FORMER NESTLE FACTORY, HAYES

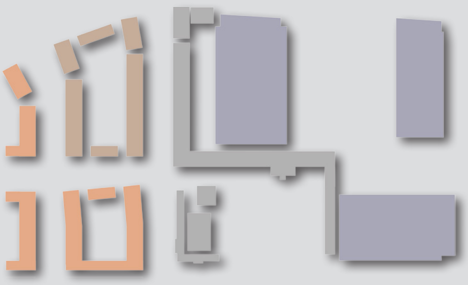
ENVIRONMENTAL STATEMENT VOLUME 3
TRANSPORT ASSESSMENT - MAY 2017

BARRATT LONDON

SEGRO

BARTON WILLMORE
Planning · Design · Delivery

Assessment of the effects of the development on the local highway network.



BARRATT LONDON

SEGRO

BARTON WILLMORE
Planning · Design · Delivery

BARTON WILLMORE
7 Soho Square
London
W1D 3Q

Nestle Site, Hayes

Transport Assessment

May 2017

Report – R01

Prepared for:
Barratt London & SEGRO Ltd

Prepared by:
Markides Associates
9th floor The Tower Building
11 York Road
London SE1 7NX
United Kingdom

+44 (0)20 7442 2225
http://markidesassociates.co.uk

CONTENTS

1.0 INTRODUCTION

1.1 Markides Associates (MA) have been instructed by SEGRO PLC and Barratt London Ltd (the Applicants), to prepare a Transport Assessment (TA) in support of their development proposals for the Former Nestle Site, Nestles Avenue, Hayes, UB3 4RF (the Site). Assistance in the production of this document has been provided by Peter Brett Associates (PBA) in relation to the commercial element of the development.

1.2 Figures and drawings referred to are available at the end of this Report. All Appendices are available electronically on request.

1.3 The Site is located to the south-east of Hayes Town Centre as shown in **Figure 1.1**, bounded to the north by the Great Western Rail Line and Grand Union Canal and to the south by Nestles Avenue. The former Nestle Factory has been split into two separate development parcels covered by the same planning application. The land being redeveloped by Barratt London Ltd is the western portion of the site with the eastern portion being developed by SEGRO for complementary employment uses. This Transport Assessment covers the entire development proposals.

1.4 The Site has an established B2 General Industrial land use and was occupied by Nestle from 1913 up until 2014 when Nestle finally vacated the Site. The Nestle Factory in total has a floor area of approximately 91,000 sqm GFA.

1.5 Historically, vehicular access into the site was available from Nestles Avenue and two existing accesses physically remain in place; however, these have been fenced off for some considerable time. Vehicular access to the Nestle operations since the late 1990's has been solely from North Hyde Gardens.

Site Allocation

1.6 The Site was originally identified in the London Borough of Hillingdon Unitary Development Plan (adopted 1998) under policy PR10 as being allocated for development for business, industrial and warehousing purposes and associated canalside activities.

This policy was saved in 2007. More recently it has been identified as part of a larger allocated site for residential and employment uses within the LBH draft Local Plan: Part 2 – Site Allocation and Designations document (October 2015), under Policy *SA 5: Land to the South of the Railway, including Nestle Site*. The Site forms Site A of the designation, which is being promoted jointly by Barratt and SEGRO as mentioned earlier.

Development Proposals and Application Form

1.7 The development proposals are for the part-demolition of existing factory buildings and associated structures, and redevelopment to provide 1,381 dwellings (Use Class C3), office, retail, community and leisure uses (Use Classes A1/A3/A4/B1/B8/D1/D2), 22,663 sqm (GEA) of commercial floorspace (Use Classes B1c/B2/B8 and Data Centre (sui generis)), amenity and playspace, allotments, landscaping, access, service yards, associated car parking and other engineering works.

1.8 For the purposes of this assessment it has been assumed that a total of 1400 residential units and 22,600 sqm of commercial floorspace are accommodated on site.

1.9 It is intended to provide car parking at an average ratio of 0.5 spaces per residential unit for the residential part of the site with parking provided beneath the podium within the two main perimeter blocks and at ground level disbursed along the internal road network within the site. A further 20 spaces are provided for the retail, commercial and community space within the residential scheme. This results in a total of 712 parking spaces. The B1c/B2/B8 and Data Centre (sui generis) has a total of 213 parking spaces.

Pre-Application Discussions

1.10 Extensive pre-application discussions regarding the scope of the transport assessment have been undertaken with LB Hillingdon (LBH) and Transport for London (TfL). **Appendix A** of this Report includes copies of the various scoping notes and correspondence on this these issues. LBH and TfL have requested two different approaches to the assessment of traffic impact.

LB Hillingdon Road Network Assessment

1.11 LBH requires the impact on their road network to be assessed using a VISSIM model. To inform the construction of this model, stand alone junction tests using LINSIG, ARCADY and PICADY are to be undertaken using traffic survey data gathered in 2016. The VISSIM model is constructed using OD data taken from TfL's 2014 WeLHAM model. The VISSIM model is a real time simulation model of Hayes town centre road network. It is calibrated and validated against the observed journey times on various routes through the network, as well as the observed traffic flows and turning proportions at the various junctions. The models cover weekday AM and PM peak traffic conditions.

1.12 As well as assessing the network under observed 2016 traffic flows, it will be necessary to assess the performance of the network under the following scenarios:

- Opening year baseline
- Opening year with development
- Opening year with cumulative developments
- 5 years after opening year baseline
- 5 years after opening with development
- 5 years after opening with cumulative developments

1.13 The opening year and 5 years after opening year flows will be based on 2016 traffic flows with appropriate growth factors from TEMPRO applied and committed development traffic added on. The existing use on the site has also been taken into account. LBH do not support this assumption, but Transport for London are in agreement that this is appropriate as this approach is supported by TfL and Government guidance on Transport Assessments.

1.14 The with development traffic flows are derived from the baseline flows with traffic flows from the proposed uses replacing the trip generation associated with the existing floorspace on site. The trip generation is based on TRICS trip rates and the distribution on 2011 Census data.

Transport for London Road Network Assessment

1.15 TfL have agreed that their own LINSIG models of the M4 Junction 3 and Bulls Bridge roundabout can be used to assess the impact of the proposals on the TLRN. They have provided LINSIG models of the junctions.

1.16 TfL have requested that their WeLHAM strategic (SATURN) model is used to predict future year baseline and with development traffic flows. The WeLHAM model will be reviewed against turning counts at critical junctions in the model to ensure that the model is accurate in the area of concern. If necessary alterations will be made to ensure that it is fit for purpose. Future year base traffic flows will be generated using the WeLHAM strategic model for 2021 as this is the closest year to opening that is available and will assume that the site is occupied. The resultant flows from WeLHAM will be used in the LINSIG models to assess the impact of the proposals.

TA Aims and Structure

1.17 This Transport Assessment (TA) provides an appraisal of the traffic and transportation issues associated with the development proposals. The TA reviews the site accessibility and undertakes a multimodal trip generation and impact assessment, promoting mitigation strategies where necessary and ensuring the proposals reflect national, regional, and local transport related planning policy and guidance.

1.18 Following this introduction, the remainder of the TA is structured as follows:

- Section Two outlines the relevant transport related national, regional and local policy considerations to ensure they are met by the development proposals;
- Section Three describes the existing public transport provision in the area around the site, as well as pedestrian and cycle infrastructure, including a summary of the PERS and CERS audits undertaken. The accessibility of the site by sustainable modes of transport is also examined within this section;
- Section Four describes the highway network around the site, identifies the surveys that were undertaken, sets out the traffic modelling approach that is undertaken and provides a summary of the current performance of the network based on the junction models and VISSIM output.
- Section Five provides a description of the development proposal including vehicle swept paths, servicing and delivery access, site access layouts and their capacity;
- Section Six examines the relevant parking policy, justifies the proposed level of provision and sets out an outline car park management strategy for the site;

- Section Seven identifies the methodology for deriving traffic flows used in the assessment of traffic impact, including trip rates, growth factors, committed development assumptions and cumulative development assumptions;
- Section Eight sets out the findings of the traffic impact assessment from the stand along junction models and VISSIM;
- Section Nine identifies the proposed mitigation measures; and
- Section Ten provides a summary and conclusion.

1.19 In addition to this TA, a Travel Plans have also been provided to support the proposed development and these should be read in conjunction with this document. The TPs set out a range of management strategies and a number of measures to encourage the residents of the site to travel more sustainable and not be wholly reliant on individual car use.

2.0 RELEVANT POLICY REVIEW

2.1 The following paragraphs include a review of transport related planning policy at national, regional and local levels to ensure specific policies are met by the development proposals.

National Planning Policy

National Planning Policy Framework (NPPF) (2012)

2.2 The Government's National Planning Policy Framework was adopted in March 2012, and sets out Government planning policy, provides guidance on how local planning policy should be produced and a framework for decision making.

2.3 NPPF guidance focusses on sustainable development, and states that sustainable transport policies play an important role in facilitating sustainable development. The NPPF requires all developments which generate a 'significant' amount of movement to be supported by a Transport Statement (TS) or TA and that planning decisions should take account of whether:

- 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'.

2.4 The NPPF states that decisions should ensure developments that generate 'significant' movement are located where the need to travel will be minimised and the use of sustainable transport modes can be maximised. Therefore, developments should be located and designed where practical to:

- Give priority to pedestrian and cycle movements, and have access to high quality public transport facilities;
- Create safe and secure layouts which minimise conflicts between traffic and cyclists or pedestrians; and
- Consider the needs of people with disabilities by all modes of transport.

2.5 With regards to car parking, the NPPF does not include any standards and recommends that local planning authorities should take into account the accessibility of the development, the availability of and opportunities for public transport, local car ownership and an overall need to reduce the use of high-emission vehicles.

Regional Planning Policy

London Plan (2015) and MALPS (2015-2016)

2.6 The London Plan was adopted in January 2011, with revised minor alterations published in January 2014 (REMA), further alterations published in March 2015 (FALP) and brought together into a Consolidated London Plan 2015. Since the publication of the consolidated London Plan 2015 there have been further, additional minor alterations relating to parking and housing adopted in March 2016. The London Plan sets out the integrated economic, environment, transport and social framework for the development of London over the next 20-25 years.

2.7 Chapter 6 of the London Plan describes the specific transport policies, the integration of transport and development is the central theme, with an aim to encouraging development that reduces the need to travel, especially by car, and locating development that generates high levels of trips at locations with either current or committed high levels of accessibility to public transport, cycling and pedestrian networks.

2.8 The London Plan identifies that development proposals should support sustainable travel through the inclusion of appropriate cycle parking and facilities, high quality pedestrian environments and consideration of public transport accessibility levels in relation to housing density and car parking standards.

Local Adopted Planning Policy

LBH Local Plan: Part 1 - Strategic Policies Document (2012)

2.9 The Hillingdon Local Plan: Part 1 – Strategic Policies was adopted in November 2012 and is the key strategic planning document for Hillingdon which sets out the long-term vision and objective for the Borough, against which development proposals are assessed.

2.10 With regards to Transport, the SO12 strategic objective promotes the reduction of reliance on the use of the car by promoting safe and sustainable forms of transport, such as improved walking and cycling routes and encouraging travel plans.

2.11 Policy T1 states that the council will steer development to the most appropriate location in order to reduce their impact on the transport network and all development should encourage access by sustainable modes including walking and cycling.

Local Emerging Planning Policy

Local Plan: Part 2 – Development Management Policies (2015), Site Allocations and Designations (2015).

2.12 The Local Plan Part 2 comprises Development Management Policies, Site Allocations and Designations and Policies Map. Once adopted it will deliver the detail of the strategic policies set out in the Local Plan: Part 1 - Strategic Policies (2012). Together they will form a comprehensive development strategy for the borough up to 2026.

2.13 The transport policies relating to the proposed development are presented below.

Policy DMT 1 – Managing Transport Impacts.

2.14 Policy DMT 1 states developments proposals will be required to undertake a TA and Travel Plan if they meet or exceed the thresholds of 80 units for C3 residential developments. DMT 1 also states that in order for developments to be acceptable they are required to:

- Be accessible by public transport, walking and cycling and the services and facilities necessary to support the development;

- Maximise safe, convenient and inclusive accessibility to, and from developments for pedestrians, cyclists and public transport users;
- Provide equal access for all people, including inclusive access for disabled people;
- Adequately address delivery and servicing requirements; and
- Have no significant transport or associated air quality and noise impacts on the local and wider environment and strategic road network.

Policy DMT 2 – Highways Impacts

2.15 Policy DMT 2 requires development proposals to ensure that safe and efficient vehicular access to the highway network is provided to the Council's standards, and they do not contribute to the deterioration of air quality and noise. This policy also requires safe, secure and convenient access and facilities for cyclists and pedestrians.

Policy DMT 4 – Public Transport

2.16 Policy DMT 4 states that the council may require development to mitigate transport impacts from development proposals by improving local public transport facilities and services.

Policy DMT 5 – Pedestrians and Cyclists

2.17 Policy DMT 5 requires development proposals to ensure that safe and direct access for pedestrians and cyclists is provided on the site connecting it to the wider network, including:

- The retention and, where appropriate, enhancement of any existing pedestrian and cycle routes;
- The provision of a high quality and safe public realm, which facilitates convenient and direct access to the site for pedestrian and cyclists;
- The provision of well signposted, attractive pedestrian and cycle routes separated from vehicular traffic where possible; and
- The provision of cycle parking and changing facilities in accordance with the maximum C3 Flat standards of 1 cycle parking space per 1 or 2 bedroom unit and 2 spaces per 3 or more bedroom unit.

3.0 SUSTAINABLE MODES OF TRANSPORT AND ACCESSIBILITY

Site Location

3.1 The site is located at the Former Nestle Factory, Nestles Avenue, Hayes. Nestles Avenue is located along the southern boundary, from which the Nestle Factory was historically accessed. The northern boundary is split with the north-western section bordering the Great Western Railway and the north-eastern section being adjacent to the Grand Union Canal. The eastern boundary is adjacent to North Hyde Gardens and the western boundary is adjacent to industrial units accessed from Viveash Close. The site is located to the south east of Hayes Town Centre and Hayes and Harlington Railway Station. A site location plan is attached as **Figure 1.1**.

Site Accessibility

3.2 The Proposed Development is within a walking distance of 800m (an approximate 10 minute walk) of five essential shop uses (located to the north of Hayes and Harlington Station on Station Road and Blyth Road). This is a distance set by Paragraph 3.15 of Policy DMTC 2 of the LBH Draft Local Plan Part 2 October 2015 which establishes whether a development site is deemed 'deficient' in terms of accessibility to facilities. Clearly the development site is not deficient and in any event has been allocated within Policy SA4 of the draft Site Allocations and Designations document October 2015.

3.3 The nearest commercial centre is Hayes Town Centre which is located 800m walking distance to the north of the site. LBH are carrying out improvement works to Hayes Town Centre and the phase one work which was completed in April 2016 involved new paving and cycle layout, parallel parking bay arrangement and modern street lighting (see **Photo 1**). The removal of the raised central reservation enabling motorists to easily pass stationary vehicles and buses to improve traffic flows. Trees have also been planted and the Town Centre will be fully resurfaced by April 2017.

Photo 1 – Hayes Town Centre

3.4 Its proximity to the Town Centre ensures that the Site benefits from being located within walking distance of a range of land uses that act as typical trip attractors for residential land uses, such as employment, education, retail, leisure and health.

3.5 Examples of these land uses and their associated walk distance are summarised in **Table 3.1**. Social infrastructure is indicated on the attached **Figure 3.1**.

Table 3.1: Trip Attractors

Land Use	Site	Walk Distance	Route
Education	Cranford Park Academy	850m	Nestles Ave, Harold Ave, North Hyde Rd, Crane Gardens, Cranford Dr, Coronation Rd, Phelps Way
	Botwell House Roman Catholic Primary School	1.1km	Nestles Ave, Station Rd, Botwell Ln
	Featherstone Primary School and Nursery School	1.9km	Nestles Ave, North Hyde Gardens, North Hyde Rd, Hayes Rd, Western Rd
Convenience Retail	MS Newsagents	650m	Nestles Ave, Station Rd
Food Retail	Tesco Express	600m	Nestles Ave, Station Rd, Station Approach
	Asda Superstore	450m	Nestles Ave, Station Rd
	Tesco extra	950m	Nestles Ave, North Hyde Gardens, North Hyde Rd, The Pkwy Underpass, Hayes Rd
	Iceland	800m	Nestles Ave, Station Rd
Leisure	Grand Union Canal Towpath	650m	Nestle Ave, North Hyde Gardens
	Crane Meadows / Cranford Park	1.3km	Nestles Ave, Harold Ave, North Hyde Rd, Crane Gardens, Cranford Dr, Fuller Way, M4 Underpass
	Post Office	900m	Nestles Ave, Station Rd
	Botwell Green Sports and Leisure Centre	1.1km	Nestles Ave, Station Rd, Botwell Lane, East Ave
	Botwell Green Library	1.1km	Nestles Ave, Station Rd, Botwell Lane, East Ave
Health	Boots Pharmacy	750m	Nestle Ave, Station Rd
	North Hyde Practice	650m	Nestle Ave,
	Hayes Town Medical Centre	800m	Nestle Ave, Station Rd
	Hayes Medical Centre	300m	Nestle Ave, Old Station Rd

3.6 **Table 3.1** therefore confirms that there are a range of trip attractors within close proximity of the site, predominately located within Hayes and Harlington town centre. The town centre accommodates a variety of food and non-food retail stores.

3.7 This close proximity ensures that future residents can access these trip attractors by the most sustainable forms of travel, on foot and by bike, ensuring they are not reliant on travel by private car.

Pedestrian Infrastructure

3.8 Pedestrian and cycle infrastructure which is located in close proximity to the site is identified in **Figure 3.2**.

3.9 Pedestrian access to the site is from the southern and eastern boundaries, via an established street-lit footway network that runs along Nestles Avenues, connecting to North Hyde Gardens to the east and Station Road to the west. Nestles Avenue is identified in **Photo 2**. Station Road provides access to Hayes and Harlington station and the town centre northwards.

Photo 2 – Nestle Avenue

3.10 Levels of traffic on Nestles Avenue are low and no controlled pedestrian crossing facilities are provided (or required). Station Road to the west and North Hyde Road to the south carry much greater traffic flows and pedestrian crossing is facilitated by a mixture of pedestrian refuge islands, zebra and pelican crossings and crossings at signal controlled junctions.

3.11 The site is situated in close proximity to the London Loop, which is a signed footpath starting in Erith, north Bexley and continues in a loop around London and ending in Purfleet, south Thurrock. The London Loop is split into 24 sections, with Section 10 and

Section 11 travelling through Hayes and Harlington along the Grand Union Canal, approximately 500m from the site. Section 10 travels from Hatton Cross along the River Crane and through Cranford, reaching the Grand Union Canal towpath, in Hayes and Harlington. Section 11 continues on the Grand Union Canal Towpath and travels north to Uxbridge, travelling through Yiewsley and Cowley.

3.12 The Grand Union Canal towpath can be accessed from the site via Nestles Avenue, Station Road and Western View and via Nestles Avenue and North Hyde Gardens. Western View provides step and ramp access and North Hyde Gardens provides a sloped access allowing both pedestrians and cyclists access to the London Loop path. The Towpath runs along the northern side of the Grand Union Canal, and connects with the LBH's Hayes Towpath Trail to the north of Bulls Bridge roundabout. The Grand Union Canal at Western View is shown in **Photo 3**.

Photo 3 – Grand Union Canal Pathway

Cycling Infrastructure

3.13 **Figure 3.2** shows both pedestrian and cycle infrastructure in the area around the site. In terms of cycle infrastructure, whilst Nestle Avenue does not form part of any established cycle network, there is an established shared surface pedestrian / cycle path along both sides of Station Road. On the western side, the cycle lane begins north of the Fairey Corner Bus stop and on the eastern pathway the cycle lane beings close to the Old Station Road. Both cycle lanes link with the Hayes and Harlington Station to the north. The eastern shared pedestrian / cycle pathway continues on-road until it reaches the

Station Road Parade, where a segregated off-street two-way cycle lane is provided and travels south until the Station Road junction with Millington Road. The two-way Station Road cycle link is presented in **Photo 4** below.

Photo 4 – Station Road two-way off-street cycle lane.

3.14 The site is also situated in close proximity to The Parkway's two-way off-street dedicated cycle lane which travels north to the Lombardy Retail Park where it links with an eastbound and westbound off-street cycle link. The off-street cycle link travels south along The Parkway linking to Cranford. The Bulls Bridge Roundabout provides a variety of crossing facilities for cyclists providing access to these cycle links. A toucan crossing facility is provided across North Hyde Road which links with the two-way cycle link on The Parkway. This Toucan crossing is presented in **Photo 5**. An underpass is provided which travels from North Hyde Road, under The Parkway and remerges on Hayes Road where is connects with a toucan crossing across Hayes Road. The Parkway cyclist and pedestrian underpass is presented in **Photo 6**.

Photo 5 – Toucan Crossing across North Hyde Road

Photo 6 – The Parkway cyclist and pedestrian underpass

3.15 Sustrans identifies that the site is also located in close proximity to an off-road local cycle route on the Grand Union Canal Towpath. The local cycle route begins at the Bulls Bridge roundabout and travels south-east connecting with Norwood Green, Brentford, Osterley Park and Richmond. The towpath also provides access to Hayes Town Centre, and can be accessed via Western View. The Grand Union Canal Towpath can also be accessed from The Parkway's northern off-street cycle lane, via a ramp and also by a ramp from North Hyde Gardens.

3.16 There are 18 cycle spaces at Hayes and Harlington Station although the facilities are being improved as a result of Crossrail which will be discussed further in this section.

PERS and CERS Audits

3.17 A Pedestrian Environment Review Systems (PERS) audit and a Cyclist Environment Review Systems (CERS) audit were undertaken by MA in January 2017. The PERS audit covered a number of pedestrian routes, public transport waiting areas and crossing facilities, while the CERS audit covered cycle routes, junctions, cycle parking facilities and interchange areas in the vicinity of the Site.

3.18 PERS and CERS are objective methods of grading the pedestrian / cyclist environment through a walking audit tool and is recommended for use by TfL and LBH to assess the level of service and quality provided for pedestrians and cyclists across a range of environments. The PERS style Audit report is included in **Appendix B**, and the CERS style Audit report is attached as **Appendix C.**

3.19 The PERS and CERS findings are summarised below.

PERS Audit

3.20 The results of the PERS audit indicate that the existing pedestrian environment is generally of a good quality with the majority of the selected routes achieving average and good scores for links, crossings and public transport waiting areas.

3.21 The site's surrounding public transport waiting areas received particularly high scores, with the majority of the bus stops providing shelters / seating areas, detailed timetable and service information. The site is also surrounded by good quality crossing facilities, with the Station Road / Hyde Road signalised crossing receiving good overall scores due to good quality tactile paving and dropped kerbs, which are adequately maintained and are located along pedestrian desire lines. The PERS audit, however, found that the zebra crossing at the Station Road / Clayton Road junction lacked tactile information and suffered from ponding. This is a key crossing for pedestrians travelling to the town centre and would benefit from improvement.

3.22 The PERS style Audit found that the majority of the pedestrian links and crossing were of an average to good quality, however North Hyde Road received a low average score due to lack of tactile information at junctions, uneven pathways in certain areas and littering. Nestles Avenue was scored highly for overall footway width and quality, however there is some damage to the surfacing in places, primarily associated with tree roots.

3.23 It was noted that during the day of the site visit / audit, there were no observed incidents of serious user conflicts on any of the assessed routes.

CERS Audit

3.24 The results of the CERS audit specify that the existing cyclist environment is generally of a good quality with the majority of the selected routes achieving an average to good score for links, junctions, cycle parking facilities and interchanges areas.

3.25 The CERS audit identified that the site is located in close proximity to a number of good quality cycle links, with the majority of the links surrounding the site receiving an average to good score. The audit found that Nestles Avenue, which runs adjacent to the southern border of the site, provides a good quality on-street cycle link. Nestles Avenue provides a safe cycling link due to low traffic flow and good surface quality. The audit identified that the Station Road off-street cycle links and The Parkway off-street cycle link are of high quality, and provide a direct and safe link for cyclists.

3.26 In regards to surrounding junctions, the audit identified that the site is surrounded by average to good quality junctions for cyclists, with the Nestle Avenue / Station Road junction scoring highly due to sightlines and good visibility.

3.27 The audit concluded that cycle parking around important trip attractors needed to be improved. Cycle parking at the Hayes and Harlington Station received an average score due to overcrowding and lack of availability of cycle parking spaces, therefore on that basis, increase provision would be encouraged. The CERS audit also identified that the cycle parking provided at the North Hyde parade was of poor environmental quality and suffered from obstructions, ponding and litter. The Hayes and Harlington Station cycle parking provision and the North Hyde Parade cycle parking provisions are the only improvements encouraged by the CERS audit.

3.28 It was noted that during the day of the site visit / audit, there were no observed incidents of serious user conflicts on any of the assessed routes.

Public Transport Accessibility Level (PTAL)

3.29 Public Transport Accessibility Levels (PTALs) are a theoretical measure of accessibility of a given point to the public transport network, taking into account walk access time and service availability. All bus routes with 640m and underground/railway station within 960m are taken into account.

3.30 The PTAL score ranges between 1a and 6b, where 1a represents a poor level of accessibility and 6b an excellent level.

3.31 A PTAL assessment using the TfL land use planning PTAL assessment tool WebCAT has therefore been undertaken (https://tfl.gov.uk/info-for/urban-planning-and-construction/planning-with-webcat/webcat).

3.32 For a 2011 Base Year, the WebCAT assessment identifies that site has a PTAL range of between 1b and 4 from east to west. The range in PTAL rating is due to the increased walking distances across the site from the nearest bus stops on North Hyde Road and Station Road and Hayes and Harlington Railway Station on Station Road. The 2011 PTAL Output is attached as **Appendix D**.

3.33 For 2021 Forecast Year, the WebCAT assessment identifies the site experiences little change to the PTAL rating, with the majority of the site still within the 1b and 4 PTAL range. The 2021 forecast Output is also attached in **Appendix D**.

Bus Provision

3.34 Subsequent paragraphs offer a description of each public transport mode of travel accessible from the site, which is also presented in **Figure 3.3**.

3.35 Station Road, accessed from the Site via Nestles Avenue, acts as an important north/south bus corridor and provides access to Heathrow Airport, Brentford, Cranford and West Drayton. The northbound bus stop, Hayes and Harlington Station (Stop L), is located approximately 400m from the closest point on the site and the southbound bus stop, Hayes and Harlington Station (Stop E), is approximately 360m from the closest point on the site. Both bus stops are sheltered, with real-time information boards, service and timetable information. The Hayes and Harlington Station southbound bus stop is shown **Photo 7**.

Photo 7 – Hayes and Harlington Station southbound sheltered bus stop

3.36 A number of bus stops are also located on North Hyde Road and are accessed via Nestle Avenue and Harold Avenue. The closest bus stop is the Harold Avenue (Stop H), which is a flag stop located approximately 310m from the site.

3.37 **Table 3.2** below identifies the existing services, their key destinations and weekday and weekend frequencies.

Table 3.2 - Existing Bus Provision

Bus Stop	Bus Routes	From	To	Key Destinations	Daily Service Frequency (Monday - Friday)	Daily Service Frequency (Saturday - Sunday)
Hayes and Harlington Station (Stop L and E)	90	Northolt Station	Feltham Leisure West	Kingston Close, Hatton Cross, Fern Grove, Victoria Road	Every 6-11 mins	Every 8-15 mins
	140	Heathrow Central Bus Station	Long Elmes	West End Lane, Bengarth Road, Northolt Station, Harrow Town Centre, Wealdstone Centre	Every 5-10 mins	Every 6-12 mins
	195	Romney Road	Brentford County Court	Uxbridge County Court, Brent Road, Southall Broadway, Brentford Station	Every 10-13 mins	Every 12-14 mins
	350	Clarendon Road	Heathrow Terminal 5	Whitethorn Avenue, Church Road, Harmondsworth Road	Every 11-13 mins	Every 20 minutes
	696 (School Service)	Conway Drive	Hume Way	Clement Gardens, Belmore Parade, Kingsash Drive, Ruislip Gardens Station	Two buses between 4pm-5pm	No weekend Service
	698	West Drayton Station	Ickenham Station	Church Road, Porters Way, Rosedale Park, Hillingdon Station	Three buses between 4pm-5pm	No weekend Service
	E6	Greenford Station	Bulls Bridge Tescos	Costons Lane, Jollys Lane, East Way, Crowland Avenue	Every 8-11 mins	Every 7-15 mins
	H98	School Road	Wood End Green Road	Hounslow West, Oxford Avenue, Hanover Circle	Every 3-8 mins	Every 7-15 mins
	U4	Prologis Park	Belmont Road	Glamis Crescent, Barwick Drive, Brunel University, Civic Centre, The Greenway	Every 6-10 mins	Every 7-15 mins
	U5	Uxbridge Station	Fairey Corner	Uxbridge High Street, Station Road, West Drayton Station, Kings Road, The Square	Every 10-12 mins	Every 12-20 mins
Harold Avenue (Stop H)	195	Romney Road	Brentford County Court	Sussex Road, King Street, Ealing Hospital, Boston Manor Station, Manor Drive	Every 10-13 mins	Every 12-15 mins

Rail Access

3.38 In terms of rail infrastructure, the site benefits from being located within an acceptable walk distance of Hayes and Harlington Station, with an approximate walk distance of 420m from the western boundary of the site on Nestles Avenue to the main station entrance.

3.39 Hayes and Harlington Station is a National Rail Station situated on the Heathrow Connect/Express Line and Great Western Railway (GWR) Line. The Heathrow Connect Line gives direct access to London Paddington to the east and Heathrow Terminals 1, 2 and 3 to the south; Heathrow Express services do not stop at Hayes and Harlington Station. The GWR line gives direct access to London Paddington to the east and Oxford and Reading to the west.

3.40 **Table 3.3** below identifies the existing direct rail routes that are accessed from Hayes and Harlington Station.

Table 3.3: Existing Rail Provision

Train Station			Main Stations	Direct Train Frequency at Peak Times
Hayes and Harlington Station	**Heathrow Connect**	Eastbound (Terminates at Paddington)	Southall, Hanwell, West Ealing, Ealing Broadway, Paddington	2 per hour
		Southbound (Terminates at Heathrow Terminals 1, 2 and 3)	Heathrow Terminals 1, 2 and 3	2 per hour
	Great Western Railway	Eastbound (Terminates at Paddington)	Southall, Hanwell, West Ealing, Ealing Broadway, Acton Main Line, Paddington	5 per hour
		Westbound (Terminates at Oxford)	West Drayton, Iver, Langley, Slough, Maidenhead Station, Twyford, Ready Station, Tilehurst, Pangbourne, Goring and Streatley, Cholsey, Didcot Parkway, Culham, Oxford	2 per Hour
		Westbound (Terminates at Reading)	West Drayton, Slough, Burnham, Maidenhead Station, Twford, Reading Station	4-5 per hour

3.41 Hayes and Harlington Station is on The Elizabeth Line (Crossrail) that will operate from Reading / Heathrow Airport to the west and Shenfield and Abbey Wood to the east. The new line will provide direct access to a number of new stations including Bond Street, Tottenham Court Road, Liverpool Street, Canary Wharf and Stratford. From May 2018, up to four Elizabeth line trains an hour will run between Paddington and Heathrow. From December 2019, when the full route opens, up to ten Elizabeth line services an hour will allow passengers from Hayes and Harlington to travel to Reading or Heathrow in the west or through the central London tunnels to east London and Essex.

3.42 A comparison of current and future key journey times from Hayes and Harlington Station, as a result of Crossrail, are presented below in **Table 3.4**.

Table 3.4: Key Journey times from Hayes and Harlington Station

To	Current Journey Time (2016) (Minutes)	Elizabeth Link Journey Time (Minutes)	Reduced Travel Time (Minutes)
Bond Street	36	20	16
Liverpool Street	49	27	22
Canary Wharf	57	34	23
Tottenham Court Road	39	22	17
Stratford	58	36	22
Reading	46	33	13

3.43 **Table 3.4** demonstrates that the new Elizabeth Line serving Hayes and Harlington Station will improve access and journey times to central London, east London and Essex.

3.44 As part of the Crossrail programme, major improvements are proposed for Hayes and Harlington Station. A new, bright, spacious ticket hall will provide a more welcoming environment for passengers and a range of other improvements will be made to the station, including:

- A new footbridge with four new lifts to provide step free access to every platform;
- A new waiting room on platform 4/5;
- Platform extensions and new and replacement canopies; and
- New lighting, customer information screens, station signage, help points and CCTV.

4.0 HIGHWAY NETWORK

Description of Local Highway Network

4.1 The site is bound to the south by Nestle Avenue, which currently operates as a two-way single carriageway road, and links to North Hyde Gardens to the east and Station Road to the west. There is no vehicle access through from Nestle Avenue to North Hyde Gardens, only pedestrian and cyclist access. Harold Avenue links Nestle Avenue to North Hyde Road which is a two-way single carriageway road which runs parallel with Nestle Avenue.

4.2 North Hyde Road links with Station Road to the west and the TLRN at Bulls Bridge Roundabout to the east, which is the responsibility of Transport for London (TfL).

4.3 To the west, North Hyde Road forms one of the four arms of the North Hyde Road / Station Road signal junction. This junction has recently undergone improvement works, with improved pedestrian footpath and crossing facilities, as well as clearer road markings and some localised carriageway widening.

4.4 To the east, North Hyde Road forms one of the four major arms on the Bulls Bridge Roundabout, which provides access to The Parkway northbound, The Parkway southbound and Hayes Road. The Parkway travels south linking with the M4, Great South-West Road and Heathrow Airport and north where it connects with the Ossie Garvin Roundabout and Uxbridge Road. Hayes Road travels east past the Tesco Extra supermarket to Southall where is reduces to a single carriageway.

Traffic Surveys

4.5 In order to inform this Transport Assessment, a range of traffic surveys were undertaken during 2016 at locations that reflect the geographical scope of assessment agreed with LBH. These included weekday AM and PM peak turning counts and queue surveys at the following junctions:

- Dawley Road / Botwell Common Road priority junction
- Botwell Common Road / Botwell Lane mini-roundabout

- Botwell Lane / Printinghouse Lane priority junction
- Botwell Lane / Church Road mini-roundabout
- Botwell Lane / Pump Lane / Coldharbour Lane / East Avenue roundabout
- Dawley Road / Kestrel Way / Betam Road / Blyth Road roundabout
- Dawley Road / North Hyde Road / Millington Road / Bourne Avenue roundabout
- North Hyde Road / Station Road signals
- Station Road / Millington Road signals
- Station Road / High Street signals
- Station Road / Nestles Avenue priority junction
- Nestles Avenue / Harold Avenue priority junction
- Harold Avenue / North Hyde Road / Crane Gardens priority junction
- North Hyde Road / North Hyde Gardens / Watersplash Lane signals
- Bulls Bridge signalised roundabout

4.6 In addition to flows and queues, at the signal controlled junctions observations on signal timings, saturation flows and degrees of saturation were also taken.

4.7 A location plan identifying the various junctions and the results of the junctions surveys are provided in **Appendix E** and summarised in **Figure 4.1** and **4.2**.

4.8 As well as junction surveys, a number of journey time surveys were also undertaken. The routes followed and the results of the surveys are provided in **Appendix E**.

Junction Capacity Assessments

4.9 Junction capacity models of each of the above junctions apart from the Bulls Bridge Roundabout (including the North Hyde Gardens / North Hyde Road signals which form part of the same SCOOT network) and J3 of the M4, have been undertaken using PICADY, ARCADY and LINSIG. These are industry standard software packages that are used for the assessment and design of priority junctions, roundabouts and signal junctions respectively. The Bulls Bridge Roundabout and J3 of the M4 already have approved TfL LINSIG models. The following paragraphs look at each junction in turn.

Dawley Road / Botwell Common Road Priority Junction

4.10 The Dawley Road / Botwell Common Road priority junction has been modelled using industry standard software and traffic survey data from June 2016. The results model results are shown in full in **Appendix F** and summarised in **Table 4.1.**

Table 4.1: Dawley Road / Botwell Common Road – 2016 Traffic Flows

Arm	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Botwell Common Road – Left Turn	1.06	18	0.52	1.1
Botwell Common Road – Right Turn	1.02	9.3	0.68	2.1
Dawley Road – Right Turn	0.42	0.8	0.64	2.2

4.11 Two useful outputs of the PICADY model at the RFC and queue length predictions. The RFC is the ratio of flow to capacity, RFC's below 0.85 indicate that a junction is operating within practical capacity. RFC's between 0.85 and 1.0 indicate that while the junction is within theoretical capacity, its performance would begin to be impaired and queuing would start to become noticeable. RFC's above 1.0 indicate that the junction is above its theoretical capacity and significant queuing would start to be observed. It should be noted that the reliability of the output of PICADY models in situations with RFCs above 1.0 is diminished as the model is operating beyond its normal limits.

4.12 It can be seen from **Table 4.1** that under existing flows in the AM peak the Botwell Common Road arm of the junction already has capacity problems, with RFC's in excess of 1.0 and queues of up to 18 vehicles. In the PM peak the junction operates within capacity.

Botwell Common Road / Botwell Lane Mini-Roundabout

4.13 Turning next to the Botwell Common Road / Botwell Lane mini-roundabout, this has been modelled using ARCADY. Results are provided in full in **Appendix G** and summarised in **Table 4.2.**

Table 4.2: Botwell Common Road / Botwell Lane – 2016 Traffic Flows

Arm	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Botwell Lane North	0.46	0.9	0.26	0.4
Botwell Lane South	0.41	0.8	0.43	0.8
Botwell Common Road	0.34	0.6	0.31	0.5

4.14 The output from ARCADY is in a similar format to PICADY. It can be seen that under 2016 traffic flows this junction operates within capacity, with little queueing taking place.

Botwell Lane / Printinghouse Lane Priority Junction

4.15 The Botwell Lane / Printinghouse Lane priority junction has been modelled using PICADY. Full results are available in **Appendix H** and are summarised in **Table 4.3.**

Table 4.3: Botwell Lane / Printinghouse Lane – 2016 Traffic Flows

Arm	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Printinghouse Lane – Left and Right Turn	0.76	3.3	1.09	31.3
Botwell Lane – Right Turn	0.58	2.2	0.25	0.6

4.16 It can be seen that in 2016 under the AM peak hour flows this junction operates within capacity. However, in the PM peak hour the Printinghouse Lane arm of the is over capacity.

Botwell Lane / Church Lane Mini-Roundabout

4.17 The Botwell Lane / Church Lane mini-roundabout has been modelled using ARCADY, with full results provided in **Appendix I** and summarised in **Table 4.4**

Table 4.4: Botwell Lane / Church Road – 2016 Traffic Flows

Arm	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Church Road	0.7	2.4	0.46	0.9
Botwell Lane South	1.13	55.6	0.95	12.9
Botwell Lane West	0.65	2	0.83	5

4.18 It can be seen that in both peak hours the Botwell Lane arm of the junction is seen to have capacity problems under 2016 traffic flows.

Botwell Lane / Pump Lane / Coldharbour Lane / East Avenue Roundabout

4.19 The Botwell Lane / Pump Lane / Coldharbour Lane / East Avenue roundabout has been modelled using ARCADY, full results are provided in **Appendix J** and summarised in **Table 4.5.**

Table 4.5: Botwell Lane / Pump Lane / Coldharbour Lane / East Avenue – 2016 Traffic Flows

Arm	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Coldharbour Lane	0.77	3.2	0.61	1.5
Pump Lane	0.61	1.5	0.83	4.6
Botwell Lane	0.33	0.5	0.42	0.7
East Avenue	0	0	0	0

4.20 It can be seen that this junction operates within capacity under 2016 traffic flows.

Dawley Road / Kestrel Way / Betam Road / Blyth Road Roundabout

4.21 The Dawley Road / Kestrel Way / Betam Road / Blyth Road roundabout has been modelled using ARCADY, full results are provided in **Appendix K** and summarised in **Table 4.6**.

Table 4.6: Dawley Road / Kestrel Way / Betam Road / Blyth Road – 2016 Traffic Flows

Arm	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Dawley Road North	0.68	2.3	0.47	1
Blyth Road	0.73	2.9	0.79	3.8
Dawley Road South	0.84	5.4	0.81	4.4
Kestrel Way	0.11	0.1	0.22	0.3
Betam Road	0.07	0.1	0.17	0.2

4.22 It can be seen that this junction operates within capacity under current traffic flows.

Dawley Road / North Hyde Road / Millington Road / Bourne Avenue Roundabout

4.23 The Dawley Road / North Hyde Road / Millington Road / Bourne Avenue roundabout has been modelled using ARCADY, full results are provided in **Appendix L** and summarised in **Table 4.7.**

Table 4.7: Dawley Road / North Hyde Road / Millington Road / Bourne Avenue – 2016 Traffic Flows

Arm	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Dawley Road North	0.73	2.9	0.66	2.1
North Hyde Road	0.41	0.8	0.43	0.8
Millington Road	0.1	0.1	0.43	0.8
Dawley Road South	0.7	2.5	0.66	2.1
Bourne Avenue	0.56	1.4	0.39	0.7

4.24 It can be seen that this junction operates within capacity under current traffic flows.

Station Road / North Hyde Road and Station Road / Millington Road Signal

4.25 The North Hyde Road / Station Road and Station Road / Millington Road operate on the same signal cycle time and have therefore been modelled as part of a single LINSIG model. Full results are provided in **Appendix M** and summarised in **Table 4.8**. Also provided in **Appendix N** is a comparison between observed and modelled Degrees of Saturation that demonstrates that the model is reflecting the conditions on the ground.

Table 4.8: Station Road / North Hyde Road and Station Road / Millington Road – 2016 Traffic Flows

Arm	AM Peak		PM Peak	
	DoS (%)	Queue	DoS (%)	Queue
Station Rd South of North Hyde Road – Left and Ahead	50.4	5.7	57.3	9.1
Station Rd South of North Hyde Road – Right	61.7	2.6	79.9	8.4
Station Rd North	71.8	15.1	72.4	14.5
North Hyde Road West	70.7	11.0	78.7	12.4
North Hyde Road East	71.3	10.4	80.0	10.2
Station Rd North of Millington Rd	52.7	18.0	49.8	6.1
Bedwell Gardens	29.1	2.5	30.8	2.1
Station Road South of Millington Rd	57.9	13.5	58.5	13.5
Millington Rd	45.7	3.9	59.0	6.6

4.26 Outputs from LINSIG are slightly different to ARCADY and PICADY, in that rather than RFC they provide Degree of Saturation (DoS) as an output, which is the flow divided by capacity (therefore effectively the same measure). For signal junctions, a DoS of 90% or less indicates that the junction operates within capacity, between 90% and 100% the junction is approaching theoretical capacity and queues would begin to build and over 100% indicates that the junction exceeds theoretical capacity and queues would increase rapidly.

4.27 It can be seen that the junction operates within capacity under 2016 observed traffic flows.

Station Road / High Street Signals

4.28 The Station Road / High Street signals has been modelled using LINSIG, full results are provided in **Appendix O** along with a comparison of observed and modelled Degrees of Saturation. The results are summarised in **Table 4.9.**

Table 4.9: Station Road / High Street – 2016 Traffic Flows

Arm	AM Peak		PM Peak	
	DoS	Queue	DoS	Queue
Station Road North	61.8:61.8	8.6	49.8:49.8	6.1
High Street	67.8:67.8	6.1	68.7:69.8	7.5
Station Road West	78.3	9.6	78.2	9.2

4.29 It can be seen that this junction operates well within capacity under 2016, with all degreed of saturation below 80%.

Station Road / Nestles Avenue Priority Junction

4.30 The Station Road / Nestles Avenue priority junction has been modelled using PICADY, full results are provided in **Appendix P** and summarised in **Table 4.10**.

Table 4.10 : Station Road / Nestles Avenue – 2016 Traffic Flows

Arm	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Nestles Avenue	0.27	0.4	0.24	0.3
Station Road North – Right	0.03	0	0.05	0.1
Keith Road	0.17	0.2	0.11	0.1
Station Road South - Right	0.13	0.2	0.11	0.1

4.31 It can be seen that this junction operates within capacity under current traffic flows.

Nestles Avenue / Harold Avenue Priority Junction

4.32 The Nestles Avenue / Harold Avenue priority junction has been modelled using PICADY, full results are provided in **Appendix Q** and summarised in **Table 4.11**.

Table 4.11: Nestles Avenue / Harold Avenue – 2016 Traffic Flows

Arm	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Harold Avenue	0.16	0.2	0.11	0.1
Nestles Avenue - Right	0.23	0.3	0.19	0.2

4.33 It can be seen that this junction operates within capacity under observed traffic flows.

Harold Avenue / North Hyde Road / Crane Gardens Priority Junction

4.34 The Harold Avenue / North Hyde Road / Crane Gardens priority junction has been modelled using PICADY, full results are provided in **Appendix R** and summarised in **Table 4.12.**

Table 4.12 : Harold Avenue / North Hyde Road / Crane Gardens – 2016 Traffic Flows

Arm	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Crane Gardens	0.13	0.2	0.08	0.1
North Hyde Road East – Right	0.3	1	0.18	0.6
Harold Avenue	0.36	0.6	0.3	0.5
North Hyde Road West - Right	0.2	0.6	0.08	0.2

4.35 It can be seen that this junction operates within capacity under current traffic flows.

Bulls Bridge Roundabout and M4 Junction 3

4.36 The TfL base model performance of the TfL LINSIG models of the Bulls Bridge Roundabout and M4 Junction 3 are summarised in **Tables 4.13 and 4.14** and shown in full in **Appendix S**.

Table 4.13: Bulls Bridge Roundabout Approved TfL Base Model

Arm	Approach Name	AM Peak		PM Peak	
		DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)
A	The Parkway [N] SB	100%	34	99%	39
B	Hayes Lane [E] WB	84%	10	87%	17
C	The Parkway [S] NB	99%	33	100%	42
D	North Hyde Road [W] EB	94%	20	95%	19

Table 4.14: M4 J3 Approved TfL Base Model

Arm	Approach Name	AM Peak		PM Peak	
		DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)
A	The Parkway [N] SB	111%	81	103%	44
B	WB M4 [E] Offslip	110%	23	112%	33
C	The Parkway [S] SB	98%	25	93%	18
D	EB M4 [W] Offslip	101%	28	102%	29

4.37 It can be seen that the approved TfL base models show both of these junction operating with degrees of saturation in excess of 90%.

VISSIM Model

4.38 As required by LBH, a VISSIM mode has been constructed to include Station Road to the south, Botwell Common Road to the north, Bulls Bridge Roundabout to the east and Dawley Road to the west. The model has been prepared to ensure that it provides a suitable representation of typical network conditions during weekday AM and PM peak periods. The area covered by the model is shown in **Figure 4.3** below:

Figure 4.3 : Extent of VISSIM Model

4.39 Full details of the model methodology, calibration and validation are set out in the Local Model Validation Report (LMVR) included in **Appendix T**. In line with TfL modelling guidelines, the model has been validated against observed journey times on routes agreed with LBH, apart from the area shaded blue, where it was agreed with LBH that validation against turning counts was all that would be required. The routes on which journey times have been validated are shown in **Figures 4.4** to **4.6**.

Figure 4.4 : Journey Time Routes 1A, 1B, 1C

Figure 4.5 : Journey Time Routes 2A, 2B, 2C, 2D

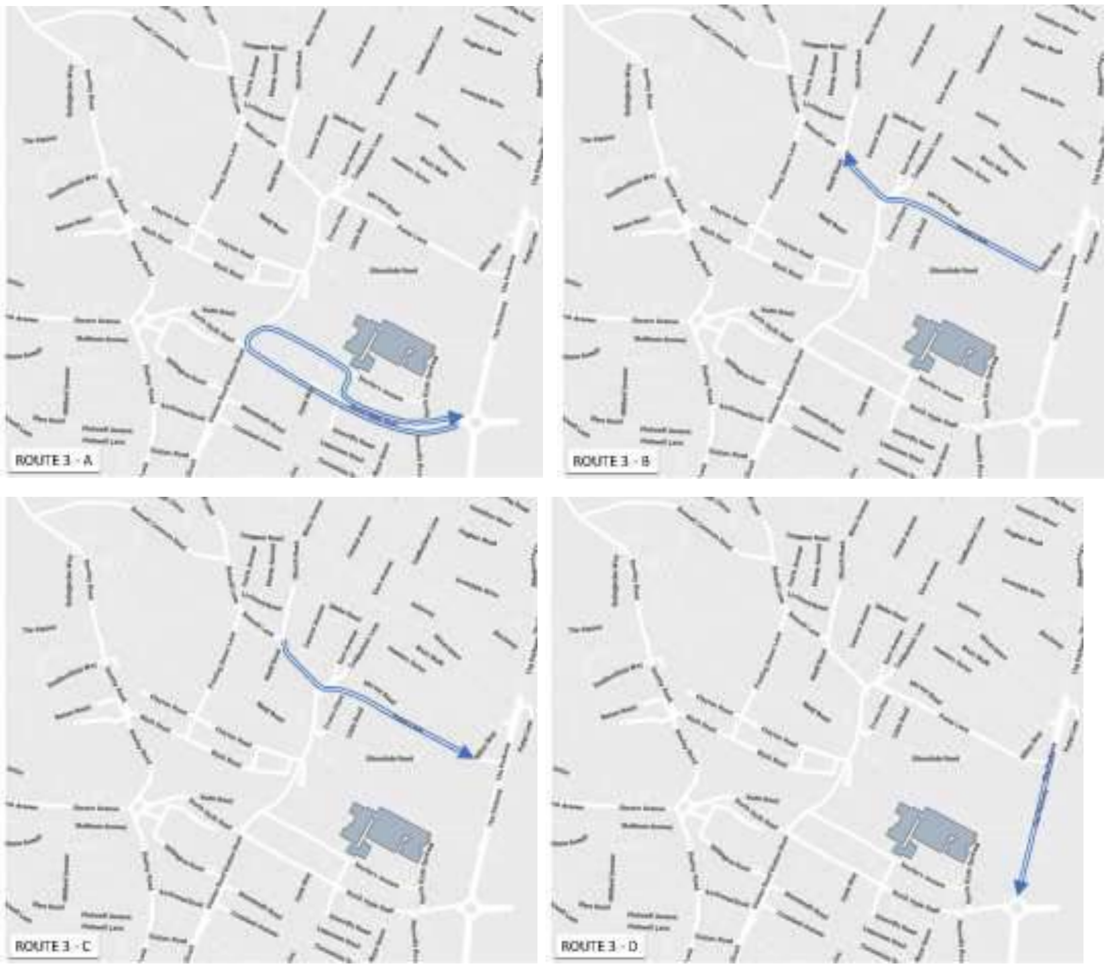


Figure 4.6 : Journey Time Routes 3A, 3B, 3C, 3D

4.40 **Tables 4.15** to **4.17** set out the observed and modelled journey times and compares them to demonstrate that the model is reasonably reflecting the situation on the ground.

