Attachment D

Transport Study
Oxford Street Cultural and Creative Precinct

City of Sydney

MARCH 2022

Oxford Street Cultural and Creative Precinct

Transport Impact Assessment

Question today
Imagine tomorrow
Create for the future

Oxford Street Cultural and Creative Precinct
Transport Impact Assessment

City of Sydney

WSP
Level 27, 680 George Street
Sydney NSW 2000
GPO Box 5394
Sydney NSW 2001

Tel: +61 2 9272 5100
Fax: +61 2 9272 5101
wsp.com

REV	DATE	DETAILS
	4 March 2022	Draft
A	15 March 2022	Final

	NAME	DATE	SIGNATURE
Prepared by:	Nathan Wong	15 March 2022	
Reviewed by:	Ody Murlianto	15 March 2022	
Approved by:	Richard West	15 March 2022	

WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

Table of contents

List of tables

List of figures

List of appendices

1 Introduction

1.1 Site location and context

A planning proposal is currently being considered by City of Sydney (the City) to encourage uses that support Oxford Street's role as a local centre and an activity street. The uses would include cultural and creative, entertainment, education, commercial and tourism sectors in the precinct, aligning its role with the objectives of planning policies on both a State and Local level.

The planning proposal, known as **Oxford Street Cultural and Creative Precinct**, would allow greater heights and floor space on Oxford Street if the development provides uses that are strategically important to the local centre and creates more space for creative and cultural activities. It would protect heritage items, public spaces and local characters.

The precinct is in the eastern part of the City of Sydney Local Government Area and the suburbs of Surry Hills and Darlinghurst. The location of the proposed precinct is shown in Figure 1.1 extending from Whitlam Square (Oxford Street/Liverpool Street/College Street/Wentworth Avenue intersection) to Greens Road in Darlinghurst.

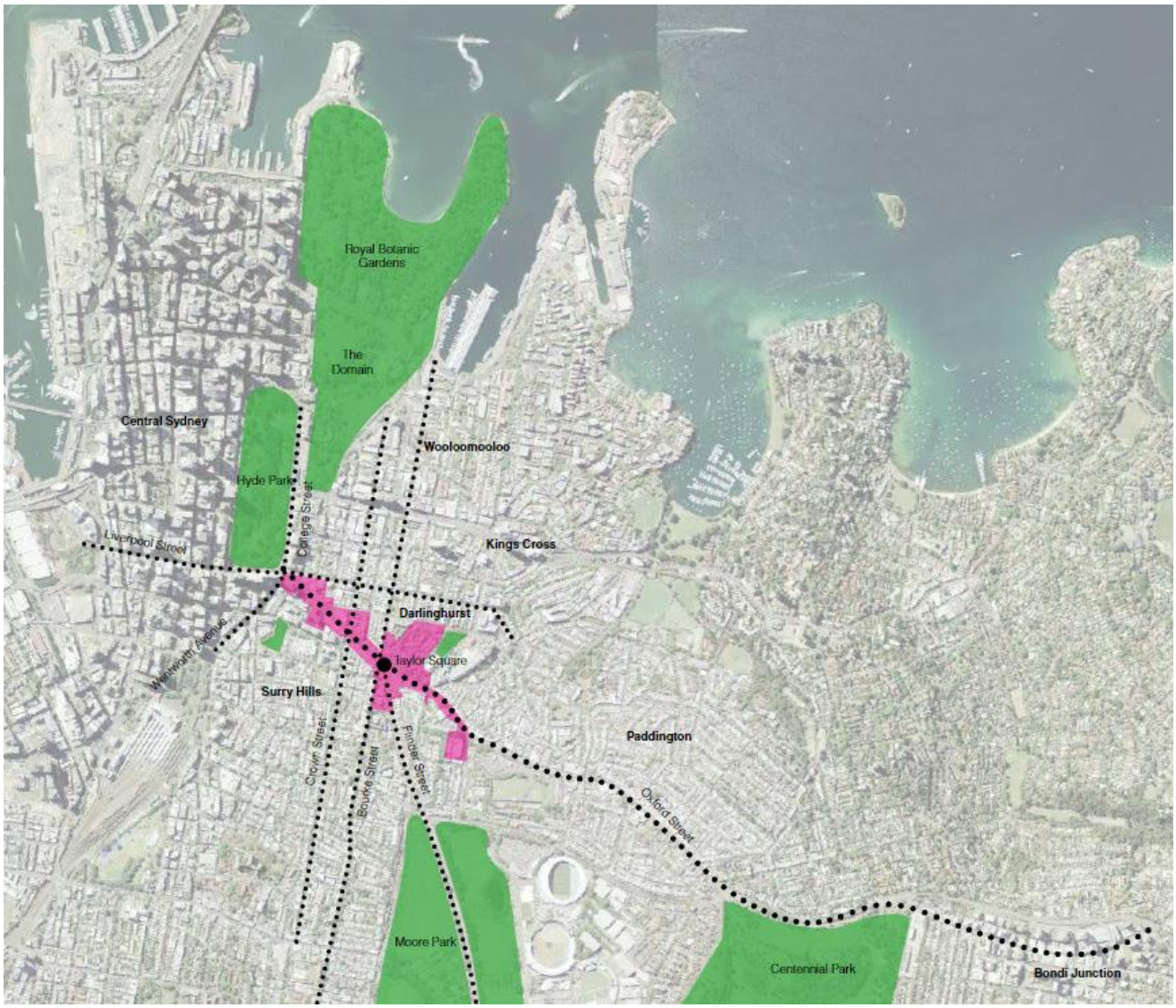


Figure 1.1 Location map

The details of the planning proposal are further discussed in section 2.

1.2 Project objectives

According to the City, the new planning controls have the following objectives:

- Retain existing entertainment, creative and cultural floor space
- Encourage new creative and cultural activity by allowing extra floor space and height on existing buildings
- Encourage entertainment floor space at basement levels
- Protect the fabric, features and structural integrity of heritage items and provide appropriate upper-level setbacks
- Promote more activities in commercial developments and support the night-time economy
- Do not apply to residential development to reduce conflicts
- Allow extra uses at the National Art School to support its continued educational and cultural role and increase the range of commercial and entertainment activities
- Increase the floor-space ratio at the National Art School to support its growth
- Promote uses at street level to attract passer-by balanced with the need to service sites
- Require large sites to activate laneways with small retail and food and drink businesses, opportunities for art and better experiences for people walking
- Promote food and drink premises fronting key public spaces
- Expand the Oxford Street heritage conservation area to include 276–278 Crown Street.

1.3 Transport for NSW (TfNSW) correspondence

Following a public exhibition of the planning proposal, TfNSW provided a submission to advise that a transport assessment is to be undertaken with specific focus on the potential increase in traffic to serve and facilitate the 11,300 m^2 of creative and cultural floor space. The following assessments were requested on the potential increase in GFA:

- Strategic context including an assessment of the Planning Proposal meeting the Objectives of the relevant strategic plans, regional strategic plans and alignment to Future Transport 2056.
- Opportunities and constraints.
- Review of the current transport conditions for Active Transport, Bus Operations, Freight Operations, Point to Point Operations, Road, Parking, Travel Behaviours, Crash Analysis.
- Quantum, location, type of additional floor space and potential traffic generation.
- Network and intersection capacity.
- Future land use and infrastructure analysis, which includes but not limited to:
  - Precinct development
  - Future land use
  - Transport network
  - Multimodal assessment
  - Transport modelling
  - Recommendations.

1.4 Report objectives

The purpose of this report is to assess the potential traffic and transport impacts from the planning proposal in line with Transport for NSW's feedback and State and Local policies. Specifically, this report has the following objectives:

- Review the strategic context of the Planning Proposal and its alignment with the objectives of the relevant strategic plans, regional strategic plans and alignment to Future Transport 2056.
- Describes the existing conditions and capacity for all modes of transport in the study area including general access vehicles, freight, public transport (rail services, bus services and point-to-point transport) and active transport (bicycles and pedestrians). Include assessments on existing travel behaviours and crash analysis.
- Describes the existing environment (road function, classification and operation) in the study area that are likely to be affected by the planning proposal. Describe the existing planning control associated with traffic and transport for the study area.
- Describe the Planning Proposal and additional trips likely to be generated.
- Assesses the impacts of the addition trips from the planning proposal to the surrounding road network, including the potential impacts to public transport, active transport and servicing.
- Provide mitigation measures to manage identified traffic and transport impacts of the planning proposal.

1.5 Structure of this report

Section 1 Introduction: Describes the context of the planning proposal in terms of location, objectives and the correspondence received from Transport for NSW during the consultation process. it also summarises the documents referenced for this study and the strategic context in alignment with the state and local policies.

Section 2 Proposal description: Describes the planning proposal including the existing and proposed land uses and potential increase in employment. This section also divides the precinct into sub-precincts for analysis purposes in line with the planning proposal and Urban Design study undertaken for the precinct.

Section 3 Existing conditions: Describes the existing condition of the road network, transport services and abutting developments. This section also describes the existing demand on the various transport modes on Oxford Street.

Section 4 Transport impact: Provides an analysis of the Planning Proposal impacts on the road network.

Section 5 Mitigation measures and management: Discusses and recommends the available mitigation measures to address any significant impacts identified in this assessment.

Section 6 Conclusion: Provides concluding remarks on the assessment and recommended mitigation measures.

1.6 Referenced documents

Table 1.1 below lists and describe a number of documents which have been referenced as part of this study.

