IKEA Properties Investments Limited and LXB RP (No. 20) Limited

IKEA, Millennium Retail Park, Greenwich Peninsula

Transport Assessment Report

December 2013

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1 INTRODUCTION

1.1 Vectos has been retained by IKEA Properties Limited and LXB RP (No. 20) Limited to provide traffic and transport advice relating to their proposal for a new IKEA store (use class A1 non-food retail), located within the Millennium Retail Park at Greenwich Peninsula, in the Royal Borough of Greenwich.

1.2 The strategic location of the Site is shown in **Figure 1**, whilst the Site's location in respect of the local area is shown in **Figure 2**.

1.3 In line with their long term sustainability vision, IKEA is seeking that this store will be their most accessible store in the UK for customers visiting by public transport, providing an accessible store to the high proportion of the London population who do not own a vehicle.

1.4 The Millennium Retail Park is located to the north of the A102 Blackwall Tunnel Approach, approximately 1.9km south of the 0^2 Arena (Millennium Dome). The Retail Park currently encompasses a Sainsbury's foodstore, Sainsbury's Petrol Filling Station, Comet (which is vacant), and a B&Q. The Retail Park shares a car park with the Millennium Leisure Park, which includes an Odeon Cinema and a number of restaurants. The car park has approximately 1017 spaces. Vehicle access to the Millennium Retail Park is via Peartree Way and Bugsby's Way.

1.5 As a result of a recent planning consent (planning ref: 12/0835/F), Sainsbury's will be relocating their foodstore to a site north of Woolwich Road and west of Gallions Road, approximately 1 km from its current position in the Millennium Retail Park.

1.6 The proposals are to replace the Sainsbury's foodstore and vacant Comet unit with a new IKEA store.

1.7 This Transport Assessments supports an application which seeks outline planning permission (with all matters reserved with the exception of access and layout) for the redevelopment of the site to provide one non-food retail unit (Use Class A1) of up to 33,000 square metres (gross floor area), service yard and associated infrastructure.

1.8 In addition the following are proposed: some minor amendments to the car park to assist traffic flow and aid customer pick-up; amendments to the service access; a new left-in/left-

out access junction on Peartree Way which will be used only by IKEA home delivery vehicles, which consist of Luton style vans.

1.9 This Transport Assessment Report sets out the accessibility of the site by all modes of transport, as well as the impact of the proposed development on the local highway network, and on local public transport facilities. Walking and cycling routes in the local area have also been assessed as part of this Transport Assessment.

1.10 Prior to the submission of this Transport Assessment discussions have taken place with Transport of London, and highways officers at the London Borough of Greenwich. A detailed Scoping Note was submitted to both authorities and a pre-application meeting was held on 10th October 2013. The comments contained within TfL's pre application advice letter have been included within the TA where appropriate. A copy of the Scoping Note and TfL's pre-application advice letter are included at **Appendix A**.

1.11 A public consultation event also took place on Saturday 9th November and Vectos staff were in attendance.

1.12 This report has been prepared with the benefit of our knowledge and experience gained through working on similar developments in this area of Greenwich, and through working on various IKEA developments throughout the country.

1.13 The remainder of the report is set out as follows:

Section 2	-	Existing situation of the Site, including the local highway network, and accessibility by non-car modes of transport;
Section 3	-	Development Proposals;
Section 4	-	Policy Context;
Section 5	-	Sustainable Transport Strategy
Section 6	-	Trip Generation, Distribution and Assignment;
Section 7	-	Effects of the Proposals on the Local Public Transport Facilities
Section 8	-	Effects of the proposals on the Local Highway Network
Section 9	-	Impact on Parking and Car Park Management
Section 9	-	Summary

2 EXISTING SITUATION

2.1 This section summarises the existing situation of the proposed Site at Greenwich Millennium Retail Park, including the surrounding local highway network, and accessibility by non-car modes of transport.

Site Location

2.2 Greenwich Millennium Retail Park, the location of the proposed IKEA store, is situated in North Greenwich. The Site is bordered by Bugsby's Way to the north, Peartree Way to the east, the A102 to the south, and Blackwall Lane to the west.

2.3 The strategic location of the Site is shown in **Figure 1**, whilst the Site's location in respect of the local area is shown in **Figure 2**.

2.4 The existing layout of Greenwich Millennium Retail Park is shown in **Appendix B**.

2.5 Greenwich Millennium Retail Park currently comprises a B&Q store and a Sainsbury's foodstore. A vacant unit that was previously occupied by Comet is situated between the B&Q and Sainsbury's foodstore. The unit became vacant in December 2012 just after the company went into administration. To the west, and within the Retail Park boundary, is the Millennium Leisure Park which contains restaurants and an Odeon cinema.

2.6 Also within the Greenwich Peninsula is the O2 Arena (Millennium Dome) and Millennium Village. Greenwich Peninsula is a major regeneration area. An extensive residential area is situated to the south of the Millennium Retail Park.

Local Highway Network

2.7 A description of the key vehicle routes in the vicinity of the application site is given in the following paragraphs.

A102

2.8 The A102 links the A2 in Charlton at the Sun in Sands Roundabout with the A13 East India Dock Road through the Blackwall Tunnel. It is part of the Transport for London Road Network (TLRN), which consists of roads that are maintained by Transport for London (TfL). In the

vicinity of Greenwich Millennium Retail Park, the A102 is a three carriageway road which narrows to two carriageways at the Blackwall Tunnel Approach.

2.9 Data from TfL suggests that, on an average day, there are approximately 99,000 two way vehicle movements on the A102.

Bugsby's Way

2.10 Bugsby's Way is a dual carriageway which links Anchor and Hope Lane to the east with Peartree Way and Blackwall Lane to the west. It provides access to the various industrial and retail estates including the Greenwich Shopping Park and Peninsular Retail Park on the southern side and the Meridian Trading Estate on the northern side.

2.11 In the section of Bugsby's Way between Blackwall Lane and the Site access, there are approximately 12,000 two way movements on an average day.

A206 Woolwich Road

2.12 Woolwich Road links Greenwich to the west with Woolwich to the east. It is of strategic significance, forming part of the A206 which is designated as a London Distributor Road and is routed between the Queen Elizabeth II Crossing in the east and the A2 in the west. It also connects with the A205 South Circular at Woolwich and the A102 Blackwall Tunnel Approach at Greenwich. To the south east of the site, Woolwich Road forms a signalised junction with the A1020 Peartree Way and the A102.

2.13 Automatic Traffic Count (ATC) Data shows that Woolwich Road has approximately 18,000-22,000 two way movements on an average day.

A1020 Peartree Way

2.14 Peartree Way forms the eastern boundary of Greenwich Millennium Retail Park and links Bugsby's Way to the signalised junction at the A102 and A206 Woolwich Road. North of Bugsby's Way, Peartree Way connects pedestrians to the Thames River Footpath.

2.15 Between the roundabout with Bugsby's Way and the A102, Peartree Way is a dual carriageway road with a large central reservation. There are two signalised junctions providing access to Greenwich Millennium Retail Park. The northern junction permits access for buses only, connecting to the Millennium Way Bus Lane routed through the retail park,

whilst the southern junction provides access to the customer car park and petrol filling station.

2.16 There are wide footpaths on both sides of Peartree Way. Alongside the northbound carriageway this is in the form of a segregated footway/cycleway.

2.17 On Peartree Way, ATC data shows approximately 13,600 two way vehicles movements on an average day.

Commercial Way

2.18 Commercial Way is a single carriageway road that provides access through the shared car park used by customers of the Millennium Retail Park. It links Bugsby's Way to the north with the A1020 Peartree Way to the east at signal junctions.

Millennium Busway

2.19 Greenwich Millennium Retail Park has a dedicated bus only lane which forms part of the Millennium Busway, which links the site to the 0^2 Arena (Millennium Dome) and North Greenwich Underground Station. There are two bus stops within Greenwich Millennium Retail Park. One located outside B&Q, and one located outside the existing Sainsbury's Store, which forms part of the proposed IKEA site.

Vehicle Access and Car Parking

2.20 Access to the Greenwich Millennium Retail Park car park is via a signalised junction on Bugsby's Way, and two signalised junctions located on Peartree Way. The northern junction on Peartree Way forms part of the Millennium Bus Way, permitting access to buses only. The southern access provides access to the customer car park and petrol filling station.

2.21 The Greenwich Millennium Retail Park and Millennium Leisure Park shared car park has 1,017 parking spaces. This includes 46 disabled parking bays and 24 parent and toddler bays.

Personal Injury Accidents

2.22 A review of personal injury accident (PIA) data has been undertaken for a 5 year period between 01/06/2008 and 31/05/02013. The raw data from TfL is included within **Appendix C**. The study area for accident analysis includes the following junctions:

- A102/Blackwall Lane;
- A102/Woolwich Road/Peartree Way;
- Bugsby's Way/Blackwall Lane;
- Bugsby's Way/Commercial Way;
- Bugsby's Way/Peartree Way;
- Peartree Way/Millennium Bus Way; and
- Peartree Way/Commercial Way

2.23 In summary, there were 132 accidents within the study area surrounding the Site. Of these, 116 accidents resulted in slight injuries, 13 accidents resulted in serious injuries and two accidents resulted in fatal injuries. A breakdown of accident by junction is shown below in **Table 2.1.**

Table 2.1: Accident Severity by Junction

Junction	Slight	Serious	Fatal	Total
A102/Blackwall Lane	30	2	0	32
A102/Woolwich Road/Peartree Way	60	3	1	64
Bugsby's Way/Blackwall Lane	14	2	0	16
Bugsby's Way/Commercial Way	4	5	1	10
Bugsby's Way/Peartree Way	4	1	0	5
Peartree Way/Millennium Bus Way	0	0	0	0
Peartree Way/Commercial Way	3	1	0	4
Total	**116**	**13**	**2**	**131**

2.24 **Table 2.2** below summarises the transport modes that were involved in the accidents at each junction within the study area:

Table 2.2: Transport Mode of Accident by Junction

	Driver	Passenger	Cyclist	Pedestrian	Total
A102/Blackwall Lane	24	7	1	0	32
A102/Woolwich Road/Peartree Way	50	10	4	0	64
Bugsby's Way/Blackwall Lane	12	2	2	0	16
Bugsby's Way/Commercial Way	2	0	1	7	10
Bugsby's Way/Peartree Way	2	1	0	1	5
Peartree Way/Millennium Bus Way	0	0	0	0	0
Peartree Way/Commercial Way	3	0	0	1	4
Total	94	20	7	9	131

2.25 Table 2.2 shows that 114 of the accidents involved vehicle occupant only injuries (driver or passenger). These include cars, motorcycles, LGVs, HGVs and buses. Of the remaining accidents, 7 involved cyclists and 9 involved pedestrians.

2.26 A summary of the accidents at each junction is provided below:

A102/Blackwall Lane

2.27 There were a total of 32 accidents at the A102/Blackwall Lane junction during the five year study period. Of these, 30 resulted in slight injuries and two resulted in serious injuries. There were no fatalities. One of the accidents involved a cyclist.

2.28 The first serious accident occurred when a vehicle changed lane at the last minute to reach the A102 slip road and collided with a motorcycle causing the rider to fall off. The second serious accident also involved injuries to a motorcyclist who was hit from behind by a car.

2.29 In a separate accident, a cyclist received slight injuries when a car collided with their rear wheel.

A102/Woolwich Road/Peartree Way

2.30 There were a total of 63 accidents at the A102/Woolwich Road/Peartree Way junction during the five year study period. Of these, 60 resulted in slight injuries and three resulted in serious injuries. There was one fatal accident. Four of the accidents involved cyclists.

2.31 The fatal accident at this junction occurred to a cyclist. The cyclist was knocked off their bicycle by a car.

2.32 The three other accidents that involved cyclists resulted in slight injuries. Two of these accidents involved a left turning vehicle colliding with a cyclist on their inside. The other accident occurred when a car pulled out in front of a cyclist.

2.33 The first serious accident on this junction occurred as a result of a driver losing control of their vehicle, and colliding with a central barrier. The other two serious accidents occurred when a driver broke suddenly and a following vehicle collided with their vehicle rear-end.

Bugsby's Way/Blackwall Lane

2.34 There were a total of 16 accidents at the Bugsby's Way/Blackwall Lane junction during the five year study period. Of these, 14 resulted in slight injuries and two resulted in serious injuries. There were no fatalities. Two of the accidents involved a cyclist.

2.35 The first serious accident occurred when a vehicle turned left into another vehicle, causing them to hit a lamppost. The passenger of the vehicle hit received serious injuries. The second serious accident occurred to a cyclist when a vehicle pulled left across the cyclists causing them to fall off of their bicycle.

2.36 In a separate accident, a cyclist received slight injuries when a vehicle pulled into the roundabout across their path.

Bugsby's Way/Commercial Way

2.37 There were a total of 10 accidents at the Bugsby's Way/Commercial Way junction during the five year study period. Of these, four resulted in slight injuries and five resulted in serious injuries. There was one fatal accident. One of the accidents involved a cyclist whilst seven involved pedestrians.

2.38 The fatal accident occurred to a pedestrian who stepped out into the road into the path of an oncoming bus. The accident was attributed to the pedestrian not looking properly and improper use of a crossing.

2.39 Six additional accidents involving pedestrians occurred at this junction during the five year study period.

2.40 Three of the accidents involving pedestrians resulted in slight injuries. Two of these accidents were a result of pedestrians stepping out into the road into the path of buses. Both were attributed to improper use of the crossing by pedestrians. The other accident occurred on a pedestrian crossing when a vehicle failed to see the pedestrian using the crossing facility.

2.41 The remaining three accidents involving pedestrians resulted in serious injuries. All three of these accidents were a result of pedestrians stepping out into the road into the path of buses. All were attributed to improper use of the crossing by pedestrians.

2.42 The remaining serious accident at this junction involved a cyclist.

Bugsby's Way/Peartree Way

2.43 There were a total of five accidents at the Bugsby's Way/Peartree Way junction during the five year study period. Of these, four resulted in slight injuries and one resulted in serious injuries. There were no fatalities. One of the accidents involved a pedestrian.

2.44 The serious accident occurred when a driver broke suddenly and a following vehicle collided with their vehicle rear-end.

2.45 The accident involving a pedestrian occurred when a pedestrian stepped into the road without looking. This accident resulted in slight injuries to the pedestrian.

Peartree Way/Commercial Way

2.46 There were a total of four accidents at the Bugsby's Way/Commercial Way junction during the five year study period. Of these, three resulted in slight injuries and one resulted in serious injuries. There were no fatalities. One accident involved pedestrian.

2.47 One accident resulted in serious injuries to a pedestrian. This occurred as a result of a vehicle clipping the pedestrian.

Summary

2.48 The accident analysis has not been able to identify any specific geometric/layout issues at the majority of junctions with most of the accidents minor in nature, and as a result of driver error.

2.49 However, it is clear that there is an issue at the Bugsby's Way/Commercial Way/Millennium Busway junction, with 7 accidents involving pedestrians, one of which resulted in fatal injuries and three resulting in serious injuries. Six out of seven of these accidents occurred when pedestrians crossed the road on a red-man signal into the path of buses.

2.50 Whilst the impact of the development proposals on this and other junctions where a significant number of accidents occur are modest, IKEA is content to work with TfL and RB Greenwich to identify if any appropriate amendments can be made.

Pedestrian Facilities

2.51 The pedestrian routes in the vicinity of the site are shown in **Figure 3**.

2.52 A Pedestrian Environment Review System (PERS) audit was undertaken to assess the pedestrian routes to local public transport facilities, local retail parks and local residential areas. This is included in **Appendix D**.

2.53 Within the vicinity of the site there are wide footways on both sides of the Millennium Busway. There is an at-grade zebra crossing with tactile paving to cross the bus lane from outside the Site, which allows safe access between the store and the shared car park.

2.54 On Peartree Way to the east of the site, there are wide footways leading to the junction with the A102 and A206, where there is a signalised pedestrian crossing with tactile paving. There is also a signalised pedestrian crossing across the junction with the A102 to offer pedestrians the safe opportunity to cross the road to access the bus stops on Woolwich Road.

2.55 There are pavements on both sides of the carriageway on Bugsby's Way to provide pedestrian access to the Greenwich Millennium Village to the west of the site and the industrial areas on Bugsby's Way east of the site. There are also signalised pedestrian crossings across John Harrison Way to provide a safe pedestrian route to North Greenwich Underground station.

2.56 A footbridge over the A102 links residential units to the south of A102 directly into Greenwich Millennium Retail Park.

2.57 There are also footways along Combedale Road and Westcombe Hill to allow access for pedestrians to Westcombe Park rail station.

Cyclist Facilities

2.58 The cycle routes in the vicinity of the site are shown in **Figure 3**.

2.59 There is a segregated cycle lane alongside the footway on the Millennium Bus Way providing direct access to Greenwich Millennium Retail Park. The segregated cycle lane continues alongside the Millennium Busway to North Greenwich Underground station and the 0^2 Arena. This provides the opportunity for customers and staff to travel to the 0^2 Arena or North Greenwich Underground Station by cycle.

2.60 Peartree Way has a segregated footway/cycleway alongside the northbound carriageway. Cyclist movement is permitted in both directions along the cycleway.

2.61 Woolwich Road has on-road advisory cycle lanes on both sides. There is also a National Cycle Network traffic-free route to the north of the site, located along the towpath of the River Thames from the Greenwich Peninsula continuing east towards Erith.

2.62 There are proposals to extend the Cycle Superhighway Network to include a route from Woolwich to London Bridge (proposed route CS4). This is likely to utilise Woolwich Road.

Public Transport Services

Bus Services

2.63 Bus routes operating within the vicinity of the Site are shown in **Figure 4.1**, whilst Bus Routes operating along Woolwich Road are shown in **Figure 4.2**.

2.64 Bus stops are located on the Millennium Busway directly fronting the existing Sainsbury's foodstore, which forms part of the proposed IKEA site. Further bus stops serving additional bus routes are located on Woolwich Road, which is 320m from the approximate location of the store entrances and following the most convenient walking routes.

2.65 **Table 2.3** provides a summary of the bus services which are available from directly outside the proposed Ikea site.

Table 2.3: Existing Bus Services from Greenwich Millennium Retail Park

Service	Route / Destination	Weekday Daytime Frequency	First Bus	Last Bus	Saturday Frequency	Sunday Frequency
108	Stratford – Bow – North Greenwich – Blackheath - Lewisham	8-12 mins	24 hr	24 hr	8-12 mins	15 mins
129	North Greenwich – East Greenwich – Cutty Sark	11-13 mins	05:24	00:49	11-13 mins	20 mins
132	North Greenwich – Eltham – Blackfen – Bexley – Bexleyheath	10-13 mins	05:25	01:20	12 mins	20 mins
161	North Greenwich – Charlton – Woolwich – Eltham – Chislehurst	9-13 mins	05:11	00:57	10-12 mins	12 mins
472	North Greenwich –	5-9 mins	24 hr	24 hr	7-8 mins	10-15 mins

	Charlton – Woolwich – Plumstead – Thamesmead					
486	North Greenwich – Charlton – Welling – Bexleyheath	7-10 mins	05:20	01:20	7-10 mins	10-13 mins

2.66 **Table 2.4** provides a summary of the bus services which are available from the bus stops on Woolwich Road:

Table 2.4: Existing Bus Services from Woolwich Road bus stops

Service	Route / Destination	Weekday Frequency	First Bus	Last Bus	Saturday Frequency	Sunday Frequency
177	Peckham – New Cross – Deptford – Greenwich – Woolwich - Thamesmead	8-12 mins	04:41	00:38	9-12 mins	11-14 mins
180	Lewisham – Woolwich – Abbey Wood – Crabtree Belvedere	10-12 mins	05:06	00:24	11-14 mins	20 mins
286	Cutty Sark – East Greenwich – Eltham – Sidcup – Queen Mary's Hospital	8-12 mins	05:51	00:36	9-12 mins	13-14 mins
422	North Greenwich – East Greenwich – Woolwich – Plumstead – Bexleyheath	7-10 mins	05:09	01:18	9-12 mins	12 mins
N1	Tottenham Court Road – Waterloo – Surrey Quays – Greenwich – Charlton – Plumstead – Abbey Wood – Thamesmead	30 mins (nights only)	01:12	06:10	20 mins (nights only)	20 mins (nights only)

2.67 **Table 2.3** shows that on weekdays, there are up to 46 services per hour directly serving the site in each direction, resulting in a bus approximately every 1.5 minutes. There is a similar frequency of services on Saturdays. On Sundays, there are up to 27 buses per hour in each direction, with a bus approximately every 2.5 minutes.

