIDGEWAY
DRAPERS' COTTAGE HOMES
DAWS LANE/HAMMERS LANE
DAWS LANE BIRKBECK ROAD
MILL HILL BDY FLOWER LN
MILL HILL BROADWAY STN
MILL HILL HALE LANE
HALE LANE DOWNHURST AVE
HALE LANE DEANS LANE
HALE LN HIGHVIEW GARDENS
HALE LANE BROADFIELDS AV
EDGWARE LIBRARY
EDGWARE STATION
EDGWARE BUS STN ALIGHTING PT
EDGWARE BUS STATION
Route 240 1
Route 240 2
Route 240 Dir. Capacity
Route 240 Dir. Seat. Capacity
Route 240 Dir. Planning Capacity

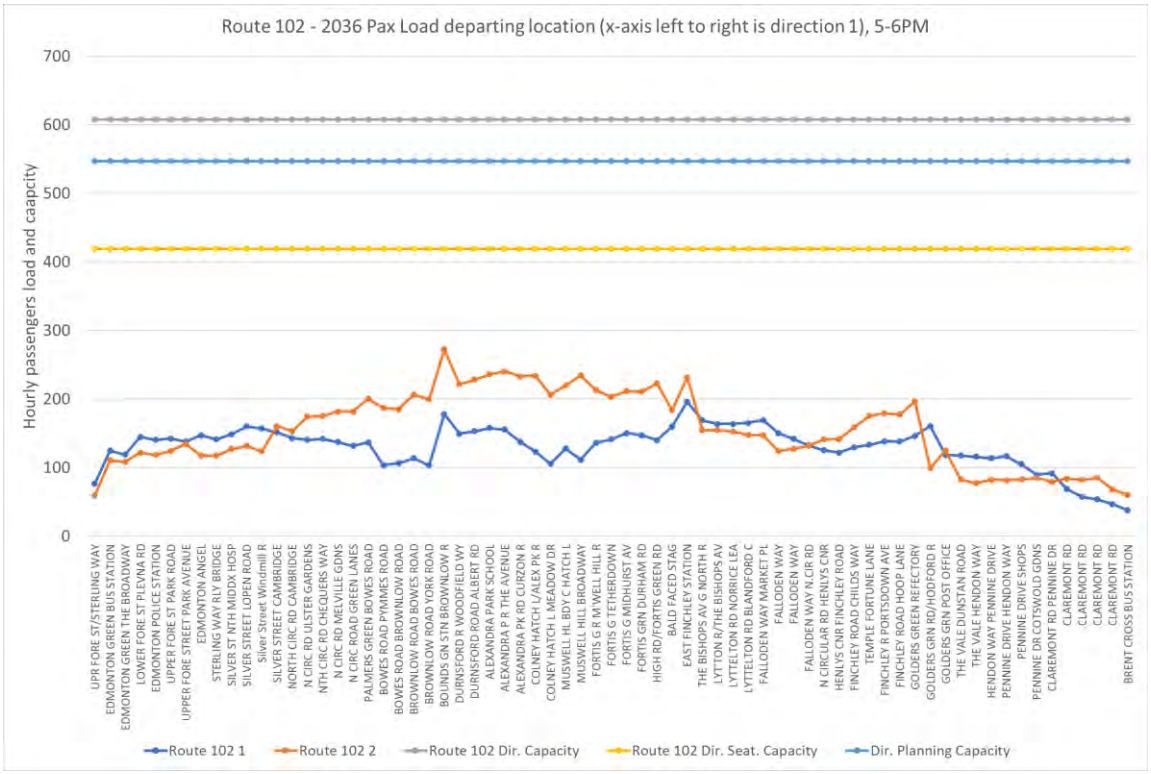

Route 251 - 2036 Pax Load departing location (x-axis left to right is direction 1), 8-9AM
Hourly passengers load and caapcity
350
300
250
200
150
100
50
0
ARNOS GROVE STATION (W/B)
ARNOS GROVE STATION FORECOURT
BOWES ROAD RAVENSCRAIS ROAD
BOWES ROAD BETSTYLE ROAD
BETSTYLE CIRCUS
OAKLEIGH RD S COPPIES GR
BRUNSWICK AVENUE
OAKLEIGH RD N BAWTRY RD
OAKLEIGH RD N RISING SUN
OAKLEIGH RD N/RUSSELL LN
OAKLEIGH R N MYDDELTON P
OAKLEIGH AVENUE
WHETSTONE THE GRIFFIN
TOTTERIDGE & W'STONE STN
TOTTERIDGE LL LONGLAND DR
TOTTERIDGE LANE LINKS DR
TOTTERIDGE PINE GROVE
TOTTERIDGE GREEN
TOTTERIDGE WAR MEMORIAL
TOTTERIDGE VILL GRANGE A
TTRIDGE CMN HORSESHOE LN
ELLERN MEDE FARM
ST EDWARD'S COLLEGE
WEST END COTTAGE
HENDON WOOD LANE
HIGHWOOD HILL RISING SUN
HIGHWOOD HILL LAWRENCE S
Lawrence St The Reddings
LAWRENCE ST SUNNYFIELD
LAWRENCE ST UPHILL ROAD
MILL HILL BOY FLOWER LN
MILL HILL BROADWAY STN
BUNNS LANE LYNDHURST AVE
LYNDHURST AVE BUNNS LANE
EVERSFIELD GS WATLING AV
WATLING A GOLDBEATERS GR
WATLING AVE MONTROSE AVE
WATLING AVE FORTESCUE RD
BURNT OAK STATION
WATLING AV BURNT OAK BDY
BURNT OAK BROADWAY
BURNT OAK BDY NORTH ROAD
EDGWARE GENERAL HOSPITAL
HIGH S EDGWARE CAMROSE A
HIGH STREET EDGWARE
EDGWARE STATION ROAD
EDGWARE BUS STN ALIGHTING PT
EDGWARE BUS STN STATION
Route 251 1
Route 251 2
Route 251 Dir. Capacity
Route 251 Dir. Seat. Capacity
Route 251 Dir. Planning Capacity

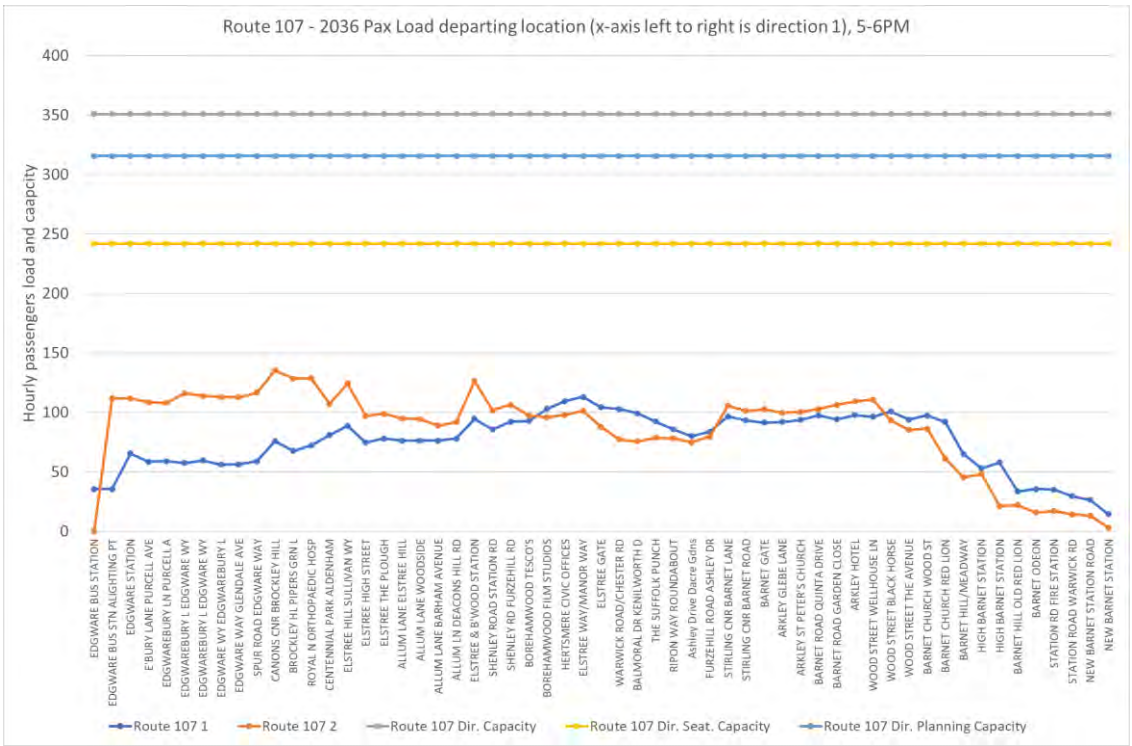

Route 326 - 2036 Pax Load departing location (x-axis left to right is direction 1), 8-9AM
Hourly passengers load and caapcity
300
250
200
150
100
50
0
STAPYLTON RD THE SPIRES
BARNET HIGH STREET
SALISBURY RD THE SPIRES
BARNET POST OFFICE
BARNET CHURCH RED LION
BARNET HILL/MEADWAY
HIGH BARNET STATION
HIGH BARNET STATION
BARNET HILL OLD RED LION
DOLLIS VALLEY WAY STAND
BARNET ODEON
STATION RD FIRE STATION
STATION ROAD WARWICK RD
NEW BARNET STATION ROAD
EAST BARNET SAINSBURY'S
E BARNET R THE ALEXANDRA
EAST BARNET RD BOURN AVE
LONGMORE AV LANCASTER RD
LONGMORE AVE/YORK ROAD
LONGMORE AVENUE MONKS AV
LYONSDOWN RD LONGMORE A
GT NORTH RD LYONSDOWN RD
HIGH RD WALFIELD AVENUE
HIGH RD FRIERN MOUNT DRV
HIGH ROAD BLACK BULL
HIGH ROAD CHANDOS AVENUE
WHETSTONE THE GRIFFIN
TOTTERIDGE & W'STONE STN
SUSSEX RING
NETHER ST DOLLIS RD
FINCHLEY CENTRAL DOLLIS PARK
FINCHLEY CHURCH END
FINCHLEY HENDON LANE
REGENTS PK RD EAST END R
Finchley Gravel Hill
HENDON LA
HENDON LA ARDEN RD
HENDON LA
Hendon Lane Gt North Way
FINCHLEY LA G NORTH WAY
FINCHLEY LA ALEXANDRA RD
THE QUADRANT FINCHLEY LA
HENDON CHURCH END
THE BURROUGHS MIDDX UNIV
HENDON TOWN HALL
THE BURROUGHS WHITE BEAR
HENDON WAR MEMORIAL
HENDON CENTRAL STATION
HENDON WAY GRAHAM ROAD
HENDON WAY BEAUFORT GDNS
BRENT CROSS FLYOVER
PR CHARLES DR SPALDING R
BRENT CROSS SPALDING RD
BRENT CROSS BUS STATION
Route 326 1
Route 326 2
Route 326 Dir. Capacity
Route 326 Dir. Seat. Capacity
Route 326 Dir. Planning Capacity

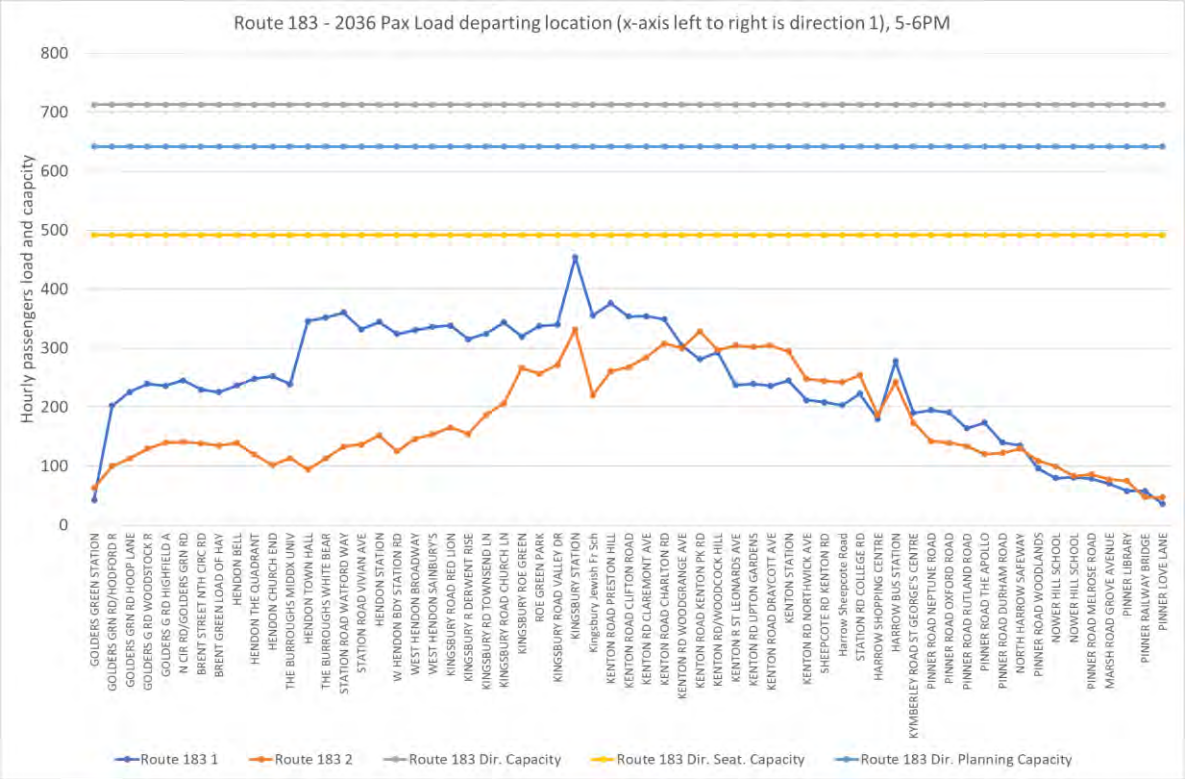

Route 382 - 2036 Pax Load departing location (x-axis left to right is direction 1), 8-9AM
Hourly passengers load and caapcity
250
200
150
100
50
0
SOUTHGATE STN FORECOURT
SOUTHGATE CHASE SIDE
CHASE SIDE CHELMSFORD RD
CHASE SIDE OSIDGE LANE
OSIDGE LANE MANOR DRIVE
HAMPDEN SQUARE
Friars Walk
Parkside Gdns East Walk
CHURCH HL R AVONDALE AVE
BARNET COLLEGE
OSIDGE LANE LIBRARY
Brunswick Park Gardens
Brunswick Crescent
New Southgate Cemetery
Brunswick Pk R Spencer R
B'wick Pk R Betstyle Cir
BOWES ROAD BETSTYLE ROAD
BOWES ROAD RAVENSCRAIG ROAD
ARNOS GROVE STATION FORECOURT
NEW SOUTHGATE STATION
STATION RD BANNERS DRAFT
BEACONSFIELD ROAD
BELLEVUE ROAD
FR BARNET R GLENTHORNE R
FR BARNET RD HARTLAND RD
FRIERN BARNET FRIERN BARNET ROAD
FRIERN BARNET TOWN HALL
Summers Lane Short Way
Summers Lane Sunny Way
Summers Ln Woodgrange Av
Summers Lane Sports Grnd
HIGH RD N F'LEY FALLOW C
HIGH RD N F'LEY N.CIR RD
Squires Ln Fallow Corner
LONG LA SQUIRES LA
LONG LANE VINES AVENUE
LONG LANE WILLOW WAY
BALLARDS LANE LONG LANE
FINCHLEY CENTRAL STATION
NETHER ST DOLLIS RD
Dollis Rd Nether Street
Dollis Road Frith Court
BITTACY HILL/FRITH LANE
MILL HILL EAST STATION
THE RAILWAY ENGINEER
INGLIS WAY BBAY ROAD
MILLBROOK PARK
Route 382 1
Route 382 2
Route 382 Dir. Capacity
Route 382 Dir. Seat. Capacity
Route 382 Dir. Planning Capacity

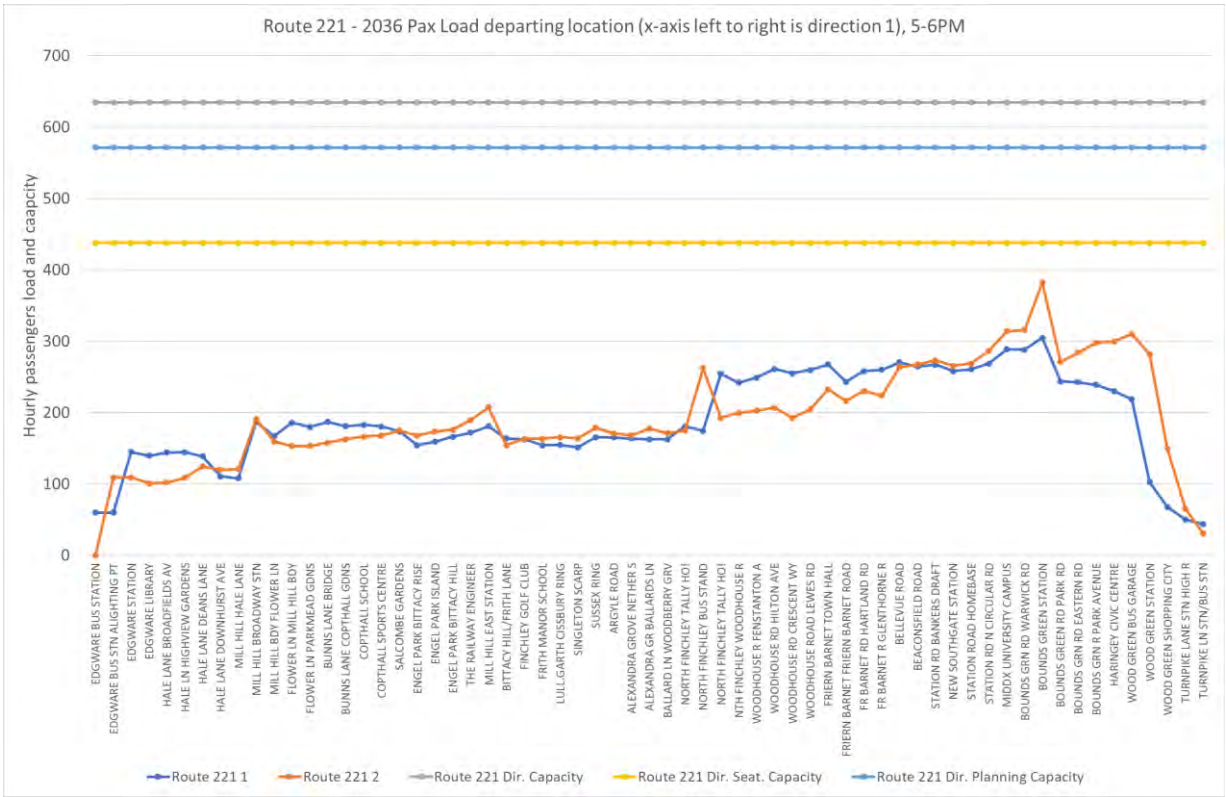
APPENDIX D

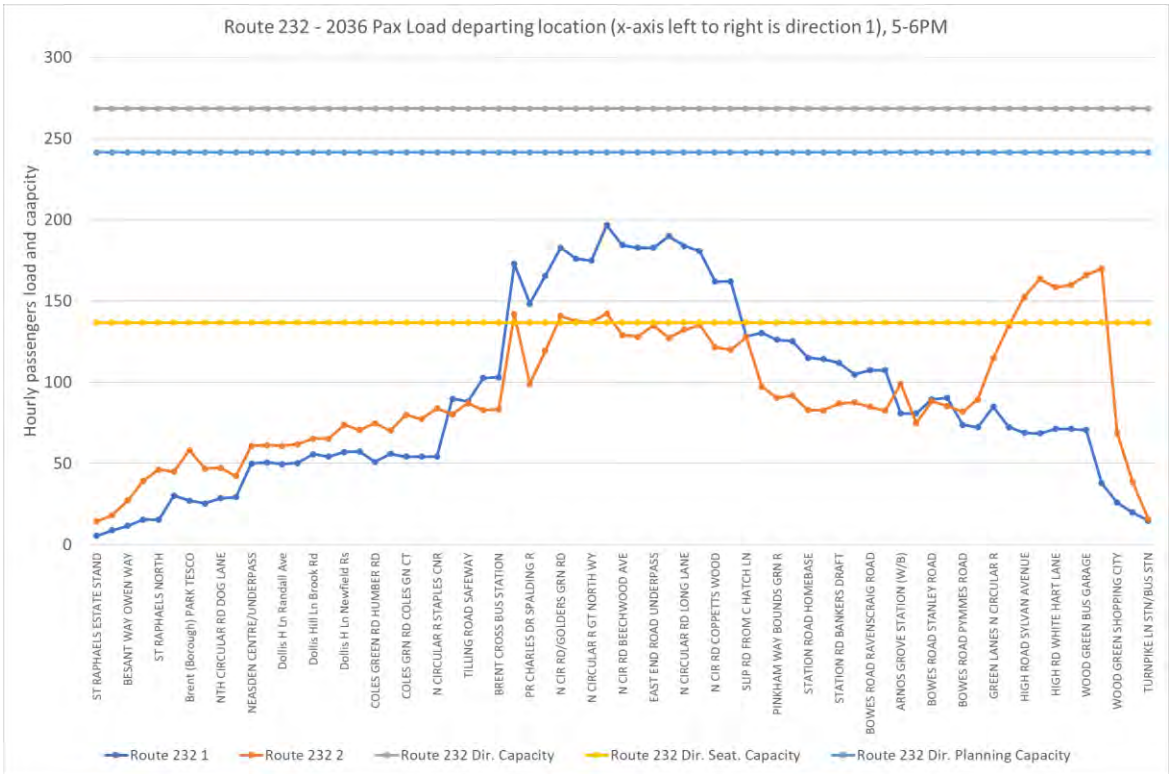
Route Demand loadings by direction of travel vs capacity – 2036 PM Highway Peak hr (+ demand uplift due to services improvement)