Table 4.15 : Route 1 Journey Times (seconds)

Route	AM			PM		
	Observed	Modelled	Difference	Observed	Modelled	Difference
Route 1A – Blyth Road to A312 EB	424	436	12 (3%)	722	639	-83 (-12%)
Route 1B – A312 to Bourne Avenue WB	286	254	-32 (-11%)	303	256	-46 (-15%)
Route 1C – Bourne Avenue to Betam Rd NB	341	340	-1 (0%)	354	324	-30 (-8%)

Table 4.16 : Route 2 Journey Times (seconds)

Route	AM			PM		
	Observed	Modelled	Difference	Observed	Modelled	Difference
Route 2A – High St to Blyth Road / Dawley Road NB	325	316	-9 (-3%)	402	378	-24 (-6%)
Route 2B – Blyth Road / Dawley Rod to Station Approach EB	133	133	1 (0%)	141	129	-11 (-8%)
Route 2C – Station Road Parking	61	62	1 (1%)	80	79	-1 (-2%)
Route 2D – Station Road to High Street SB	203	221	18 (9%)	250	264	14 (6%)

Table 4.17 : Route 3 Journey Times (seconds)

Route	AM			PM		
	Observed	Modelled	Difference	Observed	Modelled	Difference
Route 3A – A312 Parkway Loop	415	434	19 (5%)	612	544	-68 (-11%)
Route 3B – Pump Lane to Church Road Roundabout WB	86	69	-17 (-20%)	64	70	6 (9%)
Route 3C – Pump Lane to Church Road Roundabout EB	54	47	-7 (-13%)	53	53	0 (0%)
Route 3D – A312 Approach to Bulls Bridge Rdbt SB	238	244	6 (2%)	154	167	13 (9%)

4.41 The results show that the total journey time for each of the routes validate to within 15% of the observed data.

Accident Analysis

4.42 Collision data has been sourced from ECC for a period of 5 years up to the end of December 2016, encompassing Nestle Avenue, North Hyde Road, High Street, Station Road and Dawley Road. Collision data is attached as **Appendix U**.

4.43 The PIA data details injury accidents recorded to the police and does not therefore include any accident not recorded to the police or near-miss.

The Parkway / North Hyde Road / Hayes Road Roundabout

4.44 The Parkway A312 forms a major four arm roundabout junction with North Hyde Road and Hayes Road. Out of the total 56 incidents at this junction, only 2 were serious. Due to the subway pedestrian and cycle route, the incidents involving vulnerable road users (VRUs) are very low at two. The majority of the indicents are typical roundabout accidents including rear shunts and side shunts when changing lanes.

North Hyde Road / Station Road Junction

4.45 The North Hyde Road and Station Road junction is a signalised four arm junction, which experienced a total of 24 PIAs, with 2 being serious and 3 involving VRUs. This junction has recently experienced minor improvement works included the removal of guard railings, resurfacing and renewing of tactile paving, due to the introduction of the Asda superstore. The majority of collisions at this junction are due to rear and side shunts.

Station Road / Station Approach / Clayton Road Roundabout

4.46 The Station Road, Station Approach and Clayton Road four arm mini-roundabout is located approximately 130m north of Hayes and Harlington Station and is on the main pedestrian route into the town centre from the site. The roundabout has a low level of PIAs with 9 in total, however VRU are high with 7 incidents, 3 of which are classified as serious. These high VRU collisions, particularly for pedestrians, could be due to the lack of pedestrian crossings on the Station Approach and southern Station Road arms of the roundabout.

5.0 DEVELOPMENT DESCRIPTION

5.1 The proposed development description is as follows:

"Part-Demolition of existing factory buildings and associated structures, and redevelopment comprising 1,381 dwellings (Use Class C3), office, retail, community and leisure uses (Use Classes A1/A3/A4/B1/B8/D1/D2), 22,663sqm (GEA) of commercial floorspace (Use Classes B1c/B2/B8 and Data Centre (sui generis)), amenity and playspace, allotments, landscaping, access, service yards, associated car parking and other engineering works".

5.2 The following paragraphs provide a brief summary of each part of the development site in terms of access and layout.

Residential Proposals

5.3 The residential component of the development consists of 7 separate blocks:

- Block B 490 units
- Block C 212 units
- Block D 132 units
- Block E 179 units
- Block F 295 units
- Block G 55units
- Block H 18 units
- TOTAL 1381 units

5.4 The layout of these blocks can be seen in the Master Plan shown in **Appendix V**.

Vehicular, Pedestrian and Cycle Access

5.5 Vehicular access to the residential component of the development will be from Nestles Avenue. The existing vehicular access opposite Harold Avenue will be re-opened and a new access to the west will be created. The accesses have been designed to allow the existing locally listed fence on the sites frontage to be retained.

5.6 The site will be served by two main access roads, Milk Street to the west and Canal Street to the east. These routes are 6m wide to allow access to perpendicular car parking adjacent to these streets and to provide adequate room for servicing and delivery vehicles. Connection between Milk Street and Canal Street is available for emergency services vehicles via Sandow Square. Canal Street also provides access to a route that runs in an east-west direction in front of the retained factory building façade.

5.7 Pedestrian access into the site will be available on Milk Street and Canal Street. The existing access to the east of Harold Avenue will also be re-opened for pedestrian access into the site from Nestles Avenue. This will also give public access into the existing area of open space in front of the factory building. Further pedestrian access will be available along the canal frontage to the north of the site, which will provide an alternative connection to North Hyde Gardens, from which it is possible to access the towpath on the opposite bank of the canal.

5.8 Cycles access into the site will be from Nestles Avenue at Milk Street, Canal Street and the existing access to the east of Harold Avenue.

5.9 The internal layout has been designed to be permeable to pedestrians, with north-south and east-west connections provided between blocks. A central east-west route has been provided linking the open space in front of the factory building to the western site boundary. This is to enable a future east-west connection between the site and Station Road when development on the remaining sites north of Nestles Avenue comes forward.

5.10 On the canal / railway line frontage a further east-west route has been provided. This offers the potential to provide a direct link into Hayes and Harlington Station car park, subject to Network Rails proposals for their land. Also on the canal frontage, the ability to land a DDA compliant pedestrian / cycle bridge has been safeguarded, should future funding become available for a bridge connection across to the towpath.

Deliveries, Servicing, Refuse Collection and Fire Tender Access

5.11 A series of vehicle swept paths have been undertaken demonstrating that:

- a large refuse vehicle can use the site access roads and turn around within the site;
- a 16.5m articulated lorry can access the energy centre;
- a 10m rigid vehicle can access the various sub-stations around the site; and
- a fire tender can get within 18m of all cores / dry risers.

5.12 These swept paths are included in **Appendix W**.

Employment Proposals

5.13 The employment proposals seek to create 22,663sqm (GEA) of B1c/B2/B8 and sui generis data centre use for 24/7 operation. The proposals are based on the creation of four separate industrial blocks with the following areas:

- Unit 1 : 7820 sqm;
- Unit 2 : 2336 sqm;
- Unit 3 : 3274 sqm; and
- Unit 4 : 9233 sqm.

Vehicular, Pedestrian and Cycle Access

5.14 Vehicular access will be retained from the existing site on North Hyde Gardens. This will reflect like for like conditions with the former Nestle Factory vehicle distribution onto the wider highway network, however, the proposals will represent a reduced level of traffic when compared to the level of traffic that could be generated by the site if the factory buildings were brought back into use.

5.15 The retained industrial access is shown in Photo 8.

Photo 8 – Existing Industrial Access

5.16 Pedestrian access to the industrial development will be possible via a number of different routes. These include a footway leading from the existing access with North Hyde Gardens that will be retained as part of the redevelopment of the site.

5.17 Additional pedestrian access into the site will be possible via the residential scheme via a new footpath within the site that will lead eastwards to the entrance of the industrial site, parallel with Nestles Avenue.

5.18 A third point of access for pedestrians will be from a new Grand Union Canal frontage, which provides attractive car free linkage between the new residential development and the industrial element of the site.

5.19 Internal footways are provided within the industrial estate together with zebra type crossing. The pedestrian access points and internal footways and crossings are shown in **Figure 5.1**.

Figure 5.1 : Pedestrian / Cycle Access

5.20 Cycle access to the site will be via Nestles Avenue and North Hyde Gardens.

Deliveries and Servicing

5.21 Each unit will operate with swing gates to each to the service yards for security purposes. Vehicle swept path analysis has been undertaken using a 16.5m articulated HGV for each of the units to demonstrate that such a vehicle can safely enter, manoeuvre and serve each of the yards from the internal access road. **Appendix X** includes PBAs drawing that illustrates the associated vehicle swept path analysis to demonstrate that all yards and the internal access road operate effectively.

Refuse Collection

5.22 Refuse storage areas will be contained within each service yard. Refuse is anticipated to be collected by standard LBH commercial vehicles.

6.0 CAR AND CYCLE PARKING

Planning Policy Relating to Parking

Regional Policy

6.1 The Consolidated London Plan 2016 paragraph 6.43 states *"Public Transport Accessibility Levels (PTALs) are used by TfL to produce a consistent London wide public transport access mapping facility to help boroughs with locational planning and assessment of appropriate parking provision by measuring broad public transport accessibility levels. There is evidence that car use reduces as access to public transport (as measured by PTALs) increases. Given the need to avoid overprovision, car parking should reduce as public transport accessibility increases."*

6.2 The Parking Standards Minor Alterations to the London Plan March 2016 Policy 6.13 Parking sets out the GLA and TfL's position with regard to parking provision for new development. This policy begins by stating:

"The Mayor wishes to see an appropriate balance struck between promoting new development and preventing excessive car parking provision that can undermine cycling, walking and public transport use."

6.3 It goes on to state that the *'maximum standards set out in Table 6.2 in the Parking Addendum to this chapter should be the basis for considering planning applications (also see Policy 2.8), informed by policy and guidance below on their application for housing in parts of Outer London with low public transport accessibility (generally PTALs 0-1).'*

6.4 Paragraph 6.42 includes advice on setting parking standards in Outer London Boroughs, with recommendations that in areas with PTALs 0-1 higher levels of parking may be required and potentially in areas of PTAL 2 where the orientation or level of public transport mean that a development is particularly reliant on car travel. Even in areas of low PTAL it is stated:

"In deciding whether or not more generous standards are to be applied, account should be taken of the extent to which public transport might be provided in the future. Consideration should also be given to the implications for air quality and the impact of

on-street parking measures such as CPZs which may also help reduce the potential for overspill parking and congestion, and improve safety and amenity."

6.5 The Standards set out in Table 6.2 in the London Plan Parking Addendum are linked to the PTAL, whether the site is in an urban or suburban location, the density of development and the number of habitable rooms. In locations with PTAL scores of 5 to 6 a maximum standard of up to 1 space per unit is identified for all development except for large units in suburban areas. It is also noted below the table that all developments in areas of good public transport accessibility (in all parts of London) should aim for significantly less than 1 space per unit.

6.6 In terms of cycle parking, the London Plan Policy 6.13 sets minimum cycle parking standards for C3 residential developments, which are referenced below;

C3 Residential;

- 1 space per 1 bed unit
- 2 spaces per 2+ bed units
- 1 space per 40 units for visitors

6.7 For B2 and B8 employment development, the London Plan states that standards '*should have regard to the B1 standards although a degree of flexibility may be required to reflect different trip-generating characteristics.'*

6.8 The B1 parking standards identified in the London Plan are for 1 space per 100 – 600 sqm of gross internal floorspace.

6.9 The London Plan position on cycle parking for B2-B8 used is that 1 space per 500sqm should be provided for long-stay parking and 1 space per 1000sqm should be provided for short stay cycle parking.

Local Policy

6.10 LB Hillingdon's Local Plan Part 2 – Development Management Policies (Revised Proposed Submission Version October 2015) sets out LB Hillingdon's emerging policy position in relation to parking standards. It references the London Plan in relation to achieving an appropriate balance between promoting new developments and preventing excessive car parking provision. It also refers to The Mayor of London's Town Centres SPG and it states that in planning for parking standards local authorities need to take account of:

- Making the most effective use of scarce business / housing land;
- Encouraging use of public transport; and
- Parking standards should not disadvantage outer London in competition with the wider South East.

6.11 Policy DMT 6: Vehicle Parking states:

'*A) Development proposals must comply with the parking standards outlined in Appendix C Table 1 in order to facilitate sustainable development and address issues relating to congestion and amenity. The Council may agree to vary these requirements when:*

i) the variance would not lead to a deleterious impact on street parking provision, congestion or local amenity; and or

ii) a transport appraisal and travel plan has been approved and parking provision is in accordance with its recommendations.

B) All car parks provided for new development will be required to contain conveniently located reserved spaces for wheelchair users and those with restricted mobility in accordance with the Council's Accessible Hillingdon SPD.'

6.12 Appendix C Table 1 of Policy DMT 6 : Vehicle Parking identifies that parking should be provided at two spaces per dwelling for dwellings with curtilage. For flats 1 and 2 bedroom units should have 1 – 1.5 spaces per unit and for flats with 3 or more bedroom 2 spaces should be provided. Visitor parking should be provided in addition to the above. For B2-B8 uses, the provision should be 2 spaces plus 1 space per 50-100sqm of GFA.

6.13 Policy DMT 5 requires development proposals to ensure that safe and direct access for pedestrians and cyclists is provided on the site connecting it to the wider network, including:

- The retention and, where appropriate, enhancement of any existing pedestrian and cycle routes;
- The provision of a high quality and safe public realm, which facilitates convenient and direct access to the site for pedestrian and cyclists;

- The provision of well signposted, attractive pedestrian and cycle routes separated from vehicular traffic where possible; and
- The provision of cycle parking and changing facilities in accordance with the maximum C3 Flat standards of 1 cycle parking space per 1 or 2 bedroom unit and 2 spaces per 3 or more bedroom unit.
- For B2 -B8 uses 1 cycle parking space per 500sqm should be provided.

Recent Application of Residential Car Parking Standards in LB Hillingdon

6.14 Large residential housing schemes on allocated Sites within Hillingdon that have been completed at RAF Uxbridge, RAF West Ruislip and RAF Eastcote Lime Grove provide a total of 1575 dwellings and have parking provision on average of 1 space per dwelling. However, all these sites are much less accessible by sustainable modes of transport, and have a far lower PTAL, than the Former Nestle Factory Site.

6.15 LB Hillingdon have recognised that the accessibility of Hayes will result in lower car ownership levels that residential development in other parts of the Borough. More recent development schemes around Hayes and Harlington, all predominantly flatted developments and within areas of PTAL 3-5, have been approved with lower car parking levels and higher densities which is reflective of the public transport accessibility.

6.16 Privately owned flats have not historically formed part of the main tenure of housing stock within the Botwell Ward. However, since 2011 when the Census was undertaken there have been a number of new residential flatted developments that have been consented and constructed:

- Trident House, Station Road, Hayes 95 apartments completed Q1 2016
- Union House, Clayton Road, Hayes 46 apartments completed Q1 2016
- High Point Village, Station Approach 600 apartments completed 2012
- The Old Vinyl Factory, Blyth Road, Hayes- first phase under construction 132 apartments completion Q3 2016
- 20 Blyth Road, Hayes Woodlands Social Housing – 147 flats construction currently stopped.

6.17 The flatted residential developments above are all within close proximity of the Site and will change the tenure mix of the Botwell Ward. For information the Old Vinyl Factory has a parking ratio of approximately 0.7 spaces per dwelling and the residential development at 20 Blyth Road was approved with a parking ratio of 0.6 spaces per dwelling.

Existing Car Ownership Levels

6.18 The Site is within the Botwell Ward of the LB Hillingdon which includes Hayes Town Centre. The housing stock within this ward has, historically tended towards houses/bungalows rather than flatted development. However, the ease of access to Central London via Hayes and Harlington Station, along with the improvements associated with the implementation of Crossrail, have resulted in an increase in applications for flatted developments and higher densities. Any examination of 2011 Census data on car ownership and usage therefore needs to be carried out with this in mind.

6.19 Examining the 2011 Census data on car ownership, relying on average data for the ward would not reflect the proposed form of development on site. It has therefore been necessary to extract more detailed statistics that take account of the size and type of residential unit. **Table 6.1** provides a summary of the car ownership for different sizes and types of units.

Table 6.1: 2011 Census Car Ownership Data Botwell Ward

No. Habitable Rooms	All Units	Houses	Flats
1 to 3	0.597	0.688	0.555
4	0.848	0.989	0.704
5	1.155	1.183	0.606
6	1.318	1.325	1.043
7	1.558	1.588	0.429
8 or more	1.692	1.728	0.6
All units	1.039	1.197	0.625

6.20 It can be clearly seen from the available Census data for the Botwell Ward that car ownership levels for flats are already substantially lower than for houses. As the proposed development is primarily flatted, the baseline parking demand is therefore likely to be closer to 0.625 spaces per residential unit than the Ward average of 1.039 per household. This has been acknowledged by LB Hillingdon when approving recent schemes close to the site at the Former Hayes and Harlington Goods Yard and the Old Vinyl Factory.

Parking Demand at Other Residential Development

6.21 The 2011 Census data on car ownership clearly shows for the Botwell Ward that flatted developments generate lower levels of parking demand than the more prevalent terraced housing that existing in the area. To further our understanding of what typical levels of demand are associated with modern flatted developments in Outer London, investigation into what how well used the parking provided as part of a number of developments has been undertaken.

6.22 Historic car park occupancy data at Barrier Point, Tradewinds and Capital East (which are all residential developments located in London E16) is available from surveys undertaken as part of the Barrier Park East Transport Assessment 2008 (now renamed Waterside Park). The surveys were undertaken in 2007, when the area had a PTAL of 2. The results of the parking surveys at these sites is included in **Appendix Y**.

6.23 Barrier Point with 252 apartments was completed in 2002, Tradewinds with 156 apartments was completed in 2005 and Capital East Phase 1 with 388 apartments was completed in 2007. All three residential developments had parking provided at 1 space per residential unit. In each case, the actual car parking demand was substantially less than the car parking provided within each of the developments. The parking demand at Barrier Point, the oldest of the three developments, was found to be 0.84 per unit. For Tradewinds, which was completed 3 years after Barrier Point, the demand for parking was lower at an average of 0.67 per unit. The last development to be completed was Capital East Phase 1 and this was found to have an average parking demand of 0.46 spaces per unit.

6.24 It is notable that the more recently each of these development were completed the lower the car ownership and parking demand. This is related to the increases in public transport provision that were being made in the area at the time. The closest station to Barrier Point and Tradewinds is Pontoon Dock on the DLR. This station opened in 2005 as part of the North Woolwich extension to the DLR. Barrier Point was completed and occupied three years prior to this station opening and the lack of access to the DLR influenced the need for car use. Tradewinds opening in 2005, at the same time as the Pontoon Dock Station was opened. The availability of access to a DLR station meant that those buying flats at this site did not find it as necessary to own a car, as is reflected by the lower parking demand. Finally, the Capital East site is located close to Royal Victoria DLR station. This was opened in 1994 and the availability of a DLR service in this location was much longer established. It is clear from the above that the availability of public transport when residential units on these sites were purchased had a strong influence on the car ownership amongst residents.

6.25 In order to obtain more up-to-date information on car parking demand from residents of developments similar to that proposed for the Nestle site, recent surveys of car parking occupancy levels at 5am and 10am on a Saturday and weekday have been undertaken at the following sites:

- Waterside Park, Pontoon Dock, Newham
- Great West Quarter, Brentford
- High Point Village, Hayes

6.26 **Table 6.2** sets out the PTAL score for each of the sites, the parking ratio provided and the level of occupancy and the equivalent car ownership level per unit.

Table 6.2: Car Parking Demand at Other Similar Sites

	PTAL	Parking Ratio Provided	Weekday		Weekend	
			Night	Day	Night	Day
Waterside Park	2/3	0.55	55% (0.30)	47% (0.26)	59% (0.32)	45% (0.25)
Great West Quarter	2/3	0.84	63% (0.53)	54% (0.45)	67% (0.56)	45% (0.38)
High Point Village	4/5	0.76	66% (0.5)	39% (0.3)	67% (0.5)	52% (0.4)

6.27 It can be seen that the actual car parking demand on all of the above sites have been well below the number of spaces provided (generally around two-thirds of the provision). Residential parking demand at the nearby Highpoint Village Scheme is only 0.5 spaces per residential unit and in other locations with lower PTAL scores is even lower (0.32 spaces per unit at Waterside Park). It is therefore clear that the type of flatted development proposed results in lower car ownership levels than is typical for existing development in the Hayes area.

Proposed Car Parking Provision

Residential

6.28 Taking account of the LBH and London Plan parking standards, existing parking demand for flats in the area, parking demand at other similar development and the responses on parking provided by TfL and the GLA, it has been decided to provide a total of 692 residential parking space on the site, equivalent to a ratio of approximately 0.5 parking spaces per residential unit.

6.29 The initial provision on site will be broken down as follows:

- 648 standard residential spaces
- 18 spaces for residents in wheelchair accessible units; and

- 26 spaces for visiting blue badge holders.

6.30 The initial provision of 14 spaces for wheelchair units reflects the number of wheelchair units within the affordable component of the development. For the private wheelchair accessible units, the requirement for an oversized parking space will depend on the occupier of the unit and their specific needs. It is therefore intended to adopt a flexible approach to enable the number of oversized spaces to be increased as necessary when demand for them is identified. This is being done by incorporating a number of areas of landscaping adjacent to the internal roads within the site than can be made available for parking if necessary.

6.31 To enable spaces to be reallocated as necessary, the lease on parking spaces will incorporate wording to allow this to take place. If the requirement for an oversized parking space arises, there is then the ability to either convert two existing standard spaces to a wheelchair accessible space and reprovide the existing spaces in the landscaped areas or to create a wheelchair space in the landscaped areas. The decision on which approach to follow will depend upon the location of the wheelchair unit within the site.

6.32 To demonstrate that the layout can accommodate the demand if all 138 wheelchair spaces are required, the drawings in **Appendix Z** show the 'day one' parking layout and the future proofed layout to meet full demand.

6.33 In addition to monitoring the need for wheelchair accessible car parking spaces whilst the development is being built out and occupied, the overall uptake of parking spaces on the site as each phase of development is occupied will also be monitored. The overall provision of car parking will be reviewed in light of the uptake of car parking and the potential for a reduction in overall car parking provision will be identified if demand for the spaces is found to be lower than 0.5 spaces per unit.

Mixed Uses Accompanying Residential Development

6.34 It is proposed to provide a total of 20 parking spaces for the café, gym, nursery and office elements of the development. Two spaces will be allocated for staff use, a further four spaces will be designated as drop-off spaces will duration of stay restricted to 20 minutes and the remainder will be short-stay spaces for up to two hours.

6.35 The spaces will be managed by the on-site concierge to ensure that they are not misused.

Employment

6.36 The proposed level of car parking for the employment uses are as follows:

- Unit 1- a total of 73 spaces, 7 of which are for people with disabilities, 15 with electric charging facilities and 8 with passive provision for electric charging.
- Unit 2- a total of 21 spaces, 2 of which are for people with disabilities, 4 with electric charging facilities and 2 with passive provision for electric charging.
- Unit 3- a total of 31 spaces, 3 of which are for people with disabilities, 6 with electric charging facilities and 3 with passive provision for electric charging.
- Unit 4- a total of 88 spaces, 8 of which are for people with disabilities, 18 with electric charging facilities and 9 with passive provision for electric charging.

6.37 The proposed provision is below the maximum standards identified by LBH and within the range prescribed by the London Plan for Outer London locations.

Proposed Cycle Parking Provision

6.38 For the residential and mixed local centre uses, a total of 2186 cycle parking spaces are to be provided. Of these a total of 78 will be for visitors and 117 will be accessible spaces

6.39 The employment site will have the following cycle parking provision:

- Unit 1- 16 long stay spaces and 8 short stay.
- Unit 2 -6 long stay spaces and 2 short stay.
- Unit 3- 8 long stay spaces and 4 short stay
- Unit 4- 19 long stay spaces and 9 short stay.

Car Club Vehicles

6.40 It is proposed that the development will fund the provision of car club vehicles adjacent to the site on Nestles Avenue. The promotion of car clubs was identified in the Roads Task Force report in 2013 as one of a number of demand management measures which can reduce overall car dependence by making access to cars more flexible, thereby reducing pressure on road space and encouraging sustainable transport. Car clubs are recognised as a key tool in providing for Londoners' urban mobility needs by offering a realistic and economical alternative to private car ownership.

6.41 The Carplus Car Club Annual Survey 2014 / 2015 (April 2015) shows that for each car club vehicle, 8.6 cars have been removed from the road as a result of car club members who have sold a car – that equates to 20,150 private cars removed from London's streets. Joining a car club has also been proven to lead to lower levels of car ownership. Only 20% of long term members surveyed now own a car, compared to almost half owning a car before joining a car club. After joining a car club, new members reduce their car use and increase use of sustainable travel modes. Before joining a car club, 25% travelled by car at least once a week, falling to 18% after joining.

6.42 The survey also provided information to show that car club members use public transport and walked and cycle more than the average Londoner. Where car clubs have been implemented travel by train is more than double the London average, with bus use 25% higher than average. Car club members are three times more likely than the average Londoner to be regular cyclists. Car clubs are used by more people with an average vehicle occupancy of 2.3 people compared to 1.6 people for private cars.

6.43 The TfL Guidance for Residential Travel Planning in London states that every car club vehicle replaces 8 privately owned vehicles, which is consistent with the findings of the Carplus study.

6.44 Car clubs can also bring wider benefits such as:

- Freeing up parking spaces – through members selling a car or deferring a planned purchase of a car;

- Environmental benefits – including improved air quality, reduced CO2 emissions through use of cleaner vehicles (particularly if electric vehicles are used in the fleet) and greater use of sustainable transport;
- Increased familiarity with electric vehicles – making them more visible, desirable and accessible to a wider audience;
- Reduced costs of living – the true costs of owning a car (including upkeep, maintenance and depreciation) are often under-estimated by owners. Car club users can make significant savings when switching from private ownership; and
- Reduced costs of doing business – car clubs can have financial benefits for businesses through rationalised business travel and reduced commuting by car.

6.45 Zipcar have identified their willingness to introduce car club vehicles at Nestles Avenue (see Appendix AM for their proposal). Zipcar have indicated that each of their vehicles takes an average of 10-15 privately owned cars off the road, because members often sell (or do not replace) a car when they join. For this location, Zipcar have recommended a total of 5 car club vehicles would be appropriate when the development is completed. They would introduce the first vehicle at first occupation and then additional vehicles would be added to meet demand. When the first vehicle achieved a utilisation 15% above the fleet average for a period of 8 weeks, a second will be added and further vehicles will be added on this basis.

6.46 Developer funding of £83,311 +VAT will be provided to enable the introduction of these vehicles. Each residential unit will be provided with a welcome pack giving the occupier 3 years' free membership and £25 worth of driver credit per household to encourage residents to use the vehicles.

On-street Parking Controls Around the Site

6.47 At present, there are single yellow line parking controls restricting parking between 08:00-18:30 Monday to Saturday along the northern side of Nestles Avenue from Station Road to approximately 30m beyond Harold Avenue and also along the eastern side of Harold Avenue. However, the remainder of these roads have no controls apart from at junctions where double yellow lines are in place for safety reasons.

6.48 Old Station Road has double yellow lines along its eastern side and no parking controls along the western side of the carriageway. This allows vehicles to manoeuvre into and out of the parking spaces for Hayes Medical Centre.

6.49 At present, there are no other parking controls on the streets immediately to the south of the site to ensure existing residents have access to on-street parking spaces. Surveys undertaken in 2015 of on-street parking stress clearly show that there is pressure on on-street parking during the daytime on weekdays that is likely associated with commuters parking to use Hayes and Harlington Station and for the existing employment uses north of Nestles Avenue.

6.50 LB Hillingdon are in the process of producing a parking study of the area around the site, examining the need for the implementation of a residents parking zone, taking into account the potential increase in on-street parking demand that may occur once Hayes and Harlington Station is served by the Elizabeth Line. This is not yet available, but it is likely that this report will conclude that there is a need for residents parking controls.

6.51 Although it is considered that a parking provision of 0.5 spaces per unit will accommodate the demand for parking for the dwellings on site, the Applicant is prepared to providing funding towards the implementation of a residents permit scheme in the area to the south of the site and to agree that new residents of the development will not be entitled to on-street parking permits. This will ensure the proposals do not have any adverse impact on the availability of on-street parking for existing residents in the area.

7.0 TRIP GENERATION AND DISTRIBUTION

Trip Generation – Proposed Development

Employment

7.1 In order to obtain appropriate trip rates for the proposed 22,663sqm of proposed employment uses on the site, PBA have made reference to the TRICS trip rate database. Industrial Estates in England with multi-modal surveys for sites between 10,000sqm and 50,000sqm GFA have been selected. The TRICS output for these sites is included in **Appendix AA**. From these sites the peak hour person trip rates have been extracted as shown in **Table 7.1**.

Table 7.1 : TRICS Person Trip Rates – Industrial Estate (per 100sqm)

	IN	OUT	TOTAL
Weekday AM Peak	0.400	0.185	0.585
Weekday PM Peak	0.088	0.424	0.512

7.2 Applying the mode share data from the 2011 Census for Journeys to Work from the daytime population of Middle Super Output Area (MSOA) Hillingdon 030 (see **Appendix AB**), would result trip rates by mode for the proposed employment use. This is more appropriate that applying TRICS multi-modal trip rates directly as it allows for the particular characteristics of the area around the site such as public transport availability to be included in the assessment. **Table 7.2** sets out the multi-modal rates per 100sqm of employment floorspace.

Table 7.2 : Employment Multi-modal Trip Rates (per 100sqm)

Mode	AM Peak			PM Peak		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Train	0.036	0.017	0.053	0.008	0.038	0.046
Bus, minibus or coach	0.039	0.018	0.057	0.009	0.041	0.050
Taxi	0.001	0	0.001	0	0	0
Motorcycle, scooter or moped	0.005	0.002	0.007	0.001	0.005	0.006
Car or van driver	0.26	0.12	0.38	0.057	0.275	0.332
Car or van passenger	0.012	0.06	0.072	0.003	0.013	0.016
Bicycle	0.010	0.005	0.015	0.002	0.011	0.013
On foot	0.018	0.008	0.026	0.004	0.019	0.023
Other	0.001	0.001	0.002	0	0.001	0.001

7.3 In addition to trips associated with staff and visitors arriving / departing the site, there will also be trip generation by goods vehicle for this form of development. Rates for these have been taken direct from the TRICS output and are summarised in **Table 7.3**.

Table 7.3 : TRICS OGV Trip Rates – Industrial Estate (per 100sqm)

	IN	OUT	TOTAL
Weekday AM Peak	0.006	0.019	0.025
Weekday PM Peak	0.013	0.013	0.026

7.4 Applying the trip rates above to the GFA of 22,663sqm and give the multi-modal trip generation shown in **Table 7.4**.

Table 7.4 : Employment Multi-modal Trip Generation for 22663sqm GFA

Mode	AM Peak			PM Peak		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Train	8	4	12	2	8	10
Bus, minibus or coach	9	4	13	2	9	11
Taxi	0	0	0	0	0	0
Motorcycle, scooter or moped	1	0	2	0	1	1
Car or van driver	58	27	85	13	61	74
Car or van passenger	3	13	16	1	3	4
Bicycle	2	1	3	0	2	3
On foot	4	2	6	1	4	5
Other	0	0	0	0	0	0
OGV	1	4	6	3	3	6

Residential

7.5 The approach to estimating trip generation has been discussed with both LBH and TfL (see **Appendix A** for information on the pre-application discussions). For the residential uses on site, as explained in Section 6, the level of car parking to be provided on site to reflect the accessibility of the site location. This would also assist in reducing car usage for residents and visitors. It was therefore suggested that the trip generation should reflect the fact that over 50% of residents would not have access to a car and that vehicle trip rates should only be applied to the proportion of residential units with car parking. LBH did not agree with this approach and trip rates including car usage have been applied to all residential units proposed. It should be noted that using this approach does not reflect the low car ownership levels that are likely to occur at the site and therefore results, in our view, an over-estimate of the level of traffic that the proposed development will generate and, therefore, an over-estimate of the impact of traffic associated with the development on the surrounding road network.

7.6 The starting point for identifying residential trip rates has therefore been to utilise the TRICS trip rate database to obtain person trip rates for privately owned flats in Outer London. All sites available in Outer London with surveys undertaken since January 2008 included within TRICS have been used. The full TRICS output is included in Appendix AA and the resultant peak hour person trip rates are set out in Table 7.5.

Table 7.5 : TRICS Person Trip Rates – Residential (per Unit)

	IN	OUT	TOTAL
Weekday AM Peak	0.075	0.3	0.375
Weekday PM Peak	0.313	0.182	0.495

7.7 Applying the mode share data from the 2011 Census for Journeys to Work from residents of Middle Super Output Area (MSOA) Hillingdon 030 (see **Appendix AB**), would result trip rates by mode for the proposed residential use. This is more appropriate that applying TRICS multi-modal trip rates directly as it allows for the particular characteristics of the area around the site relating to public transport availability etc. to be included in the assessment. **Table 7.6** sets out the multi-modal rates per residential unit.

Table 7.6 : Residential Multi-modal Trip Rates (per Unit)

Mode	**AM Peak**			**PM Peak**		
	IN	**OUT**	**TOTAL**	**IN**	**OUT**	**TOTAL**
Underground, metro, light rail or tram	0.0046	0.0184	0.0230	0.0192	0.0112	0.0304
Train	0.0072	0.0288	0.0360	0.0301	0.0175	0.0475
Bus, minibus or coach	0.0166	0.0665	0.0832	0.0694	0.0404	0.1098
Taxi	0.0001	0.0006	0.0007	0.0006	0.0003	0.0009
Motorcycle, scooter or moped	0.0003	0.0012	0.0015	0.0013	0.0007	0.0020
Car or van driver	0.0384	0.1536	0.1920	0.1603	0.0932	0.2534
Car or van passenger	0.0026	0.0103	0.0129	0.0108	0.0063	0.0170
Bicycle	0.0010	0.0038	0.0048	0.0040	0.0023	0.0063
On foot	0.0039	0.0155	0.0193	0.0161	0.0094	0.0255
Other	0.0003	0.0012	0.0015	0.0013	0.0007	0.0020

7.8 **Table 7.7** sets out a comparison of the proposed vehicle trip generation rates with those used with TA's supporting committed developments in the area.

Table 7.7 : Vehicle Trip Rate Comparison with Other Sites

Mode	AM Peak		PM Peak	
	IN	OUT	IN	OUT
Old Vinyl Factory	0.050	0.209	0.157	0.090
Union House	0.060	0.155	0.082	0.022
Trident House	0.010	0.145	0.088	0.053
20 Blyth Road	0.035	0.124	0.097	0.078
Gatefold Building	0.016	0.166	0.118	0.055
Former Nestle Site	0.038	0.154	0.160	0.093

7.9 It can be seen that the vehicle trip rates used are similar to those found acceptable by LBH for other residential schemes in the area.

7.10 Applying these trip rates directly to the 1400 units being assessed results in the multi-modal peak hour trip generation shown in **Table 7.8**.

Table 7.8 : Residential Multi-modal Trip Generation for 1400 units

Mode	AM Peak			PM Peak		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Underground, metro, light rail or tram	6	26	32	27	16	43
Train	10	40	50	42	24	67
Bus, minibus or coach	23	93	116	97	57	154
Taxi	0	1	1	1	0	1
Motorcycle, scooter or moped	0	2	2	2	1	3
Car or van driver	54	215	269	224	130	355
Car or van passenger	4	14	18	15	9	24
Bicycle	1	5	7	6	3	9
On foot	5	22	27	23	13	36
Other	0	2	2	2	1	3

7.11 It should be noted, as explained earlier, that no account has been taken of the effect that the low level of residential parking and the provision of a residents parking controls on the streets adjacent to the site would have on the level of residential vehicular traffic generated. It is therefore considered that the above vehicle trip generation represents a substantial over-estimate of what is likely to occur in reality, but this has been used in the subsequent traffic impact analysis to satisfy LBH requirements.

Mixed Uses Within the Residential Scheme

7.12 The residential component of the scheme also incorporates a small quantum of other uses including community facilities, small scale retail and office space. For the purposed of this TA the following assumptions on the quantum and mix of these uses is as follows:

- A nursery of 582sqm GFA
- A gym of 955sqm GFA
- Office uses of 545sqm GFA; and
- A small café.

7.13 The café use will be ancillary to the other uses on the site and is not expected to generate trips in its own right.

7.14 For the nursery and gym uses the TA focuses on the vehicle trip generation as there are a limited number of appropriate multi-modal surveys available within TRICS for London sites. The full TRICS outputs are available within **Appendix AA**. For the gym, the TRICS trip rates have been applied directly and for the nursery it has been assumed that at least 50% of the places will be taken up by new residents and therefore the TRICS vehicle trip rates have been halved.

7.15 For the office use, person trip rates have been taken from TRICS and the local 2011 Census mode split data applied.

7.16 **Table 7.9** identifies the vehicle trip rates for these uses and **Table 7.10** the resultant vehicle trips.

Table 7.9 : Vehicle Trip Rates for Mixed Uses

Mode	AM Peak			PM Peak		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Gym	0.418	0.523	0.941	0.767	0.244	1.011
Nursery	3.362	3.572	6.933	2.713	4.651	7.364
Office	1.658	0.113	1.770	0.349	1.833	2.182

Table 7.10 : Vehicle Trips for Mixed Uses

Mode	AM Peak			PM Peak		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Gym	4	5	9	7	2	10
Nursery	20	21	40	16	27	43
Office	9	1	10	2	10	12

Trip Generation – Permitted Use on Site

7.17 As part of the scoping discussions, the assumption that the future year baseline traffic flows should allow for the fact that a substantial proportion of the existing buildings on site would be re-occupied if the scheme did not go ahead was proposed. There were a number of reasons for doing this:

- The Institute of Highways and Transport Guidelines for Traffic Impact Assessment (1994), Department for Transport Guidance on Transport Assessment (2007) and Transport for London Guidance on Transport Assessments all identified that where there are permitted vacant uses on site they should be taken into account in the Transport Assessment.
- The site has over 90,000 sqm GFA of existing B2 floorspace that could be re-occupied without requiring planning consent;
- Structural surveys indicate that the vast majority of the buildings are structurally sound and can be brought back into use with limited work;
- A market report indicates that there is demand in the area for B2 floorspace, particularly on ground and first floor levels, although it is unlikely that the entire floorspace would be lettable to a single tenant;

- No property owner would leave an asset of this kind vacant and not generating an income, however small, if there were no realistic prospect of redevelopment.

7.18 On the basis of the above, Transport for London have agreed that they find it acceptable to include the re-occupation of 62,040sqm of B2 floorspace on the site within the future year baseline traffic flow assumptions. LBH, however, have maintained the position that the site should be treated as 'greenfield'. However, it has been decided to proceed on the basis that the existing uses on site that can be realistically re-occupied without further planning consent should be included in the future year baseline scenarios as this is the approach that is consistent with TfL and Government guidance on Transport Assessments.

7.19 In order to obtain appropriate trip rates for the 62,040sqm of existing employment uses on the site that can be re-occupied, PBA have made reference to the TRICS trip rate database. Industrial Units in England with multi-modal surveys for sites between 10,000sqm and 50,000sqm GFA have been selected. The TRICS output for these sites is included in **Appendix AA**. From these sites the peak hour person trip rates have been extracted as shown in **Table 7.11**.

Table 7.11 : TRICS Person Trip Rates – Industrial Estate (per 100sqm)

	IN	OUT	TOTAL
Weekday AM Peak	0.555	0.090	0.645
Weekday PM Peak	0.068	0.499	0.567

7.20 Applying the mode share data from the 2011 Census for Journeys to Work from the daytime population of Middle Super Output Area (MSOA) Hillingdon 030 (see **Appendix AB**), would result trip rates by mode for the proposed employment use. This is more appropriate that applying TRICS multi-modal trip rates directly as it allows for the particular characteristics of the area around the site such as public transport availability to be included in the assessment. **Table 7.12** sets out the multi-modal rates per 100sqm of employment floorspace.

Table 7.12 : Existing Employment Multi-modal Trip Rates (per 100sqm)

Mode	AM Peak			PM Peak		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Train	0.050	0.008	0.058	0.006	0.045	0.051
Bus, minibus or coach	0.054	0.009	0.063	0.007	0.048	0.055
Taxi	0.001	0	0.001	0.001	0.001	0.002
Motorcycle, scooter or moped	0.007	0.001	0.008	0.001	0.006	0.007
Car or van driver	0.360	0.058	0.418	0.044	0.324	0.368
Car or van passenger	0.017	0.003	0.020	0.002	0.015	0.017
Bicycle	0.014	0.002	0.016	0.002	0.013	0.015
On foot	0.025	0.004	0.029	0.003	0.022	0.025
Other	0.002	0	0.002	0	0.002	0.002

7.21 In addition to trips associated with staff and visitors arrive / departing the site, there will also be trip generation by goods vehicle for this form of development. Rates for these have been taken direct from the TRICS output and are summarised in **Table 7.13.**

Table 7.13 : TRICS OGV Trip Rates – Industrial Unit (per 100sqm)

	IN	OUT	TOTAL
Weekday AM Peak	0.028	0.024	0.052
Weekday PM Peak	0.009	0.012	0.021

7.22 Applying the trip rates above to the GFA of 62040sqm and give the multi-modal trip generation shown in **Table 7.14**.

Table 7.14 : Existing Employment Multi-modal Trip Generation for 62040sqm GFA

Mode	AM Peak			PM Peak		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Train	31	5	36	4	28	32
Bus, minibus or coach	34	6	40	4	30	34
Taxi	1	0	1	1	1	2
Motorcycle, scooter or moped	4	1	6	1	4	5
Car or van driver	223	36	259	27	201	228
Car or van passenger	11	2	13	1	9	10
Bicycle	9	1	10	1	8	9
On foot	16	2	18	2	14	16
Other	1	0	1	0	1	1
OGV	17	15	32	6	7	13

Traffic Growth and Committed Development

7.23 It was not possible to reach agreement on a single approach to this that satisfied both Transport for London and LB Hillingdon. Two separate sets of analysis have therefore been carried out.

Transport for London Approach

7.24 TfL have stated that it is there view that the use of TEMPRO growth rates over-estimates future year traffic flows in London and they have required that we use their WeLHAM model to predict future year traffic flows with and without the development in place. In our view, this is the appropriate approach to predict future year traffic flows and it would be more appropriate to use this methodology to assess the entire road network.

7.25 The TfL WeLHAM model has been used to obtain future year baseline traffic flows around the site. A review of the strategic model was undertaken to ensure that it is fit for the purpose of assessing traffic reassignment in the Hayes area. This was done by checking the turning flows at critical junctions and comparing them to measured values, bearing in mid the possible difference created by the vacant site.

7.26 The Future Base traffic flows model uses a 2021 reference case, as agreed with TfL. To avoid any double counting of traffic in the zone of the model that represents the former Nestle site. Details of that zone of the model were provided by TfL and it was found to not be including any significant employment related trips. The trip generation assumptions for the re-occupation of the site were therefore included within this zone for the future base scenario. The WeLHAM model already includes committed development schemes within the 2021 reference case, including the Southall Gas Works site, and therefore no further allowance was required for committed development. Committed road improvements schemes, including the Hayes Town Centre scheme, have also been included in the Future Base model.

7.27 The Future Proposed model is the Future Base model with the trip generation for the former Nestle site zone replaced with the predicted traffic generation associated with the proposed model.

7.28 In addition to the Future Proposed model, a further set of sensitivity tests with the inclusion of additional development on the remainder of the land north of Nestles Avenue has also been run, to allow a cumulative assessment of these schemes.

7.29 The traffic flows for the Future Base, Future Proposed and Future Proposed Cumulative scenarios for the Bulls Bridge Roundabout and M4 J3 have been extracted from the WeLHAM model runs and used within the TfL LINSIG models of these junctions to assess the impact of the development on those junctions.

7.30 Further details of the WeLHAM model used in this assessment are provided in **Appendix AC**.

London Borough of Hillingdon Approach

7.31 LBH do not agree that WeLHAM is the most appropriate tool for estimating future traffic flows on their road network. They have required a methodology that sees TEMPRO growth factors applied to the 2016 survey data and the addition of traffic associated with committed developments in the area. Scenarios including the anticipated opening year (i.e. the first year that the development would be fully occupied) of the project (2024) and five years after opening (2029) have been undertaken.

7.32 The relevant traffic growth factors from TEMPRO are summarised in **Table 7.15**.

Table 7.15 : TEMPRO Traffic Growth Factors for Hillingdon

	IN	OUT
2016 – 2024	1.0843	1.0853
2016 - 2029	1.1103	1.1130

7.33 Applying these factors to the 2016 observed traffic flows, gives the resultant growthed traffic shown in **Figure 7.1** to **7.4**.

7.34 In terms of committed developments, the following have been taken into account:

- Southall Gas Works
- Old Vinyl Factory include the change from cinema to UTC college
- EMI Prologis Site
- 20 Blyth Road
- Asda Development – industrial component only
- Hyde Park Hayes Unit 4
- Hayes High Street improvement scheme
- Enterprise Hose, Blyth Road
- Trident House, Station Road
- Union House, Clayton Road
- Plot 6 Rackspace City North Hyde Road
- Unit 3 Millington Road Hayes
- Gatefold Building, Blyth Road
- Silverdale Road development

7.35 Development at Lake Farm School Botwell Lane and Costco at Western International Market were also examined and it was found that there were opening in 2014 and would therefore have been picked up in the 2016 survey data. The M4 Smart Motorways scheme was also examined and information submitted to the Examination in Public identified that this made no material change to the traffic flow on Parkway north of the M4 and would not therefore affect the area around the site.

7.36 Relevant extracts from the Transport Assessments associated with the above projects and traffic flow diagrams showing the change in traffic flow on the road network associated with each of these projects are included in **Appendix AD**.

7.37 Background traffic flows for 2024 and 2029 not associated with the site can be seen in **Figures 7.5** to **7.8**.

Former Nestle Site Trip Distribution

7.38 For the TfL analysis, trip distribution is dealt with as part of the WeLHAM modelling exercise.

7.39 For the LBH analysis, trip distribution assumptions for the proposed development are on the basis of 2011 journey to work for home based and work based data for the Hillingdon 030 middle layer super output area, which is there the development site is located. There are six main routes to / from the site onto the wide road network:

- Route 1 – North Hyde Road and the A132 to the north of the site
- Route 2 – North Hyde Road and Dawley Road
- Route 3 – Station Road and Shepiston Lane
- Route 4 – North Hyde Road and A312 to the south of the site
- Route 5 – North Hyde Road and Hayes Road to the west
- Route 6 – Station Road and High Street to the south

7.40 **Appendix AE** include a breakdown of the routeing assumptions made and proportion of trips to each destination identified from the 2011 Census data. In summary, the resultant trip distribution for residential and employment trips is shown in **Table 7.16**.

Table 7.16 : Trip Distribution Assumptions

	Residential	Employment
Route 1	21.56%	28.46%
Route 2	12.51%	9.61%
Route 3	3.85%	4.72%
Route 4	33.97%	45.55%
Route 5	12.27%	8.33%
Route 6	14.84%	3.34%

7.41 Applying the above distribution assumptions to the traffic generation associated with the permitted use on site and the predicted trip generation for proposed uses results in the traffic flows shown in **Figure 7.9** to **7.20**.

Further Development North of Nestles Avenue

7.42 To undertake cumulative tests with the introduction of development on the other sites that are located to the north of Nestles Avenue, the following assumptions on development quantum have been made:

- Precis Site – 164 residential units and 1500sqm of office floorspace. As the access storage facility is to be replaced on this site, no adjustment to the survey data to reflect existing trip generation has been made
- Beccleuch Site – 410 residential units. As there are replacement employment uses also proposed, it has been assumed that these will result in the same level of trip generation as the existing uses on the site
- Squirrels Trading Estate – 400 residential units. As there is likely to be replacement employment uses on the site, it has been assumed that these will results in the same level of trip generation as the existing uses on the site.

7.43 **Table 7.17** sets out the anticipated vehicle trip generation associated with these sites, utilising the same trip rates that have been applied to the former Nestle Site.

Table 7.17 : Vehicle Trips for Cumulative Development Schemes

Mode	AM Peak			PM Peak		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Precis Site – Residential	6	25	31	26	15	42
Precis Site – Office	25	2	27	5	27	33
Beccleuch Site	16	63	79	66	38	104
Squirrel Trading Estate	15	61	77	64	37	101

7.44 These flows have been distributed using the same assumptions as applied for the former Nestle site. The resultant development traffic flows are shown in **Figures 7.21** to **7.28**.

Traffic Flows Used in Stand Alone Junction Modelling

7.45 The various traffic flows used in the junction capacity assessments of the junctions in LBH's network are as follows:

- 2024 Baseline – 2024 background traffic with the addition of flows associated with the re-occupation of the existing uses on site. These are shown in **Figure 7.29** to **7.30**.
- 2024 With Development – 2024 background traffic with the addition of flows associated with the proposed uses on site. These are shown in Figures **7.31** to **7.32**.
- 2029 Baseline – 2029 background traffic with the addition of flows associated with the re-occupation of the existing uses on site. These are shown in **Figure 7.33** to **7.34**.
- 2029 With Development – 2029 background traffic with the addition of flows associated with the proposed uses on site. These are shown in **Figures 7.35** to **7.36**.
- 2024 Cumulative Baseline – 2024 background traffic with the addition of flows associated with the re-occupation of the existing uses on site and the redevelopment of other sites on Nestles Avenue. These are shown in **Figure 7.37** to **7.38**.
- 2024 Cumulative With Development Baseline – 2024 background traffic with the addition of flows associated with the proposed uses on site and the redevelopment of other sites on Nestles Avenue. These are shown in **Figures 7.39** to **7.40**.
- 2029 Cumulative Baseline – 2029 background traffic with the addition of flows associated with the re-occupation of the existing uses on site and the redevelopment of other sites on Nestles Avenue. These are shown in **Figure 7.41** to **7.42**.
- 2029 Cumulative With Development – 2029 background traffic with the addition of flows associated with the proposed uses on site and the redevelopment of other sites on Nestles Avenue. These are shown in **Figures 7.43** to **7.44**.

7.46 These flow diagrams have also been utilised in the development of trip matrices for the VISSIM model of the LBH road network.

8.0 TRAFFIC IMPACT

Development Traffic Impact

8.1 This section of the Transport Assessment considers the impact of the development on both the LBH and TfL road network. Following the assessment of the development traffic on its own, an assessment of the impact of cumulative development of all of the land north of Nestles Avenue follows.