2.68 **Table 2.4** shows that on weekdays, there are a further 29 services per hour available from Woolwich Road; 25 services per hour on Saturdays and 18 buses per hour on Sundays. This amounts to a bus approximately every 3 minutes. Furthermore, night bus route N1 provides a service to the site between midnight and 05:00.

Rail Services

2.69 Westcombe Park Rail Station is located approximately 780m from the site and provides regular services between central London and Dartford, Kent. This is within an acceptable walking distance to be included in the Public Transport Accessibility Level (PTAL) assessment. The existence of this rail station provides a genuine opportunity for employees and customers to visit the site by train.

2.70 There are up to six train services per hour in each direction from Westcombe Park Station on weekdays and on Saturdays, and four trains per hour in each direction on Sundays. Trains operate to London Cannon Street, Dartford and Barnehurst calling at locations which include New Cross, Lewisham, Sidcup and Woolwich Arsenal. All routes serving Westcombe Park also service Charlton Rail Station.

2.71 **Table 2.5** below summarises services from Westcombe Park Rail Station.

Table 2.5 – National Rail Services from Westcombe Park Rail Station (780m from the proposed IKEA Store

Route	Weekday Frequency	First Direct Train	Last Direct Train	Saturday Frequency	Sunday Frequency
Westcombe Park – Maze Hill – Greenwich – Deptford – London Bridge – London Cannon Street	Every 10 minutes	06:42	20:27	Every 10 minutes	Every 15 minutes
Westcombe Park – Woolwich Arsenal – Abbey Wood – Belvedere – Crayford – Sidcup	Every 30 minutes	08:34	17:28	Every 30 minutes	No Direct Service*
Westcombe Park – Charlton – Woolwich Arsenal – Abbey Wood – Erith – Dartford	Every 30 minutes	05:47	00:17	Every 30 minutes	No Direct Service*
Westcombe Park – Charlton – Woolwich Arsenal – Abbey Wood – Barnehurst	Every 30 minutes	08:04	17:07	Every 30 minutes	No Direct Service*

**Whilst there are no direct services to these locations on a Sunday, all destinations are accessible with interchanges at nearby Stations*

2.72 Frequent bus services from the Millennium Retail Park connect the Site to Charlton Rail Station (approximately 1.5km from the Site). There are approximately 25 bus services per hour between the site and Charlton Rail Station and the journey time is approximately 5-6 minutes making it a viable option.

2.73 All services calling at Westcombe Park Station also call at Charlton Station. Additional services operate to Gillingham (Kent), Dartford and Barnehurst, as well as London Charing Cross and London Cannon Street.

Underground Services

2.74 Buses also connect the Site with London Underground Jubilee Line services from North Greenwich Station (approximately 1.8km from to Site). The journey time is approximately 5-6 minutes.

2.75 **Table 2.6** shows the services from North Greenwich London Underground Station. It is served by London Underground Jubilee Line services. A summary of the number of the weekday peak hour and weekend daytime services is provided below.

Table 2.6 – London Underground Services from North Greenwich Underground Station

Route	Weekday Frequency	First Train	Last Train	Saturday Frequency	Sunday Frequency
Stanmore to Stratford (Stanmore – Wembley Park – Finchley Road – Swiss Cottage – Baker Street – Waterloo - London Bridge – Canada Water – Canary Wharf – North Greenwich – West Ham – Stratford)	Every 2-3 minutes	05.23	00.17	Every 2-3 minutes	Every 3 minutes

Emirates Air Line

2.76 The Emirates Air Line is a cable car link across the River Thames between the Greenwich Peninsula and the Royal Docks. The Greenwich Peninsula Station is located near North Greenwich Underground Station, approximately 1.6km from the proposed IKEA site. The journey time between the two stations is approximately seven minutes.

2.77 Interchanges to/from bus services are available from North Greenwich Station.

London River Services

2.78 London River Services are available from North Greenwich Pier, situated approximately 2km from the proposed Site. Services from North Greenwich Pier travel to the London Eye, Embankment, Blackfriars, London Bridge, Canary Wharf and Woolwich Arsenal.

Public Transport Accessibility Level (PTAL)

2.79 The PTAL calculation for the site is shown in **Appendix E**.

2.80 The PTAL rating has been calculated as 5, which indicates a very good level of accessibility by public transport. PTAL only accounts for the services directly accessible from the site and does not fully reflect the convenience of interchanging to North Greenwich Underground or Charlton Rail Station from bus services available from directly outside the site. PTAL is only one measure of accessibility and does not fully reflect the proximity of local facilities, bus catchments etc.

Summary

2.81 The proposed Site provides excellent access for all modes of transport. A significant benefit of the site is its proximity to public transport services, notably the Millennium Busway, North Greenwich Underground Station and Westcombe Rail Station. As such, the site has a Public Transport Accessibility Level of 5.

3 DEVELOPMENT PROPOSALS

Scheme Elements

3.1 At present, the eastern area of the retail park is occupied by a Sainsbury's foodstore of approximately 5,200 square metres (GFA) and a vacant retail unit formerly occupied by Comet of approximately 2,900 square metres (GFA), inclusive of office and storage areas.

3.2 It is proposed that the Sainsbury's foodstore and Comet will be replaced by an IKEA store over two floor levels with a GFA of up to 33,000 square metres.

3.3 The architect's site layout plan for the proposed development is included at **Appendix F**.

Vehicle Access and Car Parking

3.4 Access to Greenwich Millennium Retail Park car park will remain as existing, via signalised junctions on Bugsby's Way and Peartree Way.

3.5 The Greenwich Millennium Retail Park and Millennium Leisure Park car park currently has approximately 1017 parking spaces. This includes 46 disabled parking bays and 24 parent and toddler bays. It is not proposed to provide any additional customer parking in relation to the IKEA scheme and therefore the existing parking will continue to be utilised.

3.6 The maximum parking standards for non-food retail land uses are outlined in Annex 4 of the London Plan. For sites with a PTAL of 5-6, the following maximum car parking standards are required.

Table 3.1: London Plan Maximum Car Parking Standards (PTAL 5-6)

Land-use	Parking Provision
Non-Food Warehouse	1 space per 40-60 sqm

3.7 For a 33,000 sqm store, this relates to 550 – 825 spaces. As the car park is shared with other uses, it is considered that the proposed IKEA store complies with the maximum parking standards outlined within the London Plan. Put another way, the 609 spaces immediately outside the J Sainsbury and former Comet units falls within the above range.

3.8 The B&Q Store has a floor area of 8,790sqm. Therefore the total non-food floor area within Millennium Retail Park would be up to 41,790sqm with an IKEA in place. Applying this to the standards outlined within Table 3.1 relates to between 696 and 1,044 parking spaces.

3.9 No specific parking standards are set for leisure uses within the London Plan. However, it does state:

"In assessing the requirement for car parking for leisure uses, it is recognised that some edge-of-town sites will need on-site parking. Any provision should reflect the availability of public transport and, where appropriate, pedestrian/cycle accessibility. For sites with good public transport provision, car parking provision should be reduced"

3.10 As such, the parking provision at the Millennium Retail Park, with the proposed IKEA falls within the above range, and therefore complies with standards outlined within the London Plan, and Policy M24 of the RB Greenwich UDP.

Electrical Vehicle Parking

3.11 IKEA are committed to promoting the use of electric vehicles to access the proposed Store.

3.12 Standards outlined within the London Plan state that 10% of all parking spaces should be for electric vehicles (active spaces) and an additional 10 % should be provided for electric vehicles in the future (passive spaces).

3.13 There are currently two electric vehicle charging points within the car park.

3.14 IKEA are willing to work with TfL to determine an appropriate number of electric vehicle parking spaces for the store.

Pedestrian and Cycle Access

3.15 Pedestrian and cycle access to the Site will remain as existing, with excellent access via Peartree Way, Bugsby's Way and Tunnel Avenue via a footbridge over the A102.

3.16 The proposed development will result in the loss a footpath that is currently situated between the former Comet and existing Sainsbury's Stores, providing access from Bugsby's Way.

3.17 Whilst this footpath is used by some people accessing from the north, there are no crossing facilities on Bugsby's Way in its immediate vicinity. Therefore pedestrians/cyclists would

have to use crossing facilities on the Bugsby's Way junctions with Commercial Way and Peartree way to access the footpath. Both of these junctions in themselves provide good access to the Site for pedestrians (via Peartree Way/Commercial Way and the Millennium Bus Way). Therefore the loss of this footpath will not add significantly to pedestrian journey times.

3.18 There are currently 10 Sheffield style cycling stands within the car park adjacent to the Sainsbury's Store. This relates to 20 spaces. An additional 5 stands (10 spaces) are located by the Odeon Cinema.

3.19 IKEA propose to provide an additional 30 spaces and monitor their uptake through the Travel Plan. If demand exceeds provision then additional spaces will be provided. Secure cycle parking will also be provided for staff.

Customer Collection Area

3.20 It is proposed that a customer collection area is located at the north of the car park, opposite the IKEA entrance.

3.21 The customer collection area will consist of a covered waiting area and a small number of short-stay parking spaces. Customers can wheel goods from the entrance, over the zebra crossing to the covered waiting area, where goods can be collected by vehicles. Customers already wheel trolleys across the Busway from the existing Sainsbury's and B&Q stores. The customer collection area will reduce the need for customers to transport heavier goods using trolleys through the car park.

3.22 The Customer Collection Area will not impact on the operation of buses on the Millennium Busway, or on pedestrians/cyclists using the adjacent footway/cycleway.

Home delivery

3.23 In order to provide a home delivery service to customers, a new access junction is proposed on Peartree Way. The access junction will be left-in/left-out only. The junction will only be used by IKEA home delivery vehicles, which consist of Luton style vans. No heavy goods vehicles will use the junction.

3.24 The junction has been designed so that the impact on the existing cycle lane and footway is minimised. The footway across the junction will be at grade with the road, with tactile paving to assist visually impaired individuals. Vehicle will be able to pull out of the junction when signals on Peartree Way and on the Millennium Busway are red.

3.25 Swept Path Analysis of the home delivery area and access junction is shown in **Appendix G**.

Servicing

3.26 The existing service yard will be reconfigured to provide the optimum space for both IKEA and B&Q uses. Swept Path Analysis of the reconfigured servicing area is shown in **Appendix G**. All deliveries to the store will take place within the service yard. Refuse collection will also take place from the service yard.

3.27 The access to the service yard will remain a left in, left out movement from Bugsby's Way. It is anticipated that there will be approximately 12 deliveries to the store per day.

3.28 A Delivery and Servicing Plan (DSP) would be put in place setting out the servicing arrangements for the proposed development.

Travel Plan

3.29 As part of the development proposals, IKEA is committed to implementing a Travel Plan to encourage the use of non-car modes of travel, and assist the sustainability of the development.

3.30 A draft Travel Plan is included in **Appendix H**. This outlines the measures that IKEA will put into place in order to encourage the use of non-car modes of travel.

3.31 The Travel Plan has been developed in accordance with guidance issued by Transport for London in February 2011, 'Travel Planning for New Development in London'.

3.32 Details of the Travel Plan are discussed further in **Section 5**.

4 POLICY CONTEXT

4.1 This section of the report considers the current planning policy guidance at National, Regional and Local level.

National Policy Guidance

National Planning Policy Framework (NPPF)

4.2 The National Planning Policy Framework sets out the Government's planning policies for England and how these are expected to be applied.

4.3 One of the 12 core land-use principles within the NPPF includes:

"[to] actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling, and focus significant development in locations which are or can be made sustainable."

4.4 Section 4 of the NPPF deals with 'Promoting sustainable transport.' Paragraph 29 states that:

"the transport systems needs to be balanced in favour of sustainable transport modes, giving people a real choice about how they travel."

4.5 Paragraph 32 sets out the transport issues which should be addressed within Development Plans and decisions. These are:

- *"the opportunities for sustainable transport modes have been taken up depending on the nature and location of the site, to reduce the need for major transport infrastructure;*
- *safe and suitable access to the site can be achieved for all people; and*
- *improvements can be undertaken within the transport network that cost effectively limit the significant impacts of the development. Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe."*

Regional Policy Guidance

London Plan (July 2011)

4.6 The London Plan, Spatial Development Strategy for Greater London (July 2011) sets out an integrated economic, environmental, transport and social framework for the development of London over the next 20-25 years.

4.7 One of the Mayor's six objectives for London is:

"A city where it is easy, safe and convenient for everyone to access jobs, opportunities and facilities with an efficient and effective transport system which actively encourages more walking and cycling, makes better use of the Thames and supports delivery of all the objectives of this Plan."

4.8 The transport aspects of the London Plan, relevant to the proposed development, are discussed in the following paragraphs.

4.9 Policy 6.1 establishes the Mayor's strategic approach to transport. Of relevance it states that the Mayor will encourage the closer integration of transport and development by:

"a. encouraging patterns and nodes of development that reduce the need to travel, especially by car;

b. seeking to improve the capacity and accessibility of public transport, walking and cycling;

g. supporting measures that encourage shifts to more sustainable modes and appropriate demand management; and

i. promoting walking by ensuring an improved urban realm."

Local Policy Guidance

Royal Borough of Greenwich – Unitary Development Plan

4.10 The Greenwich UDP, adopted in July 2006, provides guidance on development within the Borough. The following paragraphs identify some of the policies which are relevant to the proposed development.

4.11 Policy TC16 refers to retail:

"Retail or indoor leisure developments or extensions on edge-of-centre or out-of-centre sites will only be acceptable where:

ii. Proposals are, or will be made, conveniently accessible by a choice of modes of transport including walking and cycling.

iii. The proposal would not unacceptably impact on residential amenity, the environment, traffic patterns or road congestion.

iv. Parking provision is consistent with the relevant standards and principles in Policies M23, M24, M26 and M27."

Royal Borough of Greenwich – Draft Core Strategy

4.12 The Royal Borough of Greenwich has published its draft Core Strategy in November 2010. The final submission version is still pending adoption.

4.13 There are two policies which are specific to transport as follows:

- Policy C3 Critical Transport Infrastructure

  "advocate and work in partnership with relevant agencies to deliver improved public transport infrastructure;

  "support improved links between residential areas in the south of the Borough and employment areas in the north, including at the Jubilee line at North Greenwich station"

- Policy C4 Sustainable Travel

  "The Council supports the development of an integrated and sustainable transport system that is extensive in coverage… All developments in the Borough should help with accessibility, safety and the use of public transport, reducing the use of the private car."

  "Cycling and walking will be encouraged in the Borough. The needs of pedestrians, including those with disabilities, and cyclists should be prioritised in development and the design and layout of development should reflect this."

Summary

4.14 The proposed development is in accordance with both regional and local transport policies. The majority of the site has a PTAL of 5, reflecting the opportunities to access the site by sustainable modes of transport. The proposed development is also accessible by walking and cycling, with cycle parking being provided and convenient access routes accommodating the desire lines from Peartree Way, Woolwich Road and Bugsby's Way. This offers connections to Charlton and North Greenwich.

4.15 This planning application also provides the opportunity for the production of a Travel Plan that will seek to maximise the uptake of sustainable modes of transport.

5 SUSTAINABLE TRANSPORT STRATEGY

5.1 This section of the report considers the accessibility of the proposed IKEA site to non-car modes. It demonstrates how IKEA's objective, to make this the most accessible store in the UK, will be put into practice. Not only does this help to reduce car use, but it will also improve social inclusion for the significant population in surrounding areas that do not have access to a car.

5.2 The following chapter reviews the development proposals in relation to the store operation, walking, cycling and public transport.

Internet Shopping

5.3 It is in the nature of furniture shopping that many customers prefer to see and feel furniture items before purchasing products. Often this is irrespective of having formed a view on items they wish to purchase after reviewing the catalogue.

5.4 However, there are also some customers who know specifically what they want and would choose not to travel to the store to make their purchases. For example, they may wish to order further versions of an item that they have previously purchased and liked.

5.5 A proportion of visitors to IKEA do so on a browsing basis without making purchases in store. Goods are subsequently ordered online at home.

5.6 IKEA offer an internet shopping service to all postcodes within the UK. This covers 75% of the IKEA product range, mainly the bulkier items. These transactions make up approximately 9% of total UK purchases.

5.7 Although there is an increasing trend for internet shopping, the traffic attraction to the proposed store is based on historical surveys. This is considered a robust assumption.

Home Deliveries

5.8 In addition to internet shopping, IKEA will operate a comprehensive Home Delivery service from the proposed store. This allows any customer to have bulky items delivered to their homes within a few days of purchase. If a customer arrives at the store but is unable to

transport goods home (regardless of the size or nature of the goods) they can have the goods delivered.

5.9 Home Delivery works on the principle that the customer purchases their goods in the normal manner and then deposits them with the Home Delivery service team and the goods are then delivered within the next few days. The continued promotion of the Home Delivery service increases the opportunity for customers to visit the store by sustainable modes of transport such as walking, cycling and public transport; as it removes the requirement to carry home bulky goods.

5.10 According to Census data, 42% of households located within London do not own a vehicle. Access to the proposed Site via non-car modes is very good with a PTAL of 5, making Home Delivery a convenient and viable option for many potential customers, particularly those without access to a car.

Pedestrians

5.11 The pedestrian routes in the vicinity of the site are shown in **Figure 3**. A 2km walking isochrone is shown in **Figure 5.**

5.12 It is commonly accepted that walking is the most important mode of travel at the local level and offers the greatest potential to replace short car trips, particularly under 2 kilometres.

5.13 A 2 kilometre catchment from the proposed Site includes the following destinations:

- North Greenwich Underground Station
- Westcombe Park Rail Station
- Charlton Rail Station
- Emirates Greenwich Peninsula Station
- North Greenwich Pier
- Retail Parks on Bugsby's Way, including Peninsular Retail Park, Greenwich Shopping Park, and Stone Lake Retail Park.
- The Valley Stadium - Charlton Football Club
- The O^2 Arena (Millennium Dome)
- Extensive residential areas to the south

- Proposed residential developments within Greenwich Peninsula

5.14 The population within a 2km walking catchment is 30,452

5.15 A Pedestrian Environment Review System (PERS) audit was undertaken to assess the pedestrian routes to local public transport facilities, local retail parks and local residential areas. This is included in **Appendix D**.

5.16 The PERS audit concluded that the pedestrian environment surrounding the Millennium Retail Park is good, particularly towards North Greenwich Station, Tunnel Avenue and on Peartree Way.

5.17 Localised improvements and "quick wins" (such as providing tactile paving on all crossings and improving footway maintenance), could improve the environment for pedestrians.

Cyclists

5.18 A 5 km cycling isochrone and an 8km cycling isochrone from the Site is shown in **Figure 6**.

5.19 It is commonly accepted that cycling has the potential to substitute for short car trips, particularly those less than 5 km and to form part of a longer journey by public transport. In addition, the Department for Transport's (DfT) 'Cycle Infrastructure Design (October 2008) states that a cycle trip distance of over five miles (8 km) is not uncommon.

5.20 Charlton, Woolwich, Greenwich and Blackheath are all located within a 5 kilometre catchment from the Site. Some 220,000 people live within this catchment. An 8 km catchment extends to Plumstead, Hither Green, New Cross and Surrey Quays. This catchment has a population of 519,000 people. Therefore it is considered that there is an excellent opportunity for customers and staff to travel to the site by cycle.

Public Transport

5.21 As described in Section 2 and as shown in **Figure 7**, the site is well served by public transport. **Figure 7** shows the catchment via public transport which can reach the Site within 60 minutes. The area extends to Kensington in the west, Bromley to the south, Upminster to the east and Walthamstow to the north.

Bus Services

5.22 There are six bus routes directly serving the Site, with an additional five services operating nearby on Woolwich Road. These routes are shown in **Figure 4.1** and **Figure 4.2.**

5.23 Areas accessible by bus (without the need to interchange), and their journey times include:

- North Greenwich Station (5 minutes)
- Charlton Rail Station (5 minutes)
- Blackheath (6 minutes)
- Greenwich Town Centre (11 minutes)
- Woolwich Arsenal Station (15 minutes)
- Eltham Station (15 minutes)
- Bromley-by-Bow Station (20 minutes)
- Lewisham (20 minutes)
- Thamesmead Town Centre (27 minutes)
- Stratford (28 minutes)
- Bexley Station (39 minutes)
- Chislehurst (48 minutes)

5.24 Analysis has been carried out using Arc-GIS to establish the population within 400m and 640m (PTAL guidance recommended walk distance to a bus stop) of all direct bus routes. In total, 362,500 people are within 400m of these bus routes, and 522,069 people are within 640m of these bus routes.