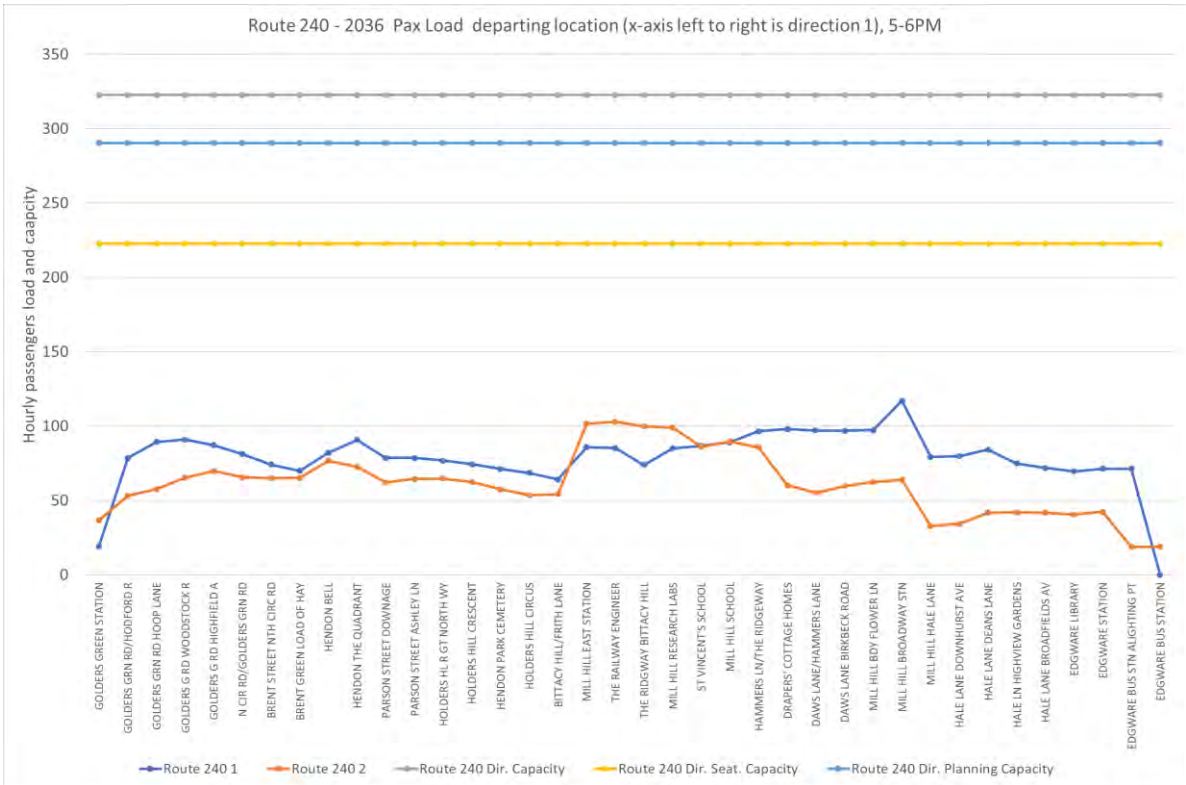

Route 102 - 2036 Pax Load departing location (x-axis left to right is direction 1), 5-6PM
Hourly passengers load and caapcity
700
600
500
400
300
200
100
0
UPR FORE ST/STERLING WAY
EDMONTON GREEN BUS STATION
EDMONTON GREEN THE BROADWAY
LOWER FORE ST PLEVNA RD
EDMONTON POLICE STATION
UPPER FORE ST PARK ROAD
UPPER FORE STREET PARK AVENUE
EDMONTON ANGEL
STERLING WAY RLY BRIDGE
SILVER ST NTH MIDDX HOSP
SILVER STREET LOPEN ROAD
Silver Street Windmill R
SILVER STREET CAMBRIDGE
NORTH CIRC RD CAMBRIDGE
N CIRC RD ULSTER GARDENS
NTH CIRC RD CHEQUERS WAY
N CIRC RD MELVILLE GDNS
N CIRC ROAD GREEN LANES
PALMERS GREEN BOWES ROAD
BOWES ROAD PYMMES ROAD
BOWES ROAD BROWNLOW ROAD
BROWNLOW ROAD BOWES ROAD
BROWNLOW ROAD YORK ROAD
BOUNDS GN STN BROWNLOW R
DURNSFORD R WOODFIELD WY
DURNSFORD ROAD ALBERT RD
ALEXANDRA PARK SCHOOL
ALEXANDRA P R THE AVENUE
ALEXANDRA PK RD CURZON R
COLNEY HATCH L/ALEX PK R
COLNEY HATCH L MEADOW DR
MUSWELL HL BDY C HATCH L
MUSWELL HILL BROADWAY
FORTIS G R M WELL HILL R
FORTIS G TETHERDOWN
FORTIS G MIDHURST AV
FORTIS GRN DURHAM RD
HIGH RD/FORTIS GREEN RD
BALD FACED STAG
EAST FINCHLEY STATION
THE BISHOPS AV G NORTH R
LYTTON R/THE BISHOPS AV
LYTTELTON RD MORRICE LEA
LYTTELTON RD BLANDFORD C
FALLODEN WAY MARKET PL
FALLODEN WAY
FALLODEN WAY
FALLODEN WAY N.CIR RD
N CIRCULAR RD HENLYS CNR
HENLYS CNR FINCHLEY ROAD
FINCHLEY ROAD CHILDS WAY
TEMPLE FORTUNE LANE
FINCHLEY R PORTSDOWN AVE
FINCHLEY ROAD HOOP LANE
GOLDERS GREEN REFECTORY
GOLDERS GRN RD/HODFORD R
GOLDERS GRN POST OFFICE
THE VALE DUNSTAN ROAD
THE VALE HENDON WAY
HENDON WAY PENNINE DRIVE
PENNINE DRIVE HENDON WAY
PENNINE DRIVE SHOPS
PENNINE DR COTSWOLD GDNS
CLAREMONT RD PENNINE DR
CLAREMONT RD
CLAREMONT RD
CLAREMONT RD
CLAREMONT RD
BRENT CROSS BUS STATION
Route 102 1
Route 102 2
Route 102 Dir. Capacity
Route 102 Dir. Seat. Capacity
Dir. Planning Capacity

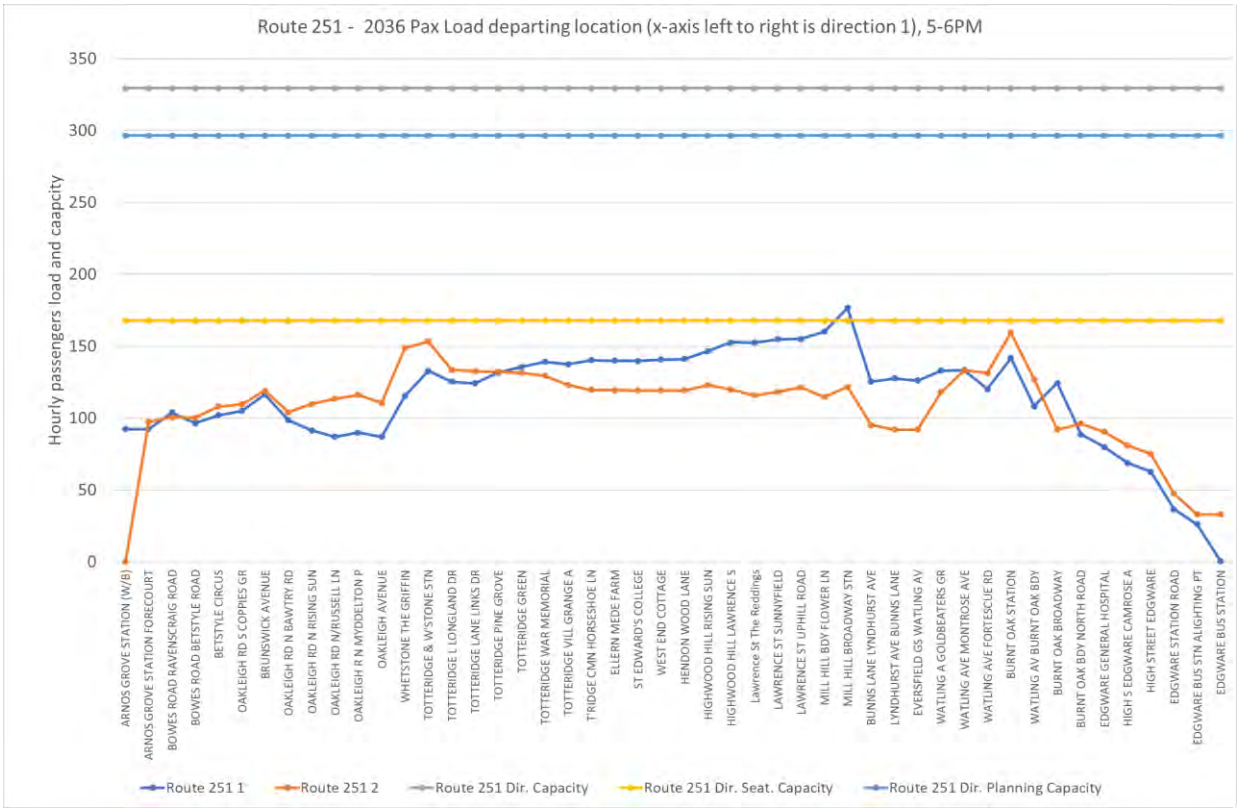

Route 107 - 2036 Pax Load departing location (x-axis left to right is direction 1), 5-6PM
Hourly passengers load and caapcity
400
350
300
250
200
150
100
50
0
EDGWARE BUS STATION
EDGWARE BUS STN ALIGHTING PT
EDGWARE STATION
E BURY LANE PURCELL AVE
EDGWAREBURY LN PURCELL A
EDGWAREBURY L EDGWARE WY
EDGWAREBURY L EDGWARE WY
EDGWARE WY EDGWAREBURY L
EDGWARE WAY GLENDALE AVE
SPUR ROAD EDGWARE WAY
CANONS CNR BROCKLEY HILL
BROCKLEY HL PIPERS GRN L
ROYAL N ORTHOPAEDIC HOSP
CENTENNIAL PARK ALDENHAM
ELSTREE HILL SULLIVAN WY
ELSTREE HIGH STREET
ELSTREE THE PLOUGH
ALLUM LANE ELSTREE HILL
ALLUM LANE WOODSIDE
ALLUM LANE BARHAM AVENUE
ALLUM LN DEACONS HILL RD
ELSTREE & B'WOOD STATION
SHENLEY ROAD STATION RD
SHENLEY RD FURZEHILL RD
BOREHAMWOOD TESCO'S
BOREHAMWOOD FILM STUDIOS
HERTSMERE CIVIC OFFICES
ELSTREE WAY/MANOR WAY
ELSTREE GATE
WARWICK ROAD/CHESTER RD
BALMORAL DR KENILWORTH D
THE SUFFOLK PUNCH
RIPON WAY ROUNDABOUT
Ashley Drive Dacre Gdns
FURZEHILL ROAD ASHLEY DR
STIRLING CNR BARNET LANE
STIRLING CNR BARNET ROAD
BARNET GATE
ARKLEY GLEBE LANE
ARKLEY ST PETER'S CHURCH
BARNET ROAD GARDEN CLOSE
ARKLEY HOTEL
WOOD STREET WELLHOUSE LN
WOOD STREET BLACK HORSE
WOOD STREET THE AVENUE
BARNET CHURCH WOOD ST
BARNET CHURCH RED LION
BARNET HILL/MEADWAY
HIGH BARNET STATION
HIGH BARNET STATION
BARNET HILL OLD RED LION
BARNET ODEON
STATION RD FIRE STATION
STATION ROAD WARWICK RD
NEW BARNET STATION ROAD
NEW BARNET STATION
Route 107 1
Route 107 2
Route 107 Dir. Capacity
Route 107 Dir. Seat. Capacity
Route 107 Dir. Planning Capacity

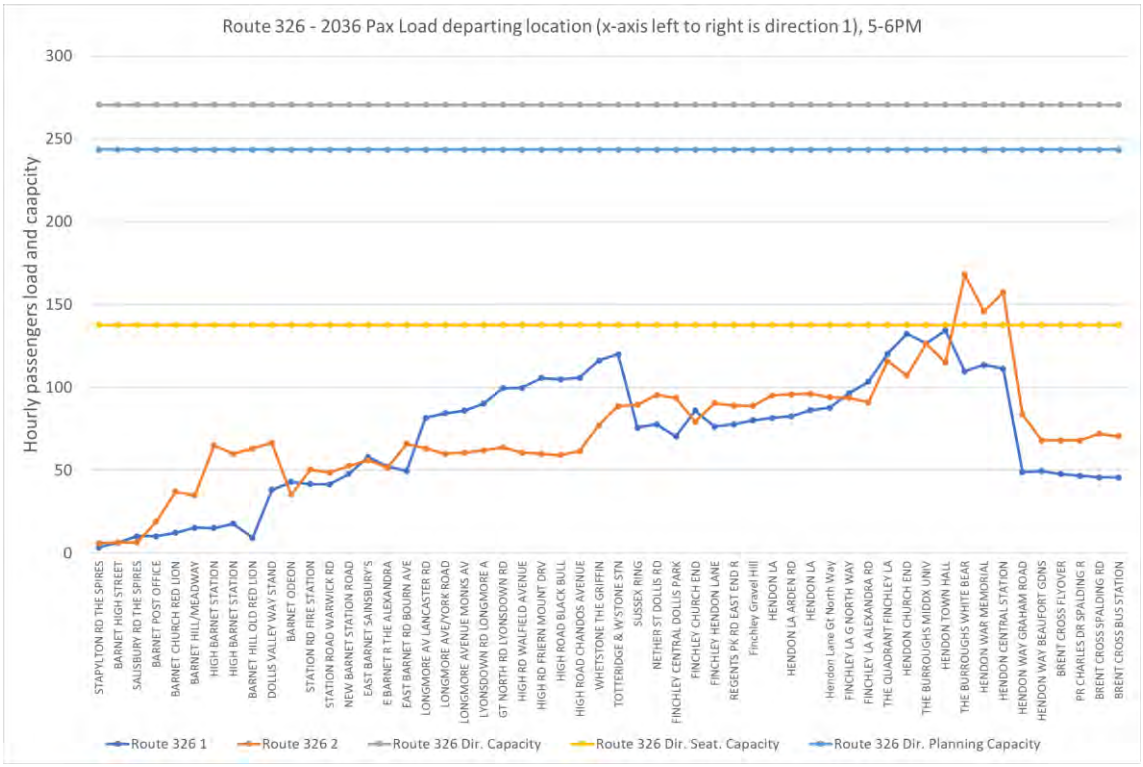

Route 183 - 2036 Pax Load departing location (x-axis left to right is direction 1), 5-6PM
Hourly passengers load and caapcity
800
700
600
500
400
300
200
100
0
GOLDERS GREEN STATION
GOLDERS GRN RD/HOOFORD R
GOLDERS GRN RD HOOP LANE
GOLDERS G RD WOODSTOCK R
GOLDERS G RD HIGHFIELD A
N CIR RD/GOLDERS GRN RD
BRENT STREET NTH CIRC RD
BRENT GREEN LOAD OF HAY
HENDON BELL
HENDON THE QUADRANT
HENDON CHURCH END
THE BURROUGHS MIDDX UNIV
HENDON TOWN HALL
THE BURROUGHS WHITE BEAR
STATION ROAD WATFORD WAY
STATION ROAD VIVIAN AVE
HENDON STATION
W HENDON BDY STATION RD
WEST HENDON BROADWAY
WEST HENDON SAINBURY'S
KINGSBURY ROAD RED LION
KINGSBURY R DERWENT RISE
KINGSBURY RD TOWNSEND LN
KINGSBURY ROAD CHURCH LN
KINGSBURY ROE GREEN
ROE GREEN PARK
KINGSBURY ROAD VALLEY DR
KINGSBURY STATION
Kingsbury Jewish Fr Sch
KENTON ROAD PRESTON HILL
KENTON ROAD CLIFTON ROAD
KENTON RD CLAREMONT AVE
KENTON ROAD CHARLTON RD
KENTON RD WOODGRANGE AVE
KENTON ROAD,KENTON PK RD
KENTON RD/WOODCOCK HILL
KENTON R ST LEONARDS AVE
KENTON RD LIPTON GARDENS
KENTON ROAD DRAYCOTT AVE
KENTON STATION
KENTON RD NORTHWICK AVE
SHEEPCOTE RD KENTON RD
Harrow Sheepcote Road
STATION RD COLLEGE RD
HARROW SHOPPING CENTRE
HARROW BUS STATION
KYMBERLEY ROAD ST GEORGE'S CENTRE
PINNER ROAD NEPTUNE ROAD
PINNER ROAD OXFORD ROAD
PINNER ROAD RUTLAND ROAD
PINNER ROAD THE APOLLO
PINNER ROAD DURHAM ROAD
NORTH HARROW SAFEWAY
PINNER ROAD WOODLANDS
NOWER HILL SCHOOL
NOWER HILL SCHOOL
PINNER ROAD MELROSE ROAD
MARSH ROAD GROVE AVENUE
PINNER LIBRARY
PINNER RAILWAY BRIDGE
PINNER LOVE LANE
Route 183 1
Route 183 2
Route 183 Dir. Capacity
Route 183 Dir. Seat. Capacity
Route 183 Dir. Planning Capacity

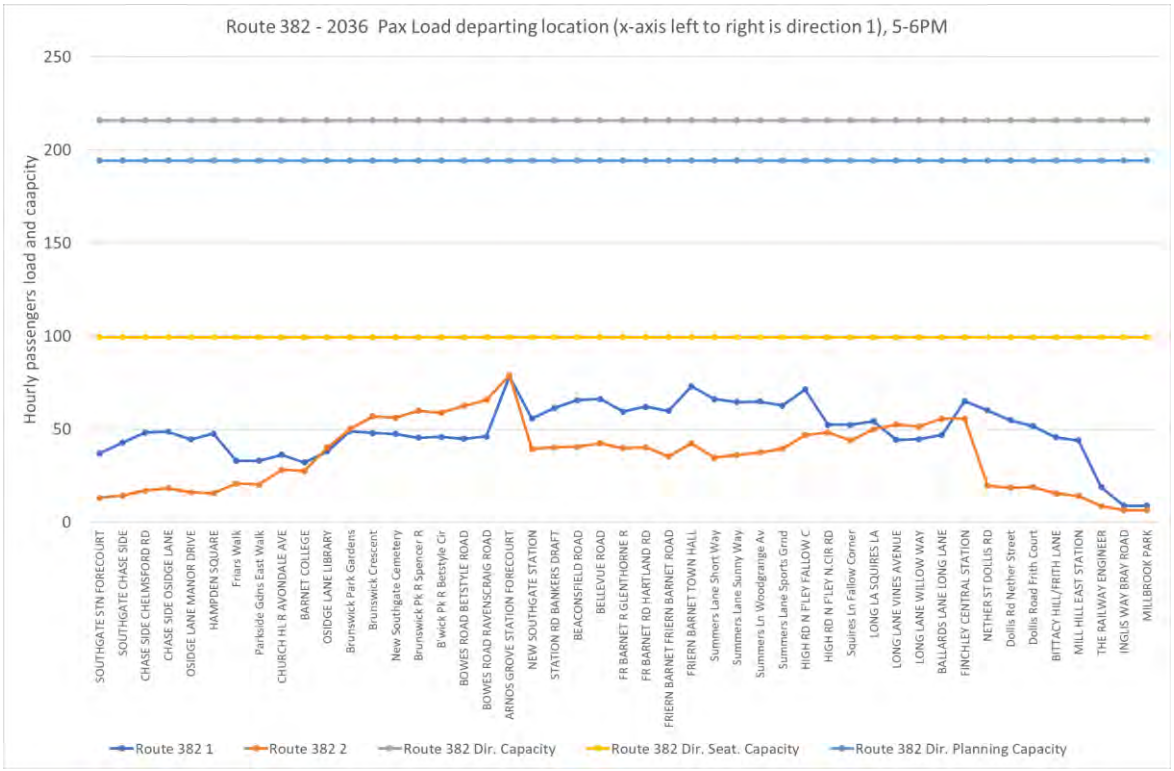

Route 221 - 2036 Pax Load departing location (x-axis left to right is direction 1), 5-6PM
Hourly passengers load and caapcity
700
600
500
400
300
200
100
0
EDGWARE BUS STATION
EDGWARE BUS STN ALIGHTING PT
EDGWARE STATION
EDGWARE LIBRARY
HALE LANE BROADFIELDS AV
HALE LN HIGHVIEW GARDENS
HALE LANE DEANS LANE
HALE LANE DOWNHURST AVE
MILL HILL HALE LANE
MILL HILL BROADWAY STN
MILL HILL BDY FLOWER LN
FLOWER LN MILL HILL BDY
FLOWER LN PARKMEAD GDNS
BUNNS LANE BRIDGE
BUNNS LANE COPTHALL GDNS
COPTHALL SCHOOL
COPTHALL SPORTS CENTRE
SALCOMBE GARDENS
ENGEL PARK BITTACY RISE
ENGEL PARK ISLAND
ENGEL PARK BITTACY HILL
THE RAILWAY ENGINEER
MILL HILL EAST STATION
BITTACY HILL/FRITH LANE
FINCHLEY GOLF CLUB
FRITH MANOR SCHOOL
LULLGARTH CISSBURY RING
SINGLETON SCARP
SUSSEX RING
ARGYLE ROAD
ALEXANDRA GROVE NETHER S
ALEXANDRA GR BALLARDS LN
BALLARD LN WOODBERRY GRV
NORTH FINCHLEY TALLY HOI
NORTH FINCHLEY BUS STAND
NORTH FINCHLEY TALLY HOI
NTH FINCHLEY WOODHOUSE R
WOODHOUSE R FENSTANTON A
WOODHOUSE RD HILTON AVE
WOODHOUSE RD CRESCENT WY
WOODHOUSE ROAD LEWES RD
FRIERN BARNET TOWN HALL
FRIERN BARNET FRIERN BARNET ROAD
FR BARNET RD HARTLAND RD
FR BARNET R GLENTHORNE R
BELLEVUE ROAD
BEACONSFIELD ROAD
STATION RD BANKERS DRAFT
NEW SOUTHGATE STATION
STATION ROAD HOMEBASE
STATION RD N CIRCULAR RD
MIDDX UNIVERSITY CAMPUS
BOUNDS GRN RD WARWICK RD
BOUNDS GREEN STATION
BOUNDS GREEN RD PARK RD
BOUNDS GRN RD EASTERN RD
BOUNDS GRN R PARK AVENUE
HARINGEY CIVIC CENTRE
WOOD GREEN BUS GARAGE
WOOD GREEN STATION
WOOD GREEN SHOPPING CITY
TURNPIKE LANE STN HIGH R
TURNPIKE LN STN/BUS STN
Route 221 1
Route 221 2
Route 221 Dir. Capacity
Route 221 Dir. Seat. Capacity
Route 221 Dir. Planning Capacity


Route 232 - 2036 Pax Load departing location (x-axis left to right is direction 1), 5-6PM
Hourly passengers load and caapcity
300
250
200
150
100
50
0
ST RAPHAELS ESTATE STAND
BESANT WAY OWEN WAY
ST RAPHAELS NORTH
Brent (Borough) PARK TESCO
NTH CIRCULAR RD DOG LANE
NEASDEN CENTRE/UNDERPASS
Dollis H Ln Randall Ave
Dollis Hill Ln Brook Rd
Dollis H Ln Newfield Rs
COLES GREEN RD HUMBER RD
COLES GRN RD COLES GN CT
N CIRCULAR R STAPLES CNR
TILLING ROAD SAFEWAY
BRENT CROSS BUS STATION
PR CHARLES DR SPALDING R
N CIR RD/GOLDERS GRN RD
N CIRCULAR R GT NORTH WY
N CIR RD BEECHWOOD AVE
EAST END ROAD UNDERPASS
N CIRCULAR RD LONG LANE
N CIR RD COPPETTS WOOD
SLIP RD FROM C HATCH LN
PINKHAM WAY BOUNDS GRN R
STATION ROAD HOMEBASE
STATION RD BANKERS DRAFT
BOWES ROAD RAVENSCRAIG ROAD
ARNOS GROVE STATION (W/B)
BOWES ROAD STANLEY ROAD
BOWES ROAD PYMMES ROAD
GREEN LANES N CIRCULAR R
HIGH ROAD SYLVAN AVENUE
HIGH RD WHITE HART LANE
WOOD GREEN BUS GARAGE
WOOD GREEN SHOPPING CITY
TURNPIKE LN STN/BUS STN
Route 232 1
Route 232 2
Route 232 Dir. Capacity
Route 232 Dir. Seat. Capacity
Route 232 Dir. Planning Capacity

