Appendix J

Trip Generation Technical Note

London Borough of Enfield

Meridian Water Phase 2 and Strategic Infrastructure Works

Trip Generation Technical Note

MWP2-7/MWSIW-6 – Appendix J

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1 Introduction

1.1 Background

This Trip Generation Technical Note has been prepared by Ove Arup and Partners Ltd. ('Arup') on behalf of the London Borough of Enfield regeneration team (the 'Applicant'). The application falls within the London Borough of Enfield ('LBE') and the Local Planning Authority ('LPA') will determine the planning application. Some ancillary highway works fall within the adjoining London Borough of Haringey and will be addressed under the Highway Acts.

The Applicant will oversee the delivery of infrastructure works and will be appointing developers to deliver development plots. An earlier phase, Meridian Water Phase 1, is progressing to delivery, with a developer partner selected and the new Meridian Water Station opened in June 2019.

Meridian Water Phase 2 and Strategic Infrastructure Works ('the project') is the next phase of Meridian Water. This is made up of two linked planning applications which constitute the 'Proposed Development', namely

- Full planning application for Meridian Water Strategic Infrastructure Works ('**MWSIW'**)
- Outline planning application for Meridian Water Phase 2, a mixed-use residential-led development ('**MWP2'**)

The majority of the land for the Proposed Development is within the ownership of LBE. There are a number of other landowners who have been notified and with whom there are ongoing discussions regarding the proposals.

1.2 Structure of Application(s)

The two planning applications for the Proposed Development comprise a suite of co-developed plans and documents. On the basis that the two applications are being submitted in tandem and have a number of interrelationships, planning documents have been shared where appropriate.

For example, the Environmental Statement reports the findings of the Environmental Impact Assessment as undertaken for the combined project and the Design and Access Statement has been produced with site context and masterplan material which applies equally to the two separate applications. The following table sets out the application documents, reference numbers and identifies which documents are shared or not.

Table 1: Planning application documents

Document Title	MWSIW	MWP2	Shared
Cover Letter, Application Form	MWSIW-0	MWP2-0	N
Planning Statement	MWSIW-1	MWP2-1	N
Environmental Statement	MWSIW-2 / MWP2-2		Y
ES Non-Technical Summary	MWSIW-2.1 / MWP2-2.1		Y
Remediation Baseline and Framework	MWSIW-2.2 / MWP2-2.2 MWSIW-2.3 / MWP2-2.3		Y
Archaeological Desk Based Assessment	MWSIW-2.4 / MWP2-2.4		Y
Draft Code of Construction Practice	MWSIW-2.5 / MWP2-2.5		Y
Habitats Regulation Assessment	MWSIW-2.6 / MWP2-2.6		Y
Ecology Baseline Surveys	MWSIW-2.7 / MWP2-2.7		Y
Arboricultural Report	MWSIW-2.8 / MWP2-2.8		Y
Water Framework Directive Assessment	MWSIW-2.9 / MWP2-2.9		Y
Statement of Community Involvement	MWSIW-3 / MWP2-3		Y
Design Code	N/A	MWP2-4	N
Design and Access Statement	MWSIW-4 / MWP2-5		Y
Flood Risk Assessment	MWSIW-5 / MWP2-6		Y
Transport Assessment	MWSIW-6 / MWP2-7		Y
Framework Travel Plan	MWP2-7.1		Y
Construction Logistics Plan	MWP2-7.2		Y
Sustainability and Energy Statement	MWSIW-7 / MWP2-8		Y
Energy Assessment	N/A	MWP2-8.1	N
BREEAM Pre-Assessment	N/A	MWP2-8.2	N
Site Waste Management Plan	MWSIW-7.1	MWP2-8.3	N
Integrated Water Management Plan	MWSIW-7.1 / MWP2-8.4		Y
Daylight and Sunlight Assessment	N/A	MWP2-8.5	N
Affordable Housing Viability Assessment	N/A	MWP2-9	N

1.3 Meridian Water Context and Vision

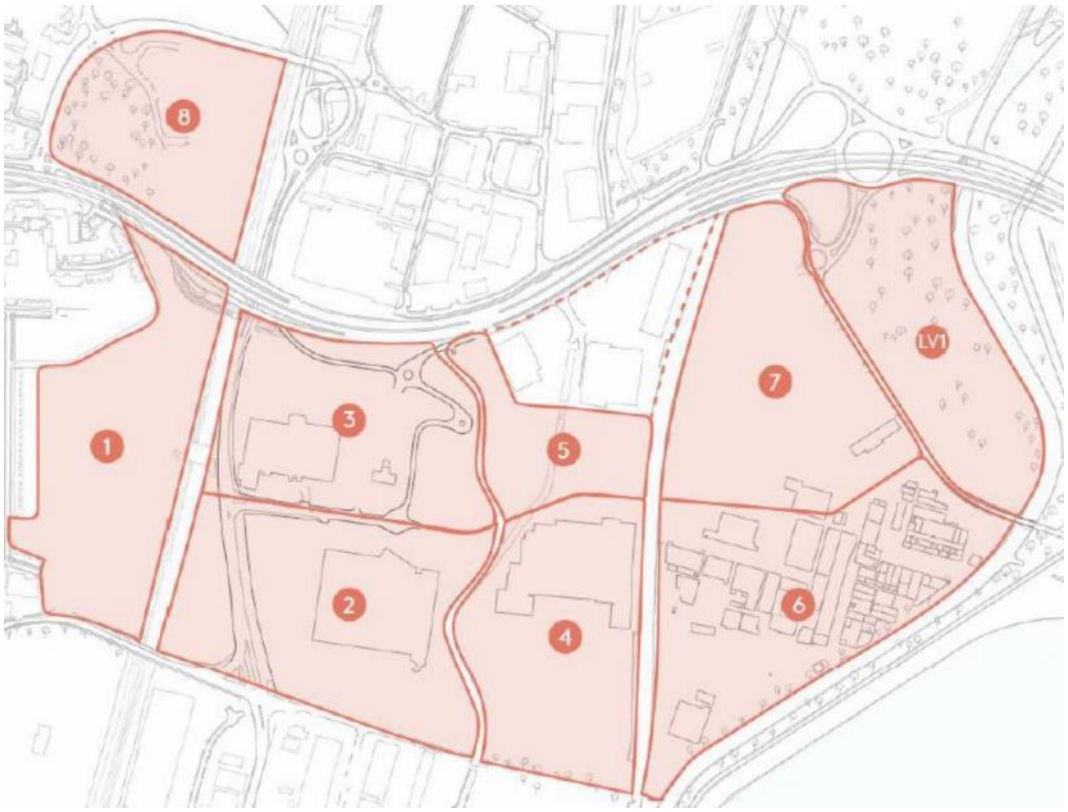
Meridian Water is one of the largest brownfield development opportunities in Greater London, which has the potential to deliver significant housing and employment growth ambitions of LBE, as set out in the 2010 Core Strategy. Meridian Water will contribute to the delivery of much-needed homes and jobs, meeting the strategic need and regeneration ambitions of London as set out in the adopted London Plan 2016 and emerging Draft New London Plan.

LBE is leading a pioneering approach to regeneration at Meridian Water for the long-term benefit of local people and future generations through the delivery of new homes, employment and infrastructure.

Meridian Water is a mixed-use regeneration scheme, comprising 85 hectares (ha) of land in Upper Edmonton. The regeneration scheme will bring forward land for redevelopment over time to maximise the potential for what is currently either vacant or low density industrial and retail land. For reference purpose the Development Zones of Meridian Water are set out on Figure 1.

The project will deliver elements of a successful new neighbourhood including schools and other social infrastructure, new rail infrastructure, connection to the Meridian Water Heat Network (MWHN) and new open spaces.

Figure 1: Meridian Water Development Zones



LBE has already invested significant resources, particularly in land assembly, remediation and infrastructure and Meridian Water has now reached the exciting first phase of development, known as 'Meridian One' comprising 725 residential units next to the new Meridian Water station with a development partner now

selected. A range of innovative meanwhile uses are also being explored to activate and make efficient use of LBE landholdings prior to development.

1.4 Strategic Infrastructure Works Application

LBE ('the Applicant') is seeking full planning permission for Strategic Infrastructure Works (MWSIW) at Meridian Water with the following description of development:

> *"Full application for redevelopment of the site to provide infrastructure works for the delivery of a mixed-use development comprising: Construction of an east-west link road between Glover Drive and Harbet Road ('the Central Spine'); alteration of access road between Argon Road and Glover Drive, construction of a link road between Leeside Road and the Central Spine, pedestrian and cycleway improvements to Glover Drive and Leeside Road, the construction of 4 no. bridges across the Pymmes and Salmon Brooks and River Lee Navigation; alteration to the Pymmes Brook channel and associated landscaping. Enabling works, comprising: earthworks; remediation; flood conveyance channel, storage and outfall works; utilities infrastructure; demolition of existing buildings and associated works."*

In summary, the MWSIW comprises the following elements:

- **The Central Spine Road** - a new tree-lined east-west boulevard connecting to Glover Drive and new Meridian Water Station in the west, crossing the Pymmes and Salmons Brook and River Lee Navigation to Harbet Road in the east;
- **Leeside Link Road** – a new link road providing access for cars, pedestrians and cyclists from Leeside Road through to the Central Spine Road;
- **Bridges (x4)** – erection of bridges and associated works to enable the Central Spine Road and Leeside Link Road to span the Pymmes and Salmons Brook and River Lee Navigation;
- **Brooks Park and River Naturalisation** – naturalising the channelised Pymmes Brook to introduce an ecological river landscape, as well as providing riverside parkland;
- **Edmonton Marshes and Flood Alleviation Works** – re-levelling and remediation of land to the east of Harbet Road, providing comprehensive flood alleviation works and a new high quality public open space within the Lee Valley Regional Park.
- **Access Works –** third party access works to provide new and altered accesses to the IKEA store, a new north-south link between Argon Road and Glover Drive, the creation of a link between the Central Spine Road and Anthony Way and other improvements to maintain access, along with other ancillary highway works to Glover Drive, Leeside Road and Meridian Way.
- **Earthworks, Remediation, Utilities and other ancillary works** – earthworks, retaining structures and remediation within Development Zones 4

and 5, installation of main utility networks and ancillary works including the demolition of existing buildings and structures.

1.5 Meridian Water Phase 2 Application

LBE ('the Applicant') is seeking outline planning permission for Meridian Water Phase 2 (MWP2) at Meridian Water with the following description of development:

> *"Outline planning application for comprehensive mixed use redevelopment at Meridian Water, comprising up to 2,300 residential units (Class C3), Purpose Built Student Accommodation and/or Large-Scale Purpose-Built Shared Living (Sui Generis); a hotel (Class C1), commercial development (Class B1a,b,c); retail (Class A1 and/or A2 and/or A3 and/or A4), social infrastructure (Class D1 and/or D2), a primary school up to three forms of entry, hard and soft landscaping, new public open spaces including equipped areas for play, sustainable drainage systems, car parking provision, and formation of new pedestrian and vehicular access (all matters reserved)."*

The proposal entails the comprehensive redevelopment of Meridian Water Development Zone 4 and 5 and a part of Zone 2 for up to 284,600 sq m (GEA) of residential led mixed use development.

In summary, the Proposed Development comprises the following elements:

- Up to 2,300 new homes (Use Class C3), of which 40% shall be affordable;
- Option to provide a Hotel (Use Class C1) circa 250 rooms with up to 16,000 sq m GEA (allowing for a range of specification from budget to luxury);
- Option to provide Purpose Built Student Accommodation (PBSA) and/or Large-Scale Purpose-Built Shared Living (LSPBSL) (Sui Generis) with up to 18,000 sq m GEA in total;
- Up to 26,500 sq m GEA of commercial workspace development (Use Class B1a,b,c);
- Up to 2,000 sq m GEA of retail (Use Class A1 and/or A2 and/or A3 and/or A4);
- Up to 5,500 sq m GEA of social infrastructure (Use Class D1 and/or D2);
- A three-form entry primary school;
- The associated works to create hard and soft landscaping, new public open spaces including equipped areas for play, sustainable drainage systems, car parking provision, and formation of new pedestrian and vehicular access.

1.6 Approach to this Technical Note

Arup has prepared this technical note to set out the methodology for developing the trip generation assessment for MWP2.

This assessment is required to identify the quantum of multi-modal trips generated by the proposed development. This will be achieved through:

- Proposed land-uses;
- TRICS/TRAVL data from comparable developments;
- Bottom-up, first principles approaches providing trip estimates disaggregated by land use; and
- An assessment of the linked nature and internalisation of certain trips by journey purpose.

The remainder of this technical note addresses the points identified above.

The purpose of this note is to seek agreement with the local and strategic planning authorities with regard to the approach undertaken.

2 Assessment Approach

2.1 Assessment Scenario

The proposal entails the development of MWP2 for up to 274,750 sqm (GEA) of residential led mixed use development.

The planning application takes a flexible approach with maximum land use quantum being applied for the proposed development. The site will be not able to accommodate the maximum floor areas for all land uses. For example, the option to provide a Hotel, Purpose Built Student Accommodation (PBSA) and/or Large-Scale Purpose Built Shared Living (LSPBSL would reduce the maximum number of residential dwellings that could be provided.

For the purposes of this assessment, the reasonable development scenario is assessed which considers a robust case in terms of trip generation. This is set out in the following table. So, for example, the student accommodation would have less effect on peak hour movement, whereas a hotel would create a different balance of demand from pure residential. As a result, for the assessment no student accommodation was assumed, and a hotel was included together with reduced residential (reflecting the maximum limit) to provide a robust case in terms of trip generation.

Table 2: Assumed development quantum for assessment

Land Use	Maximum floor area	Assessment Development Quantum
Residential (C3)	2,300 homes	2,215 homes. This is lower than the maximum to allow the provision for a hotel.
Hotel (C1)	16,000 sqm	180 rooms
PBSA / LSPBSL (Sui Generis)	18,000 sqm	Residential use would generate more peak hour trips and therefore no PBSA / LSPBSL assumed.
Commercial workspace (B1 a, b, c)	26,500 sqm	26,500 sqm
Retail (A1-A4)	2,000 sqm	2,000 sqm (assumed 1200 sqm A1 retail, 800 sqm A3 cafes and restaurants)
Social infrastructure (D1-D2)	5,500 sqm	5,500 sqm (assume 3,250 sqm library, 500 sqm health centre, 1,750 gym)
Primary School	4,750 sqm (three-form entry)	4,750 sqm (two-form entry with 450 pupils)

The planning application will be submitted in outline, therefore at this stage, a number of assumptions have been made around the nature of some of the land uses proposed. This is set out in further detail the following sections of this report.

2.2 Methodology

This report reviews the previously consented Phase 1 trip generation methodology for the residential land uses in light of new sites available in TRICS and differences in the nature of the MWP2 residential provision.

Following this, the report outlines a proposed methodology for the non-residential land uses included within the MWP2 application.

The trip generation assessment has focussed on the weekday morning (8:00 – 9:00), evening (17:00 – 18:00) and interpeak peak hours (13:00 – 14:00) (which acts as a Saturday peak hour proxy), to reflect when the operation of the transport network will be at its highest.

The following sections will consider each land use in turn, outlining the proposed methodology for assessing the anticipated multimodal trip generation associated with the development proposals. It should be noted that the numbers outlined within this report are subject to rounding.

3 C3 Residential Trip Generation Assessment

The MWP2 development envisages the provision of 2,215 flats. At this stage the proportion of private and affordable type flats is yet to be fixed. Therefore, an assumption of 65% private (1,440) and 35% affordable (775) has been used in this assessment to reflect policy requirements.

3.1 Phase 1 Consented Residential Trip Rates and Mode Shares

For Phase 1, it was agreed with LBE and TfL that a combination of TRICS and TRAVL sites would be used. The consented residential total people trip rates are provided in Table 3.

Table 3: Consented Meridian Water Phase 1 Residential Total People Trip Rates

Time Period	Total People Trip Rates (per dwelling)		
	In	Out	Total
08:00 – 09:00	0.086	0.399	0.485
17:00 – 18:00	0.249	0.143	0.392

The residential travel to work mode share was then applied, with adjustments to reflect public transport improvements. The consented mode shares are shown in Table 4.

Table 4: Consented Meridian Water Phase 1 Residential Mode Shares

Mode	Consented Residential Mode Share
Work mainly at or from home	7%
Underground, metro, light rail or tram	6%
Train	17%
Bus, minibus or coach	27%
Taxi	0%
Motorcycle, scooter or moped	1%
Driving a car or van	20%
Passenger in a car or van	6%
Bicycle	7%
On foot	8%
Other method of travel to work	1%

3.2 MWP2 Trip Generation Approach

To establish suitable trip rates for MWP2, the approved Phase 1 total people trip rates have been reviewed against the latest data available within the TRICS database.

An assessment of the proposed private and affordable flats has been undertaken separately. The resulting trip generation by mode has then been combined proportionally by the provision of 65% private flats and 35% affordable flats (in line with policy requirements, although the specific split is yet to be confirmed) to

provide a combined total residential multimodal trip generation for comparison with Phase 1.

3.2.1 Private Flats

The TRICS database was used to identify relevant total people residential trip rates per dwelling associated with the 1,314 private flats.

This assessment considers the total number of movements by mode and the impact of local travel characteristics is therefore relevant. Sites within Greater London were therefore selected for their relevance to the location of the MWP2 site.

Relevant comparable sites were selected in line with the criteria outlined below:

- **Land use and Category:** 03 Residential; C- Flats Privately Owned
- **Regions:** Greater London;
- **Location type:** Edge of Town Centre, Suburban Area and Neighbourhood Centres
- **Survey Date Range:** 01/01/2013 - 31/12/2018
- **Survey Days:** Weekday
- **Units:** 100 +

This selection criteria resulted in the following sites being identified:

Table 5: Weekday Residential (Private Flats) TRICS Site Selection

Site	Area	Units	Parking per unit	PTAL Rating	TRICS Reference
Royal Waterside, Park Royal	Brent	170	1.2	3 Moderate	BT-03-C-01
Emerald Gardens, Wembley	Brent	472	0.3	5 Very Good	BT-03-C-02
Brentford Lock West	Hounslow	150	0.7	2 Poor	HO-03-C-03
Isleworth	Hounslow	203	0.7	3 Moderate	HO-03-C-04
Reflections, Romford	Havering	493	0.5	2 Poor	HV-03-C-02
Bessant Drive, Kew	Richmond	120	1.4	1b Very poor	RD-03-C-03
Canaletto Tower, Islington	Islington	157	0.3	6a Excellent	IS-03-C-04

Further criteria were considered during interrogation of the resulting sites. Site IS-03-C-04 (highlighted above) was identified as having a high PTAL and a central London location – uncharacteristic of the proposed MWP2 site. This survey site was therefore excluded from the trip generation assessment.

The remaining applicable sites produced the peak hour vehicle and person trip rates per unit presented in Table 6.

Table 6: Weekday Person and Vehicle Trip Rates per unit (Private Flats) derived from TRICS Site Selection

Trip Rate	Time Period	Arrivals	Departures	Total
Person Trip Rate Per unit	AM Peak (0800-0900)	0.072	0.386	0.458
	Interpeak (13:00 - 14:00)	0.124	0.145	0.269
	PM Peak (1700-1800)	0.270	0.134	0.404
Vehicle Trip Rate Per unit	AM Peak (0800-0900)	0.025	0.074	0.099
	PM Peak (1700-1800)	0.083	0.046	0.129

This assessment produced the modal split shown in Table 7.

Table 7: MWP2 Residential (Private Flats) TRICS Derived Mode Share

Mode	Mode Share											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	26%	17%	18%	24%	23%	24%	26%	27%	26%	23%	23%	23%
Taxi	4%	1%	2%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Motorcycle	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Vehicle Passenger	3%	8%	7%	9%	7%	8%	10%	13%	11%	10%	10%	10%
Pedestrian	41%	28%	30%	28%	37%	33%	22%	23%	22%	29%	29%	29%
Cycle	1%	2%	2%	2%	1%	2%	1%	1%	1%	1%	1%	1%
Bus/Tram	13%	16%	15%	15%	16%	15%	15%	15%	15%	13%	15%	14%
Rail	4%	14%	13%	7%	4%	5%	13%	4%	10%	9%	8%	8%
Underground	4%	14%	13%	14%	10%	12%	10%	13%	11%	12%	13%	12%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

3.2.2 Affordable Flats

The same methodology used in section 3.2.1 for private flats was used when considering the 707 affordable flats. TRICS was used to obtain relevant comparable sites following the selection criteria outlined below:

- **Land use and Category:** 03 - Residential B - Affordable/Local Authority Houses
- **Regions:** Greater London;
- **Location type:** Edge of Town Centre, Suburban Area and Neighbourhood Centres
- **Survey Date Range:** 01/01/2013 - 31/12/2018
- **Survey Days:** Weekday
- **Units:** 100 +

This selection criteria resulted in the following sites being identified:

Table 8: Weekday Residential (Affordable Flats) TRICS Site Selection

Site	Area	Units	Parking per unit	PTAL Rating	TRICS Reference
Dollis Hill Estate, Brent	Brent	160	1.0	2	BT-03-D-01
Barnsbury Estate, Islington	Islington	250	0.3	5	IS-03-D-02
Liverpool Road Estate, Highbury	Islington	247	0.0	5	IS-03-D-04

The peak hour vehicle and person trip rates per unit, is presented in Table 9.

Table 9: Weekday Person and Vehicle Trip Rates per unit (Affordable Flats) derived from TRICS Survey Sites

Trip Rate	Time Period	Arrivals	Departures	Total
Person Trip Rate Per unit	AM Peak (0800-0900)	0.126	0.689	0.815
	Interpeak (13:00 - 14:00)	0.155	0.145	0.300
	PM Peak (1700-1800)	0.367	0.221	0.588
Vehicle Trip Rate Per unit	AM Peak (0800-0900)	0.046	0.117	0.163
	PM Peak (1700-1800)	0.064	0.046	0.110

This assessment produced the modal split shown in Table 10.

Table 10: MWP2 Residential (Affordable Flats) TRICS Derived Mode Share

Mode	Mode Share											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	23%	14%	15%	12%	15%	13%	13%	15%	14%	14%	15%	15%
Taxi	5%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Motorcycle	0%	0%	0%	0%	0%	0%	1%	2%	1%	1%	1%	1%
Vehicle Passenger	0%	14%	12%	12%	5%	9%	8%	8%	8%	7%	7%	7%
Pedestrian	64%	41%	44%	55%	42%	49%	49%	52%	50%	52%	50%	51%
Cycle	3%	1%	2%	0%	2%	1%	3%	5%	4%	2%	3%	2%
Bus/Tram	5%	19%	17%	19%	27%	23%	16%	12%	14%	15%	14%	15%
Coach	0%	0%	0%	0%	2%	1%	0%	0%	0%	0%	0%	0%
Rail	2%	9%	8%	3%	7%	5%	8%	4%	7%	8%	8%	8%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

3.2.3 Total MWP2 Residential Provision

The trip rates derived for the proposed private and affordable flats have been combined in accordance with the estimated provision of each housing type (65% private and 35% affordable). The resulting overall residential trip rates are shown within Table 11.

Table 11: Total MWP2 Residential Weekday Person and Vehicle Trip Rates Per Unit

Trip Rate	Time Period	Arrivals	Departures	Total
Person Trip Rate Per unit	AM Peak (0800-0900)	0.091	0.492	0.583
	Interpeak (13:00 - 14:00)	0.135	0.145	0.280
	PM Peak (1700-1800)	0.304	0.164	0.468
Vehicle Trip Rate Per unit	AM Peak (0800-0900)	0.032	0.089	0.121
	PM Peak (1700-1800)	0.076	0.046	0.122

This assessment produced the modal split shown in Table 12.

Table 12: MWP2 Total Residential Mode Share Before Adjustment

Mode	Mode Share											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	25%	16%	17%	20%	20%	20%	22%	23%	22%	20%	20%	20%
Taxi	4%	1%	1%	1%	0%	1%	1%	2%	2%	1%	1%	1%
Motorcycle	1%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Vehicle Passenger	2%	10%	9%	10%	6%	8%	9%	12%	10%	9%	9%	9%
Pedestrian	49%	32%	35%	38%	39%	39%	31%	33%	32%	37%	36%	37%
Cycle	2%	1%	2%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Bus/Tram	10%	17%	16%	16%	19%	18%	15%	14%	15%	14%	15%	14%
Coach	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Rail	3%	12%	11%	6%	5%	5%	11%	4%	9%	8%	8%	8%
Underground	3%	9%	8%	9%	6%	8%	7%	9%	7%	8%	8%	8%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

3.2.4 Comparison with Phase 1 Total Residential Trip Generation

The combined (private and affordable) total daily residential mode share derived for the MWP2 application has been compared to the consented Phase 1 mode shares in Table 13. It should be noted that the TRICS approach used for the MWP2 trip generation assessment quantifies the total number of trips made per unit. It therefore does not identify a proportion for home working.

Table 13: Comparison Phase 1 Consented and MWP2 Derived Residential Mode Shares

Mode	Consented Phase 1 Mode Share	Proposed MWP2 Mode Share
Underground, metro, light rail or tram	6%	8%
Train	17%	8%
Bus, minibus or coach	27%	14%
Taxi	0%	1%
Motorcycle, scooter or moped	1%	1%
Driving a car or van	20%	20%

Mode	Consented Phase 1 Mode Share	Proposed MWP2 Mode Share
Passenger in a car or van	6%	9%
Bicycle	7%	2%
On foot	8%	37%
Work mainly at or from home	7%	0%
Other method of travel to work	1%	0%
Total	**100%**	**100%**

Table 13 demonstrates that the percentage mode share for vehicular trips are the same between the consented Phase 1 and MWP2 trip generation assessments at 20%. Likewise, the mode shares for vehicle passenger, motorcycle, underground, bicycle and car trips are very comparable.

The MWP2 assessment predicts a lower bus mode share and a higher pedestrian mode share when compared to the Phase 1 consented trip rates. This is applicable to the mixed-use nature of the MWP2 proposals – creating a local centre by providing a range of local facilities to future residents within walking distance. This difference in predicted mode shares is therefore reasonable and reflective of the specific nature of MWP2.

There are also differences between those using the train to travel. One of limitations of using Journey to Work Census data for modal split is that it does not consider trips made for other purposes (education, retail, leisure etc.). As such it tends to significant under represent walking or journeys on foot. Furthermore, the Census data from 2011 is now 8 years old, whilst the assessment set out in this note has only included TRICS surveys undertaken within the last 5 years. Due to the reasons outlined above, it was deemed more representative of the proposed developed to use TRICS modal splits compared to those suggested by Census data.

As a result of the points above, the MWP2 trip generation methodology is considered to produce a robust and acceptable assessment of prospective travel patterns in the area for residential uses when compared with the Phase 1 consented methodology.

3.2.5 Adjustment for Car Parking Provision

It is the intention for the level of parking to be restricted across the entire masterplan development. Phase 1 was given consent based on a parking provision of 0.4 spaces per unit. The ambition is to make Meridian Water an essentially car-free development and the aim is to provide 0.25 spaces per unit, which would essentially satisfy the requirement for Blue Badge parking, visitors and essential users only.

