SKM COLIN BUCHANAN

Baker Street 2W Scheme

Scheme option feasibility report

WESTMINSTER CITY COUNCIL - BAKER STREET TWO-WAY STUDY

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Baker Street two-way study

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EXECUTIVE SUMMARY

Background

SKM Colin Buchanan (SKM CB) has been commissioned by Westminster City Council to undertake a feasibility study to identify, design and assess two-way scheme options for Baker Street and Gloucester Place. The scheme options identified are proposed to introduce two-way operation on Baker Street and Gloucester Place for traffic, from Rossmore Road to Oxford Street.

The demand for a significant improvement scheme on Baker Street is high. The Baker Street BID and The Portman Estate have committed funding for the development and implementation of a high quality public realm scheme. Studies have shown that the development of the Cross Rail link at Bond Street Station will be likely to generate a significant increase in pedestrian footfall throughout the area between Marylebone Road and Oxford Street. Baker Street represents the most direct route for this increase in pedestrian traffic and therefore there is an opportunity to achieve significant benefits for the local economy and landmark place making in combination with the necessary uplift in pedestrian comfort.

The objectives of the scheme are summarised below:

- Provide a significant improvement to the quality of public realm on Baker Street and throughout the study area;
- Reduce the dominance of traffic throughout the study area by removing the one-way system, introducing a two-way City Street environment on Baker Street; reduce vehicle speeds and thereby improve safety; reduce vehicle trip length (and therefore noise pollution and emissions) by improving accessibility;
- Improve the environment for pedestrians by increasing available space, improving crossings and alleviating barriers to pedestrian movement such as Marylebone Road;
- Improve public transport accessibility by providing bus access to Baker Street for northbound services, enhancing bus stops and connectivity between bus services, coaches and underground rail;
- Improve conditions for cyclists and provide a key cycle link between the proposed CSH11 route at Regents Park to interface with the Westminster Cycle Grid at Upper Berkeley Street and George Street;
- Ensure adequate kerbside capacity is maintained to provide affective loading, servicing and parking for local residents and businesses;
- Avoid any unacceptable impacts to traffic operation, in particular on Marylebone Road, Oxford Street and Marble Arch;
- Provide a safe environment for all road users.

The design team has considered all of the scheme objectives and has developed proposed concept scheme designs which are intended to deliver benefits in all of the key areas. The development of the concept scheme design is detailed by this report.

Baker Street Scheme

A scheme design has been developed for Baker Street based on a review of existing conditions, both operational and geometric, to determine what benefits can be introduced without resulting in significant negative impacts on the movement of road users. The project team has identified a scheme that will perform well against the design objectives without compromising the function of the street environment. The proposed designs are presented in the report and the key details are summarised in the following table.

Table 0.1: Proposed Baker Street Scheme

Proposed Scheme Element	Location	Key performance criteria
Footway widening 1.2m-2.0m	East side of Baker Street between Marylebone Road and Fitzhardinge Street	Average footway increase of 1m along entire length of Baker Street
Footway de-cluttering	Throughout Baker Street	40% improvement in usable footway width (when combined with widening on east side)
Crossings widened from 2.4-3.2m range to 4.0-6.0m range	Throughout the study area	Reduced pedestrian congestion at crossing points
Introduction of pedestrian signal stages	All signal junctions on Baker Street and Gloucester Place (except at Marylebone Road)	23 New controlled crossing movements (not including diagonal movements)
Introduction of diagonal crossings	All signal junctions on Baker Street and Portman Square south of Marylebone Road	Average Crossing distance reduced by 2.9m
Introduction of two-way traffic movement	Baker Street, Gloucester Place and Park Road south of Rossmore Road	Average of 80m reduction in length of local vehicle trips
Introduction of central median at specific points	Four different locations on Baker Street and Gloucester Place	27% reduction in average maximum distance to crossing point
Other general improvements include raised surface treatments, improved quality of materials, improved lighting and street furniture, improved cycle parking provision, design solutions at specific locations to address local requirements.		

Gloucester Place Scheme

Throughout the concept design development process a number of design options have been identified for the treatment of Gloucester Place within the over-all two way scheme. The function of Gloucester Place is integral to the implementation of the proposed Baker Street scheme. The introduction of two-way traffic flow necessarily results in a reduction in traffic capacity, therefore, in order to maintain traffic network resilience, some traffic that currently uses Baker Street for southbound movements must transfer to Gloucester Place.

Under the proposed two-way scheme, Gloucester Place is required to carry a significant amount of southbound traffic flow as well as most of the existing northbound traffic flow. In addition to these requirements, there is an aspiration to achieve an improvement in pedestrian environment and public realm, maintain kerbside capacity for residents and businesses and deliver a key cycle route connection between Regents Park and The Westminster Cycle Grid at Upper Berkeley Street. Because of these competing design requirements, it has been necessary to consider potential compromises against some of the objectives, as a result, several scheme options have been developed and assessed. These options have been developed as a result of the following process.

Public transport integration

The introduction of the proposed two-way scheme offers significant opportunities to achieve better accessibility and integration of public transport services. There are currently a large number of bus and coach services that stop within the study area. As a result of the existing one-way system, the northbound services are confined to Gloucester Place despite the centre of mass for passenger demand being located around Baker Street. The two-way scheme will provide the opportunity for northbound bus services to operate on Baker Street, thereby improving access and legibility as buses will follow the same alignment southbound and northbound.

The bus services which will be re-routed are likely to be those with the highest levels of passenger interchange. These will be determined and agreed with Transport for London. The project team predict that approximately 50% of northbound bus movements on Gloucester Place will be transferred to Baker Street. Similarly some southbound buses are likely to be transferred to Gloucester Place. These will be services that terminate at Marble Arch. They will remain on Baker Street southbound until transferring to Gloucester Place before Portman Square.

There are currently a large number of coach services which stop immediately north of Marylebone Road. These stops are currently up to 270m walk from Baker Street underground station and are concentrated in two separate locations on Gloucester Place and Baker Street. The two-way scheme will present the opportunity to relocate these stops to form a more coherent coach hub. The design team are exploring options with regard to coach stopping locations around the junction of Baker Street and Park Road for both northbound and southbound coach movements. This will provide the opportunity for a more legible signing strategy and will assist with minimising friction on the traffic network caused by stopped coaches which could impair affective operation of the scheme.

Option development process

- Initially two options were considered. **Option A** provided advisory cycle lanes on Gloucester Place with a minimum impact on traffic network operation and kerbside capacity.
- **Option B** examined the potential for introducing a 3m wide segregated cycle facility throughout the length of Gloucester Place and again sought to have a minimum impact on traffic network operation and kerbside capacity.
- These options were developed, assessed and discussed as part of the Project Board. It was concluded that Option B had compromised on the geometry of the proposed segregated cycling facility in order to achieve minimum traffic impact. This meant that Option B may not provide sufficient capacity for cyclists in accordance with future growth estimates and therefore a further option should be considered.
- **Option C** was developed which considers the impact of implementing a 4m wide segregated cycle facility which would ensure adequate capacity for future cyclist growth. This option compromised on carriageway width for traffic capacity and kerbside activity.
- A modelling assessment of the three options was presented to the project board. This assessment showed that Options B and C were unlikely to provide sufficient traffic capacity for an acceptable level of traffic network resilience to be achieved. The conclusions of this assessment were agreed at the project board but it was also considered that Option A did not provide an optimal solution for cyclists. The design team were therefore challenged to develop a fourth option which would seek to further improve facilities for cyclists while maintaining an acceptable level of traffic network resilience.
- **Option D** was developed which provides mandatory cycle lanes of 2m width for the majority of Gloucester Place coupled with specific measures at key nodes to improve conditions for cyclists and to maintain route continuity. This option is shown to successfully minimise impact on kerbside capacity while achieving traffic network performance almost equal to Option A.

A summary of modelling results and analysis of the Gloucester Place design options is presented in the following table. Key performance criteria have been picked out for critical elements of the scheme. Ie. the location / direction of movement / peak hour has been selected to demonstrate the key differences between the scheme options.

Table 0.2: Summary of analysis

Performance criteria		Base	Option A	Option B	Option C	Option D
Kerbside impact	Number of residents permit parking bays – whole study area	102	103	81	33	94
Degree of saturation	N/B Gloucester Place @ Marylebone Road PM peak	89%	89%	90%	140%*	90%
	N/B Gloucester Place @ bottleneck (George Street & Crawford Street) PM peak	61%	71%	90%	153%*	85%
Journey times - Traffic	Gloucester Place N/B PM peak	277s	318s	426s	Significantly worse than Option B*	352s
Journey times - buses	Gloucester Place N/B PM peak	350s	420s	490s	Significantly worse than Option B*	435s
Journey times – cyclists Inter Peak		**Quiet-way** Montagu Street	**Option A –** Gloucester Place	**Option B** Using segregation	**Option B** Using carriageway	**Option C** Gloucester Place	**Option D** Gloucester Place
	N/B	333s	408s	489s	413s	Worse than Option B*	375s
	S/B	270s	367s	458s	389s	Worse than Option B*	362s

*No modelling of Option C has been undertaken to date. Predicted degrees of saturation are based on manual calculations derived from the analysis of issues presented in the report.

Summary of conclusions

A summary of the feasibility of the four options when considered in the context of a combined Baker Street and Gloucester Place Two-Way scheme is presented in the following table. The table demonstrates that there are several "show stopping" impacts associated with the Option B and Option C schemes.

Table 0.3: Summary of conclusions

Scheme Objective	Option A	Option B	Option C	Option D
Quality of public realm	V. Good benefit	Unacceptable impact *(2)	Acceptable	V. Good benefit
Pedestrian environment	V. Good benefit	Unacceptable impact *(2)	Acceptable	V. Good benefit
Public transport accessibility	Good benefit	Negative impact	Unacceptable impact *(6)	Good benefit
Cycling level of service	Good benefit *(1)	Unacceptable impact *(3)	V. Good benefit	V. Good benefit
Kerbside operation	Acceptable	Unacceptable impact *(4)	Unacceptable impact *(7)	Acceptable
Local vehicle accessibility	Good benefit	Good benefit	Good benefit	Good benefit
Safety	Acceptable	Acceptable	Unacceptable impact *(8)	Acceptable
Traffic network resilience	Acceptable	Severe impact *(5)	Unacceptable impact *(9)	Acceptable
Journey time assessment - Traffic	Good benefit	Acceptable	Unacceptable impact *(9)	Good benefit
Journey time assessment - Cyclists	Acceptable	Negative impact	Negative impact *(10)	Acceptable
Impact on external road network	Acceptable	Severe impact *(5)	Unacceptable impact *(9)	Acceptable

1) Cycle lanes, ASLs and proposed parallel quiet-way provide good benefit relative to existing
2) Shared footway/cycle crossings and associated infrastructure unacceptable to Westminster
3) 3m cycle track provides inadequate capacity for potential future growth
4) Significant loss of kerbside capacity unacceptable to Westminster and Baker Street BID
5) Congestion on Gloucester Place with blocking into Oxford Street & potentially Marble Arch
6) Loss of bus / coach stops on Gloucester Place
7) Total loss of Glos. P. kerbside capacity unacceptable to Westminster and Baker Street BID
8) Poor junction geometric arrangements unlikely to pass safety audit
9) Total failure of traffic network predicted
10) Increased cycle delay relative to A & B, congestion impacts cycle JTs on other routes

Recommendations

The analysis and conclusions demonstrate that the Option B and Option C schemes are unlikely to result in an acceptable impact to traffic network resilience. In addition, there are a number of critical impacts associated with both options. SKM CB does not consider that the impacts associated with the Option B and Option C schemes can be effectively mitigated and therefore recommend that they are not taken forward for further development.

Option A is predicted to have some impact in terms of journey times and network capacity, although when viewed across all peaks throughout the day is generally expected to provide a benefit. It is anticipated that any negative impacts can be mitigated or managed through development of the design in close liaison with TfL NP and TI.

Option D provides a similar level of traffic network performance to Option A but with greatly enhanced cycle facilities on Gloucester Place in the form of wide mandatory cycle lanes where possible. The overall benefits associated with Option D are very similar to Option A but are more closely aligned with the Mayor's strategy for cycle growth. It is therefore recommended by the design team and project board that the Option D concept is taken forward as the preferred scheme design.