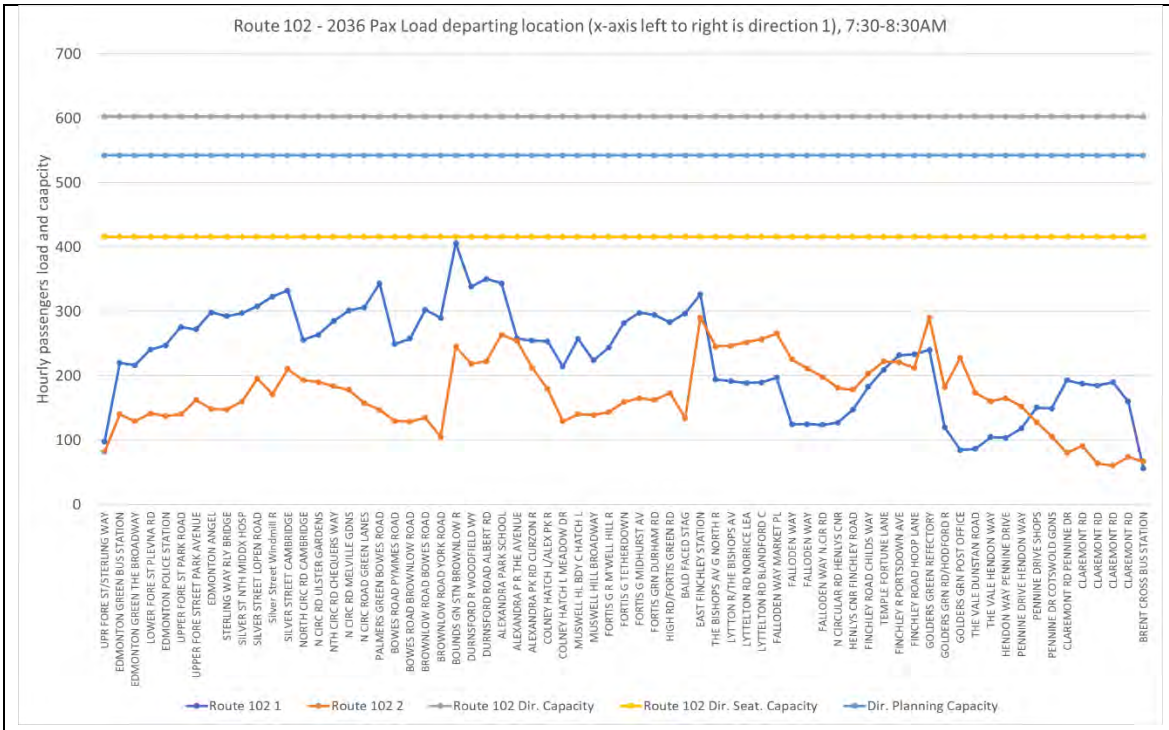

Route 240 - 2036 Pax Load departing location (x-axis left to right is direction 1), 5-6PM
Hourly passengers load and caapcity
350
300
250
200
150
100
50
0
GOLDERS GREEN STATION
GOLDERS GRN RD/HODFORD R
GOLDERS GRN RD HOOP LANE
GOLDERS G RD WOODSTOCK R
GOLDERS G RD HIGHFIELD A
N CIR RD/GOLDERS GRN RD
BRENT STREET NTH CIRC RD
BRENT GREEN LOAD OF HAY
HENDON BELL
HENDON THE QUADRANT
PARSON STREET DOWNAGE
PARSON STREET ASHLEY LN
HOLDERS HL R GT NORTH WY
HOLDERS HILL CRESCENT
HENDON PARK CEMETERY
HOLDERS HILL CIRCUS
BITTACY HILL/FRITH LANE
MILL HILL EAST STATION
THE RAILWAY ENGINEER
THE RIDGWAY BITTACY HILL
MILL HILL RESEARCH LABS
ST VINCENT'S SCHOOL
MILL HILL SCHOOL
HAMMERS LN/THE RIDGEWAY
DRAPERS' COTTAGE HOMES
DAWS LANE/HAMMERS LANE
DAWS LANE BIRKBECK ROAD
MILL HILL BDY FLOWER LN
MILL HILL BROADWAY STN
MILL HILL HALE LANE
HALE LANE DOWNHURST AVE
HALE LANE DEANS LANE
HALE LN HIGHVIEW GARDENS
HALE LANE BROADFIELDS AV
EDGWARE LIBRARY
EDGWARE STATION
EDGWARE BUS STN ALIGHTING PT
EDGWARE BUS STATION
Route 240 1
Route 240 2
Route 240 Dir. Capacity
Route 240 Dir. Seat. Capacity
Route 240 Dir. Planning Capacity

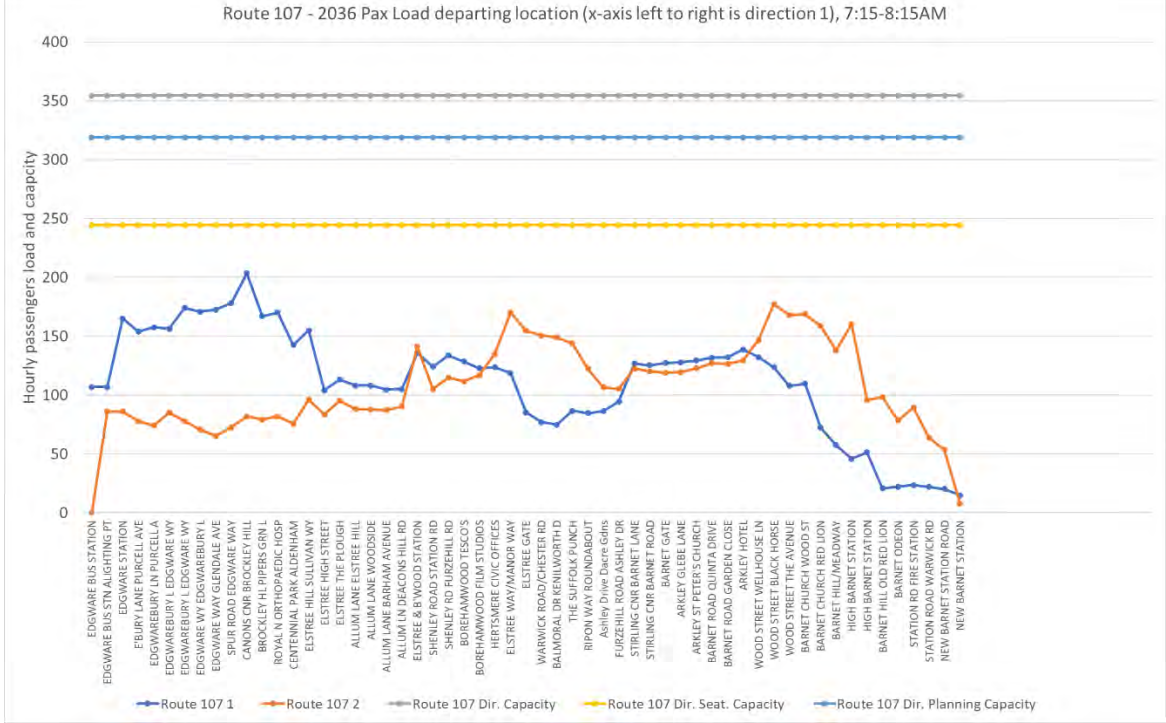

Route 251 - 2036 Pax Load departing location (x-axis left to right is direction 1), 5-6PM
Hourly passengers load and caapcity
350
300
250
200
150
100
50
0
ARNOS GROVE STATION (W/B)
ARNOS GROVE STATION FORECOURT
BOWES ROAD RAVENSCRAIG ROAD
BOWES ROAD BETSTYLE ROAD
BETSTYLE CIRCUS
OAKLEIGH RD S COPPIES GR
BRUNSWICK AVENUE
OAKLEIGH RD N BAWTRY RD
OAKLEIGH RD N RISING SUN
OAKLEIGH RD N/RUSSELL LN
OAKLEIGH R N MYDDELTON P
OAKLEIGH AVENUE
WHETSTONE THE GRIFFIN
TOTTERIDGE & W'STONE STN
TOTTERIDGE L LONGLAND DR
TOTTERIDGE LANE LINKS DR
TOTTERIDGE PINE GROVE
TOTTERIDGE GREEN
TOTTERIDGE WAR MEMORIAL
TOTTERIDGE VILL GRANGE A
TRIDGE CMN HORSESHOE LN
ELLERN MEDE FARM
ST EDWARD'S COLLEGE
WEST END COTTAGE
HENDON WOOD LANE
HIGHWOOD HILL RISING SUN
HIGHWOOD HILL LAWRENCE S
Lawrence St The Roddings
LAWRENCE ST SUNNYFIELD
LAWRENCE ST UPHILL ROAD
MILL HILL BDY FLOWER LN
MILL HILL BROADWAY STN
BUNNS LANE LYNDHURST AVE
LYNDHURST AVE BUNNS LANE
EVERSFIELD GS WATLING AV
WATLING A GOLDBEATERS GR
WATLING AVE MONTROSE AVE
WATLING AVE FORTESCUE RD
BURNT OAK STATION
WATLING AV BURNT OAK BDY
BURNT OAK BROADWAY
BURNT OAK BDY NORTH ROAD
EDGWARE GENERAL HOSPITAL
HIGH S EDGWARE CAMROSE A
HIGH STREET EDGWARE
EDGWARE STATION ROAD
EDGWARE BUS STN ALIGHTING PT
EDGWARE BUS STATION
Route 251 1
Route 251 2
Route 251 Dir. Capacity
Route 251 Dir. Seat. Capacity
Route 251 Dir. Planning Capacity

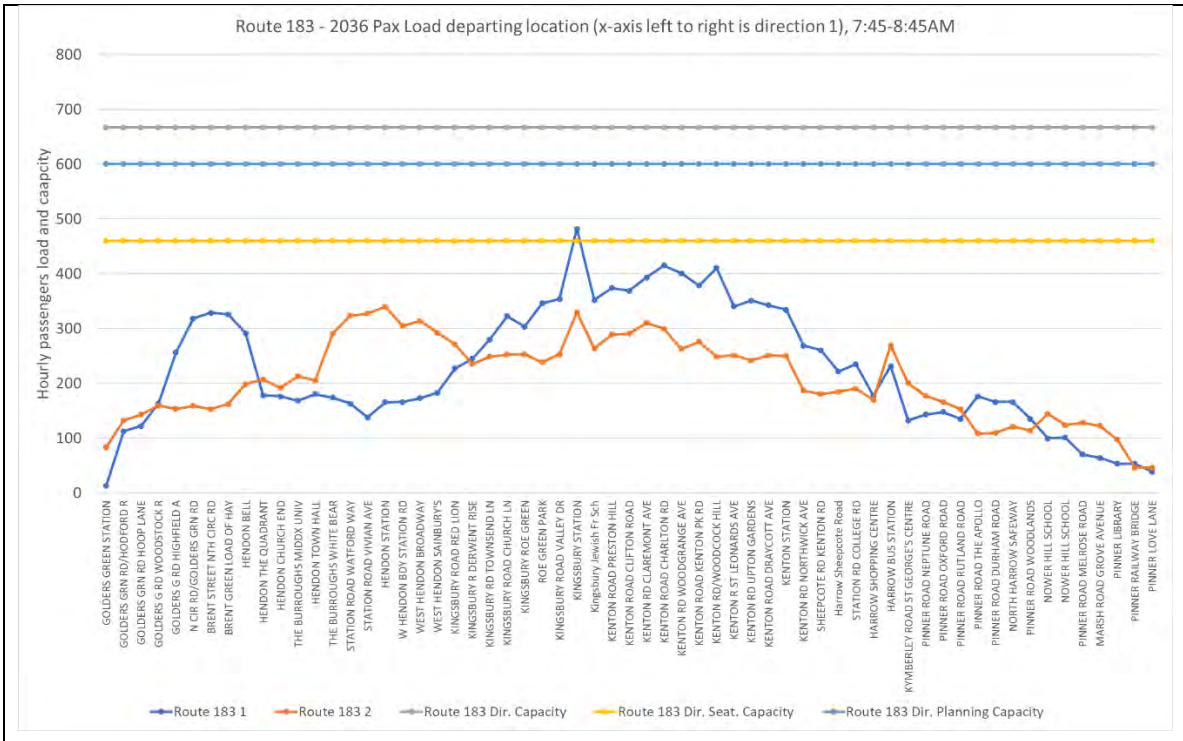

Route 326 - 2036 Pax Load departing location (x-axis left to right is direction 1), 5-6PM
Hourly passengers load and caapcity
300
250
200
150
100
50
0
STAPYLTON RD THE SPIRES
BARNET HIGH STREET
SALISBURY RD THE SPIRES
BARNET POST OFFICE
BARNET CHURCH RED LION
BARNET HILL/MEADWAY
HIGH BARNET STATION
HIGH BARNET STATION
BARNET HILL OLD RED LION
DOLLIS VALLEY WAY STAND
BARNET ODEON
STATION RD FIRE STATION
STATION ROAD WARWICK RD
NEW BARNET STATION ROAD
EAST BARNET SAINSBURY'S
E BARNET R TH E ALEXANDRA
EAST BARNET RD BOURN AVE
LONGMORE AV LANCASTER RD
LONGMORE AVE/YORK ROAD
LONGMORE AVENUE MONKS AV
LYONSDOWN RD LONGMORE A
GT NORTH RD LYONSDOWN RD
HIGH RD WALFIELD AVENUE
HIGH RD FRIERN MOUNT DRV
HIGH ROAD BLACK BULL
HIGH ROAD CHANDOS AVENUE
WHETSTONE THE GRIFFIN
TOTTERIDGE & W'STONE STN
SUSSEX RING
NETHER ST DOLLIS RD
FINCHLEY CENTRAL DOLLIS PARK
FINCHLEY CHURCH END
FINCHLEY HENDON LANE
REGENTS PK RD EAST END R
Finchley Gravel Hill
HENDON LA
HENDON LA ARDEN RD
HENDON LA
Hendon Lane Gt North Way
FINCHLEY LA G NORTH WAY
FINCHLEY LA ALEXANDRA RD
THE QUADRANT FINCHLEY LA
HENDON CHURCH END
THE BURROUGHS MIDDX UNIV
HENDON TOWN HALL
THE BURROUGHS WHITE BEAR
HENDON WAR MEMORIAL
HENDON CENTRAL STATION
HENDON WAY GRAHAM ROAD
HENDON WAY BEAUFORT GDNS
BRENT CROSS FLYOVER
PR CHARLES DR SPALDING R
BRENT CROSS SPALDING RD
BRENT CROSS BUS STATION
Route 326 1
Route 326 2
Route 326 Dir. Capacity
Route 326 Dir. Seat. Capacity
Route 326 Dir. Planning Capacity

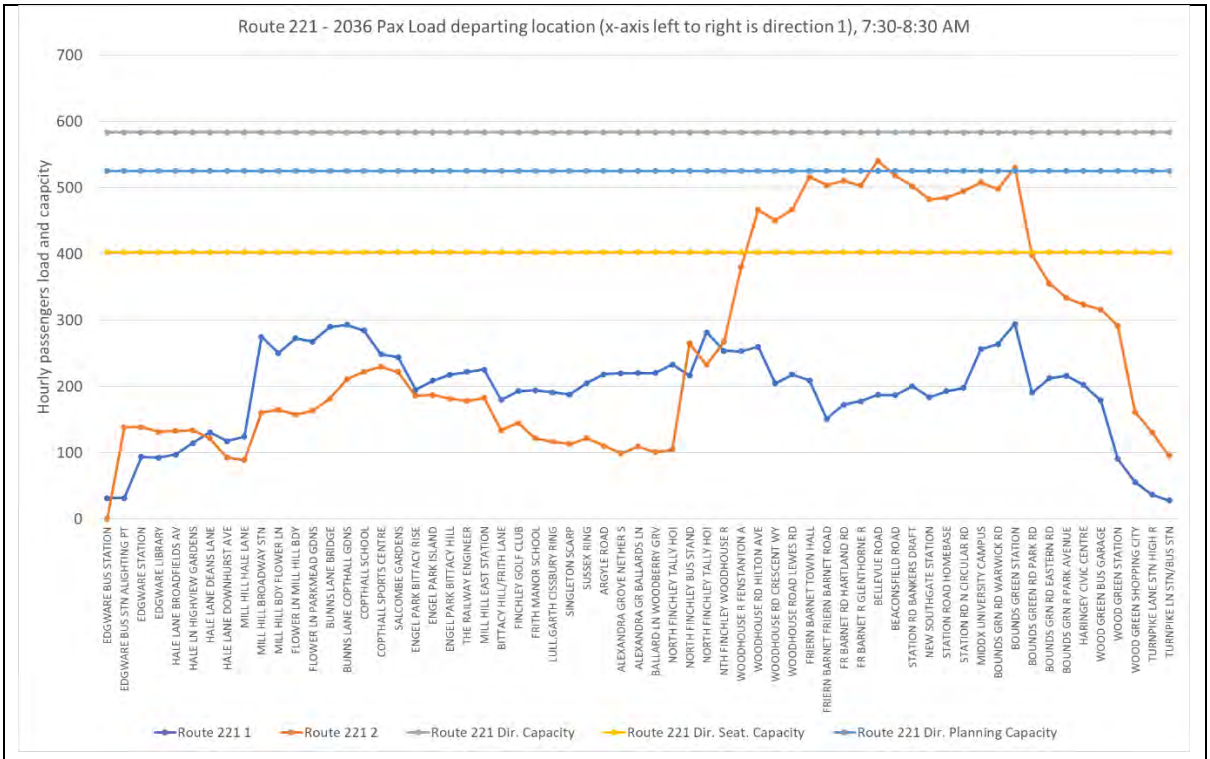

Route 382 - 2036 Pax Load departing location (x-axis left to right is direction 1), 5-6PM
Hourly passengers load and caapcity
250
200
150
100
50
0
SOUTHGATE STN FORECOURT
SOUTHGATE CHASE SIDE
CHASE SIDE CHELMSFORD RD
CHASE SIDE OSIDGE LANE
OSIDGE LANE MANOR DRIVE
HAMPDEN SQUARE
Friars Walk
Parkside Gdns East Walk
CHURCH HL R AVONDALE AVE
BARNET COLLEGE
OSIDGE LANE LIBRARY
Brunswick Park Gardens
Brunswick Crescent
New Southgate Cemetery
Brunswick Pk R Spencer R
B wick Pk R Betstyle Cir
BOWES ROAD BETSTYLE ROAD
BOWES ROAD RAVENSCRAIG ROAD
ARNOS GROVE STATION FORECOURT
NEW SOUTHGATE STATION
STATION RD BANKERS DRAFT
BEACONSFIELD ROAD
BELLEVUE ROAD
FR BARNET R GLENTHORNE R
FR BARNET RD HARTLAND RD
FRIERN BARNET FRIERN BARNET ROAD
FRIERN BARNET TOWN HALL
Summers Lane Short Way
Summers Lane Sunny Way
Summers Ln Woodgrange Av
Summers Lane Sports Grnd
HIGH RD N F'LEY FALLOW C
HIGH RD N F'LEY N.CIR RD
Squires Ln Fallow Corner
LONG LA SQUIRES LA
LONG LANE VINES AVENUE
LONG LANE WILLOW WAY
BALLARDS LANE LONG LANE
FINCHLEY CENTRAL STATION
NETHER ST DOLLIS RD
Dollis Rd Nether Street
Dollis Road Frith Court
BITTACY HILL/FRITH LANE
MILL HILL EAST STATION
THE RAILWAY ENGINEER
INGLIS WAY BRAY ROAD
MILLBROOK PARK
Route 382 1
Route 382 2
Route 382 Dir. Capacity
Route 382 Dir. Seat. Capacity
Route 382 Dir. Planning Capacity

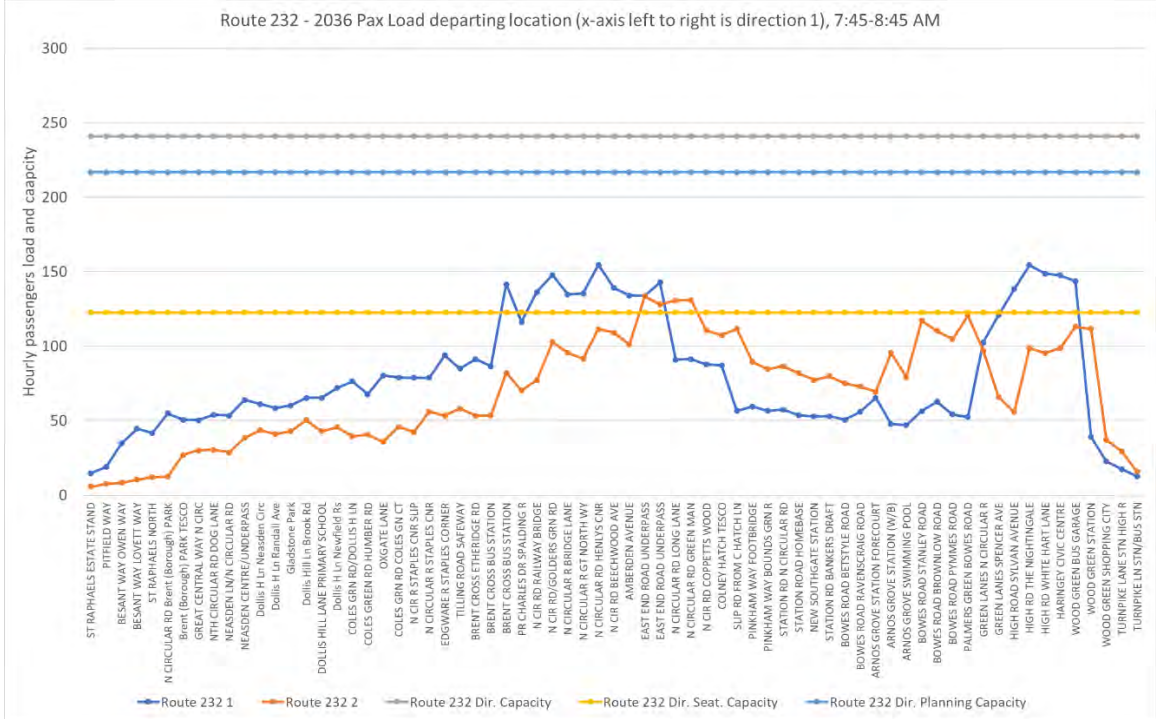
Route Demand loadings by direction of travel vs capacity – 2036 AM Bus Demand Peak hr (+ demand uplift due to services improvement)