8.2 The assessments have been carried out utilising the various models that were used to understand the existing situation in Section 4 of this report. The assessments have been carried out using the traffic flows derived as explained in Section 7. As the baseline scenario includes traffic that would be generated by the re-occupation of existing buildings of the site, there are some locations that would potentially experience less traffic with the development proposals in place than if the site were re-occupied. As a result, in some locations the modelling may show reduction in queues on certain junction approaches in the with development scenario when compared to the baseline. It should also be noted that using the methodology recommended by TfL and making use of the WeLHAM strategic model, this allows for the wider redistribution of traffic across the road network, which may also show lower levels of traffic on some junctions approaches in the with development scenario when compared to the baseline.

8.3 The assessments identify the changes in queues and RFC / Degree of Saturation at particular junctions and changes in journey times on particular routes. The test against which developments are assessed in terms of the acceptability of their traffic impact is set out in paragraph 32 of the NPPF, where it is stated that developments should not be refused planning consent unless they have a severe residual cumulative impact. There is, however, no statutory definition of what a 'severe' impact is and it is a matter for professional judgement. Where junctions experience RFC's below 0.85 and Degrees of Saturation below 90%, the junctions are considered to operate within capacity and if they remain within these limits the development would not be considered to have any significant impact. Where these limits are exceeded in the baseline scenario or as a result of the development proposals, then consideration needs to be given to what effect there is on queue lengths. It is generally considered that queue lengths increase of three vehicles or less would be considered a minor impact, between 3 and 10 vehicle queue length increases a moderate impact and increases of more than 10 vehicles could begin to be considered as a severe impact.

London Borough of Hillingdon Road Network

Stand-alone junction modelling

8.4 The starting point for assessing the impact of development has been to use the stand-alone junction models with predicted future year flows to assess the effect that development traffic would have on the network. The following scenarios (as described in Section 7) are assessed:

- 2024 Baseline and With Development
- 2029 Baseline and With Development

8.5 The following paragraphs look at each junction in turn.

Dawley Road / Botwell Common Road Priority Junction

8.6 The base PICADY model used in Section 3 has been re-run with the traffic flows for each of the scenarios identified. The results are summarised in **Tables 8.1** and **8.2**.

Table 8.1: Dawley Road / Botwell Common Road – 2024 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Botwell Common Road – Left Turn	2.1	172.8	2.11	173.4	2.16	70.2	2.34	76.3
Botwell Common Road – Right Turn	2.08	66.5	2.09	66.8	2.16	67.5	2.34	73.3
Dawley Road – Right Turn	0.67	2.7	0.66	2.7	0.92	19.7	0.94	22.8

Table 8.2: Dawley Road / Botwell Common Road – 2029 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Botwell Common Road – Left Turn	2.23	189.2	2.24	189.7	2.48	82.5	2.74	89.4
Botwell Common Road – Right Turn	2.21	73.2	2.22	73.4	2.48	79.4	2.74	86
Dawley Road – Right Turn	0.69	3.1	0.69	3	0.96	27.5	0.97	32.3

8.7 It can be seen that the by 2024, the additional traffic growth and committed development traffic results in the Botwell Common Road arm of the junction being significantly over capacity, with RFC's in excess of 2 in both peaks. The Dawley Road right turn operates within capacity in the AM peak, but is over-capacity in the PM peak at 0.92 in 2024 and 0.96 in 2029.

8.8 The introduction of development traffic has very little impact on Dawley Road in the PM peak, increasing RFCs by no more 0.2 and queues by 3 vehicles in the PM peak in 2024 and by less than 5 vehicles in 2029.

8.9 The impacts on Botwell Common Road in the AM peak are also very small, with queues increasing by less than 1 vehicle as a result of development. However, in the PM peak queues increase with the development by 6 vehicles in 2024 and 7 vehicles in 2029. The potential for improving capacity on this arm of the junction has therefore been investigated in Section 9 of this Report.

Botwell Common Road / Botwell Lane Mini-roundabout

8.10 The base ARCADY model used in Section 3 has been re-run with the traffic flows for each of the scenarios identified. The results are summarised in Tables 8.3 and 8.4

Table 8.3: Botwell Common Road / Botwell Lane – 2024 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Botwell Lane North	0.71	2.6	0.71	2.6	0.28	0.4	0.28	0.4
Botwell Lane South	0.59	1.5	0.59	1.5	0.74	3	0.74	3
Botwell Common Road	0.49	1.1	0.49	1.1	0.46	0.9	0.46	0.9

Table 8.4: Botwell Common Road / Botwell Lane – 2029 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Botwell Lane North	0.73	2.8	0.73	2.8	0.29	0.4	0.29	0.4
Botwell Lane South	0.6	1.6	0.6	1.6	0.75	3.2	0.75	3.2
Botwell Common Road	0.5	1.1	0.5	1.1	0.47	1	0.47	1

8.11 It can be seen that this junction continues to operate within capacity under all scenarios and no improvement is required.

Botwell Lane / Printinghouse Lane Priority Junction

8.12 The Botwell Lane / Printinghouse Lane priority junction PICADY model has been re-run under 2024 and 2029 baseline and with development flows. Full results are available in **Appendix F** and are summarised in **Tables 8.5** and **8.6**.

Table 8.5: Botwell Lane / Printinghouse Lane – 2024 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Printinghouse Lane – Left and Right Turn	1.18	33.4	1.18	33.4	1.74	249	1.74	249
Botwell Lane – Right Turn	1	25.7	1	25.7	0.33	0.8	0.33	0.8

Table 8.6: Botwell Lane / Printinghouse Lane – 2029 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Printinghouse Lane – Left and Right Turn	1.25	41.4	1.25	41.4	1.8	272.4	1.8	272.4
Botwell Lane – Right Turn	1.03	32.2	1.03	32.2	0.34	0.9	0.34	0.9

8.13 It can be seen that the Printinghouse Lane arm of this junction is over capacity in both 2024 and 2029 as a result of the introduction of traffic growth and committed development traffic. The right turn from Botwell Lane also has capacity issues in the AM peak under baseline flows.

8.14 Looking at the with development scenario results, these are unchanged as a result of the development and no improvements are required to mitigate for development traffic impact.

Botwell Lane / Church Lane Mini-roundabout

8.15 The Botwell Lane / Church Lane mini-roundabout ARCADY model has been re-run under 2024 and 2029 baseline and with development traffic flows. Full results provided in **Appendix G** and summarised in **Tables 8.7** and **8.8.**

Table 8.7: Botwell Lane / Church Lane mini-roundabout- 2024 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Church Road	1.12	40.9	1.12	40.9	0.66	2.1	0.66	2.1
Botwell Lane South	1.54	280.6	1.54	280.6	1.29	131.6	1.29	131.6
Botwell Lane West	0.91	9.2	0.91	9.2	0.97	15.9	0.97	15.9

Table 8.8: Botwell Lane / Church Lane mini-roundabout- 2029 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Church Road	1.15	48.3	1.15	48.3	0.68	2.2	0.68	2.2
Botwell Lane South	1.57	307.8	1.57	307.8	1.33	151.1	1.33	151.1
Botwell Lane West	0.93	10.6	0.93	10.6	1	20.3	1	20.3

8.16 It can be seen that all arms of this junction have RFC's in excess of 0.85 in the AM peak baseline flows in both 2024 and 2029. In the PM peak, only the Church Road arm has RFCs below 0.85 under both baseline scenarios.

8.17 It can be seen that the junction performance is unchanged by the development and therefore no mitigation is required.

Botwell Lane / Pump Lane / Coldharbour Lane / East Avenue Roundabout

8.18 The Botwell Lane / Pump Lane / Coldharbour Lane / East Avenue roundabout ARCADY model has been re-run using the 2024 and 2029 baseline and with development traffic flows. Full results are provided in **Appendix H** and summarised in **Tables 8.9** and **8.10.**

Table 8.9: Botwell Lane / Pump Lane / Coldharbour Lane / East Avenue roundabout – 2024 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Coldharbour Lane	1.68	256	1.68	256	0.96	12.3	0.96	11.6
Pump Lane	0.86	6.1	0.86	6.1	0.88	6.7	0.88	6.2
Botwell Lane	0.55	1.4	0.55	1.4	0.67	2.2	0.67	2
East Avenue	0	0	0	0	0	0	0	0

Table 8.10 : Botwell Lane / Pump Lane / Coldharbour Lane / East Avenue roundabout – 2029 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Coldharbour Lane	1.73	275.5	1.73	275.5	0.99	16.3	0.99	15.4
Pump Lane	0.88	6.7	0.88	6.7	0.91	8.3	0.91	7.7
Botwell Lane	0.56	1.4	0.56	1.4	0.68	2.3	0.68	2.1
East Avenue	0	0	0	0	0	0	0	0

8.19 It can be seen that both the Coldharbour Lane and Pump Lane arms of this junction would have RFCs in excess of 0.85 in both peak periods under 2024 and 2029 baseline traffic flows. This is as a result of the traffic growth and committed development traffic flows, as the junction was assessed to operate within capacity under 2016 flows.

8.20 The introduction of development traffic has no effect of the performance of this junction and no mitigation is required as a result of the development.

Dawley Road / Kestrel Way / Betam Road / Blyth Road Roundabout

8.21 The Dawley Road / Kestrel Way / Betam Road / Blyth Road roundabout is to have improvement measures implemented as part of the Old Vinyl Factory development proposals. The ARCADY model has been updated to reflect these and has been run using 2024 and 2029 baseline and with development traffic flows. Full results are provided in **Appendix I** and summarised in **Tables 8.11** and **8.12.**

Table 8.11: Dawley Road / Kestrel Way / Betam Road / Blyth Road with OVF Improvements – 2024 Traffic Flows-

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Dawley Road North	0.84	5.6	0.83	5.2	0.49	1	0.51	1.1
Blyth Road	0.93	10.4	0.93	9.7	1.18	93.4	1.21	102.9
Dawley Road South	1.26	202.4	1.28	226.8	1.08	67.2	1.09	68.5
Kestrel Way	0.17	0.2	0.17	0.2	0.37	0.6	0.37	0.6
Betam Road	0.1	0.1	0.1	0.1	0.27	0.4	0.27	0.4

Table 8.12: Dawley Road / Kestrel Way / Betam Road / Blyth Road With OVF Improvements – 2029 Traffic Flows-

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Dawley Road North	0.86	6.2	0.85	5.8	0.5	1.1	0.52	1.2
Blyth Road	0.97	14.7	0.96	13.5	1.22	107.8	1.24	117.5
Dawley Road South	1.28	230.6	1.31	255.8	1.1	80.5	1.11	82.5
Kestrel Way	0.17	0.2	0.17	0.2	0.38	0.7	0.38	0.7
Betam Road	0.11	0.1	0.11	0.1	0.27	0.4	0.27	0.4

8.22 It can be seen that the in both peak in both years, the Blyth Road and Dawley Road South arms of this junction have RFC's in excess of 0.85 in the baseline scenarios. This is a result of background traffic growth and committed development. The Blyth Road approach to the junction, in particular, experiences a substantial increase in traffic as a result of the Old Vinyl Factory and other adjacent to it.

8.23 The addition of traffic associated with the Nestle site development has limited impact on the Blyth Road arm of the junction, but has a noticeable effect on Dawley Road South arm of the junction in the AM peak period. The potential for improvements to be made to the Dawley Road South arm of the junction are examined in Section 9 of this report.

Dawley Road / North Hyde Road / Millington Road / Bourne Avenue Roundabout

8.24 The Dawley Road / North Hyde Road / Millington Road / Bourne Avenue roundabout has been modelled using ARCADY, full results are provided in **Appendix J** and summarised in **Tables 8.13** and **8.14**.

Table 8.13: Dawley Road / North Hyde Road / Millington Road / Bourne Avenue – 2024 Traffic Flows –

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Dawley Road North	0.93	12.5	0.93	11.5	0.94	13.3	0.96	16.8
North Hyde Road	0.78	3.7	0.81	4.4	0.65	2	0.66	2
Millington Road	0.2	0.3	0.21	0.3	0.85	5.1	0.86	5.4
Dawley Road South	1.11	65.5	1.12	71.1	0.85	5.6	0.85	5.9
Bourne Avenue	1.01	15.3	1.03	17.7	0.54	1.3	0.55	1.3

Table 8.14: Dawley Road / North Hyde Road / Millington Road / Bourne Avenue – 2029 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Dawley Road North	0.95	15.7	0.95	14.2	0.96	17.2	0.97	21.2
North Hyde Road	0.8	4.1	0.83	5	0.67	2.2	0.68	2.2
Millington Road	0.22	0.3	0.22	0.3	0.9	7	0.9	7
Dawley Road South	1.13	77.5	1.15	83.9	0.88	6.8	0.88	6.9
Bourne Avenue	1.03	19	1.06	21.8	0.57	1.4	0.57	1.4

8.25 It can be seen that in the AM peak Dawley Road North, Dawley Road South and Bourne Avenue all have RFCs in excess of 0.85 in 2024 and 2029 baseline scenarios. In the PM peak 2024 baseline scenario, only Dawley Road North has an RFC in excess of 0.85. By 2029, Millington Road and Dawley Road South also have RFC's over 0.85 in the baseline scenario.

8.26 The introduction of development traffic slightly worsens the performance of this junction, with the biggest impact being an increase in queue length on Dawley Road South in the AM peak hour with an increase of 5.6 vehicles in 2024 and 6.4 vehicles in 2029. This is not considered to be a severe adverse impact and no improvement as a result of the development is required.

North Hyde Road / Station Road and Station Road / Millington Road Signals

8.27 The North Hyde Road / Station Road and Station Road / Millington Road LINSIG model has been amended to reflect the improvements identified to be provided as part of the Old Vinyl Factory scheme (as shown in **Appendix AF**) and run using 2024 and 2029 baseline and with development traffic flows. Full results are provided in **Appendix K** and summarised in **Tables 8.15** and **8.16**.

Table 8.15: Station Road / North Hyde Road and Station Road / Millington Road – 2024 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	DoS	Queue	DoS	Queue	DoS	Queue	DoS	Queue
Station Rd South of North Hyde Road – Left and Ahead	43.4	15	43.2	18.3	58.6	17.9	65.0	9.9
Station Rd South of North Hyde Road – Right	94.4	15.9	98.0	16.6	87.8	11.0	90.7	7.3
Station Rd North	74.2	14.6	77.8	16.6	69.4	11.0	79.8	13.5
North Hyde Road West	64.5	10.1	66.8	10.1	83.5	16.4	85.3	17.0
North Hyde Road East	94.3	31.6	98.2	36.8	87.8	17.9	91.2	17.2
Station Rd North of Millington Rd	60.3	16.2	58.9	13.4	70.4	17.1	62.4	17.4
Bedwell Gardens	25.5	2.5	41.7	3.4	17.0	2.1	35.1	2.4
Station Road South of Millington Rd	71.5	19.2	74.8	20.7	85.8	23.1	76.9	17.5
Millington Rd	61.1	5.2	56.3	5.9	87.7	11.8	75.9	9.1

Table 8.16: Station Road / North Hyde Road and Station Road / Millington Road – 2029 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	DoS	Queue	DoS	Queue	DoS	Queue	DoS	Queue
Station Rd South of North Hyde Road – Left and Ahead	42.9	6.1	58.8	14.4	60.6	18.2	68.8	25.3
Station Rd South of North Hyde Road – Right	98.2	11.2	107.5	22.4	90.8	11.8	93.1	15.6
Station Rd North	62.3	12.1	107.9	68.1	72.1	11.8	92.8	20.4
North Hyde Road West	68.1	9.3	57.6	6.4	83.7	16.9	76.3	12.4
North Hyde Road East	98.3	34.6	82.0	17.1	90.7	18.9	91.3	15.9
Station Rd North of Millington Rd	57.0	17.7	65.1	18.3	58.8	16.8	62.6	18.9
Bedwell Gardens	43.1	3.4	22.9	2.6	36.0	2.6	36.0	2.6
Station Road South of Millington Rd	67.0	14.0	76.1	20.2	70.6	19.9	91.6	27.8
Millington Rd	55.5	6.2	67.5	5.7	85.3	13.4	80.4	12.0

8.28 It can be seen that in the AM peak under both 2024 and 2029 baseline flows the right turn from Station Road south and the North Hyde Road east arms of the junction have degrees of saturation in excess of 90%. In the PM peak under 2024 baseline flows the junction is within capacity and has degrees of saturation marginally over 90% on the Station Road south right turn and North Hyde Road East.

8.29 The addition of development traffic worsens the performance of this junction marginally under the 2024 scenario, but more noticeably under in the AM peak in 2029. Further examination of the potential for improving the junction performance is therefore undertaken in Section 9.

Station Road / High Street Signals

8.30 The Station Road / High Street signals LINSIG model has been re-run under 2024 and 2029 baseline and with development traffic flows. Full results are provided in **Appendix L** and are summarised in **Tables 8.17** and **8.18**

Table 8.17: Station Road / High Street – 2024 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	DoS	Queue	DoS	Queue	DoS	Queue	DoS	Queue
Station Road North	77.8:73.8	11.7	78.2:78.2	11.4	68.4:74.9	9.0	68.6:82.9	10.7
High Street	74.6:74.6	6.9	79.3:79.3	8.5	82.9:82.9	12.2	86.1:86.1	11.9
Station Road West	77.1	9.8	82.1	12.0	84.1	12.5	84.9	10.9

Table 8.18: Station Road / High Street – 2024 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	DoS	Queue	DoS	Queue	DoS	Queue	DoS	Queue
Station Road North	79.7:76.0	12.3	80:0:80.0	12.0	70.0:77.9	9.3	70.1:83.6	10.8
High Street	76.2:76.2	7.1	81.0:81.0	8.8	84.9:84.9	13.0	88.0:88.0	13.8
Station Road West	78.6	10.1	83.9	12.5	86.1	13.3	87.7	11.7

8.31 It can be seen that these signals would remain within capacity under all of the scenarios tests.

Station Road / Nestles Avenue Priority Junction

8.32 The Station Road / Nestles Avenue priority junction PICADY model has been re-run using 2024 and 2029 baseline and with development traffic flows. Full results are provided in **Appendix M** and summarised in **Tables 8.19** and **8.20**.

Table 8.19: Station Road / Nestles Avenue – 2024 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Nestles Avenue	0.36	0.6	0.55	1.3	0.33	0.5	0.49	1
Station Road North – Right	0.04	0	0.04	0	0.06	0.1	0.06	0.1
Keith Road	0.22	0.3	0.23	0.3	0.16	0.2	0.16	0.2
Station Road South - Right	0.16	0.2	0.23	0.3	0.13	0.2	0.33	0.6

Table 8.20: Station Road / Nestles Avenue – 2029 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Nestles Avenue	0.38	0.7	0.57	1.4	0.34	0.6	0.51	1.1
Station Road North – Right	0.04	0	0.04	0	0.06	0.1	0.06	0.1
Keith Road	0.23	0.3	0.24	0.3	0.16	0.2	0.17	0.2
Station Road South - Right	0.17	0.2	0.23	0.3	0.14	0.2	0.33	0.6

8.33 It can be seen that this junction remains within capacity under all scenarios modelled.

Nestles Avenue / Harold Avenue Priority Junction

8.34 The Nestles Avenue / Harold Avenue priority junction PICADY model has been re-run under 2024 and 2029 baseline and with development traffic flows. Full results are provided in **Appendix N** and summarised in **Tables 8.21** and **8.22**.

Table 8.21: Nestles Avenue / Harold Avenue – 2024 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Harold Avenue	0.17	0.2	0.17	0.2	0.12	0.1	0.12	0.1
Nestles Avenue - Right	0.25	0.3	0.25	0.3	0.21	0.3	0.21	0.3

Table 8.22: Nestles Avenue / Harold Avenue – 2029 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Harold Avenue	0.18	0.2	0.18	0.2	0.13	0.1	0.13	0.1
Nestles Avenue - Right	0.26	0.4	0.26	0.4	0.21	0.3	0.21	0.3

8.35 It can be seen that this junction operates within capacity under all scenarios tests.

Harold Avenue / North Hyde Road / Crane Gardens Priority Junction

8.36 The Harold Avenue / North Hyde Road / Crane Gardens priority junction PICADY model has been re-run using 2024 and 2029 baseline and with development traffic flows. Full results are provided in **Appendix O** and summarised in **Tables 8.23** and **8.24**.

Table 8.23: Harold Avenue / North Hyde Road / Crane Gardens – 2024 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Crane Gardens	0.17	0.2	0.18	0.2	0.1	0.1	9999999999	19.4
North Hyde Road East – Right	0.7	6.5	0.99	34.6	0.31	1.4	1.03	44.1
Harold Avenue	0.55	1.3	0.97	10.5	0.41	0.8	0.7	2.4
North Hyde Road West - Right	0.48	3.2	0.6	5.2	0.17	0.6	0.24	1.1

Table 8.24: Harold Avenue / North Hyde Road / Crane Gardens – 2029 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Crane Gardens	0.18	0.2	1.18	7.7	0.1	0.1	9999999999	20.5
North Hyde Road East – Right	0.75	8.2	0.99	36.8	0.33	1.6	1.05	51
Harold Avenue	0.58	1.4	1.01	13.7	0.43	0.8	0.73	2.7
North Hyde Road West - Right	0.52	3.7	0.64	6	0.19	0.7	0.26	1.3

8.37 It can be seen that under baseline traffic flows the junction operates within capacity in 2024 and 2029 during both peaks. The addition of development traffic pushes this junction over capacity and further consideration to mitigation measures is made in Section 9.

North Hyde Gardens / North Hyde Road / Watersplash Lane Junction

8.38 This is a signal controlled junction on North Hyde Road in close proximity to the Bulls Bridge Roundabout. It forms part of the SCOOT network that operates at the Bulls Bridge Roundabout signals and its operation and signal timings are directly linked to the roundabout. This junction is included within the TfL approved model of the Bulls Bridge Roundabout, with signal staging and operation fully incorporated although the full link structure was not created. As this junction is inextricably linked to the Bulls Bridge Roundabout it is appropriate that it is assessed using the TfL LINSIG model and traffic flows. The model output included in Appendix S has therefore been used to obtain summary results of the junction performance, as shown in **Tables 8.25 and 8.26**.

Table 8.25 : North Hyde Gardens / North Hyde Road / Watersplash Lane – Baseline Flows

Approach Name	AM Peak		PM Peak	
	DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)
North Hyde Road East	21.1	2	67.7	8
North Hyde Gardens	64.2	4	92.2	12
Watersplash Lane	2.7	0	5.8	0
North Hyde Road West	83.8	21	87.1	17

Table 8.26 : North Hyde Gardens / North Hyde Road / Watersplash Lane – With Development Flows

Approach Name	AM Peak		PM Peak	
	DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)
North Hyde Road East	27.0	2	73.5	14
North Hyde Gardens	52.4	3	57.8	4
Watersplash Lane	2.7	0	5.8	0
North Hyde Road West	75.2	17	86.0	17

8.39 In the AM peak baseline the junction operates within capacity. In the PM peak, with the factory building re-occupied the junction would have some capacity issues on the North Hyde Gardens approach. In the with development scenario the junction operates within capacity.

VISSIM modelling

8.40 Details of the methodology applied to construct the future year VISSIM models is provided in **Appendix AD**. The models have been run using dynamic assignment as requested and by LBH under the following scenarios:

- 2016 Base model AM and PM peak
- 2024 Baseline model AM and PM peak
- 2024 Baseline plus Development AM and PM peak
- 2024 Baseline plus Development plus Cumulative AM and PM peak
- 2029 Baseline model AM and PM peak
- 2029 Baseline plus Development AM and PM peak
- 2029 Baseline plus Development plus Cumulative AM and PM peak

8.41 VISSIM does not provide outputs in the form of flow over capacity ratios in the way that stand alone junction models do. The main output is in the form of journey times through the network. In order to identify the change in journey time under each scenario, journey time data has been extracted for each of the routes that were covered in the original journey time surveys (see **Figures 4.4** to **4.6** in Section 4). These are set out graphically in the Figures below.

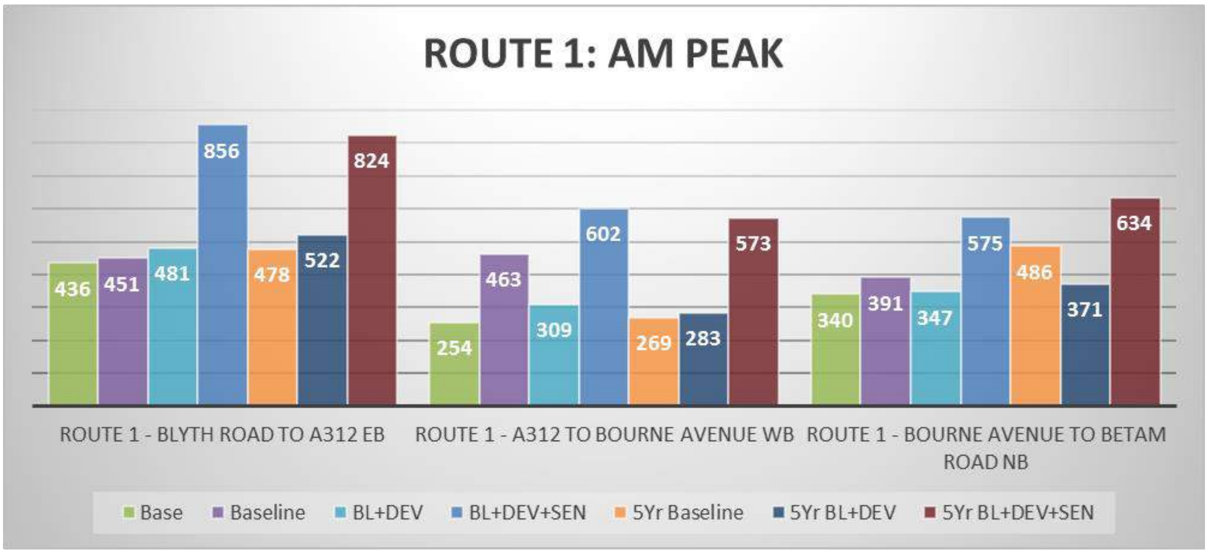


Figure 8.1 : AM Peak Journey Times Dawley Road / North Hyde Road

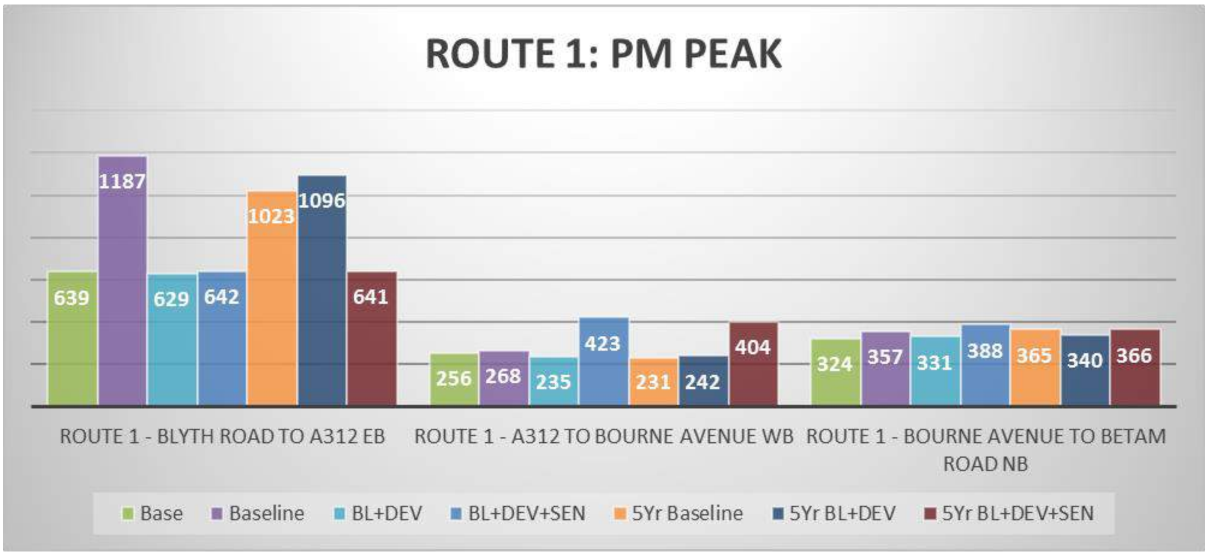


Figure 8.2 : PM Peak Journey Times Dawley Road / North Hyde Road

8.42 Looking firstly at the route from the north of Blyth Road through to the Bulls Bridge Roundabout, the journey time in the 2024 baseline scenario is 451 seconds in the AM peak. The introduction of the development traffic increases this journey time by 30 seconds. In the PM peak, the VISSIM model shows the journey time on this route reducing by 528 seconds from 1187 seconds to 629 seconds. The reason for this decrease is that the level of traffic that would result from the re-occupation of the Nestle site in the baseline scenario would result in much more significant delays on the North Hyde Road east approach to the Bulls Bridge Roundabout.

8.43 For the 2029 scenarios, journey time form Blyth Road to the A312 eastbound would have increased to 478 seconds in the baseline scenario and to 522 seconds in the with development scenario, an increase of 44 seconds. In the PM peak, baseline journey times are much higher in this direction at 1023 seconds, increasing to 1096 seconds with development, an increase of 73 seconds.

8.44 Looking at the reverse route, travelling along North Hyde Road and Dawley Road to Bourne Avenue, in the AM peak baseline scenario the journey time for this route would be 463 seconds. In the with development scenario, this would reduce to 309 seconds. Again, this is as a result of the reduction in delay at the Bulls Bridge Roundabout in this direction when compared with the existing uses being re-occupied. In the PM peak the baseline journey time would be 268 seconds reducing to 235 seconds.

8.45 In the 2029 scenarios in the AM peak the baseline journey time would increase from 269 seconds to 283 seconds with the development (an increase of 14 seconds). For the PM peak the baseline journey time would be 231 seconds increase to 242 seconds with the development in place (an increase of 11 seconds).

8.46 The final route shown on these plans is from Bourne Avenue travelling north to Betam Way. In the 2024 AM peak the baseline journey time would be 391 seconds reducing to 347 seconds with the development in place. In the PM peak the journey times are slightly lower at 357 seconds in the baseline reducing to 331 seconds with the development.

8.47 In the 2029 scenarios, the AM peak journey times reduce from 486 seconds in the baseline to 371 seconds with the development. In the PM peak there is also a reduction from 365 seconds in the baseline to 340 seconds in the with development scenario.

8.48 It can be seen that the proposed development does not have a severe adverse effect on journey times on any of these routes.

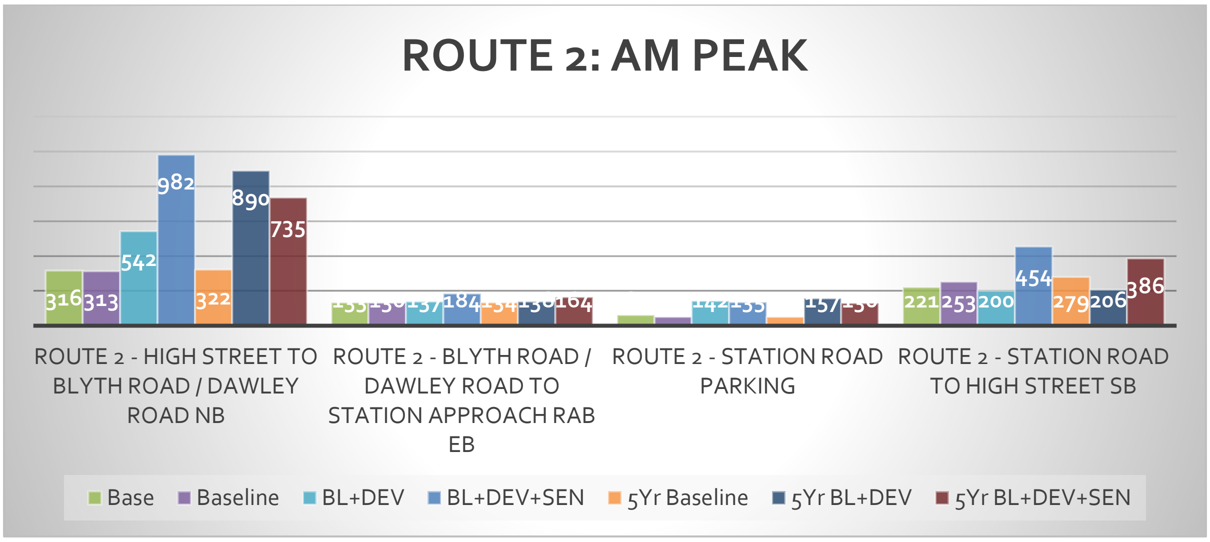


Figure 8.3 : AM Peak Journey Time Station Road and Blyth Road / Clayton Road

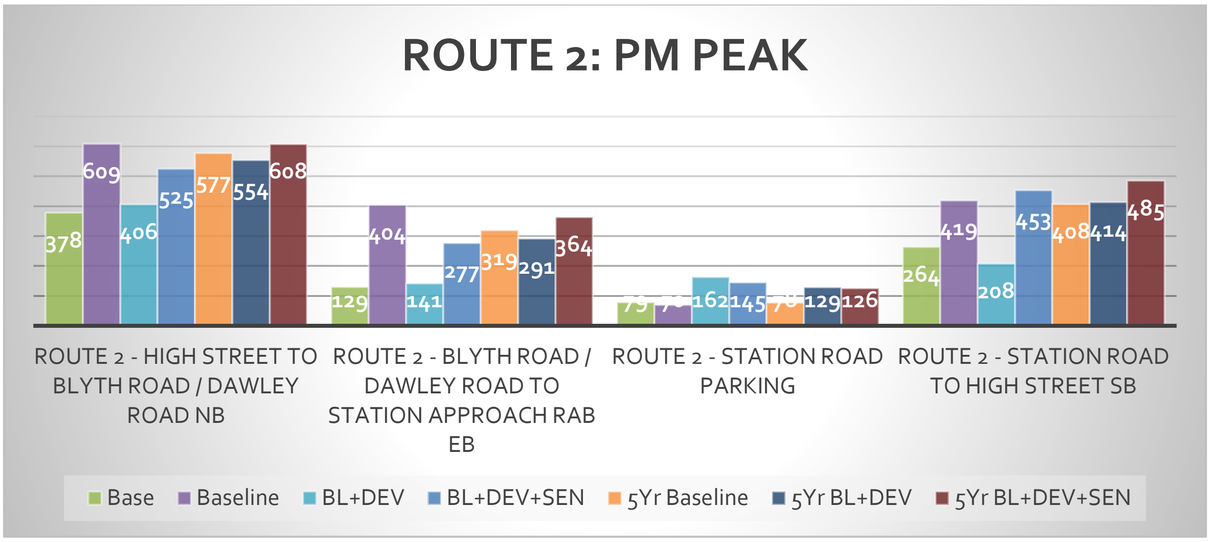


Figure 8.4 : PM Peak Journey Time Station Road and Blyth Road / Clayton Road

8.49 Looking firstly at the route along Station Road northbound from High Street onto Clayton Road / Blyth Road through to Dawley Road. In the AM peak, the journey time on this route would be 313 seconds, increasing to 542 with the development. The majority of this increase occurs at the North Hyde Road signals and at the Blyth Road / Dawley Road junctions. In the PM peak on the same route the baseline journey time is 609 seconds, reducing down to 406 seconds.

8.50 In the 2029 scenario, the AM peak increase in journey time of this route is even more pronounced at 322 seconds increasing to 890 seconds. In the PM peak there is a reduction from 577 seconds in the baseline to 554 seconds with the development in place.

8.51 Looking next at the return route from Dawley Road along Blyth Road to the Station Approach roundabout, the 2024 AM peak journey times in the baseline are 130 seconds increasing to 137 seconds with the development. In the PM peak these journey times are 404 seconds in the baseline reducing to 141 seconds with the development in place.

8.52 Under the 2029 scenario on this route, the AM peak journey times are 134 seconds in the baseline increasing to 138 seconds with the development. In the PM peak, there is a reduction in journey time from 319 seconds to 291 seconds.

8.53 Looking next at the journey along Station Road from north to south, under the 2024 scenario in the AM peak the journey time would be 253 seconds, reducing to 200 seconds with the development. In the PM peak the journey time on this route would reduce from 419 seconds to 208 seconds.

8.54 Under the 2029 flows, the picture is similar in the AM peak, with journey times reducing from 279 to 206 seconds between baseline and with development scenarios. In the PM peak the journey times are broadly similar at 408 seconds in the baseline and 414 seconds with development

8.55 The only journey time showing any significant increase in the with development scenarios is the route along Station Road through to Dawley Road via Clayton Road and Blyth Road in the AM peak period.

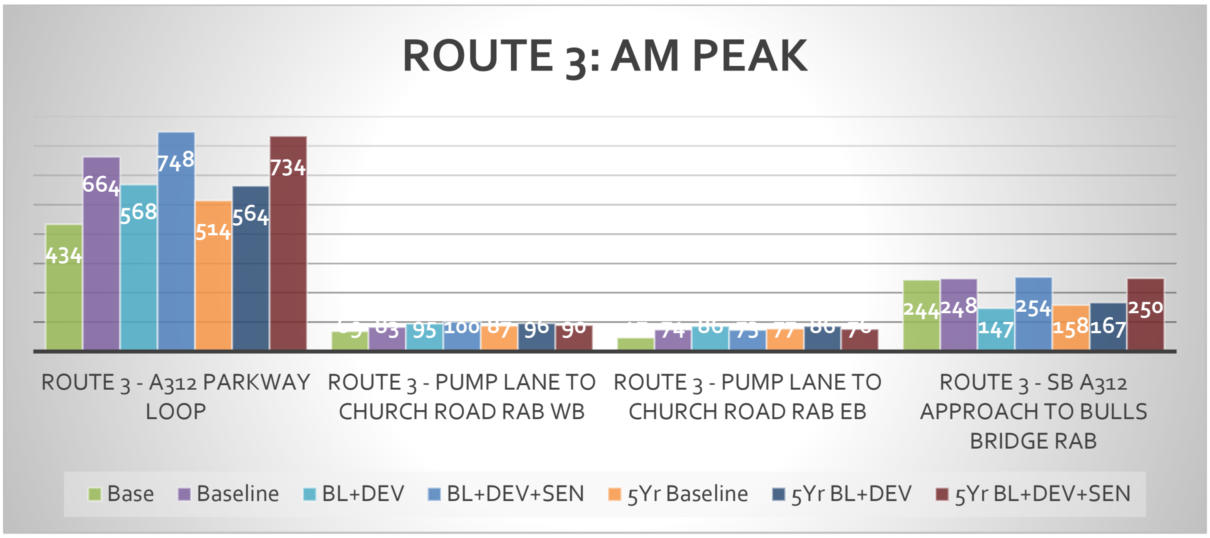


Figure 8.5 : AM Peak Journey Times A312, Pump Lane and North Hyde Road

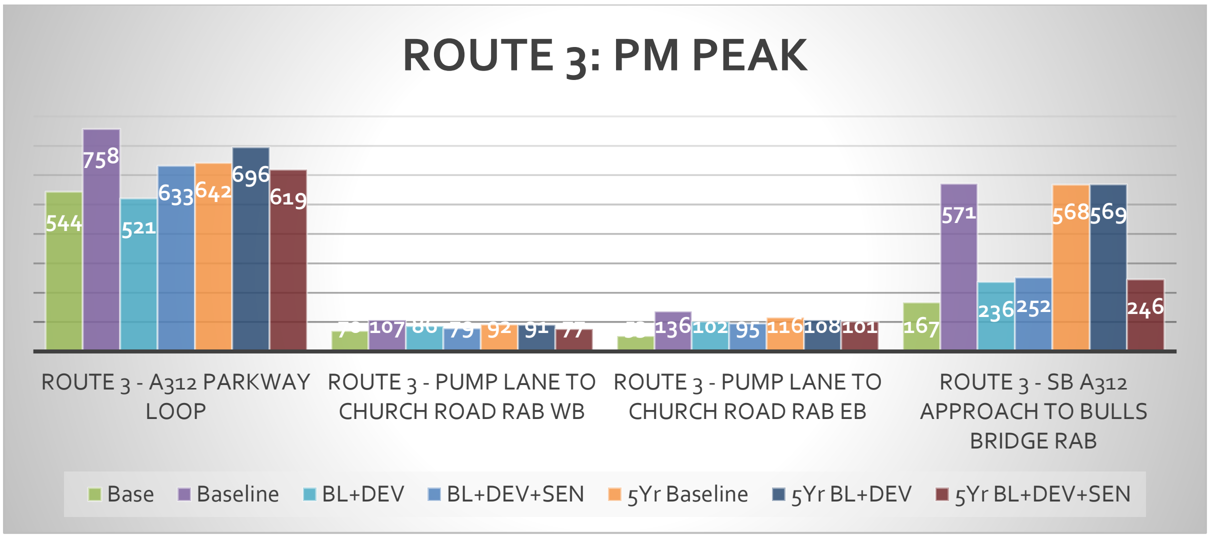


Figure 8.6 : PM Peak Journey Times A312, Pump Lane and North Hyde Road

8.56 Looking firstly at the return journey along the North Hyde Road from the Bulls Bridge Roundabout to Station Road (the A312 Parkway Loop), in the 2024 AM peak baseline scenario this journey takes 664 seconds and reduced to 568 seconds with the development in place. In the PM peak the reduction is from 758 to 521 seconds.

8.57 Under 2029 traffic flows, the journey AM peak baseline journey time is 514 seconds and this increases to 564 seconds with the development. In the PM peak the increase is from 642 seconds in the baseline to 696 seconds with the development.

8.58 The route westbound from Pump Lane to the Church Road roundabout on Botwell Lane the 2024 AM peak baseline journey time is 83 seconds, which increases to 95 seconds in the with development scenario. In the PM peak the baseline journey time is 86 seconds reducing to 79 seconds in the with development scenario.

8.59 Under 2029 traffic flows, the AM peak baseline journey time on this route is 87 seconds, increasing to 96 seconds with development. In the PM peak, the baseline is 92 seconds and barely changes at 91 seconds with development.

8.60 In the reverse direction, the 2024 AM peak baseline journey time is 74 seconds, increasing to 36 seconds with the development in place. In the PM peak, the baseline journey time is 136 seconds, reducing to 102 seconds with the development in place.

8.61 Under the 2029 scenario, the journey time on the same route in the AM peak baseline scenario is 77 seconds, increasing to 86 seconds. In the PM Peak baseline scenario the journey time is 116 seconds, reducing to 108 seconds with the development.

8.62 The final journey time is the southbound approach to the Bulls Bridge Roundabout on the A312. Under 2024 baseline traffic flows in the AM peak the journey time on this route is 248 seconds, reducing to 147 seconds with the development. In the PM peak, the journey time of 571 seconds in the baseline reduces to 236 seconds with development.

8.63 For the 2029 VISSIM runs, the AM peak baseline journey time is 158 seconds, increasing to 167 seconds with the development in place. For the PM peak, the baseline journey time is 568 seconds, barely changing to 569 seconds with the development.

8.64 It can be seen from the various journey times taken from the model, the only route seen to experience a significant increase in journey time is from Station Road at High Street to Dawley Road via Blyth Road.

Transport For London Road Network

Stand-alone junction modelling

8.65 The LINSIG models of the existing layout of the Bulls Bridge Roundabout and for the identified improvement scheme at this junction (included in **Appendix AG**) have run using the baseline and with development traffic flows from the WeLHAM model. The results are provided in full in **Appendix S** and summarised in **Tables 8.27** to **8.30**.

Table 8.27 : Bulls Bridge Roundabout Existing Layout – Baseline Flows

Arm	Approach Name	AM Peak		PM Peak	
		DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)
A	The Parkway [N] SB	86%	16	78%	19
B	Hayes Lane [E] WB	98%	18	87%	18
C	The Parkway [S] NB	90%	23	100%	50
D	North Hyde Road [W] EB	97%	28	98%	28

Table 8.28 : Bulls Bridge Roundabout Existing Layout – With Development Flows

Arm	Approach Name	AM Peak		PM Peak	
		DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)
A	The Parkway [N] SB	90%	19	76%	17
B	Hayes Lane [E] WB	94%	15	88%	18
C	The Parkway [S] NB	88%	21	100%	49
D	North Hyde Road [W] EB	92%	21	98%	26

Table 8.29 : Bulls Bridge Roundabout Proposed Layout – Baseline Flows

Arm	Approach Name	AM Peak		PM Peak	
		DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)
A	The Parkway [N] SB	89%	20	91%	24
B	Hayes Lane [E] WB	97%	18	71%	7
C	The Parkway [S] NB	90%	23	99%	49
D	North Hyde Road [W] EB	97%	28	98%	32

Table 8.30 : Bulls Bridge Roundabout Proposed Layout – With Development Flows

Arm	Approach Name	AM Peak		PM Peak	
		DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)
A	The Parkway [N] SB	84%	17	89%	22
B	Hayes Lane [E] WB	74%	10	67%	8
C	The Parkway [S] NB	84%	17	97%	36
D	North Hyde Road [W] EB	89%	19	96%	26

8.66 Comparing baseline and with development results for both layout options, it can be seen that the proposed development does not have a material impact on the performance of the junction. This is in part because the WeLHAM model has resulted in the wider reassignment of traffic meaning that the junction does not experience a significant increase in flows with the development in place.

8.67 **Tables 8.31** to **8.34** summarise the LINSIG model runs for the M4 J3 for both the existing and potential improvement scheme.

Table 8.31 : M4 Junction 3 Existing Layout – Baseline Flows

Arm	Approach Name	AM Peak		PM Peak	
		DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)
A	The Parkway [N] SB	129%	167	155%	243
B	WB M4 [E] Offslip	78%	6	84%	7
C	The Parkway [S] SB	122%	154	115%	140
D	EB M4 [W] Offslip	137%	167	118%	104

Table 8.32 : M4 Junction 3 Existing Layout – With Development Flows

Arm	Approach Name	AM Peak		PM Peak	
		DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)
A	The Parkway [N] SB	126%	152	153%	232
B	WB M4 [E] Offslip	77%	6	88%	8
C	The Parkway [S] SB	123%	161	112%	121
D	EB M4 [W] Offslip	137%	167	118%	105

Table 8.33 : M4 Junction 3 Proposed Layout – Baseline Flows

Arm	Approach Name	AM Peak		PM Peak	
		DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)
A	The Parkway [N] SB	74%	11	93%	21
B	WB M4 [E] Offslip	63%	5	50%	5
C	The Parkway [S] SB	98%	24	99%	27
D	EB M4 [W] Offslip	86%	16	97%	24

Table 8.34 : M4 Junction 3 Proposed Layout – With Development Flows

Arm	Approach Name	AM Peak		PM Peak	
		DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)
A	The Parkway [N] SB	72%	10	91%	18
B	WB M4 [E] Offslip	62%	5	50%	5
C	The Parkway [S] SB	96%	22	99%	26
D	EB M4 [W] Offslip	85%	16	97%	24

8.68 It is clear that the existing junction has capacity issues under baseline traffic flows, but comparing baseline and with development results, it can be seen that the proposed development does not have a material impact on the performance of the junction. The proposed layout results in a significant improvement in performance, but again, the development is not seen to have any adverse impact on this.

Cumulative Traffic Impact

London Borough of Hillingdon Road Network

Stand-alone junction modelling

8.69 The analysis carried out above have been repeated for the cumulative baseline and with development scenarios (i.e. incorporating further development north of Nestles Avenue). The results of this are discussed in the following paragraphs.

Dawley Road / Botwell Common Road Priority Junction

8.70 The base PICADY model for this junction has been re-run with the traffic flows for the cumulative impact scenarios for 2024 and 2029. The results are summarised in **Tables 8.35** and **8.36**.

Table 8.35: Dawley Road / Botwell Common Road – 2024 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Botwell Common Road – Left Turn	2.15	176.8	2.25	184.7	2.32	75.7	2.66	85.1
Botwell Common Road – Right Turn	2.12	68.1	2.22	71.1	2.32	72.8	2.66	81.8
Dawley Road – Right Turn	0.67	2.8	0.68	2.9	0.93	22.1	0.95	26.6

Table 8.36: Dawley Road / Botwell Common Road – 2029 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Botwell Common Road – Left Turn	2.29	193.5	2.4	201.8	2.71	88.5	3.23	99
Botwell Common Road – Right Turn	2.26	74.8	2.38	78.1	2.71	85.2	3.23	95.2
Dawley Road – Right Turn	0.69	3.1	0.7	3.3	0.97	31	0.99	37.7

8.71 In the cumulative scenario the performance of this junction is marginally worse than in the earlier assessments considering the development of the former Nestle Factory on its own. However, the relative impact of the development on the former Nestle site is comparable with the earlier assessment. Improvement of this junction is considered further in Section 9.

Botwell Common Road / Botwell Lane Mini-roundabout

8.72 The base ARCADY model for this junction has been re-run with the traffic flows for the cumulative impact scenarios for 2024 and 2029. The results are summarised in **Tables 8.37** and **8.38**.

Table 8.37: Botwell Common Road / Botwell Lane – 2024 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Botwell Lane North	0.71	2.6	0.71	2.6	0.28	0.4	0.28	0.4
Botwell Lane South	0.59	1.5	0.59	1.5	0.74	3	0.74	3
Botwell Common Road	0.49	1.1	0.49	1.1	0.46	0.9	0.46	0.9

Table 8.38 : Botwell Common Road / Botwell Lane – 2029 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Botwell Lane North	0.73	2.8	0.73	2.8	0.29	0.4	0.29	0.4
Botwell Lane South	0.6	1.6	0.6	1.6	0.75	3.2	0.75	3.2
Botwell Common Road	0.5	1.1	0.5	1.1	0.47	1	0.47	1

8.73 It can be seen that this junction continues to operate within capacity under all scenarios modelled.

Botwell Lane / Printinghouse Lane Priority Junction

8.74 The base PICADY model for this junction has been re-run with the traffic flows for the cumulative impact scenarios for 2024 and 2029. The results are summarised in **Tables 8.39** and **8.40**.

Table 8.39: Botwell Lane / Printinghouse Lane – 2024 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Printinghouse Lane – Left and Right Turn	1.18	33.4	1.18	33.4	1.74	249	1.74	249
Botwell Lane – Right Turn	1	25.7	1	25.7	0.33	0.8	0.33	0.8

Table 8.40: Botwell Lane / Printinghouse Lane – 2029 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Printinghouse Lane – Left and Right Turn	1.25	41.4	1.25	41.4	1.8	272.4	1.8	272.4
Botwell Lane – Right Turn	1.03	32.2	1.03	32.2	0.34	0.9	0.34	0.9

8.75 The performance of this junction is the same as in the earlier assessment just considering the development of the former Nestle site. As before, the cumulative developments are not expected to have any impact on the performance of this junction.

Botwell Lane / Church Lane Mini-roundabout

8.76 The base ARCADY model for this junction has been re-run with the traffic flows for the cumulative impact scenarios for 2024 and 2029. The results are summarised in **Tables 8.41** and **8.42.**

Table 8.41: Botwell Lane / Church Lane mini-roundabout- 2024 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Church Road	1.12	40.9	1.12	40.9	0.66	2.1	0.66	2.1
Botwell Lane South	1.54	280.6	1.54	280.6	1.29	131.6	1.29	131.6
Botwell Lane West	0.91	9.2	0.91	9.2	0.97	15.9	0.97	15.9

Table 8.42: Botwell Lane / Church Lane mini-roundabout- 2029 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Church Road	1.15	48.3	1.15	48.3	0.68	2.2	0.68	2.2
Botwell Lane South	1.57	307.8	1.57	307.8	1.33	151.1	1.33	151.1
Botwell Lane West	0.93	10.6	0.93	10.6	1	20.3	1	20.3

8.77 The performance of this junction is the same as in the earlier assessment just considering the development of the former Nestle site. As before, the cumulative developments are not expected to have any impact on the performance of this junction.

