Transport for London

Programme: Transforming Streets and Places

Project: Old Street Roundabout

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Project Feasibility Report

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I confirm that this deliverable meets the requirements of the relevant Pathway Product Description and that all consultation comments have been addressed to the satisfaction of consultees.

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Distributed to

Working Group

Project Board

Document History

Revision	Date	Summary of changes
1	19/08/2014	Version 1 – for Gate 2 Approval
2	03/11/2015	Version 2 – Update for Gate 3
3	13/11/2015	Version 3 – for Gate 3 Approval

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1 Purpose

This report outlines the work which has been undertaken during the feasibility stage of design of the Old Street Roundabout project.

The report begins with an overview and background of the scheme. The report then explores the scope and remit of the scheme proposed, followed by a more detailed breakdown of the options explored during design development, before making a recommendation as to how best to proceed at single option selection stage.

2 Executive Summary

The Old Street Roundabout project seeks to improve a key junction on the network which has historically been a collision black spot for cyclists, who are particularly poorly catered for at this location. This report outlines the options which were considered in order to meet this objective, before making a recommendation as to which option should proceed to single option selection.

The report identifies that option three (south-east arm closure) and option five (north-west arm closure) were potentially viable to progress to single option selection stage. Both of these options would remove the one way operation of the existing roundabout; significantly improve the cycling infrastructure around Old Street and create new peninsular spaces providing improved amenity for pedestrians travelling through the area. These options were presented at Design Review Group (DRG) for consideration and subsequently option 5 - pursuing the closure of the north-west arm of the roundabout, was recommended to be progressed to single option selection and consultation.

This decision was made for a number of reasons:

Traffic Impact: Review of the early traffic modelling which was undertaken on the two options presented to DRG suggested that option five had lesser impacts - particularly on the Inner Ring Road, where the south-east arm closure would require the loss of a lane which would have a significant impact in respect to queuing on the network.

Scheme Benefits: It was felt that the urban realm benefits which could be delivered by option five when considered alongside option three were greater; in that the peninsular space created in option five abuts the Promenade of Light and better complements a key desire line too and from Old Street station. Further, it is possible to simplify pedestrian crossing movements to and from the peninsular in this proposal, where option three necessitated the introduction of staggered crossings which would further delay pedestrian crossing movements around Old Street.

Borough Support: The London Borough of Islington, the authority in which Old Street is sited, supported the progression of option five over the further development of option three.

On balance of the above considerations, it was felt that option five represented the best and most viable option to take forwards to the concept design stage. It was however acknowledged that some issues remained, most notably the objection to the design which was raised by the London Borough of Hackney; section 7.1 identifies the key outstanding issues and further investigations required during concept design to allow the scheme to proceed.

3 Background

3.1 Background Description

The Old Street Roundabout project seeks to remove the existing one-way operation of the existing signalised roundabout in order to improve the cycle and pedestrian facilities, reduce collisions (particularly cycle related), and enhance urban realm. The selected option seeks to improve access to Old Street station, particularly via surface-level pedestrian crossings, and contribute to significant place-making to ensure Old Street supports the economic regeneration of the surrounding area, informally known as 'Tech City'.

Despite the significant barrier to movement that the existing roundabout creates, Old Street roundabout has become the hub of the technology industry in London, which has seen a remarkable resurgence despite the downturn in the UK economy. In order to continue attracting investment in the area, a wholesale improvement of the roundabout and station is required. Alongside this project which seeks to improve the road layout, a complimentary scheme is being progressed by London Underground which seeks to enhance station capacity.

3.2 Strategic Context

The Mayor of London has an ambition to create a 'cyclised city'– a civilised city, where people can ride their bikes safely in a pleasant environment. Cycling, with all its social, environmental, health and financial benefits, has an important role to play in the future of the Capital.

Since the start of London's Cycling Revolution, TfL and its partners have been striving to achieve this goal with unprecedented levels of investment. As part of the Mayor's broader strategy to transform London into a safe and pleasurable place for all kinds of people to cycle, this work will help to ensure that all road users are better catered for at key junctions across London and will deliver improvements for cyclists and other vulnerable road users.

TfL is seeking to deliver benefits to cyclists and other vulnerable road users by:

- Introducing significant infrastructure improvement for cyclists and others
- Investigating and potentially trialling (subject to DfT approval) innovative solutions to enhance the operation of junctions for these user groups; and
- Working with developers and London Boroughs to take account of cyclists needs as part of large-scale regeneration or as part of major urban realm improvement providing a transformation for an area or place

In order to achieve the Mayor's Vision for Cycling, the Better Junctions Programme was established as part of a wider portfolio of investment, development and behavioural change, aimed at making key locations on London's road network safer and more attractive for cyclists, pedestrians and other vulnerable users - therefore contributing to TfL's targets for improvements in road safety and for increasing the visibility and attractiveness of cycling and walking.

The scheme initially formed part of this programme and the wider Cycling Portfolio which presents the strategic case for significant investment in cycling through an evidence-based approach and indeed a very significant element of the scheme remains focused upon delivering improvements at the junction for cyclists.

Improvements to Old Street roundabout are required in order to reduce the number of collisions occurring at the junction, and to contribute to the Mayor's cycling growth strategy as set out in the Mayor's Transport Strategy (MTS) and his casualty reduction target. The aim is not only to provide improved facilities for existing cyclists but also to attract new cyclists by breaking down negative perceptions associated with the dangers.