The site will be well served by public transport as well as having excellent connections to the walking and cycling network and therefore it is considered that an ambitious level of parking restriction could be achieved, in keeping with national, regional and local policies.

Car parking provision has a relationship with the quantum of vehicular trips generated. In order to benchmark any adjustments to the TRICS generated mode

shares, the car ownership levels for the sites in TRICS used to derive the MWP2 mode share in Table 12 were interrogated using 2011 Census Car Ownership data. The resulting weighted average car ownership for the private and affordable sites selected are shown in Table 14 and Table 15.

Table 14: MWP2 Private Flats TRICS Sites Car Ownership

Site	Area	Units	Census Output Areas	Car Ownership (per unit)
Royal Waterside, Park Royal	Brent	170	E00174692	0.63
Emerald Gardens, Wembley	Brent	472	E00174722	0.34
Brentford Lock West	Hounslow	150	E00013330	0.63
Isleworth	Hounslow	203	E00168883	1.12
Reflections, Romford	Havering	493	E00166784	0.62
Bessant Drive, Kew	Richmond	120	E00174880	0.72
Weighted Average				**0.61**

Table 15: MWP2 Affordable Flats TRICS Sites Car Ownership

Site	Area	Units	Census Output Areas	Car Ownership (per unit)
Dollis Hill Estate, Brent	Brent	160	E00002424	0.81
Barnsbury Estate, Islington	Islington	250	E00013416	0.29
Liverpool Road Estate, Highbury	Islington	247	E00013945	0.41
Weighted Average				**0.46**

The overall car ownership when combining the estimated 65% private and 35% affordable provision equates to circa 0.6 cars per unit. This level of car ownership is associated with the 20% total daily vehicular mode share calculated for MWP2 in Table 12.

The MWP2 development is envisaged to provide a car parking provision of 0.25 spaces per dwelling. As such, the vehicular mode share has been factored down in line with the lower levels of parking provision and therefore an anticipated lower level of car ownership. This is a reduction from 0.6 cars per unit from the TRICS analysis to 0.3 cars per unit (on the basis of a provision of 0.25 car parking spaces per dwelling with an additional 0.05 flexibility for assessment robustness). Trips have been reallocated pro rata to all other modes bar walking and cycling (long distance modes only).

It is acknowledged that there may not be a perfect linear relationship between car ownership and vehicle trip rates, however the allowance of a 0.05 additional ownership figure builds in a level of flexibility around this relationship.

The resulting revised residential mode share for the MWP2 private and affordable flats are shown within

Table *16* and *Table 17.*

Table 16: MWP2 Private Flats Residential Mode Share – Adjusted for Parking Provision

Mode	Mode Share											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	13%	8%	9%	12%	11%	12%	13%	13%	13%	12%	11%	11%
Taxi	7%	1%	2%	1%	1%	1%	2%	4%	3%	2%	2%	2%

Mode	Mode Share											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Motorcycle	2%	1%	1%	1%	2%	2%	2%	1%	2%	1%	1%	1%
Vehicle Passenger	1%	4%	3%	5%	3%	4%	5%	7%	5%	5%	5%	5%
Pedestrian	41%	28%	30%	28%	37%	33%	22%	23%	22%	29%	29%	29%
Cycle	1%	2%	2%	2%	1%	2%	1%	1%	1%	1%	1%	1%
Bus/Tram	20%	20%	20%	21%	23%	22%	21%	24%	22%	19%	21%	20%
Coach	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Rail	7%	18%	16%	10%	5%	8%	19%	6%	15%	13%	11%	12%
Underground	7%	18%	17%	20%	14%	17%	15%	21%	17%	17%	19%	18%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table 17: MWP2 Affordable Flats Residential Mode Share – Adjusted for Parking Provision

Mode	Mode Share											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	15%	9%	10%	8%	10%	9%	9%	10%	9%	9%	10%	9%
Taxi	8%	1%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Motorcycle	0%	1%	1%	0%	0%	0%	1%	3%	2%	1%	1%	1%
Vehicle Passenger	0%	9%	8%	8%	3%	6%	5%	5%	5%	5%	5%	5%
Pedestrian	64%	41%	44%	55%	42%	49%	49%	52%	50%	52%	50%	51%
Cycle	3%	1%	2%	0%	2%	1%	3%	5%	4%	2%	3%	2%
Bus/Tram	9%	25%	23%	26%	32%	29%	20%	17%	19%	19%	19%	19%
Coach	0%	0%	0%	0%	3%	1%	0%	0%	0%	0%	0%	0%
Rail	3%	12%	11%	5%	8%	6%	10%	6%	9%	10%	11%	10%
Underground	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

The overall mode share when combining the estimated 65% private and 35% affordable provision is shown within *Table 18.*

Table 18: MWP2 Total Residential Mode Share – Adjusted for Parking Provision

Mode	Mode Share											
	AM			**Interpeak**			**PM**			**Daily**		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	14%	9%	9%	10%	11%	11%	11%	12%	12%	11%	11%	11%
Taxi	7%	1%	2%	1%	1%	1%	2%	3%	2%	2%	2%	2%
Motorcycle	1%	1%	1%	1%	1%	1%	1%	2%	2%	1%	1%	1%
Vehicle Passenger	1%	6%	5%	6%	3%	5%	5%	6%	5%	5%	5%	5%
Pedestrian	49%	32%	35%	38%	39%	39%	31%	33%	32%	37%	36%	37%
Cycle	2%	1%	2%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Bus/Tram	16%	22%	21%	23%	26%	25%	21%	21%	21%	19%	20%	20%
Coach	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Rail	5%	16%	15%	8%	6%	7%	16%	6%	13%	12%	11%	12%
Underground	4%	12%	11%	13%	9%	11%	10%	14%	11%	11%	12%	12%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

The resulting mode share is therefore a more realistic calculation of the anticipated mode share of prospective residents of the MWP2 development.

The total trip generation envisaged for the circa 2,215 home MWP2 development is shown in Table 19.

Table 19: MWP2 Total Residential Trip Generation

Mode	Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	28	96	123	30	35	65	74	42	117	612	626	1238
Taxi	14	13	24	2	2	5	14	11	24	111	112	223
Motorcycle	2	7	9	2	5	7	9	8	17	79	73	152
Vehicle Passenger	1	70	73	18	11	28	34	22	56	280	281	561
Pedestrian	104	374	476	116	125	241	225	133	358	2313	2277	4590
Cycle	4	16	20	3	5	8	14	10	24	98	109	207
Bus/Tram	30	247	278	69	84	153	141	75	215	1138	1205	2344
Coach	0	0	0	0	3	3	0	0	0	3	3	6
Rail	10	166	178	24	21	45	102	22	127	671	666	1336
Underground	7	102	110	36	30	66	58	41	98	555	608	1164
Total	**201**	**1090**	**1291**	**301**	**320**	**621**	**671**	**364**	**1035**	**5858**	**5962**	**11820**

4 C1 Hotel Trip Generation Methodology

To determine the number of trips generated in the peak hours and daily by the proposed 180-bedroom hotel, TRICS was used to obtain relevant comparable sites following the selection criteria outlined below:

- **Land use and Category:** 06 - Hotel;
- **Regions:** UK *(in the absence of Greater London sites);*
- **Survey Date Range:** 01/01/2013 - 31/12/2018
- **Survey Days:** Weekday

This site selection is shown within Table 20. A number of sites were removed that were not considered representative of the hotel development proposed due to their associated parking provision; these are highlighted in the table below.

Table 20: Hotel TRICS Site Selection

Site	Bedrooms	Employees	PTAL	Parking	TRICS Reference
Holiday Inn – Bexley	107	50	3 Moderate	158	BE-06-A-02
Holiday Inn – Aylesbury	139	70	N/A	179	BU-06-A-02
Hotel – Carlisle	92	54	N/A	31	CB-06-A-01
Ibis – Manchester	127	2	N/A		GM-06-A-08
Novotel – Greenwich	151	35	4 Good	36	GR-06-A-03
Premier Inn - Cheltenham Spa	67	25	N/A	63	GS-06-A-02
Premier Inn – Nottingham	87	39	N/A	70	NT-06-A-02
Thistle – Middlesbrough	132	76	N/A	64	TV-06-A-04
Hotel – Newcastle Upon Tyne	24	19	N/A	19	TW-06-A-03
Holiday Inn Express – Swindon	134	30	N/A	2	WL-06-A-02

The peak hour person and vehicular trip rates per room are presented in *Table 21*.

Table 21: Weekday person and vehicular trip rates for C1 Hotel derived from TRICS Survey Sites

Trip Rate	Time Period	Arrivals	Departures	Total
Person Trip Rate Per Room	AM Peak (0800-0900)	0.179	0.331	0.510
	Interpeak (13:00 - 14:00)	0.135	0.160	0.295
	PM Peak (1700-1800)	0.310	0.182	0.492
Vehicle Trip Rate Per Room	AM Peak (0800-0900)	0.154	0.231	0.385
	PM Peak (1700-1800)	0.171	0.107	0.278

This assessment produced the modal split shown in Table 22.

Table 22: MWP2 C1 Hotel TRICS Derived Mode Share

Mode	Mode Shares											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	76%	64%	68%	60%	57%	59%	51%	53%	51%	55%	57%	56%
Taxi	8%	4%	5%	2%	0%	1%	1%	2%	2%	3%	3%	3%
Motorcycle	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
Vehicle Passenger	1%	17%	11%	16%	16%	16%	16%	5%	12%	18%	17%	18%
Pedestrian	6%	15%	12%	20%	17%	19%	27%	33%	29%	19%	19%	19%
Cycle	4%	0%	1%	0%	4%	2%	1%	1%	1%	1%	1%	1%
Bus/Tram	5%	1%	2%	2%	4%	3%	1%	5%	2%	2%	2%	2%
Coach	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Rail	0%	0%	0%	0%	1%	1%	3%	1%	2%	1%	1%	1%
Underground	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Applying the trip rates shown in Table 21 and the mode shares outlined within Table 22 to the proposed 180-bedroom hotel results in the estimated trip generation shown in Table 23 inclusive of employee and visitor trips.

Table 23: MWP2 C1 Hotel Trip Generation – Pre-adjustment

Mode	Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	25	38	62	15	17	31	28	17	46	322	332	654
Taxi	3	2	5	0	0	0	1	1	2	16	16	32
Motorcycle	0	0	0	0	0	0	0	0	0	1	1	2
Vehicle Passenger	0	10	10	4	5	9	9	2	11	107	100	207
Pedestrian	2	9	11	5	5	10	15	11	26	110	110	220
Cycle	1	0	1	0	1	1	0	0	1	5	6	10
Bus/Tram	2	0	2	0	1	2	0	2	2	11	10	22
Coach	0	0	0	0	0	0	0	0	0	1	1	2
Rail	0	0	0	0	0	0	2	0	2	8	6	14
Underground	0	0	0	0	0	0	0	0	0	0	0	0
Total	**32**	**60**	**92**	**24**	**29**	**53**	**56**	**33**	**89**	**581**	**583**	**1163**

The vehicular trip generation calculated is influenced by the parking provision available at the TRICS sites used to derive it. An average number of car parking spaces per room was calculated from the TRICS survey sites in Table 21. This equated to 0.64 parking spaces per bedroom; equivalent to 115 spaces when applied to the proposed 180 bed hotel. The vehicular trip generation in Table 23 is therefore based on a provision of 115 spaces onsite, an overestimate when compared with the proposed parking quantum.

The proposed development will provide 60 spaces onsite in line with the peak anticipated vehicular accumulation.

The vehicular mode share has therefore been proportionally factored down in line with the proposed lower level of parking provision (from 115 to 60). Trips have been reallocated pro rata to all other modes bar walking and cycling (long distance modes only).

The trip rates derived from the selected TRICS survey sites indicated limited trips by rail and a high number of trips by taxi. The specific location of the proposed MWP2 development will enable high accessibility to rail services as a main mode of travel. It was therefore deemed reasonable to reallocate 50% of anticipated taxi trips to rail.

The resulting estimated trip generation associated with the proposed 180-bedroom hotel is outlined within *Table 24*.

Table 24: Final MWP2 C1 Hotel Trip Generation – Post-adjustment

Mode	**Trip Generation**											
	AM			**Interpeak**			**PM**			**Daily**		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	13	20	33	8	9	16	15	9	24	168	174	342
Taxi	5	11	15	2	0	2	2	2	4	51	55	106
Motorcycle	0	0	0	0	0	0	2	0	2	7	8	15
Vehicle Passenger	0	5	5	2	2	4	5	1	6	56	52	108
Pedestrian	2	9	11	5	5	10	15	11	26	110	110	220
Cycle	1	0	1	0	1	1	0	0	1	5	6	10
Bus/Tram	6	4	12	5	9	14	2	7	11	73	73	146
Coach	0	0	0	0	0	0	0	0	0	7	8	15
Rail	5	11	15	2	3	5	14	3	15	103	97	200
Underground	0	0	0	0	0	0	0	0	0	0	0	0
Total	**32**	**60**	**92**	**24**	**29**	**53**	**56**	**33**	**89**	**581**	**583**	**1163**

5 D1 Education Trip Generation Methodology

The MWP2 development proposals include the provision of a primary school onsite. The anticipated primary school capacity and child yield of the MWP2 development are provided within Table 25.

Table 25: Education Assessment Assumptions

School	School Capacity	Site Child Yield
Primary	450	390

5.1 Primary School Trip Rates – All Journey Purposes

To determine the prospective trip rates of the proposed primary school, TRICS was used to obtain relevant comparable sites following the selection criteria outlined below:

- **Land use and Category:** 04 - Education; A - Primary
- **Regions:** UK *(in the absence of Greater London sites)*
- **Survey Date Range:** 01/01/2013 - 31/12/2018
- **Survey Days:** Weekday

This selection criteria resulted in the following sites being identified:

Table 26: Weekday Education (Primary School) TRICS Site Selection

Site	Pupils	Parking	Employees	GFA	TRICS Reference
Primary – Blackburn	472	23	75	3359	LC-04-A-05
Primary - Blackpool	449	5	90	4520	LC-04-A-06
Primary – Liverpool	264	16	31	2500	MS-04-A-02
Primary – Merthur Tydfil	184	20	26	1000	MT-04-A-01
Primary – Scunthorpe	147	14	22	625	NE-04-A-01
Employee to Pupil Ratio	0.16				

From these sites an employee to pupil ratio of 0.16 was derived in order to estimate the likely number of employee trips per pupil associated with the proposed primary school. This equates to a total of 72 employees.

The peak hour person trip rates per pupil, is presented in Table 27.

Table 27: Weekday Total People Trip Rates per Pupil (Primary) derived from TRICS Survey Sites

Trip Rate	Time Period	Arrivals	Departures	Total
Total People Trip Rate Per Pupil	AM Peak (0800-0900)	1.183	0.332	1.515
	PM Peak (1700-1800)	0.022	0.051	0.073

The trip rates shown in Table 27 comprise trips made by pupils, those escorting pupils to school, visitors and staff. It was assumed that negligible trips would be made during the interpeak hour.

5.2 Mode Share

Primary schools within the local area were reviewed in order to inform the derivation of an appropriate mode share for the prospective MWP2 primary school. Meridian Angel Primary School, located adjacent to Phase 1 and approximately 700m (as the crow flies) from MWP2; was granted consent in 2014 for a facility with greater capacity (Ref: 14/04205/FUL).

The trip generation assessment undertaken as part of that application used mode shares derived from pupil and employee survey data collected the old school. This was then compared to survey data from other local primary schools as provided by LBE. That assessment concluded that the mode shares derived from the surveys of the Meridian Angel Primary School were reflective of general travel patterns to/from local primary schools. The mode share comparison within the Transport Assessment submitted as part of the application is summarised within Table 28 and an average of the mode shares considered has been calculated.

Table 28: Meridian Angel Primary School Mode Share Evidence Base

School		% Walk	% Cycle	% Car (including car share)	% Public Transport	Sum
Brettenham primary	Pupil	67%	2%	20%	10%	100%
	Staff	19%	3%	67%	12%	100%
Fleecefield primary	Pupil	75%	0%	16%	9%	100%
	Staff	10%	2%	84%	4%	100%
St Johns and St James C of E primary	Pupil	69%	1%	17%	13%	100%
	Staff	26%	5%	41%	28%	100%
Meridian Angel (pre-2014)	Pupil	73%	3%	12%	12%	100%
	Staff	0%	0%	79% (65% Car, 14% Car Share)	21%	100%
Average	Pupil	71%	2%	16%	11%	100%
	Staff	14%	3%	68%	16%	100%

Table 28 demonstrates that the mode shares used within the Meridian Angel Transport Assessment present broadly consistent travel habits in the local area. Therefore, the average mode shares for pupil and staff have been used as the basis for deriving the multimodal primary school trip generation for the MWP2 application.

The following assumptions were made in the derivation of the final mode shares used within this assessment:

- The staff *'Car and Car Share'* category was split proportionally using the breakdown provided by the Meridian Angel survey highlighted in Table 28; resulting in an average split of 68% Car and 12% Car Share. The Meridian Angel application assumed that car sharing staff would include two staff members per vehicle – therefore those car sharing represent one

vehicle trip and one vehicle passenger trip. Half of the car share proportion of trips has therefore been allocated to vehicles and half to vehicle passengers. This results in a 62% vehicular mode share and 6% vehicle passenger mode share.

- For robustness it is assumed that pupils will arrive 1 per vehicle as assumed in the Meridian Angel assessment. Each pupil that travels by car would therefore equate to one vehicle trip (with a car driver escort) and one passenger trip (the pupil). The 16% car proportion was therefore replicated in both vehicle and vehicle passenger mode shares, resulting in a recalculation of the overall % for each mode.
- Due to the local availability of public transport and catchment areas for primary schools it has been assumed that all public transport trips will be made by bus.
- The 'pupil' mode share has been applied for all non-staff trips (i.e. trips by pupils, pupil escorts and visitors). The 'staff' mode shares have been applied to trips by employees only.

The final pupil/pupil escort/visitor and staff mode shares used within this assessment are outlined within Table 29.

Table 29: Final Primary School Pupil and Staff Mode Shares

Final mode shares	% Walk	% Cycle	% Vehicle	% Vehicle passenger	% Bus	Sum
Pupil/Pupil Escort/Visitors	61%	1%	14%	14%	9%	100%
Staff	14%	3%	62%	6%	16%	100%

5.3 Employee Trip Rates

The TRICS assessment outlined in the section 6.1 provides a trip rate for trips of all purposes to the proposed MWP2 primary school. In order to apply the specific staff and non-staff mode shares derived above the employee trips have been isolated in line with the following assumptions provided within the Meridian Angel application:

- 32% staff would arrive 8-9am;
- 16% staff depart 3-4pm; and
- 13% staff arrive during 3-4pm.
-

Assuming each member of staff makes one arrival trip and one departure trip per day, this results in the distribution of trips per staff member for the peak hours and daily shown in Table 30.

Table 30: Primary School Employee Trip Rates

Total Trips Per Employee	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
	0.32	0	0.32	0	0	0	0	0	0	1	1	2

5.4 Final Primary School Trip Generation

Applying the employee trip rates in Table 30 and the staff mode shares outlined in Table 29 to the estimated 72 employees onsite results in the estimated trip generation shown in Table 31.

Table 31: MWP2 Total Primary School Employee Trip Generation

Mode	Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	14	0	14	0	0	0	0	0	0	45	45	89
Taxi	0	0	0	0	0	0	0	0	0	0	0	0
Motorcycle	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Passenger	1	0	1	0	0	0	0	0	0	4	4	9
Pedestrian	3	0	3	0	0	0	0	0	0	10	10	20
Cycle	1	0	1	0	0	0	0	0	0	2	2	4
Bus/Tram	4	0	4	0	0	0	0	0	0	12	12	24
Coach	0	0	0	0	0	0	0	0	0	0	0	0
Rail	0	0	0	0	0	0	0	0	0	0	0	0
Underground	0	0	0	0	0	0	0	0	0	0	0	0
Total	**23**	**0**	**23**	**0**	**0**	**0**	**0**	**0**	**0**	**73**	**73**	**145**

In order to derive the number of trips made for all other purposes (pupils, pupil escorts and visitors) the TRICS all journey purpose trip rates were applied to the circa 450 pupil capacity of the school, and the employee trips deducted from this total. The non-staff mode shares outlined within Table 29 were then applied - resulting in the estimated trip generation shown in Table 32. It should be noted that where trips that were derived from TRICS and from first principals for employees could not be reconciled (i.e. where the number of employee trips by a particular mode was greater than the total trips predicted by TRICS) these trips have been double counted for robustness.

Table 32: MWP2 Total Primary School Pupil/Pupil Escort/Visitor Trip Generation

Mode	Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	60	21	81	0	0	0	1	3	5	87	86	173
Taxi	0	0	0	0	0	0	0	0	0	0	0	0
Motorcycle	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Passenger	73	21	94	0	0	0	1	3	5	127	127	254
Pedestrian	323	91	414	0	0	0	6	14	20	565	563	1128
Cycle	6	2	8	0	0	0	0	0	0	10	10	21
Bus/Tram	47	14	61	0	0	0	1	2	3	77	77	154
Coach	0	0	0	0	0	0	0	0	0	0	0	0
Rail	0	0	0	0	0	0	0	0	0	0	0	0
Underground	0	0	0	0	0	0	0	0	0	0	0	0
Total	509	149	659	0	0	0	10	23	33	867	863	1730

The overall total trip generation for the peak hours and across the day associated with the proposed primary school as part of the MWP2 application is therefore shown within Table 33.

Table 33: MWP2 Total Primary School Trip Generation

Mode	Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	75	21	96	0	0	0	1	3	5	132	131	263
Taxi	0	0	0	0	0	0	0	0	0	0	0	0
Motorcycle	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Passenger	75	21	96	0	0	0	1	3	5	132	131	263
Pedestrian	326	91	417	0	0	0	6	14	20	575	573	1148
Cycle	7	2	9	0	0	0	0	0	0	12	12	24
Bus/Tram	50	14	65	0	0	0	1	2	3	89	89	178
Coach	0	0	0	0	0	0	0	0	0	0	0	0
Rail	0	0	0	0	0	0	0	0	0	0	0	0
Underground	0	0	0	0	0	0	0	0	0	0	0	0
Total	**532**	**149**	**682**	**0**	**0**	**0**	**10**	**23**	**33**	**940**	**936**	**1876**

The estimated primary school child yield of the site equates to 390 pupils. The proposed primary school will have a capacity of circa 450 pupils and is envisaged to mainly serve residents of the proposed development (it is acknowledged that that a small proportion of pupils will attend other local schools, however this is considered to have a negligible impact on this assessment).

The trips shown in Table 33 would therefore be generated by residents of MWP2. These trips would form part of the residential trip generation assessment and would therefore be internal to the MWP2 site or part of a linked trip (for example as part of a commuting trip). As internal and linked trips would form a proportion of the trip generation calculated in Table 33, a third of the Pupil/Pupil Escort/Visitor vehicular trips are considered to be internal/linked and not additional trips generated by the primary school development. Trips made by walking and cycling are also considered to be internal to the MWP2 site.

5.5 Nursery

It is currently unknown whether some of the D1 provision on site will be designated as nurseries (in line with the outline nature of the proposals). As such this has not been considered and trips to the D1 land uses will be covered by other Leisure uses. This was deemed as a robust assessment as any nursery provision on site is likely to only serve residents on site and as such all trips to and from the nursery will either be by walking, cycling or linked/internal trips via other modes.

6 B1 Business Trip Generation Methodology

The MWP2 development proposals include the provision of B1 Business in a number of forms. As the development proposals are being submitted in outline an assumed split has been applied to assume a mix of specific land use types for the purposes of the assessment as shown in Table 34.

Table 34: Assumed B1 Business Land Use Types for Assessment

Land Use	Assumed Land Use Type for Assessment	Quantum (sqm)	
B1 Total		26,500	22500
	B1a Offices	10,600	GIA
	B1b R&D	7,950	GIA
	B1c Light Industrial	7,950	GIA

The approach to each land use type is set out within the following sections.

6.1 B1a General Office - Corporate

MWP2 will provide circa 10,600 sqm GIA of B1a General Office floorspace, equivalent to a provision of 8,480 sqm NIA using a standard conversion rate of gross to net ratio of 80% GIA to NIA.

6.1.1 Employee Trip Rates

To calculate the peak hour and daily person trips generated by the proposed B1a General Office type provision, the following first principles methodology has been adopted to reflect the likely trip generation of new office development in light of the latest office density research available for London.

The following assumptions were made as part of this first principals approach:

- It is assumed that each office employee occupies 10.9 sqm NIA. This is based on the GLA London Office Floorspace Projections Report 2014[1];
- An assumption of an 85% daily employee attendance rate has been used based on professional judgement and industry accepted assumptions to account for those on annual leave, sick leave and those working away from the office;
- It is assumed that 55% of office employees travel in the peak direction during the AM or PM peak hour. This is as set out in the TfL Transport Assessment Best Practice Guide (2010). The use of the 55% factor in the PM peak hour is particularly robust, as PM departures are more dispersed than AM arrivals;
- A further 5% of employees have been assumed to travel in the opposite direction to the peak flow to account for differing working patterns;
- To account for visitors a trip rate of 0.3 people per 100sqm NIA was applied to the office floorspace; based on previous accepted methodologies and professional judgement. Visitors are assumed to adopt the same arrival and departure profile as employees; and

[1] Available here: https://www.london.gov.uk/what-we-do/planning/london-plan/london-office-policy-reviews

- Negligible interpeak trips were anticipated with the majority captured as part of the trip generation assessment of other proposed land uses (e.g. retail and leisure).

The resulting total people trips that would be generated by this provision is shown within Table 35.

Table 35: B1a General Office Person Trips – First Principles Approach

	Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Staff	364	33	397	33	364	397	661	661	1323	364	33	397
Visitors	14	1	15	1	14	15	25	25	51	14	1	15
Total	378	34	412	34	378	412	687	687	1373	378	34	412

6.1.2 Employee Mode Share

The proposed mode split of trips associated with the B1a office land use has been derived from 2011 Census data for employee population method of journey to work.

The Medium Super Output Area (MSOA) in which the MWP2 site is located (E02000309) was compared with other surrounding MSOA's in the London borough of Enfield and Haringey. The census mode shares and average overall mode shares are shown within Table 36.

Table 36: Method of Travel to Work (Workplace population) for the MSOA's surrounding the Site

Area	**Train**	**Underground**	**Bus, minibus or coach**	**Taxi**	**Motorcycle/ scooter/ moped**	**Driving a car or van**	**Passenger in a car or van**	**Bicycle**	**On foot**	**All**
E02000309 : Enfield 033*	5%	6%	25%	0%	1%	50%	4%	2%	7%	100%
E02000306 : Enfield 030	7%	4%	18%	0%	1%	58%	3%	2%	7%	100%
E02000303 : Enfield 027	7%	6%	18%	1%	1%	53%	3%	2%	9%	100%
E02006793 : Enfield 037	7%	7%	20%	1%	1%	50%	3%	1%	11%	100%
E02000398 : Haringey 002	6%	9%	18%	0%	1%	53%	4%	3%	6%	100%
E02006794 : Haringey 037	8%	12 %	22%	0%	1%	40%	3%	3%	10%	100%
Average	7%	8%	20%	0%	1%	51%	3%	2%	8%	100%

* Site Location

The average mode shares recorded were used within this assessment.