Table 1.1 Referenced documents

Document	Description and relevance
Draft Sydney Development Control Plan 2012 – Oxford Street Cultural and Creative Precinct (City of Sydney, 2021)	The draft Development Control Plan (DCP) is to amend the Sydney Development Control Plan 2012, adopted by Council on 14 May 2012 and which came into effect on 14 December 2012. This DCP seeks to insert precinct specific provisions to guide future development within the Oxford Street Cultural and Creative Precinct. This document also includes the fine grain of the DCP to be considered as part of development applications of eligible developments.
Oxford Street Cultural and Creative Precinct Planning Proposal (City of Sydney, 2021)	This document explains the objectives and justification for proposed amendments to the Sydney Local Environmental Plan 2012 (Sydney LEP 2012) that will apply to land identified within the Oxford Street corridor between Whitlam Square and Greens Road in Darlinghurst, known as the Oxford Street Cultural and Creative Precinct. This document also provides the proposed changes to the LEP maps as part of the planning proposal.
Oxford Street Urban Design Study (Studio Hollenstein, 2021)	This urban design study has been developed to support the objectives of the Cultural and Creative Precinct. The urban design study utilises a place-based approach to understanding the unique structural, heritage and built aspects of the study area. This study includes context and site analysis of the study area, review of the controls for the study area, existing built form analysis, review of the heritage study, development of Structure Plan and Principles, and Master Plan options.
Oxford Street West (Taylor Square to Castlereagh Street) Strategic Design Report (WSP, 2021)	This design and accompanying report detail the proposed design, specifications, challenges, available options, traffic management, and tie-ins that were done to develop a strategic design of a separated bi-directional cycleway on the northern kerbside of Oxford Street between Taylor Square and Castlereagh Street. The strategic design was completed by the design team in consultation with the City of Sydney and Transport for NSW. This study is the foundation for the design team to continue with the concept and detailed designs of the cycleway.
Austroads Guide to Road Design	The *Guide to Road Design* is a set of comprehensive Austroads guides developed to capture the contemporary practice of member organisations in road design. It provides guidance to designers in the production of safe, economical and efficient road designs, which are most relevant in developing feasible mitigation measures suggested in this report.
Austroads Guide to Traffic Management	The *Guide to Traffic Management* captures the contemporary traffic management practice including emerging techniques and technologies, and relevant international experience. For this study, this guide provides valuable guidance and considerations to achieve efficient, safe and economical management of road traffic.

Document	Description and relevance
Traffic Control at Work Sites v6.0 (TfNSW, 2020)	This manual has been developed with an aim to maximise safety by ensuring that traffic control at work sites within NSW consistently complies with best practice. It is intended to help personnel to comply with the Work Health and Safety Act 2011 and the Work Health and Safety Regulation 2017. This guide refers to Australian Standards 1742 (*Manual of uniform traffic control devices*) and 1743 (*Road signs – specifications*) to ensure consistent application with the Australian Standards.
Technical Directions	Various technical directions published by TfNSW, encompassing design guidelines as accepted in New South Wales roads (e.g. safety barriers, design of traffic facilities, traffic signal design, delineation).
Australian Standards (1742, 1743 series)	The Australian Standards most directly applicable to this study area as follows: — Traffic control devices for general use (1742.2–2009): This Standard specifies requirements for regulatory and warning signs, pavement markings and other devices for general use on roads including intersections, between intersections and specific situations (substandard horizontal and vertical curves) which may be relevant to this study. — Traffic control for works on roads (1742.3–2009): This Standard specifies the traffic control measures and devices to be used to warn, instruct and guide road users in the safe negotiation of work sites on roads including unsealed roads together with footpaths, shared paths and bicycle paths adjacent to the roadway. — Road signs – specifications (1743–2018): This Standard specifies graphics, fonts, layout and size requirements together with an abridge materials and manufacturing specification for the manufacture of the standard road signs provided for in the AS1742 series.

1.7 Strategic context

1.7.1 State-level policies

1.7.1.1 Future Transport Strategy 2056

Future Transport 2056 is a 40-year vision for the State's transport system, supported by a suite of plans. The Strategy aims to deliver six state-wide customer outcomes including Successful Places. The Successful Places outcome notes that 'walking or cycling is the most convenient option for short trips around centres and local areas, supported by a safe road environment and suitable pathways'.

Future Transport 2056 builds on principles and objectives for walking and cycling set out in the State Infrastructure Strategy, to encourage active transport for short trips.

It prioritises the delivery of connected cycling networks within 10 kilometres of metropolitan city centres, and within 5 kilometres of strategic centres. It also prioritises walking access to public transport and key destinations.

Future Transport 2056 also embeds a Movement and Place Framework into transport planning decisions. The Framework aims to integrate efficient movement of people and goods with the amenity and quality of places, to contribute to the attraction, success and sustainability of our cities and towns.

Under the Framework, streets that prioritise 'place' can be designed in a way that prioritise spaces for people and for walking and cycling. The Movement and Place principles work to support street environments that deliver place outcomes such as health and well-being benefits and movement outcomes such as moving people and goods safely, reliably and efficiently and encouraging sustainable transport modes. The Framework identifies different street environments and the necessary considerations to support those environments. Pedestrian and bicycle treatments should be considered to improve place qualities as well as access to and within places.

1.7.1.2 Greater Sydney Region Plan – A Metropolis of Three Cities

The Greater Sydney Region Plan (GSRP) is the NSW Government's metropolitan strategy for the Greater Sydney region. Over the next 40 years, the GSRP aims to transform Greater Sydney into a metropolis of three cities: The Western Parkland City, Central River City and the Eastern Harbour City. The 'Harbour CBD' is the metropolitan centre at the heart of the Eastern Harbour City and is the largest economic centre in Australia. The GSRP aims to make the Harbour CBD stronger and more competitive and acknowledges the importance of innovation and diverse activities in and near the Harbour CBD. A summary of key transport related actions included in the plan are:

— Headline indicator: 'Walkable Places'

— 30-minute cities where people live within 30 minutes by public transport to jobs, education and health services in their nearest strategic or metropolitan centre

— Directions and indicators include designing places for people; a well-connected city that is more accessible and walkable; and an efficient city with reduced transport-related greenhouse gas emissions

— Walking and cycling support place outcomes and planning priorities (infrastructure and collaboration, liveability, productivity and sustainability)

— Connected to the Green Grid and open spaces.

1.7.1.3 Eastern City District Plan

The Eastern City District Plan (ECDP) is a 20-year strategy which gives effect to the GSRP in the City of Sydney and the remainder of the Eastern City District. It is intended to inform local level strategic planning and the assessment of planning proposals.

It recognises the Harbour CBD as having a strong cultural, arts and education focus. One of the ECDP's objectives is to sustain communities through vibrant public places, walking and cycling and cultural, artistic and tourism assets.

1.7.1.4 Building Momentum – State Infrastructure Strategy 2018–2038

The State Infrastructure Strategy (SIS) is a 20-year plan which sets out the investments in infrastructure that is integrated with land use planning. The SIS aims to prioritise achievable and affordable infrastructure investments which deliver the highest economic, employment and liveability benefits to the people of NSW. Key summaries of this plan relevant to transport are:

— Business cases for investment in a network of protected cycleways linking major strategic centres across the three cities; in partnership with local government and aligned with the Green Grid (Recommendation 50).

— 10-year rolling program that prioritises active transport at high volume and high-profile locations in partnership with local government (Recommendation 51).

— Investment in walking and cycling infrastructure and parks and open spaces as part of the ongoing integration of health into land use planning and transport strategies (Recommendation 99).

1.7.2 Local-level policies

1.7.2.1 Sustainable Sydney 2030

Sustainable Sydney 2030 is the City's overarching community strategic plan that sets a vision for a Green, Global and Connected city. It is the City's highest level strategic plan which provide strategic directions to guide the City's future commitments, projects and services.

The 10 strategic directions to guide the future of the city are:

1 A globally competitive and innovative city
2 A leading environmental performer
3 Integrated transport for a connected city
4 A city for walking and cycling
5 A lively and engaging city centre
6 Resilient and inclusive local communities
7 A cultural and creative city
8 Housing for a diverse population
9 Sustainable development, renewal and design
10 Implementation through effective governance and partnerships.

1.7.2.2 City Plan 2036

City Plan 2036 is the City's Local Strategic Planning Statement which reinforces the links between the NSW Government's strategic plans and the City's community strategic plan (Sustainable Sydney 2030) and the planning controls that guide development in the City. The planning statement sets out:

- The 20-year vision for land use planning in the city
- The basis or context for planning
- The planning priorities and actions needed to achieve the vision
- The governance and monitoring of the priorities and actions.

The Planning Statement builds on the themes of Green, Global and Connected. The City's vision is for a connected city that is easy to get around with a local network for walking and cycling, and opportunities and activities are connected by transit routes between the villages, city centre and the rest of Sydney.

1.7.2.3 Cycling Strategy and Action Plan 2018

This plan sets out the City's commitment to making bicycle transport easier and safer, to make it an attractive and feasible option for more people. This action plan's priorities are set out as follows:

- **Connect the network** – build a bike network to make it safer for people to ride in Sydney
- **Support people to ride** – understand and address barriers and help people to start and continue riding
- **Support business** – partner with employers to encourage staff to ride
- **Lead by example** – share our expertise and be a positive influence for improvements for cycling within and beyond our boundaries.