The investment in cycling proposed at Old Street roundabout will take place against the background of a significant programme of activity on London's road network over the next 5-10 years, as identified in the report from the Mayor's Roads Task Force. An important part of this programme is TfL's own investment in London's roads, with its 2012 Business Plan earmarking more than £4bn of new investment by 2022 as part of the Roads Modernisation Plan (Transforming Streets and Places portfolio). Within TfL's response to the Roads Task Force report, Old Street roundabout was identified as having the potential for significant improvement following the completion of a robust prioritisation exercise which scored each project identified for progression as part of the Transforming Streets and Places portfolio against various movement, place and growth criterion. Old Street roundabout presently ranks fourth of all projects forming part of the portfolio, and can deliver interventions which are truly transformational, allowing the area to develop into a centre for new economic activity. The removal of the roundabout is seen as key to achieving this.

An enhancement of Old Street roundabout is also specified in the City Fringe Opportunity Area Planning Framework (OAPF). This document recognises Old Street roundabout as a key strategic interchange, which if replaced with a peninsula layout, could contribute towards significant development and urban realm opportunities.

If the existing roundabout layout and subsurface pedestrian access were to be retained, this would inhibit growth and investment, and constrain the economic regeneration of the area. The roundabout would also continue to act as a major barrier to cycling, failing to contribute to the cycle KSI reduction targets, and presenting a significant obstacle to east-west cycle movement through Central London which forms part of the Central London Cycle Grid.

3.3 Business Objectives

The principle business objectives for the project are as follows:

- Improved cycle movement, permeability and facilities; including a safe, convenient and comfortable cycle route east/west through the area, and links into north/south routes
- Improved pedestrian movements, public spaces and access to the LU station
- Improved safety for all road users, in particular pedestrian and cyclists.
- Provision of comparable (to existing) bus journey times, services and infrastructure.
- Better balancing of the impact of traffic with the need to create an improved place to live, work and visit (improvements to the urban realm).
- Maintain appropriate movement function for general traffic through the area.
- Appropriate access and provision for taxis, private hire vehicles, servicing and freight.
- Ensure highway changes do not hinder future development of LU Station or OSD

3.4 Responsibilities

Sponsor: The Sponsor is responsible for setting the strategic direction of the project, developing the Business Case, Project Requirements and Benefits and Value Management Strategy throughout the lifecycle, and maintaining all key stakeholder relationships.

Project Manager: The Project Manager is responsible for maintaining and updating the Procurement Strategy, Schedule, Risk Register, Cost Plan and Project Execution Plan. The project manager should also provide advice to the sponsor and suppliers in relation to the build-ability of the options proposed, throughout the lifecycle.

Suppliers (Outcome Design Engineering, Outcome Management, Urban Design team and any external consultants procured): The suppliers seek to achieve a design solution that best meets the projects objectives, whilst working within the time and cost constraints set out in the Project Requirements document. These suppliers should also formally document the development of their respective outputs as appropriate (as reports etc)

3.5 Reporting and Control Requirements

The sponsor ultimately required a preferred design solution (drawings, plans, reports) including outline impacts on all road users in order to produce a robust project Business Case and quantified benefit/cost ratio for the recommended solution.

Reporting mechanisms for the management of the scheme throughout the lifecycle were identified from the onset of the project, these were as follows; Directors bi-weekly update, periodic reporting via P3M project management system and escalation of any key issues via the design working group in the first instance, which would recommend escalation to Project Board where necessary/appropriate.

The Project Manager's responsibilities include the approval of minor, low cost financial changes to progress works and these are reported to the sponsor bi weekly via the change control log. The sponsor can approve changes of up to £10,000 and reports these changes to the Project Board periodically. Project Board approval is required for changes over £50,000, related to key material or concept changes.

3.6 Customer Quality Expectations

The feasibility study for the scheme outlined how the business objectives set out in section 1.2 could be achieved at Old Street. The study looked at six different design options which have been reviewed against the project objectives in terms of their strategic fit as part of a 'Strategic Assessment Framework' style exercise. The options considered will be explored in greater detail in section four of this paper.

3.7 Risks & Issues

A project Risk Management Strategy is in place for the project and frequently reviewed to ensure that the process for managing risk is effective and suitable foe the project. The Risk Register is reviewed every period to ensure that all risks are accurately captured and revised to show the accurate levels of exposure and the mitigation strategies have been put in to place to minimise their potential impacts.

4 Main Project Business Benefits

The objectives for the Old Street project were developed with consideration for the 10 Principal Surface Outcomes and the recent Roads Task Force (RTF) work. The single option selected to be taken forwards through concept, detailed design and ultimately to delivery on the network will be optimised as best as is possible to meet eight of the ten Surface Transport Outcomes as outlined below:

Quality Bus Network: By improving bus services, journey time reliability will be improved. The revised layout should seek to deliver efficiencies to routes and improvements to bus stop accessibility.

Reliable Roads: Changes to the road layout should improve the integrity of the infrastructure provided at Old Street,. Traffic flow should be smoothed, congestion reduced and journey times made more reliable wherever possible. The efficient operation of the Inner Ring Road should be protected and prioritised accordingly in the design and modelling process.

More and Safer Cycling: The revised layout should provide new segregated cycle facilities and ASLs, and early start facilities should be prioritised where possible to provide more options for cyclists of all abilities at Old Street. The legibility of cycle facilities and way-finding should be improved, as should cycle hire and cycle parking facilities.

More and Safer Walking: The revised layout should seek to improve safety for pedestrians travelling around Old Street. The scheme should explore opportunities to provide new at grade pedestrian crossing facilities to improve permeability and legibility, and consider the removal of the subway network wherever possible.

Efficient Deliveries: Clearer signage and improved loading/unloading facilities should be provided as part of the scheme.