Applying the mode shares outlined within Table 36 to the trip generation shown in Table 35 results in the estimated trip generation shown in Table 37 inclusive of employee and visitor trips.

Table 37: MWP2 B1a Office Trip Generation

Mode	Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	191	17	208	0	0	0	17	191	208	347	347	694
Taxi	1	0	2	0	0	0	0	1	2	3	3	5
Motorcycle	3	0	3	0	0	0	0	3	3	5	5	11
Vehicle Passenger	13	1	14	0	0	0	1	13	14	23	23	46
Pedestrian	32	3	35	0	0	0	3	32	35	58	58	115
Cycle	9	1	10	0	0	0	1	9	10	16	16	32
Bus/Tram	76	7	83	0	0	0	7	76	83	138	138	275
Coach	0	0	0	0	0	0	0	0	0	0	0	0
Rail	25	2	27	0	0	0	2	25	27	46	46	91
Underground	28	3	31	0	0	0	3	28	31	52	52	103
Total	378	34	412	0	0	0	34	378	412	687	687	1373

6.2 B1b Research & Development

MWP2 will provide circa 7,950 sqm GIA of B1b Research & Development, equivalent to a provision of 6,360 sqm NIA using a gross to net ratio of 80% GIA to NIA.

To calculate the peak hour and daily person trips generated by the proposed B1b Research & Development-type provision, the same approach as outlined for the proposed B1a General Office above was implemented, with the exception of the employment density assumed.

For this land use it was considered more appropriate to use a density factor of 50 sqm NIA per employee, a midpoint in the density range of 40-60 sqm found within the GLA's Employment Density Guide (2014).

The resulting person trips calculated using this approach is shown in Table 40.

Table 38: B1b Research & Development Person Trips – First Principles

	Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Staff	59	5	65	5	59	65	108	108	216	59	5	65
Visitors	2	0	2	0	2	2	4	4	8	2	0	2
Total	62	6	67	6	62	67	112	112	225	62	6	67

The mode share derived within the B1a General Office assessment in section 7.1 (Table 36) was used within this assessment of B1b Research & Development provision.

Applying the mode shares outlined within Table 36 to the total estimated number of trips in the peak hours and daily in Table 38 results in the estimated total trip generation shown in Table 39.

Table 39: MWP2 B1b Research & Development Trip Generation

Mode	Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	31	3	34	0	0	0	3	31	34	57	57	113
Taxi	0	0	0	0	0	0	0	0	0	0	0	1
Motorcycle	0	0	1	0	0	0	0	0	1	1	1	2
Vehicle Passenger	2	0	2	0	0	0	0	2	2	4	4	8
Pedestrian	5	0	6	0	0	0	0	5	6	9	9	19
Cycle	1	0	2	0	0	0	0	1	2	3	3	5
Bus/Tram	12	1	14	0	0	0	1	12	14	23	23	45
Coach	0	0	0	0	0	0	0	0	0	0	0	0
Rail	4	0	4	0	0	0	0	4	4	7	7	15
Underground	5	0	5	0	0	0	0	5	5	8	8	17
Total	62	6	67	0	0	0	6	62	67	112	112	225

6.3 B1c Light Industrial

MWP2 will provide circa 7,950 sqm GIA of B1c Light Industrial floorspace, equivalent to a provision of 6,360 sqm NIA using a gross to net ratio of 80% GIA to NIA.

To calculate the peak hour and daily person trips generated by the proposed B1c Light Industrial-type provision, the same approach as outlined for the proposed B1a General Office above was implemented, with the exception of the employment density assumed.

For this Office type it was considered more appropriate to use the corresponding B1c Light Industrial density factor of 47 sqm NIA per employee found within the GLA's Employment Density Guide (2014).

The resulting person trips calculated using this approach is shown in Table 40.

Table 40: B1c Light Industrial Person Trips – First Principles

	Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Staff	63	6	69	6	63	69	4	4	8	63	6	69
Visitors	2	0	3	0	2	3	135	135	271	2	0	3
Total	66	6	72	6	66	72	139	139	278	66	6	72

The mode share derived within the B1a General Office assessment in section 7.1 is an appropriate proxy for prospective B1c Light Industrial employees.

Therefore, the modal split within Table 36 has been used within this assessment.

Applying the mode shares outlined within Table 36 to the total estimated number of trips in the peak hours and daily in Table 40 results in the estimated total trip generation shown in Table 41.

Table 41: MWP2 Total B1c Light Industrial Trip Generation

Mode	Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	33	3	36	0	0	0	3	33	36	60	60	121
Taxi	0	0	0	0	0	0	0	0	0	0	0	1
Motorcycle	1	0	1	0	0	0	0	1	1	1	1	2
Vehicle Passenger	2	0	2	0	0	0	0	2	2	4	4	8
Pedestrian	6	1	6	0	0	0	1	6	6	10	10	20
Cycle	2	0	2	0	0	0	0	2	2	3	3	6
Bus/Tram	13	1	14	0	0	0	1	13	14	24	24	48
Coach	0	0	0	0	0	0	0	0	0	0	0	0
Rail	4	0	5	0	0	0	0	4	5	8	8	16
Underground	5	0	5	0	0	0	0	5	5	9	9	18
Total	66	6	72	0	0	0	6	66	72	119	119	239

6.4 Total B1 Business Trips

Combining the multimodal trips associated with all proposed B1 Business class provisions results in the weekday peak hour and daily quantum of trips shown in Table 42.

Table 42: MWP2 Total B1 Business Trip Generation – pre-adjustment

Mode	Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	255	23	279	0	0	0	23	255	279	464	464	928
Taxi	2	0	2	0	0	0	0	2	2	3	3	7
Motorcycle	4	0	4	0	0	0	0	4	4	7	7	14
Vehicle Passenger	17	2	19	0	0	0	2	17	19	31	31	62
Pedestrian	42	4	46	0	0	0	4	42	46	77	77	154
Cycle	12	1	13	0	0	0	1	12	13	21	21	43
Bus/Tram	101	9	110	0	0	0	9	101	110	184	184	368
Coach	0	0	0	0	0	0	0	0	0	0	0	0
Rail	34	3	37	0	0	0	3	34	37	61	61	122
Underground	38	3	41	0	0	0	3	38	41	69	69	138
Total	505	46	551	0	0	0	46	505	551	918	918	1837

The trip generation exercise estimates that circa 464 vehicle arrivals and departures will be generated by the proposed total B1 Business provision.

In accordance with parking standards outlined within the Draft London Plan (2017) the maximum provision of parking for the total proposed office element of MWP2 equates to 36 spaces.

The vehicular mode share has been factored down in line with the lower levels of parking provision (from 464 to 36). Trips have been reallocated pro rata to all other modes bar walking and cycling (long distance modes only).

The resulting estimated trip generation is outlined within Table 43.

Table 43: MWP2 Total B1 Business Trip Generation – Post-adjustment

Mode	**Trip Generation**											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	20	2	22	0	0	0	2	20	22	36	36	72
Taxi	5	0	5	0	0	0	0	5	5	8	8	16
Motorcycle	9	1	10	0	0	0	1	9	10	17	17	34
Vehicle Passenger	1	0	1	0	0	0	0	1	1	2	2	5
Pedestrian	42	4	46	0	0	0	4	42	46	77	77	154
Cycle	12	1	13	0	0	0	1	12	13	21	21	43
Bus/Tram	244	22	266	0	0	0	22	244	266	443	443	886
Coach	0	0	0	0	0	0	0	0	0	0	0	0
Rail	81	7	88	0	0	0	7	81	88	147	147	294
Underground	91	8	100	0	0	0	8	91	100	166	166	332
Total	505	46	551	0	0	0	46	505	551	918	918	1837

7 Retail Trip Generation Methodology

The MWP2 development is proposed to include some local-level retail provision. As the development proposals are being submitted in outline an assumed split has been applied to assume a mix of retail land use classes as shown in Table 44.

Table 44: Assumed Retail Provision

Land Use	Assumed Land Use Type for assessment	Quantum	
A1/A2/A3/A4 Retail Total		**2,000**	**GIA**
	A1 Retail; Convenience Store	400	GIA
	A1 Retail; Shopping Centre - Local Shops	800	GIA
	A3 Pub/Restaurant	800	GIA

The approach to each retail land use type is set out within the following sections.

7.1 A1 Retail Convenience Store

MWP2 will provide a total of 2,000 sqm GIA A1/A2/A3/A4 Retail, of which a proportion of this will likely take the form of local convenience stores. It is assumed in this instance that the maximum size of a convenience store is 280 sqm[2]. Considering the location of MWP2 in relation to other retail offers it is reasonable to assume that a maximum of 2 convenience stores will be provided on site, assumed to be circa 200sqm GIA within this assessment. The total convenience store provision assumed across the MWP2 site therefore equates to 400 sqm GIA.

To determine the number of trips generated in the peak hours and across the day by the proposed convenience stores, TRICS was used to obtain relevant comparable sites following the selection criteria outlined below:

- **Land use and Category:** 01 - Retail; O - Convenience Store
- **Regions:** Greater London
- **Survey Date Range:** 01/01/2013 - 31/12/2018
- **Survey Days:** Weekday

This site selection is shown within Table 45. A number of sites were removed that were not considered representative of the retail convenience store proposed due to their access to public transport (e.g.BT-01-O-01) and parking availability (e.g. EN-01-O-02); highlighted within the following table.

Table 45: Retail Convenience Store TRICS Site Selection

Site	GFA (sqm)	Employees	PTAL	Parking	TRICS Reference
Tesco Express - Wembley	310	18	5 Very Good	0	BT-01-O-01
Co-Operative - Enfield	375	24	3 Moderate	0	EN-01-O-01
Little Waitrose - Enfield	795	12	3 Moderate	44	EN-01-O-02
The Co-Operative - Enfield	257	10	1b Very poor	0	KI-01-O-01

[2]The Local Shops Report 2016, Association of Convenience Stores

The peak hours person and vehicular trip rates per 100sqm GFA are presented in Table 46.

Table 46: Weekday Person Trip Rates for A1 Retail Convenience Store derived from TRICS Survey Sites

Trip Rate	Time Period	Arrivals	Departures	Total
Person Trip Rate Per 100sqm GFA	AM Peak (0800-0900)	17.847	17.559	35.406
	Interpeak (13:00 - 14:00)	18.941	18.998	37.939
	PM Peak (1700-1800)	18.365	18.48	36.845
Vehicle Trip Rate Per 100sqm GFA	AM Peak (0800-0900)	3.109	2.015	5.124
	PM Peak (1700-1800)	1.9	2.591	4.491

This assessment produced the modal split shown in Table 47.

Table 47: MWP2 A1 Retail Convenience Store TRICS Derived Mode Share

Mode	Mode Shares											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	15%	9%	12%	9%	7%	8%	10%	13%	11%	12%	12%	12%
Taxi	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Motorcycle	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Vehicle Passenger	1%	1%	1%	1%	2%	2%	1%	3%	2%	2%	2%	2%
Pedestrian	54%	70%	62%	79%	80%	79%	48%	64%	56%	63%	70%	66%
Cycle	0%	0%	0%	1%	2%	1%	3%	2%	2%	2%	1%	1%
Bus/Tram	24%	8%	16%	8%	6%	7%	18%	14%	16%	14%	8%	11%
Coach	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Rail	2%	9%	6%	2%	2%	2%	12%	3%	8%	4%	3%	4%
Underground	3%	2%	2%	1%	0%	0%	8%	0%	4%	3%	1%	2%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Applying the trip rates shown in Table 46 and the mode shares outlined within Table 47 to the total proposed 400 sqm GIA retail convenience store provision results in the estimated trip generation shown in Table 48 inclusive of employee and visitor trips.

Table 48: MWP2 A1 Retail Convenience Store Trip Generation

Mode	Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	11	6	17	6	6	12	7	10	17	119	121	240
Taxi	0	0	0	0	0	0	0	0	0	4	4	8
Motorcycle	0	0	1	0	0	0	0	0	0	1	1	3
Vehicle Passenger	1	1	2	1	2	3	1	3	3	23	23	46
Pedestrian	38	49	87	60	61	120	35	47	83	617	687	1304
Cycle	0	0	0	1	1	2	2	1	3	15	14	29
Bus/Tram	17	5	22	6	5	10	13	10	23	138	82	220
Coach	0	0	0	0	0	0	0	0	0	0	0	0
Rail	2	6	8	1	2	3	9	3	11	43	33	76
Underground	2	1	3	1	0	1	6	0	6	26	10	36
Total	71	70	142	76	76	152	73	74	147	987	975	1962

7.2 A1 Retail; Local Shops

The remaining MWP2 retail provision (1,600 sqm GIA) has been split between A1 local shops (800 sqm GIA) and A3 food & beverage (800 sqm GIA).

To determine the number of trips generated in the peak hours and daily by the proposed A1 retail local shops, an alternative method was used. Due to a lack of representative surveys undertaken across London available in TRICS, the download function of TRICS was used to search historic TRAVL data. This approach was used in order to isolate the *Southside Centre* (Survey code 505) site; which is a well-used comparable proxy for a land use provision of this type. The site specific details are as follows:

- **Name:** Southside Centre (Shops)
- **Land use and Category:** A1 - Other Use
- **Borough/Area:** Wandsworth / Inner London
- **Survey Date:** 23/06/07
- **PTAL:** 5
- **GFA:** 47, 278

Whilst it is appreciated that this is an older survey, beyond the recommended 5-year limit, there is a lack of other survey information that represent the travel characteristics of this type of retail offer. On balance therefore, it has been determined that this gives a more realistic and comparable travel evidence base.

The peak hours person and vehicular trip rates per 100sqm GFA are presented in Table 49.

Table 49: Weekday Person Trip Rates for A1 Retail Local Shops derived from TRAVL Survey Site

Trip Rate	Time Period	Arrivals	Departures	Total
Person Trip Rate Per 100sqm GFA	AM Peak (0800-0900)	1.04	0.44	1.48
	Interpeak (13:00 - 14:00)	5.76	4.63	10.39
	PM Peak (1700-1800)	4.96	7.49	12.44
Vehicle Trip Rate Per 100sqm GFA	AM Peak (0800-0900)	0.10	0.04	0.14
	PM Peak (1700-1800)	0.40	0.71	1.10

This assessment produced the modal split shown in *Table 50*.

Table 50: MWP2 A1 Retail Local Shops TRAVL Derived Mode Share

Mode	Mode Share											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	10%	9%	10%	9%	9%	9%	8%	9%	9%	9%	9%	9%
Taxi	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Motorcycle	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Vehicle Passenger	3%	4%	4%	7%	6%	6%	27%	21%	24%	11%	13%	12%
Pedestrian	55%	65%	60%	74%	77%	75%	57%	63%	60%	45%	61%	53%
Cycle	3%	4%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bus/Tram	24%	7%	15%	7%	6%	7%	6%	5%	5%	17%	13%	15%
Coach	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Rail	2%	8%	5%	1%	2%	2%	1%	2%	2%	11%	3%	7%
Underground	3%	2%	2%	1%	0%	0%	1%	0%	0%	7%	0%	4%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Applying the trip rates shown in Table 49 and the mode shares outlined within Table 50 to the estimated proposed 800 sqm GIA of A1 retail local shops results in the estimated trip generation shown in Table 51, inclusive of employee and visitor trips.

Table 51: MWP2 A1 Retail Local Shops Trip Generation

Mode	Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	1	0	1	4	3	8	3	6	9	40	39	79
Taxi	0	0	0	0	0	0	0	0	0	0	0	0
Motorcycle	0	0	0	0	0	0	0	0	0	0	0	1
Vehicle Passenger	0	0	0	3	2	5	11	13	23	46	58	104
Pedestrian	5	2	7	34	28	63	23	38	60	193	274	464
Cycle	0	0	0	0	0	0	0	0	0	2	2	4
Bus/Tram	2	0	2	3	2	5	2	3	5	71	59	131
Coach	0	0	0	0	0	0	0	0	0	0	0	0
Rail	0	0	1	1	1	2	0	1	2	48	15	64
Underground	0	0	0	0	0	0	0	0	0	31	1	34
Total	8	4	12	46	37	83	40	60	100	432	448	881

7.3 A3 Food and Beverage

For the purposes of this assessment, 800 sqm GIA of the total retail provision is envisaged to take the form of A3 food & beverage.

To determine the number of trips generated in the peak hours and daily, TRICS was used to obtain relevant comparable sites following the selection criteria outlined below:

- **Land use and Category:** 06 - Hotel, Food & Drink C - Pub/Restaurant
- **Regions:** UK *(in order to gather a larger number of sites)*

- **Size:** < 400 sqm
- **Survey Date Range:** 01/01/2013 - 31/12/2018
- **Survey Days:** Weekday

This site selection is shown within Table 52.

Table 52: A3 Food and Beverage TRICS Site Selection

Site	GFA (sqm)	Employees	Parking	PTAL Rating	TRICS Reference
Wetherspoon – Bristol	327	70	0	N/A	BR-06-C-01
Pub/Restaurant – Shoreditch	320	23	0	6b (High) Excellent	HK-06-C-01
Pub/Restaurant – Canonbury	350	15	0	6a Excellent	IS-06-C-01
Pub/Restaurant - Clerkenwell	320	8	0	6a Excellent	IS-06-C-02
Pub/Restaurant - Waterloo	220	13	0	6a Excellent	LB-06-C-01
Pub/Restaurant - Wandsworth	400	10	0	6a Excellent	WH-06-C-01
Pub/Restaurant - Wolverhampton	200	13	14	N/A	WM-06-C-02
Pub/Restaurant - Worcester	250	11	0	N/A	WO-06-C-03

Site WM-06-C-02 was deselected on account of the high associated parking provision. Site BR-06-C-01 was also deselected as this site produced anomalously high total people trip rates per 100 sqm GFA (44 PM peak two way total people trips per 100 sqm GFA). Many of the remaining sites are located in areas of a much higher PTAL than the proposed MWP2 site. Sites in areas measuring at a higher PTAL display travel characteristics skewed towards sustainable modes rather than vehicular.

It is acknowledged that a provision of this nature could take a number of forms. This assessment intends to capture the trip generation associated with retail developments of this specific F&B nature whereas a different F&B retail offering (such as a café) could display similar travel habits captured in the other forms of retail assessed (such as convenience stores).

As this proposed retail provision will primarily serve residents and employees of the site itself and the local area (not forming a retail destination for external trips) this was considered to be acceptable.

The peak hour person and vehicular trip rates per 100 sqm GFA are presented in Table 53. It should be noted that all surveys start post AM peak.

Table 53: Weekday Person Trip Rates for A3 Food and Beverage derived from TRICS Survey Sites

Trip Rate	Time Period	Arrivals	Departures	Total
Person Trip Rate Per 100sqm GFA	AM Peak (0800-0900)	0.000	0.000	0.000
	Interpeak (13:00 - 14:00)	7.682	7.270	14.952

Trip Rate	Time Period	Arrivals	Departures	Total
	PM Peak (1700-1800)	13.672	7.682	21.354
Vehicle Trip Rate Per 100sqm GFA	AM Peak (0800-0900)	0.000	0.000	0.000
	PM Peak (1700-1800)	0.366	0.091	0.457

This assessment produced the modal split shown in *Table 54.*

Table 54: MWP2 A3 Food and Beverage TRICS Derived Mode Share

Mode	Mode Share											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	0%	0%	0%	25%	15%	20%	3%	1%	2%	9%	10%	9%
Taxi	0%	0%	0%	0%	0%	0%	0%	1%	0%	3%	4%	4%
Motorcycle	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Vehicle Passenger	0%	0%	0%	4%	1%	2%	0%	1%	0%	1%	1%	1%
Pedestrian	0%	0%	0%	47%	68%	57%	75%	64%	71%	70%	62%	66%
Cycle	0%	0%	0%	0%	1%	0%	0%	2%	1%	1%	1%	1%
Bus/Tram	0%	0%	0%	14%	10%	12%	4%	4%	4%	7%	7%	7%
Coach	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Rail	0%	0%	0%	9%	6%	8%	17%	27%	21%	10%	15%	12%
Underground	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Applying the trip rates shown in Table 53 and the mode shares outlined within Table 54 to the estimated proposed 800 sqm GIA of A3 Food and Beverage results in the estimated trip generation shown in Table 55 inclusive of employee trips.

Table 55: MWP2 A3 Food and Beverage Trip Generation

Mode	Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	0	0	0	16	9	24	3	1	4	115	117	232
Taxi	0	0	0	0	0	0	0	0	1	45	45	90
Motorcycle	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Passenger	0	0	0	3	0	3	0	0	1	9	11	20
Pedestrian	0	0	0	29	40	68	82	39	121	904	734	1638
Cycle	0	0	0	0	0	0	0	1	1	12	12	23
Bus/Tram	0	0	0	9	6	14	5	3	7	89	77	166
Coach	0	0	0	0	0	0	0	0	0	0	0	0
Rail	0	0	0	6	4	9	19	17	36	126	180	306
Underground	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	61	58	120	109	61	171	1301	1175	2476

It is acknowledged that a provision of this nature could take a number of forms. This assessment intends to capture the trip generation associated with retail developments of this specific F&B nature whereas a different F&B retail offering (such as a café) could display similar travel habits captured in the other forms of retail assessed (such as convenience stores).

7.4 Total Retail Trips

Combining the multimodal trips associated with all proposed retail provisions results in the weekday peak hour and daily quantum of trips shown in Table 56.

Table 56: MWP2 Total Retail Trip Generation

Mode	Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep	Total	Arr.	Dep.	Total
Vehicles	12	7	19	26	18	44	13	16	29	275	276	551
Taxi	0	0	0	0	0	0	1	1	1	49	49	99
Motorcycle	0	0	1	0	0	0	0	0	0	2	2	4
Vehicle Passenger	1	1	2	7	4	11	12	15	27	77	92	169
Pedestrian	43	51	95	123	129	252	140	124	264	1715	1694	3406
Cycle	0	0	1	1	2	3	2	2	5	28	28	56
Bus	19	6	24	18	12	30	20	16	36	299	218	517
Coach	0	0	0	0	0	0	0	0	0	0	0	0
Rail	2	7	9	7	6	14	28	20	48	217	227	445
Underground	2	1	4	1	0	1	6	0	6	57	11	70
Total	80	74	153	183	171	354	222	195	418	2720	2598	5318

The proposed retail provision will primarily serve residents and employees of the site itself (not forming a destination for external trips). Therefore, the trips calculated will be internal to the site or form part of a linked trip (e.g. to employment).

8 D1 / D2 Social Infrastructure Trip Generation Methodology

The MWP2 development proposals include the provision of D1/D2 facilities. As the proposals are being submitted in outline with just an overall quantum of D1/D2, a split has been applied to assume a mix of social infrastructure land use classes as shown in Table 57.

Table 57: Assumed Social Infrastructure Provision

Land Use	Assumed Land Use Type for assessment	Quantum	
D1 / D2 Social Infrastructure		**5,500**	**GIA**
	D1 Healthcare	500	GIA
	D1 Library	3250	GIA
	D2 Gym	1750	GIA

The approach to each land use type is set out within the following sections.

8.1 D1 Healthcare

It has been assumed for the purposes of this assessment that the proposed D1 healthcare provision would take the form of a local GP surgery, predominantly serving residents of the proposed development, but likely to also serve the wider local community.

To determine the number of trips generated in the peak hours and across the day by the proposed GP Surgery, TRICS was used to obtain relevant comparable sites following the selection criteria outlined below:

- **Land use and Category:** 05 - Health/G - GP Surgeries
- **Regions:** UK *(in the absence of Greater London sites)*
- **Survey Date Range:** 01/01/2013 - 31/12/2018
- **Survey Days:** Weekday

A number of sites were removed that were not considered representative of the medical facility proposed due to their access to public transport and parking availability. This final site selection is as follows:

Table 58: Medical facility TRICS Site Selection

Site	Floor Area	Employees	Doctors	Parking	TRICS Reference
GP Surgery Cardiff	450 sqm	7	7	24	CF-05-G-02
GP Surgery Dundee	350 sqm	5	5	48	DU-05-G-01
GP Surgery Lincoln	506 sqm	4	4	17	LN-05-G-01
GP Surgery Nottingham	460 sqm	2	2	10	NT-05-G-01
GP Surgery Knaresborough	416 sqm	6	6	22	NY-05-G-02

The peak hours person and vehicular trip rates per 100 sqm GFA are presented in Table 59.

Table 59: Weekday Person and Vehicle Trip Rates derived from TRICS Survey Sites

Trip Rate	Time Period	Arrivals	Departures	Total
Person Trip Rate Per 100sqm GFA	AM Peak (0800-0900)	5.591	2.75	8.341
	Interpeak (13:00 - 14:00)	4.033	2.429	6.462
	PM Peak (1700-1800)	3.346	5.866	9.212
Vehicle Trip Rate Per 100sqm GFA	AM Peak (0800-0900)	3.529	1.65	5.179
	PM Peak (1700-1800)	2.062	3.162	5.224

This assessment produced the modal split shown in Table 60.

Table 60: MWP2 D1 Healthcare TRICS Derived Mode Share

Mode	Mode Share											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	61%	56%	60%	41%	50%	44%	62%	54%	57%	47%	47%	47%
Taxi	0%	2%	1%	0%	0%	0%	0%	0%	0%	1%	1%	1%
Motorcycle	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Vehicle Passenger	8%	7%	7%	15%	6%	12%	12%	9%	10%	12%	12%	12%
Pedestrian	18%	30%	22%	38%	34%	37%	25%	33%	30%	34%	34%	34%
Cycle	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	1%	1%
Bus/Tram	13%	5%	10%	6%	10%	7%	1%	2%	2%	4%	4%	4%
Coach	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Rail	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Underground	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Applying the trip rates shown in Table 59 and the mode shares outlined within Table 60 to the proposed 500 sqm GIA healthcare facility results in the estimated trip generation shown in Table 61.

Table 61: MWP2 D1 Healthcare Trip Generation – Pre-adjustment

Mode	Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	17	8	25	8	6	14	10	16	26	156	155	311
Taxi	0	0	0	0	0	0	0	0	0	5	4	9
Motorcycle	0	0	0	0	0	0	0	0	0	1	1	2
Vehicle Passenger	2	1	3	3	1	4	2	3	5	41	41	83
Pedestrian	5	4	9	8	4	12	4	10	14	114	113	227
Cycle	0	0	0	0	0	0	0	0	0	2	2	5
Bus	4	1	4	1	1	2	0	1	1	14	14	28
Coach	0	0	0	0	0	0	0	0	0	0	0	0
Rail	0	0	0	0	0	0	0	0	0	0	0	1
Underground	0	0	0	0	0	0	0	0	0	0	0	0
Total	**28**	**14**	**42**	**20**	**12**	**32**	**17**	**29**	**46**	**333**	**332**	**665**

The vehicular trip generation calculated is influenced by the parking provision available at the TRICS sites used to derive it. An average number of car parking spaces per 100sqm GFA was calculated from the TRICS survey sites in Table 58. This equated to around 6 parking spaces per 100sqm GFA; equivalent to 30 spaces when applied to the proposed 500sqm GP Surgery. The vehicular trip generation in Table 61 is therefore based on a provision of 30 spaces onsite, an overestimate when compared with the proposed parking quantum.

