

## LBN Pudding Mill Lane S106 Scheme

# Traffic and Public Realm Improvements Project

Client Name: London Borough of Newham

Reference: 7892

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[REDACTED]

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## 1. INTRODUCTION

The London Borough of Newham (LBN) commissioned Project Centre Limited (PCL) to develop a feasibility study for traffic and public realm improvements on Pudding Mill Lane, in response to road safety concerns raised within the Queen Elizabeth Olympic Park (QEOP). A full review of the existing lighting within the scope of the project, and detailed design for Pudding Mill Lane only is included in the brief.

A comprehensive Road Safety Audit (RSA) was undertaken in February 2020 which highlighted several road safety issues concerning pedestrians, cyclists, and motorcyclists. These issues are consistent with the aim to introduce long-term behavioural change in QEOP area with a road network less dominated by service vehicles and more pedestrian focused.

LLDC (London Legacy Development Corporation) is working with LB Newham to develop feasibility, detailed design and implementation of Pudding Mill Lane Traffic & Public Realm Improvements project. The project looks to create a safe and pedestrian friendly environment that would adequately serve the increased footfall resulting from new developments on Marshgate Lane and Pudding Mill Lane.

### 1.1 Scheme Objectives

The schemes objectives are as follows.

- Support a Temporary Theatre site Development, part of the Legacy Communities Scheme (LCS) known as "Pudding Mill". The temporary theatre has a time limited planning permission to allow this site to be occupied by a temporary theatre and supporting interim uses for up to five years. The works are expected to be delivered in readiness for the Temporary Theatre which is planned to be open for use from mid-April 2022.
- Address the issues raised by residents, Ward Councillors and businesses and will improve the safety of all road users including cyclists, motorcyclists, pedestrians, and motor vehicles in advance of the new developments on Pudding Mill Lane and Marshgate Lane.
- Provide a safe and pedestrian friendly environment that would adequately serve the increased footfall resulting from the new developments on Marshgate Lane and Pudding Mill Lane.

### 1.2 Design Requirements

The concept designs on Pudding Mill Lane should aim to:

1. Consider whether the speed limit and associated road signage on Marshgate Lane should be changed to reduce traffic speeds.
2. Improve visibility between vehicles at the junction of Barley Lane and Pudding Mill Lane.
3. Provide temporary footway widening on Pudding Mill Lane to implement a one-way system with the associated junction until the permanent project is implemented.
4. Review and improve the existing zebra crossings on Marshgate Lane and Pudding Mill Lane.

These link to the brief provided to Newham by LLDC. Those items are as follows:

1. Review existing traffic speeds, the speed limit and associated road signage on Marshgate Lane and consider introducing a 20mph speed limit. Review existing traffic signs, roadmaking, and temporary one-way system on Pudding Mill Lane to improve visibility between vehicles at the junction of Marshgate Lane & Pudding Mill Lane.
2. Provide temporary footway widening on both sides of the carriageway on Pudding Mill Lane and implement a one-way system with the associated junction and street definition (public realm, e.g., planters) until the permanent project is implemented. [REDACTED] [REDACTED] [REDACTED]
3. Review existing Traffic Management Orders and make Permanent Traffic Order for widened footway and one-way system on Pudding Mill Lane.
4. Improve [REDACTED] at the junction of Marshgate Lane with the Off Green [REDACTED] (the intersection between Greenway [REDACTED] and Marshgate Lane). **It was agreed to do nothing at this stage due to time and cost constraints. Options will be considered at later stage when the second phase of the area developments are being considered.**
5. Introduce parking control on Marshgate Lane between the Railway Structure and a point 50m south of the zebra crossing on Marshgate Lane. Parking control is being introduced with no parking and loading restriction (double blips on kerbs)
6. Investigate land ownership on the land adjacent to the Greenway and implement parking controls if possible. Land ownership is detailed in section 2.1 and identified in figure 3 below
7. Review and improve the existing zebra crossings on Marshgate Lane and Pudding Mill Lane
8. Review existing street lighting on Pudding Mill Lane, Marshgate Lane from junction of Pudding Mill Lane to greenway ramp, the underpass, and Barbers Road from the front of the station to Marshgate Lane and Pudding Mill Lane. Following review of the lighting, the scope of lighting improvement works will be agreed with LLDC.
9. Remove partial remaining road gateline on Pudding Mill Lane.
10. Review and provide Legible London signage near the DLR station. **It was agreed to do nothing at this stage due to time and cost constraints. Options will be considered at later stage when the second phase of the area developments are being considered.**

These items will be referred to within the remainder of this report except those excluded for the reasons highlighted in bold.

## 2. STUDY AREA

The study area is in the eastern region of the London Borough of Newham, south of Stratford as shown in Figure 1.

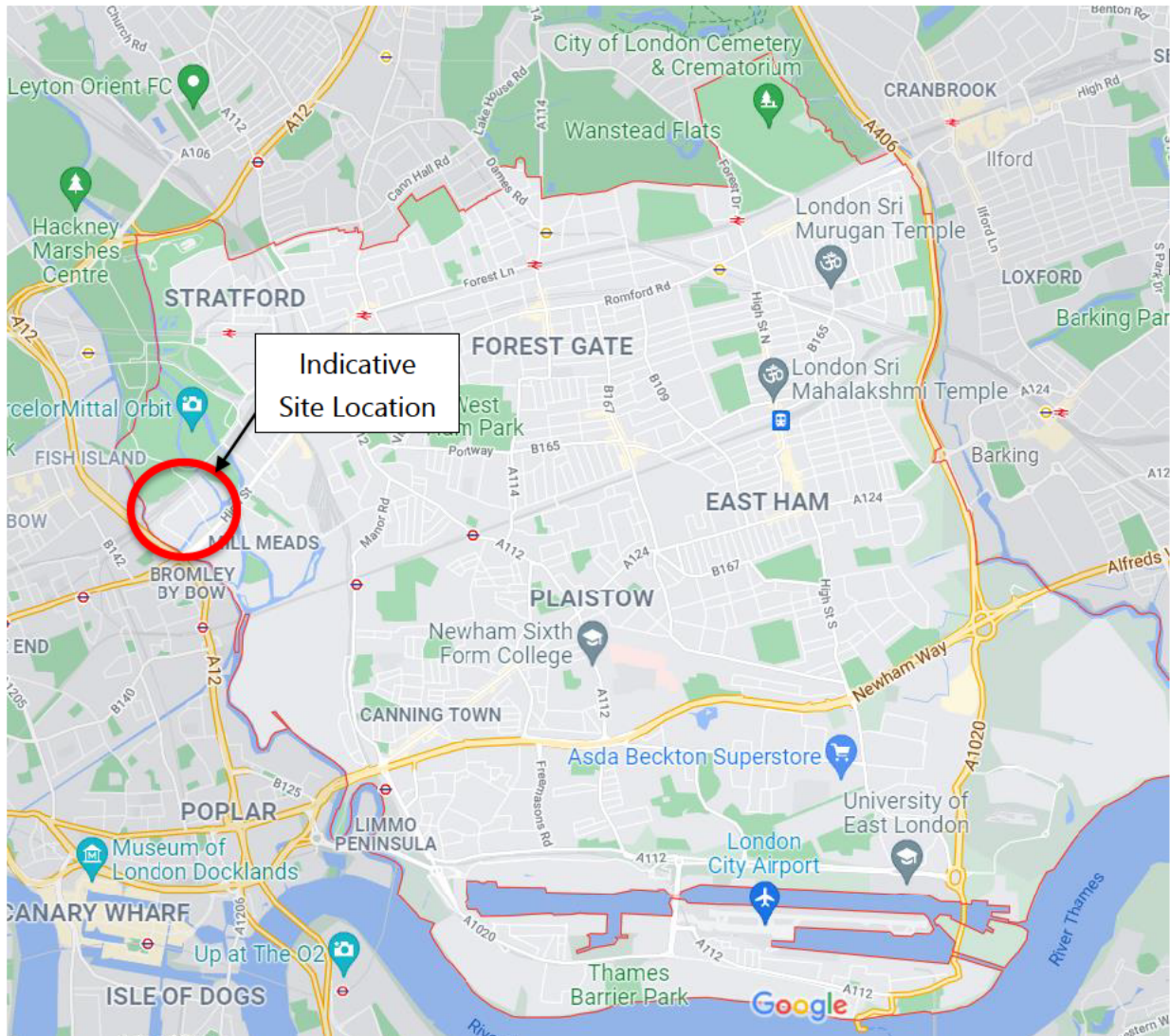


Figure 1: Location of Scheme in Newham

Figure 2 shows the site extent. It includes Pudding Mill Lane, Barley Lane, the section of Marshgate Lane north of Barley Lane to underneath the railway line, and the section of Barbers Lane between Pudding Mill Lane and Marshgate Lane. It is in close proximity to Pudding Mill Lane Train Station.

