Waungron Road, Cardiff

lime TRANSPORT

Transport Statement

Cardiff Council's Housing Development

MAY 2021

Lime Transport Ltd
5A Andrews Buildings
Stanwell Rd
Penarth, CF64 2AA

t: 02920 700924
e: mail@limetransport.com

www.limetransport.com

Project no.	20051
Document ref.	D1f
Status	Final
Date	[20 May 2021]

Table of contents

Figures

Appendices

1 Introduction

1.1 Background

1.1.1 Lime Transport has been commissioned by Cardiff Council's Housing Development team to prepare a Transport Statement in support of a planning application for a mixed use development comprising 44 x 1 and 2 bedroom council apartments together commercial (retail and office) space, provision of a new highway to accommodate a Bus Interchange, improved cycle and pedestrian infrastructure and associated landscape works.

1.1.2 The site is located within a mainly residential area in west Cardiff, and is adjacent to Waun-gron Park rail station. The location of the site is outlined in **Figure 1.1** below.

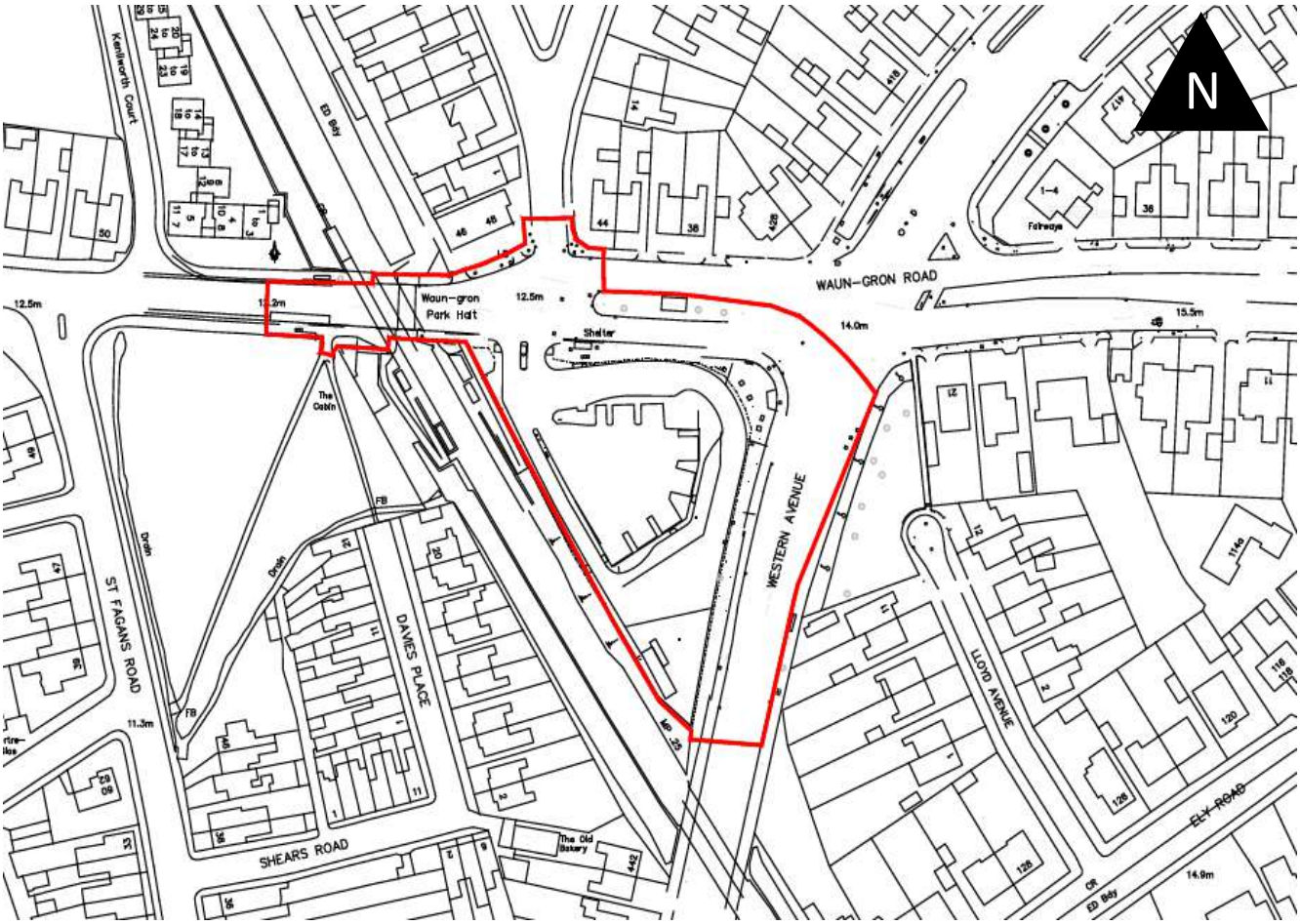


Figure 1.1 Site location

1.1.3 The purpose of this Transport Statement is to assess the transport characteristics of the proposed development, consider the likely impact of the proposals on the surrounding transport network, and identify any potential mitigation measures, should any be required.

1.2 Why is the development proposed?

1.2.1 This mixed-use development is proposed in response to Cardiff's Local Plan which states that:

- There is evidenced housing need and a need to develop sustainable neighbourhoods, tackle deprivation and improve the quality of life for all;
- Mixed use developments can create vibrant, mixed use communities where people live and shop; and,
- Provision of transport interchanges between transport modes will help minimise travel demand and reduce car dependency.

1.2.2 This development will consist entirely of council owned flats, with commercial (retail and office) uses provided on the ground floor, creating a vibrant community. In addition, the development includes the newly proposed public transport interchange, which will enable a car-free lifestyle and encourage travel by sustainable modes.

1.3 Policy context

1.3.1 Policies encourage active travel, which is about 'living locally' and giving people the ability to access most of their needs within an easy walk or cycle from their home, with safe access to cycling and local public transport options.

1.3.2 This requires facilities to be reached within an easy walk and cycle distance, which then means that key car-free journeys can be made.

1.3.3 Research shows that 20% of journeys are under a mile, a distance which can be easily walked or cycled by many people. Locating development near a district centre, reduces traffic and provides safer environments for people and children and also creates social, health and environmental benefits.

1.3.4 The majority of facilities within Cardiff can be accessed within an easy 20min cycle journey, with majority of facilities in close proximity to the site along Waungron Road, Lansdowne Road and Cowbridge Road East. In addition, Cardiff City Centre and Cardiff Bay, as well as, north and west Cardiff, where various retail, education, shopping, leisure, cultural and health facilities are located, can be accessed within a 20-minute cycle journey. The 20min cycle isochrone is included in **Figure 1.2.**

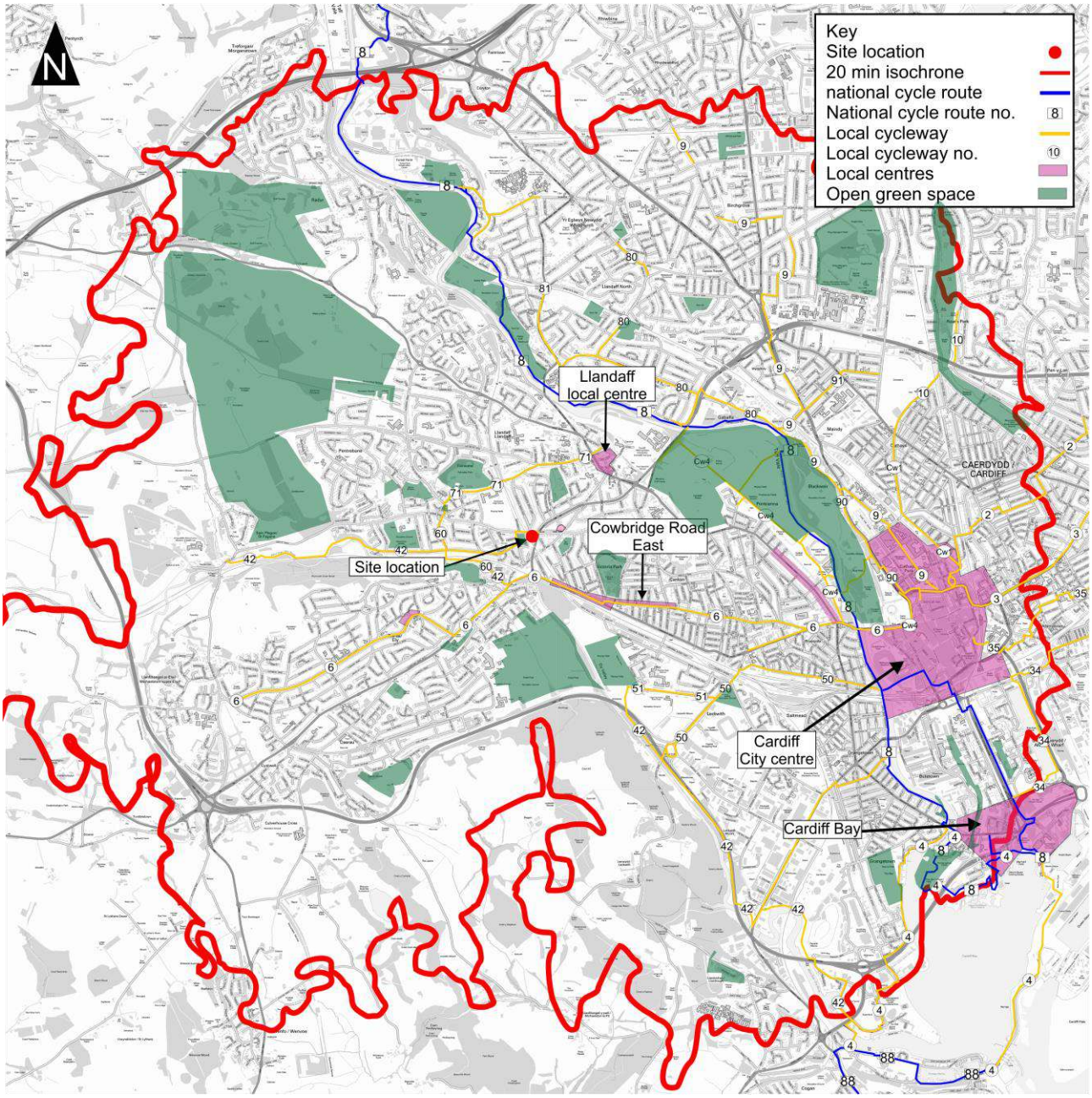


Figure 1.2 20min cycle isochrone

1.3.5 The development meets this sustainable living criteria by:

- **Being mixed use** – retail and office uses will be provided on the ground floor in addition to residential uses. All dwellings are affordable.
- **Providing space for communal area with seating and 'grow your own' areas**, where residents can congregate at further strengthen the sense of community;
- **Designed to be safe** – a car-free development, with loading facilities provided along the northern site frontage on Waungron Road. Lighting and landscaping areas will

be provided to increase street activity and natural surveillance, shade and shelter from high winds and rain.

- **Improving pedestrian and cycle priority environment** – by maintaining at least 2.5m wide footways around the site and providing high-quality cycle parking in secure and convenient locations for residents, staff and visitors of the development.
- **Providing a car-free development and generous cycle parking** – this will further encourage travel by sustainable modes and reduce the impact of the development in terms of traffic and air quality.
- **Providing a transport interchange** – this will enable interchange between bus and rail and further encourage the use of sustainable travel modes and reduce dependency on a car.

Cardiff Council's Transport White Paper

1.3.6 The Cardiff Council's Transport White Paper sets out an ambitious 10-year plan to tackle the climate emergency, reduce congestion and improve air quality in the city. The 2025 targets for work journeys by Cardiff residents are as follows:

- 37% - walking and cycling (19% cycle, 18% walk);
- 27% - bus rail and tram; and,
- 37% - car.

1.4 Scope of the report

1.4.1 The scope of this Transport Statement is summarised below:

- Assess the accessibility of the site by walking, cycling and public transport and provide a Census data summary;
- Estimate the likely person trip generation (by mode) for the existing and proposed development, based on a review of the TRICS 7.7.3 trip generation database;
- Review five years' personal injury accident data within the area immediately surrounding the site;
- Assess car and cycle parking requirements, based on the Cardiff Council's adopted maximum parking standards and car ownership data (based on 2011 census);
- Review arrangements for deliveries and servicing;
- Describe the proposed Waun-gron Park interchange; and,
- Comment on the likely impact of the proposals on the surrounding highway network.

1.5 Structure of the report

1.5.1 Following this introductory section, the report is structured as follows:

- Section 2 describes the existing transport conditions surrounding the site, including accessibility by all modes of transport together with a review of personal injury accident data within the study area;

- Section 3 describes the development proposals including the proposed bus interchange, site accesses, cycle parking and defuse storage and collection;
- Section 4 estimates the travel demand associated with the existing and proposed development, and identifies the likely impact of the proposals on the surrounding transport network; and,
- Section 5 summarises the findings of the report.

2 Existing situation

2.1 Site location

2.1.1 As outlined above, the development site is situated within a predominantly residential area of Llandaff, 4km to the north-west of Cardiff City Centre. The site is bounded by:

- Waungron Road to the north;
- A48/Western Avenue to the east; and,
- Cardiff City Line and Waun-gron Park railway station to the west.

2.1.2 The location of the development site together with the local highway network is shown in **Figure 2.1** below.

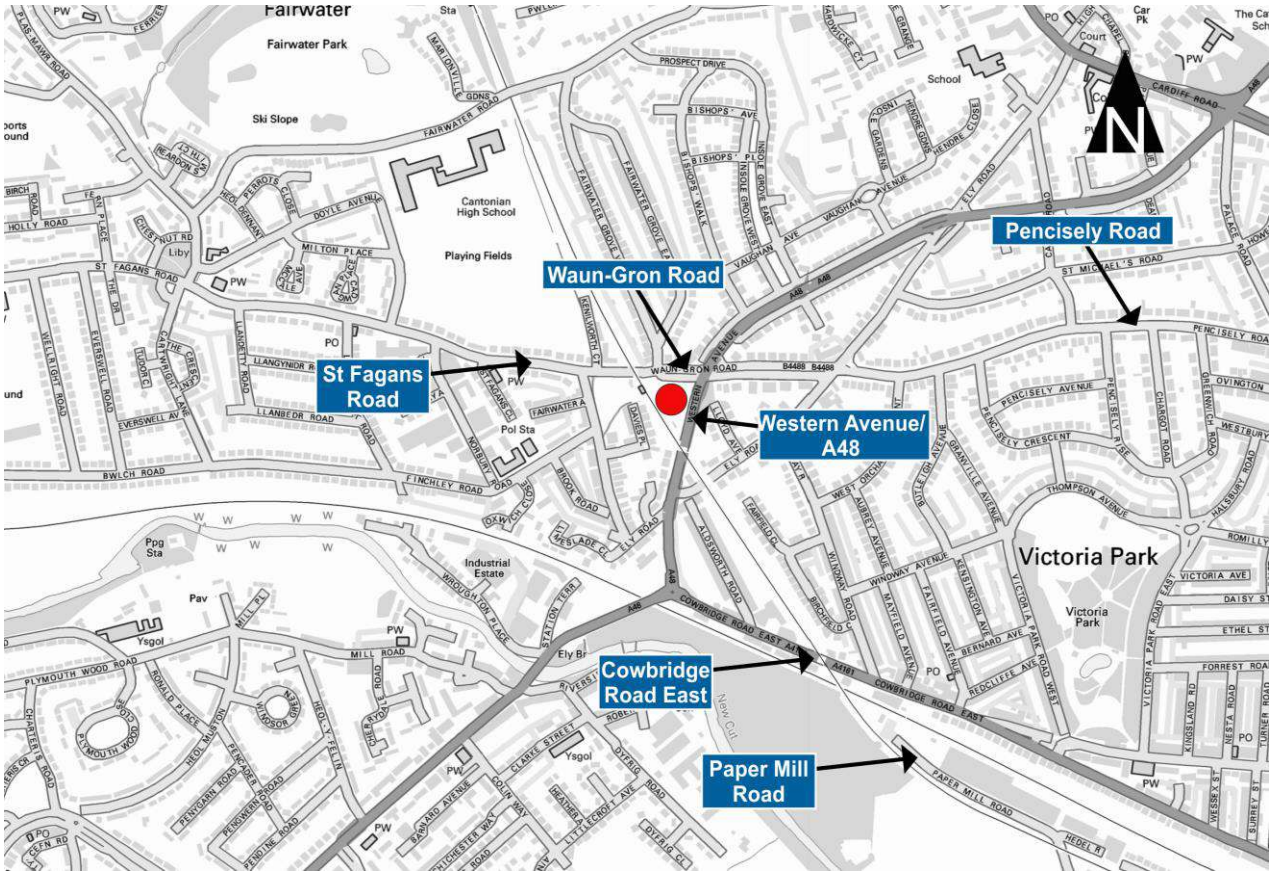


Figure 2.1 Local highway network

2.2 Travel characteristics

2.2.1 The site is located on the outer edges of the central area of Cardiff (based on the Cardiff Council's Managing Transportation Impacts SPG) and is located in a sustainable location.

