Oxford City Centre
Movement and Public Realm Strategy

Final Report

Oxford City Council and Oxfordshire County Council







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1 Executive Summary

1.1 The Study

The overarching aim of this study is to support the vision set out in the Oxford Local Plan 2036, which will look at least 20 years ahead and consider how it can best address the pressures and challenges that Oxford will meet as it continues to grow and develop. This growth must be associated with a liveable and sustainable city centre that balances economic, social and environmental needs; ensuring that it remains a highly desirable place to live, work and visit. Oxford must continue to have a strong economy, contributing to advancements in learning and innovation locally, nationally and globally.

It is anticipated that within the plan period there will be significant growth within both the Oxford City Council administrative area and in the surrounding Oxfordshire districts, but that Oxford will continue to sit at the heart of the region's economy. The study therefore aims to develop a strategy for the city centre's transport systems and its public realm. In doing so it seeks to ensure the city centre is served by adequate infrastructure, so that continued growth does not compromise local quality of life or the city centre's unique environment.

Between September 2017 and February 2018 the project team has undertaken a comprehensive programme of engagement with key stakeholders; including local interest groups, businesses and elected members. The engagement process comprised design workshops, meetings with key officers, site visits with elected members and a presentation to the Oxford Design Review Panel.

1.2 Assessment

The baseline assessment process started with a review of previous studies undertaken by, and on behalf of, both authorities. This was then followed by a data-led analysis of the existing traffic arrangements and public realm across the city centre at a high level, with a number of key streets being selected for closer scrutiny. Stakeholder engagement was a core part of this process and has informed the study at key milestones during the process. The following table draws out the key points revealed through this evidence and the strategic implications.

Figure 1-1 Key points revealed through evidence

Key points revealed through evidence	Strategy implications	Themes
The principal focus of this study is to enable the local authorities to achieve a much improved public realm and achieve more walking and cycling by adopting a revised transport management strategy: ▪ There is inadequate pedestrian circulation space along many streets. ▪ The space required for two-way bus movements on High Street and St Aldate's compromises the pedestrian environment. ▪ Overall there is a lack of well-designed and purposed public space across the city centre where people can simply enjoy the time they spend in Oxford. There are few resting places for pedestrians and limited provision of seating.	▪ Reclaim highway space for pedestrians in key locations including High Street, Queen Street, St Aldates, Broad Street and St Giles. ▪ Reduce the width of carriageway to be crossed where possible. ▪ Where streets are very lightly trafficked they should generally be paved at a level surface across the street to give informal priority to pedestrians and enable them to use the whole of the street.	▪ Inclusive Environment ▪ Movement ▪ Public Realm
Oxford City Centre is fundamentally constrained: ▪ Overall movement patterns within the city centre, and consequently ease of movement by mode is constrained by the historic structure of the city and its watercourses. ▪ Most of the urban hinterland lies to the south-east of the city, so Magdalen Bridge and High Street is the natural approach route for many people on all modes. ▪ Accident data shows prominent clustering evident around St Giles, High Street and St Aldates.	▪ There is limited potential for place based improvement within the current movement framework. ▪ A bolder approach is required to better balance the street environment to create a public realm fitting for a successful and growing world-class city. ▪ The reallocation of road space on key streets means that there will be opportunities to create defined areas for loading and unloading that do not conflict with traffic, particularly buses.	▪ Movement ▪ Safety and Public Health ▪ Economy
The character of Oxford is under threat: ▪ The quality of the public realm and experience of the city for residents and visitors does not befit the city's status as a globally-renowned place for learning and a draw for international tourism. ▪ There are strong controls on traffic movement and parking/servicing across the city centre, this has required the erection of many street signs and road markings which strongly detract from the quality of place. ▪ In key locations including Broad Street and St. Giles on-street parking tends to dominate, exacerbated by the circulation of cars searching for spaces at peak periods.	▪ Consideration should be given to developing a consistent and higher quality palette of materials and treatments for use across the different types of streets in the city centre. ▪ The authorities should adopt a clear 'blank canvas' policy to reduce street clutter and enhance overall visual appearance and functionality.	▪ Public Realm
Air quality: ▪ In order to address air quality within the city centre the City and County Councils jointly propose to introduce a Zero Emissions Zone (ZEZ) in stages from 2020, with full rollout by 2035. ▪ It will be necessary to carefully consider taxi access and rank locations in developing the detailed proposals for the revised city centre streets.	▪ All future plans and proposals will need to work alongside the ZEZ roll out stages.	▪ Safety and Public Health ▪ Economy

1.3 Preferred Spatial Vision / Strategy

Central to this study is the creation of a Spatial Vision / Strategy which supports the vision set out in the Oxford Local Plan 2036, to create:

- A centre for learning, knowledge and innovation
- A prosperous city with opportunities for all
- A environmentally sustainable city
- An enjoyable city to live in and visit
- A strong community
- A healthy place

To deliver this vision and address challenges faced by Oxford, the following spatial vision / strategy sets out our ambitions and how collectively they will create a prosperous and sustainable Oxford.

Inclusivity

- Maintain good bus access to key locations in the city centre.
- Reduce conflict with traffic, including buses.
- More place and spaces to sit and rest.
- Greater extent of level surfaces in low / zero traffic streets.

Movement

- Allow for future growth in travel to / within the city centre.
- Reduce pedestrian congestion by increasing space and encouraging more balanced distribution.
- Minimise need to interchange.
- Improve reliability of bus journey time to / through Oxford.
- Realise potential significant increase in cycling, particularly short journeys currently being made by bus.
- Improvements needed in advance of potential radical change to public transport vehicles.
- Allow for continued access to the city centre by long-distance coaches, tourist coaches and taxis.

Public Realm

- Raise the quality of Oxford's public realm to a stand befitting its world-class heritage.
- Reclaim movement space on key heritage streets.
- Minimising street clutter, including removal of traffic signals where possible.
- Improve wayfinding through design.

Safety and Public Health

- Reduce conflict between pedestrians, cyclist and motor vehicles.
- Simplifying junction conflicts and operations
- Enabling smoother less congested motor vehicle movements.

Economy

- Balance reduction in car parking with an increase in cycle parking.
- Maintain servicing to retail and business premises, but encourage the use of more sustainable arrangements including cycle freight.

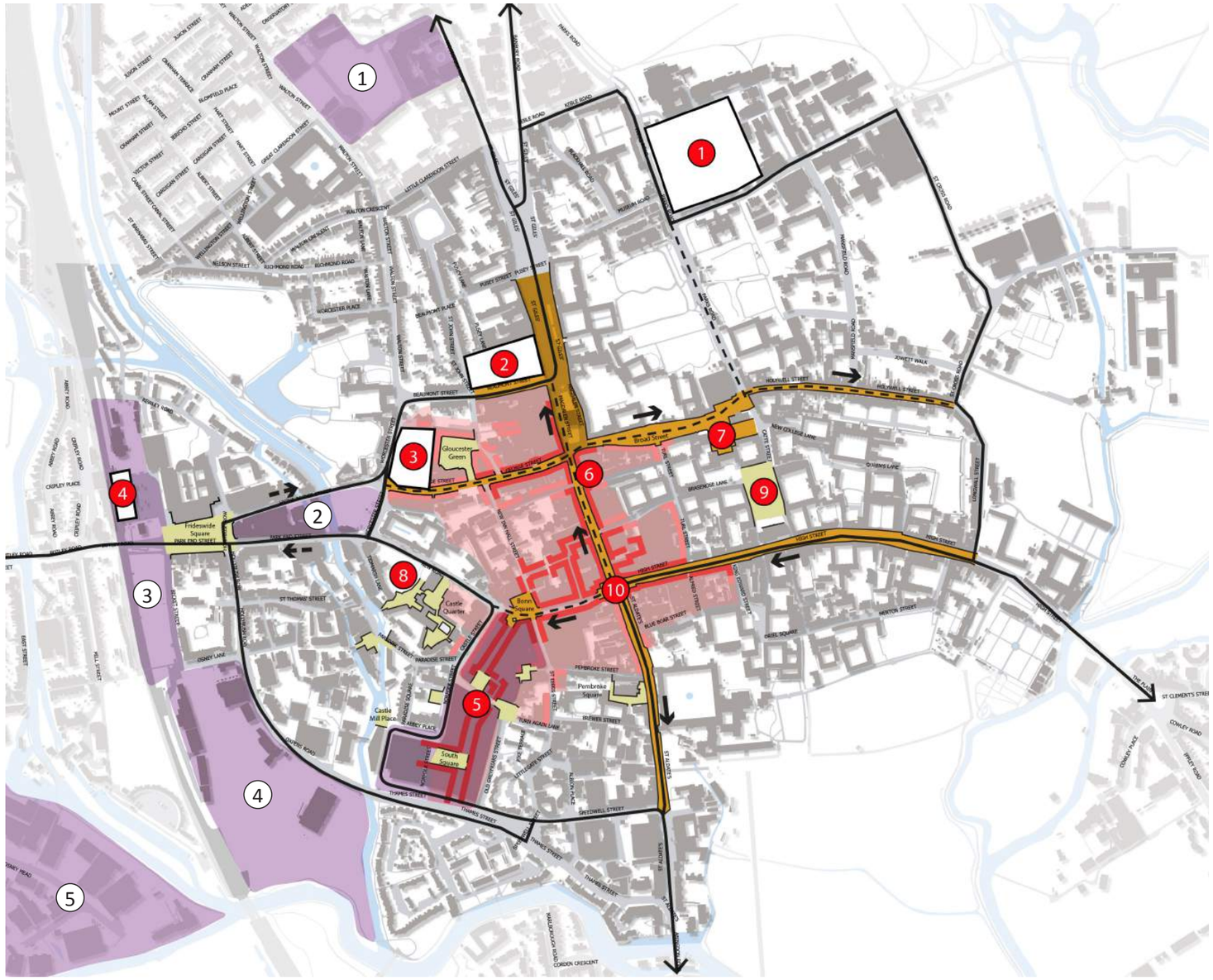


Figure 1-2 Preferred Spatial Vision and Strategy

1.4 Transport Management

We recommend that High St and St Aldate's and the route through the Carfax junction should be made one-way for motor vehicles and two-way for cycling. This will address the most pressing problems in the city centre. Making these streets and spaces one-way will enable substantial road space to be reallocated away from motor vehicles and given over to more benign and beneficial uses.

These streets would form a key part of a revised transport management system which would allow buses to travel around the whole city centre. This would continue to provide cross-connectivity, for example between the railway station and east Oxford, and would enable the County's proposed BRT routes to be accommodated.

Broad Street and Holywell Street have the potential to be used for some bus movements. They should be one-way eastbound to reduce the impact on heritage and enable the maximum reallocation of road space to public realm activities, pedestrians and cyclists.

Similarly, Cornmarket Street has the potential to be used for some bus movements and bus movements retained on Queen Street (which would become westbound). They would travel one way with no bus stops and a requirement for vehicles to travel very slowly.

George Street is presently used by buses in both directions, our recommendation would be for this to become a similar one-way (eastbound) pedestrian priority street.

Magdalen Street West should become a one-way (northbound) pedestrian priority street, and traffic should be removed entirely from Magdalen Street East (apart from access vehicles). These changes would enable a very high-quality area of public realm to be created at this important node within the city, linking with an enhanced area at the southern end of St Giles.

1.5 Next steps

This report has recommended an overall place and movement strategy for Oxford city centre, but the complexity of the issues means that considerable further work needs to be done to move the proposals forward towards implementation. It is recognised that the proposals represent radical change, and will therefore need to be thoroughly tested and refined through public consultation and discussion with stakeholders.

We have recommended a phased approach to implementation, based on iterative learning from pilot implementation of some of the measures. There are also a number of critical dependencies, which include Oxfordshire County Councils proposed traffic control points and the Zero Emission Zone.

Maximum benefit from these recommendations will likely only be achieved through full implementation in partnership with local and regional public transport operators.

2 Introduction

2.1 Project Summary

This report presents a Movement and Public Realm Strategy for better managing access and movement to and within Oxford city centre; and achieving a substantial improvement in the quality and usability of the public realm.

The overarching aim of the strategy is to support the vision set out in the Oxford Local Plan 2036 which will look at least 20 years ahead and consider how it can best address the pressures and challenges that Oxford will meet as it continues to grow and develop. This growth must be associated with a liveable and sustainable city centre that balances economic, social and environmental needs, ensuring that it remains a highly desirable place to live, work and visit. Oxford must continue to have a strong economy, contributing to advancements in learning and innovation locally, nationally and globally.

It is anticipated that within the plan period there will be significant growth with the Oxford City Council's administrative area and in the surrounding Oxfordshire districts, but that Oxford will continue to be the heart of this growing region. The study therefore aims to develop a strategy for the city centre's transport systems and its public realm to ensure it is served by adequate infrastructure, so that this continued growth does not compromise local quality of life or the city centre's unique environment.

Figure 2-1 Oxford city centre

2.2 Geographic scope

The broad scope of this study is the city centre of Oxford as shown on Figure 2-2 below. The study is mindful of developments outside this area but focuses on measures that will improve the public environment in the historic and economic core of the city. Where necessary, however, recommendations are made for places outside this area if they are relevant to the aims of the study.

Figure 2-2 Study area

2.3 Process

Since the start of the commission in September 2017 the project team have undertaken a comprehensive programme of engagement with key stakeholders, including local interest groups, businesses and elected members. The engagement process has included design workshops, meetings with key officers, site visits with elected members and a presentation to the Oxford Design Review Panel.

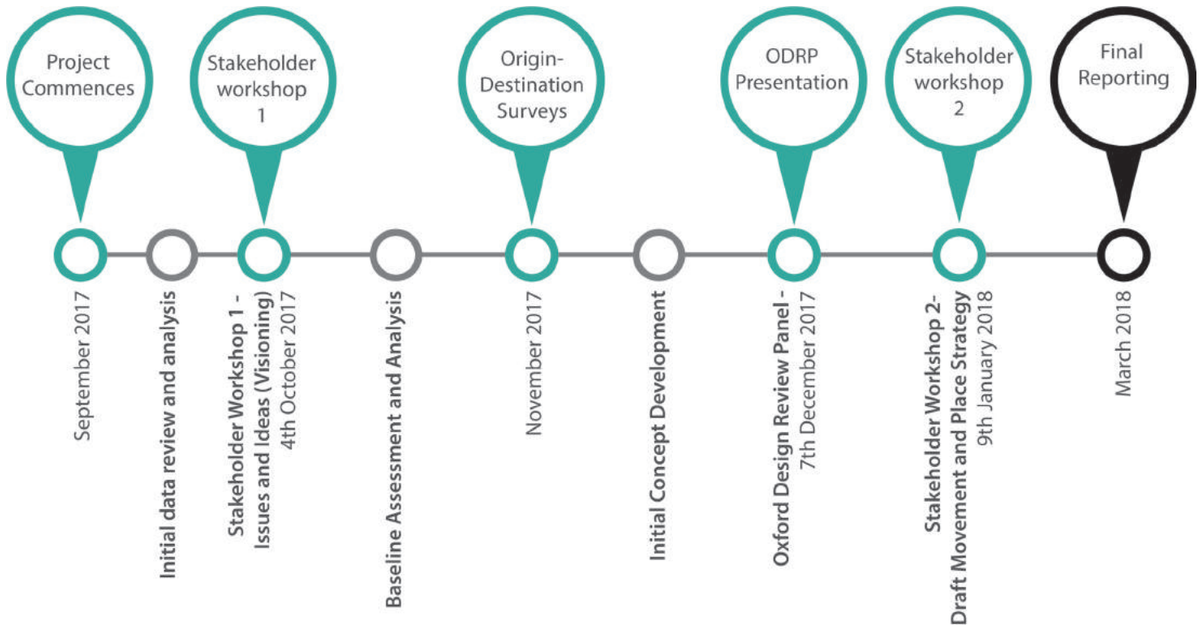


Figure 2-3 Study process

2.4 Purpose of the study

A key aim in developing the movement and public realm strategy is to compile an evidence base to inform relevant emerging policies in the Oxford Local Plan 2036; and the further development of detailed transport proposals and policies set out in the Oxford Transport Strategy (OTS), which take into account the impact of planned development across the County.

The former is being produced by Oxford City Council as the local planning authority, while the latter is the responsibility of Oxfordshire County Council. Our report, which was commissioned jointly by the two authorities, aims to develop a strategy for the city centre which respects and advances the interests of both statutory bodies.

Further details of the Local Plan process and the OTS proposals are given in Section 3.

2.5 Oxford's key issues and challenges

The structure of Oxford's movement network is largely the same as it has been for many centuries. The four key radial approach routes are restricted by the Cherwell and Thames rivers, and are reliant on river crossing points established in the Middle Ages when the settlement was first laid out.

Despite the success of the local authorities on limiting private car travel to the city centre, it experiences intense levels of demand across many of the city's streets resulting in a real mismatch between their movement and place functions.

Oxford's success means that it is an attractive place to live, work and study. The pressures of success can be seen in the high house prices, congestion and poor air quality in certain areas. As the city continues to grow to 2036 pressure on its infrastructure will increase and a radical approach to the future pattern and type of movement is therefore needed.

Some of the key issues and challenges are as follows:

2.5.1 Traffic congestion and air quality

- Medieval streets within the city are often narrow and not well suited to motorised vehicles so conflict for limited space between different transport types.
- Levels of traffic in the centre undermine the sense of place and exceptional heritage context.
- The city centre suffers from poor air quality, with locations including St Clements and High Street identified as key problem areas. In Oxford 5.6% of all mortality is attributable to long-term exposure to fine particulate matter (PM2.5);
- Low Emission Zone (LEZ) introduced for the city centre in 2014 led to improvements but levels of some pollutants are still above target levels, requiring us to act now.
- Car parking compromises key heritage assets, e.g. parking on St Giles and Broad Street.

2.5.2 Managing rapid growth

- Population increased by 12% in last decade.
- Significant economic and population growth expected to continue to 2036.
- Challenges include pressure on infrastructure, declining affordability and skills shortages.
- Must accommodate growth in a way that builds on characteristics that make Oxford special.

2.6 Key objectives

Our key objectives in preparing our recommendations are:

- Ensure the city centre is geared up to accommodate a significant increase in journeys, without a detrimental impact on the experience of visiting the city centre;
- Allow penetration of public transport services as close to the city centre as possible but also optimising the capacity of the central area for walking and cycling;
- Ensure buses have the minimum possible impact on the city centre by having minimum dwell times and by being able to progress steadily along bus routes in the city centre;
- Create sufficient bus stopping space for a significant growth in passenger numbers, as well as opportunities for easy public transport interchange;
- Create a legible, fine-grained network for walking and cycling in the city centre;
- Create a coarse-grained but functional network for general traffic, with restrictions on movement through the centre as envisaged in the OTS;
- Ensure servicing and deliveries can be managed efficiently;
- Reduce air pollution and noise from transport sources.

2.7 Structure of the report

Following this introduction, the report is structured as follows:

- Section 3 provides a summary of the policy context and justification for the study
- Section 4 provides a summary of the baseline assessment, analysis and appraisal methodology
- Section 5 provides a summary and appraisal of the previous transport management options presented in the OTS and prepared by Alan Baxter Associates.
- Section 6 introduces the overarching strategy proposals
- Section 7 presents our option development appraisal
- Section 8 presents our preferred strategy
- Section 9 describes the next steps including funding and deliverability.

3 Policy Context

3.1 Oxford Local Plan 2036

The emerging Oxford Local Plan 2036 sets out a vision for the city over the next two decades.

The Oxford Local Plan 2036 will replace the saved policies of the Oxford Local Plan 2001-2016, the Oxford Core Strategy 2026 and the Sites and Housing Plan. The Local Plan will ensure there is a strategy for sustainable growth of the city that addresses identified needs, does not compromise quality of life or the environment and is served by adequate infrastructure. It will have policies to protect important aspects of Oxford and will allocate sites for significant growth and development.

Figure 3-1 Oxford Local Plan Vision for 2036

3.1.1 Planned Growth

Growth within Oxford city centre

It is anticipated that there will be significant growth within the Oxford City Council administrative area and in surrounding Oxfordshire districts, including potential urban extensions close to Oxford. The increase in population, an increased offer in Oxford city centre with the new Westgate shopping centre and anticipated growth in Oxford's (and Oxfordshire's) economy, are all likely to lead to increased movement both to and within Oxford, particularly the city centre.

Oxford's planning policy identifies a range of development sites across the city. The population of Oxford in 2016 is approximately 160,000. By 2036 the population is likely to have grown to at least 185,000. Urban extensions to Oxford may add a further 37,000 to the population.

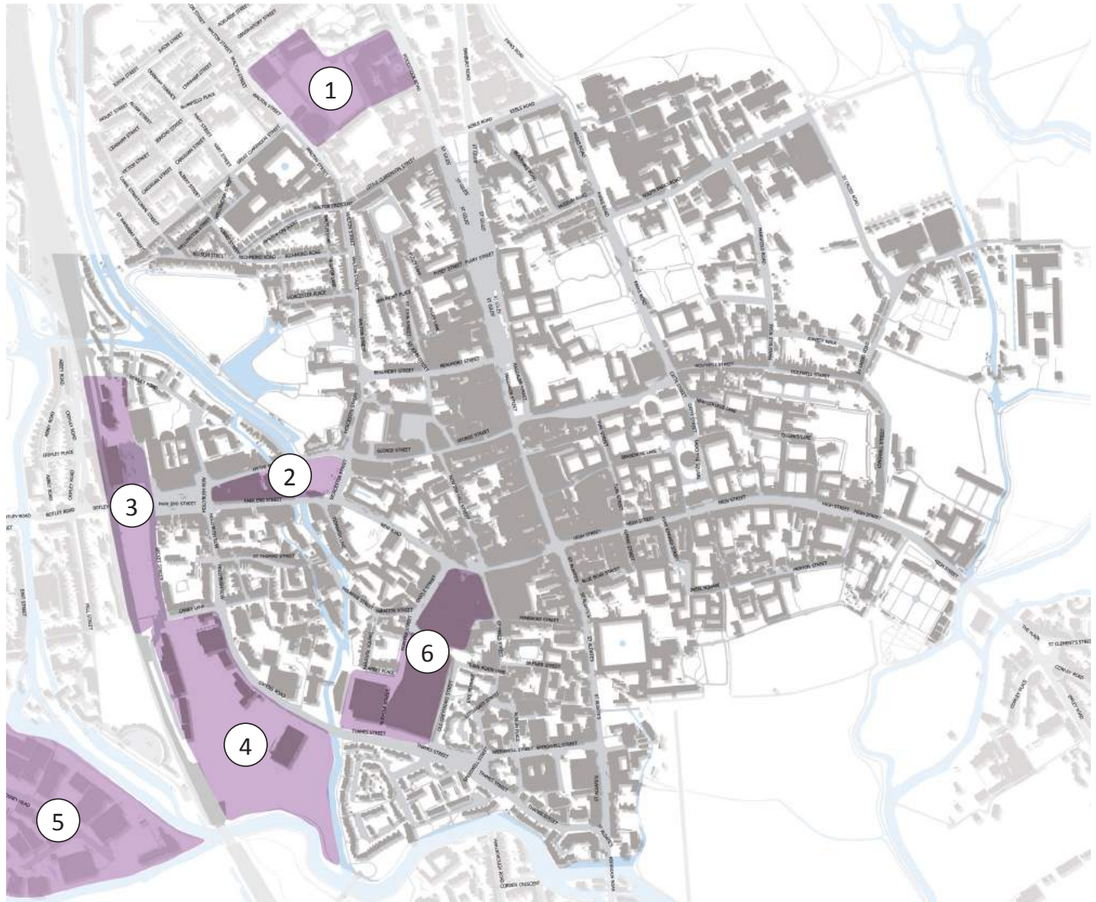


Figure 3-2 City centre development sites

Figure 3-2 shows the location of the most significant sites for development within the study area.

1. Radcliffe Observatory Quarter
2. Island site
3. Railway station
4. Oxpens – mixed use development including commercial and residential uses.
5. Osney Mead
6. Westgate – retail development (open)

The clustering of these developments to the west of the city centre combined with the impact of new housing growth in the city being to the east and north will result in more demand for cross-city centre movement. This will place particular pressure on High Street and St. Aldates, both of which currently suffer from congestion.

Oxfordshire County Council have conducted analysis to estimate the additional commuting trips (to the city) generated by the SHMA housing allocations for the whole county.

Existing commuting trips to Oxford per household (based on 2011 Census data) were calculated and the resultant ratios were then applied to the expected number of new homes in each area to determine the number of additional commuting trips.

It is anticipated, through the application of the existing origin-destination patterns, that over 23,000 additional commuting trips to Oxford will be generated by the 100,000 new homes which are expected to be built across Oxfordshire between 2011 and 2031 Furthermore, an additional 3,000 out-commuting trips will be generated.

Growth in Oxford's wider urban area

Between 2001 and 2011 Oxford's urban area population grew by over 17,000 people – with the city centre and the eastern Oxford areas of Headington, Cowley and Barton seeing the largest increases. Within the same time period, north and west Oxford have experienced lower levels of population growth (see Figure 3-3). The majority of the Eastern Arc's circa. 11,000-person population increase during this period has occurred in areas which are closer to the ring road than they are to the city centre. It highlights that much of Oxford's growth is being accommodated by infilling or expanding into undeveloped land.

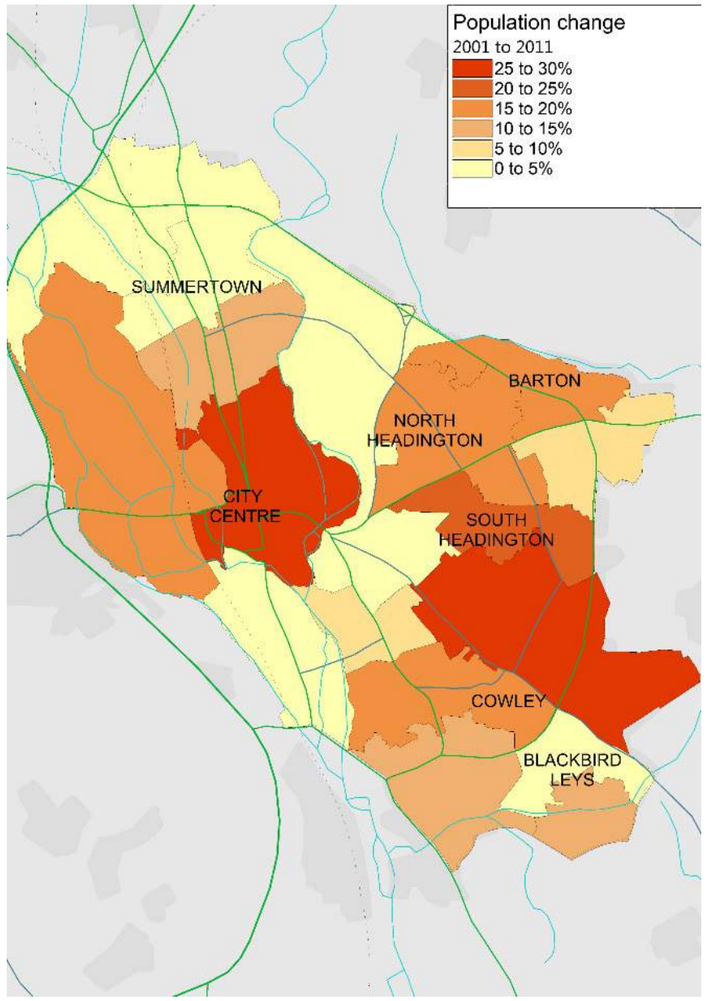


Figure 3-3 Population Change (2001 to 2011) *taken from 'Changing Patterns of Growth and Travel', Atkins

Past and future growth proposals for the wider urban area of Oxford, which wraps around the city centre, are informed by its strategic location mid-way between London and Birmingham. The National Infrastructure Commission (NIC) has recognised Oxford's importance, in partnership with Milton Keynes and Cambridge, as a regional economic growth engine. It's "Partnering for Prosperity" report identifies the need for housing delivery rates to double in order to keep pace with economic growth along this 'arc'. It also highlights a need for enhanced connectivity between these regional growth poles and has committed major Highways England and Network Rail investments along the East-West movement corridor:

- East-West Rail (phase 2) will reopen the Varsity Line between Bicester and Bletchley to passenger traffic and construct new railway between Bedford and Royston; completing a direct rail link between Reading and Cambridge via Oxford. Phase 1 has already established a direct rail link between Bicester and Oxford and established a new Parkway station to the north of Oxford offering direct trains to Marylebone.
- Oxford-Cambridge Expressway is expected to provide a mix of off-line or on-line upgrades to the A421 and A428 to establish a new high-speed and high-capacity road link between Oxford and Cambridge via Milton Keynes and Bedford. Three route proposals are being explored for delivery in Highways England's second Road Infrastructure Strategy (RIS 2, post which covers post-2020 investments) as one of six major UK highway projects identified by the current Government.

Figure 3-4 Partnering for Prosperity Report, National Infrastructure Commission

Recognising these regional growth pressures (see Figure 3-5), the Secretary of State for Housing, Communities and Local Government signed the Oxfordshire Housing and Growth Deal on 15th March 2018. It commits the county's planning and highway authorities to deliver 100,000 homes by 2031, a significant proportion of which are required in locations that are well-connected to the Oxford urban area in order to service its continued economic growth. Significantly, the Growth Deal will provide £150m for transport and supporting infrastructure (£30m per annum) to 2023 in a bid to accelerate the delivery of connectivity improvements that can help to unlock housing growth.

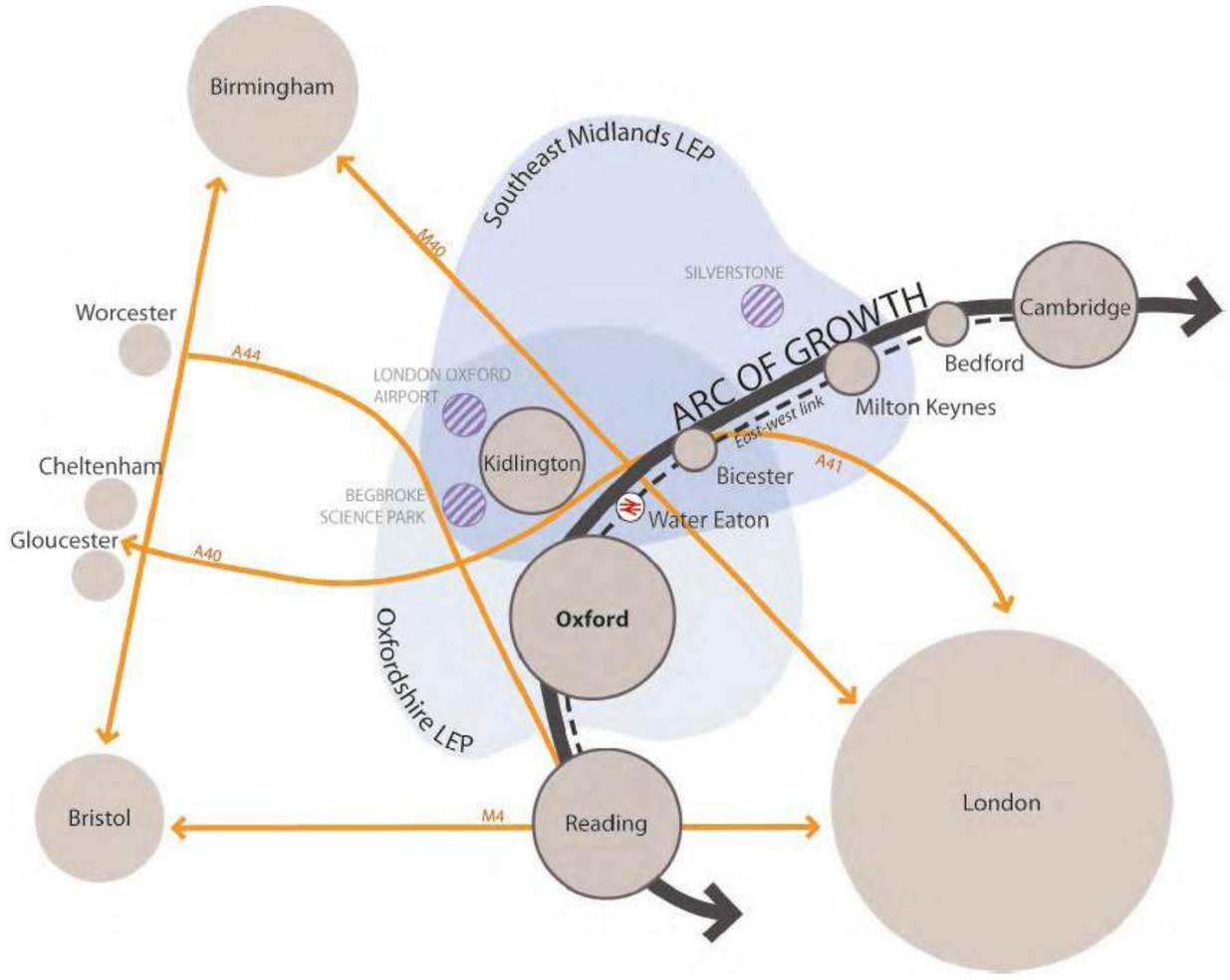


Figure 3-5 Regional Growth

District Council Planning Authorities across Oxfordshire are currently working with County Council colleagues to develop land-use and transport proposals that will be enshrined in the current round of Local Plans and Local Plan Reviews. Figure 3-6 shows how existing growth allocations for Oxford are expected to result in population changes further towards the edge of the city's established urban area. This is significant in the context of the current city centre access and movement study, because it indicates that:

- Growth in demand for travel to key employment areas in Oxford City Centre; and those to the north, east and south of the city; is most likely to be by motorised modes of travel given the greater travel distances involved.
- Should high-quality alternatives to private car use not be provided in parallel, and ideally in advance, of this growth then greater pressure is likely to be exerted on the key highway arterial and radial routes into and around Oxford during the AM and PM peak hours.
- In the event that public transport services are improved to accommodate demand for movement from the growth areas, the city centre's road networks may need to be re-prioritised in order to facilitate rapid access to key employment, education and leisure destinations by bus as well as easier interchange between travel modes.
- Strategic walking and cycling routes may need to extend over longer distances in order to promote more widespread uptake of active travel modes beyond the city centre and immediate surrounds (where high levels of walking and cycling are already commonplace).

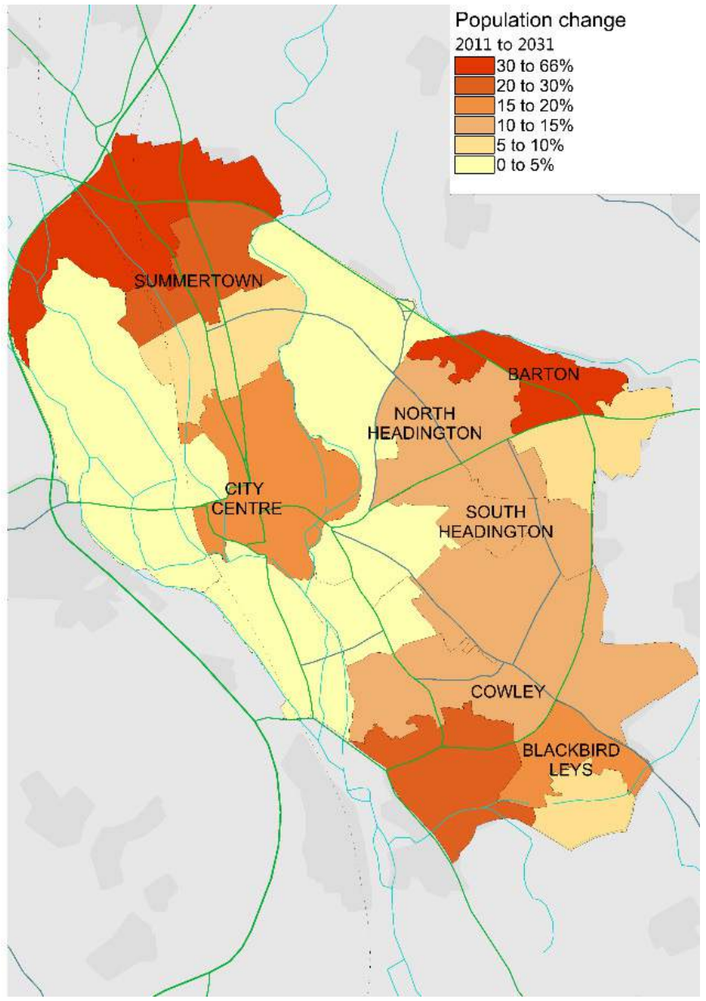


Figure 3-6 Population Change (2011 to 2031) *taken from 'Changing Patterns of Growth and Travel', Atkins

3.2 Transport context

3.2.1.1 Local Transport Plan – 'Connecting Oxfordshire' (2015)

Car ownership in Oxfordshire is high, resulting from a combination of existing patterns of growth and high income; for example, 88% of households in South Oxfordshire own a car compared to the national average of 74%. Forecasts based on future housing and employment growth across Oxfordshire predict that car ownership will increase by approximately 19% between 2013 and 2031. This growth in car ownership and car use is disproportionate to the estimated growth in the number of households, estimated at just 16% between 2013 and 2031. In recent years the general trend has been for the sustainable travel mode share (walking / cycling / public transport) to be increasing in the City of Oxford, but to be declining outside the city.

The necessary growth that will be proposed in the Oxford Local Plan 2036 must be supported by a suitable transport strategy which meets the overall policies of both the City and County Councils. The current Local Transport Plan, 'Connecting Oxfordshire', was adopted in 2015. It sets out the County Council's strategy for developing the transport system in the county to 2031. It includes the Oxford Transport Strategy (OTS), which sets out the Council's transport vision and strategy for the city of Oxford over the next 20 years.

The OTS recognises that Oxford is a growing city, with a 14% increase in resident population between 2001 and 2013 (from 135,500 to 154,800) and job growth from 99,000 in 2001 to 118,000 in 2012. A 10% reduction in mode share of the car would be needed for the car trips to remain at the same number as 2011.

It also recognises that 'the narrow medieval streets are often unsuitable for motorised vehicles, with competition between cars, buses, delivery vehicles, pedestrians and cyclists for limited space in the city centre, and movement and access needs conflicted with providing an attractive city centre environment for people'. This represents a key challenge in accommodating growth.

Traffic restraint – OTS proposals

The OTS identifies the current and future challenges for transport in Oxford and sets out a strategy based on a combination of infrastructure projects and supporting measures to enable economic and housing growth within and beyond the city. The strategy has three components comprising bus rapid transit, more walking and cycling and managing traffic and travel demand. All three components are needed in combination in an integrated approach in order to deliver the OTS's objectives.

