

Transport Matrix: Table T25 -Construction Traffic Movements - extracted from Construction Impact Assessment Report, Woolf, September 2008,

Junction	Period	Veh Movements /month	Ave work days/month	Veh Type	Vehicle Movements		
					Weekday	0800-0900*	1700-1800*
A41/A406 Mid-Level	Q1 2012	1640	22	HGV	75	9	2
		6120	22	LG&P	278	24	29
	Q1 2015	1216	22	HGV	55	6	2
		5042	22	LG&P	229	20	24
M1 Junction	Q1 2012	2240	22	HGV	102	12	3
		8675	22	LG&P	394	34	41
	Q1 2015	3769	22	HGV	171	20	5
		15655	22	LG&P	712	62	74
Staples Corner	Q1 2012	800	22	HGV	36	4	1
		3098	22	LG&P	141	12	15
	Q1 2015	1346	22	HGV	61	5	2
		5591	22	LG&P	254	22	26

* Based on 1 hour average of 3 hour peak period

Construction Traffic Movements - extracted PDP Sensitivity Tests Performed January 2009

Junction	Period	Veh Movements /month	Ave work days/month	Veh Type	Vehicle Movements		
					Weekday	0800-0900	1700-1800
A41/A406 Mid-Level	Q1 2012			HGV		11	3
				LG&P		24	29
M1 Junction	Q3 2015			HGV		24	6
				LG&P		62	74
Staples Corner	Q1 2015			HGV		9	3
				LG&P		22	26

Benchmark Narratives

1. **Details of Development Quantum** - Worksheets T2 – T10 will consider and analyse whether the actual development floorspace proposed within the element of the development being applied for falls within the land use and locational parameters set out in Revised Development Specification & Framework, particularly Appendix 5. This benchmark is a simple compliance test. The worksheets currently identify the distribution of development floorspace based on the assumed phasing set out in the Indicative Phasing Parameter Plan 029. Changes to these indicative phases may be approved by the planning authority in accordance with the anticipated planning conditions. Where such approval is granted it will be appropriate to update these worksheets to identify the updated development quantum for each phase in so long as it is consistent with Appendix 5 of the RDSF.
2. **Total Number of Development Trips** – Worksheets T11 – T19 will calculate the cumulative total of person trips based on the trip rates employed in the BXC TA for the total specified quantum of proposed development at that stage. This cumulative assessment will have regard to the results of any monitoring of trips generated by the development completed and occupied at that stage. The worksheets will allow identification as to whether the number of BXC person trips generated by that element of the development in the weekday AM, PM or Saturday peak hour exceed those forecast in the BXC TA. If the cumulative total exceeds that predicted in the TA the matter will be considered and addressed in the PTR. For the avoidance of doubt the matrix will only consider BXC related trips and exclude background/network growth.
3. **Total Trip Generation by Mode** – Worksheets T20 - T22 will identify, by using any monitoring information available to date and combining this data with forecast trips by mode for the next proposed stage of development, whether the mode share by car is consistent with the objectives set out for that stage of the development in the TA. If the proportion of BXC trips by car during the weekday AM and PM peak hours is more than the proportion predicted in the BXC TA the matter will be considered and addressed in the PTR. In applying this test, consideration can legitimately be given to any success in enhancing car occupancy through car sharing or car club initiatives. This test is not applied to Saturdays.
4. **Mitigation and Triggers** – Worksheet T23 will identify whether the defined items of infrastructure have come forward in accordance with or before the triggers defined in detail in the Revised Development Specification & Framework Appendix 7, having regard to the quantum of floorspace approved and now proposed. This benchmark is a simple compliance test.
5. **Gateway Junction Demand** – Worksheet T24 will show, using the trip generation and trip distribution and mode share information from the above benchmarks, whether that element of the BXC development being assessed, i.e. part occupied, part under construction and part applied for, is forecast to generate greater trips at the gateway junctions in the

weekday, AM, PM or Saturday peak hours than indicated in the BXC TA for the cumulative development approved so far and now proposed. The end-state proposals for the Gateway Junctions, as defined in the Revised Development Specification & Framework, have been assessed as follows:

- A41/A406 [TASR II Appendix 2/14];
- M1/A5/A406 [TASR II Appendix 2/14];
- BXSC Ingress/egress [TA Appendix IV];
- A41 junction [TASR II Appendix 2/14];
- A407/A5 [TASR II Appendix 2/14];;
- A407/Claremont Road [TASR II Appendix 2/14]; and
- A5/MML Road Bridge [TASR II Appendix 2/14].

This test relates to network performance, network capacity and capacity shortfall. Each assessment will have to forecast the amount of traffic likely to be generated by the total quantum of development that is being assessed, using the assumptions provided in the BXC TA. The distribution and assignment of trips to the networks will be undertaken adopting suitable assumptions regarding traffic distribution, redistribution and assignment as agreed with the Authorities and included in the TA. If the number of passenger car unit trips passing through any gateway junction is more than than predicted the matter will be considered and addressed in the PTR or (as the case may require) RMTR.

The BXC TA identifies the likely flow conditions at each of these junctions which is fully described in Chapter 6 and Appendix IV (L1) and (M1) to the TA, and in Appendix 2/14 (TN55) of TASR II. The 2016 traffic flows used in this worksheet are based on the traffic data from Appendix 2/6 – i.e. Technical Note 35, in TASR II.

6. **Construction Traffic Movements** – Worksheet T25 considers the number of construction vehicle movements passing through specified gateway junctions having regard to monitoring information and forecasts for the next proposed stage of development. If the number of BXC related construction vehicle movements passing through these junctions is forecast to be more than the maximum peak hour movements predicted by the BXC TA the matter will be considered and addressed in the PTR or (as the case may require) RMTR.

