

An architectural rendering of a modern residential courtyard. The scene features two-story brick buildings with multiple windows and balconies. In the foreground, there are stone retaining walls, green lawns, and several wooden benches. A path leads through the courtyard, flanked by trees and shrubs. The overall atmosphere is bright and sunny.

Gas Holder Site, Reading

Transport Assessment

April 2019

Gas Holder Site, Reading

**Prepared for Danescroft
(Kenavon Drive Project
Management) LLP**

by

**Stuart Michael Associates
Limited**

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Coombe House
Coombe Square
Thatcham
Berkshire
RG19 4JF

T: 01635 867711
F: 01635 861715
E: mail@stuartmichael.co.uk
W: www.stuartmichael.co.uk

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Registered Office: Coombe House, Coombe Square, Thatcham, Berkshire RG19 4JF.

Telephone: 01635 867711 Facsimile: 01635 861715.



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1.0 INTRODUCTION

- 1.1 Stuart Michael Associates (SMA) has been appointed by Danescroft (Kenavon Drive Project Management) LLP (the 'Applicant') to prepare a Transport Assessment (TA) in support of a full Planning Application for the proposed development of 130 residential flats on the land known as The Gas Holder site at Alexander Turner Close, Reading.
- 1.2 The site was formerly used to store gas as part of the national gas network. The gas holder and associated apparatus are to be cleared in preparation for redevelopment of the site. The River Kennet forms the eastern boundary to the site. To the north is the Reading to Waterloo railway line, the Great Western Mainline and the River Thames just beyond this.
- 1.3 To the west of the site is the new residential development, and the existing residential properties off Kennet Walk. Further West is a mix of retail units, apartments and disused industrial units. Existing vehicle access to the site is from Alexander Turner Close through the existing residential development. **Figure 1.1** illustrates the site location.
- 1.4 Following publication of the National Planning Policy Framework (NPPF), most recently updated Feb 2019, the Department for Transport has issued new Planning Practice Guidance for Transport Assessments & Travel Plans. This TA has been prepared in accordance with this new guidance.
- 1.5 As part of the pre-application process extensive discussion have taken place with Reading Borough Council (RBC) through meetings and correspondence. The scope of the TA has been discussed with RBC, a copy of the correspondence is provided in **Appendix A** covering the following:
 - The extent of the junction assessment
 - Trip Rates
 - Committed development
 - Car parking standards



- 1.6 Public exhibitions have also been undertaken to ensure that local residents and interested parties are aware of the development proposals and have been able to provide their views and input. Public exhibitions were held on 9th July 2018 and 25 / 26th January 2019.

Report Outline

- 1.7 The remaining sections of this report include:

Section 2: provides an overview of the relevant national, regional and local policies;

Section 3: Examines the existing conditions of the site and local area, including the local highway network, accessibility for non-motorised users, highway safety and vehicular accessibility;

Section 4: Describes the proposed development, access arrangements and parking provision;

Section 5: provides an assessment of the likely number of trips generated by the proposed development;

Section 6: Gives a summary of the report and draws its conclusions from the assessment.



2.0 TRANSPORT PLANNING POLICY AND GUIDANCE

2.1 The National Planning Policy Framework (NPPF) was revised on 19th February 2019. At the heart of the NPPF is a presumption in favour of sustainable development.

2.2 With regard to promoting sustainable transport, it is recognised that when assessing sites that may be allocated for development in plans; or specific applications for development, it should be ensured that:

- “appropriate opportunities to promote sustainable transport modes can be – or have been - taken up, given the type of development and its location;
- safe and suitable access to the site can be achieved for all users; and
- any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree.” (NPPF, paragraph 108).

2.3 Development should only be prevented or refused on highway grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe. (NPPF, paragraph 109).

2.4 Within this context, applications for development should:

- *“give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second – so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use;*
- *address the needs of people with disabilities and reduced mobility in relation to all modes of transport;*
- *create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards;*
- *allow for the efficient delivery of goods, and access by service and emergency vehicles; and*



- *be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations.”*
(NPPF, paragraph 110).

Local Planning Policy and Guidance

Local Transport Plan 3

- 2.5 The third Reading Borough Council **Local Transport Plan** (LTP3) outlines the transport strategy for the period 2011-2026. The vision for the strategy is to get Reading Connected:

“Transport in Reading will better connect people to the places that they want to go: easily, swiftly, safely, sustainably and in comfort. We will meet the challenges of a dynamic, low-carbon future to promote prosperity for Reading.

Whichever way you choose to travel, by foot or bicycle, motorcycle, bus, rail, car or boat whether to work or education, to leisure or the services you need, our transport system will help you get there”.

- 2.6 The LTP3 has identified the future transport challenges for the central area these are summarised in **Table 2.1**

Table 2.1: LTP3 Transport Challenges for the Central Area

Central Area Challenge	Challenge Summary
Network Efficiency	Improve flows on the IDR, especially during peak times, and ensure that buses have sufficient priority to improve journey times and reliability and thus the attractiveness of bus travel within the central area.
HGV Through Traffic	Reduce the use of the IDR as a through route for HGVs and encouraging the use of more suitable strategic routes.
Severance	Improve connectivity over the River Thames, the railway and the IDR, by either providing more crossing points or improving the journey experience on existing crossing points.
Future Development Proposals	Ensure that the transport network can efficiently accommodate the additional demand created by the new proposed developments in the central area and minimise impacts on the environment.
Rail	Increase the capacity of the railway station and track and improve the integration of transport facilities for sustainable modes around, to and from the station.
Safety	Reduce the level of accidents through safer pedestrian and cycle facilities in areas where there are high vehicle flows and conflicting movements.
Car Parking	Manage demand for the existing central car parks and on-street parking space, and to maximise use of alternative means of accessing central Reading, or to expand car park capacity centrally or at Park & Ride locations in order to support the area’s ongoing economic prosperity.



- 2.7 RBC has made progress on a number of challenges so far including increased train capacity and an improved public realm surrounding the station, a new pedestrian/cycle link under the railway between Napier Road and Kenavon Drive and new cycle parking facilities.

Local Development Framework (LDF)

- 2.8 The RBC **Local Development Framework (LDF)** is a collection of development plans which affect Reading, of which the **Reading Borough Core Strategy** is the central document. It was adopted in 2008 (altered 2015); setting out the Council's planning strategy for the Borough. It sets out how planning and development will achieve the Reading 2020 Vision for the town. Policies which relate to the proposed development include:

- Policy CS4: Accessibility and the Intensity of Development;
- Policy CS16: Affordable Housing (altered 2015);
- Policy CS22: Transport Assessments;
- Policy CS23: Sustainable Travel and Travel Plans.

- 2.9 RBC aim to influence travel behaviour by encouraging sustainable travel choices. The Core Strategy states under **Policy CS23** that all major developments must implement measures to promote and improve sustainable transport facilities through agreed travel plans before planning permission is granted.

- 2.10 The Eastern and South Eastern Local Action Plan has encouraged the use of public transport by painting red lines.

- 2.11 **Reading Central Area Action Plan (RCAAP)** adopted 2009 provides the development strategy for central Reading to 2026, within which the site is located. The RCAAP forms part of RBC's LDF as a Development Planning Document (DPD).

- 2.12 The RCAAP recognises the importance of timing spatial planning with transport infrastructure improvements. Major transport issues were identified as:

- Reading Station is the second busiest interchange outside of London but is a major bottleneck on the national rail network.
- Road congestion, particularly on the Inner Distribution Road (IDR) encircling the centre, has become heavily used by through traffic.
- The challenge of how transport links with the vibrant evening economy of the centre and ensures the safety of visitors.



- 2.13 The site is allocated in the RCAAP under the heading 'East Side Major Opportunity Area', specifically RC3f '*Gas Holder*'. The allocation is for a "residential development and should maximise the potential of the site to be a river gateway to Reading".
- 2.14 Parking standards for the proposed development are set out in RBC's **Revised Parking Standards and Design Supplementary Planning Document (SPD)**, part of the LDF. The proposed development is within Zone 2, Primary Core Area.
- 2.15 Further advice has been referred to in preparation of this TA, which includes the following documents:
- Manual for Streets 1 & 2;
 - Planning Practice Guidance.



3.0 THE EXISTING SITUATION

Site Overview

- 3.1 The site is a former gas storage facility and depot. While the gas holder itself is now out of use the site it still used as a depot. To the west of the site is the recent residential development on Alexander Turner Close, built by Bellway Homes. Alexander Turner Close provides access to Robert Parker Road, the principal route through the recent development providing vehicle access to the site. Beyond this are disused industrial and retail units.
- 3.2 The River Kennet flows southwest to northeast passed the site, meeting the River Thames just beyond the railway line. Reading station is approximately 1.5km to the west of the site. The Reading to Waterloo railway line forms the site's northern boundary with the River Thames flowing east to west beyond the railway line. Beyond the River Kennet, to the south of the site, is Reading College and existing residential properties.
- 3.3 As mentioned, the area was identified in the RCAAP as a major opportunity area. The existing industrial/retail units off Kenavon Drive are to be redeveloped into residential led mixed use schemes. In January 2018 the former 'Homebase & Toys r Us' site received planning consent for 765 homes and retail units.

Non-Motorised Users (NMUs) Accessibility

Access on Foot/Cycle

- 3.4 The local area is supported by a good pedestrian and cycle network. This facilitates safe and convenient movement on foot and cycle between the site and the surrounding area. Furthermore, recent and planned developments within the area will help to improve the quality of infrastructure and permeability of the area.
- 3.5 The Bellway Homes development included new pedestrian / cycle routes to Kenavon Drive and Napier Road. A new route runs parallel to Kennet Walk linking with Kenavon Drive. A passageway between Kennet Walk and the route is provided.



Photo 3.1 – Passageway between Kennet Walk and Kenavon Drive

- 3.6 A new route also links the Bellway Homes development with Napier Road (via the railway underpass). The route runs parallel to the existing railway line, as shown in the photos below.

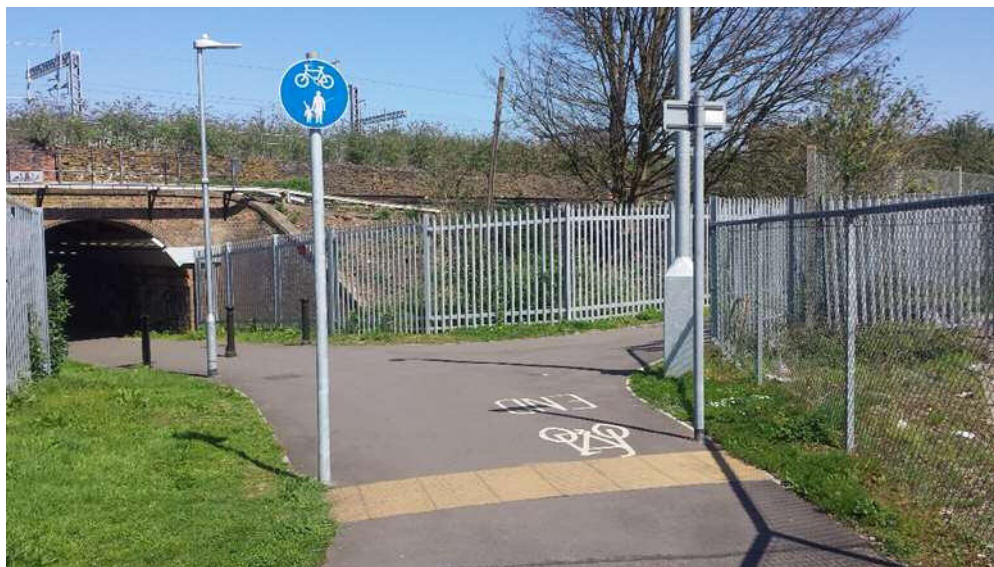


Photo 3.2 – The link between the Bellway Homes development and Napier Road

- 3.7 Alternatively a 2m footway is also provided along Alexander Turner Close and Robert Parker Road. These footways are lit with dropped kerbing and uncontrolled pedestrian crossing points.
- 3.8 The new pedestrian and cycle route via the railway underpass linking Napier Road and Kenavon Drive provides an improved connection to the Tesco Extra store, bus services on Napier Road (and possible future buses on the East Reading Mass Rapid Transit route) and King's Meadow.



Photo 3.3 – Railway underpass between Napier Road and Kenavon Drive

- 3.9 It is also possible to walk the footpath along the banks of the River Kennet. A pedestrian/cycle bridge immediately opposite the site and another just beyond the railway line provide a link across the river and to the Thames path.



Photo 3.4 – Footpath along the bank of the River Kennet and footbridge over the river



- 3.10 Reading station and town centre are to the west of the site, approximately 1.5km and 1.8km respectively. The principal desire line for pedestrians to access the station is likely to be via Kenavon Drive, Forbury Road and Blagrove Street. Depending on the end location within Reading town centre, the desire line could follow the same route to the station or take the footpath along the River Kennet or via Gas Works Road and Kings Road. Each route has wide footways/footpaths with crossing points (signalised on the main roads) and dropped kerbing.
- 3.11 Reading has a comprehensive cycle network with 7 colour coded routes from the town centre to the wider urban area of Reading and a circular route around the town centre. The cycle network connects all the town's major public facilities, employment and leisure areas. **Figure 3.1** shows the Reading Cycle Network Map, within the vicinity of the site.
- 3.12 The East Reading & Woodley route (shown in orange on **Figure 3.1**) runs along the banks of the River Kennet opposite the site. This route links with the town centre circular route (shown in purple on **Figure 3.1**) near Kennet Side.
- 3.13 National Cycle Network (NCN) routes 4 & 5 pass through Reading. The East Reading & Woodley route also forms part of the NCN route 4. Route 5 runs along the river Thames to the north. Both routes link together where the River Kennet meets the River Thames, approximately 370m cycle north of the site.

Local Facilities

- 3.14 'Manual for Streets' (MfS) describes "walkable neighbourhoods" as those which are "typically characterised by having a range of facilities within 10 minutes' (around 800m) walking distance". **Table 3.1** summarises the IHT guidelines for Journeys on Foot (IHT, 2000).

Table 3.1: IHT Guidelines for Journeys on Foot

	Town Centres	Commuting / School / Sight Seeing	Elsewhere
Desirable	200	500	400
Acceptable	400	1000	800
Preferred Maximum	800	2000	1200

- 3.15 The site is in an ideal location in close proximity to Reading town centre (approximately 800m). Reading town centre is a well-developed retail, employment and services centre. A wide range of high street stores, department stores and the Oracle shopping centre provide many retail options.



- 3.16 **Table 3.2** provides a summary of some of the local facilities and an estimated walking distance and cycling time from the centre of the site. Further details of this are provided in **Figure 3.2**.

Table 3.2: Local Facilities

Facility	Distance (m/km)	Walking Times (minutes)	Cycling Times (minutes)
New Town Primary School	200	2 ½ minute	½ minute
The Jolly Anglers Public House	250	3 minute	1 minute
St. John's CoE Primary School	330	4 minute	1 minute
Sun Street Community Centre	350	4 minute	1 minute
Bus Stop (Kenavon Drive)	370	4 ½ minute	1 minute
Reading College	400	5 minutes	1 ½ minute
Kennet Corner Store	450	5 ½ minute	1 ½ minute
Kings Road (Bus Stop)	700	8 minutes	2 minutes
King's Meadow	730	8 ½ minute	2 ½ minute
Forbury Retail Park	790	9 ½ minute	2 ½ minute
SSE	950	11 ½ minute	3 minutes
Tesco Extra (Napier Rd)	800	9 ½ minute	2 ½ minute
Royal Berkshire Hospital	1.3km	16 minutes	4 ½ minute
Town Centre (Broad Street)	1.5km	17 ½ minute	5 minutes
Reading Train Station	1.5km	18 ½ minute	5 minutes
The Oracle	1.59km	19 minutes	5 ½ minute
University of Reading	2.2km	26 minutes	7 ½ minutes

- 3.17 New Town Primary School is 200m from the site, on the opposite bank of the River Kennet. St. John's CoE Primary School is 330m to the south of the site and Reading College is 400m to the south. Both are accessed by crossing the bridge over the River Kennet beside the site. Reading University is to the south of the site approximately 2.2km away or a 7 and half minute cycle.
- 3.18 There is a good level of recreational facilities within a reasonable distance of the site including both the River Kennet and River Thames as well as open green spaces like Forbury Park to the east of the site and the King's Meadow recreational ground to the north east of the site.
- 3.19 The large Tesco Extra to the north of the site, is walkable in under 10 minutes and includes a pharmacy, opticians and café.



- 3.20 There are a number of employment opportunities located within 1km walking distance of the site. These include SSE, Prudential, HMRC and Wipro Technologies. Primark HQ is also located within 2km of the site.
- 3.21 Links by bus and train also provide access to employment further afield such as London. Journey times from Paddington to Reading are approximately 25 minutes.

Accessibility by Public Transport Services

Bus Services

- 3.22 As part of the Bellway Homes site on Kenavon Drive, the 42/42a bus service was implemented to serve the surrounding roads. The route provides a link from the site to Reading town centre via the Reading Railway Station and Tesco Superstore on Napier Road.
- 3.23 Reading Buses route 42/42a eastern terminus is located 370m from the site at the roundabout to the Bellway Homes development. This stop is easily accessible on foot from the site. **Table 3.2** and **Figure 3.3** provide a summary of the route and hours of service.

Table 3.2 – 42/42a timetable

Route (42/42a)	Monday-Friday		Saturday	
	Operating Hours	Frequency	Operating Hours	Frequency
Kenavon Drive – Central Reading	06:00-19:22	2/hour	07:00-19:22	1-2/hour
Central Reading – Kenavon Drive	06:11-19:13	2/hour	07:28-19:13	1-2/hour

- 3.24 Other bus stops can be found on Kings Road, approximately 700m or less than a 9 minute walk from the site which are served by some 7 bus services. These buses serve the town centre and surrounding towns of Reading including; Bracknell, Maidenhead, Wokingham and Newbury.
- 3.25 **Table 3.3** details some of the key bus routes serving the wider area. The site is well connected to the town centre and much of the Reading urban area.