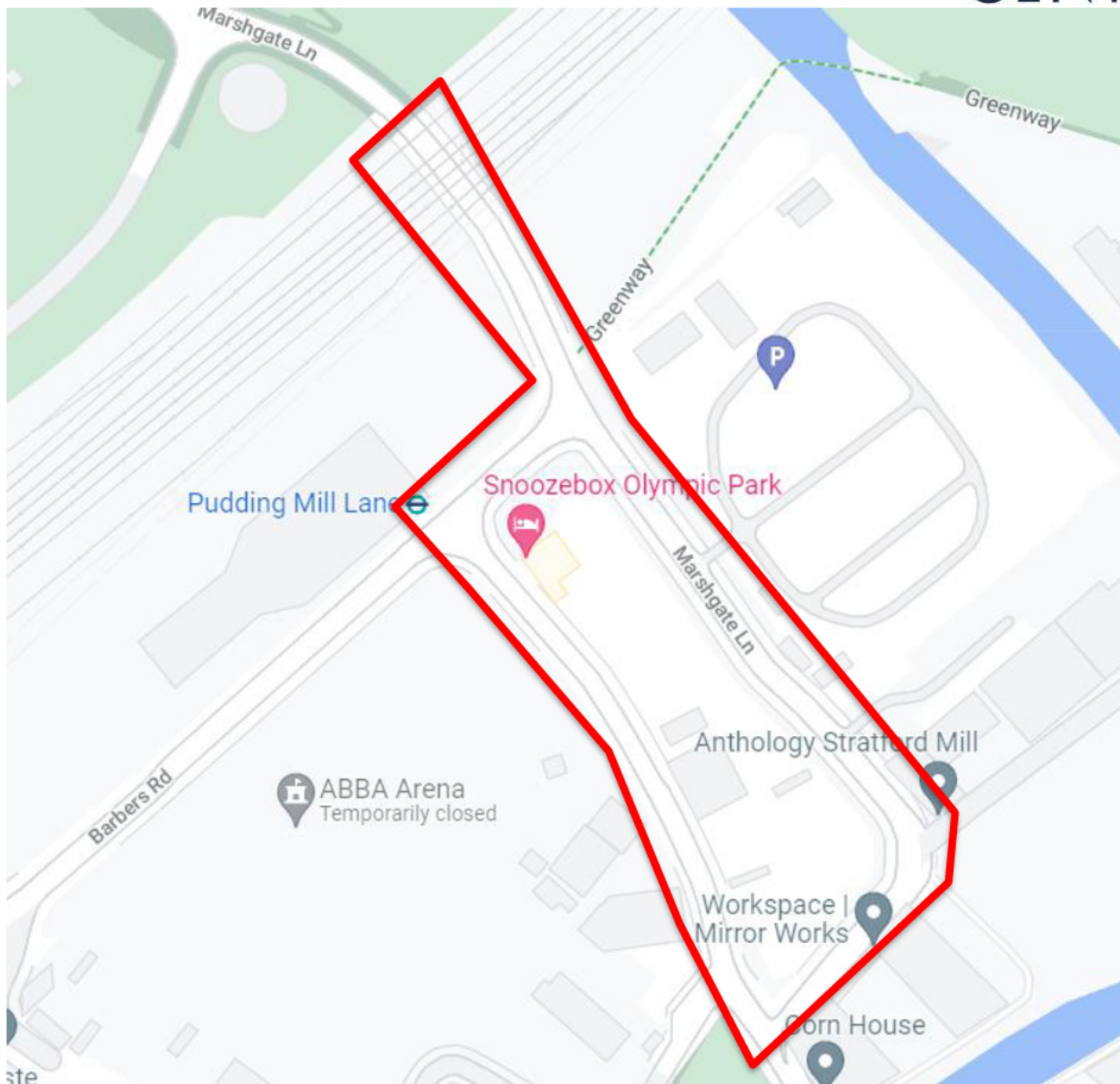


Figure 2: Site Extents

The streets are two-way streets with one lane in each direction with double yellow lines on both sides. The roads are wide with straight alignments, which may result in higher speeds. Barbers Road in particular has a 7m wide carriageway. The junctions have large radius, likely associated with the surrounding industrial nature.

There are pedestrian footway on the west side of pudding mill lane, and a zebra crossing is provided and there is an existing crossing on Marshgate Lane which will be upgraded. No cycle facilities are provided.

Due to existing construction on Marshgate Lane, it currently operates as one-way northbound. A section of the southbound lane and footway is currently closed to general traffic and is used for parking associated with the construction site.

## 2.1 Landownership

A section of Pudding Mill Lane highlighted red is owned by the LLDC as shown in Figure 3. The remaining highway highlighted in black is owned by LBN. The Pudding Mill Lane DLR station is owned by TfL, with the remaining land parcels owned privately. Adjacent to the eastern section of LLDC land and ramp is assumed to belong to National Rail (confirmation is required).

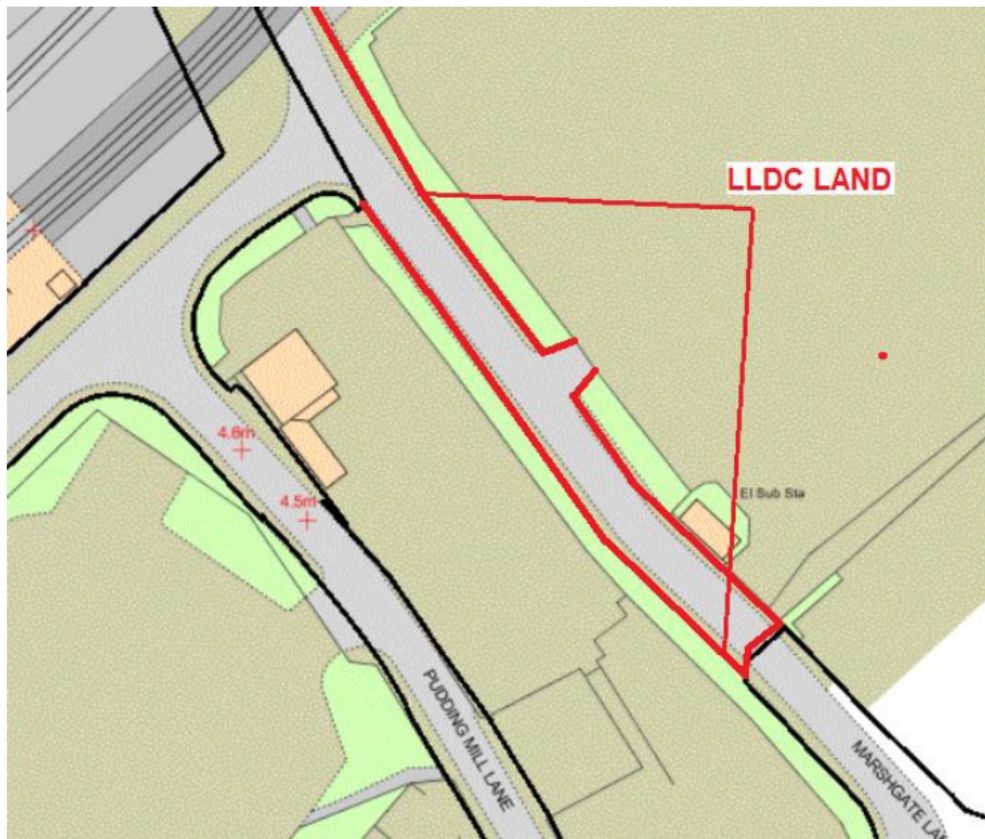


Figure 3: Landownership

## 2.2 Speed Environment

The posted speed limit on all roads is 30mph with temporary 20mph in place for development works in the area. Automatic Traffic Count surveys were undertaken in June 2019, with the results shown in Figure 4. This demonstrates that mean speed was below the posted speed limit on Pudding Mill Lane, but the mean speed exceeds the posted speed limit on both Marshgate Lane and Barbers Lane. Further, the 85<sup>th</sup> percentile speed is close to 30mph on Marshgate Lane and exceeds 30mph on Barbers Lane. This is likely due to the straight road alignment and the absence of other traffic calming measures.

It is recommended that traffic calming measures be introduced where possible on Marshgate Lane and Barbers Road. A raised table has been proposed on Barbers Road west of Marshgate Lane as part of the temporary theatre project being undertaken by the LLDC. No zebra crossing is proposed on Barbers Road except one west of Pudding Mill Lane which is part of S278 agreement. This would likely reduce traffic speeds in vicinity of Pudding Mill Lane significantly.