The BXC TA (Chapter 12) identifies the likely flow conditions at the specified gateway junctions which has been extracted from the Construction Impact Assessment (November 2008) and Addendum (March 2009), and specifically the forecast peak flows at Appendix 6. A further sensitivity test to consider worst case construction traffic impact (using smaller vehicles) also forecasts proposed flows and is set out in TASR II Appendix 2/16.

NOTES TO ACCOMPANY THE BXC WORKSHEETS

a) General

1. In applying the Transport Matrix, the following should be taken into account:
 - The accompanying tables relate to the peak hours as requested by LB Barnet, the TA modelled 3-hour AM and PM peak periods (0700-1000 and 1600-1900 respectively) that were then related to the AM and PM peak hours of 0800-0900 and 1700-1800. The peak periods were related to the peak hours by applying a factor of 0.54 to the public transport forecasts and 0.33 to the highway forecasts. The Saturday typical peak hour modelled relates to 1400-1500;
 - The bus forecasts in the tables are assumed to include the Rapid Transit System (RTS) patronage as well;
 - Worksheets T2-10 currently identify the distribution of development floorspace based on the assumed phasing set out in the Indicative Phasing Parameter Plan 029. Changes to these indicative phases may be approved by the planning authority in accordance with the anticipated planning conditions. Where such approval is granted it will be appropriate to update these worksheets to identify the updated development quantum for each phase in so long as it is consistent with Appendix 5 of the RDSF.
 - It is considered that if the timing of development changes, so too will the timing of the associated trigger(s) e.g. if a plot is brought forward in time, so too the trigger would similarly be brought forward in time, and vice versa.

b) Gateway Junction Worksheet

2. The following section provides an explanation of how the Gateway Junction Worksheet ((see Worksheet T24) has been formulated. The worksheet provides details of the Base Year, 2016 and 2026 End-state flows. Also included are details of how the strategic flows as predicted by the TA's strategic SATURN highways model have been adjusted to provide sets of validated flows that were used in the detailed junction capacity assessments. The flow adjustments applied in this worksheet, where it has been possible to apply these, are derived from a methodology that has been agreed with LB Barnet and TfL.
3. This method has been detailed in BXC05 TA, Vol.2 Appendix IV (L1). The basis for the adjustments is the reference back to fully observed turning flows at the corresponding junctions. The adjustment formulation follows:

$$DM_{\text{flow}} = BY_{\text{obs}} + [DM_{\text{mod}} - BY_{\text{mod}}]$$

$$DS_{\text{flow}} = BY_{\text{obs}} + [DS_{\text{mod}} - BY_{\text{mod}}]$$

Where:

BY = Base Year
DM = Do Minimum

DS = Do Something
 flow = directional flow on approach/exit to intersection for analysis purposes
 obs = observed flow as used in base year junction analysis
 mod= modelled traffic flow from SATURN model

4. The second term in each case is set to zero if the original result is negative.
5. Therefore the actual observed turning movements at existing junctions will influence the degree of adjustments made to modelled turning movements for junction assessment use.
6. Note that the gateway junction configurations vary between the different scenarios considered, according to the BXC proposals.
7. All junction flows in the table represent demand flows in pcu/hr that are forecast within the TA to use each particular junction. The junction assessments then provide the actual throughput based on the forecast detailed signal operation. Any residual flows appear as queues on the junction approaches which then dissipate outside the peak period being considered.
8. Specific detailed comments in relation to the junction flows are made as follows:
 - The flows quoted for the DS 2026 at the A406/A41 Mid-level Junction Group (as used in the detailed junction assessments) include movements to/from A41 overpass at the Whitefield Ave junction.
 - At the A406/A5/M1 junction, the DS flows for 2026 could not be adjusted as this was not possible due to significant changes to the junction configuration in the scheme, compared to the existing layout and hence the base count data available.
 - At the A406/A5/M1 junction, the DS 2016 flows were not adjusted to maintain compatibility with the DS 2026 situation.

c) Definition of Trips, Trip Rates and Mode Split

Introduction

9. The Transport Matrices place a significant emphasise on trips and mode split. This section describes what a trip is; how a trip should be measured and monitored through the surveys proposed in the FTP; shows how the mode splits from the Development Framework relate to those modelled in the TA; and presents the TA model results in way that demonstrates and thus provides a robust confidence that the mode split progressions will follow the forecast progressions to meet the End-state targets.
10. The TA describes the person trip rates² that have been largely derived from the TRAVL and TRICS databases which have been used in the assessment of the scheme; these provide rates by land use and by mode for defined time periods throughout the day, based on surveyed sites with similar characteristics. Car driver/passenger, public transport and soft modes are all included in the databases. The trip rates from TRICS and TRAVL are based on main-mode or final mode of travel, this is either the mode of travel used for most of a journey or the mode by which people arrive at their destinations.

² Trip rates are defined as the number of trips per 100 m²

Multi-leg journeys which use different modes for each leg of the journey are not specifically recorded in TRICS and TRAVL. In the assessment of the BXC development, main-mode was used to derive the initial trip rates that were then input into the demand modelling process.

11. Development related trips have been derived by applying the defined trip rates to the end-state quantum of development for each land use. This takes into consideration cross visitation, which takes account of visitors to the BXC development site using more than one land use e.g. retail and leisure.
12. The generated trips which have been included in the highway and PT modelling include car driver, bus, underground, rail and walk. The modelling does not specifically take account of pedal cycle, motor cycle, taxi and coach trips.
13. Within the Public Transport mode (PT) there are defined sub-mode split progressions for bus, rail and Underground. It is considered that the main objective for the BXC development site is to maximise sustainable travel and that the relative split between the PT sub-modes and soft modes is of lesser importance. The PT sub-mode split is harder to model than the PT/car split and it is this latter split that is considered of paramount importance. Clearly however all modes will need to be monitored to ensure that there is an appropriate balance between the use of all modes.