Scheme development

The options reviewed by this report represent concept designs. Once the preferred concept has been determined, the project will move forward into the design development stage with the following key objectives:

- Marylebone Road – Work with Transport for London to identify the best solution for the interface between the scheme and Marylebone Road. A number of concept arrangements for this have been identified but further development and assessment of these options is required to determine the optimum arrangement.
- Develop the detail of the design through consultation with stakeholders, fine-tune the concept layout to provide an optimal arrangement to be taken forward to initial design.
- Provide a scheme submission to Transport for London and achieve Network Management Approval.
- Progress forward with the Initial design stage.

Millstone dates

- Initial design – September 2014 to June 2015
- Consultation – Spring 2015
- Detailed Design – June 2015 to November 2015
- Implementation commences – November 2015 to April 2017

Key scheme benefits

South of Marylebone Road (SRN):

- A true City Street environment on Baker Street and Gloucester Place with reduced traffic dominance and uplifted public realm contributing to the creation of a landmark location.
- Significantly increased pedestrian comfort, permeability and amenity fit to meet increasing levels of demand generated by the Bond Street Cross Rail link and the aspiration for locally increased economic and social activity.
- A landmark street identity generated by footway widening, footway de-cluttering, Oxford Circus style diagonal crossings at all signal junctions on Baker Street and Portman Square and sections of centrally located median strips.
- A safe, coherent and comfortable cycling link on Gloucester Place fit to meet increasing levels of cycle demand, linking the proposed CSH11 route at Regents Park with the quiet-way 7 route at George Street or Upper Berkeley Street (alignment to be confirmed).
- Direct access to northbound bus services from Baker Street.
- A well thought out allocation of kerbside capacity to provide for the servicing and parking requirements of local businesses and residents.

North of and including Marylebone Road (TLRN):

- Continuation of the proposed City Street environment on Baker Street and Gloucester Place with reduced traffic dominance and uplifted public realm created by the removal of the existing one-way system and the introduction of two-way flow.
- Significantly increased pedestrian crossing amenity on Marylebone Road and at key junctions such as Melcombe Street / Baker Street and Melcombe Street / Gloucester Place, fit to meet current and future levels of demand generated by the Bond Street Cross Rail link. Improved pedestrian comfort through increased crossing capacities, footway de-cluttering and specific junction crossing upgrades.
- A safe, coherent and comfortable cycling link on Gloucester Place fit to meet increasing levels of cycle demand, linking the proposed CSH11 route at Regents Park with the quiet-way 7 route at George Street or Upper Berkeley Street (alignment to be confirmed).
- Direct access to northbound bus services from Baker Street.
- The potential to develop a legible coach stopping hub around the northern end of Baker Street for both northbound and southbound coach movements.

Initial cost estimates

An initial cost estimate of the proposed scheme has identified a total project estimate of £12.9 million ex. VAT including a budget for contingency and risk. Approximately £3.35 million EX. VAT of this value is for the delivery of the TLRN element of the proposed scheme.

1. Introduction

1.1 Background

1.1.1 SKM Colin Buchanan (SKM CB) has been commissioned by Westminster City Council to undertake a feasibility study to identify, design and assess two-way scheme options for Baker Street and Gloucester Place. The scheme options identified are proposed to introduce two-way operation on Baker Street and Gloucester Place for traffic, from Rossmore Road to Oxford Street.

1.1.2 This document represents a summary of the full feasibility assessment report prepared to identify the benefits and drawbacks of the proposed scheme options and to compare and contrast the Option A and Option B schemes.

1.2 Summary of contents

Chapter 2 – Existing conditions

Chapter 3 – Proposed scheme concept options

- Design objectives
- Proposed concept options
- Cycling strategy

Chapter 4 - Qualitative assessment

- Pedestrian permeability and level of service
- Public transport accessibility and operation
- Cycling level of service
- Servicing and kerbside demand and capacity
- Local traffic accessibility
- Road safety

Chapter 5 - Modelling assessment

- Study area traffic network capacity and resilience - TRANSYT
- Journey time assessment - VISSIM
    - General traffic
    - Cyclists
- Strategic traffic network impact

Chapter 6 – Conclusions and recommendations

2. Existing conditions

2.1 Situation

2.1.1 Baker Street and Gloucester Place south of Marylebone Road form part of the strategic road network operated by the City of Westminster. North of Marylebone Road both streets are designated as the A41, part of the Transport for London Road Network (TLRN).

2.1.2 Baker Street forms the southbound part of a one-way gyratory system connecting Oxford Street at its southern end with Park Street and Rossmore Road at its northern end. Gloucester Place currently provides the northbound part of this one-way system. Both streets are relatively wide with the majority of carriageway space provided for traffic movements. As a result, traffic behaves generally as if negotiating an urban motorway rather than a high street environment. Commensurately, footways are heavily constrained, particularly on the east side of Baker Street. The existing traffic network is summarised on Figure 0.1 provided in Appendix A.

2.2 Street environment

2.2.1 The existing conditions on site have been documented in detail as part of SKM CBs *Traffic and Public Realm Study (2012)*. The conclusion of this report is that significant improvements could be realised on Baker Street by removing the one-way system and re-introducing two-way traffic flow as part of a scheme to deliver benefits to the public realm.

2.2.2 Existing issues which impact on the quality of the street environment are summarised on Figure 0.3 of Appendix A and include but are not limited to:

- Insufficient footway width to provide an acceptable level of comfort for pedestrians and to accommodate on footway activity;
- Unnecessary / badly positioned footway clutter;
- Areas of poor quality paving, construction materials and street furniture;
- Poor quality / inadequate crossing provision along and across Baker Street and Gloucester Place;
- High traffic speeds – traffic dominated environment;
- A lack of north / south cycle facilities;
- Traffic congestion approaching Marylebone Road and Oxford Street;
- Severance from Baker Street and Marylebone Stations caused by poor quality crossing arrangements.

3. Proposed scheme concept options

3.1 Design objectives

3.1.1 The key objectives for the proposed Baker Street Two-Way scheme are as follows:

- Enhance the quality of the public realm on Baker Street and the wider area;
- Enhance permeability and level of service for pedestrians through improved footways and crossings;
- Provide a benefit to public transport accessibility by providing northbound bus services to access Baker Street and improving walking connections with the underground rail network;
- Improve conditions for cyclists in support of the Major's Vision for Cycling;
- Ensure that the streets continue to function for local residents and businesses by maintaining sufficient capacity for servicing, loading, taxi operations and parking;
- Improve travel distances and reduce emissions by improving accessibility and directness for local access traffic and strategic movements;
- Provide a safe environment with a minimum of a nil-detriment impact to accident risk;
- Maintain traffic network capacity and resilience at a level where no unacceptable increases in traffic congestion occur;
- Provide reductions in journey time for all modes where possible; where not possible, incur no unacceptable increases in journey time;
- Avoid traffic reassignment away from Baker Street or Gloucester Place to local roads or to the TLRN.

3.2 Proposed concept scheme designs

3.2.1 This report presents an assessment of the Baker Street Two-Way design Options A, B, C and D. All options provide identical arrangements on Baker Street, and the proposed amendments to the traffic network in the form of two-way regulations and the permitted turns are also the same with all options. The proposed amendments to the traffic network are set out on Figure 0.2 provided in Appendix A. The options differ significantly in their proposals for the arrangement on Gloucester Place.

3.2.2 Concept scheme design drawings have been prepared for each of the options. These drawings are provided in Appendix A

- Option A – Drawing UN50393/OS/101
- Option B – Drawing UN50393/OS/102
- Option C – Drawing UN50393/OS/103
- Option D – Drawing UN50393/OS/104

3.2.3 The proposed improvements to public realm are highlighted on Figure 0.4 of Appendix A. The significant features of the design options are summarised as follows:

Option A – Drawing UN50393/OS/101 (Appendix A)

- Introduces full two-way operation on Baker Street and Gloucester Place for the entire length of both corridors (Oxford Street to Rossmore Road);
- Provides a significant number of new traffic movements for enhanced accessibility throughout the study area;
- Provides significant footway widening on the east side of Baker Street;
- Introduces enhanced crossing facilities throughout the study area including diagonal crossings on Baker Street and around Portman Square;
- Provides advanced cycle stoplines throughout the study area and advisory cycle lanes on Gloucester Place;
- Maintains adequate servicing and kerbside capacity at all locations;
- Allows a proportion of northbound bus services to access Baker Street;
- Avoids banned movements where possible;
- Includes a place-holder arrangement for the junctions of Gloucester Place and Baker Street with Marylebone Road – this section of the scheme is under continued development with several potential options available independently of the concept option feasibility assessment.

Option B – Drawing UN50393/OS/102 (Appendix A)

- Option B is identical to Option A along the Baker Street section, however;
- Provides a 3m segregated bi-directional cycle track along Gloucester Place from Portman Square to Rossmore Road with a 500mm separation strip;
- Utilises a shared pedestrian/cycle crossings at junctions to segregated cyclists from traffic without banning movements;
- Requires a significant reduction in kerbside capacity on Gloucester Place.

Option C – Drawing UN50393/OS/103 (Appendix A)

- Option C is identical to Option B with the following amendments;
- Provides a 4m segregated bi-directional cycle track along Gloucester Place from Portman Square to Rossmore Road with a 500mm separation strip;
- Provides an on-carriageway cycle only signal stage at junctions to segregate cyclists from traffic and pedestrians without banning movements;
- Requires total loss of kerbside waiting capacity on Gloucester Place.

Option D – Drawing UN50393/OS/103 (Appendix A)

- Option D is identical to Option A along the Baker Street section, however;
- Provides mandatory cycle lanes of 2m width throughout the majority of Gloucester Place;
- Provides larger advanced cycle stoplines on Gloucester Place;
- Makes use of a number of banned turns for traffic (George Street, Dorset Street and Upper Berkeley Street), the majority of which are not currently permitted under the one-way system and are anticipated to have negligible impact on traffic operation or accessibility;
- Introduces traffic signals at Ivor Place / Gloucester Place to allow cyclists to connect between Ivor Place and Gloucester Place;
- Does not provide a pedestrian stage at Gloucester Place / George Street;
- All residential parking on Westminster SRN is largely retained (some relocation), and as with Option A the Pay by Phone parking on Portman Square west side would be lost due to need to widen the southbound approach;
- Resident parking on TLRN north of Marylebone Road would need to be further controlled, with recommendation for no waiting & loading between 7am-7pm (but perhaps scope for off-peak loading);
- Sections of single yellow line, Pay by Phone parking and loading bays would be further controlled, with recommendation for no waiting & loading between 7am-7pm (but perhaps scope for off-peak loading).

3.3 Cycling strategy

3.3.1 Along with the other key scheme objectives, it has been identified that uplift in cycling provision is a required deliverable of the Baker Street two-way scheme. The strategy for cycling provision is highlighted and discussed here as it forms a key aspect of option differentiation. However, the other scheme objectives hold equal importance and Chapter 4 which covers scheme feasibility, presents an option assessment against each of the scheme's key objectives with equal consideration given to each.

3.3.2 The proposed concept design options provide different solutions for enhancing cycling provision throughout the study area. All options provide cycle ASLs throughout the scheme and short advisory cycle lanes on approach to signal stoplines on each of the signal controlled side roads. The key difference between options is with the provision of a proposed north/ south route for cyclists on Gloucester Place.

3.3.3 **Option A** provides advisory, with-flow cycle lanes of 1.5m width northbound and southbound on Gloucester Place. These cycle lanes are continuous wherever possible. The northbound advisory cycle lanes will run outside parking bays and bus stops where this activity is required during peak times. There are presently already waiting and loading restrictions on the east side of Gloucester Place, therefore the southbound cycle lanes would be kept clear of stopping vehicles from 7am until 7pm.