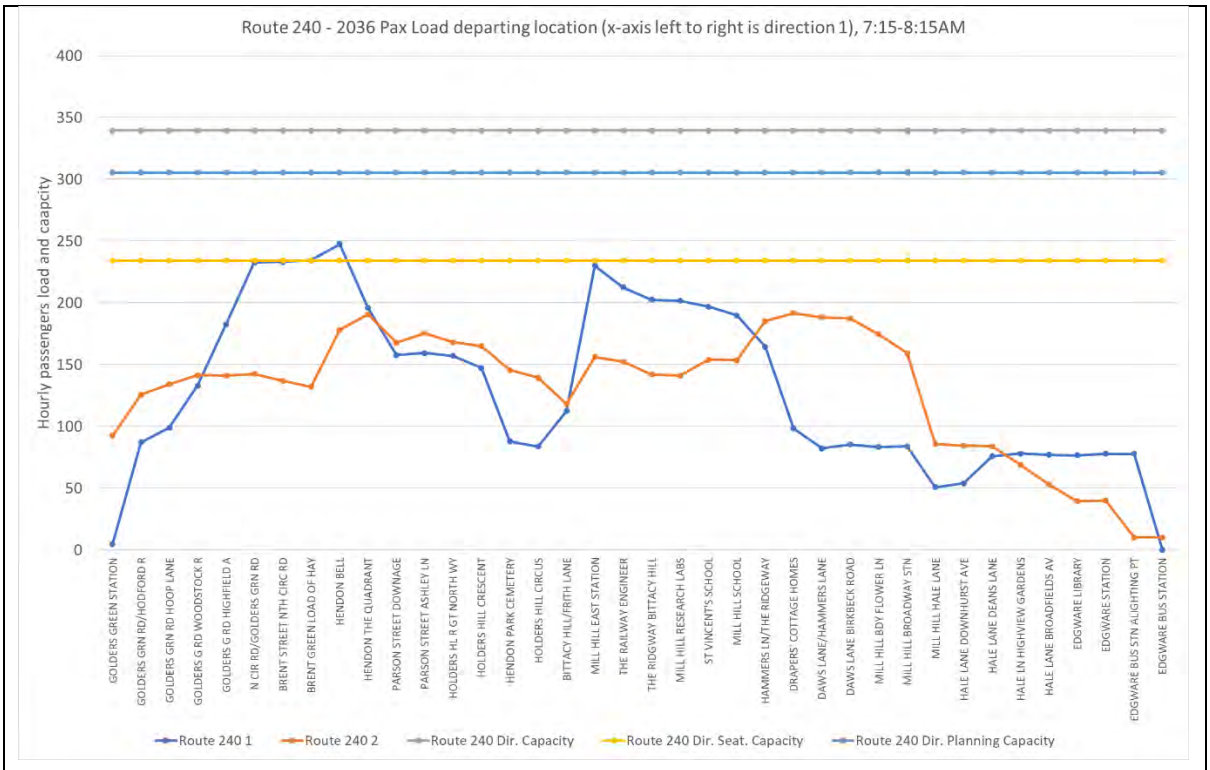


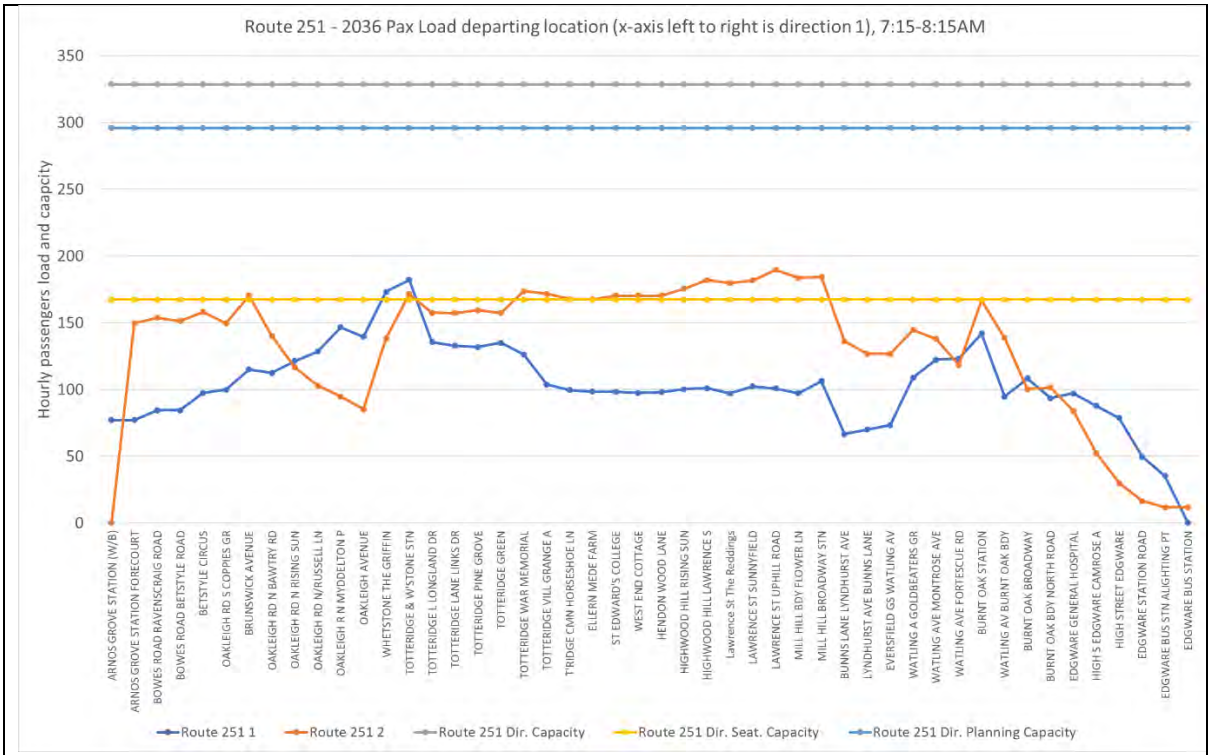

Route 107 - 2036 Pax Load departing location (x-axis left to right is direction 1), 7:15-8:15AM
Hourly passengers load and caapcity
0
50
100
150
200
250
300
350
400
EDGWARE BUS STATION
EDGWARE BUS STN ALIGHTING PT
EDGWARE STATION
E'BURY LANE PURCELL AVE
EDGWAREBURY LN PURCELL A
EDGWAREBURY L EDGWARE WY
EDGWAREBURY L EDGWARE WY
EDGWARE WY EDGWAREBURY L
EDGWARE WAY GLENDALE AVE
SPUR ROAD EDGWARE WAY
CANONS CNR BROCKLEY HILL
BROCKLEY HL PIPERS GRN L
ROYAL N ORTHOPAEDIC HOSP
CENTENNIAL PARK ALDENHAM
ELSTREE HILL SULLIVAN WY
ELSTREE HIGH STREET
ELSTREE THE PLOUGH
ALLUM LANE ELSTREE HILL
ALLUM LANE WOODSIDE
ALLUM LANE BARHAM AVENUE
ALLUM LN DEACONS HILL RD
ELSTREE & B WOOD STATION
SHENLEY RD FURZEHILL RD
BOREHAMWOOD TESCO'S
BOREHAMWOOD FILM STUDIOS
HERTSMERE CIVIC OFFICES
ELSTREE WAY/MANOR WAY
ELSTREE GATE
WARWICK ROAD/CHESTER RD
BALMORAL DR KENILWORTH D
THE SUFFOLK PUNCH
RIPON WAY ROUNDABOUT
Ashley Drive Dacre Gdns
FURZEHILL ROAD ASHLEY DR
STIRLING CNR BARNET LANE
STIRLING CNR BARNET ROAD
BARNET GATE
ARKLEY GLEBE LANE
ARKLEY ST PETER'S CHURCH
BARNET ROAD QUINTA DRIVE
BARNET ROAD GARDEN CLOSE
ARKLEY HOTEL
WOOD STREET WELLHOUSE LN
WOOD STREET BLACK HORSE
WOOD STREET THE AVENUE
BARNET CHURCH WOOD ST
BARNET CHURCH RED LION
BARNET HILL/MEADWAY
HIGH BARNET STATION
HIGH BARNET STATION
BARNET HILL OLD RED LION
BARNET ODEON
STATION RD FIRE STATION
STATION ROAD WARWICK RD
NEW BARNET STATION ROAD
NEW BARNET STATION
Route 107 1
Route 107 2
Route 107 Dir. Capacity
Route 107 Dir. Seat. Capacity
Route 107 Dir. Planning Capacity

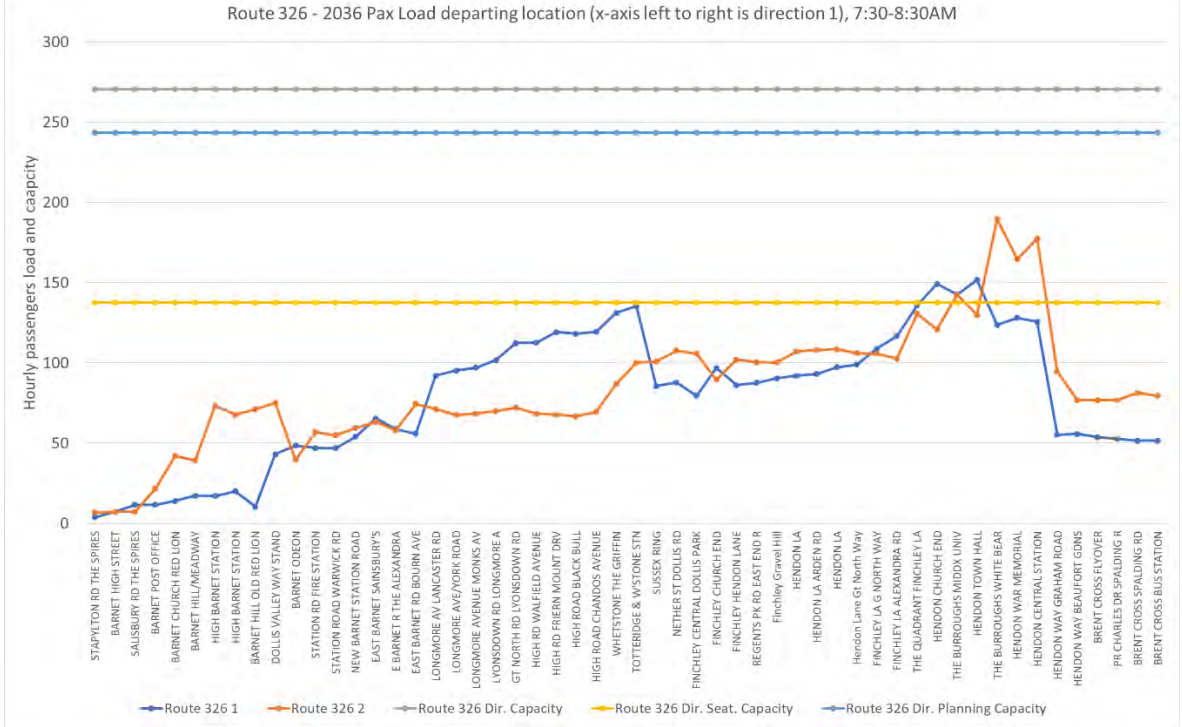

Route 183 - 2036 Pax Load departing location (x-axis left to right is direction 1), 7:45-8:45AM
Hourly passengers load and caapcity
0
100
200
300
400
500
600
700
800
GOLDERS GREEN STATION
GOLDERS GRN RD/HODFORD R
GOLDERS GRN RD HOOP LANE
GOLDERS G RD WOODSTOCK R
GOLDERS G RD HIGHFIELD A
N CIR RD/GOLDERS GRN RD
BRENT STREET NTH CIRC RD
BRENT GREEN LOAD OF HAY
HENDON BELL
HENDON THE QUADRANT
HENDON CHURCH END
THE BURROUGHS MIDDX UNIV
HENDON TOWN HALL
THE BURROUGHS WHITE BEAR
STATION ROAD WATFORD WAY
STATION ROAD VIVIAN AVE
HENDON STATION
W HENDON BDY STATION RD
WEST HENDON BROADWAY
WEST HENDON SAINSBURY'S
KINGSBURY ROAD RED LION
KINGSBURY R DERWENT RISE
KINGSBURY RD TOWNSEND LN
KINGSBURY ROAD CHURCH LN
KINGSBURY ROE GREEN
ROE GREEN PARK
KINGSBURY ROAD VALLEY DR
KINGSBURY STATION
Kingsbury Jewish Fr Sch
KENTON ROAD PRESTON HILL
KENTON ROAD CLIFTON ROAD
KENTON RD CLAREMONT AVE
KENTON ROAD CHARLTON RD
KENTON RD WOODGRANGE AVE
KENTON ROAD KENTON PK RD
KENTON RD/WOODCOCK HILL
KENTON R ST LEONARDS AVE
KENTON RD UPTON GARDENS
KENTON ROAD DRAYCOTT AVE
KENTON STATION
KENTON RD NORTHWICK AVE
SHEEPCOTE RD KENTON RD
Harrow Sheepcote Road
STATION RD COLLEGE RD
HARROW SHOPPING CENTRE
HARROW BUS STATION
KYMBERLEY ROAD ST GEORGE'S CENTRE
PINNER ROAD NEPTUNE ROAD
PINNER ROAD OXFORD ROAD
PINNER ROAD RUTLAND ROAD
PINNER ROAD THE APOLLO
PINNER ROAD DURHAM ROAD
NORTH HARROW SAFEWAY
PINNER ROAD WOODLANDS
NOWER HILL SCHOOL
NOWER HILL SCHOOL
PINNER ROAD MELROSE ROAD
MARSH ROAD GROVE AVENUE
PINNER LIBRARY
PINNER RAILWAY BRIDGE
PINNER LOVE LANE
Route 183 1
Route 183 2
Route 183 Dir. Capacity
Route 183 Dir. Seat. Capacity
Route 183 Dir. Planning Capacity

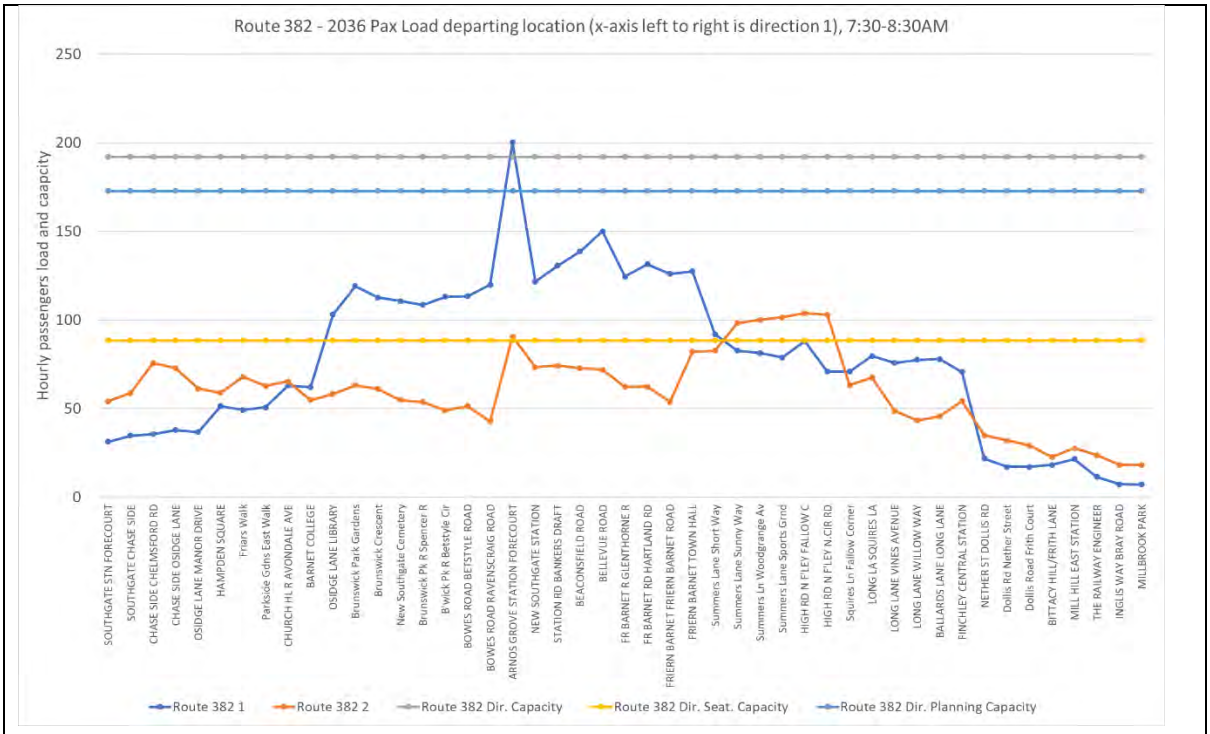

Route 221 - 2036 Pax Load departing location (x-axis left to right is direction 1), 7:30-8:30 AM
Hourly passengers load and caapcity
700
600
500
400
300
200
100
0
EDGWARE BUS STATION
EDGWARE BUS STN ALIGHTING PT
EDGWARE STATION
EDGWARE LIBRARY
HALE LANE BROADFIELDS AV
HALE LN HIGHVIEW GARDENS
HALE LANE DEANS LANE
HALE LANE DOWNHURST AVE
MILL HILL HALE LANE
MILL HILL BROADWAY STN
MILL HILL BOY FLOWER LN
FLOWER LN MILL HILL BDY
FLOWER LN PARKMEAD GDNS
BUNNS LANE BRIDGE
BUNNS LANE COPTHALL GDNS
COPTHALL SCHOOL
COPTHALL SPORTS CENTRE
SALCOMBE GARDENS
ENGEL PARK BITTACY RISE
ENGEL PARK ISLAND
ENGEL PARK BITTACY HILL
THE RAILWAY ENGINEER
MILL HILL EAST STATION
BITTACY HILL/FRITH LANE
FINCHLEY GOLF CLUB
FRITH MANOR SCHOOL
LULLGARTH CISSBURY RING
SINGLETON SCARP
SUSSEX RING
ARGYLE ROAD
ALEXANDRA GROVE NETHER S
ALEXANDRA GR BALLARDS LN
BALLARD LN WOODBERRY GRV
NORTH FINCHLEY TALLY HOI
NORTH FINCHLEY BUS STAND
NORTH FINCHLEY TALLY HOI
NTH FINCHLEY WOODHOUSE R
WOODHOUSE R FENSTANTON A
WOODHOUSE RD HILTON AVE
WOODHOUSE RD CRESCENT WY
WOODHOUSE ROAD LEWES RD
FRIERN BARNET TOWN HALL
FRIERN BARNET FRIERN BARNET ROAD
FR BARNET RD HARTLAND RD
FR BARNET R GLENTHORNE R
BELLEVUE ROAD
BEACONSFIELD ROAD
STATION RD BANKERS DRAFT
NEW SOUTHGATE STATION
STATION ROAD HOMEBASE
STATION RD N CIRCULAR RD
MIDDX UNIVERSITY CAMPUS
BOUNDS GRN RD WARWICK RD
BOUNDS GREEN STATION
BOUNDS GREEN RD PARK RD
BOUNDS GRN RD EASTERN RD
BOUNDS GRN R PARK AVENUE
HARINGEY CIVIC CENTRE
WOOD GREEN BUS GARAGE
WOOD GREEN STATION
WOOD GREEN SHOPPING CITY
TURNPIKE LANE STN HIGH R
TURNPIKE LN STN/BUS STN
Route 221 1
Route 221 2
Route 221 Dir. Capacity
Route 221 Dir. Seat. Capacity
Route 221 Dir. Planning Capacity


Route 232 - 2036 Pax Load departing location (x-axis left to right is direction 1), 7:45-8:45 AM
Hourly passengers load and caapcity
300
250
200
150
100
50
0
ST RAPHAELS ESTATE STAND
PITFIELD WAY
BESANT WAY OWEN WAY
BESANT WAY LOVETT WAY
ST RAPHAELS NORTH
N CIRCULAR RD Brent (Borough) PARK
Brent (Borough) PARK TESCO
GREAT CENTRAL WAY N CIRC
NTH CIRCULAR RD DOG LANE
NEASDEN LN/N CIRCULAR RD
NEASDEN CENTRE/UNDERPASS
Dollis H Ln Neasden Circ
Dollis H Ln Randall Ave
Gladstone Park
Dollis Hill Ln Brook Rd
DOLLIS HILL LANE PRIMARY SCHOOL
Dollis H Ln Newfield Rs
COLES GRN RD/DOLLIS H LN
COLES GREEN RD HUMBER RD
OXGATE LANE
COLES GRN RD COLES GN CT
N CIR R STAPLES CNR SLIP
N CIRCULAR R STAPLES CNR
EDGWARE R STAPLES CORNER
TILLING ROAD SAFEWAY
BRENT CROSS ETHERIDGE RD
BRENT CROSS BUS STATION
BRENT CROSS BUS STATION
PR CHARLES DR SPALDING R
N CIR RD RAILWAY BRIDGE
N CIR RD/GOLDERS GRN RD
N CIRCULAR R BRIDGE LANE
N CIRCULAR R GT NORTH WY
N CIRCULAR RD HENLYS CNR
N CIR RD BEECHWOOD AVE
AMBERDEN AVENUE
EAST END ROAD UNDERPASS
EAST END ROAD UNDERPASS
N CIRCULAR RD LONG LANE
N CIRCULAR RD GREEN MAN
N CIR RD COPPETTS WOOD
COLNEY HATCH TESCO
SLIP RD FROM C HATCH LN
PINKHAM WAY FOOTBRIDGE
PINKHAM WAY BOUNDS GRN R
STATION RD N CIRCULAR RD
STATION ROAD HOMEBASE
NEW SOUTHGATE STATION
STATION RD BANKERS DRAFT
BOWES ROAD BETSTYLE ROAD
BOWES ROAD RAVENSCRAG ROAD
ARNOS GROVE STATION FORECOURT
ARNOS GROVE STATION (W/B)
ARNOS GROVE SWIMMING POOL
BOWES ROAD STANLEY ROAD
BOWES ROAD BROWNLOW ROAD
BOWES ROAD PYMMES ROAD
PALMERS GREEN BOWES ROAD
GREEN LANES N CIRCULAR R
GREEN LANES SPENCER AVE
HIGH ROAD SYLVAN AVENUE
HIGH RD THE NIGHTINGALE
HIGH RD WHITE HART LANE
HARINGEY CIVIC CENTRE
WOOD GREEN BUS GARAGE
WOOD GREEN STATION
WOOD GREEN SHOPPING CITY
TURNPIKE LANE STN HIGH R
TURNPIKE LN STN/BUS STN
Route 232 1
Route 232 2
Route 232 Dir. Capacity
Route 232 Dir. Seat. Capacity
Route 232 Dir. Planning Capacity