Units of Flow

14. The public transport modelling has been undertaken in units of "persons".
15. All traffic flows have been specified in units of "passenger car units" (pcu).
16. All the junction assessments reported in the TA have been undertaken with demand inputs as pcu/hr extracted from the SATURN model and therefore accommodate all vehicle types as follows:
 - User Class 1 - Car / LGV
 - User Class 2 - HGV (includes OVG1/OGV2)
 - Bus
17. Where conversion to vehicle movements has been required, the following factors were applied:

• Car/LGV	=	1.0 pcu
• HGV	=	2.5 pcu
• Bus	=	2.0 pcu
18. The following occupancy factors were used to convert person trips to car trips:

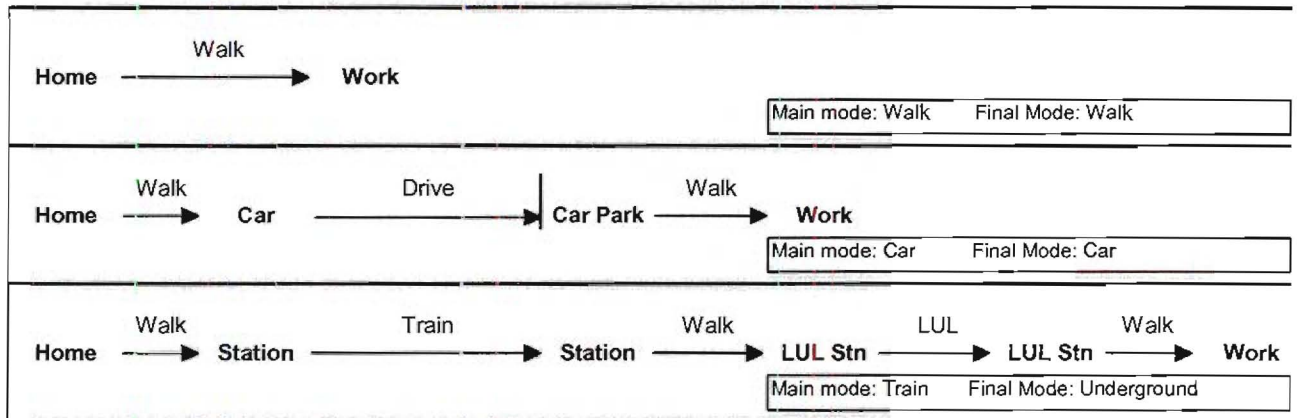
• AM Peak	=	1.30 persons/car
• PM Peak	=	1.48 persons/car
• SAT Peak	=	1.62 persons/car.

Definition of a Trip

19. A trip is considered to represent a movement between two points, with an associated purpose, such as work or education. Trips can be related to different "dimensions" e.g. persons, vehicles or passenger car units. Trips can typically be formed of a number of legs, each of which uses a difference

mode. The figure below shows examples of 1-leg, 3-leg and 5-leg journeys, with the distinction between main and final mode.

Example Showing Definition of Multi-leg Trip Components



20. In the monitoring of trips to the BXC development site, it is recommended that the “final” mode is assumed in determining the mode split. This will be consistent with the TA. In the examples above, where mechanised modes have been used, the final mode is taken to be the last mechanised mode used i.e. the last walk leg of the journey is not counted, unless it is the only leg of the journey.
 21. When monitoring outbound trips from the BXC site, the “initial” mechanised mode used should be assumed in the derivation of the mode split, unless the trip is entirely walk. The initial main-mode for trips inbound to the BXC site represents the mode by which travellers arrive at the site, rather than the modes used on other legs further from the site.
 22. A correspondingly similar definition should be used for those trips monitored as wholly within the BXC site.
- Measurement of Trips
23. Monitoring and reviewing of trips is a key element of the FTP, and is required to establish the number and mode split of trips to the BXC site. It is recommended above that the final/initial mode is used in the assessment of mode split, as these represent the modes by which travellers arrive at/depart from the site. In doing so, the distinction needs to be clearly made between travellers who walk for most of their journey and those who are walking from a public transport stop.
 24. The issues to be considered in measuring trips as part of the monitoring process are summarised below:
 - Different survey methods will be appropriate for different land uses, these are likely to include:
 - travel diaries;
 - household interviews;
 - staff surveys;
 - customer surveys;
 - traffic counts at key locations (plot or development zone based);

- public transport passenger counts;
- counts of goods vehicles, number and timing;
- use of cycle parking spaces;
- use of car parking spaces; and
- occupancy surveys of cars and PT vehicles.
- Detailed surveys will allow the identification of the amount of cross visitation that occurs on-site.
- Details of multi-leg journey elements should be recorded and identified from the surveys.
- Construction vehicle flows.
- Monitoring of queue lengths and signal timings at the same time as when junction counts are performed to inform the detailed design process.

Scope of Phase Transport Reports and Reserved Matters Transport Reports

A1 Introduction

The Transport Assessment (TA), which has been prepared to support the BXC application, assesses the transport impacts at the completion date of 2026, although an intermediate analysis at the end of the Primary Development Package (PDP) (2016) has also been provided. A Framework Travel Plan (FTP) is submitted alongside the TA, which sets out a framework for the submission of travel plans at a detailed design stage, which will influence the future operation of individual parcels of the development.