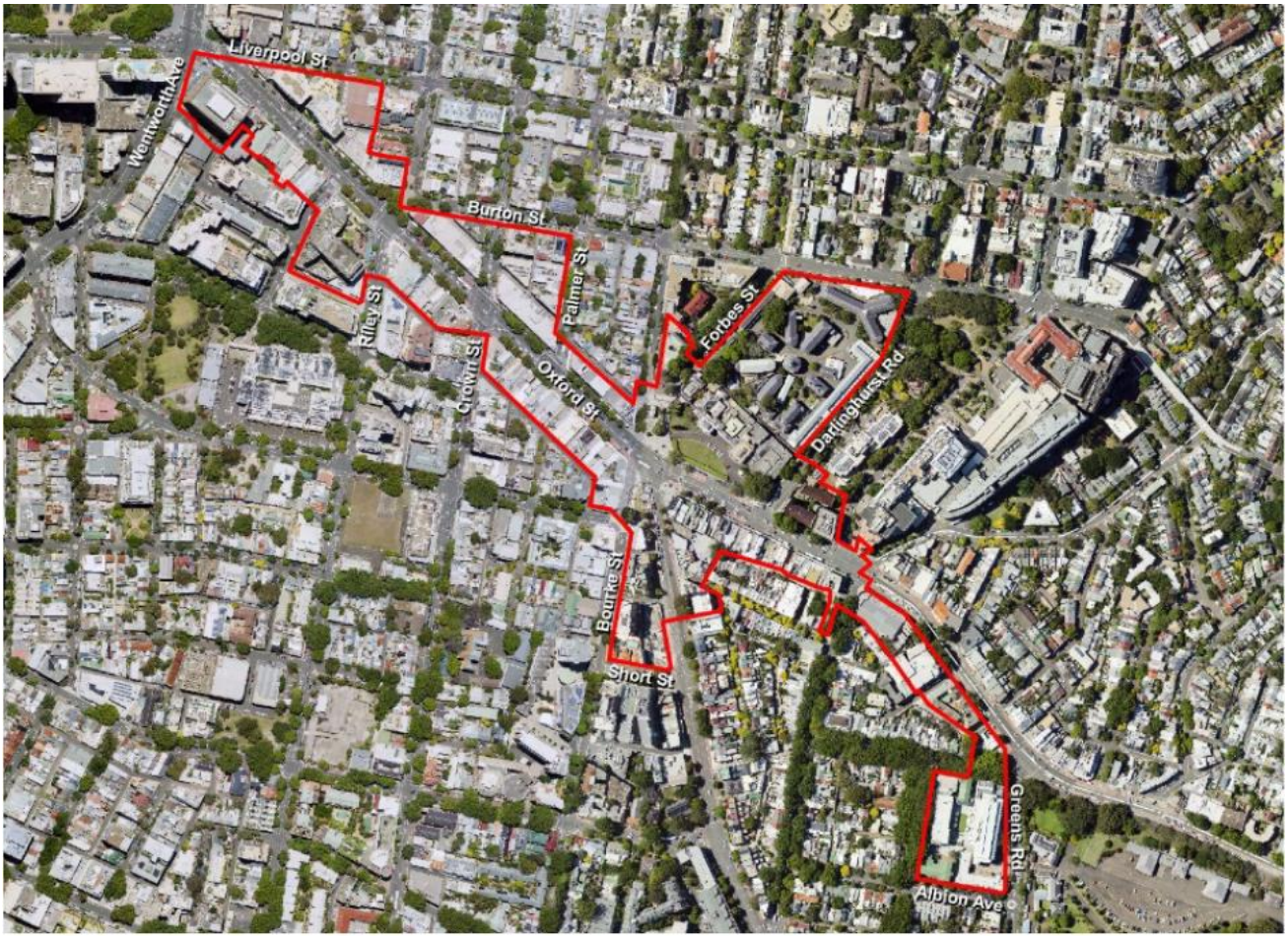
As part of this action plan, the City made a commitment to complete the 11 regional bicycle routes and substantially complete the local bike route network. One of the main priorities is to complete the Oxford Street regional bike network between Taylor Square the existing Liverpool Street cycleway.

2 Proposal description

2.1 Oxford Street Cultural and Creative Precinct

2.1.1 Location

The boundaries of the precinct are shown in Figure 2.1 below, extending approximately 1.3 km south-east between Whitlam Square to the east and Greens Road to the west.



Source: Oxford Street Cultural and Creative Precinct Planning Proposal, City of Sydney, 2021

Figure 2.1 Boundaries of the Oxford Street cultural and creative precinct

2.1.2 Existing land use

They key land uses, floor area and employments in the precinct based on the City of Sydney's *Floor Space and Employment Survey* (FES) undertaken in 2017 are detailed in Table 2.1 below. The survey indicates the largest amount of floor space (50,664 m^2) is occupied by higher education and research uses. This is followed by tourist cultural and leisure land use (26,875 m^2) and government offices (24,794 m^2). The three largest land uses account for 590, 523 and 1,283 jobs respectively for the precinct.

Creative industries occupy 9,268 m^2 of floor space in the precinct, providing 407 jobs in total. This includes creative recreation uses (e.g. cinemas or performing arts) and creative businesses (e.g. architecture, design or music publishing services). However, arts education (39,850 m^2) is not included in the creative industry category, instead it is included in the higher education and research. Combining the two, brings the total floor space for creative uses in the precinct to 49,118 m^2.

Table 2.1 Existing proportion of land use and employment in Oxford Street Creative and Cultural Precinct

City based industry	2017 Floor space (m^2) & percentage to total	2017 Jobs & percentage to total	Floor space to jobs ratio
Higher Education and Research	50,664 (28%)	590 (15%)	86
Tourist Cultural and Leisure	26,875 (15%)	523 (13%)	51
Government	24,794 (14%)	1,283 (32%)	19
Food and Drink	13,658 (7%)	355 (9%)	38
Retail and Personal	13,134 (7%)	286 (7%)	46
Creative Industries	9,268 (5%)	407 (10%)	23
Professional and Business Services	3,683 (2%)	268 (7%)	14
Health	2,710 (1%)	58 (1%)	47
Information and Communication Technology	2,388 (1%)	70 (2%)	34
Social Capital	1,847 (1%)	48 (1%)	38
Finance and Financial Services	1,626 (1%)	62 (2%)	26
Other industries	2,600 (1%)	59 (1%)	44
Total Occupied	**153,247 (84%)**	**4,009**	**38**
Vacant Floor Space	29,924 (16%)		
Total Employment Floor Space	**183,171**		

Source: Oxford Street Floorspace Supply and Demand Study, SGS Economics & Planning, 2021

2.1.3 Planning proposal

The Oxford Street Cultural and Creative Planning Proposal is for an alternative set of planning controls to deliver 42,500 m^2 of new employment floor space including 11,300 m^2 with a creative and cultural purpose. The planning proposal would increase the Floor Space Ratio (FSR) and/or height of specific sites within the precinct, provided that 10 per cent of the total Gross Floor Area (GFA) of a building is provided with a cultural and creative purpose and meets other requirements such as heritage. It also proposes to activate basements and laneways within the precinct.

For the purpose of this assessment, the indicative forecasted breakdown of future land uses in the precinct is shown in Table 2.2 below and the Cultural and Creative uses further broken down in Table 2.3. However, it should be noted that changes in floor space and land use are subject to individual development application assessments. The definition of the different Cultural and Creative uses and spatial requirement are included in the City's Draft DCP, reproduced in Appendix A.

Table 2.2 Forecasted land use increase

Land use	Floor space	Proportion %
Office	7,176	17%
Retail	5,304	12%
Food and drink	7,800	18%
Hotel	4,680	11%
Entertainment	1,560	4%
Light industry	1,560	4%
Community, health and education	3,120	7%
Cultural and Creative	11,300	27%
Total	**42,500**	**100%**

Source: City of Sydney supplied information

Table 2.3 Forecasted cultural and creative land use

Cultural and creative land use	Floor space	Proportion %
Gallery (small)	1,130	10%
Gallery (medium)	565	5%
Gallery (large)	565	5%
Studio (messy)	1,130	10%
Studio (generic)	1,130	10%
Workshop	2,260	20%
Live music venue	2,260	20%
Theatre, cinema	2,260	20%
Total	**11,300**	**100%**

Source: City of Sydney supplied information

To estimate the increase in the number of people working and visiting the area, the employment per floor space area collected in the City of Sydney's Floor Space and Employment Survey in 2017 has been applied to the forecasted increase in floor area. As depicted in Table 2.4, this is estimated to result in an additional 1,392 people working in the precinct, the majority of which (496 jobs) would be in the creative industries.

Table 2.4 Indicative job growth with planning proposal

City based industry	2017 floor space (m^2) & percentage to total	Floor space to jobs ratio	Planning proposal increase (%)	New jobs created
Higher Education and Research	50,664 (28%)	86	2,000 (4%)	23
Tourist Cultural and Leisure	26,875 (15%)	51	6,240 (23%)	121
Government	24,794 (14%)	19	5,476 (22%)	283
Food and Drink	13,658 (7%)	38	7,800 (57%)	203
Retail and Personal	13,134 (7%)	46	5,304 (40%)	115
Creative Industries	9,268 (5%)	23	11,300 (122%)	496
Professional and Business Services	3,683 (2%)	14	813 (22%)	59
Health	2,710 (1%)	47	1,120 (41%)	24
ICT	2,388 (1%)	34	527 (22%)	15
Social Capital	1,847 (1%)	38	648 (35%)	17
Finance and Financial	1,626 (1%)	26	359 (22%)	14
Other industries	2,600 (1%)	44	912 (35%)	21
Total	**153,247 (84%)**		**42,500 (28%)**	**1,392**

2.2 Sub-precincts

The Oxford Street Cultural and Creative Precinct Planning Proposal divides the precinct into four sub-precincts, based on their land use and heritage characters. The *Urban Design Study* (Studio Hollenstein, 2021) has divided this further into 15 blocks to understand their unique characteristics and built form attributes.

For the purpose of this transport study, the precinct has been divided into four sub-precincts in line with the Planning Proposal. This enables an examination into the likely distribution of new jobs along the precinct, and impact to accessibility and serviceability due to the potential floor space increases.

The sub-precincts are shown in Figure 2.2 below. For reference, the boundary of the 15 blocks assessed in the Urban Design Study are also included in the figure.