Reduced Casualties: Old Street records a high incidence of collisions; particularly involving vulnerable road users such as cyclists and pedestrians, these should be addressed as far as is possible in the delivery of the scheme.

Reduced Crime: The consideration of the removal of the existing network of subways and an improved lighting strategy for the scheme will help to address the high crime rate at Old Street.

Improving the Environment: Pedestrians, residents, business users and visitors will benefit from an improved urban realm environment which will provide new opportunities for greening of the landscape.

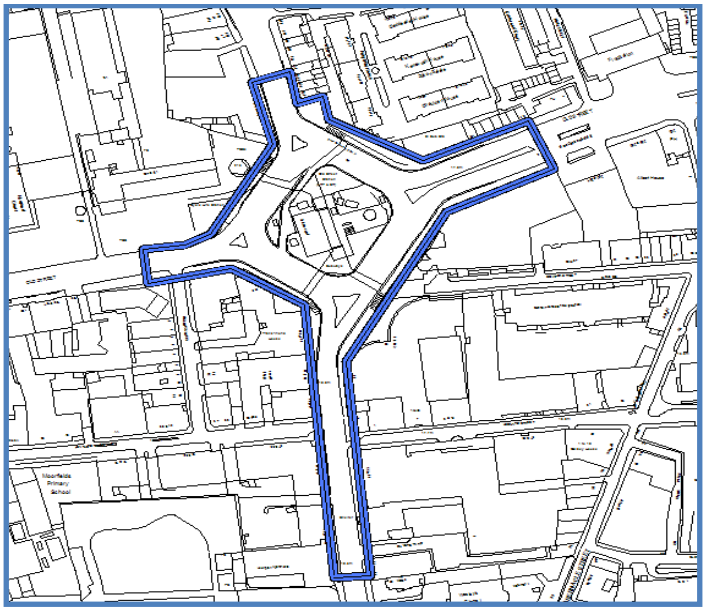
Further details of the benefits which can be realised by the Old Street scheme are detailed in the Benefits and Value Management Strategy.

5 Feasibility Study Scope

5.1 Geographic Extents

The approximate geographic extents of the scheme are shown below. It should be noted that City Road south of the roundabout and Old Street west of the roundabout do not form part of the TLRN. It is however expected that some works will need to be undertaken on these roads in order to maximise the benefits of the scheme; works proposed on these sections will require approval from the London Borough of Islington. .

Figure 1 – Approximate limits of the Old Street Improvement Works



The scope of works investigated as part of the feasibility study is as follows:

- Removal of the existing roundabout, construction of a peninsula highway layout at the roundabout and re-introduce two-way traffic movements.
- Convert the existing central island to useable public space.
- Provide a new main, widened station entrance to enable access to the underground station and other facilities on the central island (retail etc).
- Close pedestrian subways wherever possible and provide surface level crossings at the roundabout to reduce severance.
- Provide high quality, on-carriageway cycling facilities on the roundabout and approaches to the roundabout.
- Relocate/re-design infrastructure on central island to accommodate/facilitate future LU station development.
- Transformation of the streetscape to provide a significantly improved public realm and create a sense of place. To include renewal/replacement of all street furniture and surface materials.
- Extension of the north bound bus lane on City Road South

The feasibility study explored six options in the design development stage, which were taken through the Internal Technical Assurance Group (ITAG) and Design Review Group (DRG) processes which were introduced as part of the Better Junctions process. A preferred solution was then identified and taken through a detailed modelling process prior to stage gate two sign off.

5.2 Critical Issues Identified

At the conclusion of the feasibility study, a number of issues were identified:

The preferred solution is supported by the London Borough of Islington, but the London Borough of Hackney were fundamentally opposed to the scheme proceeding as they had preferenced the progression of a crossroads alignment or a peninsularisation from the north side (closing the North East arm on Old Street and re-routing the Inner Ring Road), both of which were not viable to proceed for numerous reasons outlined in section four..

The scheme will have a significant impact on a number of bus routes through Old Street (north-south and south-north movement principally) which has led to concerns from Buses and may potentially require additional buses to be put into service in order to mitigate (quantified in the business case assistant)

The requirement for planning permission from the London Borough of Islington to enable the remodelling of the Cowper Street subway, and build of a new station entrance from the peninsular (discussions now underway and not thought that this process will be problematic at this stage)

5.3 Research & Analysis of Existing Systems and Operations

It is essential that the A501 Old Street, which forms part of the Inner Ring Road, remains open and operational at all times during the construction phase of the project.

The operation of Old Street Station which sits underneath the existing roundabout must also be protected throughout construction. Any changes to London Underground infrastructure ie ventilation shafts must be agreed and approved with London Underground in advance of any works starting on site.

The JC Decaux advertising structure which is currently sited on the roundabout must be retained within any scheme proposed as it generates over £1m revenue for TfL per annum.

5.4 Physical Environment

The area around Old Street is predominantly occupied by residential and commercial properties which are somewhat dominated by Old Street roundabout.

Figure 2: Old Street Roundabout – built environment

The physical environment of the project is the road and subway network and surrounding urban realm landscape of the junction itself.