Rises in traffic within the city have, to date, been avoided or minimised by long standing transport strategies aimed at restricting use of the private car within the city. However, the OTS notes that projections also show the number of buses entering the city centre increasing by 40% if growth is left unchecked. Further traffic restraint is envisaged in the Oxford Transport Strategy (OTS), which recognises that buses, walking and cycling are the most space-effective means of transporting people on mass.

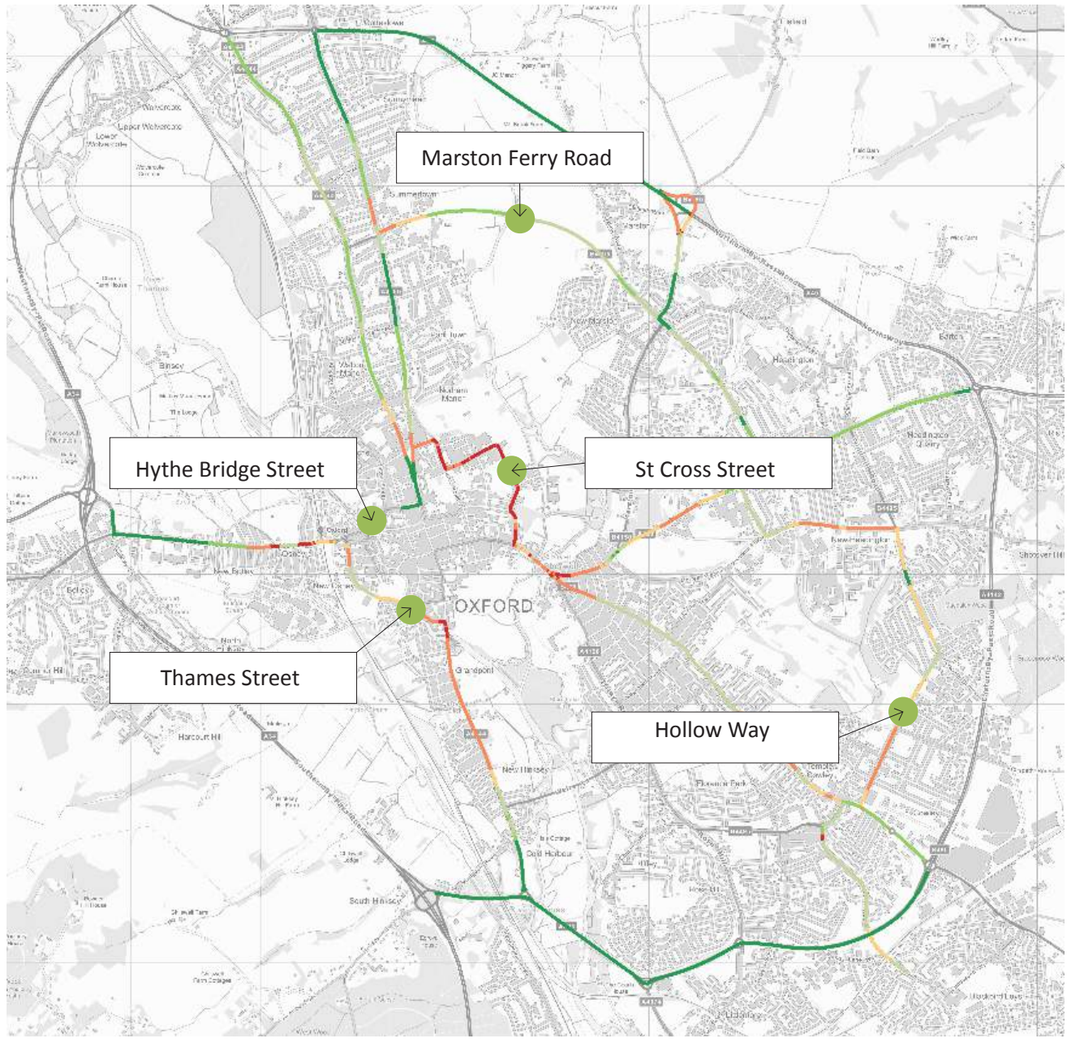


Figure 3-7 Vision for 2036

In addition to existing 'bus gates' further controls could be introduced (as shown on Figure 3-7) which place restrictions on through traffic within the city centre and inner ring road, whilst allowing unimpeded bus, cycle and pedestrian movements.

Road user charging could be an alternative option for reducing traffic levels on certain links but unlike access measures would not result in 'complete' road closures, and thus offers greater flexibility.

If city-wide, road user charging could reduce traffic levels over a wider area and has the potential to raise money that would be ring-fenced to improve the local transport network. This is particularly relevant where fuel duty revenue to the Exchequer is falling as a result of improved efficiency and uptake of vehicles not powered by conventional fossil fuels.

A workplace parking levy (WPL) is a fee charged to employers for spaces used for employee commuter car parking. Its aim is to reduce traffic levels by discouraging commuting by private car. It also provides an incentive for employers to reduce their car parking stock. A WPL would raise money that would be ring-fenced to improve the local transport network, however, on its own it is unlikely to reduce traffic levels significantly and so is being considered alongside access measures.

4 Baseline Assessment

4.1 Overview of assessment process

The baseline assessment process started with a review of the numerous previous studies undertaken by and on behalf of both authorities. This was then followed by a data-led analysis of the existing traffic arrangements and public realm across the city centre at a high level, with a number of key streets being selected for closer scrutiny. Stakeholder engagement was a core part of this process and has informed the study at key milestones during the process.

4.1.1 Background Information Reviewed

A large amount of background information, data and previous studies were provided to the team by the City and County Councils, including:

- Oxford Local Plan 2036 Preferred Options document (2017), plus background papers
- Oxford City Council's response to the OTS (Alan Baxter Associates, 2015)
- Traffic restrictions study - led by County Council
- Zero Emission Zone Feasibility Study (2017) - led by City and County Council
- Workplace parking levy study - led by County Council
- Rapid Transit Operation study – led by County Council
- The Science Transit Strategy – County Council
- Oxpens Supplementary Planning Document - Oxford City Council
- Oxford Station Masterplan and Supplementary Planning Document (Oxford City Council, 2017)
- Network Rail's plans for improvements around the railway station (Network Rail, 2017)
- Westgate shopping centre planning application (Westgate Oxford Alliance, 2013)
- Oxford City Centre Street Scene Manual (City and County Council, 2010)
- Freight Options study (Peter Brett Associates, 2014)

4.1.2 Additional Data Collected

In addition to the core background data and previous studies provided additional data collection was undertaken specifically to inform this study:

- Site visits and walking tours with key officers and Councillors.
- Origin-destination interview survey of pedestrians in the city centre (see Appendix B)
- Space Syntax analysis of the city centre network
- Detailed analysis of key streets and spaces.

The key streets reviewed in detail, including surveys of key frontages, activity and use of the public realm are as follows:

- Cornmarket
- Queen Street
- Broad Street
- High Street
- St Aldate's

This analysis allows our study to critique the competing visions and studies put forward to date, with the aim of making

4.2 Appraisal framework

recommendations consistent with the requirement of the brief.

Topic meetings were held with local bus operators and information was provided by freight operators, including a local cycle freight company.

The extensive number of previous studies undertaken illustrates the varied competing pressures that the city centre is expected to bear. Each of the above studies can inform and influence a strategy for individual modes of transport or functions, but a comprehensive vision for transport and streets is needed that will bind them together.

This is what the OTS 2025 and Alan Baxter Visions were attempting to achieve, and we can see that the City and County councils have already implemented many successful interventions over time. But the challenges presented by the city's continued success and growth prompt an opportunity for the previous piecemeal interventions to be reviewed afresh.

Our appraisal of this wide range of background information and subsequently the options for change, has made use of the following five themes:

- Inclusive Environment
- Ease of Movement
- Quality of Place (Public Realm)
- Safety and Public Health
- Economic Benefit

These themes were recommended in a recent publication of the Chartered Institution of Highways and Transportation (CIHT), 'Creating better streets: Inclusive and accessible places', on the basis that they encompass most of the typical objectives of street improvements in urban centres.

The use of these themes was tested at the first Stakeholder Workshop and was generally supported by those attending.

4.3 Review of existing situation

The following Section summarises our analysis of the existing situation in the study area against the five appraisal themes.

4.3.2.1 Inclusive Environment

Oxford city centre has a walkable human scale and generally the compactness of the centre means that accessibility is good. The entire city centre is located within 400m of a bus stop (see Figure 4-1), although the concentration of buses in the south and west means that other parts of the city centre are less well served. Clearly the Science Area is poorly served, but this is almost never raised as an issue by anyone, probably because nearly all the travel to and from the area is students. A bus service through the area was tried but failed to attract any significant use.

However, in many locations, footways are narrow and suffer from significant congestion, particularly around bus stops and over bridges, which can cause difficulty for people with disabilities.

Footway congestion is also compounded by significant street clutter including temporary signage and advertising boards and poorly parked bicycles.

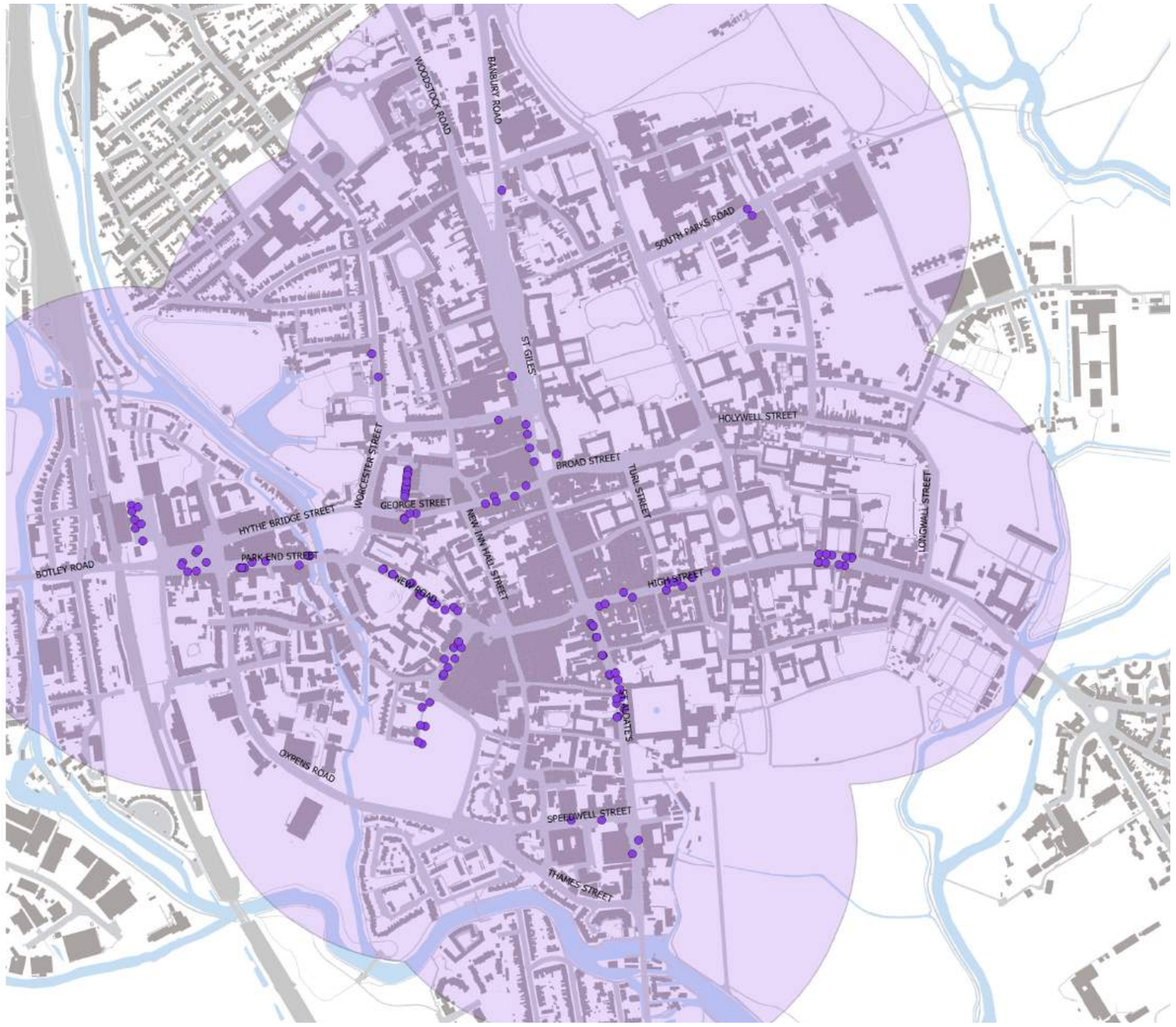


Figure 4-1 Inclusivity – 400m walking distance of a bus stop

Within the city centre a number of improvement schemes have introduced level surfaces on some key streets e.g. Queen Street and Cornmarket Street. This has improved accessibility for wheelchair users and other people with mobility problems.

The presence of moving buses on Queen Street may cause some concerns for people, particularly those with visual impairments, although it was noted that buses do travel very slowly, with drivers giving priority to pedestrians.

Figure 4-2 Inclusivity – Pedestrian congestion on High Street and footway pinch-points on St Aldate's

Figure 4-3 Inclusivity – Street clutter

Figure 4-4 Inclusivity – Level surface and pedestrian priority on Queen Street

Inclusive Environment

Summary:

- There is inadequate pedestrian circulation space along many streets due to high footfalls, particularly on summer weekends when there are high visitor numbers as well as people coming into the city centre from the rest of Oxford and the surrounding towns.

Strategy Implications:

- Reclaim highway space for pedestrians in key locations including High Street, Queen Street, St Aldates, Broad Street and St Giles.
- Reduce the width of carriageway to be crossed where possible.
- Where streets are very lightly trafficked they should generally be paved at a level surface across the street to give informal priority to pedestrians and enable them to use the whole of the street.

4.3.2.2 Ease of Movement

Overall movement patterns within the city centre, and consequently ease of movement by mode is constrained by the historic structure of the city and its watercourses. The main movement corridors into the city centre are the A4144 Woodstock Road and A4165 Banbury Road from the north, via the Plain roundabout and Magdalen Bridge from the east, A420 Botley Road to the west and A4144 Abingdon Road to the south.

Most of the urban hinterland lies to the south-east of the city, so Magdalen Bridge and High Street is the natural approach route for many people on all modes. This leads to a concentration of bus flows on High Street and St Aldate's because of the absence of other east-west routes through the city centre. The space required for two-way bus movements on High Street and St Aldate's compromises the pedestrian environment as we have already seen in the preceding Section on inclusivity. Key movement corridors and destinations are summarised on Figure 4-5.

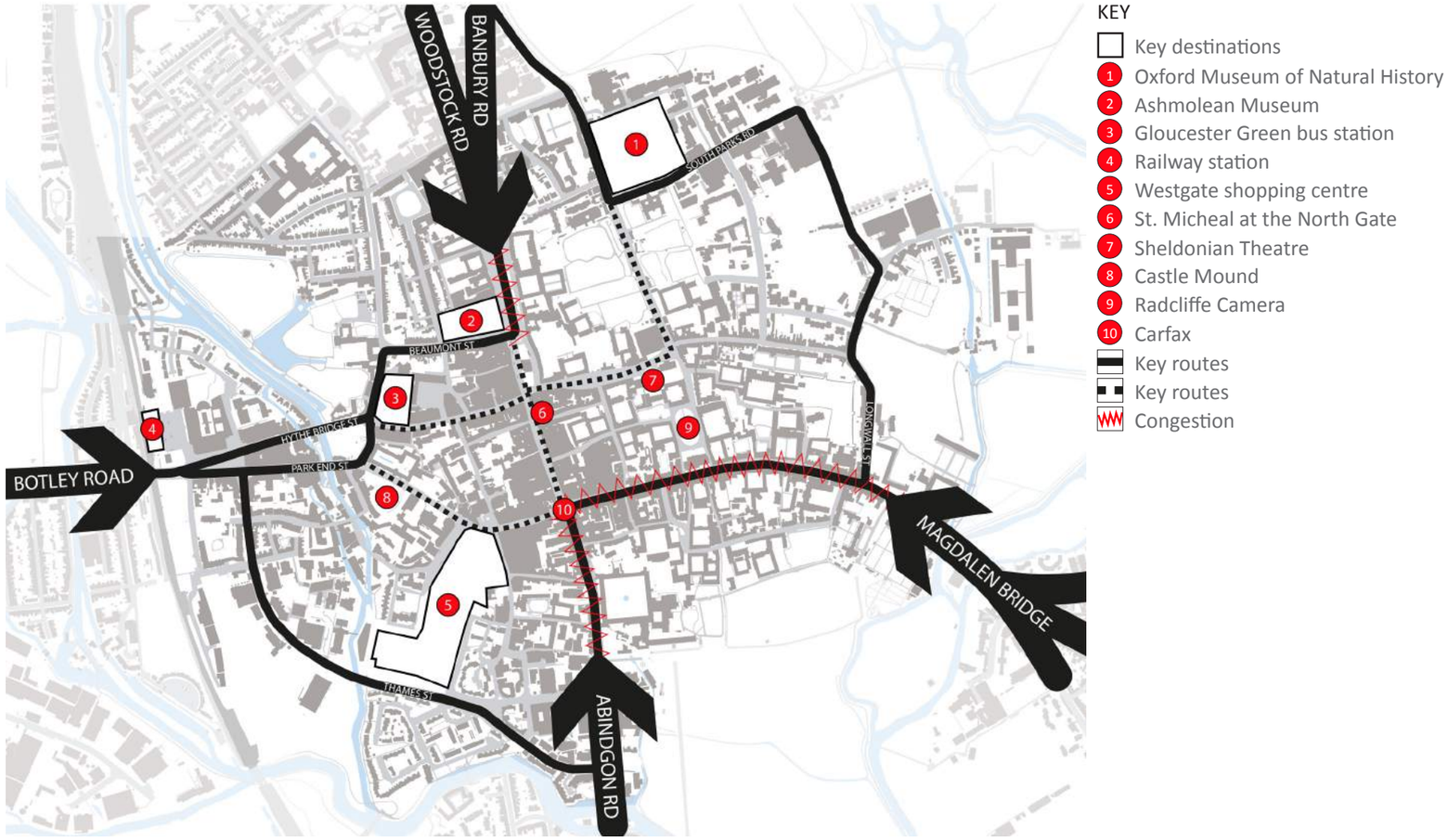


Figure 4-5 Movement – Main movement corridors and key destinations

The Sections below provide a summary of our key observations and understanding of ease of movement within the city centre.

Space Syntax

As part of our analysis of the study area we have prepared a space syntax model of the city centre. Space syntax is a tool which allows complex places to be 'measured' for their movement properties, creating a heat map which determine street function and their likelihood of their selection as a natural route choice. The warmer the colour (red) the higher the likelihood of selection, the cooler the colour (blue) the lower the likelihood.

This analysis can be a useful means of predicting or validating where footfall and activity are highest. While space syntax doesn't necessarily mean streets will have a high footfall, it can nevertheless be used to understand how changes to the environment may influence footfall, or why some areas are more economically vibrant than others, as historically retail businesses have tended to locate themselves in locations where pedestrian

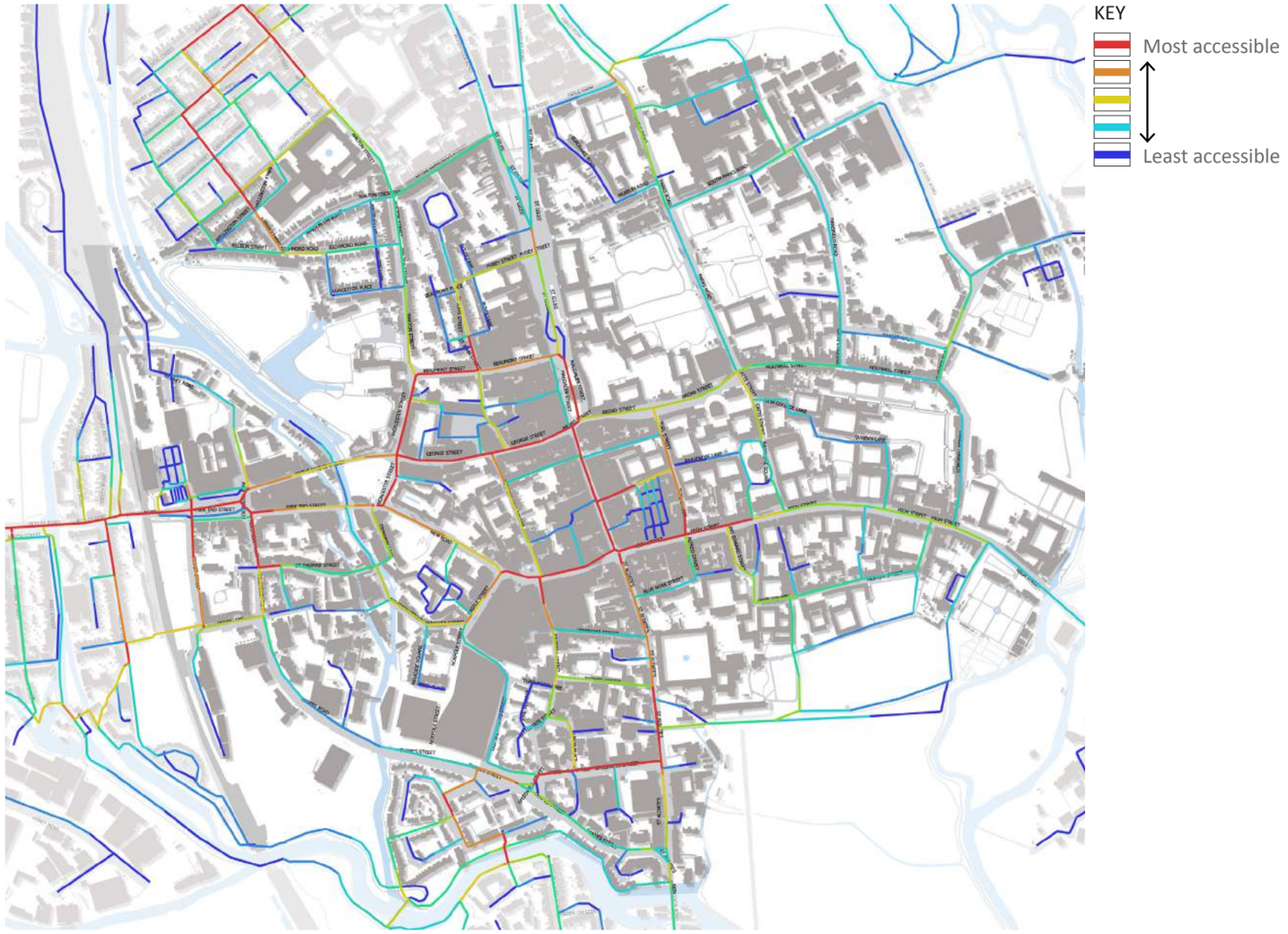


Figure 4-6 Public realm – "Space Syntax" (400m)

accessibility is highest. While this link has been broken somewhat in car-oriented societies, it still generally holds true in traditional urban centres.

Space syntax natural choice analysis can be run for distances of varying lengths: we have focused on 400m (as a typical walking distance) and 2500m (to reflect the needs of servicing traffic and cycle traffic)

At 400m (see Figure 4-6), the space syntax analysis validates the observed density of walking trips on the Carfax junction area. The analysis also shows that many of the most useful pedestrian streets are west of Carfax, and this corresponds to the retail core, but that High Street and St Aldate's also play an important role in the natural walking network which is not necessarily reflected in their layout.

This natural focus on Carfax means that the junction suffers from high movement pressure. In addition, there is currently an uneven and uncomfortable balance between the four arms of the cross roads, with high vehicular movement from High Street to St Aldate's meaning that the space feels very vehicular dominated

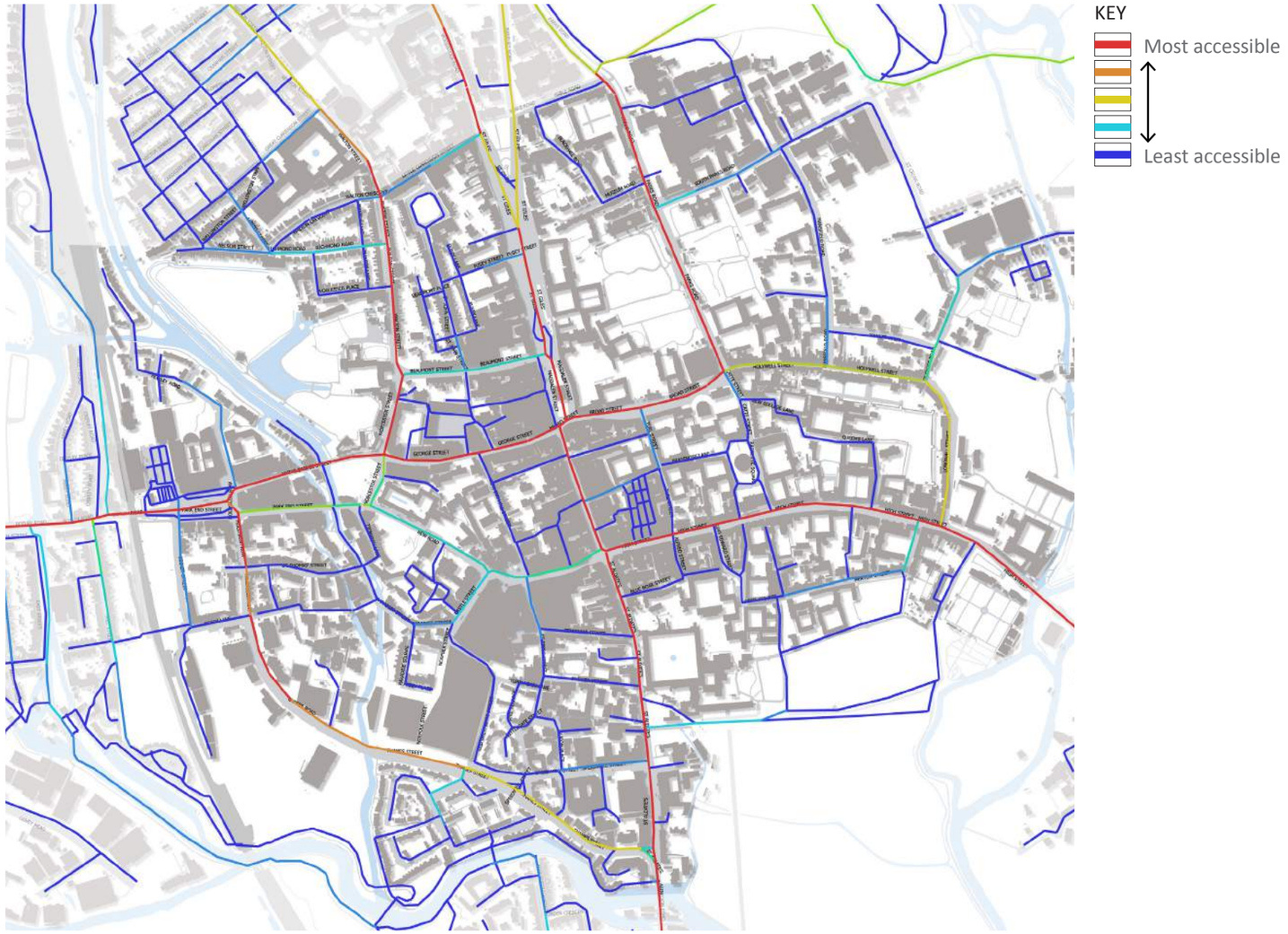


Figure 4-7 Public realm – "Space Syntax" (2,500m)

and difficult to cross undermining its high place value.

Magdalen Street East, Cornmarket and George Street also act as a natural focus for movement. Similarly, the space around St. Mary Magdalen church also feels very vehicle dominated undermining the importance of this space in place terms.

At 2500m, the space syntax analysis suggests that Broad Street and High Street are similarly attractive as each other for vehicular traffic, despite the latter being the only direct east-west route available (see Figure 4-7). In terms of place quality both Broad Street and High Street are currently underperforming with a significant imbalance between place and movement, particularly given their importance as part of a legible city centre network. Broad Street particularly is dominated by on street parking and wide swathes of highway / asphalt.

Considering these two analyses together, it suggests that there is a need to balance the environment around Carfax particularly and to better distribute traffic around the city centre as a whole.

Walking

Oxford city centre has a walkable human scale and is generally flat. Nearly all journeys to and in the city centre involve some walking and the city's heritage and environment is best enjoyed in this way. The 2011 census shows that 10.7% of journeys to work within Oxford were made on foot.

A key observation for the study area is that there is inadequate pedestrian circulation space along many streets due to high footfalls, particularly on summer weekends when there are high visitor numbers as well as people coming into the city centre from the rest of Oxford and the surrounding towns. This is particularly acute on the key walking routes identified in our analysis of the origin and destination survey, which highlights High Street, Carfax, St Aldate's and Queen Street as the most popular routes (see Figure 4-12).

These high footfalls conflict with other users, in particular people waiting at bus stops, due to limited amount of footway space available (see Figure 4-8). Footfall is also very high on the pedestrianised streets, especially Queen Street which has seen an increase in numbers following the opening of the Westgate Centre.

Although there are few private motor vehicles in the city centre, crossing some of the busier streets can be difficult and unpleasant. This is particularly the case on High Street and St Aldate's, especially around the Carfax junction, and on Beaumont Street.

There is a strong concentration of walking movements in the area around Carfax and Westgate. This is in part influenced by the concentration of bus stops here, but also reflects that Carfax is the historic centre of the city and a popular meeting point at the heart of the retail core. The top 20% of walking movements correspond to the key gateways and trip attractors in the city centre.

A detailed pedestrian survey of pedestrian origins and destinations was undertaken as part of this study. A total of 2,103 surveys were undertaken with members of the public across 12 locations in Oxford city centre between 30th October

and 4th November 2017. The survey achieved a good balance of responses from different genders (48% male, 52% female) and age groups (25%: 16-25, 35%: 26-45, 25%: 46-64, 15%: over 65).

The questions sought to understand people's reasons for visiting Oxford, how they travelled to the city centre, where they were travelling from, and their origins and destinations within the city centre. The particular focus of the survey was in trying to understand the movements of people within the city centre in respect of points of arrival and departure (e.g. bus stops, car parks, taxi ranks, the rail station) and destinations in different areas of the city.

The majority (95%) of survey respondents were travelling directly between their origin/destination within Oxford city centre and a point of arrival/departure. Of the 105 people (5%) interchanging between travel modes within the city centre:

- 10% (11 people) were moving from bus to train
- 90% (94 people) were changing buses.

Figure 4-8 Ease of Movement – Pedestrian congestion on High Street

Figure 4-9 Ease of Movement – Pedestrian congestion at Carfax

Figure 4-10 shows how bus and park & ride accounted for over half of all journeys made by respondents into the Oxford city centre across the sample, while walking (21%) and cycling (4%) represented around a quarter. The in-street intercept nature of the survey methodology, and the specific locations surveyed, means that trips made by people on cycles and by car are likely to be under-represented, while those by bus and train passengers are likely to be over-represented.

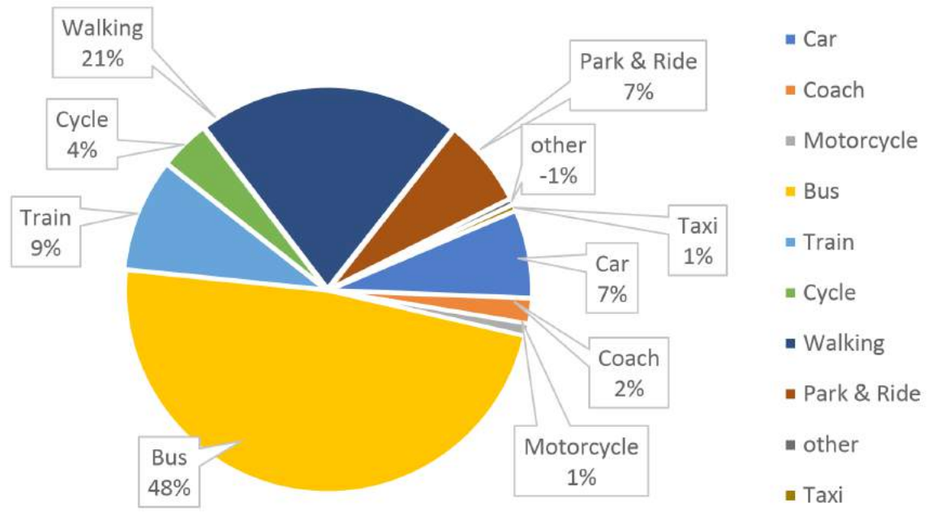


Figure 4-10 Ease of Movement – Mode split of trips into / out of Oxford city centre

Figure 4-11 shows that travel for work (33%) and shopping (28%) purposes accounted for the largest overall proportion of trips. The importance of the city centre University campuses is reflected by 15% of all trips being for the purpose of accessing education, while the 10% of trips being made by tourists visiting the city reminds us of the significance of Oxford's heritage assets and museums. Only 2% of all pedestrians identified that interchanging between transport services was their primary reason for moving through the city centre.

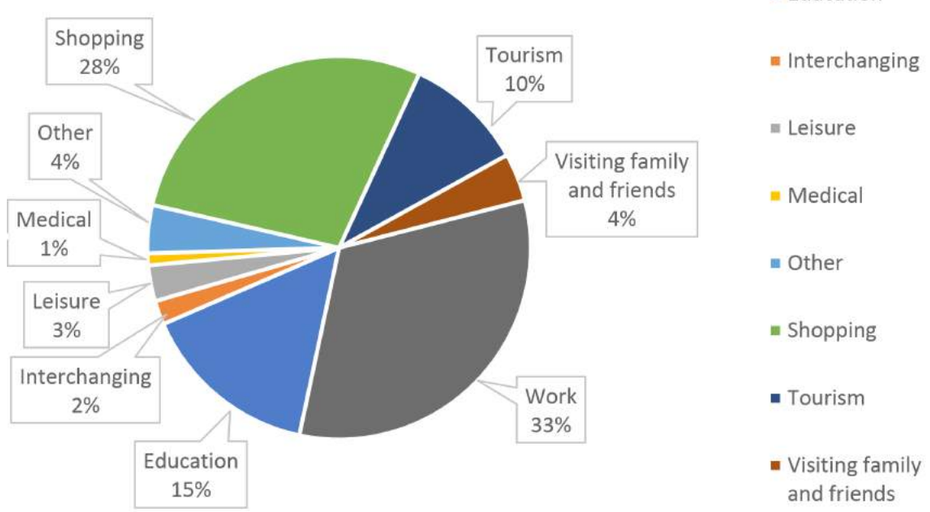


Figure 4-11 Ease of Movement – Trip purpose and survey respondents

Analysis of city centre pedestrian origin-destination movement patterns (see Figure 4-12) identified five predominant pedestrian flows around the city centre. These comprise both existing important transport nodes, as well as key Oxford destinations, and include:

- St Aldates bus stops / Christ Church
- The Westgate Shopping Centre
- High Street bus stops and University Colleges
- Cornmarket
- St Giles / Ashmolean Museum

These highly centralised main movement flows are partially a function of existing public transport nodes, but they do serve to highlight the locations and movement corridors along which the greatest need for pedestrian priority is likely to exist. Oxford train station, the Gloucester Green bus station, and the Radcliffe Camera/Bodleian Library also emerged as key trip destinations which should be considered in this process.

Figure 4-12 Ease of Movement – Principal Walking Movements (from Origin-Destination surveys)

Cycling

Cycling in Oxford is an important and growing mode of transport. The 2011 census showed that 17.1% of journeys to work within Oxford were made by cycle, up from 14.9% in 2001, making Oxford second only to Cambridge in terms of the proportion of people cycling to work.

Based on the Department for Transport's Walking and Cycling Statistics, 38.8% of Oxford residents cycle at least once per week. Count data provided by the County Council show that cycles are the most common type of vehicle using Magdalen Bridge for journeys to/from the city.

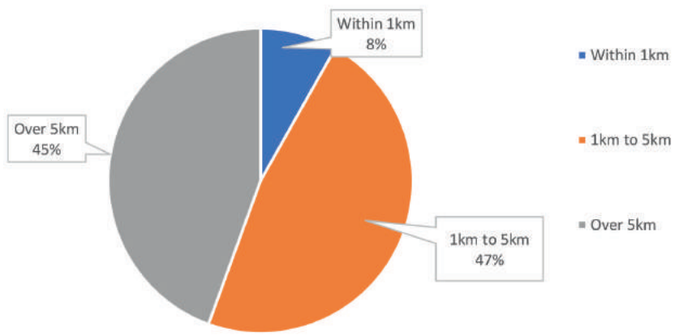


Figure 4-13 Ease of Movement – Bus trip origins

Figure 4-14 Ease of Movement – Bus trip origins (potential for walking cycling)

The County Council's Oxford Transport Strategy strongly supports more grown in cycling and has identified a number of routes across the city centre for 'cycle super route' status. These aim to deliver - but cannot in all cases guarantee - physically protection for cyclists, however, and may just consist of a bus lane due to limitations on space.

Experience in other cities has shown that providing greater physical protection on main routes does broaden the appeal of cycling to more people and is likely to lead to a greater take up. The first stakeholder workshop strongly supported the idea of more protected routes (see below).

Our analysis of journeys into the city centre showed that many people are travelling by bus from relatively short distances away, and that those journeys could therefore easily be made by cycle by most people (see Figure 4-14). Although achieving a mode shift from bus to cycle may not directly result in fewer vehicles, this will help to offset the growth in bus numbers anticipated by the OTS.