5.25 Bus stops on the Millennium Way will be retained as part of the development proposals. A bus stop audit of the bus stops within the Millennium Retail Park has been carried out and is included in **Appendix I**.

Rail and Underground Services

5.26 As noted in Section 2 the site is accessible to National Rail services and London Underground Services.

5.27 Westcombe Park Rail Station is located approximately 650 metres from the Site. There are up to six train services per hour in each direction from Westcombe Park Station on weekdays and on Saturdays, and four trains per hour in each direction on Sundays. Areas accessible for Westcombe Station (without the need to interchange) and their journey times include:

- Charlton (3 minutes)
- Greenwich (5 minutes)
- Deptford (7 minutes)
- Woolwich Arsenal (8 minutes)
- London Bridge (14 minutes)
- Abbey Wood (14 minutes)
- London Cannon Street (18 minutes)
- Erith (19 minutes)
- Dartford (26 minutes)
- Bexley (36 minutes)
- Barnehurst (40 minutes)
- Sidcup (41 minutes)

5.28 Frequent bus services from the Millennium Retail Park connect the Site to Charlton Rail Station (approximately 1.5km from the Site). There are approximately 25 bus services per hour between the site and Charlton Rail Station and the journey time is approximately 5-6 minutes making it a viable option.

5.29 All services calling at Westcombe Park Station also call at Charlton Station. Additional services operate to Gillingham (Kent), Dartford and Barnehurst, as well as London Charing Cross and London Cannon Street.

5.30 North Greenwich Station, approximately 1.8 km from the site, provides access to the London Underground. North Greenwich Station can be reached from the proposed IKEA site by bus in approximately 5 minutes.

5.31 The Jubilee Line serves North Greenwich Station. Other stations on the Jubilee Line include Stratford, Canary Wharf, London Bridge, Waterloo, Green Park, Bond Street, Baker Street and Wembley Park.

5.32 Interchanges to other London Underground and National Rail lines are possible for various stations on the Jubilee Line. Possible interchanges and journey time from North Greenwich Station include:

- Canning Town – Docklands Light Railway (DLR) – 2 minutes
- West Ham – District Line and Hammersmith and City Line – 4 minutes
- Stratford – DLR, Central Line, London Overground and National Rail – 8 minutes
- Canada Water – London Overground – 4 minutes
- London Bridge – Northern Line (Bank Branch) and National Rail – 8 minutes
- Waterloo – Northern Line (Charing Cross Branch), Bakerloo Line, Waterloo and City Line and National Rail – 11 minutes
- Green Park – Victoria Line – 14 minutes
- Baker Street – Metropolitan Line, Circle Line, Hammersmith and City Line and National Rail – 19 minutes

5.33 An assessment has been undertaken to establish the impact of the proposed IKEA on public transport routes. This is discussed in **Section 7**.

Travel Plan

5.34 A draft Travel Plan for the proposed IKEA store in Greenwich is included at **Appendix H**. This plan will provide strong encouragement to employees and customers to use modes other than single occupancy cars. A summary of the potential measures is given below:

IKEA Travel Plan

- Appoint a Travel Plan Co-ordinator (TPC) within 3 months of the store opening for trading;
- Offer Personalised Travel Planning services for all co-workers;
- Design/produce Sustainable Travel Marketing material before the store opens;
- Provision of shower and locker facilities for co-workers;
- Provision of secure cycle stands in close proximity to the store entrance
- Co-workers will be provided with information and advice regarding safe pedestrian and cycle facilities to the store;

- Promote the health benefits of walking and cycling to co-workers; and
- The TPC will set up a car share scheme for use by co-workers.

Summary

5.35 In summary it can be seen from the above analysis that the site has excellent accessibility by non-car modes. Over half a million people live within an 8km cycle of the site or within 640m of a direct bus route. In addition the site is served by Westcombe Park rail station and North Greenwich underground station (via a very frequent bus service). This provision means that the site is accessible both from the local area and from a wider catchment of south, east and central.

6 VEHICLE TRIP GENERATION AND DISTRIBUTION

6.1 This section of the Transport Assessment sets out the methodology that has been used to predict the vehicle trip attraction of the proposed IKEA Greenwich store. It also sets out the likely distribution and assignment of trips on the local highway network.

Peak Hours used in this Assessment

6.2 The proposed IKEA store will not open until 10:00. Therefore there will be no material traffic impact during the AM peak as a result of the proposed development. As such, there is no AM peak hour assessment included within this Transport Assessment. This has been agreed with Transport for London.

6.3 The PM peak hour and Saturday peak hour have been calculated using traffic data from the local area and the predicted trip generation of the proposed IKEA store.

6.4 Manual Classified Count (MCC) surveys were undertaken at the junctions surrounding the Millennium Retail Park at Greenwich Peninsula. These were used to determine the network peak hour during weekday and on Saturday. **Table 6.1** below summarises the total junction flows for each hour.

Table 6.1: Total Traffic Flows on Local Highway Network Peak Hour

Weekday PM		Saturday	
Hour	**Flow**	**Hour**	**Flow**
16:00-17:00	10,740	13:00-14:00	11,463
16:15-17:15	10,941	13:15-14:15	11,536
16:30-17:30	11,165	13:30-14:30	11,812
16:45-17:45	11,447	**13:45-14:45**	**11,823**
17:00-18:00	**11,776**	14:00-15:00	11,789
17:15-18:15	11,693	14:15-15:15	11,796
17:30-18:30	11,681	14:30-15:30	11,730
17:45-18:45	11,271	14:45-15:45	11,693
18:00-19:00	10,919	15:00-16:00	11,640
		15:15-16:15	11,505
		15:30-16:30	11,193
		15:45-16:45	11,094
		16:00-17:00	11,046

6.5 Table 6.1 indicates that peak traffic in the area surrounding the proposed Site occurs between 17:00-18:00 during the weekday PM, and between 13:45-14:45 during a Saturday.

6.6 **Table 6.2** below breaks down the two-way IKEA vehicle trips by hour for the weekday PM and Saturday. The methodology of how these trips were derived is explained later in this chapter.

Table 6.2: Proposed IKEA Development Trips (Two-Way)

Weekday PM		Saturday	
Hour	**Flow**	**Hour**	**Flow**
16:00-17:00	394	13:00-14:00	884
17:00-18:00	425	14:00-15:00	987
18:00-19:00	403	15:00-16:00	995
		16:00-17:00	829

6.7 Table 6.2 shows that development related trips are highest between 17:00-18:00 during the weekday PM period. This is consistent with the existing traffic flows in the area.

6.8 On a Saturday, IKEA related trips between 15:00-16:00 are marginally higher than between 14:00-15:00. However, the existing traffic flows for 13:45-14:45 are considerably higher than for 15:00-16:00. Therefore IKEA trips for between 14:00-15:00 and the existing traffic flows for between 13:45-14:45 will form the basis of the Saturday assessment.

6.9 To summarise, the resultant peak hours used within the Transport Assessment are as follows:

- Weekday PM Peak – 17:00-18:00
- Saturday Peak – 13:45-14:45 (with IKEA trips for 14:00-15:00 applied)

6.10 TfL have also requested an assessment for a Sunday.

6.11 Background traffic flows on the local highway network are marginally higher on the Saturday peak hour compared to a Sunday. This is discussed in more detail in Section 8, and shown in Table 8.1. A comparison of IKEA generation on a Saturday and Sunday depends on the hour that is selected. However, as a robust assessment, a Sunday sensitivity test has been undertaken. This will be based on Saturday traffic generation figures plus 10%.

Existing Vehicle Trip Generation

6.12 As highlighted earlier within this report, the existing Sainsbury's is set to. The Comet Store is currently vacant.

6.13 It is not possible to undertake a meaningful traffic survey of the existing Sainsbury's foodstore and former Comet store due to the shared use of the car park with B&Q and the Millennium Leisure Park. Therefore, the existing trip generation is based on information contained in the Transport Assessment associated with planning application ref. 12/0835/F for a new Sainsbury's foodstore and Marks and Spencer store on Gallions Road.

6.14 The methodology to calculate the existing vehicle trip generation is provided below, with the TRAVL outputs and calculations shown in **Appendix J**.

6.15 As part of the Sainsbury's and M&S Transport Assessment, daily person trip rates for food retail and non-food retail were obtained from TRAVL. Hourly trip rates were determined by using the profiles within TRAVL, whilst vehicle trips were calculated by applying a mode split for car driver. This trip generation methodology was agreed with TfL as part of their consideration of the planning application.

6.16 The daily person trip rates for food retail and non-food retail are shown below in **Table 6.3**.

Table 6.3: Daily Person Trip Rates for Existing Site

Land Use	Weekday	Saturday
Food Retail (Sainsbury's)	190.3 per 100 sqm	212.5 per 100 sqm
Non-Food Retail (Comet)	70.0 per 100 sqm	132.1 per 100 sqm

6.17 Modal split data for car driver was applied to these daily trip rates to establish the likely number of vehicle movements. The mode split data used for the Sainsbury's and M&S assessment are shown below in **Table 6.4**.

6.18 Within the TA for the Sainsbury's and M&S application, the mode split for food retail was based on a local household survey, whilst the mode split for non-food retail was taken from TRAVL. The household survey is shown in **Appendix L**. Within the household survey respondents were also asked to state the mode of transport they use when shopping for non-food goods. The results from this question of survey are also shown in **Table 6.4.**

Table 6.4: Mode Split for Food Retail and Non-Food Retail from Sainsbury's and M&S Transport Assessment

Mode	Food Retail (Household Survey)	Non-Food Retail (TRAVL)	Non-Food Retail (Household Survey)
Car Driver	62%	55%	44%
Car Passenger	14%	23%	16%
Motorcycle	0%	1%	0%
Bus	15%	5%	25%
Rail	1%	1%	4%
Taxi	2%	0%	1%
Foot	6%	14%	4%
Cycle	0%	1%	0%
Other	0%	0%	6%
TOTAL	100%	100%	100%

6.19 For non-food retail, the household survey shows a lower mode split for car driver compared to the TRAVL results. The household survey results have been used as a basis for establishing the vehicle trips associated with the former Comet store. This provides a more robust assessment (since it gives a lower car driver proportion).

6.20 The Household survey results also revealed that 28.8% of respondents combined non-food shopping with their main food shopping trip. Therefore, the estimated non-food (Comet) trips have been reduced by 28.8% to allow for this linkage.

6.21 A daily profile of vehicle trips was established using TRAVL. This was applied to the daily trip rate and car driver mode split data to establish the peak hour trips for the weekday PM peak hour, and Saturday peak hour.

6.22 The existing trip generation of the Sainsbury's and former Comet Stores is provided below for the weekday PM Peak hour and Saturday Peak hour.

Table 6.5 –Existing Foodstore/Non-Food Retail Unit Vehicle Trip Generation

Land Use	Weekday PM Peak (17:00-18:00)			Saturday Peak (14:00-15:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Sainsbury's Food Store	245	276	521	427	374	801
Comet (excluding linked trips)	20	24	44	85	70	155
Total Existing	265	300	565	512	444	956

IKEA Trip Generation

6.23 Traffic generation at IKEA stores is not directly related to store size but rather factors such as: store location; accessibility by non-car modes; number of car parking spaces; the catchment area; the spending power of the catchment population; and the store's location in relation to other IKEA stores.

6.24 Vectos has experience of deriving appropriate traffic generation estimates for other IKEA stores (e.g. Cardiff, Southampton, consented store at Reading and proposed store at Exeter).

6.25 Within the Transport Assessment Scoping Report, it was proposed to base the proposed IKEA trip generation on the trip generation of the existing Southampton Store. This was due to the similarities between the two store locations in terms of public transport provision and catchment area.

6.26 Following discussions with TfL, the trip generation has now been based on information from the existing London based IKEA stores (Croydon, Wembley, Tottenham and Thurrock).

London IKEA Store Surveys

6.27 Surveys have been carried out at the existing London Stores at Tottenham, Thurrock, Croydon and Brent Park (Wembley) to establish the number of vehicles arriving at each Store during the weekday and Saturday peak hours. The results of these surveys for the peak hours are summarised in **Table 6.6** below. The raw data for the surveys is shown in **Appendix K**.

Table 6.6: Vehicle Trip Generation of existing London Stores

	Traffic Generation					
	Weekday PM Peak (17:00-18:00)			Saturday Peak (1400-1500)		
Store	Arrival	Departure	Total	Arrival	Departure	Total
Brent Park (Wembley)	230	340	570	557	507	1064
Croydon	214	239	453	679	512	1191
Tottenham (Tottenham)	283	307	590	658	629	1287
Thurrock (Lakeside)	214	215	429	587	615	1202
Average (London Based Stores)	235	275	511	620	566	1186

6.28 Table 6.6 shows that, on average, IKEA stores in London generate in the region of 511 two way vehicle movements during the PM Peak (17:00-18:00) and 1,186 vehicle movements during the Saturday Peak (14:00-15:00).

6.29 It is considered that a proposed IKEA store is Greenwich will generate less vehicle trips than the existing London Stores due to the reasons highlighted below.

Catchment

6.30 The catchment for the proposed IKEA store and the methodology behind how it was derived is described later in this chapter. The population within the catchment is 2.17 million. This is lower than the catchment populations for the existing London stores, which are outlined below:

- Croydon – 2.99 million
- Tottenham – 2.45 million
- Wembley – 4.83 million
- Thurrock – 3.78 million

Car Park

6.31 At Greenwich Millennium Retail Park there are approximately 1,017 parking spaces. Within the area outside of the proposed IKEA store there are approximately 609 parking spaces.

6.32 Existing London Stores typically have in the region of 1,000 car parking spaces.

6.33 A lower level of parking at the Millennium Retail Park will mean that trips generation will be more constrained compared to the existing London store. This will encourage the uptake of sustainable means of travel.

Accessibility by non-car modes

6.34 As discussed earlier in this report, Greenwich Millennium Retail Park has a PTAL of 5, with numerous bus services operating along the Millennium Busway through the Site, and nearby on Woolwich Road. Westcombe Railway Station is also located within a short walk of the Site and North Greenwich Underground Station and Charlton Rail Station are a short bus ride from the Site. There is also a significant residential catchment within walking and cycling distance.

6.35 Other London based IKEA stores only benefit from a PTAL of 2 (except Thurrock, which falls outside of the PTAL calculation area). A comparison of public transport services at the

proposed IKEA in Greenwich and the existing IKEA stores in London is provided below in **Table 6.7**.

Table 6.7: Public Transport Comparison of London Based IKEA Stores

Store	PTAL	Bus Services		Rail Services	
		Closest Bus Stop	Buses per hour	Closest Train Station/Underground	Distance from Store Entrance
'Greenwich Peninsula Retail Park (Proposed)	5	<100m	62.5	Westcombe Park (NR)	836m
				North Greenwich (Jubilee)	1.7km
Brent Park (Wembley)	2	398m	28	Neasden Station (Jubilee)	1.1 km
Croydon	2	114m	17	Ampree Way (Tram)	550m
Tottenham	2	115m	12	Angel Road	567m
Thurrock (Lakeside)	-	300m	13	Chafford Hundred	850m

Car Ownership

6.36 According to Census data, 42% of households located within Greater London do not own a vehicle.

6.37 A significant proportion of the proposed store catchment covers central London boroughs, such as Greenwich, Newham, Tower Hamlets and Southwark. The percentage of households that do not own a vehicle is higher within these boroughs compared to the Greater London average.

6.38 The existing London IKEA stores are situated in areas of outer London. The percentage of households that do not own a vehicle is lower in outer London Boroughs compared to central London Boroughs.

6.39 Therefore, within the catchment for the proposed Greenwich Store, there are a higher proportion of households that do not own a vehicle, compared to the catchments for existing London Stores. These customers that do not own a vehicle will be well catered for due to the high level of public transport accessibility in Greenwich.

Mode Split

The consequence of the significantly better public transport accessibility of the proposed Greenwich store will be a higher proportion of visits by non-car modes compared to other London stores. This is detailed below.

Existing IKEA customer surveys

6.40 A customer questionnaire was undertaken at the Tottenham IKEA Store on 6th March 2010, asking respondents what mode of transport they use to access the Store. This is shown in **Appendix L**. This gave the below mode split.

Table 6.8: Mode Split at IKEA Tottenham

Mode	Percentage Split
Car	78%
Bus	19%
Rail	1%
Walk	0%
Taxi	1%
Cycle	0%
Other	1%
Total	100%

6.41 Table 6.8 indicates that 78% of those arriving at the existing IKEA store in Tottenham arrive in a car. The split between car driver and car passenger cannot be determined from the survey.

6.42 An additional customer survey took place in the Existing Bristol IKEA on 25th September 2010 which asked respondents who arrived via car to state its occupancy. This suggests that car occupancy is in the region of 1.59. The car occupancy is unlikely to vary significantly between store locations and therefore we consider that the Bristol car occupancy can be applied to the Tottenham trip rates.

6.43 Applying a car occupancy rate of 1.59 to the Tottenham mode split figures suggests that approximately 46% of people arriving to the store are car drivers, and 32% are car passengers.

Local Household Survey

6.44 The mode split for the proposed IKEA at Greenwich has been based on a local household survey. This is shown in **Appendix L**

6.45 As described earlier in this report, a household survey was undertaken in the area in association with the Sainsbury's/M&S proposals on Bugsbys Way (planning ref. 12/0835/F). The household survey asked respondents to state the mode of transport they use when shop for non-food goods. The results are shown below in **Table 6.9.**

Table 6.9 Mode Split for Non-Food Retail – Local Household Survey

Mode	Non-Food Retail (Household Survey)
Car Driver	44%
Car Passenger	15.5%
Motorcycle	0%
Bus	25%
Rail	4%
Taxi	1%
Foot	4%
Cycle	0%
Other	5.5%
Home Delivery	1%
TOTAL	100%

6.46 Table 6.9 shows that approximately 60% arrive to non-food retail units via a car. A split of 15.5% passenger to 44% driver gives a car occupancy of 1.35.

6.47 To be robust, the 5% associated with 'Other Modes' has been added to show that 65% of customers will arrive at the proposed IKEA via car.

6.48 It is to be expected that the car occupancy for an IKEA will be greater than for non-food outlets normally found on a retail park. This is because the trip is normally less frequent, of longer distance and given the choices to be made will normally involve more than one member of a household. Therefore we have applied the Bristol car occupancy to the car based customers recorded in Greenwich. This leads to 41% arriving (65%/1.59) at the proposed store as car driver and 24% (65%-41%) as car passenger.

6.49 Therefore, **Table 6.10** below shows compares the mode split between Tottenham and the proposed IKEA in Greenwich.

Table 6.10: Comparison of Existing Tottenham Mode Split, and Proposed Greenwich Mode Split

Mode	Tottenham	Greenwich
Car Based Customer	78%	65%
Car Driver	*49%*	*41%*
Car Passenger	*29%*	*24%*
Non Car Customer	22%	35%

6.50 We consider this to be a logical and robust result with a lower number of car drivers and higher use of public transport in Greenwich compared with Tottenham.

6.51 The above figures on modal split are taken forward to the trip generation calculation below.

Trip Generation Calculation

6.52 As noted above, Table 6.6 shows that, on average, IKEA stores in London generate in the region of 511 two way vehicle movements in the PM Peak (17:00-18:00) and 1,186 vehicle movements during the Saturday Peak. This can be factored up to the number of person trips based on the Tottenham Survey results and Bristol car occupancy level. This assumes those arriving by car relate to 78% of all customer trips, with an average car occupancy of 1.59.

- The average number of vehicle trips to existing London Stores is:
  - 511 two way (arrivals + departures) vehicle trips during the weekday PM peak hour;
  - 1186 two way vehicle trips during the Saturday peak hour.

- Multiplied by a car occupancy of 1.59 relates to:
  - 802 two way vehicle based trips (driver + passenger) during the weekday PM peak hour;
  - 1,886 two way vehicle based trips (driver + passenger) during the Saturday peak hour.

- Based on the Tottenham mode split, this relates to 78% of all customer trips during the peak hours. The remaining 22% are non-car trips. This relates to:
  - 225 two way non-car based trips during the weekday PM peak;
  - 529 two way non-car based trips during the Saturday peak.

- Therefore, the following total two way person trips are calculated:
  - 1,040 two way movements during the weekday PM peak (499 arrivals and 541 departures);
  - 2,415 two way movements during the Saturday peak (1,234 arrivals and 1,180 departures).

6.53 A survey was carried out at the existing Tottenham Store on Saturday 16th November 2013 to validate the above person trips. Between 14:00 and 15:00 there were 1,125 arrivals into the store. This is 109 less than the calculated arrivals. Therefore the calculations are considered robust.