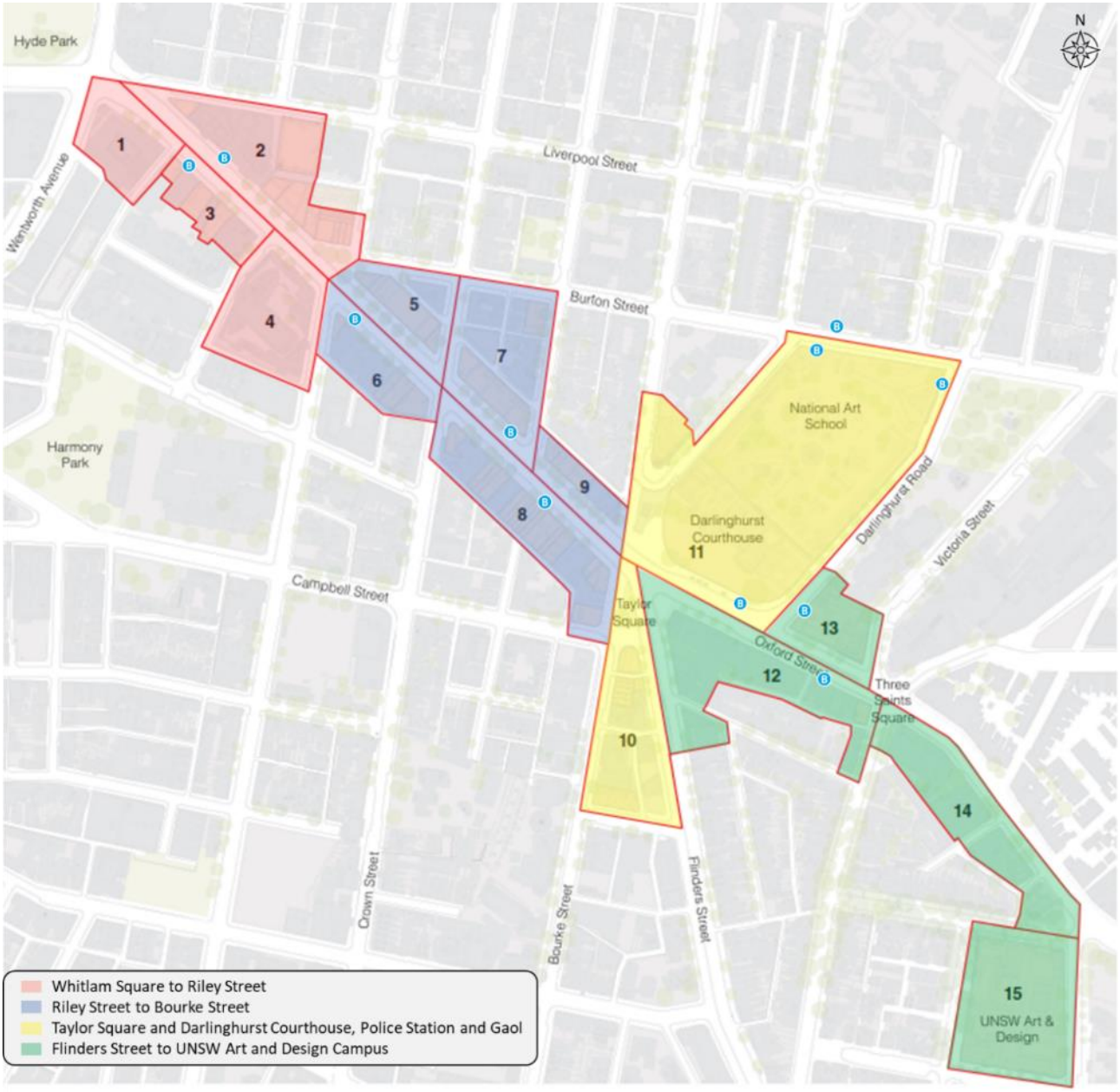


Figure 2.2 Oxford Street Cultural and Creative sub-precincts

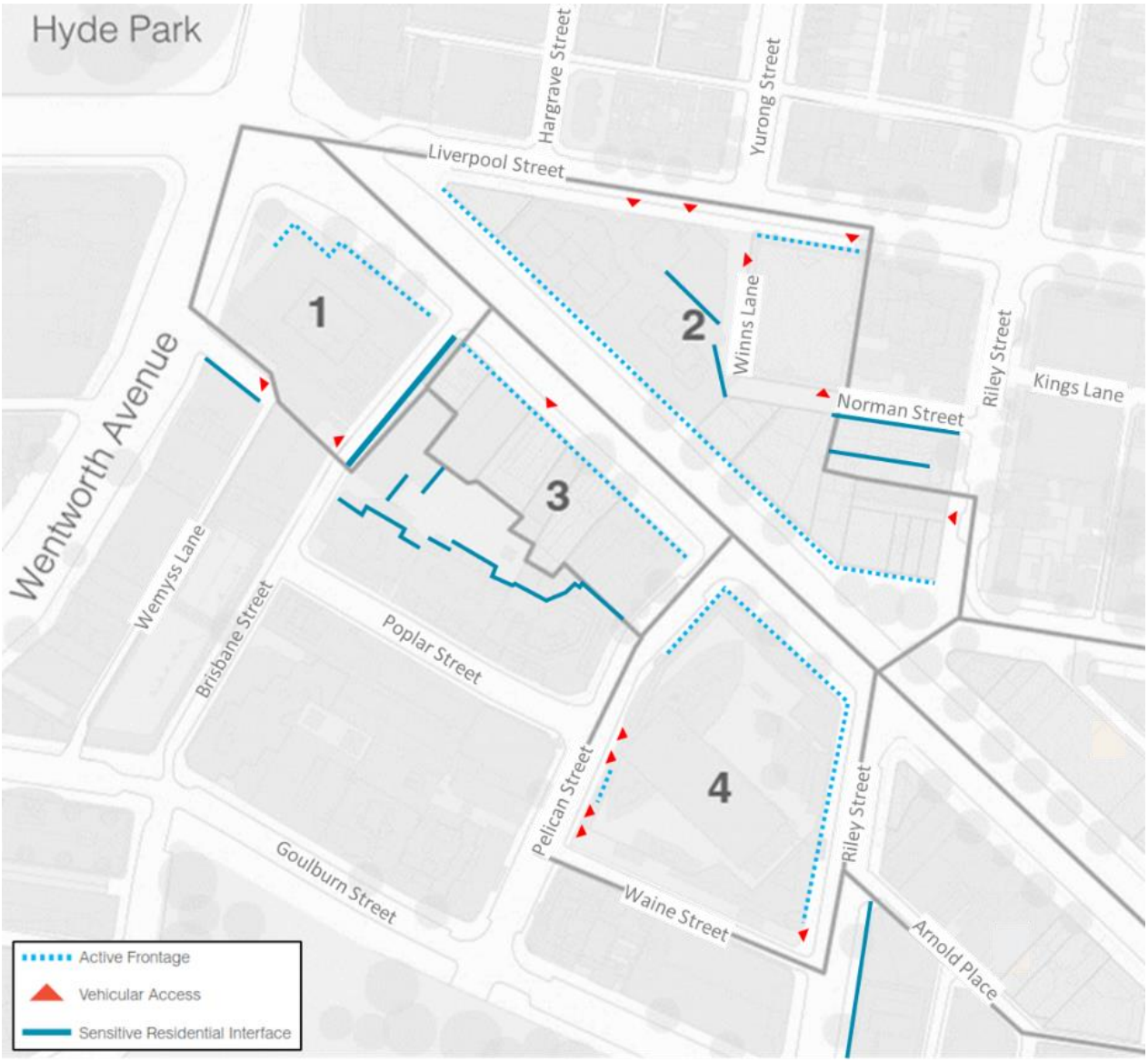
2.2.1 Whitlam Square to Riley Street

The section of Oxford Street between Hyde Park and Riley Street provides the gateway entry and exit to the precinct. Located closest to the CBD this sub-precinct has a more contemporary built form with building heights ranging from 2–3 to 24 storeys.

Key elements of the sub-precinct include:

- Burdekin Hotel, which is a heritage listed hotel on the north side of Oxford Street on the corner of Liverpool Street immediately adjacent to apartment towers
- Oxford Village is a shopping centre occupying most of the southern block between Pelican Street and Riley Street
- Oxford Square is a public open space located on two levels at the intersection of Riley and Burton Streets comprising an area up to 1,100 m^2 up to the edge of the sidewalks surrounded by heritage listed buildings.

Active frontages to this precinct are located mainly along Oxford Street. Vehicular accesses for servicing and off-street parking of developments are mainly accessed through the rear lanes or side streets abutting Oxford Street. The exception being property number 21–35 Oxford Street, which is accessed via Oxford Street.

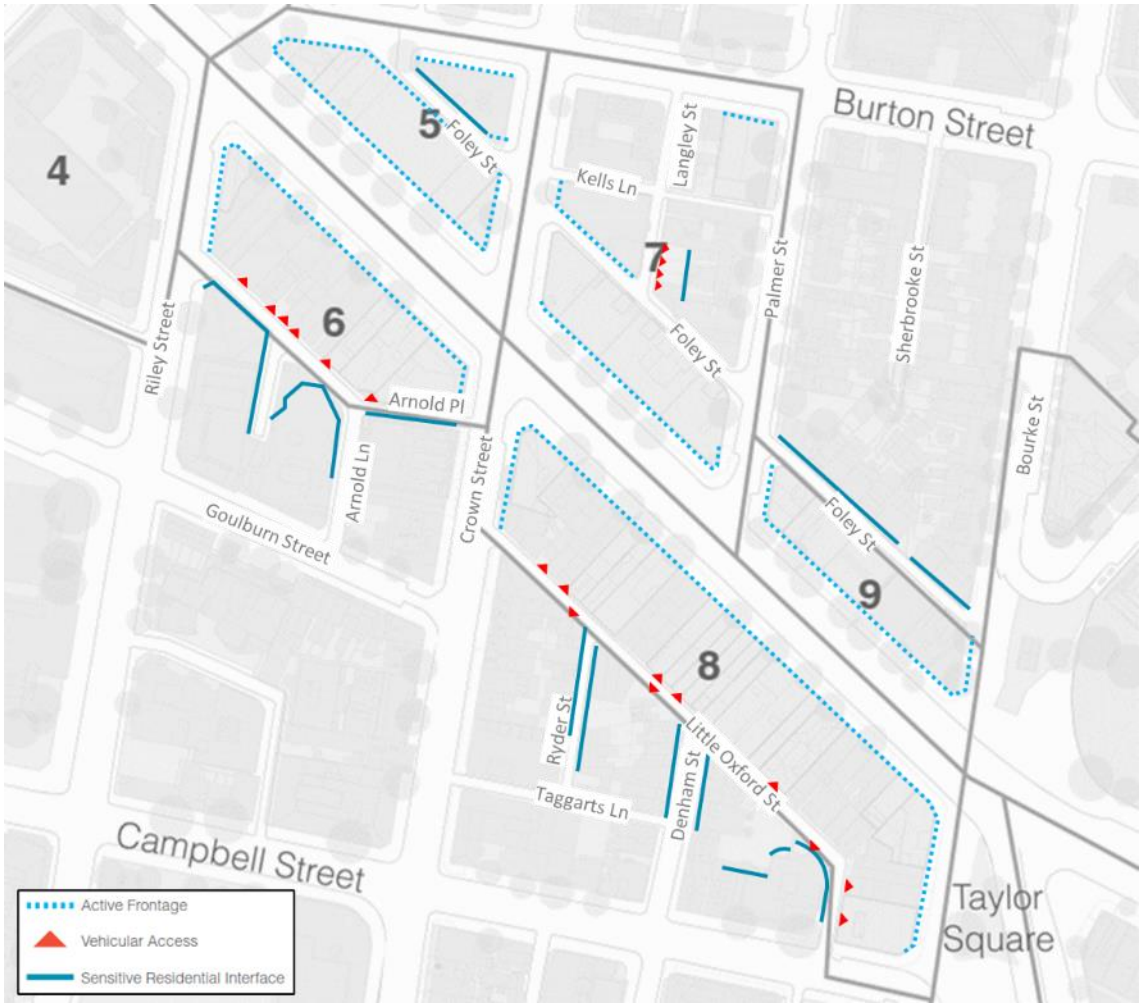


Source: Urban Design Study (Studio Hollenstein, 2021)

Figure 2.3 Whitlam Square to Riley Street

2.2.2 Riley Street to Bourke Street

The sub-precinct between Riley and Bourke Streets generally consists of low-rise development which include a significant number of (14 in total) heritage listed buildings. The southern block from Crown to Bourke Street is the longest in the precinct. Three blocks of the north side of the precinct are occupied by large three storey commercial buildings. As depicted in Figure 2.3, the precinct's active shopfronts are typically located along Oxford Street and spills over to the abutting side streets. Vehicular accesses are typically accessed from the rear laneways.