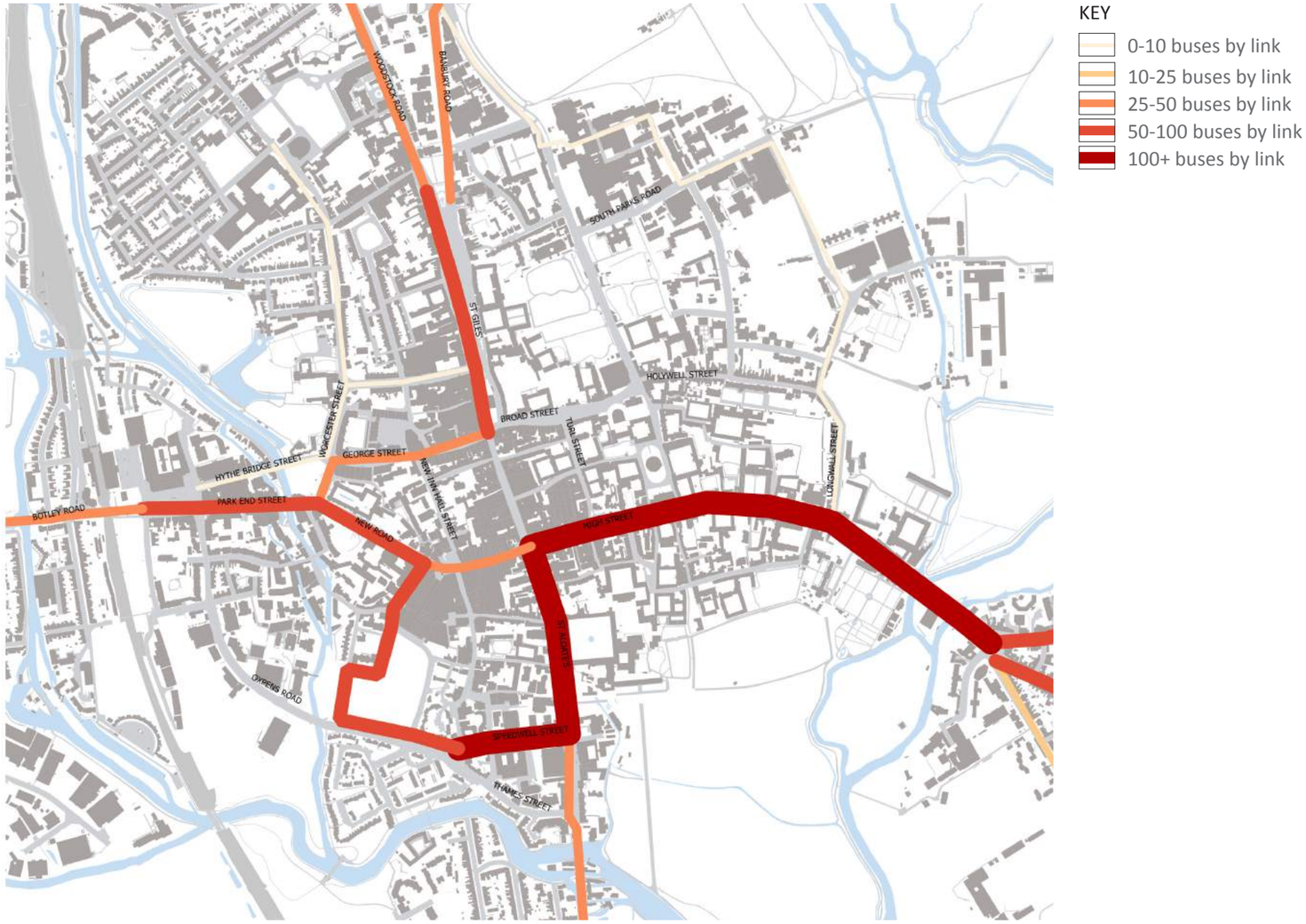


Figure 4-15 Ease of Movement – Hourly bus frequency (AM peak)

Public Transport

Our analysis of movement has shown that buses carry more people to and from Oxford city centre than any other mode of travel, with current services comprising scheduled buses serving the wider city, routes from outlying settlements in the region and long-distance coach routes to the centre of London and Heathrow and Gatwick airports.

There are currently very high bus flows on High Street and St Aldate's (see Figure 4-15) leading to congestion and collisions. Details of reported collisions is presented in the safety and public health section at Figure 4-26. Our analysis of cross city bus services shows that Magdalen Bridge is the key entry point into the city for buses, resulting in high movement pressure on High Street (see Figure 4-16).

Most bus services terminate and turn within the city centre rather than crossing it.

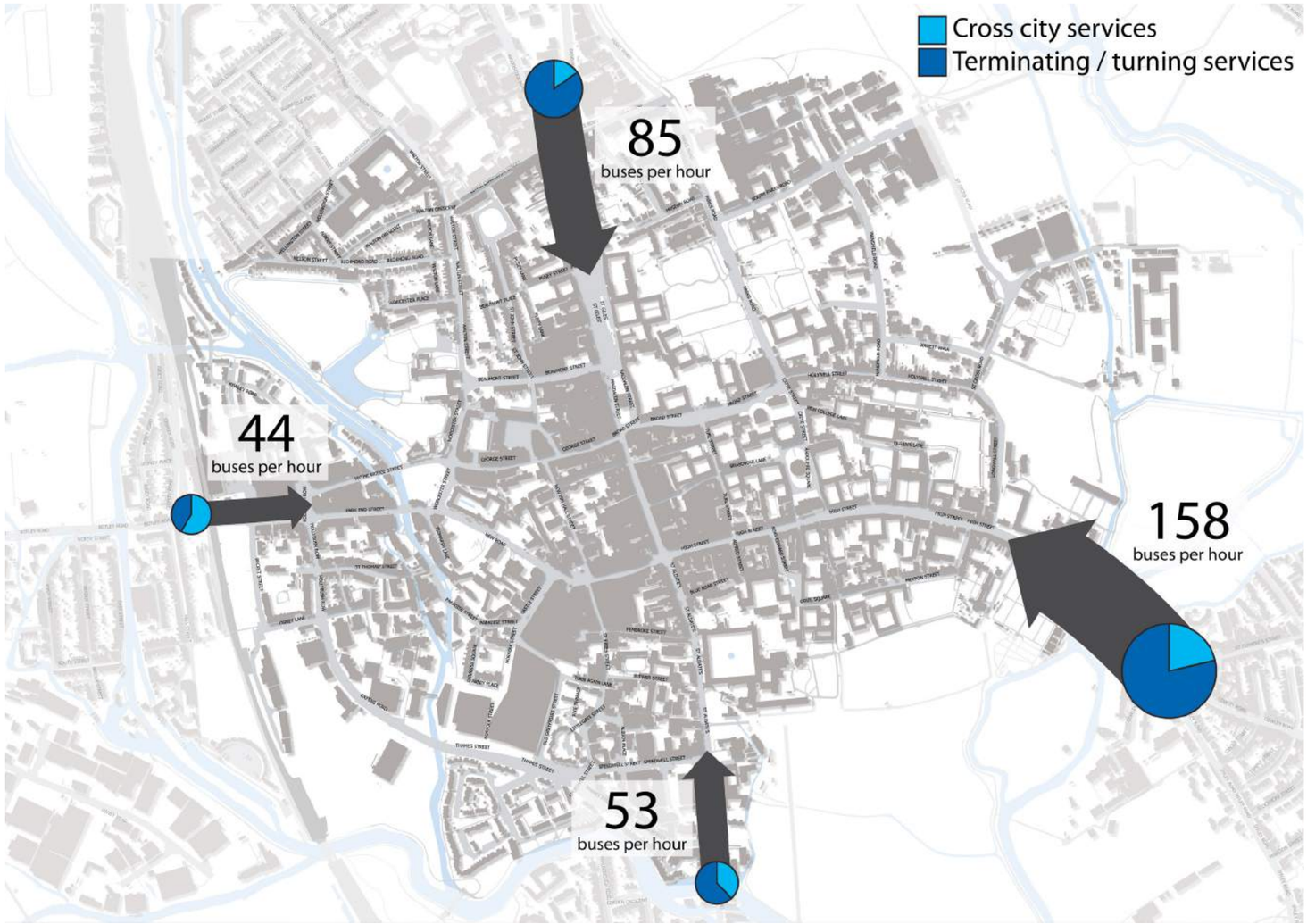


Figure 4-16 Ease of Movement – cross city and terminating bus services (at peak)

Motor Traffic

Oxford County Council provided the team with a number of Manual Classified Counts (MCC) for key locations around the city centre. Analysis of the data provided shows that despite existing traffic restrictions in place, cars still make up a fairly high proportion of traffic entering the city centre. As a proportion of total vehicles, buses are not the largest proportion of vehicles, but occupancy levels are high meaning that it is the principal motorised mode. Pedal cycle flows are also very high, particularly from the east across Magdalen Bridge.

Traffic composition at the survey sites provided is summarised in Figure 4-17.

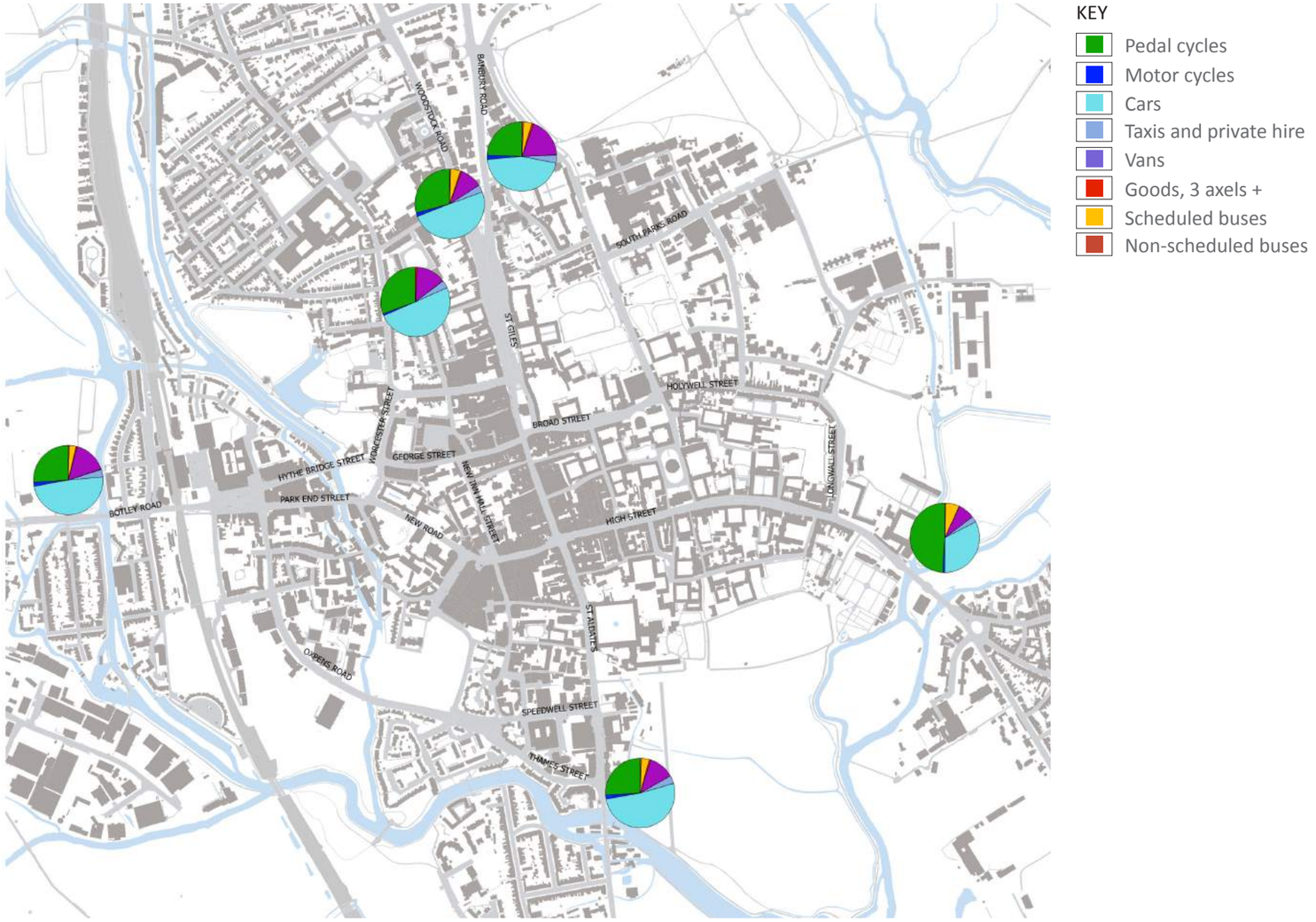


Figure 4-17 Ease of Movement – Traffic composition at surveyed sites (Oxford City MCC – single day)

Movement

Summary:

- Overall movement patterns within the city centre, and consequently ease of movement by mode is constrained by the historic structure of the city and its watercourses. The main movement corridors into the city centre are the A4144 Woodstock Road and A4165 Banbury Road from the north, via the Plain roundabout and Magdalen Bridge from the east, A420 Botley Road to the west and A4144 Abingdon Road to the south.
- Most of the urban hinterland lies to the south-east of the city, so Magdalen Bridge and High Street is the natural approach route for many people on all modes. This leads to a concentration of bus flows on High Street and St Aldate's because of the absence of other east-west routes through the city centre.
- The space required for two-way bus movements on High Street and St Aldate's compromises the pedestrian environment as we have already seen in the preceding Section on inclusivity.

Strategy Implications:

- Due to the fundamentally constrained medieval structure of Oxford city centre, and its lack of alternative routes which would allow for greater displacement of buses outside of the central core, there is limited potential for place based improvement within the current movement framework.
- The principal focus of this study is to enable the local authorities to achieve a much improved public realm and achieve more walking and cycling by adopting a revised transport management strategy.
- Our analysis of the city centre suggests that a bolder approach is required to better balance the street environment to create a public realm fitting for a successful and growing world-class city.

4.3.2.3 Public Realm

Oxford city centre comprises a rich and varied character that has evolved over many centuries. However, despite the high architectural quality of the overall city, the quality of the public realm and experience of the city for residents and visitors does not befit the city's status as a globally-renowned place for learning and a draw for international tourism.

The following Sections provide a summary of our key observations and understanding of the public realm within the city centre.

Heritage

The majority of the city centre is extremely sensitive in heritage terms, and a significant proportion of the study area is located within the central conservation area. There is a high concentration of listed buildings and a number of scheduled ancient monuments as identified on Figure 4-18.

Poor movement conditions on key streets discussed in previous Sections has an impact on visitors ability to appreciate the quality

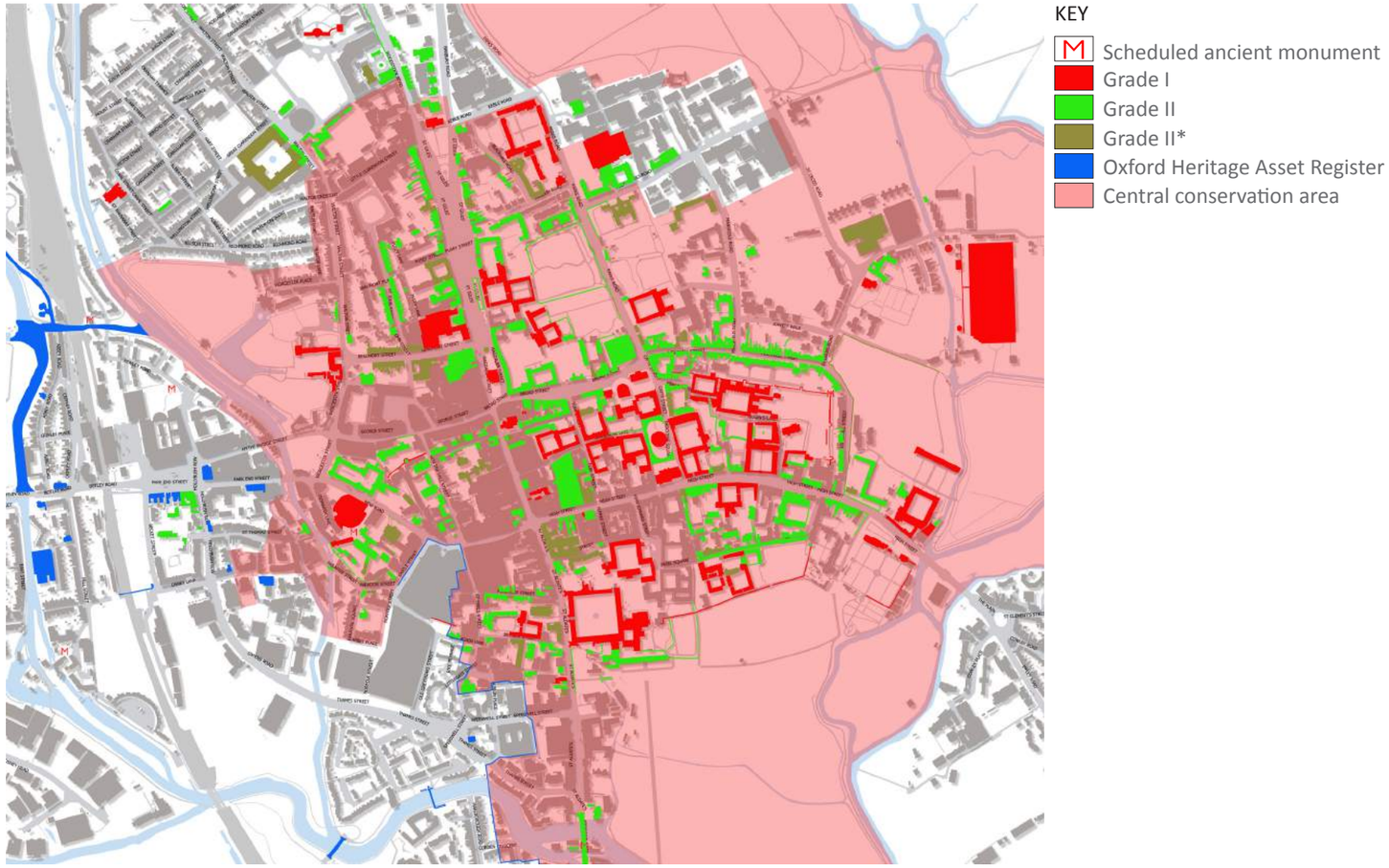


Figure 4-18 Public Realm - Heritage Assets

of these heritage assets, particularly as movement is focussed on a few key routes where there are high concentrations of listed buildings, including St. Aldate's and High Street.

Use

The city centre has a clearly defined retail core which radiates from the historic centre of the city at the Carfax junction, which is derived from Latin quadrifurcus meaning "four forks". The opening of the Westgate shopping centre has resulted in the emphasis of the retail quarter moving to the west of the Carfax.

The university colleges generally lie to the east of the Carfax, and these are a draw for tourists and visitors as well as the people who work and study there. Visitor attractions are distributed around all parts of the city centre. A summary of the city centre land uses and city quarters is provided at Figure 4-19.

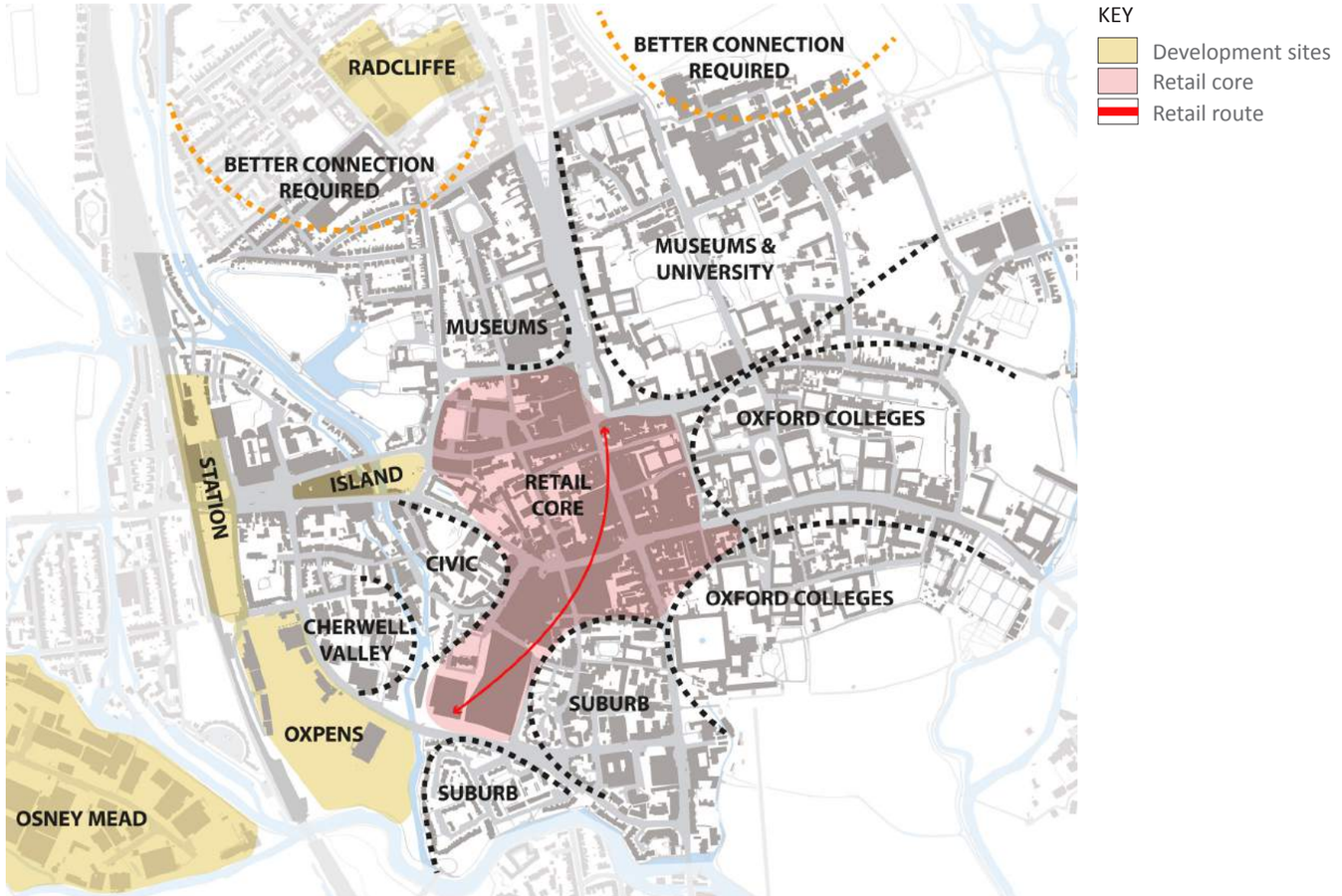


Figure 4-19 Public realm – land uses and city quarters

Green Spaces

Within the study area there is little green space within public accessible locations. The majority of green spaces and planting is located within private spaces primarily within the city's colleges. Figure 4-20 provides a summary of green spaces within the study area.

Figure 4-20 Public Realm - Green spaces

Key Public Spaces

Overall there is a lack of well-designed and purposed public space across the city centre where people can simply enjoy the time they spend in Oxford. There are few resting places for pedestrians and limited provision of seating, both private and public. Figure 4-21 provides a summary of the key public spaces within the city centre.

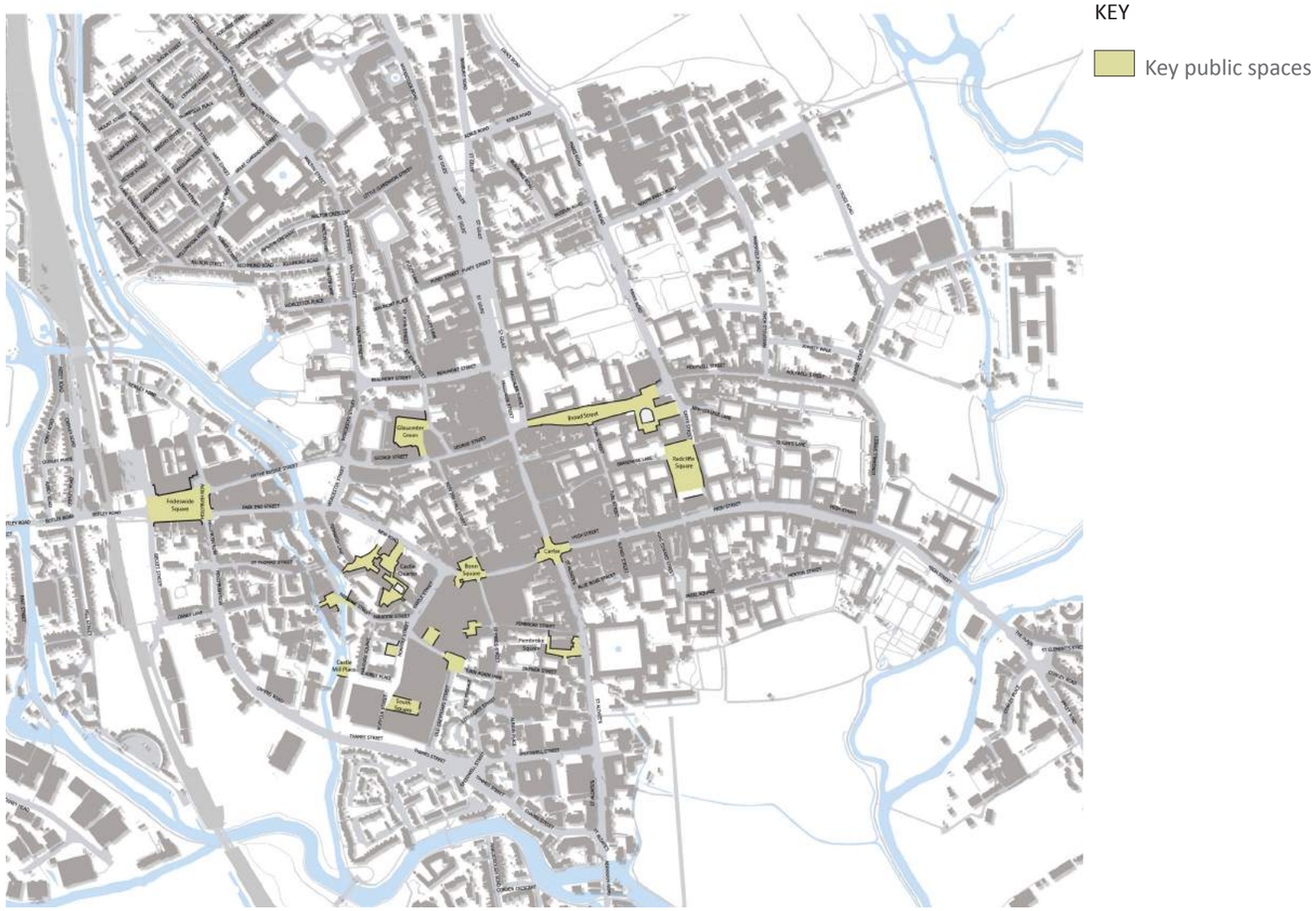


Figure 4-21 Public Realm - Key public spaces

Bonn Square located on Queen Street provides some limited opportunities for sitting but it is not of high quality and has the appearance of a somewhat ‘left over’ space. There is also some seating at Gloucester Green but this is largely incidental to the use of the space as a market.

Broad Street is very much an unrealised opportunity for the city. At the moment there is a very limited amount of café seating and the lack of any through traffic means that street overall functions to some as an informal public space, but the wide areas of carriageway, largely occupied by on-street parking both in the centre and along the edges of the street severely limits its current potential.

Figure 4-22 Key public spaces – Broad Street

Figure 4-23 Key public spaces – Gloucester Green

Frontages and Street Activity

In order to understand how these key streets and spaces are currently used, detailed site observations were made by the design team to record active frontages and street activity. These are presented at Figure 4-24.

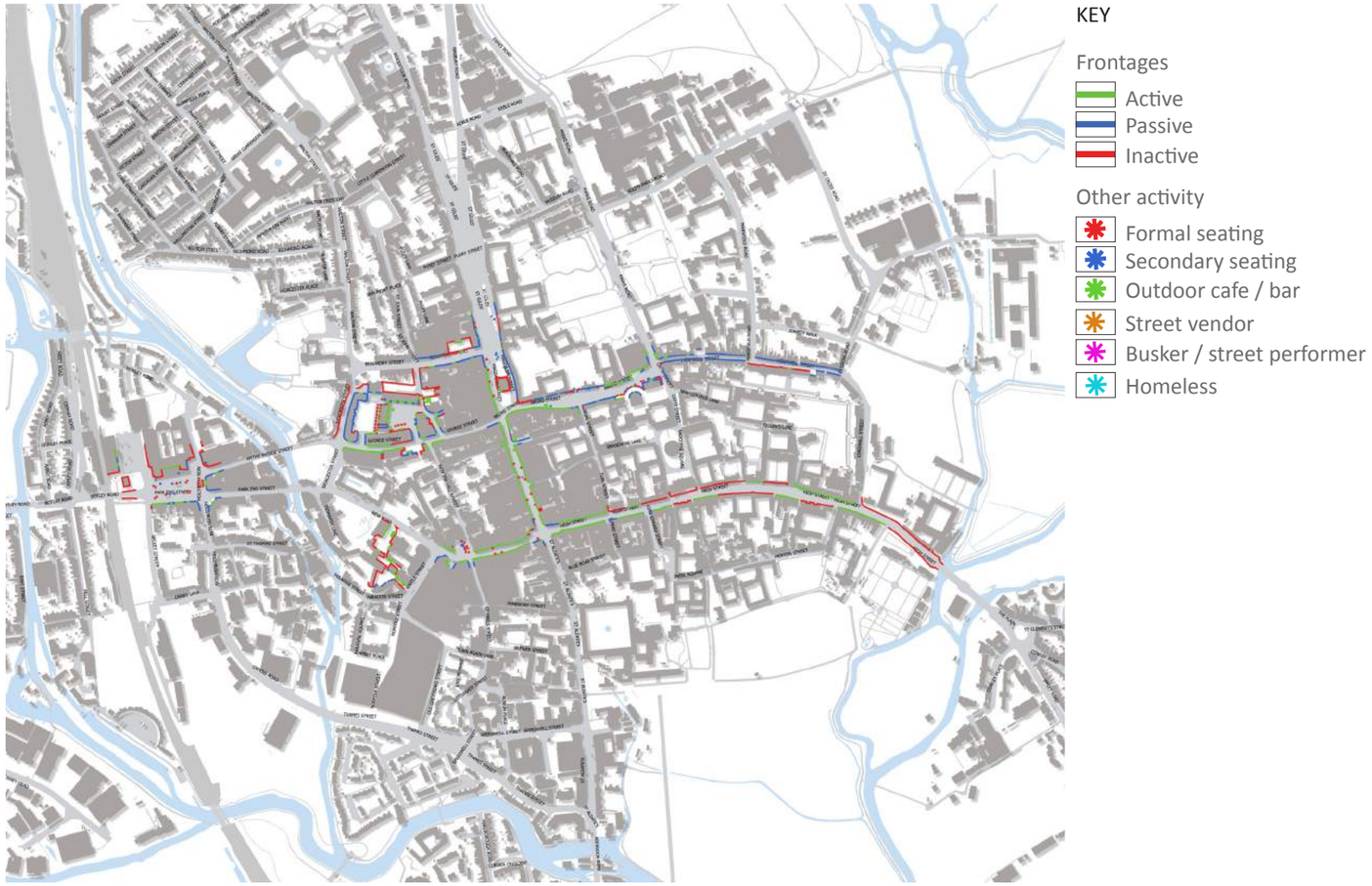


Figure 4-24 Public Realm: Frontages and Street Activity

Public Realm

Summary:

- Oxford city centre comprises a rich and varied character that has evolved over many centuries. However, despite the high architectural quality of the overall city, the quality of the public realm and experience of the city for residents and visitors does not befit the city's status as a globally-renowned place for learning and a draw for international tourism.
- Overall there is a lack of well-designed and purposed public space across the city centre where people can simply enjoy the time they spend in Oxford. There are few resting places for pedestrians and limited provision of seating, both private and public.
- There are strong controls on traffic movement and parking/servicing across the city centre but while the need for this is well understood, this has required the erection of many street signs and road markings which strongly detract from the quality of place.
- In key locations including Broad Street and St. Giles on-street parking tends to dominate, exacerbated by the circulation of cars searching for spaces at peak periods.

Strategy Implications:

- Highway space should be reallocated for public realm on busy streets, particularly carriageway space.
- Focus on opportunities for creation of new public spaces, including outdoor dining and retail space (e.g. cafes) and seating, as well as for public performances and gatherings.
- Consideration should be given to developing a consistent and higher quality palette of materials and treatments for use across the different types of streets in the city centre.
- The authorities should adopt a clear 'blank canvas' policy to reduce street clutter and enhance overall visual appearance and functionality.

4.3.1 Safety and Public Health

Safety

Crime data for the city centre was provided by the City Council. Analysis of the data is presented at Figure 4-25 below and illustrates that there are no obvious crime hotspots.

Figure 4-25 Safety and Public Health: Reported Crime

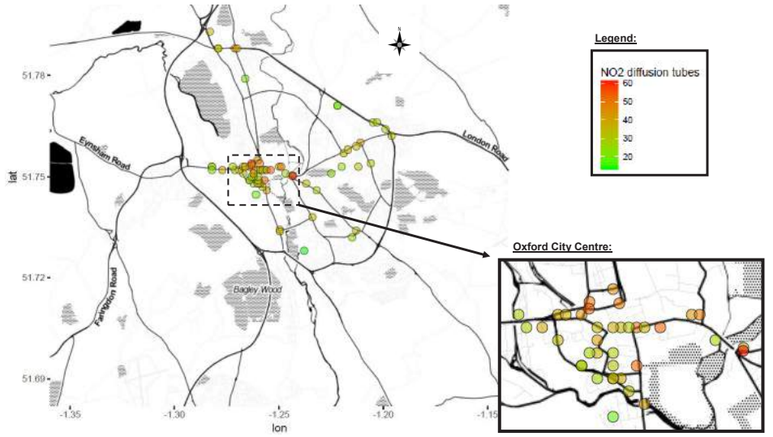
Three years of accident data (2014-2016) has been analysed and presented at Figure 4-26. The data shows a spread of reported personal injury collisions around the city centre, with prominent clustering evident around St Giles, High Street and St Aldates.

Figure 4-26 Safety and public health – Reported injury collisions (2014 - 2016)

Public Health

The entire district of the City of Oxford has been in an Air Quality Management Area (AQMA) for NO2 since 2010. Previously an AQMA covered the city centre since 2004. Data presented in the 2016 air quality Annual Status Report shoes that air quality along a number of main routes in the city centre is currently poor (Figure 4-27) despite the Low Emissions Zone which currently operates in the city centre, with restrictions on engine emissions for public service vehicles with some exemptions (Figure 4-28).

Table D.2 – Oxford's diffusion tube locations by level of NO_2, 2016.



Source: GGmap package for Rstudio[12]

Figure 4-27 Safety and public health – Air Quality (from 2016 Annual Status Report)

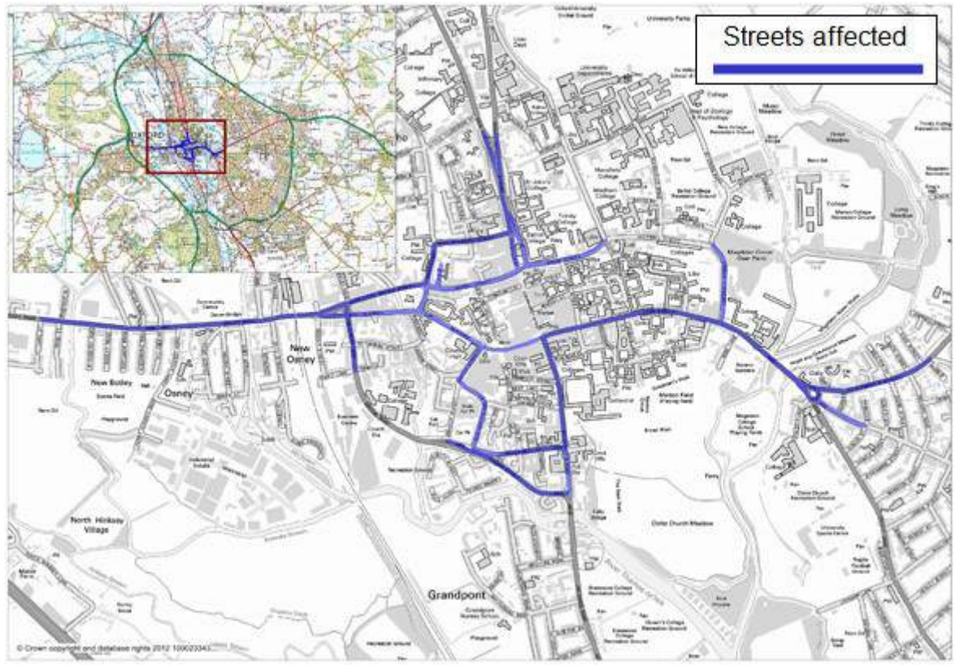


Figure 4-28 Safety and public health – existing Low Emissions Zone

In order to address air quality within the city centre the City and County Councils jointly propose to introduce a Zero Emissions Zone (ZEZ) in stages from 2020, with full rollout by 2035. While a "do nothing" approach may well still tackle air quality as fleets naturally become more efficient and uptake of electric vehicles continue, proposing a ZEZ is a welcome means of fast tracking that process. The proposed boundary options for the ZEZ are identified on Figure 4-29.

