

Hilsea Lines

Transport Consultancy Study



0



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Section 1

Introduction

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INTRODUCTION

Introduction

Hilsea Lines is Portsea Island's largest greenspace, situated on the island's northern edge. It is an area of historical and environmental significance (PCC,2023). However, it is somewhat severed from the city of Portsmouth, bordered by busy roads and an industrial estate. Access to the site for sustainable and active travel modes is difficult, with infrastructure bordering the site designed to prioritise motor vehicles at the expense of other modes.

In 2021, Portsmouth City Council (PCC) published the Portsmouth Transport Strategy (LTP4), seeking to redress the balance between different transport users and promote sustainable travel options for all in the context of climate change and poor air quality in the city (PCC,2021). The area around Hilsea Lines provides an opportunity to do just this, connecting residents to local greenspace to improve health, wellbeing and air quality through sustainable travel options, in line with the Strategy's ambitions.

The western side of Hilsea Lines has high potential for active travel access from local residential areas, and bus access from further away. However, it is blighted by London Road, a six-lane A-road that severs the west of Portsmouth from Hilsea Lines. High volumes of fast moving traffic cause air and noise pollution, damaging the experience of visiting Hilsea Lines. These are the types of transport issues that the LTP4 seeks to address.

This report contributes towards this. It firstly provides an assessment of the present conditions to the west of Hilsea Lines and the challenges and opportunities for improving access by sustainable modes. It then outlines a number of short-term solutions to present issues, before setting out three long-term design packages that seek to transform the area and support the implementation of the LTP4. The study concludes with a project appraisal, assessing and selecting the design package that best suits Portsmouth's strategic context, namely the ambitions of the LTP4.



INTRODUCTION

Project Scope

This project centers around Hilsea Lines, forming part of a wider initiative by PCC to improve access to greenspace. PCC has commissioned Sustrans to investigate how access to Hilsea Lines can be improved, engaging community stakeholders and developing inclusive solutions for Hilsea Lines and its surrounding areas to create a continuous, holistic greenspace. The commission incorporates the following objectives:

- Improve greenspace access and connectivity to northern and southern communities,
- Be inclusive of surrounding residents,
- Incorporate a variety of different activities and opportunities for users,
- Highlight the area's history and biodiversity,
- Do the above in a timely and cost-effective manner.

This project focuses on London Road and the western entrance to Hilsea Lines. In addition to addressing the objectives above, solutions will tackle the following:

- Reduce severance and blight induced by London Road,
- Improve western access to Hilsea Lines,
- Improve long distance and public transport connections to the green-space,
- Enhance green infrastructure.



INTRODUCTION

Portsmouth Context

PCC has ambitions to improve the quality of city spaces for communities and economic prosperity. The council has facilitated a project called 'Imagine Portsmouth', tasked with creating the city's vision for 2040 (Imagine Portsmouth, 2023).

Imagine Portsmouth collaborated with communities, local organizations, and businesses to create an inclusive vision, shown in Figure 1.

The city wants to emphasize its existing assets, highlighting Hilsea Lines as one of these - a natural greenspace and heritage site. PCC state "*Hilsea Lines are of low quality although highly valued by the local community*" thus there is consequent "*scope at these spaces to improve their quality and accessibility to encourage more people to use them [...] for day-to-day recreation*" (PCC, 2012:35).

Further, PCC published the Portsmouth Transport Strategy (LTP4) in 2021. The Strategy seeks to promote sustainable and active travel modes within the city to improve air and noise quality, road safety and health and wellbeing, whilst reducing carbon emissions.





History of Hilsea

Portsmouth is an historic city, located on Portsea Island in the south of England. It is renowned for its rich maritime heritage and port. One of Portsmouth's most famous landmarks is its Historic Dockyard, housing several historic ships and showcasing the city's naval history. Portsmouth also houses several historic fortifications, including Southsea Castle and Hilsea Lines to the North.

Hilsea Lines is an historic defensive fortification, featuring ramparts, bastions and ditches built in the 19th century to protect the city from invasion. The Lines were equipped with gun batteries, used to protect the area from enemy ships. During World War II, Hilsea Lines played an important role in defending Portsmouth. The area was heavily fortified and used as a base for anti-aircraft guns and searchlights. The Lines were also used for training British troops.

Today, Hilsea Lines is a linear greenspace with the potential to attract visitors to Portsmouth to explore the area's history (PCC, 2023). The space is a designated nature reserve, housing a variety of wildlife. Visitors can explore the earthworks, enjoy the surrounding views, and visit local businesses (PCC, 2023).



Figure 2: 1756 Map of Hilsea Lines (Source: Portsmouth City Council 2009)

INTRODUCTION

Report Overview

This report contains eight sections. The following provides an overview of each section.

Section 2 - Study Area:

This section provides the project's geographical context. It outlines the site's location, physical characteristics, and other relevant details.

Section 3 - Baseline Assessment:

This section assesses the site's current limitations and opportunities.

Section 4 - Vision:

The vision outlines the project's strategic framework and objectives that guide the project.

Section 5 - Quick Wins:

This section outlines achievable 12-month interventions to improve the site's quality. These interventions address the most pressing issues identified in the baseline assessment.

Section 6 - Proposals:

This section outlines three long-term design packages to redevelop the site, in line with the project's aims.

Section 7 - Appraisal:

This section uses multi-criteria analysis to assess each proposal and determine which of the three design packages is the best strategic fit for Portsmouth.

Section 8 - Conclusion:

The conclusion summarises the study's findings and recommends future actions.

Overall, this report provides a detailed analysis of the study area and proposes solutions to improve its accessibility and vitality, in line with PCC's strategic priorities.



Section 2

Study Area

9 ____Focus Area

10 ____Site Elements



STUDY AREA

Focus Area

The study area (shown in figure 3) is situated adjacent to the M27 and west of Hilsea Lines and shown in Figure 3. It is primarily a residential area and home to Hilsea Lido, a recently restored outdoor swimming pool.

The area is served by several bus routes, including connections to Portsmouth city centre. It is also situated near to Hilsea railway station, providing public transport options for residents and visitors. The area houses schools including Portsmouth Grammar School. However, access to greenspace is limited, and quality infrastructure for pedestrians and cyclists is lacking. Addressing these issues is crucial to improving the quality of life for residents and meeting the objectives of the Portsmouth Transport Strategy.

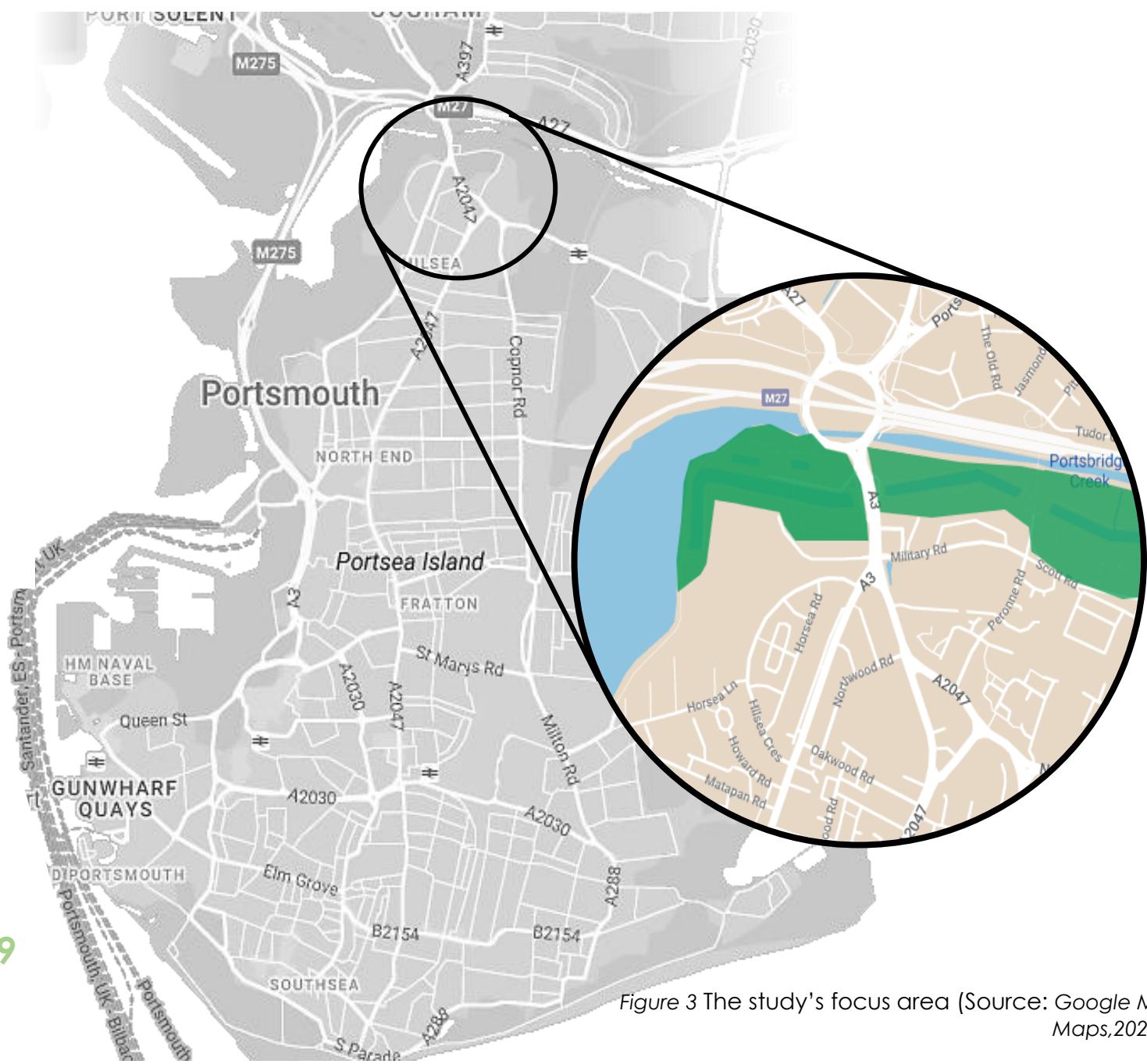


Figure 3 The study's focus area (Source: Google My Maps, 2023)

STUDY AREA

Site Elements

London Road features six motor vehicle traffic lanes and a northbound bus lane. Two additional lanes have been designated as overspill parking areas for the bus stations on London Road. Two further lanes serve as bus stops.

To the west of London Road lies Hilsea Lido, which has undergone recent regeneration including the installation of wayfinding signs, benches, and levelled pathways along the Hilsea Shore Path. Regeneration also introduced leisure facilities including a splash pool and playground, creating a popular destination for local families and residents.

Hilsea Lines sits east of London Road. The area suffers from uneven pathways that become muddy and slippery during adverse weather. There is a lack of signage and wayfinding, making it difficult for visitors to navigate the area. Additionally, the absence of lighting raises safety concerns for visitors in the evening and winter.

Although both Hilsea Lido and Hilsea Lines provide outdoor recreational opportunities, the two green spaces are disconnected, separated by London Road which causes severance between the two.

North of London Road is Portsbridge Roundabout, an interchange with significant traffic flow and multiple onward connections. It links Portsea Island with Cosham via the A27 and A397 to the north, and to the M27 and A27 to the west, facilitating intercity travel by road.

At the southern end of London Road, a junction divides it into the A3 and A2047, leading southwest and south through the city centre towards the coastline. There is an existing blue footbridge, with a width of 1.7 meters and a gradient of 9 degrees, that provides the only pedestrian connection over the junction. A large concrete bridge, with a width of 1.7m and a gradient of 7 degrees, connects Hilsea Lines and Lido at the centre of London Road. Both bridges are limited by their steep gradients, narrowness and right angled turns that make them unsuitable for wheelchair access.

Section 3

Baseline Assessment

- 12 ____ Barriers
- 13 ____ Demographics
- ? ____ Road safety
- 16 ____ Traffic Conflicts
- 17 ____ Traffic Analysis
- 18 ____ Vulnerable Groups



BASELINE ASSESSMENT

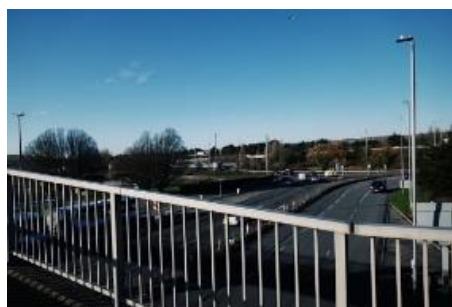
Barriers

A site visit was conducted on 19 January 2023. It found the area to contain numerous infrastructure barriers for specific users. These prevent and reduce access to the greenspaces in both Hilsea Lines and Lido, limiting connectivity to the site and impacting the effectiveness of the Hilsea Lido bus stop. These barriers are shown in Figure 4 and include the following:

- High traffic speeds and a 10-lane width makes London Road difficult to cross.
- The concrete bridge is narrow, steep, susceptible to noise and air pollution, and is perceived as unsafe regarding personal security and adverse weather.
- The blue bridge has similar issues and can only be accessed via stairs, excluding cyclists, wheelchair users and pushchairs.
- Non-motorised transport infrastructure is limited and, where it does exist, pedestrians and cyclists are not segregated, potentially causing conflict (DfT,2020).
- Bus stops lack clear navigation information and are in disrepair.