6.54 It is assumed that the IKEA in Greenwich will have a similar trade pattern to the London based stores. Therefore total customer numbers will be similar. By applying the above peak hour customer trips to the mode split derived in Table 6.8 above, produces the trip generation figures for the proposed IKEA in Greenwich. This is summarised in **Table 6.11** below.

Table 6.11: Proposed IKEA Greenwich Trip Generation

Store	Mode Split	Trips PM Peak	Trip Sat Peak
Customers	100%	1,040	2,415
Car Driver	41%	425	987
Car Passenger	24%	251	583
Non-Car	35%	364	845

6.55 Therefore, it is estimated that there will be 425 vehicle trips (two-way) associated with the IKEA store during the weekday PM peak hour, and 987 vehicle trips (two-way) during the Saturday peak hour. By assuming a similar arrivals and departures profile to the Tottenham Store, this relates to the following:

Table 6.12: Proposed IKEA Greenwich Vehicle Trip Generation

	Arr	Dep	Total
Weekday PM Peak Hour	204	221	425
Sat Peak Hour	505	482	987

6.56 As discussed, TfL have asked for a Sunday assessment. As a robust sensitivity test, the Sunday trip generation is based on Saturday flows plus 10%. Based on this, the Sunday sensitivity peak hour trip generation is shown in **Table 6.13** below.

Table 6.13: Proposed IKEA Greenwich Vehicle Trip Generation – Sunday Sensitivity Test

	Arr	Dep	Total
Sunday PM Peak Hour (Sensitivity Test)	555	531	1086

Linked Trips

6.57 Whilst it is considered that there is the opportunity for a significant number of trips to the proposed IKEA to be linked with trips to other retail stores in the area, the same could also be assumed for the existing Sainsbury's and former Comet store. Therefore no adjustments have been applied to the trip generation figures.

Comparison of Proposed vs Existing Uses

6.58 **Table 6.14** below compares the existing Sainsbury's and former Comet Trips to the proposed IKEA Greenwich Trips.

Table 6.14 – Comparison of Net Impact between Existing Foodstore/Non-Food Retail Unit and proposed IKEA Store

Land Use	Weekday PM Peak (17:00-18:00)			Saturday Peak (14:00-15:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Existing	265	300	565	512	444	956
IKEA	204	221	425	505	482	987
Net Impact	**-61**	**-78**	**-139**	**-7**	**38**	**31**

6.59 Table 6.14 shows that there will be a reduction of approximately 139 two-way trips to the Site during the weekday PM peak as a result of the development proposals. During the

Saturday peak hour, there are likely to be approximately 31 additional trips to the Site as a result of the development.

6.60 The results given in Table 6.9 are as expected given that there is no increase in car parking provision. The breakdown of non-car trips to the proposed IKEA store in Greenwich by public transport mode is discussed in **Section 7**.

IKEA Staff Travel

6.61 The above trip generation calculations include IKEA staff trips.

6.62 Information supplied by IKEA suggests that there is likely to be up to circa 110 staff on site at any one time comprising a mix of full and part time staff.

6.63 However, the shift patterns employed by IKEA ensure that the majority of staff trips to the store take place at off peak times. For reference, the typical shift patterns for IKEA staff are summarised in Table **6.15**.

Table 6.15 Summary of IKEA Shift Patterns

Type	Shift	No of Staff
Replen & Goods Flow Co-Workers	03:00-11:00	12 to 15
IKEA Food Co-Workers	07:00-13:00	7 to 10
Comin Co-Workers	07:00-16:00	15 to 20
Early Shift Co-Workers	08:00-17:00	40 to 50
Mid Shift Co-Workers	13:00-18:00	30 to 40
Late Shift Co-Workers	18:00-22:00	40 to 50

6.64 As shown in Table 6.15, only the end of the early shift coincides with a peak hour, when between 40 and 50 co-workers will be departing at 17:00.

6.65 The majority of staff will be appointed from the local area. IKEA are not proposing to offer any dedicated staff parking spaces, and are producing a robust Travel Plan to encourage sustainable travel to the store. Therefore it is considered that the vast majority of trips (if not all) will be via public transport, walking or cycling, the exception potentially being staff on the early morning (03:00-11:00) shift. For these staff, car sharing will be encouraged. The non-car mode for staff is likely to be significantly higher at Greenwich than at other London stores.

Distribution/Assignment of Vehicle Trips

Distribution and Assignment of Existing Comet/Sainsbury's Vehicle Trips

6.66 The existing trip distribution and assignment is based on information contained in the Transport Assessment associated with planning application ref. 12/0835/F for a new Sainsbury's foodstore and Marks and Spencer Store on Gallions Road. This was agreed with TfL as part of the application. A summary of the distribution/assignment is provided in **Table 6.16** below:

Table 6.16: Distribution/Assignment of Existing Trips for Sainsbury's and Comet

Origin	%
A102 North	0%
A102 South	27%
Woolwich Road/Bugsby's Way	30%
Woolwich Road West	29%
Millennium Way	14%
Total	100%

Distribution/Assignment of IKEA Trips

Catchment

6.67 The catchment for the proposed IKEA at Greenwich Millennium Retail Park is shown in **Figure 8**.

6.68 The existing Sainsbury's and former Comet stores will have a much more local catchment than the proposed IKEA due to the number of alternative stores throughout London. For example, it is highly unlikely that anyone would travel from the north of the river to access Sainsbury's considering that there will be numerous food stores that will be more local.

6.69 Within the London area there are four existing IKEA stores, in Croydon, Brent Park (Wembley), Tottenham and Thurrock (Lakeside). Due to there being only four stores, the catchments will be wider than for a Sainsbury's or Comet. It is considered reasonable to assume that car based customers would visit their nearest IKEA store, based on drive-time.

6.70 As part of the feasibility study into providing a store in Greenwich, IKEA undertook an exercise to determine where trade was likely to originate from. The study showed that the majority of trade is likely to come from within a 60minute drive time of the site.

6.71 A 60-minute drive time catchment for the Greenwich store has been produced using ARC-GIS and the TomTom Street Map Premium Dataset. This takes into account traffic speeds during peak hours. Catchments have also been produced for the other London IKEA stores (Croydon, Brent Park, Tottenham and Thurrock).

6.72 The 60 minute drive time catchments for the existing London stores and the proposed Greenwich Store are shown in **Figure 10**.

6.73 As shown in **Figure 10**, there are large areas where the 60-minute catchments overlap. In these areas, it is assumed that potential customers will travel to their closest IKEA (in terms of drive time). The catchment from the proposed IKEA is therefore based on the area where the proposed Greenwich store will be the closest IKEA.

6.74 The catchment for the proposed IKEA at Greenwich Millennium Retail Park taking into account other IKEA stores is shown in **Figure 8**. Within this catchment there is a total population of 2.17million . Catchment drive times are shown in **Figure 9**.

6.75 Population data was extracted for each ward within the catchment. **Table 6.17** below shows the populations within the catchment split into geographical area.

Table 6.17: Populations within the Proposed IKEA Catchment in Relation to Store:

Routes	Total Pop	%
North	826455	38.1%
South	565699	26.0%
East	162194	7.5%
West	617616	28.4%
Total	2171964	100%

6.76 Table 6.17 indicates that approximately 38.1% of the catchment population reside to the north of the Site (largely north of the River Thames), whilst 26% reside to south of the Site. In total, 28.4% and 7.5% reside to the West and East of the Site respectively.

Spend Factor Adjustment

6.77 Additional research undertaken by IKEA shows that the average spend per customer trip varies according to the distance travelled by the customer. The research shows that, although customers within the catchment area are likely to spend the same amount

annually, those living closer to the store will visit more times, but spend less per visit, than those living further away.

6.78 This relationship between distance travelled and spend per visit is shown in **Table 6.18**.

Table 6.18: Distance Travelled and Number of Visits to Reach Annual Spend

Drive Time (minutes)	No. of Visits per Annual Spend Factor
0 – 10	1.83
11 – 20	1.74
21 – 30	1.47
31 – 40	1.29
41 – 50	1.20
51 – 60	1.16
>60	1.00

6.79 These average spend per visit factors have been applied, which has adjusted the catchment slightly. The resulting catchment is summarised in **Table 6.15** below.

Table 6.19: Populations within the Proposed IKEA Catchment:

Routes	Total Pop	%
North	826455	39.1%
South	565699	26.4%
East	162194	7.7%
West	617616	26.9%
Total	**2171964**	**100%**

Assignment

6.80 The route between each ward within the catchment and the proposed IKEA store in Greenwich has been identified using StreetMap Premium for ArcGIS Europe TomTom and validated using Google Maps. Both Arc-GIS and Google Maps suggested that vehicles traveling from London Borough's in the west of the catchment including Westminster, Wandsworth, Lambeth, and Camden would travel to the north of the River Thames and cross the river at the Blackwall Tunnel. This is considered unlikely due to traffic knowledge of Central London. Therefore, assignment from these boroughs was amended so that they cross the river at an earlier opportunity and arrive via Woolwich Road West. The resulting assignment of trips to the local highway network surrounding the Site is summarised in **Table 6.20** below:

Table 6.20: Assignment of Primary IKEA Trips

Link	%
A102 North	39.1%
A102 South	39.8%
Woolwich Road/Bugsby's Way	7.7%
Woolwich Road West	13.4%
Total	100%

6.81 Table 6.20 indicates that the majority of trips to the proposed IKEA store will use the A102 either from the north or the south. The remaining trips will arrive either from Woolwich Road to the west, or Woolwich Road/Bugsby's Way to the east.

6.82 It has been assumed that all vehicles arriving from and leaving to the north will use the A102 junction with Blackwall Lane and use the access junction on Bugsby's Way. All vehicles arriving from and leaving to Woolwich Road (east and west) and the A102 South, area are assumed to use the A102/Peartree Way junction.

Signage

6.83 The above assignment assumes that drivers will travel to their most convenient junction in order to access the proposed IKEA store.

6.84 IKEA are keen to work with TfL, the Royal Borough of Greenwich and other local retail stores to improve signage in an effort to better balance traffic flows in the area. Currently, and as discussed in more detail in **Section 8**, the A102/Woolwich Road junction is heavily used by vehicles using the A102 to access local retail facilities, whilst the A102/Blackwall Lane junction is underused, with significant spare capacity.

6.85 IKEA propose to put signage within the car park, directing anyone exiting to the A102 to use the Blackwall Lane junction, to reduce demand at the Woolwich Road Junction. IKEA also seek to work with TfL to investigate how signage could be utilised on the A102 and in the local area to assist in distributing arriving traffic. This could be in conjunction with other retail parks/units on Bugsby's Way, to find an area wide solution.

6.86 However, in order to be robust, for the purpose of the analysis in this report the assignment as shown in Table 6.16 will be used.

Section Summary

6.87 This section has outlined the trip generation of the existing and proposed sites. It shows that there will be a reduction in vehicle trips during the weekday PM peak as a result of the development proposals, and only a slight increase in vehicle trips on the Saturday peak.

6.88 The distribution and assignment of trips on the local highway network will differ between the existing and proposed scenarios. Existing trips are likely to come from a more local area, with trips associated with the proposed IKEA coming from a wider area which would utilise the A102.

7 IMPACT ON SUSTAINABLE MODES OF TRANSPORT

7.1 This section will discuss the impact of the proposed IKEA store on the local public transport network.

7.2 As discussed earlier in this report, the application Site benefits from a PTAL of 5, with 10 local bus routes, and good access to North Greenwich Underground Station and Westcombe Park Rail Station.

Person Trip Generation

7.3 As highlighted in Section 6, a proposed IKEA in Greenwich is expected to have a similar number of customers as the existing store in Tottenham. This is recorded as being:

- 1,040 people movements during the weekday PM peak (499 arrivals and 541 departures);
- 2,415 people movements during the Saturday peak (1,234 arrivals and 1,180 departures).

7.4 Section 6 also highlighted that 65% of trips to the store will be made by car based transport, whilst 35% will be made by non-car modes of transport.

7.5 It is expected that a small proportion of customers will walk or cycle as their main mode of travel to the Store. In order to provide a robust assessment, it will be assumed that all 35% on non-car based travel to the Store will be via public transport (bus, rail or underground).

IKEA Mode Split

7.6 The catchment for the proposed IKEA store in Greenwich is shown in **Figure 7** and discussed in Section 6.

7.7 A public transport route to the proposed store has been assigned to each ward. In cases where there are more than one method of travel to the Store, an even split between the modes for that ward has been assumed. Table 7.1 below summarises the mode split of the proposed IKEA store based on the above.

Table 7.1: Mode Split for Public Transport (Main Mode)

Mode	% Split
Underground	19%
Rail	5%
Bus	11%
Total Public Transport	35%

7.8 Relating this to the two-way person trips (customer arrivals and departures) shows the number of trips expected on public transport modes that will be associated with the proposed IKEA store in Greenwich.

Table 7.2: Public Transport Trips Associated with IKEA (Main Mode)

Mode	Weekday PM Peak	Saturday Peak
Underground	202	470
Rail	51	118
Bus	110	255
Total Public Transport	363	843

Existing Public Transport Trips

7.9 The person trip generation of the existing Sainsbury's foodstore and former Comet store is shown below in **Table 7.3**. This is based on information for the Sainsbury's/M&S application which is discussed further in Section 6. As with the vehicle trip generation calculations, Comet trips have been discounted by 28% to allow for linked trips with the Sainsbury's.

Table 7.3: Person Trip Generation of Existing Stores

	Sainsbury's	Comet	Total
Weekday PM Peak	798	109	907
Saturday Peak	1,249	330	1,579

7.10 The household survey undertaken as part of Sainsbury's/M&S application shows that 15% of trips to Simsbury's are by bus and 1% by rail/underground. Furthermore, the household survey also shows that 25% of trips to non-food units are by bus, with 4% by rail/underground.

7.11 **Table 7.4** below therefore summarises the likely public transport trips associated with the Sainsbury's and Comet. The rail and underground trips for the Sainsbury's have been split 50%-50%.

Table 7.4: Public Transport Trips Associated with Existing Uses (Main Mode)

Mode	Weekday PM Peak	Saturday Peak
Underground	6	13
Rail	6	13
Bus	147	270
Total Public Transport Trips	164	315

Additional Public Transport Trips

7.12 Based on the IKEA public transport trips outlined in Table 7.2, and the public transport trips likely to be associated with the existing uses, as outlined in Table 7.4, it is possible to calculate the additional public transport trips that are likely to arise as a result of the development proposals. This is summarised in **Table 7.5** below.

Table 7.5: Additional Public Transport Trips as a Result of Proposed Development (Main Mode)

Mode	Weekday PM Peak	Saturday Peak
Underground	196	457
Rail	45	105
Bus	-37	-15
Total Public Transport Trips	199	528

7.13 Table 7.5 indicates that, during the PM peak hour for main mode trips, there are likely to be an additional 196 Underground journeys, 42 rail journeys but 37 less bus journeys. During the Saturday peak there are likely to an additional 457 Underground journeys, 105 rail journeys and but 15 less bus journeys. This result is as expected since existing customers come from a smaller catchment area and are therefore more likely to use bus than rail/underground.

7.14 The above analysis relates to main mode of travel only. Journeys that require more than one mode are discussed in more detail below.

Impact on Underground and Rail

Underground

7.15 Table 7.5 shows that there will be an additional 196 underground journeys during the weekday PM (98 arrivals and 98 departures) peak and 457 underground during the Saturday peak (229 arrivals and 228 departures). As a robust sensitivity for Sunday, 10% has been added to Saturday trips resulting in 503 underground trips (252 arrivals and 251 departures)

7.16 The frequency of services on the Jubilee Line is for a train every 2-3 minutes in each direction on Monday – Saturday, and every 3 minutes on a Sunday.

7.17 Assuming that a Jubilee Line has a service every 3 minutes, this relates to 20 services per hour. Therefore the number of additional customers per train is summarised in **Table 7.6** below.

Table 7.6: Additional passengers per Jubilee Line Service Attributed to the Proposed IKEA

Period	Additional Passengers per Service
PM Peak (17:00-18:00)	5
Saturday Peak (14:00-15:00)	12
Sunday Peak (Saturday + 10%)	13

Table 7.6 suggests that, during the busiest periods there are likely to be a maximum of 13 additional underground passengers per train as a result of the proposed IKEA in Greenwich.

Rail

7.18 Table 7.5 shows that there will be an additional 45 rail journeys during the weekday PM peak (23 arrivals and 22 departures) and 105 rail journeys during the Saturday peak (53 arrivals and 52 departures). As a robust sensitivity for Sunday, 10% has been added to Saturday trips resulting in 116 rail trips (58 arrivals and 58 departures)

7.19 Whilst is it considered that a proportion of the rail users will alight at Charlton, as a robust case, this assessment assumes that all rail users will alight at Westcombe Park

7.20 The frequency of services at Westcombe Park is for a train every 10 minutes in each direction on Monday – Saturday, and every 15 minutes in each direction on a Sunday. Therefore there

are six trains per hour in each direction on Monday to Saturday and two trains in each direction on a Sunday.

7.21 Based on the above information, the number of additional customers per train is summarised in **Table 7.7** below.

Table 7.7: Additional passengers per Westcombe Station Rail Service Attributed to the Proposed IKEA

Period	Additional Passengers per Service
PM Peak (17:00-18:00)	4
Saturday Peak (14:00-15:00)	9
Sunday Peak (Saturday + 10%)	14

7.22 Table 7.7 suggests that, during a Sunday, there are likely to be 14 passengers per train associated with IKEA. Between Monday and Saturday, when train frequency is greater, there are likely to be less than 10 IKEA customers per train.

Impact on Buses

7.23 As a main mode of travel, Table 7.5 indicates that there is likely to be a net decrease in bus use compared to the existing situation. This is logical as there is likely to be a significant number of local trips to the foodstore that would utilise the excellent bus service in the area.

7.24 However, it is considered that those arriving via the Underground would utilise the bus services from North Greenwich to IKEA.

7.25 Six bus routes operate between North Greenwich Station and the proposed IKEA store .Table 2.1 (Section 2) summarise the frequency of these routes, showing that there are between 31 and 46 buses per hour in each direction on Monday to Saturday. On a Sunday there are between 23 and 27 buses per hour in each direction. Taking an average, it can be assumed that there will be 38 buses in each direction between North Greenwich Station and the proposed IKEA on Monday to Saturday, and 25 buses in each direction on a Sunday.

7.26 A double decker bus has a capacity of 80 passengers (lower deck: 22 seats, 1 wheelchair space, 18 standing; upper deck: 40 seats)

7.27 As stated above, Table 7.5 shows that there will be an additional 196 underground journeys during the weekday PM (98 arrivals and 98 departures) peak and 457 underground during the Saturday peak (229 arrivals and 228 departures). As a robust sensitivity for Sunday, 10% has been added to Saturday trips resulting in 503 underground trips (252 arrivals and 251 departures). Based on this, Table 7.8 summarises the number of additional trips per bus between North Greenwich Station and the proposed IKEA store during the peak periods.

Table 7.8: Additional Passengers per Bus service Between North Greenwich and the Proposed IKEA Store

Period	Additional Passengers per Service
PM Peak (17:00-18:00)	3
Saturday Peak (14:00-15:00)	6
Sunday Peak (Saturday + 10%)	10

7.28 Table 7.8 suggests that there will be an additional three passengers per bus during the weekday PM peak. During the Saturday peak hour there will be an additional six passengers per bus. On a Sunday when bus frequency is lower, there could be approximately 10 extra passengers per bus.

7.29 It is considered that customers will board the first bus that arrives rather than waiting for a specific route.

7.30 Turning to rail services to Westcombe Park, it is likely that the majority of customers visiting the store will walk the short distance to/from the store.

7.31 For those who do elect to use the bus, one bus route operates between Westcombe Park Station and the proposed IKEA (bus route 108). This service has a frequency of 6 buses per hour between Monday and Saturday, and 4 buses per hour on a Sunday.

7.32 **Table 7.9** provides the additional passengers per bus assuming a worst case scenario whereby all rail users wish to travel by bus between Westcombe Rail Station and the proposed IKEA. As noted above this is very unlikely to occur in practice.

Table 7.9: Additional Passengers per Bus service between Westcombe Rail Station and the Proposed IKEA Store

Period	Additional Passengers per Service
PM Peak (17:00-18:00)	4
Saturday Peak (14:00-15:00)	9
Sunday Peak (Saturday + 10%)	14

7.33 Table 7.9 shows that, if all customers arriving by rail get the bus between Westcombe Rail Station and the proposed IKEA, there will be an additional 4 passengers per bus during the weekday PM peak hour, 9 additional passengers per bus during the Saturday peak hour and 14 additional passengers per bus during on a Sunday. It is considered very unlikely that this scenario will occur, as the IKEA store is within the PTAL guidance recommended walking distance from the Store.