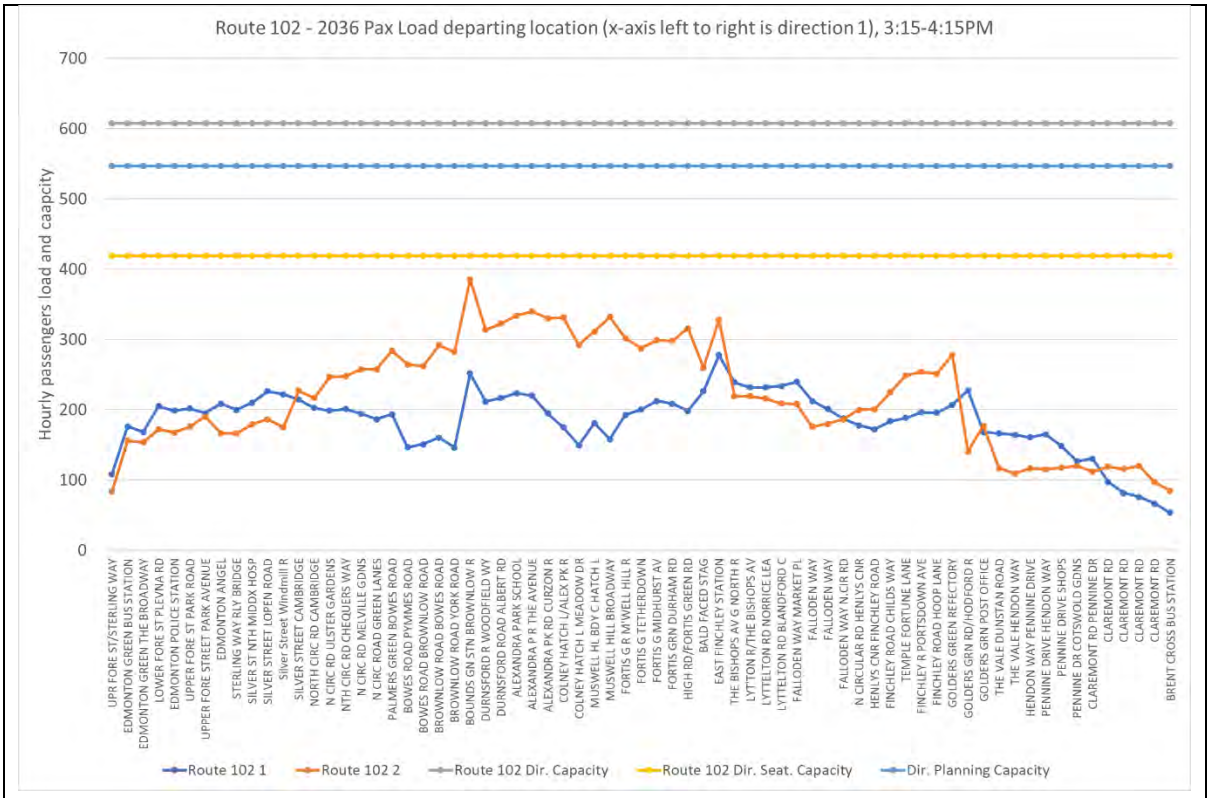

Route 240 - 2036 Pax Load departing location (x-axis left to right is direction 1), 7:15-8:15AM
Hourly passengers load and caapcity
400
350
300
250
200
150
100
50
0
GOLDERS GREEN STATION
GOLDERS GRN RD/HODFORD R
GOLDERS GRN RD HOOP LANE
GOLDERS G RD WOODSTOCK R
GOLDERS G RD HIGHFIELD A
N CIR RD/GOLDERS GRN RD
BRENT STREET NTH CIRC RD
BRENT GREEN LOAD OF HAY
HENDON BELL
HENDON THE QUADRANT
PARSON STREET DOWNAGE
PARSON STREET ASHLEY LN
HOLDERS HL R GT NORTH WY
HOLDERS HILL CRESCENT
HENDON PARK CEMETERY
HOLDERS HILL CIRCUS
BITTACY HILL/FRITH LANE
MILL HILL EAST STATION
THE RAILWAY ENGINEER
THE RIDGWAY BITTACY HILL
MILL HILL RESEARCH LABS
ST VINCENT'S SCHOOL
MILL HILL SCHOOL
HAMMERS LN/THE RIDGEWAY
DRAPERS' COTTAGE HOMES
DAWS LANE/HAMMERS LANE
DAWS LANE BIRKBECK ROAD
MILL HILL BDY FLOWER LN
MILL HILL BROADWAY STN
MILL HILL HALE LANE
HALE LANE DOWNHURST AVE
HALE LANE DEANS LANE
HALE LN HIGHVIEW GARDENS
HALE LANE BROADFIELDS AV
EDGWARE LIBRARY
EDGWARE STATION
EDGWARE BUS STN ALIGHTING PT
EDGWARE BUS STATION
Route 240 1
Route 240 2
Route 240 Dir. Capacity
Route 240 Dir. Seat. Capacity
Route 240 Dir. Planning Capacity

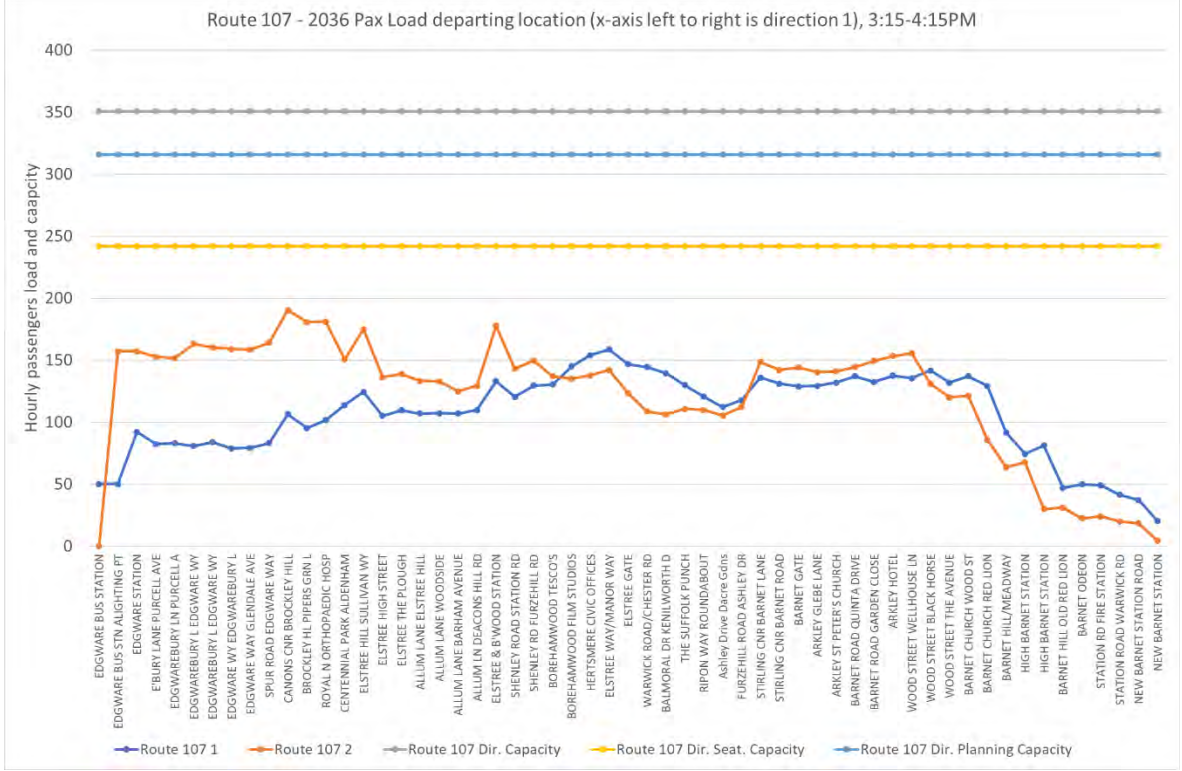

Route 251 - 2036 Pax Load departing location (x-axis left to right is direction 1), 7:15-8:15AM
Hourly passengers load and caapcity
350
300
250
200
150
100
50
0
ARNOS GROVE STATION (W/B)
ARNOS GROVE STATION FORECOURT
BOWES ROAD RAVENSCRAIG ROAD
BOWES ROAD BETSTYLE ROAD
BETSTYLE CIRCUS
OAKLEIGH RD S COPPIES GR
BRUNSWICK AVENUE
OAKLEIGH RD N BAWTRY RD
OAKLEIGH RD N RISING SUN
OAKLEIGH RD N/RUSSELL LN
OAKLEIGH R N MYDDELTON P
OAKLEIGH AVENUE
WHETSTONE THE GRIFFIN
TOTTERIDGE & W'STONE STN
TOTTERIDGE L LONGLAND DR
TOTTERIDGE LANE LINKS DR
TOTTERIDGE PINE GROVE
TOTTERIDGE GREEN
TOTTERIDGE WAR MEMORIAL
TOTTERIDGE VILL GRANGE A
TTRIDGE CMN HORSESHOE LN
ELLERN MEDE FARM
ST EDWARD'S COLLEGE
WEST END COTTAGE
HENDON WOOD LANE
HIGHWOOD HILL RISING SUN
HIGHWOOD HILL LAWRENCE S
Lawrence St The Reddings
LAWRENCE ST SUNNYFIELD
LAWRENCE ST UPHILL ROAD
MILL HILL BDY FLOWER LN
MILL HILL BROADWAY STN
BUNNS LANE LYNDHURST AVE
LYNDHURST AVE BUNNS LANE
EVERSFIELD GS WATLING AV
WATLING A GOLDBEATERS GR
WATLING AVE MONTROSE AVE
WATLING AVE FORTESCUE RD
BURNT OAK STATION
WATLING AV BURNT OAK BDY
BURNT OAK BROADWAY
BURNT OAK BDY NORTH ROAD
EDGWARE GENERAL HOSPITAL
HIGH S EDGWARE CAMROSE A
HIGH STREET EDGWARE
EDGWARE STATION ROAD
EDGWARE BUS STN ALIGHTING PT
EDGWARE BUS STATION
Route 251 1
Route 251 2
Route 251 Dir. Capacity
Route 251 Dir. Seat. Capacity
Route 251 Dir. Planning Capacity

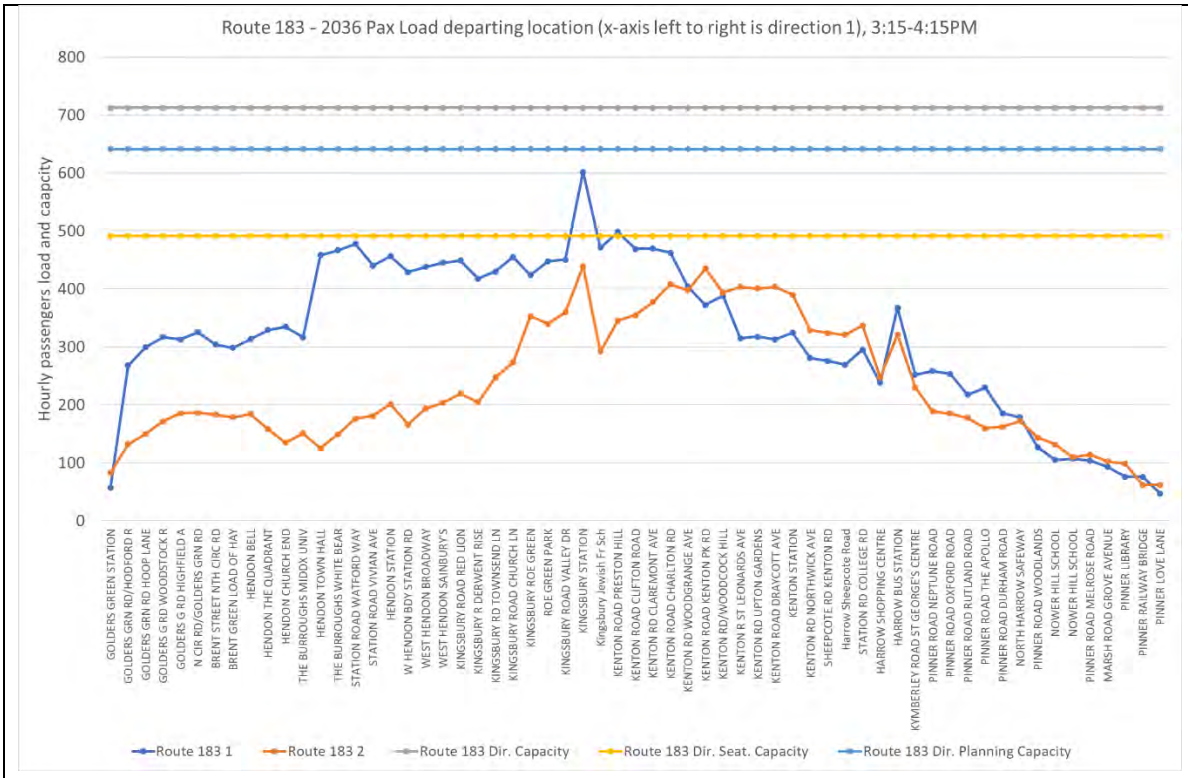

Route 326 - 2036 Pax Load departing location (x-axis left to right is direction 1), 7:30-8:30AM
Hourly passengers load and caapcity
300
250
200
150
100
50
0
STAPYLTON RD THE SPIRES
BARNET HIGH STREET
SAUSBURY RD THE SPIRES
BARNET POST OFFICE
BARNET CHURCH RED LION
BARNET HILL/MEADWAY
HIGH BARNET STATION
HIGH BARNET STATION
BARNET HILL OLD RED LION
DOLLIS VALLEY WAY STAND
BARNET ODEON
STATION RD FIRE STATION
STATION ROAD WARWICK RD
NEW BARNET STATION ROAD
EAST BARNET SAINSBURY'S
E BARNET R THE ALEXANDRA
EAST BARNET RD BOURN AVE
LONGMORE AV LANCASTER RD
LONGMORE AVE/YORK ROAD
LONGMORE AVENUE MONKS AV
LYONSDOWN RD LONGMORE A
GT NORTH RD LYONSDOWN RD
HIGH RD WALFIELD AVENUE
HIGH RD FRIERN MOUNT DRV
HIGH ROAD BLACK BULL
HIGH ROAD CHANDOS AVENUE
WHETSTONE THE GRIFFIN
TOTTERIDGE & W'STONE STN
SUSSEX RING
NETHER ST DOLLIS RD
FINCHLEY CENTRAL DOLLIS PARK
FINCHLEY CHURCH END
FINCHLEY HENDON LANE
REGENTS PK RD EAST END R
Finchley Gravel Hill
HENDON LA
HENDON LA ARDEN RD
HENDON LA
Hendon Lane Gt North Way
FINCHLEY LA G NORTH WAY
FINCHLEY LA ALEXANDRA RD
THE QUADRANT FINCHLEY LA
HENDON CHURCH END
THE BURROUGHS MIDDX UNIV
HENDON TOWN HALL
THE BURROUGHS WHITE BEAR
HENDON WAR MEMORIAL
HENDON CENTRAL STATION
HENDON WAY GRAHAM ROAD
HENDON WAY BEAUFORT GDNS
BRENT CROSS FLYOVER
PR CHARLES DR SPALDING R
BRENT CROSS SPALDING RD
BRENT CROSS BUS STATION
Route 326 1
Route 326 2
Route 326 Dir. Capacity
Route 326 Dir. Seat. Capacity
Route 326 Dir. Planning Capacity

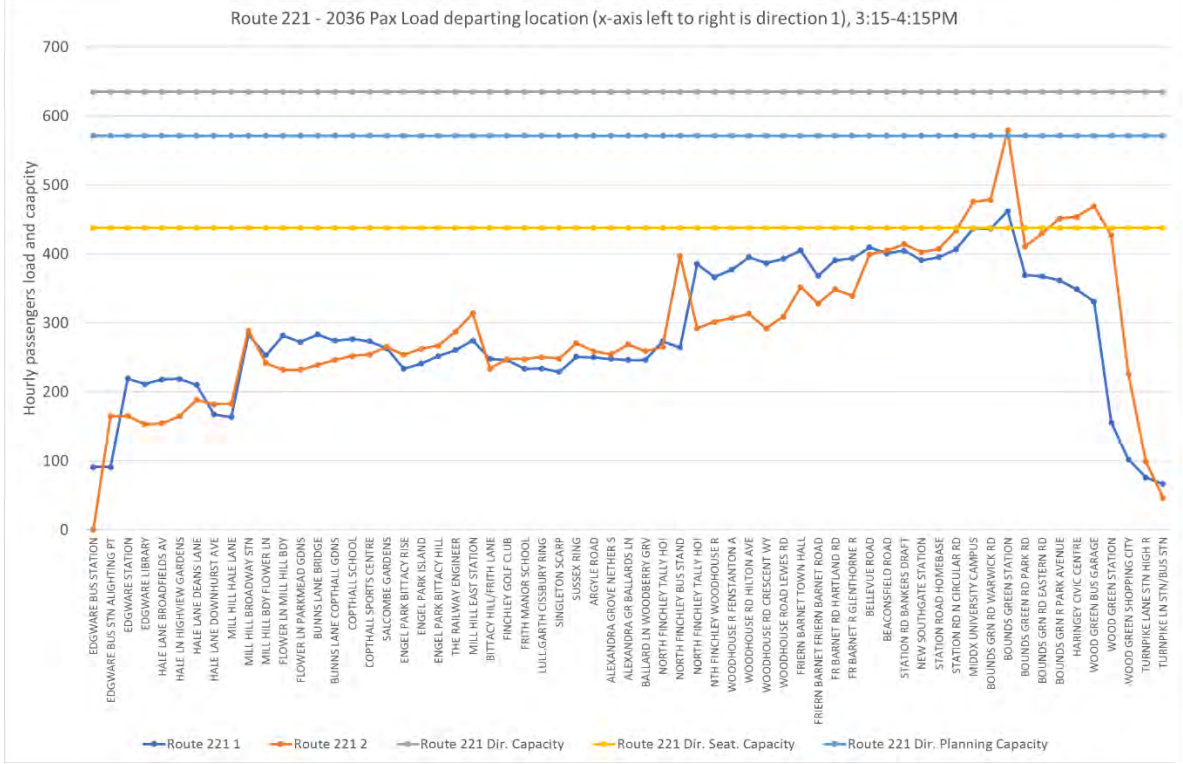

Route 382 - 2036 Pax Load departing location (x-axis left to right is direction 1), 7:30-8:30AM
Hourly passengers load and caapcity
250
200
150
100
50
0
SOUTHGATE STN FORECOURT
SOUTHGATE CHASE SIDE
CHASE SIDE CHELMSFORD RD
CHASE SIDE OSIDGE LANE
OSIDGE LANE MANOR DRIVE
HAMPDEN SQUARE
Friars Walk
Parkside Gdns East Walk
CHURCH HL R AVONDALE AVE
BARNET COLLEGE
OSIDGE LANE LIBRARY
Brunswick Park Gardens
Brunswick Crescent
New Southgate Cemetery
Brunswick Pk R Spencer R
B'wick Pk R Betstyle Cir
BOWES ROAD BETSTYLE ROAD
BOWES ROAD RAVENSCRAIG ROAD
ARNOS GROVE STATION FORECOURT
NEW SOUTHGATE STATION
STATION RD BANKERS DRAFT
BEACONSFIELD ROAD
BELLEVUE ROAD
FR BARNET R GLENTHORNE R
FR BARNET RD HARTLAND RD
FRIERN BARNET FRIERN BARNET ROAD
FRIERN BARNET TOWN HALL
Summers Lane Short Way
Summers Lane Sunny Way
Summers Ln Woodgrange Av
Summers Lane Sports Grnd
HIGH RD N FLEY FALLOW C
HIGH RD N FLEY N.CIR RD
Squires Ln Fallow Corner
LONG LA SQUIRES LA
LONG LANE VINES AVENUE
LONG LANE WILLOW WAY
BALLARDS LANE LONG LANE
FINCHLEY CENTRAL STATION
NETHER ST DOLLIS RD
Dollis Rd Nether Street
Dollis Road Frith Court
BITTACY HILL/FRITH LANE
MILL HILL EAST STATION
THE RAILWAY ENGINEER
INGLIS WAY BRAY ROAD
MILLBROOK PARK
Route 382 1
Route 382 2
Route 382 Dir. Capacity
Route 382 Dir. Seat. Capacity
Route 382 Dir. Planning Capacity

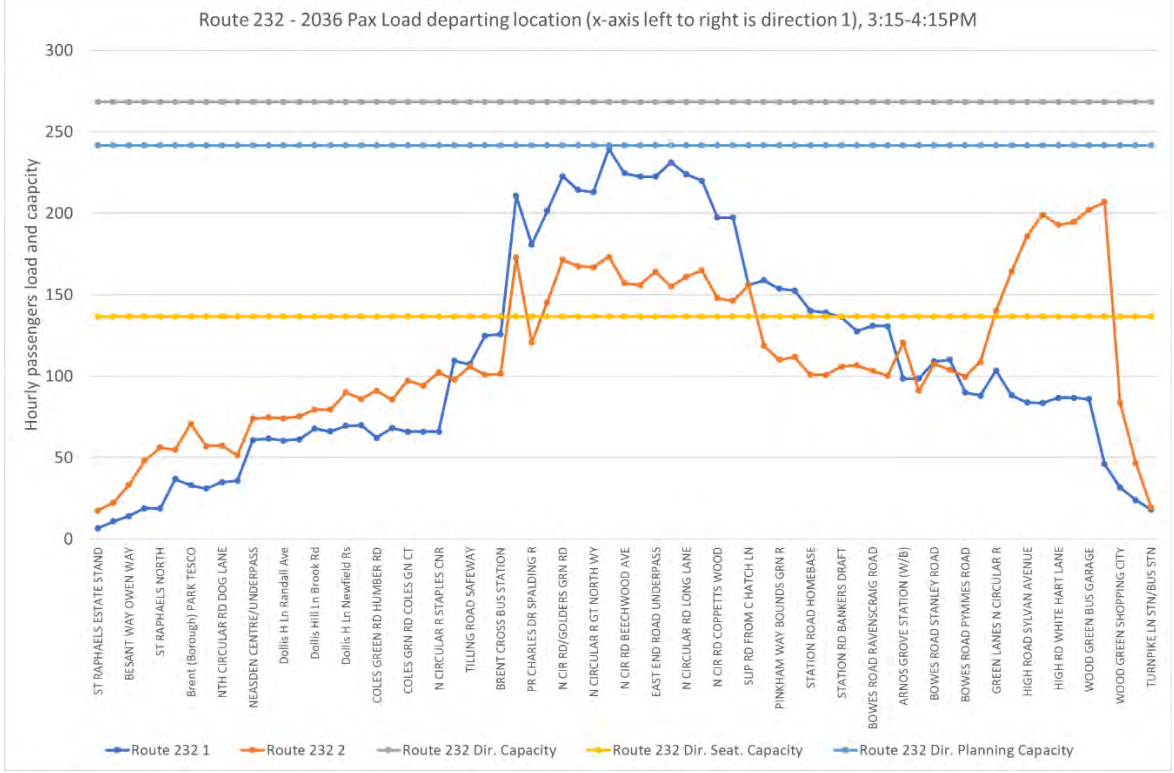
Route Demand loadings by direction of travel vs capacity – 2036 PM Bus Demand Peak hr (+ demand uplift due to services improvement)