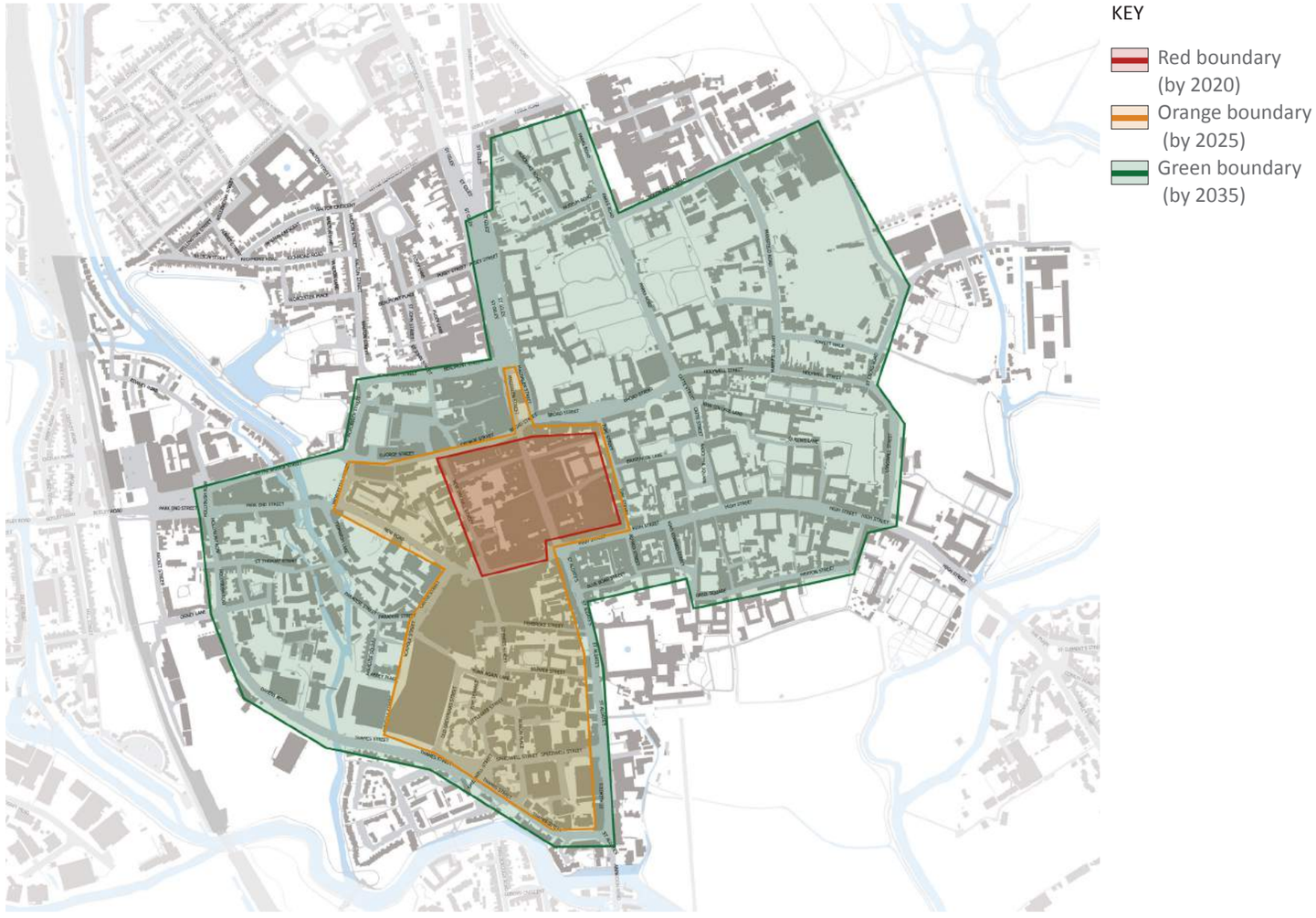


Figure 4-29 Safety and Public Health: Zero Emission Zone Boundary Options

Safety and Public Health

Summary:

- Crime data for the city centre was provided by the City Council indicates that there are no obvious crime hotspots.
- Three years of accident data (2014-2016) has been analysed and shows a spread of reported personal injury collisions around the city centre, with prominent clustering evident around St Giles, High Street and St Aldates.
- In order to address air quality within the city centre the City and County Councils jointly propose to introduce a Zero Emissions Zone (ZEZ) in stages from 2020, with full rollout by 2035.

Strategy Implications:

- Reduce conflict between pedestrians, cyclists and motor vehicles.
- Simplifying junction conflicts and operations.
- Enabling smoother less congested motor vehicle movements.

4.3.1.1 **Economy**

Retail

Research undertaken by CABE as part of their study 'Paved with Gold' (2007) investigates the value of design. The study shows how the value that good street design can contribute to extra financial value and that a high quality public realm will support businesses by attracting footfall and enabling people to dwell longer.

Other than the part pedestrianised streets of Cornmarket Street and Queen Street, the typical character of main streets in Oxford is narrow footways and limited opportunities to enjoy the space. Apart from Bonn Square and Gloucester Green, the locations for pedestrians to dwell and enjoy the environment do not correspond to areas of economic activity.

Figure 4-30 shows the extent of the primary and secondary retail frontage in the city centre, which notably overlaps with key streets with the highest movement function discussed in previous Sections in this Section. A rationalisation of movement, to achieve a better balance in favour of pedestrians, can identify

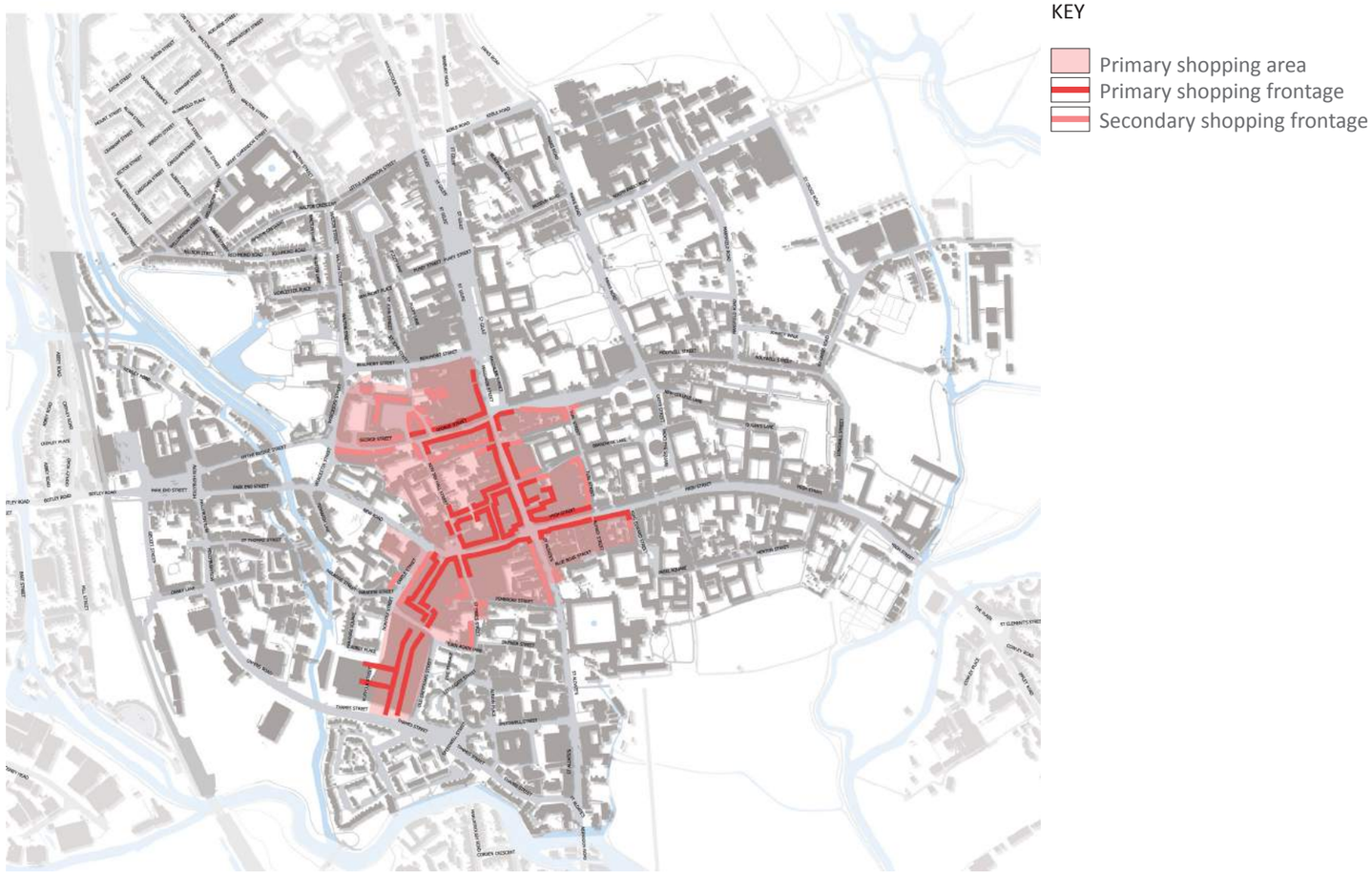


Figure 4-30 Economy - Retail frontage

scope for new public spaces and improved public realm to support frontage activity.

Deliveries

In addition to high street retail activity, deliveries also play an important role in supporting the city centre economy. Data was made available to the project team from a major UK parcel carrier which showed where all the deliveries within the study area occurred on the busiest day in the past 12 months. Figure 4-31 shows that the main delivery locations were along Broad Street, and just off High Street and Queen Street.

Deliveries on High Street are only restricted during the peak hours and this is a significant cause of daytime congestion.

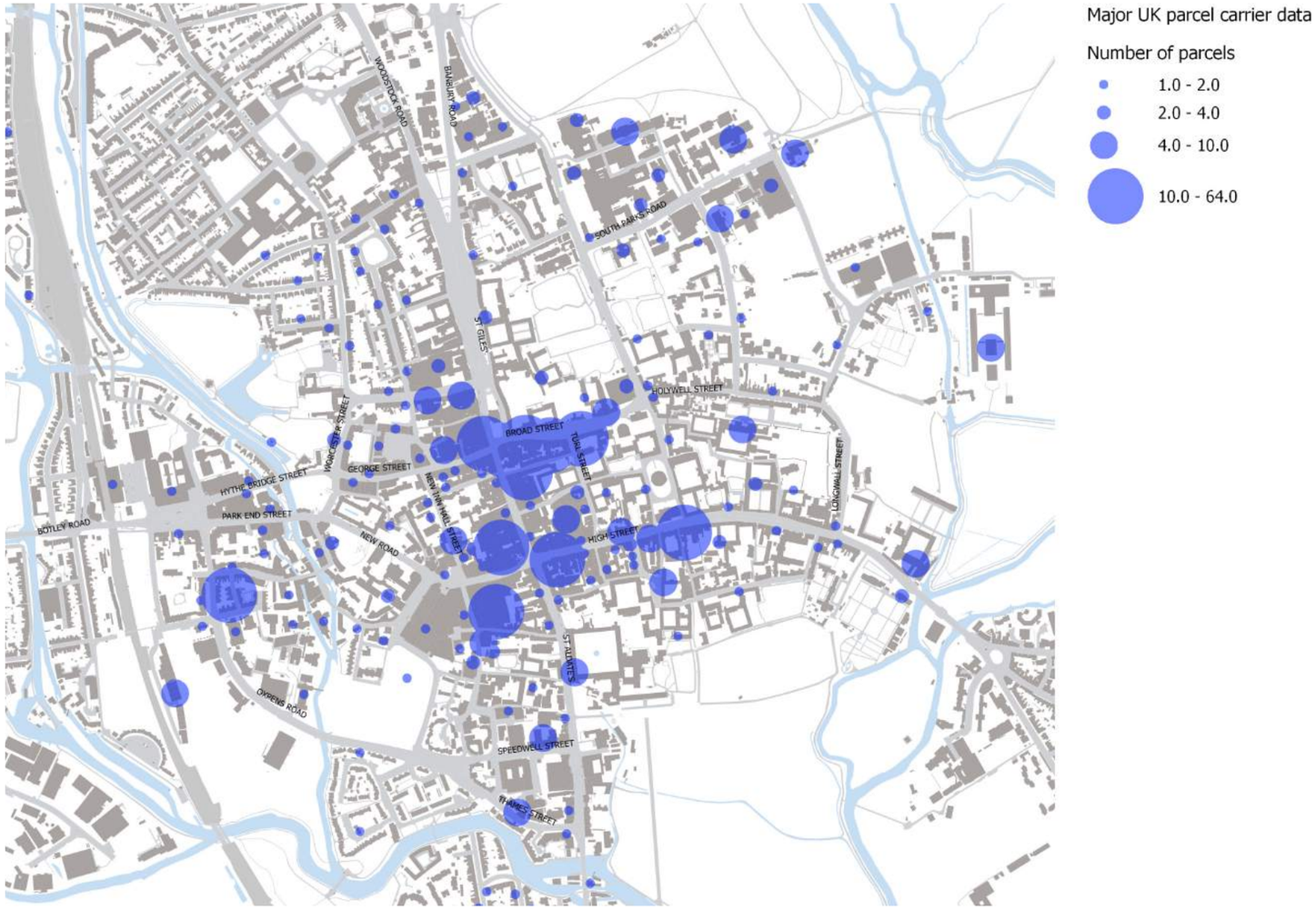


Figure 4-31 Economy - Parcel delivery clusters

Taxis

There are six official taxi rank locations for licenced Hackney carriages in the city centre, as shown on Figure 4-32. Licenced private hire vehicles are not permitted to stand on the stand on the ranks or pick up passengers on street.

In all other respects both types of taxi operate similarly and are exempt from the access restrictions on High Street, St Aldates and George Street. Taxis are not permitted to travel along Cornmarket Street, Queen Street and the Westgate 'bus link' of Norfolk Street at any time.

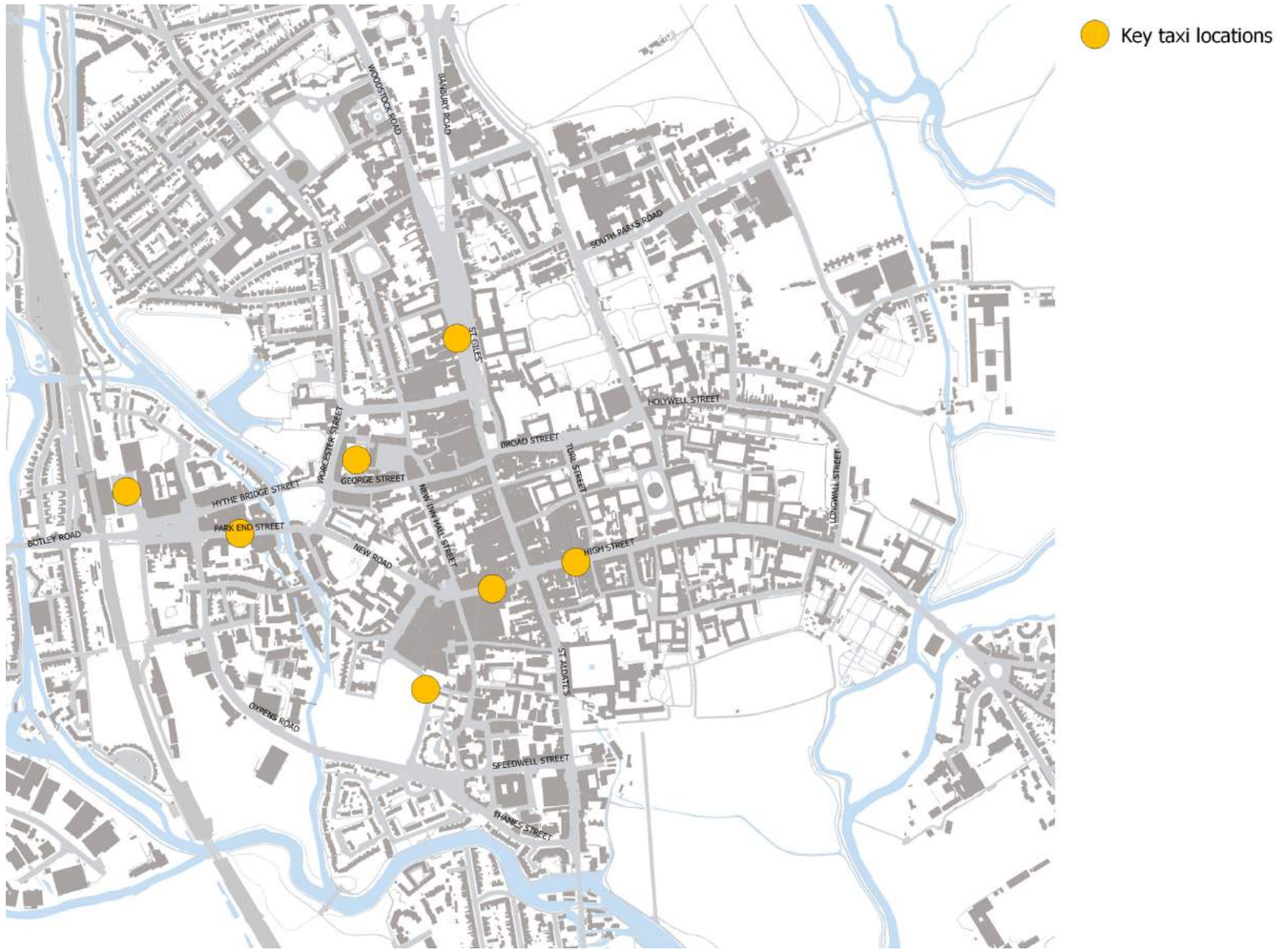


Figure 4-32 Economy - Taxi ranks

Economy

Summary:

- The stakeholder information gathering process has determined that the role of taxis is of growing importance.
- Conflict with pedestrians was reported when a taxi rank was operating on Cornmarket (while buses and taxis were not allowed to use Queen Street), which required taxis to execute a u-turn. We have observed that similar problems are currently occurring at Carfax, adding to the level of congestion at this key location.
- It will be necessary to carefully consider taxi access and rank locations in developing the detailed proposals for the revised city centre streets. The Zero Emissions Zone may prevent excluding taxis from the city centre unless supporting measures are put in place to support the uptake of electric and hybrid taxi vehicles.

Strategy Implications:

- Retaining taxi access in the city centre will therefore continue to be important.
- Oxfordshire County Council has previously commissioned studies on the potential to reduce the number and size of service vehicles needing to access the city centre through a range of interventions, including policies requiring and encouraging organisations to develop Delivery and Servicing Plans and the establishment of consolidation and micro-consolidation centres outside the city centre. These initiatives should be restarted.
- The reallocation of road space on key streets means that there will be opportunities to create defined areas for loading and unloading that do not conflict with traffic, particularly buses. This means that it may be possible to provide more opportunities for servicing during the peak hours than at present, which will spread demand throughout the day.

4.4 Stakeholder workshop 1

To begin dialogue with Councillors and stakeholders, two workshops were held at Oxford Town Hall on Wednesday 4th October 2017. The purpose of the workshops was to:

- Inform members and stakeholders about the process and timescale for the study
- Present the consultants' initial assessments of the current situation and existing options for city centre movement (see Section 5 below)
- Invite views of these options and further options for consideration
- Invite views on the process by which options will be appraised

Due to room capacity issues two separate workshops were held. The session for members ran between 14:00 and 16:00 hrs and then a session for key stakeholders' session between 17:30 and 19:30 hrs. Each workshop session followed the same structure. A total of 21 people attended the Members' event and 33 the stakeholder event.

4.4.1.1 Summary of workshop outcomes

Appraisal themes

Although members and stakeholders set down a broad range of desirable outcomes during this part of the workshop, in general there appeared to be agreement that the five headings as recommended in the CIHT review would form an appropriate structure for the appraisal of the previous and emerging options.

Issues and visioning

A large range of comments emerged from the visioning exercise, covering a range of geographical locations across the city centre and beyond. The common themes which emerged are summarised below:

- Walking – Stakeholders considered that pedestrian congestion, caused by too narrow footways and excessive footfall on some streets, was a major problem.
- Cycling – there was support for significant improvements in provision for cycling, including traffic free and segregated cycle routes on busier highways.
- Public transport – while maintaining bus access to the city centre was seen as vital, stakeholders were concerned over high levels of bus congestion on some streets, notably High Street and St Aldates
- Public realm – Stakeholders felt that generally the public realm across the city centre was not of a quality that reflected the importance of Oxford as a place of national and international significance.

4.5 Conclusions from the Data

Figure 4-33 Key points revealed through evidence

Key points revealed through evidence	Strategy implications	Themes
The principal focus of this study is to enable the local authorities to achieve a much improved public realm and achieve more walking and cycling by adopting a revised transport management strategy: ▪ There is inadequate pedestrian circulation space along many streets. ▪ The space required for two-way bus movements on High Street and St Aldate's compromises the pedestrian environment. ▪ Overall there is a lack of well-designed and purposed public space across the city centre where people can simply enjoy the time they spend in Oxford. There are few resting places for pedestrians and limited provision of seating.	▪ Reclaim highway space for pedestrians in key locations including High Street, Queen Street, St Aldates, Broad Street and St Giles. ▪ Reduce the width of carriageway to be crossed where possible. ▪ Where streets are very lightly trafficked they should generally be paved at a level surface across the street to give informal priority to pedestrians and enable them to use the whole of the street.	▪ Inclusive Environment ▪ Movement ▪ Public Realm
Oxford City Centre is fundamentally constrained: ▪ Overall movement patterns within the city centre, and consequently ease of movement by mode is constrained by the historic structure of the city and its watercourses. ▪ Most of the urban hinterland lies to the south-east of the city, so Magdalen Bridge and High Street is the natural approach route for many people on all modes. ▪ Accident data shows prominent clustering evident around St Giles, High Street and St Aldates.	▪ There is limited potential for place based improvement within the current movement framework. ▪ A bolder approach is required to better balance the street environment to create a public realm fitting for a successful and growing world-class city. ▪ The reallocation of road space on key streets means that there will be opportunities to create defined areas for loading and unloading that do not conflict with traffic, particularly buses.	▪ Movement ▪ Safety and Public Health ▪ Economy
The character of Oxford is under threat: ▪ The quality of the public realm and experience of the city for residents and visitors does not befit the city's status as a globally-renowned place for learning and a draw for international tourism. ▪ There are strong controls on traffic movement and parking/servicing across the city centre, this has required the erection of many street signs and road markings which strongly detract from the quality of place. ▪ In key locations including Broad Street and St. Giles on-street parking tends to dominate, exacerbated by the circulation of cars searching for spaces at peak periods.	▪ Consideration should be given to developing a consistent and higher quality palette of materials and treatments for use across the different types of streets in the city centre. ▪ The authorities should adopt a clear 'blank canvas' policy to reduce street clutter and enhance overall visual appearance and functionality.	▪ Public Realm
Air quality: ▪ In order to address air quality within the city centre the City and County Councils jointly propose to introduce a Zero Emissions Zone (ZEZ) in stages from 2020, with full rollout by 2035. ▪ It will be necessary to carefully consider taxi access and rank locations in developing the detailed proposals for the revised city centre streets.	▪ All future plans and proposals will need to work alongside the ZEZ roll out stages.	▪ Safety and Public Health ▪ Economy

5 Previous Transport Management Options

5.1 Introduction

Using the information gathered during the baseline assessment, the two previous strategies for movement in the city centre were reviewed:

- The 2025 Vision from the Oxford Transport Strategy (OTS), as proposed by the County Council
- The City Council's response to this vision, as devised by their consultants Alan Baxter Associates

5.2 Option 1 - 2025 Vision from the Oxford Transport Strategy (OTS)

The OTS identifies the key challenge of providing capacity for public transport patronage to grow substantially over the next 20 years, whilst also improving the experience of walking, cycling and simply spending time in the city centre.

These changes are underpinned by a set of demand management measures which will achieve a reduction in private motor vehicle travel across the whole of Oxford – a 10% decrease in the car driver mode share is needed to prevent traffic levels rising in the 2031 scenario.

In parallel with this study further work is being undertaken by the County Council on the most appropriate method of managing demand, and three broad options are being considered – a Workplace Parking Levy which will charge employers who provide employee parking above a certain threshold; Road User Charging; and a series of traffic control points on key routes around the city centre.

Within the study area the control points would potentially be placed on:

- Hythe Bridge Street
- Thames Street; and
- St Cross Road

While a detailed consideration of these demand management measures is beyond the scope of this study we have assumed that there will be a significant reduction in private car use on the existing routes around the city centre, particularly on the north-east and north-west.

The proposals for public transport in the city centre builds up in phases. The vision for 2025 is for two intersecting cross-city BRT lines terminating at the park and ride sites: Line 1 running North-South between Langford Lane and Blackbird Leys; and Line 2 running East-West between Cumnor and Thornhill. Both BRT lines cross Magdalen Bridge, reflecting that the eastern arc of the city is where the bulk of the population of the city lives. A further BRT Line would pass around the eastern side of the city from the north/north-west to the south/south-west but would not be routed through the city centre.

The OTS proposes that tunnels under the city centre of one form or another could form part of a much longer term (post Local Plan) solution and is working with other authorities with similar proposals to investigate this further. It is however acknowledged that shorter term solutions are needed in the meantime, particularly as tunnels remain an unproven and very expensive option.

In addition to these principal BRT lines, more conventional buses would continue to enter the city centre, principally serving settlements outside the city centre. A series of interchanges around the city centre would provide for passengers to transfer between bus services to enable more complex journeys to be made.

In terms of cycling, the OTS identifies the creation of 'cycle super routes' on most of the principal streets around and across the city centre, including:

- St Giles and Magdalen Street
- St Aldate's and Abingdon Road
- George Street, Broad Street and Holywell Street

- Botley Road, Frideswide Square, New Road, Queen Street, High Street and Magdalen Bridge
- Oxpens Road and Thames Street

The proposed quality of provision on these routes is variable, however, with segregation proposed only 'where possible' and with cyclists being required to use bus lanes or mandatory cycle lanes in some locations.

For walking, the OTS identified the need for major improvements to the public realm and the 'sense of place' in the city and proposed the pedestrianisation of Queen Street and George Street. By 2025 the OTS envisaged that Park End Street, New Road, Castle Street and Norfolk Street would also become largely traffic-free, creating high quality walking route from the railway station to and across the city centre.

Figure 5-1 illustrates the 2025 vision for public transport and the potential traffic control points, with the addition of the opportunities for low-traffic or traffic-free streets identified by the PJA / ITP team.

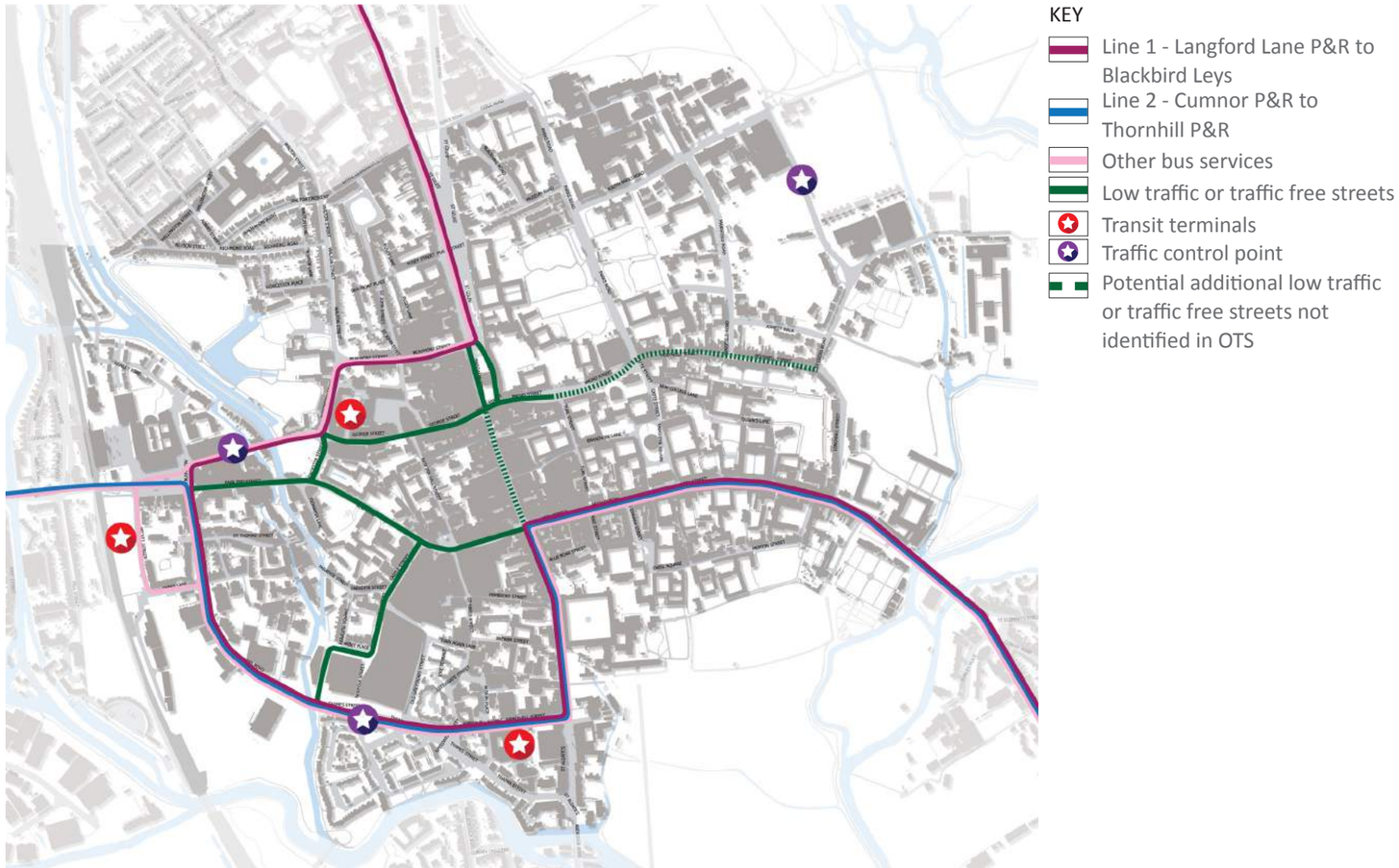


Figure 5-1 OTS 2025 Vision

Figure 5-2 sets out our assessment of the OTS option against the five themes.

In summary, the measures identified for 2020 and 2025 will lead to a significant reduction in the number of buses in several key city centre streets and consequent improvements in provision for walking, cycling and the overall public realm.

However, three significant issues remain:

- very intensive mass transit operation in High Street and St Aldate's and at Carfax, with no relief of the problems of congestion for all modes, particularly pedestrians, and road safety;
- mass transit will have a reduced level of access to and through the city centre core, particularly the Westgate Centre, thus reducing its accessibility to less able people and
- significant walking distances will be created between some the transit terminals and key destinations in the city centre.

Figure 5-2 Evaluation Matrix – 2025 Vision from the Oxford Transport Strategy

	INCLUSIVITY	MOVEMENT	PUBLIC REALM	SAFETY & PUBLIC HEALTH	ECONOMY
Positives	▪ Good level of bus penetration into the city. ▪ Small or zero walk distance for bus interchange. ▪ Cornmarket remains pedestrianised. ▪ Queen Street pedestrianised.	▪ Walk: Improved walking conditions across much of city core on low traffic streets. ▪ Cycling: Improved cycling conditions on low traffic streets. ▪ Long distance coaches still have access to Gloucester Green. ▪ Taxi penetration can remain (depends on traffic control points).	▪ Opportunities for improved public realm across much of the city core on low traffic streets. ▪ Removal of buses from George Street, Magdalen St and Magdalen St East offers opportunity for enhancement. ▪ Opportunity for removal / rationalisation of some bus stops on High Street and St Aldate's around Carfax.	▪ Queen Street pedestrianised removing conflict with buses	▪ Servicing can remain (depends on traffic control points) but limited additional servicing facilities.
Negatives	▪ Limited potential to address high levels of pedestrian congestion which would negatively impact on disabled people. ▪ Reduced level of bus penetration compared to existing. ▪ No bus access to Westgate ▪ No bus services in NE of the city centre.	▪ Bus: Large volume of buses remain on High St and St Aldates, high congestion and slow travel times will likely remain an issue. ▪ Walk: Key sections of High Street and St Aldate's will still have narrow pavements. ▪ Cycle: Limited opportunity to improve conditions on High St and St Aldate's	▪ Limited opportunity to improve overcrowded pavements on High Street and St Aldate's.	▪ Present level of conflict between buses and cyclist on High Street and St Aldate's remains. ▪ Air quality: Bus layover still in city. ▪ Air quality: high bus flows remain in High St & St Aldates	▪ Increasing pedestrian activity and limited potential for place improvements on main streets impacts attractiveness as a retail and leisure destination. ▪ Limited potential to improve servicing regimen on High Street and St Aldate's.

5.3 Option 2 – Alan Baxter Associates (2025 Vision)

In April 2015 Alan Baxter Associates prepared a response on behalf of Oxford City Council to the consultation draft Oxford Transport Strategy published by Oxfordshire County Council as part of the broader Local Transport Plan consultation.

The response sets out an alternative strategy for the operation of the city's public transport system, which seeks to resolve the intensity of buses in the city centre by displacing the proposed BRT routes to its fringes (see Figure 5-3).

The two BRT routes would not interchange with each other; one route would operate north to west and vice-versa, and the other running south to east and vice-versa. The N-W route would pass along Beaumont Street and Hythe Bridge Street allowing interchange with the station. The S-E route would turn at The Plain roundabout and would not cross Magdalen Bridge. An inner orbital route would connect the two BRT lines together, and providing connection into (or more accurately, around) the city centre.

Like the OTS 2025 vision, the Alan Baxter vision envisages the removal of most buses from Queen Street, George Street and Magdalen Street although it does propose a low speed city centre shuttle that would be permitted to travel along Queen Street (and presumably other similar streets) to provide improved accessibility for less able people.

The displacement of buses further out than the OTS 2025 Vision presents a slightly greater opportunity for congestion, safety and public realm improvements on St Aldate's, High Street, Carfax and also Magdalen Bridge, but this assumes that the most passengers would transfer on foot and thus fewer buses would be needed. The extent to which any carriageway space could be reallocated to walking and cycling would also be limited if (as is likely) the buses on the inner orbital route were of a similar size to the buses now in use.

If all passengers transferred via the orbital buses, there would be little scope for improvements as the number of vehicles required would be the same as if the BRT ran through. There may however be some marginal gains from optimising vehicles for standing passengers, like the Red Arrows buses in London.

Critically however, as a large proportion of Oxford's residents live east of Magdalen Bridge, this interchange at The Plain demand represents a significant number of people either transferring vehicles, or adding to the footfall on Magdalen Bridge and High Street, which already struggle with existing pedestrian flows.

Moreover, the "interchange" penalty of transferring vehicles or connecting on foot may simply deter people from travelling to the city centre by bus. While this may be useful if mode shift were to more sustainable means, such as walking or cycling door-to-door, there may be a risk that these journeys are transferred to car, either into the city centre or to other retail centres. This would not be positive to Oxford's environment or economy.

One advantage of the Alan Baxter Vision, however, is the introduction of more buses in the north-eastern part of the city centre, where many people working or studying at the University

will be trying to get to, but currently may need to walk from St Giles or High Street if arriving by bus. However, given the orbital route requires interchange anyway, it is questionable whether the transfer to another vehicle would be worth it compared to a one-seat ride.

Our overall evaluation of the ABA option is given in Figure 5-4 below.

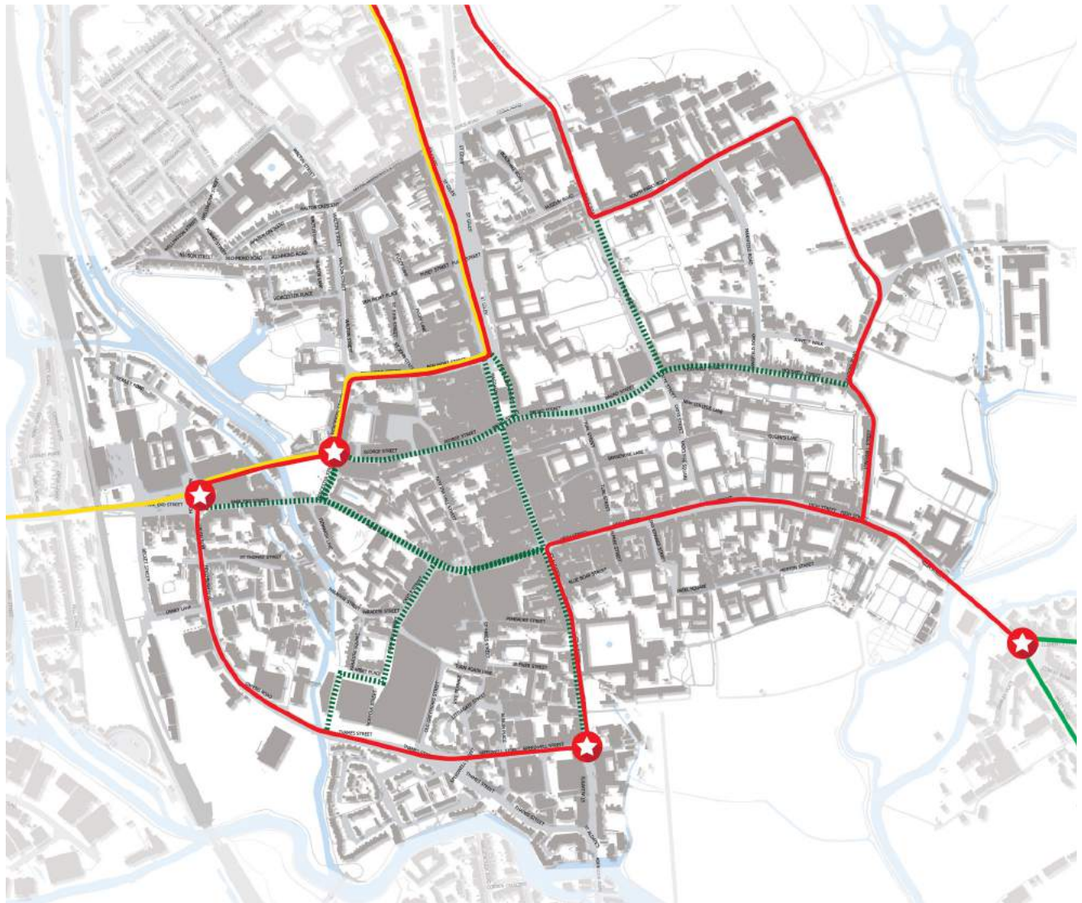


Figure 5-3 Alan Baxter Associates – 2025 Vision

Figure 5-4 Evaluation Matrix – Alan Baxter Associates (2025 Vision)

	INCLUSIVITY	MOVEMENT	PUBLIC REALM	SAFETY & PUBLIC HEALTH	ECONOMY
Positives	▪ Good level of bus penetration into the city. ▪ Small or zero walk distance for bus interchange. ▪ Shuttle service through along Queen Street. ▪ Cornmarket remains pedestrianised.	▪ Bus: improved speed and reliability in city. ▪ Walk: Improved walking conditions across much of city core on low traffic streets. ▪ Cycle: quieter city roads, including High Street and St Aldate's ▪ Long distance coaches still have access to Gloucester Green. ▪ Taxi penetration can remain (depends on traffic control points).	▪ Opportunities for improved public realm across much of the city core on low traffic streets. ▪ Opportunity for removal / rationalisation of some bus stops on High Street and St Aldate's around Carfax -> limited opportunity for placed based improvements.	▪ Increased walk distances by those not wanting to interchange. ▪ Reduced conflict with bus and cycling.	▪ Servicing can remain (depends on traffic control points) but limited additional servicing facilities. ▪ On-street car parking can remain. ▪ Some opportunity to improve servicing regimen on High Street and St Aldate's.
Negatives	▪ Requires interchange to access most of city centre core. ▪ Slight reduction in level of bus penetration compared to existing (assuming interchange) ▪ Limited bus access to Westgate ▪ Limited potential to address high levels of ped congestion which would negatively impact on disabled people.	▪ Bus interchange required on most journeys to access city. ▪ Not enough space for significant interchange location at Plain roundabout. ▪ Two-way buses on route to NE of city centre difficult to accommodate. ▪ Walk: Key sections of High Street and St Aldate's will still have narrow pavements	▪ Limited opportunity to improve overcrowded pavements on High Street and St Aldate's. ▪ Limited opportunity for placed based improvements on High Street and St Aldate's.	▪ Some public transport vehicles remain on Queen Street.	▪ Increasing pedestrian activity and limited potential for place improvements on main streets impacts attractiveness as a retail and leisure destination. ▪ Retaining car parking limits opportunities for increased cycle parking.