2.2.2 2011 Census data has been reviewed, to establish the travel characteristics of the existing population surrounding the site, including travel to work and car ownership data.

2.2.3 The development will be used as follows:

- Residential flats – by new residents, visitors and deliveries;
- Retail unit – by staff, customers and deliveries; and,
- Office – by staff, visitors and deliveries.

2.2.4 It is anticipated that the trip profiles and journey purposes of users of each element of the development will be as follow.

Residential use

2.2.5 It is anticipated that the trip profiles of residents will fluctuate across the day with weekday peaks as follows:

- Late morning (11am to 12am) - arrivals and departures to/from retail, leisure and work;
- Late afternoon and evening (3pm to 6pm) - arrivals and departures to/from retail leisure and work by residents and arrivals and departures of any visitors.

2.2.6 **Figure 2.2** below shows the likely profile for weekday daytime trips based on comparable sites within the TRICS trip generation database.

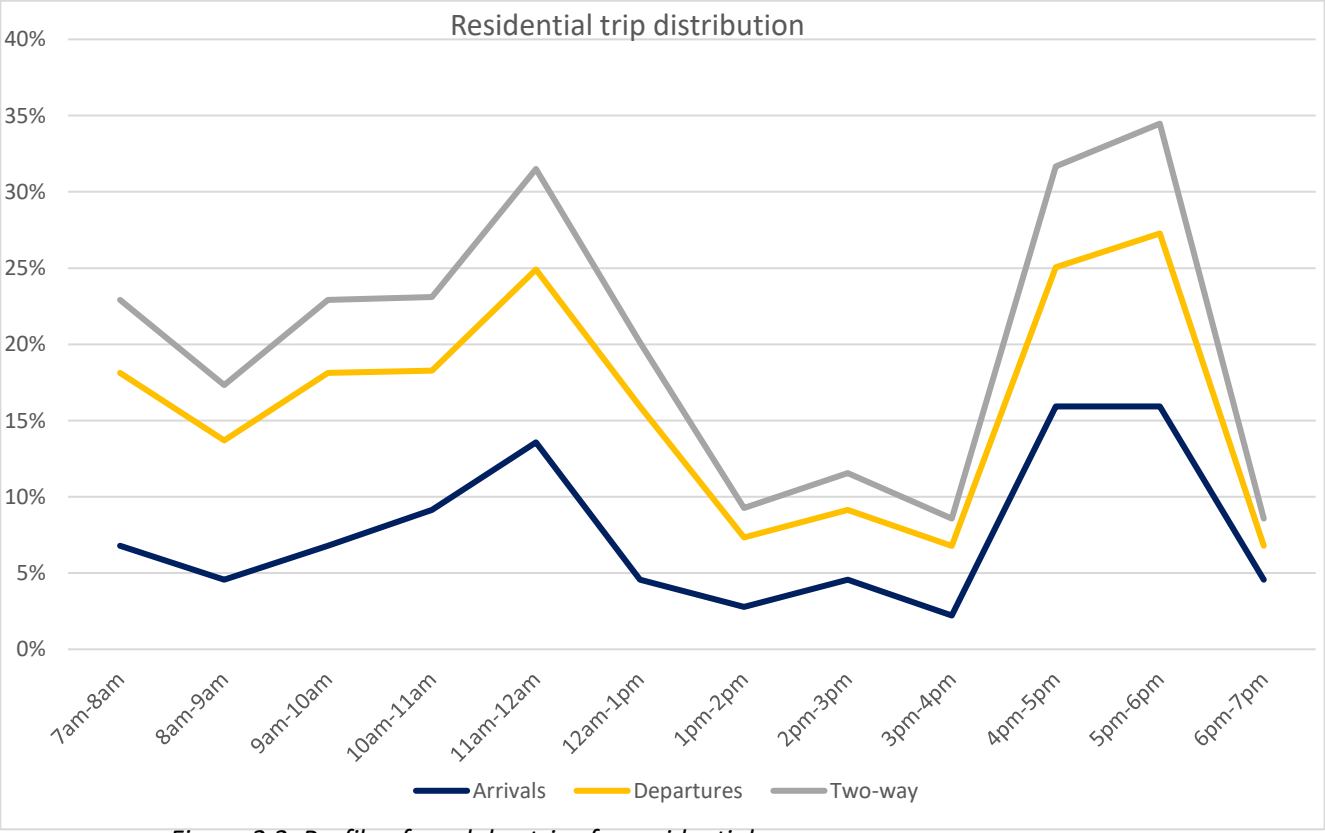


Figure 2.2 Profile of weekday trips for residential use

Retail (A1 & A3 uses) and Office (B1 use)

2.2.7 It is anticipated that the profile of trips will fluctuate across the day with weekday peak being morning (arrivals of staff), afternoon (arrivals and departures of staff during lunchbreak and deliveries) and evening (departures of staff).

Travel to work

2.2.8 Travel to Work data from the 2011 Census has been used to establish the mode of travel to work for existing residents in the area.

2.2.9 Super output areas are geographical areas built from contiguous output areas, which are consistent in population size. Between four to six output areas make up Lower Super Output Areas (LSOA), and between four to six LSOA areas make up Middle Super Output Areas (MSOA).

2.2.10 **Table 2.1** below shows the travel to work mode split for the Lower Super Output Area (LSOA 026D) in which the site is located, the Middle Super Output Area (MSOA 026), Llandaff Ward and Cardiff County as a whole. This data excludes those that work from home and those not in employment.

Table 2.1 Mode split for journey to work based on 2011 Census data

Mode	Mode share (%)			
	LSOA 026D	MSOA 026	Llandaff	Cardiff County
Train and underground	5	6	6	3
Bus, minibus or coach	6	8	8	11
Taxi	1	0	0	0
Motorcycle, scooter or moped	1	0	0	0
Car or van (as driver)	70	67	67	59
Passenger in car or van	5	5	5	5
Cycle	4	4	4	4
Walk	8	9	9	16
Other	1	1	1	1
Total			100%	

2.2.11 It should be noted that, Census Travel to Work data differs from the trip generation survey data, as the survey data records vehicle journeys for all purposes, not just work related.

2.2.12 It can be seen from the table above, 70% of existing residents that live within the lower super output area in which the site is located, travel to work by car (as driver), with a further 5% travelling as a passenger. This is higher than the overall figure for Cardiff, with 59% driving to work and a further 5% travelling as passenger. In the LSOA, 11% travel by public transport and 12% walk or cycle to work.

Car ownership

2.2.13 Car ownership in the area is 1.51 cars per dwelling. However, only 1% of properties are affordable dwellings, 93% comprise 3+ bedroom units and only 5% are flats. Therefore, it is considered that the car ownership in the area would not be comparable to that at the proposed development, which will comprise of affordable, predominantly one-bedroom flats.

2.3 Connectivity

Walking

2.3.1 All of the roads within the vicinity of the site have footways on both sides of the carriageway that provide links between the site and the surrounding amenities and facilities. In addition, residential roads in the vicinity of the site are generally provided with dropped kerbs on approach to the junctions.

2.3.2 The closest formal crossing to the site is a signalised crossing across B4488 St Fagans Road, approximately 50m to the west of the site – this crossing provides convenient access to the railway station.

2.3.3 Additional pedestrian crossings (provided with dropped kerbs and tactile paving) are conveniently located at the following locations:

- Signalised crossing at Waungron Road/A48 Western Avenue signalised junction, approximately 70m to the east of the site. These crossings provide convenient and safe access between the site and local facilities in the vicinity.
- Informal crossing on Western Avenue, approximately 200m to the south of the site. This crossing is provided with a pedestrian refuge island and provides access to bus stops.

2.3.4 The Chartered Institution of Highways and Transportation (CIHT) 'Providing for Journeys on Foot' indicates that the desirable walking distance for commuting and school journeys is 500m, the acceptable walking distance is 1km, and 2km is the preferred maximum.

2.3.5 The CIHT guidelines also indicate that the desirable walking distance for 'elsewhere', including local amenities is 400m, the acceptable walking distance is 800m and 1.2km is the preferred maximum.

2.3.6 **Figure 2.3** shows facilities within 1.2km of the site (divided into 200m bands from the centre of the site), together with local amenities within walking distance.

2.3.7 There is a wide variety of local amenities within walking distance of the site, in particular along the A48 (to the south) and St Fagans Road (to the west) and include:

- Fast food/takeaways;
- Gym;
- Food stores;

- Community Centre;
- Places of worship;
- Convenience goods/retail facilities;
- Healthcare/pharmacies/dentists;
- Western Business Centre;
- Post Office;
- Pubs/restaurants;
- Cafes; and,
- Leisure and recreation facilities.

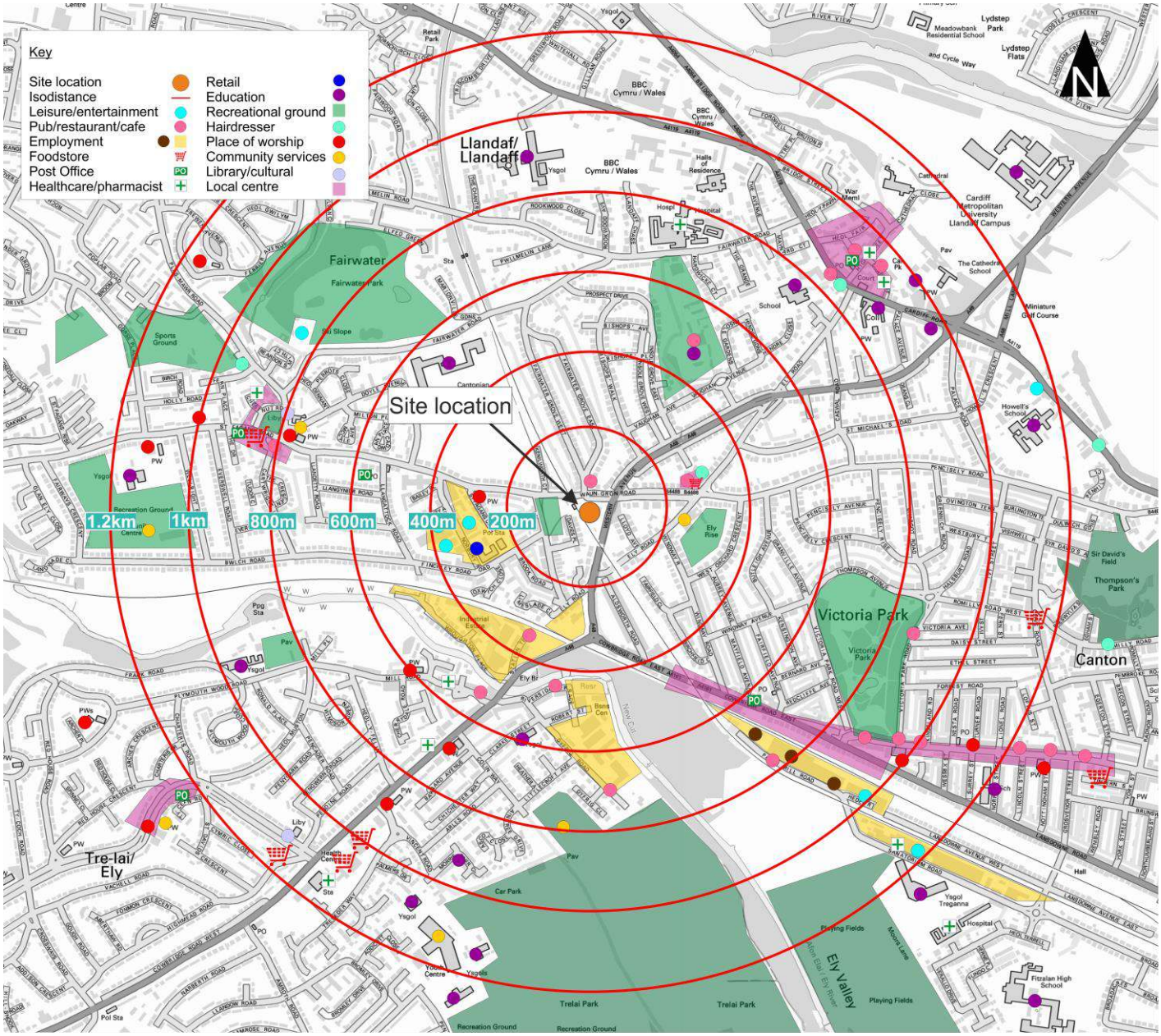


Figure 2.3 Local amenities within walking distance of the site

2.3.8 The site is also located within the vicinity of a number of the following local centres, including:

- Fairwater Green local centre (approximately 300m to the east), with a hairdressing salon, a foodstore and cafés/takeaways;
- High Street in Llandaff (approximately 970m north-east), with a wide variety of local cafes, shops, restaurants and health facilities;
- Cowbridge Road East in Canton (990m-2km south-east), with additional retail/ shopping, leisure and cultural facilities;
- A48/Western Avenue (600m-2km to the south), with a wide variety of retail, leisure health facilities. This road also provides access to Western Business Centre; and,
- Paper Mill Road (900m-1km to the south-east), with leisure, restaurant and employment facilities.

2.3.9 There are convenient pedestrian links provided at Waun-gron Park to the west, which provide access between Waungron Road and St Fagans Road.

Cycling

2.3.10 The nearest local cycle route is route 6, provided approximately 350m to the south of the site along Cowbridge Road East. This route is provided in shared bus, taxi, motorcycle and cycle land and provides access between Ely and Cardiff Queen Street Station and is provided along the A48 and Cowbridge Road East in the vicinity of the site.

2.3.11 Local routes 71 and 60, are provided along residential rods and provide access between Llandaff to the north-east and Bwlch Road to the south-west. These routes can be accessed via St Fagans Road, within 860m of the centre of the site.

2.3.12 The closest national cycle route to the site is National Cycle Network (NCN) Route 8 – Lon Las Cymru, that runs between Cardiff and Holyhead – and the nearest access point is along the River Taff (accessed from the A48/Western Avenue), located approximately 1.6km north- west of the site. The route runs along the Taff Trail, and provides more local links to Cardiff Bay and north Cardiff.

2.3.13 In addition, it should be noted that there are shared footway/cycleway sections provided along the A48/Western Avenue.