Botwell Lane / Pump Lane / Coldharbour Lane / East Avenue Roundabout

8.78 The base ARCADY model for this junction has been re-run with the traffic flows for the cumulative impact scenarios for 2024 and 2029. The results are summarised in **Tables 8.43** and **8.44.**

Table 8.43: Botwell Lane / Pump Lane / Coldharbour Lane / East Avenue roundabout – 2024 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Coldharbour Lane	1.68	256	1.68	256	0.96	12.3	0.96	11.6
Pump Lane	0.86	6.1	0.86	6.1	0.88	6.7	0.88	6.2
Botwell Lane	0.55	1.4	0.55	1.4	0.67	2.2	0.67	2
East Avenue	0	0	0	0	0	0	0	0

Table 8.44: Botwell Lane / Pump Lane / Coldharbour Lane / East Avenue roundabout – 2029 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Coldharbour Lane	1.73	275.5	1.73	275.5	0.99	16.3	0.99	15.4
Pump Lane	0.88	6.7	0.88	6.7	0.91	8.3	0.91	7.7
Botwell Lane	0.56	1.4	0.56	1.4	0.68	2.3	0.68	2.1
East Avenue	0	0	0	0	0	0	0	0

8.79 The performance of this junction is the same as in the earlier assessment just considering the development of the former Nestle site. As before, the cumulative developments are not expected to have any impact on the performance of this junction.

Dawley Road / Kestrel Way / Betam Road / Blyth Road Roundabout

8.80 The base ARCADY model for this junction has been re-run with the traffic flows for the cumulative impact scenarios for 2024 and 2029. The results are summarised in **Tables 8.45** and **8.46.**

Table 8.45: Dawley Road / Kestrel Way / Betam Road / Blyth Road – 2024 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Dawley Road North	0.84	5.7	0.85	5.8	0.5	1.1	0.52	1.2
Blyth Road	0.94	11	0.95	12.2	1.2	100.1	1.23	111.1
Dawley Road South	1.27	219.5	1.3	251	1.09	73.1	1.11	85.4
Kestrel Way	0.17	0.2	0.17	0.2	0.37	0.6	0.37	0.6
Betam Road	0.1	0.1	0.1	0.1	0.27	0.4	0.27	0.4

Table 8.46: Dawley Road / Kestrel Way / Betam Road / Blyth Road – 2029 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Dawley Road North	0.86	6.2	0.85	5.8	0.5	1.1	0.52	1.2
Blyth Road	0.97	14.7	0.96	13.5	1.22	107.8	1.24	117.5
Dawley Road South	1.28	230.6	1.31	255.8	1.11	81.1	1.11	82.5
Kestrel Way	0.17	0.2	0.17	0.2	0.38	0.7	0.38	0.7
Betam Road	0.11	0.1	0.11	0.1	0.27	0.4	0.27	0.4

8.81 In the cumulative scenario the performance of this junction is marginally worse than in the earlier assessments considering the development of the former Nestle Factory on its own. However, the relative impact of the development on the former Nestle site is comparable with the earlier assessment. Improvement of this junction is considered further in Section 9.

Dawley Road / North Hyde Road / Millington Road / Bourne Avenue Roundabout

8.82 The base ARCADY model for this junction has been re-run with the traffic flows for the cumulative impact scenarios for 2024 and 2029. The results are summarised in **Tables 8.47** and **8.48.**

Table 8.47: Dawley Road / north Hyde Road / Millington Road / Bourne Avenue – 2024 Cumulative Traffic Flows –

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Dawley Road North	0.94	13.1	0.95	14.2	0.95	15.5	0.97	20.4
North Hyde Road	0.8	4.1	0.84	5.2	0.66	2.1	0.69	2.4
Millington Road	0.21	0.3	0.22	0.3	0.86	5.5	0.89	6.4
Dawley Road South	1.12	69.4	1.13	76.3	0.85	5.8	0.86	6.3
Bourne Avenue	1.02	17	1.05	20.3	0.55	1.3	0.56	1.4

Table 8.48: Dawley Road / North Hyde Road / Millington Road / Bourne Avenue – 2029 Cumulative Traffic Flows –

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Dawley Road North	0.96	16.4	0.96	18.2	0.97	20.5	0.99	27.1
North Hyde Road	0.82	4.7	0.86	5.9	0.68	2.3	0.71	2.6
Millington Road	0.22	0.3	0.23	0.3	0.91	7.5	0.94	8.9
Dawley Road South	1.14	81.6	1.16	89.3	0.88	7.1	0.89	7.7
Bourne Avenue	1.05	21	1.08	24.7	0.58	1.5	0.59	1.5

8.83 In the cumulative scenario the performance of this junction is marginally worse than in the earlier assessments considering the development of the former Nestle Factory on its own. However, the relative impact of the development on the former Nestle site is comparable with the earlier assessment.

North Hyde Road / Station Road and Station Road / Millington Road Signals

8.84 The LINSIG model for this junction has been re-run with the traffic flows for the cumulative impact scenarios for 2024 and 2029. The results are summarised in **Tables 8.49** and **8.50.**

Table 8.49: Station Road / North Hyde Road and Station Road / Millington Road – 2024 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	DoS	Queue	DoS	Queue	Dos	Queue	DoS	Queue
Station Rd South of North Hyde Road – Left and Ahead	43.9	15.0	43.2	8.5	63.7	21.9	68.5	21.6
Station Rd South of North Hyde Road – Right	99.2	17.8	104.7	19.6	88.9	11.8	95.9	13.9
Station Rd North	77.1	15.2	80.0	15.5	82.8	15.5	89.9	18.2
North Hyde Road West	80.3	11.8	81.3	15.1	74.9	14.0	84.9	18.7
North Hyde Road East	97.4	34.3	104.7	60.4	89.3	16.4	96.0	24.3
Station Rd North of Millington Rd	57.5	15.1	64.2	15.7	62.0	16.8	67.8	21.0
Bedwell Gardens	30.6	2.8	26.2	2.7	34.6	2.4	35.1	2.3
Station Road South of Millington Rd	68.3	18.7	103.8	50.8	75.9	19.0	83.0	21.6
Millington Rd	68.0	5.6	68.7	6.3	74.5	9.7	71.7	9.0

Table 8.50: Station Road / North Hyde Road and Station Road / Millington Road – 2029 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	DoS	Queue	DoS	Queue	DoS	Queue	DoS	Queue
Station Rd South of North Hyde Road – Left and Ahead	43.8	7.4	42.9	3.9	63.7	21.9	72.6	25.7
Station Rd South of North Hyde Road – Right	109.5	23.1	105.5	15.6	88.9	11.8	100.9	17.8
Station Rd North	75.5	13.9	73.3	14.2	82.8	15.5	100.9	32.8
North Hyde Road West	101.5	28.6	72.0	10.9	74.9	14.0	80.2	14.5
North Hyde Road East	99.2	41.7	103.7	56.6	89.3	16.4	97.9	22.5
Station Rd North of Millington Rd	72.7	11.8	72.7	22.1	62.0	16.8	61.0	19.9
Bedwell Gardens	25.0	2.7	29.6	3.1	34.6	2.4	34.5	2.4
Station Road South of Millington Rd	110.6	69.8	106.0	55.2	75.9	19.0	74.5	21.2
Millington Rd	48.2	6.1	48.7	5.7	74.5	9.7	100.6	20.3

8.85 As would be expected, the additional traffic associated with the cumulative development of the various sites to the north of Nestles Avenue further worsens the performance of the Station Road / North Hyde Road signals. Section 9 examines the potential for improvement in this location.

Station Road / High Street Signals

8.86 The LINSIG model for this junction has been re-run with the traffic flows for the cumulative impact scenarios for 2024 and 2029. The results are summarised in **Tables 8.51** and **8.52.**

Table 8.51: Station Road / High Street – 2024 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	DoS	Queue	DoS	Queue	DoS	Queue	DoS	Queue
Station Road North	80.7:75.6	12.5	81.2:81.2	12.3	70.1:77.7	9.3	71.0:89.3	11.3
High Street	75.2:75.2	7.0	81.0:81.0	8.8	85.0:85.0	13.0	88.2:88.2	13.3
Station Road West	77.5	9.9	84.4	12.6	85.1	13.0	86.9	11.8

Table 8.52: Station Road / High Street – 2029 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	DoS	Queue	DoS	Queue	DoS	Queue	DoS	Queue
Station Road North	82.5:77.7	13.1	82.9:82.9	13.0	71.6:80.4	9.8	72.9:89.9	10.9
High Street	76.8:76.8	7.2	82.7:82.7	9.3	87.0:87.0	14.3	90.2:90.2	16.0
Station Road West	79.1	10.2	76.1	13.1	87.2	13.7	89.0	13.4

8.87 It can be seen that this junction operates within capacity under all scenarios tested except for 2029 PM peak, when the degree of saturation on High Street increases to 90.2, marginally over the recommended maximum of 90.

Station Road / Nestles Avenue Priority Junction

8.88 The PICADY model for this junction has been re-run with the traffic flows for the cumulative impact scenarios for 2024 and 2029. The results are summarised in **Tables 8.53** and **8.54.**

Table 8.53: Station Road / Nestles Avenue – 2024 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Nestles Avenue	0.46	0.9	0.65	2	0.4	0.7	0.57	1.4
Station Road North – Right	0.04	0	0.04	0	0.06	0.1	0.06	0.1
Keith Road	0.22	0.3	0.23	0.3	0.16	0.2	0.16	0.2
Station Road South - Right	0.2	0.3	0.27	0.4	0.26	0.4	0.45	1

Table 8.54: Station Road / Nestles Avenue – 2029 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Nestles Avenue	0.47	1	0.67	2.1	0.41	0.8	0.59	1.5
Station Road North – Right	0.04	0	0.04	0	0.06	0.1	0.06	0.1
Keith Road	0.23	0.3	0.24	0.3	0.16	0.2	0.17	0.2
Station Road South - Right	0.21	0.3	0.27	0.4	0.26	0.4	0.45	1.1

8.89 This junction continues to operate within capacity under all scenarios tested.

Nestles Avenue / Harold Avenue Priority Junction

8.90 The PICADY model for this junction has been re-run with the traffic flows for the cumulative impact scenarios for 2024 and 2029. The results are summarised in **Tables 8.55** and **8.56.**

Table 8.55: Nestles Avenue / Harold Avenue – 2024 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Harold Avenue	0.17	0.2	0.17	0.2	0.12	0.1	0.12	0.1
Nestles Avenue - Right	0.25	0.3	0.25	0.3	0.21	0.3	0.21	0.3

Table 8.56: Nestles Avenue / Harold Avenue – 2029 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Harold Avenue	0.18	0.2	0.18	0.2	0.13	0.1	0.13	0.1
Nestles Avenue - Right	0.26	0.4	0.26	0.4	0.21	0.3	0.21	0.3

8.91 This junction continues to operate within capacity under all scenarios tested.

Harold Avenue / North Hyde Road / Crane Gardens Priority Junction

8.92 The LINSIG model for this junction has been re-run with the traffic flows for the cumulative impact scenarios for 2024 and 2029. The results are summarised in **Tables 8.57** and **8.58.**

Table 8.57: Harold Avenue / North Hyde Road / Crane Gardens – 2024 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Crane Gardens	0.18	0.2	9999999999	30.4	0.1	0.1	9999999999	35.1
North Hyde Road East – Right	0.99	37.3	1.06	63.4	0.91	16	1.31	173.4
Harold Avenue	0.87	5.4	1.53	76.2	0.64	1.9	9999999999	176.4
North Hyde Road West - Right	0.6	5.2	0.65	6.4	0.22	0.9	0.3	1.7

Table 8.58: Harold Avenue / North Hyde Road / Crane Gardens – 2029 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Crane Gardens	1.32	9.6	9999999999	31.6	0.11	0.1	0.11	0.1
North Hyde Road East – Right	0.99	37.8	1.08	71.5	0.95	22.3	0.95	22.3
Harold Avenue	0.92	7	1.78	91.4	0.67	2.1	0.67	2.1
North Hyde Road West - Right	0.65	6.2	0.68	7.2	0.24	1.1	0.24	1.1

8.93 Introducing other development schemes north of Nestles Avenue into the baseline scenario results in this junction being over capacity in the baseline and the performance is worsened with the introduction of development traffic. Consideration is given to mitigation measures in Section 9 of this Report.

North Hyde Gardens / North Hyde Road / Watersplash Lane Signal Junction

8.94 The cumulative impact test outputs from the model are included in **Appendix S** and asummary of the junction performance is shown in **Tables 8.59 and 8.60**.

Table 8.59 : North Hyde Gardens / North Hyde Road / Watersplash Lane – Baseline Flows

Approach Name	AM Peak		PM Peak	
	DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)
North Hyde Road East	21.1	2	67.7	8
North Hyde Gardens	64.2	4	92.2	12
Watersplash Lane	2.7	0	5.8	0
North Hyde Road West	83.8	21	87.1	17

Table 8.60 : North Hyde Gardens / North Hyde Road / Watersplash Lane – With Cumulative Development Flows

Approach Name	AM Peak		PM Peak	
	DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)
North Hyde Road East	27.5	2	76.2	15
North Hyde Gardens	52.4	3	57.8	4
Watersplash Lane	2.7	0	5.8	0
North Hyde Road West	75.5	17	85.5	16

8.95 The cumulative assessment results are similar to the previous assessment, with the North Hyde Gardens arm of the junction having capacity problems in the PM peak baseline scenario but operating within capacity under all other tests.

VISSIM modelling

8.96 The VISSIM model has also been used to test the cumulative scenario, with all sites north of Nestles Avenue built out. The summary results of these are shown in F**igures 8.1** to **8.6** earlier in this Section.

8.97 Comparing the journey times on the various use in the baseline scenario with the cumulative development scenario gives the results shown in **Tables 8.61** to **8.66**.

Table 8.61 : Route 1 Journey Time Increases with Additional Development North of Nestles Avenue - 2024

Route	AM			PM		
	Baseline	With Cumulative Dev	Difference	Baseline	With Cumulative Dev	Difference
Route 1A – Blyth Road to A312 EB	451	856	405	1187	642	-545
Route 1B – A312 to Bourne Avenue WB	463	602	139	268	423	155
Route 1C – Bourne Avenue to Betam Rd NB	391	575	184	357	388	31

Table 8.62 : Route 1 Journey Time Increases with Additional Development North of Nestles Avenue - 2029

Route	AM			PM		
	Baseline	With Cumulative Dev	Difference	Baseline	With Cumulative Dev	Difference
Route 1A – Blyth Road to A312 EB	478	824	346	1023	641	-382
Route 1B – A312 to Bourne Avenue WB	269	573	304	231	404	173
Route 1C – Bourne Avenue to Betam Rd NB	486	634	148	365	366	1

Table 8.63: Route 2 Journey Time Increases with Additional Development North of Nestles Avenue - 2024

Route	AM			PM		
	Baseline	With Cumulative Dev	Difference	Baseline	With Cumulative Dev	Difference
Route 2A – High St to Blyth Road / Dawley Road NB	313	982	669	609	525	-84
Route 2B – Blyth Road / Dawley Rod to Station Approach EB	130	184	54	404	277	-127
Route 2C – Station Road Parking	50	135	85	70	145	75
Route 2D – Station Road to High Street SB	253	454	201	419	453	34

Table 8.64: Route 2 Journey Time Increases with Additional Development North of Nestles Avenue - 2029

Route	AM			PM		
	Baseline	With Cumulative Dev	Difference	Baseline	With Cumulative Dev	Difference
Route 2A – High St to Blyth Road / Dawley Road NB	322	735	413	577	608	31
Route 2B – Blyth Road / Dawley Rod to Station Approach EB	134	164	30	319	364	45
Route 2C – Station Road Parking	50	130	80	78	126	48
Route 2D – Station Road to High Street SB	279	386	107	408	485	77

Table 8.65 : Route 3 Journey Time Increases with Additional Development North of Nestles Avenue - 2024

Route	AM			PM		
	Baseline	With Cumulative Dev	Difference	Baseline	With Cumulative Dev	Difference
Route 3A – A312 Parkway Loop	664	748	84	758	633	-125
Route 3B – Pump Lane to Church Road Roundabout WB	83	100	17	107	79	-28
Route 3C – Pump Lane to Church Road Roundabout EB	74	73	-1	136	95	-41
Route 3D – A312 Approach to Bulls Bridge Rdbt SB	248	254	6	571	252	-319

Table 8.66 : Route 3 Journey Time Increases with Additional Development North of Nestles Avenue - 2029

Route	AM			PM		
	Baseline	With Cumulative Dev	Difference	Baseline	With Cumulative Dev	Difference
Route 3A – A312 Parkway Loop	664	734	70	758	619	-139
Route 3B – Pump Lane to Church Road Roundabout WB	83	90	7	107	77	-30
Route 3C – Pump Lane to Church Road Roundabout EB	74	76	2	136	101	-35
Route 3D – A312 Approach to Bulls Bridge Rdbt SB	248	250	2	571	246	-307

8.98 In the AM peak period the increases in journey times are noticeably higher with all sites north of Nestles Avenue redeveloped than just the former Nestle site alone. As well as Route 2A experiencing a significant increase in journey times, Routes 1A, 1B and 1C also experience significant increases. In the PM peak the impact on journey times is less pronounced.

Transport For London Road Network

Stand-alone junction modelling

8.99 The LINSIG models of the Bulls Bridge Roundabout and M3 J3 have also been re-run using the cumulative development flows for 2024 and 2029 scenarios. The results are summarised in Tables 8.67 to 8.70.

Table 8.67 : Bulls Bridge Roundabout Existing Layout – Cumulative Development Flows

Arm	Approach Name	AM Peak		PM Peak	
		DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)
A	The Parkway [N] SB	90%	19	75%	17
B	Hayes Lane [E] WB	93%	14	88%	18
C	The Parkway [S] NB	89%	22	100%	49
D	North Hyde Road [W] EB	93%	21	98%	25

Table 8.68 : Bulls Bridge Roundabout Proposed Layout – Cumulative Development Flows

Arm	Approach Name	AM Peak		PM Peak	
		DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)
A	The Parkway [N] SB	83%	17	88%	21
B	Hayes Lane [E] WB	73%	10	68%	7
C	The Parkway [S] NB	85%	19	100%	46
D	North Hyde Road [W] EB	89%	19	96%	26

Table 8.69 : M4 J3 Roundabout Existing Layout – Cumulative Development Flows

Arm	Approach Name	AM Peak		PM Peak	
		DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)
A	The Parkway [N] SB	126%	152	153%	234
B	WB M4 [E] Offslip	81%	6	88%	8
C	The Parkway [S] SB	118%	132	112%	121
D	EB M4 [W] Offslip	137%	167	119%	105

Table 8.70: M4 J3 Roundabout Proposed Layout – Cumulative Development Flows

Arm	Approach Name	AM Peak		PM Peak	
		DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)
A	The Parkway [N] SB	70%	10	85%	15
B	WB M4 [E] Offslip	65%	6	53%	5
C	The Parkway [S] SB	96%	21	99%	26
D	EB M4 [W] Offslip	85%	16	98%	25

8.100 As with the assessment of just the former Nestle site on its own, the cumulative development to the north of Nestles Avenue is shown to have no significant impact on these junctions, either in their existing form or with the proposed improvements in place. The improvement schemes at both junctions shown benefits to the junction performance, particularly at the M4 J3.

9.0 MITIGATION MEASURES

Junction Capacity Improvements

9.1 In Section 8 of this Report, it was identified that the following junctions should be examined in more detail to identify the potential for capacity improvements:

- Dawley Road / Botwell Common Road
- Dawley Road / Kestrel Way / Betam Way / Blyth Road
- Harold Avenue / North Hyde Road
- Station Road / North Hyde Road

Dawley Road / Botwell Common Road Priority Junction

9.2 In Section 8, the capacity assessments of this junction showed a worsening of the performance of the Botwell Common Road arm of this junction in the with development and with cumulative development scenarios. Widening the Botwell Common Lane approach to the junction to introduce separate left and right turn lanes on the immediate approach to the junction, as shown in Drg No 16018-01-016, would increase the capacity on this approach. This has been modelling this using PICADY (full results shown in **Appendix AH**) and the results with the baseline scenario in **Tables 9.1** to **9.4**.

Table 9.1: Dawley Road / Botwell Common Road – 2024 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev+Mit		Base		With Dev+Mit	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Botwell Common Road – Left Turn	2.1	172.8	1.78	125	2.16	70.2	2.21	63.6
Botwell Common Road – Right Turn	2.08	66.5	1.74	48.4	2.16	67.5	2.18	61.8
Dawley Road – Right Turn	0.67	2.7	0.66	2.7	0.92	19.7	0.94	22.8

Table 9.2: Dawley Road / Botwell Common Road – 2029 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev+Mit		Base		With Dev+Mit	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Botwell Common Road – Left Turn	2.23	189.2	1.89	141.5	2.48	82.5	2.6	78.3
Botwell Common Road – Right Turn	2.21	73.2	1.86	54.9	2.48	79.4	2.6	75.5
Dawley Road – Right Turn	0.69	3.1	0.69	3	0.96	27.5	0.97	32.3

Table 9.3: Dawley Road / Botwell Common Road – 2024 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev+Mit		Base		With Dev+Mit	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Botwell Common Road – Left Turn	2.15	176.8	1.9	137.8	2.32	75.7	2.54	73.6
Botwell Common Road – Right Turn	2.12	68.1	1.86	53.3	2.32	72.8	2.51	71.3
Dawley Road – Right Turn	0.67	2.8	0.68	2.9	0.93	22.1	0.95	26.6

Table 9.4: Dawley Road / Botwell Common Road – 2029 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev+Mit		Base		With Dev Mit	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Botwell Common Road – Left Turn	2.29	193.5	2.04	155.2	2.71	88.5	3.09	89.4
Botwell Common Road – Right Turn	2.26	74.8	2.01	60.2	2.71	85.2	3.09	86
Dawley Road – Right Turn	0.69	3.1	0.7	3.3	0.97	31	0.99	37.7

9.3 It can be seen that in all scenarios the improvement measures proposed mitigate for the effect of the traffic associated with the development on the former Nestle site and result in improved performance of this arm of the junction when compared to the baseline scenario.

Dawley Road / Kestrel Way / Betam Road / Blyth Road Roundabout

9.4 In Section 8, the capacity assessments of this junction showed a worsening of the performance of the Dawley Road South arm of this junction in the with development and with cumulative development scenarios. Increasing the length of the flare on the Dawley Road South approach to the junction, as shown in Drg No 16018-01-015, would increase the capacity on this approach. This has been modelling this using ARCADY (full results shown in **Appendix AH**) and the results with the baseline scenario in **Tables 9.5** to **9.8**.

Table 9.5: Dawley Road / Kestrel Way / Betam Road / Blyth Road – 2024 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev+Mit		Base		With Dev+Mit	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Dawley Road North	0.84	5.6	0.84	5.4	0.49	1	0.51	1.1
Blyth Road	0.93	10.4	0.93	9.7	1.18	93.4	1.21	102.8
Dawley Road South	1.26	202.4	1.24	186.7	1.08	67.2	1.05	49
Kestrel Way	0.17	0.2	0.18	0.2	0.37	0.6	0.4	0.7
Betam Road	0.1	0.1	0.11	0.1	0.27	0.4	0.28	0.4

Table 9.6: Dawley Road / Kestrel Way / Betam Road / Blyth Road – 2029 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev+Mit		Base		With Dev+Mit	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Dawley Road North	0.86	6.2	0.85	6.1	0.5	1.1	0.52	1.2
Blyth Road	0.97	14.7	0.96	13.5	1.22	107.8	1.24	117.5
Dawley Road South	1.28	230.6	1.26	213.3	1.1	80.5	1.07	61.4
Kestrel Way	0.17	0.2	0.18	0.2	0.38	0.7	0.4	0.7
Betam Road	0.11	0.1	0.11	0.1	0.27	0.4	0.29	0.4

Table 9.7: Dawley Road / Kestrel Way / Betam Road / Blyth Road – 2024 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev+Mit		Base		With Dev+Mit	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Dawley Road North	0.84	5.7	0.85	6.1	0.5	1.1	0.52	1.2
Blyth Road	0.94	11	0.95	12.2	1.2	100.1	1.23	111.1
Dawley Road South	1.27	219.5	1.26	208.7	1.09	73.1	1.07	64.1
Kestrel Way	0.17	0.2	0.18	0.2	0.37	0.6	0.4	0.7
Betam Road	0.1	0.1	0.11	0.1	0.27	0.4	0.28	0.4

Table 9.8: Dawley Road / Kestrel Way / Betam Road / Blyth Road – 2029 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev+Mit		Base		With Dev+Mit	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Dawley Road North	0.86	6.2	0.87	6.9	0.5	1.1	0.53	1.2
Blyth Road	0.97	14.7	0.99	17.5	1.22	107.8	1.27	125.6
Dawley Road South	1.28	230.6	1.28	236	1.11	81.1	1.09	77.2
Kestrel Way	0.17	0.2	0.18	0.2	0.38	0.7	0.41	0.7
Betam Road	0.11	0.1	0.11	0.1	0.27	0.4	0.29	0.4

9.5 It can be seen that in all scenarios the improvement measures proposed mitigate for the effect of the traffic associated with the development on the former Nestle site when compared to the baseline scenario.

Harold Avenue / North Hyde Road / Crane Gardens Priority Junction

9.6 In Section 8, the capacity assessments of this junction showed development traffic resulting in this junction being over capacity, particularly the right turn movement from North Hyde Road into Harold Avenue during the PM peak. Introducing a right turn refuge lane on North Hyde Road, as shown in Drg No 16018-01-004, would improve the situation as it would allow right turning vehicles to wait without blocking westbound ahead traffic. This has been modelling this using ARCADY (full results shown in **Appendix AH**) and the results with the baseline scenario in **Tables 9.9** to **9.12**.

Table 9.9: Harold Avenue / North Hyde Road / Crane Gardens – 2024 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev+Mit		Base		With Dev+Mit	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Crane Gardens	0.17	0.2	0.18	0.2	0.1	0.1	0.11	0.1
North Hyde Road East – Right	0.7	6.5	0.36	0.6	0.31	1.4	0.54	1.3
Harold Avenue	0.55	1.3	0.89	6.7	0.41	0.8	0.66	2
North Hyde Road West - Right	0.48	3.2	0.62	5.5	0.17	0.6	0.24	1.1

Table 9.10: Harold Avenue / North Hyde Road / Crane Gardens – 2029 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev+Mit		Base		With Dev+Mit	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Crane Gardens	0.18	0.2	0.19	0.3	0.1	0.1	0.11	0.1
North Hyde Road East – Right	0.75	8.2	0.37	0.6	0.33	1.6	0.55	1.3
Harold Avenue	0.58	1.4	0.91	7.9	0.43	0.8	0.68	2.3
North Hyde Road West - Right	0.52	3.7	0.67	6.7	0.19	0.7	0.26	1.3

Table 9.11: Harold Avenue / North Hyde Road / Crane Gardens – 2024 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev+Mit		Base		With Dev+Mit	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Crane Gardens	0.18	0.2	0.19	0.2	0.1	0.1	0.12	0.1

North Hyde Road East – Right	0.99	37.3	0.48	1	0.91	16	0.82	4.3
Harold Avenue	0.87	5.4	1.21	48.2	0.64	1.9	0.89	6.7
North Hyde Road West - Right	0.6	5.2	0.74	9.6	0.22	0.9	0.33	2.1

Table 9.12: Harold Avenue / North Hyde Road / Crane Gardens – 2029 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev+Mit		Base		With Dev+Mit	
	RFC	Queue	RFC	Queue	RFC	Queue	RFC	Queue
Crane Gardens	1.32	9.6	0.2	0.3	0.11	0.1	0.12	0.2
North Hyde Road East – Right	0.99	37.8	0.49	1	0.95	22.3	0.83	4.6
Harold Avenue	0.92	7	1.24	53.1	0.67	2.1	0.93	8.8
North Hyde Road West - Right	0.65	6.2	0.79	12.1	0.24	1.1	0.35	2.4

9.7 It can be seen that the introduction on this right turn lane would resolve the right turn issue from North Hyde Road. The maximum RFC with the former Nestle site redeveloped would be 0.91 on Harold Avenue in the AM peak period in 2029, which is slightly over the preferred maximum of 0.85 but still within theoretical capacity.

9.8 Under the cumulative traffic flows, the introduction of the right turn refuge resolves the issue of queues on North Hyde Road east. However, in the AM peak hour the RFC on Harold Avenue would be 1.24 in the AM peak in 2029. Further improvement would be required at this junction to accommodate the cumulative development flows.

Station Road / North Hyde Road and Station Road / Millington Road Signals

9.9 The LINSIG assessments included in Section 9 of this report that assess the effects of the former Nestle site development on this junction show that development traffic worsens the performance of this junction. Rather than using the signal staging that was put forward as part of the Old Vinyl Factory proposed improvement, the introduction of an early cut-off on Station Road north to allow the right turn from Station Road south to run unopposed for part of the cycle is proposed. Running the LINSIG models applying this gives the results shown in Tables 9.13 to 9.16.

Table 9.13: Station Road / North Hyde Road and Station Road / Millington Road – 2024 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	DoS	Queue	DoS	Queue	DoS	Queue	DoS	Queue
Station Rd South of North Hyde Road – Left and Ahead	43.4	15	52.8	7.1	58.6	17.9	69.6	14.5
Station Rd South of North Hyde Road – Right	94.4	15.9	86.8	6.7	87.8	11.0	78.7	7.3
Station Rd North	74.2	14.6	92.4	19.5	69.4	11.0	88.4	15.9
North Hyde Road West	64.5	10.1	60.8	7.5	83.5	16.4	41.9	16.4
North Hyde Road East	94.3	31.6	92.1	24.2	87.8	17.9	16.9	15.2
Station Rd North of Millington Rd	60.3	16.2	60.9	14.5	70.4	17.1	62.4	17.9
Bedwell Gardens	25.5	2.5	39.9	3.2	17.0	2.1	35.1	2.3
Station Road South of Millington Rd	71.5	19.2	67.7	17.3	85.8	23.1	676.9	19.8
Millington Rd	61.1	5.2	52.2	5.5	87.7	11.8	75.9	9.4

Table 9.14: Station Road / North Hyde Road and Station Road / Millington Road – 2029 Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	DoS	Queue	DoS	Queue	DoS	Queue	DoS	Queue
Station Rd South of North Hyde Road – Left and Ahead	42.9	6.1	52.5	10.2	60.6	18.2	70.7	18.6
Station Rd South of North Hyde Road – Right	98.2	11.2	80.3	6.9	90.8	11.8	88.0	10.8
Station Rd North	62.3	12.1	95.2	29.1	72.1	11.8	88.1	16.2
North Hyde Road West	68.1	9.3	68.1	10.1	83.7	16.9	76.3	14.7
North Hyde Road East	98.3	34.6	95.2	34.1	90.7	18.9	88.1	15.6
Station Rd North of Millington Rd	57.0	17.7	58.4	22.2	58.8	16.8	63.1	20.3
Bedwell Gardens	43.1	3.4	42.7	3.2	36.0	2.6	36.0	2.3
Station Road South of Millington Rd	67.0	14.0	64.1	15.3	70.6	19.9	77.8	19.2
Millington Rd	55.5	6.2	64.5	6.0	85.3	13.4	78.8	9.7

Table 9.15: Station Road / North Hyde Road and Station Road / Millington Road – 2024 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	DoS	Queue	DoS	Queue	Dos	Queue	DoS	Queue
Station Rd South of North Hyde Road – Left and Ahead	43.9	15.0	50.3	8.2	63.7	21.9	73.3	15.6
Station Rd South of North Hyde Road – Right	99.2	17.8	92.3	13.5	88.9	11.8	88.0	11.6
Station Rd North	77.1	15.2	91.3	18.3	82.8	15.5	90.9	19.2
North Hyde Road West	80.3	11.8	66.5	9.0	74.9	14.0	82.8	18.8
North Hyde Road East	97.4	34.3	94.9	25.3	89.3	16.4	92.5	19.2
Station Rd North of Millington Rd	57.5	15.1	60.4	17.4	62.0	16.8	65.4	21.6
Bedwell Gardens	30.6	2.8	41.7	3.1	34.6	2.4	35.1	2.5
Station Road South of Millington Rd	68.3	18.7	65.5	17.1	75.9	19.0	79.7	19.5
Millington Rd	68.0	5.6	62.0	5.6	74.5	9.7	77.4	9.7

Table 9.16: Station Road / North Hyde Road and Station Road / Millington Road – 2029 Cumulative Traffic Flows

Arm	AM Peak				PM Peak			
	Base		With Dev		Base		With Dev	
	DoS	Queue	DoS	Queue	DoS	Queue	DoS	Queue
Station Rd South of North Hyde Road – Left and Ahead	43.8	7.4	53.6	9.5	63.7	21.9	74.7	16.3
Station Rd South of North Hyde Road – Right	109.5	23.1	97.3	16.1	88.9	11.8	92.0	13.1
Station Rd North	75.5	13.9	96.6	23.4	82.8	15.5	95.4	23.2
North Hyde Road West	101.5	28.6	81.7	13.2	74.9	14.0	82.1	16.1
North Hyde Road East	99.2	41.7	97.2	32.7	89.3	16.4	97.1	27.9
Station Rd North of Millington Rd	72.7	11.8	68.9	15.3	62.0	16.8	66.6	18.9
Bedwell Gardens	25.0	2.7	43.1	3.3	34.6	2.4	36.0	2.6
Station Road South of Millington Rd	110.6	69.8	77.8	18.7	75.9	19.0	81.3	20.3
Millington Rd	48.2	6.1	45.7	5.5	74.5	9.7	78.9	10.4

9.10 It can be seen that the introduction of an early cut-off results in the with development scenarios in the AM peak performing with lower maximum degrees of saturation than under the baseline scenario and operating within capacity in the PM peak. In the cumulative scenario, the early cut-off also mitigates for the effect of development traffic in the AM peak. In the PM peak the junction operates marginally over capacity and consideration will need to be given to further improvements at this junction.

Parking Control

9.11 As explained in Section 6 of this Report, it is proposed to provide an average of 0.5 car parking spaces per residential unit, which is considered to be an appropriate level of provision to accommodate parking demand from the site. In order to ensure that the proposals do not result in additional pressure being placed on on-street parking in the area, a financial contribution towards the introduction of a Controlled Parking Zone on Nestles Avenue and existing streets to the south of the site. Residents of the development on the Former Nestle Factory Site will not be entitled to on-street parking permits within the CPZ.

Encouraging Sustainable Travel

9.12 In addition to the junction improvement schemes and contributions towards the implementation of a Controlled Parking Zone to the south of the site, both the residential and employment elements of the proposal will have Travel Plans in place to encourage residents, staff and visitors to travel to and from the site by sustainable models of transport. Measures include:

- Appointment of Travel Plan Coordinators (TPCs) who will ultimately be responsible for the implementation of the TP at a site wide level. The TPCs will be appointed 3 month before the initial occupation of the development.
- A Steering Group will be set up to provide a feedback loop between residents, employees, the TPC and external parties
- Information sheets will be provided in the on-site marketing office and show home to promote the TP
- Welcome packs will be provided to all new households on first occupation that provide information on sustainable travel options
- Travel Information Points and Notice Boards will be provided in lobbies and other appropriate locations around the site.
- The TPC will organise participation amongst residents and employees in promotional events such as 'Walk to School Week' or 'Walk to Work Week'.
- A Bike User Group (BUG) will be formed by the TPC and residents will be invited to join
- Reasonable endeavours will be used to obtain a discount for residents at a local bicycle shop
- The TPC will organise participation on promotional events like 'Bike to Work Week', will encourage residents and employees to attend cycle training sessions

provided by LBH and promote Dr Bike maintenance sessions and cycle maintenance training.

- A dedicated webpage will be created with reference to the TP and relevant information on the sustainable travel options.
- A car share database will be created and included on the webpage where residents can log their travel patterns and allow them to search for common routes.

9.13 As well as the Travel Plan, the development will be funding the provision of 5 car club vehicles. Developer funding of £83,311 +VAT will be provided to enable the introduction of these vehicles. Each residential unit will be provided with a welcome pack giving the occupier 3 years' free membership and £25 worth of driver credit per household to encourage residents to use the vehicles.

Policy Compliance

9.14 In terms of policy compliance, the the TA demonstrates the site is accessible to a range of social infrastructure and benefits from being located within close proximity to a range of public transport infrastructure, ensuring residents are not reliant on travel by private car.

9.15 This level of accessibility supports the proposed strategy for limited car parking provision, and includes disabled car parking that ensures each wheelchair accessible units has a parking space available at first occupation.

9.16 The proposals also allow for the introduction of cycle parking which reflect relevant standards.

9.17 In line with the requirements of the NPPF:

- Opportunities for sustainable transport modes have been taken up 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 that cost effectively reduce the impact of the development and ensure that it does not have a severe residual impact.

10.0 SUMMARY

10.1 Markides Associates (MA) have been instructed by SEGRO PLC and Barratt London Ltd (the Applicants), to prepare a Transport Assessment (TA) in support of their development proposals for the Former Nestle Site, Nestles Avenue, Hayes, UB3 4RF (the Site). Assistance in the production of this document has been provided by Peter Brett Associates (PBA) in relation to the commercial element of the development.

10.2 The Site is located to the south-east of Hayes Town Centre as shown in **Figure 1.1**, bounded to the north by the Great Western Rail Line and Grand Union Canal and to the south by Nestles Avenue. The former Nestle Factory has been split into two separate development parcels covered by the same planning application. The land being redeveloped by Barratt London Ltd is the western portion of the site with the eastern portion being developed by SEGRO for complementary employment uses. This Transport Assessment covers the entire development proposals.

10.3 The development proposals are for the part-demolition of existing factory buildings and associated structures, and redevelopment to provide to 1,381 dwellings (Use Class C3), office, retail, community and leisure uses (Use Classes A1/A3/A4/B1/B8/D1/D2), 22,663 sqm (GEA) of commercial floorspace (Use Classes B1c/B2/B8 and Data Centre (sui generis)), amenity and playspace, allotments, landscaping, access, service yards, associated car parking and other engineering works.

Existing Transport Conditions

10.4 The site benefits from highly accessible by sustainable modes of transport. Hayes town centre is less than 1km away and there are a range of retail, employment, education, health and leisure uses within walking and cycling distance of the site. Pedestrian and cycle audits of the area around the site show that existing infrastructure is generally of good quality, with very few areas that would benefit from improvements.

10.5 Hayes and Harlington Station is approximately 420m from the closest point on the site and is currently served by Heathrow Connect and Great Western Railway Services to Heathrow, London Paddington, Oxford and Reading. Hayes and Harlington is a Crossrail station and in 2018 it will be served by The Elizabeth Line, operating from Reading / Heathrow Airport in the west to Shenfield and Abbey Wood to the east. This will give direct access to Bond Street, Tottenham Court Road, Liverpool Street, Canary Wharf and Stratford. As part of the Crossrail scheme, Hayes and Harlington Station will experience major improvements, with a new ticket hall and step free access to all platforms.

10.6 The site is also well served by buses, with nine different services within approximately 400m of the nearest point on the site. These serve destinations such as Northolt, Feltham, Heathrow, Brentford, Ickenham, Greenford and Uxbridge.

10.7 With regard to the road network, the site is bounded to the south by Nestles Avenue and to the east of North Hyde Gardens. There is no vehicular connection between these two roads as there is a closure at the eastern end of Nestles Avenue that allows access by pedestrians and cyclists only. At the eastern end of Nestles Avenue is Station Road, which forms a north / south route from Hayes Town Centre through Harlington to the A41 north of Heathrow. To the south of and parallel with Nestles Avenue is North Hyde Road. This connects to Station Road to the east of site at a signal controlled junction. To the west of the site it gives access to North Hyde Gardens and the Bulls Bridge Roundabout, where the A312 Parkway provides access to the M3 J3 to the south and the A4020 and A40 to the north. The A312 and Bulls Bridge Roundabout form part of TfL's road network, whilst North Hyde Road and Station Road and the responsibility of LBH.

10.8 Junction capacity assessment have identified that both the Bulls Bridge Roundabout and M4 J3 have capacity problems under current traffic conditions. In addition, on the LBH road network, the junctions of Dawley Road / Botwell Common Road, Botwell Lane / Printinghouse Lane and Botwell Lane / Church Road were found to have capacity problems.

Development Proposals

10.9 The proposed development is as identified in paragraph 10.3. The employment development will be accessed from North Hyde Gardens, utilising the same access as the existing Nestle Factory, whilst the residential element of the development will be accessed from Nestles Avenue.

10.10 Car and cycle parking provision for the employment uses is in line with the London Plan for non-B1 employment uses. The residential scheme has cycle parking provided in line with the London Plan standards. Car parking for the residential scheme is proposed to be provided at an average of 0.5 spaces per unit. This complies with the London Plan requirements for substantially less than 1 space per unit in locations with good public transport accessibility. A detailed examination of the proposed residential parking and justification for the level being proposed is set out in Section 6 of this Report.

Traffic Impact

10.11 Extensive discussions took place with LBH and TfL with regard to the scope of this Transport Assessment and the methodology to be used to identify the traffic impact of the development proposals (see **Appendix A**).

10.12 The assessment approach used for the TfL and LBH road networks differs. TfL have required the use of their WeLHAM model to predict future year traffic flows, whereas LBH have required the use of TEMPRO growth factors and traffic flows associated with committed development in the area around the site. Section 7 of this report sets out the methodology being used to predict future year traffic flows with and without the development in place.

10.13 The methodology for assessing network capacity also differs between the two authorities. TfL have provided LINSIG models of the Bulls Bridge Roundabout and M4 J3 to allow the junctions to be assessed with the predicted future traffic flows. Improvement schemes for both of these junctions have already been identified in conjunction with committed developments in the area (in particular the Southall Gas Works site) and model for these as well as the existing junction layouts have been provided.

10.14 The LBH network has initially been assessed using stand alone junction models and a VISSIM model of the area around Hayes town centre and the site has also been constructed, at the specific request of LBH.

10.15 The assessment at the Bulls Bridge Roundabout and M4 J3 show that the proposed development does not have a material impact on the performance of these junctions.

Mitigation Measures

10.16 For the LBH network, the following junctions are identified to be adversely impacted by the development proposals to the extent that improvements are justified:

- Dawley Road / Botwell Common Road Priority Junction
- Dawley Road / Kestrel Way / Betam Road / Blyth Road Roundabout
- Harold Avenue / North Hyde Road Priority Junction and
- Station Road / North Hyde Road Signals.

10.17 It should be noted that we remain of the view that the assessment approach required by LBH results in excessively high estimates of future year background and development traffic flows, therefore overstating the impact of the proposals on the road network. Despite this, the potential for capacity improvements at these junctions has been examined in detail.

10.18 For the first two of these junctions, improvements consisting of localised widening have been identified to mitigate the development impact. At the Harold Avenue / North Hyde Road junction, the introduction of a right turn refuge in the centre of North Hyde Road is proposed to mitigate development traffic impact. Finally, at the Station Road / North Hyde Road signals changes to the signal staging are identified to improve the junction performance.

10.19 Assessments including the cumulative effects of development north of Nestles Avenue identify that the proposed mitigation at the first two junctions is sufficient to mitigate the impact of development at the former Nestle site. Further improvement may be required at the Harold Avenue / North Hyde Road and Station Road / North Hyde Road junctions to mitigate the cumulative effects of all of the sites north of Nestles Avenue.

10.20 As well as junction improvements, there are a number of other measures that will be funded by the development to ensure car ownership at the site is as low as possible and to encourage the use of sustainable modes of transport. These include:

- Funding for the provision of a Controlled Parking Zone on the road network adjacent to the site;
- The introduction of a Travel Plan for the development to encourage the use of sustainable modes of transport;
- Funding for the provision of 5 car club vehicles and free membership for each household on the development for three years.

FIGURES

Rev	Amendments
Drn	Chk
App	Date

MARKIDES ASSOCIATES

9th Floor, The Tower Building, York Road, London, SE1 7NX

Telephone: 0207 442 2225

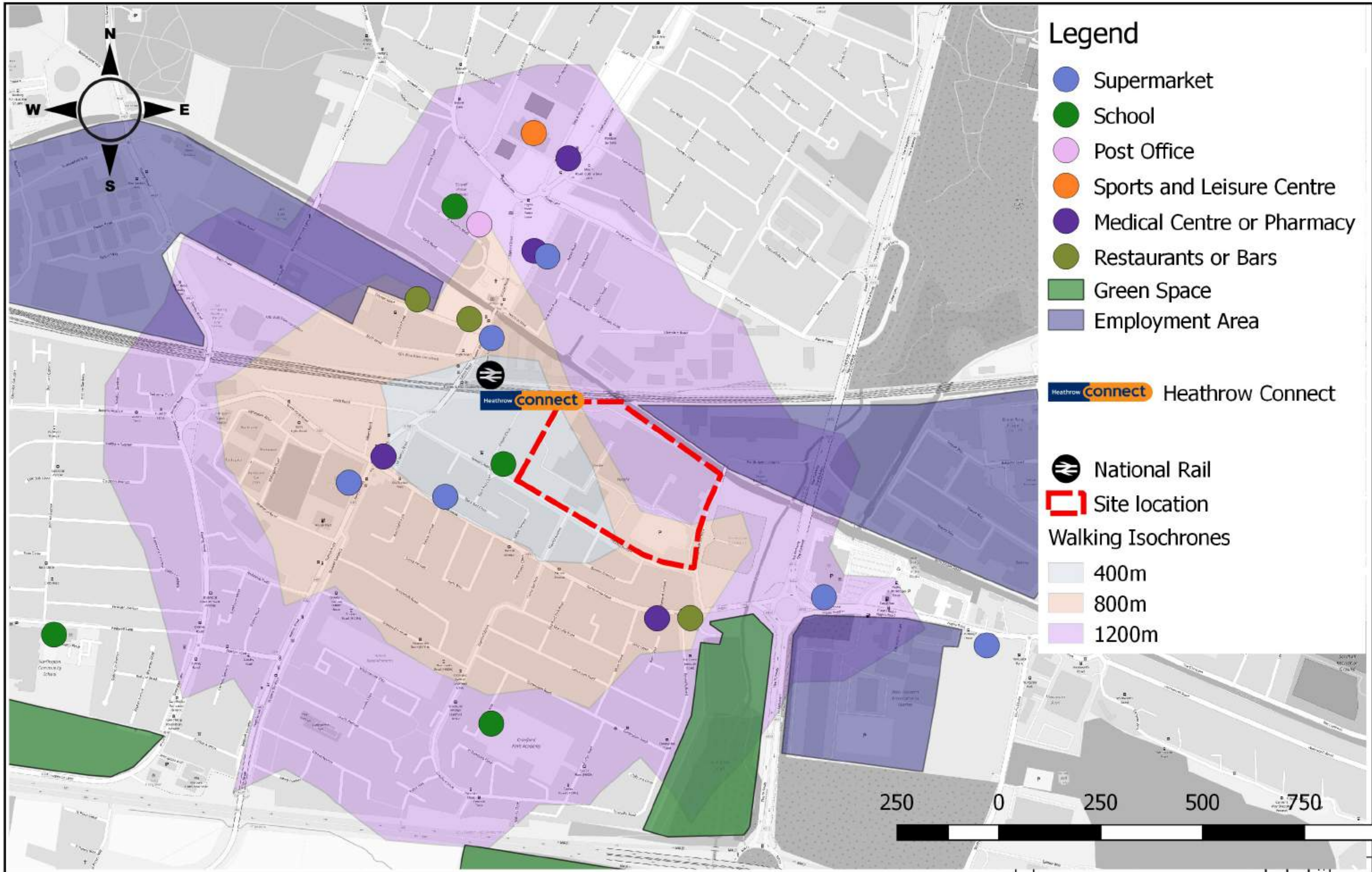
E: enquiries@markidesassociates.com
W: www.markidesassociates.com

Job Title: FORMER NESTLE SITE, HAYES

Drawing Title: SITE LOCATION PLAN

Client: SEGRO PLC AND BARRATT LONDON

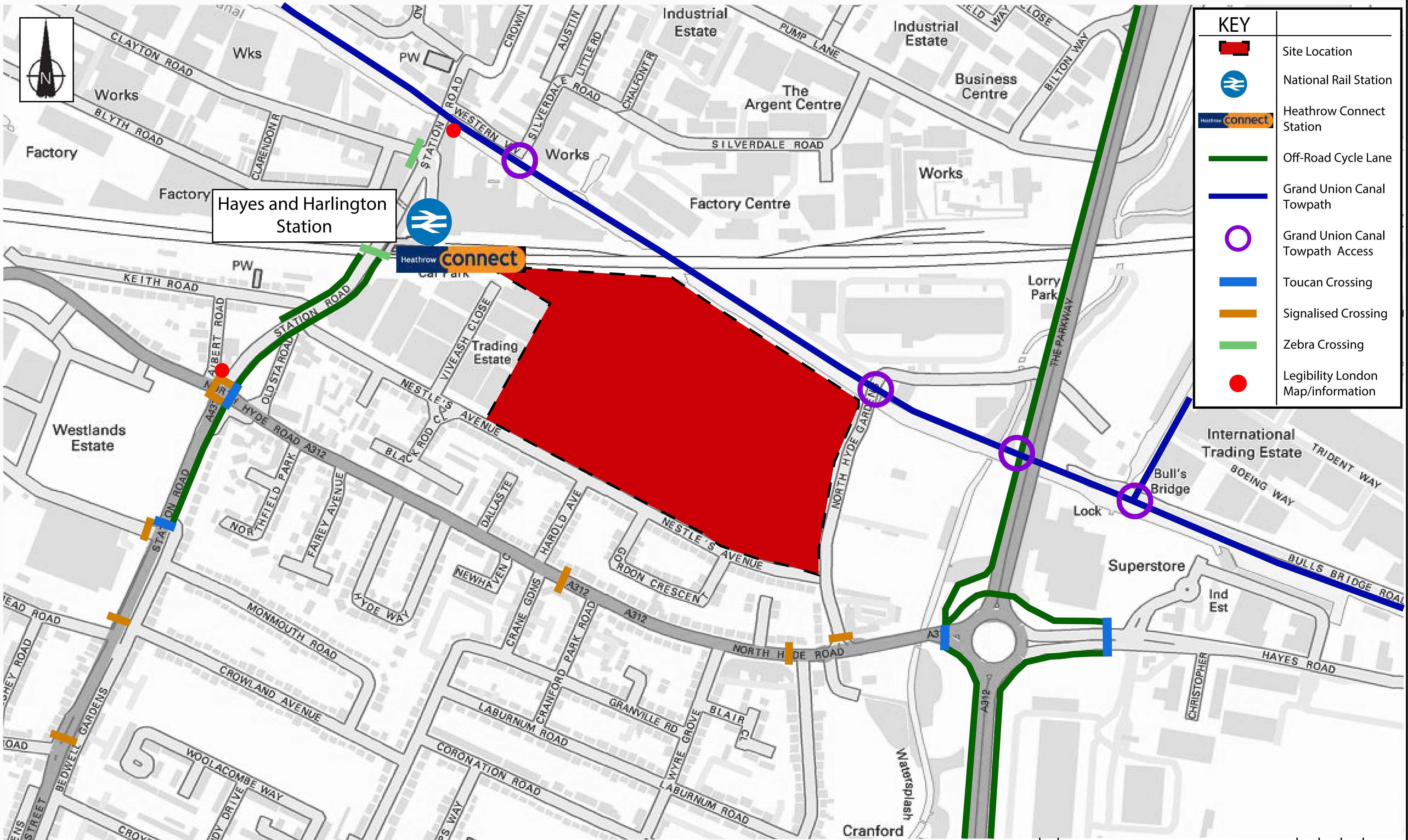
Scale	Date	Designed
NTS	FEB '17	GE
Drawn	Checked	Approved
SEC	JB	JB
Job No	Figure No	Rev
16-018-01	FIGURE 1.1	A



MARKIDES ASSOCIATES

5th Floor, The Tower Building, York Road, London, SE1 7NX
Telephone: 0207 442 2225
E: enquiries@markidesassociates.com
W: www.markidesassociates.com

Job Title	Client	Scale	Date	Designed
FORMER NESTLE SITE, HAYES	SEGRO PLC AND BARRATT LONDON	1:20000	31/03/2017	PF
Drawing Title		Drawn	Checked	Approved
SOCIAL INFRASTRUCTURE PLAN		PF	JB	JB
		Job No	Figure No	Rev
		16018-01	FIGURE 3.1	A



Reproduced from Ordnance Survey with the permission of the Controller of Her Majesty's Stationery Office, Crown Copyright Reserved.