Table 3.3: Summary of Local Bus Services

Service	Route	Distance From Site	Monday-Friday		Saturday		Additional Notes
			Operating Hours	Typical Frequency	Operating Hours	Typical Frequency	
42/42a	Kenavon Drive – Reading - Rivermead	370m	06:00-19:22	Every 25 minutes	07:00-19:22	Every 25 minutes	No Sunday service from Kenavon Drive
3/10	Bracknell – Central Reading	700m	05:53 – 00:12	Every 30mins	06:33 – 00:11	Every 15-20 mins	Sundays 09:23-00:15, 30 mins
4/X4	Reading - Bracknell	700m	05:20 – 23:05	Every 15 mins	06:20 – 23:05	Every 15 mins	Sundays 07:20 – 19:40, every 30 mins
19a/b/c	Reading – Woodley – Lower Earley	700m	06:13 – 19:07	Every 30 mins	07:03 – 18:57	Every 30 mins	No Sunday service
9	Central Reading – Whitley	700m	05:43 – 19:37	Every Hour	07:32 – 20:27	Every Hour	No Sunday service
17	Wokingham Road - Reading - Oxford Road	700m	24hrs	Every 7mins	24hrs	Every 7mins	Sundays 24hrs, 30 mins
702/703	Reading – Bracknell – Slough	750m	04:34 – 07:50	Hourly	05:49-08:50	Every 20mins	Sundays same as Saturday

- 3.26 The bus route 17 runs 24 hours, 7 days a week. This connects the site to central Reading, Three Turns in the east and Tilehurst and Theale in the west.
- 3.27 Friar Street and Reading train station, both within easy walking distance of the site are also served by numerous bus routes. **Figure 3.4** provides a plan of the bus service routes for the wider area.
- 3.28 A premium express coach service operates from Reading train station to Heathrow Airport. The service has frequencies up to every 20 mins between 04:00 and 23:00 Monday to Saturday. Sunday services operate on a reduced timetable.
- 3.29 National Express coach services for Reading operate from Mere oak park-and-ride just off junction 11 of the M4 to the south of the site. Reading buses Greenwave route links the town centre (St. Marys Butts stop) to the park-and-ride site and the National Express coach stop.
- 3.30 Greenwave buses run Monday to Saturday (with reduced services on Sundays and bank holiday) every 10 to 15 minutes and the journey takes 20 to 25 minutes.
- 3.31 National Express coach operates services from Reading to numerous destinations across the south and south west including Bath, Bristol, Cardiff, Penzance, Plymouth and Gatwick and Heathrow airports. A service to Cork in Ireland is also available.



Train Services

- 3.32 The site is located 1.5km west of Reading train station, a major train interchange. The majority of services into Reading have an origin/destination of London Paddington. The station is served by three major train operating companies: Great Western Rail, Cross Country, and South West Trains. Services operate 7 days a week at a high frequency through the day and night.
- 3.33 Destinations that can be accessed from Reading train station are summarised below by train operator:
- **Great Western Rail:** London Paddington, Slough, Basingstoke, Gatwick Airport, Oxford, Hereford, Worcester, Bristol, Plymouth, the South West of England and South Wales;
 - **Cross Country Trains:** Bournemouth, Southampton, Guildford, Banbury, Coventry, Birmingham, the North of England and Scotland;
 - **South Western Railway:** Wokingham, Staines, Richmond, Clapham Junction, London Waterloo, Basingstoke, Winchester, Southampton, Portsmouth and Brighton.
- 3.34 Major redevelopment works have been undertaken at the station to increase the number of trains that can operate through the station at any one time and ease congestion.
- 3.35 At the beginning of 2018, Great Western Railway introduced new cleaner electric trains on routes serving Reading. The new trains provide increased capacity, better on-board facilities and a more environmentally sustainable means of travel. The new trains (along with the roll-out of new intercity trains) serve routes from London Paddington to Maidenhead, Reading, Didcot and further west to Bristol and Cardiff.
- 3.36 Reading is to benefit from the Elizabeth Line (formerly known as Crossrail) from 2019. It will provide improved journey times across London, easing congestion and enabling better connections. There will be two trains an hour from Reading and passengers will be able to travel into, and beyond, central London without the need to change at Paddington. It will also provide greater flexibility for future timetabling of services.



Summary

- 3.37 The site is in a highly sustainable location in transportation terms, conveniently accessible by all travel modes. The site is within reasonable walking distance of numerous facilities, amenities and employment opportunities and is well linked to other employment centres around the town. The high quality inter-urban connections offered by both the nearby bus stops and train station further reduce the need to drive.

Local Road Network

- 3.38 The site is a 2km drive from the Caversham Road (A329) / Richfield Avenue Roundabout, this is the main route in and out of Reading to the south, linking directly to the M4 (Junction 11). To get there traffic will have to follow Kenavon Drive before joining Vastern Road and Forbury Road, both of which form the A329.
- 3.39 The A329 Caversham Road forms part of the Inner Distribution Road (IDR) which loops around Reading town centre. The A329 takes the form of a dual carriageway and is restricted to a 40mph speed limit. To the north the A329 connects with Vastern Road and the A4155.
- 3.40 To the south the A329 continues connects to the A33, which provides direct access to the M4 at junction 11. Alternative access to the M4, for destinations east of Reading, can be sought via the A329 south of the site linking with the A4 Bath Road.
- 3.41 To head north of the development towards Caversham, traffic will use the A4155 over the river Thames. Traffic wishing to go west towards Didcot will take Woodcote Road (A4047) out of Reading. Traffic wishing to head east will follow the A4155 (Henley Road) towards Henley-on-Thames.
- 3.42 Vastern Street (A329) links with Caversham Road at a signalised junction to the north-west of the site. It is possible to join either carriageway of Caversham Road from this junction. The A329 is also stopped at 6 points along its route by traffic lights and features 2 roundabouts before joining Caversham Road.
- 3.43 Kenavon Drive and the A329 are subject to a 30mph speed restriction, typical of a built-up area. There are on-street parking restrictions present along these roads.



Existing Traffic Conditions

- 3.44 As part of the scoping exercise it was agreed with RBC that the TA would look at the following key junctions:
- Forbury Road/ Vastern Roundabout;
 - Forbury Road / Kenavon Drive Roundabout;
 - Kenavon Drive / Gas Works Road;
 - Oscar Wild Road / Kenavon Drive / Kennet Walk;
 - Watlington Street Gyratory.
- 3.45 To determine the baseline traffic situation (2019) near the proposed development site, Manual Classified Counts (MCC) and queue length counts were undertaken by Advanced Transport Research, in locations agreed with the local HA.
- 3.46 These surveys were undertaken on 4th July and further surveys were carried out on 18th September. Full survey results are attached as **Appendix B**. A summary of the traffic flows for the AM and PM peak periods for the 2018 survey data (referred to as the Baseline) is provided in **Figures 3.5 and 3.6** respectively.

Road Safety

- 3.47 Personal Injury Accident (PIA) data for the study area has been obtained from RBC for the 5 year period 04/09/2013 to the 04/09/2018. **Appendix C** contains a full copy of the PIA data. **Figure 3.7** illustrates the PIAs within the study area.
- 3.48 A total of 21 incidents were recorded in the study area over the 5 year period. One incident was recorded as serious and happened on the A329 Forbury Road involving a car and a pedestrian. The incident occurred at 1am when the road was lightly trafficked and weather conditions were fine. The incident did not occur within 50m of a pedestrian crossing or 20m of a junction, therefore it can be assumed that the cause of the incident was not to do with any underlying highway design issues.
- 3.49 All of the remaining incidents, numbering 20, were recorded as slight. No incidents were recorded in front of the site or on Alexander Turner Close. The nearest incident to the site occurred on Kenavon Drive, close to the Forbury Road roundabout.



- 3.50 Of the incidents, 6 involved cyclists and 2 involved pedestrians. These mostly involved drivers failing to give way entering the roundabout, failing to look properly, poor manoeuvres and rear end shunts.
- 3.51 Although a number of accidents occurred within the identified network within the study period, the average number of accidents across the selected junctions was 5 per year. Given the A329 is a key route through Reading and the study area includes a large roundabout, this average numbers of accidents per year is not considered high.
- 3.52 There are no clusters found at any of the junctions, therefore the PIA data does not indicate any underlying safety or design issues on the surrounding highway network.



4.0 DEVELOPMENT PROPOSALS

- 4.1 The proposed development is for 130 flats on the land known as the Gas Holder site at Alexander Turner Close, Reading. The proposed development is to provide a mix of 1, 2 and 3 bed private and affordable flats. A proposed site layout is attached as **Appendix D**.

Vehicle Access Arrangements

- 4.2 The proposed development will use an extension of Alexander Turner Close as a point of vehicle access. This access was considered within the allocation of the site and the connection built into the Bellway development scheme. This has always therefore been the intended access point for the site. It is understood that the roads within the Bellway scheme have now been formally adopted by RBC and now constitute public highway.
- 4.3 The width of the proposed access road is 6.1m. This not only allows suitable reversing space for the proposed parking spaces along the northern side of the road but allows access sufficient width for emergency vehicles access even in the situation where a vehicle is broken down on the access road. The minimum width required for emergency vehicle access is 3.75m.

Connection to Alexander Turner Close

- 4.4 As part of the pre-application discussions RBC have requested that consideration be given to the connection to the existing Alexander Turner Close and its currently layout. As part of the Bellway scheme the design of Alexander Turner Close allowed for a connection through to the Gas Holder site, however as the Gas Holder site layout has developed the access alignment has moved further south of that initial anticipated connection point and more in line with the existing site access. RBC indicated that this alignment would leave an area of unused tarmac on Alexander Turner Road which RBC would prefer to see landscaped to provide a better overall road alignment connecting the two sites. The developer will provide these works via a S278 agreement as this is work to the public highway.

Servicing

- 4.5 The proposed site layout (**Appendix D**) shows a refuse store at the eastern entrance to the multi-story car park and the southern boundary of the access road.



- 4.6 **Drawing 5757.SK10A** shows the swept path analysis of the refuse vehicle entering and exiting the site. The turning head to the east of the site allows the refuse vehicle to turn and reverse up to the refuse store at the entrance to the multi-story car park before moving back to first gear, can also access the other bin stores and the exit the site.

Car Parking Provision

- 4.7 RBC car and cycle parking standards are detailed in the Revised Parking Standards and Design SPD. Reading is divided into 4 zones, parking requirements depend on which zone a development is located.
- 4.8 In regards to car parking the SPD details the standards required for a new development. However the document also states;

“Should a developer require fewer spaces than are set out [in the table] then there would need to be demonstration, to the Highway Authority’s satisfaction, that there would be no detriment to highway safety as a result”.

- 4.9 The proposed development site is within Zone 2, ‘Primary Core Area’, however, the Bellway Homes site successfully argued that due to the highly accessible location it should be classified as Zone 1. That scheme therefore applied a Zone 1 parking standard.
- 4.10 In principle then, it could argued that the proposed development could also apply the Zone 1 parking standard as did the Bellway Homes scheme, however the developer wishes to provide more parking on the site than would be required under Zone 1, but slightly less parking spaces than required for Zone 2 in the SPD.
- 4.11 Table 4.1 sets out the parking standards required for both Zone 1 and 2 alongside the level of parking proposed on site of 127 spaces.

Table 4.1 – Reading Parking Standards for Zones 1 and 2 and proposed parking provision

Bedroom	No. of dwellings Proposed	Parking Spaces as per Zone 1	Parking spaces as per Zone 2	Parking spaces provided
Residential Spaces	130	69	134	127
Visitor Spacing		0	13	0
Garage Spaces (not included in parking standard)				
Total	130	69	147	127



- 4.12 As can be seen from the table, the developer is providing significantly more parking on site than if the Zone 1 parking standard had been applied as was done for the Bellway site. In comparison the parking standard for Zone 2 the site is providing 7 less spaces for the provision for the flats only but 20 overall when considering the visitor parking.
- 4.13 Within this parking provision are 13 electric spaces and 7 disabled spaces. The developer has also approached a car club operator with the aim of providing a car club vehicle on site for use of future residents. Co-Wheels car club expressed an interest in providing a car club space for the site via email on 31st January 2019. This email trail is provided in **Appendix E**. The provision of a car club on site will provide residents with an alternative to owning a car.
- 4.14 The accompanying Travel Plan will encourage residents to use this car club and therefore reduce the need for parking provision.
- 4.15 As set out in Section 3 the site is located in a highly accessible location, within reasonable walking distance of the town centre, the railway station and frequent bus services. There is therefore ample alternatives to travel than by car.
- 4.16 As the area was considered to be suitably located in a highly accessible location as part of the Bellway Homes application, this must still apply for the Gas Holder site, therefore a slight reduction on the Zone 2 parking standards is justified.
- 4.17 A review of the local Census data (Nomis Table LC4415EW - Accommodation type by car or van availability by number of usual residents aged 17 or over in household) for the area shows that car ownership levels for flats are low, with 49% of households made up of Flats having no car or van and 44% only having 1 car/ van. On average the car / van ownership in this area is 0.578 per flat. The source data from NOMIS is contained in **Appendix F**.
- 4.18 This provides clear evidence that residents of flats in this area of Reading do not require 1 parking space per flat and given that the development is providing an average of 0.97 spaces per flat (excluding visitor provision) adequate parking is being provided on site. It is proposed that the parking onsite will be unallocated and so available to all residents and visitors to the site.



- 4.19 The SPD set out that where a reduction in parking provision is proposed it needs to be demonstrated that there would be no detriment to highway safety as a result. The data above demonstrates there will be adequate parking provision proposed onsite for the needs of the future residents.
- 4.20 However to ensure that vehicles are not parked along the access road, on-site parking will be controlled in a form to be agreed with the highway authority but which may be made up of permit parking, on street parking controls and / or a gate at the site access. There will therefore be no detriment to highway safety.
- 4.21 Car parking spaces will be 2.4m wide and 4.8m long. The parking provision onsite has been reviewed in terms of usability and tracked using a large saloon car. This is shown in **Drawing 5757.SK10A** for spaces along the site access road.
- 4.22 With reference to Design recommendations for multi-storey and underground car parks (4th Edition) and in particular Section 4 Design geometry and layout. All the car parking spaces are 90 degree, standard size, 2.4m x 4.8m with a 6m minimum aisle width. The disabled spaces have an extra 1.2m minimum standard wide margin between spaces.
- 4.23 The columns between the car parking spaces are setback and side clearance on parking spaces adjacent to walls/structures is 0.3m or greater to allow for sufficient room for manoeuvres. The ramp is 6m wide with 0.5m clearance between walls/structures. Given the low traffic speeds and amount of spaces proposed on the first floor this is considered appropriate.
- 4.24 **Drawing 5757.SK09B** shows a large saloon car traversing the ramp within the car park and shows that two large cars can safely manoeuvre on the ramp at the same time. The ramp gradient between the ground and first floor is 1 in 8 with transitions at the bottom and top to prevent vehicles grounding. The pedestrian emergency access route and stairs width is 1.2m. This is considered appropriate given the amount of spaces proposed on the first floor.



Impact of parking on Surrounding Areas

- 4.25 During the public exhibitions a number of residents raised concerns about cars from the proposed development parking on the existing roads surrounding the site. This was due to problems incurred on the Bellway Homes site prior to the roads being adopted, as commuters were parking on the roads all day causing issues for access. Since these concerns were raised these roads have been adopted and parking restrictions introduced. This has now removed this commuter parking issue.
- 4.26 The future parking demand for the proposed site will be met within the development. No overspill parking from the site onto the Bellway Homes development will be possible as new double yellow line restrictions have been introduced and parking bays are allocated to the existing residents and clearly marked for resident use only.
- 4.27 Kenavon Drive features double yellow lines (no parking at any time) except for some marked bays. Some of the parking bays on Kenavon Drive are free to use whereas others, slightly further down Kenavon Drive towards the Forbury Road roundabout, are pay and display. These bays are operated by RingGo on behalf of RBC.
- 4.28 The large retail car park near the site is privately owned and has multiple signs stating that it is for customers only, thus not available as parking for the development.
- 4.29 Given the extensive parking restrictions on the surrounding streets and RBC policy to not offer new parking permits for residents of proposed developments, future residents will be unable to legally park on surrounding streets, except in limited spaces on Kenavon Drive, however it is unlikely that residents would park this far from the site.

Cycle Parking

- 4.30 The SPD notes 0.5 cycle spaces is required for 1 or 2 bedroom dwellings and 1 space is required for 3 or more bedroom dwellings. The proposed development is to provide 74 cycle parking spaces or 0.52 spaces per unit, providing some 5.5 spaces over the number required by the SPD.



Sustainable Accessibility

- 4.31 To encourage and maximise the opportunities for travel by public bus services, new developments are required to be 'located so that public transport trips involve a walking distance of less than 400m to the nearest bus stop or 800m to the nearest railway station' (ref: paragraph 5.21 Planning for Public Transport in developments, IHT 1999)
- 4.32 The nearest bus stops to the development are located on Kenavon Drive, 370m south west of the site. The bus stop is served by number 42/42a, which was implemented as part of the Bellway Homes development. Additional bus routes are available from bus stops located on King's Road approximately 700m east of the site. These include the 24 hour service no. 17 which runs to the centre of Reading and services 3, 9, 10, 19a/b/c and 702. Details are provided above.
- 4.33 The site benefits from being located 1.5km from Reading train station, a major transport hub. Residents would therefore have access to numerous, direct frequent train services to employment and retail centres across the South, South East, London, Midlands, South West and Wales.
- 4.34 The site is therefore considered to be compliant with sustainable development policies.



5.0 TRANSPORT IMPACT ASSESSMENT

Trip Generation

- 5.1 During the scoping with RBC, the accepted trip rates which were presented within the permitted Bellway Homes application were proposed as these were considered relative to the development. However, RBC requested that a review be undertaken of these trip rates to consider if more recent data was available.
- 5.2 The TRICS database was interrogated to ascertain a trip generation rate for the AM peak (08:00-09:00) and the PM peak (17:00-18:00). The following have been used as parameters for the database;
- Land Use: Residential
 - Category: Flats, Privately Owned
 - Area: Sites Located in Greater London, Scotland, Wales & Ireland have been excluded.
 - Travel Plan: No
 - Survey Dates: Monday – Friday
 - Quantum: 20-154 Units
- 5.3 Privately Owned Flats have been selected using the TRICS database to provide a robust case as this would not take into account the affordable element of the developer which is generally accepted to generate less trips than those that are private. The TRICS output is provided in **Appendix G**.
- 5.4 The vehicular trip rates and likely trip generation for a 130 dwelling development are summarised in **Table 5.1**.