2.3.14 All cycle routes are shown in **Figure 2.4** below.

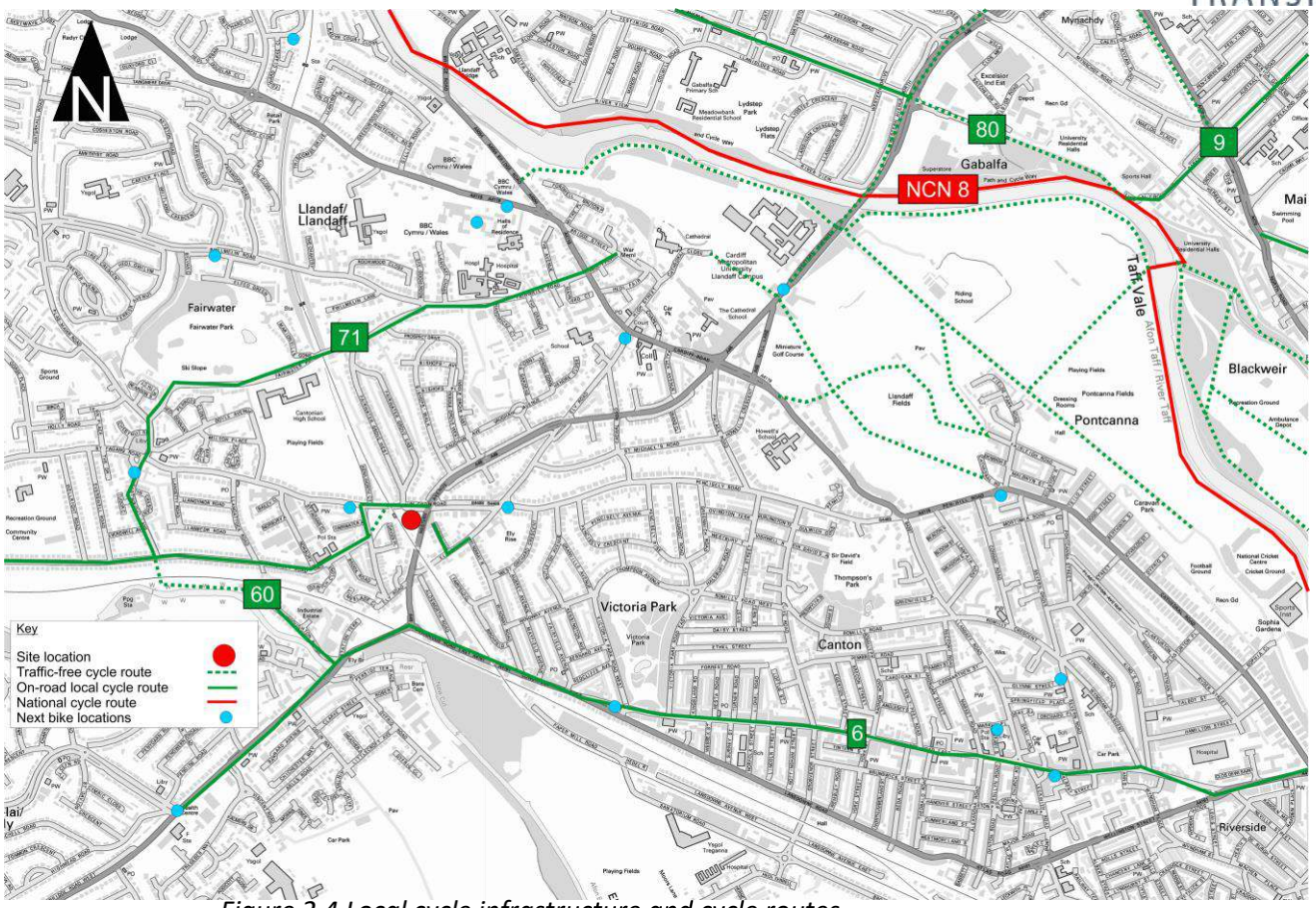


Figure 2.4 Local cycle infrastructure and cycle routes

2.3.15 There are two next bike hubs provided in the vicinity of the site, with one on St Fagan's Road 150m to the west, with six bike racks. Another cycle hub is provided on Waungron Road, approximately 300m to the east of the site, with eight bike racks. Additional bike hubs are provided along St Fagan's Road, Victoria Park, Cardiff Road and the A48/Western Avenue.

Bus services

2.3.16 The site is very well connected by public transport, providing connections throughout Cardiff and further afield. The nearest bus stop is provided adjacent to the site on Waungron Road (30m to the north). Additional bus stops are located along the A48/Western Avenue (90m to the east) and Waungron Road (300m to the east). Additional bus stop is provided 425m to the south of the site on Cowbridge Road East.

2.3.17 These routes provide access to connections within Cardiff including Leckwith, Birchgrove Cardiff City Centre, Ely, St Fagans, Pentrebane, University Hospital Wales and the surrounding area including Talbot Green, Llandough and Barry.

2.3.18 The location of the closest bus stops, together with bus routes that call at these stops is shown in **Figure 2.5** below, and **Table 2.1** provides a summary of the routes serving the closest bus stops to the site.

Table 2.1 Summary of bus services

Route No.	Route	Walk distance (m)	Weekday Frequency
Waun Gon Road			
32A	Cardiff City Centre – St Fagans	30	6 per day
	St Fagans – Cardiff City Centre	90	
61	Cardiff City Centre – Pentrebane	30	5 per hour
	Pentrebane – Cardiff City Centre	90	
64	Cardiff City Centre – University Hospital Wales	30	8 per day
	University Hospital Wales – Cardiff City Centre	90	
320	Cardiff City Centre – Talbot Green	30	6 per day
	Talbot Green – Cardiff City Centre	90	
Western Avenue			
1/2 City Circle	Birchgrove	170	2 per hour
	Leckwith	90	
15	Cardiff City Centre – University Hospital Wales	170	6 per day
	University Hospital Wales - Cardiff City Centre	90	
Cowbridge Road East			
12	Leckwith – Canton – Mansell Avenue	425	6 per day
	Mansell Avenue – Canton – Leckwith	525	
13	Llandough - Cardiff City Centre – Michaelston Super Ely	425	2 per hour
	Michaelston super Ely – Cardiff City Centre - Llandough	525	
17	Cardiff City Centre – Canton – Ely	425	6 per hour
	Canton - Ely – Cardiff City Centre	525	
18	Cardiff City Centre – Canton – Ely	425	6 per hour
	Canton - Ely – Cardiff City Centre	525	
96A	Cardiff City Centre – Barry	425	4 PM only services (hourly)
	Barry – Cardiff City Centre	525	
X1	Culverhouse Cross – Pontprennau	425	3 per hour
	Pontprennau – Culverhouse Cross	525	

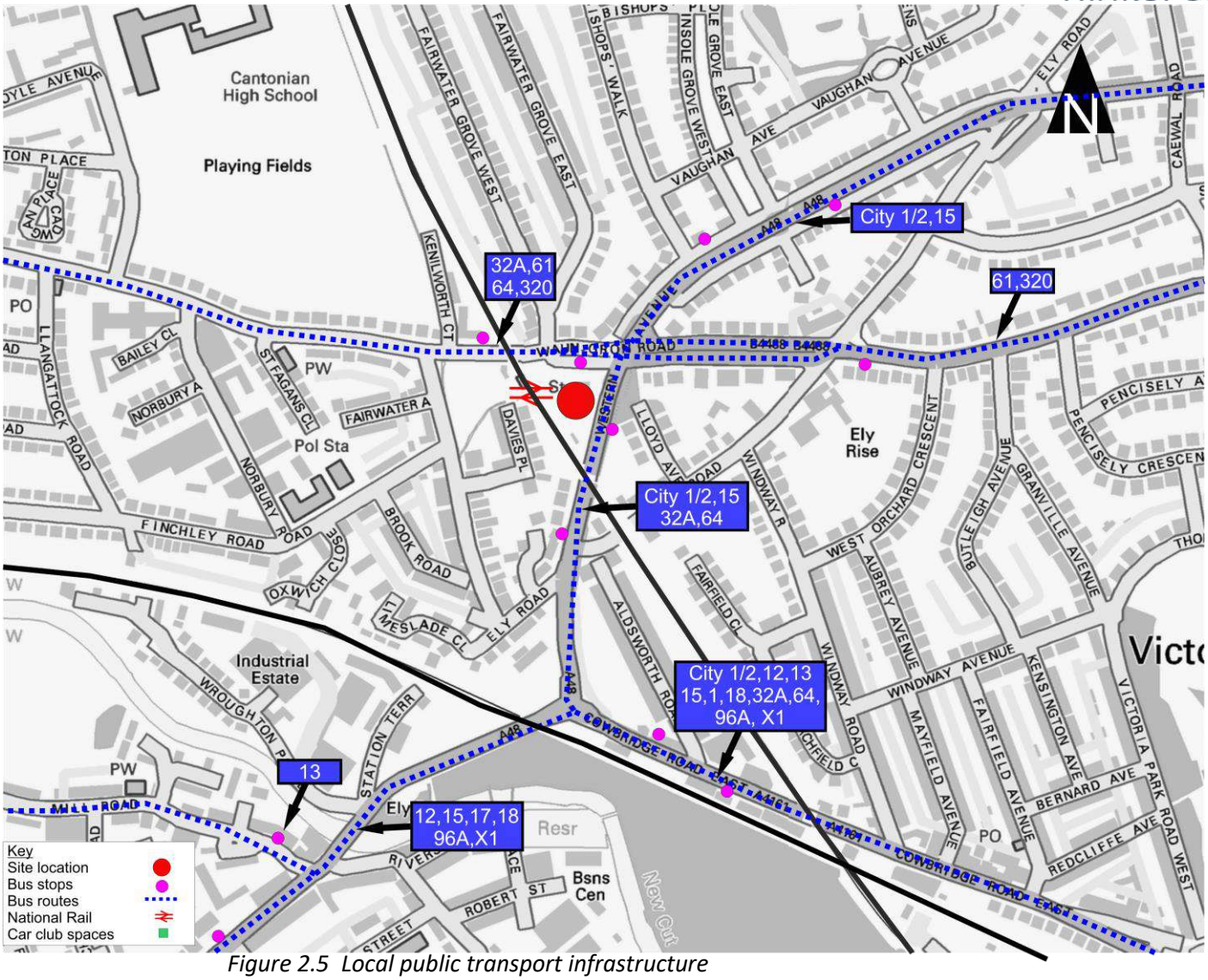


Figure 2.5 Local public transport infrastructure

Rail services

2.3.19 The closest railway station is Waun-gron Park, which lies along the western boundary of the site. This station is located on the City Line, which runs between Radyr and Cardiff Queen Street via Fairwater. The station provides two trains per hour, with one eastbound service to Cardiff Central, Cardiff Queen Street and Coryton and one westbound service to Radyr. The journey time to Cardiff Central station is eight minutes, to Radyr it is 11 minutes and to Coryton it is 28 minutes.

2.3.20 The long-term aspiration is to increase services at this station from two services to four services per hour.

Car clubs

2.3.21 Car clubs provide an affordable alternative for occasional car use and reduce the need to own a car. In addition, car club members tend to cycle more and use public transport more.

2.3.22 Enterprise car club is the current car club operator in Cardiff. Car club cars tend to be newer and, therefore, more energy efficient and cleaner than average cars. It is considered that car clubs provide the following benefits:

- Relieve parking pressures within the area;
- Reduce the reliance on the private motor-vehicle by residents;
- Provide an attractive and convenient alternative to owning a car;
- Cost effective for those that drive fewer than 8,000 miles per year; and,
- Act as a catalyst to use sustainable modes of travel.

2.3.23 There are car club spaces in the vicinity of the site at the following locations:

- Market Road – located approximately 2.4km to the south-east (near Chapter Arts Centre); and,
- Sneyd Street in Pontcanna – located approximately 2.4km to the east of the site.

Parcel collection

2.3.24 There are various parcel collection points in the vicinity of the site, which can reduce the likelihood of repeat deliveries. Hermes collection point is located on Waungron Road, approximately 50m to the west of the site. In addition, a Collect+ parcel location (for Yodel, Amazon, DHL, DPD etc. parcels) point is located approximately 670m to the south of the site on Riverside Terrace.

2.4 Local highway network

2.4.1 A description of the local highway network is outlined in **Table 2.2** below and is shown on Figure 2.1.

Table 2.2 Local highway network

	Description
Waungron Road	
Description	A dual carriageway road local distributor road separated by a grass verge. The road becomes Pencisely Road/B4488 single carriageway at the eastern end and provides access to Pontcanna to the east. At the western end, the road becomes St Fagans Road single carriageway and provides access to St Fagans village. Footways are provided on both sides of the carriageway.
Width	Approximately 14m wide in the vicinity of the site. The road becomes approximately 8-8.5m wide as it becomes St Fagans Road and Pencisely Road
Speed limit	30mph
Street lighting	Yes, along the length of the carriageway

Crossing facilities	Yes. Signalised crossing provided immediately to the west of the site. Other signalised crossings provided at junctions
Bus route	Yes
Character	An urban road with predominantly residential frontages and commercial frontages at the eastern end
On-street parking	A mixture of no parking restrictions and dedicated bays outside residential properties at the eastern end double yellow lines at the western end
A48/Western Avenue	
Description	A single carriageway, major distributor road. The road can be accessed via a roundabout junction with Lansdowne Road at the southern end and via a signalised crossroads junction with Waungron Road. The southern end of the A48 provides access to various towns and villages including Cowbridge, Bridgend, Port Talbot, Swansea and Carmarthen the northern end provides access to east Cardiff, Newport and Gloucester. In the vicinity of the site, footways are provided along both sides of the carriageway.
Width	Approximately 13-17m in the vicinity of the site
Speed limit	30 mph
Street lighting	Yes
Crossing facilities	Yes, signalised crossings are provided at major junctions
Bus route	Yes
Character	A single carriageway, major distributor road with commercial and residential frontages in the vicinity.
On-street parking	No parking observed

2.5 Parking provision in the surrounding area

2.5.1 Within 200m of the site, there are various opportunities for parking, including:

- St Fagans Road - no parking restrictions;
- Fairwater Road - no parking restrictions;
- Norbury Road - no parking restrictions;
- Brook Road - no parking restrictions;
- Kenilworth Court - no parking restrictions;
- Shears Road/Davies Place - no parking restrictions;
- Fairwater Grove west - no parking restrictions;
- Ely Road - no parking restrictions;
- Fairwater Grove east - no parking restrictions; and,
- Western Avenue service road - no parking restrictions.

2.6 Collision analysis

2.6.1 Collision data has been obtained for the period 2015 to 2019 for the area immediately adjacent to the site. This study area and the location and severity of collisions that occurred within it are shown on **Figure 2.6** below, and the number and severity of casualties sustained is outlined in **Table 2.3** below.

Table 2.3 Number and severity of casualties

	Personal injury			No. of casualties	Vulnerable users			
	Fatal	Serious	Slight		Children	Pedestrians	Motorcycles	Pedal cycles
2015	0	1	4	5	0	0	2	2
2016	0	0	0	0	0	0	0	0
2017	0	3	3	6	0	1	2	4
2018	0	0	2	4	0	0	0	0
2019	0	0	4	6	0	0	1	0
Total	**0**	**4**	**13**	**21**	**0**	**1**	**5**	**6**

2.6.2 It can be seen from Table 2.3 and Figure 2.3 above that 13 slight and four serious collisions occurred within the study area during the period 2015 to 2019. It can also be seen that 12 accidents involved vulnerable road users, including:

- One accident involving a pedestrian casualty sustaining a slight injury;
- Five accidents involving motorcyclists with three sustaining slight injuries and two sustaining serious injuries; and,
- Six accidents involving cyclist casualties with two sustaining serious injuries and four sustaining slight injuries.

2.6.3 This collision rate appears typical for the environment and volume of traffic, and it is concluded that there is no particular highway safety problem on the local highway network that will be exacerbated by the proposals.

Figure 2.6 Personal injury accident data

3 Development proposals

3.1 Introduction

3.1.1 As outlined in Section 1 above, it is proposed to re-develop the previous household recycling centre to provide:

- a mixed use residential/commercial development; and,
- a new bus interchange.

3.1.2 The development comprises:

- 40 x 1-bedroom council apartments;
- 4 x 2-bedroom council apartments;
- 165m^2 of B1 use on the ground floor;
- 118m^2 of A3 use on the ground floor;
- 101m^2 of A1 use on the ground floor;
- Secure cycle storage facilities, with space for up to 48 residents' cycles on the ground floor;
- Secure cycle storage facilities, with space for up to four bikes for the office staff on the ground floor;
- Cycle parking for retail staff and visitors; and,
- Communal area with seating and 'grow your own' areas provided for use by residents.

3.1.3 Given the anticipated low car ownership among the future residents and the sustainable location of the site, the development will be car-free.

3.1.4 This section of the report sets out the development proposals, including the proposed bus interchange, and considers the proposed access arrangements, delivery and servicing, as well as car and cycle parking provision.

3.1.5 The development proposals are outlined in **Figure 3.1** below.

Figure 3.1 Development proposals

3.2 Proposed bus/rail interchange

3.2.1 As part of the South Wales Metro, it is proposed to provide transport hubs in key areas of Cardiff, with Waun-gron Park station being one of the identified key locations. It is considered that these integrated 'hubs' will provide a convenient, frequent and well-connected public transport network within the South Wales region (including cross-city and local routes). Within Cardiff, it is anticipated that these hubs will provide access between new developments in outer Cardiff and Heath Hospital, Cardiff West, Cardiff East and Cardiff Bay. It is considered that provision of public transport hubs will also help to achieve Cardiff Council's 50:50 mode shift target, with 50% of trips being undertaken by sustainable modes.

Previous interchange

3.2.2 A planning application (app. ref. 16/01565/MNR) was previously submitted in June 2016 and approved in November 2016 for a new bus/rail interchange. It is understood that when the provision of the interchange was being considered, there were no proposals to develop the remainder of the site (except for access into the site car park). Therefore, the functionality of the interchange was the primary concern.