Section Summary

7.34 This section has summarised the impact of the development proposed of the local public transport network, namely underground, rail and bus services.

7.35 Compared to the existing situation, it is considered that the greatest increase in passenger numbers as a result of the development proposals will occur on the Jubilee Underground Line and subsequent buses between North Greenwich Station and the IKEA store.

7.36 However, we do not consider that the numbers involved are likely to cause any significant congestion issues on the public transport network especially as the majority of the demand will be during off peak periods.

8 IMPACT ON THE LOCAL HIGHWAY NETWORK

Methodology

8.1 This section of the report summarises the methodology used to assess the impact on the highway network associated with the proposed Development.

Traffic Figures

8.2 The following traffic figures are included at the end of this Transport Assessment.

- Traffic Figure 1: Observed - PM Peak Hour (17:00-18:00)
- Traffic Figure 2: Observed - Saturday Peak Hour (13:45-14:45)
- Traffic Figure 3: Committed Development - PM Peak Hour
- Traffic Figure 4: Committed Development - Saturday Peak Hour
- Traffic Figure 5: Base Year - PM Peak Hour
- Traffic Figure 6: Base Year - Saturday Peak Hour
- Traffic Figure 7: Existing Sainsbury's and Comet Distribution - PM Peak Hour
- Traffic Figure 8: Existing Sainsbury's and Comet Distribution - Saturday Peak Hour
- Traffic Figure 9: Existing Sainsbury's and Comet Trips - PM Peak Hour
- Traffic Figure 10: Existing Sainsbury's and Comet Trips - Saturday Peak Hour
- Traffic Figure 11: Base minus Existing Sainsbury's and Comet Trips - PM Peak Hour
- Traffic Figure 12: Base minus Existing Sainsbury's and Comet Trips - Saturday Peak Hour
- Traffic Figure 13: IKEA Trip Distribution - PM Peak Hour
- Traffic Figure 14: IKEA Trip Distribution - Saturday Peak Hour
- Traffic Figure 15: IKEA Trips - PM Peak Hour
- Traffic Figure 16: IKEA Trips - Saturday Peak Hour
- Traffic Figure 17: IKEA Trips – Sunday Peak Hour Sensitivity
- Traffic Figure 18: Base minus Existing Sainsbury's and Comet Trips plus IKEA Trips - PM Peak Hour

- Traffic Figure 19: Base minus Existing Sainsbury's and Comet Trips plus IKEA Trips - Saturday Peak Hour
- Traffic Figure 20: Base minus Existing Sainsbury's and Comet Trips plus IKEA Trips - Sunday Peak Hour Sensitivity

8.3 Due to the different distribution of the proposed Ikea store compared to the existing Sainsbury's and former Comet stores, an increase in traffic flows is seen on some junctions, with a decrease in traffic at others. For example, the A102/Blackwall Lane junction, the Millennium Way/Bugsby's Way roundabout and the Bugsby's Way/Commercial Way junction will see an increase in traffic flows as a result of the proposed development whilst the A102/Woolwich Road Junction, the Peartree Way /Commercial Way Junction and the Peartree Way/Bugsby's Way Roundabout will see a reduction in traffic flows as a result of the development proposals.

8.4 The following traffic figures have also been included to demonstrate the junctions changing flows at each junction:

- Traffic Figure 21: Existing vs Proposed Traffic Flow Comparison - PM Peak Hour
- Traffic Figure 22: Existing vs Proposed Traffic Flow Comparison - Saturday Peak Hour

Scope

8.5 The study area assessed as part of this TA includes the following junctions. This scope has been agreed by TfL.:

- A102/Woolwich Road/Peartree Way (Signalled Junction)
- A102/Blackwall Lane (Signalled Junction)
- Blackwall Lane/Millennium Way/Bugsby's Way (Roundabout)
- Commercial Way/Bugsby's Way/Millennium Busway (Signalled Junction)
- Peartree Way/Bugsby's Way (Roundabout)
- Millennium Bus Way/Peartree Way (Signalled Junction)
- Commercial Way/Peartree Way/Horn Lane

8.6 Transport for London have also requested a proportional impact assessment for the two following junctions:

- Anchor and Hope Lane/Bugsby's Way
- Anchor and Hope Lane/Woolwich Road

Traffic Surveys

8.7 Raw traffic survey data is included in **Appendix M**.

8.8 A set of manual classified count traffic (MCC) and queue length surveys were carried out at the following junctions in July 2013 :

- A102/Blackwall Lane (Signalled Junction)
- Millennium Bus Way/Peartree Way (Signalled Junction)
- Commercial Way/Peartree Way/Horn Lane

8.9 The surveys were undertaken at the following dates/times.

- Thursday 18th July between 16:00-19:00; and
- Saturday 20th July between 11:00-17:00.

8.10 Additional surveys (MCC and queue length) were undertaken in October 2010 as part of the Transport Assessment for the Sainsbury's and M&S stores on Gallions Road for the following junctions:

- A102/Woolwich Road/Peartree Way (Signalled Junction)
- Blackwall Lane/Millennium Way/Bugsby's Way (Roundabout)
- Commercial Way/Bugsby's Way
- Anchor and Hope Lane/Bugsby's Way
- Anchor and Hope Lane/Woolwich Road

8.11 These surveys were undertaken at the following dates/times:

- Thursday 7th October 2010 between 07:00-10:00 and 16:00-19:00; and
- Saturday 9th October between 11:00-17:00.

8.12 Additionally the A102/Woolwich Road/Peartree Way Gyratory was surveyed in November/December 2011 as part of the Transport Assessment for the Sainsbury's and M&S stores on Gallions Road. This survey took place at the following times.

- Saturday 26th October 2011 between 15:00-16:00; and
- Friday 2nd December 2011 between 16:45 and 17:45

8.13 Automatic Traffic Counters (ATC) were also installed over a 7 day period to assist in validating the traffic flows.

8.14 The MMC surveys and ATC surveys discussed above were used to determine the network peak hours during weekdays and on Saturday. The network peak hours were determined by summing the manual turning count movements. The resultant peak hours are as follows:

- Weekday PM Peak – 17:00-18:00
- Saturday Peak – 13:45-14:45

8.15 These peak hours represent the highest combined flows between the surveyed traffic flows and proposed IKEA related traffic.

8.16 Whilst the times for the A102/Woolwich Road/Peartree Way survey are not consistent with the peak hours shown in the other surveys, flows are broadly similar between the different periods. Based on the turning counts for all other junctions, the difference in traffic flows between 16:45 and 17:45 compared to 17:00 and 18:00 on a weekday is 2.9%. On a Saturday, the difference in traffic flows between 13:45-14:45 and 15:00-16:00 is 1.6%. Therefore the surveys are considered valid for the purpose of this peak hour assessment.

8.17 TfL have requested that an assessment is carried out for the Sunday peak hour.

8.18 Traffic flows for a Saturday and for a Sunday have been compared using ATC data. Comparisons were made for the peak hour traffic flows and the daily traffic flows for both days (as ATC data produces hourly flows as opposed to flows every 15 minutes flows between 14:00-15:00 on both Saturday and Sunday have been compared). The flows are summarised in **Table 8.1** below.

Table 8.1: Comparison of Saturday and Sunday Flows (ATC)

Link	Saturday		Sunday	
	14:00-15:00	24 hr	14:00-15:00	24 hr
Millennium Way	851	13,784	675	13,040
Bugsby's Way	815	12,189	863	10,468
Peartree Way	1,174	14,543	1,170	10,353
Woolwich Road	1,089	18,854	1,167	17,032
Blackwall Lane	633	11,698	613	11,519
Total	4,562	71,068	4,488	62,412

8.19 Table 8.1 shows that, during the peak hour of 14:00-15:00, base traffic flows for Saturday are marginally higher than on a Sunday. Over a daily period, there is significantly more traffic on a Saturday compared to a Sunday.

8.20 There is currently only limited information on Sunday traffic for the London based IKEA stores. As such, a sensitivity test has been carried out for a Sunday assuming the same baseline traffic flows as Saturday, with a 10% increase in development flows. This is considered robust.

Assessment Years

8.21 The opening of the proposed development is anticipated to be 2016. Due to the congested nature of the transport network in London during peak hours, it is not considered that background traffic flows will increase. As a result no traffic growth has been included within this assessment. Instead, specific committed developments will be considered on an individual basis. This approach was included in our Scoping Note and agreed with TfL. It was also the agreed approach on the J Sainsbury/M&S application.

Assessment Scenarios

8.22 The following scenarios have been assessed to determine the traffic impact of the Development:

- **Observed Scenario:** based on the 2010/2013 survey flows. Comet flows have been added to the 2013 surveyed junctions to produce an existing case.

- **Without Development Scenario:** Observed traffic flows + Committed Developments
- **With Development Scenario:** Observed traffic flows + Committed Developments – Existing Sainsbury's and Comet trips + IKEA trips.

Committed Development

8.23 The assessment will consider the predicted trip generation of committed developments in the vicinity of the site where there would be a traffic impact within the study area. As a robust case traffic from all of the committed development that were assessed as part of the Enerby Wharf Transport Assessment (2010) and the M&S/Sainsbury's Transport Assessment have been included in the base case. These committed developments include:

- Cruise Terminal, Enderby Wharf;
- Sainsbury's/M&S – Gallions Road
- Brocklebank Road
- A DIY unit of 2,463 sqm on Brocklebank Road on Charlton;
- A 120 bedroom Travelodge hotel and 1,446 sqm retail unit on Woolwich Road;
- 283 residential units at 40 Victoria Way;
- 741 consented residential units, part of the Greenwich Peninsula Masterplan; and
- 4,160 sqm retail floorspace, 6,715 sqm industrial floorspace at the Schroders Site, Bugsby's Way (Without Development Scenario Only).
- Greenwich Peninsula;
- Lovell's, Granite, Badcock's and Pipers Wharves, Greenwich;
- Greenwich Millennium Village (phases 3, 4 and 5);
- Tesco Love Lane, Woolwich;
- Stockwell Street, Greenwich;
- Greenwich Reach;
- Creekside Industrial Estate, Greenwich; and
- Heart of East Greenwich.

Results

8.24 Stand-alone junction assessments have been carried out at seven junctions on the wider highway network. The modelling output is included in **Appendix N**. The results are summarised below.

A102/Blackwall Lane/Tunnel Avenue

8.25 The results for the assessment of the A102 / Woolwich Road/Peartree Way Gyratory are presented in **Table 8.2** to **Table 8.4** below. This junction was modelled using LinSig.

Table 8.2: LINSIG Results – A102 / Blackwall Lane / Tunnel Avenue Gyratory – Observed

Observed + Comet Flows			PM Peak Hour		Saturday Peak Hour	
		Cycle Time -->	89 seconds		89 seconds	
Junction	Link(s)	Lane	Degree of Saturation	Queue Length	Degree of Saturation	Queue Length
A102 / S/B On Slip Road	1/1	Blackwall Lane S/B Left onto A102 S/B On Slip	27.5	2.6	14.9	1.3
A102 / N/B On Slip Road	1/3	Blackwall Lane S/B Right onto A102 N/B On Slip - Ln 1	58.6	6.3	30.4	3.7
	1/4	Blackwall Lane S/B Right onto A102 N/B On Slip - Ln 2	59.5	6.6	31.1	3.9
	2/1	Blackwall Lane N/B Left onto A102 N/B On Slip	70.4	11.2	28.6	0.9
	2/2	N/B Mid (S) Ahead	19.5	4.4	15.6	0.5
	2/3	N/B Mid (S) Ahead	10.5	0.2	20.4	5.2
A102 / S/B Off Slip Road	3/1	N/B Mid (N) Ahead - Bus Lane	0.0	0.0	0.0	0.0
	3/2	N/B Mid (N) Ahead - Lane 1	38.0	3.6	25.6	1.9
	3/3	N/B Mid (N) Ahead - Lane 2	19.1	0.5	31.1	0.4
	4/1	A102 S/B Off Slip Road - Lane 1	34.3	2.3	32.8	2.2
	4/2	A102 S/B Off Slip Road - Lane 2	37.1	2.7	35.8	2.6
A102 N/B Off Slip Road / Tunnel Avenue	1/1+1/2	Blackwall Lane (North)	34.3	4.2	30.3	3.7
	2/2+2/1	A102 N/B Off Slip Road - Lanes 1 & 2	85.0	13.8	4.0	0.3
	2/3	A102 N/B Off Slip Road - Lane 3	25.9	2.7	66.9	5.7
	3/1+3/2	A2203 Blackwall Lane (South)	53.8	6.6	33.8	3.8
	4/1+4/2	Tunnel Avenue	22.4	1.3	4.8	0.3

Table 8.3: LINSIG Results – A102 / Blackwall Lane / Tunnel Avenue Gyratory – Base 2016

Base Case			PM Peak Hour		Saturday Peak Hour	
		Cycle Time -->	89 seconds		89 seconds	
Junction	Link(s)	Lane	DoS	Queue Length	DoS	Queue Length
A102 / S/B On Slip Road	1/1	Blackwall Lane S/B Left onto A102 S/B On Slip	28.8	2.8	16.8	1.4
A102 / N/B On Slip Road	1/3	Blackwall Lane S/B Right onto A102 N/B On Slip - Ln 1	58.6	6.3	30.4	3.7
	1/4	Blackwall Lane S/B Right onto A102 N/B On Slip - Ln 2	59.5	6.6	31.1	3.9
	2/1	Blackwall Lane N/B Left onto A102 N/B On Slip	80.2	15.1	40.4	2.4
	2/2	N/B Mid (S) Ahead	38.7	9.9	35.6	1.9
	2/3	N/B Mid (S) Ahead	10.5	0.2	20.4	5.2
A102 / S/B Off Slip Road	3/1	N/B Mid (N) Ahead - Bus Lane	0.0	0.0	0.0	0.0
	3/2	N/B Mid (N) Ahead - Lane 1	75.4	10.8	58.2	5.8
	3/3	N/B Mid (N) Ahead - Lane 2	19.1	0.5	31.1	0.4
	4/1	A102 S/B Off Slip Road - Lane 1	36.7	2.5	35.4	2.4
	4/2	A102 S/B Off Slip Road - Lane 2	39.3	2.9	38.2	2.8
A102 N/B Off Slip Road / Tunnel Avenue	1/1+1/2	Blackwall Lane (North)	56.1	8.6	49.7	7.7
	2/2+2/1	A102 N/B Off Slip Road - Lanes 1 & 2	87.4	14.8	10.0	0.6
	2/3	A102 N/B Off Slip Road - Lane 3	25.9	2.7	66.9	5.7
	3/1+3/2	A2203 Blackwall Lane (South)	78.4	11.9	54.2	6.1
	4/1+4/2	Tunnel Avenue	30.1	1.7	15.0	1.0

Table 8.4: LINSIG Results – – A102 / Blackwall Lane / Tunnel Avenue Gyratory – Base + Development 2016

Development Case			PM Peak Hour		Saturday Peak Hour		Sunday Peak Hour	
		Cycle Time -->	89 seconds		89 seconds		89 seconds	
Junction	Link(s)	Lane	DoS	Queue	DoS	Queue	DoS	Queue
A102 / S/B On Slip Road	1/1	Blackwall Lane S/B Left onto A102 S/B On Slip	28.8	2.8	16.8	1.4	16.8	1.4
102 / N/B On Slip Road	1/3	Blackwall Lane S/B Right onto A102 N/B On Slip - Ln 1	68.1	7.7	44.1	5.7	45.4	6.0
	1/4	Blackwall Lane S/B Right onto A102 N/B On Slip - Ln 2	68.8	8.0	44.7	6.0	46.1	6.3
	2/1	Blackwall Lane N/B Left onto A102 N/B On Slip	80.2	**15.1**	40.4	2.4	40.4	2.4

	2/2	N/B Mid (S) Ahead	38.0	9.6	33.9	1.4	34.0	1.4
	2/3	N/B Mid (S) Ahead	10.5	0.2	20.4	5.2	20.4	5.2
102 / S/B Off Slip Road	3/1	N/B Mid (N) Ahead - Bus Lane	0.0	0.0	0.0	0.0	0.0	0.0
	3/2	N/B Mid (N) Ahead - Lane 1	74.0	10.4	55.5	5.4	55.6	5.4
	3/3	N/B Mid (N) Ahead - Lane 2	19.1	0.5	31.1	0.4	31.1	0.4
	4/1	A102 S/B Off Slip Road - Lane 1	42.5	3.0	49.5	3.6	50.9	3.8
	4/2	A102 S/B Off Slip Road - Lane 2	45.3	3.4	52.1	4.1	53.5	4.2
102 N/B Off Slip Road / Tunnel Avenue	1/1+1/2	Blackwall Lane (North)	55.0	8.4	48.3	7.3	48.4	7.4
	2/2+2/1	A102 N/B Off Slip Road - Lanes 1 & 2	87.4	14.8	10.0	0.6	10.0	0.6
	2/3	A102 N/B Off Slip Road - Lane 3	25.9	2.7	66.9	5.7	66.9	5.7
	3/1+3/2	A2203 Blackwall Lane (South)	78.1	11.8	53.6	6.1	53.6	6.1
	4/1+4/2	Tunnel Avenue	30.1	1.7	15.0	1.0	15.0	1.0

8.26 In the Observed scenario, the signalled gyratory of the A206 Woolwich Road / Blackwall Lane/Tunnel Avenue operates within theoretical capacity on each approach with a maximum cycle time of 89 seconds during both the PM peak and Saturday peak hours. During the PM peak queuing is appearing on the Blackwall Lane northbound left turn onto the A102 northbound on-slip. This is largely due to queuing occurring on the A102 at the time of the survey. In this period, vehicles were using the A102 northbound off-slip to exit the A102. They then performed an illegal movement to re-join the A120 via the A102 northbound on-slip. Spare capacity exists on all arms during the Saturday Peak.

8.27 The junction still operates within theoretical capacity during the base case and during the base + development scenario during the PM peak hour, Saturday peak hour and Sunday peak hour. The biggest impact on the junction is on the right turn from Blackwall Lane (southbound) onto the A102 northbound on-slip. This does not impact significantly on queuing at the junction.

A102/Woolwich Road/Peartree Way

8.28 The results for the assessment of the A102 / Woolwich Road/Peartree Way Gyratory are presented in **Table 8.5** to Table **8.7** below. This junction was modelled using LinSig.

