ATKINS

Wealdstone Town Centre

Transport Study

London Borough of Harrow

6 November 2017

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1. Introduction

Atkins in conjunction with Mark Projects have been commissioned by the London Borough of Harrow (LBH) to undertake a Transport Study for Wealdstone town centre, which aims to enhance the economic vitality of the town centre by enabling and supporting proposed developments through the provision of enhanced infrastructure for all modes of transport as well as public realm improvements.

1.1. Background

Wealdstone is located approximately in the centre of the London Borough of Harrow, and has good accessibility to public transport provided by Harrow and Wealdstone station and many bus routes. The A409 George Gange Way is a single carriageway road and is the main north / south route through Wealdstone. Wealdstone town centre and the nearby Harrow town centre, have been collectively named as the 'Heart of Harrow' by LBH in the 2013 Harrow and Wealdstone Area Action Plan (H&W AAP). This area has been identified by the Council and the Mayor of London as a priority area for regeneration and is designated in the Harrow Core Strategy and the London Plan (2011) as an Opportunity Area. The vision for the area as described originally in the H&W AAP (Harrow and Wealdstone Area Action Plan, July 2013) and updated in the draft Regeneration Strategy 2014 – 2026 is to deliver 5,500 new homes, two new schools and around 3,000 additional new jobs.

To this end, LBH are keen to unlock the development potential of Wealdstone by seeking investment for the development of key opportunity sites identified in the H&W AAP and to enhance the public realm to ensure the continued vitality of the Wealdstone and Harrow town centres. A number of issues such as busy roads, traffic congestion, poor cycle provision, limited routes and poor destination signage for pedestrians and poor public realm have been identified as key challenges to unlocking development potential. The 'ability to manage traffic movements including altering vehicle routings, managing the flow of people and vehicles are considered necessary to sustain the vitality of the town centre' (Harrow and Wealdstone Area Action Plan, July 2013).

The output from this study documents the processes (e.g. scoping, assessments, stakeholder engagement) which were undertaken during the study to provide an evidence base in terms of detailed traffic assessments and feasibility design proposals to support the economic viability and sustainability goals of Wealdstone Town Centre area.

1.2. Objectives

The redevelopment of these sites will change travel patterns and increase travel demand which will have implications for transport infrastructure in Wealdstone. The proposed redevelopments also offer the opportunity to achieve a shift to more sustainable travel, such as public transport, walking and cycling, through complimentary infrastructure provision that promotes these modes of transport over the use of the private car. This is crucial to delivering sustainable regeneration of Wealdstone Town Centre, given that the road network is already highly congested. The objectives of the study are as follows:

- Understand the current conditions in the study area for all modes of transport;
- Determine the change in traffic demand and impact on the highway network due to committed and known development proposals;
- Facilitate regeneration in the area by identifying opportunities and developing measures to:
  - Mitigate the impact of proposed development on the road network in the study area
  - Improve pedestrian and cycle access to the town centre, particularly east-west connections. This should include links from confirmed development sites;
  - Enhance the public realm in the study area, particularly within and around the core retail areas and the station;
  - Enhance connections to public transport and maintain journey times for buses; and
- As part of the development of measures investigate ways to reduce street clutter and contribute to improved air quality.

1.3. Structure

This report is structured as follows:

- Section 2 provides the policy context relevant to this study;
- Section 3 considers the proposed developments within the town centre and the surrounding areas;
- Section 4 outlines the existing situation and key issues in the study area, including an initial collision analysis;
- Section 5 summarises the urban design review undertaken;
- Section 6 details the base traffic modelling;
- Section 7 outlines design options;
- Section 8 describes the shortlisting of options;
- Section 9 provides an appraisal of the shortlisted options;
- Section 10 evaluates the shortlist options against TfL's Healthy Streets objectives; and
- Section 11 provides the conclusions and recommendations of the study

2. Policy Context

The following section demonstrates how the Wealdstone town centre transport study is aligned with local, regional and national policies and guidance.

2.1. Local Policy and Guidance

2.1.1. Harrow Core Strategy (2012)

The Harrow Core Strategy, adopted in February 2012, sets out Harrow's strategic approach to managing growth and development to 2026. The Harrow Core Strategy is consistent with national and regional policy, including the London Plan and the National Planning Policy Framework (NPPF).

The overall objectives of the Harrow Core Strategy area:

- To protect the historical and environmental features that contribute to Harrow's character and distinctiveness as a place to live, work and visit;
- Enhance the infrastructure, environment and other resources which make Harrow a desirable place to live, work and visit; by improving sustainable transport capacity, delivering a mix of homes and maintaining open space;
- Manage the borough's contribution to climate change and increase resilience to flooding to promote more sustainable patterns of land use and reduce reliance on private vehicles; and
- Adapt to population and demographic changes to meet people's needs and quality of life by securing high quality and accessible residential development and promoting walking and cycling.

Area objectives specific to Harrow and Wealdstone (Core Policy 2):

- Regenerate Wealdstone district centre, as redeveloping industrial estates contributes to long term growth and vitality;
- Improve the amenity and connectivity of Station Road;
- Strengthen the role of Harrow town centre;
- Increase the borough's 'visibility' to secure investment;
- Accommodate a minimum of 2,800 new homes and 3,000 new jobs;
- Improve accessibility to parks and open spaces by walking and cycling; and
- Ensure public transport links to employment opportunities outside the area.

The schemes developed as part of the Wealdstone town centre study aim to achieve these objectives by facilitating the regeneration of the town centre and improving the walking and cycling environment for all users in the local area. The scheme will also aim to achieve a consistent flow of traffic through the study area, maintaining the current level of throughput of vehicles. This transport study aligns with the strategic objectives and policies outlined in the Harrow Core Strategy as it aims to support the regeneration of Wealdstone town centre by enhancing sustainable transport capacity.

2.1.2. Local Development Framework – Harrow and Wealdstone Area Action Plan (2013)

The Harrow and Wealdstone Area Action Plan (H&W AAP), adopted in July 2013, develops the Harrow Core Strategy and aims to provide an overarching framework for the development and revitalisation of the "Heart of Harrow" areas, including Harrow and Wealdstone town centres, identified by the Council and the Mayor of London as a priority area for regeneration.

The aims of the AAP are to:

- Guide development and investment decisions in the Heart of Harrow over the next 15 years;
- Provide clarity and increased certainty about how places and strategic sites are to develop and change;
- Deliver the agreed vision for the area through policies and site allocations aimed at managing the distribution, scale, form and function of development across the Heart of Harrow;
- Identify and secure the coordinated delivery of social and physical infrastructure improvements;

- Determine the appropriate phasing of development, taking into account the need to ensure regeneration occurs across the whole area, including sites with greater constraints than others; and
- Assess and direct decisions on planning applications.

The general principles set out for Wealdstone in the AAP, relevant to this study, include:

AAP 3: Wealdstone

- Strengthen the identity of Wealdstone as a district centre and improve the vibrancy of the high street;
- New development within the three sub areas of Wealdstone is expected to contribute to a programme of urban realm enhancements based around Harrow and Wealdstone station;
- Proposals should contribute to the enhancement of the urban realm and visual amenity of the district centre as a key transport gateway into the Heart of Harrow; and
- Improve pedestrian and cyclist connections across and from the Wealdstone west sub area to Wealdstone district centre and beyond.

AAP 7: Creating a New Public Realm

- New areas of public realm designed to accommodate and strengthen pedestrian and cyclist linkages to surrounding areas;
- Reduction in street clutter and the rationalisation of existing street furniture wherever possible; and
- Priority will be given to the improvement of east-west connections in particular, linking the Kodak (Harrow View) development site in the west with Harrow Leisure Centre in the east.

AAP13: Housing within the Heart of Harrow

- Provision of a minimum of 2,800 net new homes by 2026; and
- Aligning with the London Plan tenure split – 60% affordable housing, 40% intermediate.

AAP19: Transport, Parking and Access within the Heart of Harrow

- All major development proposals should prioritise access by sustainable modes of transport – provision of safe and attractive walking routes to nearby facilities and to public transport;
- Provide safe and attractive routes that are easy to navigate and connect with existing walkways and link cycle routes to create a network; and
- Developments in Controlled Parking Zones (CPZs) are encouraged to be car-free.

The AAP also sets out the following sub-area and site specific guidance:

- Improvements to pedestrian and cyclist facilities under the railway line, linking Wealdstone town centre and the proposed development of the Kodak site;
- The Kodak redevelopment site target outputs are 1,230 jobs and 985 homes;
- The ColArt site redevelopment target outputs are 190 jobs and 195 houses;
- Public realm improvements at Harrow and Wealdstone station to safely connect pedestrians and cyclists to the High Street; and
- De-clutter George Gange Way to remove guard railings and provide new cycle crossing facilities.

The sub-area specific guidance recognises several development sites within Wealdstone town centre, but also notes that these provide an opportunity to enhance the public realm in the town centre and improve provisions for walkers and cyclists. This transport study aligns with the strategic objectives and policies outlined in the H&W AAP as it aims to mitigate increases in traffic due to developments, whilst improving the public realm and vitality of Wealdstone town centre.

2.1.3. Harrow Transport Local Implementation Plan 2011 / 12 – 2013 / 14

The Harrow Transport Local Implementation Plan (LIP) sets out how the borough proposes to implement the Mayor of London's Transport Strategy. It is a statutory document, produced under Section 145 of the Greater London Authority Act, 1999, with this version produced in response to the Mayor's Transport Strategy published in April 2010.

A particular challenge in Harrow, highlighted by the Mayor's Transport Strategy, is supporting sustainable population and employment growth. Harrow's population will continue to rise over the next decade, with 2500 new homes to be delivered in the Harrow and Wealdstone Intensification Area by 2026. As car ownership is

already high, promoting sustainable transport use will become increasingly important, and the borough will look to address the low levels of cycling in the borough compared with other parts of London.

The following actions have been identified in relation to the Mayor's goal of supporting economic development and population growth relevant in Wealdstone:

- Work with TfL to improve bus service reliability and to improve orbital bus links between the town centres and major employment locations and to other key destinations within Harrow and neighbouring boroughs;
- Ensure the vitality of town centres are supported through good transport access via all modes of transport, prioritising sustainable modes of transport;
- Improve transport connectivity within the Intensification Area between Harrow town centre and Wealdstone including the provision of in-station cycle parking;
- Improve the environment for pedestrians and cyclists in the whole borough and particularly within the Harrow Intensification Area;
- Monitor and review the provision and operation of CPZs in all areas of the borough experiencing on-street parking stress;
- Recognising that road transport will remain the basis for freight movement, delivery and servicing provision within Harrow, the Council will promote and maintain local area lorry bans together with supporting initiatives to move freight by non-road transport modes;
- Support the local economy by promoting short stay on-street parking and by discouraging long-stay parking;
- Attempt to improve air quality and reduce CO_2 emissions in Harrow, focused on reducing emissions from road traffic;
- When considering housing developments, the council will encourage developers to explore the potential for schemes to provide access to cars without individual ownership, perhaps linked to inducements to use other modes; and
- Ensure convenient access for walking, cycling and public transport be required in the design and layout of new development.

This study will directly align with the priorities set out within the Harrow Transport LIP, to provide sufficient transport for a growing population within the borough, whilst also looking to regenerate the town centre and promote economic growth. Due to the number of developments proposed for Wealdstone and the surrounding area, it will be essential to ensure that the existing road network will cope with additional trips, with sustainable transport promoted and enhanced to increase the numbers of walkers and cyclists, and those using public transport, within the borough.

Key themes to achieving Harrow's objectives, as set out in the LIP, include upgrading public transport and reviewing gaps in the provision of local bus services, using green links and completing London Cycle Network routes to improve connectivity and safety for cyclists and improving orbital transport, such as connecting to Crossrail and High Speed 2 (HS2) rail lines. Actions to address the objectives on air quality include restrictions on heavy goods vehicles and increasing the number of trees in both major and neighbourhood schemes.

2.1.4. Harrow Regeneration Strategy 2014-2026 (November 2014)

The Harrow Regeneration Strategy, adopted in November 2014, aims to deliver three core objectives of place, community and business by delivering the H&W AAP, investing £1.75bn in the Heart of Harrow Opportunity Area. The aim is to provide 5,500 new homes, two new schools and 3,000 new jobs. The following goals have been set out by the Harrow Regeneration Strategy:

- Meet the demands of a growing population;
- Build on skills base to support sustainable business growth;
- Deliver more jobs and homes to meet targets agreed with the Mayor;
- Increase accessibility to an increasing customer base;
- Provide an environment which promotes physical activity and healthy living; and
- Achieve a step change in the quality of design and development.

Strategic sites in the pipeline identified by the Regeneration Strategy include:

- Redevelopment of the Kodak Site (Harrow View) providing 985 residential dwellings, 1,230 jobs, 220 student dwellings, senior living facilities, a three-form entry primary school and leisure and community centre facilities; and
- Redevelopment of the ColArt site with target outputs of 195 houses and 190 jobs.

The redevelopment of the Kodak and ColArt sites alone will provide the biggest opportunity to regenerate Wealdstone district centre. In addition to providing new houses and services, the Regeneration Strategy aims to increase accessibility to the town centre for a growing number of residents, improve the public realm to encourage users to the town centre, and provide an environment that encouragers users to walk and cycle.

2.1.5. Harrow Cycling Strategy 2015 – 2018

According to the Mayor's Vision for Cycling, two-thirds of London's cycling potential exists in outer London where around half of all car trips are less than 2km and public transport provision is less comprehensive than central London. The Harrow Cycling Strategy recognises the role of cycling as both a sustainable transport mode and leisure activity, and the Council has highlighted a need for good quality and safe infrastructure in the borough. The pressures driving the strategy include a growing population, growth in demand for motorised travel and health and wellbeing. The council aims to achieve a 5% modal share for cycling by 2026, as outlined in the Mayor's Transport Strategy.

Harrow's Cycling Strategy recognises that, as of December 2014, the borough has 41km of on-road cycle routes, 4.8km of off-road and 6.5km of Greenway cycle routes. The Strategy recognises the need in the borough to provide a more comprehensive cycle network, providing safe facilities for entire journeys. This is especially important as the most frequent answer in a TfL survey for non-cyclists not wanting to take up cycling was due to concerns for personal safety.

A focus for the Wealdstone Transport Study will be to enhance the cycling network, as the current provision features incomplete and disjointed routes, many of which are on-carriageway and perceived as unsafe by potential users. Previous focus within the borough has been on road sections with safety risks and where it is low cost to install schemes, which has resulted in sections of the borough having breaks in cycling infrastructure, therefore not enabling continuous cycling routes.

The Harrow Cycling Strategy aims to overcome the barriers to cycling and increase the number of cyclists by achieving the following:

- Creating a safer and better environment that supports cycling as an equal mode of transport;
- Promote cycling as a convenient, secure, inclusive and enjoyable activity;
- Elevating cycling as an important sustainable mode of travel in the borough; and
- Facilitating and supporting bicycle ownership / access.

The strategies to overcome barriers to cycling, particularly relevant to Wealdstone town centre include improving permeability across the cycle network through improved routes and crossings, utilise development planning powers to create cycle routes through new developments, introduce traffic restraint measures and utilising funding to enhance cycling provision.

2.1.6. Harrow Air Quality Action Plan (Review and Assessment, April 2010)

The LBH declared the whole borough as an Air Quality Management Area (AQMA) in 2002, as a review and assessment of the air quality predicted that pollutants PM_{10}s (small particles) and NO_2 (Nitrogen Dioxide) were likely to exceed nationally set objectives. The Air Quality Action Plan contains new policies to improve air quality in Harrow, linked to the Local Plan and taking the Mayor's Air Quality Strategy into account.

As road traffic is the main source of NO_2 and a major source of fine particle emissions within the borough, most of the measures within the Action Plan relate to attempting to reduce the emissions from this source. The following policy categories are relevant to the transport study for Wealdstone:

- Reducing road traffic – discouraging non-essential journeys by road
- Promoting alternative modes of transport to the private car;
- Encouraging walking as a means of travel;
- Encouraging cycling as a means of travel; and
- Encourage development which does not impact upon air quality.

The most notable policies from the Air Quality Action Plan relevant to the transport study include reallocating road space for buses, walkers and cyclists, supporting initiatives to move freight by non-transport modes, increase efficiency in the use of road space by using new technology and signal control and managing the highway in the context of a broader urban design strategy.

By aligning this study with the policies recognised within the Action Plan, the study can mitigate against future population and traffic growth that is associated with increasing air pollution in London. This is particularly important in Wealdstone as it has been highlighted as an Air Quality Focus Area by the Mayor of London, meaning efforts should be made to reduce congestion, and therefore pollution, within the town centre.

2.2. National and Regional Policy and Guidance

The H&W AAP aligns with several national and regional policies and guidance, including:

2.2.1. The National Planning Policy Framework

The National Planning Policy Framework (NPPF) came into effect in March 2012 and is intended as a framework for the development of local and neighbourhood plans.

The NPPF emphasises that the purpose of planning is to help achieve sustainable development, resulting in positive growth and economic, environmental and social progress. Proposed development that accords with an up-to-date Local Plan should be approved, and any proposed development that conflicts should be refused unless other material considerations indicate otherwise.

The NPPF sets out twelve core land-use planning principles, and the relevant principles specific to the development of Wealdstone town centre are as follows:

- Proactively drive and support sustainable economic development to deliver the homes, business and industrial units, infrastructure and thriving local places that the country needs;
- Encourage the effective use of land by reusing land that has been previously developed (brownfield land), provided it is not of high environmental value;
- Actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling, and focus significant development in locations which are or can be made sustainable;
- Take account of the different roles and character of different areas, promoting the vitality of our main urban areas; and
- Promote mixed use developments and encourage multiple benefits from the use of land in urban and rural areas.

The NPPF suggests that policies should promote competitive town centre environments and set out plans for management and growth in these areas. The following should be considered by local planning authorities in relation to town centres:

- Recognise town centres as the heart of their communities and pursue policies that support their viability and vitality;
- Promote competitive town centres that provide customer choice and a diverse retail offer and which reflect the individuality of town centres;
- Ensure markets remain attractive and competitive by enhancing existing markets and creating new ones;
- Allocate a range of suitable sites to meet the scale and type of mixed use development within the town centre; and
- Recognise that residential development can play an important role in ensuring the vitality of centres and set out policies to encourage residential development on appropriate sites.

The NPPF guidance has been used to inform the regional and local policies developed by the Mayor of London and the London Borough of Harrow. This transport study will align with the NPPF's core principle of sustainable development by assessing the transport impacts of new developments and providing improvements to the pedestrian and cycling infrastructure across Wealdstone town centre. The study will align with the NPPF policy to ensure the vitality of town centres, enhancing Wealdstone as a competitive town centre, providing a diverse retail offer and ensuring edge of centre sites are well connected to the town centre, therefore encouraging economic growth in Wealdstone.

2.2.2. The London Plan (2015)

The London Plan, as prepared by the Mayor of London, is the overall strategic plan for London, setting out a full integrated economic, environmental, transport and social framework for the development of the capital between 2011 and 2031. The objectives of the policies of the plan are translated into more local planning policy by the boroughs. The development plans for the borough must conform to the policies within the London Plan, which must conform to national government policies.

The Mayor's vision aims to ensure that London is:

1. A city that meets the needs of economic and population growth;
2. An internationally competitive and successful city;
3. A city of diverse, strong, secure and accessible neighbourhoods;
4. A city that delights the senses;
5. A world leader in improving the environment; and
6. Easy, safe and convenient to access jobs, opportunities and facilities.

Key policies from the London Plan relating to the Wealdstone town centre scheme are as follows:

- **Policy 2.15 Town Centres:**
  - Town centres should provide the main focus beyond the Central Activities Zone (CAZ) for commercial development and intensification, including residential development; and
  - Development proposals should sustain and enhance the vitality and viability of the centre.

  By improving the street scene and attractiveness of using the town centre the proposed scheme should help to achieve this objective by attracting inward investment in Wealdstone.

- **Policy 6.7 Better Streets and Surface Transport:** The Mayor will work with TfL and boroughs to implement London-wide improvements to the quality of bus, bus transit and tram services and pleasant walking routes to bus stops. The proposed scheme will aim to improve the connectivity to bus services in Wealdstone, by improving the public realm in the town centre, in addition to scheme proposals that offer benefits to bus journey times.

- **Policy 6.9 Cycling:** The mayor will work with all relevant partners to bring about a significant increase in cycling in London, so this accounts for at least 5% modal share by 2026. The H&W AAP identifies a need to improve the cycling network in Wealdstone, particularly to improve east-west connections.

- **Policy 6.10 Walking:** The mayor will work with all relevant partners to bring about a significant increase in walking in London, by emphasising the quality of the pedestrian and street environment, including the use of shared space principles. The scheme will promote improved connections for pedestrians to / from and within the town centre, particularly aiming to provide connections from the proposed Kodak development in the west with Wealdstone town centre, Harrow and Wealdstone station, Station Road to the south and Harrow leisure centre in the east.

- **Policy 6.11 Smoothing Traffic Flow and Tackling Congestion:** Local Implementation Plans (LIPs) should take a strategic approach to smoothing traffic flow and tackling congestion through implementations and recommendations of the Road Task Force report. An integrated package of measures should promote local services to reduce the need to travel, improve the extent and quality of the pedestrian and cycling network and improving the extent and quality of public transport. Considerations will be made to mitigate issues arising from additional transport on the network in Wealdstone due to new developments, with traffic modelling used to predict future flows and impacts of proposed schemes on the highway network. Any proposed development site will have an associated Transport Assessment (TA) that will assess the impact of the development on the highway network and proposals for improved walking and cycling connections.

- **Policy 7.5 Public Realm:** London's public spaces should be secure, accessible, inclusive, connected, easy to understand and maintain, relate to local context, and incorporate the highest quality design landscaping, planting, street furniture and surfaces. Development should make the public realm comprehensive at a human scale using gateways, focal points and landmarks. The proposals for Wealdstone town centre will be developed in context of the surrounding built landscape, creating a change in perception of the environment which should influence driver behaviour, placing a greater emphasis on the movement of non-motorised users.

2.2.3. The Mayor's Transport Strategy (2010)

The Mayor's Transport Strategy (MTS) is the principal policy tool through which the Mayor exercises his responsibility for the planning, management and development of transport in London. The MTS takes into account the London Plan and the Mayor's Economic Development Strategy.

The MTS sets out the following vision for London's transport system:

"London's transport system should excel among those of global cities, providing access to opportunities for all its people and enterprises, achieving the highest environmental standards and leading the world in its approach to tackling urban transport challenges of the 21st century."

Key proposals from the MTS relevant to the Wealdstone Town Centre scheme are:

- **Proposal 23**: The Mayor, through TfL, and working with the London boroughs and other stakeholders, will keep the development of the bus network under regular review, including reviews of the strategic priorities underlying the process approximately every five years, to ensure it caters for growth in population and employment, while maintaining ease of use, attractive frequencies and adequate capacity, reliable services, good coverage and good interchange with other modes. All proposals for change will be appraised to ensure that they deliver good value for money and that the funds available are being invested in optimum service improvements.
- **Proposal 30:** The Mayor, through TfL, and working with the London boroughs, will introduce measures to smooth traffic flow to manage congestion for all people and freight movements to maximise efficiency of the road network;
- **Proposal 54:** The Mayor, through TfL, and working with the London boroughs, will deliver improvements to cycling infrastructure and training to support the cycling revolution;
- **Proposal 60:** The Mayor, through TfL, and working with the London boroughs, will improve the walking experience by enhancing the urban realm and taking focused action to ensure safe, comfortable and attractive walking conditions;
- **Proposal 83:** The Mayor, through TfL, and working with the London boroughs and other stakeholders, will use the principles of 'better streets' to seek to improve town centres, in particular: removing clutter and improving the layout and design of streets; enhancing and protecting the built and historic environment; increasing the permeability of streets; and creating clear and easily understandable routes and spaces to make it easier for cyclists, pedestrians and disabled people to get about.

The MTS, in conjunction with the London Plan, has informed the proposals in the H&W AAP with aims to ensure that new developments do not have an adverse effect on the road network in Wealdstone, and improvements are made to the connectivity of walking and cycling routes in the town centre to encourage travel by sustainable modes.

2.2.4. Cleaning the air: The Mayor's Air Quality Strategy (December 2010)

In line with the Government's National Air Quality Strategy, the Mayor of London has a legal responsibility to prepare and review an Air Quality Strategy for the Greater London Area. The overall aim of the Strategy is to reduce air pollution in London and thereby improve the health of Londoners. In doing this, London will also achieve compliance with nationally prescribed air quality standards and objectives. The Mayor's vision for air quality is to protect the health of Londoners and enhance their quality of life by improving the quality of air in London, which will:

- Make London are more pleasant place to live and work in;
- Reduce the burden on health services in the capital;
- Enhance London's reputation as a green city – making it more attractive to tourists and businesses; and
- Make London cleaner whilst safeguarding its biodiversity.

2.2.4.1. London Atmospheric Emissions Inventory (LAEI) 2013 Air Quality Focus Areas (updated December 2016)

Across London, there are 187 Air Quality Focus Areas, which are locations that exceed the EU annual limit value for NO_2 in addition to being locations with high human exposure. They are areas where the GLA believe air quality issues are the most acute.

The LAEI identifies five Air Quality Focus areas within the LBH, one of which is in Wealdstone, particularly the area outside Harrow and Wealdstone station and the A409 George Gange Way. As pollution levels have already been recognised as exceeding the EU annual limit in Wealdstone, and with traffic as the major contributory factor, it is imperative that this transport study reduces congestion and encourages sustainable methods of transport in Wealdstone town centre.

3. Area Specific Proposals

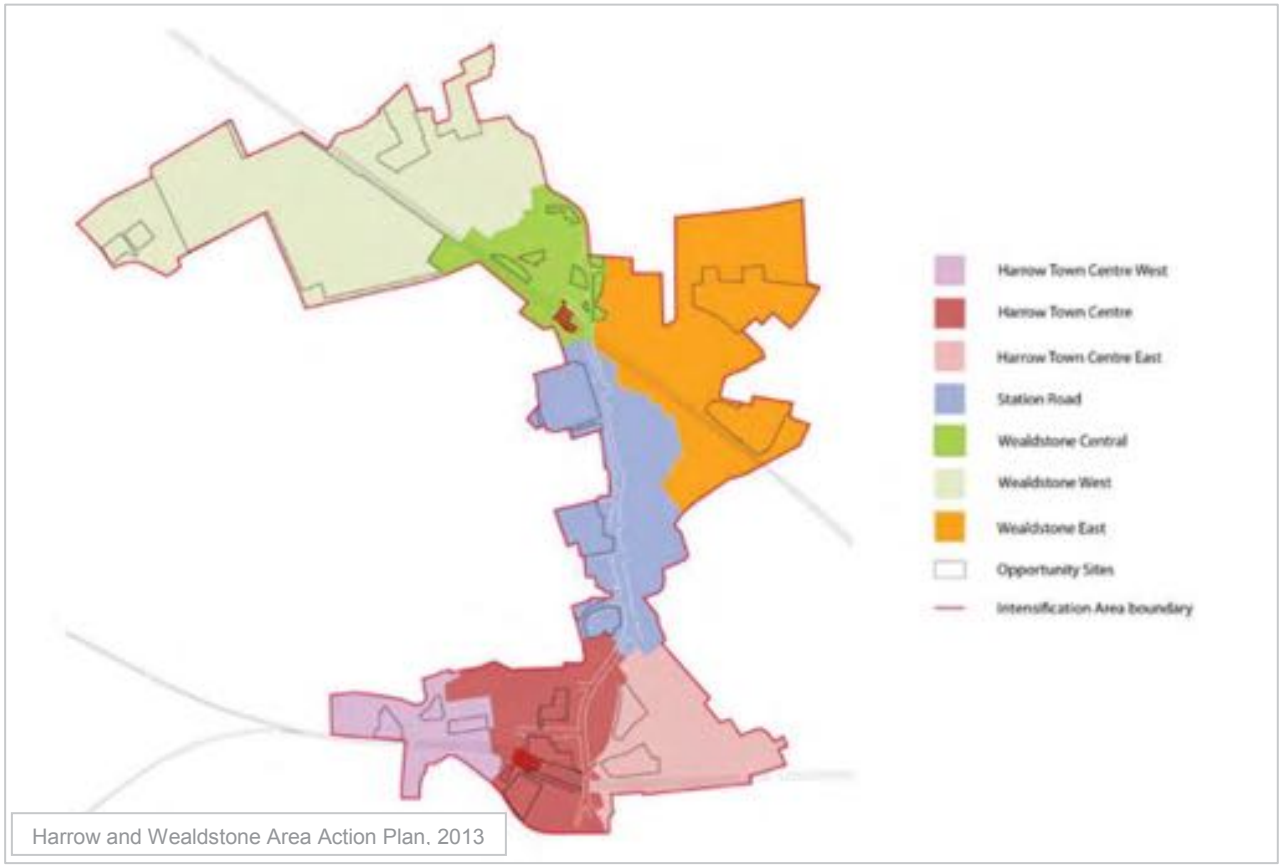
A key objective of the H&W AAP is to take advantage of opportunity sites for re-development within the borough to meet the housing and job provision targets for the area. The transport study must take into account these development opportunities and consider their transport impact. Transport infrastructure interventions will need to be identified that accommodate the forecast changes in travel demand, promote a shift to more sustainable modes of travel and support regeneration by enhancing the public realm and vitality of Wealdstone town centre.

3.1. Opportunity Areas

The H&W AAP identifies seven sub-areas within the Heart of Harrow with 22 opportunity sites, as identified in Figure 3-2. Several of these proposals are located within the vicinity of Wealdstone Town Centre and will potentially impact the current transport facilities. The sub-areas and opportunity sites are as follows and shown on Figure 3-1:

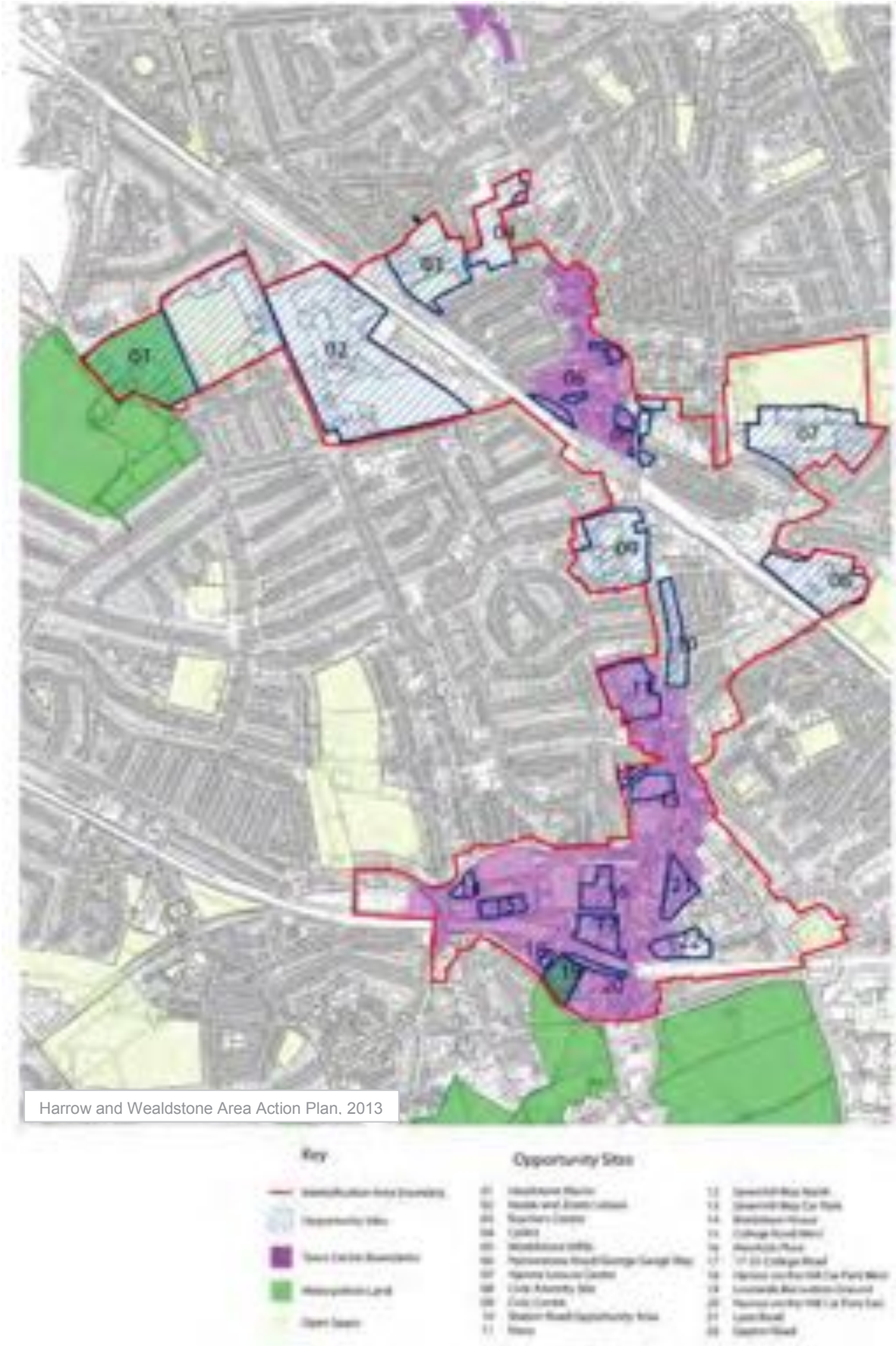
- **Wealdstone West** – the sub area comprises historic employment and industrial uses, with opportunity sites at Headstone Manor and environs, Kodak and Zoom Leisure, Teachers Centre and ColArt.;
- **Wealdstone Central** – covers Wealdstone town centre and Harrow and Wealdstone station, with identified opportunity sites at the Wealdstone infills and Palmerston Road / George Gange Way;
- **Wealdstone East** – comprising Harrow Leisure Centre, Civic Amenity and Council Depot;
- **Station Road** – running north south between Harrow and Wealdstone town centres, currently dominated by heavy vehicle movements. Opportunity sites identified here include the Civic Centre, High Road Opportunity Area, Tesco, Greenhill Way car park north and Greenhill Way car park; and
- **Harrow Town Centre** – currently comprises the bulk of Harrow's retail and office stock, the bus station and Harrow-on-the-Hill station. Opportunity sites in the AAP are Bradstowe House and College Road west; Havelock Place, 19 to 51 College Road, Harrow-on-the-Hill car park west, Lowlands Recreation Ground and Harrow-on-the-Hill car park east, Lyon Road and Gayton Road.

Figure 3-1 Heart of Harrow Sub Area Boundaries



Harrow and Wealdstone Area Action Plan, 2013

Figure 3-2 Harrow and Wealdstone AAP Opportunity Sites



Harrow and Wealdstone Area Action Plan, 2013

The H&W AAP sets out several principles for each Opportunity Area which are of relevance to the development of the highways and streetscape enhancement schemes.

3.1.1. Wealdstone West

The H&W AAP highlights the requirement for a comprehensive approach to development and public realm improvements to provide housing and employment, whilst improving east west connectivity in Wealdstone.

Key transport proposals in Wealdstone West can be summarised as follows:

- Improvements to pedestrian and cyclist provision under the railway line at eastern end of Headstone Drive to ensure good linkages between Wealdstone and future development of the Kodak site;
- Maintain the potential for a future pedestrian and cycle bridge / underpass across the railway line, linking the Kodak site on the western side and Tudor Road to the east;
- Amendments to the alignment and traffic management systems along Harrow view to integrate the development planned for either side of this road (Zoom Leisure and Kodak sites) and smooth traffic flows as far as possible;
- Improve the traffic flow at the junction of Headstone Drive and Harrow View; and
- Creation of new pedestrian linkages between the High Road and Whitefriars Avenue through the ColArt site.

3.1.2. Wealdstone Central

The Wealdstone Central is a popular but underperforming local area, comprised of local shops, restaurants, community uses and Harrow and Wealdstone station.

Key transport and public realm proposals in the Wealdstone Central sub area may be summarised as follows:

- Improvements to public realm at Harrow and Wealdstone station to safely connect pedestrians and cyclists to the High Street and enhance the arrival experience;
- Reconfiguration of road space (including potential removal of roundabout) to west of town centre and either side of railway underpass on Headstone Drive to improve pedestrian and cyclist connectivity to Kodak site;
- Improving the environment, access and quality of the underpass itself;
- Provision of legible London and route wayfinding from High Street to Leisure Centre and Headstone Manor (via Kodak) including targeted improvements to crossing facilities;
- New waymarked cycle route between Headstone Manor and Leisure Centre crossing High Street; and
- New CCTV facilities for the town centre.

3.1.3. Wealdstone East

The Wealdstone East sub area hosts the borough's leisure centre, Byron Park and a significant proportion of the borough's industrial land and uses as well as large residential areas.

Key transport and public realm proposals in the Wealdstone East sub area are:

- New cycle route connecting pedestrians / cyclists to leisure centre;
- Street furniture and signage designed to ensure these do not result in a cluttering of the streetscape;
- Improvements to existing east west routes linking Harrow Leisure Centre to Wealdstone; and
- Improvements to boundary treatments and signage along railway edge to improve impression of area from the train.

3.1.4. Station Road

Station Road currently operates as a key transport route through the borough, as well as the primary pedestrian and bus corridor between Harrow and Wealdstone town centres.