Given the large physical scale of the development and the anticipated timescale for its implementation, a tiered approach to transport assessment is proposed, as follows:-

1. The grant of outline planning consent will contain a series of conditions and obligations regulating the performance of the development within a clear set of parameters and controls. The outline planning consent will establish, in principle, the acceptability of the development in transport terms and will contain the obligations which define the commitments to the mitigation of its transport effects;
2. The BXC development is divided into 7 indicative phases, which are shown on Parameter Plan 029. Prior to the submission of reserved matters applications within any phase, the outline planning permission will require the applicants to submit for approval proposals for the general location of key roads, public transport services and infrastructure and pedestrians/cycle routes, public realm and principal open spaces within each phase. To accompany each submission, the applicants will be required to produce a Phased Transport Report;
3. The detail of development (including buildings and transport infrastructure) will need to be the subject of Reserved Matters Applications (RMAs). Each substantive RMA (defined for these purposes as a RMA which either brings forward specific transport infrastructure or which proposes more than 20,000 sqm of built floorspace) will need to be accompanied by a Reserved Matters Transport Report (RMTR).

This annex describes the scope of the PTRs and the RMTRs.

A2 Phase Transport Reports (PTRs)

A PTR will be required to support each submission for the phased development of BXC required by the Permission and Initial Planning Agreement. Essentially, these are Transport Masterplans for each phase. Each PTR should set out and address the transport issues relating to the proposed phase of development, having regard to the principles established in the Permission and recognising that the detailed design of transport infrastructure is a matter that will be addressed in subsequent reserved

matters applications. The PTR will also have regard to any of the Transport Matrix benchmarks which have been identified exceedances compared to the forecasts within the BXC TA. It is acknowledged that some variation in these benchmarks forecasts will be acceptable, unless the variances are so adversely significant that a fresh planning application or TA would be required. The PTR will consider these issues and demonstrate its acceptability.

The purpose of the phase submission required by Section 6 of the RDSF is to establish a coherent framework within which the development of the phase can be rolled out. Where appropriate, a degree of flexibility will need to be retained at the phase stage in recognition of the fact that detailed proposals for subsequent building plots will need to be able to respond to the precise requirements of market and occupier demand. Nevertheless, it is important to establish at the phase stage the necessary principles which ensure that the phase can be developed acceptably and consistently with the parameters and principles set out in the RDSF.

Against this background, the PTR will be required to address the following headings.

A2.1 Study Area

The applicant shall establish a Study Area which is relevant and appropriate to the PTR in question. In addition to the area of the phase itself, this Study Area shall represent a zone of influence within which it is necessary to understand transport infrastructure, transport connections and transport conditions in order to make rational judgements about transport proposals for the phase itself.

The study Area may be larger than the BXC application site itself where necessary but, in drawing up the boundary, it should be recognised that :-

- The geometric layout of the gateway junctions have already been designed and approved in detail as part of the BXC planning permission;
- The applicants monitoring commitment extends only to monitoring trips with an origin or destination within the BXC development (but, for the avoidance of doubt, the Transport Report will take account of the background growth on the network as forecast in the TA); and
- Appropriate corridors are the subject of separate studies.

The Study Area will be agreed with the highway authorities prior to the submission of the Phased Transport Report.

A2.2 Existing Conditions

The applicant shall provide a full description of:

- existing site information – describing the current physical infrastructure and characteristics of the phase and its defined Study Area
- baseline transport data – available published background transport data and current transport infrastructure details within the Study Area;

This information should be accurately established to understand the context of the phase proposal. The description should include as a minimum:

A2.3 Existing site information

- a site location plan that shows the proposed phase in relation to the surrounding area and transport system;
- relevant permitted and existing use of the Study Area;
- whether the location of the phase is within or near a designated Air Quality Management Area (AQMA);

A2.4 Baseline transport data

- a qualitative description of the travel characteristics of the Study Area, including pedestrian and cyclist facilities;
- any relevant quantitative data obtained from monitoring undertaken to date, the overall scope of which is set out in Annex 6;
- existing public transport provision, including provision/frequency of services, capacity, location of bus stops/train stations, park-and-ride facilities;
- a description and functional classification of the highway network in the Study Area;
- an analysis of the injury accident records on the public highway in the Study Area for the most recent three-year period, or five-year period if the area has been identified as within a high accident area
- the PTAL characteristics of the study area.

A2.5 Proposed Development

The PTR should provide a full description of the proposals for the phase in so far as they are known at the time of the PTR including, as a minimum (but where necessary identifying limits of deviation)

- plans and drawings showing the proposed phase layout, particularly the general location of primary and secondary roads and related pedestrian and cycle routes as well as principal open spaces across the phase – the layout will need to be consistent with the Parameter Plans;
- the proposed distribution of land uses across the phase;
- the scale of development, such as numbers of residential units and/or gross floor area (GFA), subdivided by land use where appropriate;
- a masterplan layout of the proposed phase;
- the person-trip generation of the proposed phase development and the forecast distribution of trips across modes;
- a qualitative and quantitative description (based on recent site observations) of the principal travel characteristics of the proposed development, including pedestrian and cyclist facilities/movements;
- proposed improvements to phase accessibility via sustainable modes of travel, such as provision/enhancement of footpath and cycle path linkages, public transport improvements and servicing arrangements where appropriate;