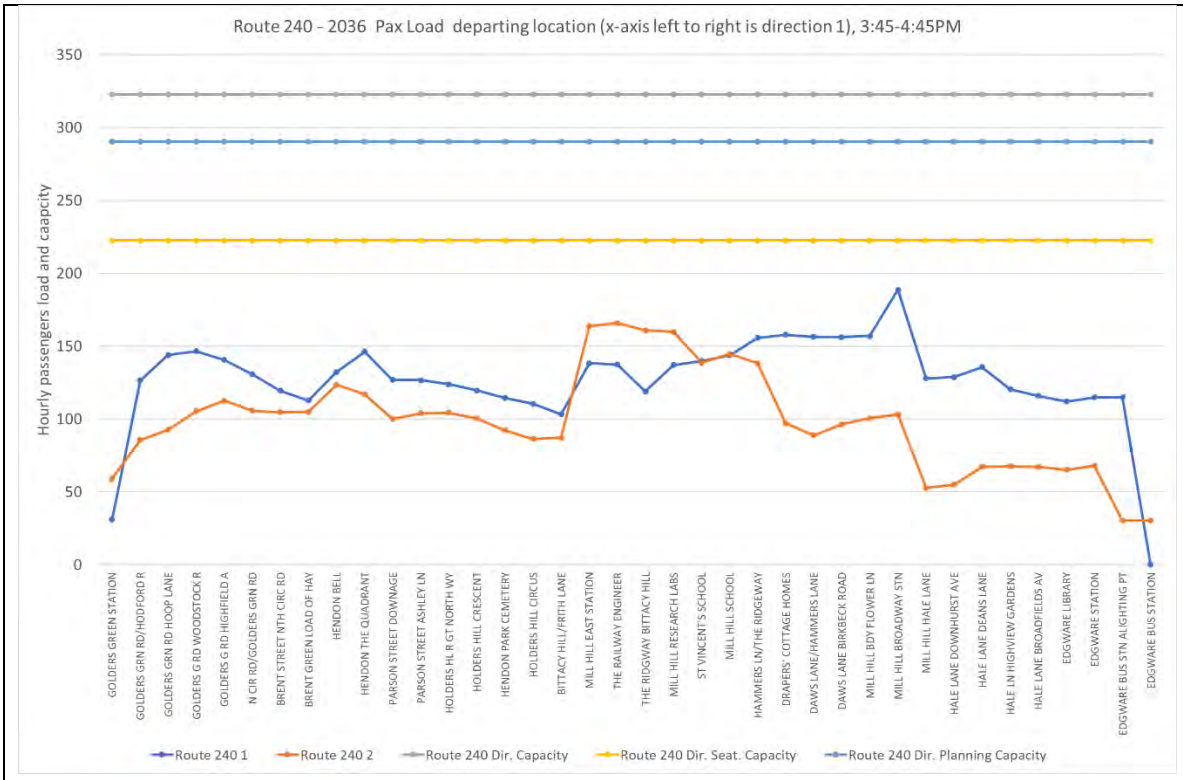


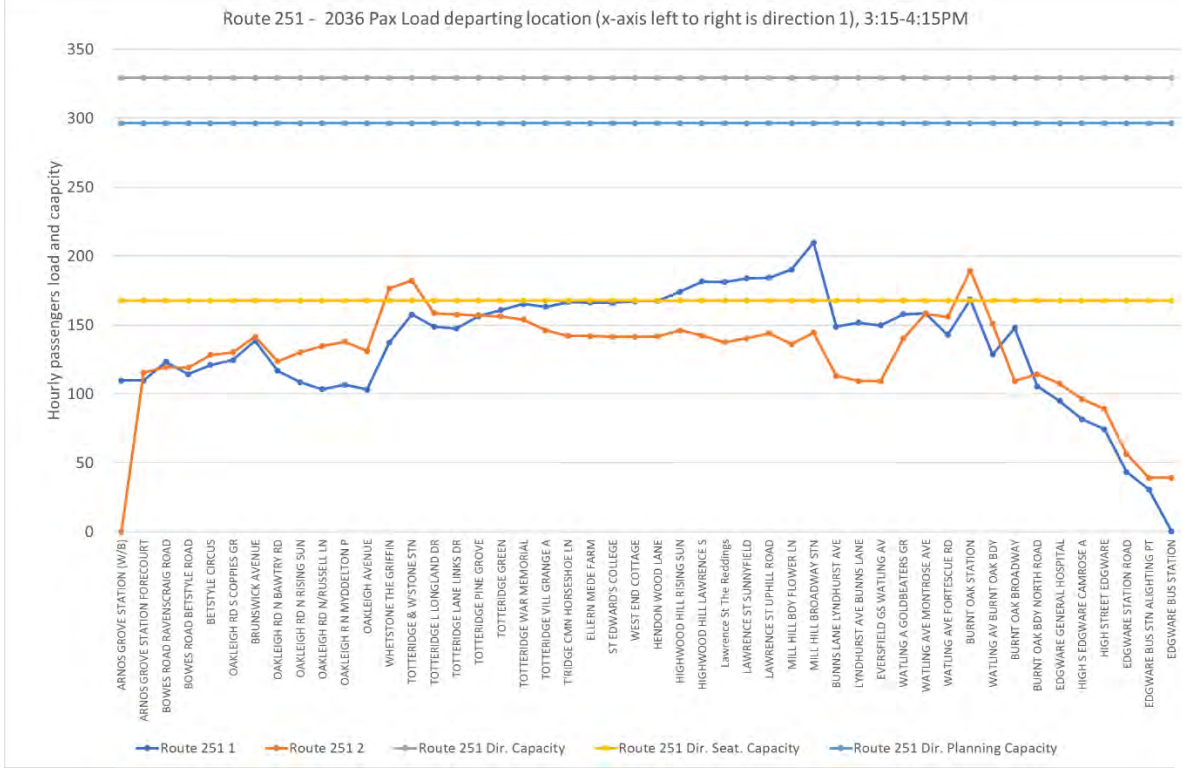

Route 107 - 2036 Pax Load departing location (x-axis left to right is direction 1), 3:15-4:15PM
Hourly passengers load and caapcity
400
350
300
250
200
150
100
50
0
EDGWARE BUS STATION
EDGWARE BUS STN ALIGHTING PT
EDGWARE STATION
E'BURY LANE PURCELL AVE
EDGWAREBURY LN PURCELL A
EDGWAREBURY L EDGWARE WY
EDGWAREBURY L EDGWARE WY
EDGWARE WY EDGWAREBURY L
EDGWARE WAY GLENDALE AVE
SPUR ROAD EDGWARE WAY
CANONS CNR BROCKLEY HILL
BROCKLEY HL PIPERS GRN L
ROYAL N ORTHOPAEDIC HOSP
CENTENNIAL PARK ALDENHAM
ELSTREE HILL SULLIVAN WY
ELSTREE HIGH STREET
ELSTREE THE PLOUGH
ALLUM LANE ELSTREE HILL
ALLUM LANE WOODSIDE
ALLUM LANE BARHAM AVENUE
ALLUM LN DEACONS HILL RD
ELSTREE & B'WOOD STATION
SHENLEY ROAD STATION RD
SHENLEY RD FURZEHILL RD
BOREHAMWOOD TESCO'S
BOREHAMWOOD FILM STUDIOS
HERTSMERE CIVIC OFFICES
ELSTREE WAY/MANOR WAY
ELSTREE GATE
WARWICK ROAD/CHESTER RD
BALMORAL DR KENILWORTH D
THE SUFFOLK PUNCH
RIPON WAY ROUNDABOUT
Ashley Drive Dacre Gdns
FURZEHILL ROAD ASHLEY DR
STIRLING CNR BARNET LANE
STIRLING CNR BARNET ROAD
BARNET GATE
ARKLEY GLEBE LANE
ARKLEY ST PETER'S CHURCH
BARNET ROAD QUINTA DRIVE
BARNET ROAD GARDEN CLOSE
ARKLEY HOTEL
WOOD STREET WELLHOUSE LN
WOOD STREET BLACK HORSE
WOOD STREET THE AVENUE
BARNET CHURCH WOOD ST
BARNET CHURCH RED LION
BARNET HILL/MEADWAY
HIGH BARNET STATION
HIGH BARNET STATION
BARNET HILL OLD RED LION
BARNET ODEON
STATION RD FIRE STATION
STATION ROAD WARWICK RD
NEW BARNET STATION ROAD
NEW BARNET STATION
Route 107 1
Route 107 2
Route 107 Dir. Capacity
Route 107 Dir. Seat. Capacity
Route 107 Dir. Planning Capacity

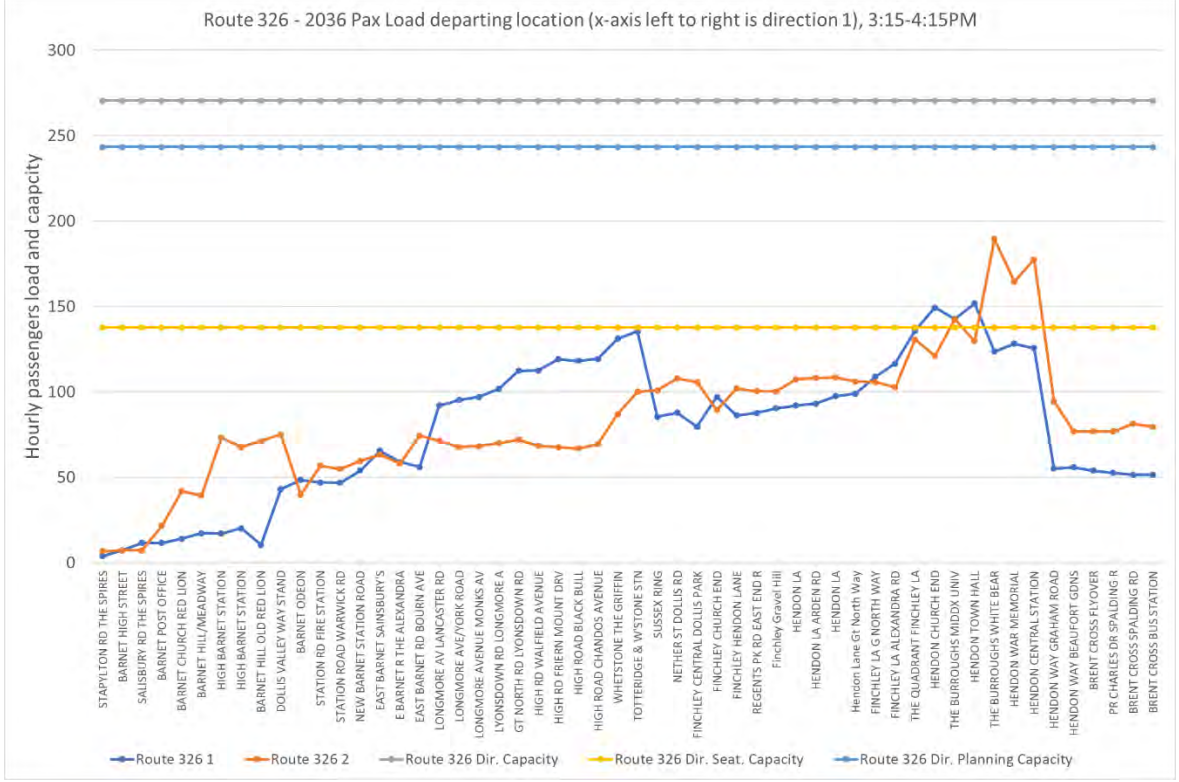

Route 183 - 2036 Pax Load departing location (x-axis left to right is direction 1), 3:15-4:15PM
Hourly passengers load and caapcity
800
700
600
500
400
300
200
100
0
GOLDERS GREEN STATION
GOLDERS GRN RD/HODFORD R
GOLDERS GRN RD HOOP LANE
GOLDERS G RD WOODSTOCK R
GOLDERS G RD HIGHFIELD A
N CIR RD/GOLDERS GRN RD
BRENT STREET NTH CIRC RD
BRENT GREEN LOAD OF HAY
HENDON BELL
HENDON THE QUADRANT
HENDON CHURCH END
THE BURROUGHS MIDDX UNIV
HENDON TOWN HALL
THE BURROUGHS WHITE BEAR
STATION ROAD WATFORD WAY
STATION ROAD VYVIAN AVE
HENDON STATION
W HENDON BDY STATION RD
WEST HENDON BROADWAY
WEST HENDON SAINBURYS
KINGSBURY ROAD RED LION
KINGSBURY R DERWENT RISE
KINGSBURY RD TOWNSEND LN
KINGSBURY ROAD CHURCH LN
KINGSBURY ROE GREEN
ROE GREEN PARK
KINGSBURY ROAD VALLEY DR
KINGSBURY STATION
Kingsbury Jewish Fr Sch
KENTON ROAD PRESTON HILL
KENTON ROAD CLIFTON ROAD
KENTON RD CLAREMONT AVE
KENTON ROAD CHARLTON RD
KENTON RD WOODGRANGE AVE
KENTON ROAD KENTON PK RD
KENTON RD/WOODCOCK HILL
KENTON R ST LEONARDS AVE
KENTON RD UPTON GARDENS
KENTON ROAD DRAYCOTT AVE
KENTON STATION
KENTON RD NORTHWICK AVE
SHEEPCOTE RD KENTON RD
Harrow Sheepcote Road
STATION RD COLLEGE RD
HARROW SHOPPING CENTRE
HARROW BUS STATION
KYMBERLEY ROAD ST GEORGES CENTRE
PINNER ROAD NEPTUNE ROAD
PINNER ROAD OXFORD ROAD
PINNER ROAD RUTLAND ROAD
PINNER ROAD THE APOLLO
PINNER ROAD DURHAM ROAD
NORTH HARROW SAFEWAY
PINNER ROAD WOODLANDS
NOWER HILL SCHOOL
PINNER ROAD MELROSE ROAD
MARSH ROAD GROVE AVENUE
PINNER LIBRARY
PINNER RAILWAY BRIDGE
PINNER LOVE LANE
Route 183 1
Route 183 2
Route 183 Dir. Capacity
Route 183 Dir. Seat. Capacity
Route 183 Dir. Planning Capacity

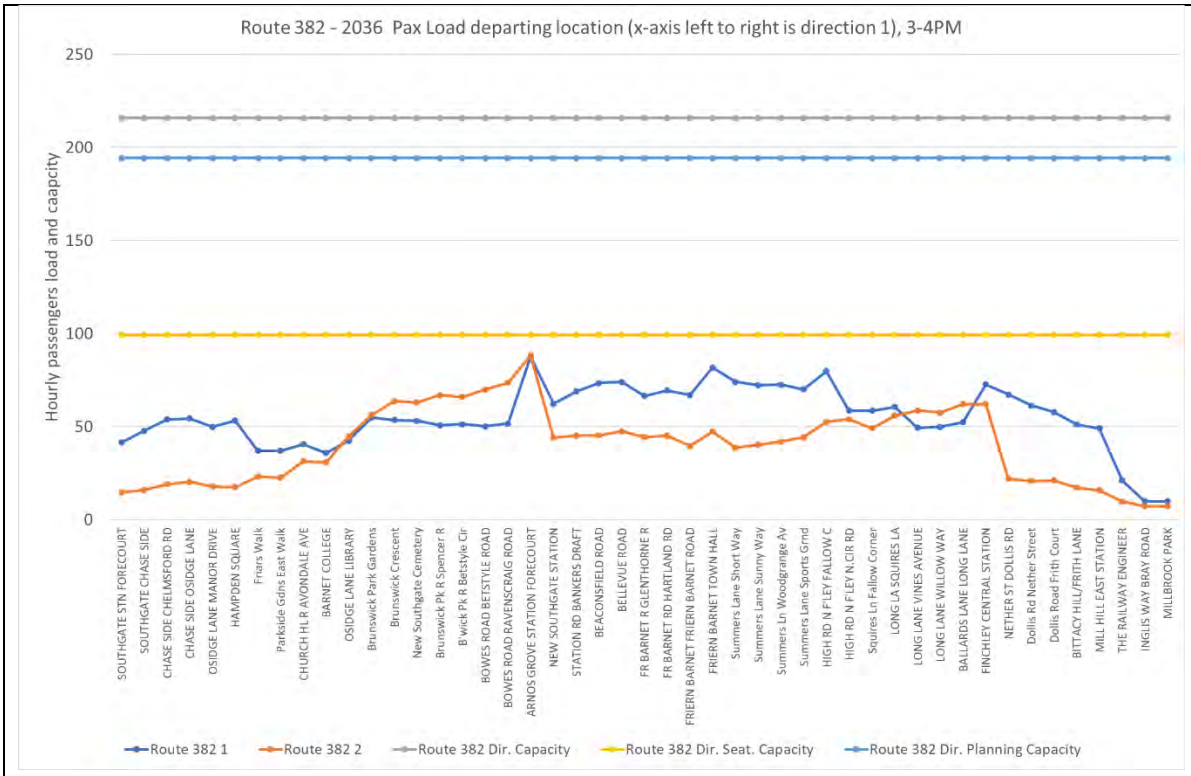

Route 221 - 2036 Pax Load departing location (x-axis left to right is direction 1), 3:15-4:15PM
Hourly passengers load and caapcity
700
600
500
400
300
200
100
0
EDGWARE BUS STATION
EDGWARE BUS STN ALIGHTING PT
EDGWARE STATION
EDGWARE LIBRARY
HALE LANE BROADFIELDS AV
HALE LN HIGHVIEW GARDENS
HALE LANE DEANS LANE
HALE LANE DOWNHURST AVE
MILL HILL HALE LANE
MILL HILL BROADWAY STN
MILL HILL BDY FLOWER LN
FLOWER LN MILL HILL BDY
FLOWER LN PARKMEAD GDNS
BUNNS LANE BRIDGE
BUNNS LANE COPTHALL GDNS
COPTHALL SCHOOL
COPTHALL SPORTS CENTRE
SALCOMBE GARDENS
ENGEL PARK BITTACY RISE
ENGEL PARK ISLAND
ENGEL PARK BITTACY HILL
THE RAILWAY ENGINEER
MILL HILL EAST STATION
BITTACY HILL/FRITH LANE
FINCHLEY GOLF CLUB
FRITH MANOR SCHOOL
LULLGARTH CISSBURY RING
SINGLETON SCARP
SUSSEX RING
ARGYLE ROAD
ALEXANDRA GROVE NETHER S
ALEXANDRA GR BALLARDS LN
BALLARD LN WOODBERRY GRV
NORTH FINCHLEY TALLY HOI
NORTH FINCHLEY BUS STAND
NORTH FINCHLEY TALLY HOI
NTH FINCHLEY WOODHOUSE R
WOODHOUSE R FENSTANTON A
WOODHOUSE RD HILTON AVE
WOODHOUSE RD CRESCENT WY
WOODHOUSE ROAD LEWES RD
FRIERN BARNET TOWN HALL
FRIERN BARNET FRIERN BARNET ROAD
FR BARNET RD HARTLAND RD
FR BARNET R GLENTHORNE R
BELLEVUE ROAD
BEACONSFIELD ROAD
STATION RD BANKERS DRAFT
NEW SOUTHGATE STATION
STATION ROAD HOMEBASE
STATION RD N CIRCULAR RD
MIDDX UNIVERSITY CAMPUS
BOUNDS GRN RD WARWICK RD
BOUNDS GREEN STATION
BOUNDS GREEN RD PARK RD
BOUNDS GRN RD EASTERN RD
BOUNDS GRN R PARK AVENUE
HARINGEY CIVIC CENTRE
WOOD GREEN BUS GARAGE
WOOD GREEN STATION
WOOD GREEN SHOPPING CITY
TURNPIKE LANE STN HIGH R
TURNPIKE LN STN/BUS STN
Route 221 1
Route 221 2
Route 221 Dir. Capacity
Route 221 Dir. Seat. Capacity
Route 221 Dir. Planning Capacity


Route 232 - 2036 Pax Load departing location (x-axis left to right is direction 1), 3:15-4:15PM
Hourly passengers load and caapcity
300
250
200
150
100
50
0
ST RAPHAELS ESTATE STAND
BESANT WAY OWEN WAY
ST RAPHAELS NORTH
Brent (Borough) PARK TESCO
NTH CIRCULAR RD DOG LANE
NEASDEN CENTRE/UNDERPASS
Dollis H Ln Randall Ave
Dollis Hill Ln Brook Rd
Dollis H Ln Newfield Rs
COLES GREEN RD HUMBER RD
COLES GRN RD COLES GN CT
N CIRCULAR R STAPLES CNR
TILLING ROAD SAFEWAY
BRENT CROSS BUS STATION
PR CHARLES DR SPALDING R
N CIR RD/GOLDERS GRN RD
N CIRCULAR R GT NORTH WY
N CIR RD BEECHWOOD AVE
EAST END ROAD UNDERPASS
N CIRCULAR RD LONG LANE
N CIR RD COPPETTS WOOD
SUP RD FROM C HATCH LN
PINKHAM WAY BOUNDS GRN R
STATION ROAD HOMEBASE
STATION RD BANKERS DRAFT
BOWES ROAD RAVENSCRAIG ROAD
ARNOS GROVE STATION (W/B)
BOWES ROAD STANLEY ROAD
BOWES ROAD PYMMES ROAD
GREEN LANES N CIRCULAR R
HIGH ROAD SYLVAN AVENUE
HIGH RD WHITE HART LANE
WOOD GREEN BUS GARAGE
WOOD GREEN SHOPPING CITY
TURNPIKE LN STN/BUS STN
Route 232 1
Route 232 2
Route 232 Dir. Capacity
Route 232 Dir. Seat. Capacity
Route 232 Dir. Planning Capacity


Route 240 - 2036 Pax Load departing location (x-axis left to right is direction 1), 3:45-4:45PM
Hourly passengers load and caapcity
350
300
250
200
150
100
50
0
GOLDERS GREEN STATION
GOLDERS GRN RD/HODFORD R
GOLDERS GRN RD HOOP LANE
GOLDERS G RD WOODSTOCK R
GOLDERS G RD HIGHFIELD A
N CIR RD/GOLDERS GRN RD
BRENT STREET NTH CIRC RD
BRENT GREEN LOAD OF HAY
HENDON BELL
HENDON THE QUADRANT
PARSON STREET DOWNAGE
PARSON STREET ASHLEY LN
HOLDERS HL R GT NORTH WY
HOLDERS HILL CRESCENT
HENDON PARK CEMETERY
HOLDERS HILL CIRCUS
BITTACY HILL/FRITH LANE
MILL HILL EAST STATION
THE RAILWAY ENGINEER
THE RIDGWAY BITTACY HILL
MILL HILL RESEARCH LABS
ST VINCENT'S SCHOOL
MILL HILL SCHOOL
HAMMERS LN/THE RIDGEWAY
DRAPERS' COTTAGE HOMES
DAWS LANE/HAMMERS LANE
DAWS LANE BIRKBECK ROAD
MILL HILL BOY FLOWER LN
MILL HILL BROADWAY STN
MILL HILL HALE LANE
HALE LANE DOWNHURST AVE
HALE LANE DEANS LANE
HALE LN HIGHVIEW GARDENS
HALE LANE BROADFIELDS AV
EDGWARE LIBRARY
EDGWARE STATION
EDGWARE BUS STN ALIGHTING PT
EDGWARE BUS STATION
Route 240 1
Route 240 2
Route 240 Dir. Capacity
Route 240 Dir. Seat. Capacity
Route 240 Dir. Planning Capacity