Transport and public realm improvement proposals in the Station Road area include:

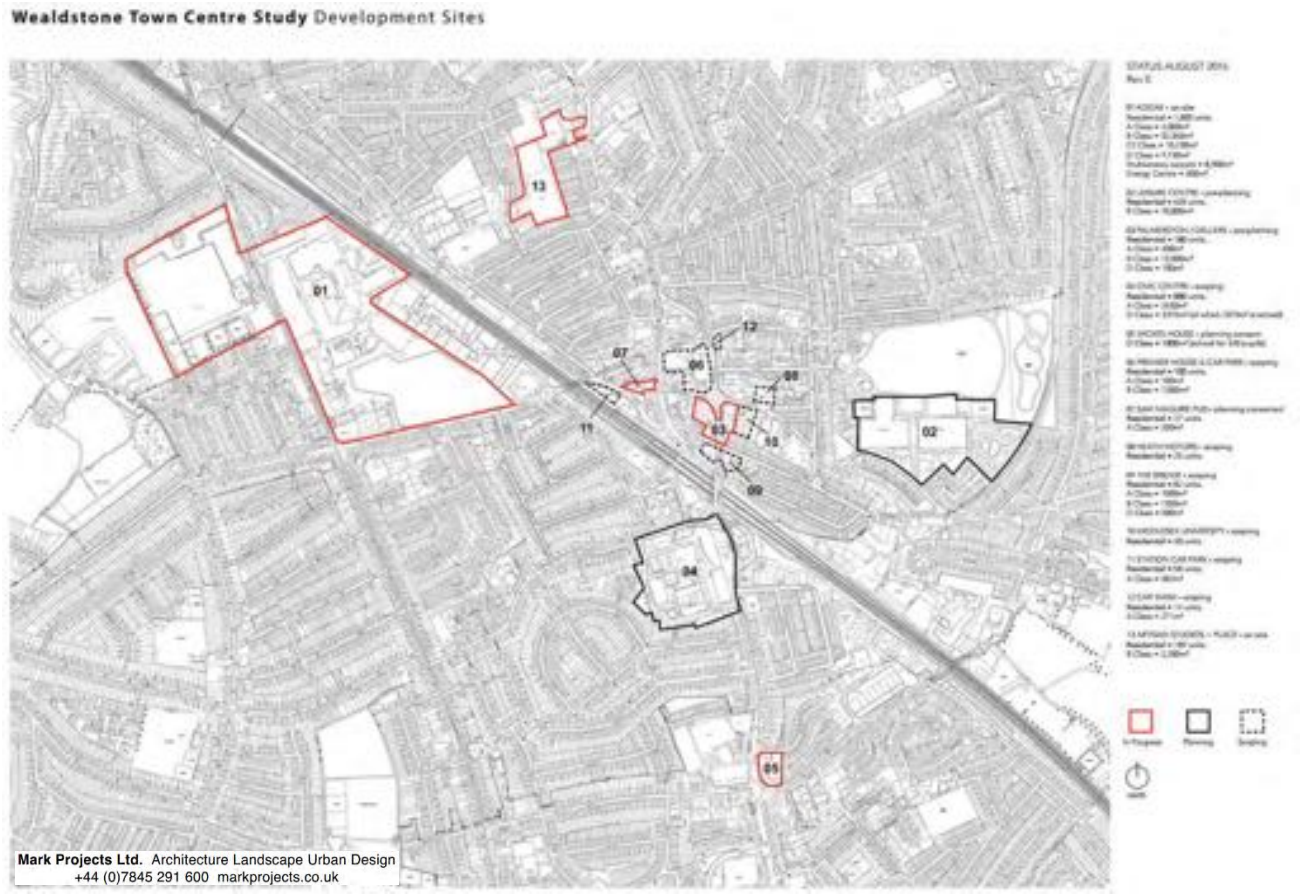
- Upgrades to kerb lines and junctions where possible to smooth traffic flow and ease congestion;

- Retain and enhance recognised desire lines to Harrow and Wealdstone station through the Civic Centre site;
- Public realm enhancements to the southern side of Harrow and Wealdstone station including the car park area;
- Improvements to footways along length of road to improve comfort and safety of pedestrians and encourage more users to shop and walk along its length; and
  Remodel service roads and parking bays to create shared space / more generous footpaths.

3.2. Development Sites

Across the seven opportunity areas, 22 development sites have been proposed within the H&W AAP. This section provides details of the approved and potential development opportunities within the Heart of Harrow Study Area. Development sites must come forward with a comprehensive framework to ensure that opportunities for improvements to the public realm and transport set out in the H&W AAP are secured. The development sites around Wealdstone town centre and stage of development, correct as of August 2016, are shown in Figure 3-3 below and in Appendix A.

Figure 3-3 Wealdstone Proposed Development Sites



3.2.1. The Kodak Site (Harrow View)

The Kodak and Zoom Leisure site has been identified as an important development opportunity in Wealdstone. Planning permission was granted in 2012, for a mixed-use development located to the west of Wealdstone town centre, comprising of both Harrow View East and Harrow View West sites. Key proposals at the site include the delivery of residential dwellings, employment, senior living, community facilities and a three-form entry primary school. The Intensification Area defined in the H&W AAP has been upgraded to one of London's newest Opportunity Areas as part of the London Plan, and hence Land Securities (in partnership with the Council) is producing an updated planning application with increased housing densities, providing up to 1,800 new homes on the eastern part of the site.

3.2.1.1. Harrow View West (Under construction)

The Harrow View West site is approximately 20 acres in size, with the site previously comprising of the former Zoom leisure sports grounds and car parking areas that closed in 2011. Planning permission was granted in 2012 for the provision of 314 new homes, plus extensive public space and recreational areas. Detailed consent was received in 2015, although the planning application was subsequently revised in summer 2016 to provide a total of 580 new homes, including four-storey blocks of dwellings. A planning decision has yet to be made on the revised application, which was open to public consultation until the end of October 2016. Construction began on site in 2016 for the first phase of construction, with five phases proposed to complete the Harrow View West development. The completion date is currently 2023.

3.2.1.2. Harrow View East

A joint venture is under way between Hyde Housing and Barratt London to develop the 30-acre site known as Harrow View East. The Harrow View East scheme has outline planning permission for a large-scale mixed-use development to provide 1,150 new homes, 350,000 square feet of employment space, senior living facilities, a community centre and leisure facilities.

Current plans are to demolish the existing site and start rebuilding the first phase in spring 2018, with homes available from late 2018.

3.2.2. ColArt Site

A mixed-use development has been completed at the ColArt site in December 2016, which is located to the north of Wealdstone town centre. Planning permission was granted in 2013, due to the proposals aligning with the H&W AAP. The development includes the provision of 195 new homes and 190 jobs, including homes for both shared ownership and affordable rent. The development has refurbished a former manufacturing site with office and residential provisions. The Winsor and Newton office building and frontage were retained to support and reinforce a strong local identity to Whitefriars Avenue and the building heights varied between 3-4 storeys high, in line with recommendations set out within the H&W AAP.

3.2.3. Current Civic Centre Site (Poets Corner)

Plans are currently being developed to formulate a strategy to redevelop the 4.6-ha site that currently operates as the LBH's Civic Centre, located on Station Road, south of Wealdstone. A planning application is yet to be submitted for the site, but it is expected to provide between 800 and 900 new homes, a community facility such as a school, employment space, retail and public realm areas. The site will also look to improve pedestrian links to Harrow and Wealdstone station.

The LBH held a consultation for local residents to comment on the proposals at the site between 23rd February and 31st March 2017. It is anticipated that the development will comprise of at least two phases, with phase 1 to be completed by 2021.

Figure 3-4 Poet's Corner Masterplan

3.2.4. Proposed Civic Centre Site

Architects have been appointed to develop designs for the proposed Harrow Civic Centre site, which is proposed to move from its current location on Station Road to Wealdstone town centre. The proposal includes moving the council offices to the current Peel House multi-storey car park, therefore relocating council staff to Wealdstone town centre to stimulate new trade and opportunities to regenerate the High Street. This will be a mixed-use development comprising a major new civic building, a religious building and a residential development of between 80-100 homes.

It is proposed that the new Civic Centre site in Wealdstone will be completed and occupied by 2020.

Figure 3-5 New Civic Centre masterplan

3.2.5. Byron Park Site

The current Harrow leisure centre and Byron Park site houses the single most used leisure facility across the borough. The Byron Quarter development aims to better meet current user demand at the leisure centre, by providing new and improved sports and leisure facilities, better connections with Byron Park, in addition to providing a mix of new housing with a minimum of 200 homes. The project looks to create a vibrant neighbourhood and leisure destination for residents.

Public consultation on the scheme was held in spring 2017, with planning applications for phase one and outline proposals for later stages to be permitted to the LBH. If permission is granted, phase one of the scheme will include 200 build-to-rent units, to be completed in 2020.

Figure 3-6 Byron Park Site masterplan

3.2.6. Palmerston Road / Deller Site

A planning application was submitted to the LBH in May 2016 for the redevelopment of the Palmerston Road and Deller site, located either side of the A409, on the southern side of Palmerston Road, connected under the fly over. The proposals are for the redevelopment of the two sites, to provide 187 new residential units, and seven commercial units amounting to 2,548m^2. The development will comprise five buildings, between one and 17 storeys in height.

The planning application was rejected by the LBH as the 17-storey development was considered too high. In January 2017, the Mayor of London took over the application for the redevelopment of Palmerston Road. A public representation hearing was held in March, and following this, the Mayor granted permission subject to planning conditions and a section 106 legal agreement to provide affordable new homes in Wealdstone.

3.2.7. Additional Opportunity Sites

A plan of the committed and proposed developments and planning stage in August 2016 can be found in Appendix A. Additional opportunity sites in the vicinity of Wealdstone town centre include the following:

- Proposed redevelopment at Wealdstone Infills site, supporting 95 jobs and 100 new homes, improving the public realm by making use of derelict buildings, currently at scoping stage;
- Proposals are currently at scoping stage for the development of The Bridge / A409 George Gange Way site to improve the impression of Wealdstone to drivers, providing office and industrial land use as well as target outputs of 95 homes and 95 jobs; and
- Planning has been consented for a proposed primary school at the Wickes House site located on Station Road.

4. Existing Situation, Issues and Opportunities

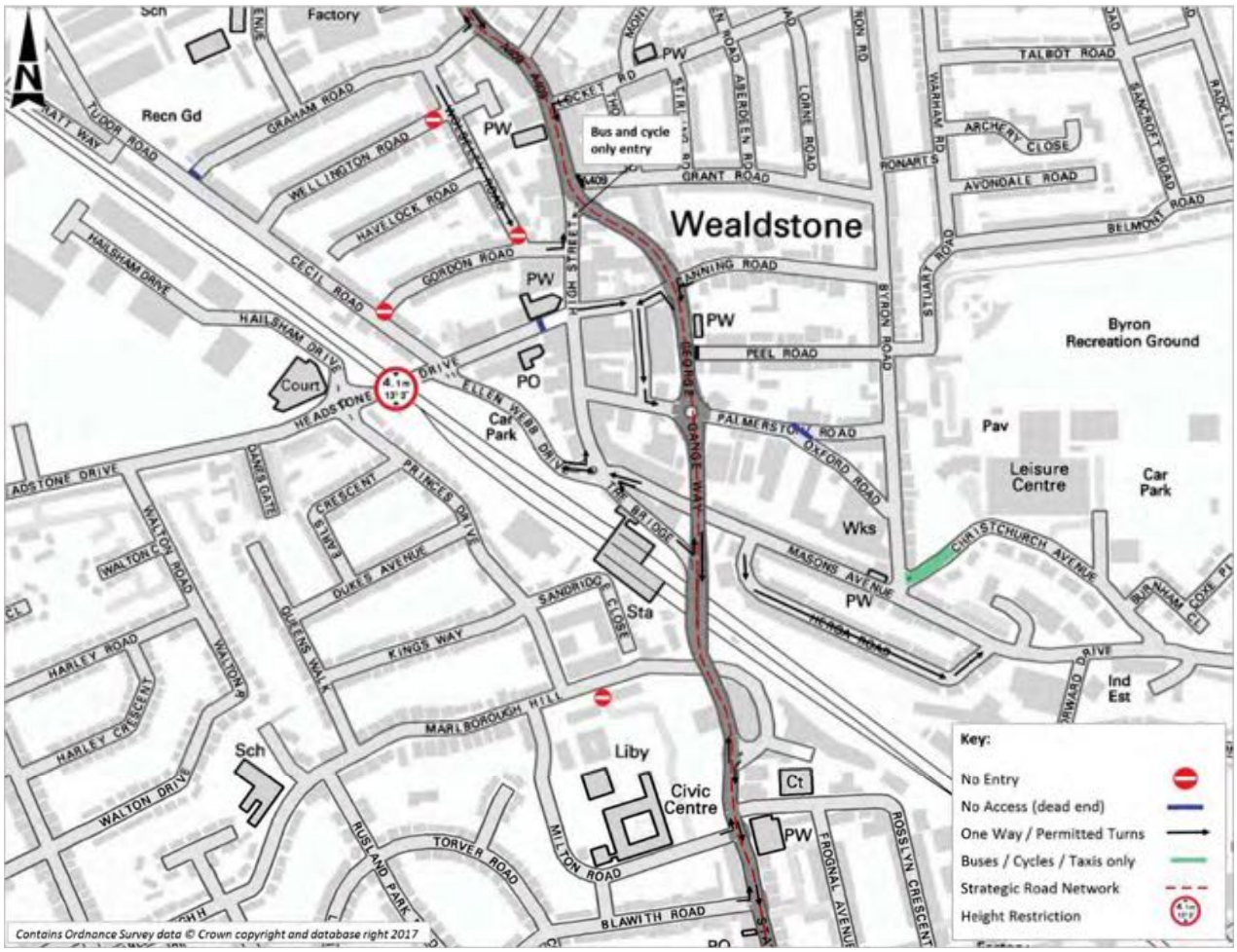
This section details the key characteristics of the existing urban environment in Wealdstone town centre and highlights some of the issues identified.

4.1. Traffic Management Arrangements

There are several banned turns, one-way streets and vehicle restrictions on the highway network around Wealdstone Town Centre. A plan of the traffic management in place within the study area is provided in Figure 4-1 and Appendix B.

The High Street is only accessible by buses and cycles from the north, with general traffic diverted via A409 George Gange Way, therefore by-passing the High Street. Right turns from The Bridge are restricted to buses and cycles only, with general traffic only permitted to turn left. Therefore, traffic wishing to access the A409 George Gange Way southbound must take a convoluted route, either using the High Street or u-turning at the Palmerston Road roundabout.

Figure 4-1 Wealdstone Traffic Management Arrangements

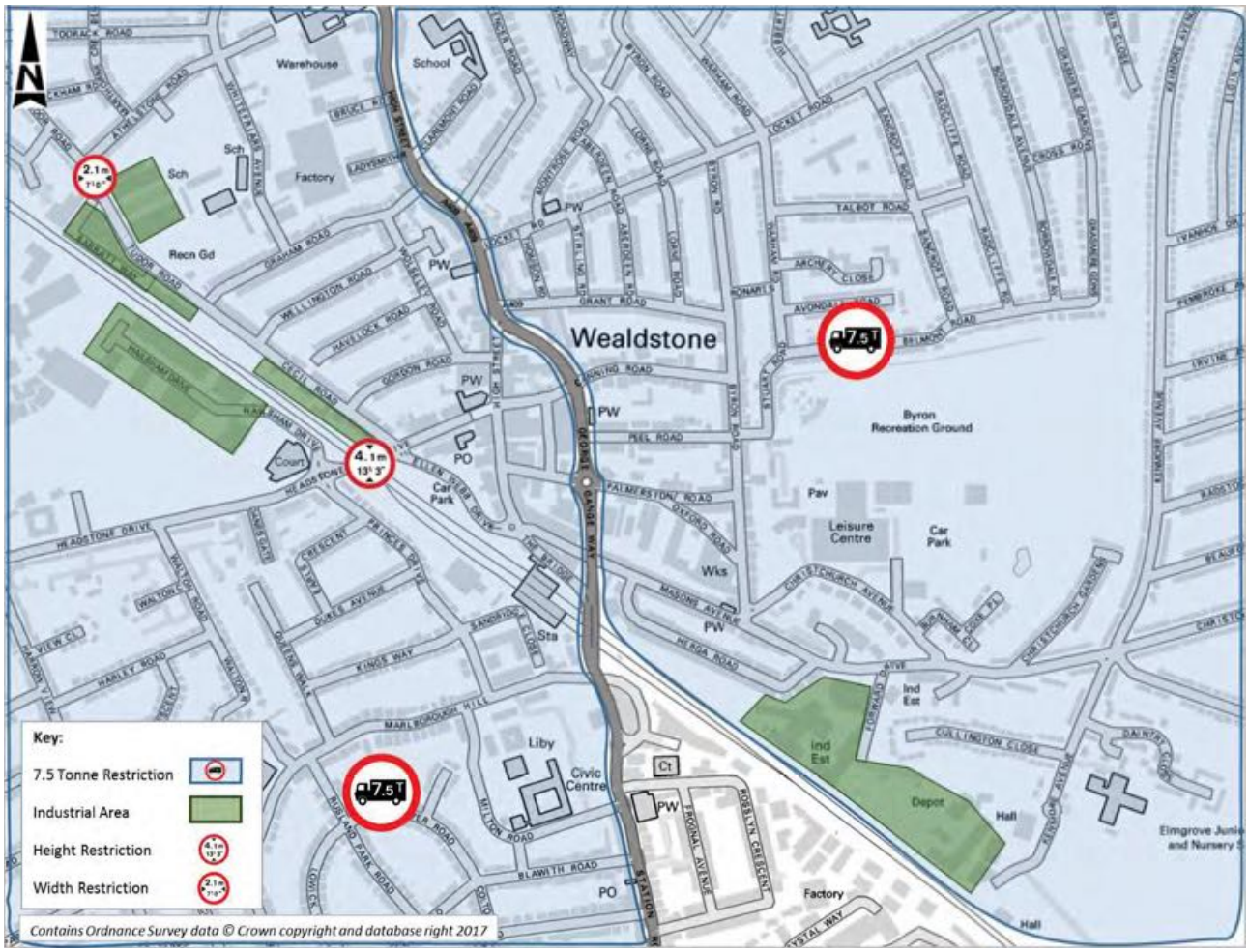


4.1.1. Freight

A plan showing HGV restrictions and industrial areas around Wealdstone is shown in Figure 4-2. The A409 is the designated route for Heavy Goods Vehicles and other through traffic, forming part of the Strategic Road Network (SRN). A 7.5 tonne restriction is in place on most of the roads surrounding the town centre, with exceptions for access. The A409 and roads to the south of the town centre are permitted for use by HGVs.

There are multiple industrial areas around Wealdstone town centre, including the civic amenity site located on Forward Drive, meaning many large vehicles and refuse trucks use the A409 George Gange Way and Oxford Road to access the site. There are also industrial sites on Hailsham Drive, Cecil Road and Tudor Road, with the latter two only accessible from the south due to a width restriction.

Figure 4-2 HGV Restrictions in Wealdstone



4.2. Public Transport

Wealdstone town centre is well connected by public transport, with the majority of the area having a Public Transport Accessibility Level (PTAL) of 4, which represents a 'high' level of accessibility.

4.2.1. Bus Routes

Nine bus routes provide a service through Wealdstone Town Centre with most buses currently stopping on the High Street and on The Bridge near Harrow and Wealdstone station. All the bus routes in Harrow are TfL services. The route details and frequencies are provided in Table 4-1 and an illustrative map of bus services in Wealdstone is provided in Figure 4-3.

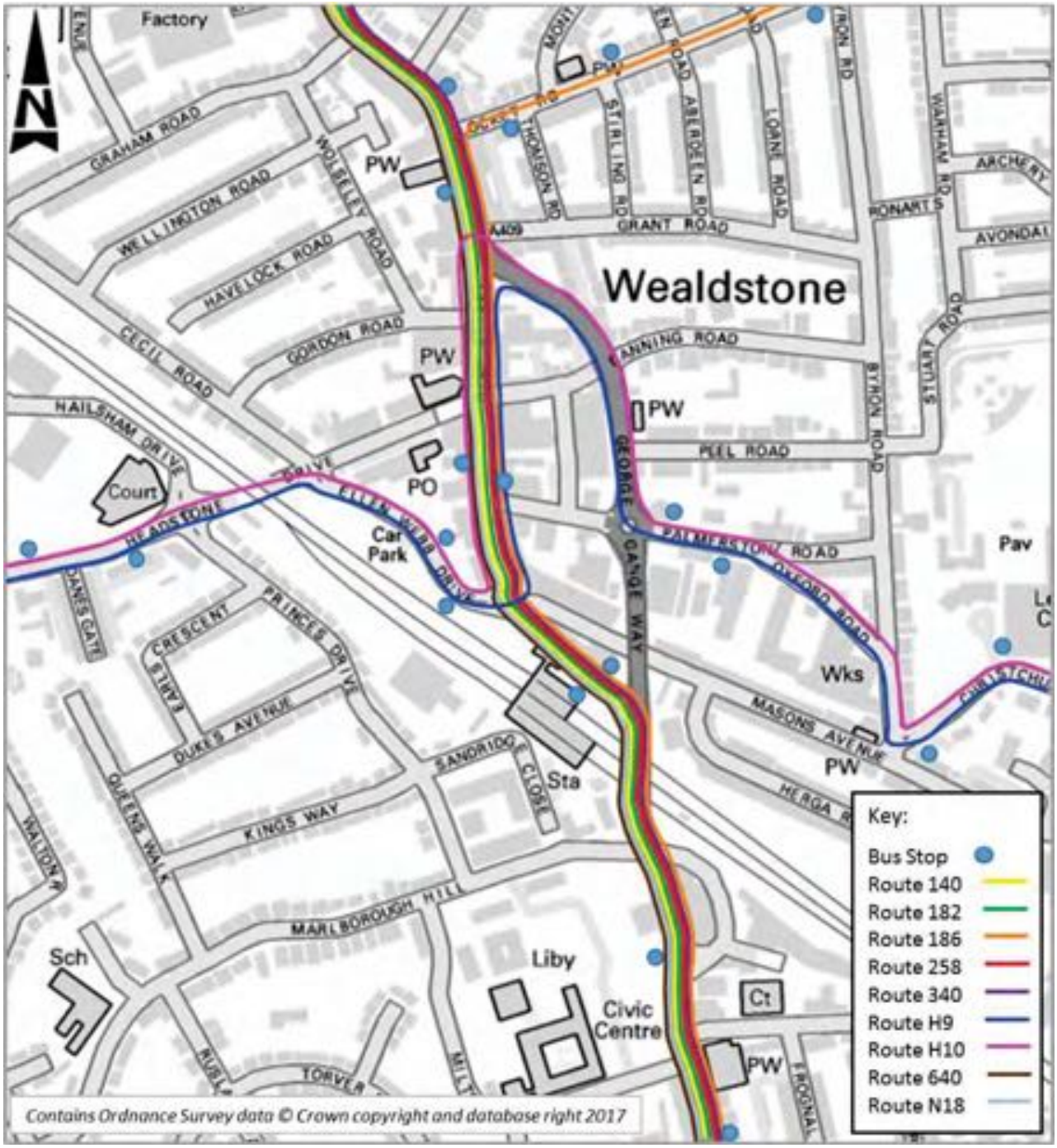
Table 4-1 Bus Routes and Frequencies Serving Wealdstone Town Centre

Route	From	To	AM Peak Hour Frequency (buses per hour)
140 (24-hour service)	Harrow Weald Bus Garage	Heathrow Central Bus Station	10
182	Bannister Playing Fields	Brent Cross Shopping Centre	7
186	St Mark's Hospital	Brent Cross Shopping Centre	5
258	Watford Junction Railway Station	South Harrow Bus Station	4
340	Edgware Bus Station	Harrow Bus Station	5
640 (school service)	South Harrow Bus Station	Bentley Wood High School	2*
H9	Harrow Bus Station	Harrow Bus Station	6**
H10	Harrow Bus Station	Harrow Bus Station	6**
N18	Harrow Weald Bus Garage	Trafalgar Square	4

**Route 640 is a school service operating two services in the morning and two in the afternoon during term time only, with no service on weekends or during school holidays.*

***Route H9 and H10 are circular routed, with H9 operating anticlockwise only and H10 operating clockwise only.*

Figure 4-3 Bus services in Wealdstone Town Centre



4.2.1.1. Issues for Bus Services

Although the town centre is well serviced by buses, there are several issues that could be addressed to improve bus journey times and service provision for users. The issues in have been identified for buses within the town centre:

Table 4-2 Issues for Buses

Location	Issue
Whole town centre	• There are no bus standing facilities within the town centre, with routes starting and terminating outside of Wealdstone. The closest bus standing facility to Wealdstone, at Harrow Weald has recently been lost, with no scope for replacement. Therefore, scope to replace this facility could be considered.
A409 High Street / Locket Road junction	• When in use, the loading bay on southbound side of the A409 High Street (south of Locket Road) causes traffic to move into the opposite side of the road. • The loading bay on the northbound side of the A409 High Street, when in use, causes delays to general traffic as there is limited room to overtake buses.
High Street / A409 George Gange Way junction	• Southbound buses must wait to turn right from the A409 High Street, onto the High Street, as there are no bus priority measures at the junction.
High Street	• The location of bus stops opposite each other in the middle of the High Street causes delays to general traffic, as there are often buses standing on either side of the carriageway, meaning traffic cannot overtake
A409 George Gange Way / The Bridge junction	• General traffic on The Bridge can block back, preventing right-turning buses from accessing the right turn lane (which has bus priority), therefore causing delay.

4.2.2. Route 140

A route study assessment for route 140 has been undertaken, identifying bus performance and many issues at locations along the route. This service is a key route, connecting Harrow Weald and Heathrow airport. A number of issues and points of delay along the route were identified in Wealdstone town centre, as summarised below:

- Analysis of iBus data for the AM peak indicated delays of 45-180 seconds southbound, on the A409 and through the High Street. Delays of 15-45 seconds were recorded northbound;
- During the PM peak, delays of 15-45 seconds were recorded southbound between Locket Road and the Bridge and 45-180 seconds from the Bridge to the A409 Station Road. Northbound, delays between 15-45 seconds were recorded from the A409 Station Road to The Bridge, and 45-180 seconds from The Bridge travelling north through the High Street;
- The loading bay north of Locket Road blocks northbound traffic when in use, therefore delaying buses;
- Southbound buses must wait to turn right onto the High Street at the junction with the A409 George Gange Way. Provision of bus priority measures, such as a bus gate, would reduce delay to buses;
- The loading bay opposite Sainsbury's at the Palmerston Road junction creates a pinch point when in use, delaying the ahead movement and therefore buses;
- The location of two signalised junctions (High Street / Palmerston Road and High Street / Ellen Webb Drive) close together restricts flow and causes delay to buses;
- Southbound traffic on the A409 George Gange Way can block back, restricting the right turn from The Bridge which operates with bus priority. Yellow box markings could be installed to restrict blocking; and
- Consideration of providing bus lanes on either side of The Bridge as the carriageway is wide.

The issues and opportunities identified from the route 140 study should be investigated in the transport study to identify measures to improve bus journey times, particularly for key routes.

4.2.3. Rail Facilities

Harrow and Wealdstone rail station is located on The Bridge to the south of Wealdstone High Street. The station is well connected to London, the Midlands and the North West. The H&W AAP recognises that the public realm around the station entrance is poor, with no designated pedestrian routes through the car park to the west and poor signage towards Station Road or other destinations. The AAP recognises clear pedestrian

routes to and from the station, along with eventual upgrades to the station and environs as important considerations.

Harrow and Wealdstone station is served by London Overground, London Midland, Southern and London Underground Bakerloo line services to the following stations:

- East Croydon
- London Euston
- Milton Keynes Central
- Tring
- Watford Junction
- Elephant and Castle

Bus stops in either direction are located on The Bridge, approximately 30 metres from the station. Harrow and Wealdstone station is served by London Buses routes 140, 182, 186, 258, 340, H9, H10 and N18.

4.3. Cycling Environment

There are several designated and recommended cycle routes that pass-through Wealdstone town centre and these are shown on Figure 4-4 which includes existing signed cycle routes, based on the information provided in London Cycling Guide 3 (2015). Although there is some provision for cyclists, much of the infrastructure is inconsistent and disjointed providing poor quality cycle links to the town centre. Therefore, as part of the LBH's Major Scheme Bid, proposed future cycling routes are also shown on the plan, to better connect Wealdstone to the east / west and north / south.

There are cycle parking facilities located outside Harrow and Wealdstone station and cycle stands located at various points along Wealdstone High Street and on side streets.

Figure 4-4 Map of Existing and Proposed Cycle Infrastructure in Wealdstone Town Centre

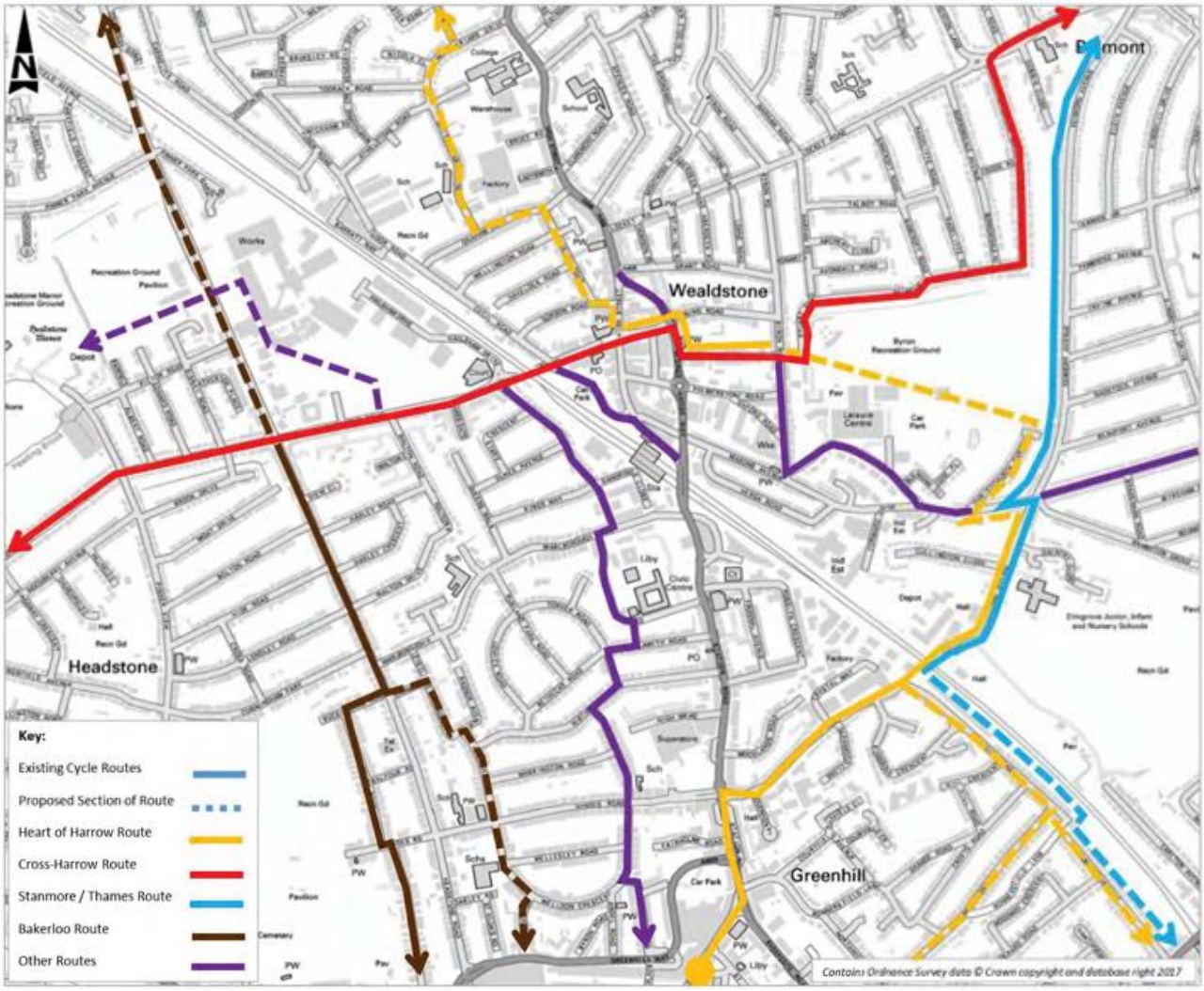


Table 4-3 Existing Cycle Facilities and Issues

Location	Cycle Provision	Issues
A409 George Gange Way (between High Street / A409 junction and Canning Road).	On-carriageway advisory cycle lanes are present on either side of the carriageway between Canning Road and the junction with the High Street. The southbound route continues to the Toucan crossing opposite Peel road.	• On-carriageway cycle routes present a conflict between vehicles and cyclists. • There are no advanced stop lines for northbound cyclists. • A lack of connecting routes when cyclists reach the junction with the High Street.
A409 George Gange Way (between Palmerston Road roundabout and Canning Road)	There is a two-way cycle track on the northbound footway between the Palmerston Road roundabout and Canning Road, with a dedicated cycle crossing on the Palmerston Road (W) arm of the roundabout.	• The track is approximately 130 metres long, meaning cyclists must switch from on-carriageway to off-carriageway cycle tracks over short distances.
A409 George Gange Way (between The Bridge and Palmerston Road roundabout)	On-carriageway advisory cycle lanes are present on the northbound side of the carriageway between The Bridge and Palmerston Road.	• There is a conflict between cyclists and general traffic on the carriageway.

Location	Cycle Provision	Issues
		• The cycling infrastructure on the A409 is poorly linked, making the route disjointed and confusing for cyclists.
Palmerston Road (between the High Street and Palmerston Road roundabout)	On-carriageway cycle markings at the eastern end of Palmerston Road, where it meets the A409 roundabout.	• The cycle markings have been painted over with double yellow lines and are only 15 metres in length. This creates a poor connection for cyclists to the High Street.
Peel Road	There is a toucan crossing on the A409 opposite Peel Road. Peel Road is a signed cycle route connecting to Harrow Leisure Centre and the Byron recreation ground.	• Poor route definition for cyclists travelling east, with a lack of cycle signs and markings to direct cyclists.
Byron Road	There are cycle route signs present on Byron Road, with connecting south to Harrow Leisure Centre, east to Belmont and Edgware and west to Harrow & Wealdstone, North Harrow and Northolt.	• Cycle signs are only provided at the Byron Road / Peel Road junction. • On carriageway parking on either side of the road reduces the space for cyclists and increases the conflict with general traffic.
Ellen Webb Drive	There is a 20-metre two-way cycle track on the footway between Harrow and Wealdstone station and the toucan crossing on Ellen Webb Drive. There are advisory cycle lanes on either side of the carriageway between the Ellen Webb Drive / The Bridge junction and the pedestrian crossing south of Headstone Drive.	• Disjointed and confusing cycle infrastructure at the junction dominated by traffic. • Westbound advisory cycle lane is not continuous, giving priority to general traffic.
Headstone Drive	There are advisory cycle lanes on either side of the carriageway on Headstone Drive between Walton Road and the zebra crossing to the west of the Princes Drive roundabout. Cycle markings are also present on Headstone Drive from the junction with Cecil Road and connecting to the High Street through Trinity Square.	• Cycle markings at the Cecil Road junction are faded with no designated cycle lanes provided. • Advisory cycle lanes east of Princes Drive are not continuous, creating a disjointed route.

Although there are existing cyclist facilities across the study area, in many cases these are disjointed and confusing, meaning that they are not attractive to cyclists. The current cycling infrastructure does not provide safe routes for cyclists to navigate to and from the town centre. By providing improved facilities for cyclists, particularly connecting development sites, will encourage greater number of cyclists and therefore mitigate the impact of future developments on the highway network.

The Cycling Strategy for Harrow 2015 – 2018 recognises that more needs to be done to expand the cycle network and improve the cycle links across the borough. The LBH's aspirational cycle network is shown in Figure 4-5 and proposed routes highlighted in green in Figure 4-4. The future aspiration for Wealdstone includes a main east – west route connecting to Belmont and Canons Park in the east and Headstone and North Harrow in the West. The north – west aspirations include linking to Harrow Weald in the north and Harrow town centre to the south of Wealdstone.

Figure 4-5 Harrow's Aspirational Strategic Cycle Network (Cycling Strategy for Harrow 2015-2018)

4.4. Pedestrian Environment

Footfall in the town centre is moderate throughout the day. In general, the existing pedestrian facilities are adequate for the recorded pedestrian flows, however the existing public realm could be greatly improved to provide better pedestrian links and a much more attractive environment on the High Street.

4.4.1. Crossings

Controlled pedestrian crossing facilities provided within the study area and associated issues are outlined in Table 4-4.

Table 4-4 Pedestrian Crossing Facilities and Issues

Location	Provision	Issues
A409 High Street / Locket Road	Traffic signals at junction – straight through pedestrian crossing with central island on A409 High Street (North). Straight through pedestrian crossing, set back from the pedestrian desire line on Locket Road. No crossing on the A409 High Street (South) arm.	• Unconventional junction layout with pedestrian crossing set back from the desire line on Locket Road. Guard railing is present to prevent pedestrians crossing Locket Road, closer to the High Street,

Location	Provision	Issues
A409 High Street / A409 George Gange Way	Traffic signals at junction – straight through pedestrian crossings with central islands on the A409 High Street and A409 George Gange Way arms. Staggered pedestrian crossing provided on the High Street (South) arm.	• Staggered crossings on the High Street arm are less desirable for pedestrians.
High Street / Palmerston Road	Traffic signals at junction – straight through crossings on all arms.	• No issues
High Street / Masons Avenue / Ellen Webb Drive / The Bridge	Traffic signals at junction – straight through pedestrian crossing on the High Street. Straight through pedestrian and cycle crossings on The Bridge and Masons Avenue. Straight through pedestrian and cycle crossing with central island on Ellen Webb Drive. No crossing facilities provided on Masons Avenue left turn.	• The size of the junction is daunting for pedestrians. At least two crossings must be made to access the eastern footway of the High Street.
A409 George Gange Way / The Bridge	Traffic signals at junction – unsignalised pedestrian crossings provided on all arms.	• No signalised crossings are provided, with high traffic flows recorded on the A409 George Gange Way, making it difficult for pedestrians to cross safely.
Ellen Webb Drive (south of Headstone Drive)	Straight through Pelican crossing.	• No issues
A409 George Gange Way (south of Peel Road)	Straight through Toucan crossing.	• No issues

Despite the provision of crossing facilities at several locations through Wealdstone town centre, the links beyond the High Street restrict pedestrian movement. This includes the east-west links, particularly due to the excessive guard railing at the Headstone Drive / Cecil Road junction. In addition, although Harrow and Wealdstone station is near the High Street, the High Street / Masons Avenue / The Bridge / Ellen Webb Drive junction dominates the streetscape at this location and is a barrier to pedestrian permeability.

Opportunities should also be explored to improve the existing pedestrian crossing facilities on the A409 George Gange Way, as this route will become increasingly used by pedestrians, particularly with the development of the new Civic Centre and development sites at the Palmerston Road roundabout. Development sites are expected to increase pedestrian crossing movements along the corridor.

4.4.2. Footways

The footways within the town centre vary in width, with street furniture contributing to the creation of pinch points at many locations along the High Street. These are caused by market stalls and signage that restricts the available space for pedestrians. The northbound bus shelter located on a busy part of the High Street also creates an acute pinch point, as shown in Figure 4-6.