A: London Road: 6-10 lanes, 30mph



B: Roundabout intersection: 50mph



C: Non-segregated walkway



D: Cluttered Pavement



E: Narrow, windy grey bridge



F: No NMT crossing at intersections



G: Low usability of bridge



H: Steps on blue bridge



I: Unappealing bus stop

BASELINE ASSESSMENT

Demographics

Analysis of the study area's demography has informed the study's proposed interventions. Figure 5 and Table 1 describe the site's demographic characteristics. Whilst the demographic analysis of the area reveals important insights for our intervention strategies. Figure 5 and Table 1 shows who the site serves. While there are similarities in the proportion of women, elderly, children, and immigrants is fairly consistent across all six sub-areas, distinct characteristics are present within each sub-area.

For instance, Area 1 has budget-conscious population living in mixed-use terraced 2 has a relatively low level of disability. 3 has a higher proportion of public transport and bicycle , and 4 comprises cosmopolitan families with a median house price, making car ownership more likely. 5 stands out as the most vulnerable area, with a high level of disability, 52% unemployment rate, and a significant proportion of single households and vulnerable pensioners. Half of residents do not own a car, on public transport and



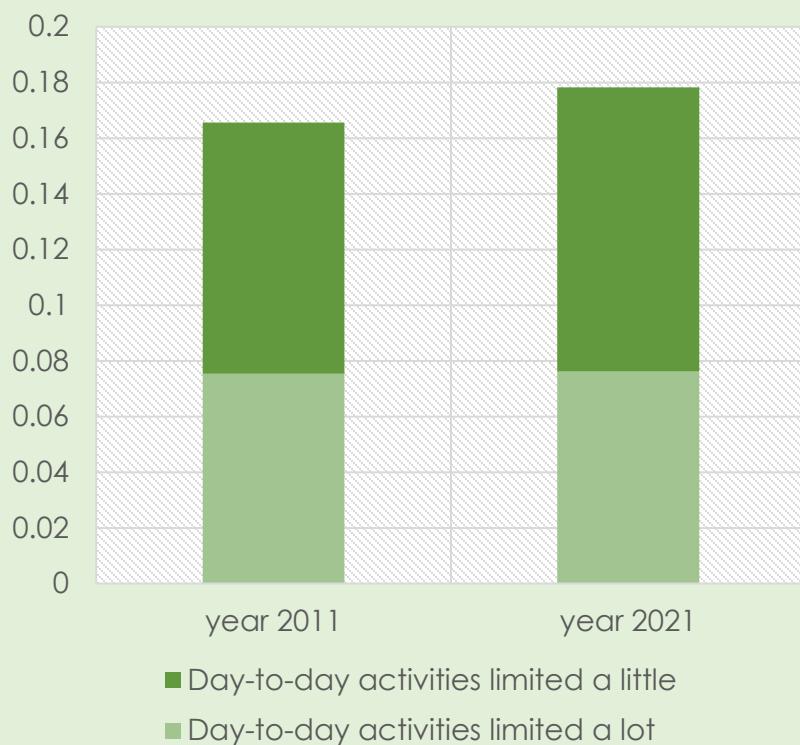
Figure 5: Demographics by Area Group, data from CDRC MapMaker, 2011& Datashine, 2011

BASELINE ASSESSMENT

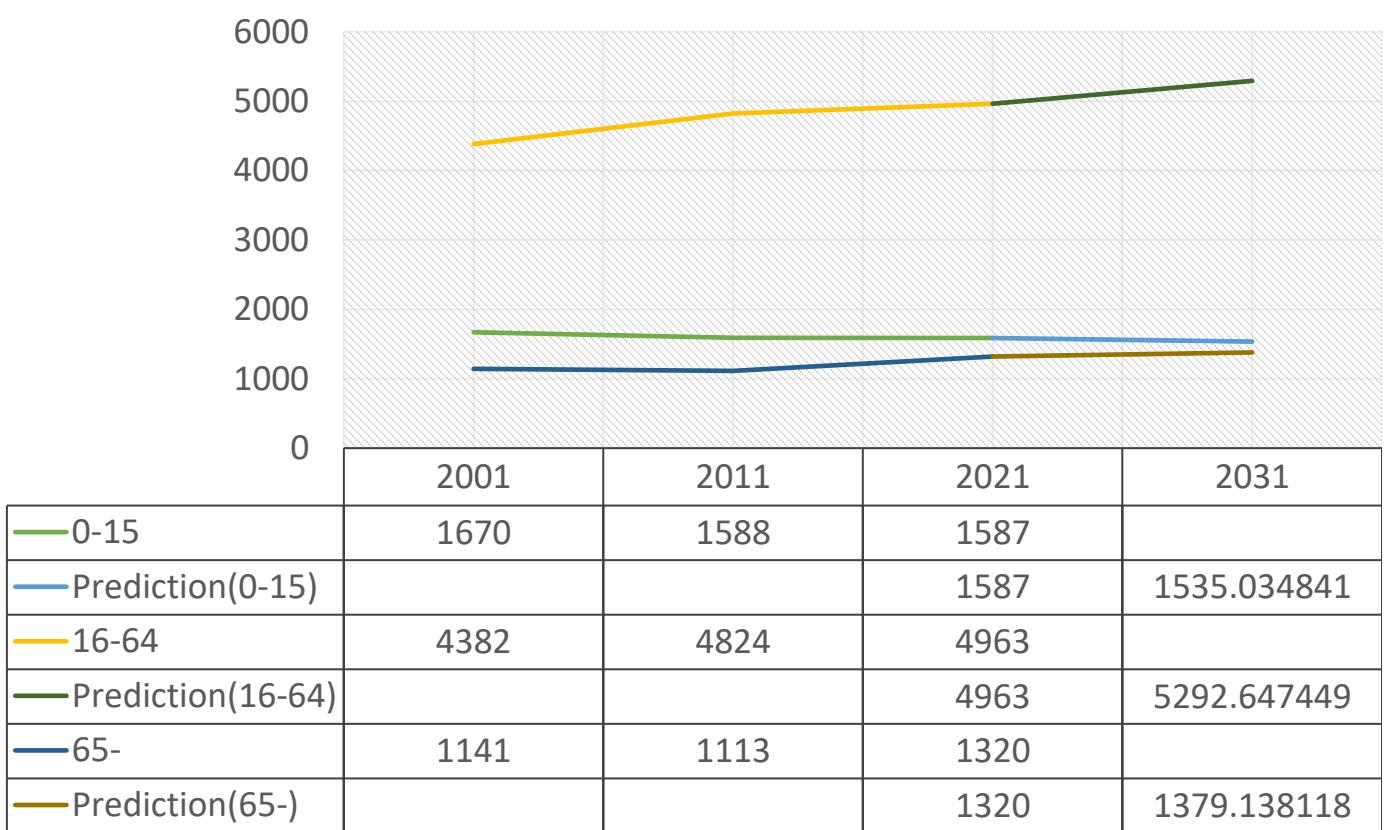
Table 1 Demographics by Area Group (data from CDRC MapMaker, 2011 & Datashine, 2011)

Demographics	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6
Gender	48-54% women	54-94% women	48-54% women	47-54% women	54-94% women	47-50% women
Age	19% children, 12% elderly	19% children, 12% elderly	Approx 19% children, 12% elderly	Approx 19% children, 12% elderly	Approx 19% children, 12% elderly	Approx 19% children, 12% elderly
Immigrants	16% immigrants	16% immigrants	16% immigrants	16% immigrants	16% immigrants	16% immigrants
Other Features	40% no employment, Terraced mixed use, stable household, People on a budget	Medium-low levels of disability, Terraced mixed use, stable household	Highest area of bus use to work 11% and bicycle 7%, Largest number of young children 9%	Cosmopolitan family	Highest level of disability, 50% users do not have car, 52% no employment, Disadvantaged single household, Largest number of elderly people, Vulnerable Pensioner	None

BASELINE ASSESSMENT



In addition to the existing demographic data, a demographic analysis of the population along Hilsea Lines based on age and disability have been conducted, as shown in Figure 6 and Figure 7. It is notable that the elderly population is expected to increase in 2031 and the proportion of disability is also on the rise. Therefore, in the further analysis, there should be a certain degree of focus on considering the needs of the elderly and disabled population. The data suggests that special attention should be given to the requirements of the elderly and the disabled while planning for interventions along the Hilsea Lines to make it more inclusive and accessible for all members of the community.



BASELINE ASSESSMENT

Road Safety

As Figure 8 shows, the frequency of collisions on London Road has been increasing, aside from 2019 and during the covid pandemic, where travel was reduced. Measures such as traffic calming, segregated cycle lanes, pedestrian crossings, and speed reductions could improve road safety. A multi-faceted approach can create a safer and more inclusive environment for all road users.

The southern junction of London Road is a collision hotspot. Accidents involving cyclists are frequent, illustrated in Figure 9. The absence of any signalized, at-grade crossings at the junction (depicted in Figure 10) greatly contributes towards this. To address this, interventions must improve the safety of cyclists at this location. This will also improve perceived safety, encourage more cycling.

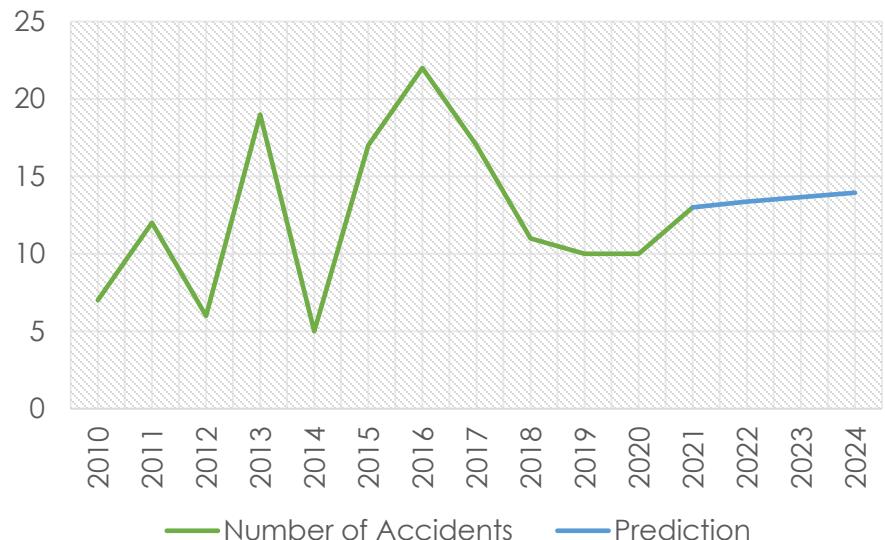


Figure 8 Statistics and Forecast of Accidents on London Road (data from Crashmap)

BASELINE ASSESSMENT



(Top) Figure 9 Cycle casualties at the southern junction, 2017-2021 (Source: Crashmap, 2023)
(Bottom) Figure 10 The southern junction (Source: Google Maps, 2023)

BASELINE ASSESSMENT

Traffic Analysis

This study aims to resolve severance and blight on London Road between Portsbridge Roundabout and the Parade Court Junction. The road is composed of three lanes per direction, two lanes of bus parking, and two lanes of bus stops. Site visit observations took place on Thursday, 19 January 2023, around 3PM, revealing low traffic flows, suggesting the road is operating below-capacity. The road's average annual daily flow for the year 2021 is 41,499 motorised vehicles (DfT,2021a). According to TfL (n.d.), roadway efficiency can be assessed by dividing the average annual daily flow by the carriageway width. For the London Road datapoint, the carriageway width is 33 meters. This puts the ratio of average annual daily flow to width at 1,257 vehicles/day/metre, falling at the lower end of the spectrum in terms of carriageway width efficiency (TfL,n.a.). It can be concluded that the road is operating below capacity.

The road network around the study area was also examined (Figure 11). Analysis reveals an intensive motorway network circulating around the north of Portsmouth. The necessity for a motor-intensive roadway on the A3 is questioned by this reality, particularly as it transects the study area's residential areas, causing severance and blight.