The proposed development will provide 18 spaces onsite in line with the peak anticipated vehicular accumulation and some flexibility.

The vehicular mode share has therefore been proportionally factored down in line with the proposed lower level of parking provision (from 30 to 18). Trips have been reallocated pro rata to all other modes bar walking and cycling (long distance modes only).

The resulting estimated trip generation is outlined within Table 62.

Table 62: MWP2 Health Trip Generation – Post-adjustment

Mode	Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	10	5	15	5	4	9	6	10	16	94	94	187
Taxi	0	1	1	0	0	0	0	0	0	23	22	44
Motorcycle	1	0	1	0	0	0	0	0	0	4	4	7
Vehicle Passenger	1	1	2	2	0	2	1	2	3	25	25	50
Pedestrian	5	4	9	8	4	12	4	10	14	114	113	227
Cycle	0	0	0	0	0	0	0	0	0	2	2	5
Bus/Tram	11	3	14	6	4	10	5	6	11	70	71	140
Coach	0	0	0	0	0	0	0	0	0	0	0	0
Rail	0	0	0	0	0	0	0	2	3	2	1	3
Underground	0	0	0	0	0	0	0	0	0	0	0	0
Total	28	14	42	20	12	32	17	29	46	333	332	665

A proportion of the trips associated with the proposed medical facility will be made by future residents of MWP2 and will therefore be internal to the site. Due to the facility's close proximity to these future residents it has been assumed that these trips comprise the walking and cycling trips described in Table 62.

Patients from further afield served by the facility generate external trips made by the remaining modes.

8.2 D1 Library

The remaining MWP2 D1 provision (3,250 sqm GIA) is envisaged to take the form of a community library.

In order to determine the likely trip generation of this proposed land use TRICS was used to obtain relevant comparable sites following the selection criteria outlined below:

- **Land use and Category:** 07 - Leisure V - Library

- **Regions:** Greater London;
- **Survey Date Range:** 01/01/2013 - 31/12/2018
- **Survey Days:** Weekday

This selection criteria resulted in one site being identified:

Table 63: Library TRICS site selection

Site	GFA (sqm)	Employees	PTAL	Parking	TRICS Reference
Library - Wandsworth	900	13	6a Excellent	0	WH-07-V-01

The single site available is in an area with a higher PTAL than that of the proposed MWP2 site. Sites in areas measuring at a higher PTAL display travel characteristics skewed towards sustainable modes rather than vehicular. As this proposed leisure provision will primarily serve residents and employees of the site itself (not forming a destination for external trips) this was considered to be acceptable.

The peak hours person and vehicular trip rates per 100sqm GFA are presented in Table 64.

Table 64: Weekday Person and Vehicle Trip Rates derived from TRICS Survey Sites

Trip Rate	Time Period	Arrivals	Departures	Total
Person Trip Rate Per 100sqm GFA	AM Peak (0800-0900)	0.778	0.000	0.778
	Interpeak (13:00 - 14:00)	8.111	6.999	15.111
	PM Peak (1700-1800)	3.778	4.889	8.667
Vehicle Trip Rate Per 100sqm GFA	AM Peak (0800-0900)	0.111	0.000	0.111
	PM Peak (1700-1800)	0.111	0.222	0.333

This assessment produced the modal split shown in Table 65.

Table 65: MWP2 D1 Library TRICS Derived Mode Share

Mode	Mode Share											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	14%	0%	14%	4%	5%	4%	3%	5%	4%	4%	4%	4%
Taxi	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Motorcycle	0%	0%	0%	1%	2%	1%	0%	0%	0%	1%	1%	1%
Vehicle Passenger	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%
Pedestrian	14%	0%	14%	75%	75%	75%	68%	66%	67%	70%	70%	70%
Cycle	14%	0%	14%	0%	0%	0%	3%	2%	3%	1%	1%	1%
Bus/Tram	57%	0%	57%	16%	16%	16%	26%	27%	27%	20%	20%	20%
Coach	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Rail	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	3%	3%
Underground	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%	0%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Applying the trip rates shown in Table 64 and the mode shares outlined within Table 65 to the estimated proposed 3,250 sqm GFA Library facility results in the estimated trip generation shown in Table 66.

Table 66: MWP2 D1 Library Trip Generation – Pre-adjustment

Mode	Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	4	0	4	11	11	22	4	7	11	87	87	174
Taxi	0	0	0	0	0	0	0	0	0	0	0	0
Motorcycle	0	0	0	4	4	7	0	0	0	14	14	29
Vehicle Passenger	0	0	0	0	0	0	0	0	0	11	11	22
Pedestrian	4	0	4	199	170	368	83	105	188	1410	1410	2820
Cycle	4	0	4	0	0	0	4	4	7	25	25	51
Bus/Tram	14	0	14	43	36	79	33	43	76	402	402	804
Coach	0	0	0	0	0	0	0	0	0	0	0	0
Rail	0	0	0	7	7	14	0	0	0	65	58	123
Underground	0	0	0	0	0	0	0	0	0	0	0	0
Total	25	0	25	264	227	491	123	159	282	2015	2008	4023

The trip generation exercise estimates a total of 87 daily vehicle arrivals and departures. This proposed leisure provision will primarily serve residents and employees of the site itself (not forming a destination for external trips) and therefore one blue badge bay will be provided only.

The vehicular mode share has therefore been factored down in line with the lower levels of parking provision (from 87 daily vehicle arrivals and departures to one blue badge arrival and departure). Trips have been reallocated pro rata to all other modes bar walking and cycling (long distance modes only).

The resulting estimated trip generation is outlined within *Table 24*.

Table 67: MWP2 D1 Library Trip Generation – Post-adjustment

Mode	**Trip Generation**											
	AM			**Interpeak**			**PM**			**Daily**		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	0	0	0	0	0	0	0	0	0	1	1	2
Taxi	0	0	0	0	0	0	0	0	0	0	0	0
Motorcycle	0	0	0	4	4	9	0	0	0	17	17	35
Vehicle Passenger	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian	4	0	4	199	170	368	83	105	188	1410	1410	2820
Cycle	4	0	4	0	0	0	4	4	7	25	25	51
Bus/Tram	18	0	18	52	44	96	36	50	87	483	484	967
Coach	0	0	0	0	0	0	0	0	0	0	0	0
Rail	0	0	0	9	9	17	0	0	0	78	70	148
Underground	0	0	0	0	0	0	0	0	0	0	0	0
Total	25	0	25	264	227	491	123	159	282	2015	2008	4023

As this proposed leisure provision will primarily serve residents and employees of the site itself, the trips calculated will be internal to the site.

8.3 D2 Gym

The proposed MWP2 D2 provision (1,750 sqm GIA) is envisaged to take the form of a local gym.

In order to determine the likely trip generation of this proposed land use TRICS was used to obtain relevant comparable sites following the selection criteria outlined below:

- **Land use and Category:** 07 - Leisure K - Fitness Club (Private)
- **Regions:** Greater London;
- **Survey Date Range:** 01/01/2013 - 31/12/2018
- **Survey Days:** Weekday

This selection criteria resulted in the following sites being identified:

Table 68: Gym TRICS site selection

Site	GFA (sqm)	Employees	PTAL Rating	Parking	TRICS Reference
Lifestyle Fitness - Wembley	1750	15	6a	22	BT-07-K-01
The Gym – Wood Green	1440	16	6b	6	HG-07-K-02
The Gym - Angel	1225	14	6a	0	IS-07-K-02

Site BT-07-K-01was deselected on account of the high associated parking provision. The remaining sites are located in areas of a higher PTAL than the proposed MWP2 site. Sites in areas measuring at a higher PTAL display travel characteristics skewed towards sustainable modes rather than vehicular. As this proposed leisure provision will primarily serve residents and employees of the site itself (not forming a destination for external trips) this was considered to be acceptable.

The peak hours person and vehicular trip rates per 100sqm GFA are presented in Table 69.

Table 69: Weekday Person and Vehicle Trip Rates derived from TRICS Survey Sites

Trip Rate	Time Period	Arrivals	Departures	Total
Person Trip Rate Per 100sqm GFA	AM Peak (0800-0900)	2.627	3.640	6.267
	Interpeak (13:00 - 14:00)	4.090	4.728	8.818
	PM Peak (1700-1800)	8.180	3.602	11.782
Vehicle Trip Rate Per 100sqm GFA	AM Peak (0800-0900)	0.188	0.300	0.488
	PM Peak (1700-1800)	0.450	0.150	0.600

This assessment produced the modal split shown in Table 70.

Table 70: MWP2 D2 Gym TRICS Derived Mode Share

Mode	Mode Share											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	4%	7%	6%	4%	3%	3%	4%	3%	3%	7%	7%	7%
Taxi	1%	1%	1%	0%	0%	0%	0%	1%	1%	0%	0%	0%
Motorcycle	1%	0%	1%	0%	1%	0%	1%	0%	1%	1%	1%	1%
Vehicle Passenger	0%	1%	1%	1%	2%	1%	1%	0%	1%	1%	1%	1%
Pedestrian	54%	61%	58%	64%	71%	68%	58%	57%	58%	57%	55%	56%
Cycle	10%	10%	10%	3%	3%	3%	3%	4%	4%	4%	4%	4%
Bus	23%	8%	14%	17%	10%	14%	19%	19%	19%	18%	18%	18%
Coach	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Rail	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Underground	6%	11%	9%	11%	10%	11%	13%	15%	14%	13%	12%	13%
Total	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %

Applying the trip rates shown in Table 69 and the mode shares outlined within Table 70 to the estimated proposed 1,750 sqm GIA gym facility results in the estimated trip generation shown in Table 71.

Table 71: MWP2 D2 Gym Trip Generation – Pre-adjustment

Mode	Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	2	5	7	3	3	5	5	2	7	83	87	170
Taxi	1	1	1	0	0	0	1	1	1	1	1	3
Motorcycle	1	0	1	0	1	1	2	0	2	8	9	17
Vehicle Passenger	0	1	1	1	1	2	1	0	1	18	16	34
Pedestrian	25	39	64	46	58	104	83	36	119	701	644	1345
Cycle	5	7	11	2	3	5	5	3	7	51	53	104
Bus	11	5	16	12	9	21	28	12	39	219	211	430
Coach	0	0	0	0	0	0	0	0	0	0	0	0
Rail	0	0	0	0	0	0	0	1	1	0	9	9
Underground	3	7	10	8	9	16	19	9	28	157	146	304
Total	46	64	110	72	83	154	143	63	206	1239	1178	2417
Total	25	0	25	264	227	491	123	159	282	2015	2008	4023

The vehicular trip generation calculated is influenced by the parking provision available at the TRICS sites used to derive it. An average number of car parking spaces per 100sqm GFA was calculated from the TRICS survey sites in Table 68. This equated to 0.21 spaces per 100sqm GFA; equivalent to 4 spaces when applied to the proposed 1,750 sqm GIA Gym. The vehicular trip generation in *Table 71* is therefore based on a provision of 4 spaces onsite, an overestimate when compared with the proposed parking quantum.

This proposed leisure provision will primarily serve residents and employees of the site itself (not forming a destination for external trips) and therefore one blue badge bay will be provided only.

The vehicular mode share has therefore been proportionally factored down in line with the proposed lower level of parking provision (from 4 to 1). Trips have been reallocated pro rata to all other modes bar walking and cycling (long distance modes only).

The resulting estimated trip generation is outlined within Table 72.

Table 72: Final MWP2 D2 Gym Trip Generation – Post-adjustment

Mode	Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep.	Total
Vehicles	1	1	2	1	1	1	1	1	2	23	24	47
Taxi	1	1	2	0	0	0	1	1	1	2	2	3
Motorcycle	1	0	1	0	1	1	2	0	2	9	11	21
Vehicle Passenger	0	0	0	0	0	1	0	0	0	5	4	9
Pedestrian	25	39	64	46	58	104	83	36	119	701	644	1345
Cycle	5	7	11	2	3	5	5	3	7	51	53	104
Bus/Tram	12	7	19	14	10	24	30	13	43	260	253	514
Coach	0	0	0	0	0	0	0	0	0	0	0	0
Rail	0	0	0	0	0	0	0	1	1	0	11	11
Underground	3	9	12	9	10	19	21	10	31	187	175	363
Total	46	64	110	72	83	154	143	63	206	1239	1178	2417

As this proposed leisure provision will primarily serve residents and employees of the site itself, the trips calculated will be internal to the site.

8.4 Total D1/D2 Trips

Combining the multimodal trips associated with all proposed D1/D2 provisions results in the weekday peak hours and daily quantum of trips shown in Table 73.

Table 73: MWP2 Total D1/D2 Trip Generation

Mode	Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep	Total	Arr.	Dep.	Total
Vehicles	1	1	2	1	1	2	1	1	2	24	25	49
Taxi	1	1	2	0	0	0	1	1	1	2	2	3
Motorcycle	1	0	1	4	5	9	2	0	2	27	29	55
Vehicle Passenger	0	0	0	0	0	1	0	0	0	5	4	10
Pedestrian	29	39	67	245	228	473	166	141	307	2111	2054	4165
Cycle	8	7	15	2	3	5	8	6	14	77	78	155
Bus/Tram	30	7	37	66	54	120	66	63	129	743	738	1481
Coach	0	0	0	0	0	0	0	0	0	0	0	0
Rail	0	0	0	9	9	17	0	1	1	78	81	159
Underground	3	9	12	9	10	19	21	10	31	187	175	363
Total	71	64	135	335	310	645	266	222	488	3254	3185	6439

9 Delivery and Servicing Trip Generation

An assessment of the likely number of delivery and servicing vehicle trips associated with the proposed uses on site has been undertaken using TRICS to identify relevant comparable site surveys from which appropriate LGV and OGV trip rates and daily profiles have been derived.

The same selection criteria used to derive total people trips for the relevant land uses within the previous chapters were used when deriving LGV and OGV trip rates, noting the following:

- The A1 Retail Local Shops provision used servicing trip rates derived for the A1 Retail Convenience Store provision as this was considered to be a comparable proxy;
- The servicing trip rates used for the Office B1a provision were derived from B1 TRICS sites that were not constrained by parking provision and PTAL (in order to obtain a higher number of site surveys and therefore a more reflective average); and
- The servicing trip rates used for the Office B1b & B1c provision were derived from Business Park TRICS sites. Sites of this nature comprise a mix of B1 class provision; this is reflective of the nature of the proposed B1b & B1c onsite. Site selection was not constrained by parking provision and PTAL (in order to obtain a higher number of site surveys and therefore a more reflective average).

The raw TRICS outputs are included as an Appendix to this note. A summary of the servicing trip rates derived per land use is provided for MWP2 within Table 74 and trip generation in Table 75.

Table 74: MWP2 Servicing Trip Rates

	Residential (Private Flats Per Unit)				Residential (Affordable Flats Per Unit)				C1 Hotel (Per Room)			
	Time Period	*Arrivals*	*Departures*	*Totals*	*Time Period*	*Arrivals*	*Departures*	*Totals*	*Time Period*	*Arrivals*	*Departures*	*Totals*
LGV	0800-0900	0.002	0.003	0.005	0800-0900	0.014	0.011	0.025	0800-0900	0.011	0.017	0.028
	1300-1400	0.006	0.007	0.013	1300-1400	0.008	0.009	0.017	1300-1400	0.004	0.002	0.006
	1700-1800	0.007	0.007	0.014	1700-1800	0.008	0.006	0.014	1700-1800	0.013	0.008	0.021
	Daily	0.072	0.070	0.142	Daily	0.108	0.104	0.212	Daily	0.118	0.125	0.243
OGV	0800-0900	0.001	0	0.001	0800-0900	0	0	0	0800-0900	0.006	0.006	0.012
	1300-1400	0.002	0.003	0.005	1300-1400	0.002	0.002	0.004	1300-1400	0.002	0.004	0.006
	1700-1800	0.001	0.001	0.002	1700-1800	0	0	0	1700-1800	0	0	0
	Daily	0.019	0.02	0.039	Daily	0.011	0.011	0.022	Daily	0.037	0.035	0.072
	Retail Convenience Stores (Per 100sqm)				**Retail Local Shops (Per 100sqm)**				**Retail F&B (Per 100sqm)**			
	Time Period	*Arrivals*	*Departures*	*Totals*	*Time Period*	*Arrivals*	*Departures*	*Totals*	*Time Period*	*Arrivals*	*Departures*	*Totals*
LGV	0800-0900	0.115	0.173	0.288	0800-0900	0.115	0.173	0.288	0800-0900	0	0	0
	1300-1400	0.115	0.115	0.23	1300-1400	0.115	0.115	0.23	1300-1400	0.046	0.046	0.092
	1700-1800	0	0.058	0.058	1700-1800	0	0.058	0.058	1700-1800	0.091	0.091	0.182
	Daily	1.9	1.901	3.801	Daily	1.9	1.901	3.801	Daily	1.359	1.352	2.711
OGV	0800-0900	0.173	0.173	0.346	0800-0900	0.173	0.173	0.346	0800-0900	0	0	0
	1300-1400	0	0	0	1300-1400	0	0	0	1300-1400	0.046	0.091	0.137
	1700-1800	0	0	0	1700-1800	0	0	0	1700-1800	0.046	0.046	0.092
	Daily	0.636	0.634	1.27	Daily	0.636	0.634	1.27	Daily	0.375	0.375	0.750
	D1 GP Surgery (Per 100sqm)				**D1 Library (Per 100sqm)**				**D2 Gym (Per 100sqm)**			
	Time Period	*Arrivals*	*Departures*	*Totals*	*Time Period*	*Arrivals*	*Departures*	*Totals*	*Time Period*	*Arrivals*	*Departures*	*Totals*
LGV	0800-0900	0.137	0.137	0.274	0800-0900	0	0	0	0800-0900	0	0	0
	1300-1400	0.092	0.137	0.229	1300-1400	0	0	0	1300-1400	0	0	0
	1700-1800	0	0	0	1700-1800	0	0	0	1700-1800	0	0	0
	Daily	2.842	2.84	5.682	Daily	0.222	0.222	0.444	Daily	0.188	0.188	0.376
OGV	0800-0900	0	0	0	0800-0900	0	0	0	0800-0900	0	0	0
	1300-1400	0	0	0	1300-1400	0	0	0	1300-1400	0	0	0
	1700-1800	0	0	0	1700-1800	0	0	0	1700-1800	0	0	0
	Daily	0.092	0.092	0.184	Daily	0	0	0	Daily	0	0	0
	B1a Office (Per 100sqm)				**B1b Office (Per 100sqm)**				**B1c Office (Per 100sqm)**			
	Time Period	*Arrivals*	*Departures*	*Totals*	*Time Period*	*Arrivals*	*Departures*	*Totals*	*Time Period*	*Arrivals*	*Departures*	*Totals*
LGV	0800-0900	0.021	0.017	0.038	0800-0900	0.038	0.024	0.062	0800-0900	0.038	0.024	0.062
	1300-1400	0.009	0.008	0.017	1300-1400	0.027	0.028	0.055	1300-1400	0.027	0.028	0.055
	1700-1800	0.008	0.012	0.02	1700-1800	0.008	0.018	0.026	1700-1800	0.008	0.018	0.026
	Daily	0.174	0.171	0.345	Daily	0.316	0.316	0.632	Daily	0.316	0.316	0.632
OGV	0800-0900	0.002	0.003	0.005	0800-0900	0.004	0.003	0.007	0800-0900	0.004	0.003	0.007
	1300-1400	0	0	0	1300-1400	0.004	0.004	0.008	1300-1400	0.004	0.004	0.008
	1700-1800	0	0.001	0.001	1700-1800	0.001	0.002	0.003	1700-1800	0.001	0.002	0.003
	Daily	0.016	0.016	0.032	Daily	0.05	0.048	0.098	Daily	0.05	0.048	0.098

	Primary Education (Per Pupil)			
	Time Period	*Arrivals*	*Departures*	*Totals*
LGV	0800-0900	0.001	0.001	0.002
	1300-1400	0.004	0.002	0.006
	1700-1800	0	0	0
	Daily	0.013	0.013	0.026
OGV	0800-0900	0.001	0.001	0.002
	1300-1400	0.001	0.001	0.002
	1700-1800	0	0	0
	Daily	0.005	0.005	0.01

Table 75: MWP2 Total Servicing Trips

	Residential (Private Flats)				Residential (Affordable Flats)				C1 Hotel			
	Time Period	*Arrivals*	*Departures*	*Totals*	*Time Period*	*Arrivals*	*Departures*	*Totals*	*Time Period*	*Arrivals*	*Departures*	*Totals*
LGV	0800-0900	3	4	7	0800-0900	11	9	19	0800-0900	2	3	5
	1300-1400	9	10	19	1300-1400	6	7	13	1300-1400	1	0	1
	1700-1800	10	10	20	1700-1800	6	5	11	1700-1800	2	1	4
	Daily	104	101	204	Daily	84	81	164	Daily	21	23	44
OGV	0800-0900	1	0	1	0800-0900	0	0	0	0800-0900	1	1	2
	1300-1400	3	4	7	1300-1400	2	2	3	1300-1400	0	1	1
	1700-1800	1	1	3	1700-1800	0	0	0	1700-1800	0	0	0
	Daily	27	29	56	Daily	9	9	17	Daily	7	6	13
	Retail Convenience Stores & Local Shops								**Retail F&B**			
	Time Period	*Arrivals*	*Departures*	*Totals*					*Time Period*	*Arrivals*	*Departures*	*Totals*
LGV	0800-0900	1	2	3					0800-0900	0	0	0
	1300-1400	1	1	3					1300-1400	0	0	1
	1700-1800	0	1	1					1700-1800	1	1	1
	Daily	23	23	46					Daily	11	11	22
OGV	0800-0900	2	2	4					0800-0900	0	0	0
	1300-1400	0	0	0					1300-1400	0	1	1
	1700-1800	0	0	0					1700-1800	0	0	1
	Daily	8	8	15					Daily	3	3	6
	D1 GP Surgery				**D1 Library**				**D2 Gym**			
	Time Period	*Arrivals*	*Departures*	*Totals*	*Time Period*	*Arrivals*	*Departures*	*Totals*	*Time Period*	*Arrivals*	*Departures*	*Totals*
LGV	0800-0900	1	1	1	0800-0900	0	0	0	0800-0900	0	0	0
	1300-1400	0	1	1	1300-1400	0	0	0	1300-1400	0	0	0
	1700-1800	0	0	0	1700-1800	0	0	0	1700-1800	0	0	0
	Daily	14	14	28	Daily	7	7	14	Daily	3	3	7
OGV	0800-0900	0	0	0	0800-0900	0	0	0	0800-0900	0	0	0
	1300-1400	0	0	0	1300-1400	0	0	0	1300-1400	0	0	0
	1700-1800	0	0	0	1700-1800	0	0	0	1700-1800	0	0	0
	Daily	0	0	1	Daily	0	0	0	Daily	0	0	0
	B1a Office				**B1b & B1c Office**				**Primary Education**			
	Time Period	*Arrivals*	*Departures*	*Totals*	*Time Period*	*Arrivals*	*Departures*	*Totals*	*Time Period*	*Arrivals*	*Departures*	*Totals*
LGV	0800-0900	2	2	4	0800-0900	6	4	10	0800-0900	0	0	1
	1300-1400	1	1	2	1300-1400	4	4	9	1300-1400	2	1	3
	1700-1800	1	1	2	1700-1800	1	3	4	1700-1800	0	0	0
	Daily	18	18	37	Daily	50	50	100	Daily	6	6	12
OGV	0800-0900	0	0	1	0800-0900	1	0	1	0800-0900	0	0	1
	1300-1400	0	0	0	1300-1400	1	1	1	1300-1400	0	0	1
	1700-1800	0	0	0	1700-1800	0	0	0	1700-1800	0	0	0
	Daily	2	2	3	Daily	8	8	16	Daily	2	2	5

10 Total Estimated Site Trip Generation

As per the above sections, the total trip generation attributed to the proposed MWP2 development is shown in Table 76. It should be noted that the *Total Vehicles* row includes vehicle, taxi, OGV and LGV modes.

Table 76: Total Proposed Trip Generation for the MWP2 Development Proposals

Mode	Total Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep	Total	Arr.	Dep.	Total
Vehicles	158	151	308	70	65	136	113	100	214	1340	1362	2702
Taxi	25	26	46	5	3	7	18	18	36	244	248	492
Motorcycle	14	8	22	7	10	16	15	18	32	135	133	268
Vehicle Passenger	80	99	180	28	18	46	53	45	98	577	589	1165
Pedestrian	551	573	1122	496	491	987	559	475	1034	7015	6898	13910
Cycle	33	26	58	6	10	16	26	32	58	243	257	500
Bus	389	303	695	164	163	327	258	413	672	2855	2836	5692
Coach	0	0	0	0	3	3	0	0	0	11	11	22
Rail	98	190	290	42	39	81	151	129	282	1218	1220	2438
Underground	103	121	225	46	40	86	93	142	234	966	961	1928
Total	**1449**	**1496**	**2945**	**864**	**842**	**1706**	**1288**	**1372**	**2660**	**14604**	**14515**	**29119**
LGV	26	25	51	25	26	51	21	22	43	342	336	678
OGV	6	4	10	6	8	15	2	2	4	66	66	132
Total Vehicles	**215**	**206**	**415**	**106**	**102**	**208**	**155**	**143**	**297**	**1991**	**2013**	**4004**

*Note the above values are subject to rounding

The external (new) trips generated by the MWP2 development have been isolated from the internal/linked trips on the basis of the assumptions in Table 77.

Table 77: MWP2 Internal and External Trip Generation Assumptions by Land Use

Land Use	Internal/Linked	External (new)
A1/A2/A3/A4 Retail	**All Trips** – this provision would primarily serve employees and residents of the proposed development and will therefore form part of internal / linked trips.	-
B1 Office Total	-	All trips will be external to the site as a worst-case assessment.
C1 Hotel	-	All trips will be external to the site as a worst-case assessment.
Residential Total	-	All trips will be external to the site as a worst-case assessment.
D1 Primary School	Walking and cycling trips made by pupils and pupil escorts are considered to be internal trips made by residents of the MWP2 development. A third of vehicle and vehicle passenger trips are considered to be part of a linked trip made by residents of the MWP2 development.	All employee trips are considered to be external to the MWP2 development as a worst-case assessment. Two thirds of pupil and pupil escort trips are considered to be external to the MWP2 development associated with pupils in the wider area. Pupil and pupil escort trips made by public transport are considered to be external trips from surrounding areas.
D1 Healthcare	Trips made by walking and cycling are considered to be internal trips made by residents of the MWP2 development.	Trips made by long-distance modes (vehicles / public transport) are considered to be external trips from surrounding areas.