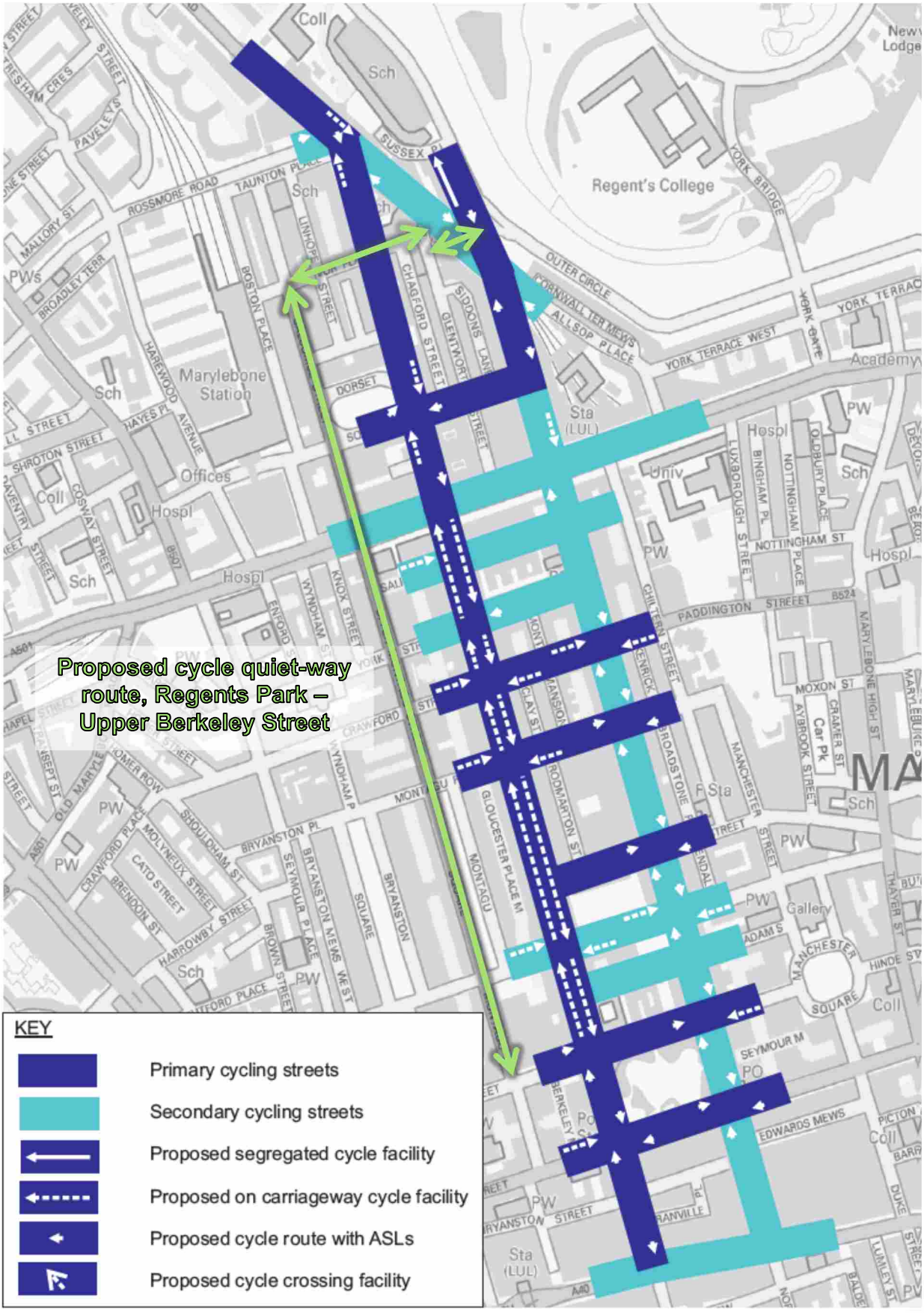
3.3.4 Where the advisory cycle lane does not continue, it is proposed that a coloured surface strip will be provided (a courtesy cycle lane) and parking and loading will be restricted to off-peak times only. Therefore, even where it is not possible to provide a cycle lane, the carriageway will be kept clear of kerbside activity for all periods of significant cycle flow, and traffic will be given a visual indication to leave space for cycle movements. This form of cycle lane is already in use on Cycle Superhighways, and it is acknowledged that these have caused some concern over safety at specific locations. The Option A design does not contain any courtesy cycle lane on the approach to junctions – these are all to be advisory cycle lanes, and so confusion over status of the lane at key conflict zones is not an issue.

3.3.5 The Option A cycling strategy is shown diagrammatically on Figure 1 and in detail on Drawing UN50393/OS/101 (Appendix A)

3.3.6 **Upper Montagu Street cycle quiet-way.** The Option A cycling strategy is compatible with and will support the provision of an enhanced parallel cycle quiet-way facility on Balcombe Street and Upper Montagu Street. This quiet-way is included as part of the Westminster Cycle Grid proposals but is unlikely to be implemented under a scenario where Options B or C are taken forward as Gloucester Place would become a key link of the cycle grid. The quiet-way could be provided with Option D if considered appropriate but can be treated as a separate scheme to Baker Street Two-Way in this instance as the schemes would not be inter-dependent.

3.3.7 The Option A scheme will allow cyclists to connect between Regents Park and Balcombe Street via a segregated cycle facility and quiet-way route on Park Road and Ivor Place. The quiet-way itself would provide a safe and direct route between Ivor Place and Upper Berkeley Street, incorporating sections of contra-flow cycle lane through Montagu Square. A cycle crossing facility would be provided over Marylebone Road at the junction with Balcombe Street.

Figure 1: Proposed Option A cycle arrangements



3.3.8 **Option B** has been developed through detailed study of the potential strategy options for cycle segregation on Gloucester Place (See SKM CB report *Gloucester Place cycling segregation options, Sep 2013*). Option B proposes a bi-directional segregated cycle track along Gloucester Place, adjacent to the carriageway. The cycle facility would run between the north side of Portman Square to Rossmore Road. The cycle facilities will include shared, (with) pedestrian cycle crossings at each signal controlled crossing, which will facilitate the segregation of ahead and turning cyclists from general traffic but will mix them on shared areas of footway with pedestrians. Banned turns have been considered as a method of facilitating segregation but this runs contrary to the stated aims of the project and is not considered to be an acceptable solution by The City of Westminster.

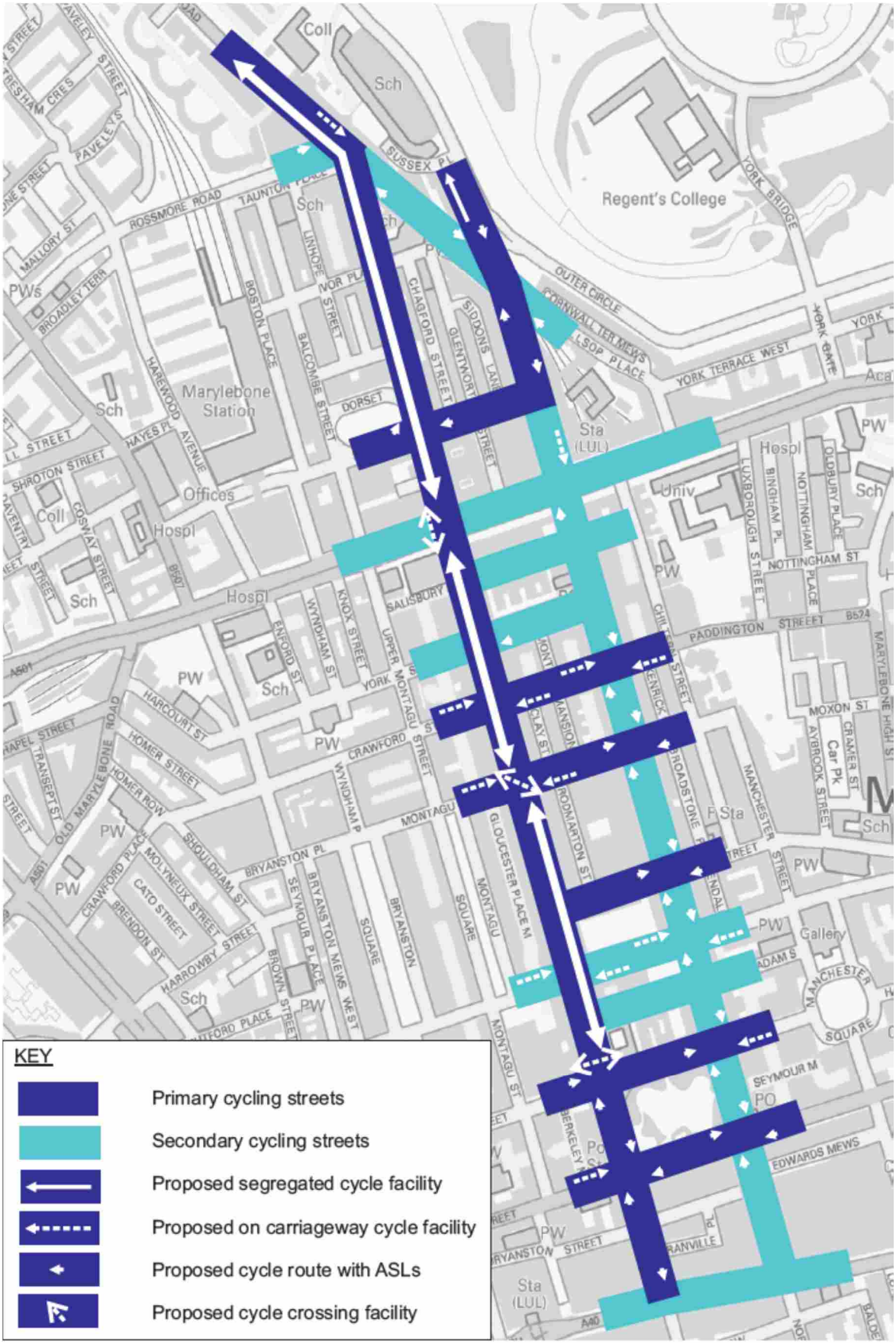
3.3.9 The impact on pedestrians resulting from this method of control could be significant. Wherever shared activity is introduced the footway will be widened with new build-outs, however, pedestrians will be required to interact with streams of moving cyclists which introduces a new conflict. The demand in terms of pedestrian activity on Gloucester Place is a small fraction of that experienced on Baker Street, and current cycle flows are limited to a peak of approximately 3-4 cyclists per signal cycle in each direction. It is expected that cycle demand will increase following the introduction of the proposed A41 cycle super-highway and therefore the conflict of cyclists and pedestrians could become an issue with particular implications for vulnerable pedestrians who will be forced to interact, to a degree, with cyclists.

3.3.10 The carriageway space available on Gloucester Place is limited to an average of approximately 11.8m. This means that the dimensions of the proposed segregated facility are constrained. The design has been prepared assuming dimensions for each way cycle movement of 1.5m. Where the segregated facility approaches a junction and is raised up to become a shared footway area, this results in a loss of available carriageway width of approximately 3.3-3.5m leaving less than 8.5m for two-way traffic operations. There is therefore significantly reduced scope for more than one lane in either direction at many locations if some kerbside capacity is to be retained. Where a flare lane is necessary to achieve acceptable junction operation, lanes of 2.75m are required (with a minimum of 3.3m for traffic heading in a single lane in the opposite direction).

3.3.11 The design has been prepared on the assumption that a method of segregation that requires a minimal footprint can be achieved. Initially armadillos were considered but it was determined that they have not been approved for use by the City Council or PRAG and are unlikely to be so. Therefore the minimum impact solution would be to provide a 500mm kerbed median. It is not anticipated that any signing or street furniture would be located on this median under Option B.

3.3.12 The Option B cycling strategy is shown diagrammatically on Figure 2 and in detail on Drawing UN50393/OS/102 (Appendix A). Indicative detail of the proposed control arrangement options is provided on Drawing UN50393/OS/102 – Design detail 1 & design detail 2 (Appendix A).

Figure 2: Proposed Option B cycle arrangements



3.4 Cycle strategy – Option C

3.4.1 The proposed Option C scheme has been prepared in response to comments issued by the Project Board following presentation of the Option A and Option B schemes. The proposed Option C scheme adopts the same overall strategy for cycle segregation as Option B (shown on figure 2). However, it provides different geometry and method of control at junctions and links on Gloucester Place.

3.4.2 The proposed Option B scheme design has been prepared on the basis of a do minimum cycle segregation design which uses a two-way 3m wide cycle track and achieves segregation from traffic at junctions by using shared crossings which introduce a conflict with pedestrians.

3.4.3 The London Cycle Design Guide indicates that a 3m wide cycle track is not desirable where cycle flow is considered to be high. The introduction of the proposed cycle super-highway on Finchley Road to the north of the study area is likely to result in significant cycle growth and therefore it is likely that cycle north/south cycle demand will be in the high category at some point in the future. The 3m cycle track will not be sufficient to guarantee adequate capacity for potential future growth. Therefore there would be a significant risk that if the 3m cycle track arrangement were implemented, it would result in congestion issues for cyclists.

3.4.4 It is considered that if a segregated facility is to be installed it must provide sufficient capacity to meet potential future demand or risk a situation where remedial widening of the segregation is required, which may not be feasible within the available carriageway space and which would represent an unacceptable impact to residents and street users, as well as requiring further public funding.

3.4.5 The proposed shared pedestrian / cycle crossings which form the principal method of control of junctions on Gloucester place under Option B are not considered to be desirable by The City of Westminster. The impact on pedestrians caused by the sharing of footway space with cyclists is considered to be unacceptable. As is the impact on the public realm caused by the level of infrastructure required to control cyclists with pedestrians at the crossing points. Therefore an alternative method of control has been assessed as part of Option C.