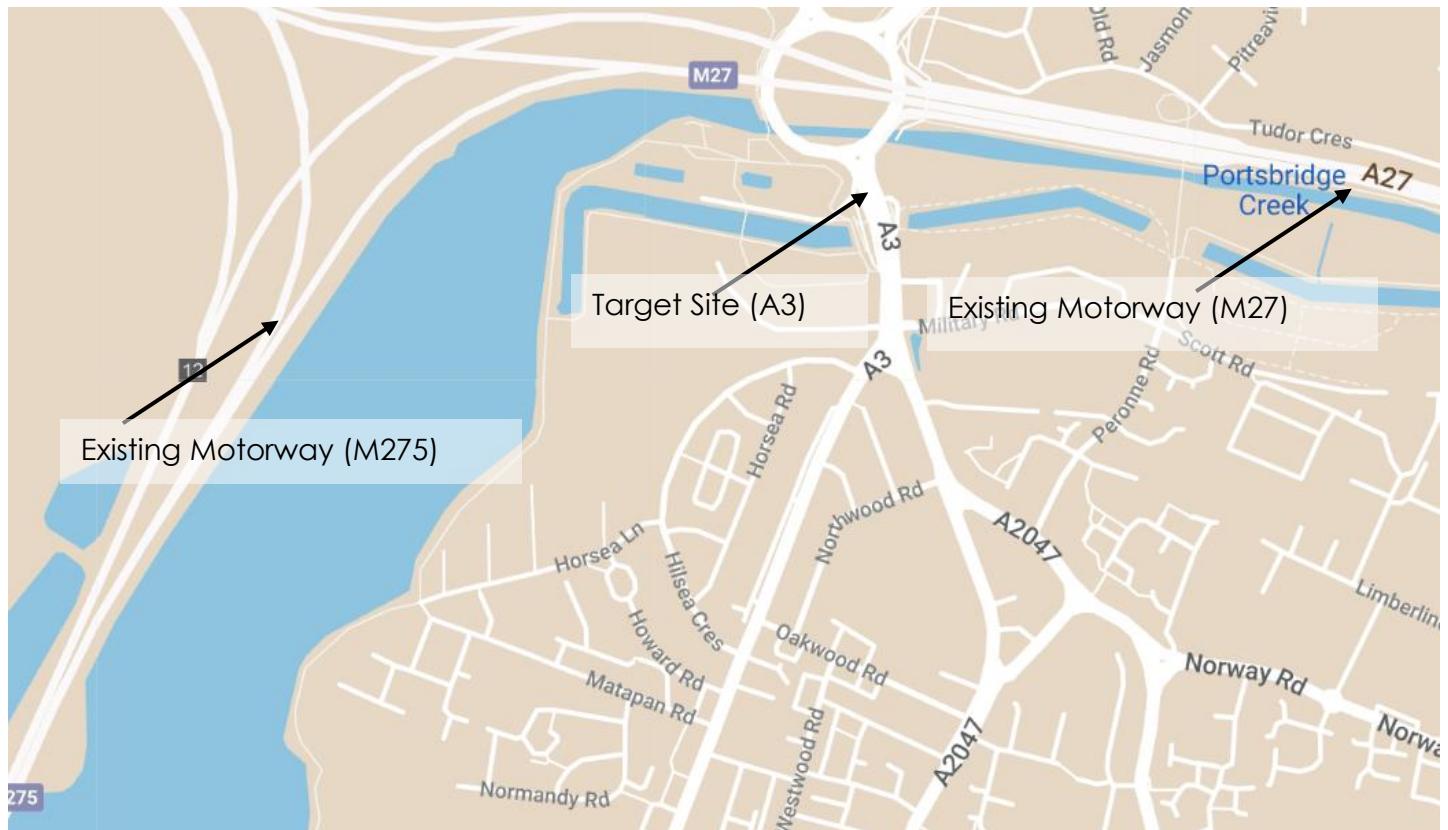


Figure 11 Road Layout Around Target Site (from Google Maps)

BASELINE ASSESSMENT

Vulnerable Groups

Attempt was made to view the area from the perspective of different demographic and user groups (Table 2). Socio-demographic groups are based on Kuttler and Moraglio (2021), whose work centres on mobility poverty. Analysis considered the needs of vision, hearing and mobility impaired users. It analysed the perspectives of the elderly and children and considered experiences of women and low-income users. It also considered the needs of bus users, pedestrians, cyclists, and motorists.

The barriers considered were drawn from the preceding analysis. Barriers were categorised as spatial, temporal, and financial. Spatial barriers are obstacles to mobility caused by built environments. These include noisy, steep, and stair-only pedestrian routes, poor bus stop facilities, fast traffic on London Road, and poor bus connectivity. Temporal barriers involve seasonal, time-of-day, and bus timetabling obstacles. Financial barriers consider the impacts of historic investment in car-centric initiatives, as well as the impacts of mobility constraints on different groups regarding health, safety, comfort, and wellbeing.

In populating Table 2, the analysis views the identified barriers from the perspectives of different groups, ranking the severity of barriers using a Likert Scale - 1 representing the least severe, 5 the most. This exercise revealed that visually impaired groups currently experience the most disadvantage (scoring 41 out of 45), followed by mobility impaired users (scoring 40), then bus users and pedestrians (38). Hearing-impaired groups scored 37, and the elderly, children, and cyclists all scored 36. Car-users scored 3, indicating that present conditions favour them the most.

This analysis helped to establish the study's target groups, revealing which groups suffered from limited access and thus needed to be the focus of proposed interventions.

However, this analysis is limited in that it overlooks intersecting social identities and disadvantages. For instance, it does not consider the perspectives of women who are mobility impaired. It is also based on the authors' speculation as to how barriers are experienced by different groups due to a limited capacity to conduct community engagement.

BASELINE ASSESSMENT

Table 2 Impacts of Barriers on Different Sociodemographic and User Groups

	Feature	Spatial Barriers				Temporal Barriers			Financial Barriers		Total of 45
		Pedestrian Bridges	Bus Stop	Road	Bus Services	Seasonal	Time of day	Bus Services	Historic investment / policy focus	Externalities	
		Noisy, steep, stairs	Poor facilities	Fast, Car-centric	Poor connectivity	Exposure to wind, rain	Poor Lighting	Poor Timetabling Info	Car-centric	time, safety, comfort	
Sociodemographic Groups (based on Kuttler and Moraglio, 2021)	Visually Impaired	5	5	5	4	4	5	5	3	5	41
	Difficulty hearing	3	5	4	4	4	4	5	3	5	37
	Mobility Impaired	5	5	4	5	4	4	5	3	5	40
	Parents (single)	3	3	5	3	4	4	3	3	4	32
	Elderly	5	4	4	4	4	5	3	3	4	36
	Children , youth	1	4	5	4	4	5	3	5	5	36
	Women	4	4	2	3	3	5	5	2	3	31
	Low income	2	3	4	4	4	4	4	4	5	34
	Bus users	3	4	3	5	5	4	5	5	4	38
	Pedestrians	3	3	5	4	5	5	3	5	5	38
Mobility Groups	Cyclists	4	3	5	1	5	5	3	5	5	36
	Car users	0	0	0	0	0	3	0	0	0	3

Section 4

Vision

22 Policy Review

23 Vision Statement



VISION

Policy Review

This section outlines the project's vision and explains how it was formed. The Vision Statement has been used to guide the project at all stages, providing a strategic framework that ensures proposals are aligned with PCC's strategic priorities.

The vision was formulated following a policy review of local policies relevant to transport and placemaking, as well as consideration of the project brief. The following policies were considered:

- Portsmouth Transport Strategy, 2021-2038
- Portsmouth Local Cycling and Walking Infrastructure Plan (LCWIP), 2020-2030
- 'A city to share' published by Portsmouth Cycling Campaign, adopted by Portsmouth City Council
- Economic Development and Regeneration Strategy
- Tourism and Visitor Economy Strategy
- PCC Corporate Strategy
- Social, Emotional and Mental Health Strategy
- Imagine Portsmouth 2040
- Draft new Portsmouth Local Plan
- Portsmouth Air Quality Strategy, 2017-2027

The policy review revealed key themes present within PCC's strategic aims. Developing a Vision Statement consistent with these themes ensures that this project will align with PCC's priorities. Figure 13 outlines the key themes that form the basis of the Vision Statement.



VISION

Vision Statement

The below Vision Statement incorporates these key themes, ensuring they are central to the project's themes. The proposals presented within this report are consistent with this vision, and thus the council's priorities.

Clean air

Universal accessibility

Sustainable transport

Thriving local businesses

Health and wellbeing

Access to green spaces

Figure 13: Key themes extracted by the policy review.

Our vision is:

"To create a thriving, liveable area where local culture, businesses, nature and clean air are accessible to all, and mental and physical health and wellbeing are improved through access to green infrastructure and sustainable travel options."



Figure 14: Examples of policies reviewed

Section 5

Quick Wins

- 25 Map of Interventions
- 27 Severance
- 28 Bus stop
- 30 Greenway
- 32 Long Distance Connections



QUICK WINS

Map of Interventions

Short-term solutions for the study area, as shown in Figure 15), cover four main themes: reducing severance created by London Road, improving the bus stops on London Road, developing Hilsea Lines as a continuous greenway, and improving connectivity to surrounding areas. The short-term proposals seek to create a more accessible and attractive environment whilst promoting sustainable travel modes.

Photographs taken by Author



QUICK WINS

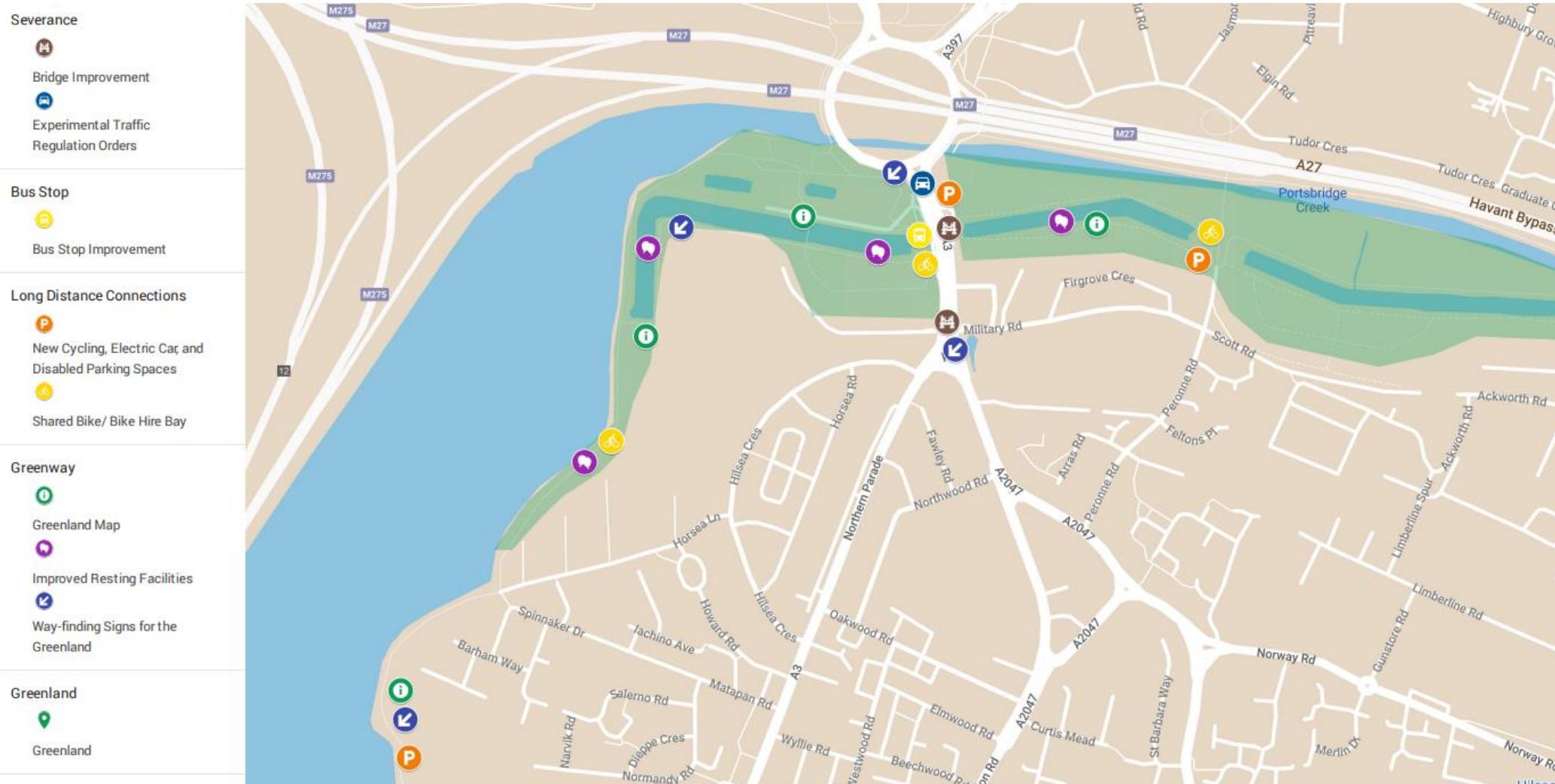


Figure 15 Map showing the short-term interventions (Source: Author's own)

QUICK WINS

Severance

These proposals aim to decrease severance caused by London Road, focusing on the two existing bridge crossings by improving aesthetics, accessibility, and comfort.