5.5 Site Surveys

A wide range of survey data has been collated throughout the life of the project. In specific regard to the feasibility stage of development, the below data was collected:

- Schedule of current/programmed public or private sector developments that could have a direct or indirect impact on the route (Derwent, Helical Bar etc)
- Traffic Data: General Traffic, HGV's, Cyclists, Pedestrians, BODs, RODs
- Cycle Hire docking station locations and requirements of future facility at end state to meet demand
- Collision data and location plot of all collisions at Old Street in the past 36 months
- Speed limits on the route.
- Frontage activity e.g. parking/loading/street trading
- Waiting and loading restrictions
- Topographical survey
- C2 enquiries

Following the identification of a preferred solution for Old Street, the Project Manager has commissioned further surveys to understand the feasibility and potential issues in delivery of this option, these are as follows:

- Structural Integrity Surveys to confirm the loading capabilities of the LU station box
- Structural Integrity Surveys to confirm the loading capabilities of the subways and the raised roof structure over the central area of the subway
- Asbestos Surveys of all structures
- Sewer Surveys – structural integrity and locational
- PAS 128 Utility alignment surveys (Level 1B)
- C3 and C4 enquiries
- Drainage Surveys and Flood Risk Assessment
- Air Flow and Velocity surveys in the LU Station
- Unexploded Ordnance surveys
- Ecology and Environmental surveys (inc Noise and Air pollution)
- Geology surveys
- Lighting level surveys
- Basement structural surveys
- M&E Assessmnet of the LU Station and Subways

5.6 Budget

The overall budget for the Old Street roundabout project is £25.5m; this is almost entirely funded by the Transforming Streets and Places Portfolio (£24.9m) and is fully budgeted within the current business planning period (to 2021). £700k will be contributed to the project from section 106 contributions from The Bower development, towards improvements on City Road north.

5.7 Milestones

The table below outlines the key milestones in the feasibility/concept design stages.

Pathway Stage	Activity/Deliverable	Milestone (PAM/PMM)	Date
Stage 2	Start Feasibility study	Stage Gate	03/01/2013
Stage 2	Surveys and data collection commenced	PMM	06/01/2014
Stage 2	Produce feasibility options	PMM	25/04/2013
Stage 2	Stakeholder consultation – ITAG DRG	PMM PMM	15/08/2013 26/09/2013 & 29/04/2014
Stage 2	Produce feasibility report (inc preferred option selection)	PMM	29/04/2014
Stage 2	Stage Gate 2 Sign-off by better Junctions Programme Board and sign up by DRG	PMM	03/09/2014
Stage 3	Commence concept design	PMM	04/09/2014
Stage 3	Stakeholder consultation commence DRG	PMM	10/11/2014
Stage 3	Completion of highway concept design package	PMM	28/05/2015
Stage 3	Architecture design of Cowper Street subway complete	PMM	27/11/2015
Stage 3	Submission of Planning Application 1 (Cowper Street Subway)	PMM	12/12/2015
Stage 3	Stage Gate 3 sign-off progress into stage 4 detailed design	STB	19/01/2016
Stage 4	Urban Realm and architecture commission complete	PMM	23/02/2016
Stage 4	Submission of Planning Application 2 (Main peninsular entrance)	PMM	02/03/2016

5.8 Resources

The primary internal resources required to undertake the feasibility study were as follows:

- Portfolio Sponsor (0.25 x FTE)
- Senior Sponsor (0.75 x FTE)
- Sponsor (0.25 x FTE)
- Project Manager (0.75 x FTE)
- Assistant Project Manager (0.75 x FTE)
- Lead Design Engineer (0.25 x FTE)
- Design Engineer (0.5 x FTE)
- Traffic Modeller (0.5 x FTE)

At times of peak activity, further resources, such as a consultation specialist were required. A more detailed breakdown of the resources required is available in the project Resource Plan and through analysis of periodic actual demonstrating time charged by staff against the project.

5.9 Other Assumptions & Constraints

There are a number of constraints and dependencies which had to be considered in the development of the Old Street design:

Requirement to maintain efficiency of the Inner Ring Road

The Old Street scheme is primarily aimed at improving cycling and pedestrian facilities and, as a result, a measure of traffic capacity will be lost in order to deliver significant cycling improvements. However, the northern and eastern approaches to the roundabout form part of the Inner Ring Road, a key arterial route for traffic in London. As a result, there are limitations to how far general traffic capacity can be reduced in order to provide cycle lanes/segregation etc. The project must deliver the required benefits whilst ensuring the continued efficiency of the Inner Ring Road, within tolerances agreed between the Project Sponsor and OM (Outcome Management).

Limitations on available land

The area around Old Street Roundabout is heavily developed and occupied by commercial, retail and residential buildings. Moreover, there are two large developments underway adjacent to the existing roundabout (The Bower and White Collar Factory (Derwent). As a result, there are constraints on available land should any additional land be required to deliver the project. It has been assumed that the scope of the project cannot extend beyond TfL's current land boundaries and any boundaries on borough land as agreed with LB Islington and LB Hackney.

Retail Acquisition

In order to facilitate the creation of a new widened staircase from the peninsular to Old Street station, as a minimum, TfL will need to acquire one protected retail unit and one adjacent unit with no permenant tenant. The requirement for a widened staircase (12m) is predicated upon the desire to close three of the four existing subways around Old Street Roundabout.

This width has been confirmed by London Underground, (LU), to provide sufficient egress capacity to be able to evacuate the LU ticket hall in the event of an emergency. This width is also deemed approriate to provide sufficient air flow in to the station to offset the loss of ventilation through the closure of three of the subways and of the rotunda vent shaft sited above the escalators in the ticket hall.

LU future development

London Underground is currently investigating the potential for a large-scale over-station development (OSD) at Old Street, which if taken forwards, would be due to commence on site circa 2020. As a result the design – and specifically the design for the central peninsula – should be viewed as a short-medium term intervention (5-10 years) which can subsequently be redesigned at a later stage should an OSD be proposed.