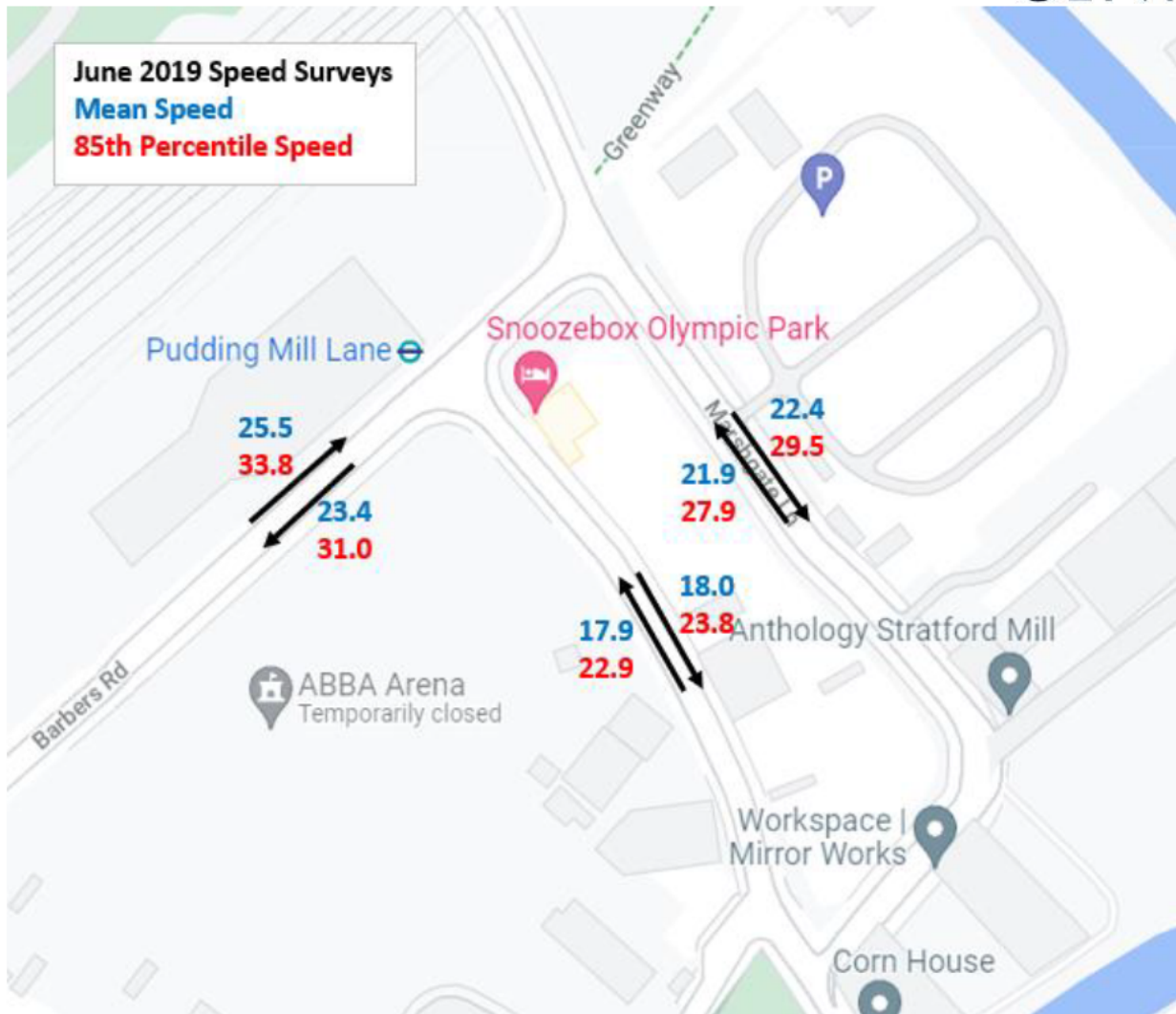


Figure 4: Speed Environment

### 2.3 Collisions

A review of collisions within the study area has been undertaken. The last collision that occurred was in July 2017. No other collisions have occurred in the last five years from April 2021.

The July 2017 collision occurred at the junction of Pudding Mill Lane and Marshgate Lane. It was of slight severity and occurred between two motor vehicles. A driver failed to look properly and disobeyed the give way markings on Pudding Mill Lane.

This collision does not indicate there are significant safety issues within the area.

### 3. **CONCEPT DESIGN OPTIONS**

Three concept designs have been developed for consideration by Newham. These concept designs aim to improve pedestrian infrastructure and improve road safety for all users.

The scheme would be constructed under an experimental order.

Three previous solutions were considered which have since been discounted. These are provided in Appendix A.

#### 3.1 **Option B**

##### **LLDC Item 2**

Option B consists of converting Pudding Mill Lane to one direction northbound as shown in Drawing 1000007892-3-9008-01 in Appendix B. The minimum proposed width of clear carriageway is 3.5m m [REDACTED] Pudding Mill Lane. [REDACTED]

Vehicle tracking has been undertaken with an articulated vehicle to ensure that the design can accommodate suitable vehicles (as shown in Drawing 1000007892-3-9008-02 in Appendix C). The tracking shows that an articulated vehicle can enter the temporary theatre site on Barbers Road and exit left onto Pudding Mill Lane and navigate the Pudding Mill Lane / Barber Road junction.

##### 3.1.1 **Footway Widening**

##### **LLDC Item 2**

The proposed carriageway width reduction creates opportunity for significant footway widening. It is proposed that the footways be widened at various section on either side of the road along Pudding Mill Lane.

##### 3.1.2 **Pudding Mill Lane / Barbers Road Junction**

##### **LLDC Item 1**

The Pudding Mill Lane/Barbers Road junction is being narrowed on the Pudding Mill Lane approach to reduce speed of turning vehicles. It also will create a shorter crossing distance for pedestrians. The proposed raised table will help reduce the speed of traffic when exiting the junction.

The conversion of Pudding Mill Lane to northbound only will also reduce conflict points at this junction, further improving vehicle and pedestrian safety.

##### 3.1.3 **Pudding Mill Lane / Barley Lane Junction**

##### **LLDC Item 1**

The Pudding Mill Lane/ Barley Lane junction is being narrowed on the Pudding Mill Lane arm. This will reduce speed of turning vehicles. It also will create a shorter crossing distance for

pedestrians. This junction is proposed to be raised on the Pudding Mill Lane arm with tactile paving to improve pedestrian facility and reduce speed of traffic entering Pudding Mill Lane.

The conversion of Pudding Mill Lane and Barley Lane to one-way will reduce vehicle conflict points and improve vehicle visibility.

### 3.1.4 Pedestrian Crossing Locations

#### **LLDC Item 7**

The existing crossing on Marshgate Lane is to be upgraded to a formal zebra crossing through the installation of belisha beacons. The crossing is not proposed as a raised crossing as there is only an approximate 50mm upstand between the existing footway and carriageway. Therefore, to raise the crossing, extensive footways work would also be required to raise the footway.

The existing crossing [redacted] Pudding Mill Lane will be removed as its location is not a [redacted] pedestrian desire line [redacted] [redacted].

#### Proposed Taxi Rank

A secondary taxi rank [redacted] on the southwestern side on Pudding Mill Lane close to its junction with Barbers Road. This is 28m long by 2m wide rank. The location of this taxi rank retains a 2m wide pedestrian footway at its most narrow point.

The locations are also within the existing carriageway which provides a cost-effective solution that does not require the relocation of any utilities. The relocation of any utilities would be cost prohibitive.

### 3.1.5 Speed Limit

#### **LLDC Item 1**

It is proposed to make the existing temporary 20mph speed limit permanent.

The provision of raised tables on Pudding Mill Lane will also reduce the speed of traffic.

### 3.1.6 Street Lighting

#### **LLDC Item 8**

The proposed changes to the lighting arrangement are as follows:

- Marshgate Lane
  - 9 lanterns to be upgraded from Son-T to LED
- Pudding Mill Lane
  - 2 new 10m columns
  - 5 existing columns relocated to the back of the footway
- Barley Lane and Barbers Road
  - no change

3.1.7 Road Gateline

**LLDC Item 9**

There is an existing gate on Pudding Mill Lane that falls within the public highway rather than on private land as shown in Figure 5. It is recommended that this gate be moved to within the private land boundary.



Figure 5: Existing gate in public highway

3.1.8 Additional Public Realm Improvements

Low level planters and trees have also been proposed throughout the scheme with the majority of them being at junctions.

3.1.9 Cost Estimate

The cost of the works is estimated to cost £185,724 including a 20% risk as itemised in Table 1A.

This is above the available budget of £140,000. To undertake these works closer to the budget, works on Marshgate Lane and greenery could be removed. This would bring the total cost to £136,644 including 20% risk as itemised in Table 1B.

Table 1A: Option B Cost Estimate

OPTION B		Cost
<b>Pudding Mill Lane</b>		
Site Clearance		£ 3,500
Drainage		£ 13,000
Raised Entry Treatment		£ 5,000
Resurfacing		£ 3,500
New Footway		£ 61,670
Street Lighting		£ 21,700
Trees		£ 6,600
Planting Area		£ 4,800
Zebra Crossing		£ -
Cycle Stands		£ -
Traffic Management Order		£ 5,000
Section 23 Notice for changes to crossings		£ 500
Cost of Works		£ 125,270
Risk	20%	£ 25,054
Total		£ 150,324
<b>Marshgate Lane</b>		
New belisha beacons		£ 27,000
Tactile Paving		£ 2,500
Cost of Works		£ 29,500
Risk	20%	£ 5,900
Total		£ 35,400
<b>Total</b>		
Cost of Works		£ 154,770
Risk	20%	£ 30,954
Total		£ 185,724

Table 2B: Option B Cost Estimate – Reduced Works

OPTION B		Cost
<b>Pudding Mill Lane</b>		
Site Clearance		£ 3,500
Drainage		£ 13,000
Raised Table / Entry Treatment		£ 5,000
Resurfacing		£ 3,500
New Footway		£ 61,670
Street Lighting		£ 21,700
Zebra Crossing		£ -
Cycle Stands		£ -
Traffic Management Order		£ 5,000
Section 23 Notice for changes to crossings		£ 500
<b>Total</b>		
Cost of Works		£ 113,870
Risk	20%	£ 22,774
Total		£ 136,644

## **3.2 Option D**

### **LLDC Item 2**

Option D consists of converting Pudding Mill Lane to one direction northbound as shown in Drawing 1000007892-3-9005-01 in Appendix B. The minimum proposed width of clear carriageway is 3.5m metres on Pudding Mill Lane.

Vehicle tracking has been undertaken with an articulated vehicle to ensure that the design can accommodate suitable vehicles (as shown in Drawing 1000007892-3-9005-02 in Appendix C). The tracking shows the articulated vehicle from the [REDACTED] site [REDACTED] Road and exit left onto Pudding Mill Lane and navigate the Pudding Mill Lane / Barber Road junction.

#### **3.2.1 Footway Widening**

##### **LLDC Item 2**

The proposed carriageway width reduction creates opportunity for significant footway widening. It is proposed [REDACTED] footways be widened at various section on either side of the road along Pudding Mill Lane.

#### **3.2.2 Pudding Mill Lane / Barbers Road Junction**

##### **LLDC Item 1**

The Pudding Mill Lane/Barbers Road junction is being narrowed on the Pudding Mill Lane approach to reduce speed of turning vehicles. It also will create a shorter crossing distance for pedestrians. This junction is proposed with a raised table on the Pudding Mill Lane approach to improve pedestrian facility.

The conversion of Pudding Mill Lane to northbound only will also reduce conflict points at this junction, further improving vehicle and pedestrian safety.