The concrete bridge has a width of 1.7 meters; just above the absolute minimum of 1.5 meters (DfT,2021b). Therefore, vertical greenery, similar to the Sarajevo Bridge in Barcelona (Figure 16) is recommended.¹⁶ The bridge gradient is currently at the maximum permissible, at 12.5/20, and can be made more accessible by installing two-level railings and tactile paving (DfT,2021b). Solar-powered lighting is proposed to improve temporal access (Figure 17). Provision of sheltering and weather protection is recommended to overcome seasonal barriers in the form of a steel mesh dome, similar to Figure 18.

The blue bridge's step-only access is hugely inaccessible to all but the able-bodied. Tactile paving and handrails at two different levels are recommended, as well as improved lighting. This does not solve accessibility issues, which will be addressed in the long-term proposals.

Short-term improvements to London Road can mitigate against severance and the car-dominated environment. The road currently has guardrail in the center, which prioritises cars above pedestrians by limiting the ability to cross. Removal of the guardrail is proposed which will also help to calm traffic. A reduction in London Road's speed limit is proposed to improve road safety and address severance, noise and air pollution, implemented through an Experimental Traffic Regulation Order. This is a precursor to future long-term proposals including roadway width reductions.



(Top) Figure 16 - Sarajevo Bridge, Barcelona (Archello by BCQ Architectura Barcelona, 2023)

(Middle) Figure 17 Solar-powered bridge, Beijing (The Chicago Athenaeum Museum of Architecture and Design, 2019)

(Bottom) Figure 18 Steel Mesh Dome, Manchester (UK Government, 2016)

QUICK WINS

Bus Stop

A key feature of the study area is the Hilsea Lido bus stop. The bus stop consists of four stops and four bus lanes. Its location at the northern tip of Portsmouth, on one of only three access roads into the, renders it a potential transport hub with the stop including multiple stands. However, the site is not being used to its full potential, with few users observed during the site visit. The stop includes several access barriers as discussed in the baseline assessment. These include dilapidated shelters, perceived unsafety, limited wheelchair access and unclear wayfinding.

Short term upgrades can mitigate against these barriers. These proposals aim to improve accessibility and comfort for bus stop users and to promote additional use of the stop, increasing sustainable travel and visitors to Hilsea Lines. This is achievable with new bus shelters incorporating the following features:

- Modern and open structure to provide welcoming atmosphere,
- Addition of plants and a bee garden on the roof of the stops (as in Figure 18 to link with the surrounding green space and to counter some of the air pollution caused by London Road,

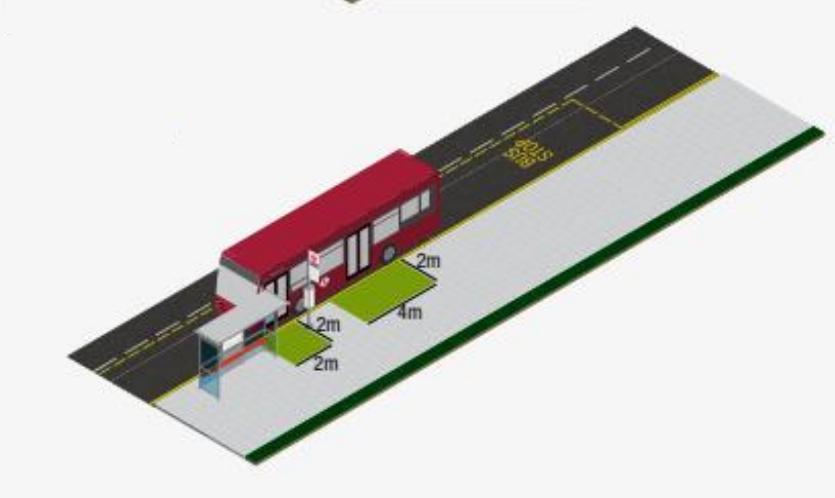
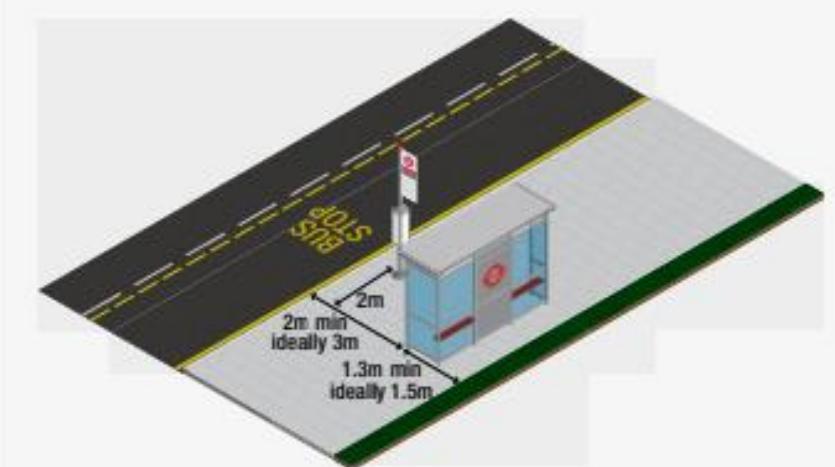


(Top) Figure 19 Example of green bus stop in Amsterdam, Netherlands (Haigh, 2021)

(Middle) Figure 20 Example of 'Buzz stop' in Leicester, UK (Carey, 2021)

(Bottom) Figure 21 Example of improved lighting in UK (E&T, 2019)

QUICK WINS



- Solar panels, ensuring the site's sustainability
- Disability friendly shelters, as in Figure 23.
- Space for alighting, as in Figure 24.
- Improve navigability of the stops through providing real time information boards, route maps and clearly numbered stops, also using braille and audio features for universal accessibility.
- Provide cycle parking to improve last-mile connections and promote active travel.
- Additional lighting to improve perceived personal safety.

These proposals align with the project's vision, improving access for all users. However, these interventions are only short-term solutions, installable within 12 months. This limits their ability to address all present constraints, particularly issues that require infrastructure alterations like increased pavement space and cycle lanes.

(Top) Figure 22 Example of RTI board in Utrecht, Netherlands (photo by Author)

(Middle) Figure 23 Accessible bus shelter (TfL, 2017, pp 21)

(Bottom) Figure 24 Accessible alighting area (TfL, 2017, pp 22)

QUICK WINS

Greenway

The Greenway component intends to make Hilsea Lines more accessible to cyclists, pedestrians and families by extending the greenspace of Hilsea Lines onto local active travel routes, incentivizing travel to the site via active modes. The Greenway extends Hilsea Lines, forming a coherent, interesting, and distinct active travel corridor to Hilsea Lines from the southern residential areas. Figure 25 provides a map of the Greenway.



Figure 25 The proposed Hilsea Lines Greenway created by Cara Richmond

The Greenway's key features upgrade existing facilities on the Hilsea Shore Path. Consequently, implementation is achievable within 12 months no new infrastructure is required.

The proposed upgrades are:

- Improved wayfinding on the Hilsea Shore Path, directing users to Hilsea Lines and other local destinations coherently and accessibly (including braille wayfinding).
- Signposting to the Greenway in the local area, encouraging more sustainable local journeys to Hilsea Lines, via the Greenway.
- Providing a painted line to segregate cyclists and pedestrians along the route, allowing bi-directional travel for both groups, to make the Greenway LTN 1/20 compliant (DfT,2020),

QUICK WINS

ensuring that conflict between users is minimised and vulnerable users are protected from collisions. This increases safety and accessibility to Hilsea Lines. Figure 26 depicts a similar segregated urban greenway.

- An activity trail for families, culminating at Hilsea Lines. The trail acts as a treasure hunt to spot local flora and fauna, providing information and challenges to families at spaced intervals along the Greenway. A similar trail is shown in figures 27 and 28.

Overall, the Greenway will improve access to Hilsea Lines for cyclists, pedestrians, and families, encouraging increased active travel. The activity trail provides a fun, inexpensive experience for families, enabling physical activity and providing entertainment for the study area's economically-disadvantaged families, identified in the baseline assessment.

By coherently signposting both the location of the Greenway and Hilsea Lines, access to Hilsea Lines and its greenspaces is improved, in line with the project's vision.

The Greenway is complimented by measures to improve longer distance connections to Hilsea Lines (set out on the following page), namely bike sharing. This enables families unable to afford a bicycle to enjoy the Greenway and activity trail, accessing physical activity and greenspace to improve health and wellbeing (Nguyen et al,2021).



(Top)Figure 26 Segregated urban greenway, New Malden to Kingston, London (Source: Sustrans, 201

(Bottom two) Figure 27 and 28 Kids activity trails in Wendover Woods, Buckinghamshire (Free Time With the Kids, 2023).

QUICK WINS

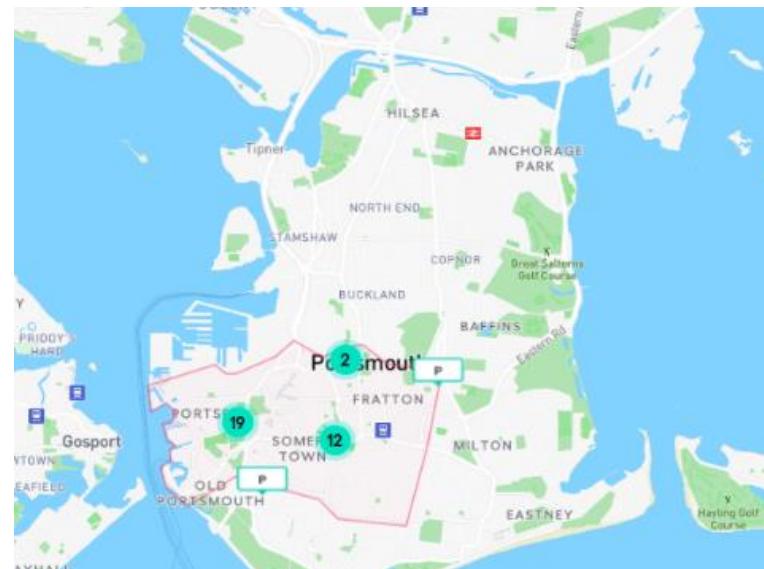
Long Distance Connections

The final short-term proposals improve sustainable longer-distance connections to the area. By improving connectivity and providing more convenient transport options, greater levels of walking, cycling and bus use are incentivized. This will reduce reliance on private cars, increasing sustainable travel, and reducing congestion, noise and air pollution in the study area. This enhances quality of life, health and wellbeing, and promotes connectivity between Portsmouth city centre and its suburbs, facilitating the growth of the city's economy and tourism industry.

The Portsmouth LCWIP (PCC,2022) states that 64% of journeys within Portsmouth are below 10km, showcasing the potential for cycling to replace trips currently made by cars. To facilitate increased cycling the implementation of a bike-sharing scheme is proposed for the study area. Figure 29 shows Portsmouth's existing "Beryl Bikes by Breeze" scheme, concentrated in the city centre. It is proposed that this scheme be extended to the study area, increasing cycling connectivity between Hilsea and the city centre, bringing increased visitors to Hilsea.

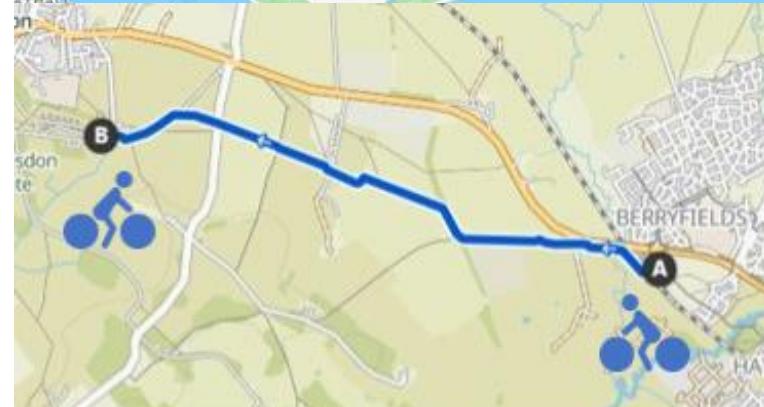
Beryl Bays

P 35



Beryl Bikes

98



Beryl e-Bikes

61



(Top) Figure 29 "Beryl Bikes by Breeze" in Portsmouth (Portsmouth Beryl, 2023)

(Middle) Figure 30 B-Bike scheme in Buckinghamshire (Getting here – Waddesdon Manor, 2023)

(Bottom) Figure 31 Experimental Segregated Cycle Lane Using Wands in Dorset (Dorset Council, 2021)

QUICK WINS

The proposed bike sharing scheme will offer bikes and e-bikes for hire at both ends of the greenway, similar to the successful B-Bike scheme implemented by Sustrans in Buckinghamshire (Figure 31), encouraging increased physical activity and modal shift.

To further support longer-distance travel by sustainable modes, the parking facilities at the coastal entrance, car parks and bus stops will be upgraded to provide cycle, cargo bike and disabled parking spaces. The existing parking space to the north of London Road will be redesigned to into four different zones, depicted in Figure 32. One notable limitation of these proposals is the resources and cost required to administrate them, particularly the bike-sharing scheme.