Public Opinion

There is considerable political and public interest in the project and the scheme outcomes must be sensitive to the desires of these key stakeholders. A public consultation exercise was undertaken following single option selection (between November 2014 and January 2015); which recorded 87% public support for the scheme to proceed. The consultation report was published in May 2015 and confirmed our intention to proceed with the project, with delivery scheduled to begin in 2017. Successful engagement and consultation is therefore critical to delivering the planned benefits.

5.10 Organisational Extent

The following internal, cross-modal and cross-organisational teams were involved in the feasibility study.

- Highway Operations – supplied the project team with an insight into current deficiencies of the roundabout
- Surface Asset Management – supplied project team with plans, drawings and data for the existing subway structures at Old Street and a perspective on the build ability and ongoing maintenance liability of the options considered
- Surface Planning – assisted with the development of the scope and remit of the Old Street Roundabout project and respective weighting of each of the objectives considered
- Traffic Infrastructure – provided signal phasing's and timings to feed into traffic modelling assessments. Provided assurance around safety of scheme design in respect to the traffic infrastructure proposed at single option selection stage.
- Bus Network Development – provided insight into current operations at Old Street, routes in service, routes which must be maintained etc

- Taxis and Private Hire – contributed to exercise to weight the project objectives and scoring of options as they emerged
- Freight– contributed to exercise to weight the project objectives and scoring of options as they emerged
- Walking and Accessibility– contributed to exercise to weight the project objectives and scoring of options as they emerged
- Network Impact Management Team – Provided advice to sponsor in respect to permitting and works approvals.
- Environment– contributed to exercise to weight the project objectives and scoring of options as they emerged; completed Environmental Impact Assessment on behalf of the project team
- Outcome Design Engineering – developed design brief into tangible options for consideration by the sponsor and the wider project team. Provided high level assessment of costs and timescales to deliver each of the options, alongside key benefits and disbenefits in each scenario
- London Underground (Infrastructure Protection, Ventilation & Air Velocity, Operations, Station Access, Station Capacity, Emergency Access and Flood Prevention teams – supported in respect to requirement to access restricted areas of Old Street station for surveys, and facilitated regular update meetings on interfacing Station Capacity Upgrade scheme.

6 Options Considered (including Preferred Option)

6.1 Option Analysis

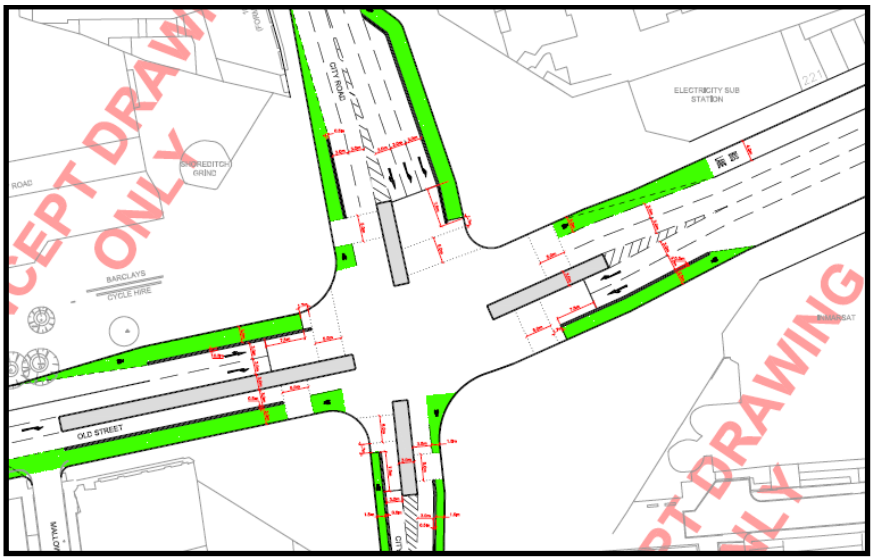
Six options have been investigated by TfL's Outcome Design Engineering (ODE) team; ranging from a do nothing scenario to exploration of a crossroads concept, and peninsularisation from all approach arms of the junction. All options have common objectives to improve road safety and enhance provisions at Old Street for vulnerable road users, decrease vehicular dominance at the junction and protect capacity on the Inner Ring Road. The options considered are summarised below:

Option One - Crossroads Option

This option involves amending the highway layout to introduce a crossroads layout at Old Street. Prior to the introduction of the roundabout in 1960s, a crossroads arrangement was in existence at this location and returning the junction to a crossroads layout was seen as a popular solution among cycling groups, in particular the Hackney Cycling Campaign. A crossroads design was considered carefully, but has a number of significant drawbacks:

- A crossroads arrangement conflicts with the location of two lift-shafts which must be retained with a view to the delivery of a London Underground station capacity upgrade project at Old Street (circa 2020).
- Introducing a crossroads arrangement at Old Street Roundabout has a significant negative impact on traffic capacity in the area. In order to provide sufficient capacity the junction would need to be very large, thereby increasing severance issues and decreasing the quality of the local environment.
- Proceeding with this option would not allow us to provide the large public realm space which other options can; instead creating several smaller pockets which would be difficult to usefully utilise.
- A crossroads arrangementnecessitates the provision of staggered pedestrian crossings as opposed to straight across crossings due to the amount of time required to accomodate a straight across facility on such a wide expanse of highway, leading to greater capacity issues for all users of the junction.
- This option fails to meet a fundamental requirement of the scheme; being to protect the performance and capacity of the Inner Ring Road, which is compromised by an increased cycle time at the junction.
- A large crossroads layout would require us to retain much of the existing sub-surface pedestrian environment to address the longer wait times for pedestrians crossing at surface level in this arrangement. This would mean that we fail to address TfL's ambition to remove subways from our network, which are characterised by anti-social behaviour and poor ambience.