Land Use	Internal/Linked	External (new)
D1 Library	**All Trips** – this provision would primarily serve employees and residents of the proposed development and therefore form part of internal / linked trips.	-
D2 Gym	**All Trips** – this provision would primarily serve employees and residents of the proposed development and therefore form part of internal / linked trips.	-

The following tables outline the anticipated internal and external trip generation associated with the MWP2 development proposals in line with these assumptions.

Table 78: Total Internal Trip Generation for the MWP2 Development Proposals

Mode	Internal Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep	Total	Arr.	Dep.	Total
Vehicles	32	15	47	27	18	45	15	18	33	328	330	658
Taxi	1	1	2	0	0	0	1	1	3	51	51	102
Motorcycle	1	0	2	4	5	10	2	0	3	29	30	59
Vehicle Passenger	26	8	34	7	4	11	13	17	29	125	139	264
Pedestrian	399	186	585	375	361	736	316	289	604	4505	4424	8926
Cycle	15	9	24	3	4	7	11	9	20	118	118	236
Bus	48	12	61	84	67	150	86	79	165	1042	956	1998
Coach	0	0	0	0	0	0	0	0	0	0	0	0
Rail	2	7	9	16	15	31	28	21	49	295	308	605
Underground	5	11	15	10	10	20	27	10	37	245	186	432
Total	**529**	**249**	**778**	**526**	**486**	**1012**	**500**	**444**	**943**	**6737**	**6544**	**13281**
LGV	0	0	0	0	0	0	0	0	0	0	0	0
OGV	0	0	0	0	0	0	0	0	0	0	0	0
Total Vehicles	**33**	**16**	**49**	**27**	**19**	**46**	**17**	**19**	**36**	**379**	**381**	**760**

Table 79: Total External Trip Generation for the MWP2 Development Proposals

Mode	External Trip Generation											
	AM			Interpeak			PM			Daily		
	Arr.	Dep.	Total	Arr.	Dep.	Total	Arr.	Dep	Total	Arr.	Dep.	Total
Vehicles	125	136	260	43	47	90	98	83	181	1012	1032	2044
Taxi	24	25	45	5	2	6	17	17	33	193	197	390
Motorcycle	12	8	20	2	5	7	13	17	30	107	103	209
Vehicle Passenger	54	90	146	21	14	35	41	28	69	452	450	902
Pedestrian	152	387	537	121	130	251	244	186	430	2510	2474	4984
Cycle	18	17	34	3	6	9	15	22	38	125	138	264
Bus	341	290	635	80	97	177	172	334	506	1813	1880	3694
Coach	0	0	0	0	3	3	0	0	0	10	11	22
Rail	96	184	281	26	24	50	123	108	233	923	911	1833
Underground	98	110	210	36	30	66	66	132	197	722	774	1496
Total	**920**	**1247**	**2167**	**338**	**356**	**694**	**788**	**928**	**1716**	**7867**	**7971**	**15838**
LGV	26	25	51	25	26	51	21	22	43	342	336	678
OGV	6	4	10	6	8	15	2	2	4	66	66	132
Total Vehicles	**181**	**190**	**366**	**79**	**84**	**162**	**138**	**123**	**261**	**1613**	**1632**	**3244**

11 Trip distribution

This chapter outlines the approach taken to estimate the likely directional distribution of trips to and from the proposed development

11.1 Trip Distribution Approach

As part of the Phase 1 trip generation impact assessment the Census 2011 Origin-Destination dataset was used to derive the directional distribution of vehicle trips to and from MSOA in which the site is located.

The Origin-Destination dataset was mapped and the directional split resulting from this exercise for all modes is shown within *Table 80*.

Table 80: Census 2011 Trip Distribution to and from Enfield MSOA E02000309

Compass Direction	From Enfield	To Enfield
North	13%	20%
North West	15%	17%
West	20%	17%
South West	20%	6%
South	12%	7%
South East	7%	11%
East	6%	11%

The dataset was disaggregated by mode to estimate the multimodal directional distribution of external trips related to the Phase 1 proposals.

This approach has also been implemented for the MWP2 impact assessment.

11.2 Vehicular trip distribution

In line with the approach taken for Phase 1; the origin and destination of trips made by car have used to determine the directional distribution of residential and non-residential trips to and from the site. Trips made by residents were considered to form the outbound trips form the site and trips made for all other uses forming the inbound trips to the site. The results of this exercise are shown within *Table 81*.

Table 81: Proposed Vehicular Trip Distribution

Compass Direction	Residential	Non-Residential
North	15%	23%
North West	17%	18%
West	23%	17%
South West	13%	5%
South	11%	6%
South East	8%	10%
East	7%	12%

This distribution was applied to the external vehicular trip generation calculated within Chapter 11.

Vehicles traveling to and from the site in each direction were assigned specific routes on the basis of the shortest travel distance and the availability of wider highway connectivity.

The sum of all vehicle trips on assigned routes entering and exiting the site established the proposed net vehicular demand on local roads within the study area. This formed the basis of local junction modelling described in further detail within the TA.

11.3 Public Transport Distribution

11.3.1 Bus Trip Distribution

As with the approach taken to vehicular trip distribution the origin and destination of trips made by bus have used to determine the directional distribution of bus trips to and from the site.

The MWP2 Bus Strategy appended to the MWP2 TA provides an outline of the proposed routing strategy for bus services within the local area in line with MWP2 and wider masterplan proposals.

In order to more accurately assign bus trips onto local services in light of the proposed routing amendments and extensions bus trips OD's were mapped and then assigned to a route that would serve the MWP2 development on the basis of proximity. This resulted in an estimated net demand on each local service by direction.

11.3.2 Rail

The impact of National rail and underground trips generated by the MWP2 development has been calculated for a worst-case scenario. This assumed that all trips made onto services available in the opening year would travelling southbound towards Tottenham Hale and either continue on to Stratford or change to services into central London during the AM peak, and vice versa in the PM peak. This is in line with the predominant direction of commuter travel.

This approach is outlined in further detail within the MWP2 TA.

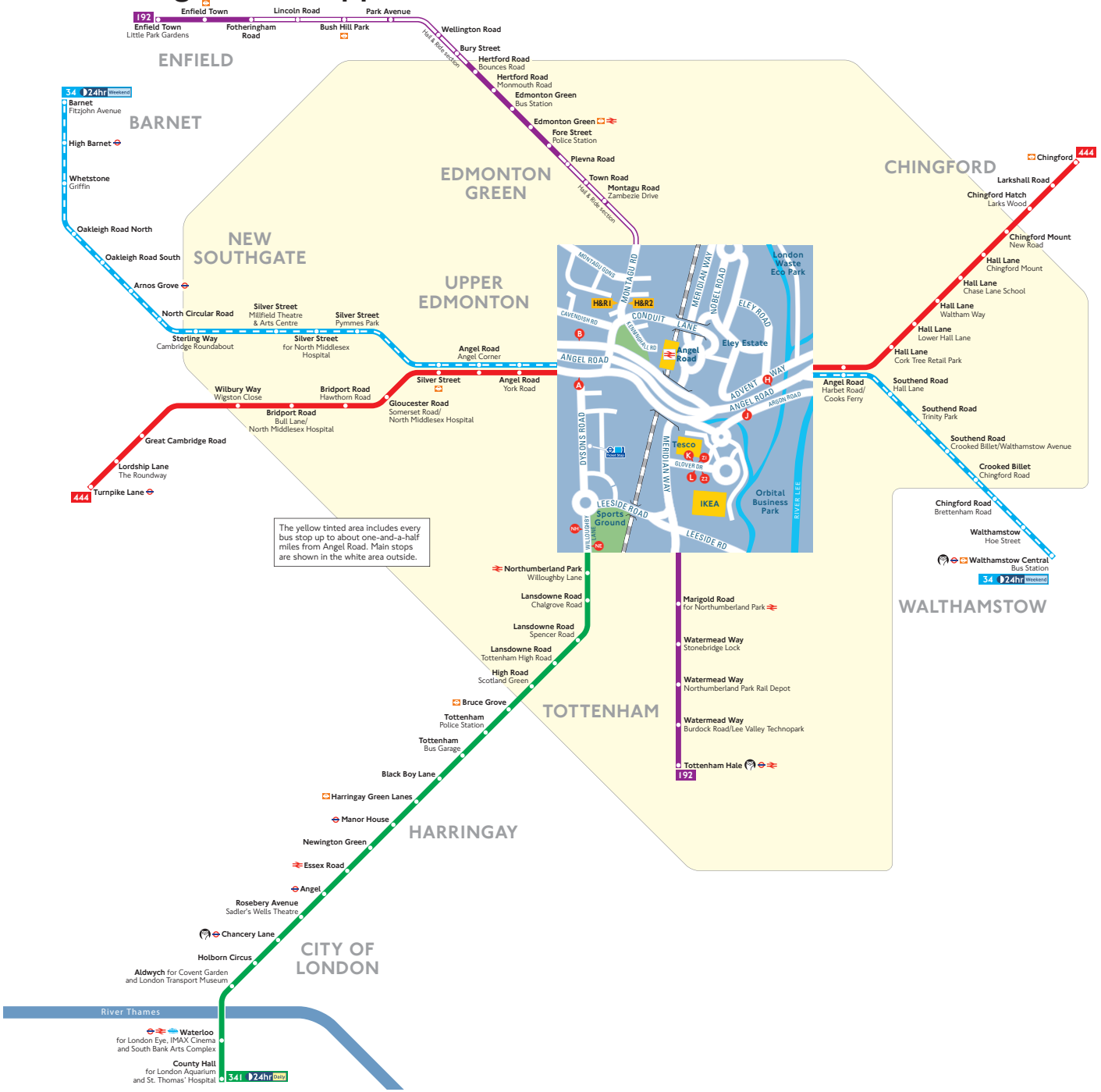
11.4 Pedestrian and Cycle Distribution

Pedestrian and cycle trips generated by the MWP2 development will be distributed onto the local networks in accordance with key local trip attractors identified within the Active Travel Strategy appended to the MWP2 TA.

Appendix K

Bus spider map

Buses from Angel Road (Upper Edmonton)



Route finder

Bus route	Towards	Bus stops
34 24hr Weekend	Barnet	A J
	Walthamstow	B H
192	Enfield	K L H&R1
	Tottenham Hale	K L H&R2
341 24hr Daily	County Hall	L NF
444	Chingford	B H
	Turnpike Lane	A J

Hail & Ride Route 192 operates as Hail and Ride on the sections of roads marked H&R1 and H&R2 on the map. Buses stop at any safe point along the road. There are no bus stops at these locations, but please indicate clearly to the driver when you wish to board or alight.

Information correct from June 2016

Appendix L

Bus Strategy

London Borough of Enfield

Meridian Water Phase 2 and Strategic Infrastructure Works

Bus Strategy

MWP2-7/MWSIW-6 – Appendix L

Final | 21 June 2019

Job number 260637-00

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Contents

1 Introduction

1.1 Background

This Bus Strategy has been prepared by Ove Arup and Partners Ltd. ('Arup') on behalf of the London Borough of Enfield regeneration team (the 'Applicant'). The application falls within the London Borough of Enfield ('LBE') and the Local Planning Authority ('LPA') will determine the planning application. Some ancillary highway works fall within the adjoining London Borough of Haringey and will be addressed under the Highway Acts.

The Applicant will oversee the delivery of infrastructure works and will be appointing developers to deliver development plots. An earlier phase, Meridian Water Phase 1, is progressing to delivery, with a developer partner selected and the new Meridian Water Station opened in June 2019.

Meridian Water Phase 2 and Strategic Infrastructure works ('the project') is the next phase of Meridian Water. This is made up of two linked planning applications which constitute the 'Proposed Development', namely

- Full planning application for Meridian Water Strategic Infrastructure Works ('**MWSIW'**)
- Outline planning application for Meridian Water Phase 2, a mixed-use residential-led development ('**MWP2'**)

The majority of the land for the Proposed Development is within the ownership of LBE. There are a number of other landowners who have been notified and with whom there are ongoing discussions regarding the proposals.

The two planning applications for the Proposed Development comprise a suite of co-developed plans and documents. On the basis that the two applications are being submitted in tandem and have a number of interrelationships, planning documents have been shared where appropriate.

For example, the Environmental Statement reports the findings of the Environmental Impact Assessment as undertaken for the combined project and the Design and Access Statement has been produced with site context and masterplan material which applies equally to the two separate applications. The following table sets out the application documents, reference numbers and identifies which documents are shared or not.

Table 1: Planning application documents

Document Title	MWSIW	MWP2	Shared
Cover Letter, Application Form	MWSIW-0	MWP2-0	N
Planning Statement	MWSIW-1	MWP2-1	N
Environmental Statement	MWSIW-2 / MWP2-2		Y
ES Non-Technical Summary	MWSIW-2.1 / MWP2-2.1		Y
Remediation Baseline and Framework	MWSIW-2.2 / MWP2-2.2 MWSIW-2.3 / MWP2-2.3		Y
Archaeological Desk Based Assessment	MWSIW-2.4 / MWP2-2.4		Y
Draft Code of Construction Practice	MWSIW-2.5 / MWP2-2.5		Y
Habitats Regulation Assessment	MWSIW-2.6 / MWP2-2.6		Y
Ecology Baseline Surveys	MWSIW-2.7 / MWP2-2.7		Y
Arboricultural Report	MWSIW-2.8 / MWP2-2.8		Y
Water Framework Directive Assessment	MWSIW-2.9 / MWP2-2.9		Y
Statement of Community Involvement	MWSIW-3 / MWP2-3		Y
Design Code	N/A	MWP2-4	N
Design and Access Statement	MWSIW-4 / MWP2-5		Y
Flood Risk Assessment	MWSIW-5 / MWP2-6		Y
Transport Assessment	MWSIW-6 / MWP2-7		Y
Framework Travel Plan	MWP2-7.1		Y
Construction Logistics Plan	MWP2-7.2		Y
Sustainability and Energy Statement	MWSIW-7 / MWP2-8		Y
Energy Assessment	N/A	MWP2-8.1	N
BREEAM Pre-Assessment	N/A	MWP2-8.2	N
Site Waste Management Plan	MWSIW-7.1	MWP2-8.3	N
Integrated Water Management Plan	MWSIW-7.1 / MWP2-8.4		Y
Daylight and Sunlight Assessment	N/A	MWP2-8.5	N
Affordable Housing Viability Assessment	N/A	MWP2-9	N

1.2 Meridian Water Context and Vision

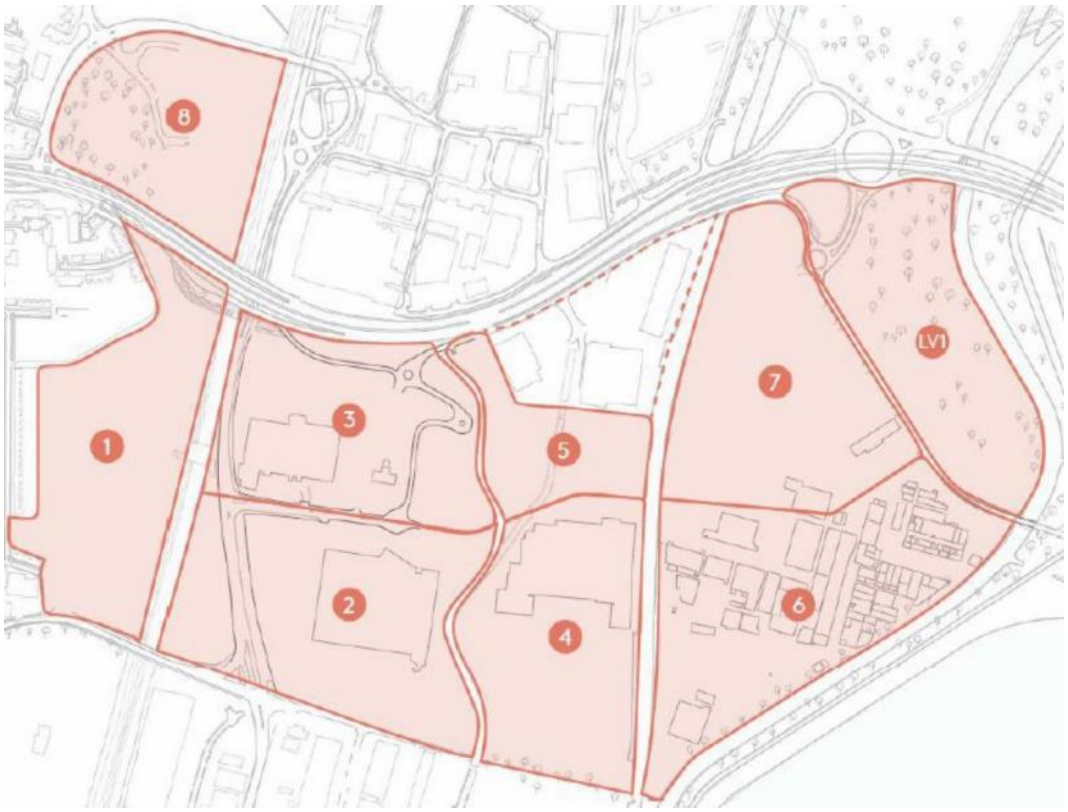
Meridian Water is one of the largest brownfield development opportunities in Greater London, which has the potential to deliver significant housing and employment growth ambitions of LBE, as set out in the 2010 Core Strategy. Meridian Water will contribute to the delivery of much-needed homes and jobs, meeting the strategic need and regeneration ambitions of London as set out in the adopted London Plan 2016 and emerging Draft New London Plan.

LBE is leading a pioneering approach to regeneration at Meridian Water for the long-term benefit of local people and future generations through the delivery of new homes, employment and infrastructure.

Meridian Water is a mixed-use regeneration scheme, comprising 85 hectares (ha) of land in Upper Edmonton. The regeneration scheme will bring forward land for redevelopment over time to maximise the potential for what is currently either vacant or low density industrial and retail land. For reference purpose the Development Zones of Meridian Water are set out on Figure 1.

The project will deliver elements of a successful new neighbourhood including schools and other social infrastructure, new rail infrastructure, connection to the Meridian Water Heat Network (MWHN) and new open spaces.

Figure 1: Meridian Water Development Zones



LBE has already invested significant resources, particularly in land assembly, remediation and infrastructure and Meridian Water has now reached the exciting first phase of development, known as 'Meridian One' comprising 725 residential units next to the new Meridian Water station with a development partner now

selected. A range of innovative meanwhile uses are also being explored to activate and make efficient use of LBE landholdings prior to development.

1.3 Strategic Infrastructure Works Application

LBE ('the Applicant') is seeking full planning permission for Strategic Infrastructure Works (MWSIW) at Meridian Water with the following description of development:

> *"Full application for redevelopment of the site to provide infrastructure works for the delivery of a mixed-use development comprising: Construction of an east-west link road between Glover Drive and Harbet Road ('the Central Spine'); alteration of access road between Argon Road and Glover Drive, construction of a link road between Leeside Road and the Central Spine, pedestrian and cycleway improvements to Glover Drive and Leeside Road, the construction of 4 no. bridges across the Pymmes and Salmon Brooks and River Lee Navigation; alteration to the Pymmes Brook channel and associated landscaping. Enabling works, comprising: earthworks; remediation; flood conveyance channel, storage and outfall works; utilities infrastructure; demolition of existing buildings and associated works."*

In summary, the MWSIW comprises the following elements:

- **The Central Spine Road** - a new tree-lined east-west boulevard connecting to Glover Drive and new Meridian Water Station in the west, crossing the Pymmes and Salmons Brook and River Lee Navigation to Harbet Road in the east;
- **Leeside Link Road** – a new link road providing access for cars, pedestrians and cyclists from Leeside Road through to the Central Spine Road;
- **Bridges (x4)** – erection of bridges and associated works to enable the Central Spine Road and Leeside Link Road to span the Pymmes and Salmons Brook and River Lee Navigation;
- **Brooks Park and River Naturalisation** – naturalising the channelised Pymmes Brook to introduce an ecological river landscape, as well as providing riverside parkland;
- **Edmonton Marshes and Flood Alleviation Works** – re-levelling and remediation of land to the east of Harbet Road, providing comprehensive flood alleviation works and a new high quality public open space within the Lee Valley Regional Park.
- **Access Works –** third party access works to provide new and altered accesses to the IKEA store, a new north-south link between Argon Road and Glover Drive, the creation of a link between the Central Spine Road and Anthony Way and other improvements to maintain access, along with other ancillary highway works to Glover Drive, Leeside Road and Meridian Way.
- **Earthworks, Remediation, Utilities and other ancillary works** – earthworks, retaining structures and remediation within Development Zones 4

and 5, installation of main utility networks and ancillary works including the demolition of existing buildings and structures.

1.4 Meridian Water Phase 2 Application

LBE ('the Applicant') is seeking outline planning permission for Meridian Water Phase 2 (MWP2) at Meridian Water with the following description of development:

> *"Outline planning application for comprehensive mixed use redevelopment at Meridian Water, comprising up to 2,300 residential units (Class C3), Purpose Built Student Accommodation and/or Large-Scale Purpose-Built Shared Living (Sui Generis); a hotel (Class C1), commercial development (Class B1a,b,c); retail (Class A1 and/or A2 and/or A3 and/or A4), social infrastructure (Class D1 and/or D2), a primary school up to three forms of entry, hard and soft landscaping, new public open spaces including equipped areas for play, sustainable drainage systems, car parking provision, and formation of new pedestrian and vehicular access (all matters reserved)."*

The proposal entails the comprehensive redevelopment of Meridian Water Development Zone 4 and 5 and a part of Zone 2 for up to 284,600 sq m (GEA) of residential led mixed use development.

In summary, the Proposed Development comprises the following elements:

- Up to 2,300 new homes (Use Class C3), of which 40% shall be affordable;
- Option to provide a Hotel (Use Class C1) circa 250 rooms with up to 16,000 sq m GEA (allowing for a range of specification from budget to luxury);
- Option to provide Purpose Built Student Accommodation (PBSA) and/or Large-Scale Purpose-Built Shared Living (LSPBSL) (Sui Generis) with up to 18,000 sq m GEA in total;
- Up to 26,500 sq m GEA of commercial workspace development (Use Class B1a,b,c);
- Up to 2,000 sq m GEA of retail (Use Class A1 and/or A2 and/or A3 and/or A4);
- Up to 5,500 sq m GEA of social infrastructure (Use Class D1 and/or D2);
- A three-form entry primary school;
- The associated works to create hard and soft landscaping, new public open spaces including equipped areas for play, sustainable drainage systems, car parking provision, and formation of new pedestrian and vehicular access.

2 The Purpose of the Bus Strategy

The Meridian Water masterplan is situated on the south east boundary of LBE and the existing Public Transport Accessibility Level (PTAL) is 1b ('very poor') to 2 ('poor'). These scores reflect the current lack of connectivity between the site and existing public transport networks.

The delivery of an integrated masterplan that puts a healthy streets approach at its heart will need to improve connectivity to public transport networks. The delivery of Meridian Water rail station in combination with the MWSIW and MWP2 will significantly improve access to rail services.

The aim is to deliver a sustainable development and an illustrative masterplan for MWP2 has been prepared to accompany the outline planning application. This is shown in Figure 2.

Figure 2: MWP2 Illustrative Masterplan

This Bus Strategy has been prepared to allow the Proposed Development to benefit from improved access to public transport, and specifically to local bus services which are well integrated with the wider masterplan, rail services and surrounding local centres, communities and amenities. As such, buses will be the key driver to enabling growth at MWP2.

It should be noted that any proposed alterations to existing bus routes / services in this study are indicative and subject to further change and development as the masterplan proposals evolve. Proposed alterations to bus routes have been developed through previous discussions with TfL and a number of options considered. However, it is recognised that bus provision needs to be dynamic and capable of responding to changes in demand and wider network opportunities/ constraints. The proposals will need to be accepted and agreed by TfL and ownership of this taken on by TfL as it is responsible for planning the bus network and any definitive proposals that are taken forward will need to be formally consulted upon.

The Proposed Development will fundamentally alter the nature of the area and it will become more focused around people and place. This is an important theme in terms of delivering Vision Zero and Healthy Streets. Further details of the MWP2 proposals are provided in the Transport Assessment.

2.1 Other Development Assumptions

The completion of Phase 1 of Meridian Water, including the new rail station and bridge over the WAML, is the next milestone for Meridian Water.

The introduction of improved services along the rail corridor would have a direct impact on the planned bus network, with new connections being created between site and station.

In addition, it is reasonable to assume some background growth will stem from the Upper Lea Valley OAPF forecast growth and the neighbouring boroughs' planned growth, notably in the Tottenham neighbourhood of Haringey.

3 Existing Bus Network

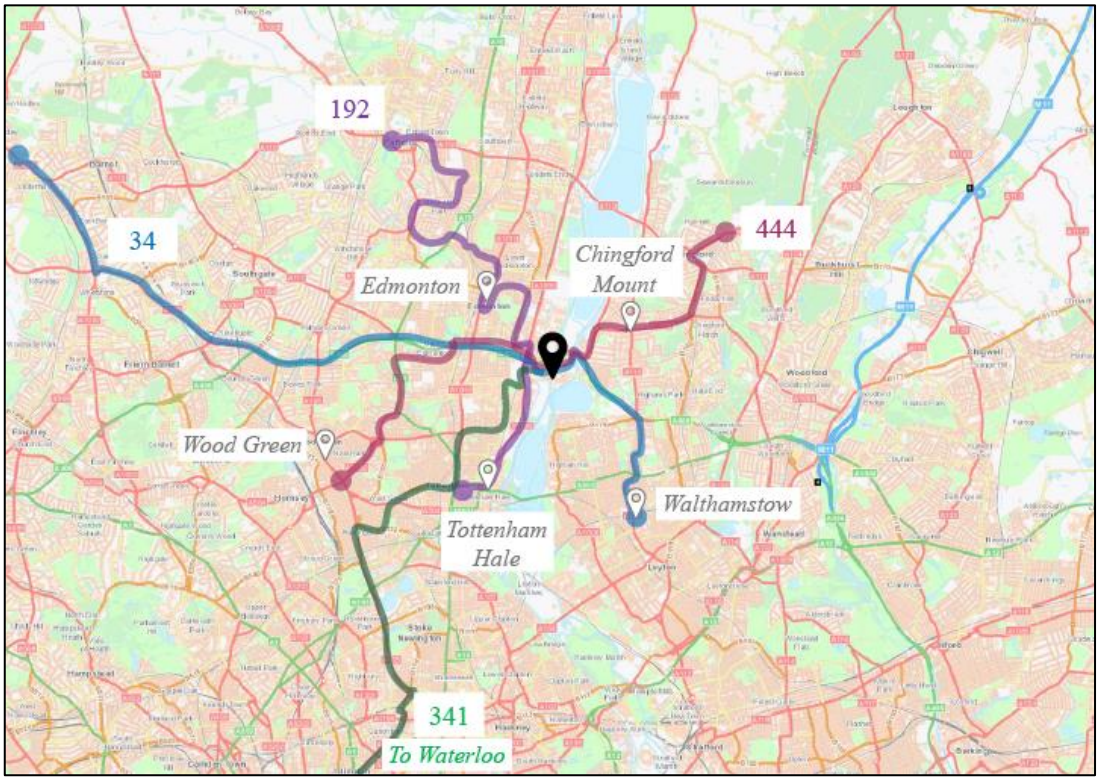
Across the MWP2 area, the existing Public Transport Accessibility Level (PTAL) is recorded from 1b ('very poor') to 2 ('poor'). These scores reflect the current lack of connections between the site and existing bus network. The location of Angel Road rail station to the north of the North Circular and infrequent services are reflected in the very poor score that the site currently achieves. Despite this, there are a number of services and facilities in the surrounding area which are set out in the following sections.