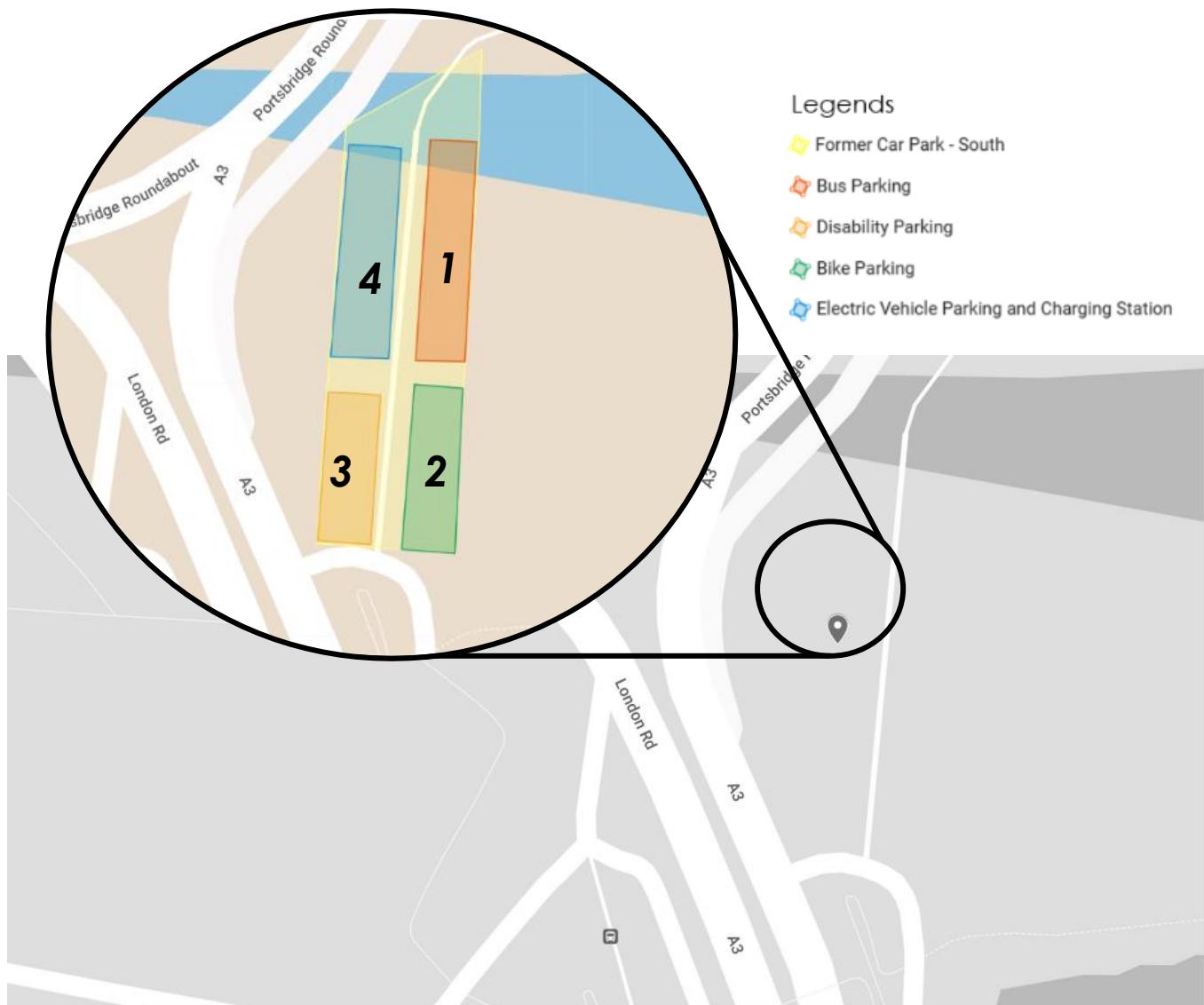


Figure 32 Re-design of the Portsbridge Car Park – South (drawn by author)

Section 6

Proposals

35 __ Fixed components

38 __ Package 1

42 __ Package 2

46 __ Package 3



PROPOSAL

This section outlines the longer-term proposals for the study area. Three design packages are presented as well as a set of fixed components uniform across all packages.

Fixed components

Core components are proposed for the study area. These interventions feature within all three long-term design packages to address access barriers to the site identified in the baseline assessment, in line with the project's vision.

The first fixed component is removing the bus parking spaces at the London Road bus stops. Subject to feasibility, buses will be moved to the existing Military Road depot. This creates new space, utilized differently in each design.

In addition to upgraded parking facilities identified in the longer-distance connections quick-wins, electric vehicle charging and parking will be added including for cars and e-bikes, consistent with the Portsmouth Transport Strategy's commitments.

Pedestrian accessibility upgrades, through implementing dropped curbs and tactile paving at all side road junctions within the study area, is proposed. This improves accessibility across the area and to Hilsea Lines for those with visual and mobility impairments, addressing network issues identified in the Portsmouth LCWIP.



Figure 33 (left) and 34 (right) The current blue bridge over London Road (Source: Author's own)

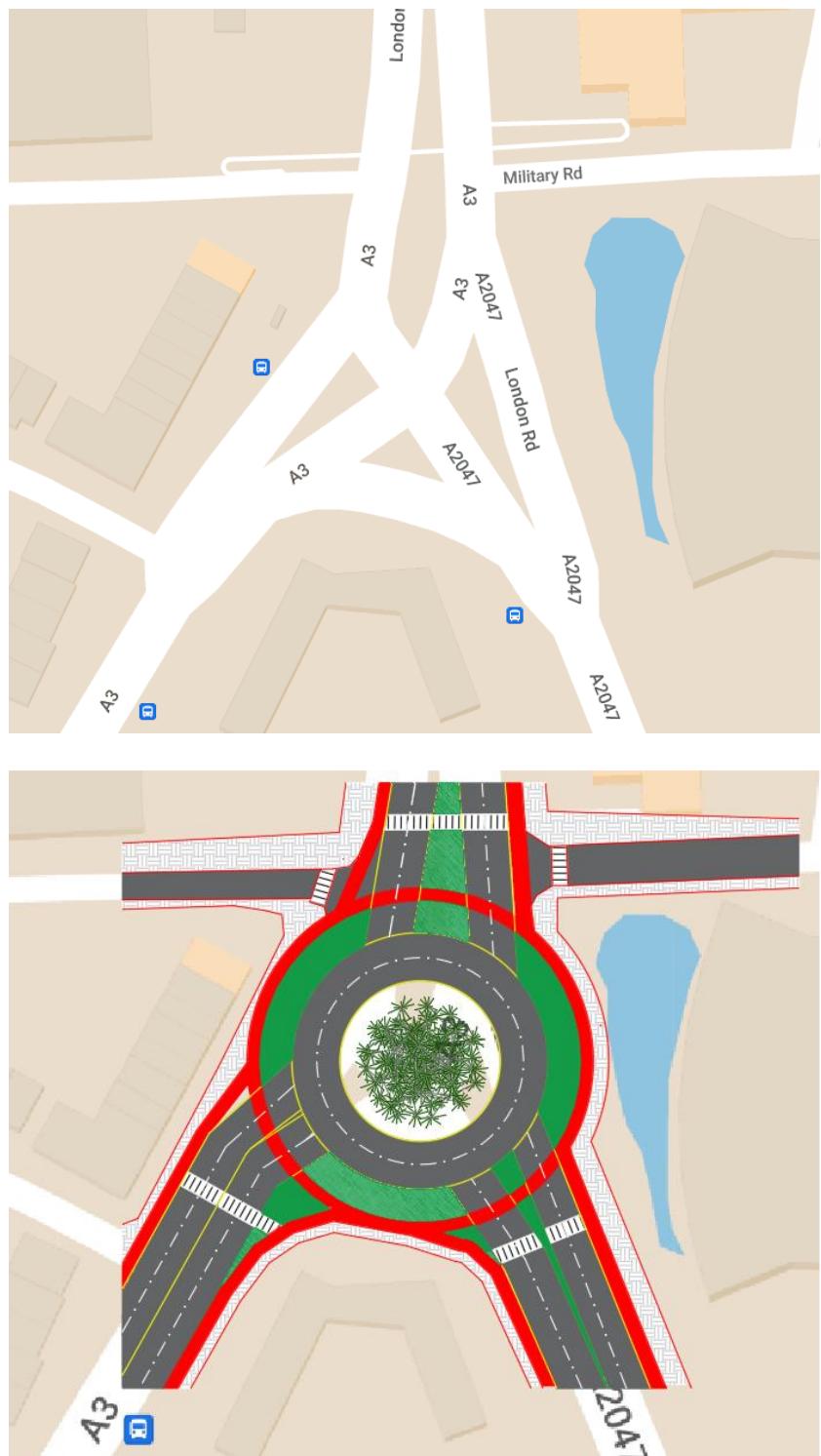
The present blue bridge (Figure 33 and 34) over London Road, at the junction with Military Road, is not LTN 1/20 compliant (DfT, 2020) – it is accessible only by stairs, of steep gradient, and features sharp, right-angle turns. It is accessible to only able-bodied individuals able to carry bikes and pushchairs up the steps and excludes wheelchair users completely causing severance disproportionately affecting vulnerable users. Consequently, each design proposes removing the bridge.

To replace it, reconfiguring the London Road, A3 and A2047 junction - immediately south of the bridge's location (Figure 35) - as a Dutch-style roundabout is proposed.

PROPOSAL

Dutch-style roundabouts implement a user hierarchy based on vulnerability, prioritizing pedestrians, cyclists, and lastly cars to reduce severance, promote sustainable modes and increase road safety (Bent, 2021). Cambridge provides an example of a successful Dutch-style roundabout (Figure 37).

The junction redesign is presented in Figure 36. Accompanied by tactile paving, dropped kerbs, zebra crossings on each arm, and segregated cycle lanes, the new roundabout creates a safe, accessible active travel route across the study area, connecting currently severed local communities and vulnerable groups to Hilsea Lines and promoting active travel. The design introduces sustainable urban drainage and new green infrastructure through a rain garden on the roundabout's center.



(Top) Figure 35:) The current London Road, A3 and A2047 junction (source: GoogleMyMaps, 2023).

(Middle) Figure 36: The proposed Dutch-style roundabout at the London Road, A3 and A2047 junction. (Source: Author's own)

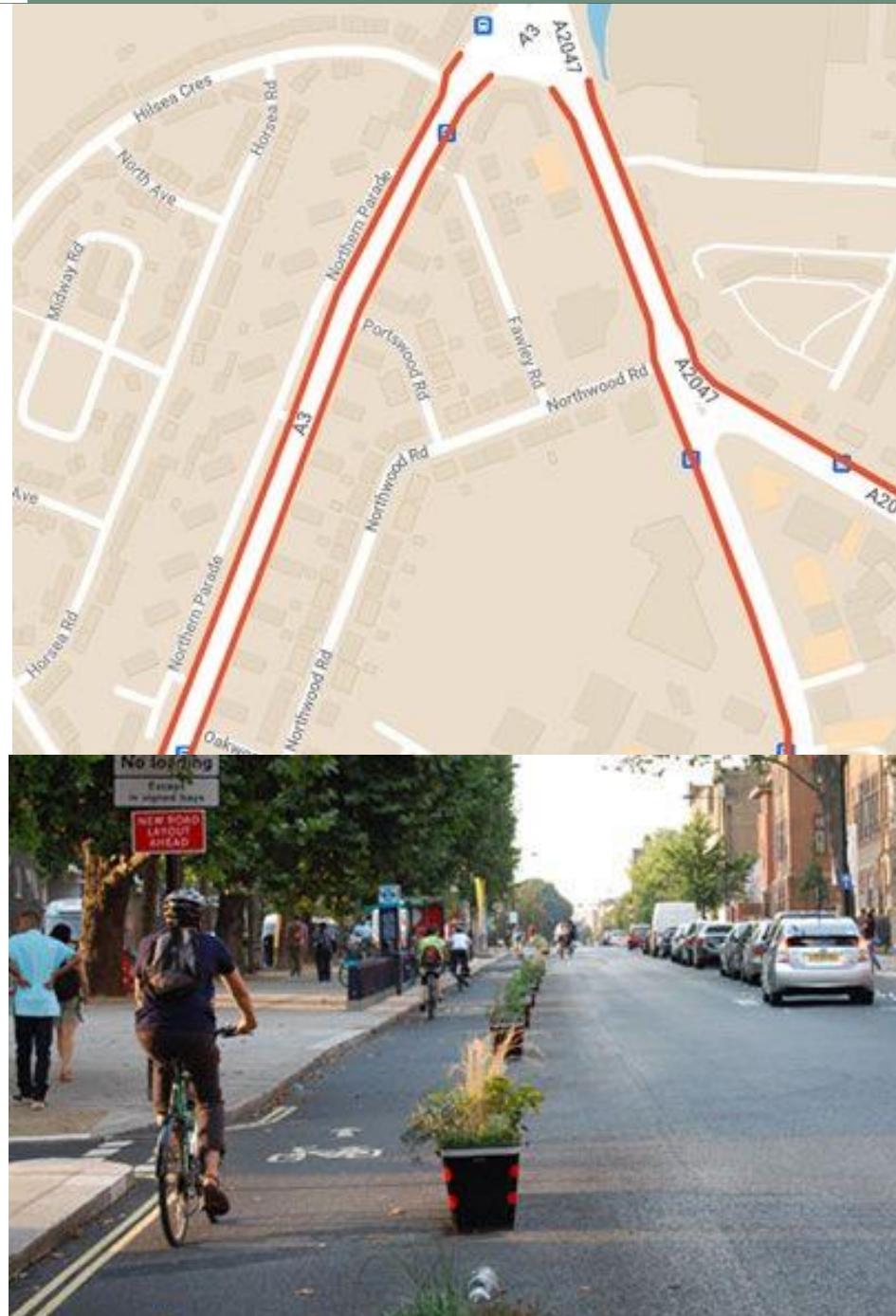
(Left): Figure 37 A Dutch-style roundabout in Cambridge, England (source: Harris, 2020)

PROPOSAL

To compliment this, segregated cycle lanes in both directions on the A3 and A2047 are proposed (Figure 38). This creates a fast, safe and convenient cycle route, connecting local residential areas to the roundabout and Hilsea Lines beyond. This will greatly improve cycling access to Hilsea Lines, facilitating more sustainable journeys.