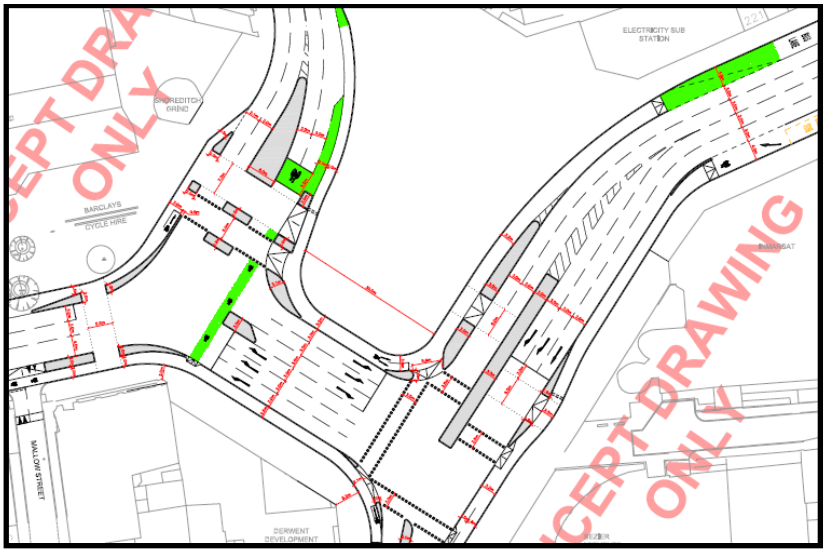
Figure 3: Option One - Crossroads



Option Two - North Arm Build Out

This option involves building out the northern arm of the existing roundabout to create a peninsula arrangement at Old Street. The peninsula created in this option would border the London Borough of Hackney.

Figure 4: Option Two - North Arm Build Out



This option delivers a number of benefits when compared to the existing layout:

- Improved cycling facilities; including segregated tracks around the junction in its entirety, could be facilitated in this layout.
- At surface level, pedestrian crossings can be created to provide access to to and from the peninsula.
- A number of subways around the junction could be removed in this arrangement, bringing more movements to grade; a key ambition of the scheme.
- The build out of the northern arm would also link well with the Helical Bar development to the north-west of the roundabout and therefore create a good public space adjacent to this. Further, the London Borough of Hackney have identified the site immediately north of the peninsula shown in this option for development, thus there are public realm opportunities which could be realised if the two could be successfully coordinated.

There are however some drawbacks of this arrangement;

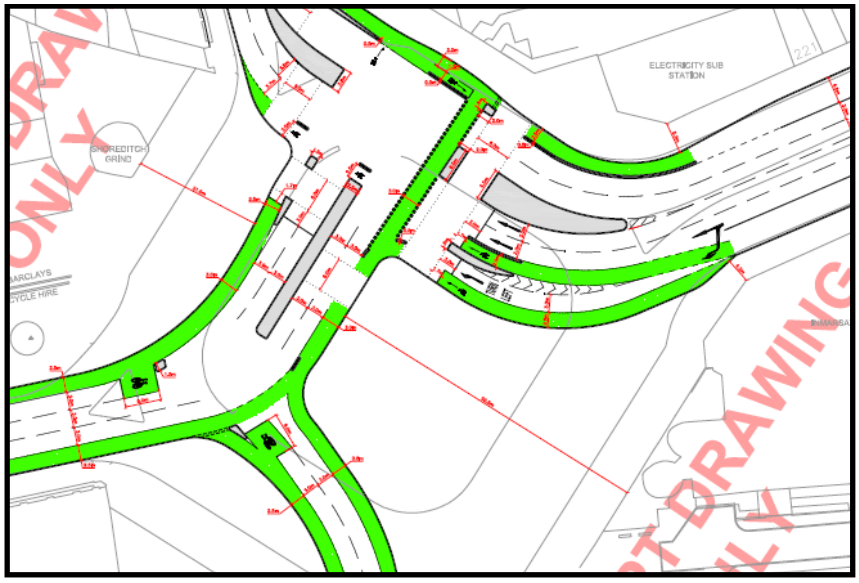
- The build out of the northern arm has a significant impact upon the aligment of the Inner Ring Road (IRR). Traffic travelling on the IRR from the direction Kings Cross for instance would be effectively making a U-turn to continue on the IRR eastbound. This has a large impact upon the perfomance of the network as whole, introducing additional delay to strategic traffic movements from North-East and vice versa.
- Some staggered pedestrian crossings would need to be provided to accommodate the progression of traffic around the junction, which would slow progression for pedestrians and could create additional congestion on footways/encourage dangerous informal crossing movements as a result.

- The additional spatial requirements for traffic lanes to the south side of the peninsula would necessitate the movement or removal of the JC Deceux structure which is currently sited on the roundabout, for which TfL have a long term contract (to 2025) with JC Deceux which would be costly to break early, or to remove the structure all together.

Option Three - South-East Arm Closure

This option looks to close the south-east arm of the roundabout and provide a peninsular on the southern end of the site.