Source: Urban Design Study (Studio Hollenstein, 2021)

Figure 2.4 Riley Street to Bourke Street

This sub-precinct includes the following laneways:

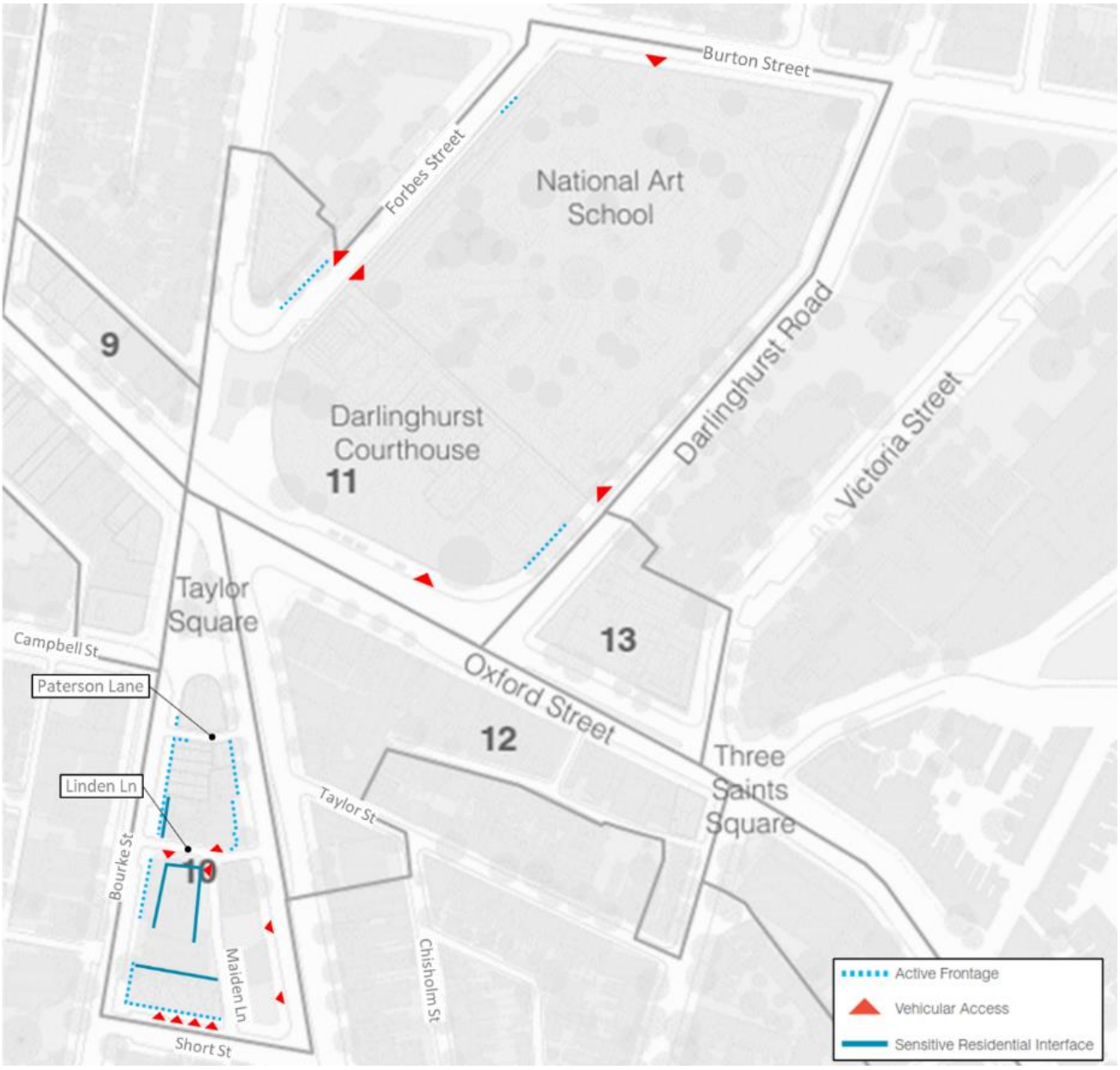
- **Arnold Place**, a 6 m and 4.5 m laneway which runs the length of the rear of south block between Crown Street and Riley Street. It provides servicing and access only.
- **Little Oxford Street**, a 5 m wide lane to the rear of the south block between Crown Street and Taylor Square which is accessed from Campbell Street. It intersects with Ryder and Denham Streets, an area of small-scale residential terraces. This laneway provides servicing and access only.
- **Foley Street** is a westbound laneway which spans three northern blocks parallel to Oxford Street between Burton Street to Crown Street, Palmer Streets, and onto Forbes Street. Foley Street is an activated laneway between Burton Street to Crown Street. The remainder of Foley Street is a laneway which provides access and servicing only.
- **Kells Lane** and **Langley Street** are narrow lanes off Crown, Palmer and Burton Streets measuring 4 m, 6 m, and 5 m, respectively.

2.2.3 *Taylor Square, Darlinghurst Courthouse, former Police Station and Gaol*

Taylor Square at the centre of the cultural and creative precinct is a 1,300 m^2 triangular shaped open space, bordered by Flinders Street, Bourke Street, Oxford Street and surrounding heritage buildings. The Oxford Hotel, Darlinghurst Courthouse and former Police Station is located to the north of Taylor Square. To the north of Courthouse, is the former Darlinghurst Gaol which is currently used as the National Art School (NAS).

As shown in Figure 2.5, developments at Taylor Square typically have active frontage along Bourke Street and Flinders Street with servicing through the rear laneways. The site 23–47 Flinders Street between Linden Lane and Short Street is currently under construction with truck access via Flinders Street.

Developments north of Oxford Street, including the former police station and gaol site are typically surrounded by a heritage sandstone wall which limits the active frontage. Vehicle access are available through the side streets such as Darlinghurst Road, Burton Street and Forbes Street.



Source: Urban Design Study (Studio Hollenstein, 2021)

Figure 2.5 Taylor Square, Darlinghurst Courthouse, former Police Station and Gaol

Education facilities such as the NAS and the UNSW School of Art and Design are key to the precinct and to encourage more creativity and innovation in the area. The NAS, which will be subject to a separate development application would seek for two amendments:

1 An amendment to seek additional entertainment facilities, community facilities, function centres, offices, information and education facilities, market retail, recreation area, filming, shops and food and drink premises on the basis that it only supports the educational use and cultural and creative activity on the site only.

2 An amendment to the existing FSR increasing it from 0.9:1 to 1:1. This minor increase in FSR will increase the permissible floor space on the site from 18,200 to 20,256 m^2.

2.2.4 *Flinders Street to UNSW Art and Design Campus*

This sub-precinct holds a number of prominent heritage sites including The Sacred Heart Catholic Church, the Benedict XVI Medical Library, the former Olympia Theatre (at Verona Street) and the Beacham Hotel. The remainder of the sub-precinct comprises a mix of two-storey heritage and modern commercial terraces, and a small number of three storey buildings.

The blocks east of South Dowling Street are generally two-three storeys in height and front commercial properties in the Woollahra LGA to the north. A service station and the UNSW Art and Design Campus are located at the eastern most end of the precinct on Greens Road.

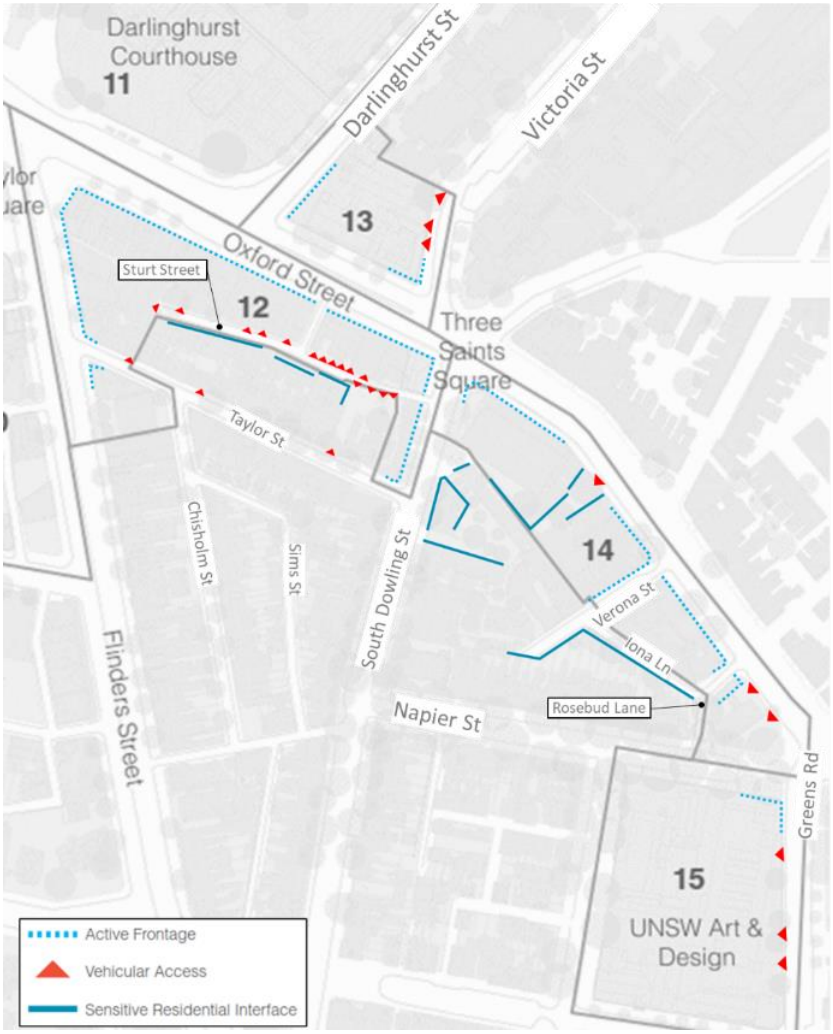
As shown in Figure 2.6, this sub-precinct includes the following laneways where access and servicing of developments are typically carried out from:

— **Sturt Street** is an approximately 5 m wide laneway located to the rear of commercial premises along the southern kerbside of Oxford Street. This laneway is also used to provide access to 23 two-storey residential terraces permitting on-street parking.