#### **3.2.3 Pudding Mill Lane / Barley Lane Junction**

##### **LLDC Item 1**

The Pudding Mill Lane/Barbers Road junction is being narrowed on the Pudding Mill Lane approach to reduce speed of turning vehicles. It also will create a shorter crossing distance for pedestrians. The proposed raised table will help reduce the speed of traffic when exiting the junction.

The conversion of Pudding Mill Lane to northbound only will also reduce conflict points at this junction, further improving vehicle and pedestrian safety.

#### **3.2.4 Pedestrian Crossing Locations**

##### **LLDC Item 7**

The existing crossing on Marshgate Lane is to be upgraded to a formal zebra crossing through the installation of belisha beacons. The crossing is not proposed as a raised crossing as there is only an approximate 50mm upstand between the existing footway and carriageway. Therefore, to raise the crossing, extensive footways work would also be required to raise the footway.

The existing crossing on Pudding Mill Lane will be removed as its location is not along a pedestrian desire line. Rather, a raised table is proposed with tactile paving on the Pudding Mill Lane/Barbers Road junction. This will provide more pedestrian improvement on the pedestrian desire line.

### 3.2.5 Taxi Rank

Two sections of taxi rank is provided on the south western side on Pudding Mill Lane close to its junction with Barbers Road. This is 12m long by 2m wide rank and 28m long by a minimum 1.8m wide rank. The location of this taxi rank retains a 2m wide pedestrian footway at its most narrow point.

The locations are also within the existing carriageway which provides a cost-effective solution that does not require the relocation of any utilities. The relocation of any utilities would be cost prohibitive.

### 3.2.6 Speed Limit

#### **LLDC Item 1**

It is proposed to maintain the temporary 20mph speed limit on a permanent basis.

The provision of raised tables at both the Pudding Mill Lane / Barbers Road and Pudding Mill Lane / Barley Lane junctions and the narrow carriageway will also calm traffic.

### 3.2.7 Street Lighting

#### **LLDC Item 8**

The proposed changes to the lighting arrangement are as follows:

- Marshgate Lane
  - 9 lanterns to be upgraded from Son-T to LED
- Pudding Mill Lane
  - 2 new 10m columns
  - 5 existing columns relocated to the back of the footway
- Barley Lane and Barbers Road
  - no change

### 3.2.8 Road Gateline

#### **LLDC Item 9**

There is an existing gate on Pudding Mill Lane that falls within the public highway rather than on private land as shown in Figure 5. It is recommended that this gate be moved to within the private land boundary.

### 3.2.9 Additional Public Realm Improvements

Low level planters and trees have also been proposed throughout the scheme with the majority of them being at junctions. Cycle parking has also been proposed on junctions close to Pudding Mill Lane DLR station.

### 3.2.10 Cost Estimate

The cost of the works is estimated to cost £154,320 including a 20% risk as itemised in Table 3A.

This is above the available budget of £140,000. To undertake these works under budget, works on Marshgate Lane, greenery and cycle stands could be removed. This would bring the total cost to £135,840 including 20% risk as itemised in Table 3B.

Table 3A: Option D Cost Estimate

OPTION D		Cost
<b>Pudding Mill Lane</b>		
Site Clearance		£ 3,500
Drainage		£ 13,000
Raised Entry Treatment		£ 5,000
Resurfacing		£ 3,500
New Footway		£ 61,000
Street Lighting		£ 21,700
Trees		£ 6,600
Planting Area		£ 4,800
Zebra Crossing		£ -
Cycle Stands		£ 4,000
Traffic Management Order		£ 5,000
Section 23 Notice for changes to crossings		£ 500
Cost of Works		£ 128,600
Risk	20%	£ 25,720
Total		£ 154,320
<b>Marshgate Lane</b>		
New belisha beacons		£ 27,000
Tactile Paving		£ 2,500
Cost of Works		£ 29,500
Risk	20%	£ 5,900
Total		£ 35,400
<b>Total</b>		
Cost of Works		£ 158,100
Risk	20%	£ 31,620
Total		£ 189,720



Table 4B: Option D Cost Estimate – Reduced Works

OPTION D		Cost
<b> pudding Mill Lane</b>		
Site Clearance		£ 3,500
Drainage		£ 13,000
Raised Entry Treatment		£ 5,000
Resurfacing		£ 3,500
New Footway		£ 61,000
Street Lighting		£ 21,700
Zebra Crossing		£ -
Traffic Management Order		£ 5,000
Section 23 Notice for changes to crossings		£ 500
<b>Total</b>		
Cost of Works		£ 113,200
Risk	20%	£ 22,640
Total		£ 135,840

### 3.3 Option E

#### LLDC Item 2

Option E consists of converting Pudding Mill Lane to one direction northbound as shown in Drawing 1000007892-3-9006-01 in Appendix B. The minimum proposed width of clear carriageway is 3.5m metres on Pudding Mill Lane.

Vehicle tracking has been undertaken with an articulated vehicle to ensure that the design can accommodate suitable vehicles (as shown in Drawing 1000007892-3-9006-02 in Appendix C). The tracking shows that an articulated vehicle can enter the temporary theatre site on Barbers Road and exit left onto Pudding Mill Lane and navigate the Pudding Mill Lane / Barber Road junction.

#### 3.3.1 Footway Widening

##### LLDC Item 2

The proposed carriageway width reduction creates opportunity for significant footway widening. It is proposed that the footways be widened at various section on either side of the road along Pudding Mill Lane.

#### 3.3.2 Pudding Mill Lane / Barbers Road Junction

##### LLDC Item 1

The Pudding Mill Lane/Barbers Road junction is being narrowed on the Pudding Mill Lane approach to reduce speed of turning vehicles. It also will create a shorter crossing distance for

pedestrians. This junction is proposed with a raised table on the Pudding Mill Lane approach to improve pedestrian facility.

The conversion of Pudding Mill Lane to northbound only will also reduce conflict points at this junction, further improving vehicle and pedestrian safety.

### 3.3.3 Pudding Mill Lane / Barley Lane Junction

#### **LLDC Item 1**

The Pudding Mill Lane/Barbers Road junction is being narrowed on the Pudding Mill Lane approach to reduce speed of turning vehicles. It also will create a shorter crossing distance for pedestrians. The proposed raised table will help reduce the speed of traffic when exiting the junction.

The conversion of Pudding Mill Lane to northbound only will also reduce conflict points at this junction, further improving vehicle and pedestrian safety.

### 3.3.4 Pedestrian Crossing Locations

#### **LLDC Item 7**

The existing crossing on Marshgate Lane is to be upgraded to a formal zebra crossing through the installation of belisha beacons. The crossing is not proposed as a raised crossing as there is only an approximate 50mm upstand between the existing footway and carriageway. Therefore, to raise the crossing, extensive footways work would also be required to raise the footway.

The existing crossing on Pudding Mill Lane will be removed as its location is not along a pedestrian desire line, instead a zebra crossing on a raised table is proposed with tactile paving on the Pudding Mill Lane/Barbers Road junction. This will provide more pedestrian improvement on the pedestrian desire line.

### 3.3.5 Taxi Rank

Two sections of taxi rank are provided on the southwestern side on Pudding Mill Lane close to its junction with Barbers Road. This is 12m long by 2m wide rank and 28m long by a minimum 1.8m wide rank. The location of this taxi rank retains a 2m wide pedestrian footway at its most narrow point.

The locations are also within the existing carriageway which provides a cost-effective solution that does not require the relocation of any utilities. The relocation of any utilities would be cost prohibitive.

### 3.3.6 Speed Limit

#### **LLDC Item 1**

It is proposed to maintain the temporary 20mph speed limit on a permanent basis.

The provision of raised tables at both the Pudding Mill Lane / Barbers Road and Pudding Mill Lane / Barley Lane junctions and the narrow carriageway will also calm traffic.

### 3.3.7 Street Lighting

#### **LLDC Item 8**

The proposed changes to the lighting arrangement are as follows:

- Marshgate Lane
  - 9 lanterns to be upgraded from Son-T to LED
- Pudding Mill Lane
  - 2 new 10m columns
  - 5 existing columns relocated to the back of the footway
- Barley Lane and Barbers Road
  - no change

### 3.3.8 Road Gateline

#### **LLDC Item 9**

There is an existing gate on Pudding Mill Lane that falls within the public highway rather than on private land as shown in Figure 5. It is recommended that this gate be moved to within the private land boundary.

### 3.3.9 Additional Public Realm Improvements

Low level planters and trees have also been proposed throughout the scheme with the majority of them being at junctions. Cycle parking has also been proposed on junctions close to Pudding Mill Lane DLR station.

### 3.3.10 Cost Estimate

*The cost of the works is estimated to cost £225,720 including a 20% risk as itemised in*

Table 5A.

This is above the available budget of £140,000. To undertake these works under budget, the raised entry treatments, works on Marshgate Lane, trees, planting and cycle stands could be removed. This would bring the total cost to £165,840 including 20% risk (£27,640) i.e., cost of works alone is £138,200, as itemised in Table 3B.