Figure 5: Option Three - South-East Arm Closure



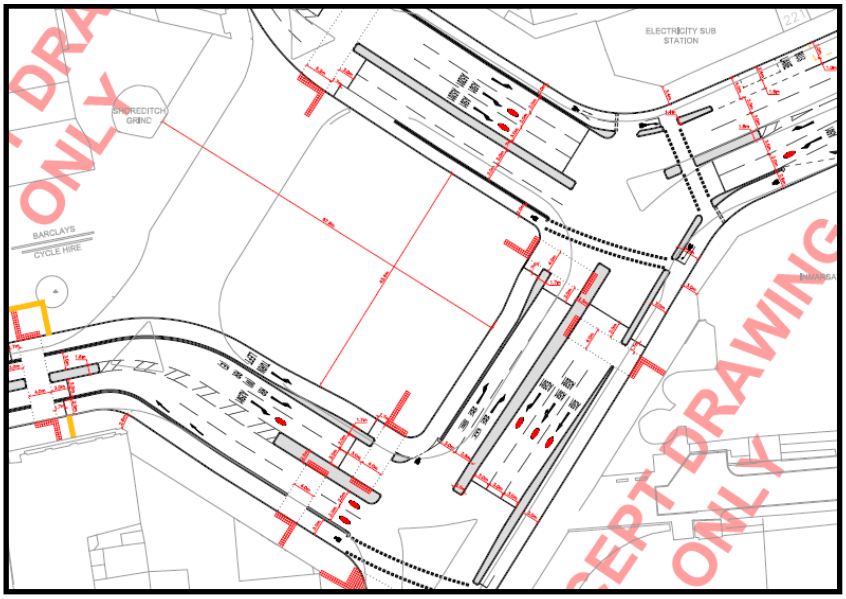
This option could deliver a number of benefits:

- This concept allows for improved cycle facilities to be created around the junction , with clear cycle tracks and a safe right turn facility from the IRR onto Old Street (west-bound). On the other hand, ASLs are not provided on the eastern approach to Old Street. Pedestrian crossings are at surface level and the impact upon the IRR capacity is likely to be minimised by the highway layout.
- The creation of a peninsula on the southern arm of the roundabout would create a large public space in front of the Immarsat building and may contribute to the image of Old Street as the heart of the IT sector in London.

Option Four - North-West Arm Closure (Max. Central Space)

This option proposes to close the north-west arm of the Old Street Roundabout, in order to maximise the peninsula space available.

Figure 6: Option Four - North-West Arm Closure (Max Central Space)



This option proposes to close the north-west arm of the Old Street Roundabout, in order to maximise the peninsula space available.

This option is able to deliver many benefits;

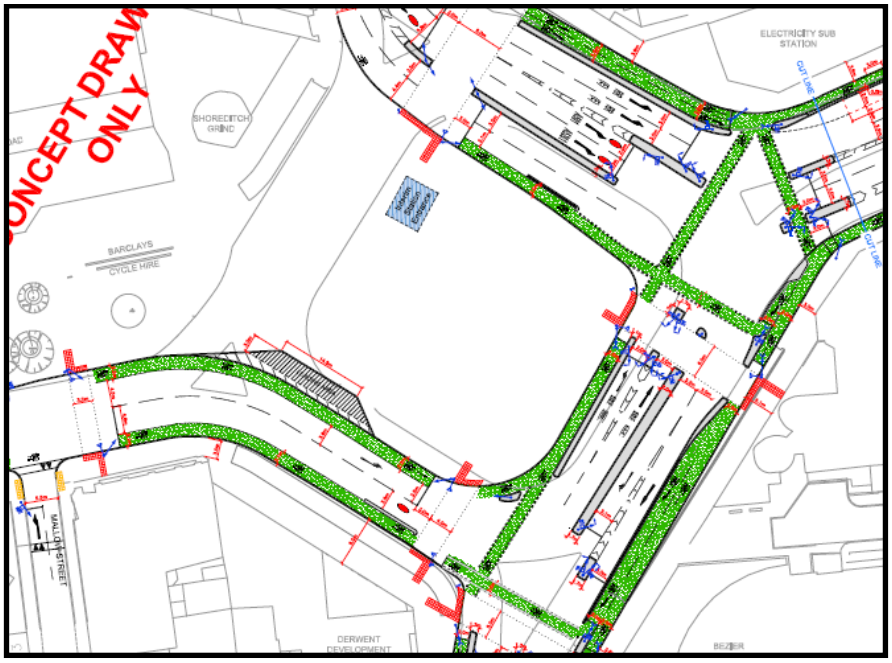
- Provision of at grade pedestrian crossing facilities; though it is of note that many of these will need to be staggered as opposed to straight across facilities owing to the constraints on traffic capacity at this location.
- Fully segregated cycle facilities are able to be provided around the peninsula and junction in its entirety, meeting cycle grid standards.
- Subway closures to all arms except for the south east corner of the junction would be pursued, allowing for more movements to be made at grade, in safe, open and well lit spaces.
- Additionally, the alignment of IRR in this option indicates that the schemes impact upon the performance of the road network will be lesser than other options which have been explored in the feasibility stage.
- The location of the central peninsular coordinates well with the proposed London Underground development and would allow the provision of a large public realm.

The maximisation of central space for public realm improvements does however reduce the amount of space available for cycle facilities and general traffic lanes. Due to the detrimental impact which this has on traffic flow, a further option; option five (see below) has been developed which mitigates against this.

Option Five - North-West Arm Closure

As with option four, this option proposes to close the north-west arm of the Old Street Roundabout. However, by comparison to option four, the extension of the central area is foregone to ensure that sufficient space for cycle provision is maintained.

Figure 7: Option 5 – North-West Arm Closure



This option is able to deliver all of the benefits associated with option four above whilst compromising on an extension of the peninsula space in order to protect the creation of segregated cycle facilities around the junction.

The location of the central peninsular coordinates well with the potential future footprint of any London Underground redevelopment, and would allow for the creation of a large public realm space in the short to medium term.