— **Iona Lane** is a 6.2 m laneway which connects Rosebud lane and Verona Street behind the block containing the Arts Hotel and Berkelouw Books.

— **Rosebud Lane** is a 7 m laneway runs between the Shamrock and Thistle Hotel at 19-–Oxford Street and the Service Station at 59 Oxford Street Paddington.

— **Verona Street** is a 9 m access road into the block with through no through access.



Source: Urban Design Study (Studio Hollenstein, 2021)

Figure 2.6 Flinders Street to UNSW Art and Design Campus

2.2.5 Jobs distribution

The location of potential additional floor space has been further analysed by the City of Sydney based on opportunities following investigations including on urban design and heritage studies among others. The distribution of an additional 1,392 jobs across the precinct has been estimated based on the potential additional floor space, which is detailed in Table 2.5.

The sub-precinct between Riley Street to Bourke Street and Flinders Street to UNSW Art and Design Campus would have the most potential for increased floor space and consequently job creation.

Table 2.5 Additional jobs by sub-precinct

Sub-precinct	Block no.	Additional floorspace (m^2)	Additional Jobs	By sub-precinct
Whitlam Square to Riley Street	1	0	0	236
	2	3,950	129	
	3	3,254	107	
	4	0	0	
Riley Street to Bourke Street	5	2,480	81	601
	6	3,731	122	
	7	2,809	92	
	8	7,630	250	
	9	1,700	56	
Taylor Square and Courthouse, Police Station and Gaol	10	383	13	13
	11	0	0	
Flinders Street to UNSW Art and Design Campus	12	6,376	209	542
	13	0	0	
	14	10,187	333	
	15	0	0	
Total		42,500	1,392	1,392

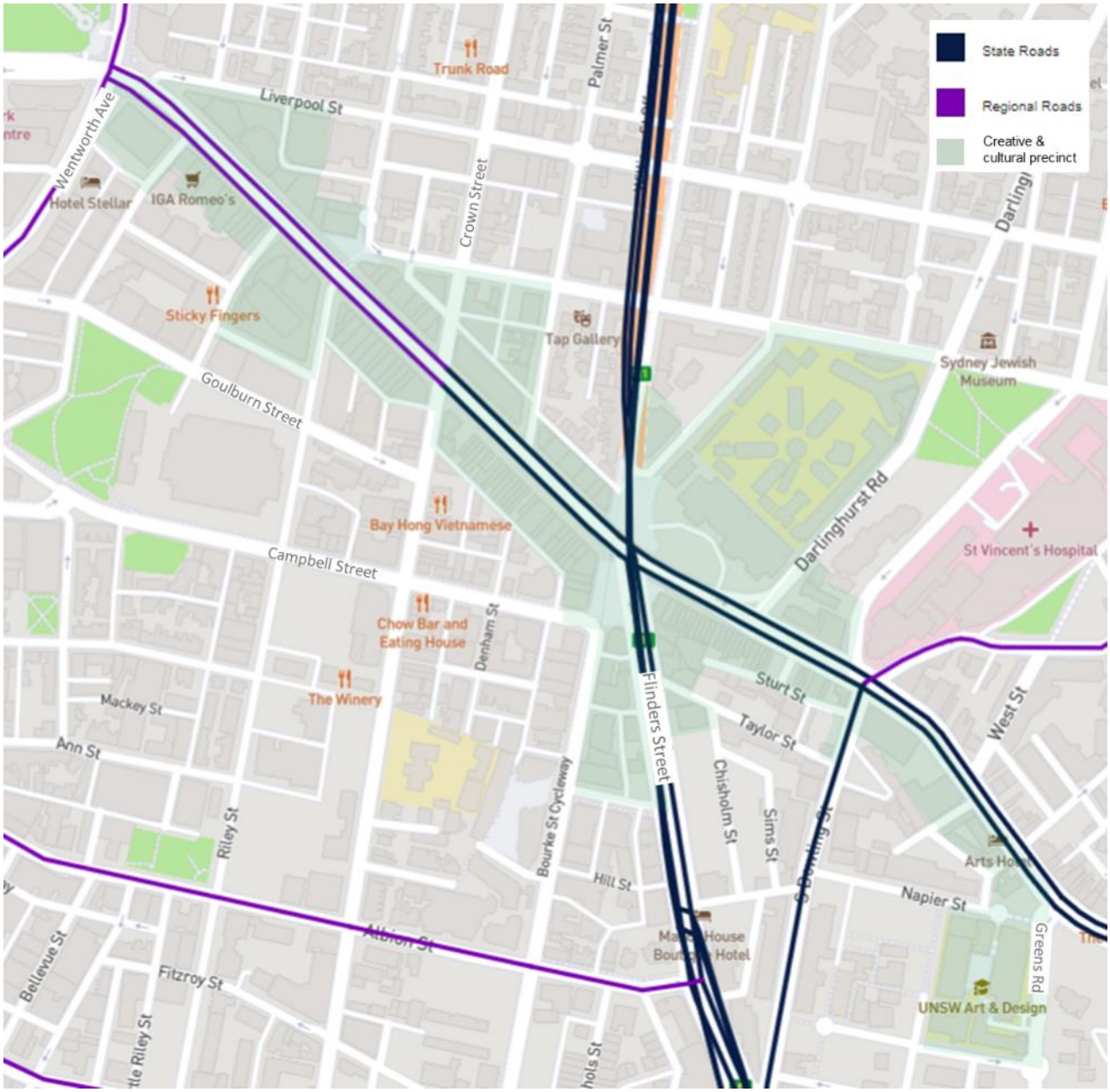
Source: City of Sydney supplied information

3 Existing conditions

3.1 Existing facilities

3.1.1 Road classification

The Oxford Street Cultural and Creative Precinct centres around Oxford Street between the intersection of Wentworth Avenue/College Street/Liverpool Street and Green Street. The classification of the road network in the study area is shown in Figure 3.1 depicting that Oxford Street is both a regional road (between Wentworth Avenue to Crown Street) and a State Road (east of Crown Street). Other State Roads in the study area include Flinders Street, the Eastern Distributor Tunnel and South Dowling Street.



Source: NSW Road Network Classifications (Transport for NSW, 2022)

Figure 3.1 Road network classifications in study area

3.1.2 Oxford Street

Oxford Street is a direct east-west travel route between Bondi Junction and Sydney CBD. Within the study area, Oxford Street is predominantly a six-lane, two-way road which includes bus lanes running on both the eastbound and westbound kerbside lanes of the corridor (see Figure 3.2).