Table 8.5: LINSIG Results – A102 / Woolwich Road / Pear Tree Way Gyratory – Observed

Observed + Comet		PM Peak Hour		Saturday Peak Hour	
Link No:	Lane	Degree of Saturation	Queue Length	Degree of Saturation	Queue Length
	Cycle Time -->	52 secs		52 secs	
J1: NORTH - (J&C) Woolwich Road - A102M Slip Roundabout					
1/2+1/1	A102 (S/B) - Lane 1 - Ahead Left	42.7	2.4	42.7	2.4
1/3	A102 (S/B) - Lane 2 - Ahead	25.2	1.3	24.1	1.3
2/1	Peartree Way - Lane 1	43.5	4.2	55.2	5.9
2/2	Peartree Way - Lane 2	43.0	4.1	55.1	5.9
3/1	Peartree Way - Exit - Lane 1	26.7	1.3	41.0	2.0
3/2	Peartree Way - Exit - Lane 1	19.2	1.7	35.0	2.5
4/1	A102 - N/B Exit - Lane 1	16.7	2.7	14.1	2.3
4/2	A102 - N/B Exit - Lane 2	13.8	2.2	10.9	1.8
5/1	Circ. towards Peartree Way - Lane 1	25.9	1.4	39.6	2.2
5/2	Circ. towards Peartree Way - Lane 2	18.5	1.9	33.9	3.0
6/1	Circulating - N/B - Lane 1	25.0	2.2	33.8	2.3
6/2	Circulating - N/B - Lane 2	33.7	2.5	44.6	2.7
6/3	Circulating - N/B - Lane 3	9.4	0.1	12.3	0.1
7/1+7/2	Woolwich Road (west) - Entry	89.6	14.3	89.0	14.4
8/1	Circulating - E/B - Lane 1	37.5	1.7	36.5	1.7
8/2	Circulating - E/B - Lane 2	41.2	1.9	38.2	1.2
9/1	Southbound from Peartree - Lane 1	73.3	6.4	87.8	9.8
9/2	Southbound from Peartree - Lane 2	70.6	5.2	86.5	7.9
J2: SOUTH - (J&C) Woolwich Road - A102M Slip Roundabout					
1/1	Woolwich Road (east) - Entry Lane 1	82.3	7.5	72.4	5.8
1/2	Woolwich Road (east) - Entry Lane 2	81.3	7.2	69.7	5.5
3/1	Circulating - S/B - Lane 1	33.5	2.4	45.2	2.9
3/2	Circulating - S/B - Lane 2	38.8	3.2	44.9	3.3
3/3	Circulating - S/B - Lane 3	14.7	0.7	19.8	0.8
4/1	Exit - S/B - Lane 1	26.7	1.5	32.8	1.4
4/2	Exit - S/B - Lane 2	23.0	2.2	25.9	2.6
5/1	Circulating - W/B - Lane 1	46.1	3.3	47.3	4.0
5/2	Circulating - W/B - Lane 2	60.5	3.2	60.8	4.2
6/1	A102 (N/B) - Entry Lane 1	44.1	4.5	62.0	7.0
6/2	A102 (N/B) - Entry Lane 2	42.9	4.3	61.9	7.0
7/1	A102 (N/B) Pre-Signals - Approach Lane 1	18.3	2.1	26.3	3.4
7/2	A102 (N/B) Pre-Signals - Approach Lane 2	18.9	2.3	26.9	3.5
8/1	Westcombe Hill - southbound	13.0	1.5	11.1	1.3
9/1	Westcombe Hill - Bus Exit	10.9	0.8	14.9	1.0

Table 8.6: LINSIG Results – A102 / Woolwich Road / Pear Tree Way Gyratory – Base 2016

Base Case		PM Peak Hour		Saturday Peak Hour	
Link No:	Lane	Degree of Saturation	Queue Length	Degree of Saturation	Queue Length
	Cycle Time -->	52 secs		52 secs	
J1: NORTH - (J&C) Woolwich Road - A102M Slip Roundabout					
1/2+1/1	A102 (S/B) - Lane 1 - Ahead Left	44.1	2.5	42.4	2.4
1/3	A102 (S/B) - Lane 2 - Ahead	25.7	1.4	24.4	1.3
2/1	Peartree Way - Lane 1	50.8	5.1	68.6	8.2
2/2	Peartree Way - Lane 2	50.7	5.1	68.1	8.2
3/1	Peartree Way - Exit - Lane 1	26.3	1.0	40.0	2.1
3/2	Peartree Way - Exit - Lane 1	19.6	1.8	34.6	2.1
4/1	A102 - N/B Exit - Lane 1	16.7	2.6	13.6	2.3
4/2	A102 - N/B Exit - Lane 2	14.7	2.3	11.0	1.8
5/1	Circ. towards Peartree Way - Lane 1	25.4	1.3	38.8	2.5
5/2	Circ. towards Peartree Way - Lane 2	19.0	1.9	33.5	2.5
6/1	Circulating - N/B - Lane 1	27.3	2.2	34.2	2.2
6/2	Circulating - N/B - Lane 2	32.9	2.6	43.2	2.7
6/3	Circulating - N/B - Lane 3	15.2	0.1	23.9	0.2
7/1+7/2	Woolwich Road (west) - Entry	100.2	28.1	106.0	51.7
8/1	Circulating - E/B - Lane 1	47.3	2.2	50.3	2.7
8/2	Circulating - E/B - Lane 2	49.6	2.0	50.8	2.6
9/1	Southbound from Peartree - Lane 1	82.9	8.2	104.3	39.2
9/2	Southbound from Peartree - Lane 2	81.3	7.0	104.1	36.1
J2: SOUTH - (J&C) Woolwich Road - A102M Slip Roundabout					
1/1	Woolwich Road (east) - Entry Lane 1	85.7	8.3	73.5	5.9
1/2	Woolwich Road (east) - Entry Lane 2	84.6	8.0	70.5	5.6
3/1	Circulating - S/B - Lane 1	39.0	2.5	52.8	2.7
3/2	Circulating - S/B - Lane 2	43.1	3.2	49.8	3.4
3/3	Circulating - S/B - Lane 3	17.3	0.7	24.0	0.9
4/1	Exit - S/B - Lane 1	30.3	1.5	38.7	1.1
4/2	Exit - S/B - Lane 2	24.3	2.3	25.3	2.3
5/1	Circulating - W/B - Lane 1	51.3	4.0	54.0	4.8
5/2	Circulating - W/B - Lane 2	65.5	3.9	66.5	4.9
6/1	A102 (N/B) - Entry Lane 1	48.7	5.1	70.7	8.6
6/2	A102 (N/B) - Entry Lane 2	48.7	5.0	70.5	8.6
7/1	A102 (N/B) Pre-Signals - Approach Lane 1	20.4	2.4	30.1	4.0
7/2	A102 (N/B) Pre-Signals - Approach Lane 2	21.5	2.6	30.9	4.1
8/1	Westcombe Hill - southbound	13.0	1.5	11.1	1.3
9/1	Westcombe Hill - Bus Exit	10.9	0.8	14.9	1.0

Table 8.7: LINSIG Results – A102 / Woolwich Road / Pear Tree Way Gyratory – Base + Development 2016

Development Case		PM Peak Hour		Saturday Peak Hour		Sunday Peak Hour	
Link No:	Lane	DoS	Queue Length	DoS	Queue Length	DoS	Queue Length
	Cycle Time -->	52 secs		52 secs		52 secs	
J1: NORTH - (J&C) Woolwich Road - A102M Slip Roundabout							
1/2+1/1	A102 (S/B) - Lane 1 - Ahead Left	44.3	2.6	41.4	2.3	41.2	2.3
1/3	A102 (S/B) - Lane 2 - Ahead	25.5	1.4	25.5	1.4	25.7	1.4
2/1	Peartree Way - Lane 1	46.7	4.7	67.2	8.0	68.6	8.2
2/2	Peartree Way - Lane 2	46.6	4.5	66.0	7.8	67.3	8.0
3/1	Peartree Way - Exit - Lane 1	23.1	0.7	36.6	1.4	38.8	1.5
3/2	Peartree Way - Exit - Lane 1	16.8	1.2	33.2	1.5	34.8	1.6
4/1	A102 - N/B Exit - Lane 1	16.1	2.6	12.7	2.1	13.1	2.2
4/2	A102 - N/B Exit - Lane 2	15.3	2.4	12.1	2.0	11.9	2.0
5/1	Circ. towards Peartree Way - Lane 1	22.3	0.9	35.4	1.6	37.5	1.7
5/2	Circ. towards Peartree Way - Lane 2	16.2	1.4	32.1	1.8	33.6	1.9
6/1	Circulating - N/B - Lane 1	27.9	2.1	36.6	2.1	38.1	2.2
6/2	Circulating - N/B - Lane 2	32.2	2.3	42.4	2.4	44.1	2.4
6/3	Circulating - N/B - Lane 3	13.9	0.1	24.1	0.3	24.2	0.3
7/1+7/2	Woolwich Road (west) - Entry	94.4	17.9	96.6	21.3	97.4	22.5
8/1	Circulating - E/B - Lane 1	48.7	2.4	52.2	2.7	52.5	2.7
8/2	Circulating - E/B - Lane 2	48.4	2.1	53.3	2.7	53.0	2.7
9/1	Southbound from Peartree - Lane 1	78.1	7.1	102.0	31.6	103.6	37.0
9/2	Southbound from Peartree - Lane 2	75.7	5.9	101.8	29.1	103.7	34.8
J2: SOUTH - (J&C) Woolwich Road - A102M Slip Roundabout							
1/1	Woolwich Road (east) - Entry Lane 1	83.4	7.8	69.5	5.4	69.5	5.4
1/2	Woolwich Road (east) - Entry Lane 2	81.9	7.4	65.7	4.9	66.1	5.0
3/1	Circulating - S/B - Lane 1	37.9	2.6	55.6	3.1	55.9	3.0
3/2	Circulating - S/B - Lane 2	41.7	3.3	52.1	3.8	52.0	3.7
3/3	Circulating - S/B - Lane 3	15.3	0.7	22.7	0.9	22.5	0.9
4/1	Exit - S/B - Lane 1	29.9	1.6	40.8	1.6	41.1	1.3
4/2	Exit - S/B - Lane 2	25.2	2.3	29.3	2.5	29.2	2.4
5/1	Circulating - W/B - Lane 1	46.2	3.4	47.7	4.1	47.7	4.1
5/2	Circulating - W/B - Lane 2	61.5	3.4	62.3	4.5	62.2	4.5
6/1	A102 (N/B) - Entry Lane 1	49.0	5.1	75.1	9.5	79.5	10.5
6/2	A102 (N/B) - Entry Lane 2	49.7	5.3	75.3	9.5	79.7	10.6
7/1	A102 (N/B) Pre-Signals - Approach Lane 1	20.5	2.5	32.1	4.3	34.1	4.7
7/2	A102 (N/B) Pre-Signals - Approach Lane 2	22.0	2.6	33.0	4.5	35.0	4.8
8/1	Westcombe Hill - southbound	13.0	1.5	11.1	1.3	11.1	1.3

9/1	Westcombe Hill - Bus Exit	10.9	0.8	14.9	1.0	14.9	1.0

8.29 In the Observed scenario, the signalised gyratory of the A206 Woolwich Road / Pear Tree Way / Blackwall Tunnel Slips operates within theoretical capacity on each approach with a maximum cycle time of 52 seconds during both the PM peak and Saturday peak hours. The junction does get close to capacity on the Woolwich Road western entry and southbound on Peartree Way during both the weekday and Saturday (and Sunday) peak hours.

8.30 In the future base scenario, with the addition of committed development in the area, the junction breaches theoretical capacity on the Woolwich Road western entry during both the weekday PM peak hour and Saturday peak hour. During the Saturday peak hour theoretical capacity is also breached southbound on Peartree Way.

8.31 With the removal of the Sainsbury's and Comet trips, and the addition of IKEA trips, the junction performs with greater spare capacity than in the base case. This is due to the re-distribution of traffic as a result of the development proposals.

8.32 If the signals at the junction are optimised, there will be operational improvements. **Table 8.8** below shows how the junction would operate with optimised signals in the Base + Development case.

Table 8.8: LINSIG Results – A102 / Woolwich Road / Pear Tree Way Gyratory – Base + Development 2016 – Optimised Signals

Development Case		PM Peak Hour		Saturday Peak Hour		Sunday Peak Hour	
Link No:	Lane	DoS	Queue	DoS	Queue Length	DoS	Queue Length
	Cycle Time -->	52 secs		52 secs		52 secs	
J1: NORTH - (J&C) Woolwich Road - A102M Slip Roundabout							
1/2+1/1	A102 (S/B) - Lane 1 - Ahead Left	44.3	2.6	41.4	2.3	41.2	2.3
1/3	A102 (S/B) - Lane 2 - Ahead	25.5	1.4	25.5	1.3	25.7	1.3
2/1	Peartree Way - Lane 1	46.7	4.7	67.2	8.0	68.6	8.2
2/2	Peartree Way - Lane 2	46.6	4.5	66.0	7.8	67.3	8.0
3/1	Peartree Way - Exit - Lane 1	23.1	0.9	36.6	1.9	38.8	2.0
3/2	Peartree Way - Exit - Lane 1	16.8	0.9	33.2	2.0	34.8	2.0
4/1	A102 - N/B Exit - Lane 1	10.7	0.1	9.4	0.1	9.7	0.2
4/2	A102 - N/B Exit - Lane 2	10.1	0.2	8.9	0.1	8.7	0.2
5/1	Circ. towards Peartree Way - Lane 1	22.3	1.1	35.4	1.9	37.5	2.0
5/2	Circ. towards Peartree Way - Lane 2	16.2	1.3	32.1	2.1	33.6	2.2

6/1	Circulating - N/B - Lane 1	49.1	3.3	48.4	3.8	50.4	3.9
6/2	Circulating - N/B - Lane 2	56.6	4.0	55.9	5.0	58.2	5.0
6/3	Circulating - N/B - Lane 3	24.4	0.4	31.7	0.3	31.8	0.3
7/1+7/2	Woolwich Road (west) - Entry	62.1	8.0	75.5	11.6	76.1	11.2
8/1	Circulating - E/B - Lane 1	61.5	6.4	73.7	7.5	74.1	7.6
8/2	Circulating - E/B - Lane 2	61.1	6.3	75.2	7.8	74.9	7.8
9/1	Southbound from Peartree - Lane 1	62.5	5.4	75.6	7.3	76.8	7.4
9/2	Southbound from Peartree - Lane 2	60.5	3.4	75.4	4.3	76.8	4.5
J2: SOUTH - (J&C) Woolwich Road - A102M Slip Roundabout							
1/1	Woolwich Road (east) - Entry Lane 1	52.9	5.0	56.4	5.0	56.4	5.0
1/2	Woolwich Road (east) - Entry Lane 2	51.9	4.9	53.4	4.6	53.7	4.6
3/1	Circulating - S/B - Lane 1	50.0	2.6	62.9	3.1	64.4	3.2
3/2	Circulating - S/B - Lane 2	55.0	3.9	58.5	5.1	59.3	5.1
3/3	Circulating - S/B - Lane 3	20.1	0.4	25.6	0.8	25.8	0.8
4/1	Exit - S/B - Lane 1	29.9	0.8	41.7	0.7	42.7	0.7
4/2	Exit - S/B - Lane 2	25.2	1.3	29.6	1.9	29.8	1.9
5/1	Circulating - W/B - Lane 1	44.4	3.5	53.5	4.7	55.2	4.9
5/2	Circulating - W/B - Lane 2	59.2	3.7	69.8	5.7	71.9	6.0
6/1	A102 (N/B) - Entry Lane 1	51.8	4.4	66.0	7.0	68.2	7.5
6/2	A102 (N/B) - Entry Lane 2	52.6	4.4	66.1	6.8	68.3	7.2
7/1	A102 (N/B) Pre-Signals - Approach Lane 1	19.1	1.9	30.2	3.5	32.1	3.7
7/2	A102 (N/B) Pre-Signals - Approach Lane 2	20.4	2.0	31.0	3.6	32.9	3.8
8/1	Westcombe Hill - southbound	12.1	1.2	10.4	1.0	10.4	1.0
9/1	Westcombe Hill - Bus Exit	19.2	0.9	23.1	1.2	23.1	1.2

8.33 Table 8.8 suggests that the operation of the A102/ Woolwich Road/Peartree Way junction can be improved by optimising the signals at the junction.

8.34 Whilst it is considered that the proposed development will not add to capacity issues at the junction, IKEA are willing to engage with Transport for London and the Royal Borough of Greenwich to consider whether enhancements can be made.

Blackwall Lane/Millennium Way/Bugsby's Way

8.35 The results for the assessment of the Blackwall Lane/Millennium Way/Bugsby's Way Roundabout are presented in **Table 8.9** to **Table 8.11** below. This junction was modelled using ARCADY.

Table 8.9: ARCADY Results – Blackwall Lane/Millennium Way – Observed

Arm	PM Peak Hour		Saturday Peak Hour	
	RFC	Queue	RFC	Queue
John Harrison Way	0.08	1	0.67	1
Bugsby's Way	0.346	1	0.313	1
Blackwall Lane	0.339	1	0.271	1
Millennium Way	0.334	1	0.139	1

Table 8.10: ARCADY Results – Blackwall Lane/Millennium Way – Base

Arm	PM Peak Hour		Saturday Peak Hour	
	RFC	Queue	RFC	Queue
John Harrison Way	0.099	1	0.089	1
Bugsby's Way	0.415	1	0.374	1
Blackwall Lane	0.413	1	0.333	1
Millennium Way	0.408	1	0.181	1

Table 8.11: ARCADY Results – Blackwall Lane/Millennium Way – Base + Development

Arm	PM Peak Hour		Saturday Peak Hour		Sunday Peak Hour	
	RFC	Queue	RFC	Queue	RFC	Queue
John Harrison Way	0.091	1	0.077	1	0.078	1
Bugsby's Way	0.442	1	0.438	1	0.447	1
Blackwall Lane	0.431	1	0.382	1	0.387	1
Millennium Way	0.409	1	0.181	1	0.182	1

8.36 Table 8.9 to Table 8.11 show that the Blackwall Lane/Millennium Way Roundabout operates within capacity during all scenarios.

Bugsby's Way/Commercial Way

8.37 The results for the assessment of the Bugsby's Way/Commercial Way junction are presented in **Table 8.12** to **Table 8.14** below. This junction was modelled using LinSig.

Table 8.12: LINSIG Results – Bugsby's Way/Commercial Way – Observed

Observed + Comet Flows			PM Peak Hour		Saturday Peak Hour	
		Cycle Time -->	99 seconds		100 seconds	
Junction	Link(s)	Lane	DoS	Queue	DoS	Queue Length
Retail Park	1/1	Busway S/B Ahead	37.1	2.5	34.3	2.3
	2/2+2/1	Bugsby's Way (E) - Lanes 1 & 2	82.3	11.4	81.3	10.9

	2/3	Bugsby's Way (E) - Lane 3	83.0	12.3	80.2	11.4
	3/1	Commercial Way (Exit) - Left Turn	56.7	3.6	89.1	8.7
	3/2	Commercial Way (Exit) - Right Turn	8.3	0.2	13.0	0.3
	4/1	Busway N/B Ahead	13.1	0.1	13.1	0.1
	5/1+5/2	Bugsby's Way (W) - Lanes 1 & 2	72.7	9.8	68.7	9.0
	5/3	Bugsby's Way (W) - Right turn lane	42.1	3.4	50.3	4.1
Bus Lane Junction	8/1	Left to Car Park	12.7	2.7	18.0	3.4
	11/1	Commercial Way (CP Exit) Ahead	32.6	3.5	55.0	6.8
	12/1	Ellis & Everard Site Exit	0.0	0.0	0.0	0.0
	13/1	Busway (N/B Mid) Ahead	17.3	0.3	17.2	0.3
	14/1	Busway (N/B CP Exit) Right	29.3	2.3	29.3	2.4

Table 8.13: LINSIG Results – Bugsby's Way/Commercial Way – Base

Base Case			**PM Peak Hour**		**Saturday Peak Hour**	
		Cycle Time -->	**100 seconds**		**101 seconds**	
Junction	**Link(s)**	**Lane**	**DoS**	**Queue**	**DoS**	**Queue**
Retail Park	1/1	Busway S/B Ahead	37.5	2.5	34.6	2.3
	2/2+2/1	Bugsby's Way (E) - Lanes 1 & 2	88.9	14.1	89.7	13.8
	2/3	Bugsby's Way (E) - Lane 3	89.5	15.1	89.6	14.4
	3/1	Commercial Way (Exit) - Left Turn	57.3	3.6	85.5	8.0
	3/2	Commercial Way (Exit) - Right Turn	8.4	0.2	12.5	0.3
	4/1	Busway N/B Ahead	13.3	0.1	13.2	0.1
	5/1+5/2	Bugsby's Way (W) - Lanes 1 & 2	85.3	13.2	79.8	11.4
	5/3	Bugsby's Way (W) - Right turn lane	42.5	3.4	50.8	4.2
Bus Lane Junction	8/1	Left to Car Park	12.6	2.7	17.8	3.4
	11/1	Commercial Way (CP Exit) Ahead	32.9	3.5	53.9	6.7
	12/1	Ellis & Everard Site Exit	0.0	0.0	0.0	0.0
	13/1	Busway (N/B Mid) Ahead	17.4	0.3	17.4	0.3
	14/1	Busway (N/B CP Exit) Right	29.6	2.4	29.6	2.4

Table 8.14: LINSIG Results – Bugsby's Way/Commercial Way – Base + Development

Development Case			**PM Peak Hour**		**Saturday Peak Hour**		**Sunday Peak Hour**	
		Cycle Time -->	**101 seconds**		**120 seconds**		**120 seconds**	
Junction	**Link(s)**	**Lane**	**DoS**	**Queue**	**DoS**	**Queue**	**DoS**	**Queue**
Retail Park	1/1	Busway S/B Ahead	37.7	2.6	41.1	3.1	41.1	3.1
	2/2+2/1	Bugsby's Way (E) - Lanes 1 & 2	88.4	13.9	90.0	15.8	97.1	19.4
	2/3	Bugsby's Way (E) - Lane 3	89.2	14.9	90.0	16.6	96.8	19.7
	3/1	Commercial Way (Exit) - Left Turn	86.8	7.4	90.2	16.0	96.4	19.7
	3/2	Commercial Way (Exit) - Right Turn	1.2	0.0	2.0	0.1	2.0	0.0

	4/1	Busway N/B Ahead	13.3	0.1	15.7	0.1	15.7	0.1
	5/1+5/2	Bugsby's Way (W) - Lanes 1 & 2	85.7	13.2	86.3	14.4	90.0	16.6
	5/3	Bugsby's Way (W) - Right turn lane	61.2	5.2	91.2	12.8	96.6	16.6
Bus Lane Junction	8/1	Left to Car Park	15.8	4.2	24.8	5.8	26.6	5.7
	11/1	Commercial Way (CP Exit) Ahead	44.6	5.0	63.3	12.5	75.8	14.6
	12/1	Ellis & Everard Site Exit	0.0	0.0	0.0	0.0	0.0	0.0
	13/1	Busway (N/B Mid) Ahead	17.5	0.3	20.7	0.4	20.7	0.4
	14/1	Busway (N/B CP Exit) Right	29.8	2.4	35.1	3.2	35.1	3.1

8.38 The Bugsby's Way/Commercial Way junction operates within theoretical capacity during the observed and base scenarios.