3.2.3 The previously approved interchange is presented in **Appendix A.**

3.2.4 Following a review of the planning application, and in particular the comments from the Llandaff residents' society, it is clear that the principle of the public transport interchange in this location was supported, but the design of the scheme was considered unattractive. The main criticism of the design was a wide carriageway, which was criticised for:

- increasing the opportunities for rat-running by other drivers;
- creating a complex and confusing road layout, which was perceived as unsafe for pedestrians; and,
- unattractive tarmac layout.

3.2.5 The previous design focuses on a street as a function, rather than a street as a place for people to dwell and congregate or for pedestrians and cyclists to move around. It is, therefore, considered that there is scope to improve the proposed interchange design and create a more pleasant environment, without impacting on the capacity of the interchange.

Proposed interchange road

3.2.6 A Transport Technical Note (dated September 2020), included in **Appendix B**, was prepared and discussions were held with Cardiff Council to amend the previously approved interchange. As part of the new proposals, it is proposed to provide a narrowed carriageway, with a width of up to 10.2m, with 3.3m wide bus bays (accommodating two bus stops each) and a 3.6m wide carriageway. It is anticipated that a two-way system would be maintained and that the 3.6m wide lane would be shared between northbound and southbound buses.

3.2.7 It is proposed to provide signalised junctions at the northern end of the interchange (onto Waungron Road) and the southern end of the interchange (onto Western Avenue), with conveniently designed crossings incorporated into the scheme. The pedestrian crossings will be provided on raised tables providing priority and easy access for pedestrians and cyclists. It is considered that these crossings will also slow down vehicles travelling along the main interchange road. The interchange road will only be accessible for buses and refuse vehicles, and no access will be provided for other vehicles.

3.2.8 Additional signalised crossings (with dropped kerbs and tactile paving) will be provided on Fairwater Grove West and on A48/Western Avenue. It is anticipated that the proposed crossing on the A48/Western Avenue will provide a more convenient access to a local cycle route which starts at Lloyd Avenue to the north-west.

3.2.9 The access junctions at the northern and the southern end will be signalised and provided with advanced cycle stop lines to ensure that priority for pedestrians and cyclists is maintained around the development. The proposed junction layouts are based on the previously agreed scheme (except for the changes made to the interchange road). It is proposed to extend yellow box road markings on the A48/Western Avenue to ensure that no traffic blocks the entrance and exit to the new interchange road for buses. The right-turn from Western Avenue will be banned as it is assumed that buses travelling from the north will turn right onto Waungron Road to access the interchange.

3.2.10 The proposed interchange is illustrated in **Figure 3.2** below and included in **Appendix C.**

Figure 3.2 Proposed Waungron Road interchange layout

Potential routeing of buses

3.2.11 The proposed routeing of buses has not been determined. There is a potential to divert the buses currently stopping at the bus stop on Western Avenue (routes City 1&2, 15, 32A and 64) and bus stops on Precisely Road serving routes 61 and 320 via the new interchange road.

3.2.12 **Figure 3.3** below shows potential routeing of buses, with routes as follows:

- **Route 1** – bus routes City 1& 2 and 15, travelling northbound/southbound along Western Avenue;
- **Route 2** – bus routes 32A and 64, travelling eastbound/westbound along Waungron Road, from/to Western Avenue; and,
- **Route 3** – bus routes 61 and 320, travelling eastbound/westbound along Waungron Road, from/to Pencisely Road.

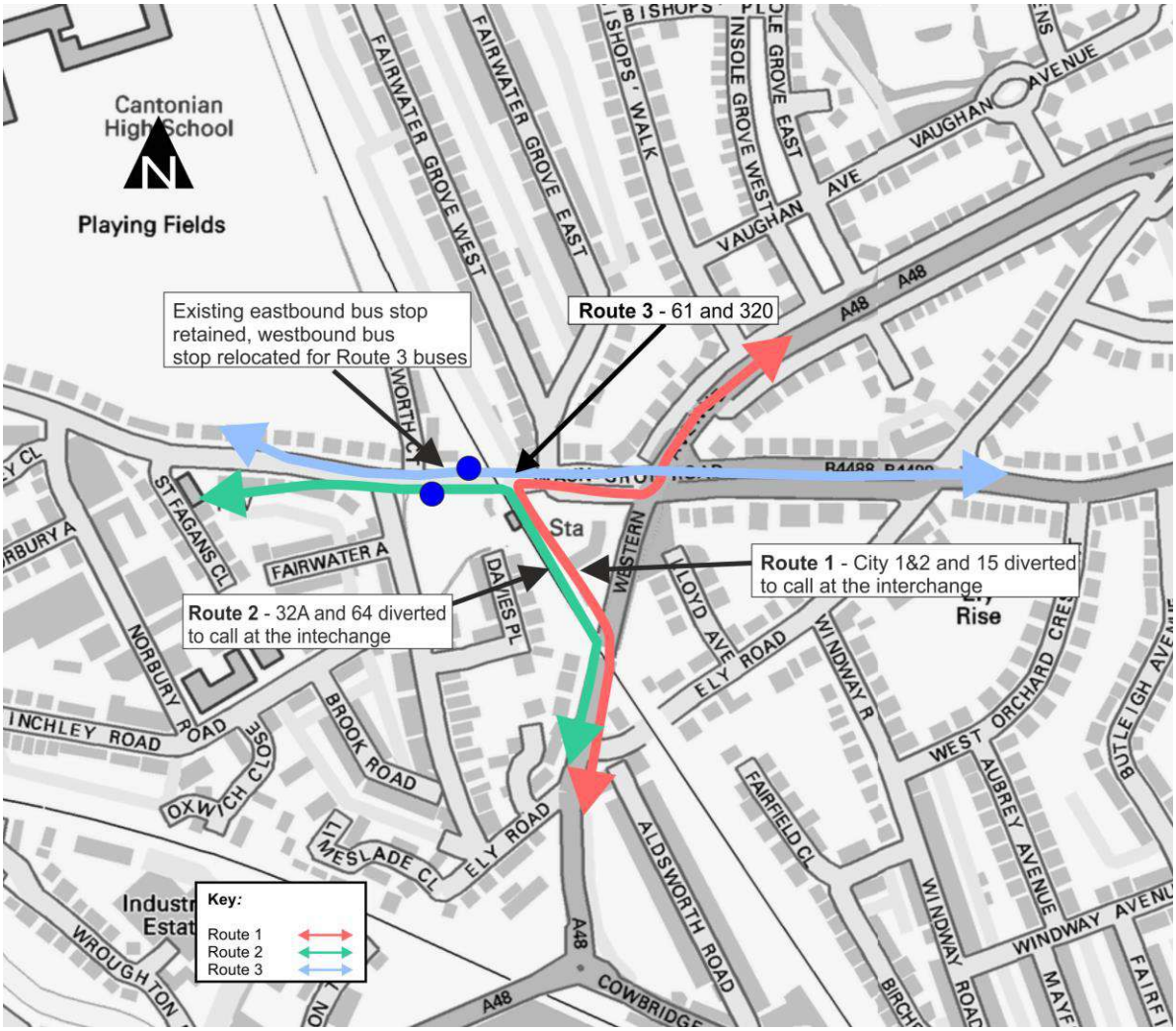


Figure 3.3 Potential routeing of buses

3.2.13 It is understood that Cardiff Council anticipate that up to 8-10 buses per hour (both directions) would be diverted via the new interchange. This may increase to up to 25 or more buses per hour if the demand exists. The new interchange road capacity was tested as part of the previous planning application (app. ref. 16/01565/MNR), which shows that the surrounding road network could accommodate a maximum of 40 buses per hour (both directions). It is, therefore, considered that the new interchange road (with some minor amendments to the original interchange layout) will have a minimal impact on the surrounding road network.

3.2.14 Given that the proposed junctions providing access to the proposed bus interchange will be signalised, the current southbound bus stop on Western Avenue will require relocation further to the south of the interchange road, provided that the demand for this bus stop exists. To accommodate bus routes 61 and 320 (travelling from/to Pencisely Road), the westbound bus stop on Waungron Road may be relocated approximately 100m to the west and the eastbound bus stop will be retained.

3.2.15 Following a pre-app with Cardiff Bus, a swept-path analysis of 12m rigid buses manoeuvring along the bus interchange road is included in **Appendix D.**

Proposed railway station improvements

3.2.16 Discussions have also been held with Transport for Wales (TfW) and Network Rail, who have confirmed that there is funding to provide the existing Waungron Road station. It has been suggested that some improvements may include:

- Cycle racks for six bikes (three stands);
- Rebranding and new signage;
- New smart card system;
- Wi-Fi provision;
- Help point;
- CCTV cameras;
- Basic upgrading of the station;
- Integrated bus/rail arrival and departure screen.

3.2.17 The current rail station operates two trains per hour and the long-term vision is to improve the railway service frequency to four services per hour.

Proposed public realm improvements

3.2.18 The Transport for London (TfL) document 'The Healthy Streets Approach' provides a framework of policies and strategies to encourage active travel, tackle environmental issues, such as air pollution and congestion, as well as health issues associated with physical inactivity. The document states that re-examination of our streets is required, where walking, cycling and public transport is prioritised and the impact of cars (including safety, air pollution and congestion) are limited.

3.2.19 A review of the proposals has been carried out based on the 10 Healthy Streets Indicators and set out in **Table 3.1** below. It provides a design check to ensure that the development layout and public realm is healthy, safe and welcoming.

Table 3.1 Healthy Streets Indicators

Healthy Streets Indicator	Proposed development
Pedestrians from all walks of life – streets should be welcoming places where people can walk, spend time and engage in community life	The development benefits from high-quality public realm improvements, including links to the surrounding area and communal open space. The on-site layout and access to the development has been designed with pedestrian and cyclist priority. High quality public realm area with seating areas will be provided, which will allow for 'activity' to take place and create a feeling of place, where people can congregate. In addition, a potential to provide a water station and a communal bike pump is being explored. Communal roof top terrace with seating areas and 'grow your own' areas will be provided, where residents can congregate and socialise in.
Easy to cross – making streets easy to cross can encourage more people to walk and connect communities, therefore direct routes are preferred. Physical barriers, fast moving or heavy traffic can make streets difficult to cross.	As part of the development, it is proposed to create a low traffic, low speed environment and incorporate raised table crossings at the northern and southern end of the interchange road. Pedestrian footways will be of sufficient width to keep pedestrians from the main road at a safe distance.
Shade and shelter – providing shelter from high winds, heavy rain and direct sunlight will enable everyone to use the streets in whatever weather	The development includes provision of a bus/rail interchange with bus stops provided on both sides of the new interchange road, with shelter and seating areas. In addition, it is proposed to provide new trees as part of the landscaping near the bus stops and along the eastern edge of the site. Provision of bus stops and trees will provide shade, shelter from rain, and protection from high winds and traffic.
Places to stop and rest – a lack of resting places can limit mobility for certain groups of people. Provision of resting places can encourage people to visit, spend time in and meet people on the streets	Pedestrians can stop and rest at the proposed sheltered bus stops with seating areas. This will allow pedestrians to navigate at their preferred speed. There is also a potential to provide a water station.
Not too noisy – reducing the noise impact of motor traffic will improve the street environment and encourage active travel and human interaction	The development is designed to be car-free, with majority of vehicle trips associated with the bus interchange, deliveries, servicing and taxi/Uber pick-ups and drop offs. However, it is likely that vehicle traffic will be low (see Section 4).
People choose to walk, cycle and use public transport – a successful transport system encourages and enables people to walk and cycle, which can be achieved through reduction of volume and dominance of cars	The development includes provision of a new bus/rail interchange at the doorstep of future residents. The development will provide an attractive environment and as a minimum, a 2.5m wide footway will be provided around the site building. In addition, raised table crossings with

	pedestrian and cyclist priority will be provided at the northern and southern edge of the new interchange road. Potential provision of a water station and a communal bike pump is being explored, which can provide access to bike maintenance facilities and further encourage cycling. Provision of trees along the eastern edge of the site will create a buffer between the footway and traffic along Western Avenue and encourage walking. High quality cycle parking will be provided in secure locations for residents and commercial space users.
People feel safe – people should feel comfortable on streets at all times and not be worried about road danger or experience threats	The development is designed to be car-free. The layout will improve safety by providing high-quality footway around the site, as well as conveniently located pedestrian/cyclist crossings. Lighting and passive surveillance from residential dwellings and commercial units will provide a safer environment. Provision of a bus/rail interchange will help create an active environment.
Things to see and do – people are more likely to use streets when the journey is stimulating, with attractive views, buildings, planting and street art. People will be less dependent on cars if facilities are within short distances	Landscaping will be provided as part of the proposals, creating an attractive environment. The western edge of the site will be provided with a creative artwork display, creating a more interesting journey for all site users and residents.
People feel relaxed – more people will choose to walk or cycle if streets are not dominated by cars and if pavements and cycle paths are not overcrowded, dirty cluttered or in disrepair	The layout will create a relaxing environment providing high-quality public realm environment, with convenient pedestrian crossings and footways (at least 2.5m wide) provided around the site. The development is designed to be car-free and majority of traffic is associated with deliveries, servicing and buses at the interchange. Lighting, as well as passive surveillance from residential dwellings and commercial units will help create a safer environment. Provision of trees along the eastern edge of the site will create a buffer between the footway and traffic along Western Avenue. Further measures to encourage the residents to travel by sustainable modes including high-quality, secure and sheltered cycle parking.
Clean air – improving air quality delivers benefits and reduces health inequalities	Provision of car-free development, high-quality cycle parking and the proposed bus interchange means that the more people will choose to use sustainable modes of travel improving air quality.

3.3 Access, refuse and servicing

Access

3.3.1 As outlined above, the development is designed to be car-free and, therefore, there will be no vehicular access to the site. However, pedestrians and cyclists will be able to access the building from Waungron Road (to the north), Western Avenue (to the east) and the new interchange road (to the west). These accesses will provide access to the main building and the access bike stores on the ground floor (see **Figure 3.4**).

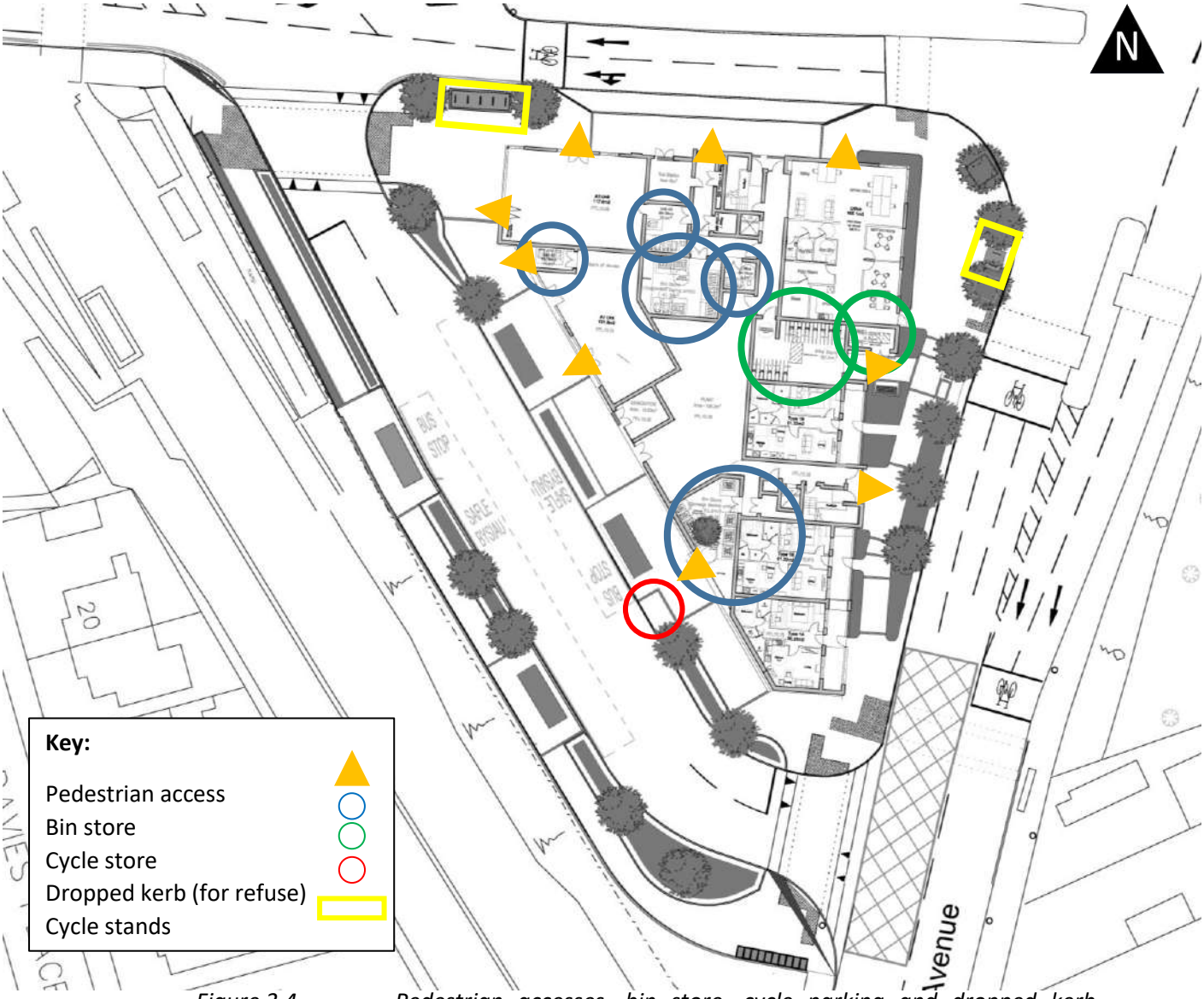


Figure 3.4 Pedestrian accesses, bin store, cycle parking and dropped kerb locations

Refuse

3.3.2 As outlined above, the residential and commercial refuse will be stored separately and five bin stores will be provided as follows:

- Four bin stores accessed off Waungron Road to serve the A1, the A3 unit, the B1 office unit and the residential dwellings fronting Waungron Road;
- One bin store accessed from the new interchange road to serve the residential dwellings fronting Western Avenue; and,

3.3.3 It is anticipated that residential refuse will be collected on-street from a loading on Waungron Road and from the new interchange road, by the local authority as part of the existing residential waste collection. It is likely that the residential element of the development is likely to generate a maximum of three trips per week on the same day. One refuse collection will be for general waste collections (bi-weekly) and one for recycling (weekly) and one for food waste (weekly). For refuse collection undertaken from the new interchange road, a dropped kerb will be provided to allow refuse operatives to wheel the bins and load these to the refuse vehicle.