- proposed parking ratios and number by land use for the phase, including where appropriate, proposed ratios for residential parking and the principles relevant to that phase from the approved Car Park Management Strategy;
- the principal requirements of site construction for the phase, including the requirements of abnormal loads in the construction, use and decommissioning the present development;
- an assessment and justification of the scale and extent of the transport infrastructure proposed for the phase having regard to the scale of trips forecast to be generated by the BXC development;
- a proposed cycle/pedestrian strategy for the phase, having regard to the conclusions of the Area Wide Walking & Cycling Study and demonstrating connectivity to existing and newly completed surrounding routes;
- principles for the phased introduction of transport related Critical Infrastructure to the phase and programming in question, which are consistent with the sequencing and approximate duration of operations as set out in the Indicative Construction Programme (ICP) as attached to the Environmental Statement or as varied by planning condition. These details will be used within the relevant Detailed Delivery Programme to be submitted to the LPA for approval under the planning conditions;
- a strategy for any demand management measures or transport mitigation measures proposed for the phase consistent with the BXC planning permission.
- Public transport service and infrastructure improvements relevant to that phase;
- Phase related measures from the Framework Servicing and Delivery Strategy;
- a commentary on how the transport characteristics forecast for the Study Area are appropriate for that phase and how these relate to the end state;
- identify and address any benchmarks which were exceeded when compared to the forecasts in the BXC TA during the completion of the relevant Transport Matrix. In such instances the PTR will need to demonstrate that the variance is within acceptable bounds and has no significant adverse impact on the transport network as a result of the development;
- the Developers will undertake periodic peak hour surveys of the bus and underground patronage generated by the development as the development unfolds, and this data will be assessed as part of the PTR to compare actual patronage with the patronage forecasts contained in the TA. Then, any measures necessary to address significant variations will be agreed with TfL and LBB. If the patronage is significantly less than the forecasts and/or the mode split progression is less than that shown in the FTP then the Development Partners shall implement further measures set out in the FTP to promote more bus use and/or consider other options as may be appropriate.;

- as a result of monitoring information consider whether bus journey times on corridors within the application site are consistent with that assumed in the TA, save that some variation will be acceptable where it does not have a significant adverse impact on the transport network.

A2.6 Gateway Junctions

In determining the specific scope of a PTR consideration shall be had to the need to include one or more of the Gateway Junctions. Monitoring information and the potential impact of the prospective next phase of development shall consider congestion and queue lengths compared to that predicted in the BXC TA. The PTR, assisted by monitoring, shall identify whether any such congestion is directly as a result of BXC related trips or non development related actions. It is acknowledged that the development does not need to take account of background growth on the network (beyond that assumed in the BXC TA) and furthermore that some variance will be considered acceptable where there is no significant adverse impact on the transport network as a result of the BXC development.

It shall be within the legitimate scope of a PTR to consider whether up to date information at that time requires particular Gateway Junctions to be studied as part of the PTR. If such study is necessary, it will be appropriate for the PTR to consider whether detailed proposals for the relevant junction contained within the planning application need to be refined or even redesigned prior to their implementation. Any necessary measures of refinement or redesign will be agreed with the Borough Council (and highway authorities as part of the S.278 process) – provided always that the liability of the Development Partners for any cost for works to the relevant Gateway Junction is limited to the equivalent cost of the proposals set out in the BXC planning application for that junction, ie that attributable to BXC travel demand, which will be controlled and limited to that assessed in the BXC application documents through the operation of other Matrix benchmarks.

The purpose of this provision within the scope of the PTRs is to recognize that circumstances on the wider network may have changed by the time the particular junction comes to be implemented, as a consequence of matters outside the control of the Development Partners.

A3 Proposed Contents of Reserved Matters Transport Reports

Each RMTR should set out the transport issues relating to the proposed development site (existing conditions) and details of the development proposals (proposed development). The applicants recognise that it would be good practice to agree a scope for each report prior to its preparation and this is required in the planning conditions. The scope in each case will need to be consistent with the terms of this annex and the framework established in this document and by the terms of the BXC planning permission.

A3.1 Existing Conditions

The developer should provide a full description of:-

- existing site information – describing the current physical infrastructure and characteristics of the site and its surroundings;
- baseline transport data – available published background transport data and current transport infrastructure details.

This information should be accurately established to understand the context of the development proposal. The description should include as a minimum:

A3.2 Existing site information

- a site location plan that shows the proposed development site in relation to the surrounding area and transport system;
- relevant permitted and existing use of the site;
- the existing land uses in the vicinity of the site, including development plan allocations, or potential future use in the case of undeveloped sites;
- existing site access arrangements including access constraints, where appropriate;
- whether the location of the site is within or near a designated Air Quality Management Area (AQMA);
- any abnormal load uses of the current site

A3.3 Baseline transport data

- a qualitative (based on recent site observations) and quantitative description of the travel characteristics of the relevant part of the existing site, including pedestrian and cyclist movements and facilities/movements, as well as bus routes and bus priority in the site;
- existing public transport provision, including provision/frequency of services, location of bus stops/train stations, park-and-ride facilities;
- a description and functional classification of the highway network in the vicinity of the site;
- an analysis of the injury accident records on the public highway in the vicinity of the site access for the most recent three-year period, or five-year period if the proposed site has been identified as being within a high accident area

A3.4 Proposed Development

The RMTR should provide a full description including, as a minimum;

- plans and drawings showing the proposed site layout, particularly the proposed pedestrian, cycle, bus and vehicular access points into the site;
- the proposed land use;
- the scale of development, such as numbers of residential units and/or gross floor area (GFA), subdivided by land use where appropriate;
- the main features (design layout and access points) of the development;
- the person-trip generation of the proposed development and distribution of trips across mode;
- a qualitative and quantitative description of the forecast travel characteristics of the proposed development;

- proposed improvements to site accessibility via sustainable modes of travel, such as provision/enhancement of footpath and cycle path linkages, public transport improvements and servicing arrangements where appropriate;
- proposed parking numbers and internal vehicular circulation (including number of spaces, parking accumulation, parking layout in relation to other site elements, ratio of operational to non-operational spaces, method of car park operation, overspill parking considerations, disabled parking, motorcycle parking, cycle parking, taxi drop off and pick up points) – this will include reference to initiatives for car sharing, car clubs etc, although these are subject to the separate requirements of the FTP;
- residual vehicular trip impact;
- the transport impacts of site construction, including the requirements of abnormal loads in the construction, use and decommissioning the present development and proposed mitigation measures;
- the transport impacts of freight or service operations and measures to promote the sustainable movement of goods; and
- if the site of the proposed development has a current use or an extant planning permission with trip patterns/volumes, the net level of change that might arise out of the new proposals will be set out.