3.1 Existing Bus Routes

Four bus routes currently operate in the vicinity of the wider Meridian Water Masterplan Area.

Figure 3 shows that existing bus routes provide good geographical coverage from the to/ from the site and serve surrounding urban centres of Walthamstow, Tottenham Hale, Edmonton, Enfield, and central London.

Figure 3: Existing bus services in the vicinity of Meridian Water



Bus routes shown in Figure 3 are well served with weekday services of between 5 and 13-minute headway as detailed in Table 2.

Table 2: Existing bus frequencies in the vicinity of the MWP2 Meridian Water

Route	Description	Weekday Frequencies*	Saturday Frequencies*	Sunday Frequencies*	24 Hour Service
341	between Angel Road Superstores and Waterloo This route starts and finishes at the Masterplan area and provides connections with central London.	Every 10-12 minutes (max. 6 buses per hour)	Every 9-12 minutes	Every 10-13 minutes	Yes
192	between Tottenham Hale and Enfield This route connects the Masterplan area with Enfield in the north and with Tottenham Hale station in the south.	Every 8-11 minutes (max. 8 buses per hour)	Every 9-12 minutes	Every 10-14 minutes	No
34	between Barnet Church and Walthamstow Central This route connects the Masterplan area with Barnet in the west and with Walthamstow in the east.	Every 6-10 minutes (max. 10 buses per hour)	Every 7-10 minutes	Every 10-13 minutes	Weekend Only
444	between Turnpike Lane Station and Chingford Station This route connects the Masterplan area with Turnpike Lane in the southeast and with Chingford in the northeast.	Every 9-14 minutes (max. 7 buses per hour)	Every 12-13 minutes	Every 15 minutes	No

*Frequencies for the 341 and 192 services from Glover Drive/Ikea bus stop. Frequencies for the 34 and 444 services from Harbet Road/Cooks Ferry bus stop.
NB. Service frequencies presented as of 05/06/2019 but are subject to change.

The existing bus services identified in this section provide interchange with rail and underground services at locations summarised in Table 3. This shows that existing bus routes are currently well connected with rail services, providing

onward public transport connections via the Underground, Overground and National Rail networks.

Table 3: Potential for bus interchange with rail networks

Route	Bus/ Rail Interchange	Services Available
341	Northumberland Park Station	National Rail
	Bruce Grove Station	London Overground/ National Rail
	Harringay Green Lanes Station	London Overground/ National Rail
	Manor House Station	Piccadilly Line
	Essex Road Station	National Rail
	Angel Station	Northern Line
	Chancery Lane Station	Central Line
	Waterloo Bridge	Bakerloo/ Jubilee/ Northern/ W&City Lines
	Lambeth North Station	National Rail
		Bakerloo line
192	Enfield Town Station	London Overground/ National Rail
	Bush Hill Park Station	London Overground/ National Rail
	Edmonton Green Station?	London Overground/ National Rail
	Angel Road Station	National Rail
	Tottenham Hale Bus Station	Victoria Line/ National Rail
34	Walthamstow Central	Victoria Line/ London Overground/ National Rail
	Arnos Grove Station	Piccadilly Line
	Silver Street Station	London Overground/ National Rail
	High Barnet Station	Northern Line
444	Turnpike Lane	Piccadilly Line
	Silver Street Station	London Overground/ National Rail
	Chingford Station	London Overground/ National Rail

3.2 Existing Bus Stops

There are several bus stops within walking distance of the Masterplan area, indicative 400m catchments (as the crow flies) are illustrated in Figure 4 and existing walking isochrones provided in Figure 5.

Figure 4: Existing bus stop 400m catchments

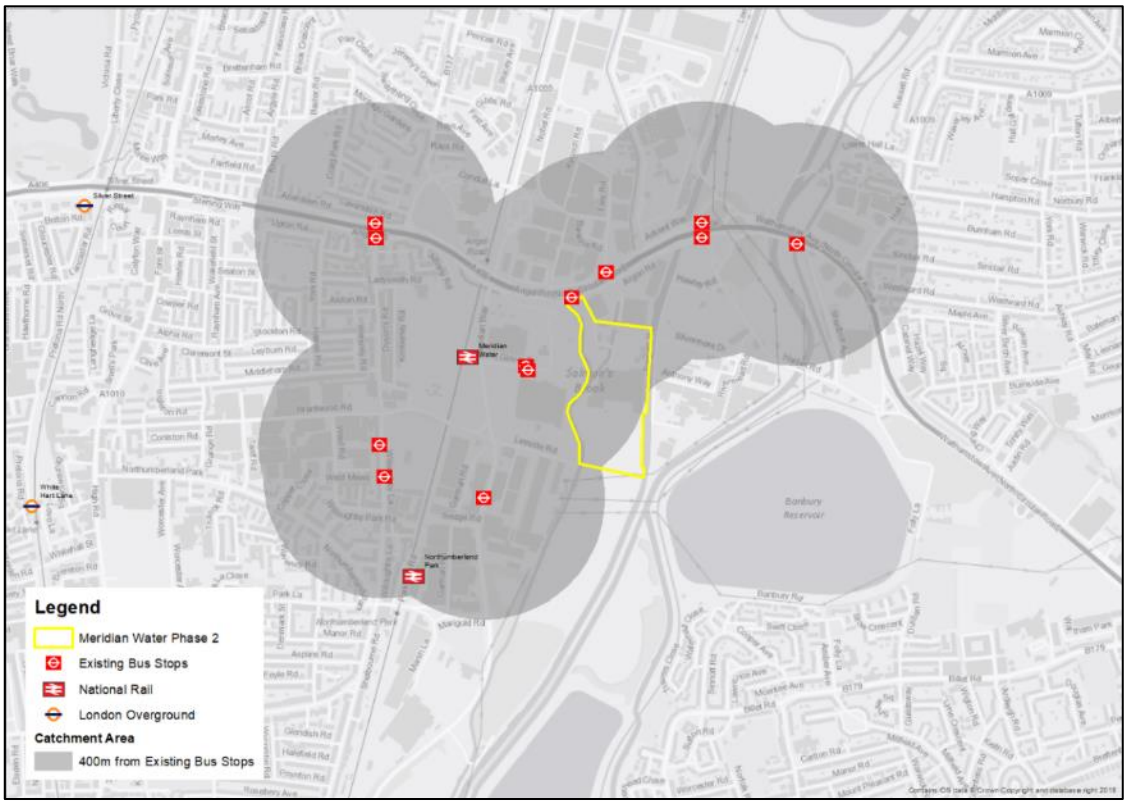
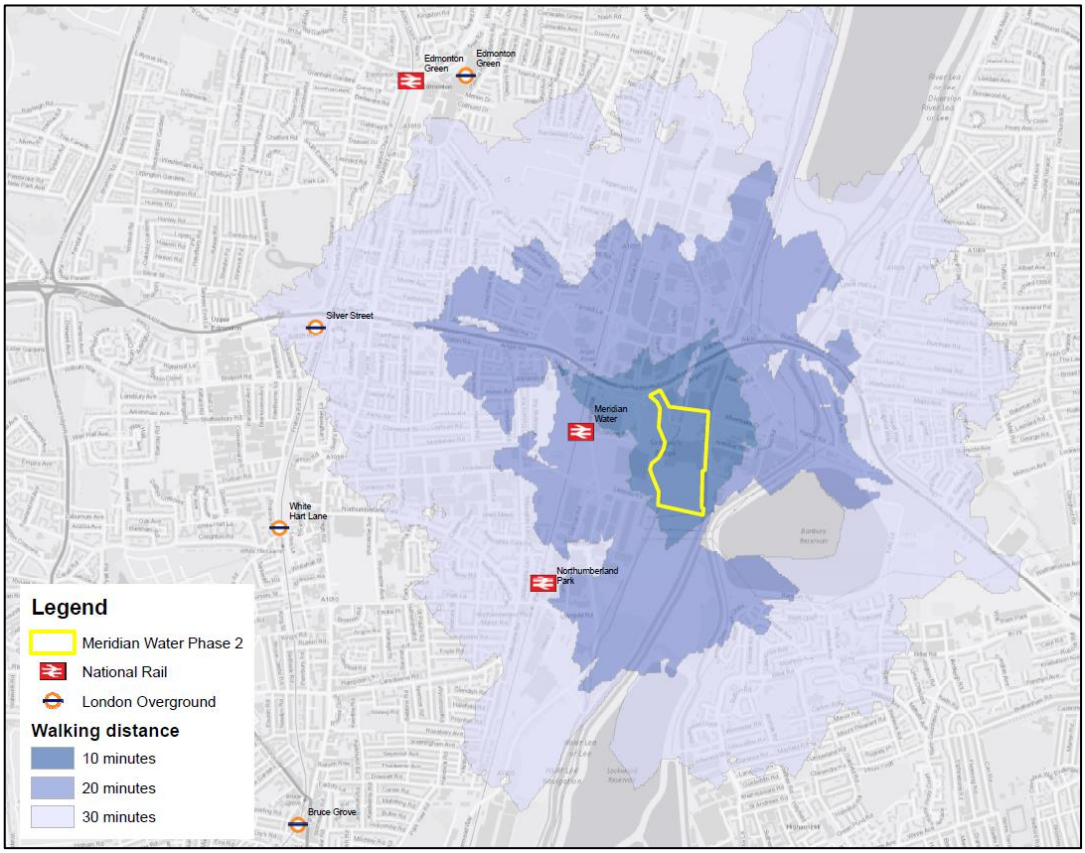


Figure 5: Pedestrian isochrones (10, 20, and 30 mins) from the centre of the existing MWP2 site



The existing bus routes and stops in the vicinity of the MWP2 site are shown in Figure 6, with further details of the existing bus stops provided in Table 4.

Figure 6: Existing bus routes (Angel Road Spider Map)

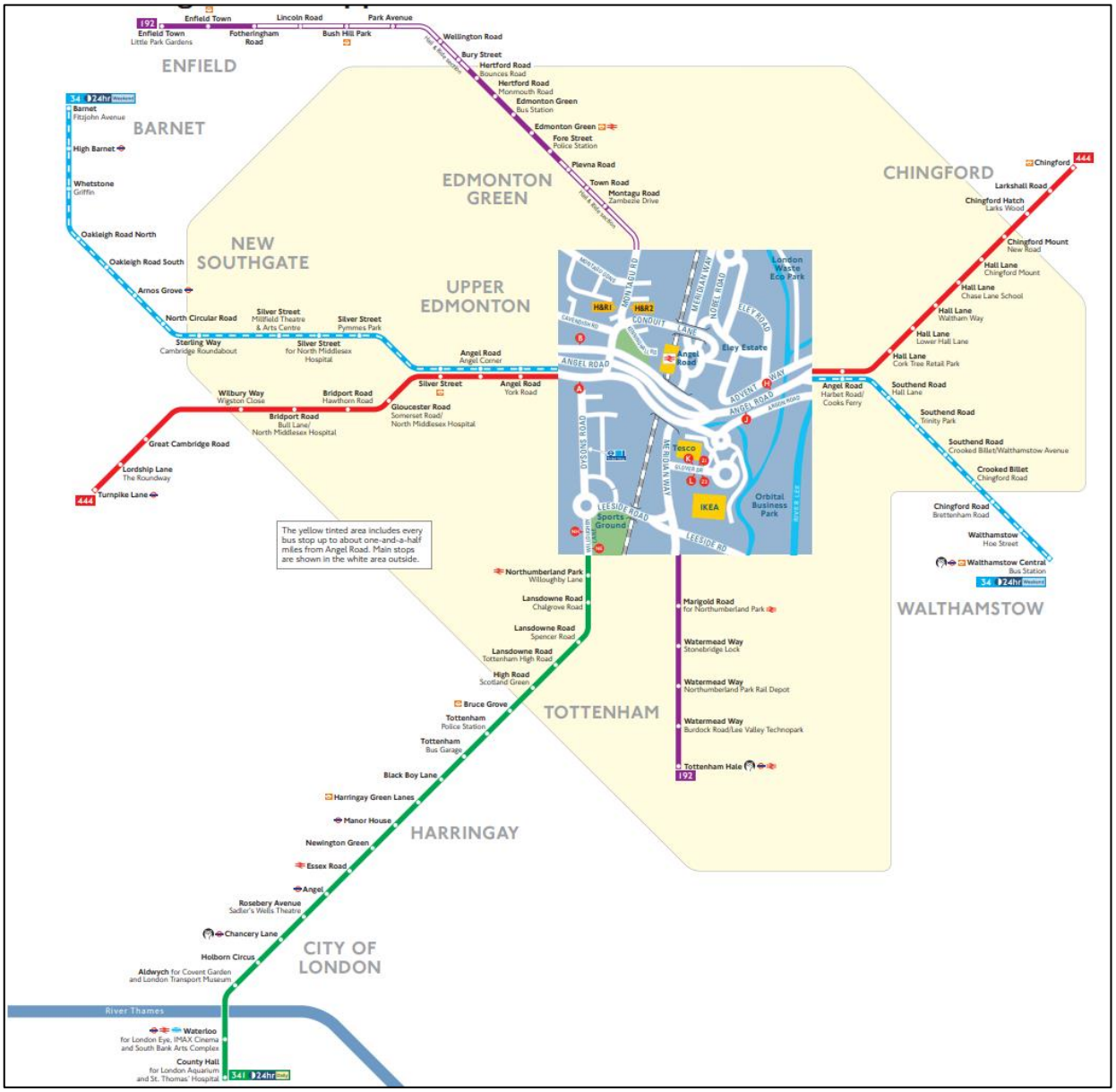


Figure 7: Existing bus routes (local routes and stops)

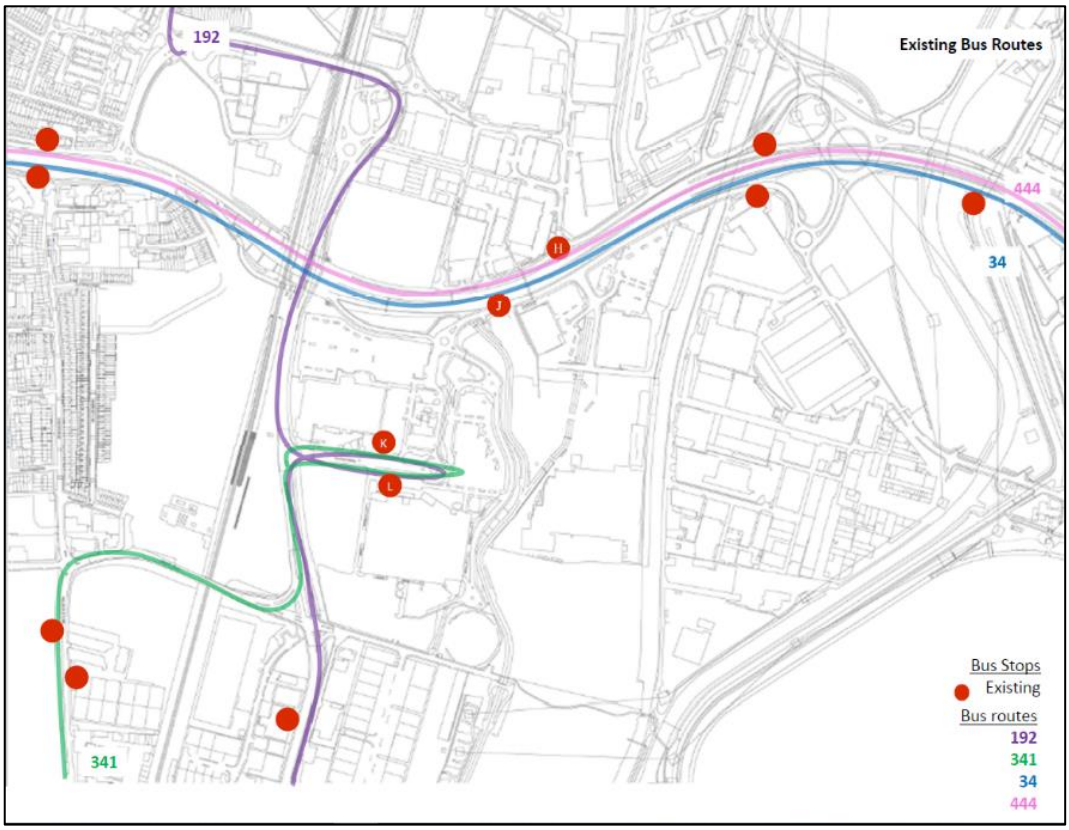


Table 4: Bus stops in the Masterplan area

Bus Stop	Description
Bus Stop H – Eley Trading Estate	• Eastbound carriageway of North Circular (A406) opposite Advent Way j/w Eley Road • Flag, shelter with seats, bin and timetable information • On carriageway of North Circular – Accessed via crossing Advent Way – no formal crossing although dropped kerbs and tactile paving are present • Little visible security features e.g. CCTV
Bus Stop J – Ravenside Trading Estate	• Westbound carriageway of North Circular just north of Argon Road • Flag, shelter with seats, bin and timetable information • On carriageway of North Circular – Accessed via crossing Argon Way – no formal crossing although dropped kerbs are present. No tactile paving • Little visible security features e.g. CCTV
Bus Stop K – Glover Drive Tesco	• On northern side of Glover Drive • Flag, shelter with seats and timetable information • Pedestrian crossing at Angel Edmonton Road/Glover Drive • Dropped kerbs and tactile paving along footway from bus stop
Bus Stop L – Glover Drive Ikea	• On southern side of Glover Drive • Flag, double shelter with seats and timetable information • Pedestrian crossing at Angel Edmonton Road/Glover Drive • Dropped kerbs and tactile paving along footway from bus stop • Located along off-road cycle and pedestrian route – could lead to conflict between passengers alighting buses and cyclists travelling at speed
Harbet Road Cooks Ferry (westbound)	• Slip road on westbound carriageway of North Circular, west of Cooks Ferry roundabout • Flag, shelter with seats, bin and minimal timetable information • Can be accessed from towpath along River Lea Navigation via crossing Argon Road • Dropped kerbs and tactile paving at Argon Way • Little visible security features e.g. CCTV and next to high traffic flows at fast speed
Harbet Road Cooks Ferry (eastbound)	• Slip road on eastbound carriageway of North Circular Road, just south of Advent Way • Flag, shelter with seats, bin and minimal timetable information • Accessed via walkway along road or via footpath-Ardent-Road- towpath • Little security features e.g. CCTV and next to high traffic flows at fast speed

3.2.1 Existing Bus Stands and Depots

Bus stands are currently provided on Glover Drive, just south of the Tesco Extra store and just north of the Ikea store. These stands (marked as Z1 and Z2) accommodate two buses in total and is used by route 341 for layover. Further bus standing and driver facilities will need to be provided to accommodate any extension of bus route 341 into the Masterplan Area.

Two bus garages are located near to the MWP2 site: Arriva London's Edmonton garage is within the Masterplan Area, off Towpath Road; and Go-Ahead London's Northumberland Park garage is approximately 1.2 km to the south of the Masterplan area.

Alternative access arrangements will be provided as part of the MWSIW in order to retain access to the Arriva bus garage as a result of the severance of Towpath Road (which is the current access route) when the proposed bridge on the Lee Navigation channel is delivered. There are ongoing discussions with Arriva and TfL regarding the potential re-provision or relocation of the Bus Garage to accommodate potential future phases of the MW masterplan.

3.3 Existing Access Routes to Bus Stops

Existing routes between existing bus stops and the MWP2 site are shown in Figure 8.

Figure 8: Existing Routes to Bus Stops from the MWP2 site

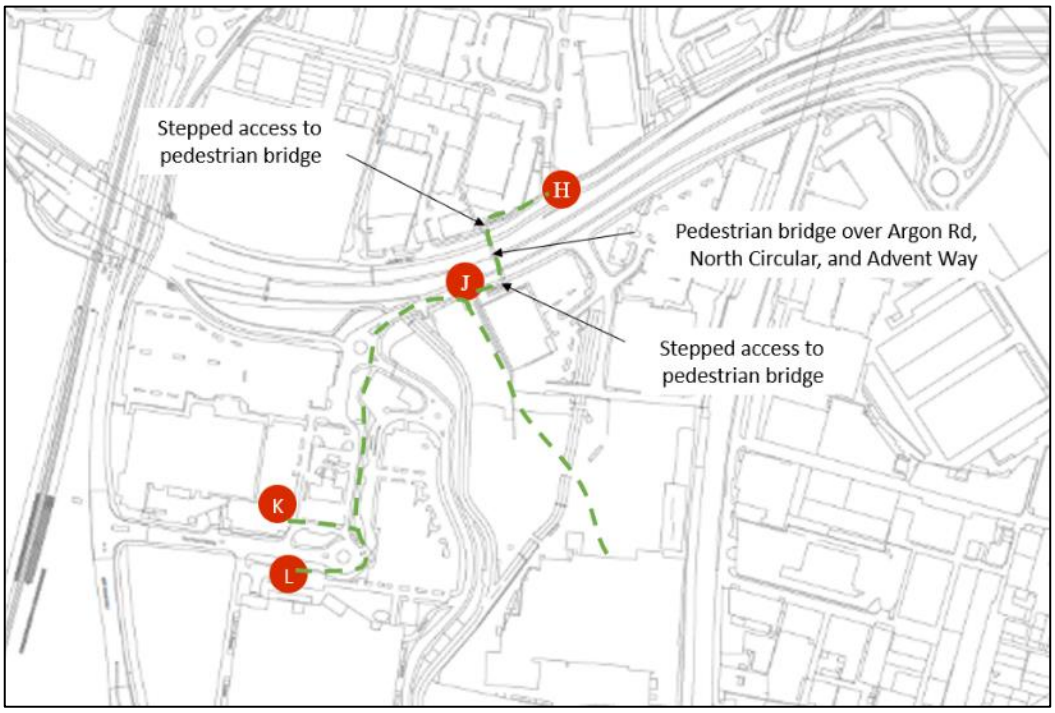


Figure 8 shows that the existing pedestrian connections available to/from bus services from the MWP2 site are indirect and do not meet the Healthy Streets aspirations of the Meridian Water masterplan.

As part of the development proposals and the aims of this strategy it is proposed that the location and type of facilities that are currently provided will be relocated and improved. This is set out in the strategy section of this report.

3.4 Existing Bus Demand

TfL have provided aggregated Oyster card data for the Meridian Water Masterplan area, to aid understanding of current bus usage and trip patterns. The Oyster data provided was uplifted by TfL to match the daily ETM (Electronic Ticket Machine) records. TfL confirmed in October 2016 the uplift methodology and suggested that data was provided for a 3-hour weekday period in March 2016.

Oyster bus travel information is provided by bus stop or access node. The access nodes in the vicinity of Meridian Water masterplan are highlighted in Figure 9.

Figure 9: Bus stop access node references in the vicinity of the Meridian Water Masterplan Area

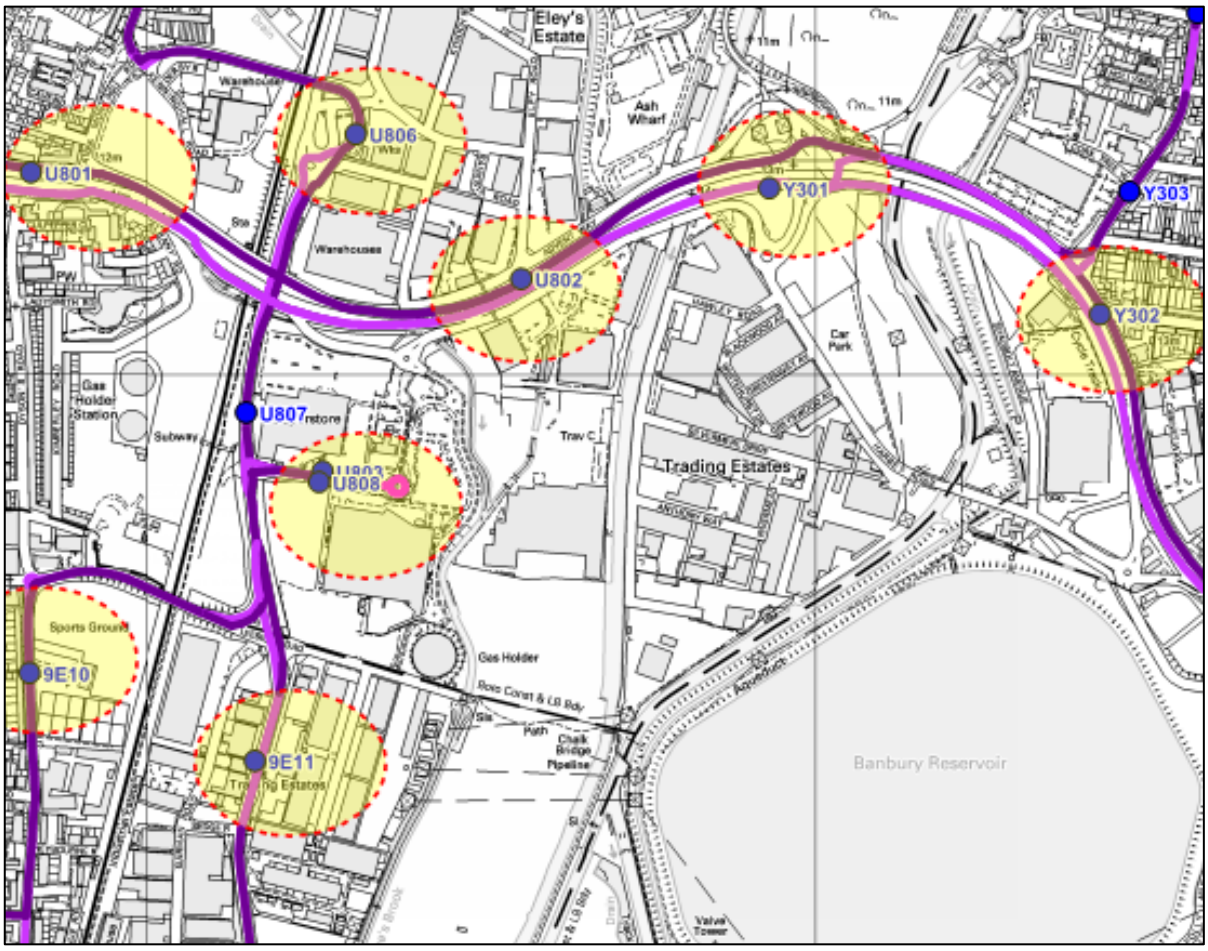


Table 5 provides a summary of daily bus demand for the closest existing access points to the bus network (nodes U808, U802 and Y301) from the MWP2 site. This data is based on surveys undertaken by TfL during 2015/ 2016, prior to clearance of SIL in the north east of the full masterplan area. It should be not that although U806 is marked on the plan this stop is no longer in use.