Table 5A: Option E Cost Estimate

OPTION E		Cost
<b>Pudding Mill Lane</b>		
Site Clearance		£ 3,500
Drainage		£ 13,000
Raised Entry Treatment		£ 5,000
Resurfacing		£ 3,500
New Footway		£ 61,000
Street Lighting		£ 21,700
Trees		£ 6,600
Planting Area		£ 4,800
Zebra Crossing		£ 30,000
Cycle Stands		£ 4,000
Traffic Management Order		£ 5,000
Section 23 Notice for changes to crossings		£ 500
Cost of Works		£ 158,600
Risk	20%	£ 31,720
Total		£ 190,320
<b>Marshgate Lane</b>		
New belisha beacons		£ 27,000
Tactile Paving		£ 2,500
Cost of Works		£ 29,500
Risk	20%	£ 5,900
Total		£ 35,400
<b>Total</b>		
Cost of Works		£ 188,100
Risk	20%	£ 37,620
Total		£ 225,720

Table 6B: Option E Cost Estimate – Reduced Works

OPTION E		Cost
<b> pudding Mill Lane</b>		
Site Clearance		£ 3,500
Drainage		£ 13,000
Resurfacing		£ 3,500
New Footway		£ 61,000
Street Lighting		£ 21,700
Zebra Crossing		£ 30,000
Traffic Management Order		£ 5,000
Section 23 Notice for changes to crossings		£ 500
<b>Total</b>		
Cost of Works		£ 138,200
Risk	20%	£ 27,640
<b>Total</b>		<b>£ 165,840</b>

### 3.4 Other Improvements Considered

Other improvements were considered but discounted as they would be cost prohibitive, or they are not considered a safe solution.

#### 3.4.1 Continuous Crossing

A continuous crossing was also considered at the Pudding Mill Lane / Barbers Road junction. However, due to the wide radii required to manoeuvre an articulated vehicle through this junction, a continuous crossing in this location would have a long pedestrian crossing distance which is a safety risk.

## 4.0 LIGHTING REVIEW

### 4.1 Lighting Introduction

4.1.1 This lighting assessment specifically focuses on street lighting on Pudding Mill Lane, Marshgate Lane, Barley Lane and Barbers Road outside Pudding Mill Lane station. This report will also touch on the underpass on Marshgate Lane.

4.1.2 Figure 2 (above) shows the lighting assessment extents assessed in this report.

4.1.3 This lighting report aims to identify where lighting can be updated to ensure adequate lighting levels are obtained for the area that will see higher pedestrian and vehicular use following the installation of the theatre.

## 4.2 Lighting Standards, Guidelines and Specifications

4.2.1 The street lighting strategy and design for this project are based on the following standards, guidelines, and specifications.

- BS 5489-1:2020 Code of practice for the design of road lighting, Part 1: Lighting of roads and public amenity areas
- BS EN 13201-2:2015 Road lighting Part 2: Performance requirements
- ILP PLG02: 2013 The application of conflict areas on the highway
- ILP GN01;2020 Guidance Notes for the reduction of obtrusive light

## 4.3 Assumptions

- Inventory data was requested from LBN on the 6th of December> PCL were informed on 8th December that there was not information available for this area. LBN have not confirmed the specification of existing lighting assets. To progress this assessment, reasonable assumptions have been made based on our site visit on 21st December 2021.
- PCL have requested existing lighting levels for the project area, however LBN have advised that that these are not available. Accordingly, it was agreed for PCL to model the existing lighting system as best as possible and where necessary propose new lighting classes based on the requirements of the project.
- Existing lighting equipment, models, and manufacturer are assumed. Optics used in the lighting models are WRTL 150W SON-T, Urbis Schreder Axia 2.2 and Philips Luma pedestrian crossing luminaires.
- At time of undertaking the lighting assessment the General Arrangement design is ongoing. Pedestrian crossing and kerb alignments are yet to be finalised.
- Proposed pedestrian design crossing in abeyance. Preferences for localised pedestrian lighting to be confirmed by LBN and can be included the lighting design in future design stages.
- As we were unable to obtain the street lighting inventory from LBN, the authority responsible for the underpass lighting will need to be confirmed. We assume all lighting assets featured in this assessment are under the responsibility of LBN.
- Testing of existing assets is outside of the scope of this assessment. Where it has been suggested that existing assets are in reasonable condition and can be reused, the authority responsible needs to undertake necessary checks and tests to confirm the suitability for reuse.
- LBN have advised that the proposed works associated with the modification to the highway are considered temporary and will be in place for approximately 5 years. For the purposes of this lighting assessment, the concern lighting works are considered as permanent solutions.

- Costs denoted in this assessment for any lighting improvement works, are based on assumed figures. These figures should be checked and confirmed with LBN street lighting contractor and agreed schedule or rates.

#### 4.4 Lighting Class Selection

4.4.1 The project area for study under this assessment concerns different roads which can be viewed and considered differently despite being near each other.

4.4.2 Further to this, the proposed road alignment and nearby amenities must be considered when selecting the proposed lighting classes as things may have changed since the existing lighting system was designed.

4.4.3 Based on our studies of the area, the corridor linking Marshgate Lane, and Barley can be considered as a traffic route (M class). Along this corridor, there are double yellow lines throughout prohibiting parking and an underpass to facilitate free flowing vehicular traffic linking Queen Elizabeth Olympic Park and West Ham's London Stadium to the High Street, A118, and the A12.

4.4.4 Pudding Mill Lane serves Road crucially serves and interfaces important amenities such as:

- Pudding mill Lane DRL station
- ABBA arena
- Snoozebox Olympic Park
- And a proposed outdoor theatre

4.4.5 Further to the above the Olympic Park and West Ham football stadium is located within 0.5 miles from the project area.

4.4.6 Considering the above together with the anticipated increased in pedestrian activities facilitated by the proposed theatre and associated highway improvements, we feel that street lighting within the project area shall conform to lighting classes for town centres.

4.4.7 Current lighting standards BS 5489-1:2020 gives guidance for lighting cities and town centres, which are to be treated differently from other sections of highway because of the high number of pedestrians. This includes but is not limited to;

- Applying more uniform lighting
- Selecting appropriate light colour temperature

4.4.8 To establish the correct lighting levels, Project Centre has selected the lighting class in accordance with BS 5489-1:2020.

4.4.9 In addition to the lighting class selection, it is important to select the correct environmental zone. The project extents fall into the category of zone E3 – Area of medium

district brightness and lighting will generally be provided in accordance with the ILP GN01/2020 Guidance Notes Reduction of Obtrusive Light.

4.4.10 From the BS 5489-1:2020, benchmark lighting classes were derived and are shown in Figure 6 and Table 4. The lighting class risk assessment can be seen in Appendix D.

**Table A.6 — Lighting classes for city and town centres**

Type of traffic	Lighting class			
	Normal traffic flow		High traffic flow	
	E3 <sup>A)</sup>	E4 <sup>A)</sup>	E3 <sup>A)</sup>	E4 <sup>A)</sup>
Pedestrian thoroughfare	P2	P1	P2	P1
Pedestrian only	C4	C3	C3	C2
Mixed vehicle and pedestrian with separate footways	<b>C3</b>	C2	C2	C1
Mixed vehicle and pedestrian on same surface	C2	C1	C1	C1

<sup>A)</sup> Environmental zone, as given in ILP GN01 [N2].

Figure 6 - Table from BS5489-1:2020

Location	Proposed Benchmark Lighting Class	Lux Average	Uniformity (Uo)
Pudding Mill Lane	C3	15	0.40
Marshgate Lane, Marshgate Lane underpass, Barley Lane	M3 (C3 comparable)	15	0.40

Table 4 – Benchmark Lighting Classes

4.4.11 Current lighting standards and guidelines permit authorities to adopt luminaire profiling to enable energy savings, reduce carbon emissions, and to minimise effects to wildlife. Dimming profiles can be discussed during Stage 3 preliminary design when the lighting approach has been confirmed.

4.4.12 Below is a summary of some key items considered in our assessment for this project;

- Expectation is that pedestrian flows will vary throughout hours of darkness due to the operational times and events from nearby amenities
- The project environment has medium ambient lighting.



- The requirement for good facial recognition to create a safer feeling for pedestrians and to assist capturing good quality CCTV images.

## 4.5 Existing Conditions

### 4.5.1 Pudding Mill Lane

4.5.1.1 The existing lighting mainly comprises of 10m high lighting columns fitted with LED lanterns. There is also localised lighting for the 2 pedestrian crossings. The lighting columns are located towards the front of the existing footpath with an approximate setback of 0.8m, which does make some of the columns appear in the middle of the footpath. Power for the existing lighting columns is supplied directly by the local DNO. In general, the existing lighting columns appear to be in reasonable condition.

4.5.1.2 Column spacings on the northern half of Pudding Mill Lane are excessive and as a result, this section would appear dark at night. Pudding Mill Lane would benefit from a new lighting installation.

4.5.1.3 Figure 7 shows an example of one of the 10m columns on Pudding Mill Lane, with an LED lantern and appropriate bracket.

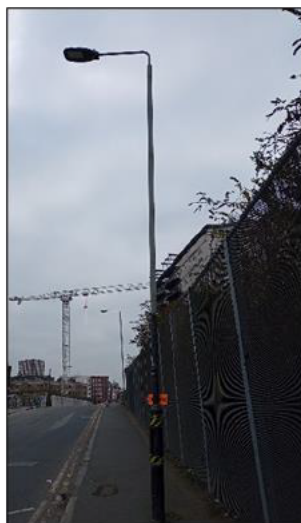


Figure 7 – Lighting column on Pudding Mill Lane

### 4.5.2 Marshgate Lane and Barley Lane

4.5.2.1 The existing lighting comprises of 10m high lighting columns fitted with old High Pressure Sodium lanterns, which give off a warm orange light. These lighting columns are located at the rear of the existing footpath and power is supplied directly by the local DNO. In

general, the existing lighting columns appear to be in reasonable condition. Columns can be seen in Figure 8.

4.5.2.2 Under this project, one potential option for these roads would be to undertake a lantern replacement using new LED luminaires on the existing columns. This will be subject to lighting calculations and structural column tests etc.