3.4.6 Option C provides segregation for cyclists from traffic and pedestrians by providing a separate signal phase for the northbound and southbound cycle ways. Because turning movements for traffic must be permitted it is not possible to operate these phases in parallel with traffic and therefore a fourth signal stage for cyclists is required.

3.4.7 The Option C cycling strategy is shown diagrammatically on Figure 2 (same as Option B) and in detail on Drawing UN50393/OS/103 (Appendix A). Indicative detail of the proposed control arrangement options is provided on Drawing UN50393/OS/103 – Design detail 1 (Appendix A).

3.5 Cycle strategy – Option D

3.5.1 The proposed Option D scheme has been developed following the review of the Option A, B and C scheme proposals by the Baker Street Two Way Project Board. The board concluded that Options A and B both had desirable elements and there was therefore a desire to examine the potential for a hybrid scheme that would provide improved benefits for cycling in line with Option B but with the acceptable level of network operation offered by Option A. The design team worked closely with Transport for London to identify a hybrid scheme proposal based on the Option A scheme but with the following design objectives:

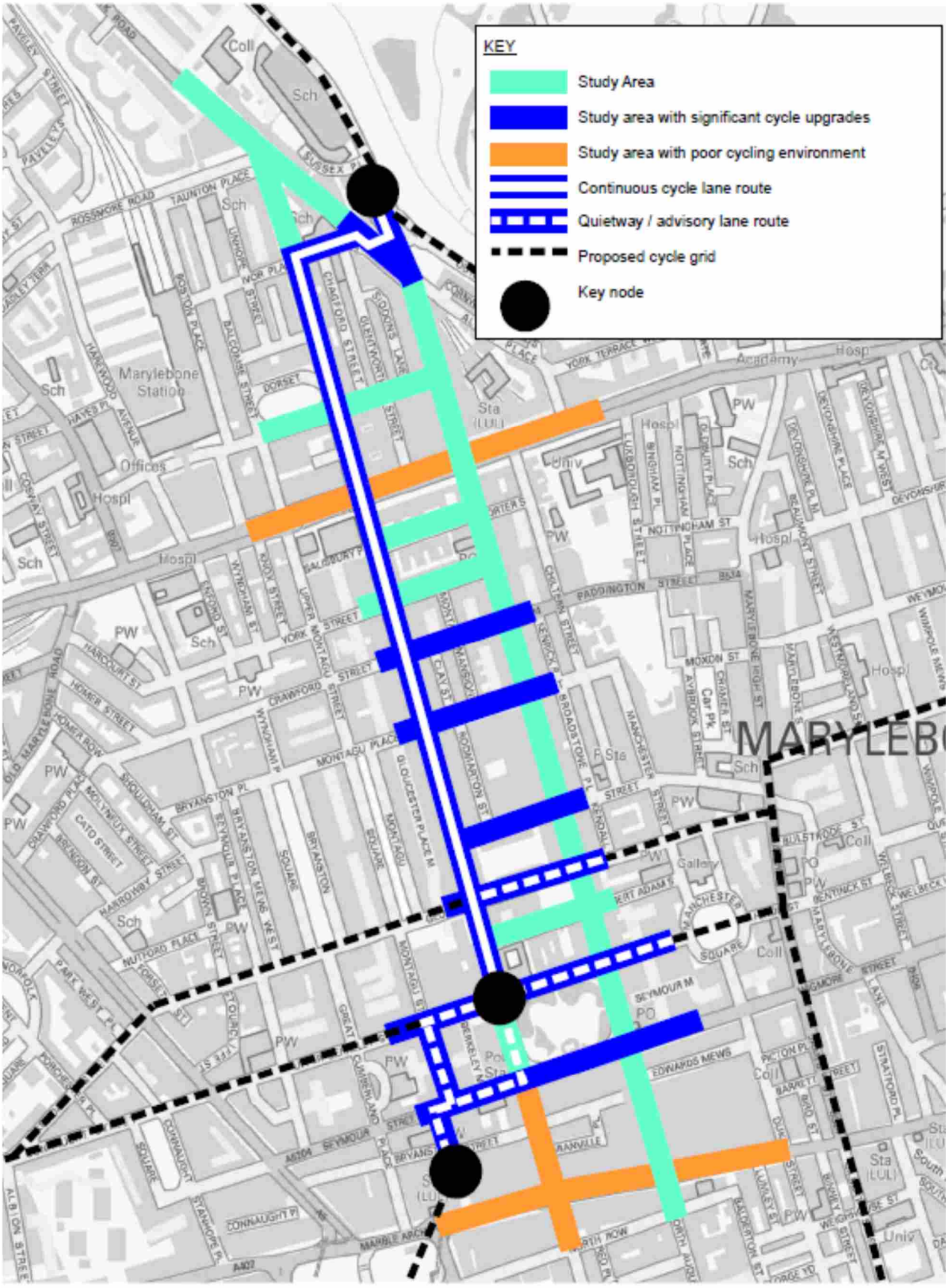
- 2m Mandatory cycle lanes where possible throughout Gloucester Place;
- Cycle advanced stoplines of 7.5m;
- Cycle infrastructure at key locations to maintain route connectivity;
- Banned turns for traffic at key locations to improve route safety;
- Connection though to Oxford Street;
- Coherent and linear route where possible.

3.5.2 The proposed Option D scheme is shown diagrammatically on Figure 3 and in detail on Drawing UN50393/OS/104. The Option D scheme design achieves the following performance against the objectives listed above:

- 67% of the route achieves a minimum cycle lane width of 2m with the remainder between 1.9m and 1.5m;
- 74% of the route with mandatory or segregated cycle lanes;
- 100% of cycle advanced stoplines on Gloucester Place at 7.5m;
- Connectivity maintained through use of specific measures at the junctions of Gloucester Place with Ivor Place and Upper Berkeley Street to link to the proposed CSH11 route from Regents Park and the Westminster Cycle Grid;
- Banned turns proposed at Gloucester Place / Montagu Place and Gloucester Place / Upper Berkeley Street and Gloucester Place / George Street. These are not expected to have any significant impact on traffic operation or accessibility;
- Connection through to Oxford Street achieved by provision of quiet-way link through to the southern end of Old Quebec Street which will become an enhanced hub for cycle parking;
- Continuous, linear route from Ivor Place to Upper Berkeley Street.

3.5.3 The Option D cycle strategy uses Gloucester Place as a high quality link between the proposed CSH 11 route from Regents Park to the proposed Westminster Cycle Grid at Upper Berkeley Street from where cyclists can progress east, west and south without being directed towards Portman Street or Oxford Street which are considered by the design team to be poor cycling environments due to geometric constraints and high numbers of bus movements. It would be possible to provide the proposed Upper Montagu Street quiet way in parallel with this route but not essential and therefore they can be considered as separate schemes.

Figure 3: Proposed Option D cycle arrangements



4. Qualitative assessment of Options

4.1 Pedestrian permeability and level of service

4.1.1 Details of the determination of pedestrian permeability and level of service are included at Appendix A.

Footway width assessment

4.1.2 The proposed scheme options all provide identical enhancement to the footway provision on Baker Street. It is proposed that the eastern footway on Baker Street will be widened for the majority of its length. Also it is proposed that existing clutter in the form of street furniture, phone boxes, cycle parking, bus shelters, signing, lighting and signal columns will be reviewed and rationalised. As a result, it has been calculated that significant benefits in average footway width and effective footway width will be achieved.

Table 4.1: Average actual footway width (metres), Baker Street (Oxford Street to Marylebone Road)

West footway		East footway	
Existing	All options	Existing	All options
5.2	5.2	4.6	5.6
No change		22% improvement	

Table 4.2: Average effective footway width (metres), Baker Street (Oxford Street to Marylebone Road)

West footway - Effective		East footway - Effective	
Existing	All options	Existing	All options
2.9	3.1	2.7	3.8
7% improvement		40% improvement	

Longitudinal crossing assessment

4.1.3 The proposed scheme options all provide identical enhancement to the longitudinal crossing arrangements on Baker Street and Gloucester Place. The proposed scheme provides significant enhancements to crossing movements on side roads by signalising existing uncontrolled crossings and providing enhancements in the form of headway treatments to uncontrolled crossings. Ad hoc crossing movements are facilitated at key points on Baker Street through the use of new medians and traffic islands.

Table 4.3: Longitudinal crossing assessment for Baker Street

North/south crossing type	West footway		East footway	
	Existing	All options	Existing	All options
Controlled	7	8	7	8
Enhanced uncontrolled	0	3	0	2
Uncontrolled	5	1	4	1
Total crossings	12	12	11	11

Table 4.4: Longitudinal crossing assessment for Gloucester Place

North/south crossing type	West footway		East footway	
	Existing	All options	Existing	All options
Controlled	2	8*	2	7*
Enhanced uncontrolled	0	0	0	0
Uncontrolled	8	2	11	6
Total crossings	10	10	13	13

*NB. Option D does not provide controlled crossings over the east and west arms at George Street and therefore provides one less controlled and one more enhanced uncontrolled on both sides of Gloucester Place.

Permeability assessment

4.1.4 The proposed scheme options all provide identical enhancement to the permeability of Baker Street and Gloucester Place. Permeability has been assessed by measuring the average maximum walking distance to any crossing point on Baker Street and Gloucester Place. In addition, however, permeability is also improved through reduction in crossing distances on Baker Street as a consequence of footway widening.

Table 4.5: Average maximum distance to crossing point (metres)

Gloucester Place		Baker Street	
Existing	Options A & B	Existing	Options A & B
55	54	49	36
2% improvement		27% improvement	

4.1.5 All of the proposed scheme options will provide very significant benefits to pedestrian movement and permeability on Baker Street and Gloucester Place.

4.2 Public transport accessibility and operation

4.2.1 A key benefit of the proposed scheme is that it will permit northbound buses to access Baker Street. Commensurately, some bus services will need to re-routed southbound to Gloucester Place. The proposed scheme necessarily will require some reorganisation of stops. The detailed analysis of the impact of the schemes on public transport accessibility and operation is contained at Appendix A.

Proposed service routeing

4.2.2 In order to maximise benefit and minimise impact, it is proposed that buses re-routing northbound will do so for the entire length of Baker Street, turning into Orchard Street from Oxford Street and travelling north to Park Street. Southbound bus services will remain on Baker Street southbound until at least Blandford Street before re-routeing across to Gloucester Place.

4.2.3 The services to be re-routed largely depend on some of the turning movements permitted at Marylebone Road and Oxford Street. However, where possible the re-routeing of services is proposed to result in maximum benefit and minimum impact based on existing boarding, alighting and dwell time information.

4.2.4 The services proposed to be re-routed northbound to use Baker Street are the 13, 113, 189 and 274. All of these services will benefit from direct access to stops on Baker Street rather than on Gloucester Place.

4.2.5 The services proposed to be re-routed southbound to use Gloucester Place are the 30, 82 and 274. These services have been selected because the daily average boarding at the existing stop at the southern end of Baker Street is very low (less than 2 passengers).