Figure 4-6 Pinch Points on the High Street

The presence of guard railing at the High Street / Locket Road and Headstone Drive / Cecil Road junctions reduce the effective footway width which forces pedestrians to take inconvenient routes and results in people walking in the carriageway, which was particularly evident at the Cecil Road junction during a site visit.

Throughout the town centre, a mix of paving materials has been used which, in places, is dated in appearance and in need of renewal. This adds to the cluttered appearance, as there is no clear palette or identifiable character to the materials used for footways. The quality and disrepair creates a poor impression, as shown in Figure 4-7.

Figure 4-7 Mix of Paving Materials in Wealdstone

4.4.3. Pedestrian Survey

Pedestrian surveys were undertaken in Wealdstone Town Centre on Thursday 9th June 2016. The count locations are indicated by the arrows presented in the pedestrian flow maps in Appendix C. Both the number of pedestrians on footways and crossing counts at specified points were recorded. The AM and PM peak hours were assessed using the TfL Pedestrian Comfort Guidance for London (2010).

The total pedestrian footfall data was analysed to determine the pedestrian peak hours on the day of the traffic surveys. The following peak hours were identified:

- AM Peak – 08:00 – 09:00; and
- PM Peak – 17:15 – 18:15 hours.

Pedestrian flows recorded in Wealdstone town centre are modest in comparison to other town centres in London. This is due to Wealdstone's role as a district town centre, rather than a major centre. The highest two-way flow recorded was 687 pedestrians. Based on TfL's Pedestrian Comfort Level Guidance, flows between 600 and 1,200 people per hour represents an 'Active Flow' so the peak flows fall into this category, with flows at most other locations in the town centre falling into the 'Low Flow' category.

4.4.4. Key Findings of Pedestrian Surveys

The following trends were observed from the pedestrian footfall and crossing counts during the AM Peak hour:

- The highest two-way pedestrian flow was recorded on the footway outside Harrow & Wealdstone station, with 687 pedestrians recorded.
- 515 pedestrians were recorded on the western footway of the High Street, at the count just north of Headstone Drive.
- The highest crossing counts were recorded on the Ellen Webb Drive signalised crossing and the zebra crossing on The Bridge, with 491 and 441 two-way crossings recorded respectively.
- Low pedestrian counts were recorded at counts along the A409 and all arms of the Palmerston Road roundabout. The highest counts recorded to the east of the town centre were at the Peel Road toucan crossing, with 174 crossings recorded.
- Higher pedestrian footfall counts were recorded on the western footway along the High Street, with a total of 2083 pedestrians recorded, in comparison to 1121 recorded on the eastern footways.

The following trends were identified from the pedestrian footfall and crossing counts during the PM peak hour:

- Generally, the two-way trends followed a similar pattern to the AM peak counts, with the highest numbers of pedestrians recorded by Harrow & Wealdstone station.
- The highest two-way pedestrian flow on the footway was recorded on the western footway outside Harrow & Wealdstone station, with 651 pedestrians recorded.
- The highest two-way crossing counts were recorded on the zebra crossing outside the station, with 536 crossings recorded.
- Higher pedestrian footfall counts were recorded on the western footway along the High Street, with a total of 2159 pedestrians recorded, in comparison to 1477 recorded on the eastern footways.
- During both the AM and PM peak hours, crossing flows were low across the High Street at the junction outside the station, with 33 and 49 crossings recorded during each peak hour respectively.

4.4.5. Level of Service Analysis

Footways are the infrastructure for walking and, as such, appropriate provision is an essential factor in encouraging or hindering walking. To encourage walking, footways should have sufficient width for the number and type of users.

Footway provision is measured by calculating the level of crowding of the footway in pedestrians per minute, per metre of clear footway width (ppmm). This is calculated from data on pedestrian activity and the clear footway width. Clear footway width is the actual space available for walking and considers any barriers, street furniture, (e.g. benches, bins) or blockages (such as guard railing) that permanently reduce the space available for walking. The TfL guidance also gives recommendations of the 'buffers' around each object, as people would not walk closer than 0.2m to a kerb, for example.

Transport for London's Pedestrian Comfort Guidance gives recommendations on how many ppmm is comfortable for different area types, with Level B+ (9-11 ppmm) the recommended minimum for all area types. The peak hour flow recorded at each location was used, to assess the worst-case scenario on the day surveyed. The data collected for Wealdstone town centre shows that most two-way pedestrian flows are <500 people per hour, on average, with 687 people per hour recorded at the busiest point. The Pedestrian Comfort Level for both the average and peak hour pedestrian flows at all locations ranged from A to A+ PCL, comfortably within the recommendation of PCL B+.

TfL's Pedestrian Comfort Guidance states an absolute minimum clear footway width of 1.5m, which translates to a width of 2m if typical street furniture, such a lamp columns and road signs need to be accommodated. This total width is required for two users to pass each other comfortably and to meet Department for Transport (DfT) minimum standards. However, as Wealdstone is a district shopping centre with significant footfall, a wider footway width should be provided wherever possible. For Active Flows, TfL's Guidance recommends a total width of 4.2m, which allows enough space for comfortable movement and street furniture, such as a wayfinding signs, benches or bus shelters. However, there are currently pinch points within the town centre where the footway widths would not be sufficient for one person and a buggy to pass each other. Therefore, opportunities to widen footways to provide sufficient space for all users will be considered.

Although the level of service analysis for Wealdstone showed the PCLs for the surveyed footways were within recommended levels, the analysis will be used to inform design options to widen footways and reduce street clutter where possible, therefore improving pedestrian accessibility around Wealdstone.

4.5. Parking

An assessment has been undertaken of the provision and demand for parking in Wealdstone town centre. A technical note was produced analysing the results which is presented in Appendix D, with the results summarised below. The assessment of demand in the study area has focussed on the following car parks and on-street pay and display bays (Figure 4-8). Both the on-street and off-street parking can facilitate long stay duration parking and there is no maximum stay limit set. The details of car parks and on-street pay and display bays are as follows:

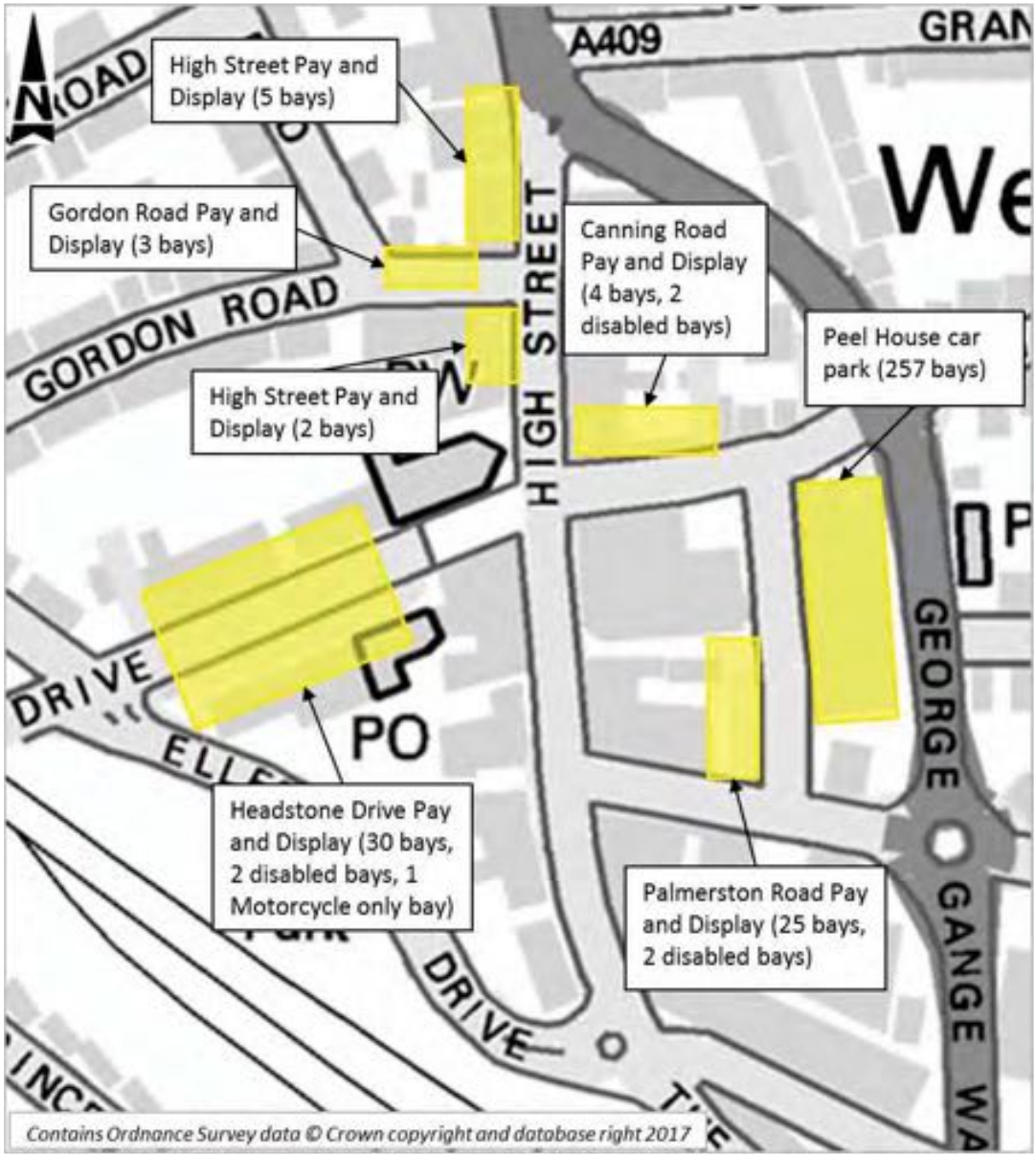
Car parks

- Peel House multi-storey car park – 257 bays; and
- Palmerston Road Pay & Display car park – 27 bays.

On-street pay and display bays

- High Street – 7 bays (including 1 disabled bay);
- Canning Road – 6 bays (including 2 disabled bays);
- Gordon Road – 3 bays
- Headstone Drive – 33 bays (including 1 disabled bay and 1 motorcycle bay)

Figure 4-8 Map of the location of the parking surveys



4.5.1. Peel House Multi Storey Car Park

Car park data was obtained from LBH for the Peel House multi-storey car park to establish the occupancy at different times of the day and different days of the week. The volume of entries and exits to the car park per hour were provided for October 2015.

The minimum occupancy recorded was 12 vehicles (5% of capacity) and the maximum recorded was 173 vehicles, 69% of the maximum capacity.

The car park occupancy data was also broken down into business permit holders and 'pay on foot' tickets. On average, between 0900 – 1700 hours during weekdays there is an even split of permit holders and 'pay on foot' tickets in the car park. As expected, the number of business permit holders reduces from 1600 hours at all locations.

4.5.2. Palmerston Road Pay and Display

Car park data for the Palmerston Road car park was provided by LBH for October 2015, showing the daily number of tickets purchased and the average length of ticket purchased. The car park has a charge of £0.80 per hour, with charges operating Monday to Saturday between 0800 and 1830 hours.

The data obtained from the LBH shows that, in October 2015, the average number of tickets purchased per day was 147, with an average transaction of 1.5 hours.

The results of the on-street parking beat surveys are summarised below:

- The average occupancy recorded in the car park was 23 vehicles (85%), with a maximum recorded occupancy of 26 vehicles (96%).
- Demand recorded at the Palmerston Road car park was high, with occupancy varying between 62% and 96%.
- The highest occupancy (96%) was recorded at 1130 hours.
- The lowest recorded occupancy was 17 vehicles (62%) at 1530 hours.

4.5.3. New Civic Centre

It is expected that when the Civic Centre is relocated to the current Peel House car park site, both the Palmerston Road and the Peel House car parks would be removed and replaced with a basement car park with a capacity of around 120 spaces. The data analysed from October 2015 indicates that, based on weekday average data, a total of 97 spaces (60 public spaces, plus 37 business permit spaces) would be required to accommodate existing demand (Palmerston Road and Peel House car parks), as detailed in the breakdown in Table 4-5.

Table 4-5 Average and Maximum Car Park Occupancy

Car Park	Weekday Average		Maximum Occupancy
	Permit Holders	Pay on Foot	
Peel House	37	34	179
Palmerston Road	-	26	26
Total	**97**		**205**

It is not feasible within the proposed New Civic Centre layout to accommodate both the existing public demand to park from the car parks and the demand for council staff and visitors on the current Civic Centre site. A reduction in the number of parking spaces for council staff is planned for the New Civic Centre and there will be very limited on-site provision. LBH's parking policy will be to introduce a new travel plan and travel change programme focussed on promoting alternative sustainable modes of transport for the transition between sites. Additionally, public parking would be limited to existing demand (60 spaces) and if additional provision is not created there is potential that demand may decline or on-street parking activity may increase putting additional pressure on public highway parking spaces. It is possible that additional on-street parking restrictions will be required.

4.5.4. On-street Parking Beat Surveys

Parking beat surveys were conducted in Wealdstone town centre at the locations identified in Figure 4-8. Spot checks were undertaken at eight time periods during the day (between 0900 to 1700 hours) and on various days of the week across June and July 2016, to obtain a robust estimate of parking demand in the town centre. The surveys also recorded any illegal parking which occurred during the survey (i.e. parking outside of the marked bays) hence maximum occupancies occasionally exceed 100%.

The results of the parking beat surveys show that the average and maximum parking occupancy is generally high in Wealdstone, with the maximum exceeding 100% where vehicles were recorded parking outside of marked bays. The following trends were observed:

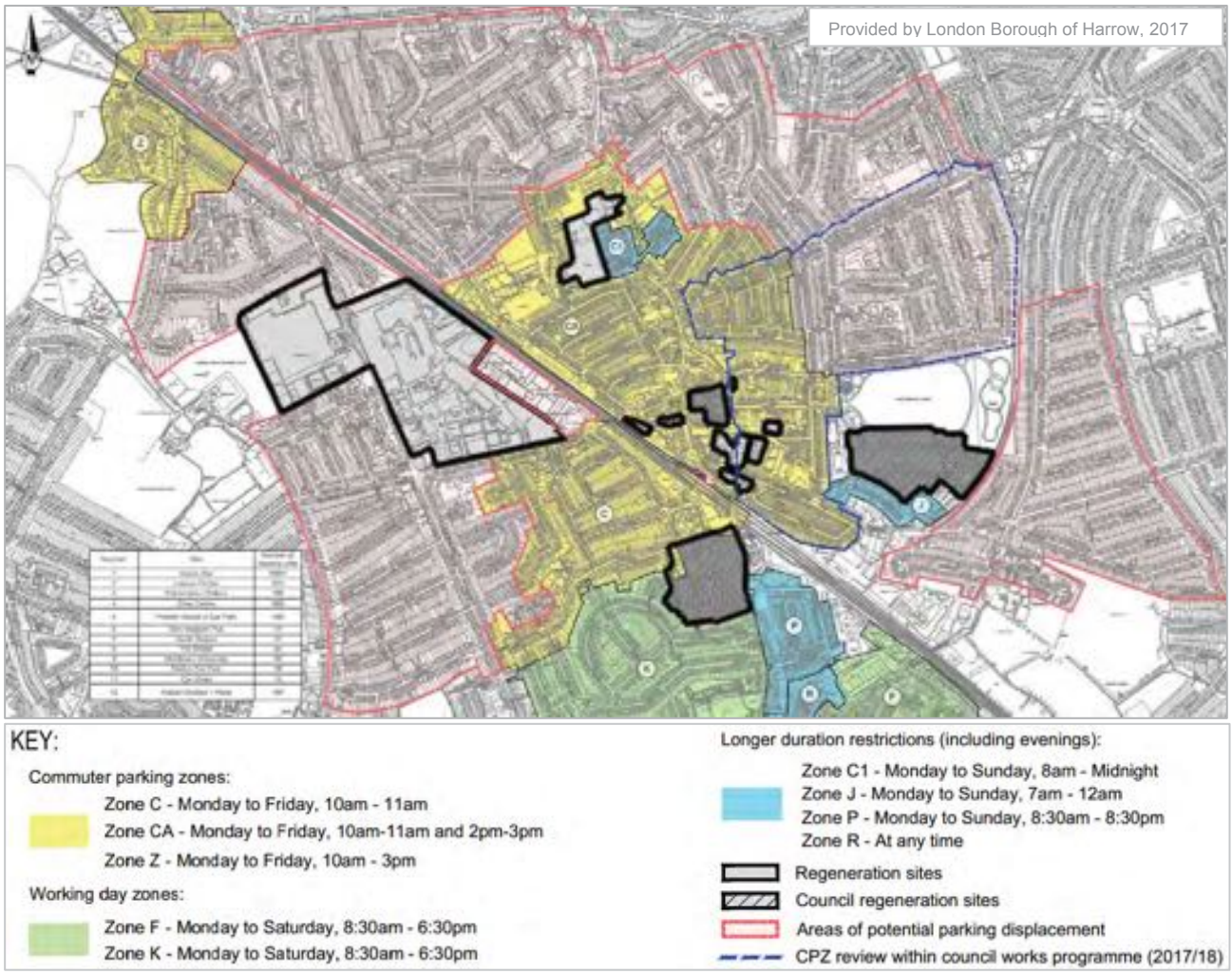
- The demand for parking in Headstone Drive was high, with an average of 83% and maximum of 109% occupancy. The highest utilisations were recorded at 10:30 and 13:30 across the surveyed area.
- Occupancy exceeded 100% in three of the four surveyed areas, where vehicles were observed outside of marked bays or on double yellow lines.
- Every location in the survey was observed at 100% capacity at least once during the surveyed time periods.
- The survey indicates that all on-street parking within the surveyed area is well used, although there is only provision of 43 bays, 5 disabled bays and a motorcycle bay.

In the future scenario, the quantity of on-street parking for local amenities would need to be maintained. The high levels of occupancy recorded during the surveys may be due to the bays being utilised for long-stay parking. Due to the shortage of dedicated short stay parking in Wealdstone town centre, on street Pay and Display parking bays should be prioritised to short stay provision and have a maximum stay limit introduced to prevent long term parking. This will provide improved access for customers to local shops.

4.5.5. Existing Controlled Parking Zones (CPZs) in Wealdstone

Due to the parking pressure in Wealdstone, many roads around the town centre are within existing Controlled Parking Zones (CPZs).

Figure 4-9 CPZs in Wealdstone



The CPZs around Wealdstone are shown in Figure 4-9 and Appendix E. The following restrictions are currently in place:

- Zone CA – Wealdstone – Monday to Friday between 10:00 – 11:00 hours and 14:00 – 15:00 hours.
- Zone C1 – Wealdstone – Monday to Sunday between 08:00 – 00:00 hours.
- Zone C – Wealdstone (Royal Estate) Monday to Friday between 10:00 – 11:00 hours.
- Zone J – Leisure Centre – Monday to Sunday between 07:00 – 00:00 hours.
- Zone K – Harrow Town Centre (North) – Monday to Saturday between 08:00 – 18:30 hours.
- Zone P – Rosslyn Crescent and Frognal Avenue – Monday to Sunday between 08:30 – 20:30 hours.

A large proportion of Wealdstone town centre is already within a CPZ, however, with the quantity of public car park spaces set to reduce significantly at the new Civic Centre site, and on-street parking demand likely to increase because of the increasing number of new homes and businesses in the area, it is inevitable that parking will become an issue on the uncontrolled residential roads located around the town centre. The areas highlighted in red (Figure 4-9) are currently uncontrolled but may experience long stay parking pressures in the future from a combination of commuters for the rail station, work place parking, local businesses and new residents in the area.

The current extent of the existing CPZs is unlikely to deter the use of the private car, for example, the estimated walking time from the northern end of Byron Road (currently not in a CPZ) to the new Civic Centre site is 8 minutes, which is only a short walk and it is unlikely that drivers would change to an alternative and more sustainable mode of transport.

The intensification of the development in Wealdstone over the next five years is likely to lead to greater pressure on parking availability in Wealdstone town centre and the surrounding areas. Therefore, it is anticipated that increases to the operational hours of existing CPZs and the introduction of new CPZs covering additional areas will be required to restrict long-term parking on-street by commuters, work place parking, businesses and new developments. CPZ controls aims to protect the parking amenity of the local residents and contribute to encouraging modal shift in line with the MTS. A CPZ review is already underway in the Leisure Centre area, as a consequence of existing parking pressures, shown by the dashed blue line in Figure 4-9, and this is already indicating a trend towards longer operational hours to protect local residents' parking amenity.

4.5.6. Parking Summary

In summary, a total of 333 parking bays in Wealdstone have been surveyed. Of these, 257 are located within the Peel House multi-storey car park, 27 in the Palmerston Road pay and display car park and 49 on-street pay and display bays.

There are a limited number of on-street bays in Wealdstone town centre, and based on the 2016 surveys, these are in high demand throughout the day. The average occupancy recorded across all on-street parking bays was 81%, with illegal parking on double yellow line and in loading bays at many locations. The Palmerston Road car park is also well used but, based on the October 2015 data, the Peel House car park has a lower level of occupancy, with a maximum of 69% (173 vehicles).

The maximum occupancies were observed at the following times in each location:

- On-street – 50 vehicles (104%), 1330 hours
- Peel House car park – 173 vehicles (69%) Friday, 2300 hours
- Palmerston Road car park – 26 vehicles (96%) 1130 hours.

The reduction in the quantity of public car park spaces in the development at the new Civic Centre site (longer duration parking), may encourage an increase in travel to Wealdstone by sustainable modes of transport, but there is a significant risk that on-street parking (both legal and illegal) will increase significantly due to the reduced number of car park spaces being provided in the future. This may result in the need for increased parking restrictions on-street to regulate demand.

The existing short stay parking provision in the town is limited to the on-street pay and display bays which are currently heavily used by long stay parking because there is no maximum stay limit. This makes access to short stay parking difficult. It is suggested that the quantity of parking bays be maintained and that these bays be dedicated to short stay parking with a maximum stay limit in order to facilitate customer parking for local shops and amenities to benefit the local economy.

The wider impact of the regeneration programme with the creation of up to 5,500 new homes and 3,000 new jobs in the area will place significant additional parking pressure on public highway parking space in the town and surrounding areas by new residents, employees and businesses. The amount of public highway parking space will remain static and there will be greater competition between different user groups for the available parking space. Therefore the extent and duration of CPZs and parking controls in the area will need to increase significantly in order to manage long stay parking, to protect local residents parking amenity and to encourage the use of sustainable modes of travel in line with the MTS.

4.6. Collision Analysis

A review of personal injury collisions recorded in the study area over the three-year period from 1st December 2012 - 30th November 2015 has been conducted. The aim of the analysis is to identify and understand any trends or patterns in the in the occurrence of collisions within the study area.

The collision data provided by TfL shows that 57 collisions were recorded in the study area during the 36-month period specified, resulting in 67 recorded casualties. Of these, 19 (33%) involved pedestrians and 9 (16%) involved cyclists.

4.6.1. Collision Severity

All recorded collisions are classified by their severity. The possible classifications are slight, serious and fatal. Table 4-6 provides details of the reported collisions by severity.

Table 4-6 Collision Severity

Severity	Number of Collisions
Serious	9 (16%)
Slight	48 (84%)
Total	**57**

There were no fatal collisions recorded in the study area over the three-year period. Of the nine recorded serious collisions:

- 4 involved pedestrians failing to look properly for oncoming vehicles when crossing the road, three of which were away from formal crossing facilities;
- 1 involved a car driver failing to indicate right at a roundabout and colliding with another vehicle;
- 1 involved a car driver mounting the kerb and hitting a pedestrian on the footpath;
- 1 involved a car driver reversing into a stationary vehicle;
- 1 involved a driver under the influence of alcohol losing control of the vehicle; and
- 1 involved an elderly passenger tripping whilst getting off the bus.

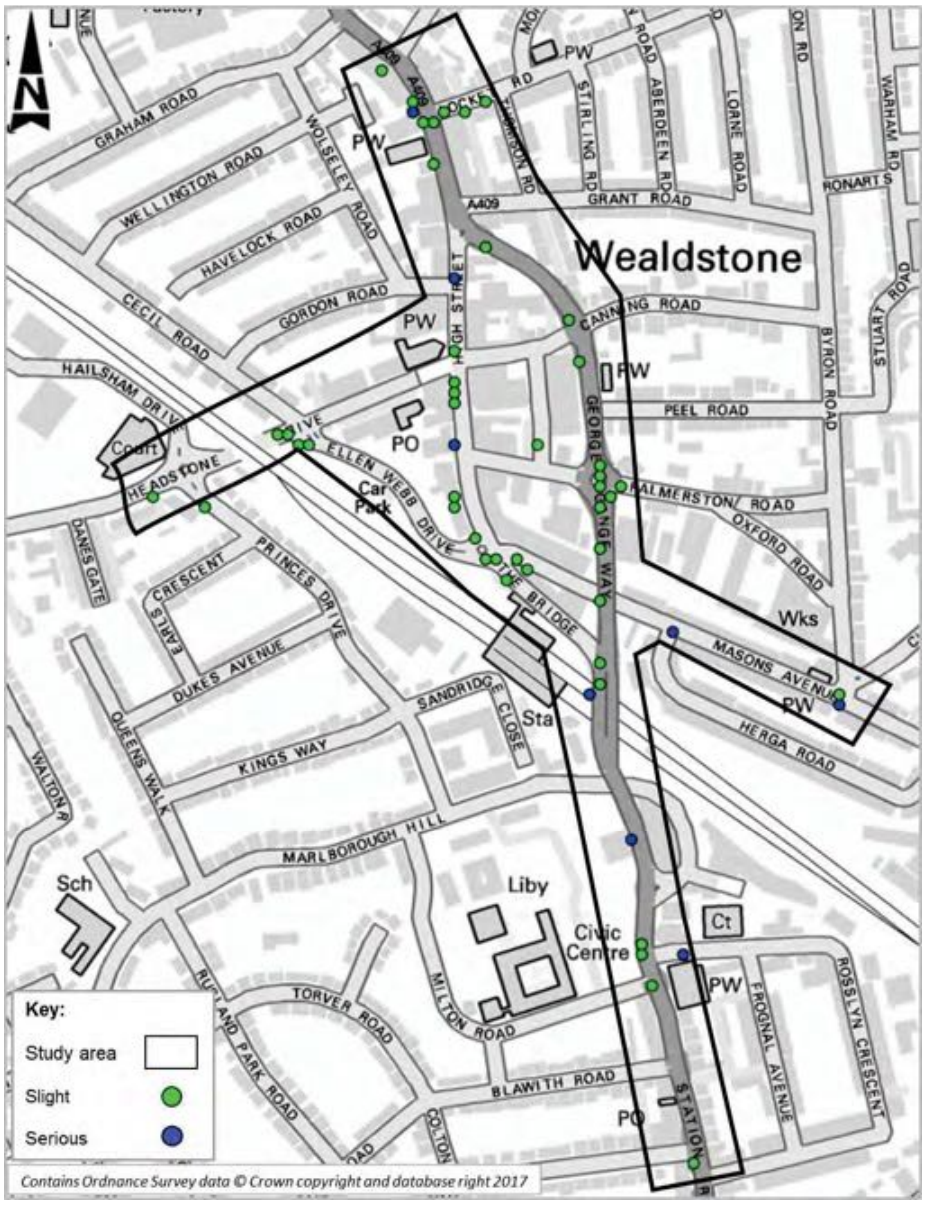
Out of the 48 collisions classified as slight:

- 9 were caused by rear shunts;
- 8 were caused by vehicles colliding with pedestrians crossing the road away from formal crossing facilities;
- 6 were caused by vehicles turning into the path of other vehicles;
- 4 were caused by drivers opening vehicle doors into the path of oncoming cyclists;
- 4 were caused by drivers disobeying give way markings / traffic signals;
- 3 were caused by vehicles colliding with pedestrians at a formal crossing facility;
- 2 were caused by buses suddenly braking, causing passengers to fall;
- 2 were caused by vehicles trying to overtake and colliding with oncoming vehicles;
- 2 were caused by vehicles turning across the path of a cyclist;
- 2 were caused by drivers losing control of their vehicle;
- 2 were caused by vehicles pulling out into the path of other vehicles;
- 2 were caused by sudden braking to avoid collisions;
- 1 was caused by a cyclist riding off the pavement into the path of an oncoming vehicle; and
- 1 was caused by a pedestrian colliding with a bus whilst chasing it.

4.6.2. Collision Locations

Figure 4-10 shows the locations of the recorded collisions in the study area.

Figure 4-10 Collision Locations and Severity



The collisions are dispersed across the study area, however there is a higher concentration of collisions around some junctions. Details of these are as follows:

- **A409 High Street / Locket Road junction**
  A total of nine collisions were recorded at this junction. Of these, three involved pedestrians and one involved a cyclist. One serious collision occurred at this junction where a pedestrian crossed the road into the path of a motorcycle.
- **Ellen Webb Drive / Cecil Road / Headstone Drive junction**
  A total of four collisions were recorded, one of which involved a vehicle colliding with a pedestrian crossing the road away from a formal crossing.
- **Ellen Webb Drive / The Bridge / High Street / Masons Avenue junction**
  Eight collisions were recorded at this junction, three involving pedestrians and two involving cyclists.
- **A409 George Gange Way / Palmerston Road roundabout**

A total of seven collisions occurred at the roundabout, one of which involved a pedestrian failing to look and being hit by an oncoming vehicle and one involving a vehicle passing too close to a cyclist.

- **Christchurch Avenue / Masons Avenue / Byron Road roundabout**
  Three collisions occurred at this location, including a serious collision. The serious collision involved a driver turning right over the centre of the mini-roundabout without indicating and colliding with an oncoming vehicle.
- **High Street**
  A cluster of seven collisions were recorded between the junctions with Canning Road and Palmerston Road. Most of these collisions involved pedestrians failing to look whilst crossing the road and being struck by oncoming vehicles. Two involved passengers falling whilst on a bus and one occurred when a vehicle lost control and mounted the footway.

4.6.3. Casualties

There were 66 casualties as a result of the 57 recorded collisions during the study period. The casualties from the 9 recorded serious collisions included five pedestrians, three car drivers and one bus passenger. Most casualties were vehicle drivers (25 casualties, 38%) but a large proportion were pedestrians (19 casualties, 29%) and cyclists (9 casualties, 14%). Table 4-8 compares the percentage of accidents by user group for the study area to the percentage of all casualties in LBH in 2014 (DfT Road Accidents and Safety Annual Report 2014). The data indicates there is a higher proportion of pedestrian and cycle casualties in the study area compared to the borough average. This may be attributed to the town centre location of the study area where pedestrian and cyclists' flows are likely to higher than average across the borough.

Table 4-7 Type and Number of Casualties

Casualty Type	Number of Casualties	Proportion of Total Casualties
Vehicle Driver	25	38%
Pedestrian	19	29%
Vehicle Passenger	13	19%
Cyclist	9	14%
Total	**66**	**100%**

Table 4-8 Summary of Casualties

User Group	Casualties (%)	
	Study Area	LBH 2014
Driver / Passenger	57%	70%
Pedestrian	29%	22%
Cyclist	14%	8%

4.6.4. Condition at Time of Collision

Out of all recorded collisions in the study area, 46 occurred when the road was dry and 11 occurred when the road was wet. Most collisions occurred during the day and with a dry road condition, see Table 4-9.

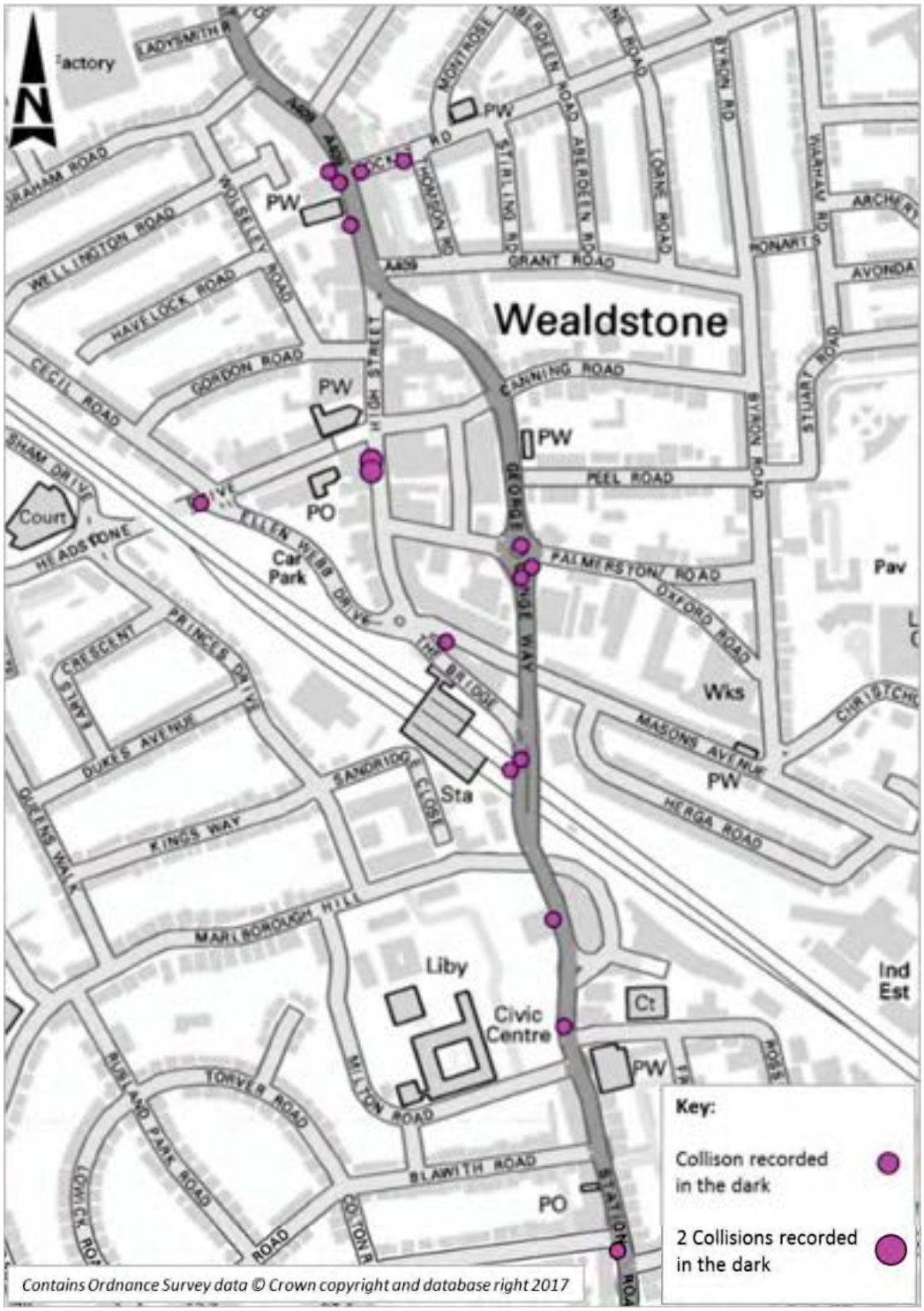
Table 4-9 Condition of Road and Light Levels at Time of Collision

Road Condition	Light Level	Number of Collisions
Dry	Daylight	32
Dry	Dark	14
Wet	Daylight	6
Wet	Dark	5

One third of recorded accidents in the study area occurred during the dark, the locations of which are identified in Figure 4-11. There are clusters of collisions located at Locket Road, Palmerston Road roundabout and in

the middle of the High Street. This is only a slightly higher proportion than the 29% average for LBH and the whole of London and is not statistically significant. Nonetheless it is recommended that street lighting should be reviewed to ensure the current provision is adequate. Four collisions were recorded at the same location in the centre of the High Street, where there are two bus stops which may block the street lighting if two buses are standing. Three of the five collisions recorded at the Locket Road junction involved pedestrians being hit by oncoming vehicles. Street lighting is sparse around the junction which has an unconventional layout, so should be reviewed here.

Figure 4-11 Collisions During Hours of Darkness



4.6.5. Cause of Collisions

Most collisions were caused by driver, pedestrian or cyclist error and were not caused by the condition of the road. Only three recorded collisions were attributed to drivers travelling too fast for the weather conditions. As mentioned previously, most casualties were vehicle drivers and most collisions involving vehicle drivers were caused by rear shunts. The high number of pedestrian casualties were caused by pedestrians failing to look properly when crossing the road and cars not stopping in time, many cases occurring away from formal crossing facilities. Other main causes of collisions involved vehicles turning into other vehicle's paths and failing to give way to other traffic.

4.6.6. Collision Frequency

Figure 4-12 and Figure 4-13 show a breakdown of collisions by month and day of the week respectively. Most collisions occurred during March and June with the greatest proportion occurring on Mondays and Saturdays.

Figure 4-12 Collision Occurrence by Month

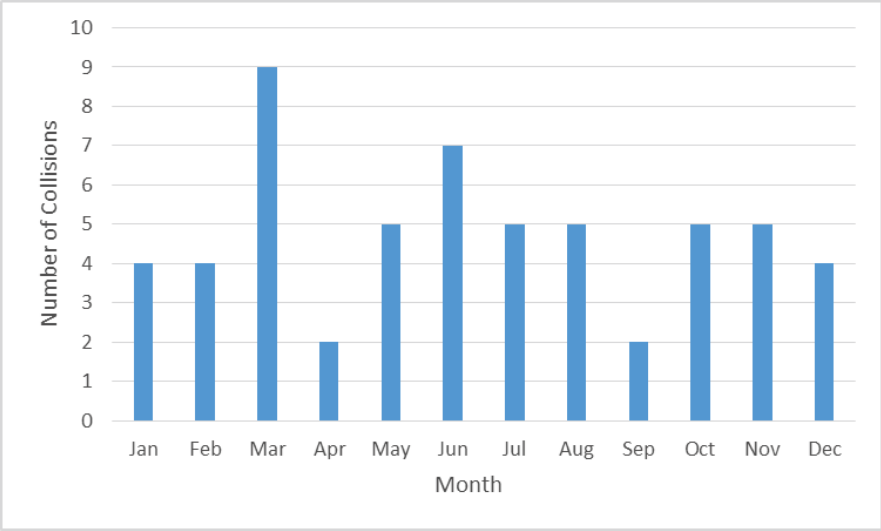
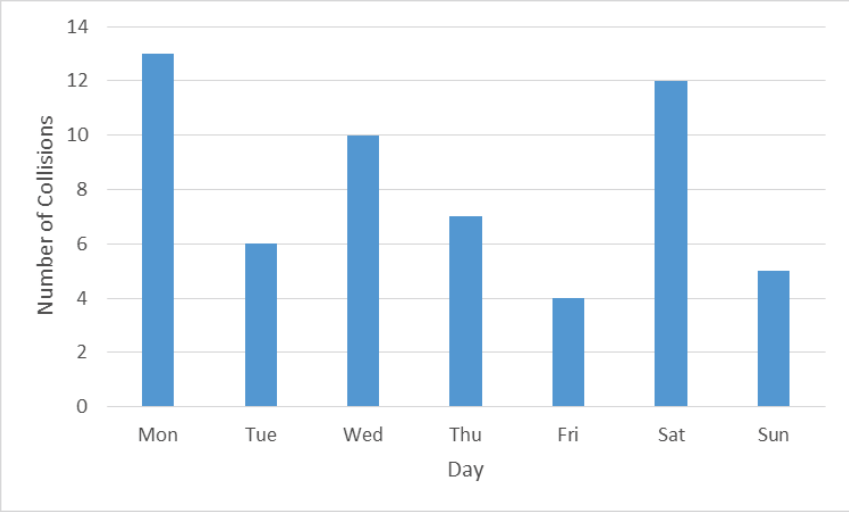


Figure 4-13 Collision Occurrence by Day



4.6.7. Collision Summary

It has been identified, based on the collision data supplied by TfL that the majority (38%) of recorded collisions between 1st December 2012 and 30th November 2015 resulted in a vehicle driver casualty. Pedestrian and cyclist casualties made up 29% and 14% of casualties respectively, recorded during the study period. Most collisions were caused by driver, pedestrian and cyclist error and were not caused by the condition of the road. Only three collisions were attributed to a slippery road surface or drivers travelling too fast for the weather conditions.