3.3.4 In addition, refuse collection for retail (A1), retail (A3) and office (B1) units will also be undertaken from the loading bay on Waungron Road once per week.

3.3.5 It is considered that the refuse vehicle will have a negligible impact on the operation of the interchange road given that:

- Refuse will be collected once a week, generating a maximum of three deliveries per day;
- Refuse collection will be undertaken in 5 minutes or less;
- Refuse collection will be undertaken outside the AM and PM peak periods; and,
- The likely number of buses using the new interchange road is minimal.

3.3.6 A swept-path analysis of a refuse vehicle (based on Cardiff Council's Waste Collections and Storage Facilities SPG) is included in **Appendix E.**

Deliveries and servicing

3.3.7 It is anticipated that all other servicing and deliveries will be undertaken from a loading bay along the northern boundary of the site on Waungron Road. It is anticipated that an appropriate Traffic Registration Order (TRO) will need to be implemented to manage the use of the loading bay, prevent parking by unauthorised vehicles and ensure that vehicles do not stay at the bay for a prolonged period of time.

3.3.8 It is considered that a development of 44 dwellings, is likely to generate four servicing trips per day (6 days/week) and the commercial aspect of the scheme is likely to generate three trips per day for food deliveries and office supplies (see Section 4 for details). It is considered that these trips can be accommodated from the proposed loading bay provided on Waungron Road.

3.3.9 The maximum size of vehicle that would be reasonably expected to deliver is a 10m rigid vehicle. In practice, it is more likely that the maximum size of vehicle will be an 8m rigid vehicle, with transit sized vehicles being much more commonly used. It is considered that all deliveries will be undertaken outside the typical morning (0700-1000) and evening (1600-1800) peak hours. It should also be noted that small deliveries are increasingly being undertaken by cars or motorbikes/scooters (e.g. Deliveroo or Uber), which take up less space.

Sub-station

3.3.10 The proposed sub-station is located on the northern side of main building, and it is anticipated that the sub-station will be maintained and serviced from the loading bay on Waungron Road.

3.4 Cycle parking

3.4.1 To complement the development and enable a car-free lifestyle, generous cycle parking will be provided for residents and visitors of the site.

3.4.2 **Table 3.1** below outlines the required number of cycle parking spaces in accordance with Cardiff Council's adopted parking standards 'Managing Transportation Impacts (Incorporating Paring Standards) Supplementary Planning Guidance, July 2018'.

Table 3.1 Cycle parking provision

Land use	No. of units/ floor area	Cycle parking standards		Provision
		Parking spaces per bedroom/ Floor area	No. of spaces required	
Residential uses				
1 - bed flats	40	1	40	40
2-bedroom flats	4	1	8	8
Retail/A1				
Long-stay	101	2/100m^2	2	2
Short-stay	101	1/100m^2	1	1
Retail/A3				
Long-stay	118	2/100m^2	4	4
Short-stay	118	1/100m^2	2	2
B1 office				
Long-stay	165	2/100m^2	4	4
Short-stay	165	4 plus 1/1000m^2	5	5

3.4.3 It can be seen from the table above that the level of cycle parking proposed is in accordance with the adopted parking standards.

Residents

3.4.4 Residents' cycle parking (48 spaces) will be provided within the secure, accessible and convenient location on the ground floor. This bike store will be accessible from Waungron Road and from A48 Western Avenue. Each one-bedroom dwelling will be provided with one space per dwelling and two-bedroom dwellings will be provided with two cycle parking spaces.

3.4.5 A potential to provide a communal bike pump and a water station is being explored.

A1-A3 use staff and B1 visitors

3.4.6 A total of seven cycle parking stands (14 spaces) will be provided as part of the development for commercial space (office and retail) visitors and retail staff. Five of these cycle stands (10 spaces) will be provided adjacent to Waungron Road near the entrance to retail units. The other two cycle stands (four spaces) will be provided in the north-east corner of the site the office unit, adjacent to the A48/Western Avenue.

B1 use staff

3.4.7 A total of four staff cycle parking spaces (two stands) for the office space users will be provided within a dedicated cycle store on the ground floor level in a secure, convenient and accessible location with entrance from the A48/Western Avenue (see Figure 3.4).

Bus interchange users

3.4.8 In addition, to encourage sustainable travel, 10 secure cycle parking spaces will be provided along the western edge of the new interchange road (on the southern end of the interchange road) for users of the interchange and rail station (see Figure 3.4).

3.5 Parking provision

3.5.1 As outlined above, the proposed development of 44 dwellings, will be designed as 'car-free' and it is considered that residents of the development are likely to travel by sustainable modes (bus, rail, cycling or walking). In addition, commuter parking is unlikely as a bus/rail interchange is provided as part of the development. People arriving from other areas in Cardiff to the Waungron Interchange, are likely to use bus and/or rail. Staff of commercial uses have the opportunity to not commute by car, given public transport improvements and the proposed creation of a pedestrian and cyclist friendly environment near the site.

Parking survey

3.5.2 Following a pre-application consultation, a parking survey and a supporting technical note was prepared to help understand the existing parking stress in the area and consider the impact of the proposed development on parking (in an event where future residents own cars). The surveys were carried out over two weekday nights (Wednesday 10th and Thursday 11th of March, 2021).

3.5.3 During the night, the existing parking demand is at 63% and there are 48 space spaces available, before practical capacity is reached at 85%. Practical capacity is typically considered to be reached at 85%. Above this level, finding a space may become difficult and vehicles may need to circulate in an area. Also depending on the layout and width of the carriageway, streets fully parked on both sides may have fewer passing places, which can affect vehicle circulation in an area and possibly access by large vehicles. There are 81 unoccupied spaces. During the night, eight spaces are available on Waungron Road, 14 on St Fagans Road, 8 on Western Avenue service roads and 12 on Ely Road.

3.5.4 Daytime parking surveys were also undertaken to establish whether there is spare capacity to accommodate daytime commuter parking. Daytime parking beat surveys were carried out on Thursday 11th March and Saturday 13th March, 2021. During the day, the existing parking demand is at 63% and there are 48 spare space spaces available, before practical capacity is reached at 85%. There are 81 unoccupied spaces. During the day, there are 10 spaces available on Waungron Road, 12 on St Fagans Road, 7 on Western Avenue service roads and 12 on Ely Road.

3.5.5 Car ownership for the future residents is based on three similar areas within Cardiff – Pentrebane, Gabalfa and Tremorfa, in terms of tenure, house type and location. Car ownership at these sites varies between 0.26 to 0.3, and in these areas approximately 82-95% of dwellings are flats, with majority being one and two-bedroom. It should be noted that the three selected areas are not located near a rail/bus interchange, whereas the proposed development is, and therefore, it is likely that car ownership at the proposed development will be lower than predicted.

3.5.6 In the unlikely event that residents own a car, the maximum demand is likely to be approximately 13 cars (based on the higher car ownership rate of 0.3 observed in Gabalfa). In the event that residents own a maximum of 13 cars, these can be accommodated on Waungron Road, Western Avenue service roads, St Fagans Road and Ely Road. In addition, the additional 13 cars associated with residents would increase parking stress marginally from 63% to 69% during the day and night. This would leave approximately 35 spaces available before practical capacity is reached at 85% and 68 unoccupied spaces.

3.5.7 The full parking survey report is included in **Appendix F.**

Summary

3.5.8 It is also considered that a car-free development can be justified given that:

- The development will comprise of council accommodation, aimed at single occupancy tenants;
- The site lies on the boundary of the 'Central area' boundary and is within the maximum parking standards.
- Is in accordance with the national policy, which focuses on reducing reliance on a private car.
- The site is located within easy walk distance of local district areas provided at Fairwater Green local centre, Cowbridge Road East and High Street in Llandaff with majority of local facilities.
- The proposed development is designed to integrate with the proposed Waungron Interchange hub, further reducing the need to own a car.
- Complementary cycle parking will be provided on-site, in accessible, secure and convenient location on the ground floor.
- Parking stress in the area (during the day and the night) is 63% and there are 48 spaces available for parking before practical capacity is reached at 85%, suggesting that surrounding roads can accommodate residential parking during the night and commuter parking during the day.

4 Transport characteristics

4.1 Introduction

4.1.1 In order to assess the impact of the proposed development on the existing transport network, it is necessary to estimate the number of person trips generated by the proposed uses on the site.

4.1.2 This section therefore outlines the methodology used to predict the person trip generation (by mode) vehicle trip generation, based on a review of the TRICS 7.7.3 trip generation database.

4.1.3 It is anticipated that the retail/commercial and office space on the ground floor will generate a very limited number of trips. Retail space especially is likely to generate local trips from residents of the development and the surrounding area.

4.1.4 This section of the report summarises the number of trips generated by the proposed development.

4.2 Trip generation

Residential (44 dwellings)

4.2.1 It is considered that the number of trips associated with the accommodation provided by the development will be similar in that they are aimed at single occupancy with low car ownership levels.

4.2.2 Sites have been selected on the basis of the following criteria:

- Land use: Residential, affordable/local authority flats;
- Survey type: multi-modal;
- Survey days: Monday-Friday;
- Number of units: 0 - 191
- Location of selected sites: town centre, suburban area, edge of town centre;
- Geographical areas: UK (excluding Greater London, Northern Ireland and Republic of Ireland).

4.2.3 There is a limited number of car-free developments available on TRICS database in Cardiff. Therefore, sites with parking provision of less than one per dwelling were selected. A total of three sites have been selected. The AM, PM and daily number of trips generated is summarised in **Table 4.1** below, and presented in full in **Appendix G**. There is limited TRICS data available to obtain 85th percentile trip rates, therefore, average trip rates have been used.

Table 4.1 Weekday person trip rates – 44 dwellings

Time period	Arrival trip rate	No. of arrivals	Depart trip rate	No. of departs	Total trip rate	Total no. of trips
Total persons						
8am-9am	0.115	5	0.426	19	0.541	24
5pm-6pm	0.377	17	0.180	8	0.557	25
7am-7pm	3.198	141	3.327	146	6.525	287
Pedestrians						
8am-9am	0.082	4	0.262	12	0.344	15
5pm-6pm	0.262	12	0.066	3	0.328	14
7am-7pm	1.950	86	1.902	84	3.852	169
Cyclists						
8am-9am	0.000	0	0.016	1	0.016	1
5pm-6pm	0.000	0	0.000	0	0.000	0
7am-7pm	0.016	1	0.032	1	0.048	2
Public transport users						
8am-9am	0.011	0	0.000	0	0.015	1
5pm-6pm	0.033	1	0.000	0	0.033	1
7am-7pm	0.361	16	0.458	20	0.819	36
Vehicles						
8am-9am	0.033	1	0.660	29	0.099	4
5pm-6pm	0.115	5	0.082	4	0.197	9
7am-7pm	0.722	32	0.072	3	1.445	64

4.2.4 It can be seen from the table above that the proposed development could generate up to four (two-way) vehicle movements in the AM peak and nine (two-way) vehicle movements in the PM peak. It can also be seen that walking and public transport are likely to be the most popular modes of travel representing 72% of trips. It is considered that vehicle trips will be lower and cycling trips will be higher than predicted, given that the development is car-free, the proximity to the new bus/rail interchange and the public realm improvements in the vicinity.

4.2.5 It is considered that majority of vehicle trips generated by the proposed development will be taxi/Uber drop offs/pick-ups and delivery and servicing (refuse) trips.

Office (B1) and retail (A3 & A1)

4.2.6 Given that the development will be car-free, any vehicular traffic generated by these uses will be either deliveries, servicing and taxi/Uber drop-offs and pickups. It is considered that the majority of employees will have the opportunity to not use a car and may be likely to walk, cycle or use the interchange (bus or rail) to access the site, given that no parking is proposed on-site.

4.3 Potential impact

4.3.1 Based on the volume of trips (by mode) identified in the table above, it is considered that the proposed development will have a minimal impact on the surrounding transport network, and that the proposed development can be accommodated within the existing highway and public transport networks without increasing queues and delays for existing users.

Walking

4.3.2 The development is likely to generate 169 daily pedestrian movements. In addition, a further 36 daily public transport trips are likely to walk to reach public transport facilities. The majority of walking trips will be spread across a number of local roads and it is anticipated that there will be no adverse impact to the pedestrian network.

Cycling

4.3.3 It is highly likely that the proposed development will generate a higher proportion of cycling trips then predicted, given the proposed public realm improvements and given that it is car-free. It is started in the Cardiff Council Transport White Paper 2020 that by 2025, the desired target for cycling is 19%. Based on this, it is likely that cycling trips will be higher than predicted by the TRICS database and there may be up to 55 daily cyclist movements per day. The cycling trips will be spread across a number of local roads and it is anticipated that there will be no adverse impact to the cycle network. Whilst low, there are proposals across Cardiff to encourage active travel and this has the potential to increase.

Public transport

4.3.4 The development is likely to generate 36 public transport trips per day. These are likely to be mainly undertaken by bus and some by rail and it is considered that this level of additional passengers will not have a material impact on the public transport network.

4.3.5 It is also considered that the new interchange road will have a minimal impact on the surrounding road network, given that it is likely that only 8-10 buses per hour will be using the new interchange road.

Vehicles

4.3.6 It is considered likely that a total of 64 vehicle movements could be generated by the proposed development as a whole (residential, commercial and office), with four vehicle movements in the AM peak and nine in the PM peak. It is considered that majority of vehicle trips generated by the proposed development will be taxi/Uber drop offs/pick-ups and delivery and servicing (refuse) trips, given that the development will be car-free.

4.4 Servicing

4.4.1 It is considered that all deliveries will be undertaken from the proposed loading bay on Waungron Road along the northern boundary of the site on Waungron Road. It is anticipated that an appropriate Traffic Registration Order (TRO) will need to be implemented to manage the use of the loading bay, prevent parking by unauthorised vehicles and ensure that vehicle do not park in the loading bay for a prolonged time.