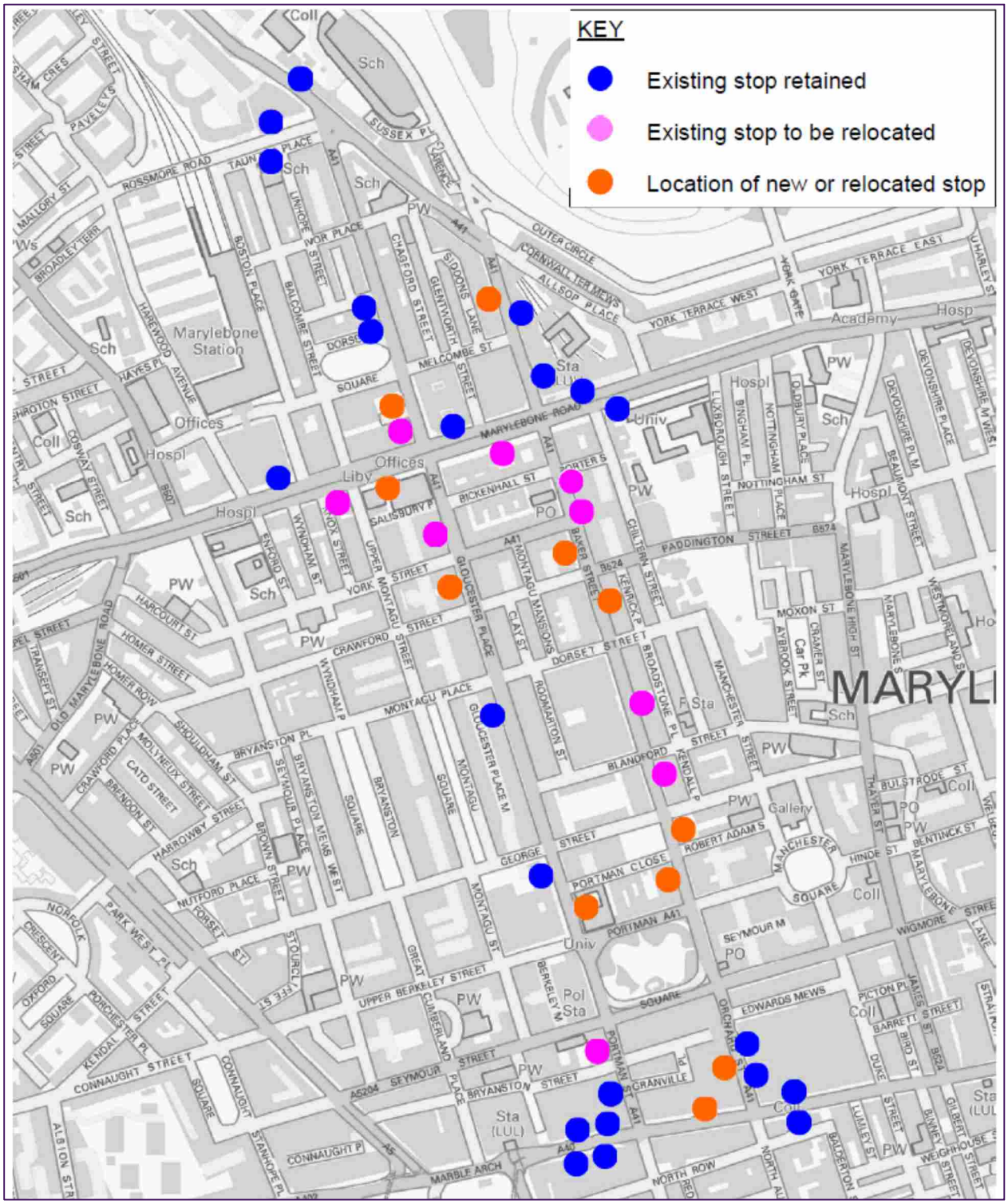
4.2.6 The final bus service arrangements will need to be agreed in detail with TfL and therefore the services currently listed are subject to revision.

Proposed bus stop arrangements

4.2.7 The proposed scheme will require some reorganisation of bus stops. The proposed scheme options all provide the same number, location and frequency of bus stop arrangements. The frequency of proposed bus stops will be equivalent to the existing arrangement but with a better spread along the corridor and with new stops northbound on Baker Street and a new stop southbound on Gloucester Place.

4.2.8 The proposed scheme options all provide the same design arrangements on Baker Street, however, the proposed Option B scheme requires segregation of cycling movements past bus stops. This is achieved by using a mixture of bus stop by-pass arrangements depending on the geometric circumstances at each location. In general the northbound bus stops on Gloucester Place will provide a reduced level of quality for passengers waiting to board and the length, and thus resilience of the bus stops will be reduced.

Figure 4: Proposed bus stop arrangements



4.3 Cycling level of service

4.3.1 A draft copy of TfL's cyclist level of service tool has been used to provide a guideline for the assessment of the options against key criteria for the quality of cycle provision. The Cyclist Level of Service Assessment Tool is currently in development and therefore is not a formal TfL guideline at this date. The assessment tool sets out six key criteria under which sub categories are listed for assessment.

Table 4.6: Cycling level of service assessment

Assessment Criteria	Maximum Score	Base	Option A	Option B	Option C	Option D
Safety	48	9	19	35	45	27
Directness	8	5	5	1	3	6
Coherence	6	4	5	3	3	6
Comfort	20	10	14	13	14	15
Attractiveness	12	6	9	6	6	8
Adaptability	6	4	3	2	1	4
Combined total	**100**	**38**	**55**	**60**	**72**	**67**

4.3.2 The different proposed design options all provide a significant benefit in terms of improved level of service for cyclists on Gloucester Place and throughout the study area when compared to the Base. The level of benefit is generally commensurate with the degree to which cycling facilities have been prioritised over operation for other road users although Option D provides good benefit without a significant traffic impact.

- Option A provides the lowest cycle level of service improvement. This is because it provides 1.5m wide advisory cycle lanes when the other options provide a combination of wider cycle lanes or greater segregation.
- Option B provides a full segregation arrangement for cyclists but limits the width and operation of the segregated facility to attempt to maintain traffic capacity.
- Option C provides the greatest benefit to cycling level of service by committing the greatest amount of carriageway space to provide full cycle segregation with 2m cycle lanes in each direction and separate control for cyclists at junctions.
- Option D provides very good benefit to cyclists by providing wide mandatory cycle lanes and by examining and addressing issues at specific locations to obtain improvements in connectivity and coherence.

4.3.3 The journey time assessment for cyclists presented in the following sections of this report demonstrates that Options A and D are likely to provide the quickest cycle journeys relative to Options B, C and the existing arrangement.

4.4 Servicing and kerbside demand and capacity

4.4.1 A detailed survey of existing kerbside capacity and demand covering the period of 8am-8pm has been carried out. A plan showing existing kerbside waiting and loading restrictions is included at Appendix A. The study area has been summarised by zones and type of kerbside activity (simplified in this report). The peak degree of saturation of each type of kerbside demand is presented in the following table.

Table 4.7: Existing kerbside usage (% degree of saturation)

Study area zone	General / Residents Parking	Servicing / Loading	Off-peak only parking
Zone 1 - Rossmore Road to Marylebone Road	93%	28%	20%
Zone 2 - Marylebone Road to Dorset Street	95%	24%	33%
Zone 3 - Dorset Street to Upper Berkeley Street	87%	22%	24%
Zone 4 - Upper Berkeley Street to Oxford Street	93%	42%	47%

4.4.2 The proposed scheme options have been analysed to determine the potential impact on kerbside capacity. The proposed scheme alters the fundamental nature of Gloucester Place and Baker Street and therefore it is necessary that parking and loading provision must be reconfigured.

Table 4.8: Assessment of impact on general / residents parking (24hr)

Study area zone	Existing	Option A	Option B	Option D
Zone 1 - Rossmore Road to Marylebone Road	51	44	27	39
Zone 2 - Marylebone Road to Dorset Street	18	18	18	17
Zone 3 - Dorset Street to Upper Berkeley Street	20	25	25	25
Zone 4 - Upper Berkeley Street to Oxford Street	13	11	11	13
Totals	102	98	81	94

Table 4.9: Assessment of impact on servicing/ loading provision

Study area zone	Existing	Option A	Option B	Option D
Zone 1 - Rossmore Road to Marylebone Road	63	47	34	48
Zone 2 - Marylebone Road to Dorset Street	3	0	0	3
Zone 3 - Dorset Street to Upper Berkeley Street	0	3	3	0
Zone 4 - Upper Berkeley Street to Oxford Street	0	0	0	0
Totals	66	51	37	51

Table 4.10: Assessment of impact on Off-peak only parking

Study area zone	Existing	Option A	Option B	Option D
Zone 1 - Rossmore Road to Marylebone Road	10	6	6	20
Zone 2 - Marylebone Road to Dorset Street	96	75	55	75
Zone 3 - Dorset Street to Upper Berkeley Street	126	75	54	75
Zone 4 - Upper Berkeley Street to Oxford Street	46	37	35	37
Totals	278	182	139	196

4.4.3 The assessment of impact on kerbside provision suggests the following key conclusions:

- Option A provides a negligible impact to general and residents parking. Considering the high degree of saturation for the existing provision, this is a key option benefit;
- Option B provides a 21% reduction in general and residents parking, nearly all of which occurs on Gloucester Place. This is likely to result in difficulty for residents and an increase in illegal parking and stopping activity as capacity will no longer meet demand. Illegally parked vehicles are likely to result in a loss of network resilience and could pose a risk to the safety of road users such as cyclists and pedestrians;
- Option D would result in a slightly greater impact on 24 hour parking than Option A with a total loss of 8 parking spaces over the length of Baker Street and Gloucester Place. However, this should provide sufficient on-street parking to meet existing demand. It is also balanced by some degree by 14 more off-peak parking spaces than Option A. The sections of Westminster SRN within the study area are not expected to experience any net loss of 24 hour parking provision.
- All options will have some impact on existing loading and servicing provision. This impact will be carefully controlled so that bays which have a specific requirement are maintained. However, the surveys show that the existing provision is not used to maximum capacity and therefore carefully developed reduction will be acceptable.

4.5 Local traffic accessibility

4.5.1 The proposed two-way scheme for Baker Street and Gloucester Place will significantly enhance accessibility for local traffic and other users. The existing one-way system forces local traffic to take longer, less direct journeys through the area resulting in unnecessary pollution in terms of noise and emissions.

4.5.2 The one-way system results in a significant number of G-turn manoeuvres which means that vehicles are turning at numerous different junctions. This will become a simple turn at a single junction under the proposed scheme. This behaviour increases traffic demand at junctions and therefore affects operational resilience when congested conditions occur.

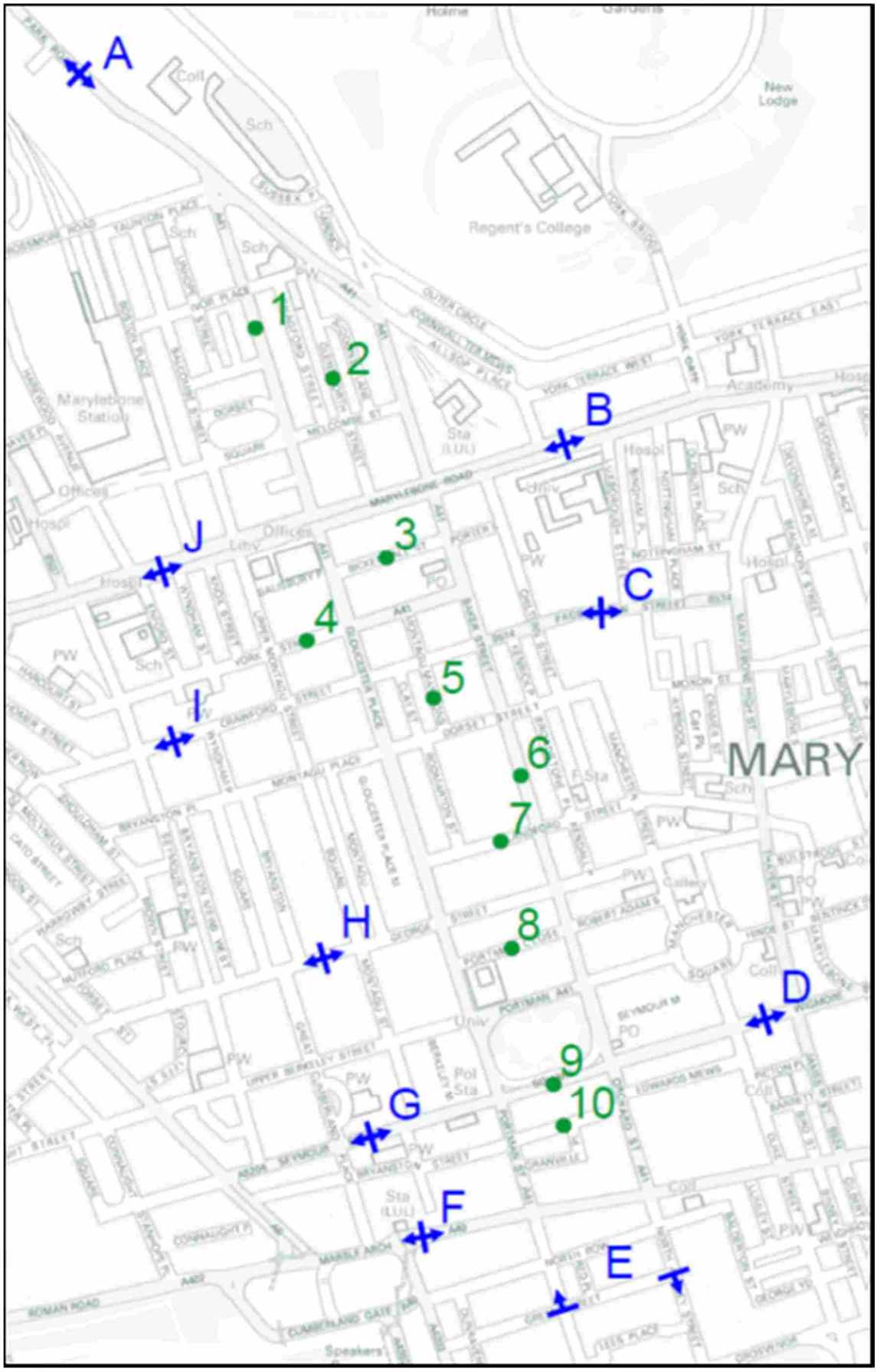
4.5.3 All proposed options permit identical vehicle movements at all junctions (with the exception of Option D – although the differences have been examined and determined to be of negligible impact). Therefore a single assessment of number of turns and journey distance has been undertaken. A matrix of 10 key access points into the study area and ten key local destinations has been assessed. The distance and number of turns taken to get to and from each has been measured. The key access and destination points assessed is shown on Figure 5, and the resulting change in number of turns and distance travelled as a consequence of the introduction of two-way is shown in Table 4.11.