Table 5.1: Trip Rates from TRICS Database

	Trip Rates			Potential Trip Generation		
	Arrivals	Departures	Two Way	Arrivals	Departures	Two Way
AM Peak 08:00-09:00	0.045	0.118	0.163	6	15	21
PM Peak 17:00-18:00	0.116	0.077	0.193	15	10	25

- 5.5 The proposed development of 130 housing units is likely to generate some 21 two-way movements during the AM peak and 25 two-way movements during the PM peak. This equates to 1 additional trip on the local highway network every 3 minutes during the AM Peak and every 2 minutes during the PM Peak.



- 5.6 A review was undertaken of the trip rates accepted by RBC as part of the application for the Toys R Us site located on Kenavon Drive. This indicated that a lower trip rate had been used than those set out in **Table 5.1**.
- 5.7 As the TRICS data used within this assessment provided a higher trip rate than used for the Toys R Us development which has been approved by RBC, these rates are considered robust for the purposes of assessing highway impact of the proposed development.

Multi-Modal Trip Generation

- 5.8 Two data sets have been used to create an accurate representation of multi-modal trip generation. The TRICS database has been used to show all trips over a daily period. A second multi-modal trip generation assessment has been undertaken using 2011 Census Data. This shows area specific data for the site, however it only uses Journey to Work Data. By combining the results of the two datasets, it is possible to get a more accurate conclusion.

TRICS Database

- 5.9 The TRICS database provides information on travel by all modes. Using the previous trip generation data (**Appendix G**), **Table 5.2** displays the modal share breakdown.

Table 5.2 – Trip Generation by Mode

Mode of Travel	Daily	%
Car Driver	237	40%
Cyclist	10	2%
Pedestrian	270	46%
Bus/Tram	40	7%
Train	34	5%
Total	591	100%

- 5.10 From **Table 5.2** it can be seen that sustainable travel modes are the predominant method of travel at 60%. Of these, 46% are pedestrians. The modal share reflects the site's location being close to Reading town centre and the well-connected pedestrian links. The extensive public transport provision in the surrounding area facilitates the use of buses and trains.



Census 2011 Data

- 5.11 Vehicle trip distribution for the proposed development is based on Census 2011 Journey to Work Data, specifically the 'Location of usual residence and place of work' dataset. The Census data is contained in **Appendix H**.
- 5.12 **Table 5.3** provides trip generation to work by mode for the Reading MSOA areas 10 and 11 (the site) to the rest of Reading.

Table 5.3 – Trip Generation to work by mode

Mode of Travel	Daily	%
Car Driver	4033	33%
Car Share	397	3%
Cyclist	601	5%
Pedestrian	3657	29%
Bus/Tram	1518	12%
Train	2015	16%
Motorcyclist	55	1%
Other	98	1%
Total	5394	100%

- 5.13 Sustainable travel modes (cyclist, pedestrian, bus, train, car share and other) are the most predominant method of travel at 66%. Only 33% of trips are made by single occupancy car trips and 1% motorcycles.

Summary

- 5.14 **Table 5.2** and **Table 5.3** indicate high levels of sustainable travel modes, particularly walking at 46% and 29% respectively. Car driver modes are relatively low for both assessments which reflects the highly accessible location of the site. This further supports the reduction in parking provision as mentioned in sections 4.6-4.18.

Trip Distribution

- 5.15 Vehicle trip distribution is based on the 2011 Census Journey to Work Data. As the site is on the very western edge of MSOA area 10, areas 10 and 11 have been used. All vehicular modes leaving the site must pass through area 11 to reach further destinations and most facilities surrounding the site are found in area 11. Therefore, both areas have been used as they more accurately represent the flow of people around the Reading area.



- 5.16 Using an independent tool such as Google Maps to assign trips to and from the site, three principal vehicle routes have been identified based on the Census destination data. All vehicles from the site use Alexander Turner Close, followed by Robert Parker Road and then travel to the Forbury Road / Kenavon Drive Roundabout. Three routes are available from the roundabout. **Table 5.4** and **Appendix I** details these routes and the assignment of development trips to these.

Table 5.4 – Principal Routes to / from the site

Routes		% of Trips
1	via Vastern Road for destinations north of Reading.	18%
2	Via Forbury Road south towards Watlington Road Gyratory and head then via Queens Road for destinations to the east of Reading and the A329.	51%
3	via Forbury Road south towards Watlington Road Gyratory and then via Kings Road for destination to the south and west of Reading and the M4.	31%

Percentage Impact of Development flows

- 5.17 As detailed in Section 3, MCCs have been undertaken at a number of junctions in the vicinity of the site. **Table 5.5** compares the expected development flows with the observed traffic flows and provides a percentage impact.



Table 5.5 - Observed Two-Way Flows compared to Development Flows

Kenavon Drive east of Gas Works Road			
	Total Two-Way	Dev. Flows	% Impact
AM Peak	128	21	16%
PM Peak	89	25	28%
Kenavon Drive West			
	Total Two-Way	Dev. Flows	% Impact
AM Peak	308	21	7%
PM Peak	401	25	6%
Forbury Road west			
	Total Two-Way	Dev. Flows	% Impact
AM Peak	1656	4	0%
PM Peak	1469	5	0%
Forbury Road south			
	Total Two-Way	Dev. Flows	% Impact
AM Peak	1672	17	1%
PM Peak	1680	20	1%
Kings Road			
	Total Two-Way	Dev. Flows	% Impact
AM Peak	1907	12	1%
PM Peak	1941	8	0%
Queens Road			
	Total Two-Way	Dev. Flows	% Impact
AM Peak	467	8	2%
PM Peak	380	11	3%
Watlington Road			
	Total Two-Way	Dev. Flows	% Impact
AM Peak	1867	5	0%
PM Peak	1616	12	1%

- 5.18 From this percentage change assessment it can be seen that on the wider highway network the development results in a 3% or less increase on the 2018 observed flows. As all development trips must travel along Kenavon Drive the percentage increase to existing flows is higher. To the western end of Kenavon Drive the development trips result in a 6-7% increase in flows.
- 5.19 TA 79/99 of Design Manual for Road and Bridges (DRMB) paragraph 2.2 suggests daily capacity flows can be affected by a wide range of factors and may not always accurately predicted flows hence an allowance of plus or minus 10% is recommended. The proposed development trips are therefore similar to the levels expected for daily variations in traffic.



- 5.20 To the eastern end Kenavon Drive serves only limited existing residential properties on the Bellway Site and Kennet Walk and so existing flows are currently very low, with two way flows of 128 in the AM and 89 in the PM. The addition of the 21 and 25 two way development flows therefore results in a 16% and 28% increase of flows, however this still only results in an overall two way flow of 149 in the AM peak and 114 in the PM peak.

Percentage Impact on Junction Inflows

- 5.21 **Table 5.5** compares the expected development junction inflows with the observed junction inflows and provides a percentage impact.

Table 5.6 – Observed Flows compared to Development Flows

Forbury Road / Kenavon Drive Junction			
	Junction Inflow	Dev. Flows	% Impact
AM Peak	1824	21	1%
PM Peak	1898	25	1%
Oscar Wilde Road / Kennet Walk / Kenavon Drive Junction			
	Junction Inflow	Dev. Flows	% Impact
AM Peak	114	21	19%
PM Peak	71	25	35%
A329 / Orts Road / Queen's Road Junction			
	Junction Inflow	Dev. Flows	% Impact
AM Peak	2094	15	1%
PM Peak	2114	16	1%
Vastern Road / Forbury Road Junction			
	Junction Inflow	Dev. Flows	% Impact
AM Peak	1973	4	0%
PM Peak	1875	5	0%
Forbury Road / Kings Road Junction			
	Junction Inflow	Dev. Flows	% Impact
AM Peak	2956	17	1%
PM Peak	2925	20	1%
Watlington Street / Queens Road Junction			
	Junction Inflow	Dev. Flows	% Impact
AM Peak	2125	5	0%
PM Peak	1906	12	1%



- 5.22 The PM peak period for Kenavon Drive / Oscar Wilde Road / Kennet Walk has the biggest increase at 35% or 25 vehicles. It is worth noting that observed inflows on this junction are very low, no more than 114 vehicles in either peak. This is because the road currently only leads to one residential development and is not a through road. The addition of 25 vehicles to this junction will therefore make no material impact on its operation.

Assessment Summary

- 5.23 The proposed development is located in a highly accessible location close to Reading town centre and well served by public transport. Census data shows journeys on foot and public transport are the dominant mode for the residents of the local ward. The potential vehicle trips generated by the proposed development will have a negligible impact on the surrounding road network in relation to the percentage increase in trips on the link or junctions.



6.0 OPERATIONAL ASSESSMENT OF JUNCTIONS

General

6.1 It has been shown above that the proposed development is predicted to lead to a negligible increase in traffic flows on links and junctions on the surrounding highway network. Notwithstanding this conclusion, it has been agreed with the Highway Authority that operational assessments will be carried out for the following junctions on the local highway network:

- Forbury Road / Kenavon Drive
- Forbury Road / Vastern Road
- Watlington Street Gyratory

6.2 For the assessment of development impact on junction capacity it is usual to assess a future year 5 years from the date of the application. In this instance this will be 2024. As part of this an assessment of the committed developments in the area would be undertaken. It was agreed with RBC that this would include the Thames Quarter, King's Point, Energis House and Toys R Us / Homebase developments. A review of these committed developments indicates that the Energis House development is built and occupied at the time of the traffic survey and so the trips associated with this development are contained within the surveys that were undertaken. Trips associated with the remaining committed developments have been obtained from the TAs produced for each application.

6.3 The traffic growth predicted by TEMPRO allows for the development of 641 residential dwellings in Reading areas 10 and 11 to the year 2024. Since the Toys R Us and the Gas Holder Site developments together account for 655 units, TEMPRO background growth has not been applied, only the trips from the committed developments, so as to ensure no double counting is applied to the allowance for local development.

6.4 The following assessment scenarios have been undertaken for the AM peak and PM peak hours:

- 2018 Baseline
- 2024 Baseline + Committed Developments
- 2024 Baseline + Committed Developments + Proposed 130 unit Development



Existing Junction Operation

- 6.5 Operational assessments have been undertaken for the 2018 baseline to compare to the observed queue lengths. Junction operational assessments have been undertaken using industry standard software; Junctions 9 for priority and roundabout junctions and LINSIG for signalised junctions.
- 6.6 The results of the Junctions 9 operational assessments are expressed in terms of the ratio of flow to capacity (RFC) of each of the opposed traffic movements at the junctions. An RFC value in excess of 0.85 is generally interpreted as indicating that the arm or movement may become congested and may result in an increase in predicted queue lengths.
- 6.7 The results of LINSIG operational assessments are expressed as the Degree of Saturation (DOS) of each signalised arm of the junction. A DOS in excess of 90% is generally accepted as the point at which the junction / arm is becoming congested.

Forbury Road / Kenavon Drive

- 6.8 Forbury Road / Kenavon Drive provides access to the development site and a number of retail units to the east of the development. The other arms provide access to the Watlington Gyratory to the south and Forbury Road / Vastern Road Roundabout to the west.
- 6.9 **Table 6.1** provides a summary of the junction's performance during the peak periods. Full details of the modelling outputs are provided within **Appendix I**.

Table 6.1 Forbury Road / Kenavon Drive Junction Modelling Results (2018)

	RFC	Queue (Veh)	Delay (sec)	RFC	Queue (Veh)	Delay (sec)
	AM 08:00-09:00			PM 17:00-18:00		
Kenavon Drive	0.16	0.2	4.32	0.19	0.2	4.13
Forbury Road (S)	0.33	0.5	2.16	0.41	0.7	2.46
Forbury Road (N)	0.37	0.6	2.12	0.32	0.5	2.00

- 6.10 As shown, as a standalone junction this operates with adequate spare capacity during both peak periods, with a maximum RFC of 0.37 during the morning peak and 0.41 during the evening peak hour along Forbury Road. In view of these results, it is considered that the junction currently operates without any capacity constraints during either peak periods. Full details of the modelling outputs are provided within **Appendix J**.



- 6.11 However it is acknowledged from site observations and the queue length surveys that there is congestion on the network which affects the operation of this junction. This network congestion is related to issues elsewhere in the network. This is discussed further below.

Forbury Road / Vastern Road

- 6.12 The Forbury Road / Vastern Road is a roundabout with 3 arms which provide vehicular access through the centre of Reading.
- 6.13 **Table 6.2** summarises the extent of available capacity at the junction during both peak periods (08:00-09:00 and 17:00-18:00) based upon existing traffic flow data.

Table 6.2 Forbury Road / Vastern Road Junction Modelling Results (2018)

	RFC	Queue (Veh)	Delay (sec)	RFC	Queue (Veh)	Delay (sec)
	AM 08:00-09:00			PM 17:00-18:00		
Forbury Road (E)	0.40	0.7	3.12	0.37	0.6	2.82
Forbury Road (W)	0.31	0.5	7.20	0.45	0.8	8.62
Vastern Road	0.37	0.6	1.84	0.27	0.4	1.51

- 6.14 As shown, the standalone junction operates with adequate spare capacity during both peak periods, with a maximum RFC of 0.40 during the morning peak and 0.45 during the evening peak hour along Forbury Road (east). In view of these results, it is considered that the junction currently has the capacity as a standalone junction to accommodate the flows observed during either peak periods. Full details of the modelling outputs are provided within **Appendix J**.

Watlington Street Gyratory

- 6.15 The Watlington Street Gyratory system is a multi-junction gyratory system located 200m south of the Forbury Road/ Kenavon Drive Roundabout. For the purposes of this modelling exercise the following junctions have been included in the LINSIG model: Forbury Road/ Kings Road/ Watlington Street signalised junction, Kings Road/ Queen's Road signalised junction and Queen's Road/ Watlington Street signalised junction – and one left in left out junction - Kings Road/ Gas Works Road junction.
- 6.16 All three of the signalised junctions have pedestrian crossing facilities. All controllers have used signal timings of 120 seconds, in both scenarios.



6.17 **Table 6.3** summarises the gyratory system operates with spare capacity in both the AM and PM peak periods.

Table 6.3- Kings Road / Queens Road / Watlington Road Gyratory (2018) Junction Modelling Results

Junction	Approach Arm	AM (08.00-09.00)		PM (17.00-18.00)	
		Degree Sat (%)	MMQ	Degree Sat (%)	MMQ
Junction 1	Forbury Road - Ahead	70.9%	14.5	79.5%	16.3
	Forbury Road – Ahead	74.7%	16.8	84.6%	19.5
	Watlington St. – Ahead/left	30.4%	5.6	24.9%	3.2
	Watlington St. - Ahead	50.7%	4.5	43.7%	3.0
	Watlington St. – Right	74.4%	16.4	83.5%	16.7
	Watlington St. – Right	74.7%	16.6	83.5%	16.7
	Kings Road – Left/ Ahead	69.6%	4.8	85.2%	9.5
Junction 2	Kings Road – Left/ Ahead	49.1%	7.3	48.1%	0.5
	Kings Road - Ahead	58.5%	21.0	60.7%	17.3
	Gas Works Road - Left	1.3%	0.0	3.6%	0.0
Junction 3	Kings Road – Left/ Ahead	51.9%	12.8	56.9%	5.0
	Kings Road – Ahead	51.1%	9.0	56.1%	4.4
	Kings Road – Right	71.7%	16.1	69.4%	19.2
	Orts Road – Right/ Left	32.6%	1.3	44.6%	1.9
	Kings Road - Ahead	15.0%	2.2	11.5%	1.7
	Kings Road - Ahead	14.0%	0.1	11.9%	0.1
Junction 4	Queens Road – Ahead	53.5%	8.0	66.8%	11.3
	Queens Road – Right	70.8%	9.4	52.1%	6.6
	Watlington St. – Left	15.0%	2.4	7.0%	1.1
	Watlington St. – Left	49.1%	11.2	40.6%	8.6
	Watlington St. – Left	72.5%	21.7	72.8%	21.8
		PRC for all Lanes: 20.4%		PRC for all Lanes: 5.6%	

6.18 From this assessment it can be seen that when considered against the observed traffic flows the gyratory has sufficient capacity to accommodate the traffic flows, with a Practical Reserve Capacity of 20.4% in the AM peak and 5.6% in the PM peak. The maximum Degree of Saturation produced was 84.6% and so within the 90% traditionally sought.

6.19 As with all the junctions on this network it is acknowledged that network congestion does occur that impacts on the operation of these junctions. So whilst the junctions when considered as standalone junctions have sufficient capacity to accommodate the overserved flows, queuing is observed across the network as a result of the Cemetery Lane junction further to the east.

6.20 The impact of the Cemetery Lane junction is an historic problem in Reading Town Centre and is acknowledged by RBC in their strategic transport plans and is identified for inclusion in future strategies to be included in the Local Transport Plan. New development in the area will contribute to this strategy.



- 6.21 Therefore to assess the actual impact of the development on the key network around the site, this report considers the operation of the junctions as standalone junction and compares the difference in operational capacity with and without development.

2024 Baseline + Committed Developments Junction Modelling Results

Forbury Road / Vastern Road

- 6.22 The impacts of the addition of committed development traffic flows and the 2024 baseline flows have been assessed for the Forbury Road / Vastern Road Roundabout.
- 6.23 As the summarised results provided in **Table 6.4** demonstrate, the junction would operate with adequate spare capacity during both peak periods, with maximum RFC's of 0.43 during the AM peak and 0.47 during the PM peak.

Table 6.4 Forbury Road / Vastern Road Junction Future Year (2024) + Committed/ Anticipated Development Junction Modelling Results

	RFC	Queue (Veh)	Delay (sec)	RFC	Queue (Veh)	Delay (sec)
	AM 08:00-09:00			PM 17:00-18:00		
Forbury Road (E)	0.43	0.8	3.26	0.40	0.7	2.99
Forbury Road (W)	0.33	0.5	7.58	0.47	0.9	9.28
Vastern Road	0.39	0.6	1.86	0.30	0.4	1.60

Forbury Road / Kenavon Drive

- 6.24 The impacts of the addition of committed development traffic flows and the 2024 baseline flows have been assessed for the Forbury Road / Kenavon Drive Roundabout.
- 6.25 As the summarised results provided in **Table 6.5** demonstrate, the junction would operate with adequate spare capacity during both peak periods, with maximum RFC's of 0.39 during the AM peak and 0.44 during the PM peak.