8.39 As a result of the development proposals, there are likely to be additional trips using this junction. IKEA are also keen to promote the use of this junction for vehicles accessing the A102, in order to free up capacity on the A102/Woolwich Road. As a result of the subsequent increase in movements, the degree of saturation for the left turn out of Commercial Way exceeds 90% as does the right turn into Commercial Way from Bugsby's Way during both the Saturday peak hour and Sunday peak hour.

8.40 IKEA are willing to engage with Transport for London and the Royal Borough of Greenwich to consider whether enhancements can be made to this junction. One possible measure is to allow left turning vehicles from Commercial Way to exit during the Busway phase. This does not impact on pedestrian movement and there are no conflicting movements. The results of this scheme are summarised in **Table 8.15** below.

Table 8.15: LINSIG Results – Bugsby's Way/Commercial Way – Base + Development (Proposed)

Development Case (Proposed)			**PM Peak Hour**		**Saturday Peak Hour**		**Sunday Peak Hour**	
		Cycle Time -->	**100 seconds**		**113 seconds**		**119 seconds**	
Junction	**Link(s)**	**Lane**	**DoS**	**Queue**	**DoS**	**Queue**	**DoS**	**Queue**
Retail Park	1/1	Busway S/B Ahead	37.5	2.5	38.7	2.8	40.8	3.0
	2/2+2/1	Bugsby's Way (E) - Lanes 1 & 2	87.9	13.8	88.8	14.8	87.7	15.2
	2/3	Bugsby's Way (E) - Lane 3	88.7	14.8	89.1	15.7	86.9	15.7
	3/1	Commercial Way (Exit) - Left Turn	34.2	0.5	65.2	5.3	67.4	6.3
	3/2	Commercial Way (Exit) - Right Turn	1.3	0.0	2.8	0.1	2.5	0.1
	4/1	Busway N/B Ahead	13.3	0.1	14.8	0.1	15.6	0.1
	5/1+5/2	Bugsby's Way (W) - Lanes 1 & 2	85.3	13.2	84.5	13.4	83.7	13.9
	5/3	Bugsby's Way (W) - Right turn lane	68.9	6.2	87.1	11.7	88.6	13.2

Bus Lane Junction	8/1	Left to Car Park	15.9	4.2	26.0	5.7	26.7	5.8
	11/1	Commercial Way (CP Exit) Ahead	51.5	5.1	89.2	15.1	89.6	16.6
	12/1	Ellis & Everard Site Exit	0.0	0.0	0.0	0.0	0.0	0.0
	13/1	Busway (N/B Mid) Ahead	17.4	0.3	19.4	0.4	20.5	0.4
	14/1	Busway (N/B CP Exit) Right	29.6	2.4	33.1	2.9	34.8	3.1

8.41 Table 8.15 indicates that the junction will operate with spare capacity with the proposed amendment to the signal timings.

Bugsby's Way/Peartree Way

8.42 The results for the assessment of the Bugsby's Way/Peartree Way Roundabout are presented in **Table 8.16** to **Table 8.18** below. This junction was modelled using ARCADY.

Table 8.16: ARCADY Results – Bugsby's Way/Peartree Way – Observed

Arm	PM Peak Hour		Saturday Peak Hour	
	RFC	Queue	RFC	Queue
Peartree Way (North)	0.116	1	0.102	1
Bugsby's Way (East)	0.476	1	0.608	2
Peartree Way (South)	0.305	1	0.549	2
Bugsby's Way (West)	0.299	1	0.354	1

Table 8.17: ARCADY Results – Bugsby's Way/Peartree Way – Base

Arm	PM Peak Hour		Saturday Peak Hour	
	RFC	Queue	RFC	Queue
Peartree Way (North)	0.132	0	0.136	1
Bugsby's Way (East)	0.586	2	0.766	4
Peartree Way (South)	0.349	0	0.597	2
Bugsby's Way (West)	0.34	0	0.408	1

Table 8.18: ARCADY Results – Bugsby's Way/Peartree Way – Base + Development

Arm	PM Peak Hour		Saturday Peak Hour		Sunday Peak Hour	
	RFC	Queue	RFC	Queue	RFC	Queue
Peartree Way (North)	0.127	1	0.125	1	0.125	1
Bugsby's Way (East)	0.57	1	0.735	3	0.736	3
Peartree Way (South)	0.32	1	0.557	2	0.558	2
Bugsby's Way (West)	0.331	1	0.387	1	0.387	1

8.43 Table 8.16 to Table 8.18 show that the Blackwall Lane/Millennium Way Roundabout operates within capacity during all scenarios. The roundabout operates with more spare capacity in the with development scenario. This is because of a different distribution compared to the existing situation, with more vehicles will be encouraged to use the Bugsby's Way junction when visiting the store.

Peartree Way/Commercial Way and Peartree Way/Millennium Busway

8.44 The results for the assessment of the Peartree Way/Commercial Way junction and the Peartree Way/Millennium Busway junction are presented in **Table 8.19** to Table **8.21** below. This junction was modelled using LinSig.

Table 8.19: LINSIG Results – Peartree Way/Commercial Way and Peartree Way/Millennium Busway – Observed

Observed + Comet Flows			PM Peak Hour		Saturday Peak Hour	
		Cycle Time -->	61 / 90 seconds		105 / 95 seconds	
Junction	Link(s)	Lane	Degree of Saturation	Queue Length	Degree of Saturation	Queue Length
Retail Park	1/1	Peartree Way (N) - Lane 1	50.0	4.7	58.2	12.2
	1/2	Peartree Way (N) - Lane 2	59.4	3.9	76.6	5.2
	2/1	Horn Lane	23.2	1.0	75.0	4.3
	3/1	Peartree Way (S) - Lane 1	59.8	5.3	56.1	10.3
	3/2+3/3	Peartree Way (S) - Lanes 2 & 3	59.9	6.1	48.4	9.1
	4/1	Commercial Way - Lane 1	27.1	1.8	38.1	4.5
	4/2	Commercial Way - Lane 2	63.4	5.4	75.4	11.8
Bus Lane Junction	1/1	Peartree Way (N) - Lane 1	21.7	3.0	34.9	5.5
	1/2	Peartree Way (N) - Lane 2	16.3	2.2	11.9	1.6
	2/1	Peartree Way (S) - Lane 1	15.8	2.3	20.1	3.1
	2/2	Peartree Way (S) - Lane 2	31.5	5.4	33.5	6.0
	3/1	Bus Lane	46.7	4.1	52.6	4.5

Table 8.20: LINSIG Results – Peartree Way /Commercial Way – Base 2016

Base Case			PM Peak Hour		Saturday Peak Hour	
		Cycle Time -->	61 / 90 seconds		105 / 95 seconds	
Junction	Link(s)	Lane	DoS	Queue	DoS	Queue
Retail Park	1/1	Peartree Way (N) - Lane 1	60.2	6.0	73.8	17.9
	1/2	Peartree Way (N) - Lane 2	66.2	5.6	73.1	7.9
	2/1	Horn Lane	23.2	1.0	66.6	3.8
	3/1	Peartree Way (S) - Lane 1	62.3	5.6	55.1	10.2

	3/2+3/3	Peartree Way (S) - Lanes 2 & 3	63.0	6.5	50.0	9.7
	4/1	Commercial Way - Lane 1	27.3	1.8	40.9	4.7
	4/2	Commercial Way - Lane 2	63.4	5.4	71.2	10.3
Bus Lane Junction	1/1	Peartree Way (N) - Lane 1	26.1	3.7	46.2	8.3
	1/2	Peartree Way (N) - Lane 2	22.3	3.3	19.8	2.9
	2/1	Peartree Way (S) - Lane 1	16.9	2.4	20.2	3.1
	2/2	Peartree Way (S) - Lane 2	32.9	5.7	35.6	6.5
	3/1	Bus Lane	49.8	4.2	52.6	4.5

Table 8.21: LINSIG Results – Peartree Way /Commercial Way – Base + Development

Development Case			**PM Peak Hour**		**Saturday Peak Hour**		**Sunday Peak Hour**	
		Cycle Time -->	**61 / 90 seconds**		**105 / 95 seconds**		**105 / 95 seconds**	
Junction	**Link(s)**	**Lane**	**DoS**	**Queue Length**	**DoS**	**Queue Length**	**DoS**	**Queue Length**
Retail Park	1/1	Peartree Way (N) - Lane 1	48.3	4.8	53.7	10.5	56.0	10.9
	1/2	Peartree Way (N) - Lane 2	51.5	5.2	57.2	10.4	60.1	10.4
	2/1	Horn Lane	23.2	1.0	54.5	3.4	60.0	3.6
	3/1	Peartree Way (S) - Lane 1	50.4	4.6	54.8	9.7	58.1	10.4
	3/2+3/3	Peartree Way (S) - Lanes 2 & 3	51.7	5.3	52.9	9.9	55.6	10.6
	4/1	Commercial Way - Lane 1	22.5	1.3	27.8	3.2	26.2	3.2
	4/2	Commercial Way - Lane 2	53.8	4.0	57.7	8.3	58.7	8.9
Bus Lane Junction	1/1	Peartree Way (N) - Lane 1	23.4	3.2	31.6	4.9	31.9	4.9
	1/2	Peartree Way (N) - Lane 2	23.0	3.4	30.1	4.9	29.8	4.7
	2/1	Peartree Way (S) - Lane 1	17.3	2.5	18.3	2.7	16.7	2.5
	2/2	Peartree Way (S) - Lane 2	29.7	5.0	33.8	6.2	35.4	6.5
	3/1	Bus Lane	49.8	4.2	52.6	4.5	52.6	4.5

8.45 The Peartree Way/Millennium Busway junction operates within theoretical capacity during all scenarios. There will be no change to the number of vehicles entering/exiting the Millennium Busway junction as a result of the development proposals.

8.46 The Commercial Way /Peartree Way junction also operates within theoretical capacity during all scenarios. The Peartree Way southbound movement is close to capacity in the observed and base scenarios with a queue of approximately 18 vehicles during the Saturday Peak hour. In the development scenario more vehicles will be encouraged to use the

Bugsby's Way junction. Therefore there should be reduction in vehicles using the Peartree Way Junction. The operation of the junction should improve as a result.

Anchor and Hope Lane – Proportional Impact Assessment

8.47 Transport for London have requested a proportional impact assessment for Anchor and Hope Lane junctions with Bugsby's Way and Woolwich Road.

8.48 Base plus development trips for these junctions were extracted from the Transport Assessment which supported the application for the new Sainsbury's and Marks & Spencer on Gallions Road. Development trips for proposed IKEA were subsequent add to these flows.

8.49 **Table 8.22** summarises the proportional impact of the proposed IKEA on the Anchor and Hope Lane/Bugsby's Way Roundabout, whilst Table **8.23** summarises the proportional impact of the proposed IKEA on the Anchor and Hope Lane/Woolwich Road junction.

Table 8.22: Proportional Impact - Anchor and Hope Lane/Bugsby's Way

Arm	Weekday PM Peak				Saturday Peak				Sunday Sensitivity			
	Base	Dev	Base + Dev	% Change	Base	Dev	Base + Dev	% Change	Base	Dev	Base + Dev	% Change
Anchor and Hope Lane (N)	300	0	300	0.0%	73	0	73	0.0%	73	0	73	0.0%
Anchor and Hope Lane (S)	988	8	996	0.8%	1141	20	1161	1.7%	1141	22	1163	1.9%
Bugsby's Way	1003	9	1012	0.9%	1191	19	1210	1.6%	1191	21	1212	1.7%
Total	2290	17	2307	0.7%	2406	39	2445	1.6%	2406	43	2448	1.8%

Table 8.23: Proportional Impact - Anchor and Hope Lane/Woolwich Road

Arm	Weekday PM Peak				Saturday Peak				Sunday Sensitivity			
	Base	Dev	Base + Dev	% Change	Base	Dev	Base + Dev	% Change	Base	Dev	Base + Dev	% Change
Anchor and Hope Lane (N)	925	8	933	0.9%	960	18	978	1.8%	960	20	980	2.0%
Woolwich Road (E)	1585	16	1601	1.0%	1584	39	1623	2.4%	1584	43	1627	2.6%
Charlton Church Lane	206	0	206	0.0%	264	0	264	0.0%	264	0	264	0.0%
Woolwich Road (W)	812	8	820	1.0%	762	0	762	0.0%	762	0	762	0.0%
Total	2604	24	2628	0.9%	2610	39	2649	1.5%	2610	43	2653	1.6%

8.50 Table 8.22 indicates that the proposed IKEA traffic relates to a maximum of 1.8% of all traffic flows at the Anchor and Hope Lane/Bugsby's Way Roundabout. Table 8.23 indicates that the proposed IKEA traffic relates to a maximum of 1.6% of all traffic flows at the Anchor and Hope Lane/Woolwich Road Junction.

Section Summary

8.51 Junction modelling indicates that all junctions within the study network operate within theoretical capacity in the existing situation. With the addition of traffic associated with committed developments in the area, the A102/Woolwich Road operates at above capacity on certain approaches. Due to different distributions, traffic flows at this junction will decrease with the replacement of the existing Sainsbury's and former Comet store with the proposed IKEA store.

8.52 Whilst it is considered that the proposed development will not add to capacity issues at the junction, IKEA are willing to engage with Transport for London and the Royal Borough of Greenwich to consider whether enhancements can be made.

9 IMPACT ON PARKING AND CAR PARK MANAGEMENT

9.1 This section of the report will detail the likely impact on the car park as a result of the development proposal. It will also discuss how the car park will be managed.

Car Park

9.2 As discussed earlier in this report, all uses at the Greenwich Millennium Retail Park make use of a shared car parking area consisting of approximately 1,017 spaces.

9.3 Access into the retail park car park is provided from Commercial Way, which runs along the south of the retail park from a signalised junction with the A1020 Peartree Way to the east, to a signalised junction with Bugsby's Way to the north-west.

9.4 A separate bus only access is provided from Peartree Way along the frontage of the retail units before re-joining Commercial Way with bus priority signals on the exit linking to the junction with Bugsby's Way.

Parking Beat Survey

9.5 A parking beat survey was carried out at Greenwich Peninsular Retail Park by an independent survey company at the following times:

- Saturday 15th June 2013 (09:00-19:00)
- Sunday 16th June 2013 (11:00-16:00)
- Tuesday 18th June 2013 (07:00-19:00)

9.6 The objective of the survey was to assess the existing operation of the car park by showing the accumulation of vehicles throughout the day. This was achieved by assessing the number of occupied bays and vacant bays every 30 minutes. For the purpose of the survey, the car park was split into three zones, as follow:

- Zone 1: Outside the Odeon Cinema and the B&Q Warehouse
- Zone 2: Outside the B&Q garden centre and the closed Comet retail unit (Zone 2a outside of the B&Q and Zone 2b outside of the Comet)
- Zone 3: Outside the Sainsbury's Store

9.7 The raw survey data and Zone Plan can be found in **Appendix O**.

Parking Accumulation

Existing Parking Accumulation

9.8 The first stage of the analysis is to establish the existing situation at the Millennium Retail Park. This is based on the surveys outlined above. As the Comet retail unit was already vacant when the surveys took place, an accumulation for the store was established using the trip rates and trip generation outlined in **Section 6** and added to overall car park accumulation.

Weekday

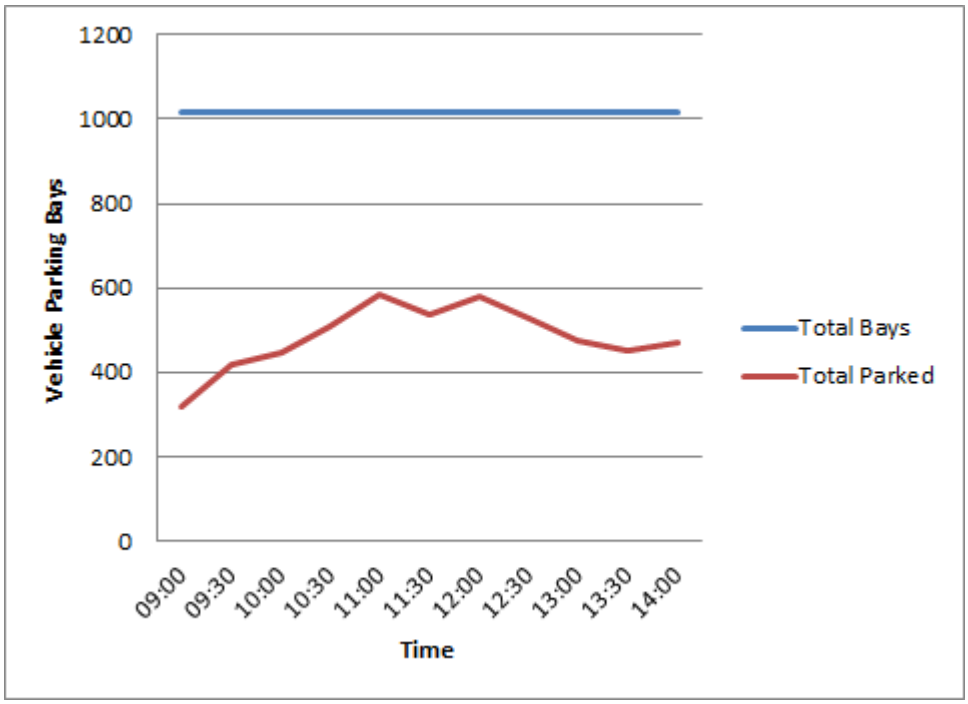
9.9 **Table 9.1** and **Graph 9.1** below show the existing operation of the car park for a typical weekday based on the survey data. Table 9.1: Existing Parking Accumulation – Weekday

Table 9.1: Existing Parking Accumulation - Weekday

Time	Total Bays	Observed	Comet*	Total Parked	Total Vacant	% Vacant
09:00	1017	294	23	317	700	87.38%
10:00	1017	388	30	418	599	78.82%
11:00	1017	414	32	446	571	67.96%
12:00	1017	475	32	507	510	58.70%
13:00	1017	554	30	584	433	56.33%
14:00	1017	507	30	537	480	50.30%
15:00	1017	560	22	582	435	43.38%
16:00	1017	509	21	530	487	48.05%
17:00	1017	461	17	478	539	43.30%
18:00	1017	440	15	455	562	48.52%
19:00	1017	464	9	473	544	53.78%

**Comet accumulation based on trip generation outlined in Section 6*

Graph 9.1: Existing Parking Accumulation - Weekday



9.10 Table 9.1 and Graph 9.1 show that peak accumulation occurred at approximately 15:00 when 560/1017 car parking spaces were occupied. During this period there were 435 vacant spaces (43.4% of the car park).

Saturday

9.11 **Table 9.2** and **Graph 9.2** below show the existing operation of the car park for a Saturday based on the survey data.