Table 4.11: Summary of accessibility assessment

Average number of turns		Average distance travelled	
Existing	All Options	Existing	All options
2.4	2.2	877m	797m
9% improvement		9% improvement	

4.5.4 A significant reduction in average journey distance for local access traffic is expected as a result of the scheme. This should provide benefits in terms of reduced noise pollution and emissions. The predicted reduction in the number of turns for local access traffic will provide significant benefits in terms of reduced rat-running, traffic flow on side streets and quiet streets and reduction in turning movements at junctions.

Figure 5: Accessibility assessment matrix



4.6 Road safety

Existing personal injury accident data

4.6.1 In order to determine the current level of personal injury accident (PIA) data in the study area and to identify any particular trends, collision data for the 36-month period to the end of October 2013 has been obtained from TfL London Accident Analysis Unit. The area includes all of Baker Street and Gloucester Place, a section of Marylebone Road 200m in each direction to the east and west of the corridors, and Oxford Street including 50m each side of Portman Street and Orchard Street.

4.6.2 Across the whole study area, there were over 200 PIAs in 3 years, with around 60 PIAs resulting in injury to pedestrians, and also around 60 PIAs resulting in injury to cyclists.

4.6.3 As would be expected, the accidents tend to cluster around key junctions where vehicle/ vehicle and vehicle/ pedestrian conflicts are at their highest. The data shows that the main junctions experiencing the greatest number of PIAs, some of which result in serious injury, are:

- Baker Street/ Marylebone Road;
- Oxford Street/ Portman Street/ Park Street;
- Gloucester Place/ Marylebone Road;
- Oxford Street/ Orchard Street/ North Audley Street.

4.6.4 To the north of Marylebone Road, a notable cluster of accidents occur at Baker Street/ Outer Circle (involving cyclists) and around the pedestrian crossing on Baker Street/ Melcombe Street (though with few pedestrian accidents).

4.6.5 Along the Baker Street corridor, the data shows that there have been around 20 PIAs over 3 years, yet there are not many significant clusters of PIAs, with the most notable being located at:

- Section between Marylebone Road and Crawford Street (mainly involving pedestrians or cyclists);
- George Street (2 out of 4 involving cyclists);
- Portman Square/ Wigmore Street (mainly involving pedestrians or cyclists).

4.6.6 Along the Gloucester Place corridor, the data shows that there have been a greater number of accidents when compared to Baker Street (almost 40 PIAs in 3 years) and that there are more noticeable clusters of PIAs, located at:

- George Street (over half involving cyclists)
- Crawford Street (mainly involving cyclists)
- Portman Square/ Upper Berkeley Street
- Portman Square/ Seymour Street (mainly involving pedestrians and cyclists)
- York Street (mix of vehicle, pedestrian, cyclist)
- Between Portman Square and Oxford Street (mainly vehicle)

4.6.7 The greatest numbers of accidents involving pedestrians occur at the junctions along Marylebone Road and Oxford Street, accounting for around two thirds of all accidents in the area. Along the Baker Street corridor, there were less than 10 PIAs involving pedestrians, with a mixture at and away from junctions. Along the Gloucester Place corridor, there were only 2 PIAs resulting in injury to pedestrians, which is a function of the low volume of pedestrian movements but also due to the relative lack of formal crossing facilities and the need for pedestrians to exercise greater caution when crossing in gaps between vehicles. As tends to be the case at uncontrolled locations with low crossing volumes, the heightened level of risk results in fewer accidents.

4.6.8 Along the Gloucester Place corridor, there were around 15 PIAs in 3 years, and these tended to be at junctions and involve turning vehicles. Oxford Street junctions with Park Street and Orchard Street also experienced around 15 PIAs. Baker Street experienced less than 10 PIAs in 3 years, with most of these at Outer Circle. Along the section of Marylebone Road there were around 15 PIAs in 3 years involving cyclists.

Figure 6: Existing personal injury accident data

Scheme impact on risk of personal injury accidents

4.6.9 All scheme options will result in greater provision of cycling facilities, making cyclists and cycling more conspicuous. Options B & C provide segregated facilities along Gloucester Place and this may result in the likelihood of fewer accidents involving turning vehicles, however this relies on cyclists taking advantage of the shared footway crossing facilities, rather than remaining on-carriageway.

4.6.10 All scheme options introduce two-way movements at junctions throughout the corridor. As a consequence, there is a greater degree of vehicle/vehicle and vehicle/cyclist conflict (where cyclists are on-carriageway) and so there is potentially an increased risk of PIAs.

4.6.11 Nevertheless, this is offset by the expected reduction in vehicle speeds due to the reduction in number of lanes, greater kerbside activity and the public realm improvements which will create a high street environment, thus removing the urban motorway environment that exists currently. There will also be a reduction in vehicle weaving, lane changing and U-turning behaviour, through greater accessibility across the corridors.

4.6.12 All scheme options provide considerable improvement to pedestrian crossing facilities and amenity which will reduce the risk to pedestrians, including:

- The introduction of diagonal crossings at 8 sites along Baker Street and Portman Square, which will encourage pedestrians to wait for a safe moment to cross, and removes some of the ambiguity that currently exists with partially controlled junctions and the need to judge appropriate gaps in which to cross;
- Improved crossing amenity proposed at Marylebone Road junctions with Baker Street and Gloucester Place, through the provision of straight across crossings (subject to the agreement of Transport For London Signal Infrastructure);
- Proposed central median between Dorset Street and Blandford Street will provide safer refuge at a point midway between junctions where crossing demand will be significant;
- Improvements to side road treatments, and raising of carriageway at junctions to footway level on Baker Street and Portman Square.

4.6.13 Nevertheless, there is expected to be a large increase in pedestrian volumes in the Baker Street area over coming years, not least because of Crossrail and the Chiltern Line improvements to the route into Marylebone Station. As a consequence, greater pressure will be placed on crossing locations and during peak times this may result in pedestrians taking risks when crossing.

4.6.14 On balance, the diversity of safety improvements and the potential for new risks to safety mean that it is difficult to forecast any significant overall benefit or detriment to road safety. It is therefore considered that, in general, the introduction of the 2-way scheme under either Option will not result in an increase in PIAs, and has the potential to reduce risk and severity of PIAs.

4.7 Design review - Option C – Drawing UN50393/OS/103 (Appendix A)

4.7.1 The project team has examined the issues that would be generated by providing the Option C scheme design. A modelling exercise to assess the impact of the C design has not been undertaken to date. The design causes significant reductions in traffic capacity relative to Option B such that the traffic network could not operate within capacity. The issues that cause these reductions in capacity are summarised below:

- The 4m cycle track results in a loss of 4.5m of available carriageway for traffic at mid-link locations. This necessitates the loss of two lanes compared to the loss of one (3.5m) with the 3m cycle track arrangement proposed by Option B.
- The proposed method of control means that a further reduction in carriageway width of 1m is required at junctions in order to be able to mount signal control equipment within the separating median. This means that at a number of locations, the remaining carriageway width would fall below a safe operating width for two-way traffic flow and that signal stoplines will need to be set back a considerable distance to allow turning movements to take place. This will impact on stopline inter-visibility.
- At several locations the provision of a single northbound lane will have a severe impact and limit traffic capacity to a level where extreme levels of congestion will occur. The northbound approach to Marylebone Road would operate significantly over 100% saturation unless 15s of green time was taken away from Marylebone Road. It is not possible to reduce green time on Marylebone Road and therefore the resultant degree of saturation would be at least 140% in the PM peak period meaning that approximately 260 PCUs (or 1.5km of queued vehicles) could not pass through the junction within the PM peak hour.
- The reduction in carriageway width means that at the majority of junctions on Gloucester Place, no right-turn storage would be available for northbound or southbound traffic. Therefore when a right-turning vehicle is stopped to turn, it would block any ahead movement resulting in a significant reduction in traffic capacity.
- The proposed method of control for cyclists at junctions on Gloucester Place means that a reduction in green time for traffic would be required relative to the Option A and Option B schemes. This is likely to equate to a minimum of 18% to provide the minimum length of cycle stage. This percentage may be increased should cycle demand increase significantly to avoid the cycle track operating over 100% capacity.

- The proposed method of control for cyclists at junctions on Gloucester Place means that a reduction in green time for traffic would be required relative to the Option A and Option B schemes. This is likely to equate to a minimum of 18%.
- The 4m cycle track option would result in a total loss of kerbside capacity for parking and would mean that any illegal waiting would result in a further significant reduction in capacity. This arrangement would not be acceptable to the residents and businesses located on Gloucester Place.
- The combination of the elements described above would result in a catastrophic impact on link capacity which will generate severe congestion throughout the vicinity of Gloucester Place, would undoubtedly increase journey times by a considerable margin relative to Option B and would in all probability result in queues that would severely impact the operation of Oxford Street, Marble Arch and therefore the Inner Ring Road. Limiting capacity on these strategic routes would result in increased traffic reassigning to local roads, which would impact on the comfort and safety of the quiet way routes for cyclists and other street users.

5. Modelling assessment

5.1 Study area traffic network capacity and resilience – TRANSYT modelling assessment

Existing conditions

5.1.1 SKM CB has prepared calibrated and validated base TRANSYT modelling in line with TfLs modelling guidelines. This modelling has been submitted to TfL for review but formal feedback is not scheduled until a later date. The base modelling results are presented on Figures 1.1,1.2 & 1.3 of Appendix B. The figures show colour coded degrees of saturation. The results are presented for each of the peak hour periods assessed; AM 0730-0830, Inter Peak 1245-1345 and PM 1730-1830.

5.1.2 Key points of congestion:

- Marylebone Road experiences high degrees of saturation with very little resilience in all periods assessed.
- In the AM peak, Baker Street southbound approaching Marylebone Road, Orchard Street southbound approaching Oxford Street and the Gloucester Place northbound right-turn into Marylebone Road all operate close to capacity and generate congestion.
- The inter peak generally follows the same pattern as the AM peak but with increased levels of congestion and queuing. Orchard Street southbound approaching Oxford Street is over capacity resulting in exit blocking on junctions further up Baker Street into Portman Square. Gloucester Place northbound approaching Marylebone Road operates close to capacity generating queues which cause exit blocking at York Street. Baker Street southbound approaching Marylebone Road continues to operate close to capacity.
- PM peak conditions are very similar to inter peak conditions except with some reduced queuing at points within the hour, with the exception of southbound on Baker Street approaching Oxford Street. The inter peak provides the worst case.

TRANSYT model results - Option A

5.1.3 TRANSYT modelling of the proposed scheme options has been prepared. Signal method of control and timings have been designed in accordance with TfLs SQA-0064 i2 with some exceptions which have been discussed but need to be further agreed with TfL TI. It has been assumed that all existing levels of traffic demand will be retained within the study area to develop a proposed traffic flow network. This is a robust assumption as it assumes no traffic will reassign from the area and no turning flows will reduce as a result of improved accessibility. This assumption has been verified as reasonable based on the results of the strategic modelling assessment.