Servicing trips to the residential development

4.4.2 The likely number of deliveries is based on surveys undertaken at a residential development of more than 300 dwellings (in July 2020) in a town centre location with access to good public transport links. The surveys were undertaken during a period when restrictions in relation to COVID-19 were still in place and when the number of deliveries was likely to be higher than usual. This corresponded with increased proportion of people either working from home or being furloughed, and when the shops and restaurants were not fully open, therefore, resulting in higher number of food and other deliveries. The surveys indicated that the delivery trip rate per household is 0.1. The data has also indicated that 85% of deliveries were undertaken by LGV vehicles (small vans less than 3.5t) and 15% by OGV and HGV vehicles (3.5t or more). The busiest time for deliveries was between 10am-2pm, which is outside the AM and PM peak hours. It is likely that of the 64 daily vehicle movements, the residential element of the scheme is likely to generate four deliveries per day (eight movements).

Office (B1) and retail (A3 & A1)

4.4.3 It is likely that the commercial element of the scheme could generate a maximum of three deliveries per day (six movements in total) for food and office supplies.

Refuse collection

4.4.4 Residential and commercial refuse collection will be undertaken from the loading bay provided along the northern site frontage on Waungron Road and from the newly proposed interchange road.

4.4.5 It is likely that there will be a maximum of three refuse collections (food waste, recycling and general waste) per week, generated by the residential element of the scheme. It is considered that commercial and residential waste will be collected separately. Cardiff Council collects food and recycling waste weekly and general waste biweekly for residential dwellings.

4.4.6 It is understood that occupiers of the retail and the office unit will need to sign up separately for refuse collection and these would be undertaken once a week.

4.4.7 Based on the volume of trips identified above, it is considered that the proposed development will have a minimal impact on the surrounding transport network, and that the proposed development can be accommodated within the existing highway and public transport networks.

4.5 Conclusions

4.5.1 It is considered that the impact of the proposed development on the surrounding highway network will be minimal, and the proposed development could generate up to four (two-way) vehicle movements in the AM peak and nine (two-way) vehicle movements in the PM peak. It can also be seen that walking and public transport are likely to be the most popular modes of travel representing 72% of trips. It is considered that vehicle trips will be lower and cycling trips will be higher than predicted, given that the development is car-free, the proximity to the new bus/rail interchange and the public realm improvements in the vicinity.

4.5.2 It is considered that all deliveries and servicing will be undertaken from the proposed loading bay on Waungron Road along the northern boundary of the site. It is likely that of the 64 daily vehicle movements, the residential element of the scheme is likely to generate four deliveries per day (eight movements) and the commercial element of the scheme could generate a maximum of three deliveries per day (six movements in total) for food and office supplies. In addition, it is likely that there will be a maximum of three refuse collections per week, generated by the residential element and one by the commercial element (retail and office) of the scheme.

4.6 Design solutions and mitigation measures

4.6.1 This Transport Statement has demonstrated that the development will not have a significant impact on the surrounding streets and the following measures are proposed to reduce any impact further.

4.6.2 A range of measures are embedded within the scheme design including:

- High quality cycle parking provided in secure, easily accessible internal storage for residents of the development and a separate storage will be provided the office unit staff. Visitor and retail cycle parking will be provided as part of the landscaping.
- Mixed use development with residential, retail and office uses provided on the ground floor.
- Car-free development.
- Provision of a transport interchange, which encourages interchange between transport modes (bus and rail) and reduces reliance on a car.
- Improved permeability around the site with improved pedestrian and cyclist facilities and connections to the surrounding area, achieved by provision of generous footways and raised table crossings.
- New landscaping and public realm improvements with enhanced lighting, passive surveillance and planting.

5 Summary and conclusions

5.1 Background

5.1.1 Lime Transport has been commissioned by Cardiff Council's Housing Development team to prepare a Transport Statement in support of a full planning application for a mixed use development comprising 44 x 1 and 2 bedroom council apartments together with office and commercial spaces, provision of a new highway to accommodate a Bus Interchange, improved cycle and pedestrian access and associated works.

5.1.2 The proposed development site is located within a mainly residential area in west Cardiff and is provided adjacent to the Waun-gron Park station.

5.2 Development proposals

5.2.1 The development comprises:

- 40 x 1-bedroom council apartments;
- 4 x 2-bedroom council apartments;
- 165m^2 of B1 use on the ground floor;
- 118m^2 of A3 use on the ground floor;
- 101m^2 of A1 use on the ground floor;
- Secure cycle storage facilities, with space for up to 48 residents' cycles on the ground floor;
- Secure cycle storage facilities, with space for up to four bikes for the office staff on the ground floor;
- Cycle parking for retail staff and visitors; and,
- Communal area with seating and 'grow your own' areas provided for use by residents.

5.2.2 The development will be car-free given the anticipated low car ownership among the tenants and sustainable location of the site.

Access

5.2.3 The development is designed to be car-free and, therefore, there will be no vehicular access to the site. However, pedestrians and cyclists will be able to access the building from Waungron Road (to the north), Western Avenue (to the east) and the new interchange road (to the west). These accesses will provide access to the main building and the access bike store on the ground floor.

Refuse and servicing

5.2.4 It is anticipated that residential and commercial refuse will be stored separately and will be collected from Waungron Road or the new interchange road.

5.2.5 Residential refuse will be collected on-street from a loading on Waungron Road and from the new interchange road, by the local authority as part of the existing residential waste collection. It is likely that the residential element of the development is likely to generate a maximum of three trips per week on the same day. One refuse collection will be for general waste collections (bi-weekly) and one for recycling (weekly) and one for food waste (weekly). For refuse collection undertaken from the new interchange road, a dropped kerb will be provided to allow refuse operatives to wheel the bins and load these to the refuse vehicle.

5.2.6 In addition, refuse collection for retail (A1), retail (A3) and office (B1) units will also be undertaken from the loading bay on Waungron Road once per week.

Car and cycle parking provision

5.2.7 It is proposed that the development will be car-free. This is in accordance with national policy as it takes into account the sustainability of the site's location, the characteristics of the development and the local car ownership rate. It is considered that a variation from the local parking standards is justified in this case and a car-free lifestyle is a realistic option, given that:

- The development will comprise of council accommodation, aimed at single occupancy tenants;
- The site lies on the boundary of the 'Central area' boundary and is within the maximum parking standards.
- Is in accordance with the national policy, which focuses on reducing reliance on a private car.
- The site is located within easy walk distance of local district areas provided at Fairwater Green local centre, Cowbridge Road East and High Street in Llandaff with majority of local facilities.
- The proposed development is designed to integrate with the proposed Waungron Interchange hub, further reducing the need to own a car.
- Complementary cycle parking will be provided on-site, in accessible, secure and convenient location on the ground floor.
- Parking stress in the area (during both the daytime and the night time surveys) was 63% and there are 48 spaces available for parking before practical capacity is reached at 85%, suggesting that surrounding roads can accommodate residential parking during the night and commuter parking during the day.

5.2.8 Cycle parking will be provided in accordance with the adopted parking standards and visitor parking associated with commercial/retail and office use will be provided in convenient locations in close proximity to the building entrances.

Travel characteristics

5.2.9 It is considered that a total of four vehicle movements in the AM peak and nine in the PM peak could be generated by the proposed development. These are likely to be taxi drop offs and pickups and deliveries and servicing, given that the development is car-free.

5.2.10 Based on the level of demand it is considered that the impact of the proposed development on the surrounding transport network will be minimal.

5.3 Summary table

5.3.1 It is considered that the public transport network can accommodate the additional trips. **Table 5.1** below sets out the key transport impacts associated with the development.

Table 5.1 Summary of key transport impacts and solutions

	Key transport impacts/issues	Solutions/mechanisms
Site and surroundings	Practicalities of living car-free lifestyle	Inclusion of high-quality cycle facilities for residents. Provision of cycle parking for staff and visitors of the office and retail units. The site is well located with easy access to a wide range of facilities. Provision of a new bus interchange.
	Car-free development has potential to displace parking to surrounding streets	The site's sustainability and access to a wide variety of facilities and various sustainable transport modes (bus and rail, Next bikes and cycle routes) means that that the travel needs of future residents will be met. Night-time parking surveys showed that the surrounding streets operate at 63% capacity with 48 spaces available before practical capacity is reached at 85%.
	Car-free development has potential to increase commuter parking to surrounding streets	The site's sustainability and access to a wide variety of facilities and various sustainable transport modes (bus and rail, Next bikes and cycle routes) means that that the travel needs of future residents will be met. Daytime parking surveys undertaken within 200m of the site show that the surrounding streets operate at 63% capacity with 48 spaces available before practical capacity is reached at 85%.
Cardiff-wide network	Predominant increases in trips are by walking, cycling and public transport	Can be accommodated on the transport network. No action required.
	Effect of servicing trips particularly large vehicles	A loading bay will be provided along the northern site frontage on Waungron Road. This bay will be provided with parking restrictions to ensure that vehicles do not stay at the bay for a prolonged period of time.
	Effect of buses	Can be accommodated on the proposed transport network. It will be ensured that the new road is used by buses and refuse vehicles only.
During construction	Impact of construction traffic	Implementation of Construction Logistics Plan

Appendices

Appendix A - previous interchange

PROPOSED TOUCAN CROSSING FACILITY REFER TO DRAWING CO16017-500-01 & 02 FOR DETAILS

DIAG 1057 TO BE 2750mm HIGH

PROPOSED 225Ø CARRIER DRAIN TO CONNECT INTO THE EXISTING DRAINAGE OUTLET

PROPOSED TOUCAN FACILITY REFER TO DRAWING CO16017-500-01 & 02 FOR DETAILS

EXISTING BUS SHELTER TO BE REMOVED AND BUS STOP RELOCATED

PROPOSED ACCESS INTO DEVELOPMENT LAND TO BE TABLED

CARRIAGEWAY TEXT TO BE 1.6m HIGH

PROPOSED BUS SHELTER REFER TO BE SUPPLIED AND INSTALLED BY CCC NOMINATED CONTRACTOR

PROPOSED RETAINING WALL REFER TO DRAWING CO16017-2400-01 FOR DETAILS

PROPOSED TOUCAN FACILITY REFER TO DRAWING CO16017-500-01 & 02 FOR DETAILS

PROPOSED TOUCAN F TO DRAWING CO16017 DETAILS

DIAG 1004 DIAG 1018.1 DIAG 1001.2 DIAG 1038 DIAG 1001 DIAG 1009 DIAG 1003 DIAG 1025.1 DIAG 1004 DIAG 1001 DIAG

MANHOLE 1 CL - 12.32 IL - 10.44

MANHOLE 2 CL - 12.27 IL -

MANHOLE 3 CL - 12.79 IL -

MANHOLE 2 CL - 12.72 IL -

MANHOLE 2 CL - 12.29 IL -

KEY

- PROPOSED ALIGNMENT REFER TO DRAWING CO16017-1200-01 & 02 FOR DETAILS
- PROPOSED CARRIAGEWAY CONSTRUCTION REFER TO DRAWING CO16017-700-01 FOR DETAILS APPROXIMATE DEPTH 550mm
- PROPOSED 400x400x60mm PRECAST CONCRETE PAVING IN COLOUR SILVER GREY LAID ON 30mm BEDDING SAND ON 100mm TYPE 2 SUB-BASE
- PROPOSED FLEXIBLE FOOTWAY CONSTRUCTION AS STANDARD DETAIL HSM/HO/PC/1101-030 APPROXIMATE DEPTH 175mm
- PROPOSED 400x400x60mm TACTILE PAVING IN COLOUR RED LAID ON 30mm BEDDING SAND ON 100mm TYPE 2 SUB-BASE
- PROPOSED 400x400x60mm TACTILE PAVING IN COLOUR BUFF LAID ON 30mm BEDDING SAND ON 100mm TYPE 2 SUB-BASE
- PROPOSED 400x400x60mm CORDUROY PAVING IN COLOUR BUFF LAID ON 30mm BEDDING SAND ON 100mm TYPE 2 SUB-BASE
- PG — PROPOSED GULLY AS STANDARD DETAIL HSM/HO/PC/508-051
- PROPOSED 225mm PIPE
- PROPOSED 150mm PIPE
- MH — PROPOSED MANHOLE
- IC — PROPOSED TELEMATIC INSPECTION CHAMBER REFER TO DRAWING CO16017-500-01 & 02 FOR DETAILS
- TS — PROPOSED TRAFFIC SIGNAL REFER TO DRAWING CO16017-500-01 & 02 FOR DETAILS
- LB — PROPOSED CARRIAGEWAY LOOP BOX REFER TO DRAWING CO16017-500-01 & 02 FOR DETAILS
- CCTV — PROPOSED CCTV REFER TO DRAWING CO16017-500-01 & 02 FOR DETAILS
- B — PROPOSED 'MANCHESTER' GLASDON BOLLARD WITH RED/WHITE REFLECTIVE STRIP
- SL — PROPOSED TRAFFIC SIGN REFER TO DRAWING CO16017-1300-01 FOR DETAILS
- LC — PROPOSED STREET LIGHTING COLUMN REFER TO SPECIFICATION SHEETS
- PROPOSED AREA 100mm TOPSOIL AND GRASS SEEDED

NETWORK RAIL LAND

5m SHARED FOOTWAY | 3.5m BUS STOP | 3.5m RUNNING LANE | 3.5m RUNNING LANE | 3.5m BUS STOP | 5m SHARED FOOTWAY

PROPOSED DEVELOPMENT

PROPOSED RETAINING WALL

PROPOSED BUS SHELTER DESIGN TO BE AGREED

CYNGOR DINAS CAERDYDD
THE CITY OF CARDIFF COUNCIL

BSI FS 25745 — UKAS QUALITY MANAGEMENT 003

CARDIFF CAERDYDD

DESIGN CONTRACTS AND DELIVERY
DYLUNIO CONTRACTAU A DARPARU
Andrew Gregory
DIRECTOR FOR CITY SERVICES
CYFARWYDDWR GWASANAETHAU'R DDINAS

Rev	By	Date	Description of Amendment	Chk.by	Date

Project	WEST CARDIFF TRANSPORT INTERCHANGE
Title	GENERAL ARRANGEMENT SHEET 1 OF 2
Checked	CRH
Drawn	OM
Scale	1:200
Date	SEPT'16
Path	
Project Number	CO16017
Drawing Number	02

do not scale drawing except for planning application purposes

County Hall, Atlantic Wharf, Cardiff CF10 4UW
Telephone 029 2087 2456

PROPOSED FOOTWAY TO BE CONSTRUCTED ON EXISTING GRASS VERGE REFER TO DRAWING CO16017-SD01 FOR DETAILS

PROPOSED TOUCAN FACILITY REFER TO DRAWING CO16017-500-01 & 02 FOR DETAILS

PROPOSED TOUCAN FACILITY REFER TO DRAWING CO16017-500-01 & 02 FOR DETAILS

EXISTING LIGHTING AND FEEDER PILLAR TO BE RELOCATED TO THE BACK TO PROPOSED FOOTWAY

EVELOPMENT LAND

DIAG 1057 TO BE 2750mm HIGH

EXISTING TREE TO BE REMOVED

EXISTING BUS SHELTER TO BE REMOVED AND BUS STOP RELOCATED REFER TO INSERT A FOR LOCATION

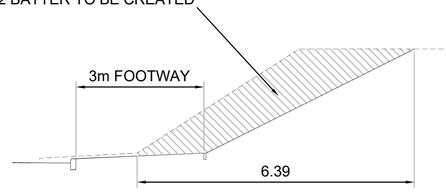
PROPOSED 300mmØ ELEPHANTS FEET AT 2m CENTERS