Table 9.2: Existing Parking Accumulation - Saturday

Time	Total Bays	Observed	Comet*	Total Parked	Total Vacant	% Vacant
09:00	1017	186	18	204	813	79.94%
10:00	1017	300	47	347	670	65.91%
11:00	1017	431	64	495	522	51.28%
12:00	1017	452	92	544	473	46.50%
13:00	1017	527	106	633	384	37.79%
14:00	1017	548	127	675	342	33.63%
15:00	1017	644	134	778	239	23.50%
16:00	1017	658	147	805	212	20.86%
17:00	1017	646	138	784	233	22.96%
18:00	1017	704	98	802	215	21.17%

19:00	1017	653	67	720	297	29.16%

**Comet accumulation based on trip generation outlined in Section 6*

Graph 9.2: Existing Parking Accumulation - Saturday

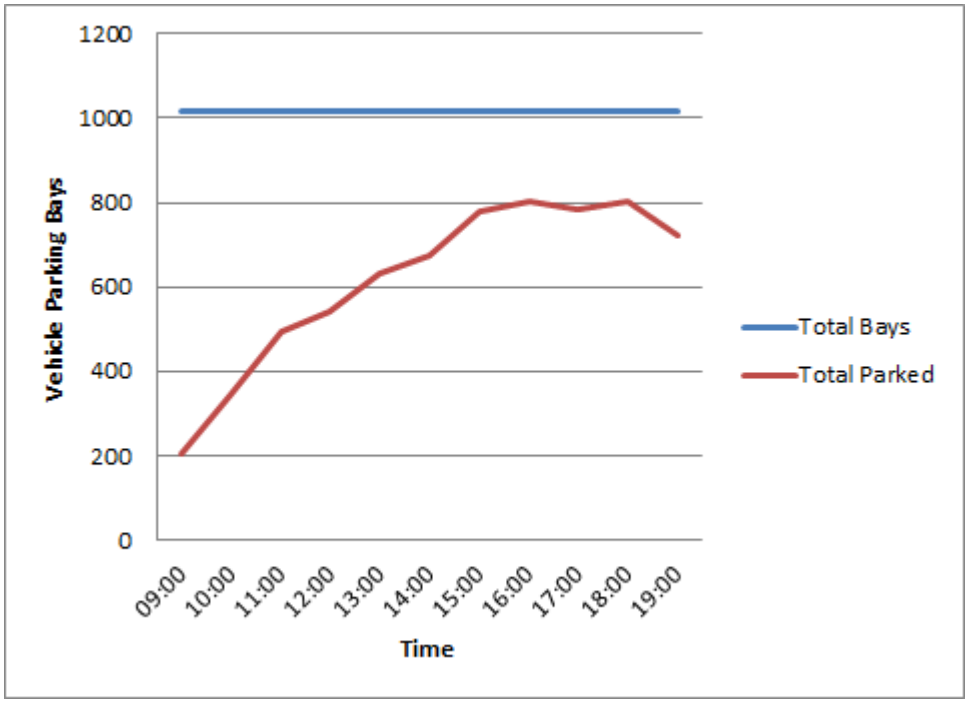


Table 9.2 and Graph 9.2 show that peak accumulation occurred at approximately 16:00 when 805/1017 car parking spaces were occupied. During this period there were 212 vacant spaces (20.8% of the car park).

Sunday

9.12 **Table 9.3** and **Graph 9.3** below show the existing operation of the car park for a Sunday based on the survey data.

Table 9.3: Existing Parking Accumulation - Sunday

Time	Total Bays	Comet*	Total Parked	Total Vacant	% Vacant
11:00	1017	64	444	573	56.34%
12:00	1017	92	532	485	47.69%
13:00	1017	106	577	440	43.26%
14:00	1017	127	694	323	31.76%
15:00	1017	134	785	232	22.81%

**Comet accumulation based on trip generation outlined in Section 6*

Graph 9.3: Existing Parking Accumulation – Sunday

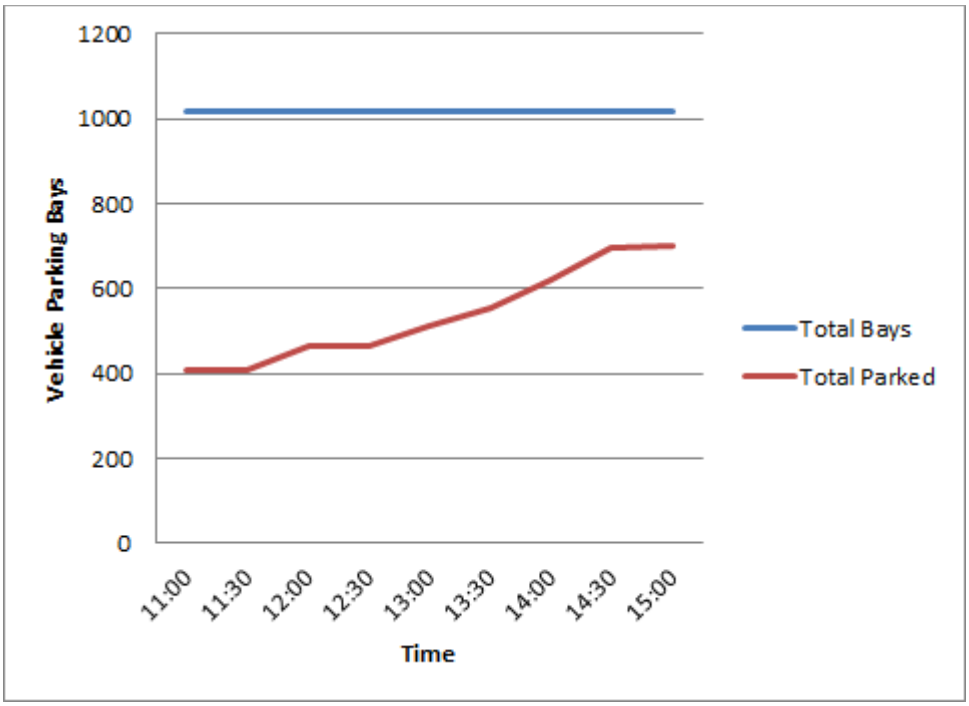


Table 9.3 and Graph 9.3 show that peak accumulation occurred at approximately 15:00 when 785/1017 car parking spaces were occupied. During this period there were 232 vacant spaces (22.8% of the car park).

IKEA Parking Accumulation

9.13 The second stage of this analysis is to establish the likely parking accumulation of the proposed IKEA store.

9.14 As stated earlier in this report, a vehicle trip survey was undertaken at the existing IKEA Tottenham Store in March 2010. This gave a profile for daily trips during a Friday and Saturday period.

9.15 The daily profile of the Tottenham store can be applied to the vehicle trip generation of the proposed IKEA store to establish the likely profile of vehicle trips to the proposed IKEA in Greenwich.

9.16 **Table 9.4** below shows the IKEA parking accumulation for a weekday, whilst **Table 9.5** shows the parking accumulation for a Saturday. **Table 9.6** shows the parking accumulation for a Sunday, assuming a 10% increase on Saturday trips as a robust sensitivity.

Table 9.4: Proposed IKEA Parking Accumulation: Weekday

Hour Starting	In	Out	Two Way	Accumulation
07:00	0	0	0	0
08:00	0	0	0	0
09:00	0	0	0	0
10:00	183	94	278	89
11:00	222	187	409	124
12:00	198	195	393	126
13:00	219	215	**434**	130
14:00	184	215	399	99
15:00	181	192	373	88
16:00	187	208	394	67
17:00	204	221	425	50
18:00	206	197	403	59
19:00	148	184	332	24

Table 9.5: Proposed IKEA Parking Accumulation: Saturday

Hour Starting	In	Out	Two Way	Accumulation
07:00	0	0	0	0
08:00	64	25	88	39
09:00	224	93	317	170
10:00	327	189	516	309
11:00	404	303	707	410
12:00	449	345	794	514
13:00	459	425	884	548
14:00	505	482	987	571
15:00	479	516	995	533
16:00	385	444	829	474
17:00	362	419	781	417
18:00	250	352	602	315
19:00	175	247	422	243

Table 9.6: Proposed IKEA Parking Accumulation: Sunday

Hour Starting	In	Out	Two Way	Accumulation
11:00	445	333	778	451
12:00	494	380	873	565
13:00	505	467	973	603
14:00	555	531	1086	628
15:00	526	568	1094	586
16:00	424	488	912	521
17:00	398	461	859	459

9.17 The above tables show that peak accumulation for the proposed IKEA at Greenwich is likely to occur at 13:00 on a weekday, when 130 vehicles will be parked. On a Saturday, peak accumulation is likely to occur at 14:00 with 571 IKEA related vehicles parked. On a Sunday, using the sensitivity of Saturday flows +10%, peak accumulation will also occur at 14:00 with 628 vehicles associated with IKEA parked.

Future Parking Accumulation with Proposed IKEA

9.18 The final stage of this analysis is to deduct Sainsbury's and Comet trips from the existing parking accumulation, and add the accumulation likely to be associated with the proposed IKEA store.

9.19 It is considered that customers park their vehicles as close as they can to the store they are visiting. Therefore, customers of B&Q and Customers of the Millennium Leisure Park will park their vehicles in Zone 1 and the half of Zone 2 outside of the B&Q (Zone 2a). There are approximately 430 spaces outside of the Millennium Leisure Park and B&Q.

9.20 The below analysis assumes that those parked in the areas outside of the Comet (Zone 2b) and Sainsbury's units (Zone3) will be vehicles associated with these stores. To establish the likely future accumulation of the car park, vehicles parked in Zone 2b and 3 (Sainsbury's and Comet) have been removed and the IKEA trips (outlined in Table 9.4 to Table 9.6) added.

Weekday

9.21 **Table 9.7** below shows show the accumulation Zone 1 and Zone 2a of the car park which are outside of the Millennium Leisure Park and the B&Q store during the surveyed weekday.

Table 9.7: Parking Accumulation outside Millennium Leisure Park and B&Q - Weekday

Time	Zone 1 Parking Spaces	Zone 1 Parked Vehicles	Zone 1 % Occupied	Zone Parking Spaces	Zone 2a Parked Vehicles	Zone 2a % Occupied	Total Spaces	Total Parked
09:00	220	101	45.9%	210	25	11.9%	430	126
10:00	220	123	55.9%	210	36	16.9%	430	159
11:00	220	147	66.8%	210	35	16.7%	430	182
12:00	220	147	66.8%	210	52	24.5%	430	199
13:00	220	205	93.2%	210	55	26.0%	430	260
14:00	220	170	77.3%	210	62	29.5%	430	232
15:00	220	187	85.0%	210	69	32.6%	430	256
16:00	220	181	82.3%	210	61	28.8%	430	242
17:00	220	136	61.8%	210	50	23.6%	430	186
18:00	220	152	69.1%	210	43	20.2%	430	195
19:00	220	200	90.9%	210	58	27.6%	430	258

9.22 Table 9.7 shows that during peak occupancy at 19:00, 258 of the 430 spaces in Zone 1 and Zone 2a are occupied.

9.23 **Table 9.8** below adds the likely IKEA accumulation on a Weekday to the Millennium Leisure Park and B&Q accumulation to get an overall accumulation for the future operation of the car park with the proposed IKEA in place.

Table 9.8: Future Car Park Accumulation with Proposed IKEA Store - Weekday

Time	Total Space	B&Q + Cinema	IKEA	Total Parked	Total Vacant	% Vacant
09:00	1017	126	0	126	891	87.6%
10:00	1017	159	89	247	770	75.7%
11:00	1017	182	124	306	711	69.9%
12:00	1017	199	126	325	692	68.1%
13:00	1017	260	130	390	627	61.7%
14:00	1017	232	99	331	686	67.4%
15:00	1017	256	88	343	674	66.2%
16:00	1017	242	67	309	708	69.7%
17:00	1017	186	50	235	782	76.9%
18:00	1017	195	59	254	763	75.1%
19:00	1017	258	24	282	735	72.3%

Table 9.8 indicates that the car park will still operate at well below capacity during the weekday period with an IKEA in place.

Saturday

9.24 Table 9.9 below shows show the accumulation Zone 1 and Zone 2a of the car park which are outside of the Millennium Leisure Park and the B&Q store during the surveyed Saturday.

Table 9.9: Parking Accumulation outside Millennium Leisure Park and B&Q - Saturday

Time	Zone 1 Parking Spaces	Zone 1 Parked Vehicles	Zone 1 % Occupied	Zone Parking Spaces	Zone 2a Parked Vehicles	Zone 2a % Occupied	Total Spaces	Total Parked
09:00	220	60	27.3%	210	14	6.7%	430	74
10:00	220	96	43.6%	210	21	10.0%	430	117
11:00	220	157	71.4%	210	31	14.8%	430	188
12:00	220	178	80.9%	210	35	16.7%	430	213
13:00	220	187	85.0%	210	58	27.6%	430	245
14:00	220	177	80.5%	210	67	31.7%	430	244
15:00	220	217	98.6%	210	102	48.6%	430	319
16:00	220	216	98.2%	210	112	53.3%	430	328
17:00	220	195	88.6%	210	111	52.6%	430	306
18:00	220	218	99.1%	210	146	69.5%	430	364
19:00	220	211	95.9%	210	148	70.5%	430	359

9.25 Table 9.9 shows that during peak occupancy at 18:00, 364 of the 430 spaces in Zone 1 and Zone 2a are occupied.

9.26 **Table 9.6** below adds the likely IKEA accumulation on a Saturday to the Millennium Leisure Park and B&Q accumulation to get an overall accumulation for the future operation of the car park with the proposed IKEA in place.

Table 9.10: Future Car Park Accumulation with Proposed IKEA Store - Saturday

Time	Total Space	B&Q + Cinema	IKEA	Total Parked	Total Vacant	% Vacant
09:00	1017	74	170	244	773	76.0%
10:00	1017	117	309	426	591	58.1%
11:00	1017	188	410	598	419	41.2%
12:00	1017	213	514	727	290	28.5%
13:00	1017	245	548	793	224	22.0%
14:00	1017	244	571	815	203	19.9%
15:00	1017	319	533	852	165	16.2%

16:00	1017	328	474	802	215	21.1%
17:00	1017	306	417	723	295	29.0%
18:00	1017	364	315	679	338	33.2%
19:00	1017	359	243	602	415	40.8%

Table 9.10 indicates that the, during peak capacity at 15:00 on a Saturday, the car park will operate with 16 % spare capacity with the proposed IKEA in place.

Sunday

9.27 **Table 9.11** below shows show the accumulation Zone 1 and Zone 2a of the car park which are outside of the Millennium Leisure Park and the B&Q store during the surveyed Sunday.

Table 9.11: Parking Accumulation outside Millennium Leisure Park and B&Q - Sunday

Time	Zone 1 Parking Spaces	Zone 1 Parked Vehicles	Zone 1 % Occupied	Zone Parking Spaces	Zone 2a Parked Vehicles	Zone 2a % Occupied	Total Spaces	Total Parked
11:00	220	123	55.9%	210	23	11.0%	430	146
12:00	220	166	75.5%	210	40	18.8%	430	206
13:00	220	180	81.8%	210	59	27.9%	430	239
14:00	220	184	83.6%	210	92	43.8%	430	276
15:00	220	203	92.3%	210	120	56.9%	430	323

9.28 Table 9.11 shows that during peak occupancy at 15:00, 323 of the 430 spaces in Zone 1 and Zone 2a are occupied.

9.29 **Table 9.12** below adds the likely IKEA accumulation on a Sunday to the Millennium Leisure Park and B&Q accumulation to get an overall accumulation for the future operation of the car park with the proposed IKEA in place.

Table 9.12: Future Car Park Accumulation with Proposed IKEA Store - Sunday

Time	Total Space	B&Q + Cinema	IKEA	Total Parked	Total Vacant	% Vacant
11:00	1017	146	451	597	420	41.3%
12:00	1017	206	565	771	247	24.2%
13:00	1017	239	603	842	176	17.3%
14:00	1017	276	628	904	113	11.1%
15:00	1017	323	586	909	109	10.7%

Table 9.12 indicates that the, during peak capacity at 15:00 on a Saturday, the car park will operate with 10.7 % spare capacity with the proposed IKEA in place.

9.30 In light of the above, it is considered that the car park will have sufficient capacity to cater for the predicted demand.

Car Park Management

9.31 Historically a car park management scheme has been in place at the Millennium Retail Park.

9.32 The car park management scheme was applied between the hours of 10:00-19:00, seven days a week. During this period visitors were entitled to three hours free parking to accommodate linked food/non-food shopping trips. Cinema-goes were allowed to extend their stay up to five hours by means of a pass card obtained from the booking hall. Car park attendants carried out regular inspections by recording all vehicle registration numbers on hand held data loggers. The data loggers would identify vehicles that had been present longer than three hours, upon which the attendant would apply a fixed penalty parking ticket to the windscreen.

9.33 This scheme is no longer enforced so, in effect, there are no limits on who can park and for how long. Due to the excellent public transports from the Millennium Retail Park and the unrestricted parking available, there is a suggestion that the car park is being used as an informal park and ride for some commuters and visitors into central London.

9.34 If long stay parking is considered to be a problem then the managers of the stores within the Millennium Retail Park have the ability to re-introduce a parking management regime if considered appropriate.

10 SUMMARY

10.1 Vectos has been retained by IKEA Properties Limited and LXB RP (No. 20) Limited to provide traffic and transport advice relating to their proposal for a new IKEA store (use class A1 non-food retail), located within the Millennium Retail Park at Greenwich Peninsula, in the Royal Borough of Greenwich.

10.2 Greenwich Millennium Retail Park is situated in North Greenwich. The Site is bordered by Bugsby's Way to the north, Peartree Way to the east, the A102 to the south, and Blackwall Lane to the west.

10.3 This Transport Assessments supports an application which seeks outline planning permission (with all matters reserved with the exception of access and layout) for the redevelopment of the site to provide one non-food retail unit (Use Class A1) of up to 33,000 square metres (gross floor area), service yard and associated infrastructure. The proposed IKEA store will replace an existing Sainsbury's foodstore, and vacant Comet unit.

10.4 There are no proposals to change the number of parking spaces at the retail park. The number of car parking spaces accords with London Plan Standards and our analysis indicates that the estimated maximum parking accumulation can be accommodated within the existing car park.

10.5 Introduction of car park management measures (a limit on the duration of stay) will be considered if long stay parking becomes an issue.

10.6 In line with their long term sustainability vision, IKEA is planning that this store will be their most accessible store in the UK for customers visiting by public transport, providing an accessible store to the high proportion of London's population who do not own a vehicle.

10.7 The site provides excellent access for all modes of transport. Notably the Millennium Busway runs in front of the site with frequent buses running to/from North Greenwich Underground Station (for Jubilee Line Services) and Westcombe Rail Station. During the weekday and Saturday daytime period there are approximately 42 buses per hour calling at bus stops immediately adjacent to the Site. As such, the site has a Public Transport Accessibility Level (PTAL) of 5.

10.8 The impact of the proposed IKEA store on the local public transport network has been assessed as part of this Transport Assessment. Compared to the existing situation, it is considered that the greatest increase in passenger numbers as a result of the development proposals will occur on the Jubilee Underground Line and buses between North Greenwich Station and the IKEA store. However these impacts are considered to be modest.

10.9 Vehicle trip generation has been based on data from the existing IKEA stores in London, and data from a local household survey which gives information on existing retail travel patterns. Results indicate generation of 425 two way vehicle movements in the weekday PM hour and 987 two-way vehicle movements during the Saturday peak hour. This is a **reduction** in vehicle trips during the weekday PM peak compared to the existing Sainsbury's and former Comet stores, and only a slight increase in vehicle trips during the Saturday peak.

10.10 A Draft Travel Plan has been prepared for the proposed IKEA store. This plan will provide strong encouragement to co-workers and customers to use alternative modes of transport to the proposed store.

10.11 The distribution and assignment of trips on the local highway network will change with the introduction of the Ikea store. Existing trips are likely to come from a more local area, with trips associated with the proposed IKEA coming from a wider area. Many of the trips from the wider area will use the A102.

10.12 Due to the different distribution of trips to the proposed IKEA store compared to the existing Sainsbury's and former Comet stores, an increase in traffic flows is seen on some junctions, with a decrease in traffic flows at others.

10.13 Junction modelling indicates that all junctions within the study network operate within theoretical capacity in the existing situation. With the addition of traffic associated with committed developments in the area, the A102/Woolwich Road operates at above capacity on certain approaches. Due to the different distribution of the Ikea store, traffic flows at this junction will decrease in the with-development scenario.

10.14 Whilst it is estimated that the proposed development will not have an adverse impact at this junction, IKEA are willing to engage with Transport for London and the Royal Borough of Greenwich to consider whether any capacity enhancements can be made.

10.15 In summary it is not considered that the development proposals will result in any unacceptable operating conditions at the junctions analysed compared to a base scenario.

Conclusion

10.16 The analysis demonstrates that the site is accessible by non-car modes and that the traffic associated with the IKEA can be accommodated on the local highway network.

10.17 We consider that the development passes the key tests set out in the NPPF, i.e.

- The opportunities for sustainable transport modes have been taken up;
- Safe and suitable access to the site can be achieved for all people; and
- The residual cumulative impacts of the development are not severe.

10.18 In conclusion, it is considered that the development proposals are reasonable and appropriate for the location and that there are no traffic or transportation reasons why it should not be granted planning permission.