Route 251 - 2036 Pax Load departing location (x-axis left to right is direction 1), 3:15-4:15PM
Hourly passengers load and caapcity
350
300
250
200
150
100
50
0
ARNOS GROVE STATION (W/B)
ARNOS GROVE STATION FORECOURT
BOWES ROAD RAVENSCRAIG ROAD
BOWES ROAD BETSTYLE ROAD
BETSTYLE CIRCUS
OAKLEIGH RD S COPPIES GR
BRUNSWICK AVENUE
OAKLEIGH RD N BAWTRY RD
OAKLEIGH RD N RISING SUN
OAKLEIGH RD N/RUSSELL LN
OAKLEIGH R N MYDDELTON P
OAKLEIGH AVENUE
WHETSTONE THE GRIFFIN
TOTTERIDGE & W'STONE STN
TOTTERIDGE L LONGLAND DR
TOTTERIDGE LANE LINKS DR
TOTTERIDGE PINE GROVE
TOTTERIDGE GREEN
TOTTERIDGE WAR MEMORIAL
TOTTERIDGE VILL GRANGE A
T'RIDGE CMN HORSESHOE LN
ELLERN MEDE FARM
ST EDWARD'S COLLEGE
WEST END COTTAGE
HENDON WOOD LANE
HIGHWOOD HILL RISING SUN
HIGHWOOD HILL LAWRENCE S
Lawrence St The Reddings
LAWRENCE ST SUNNYFIELD
LAWRENCE ST UPHILL ROAD
MILL HILL BDY FLOWER LN
MILL HILL BROADWAY STN
BUNNS LANE LYNDHURST AVE
LYNDHURST AVE BUNNS LANE
EVERSFIELD GS WATLING AV
WATLING A GOLDBEATERS GR
WATLING AVE MONTROSE AVE
WATLING AVE FORTESCUE RD
BURNT OAK STATION
WATLING AV BURNT OAK BDY
BURNT OAK BROADWAY
BURNT OAK BDY NORTH ROAD
EDGWARE GENERAL HOSPITAL
HIGH S EDGWARE CAMROSE A
HIGH STREET EDGWARE
EDGWARE STATION ROAD
EDGWARE BUS STN ALIGHTING PT
EDGWARE BUS STATION
Route 251 1
Route 251 2
Route 251 Dir. Capacity
Route 251 Dir. Seat. Capacity
Route 251 Dir. Planning Capacity


Route 326 - 2036 Pax Load departing location (x-axis left to right is direction 1), 3:15-4:15PM
Hourly passengers load and caapcity
300
250
200
150
100
50
0
STAPYLTON RD THE SPIRES
BARNET HIGH STREET
SALISBURY RD THE SPIRES
BARNET POST OFFICE
BARNET CHURCH RED LION
BARNET HILL/MEADWAY
HIGH BARNET STATION
HIGH BARNET STATION
BARNET HILL OLD RED LION
DOLLIS VALLEY WAY STAND
BARNET ODEON
STATION RD FIRE STATION
STATION ROAD WARWICK RD
NEW BARNET STATION ROAD
EAST BARNET SAINSBURY'S
E BARNET R THE ALEXANDRA
EAST BARNET RD BOURN AVE
LONGMORE AV LANCASTER RD
LONGMORE AVE/YORK ROAD
LONGMORE AVENUE MONKS AV
LYONSDOWN RD LONGMORE A
GT NORTH RD LYONSDOWN RD
HIGH RD WALFIELD AVENUE
HIGH RD FRIERN MOUNT DRV
HIGH ROAD BLACK BULL
HIGH ROAD CHANDOS AVENUE
WHETSTONE THE GRIFFIN
TOTTERIDGE & W'STONE STN
SUSSEX RING
NETHER ST DOLLIS RD
FINCHLEY CENTRAL DOLLIS PARK
FINCHLEY CHURCH END
FINCHLEY HENDON LANE
REGENTS PK RD EAST END R
Finchley Gravel Hill
HENDON LA
HENDON LA ARDEN RD
HENDON LA
Hendon Lane Gt North Way
FINCHLEY LA G NORTH WAY
FINCHLEY LA ALEXANDRA RD
THE QUADRANT FINCHLEY LA
HENDON CHURCH END
THE BURROUGHS MIDDX UNIV
HENDON TOWN HALL
THE BURROUGHS WHITE BEAR
HENDON WAR MEMORIAL
HENDON CENTRAL STATION
HENDON WAY GRAHAM ROAD
HENDON WAY BEAUFORT GDNS
BRENT CROSS FLYOVER
PR CHARLES DR SPALDING R
BRENT CROSS SPALDING RD
BRENT CROSS BUS STATION
Route 326 1
Route 326 2
Route 326 Dir. Capacity
Route 326 Dir. Seat. Capacity
Route 326 Dir. Planning Capacity


Route 382 - 2036 Pax Load departing location (x-axis left to right is direction 1), 3-4PM
Hourly passengers load and caapcity
250
200
150
100
50
0
SOUTHGATE STN FORECOURT
SOUTHGATE CHASE SIDE
CHASE SIDE CHELMSFORD RD
CHASE SIDE OSIDGE LANE
OSIDGE LANE MANOR DRIVE
HAMPDEN SQUARE
Friars Walk
Parkside Gdns East Walk
CHURCH HL R AVONDALE AVE
BARNET COLLEGE
OSIDGE LANE LIBRARY
Brunswick Park Gardens
Brunswick Crescent
New Southgate Cemetery
Brunswick Pk R Spencer R
B wick Pk R Betstyle Cir
BOWES ROAD BETSTYLE ROAD
BOWES ROAD RAVENSCRAIG ROAD
ARNOS GROVE STATION FORECOURT
NEW SOUTHGATE STATION
STATION RD BANKERS DRAFT
BEACONSFIELD ROAD
BELLEVUE ROAD
FR BARNET R GLENTHORNE R
FR BARNET RD HARTLAND RD
FRIERN BARNET FRIERN BARNET ROAD
FRIERN BARNET TOWN HALL
Summers Lane Short Way
Summers Lane Sunny Way
Summers Ln Woodgrange Av
Summers Lane Sports Grnd
HIGH RD N FLEY FALLOW C
HIGH RD N FLEY N.CIR RD
Squires Ln Fallow Corner
LONG LA SQUIRES LA
LONG LANE VINES AVENUE
LONG LANE WILLOW WAY
BALLARDS LANE LONG LANE
FINCHLEY CENTRAL STATION
NETHER ST DOLLIS RD
Dollis Rd Nether Street
Dollis Road Frith Court
BITTACY HILL/FRITH LANE
MILL HILL EAST STATION
THE RAILWAY ENGINEER
INGLIS WAY BRAY ROAD
MILLBROOK PARK
Route 382 1
Route 382 2
Route 382 Dir. Capacity
Route 382 Dir. Seat. Capacity
Route 382 Dir. Planning Capacity