ER TO DETAILS

RELOCATED BUS STOP WITH ASSOCIATED CANTILEVER BUS SHELTER

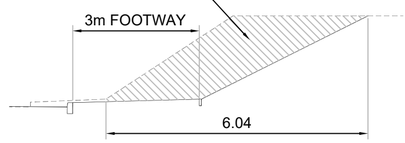
INSERT A

EXISTING EMBANKMENT TO BE DUG OUT
1:2 BATTER TO BE CREATED



SECTION A-A

EXISTING EMBANKMENT TO BE DUG OUT
1:2 BATTER TO BE CREATED



SECTION B-B

KEY

- PROPOSED ALIGNMENT REFER TO DRAWING CO16017-1200-01 & 02 FOR DETAILS
- PROPOSED CARRIAGEWAY CONSTRUCTION REFER TO DRAWING CO16017-700-01 FOR DETAILS APPROXIMATE DEPTH 550mm
- PROPOSED 400x400x60mm PRECAST CONCRETE PAVING IN COLOUR SILVER GREY LAID ON 30mm BEDDING SAND ON 100mm TYPE 2 SUB-BASE
- PROPOSED FLEXIBLE FOOTWAY CONSTRUCTION AS STANDARD DETAIL HSM/HO/PC/1101-030 APPROXIMATE DEPTH 175mm
- PROPOSED 400x400x60mm TACTILE PAVING IN COLOUR RED LAID ON 30mm BEDDING SAND ON 100mm TYPE 2 SUB-BASE
- PROPOSED 400x400x60mm TACTILE PAVING IN COLOUR BUFF LAID ON 30mm BEDDING SAND ON 100mm TYPE 2 SUB-BASE
- PROPOSED 400x400x60mm CORDUROY PAVING IN COLOUR BUFF LAID ON 30mm BEDDING SAND ON 100mm TYPE 2 SUB-BASE
- PG — PROPOSED GULLY AS STANDARD DETAIL HSM/HO/PC/508-051
- PROPOSED 50mm ORANGE FLEXI DUCT
- PROPOSED 2x100mm SOLID WALL ORANGE DUCT
- IC — PROPOSED TELEMATIC INSPECTION CHAMBER REFER TO DRAWING CO16017-500-01 & 02 FOR DETAILS
- TS — PROPOSED TRAFFIC SIGNAL REFER TO DRAWING CO16017-500-01 & 02 FOR DETAILS
- LB — PROPOSED CARRIAGEWAY LOOP BOX REFER TO DRAWING CO16017-500-01 & 02 FOR DETAILS
- CCTV — PROPOSED CCTV REFER TO DRAWING CO16017-500-01 & 02 FOR DETAILS
- B — PROPOSED 'MANCHESTER' GLASDON BOLLARD WITH RED/WHITE REFLECTIVE STRIP
- SL — PROPOSED TRAFFIC SIGN REFER TO DRAWING CO16017-1300-01 FOR DETAILS
- LC — PROPOSED STREET LIGHTING COLUMN REFER TO SPECIFICATION SHEETS
- ISL — ILLUMINATED TRAFFIC SIGN REFER TO DRAWING CO16017-1300-01 FOR DETAILS
- SB — PROPOSED STREET LIGHTING INSPECTION CHAMBER 300x450mm NAL 'STAKKABOX' MODULA
- PROPOSED AREA 100mm TOPSOIL AND GRASS SEEDED

FS 25745

CARDIFF CAERDYDD

DESIGN CONTRACTS AND DELIVERY
DYLUNIO CONTRACTAU A DARPARU
Andrew Gregory
DIRECTOR FOR CITY SERVICES
CYFARWYDDWR GWASANAETHAU'R DDINAS

Rev	By	Date	Description of Amendment	Chk.by	Date

Project: WEST CARDIFF TRANSPORT INTERCHANGE

Title: GENERAL ARRANGEMENT SHEET 2 OF 2

Checked: CRH
Drawn: OM
Scale: 1:200
Date: SEPT'16
do not scale drawing except for planning application purposes
Path:
Project Number: CO16017
Drawing Number: 03

CYNGOR DINAS CAERDYDD
THE CITY OF CARDIFF COUNCIL
County Hall, Atlantic Wharf, Cardiff CF10 4UW
Telephone 029 2287 2456

Appendix B - transport technical note

Project number:	20051
Prepared by:	RB/ABR
Subject:	Waun Gron Park Interchange
Date:	22nd September 2020
File name:	D1a

1 Introduction

1.1.1 Lime Transport has been commissioned by Cardiff Council's Housing Development team to review the design of the proposed Waun Gron Park interchange, as part of the proposed development of council accommodation at the former recycling centre adjacent to the Waun Gron Park railway station.

1.2 Background

1.2.1 As part of the re-development of the site, it is proposed to provide approximately 44 council accommodation dwellings, integrate this development with the proposed public transport hub, and create a safe and pleasant pedestrian/cycle friendly environment.

1.2.2 The location of the proposed development is shown in **Figure 1.1** below.

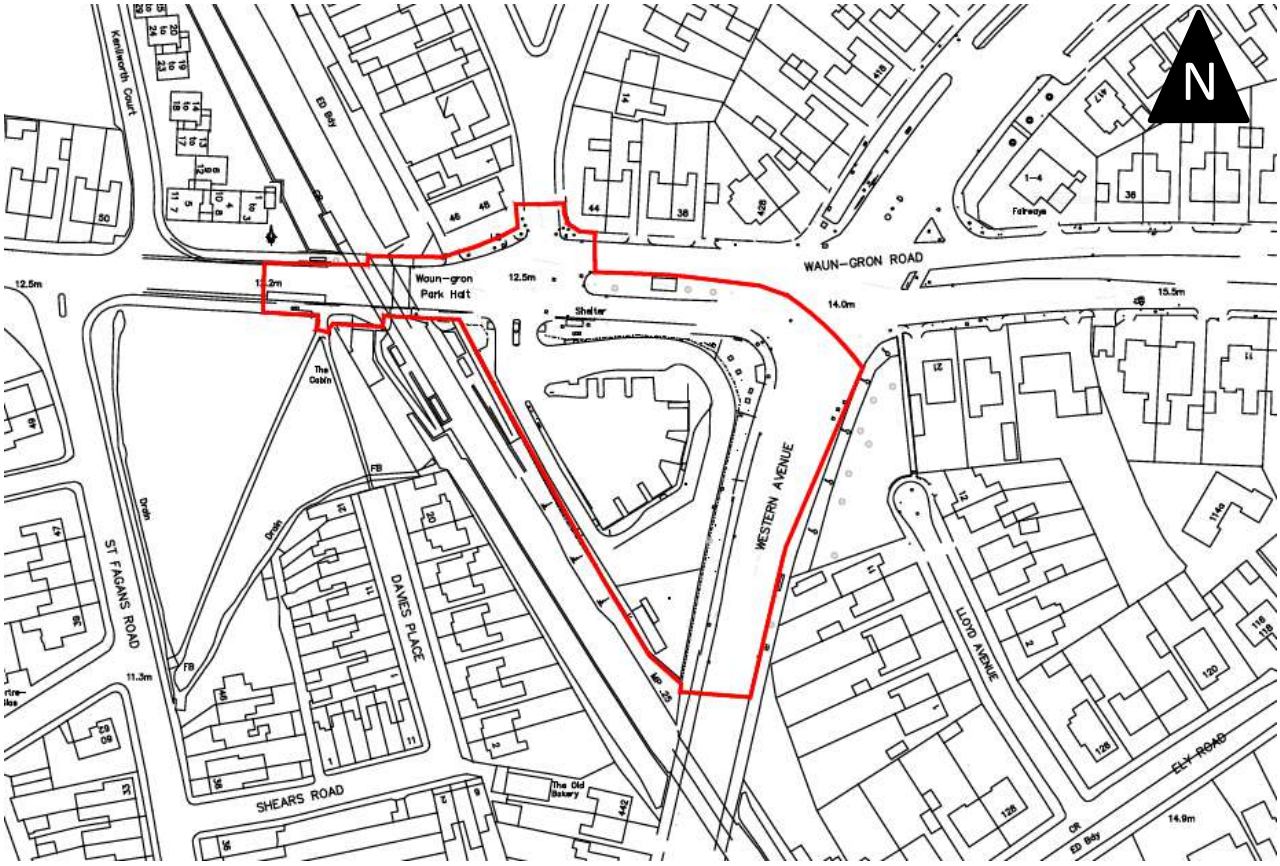


Figure 1.1 Site location

1.3 Purpose of the Technical Note

1.3.1 The purpose of this technical note is to review the proposed interchange access design and explore options to improve the public realm throughout the development.

1.3.2 Following this introductory chapter, the remainder of the report is structured as follows:

- Section 2 – provides a contextual appraisal of the local area, including a review of the 'travel to work' datasets from the 2011 Census data, the sustainability of the local area and access to local facilities;
- Section 3 – provides a review of the proposed interchange layout. This section reviews the potential options to improve and refine the layout including a review of the options to modify the approved public transport interchange; and,
- Section 4 – outlines the further improvements to the public realm that could be incorporated to provide a more pleasant environment, following the Healthy Streets approach.

2 Existing situation

2.1.1 The site is located on the outer edges of the Cardiff Central Area (as identified in Cardiff Council's 'Managing Transportation Impacts' SPG) and is located in a sustainable location. This section provides an introduction to 2011 Census data and the existing walking, cycling and public transport infrastructure.

2.2 2011 Census data

2.2.1 Census data shows that in this area of Cardiff, 70% of existing residents travel to work by car (as driver), with a further 5% travelling as a passenger. This is higher than the overall figure for Cardiff, with 59% driving to work and a further 5% travelling as passenger. In the LSOA, 11% travel by public transport and 12% walk or cycle to work.

2.2.2 Car ownership in the area is 1.51 cars per dwelling. However, only 1% of properties are of affordable dwellings, 93% comprise 3+ bedroom units and only 5% are flats. Therefore, it is considered that the car ownership in the area would not be comparable to that at the proposed development, which will comprise 100% of affordable, studio/1-bedroom flats.

2.2.3 Three areas in Cardiff have been identified, with a high proportion of 1-bedroom, affordable flats and within approximately 4-6km of Cardiff Central station. Car ownership in these areas is approximately 0.3 cars/dwelling and it is likely that the proposed development will have a similar level of car ownership.

2.3 Accessibility by walking and cycling

2.3.1 All of the roads within the vicinity of the site have footways on one or both sides of the carriageway that provide links between the site and the surrounding amenities and facilities.

2.3.2 The closest formal crossing to the site is a signalised crossing across Waun Gron Road, at the northern edge of the site. Additional formal crossings are incorporated within the Waun Gron Road/A48 Western Avenue signalised junction at the north-east corner of the site. These crossings provide convenient and safe access between the site and local facilities in the vicinity.

2.3.3 There is a wide variety of local amenities within walking distance of the site, in particular along the A48 (to the south) and St Fagans Road (to the west) and include:

- Fast food/takeaways;
- Gym;
- Food stores;
- Community Centre;
- Places of worship;
- Convenience goods/retail facilities;
- Healthcare/pharmacies/dentists;
- Western Business Centre;
- Post Office;
- Pubs/restaurants;
- Cafes; and,
- Leisure and recreation facilities.

2.3.4 The site is also located within the vicinity of a number of the following local centres, including:

- Waun Gron Road local centre (approximately 300m to the east), where a hairdresser salon, a foodstore and cafés are provided;
- High Street in Llandaff (approximately 970m north-east), where a wide variety of local cafes, shops, restaurants and health facilities are located;
- Cowbridge Road East in Canton (990m-2km south-east), where additional retail, leisure and cultural facilities are provided;
- A48/Western Avenue (600m-2km to the south), where a wide variety of retail, leisure health facilities are located. This road also provides access to Westren Business Centre; and,
- Paper Mill Road (900m-1km to the south-east), where leisure and employment facilities are located.

2.3.5 There are local on-road cycle routes provided along the A48 and Cowbridge Road East to the south. The closest national cycle route to the site is National Cycle Network (NCN) Route 8 – Lon Las Cymru, that runs between Cardiff and Holyhead – and the nearest access point is along the River Taff (accessed from the A48/Western Avenue), located approximately 1.6km north- west of the site. The route runs along the Taff Trail, and provides more local links to Cardiff Bay and north Cardiff.

2.3.6 There are two next bike hubs provided in the vicinity of the site, with one on St Fagan's Road 150m to the west, with six bike racks. Another cycle rack is provided on Waun Gron Road, approximately 300m to the east of the site, with eight bike racks. Additional next bike hubs are provided along St Fagan's Road, Victoria Park, Cardiff Road and the A48/Western Avenue.

2.4 Accessibility by public transport

Buses

2.4.1 The site is very well connected by public transport, providing connections throughout Cardiff and further afield. The nearest bus stops is provided adjacent to the site on Waun Gron Road (30m to the north). Additional bus stops are provided along the he A48/Western Avenue (90m to the east) and Waun Gron Road (300m to the east). Additional bus stop is provided 425m to the south of the site on Cowbridge Road East.

2.4.2 **Table 2.1** provides a summary of the routes serving the closest bus stops to the site.

Table 2.1 Summary of bus services

Route No.	Route	Walk distance (m)	Weekday Frequency
Waun Gron Road			
32A	Cardiff City Centre – St Fagans	30	6 per day
	St Fagans – Cardiff City Centre	90	
61	Cardiff City Centre – Pentrebane	30	5 per hour
	Pentrebane – Cardiff City Centre	90	
64	Cardiff City Centre – University Hospital Wales	30	8 per day
	University Hospital Wales – Cardiff City Centre	90	
320	Cardiff City Centre – Talbot Green	30	6 per day
	Talbot Green – Cardiff City Centre	90	
Western Avenue			
1/2 City Circle	Birchgrove	170	2 per hour
	Leckwith	90	
15	Cardiff City Centre – University Hospital Wales	170	6 per day
	University Hospital Wales - Cardiff City Centre	90	
Cowbridge Road East			
12	Leckwith – Canton – Mansell Avenue	425	6 per day
	Mansell Avenue – Canton – Leckwith	525	
13	Llandough - Cardiff City Centre – Michaelston Super Ely	425	2 per hour
	Michaelston super Ely – Cardiff City Centre - Llandough	525	
17	Cardiff City Centre – Canton – Ely	425	6 per hour
	Canton - Ely – Cardiff City Centre	525	
18	Cardiff City Centre – Canton – Ely	425	6 per hour
	Canton - Ely – Cardiff City Centre	525	
96A	Cardiff City Centre – Barry	425	

	Barry – Cardiff City Centre	525	4 PM only services (hourly)
X1	Culverhouse Cross – Pontprennau	425	3 per hour
	Pontprennau – Culverhouse Cross	525	

Rail services

2.4.3 The closest railway station is Waun Gron Park, which lies along the western boundary of the site. This station is located on the City Line, which runs between Radyr and Cardiff Queen Street via Fairwater. The station provides two trains per hour, with one eastbound service to Cardiff Central, Cardiff Queen Street and Coryton and one westbound service to Radyr. The journey time to Cardiff Central station is eight minutes, to Radyr it is 11 minutes and to Coryton it is 28 minutes.

3 Existing design review

3.1 Planning application

3.1.1 A planning application (no. 16/01565/MNR) for the proposed interchange was submitted in June 2016 and approved in November 2016. It is understood that when the provision of the interchange was being considered there were no proposals to develop the remainder of the site and, therefore, the functionality of the interchange was the primary concern.

3.1.2 The purpose of the interchange is to provide a convenient, frequent and well-connected public transport network in Cardiff (including cross-city and local routes) to provide access between new developments in outer Cardiff and Heath Hospital, Cardiff West and East and Cardiff Bay, as well as, help to achieve Cardiff Council's 50:50 mode shift target.

3.1.3 Following a review of the planning application and in particular, comments from the Llandaff residents' society it is clear, that the principle of the public transport interchange in this location was supported, but the design of the scheme was considered unattractive. The main criticism of the design was a wide carriageway, which was criticised for:

- increasing the opportunities for rat-running by other drivers;
- creating a complex and confusing road layout, which was perceived as unsafe for pedestrians; and,
- unattractive tarmac layout.

3.1.4 It has been suggested by the Llandaff society that a three-lane carriageway would be acceptable in this location, but the four-lane proposals are over-engineered. The residents' society has also suggested that the interchange could be provided along Waun Gron Road instead.

3.1.5 The agreed Waun Gron Park interchange layout is illustrated in **Figure 3.1** below.

Figure 3.1 Proposed Waun Gron Park interchange layout

3.1.6 It can be seen from the drawing that the total width of the carriageway width is 14m, with four lanes each 3.5m wide. The pedestrian crossings are approximately 15m wide, with an approximate crossing time of 13 seconds.

3.1.7 The current design focuses on the street as a function, rather than a street as a place for people to dwell and congregate or for pedestrians and cyclists to move around. It is, therefore, considered that there is scope to improve the proposed interchange design and create a more pleasant environment for pedestrians and cyclists, without impacting on the capacity of the interchange.

3.1.8 It is also considered that there is an opportunity to provide the infrastructure on a phased basis, by safeguarding land for future expansion.

3.2 Likely number of buses

3.2.1 As stated in section 2 of the report, the surrounding area is served by the following buses:

- Waun Gron Road: routes 32A, 61, 64 and 320;
- Western Avenue: City 1 (and 2), 15; and,
- Cowbridge Road East: 12, 13, 17, 18, 96A and X1.

3.2.2 At this stage, it is unknown whether the operators of bus services along Cowbridge Road East would consider re-routing all of the services via the proposed Waun Gron Road interchange. Therefore, the following assumptions should be treated as a maximum number of buses using the interchange:

- Phase 1 – 10 buses per hour during peak periods;
- Phase 2 – 25 buses per hour during peak periods;
- Potential future phase – 40 buses per hour during peak periods.