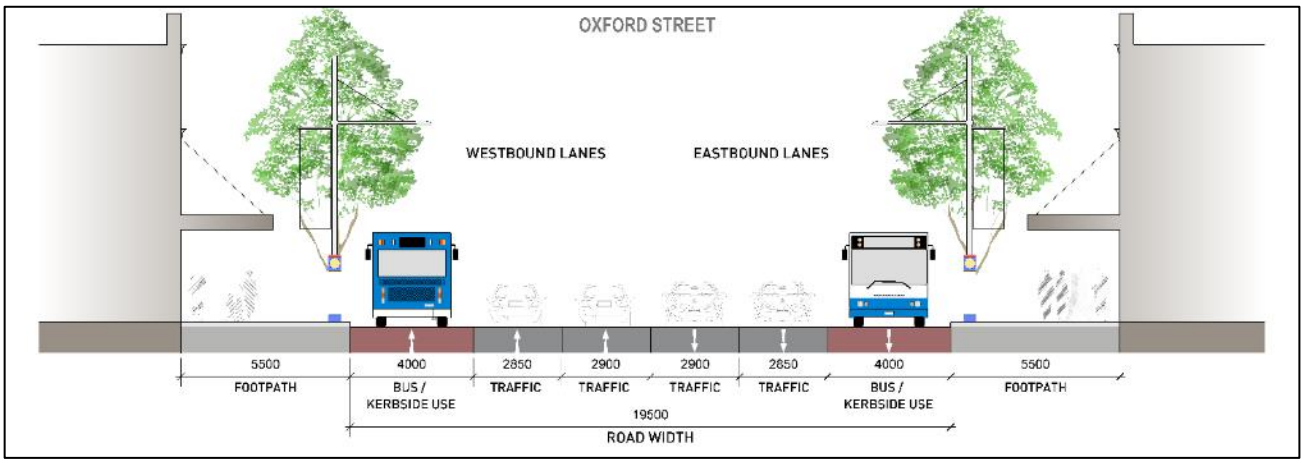


Figure 3.2 Oxford Street typical existing road width and features

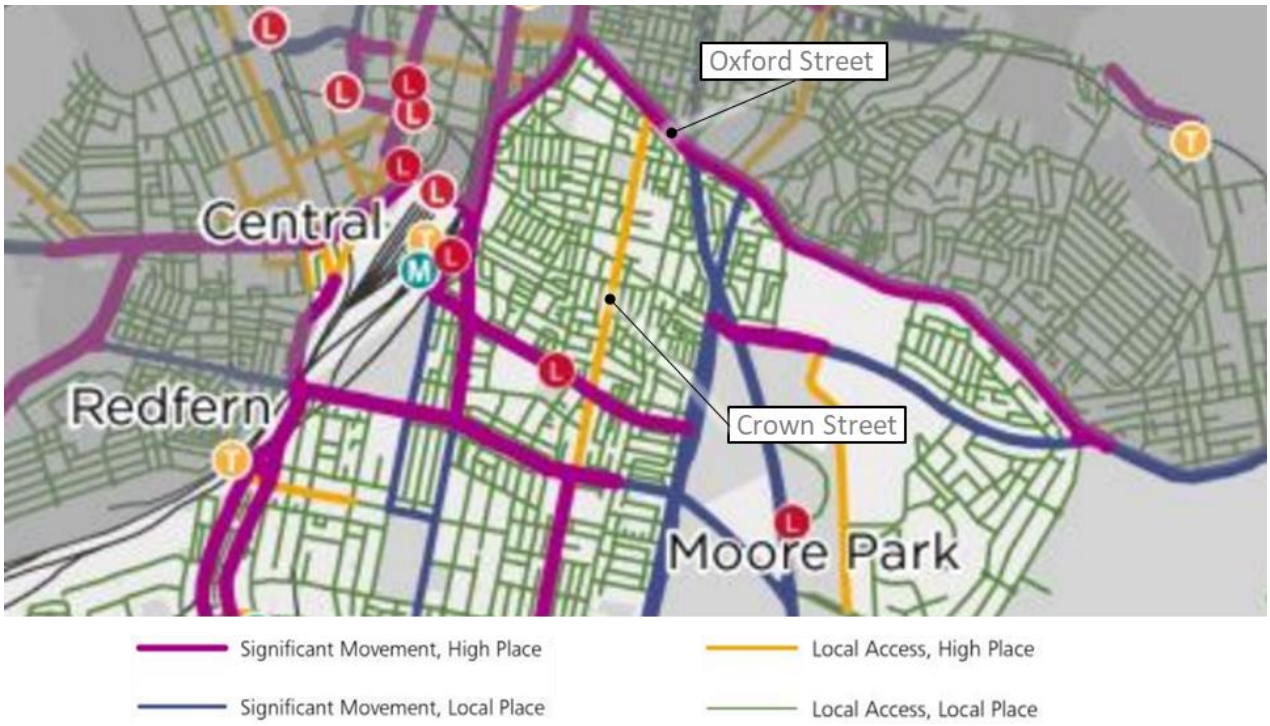
Given its direct travel route to Sydney CBD, Oxford Street functions as a trunk public transport route and has high demand for pedestrians and cyclists. The existing transport demand on Oxford Street is further discussed in section 3.2.

There are currently existing turning restrictions into and out of Oxford Street which includes:

- No right turn from College Street (north) to Liverpool Street (west). Liverpool Street is an extension of Oxford Street to the west of College Street/Wentworth Avenue.
- Oxford Street eastbound (i.e. west approach) – No right turn restrictions apply to abutting streets to the south, which includes Riley Street, Crown Street and South Dowling Street. Right turns from Oxford Street eastbound are currently allowed into Wentworth Avenue, Flinders Street and Greens Road. However, auxiliary (separated) right turn lanes are only available at turns into Wentworth Avenue and Flinders Street.
- Oxford Street westbound (i.e. east approach) – No right turn restrictions apply to abutting streets to the north, which includes Crown Street, Palmer Street, Barcom Avenue, Palmer Street and Crown Street. Right turns from Oxford Street westbound are currently permitted into Darlinghurst Road and College Street.
- The following turning restrictions out of the abutting side streets also apply:
  - Right turn movement out of Crown Street north to Oxford Street west
  - Right turn movement out of Palmer Street north to Oxford Street west
  - Right turn movement out of Flinders Street south to Oxford Street east.

In terms of **Movement and Place** function, the *South East Sydney Transport Strategy* (Transport for NSW, 2020) developed for the south-east Sydney region as part of Future Transport 2056 envisions Oxford Street as a Main Street corridor with significant movement and high place function – refer to Figure 3.3.

It is considered a corridor with significant movement as it is a trunk public transport route connecting metropolitan and strategic centre in Sydney CBD and Bondi Junction respectively. It is considered a high-place corridor due to the activity it creates for people, the physical form and its values to people. This includes the significant presence of heritage buildings on Oxford Street and the importance of the place to the local residents, including as a creative and cultural precinct.



Source: South East Sydney Transport Strategy, 2020

Figure 3.3 Movement and place function

3.1.2.1 Oxford Street west cycleway

Through its *Cycling Strategy and Action Plan*, 2018, the City of Sydney has committed to improve cycling and public transport along Liverpool Street and Oxford Street between Castlereagh Street and Flinders Street.

Aligned with the action plan's objectives, this project aims to connect the network, make cycling more accessible and comfortable for everyone (including for 12-year-old children) to cycle, support businesses and lead by example. The cycleway on this important corridor includes a number of key features including:

- New 1.7 kilometres separated bi-directional cycleway proposed along the northern kerbside of Oxford Street and Liverpool Street.
- New bus boarding islands of approximately 2.5 metres wide with bus shelter, pedestrian lane marking connections, kerb connections, and garden bed.
- Modified kerb returns to suit turning movements support operational function of the road network.
- Modified turn restrictions.
- Relocate the existing eastbound bus stop on Liverpool Street near Museum Station to Elizabeth Street.

This project has been exhibited to the public, gained in-principle support from Transport for NSW and local communities, and has now progressed to the detailed design stage.

The City and Transport for NSW are also investigating the extension of the cycleway east of Flinders Street to Centennial Park.

Figure 3.4 and Figure 3.5 depicts the proposed cross sections of Oxford Street with the cycleway at a typical cross section and where a floating bus stop is required.

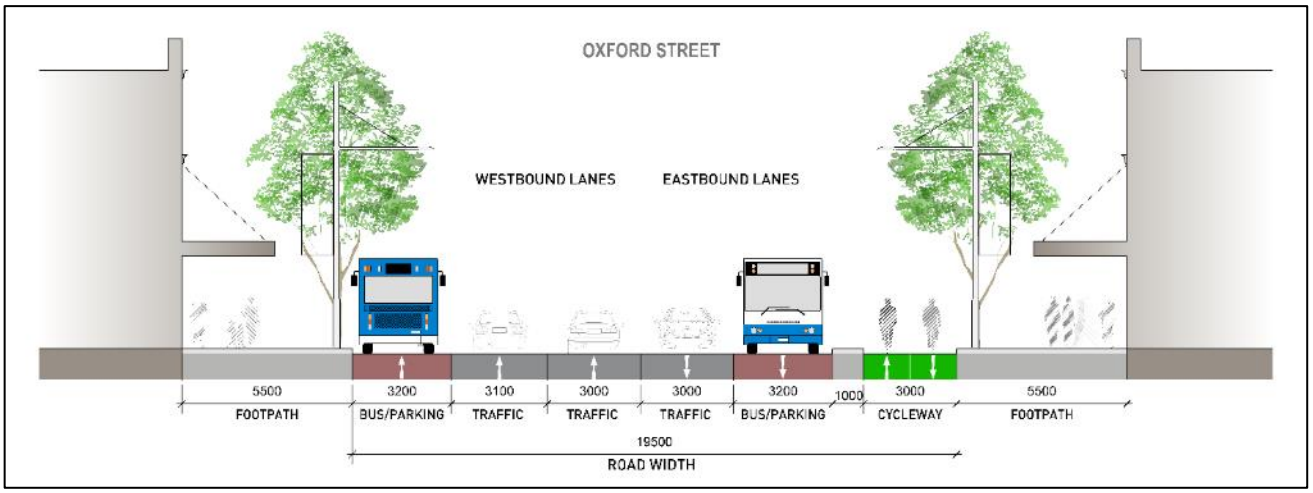


Figure 3.4 Oxford Street typical proposed road width and features

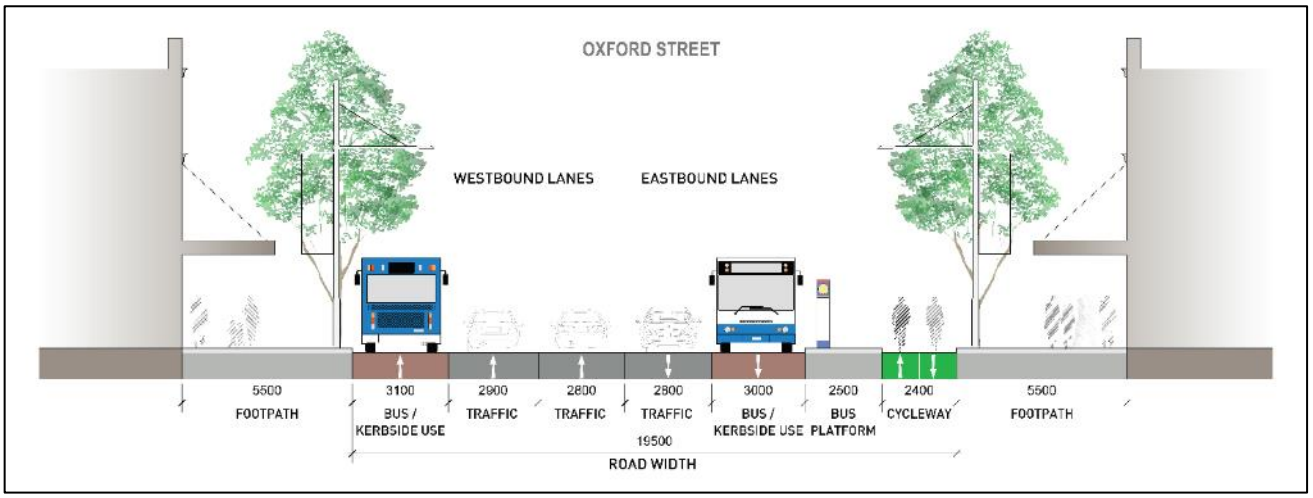


Figure 3.5 Oxford Street typical proposed road width at bus floating bus stops

Access changes

To enable the installation of a separated bi-directional cycleway along the northern kerbside, the design included a review of currently permitted vehicle turning movements along the corridor. The impacts to local accesses include removal of the traffic movements listed below:

- Right turn from Liverpool Street (west) to Wentworth Avenue (south)
- Left turn from Liverpool Street (west) to College Street (north)
- Left turn from Oxford Street to 'little' Liverpool Street (east of College Street)
- Left turn from Oxford Street into Palmer Street.