The proportion of pedestrian and cyclist casualties in the study area was higher than the average for LBH in 2014. Eight recorded collisions involved pedestrians at an uncontrolled or informal crossing point. Clusters of collisions occurred at several junctions within the study area. A high number of collisions occurred at the A409 High Street / Locket Road junction, three of which involved pedestrians and one involving a cyclist.

The findings of this collision analysis will be considered during the preparation of the proposed design options with the aim of addressing any identified road safety issues.

4.7. Issues and Opportunities Workshop

The combination of issues raised above results in a constrained environment for pedestrians and cyclists. Street furniture and guard railing reduce the effective footway width at multiple areas within the town centre, creating pinch points and congestion along the footway, reducing the attractiveness of the town centre as a place to visit and spend time in. Therefore, there is an opportunity to improve the pedestrian environment along the High Street by rationalising street furniture and enhancing the public realm, and hence has resulted in the development of a major scheme bid by the LBH.

As part of this study a site visit was undertaken and a stakeholder workshop was held in May 2016 to identify the existing issues in the town centre and generate potential opportunities to tackle these issues. The workshop process and the resultant outputs are outlined below, with an issues and opportunities summary plan included in Appendix F.

4.7.1. Workshop Attendees

The following stakeholders were represented at each of the three workshops:

- London Borough of Harrow, Traffic and Highways;
- London Borough of Harrow, Regeneration;
- London Borough of Harrow, Economic Development;
- TfL, Surface Transport;
- TfL, Borough Planning;
- Peter Brett Associates;
- Mark Projects; and
- Atkins.

The following sections detail the issues and opportunities in the town centre generated by stakeholders during the initial project workshop. Many issues and opportunities were identified across the study area, based on road network performance, the public realm and the impacts of developments. The issues and opportunities identified and discussed are highlighted below, broken down by geographical location.

4.7.2. The Bridge and Harrow and Wealdstone Station

Harrow and Wealdstone Station is located to the south of Wealdstone High Street, and runs both National Rail and London Underground / Overground services. The following issues and opportunities were identified on The Bridge and near the station:

Issues

- The public realm near the station is relatively poor, where it should offer a gateway to the town centre for those arriving by rail.
- Harrow and Wealdstone station is well positioned at the southern end of the High Street, however there is a large expanse of carriageway at the High Street / Masons Avenue / The Bridge / Ellen Webb Drive junction which severs the station from the High Street;
- Pedestrians do not have a direct route from the station to the High Street, having to cross at least two signalised crossings between the two;
- Cycle routes provided at the junction are complex, making the busy junction daunting for cyclists;
- The area in the immediate vicinity of the station is poor, dominated by the taxi rank and poorly positioned cycle racks on the footways;
- There is potential to make use of the open space between the station and Ellen Webb Drive to enhance the public realm in this area and improve the arrival experience for those arriving by rail; and

- On The Bridge, there are bus stops in either direction approximately 50 metres from the station exit, however this is not immediately clear when exiting the station.

Figure 4-14 Outside Harrow and Wealdstone Station

Opportunities

- Opportunity to identify whether the traffic signals at the Ellen Webb Drive / Masons Avenue / The Bridge junction could be removed or reduced in size. The vast amount of space at the junction could be used to create a gateway to the town centre – block paving roundabout suggested;
- Open space between taxi rank and Ellen Webb Drive could be utilised;
- Potential to improve pedestrian crossings connecting the station and High Street;
- Public art could be installed on The Bridge to make a more attractive gateway to the town centre from the A409; and
- Potential to improve pedestrian crossings connecting the station and High Street.

4.7.3. A409 (George Gange Way – High Street)

The A409 by passes the town centre with the primary function of the road being traffic movement. Several issues and opportunities have been identified along the by-pass.

Issues

- The A409 is a daunting environment for pedestrians with a single controlled toucan crossing adjacent to Peel Road;
- Excessive guard railing along the carriageway restricts pedestrian movement;
- The pedestrian east-west link to the town centre is poor, currently being through an alleyway south of the Peel Road multi-storey car park;

- Entry to the town centre from the A409 George Gange Way / The Bridge junction is not obvious and the current artwork on The Bridge does not enhance the street scene;
- A lack of active frontage is detrimental to the public realm at this junction and, again, does not highlight that this is an entry into the town centre; and
- The A409 / The Bridge junction is dominated by traffic and a lack of signalised crossings makes the junction daunting for pedestrians.

Figure 4-15 A409 George Gange Way

Opportunities

- Potential to re-instate the right turn on The Bridge to stop traffic using High Street / Palmerston Road route;
- Footways on the Bridge are wide with space to create shared use pathways;
- Junction layout and pedestrian crossing facilities by Milton Road to be reviewed taking account of the current Civic Centre development (Poets Corner);
- Development potential plots to the north east and north west of George Gange Way / The Bridge junction to create active frontages; and
- Opportunity for lighting and planting on A409 between Station Road and Wealdstone to improve the public realm.

4.7.4. High Street

The public realm on the High Street is poor, with several issues and improvement opportunities identified.

Issues

- A mix of paving materials is used along the High Street;
- There is a large quantity of street furniture that restricts pedestrian movement with an excessive amount of space given to vehicles;

- The two bus stops in the centre of the High Street are located opposite each other which causes problems for through traffic as nine bus services use the stops and there is limited opportunity for general traffic to overtake buses when stopped;
- At the northern end of the High Street heavy queueing was observed during both the AM and PM peak hours at the junction with the A409. Signal timings may need to be reviewed to synchronise this junction with the Locket Road junction to the north;
- The junction is A409 / High Street junction is relatively wide, so there is an opportunity to improve the layout and create a gateway to the town centre;
- Five parking bays on the High Street are close to the junction, restricting space for vehicles to queue;
- There are signalised pedestrian crossings on all arms of the junction, although unnecessary street furniture and guard railing could be removed to enhance the pedestrian environment;
- Short term parking on the High Street and in nearby areas is limited. Current proposals to convert the Peel House multi storey car park to the new Civic Centre may put further pressure on parking in Wealdstone, potentially impacting the local economy;
- Within the study area, there are a total of five signalised junctions. Having signals along the High Street cause delay and some junctions may benefit from a review of the current signal timings. For example, the High Street / Palmerston Road junction has a signal phase for the derelict pub site which is currently being utilised as a car wash.

As noted previously, the High Street southbound is restricted to buses and cycles only, therefore most traffic uses the A409 rather than travelling down the High Street. Although this means traffic levels are low on the High Street, much of the traffic completely avoids the town centre and may be unaware that it is there, potentially negatively impacting the economy of the town centre.

Figure 4-16 Wealdstone High Street

Opportunities

- Bus stops could be relocated along the High Street if there is sufficient space, allowing vehicles to pass buses when stopping;
- Relatively wide junction at the top of the High Street could be improved to create a gateway to the town centre;
- Option for timed restrictions northbound on High Street for buses and cycles only; and
- Review of carriageway and footway widths and alignment to prioritise pedestrian / cycle movement, similar to the Harrow Town Centre, Station Road scheme.

4.7.5. Palmerston Road

Palmerston Road links the A409 and the High Street, yet the link between the two is currently unattractive with a lack of awareness that the town centre is there. There is potential to create a gateway to the town centre at the roundabout, which may encourage further use of the town centre.

The A409 / Palmerston Road roundabout has poor pedestrian crossing and cyclist facilities, and direction signs are confusing.

Figure 4-17 Palmerston Road

Opportunities:

- There is potential to create a gateway to town centre by improving the Palmerston Road link, as there is currently no indication to the town centre from the roundabout.

4.7.6. Headstone Drive

The quality of the public realm on Headstone Drive is poor, with parked cars dominating the space. The following additional issues were identified by stakeholders during the workshop:

- The current footways are narrow, with space restricted further with shop stalls on the footways;
- As outlined in Chapter 4, Headstone Drive has 30 pay and display spaces, although during surveys vehicles were often observed parking outside of marked bays;
- The Headstone Drive / Cecil Road / Ellen Webb Drive junction is part of a key east – west link for pedestrians and cyclists, linking the Kodak development site with the town centre. The current layout has excessive guard railing, creating circuitous and inconvenient pedestrian routes;
- The Cecil Road junction has an unconventional layout which may be confusing for drivers featuring a combination of poor road alignment and multiple priority junctions;

A complimentary scheme to create a public space between Headstone Drive and High Street (Trinity Square) has been approved and will be implemented. In addition, an enhancement scheme has also been proposed for a signalised junction at Headstone Drive / Cecil Road / Ellen Webb Drive, which will be funded by developer contributions. Both these schemes have been considered when evaluating proposals that affected this area.

Figure 4-18 Headstone Drive




Opportunities

- Potential to improve east / west connection, junction alignment and public realm on Headstone Drive;
- Improving pedestrian route at Headstone Drive / Princes drive roundabout will connect Kodak development to town centre; and
- Potential to re-open route through Headstone Drive to traffic. May help with poor layout at Headstone Drive / Cecil Road junction.

4.7.7. General Issues and Opportunities

Issues

- The cycle facilities throughout the study are poor, with disjointed routes and a lack of direction signing making the existing infrastructure confusing for cyclists;
- Pedestrian access to the town centre is poor, particularly east-west links;
- There is a lack of gateway features to highlight the town centre to both traffic and non-motorised users;
- Poor public realm in Wealdstone in several locations throughout the town centre;
- There is limited on-street parking within the town centre, with the current parking provision in high demand;
- Unnecessary street clutter and guard railing within the town centre which creates pinch points and areas of congestion for pedestrians; and
- Poor quality and mixed paving materials throughout the town centre contribute to the cluttered and unattractive streetscape.

Opportunities

- Potential to shorten bus routes in the town to improve circulation and reduce journey times;

- Some junctions could be converted to roundabouts (as seen in the LB Ealing) which would have minimal impact on buses and may calm general traffic;
- Proposed developments are 'car light' so present opportunities to improve pedestrian connections;
- Prioritising connections into the town centre for the new residents may benefit the local economy
- High number of signalised junctions across the study area. Signals could be reviewed and amended / removed; and
- There is a perception that a provision of parking means people will stop and spend more. TfL study on spending by different transport modes suggested public transport users spend more, however short term parking may remain important for the High Street and its users.

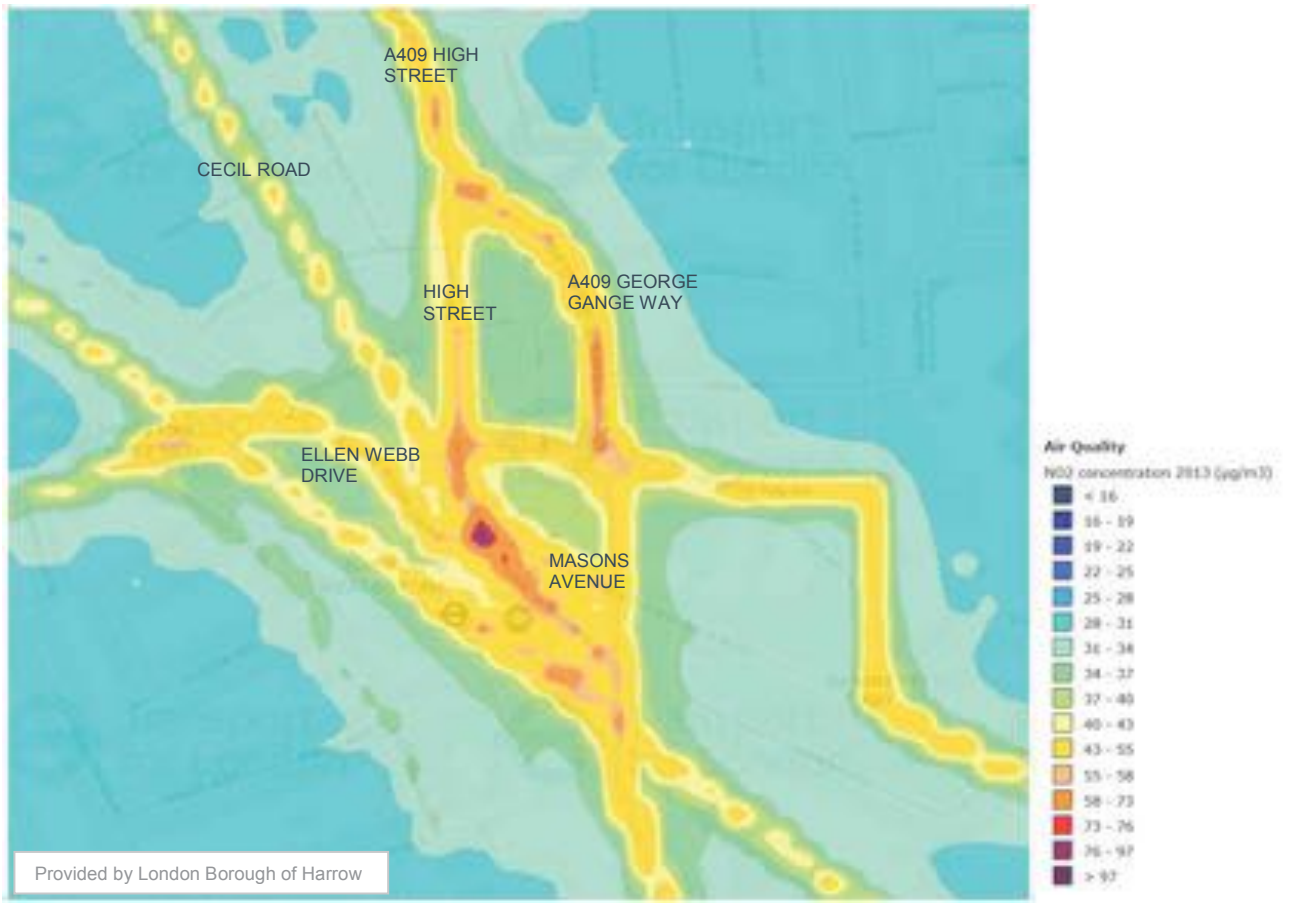
4.8. Air Quality

As outlined in The Mayor's Air Quality Strategy, improving air quality is a key consideration in London, where many of the emissions are generated from motorised traffic. The London Atmospheric Emissions Inventory (LAEI) identified five Air Quality Focus Areas within Harrow, one of which is in Wealdstone. The area of focus in Wealdstone is around The Bridge, Masons Avenue and Palmerston Road. This is one of five designated air quality areas within the borough.

An air quality map of the study area is shown in Figure 4-19, which shows the level of Nitrogen Dioxide (NO_2) recorded in 2013. As shown in the map, the highest levels of NO_2 were recorded at the High Street junction with The Bridge, outside Harrow and Wealdstone station. The highest levels recorded here were between 76-97µg/m3, whereas the annual mean NO_2 objective is 40µg/m3.

Design proposals will consider ways to reduce traffic and congestion along the route, to improve the air quality in the area. This will be important when new developments bring a number of new homes and jobs to the area, particularly the proposed Civic Centre development. Proposals to improve air quality should be identified across the study area, as traffic and congestion are an issue throughout Wealdstone. Designs will consider ways to encourage use of sustainable transport, in addition to making junctions operate more efficiently to reduce queueing in the town centre.

Figure 4-19 Air Quality in Wealdstone



4.9. Summary of Issues for Wealdstone Town Centre

A summary of the issues and opportunities, identified during the site visit to Wealdstone town centre, by location, is included in the report in Appendix F. The key transport issues identified in the town centre are summarised below:

- Wealdstone town centre is well connected by public transport, with several bus routes serving it as well as both rail and underground / overground services from Harrow and Wealdstone station. Unlike many other town centres, Harrow and Wealdstone station is close to the town centre.
- There is a high demand for on-street parking in Wealdstone town centre, and this pressure may increase with the new Civic Centre development at the Peel House car park site and the wider regeneration programme to build 5,500 homes and create 3,000 new jobs;
- The current cycle provision is disjointed and confusing, which may discourage people from cycling around the town centre;
- The presence of street clutter reduces the effective footway width at several areas within the town centre, creating pinch points and congestion;
- Excessive guard railing is present at several locations, creating convoluted routes for pedestrians; and
- The number of recorded cyclist casualties was higher than the borough average for the period assessed.

5. Urban Design Review

An urban design review has been undertaken by Mark Projects Ltd. It assessed the existing situation, identified key public realm issues and opportunities and set out a public realm vision for the study area. The full report is included in Appendix F.

Wealdstone is identified as an opportunity area and as such Wealdstone is undergoing major changes due to the development of industrial sites, such as the former Kodak site, into residential sites to deliver 5,500 new homes in the area. This is occurring alongside several other developments, including the relocation of the current Civic Centre from Station Road to the centre of Wealdstone and the redevelopment of the leisure centre at Byron Park.

5.1. Issues and Opportunities

Historic development in Wealdstone has, in some cases, had a detrimental impact on the integrity and character of the high street, especially by 'breaking' its continuity on the southern side of The Bridge. Several public realm issues and opportunities were highlighted across the study area, as summarised in section 4.7. The strengths of Wealdstone were highlighted as its strong high street character, the existing local economy and the public transport connectivity. The proximity of the station to the High Street is a particularly strength. The main issues identified in the Urban Design review arise from the poorly planned public realm in terms of pedestrian and cycle movements, exacerbated by high levels of vehicular traffic passing through the town centre.

The public realm environment could be vastly improved by looking at the engineering of key junctions and crossings from a pedestrian and cyclist perspective. In addition to this, a renewal of the streetscape and spatial interventions in key spaces, such as the station forecourt, could make a huge impact on the sense of place and the quality of public realm in the town centre. Outside the town centre itself, wider foot and cycle links will need to be improved and rationalised to improve connectivity and encourage visit by the local residential and business community on foot and by bicycle.

The public realm issues and opportunities that were identified as part of the Urban Design Review are incorporated into those listed and discussed in the previous section of this report.

5.2. Public Realm Design Strategy

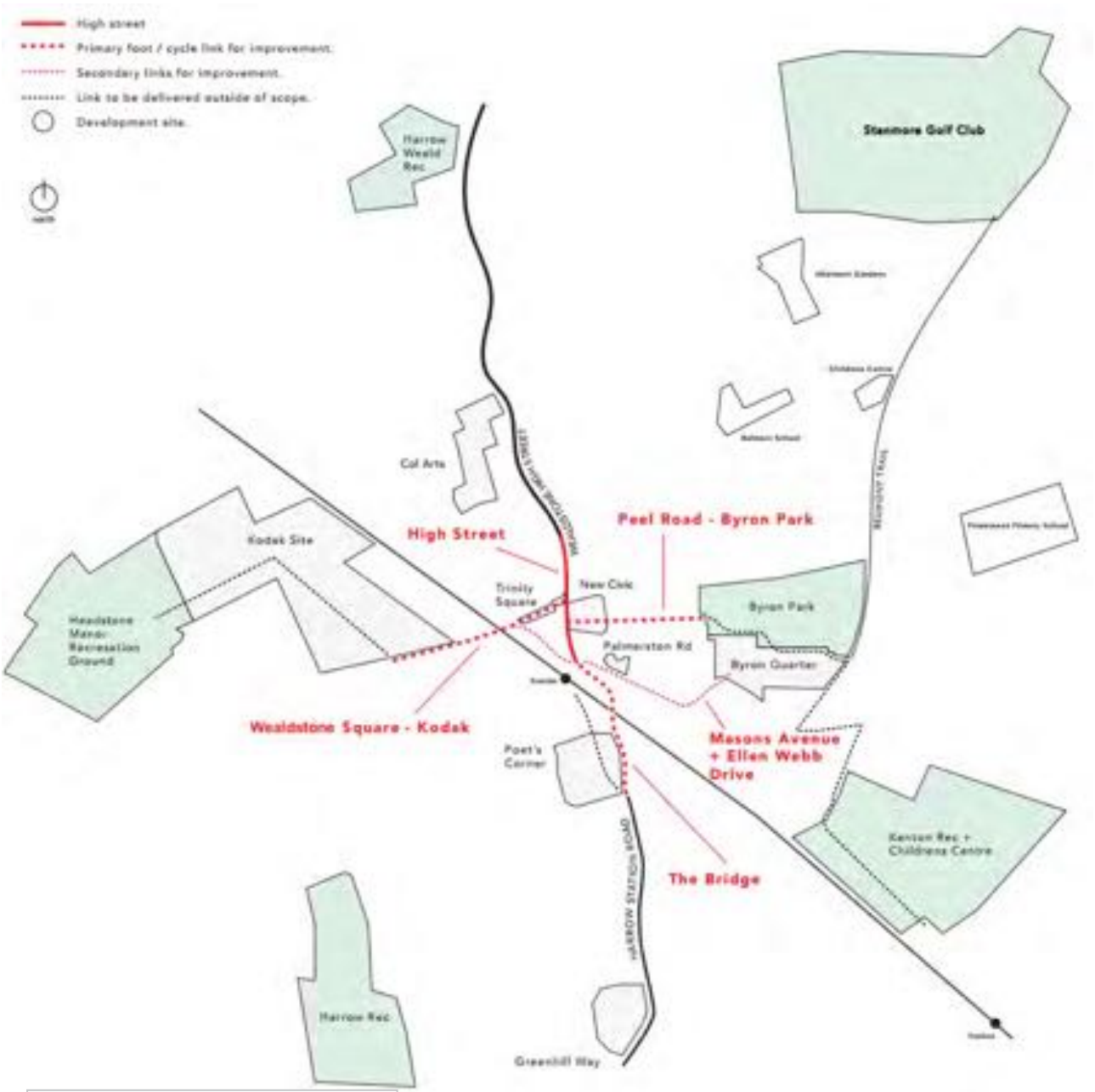
The following public realm vision and objectives have been identified for Wealdstone:

- A strengthened walking connection between Station Road and Wealdstone town centre;
- Improved arrival experience to the town centre from Harrow & Wealdstone station;
- Improved appearance and quality in the high street public realm;
- Integrated public realm in new development;
- Active and distinctive public spaces;
- Well planned, simple and useful cycle routes;
- Clear and simple way finding and signage; and
- Supporting new development.

The wider strategic objectives are that any public realm and highway improvements should boost strategic connectivity for pedestrians and cyclists and support the future development of key sites within the study area, including the Kodak site, the Byron Quarter, and the new and proposed Civic Centres, and thereby promote the regeneration and economic growth of Wealdstone. A key consideration is improving the wider links to and from Wealdstone, particularly east-west for pedestrians and cyclists.

Figure 5-1 shows the strategic linkages that will strengthened and supported by multiple and overlapping schemes, including proposals emerging from this town centre study.

Figure 5-1 Strategic Links to Wealdstone



From Mark Projects Urban Design Report, 2017

5.3. Public Realm Proposals

5.3.1. The Bridge, Poet's Corner Square and Station Square

The Bridge connects Wealdstone High Street to Harrow Station Road, for vehicular, pedestrian and cyclist movements. Improving this link is an important factor in encouraging footfall between the two high streets and supporting the local economy of both places.

Figure 5-2 Urban Design Proposals - The Bridge

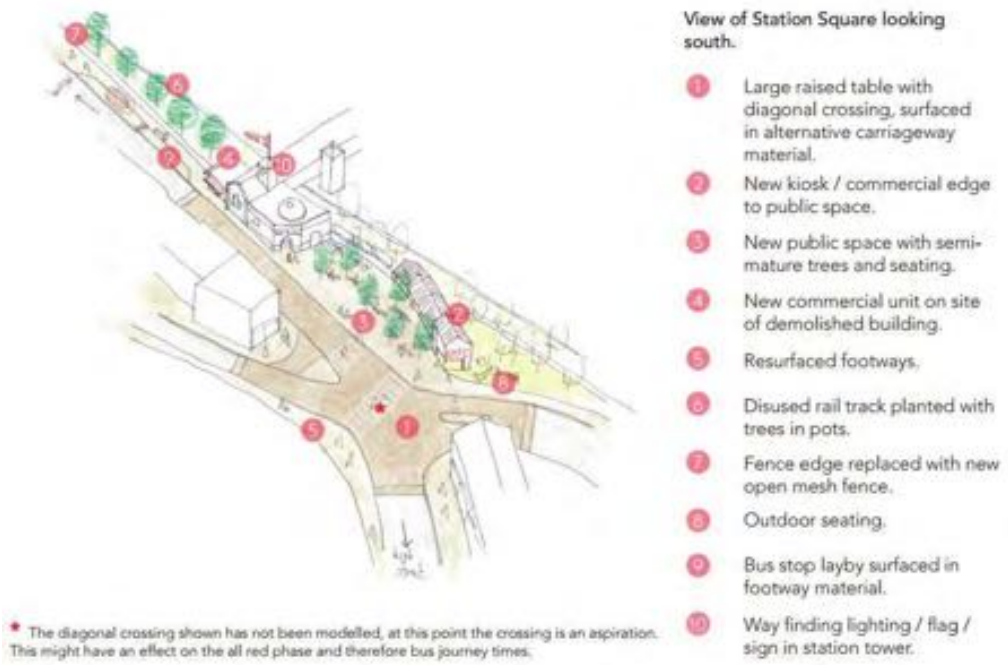
From Mark Projects Urban Design Report, 2017

Existing mature trees alongside The Bridge could be lit with canopy lighting so that as you walk up the bridge you pass close to the lit canopies. Trees in planters could also be installed on the footways and the central reserve. The site and history of the Railway Hotel could be remembered with a custom interpretation and lighting piece.

Poet's Corner Square, forming part of the existing Civic Centre development, will feature new buildings with active ground floor uses. The space will have trees and furniture installed, with options to use the area for events such as markets. Provision of a raised table would make crossing easier for pedestrians and connect the two sides of the road.

Public realm improvements to Station Square are key to reconnecting the station with The High Street. Key features of the proposed design include creating a welcoming public space outside the station through public realm enhancements consisting of high quality paving, new trees and public seating. These would be combined with a revised junction layout, potentially including a raised table, aimed at reducing the dominance of traffic and facilitating easier crossing of the junction by pedestrians and cyclists.

Figure 5-3 Station Square Proposals



From Mark Projects Urban Design Report, 2017

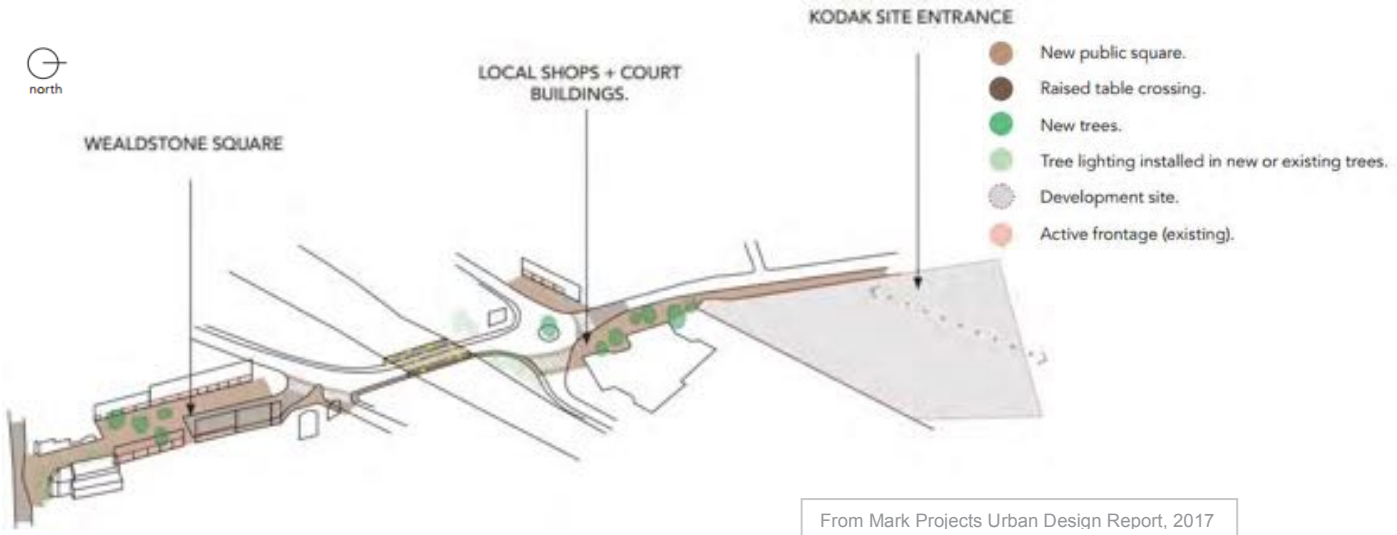
5.3.2. Wealdstone High Street

Proposed public realm improvements along Wealdstone High Street include footway widening, removal of street clutter, high quality paving and street furniture, additional seating, new street trees and better pedestrian crossings to compliment the traffic engineering proposals emerging from this study.

5.3.3. Wealdstone Square to Kodak Site

The former Kodak site will deliver over 1,000 new dwellings and therefore walking and cycling to and from Harrow and Wealdstone Station and the High Street should be encouraged through enhancements to the public realm on these routes.

Figure 5-4 Urban Design Proposals - Wealdstone Square to Kodak Site



From Mark Projects Urban Design Report, 2017

Wealdstone Square, previously known as Trinity Square, is currently in the process of being redeveloped as a key public space in the town centre. The project is scheduled for completion in 2018 and will provide a new

events space, parking and improved cycle and walking routes through the square. Improvements at the junction with Ellen Webb Drive, consisting of enhanced crossing facilities for pedestrians and cyclists and removal of guard railing, are also separately proposed and will be funded by developer contributions.

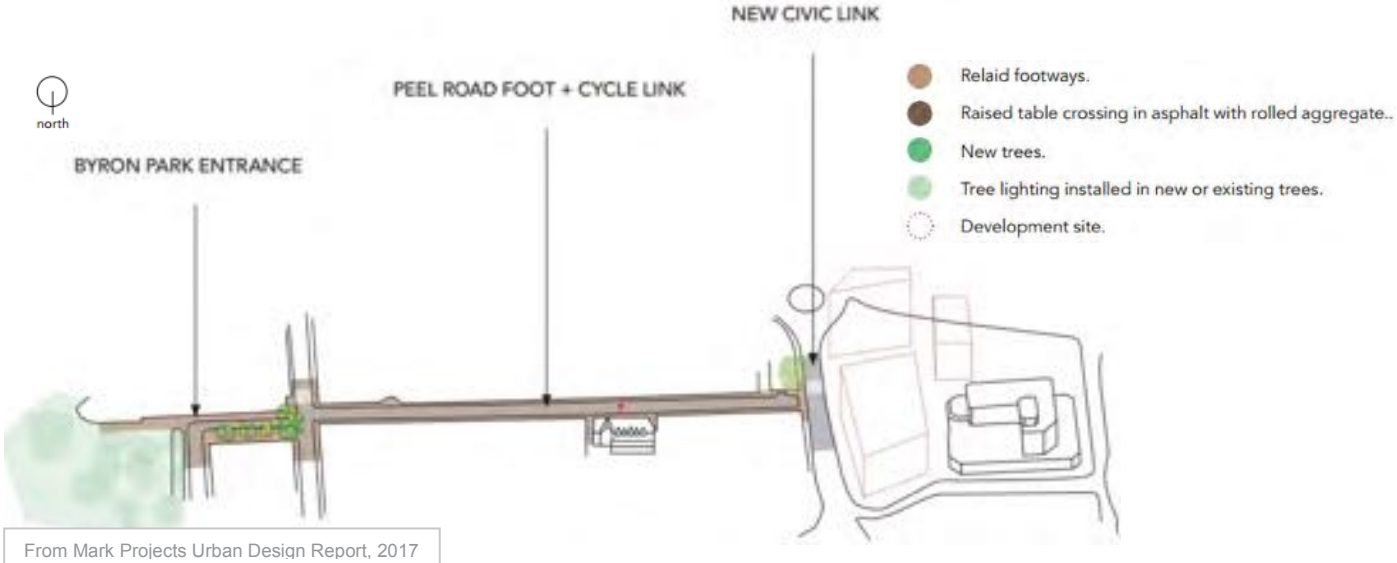
The environment under the railway bridge could be improved with a lighting scheme crossing facilities at the adjacent roundabout could be improved through footway widening and raised tables. Outside of the Court Building there is the opportunity to plant new street trees.

The Kodak site development will provide a new pedestrian and cycle route through Headstone Manor which will provide connectivity through the site to the historic museum and green space.

5.3.4. High Street to Byron Park

Wealdstone high street was once connected to Byron Park by Peel Road. This relationship still exists, but has been compromised by the building of George Gange Way and the Premier House car park which both restrict pedestrian and cyclist movements to and from the High Street. A new walking route from the High Street through Premier House site to the A409 George Gange Way is proposed as part of the new Civic Centre proposal, which is currently being developed. This route will become increasingly important with new development at the Leisure Centre site.

Figure 5-5 Urban Design Proposals - High Street to Byron Park (Leisure Centre)



From Mark Projects Urban Design Report, 2017

The Stuart Road carriageway could be realigned adjacent to the Byron Park entrance to provide a widened footway on its southern side which could be landscaped with street trees (with canopy lighting) and public seating, bringing a sense of the park into the street. A raised table with zebra crossing is proposed at the junction of Stuart Road with Peel Road and Byron Road for the benefit of pedestrians and cyclists.

The carriageway on Peel Road could be raised and resurfaced with an aggregate rolled into the top surface to calm traffic and give a sense of the link to the park which is proposed to have resin bond gravel paths. The existing pub sign could be replaced with a bold new sign that acts as an attractor and way finding element. The large tree on George Gange Way could also be lit as a way finding element.

Consideration should be given to relocating the existing crossing across George Gange Way to better align it with the new link to the High Street through the new Civic Centre development.

5.4. Urban Design London (UDL) Design Surgery

LBH attended an Urban Design London (UDL) panel in May 2016 to discuss the TfL Major Scheme proposals. The Panel were impressed by how much work had already been carried out to explain the proposed new movements for buses and cyclists, as part of the boroughs step one major scheme bid. However, LB Harrow were encouraged to be more ambitious with their aspirations for Wealdstone and were asked to reconsider the project as a placemaking scheme that uses traffic management and an exemplary public realm to achieve its objectives.

Due to the proposed increase in population and number of developments in Wealdstone, the development strategy should be well co-ordinated between the Transport and Regeneration departments to ensure their objectives align. The workshop noted that the LBH should consider pedestrian movements, the station forecourt, cycle storage facilities and the 'slow-street' interventions needed to make the streets feel welcoming, civilised and green in addition to the relationship between buildings and public spaces being key.

LB Harrow was urged to define the spaces in the town centre and set the circumstances for how they want people to use them. This will help the area to develop its own character and should shape how traffic is managed. The new Civic Centre is critical to the success of the project and the Panel advised LB Harrow to consider the significant benefits a 'Civic Square' could have at the heart of the scheme. The borough should clearly demonstrate how the scheme will make Wealdstone a better place for people, with better spaces, facilities and infrastructure.

5.5. Urban Design Summary

The urban design issues and opportunities are summarised as follows:

- Several public realm issues have been identified across the study area, focused around the station, High Street, The Bridge and the links to Byron Park and the Kodak site;
- The existing wider connectivity to and from Wealdstone, particularly for pedestrians and cyclists, are poor;
- Improving links to Wealdstone will become increasingly important due to the large number of proposed developments;
- A separate scheme, Wealdstone Square (formerly named Trinity Square) includes a new public space and improved public realm between the eastern end of Headstone Drive and the High Street;
- Urban design proposals have been developed for the area outside Harrow & Wealdstone station, to better connect the station with the High Street;
- Urban design proposals have also been developed to better link development sites to the High Street, particularly for pedestrians and cyclists. This includes the Kodak Site, Byron Park (Leisure Centre) and existing Civic Centre developments;
- LBH attended a UDL panel in May 2016 to discuss their Major Scheme proposals and were encouraged to better define the spaces within the town centre and how they should be used.

6. Base Traffic Modelling

Base traffic modelling has been undertaken using both strategic and local modelling. This process has been used to determine the current operation of the highway network, to predict the future situation taking account of all planned development sites in Wealdstone, and to inform proposed intervention options.