5.4 Previous Transport Management Options - Conclusions

Both options identify some compelling options for removing buses from certain key city centre streets but have not dealt with the locations where conflict between buses, pedestrians and cyclists is greatest: High Street, Carfax and St Aldate's. Both options seek to improve the public realm, but these improvements are opportunistic rather than where footfall is or could be expected to be greatest.

The Alan Baxter vision is very radical in how it seeks to displace buses away from the city centre, but it asks more questions than it answers in terms of requiring transfer to a remote transit terminal.

While it is appreciated that these options are very high-level concepts, our analysis of the city centre suggests that a bolder approach is required to better balance the street environment to create a public realm fitting for a successful and growing world-class city.

6 Strategic Proposals

6.1 Introduction

Considering the principles that each of the two previous options have adopted, our own strategy proposals reflect the need to prioritise modes according to the hierarchy of users. However, there is still a fundamental need to answer the question of how the city centre can continue to be served by buses and other motor traffic which is vital to its economy, including service vehicles.

Whilst the two previous options both offer some potential for place based improvement, fundamentally the constrained medieval structure of Oxford city centre, and its lack of alternative routes which would allow for greater displacement of buses outside of the central core, means that these options simply do not offer enough potential for the level of change required to improve the quality of Oxford city centre to a level befitting its world-class heritage status.

A series of overarching aims were therefore established which set out key strategy aims for each of our five appraisal themes. These are summarised in Figure 6-1 below.

In the following Sections of this Section we set out a series of inter-related strategies for particular uses and aspects of the city centre street network, together with recommendations for further study and assessment.

These strategies cover the following:

- Street Typologies
- Public Realm
- Walking
- Cycling
- Scheduled Bus Services
- Scheduled Coach Services
- Tourist Coaches
- Taxis
- Servicing and Deliveries
- Disabled Car and Cycle Parking and Access

In general, these strategies set out our recommended proposals, other than for the routing of buses, where two conceptual options are presented in this Section. How this mode is dealt with is of critical importance and was therefore the focus of further review, initially by the Oxford Design Review Panel and subsequently at a second Stakeholder Workshop.
These options, their assessment and the feedback received are discussed in Section 7, followed by a final set of recommendations.

INCLUSIVITY

- Maintain good bus access to key locations in the city centre.
- Reduce conflict with traffic, including buses.
- More place and spaces to sit and rest.
- Greater extent of level surfaces in low / zero traffic streets.

MOVEMENT

- Allow for future growth in travel to / within the city centre.
- Reduce pedestrian congestion by increasing space and encouraging more balanced distribution.
- Minimise need to interchange.
- Improve reliability of bus journey time to / through Oxford.
- Realise potential significant increase in cycling, particularly short journeys currently being made by bus.
- Improvements needed in advance of potential radical change to public transport vehicles.
- Allow for continued access to the city centre by long-distance coaches, tourist coaches and taxis.

PUBLIC REALM

- Raise the quality of Oxford's public realm to a stand befitting its world-class heritage.
- Reclaim movement space on key heritage streets.
- Minimising street clutter, including removal of traffic signals where possible.
- Improve wayfinding through design.

SAFETY & PUBLIC HEALTH

- Reduce conflict between pedestrians, cyclist and motor vehicles.
- Simplifying junction conflicts and operations
- Enabling smoother less congested motor vehicle movements.

ECONOMY

- Balance reduction in car parking with an increase in cycle parking.
- Maintain servicing to retail and business premises, but encourage the use of more sustainable arrangements including cycle freight.

Figure 6-1 Overarching Aims

6.2 Street Typologies

Our overall approach proposes introducing one-way operation for motor traffic to a number of important streets in the city centre. This would enable the rebalancing the movement and place functions of the city centre as a whole, maximising the potential for public realm enhancement and improving conditions for walking and cycling by reallocating space away from motor vehicles, particularly buses.

While there will be some additional journey length for buses and other vehicles, any impact on journey times would be offset by the reduction in conflict at key junctions, as well as the overall lowering of motor traffic volume in the city centre through the OTS demand management measures.

We note that other cities with constrained street networks in the UK, including Cheltenham, Preston, Shrewsbury and Bath have adopted similar approaches to strike an appropriate balance between competing transport modes and policy drivers.

In developing the strategy proposals, a street typology approach has been developed, based on asking the following questions for the principal city centre streets:

- Is there sufficient space in this street for a comfortable walking and cycling environment?
- If not, what needs to happen?
- Is public transport access necessary or desirable?

This decision process then leads to a street typology that is broadly consistent across the city, but reflects the local requirements of each street, allowing for variations in local geometry and character. In most cases, deliveries and servicing would be expected, but how it is catered for would reflect the specific typology of the street.

The street typology developed for Oxford city centre broadly corresponds to the following:

1. Two-way streets with access for all traffic – with or without cycle tracks
2. One-way streets with access for all traffic – with or without cycle tracks
3. Two-way streets with access for public transport and service vehicles only – with or without cycle tracks
4. One-way streets with access for public transport and service vehicles only – with or without cycle tracks
5. Pedestrian priority streets – servicing/access only; limited volume of public transport vehicles where required.

In the above, “service vehicles” includes people with who need access to specific destinations, e.g. disabled parking places or off-street premises. One-way streets for motor traffic would be expected to allow for two-way cycling, unless there are exceptional safety concerns. Oxford already has numerous cycle contraflows, and these help make cycling an attractive mode of transport, giving a clear time and distance advantage.

There are already examples of most of these street types in Oxford city centre, with the exception of one-way streets for public transport/servicing only. In addition, where there are existing one-way streets for all traffic (e.g. Brewer Street) this is only because of their extreme narrowness, and our preference would be for this type of street to become pedestrian priority streets.

The brief assumes that traffic control points or road user charging would be introduced in the city to further reduce the volume of private car traffic circulating the city centre. This being the case, we would expect there to be only few streets of type 1 or type 2 and these would be on the edge of the city core.

Street types 3 and 4 would where possible involve a much-improved public realm and a reduction or removal of formal traffic management controls. They would therefore function as 'Informal Streets' as defined in the recent CIHT Review of shared space, 'Creating better streets: Inclusive and accessible places', published in January 2018. This approach to street design achieves lower traffic speeds and encourages more courteous

Figure 6-2 One way public transport streets – Fishergate, Preston

Figure 6-3 One-way public transport streets – High Street, Shrewsbury

driver behaviour towards pedestrians by placing greater obligation on the driver to engage with his or her surroundings.

Existing examples of one-way bus streets with a high quality public realm are shown in Figures 6.2 and 6.3. These examples do not have segregated provision for cycling, which is proposed in the case of Oxford.

Because of the limited network of streets in the city centre and the demands for access there are few opportunities to create fully pedestrianised streets where motor vehicles are excluded for most of the day. As a workable alternative we have therefore identified 'pedestrian priority' streets (Type 5) as part of our street typology.

This type of street has also been identified in the CIHT Review and typically consists of a level surface street with high quality materials where pedestrians are in the majority for most of the day. Through the balance of use and the design of the space drivers perceive they are a 'guest' and proceed very slowly and carefully, with pedestrians free to wander as they wish.

Figure 6-4 Pedestrian Priority streets – Frodsham Street, Chester

Figure 6-5 'Encounter Zone' in Linz, Austria

6.3 Public Realm

Most streets in the city centre are already lightly trafficked and so we would expect the majority of streets to have the potential to become pedestrian priority streets. However, we would envisage a programme of public realm improvements to lead to more of these streets having a level surface (like Queen Street, Cornmarket Street and Pembroke Street), or at least a reduction the carriageway width to the minimum required for the passage of service vehicles. We discuss this further in the Section on walking, below.

The CIHT review also recommended that consideration should be given by Government to introducing legislation in the UK that would give a clear legal priority to pedestrians using such lightly trafficked/slow speed streets.

This is based on the Zones de Rencontre/Begegnungszone ('encounter zone') already in use in many other European countries, including Belgium, Switzerland, France and Austria. We propose that the City and County Councils consider whether this legislative change would be beneficial to Oxford and if so make appropriate representations to Government.

The key motivation for the option development as set out above is the desire to rebalance the movement and place requirements for the city as a whole, while maximising the potential for public realm enhancement by significant increasing the amount of available space for place activity, pedestrians and cyclists.

6.3.1 Issues to address

Overall there is a lack of well-designed and purposed public space across the city centre where people can simply enjoy the time they spend in Oxford. There are few resting places for pedestrians and limited provision of seating, both private and public.

Bonn Square provides some limited opportunities for sitting but it is not of high quality and has the appearance of a somewhat 'left over' space. There is also some seating at Gloucester Green but this is largely incidental to the use of the space as a market.

Broad Street is very much an unrealised opportunity for the city. At the moment there is a very limited amount of café seating and the lack of any through traffic means that street overall

Figure 6-6 Oriel Square, Oxford

functions to some as an informal public space, but the wide areas of carriageway, largely occupied by on-street parking both in the centre and along the edges of the street severely limits its current potential.

Although many of the streets have adopted a simple palette of paving materials of flag paving on footways and asphalt carriageways some areas are poorly maintained and are of low quality. Some streets, such as Pembroke Street, have been repaved at footway level which improves walkability and helps to reduce traffic speeds, and more of this approach would be welcomed.

Some streets, most notably Merton Street are paved with cobbles, which are listed. These are in a very poor state of repair, however, which detracts significantly from the quality of the street. Overall there is a general need to improve quality and extend the consistency of paving treatments across the city.

There are strong controls on traffic movement and parking/ servicing across the city centre but while the need for this is well understood, this has required the erection of many street signs and road markings which strongly detract from the quality of place.

6.3.2 Strategy approach

Enhancing the public realm throughout the city centre is a key aim of both authorities. With this in mind our approach is as follows:

- Highway space should be reallocated for public realm on busy streets, particularly carriageway space.
- Introduce significant new opportunities for creation of new public spaces, including outdoor dining and retail space (e.g. cafes) and seating, as well as for public performances and gatherings.
- The existing Street Scene Manual should be reviewed and more consistently applied, to ensure a consistent and higher quality palette of materials and treatments is available across the different types of streets in the city centre.
- We recognise that historically street trees and planting have not featured largely within Oxford city centre, with the exception of some notable specimens along St Giles, New Road and a single striking tree on Holywell Street. For the most part trees are located in private grounds such as churchyards and the Colleges. Nevertheless, it may be possible to consider some well-designed new street trees and planting to take advantage of the space which has been won back and introduce a contrasting and welcome relief to the hard surfacing of the city.
- The authorities have adopted a 'blank canvas' policy in the Street Scene Manual to reduce street clutter and enhance overall visual appearance and functionality. We recommend that this is applied consistently across the city centre to ensure that no physical obstructions or regulatory signs markings are present on the street and only those that can be justified are allowed to be present.

6.3.3 Detailed proposals

Within the limits of this study we have given thought to particular streets and spaces where there are opportunities for creating high quality public spaces. We have outlined later in the report a series of possible cross-Sections for some these streets, which should be regarded as a starting point for their design.

Broad Street has the potential to be one of the UK's great streets and public spaces, by virtue of its significant scale, the quality of the buildings that line it and its location at the heart of one of the country's most important historic cities. It should be recognised as such by the authorities and be given priority for investment.

We recognise that removing car parking from Broad Street will have some revenue implications for the County Council but given the importance of the space and that direction of travel is to restrain car use in the city centre, we recommend that this should be made a firm policy. It should be possible to replace some of the car parking with well-designed cycle parking, enabling a much more efficient use of the space while respecting the quality of the place.

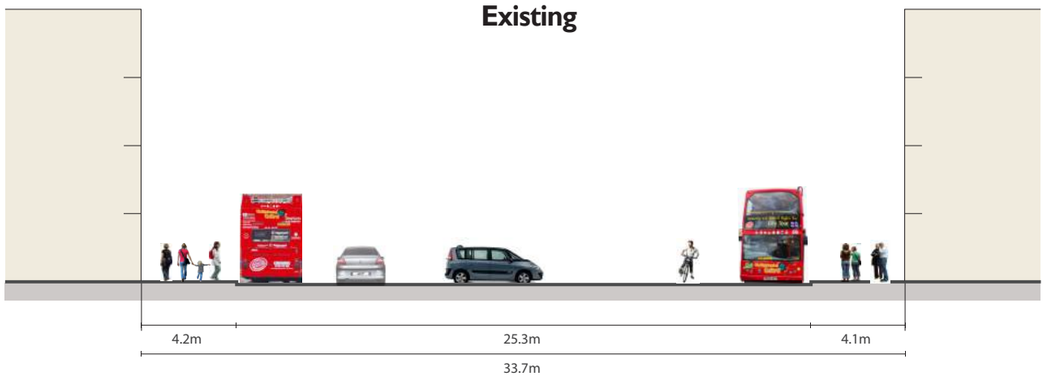


Figure 6-7 Cross Sections – Broad Street

We recognise the tension between these placemaking ambitions and allowing public transport to use this street in one direction (as discussed below) but we believe that the overall width of the street is sufficient to accommodate bus movements while retaining a substantial area for public activity.

Carfax is probably the most accessible location within the city, lying at the intersection of the four principal routes serving the city centre. At present it is a major disappointment and should be a further priority for improvement. The reallocation of carriageway space as proposed by the traffic management strategy will enable substantial increases in the extent of the public realm and, depending on the direction of operation of the one-way streets and the outcome of capacity testing, will hopefully enable the removal of the signal-controlled crossing with the attendant visual intrusion and pedestrian congestion.

It may even be possible to consider the reintroduction of the Carfax Conduit to the space, with the agreement of the present owners of Nuneham Park, or at least a visual reference to it within the redesign of the space, either as a physical structure or an area of paving and interpretation materials.

High Street is an imposing street of great beauty, particularly east of Magpie Lane where its increase width means that bus congestion is less of a problem. West of this point and on the approach to Carfax the narrowing of the carriageway and the pressures caused by stopping and waiting buses, service vehicles and disabled parking bring significant difficulties.

Figure 6-8: Cross Sections – High Street

The reduction of the carriageway width following one-way operation will enable an extended and improved public realm along the whole length of the street, particularly to the east of Magpie Lane where large areas of space would be won back and could be used for in some locations for outdoor seating – for example outside the Old Bank Hotel and the various cafes, particularly on the northern sunny side of the street – to bring an increase vibrancy and activity.

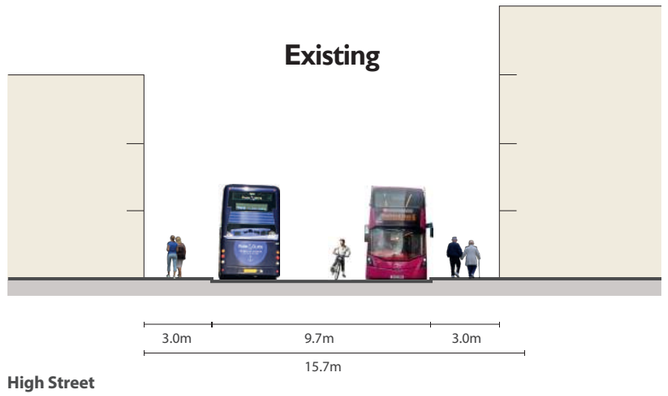


Figure 6-8 Cross Sections – High Street

At present the entrance to the Covered Market from High Street are not immediately obvious, despite the placing of totems and other devices. As part of the repaving of the widened footway it would be possible to consider extending bands of contrasting material into High Street to give a greater presence to the Covered Market and helping to draw more people into it.

St Aldate's is not as wide as High Street and appears to be less cared for with lower quality paving generally. The reallocation of carriageway following the introduction of one-way working (on the Section north of Speedwell Street) provides a great opportunity for the transformation of this street so that it can also become one of Oxford's great places.

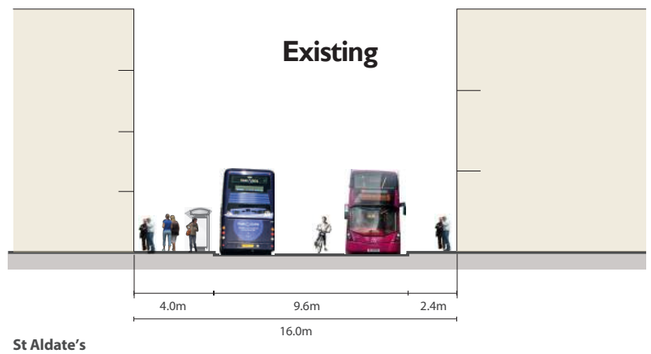


Figure 6-9 Cross Sections – St. Aldate's

Further, more detailed study of the street would be needed to establish the framework for its redesign, but the dominant Tom Tower, is a key attribute that should be celebrated, possibly through emphasising its relationship with St Aldate's church and the beautiful Pembroke Street opposite.

Holywell Street is an important street of high heritage value. It is narrow, characterised by post-medieval tenement plots. It contains a high concentration of grade I and II* listed buildings, generally with short narrow plots. It provides an important east west connection and is well used by pedestrians and cyclists. Access to the street is currently restricted.

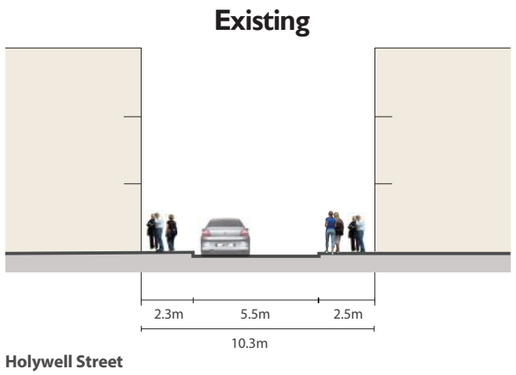


Figure 6-10 Cross Sections – Holywell Street

St Giles is a striking street forming a grand tree-lined procession into the city centre from the north. Along much of its length the mature trees on either side are able to soften the visual impact of the end-on parked cars, but outside the Ashmolean Museum the quality of the space becomes diminished due to the traffic controls on the approach and at the junction with Magdalen Street and Beaumont Street. Tourist coaches dropping off/picking up in the area adds a further visual impact.

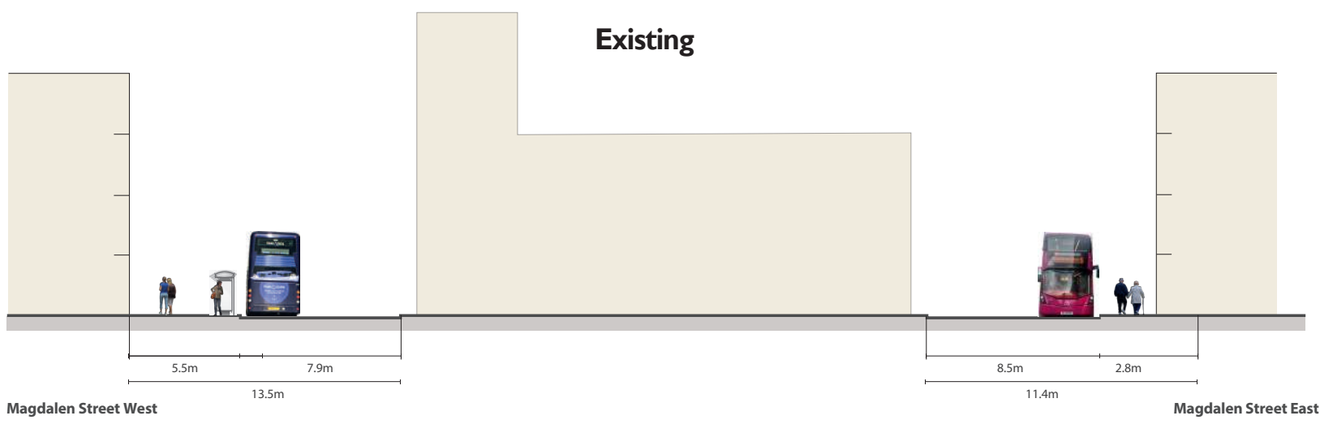


Figure 6-11 Cross Sections – Magdalen Street

Previously the County Council prepared an indicative scheme for the creation of a much-improved piece of public realm in this area, effectively creating enable a public square with bus turn-round facilities at this northern entrance to the city core, as shown in Figure 6-12 below. The simplification of traffic movements we proposed would further enable this improvement, although in our proposals there would need to be continued vehicle access to Magdalen Street (west). We recommend that this is explored further by the authorities.

Beaumont Street is an important destination within the city, as it provides the main pedestrian entrance to the Ashmolean Museum as well as other notable buildings such as the Oxford Playhouse and the Randolph Hotel. At present it is not a pleasurable street to walk or cycle along, with relatively narrow footways and a wide carriageway with car parking, drop off and bus stops. The street is somewhat austere in nature.

While Beaumont Street is proposed to remain two-way, it should be possible to reduce the width of the carriageway and give more space to walking and cycling, particularly following the reduction in traffic volumes with the demand management measures in

Figure 6-12 Indicative County Council scheme for St Giles

place. Ideally, we would recommend removing car parking from this street which would transform its appearance and character, making it feel a more integral part of the city centre rather than being very much on its periphery.

Any streetscape enhancement scheme along Beaumont Street should celebrate the entrance to the Ashmolean Museum which is very much under-expressed within the street at present.

The view along Beaumont Street is terminated by Worcester College, which frames the junction with Walton Street and Worcester Street. This is a very unattractive place at present despite the quality of the buildings, with significant congestion, narrow footways, poor crossing facilities and little provision for cycling. This space should also be considered as a site for a junction transformation scheme, to create a much-improved public square and arrival point from Jericho.

More generally across the city, much decluttering could be achieved by the introduction of a Restricted Parking Zone covering the whole of the city centre. This dispenses the need for yellow lines, and thus achieves a much cleaner visual environment. This would form a key element in the 'blank canvas' policy outlined above.

We note the major success of Frideswide Square in placemaking terms, where complex traffic signal controls were removed to create what is now an attractive square. A smaller scale but similar intervention has been made recently at the junction at the eastern end of Broad Street where a set of traffic signals have been replaced by an informal roundel with courtesy crossing points. We recommend that this approach should be applied to other locations throughout the city centre (most importantly at Carfax as discussed above), which should increase as general traffic volumes are reduce through the demand management measures.

Loading can be accommodated in footway-level "loading pads" at suitable locations: when these are not occupied by a vehicle, these constitute an extension to the footway. These have been used successfully in many locations, most notably in London, and function very well.

Figure 6-13 Frideswide Square, Oxford

6.3.4 Further Work

We emphasise that the initial ideas presented above should be seen only a starting point and that a more thorough study of Oxford's streetscapes should now be commissioned, identifying how the final reconfigured transport management system can enable change to happen.

6.4 Walking

Oxford city centre has a walkable human scale – the distance from the railway station to the Plain roundabout is only about 1.2 miles, or a 25 minute walk. Nearly all journeys to and in the city centre involve some walking and the city's heritage and environment is best enjoyed in this way. The 2011 census shows that 10.7% of journeys to work within Oxford were made on foot.

6.4.1 Issues to address

Although most of the main routes across the city in a north-south and east-west direction are clear and legible, some of the key pedestrian desire lines provide poor connectivity and legibility – for example, e.g. from the railway station to key tourist attractions such as the Ashmolean Gallery and the Pitt Rivers Museum. Some wayfinding totems with maps have been placed around the city but they are not particularly prominent and the system is far from comprehensive.

As noted above, there is inadequate pedestrian circulation space along many streets due to high footfalls, particularly on summer weekends when there are high visitor numbers as well as people coming into the city centre from the rest of Oxford and the surrounding towns.

These high footfalls conflict with other users, in particular people waiting at bus stops, due to limited amount of footway space available. Footfall is also very high on the pedestrianised streets, especially Queen Street which has seen an increase in numbers following the opening of the Westgate Centre.

Bus movements along Queen Street do cause some perceived conflict with pedestrians, particularly outside the entrance to the Westgate Centre where there is no indication in the paving pattern that buses may be expected. Notwithstanding this, our observations are that drivers of the buses do proceed very slowly and courteously along Queen Street, which is welcomed.

Although there are few private motor vehicles in the city centre, crossing some of the busier streets can be difficult and unpleasant. This is particularly the case on High Street and St Aldate's, especially around the Carfax junction, and on Beaumont Street.

6.4.2 Strategy approach

Enhancing the pedestrian provision is a key aim and the strategy approach goes hand in hand with improving the public realm environment and quality of place in the city centre, as set out in the previous Section. The strategy approach proposes to:

- Enhance pedestrian desire lines and routes in the city centre by improving connectivity and legibility.
- Reclaim highway space for pedestrians in key locations including High Street, Queen Street, St Aldates, Broad Street and St Giles.
- Reduce the width of carriageway to be crossed and introduce one-way working where appropriate to make it much easier to cross the street.
- Provide good quality links and orientation between visitor attractions and areas of high visitor numbers.
- Declutter streets of barriers to movement and enhance views to aid legibility, creating space and visibility for a more comprehensive pedestrian wayfinding system, building on those signs that are already provided.

6.4.3 Detailed proposals

The previous Section on Public Realm has already identified a number of busier streets where greater space should be given to walking through the introduction of changes to the transport management system. These will not only improve the capacity for walking but will also reduce severance, as it is far easier to cross a narrow one-way carriageway.

Where streets are very lightly trafficked they should generally be paved at a level surface across the street to give informal priority to pedestrians and enable them to use the whole of the street; however the maintenance of a contrasting 'plinth' of footway-type materials will normally be necessary to preserve the setting of the buildings. Pembroke Street is a good example of where this has been done.

Similarly, level surface paving should generally be used across side road junctions, desirably in continuous footway material, to give enable pedestrians to continue to walk in comfort and without incurring unnecessary delay. This has been done in some locations – for example at the minor streets off High Street such as Turl Street – but this is not presently the norm throughout the city centre.

George Street a key walking route to and across the city centre, as well as being used by buses, but the footways are narrow and cluttered and poorly paved in places. George Street was identified in the Oxford Transport Strategy as a potential pedestrian priority street and we support that proposal. That does not mean that buses would necessarily need to be removed entirely, which we discuss below, although they would need to run in one direction.

Hythe Bridge Street and Park End Street – are important walking routes between the railway station and the core of the city and are both constrained for pedestrians with limited width footways. Some reduction in carriageway space would be desirable, and although this may be possible on Park End Street if it remained two way, introducing one-way movement on these streets would be preferable in this regard. It is recognised that one-way working would rely on significant reductions in private traffic on these streets.

6.4.4 Further Work

Deciding on the interventions to improved conditions for walking will be an integral part of the more comprehensive streetscape study recommended above.

We also propose that a study is commissioned to explore options for the expansion of the recently introduced 'bronze signage' scheme, which would help visitors to find their way around the city more easily and help to spread footfall more evenly. There are clearly tensions with the decluttering agenda and so any new signs would need to strike the right balance between being sufficiently recognisable without causing too much visual intrusion.

6.5 Cycling

As introduced in Section 4, cycling in Oxford is an important and growing mode of transport. The 2011 census showed that 17.1% of journeys to work within Oxford were made by cycle, up from 14.9% in 2001, making Oxford second only to Cambridge in terms of the proportion of people cycling to work.

Although cycling is normally thought of as a personal mode of transport, it can also be a highly effective means of delivering and collecting freight, especially within constrained historic centres. There is already a cycle freight company operating successfully in the city and the local authorities should take steps to encourage this further through policy levers and when considering the redesign of the city's streets. We consider this further in the Section on Servicing.

6.5.1 Issues to address

Although there are some lightly-trafficked and traffic-free routes across the city centre, cyclists currently need to share many of the historic streets with motor vehicles, including buses and HGVs servicing city centre premises. There are marked cycle lanes on some streets (e.g. on Magdalen Bridge and on Oxpens Road) but these are narrow and unprotected and are now not regarded as high quality infrastructure which will attract would-be cyclists. High bus flows and congestion on some streets, principally High Street and St Aldate's and through Carfax, can be a hostile experience and records show that there have been a high number of cycle casualties on those streets.

Queen Street and Cornmarket are direct and attractive routes for cycling, but it is currently banned between 10am and 6pm, due to concerns over conflicts with pedestrians. Cyclists therefore need to take less direct alternative routes such as St Ebbes Street and George Street during most of the day.

A minority of cyclists do ignore these and other traffic regulations which can create a poor perception about cycling and adversely impacting on others' safety and enjoyment of the city centre (particularly visually or hearing impaired pedestrians).

There are plans for improved cycle connectivity around the city centre, most notably a new bridge across the Thames creating improved connections from the west and south of the city as part

of the Oxpens and Osney Mead developments, linking to Oxpens Road. We are not aware of any further proposals for cycle route improvements within the city centre core, however. There are also multi-million pound proposals for segregated cycle provision on some of the radial routes into the city centre, although the continuation of these routes within the city centre is yet to be resolved and will be informed by this study.

There is a lack of cycle parking provision at some points in the city centre, as evidenced by the large number of bikes locked to other types of street furniture and railings etc. While this is a problem that is shared with many cycle-friendly cities around the world, it does create clutter in the historic core and can be visually intrusive.

A number of dockless bike hire systems have recently been established in Oxford and while these are welcome in that they will further encourage people to cycle short trips, they are bringing further pressure to bear on the available space for cycle parking.

6.5.2 Strategy approach

- We support the authorities' views that cycling needs to play a major role in managing future access and movement to the city centre. It takes up little road space and has significant environmental and health benefits. Evidence from Cambridge and from many northern European cities is that sustained investment in and promotion of cycling can significantly grow its mode share.
- Whilst Oxford has high levels of cycling (by UK standards) and has invested in cycling infrastructure, we consider that positive measures should be taken to enable it to grow significantly.
- Most of Oxford is within an easy cycle ride of the city centre and a series of high quality legible routes should be provided across it in all directions, enabling residents and visitors to access the historic core and ride across it for longer journeys.
- More and higher quality cycle parking should be provided to cater for current and future demand without affecting the quality of the public realm.

6.5.3 Detailed proposals

There are some one-way streets at present and as set out below we are proposing that more should be created. As a rule, all streets should be two-way for cycling unless there is an overwhelming case against this. One-way systems add journey distance and time, and whilst this may be tolerable when travelling in a motor vehicle the fact that cyclists are using their own power to move means that they are much less acceptable.

Experience shows that there is no significant adverse impact on safety, even on narrow two-way streets, and providing an exemption for cycling provides an immediate advantage to the mode.

Where we are proposing narrowed one-way carriageways on some of the busier streets we have presently indicated a separate two-way cycle track which will allow cyclists protection from traffic, and also removed conflict between slow cyclists and buses, and when buses are stopped

As noted above, cycle numbers are high on Magdalen Bridge but presently there are only advisory cycle lanes. The existing carriageway width appears to be some 9.8m which would enable the carriageway to be narrowed to say 6m, which would allow for two way buses, and one 1.9m wide one stepped track on either side, which would enable side-by-side cycling in each direction.

We also propose a review of the cycling restrictions on Cornmarket Street and Queen Street, particularly if Queen Street continues to be used by buses, and Cornmarket potentially becomes a bus route. The opening of the Westgate centre may have led to a rebalancing of pedestrian flows on the two streets which would further justify a review.

Although some pedestrians and interest groups may be of the view that larger numbers of fast moving cycles are more of a hazard than a low number of slow-moving buses, cycle groups would argue that the actual level of risk is very small. Research studies have typically shown that the actual level of conflict between cyclists and pedestrians on such streets are very low, and that cyclists respond to high volumes of pedestrians by travelling more slowly and eventually dismounting. Other pro-cycling cities such as Leicester have a policy of allowing cycling throughout the pedestrianised core of the city without restriction. This approach dissipates cyclist numbers across many streets, thus reducing conflict overall.

The timing of the cycling restrictions is based on an assessment of how pedestrian flows vary over the day but a more innovative approach could be to monitor this in real time. Camera technology is now available that will measure pedestrian density and could be used to trigger 'No Cycling' signs when a pre-determined trigger level is reached. If set correctly this could be used to reinforce the typical behaviour of most cyclists when faced with high pedestrian levels, as noted above. It would also reflect the fact that pedestrian numbers would probably be lower in the winter, thus enabling cyclists to use these streets during the late afternoon hours of darkness.

A number of options have been considered for increasing cycle parking and a previous study was carried out for the County Council which identified several locations around the city where small number of additional cycle spaces could be provided. The OTS also proposes converting Gloucester Green car park into a cycle park.

We propose a slightly different approach which would involve the conversion of a significant number of car parking spaces to provide parking for cycles. Typically around 8-10 cycles can be parked in instead of one car, which represents a much greater efficiency the use of scarce kerbside space (see Figure 6-14) rather than concentrating parking in single large cycle hubs as proposed in the OTS.

Consideration could also be given to providing more dedicated and secure cycle parking within city centre car parks such as Gloucester Green, although experience shows that most people try to park their cycle as close as possible to their destination within the city and so this may not have a significant effect on reducing demand for on-street cycle parking. More complex solutions such as automated underground systems were also considered, but these are likely to be prohibitively expensive and disruptive to construct.

Figure 6-14 Cycle parking replacing a single car parking space

6.5.4 Further work

The city centre streetscape study will need to assess in detail how cycling should be accommodated on all streets, including arrangements at junctions where cycle flows move to and from a two-way track. This work will need to be linked to studies on how new cycle routes into the city centre are to be provided and existing ones improved.

This should be accompanied by a more general city centre cycling study which reviews what restrictions there should be on cycling in the pedestrianised streets, if any, and whether a more flexible system could be established using real time data.

As part of the review of the on-street car parking provision in the city centre, opportunities should be identified for reallocating the space to cycle parking and developing sensitive designs for parking structures that sit well in the historic street scape.

The authorities should commission a study of cycle freight potential to develop a programme of policy measures and physical changes to support the use of cargo cycles as a replacement for deliveries by van.

6.6 Scheduled Bus Services

Buses carry more people to and from Oxford city centre than any other mode of travel, with current services comprising scheduled buses serving the wider city, routes from outlying settlements in the region and long-distance coach routes to the centre of London and Heathrow and Gatwick airports. These long-distance coach services are discussed in more detail in Section 6.7 below.

In addition, a combination of dedicated and regular bus services link the five existing park and ride sites to the city centre, with these routes also calling at some stops on their way to and from the city centre.

6.6.1 Issues to Address

As noted in Section 4 above, the limited number of approaches to the city, one from each compass point direction, result in high bus flows on some streets.

This is particularly the case on High Street and St Aldate's, since most of the city's population and therefore travel demand is to and from the east. These high bus flows result in significant congestion at the heart of the city core, particularly when buses

are unable to pass servicing vehicles or other buses waiting at stops.

This is exacerbated by the need for buses to dwell in the city centre, which is considered essential by bus operators to maintain their schedules when they are faced with significant congestion en-route and potentially very high penalties for failing to meet reliability targets set by the Traffic Commissioner..

These problems are particularly acute on the approaches the Carfax junction, which has the highest footfall in the city. This results in frequent calls to the signalised pedestrian crossing on the St Aldate's arm which further adds to vehicle delay.

The bus routes into the city are also shared with large numbers of cyclists, particularly from the east where the alternative routes into the city to the north and south involve a considerable detour.

In reviewing the operation of buses in the city centre it is necessary to consider all types of existing service – city, park and ride, inter-urban and long distance. Consideration must also be given to the changes that can be anticipated in the bus fleet as operators respond to the County's strategy of moving to BRT-quality services, as well as the need to meet the progressive roll out of the City and County Councils' Zero Emission Zone.

6.6.2 Strategy Approach

- We propose to reduce the volume of bus movements on High Street and St Aldates and through Carfax by converting these streets to one-way operation, and spreading the load more evenly across the city.
- This would mean that buses are introduced to some streets that are very lightly trafficked now, however, and we recognise that there would be some harm, particularly to heritage assets, where buses are introduced. We have sought where possible to mitigate these effects.
- Changing the routing of buses through the city centre will require new bus stop locations and may result in some existing stops being removed. These changes will need to be planned very carefully to maintain as far as possible the existing high level of accessibility to the city core.
- Passengers taking short bus journeys, say 5km and under, should be encouraged to cycle (if physically able) to help mitigate the forecast increase in local bus journeys. This will be achieved by providing increased protection for cycling on busy streets, which will also be an achieved by the one-way operation and good cycle provision on the radial routes in the suburbs.
- Journey times through the city centre will need to be predictable and consistent, to reduce bus dwell time in city. Changing the streets to one-way operation will help to achieve this by simplifying the conflicts at junctions.
- Servicing arrangements should be rethought so that vehicles do not interfere with bus movements when loading and unloading. A freight strategy which encourages the use of smaller vehicles, including cycle freight, will help to achieve this.
- Bus priority will need to extend out of the city along the corridors wherever possible, although it is recognised that opportunities are limited by the available width. The demand management measures being developed by the County Council should result in a speeding up of bus movements on the approaches to the city centre.
- We have not considered any potential changes to bus operations if the County Council were to make use of its

powers under the Bus Services Act 2017, for example the establishment of an Advanced Quality or Enhanced Partnership. While this could offer some benefits in terms of reducing bus flows along some streets, for example by setting up a multi-operator ticketing system, it is unlikely that bus flows will reduce below present levels, given the planned growth across the Local Plan area and beyond.

6.6.3 Bus Routing Options

Making High St and St Aldates one-way (but two-way for cycling) will address what we consider to be the most pressing problems in the city. This will create a major opportunity for a step change in the quality of the public realm, the setting of the heritage assets and the comfort of the pedestrian and cycling environment on the streets where bus flows are reduced.