Any proposed contribution to the cycle/pedestrian strategy the proposed development will make and how it links in with the wider phase and end state of the development, in line with the BXC TA.

MONITORING STRATEGY

The over arching objective of the Monitoring Strategy is to relate to and provide information for the processes described in this Transport Matrix and Transport Report Schedule.

A monitoring strategy that measures all key transport impacts of the development (as well as travel behaviour) such as operational traffic, construction traffic and the impact of overlapping phases on the road network and on public transport.

Principles

1. The monitoring strategy is necessary to help ensure appropriate transport measures are implemented at the right time to minimise impacts of the development on the strategic and local transport networks.
2. Monitoring is also needed because forecasting can be unreliable in the long term. Variance from forecasts within the Transport Assessment should be measured against observed data when ever used for design or assessment purposes.
3. The aim of the monitoring strategy should be progressive in terms of keeping London moving and encouraging public transport use, cycling and walking increases as part of each phase of development.
4. The overall geographic scope of the monitoring includes the development site and area of influence where appropriate to monitor development impact.
5. The Development Partners (DPs) should produce a monitoring strategy and survey specification prior to commencing the development. The monitoring strategy should be updated on its first anniversary and annually from then until completion of the scheme or another appropriate time agreed by the Council and TfL.
6. TfL and London Borough of Barnet will both need to agree the initial specification and future updates. The Highways Agency, Network Rail and other authorities should be consulted on the overall strategy and agree appropriate monitoring on the network they are responsible for.
7. The monitoring strategy should collect and review published data available from other Bodies for the following purposes:
 - i. To populate the Matrix (trip generation, mode share, public transport demand) and benchmarks including network performance data (bus journey times,) – pre-commencement and updated regularly as long as it remains useful and relevant to future decisions.
 - ii. Data needed for Phase Transport Reports and other Transport Reports – post PDP – including car and cycle parking utilisation, Pedestrian Environmental Review System audit (and similar for the cycling network), Public Transport crowding/bus loadings, road accident data and qualitative data on walking

and cycling and other data agreed as part of the scoping of each Transport Report – .

- iii. Car parking utilisation on site and on street (including investigation into possible overspill parking into adjacent areas) every year post commencement to help inform the future approach to car parking including car parking charging, on-street parking controls, and level of provision and initiatives such as car clubs, car sharing and shared use of car parking spaces.
 - iv. Design data for highway design and Public Transport services/ infrastructure of the services/infrastructure as required.
 - v. Reporting of Travel Plan and Delivery Service Plan monitoring data – annual (either annual travel survey or summary of data from specific Travel Plans or DSP)
 - vi. Construction monitoring data –ongoing with reporting at least every 6 months including summary reporting on individual problems/mitigation/sites/ lorry movements and build out.
8. The Development Partners are fully responsible for funding the collection of data for the monitoring strategy.
 9. TfL and London Borough of Barnet will (in so far as is reasonably fit for purpose) agree a survey specification at the outset that minimises the need for additional data collection, maximises the use of existing data sources and encourages cost effective data collection techniques.
 10. TfL will use best endeavours to supply data from its own sources in a timely way to the Development Partners and may waive charges where deemed to be in the broader public interest at the time.
 11. Mode share is to be considered in two dimensions in the framework of control. In the first place, the public transport patronage predicted in the TA for the weekday AM and PM peak hours for the Phase 1 assessment will be considered and extrapolated forward to other phases and compared to observed public transport patronage to ensure that progressive improvement is achieved in the peak hours where required so as to ensure consistency with the TA forecasts and enable the public highway and public transport system to operate safely and efficiently at each phase of development. The monitoring of bus journey time reliability and demand/congestion at gateway junction will also assist with this objective. The second relates to the daily average mode share target set out in the Framework Travel Plan.

THE MONITORING STRATEGY

The need to monitor the operation and transport related impacts of the Development takes several forms. The information obtained from the various surveys and sources will be used to both control the impacts arising from the Development and to inform the later stages of the detailed design and implementation of the various elements of the approved transport infrastructure. The monitoring will differentiate between temporary impacts due to construction and any unforeseen long term impacts that need to be addressed. The scope of the monitoring should be agreed pre-commencement and reviewed annually. The minimum requirements include the following:

- Data for Travel Plans and Delivery Servicing Plans should be updated annually.
- Reporting on construction traffic should be undertaken every 6 months.
- Annual or pre-phase Bus journey time reliability surveys. Annually if based on iBus data or via a series of rolling surveys.
- Surveys for detailed design as and when required.
- Baseline information will need to be collected as part of Reserved Matter Transport Report where there are more than minor impacts on the networks.
- There will need to be on going Automatic Traffic Count data, including on local roads, to produce trends and local growth factors, and monitor any local 'rat-running'.

Therefore, the overall monitoring strategy would be best summarised by consideration of the five categories of monitoring that are described below:

1. MATRIX, PTR and RMTR INPUTS- POST GRANT OF PLANNING PERMISSION

Location:	<p>Surveys of the occupiers of the development and the construction operations, including origin and destination information and time of travel.</p> <p>Existing occupiers of the site should be surveyed as a first step.</p>
Purpose:	Regular monitoring of development related trips by mode.
Means: 1. 2. 3. 4. 5.	FTP → Individual Travel Plans, iTRACE compatible surveys – Travel Plan Co-ordinator. CWTP → Contractors – Construction Traffic Management Operations Manager. Delivery & Servicing Plans. S278 (i.e. monitoring of any junction or route impacts pre, during and post construction of the highways works). Bus journey times on the sections of roads being altered as a result of the BXC proposals, and adjacent short lengths.