E. APPENDIX E

Highway Network Flow Diagrams

2026 AM peak Sc 1 vs Sc 2

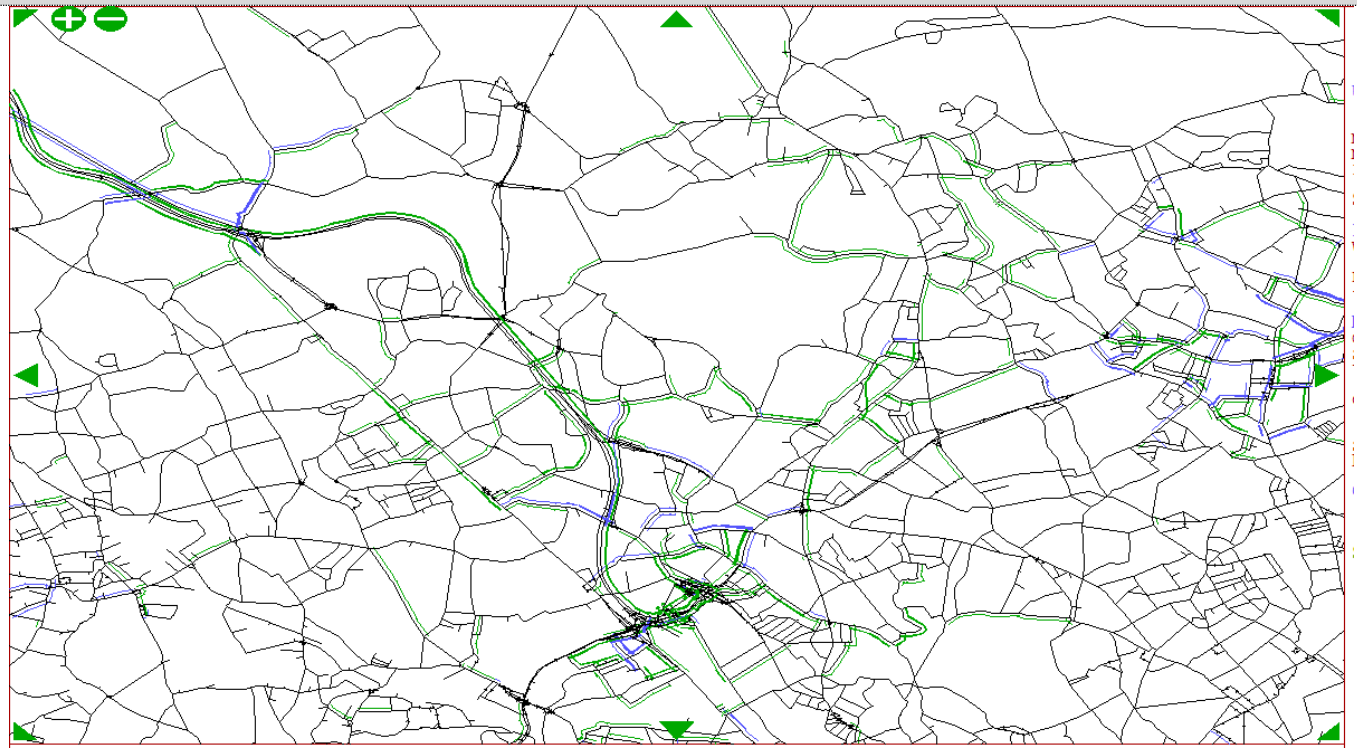


Figure E-1 2026 AM Scenario 1 vs Scenario 2 SATURN Flow diagram

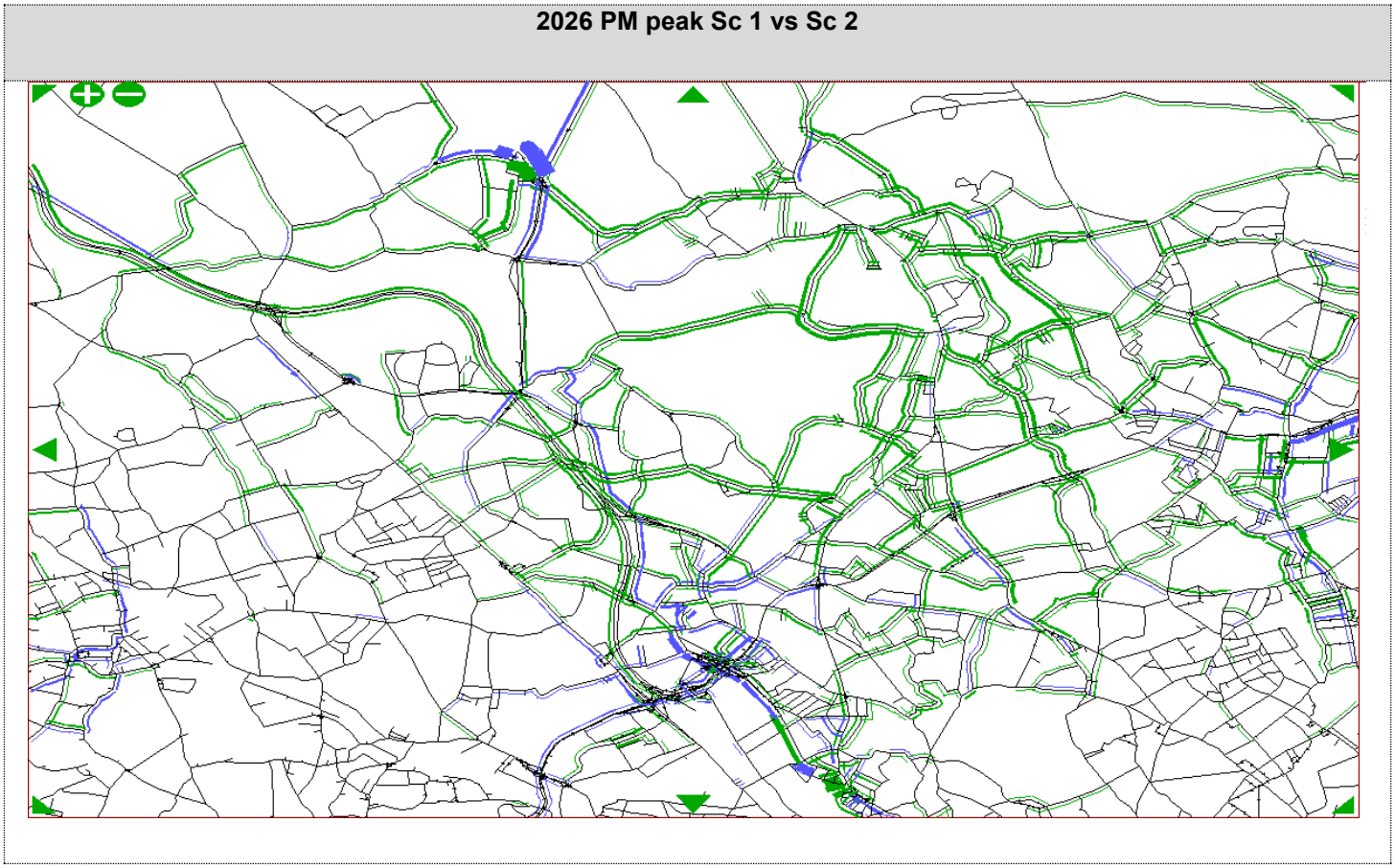


Figure E-2 2026 PM Scenario 1 vs Scenario 2 SATURN Flow diagram

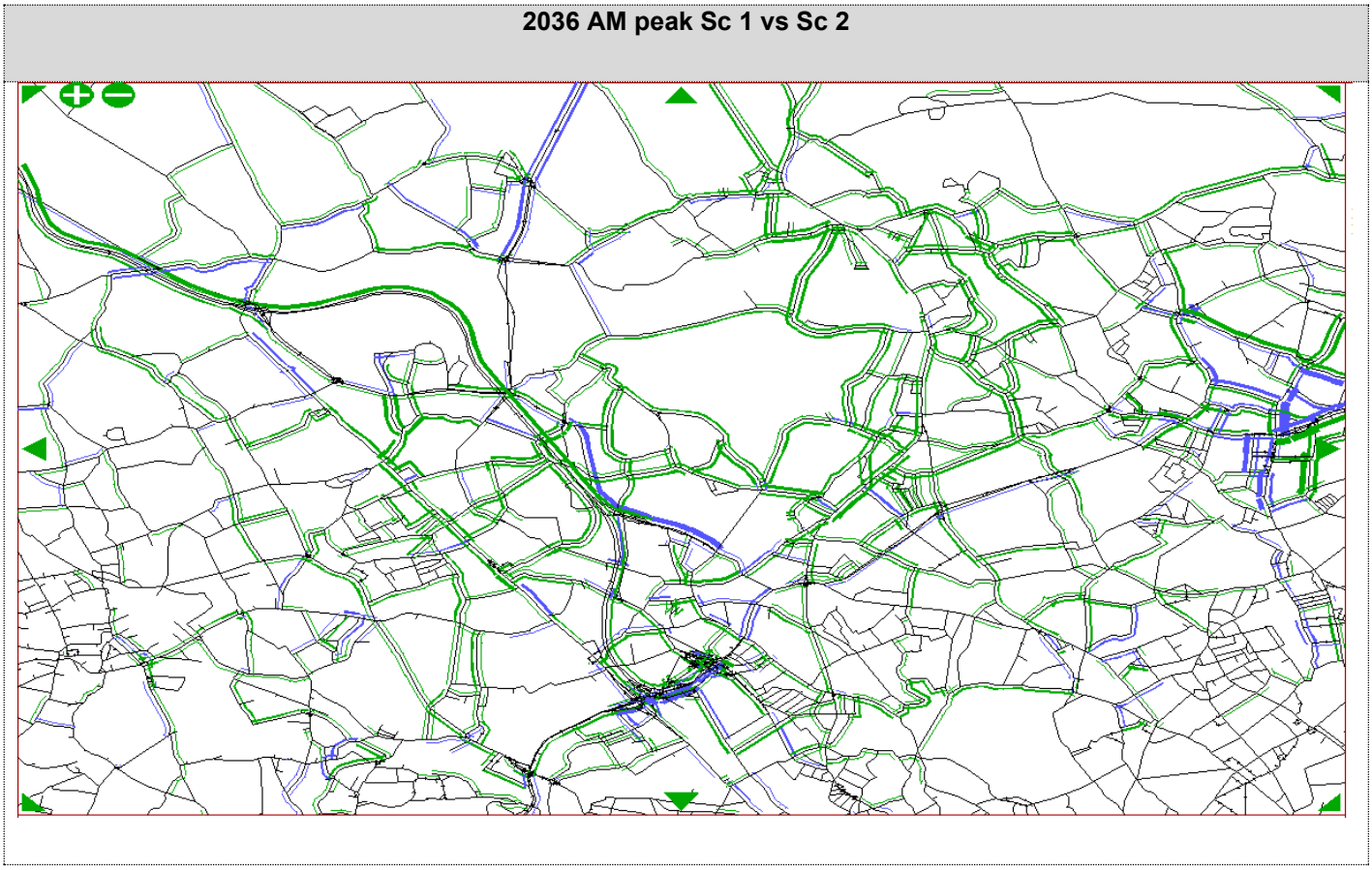


Figure E-3 2036 AM Scenario 1 vs Scenario 2 SATURN Flow diagram

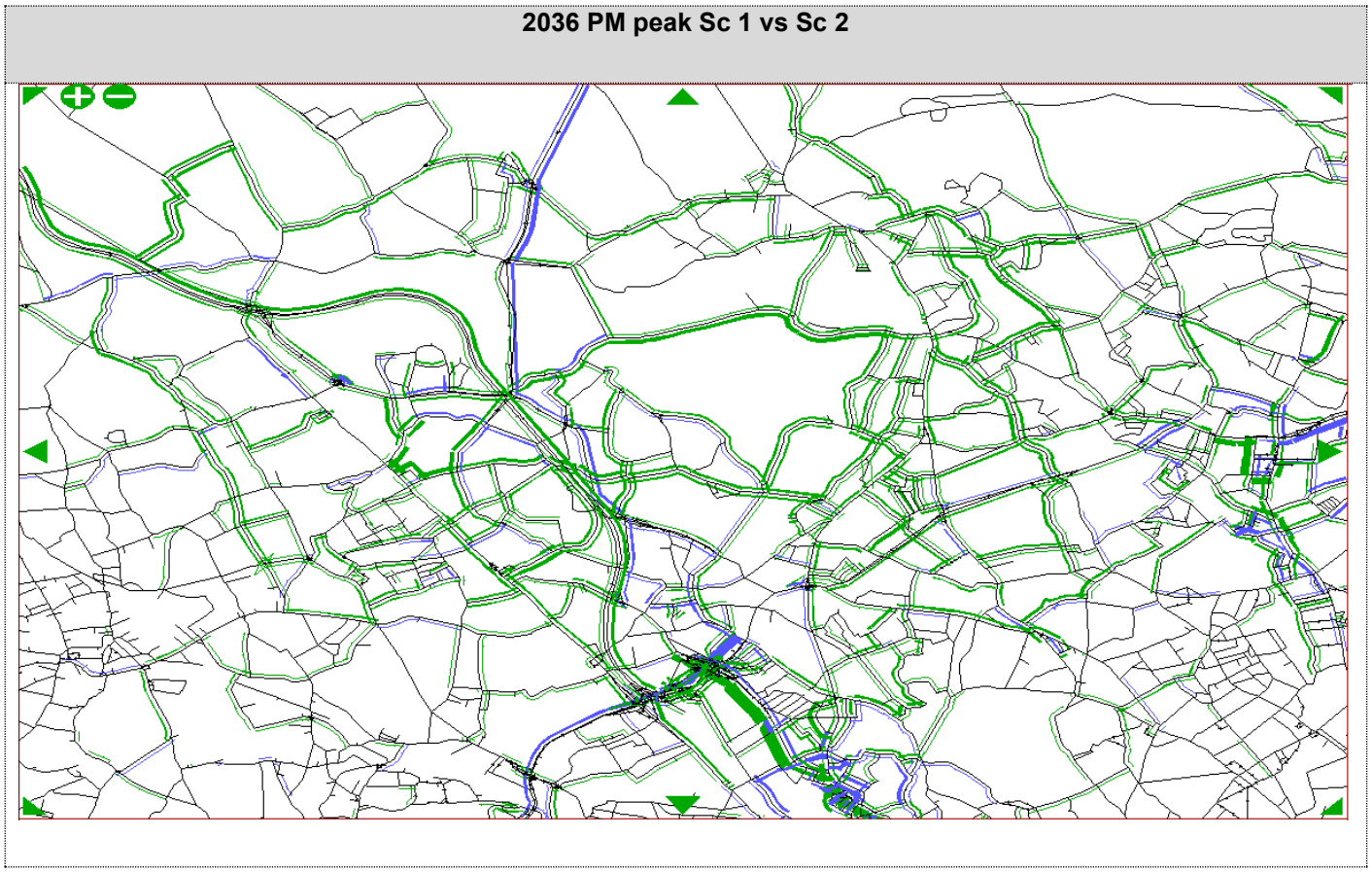


Figure E-4 2036 PM Scenario 1 vs Scenario 2 SATURN Flow diagram

2026 AM peak Sc 3 vs Sc 1

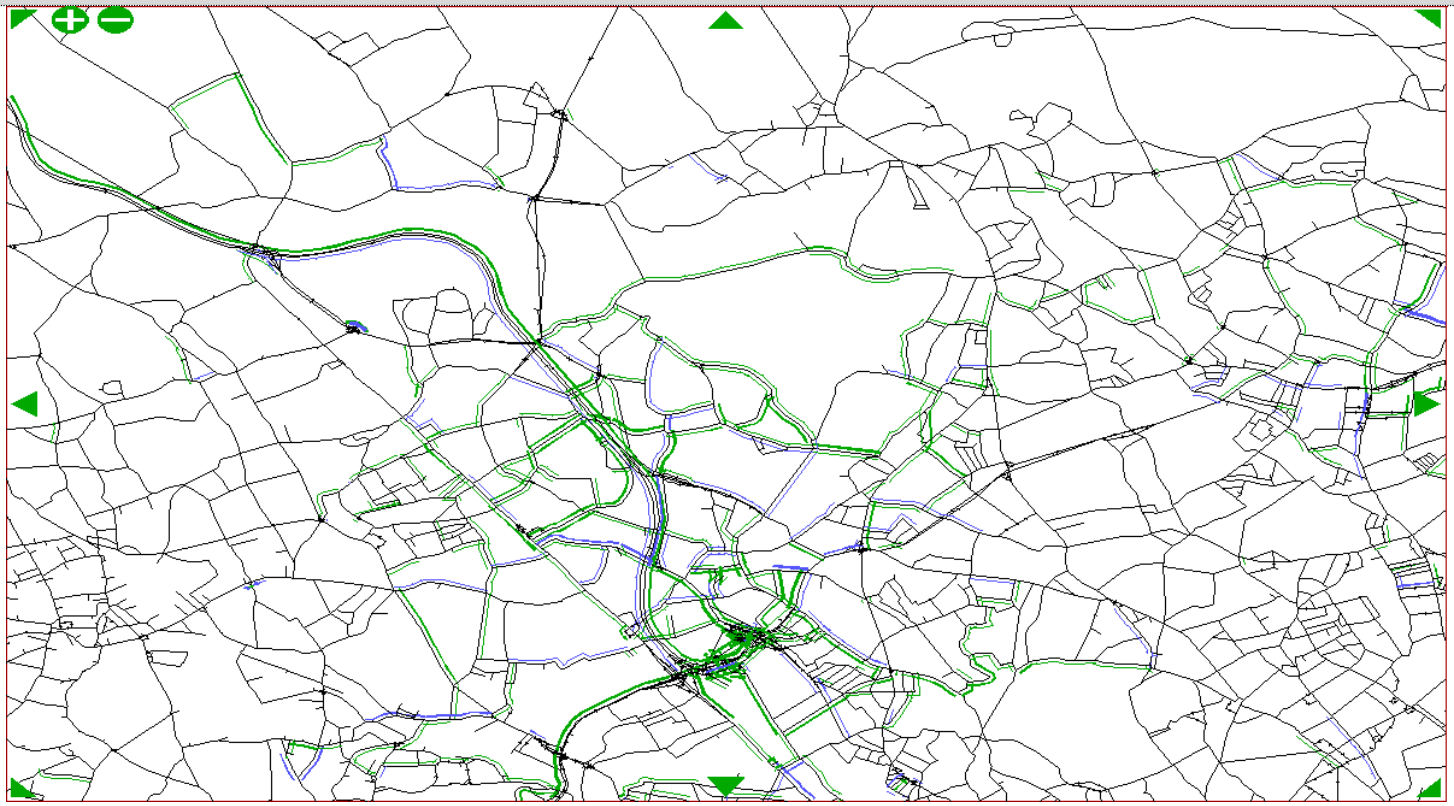


Figure E-5 2026 AM Scenario 3 vs Scenario 1 SATURN Flow diagram

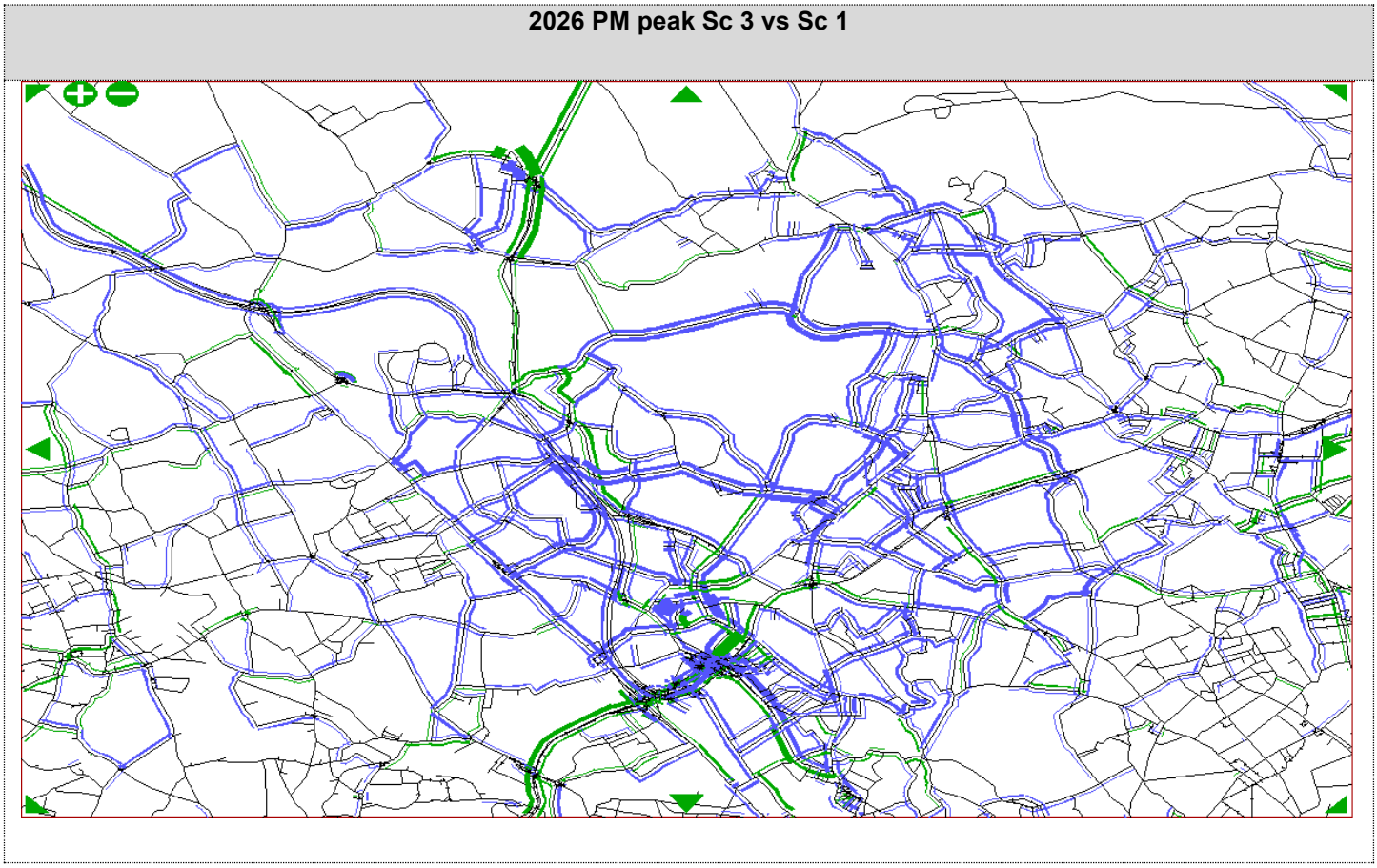


Figure E-6 2026 PM Scenario 3 vs Scenario 1 SATURN Flow diagram

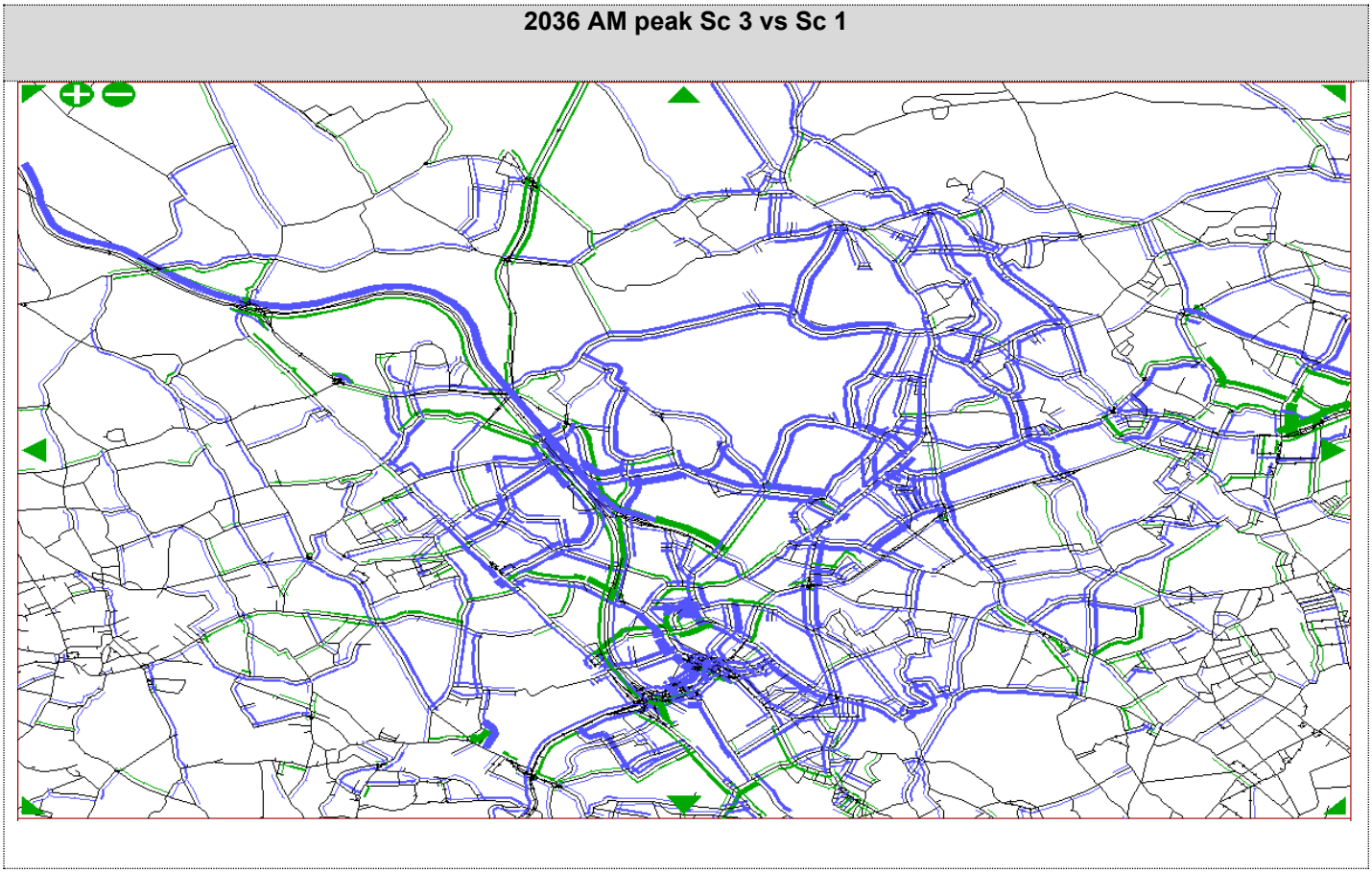


Figure E-7 2036 AM Scenario 3 vs Scenario 1 SATURN Flow diagram

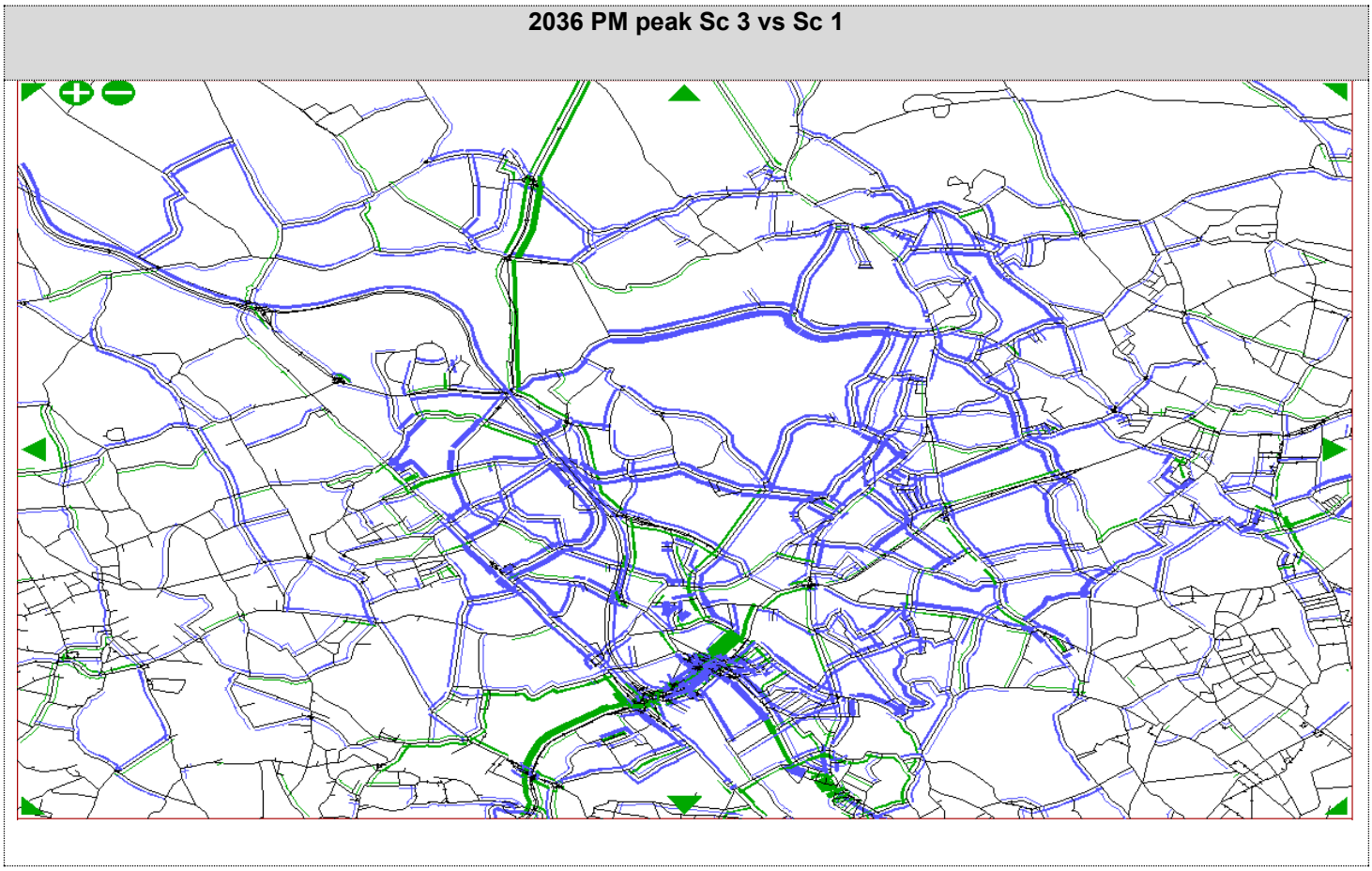


Figure E-8 2036 PM Scenario 3 vs Scenario 1 SATURN Flow diagram

F. APPENDIX F

Modelled Highway Travel Speed Analysis

Travel Time and Speed Data by Route.

Modelled Travel Speed (Kph) by Route				2026 AM			2026 PM		
RouteID	Route	DIST_Km	Dir	Sc1	Sc2	Sc3	Sc1	Sc2	Sc3
3	A110/A1000/A411	8.73	Eastbound	21.2	21.4	22.2	19.8	20.8	20.9
4	A110/A1000/A411	8.75	Westbound	15.1	15.4	16.8	19.0	20.1	20.3
7	A406 NC Rd	9.2	Eastbound	40.5	41.0	43.9	19.7	20.0	22.5
8	A406 NC Rd	9.08	Westbound	28.7	29.3	33.4	33.5	34.8	36.4
11	A504	7.98	Eastbound	15.2	15.6	18.0	14.1	14.8	15.8
12	A504	7.91	Westbound	15.5	15.7	17.4	13.6	14.2	15.5
13	A5 Edgware Road	10.21	Northbound	12.5	12.8	13.8	16.1	16.5	17.3
14	A5 Edgware Road	10.18	SB	17.3	17.3	18.0	13.8	14.0	14.7
17	A502	4.68	Northbound	18.1	18.2	19.0	12.0	11.9	12.9
18	A502	4.61	SB	13.0	13.1	13.7	16.7	17.0	18.0
29	A1	8.94	Northbound	24.3	24.4	25.1	18.9	19.5	20.7
30	A1	9.04	SB	19.8	19.9	21.1	24.1	24.5	25.3
37	A598/A1000	7.41	Northbound	19.5	19.6	21.0	18.4	19.1	19.5
38	A598/A1000	7.42	SB	15.4	15.6	17.0	19.0	19.4	20.5
39	A598	4.8	Northbound	17.8	18.0	19.1	11.1	12.1	13.5
40	A598	4.91	SB	18.6	18.7	19.4	18.8	21.5	21.2
61	A41	12.58	Northbound	23.1	23.1	24.7	18.6	20.7	21.2
62	A41	12.59	SB	20.7	21.1	22.8	25.3	26.3	27.1
63	A1	3.94	Northbound	61.2	62.0	60.0	54.5	55.0	52.1
64	A1	3.91	SB	16.1	16.4	17.2	16.6	17.7	18.2
Average				**21.7**	**21.9**	**23.2**	**20.2**	**21.0**	**21.7**

Table F-1 2026 AM/PM Travel Route speeds analysis (SATURN)

Speed Comparison by Scenario				2026 AM			2026 PM		
RouteID	Route	DIST_Km	Dir	Sc1 v Sc2	Sc3 v Sc1	-	Sc1 v Sc2	Sc3 v Sc1	-
3	A110/A1000/A411	8.73	Eastbound	-0.8%	4%	-	-5.0%	5%	-
4	A110/A1000/A411	8.75	Westbound	-1.8%	11%	-	-5.4%	7%	-
7	A406 NC Rd	9.2	Eastbound	-1.2%	8%	-	-1.9%	15%	-
8	A406 NC Rd	9.08	Westbound	-2.0%	16%	-	-3.8%	9%	-
11	A504	7.98	Eastbound	-2.7%	18%	-	-4.4%	12%	-
12	A504	7.91	Westbound	-1.4%	12%	-	-3.9%	14%	-
13	A5 Edgware Road	10.21	Northbound	-2.2%	10%	-	-2.3%	7%	-
14	A5 Edgware Road	10.18	SB	0.0%	4%	-	-1.2%	6%	-
17	A502	4.68	Northbound	-0.8%	5%	-	1.0%	8%	-
18	A502	4.61	SB	-1.3%	6%	-	-2.2%	8%	-
29	A1	8.94	Northbound	-0.7%	4%	-	-3.0%	10%	-
30	A1	9.04	SB	-0.3%	7%	-	-1.8%	5%	-
37	A598/A1000	7.41	Northbound	-0.4%	8%	-	-3.7%	6%	-
38	A598/A1000	7.42	SB	-1.1%	10%	-	-2.3%	8%	-
39	A598	4.8	Northbound	-1.3%	7%	-	-8.6%	22%	-
40	A598	4.91	SB	-0.8%	5%	-	-12.6%	13%	-
61	A41	12.58	Northbound	-0.2%	7%	-	-10.2%	14%	-
62	A41	12.59	SB	-1.6%	10%	-	-3.7%	7%	-
63	A1	3.94	Northbound	-1.2%	-2%	-	-0.8%	-4%	-
64	A1	3.91	SB	-1.3%	6%	-	-6.5%	10%	-
Average				**-1.2%**	**7.9%**	-	**-4.1%**	**9.0%**	-

Table F-2 2026 AM/PM Travel Route speeds analysis (SATURN) % changes

Modelled Travel Speed (Kph) by Route				2036 AM			2036 PM		
Route ID	Route	Km	Dir	Sc1	Sc2	Sc3	Sc1	Sc2	Sc3
3	A110/A1000/A411	8.73	Eastbound	21.4	22.1	22.4	19.9	20.6	20.7
4	A110/A1000/A411	8.75	Westbound	14.4	15.7	16.2	18.8	19.6	19.7
7	A406 NC Rd	9.2	Eastbound	37.6	39.1	40.4	17.6	19.1	20.9
8	A406 NC Rd	9.08	Westbound	25.7	27.7	30.2	31.1	32.0	33.0
11	A504	7.98	Eastbound	14.0	14.8	16.5	13.3	14.2	15.4
12	A504	7.91	Westbound	14.5	15.6	17.0	13.0	13.8	15.0
13	A5 Edgware Road	10.21	Northbound	11.7	12.1	12.7	14.3	15.2	15.5
14	A5 Edgware Road	10.18	SB	15.8	16.6	17.0	12.5	12.9	13.3
17	A502	4.68	Northbound	16.9	17.5	18.4	11.2	11.2	12.1
18	A502	4.61	SB	12.2	12.5	13.2	16.2	16.3	17.1
29	A1	8.94	Northbound	22.9	23.6	24.2	18.4	19.2	20.3
30	A1	9.04	SB	19.2	20.0	21.0	22.5	23.3	23.8
37	A598/A1000	7.41	Northbound	19.2	20.1	20.6	18.1	18.7	19.2
38	A598/A1000	7.42	SB	14.9	15.8	16.6	18.4	19.1	19.7
39	A598	4.8	Northbound	16.8	17.3	18.3	10.5	11.3	12.9
40	A598	4.91	SB	17.8	18.3	18.9	19.8	20.9	21.7
61	A41	12.58	Northbound	20.9	22.2	22.9	18.4	18.1	18.4
62	A41	12.59	SB	19.3	20.6	21.6	23.0	24.3	24.4
63	A1	3.94	Northbound	50.7	49.6	47.2	48.9	48.7	46.2
64	A1	3.91	SB	15.1	16.4	16.4	14.6	15.8	16.0
Average				**20.0**	**20.9**	**21.6**	**19.0**	**19.7**	**20.3**

Table F-3 2036 AM/PM Travel Route speeds analysis (SATURN)

Speed Comparison by Scenario				2036 AM			2036 PM		
Route ID	Route	DIST_Km	Dir	Sc1 v Sc2	Sc3 v Sc1	-	Sc1 v Sc2	Sc3 v Sc1	-
3	A110/A1000/A411	8.73	Eastbound	-3.2%	5%	-	-3.5%	4%	-
4	A110/A1000/A411	8.75	Westbound	-8.7%	13%	-	-4.2%	5%	-
7	A406 NC Rd	9.2	Eastbound	-4.0%	8%	-	-7.7%	19%	-
8	A406 NC Rd	9.08	Westbound	-7.3%	18%	-	-2.7%	6%	-
11	A504	7.98	Eastbound	-5.5%	18%	-	-6.4%	16%	-
12	A504	7.91	Westbound	-6.7%	17%	-	-6.1%	16%	-
13	A5 Edgware Road	10.21	Northbound	-3.2%	8%	-	-5.6%	8%	-
14	A5 Edgware Road	10.18	SB	-4.8%	7%	-	-2.9%	6%	-
17	A502	4.68	Northbound	-3.3%	8%	-	-0.2%	8%	-
18	A502	4.61	SB	-2.5%	8%	-	-0.9%	6%	-
29	A1	8.94	Northbound	-2.9%	6%	-	-4.5%	10%	-
30	A1	9.04	SB	-3.9%	9%	-	-3.3%	6%	-
37	A598/A1000	7.41	Northbound	-4.3%	7%	-	-3.1%	6%	-
38	A598/A1000	7.42	SB	-5.7%	11%	-	-3.4%	7%	-
39	A598	4.8	Northbound	-2.8%	9%	-	-6.6%	22%	-
40	A598	4.91	SB	-2.6%	6%	-	-5.6%	10%	-
61	A41	12.58	Northbound	-5.8%	10%	-	1.4%	0%	-
62	A41	12.59	SB	-6.3%	12%	-	-5.2%	6%	-
63	A1	3.94	Northbound	2.1%	-7%	-	0.3%	-6%	-
64	A1	3.91	SB	-8.4%	9%	-	-7.5%	10%	-
Average				**-4.5%**	**9.1%**	-	**-3.9%**	**8.2%**	-

Table F-4 2036 AM/PM Travel Route speeds analysis (SATURN) % changes

Empty Page

Capita Property and Infrastructure Ltd
Capita House
Wood Street
East Grinstead
West Sussex
RH19 1UU, United Kingdom
Tel +44 1342 327161 Fax +44 1342 333573

www.capita.co.uk/infrastructure