Table 6.5 Forbury Road / Kenavon Drive Junction Future Year (2024) + Committed/ Anticipated Development Junction Modelling Results

	RFC	Queue (Veh)	Delay (sec)	RFC	Queue (Veh)	Delay (sec)
	AM 08:00-09:00			PM 17:00-18:00		
Kenavon Drive	0.29	0.4	5.04	0.30	0.4	4.74
Forbury Road (S)	0.36	0.6	2.26	0.44	0.8	2.57
Forbury Road (N)	0.39	0.7	2.20	0.37	0.6	2.20



Watlington Gyratory

- 6.26 The impacts of the addition of committed development traffic flows and the 2024 baseline flows have been assessed for the Watlington Gyratory.
- 6.27 As the summarised results provided in **Table 6.6** demonstrate, the junction will operate with spare capacity in both the AM and PM peak periods.

Table 6.6 –Kings Road / Queens Road / Watlington Road Gyratory (2024) + Committed/ Anticipated Development Junction Modelling Results

Junction	Approach Arm	AM (08.00-09.00)		PM (17.00-18.00)	
		Degree Sat (%)	MMQ	Degree Sat (%)	MMQ
Junction 1	Forbury Road - Ahead	73.5%	16.0	86.6%	19.3
	Forbury Road – Ahead	77.3%	18.5	86.9%	20.6
	Watlington St. – Ahead/left	31.9%	5.9	28.1%	6.0
	Watlington St. - Ahead	52.8%	4.6	47.5%	2.5
	Watlington St. – Right	78.2%	16.9	85.6%	17.2
	Watlington St. – Right	78.2%	16.9	85.9%	17.3
	Kings Road – Left/ Ahead	68.6%	4.8	87.6%	10.9
Junction 2	Kings Road – Left/ Ahead	52.7%	0.6	49.6%	15.1
	Kings Road - Ahead	59.4%	16.1	62.3%	22.3
	Gas Works Road - Left	1.3%	0.0	3.6%	0.0
Junction 3	Kings Road – Left/ Ahead	63.1%	10.6	53.5%	6.0
	Kings Road – Ahead	62.3%	8.9	53.0%	5.0
	Kings Road – Right	62.5%	19.8	84.0%	16.5
	Orts Road – Right/ Left	32.6%	1.3	44.6%	1.9
	Kings Road - Ahead	15.0%	2.2	11.5%	1.7
	Kings Road - Ahead	14.0%	0.1	11.9%	0.1
Junction 4	Queens Road – Ahead	55.9%	8.5	68.0%	11.9
	Queens Road – Right	68.0%	9.1	50.0%	6.5
	Watlington St. – Left	15.2%	2.5	7.1%	1.1
	Watlington St. – Left	52.7%	12.6	45.9%	10.3
	Watlington St. – Left	73.5%	22.3	73.8%	22.4
		PRC for all Lanes: 15.1%		PRC for all Lanes: 2.7%	

2024 Baseline + Committed Development Generated Vehicle Movements + Gas Holder Site Development (130 Residential Flats)

- 6.28 The junctions have been assessed for the future year (2024) with committed development and the addition of the proposed development traffic. Details of the various junction assessments are provided in the remainder of this section, with full modelling output files being included within **Appendix J**.
- 6.29 Development generated vehicle movements have been distributed as set out in Section 4.0. Development generated flows and the anticipated distribution is set out in **Appendix I**.



Forbury Road / Vastern Road Roundabout.

- 6.30 As the summarised results provided in **Table 6.7** demonstrate, the junction would operate with adequate spare capacity during both peak periods, with maximum RFC's of 0.43 during the AM peak and 0.47 during the PM peak.

**Table 6.7 Forbury Road / Vastern Road Future Year (2024) + Committed/
Anticipated Development + Alexander Turner Close Development Junction
Modelling Results**

	RFC	Queue (Veh)	Delay (sec)	RFC	Queue (Veh)	Delay (sec)
	AM 08:00-09:00			PM 17:00-18:00		
Forbury Road (E)	0.43	0.8	3.29	0.40	0.7	3.00
Forbury Road (W)	0.33	0.5	7.60	0.47	0.9	9.30
Vastern Road	0.39	0.6	1.86	0.30	0.4	1.61

Forbury Road / Kenavon Drive

- 6.31 The impacts of the addition of development traffic and committed/ anticipated development flows to the 2024 baseline flows have been assessed for the Forbury Road / Kenavon Drive roundabout.
- 6.32 As summarised in **Table 6.8**, the junction will be operating with adequate spare capacity in both the AM peak period and in the PM peak period. Minimal vehicle queues and delays are anticipated at the junction.

**Table 6.8 Forbury Road / Kenavon Drive Future Year (2024) + Committed/
Anticipated Development + Alexander Turner Close Development Junction
Modelling Results**

	RFC	Queue (Veh)	Delay (sec)	RFC	Queue (Veh)	Delay (sec)
	AM 08:00-09:00			PM 17:00-18:00		
Kenavon Drive	0.31	0.4	5.13	0.31	0.5	4.82
Forbury Road (S)	0.36	0.6	2.27	0.45	0.8	2.64
Forbury Road (N)	0.40	0.7	2.20	0.37	0.6	2.22

Watlington Gyratory

- 6.33 The impacts of the addition of development traffic and committed/ anticipated development flows to the 2024 baseline flows have been assessed for the Watlington Gyratory.
- 6.34 As the summarised results provided in **Table 6.9** demonstrate, the junction will operate with spare capacity in both the AM and PM peak periods.



**Table 6.9 –Kings Road / Queens Road / Watlington Road Gyratory (2024) +
Committed/ Anticipated Development + Alexander Turner Close Development
Junction Modelling Results**

Junction	Approach Arm	AM (08.00-09.00)		PM (17.00-18.00)	
		Degree Sat (%)	MMQ	Degree Sat (%)	MMQ
Junction 1	Forbury Road - Ahead	74.3%	16.2	86.5%	19.2
	Forbury Road – Ahead	78.3%	18.8	88.3%	21.4
	Watlington St. – Ahead/left	32.2%	6.0	26.4%	3.5
	Watlington St. - Ahead	53.0%	4.6	49.4%	3.2
	Watlington St. – Right	78.4%	17.0	85.4%	7.1
	Watlington St. – Right	78.0%	16.9	86.1%	17.5
	Kings Road – Left/ Ahead	69.6%	4.8	87.6%	10.9
Junction 2	Kings Road – Left/ Ahead	53.8%	0.6	52.2%	0.5
	Kings Road - Ahead	58.9%	17.7	60.2%	17.7
	Gas Works Road - Left	1.3%	0.0	3.6%	0.0
Junction 3	Kings Road – Left/ Ahead	59.6%	9.4	62.0%	4.7
	Kings Road – Ahead	60.9%	9.9	61.8%	4.2
	Kings Road – Right	63.9%	17.1	64.2%	16.0
	Orts Road – Right/ Left	32.6%	1.3	44.6%	1.9
	Kings Road - Ahead	15.3%	2.3	12.1%	1.8
	Kings Road - Ahead	14.2%	0.1	12.3%	0.1
Junction 4	Queens Road – Ahead	56.9%	8.5	68.7%	12.0
	Queens Road – Right	68.8%	9.2	52.1%	6.8
	Watlington St. – Left	15.2%	2.5	7.1%	1.1
	Watlington St. – Left	52.8%	12.7	46.5%	10.3
	Watlington St. – Left	73.5%	22.3	73.8%	22.4
		PRC for all Lanes: 14.8%		PRC for all Lanes: 1.9%	

Summary

6.35 This section has set out the various junction modelling assessments for the local road network for both the baseline and future year assessments. Full details of the junction capacity assessments for each scenario are provided within **Appendix J**.

6.36 From these assessments when considering them as standalone junctions and comparing the operation of the junctions in the future year of 2024 with and without development, the following conclusions can be drawn:

- Forbury Road / Vastern Road: The junction will operate with spare capacity in the 2024 future year scenario. No highway modifications required.
- Forbury Road / Kenavon Drive: The junction will operate with spare capacity in the 2024 future year scenario. No highway modifications required.
- Watlington Gyratory: Adequate capacity at junction during both peak periods. No modifications required.



7.0 PROPOSED MITIGATION

Links to existing Transport Networks

- 7.1 The development is designed to facilitate pedestrian and cycle movement within the site and to provide connections with the surrounding pedestrian and cycle networks that provide safe, convenient and direct links to local facilities and the centre of Reading.
- 7.2 The site lies within convenient walking distance of local bus services which provide access to retail, health and leisure facilities within Reading. More services are accessible within reasonable walking distance of the site providing access to other parts of Reading and surrounding urban centres.
- 7.3 Reading Railway Station is accessible on foot, by bicycle and bus from the site.

Travel Plan

- 7.4 In accordance with government guidance, a Framework Travel Plan has been prepared to accompany this Full Planning Application. This provides details of potential measures that could be implemented as part of the Final Travel Plan, which would be completed post Planning Consent (subject to a Planning Condition and/or financial contribution through the Section 106 Agreement).
- 7.5 Typically, however, the Travel Plan would include, but not be limited to, some of the following measures:
- Preparation, collation and distribution of Residents Travel Packs to the first occupant of each dwelling;
 - Liaison with residents, local stakeholders, bus operators, councils in relation to various sustainable travel options available;
 - Promotion of local car share database and car clubs;
 - Provision of bus/train timetables, route maps and fare information;
 - Provision of subsidised bus vouchers for use on local services;
 - Provision of cycle voucher for local cycle store;
 - Completion of Residents Travel Surveys to establish travel behaviour; and
 - Continued promotion of sustainable travel modes throughout the life of the Travel Plan (typically over 5 years).
- 7.6 Further details of the potential measures that could be included as part of the Final Travel Plan, along with the management and review.



Footbridge over the River Kennet

- 7.7 There is an existing footbridge to the south of the site which provides access over the River Kennet. It has long been an aspiration of RBC to improve the footbridge and as part of the Bellway Homes site permission consideration was given as to how this footbridge could be improved and a contribution, proportional to development impact, was paid as part of the S106 for this site towards this improvement.
- 7.8 As part of the pre-application discussions with RBC officers requested that the development also consider possible connection from the site to the footbridge and possible improvements to allow a more central access ramp that accommodated the three key desire lines, from the existing PRoW on the riverside, the central footway from Kennet Walk and the access from the proposed site / Alexander Turner Close. During the consultation period, the members and officers raised a long term aspiration to provide access along the river frontage, extending the existing PRoW from Kennet Walk.
- 7.9 Consideration has been given to these requests, however there are a number of constraints relating to the possible reworking of the ramps and providing the connections suggested including land ownership and costs.
- 7.10 There is currently not sufficient room to provide a footpath along the abutment of the bridge at the water's edge to connect the site to the existing Kennet Walk route. Therefore to facilitate this would require the entire bridge to be replaced which would be cost prohibitive. Discussions with the Environment Agency have also indicated that this connection would not be welcomed by them. On this basis this was not considered any further.
- 7.11 Given the construction of the existing bridge, it would not be possible to simply redesign the existing ramps to provide a central connection, in order to achieve this the existing ramps and steps would need to be completely replaced. This again would be constrained by land ownership issues and costs.
- 7.12 SMA have therefore looked again at the scheme considered as part of the Bellway scheme. This is attached as **Appendix K**. This scheme was considered a suitable basis for a contribution to be made under the Bellway permission and so the developer is willing to provide a similar proportional contribution to RBC on the same basis.



- 7.13 Access to the footbridge will be provided via Alexander Turner Close through the removal of the existing fencing which forms part of the boundary to the site. It will then be for RBC to resolve the issues of land ownership and seek further funding from other developers in the area to fund the redesign of the ramps.

Highways Contribution

- 7.14 Junction assessments indicate that the standalone junctions are well within capacity, however the network observations on site show that there is network congestion queueing back from Cemetery Junction.
- 7.15 Given the available spare capacity and relative underutilised nature of Kenavon Drive / Gas Works Road (and surrounding streets), the additional traffic flows will have no material impact on the operation of the local highway network. However, as has occurred with other development in the area, it is expected that a proportionate contribution will be paid towards the strategic highway improvements strategy being developed by RBC.



8.0 SUMMARY AND CONCLUDING COMMENTS

- 8.1 Stuart Michael Associates (SMA) has been appointed by Danescroft (Kenavon Drive Project Management) LLP (the 'Applicant') to prepare a Transport Assessment (TA) in support of a full Planning Application for the proposed development of 130 residential flats on the land known as The Gas Holder site at Alexander Turner Close, Reading.
- 8.2 The site is a former gas storage facility and depot. To the west of the site is the recent residential development on Alexander Turner Close, built by Bellway Homes. Alexander Turner Close provides access to Robert Parker Road, the principal route through the recent development providing vehicle access to the site. Beyond this are disused industrial and retail units. Reading station is approximately 1.5km to the west of the site.
- 8.3 The site is in a highly sustainable location in transportation terms, conveniently accessible by all travel modes. The site is within 2km (18 minute walk) of several facilities, amenities and employment opportunities and is well linked to other employment centres around the town.
- 8.4 The nearest bus stops are within 400m of the site on Kenavon Drive. Other stops are found 700m away, making them easily accessible from the site and served by high frequency, 24 hour 7 days a week routes. Reading train station is easily accessible using existing infrastructure. The high quality inter-urban connections offered by both the nearby bus stops and train station further reduce the need to drive.
- 8.5 The development trip generation has been calculated using the TRICS database. The proposed development of 130 housing units is likely to generate some 21 two-way movements during the AM peak (08:00-09:00) and 25 two-way movements during the PM peak (17:00-18:00). This equates to 1 additional trip on the local highway network every 3 minutes during the AM Peak and every 2 minutes during the PM Peak.
- 8.6 The development is to provide 127 parking spaces, accessed directly from Alexander Turner Close. The development will also provide 74 cycle parking spaces. A review of the local Census data for the area shows that car ownership levels for flats are low, with 49% of households made up of Flats having no car or van and 44% only having 1 car/ van.



- 8.7 On average the car / van ownership in this area is 0.578 per flat. Therefore the proposed level of parking on site is considered appropriate for the location.
- 8.8 A comparison of the expected development traffic generation alongside the existing traffic flows shown marginal increases on the local network. Junction assessments indicate that the standalone junctions are well within capacity with and no highway modifications are required.
- 8.9 As part of the overall development contribution package it is expected that a proportional contribution will be paid toward the strategic highway strategy for Reading Town Centre as well as a proportional contribution towards improvements to the bridge over the River Kennet.

Concluding Comments

- 8.10 In the context of accessibility this TA has demonstrated that the proposed development site is located in a highly accessible and sustainable location, conveniently accessible by non-car modes. It is not anticipated that the development would cause a detrimental impact to the operation or safety of the local highway network. Therefore based on the criteria set out in NPPF the development will not have a residual cumulative impact which is severe and so there is no transport basis to refuse the planning application.