Rev	Amendments	Drn	Chk	App	Date

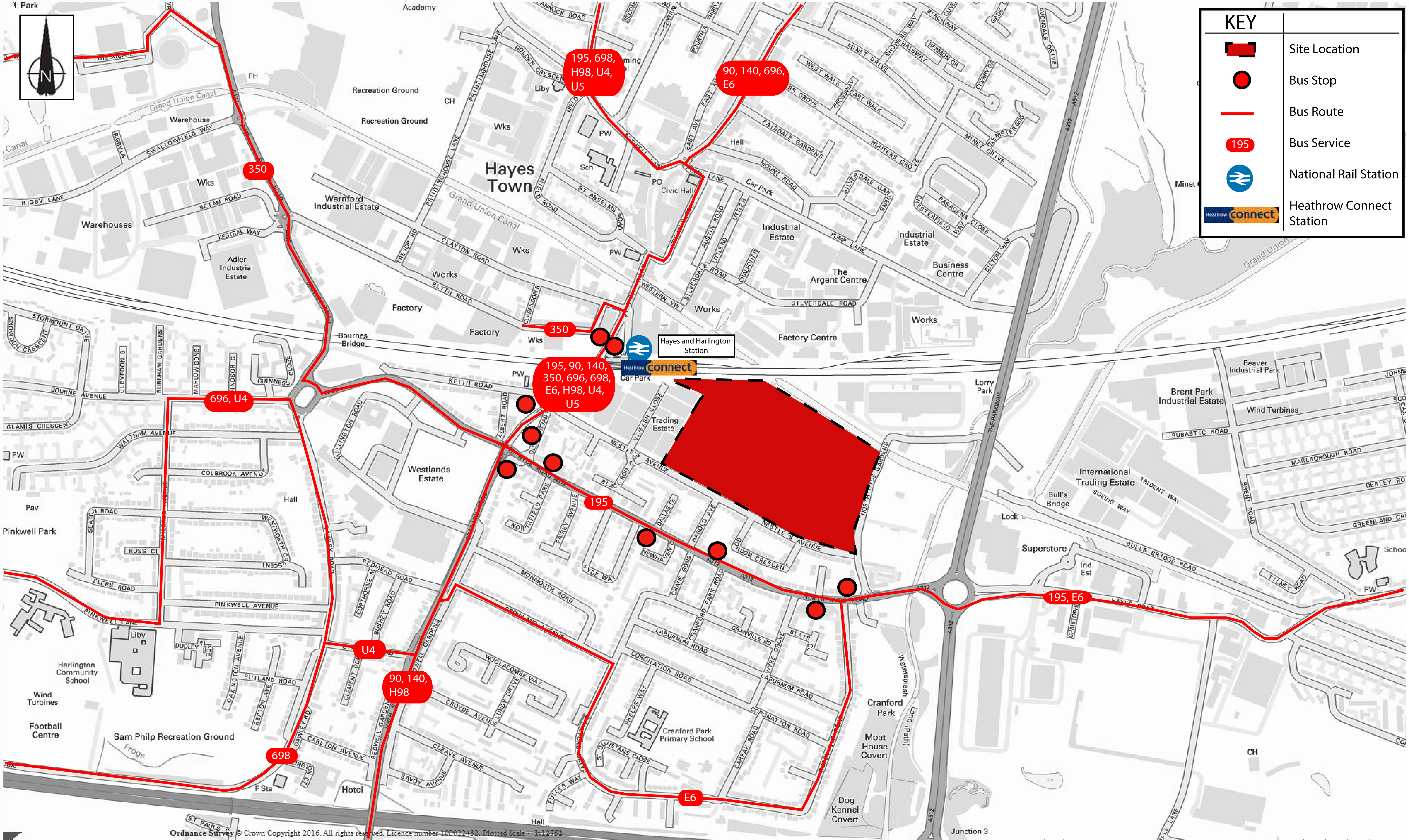
MARKIDES ASSOCIATES
9th Floor, The Tower Building,
York Road,
London,
SE1 7NX
Telephone: 0207 442 2225
E: enquiries@markidesassociates.com
W: www.markidesassociates.com

Job Title: FORMER NESTLE SITE, HAYES

Drawing Title: SUSTAINABLE TRANSPORT INFRASTRUCTURE

Client: SEGRO PLC AND BARRATT LONDON

Scale	Date	Designed
NTS	FEB` 17	GE
Drawn: SEC	Checked: JB	Approved: JB
Job No: 16018-01	Figure No: FIGURE 3.2	Rev: A



Rev	Amendments	Drn	Chk	App	Date

MARKIDES ASSOCIATES

9th Floor, The Tower Building,
York Road,
London,
SE1 7NX

Telephone: 0207 442 2225

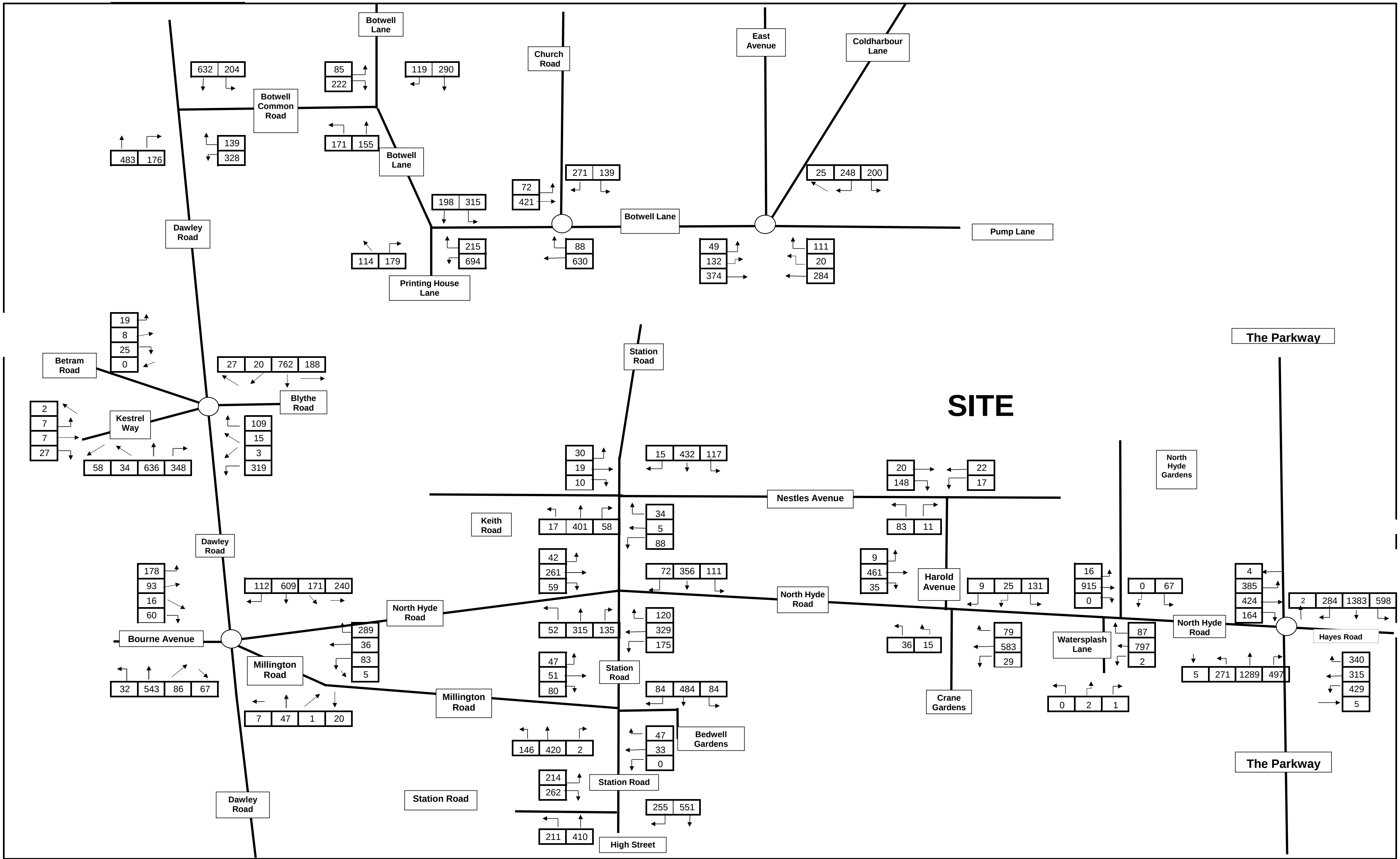
E: enquiries@markidesassociates.com
W: www.markidesassociates.com

Job Title: FORMER NESTLE SITE, HAYES

Drawing Title: PUBLIC TRANSPORT INFRASTRUCTURE PLAN

Client: SEGRO PLC AND BARRATT LONDON

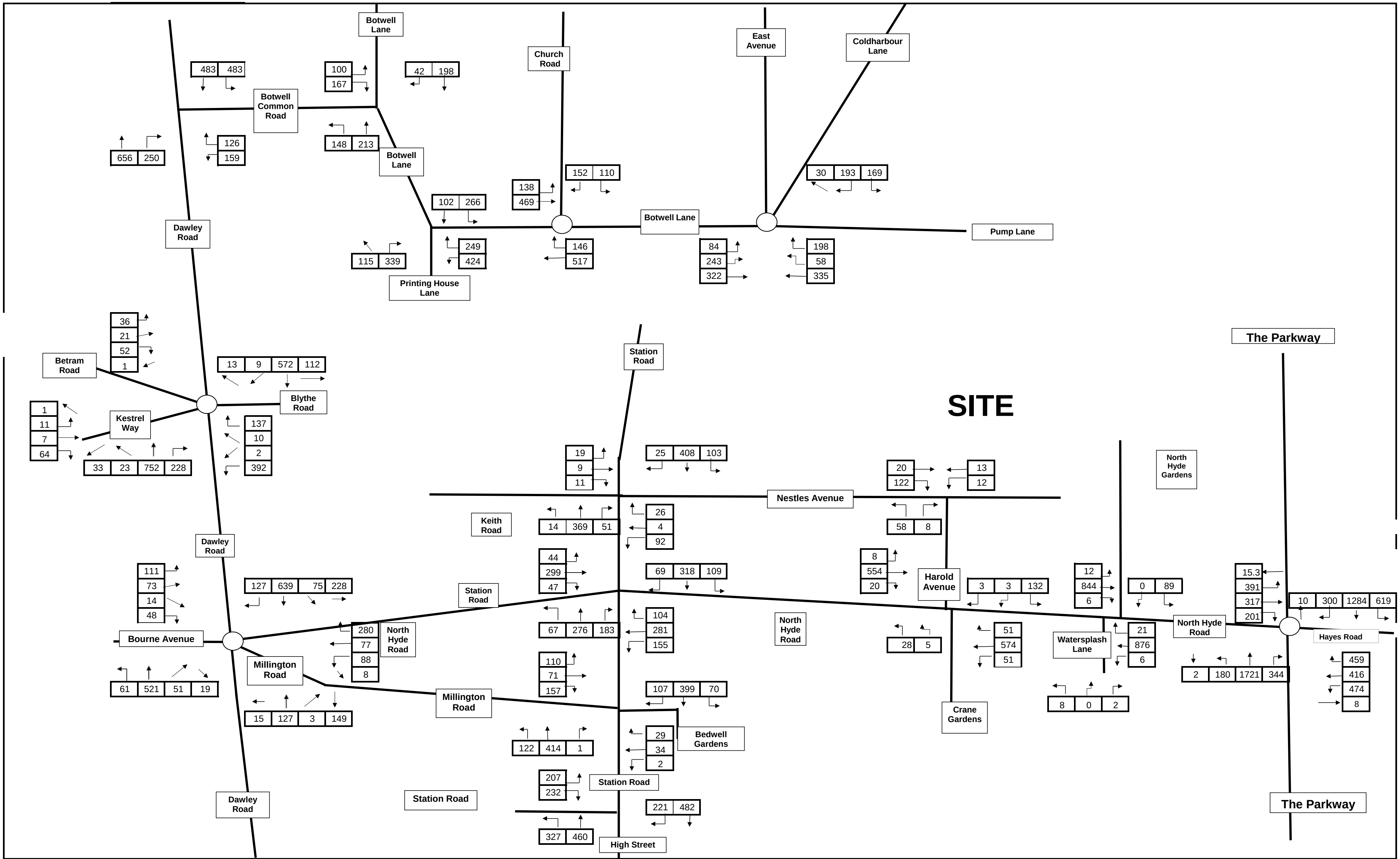
Scale: NTS	Date: JAN '17	Designed: GE
Drawn: SEC	Checked: SC	Approved: JB
Job No: 16-018-01	Figure No: FIGURE 3.3	Rev: A



MARKIDES ASSOCIATES
9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:

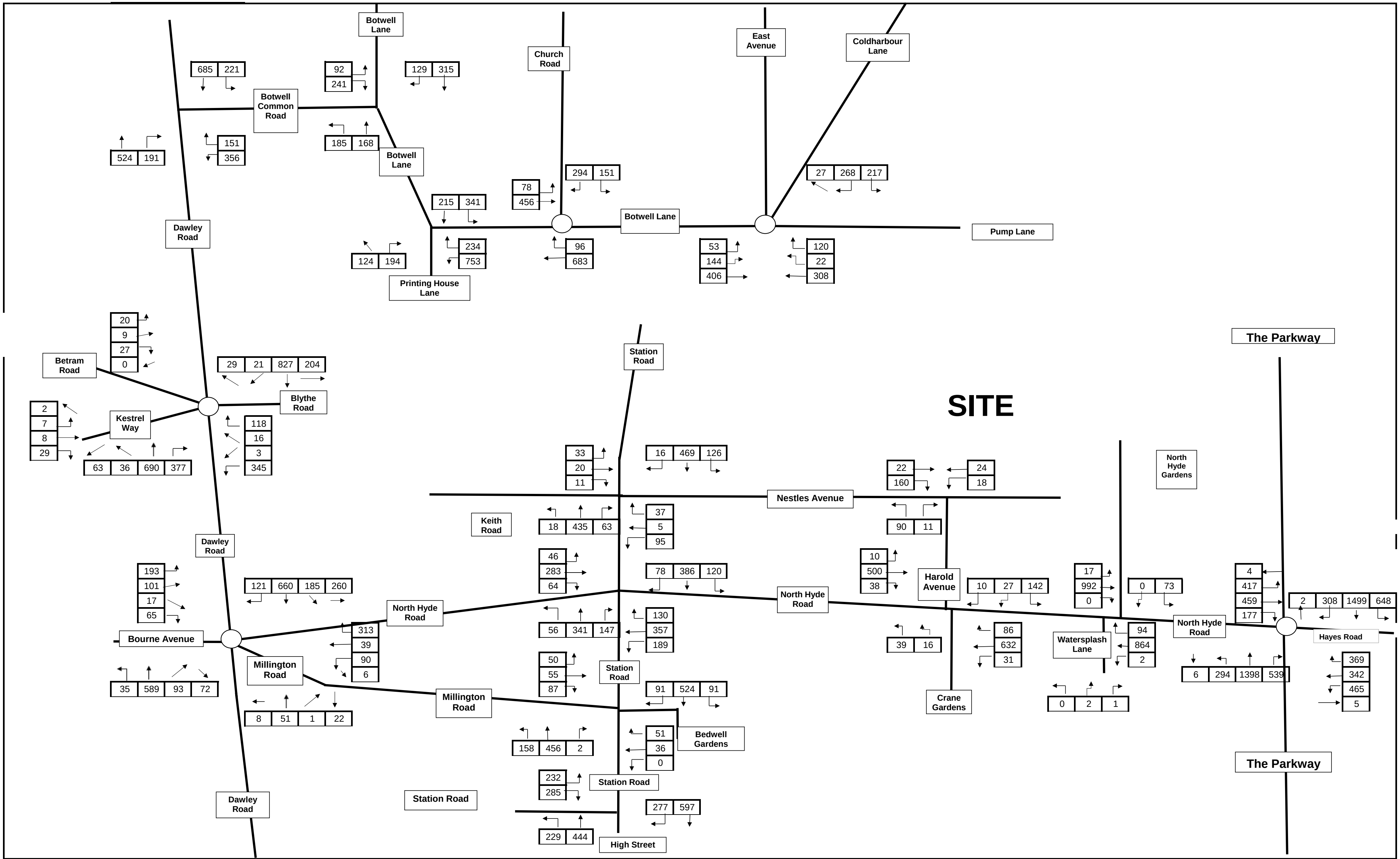
Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: 2016 AM Peak Surveys	Job No: 16018-01
Figure No: Figure 4.1	Date: 01/10/2016



MARKIDES ASSOCIATES

9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:	Job Title: Former Nestles Factory Hayes	Scale: NTS
	Drawing Title: 2016 PM Peak Surveys	Job No: 16018-01
	Figure No: Figure 4.2	Date: 01/10/2016

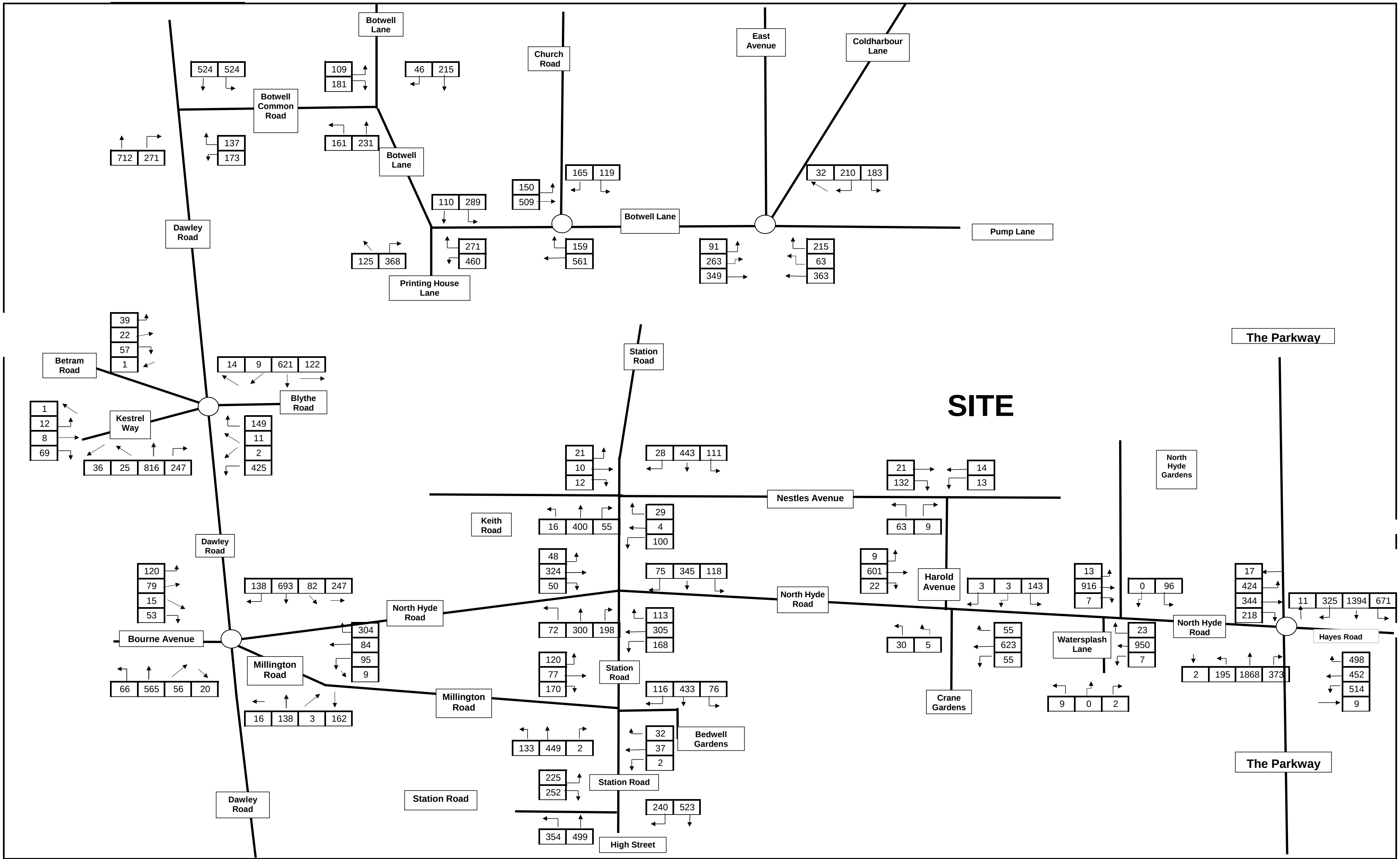


MARKIDES ASSOCIATES

9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

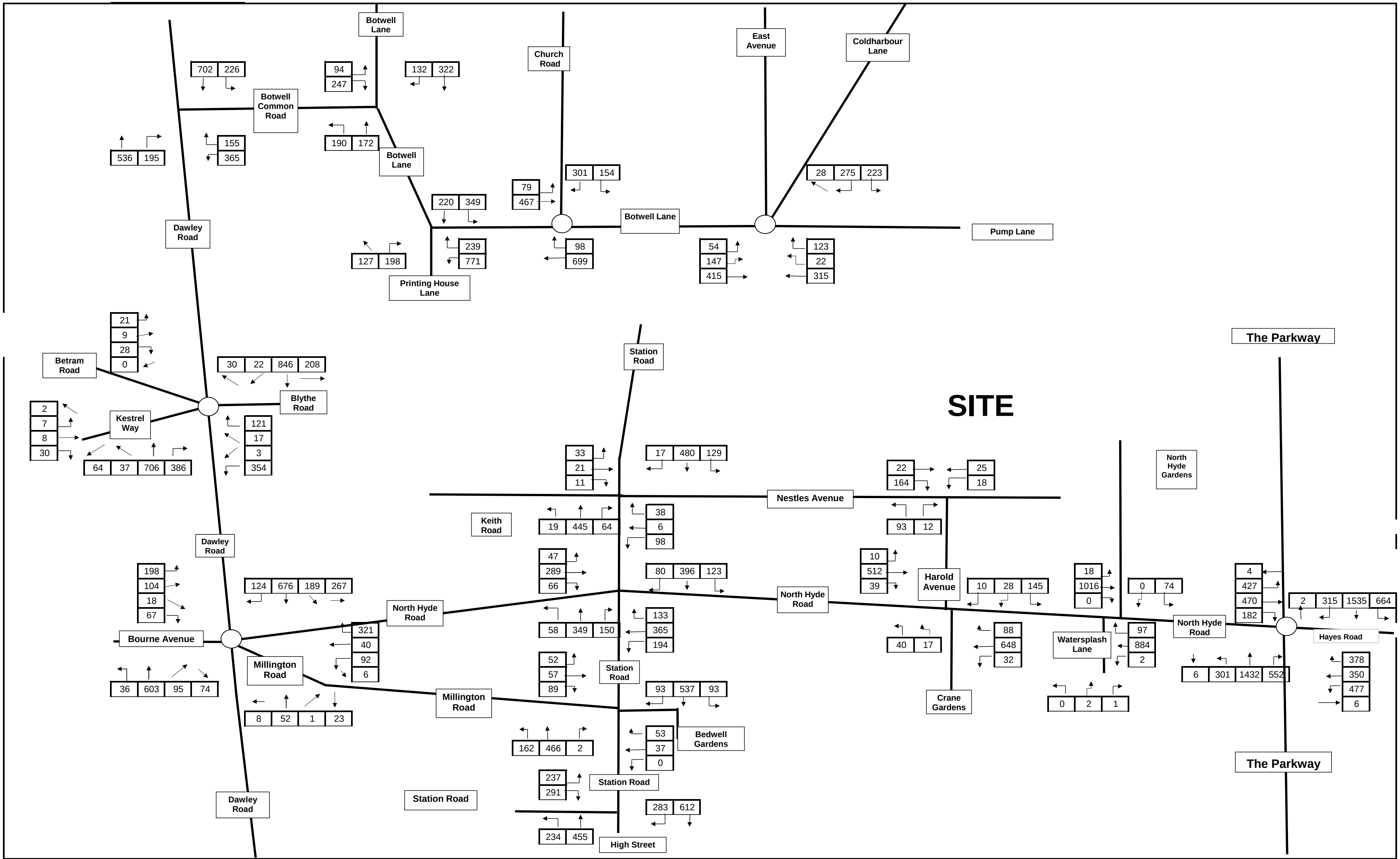
Notes:

Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: AM Peak Traffic With 2024 Growth Applied	Job No: 16018-01
Figure No: Figure 7.1	Date: 01/10/2016



MARKIDES ASSOCIATES	Notes:	Job Title: Former Nestles Factory Hayes	Scale: NTS
		Drawing Title: PM Peak Traffic With 2024 Growth Applied	Job No: 16018-01
		Figure No: Figure 7.2	Date: 01/10/2016

9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk



Notes:

Job Title:

Former Nestles Factory Hayes

Scale:

NTS

Drawing Title:

AM Peak Traffic With 2029 Growth Applied

Job No:

16018-01

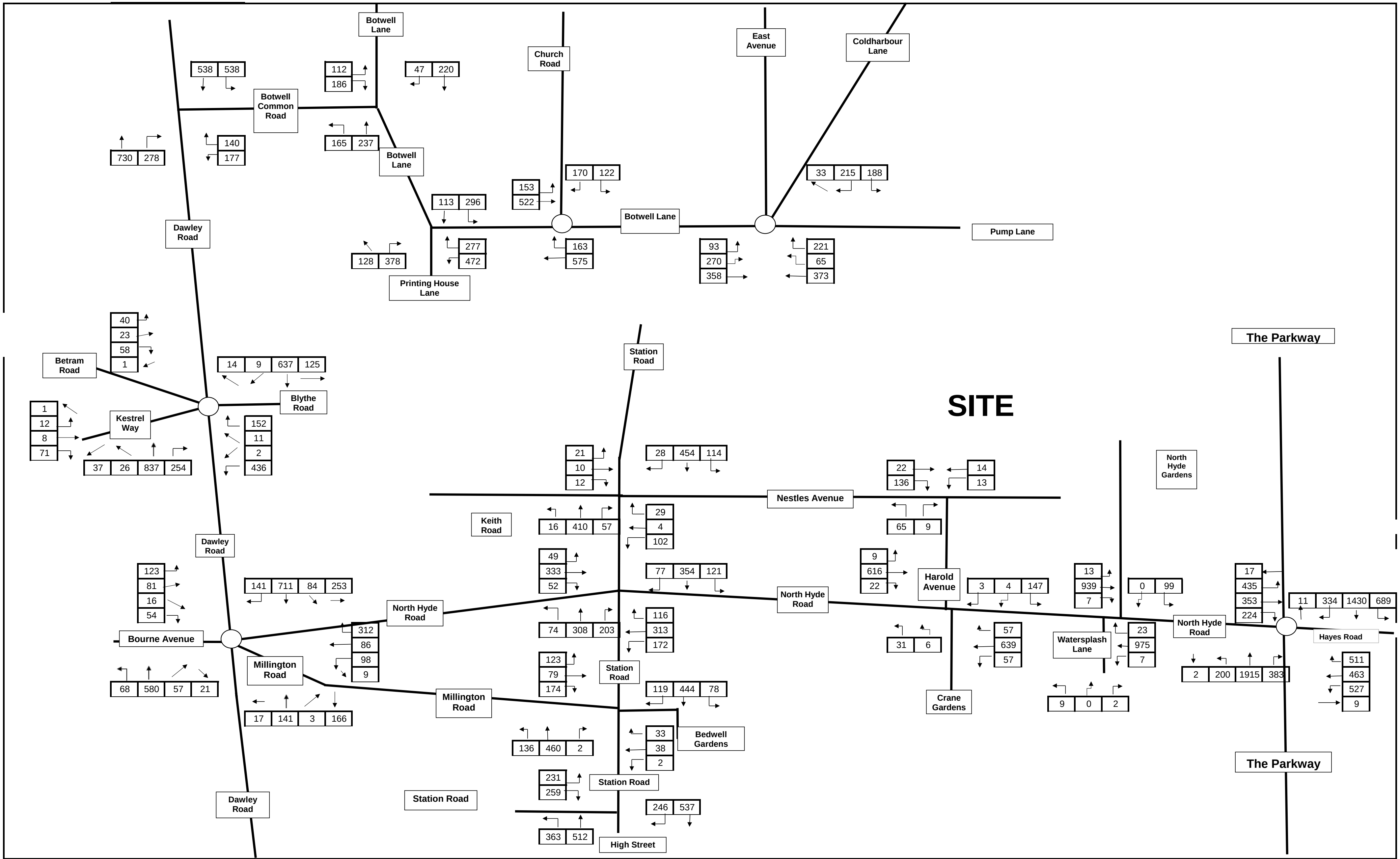
Figure No:

Figure 7.3

Date:

01/10/2016

MARKIDES ASSOCIATES
9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

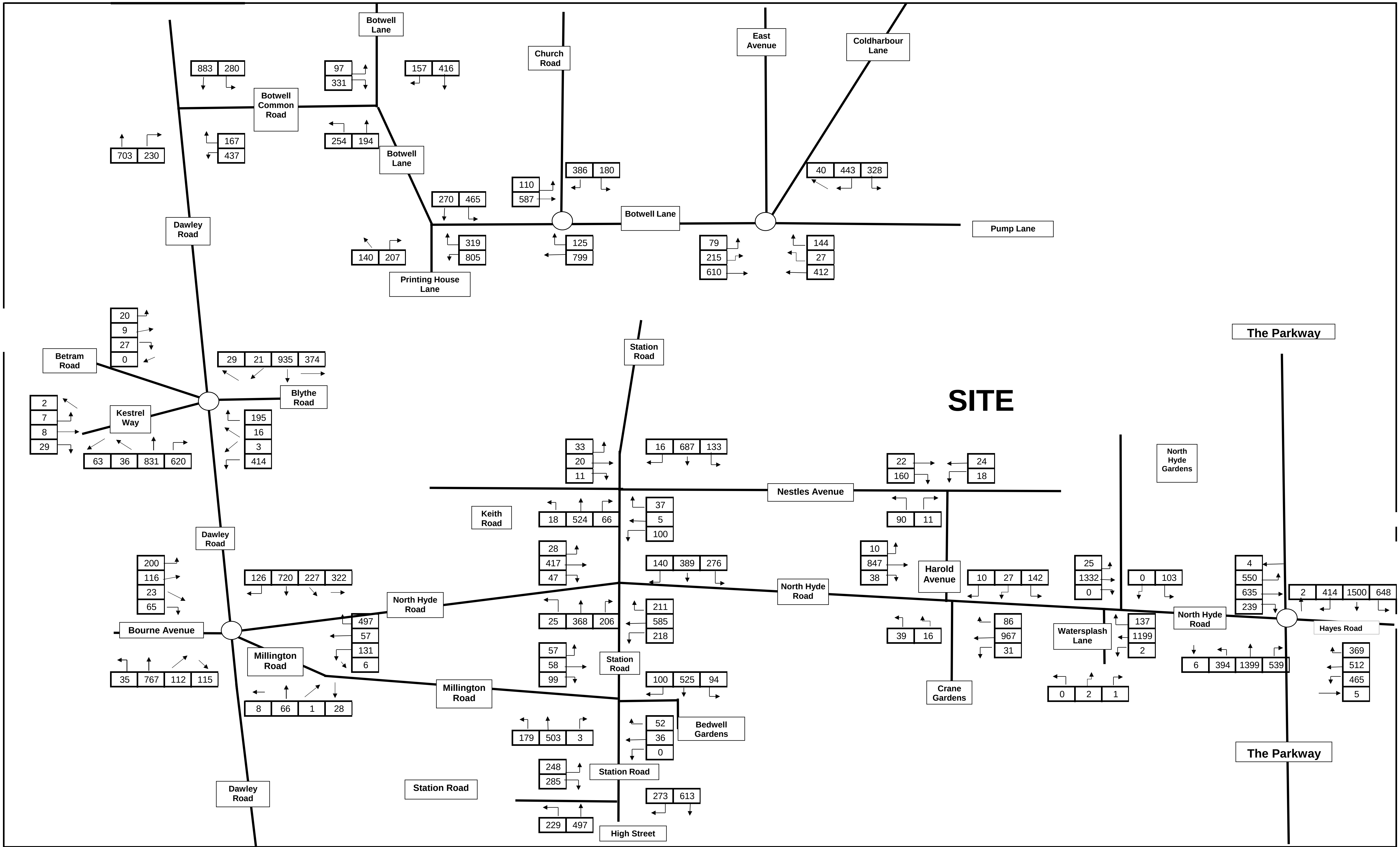


MARKIDES ASSOCIATES

9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:

Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: PM Peak Traffic With 2029 Growth Applied	Job No: 16018-01
Figure No: Figure 7.4	Date: 01/10/2016



MARKIDES ASSOCIATES
9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:

Job Title:
Former Nestles Factory Hayes

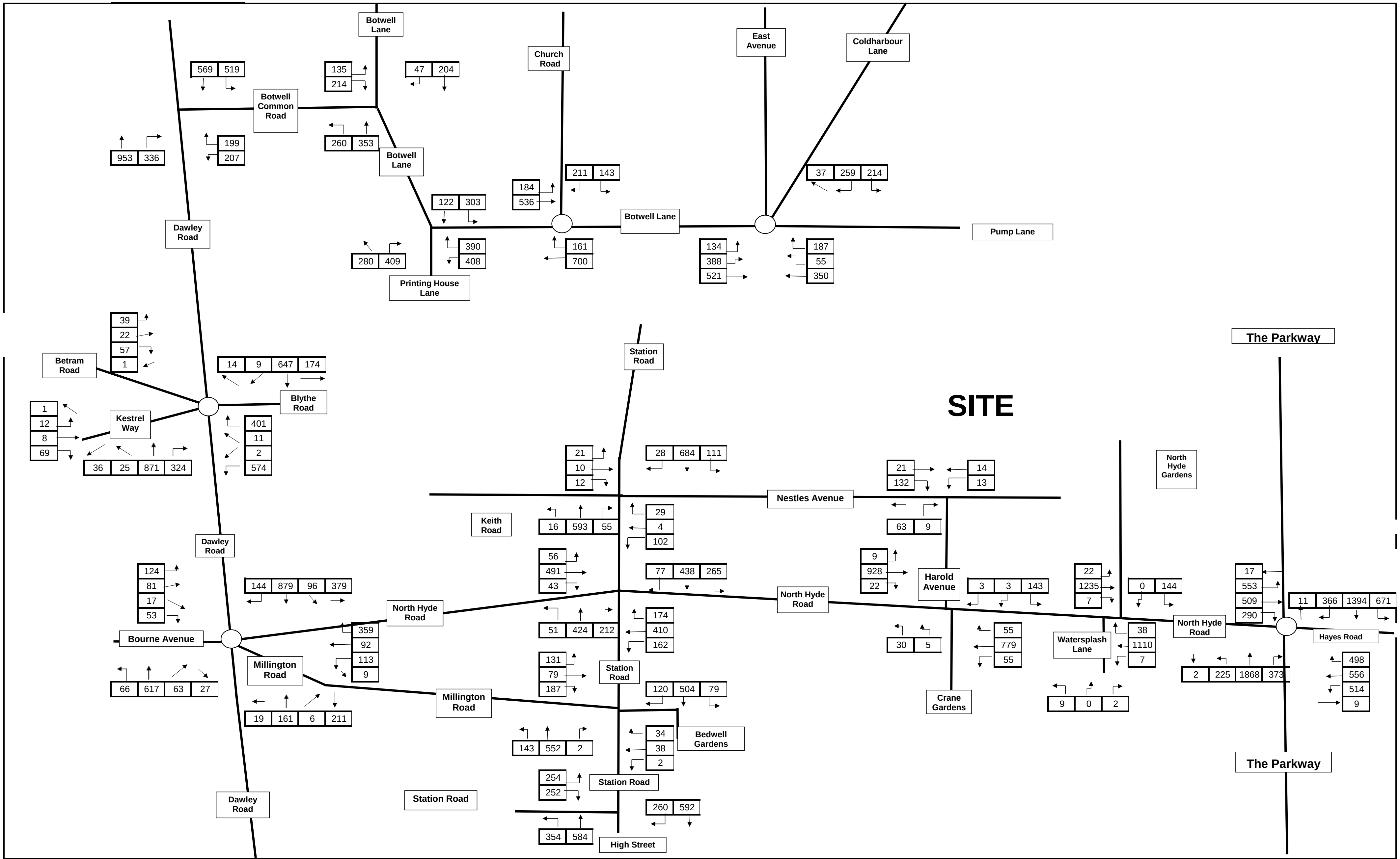
Scale:
NTS

Drawing Title:
2024 AM Peak Background Traffic - With Committed Development

Job No:
16018-01

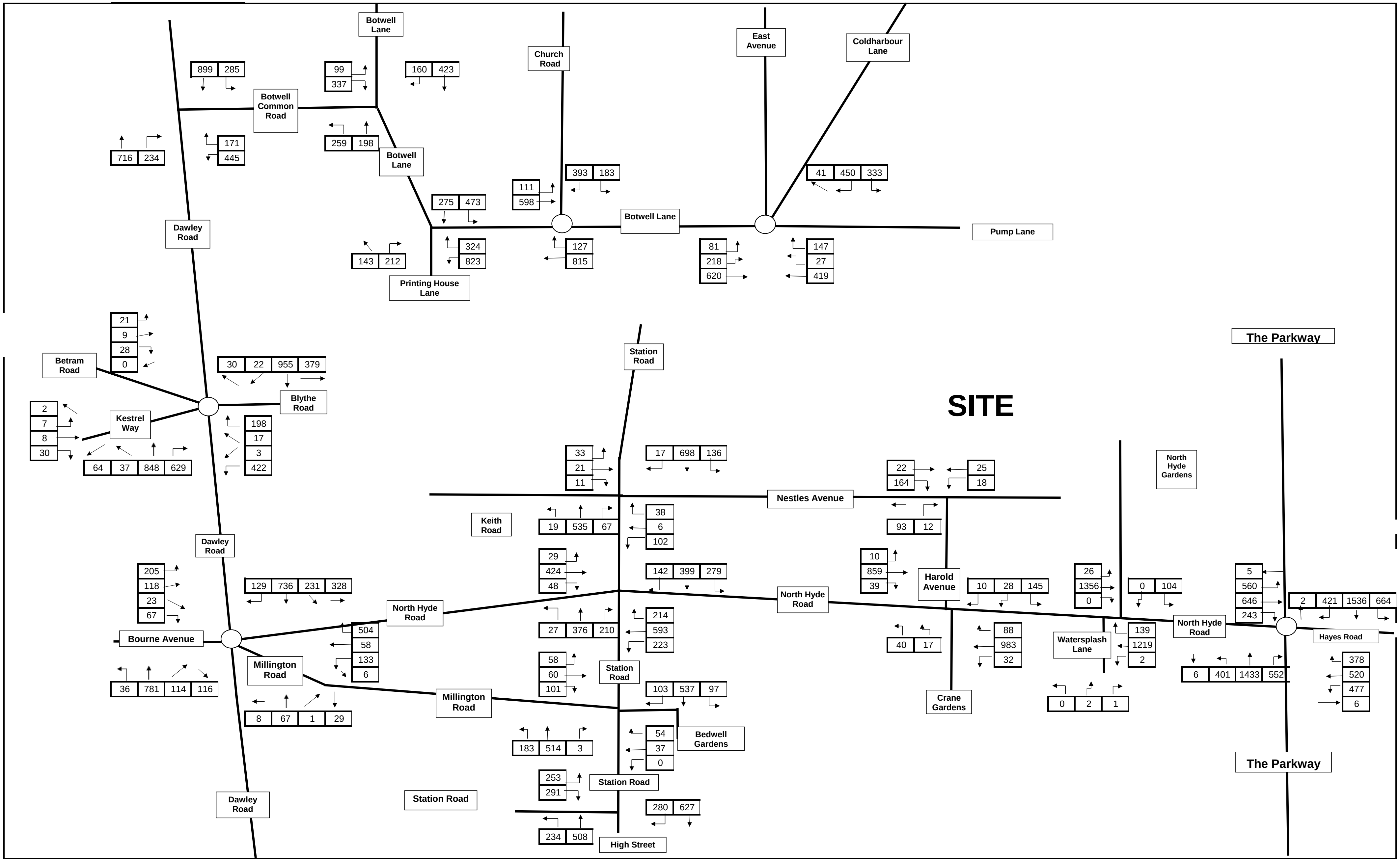
Figure No:
Figure 7.5

Date:
01/10/2016



MARKIDES ASSOCIATES
9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

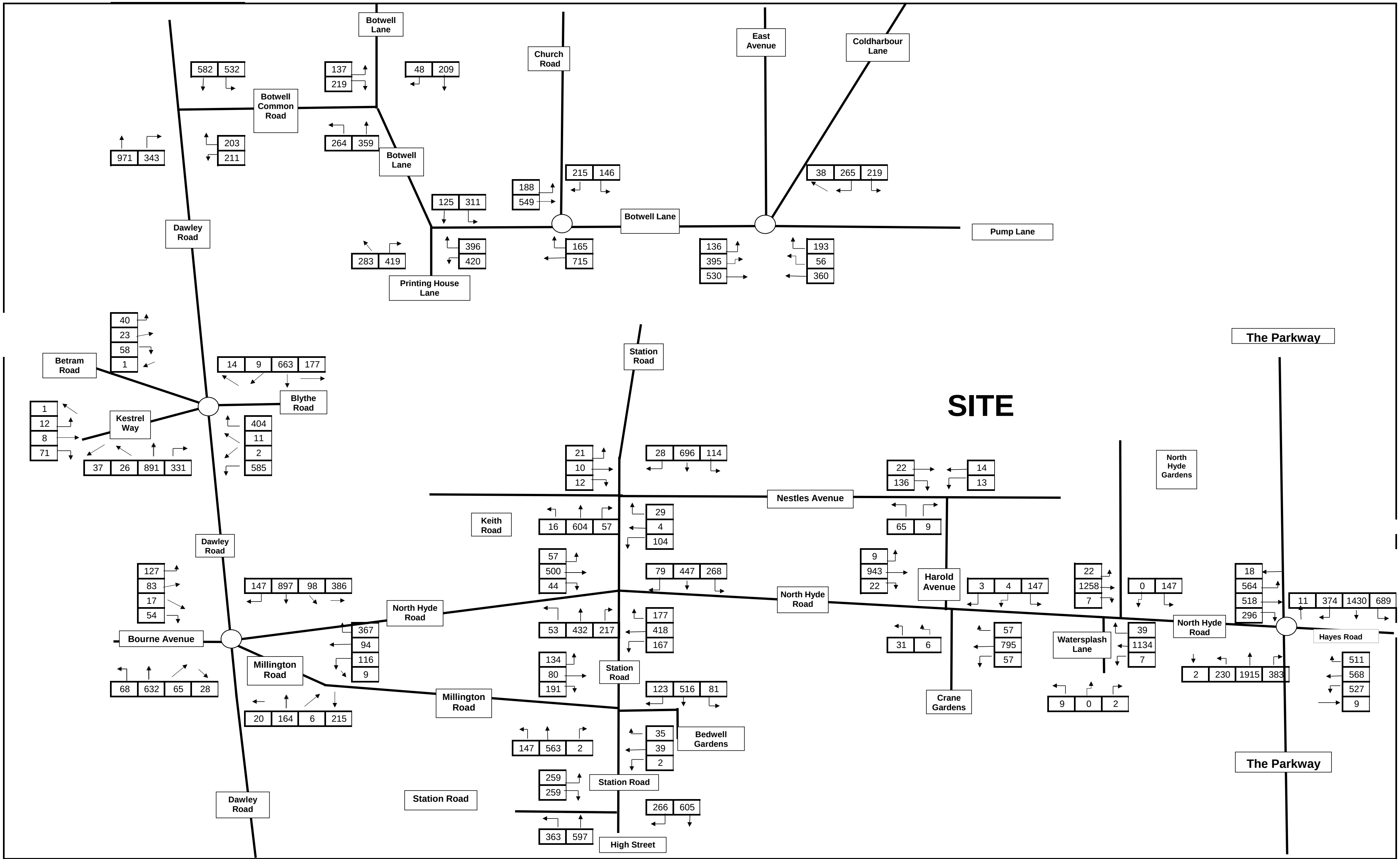
Notes:	
Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: 2024 PM Peak Background Traffic - With Committed Development	Job No: 16018-01
Figure No: Figure 7.6	Date: 01/10/2016



MARKIDES ASSOCIATES
9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:

Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: 2029 AM Peak Background Traffic - With Committed Development	Job No: 16018-01
Figure No: Figure 7.7	Date: 01/10/2016

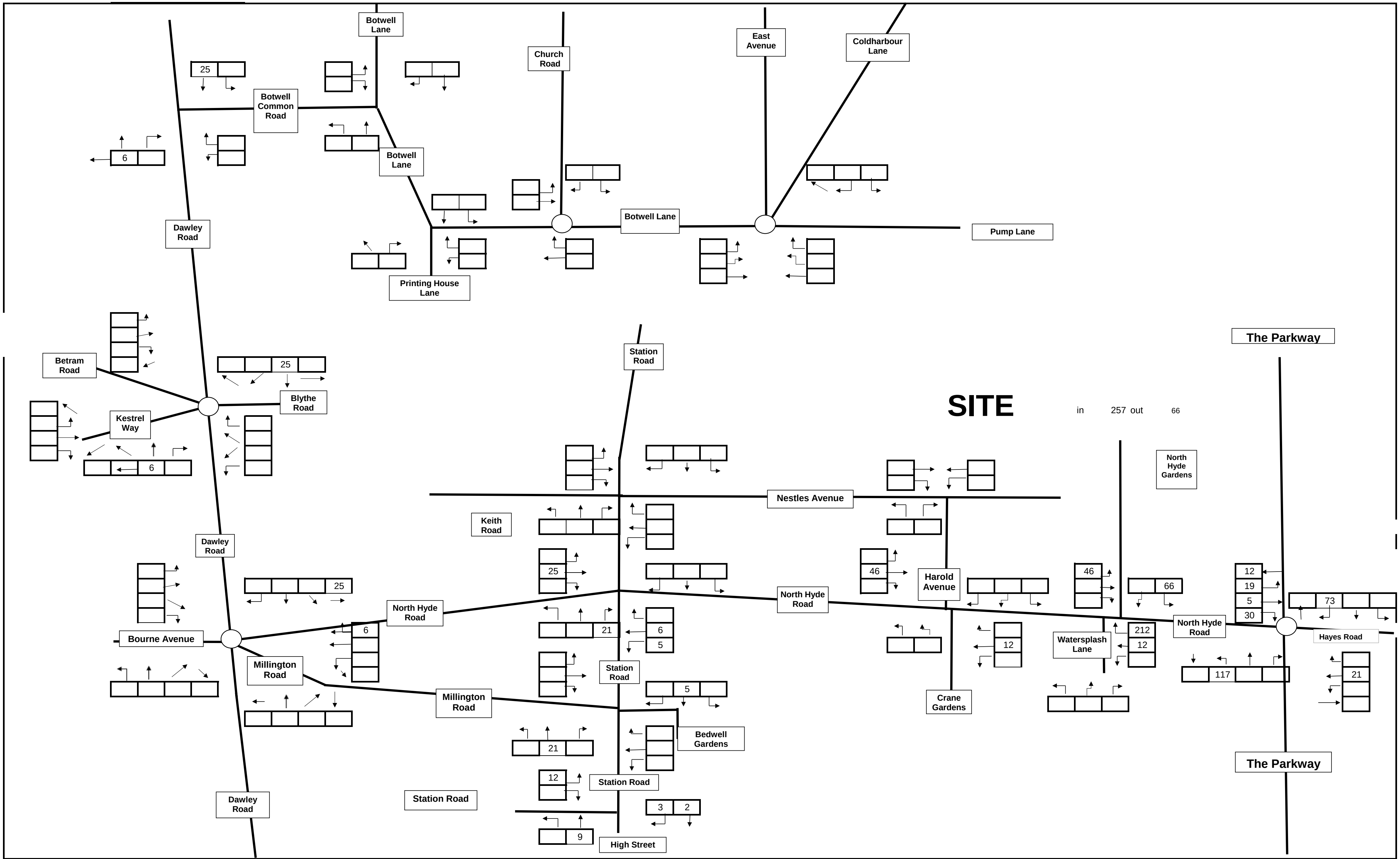


MARKIDES ASSOCIATES

9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

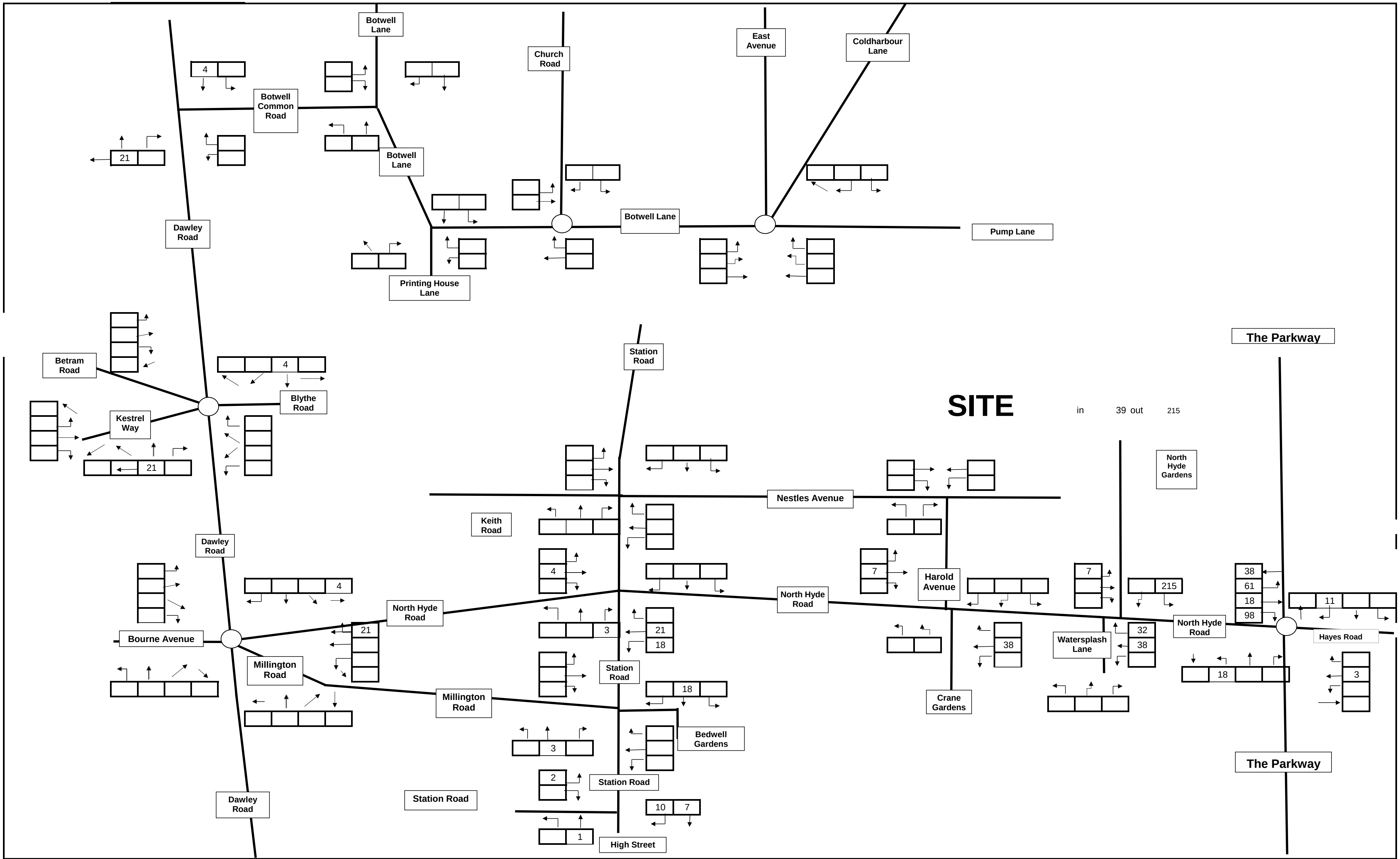
Notes:

Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: 2029 PM Peak Background Traffic - With Committed Development	Job No: 16018-01
Figure No: Figure 7.8	Date: 01/10/2016



MARKIDES ASSOCIATES
9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

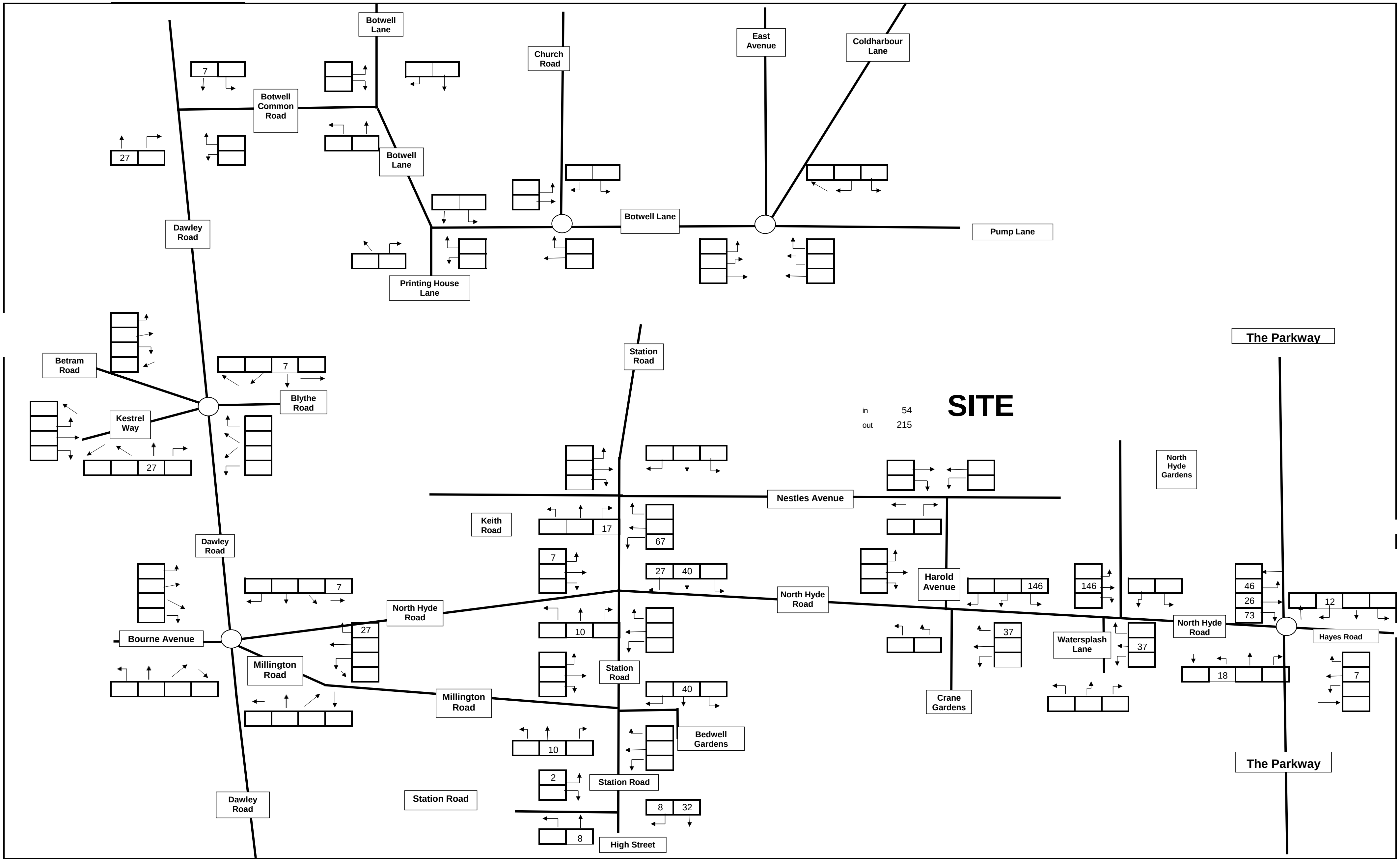
Notes:	
Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: Existing Employment Use AM Traffic Flows	Job No: 16018-01
Figure No: Figure 7.9	Date: 01/10/2016



9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

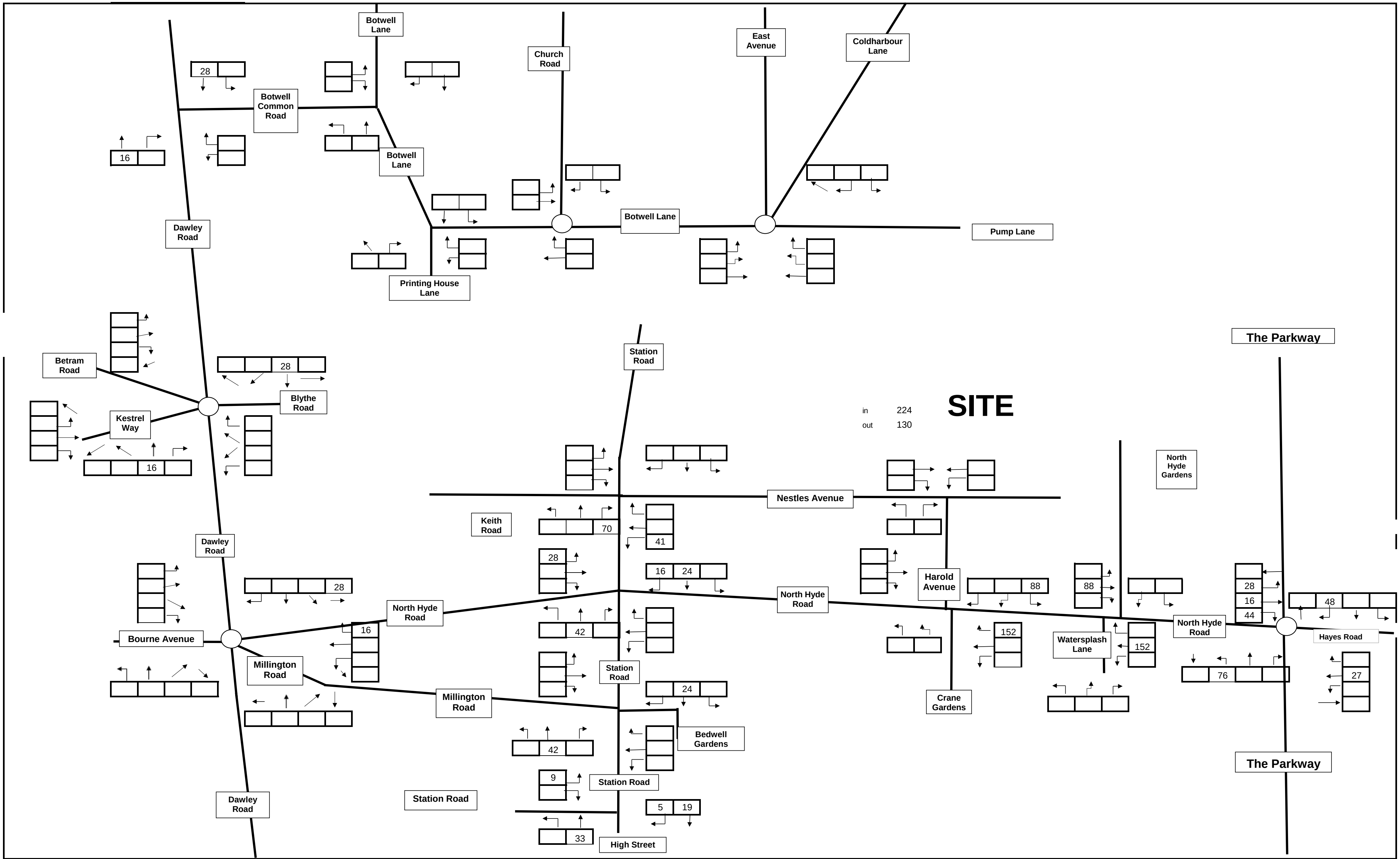
Notes:

Job Title: **Former Nestles Factory Hayes**	Scale: **NTS**
Drawing Title: **Existing Employment Use PM Traffic Flows**	Job No: **16018-01**
Figure No: **Figure 7.10**	Date: **01/10/2016**



MARKIDES ASSOCIATES
9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

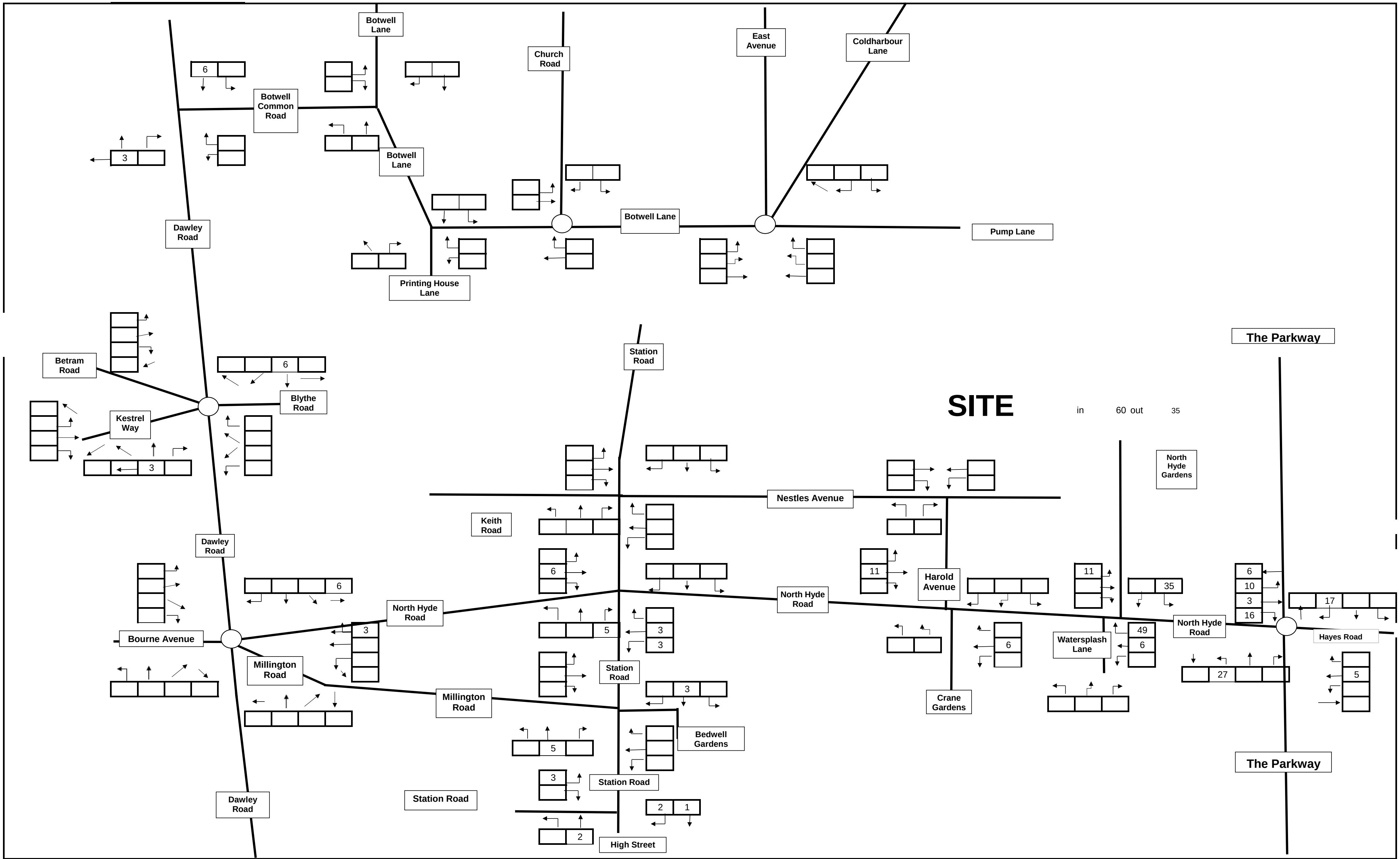
Notes:	Job Title: Former Nestles Factory Hayes	Scale: NTS
	Drawing Title: Proposed Residential Use AM Traffic Flows	Job No: 16018-01
	Figure No: Figure 7.11	Date: 01/10/2016



MARKIDES ASSOCIATES
9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

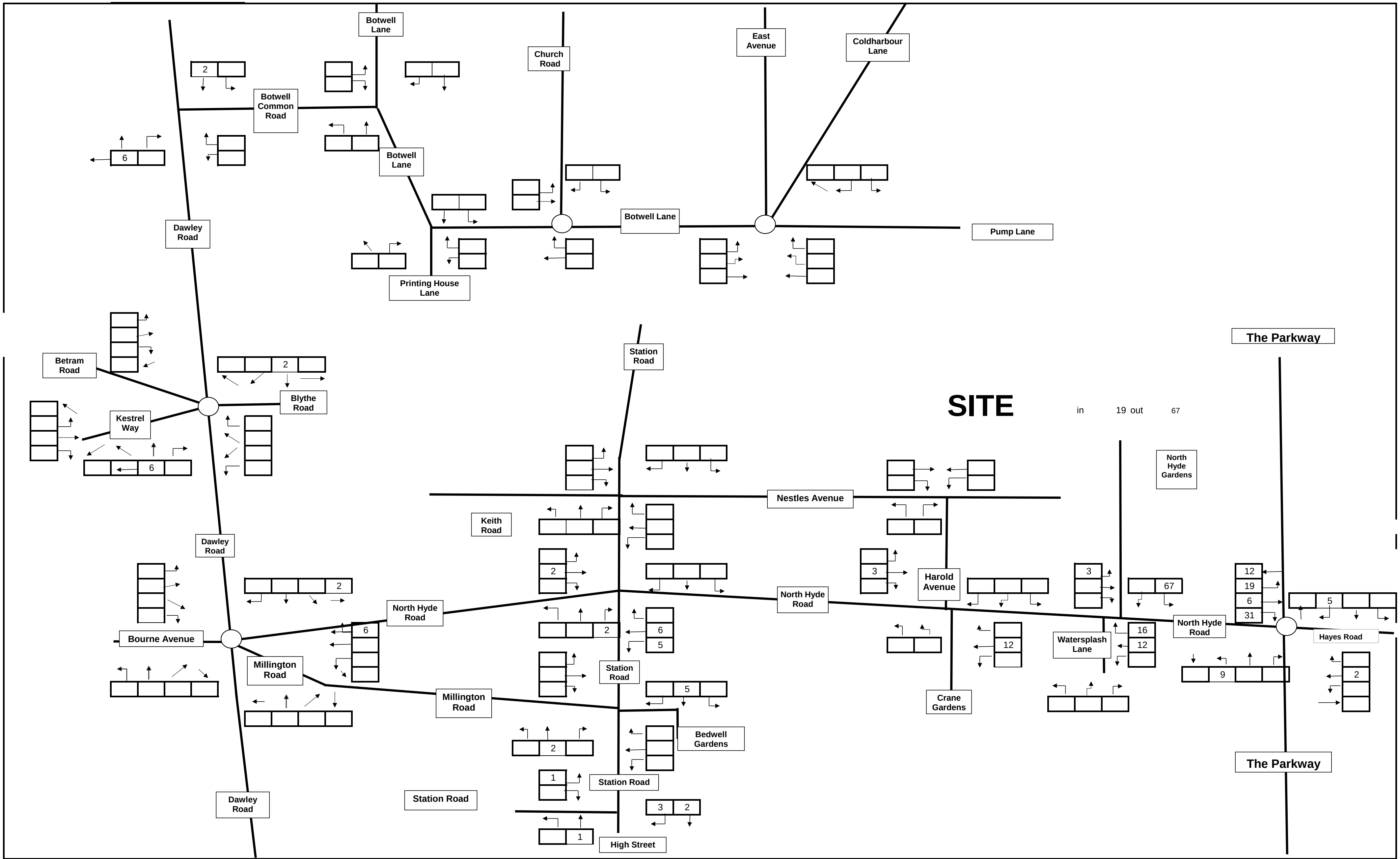
Notes:

Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: Proposed Residential Use PM Traffic Flows	Job No: 16018-01
Figure No: Figure 7.12	Date: 01/10/2016



9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:	
Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: Proposed Employment Use AM Traffic Flows	Job No: 16018-01
Figure No: Figure 7.13	Date: 01/10/2016

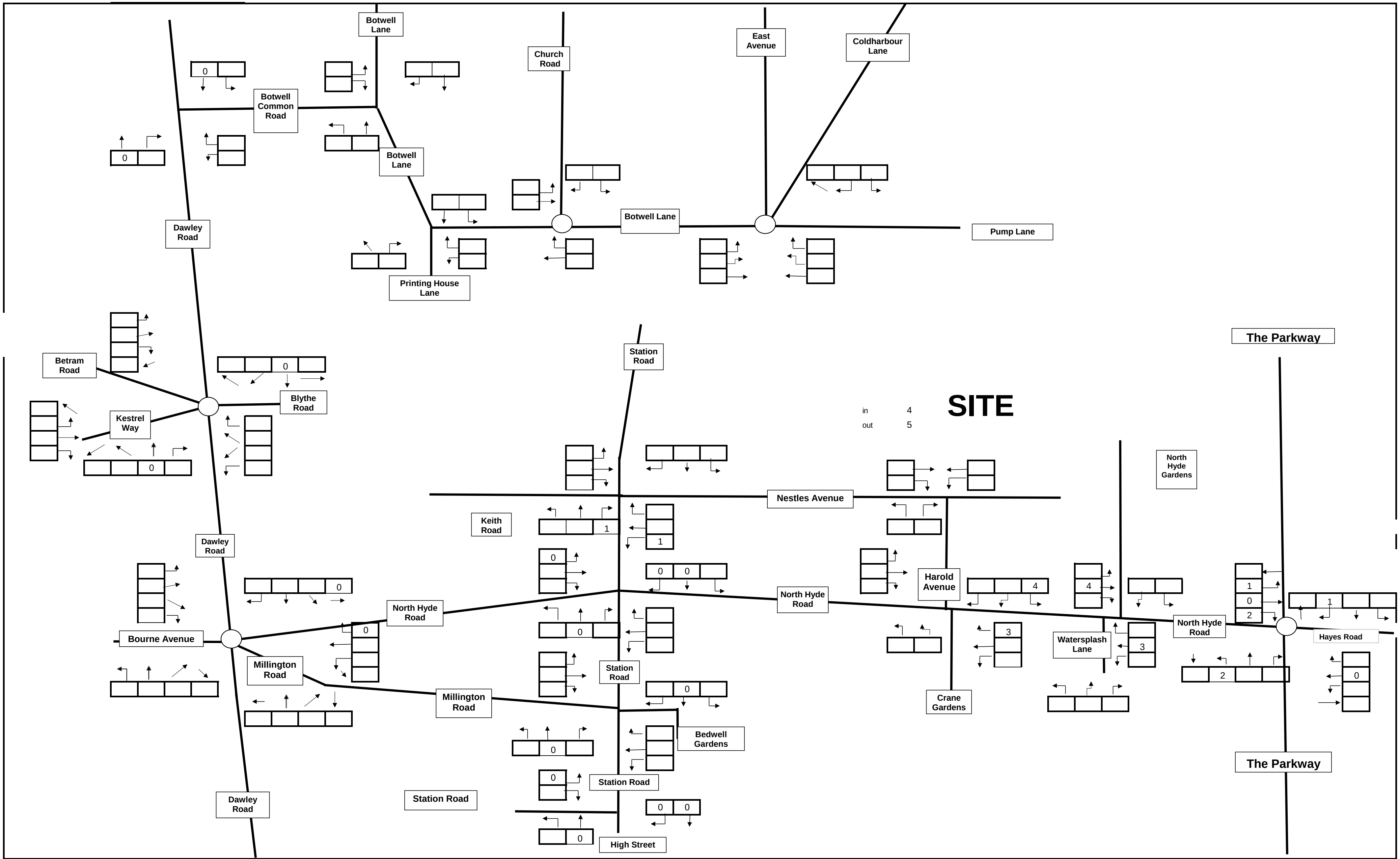


MARKIDES ASSOCIATES

9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:

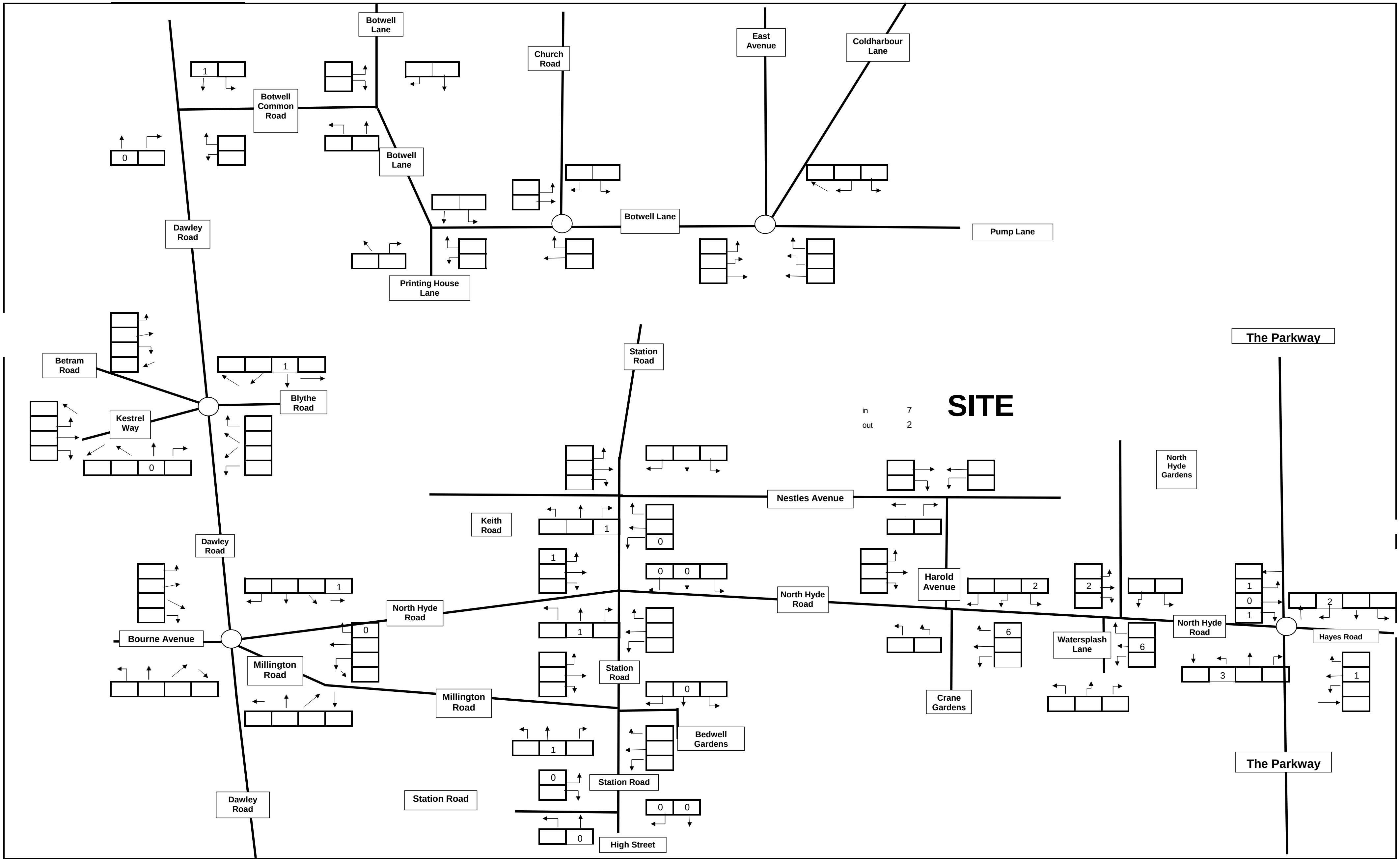
Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: Proposed Employment Use PM Traffic Flows	Job No: 16018-01
Figure No: Figure 7.14	Date: 01/10/2016



Notes:

Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: Proposed Gym Use AM Traffic Flows	Job No: 16018-01
Figure No: Figure 7.15	Date: 01/10/2016

MARKIDES ASSOCIATES
9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk



Notes:

Job Title:

Former Nestles Factory Hayes

Scale:

NTS

Drawing Title:

Proposed Gym Use PM Traffic Flows

Job No:

16018-01

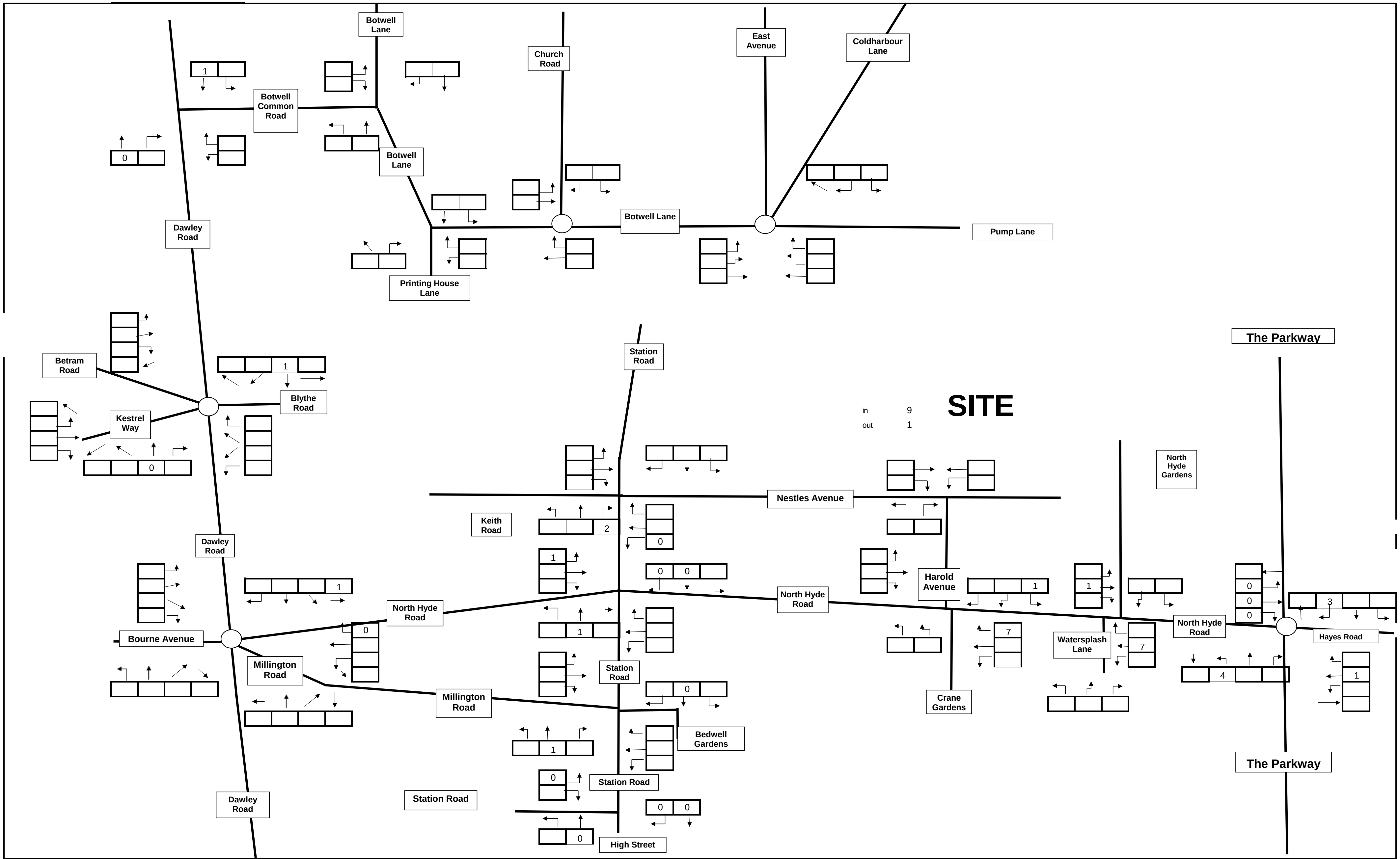
Figure No:

Figure 7.16

Date:

01/10/2016

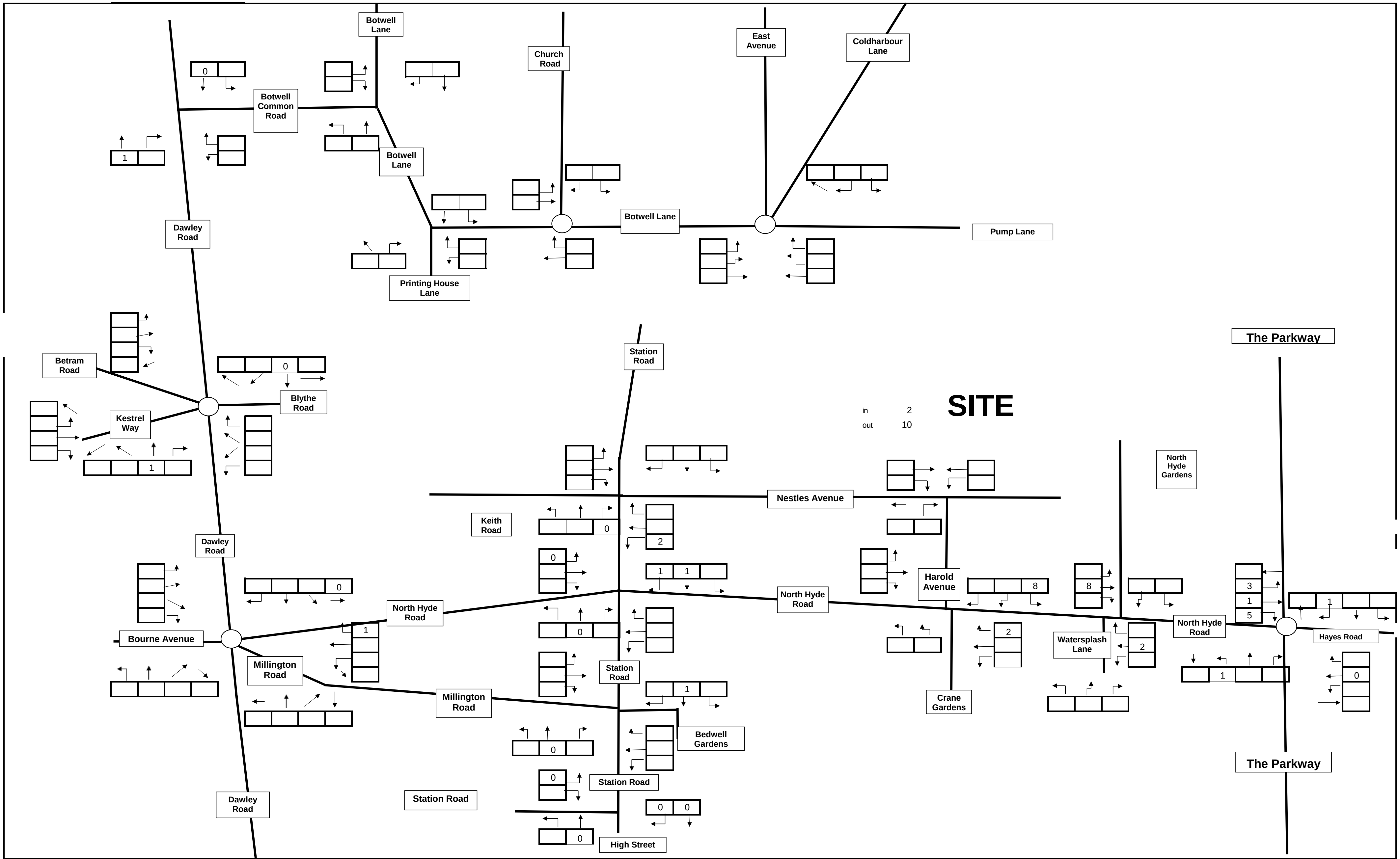
MARKIDES ASSOCIATES
9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk



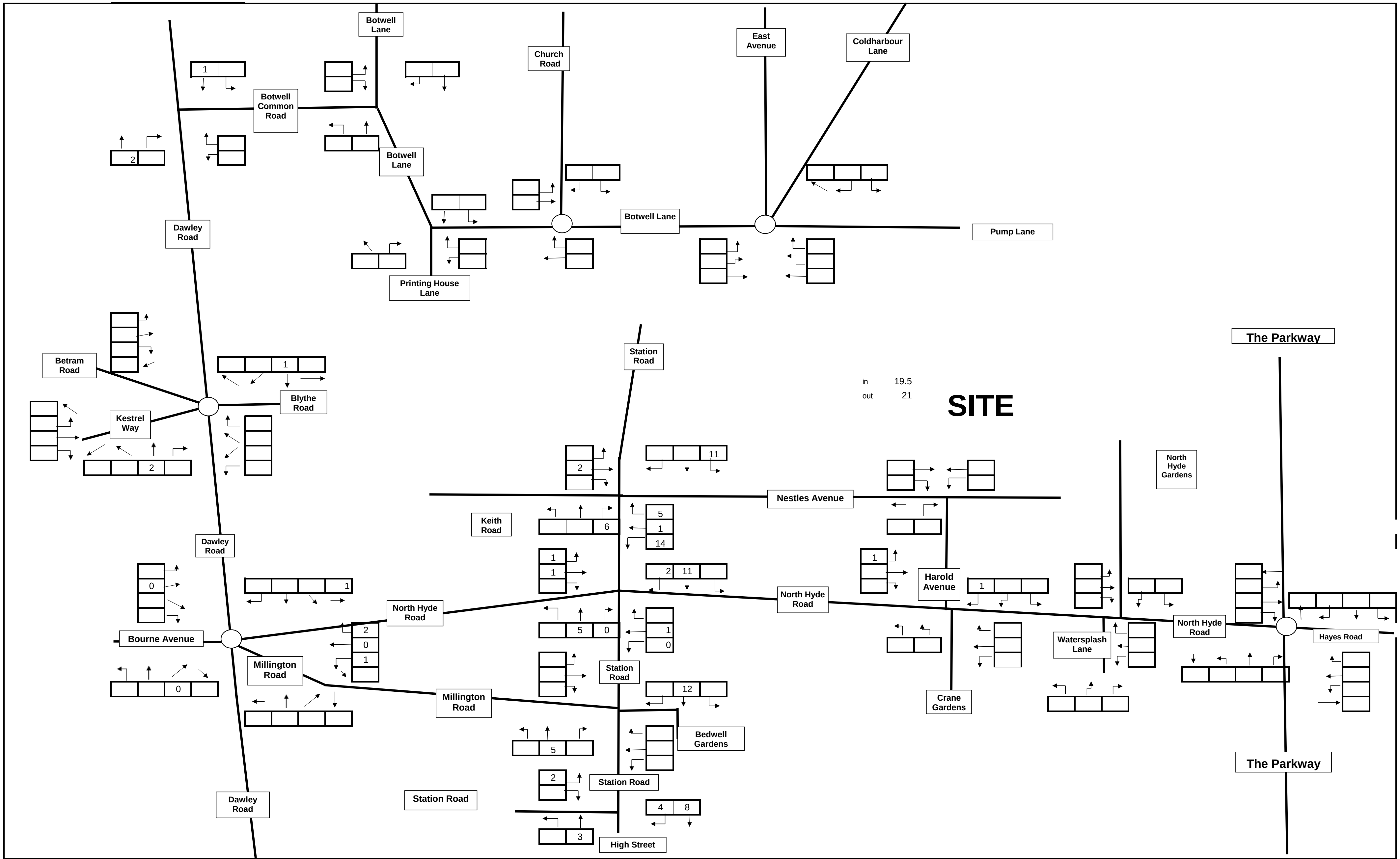
MARKIDES ASSOCIATES

9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:	
Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: Proposed Office Use AM Traffic Flows	Job No: 16018-01
Figure No: Figure 7.17	Date: 01/10/2016



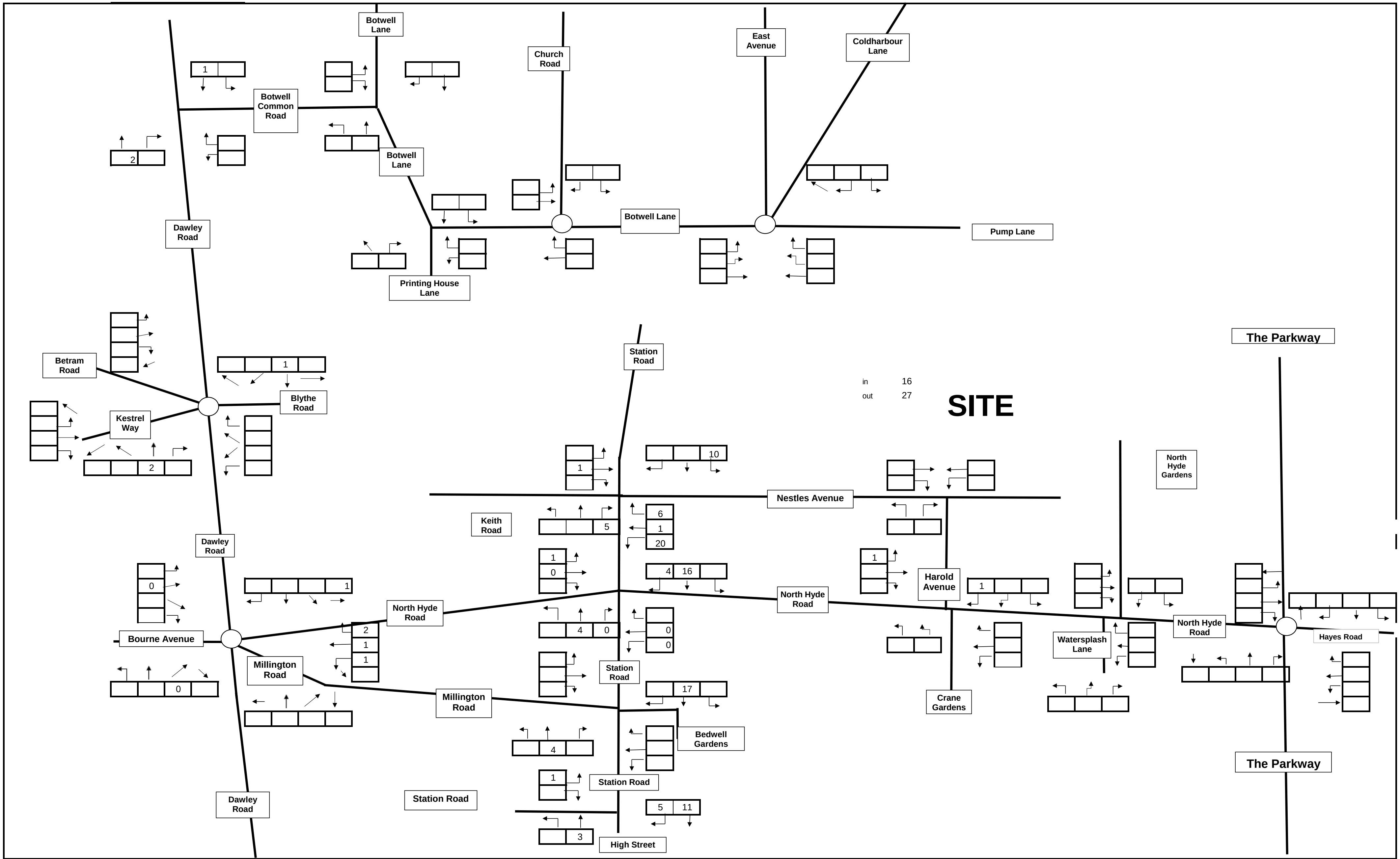
MARKIDES ASSOCIATES 9th Floor, The Tower Building London, SE1 7NX T:020 7442 2225 E: enquiries@markidesassociates.co.uk W: www.markidesassociates.co.uk	Notes:	Job Title: Former Nestles Factory Hayes	Scale: NTS
		Drawing Title: Proposed Office Use PM Traffic Flows	Job No: 16018-01
		Figure No: Figure 7.18	Date: 01/10/2016



MARKIDES ASSOCIATES

9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

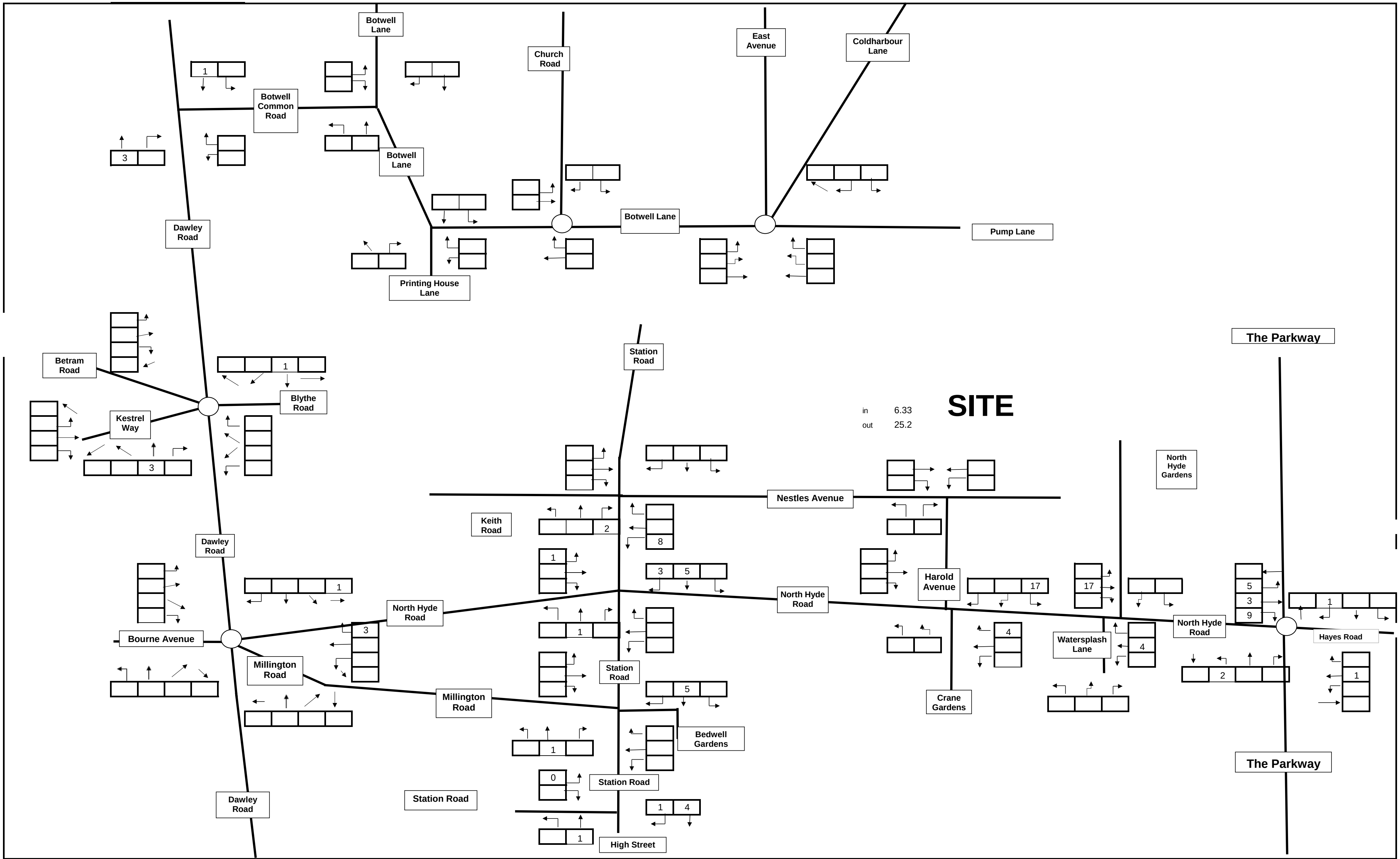
Notes:	
Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: Proposed Nursery Use AM Traffic Flows	Job No: 16018-01
Figure No: Figure 7.19	Date: 01/10/2016



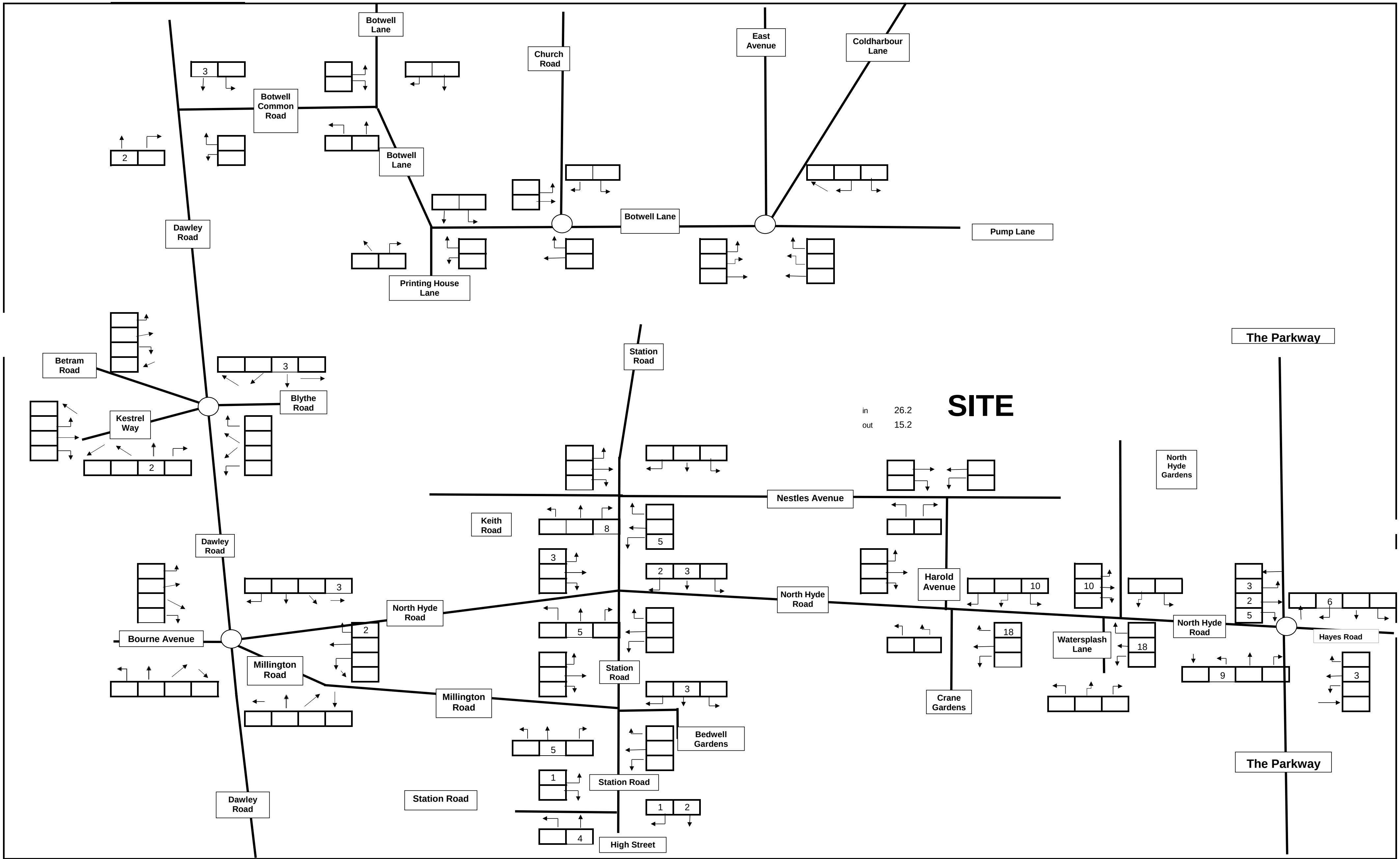
9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:

Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: Proposed Nursery Use PM Traffic Flows	Job No: 16018-01
Figure No: Figure 7.20	Date: 01/10/2016