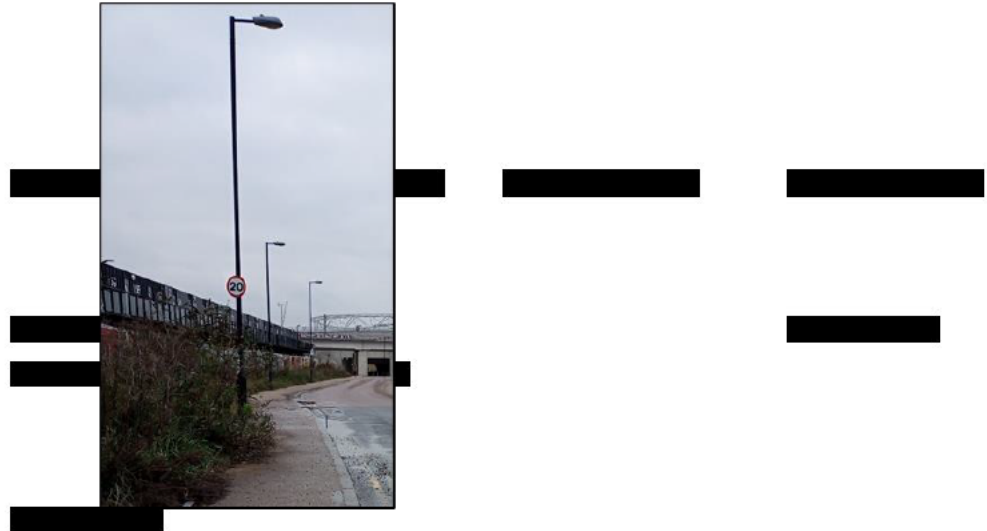


Figure 8 – Marshgate Lane, 10m columns with SON-T lanterns

### **4.5.3 Barbers Road**

4.5.3.1 The existing lighting mainly comprises of 10m high lighting columns fitted with LED lanterns. The lighting on this section appears relatively new however the specification of the luminaries is not known. These lanterns appear to have a 10-degree tilt, however this is assumed.

4.5.3.2 Under this assessment, the existing lighting system on Barbers Road shall remain unchanged.

4.5.3.3 Figure 9 shows a lighting column on Barbers Road outside Pudding Mill Lane DLR station.



Figure 9 – Lighting column outside Pudding Mill Lane DLR station

#### 4.5.4 Underpass on Marshgate Lane

4.5.4.1 As part of the lighting assessment for this project, LBN have requested for PCL to look at the existing lighting within the underpass located on the northern extent of Marshgate Lane.

4.5.4.2 Due to the complexity and time required to model this underpass for a 3D lighting simulation, LBN agreed for PCL to provide commentary on the existing lighting, based on PCL's site visit and visual observations.

4.5.4.3 The underpass on Marshgate Lane is lies beneath the DLR track and is covered for approximately 80m in length, however there is an open section of approximately 10m created between 2 adjacent s

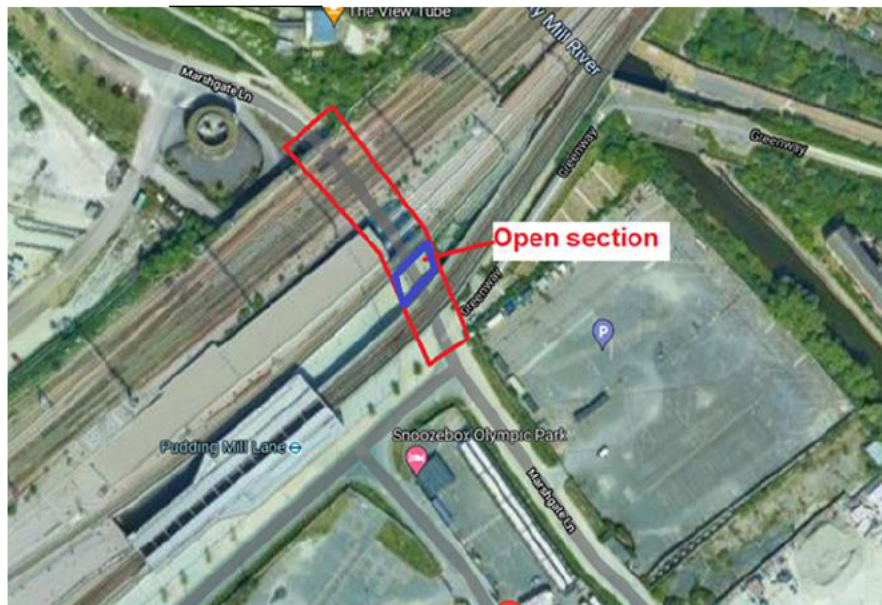


Figure 10 – Marshgate Lane Underpass – Google Satellite Image

4.5.4.4 Marshgate Lane underpass contains a single carriageway and a footpath on the southside of the road. There is a varying level difference up to approximately 2m between the surface of the carriageway and the footpath. To separate pedestrians from the fall to the carriageway, the footpath contains a guardrail that extends throughout the entire length of the underpass.



Figure 11 – Site Photo of Marshgate Lane Underpass – Northern Portal Looking South

4.5.4.5 The covered section of the underpass contains 4no wall mounted LED lanterns with brackets. The luminaires are arranged in an opposite arrangement and are spaced approximately 30m apart.

4.5.4.6 The northern and southern portals, there are existing street lighting columns located approximately 15m and 4m respectively from the covered underpass structure.

4.5.4.7 Due to the road gradient, shape, and size of the underpass structure, with a lighting model, it is not clear exactly how much light from the tie in street lighting columns would contribute to the light levels within the underpass, however we would not expect this to be substantial.



Figure 12 – Sketch of Marshgate Lane Underpass

4.5.4.8 During our site visit on 21st December 2022, we observed significant usage by pedestrian and cyclists and moderate usage of vehicular traffic. The footpath is shared so the physical barrier of the underpass wall and guard rail in combination with some cyclist travelling at speed can be hazardous.

4.5.4.9 Despite the underpass entrance and exit portals being visible from both northern and southern approaches during daylight hours, the underpass feels dark, and dark areas can be observed on both the footpath and on the carriageway. These dark spots make it difficult to view pedestrians and objects within the underpass, from certain viewpoints. It is expecting that this situation will only worsen during hours of darkness.

4.5.4.10 The existing lighting equipment within the underpass comprises of 4No wall mounted LED street lights mounted on brackets with outreach of approximately 0.5m. The LED luminaires, brackets, and wall box have been fitted with pigeon spikes to prevent pigeons and other nuisance birds from landing and roosting on these surfaces. The lighting equipment appears to be in reasonable condition, and the lights appear to be in operation 24/7.

4.5.4.11 We were unable to ascertain the source of power supply to these lights, however steel conduits can be seen extending from 2 of the wall boxes to the footway.

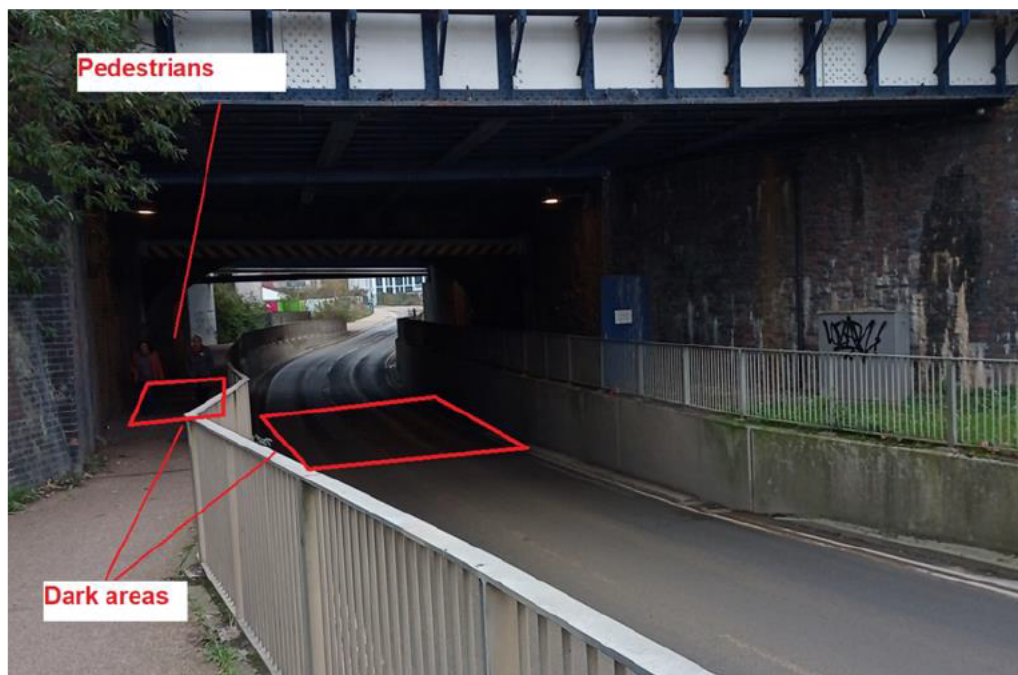


Figure 13 – Photo of Marshgate Lane Indicating Dark Areas

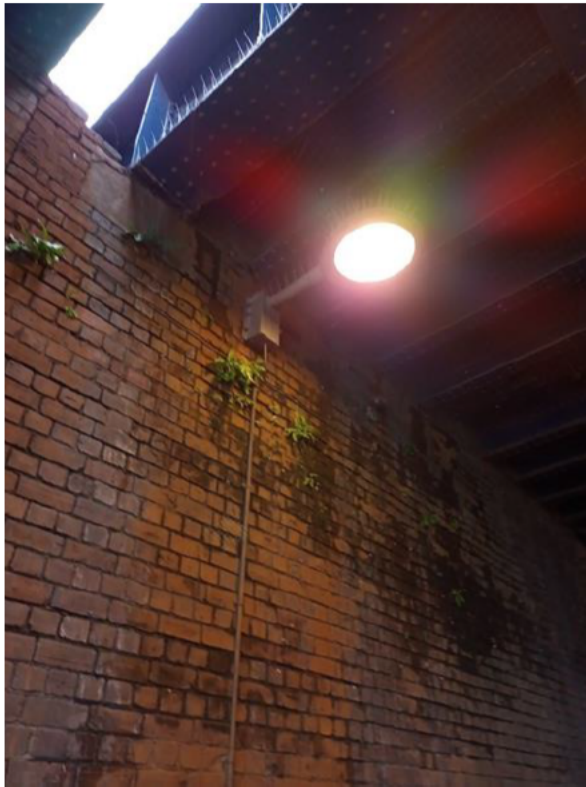


Figure 14 – Photo of Existing Wall Mounted Street Light

4.5.4.12 It must be noted that between the span of the 4 wall lights, the underpass structure contains an arch that passes the footpath and carriageway. From both approaches, the profile of the arch obscures the view of the second row of lights, noting all lights are installed above the lowest point of the arch. Due to this arrangement, we suspect that the arch blocks some of the horizontal light distributed from each wall mounted light. However, this would need to be studied and confirmed using a 3D lighting model.