The cycle lanes are fully LTN 1/20 compliant (DfT, 2020), implemented by the removing parking spaces and enforcing segregation through planters (like those from Camden, London, in Figure 39). The planters act to extend the Hilsea Lines greenspace, creating distinct, coherent new green infrastructure. The route features clear wayfinding to Hilsea Lines and signposting to the Greenway (implemented through the quick wins). Service roads parallel to the A3 absorb demand from lost parking.

The following pages present the three long-term designs.

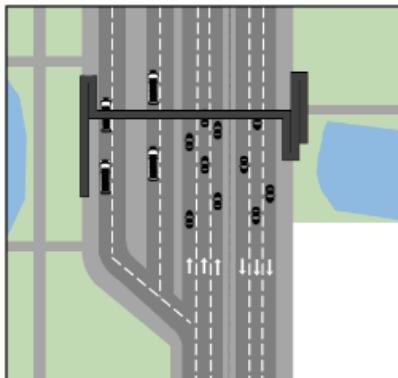


(Top) Figure 38 Proposed cycle lanes on the A3 and A2047. Source: Author's own.

(Bottom) Figure 39 A segregated cycle lane enforced by planters in Camden, London. (Source: Laker, 2013).



① Green Continuity



This package seeks to solve the problem of discontinuity between Hilsea Lines and Lido, introducing a new bridge and gardens, considered a "Park in the Sky". It enables an experience uninterrupted by London Road, aligned with the project's vision to provide universal access to nature and fresh air. It contributes towards Portsmouth Transport Strategy's Policy I, improving cycling, walking, and public transport at London Road (PPC,2021). Moreover, the bridge's design specifically addresses the issue of insufficient width for cyclists and pedestrians identified in Portsmouth's LCWIP (PCC,2022). Figure 40 compares Package 1 and the business-as-usual scenario is illustrated in Figure 41.

The proposed design aims to improve pedestrian and cycling infrastructure, while enhancing public transport services. This is achieved through reducing the roadway to 2 lanes per direction and removing the median guardrail, creating additional space for footway widening and implementing cycle parking and lanes.

Figure 40 BAU compared with Package 1

1 Green Continuity

The Bus Interchange is equipped with a shelter area, covering 1000 square metres, and a facilities area spanning 370 square metres, providing a tourist information desk, toilets, café, and real-time passenger information. These designs offer a sustainable, accessible solution to improving transport infrastructure, ensuring improved quality of life for residents and visitors.



(Left) Figure 41 Front View of the NCTU Bus Stop in Taiwan, China (Designboom, 2020)

(Middle) Figure 42 Side View of the NCTU Bus Stop in Taiwan, China (Designboom, 2020)

(Right) Figure 43 Solar Panels on Roof of Bus Stops in Kuala Lumpur, Malaysia (GWS Living Art, 2019)

The green shelter roof draws inspiration from the NCTU bus stop in Taiwan, China, displayed in Figure 41 and 42. This design inspired inclusion of planks of varying heights, allowing people to climb and sit for shade, rest, and social interaction.

The bridge features solar panels to power the station's lighting, such as those in Figure 43, aligning with the design's sustainable vision and one example of it comes from the bus stop in Malaysia, as shown in Figure 44. Therefore, the design will prioritize promoting sustainable energy, contributing to increasing Hilsea Lines' overall sustainability. The design showcases how urban planning can incorporate sustainable practices to create user-friendly and accessible parks.

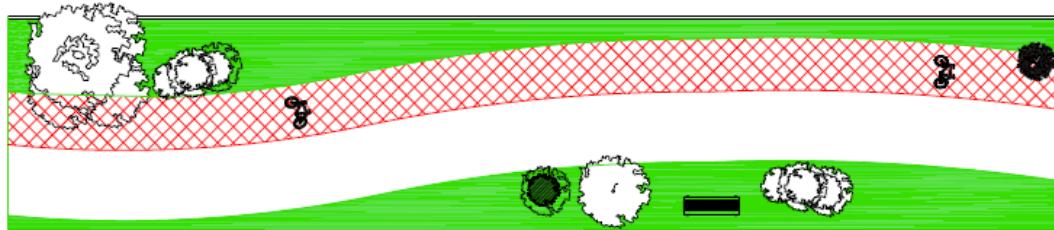
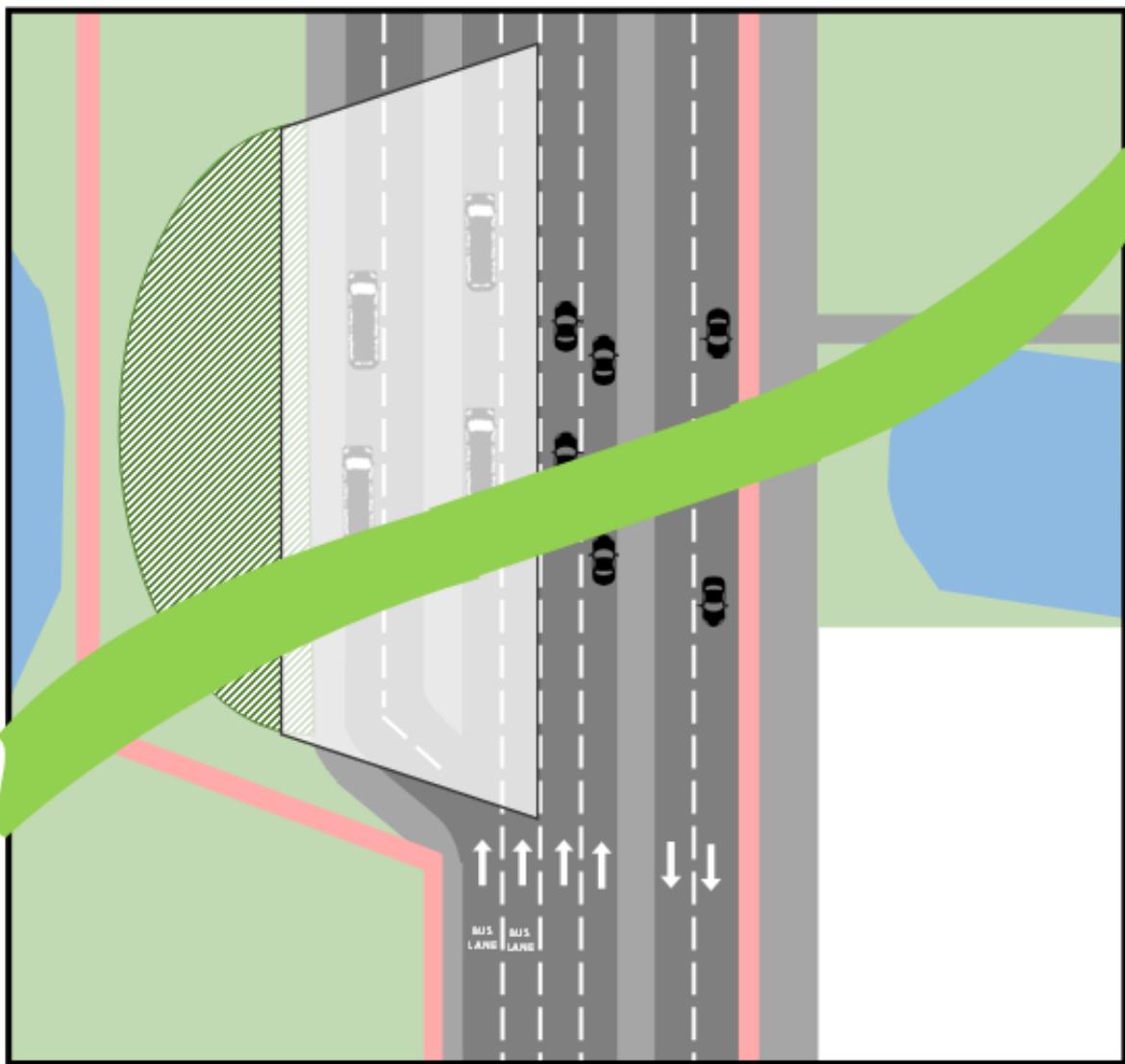
Figure 44 displays the proposed 140-meter-long, 6-meter-wide bridge. It includes a gradient of 0.05 and lifts on both sides of the road to cater to wheelchair users and cyclists,



Figure 44 Bridge Location Schematic Connecting Hilsea Lines and Lido

1 Green Continuity

improving universal accessibility. The design is inspired by the Vancouver Land Bridge (Canada) and one from Kazakhstan, which provide pedestrian and relaxation spaces and greenery. The bridge will feature green spaces, local artwork, resting areas, and segregated pathways for bicycles and pedestrians (Figure 46), making the bridge LTN 1/20 compliant (DfT,2020) and allowing cyclists to travel between Hilsea Lines and Lido without obstruction.



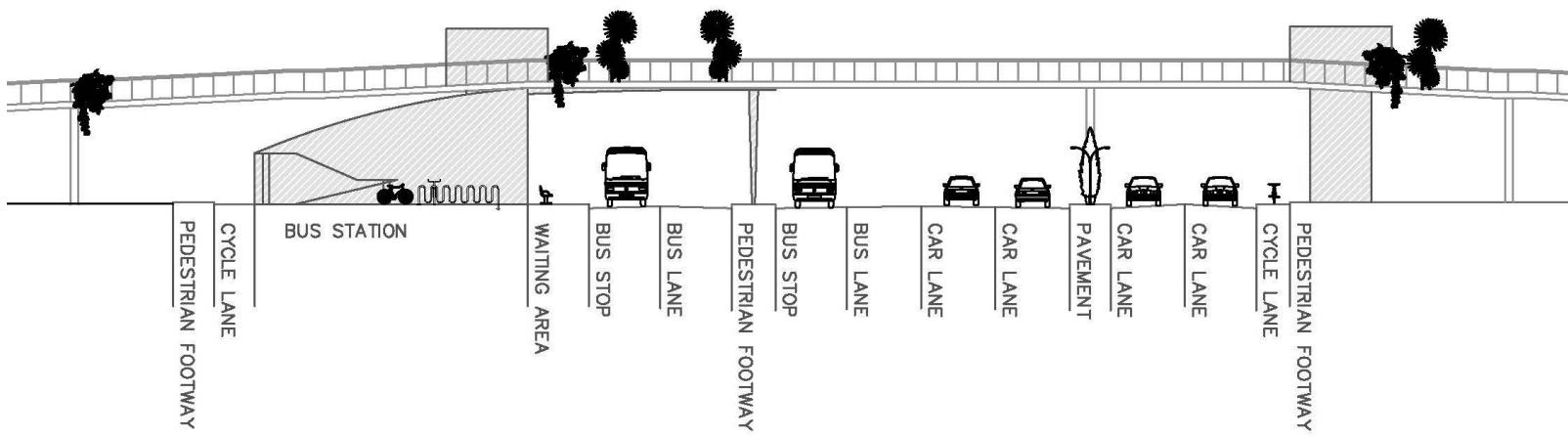
1 Green Continuity

Figure 47 shows, the bridge in Kazakhstan's unique design, leads pedestrians to a hill with observation decks and community spaces for social interaction and relaxation. The Vancouver Land Bridge (Figure 48), features loops separating pedestrian and relaxation spaces whilst incorporating greenery. These examples showcase the potential for innovative bridge designs that provide connectivity and enjoyable, sustainable park experiences.

Figure 49 displays the design's cross-sectional roadway view.