MARKIDES ASSOCIATES 9th Floor, The Tower Building London, SE1 7NX T:020 7442 2225 E: enquiries@markidesassociates.co.uk W: www.markidesassociates.co.uk	Notes:	Job Title: **Former Nestles Factory Hayes**	Scale: **NTS**
		Drawing Title: **Precis Site - Proposed Residential Use AM Traffic Flows**	Job No: **16018-01**
		Figure No: **Figure 7.21**	Date: **01/10/2016**

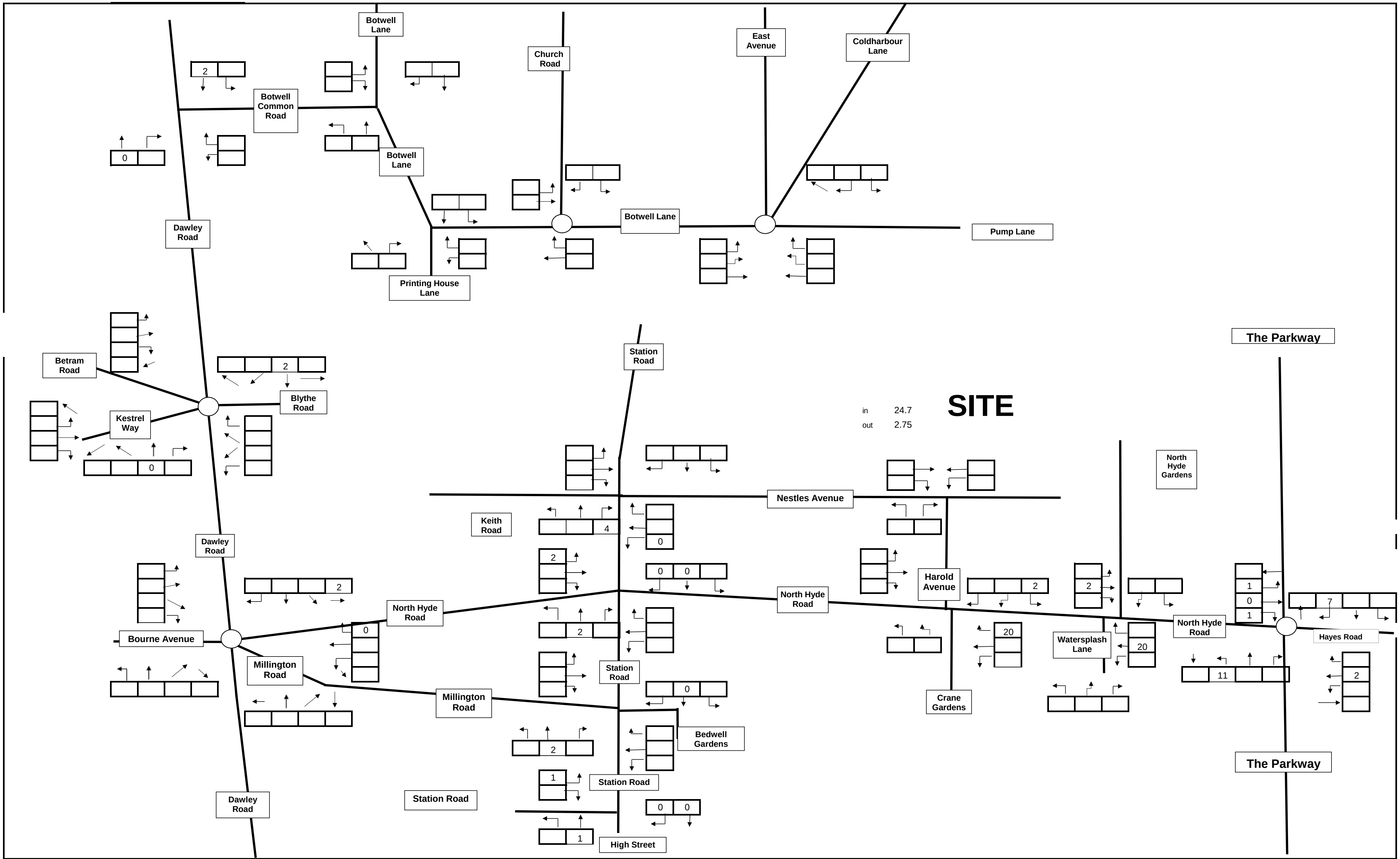


MARKIDES ASSOCIATES

9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:

Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: Precis Site - Proposed Residential Use PM Traffic Flows	Job No: 16018-01
Figure No: Figure 7.22	Date: 01/10/2016



Notes:

Job Title: **Former Nestles Factory Hayes**

Scale: **NTS**

Drawing Title: **Precis Site - Proposed Office Use AM Traffic Flows**

Job No: **16018-01**

Figure No: **Figure 7.23**

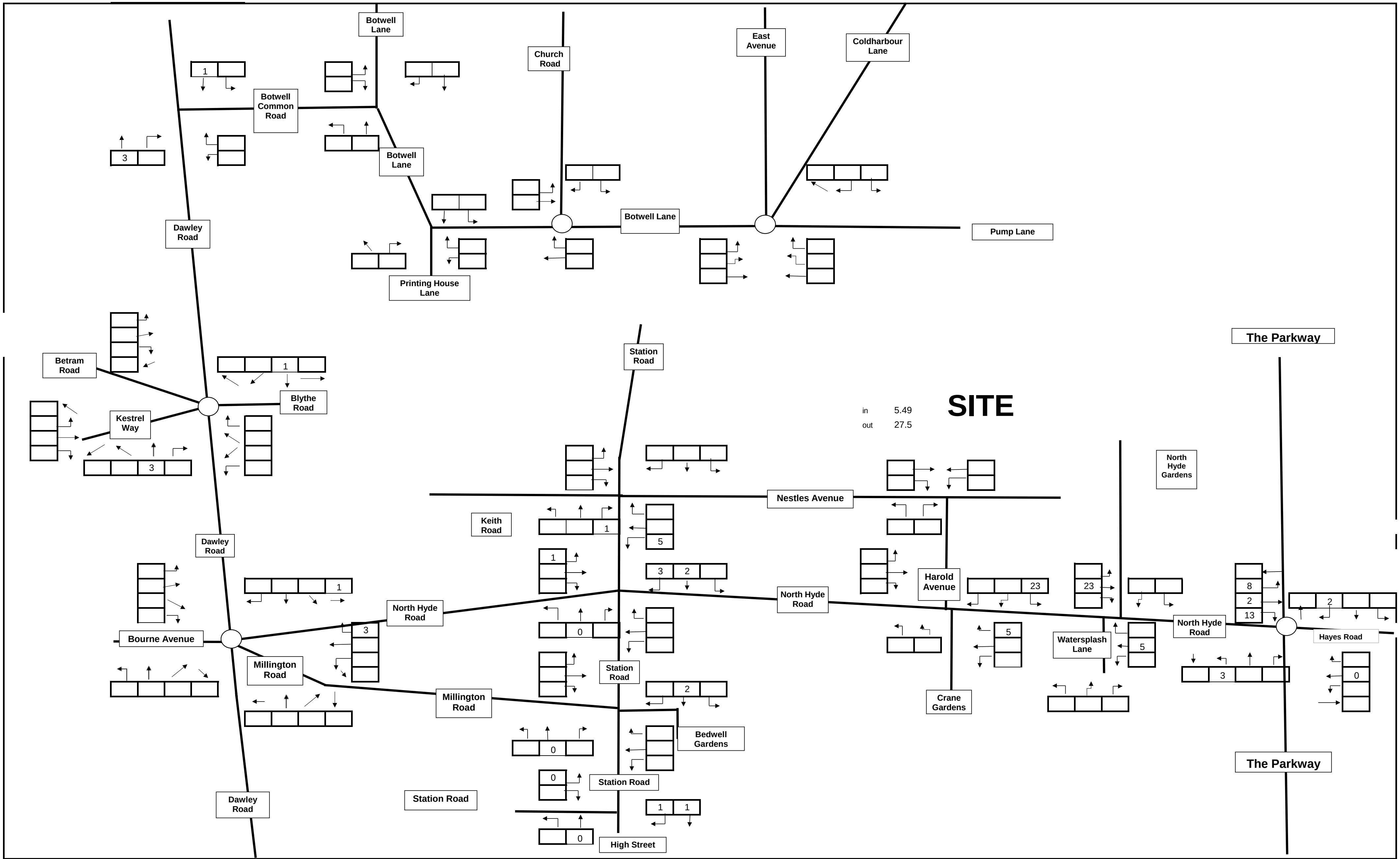
Date: **01/10/2016**

MARKIDES ASSOCIATES

9th Floor, The Tower Building
London, SE1 7NX

T:020 7442 2225

E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

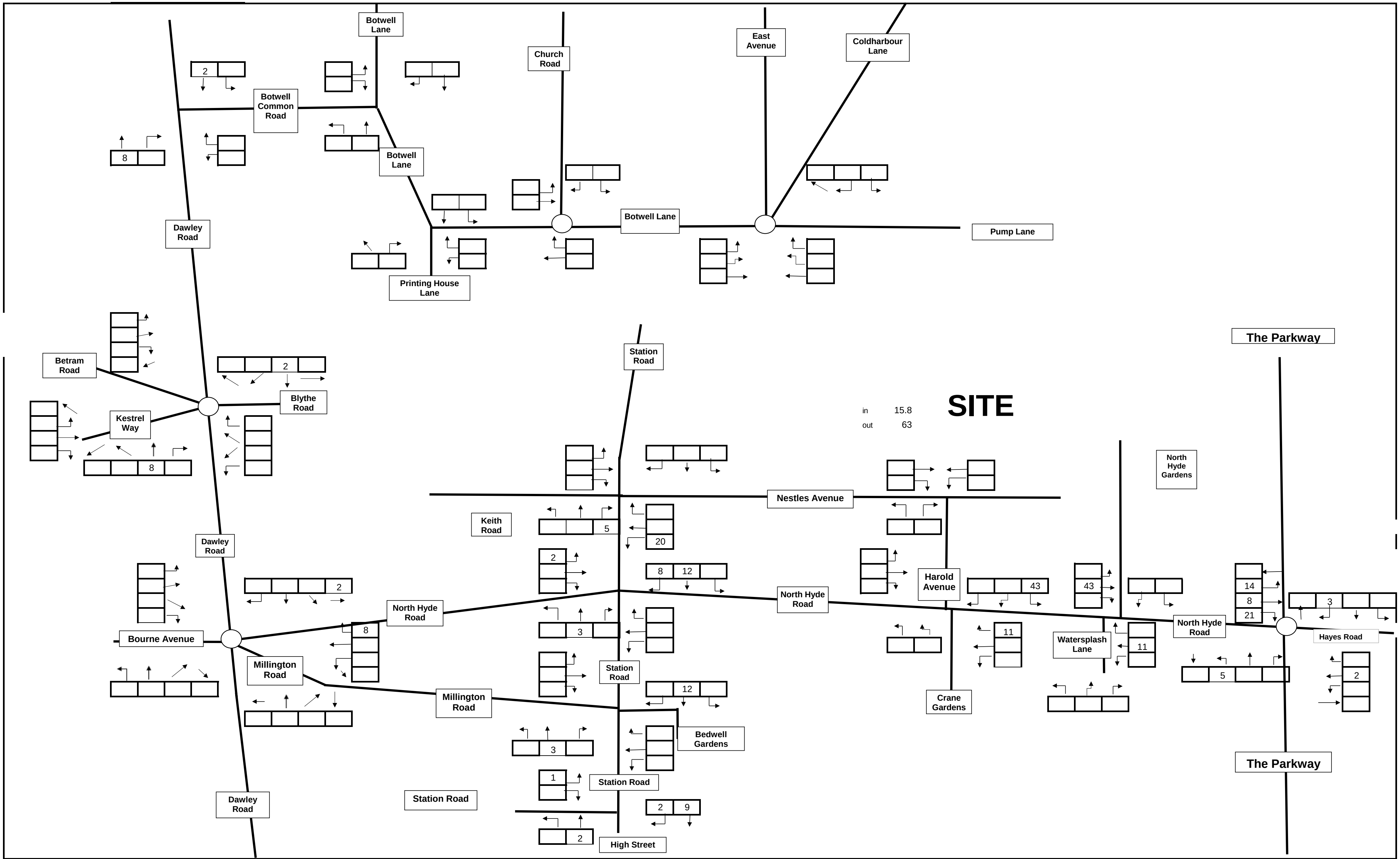


MARKIDES ASSOCIATES

9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:

Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: Precis Site - Proposed Office Use PM Traffic Flows	Job No: 16018-01
Figure No: Figure 7.24	Date: 01/10/2016



MARKIDES ASSOCIATES

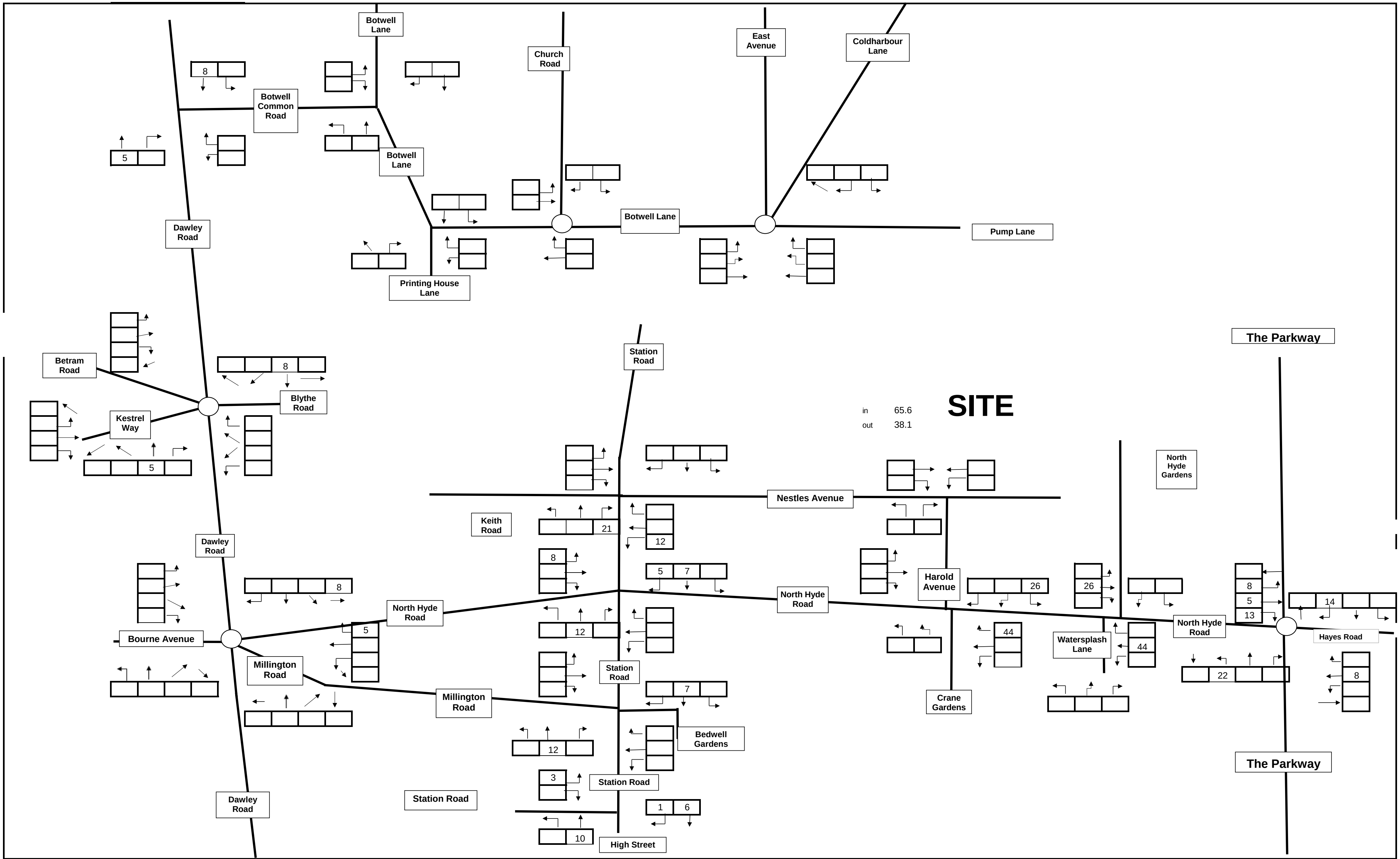
9th Floor, The Tower Building
London, SE1 7NX

T:020 7442 2225

E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:

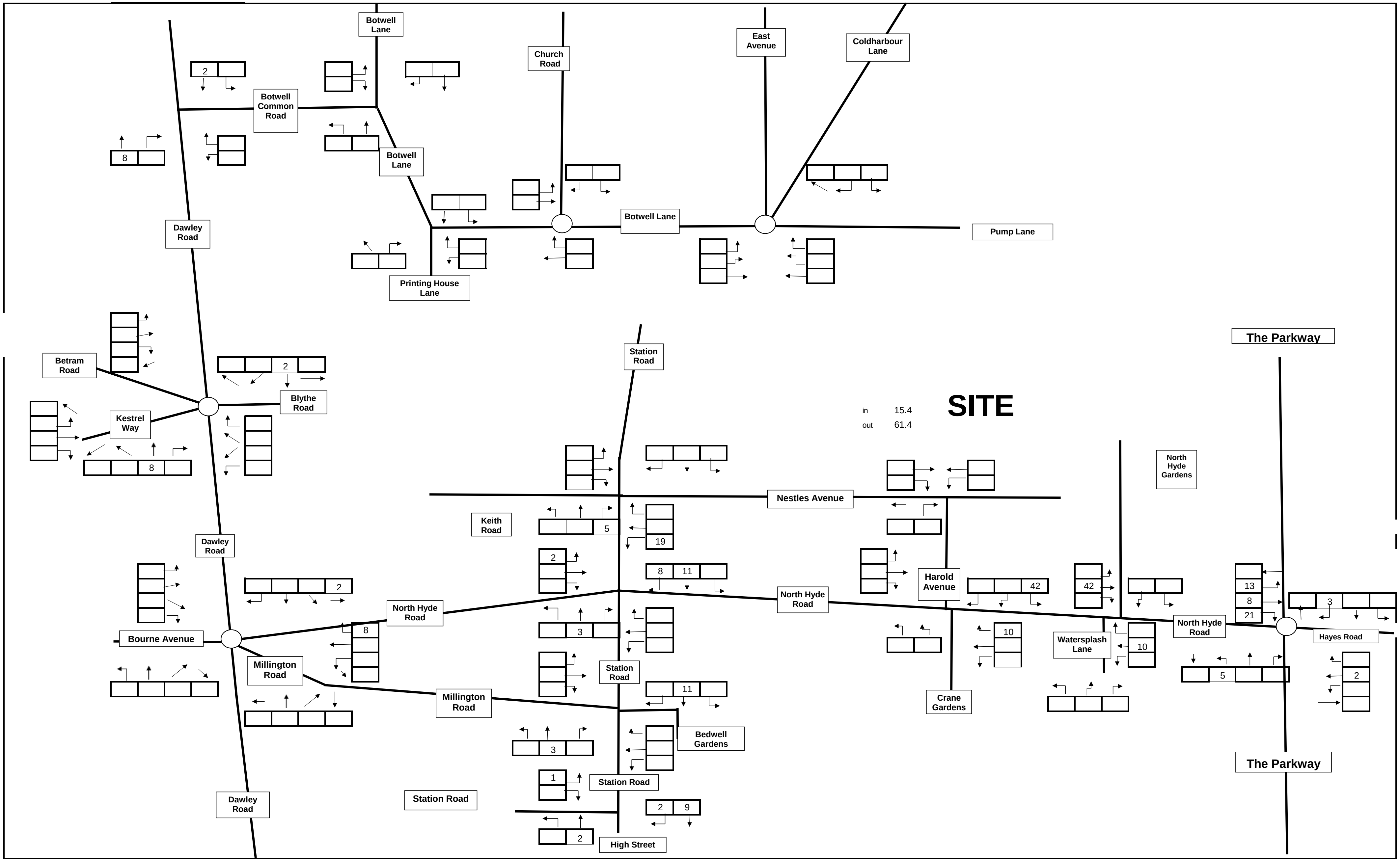
Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: Beccluech Site Proposed Use AM Traffic Flows	Job No: 16018-01
Figure No: Figure 7.25	Date: 01/10/2016



MARKIDES ASSOCIATES
9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:

Job Title: **Former Nestles Factory Hayes**	Scale: **NTS**
Drawing Title: **Beccluech Site Proposed Use PM Traffic Flows**	Job No: **16018-01**
Figure No: **Figure 7.26**	Date: **01/10/2016**



MARKIDES ASSOCIATES

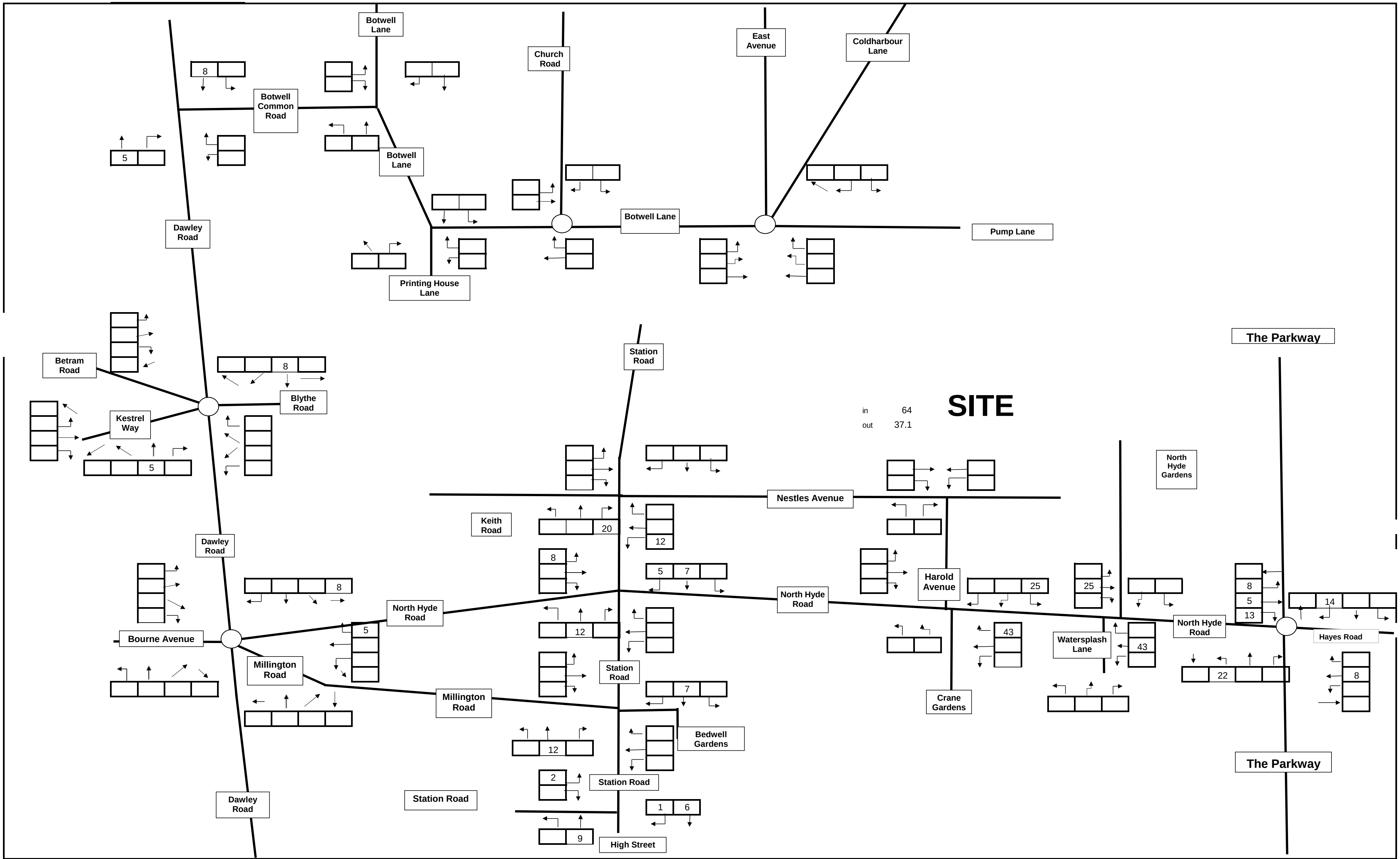
9th Floor, The Tower Building
London, SE1 7NX

T:020 7442 2225

E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:

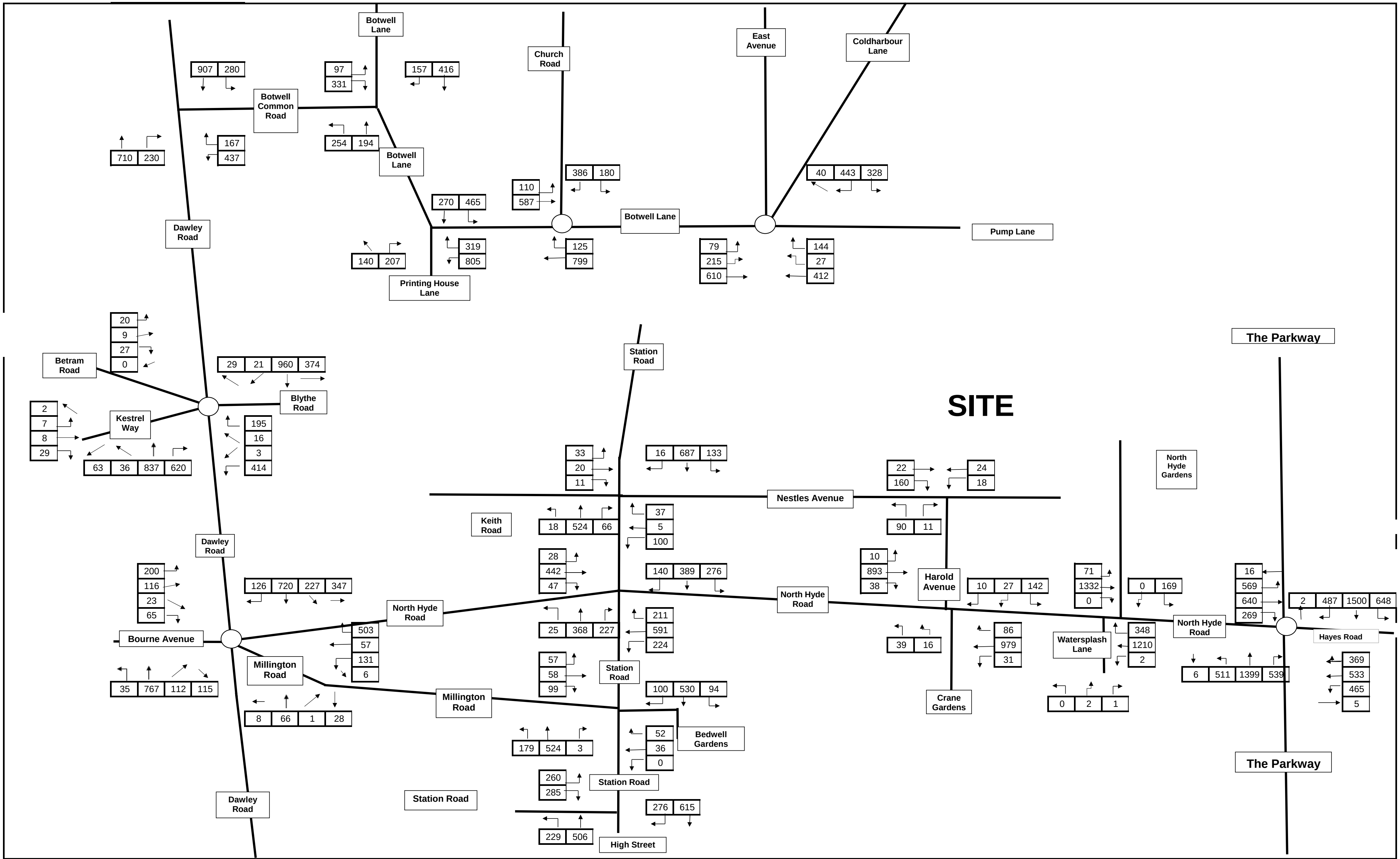
Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: Squirrel Trading Estate Proposed Use AM Traffic Flows	Job No: 16018-01
Figure No: Figure 7.27	Date: 01/10/2016



MARKIDES ASSOCIATES

9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:	Job Title: Former Nestles Factory Hayes		Scale: NTS
	Drawing Title: Squirrel Trading Estate Proposed Use PM Traffic Flows		Job No: 16018-01
	Figure No: Figure 7.28		Date: 01/10/2016



9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:

Job Title: Former Nestles Factory Hayes

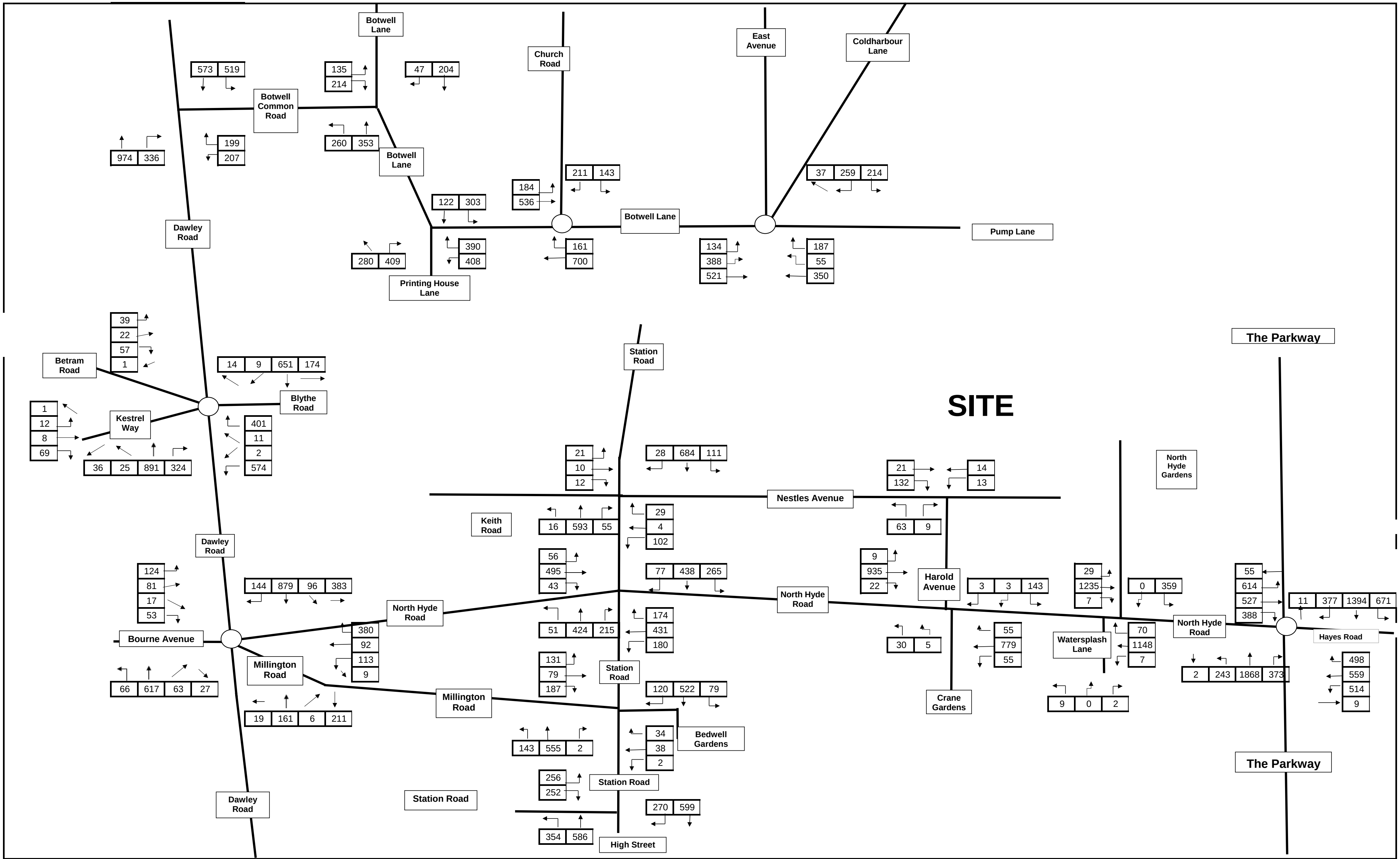
Scale: NTS

Drawing Title: 2024 AM Peak Baseline Flows

Job No: 16018-01

Figure No: Figure 7.29

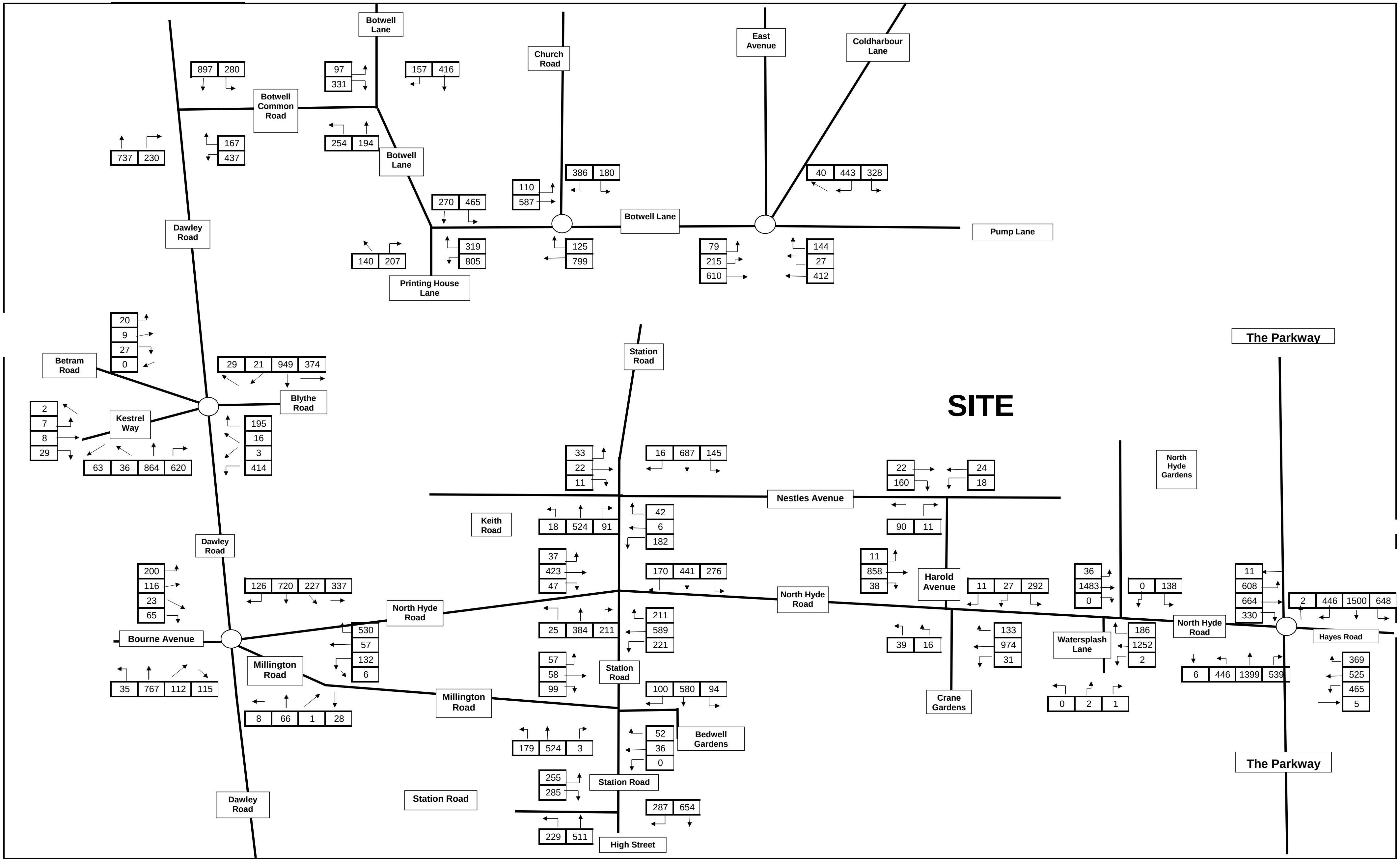
Date: 01/10/2016



MARKIDES ASSOCIATES
9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:

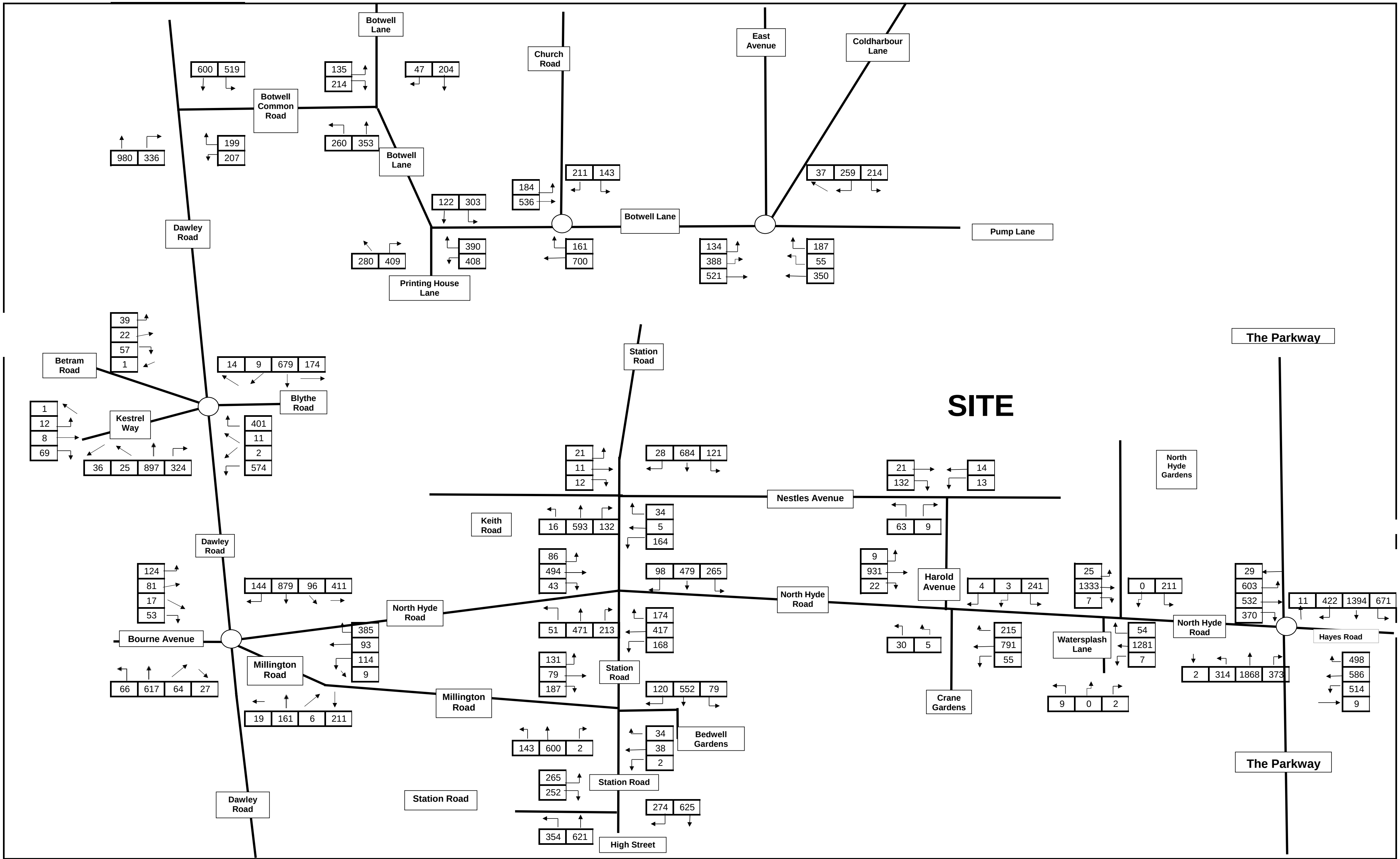
Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: 2024 PM Peak Baseline Flows	Job No: 16018-01
Figure No: Figure 7.30	Date: 01/10/2016



MARKIDES ASSOCIATES
9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:

Job Title:	Scale:
Former Nestles Factory Hayes	**NTS**
Drawing Title:	Job No:
2024 AM Peak With Development Flows	**16018-01**
Figure No:	Date:
Figure 7.31	**01/10/2016**

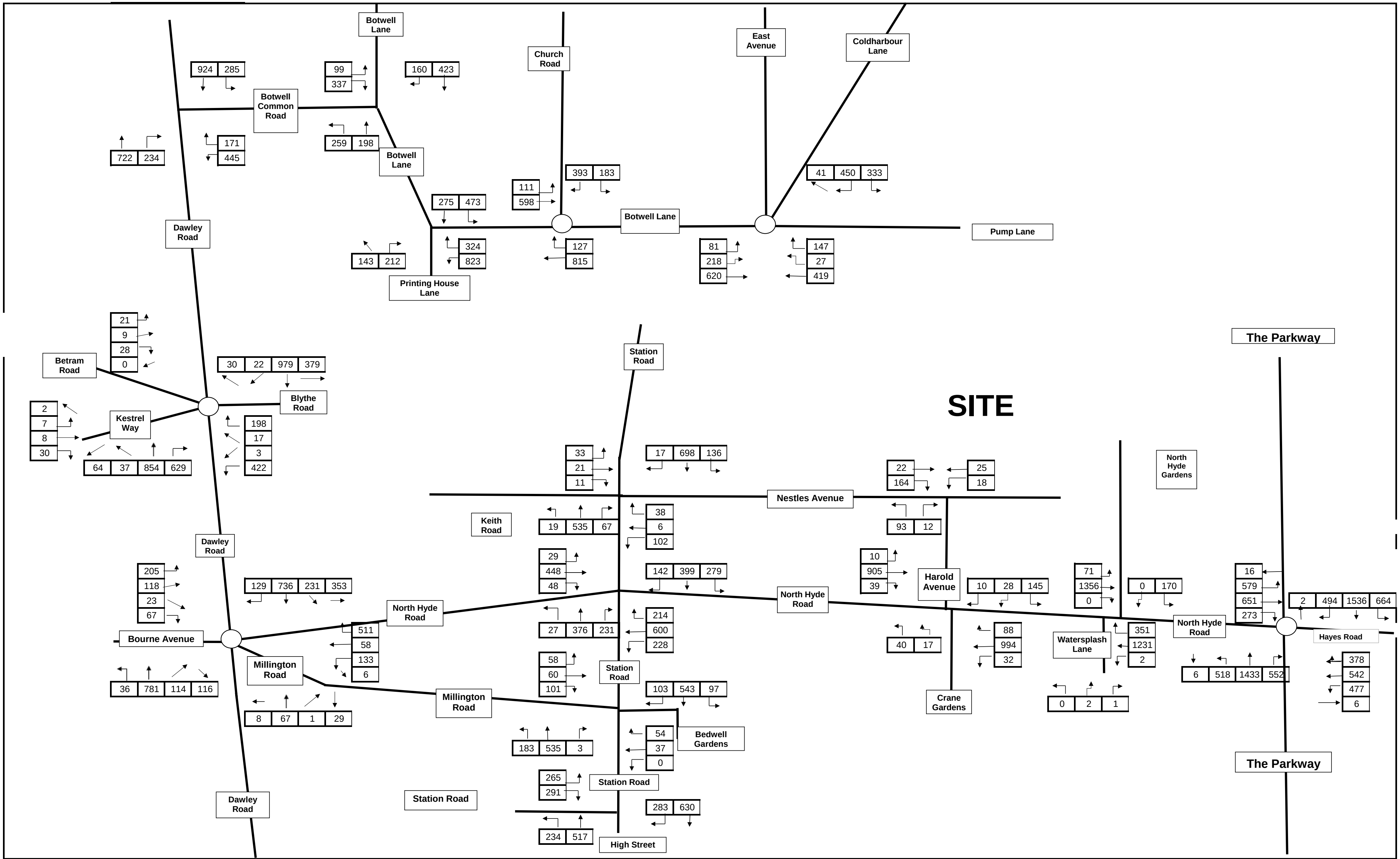


MARKIDES ASSOCIATES

9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

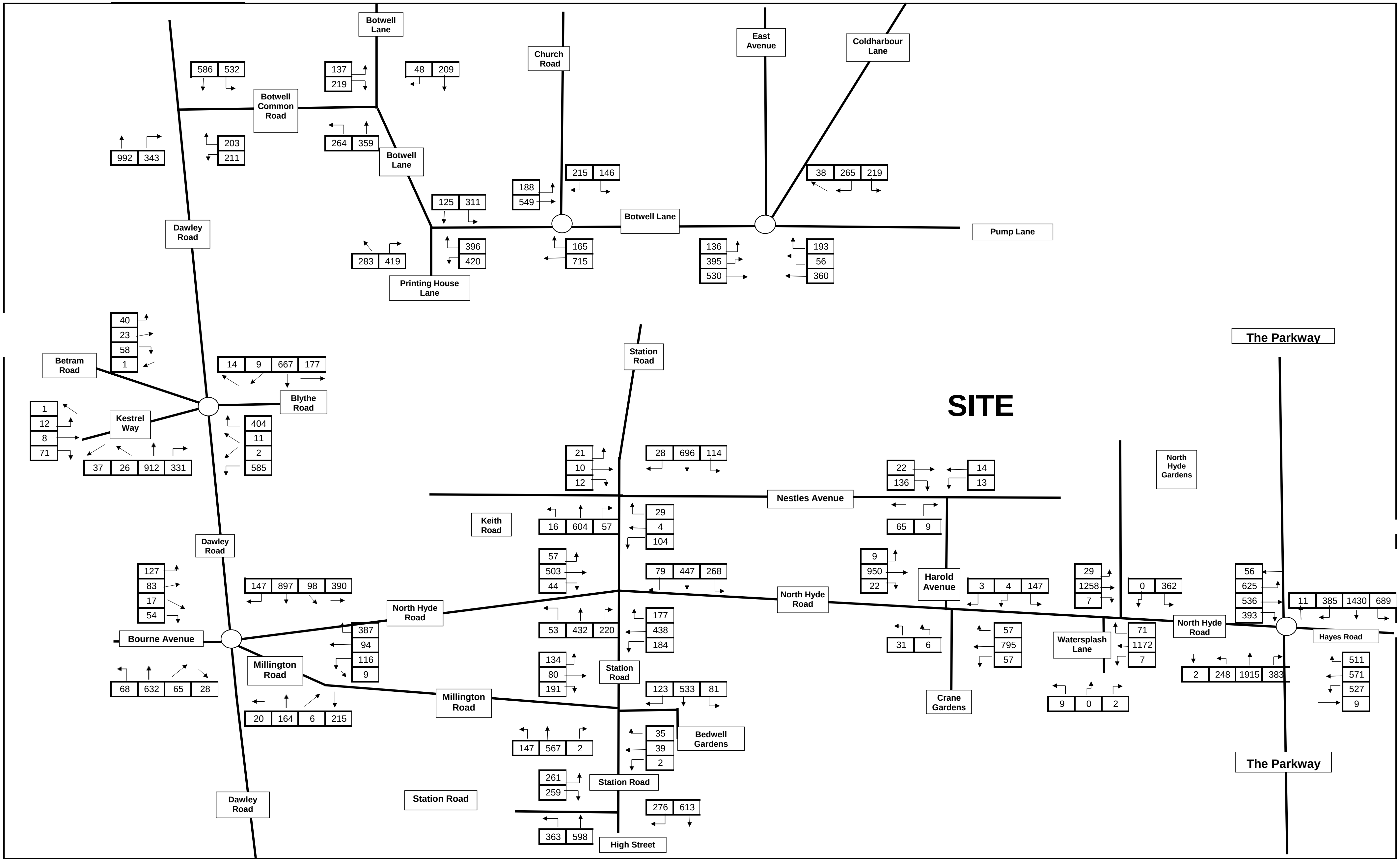
Notes:

Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: 2024 PM Peak With Development Flows	Job No: 16018-01
Figure No: Figure 7.32	Date: 01/10/2016



Notes:	Job Title: Former Nestles Factory Hayes	Scale: NTS
	Drawing Title: 2029 AM Peak Baseline Flows	Job No: 16018-01
	Figure No: Figure 7.33	Date: 01/10/2016

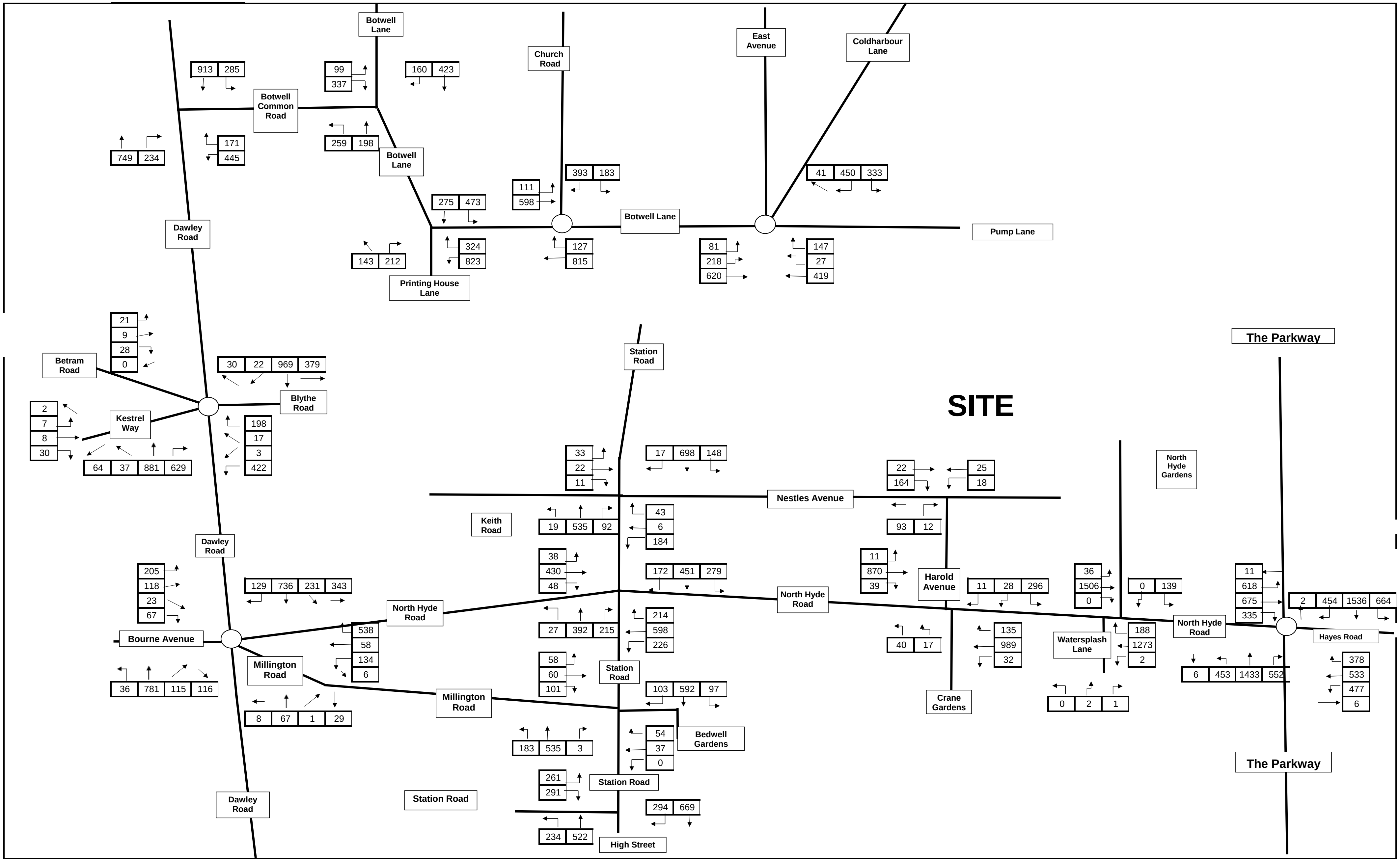
MARKIDES ASSOCIATES
9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk



MARKIDES ASSOCIATES
9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:

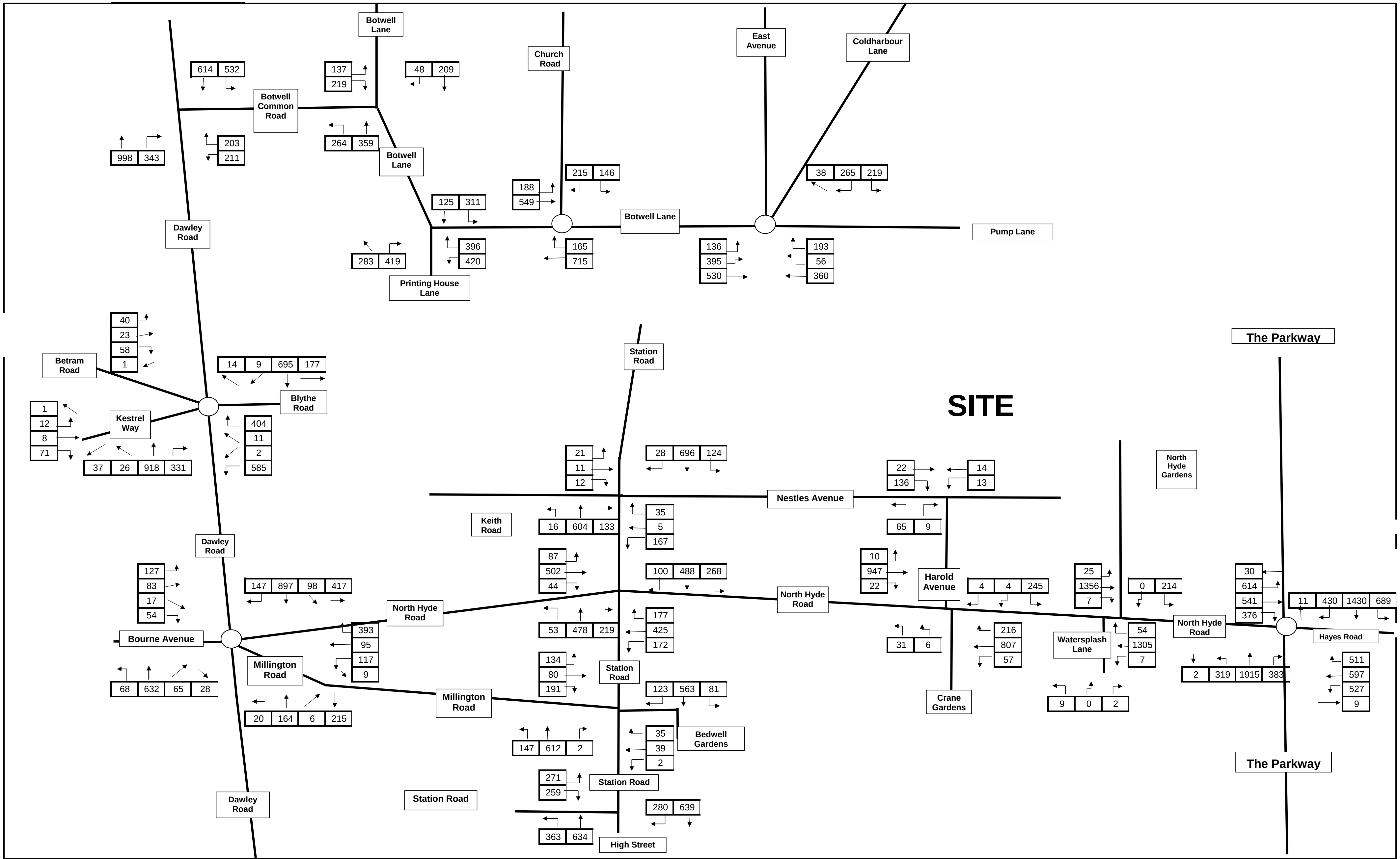
Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: 2029 PM Peak Baseline Flows	Job No: 16018-01
Figure No: Figure 7.34	Date: 01/10/2016



MARKIDES ASSOCIATES
9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

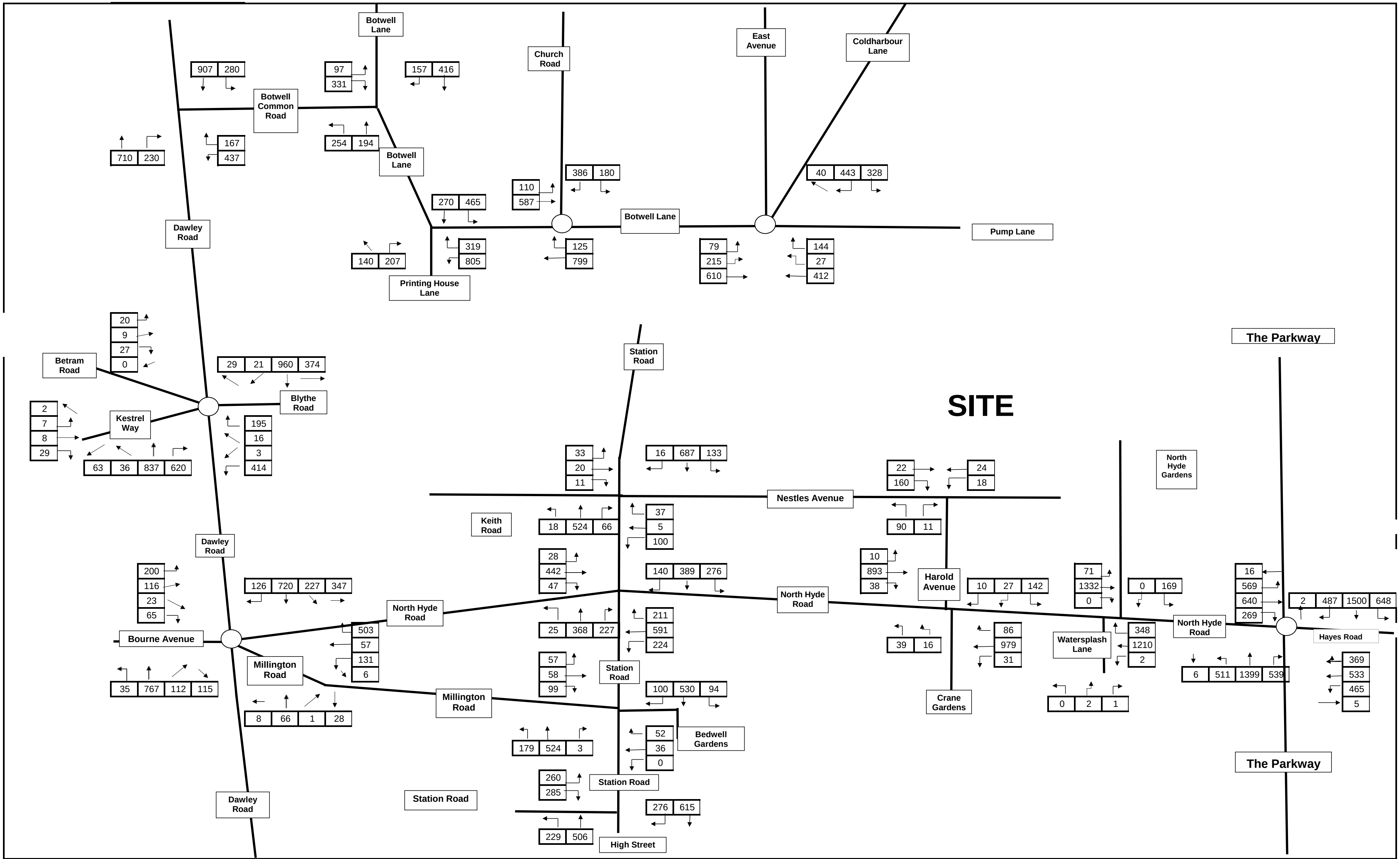
Notes:

Job Title:	Scale:
Former Nestles Factory Hayes	NTS
Drawing Title:	Job No:
2029 AM Peak With Development Flows	16018-01
Figure No:	Date:
Figure 7.35	01/10/2016



	Notes:	Job Title: Former Nestles Factory Hayes	Scale: NTS
		Drawing Title: 2029 PM Peak With Development Flows	Job No: 16018-01
		Figure No: Figure 7.36	Date: 01/10/2016

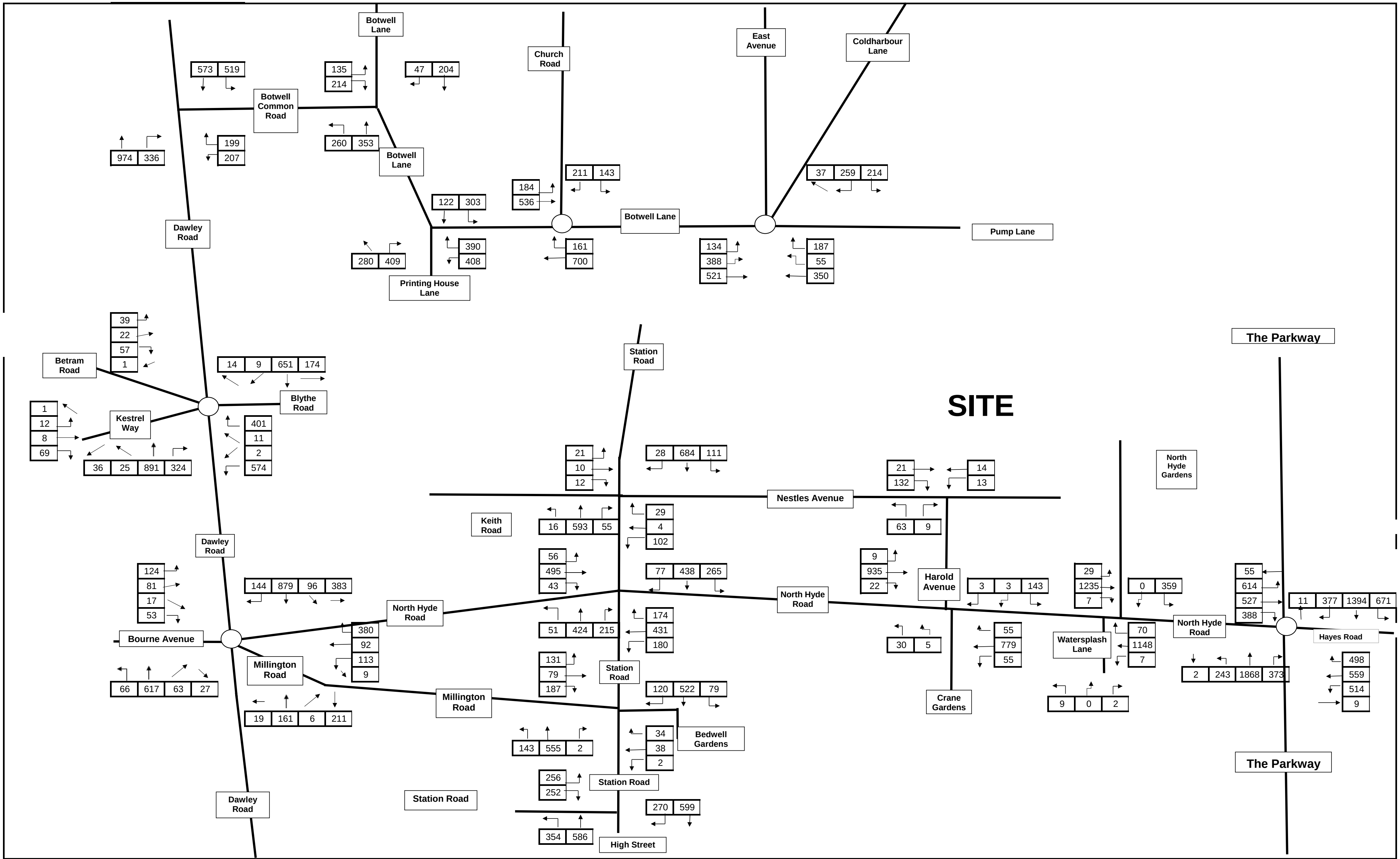
MARKIDES ASSOCIATES
9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk



MARKIDES ASSOCIATES
9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:

Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: 2024 AM Peak Cumulative Baseline Flows	Job No: 16018-01
Figure No: Figure 7.37	Date: 01/10/2016



Notes:

Job Title: **Former Nestles Factory Hayes**

Scale: **NTS**

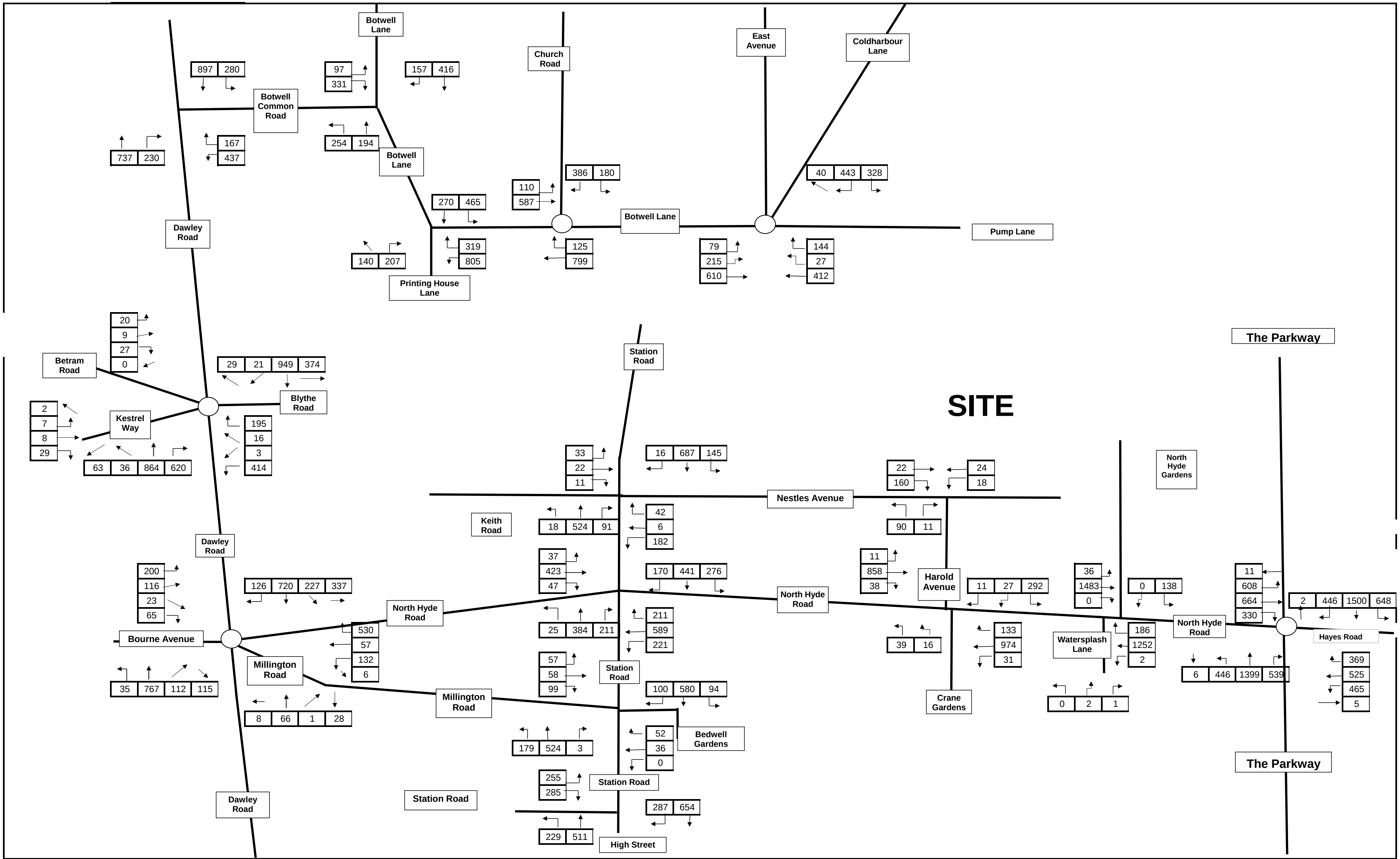
Drawing Title: **2024 PM Peak Cumulative Baseline Flows**

Job No: **16018-01**

Figure No: **Figure 7.38**

Date: **01/10/2016**

MARKIDES ASSOCIATES
9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk



Notes:

Job Title:

Former Nestles Factory Hayes

Drawing Title:

2024 AM Peak Cumulative With Development Flows

Figure No:

Figure 7.39

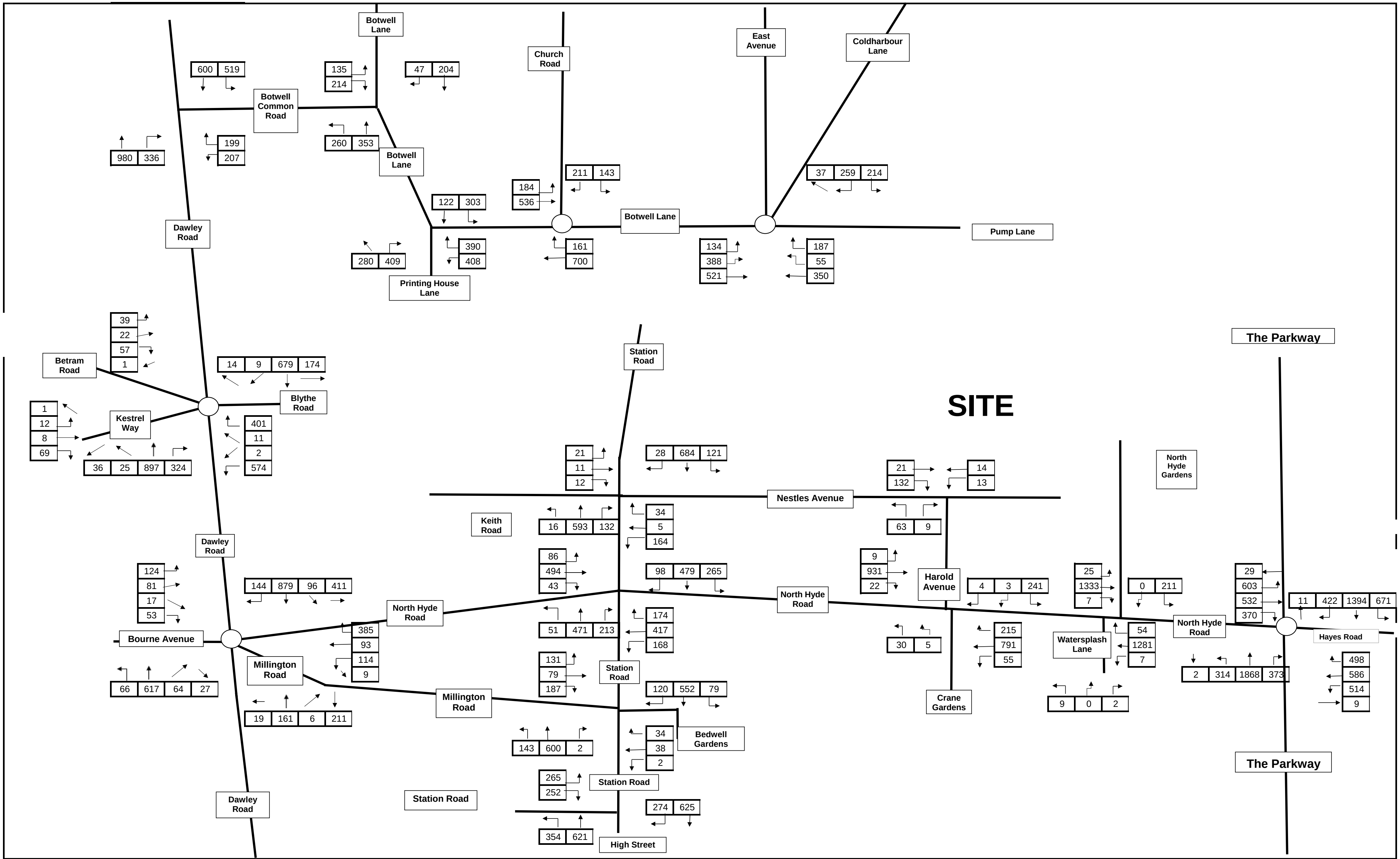
Scale: **NTS**

Job No: **16018-01**

Date: **01/10/2016**

MARKIDES ASSOCIATES

9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

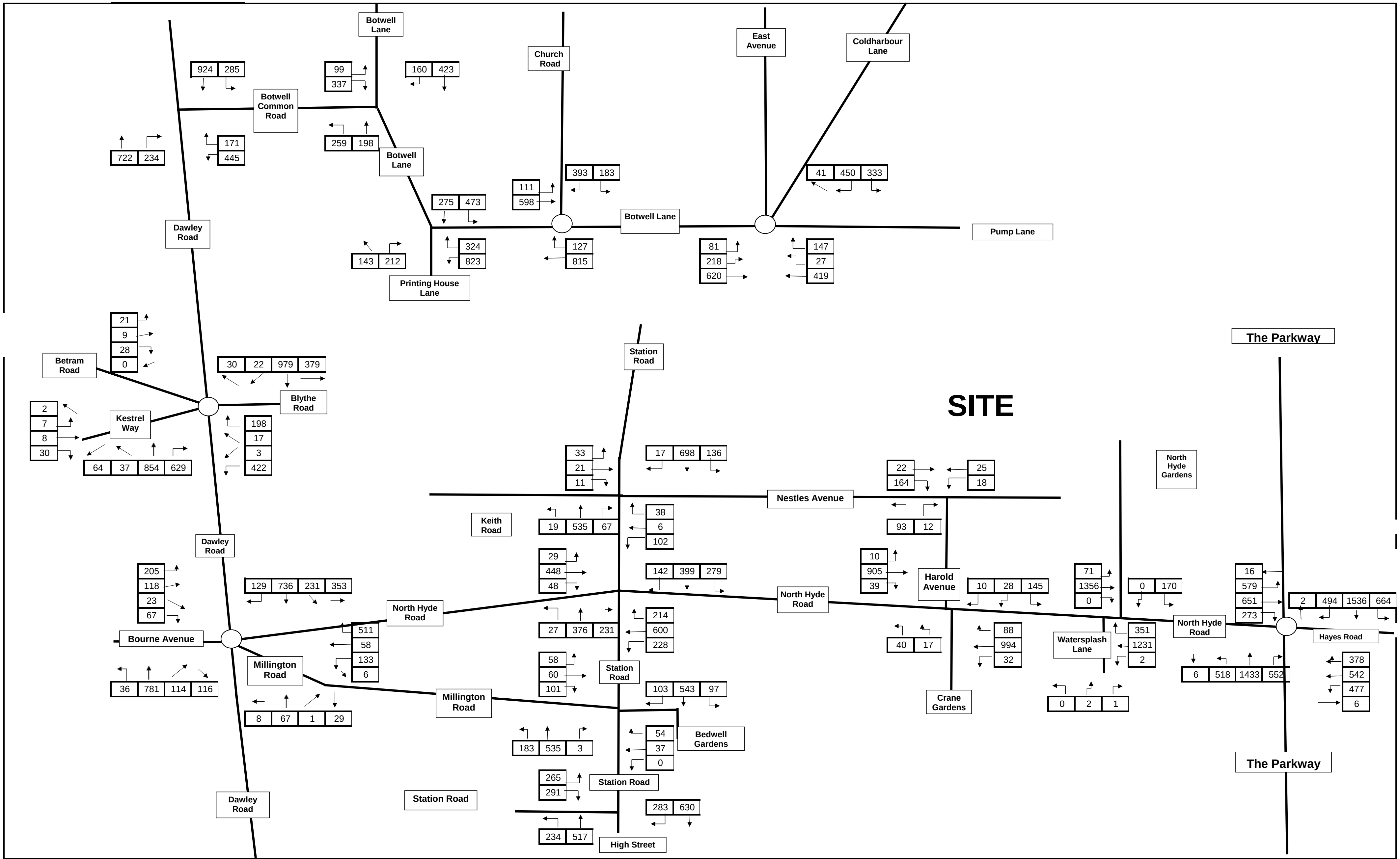


MARKIDES ASSOCIATES

9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:

Job Title:	Scale:
Former Nestles Factory Hayes	NTS
Drawing Title:	Job No:
2024 PM Peak Cumulative With Development Flows	16018-01
Figure No:	Date:
Figure 7.40	01/10/2016

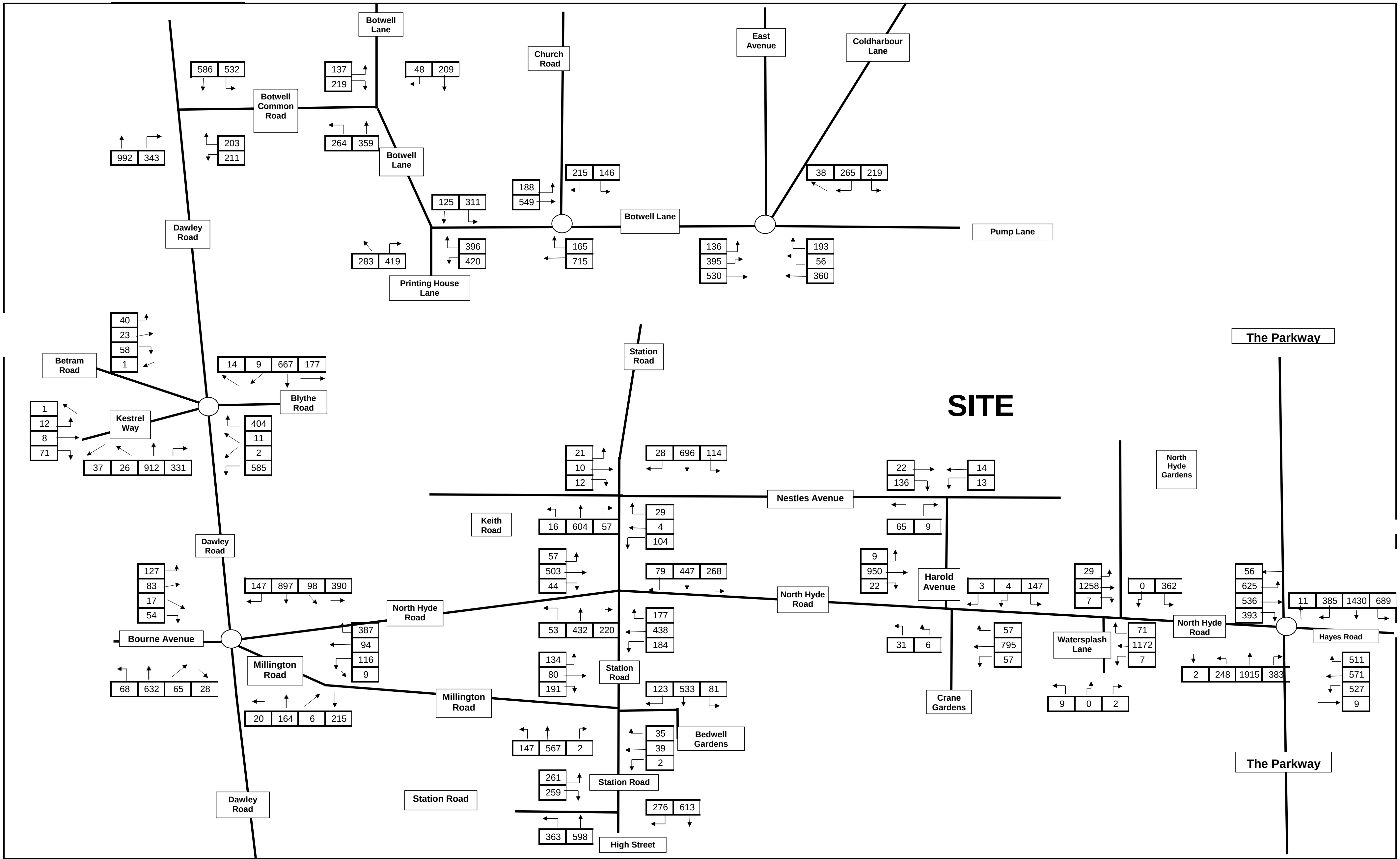


MARKIDES ASSOCIATES

9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:

Job Title: **Former Nestles Factory Hayes**	Scale: **NTS**
Drawing Title: **2029 AM Peak Cumulative Baseline Flows**	Job No: **16018-01**
Figure No: **Figure 7.41**	Date: **01/10/2016**

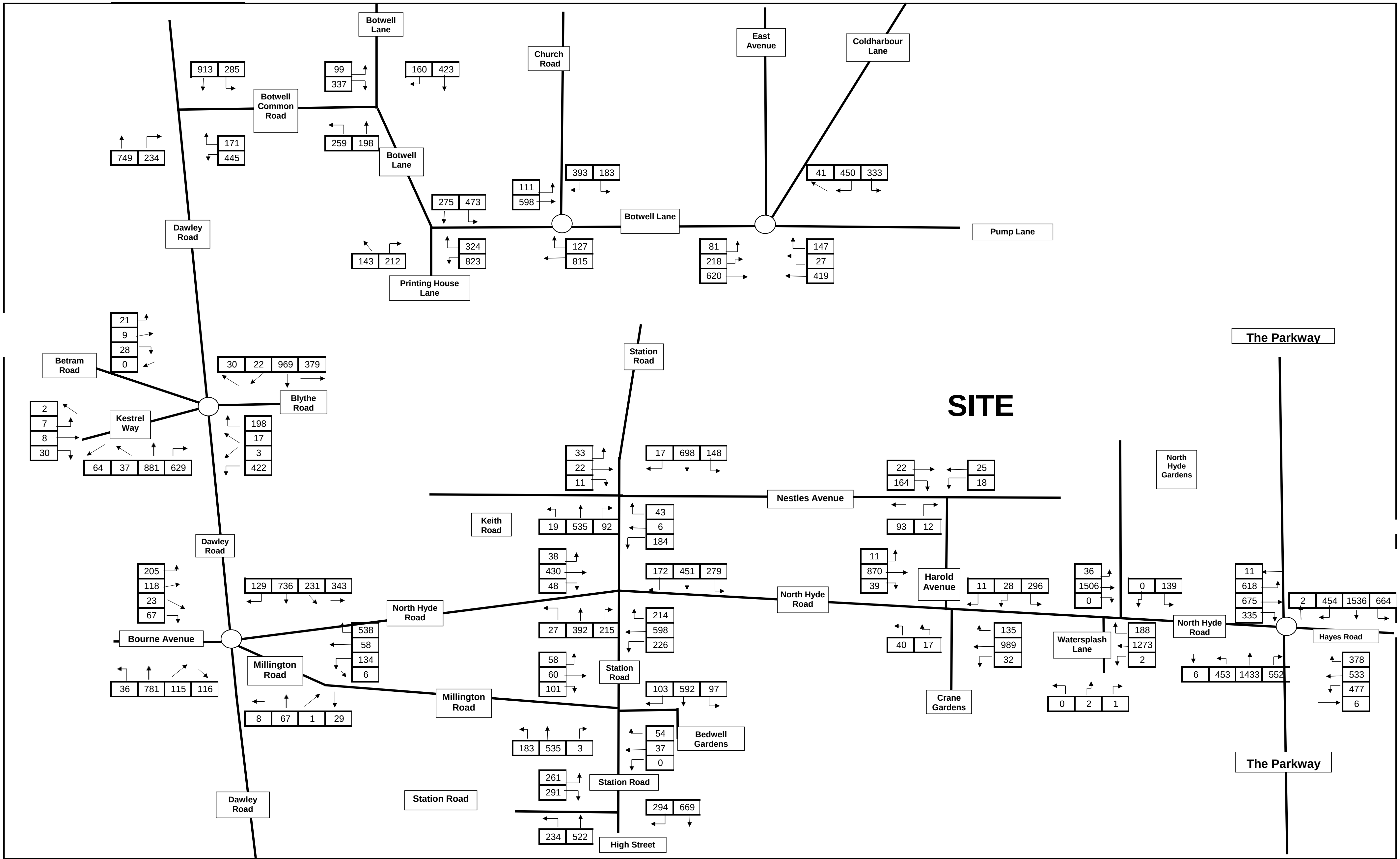


MARKIDES ASSOCIATES

9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:

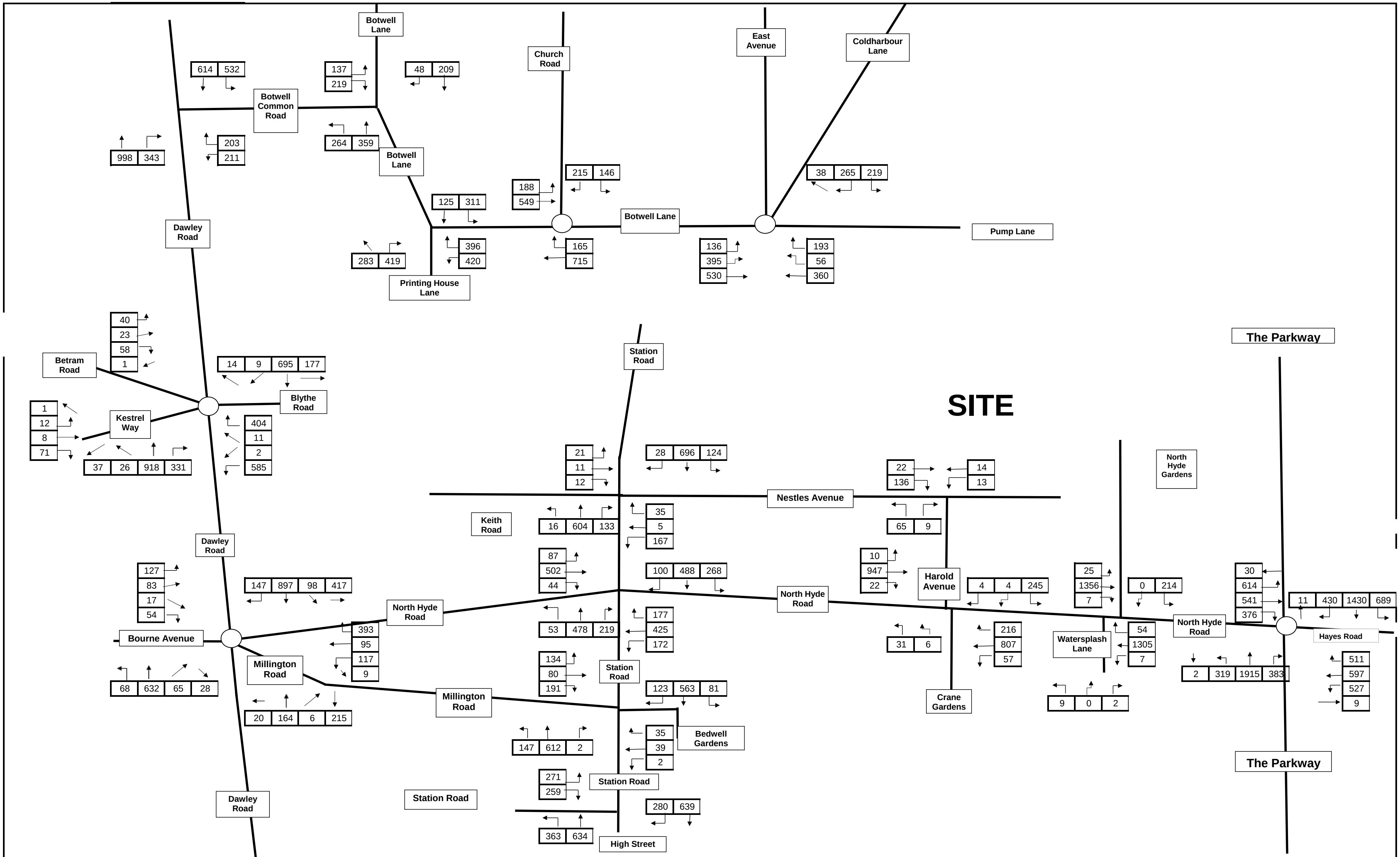
Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: 2029 PM Peak Cumulative Baseline Flows	Job No: 16018-01
Figure No: Figure 7.42	Date: 01/10/2016



MARKIDES ASSOCIATES
9th Floor, The Tower Building
London, SE1 7NX
T:020 7442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Notes:

Job Title: Former Nestles Factory Hayes	Scale: NTS
Drawing Title: 2029 AM Peak Cumulative With Development Flows	Job No: 16018-01
Figure No: Figure 7.43	Date: 01/10/2016



Notes:

Job Title:

Former Nestles Factory Hayes

Scale:

NTS

Drawing Title:

2029 PM Peak Cumulative With Development Flows

Job No:

16018-01

Figure No:

Figure 7.44

Date:

01/10/2016

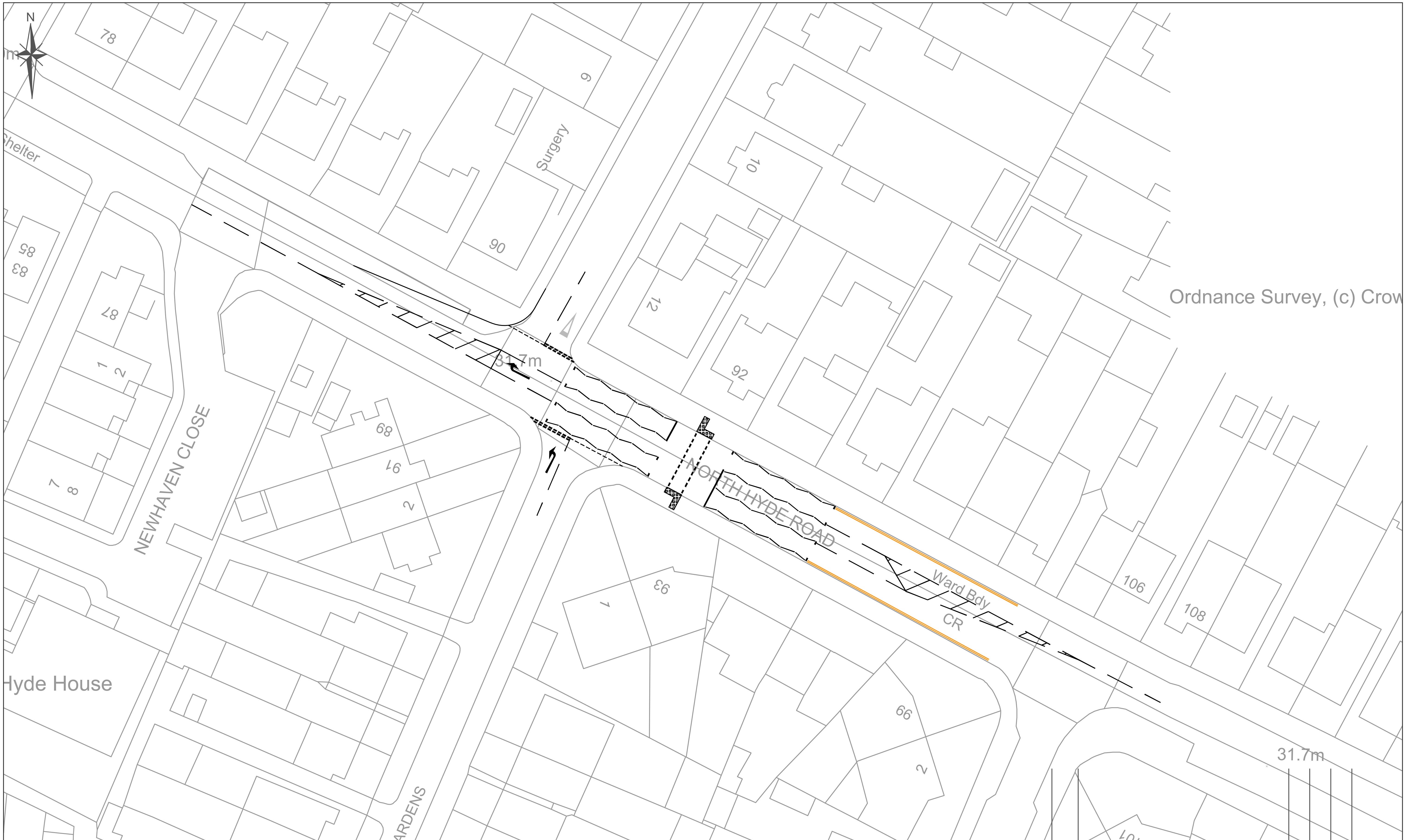
MARKIDES ASSOCIATES

9th Floor, The Tower Building
London, SE1 7NX

T:020 7442 2225

E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

DRAWINGS



Rev	Amendments	Drn	Chk	App	Date

MARKIDES ASSOCIATES

9th Floor,
The Tower Building,
York Road
London
SE1 7NX

Telephone: 0207 442 2225

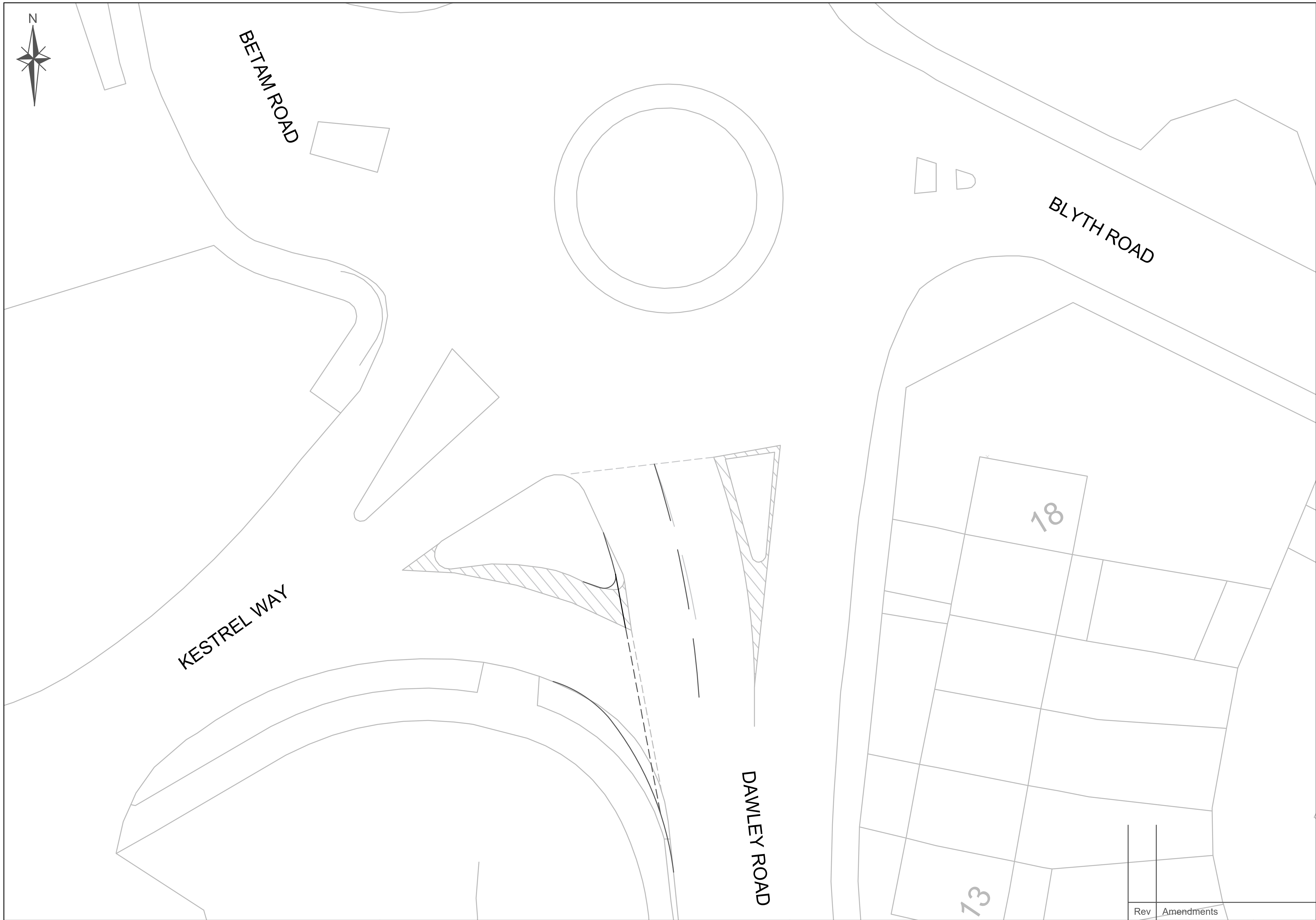
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Job Title
FORMER NESTLE FACTORY, HAYES

Drawing Title
POTENTIAL JUNCTION IMPROVEMENT
HAROLD AVENUE/NORTH HYDE ROAD

Client
BARRATT LONDON

Scale	Date	Designed
1:500 @ A3	NOV '16	FD
Drawn	**Checked**	**Approved**
FD	JB	JB
Job No	**Drawing No**	**Rev**
16018-01	16018-01-004	-



KEY

EXISTING ROAD MARKINGS

PROPOSED ROAD MARKINGS

Rev	Amendments	Drn	Chk	App	Date

MARKIDES ASSOCIATES

9th Floor ,
The Tower Building,
York Road
London
SE1 7NX

Telephone: 0207 442 2225

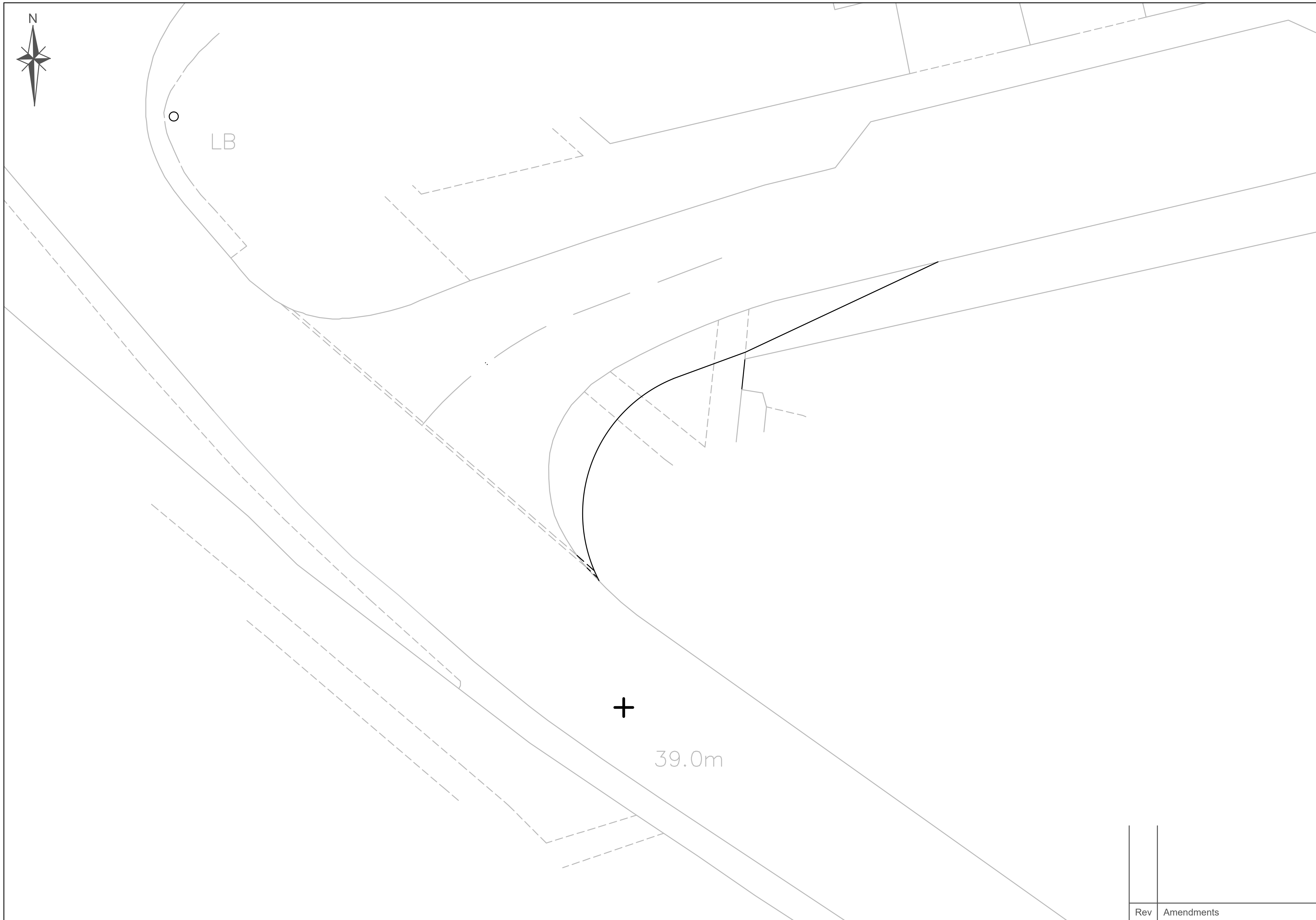
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Job Title
FORMER NESTLE FACTORY, HAYES

Drawing Title
POTENTIAL JUNCTION IMPROVEMENT
KESTREL WAY/DAWLEY ROAD/BLYTH ROAD

Client
BARRATT LONDON

Scale	Date	Designed
1:250 @ A3	FEB'17	DCP
Drawn	Checked	Approved
DCP	JB	JB
Job No	Drawing No	Rev
16018-01	16018-01-015	-



KEY

EXISTING ROAD MARKINGS

PROPOSED ROAD MARKINGS

Rev	Amendments	Drn	Chk	App	Date

MARKIDES ASSOCIATES
9th Floor, The Tower Building, York Road, London SE1 7NX
Telephone: 0207 442 2225
E: enquiries@markidesassociates.co.uk
W: www.markidesassociates.co.uk

Job Title: FORMER NESTLE FACTORY, HAYES

Drawing Title: POTENTIAL JUNCTION IMPROVEMENT DAWLEY ROAD/BOTWELL LANE JUNCTION

Client: BARRATT LONDON

Scale	Date	Designed
1:250 @ A3	FEB'17	DCP
Drawn	**Checked**	**Approved**
DCP	JB	JB
Job No	**Drawing No**	**Rev**
16018-01	16018-01-016	-