3.2.3 Based on the previous work on the bus interchange, with three bus stops northbound and two bus stops southbound, it is (simplistically) assumed that each bus stop has capacity to accommodate up to 8 buses per hour. It is, therefore, anticipated that the following maximum number of bus stops will be required:

- Phase 1 – two stops;
- Phase 2 – three to four stops;
- Potential future phase – five stops.

Phase 1 – one-way northbound (10 buses per hour)

3.2.4 As part of a first phase, a potential to provide a one-way system though the site to accommodate northbound and westbound services with two bus stops, and accommodate southbound and eastbound services with the existing bus stops on Waun Gron Road and western Avenue has been considered (see **Figure 3.2** below with swept-path analysis included in **Appendix A**).

3.2.5 With this option (a one-way bus system), the maximum number of buses likely to use the road will be 11 buses per hour during the peak hours (n-bound/w/bound routes 1 City, 15, 64, 61, 32A and 320). This excludes school buses, which will be an additional maximum of two buses in the AM peak only (total of 13 buses) and 0 in the PM peak.

3.2.6 The area immediately east of the through route can be 'safeguarded' to allow future expansion of the interchange (to accommodate two-way operation) and it is anticipated that the safeguarded land can be used to create a pleasant environment for people to congregate etc.

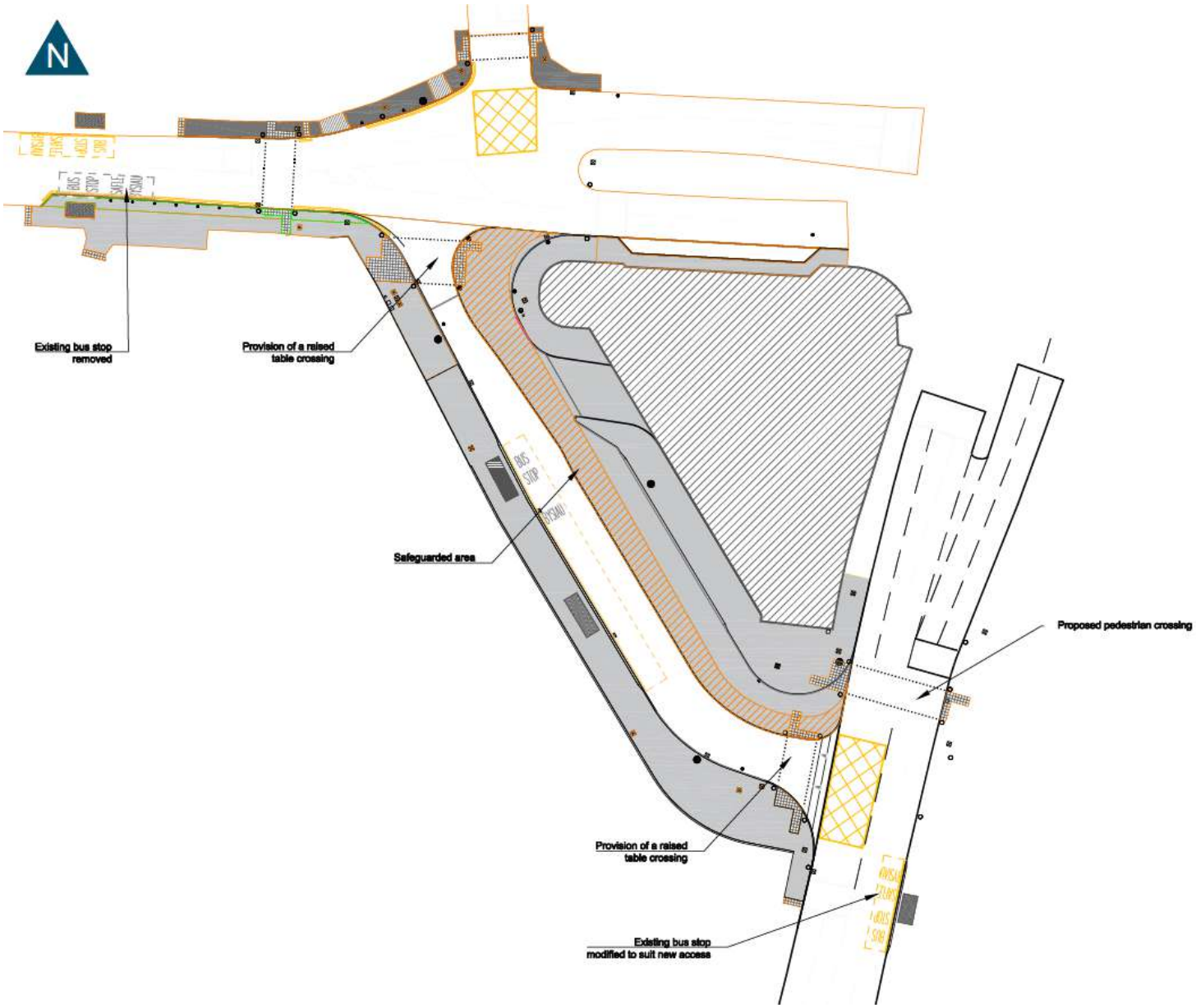


Figure 3.2 Phase 1 – one way northbound

Phase 2 – two way system with a maximum of 25 buses per hour

3.2.7 As part of phase 2, the interchange/through route can be expanded to provide a two-way system through the site to accommodate northbound /southbound and eastbound/westbound services within three to four bus stops (see **Figure 3.3** below with swept-path analysis included in **Appendix B**).

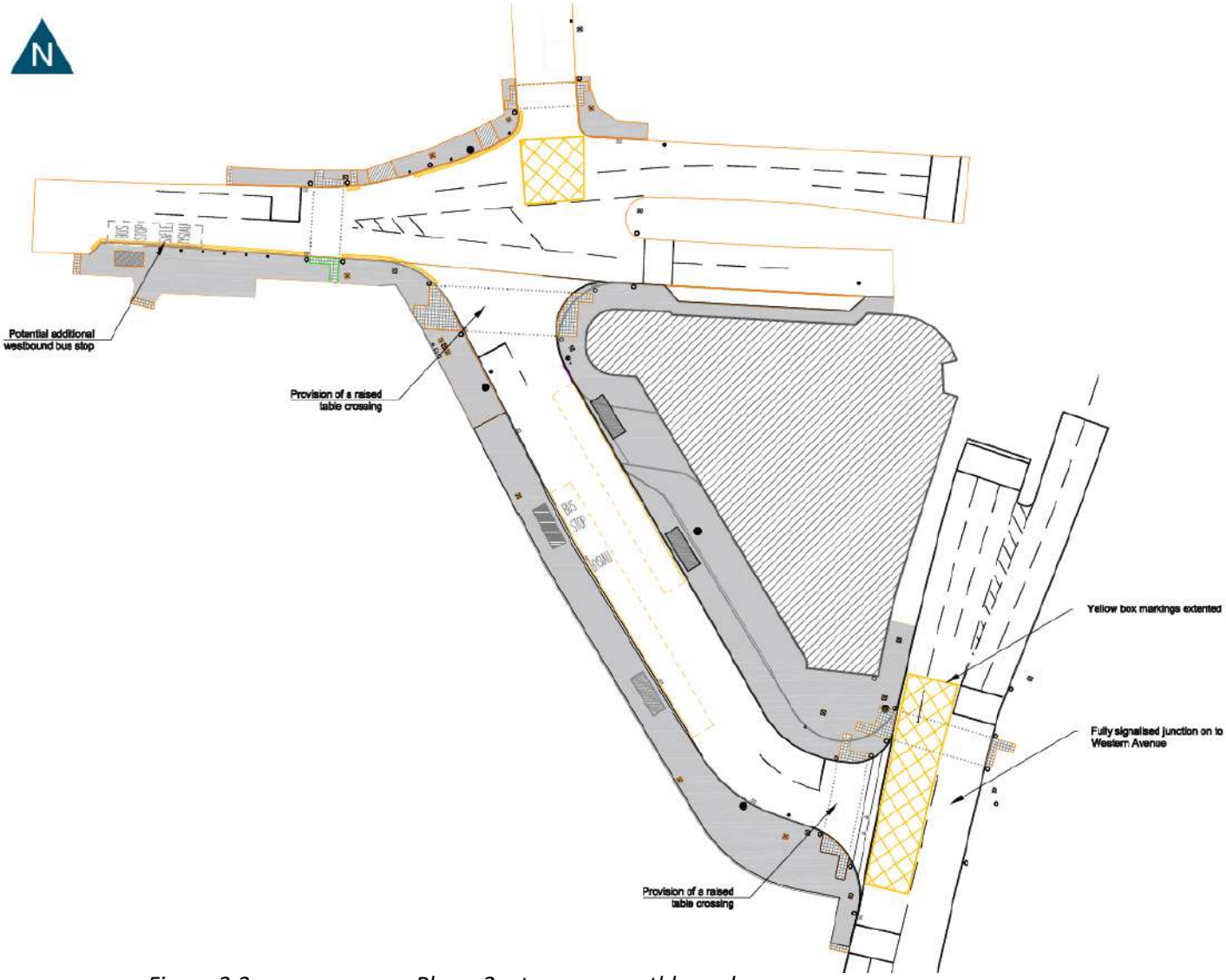


Figure 3.3 *Phase 2 – two way northbound*

3.2.8 It is envisaged that there will be 11 buses per hour (routes 1 City, 15, 64, 61, 32A and 320) travelling in the northbound direction and eight buses in the southbound (routes 32A, 61, 64 and 320) direction. The northern bus stop along Waun Gron Road is removed and only the southbound bus stop (serving routes 2 City and 15) is retained. This will result in 19 buses an hour, excluding school services. With the addition of school buses, it is expected that, a maximum of 21 buses could be using the new interchange in the AM peak and 19 in the PM peak.

3.2.9 It is anticipated that with the introduction of two-way flows through the interchange, the retained bus stops on Waun Gron Road (eastbound) and Western Avenue (southbound) could possibly be removed.

Potential future phase –two-way system with up to 40-45 buses per hour

3.2.10 With this option, the extent of public realm is greater than the approved scheme, without compromising the capacity of the interchange.

3.2.11 As part of the potential future phase, the two-way system through the site to accommodate northbound /southbound and eastbound/westbound services with between three and four stops will be retained and an additional bus stop will be provided, with total of five bus stops (see **Figure 3.4** below and **Appendix C)**.

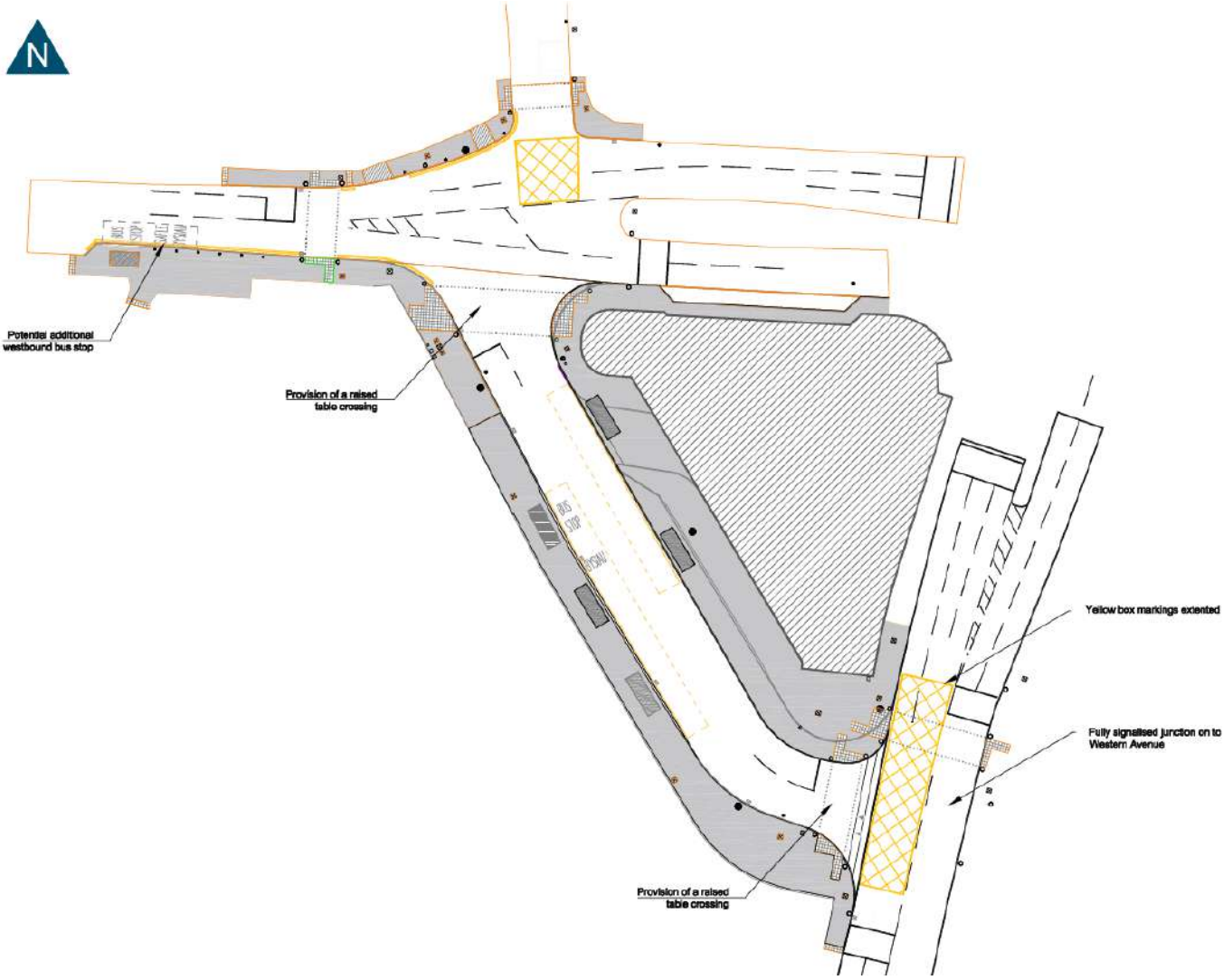


Figure 3.4 *Future phase – two-way system with up to 40-45 buses*

3.2.12 The bus stops provided as part of phase 2 will accommodate a maximum of 21 buses in the AM peak and 19 in the PM peak. With the addition of bus routes 17 (12 buses) and 18 (12 buses) diverted via the interchange, there will be an additional 20-24 buses, increasing the total two-way operation to a maximum of approximately 40-45 buses per hour (one bus arriving approximately every 1.3 minutes). It should be noted that there is likely to be 25 buses travelling northbound (one bus approx. every 2.5 minutes) and 20 buses travelling southbound (one bus every 3 minutes). Assuming that each stop can accommodate 8-10 services per hour, the proposed provision of five bus stop bays will be sufficient.

4 Improvements to the public realm

4.1.1 Following Section 3, this section explores additional improvements that could be provided as part of the improvements to the wider area.

4.1.2 The Healthy Streets for London provides a framework of policies and strategies to encourage active travel, tackle environmental issues, such as air pollution and congestion, as well as health issues associated with physical inactivity. The document states that re-examination of our streets is required, where walking, cycling and public transport is prioritised and the impact of cars (including safety, air pollution and congestion) are limited.

4.1.3 The Healthy Street Approach is based on the ten healthy streets indicators:

- Pedestrians from all walks of life – streets should be welcoming places for everyone;
- Easy to cross – to encourage walking and connect communities;
- Shade and shelter – to enable everyone to use streets regardless of the weather;
- Places to stop and rest – to meet the needs of those with limited mobility and to encourage interaction;
- Not too noisy – reducing the noise impacts will benefit health and improve ambience of streets and encourage interaction;
- People choose to walk, cycle and use public transport – a successful transport system encourages and enables people to walk and cycle.
- People feel safe;
- Things to see and do – people are likely to use streets when their journey is interesting and stimulating, with attractive buildings, street art and active shop frontages;
- People feel relaxed – where streets are not dominated by motorised traffic and pavements were not overcrowded, dirty, cluttered or in despair; and,
- Clean air – to reduce health inequalities.

4.1.4 Based on the above, it is considered that there is scope to provide the following facilities and improvements in the area surrounding the site:

- Raised table crossings at the northern and southern end of the interchange road;
- Sheltered bus stops;
- Seating areas/benches;