5.1.4 The results for Option A are provided on Figures 2.1, 2.2 & 2.3 of Appendix B.

- The TRANSYT results show that across all peak periods, the east and westbound movements on Marylebone Road will remain at similar degrees of saturation to the existing situation under the Option A scenario.
- The Option A TRANSYT results show that all existing congestion issues throughout the rest of the study area are expected to be resolved by the scheme and it is expected that the network will operate with a good level of resilience.
- The worst degree of saturation expected on Baker Street or Gloucester Place is 89% in the PM peak. This is predicted to be on the northbound ahead movement at the junction with Marylebone Road with Gloucester Place:
- Predicted improvements to or non-worsening of traffic conditions are due to a number of factors:
    - Gloucester Place junctions currently operate well within capacity, and are typically double-cycled, providing scope for modification;
    - A number of junctions on Baker Street already have pedestrian crossing stages and therefore introducing ped stages throughout does not impact any of the existing bottlenecks;
    - Northbound and southbound traffic is distributed across both corridors, effectively retaining two northbound and two southbound lanes, with an additional lane in each direction for turning vehicles, and with traffic movements designed to minimise friction.

TRANSYT model results - Option B

5.1.5 Option B is based on the Cycle Segregation Concept Option 1C identified and presented in SKM CB report *Gloucester Place cycling segregation options*. The design operates signal control arrangements with cycles running in parallel with pedestrians in order to deliver a credible level of traffic network capacity.

5.1.6 The results for the Option B TRANSYT modelling are provided on Figures 3.1, 3.2 & 3.3 of this Appendix B.

- The TRANSYT results show that across all peak periods, the east and westbound movements on Marylebone Road will remain at similar degrees of saturation to the existing situation under the Option B scenario.
- The Option B is predicted to operate with a good level of resilience in the AM peak.
- The Option B inter peak and PM peak TRANSYT results show that although existing congestion issues throughout the rest of the study area are expected to be improved by the scheme. Some new sources of congestion are likely to be introduced on Gloucester Place with the northbound approach to Crawford Street and the section of Gloucester Place between Portman Square and George Street operating close to or at capacity.

TRANSYT model results - Option D

5.1.7 The results for the Option D TRANSYT modelling are provided on Figures 4.1, 4.2 & 4.3 of Appendix B.

- The TRANSYT results show that across all peak periods, the east and westbound movements on Marylebone Road will remain at similar degrees of saturation to the existing situation under the Option D scenario.
- The Option D TRANSYT results show that all existing congestion issues throughout the rest of the study area are expected to be resolved by the scheme and it is expected that the network will operate with a good level of resilience.
- The worst degree of saturation expected on Baker Street or Gloucester Place is 90% in the PM peak (similar to the Option A scheme). This is predicted to be on the northbound ahead movement at the junction of Marylebone Road with Gloucester Place.
- The scheme provides very similar results in general to the Option A scheme. This is because the scheme has been developed to take advantage of locations where traffic capacity is not fully used to provide improved pedestrian and cycle facilities but has identified solutions at the key bottlenecks to generally provide increased traffic capacity.

TRANSYT modelling conclusions

Option A

- The proposed Option A provides a feasible scheme option that is likely to provide a beneficial effect to the operation of the local traffic network by reducing congestion and will provide an acceptable level of traffic resilience.
- It is unlikely that under the Option A scenario, any wider network reassignment will take place as the proposed network will provide sufficient capacity and resilience to carry the existing traffic demand.

Option B

- The proposed Option B initially appears viable in terms of general traffic capacity as predicted by SKM CB in the Gloucester Place Cycle Segregation Options report. However, it is expected that the reduction in resilience northbound on Gloucester Place may lead to congestion which is significantly harder to manage than under base conditions due to the reduced carriageway space under two-way operation.
- Significantly, the effects of traffic friction are expected to be greater along Baker Street and Gloucester Place under two-way operation than is currently experienced. The frictional effects may combine with high degrees of saturation to cause widespread congestion.
- There is a risk that traffic congestion on the mid-section of Gloucester Place could result in traffic being forced to use the existing quiet-way routes on adjacent streets.

Option D

- The proposed Option D provides very similar results to Option A. It is therefore appropriate to draw the same conclusions. Ie. the Option D scheme is likely to be feasible and will provide sufficient traffic network capacity to operate with an acceptable level of reliance and carry the existing traffic demand without wide-spread traffic reassignment.

5.2 Study area traffic network capacity and resilience – VISSIM modelling assessment

Journey time analysis

5.2.1 SKM CB has prepared calibrated and validated base and proposed VISSIM modelling in line with TfLs modelling guidelines. This modelling has yet to be submitted to TfL for review. Cyclists have been modelled accurately in VISSIM to allow a comparison of performance between scheme options. Journey time analysis has been undertaken to compare travel time on Gloucester Place and Baker Street for general traffic and cyclists. Proposed scheme modelling of the Option A, B and D concept layouts has been developed.

5.2.2 The journey time assessment is presented in Appendix C of this report. The journey times for cyclists are an assessment of Gloucester Place only. Journey time assessment results for general traffic are on Figures 5.1, 5.2 and 5.3 for AM, Inter and PM peaks respectively. Journey time assessment results for cyclists are on Figures 5.4, 5.5 and 5.6 for AM, Inter and PM peaks respectively.

5.2.3 In addition, a preliminary review of bus journey time for the PM peak has been carried out by considering journey times for buses travelling northbound on Gloucester Place and southbound on Baker Street between Marylebone Road and Oxford Street. This accounts for buses stopping at new and revised bus stop locations. The analysis will be finalised for the chosen scheme when more details are known and confirmed. The results of this initial analysis are summarised on Table 5.1.

Table 5.1: Bus journey time results PM peak

Route	Base JT (sec)	Option A JT (sec)	Option B JT (sec)	Option D (sec)
Gloucester Place northbound	350	420	490	435
Baker Street southbound	420	380	380	380

General traffic journey time analysis – See figures 5.1, 5.2, 5.3

5.2.4 Introduction of any of the proposed two-way scheme options will result in very significant improvements for southbound journey times relative to the existing conditions. This is achieved by resolving the congestion issues southbound on Baker Street approaching Marylebone Road and southbound on Baker Street approaching Oxford Street. The proposed southbound movement on Gloucester Place will perform well.

5.2.5 Option A northbound journey times on Gloucester Place are expected to remain at a similar level to the base, with a small improvement in the inter peak period and small increases in the AM and PM peak periods. This is because the proposed arrangement generally suffers less from over-saturation northbound at the junction with Marylebone Road which is prevalent in the inter-peak, but there is generally more delay on the corridor resulting from the introduction of pedestrian crossing signal stages. However, when over-saturation at Marylebone Road does occur, the reduced number of lanes on Gloucester Place means that longer but more short-lived queues occur than in the base arrangement.

5.2.6 Option B northbound journey times on Gloucester Place are consistently longer than Option A and are significantly worse than the base in the AM and PM peak periods while being similar to the base in the Inter peak. The longer journey times are a result of less resilience throughout the length of Gloucester Place meaning that random over-saturation is more likely to occur and when congestion does occur – as caused by exit blocking at the Marylebone Road - it rapidly spreads down Gloucester Place and propagates to the side roads feeding in to Gloucester Place. The reduced resilience means that over-saturated conditions take longer to dissipate than in the Option A arrangement.

5.2.7 Option D northbound journey times on Gloucester Place are likely to be slightly longer than Option A in the PM peak period. In the AM peak and Inter Peak, the results are almost identical between Option D and A.

Cyclist journey time analysis – Gloucester Place – See figure 5.4, 5.5, 5.6

5.2.8 Journey times for cyclists can be expected to increase slightly under Option A as a result of increased delay at junctions in order to provide more time to pedestrians. This holds true with the exception of southbound movements in the Inter and PM peaks where improvement is expected relative to the existing congested conditions.

5.2.9 Two journey times are presented for Option B. Cyclists using the proposed segregated facilities are predicted to experience generally worse journey times than would currently occur on site with the exception of southbound in the inter peak. The Option B segregated journey times are without exception worse than those provided by the Option A scheme across all peak periods.

5.2.10 An assessment of journey times for cyclists choosing not to use the segregated facilities under Option B has also been undertaken. In all but the AM peak southbound scenario, faster journey times would be achieved by not using the segregated facilities. This suggests the probability that a proportion of cyclists would chose to avoid the segregation and could therefore experience significantly worse conditions within the carriageway in terms of available space and safety than currently found on site.

5.2.11 Under Option C which has not been assessed, cyclists would experience significantly more delay than under the Option B scheme, the modelling results of which have been presented. Under Option B, cyclists are taken up onto a shared footway to utilise a shared crossing. Like pedestrians, if there is a gap in turning traffic flow it is anticipated that cyclists will cross in gaps rather than always waiting for a green signal and this is reflected in the modelling results. Under the method of control proposed for Option C, cyclists will be required to wait for a green signal and there will be no opportunity to cross in gaps. Therefore delay will be greater than Option B.

5.2.12 Journey times for cyclists under Option D are expected to be very similar or slightly quicker than Option A. Southbound journey times will be generally quicker on Gloucester Place than the current route on Baker Street and the northbound journey times on Gloucester Place slightly slower as a result of the introduction of pedestrian stages on Gloucester Place.

Cyclist journey time analysis – Upper Montagu Street quiet-way

5.2.13 An assessment of journey times for cyclists using the Upper Montagu Street quiet-way under the Option A arrangement has been undertaken. The assessment examines the northbound and southbound movements for cyclists in the inter-peak (representative of conditions throughout the day) and compares them to the modelled journey times for cyclists on the parallel route of Gloucester Place. The results of this analysis are shown on Figure 5.7 (Appendix C).

5.2.14 Figure 5.7 demonstrates that the quiet-way route would provide a quicker alternative for cyclists to any form of facility on Gloucester Place including the Option A, Option B Option C and Option D arrangements. This is because cyclists will not be delayed at traffic signals. The combination of the Option A or D design for Gloucester Place and the proposed quiet-way scheme will provide a rapid and safe facility for north and southbound cycle movements through the study area.

Bus journey time analysis

5.2.15 PM bus journey time results show that under Options A, B and D, average journey time is expected to reduce southbound on Baker Street by some 40 seconds per bus when compared to base conditions, which has reasonably significant benefits in terms of bus reliability.

5.2.16 In the northbound direction on Gloucester Place, PM results show an increase in bus journey time under all Options, as would be expected (from the introduction of the pedestrian crossing stages). Under Option B, however, the reduced network resilience results in average journey times that are forecast to be some 70 seconds higher than under Option A, 55s higher than Option D, and over 2 minutes longer than existing journey times. Even with a reasonable margin of error, this shows a significant increase in journey time and one that might result in an additional resource requirement to maintain acceptable bus operation.

Network conditions

5.2.17 The VISSIM modelling provides a clear understanding of how the levels of traffic capacity and resilience provided by the base, Option A, Option B and Option D networks manifest in terms of network behaviour and congestion. The base VISSIM network closely mirrors the conditions experienced on site. The conditions predicted by the VISSM modelling for Option A, B and D are summarised in the following table.

Table 5.2: Summary of predicted traffic conditions

Peak	Existing	Option A	Option B	Option D
AM	▪ Significant congestion southbound on Baker Street approaching Marylebone Road ▪ Limited congestion throughout the remaining study area except Marylebone Road	▪ No significant congestion throughout the study area except Marylebone Road as existing	▪ No significant congestion throughout the study area except Marylebone Road as existing	▪ No significant congestion throughout the study area except Marylebone Road as existing
Inter	▪ Significant congestion southbound on Baker Street approaching Marylebone Road ▪ Significant congestion southbound on Baker Street approaching Oxford Street ▪ Congestion northbound on Gloucester Place approaching Marylebone Road ▪ Significant congestion on Oxford Street ▪ Limited congestion throughout the remaining study area except Marylebone Road	▪ No southbound congestion approaching Marylebone Road on Baker Street ▪ No southbound congestion approaching Oxford Street on Baker Street ▪ Some congestion northbound on Gloucester Place resulting in peak queues briefly reaching back to Dorset Street and then diminishing ▪ No significant congestion throughout the remaining study area except Marylebone Road, slightly improved.	▪ No southbound congestion approaching Marylebone Road on Baker Street ▪ No southbound congestion approaching Oxford Street on Baker Street ▪ Some significant congestion northbound on Gloucester Place producing peak queues that reach back into Portman Square and cause queuing and congestion on side roads throughout the area ▪ Queuing northbound on Portman Street as a result of exit blocking to Gloucester Place, risk of impact to Oxford Street ▪ Congestion on Marylebone Road slightly improved.	▪ No southbound congestion approaching Marylebone Road on Baker Street ▪ No southbound congestion approaching Oxford Street on Baker Street ▪ Some congestion northbound on Gloucester Place resulting in peak queues briefly reaching back to Dorset Street and then diminishing. Slightly worse than Option A. ▪ No significant congestion throughout the remaining study area except Marylebone Road, slightly improved.
PM	▪ Significant congestion southbound on Baker Street approaching Oxford Street ▪ Significant congestion southbound on Baker Street approaching Marylebone Road ▪ Significant congestion northbound on Baker Street approaching Marylebone Road ▪ Limited congestion throughout the remaining study area except Marylebone Road	▪ No southbound congestion approaching Marylebone Road on Baker Street ▪ No southbound congestion approaching Oxford Street on Baker Street ▪ Some congestion northbound on Gloucester Place resulting in peak queues briefly reaching back to Dorset Street and then diminishing ▪ No significant congestion throughout the remaining study area except Marylebone Road, slightly improved.	▪ No southbound congestion approaching Marylebone Road on Baker Street ▪ No southbound congestion approaching Oxford Street on Baker Street ▪ Some congestion northbound on Gloucester Place resulting in peak queues briefly reaching back to Dorset Street and then diminishing ▪ No significant congestion throughout the remaining study area except Marylebone Road, slightly improved.	▪ No southbound congestion approaching Marylebone Road on Baker Street ▪ No southbound congestion approaching Oxford Street on Baker Street ▪ Some congestion northbound on Gloucester Place resulting in peak queues briefly reaching back to Dorset Street and then diminishing. Slightly worse than Option A. ▪ No significant congestion throughout the remaining study area except Marylebone Road, slightly improved.