As part of the traffic modelling assessment, TfL's strategic West London Highway Assignment Model (WeLHAM) has been used to determine the future year traffic flows and turning volumes at key junctions within the study area. The WeLHAM future year base model is used by TfL for forecasting the long-term impacts of planned development and schemes across west London and is informed by the following suite of TfL London-wide models:

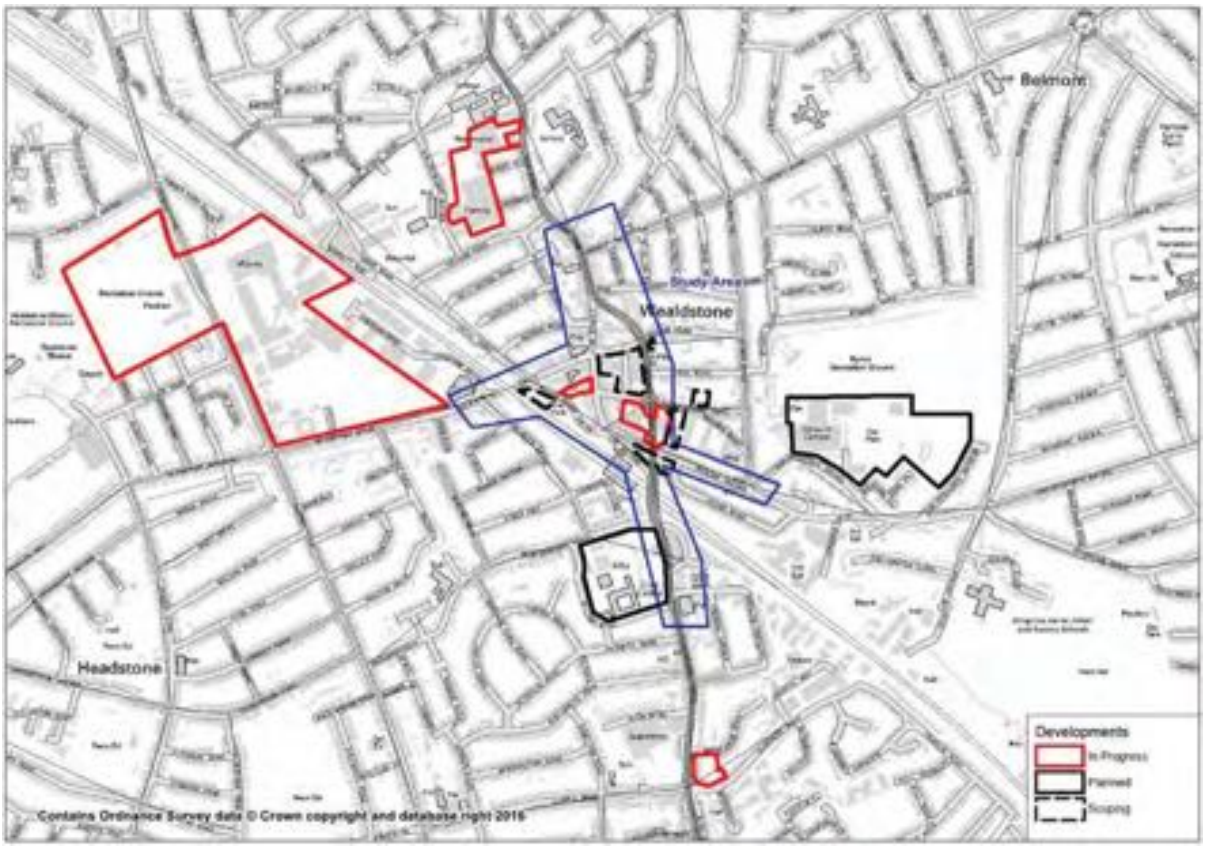
- **The London Transportation Studies model (LTS)**: A model which uses population and employment forecasts and other inputs to predict the number of trips to be made in London in the future, where people travel to and from, when they travel and which transport mode they use.
- **The London Land-Use and Transport Interaction Model (LonLUTI)**: A model which predicts the use of land for different human activities depending on Government policies and transport investment.
- **Railplan Public Transport Assignment Model**: A public transport model that predicts the public transport mode (e.g. rail, underground, bus) and route that a person chooses to get to their destination, as well as the associated crowding impacts.

These models incorporate all known planned development sites and committed highway improvements across London, including those in Wealdstone, and therefore the WeLHAM model also takes account of all planned development sites and committed highway improvements in Wealdstone when last updated.

The outputs of the WeLHAM model have been used to inform the detailed local junction modelling undertaken to evaluate the traffic impacts of the proposed options on the town centre road network in more detail.

The study area in Wealdstone, including proposed development sites is shown in Figure 6-1.

Figure 6-1 Wealdstone Study Area with Development Sites



6.1. Survey Data Collection and Analysis

Traffic surveys were conducted at the junction by Traffic Data Centre on Thursday 9th June 2016. The following data was recorded during the traffic surveys:

- Automatic Traffic Counts (ATC) recording volumetric traffic and speed data;
- Classified turning counts;
- Queue lengths;
- Cruise Times;
- Pedestrian crossing flows;
- Cycle crossing flows;
- Frequency of demand for pedestrian crossings;
- Pedestrian footfall counts;
- Degree of Saturation (DoS) / Underutilised Green Time (UGT); and
- Saturation flows.

The traffic peak hours identified within the network were as follows:

- Weekday AM Peak Hour 08:00 – 09:00; and
- Weekday PM Peak Hour 17:15 – 18:15.

6.1.1. Junction Turning Counts

The weekday peak hour flows (in PCUs) are presented within the report in Appendix G. The following trends were observed:

- High Street southbound has low traffic flows (around 70 PCUs in the peak hours) as it is restricted to buses and cycles only;
- Low flows were recorded on the High Street northbound, where all traffic is permitted. The highest flows recorded on the High Street were at the junction with Palmerston Road with 290 PCU during the AM peak.
- A409 George Gange Way (North and South) recorded the highest volume of traffic flow (around 1000 PCUs during the peak hours at the junction with The Bridge) as this is a by-pass route avoiding the High Street;
- High traffic flows were also observed on Ellen Webb Drive with 740 and 716 PCUs during the AM and PM peaks respectively. These traffic flows are higher than the A409 George Gange Way junction with the High Street where 642 PCUs were recorded travelling southbound during each peak hour.
- Most traffic at the Ellen Webb Drive / The Bridge / Masons Avenue / High Street junction makes ahead movements on Ellen Webb Drive and Masons Avenue (around 500 PCUs in each peak hour in each direction);
- Right turn flows from The Bridge onto Masons Avenue are low (around 30 PCU per hour);
- The highest traffic flows were observed on A409 George Gange Way (North) travelling southbound during the AM peak (964 PCUs);
- Flows turning right from The Bridge onto the A409 are low as this movement is restricted to buses and cycles only (around 50 PCUs per hour); and
- High traffic flows were recorded making east / west movements at the Headstone Drive roundabout, with 880 PCUs recorded on Headstone Drive (east).

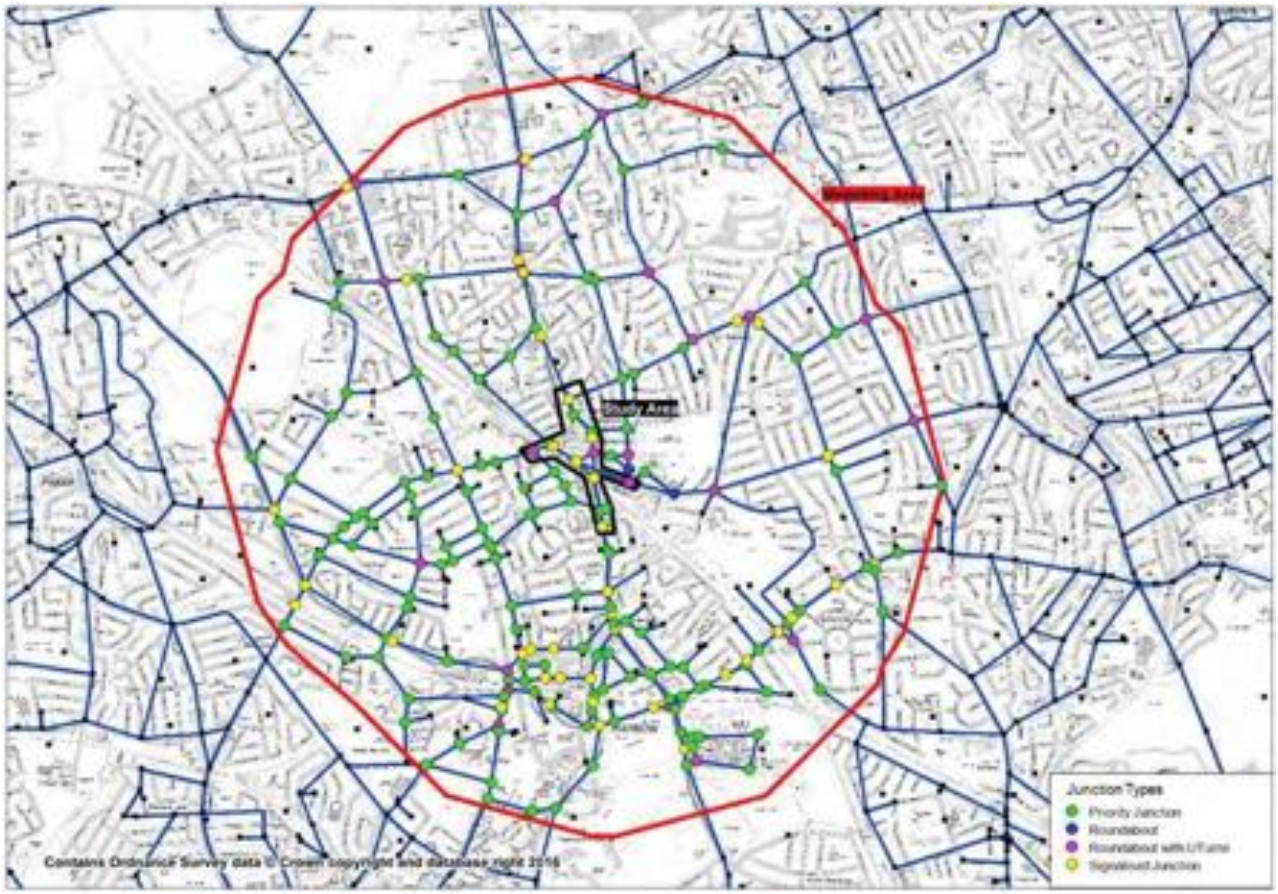
6.2. WeLHAM Base Model Review

Atkins received the WeLHAM model for base year 2012 and forecast years 2021, 2031 and 2041 (AM, IP and PM peaks). These were reviewed to confirm fitness of purpose for this study, especially for the 2021 forecast year (specifically 2021).

A technical note, outlining the full process of updating the 2012 WeLHAM model to the 2016 scenario is provided in Appendix H.

The WeLHAM modelling study area for Wealdstone town centre is shown in Figure 6-2.

Figure 6-2 WeLHAM Modelling Study Area



The base year 2012 network was reviewed and compared against the existing road network. This identified the need to modify the model to incorporate additional road links so that it would accurately represent the existing situation at the level of detail required for this study.

The base year network was updated to reflect the latest road network for year 2016, including highway schemes completed between 2012 and 2016.

Due to variations in the traffic survey observed flows and the modelled flows, the model matrix was examined and adjusted to uplift the flows to 2016 levels based on London Transport System Model (LTS) and WeLHAM data.

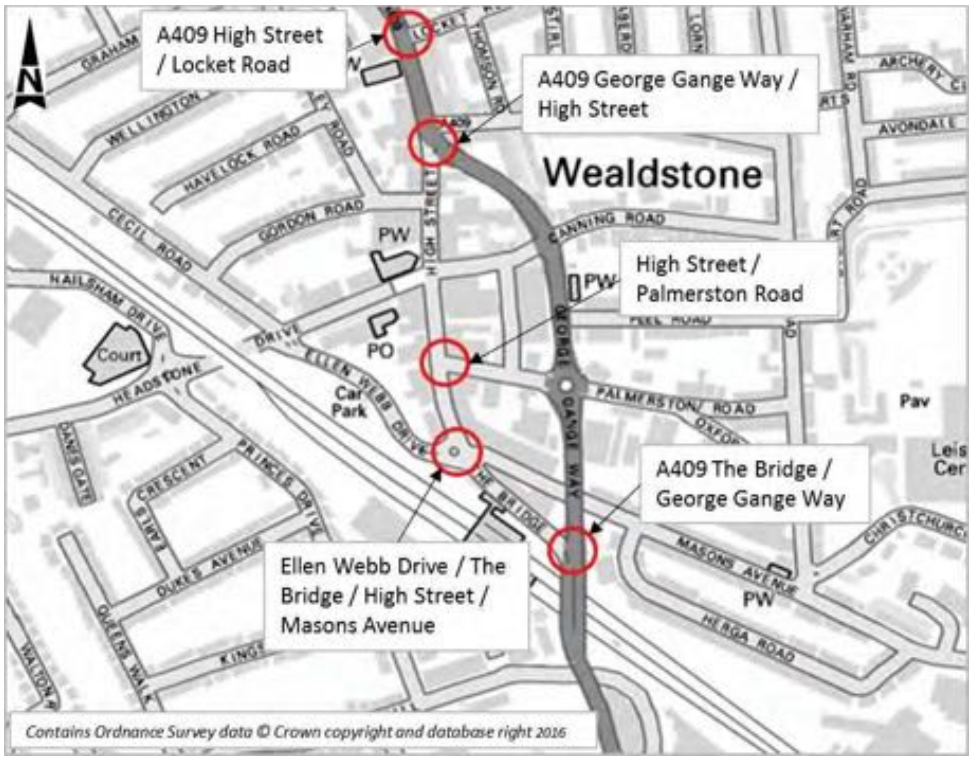
Although traffic flows were uplifted from 2012 to 2016 levels, there were some junctions where the difference between modelled and observed flows was outside an acceptable level of correlation. Therefore, the model matrix was adjusted in accordance with best practice to achieve a better level of correlation between modelled flows and the 2016 observed traffic flows, and thereby ensure the model represented the existing situation as accurately as possible.

6.3. Base LinSig Modelling

A traffic modelling assessment has been undertaken in Wealdstone Town Centre as part of the TfL Model Auditing Process (MAP), to support the assessment of the current highway network to inform proposed design options. The use of LinSig to assess the operation of the existing network and proposed schemes was agreed with TfL during the TfL MAP Stage 1 Meeting held on Tuesday 31st May 2016.

The study area included in the LinSig base model is shown in Figure 6-3. The aim of the LinSig modelling was to assess the current traffic conditions within the study area and create a base model against which proposed intervention options can be tested. The LMAP Stage 2 and 3 were audited and approved by TfL, with the validated Base Models being taken forward to test the proposed options. The LMAP 2 and 3 report is in Appendix G with the base modelling process outlined below.

Figure 6-3 Signalised Junctions in the LinSig Model Network



A base LinSig model network was prepared for the following junctions in Wealdstone:

- A409 High Street / Locket Road;
- A409 High Street / A409 George Gange Way;
- High Street / Gordon Road
- High Street / Canning Road;
- High Street / Palmerston Road;
- High Street / Masons Avenue / The Bridge / Ellen Webb Drive; and
- The Bridge / A409 George Gange Way.

In addition, the following junctions were modelled using TRL Junctions 9 (ARCADY and PICADY):

- Headstone Drive / Princes Drive / Hailsham Drive roundabout;
- A409 George Gange Way / Palmerston Road roundabout;
- Christchurch Avenue / Masons Avenue / Byron Road mini-roundabout;
- A409 Station Road / Marlborough Road; and
- A409 Station Road / Milton Road / Rosslyn Crescent.

The purpose of the base modelling was to produce validated models that accurately represent the existing performance of the highway network in Wealdstone town centre and could be used for testing proposed intervention options against.

6.3.1. Degree of Saturation Results

The Degree of Saturation (DoS) results are presented in Table 6-1. Arms with DoS 90% or above are considered to be operating over practical capacity, so are highlighted in red. Arms approaching practical capacity, between 75-90% DoS, are highlighted in orange, and arms operating well within practical capacity, under 75% DoS, are highlighted in green.

The modelled DoS on all arms were validated within five percent of the observed values during each of the peak hours.

Table 6-1 Modelled Degree of Saturation Results – 2016

Junction	Approach	Degree of Saturation (DoS) %	
		AM Peak	PM Peak
A409 High Street / Locket Road	Locket Road	31.0	37.8
	High Street (S) Ahead	56.5	70.3
	High Street (N)	46.5	49.5
A409 George Gange Way / High Street	A409 George Gange Way	73.1	79.1
	High Street (S)	78.7	91.0
	A409 High Street (N)	81.9	77.9
High Street / Palmerston Road	Palmerston Road	62.0	69.5
	High Street (S) Ahead and Left	29.1	31.0
	High Street (N)	17.5	18.1
Ellen Webb Drive / The Bridge / High Street / Masons Avenue	Masons Avenue	85.5	80.9
	The Bridge Ahead and Left	34.2	48.0
	Ellen Webb Drive Ahead	99.0	89.8
	High Street	53.0	77.1
The Bridge / A409 George Gange Way	A409 George Gange Way (N)	74.3	62.6
	The Bridge Right	24.5	29.3
	A409 George Gange Way (S)	63.2	66.1

The modelled DoS results show that the Ellen Webb Drive approach is at practical capacity in both peak hours, and the High Street (south) at the junction with the A409 is over practical capacity during the PM peak. The A409 High Street (North) and Masons Avenue approaches were modelled with over 80% DoS in one or more peak hours, so although they are currently within practical capacity, they may exceed this if more traffic pressure is applied to the network. Therefore, these approaches in the network show the current traffic pressure points, which may be exacerbated in future scenarios.

6.3.2. Queue Length Results

The modelled Mean Maximum Queue (MMQ) and observed maximum queue results, in PCUs, are presented in Table 8-1. Approaches where long queues were observed (around 10 or more PCUs) have been highlighted in red.

Generally, the modelled queue lengths correlate well with the observed queue lengths on most approaches. There are disparities between the observed and modelled queue lengths at A409 High Street / Locket Road (29/086) and A409 George Gange Way / High Street (29/079). Using the traffic survey video footage, the following observations have been made:

- The main reason for longer observed queueing is due to the interaction between the two junctions. Queues build up on A409 High Street (South), High Street (South) and A409 George Gange Way when the green signals at junction 29/079 coincide with a red phase on High Street (South).
- Bus stops to the north and south of the A409 High Street / Locket Road junction exacerbates queues.

The queues which build up during the red phase clear relatively quickly and all queues clear during the green phase.

Table 6-2 Observed Average Maximum and Modelled Maximum Queue Lengths – 2016 (PCUs)

Junction	Approach	Queue Length (PCUs)			
		AM Peak		PM Peak	
		Observed	Modelled	Observed	Modelled
	Locket Road	1	2	2	3

Junction	Approach	Queue Length (PCUs)			
		AM Peak		PM Peak	
		Observed	Modelled	Observed	Modelled
A409 High Street / Locket Road	High Street (S) Ahead	11	5	12	9
	High Street (S) Right	3	-	7	-
	High Street (N)	12	5	11	6
A409 George Gange Way / High Street	A409 George Gange Way	14	10	20	12
	High Street (S)	8	7	15	9
	A409 High Street (N) Ahead	13	12	12	11
	A409 High Street (N) Right	3	-	2	-
High Street / Palmerston Road	Palmerston Road	5	4	6	5
	High Street (S) Ahead and Left	3	2	4	2
	High Street (S) Right	2	-	2	-
	High Street (N)	2	1	3	1
Ellen Webb Drive / The Bridge / High Street / Masons Avenue	Masons Avenue	16	14	16	11
	The Bridge Ahead and Left	4	3	5	3
	The Bridge Right	1	-	1	-
	Ellen Webb Drive Ahead	16	25	11	14
	Ellen Webb Drive Left	6	-	4	-
	High Street	7	5	7	6
The Bridge / A409 George Gange Way	A409 George Gange Way (N)	9	12	8	10
	The Bridge Right	1	1	2	2
	A409 George Gange Way (S)	7	8	8	11

As highlighted in the results, there are many approaches to junctions that experience heavy queueing during the traffic peak hours. The following areas of traffic pressure were noted within the study area:

- There is notable queueing at the Locket Road and A409 / High Street junctions. As the two junctions are close together, but the signals are not linked, the interaction between the junctions exacerbates the queueing with queues often observed blocking back from the Locket Road junction to the southern junction.
- The junction outside Harrow and Wealdstone station is particularly busy, with long queues observed on both the Ellen Webb Drive and Masons Avenue approaches.
- The highest traffic volumes were observed on the A409 George Gange Way; therefore, queueing was observed on the A409 George Gange Way (N), with queues extending back to the Palmerston Road roundabout.

6.4. LinSig Base Modelling Results Summary

The results of the validated base LinSig model show that generally, the Wealdstone Town Centre network is within theoretical capacity during the peak hours assessed, however congestion and queueing were observed within the town centre. The junction outside the station (High Street / Ellen Webb Drive / Masons Avenue / The Bridge) is over theoretical capacity (90% DoS) on the Ellen Webb Drive approach during the both peak hours. The Masons Avenue approach is also approaching theoretical capacity, with results of 86% and 81% DoS in the AM and PM peaks respectively. Long queues were observed on both Ellen Webb Drive and Masons Avenue during both peak hours, with queues not clearing during one cycle of green time.

There is also pressure on the highway network with high DoS and observed queueing at the top of the High Street, at both the A409 High Street / Locket Road and the High Street / A409 George Gange Way junctions. During a site visit and observing video footage, traffic was observed from High Street (S) at the Locket Road

junction blocking back to the A409 George Gange Way / High Street junction as the traffic signals at the two junctions run on a Vehicle Actuated (VA) system and are not linked.

High traffic volumes were observed on A409 George Gange Way (North and South) and have high volumes of traffic flow (around 1000 PCUs during the peak hours at the junction with The Bridge) as this is a by-pass route avoiding the High Street. However, the A409 / The Bridge junction currently operates within capacity as the ahead movements receive long green times because the right turn from The Bridge is only permitted for buses and cyclists.

6.5. WeLHAM Future Year Base Model

The 2021 WeLHAM model supplied by TfL takes account of most of the development opportunities planned in the Wealdstone area. There are 13 identified sites where the planning data for the developments has been collated and the trip generation calculated, which are identified in Appendix A.

The 2021 WeLHAM model was modified where appropriate to be consistent with the adjustments made to the 2016 base model. It was also amended to incorporate the following committed schemes to be implemented by year 2021 that where not already accounted for in the 2021 model:

- Cecil Road / Headstone Drive – new signalised junction;
- Harrow View / Parkside Way – Localised widening of existing signalised junction; and
- Whitchurch Lane / Wemborough Road - Localised widening of existing signalised junction.

Outputs from the 2021 future year WeLHAM model indicate that there will be an overall marginal reduction in traffic flow on roads within the study area in the future, despite the overall increase in the quantum of development within Wealdstone. This is likely to be because there will be a substantial overall reduction in car parking provision as a result of the redevelopment of many sites. Therefore, the overall increase in the number of trips generated by the proposed intensification of development in Wealdstone are forecast to be made predominantly by modes of transport other than the private car, especially for commuting trips. Table 6-3 provides a comparison of traffic flows on key links from the 2016 Base and 2021 Do minimum WeLHAM models.

Table 6-3 Two-Way Base 2016 and WeLHAM Do Minimum 2021 Traffic Flows (PCUs)

Road name and direction	AM Peak Hour				PM Peak Hour			
	2016 flow	2021 Do-min flow	Change	% Change	2016 flow	2021 Do-min flow	Change	% Change
A409 High Street - (sb)	681	695	14	2.1%	457	445	12	-2.6%
A409 High Street - (nb)	558	612	54	9.7%	603	606	-3	0.5%
Locket Road - (wb)	6	6	0	0.0%	6	6	0	0.0%
Locket Road - (eb)	192	214	22	11.5%	277	273	4	-1.4%
Byron Road - (sb)	576	603	27	4.7%	209	292	-83	39.7%
Byron Road - (nb)	130	115	-15	-11.5%	108	64	44	-40.7%
Christchurch Avenue - (wb)	837	760	-77	-9.2%	881	800	81	-9.2%
Christchurch Avenue - (eb)	854	738	-116	-13.6%	892	841	51	-5.7%
Railway Approach - (nb)	808	885	77	9.5%	1,002	1,005	-3	0.3%
Railway Approach - (sb)	1,195	1,196	1	0.1%	897	820	77	-8.6%
Headstone Drive - (wb)	669	568	-101	-15.1%	709	498	211	-29.8%
Headstone Drive - (eb)	908	772	-136	-15.0%	659	739	-80	12.1%
Cecil Road - (sb)	303	200	-103	-34.0%	284	265	19	-6.7%
Cecil Road - (nb)	101	67	-34	-33.7%	266	185	81	-30.5%
TOTAL inbound	**3,880**	**3,717**	**-163**	**-4.2%**	**3,548**	**3,311**	**237**	**-6.7%**
TOTAL outbound	**3,938**	**3,714**	**-224**	**-5.7%**	**3,702**	**3,528**	**174**	**-4.7%**

7. Design Options

As outlined in Section 5, an initial stakeholder workshop was held to identify issues and opportunities within the town centre. Following this workshop, an optioneering process was undertaken by Atkins to develop several schemes that could be considered to tackle the issues identified throughout the process. An appraisal of the proposed schemes was undertaken by Atkins and at the second stakeholder workshop, with the results outlined below.

7.1. Option Generation

Our approach has been to develop several concept options for interventions. These have subsequently been assessed, using an evaluation framework and during two stakeholder workshops, in terms of their relative advantages and disadvantages on a set of criteria directly aligned with the objectives of the study. The concept option plans are included in Appendix I and Figure 7-1 to Figure 7-11 and a description of the key interventions are summarised in Table 7-1 below. Ten initial concept options were developed by Atkins, followed by a further option by Atkins and another developed by the LBH for the TfL Major Scheme bid.

Table 7-1 Wealdstone Town Centre Feasibility Options

Option	Name	Details
1	Do minimum	• Retain existing traffic management arrangements. • Re-design junctions and links to improve pedestrian and cycle links and improve the public realm in the town centre.
2	High Street two-way and Palmerston Road closed	• Two-way operation restored on the length of the High Street. • Closure of the Palmerston Road arm of the A409 roundabout. • Level surfaces outside the station and from Canning Road to the A409 junction. • Improved junctions, links and public realm as in Option 1.
3	Headstone Drive Two-Way	• Allow two-way traffic on Headstone Drive and Canning Road. • Downgrade junction outside the station. • Potential option to close Ellen Webb Drive to traffic.
4	New link to Palmerston Road	• Create new carriageway link from Ellen Webb Drive to Palmerston Road through public house development site. • Downgrade junction outside the station. • Potential to close Ellen Webb Drive south of development site and release land for development.
5	a) The Bridge and High Street (Palmerston Road to A409) bus only	• Bus and cycle only northbound and southbound on High Street between Palmerston Road and A409. • Servicing on High Street to take place off peak. • New cycle and pedestrian link through the public house development site.
	b) The Bridge and High Street (Palmerston Road to A409) bus only and Headstone Drive one-way	• As Option 5a. • Headstone Drive east of Cecil Road to operate as one-way eastbound with access onto High Street via Trinity Square. • Access to A409 from the west would be via Ellen Webb Drive – High Street – Palmerston Road.
	c) The Bridge and High Street (Palmerston Road to A409) bus only and Masons Avenue Eastbound Only	• As Option 5a. • Mason Avenue eastbound only west of Herga Road (western access).

Option	Name	Details
6	High Street bus only (Masons Avenue to A409)	• Bus and cycle only northbound and southbound on High Street between Ellen Webb Drive and A409. • Servicing on High Street to take place off peak. • Access to A409 from the west would be via Ellen Webb Drive – The Bridge. • All movement signalised junction at the A409/ The Bridge junction. • New cycle and pedestrian link through the public house development site. • Potential to downgrade Palmerston Road and routes east-west bus routes along Palmerston Road with new bus stops.
7	High Street pedestrianisation (Palmerston Road to A409)	• Close High Street to all traffic between Palmerston Road and A409. • Re-route bus services along Palmerston Road and A409. • Servicing on High Street to take place off peak.
8	High Street two-way and The Bridge bus / cycle only	• Allow general traffic to use High Street in both directions. • Close The Bridge to general traffic to create a dedicated interchange space outside the station.
9	Headstone Drive and Canning Road bus / cycle only	• Canning Road and western end of Headstone Drive restricted to buses and cycles only. • Revised route for east-west buses.
10	LBH Major Scheme bid	• As summarised in Section 7.2.2 below.

Figure 7-1 Option 1 - Do Minimum

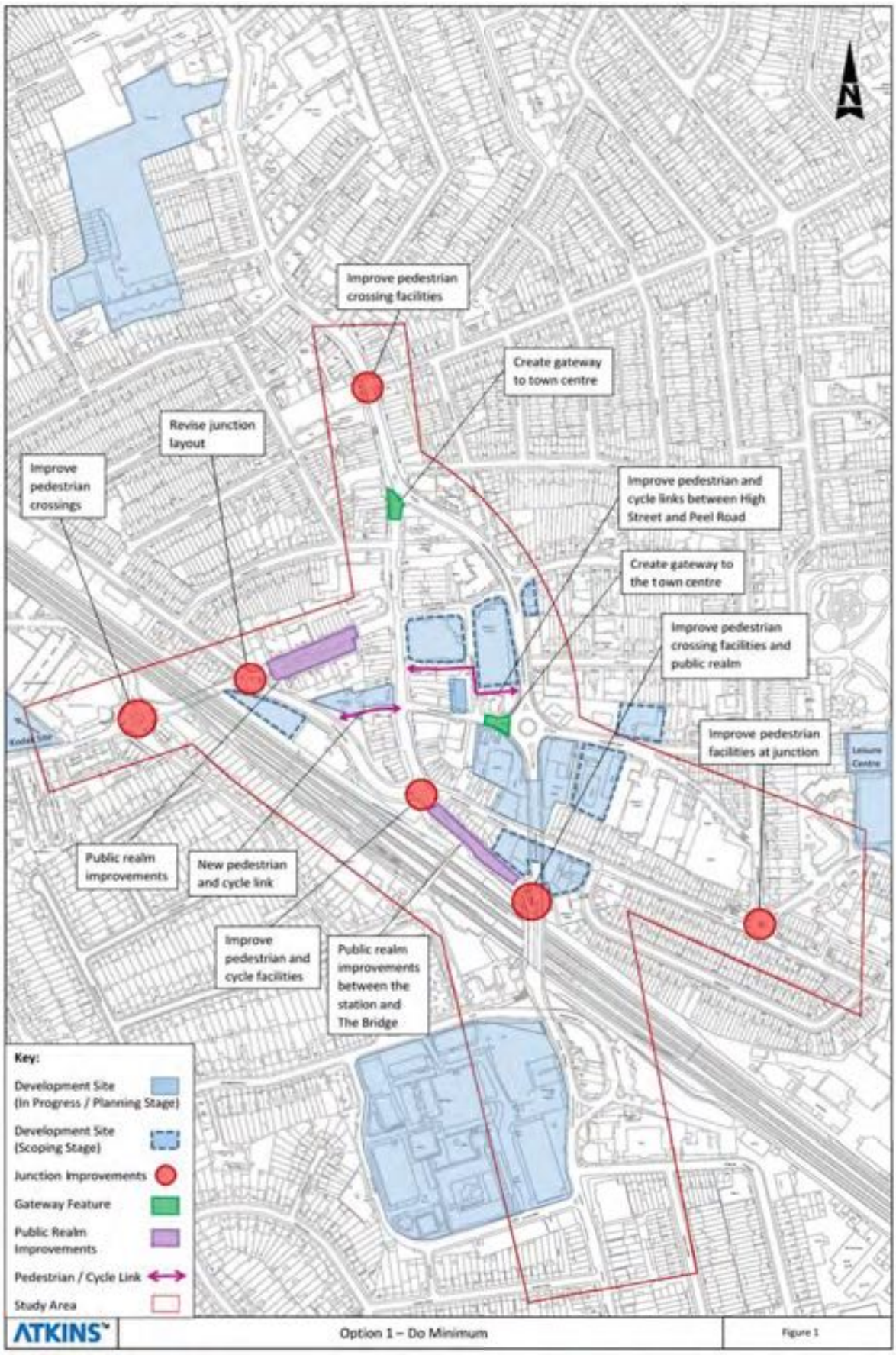


Figure 7-2 Option 2 – High Street Two-Way and Palmerston Road Closed

Figure 7-3 Option 3 – Headstone Drive Two-Way

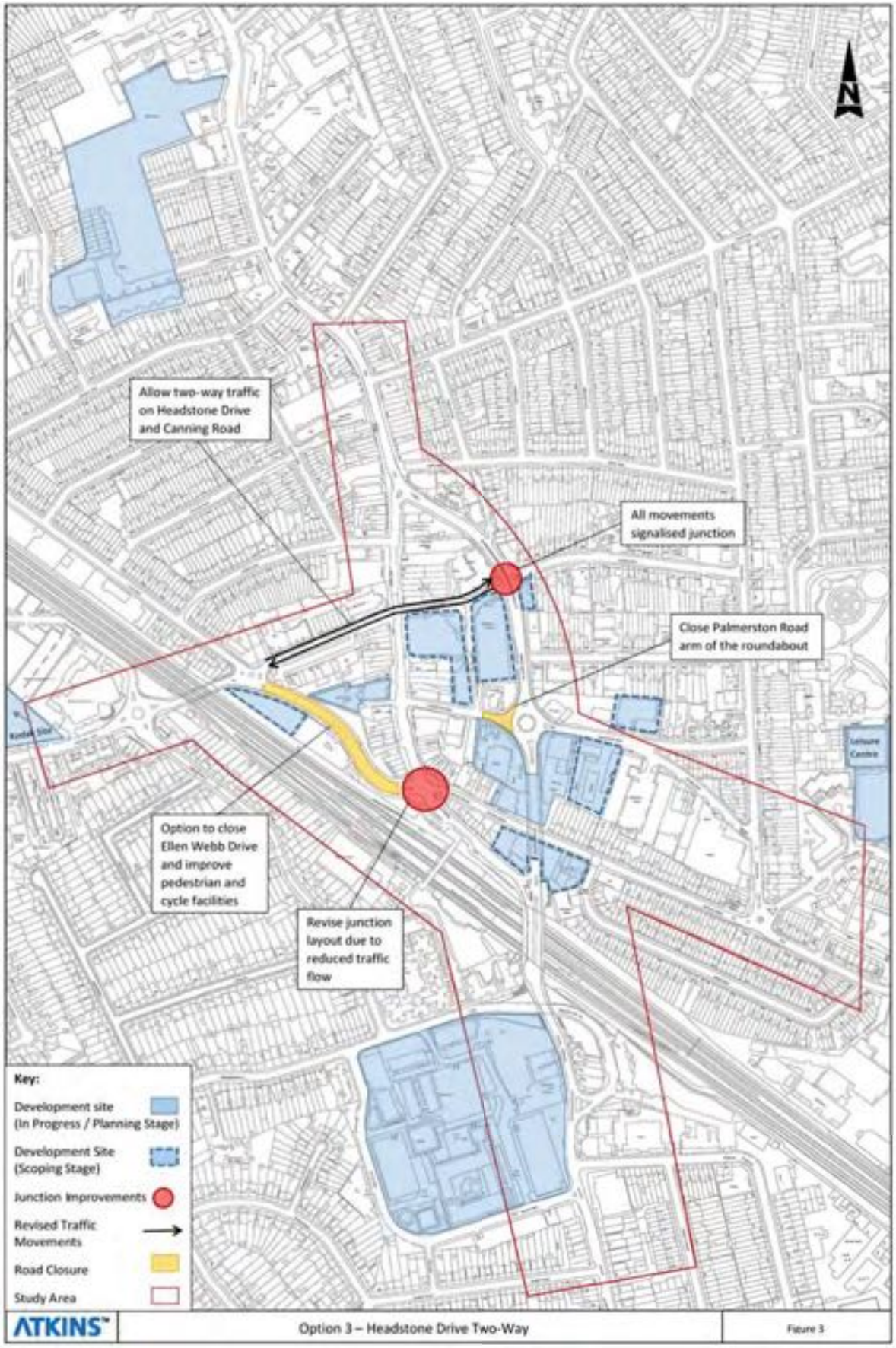


Figure 7-4 Option 4 – New Link to Palmerston Road

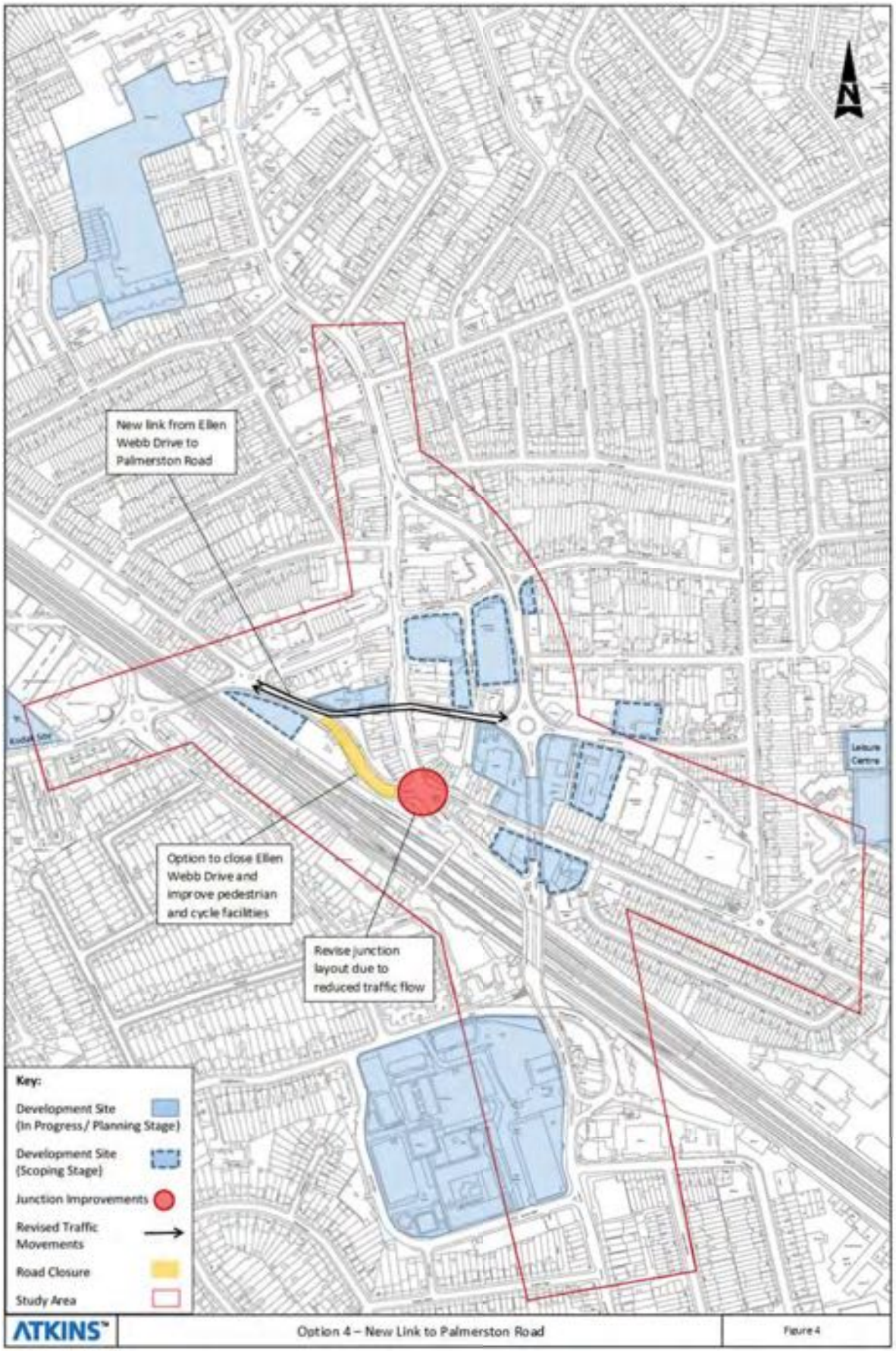


Figure 7-5 Option 5a – The Bridge and High Street (Palmerston Road to A409) Bus Only