To enable this to happen bus movement through the city centre will thus have to be re-thought, and we developed two conceptual options to test how this could be accommodated:

- Divide the city centre into two loops so that most routes do not cross the city centre but can penetrate to serve stops (Concept 1, Figure 6-15 below)
- A single loop around the city centre is provided, with options for shorter turnback loops for some services (Concept 2, Figure 6-16 below)

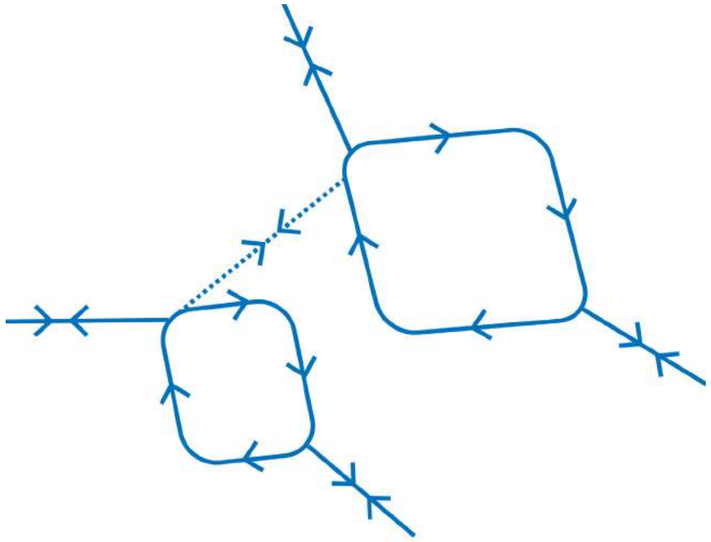


Figure 6-15 Bus concept 1: Two Loop System (note, direction of travel is reversible)

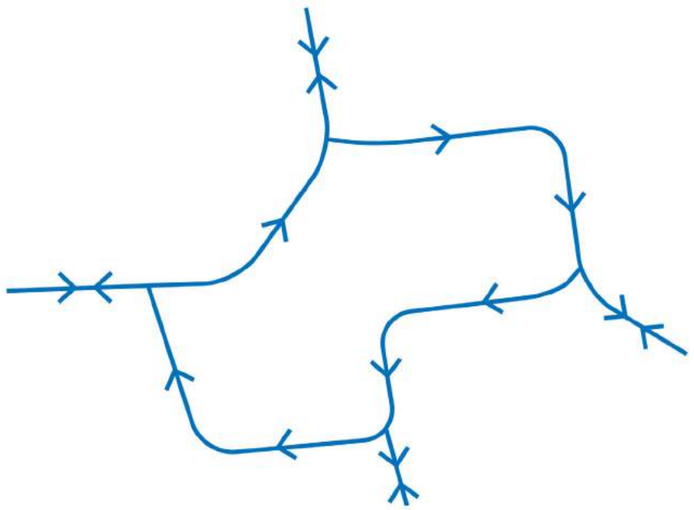


Figure 6-16 Bus concept 2: One-way system (note, direction of travel is reversible)

The direction of travel around the loops has been shown as clockwise, but this is reversible. Clockwise operation would enable buses to reach their final destination in the city centre more quickly, but anti-clockwise operation would mean that passengers would board and alight on the city centre side of the vehicles, reducing the need to cross.

6.6.4 Presentation and Review of Options

These options for bus routing around the city centre are fundamental to the overall preferred transport management strategy and were presented for further review by the Oxford Design Review Panel and subsequently at a second Stakeholder Workshop, as set out in Section 7 below.

We set out our recommendations and the further work needed to finalise the bus routing arrangements in Section 8.

6.7 Scheduled Coach Services

The 'Oxford Tube' (Stagecoach) and 'The X90' (Oxford Bus Company) provide direct coach services between Oxford and London. In addition, the Oxford Bus Company runs coaches to Heathrow and Gatwick airports, calling at a limited number of stops on the way, including in Headington.

Although the frequency of these services passing through the city on individual routes is low compared to regular scheduled buses, their presence is disproportionately felt due to the large vehicles used and the aggregation of these services along common routes.

The terminal for these coach services is Gloucester Green Coach Station, which is accessed from the western end of George Street near to its junction with Hythe Bridge Street and Worcester Street.

6.7.1 Issues to address

The routing of these large vehicles needs to be carefully considered. At present they travel in both directions along High Street and St Aldate's to Gloucester Green, where they layover.

It was suggested by some stakeholders that the long distance coaches should terminate outside the city centre – at one of the park and ride sites for example - thus avoiding any impact from these large vehicles on the city centre street network. Passengers would need to take a local bus or other mode of transport to interchange with the coaches.

There is also an issue over the potential impact of these vehicles on the Zero Emission Zone, at least in the short term. At present there are no long distance coaches that can operate on batteries for at least part of their journey.

Gloucester Green coach station functions well from the bus operators' point of view. They consider it as essential that the coaches operate from within the city centre to maintain the attractiveness of the service as a lower cost alternative to rail. Gloucester Green also provides the essential facilities required by drivers and has sufficient capacity to allow for the necessary dwell time, enabling the smooth operation of the services and driver changeover.

In land use and townscape terms, Gloucester Green coach station is less than satisfactory, however. The site is somewhat cramped and does not provide a high quality arrival space for the city, and the large coaches will constrain the scope to redesign the western Section of George Street, an important walking and cycling link, as a pedestrian priority street.

Gloucester Green town square occupies the space to the east of the coach station and although it is a reasonably well-activated space with a regular market it is inward facing and so has an awkward relationship with the rest of the city, with some sections of blank facade. The public realm within the square itself is looking somewhat tired. The ramped access into the public car park below the square is also an intrusive element.

6.7.2 Strategy approach

Our recommended approach is to:

- Retain the coach terminus in the city centre, as we consider it important that the viability of this important long-distance mode of transport is maintained. We share the operators' concern that requiring passengers to interchange outside the city centre would reduce its attractiveness and potentially its

viability.

- The routing of coach services as they enter and leave the city would need to be revised to take into account the proposed one-way street system.

6.7.2.1 Detailed proposals

Gloucester Green coach station's constrained layout for coach access and the relatively poor quality of the buildings and public realm around the town square, as well as the impact of large coaches on George Street makes the entire site a candidate for redevelopment. It is beyond the scope of this study to consider this opportunity in detail, but it could accommodate a wide range of uses including retail, leisure, employment and residential, given its high value location within the city centre.

A revised coach terminal would be needed to maintain the strong access to Oxford centre. Potential locations for this, which have the space to provide all required facilities, would include the redesigned railway station, a site on the Oxpens development, and possibly Norfolk Street (at the Westgate centre). A terminal at the station would be our preferred choice as it would be able to share the interchange facilities already provided there, i.e. car parking, taxi ranks, and cycle stands. This would create a high quality modern transport hub on the edge of the city centre and served by relatively high capacity road links.

We are well aware that there is strong resistance to the incorporation of a coach station within the redeveloped railway station, (see below), largely on viability grounds. Nevertheless, we believe that there is potentially a major gain here and the potential for a joint venture with the City Council involving both sites could be considered.

Our second preference would be for a dedicated facility in the northern part of the Oxpens development, which is closely interlinked with the railway station site. Again, we are aware that proposals are fairly well advanced for this site but given that the City Council is the major landowner and development partner it may be that a more ambitious overall scheme could be considered. However, proposals for this site are well advanced with no inclusion of an area for coach parking to serve the city.

If none of these options are feasible and Gloucester Green is retained as the terminus, its use could be restricted so that a more comfortable and accessible operation can be achieved. This would also reduce the impact of coaches on the pedestrian environment on George Street. This approach may require off-site layover facilities to be developed, so that only immediate pick up and set down takes place in the coach station itself, which could thus potentially be reduced in size.

In developing any proposals for a new or reconfigured coach terminus it may be necessary to incorporate facilities for charging hybrid/electric vehicles as part of an overall vehicle charging strategy for as part of the ZEZ roll-out.

Access to the coach terminal, for any of the options above, will need to work with the proposed one-way street system. However, due to concerns about heritage impact, it is desirable for coaches to not use any of the pedestrian priority streets, notably Holywell Street and George Street.

Alternative routes to or from (depending on the direction of operation of High Street/St Aldate's) the coach terminus include South Parks Road and Keble Road, or potentially routes further

out from the city centre: i.e. crossing the river at Marston Ferry or Donnington bridge.

6.7.3 Further work

If any of the alternative options are considered feasible in principle, a more detailed study of the potential for the relocation of Gloucester Green coach station should be carried out.

Alternatively, a strategy or management plan to limit the number and length of stay of vehicles that use Gloucester Green and improve the functioning and appearance of the coach station from a passenger perspective should be undertaken if the terminal is to remain in its present location.

In association with this it will be necessary to consider the routing options for long distance coaches to reach the terminus, carried out with the involvement of the operators.

6.8 Tourist coaches

Authorised stopping places for picking up and setting down coach passengers are provided at:

- St Aldate's (northbound), south of the junction with Speedwell Street.
- Beaumont Street (westbound), near the Oxford Playhouse
- St Giles' (northbound), in the layby near the Taylorian Library/ Ashmolean Museum

6.8.1 Issues to address

None of these locations would be affected by the proposed one-way working on key streets and so all of the bays could continue to operate as at present.

We are aware that there is congestion at some times caused by high levels of demand and coaches waiting longer than is necessary, particularly at the St Giles' stop. Police and civil enforcement officers are empowered to move on any coach which is not actually picking up or setting down passengers. These stops have not been closely managed in the past but the local authorities are funding dedicated enforcement officers during the 2018 summer season to improve compliance with the restrictions in place.

6.8.2 Strategy approach

- Some stakeholders suggested denying access for tourist coaches to the city centre, requiring them to set down and pick up at the park and ride sites, but this is not considered to be a practical strategy and it will be necessary to continue to allow coaches to gain access to the city centre. Tourists are an important element in the city's economy and their reasonable needs should be met.
- Dedicated locations for coach drop off should be retained and all three of the sites already in use are feasible, although we have recommended public realm improvements on St Giles and Beaumont Street which may be affected by the need to set aside large areas for coach drop off.
- The use of any new facility for long distance scheduled coaches could also be considered.
- A more intelligent means of managing coach drop off and pick up should be considered, potentially making use of new technology to pre-book spaces.

6.8.3 Detailed proposals

The present principle of long-stay at city-edge, drop-off/pick up in city centre should be retained as this provides an appropriate balance between use of city centre space and access for tourist coaches. The principal long stay parking area should remain at Redbridge as this has become established; Redbridge has the greatest spare capacity of all the P&R sites, and is a short distance from the city centre.

Tourist coaches should have stricter parking controls in the city centre. These will ideally combine a requirement to pre-book drop-off and pick-up locations/slots. Liaise with key tourist attractions to develop a phased arrival policy – this may have benefits to crowd management within the venues as well as on-street congestion

Dedicated spaces should continue to be provided, and a number of options can be considered, including the retention of one or more of the existing locations, the possibility of some provision at any revised long-distance scheduled coach terminus, or in other on-street locations around the city centre. The anticipated reduction in general traffic following the introduction of the demand management measures may make it easier to identify on-street locations.

Further options could include Oxpens Road, possibly widened for this purpose, the existing bus area around the Westgate centre on Norfolk Street or a suitable on-street location in the science area.

Drop-off/pick up points should be located so as to minimise the visual, noise and air quality impacts of coaches and provide a good visitor experience. Any drop-off/pick up points in sensitive historic streets should be accompanied by street design proposals to help mitigate their impact.

6.8.4 Further work

A more detailed study of tourist coach set down and pick up requirements should be carried out, taking into account existing and future demand, the potential for closer management and leading to the identification and outline design of suitable locations.

6.9 Taxis

There are six official taxi rank locations for licenced Hackney carriages in the city centre, as shown on Figure 6-17.

Licenced private hire vehicles are not permitted to stand on the ranks or pick up passengers on street.

In all other respects both types of taxi operate similarly and are exempt from the access restrictions on High Street, St Aldates and George Street. Taxis are not permitted to travel along Cornmarket Street, Queen Street and the Westgate 'bus link' of Castle Street and Norfolk Street at any time.

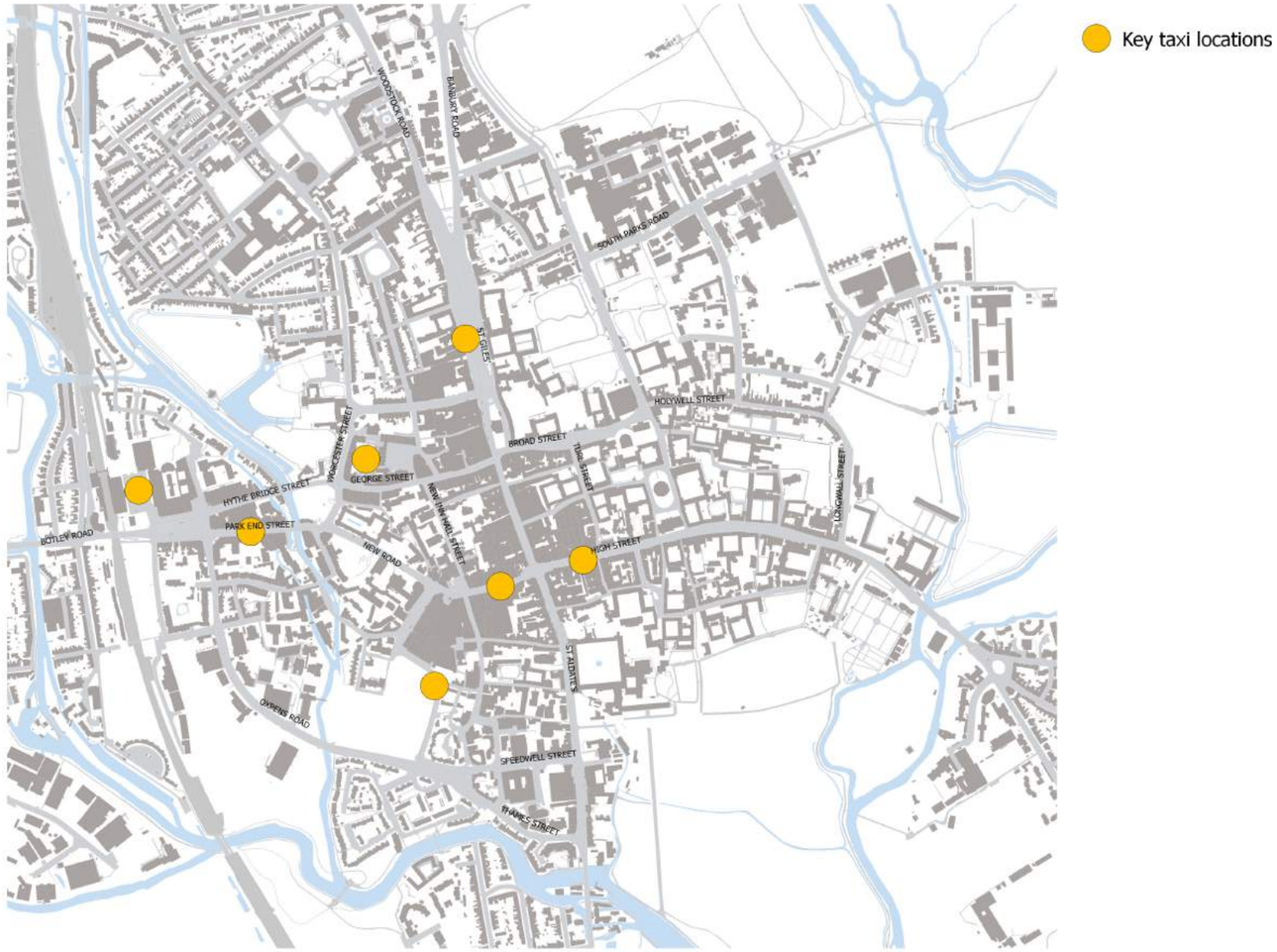


Figure 6-17 Key Taxi rank locations

6.9.1 Issues to address

Conflict with pedestrians was reported when a taxi rank was operating on Cornmarket (while buses and taxis were not allowed to use Queen Street), which required taxis to execute a u-turn. We have observed that similar problems are currently occurring at Carfax, adding to the level of congestion at this key location. It will be necessary to carefully consider taxi access and rank locations in developing the detailed proposals for the revised city centre streets. The Zero Emissions Zone may prevent excluding

taxis from the city centre unless supporting measures are put in place to support the uptake of electric and hybrid taxi vehicles.

6.9.2 Strategy approach

- Taxis play an important role in filling in the gaps in the public transport system for people who are not well served with buses and may otherwise drive into the city centre.
- Retaining taxi access in the city centre will therefore continue to be important.

6.9.3 Detailed proposals

Generally, given their role in supplementing the public transport system, taxis and private hire vehicles should be treated as buses on the one-way and two-way streets.

It will be more difficult to guarantee that taxi drivers will choose to drive slowly and cautiously along the pedestrian priority streets, such as Queen Street and Cornmarket and therefore we propose that taxis should not be permitted to travel along these streets. Taxi access to Holywell Street and George Street may need to be retained, however, possibly restricted to access for pre-booked pick up and drop off only.

We envisage that suitable locations for taxi ranks will be possible on the one-way streets of High Street and St Aldates due to the reallocation of road space. It may also be possible to introduce a rank on Broad Street although we recognise that this is a sensitive location.

Any new or re-located taxi ranks should reflect the requirements of the emerging Zero Emissions Zone by providing plug-in charging points, or potentially a system of inductive charging installed as part of the street works.

6.9.4 Further work

The proposed streetscape study will need to assess in detail how taxi ranks can be provided across the city centre to provide a reasonable distribution of sites.

6.10 Servicing and Deliveries

Figure 6-18 Taxi drop-off at Carfax

6.10.1 Issues to address

The city is currently divided into four loading zones, accessed from each of the respective compass points. This approach is effective as part of the general strategy of displacing traffic away from the city centre. Figure 6-19 shows the existing (but not showing Westgate changes) servicing traffic management system for the city centre which uses a number of control points to prevent unauthorised access to particular streets. Some but not all of these control points are camera enforced, others (e.g. at the western end of Broad Street) use physical controls with drop-down bollards.

The restrictions include

- a ban on any access to Cornmarket Street and Queen Street for servicing between 10am and 6pm
- no access through High Street (and also through the parallel route of King Edward Street/Merton Street) for service vehicles between 7.30am and 6.30pm
- a permanent closure to all vehicles at the western end of Broad Street
- a permanent closure to all vehicles at the eastern end of Holywell Street
- No loading and unloading on double yellow lines High Street and St Aldate's during the peak hours.

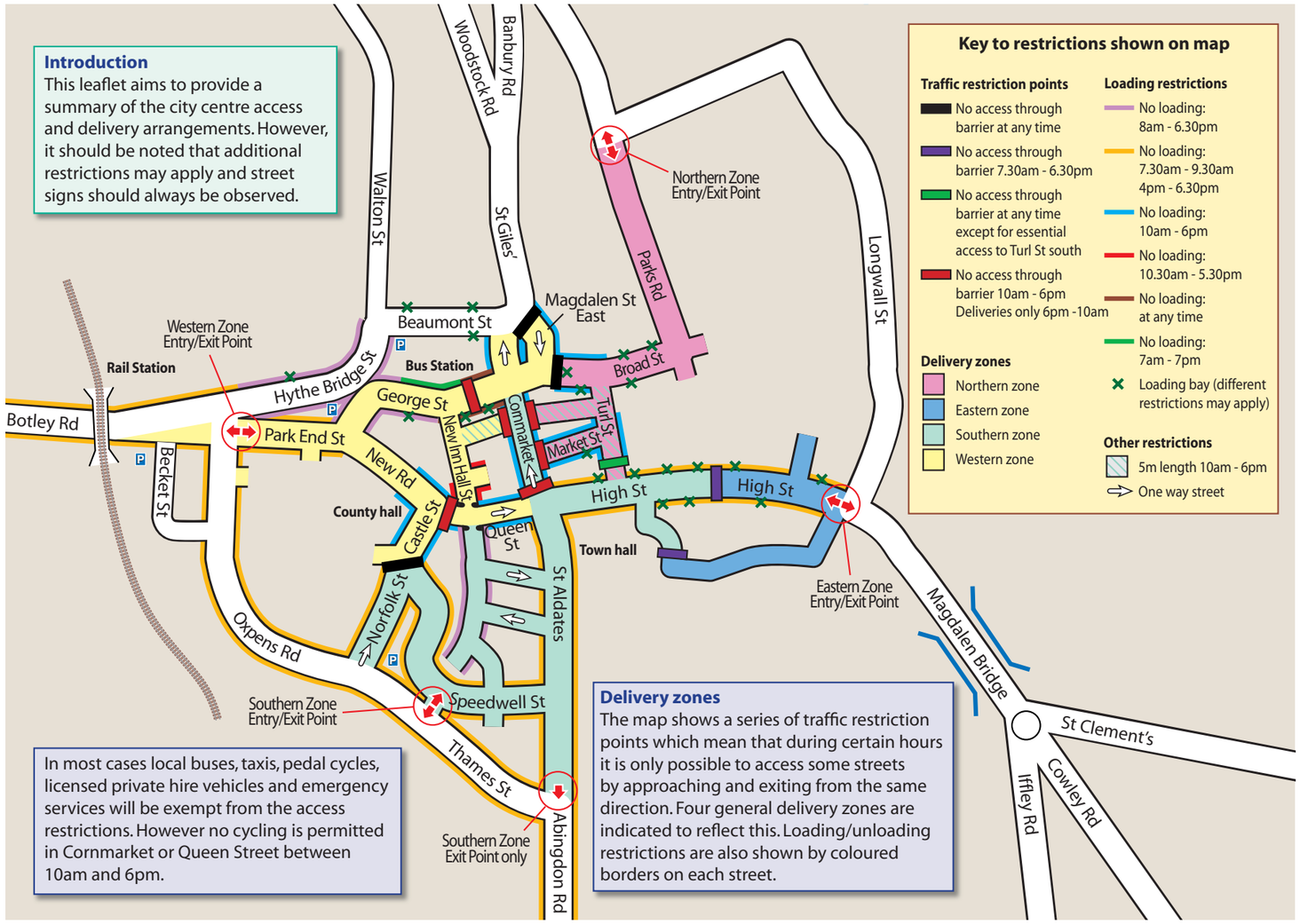


Figure 6-19 Existing City Centre Servicing Traffic Management System

- During these and other times loading and unloading is permitted on High Street in a number of defined loading bays, as well as on Broad Street, Beaumont Street and Hythe Bridge Street.
- The area around Carfax has recently been changed to prevent loading 12:00 - 20:00.

6.10.2 Issues to address

The proposed changes to the routing of traffic in the city centre will mean that this system of control will need to be fundamentally reconsidered.

The principal means of enforcing the daytime ban on general traffic passing through the city centre on High Street is achieved by a camera-enforced traffic control point between Catte Street and Queens Lane. At this point the carriageway is wide and non-authorised vehicles approaching from either side are able to u-turn and leave the area.

Making High Street one-way and narrowing the carriageway will mean that this means of control is no longer possible.

Similarly, service traffic to Broad Street and the Covered Market area, which currently enters and leaves via Parks Road, will no longer be able to leave this way.

6.10.3 Strategy approach

- Oxfordshire County Council has previously commissioned studies on the potential to reduce the number and size of service vehicles needing to access the city centre through a range of interventions, including policies requiring and encouraging organisations to develop Delivery and Servicing Plans and the establishment of consolidation and micro-consolidation centres outside the city centre. These initiatives should be restarted.
- Our proposed approach to manage service access is to extend and upgrade the use of camera enforcement to prevent access to the restricted streets in the city centre. These control points would need to be integrated with any additional traffic control points (e.g. on Hythe Bridge Street) introduced as part of the OTS demand management strategy.
- The detail and timing of the restrictions would depend on the final bus routing arrangements, as discussed in Section 7 below. In general, however we propose a consistent approach to the main pedestrian priority streets, whereby servicing on Cornmarket Street, Queen Street and George Street is only permitted between 6pm and 10am.
- Any time limitations on the ban on general (non-servicing) traffic travelling along High Street in one direction would depend on the outcomes of the OTS demand management/ traffic control studies.
- We propose that vehicles with a need to gain access for servicing to the one-way streets of High Street, St Aldate's and Broad Street (together with the places and streets taking access from them such as the Covered Market) would be allowed to travel in and out of the streets at all times, following the general one-way route. This would in some cases reduce the overall amount of travel where vehicles making multi-drops are able to take a continuous route around the city.
- The reallocation of road space on these streets means that there will still be opportunities to create defined areas for loading and unloading that do not conflict with traffic, particularly buses. This means that it may be possible to

provide more opportunities for servicing during the peak hours than at present, which will spread demand throughout the day.

6.10.4 Detailed proposals

We propose that the camera enforcement systems should use Automatic Number Plate Recognition technology to maximise the efficiency of the enforcement process, including the generation of any Fixed Penalty Notices.

Where servicing traffic would be exempt from the general ban on driving (e.g. along High St/St Aldate's and Broad Street) it would be necessary to use at least two cameras to record vehicles as the enter, leave and travel through the system. Any individual vehicle which passed through in less than a defined time would trigger an alert, and operatives would then be able to check using the cameras whether the vehicle did stop to carry out a permitted servicing activity. Any drivers of vehicles that did not do so would be liable to a penalty.

Loading areas would be provided as part of the overall redesign of the streets, and we have noted earlier that these could include loading pads at footway level so that the space is available for pedestrians to use when it is not occupied by servicing vehicles.

To reduce signs and markings to the minimum and to improve the level of enforcement, consideration should be given to establishing a system of virtual loading bays, where only vehicles that have pre-booked the use of the space would be allowed to use it. Virtual Loading Bays are currently being trialled in Wandsworth and on the Transport for London Road Network.

6.10.5 Further work

A more detailed study will be needed to assess the future level of demand for servicing across the city centre and how it can best be managed and accommodated, including through the use of new technology and cycle freight.

This study should explicitly consider how the number of freight movements and the size of vehicles could be minimised. This could be advanced through close working between the two local authorities and the University, as major employers and businesses operating from multiple sites across the city centre.

The proposed streetscape study will need to consider in detail how the required provision for servicing can be provided across the various locations in the city.

6.11 Disabled car and cycle parking and access

Disabled car parking is currently allowed in a number of locations within the city centre, as shown in Figure 6-20. In total there are 98 designated bays for blue badge holders. Disabled parking is lawful on yellow lines for up to three hours, except when loading and unloading is banned.

6.11.1 Issues to address

The provision of blue badge parking is spread well across the city centre, but access restrictions and loading restrictions are inconsistent and therefore confusion can arise.

The over-subscription of existing cycle parking can limit disabled cyclists' ability to park a tricycle or other specifically-adapted cycle, especially if they have mobility impairments.

6.11.2 Strategy approach

- Access to the city centre is essential for disabled people, regardless of their form of transport, but parking for their vehicles, both cars and cycles must be accommodated in a way that does not detract from other functions of the street.

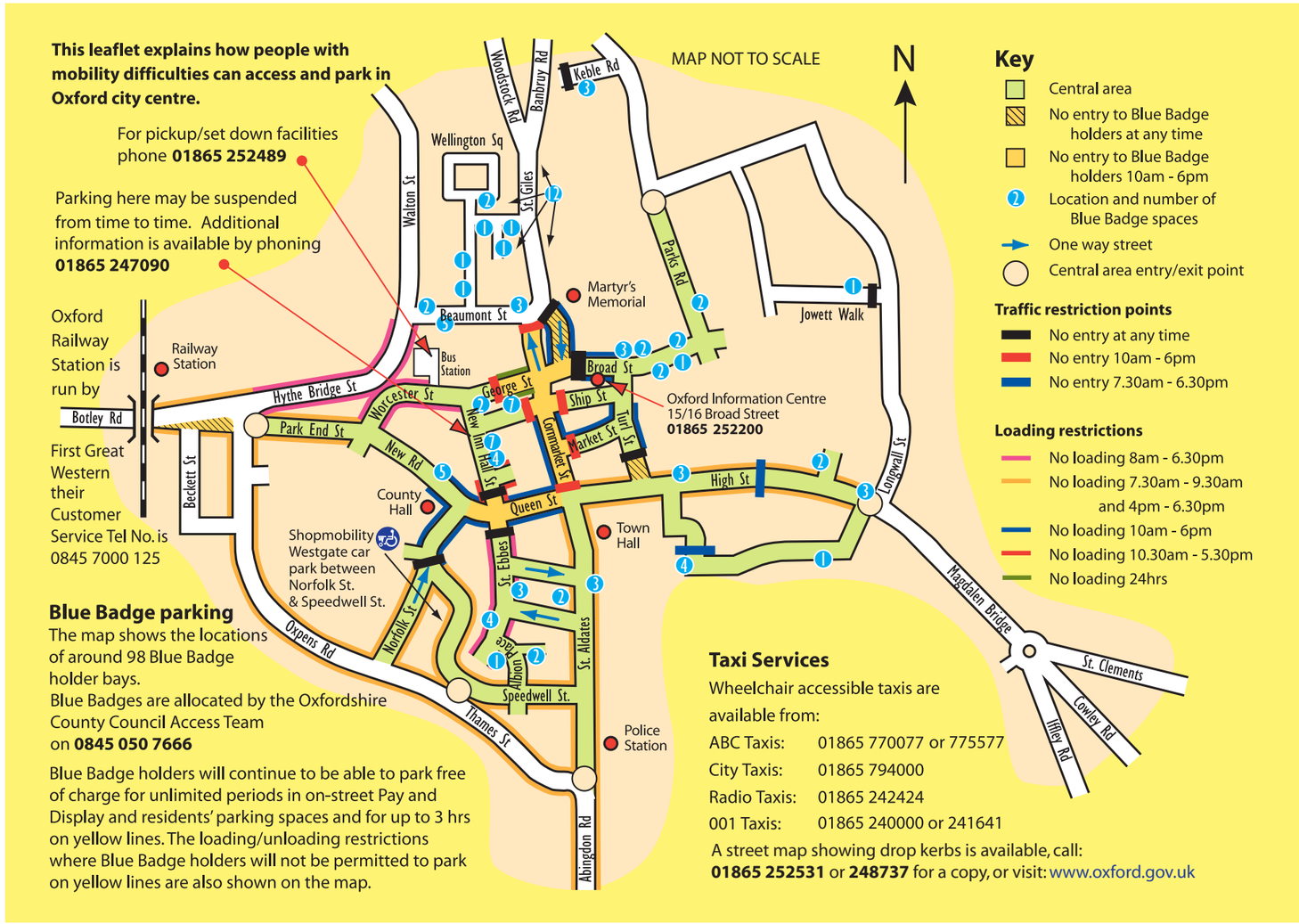


Figure 6-20 Disabled access and parking in the city centre

- The design and location of bus stops, footways, parking and cycling facilities should be designed with the needs of people with disabilities in mind.

6.11.3 Detailed proposals

Disabled people using cars will need to continue to gain access to the one-way streets and so the traffic orders will need to be drafted to permit them to use them. The proposed ANPR camera enforcement system described in Section 6.10 will need to be designed to accommodate this.

Areas for disabled car parking should be provided as part of the overall design of the streets and distributed around the city centre to maintain good accessibility for mobility-impaired people. As with loading areas, where possible these should be designed so that they may be used as footway space when they are not occupied.

Areas for cycle parking should be designed to accommodate tricycles and adapted cycles.

6.11.4 Further work

Detailed engagement with representative groups should be undertaken through the next stages of the design process to understand the specific requirements for disabled people using all modes of transport.

At present off-street blue badge spaces are charged at full rates; on-street spaces are free to use. This places more pressure on the on-street spaces.

A more detailed study to assess the future level of demand including a review of the charging policy for disabled car parking will be required. The proposed streetscape study will need to consider in detail how the required provision for disabled car and cycle parking can be provided in various locations around the city centre.

6.12 Car parking

Car parking in the city centre comprises a mixture of on street and off street parking. Current car parking capacities are as follows:

On Street (excluding blue-badge holder only bays):

- St. Giles - 141 spaces
- Broad Street - 25 spaces
- Beaumont Street - 15 spaces
- Longwall Street - 13 spaces
- Mansfield Road - 61 spaces
- TOTAL ON STREET = 255 spaces

Off Street:

- Gloucester Green car park - 104 spaces
- Becket Street car park (train station) - 556 spaces (rail users only)
- Oxpens car park - 420 spaces
- Westgate Oxford car park - 1000 spaces (Managed by Westgate Alliance)
- Worcester Street car park - 180 spaces
- TOTAL OFF STREET = 2,260 spaces

KEY

On street:
- St Giles - 141 spaces
- Broad Street - 25 spaces
- Beaumont Street - 15 spaces
- Longwall Street - 13 spaces
- Mansfield Road - 61 spaces

Off street:
- Gloucester Green - 104 spaces
- Becket Street - 556 spaces
- Westgate Oxford - 1000 spaces
- Oxpens - 420 spaces
- Worcester Street - 180 spaces

Figure 6-5 Car park locations

6.12.1 Issues to address

Car parking on key streets in the city centre has a negative impact on the quality of the street scene and compromises heritage assets, e.g. parking on St. Giles, Beaumont Street and Broad Street (see Figure 6-6).

6.12.2 Strategy approach

- Remove, reduce or rationalise on street car parking in key streets including St. Giles, Broad Street and Beaumont Street.

Figure 6-6 On street parking on Broad Street

Figure 6-7 On street parking and congestion on Beaumont Street

6.12.3 Detailed proposals

We recognise that removing car parking from St. Giles, Broad Street and Beaumont Street will have revenue implications for the City Council and therefore it is recognised that alternative funding streams (for example arising from demand management measures) are likely to be needed to make a significant loss of parking income acceptable.

Total removal of parking from Broad Street and Beaumont Street should be seen as a priority. Partial removal of parking from St. Giles (up to 50%) would have a significant impact on the overall quality of the street scene and would allow for significant place making improvement in the vicinity of the Ashmolean Museum.

Total removal of parking in these locations would result in the loss of some 181 car parking spaces. This represents 7% of the total parking in the city centre (71% of the total on street spaces) in the city centre.

It should be possible to replace some of the car parking with well-designed cycle parking, enabling a much more efficient use of the space while respecting the quality of the place.

6.12.4 Further work

A more detailed study will be needed to assess the future level of demand for on street and off street car parking and the proposed streetscape study will need to consider in detail how the required provision for car and cycle parking can be provided in various locations around the city centre.

7 Option Development and Appraisal

7.1 Introduction

It is important to recognise that while improving the public realm is vital to securing the environmental and economic success of Oxford, the key to achieving this is to rethink the city centre's transport management system so that more of its scarce street space can be given over to place activities, walking and cycling whilst preserving and enhancing access by public transport.

The previous Section 6 set out our recommended design approaches for the various uses and modes of transport that the street network must handle. These are underpinned by the strategy of redistributing motor traffic more evenly across the city centre to reduce pressure on the most problematic streets.

This Section of the report describes in more detail the transport movement options which were developed during our study, with a particular focus on bus routing. These were appraised using the five theme process and this was presented to the Oxford Design Review Panel (ODRP) and a second Stakeholder Workshop. The outcomes of these events are reported below, and this has enabled us to draw our final overall recommendations, which are presented in Section 8.

7.2 Concepts and Option Appraisal

The options presented to the ODRP and the stakeholders were generated from the two overarching approaches to city centre bus movement which were introduced in Section 6.6.

The two loop and one loop systems were applied to particular streets so that their implications could be better understood and considered by the consultees.

'Inner' and 'outer' variants were created for each option which used different streets on the eastern side of the city.

Option 1 – Two loop system

Concept 1 ((as presented at Public Consultation) provides two separate loops for bus movement on either side of the city core, as shown on Figure 7-1 (outer) and 7-3 (inner). Although both options would reintroduce bus movements to Cornmarket Street they would enable other significant streets to be made pedestrian priority including Queen Street and St Aldates.

This option assumes the predominant bus corridors continue to operate radially, and that cross-town services run north-east, west-south, and vice-versa. This arrangement largely balances the radial flows, but turnback is most likely to be required on the eastern arm.

Despite the two loops being separate, there is still scope for some services to transfer between the two loops, say via Beaumont Street, George Street or Queen Street, although has not been shown explicitly on the plans.

In both sub-options High Street and Cornmarket Street would be one-way for buses. Buses on Cornmarket Street would be required to travel very slowly without stopping, similar to how Queen Street presently operates.

Retaining some buses on Queen Street would be an option, although the two loop strategy would assume that most buses would travel around the western side of the city via Castle Street and Norfolk Street.

Service and other permitted access traffic using High Street would also need to pass along St Aldate's to enter or leave (depending on the direction of operation).

Streets around the north-western and south-western side of the city could remain two-way for buses although there are pinch points on Longwall Street which would need careful consideration. The anticipated reduction in general traffic due to the proposed demand management measures should mean that two-way operation is feasible on Longwall Street, although this would need to be tested through more detailed traffic modelling.

Similarly Oxpens Road and Thames Street are currently regularly congested, however they will benefit from an anticipated reduction in general traffic due to the proposed demand management measures. New Road and Castle Street/Norfolk Street function well as two-way streets at the moment without significant conflicts or delay.