Figure 15 – Photo highlighting the arch within underpass northern portal looking south



Figure 16 – Photo Highlighting the Arch underpass southern portal looking north

4.5.4.13 Referring to [redacted] 4, we would expect target lighting levels within the underpass to meet the M3 / C3 lighting classification. Based on our observations on site, we suspect that the existing lighting installation does not meet these requirements. This and any measures to improve lighting levels, need to be studied and confirmed using a 3D lighting model.

#### **4.5.5 Marshgate Lane between Pudding Mill Lane and High Street**

4.5.5.1 Although not included with the current project scope, lighting on this section of road appears old and would benefit from a new lighting installation. LBN may consider it beneficial for lighting improvement works on this section to be undertaken as together with improvement works associated with this project. Improvement along this section would help to create a consistent lighting approach and scheme along this corridor.

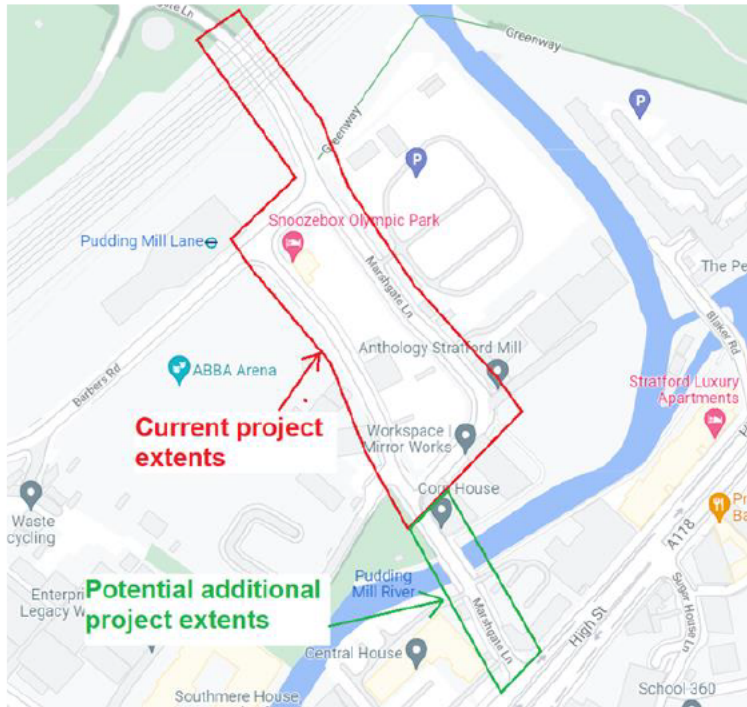


Figure 17 – Image showing the potential extension of the lighting works

#### 4.6. Lighting Summary

4.6.1 Based on our lighting assessment the lighting within the project area should be updated to meet the requirements of a C3 lighting class i.e., 15lux average and 0.4 uniformity. These proposed lighting levels are in line with town centres and cater for the anticipated high usage generated by nearby amenities.

4.6.2 After reviewing our model of the for the existing street lighting, the proposed C3 lighting class is similar to existing lighting levels within the project area – refer to Appendix E. Compared the existing, the proposed C3 lighting class has the advantage of a higher light uniformity requirement, and this is a significant benefit noting nearby amenities.

#### 4.7. Energy Comparison

Noting the assumptions made to undertake this lighting assessment, is it difficult to compare the existing lighting system against the recommendation with a good degree of accuracy.

For this reason, we would advise, that if required, an energy comparison is done when more information is confirmed by LBN and most notably,

- Existing street lighting equipment specification,
- Agreement of proposed street lighting design and specifications, and
- if LBN are to adopt any luminaire profiling in the area e.g., dimming.



#### 4.8 Next Steps

To progress the design further, we request LBN to confirm the following.

- Confirmation that LBN agrees with the recommendations by Project Centre in this lighting assessment or provide comments.
- LBN to confirm on approach for localised lighting on pedestrian crossings noting the proposed C class lighting classification
- If any further lighting study is required for the underpass on Marshgate Lane
- If any further lighting study is required for potentially additional extents on Marshgate Lane

Lane [REDACTED] [REDACTED] [REDACTED] [REDACTED]  
[REDACTED] [REDACTED]  
[REDACTED]  
[REDACTED]

## 5. RECOMMENDATIONS

### 5.1 Traffic and Public Realm Improvements

5.1.1 A comparison of the three different options has been undertaken to summarise how they differ, as shown in 5 below.

Table 5: Option Comparison

	Option B	Option D	Option E
<b>Improves Pedestrian Connectivity</b>	Yes, but no zebra crossing	Yes, but no zebra crossing	Yes, with zebra crossing
<b>Provides Taxi Rank</b>	Yes	Yes	Yes
<b>Footway Widening</b>	Yes, both sides	Yes, both sides	Yes, both sides
<b>Cost Estimate</b>	£185,724	£189,720	£225,720
<b>Recommended Option</b>	Not Recommended	Recommended	Not Recommended

5.1.2 It is recommended that Option D be taken forward as it is consistent with the design requirements and for less cost than Option E. This however is due to no zebra crossing being introduced on Pudding Mill Lane. Option D will also improve the pedestrian area leading up to the arena entrance from the Station and the separated taxi drop off areas, this will help minimise the confusion outside of the venue.

### 5.2 Lighting reviews including cost estimate.

To improve street lighting within the project areas, the following is recommended.

#### 5.2.1 Pudding Mill Lane

- 7No. 10m columns installed at back of footway. Columns spacings approximately 25-30m to match spacings on Marshgate Lane for continuity of the levels throughout the area, uniformity is increased on the road. Proposed locations are subject to access for the proposed theatre on the west side of Pudding Mill Lane.
- Lighting columns were not proposed on the eastern side of Pudding Mill Lane due to the uncertainty of the Snoozebox development accesses and footway widths
- The existing 8m column at junction with Barber Road to be replaced with a 10m column to be consistent with the other columns in the area.

**5.2.2 Marshgate Lane and Barley Lane**

- Replace 9No. High Pressure Sodium lanterns with LED lanterns to the same specification as the lighting on Barbers Road and Pudding Mill Lane. Existing columns and brackets to remain.

**5.2.3 Barbers Road**

- Barber Lane to be remain as existing, from visual inspection the lighting columns and lanterns appear to be in new condition.

**5.2.4 Marshgate Lane between Pudding Mill Lane and High Street**

- This area is not within in the scope of the lighting assessment however, it is advised to update the lanterns to LED and renew the lighting columns that are in poor condition.

**5.3 Indicative Cost of Lighting Works**

**5.3.1 Pudding Mill Lane**

Item	Cost per unit (£)	Total Item Cost (£)
2No. 8m columns taken up to store	250	500
4No. 10m columns taken up to tip	250	1000
6No. lanterns removed to store	200	1200
7No. new 10m lighting columns	1000	7000
7No. new LED lanterns	600	4200
4No. New DNO connections	1200	4800
3No. DNO transfer	1000	3000
<b>TOTAL COST OF WORKS</b>		<b>£21,700</b>

[REDACTED]

[REDACTED]

[REDACTED]

**APPENDIX A: PREVIOUS SOLUTIONS**

[REDACTED]

## Option 1

Option 1 consists of converting both Marshgate Lane and Pudding Mill Lane to one direction as shown in Drawing 1000007892-2-9001. Vehicles would be able to travel south down Marshgate Lane and north up Pudding Mill Lane, effectively forming a one-way loop. The proposed width of the carriageway would be 3.5 metres on Pudding Mill Lane and the carriageway would remain as existing on Marshgate Lane.

Vehicle tracking has been undertaken with an articulated vehicle to ensure that the design can accommodate suitable vehicles. The tracking shows that an articulated vehicle can enter the temporary theatre site on Barbers Road and exit left onto Pudding Mill Lane and navigate the Pudding Mill Lane / Barber Road junction.

## Footway Widening

The proposed carriageway width reduction creates opportunity for significant footway widening. It is proposed that the footway be widened to:

- Pudding Mill Lane eastern footway widened from 0.8m to 2.6m
- Pudding Mill Lane western footway widened from 1.5m to 3.0m
- Marshgate Lane footways to remain as existing

## Pudding Mill Lane / Barbers Road Junction

The Pudding Mill Lane/Barbers Road junction is being narrowed on the Pudding Mill Lane approach to reduce speed of turning vehicles. It also will create a shorter crossing distance for pedestrians. This junction is proposed to be raised on the Pudding Mill Lane approach with tactile paving to improve pedestrian facility.