Table 5: Daily BODs data for selected notes (Source: TfL surveys 2015-2016)

Bus Route	BODs Node	Location	Daily Demand	
			Boarding	Alighting
192 Northbound	U808	Glover Drive / Tesco & Ikea	102	85
192 Southbound	U808	Glover Drive / Tesco & Ikea	357	84
341 Northbound	U803	Glover Drive / Tesco & Ikea	0	479
341 Southbound	U808	Glover Drive / Tesco & Ikea	606	0
34 Eastbound	U802	Eley Trading Estate	207	299
34 Westbound	U802	Eley Trading Estate	295	301
34 Eastbound	Y301	Harbet Road/ Cooks Ferry	102	101
34 Westbound	Y301	Harbet Road/ Cooks Ferry	98	138
444 Eastbound	U802	Eley Trading Estate	75	110
444 Westbound	U802	Eley Trading Estate	86	80
444 Eastbound	Y301	Harbet Road/ Cooks Ferry	17	53
444 Westbound	Y301	Harbet Road/ Cooks Ferry	83	22

4 Meridian Water Bus Strategy

4.1 Opportunities for the Bus Strategy

Buses at Meridian Water should provide a viable and attractive method of mobility by offering an integrated public transport alternative to travel by private car and enabling people to access jobs, schools and health facilities. Buses are also essential in providing good accessibility for people with mobility difficulties. Therefore, buses play a vital role in promoting accessibility for all and supporting social inclusion.

The delivery of an integrated masterplan that puts a healthy streets approach at its heart will provide connectivity to the new Meridian Water rail station and thereby access to the wider rail and underground network.

Buses are key to linking communities to the new Meridian Water rail station. The proposed bus network should not only serve the new Meridian Water community, but also nearby communities that wish to use Meridian Water rail station as their gateway to national rail, Underground and Overground networks.

Similarly, buses will provide local connectivity from Meridian Water to wider bus-rail interchange opportunities which include:

- The West Anglia Main Line at Meridian Water station and Northumberland Park / Tottenham Hale;
- The London Overground at Silver Street and Chingford; and
- The London Underground Victoria line at Walthamstow and Tottenham Hale.

Figure 10 provides a summary diagram of bus-rail interchange opportunities from Meridian Water.

Figure 10: Indicative bus-rail interchange opportunities

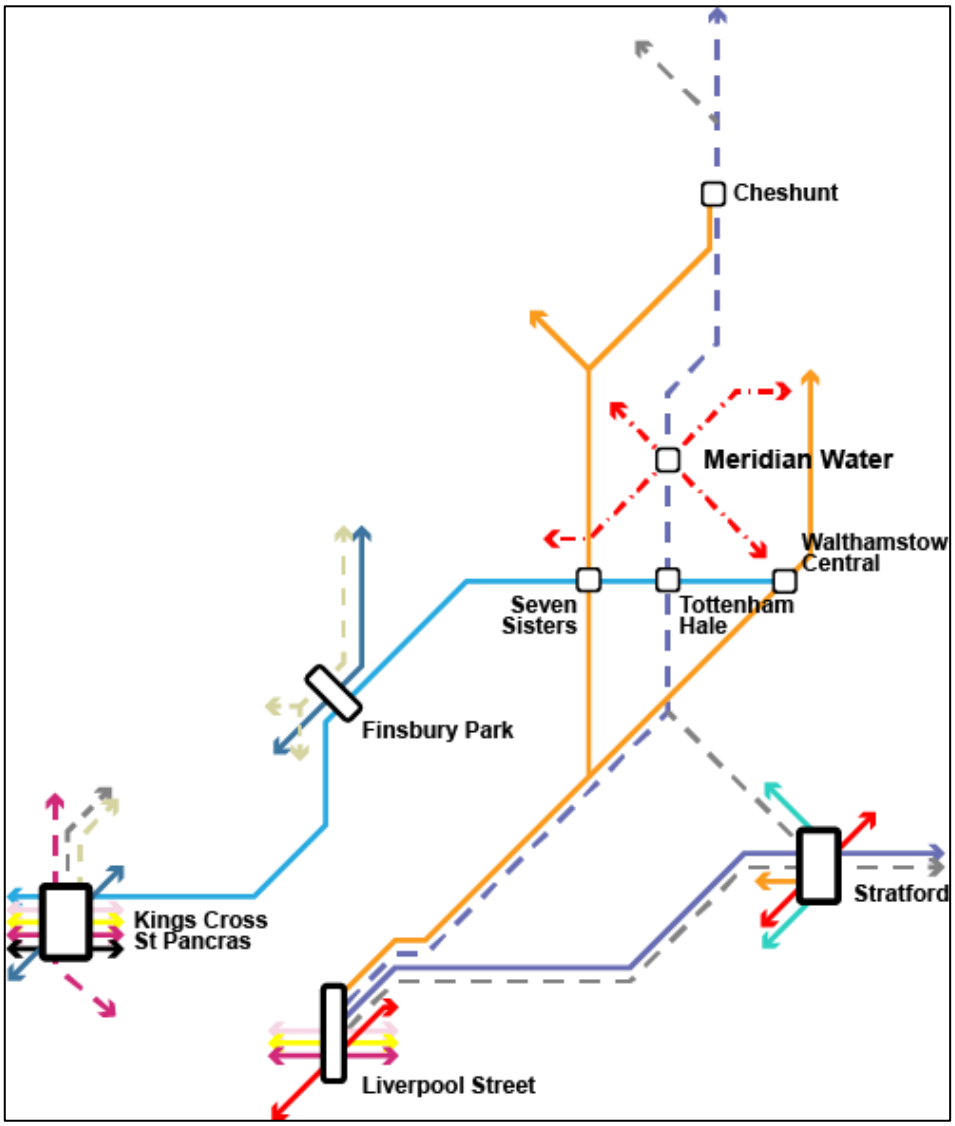


Figure 10 demonstrates that existing public transport services offer onward connections to Central London, Enfield and Hertfordshire. However, in the immediate vicinity of the site, rail infrastructure is provided along a north-south axis, which means that buses play a vital role in providing connectivity east-west.

Section 3 of this report has demonstrated that existing bus routes in the vicinity of the MWP2 site connect well with surrounding urban areas and rail networks. However, existing pedestrian and cycle connections between the MWP2 site and existing bus stops are indirect, of poor quality, and do not meet the Healthy Streets aspirations of the Meridian Water masterplan as described in the Active Travel Strategy and the Healthy Streets assessments included within the TA.

The Meridian Water Bus Strategy therefore looks to:

- Improve the attractiveness of bus stops serving the MWP2 site.
- Establish the Central Spine Road as a public transport and active travel corridor.

- Link communities to the new Meridian Water rail station.
- Contribute to the establishment of the Central Spine Road as a bus-only gateway to the Meridian Water masterplan area.
- Improve bus service accessibility within the wider masterplan site.
- Integrate the site with local communities and surrounding urban centres.
- Improve access to Strategic Industrial Land, and public open space.

4.2 Phase 1 Bus Network Proposals and Agreements

In June 2016, Phase 1 of the Meridian Water development received planning consent (ref: 16/01197/RE3) for 725 residential units together with a maximum of 950 sqm retail (A1/A2/A3), 600 sqm of community use (D1) and 750 sqm of leisure use (D2).

The new Meridian Water station also provides a new pedestrian link that will provide access from Phase 1 to the buses available from Glover Drive. In response to the Phase 1 planning application TfL proposed two options for improving buses that involved changes to routes 341 and 476, or additional capacity on 192 (2 return journeys). The five-year funding required for these options was identified as being in the region of £950,000 and £1,200,000.

4.3 MWP2 Bus Network Proposals

The detailed Strategic Infrastructure Works (SIW) application will deliver a new Central Spine Road through the site, connecting Harbet Road in the east with Glover Drive/ Meridian Way in the west.

The Central Spine Road has been designed to be the main bus corridor through the wider Masterplan area linking Harbet Road in the east to the new Meridian Water station in the west, with the bridge over the River Lee Navigation to be bus-only. There is accompanying provision for active modes, including dedicated desegregated cycle tracks and routes for emergency vehicles. Details of the street sections are provided later in this section.

The MWP2 Bus Strategy aims to provide bus services to specifically:

- serve the MWP2 development with capability to serve the wider masterplan in due course.
- link the MWP2 site and local communities to the new Meridian Water rail station.
- improve access to the existing Strategic Industrial Land (SIL) and proposed meantime uses off Harbet Road (to the east of the River Lee Navigation) in the short term.

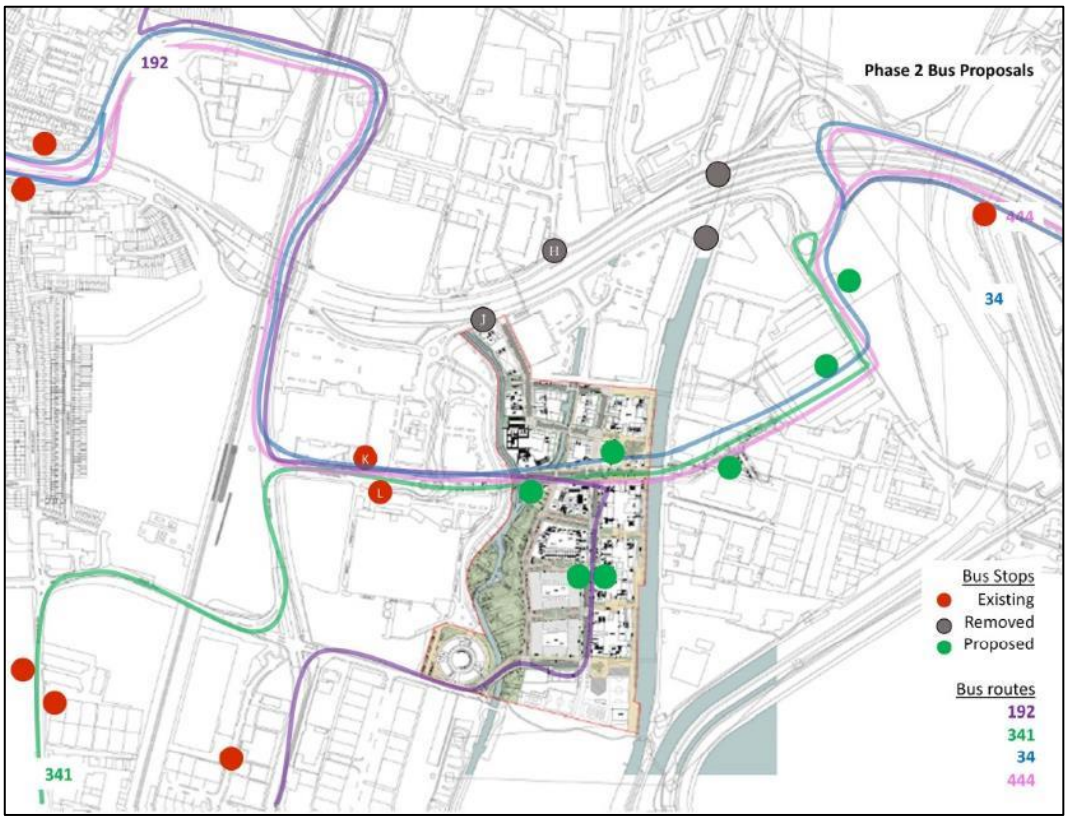
To achieve these aims it is proposed that the following existing bus routes are extended into or re-routed through the MWP2 / wider masterplan area as facilitated by the MWSIW:

- **Route 192** – This route currently runs north-south on Meridian Way currently deviates onto Glover Drive to serve the Tesco Extra and Ikea sites before doubling back along Glover Drive to re-join Meridian Way. It is proposed that this route is extended into the MWP2 site and connecting with Leeside Road, utilising the SIW bridges to form a continuous route (without the need to double back along the same section of road).
- **Route 341 –** This 24-hour service currently terminates at Glover Drive. It is proposed that this route is extended along the Central Spine Road to Harbet Road, where a new bus stand and associated driver facilities will be provided.
- **Route 34** - It is proposed that this route is diverted via Conduit Lane and the Central Spine Road, as opposed to continuing along the North Circular with a view to increase the attractiveness of this bus route and provide east-west bus connectivity through the site and to Walthamstow Central.
- **Route 444 –** It is proposed that this route is diverted via Conduit Lane and the Central Spine Road, as opposed to continuing along the North Circular with a view to increase the attractiveness of this bus route and provide east-west bus connectivity through the site to Chingford Mount.

A summary of these proposed bus route alterations is shown in Figure 8.

Figure 81

: Proposed MWP2 bus routes and stops



By routing buses through the site as part of the MWP2 proposals, this will facilitate the establishment of the Central Spine Road as a dedicated public transport and active travel corridor from day one. It is important to establish travel patterns from initial occupation of the MWP2 site to ensure that public transport and active travel options are clearly legible and can easily be communicated to maximise the attractiveness and potential uptake of public transport and active travel options by residents, employees and visitors.

It is also important that the strategy establishes a framework of bus routes that can be developed, improved and built-upon as future masterplan phases come forward. Further consideration of potential alternative future masterplan options are provided in Section 4.7.

The proposed MWP2 bus routes will result in several changes to existing bus stops. These changes are summarised in Table 6.

Table 6: Proposed changes to bus stops in the Masterplan area

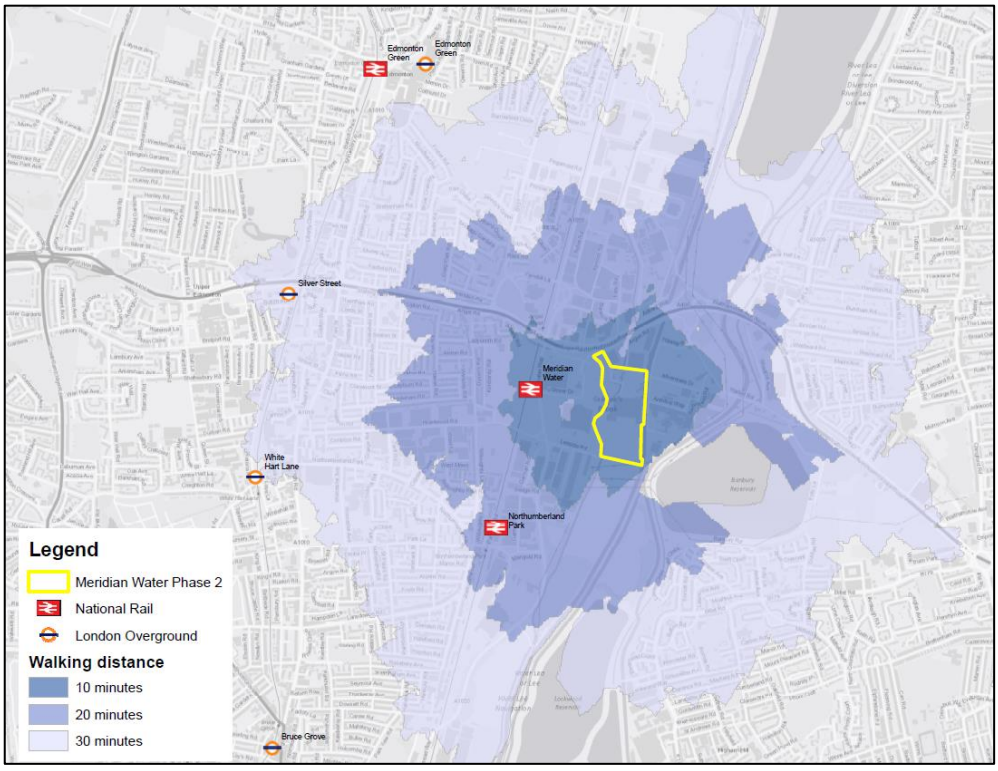
Bus Stop	Description
Bus Stop H – Eley Trading Estate	It is proposed that bus routes 34 and 444 will be re-routed through the MW masterplan area via the Central Spine Road where new stops will be provided. As such, this stop will no longer serve these routes and may no longer be required.

Bus Stop J – Ravenside Trading Estate	It is proposed that bus routes 34 and 444 will be re-routed through the MW masterplan area via the Central Spine Road where new stops will be provided. As such, this stop will no longer serve these routes and may no longer be required.
Harbet Road Cooks Ferry (westbound)	It is proposed that bus routes 34 and 444 will be re-routed through the MW masterplan area via the Central Spine Road where new stops will be provided. As such, this stop will no longer serve these routes and may no longer be required.
Harbet Road Cooks Ferry (eastbound)	It is proposed that bus routes 34 and 444 will be re-routed through the MW masterplan area via the Central Spine Road where new stops will be provided. As such, this stop will no longer serve these routes and may no longer be required.
New Stops – Central Spine Road	It is proposed that new bus stops are provided along the Central Spine Road and Harbet Road to establish the Central Spine Road as an attractive public transport corridor.
New Stops – Leeside Link Road	New bus stops will be provided within the MWP2 site on the new Leeside Link Road connection to serve route 192. This new link will remove the need for a bus turning facility on Glover Drive, resulting in a more efficient route.
New Bus Stand	It is proposed that the existing bus stand on Glover Drive will be relocated to a new facility with appropriate turning and driver facilities on Harbet Road (subject to rerouting of route 341).

The MWP2 bus routing and bus stop proposals result in increased coverage of the Meridian Water masterplan area within 400m of a bus stop as illustrated in Figure 9, in line with Guidelines for Planning Bus Services (TfL, 2012) It should be noted that this is more onerous than the 640m required for PTAL calculations, with walk isochrones shown in Figure 10.

Figure 9: Proposed bus stop 400m catchments

Figure 10: Pedestrian Isochrones (10, 20 and 30 mins) from MWP2 site



The proposed bus route alterations shown in Figure 8, in combination with the delivery of Meridian Water rail station result in accessibility improvements for the MWP2 site as detailed in Table 7.

Table 7: MWP2 site accessibility

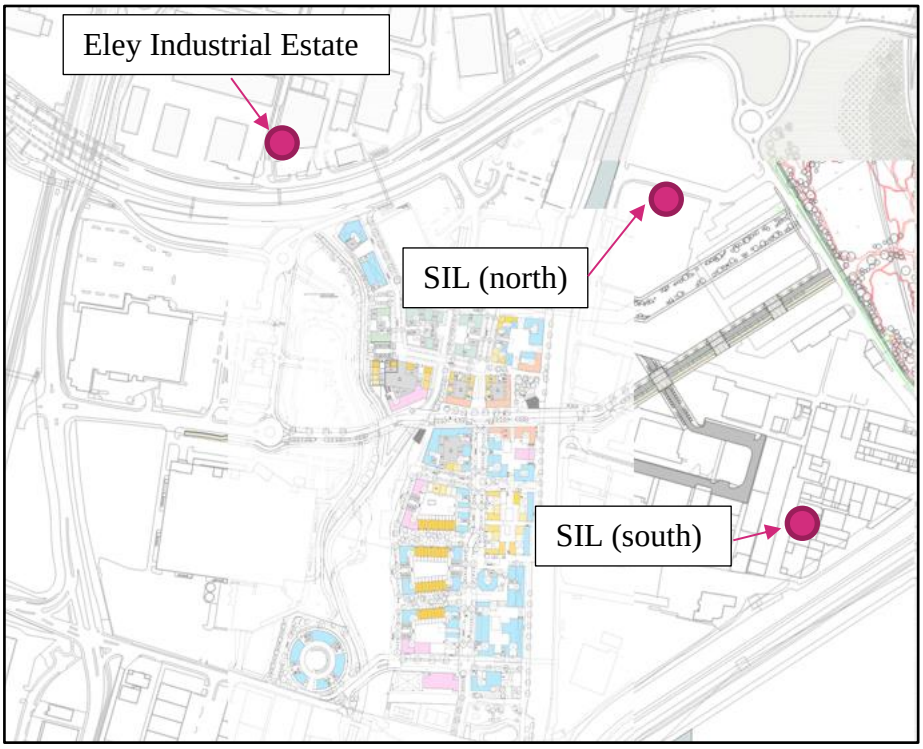
MWP2 Area	Accessibility			
	Existing		Proposed	
	PTAI	PTAL	PTAI	PTAL
MWP2 north	1.7	1a	10.03	3
MWP2 central	0	0	12.25	3
MWP2 south	4.1	1b	10.97	3

Whilst Table 7 shows accessibility improvements for the Meridian Water masterplan area, the proposed changes to bus routes 444 and 34 will result in a decrease in area within 640m walk of bus stops for these services within Eley industrial estate to the north of the North Circular. Table 8 shows the changes to PTAL at locations shown in Figure 11 resulting from the proposed bus services and changes to rail services.

Table 8: Accessibility of the SIL and Eley Industrial Estate sites

Area	Accessibility			
	Existing		Proposed	
	PTAI	PTAL	PTAI	PTAL
SIL north	4.0	1b	8.6	2
SIL south	0	0	6.08	2
Eley Industrial Estate	3.54	1b	4.05	1b

Figure 11: Indicative locations for PTAL assessment presented in Table 7



The proposed routing of bus routes 34 and 444 along the Central Spine Road will increase the travel distance for pedestrians between the Eley Industrial Estate and the proposed bus stops from the existing stops H and J on the North Circular.

This equates to an increase in walk distance of approximately 200m from Eley Industrial Estate, however, the waiting area for proposed bus stops on the Central Spine Road will be considerably more attractive than the existing environment at stops H and J adjacent to the North Circular.

The improved waiting environment and reduced traffic flows on the Central Spine Road compared to existing stops on the North Circular are considered likely to result in significant improvements in air quality in line with the Healthy Streets objectives for the MWP2 site. This, combined with the proximity of the proposed bus stops to other amenities including retail is considered to offset the c.200m increase in travel distances to/from Eley Industrial Estate.

It should also be noted that the relocation of the Meridian Water station from Angel Road will also provide improved access to rail services for MWP2 and the full masterplan area and will require employees to access on foot or cycle via the MWP2 development. With the improvement in rail and bus services, there is still an overall improvement in the accessibility of the areas identified over the baseline situation.

4.4 MWP2 Street Layout and Design

The design principles that underpin the MWP2 are to follow best practice place making to provide a high-quality environment for people to encourage walking and cycling and meet the aspirations of Healthy Streets.

In line with Healthy Streets principles, the proposals have sought to:

- Make public transport services more frequent and direct
- Allow for easy interchange between bus services and Meridian Water rail station (bus stops on Glover Drive are circa. 200m of Meridian Water rail station with convenient / direct crossing points)
- There is flexibility for further bus stop provision throughout MWP2 and the wider masterplan area
- Attractive waiting environments with shelters / shade / seating at bus stops are proposed
- Street planting, landscaping and generous footways will be provided
- Bus-only gate restricting general through traffic will minimise congestion and delays to bus services using the Central Spine Road.

The masterplan has been developed to embed good quality public realm into the street design with areas of wider footways, areas of activity focused around nodes at junctions, paved and landscaped areas throughout the site. Accommodating two-way bus movements on the major highway routes through the development on Leeside Link Road and the Central Spine Road was also intrinsic to the design principles. Typical cross-sections of these streets are shown in Figure 12 and Figure 13.

Figure 12: Typical Central Spine Road Section

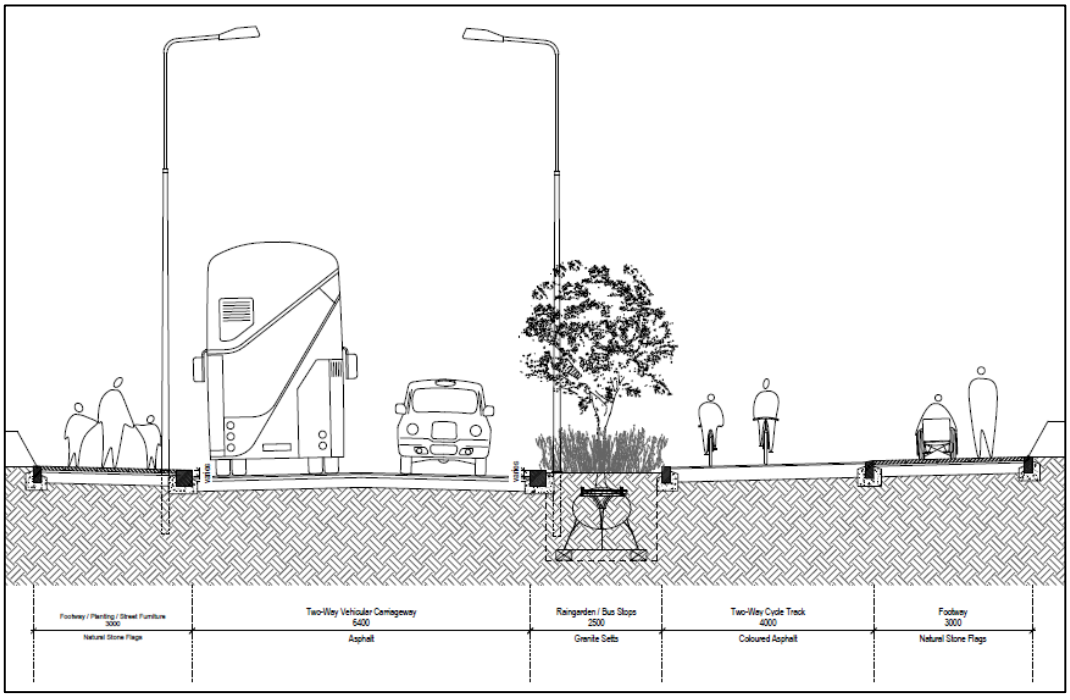
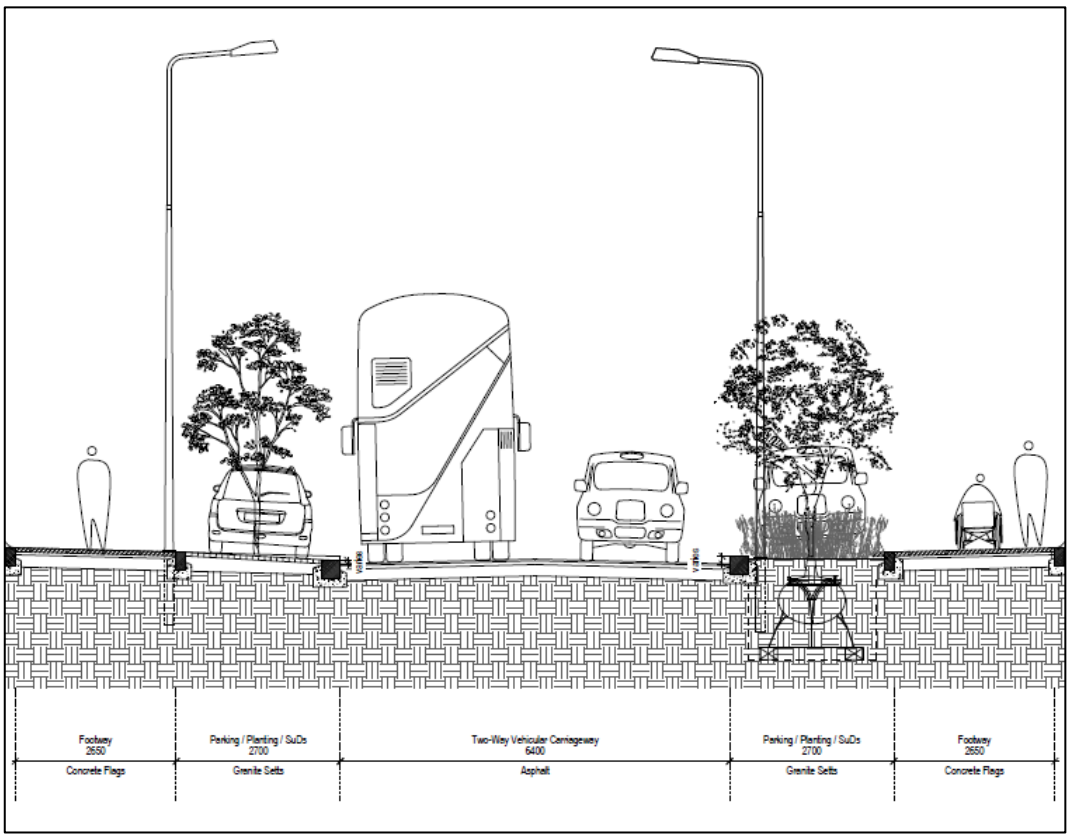


Figure 13: Typical Leeside Link Road Section



4.5 Masterplan MWP2 Bus Demand

To develop a Bus Strategy for the MWP2 site, it is first necessary to understand the additional bus trips likely to be generated by the MWP2 proposals.