6.2 Refinement of option selection

During 2013/14, these options were examined by the project team to assess their relative benefits in order to identify the most suitable high-level option to take forwards.

Each of the options was scored in order to select which of the options would be selected for presentation to the Better Junctions Board, Design Review Group and the Deputy Mayor. Following, this exercise it was decided that options 3 and 5 would be presented to senior stakeholders and the board for their consideration.

Figure 8: Assessment Criteria

Objective	***1***	***2***	***3***	***4***	***5***
Improve cycle safety	*3*	*4*	*4*	*4*	*5*
Create a safe, accessible and legible environment	*3*	*4*	*4*	*4*	*4*
Create a space/place to be	*2*	*2*	*3*	*4*	*4*
At-grade crossings on desire lines with a single LU access point	*3*	*3*	*4*	*4*	*3*
Improve environmental quality and promote social inclusion	*4*	*3*	*3*	*3*	*3*
Improve cycle priority measures	*3*	*4*	*4*	*4*	*5*
Removal of (or at least improved/reoriented) pedestrian subways	*3*	*3*	*5*	*4*	*3*
Maximise bus/tube interchange	*3*	*3*	*3*	*3*	*3*
Total	*24*	*26*	*30*	*30*	*30*
Provisional options to take to DRG			***X***		***X***

The 'do nothing' scenario was also considered but was not scored as there would be no change in this scenario. This option would fail to deliver the required benefits to vulnerable road users; more specifically pedestrians and cyclists and the urgent need to reduce cyclist collisions. Additionally, doing nothing at the junction would lead to considerable difficulties in the future as local developments increase cyclist/pedestrian traffic in the area and should the proposed London Underground OSD progresses.

The scheme was initially presented to DRG in September 2013, at which time LB Islington stated a preference towards option five (option one presented in the report and minutes) and the closure of the north-west arm of the roundabout. Option three was largely rejected due to the traffic impats resulting from the loss of a lane on the Inner Ring Road (to the north side of the peninsular created), but was also unpopular due to the number of crossing movements required to travel around the junction, and the creation of too many shared surfaces which would introduce a conflict between pedestrians and cyclists.

Further clarity around the traffic and wider impacts of option one were requested and it was agreed that the scheme would return to DRG again when more information was available.

To this end, the scheme returned to DRG in April 2014 at which time more detail was provided around the impacts of the proposal to various modal users. The London Borough of Islington were largely satisfied with the impacts given the benefits which could be achieved by this proposal. The LCC and LB Hackney raised their concerns about this option progressing, principally focused upon their preferences for a crossroads alignment (which was discounted earlier in the optioneering process – see option one narrative above).

The DRG were satisfied with the project team's justification for the progression of option five subject to a more detailed modelling exercise being undertaken and continued engagement with the London Boroughs of Islington and Hackney, and agreed that the scheme did not need to return to DRG again.

A summary table of the outcomes of the feasibility stage of design can be seen below:

Figure 9: Summary of feasibility design

Option Number	Outcome
Option One: Crossroads alignment	Option not progressed
Option Two: North arm closure	Option not progressed
Option Three: South-East arm closure	Option not progressed
Option Four: North-West arm closure (max central space)	Option not progressed
Option Five: North-West arm closure	Option to be progressed
Do nothing scenario	Option not progressed

The supporting DRG report and meeting minutes are provided with this report for further review.

7. Recommendation

On the basis of the above analysis of the six options considered, it is recommended that option five, pursuing the closure of the north-west arm of the roundabout be progressed to single option selection and consultation.

This decision was based on a number of factors:

The early traffic modelling which was undertaken on the two options presented to DRG; options three and five, suggested that option five had lesser impacts, particularly on the Inner Ring Road, where the south-east arm closure would require the loss of a lane which would have a significant impact in respect to queuing on the network.

The urban realm benefits which could be delivered by option five when considered alongside option three are greater; in that the peninsular space created in option five abuts the Promenade of Light and better complements a key desire line too and from Old Street station, and that it is possible to simplify pedestrian crossing movements to and from the peninsular in this proposal.

The London Borough of Islington, the authority in which Old Street is sited, supported the progression of option five over the further development of option three.

Option five represents the best balance for all modal user groups of all the options considered and consequently, was selected to proceed to concept level development.

7.1 Key Issues for resolution and further investigations required during Concept Design

Following single option selection a suite of further investigations have been undertaken (see section 3.5 site surveys for a full list)

Further to this, a more extensive round of traffic modelling has been undertaken – taking the initial outputs produced for gate two (VISSIM) into the ONE Model to understand the impact of the scheme alongside all the schemes programmed for delivery on the network by the end of 2016, at which point it is hoped that the delivery of the Old Street scheme will be imminent.

This modelling showed the impact of the scheme to be acceptable to TfL, however does identify some significant increases to the journey times of buses travelling through the junction as described earlier in this report. This should however be considered alongside the pre-mitigation journey time forecasts in the 2016 model without the delivery of the scheme on the network which in some cases showed additional delays to buses – with one particular route experiencing eight minutes of delay compared to the base case (2013), reducing to three minutes with the delivery of the scheme.

The project team have also continued to work with key stakeholders in an attempt to resolve their concerns around the scheme. The Old Street project has also been presented to the Road Space Performance Group in March 2015 (during concept design) for consideration given the traffic impacts of the scheme and ongoing borough objection from the London Borough of Hackney.

As we approach the end of concept design (stage gate three); a formal TMAN submission has been made to the Network Impact Management team for their review and consideration. A decision as to whether or not this will be approved is awaited by the project team.