FIGURES

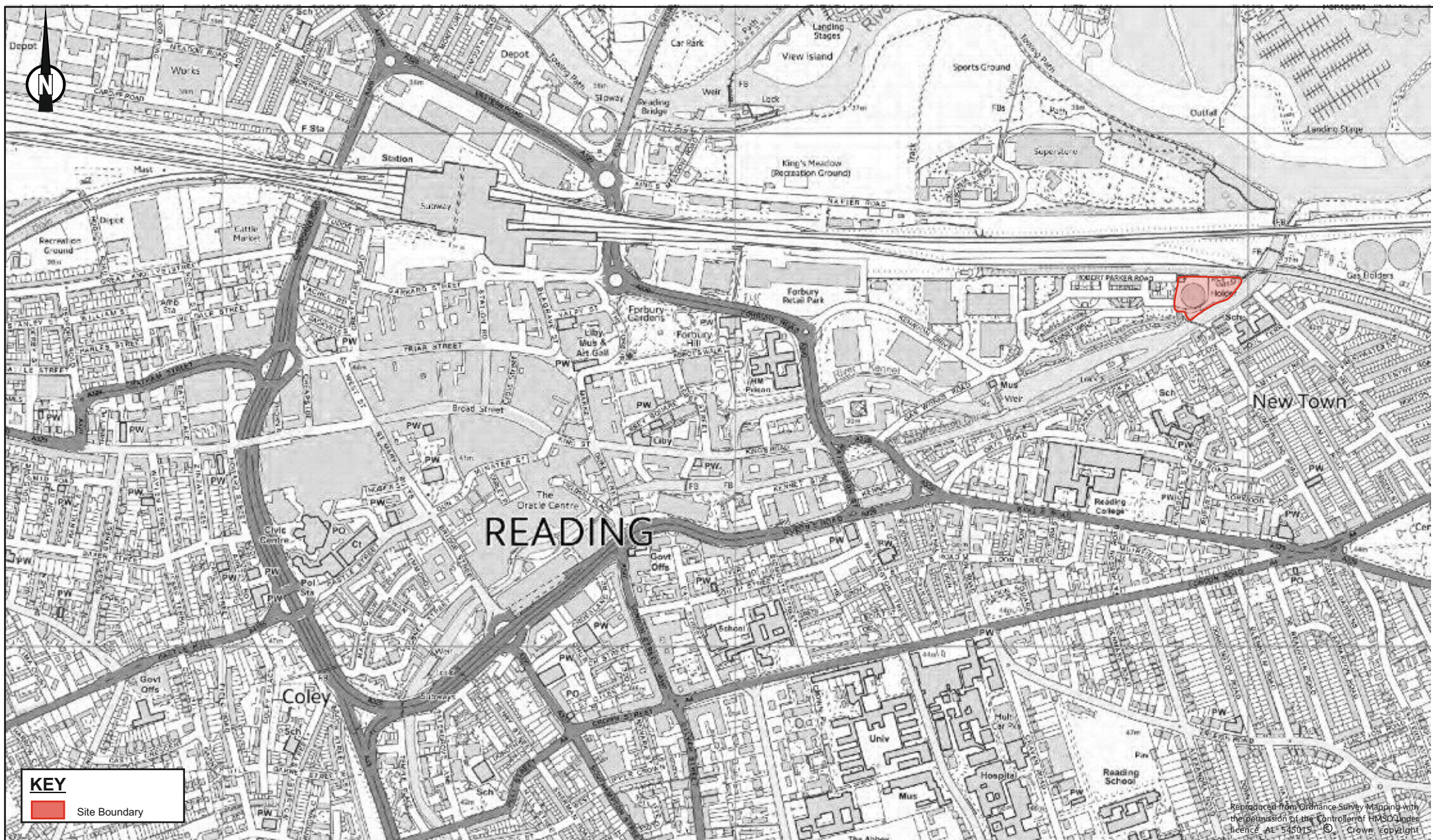
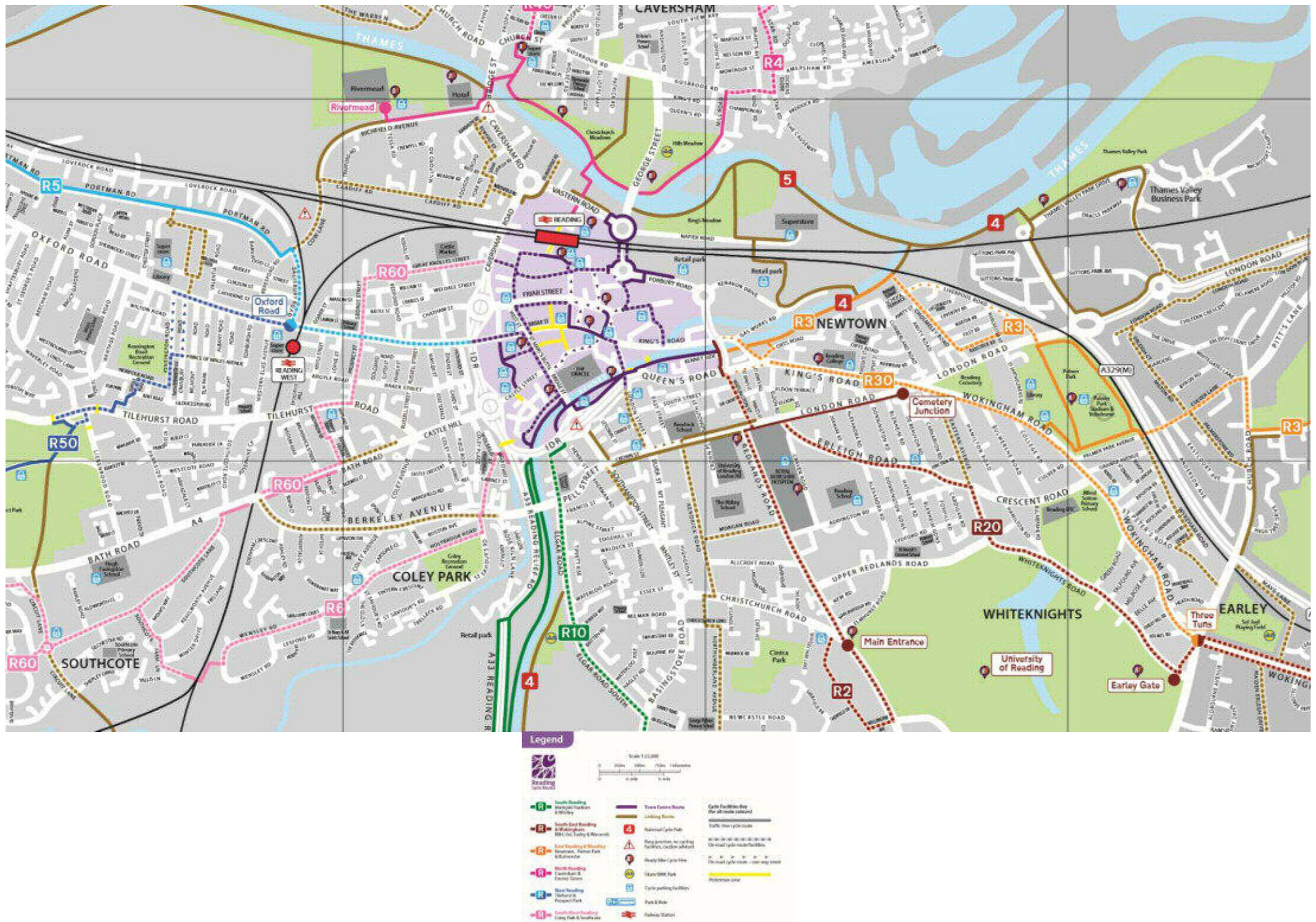


Figure 3.1 – Extract from Reading Cycle Routes Network Map



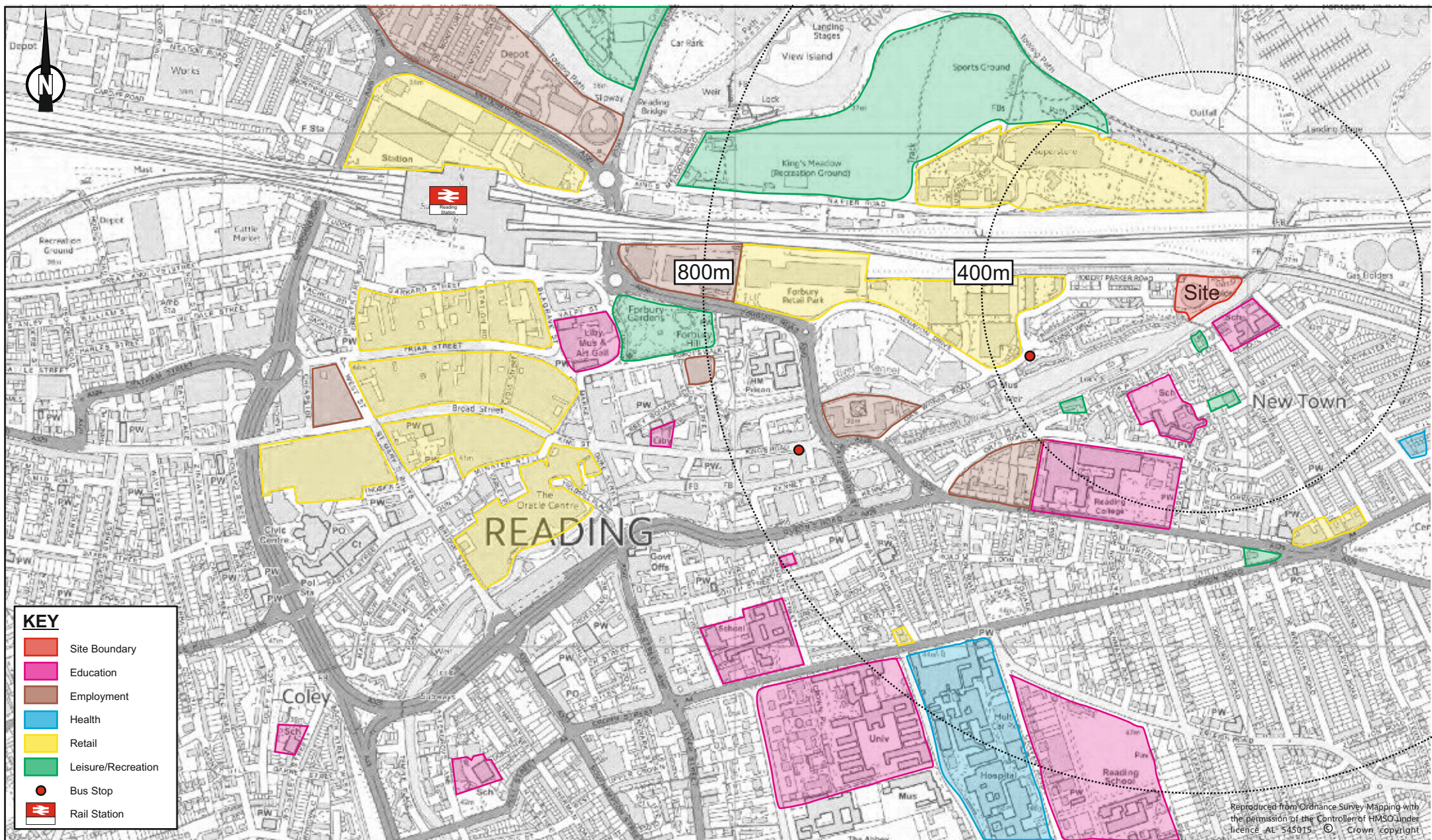
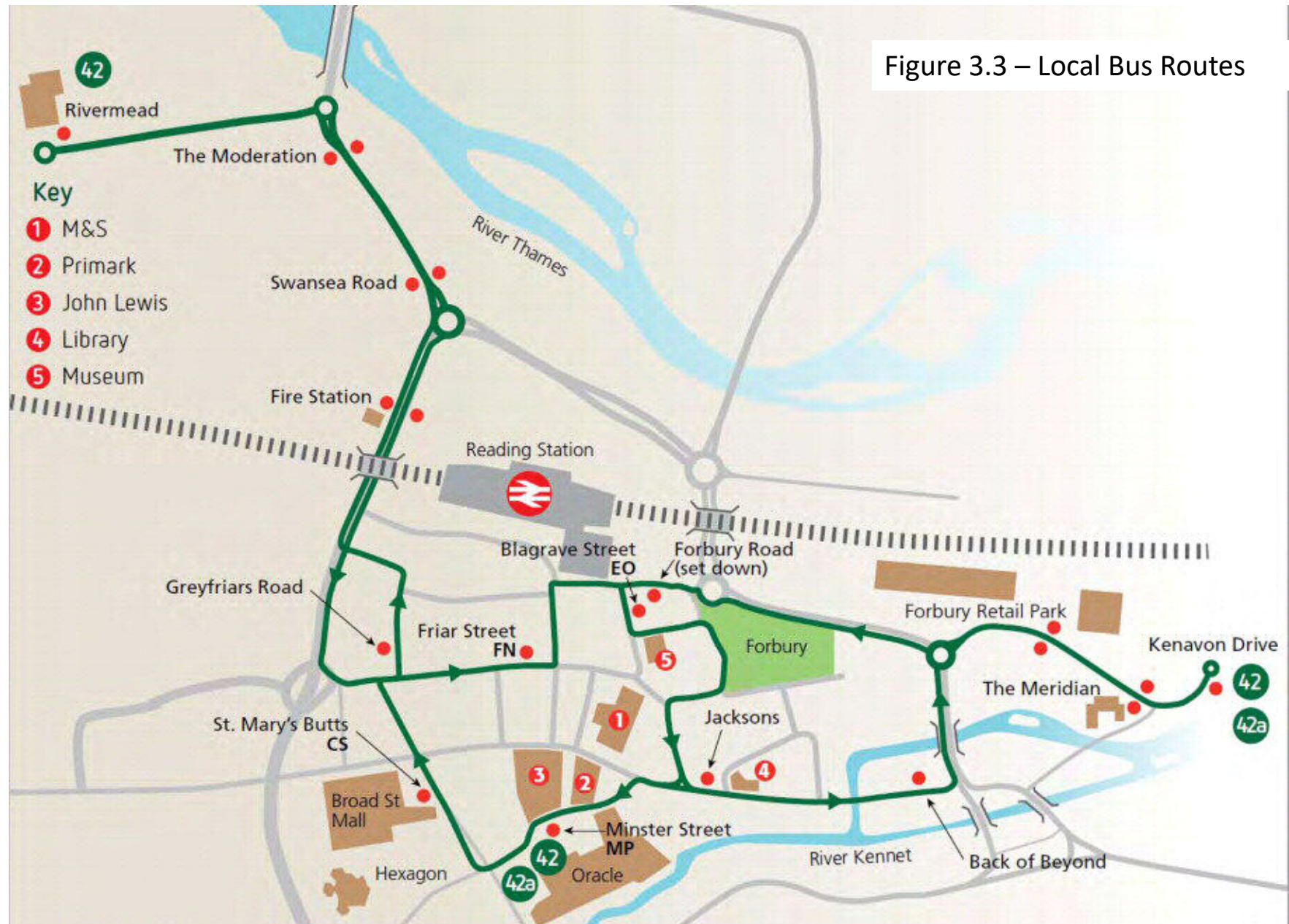


Figure 3.3 – Local Bus Routes



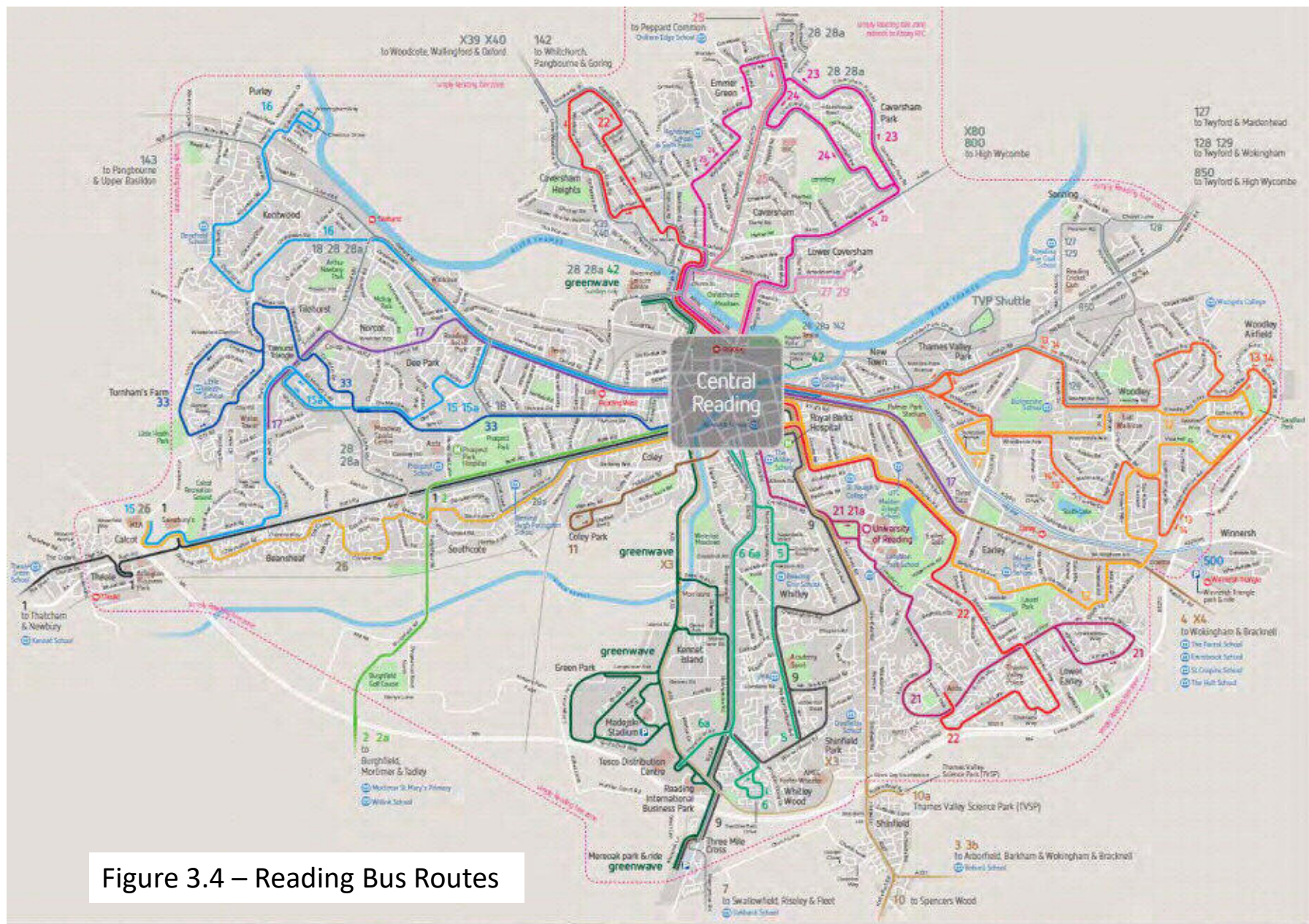
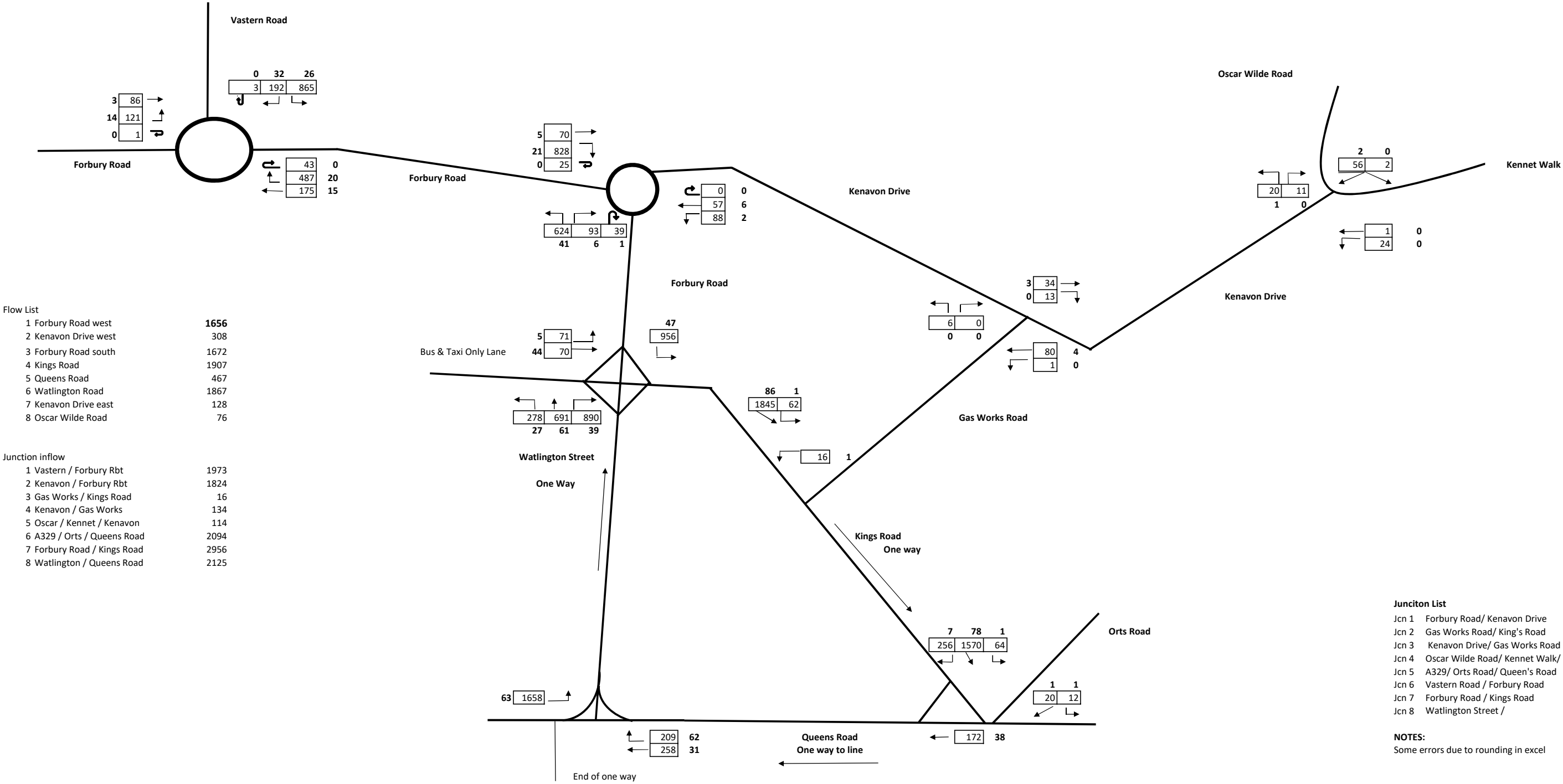