6.	<p>There will be a separate S106 obligation to undertake these surveys (see S106 Heads of Terms 3.2).</p> <p>Other surveys included in section 2 below, as appropriate and relevant to the Matrix benchmarks</p>
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2. DETAILED STUDIES- PRE DESIGN STAGES

Location:	Site specific surveys related to the approved infrastructure.
Purpose:	To inform detailed design.
Means:	<p>Volume of vehicles, pedestrians and cycle.</p> <p>Classification of vehicles.</p> <p>Turning movements and queue length surveys at the junctions.</p> <p>Routeing patterns of BXC related vehicle flows through junctions.</p> <p>Accident data and data on vulnerable road users.</p> <p>Queue length surveys at gateway junctions</p> <p>Bus journey time surveys, if required.</p> <p>Details of the Pedestrian and Cyclist networks, including PERS audits of pedestrian facilities on and around the boundaries of the site where the proposed networks integrate and connect with the wider surrounding adjacent networks</p>
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

3. A5 CORRIDOR STUDY - PRE DESIGN STAGES

Location:	Carried out nearer to the date of commencing detail design of infrastructure works and prior to submitting Phase Transport reports.
Purpose:	The Corridor Study is intended to

	inform the Phase Transport Reports and detailed design of the transport infrastructure at the time this is undertaken.
Means:	
1.	Surveys of the Pedestrian and Cyclist networks, including PERS and CERS audits of pedestrian and cyclist facilities on and around the boundaries of the site where the proposed networks integrate and connect with the wider surrounding adjacent networks
2.	
3.	Surveys of through traffic in Dollis Hill area as appropriate, traffic management, parking, loading, unloading
4.	Review of junction signal timings, linkages, traffic management
5.	Review of bus priority including bus stop facilities in and around the site
	Review of road safety and accident data

4. SPECIFIC LOCAL ISSUES SURVEYS- DURING OCCUPATION OF A PHASE

Location:	Surveys by exception at individual sites identified to TPC/TAG as having some particular problem.
Purpose:	Identify cause of issue.
Means:	May include, inter-alia:
1.	Queue lengths.
2.	Volume of vehicles, pedestrians, cycles.
3.	Classification of vehicles.
4.	Car parking accumulation, including on and off street parking, and cycle parking.

5. TRANSPORT DATA FROM OTHERS- DURING OCCUPATION OF A PHASE

Location:	Desktop Studies to obtain published data from Authorities and others as appropriate.
Purpose:	To understand background trends in context of NW London.
Means:	May include, inter-alia:
1.	Bus journey times.
2.	BODS Data – Bus loadings..
3.	RODS Data – Underground loadings.
4.	TfL annual Transport Monitoring Reports.
5.	HA Annual Traffic Monitoring
6.	Other sources of relevant published information.

6. TRANSPORT REPORT SURVEYS- DURING OCCUPATION OF A PHASE

Location:	Within the site of the development.
Purpose:	Targeted data for PTR/RMTR.
Means:	
1.	Servicing and delivery flows.
2.	Public transport flows at interchanges.
3.	Public transport passenger loadings.
4.	Baseline traffic data e.g. vehicle flows, pedestrian and cyclist counts.
	Plus, will include data from the Matrix Inputs, the Corridor and Area Studies, Local Issue Surveys and Transport Data from other published sources, as appropriate.

7. CONTINUOUS MONITORING

Location:	Local and strategic roads in and around the development.
Purpose:	Monitor changes in background traffic levels, and any local rat-running.
Means: 1.	Traffic flows e.g. via ATCs.

A5 Corridor Study

General Scope & Area of Study

The A5 Corridor Study will cover a core area of the A5 between A407 Cricklewood Lane and A406 Staples Corner including adjacent local roads within Barnet, Brent and Camden within an area anticipated to be 800 metres, or larger/smaller if considered necessary as part of the scoping, from the A5, the MML link, the Claremont Road corridor and the A407 Cricklewood Lane to include a study of road safety, cycle provision, pedestrian environment, bus priority, traffic control, freight and delivery, servicing and on-street parking strategy and management.

Table 1: Detailed Scope of A5 Corridor Study

Corridor Element	Aim	Current Guidance and relevant studies (or substitute with update guidance)	Types of Measures (illustrative/ examples)
Traffic Modelling – 2026 AM and PM peaks	<p>(a) Traffic modelling to inform the Phase Transport Reports and the detailed design of the junctions along the A5 Corridor.</p> <p>(b) Production of traffic forecasts that enable fuller understanding of impacts and testing of local traffic management measures and/or supplementary mitigation in LB Brent</p>	TfL modelling guidance, existing modelling work undertaken for the TA	<p>(a) Development of a Vissim micro-simulation model as described below.</p> <p>(b) Refinement of TA strategic modelling work as described below, e.g. zonal disaggregation,,review of trip generation and distribution from key sites e.g, WHF.</p>
Pedestrian Environmental Review / Pedestrian Routes	Create pedestrian network between the development and adjacent communities / key attractors	TRL's Pedestrian Environment Review System (PERS) as developed for TfL; TfL Streetscape Guidance	Links, footway design, pedestrian crossings, subways/bridges, routes/route choices, public spaces, interchanges, bus stops, signage and way finding

Pedestrian Accessibility	Make the above network fully accessible ³	Panel advice/ other relevant advice from the community. TfL guidance on providing for disabled people; Design Manual for Roads and Bridges	Legibility, level changes, car parking location/ design, taxi location and design, design/location of crossings and bus stops, design of interchanges (including step free access)
Traffic Management - Parking, loading and waiting review	Improve movement capacity and smooth traffic flows	Relevant TfL or Borough Guidance	Waiting/loading restrictions along corridors and parking controls in adjacent roads
Cycle Routes / cycle Audit	Create cycle network between the development and adjacent communities / key attractors	London Cycling Action Plan; Cycle Route Implementation Study Process (CRISP) studies; London Cycle Design Standards; LCN+ guidance	Cycle routes/ cycle lanes, all public highway/ footbridge designed for cyclists, Advanced Stop Lines/ Toucan crossings