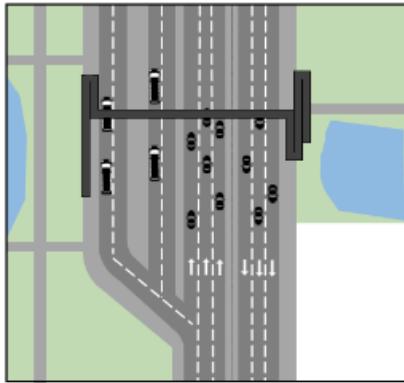


(Left) Figure 47 Pedestrian Green Bridge in Kazakhstan (Inhabitat, 2021)
(Right) Figure 48 Vancouver Land Bridge in Vancouver, Canada (Lovell, 2022)
(Below) Figure 49 Cross Sectional View of Roadway Layout for Package





2 Mobility for All



This design supports the project's aim to improve sustainable transport connections and facilitate east -west access by implementing at-grade road crossing. This supports Portsmouth Transport Strategy's Policy L: to transform public transport and '*deliver high quality public transport interchanges, stations and stops*' (PCC,2021). The London Road interchange is Portsmouth's northern gateway, a potentially major transport hub connecting local and regional trips by multiple modes, including walking, cycling, and buses. Figure 50 compares the design against the business-as-usual scenario.

The design reduces the roadway width from 3 lanes per direction to 2 direction (shown in the Figure 50). This creates a less hostile traffic environment, acting to calm traffic. The space is reallocated to widen the footways on both sides of the road, widen the median - planted with trees to improve air quality, aesthetics, and calm traffic- and implement cycle lanes on both sides of the road (shown in pink in Figure 50).

Figure 50 BAU compared with Package 2

2 Mobility for All

The bus interchange is remodeled to create a vibrant, efficient transport hub. The space gained from relocating bus parking (see fixed components) is used to create two parallel bus stops and overtake lanes (totaling four lanes). Relevant design guidance has been followed to design a best-practice bus interchange (DfT,2021b). Where pedestrians must cross the path of buses, tactile paving and clearly marked crossing points are present. A large shelter area (1000m²) provides shelter to the parallel bus stops, similar to Figure 51. East of London Road, a 370m² area is provided for a ticketing office, tourist information desk, resting area, toilets, and cafes. The access to the area is designed considering diverse needs, equipped with sensors, automatic doors, a level entrance, and clear signage. The bus interchange provides real-time passenger information and connectivity to The Hard Interchange Bus and Coach Station (shown in Figure 54). It emulates the design of The Hard Interchange Station to create a unified identity for bus travel in Portsmouth.



Figure 51 Shelter area at bus interchange in Sembawang, Singapore (Zkang123, 2020)

2 Mobility for All

The concrete pedestrian bridge is removed, replaced by an at-grade crossing. The crossing is signalized and designed according to best-practice guidance (DfT,2021b). It features priority phasing for pedestrians, allowing ample crossing time. It is highly accessible with audible information, a wide pedestrian island for slower pedestrians, and a raised toucan crossing (Figure 54) This acts as a traffic calming measure, whilst reinforcing pedestrian priority. The crossing will be aligned with Hilsea Lines and Lido, ensuring seamless access that follows desire lines.

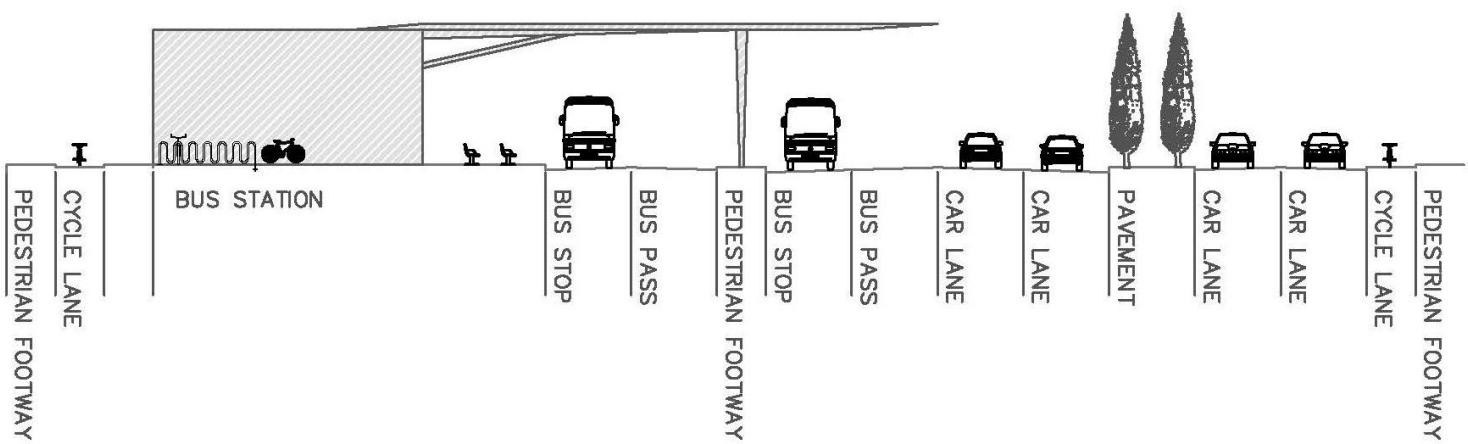


2 Mobility for All



(Left) Figure 53 The Hard Interchange Bus & Coach Station (Roc Consulting, 2023)

(Right) Figure 54 Rosehill Highways (n.d.) Raised Toucan Crossing
(Below) Figure 55 Cross sectional view of roadway layout for package 2





3 People Centred Space

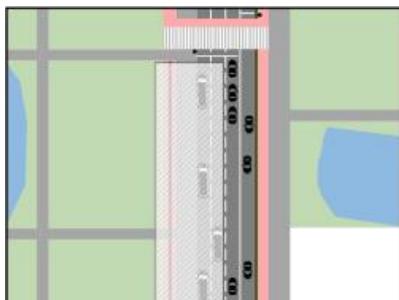
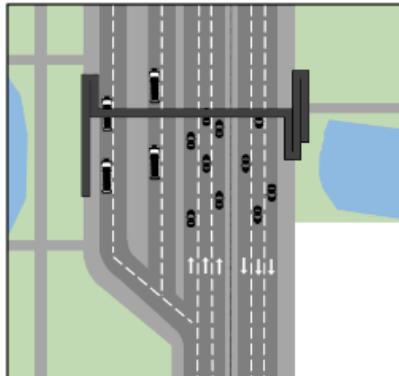


Figure 56 BAU compared to Package 3

This design aims to increase public space to diversify opportunities and activities for the community, aligning with PCC's objectives to improve public realm and maximize assets (Imagine Portsmouth, 2023).

In 2018 the UK government launched the Future High Street Fund, acknowledging the centrality of highstreets to local communities and economies (MHCLG, 2018). Portsmouth has utilized this and other funds to regenerate areas in the north of the city, proposing greenspace-centred upgrades around St Agatha's church to incorporate local culture and leisure opportunities into public space (ShapingPortsmouth, 2022).

The People-Centred Space design continues this vision, converting car-centric road space into open public space by reducing London Road's width, shown in Figure 56, the largest reduction. Lanes are reduced to one general traffic lane per direction and two northbound bus lanes, forming part of the bus stop with one for stopping and the other a passing lane. The median strip is removed to create space and better emulate a high-street.

Space is reallocated on both sides of the road for active transport and community use. East of London Road, a bi-directional cycle lane is implemented and the footway widened, separated from the roadway by greenery to enhance safety, green infrastructure and reduce air and noise pollution.

3 People Centred Space

West of London Road, a bus interchange is proposed: a large, sheltered area, approximately 1000m² in area. The waiting area and bus lanes are covered, ensuring adequate weather protection. Whilst not a building, the structure is distinct to encourage new users to the area. Figures 57 through 56 provide similar examples.



Fig 57 Examples of bus stops in London – Vauxhall (Arup Associates, 2015), Stratford (Architen Landrell, n.d.), and Edmonton Green (Rosehill, 2021)

The remaining 1330m² space is used as a multipurpose community space, designed to mirror the surrounding green space and be universally accessible. The space aims to encourage new users to engage with the area, providing opportunities and activities for the community whilst remaining flexible to suit changing local needs.

Carmona (2015) advocates highstreets be connected, adaptable, mixed, social, and intense, also noting that integration of greenspace with streets can improve highstreet vitality. Designing this community space on London Road, within proximity of existing high streets perfectly integrates Hilsea lines with local economic hubs, encouraging increased use of the greenspace to support local businesses.

Figure 58 below depicts a top view of the design, illustrating the volume of open space created. This space should be centred around community needs, with the community involved in its creation. It should incorporate activities for different community members through flexible, adaptable spaces that promote local artists, businesses, and people to make the space their own.

③ People Centred Space

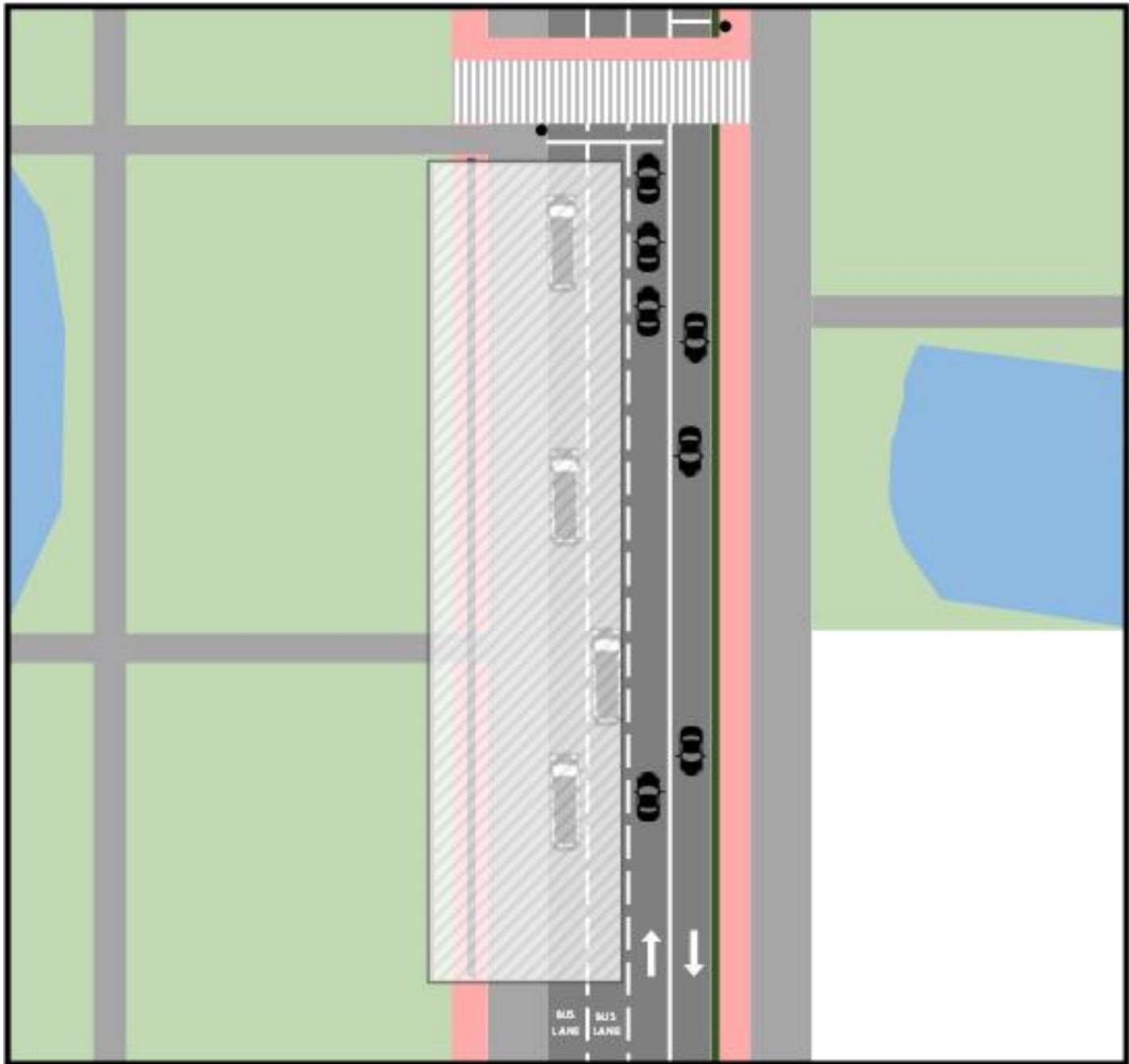


Figure 58 Top view of Package 3

3 People Centred Space



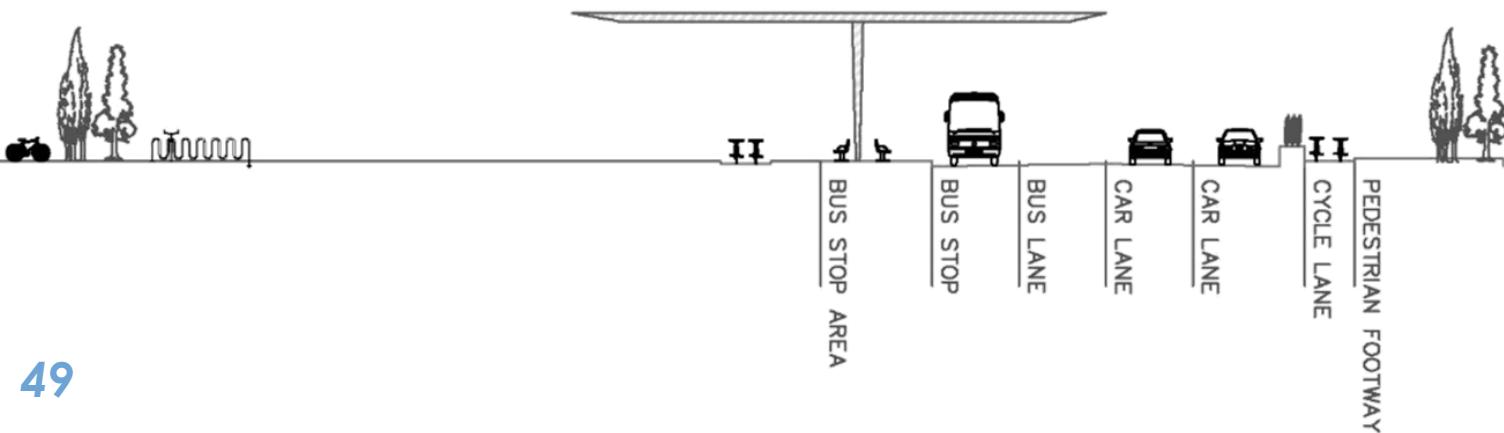
(Top Left) Figure 59 Example of use of colour and flexible space in Dallas (Briggs 2022)