The total trips anticipated to be generated by the development proposals will be at their highest on a weekday morning and evening when residents are travelling to/from key destinations during the peak hours. The proposed retail, leisure, education, and community elements of the development will be predominantly associated with prospective residents/employees, or from residents of the local area. Consequently, the total trip generation presented in the Transport Assessment (TA) for the Proposed Development includes weekday AM and PM peak periods (8:00 – 9:00 and 17:00 – 18:00) and Inter peak period (13:00 – 14:00) for all land uses. The full trip generation assessment methodology and calculations by land use is outlined within the Meridian Water MWP2 Transport Assessment (TA) and the associated Trip Generation Technical Report, which is contained as an Appendix to the TA.

The bus trips generated by MWP2 development as presented in the TA are presented in Table 9 (AM, Inter, and PM Peak hours) by route and direction.

Table 9: MWP2 peak hour bus demand

Bus Route	AM Peak (0800-0900)		Inter Peak (1300-1400)		PM Peak (1700-1800)	
	Boarding	Alighting	Boarding	Alighting	Boarding	Alighting
192 Northbound	67	8	12	10	8	40
192 Southbound	12	122	19	16	120	7
341 Northbound	6	25	5	4	24	4
341 Southbound	83	0	14	11	0	49
34 Eastbound	57	28	13	11	27	34
34 Westbound	24	115	20	17	113	14
444 Eastbound	20	15	5	4	14	12
444 Westbound	22	28	8	6	27	13

Table 9 shows that the proposed bus routes to serve the MWP2 site will be well utilised with demand well distributed across these services.

4.6 Impact on Existing Bus Services

Estimates of bus capacity to and from the Meridian Water area have been based on total bus capacity (70 passengers for a double deck bus and 36 passengers for a single deck bus) and existing bus frequencies.

Existing bus demand estimates and MWP2 demand are summarised in Table 10.

Table 10: MWP2 daily bus demand

	Surveyed Daily on-bus Demand			MWP2 Daily Demand	Total Daily Demand
Bus Route	**BODs Node**	**Location**	**Demand**		
192 Northbound (SD)	U808	Glover Drive / Tesco & Ikea	1605	471	2076
192 Southbound (SD)	U808	Glover Drive / Tesco & Ikea	2030	737	2767
341 Northbound (DD)	U808	Glover Drive / Tesco & Ikea	0	173	173
341 Southbound (DD)	U808	Glover Drive / Tesco & Ikea	606	525	1131
34 Eastbound (DD)	U802	Eley Trading Estate	7137	512	7649
34 Westbound (DD)	U802	Eley Trading Estate	7628	773	8401
444 Eastbound (SD)	Y301	Harbet Road/ Cooks Ferry	2282	208	2490
444 Westbound (SD)	Y301	Harbet Road/ Cooks Ferry	2370	295	2665

Estimates of bus capacity to and from the Meridian Water area have been based on total bus capacity (70 passengers for a double deck bus and 36 passengers for a single deck bus) and existing bus frequencies.

The resulting peak hour bus capacity estimates and MWP2 demand are summarised in Table 11.

Table 11: MWP2 peak hour bus demand against capacity

Bus Route	Peak Hour Capacity Estimate	MWP2 AM Peak Hour Demand	MWP2 Passengers per Bus
192 Northbound (SD)	288	75	9
192 Southbound (SD)	288	134	17
341 Northbound (DD)	420	31	5
341 Southbound (DD)	420	83	14
34 Eastbound (DD)	700	85	9
34 Westbound (DD)	700	138	14
444 Eastbound (SD)	252	35	5
444 Westbound (SD)	252	50	7

Table 11 shows that the Proposed Development will generate up to 14 additional passengers per double decker bus and up to 17 additional passengers per single decker bus in the AM peak hour. As the demand is well spread across existing services and directions it is anticipated that this level of demand can be accommodated within existing services.

TfL may consider that increased peak hour service frequencies are required to accommodate MWP2 peak hour demand on some routes/directions. It is anticipated that additional demand can be accommodated along existing routes, however, further routes have been identified for potential integration into the masterplan area as further phases of the masterplan are built out in the following section.

4.6.1 Alternative Strategy Scenario

Following discussions with TfL Buses, consideration has been given to MWP2 peak hour bus demand should route 34 not be routed through the site and remain on the North Circular. This would reduce the number of buses passing through the MWP2 site, but it would retain some service provision along the North Circular (utilising stops H and J), thereby reducing the potential impact on existing bus accessibility for the Eley Industrial Estate.

Table 12: MWP2 peak hour bus demand with route 34 remaining as existing

Bus Route	Peak Hour Capacity Estimate	MWP2 AM Peak Hour Demand	MWP2 Passengers per Bus
192 Northbound (SD)	288	75	9
192 Southbound (SD)	288	134	17
341 Northbound (DD)	420	31	5
341 Southbound (DD)	420	83	14
34 Eastbound (DD)	700	0	0
34 Westbound (DD)	700	0	0
444 Eastbound (SD)	252	120	17
444 Westbound (SD)	252	188	27

Table 12 shows that should 50% of the original demand for route 34 be transferred over to the 444 due to it maintaining its existing route on the A406 North Circular MWP2 demand on route 34, this would result in an additional 27 passengers per bus on route 444. It should be noted that it is still expected that people travelling to and from the development would still utilise the 34 service, but we have assumed a 50% reduction due to the additional walking distance and the poor pedestrian environment to reach those services.

4.7 Proposed Bus Stop Capacities

Following discussions with TfL buses, an assessment of the potential maximum bus stop loading at existing stops K and L, based on existing bph assumptions utilised previously, has been undertaken. Table 13 shows the maximum number of peak hour services stopping on Glover Drive.

Table 13: Bus Stop Capacity Check

Route	Bus Stop K & L (Glover Drive)
	Maximum bph (based on existing timetable frequencies)
341	6
192	8
34	10
444	7
Total bph	**31**

With the relocation of the bus stands to Harbet Road this would enable full bus stop cage lengths of 52m on the southern side and 37m on the northern side of Glover Driver. This would provide sufficient capacity to safely accommodate and load two stopped buses, which should satisfy the expected demand for stopping space as indicated by Table 13.

The bus stops on the Central Spine Road and Harbet Road will serve three bus routes and as such is unlikely to require more than standard 26m bus stop cages. This is similar to the bus stops on the Leeside Link Road where this will only accommodate a single bus route.

5 Flexibility and Resilience of Proposed Bus Strategy

The MWP2 Bus Strategy proposals are proposing that existing bus services (albeit rerouted) will absorb the additional demand generated by the MWP2 development proposals. The rerouting and extending of services will improve the connectivity of the site and the attractiveness of services for future residents, employees and visitors at MWP2.

Bus routes are reviewed in detail by TfL prior to the renewal of the contract award and TfL implements changes to route alignments and, if required, frequency in response to demand. Therefore, any proposals set out in this bus strategy are subject to change and agreement by TfL in collaboration with stakeholders.

There is therefore a need for the Meridian Water Bus Strategy to be flexible and responsive to any changes as the MWSIW, MWP2 and potential future masterplan phases are delivered. The Bus Strategy will therefore be updated to account for any material changes to public transport networks, such as Crossrail 2, or masterplan proposals, in consultation with LBE and TfL.

The MWSIW proposals allow for a variety of bus route configurations with all proposed bridges, the full Central Spine Road and the Leeside Link Road all designed to accommodate buses with accompanying bus stops, stands and driver facilities where necessary. The MWSIW will significantly increase the permeability of the MWP2 site and wider masterplan area for buses, providing additional resilience should any single bridge/connection be closed or blocked.

5.1 Additional Rerouting and Extensions

There is also potential to further increase the number of bus routes serving the Meridian Water masterplan area in future, over and above the routes proposed to be amended as part of the core MWP2 strategy. The following routes have been identified as having the potential for extension into the site from the west:

- **Route 476** – between Northumberland Park and Euston
  This route connects Northumberland Park to the southwest to Euston in central London.
- **Route W3** – between Northumberland Park and Finsbury Park
  This route connects Finsbury Park in the southwest to Northumberland Park to the southwest of the site.
- **Route W6** – between Southgate Station and Edmonton Green
  This route connects Southgate Station (Barnet) in the west to Edmonton Green to the northwest of the site.
- **Route W8** – between Chase Farm Hospital and Picketts Lock
  This route connects Chase Farm Hospital (Enfield) in the northwest to Picketts Lock to the north of the site.

The incorporation of these routes into the Bus Strategy to run through and serve the site when the wider masterplan area is delivered in full will need to be

discussed in detail with TfL and a case developed to determine the suitability for their inclusion.

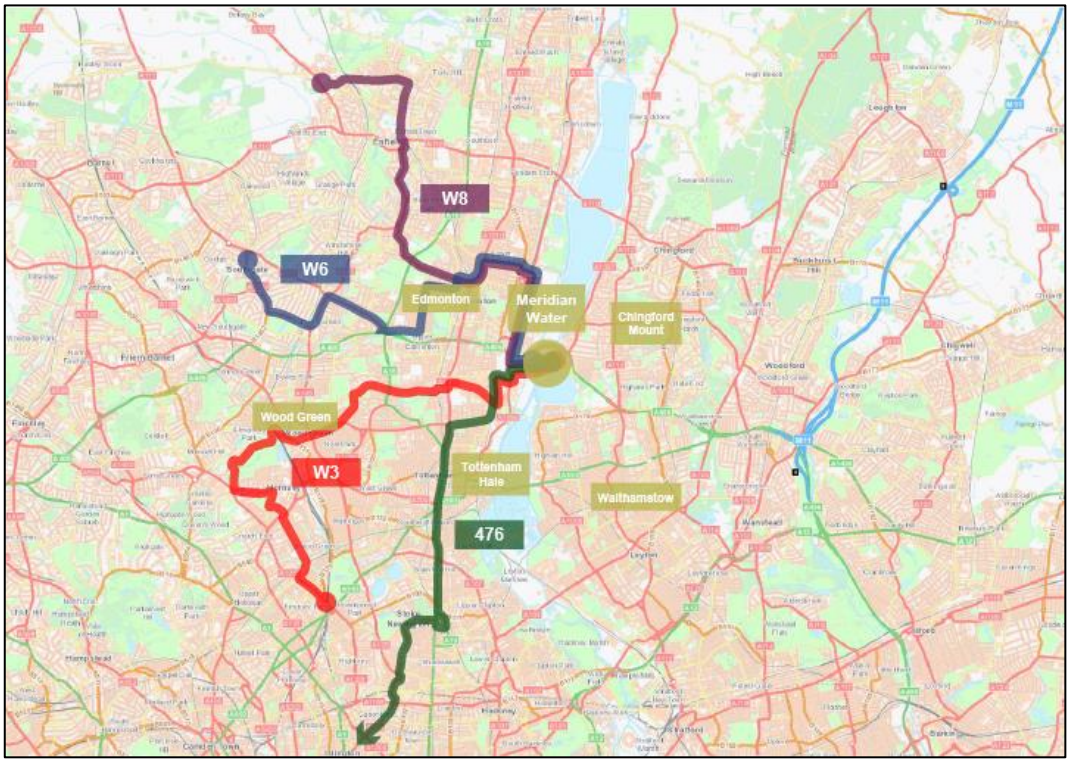
Table 14 provides a summary of the service frequencies for these potential additional services.

Table 14: Existing bus frequencies for routes with potential to be incorporated into Masterplan area (from the west)

Route	Weekday Frequencies	Saturday Frequencies	Sunday Frequencies	24 Hour Service
476	Every 5-9 minutes	Every 7-9 minutes	Every 11-13 minutes	No
W3	Every 6-10 minutes	Every 9-13 minutes	Every 10-13 minutes	Weekends only
W6	Every 8-11 minutes	Every 9-11 minutes	Every 15 minutes	No
W8	Every 6-10 minutes	Every 7-9 minutes	Every 12-13 minutes	No

Figure 14 shows the potential route extensions from the west of the site.

Figure 14: Potential bus extensions to the MWP2 site from the west



In the development of this Bus Strategy a number of further potential service alterations for routes accessing from the east have been considered and could be explored further in consultation with TfL as shown in Figure 15. These include:

- The realignment of route W11 through Meridian Water and the restructuring of route 158. The W11 is a short route running from Walthamstow Central, crossing the North Circular at Crooked Billet to Chingford Hall. Realignment would provide a connection between Meridian Water and Walthamstow Central and could increase demand such that a higher frequency service with the existing Hail and Ride sections replaced with formal bus stops. The W11 could provide an additional link for local communities to the new station at Meridian Water.
- The realignment of route 158 to Walthamstow Central via Meridian Water instead of the Crooked Billet roundabout. This would provide a 24-hour link to Stratford by bus. However, demand for another link from Meridian Water to Stratford may not be significant given the link by rail that is proposed to be provided.
- Extend the W16 from its current terminus at Chingford Mount to Meridian Water.
- Extend the 397 or 385 from their current termini at Crooked Billet to serve Meridian Water, providing more east-west links.

Figure 15: Potential bus extensions to the MWP2 site from the east

5.2 Effects on Bus Strategy on Connectivity

Figure 16 and Figure 17 show the indicative increase in bus catchment to/ from MWP2 site over a travel time of 30 minutes and 1 hour as a result of the MWP2 and current full masterplan bus proposals.

Figure 16 shows the re-routing of buses 192, 341, 34, and 444 along the Central Spine Road.

Figure 16: Increase in Bus catchment resulting from MWP2 proposals

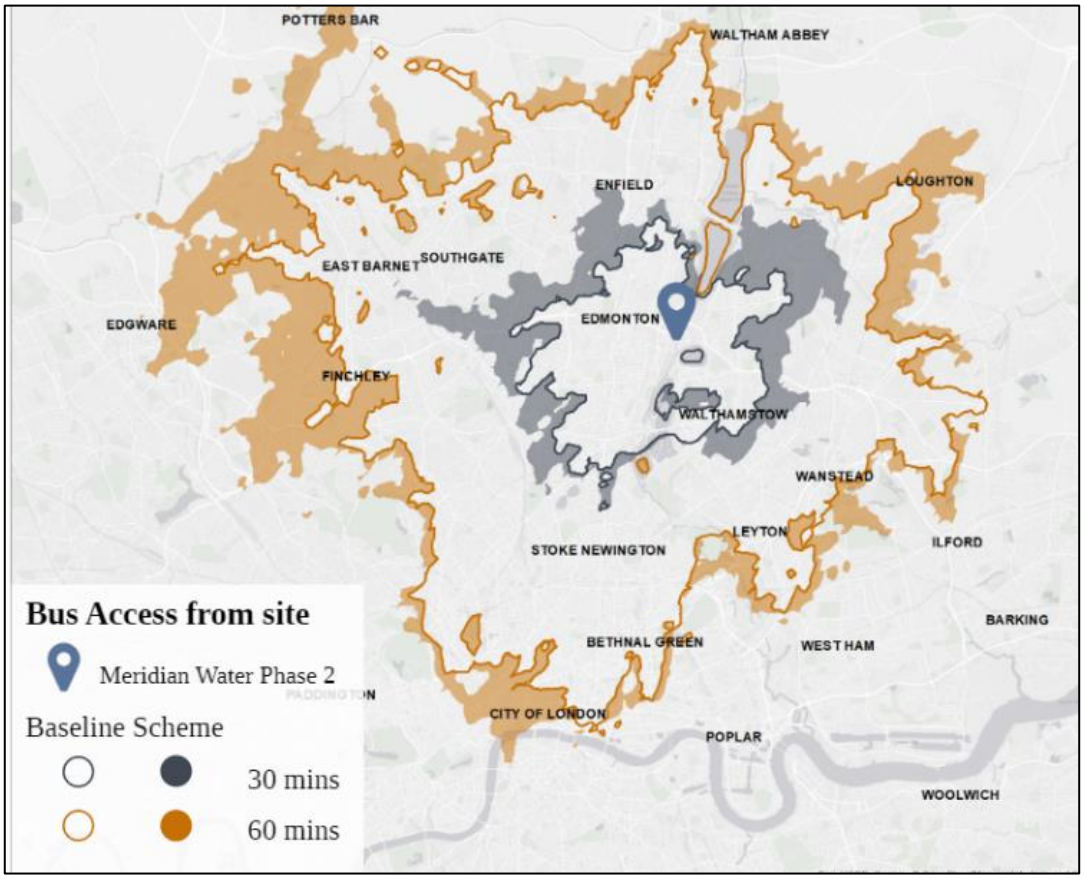
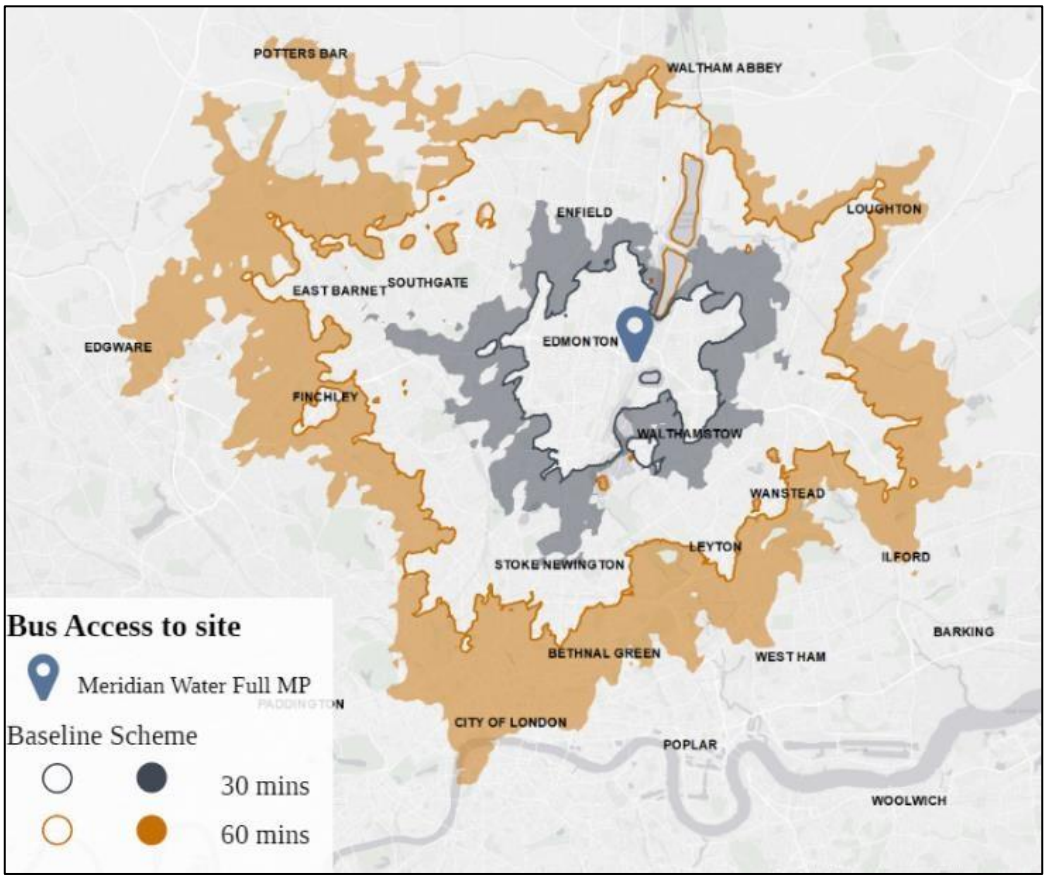


Figure 17 shows the potential increased bus catchment for the current full masterplan bus proposals which include the re-routing of buses 192, 341, 34, and 444 and extension of routes 476, W3, W6, W8, and W11 into the site and along the Central Spine Road as described earlier in this section.

Figure 17: Increase in Bus catchment resulting from Full Masterplan proposals



5.3 Potential for Bus Priority

The proposed re-routing of bus routes 34 and 444 from the North Circular to the Central Spine Road will allow the provision of a more attractive environment and waiting area for bus stops and likely increase patronage and the attractiveness of travel by bus compared to the existing stops.

The proposed re-routing may introduce additional delay to bus routes 34 and 444 as the proposed route along the Central Spine Road will result in an increase in travel distance of approximately 1km between the Harbet Road roundabout and Montagu Road junctions with the North Circular.

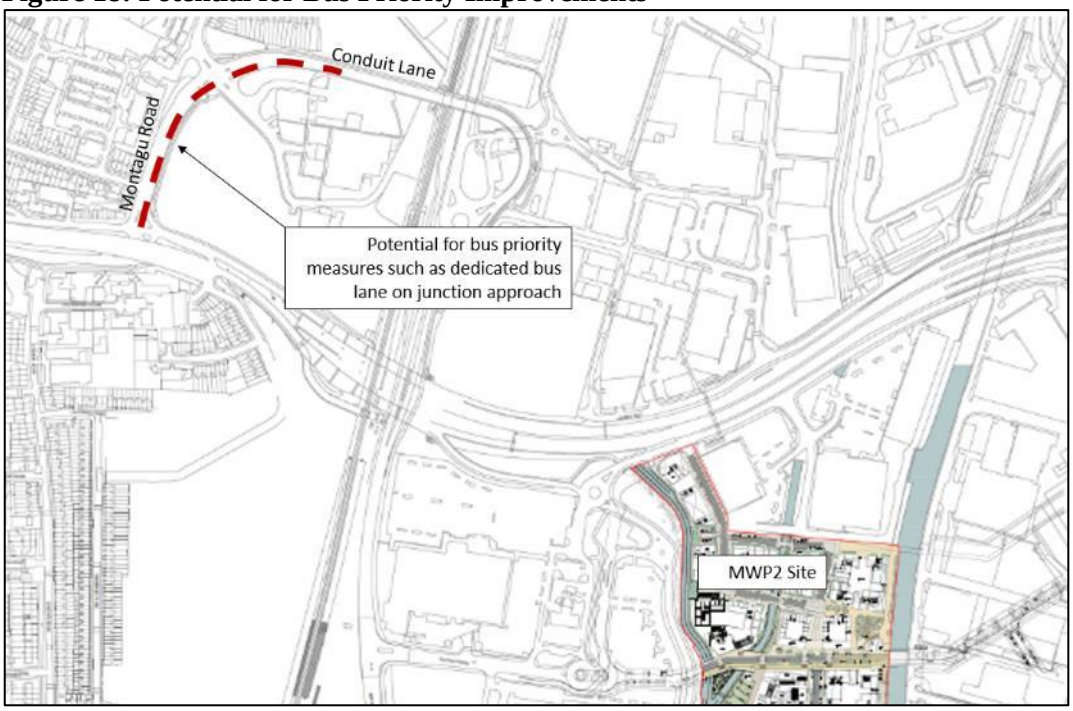
The Central Spine Road is also proposed to have a speed limit of 20mph in contrast to the 50mph speed limit on the North Circular, which would further increase proposed bus travel times compared to the existing situation. However, the Central Spine Road proposals include a bus-only link at the Lee Navigation bridge and will be lightly trafficked, therefore it is desirable to re-route bus routes onto the Central Spine Road away from the North Circular which is heavily congested and busy at peak times.

In order to minimise the potential negative effects of rerouting buses away from the North Circular, the investigation of bus priority measures on Conduit Lane/ Montagu Road in the form of a dedicated bus lane, where there is sufficient space,

as shown in Figure 18 which could help to minimise any increase in delay should be explored.

Provision of such a bus priority scheme could therefore be further explored as part of the future phases of development in consultation with TfL and LBE. There are also opportunities as part of wider LBE and TfL studies into East-West Connectivity within Enfield, linking growth areas through new public transport provision, to look into improvements in this area to improve bus reliability and journey times. The proposals at Meridian Water align with these goals and specifically through the provision of the bus-only Central Spine Road.

Figure 18: Potential for Bus Priority Improvements



5.4 Potential to improve bus service catchments to the north of North Circular

The proposed re-routing of bus routes 34 and 444 from the North Circular to the Central Spine Road will allow the provision of a more attractive environment for bus stops and likely increase patronage and the attractiveness of travel by bus compared to the existing stops which are access by poor quality pedestrian routes. However, this re-routing will with result in bus stops moving south, further away from the Eley Industrial Estate.

Whilst the provision of additional bus stops on Meridian Way, to the south of the roundabout with Conduit Lane, could be explored in consultation with TfL/ LBE, these stops would not be well served by pedestrian routes to/ from the Eley Industrial Estate and so would be considered to result in low demand.

There are also issues with land ownership and the provision of links across private land. Future redevelopment of the Eley and Montague Industrial estates will need to investigate access improvements to stops and bus services in this area.

6 Conclusion and Next Steps

Existing public transport provision and accessibility at the Meridian Water MWP2 site and wider masterplan area is poor. As the area undergoes regeneration the current bus network will need to be reconfigured to connect the site to both the new Meridian Water rail station and the surrounding communities and urban centres.

As frequent north-south links will be provided by improved rail services, and Meridian Water becomes a local trip attractor for employment and retail, it is expected that demand for more local east-west bus links will increase to accommodate demand for local connectivity in terms of access to new jobs, leisure and rail stations.

This strategy has undertaken a preliminary assessment of bus demand and capacity for MWP2 of the Meridian Water masterplan and set out proposals to reconfigure local bus routes to better serve the Meridian Water masterplan area, improve the attractiveness of travel by bus and significantly increase bus patronage. The Bus Strategy proposals, whilst not necessary in planning terms to deliver the Proposed Development, they are aspirational to ensure the best sustainable travel outcomes.

These proposals are subject to discussion with TfL, LBE and other stakeholders. It is understood that TfL will undertake further analysis and service planning of routes in this area over the next few years, linking more strategically with future rail interventions. This strategy will therefore develop in an iterative manner as a 'live' document as the MWSIW and MWP2 proposals are delivered and future masterplan phases come forward.