Figure 3.4 – Reading Bus Routes

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0.0% 2011 CENSUS DISTRIBUTION

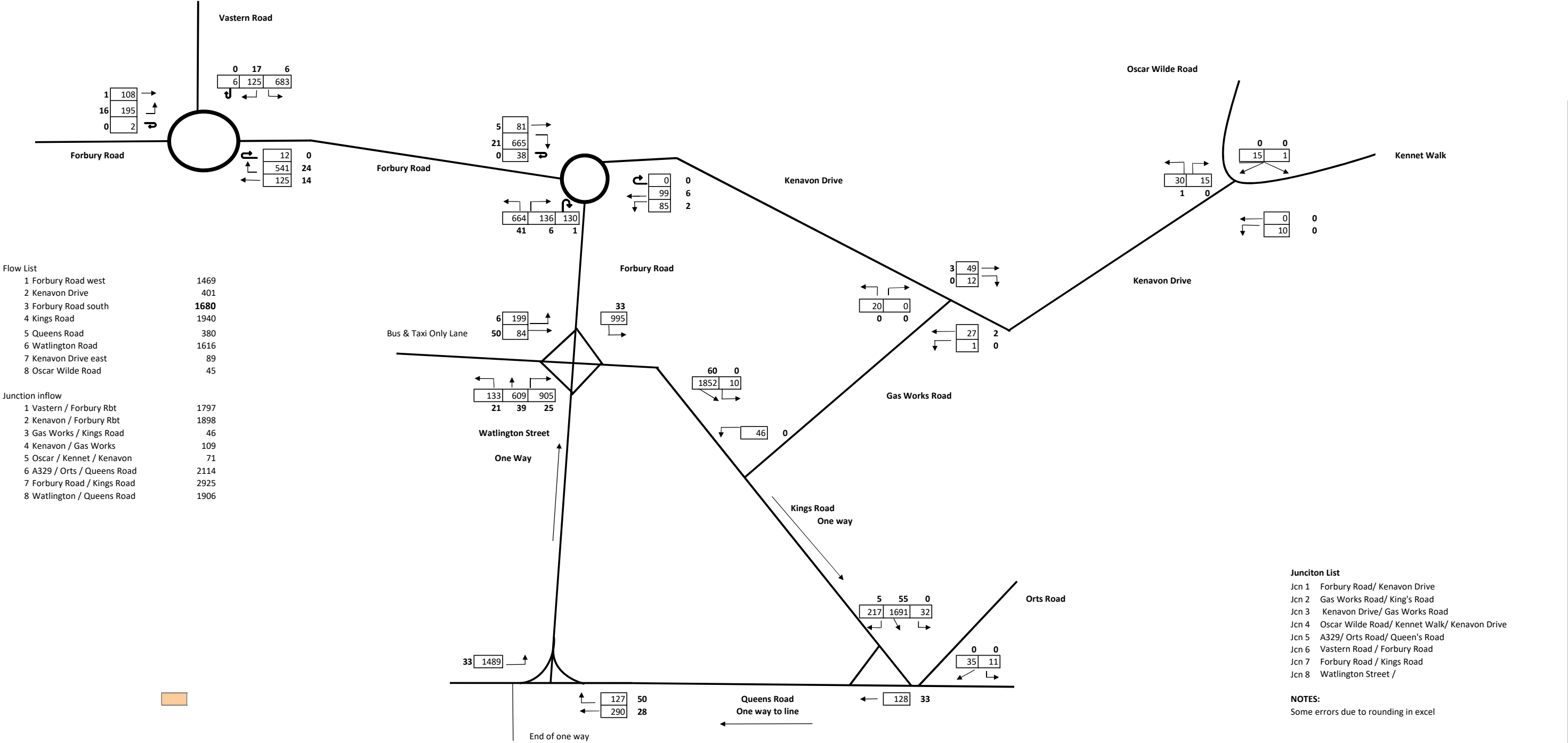


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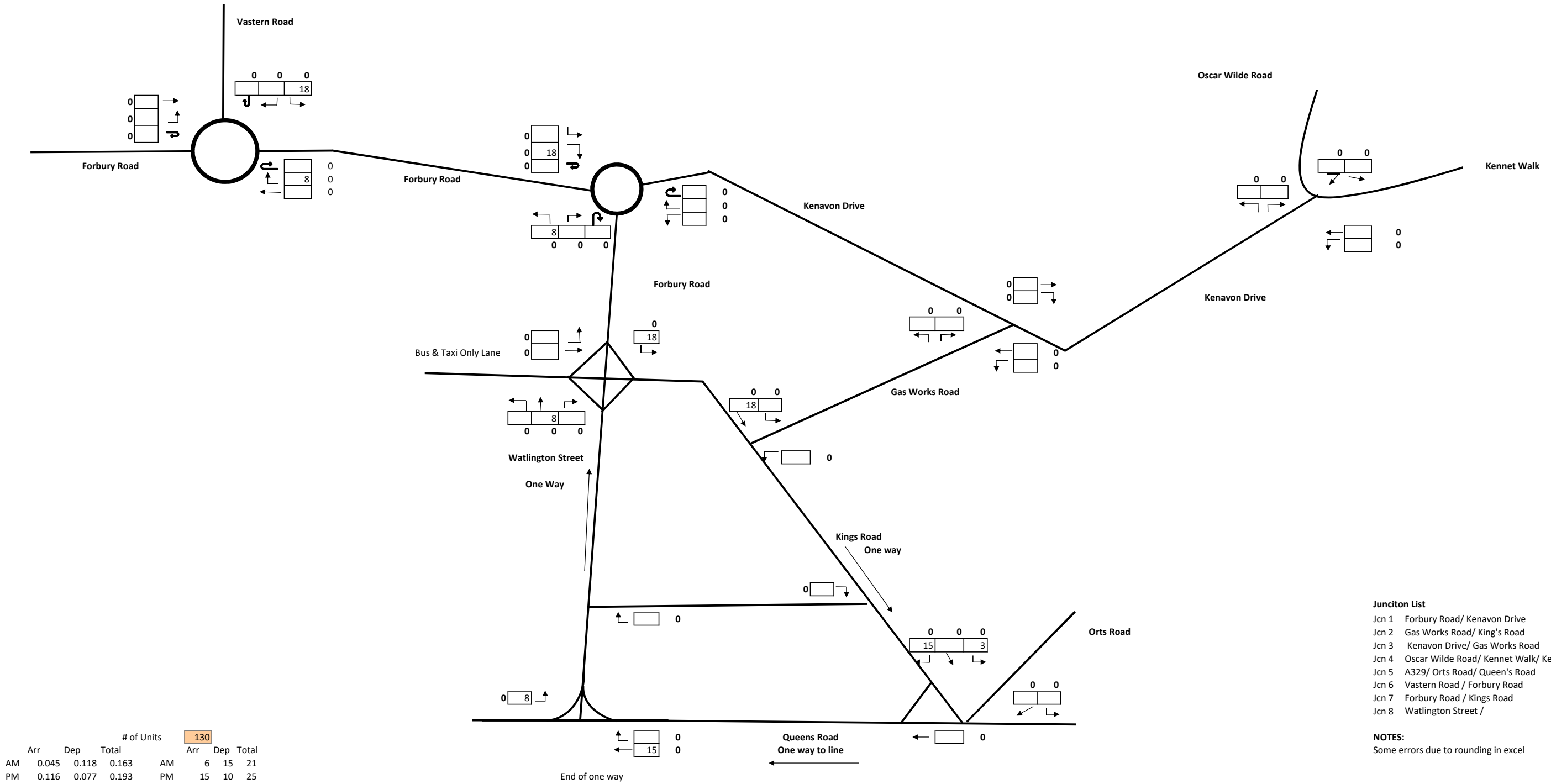
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Jcn 3 Kenavon Drive/ Gas Works Road
Jcn 4 Oscar Wilde Road/ Kennet Walk/ Kenavon Drive
Jcn 5 A329/ Orts Road/ Queen's Road
Jcn 6 Vastern Road / Forbury Road
Jcn 7 Forbury Road / Kings Road
Jcn 8 Watlington Street /

NOTES:
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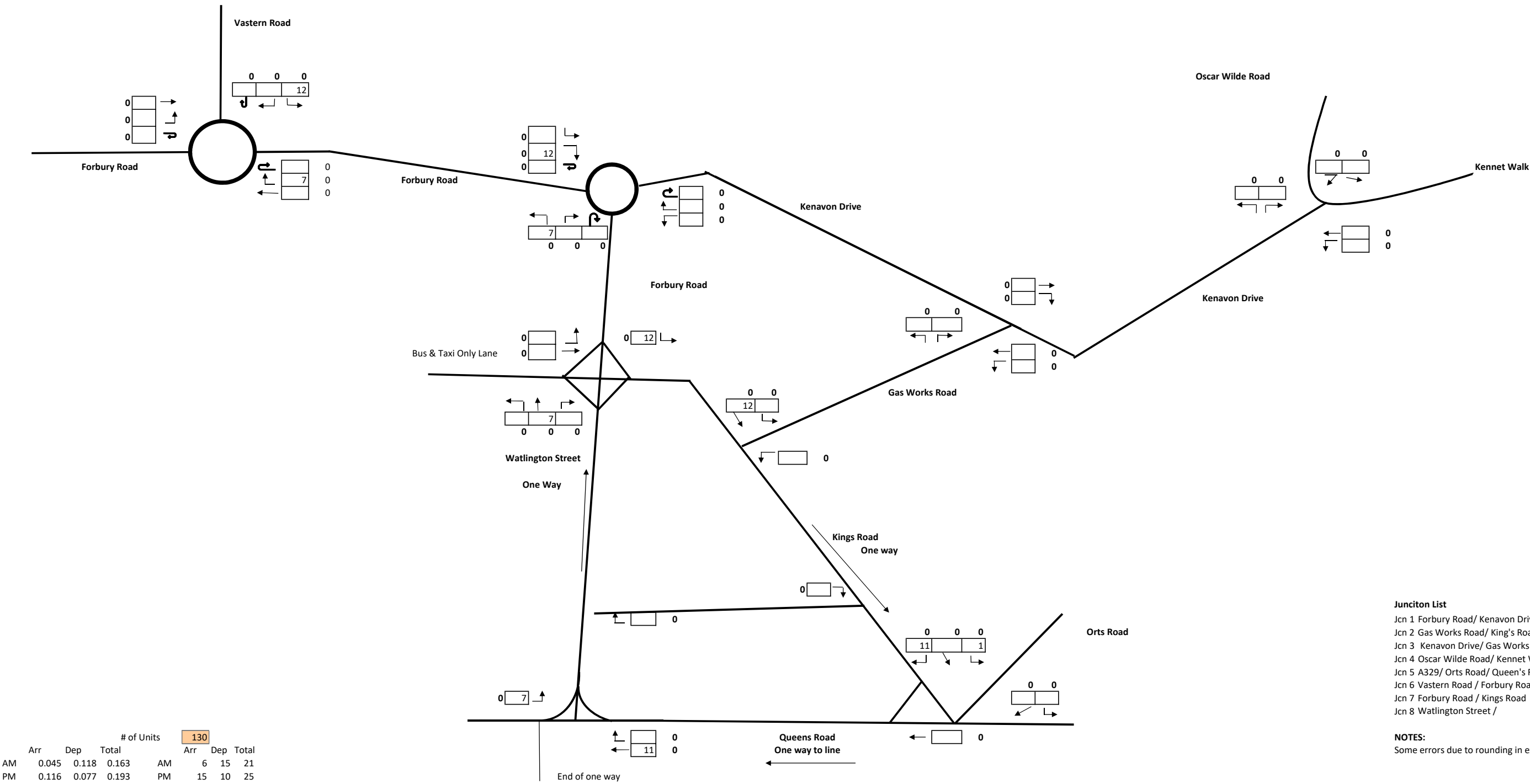
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TOTAL VEHs
0 HGVs
2011 CENSUS DISTRIBUTION



TOTAL VEHs
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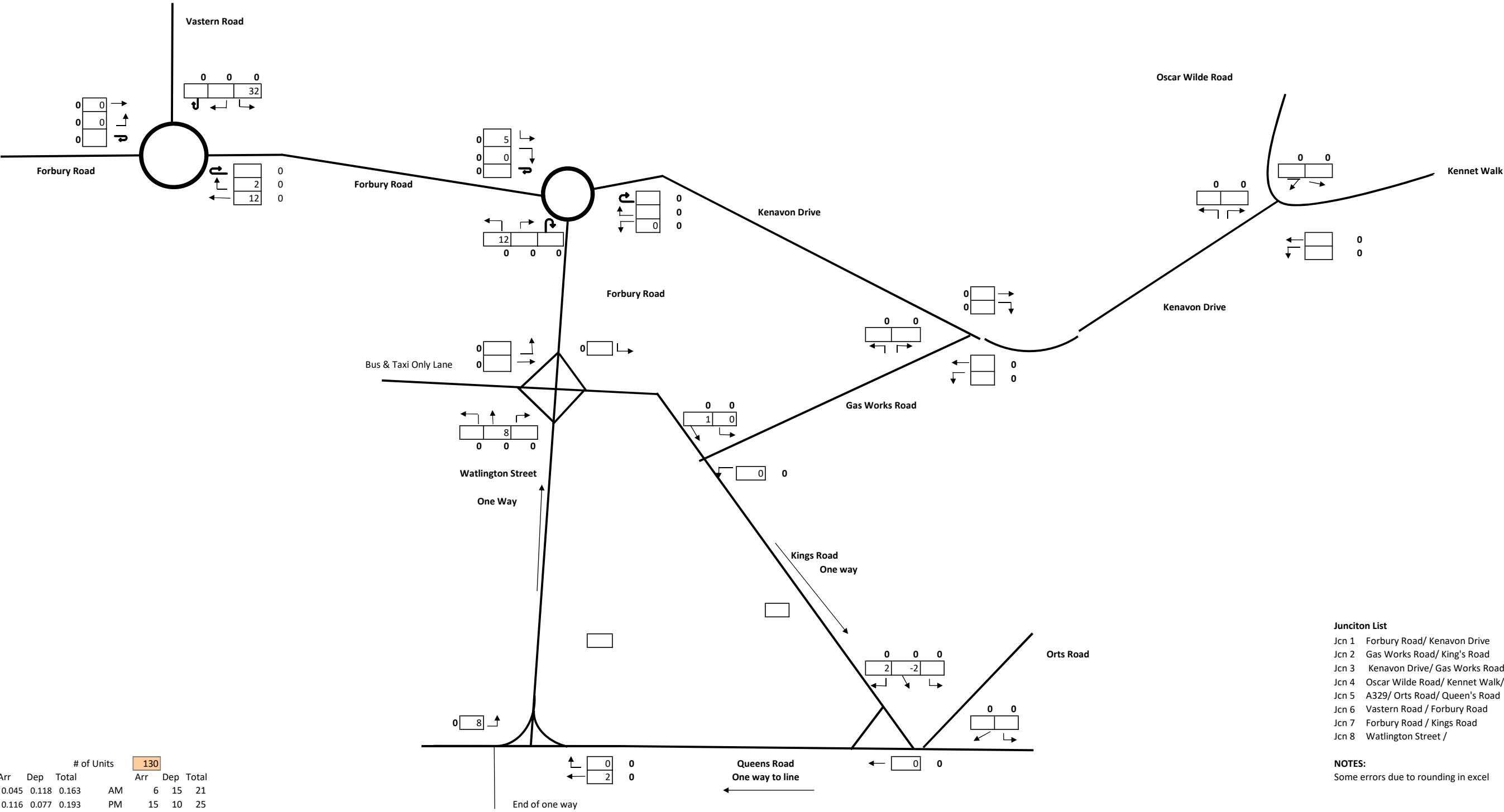


# of Units			130		
Arr	Dep	Total	Arr	Dep	Total
AM	0.045	0.118	0.163	AM	6 15 21
PM	0.116	0.077	0.193	PM	15 10 25

Junciton List
Jcn 1 Forbury Road/ Kenavon Drive
Jcn 2 Gas Works Road/ King's Road
Jcn 3 Kenavon Drive/ Gas Works Road
Jcn 4 Oscar Wilde Road/ Kennet Walk/ Kenavon Drive
Jcn 5 A329/ Orts Road/ Queen's Road
Jcn 6 Vastern Road / Forbury Road
Jcn 7 Forbury Road / Kings Road
Jcn 8 Watlington Street /

NOTES:
Some errors due to rounding in excel

TOTAL VEHS
0 HGVs
0.0% 2011 CENSUS DISTRIBUTION



# of Units			130
Arr	Dep	Total	
AM	0.045	0.118	0.163
PM	0.116	0.077	0.193

JOB TITLE:
5757 - GAS HOLDER SITE AT ALEXANDER TURNER CLOSE, READING

FIGURE TITLE:
5.3 AM PEAK 2018 BASELINE FLOWS (08:00-09:00)

DRAWN BY:

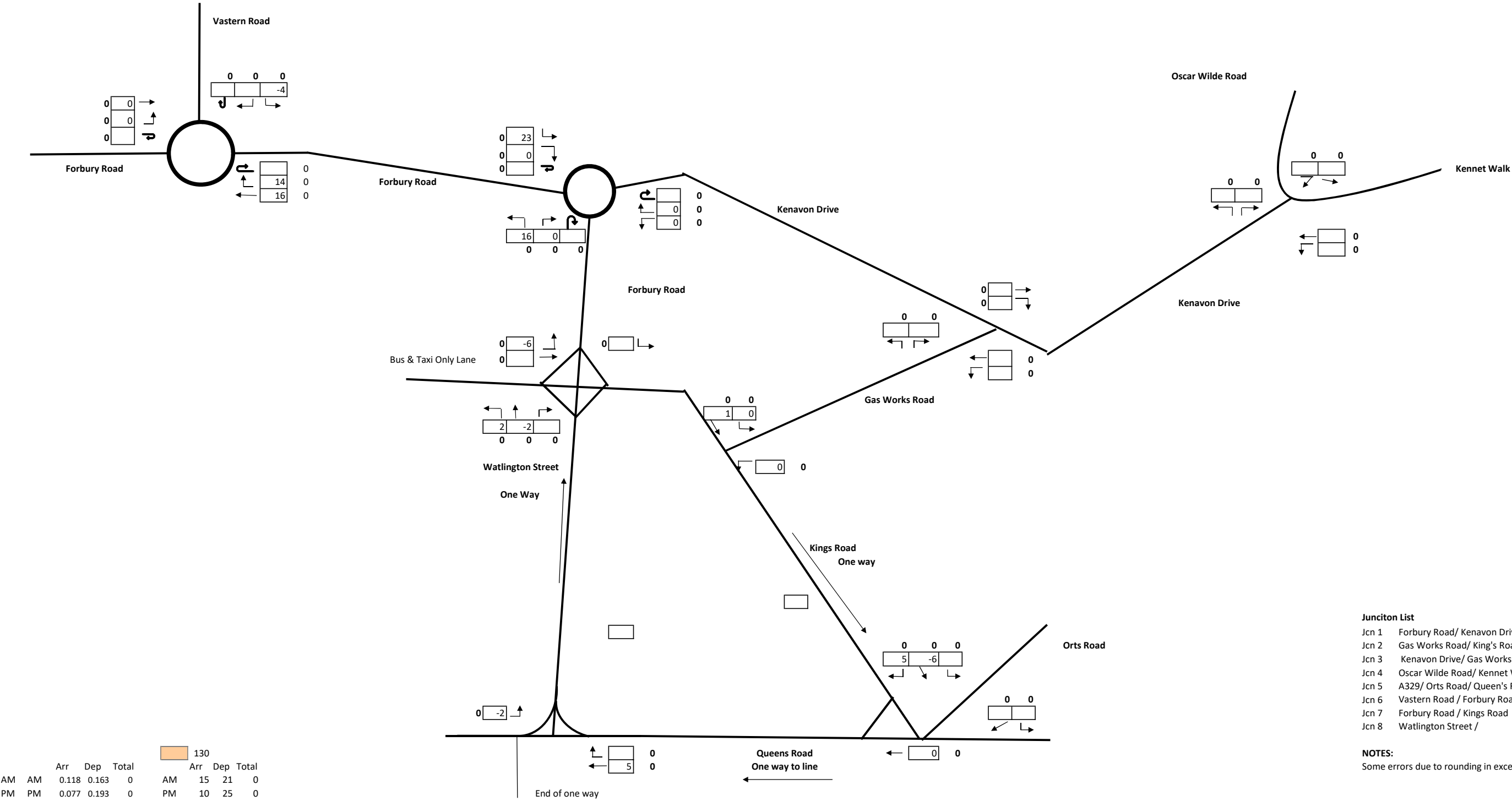
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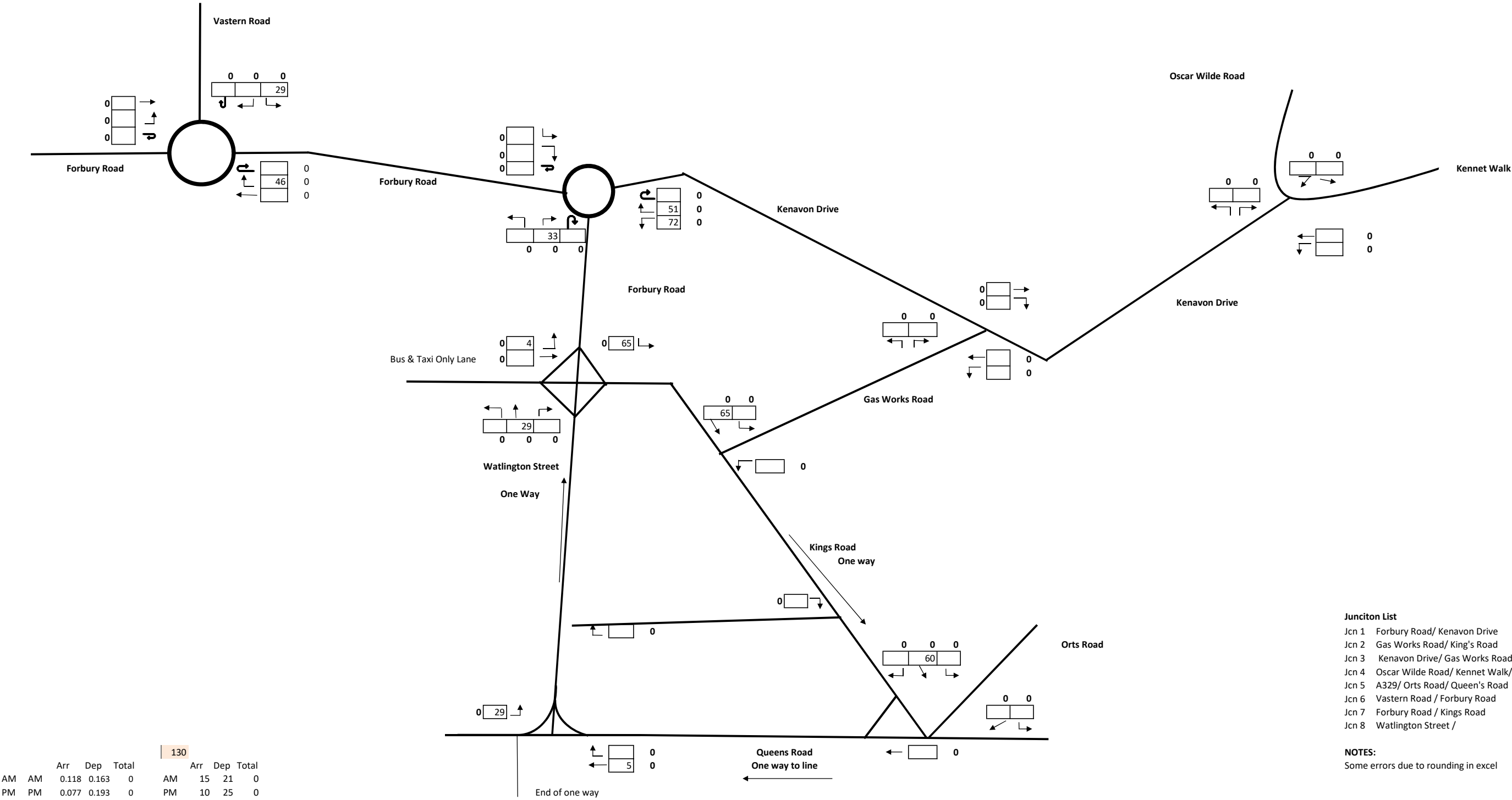
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REV:

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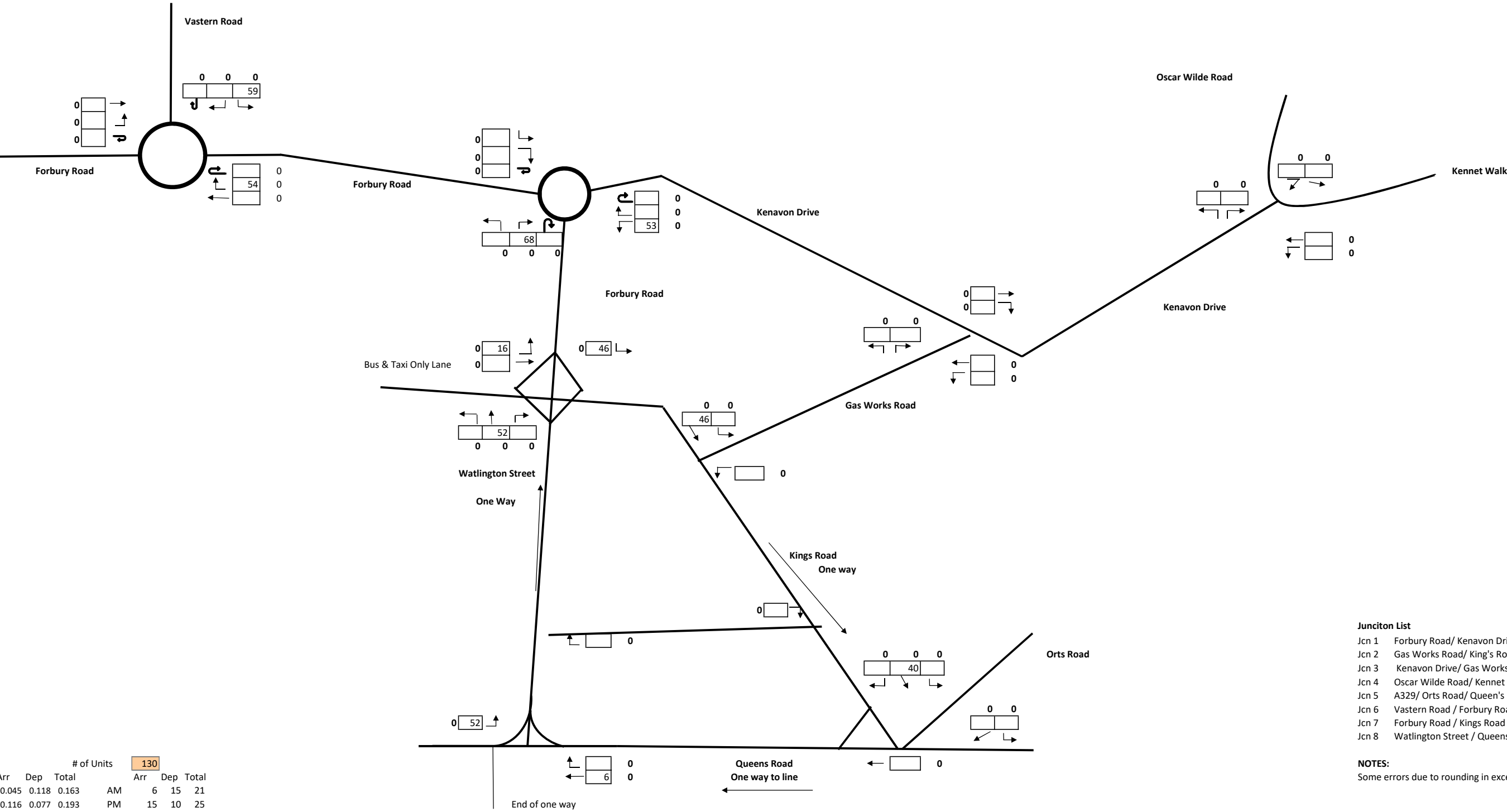


TOTAL VEHS
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0.0% 2011 CENSUS DISTRIBUTION



				130				
	Arr	Dep	Total		Arr	Dep	Total	
AM	AM	0.118	0.163	0	AM	15	21	0
PM	PM	0.077	0.193	0	PM	10	25	0

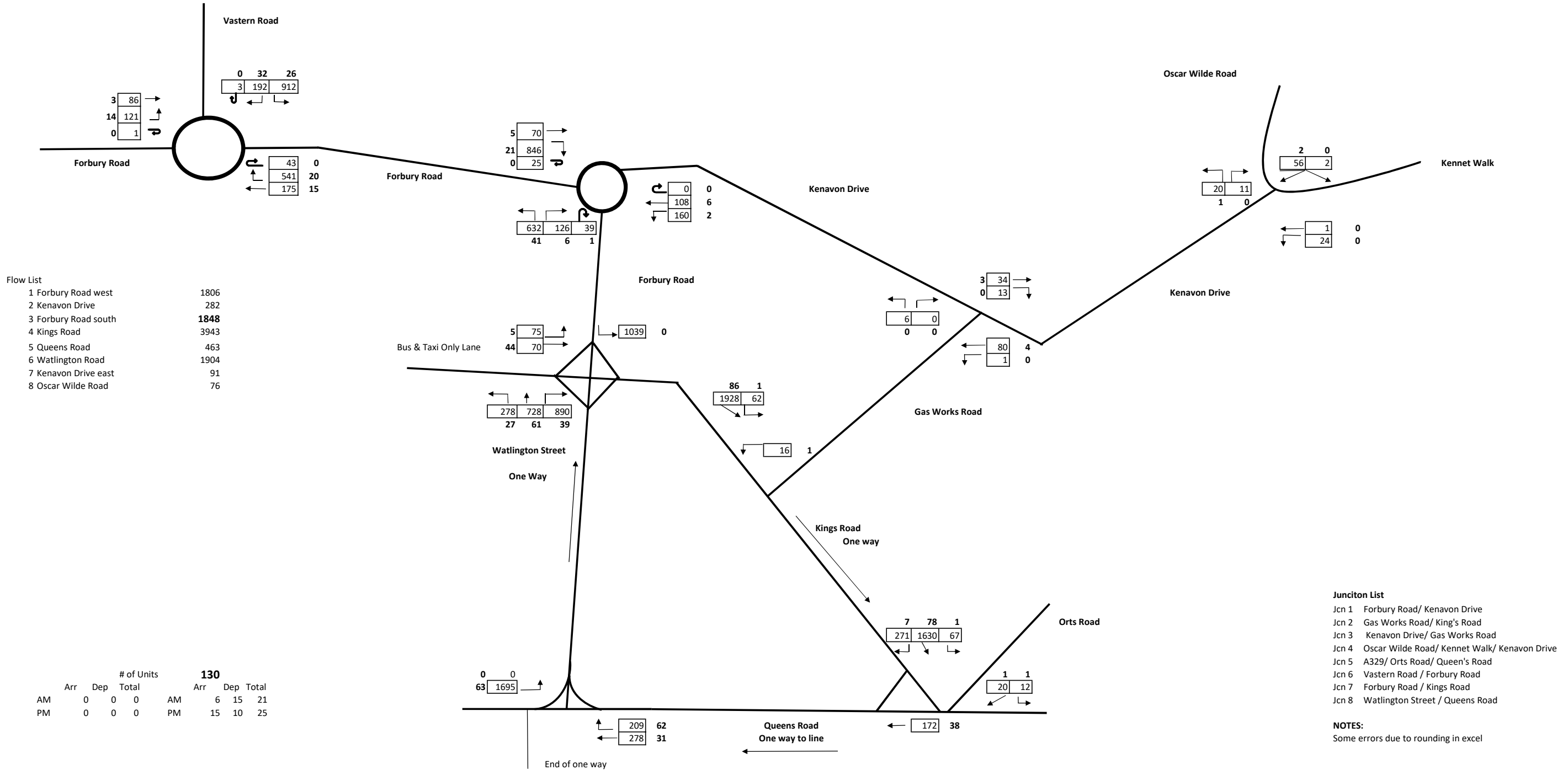
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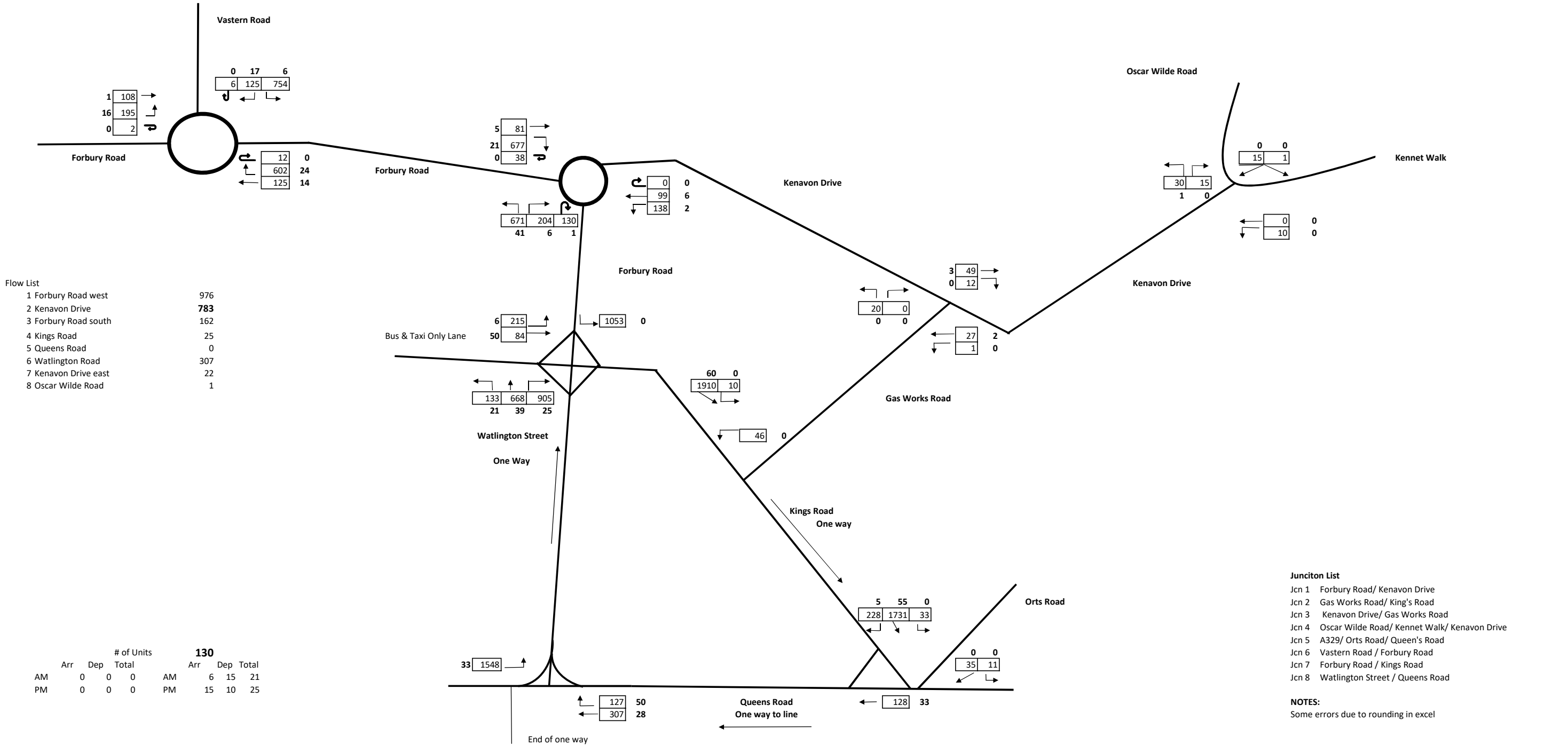
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 - Jcn 3 Kenavon Drive/ Gas Works Road
 - Jcn 4 Oscar Wilde Road/ Kennet Walk/ Kenavon Drive
 - Jcn 5 A329/ Orts Road/ Queen's Road
 - Jcn 6 Vastern Road / Forbury Road
 - Jcn 7 Forbury Road / Kings Road
 - Jcn 8 Watlington Street / Queens Road