Option 1 would require some rethinking of the County Council's BRT strategy for the city, which proposes east-west and north-south movements across the city centre. The option would sit

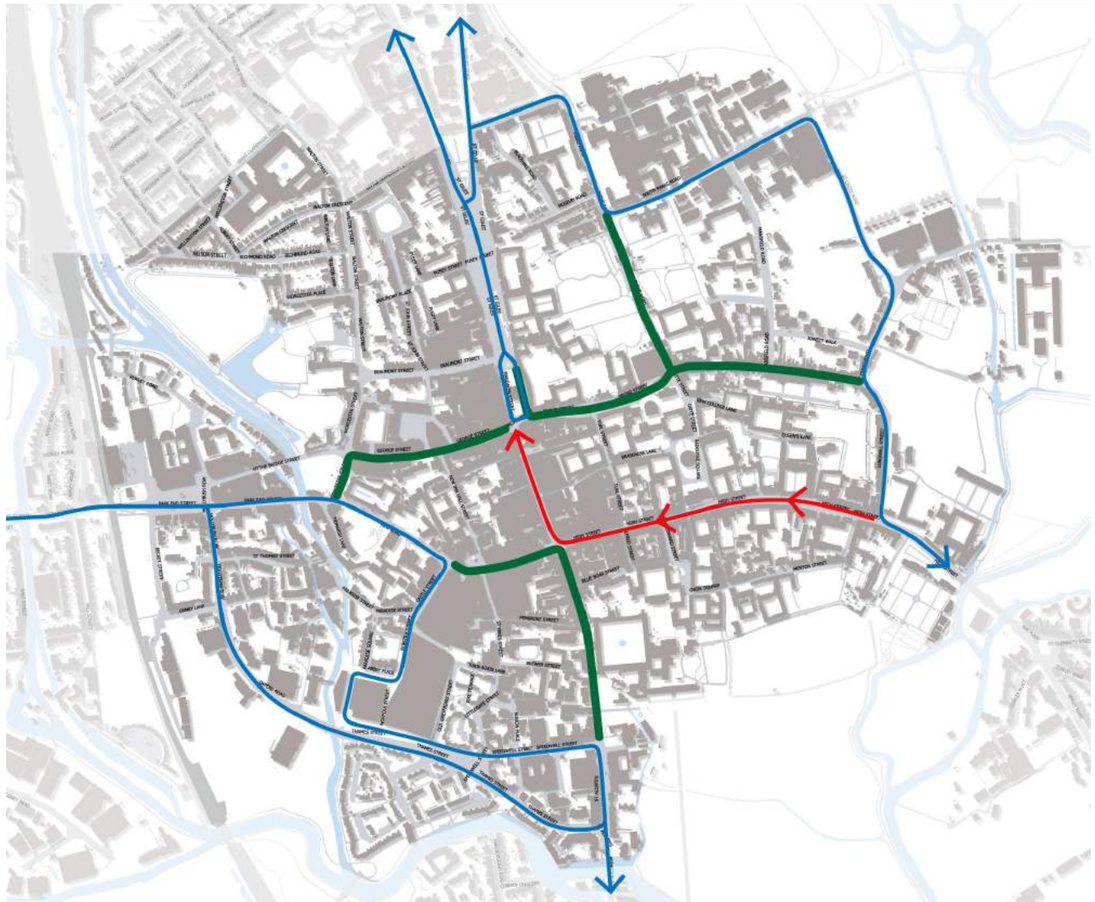


Figure 7-1 Option 1a: Two Loop System (outer)

Figure 7-2 Evaluation Matrix – Option 1a: Two Loop System (outer)

	INCLUSIVITY	MOVEMENT	PUBLIC REALM	SAFETY & PUBLIC HEALTH	ECONOMY
Positives	▪ High level of bus penetration into the city. ▪ Small walk distance for bus interchange. ▪ Greater pavement width on a number of streets allows for improved space for walking and more potential for rest areas (seating). ▪ Queen Street and northern end of St Aldate's pedestrian priority.	▪ Bus: improved speed and reliability. Improved bus access to NE city centre and N-E and S-W cross city movement now possible. ▪ Cycling: two way cycling on all one way routes. ▪ Walk: higher volume of walking space with wider pavements. ▪ Walk: reduced number of blocked pavements through crowding from bus stops. ▪ Walk: Queens street / outside Westgate entrance now pedestrian priority. ▪ General traffic: all movements still available.	▪ Queen Street and northern end of St Aldate's pedestrian priority. ▪ Greater pavement width on a number of streets allows for improved space for walking and more potential for rest areas (seating).	▪ Reduced conflict between cycles and buses ▪ Queen Street / Westgate main entrance now pedestrian priority. ▪ Reduced conflict with buses on High Street and St Aldate's.	▪ Long distance coaches can still access city. ▪ Tourist coaches to be allowed to circulate on bus routes with dedicated drop off areas. ▪ Servicing should remain as is, with parking pads in key locations to keep them from blocking one way bus routes. ▪ Significant increase in cycle parking due to narrowed carriageways and some car parking removal.
Negatives	▪ Some movements still not easily catered for by bus. ▪ Cornmarket opened up for buses. ▪ Reduced accessibility to centre compared to inner loop.	▪ Bus: Reduced space for layover, this will need to take place outside city (other end of route). ▪ Walk: Cornmarket now has buses running along it reducing capacity. ▪ No interchange between buses serving east Oxford and rail / coach stations.	▪ Cornmarket opened up for buses.		▪ Tourist coach dwell areas will need investigating. ▪ Bus layover moved out of city. ▪ Removal of some city centre on -street car parking.

well with north to east and south to west movements, however. Connectivity between the railway station and buses serving east Oxford would be more problematic with this option.

Under the Outer route option (Figure 7-1), buses would travel around the north-eastern quadrant via St Cross Road, South Parks Road and Parks Road. Opening up Keble Street to buses (and retaining cycle access) provides a useful shortcut on the north-east side of the city. Depending on the direction of travel, it may be necessary to enable buses to turn sharp right from Banbury Road to Woodstock Road, a movement which is not possible at present.

Under the Inner route option (Figure 7-3), buses would use Broad Street and Holywell Street as an alternative to the route around the north-eastern quadrant.

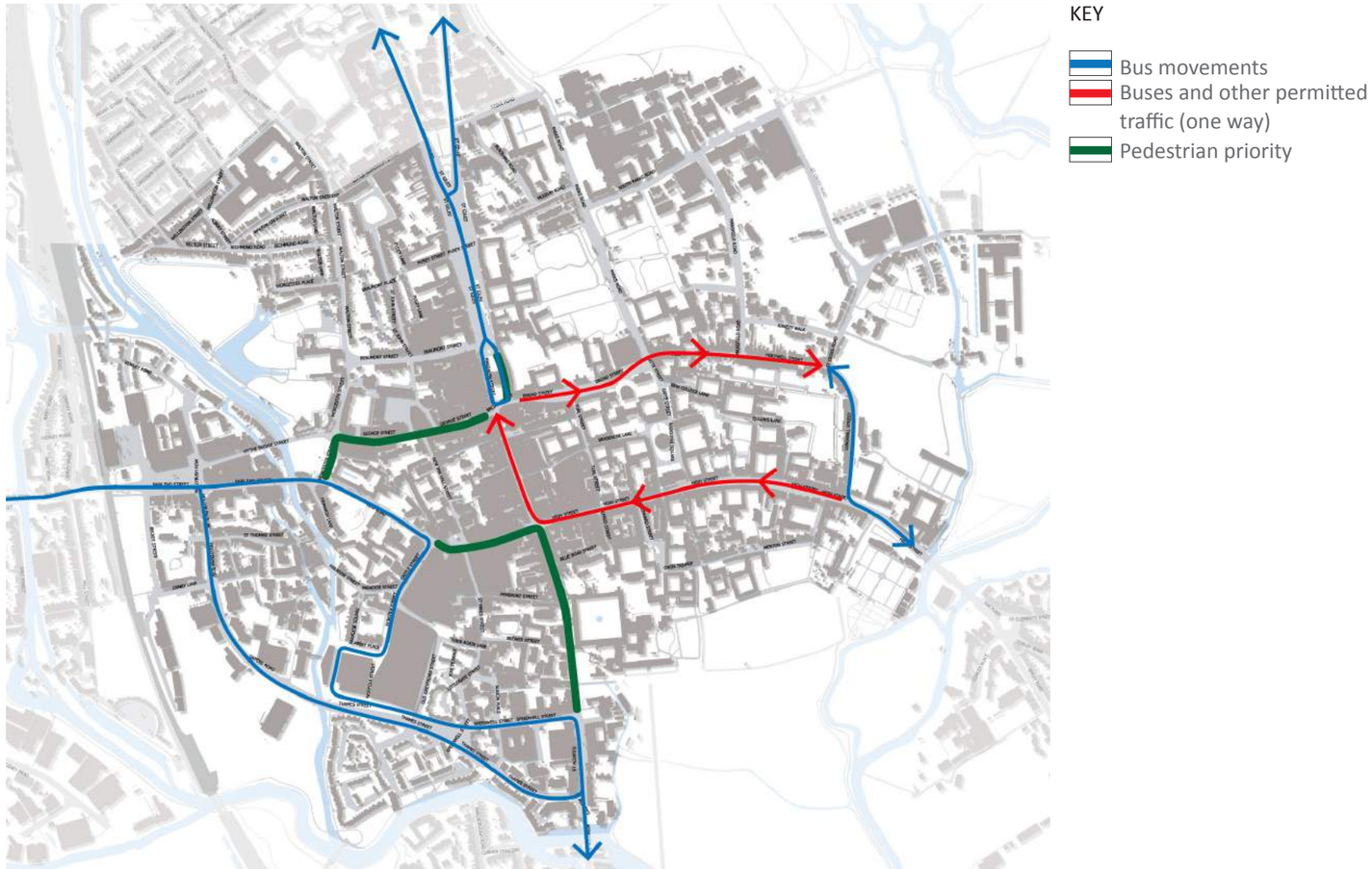


Figure 7-3 Option 1b: Two Loop System (inner)

Figure 7-4 Evaluation Matrix – Option 1b: Two Loop System (inner)

	INCLUSIVITY	MOVEMENT	PUBLIC REALM	SAFETY & PUBLIC HEALTH	ECONOMY
Positives	▪ High level of bus penetration into the city. ▪ Small walk distance for bus interchange. ▪ Greater pavement width on a number of streets allows for improved space for walking and more potential for rest areas (seating). ▪ Queen Street and northern end of St Aldate's pedestrian priority.	▪ Bus: improved speed and reliability. Improved bus access to NE city centre and N-E and S-W cross city movement now possible. ▪ Cycling: two way cycling on all one way routes. ▪ Walk: higher volume of walking space with wider pavements. ▪ Walk: reduced number of blocked pavements through crowding from bus stops. ▪ Walk: Queens street / outside Westgate entrance now pedestrian priority. ▪ General traffic: all movements should still be available.	▪ Queen Street and northern end of St Aldate's pedestrian priority. ▪ Greater pavement width on a number of streets allows for improved space for walking and more potential for rest areas (seating).	▪ Reduced conflict between cycles and buses ▪ Queen Street / Westgate main entrance now pedestrian priority. ▪ Reduced conflict with buses on High Street and St Aldate's.	▪ Tourist coaches to be allowed to circulate on bus routes with dedicated drop off areas. ▪ Servicing should remain as is, with parking pads in key locations to keep them from blocking one way bus routes. ▪ Significant increase in cycle parking due to narrowed carriageways and some car parking removal.
Negatives	▪ Some movements still not easily catered for by bus. ▪ Cornmarket opened up for buses.	▪ Bus: Reduced space for layover, this will need to take place outside city (other end of route). ▪ Walk: Cornmarket now has buses running along it reducing capacity. ▪ No interchange between buses serving east Oxforfd and rail / coach stations.	▪ Cornmarket opened up for buses. ▪ Broad Street and Holywell Street used by one-way buses (but large areas of pedestrian space created).		▪ Tourist coach dwell areas will need investigating. ▪ Bus layover moved out of city. ▪ Removal of some city centre on -street car parking.

Option 2: One Loop System

Option 2 (as presented at Public Consultation) envisages a principal bus route around the city centre, generally following one direction, as shown on Figure 7-5 (outer) and Figure 7-7 (inner). This concept would enable the creation of a coherent network of pedestrian priority streets across the entire city centre core.

Option 2 again assumes the predominant bus corridors to operate radially but allows more flexibility in bus routing than Option 1 as all combinations of radial routes are possible. It would create better connectivity across the city centre and enable more people to reach their ultimate destination without changing buses but there may be an increase cross-city journey times.

In both sub-options High Street and St Aldate's would be one-way for traffic. As with Option 1, streets on the north-east and south-west quadrants of the city could remain two-way.

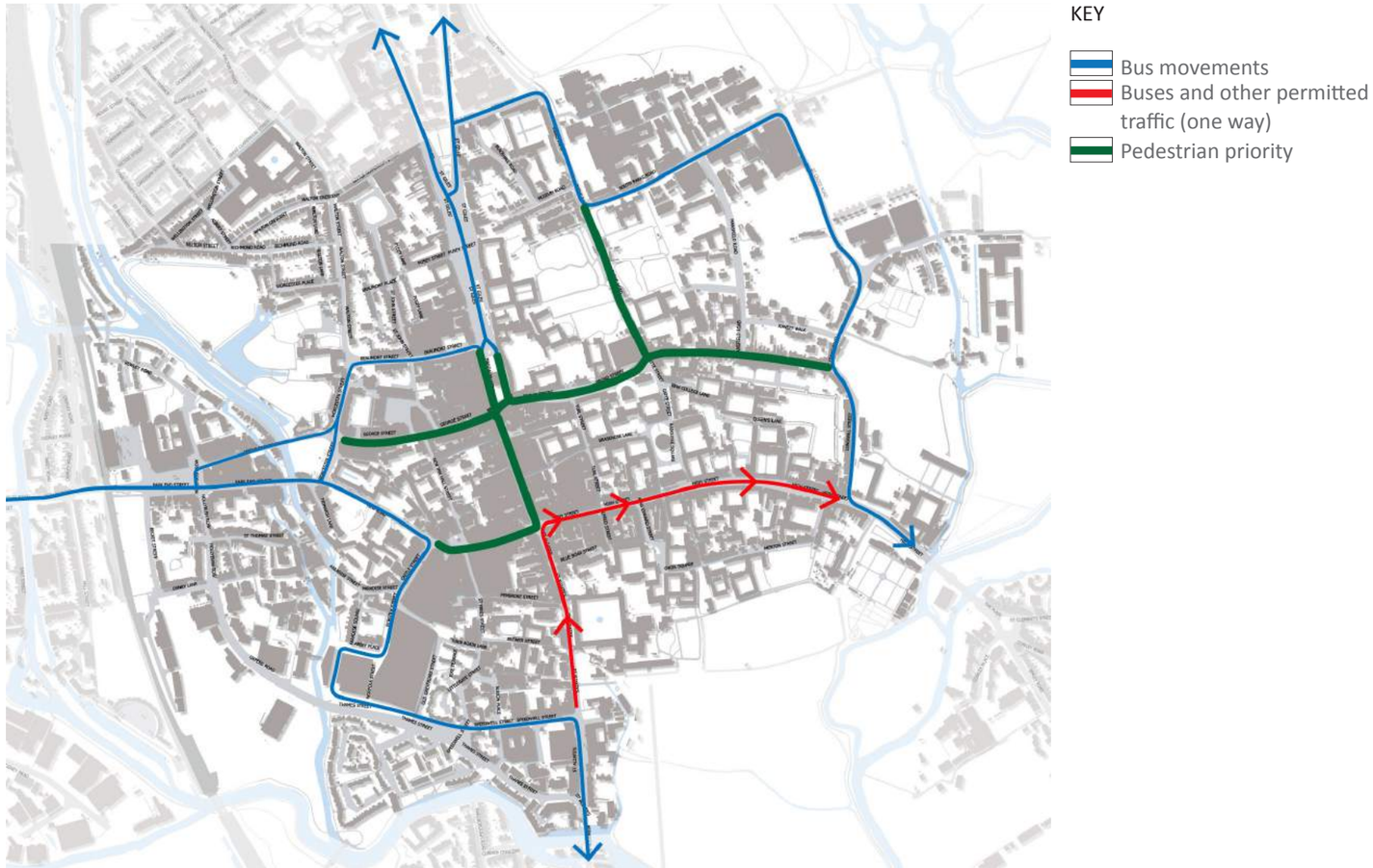


Figure 7-5 Option 2a: One-way system (outer)

Figure 7-6 Evaluation Matrix – Option 2a: One-way system (outer)

	INCLUSIVITY	MOVEMENT	PUBLIC REALM	SAFETY & PUBLIC HEALTH	ECONOMY
Positives	▪ High level of bus penetration into the city. ▪ Higher chance of getting closer to your destination by bus than existing. ▪ Small walk distance for bus interchange. ▪ Greater pavement width on a number of streets allows for improved space for walking and more potential for rest areas (seating). ▪ Queen Street and Cornmarket Street pedestrian priority.	▪ Bus: improved speed and reliability. ▪ Bus: cross city movement now possible. ▪ Cycling: two way cycling on all one way routes. ▪ Walk: higher volume of walking space with wider pavements. ▪ Walk: reduced number of blocked pavements through crowding from bus stops. ▪ Walk: Queens street / outside Westgate entrance now pedestrian priority. ▪ General traffic: all movements should still be available. ▪ Survey results: Works with analysis of key movements	▪ Queen Street and northern end of St Aldate's pedestrian priority. ▪ Greater pavement width on a number of streets allows for improved space for walking and more potential for rest areas (seating).	▪ Reduced conflict between cycles and buses. ▪ Queen Street / Westgate main entrance now pedestrian priority. ▪ Reduced conflict with buses on High Street and St Aldate's.	▪ Tourist coaches to be allowed to circulate on bus routes with dedicated drop off areas. ▪ Servicing should remain as is, with parking pads in key locations to keep them from blocking one way bus routes. ▪ Significant increase in cycle parking due to narrowed carriageways and some car parking removal.
Negatives		▪ Bus: Reduced space for layover, this will need to take place outside city (other end of route) ▪ Some bus movements may be longer and appear circuitous, putting people off.			▪ Tourist coach dwell areas will need investigating. ▪ Bus layover moved out of city. ▪ Removal of some city centre on -street car parking.

Under the Outer route option (Figure 7-5) buses would use St Cross Road, South Parks Road and Parks Road as well as Keble Street (currently cycle only), while with the Inner route option (Figure 7-7) buses would instead use Broad Street and Holywell Street.

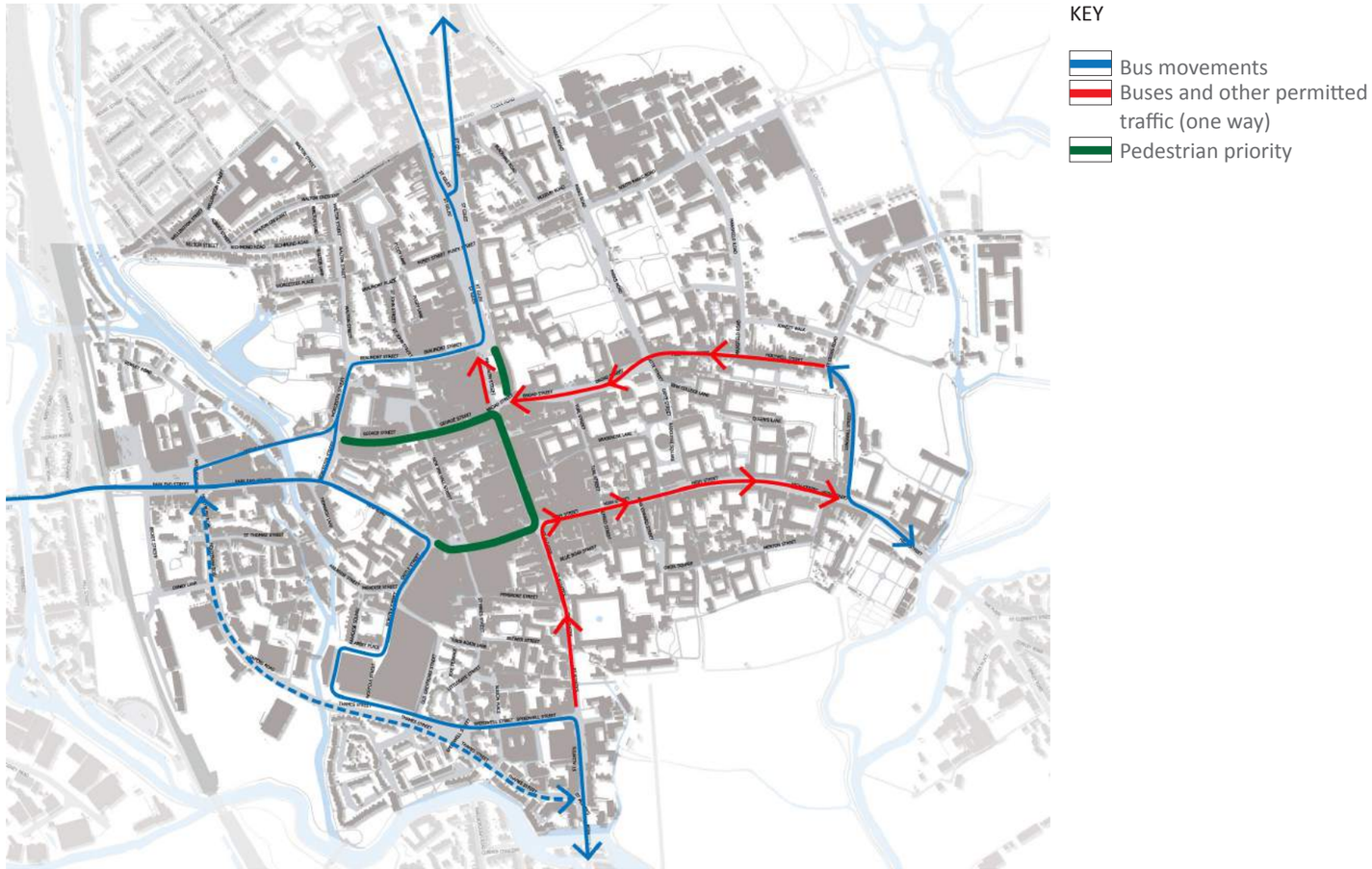


Figure 7-7 Option 2b: One-way system (inner)

Figure 7-8 Evaluation Matrix – Option 2b: One-way system (inner)

	INCLUSIVITY	MOVEMENT	PUBLIC REALM	SAFETY & PUBLIC HEALTH	ECONOMY
Positives	▪ High level of bus penetration into the city. ▪ Higher chance of getting closer to your destination by bus than existing. ▪ Small walk distance for bus interchange. ▪ Greater pavement width on a number of streets allows for improved space for walking and more potential for rest areas (seating). ▪ Queen Street and Cornmarket Street pedestrian priority.	▪ Bus: improved speed and reliability. ▪ Bus: cross city movement now possible. ▪ Cycling: two way cycling on all one way routes. ▪ Walk: higher volume of walking space with wider pavements. ▪ Walk: reduced number of blocked pavements through crowding from bus stops. ▪ Walk: Queens street / outside Westgate entrance now pedestrian priority. ▪ General traffic: all movements should still be available. ▪ Survey results: Works with analysis of key movements	▪ Queen Street and northern end of St Aldate's pedestrian priority. ▪ Greater pavement width on a number of streets allows for improved space for walking and more potential for rest areas (seating). ▪ Creates legible network of pedestrian priority street across the entire city centre core.	▪ Reduced conflict between cycles and buses. ▪ Queen Street / Westgate main entrance now pedestrian priority. ▪ Reduced conflict with buses on High Street and St Aldate's.	▪ Tourist coaches to be allowed to circulate on bus routes with dedicated drop off areas. ▪ Servicing should remain as is, with parking pads in key locations to keep them from blocking one way bus routes. ▪ Significant increase in cycle parking due to narrowed carriageways and some car parking removal.
Negatives		▪ Bus: Reduced space for layover, this will need to take place outside city (other end of route) ▪ Some bus movements may be longer and appear circuitous, putting people off.	▪ Broad Street and Holywell Street used by one-way buses (but large areas of pedestrian space created).		▪ Tourist coach dwell areas will need investigating. ▪ Bus layover moved out of city. ▪ Removal of some city centre on -street car parking.

7.3 ODRP and Stakeholder Workshop 1 Feedback

The project team presented these design concepts, and the analysis and thinking that underpinned them, to the Oxford Design Review Panel (ODRP) in December 2017 and to key stakeholders in at a second workshop event January 2018.

ODRP

The meeting of the ODRP took place on 7 December 2017 and the presentation given to the panel is included in Appendix C. The report of the Design Review Panel is given in Appendix D.

In summary, the Panel was pleased to see the significant amount of analysis that had been carried out but felt that our emerging strategy appeared to be overly transport-led and should be more visionary, giving more emphasis to public realm, culture and behaviour change.

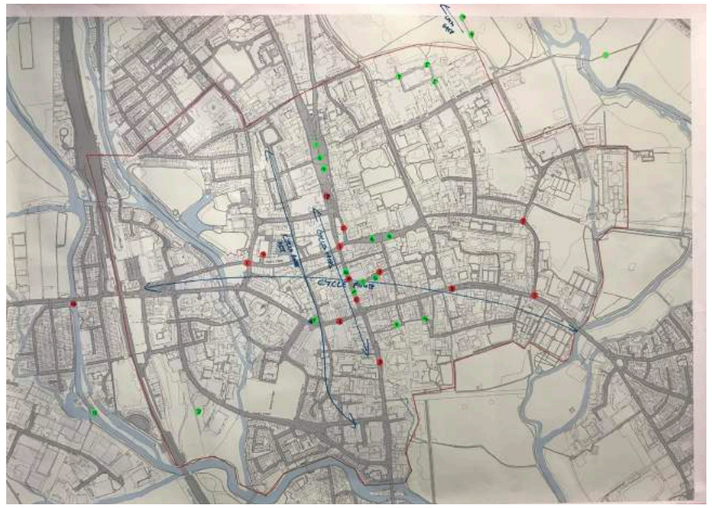
We understand this comment, which perhaps was a result from the way the information was presented to the panel, but we emphasise that in our view it is only possible to achieve significant improvements in these aspects of the city by reconsidering the transport management system.

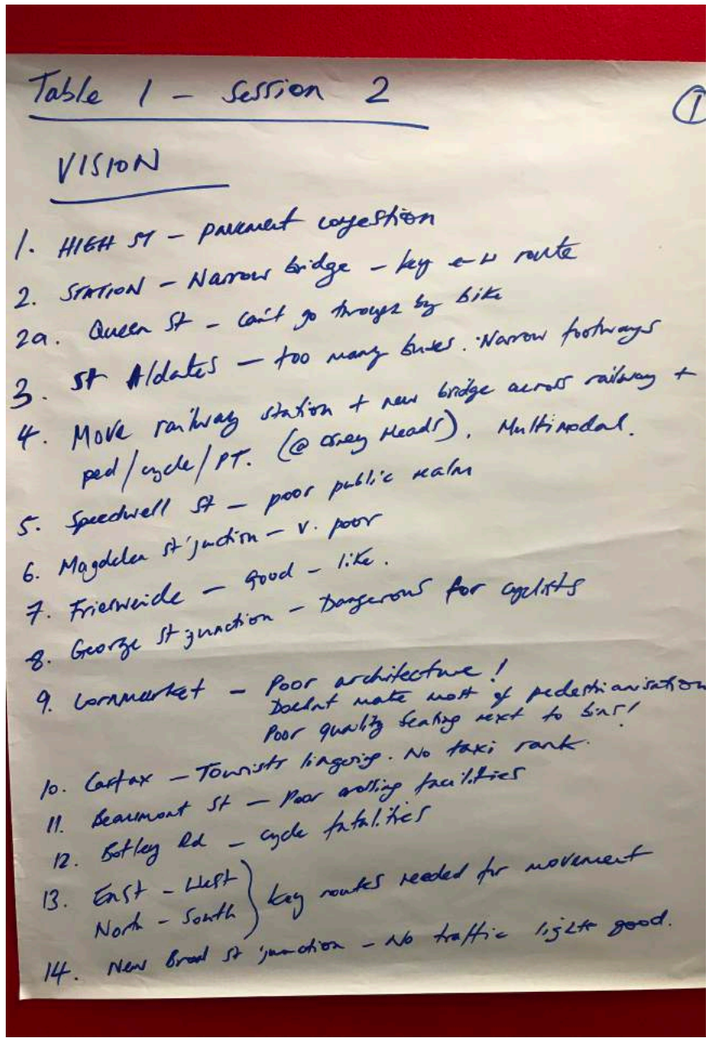
The Panel recommended that a series of public realm briefs should be prepared for each street, particularly key streets such as Broad Street and Holywell Street. We agree that this is an essential step and have included this recommendation in this report.

The Panel was supportive of 'zones de rencontre' and advised that they should be introduced across the whole city. We support this recommendation.

The Panel did not offer advice on which of the transport management options presented to them should be taken forward but considered that more analysis and testing of them is required to understand in more detail how the movement/connectivity initiatives and the public realm interventions could work together. We agree that this further, more detailed consideration is needed of the options and have referred to this in Section 9, next steps.

Figure 7-9 Workshop 1 – Final Report





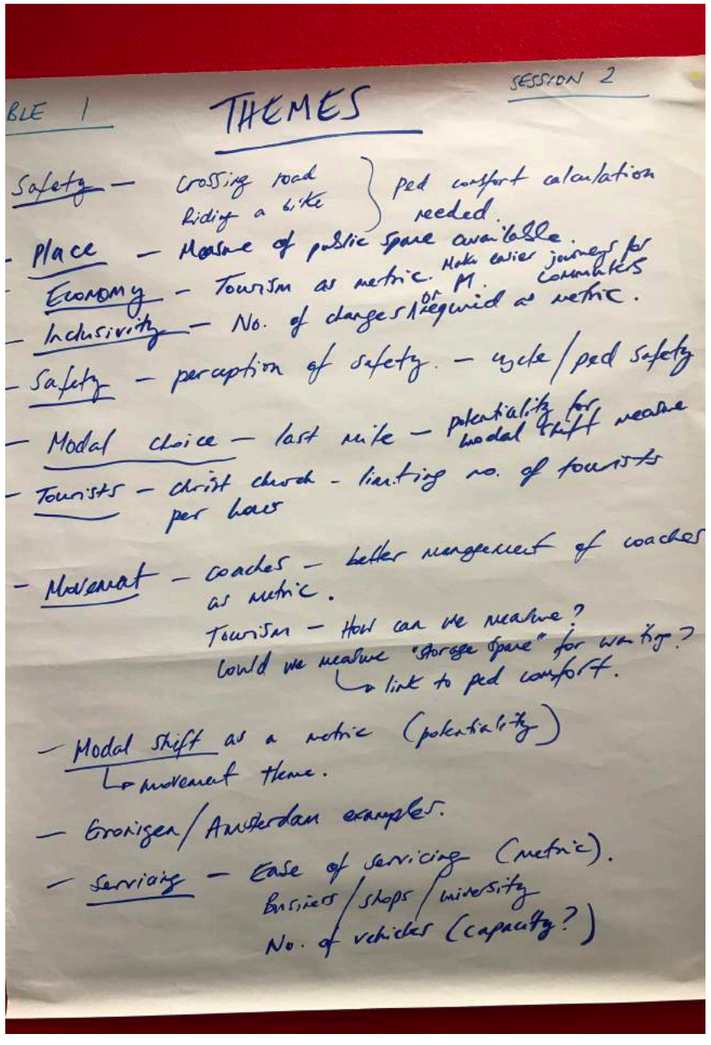


Figure 7-10 Selection of images of outputs of Workshop 1

7.4 Stakeholder Workshop 2

This workshop was held at County Hall on Tuesday 9th January 2018. The presentation given at the event is included in Appendix E and the report on the outcomes is in Appendix F. The workshop was attended by both members and wider stakeholders (a total of 46 people) and its purpose was to:

- Present the further analysis carried out by the consultant team
- Summarise the emerging overall recommendations for the city centre movement and public realm (Section 6)
- Describe the four concept sub-options for bus movement (see above) and
- Invite views on these recommendations and options

A wide range of views were given by the stakeholders, which we have sought to address as far as possible in finalising our recommendations. Figure 7-10 summarises the common themes expressed by the participants.

Figure 7-11 Workshop 2 – Common Themes

Theme	Comment	Number of times mentioned
Inclusivity		
Option 1a	Lack of connectivity between the two-loop system / impact on mobility impaired / ageing population	7
Option 2a	More inclusive option as improves E-W connectivity.	1
Movement		
Option 1a	Flexibility of route choices with two-loop system is reduced / reduction in cross city movement.	3
	Dislike lack of connectivity with the station in the two-loop system	2
	Dislike the idea of Cornmarket being opened up to bus movements / lost as pedestrian space.	5
	Like the idea of Cornmarket being opened up to bus movements.	2
Option 1a / 2a	Dislike increase in bus journey length / times.	8
	Good access to Science Park / University / Parks	3
	Important destinations are not served by the outer loop options	1
All options	More attractive cycle routes / segregated cycle routes.	4
Public Realm		
Option 1a	Positive impact on historic streets / High Street / St Aldates.	6
Option 2a	Potential for significant enhancement of public realm / continuous network of pedestrian priority streets.	3
Option 1b and 2b	Dislike potential use of Holywell Street / Broad Street for buses	6

Six of the 10 tables expressed no overall preference for an option while three tables expressed a preference for the single loop system. Only one table preferred the two loop system.

The most common comments made were that

- The increase in bus journey length/time was disliked
- the two-loop system did not provide good connectivity across the city, which would be a particular problem for the mobility impaired and elderly.
- The positive impact on High Street and St Aldate's was welcomed but the negative impact on Holywell Street and Broad Street was disliked.

These comments go to the heart of the problem – there will have to be an acceptance of some reduction in bus accessibility and impacts on some historic streets if the problems on other historic streets are to be addressed.

Theme	Comment	Number of times mentioned
All options	Positive impact of one-way operation for buses on High Street and St Aldate's.	1
	Like potential for increased public seating / rest spaces.	3
Safety and Public Health		
Air Quality	Additional bus mileage required with one-way loop may have a negative impact on air quality.	2
Safety	One way seen as positive in terms of reducing potential conflict between different users.	2
Economy		
Oxford Tube services	Should be relocated to the train station.	1
Cycle freight	Support for cycle freight within the study area.	2
Freight consolidation	Support for freight consolidation.	1
Gloucester Green	Consider alternative uses – cycle hub / tourist coaches.	2
Servicing	Over-runnable median seen as a positive for servicing / deliveries.	1
	Bookable / virtual loading bays seen as a positive for servicing.	1
General		
Demand management	Congestion charging	2
	Work Place Parking Levy	3
	Traffic control points	2

8 Recommended Strategy

8.1 Introduction

Our principal focus in the study has been to enable the local authorities to achieve a much improved public realm and achieve more walking and cycling by adopting a revised transport management strategy. This will enable in a new set of street typologies to be implemented across the city centre.

These changes will in turn lead to a more inclusive environment, better road safety and public health and an improved economy, thus achieving positive outcomes against all the key themes identified through this study.

Within the limitations of this work we have only been able to be definitive some of the of the elements of the overall strategy; some options remain, dependent on further work and consultation.

Section 6 of this report contains our more detailed recommendations for each of the principal uses of the city centre street network, including its place function. Our recommendations for transport management and the locations of the associated street typologies are set out below.

8.2 Transport Management

Our preferred transport management strategy is shown on Figure 8-1, including both the defined and optional elements. This strategy assumes that general traffic volumes in the city centre are reduced by through the demand management measures of the Oxford Transport Strategy which are essential for the proposed strategy to work.

We recommend that High St and St Aldate's and the route through the Carfax junction should be made one-way for motor vehicles and two-way for cycling.

This will address the most pressing problems in the city centre including:

- poor quality public realm
- pedestrian crowding and severance
- hostile conditions for cycling
- traffic congestion
- delays to buses
- road traffic collisions
- poor air quality

Making these streets and spaces one-way will enable substantial road space to be reallocated away from motor vehicles and given over to more benign and beneficial uses.

These streets would form a key part of a revised transport management system which would allow buses to travel around the whole city centre. This would continue to provide cross-connectivity, for example between the railway station and east Oxford, and would enable the County's proposed BRT routes to be accommodated.

The default route for buses travelling around the city centre would be via the following streets:

- High Street
- St Aldate's
- Speedwell Street
- Thames Street/Oxpens Road/Hollybush Row
- Hythe Bridge Street
- Worcester Street

- Beaumont Street
- St Giles
- Keble Road
- Parks Road
- South Parks Road
- St Cross Road
- Longwall Street

Because High Street and St Aldate's will be one-way we envisage there would be a predominant one-way bus circulation pattern around this loop, but all of the other streets would remain two-way to minimise any impact on bus journey length and delay. In addition, turn-backs and sub-loops would also be possible, as discussed below.

The direction of the one-way system is not fixed, but on balance we recommend that High Street and St Aldate's should be westbound/southbound. This would simplify the operation of the critical Carfax junction in the event that some buses continue to use Queen Street and are reintroduced to Cornmarket Street. Having vehicles enter the space from only one arm will mean there are no conflicts between motor vehicles to be handled,

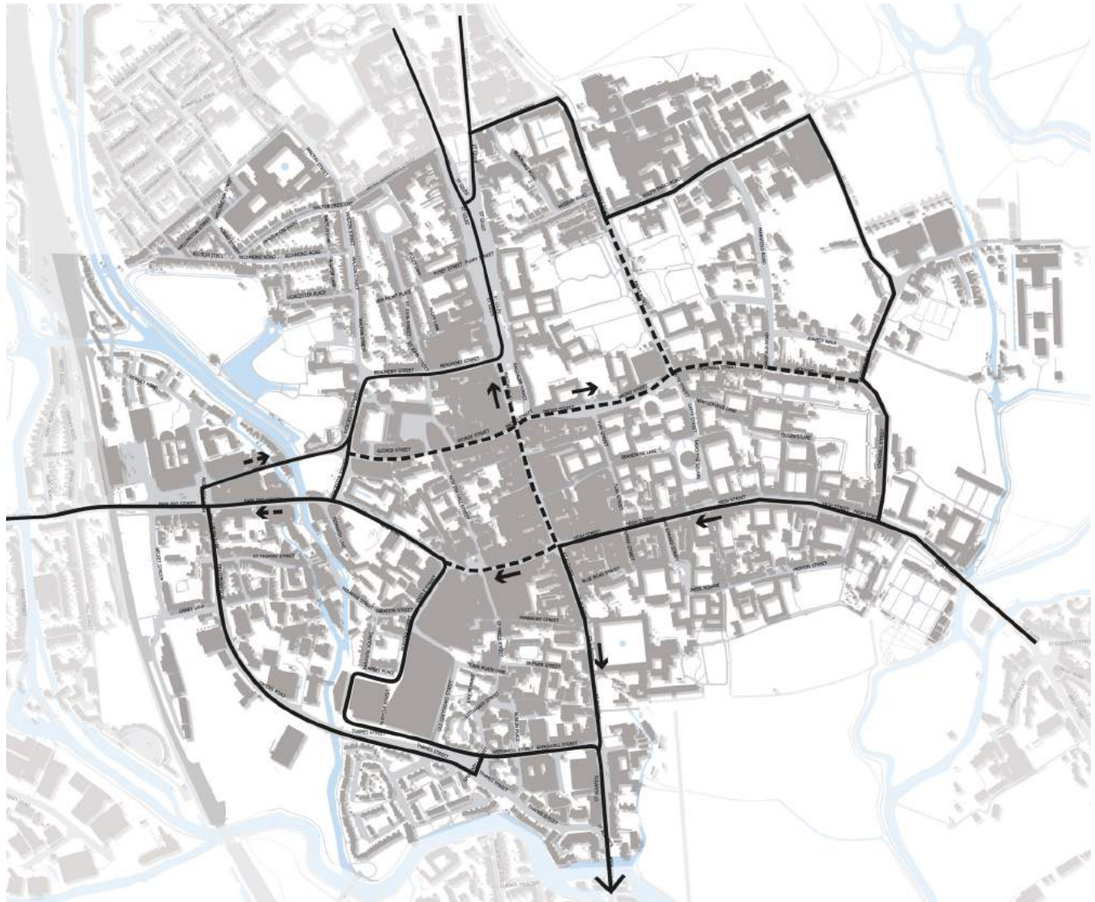


Figure 8-3 Preferred Transport Management Strategy

simplifying the traffic management arrangements and helping to reduce clutter of signals, signs and markings.

If buses enter the city centre via High Street it will enable them to reach the most important stops near to Carfax with the minimum of delay. Passengers making the return journey will obviously have to board somewhere else, but they will often be able to make their journey to that stop a purposeful part of their overall visit to the city centre. Future off board ticketing and increased access / egress doors on PT vehicles would improve boarding times so consideration should be given to boarding on High Street in the future.