Figure 7-6 Option 5b – The Bridge and High Street (Palmerston Road to A409) Bus Only and Headstone Drive one-way

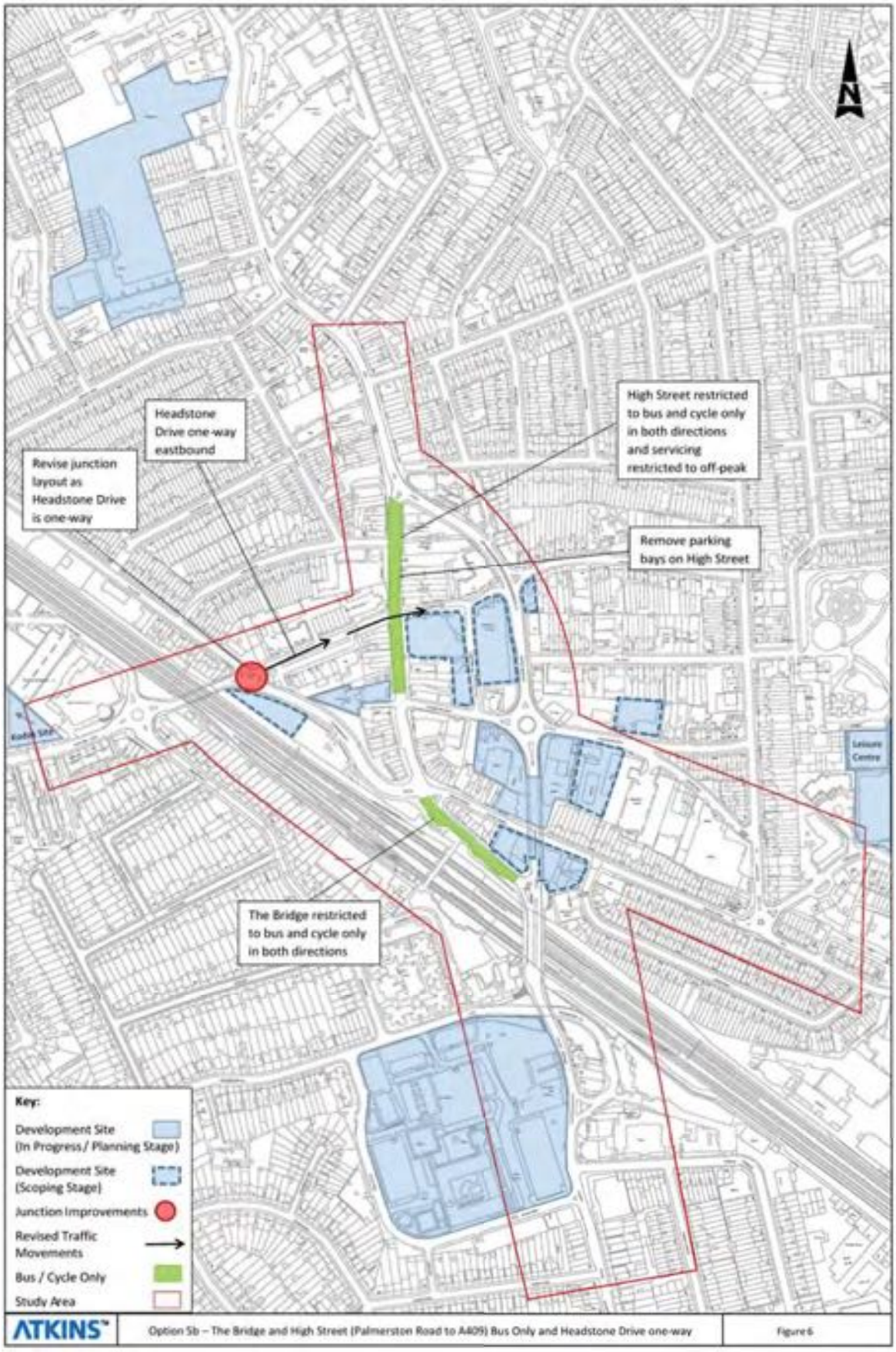


Figure 7-7 Option 5c – The Bridge and High Street (Palmerston Road to A409) Bus Only and Masons Avenue Eastbound Only

Figure 7-8 Option 6 – High Street Bus Only (Masons Avenue to A409)

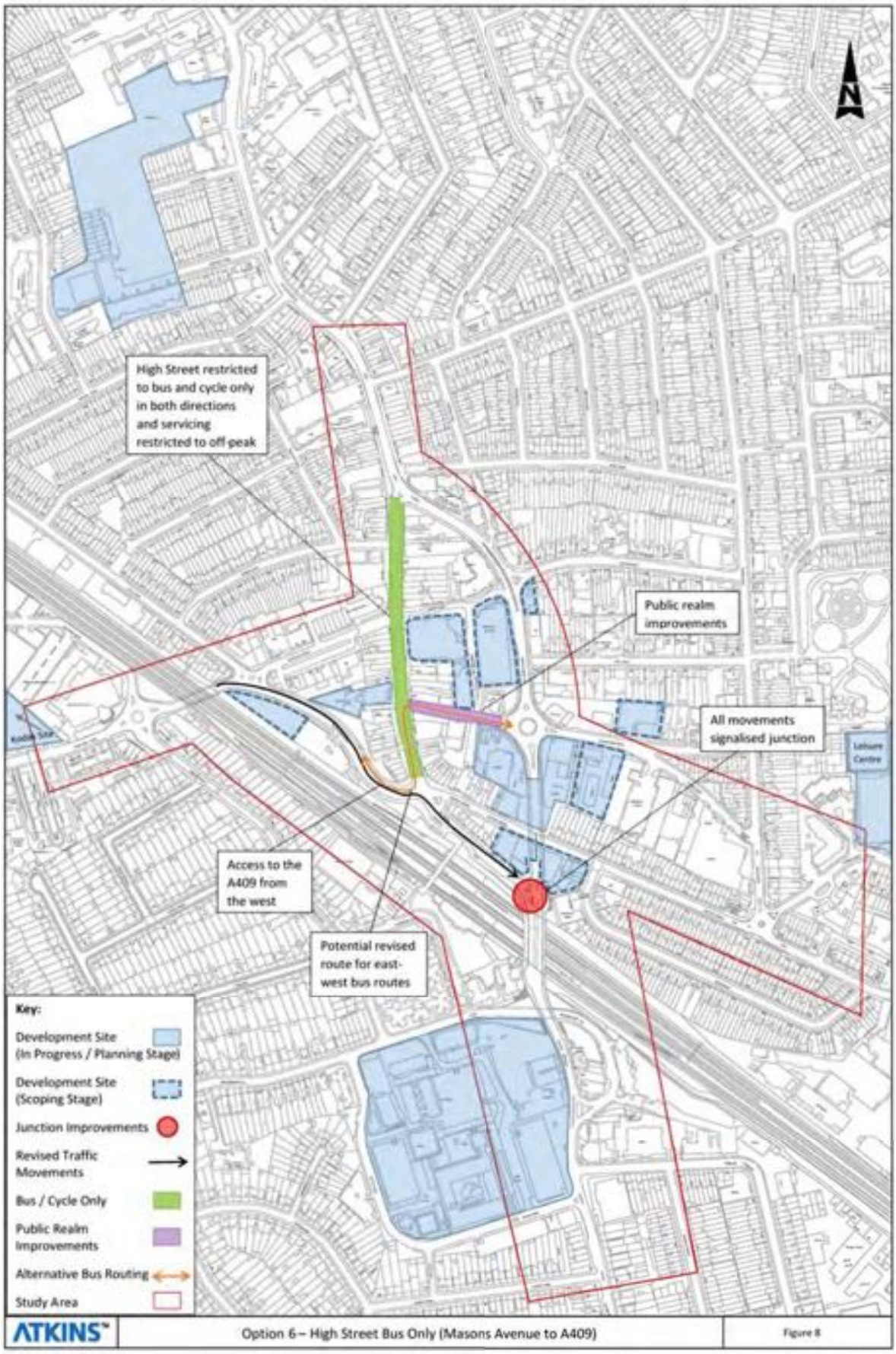


Figure 7-9 Option 7 – High Street Pedestrianisation (Palmerston Road to A409)

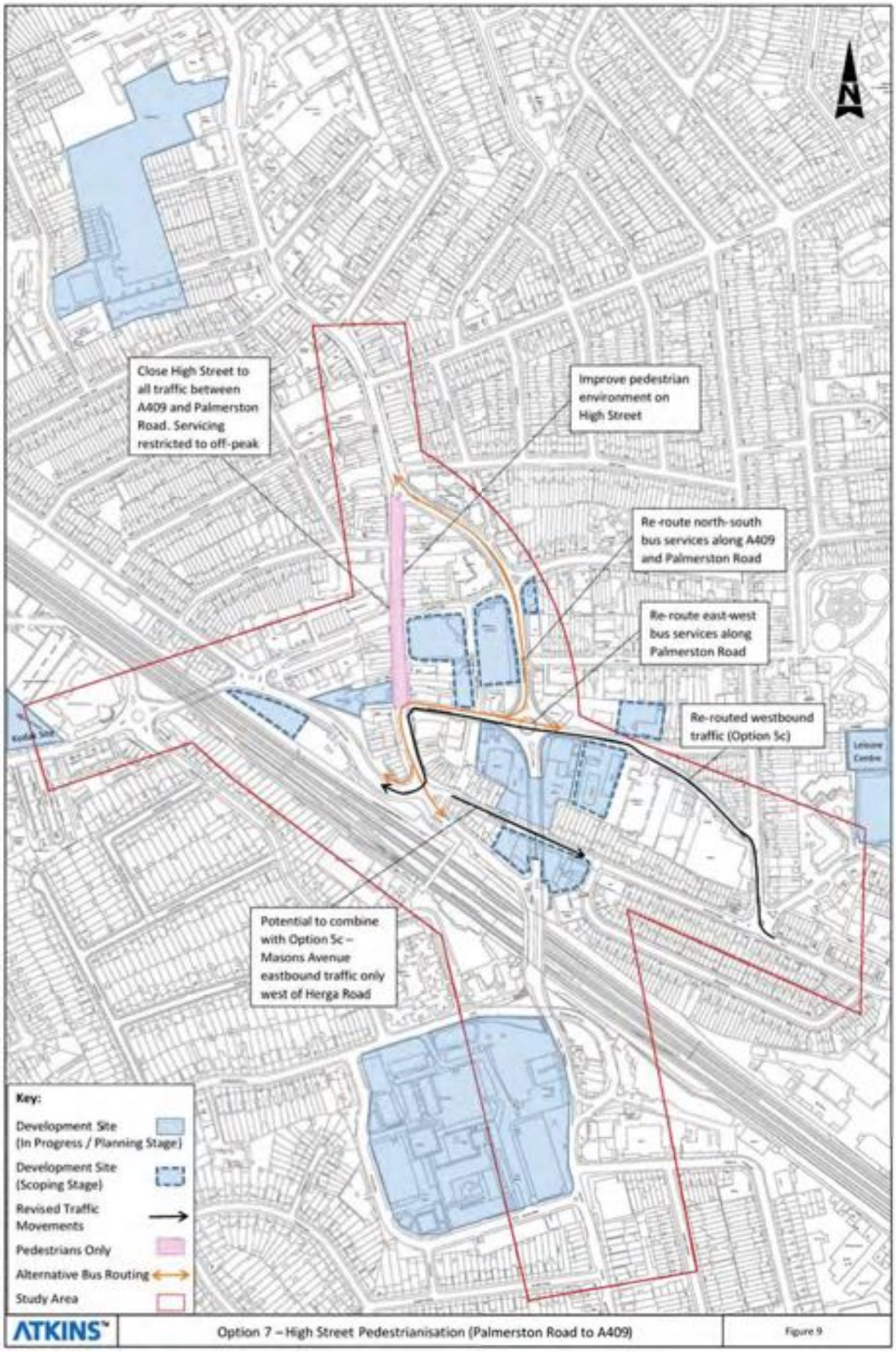


Figure 7-10 Option 8 – High Street Two-Way and The Bridge Bus / Cycle Only

Figure 7-11 Option 9 – Headstone Drive and Canning Road Bus / Cycle Only

7.2. Option Generation Review Workshop

Ten initial concept options were presented and discussed during the second workshop, held at the beginning of June 2016. Each option was discussed in relation to addressing the issues identified in the initial workshop and their ability to meet the study objectives. Stakeholders also made contributions in terms of their respective opinions and positions.

Urban design proposals for key areas including the Civic Centre, The Woods, The Walkway and the Station were presented at the workshop. It was discussed that the railway station is a key feature within the town centre, and for public realm improvements to be focussed here.

The options proposed various alterations to the existing traffic management in the study area and new links for traffic, buses, pedestrians and cyclists. The following contributions and design comments were made at the workshop:

- As the relocation of the Civic Centre is an important regeneration scheme in the town centre, considerations should be made for increased pedestrians and cyclists to access the site;
- As part of the new Civic Centre scheme, and reducing congestion on the A409, radical changes were supported for the Palmerston Road roundabout;
- Funding had been secured for a Cycle Quietway route between Headstone Drive and Canning Road, which should be taken account of and may impact options to open Headstone Drive to traffic;
- Opening Headstone Drive to traffic would also remove the pedestrian area proposed in the Trinity Square scheme, although the option should not be discounted if it brings overall benefits to the area;
- Opening Headstone Drive may also cause delay to north – south bus routes, due to a high east – west traffic flow; and
- Stakeholders from TfL Surface Transport were concerned that opening the High Street to general traffic in both directions would provide little economic benefit without more on-street parking, however providing more parking may cause delay to buses.

Following the option generation workshop, the following stakeholders held the following views on the proposed options:

- A representative from LBH Traffic and Parking felt that the current operation and traffic management on the High Street works well, so major changes may not provide sufficient benefits but tweaking the existing arrangements may be beneficial.
- It was also felt that proposals to increase east – west connections were important.
- A representative from LBH Regeneration indicated a preference for two-way operation for traffic on Headstone Drive and Canning Road.
- A representative from TfL Surface Transport indicated a preference for a scheme providing bus only access in both directions along the High Street.

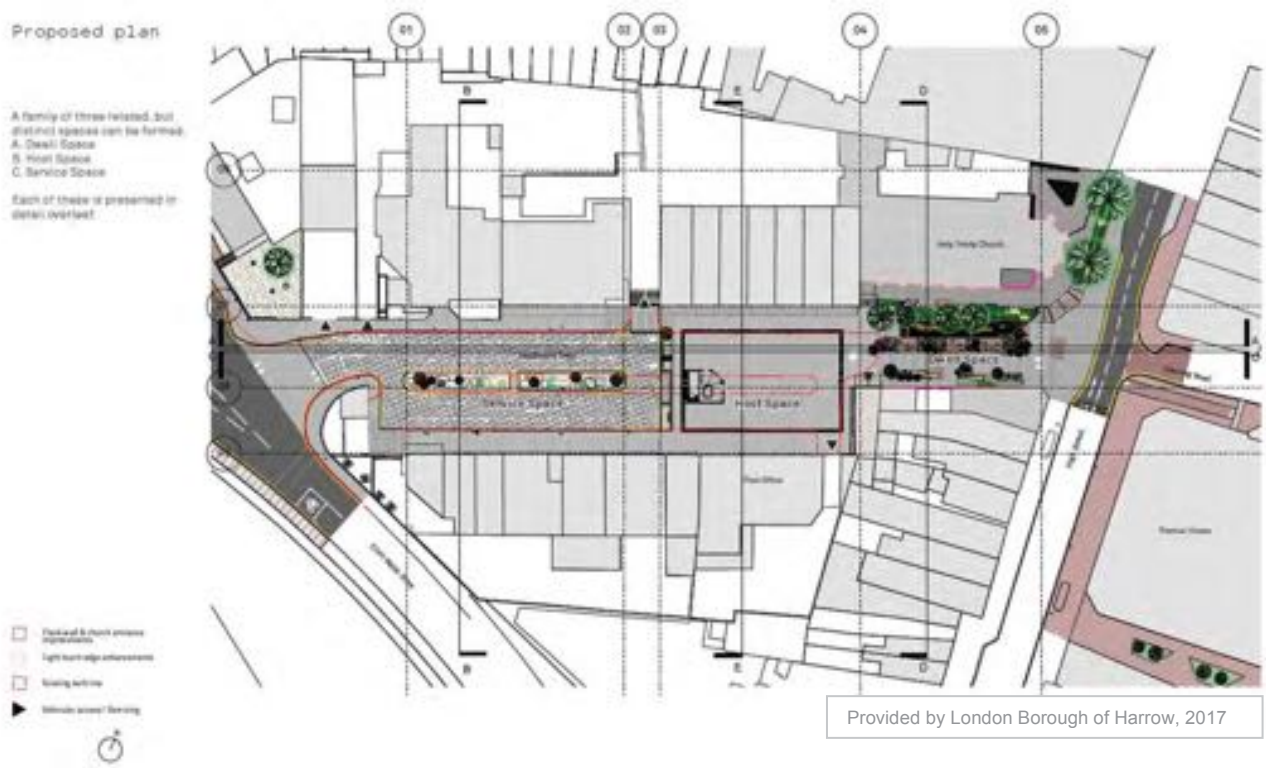
Following the workshop, Atkins were to develop and score the concept options using an evaluation framework based on the objectives of the study.

7.2.1. Wealdstone Square Project

As discussed in the second stakeholder workshop, an independent complimentary scheme to the Wealdstone Town Centre study was being developed. The scheme aims to introduce a public square in Headstone Drive at the High Street end, to act as a focal point in the town. The scheme started as a successful bid to the GLA called Trinity Square, but was rebranded Wealdstone Square during design. The proposed design of Wealdstone Square is in Figure 7-12. The scheme is being funded by the Greater London Authority (GLA) Regeneration Fund.

The Wealdstone Square project was an important consideration when evaluating the concept design options for Wealdstone, as some presented a direct conflict with the proposed scheme.

Figure 7-12 Wealdstone Square Scheme Design



7.2.2. Major Scheme Bid – Wealdstone Town Centre

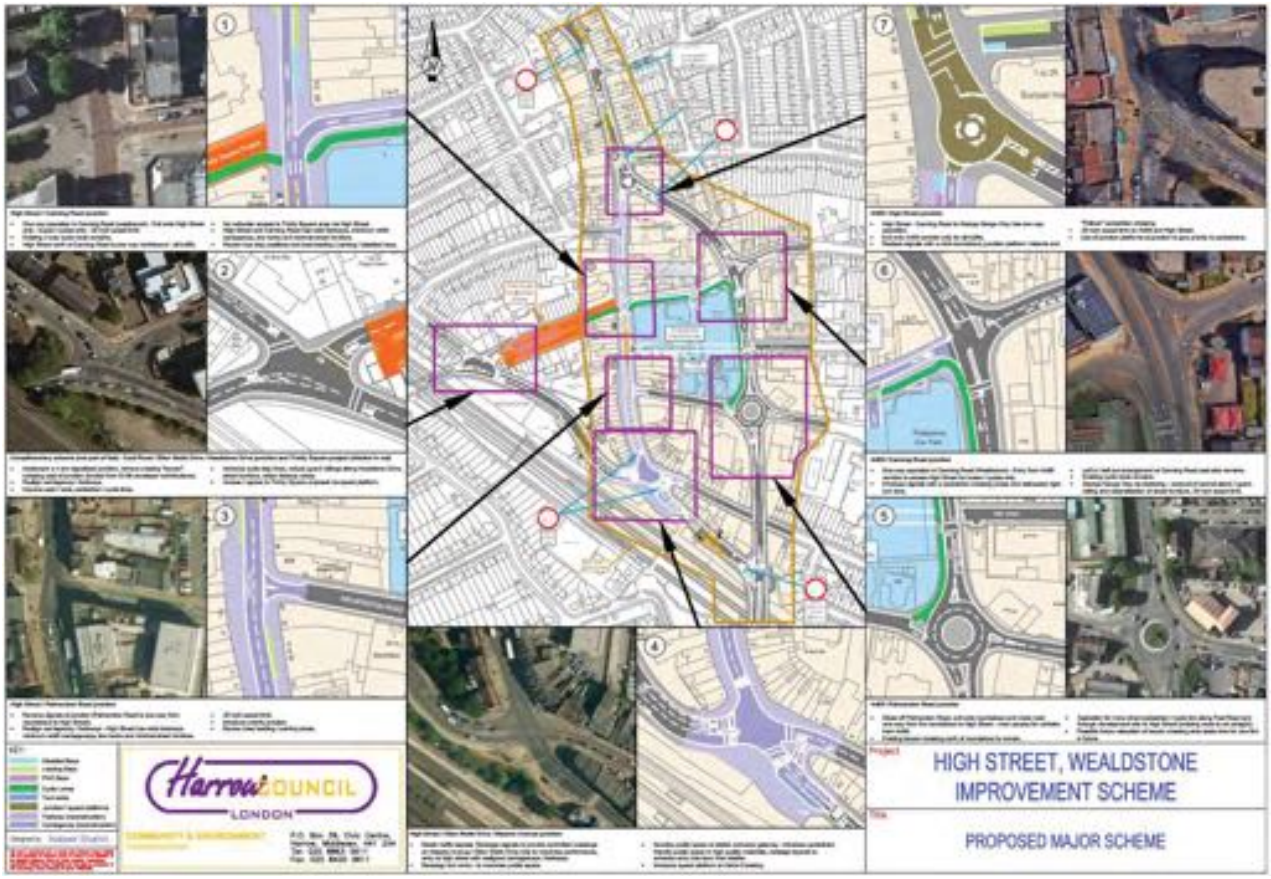
Alongside this Transport Study, the LBH have developed and submitted an application to TfL LIP Major Schemes fund for an improvements scheme for the High Street, Wealdstone. The scheme was developed on the basis of the Harrow and Wealdstone Area Action Plan, with a number of new homes and businesses proposed for the area over the next 15 years. The intensification of development will place greater demands on the existing transport network and public realm in the area which is already struggling to cope with the existing levels of traffic. The general appearance, design and condition of the public realm is tired and unattractive and not conducive to encouraging new businesses to come to the area. Wealdstone is an area of deprivation which the Council seeks to revitalise through its regeneration plans.

The key issues identified in the Major Scheme bid directly align with those in the transport study, and are as follows:

- Poor quality of public realm and overall appearance, cluttered and excessive street furniture,
- Perceived safety concerns and fear of crime from overall appearance and tone of area,
- Traffic congestion and delay on main road network affecting journey time reliability, particularly buses
- Poor environment for pedestrians, segregation by railway and SRN, excessive vehicle dominance,
- Local cycle routes have complex routes and motor vehicle dominance makes access difficult,
- Poor junction design with underutilised space for other modes.

The proposed scheme design, developed by LBH as part of the major scheme bid is shown in Figure 7-13 and Appendix J.

Figure 7-13 LBH Major Scheme Proposed Design



The proposed design changes in the study area are summarised below:

- Raised table junction at A409 High Street / Locket Road;
- Mini-roundabout junction to replace signals at the A409 George Gange Way / High Street junction;
- One-way operation on the High Street northbound, between Canning Road and the A409 junction;
- One-way link for buses and cyclists only on Canning Road (west);
- Closure of Palmerston Road eastbound, making the road one-way westbound;
- Conversion of High Street / Palmerston Road from signalised to priority junction;
- Footway and carriageway reconstruction along the length of the High Street;
- Develop public realm and space outside Harrow and Wealdstone station; and
- An extension of the existing 20mph zone to include the whole study area.

7.2.3. Station Road Major Scheme (Harrow Town Centre)

The Better Streets programme, established in 2009 has developed schemes aimed at transforming London's public spaces and street networks. The initiative aims to effectively understand the function of different places in order to support economic vitality, social wellbeing and environmental sustainability. The principles outlined in Better Streets should be considered, in conjunction with the policy guidelines above, to develop a design for Wealdstone town centre that offers a functioning highway network in addition to proving a place that encourages walking and cycling in addition to providing a place where people wish to gather and relax The document proposes the following guiding principles:

- Understanding function: a retail high street, a residential road, a place of cultural activity, a busy through route or other use such as park space. The streets in this scheme serve various functions, with the A409 being used as a by-pass where the movement of traffic is prioritised, whereas the High Street is ranked equally on the 'movement' and 'place' matrices;
- Imagine a blank canvas: every feature that remains or is replaced should be challenged and carefully justified;
- Decide on the degree of separation: Ideally segregation should be avoided;

- Reflect character: the street is the setting to the buildings or street frontage and the buildings frame the street; and
- Go for quality: good workmanship and attention to detail and finishes can make all the difference.

The Better Streets Delivered (September 2013) outlined a number of completed schemes within London and the lessons learned from them. At the time of publication, over 80 projects had been delivered as part of the scheme, which included the Harrow Town Centre Station Road scheme.

The major scheme bid developed for Wealdstone town centre used the Station Road scheme, completed in June 2011, as a model. Station Road in Harrow, located to the south of Wealdstone town centre, underwent a £3.6 million improvement scheme. The scheme was awarded £2.4 million Major Scheme contribution to improve the 500-metre study area, tackling the problems of uneven footfall, excessive street clutter and a confusing on-way bus system.

The scheme involved a public realm review, updating it with functional, accessible spaces to improve the shopping experience, re-ordering traffic flows including simplifying bus routes and increasing access for pedestrians and cyclists. The area is now attractive to all users, making Harrow more appealing for both existing users and those unfamiliar with the area. It is hoped that the success and lessons learnt from the Station Road scheme can act as a catalyst and template for further improvement within the borough, particularly by bringing regeneration north to Wealdstone town centre.

A before and after of part of the Station Road scheme (from Better Streets Delivered) is shown in Figure 7-14.

Figure 7-14 Harrow Station Road Major Scheme

8. Shortlisting of Options

To assess each of the concept options, an appraisal scoring system was developed based on the study objectives. The range of scores applied in the appraisal process are outlined in Table 8-1. The scores represent a comparison of the proposal to the existing situation. The results of the options appraisal are shown in Figure 8-1, with a ranking of 1 to 12 given to each option based on the total score.

Table 8-1 Appraisal Scoring

Score	Impact
+3	Significant improvement on existing situation
+2	Noticeably better than existing situation
+1	Marginally better than existing situation
0	No different to existing situation
-1	Marginally worse than existing situation
-2	Noticeably worse than existing situation
-3	Significantly worse than existing situation

A high-level appraisal was undertaken for each concept option against the following criteria:

- **Highway operational performance:** impact of the proposed option on the highway network, including the impact on journey times, queue lengths and the impact on freight traffic (LGVs and HGVs).
- **Pedestrian environment**: implications on pedestrian movements within the town centre, particularly east-west due to the Harrow View (Kodak site) development, connections between Harrow and Wealdstone station and the High Street and connections to other key development sites outlined in the H&W AAP.
- **Cycling environment:** measured similarly to the pedestrian environment scores, looking at the impact proposals will have on connections to the town centre for cyclists.
- **Public transport:** a focus on maintaining journey times for buses and enhancing connections to public transport from the town centre.
- **Public realm:** improving the quality of the public realm in the town centre, particularly along the High Street and Headstone Drive (alongside LBH's Trinity Square scheme), reducing street clutter across the study area and improving air quality.
- **Regeneration**: facilitating regeneration in the town centre and promoting economic growth.
- **Waiting and loading:** impacts of the proposal on on-street parking and servicing.
- **Other considerations:** ease of implementation, estimated cost of the scheme and third party land requirements.

8.1.1. Option Appraisal Workshop

A third workshop was held at the end of June 2016 to present an evaluation framework that had been developed by Atkins (Figure 8-1) and score the options against the study objectives. The design options were re-considered from the second workshop, and the evaluation scores presented and discussed. The outcome of the workshop was to determine the preferred options to take forward for further testing.

The key discussions held at the third stakeholder workshop were as follows:

- High Street two-way: benefits were questioned of providing two-way operation for general traffic if additional parking is not provided. Decision needs to be made as to whether increased short-term parking provides a benefit or not.
- It was suggested that traffic should be able to pass stationary buses at bus stops on the High Street.
- It was highlighted that there is a need to consider the long-term parking needs of the new Civic Centre.
- As Wealdstone is a District Centre, it should be a location people walk to rather than drive. Therefore, focus should be on improving walking and cycling routes.
- The Trinity Square scheme has since gained approval, been through consultation with stakeholder and secured funding, therefore delivery of Option 3 may be an issue.

- Some of the highest footfall in the town centre is around Trinity Square, which is predicted to increase with the proposed Civic Centre relocation.
- Introducing signals at the A409 / Canning Road may cause traffic to queue back onto the High Street.
- The High Street being the only pedestrian-friendly road is not good enough, it was felt that George Gange Way needs improvement for pedestrians.
- Adding further traffic on the High Street would be detrimental to bus journey times.
- Options should not be considered standalone, but elements could be chosen from a number of options to determine a preferred option.
- Public realm was deemed important on the High Street, rather than dramatically changing the traffic operation.
- TfL noted that their focus is around the Mayor's Transport Strategy, with pedestrians, cyclists air quality and accessibility important considerations.

Figure 8-1 Wealdstone Town Centre Concept Options Evaluation Framework

ASSESSMENT CRITERIA	OPTION											
	1	2	3	4	5a	5b	5c	6	7	8	9	Major Scheme Bid
	Do Minimum	High St Two-Way and Palmerston Rd Closed	Headstone Dr Two-Way	New Link to Palmerston Rd	The Bridge/High St Bus Only (Palmerston Rd to A409)	The Bridge/High St Bus Only (Palmerston Rd to A409) + Headstone Dr Two-Way	The Bridge/High St Bus Only (Palmerston Rd to A409) + Masons Ave EB Only	High St Bus Only (Masons Ave to A409)	High St Pedestrianisation (Palmerston Rd to A409)	High St Two-Way and The Bridge Bus/Cycle Only	Headstone Dr/Canning Rd Bus/Cycle Only	Mini roundabout at top of H/S and new bus link through Canning Rd
1.0 Impact on local highway operational performance												
1.1 Impact on journey times	0	0	0	0	-1	0	-2	-1	-3	0	0	-1
1.2 Impact on queue length	0	-1	-1	0	-1	-1	-2	-1	-3	0	0	-1
1.3 Maintain movement of freight traffic (HGVs and LGVs)	0	1	0	0	-1	-1	-1	1	-2	-1	0	0
Sub Total	**0**	**0**	**-1**	**0**	**-3**	**-2**	**-5**	**-1**	**-8**	**-1**	**0**	**-2**
Average	**0.00**	**0.00**	**-0.33**	**0.00**	**-1.00**	**-0.67**	**-1.67**	**-0.33**	**-2.67**	**-0.33**	**0.00**	**-0.67**
2.0 Improve accessibility for pedestrians												
2.1 Improve connections to town centre (particularly east-west)	1	1	2	1	1	1	1	2	1	1	1	1
2.2 Improve connections between Harrow and Wealdstone Stn and High St	1	1	3	3	1	1	1	1	-1	2	1	1
2.3 Improve connections to key development sites	1	2	2	1	1	1	1	2	-1	1	1	2
Sub Total	**3**	**4**	**7**	**5**	**3**	**3**	**3**	**5**	**-1**	**4**	**3**	**4**
Average	**1.00**	**1.33**	**2.33**	**1.67**	**1.00**	**1.00**	**1.00**	**1.67**	**-0.33**	**1.33**	**1.00**	**1.33**
3.0 Improve accessibility for cyclists												
3.1 Improve connections to town centre (particularly east-west)	1	1	2	1	1	1	2	1	1	1	-1	1
3.2 Improve connections between Harrow and Wealdstone Stn and High St	1	1	3	3	1	1	1	1	-1	2	1	1
3.3 Improve connections to key development sites	1	2	2	1	1	1	1	1	-1	1	1	2
Sub Total	**3**	**4**	**7**	**5**	**3**	**3**	**4**	**3**	**-1**	**4**	**1**	**4**
Average	**1.00**	**1.33**	**2.33**	**1.67**	**1.00**	**1.00**	**1.33**	**1.00**	**-0.33**	**1.33**	**0.33**	**1.33**
4.0 Improve public transport connections												
4.1 Maintain journey times for buses	0	-1	0	0	1	0	1	1	-3	0	-1	1
4.2 Enhance connections to public transport	1	1	2	2	1	1	1	1	-3	1	2	1
Sub Total	**1**	**0**	**2**	**2**	**2**	**1**	**2**	**2**	**-6**	**1**	**1**	**2**
Average	**0.50**	**0.00**	**1.00**	**1.00**	**1.00**	**0.50**	**1.00**	**1.00**	**-3.00**	**0.50**	**0.50**	**1.00**
5.0 Public Realm Improvements												
5.1 Improve quality of public realm on High St, outside stn and Headstone Dr	1	2	3	3	2	2	2	2	2	1	1	3
5.2 Reduce street clutter	2	3	2	2	1	1	1	2	3	2	1	2
5.3 Improve air quality	0	0	0	0	0	0	0	0	1	0	0	0
Sub Total	**3**	**5**	**5**	**5**	**3**	**3**	**3**	**4**	**6**	**3**	**2**	**5**
Average	**1.00**	**1.67**	**1.67**	**1.67**	**1.00**	**1.00**	**1.00**	**1.33**	**2.00**	**1.00**	**0.67**	**1.67**
6.0 Regeneration / growth												
6.1 Facilitates regeneration in the town centre	1	1	3	2	1	1	1	1	1	1	1	2
6.2 Facilitates economic growth	1	1	3	2	1	2	1	1	0	2	2	2
Sub Total	**2**	**2**	**6**	**4**	**2**	**3**	**2**	**2**	**1**	**3**	**3**	**4**
Average	**1.00**	**1.00**	**3.00**	**2.00**	**1.00**	**1.50**	**1.00**	**1.00**	**0.50**	**1.50**	**1.50**	**2.00**
7.0 Waiting and Loading												
7.1 Impact on on-street parking provision	0	0	-2	0	-1	-2	-1	-2	-3	0	-2	0
7.2 Impact on servicing	0	0	0	0	-1	-1	-1	-2	-3	1	0	0
Sub Total	**0**	**0**	**-2**	**0**	**-2**	**-3**	**-2**	**-4**	**-6**	**1**	**-2**	**0**
Average	**0.00**	**0.00**	**-1.00**	**0.00**	**-1.00**	**-1.50**	**-1.00**	**-2.00**	**-3.00**	**0.50**	**-1.00**	**0.00**
8.0 Other considerations												
8.1 Ease of implementation	3	2	-2	-3	2	-1	-1	-1	-3	2	-1	2
8.2 Cost	3	2	-2	-3	3	-1	0	0	-2	2	-1	-1
8.3 Third Party land requirements	3	3	3	-3	3	3	3	3	3	3	3	3
Sub Total	**9**	**7**	**-1**	**-9**	**8**	**1**	**2**	**2**	**-2**	**7**	**1**	**4**
Average	**3.00**	**2.33**	**-0.33**	**-3.00**	**2.67**	**0.33**	**0.67**	**0.67**	**-0.67**	**2.33**	**0.33**	**1.33**
TOTAL SCORE	**7.50**	**7.67**	**8.67**	**5.00**	**5.67**	**3.17**	**3.33**	**4.33**	**-7.50**	**8.17**	**3.33**	**8.00**
RANKING	**5**	**4**	**1**	**7**	**6**	**11**	**9**	**8**	**12**	**2**	**9**	**3**

8.2. Shortlisted Options

The results of the initial option assessment outlined in Figure 8-1 were presented to LBH officers and TfL representatives at the third stakeholder workshop. As a result of the option appraisal and subsequent discussions at the workshop, the following options were rejected as unsuitable for further consideration:

- Option 4 (new east-west link) – this option was ruled out due to the difficulty in acquiring the necessary land to provide a new link to Palmerston Road.
- Option 5a, 5b and 5c (bus only for various parts of the High Street) – all three of these options were ruled out as the bus journey time savings were predicted to be minimal, with limited scope to provide improvements for pedestrians and cyclists. The schemes would also result in complex traffic management arrangements within the town centre.
- Option 6 (bus only along the High Street) – this option was discounted due to the negative impact on traffic congestion due to diverted traffic and the fact that this was previously implemented and removed.
- Option 7 (pedestrianisation of the High Street) – discounted due to the impact on traffic congestion and the resultant impact on bus journey times due to diverted traffic.
- Option 8 (High Street two-way and The Bridge bus / cycle only) – although this option scored well on the evaluation framework, this option was not taken forward due to the resultant reassignment of traffic and the negative impact this would have on the High Street.
- Option 9 (Headstone Drive and Canning Road bus / cycle only) – this option would not provide many significant benefits and would have a negative impact on on-street parking. It would also be difficult to implement. With this option, buses would be re-routed through Headstone Drive, Trinity Square and the junction of the High Street with Canning Road, which would also be likely to have a negative impact on bus journey times. Consequently, this option scored relatively poorly overall during the evaluation and was not shortlisted.