NOTES:
Some errors due to rounding in excel

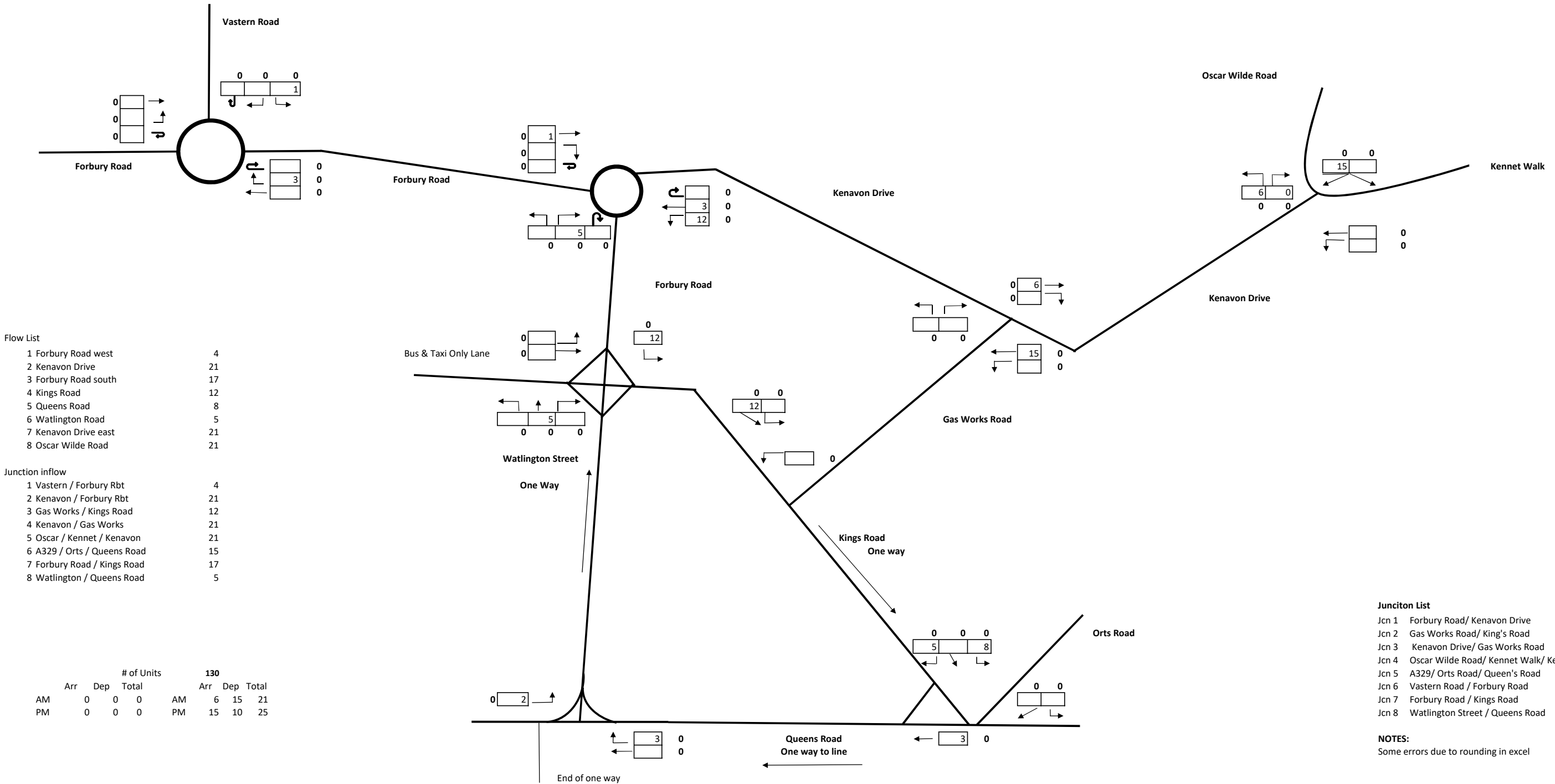
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TOTAL VEHs
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TOTAL VEHs
0 HGVs
0.0% 2011 CENSUS DISTRIBUTION



Stuart Michael Associates Ltd
Coombe House, Coombe Square
Thatcham, Berkshire RG19 4JF
T: 01635 867 711 F: 01635 861 715
e: mail@stuartmichael.co.uk
w: www.stuartmichael.co.uk

JOB TITLE:
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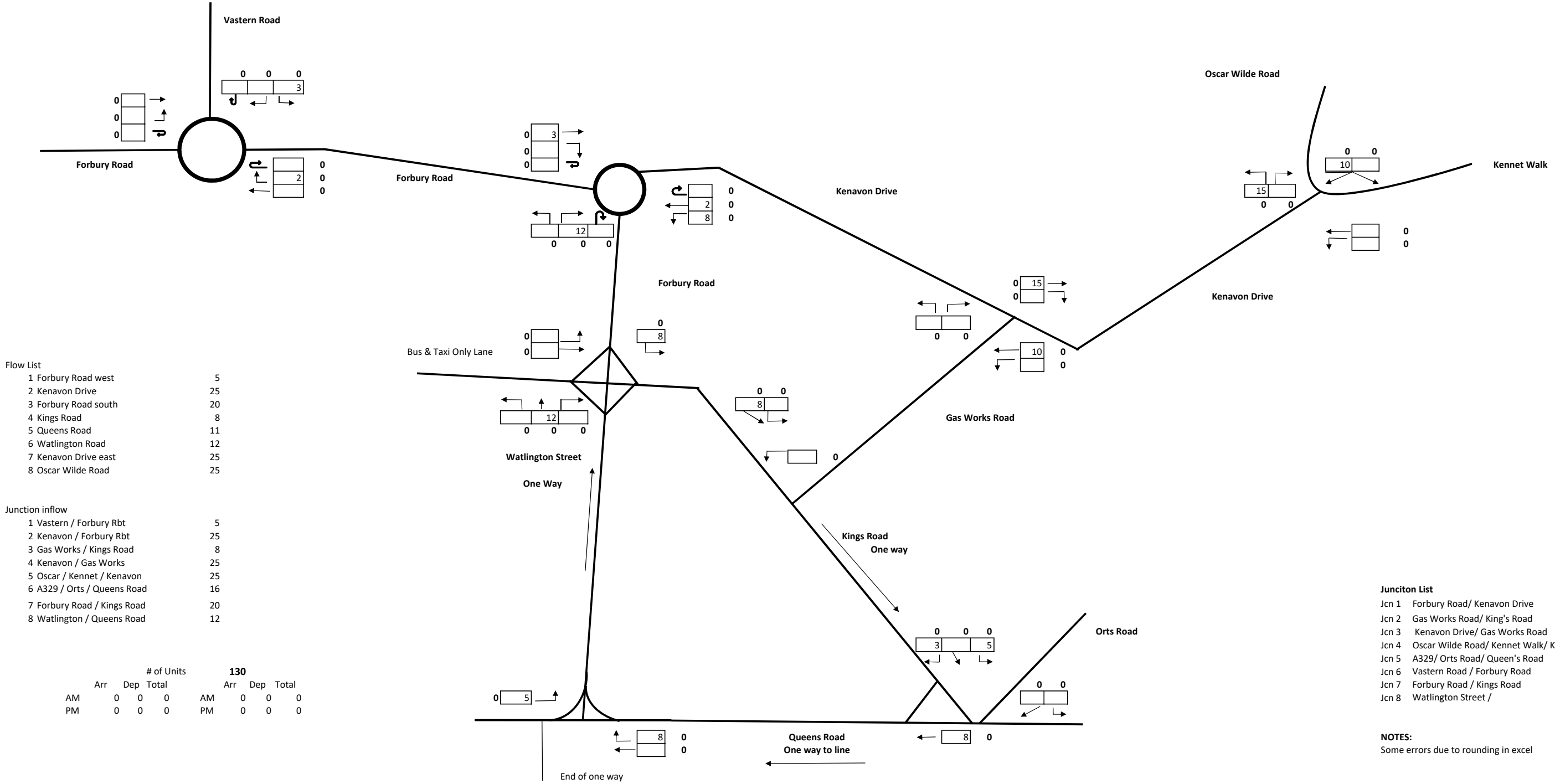
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FIG 5.9 AM DEVELOPMENT FLOWS (08:00-09:00)

DRAWN BY:
ALC

DATE:
Sep-18

REV:

TOTAL VEHs
0 HGVs
0.0% 2011 CENSUS DISTRIBUTION



- Junciton List**
- Jcn 1 Forbury Road/ Kenavon Drive
 - Jcn 2 Gas Works Road/ King's Road
 - Jcn 3 Kenavon Drive/ Gas Works Road
 - Jcn 4 Oscar Wilde Road/ Kennet Walk/ Kenavon Drive
 - Jcn 5 A329/ Orts Road/ Queen's Road
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 - Jcn 8 Watlington Street /

NOTES:
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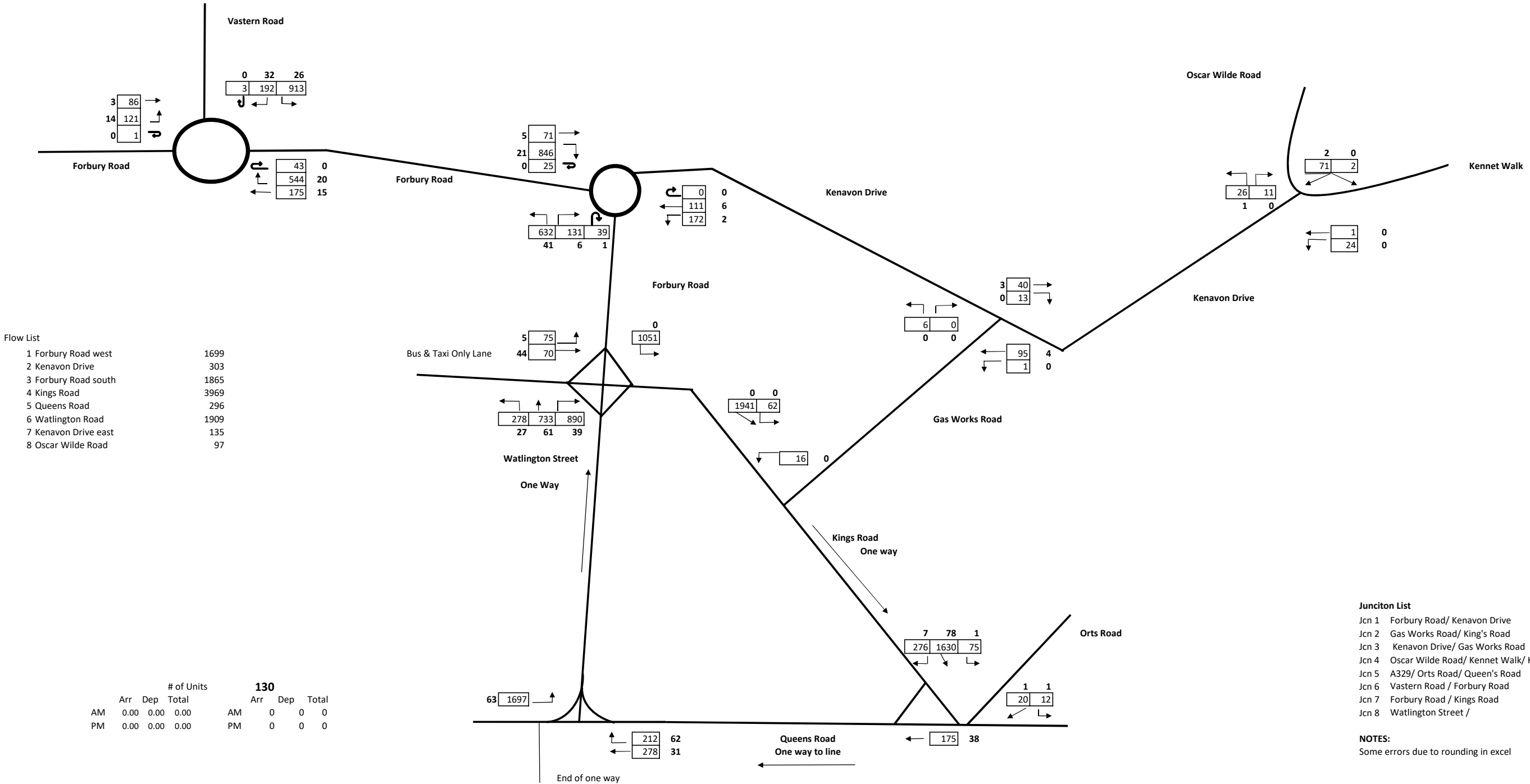
Stuart Michael Associates Ltd
Coombe House, Coombe Square
Thatcham, Berkshire RG19 4JF
T: 01635 867 711 F: 01635 861 715
e: mail@stuartmichael.co.uk
w: www.stuartmichael.co.uk

JOB TITLE:
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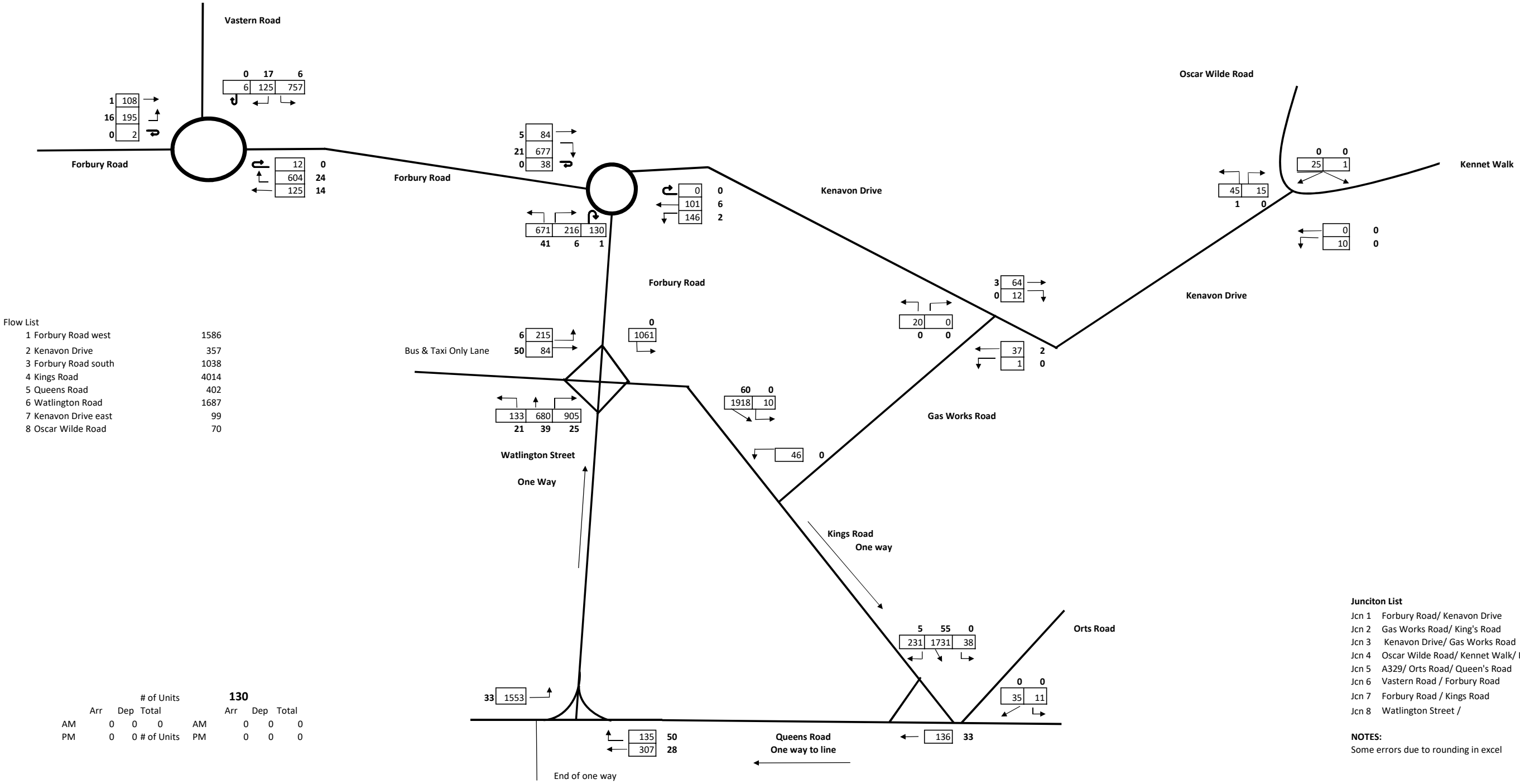
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FIG 5.10 PM DEVELOPMENT FLOWS (17:00-18:00)

DRAWN BY:
ALC
DATE:
Sep-18
REV:

TOTAL VEHs
0 HGVs
0.0% 2011 CENSUS DISTRIBUTION



TOTAL VEHs
0 HGVs
0.0% 2011 CENSUS DISTRIBUTION



Flow List

1 Forbury Road west	1586
2 Kenavon Drive	357
3 Forbury Road south	1038
4 Kings Road	4014
5 Queens Road	402
6 Watlington Road	1687
7 Kenavon Drive east	99
8 Oscar Wilde Road	70

# of Units			130		
Arr	Dep	Total	Arr	Dep	Total
AM	0	0	0	AM	0
PM	0	0	0	PM	0

- Junciton List
- Jcn 1 Forbury Road/ Kenavon Drive
 - Jcn 2 Gas Works Road/ King's Road
 - Jcn 3 Kenavon Drive/ Gas Works Road
 - Jcn 4 Oscar Wilde Road/ Kennet Walk/ Kenavon Drive
 - Jcn 5 A329/ Orts Road/ Queen's Road
 - Jcn 6 Vastern Road / Forbury Road
 - Jcn 7 Forbury Road / Kings Road
 - Jcn 8 Watlington Street /

NOTES:
Some errors due to rounding in excel