VISSIM modelling conclusions - Option A

5.2.18 The VISSIM modelling assessment shows that the proposed Option A scheme has the potential to operate successfully with acceptable levels of traffic network resilience. Under Option A, existing congestion on Baker Street and Gloucester Place could be reduced significantly resulting in an improved street environment.

5.2.19 The reduction in available carriageway width to store queues does mean that when congestion does occur it is likely to result in longer queues, but these should dissipate more rapidly due to the lower degrees of saturation expected at key bottlenecks.

5.2.20 Improvements to journey time are achieved where there is existing congestion but where congestion is not a factor then delay at individual junctions on Baker Street and Gloucester Place will increase slightly as more green time is provided to pedestrians under the proposed scheme. This accounts for the slight increase in journey times expected for cyclists travelling north and south.

VISSIM modelling conclusions - Option B

5.2.21 The VISSIM modelling assessment shows that the proposed Option B scheme has the potential to result in a significant negative impact on the local traffic network around Gloucester Place and Baker Street. Under Inter peak and PM peak conditions, the modelling demonstrates a propensity for oversaturation on Gloucester Place northbound with results in the propagation of queues on side roads.

5.2.22 The excess queuing occurs randomly and eventually dissipates in the models. However, this indicates that the resilience of the network is significantly impaired by the reduction in carriageway space on Gloucester Place and any event that results in increased levels of friction will cause significant issues. Considering that Option B will result in an under-provision of kerbside capacity and generally narrower traffic lanes on Gloucester Place, blocking caused by kerbside activity is highly likely.

5.2.23 The assessment of journey times for cyclists is significant. The use of the segregated facility will result in considerably higher delays due to the need to wait at crossing facilities along the route. It will be significantly quicker to stay on the carriageway and avoid use of the segregated facility, indicating that the segregated facility is unlikely to be fully utilised.

5.2.24 The assessment of journey times for buses is also significant. The presence of the segregated cycle facility reduces bus stop cage length and causes an increase in congestion on the approaches to junctions, meaning that access to the stops is affected and northbound journey times are considerably higher than existing, or indeed Options A and D.

VISSIM modelling conclusions - Option D

5.2.25 The VISSIM modelling assessment shows that the proposed Option D scheme has the potential to operate successfully with acceptable levels of traffic network resilience. Under Option D, existing congestion on Baker Street and Gloucester Place could be reduced significantly resulting in an improved street environment. In general, conditions under option D are expected to be very similar to Option A, although with the potential for slightly increased congestion and queuing northbound on Gloucester Place.

5.2.26 The reduction in available carriageway width to store queues does mean that when congestion does occur it is likely to result in longer queues, but these should dissipate more rapidly due to the lower degrees of saturation expected at key bottlenecks. The northbound Gloucester Place link through Crawford Street, York Street and approaching Marylebone Road is likely to be more congested in the PM peak than the Option A arrangement as the reduction in space for traffic resulting from the wider cycle lanes leads to more friction and therefore a small further reduction in capacity.

5.2.27 Improvements to journey time are achieved where there is existing congestion but where congestion is not a factor then delay at individual junctions on Baker Street and Gloucester Place will increase slightly as more green time is provided to pedestrians under the proposed scheme. This accounts for the slight increase in journey times expected for cyclists travelling north and south.

Network impact conclusions - Option C

5.2.28 Option C has not been assessed with VISSIM. However, it is clear that the proposed arrangement would provide significantly less capacity than Option B and therefore the impacts in terms of journey time and network congestion will be significantly worse.

5.3 Strategic traffic network impact

5.3.1 SATURN modelling using the TfL CLoHAM model has been carried out to assess the potential impact in terms of strategic traffic assignment. The scope of the SATURN modelling has been agreed with TfL and SKM CB has prepared a version of the CLoHAM base model which has been refined throughout the study area. The proposed Option A and Option B schemes have been assessed using this modelling, allowing the following key conclusions to be drawn:

5.3.2 The traffic flow demand assumptions made to develop the proposed TRANSYT and VISSIM models are accurate. Proposed scheme SATURN model flows match proposed scheme TRANSYT and VISSIM flows within an acceptable GEH.

5.3.3 The vast majority of northbound and southbound traffic currently using Gloucester Place and Baker Street will not be reassigned away from the scheme study area under Options A and D. No significant impact to the TLRN is predicted with either option. The SATURN assessment shows minor variations in flow on the local road network around the scheme which in the vast majority of cases are in the range of +-50 vehicles (considered to be in the range of what would be expected in terms of margin for error within SATURN).

5.3.4 The assessment of Option B shows broadly similar results except, significantly, an average of 15% less flow northbound on Gloucester Place than Options A & D. The SATURN assessment shows that this flow will reassign to local roads including Montagu Street (upper and lower), Seymour Street and Chiltern Street. This reassignment is a result of increased delay on Gloucester Place as a result of reduced traffic resilience relative to Option A and the existing arrangement.

5.3.5 Option C has not been assessed using SATURN. However, it is predicted that the reduced level of traffic capacity on Gloucester place would result in widespread reassignment of traffic flows on local roads and onto strategic routes such as Marylebone Road, Edgware Road, Marble Arch and Oxford Street. The impact of this reassignment is likely to be unacceptable.

6. Conclusions and recommendations

6.1 Assessment framework

6.1.1 An assessment framework has been prepared as a means of assessing each Option as a whole. This assessment uses a simple system to score benefit against the key objectives of the scheme ranging from +5 (Very high level of benefit) to -5 (very severe negative impact). This assessment framework can also be compared to the summary of conclusions table provided in the executive summary which highlights where further show stopping impacts have been identified and are considered to be unacceptable. The totals of these scores have been added together to provide an overall assessment of relative merit.

Table 6.1: Assessment framework

Scheme Objective	Existing	Option A	Option B	Option C	Option D
Quality of public realm	0	+4	+4	+3	+4
Pedestrian environment	0	+4	+4	+4	+4
Public transport accessibility	0	+3	+3	+3	+3
Cycling level of service	0	+2	+3	+5	+4
Kerbside operation	0	-1	-4	-5	-2
Local vehicle accessibility	0	3	3	3	+2
Safety	0	0	0	0	0
Traffic network resilience	0	0	-4	-5	0
Journey time assessment - Traffic	0	+2	0	-2	+2
Journey time assessment - Cyclists	0	-1	-3	-3	0
Impact on external road network	0	0	-1	-2	0
Unweighted totals	0	+17	+5	+1	+17

6.1.2 The assessment framework provides a clear indication that Options A and D provide the superior scheme designs. Options B & C provide very good benefits in terms of public realm and improvements to pedestrian environment (where it essentially identical to Option A & D and provide additional benefit in terms of cycle level of service over Option A, but are let down by impact on kerbside capacity, poorer journey times for traffic and cyclists and most significantly by a severe impact on network resilience.

6.1.3 The Option B scheme would potentially lead to traffic congestion spreading throughout the local roads and quiet ways around Baker Street and Gloucester place resulting in significant detriment to the quality of the environment for all users including buses and cyclists.

6.1.4 The Option C scheme would have a very severe impact on traffic capacity leading to very significant congestion and widespread reassignment of traffic onto sensitive local and strategic roads.

6.2 Recommendations

6.2.1 The conclusions of this report indicate that Options A and D would provide viable scheme designs which would deliver a very good level of benefit across the key scheme objectives. Option D provides improved cycling facilities which are balanced by some increased impact on kerbside capacity and reduced accessibility improvements.

6.2.2 The assessment framework gives both Options A and D identical scores. Given the focus of priority on cycling benefit, The City of Westminster's aims to introduce an enhanced cycle grid over the coming years and the potentially significant increase in cycle demand which will result from improved cycle infrastructure throughout central London, Jacobs SKM recommend that the Option D scheme provides the best compromise between benefit and impact and also provides the cycling capacity to compliment London's future transport needs.

7. Initial project cost estimates

7.1.1 An initial cost estimate has been developed for the project up to completion of all works. This cost estimate is provided in Table 7.1. All costs are estimates exclusive of VAT.

Table 7.1: Project cost estimate

Item	Total	Total
Design and Works Cost	WCC	TLRN (including Marylebone Road)
Stage 1-Feasibility Design - West One (WAF)	£55,628.20	
Stage 1-Feasibility Design -Contract A	£44,264.40	
Stage 2-Initial Design-Contract A	£55,632.19	£26,894.32
Stage 2-Initial Design-Contract B	£47,233.87	£49,269.29
Stage 3-Detailed Design-Contract A	£207,229.89	£100,181.33
Stage 3-Detailed Design-Contract B	£24,119.42	£25,158.78
Stage 4-Tender Action-Contract A	£10,848.28	£5,244.39
Stage 4-Tender Action-Contract B	£1,959.70	£2,044.15
Stage 5-Implementation-Contract A	£2,781,609.28	£1,344,715.79
Stage 5-Implementation-Contract B	£502,488.00	£524,141.33
Stage 6-Completion-Contract A	£8,344.83	£4,034.15
Stage 6-Completion-Contract B	£2,512.44	£2,620.71
Traffic Order Modifications-Contract E (provisional sum)	£15,000.00	£10,000.00
Topo-survey	£89,208.00	
Basement inspections	£50,000.00	
Utility Tracing	£60,000.00	
Public consultation costs	£20,000.00	
Total	£3,976,078.50	£2,094,304.24
Third Party Costs	WCC	TLRN
New Bus Shelters (5nr. Baker Street, 4nr. Gloucester Place)	£90,000.00	
Removal of Phone Kiosks (8nr. On eastern side of Baker Street)	£32,000.00	
TfL - Modelling Review	£48,000.00	
TfL / TSS Traffic Signals	£683,100.00	
Publication costs (TMO)	£20,000.00	£10,000.00
Utility Diversions (Provisional sum)	£655,500.00	£150,000.00
Jacobs Traffic Modelling - Stage 1	£406,458.61	
Jacobs Traffic Modelling - Stage 2 (provisional sum)	£100,000.00	
Road Closures Traffic Orders (assume 10)	£20,000.00	£20,000.00
Tree Planting (25@ £2,100 as per WCC latest price)	£52,500.00	
Total	£2,107,558.61	£180,000.00
Project Total	£6,280,651.95	£2,398,063.10

7.1.2 In addition the allowance for Risk and Contingency which may be considered in budgeting for the scheme is presented in Table 7.2.

Table 7.2: Project contingency estimate

Item	Allowance	Allowance
Cost Element	WCC	TLRN
Contingencies	£1,256,130	£479,613
Risk Allowance	£1,256,130	£479,613
Risk and Contingency Total	£2,512,260.78	£959,225.24
Change Budget	£762,591.13	
Project Total (incl Risk and Contingency)	£9,555,503.86	£3,357,288.33

APPENDIX A

Base figures, proposed option designs and qualitative assessment

Figure 0.1	Base permitted turns and one-way regulations
Figure 0.2	Proposed permitted turns and one-way regulations
Figure 0.3	Existing summary of public realm
Figure 0.4	Proposed summary of public realm
Drawing UN50393/OS/101	Option A
Drawing UN50393/OS/102	Option B
Drawing UN50393/OS/103	Option C
Drawing UN50393/OS/104	Option D

Pedestrian permeability and level of service

Public transport accessibility and operation

APPENDIX B

TRANSYT result summaries

APPENDIX C

VISSIM journey time assessment