Using the outputs of the option appraisal exercise, and discounting Option 8, the top four scoring options were Options 1, 2 and 3 and 10. During the workshop, it was decided that all four options should be investigated further to determine the preferred scheme for the town centre. These options were taken forward for the following reasons:

- Option 1 (do minimum) – the cumulative benefits were thought to be significant, and if elements from other options are advantageous, they could be added to the Do Minimum package.
- Option 2 (High Street two-way and Palmerston Road closed) – as Option 1, with the opportunity for further public realm improvements on Palmerston Road to complement the new Civic Centre development.
- Option 3 (Headstone Drive two-way and Palmerston Road closed) – it was agreed at the workshop that this option would be tested due to the high score in the evaluation process.
- Option 10 (Major scheme bid)– this option is based on the LBH major scheme bid and was discussed at the UDL Design Surgery. The scheme offers public realm benefits along the High Street and Palmerston Road, with a proposed new bus link that may generate benefits for bus journey times.

The proposed layouts of the four shortlisted options are shown in and in Figure 8-2 to Figure 8-5 and Appendix K.

Figure 8-2 Option 1 Proposal

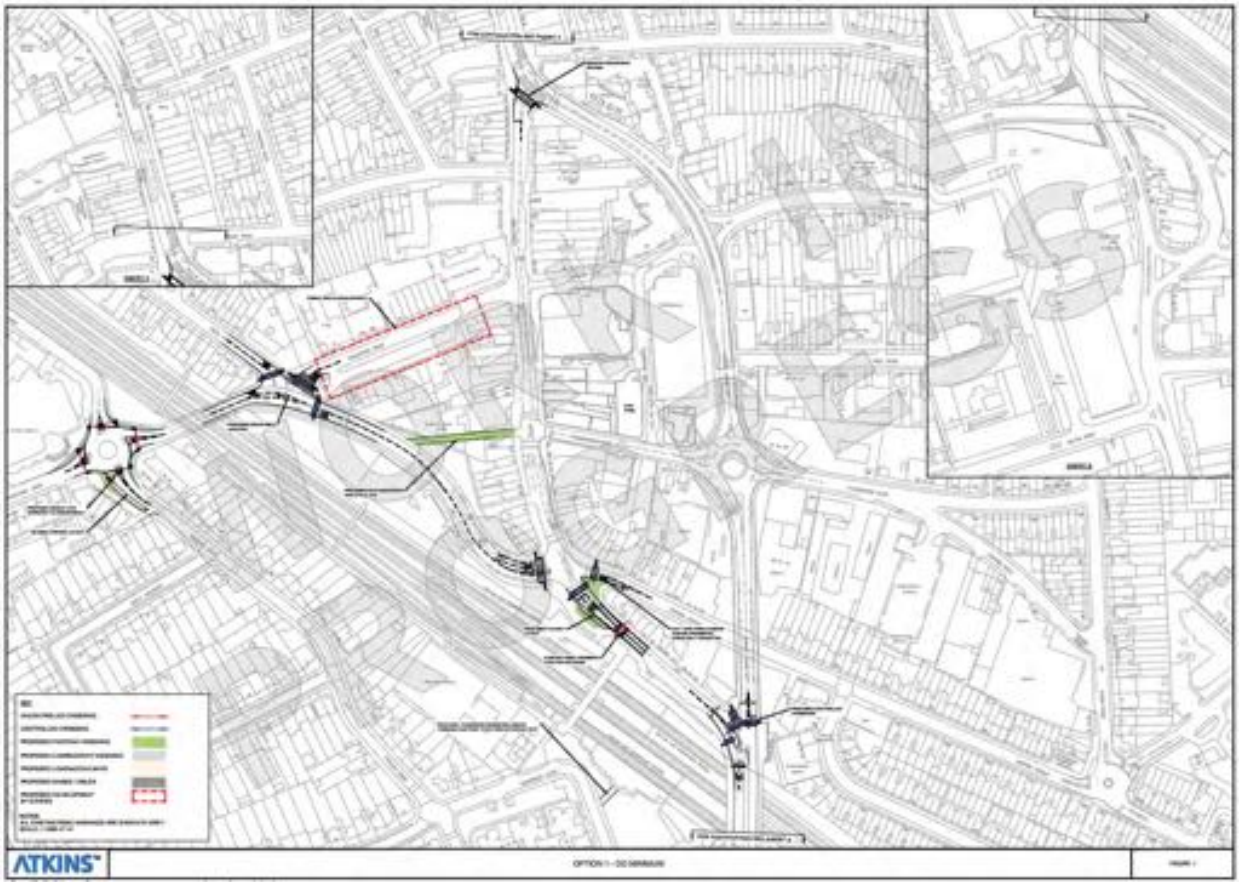


Figure 8-3 Option 2 Proposal

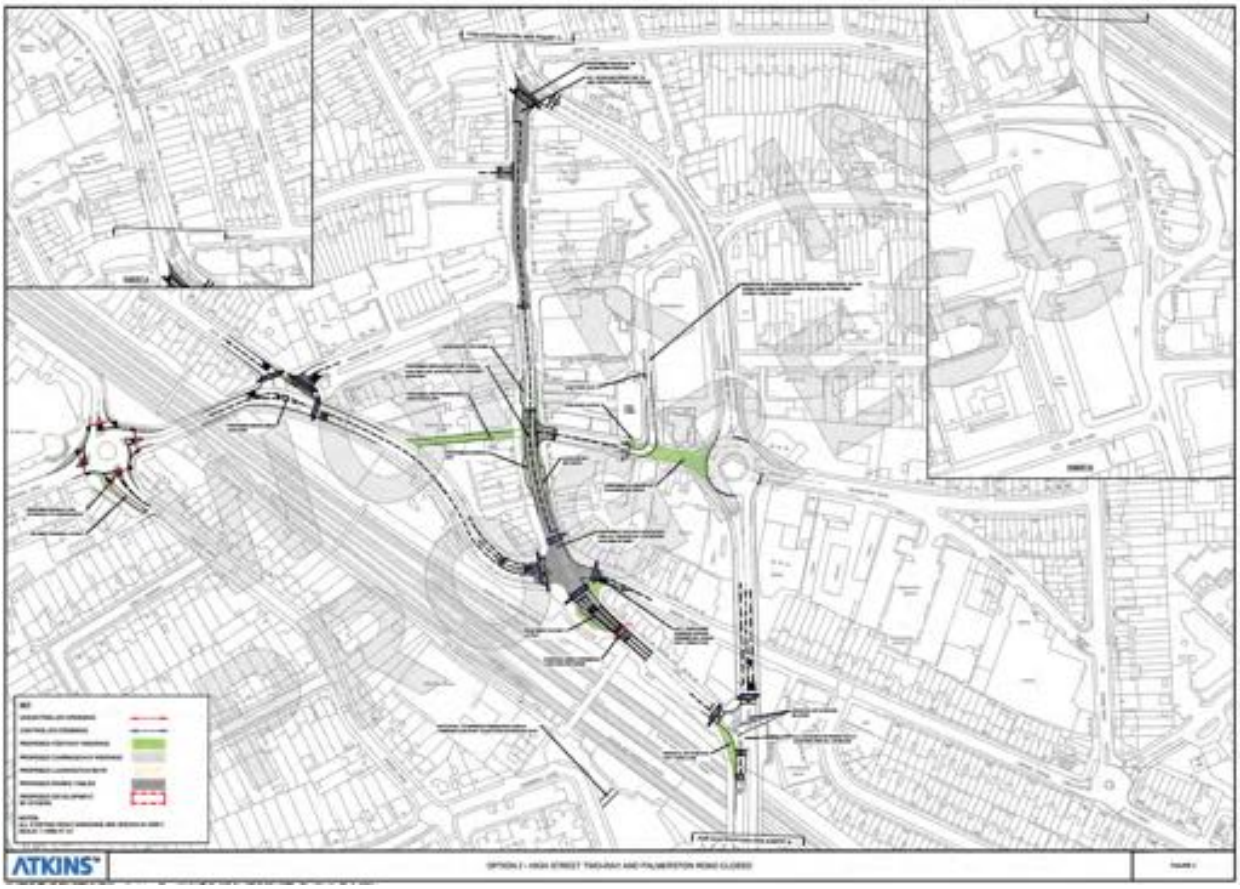


Figure 8-4 Option 3 Proposal

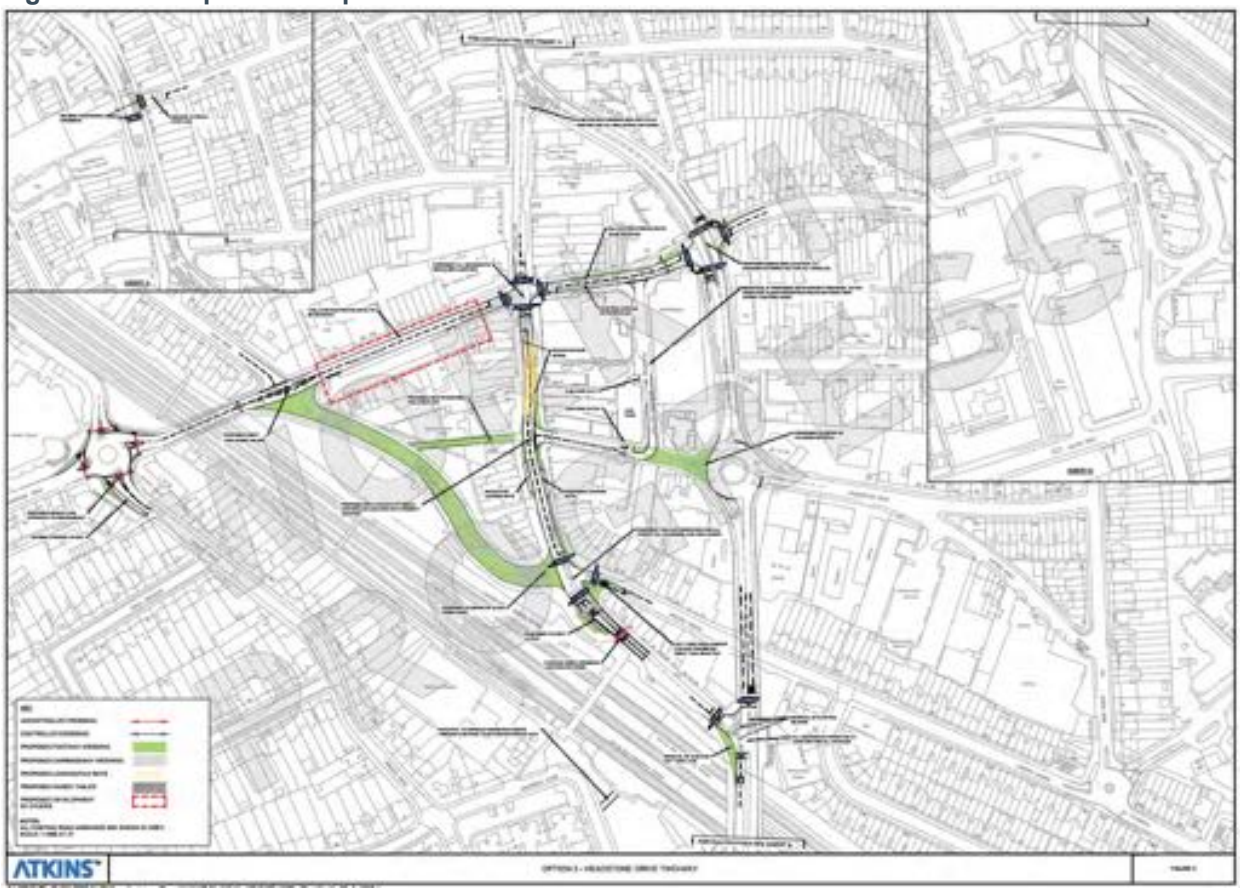
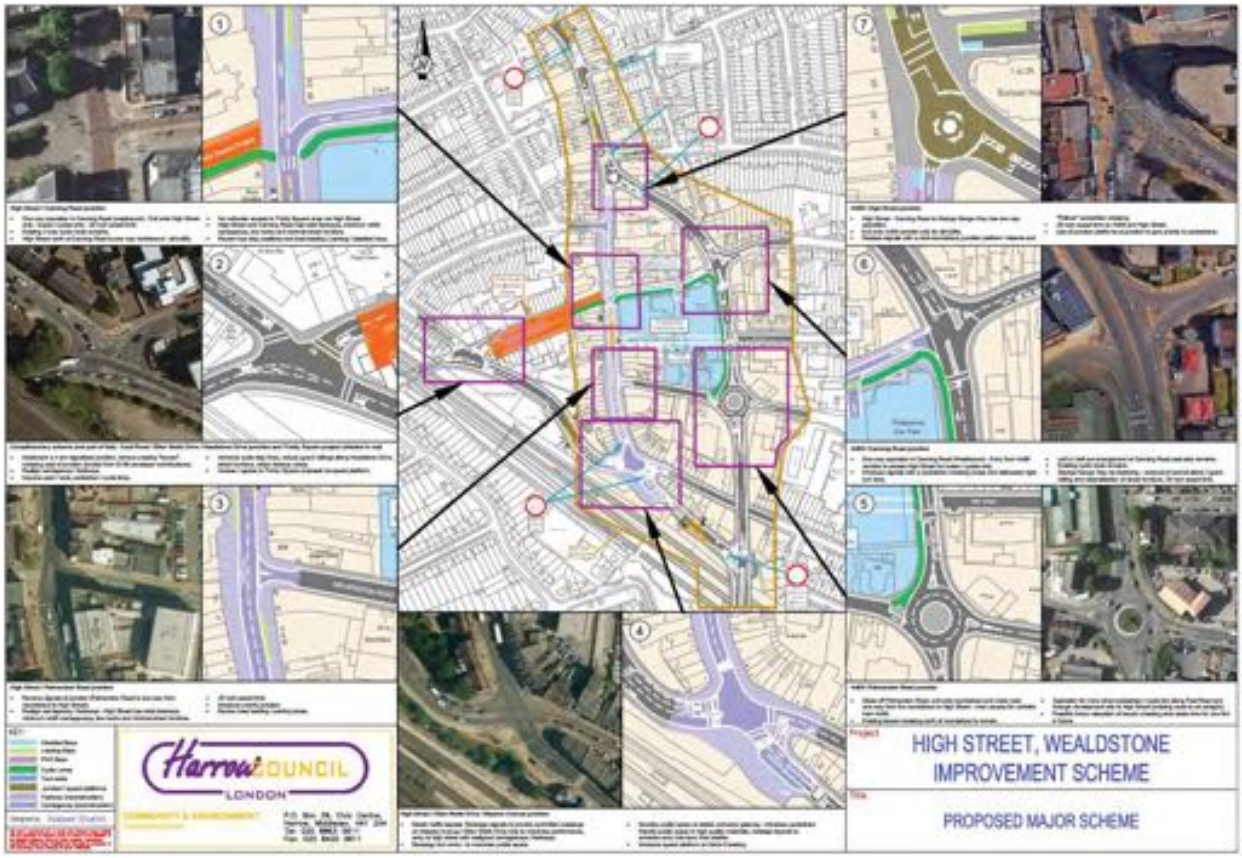


Figure 8-5 LBH Major Scheme (Option 10) Proposal



9. Appraisal of Shortlisted Options

9.1. Traffic Modelling Results

Following the workshop, traffic modelling was undertaken for the shortlisted options to assess the likely traffic impact on the road network in Wealdstone and to determine the preferred option to take forward. The options were modelled using the 2021 WeLHAM, with the change in flows then used to update the proposed LinSig models to assess the traffic impacts on Wealdstone town centre.

9.1.1. WeLHAM (2021) Modelling of proposed options

The four shortlisted options have been tested using the WeLHAM 2021 model and the results compared to the WeLHAM 2021 base model to establish the impact of each one on traffic flows, both within study area and beyond.

Figure 9-1 to Figure 9-6 show the outputs of the WeLHAM modelling, comparing the actual flows on each link between the Do Minimum and proposed scenario. In the figures below, blue lines show a reduction in traffic flow compared to the Do Minimum scenario and green shows an increase. The thickness of the lines indicates the scale of change in volume of traffic, therefore the thicker the line, the greater the increase or decrease in the volume of traffic.

9.1.1.1. Option 1 (Do Minimum)

The WeLHAM modelling of Option 1 shows that it is likely to result in minimal change to traffic flows across the Wealdstone town centre road network. Plans showing the WeLHAM output for Option 1 have not been included because the change in traffic flow is too small to be visible and so these would simply show the road network. Option 1 effectively retains the existing traffic flows, therefore providing no benefits or dis-benefits for the High Street associated with changes in traffic flow, i.e. noise, air quality, traffic delays, severance, dominance of vehicular traffic over vulnerable road uses, etc. with this option.

9.1.1.2. Option 2 (High Street two-way and Palmerston Road closed)

The WeLHAM modelling of Option 2 shows that it is likely to result in a shift of traffic flow onto the High Street from the A409 George Gange Way, as shown in Figure 9-1 and Figure 9-2.

Figure 9-1 Option 2 SATURN Outputs (Change in Actual Flow) AM Peak 2021

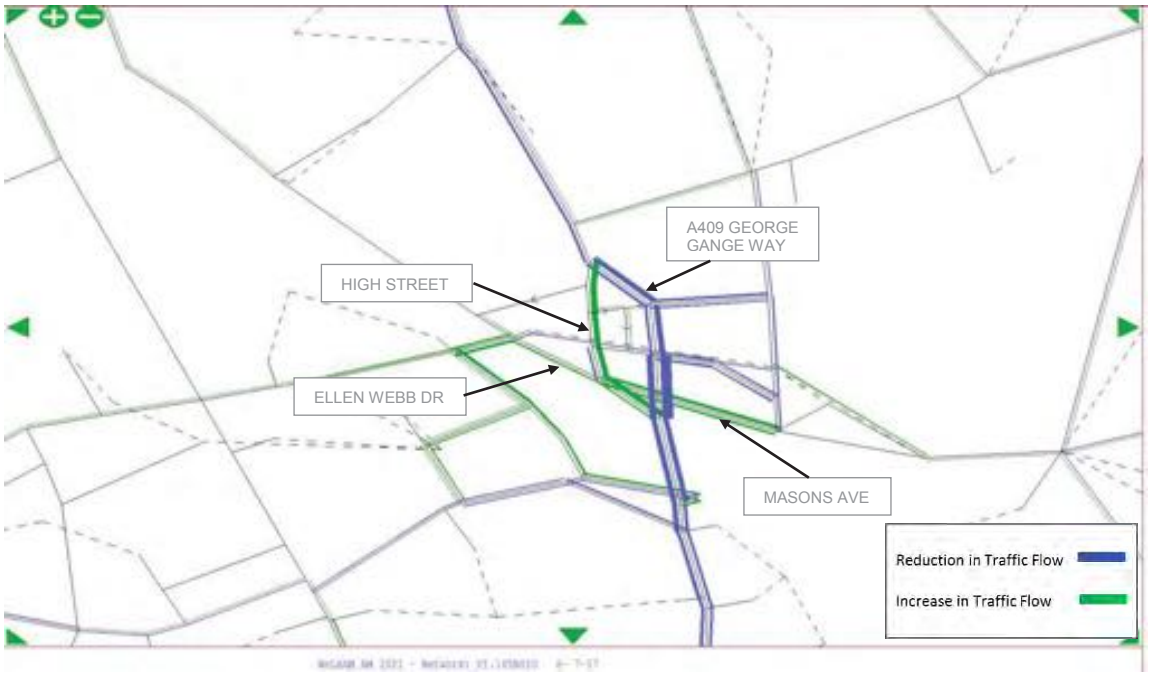
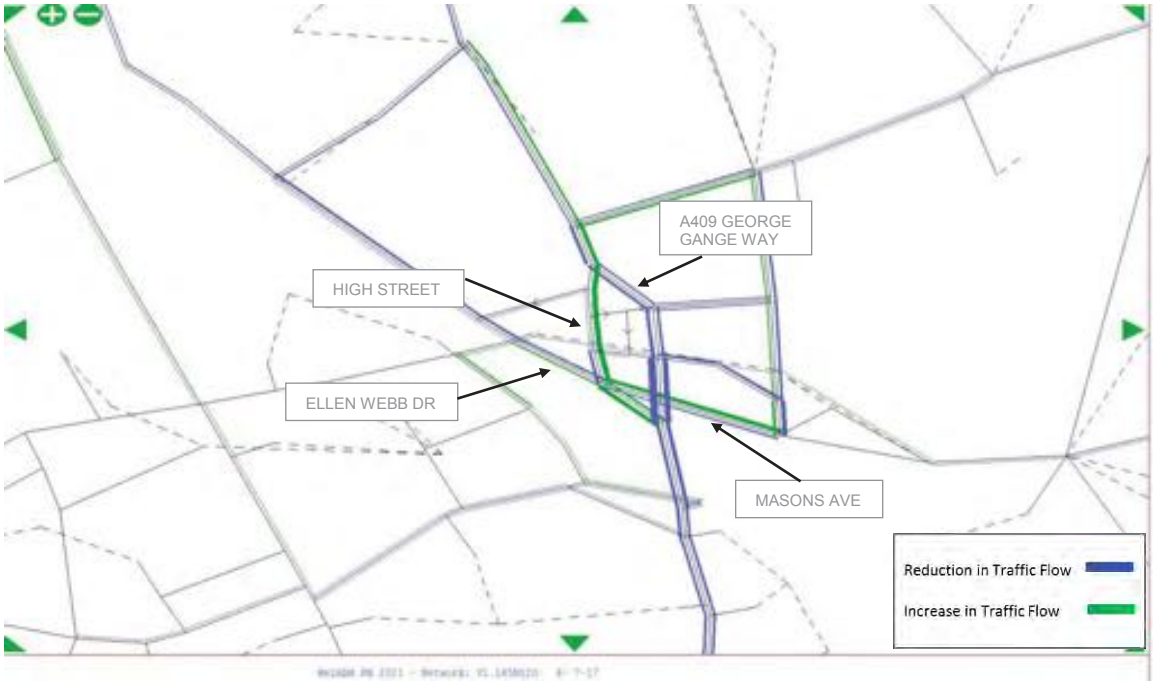


Figure 9-2 Option 2 SATURN Outputs (Change in Actual Flow) PM Peak 2021



The main changes in traffic flows predicted as a result of the Option 2 modelling are as follows:

- Allowing general traffic to access the High Street southbound would increase traffic flows along the High Street;
- Subsequently, this would reduce traffic flows on the A409 George Gange Way; and
- The model also predicts an increase of traffic flows on Masons Avenue, which already experiences congestion and queueing during peak hours.

By allowing general traffic to use the High Street southbound, this would have a detrimental impact on the High Street as increased traffic flows would generate more noise and traffic congestion, further reduce air quality and opportunities for improved facilities in the High Street due to vehicle dominance.

9.1.1.3. Option 3 (Headstone Drive two-way and Palmerston Road closed)

The change in traffic flows from the WeLHAM model, as a result of Option 3, are presented in Figure 9-3 and Figure 9-4. The WeLHAM modelling predicts that Option 3 will result in a significant reassignment of traffic away from Wealdstone town centre, from both the High Street and the A409 George Gange Way, onto inappropriate alternative roads including: Byron Road to the east and Cecil Road to the west. This is due to the A409 George Gange Way / The Bridge and A409 High Street / A409 George Gange Way junctions being unable to accommodate the additional traffic demand arising from the scheme, with traffic consequently diverting onto alternative routes to avoid areas of congestion.

The diversion of traffic away from the main road network and onto more inappropriate minor residential streets would be highly undesirable and case a significant reduction in the quality of life for residents living in those streets.

Figure 9-3 Option 3 SATURN Outputs (Change in Actual Flow) AM Peak 2021

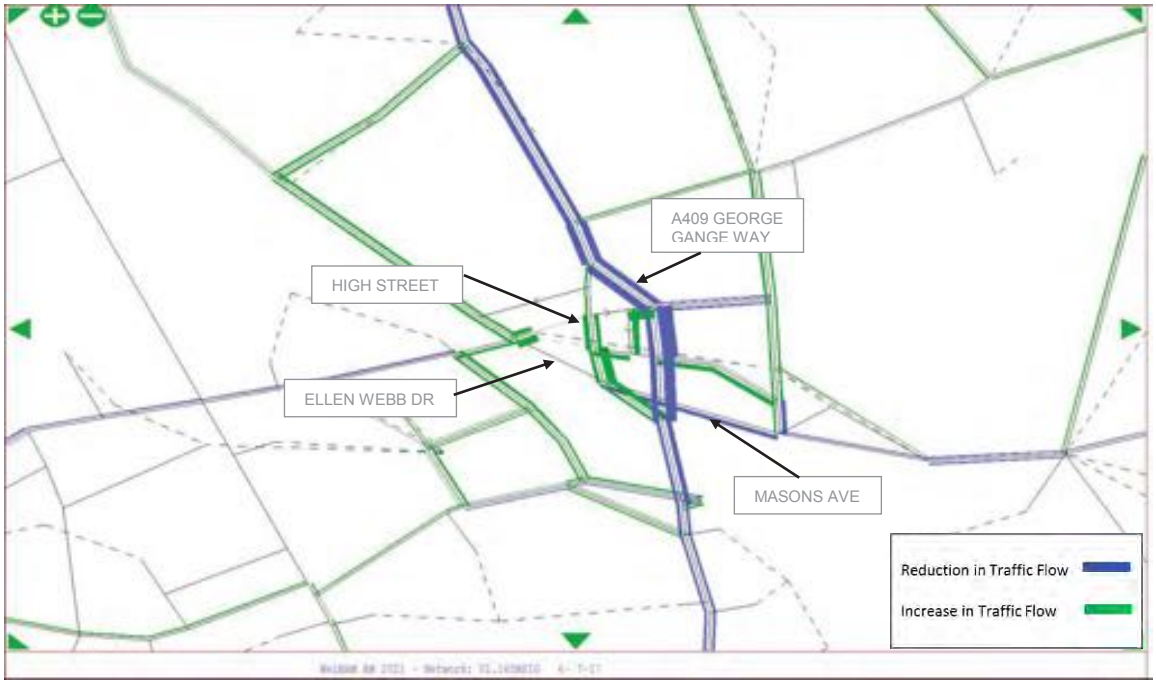
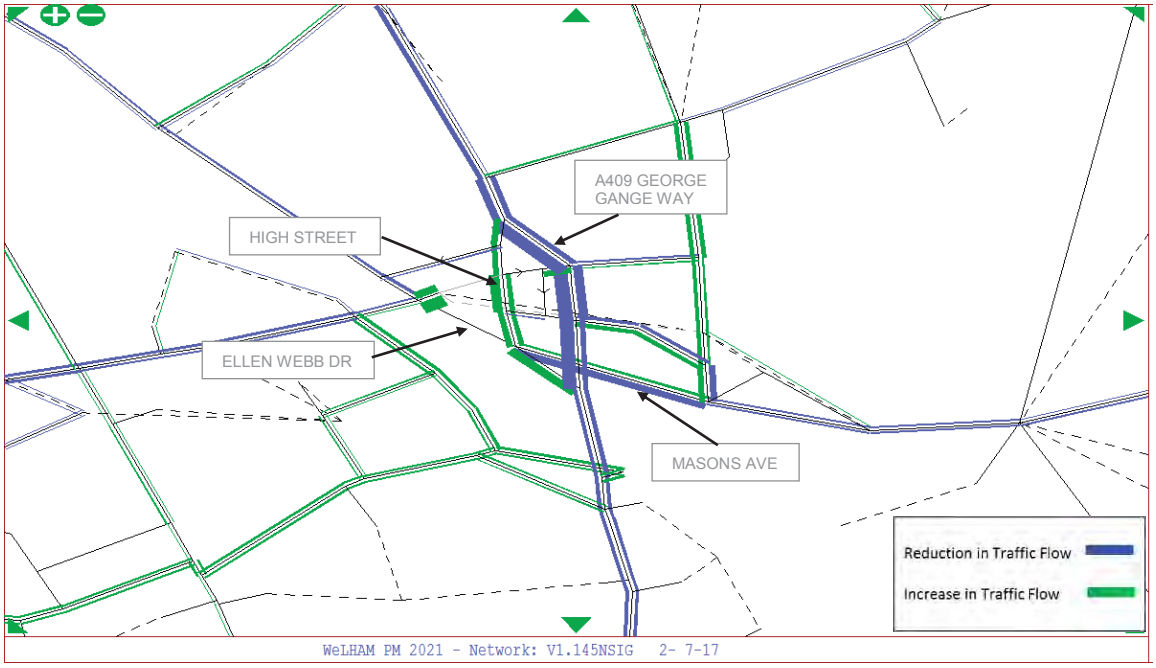


Figure 9-4 Option 3 SATURN Outputs (Change in Actual Flow) PM Peak 2021



The key changes in traffic flows predicted due to the Option 3 modelling are as follows:

- Significant overall reduction of traffic in the study area, particularly along the A409;
- Increased of traffic on Byron Road during both peak hours;
- Increase of traffic on Cecil Road during the AM peak hour; and
- Increase of traffic on Marlborough Hill during the PM peak.

9.1.1.4. Major Scheme Bid (Option 10)

The WeLHAM modelling of Option 10 predicts an increase in traffic flows on the High Street northbound and Palmerston Road. The changes in actual traffic flows are shown in Figure 9-5 and Figure 9-6. The conversion of the High Street / Palmerston Road junction from signalised to priority, and the conversion of the A409 George Gange Way / Canning Road from priority to a signalised junction, reduces delay on the High Street northbound, therefore attracting traffic from the A409 George Gange Way route.

Figure 9-5 Option 10 SATURN Outputs (Change in Actual Flow) AM Peak 2021

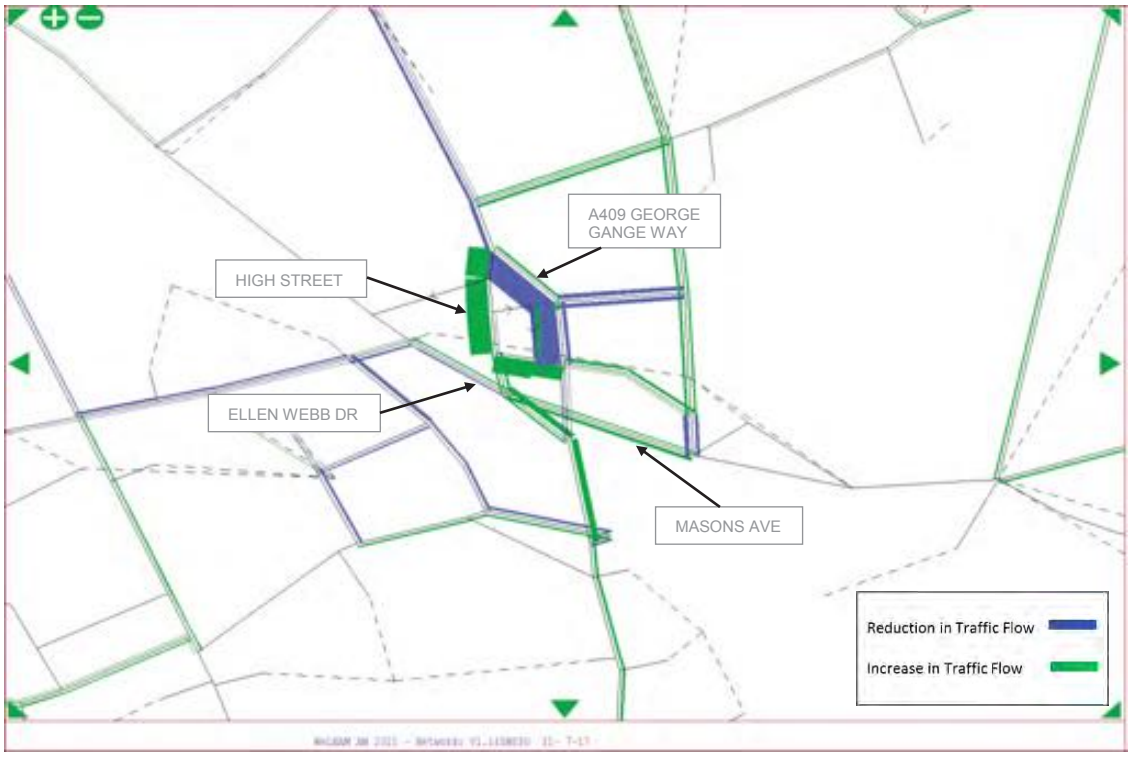
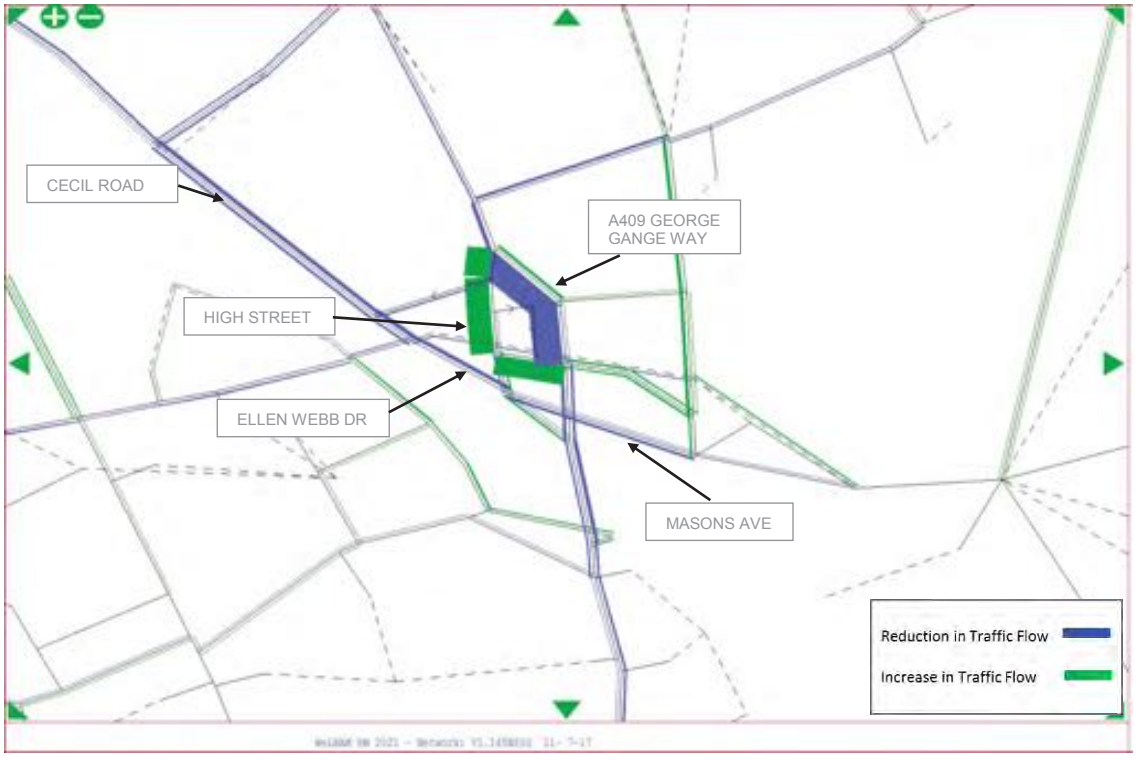


Figure 9-6 Option 10 SATURN Outputs (Change in Actual Flow) PM Peak 2021



The key changes in traffic flows due to Option 10 are as follows:

- Significant reduction of traffic on the A409 George Gange Way due to new signalised junction; and
- Significant increase in traffic along the High Street northbound and on Palmerston Road due to the introduction of new signals at the A409 / Canning Road alongside the removal of signals at High Street / Palmerston Road junction.

9.1.2. Review of Option 10

Since the shortlisting of options for appraisal, there has been a change in London Mayor who has subsequently published a draft London Mayor's Transport Strategy (MTS). The draft was published in June 2017 for public consultation, which set out a new direction for transport policy. As a consequence, a review of LBH's Major Scheme Bid Design (Option 10) has been undertaken to better align with the wider objectives set out within the strategy as follows:

- Healthy streets and healthy people;
- A good public transport experience; and
- New homes and jobs.

The main challenge identified in the MTS is a growing population in London, coupled with a reliance on private vehicles. Reducing the need to use cars will provide benefits for all Londoners, by promoting walking, cycling and public transport as an attractive mode choice. The new Transport Strategy aims to change the way people travel, so that by 2041 80% of all Londoners' trips will be made by foot, bicycle or public transport. Currently, only 64% of trips are made by sustainable modes.

The Mayor has identified the importance of providing reliable bus services as part of a strategy to avoid reliance on cars. The Wealdstone regeneration programme is anticipated to generate an increase in public transport use in the area as a consequence of the low car provision development proposed in the future and it will be important to accommodate the likely increase in demand. Therefore, Option 10 was reviewed to better reflect the draft MTS. Designs were revised to provide reduced delay to buses, therefore improving bus journey times and providing bus priority to encourage greater use of public transport, in addition to making further improvements for pedestrians and cyclists in the town centre. The process generated Options 11A and 11B, which revised Option 10's layout to provide greater benefits to buses.

9.1.3. Summary of Proposed WeLHAM Modelling

Following completion of the WeLHAM modelling of the four shortlisted options, local junction modelling was undertaken on the TfL approved validated LinSig base model for the town centre. The change in traffic flows between the Do Minimum and Do Something WeLHAM scenarios was inputted into LinSig to determine the traffic impacts for general traffic and buses in the town centre, resulting from each scheme.

However, as Option 3 results in significant reassignment of traffic onto roads outside of the study area, it was not considered appropriate to undertake local modelling of this option. The LinSig model would not capture changes in traffic delay outside of the town centre, therefore providing results that would not be representative of the overall traffic impact of this option across the wider road network.

Furthermore, with the change of London Mayor and the development of a new draft transport strategy with new objectives focussing on sustainable transport modes and bus priority, the Major Scheme programme ceased and has been subsequently replaced by a Liveable Neighbourhoods programme, reflecting a new healthy streets approach.

Consequently, and following the initial modelling results, two additional sub-options of Option 10 were developed with elements of the scheme refined to optimise the benefits for the town centre and public transport to reflect the Mayor's new transport objectives and revised scheme funding requirements.

The two sub-options of Option 10, labelled Option 11A and 11B, included the following scheme refinements:

- **Options 11A and 11B**: The junction of the High Street with A409 junction signalised rather than the proposed mini-roundabout.
- **Option 11A**: An offside southbound bus lane on A409 George Gange Way between the High Street and Canning Road and a modified layout at A409 George Gange Way / Canning Road junction, with

a secondary southbound stop line before the proposed signalised crossing on A409 George Gange Way.

- **Option 11B**: Two-way bus operation on the High Street north of Canning Road, i.e. no rerouting of bus services, and the existing layout at the junction of A409 George Gange Way with Canning Road.

The proposed arrangements for Options 11A and 11B are shown in Figure 9-7 and Figure 9-8 and also in Appendix K.