Making these two streets one-way for buses and general traffic will necessitate some significant changes to bus routing on other streets and there are a number of possibilities. Choosing the right combination of those sub-options requires more detailed study on bus routes and stop locations, but we set out some initial conclusions below.

These studies will need to consider not only the existing bus fleet and network but how it they will change in future as passenger demands increase and new types of vehicles are brought into use, ultimately leading to the high-quality BRT routes envisaged in the OTS. The implications of the Zero Emissions Zone on the type of buses to be allowed into particular streets will also need careful consideration.

As well as considering the detailed operational aspects of the bus routing options we believe it will be necessary to model the city centre network using micro-simulation to understand in detail how the network will operate. This study will assess bus travel times and so inform the final strategy as well as determining appropriate designs for the critical junctions (for example at High Street/Longwall Street) and any requirement for new traffic controls (e.g. at the Longwall Street / Holywell Street junction). This modelling will need to take into account the effects of the demand management proposals on general traffic.

It may also be appropriate to undertake temporary trials of some aspects of the bus routing strategy, similar to the trials currently being carried out on Queen Street, so that local stakeholders, bus operators and the local authorities can gain an understanding of the practicality and impacts of the alternatives.

If Broad Street and Holywell Street are to be used for some bus movements they should be one-way eastbound to reduce the impact on heritage and enable the maximum reallocation of road space to public realm activities, pedestrians and cyclists.

Given its heritage importance and sensitivity there should be no bus stops in Holywell Street, which should be designed as a pedestrian priority street with very low bus speeds.

Similarly, if buses are reintroduced to Cornmarket Street or retained on Queen Street (which would operate northbound and westbound respectively) they would travel one way with no bus stops and a requirement for vehicles to travel very slowly.

George Street is presently used by buses in both directions, but our recommendation would be for this to become a similar one-way (eastbound) pedestrian priority street.

Magdalen Street West should become a one-way (northbound) pedestrian priority street, and traffic should be removed entirely from Magdalen Street East (apart from access vehicles. These changes would enable a very high-quality area of public realm

to be created at this important node within the city, linking with the enhanced area at the southern end of St Giles, as shown in Section 6.3.

A further option would be to create a small one-way loop around the 'Island' development site by making Hythe Bridge Street one-way eastbound and Park End Street one-way westbound. This would enable footway widening and cycle facilities to be introduced on these key routes between the city centre and the railway station. This would be reliant on significant reduction in through traffic.

8.2.11.1 Bus Routing Options

We have considered how the BRT lines as proposed in the OTS and regular services serving each quadrant of the city could use this network, as follows.

BRT Lines

We envisage that the BRT would operate:

- Eastbound – Hythe Bridge Street, George Street, Broad Street, Holywell Street, Longwall Street
- Westbound – High Street, Queen Street, Park End Street, Station
- Northbound – Speedwell Street, Thames Street/Oxpens Road, Railway Station, Hythe Bridge Street, Worcester Street, Beaumont Street
- Southbound – reverse of Northbound (but possibly using Park End Street if Island site loop established)

We recognise that running the BRT lines along Holywell Street may give rise to some concerns, but we believe it would be sensible to use any limited environmental capacity on this street for one of the most important and direct cross-city routes, which are likely to be using the most modern and low impact vehicles.

Buses to/from the East

Buses serving east Oxford could turn back in the following ways after entering the city centre along High Street:

- Via the whole outer loop
- Via Queen Street, New Road, Worcester Street and the rest of the outer loop
- Via Cornmarket Street, Broad Street and Parks Road and the rest of the outer loop
- Via Cornmarket Street, Broad Street and Holywell Street

Buses to/from the South

Buses serving the south of the city would have the following options to return to the Abingdon Road:

- Via Thames Street/Oxpens Road, Park End Street, New Road, Castle Street/Norfolk Street and Speedwell Street.
- Gloucester Green (if retained) via Oxpens or via Castle Street/ Norfolk Street
- Rail station via Oxpens or via Castle Street/Norfolk Street
- Via Thames Street and Speedwell Street
- Via the outer loop (although this is unlikely).

Buses to/from the West

Buses serving the west of the city would have the following options to return to the Botley Road:

- Via Hythe Bridge Street, Worcester Street and Park End Street
- Via Hythe Bridge Street, George Street, Magdalen Street West, Beaumont Street and Worcester Street
- Via Park End Street, New Road, Castle Street/Norfolk Street and Oxpens Road
- Gloucester Green (if retained) via Park End Street
- Butterwyke Place or Thames Street/St Aldates south/ Speedwell Street, via Castle Street/Norfolk Street or via Oxpens Road
- Via the outer loop (although this is unlikely).

Buses to/from the North

Buses serving the north of the city would have the following options to return to St Giles:

- Via a new public square/bus terminus at St Giles (see Section 6.3)
- Via Beaumont Street, Worcester Street, George Street and Magdalen Street West
- Via Beaumont Street, Worcester Street, Park End Street and Hythe Bridge Street
- Via Beaumont Street, Worcester Street, New Road, Castle St/ Norfolk St, Thames St/Oxpens Road and Hythe Bridge Street
- Gloucester Green (if retained)
- Oxford station
- Butterwyke Place or Thames Street/St Aldates south/ Speedwell Street, via Castle Street/Norfolk Street or via Oxpens Road

Long Distance Coaches

Long distance coaches arriving into the city would travel along their current route via High Street, St Aldate's and Thames Street/ Oxpens Road to reach the terminus.

As noted in Section 6.7 we would not propose that coaches leave via Broad Street and Holywell Street and alternatives would need to be assessed, including South Parks Road and Keble Road, or potentially routes further out from the city centre: i.e. crossing the river at Marston Ferry or Donnington bridge in which case there may be merit in the inbound route mirroring the outbound route.

8.3 Distribution of Street Typologies

Figure 8-2 shows the resulting distribution of the various street typologies across the city centre network, together with the recommended and optional bus routes.

We stress that these are very much a starting point for the design of these streets and that, as recommended by ODRP, public realm briefs should be prepared for individual streets, particularly the key spaces of High Street, St Aldate's, Broad Street, Holywell Street, Magdalen Street and Carfax.

Further details of our proposed design approach to key streets in the city centre are given in Section 6.3.

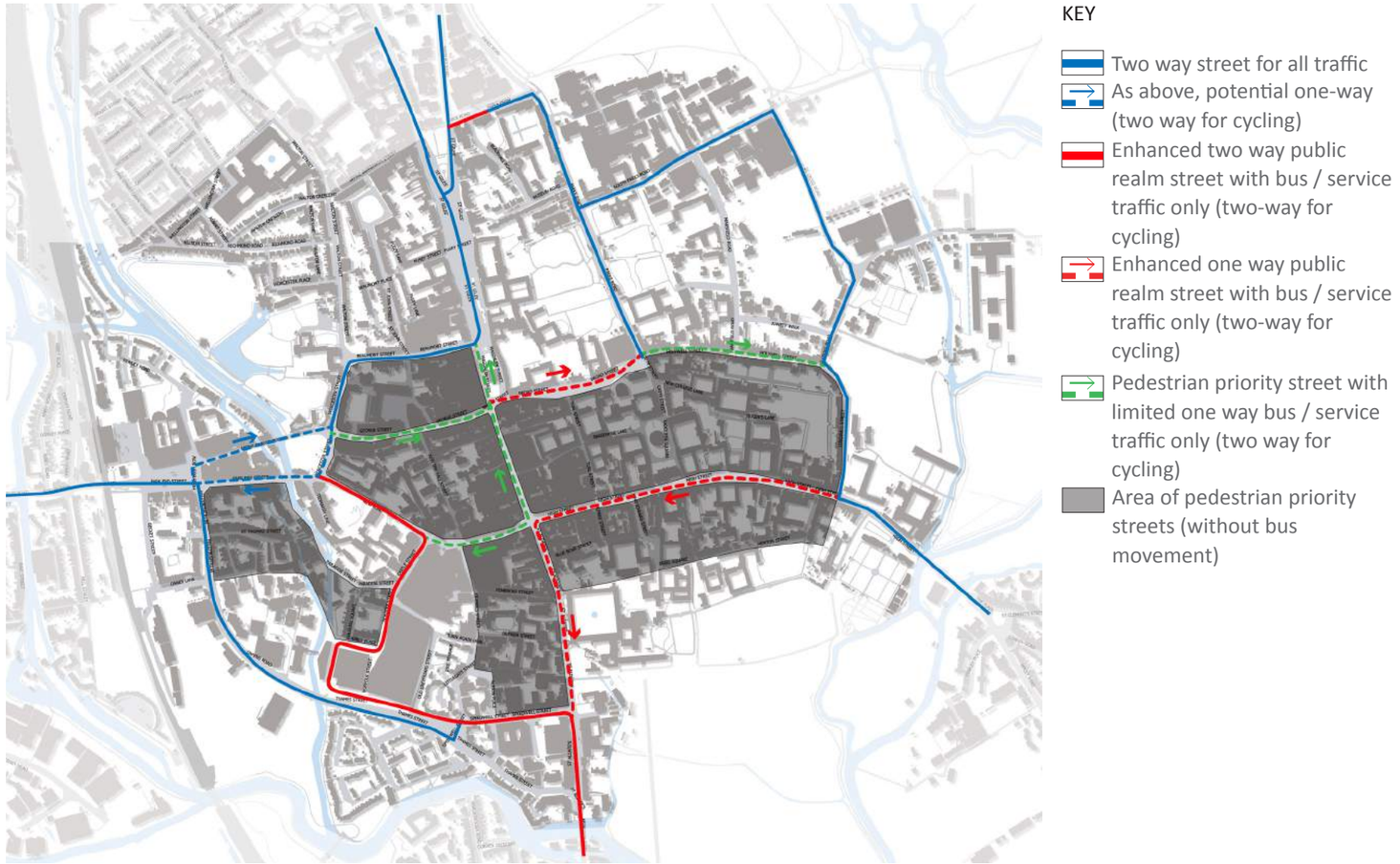


Figure 8-4 Distribution of Street Typologies

Figure 8-5 Distribution of Street Typologies

1 Two-way streets with access for all traffic – with or without cycle tracks
Beaumont Street
High Street (east of Longwall Street)
Hollybush Row
Keble Road (eastern end)
Longwall Street
Oxpens Road
Parks Road
Park End Street
South Parks Road
Speedwell Street (western end)
St. Cross Road
Thames Street
Worcester Street

2 One-way streets with access for all traffic – with or without cycle tracks
Brewer Street
Pembroke Street

3 Two-way streets with access for public transport and service vehicles only – with or without cycle tracks
Castle Street
New Road
Norfolk Street
Speedwell Street (eastern end)

4 One-way streets with access for public transport and service vehicles only – with or without cycle tracks
Broad Street
High Street
Keble Road (western end)
St. Aldates

5 Pedestrian priority streets – servicing/access only; limited volume of public transport vehicles where required.
Cornmarket Street
George Street
Holywell Street
Magdalen Street
Queen Street

8.4 Preferred Spatial Vision / Strategy

8.4.1 Objectives

Central to this study is the creation of a Spatial Vision / Strategy which supports the vision set out in the Oxford Local Plan 2036.

This Oxford Vision for 2036, as set out in the Local Plan is to create:

Vision 2036:

- A centre for learning, knowledge and innovation
- A prosperous city with opportunities for all
- A environmentally sustainable city
- An enjoyable city to live in and visit
- A strong community
- A healthy place

8.4.2 Spatial Vision / Strategy

To deliver this vision and address challenges faced by Oxford, the following spatial vision / strategy sets out our ambitions and how collectively they will create a prosperous and sustainable Oxford. The following sections provide a summary of the preferred spatial vision / strategy by theme:

Inclusivity

- Maintain good bus access to key locations in the city centre.
- Reduce conflict with traffic, including buses.
- More place and spaces to sit and rest.
- Greater extent of level surfaces in low / zero traffic streets.

Movement

- Allow for future growth in travel to / within the city centre.
- Reduce pedestrian congestion by increasing space and encouraging more balanced distribution.
- Minimise need to interchange.
- Improve reliability of bus journey time to / through Oxford.
- Realise potential significant increase in cycling, particularly short journeys currently being made by bus.
- Improvements needed in advance of potential radical change to public transport vehicles.
- Allow for continued access to the city centre by long-distance coaches, tourist coaches and taxis.

Public Realm

- Raise the quality of Oxford's public realm to a stand befitting its world-class heritage.
- Reclaim movement space on key heritage streets.
- Minimising street clutter, including removal of traffic signals where possible.
- Improve wayfinding through design.

Safety and Public Health

- Reduce conflict between pedestrians, cyclist and motor vehicles.
- Simplifying junction conflicts and operations
- Enabling smoother less congested motor vehicle movements.

Economy

- Balance reduction in car parking with an increase in cycle parking.
- Maintain servicing to retail and business premises, but encourage the use of more sustainable arrangements including cycle freight.

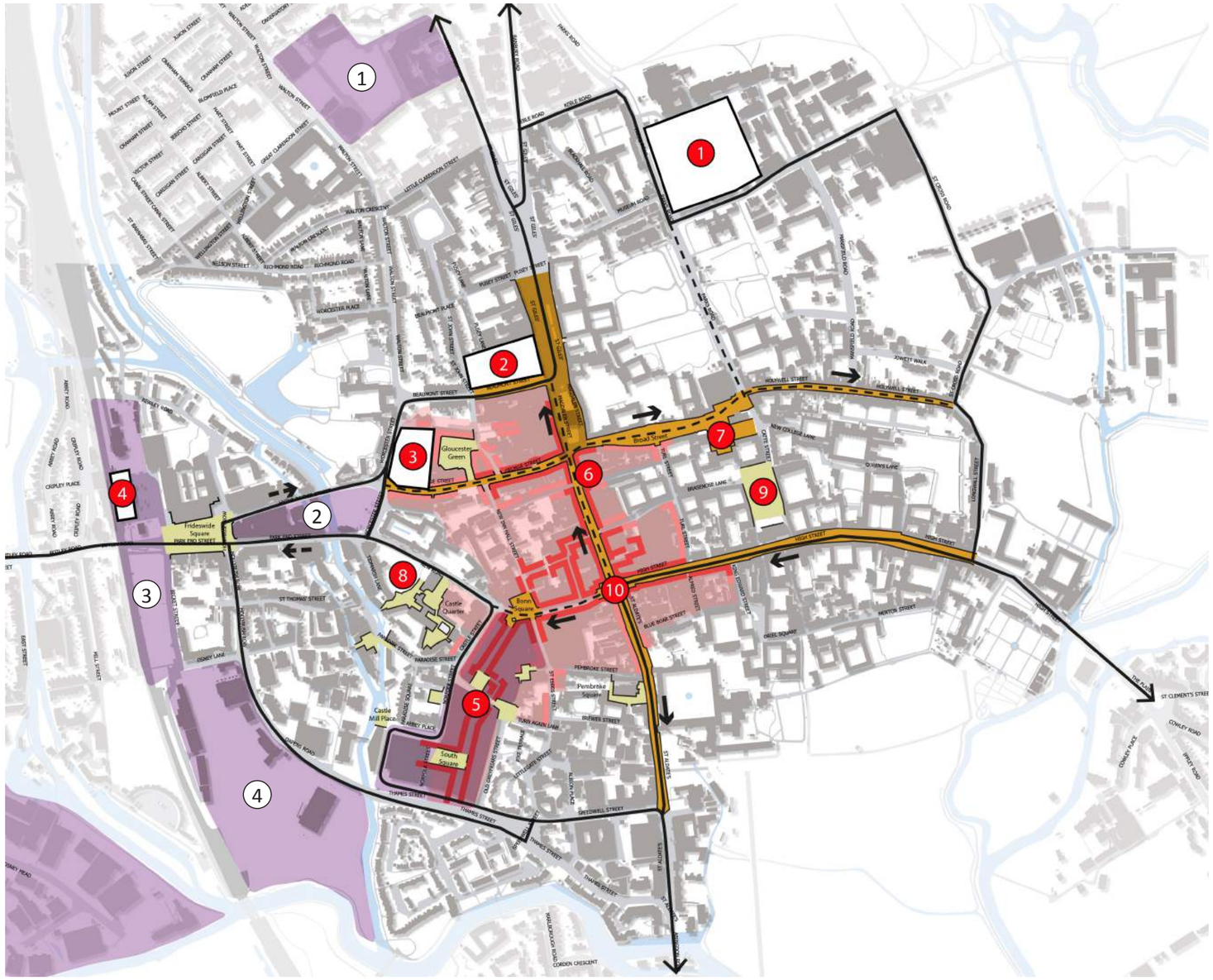


Figure 8-6 Preferred Spatial Vision and Strategy

9 Next Steps

9.1 Further Studies

This report has recommended an overall place and movement strategy for Oxford city centre, but the complexity of the issues means that considerable further work needs to be done to move the proposals forward towards implementation. We have identified many of these in Section 6 above.

We recommend the following studies, which are shown as a flow chart on Figure 9-1.

- A Streetscape Design Study, which would carry out a detailed appraisal of the character of the city centre as a whole in order to set the framework for the street typologies and the design of individual streets, taking into account key heritage constraints. The study will also identify in more detail the opportunities and space requirements for place activities as well as reviewing the overall palette of materials used across the city.
- Bus Operations study, to confirm the routing of individual services, both now and in the future. The study will need to identify the general locations and capacity requirements of

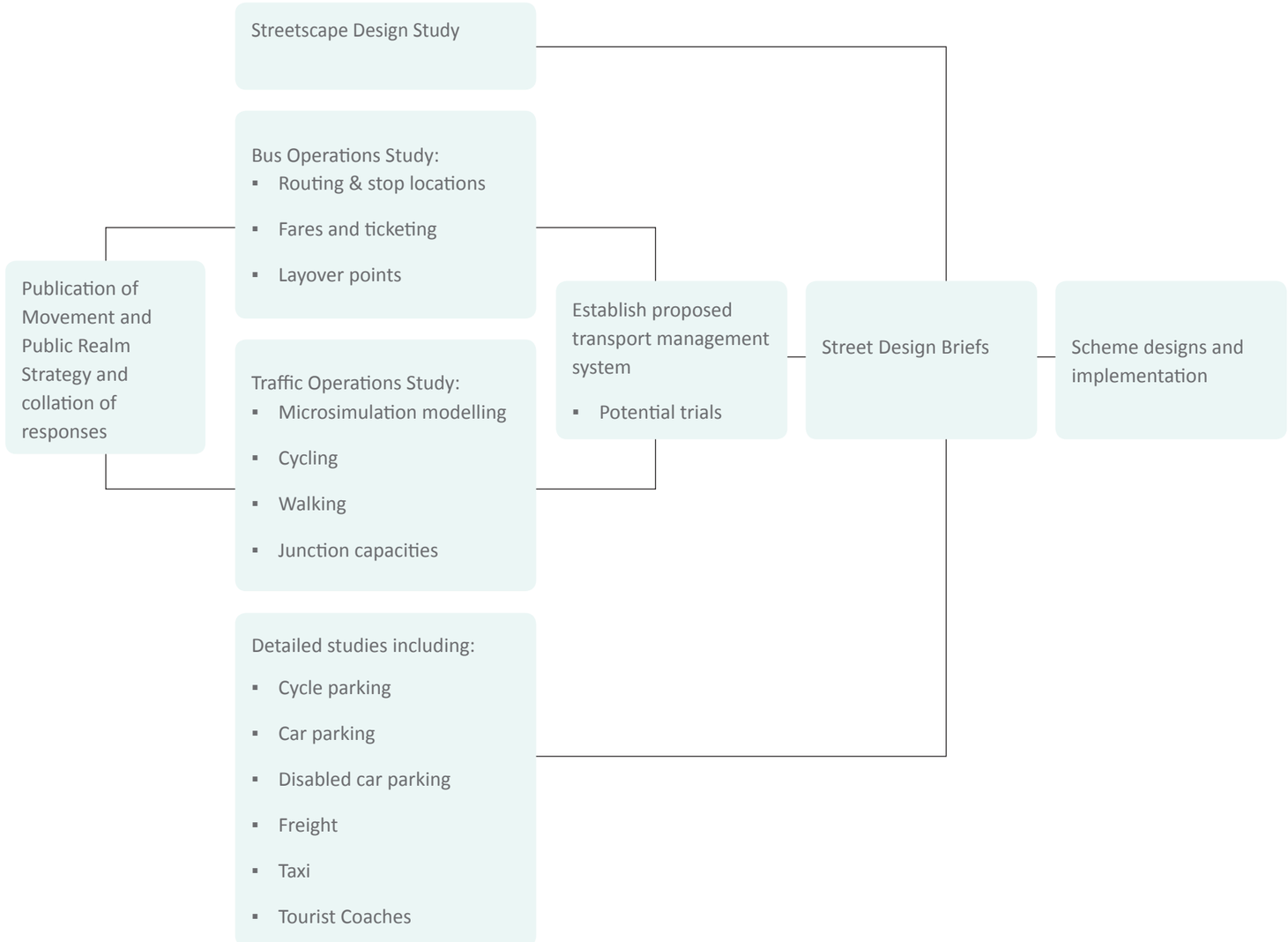


Figure 9-1 Flowchart of Further Studies

bus stops and layover points. This will need to be carried out in close collaboration with the bus operators.

- A Traffic Operations Study which would use microsimulation modelling to assess the capacity of the city centre street network and inform the preliminary design of key junctions to establish the overall space requirements, including an initial assessment of bus and long vehicle tracking and a consideration of cycling and walking infrastructure requirements, such as cycle tracks and crossings. This will take into account the County Council's emerging traffic demand management proposals.
- The Bus Operations Study and Traffic Capacity study would be undertaken in parallel, so that they lead to a recommended Transport Management System which is based on a thorough understanding on its implications on bus journey times, traffic capacity and space requirements.
- It may be appropriate to carry out trials of the transport management system before it is finalised. This may mean that the overall design process becomes iterative depending on the outcome of the traffic management trials. Our traffic management phasing is illustrated at Section 9.4.1 and sets out our suggested approach.
- We also recommend that a series of further detailed studies are carried out to establish the detailed requirements for the following:
  - Pedestrian Wayfinding
  - Review of Cycling in Pedestrian Areas
  - Cycle Parking
  - Car Parking
  - Disabled Car Parking
  - Freight
  - Taxis
  - Tourist Coaches
  - Traffic Enforcement System
  - Potential for the relocation of Gloucester Green coach station
  - Electric vehicle charging provision
- In the case of the freight study, this would need to look beyond the city centre itself to consider how the number and size of servicing vehicles arriving into the city centre can be reduced, including through policy interventions.
- The Streetscape Design Study, Transport Management System and the outcome of the relevant detailed studies would then enable detailed design briefs to be prepared to be prepared for individual streets across the city centre, to be designed and implemented as funding permits.

9.2 Deliverability and Funding

The Oxford Transport Strategy sets out a number of options which could provide a source of income which could help fund some of the improvements set out in this report. These include:

Road User Charging:

Road user charging has the potential to raise money that would be ring-fenced to improve the local transport network. This is particularly relevant where fuel duty revenue to the Exchequer is falling as a result of improved efficiency and uptake of vehicles not powered by conventional fossil fuels.

Workplace Parking Levy (WPL):

Workplace parking levy (WPL) is a fee charged to employers for spaces used for employee commuter car parking. Its aim is to reduce traffic levels by discouraging commuting by private car. It also provides an incentive for employers to reduce their car parking stock. A WPL would raise money that would be ring-

fenced to improve the local transport network, however, on its own it is unlikely to reduce traffic levels significantly and so is being considered alongside access measures.

Other options which could be considered include:

Community Infrastructure Levy (CIL):

The Community Infrastructure Levy (CIL) is a tariff in the form of a standard charge on new development to help the funding of infrastructure. Oxford City Council set and collect the levy, co-ordinate the spending of the funds and report this to the community.

The principle behind CIL is that most development has some impact on infrastructure and should contribute to the cost of providing or improving infrastructure.

CIL applies to new floor space and charges are based on the size and type of the new development. Developments of less than 100 square metres new build floor space will not be liable to pay CIL unless they result in the creation of a new dwelling. Payment of CIL is triggered by the commencement of development.

Tourist Levy:

Many European cities operate a 'tourist tax' which adds a levy onto accommodation payments in the city. For example, the Roma Capitale authority charges a tourist accommodation tax of guests of hotels, holiday homes, rented room establishments, bed and breakfasts and camping grounds in Rome (this measure does not apply to hostels). The tourist accommodation tax is due for each night spent in Rome's accommodation facilities. Similarly, Malta charges an environmental contribution measure to generate funds for general infrastructural improvements and to improve the kind of tourism offered by the country.

In the UK, Birmingham looks set to be the first city to introduce an accommodation levy in order to raise money for its successful bid to host the 2022 Commonwealth Games. Similarly, a levy has been proposed by Bath and North East Somerset Council who will put it to the Local Government Association for approval.

Gloucester Green - land disposal / redevelopment:

Section 6.7 of this report identifies the potential to relocate Gloucester Green coach station to an alternative location within the city centre. Release of the existing Gloucester Green site would offer significant opportunity to regenerate this under-performing part of the city, and potentially generate a significant capital receipt for Oxford City Council (site ownership: Corporate Assets / Estates).

9.3 Costing

Initial thoughts have been given to the potential cost implications of the proposed movement strategy. Indicative costs implications are shown on Figure 9-2 based on a price range:

- **Low cost** – decluttering and basic road resurfacing (e.g. recent Broad St scheme)
- **Medium cost** – as above plus widening and re-paving of footways in higher spec materials; some soft landscaping (e.g. Westgate's improvements to Castle Street)
- **High cost** – complete re-build, stone paving on footways and in carriageways; extensive hard and soft landscaping (e.g. Frideswide Square)

The areas highlighted will need futher detailed consideration as part of the streetscape study recommended in our conclusions, and do not take imply that any works are proposed on private land.

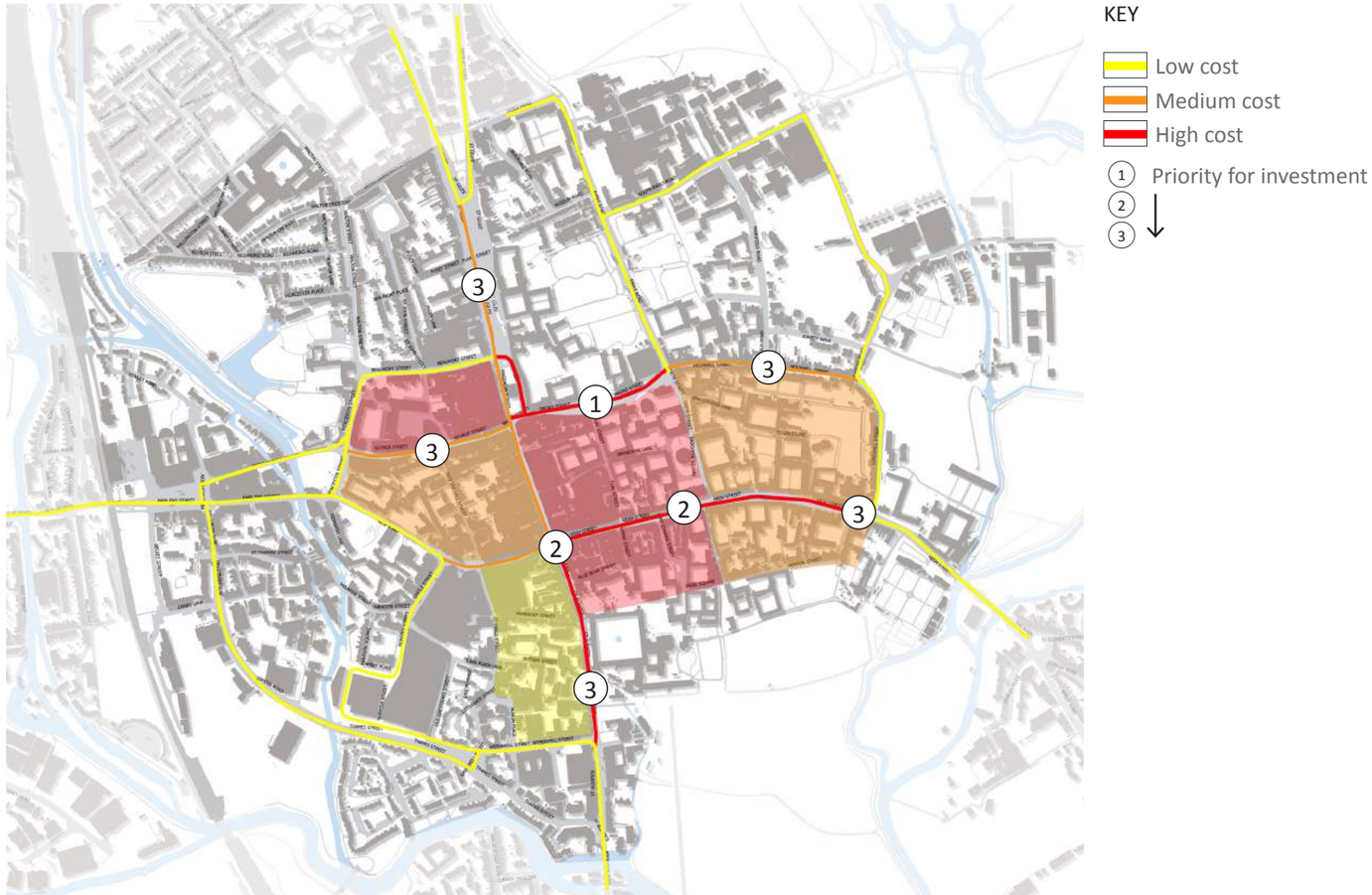


Figure 9-2 Potential Costing

9.4 Phasing

9.4.1 Traffic Management

We have given initial thought to the phasing of traffic management measures, the outcomes and key dependencies as shown in the table below.

	Measures	Outcomes	Dependencies
Phase 1 Piloting	Pilot trial of one-way outer bus loop	Test principles of one-way bus routes around large loop	Participation of bus operators
	Experimental one-way routing for all traffic along High St and St Aldates	Collect evidence of traffic and bus service/journey time impacts	
	Temporary segregation of two-way cycle routes on High St and St Aldates	Collect public feedback on more cycle and pedestrian friendly spaces	Effective use of Experimental Traffic Orders
	Temporary (trial) pedestrian area widening on High St and St Aldates		
	Trial of virtual loading bay booking system for city centre zone	Test principles of bookable loading bays	Technological readiness of virtual kerbside booking
	Trial reversal of Queen St bus movements	Monitor impact of inner bus loop for limited number of services	Participation of bus operators
	Trial one-way bus movement along George Street		
	Trial re-opening of Cornmarket for bus movements		
	Commence parking and access removal from Broad St and St Giles	Kerbside clearance in key locations in readiness for redesign	Public / political appetite for parking removal
	Re-establish proactive management and enforcement of tourist coaches	Establish greater control over traffic impacts of tourist coaches	Participation of tourist coach operators

	Measures	Outcomes	Dependencies
Phase 2 Formalising Quick Wins / Further Testing	Trial opening of Broad St and Holywell St to one-way bus movements	Test principles of sensitive inclusion of buses on Broad St/ Holywell St	Successful trial outcomes from High St / St Aldates
	Trial one-way movements on Park End St and Hythe Bridge St	Test principles of one-way traffic movement to increase space for walking and cycling	Oxon CC Traffic Control Points
	Trial of segregated cycle facilities on Park End St and Hythe Bridge St		
	Trial of widened footways on Park End St and Hythe Bridge St		
	Identify new coach station location(s) with long distance operators	Alternative site for Gloucester Green identified and secured	Land availability for coach interchange
	Experimental re-design of St Giles	Test principle of re-configuring St Giles	Participation of tourist coach operators
			Participation of bus operators
	Permanent re-design of High St and St Aldates	Enhanced public realm and bus interchange facilities	Successful trial outcomes from High St / St Aldates
	Taxi rank improvements to support ZEZ	Plug-in charging facilities at some ranks	Zero Emission Zone implementation
	Public realm improvements for tourist coaches in St Giles	Enhanced visitor pick-up/drop-off environment	On-street parking removal in St Giles area
	Enhance accessible parking areas for Blue Badge holders	More, high-quality Blue Badge parking spaces on-street	Successful kerbside clearance in phase 1
Phase 3 Completing the vision	Measures	Outcomes	Dependencies
	Permanent re-design of Broad St and Holywell St	Enhanced public realm and bus interchange facilities	Trial outcomes
	Permanent re-design of St Giles		Trial outcomes
	Relocate Gloucester Green to new coach interchange facility	Gloucester Green available for city centre redevelopment	Availability of site for new coach interchange
	Permanent re-design of Park End St and Hythe Bridge St	Re-claimed space for walking and cycling, traffic reduction	Trial outcomes
	Upgrade of selected one-way bus routes to BRT	Mass Rapid Transit accommodated in better city centre public realm	Phase 1 & 2 implementation, Rapid Transit scheme delivery

9.4.2 Public Realm

Public realm improvements in the city centre proposed as part of this study are enabled by the release of highway space in key locations by the introduction of new one way street typologies as set out in detail in Section 6 of this report.

The phasing of public realm improvements is therefore intrinsically linked to the phasing of traffic management improvements. However, once traffic management changes are made, the strategy to improve the public realm can be achieved in easy stages subject to funding being available.

New York City has successfully introduced a strategy to implement changes in a quick, inexpensive, and temporary manner and to evaluate the consequences of the changes before making permanent changes.

Figure 9-3 and 9-4 show photographs of Times Square which underwent dramatic change following the closure of Broadway to vehicles. New 'people places' were created, including more space

Figure 9-3 New York Time Square - before and after public realm improvements

Figure 9-4 New York Time Square - before and after public realm improvements

for pedestrians, cafe tables, street performances, and bicycles as a welcome relief from the overcrowded footways.

The NYC DOT Public Plaza Program used simple techniques to reclaim public space, such as painting the pavement and introducing temporary seating and umbrellas. The Public Plaza Program is now creating similar spaces all over the city, taking applications from community groups and other partners who commit to maintain the plazas and provide programming for them.

For our study area the priority for public realm investment in the permanent improvements are broadly illustrated on Figure 9-2. Given the potential of Broad Street to be a world class public space, its location at the heart of the conservation area and its exceptional grouping of listing buildings, together with the potential negative impact of introducing regular bus movements as a result of our proposed movement strategy, means that this should be the highest priority for investment.

Our second priority for investment is focussed around Carfax and its approaches on High Street and St Aldates. This historic crossroads is highlighted by our city centre surveys to be a key nodal point in the city, retaining its historic role as a central focus for movement.

How improvements are phased on High Street and St Aldates will depend on the availability of funding. Ideally all works would be undertaken in one phase, however given the extent of the works proposed this may not be possible.

Our third tier for investment radiates from these core street and spaces and comprises George Street, St Giles and Holywell Street. Beyond this we see the need for a long term programme of investment across the whole of the city centre to raise the quality of the public realm and generally capitalise on the gradual removal of traffic from the city centre as a result of traffic management measures.

9.5 Evolution Beyond 2036

Many of the options set out in this report deliberately focus on near-term proposals that could be implemented to address the urgent need for public realm-led improvements to Oxford City Centre that will also enhance access and movement. However, we are also conscious that our team was asked to consider how innovation in the mobility sector could be harnessed to support Oxford's growth and improve the city centre.

The recommended strategy we have set out in section 8 focuses on re-prioritising roadspace and public space within the city centre. It is critically dependent upon a wider programme of through-traffic reduction measures that Oxfordshire County Council is currently scoping. While there are precedents for all of these measures in other UK cities, very few (expect perhaps London, Nottingham, Bristol, and Manchester) have successfully implemented a large number of them in combination so as to significantly re-prioritise roads and public spaces. Doing so has the potential to create healthier street environments that support safe human-powered movement and sensitively-incorporate rapid transport networks. In the Oxford context, where growth to-date has already placed considerable pressure on the city's relatively limited amount of roadspace, we believe that achieving

this goal could – and should – be considered both a significant achievement and innovative.

Looking beyond the current Local Plan period, we believe the recommended strategy articulated in section 8 of this report dovetails neatly with the Oxfordshire 2050 Vision that has been set out through the County Council's work on first/last mile connectivity with evolving East-West Rail and Oxford-Cambridge Expressway proposals. The inherent uncertainty associated with innovative urban mobility development 'roadmaps' (e.g. battery technology development and electric vehicle uptake, extent of automation, social acceptability of emerging technologies, genuine sharing of mobility services), and their potential to unlock higher demand for movement in urban areas, means the future picture for how we move around cities is currently less clear than at any point in the last 30 years. Comparing the proposals we have set out for Oxford city centre with those in the 2050 Vision, reveals the following strong parallels in approach:

- Prioritising significant roadspace for direct, dedicated, safe cycle routes and to provide for walkable pedestrian networks that contribute heavily to a positive urban environment and visitor experiences. These are expected to be an essential requirement of a healthy 21st Century City.
- Prioritising significant roadspace for segregated bus-based movement could be used flexibly in the future by increasingly autonomous, zero tailpipe emission, optically-guided, rubber-tyred vehicles that require limited infrastructure to provide a tram-like user experience at relatively low cost. As mentioned at Section 5.2 the OTS proposes that tunnels under the city centre of one form or another could form part of a much longer term (post Local Plan) solution and is working with other authorities with similar proposals to investigate this further. It is however acknowledged that shorter term solutions are needed in the meantime, particularly as tunnels remain an unproven and very expensive option.
- Smarter and more deeply-integrated bus and rail network fare products, ticketing mechanisms, and passenger information to deliver personalised journey experiences (in line with the Science Transit vision). These have potential to evolve into Mobility-As-A-Service offerings that promote more-efficient shared mobility across all modes of travel.
- Virtual kerbside booking for freight and servicing loading/unloading, as well as accessible city centre parking for eligible disabled people. This could maximise the capacity of designated loading bays and on-street parking areas and optimise enforcement activities.
- Development of existing public bikeshare services into e-bike fleets capable of handling longer-distance movement around the Oxford urban area on well-signed strategic cycle route networks.
- Greater use of real-time data and camera-based technologies to allow smarter, more flexible use of pedestrianised spaces and dedicated lanes through virtual, rather than physical, segregation. This could significantly reduce the costs and delivery times associated with implementing physical highway infrastructure, while also optimising capacity at different times of day / days of the week.

In this context there is scope for the typology of urban street types that has been developed in this report to evolve flexibly as new technologies and mobility options become feasible in Oxford and its surrounds.

Appendix A - Workshop 1 Report

Appendix B - City Centre Surveys

Appendix C - ODRP Presentation

Appendix D - ODRP Response Letter

Appendix E - Workshop 2 Report

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