(Top Right) Figure 60 Example of community space in Barcelona (Patil, 2023)

(Medium Left) Figure 61 Example of public game space in Baltimore (Graham's Project, 2016)

(Medium Right) Figure 62 Example of flexible public space in Shanghai (Moreira, 2020)

(Below) Figure 63: Cross-sectional view of Package 3:



Section 7

Appraisal

51 ___ Methodology and Criteria

53 ___ Results

55 ___ Recommendations and Considerations



APPRAISAL

Methodology and Criteria

To determine a preferred design, a Multi-Criteria Assessment (MCA) framework has been developed. The MCA assesses each long-term design against a set of strategic criteria, establishing which option is the best strategic fit for Portsmouth, consistent with the project's vision. This section explains the MCA's chosen criteria before presenting the appraisal outcome and recommendations. Table 3 shows the MCA framework.

Table 3 The project's Multi Criteria Assessment Framework: criteria and relative weighting (Source: Author's own)

Criteria	Sub- Criteria	What is this measuring?	WEIGHTING
Demographic groups	Mobility impaired	<i>How much does the design improve the experience for these groups?</i>	10
	Families and children		7
	Women		7
	Low income/deprived		7
Transport user groups	Bus users		12
	Pedestrians		12
	Cyclists		12
Strategic priorities	Air & noise pollution	<i>How much will the design contribute to improved air quality?</i>	10
	Green space	<i>How much will access to green space be improved by this design? Including creation of new green spaces</i>	9
	Improved public realm	<i>How much will the design contribute to improving the public realm?</i>	6
	Improved opportunities for business	<i>How much will the design create new opportunities for businesses?</i>	8
Total			100

APPRAISAL

The MCA criteria are demographic groups, transport user groups and strategic priorities. The demographic groups result from the baseline assessment (Table 2), representing the study area's most vulnerable groups. As in the vision, a key objective of this study is universal accessibility. Accessibility issues including severance and exclusionary infrastructure were identified as key constraints within the study area, and it is therefore important to ensure each design focuses on improving access for vulnerable groups, hence this criteria.

The demographic groups are weighted according to how significantly each group's needs are unmet at present, identified through the baseline assessment (Table 2). Groups facing the greatest access barriers are allocated the highest weighting because greater focus is needed to achieve equal access. The weighting for mobility impaired users is further uplifted due to increasing disabled and elderly populations within the study area. The MCA assesses how well each design improves access and experiences for these groups. Higher scores indicate greater improvement.

This is fundamentally a transport study supporting the Portsmouth Transport Strategy. The Strategy emphasises sustainable modes, which is reflected in the user group criteria. These criteria are weighted the highest because of their seminal importance to the project. The MCA assesses how well each design improves conditions and experiences for these groups, focusing on safety and access.

Finally, the strategic priorities criteria assesses how well each design aligns and contributes towards PCC's strategic priorities. The criteria result from the Vision Statement, itself derived from a review of PCC's policies. These criteria are weighted according to frequency of occurrence across Council policies, and thus their strategic importance to PCC.

APPRAISAL

Results

Table 4 displays the MCA's results, whilst a cross-section of each design is displayed in Figure 63.

Table 4 The project's Multi Criteria Assessment Framework and outputs. (Source: Author's own)

Criteria	Sub- Criteria	What is this measuring?	WEIGHTING	BAU		Green Continuity		Mobility for All		People-Centred Space	
				Score	Weighted score	Score	Weighted score	Score	Weighted score	Score	Weighted score
Demographic groups	Mobility impaired	How much does the design improve the experience for these groups?	10	-5	-50	3	30	4	40	5	50
	Families and children		7	-3	-21	3	21	3	21	5	35
	Women		7	-2	-14	3	21	5	35	4	28
	Low income/deprived		7	-2	-14	4	28	3	21	5	35
Transport user groups	Bus users		12	-3	-36	4	48	5	60	3	36
	Pedestrians		12	-4	-48	4	48	4	48	5	60
	Cyclists		12	-5	-60	3	36	4	48	5	60
Strategic priorities	Air & noise pollution	How much will the design contribute to improved air quality?	10	-5	-50	3	30	3	30	4	40
	Green space	How much will access to green space be improved by this design? Including creation of new green spaces	9	0	0	5	45	3	27	4	36
	Improved public realm	How much will the design contribute to improving the public realm?	6	-1	-6	4	24	3	18	5	30
	Improved opportunities for business	How much will the design create new opportunities for businesses?	8	-4	-32	3	24	3	24	5	40
	Total		100		-331		355		372		450

As Table 4 shows, the Business-As-Usual scenario representing current conditions receives a significantly lower appraisal score than the designs..

APPRAISAL

The Green Continuity design scores 355. Of all designs, it most greatly contributes towards the green space strategic priority. However, it performs lowest for user groups, particularly cycling, and demographic groups, particularly mobility impaired and women. Due to the importance of these criteria in the appraisal process, Green Continuity obtains the lowest appraisal score.

The Mobility for All design scores well for demographic groups - particularly women, and for the cyclist user group - due to the at-grade crossing reducing of severance and improving road safety, convenience, and accessibility. This results in a score of 372.

The best performing package is People-Centred Space, scoring 450. This design performs across all criteria, most notably the mobility impaired demographic group and the cyclist and pedestrian user groups. The weighting of these criteria, reflecting their importance to the project's aims, results in the high appraisal score. The design performs well against each strategic priority, indicating it to be a strong strategic fit. Overall, the MCA reveals that the People-Centred Space design most greatly meets the study objectives.

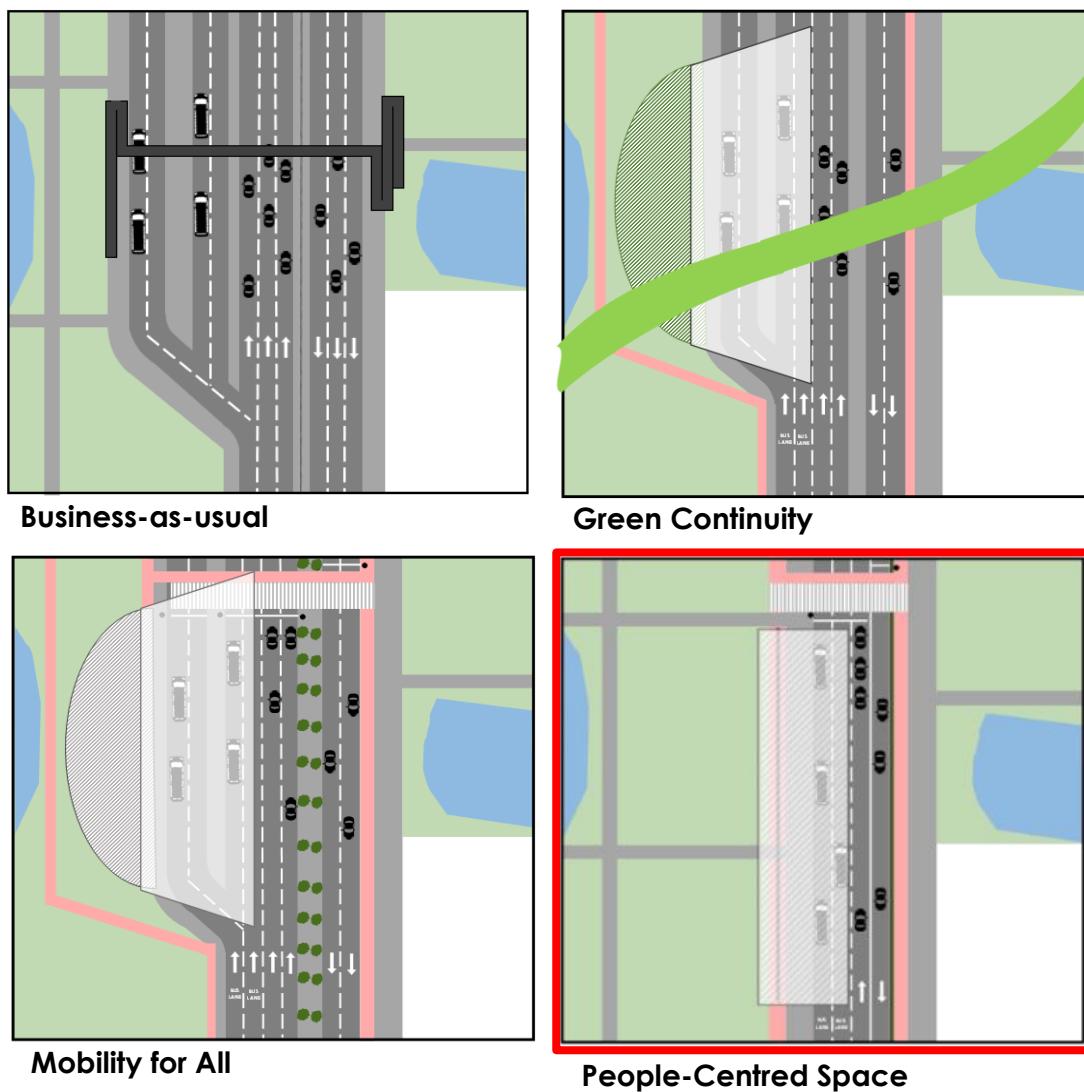


Figure 64: Cross-sectional views of each design package, including People-Centred Space (Source: Author's own).

APPRAISAL

Recommendations and Considerations

Consequently, it is recommended that the People-Centred Space design be taken forward as it most greatly improves baseline conditions, working towards universal accessibility to Hilsea Lines, promoting sustainable transport modes within the study area, and contributing towards the strategic priorities of PCC. The appraisal concludes that this design that most solidly aligns with the project's vision.

This outcome demonstrates that serving the needs of a local community can be more important than designing an iconic structure. Ultimately, ensuring universal access and meeting local needs identified in the baseline assessment was fundamental in appraising this project.

It is worth stating that the MCA deliberately favours designs improving accessibility for vulnerable groups and sustainable modes, in line with PCC's priorities. As priorities change, the appraisal process will require revisiting. Additionally, the MCA does not consider intersectionality - for example a woman who is also a cyclist, or someone with a mobility impairment who is also a female bus user. Intersectionality is best understood through qualitative studies of lived experience (McDowell, 1992), beyond the scope of this appraisal.

Further, it must be considered that the MCA provides a high-level appraisal. A more conclusive recommendation can be made through consultation with the local community, who understand their area and their own needs the best. The MCA provides an indication of which project is the best strategic fit.



Photograph taken by Author

Section 8

Conclusion

57 __ Conclusions

58 __ References



CONCLUSION

This study intended to resolve blight and severance caused by London Road, improve east-west and longer-distance access to Hilsea Lines. The analysis involved a broad baseline assessment of the study area, identifying and analysing barriers, demography, traffic conditions, and user experiences. It established a policy-based vision for a more liveable, healthy, economically prosperous, and physically and mentally engaging environment through promoting greenspace and sustainable travel.

The study provided a set of short-term, 12-month proposals and three longer-term design packages to transform the area west of Hilsea Lines. The appraisal process was heavily informed by the baseline assessment and project vision and resulted in recommending that the People-Centred Space design be taken forward as the best strategic fit for Portsmouth. This designed outscored two promising proposals, highlighting the importance of people-centered interventions.

However, the analysis could further be enhanced through engagement with local stakeholders and a higher degree of participatory multi-criteria analysis, as well as collecting more information on local demographics, travel patterns, public transport services, and socio-economic needs.



(Background) Figure 65 (Townshend Landscape Architects, 2023)

(Foreground) Figure 66 – Key themes of the People-Centred Space design

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