Corridor Element	Aim	Current Guidance and relevant studies (or substitute with update guidance)	Types of Measures (illustrative/ examples)
Traffic Management - Review of signals/ linked signals/traffic management	Improve movement capacity and smooth traffic flows	TfL modelling Guidelines; TfL signal design standards	Signal equipment, re-timing/ staging, layout changes (kerb-re-alignment, crossings, lining, signing), lighting, linked signals.
Review of bus priority including all bus stops within 400 metres of the redline boundary	Improve movement capacity and smooth traffic flows. Improve conditions for bus users	London Buses advice on bus stops and bus priority	Selective Vehicle Detection, Bus SCOOT (or similar signal control), review waiting/ loading, location of crossings, Bus stops, lighting.
Public realm ⁴	Enhance the highway environment in the corridor	TfL Streetscape Guidance	Soft and hard landscaping, including trees; lighting, drainage and public realm
Road safety/ accident data review	Improve road safety as part of the traffic management proposals	TfL guidance on road safety schemes; Design Manual for Roads and Bridges	Relates to design of the above elements including minimising safety concerns during construction.

³ The study will inform the detailed design at the junctions and the wider connectivity at the junctions which will form part of the mitigation funded by the DPs.

⁴ The DPs will carry out the works identified in the Public Realm and Open Space Parameter Plan 003 and the associated landscaping to the new junctions. Any works identified beyond this will be funded if appropriate from the consolidated Transport fund, subject to a decision of the Transport Strategy Group.

Modelling for the A5 Corridor Study

A Vissim model will be developed to inform the A5 Corridor Study. It is proposed that a Vissim micro-simulation model is formed based on an area element of the wider A5 Corridor Study around the A5 between the section of this road between A5/A406 North Circular Road and A5/A407 Cricklewood Lane junctions, also extending to include A407/Claremont Road and A5/MML Bridge to be agreed as part of the scoping. The extent of the area to be covered by the Vissim model will be agreed with the Authorities before the time when the design work on the A5 corridor is to be undertaken.

The aim will be to cordon out the A5 area from the strategic BXC model and then introduce the modelling of more localised junctions and movements into the analyses so that the impacts of these movements can also be assessed in the detailed junction assessments, and hence detailed designs.

This will also enable the operational impacts of adjacent developments on the corridor to be further assessed. The traffic demand would be taken from the BXC strategic SATURN model.

All major and minor junctions on this section of the A5 would be included in the simulation model. This would require full classified turning movement surveys to be undertaken at each of these junctions. The Vissim model will be able to assess the linking of traffic signals

The trip generation and distribution assumptions made for the ParcelForce site opposite Dollis Hill Lane will be reviewed for the appropriate form of landuse being proposed at the time the study is conducted.

The network will be taken from the SATURN model and enhanced with the introduction of local roads to get a suitable level of local detail. In this way the zonal detail would be increased so that local movements will be further represented. Matrix estimation will then be used to control the demand to the locally observed movement totals. The model would then require a local validation, which would need some further counts on adjacent links and/or junctions.

A journey time survey on the A5 would also be undertaken to further inform the calibration and validation processes.

Forecasting with the model will be done by forecasting the relative change in demand in the A5 corridor using the BXC SATURN model forecasts, including the use of the junction adjustments as included in the TA assessments. These would be applied in a relative fashion to the local model matrix, which would allow local forecasts to be run. After that the model could be used to test the various mitigation measures.

It is proposed that this work is undertaken for the AM and PM peak periods, for development scenarios to be agreed with LB Barnet and TfL, and in consultation with LBs of Brent and Camden.

Local Traffic Management Measures in Brent

The existing strategic BXC transport model will be used, where necessary, with minor modifications, to further assess any local traffic management measures proposed in LB Brent. The existing BXC strategic transport model will be used to further test any wider area implications that might arise from future local traffic management measures that are proposed to be introduced in LB Brent to address any supplementary/unforeseen impacts from the BXC proposals. Any changes to the strategic model, would be minor and targeted to provide a better representation of the local zonal structure and network, whilst still retaining the forecast demand flows from the current matrices. In this manner, the fundamental traffic assumptions inherent within the TA will be retained.

Specifically the points would include:

- The adjustments that are currently applied in the junction assessment process as reported in the TA ensure that a robust assessment of the junctions has been undertaken. However, to refine the loading of trips from east and west of the A5 it is proposed to further disaggregate the zones, and reassess the zone centroid connections, for those zones that bisect the A5, namely zones 9201, 9203 and 9204.
- To also disaggregate zone 9209 which bisects the A406 North Circular Road at Neasden, and to review its zone centroid connections, to further reflect its loading onto the network east and west of the A406.
- To review and, where appropriate, modify the northern and southern junctions and links within the strategic model network definition at the A5 and Neasden Lane/Dudden Hill Lane for the Dollis Hill Area as defined by the boundary of the A406/ A5/ Cricklewood Freight Line and Neasden Lane/ Dudden Hill Lane.

The extent of the area to be covered by this modeling will be agreed with the Authorities at the appropriate time. Modelling will be undertaken for the AM and PM peak hours.

These enhancements could be introduced in a manner that would also inform the development of the Vissim model as described above.

As a consequence of these tests, additional/ supplementary mitigation measures identified as being required will be the subject of detailed design, costing and public consultation and programmed for implementation at the appropriate time according to development phasing and impact. The associated costs of detailed design, costing, public consultation and implementation will be at the Development Partners' expense