## Barbers Road / Marshgate Lane Junction

The Barbers Road / Marshgate Lane junction will remain as existing with respect to carriageway widths. The southern portion of Marshgate Lane will be converted to southbound only.

## Pudding Mill Lane / Marshgate Lane Junction

The Pudding Mill Lane/ Marshgate Lane junction is being narrowed on the Pudding Mill Lane arm. This will reduce speed of turning vehicles. It also will create a shorter crossing distance for pedestrians. This junction is proposed to be raised on the Pudding Mill Lane arm with tactile paving to improve pedestrian facility. A planter is also proposed on the western side of the carriageway to discourage and decrease the speed of HGVs using the route.

The conversion of Pudding Mill Lane and Barley Lane to one-way will reduce vehicle conflict points and improve vehicle visibility as no vehicles will be exiting Pudding Mill Lane.

### **Pedestrian Crossing Locations**

The existing crossing on Marshgate Lane is to be upgraded to a parallel crossing to allow both cyclists and pedestrians to cross. The crossing is not proposed as a raised crossing as there is only an approximate 50mm upstand between the existing footway and carriageway. Therefore, to raise the crossing, extensive footways work would also be required to raise the footway.

A new parallel crossing has been proposed ten meters from the Barbers Road/Marshgate Lane junction on Barbers Road. This will allow cyclists and pedestrians to cross and gain access to Pudding Mill Lane DLR Station. This crossing has not been proposed as a raised crossing as there is a raised table proposed 50m west of the crossing which will slow vehicle speeds.

The footway between the two crossings has been proposed as shared use as the proposals now have sufficient width for both cyclists and pedestrians to use. Shared footway is also being proposed between the Greenway on Marshgate Lane to the crossing on Marshgate Lane. This will provide an alternative route for cyclists coming to / from the Greenway Ramp.

The existing crossing on Pudding Mill Lane will be removed as its location is not along a pedestrian desire line. Rather, a raised table is proposed on the Pudding Mill Lane approach of the Pudding Mill Lane / Barbers Road junction and the Pudding Mill Lane approach of the Pudding Mill Lane / Marshgate Lane junction. This will provide more pedestrian facility along the pedestrian desire line.

Low Level Planting has been proposed on the North Side of Barbers Road/Marshgate Lane Junction. These have been proposed to prevent pedestrians and cyclists crossing over from the Greenway in an unsafe manner. The existing dropped kerb at this location is also to be removed to encourage pedestrians to use controlled crossings.

### **Additional Public Realm Improvements**

Low level planters have also been proposed throughout the scheme with the majority of them being at junctions. Cycle parking has also been proposed on junctions close to Pudding Mill Lane DLR station and throughout the scheme.

### **Cost Estimate**

The cost of the works on Pudding Mill Lane are estimated to cost £121,272 including a 20% contingency.

The cost of the additional works on Marshgate Lane and Barbers Road are estimated to cost £72,660 including a 20% contingency. Therefore, all works would cost a total of £193,932.

All cost estimates exclude street lighting works.

### **Option 2**

Option 2 consists of converting Pudding Mill Lane to one-way northbound and retaining Marshgate Lane as two-ways as shown in Drawing 1000007892-2-9002. Pudding Mill Lane

would have a 3.5m wide carriageway. The carriageway on Marshgate Lane would remain as existing.

Vehicle tracking has been undertaken with an articulated vehicle to ensure that the design can accommodate suitable vehicles. The tracking shows that an articulated vehicle can enter the temporary theatre site on Barbers Road and exit left onto Pudding Mill Lane and navigate the Pudding Mill Lane / Barber Road junction.

### **Footway Widening**

The proposed carriageway width reduction creates opportunity for significant footway widening. It is proposed that the following footway widening on Pudding Mill Lane is proposed to:

- Pudding Mill Lane eastern footway widened from 0.8m to 2.6m
- Pudding Mill Lane western footway widened from 1.5m to 3.0m
- Marshgate Lane footways to remain as existing

### **Pudding Mill Lane / Barbers Road Junction**

The Pudding Mill Lane/Barbers Road junction would be modified consistent with Option 1.

### **Barbers Road / Marshgate Lane Junction**

The Barbers Road / Marshgate Lane junction would remain as existing.

### **Pudding Mill Lane / Marshgate Lane Junction**

The Pudding Mill Lane/ Marshgate Lane junction is being narrowed on the Pudding Mill Lane arm. This will reduce speed of turning vehicles. It also will create shorter crossing distances for pedestrians. This junction is proposed to be raised on the Pudding Mill Lane arm with tactile paving to provide more pedestrian facility.

The conversion of Pudding Mill Lane to one-way will reduce vehicle conflict points and improve vehicle visibility as no vehicles will be exiting Pudding Mill Lane.

### **Pedestrian Crossing Locations**

Consistent with the modifications in Option 1, the following changes will be made to crossing locations:

- Upgrade of the existing Marshgate Lane crossing to a parallel crossing
- A new parallel crossing on Barbers Road
- Shared footways between the crossings on Barbers Road and Marshgate Lane
- Removal of the existing crossing on Pudding Mill Lane
- Low level planting and the removal of existing dropped kerbs, to encourage pedestrians and cyclists to cross safely

### **Additional Public Realm Improvements**

Low level planters and cycle parking would be provided consistent with Option 1.

### **Cost Estimates**

The cost of the works on Pudding Mill Lane are estimated to cost £121,272 including a 20% contingency.

The cost of the additional works on Marshgate Lane and Barbers Road are estimated to cost £65,400 including a 20% contingency. Therefore, all works would cost a total of £186,672.

All cost estimates exclude street lighting works.

### **Option 3**

Option 3 has been revised based on discussions with the client. This includes the proposed changes to crossings on Barbers Road and Marshgate Lane due to the cost of implementing these.

Option 3 consists of changing Pudding Mill Lane to one-way northbound and re-aligning Marshgate Lane as two-way shown in drawing 000007892-3-010-01. This is consistent with Option 2, except for the retention of the existing crossing location on Pudding Mill Lane.

Vehicle tracking has been undertaken with an articulated vehicle to ensure that the design can accommodate suitable vehicles. The tracking shows that an articulated vehicle can enter the temporary theatre site on Barbers Road and left exit onto Pudding Mill Lane and navigate the Pudding Mill Lane / Barber Road junction.

### **Footway Widening**

The footway widening would be modified consistent with Option 2.

### **Pudding Mill Lane / Barbers Road Junction**

The Pudding Mill Lane/Barbers Road junction would be modified consistent with Options 1 and 2.

### **Barbers Road / Marshgate Lane Junction**

The Pudding Mill Lane/Marshgate Lane junction would remain as existing.

### **Pudding Mill Lane / Marshgate Lane Junction**

The Pudding Mill Lane/Marshgate Lane junction would be modified consistent with Option 2.

### **Pedestrian Crossing Locations**

The existing zebra crossing location on Pudding Mill Lane would be maintained but the crossing distance would be narrowed to 3.5m. Given the short crossing distance and that the crossing is not located on a pedestrian desire line, it is unlikely that this crossing would have significant benefit.

No additional pedestrian crossings are proposed.



### Vehicle Drop Offs

A 34m long and 2m wide vehicle drop off bay has been proposed on the north-eastern corner of Pudding Mill Lane. This would enable coaches, taxis and private hire vehicles to conduct drop offs without restricting through traffic on Pudding Mill Lane. This location has been chosen as it does not require the existing zebra crossing on Pudding Mill Lane to be relocated. The relocation of this zebra crossing would be cost prohibitive.

The location of this drop off bay retains a 2m wide pedestrian footway at its most narrow point.

### Additional Public Realm Improvements

Low level planters and cycle parking would be provided consistent with Options 1 and 2.

### Cost Estimates

The cost of the works on Pudding Mill Lane are estimated to cost £121,272 including a 20% contingency.

No additional works are proposed on Marshgate Lane or Barbers Road.

All cost estimates exclude street lighting works.

[REDACTED]

[REDACTED]  
[REDACTED]

[REDACTED]

## APPENDIX B: CONCEPT DESIGNS

[REDACTED]

[REDACTED]  
[REDACTED]

[REDACTED]  
**APPENDIX C: VEHICLE TRACKING**

[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

[REDACTED]  
**APPENDIX D: LIGHTING CLASS RISK ASSESSMENTS**

██████████	██████████	██████████	██████████
██████████			██████████
██████████	██████████		

██████████  
**APPENDIX E – EXISTING LIGHTING CALCULATION**

[REDACTED]

[REDACTED] [REDACTED] [REDACTED] [REDACTED]

[REDACTED] [REDACTED] [REDACTED]

[REDACTED]

[REDACTED]  
**APPENDIX F – PROPOSED LIGHTING CALCULATIONS**



**APPENDIX G – LIGHTING SITE CLEARANCE**



**APPENDIX H – PROPOSED LIGHTING LAYOUT**



## Quality

It is the policy of Project Centre to supply services that meet or exceed our clients' expectations of quality and service. To this end, the company's quality management system (QMS) has been structured to encompass all aspects of the company's activities including such areas as sales, design and client service.

By adopting our QMS on all aspects of the company, Project Centre aims to achieve the following objectives:

- Ensure a clear understanding of customer requirements.
- Ensure projects are completed to programme and within budget.
- Improve productivity by having consistent procedures.
- Increase flexibility of staff systems through the adoption of a common approach to staff appraisal and training.
- Continually improve the standard of service we provide internally and externally.
- Achieve continuous and appropriate improvement in all aspects of the company.

Our quality management manual is supported by detailed operational documentation. These relate to codes of practice, technical specifications, work instructions, Key performance indicators, and other relevant documentation to form a working set of documents governing the required work practices throughout the company.

All employees are trained to understand and discharge their individual responsibilities to ensure the effective operation of the quality management system.



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