Both Option 11A and 11B are likely to result in very similar changes in traffic flows to Option 10. Option 11B would be expected to result in slightly less of a reduction in traffic flows on the High Street and a smaller corresponding increase on the A409 George Gange Way compared to Options 10 and 11A, especially north of Canning Road. This was accounted for in the more detailed traffic modelling through a manual reassignment of traffic flow based on the outputs of the WeLHAM modelling for Option 10.

Figure 9-7 Option 11A Proposal

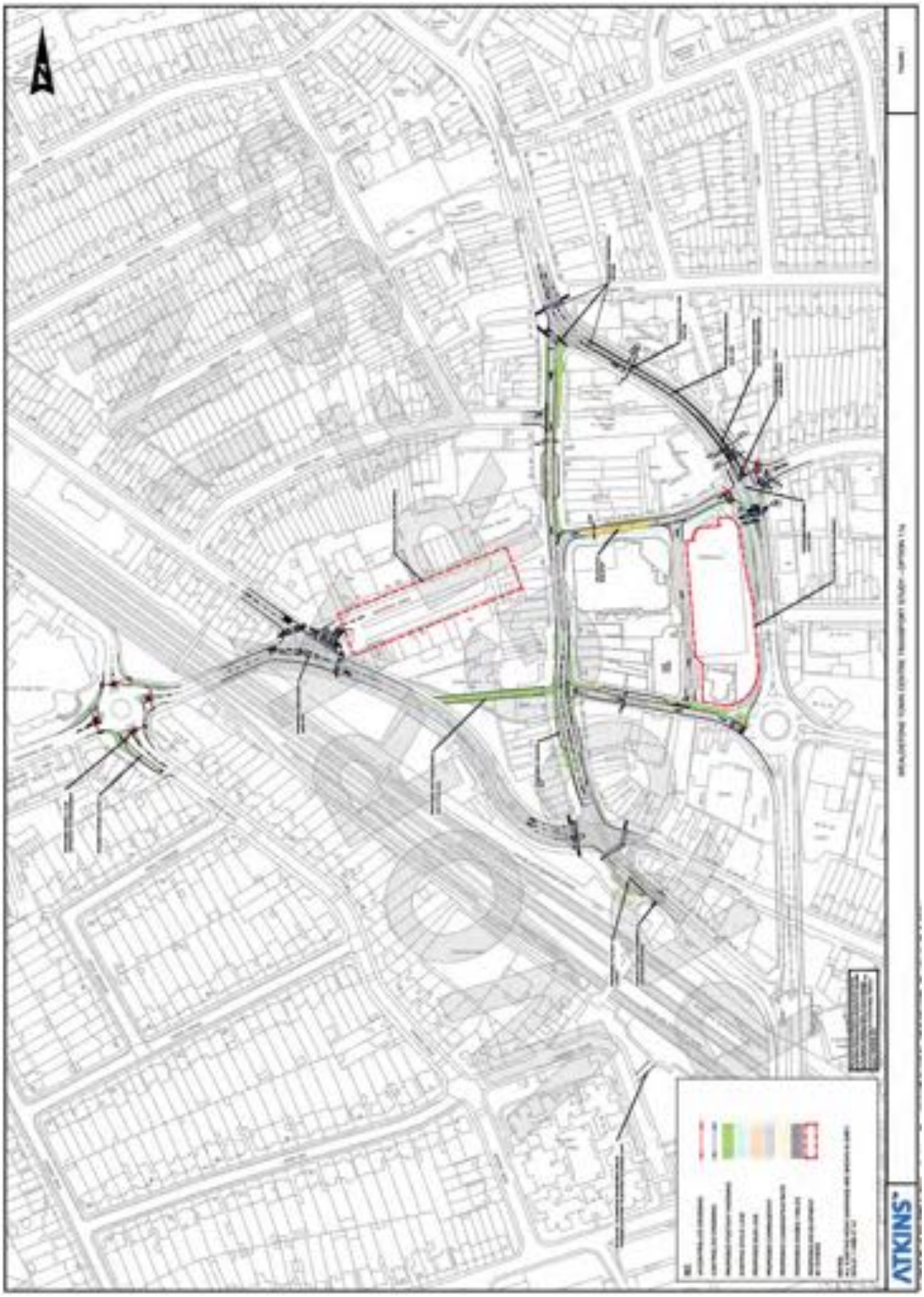
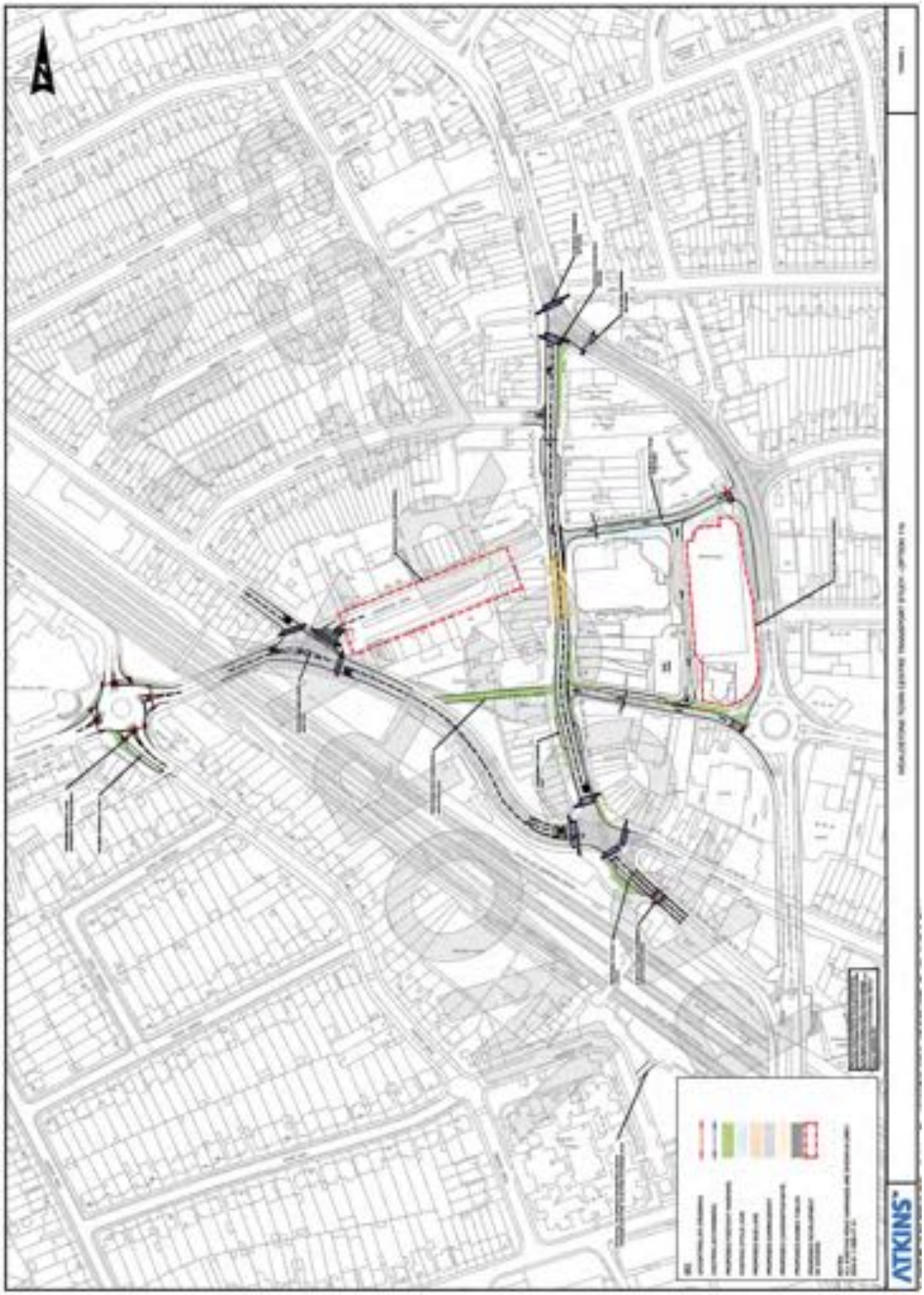


Figure 9-8 Option 11B Proposal



9.1.4. Detailed Traffic Modelling Results

Based on the results of the WeLHAM modelling, the outputs were used to update the base traffic flows to reflect the traffic patterns generated from each 'Do Something' scenario in the WeLHAM models. The traffic flows were updated in the TfL validated base model and the junctions optimised, to predict the proposed traffic impacts on the Wealdstone town centre network.

9.1.4.1. Degree of Saturation (DoS)

The DoS results for the shortlisted options, including options 11A and 11B, are presented in Table 9-1, comparing the base LinSig model results to each of the proposed options. Results with DoS of 90% or more have been highlighted in red, results over 80% in orange, and all results under 80% DoS in green.

Table 9-1 Modelled Degree of Saturation Results – 2021 (AM Peak)

Junction	Approach	Degree of Saturation (DoS) %						
		Base	Option 1	Option 2	Option 3	Option 10	Option 11A	Option 11B
A409 High Street / Locket Road	Locket Road	31.0	31.0	53.2		33.1	33.1	33.1
	High Street (S) Ahead	56.5	46.9	58.2		57.7	57.1	57.8
	High Street (N)	46.5	46.5	43.9		45.4	45.4	45.4
A409 George Gange Way / High Street	A409 George Gange Way	73.1	58.7	77.5		64.0	78.4	76.8
	High Street (S)	78.7	80.2	76.2		85.0	87.3	85.3
	A409 High Street (N)	81.9	84.4	69.4		79.0	86.4	84.9
High Street / Palmerston Road	Palmerston Road	62.0	53.9	19.3		35.2	34.9	32.5
	High Street (S) Ahead and Left	29.1	30.6	12.1		16.3	15.3	16.3
	High Street (N)	17.5	17.5	4.9		3.2	3.2	3.2
Ellen Webb Drive / The Bridge / High Street / Masons Avenue	Masons Avenue	85.5	78.9	84.3		69.5	76.7	68.0
	The Bridge Ahead and Left	34.2	34.2	75.2	N/A	51.2	42.7	44.5
	Ellen Webb Drive Ahead	99.0	99.0	94.0		87.3	86.5	86.9
	High Street	53.0	53.0	77.3		86.8	69.9	73.9
The Bridge / A409 George Gange Way	A409 George Gange Way (N)	74.3	67.6	107.4		79.0	78.8	79.3
	The Bridge Right	24.5	26.2	107.8		27.1	27.1	27.1
	A409 George Gange Way (S)	63.2	71.4	108.2		61.8	61.8	61.8
A409 George Gange Way / Canning Road	A409 George Gange Way (N)	36.5	36.5	19.3		76.8	70.8	43.9
	Canning Road	40.8	40.8	13.6		79.3	85.7	39.6
	A409 George Gange Way (S)	34.2	34.2	33.2		55.6	55.9	33.4

Table 9-2 Modelled Degree of Saturation Results – 2021(PM Peak)

Junction	Approach	Degree of Saturation (DoS) %						
		Base	Option 1	Option 2	Option 3	Option 10	Option 11A	Option 11B
A409 High Street / Locket Road	Locket Road	37.8	37.8	65.7		40.4	37.3	37.3
	High Street (S) Ahead	70.4	58.4	68.4		73.4	76.1	76.1
	High Street (N)	49.5	49.5	58.4	N/A	48.4	50.7	50.7
A409 George	A409 George Gange Way	79.1	64.7	68.3		74.0	89.9	88.3
	High Street (S)	91.0	83.3	86.0		98.0	87.2	88.3

Junction	Approach	Degree of Saturation (DoS) %						
		Base	Option 1	Option 2	Option 3	Option 10	Option 11A	Option 11B
Gange Way / High Street	A409 High Street (N)	77.8	83.2	89.2		78.0	87.5	86.0
High Street / Palmerston Road	Palmerston Road	69.5	64.6	5.2		41.2	41.2	42.2
	High Street (S) Ahead and Left	31.0	31.0	9.9		16.1	16.1	16.1
	High Street (N)	18.1	18.1	15.3		3.6	3.6	3.6
Ellen Webb Drive / The Bridge / High Street / Masons Avenue	Masons Avenue	80.9	77.8	100.9		84.8	74.5	78.2
	The Bridge Ahead and Left	48.0	48.0	97.7		40.8	34.5	35.5
	Ellen Webb Drive Ahead	89.8	89.8	92.9		92.9	88.4	90.6
	High Street	77.1	77.0	48.3		90.2	75.0	77.0
The Bridge / A409 George Gange Way	A409 George Gange Way (N)	64.0	61.2	109.2		64.9	65.7	64.9
	The Bridge Right	30.9	28.1	109.7		34.7	30.8	34.7
	A409 George Gange Way (S)	66.1	74.6	108.2		64.5	65.3	64.5
A409 George Gange Way / Canning Road	A409 George Gange Way (N)	36.1	36.1	35.8		76.8	66.7	42.1
	Canning Road	22.6	22.6	17.3		79.3	77.9	28.8
	A409 George Gange Way (S)	37.1	37.1	35.0		55.6	64.1	40.4

The results of the traffic modelling indicate that Option 1 will have a minor impact on the operation of traffic in Wealdstone town centre, as it proposes only minor changes to the existing situation. Option 2 shows several approaches exceeding practical capacity, particularly notable at the A409 George Gange Way / The Bridge junction. All approaches at the junction are predicted to exceed 100% DoS in the Option 2 scenario, therefore causing delays and congestion for both general traffic and buses. Option 10 shows approaches operating over capacity at the Ellen Webb Drive / High Street junction and on the High Street at the junction with the A409 George Gange Way. The best results, in terms of DoS, are generated by Options 11A and 11B, with all approaches operating within capacity during both peak hours, excluding Ellen Webb Drive in Option 11B during the PM peak.

9.1.5. Queue Length

Modelled queue lengths, for the shortlisted options in both the AM and PM peak hours are presented in Table 9-3 and Table 9-4. Any modelled queues exceeding 10 PCUs have been highlighted in red,

Table 9-3 Modelled Queue Length Results – 2021 (AM Peak)

Junction	Approach	Modelled Mean Maximum Queue (PCU)						
		Base	Option 1	Option 2	Option 3	Option 10	Option 11A	Option 11B
A409 High Street / Locket Road	Locket Road	2.0	2.0	3.8		2.1	2.1	2.1
	High Street (S) Ahead	5.2	3.8	6.8		5.3	5.3	5.3
	High Street (N)	4.6	4.6	5.4		4.4	4.4	4.4
A409 George Gange Way / High Street	A409 George Gange Way	10.1	7.1	13.6		2.0	12.6	13.1
	High Street (S)	7.0	7.3	8.0	N/A	6.9	11.9	12.5
	A409 High Street (N)	12.0	13.0	8.6		4.2	15.4	15.8
	Palmerston Road	3.9	3.2	0.4		0.3	0.3	0.3
	High Street (S) Ahead and Left	2.1	2.1	0.1		0.1	0.1	0.1

Junction	Approach	Modelled Mean Maximum Queue (PCU)						
		Base	Option 1	Option 2	Option 3	Option 10	Option 11A	Option 11B
High Street / Palmerston Road	High Street (N)	1.0	1.0	0.1		0.0	0.0	0.0
Ellen Webb Drive / The Bridge / High Street / Masons Avenue	Masons Avenue	10.8	9.6	16.5		10.8	11.9	11.5
	The Bridge Ahead and Left	3.2	3.2	4.2		3.9	3.6	4.0
	Ellen Webb Drive Ahead	13.6	13.6	22.0		15.5	14.3	16.9
	High Street	7.0	7.0	10.1		8.0	6.0	6.8
The Bridge / A409 George Gange Way	A409 George Gange Way (N)	12.3	10.5	32.3		14.0	13.9	14.1
	The Bridge Right	1.1	1.1	28.2		1.1	1.1	1.1
	A409 George Gange Way (S)	8.7	12.5	64.1		8.1	8.1	8.1
A409 George Gange Way / Canning Road	A409 George Gange Way (N)	0.3	0.3	0.1		21.5	11.4	7.9
	Canning Road	0.3	0.3	0.1		8.6	15.8	0.3
	A409 George Gange Way (S)	0.3	0.3	0.2		12.6	7.7	0.3

Table 9-4 Modelled Queue Length Results – 2021 (PM Peak)

Junction	Approach	Modelled Mean Maximum Queue (PCU)						
		Base	Option 1	Option 2	Option 3	Option 10	Option 11A	Option 11B
A409 High Street / Locket Road	Locket Road	2.6	2.6	6.0		2.7	2.4	2.4
	High Street (S) Ahead	9.1	5.9	10.0		9.9	10.1	10.1
	High Street (N)	5.8	5.8	8.6		5.5	5.6	5.6
A409 George Gange Way / High Street	A409 George Gange Way	12.4	8.4	12.6		3.3	18.1	17.8
	High Street (S)	9.3	7.6	9.8		21.0	13.0	13.6
	A409 High Street (N)	11.6	12.8	20.4		4.1	16.8	16.4
High Street / Palmerston Road	Palmerston Road	4.6	4.1	0.0		0.4	0.3	0.7
	High Street (S) Ahead and Left	2.3	2.3	0.1		0.1	0.1	0.1
	High Street (N)	1.0	1.0	0.1		0.0	0.0	0.0
Ellen Webb Drive / The Bridge / High Street / Masons Avenue	Masons Avenue	10.6	9.9	28.1		11.4	11.5	11.4
	The Bridge Ahead and Left	3.2	3.2	14.6	N/A	3.0	3.4	3.2
	Ellen Webb Drive Ahead	14.1	14.1	17.7		15.7	16.1	16.1
	High Street	6.0	5.9	5.0		8.3	6.9	6.8
The Bridge / A409 George Gange Way	A409 George Gange Way (N)	10.1	10.6	48.9		9.8	10.3	9.8
	The Bridge Right	1.6	1.5	14.1		1.6	1.5	1.6
	A409 George Gange Way (S)	11.0	16.8	69.7		9.9	10.5	9.9
A409 George Gange Way / Canning Road	A409 George Gange Way (N)	0.3	0.3	0.8		21.5	9.6	2.9
	Canning Road	0.1	0.1	1.5		8.9	12.6	0.2
	A409 George Gange Way (S)	0.3	0.3	0.3		17.2	0.6	0.3

9.1.6. Bus Journey Times

The predicted changes in bus journey times are presented in Table 9-5. The results have been calculated using average delay per PCU results from LinSig and compared for each link bus services would travel through in each direction.

Table 9-5 Change in Average Delay per PCU for Bus Routes

Option	Predicted Change in Average Journey Time for Bus Routes (seconds)											
	AM Peak						PM Peak					
	NB	SB	NB + SB	EB	WB	EB + WB	NB	SB	NB + SB	EB	WB	EB + WB
	33 bph	30 bph	63 bph	6 bph	6 bph	12 bph	30 bph	32 bph	62 bph	6 bph	6 bph	12 bph
1	2.2	2.3	**4.5**	3.1	-3.0	**0.1**	5.3	-17.1	**-11.8**	-21.2	-5.1	**-26.3**
2	209.8	172.6	**382.4**	41.2	-62.8	**-21.6**	278.4	247.5	**525.9**	3.4	-85.9	**-82.5**
3	N/A											
10	6.3	55.0	**61.3**	23.3	-51.5	**-28.2**	28.2	72.4	**100.6**	52.9	-23.3	**29.6**
11A	-12.7	18.0	**5.3**	28.7	-76.0	**-47.3**	-35.4	38.3	**2.9**	-3.1	-60.8	**-63.9**
11B	-4.0	-14.5	**-18.5**	11.2	-70.9	**-59.7**	-33.9	-1.6	**-35.5**	-16.5	-66.5	**-83.0**

9.2. Option Costs

A rough order of magnitude construction costs for the shortlisted options are presented in Table 9-6. A high-level breakdown of the cost estimate for each of the shortlisted schemes is provided in Appendix L.

Table 9-6 Construction Cost Estimates

Option	Construction Costs	Contingencies	Total
1	£580,000	£240,000	**£820,000-£902,000**
2	£1,130,000	£340,000	**£1,470,000-£1,617,000**
3	£2,920,000	£1,170,000	**£4,090,000-£4,499,000**
10	£2,650,000	£800,000	**£3,450,000-£3,795,000**
11A	£2,080,000	£840,000	**£2,920,000-£3,212,000**
11B	£1,700,000	£680,000	**£2,380,000-£2,618,000**

9.3. Appraisal Summary

A further appraisal of the shortlisted options has been undertaken, based on the agreed appraisal criteria with the addition of a Health Streets category. The scoring of options against the 'Impact on Local Highway Operational Performance' and 'Public Transport Connections' takes account of the traffic modelling outputs to inform the scoring.

Table 9-7 Appraisal of Shortlisted Options

Category	Option					
	1	2	3	10	11A	11B
Impact on local highway operational performance (Traffic delay)	3	1	0	2	4	5
Improve accessibility for pedestrians	0	1	4	1	3	2
Improve accessibility for cyclists	0	1	4	1	3	2
Improve public transport connections (Bus delay)	3	1	0	2	4	5
Opportunity for public realm Improvements	0	1	1	1	2	3
Facilitate regeneration and economic growth	0	0	4	1	3	2
Impact on on-street waiting and loading	2	2	0	2	2	1
Healthy streets	2	1	0	4	5	3
Ease of implementation	4	1	0	1	2	3
Construction cost	5	4	0	2	1	3
Overall score	**19**	**13**	**13**	**17**	**29**	**29**
Ranking	**3**	**5**	**5**	**4**	**1**	**1**

Scoring (excluding ranking): 0 = worst performing, 5 = best performing

The appraisal of the shortlisted options shows that the best performing options on balance across the appraisal criteria are options 11A and 11B.

These two options perform the best in terms of: providing opportunities for the proposed public realm improvements; local highway operational performance, i.e. minimising traffic delay; and public transport accessibility by providing the greatest bus journey time savings. They also perform very well in comparison to the other shortlisted options on: improving accessibility for pedestrians and cyclists through improved connectivity, facilitating regeneration and economic growth; and meeting TfL's healthy streets objectives. However, these options are likely to be more expensive and disruptive to implement than some of the other shortlisted options.

10. Healthy Streets for London

Healthy Streets for London is an initiative, developed by TfL, that aims to ensure people and their health are put at the centre of decision making in London. It ultimately aims to reduce reliance on personal vehicles, in favour of walking, cycling and using public transport to create a healthy city.

10.1. Healthy Streets Indicators

As outlined in TfL's Transport Action plan, transport has a central role in the health of Londoners. London's transport system enables people to access jobs, education, shops, recreation, health and social services, all of which are essential for a healthy, fulfilling life. A 'whole-street' approach is required to make streets more inviting for walking and cycling and better for health. The indicators of a healthy street environment are shown in Figure 10-1, which aligns TfL's Transport Action plan and Healthy Streets for London guidance.

There are ten indicators within the Healthy Streets guidance that should be considered when developing design proposals for public spaces, as shown in Figure 10-1.

Figure 10-1 Healthy Streets Indicators

An assessment has been made into the relationship between the Healthy Streets indicators and the existing and future situation in Wealdstone Town Centre. The following considerations will be made when assessing the existing situation and developing improvement proposals in the town centre:

Pedestrians from all walks of life – streets should be welcoming places for everyone to walk and spend time. By improving the public realm in Wealdstone, looking to reduce street clutter, enhance footways and provide public spaces will all enhance the vitality of the town centre and make it a more desirable place to spend time. The existing situation includes street clutter and guard railing that reduces space for pedestrians and restricts movement.

People choose to walk, cycle and use public transport – Wealdstone has a good provision of public transport, but it is important that all residents can access it, particularly considering new developments. Designs will be developed that aim to reduce bus journey times in Wealdstone. East-west connections for pedestrians and cyclists will be vital to connect new residents living in new development sites to the town centre.

Clean air – high volumes of traffic and congestion is one of the main issues in Wealdstone. Improving air quality, particularly by reducing traffic and congestion in Wealdstone, delivers benefits to all, reducing unfair health inequalities.

People feel safe – ensuring people feel safe in Wealdstone will be key to encouraging further use of the town centre, therefore improving the economic vitality of the area.

Not too noisy – reducing noise in the town centre, particularly from motor traffic, will benefit health of residents in addition to improving the ambience of the town centre, making it more desirable to shoppers and other users. Reduction in noise will also encourage further walking and cycling in the area.

Easy to cross – the pedestrian crossing facilities in Wealdstone are detailed in Table 4-4. Although the current provision is adequate, any additional proposed crossings should be developed considering NMU desire lines and reducing staggered crossings.

Places to stop and rest – although this study looks to reduce street clutter in the town centre, it will also look to provide public realm improvements and spaces for pedestrians to sit and spend time in Wealdstone. Providing spaces to stop will also benefit the local economy, encouraging people to visit and spend time in the area.

Shade and shelter – enables streets to be used in all weather conditions.

People feel relaxed – more people are likely to visit Wealdstone if motor traffic is less dominant in the town centre, there is plenty of space to walk and street clutter is reduced. The space outside the railway station is the entrance to the town centre for many visitors, but currently is not an inviting space with excessive street clutter.

Things to see and do – improving the public realm in Wealdstone, particularly at identified 'gateways' to the town centre will make people more likely to use the streets. Attractive buildings, planting and street art are to be considered to improve the current environment. If the environment to walk to the town centre is more attractive, those making short journeys in private vehicles may be less likely to do so.

10.2. Healthy Streets Assessment

Both the proposed scheme designs and freestanding urban design projects have been assessed in relation to the ten Healthy Streets indicators, particularly focusing on the impact of each proposal on the High Street in Wealdstone. Each of the Healthy Streets criteria has been compared against the option proposal, and subjectively judged as to whether the proposed design has a better, neutral or negative effect to the existing situation, shown green, amber and red respectively.

Proposed Scheme Design Options

The four shortlisted design options have been considered in relation to TfL's Healthy Streets guidance, with the results shown in Table 10-1 below.

Table 10-1 Healthy Streets Assessment

Healthy Streets Indicator	Existing Situation	Design Option			
		Option 1	Option 2	Option 3	Options 10, 11A and 11B
Pedestrians from all walks of life	Narrow footways, restricted by street clutter and guard railing. Missing tactile paving and dropped kerbs	Provides limited public realm improvements, no footway widening on H/S	Two-way traffic on the High Street restricts scope to widen footways.	Proposed footway widening between station and new junction.	One-way operation at northern end of H/S provides opportunity to widen footways.
People choose to walk, cycle & use public transport	High reliance on private vehicles, limited and disjointed cycling infrastructure and unreliable bus journey times. Severance caused	Small scale interventions may not significantly improve use of sustainable transport.	Limited improvements proposed for pedestrian and cycle links. Two-way traffic on H/S may affect bus journey times.	Limited improvements proposed for pedestrian and cycle links. New signals on H/S may affect bus journey times.	One-way operation at northern end of H/S provides opportunity to widen footways. Proposed bus lane may reduce bus journey times.

Healthy Streets Indicator	Existing Situation	Design Option			
		Option 1	Option 2	Option 3	Options 10, 11A and 11B
	by high traffic volumes, pedestrian guard railing and inadequate crossing facilities.				
Clean air	Poor air quality with Wealdstone identified as one of five Air Quality Focus Areas in the borough.	Provides minimal intervention to the existing situation	Introducing two-way for the whole H/S may encourage more traffic to use the route.	Introducing new signals in the H/S may increase congestion.	Improved public realm, pedestrian links and improved bus journey times may reduce reliance on cars.
People feel safe	The existing link for pedestrians goes through the back of the Palmerston Road car park, providing a dark and narrow access to and from the High St.	Provides minimal intervention to the existing situation.	Provides minimal intervention to the existing situation.	Provides minimal intervention to the existing situation.	Making Palmerston Road one-way may increase its use for pedestrians to access the H/S rather than the existing cut-through link.
Not too noisy	There are areas of congestion and the junctions to the north and south of the High Street, which generates undesirable noise. However, most traffic uses the A409.	Option 1 provides small scale changes from the existing situation, so likely to have minimal traffic impact.	Introducing two-way for the whole H/S may encourage more traffic to use the route, therefore more vehicle noise.	Introducing new signals in the H/S may increase congestion and vehicle noise.	Improving pedestrian and bus links may encourage sustainable transport rather than private vehicles.
Easy to cross	A number of the existing crossing facilities are restricted by guard railing, particularly at the Cecil Road junction. Some crossings are off desire lines and do not have 'green man' signals.	Improved crossings provided at A409 / High Street and A409 / The Bridge.	If traffic increases on the High Street, pedestrians may find it more difficult to cross.	New signalised crossing increases number of crossings to be taken when traveling north-south on H/S	Widen footways and one-way traffic would benefit pedestrians crossing on northern end of H/S.
Places to stop and rest	There are limited public areas within the town centre for people to sit down and spend time and where provided, the ambience and public realm are poor.	Provides minimal intervention to the existing situation.	Provides minimal intervention to the existing situation.	Option eliminates the Wealdstone Square public space project.	Widening footways increase opportunity to provide seating.
Shade and shelter	There are currently a limited number of places to stop and rest in the town, none of which offer protection from the weather.	Provides minimal intervention to the existing situation.	Provides minimal intervention to the existing situation.	Provides minimal intervention to the existing situation.	Provides minimal intervention to the existing situation.

Healthy Streets Indicator	Existing Situation	Design Option			
		Option 1	Option 2	Option 3	Options 10, 11A and 11B
People feel relaxed	The high street has poor public realm, traffic congestion and limited public space, making it an unrelaxing environment to spend time in.	Provides minimal intervention to the existing situation.	Introducing two-way for the whole H/S may encourage more traffic to use the route, more vehicle noise is less relaxing.	Removing the Trinity Square area limits the areas for people. The H/S may feel traffic dominated with new junction.	Provides minimal intervention to the existing situation.
Things to see and do	Range of retail offer in Wealdstone is limited, due to the poor quality and status of the High St relative to other town centres.	Provides minimal intervention to the existing situation, but supports regeneration.	Provides minimal intervention to the existing situation, but supports regeneration.	Provides minimal intervention to the existing situation, but supports regeneration.	Provides minimal intervention to the existing situation, but supports regeneration.

Options 10, 11A and 11B scored the best in the Healthy Streets assessment, due to opportunities to widen footways, improve the public realm by providing benches and places to rest and improving links for public transport, pedestrians and cyclists.

Options 2 and 3 performed poorly in relation to the Healthy Streets objectives, as both options may increase traffic and congestion in the High Street.

Option 1 has broadly neutral benefits on the High Street, as it offers limited improvements compared to the existing situation.

11. Conclusions and Recommendations

Atkins has been commissioned by the LBH to undertake a Transport Study for Wealdstone town centre to identify proposals which would support the economic regeneration of the town centre by enabling and supporting developments outlined in the H&W AAP through the provision of enhanced infrastructure for all modes of transport as well as public realm improvements. The objectives of the study are as follows:

- Understand the current conditions in the study area for all modes of transport;
- Determine the level of additional traffic demand and impact on the highway network due to committed and known development proposals;
- Facilitate regeneration in the area by identifying opportunities and developing measures to:
  - Mitigate the impact of proposed development on the road network in the study area
  - Improve pedestrian and cycle access to the town centre, particularly east-west connections. This should include links from confirmed development sites;
  - Enhance the public realm in the study area, particularly within and around the core retail areas and the station;
  - Enhance connections to public transport and maintain journey times for buses;
- As part of the development of measures investigate ways to reduce street clutter; and
- As part of the development of measures identify schemes to improve air quality.

11.1. Key Conclusions

Wealdstone is identified as an opportunity area and as such will undergo substantial change due to proposed redevelopment of several key sites which will deliver circa 5,500 new homes, two new schools and around 3,000 new jobs.

The proposed developments will need to be supported by transport infrastructure and public realm improvements to ensure that they are delivered sustainably and that the regeneration and associated local economic benefits are fully realised.

Wealdstone town centre benefits from good public transport accessibility due to the proximity of Harrow and Wealdstone station and many high frequency bus services. However, there are several issues with the town centre including: poor public realm; street clutter; large volumes of traffic; high-levels of traffic congestion; poor air quality; poor connectivity for pedestrians and cyclist due to inadequate and disjointed facilities to overcome barriers to movement; disorganised car parking arrangements with high demand for on-street parking, but underutilisation of public car parks; inefficient bus routing; higher than typical accidents involving cyclists; lower than average proportion of trips made by bicycle; and historic development that has broken the continuity of the high street.

Although the proposed developments will generate additional trips in Wealdstone, modelling has shown that this is not forecast to result in growth in traffic volumes on roads within the study area up to 2021, despite the overall increase in the quantum of development within Wealdstone. This is because the proposed development will have much lower levels of parking provision than the developments that they replace and the overall increase in the number of trips generated by the proposed intensification of development in Wealdstone are forecast to be made predominantly by modes of transport other than the private car, especially for commuting trips. The increasing number of journeys to, from and within Wealdstone will therefore generate a greater demand to travel by public transport, particularly bus services, as well as cycling and walking for more local trips. Consequently, the transport infrastructure improvements will need to be directed towards encouraging and accommodating these non-car modes of transport to unlock the full regeneration potential of the opportunity area and align with the new MTS and Healthy Streets Guidance.

The intensification of development in Wealdstone over the next five years is likely to lead to greater pressure on parking availability in Wealdstone town centre and the surrounding areas. Public car park spaces are anticipated to reduce and on-street parking space will remain static. Therefore, it is anticipated that increases to the operational hours of existing CPZS and the introduction of new CPZs covering additional areas will be needed to restrict long term parking on-street by commuters, work place parking and businesses. Additional CPZ controls will therefore be required to protect the parking amenity of local residents' living within the area and also encouraging a shift to the use of sustainable modes of travel in line with the MTS.

An urban design review has identified that there are significant opportunities to improve the public realm at key locations in Wealdstone that will support proposed redevelopment and associated local economic growth, improve the townscape, as well as help to improve pedestrian and cyclist connectivity. LBH attended a UDL panel in May 2016 to discuss their Major Scheme proposals and were encouraged to better define the spaces within the town centre and how they should be used. Key locations identified for public realm improvements are: The High Street, The Bridge from Poet's Corner to Station Square, Wealdstone Square to the Kodak site and the High Street to Byron Park.

Of the long list of initial intervention options considered for Wealdstone Town Centre, four were shortlisted, using multi-criteria evaluation aligned with the agreed study objectives, for more detailed appraisal including traffic modelling. The four shortlisted options are:

- Option 1 - Do-minimum: Existing highway arrangements with only public realm improvements.
- Option 2 - High Street Two-Way and Palmerston Road Closed: two-way traffic for the entire length of the High Street, allowing general traffic to turn right at the A409 High Street / A409 George Gange Way junction and western arm of the Palmerston Road roundabout closed.
- Option 3 - Headstone Drive Two-Way: New east-west link for traffic through Headstone Drive and Canning Road, allowing Ellen Webb Drive to be closed to provide a pedestrian and cycle link. Western arm of the Palmerston Road roundabout closed.
- Option 10 - Major Scheme Bid: Improved public realm on the High Street and Palmerston Road, in addition to providing a new link for buses through Canning Road. The signalised junction at the A409 High Street / A409 George Gange Way replaced with a mini-roundabout.

During the period of this study there was a change of London Mayor and the development of a new transport strategy with new transport objectives, focussed on healthy streets and a good public transport experience. The Major Scheme programme ceased and has been replaced by the Liveable Neighbourhoods programme to reflect the new transport objectives. Consequently, and following the initial modelling results, two additional sub-options of Option 10 (LBH major scheme bid), options 11A and 11B, were developed with elements of the scheme refined to optimise the benefits for the town centre and bus services to reflect the Mayor's new transport objectives and revised scheme funding requirements. These were subject to more detailed evaluation along with the other shortlisted options.

- Option 11A – As Option 10 with traffic signal controlled at the junction of the High Street with George Gange Way instead of a mini-roundabout and an offside southbound bus lane on the A409 between the High Street and Canning Road.
- Option 11B – As Option 10, but with the existing traffic signal control operation at the A409 High Street / A409 George Gange Way junction and southbound buses turning right onto the High Street. Westbound buses routed via Canning Road, which operates one-way westbound.

Further detailed appraisal of the shortlisted options shows that the best performing options on balance across the appraisal criteria are options 11A and 11B. These two options perform the best in terms of: providing opportunities for the proposed public realm improvements; local highway operational performance, i.e. minimising traffic delay; and public transport accessibility by providing the greatest bus journey time savings. They also perform very well in comparison to the other shortlisted options on: improving accessibility for pedestrians and cyclists through improved connectivity, facilitating regeneration and economic growth; and meeting TfL's health streets objectives. However, these options are likely to be more expensive and disruptive to implement than some of the other shortlisted options.

Options 11A and 11B will also deliver outcomes that are aligned with national, regional and local policy, including the new MTS.

11.2. Recommendations

The successful delivery of developments in the opportunity area requires a significant investment in transport infrastructure in order to unlock its full potential. The study has identified preferred schemes for improving the transport network that will need to support sustainable modes of transport, identified a need to manage parking controls in the Wealdstone area to mitigate the impact of development and identified opportunities for improving public realm along key routes in Wealdstone. In order to deliver these requirements, the following recommendations are made:

1. The best performing options against the study objectives, reflected by the appraisal criteria, are Option 11A and Option 11B. These two options should be taken forward for further analysis to identify a single preferred option, supported by a business case that makes a case for improved bus services infrastructure. TfL have already indicated to LBH support for undertaking this assessment of options 11A and 11B.
2. The Major Scheme bid submitted to TfL in 2016 made a strong case for improving sustainable transport networks in Wealdstone. TfL have indicated to LBH that they would support a new Liveable Neighbourhood bid for Wealdstone High Street and the town centre area that builds on the original submission, takes account the findings of this study and the new MTS and Healthy Streets guidance.
3. The increased demand to park in Wealdstone area will require a responsive programme of parking management schemes to mitigate the impact of development. LBH has an annual programme of parking management schemes and the programme needs to take account of any emerging parking pressures in Wealdstone as a priority.
4. The public realm opportunities identified along The Bridge, Headstone Drive and Peel Road will require a significant funding investment that will require a combination of external funding, Council funding and Developer Contributions in order to deliver them. LBH will need to undertake a detailed assessment and cost evaluation of each scheme to assess the funding requirements, funding opportunities and consider a possible delivery programme. It is likely that a costed programme of interventions with identified funding sources will be required over the next 5 to 10 years to implement these projects. These schemes link all the major development sites in Wealdstone and the design of public realm schemes needs to be co-ordinated with the design of the developments, to ensure there is a consistent overall design approach.