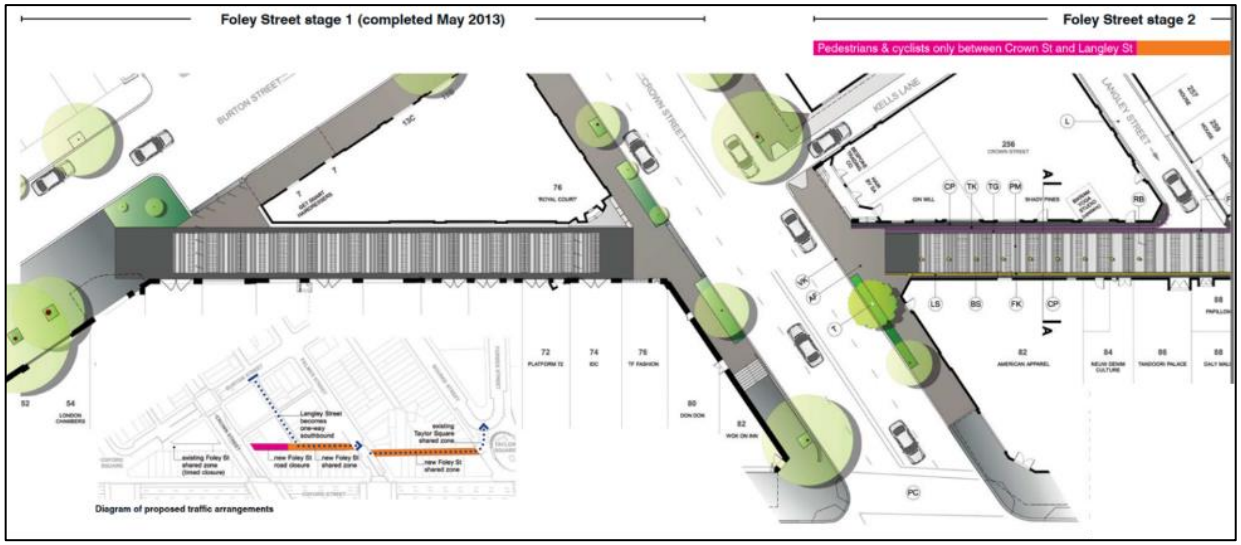
3.1.3 Foley Street upgrade

As part of the Oxford Street Cultural Quarter and to achieve the Sustainable Sydney 2030 vision for a cultural and creative city, the City has committed to upgrading Foley Street in Darlinghurst, a one-way eastbound laneway to the north of Oxford Street which runs between Crown Street and Taylor Square.

The upgrade will enhance safety for pedestrians and encourage new local businesses in the laneway. The laneway is currently used by vehicles for off-street parking, loading and garbage removal. The upgrade would close Foley Street between Crown Street and Langley Street and create a shared zone from Langley Street to Taylor Square. Access will be maintained for delivery and service vehicles and pedestrians. Other changes associated with the proposal include:

- Making Langley Street a one-way southbound only
- Raising the Foley Street pavement to the footpath level
- Continuous footpath treatment across Foley at Crown Street and Palmer Street
- Widen the footpath on Palmer Street to minimise crossing distance
- Install bollards and energy efficient LED along Foley Street
- Landscaping on Crown Street and Palmer Street footpaths
- Moving overhead power lines underground.

The Foley Street concept design has been publicly exhibited and is shown in Figure 3.6.



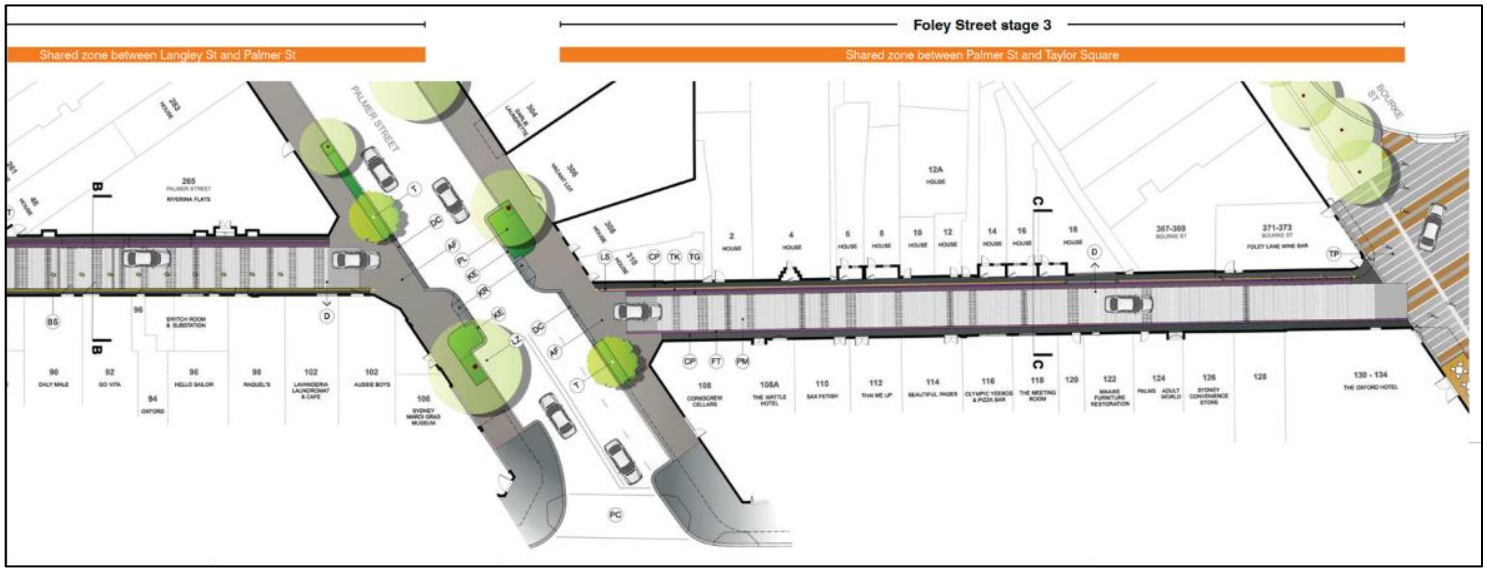


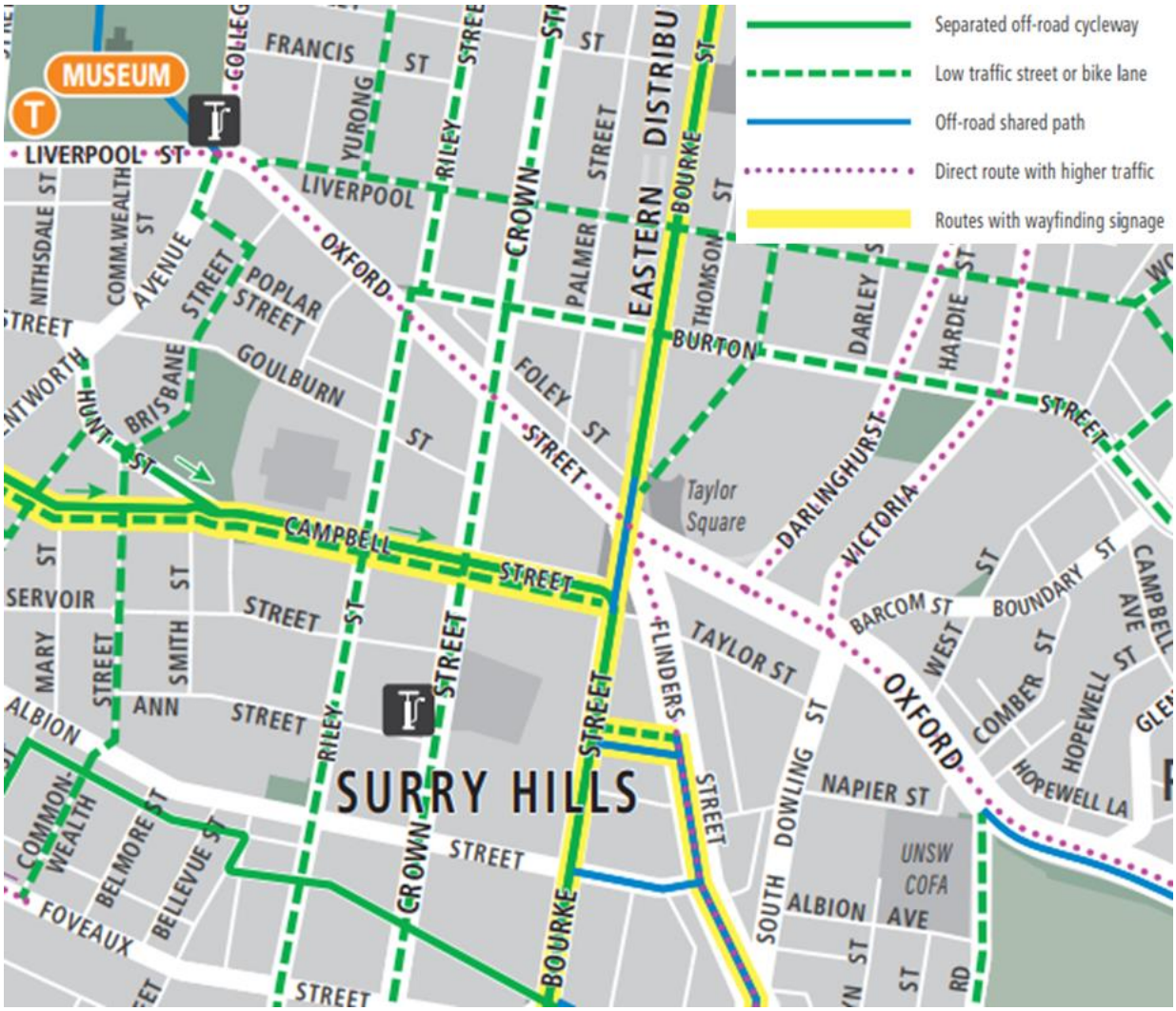
Figure 3.6 Foley Street concept design

3.1.4 *Active transport*

The proposed Cultural and Creative Precinct is surrounded by good, separated cycling infrastructure and low trafficked streets that are bicycle friendly.

As shown in Figure 3.7, separated cycleways are currently available on Bourke Street and Campbell Street. In addition there are numerous streets which incorporate either on-road line and pavement marking to indicate the presence of cyclists on the road network or bike lanes. The treatment are a mix of bicycle shoulder or mixed traffic condition. This is available on Liverpool Street (east of Oxford Street), Yurong Street, Riley Street, Crown Street, Palmer Street, Burton Street, Forbes Street, Brisbane Street and Greens Road.

In addition to the existing bicycle network, committed separated cycleway works are being planned on College Street and Oxford Street and its continuation to Liverpool Street. Currently, cyclists travel in mixed traffic conditions on either general traffic lanes or bus lanes.



Source: Sydney cycling map (City of Sydney, 2020)

Figure 3.7 Existing cycling infrastructure on Oxford Street and surrounds

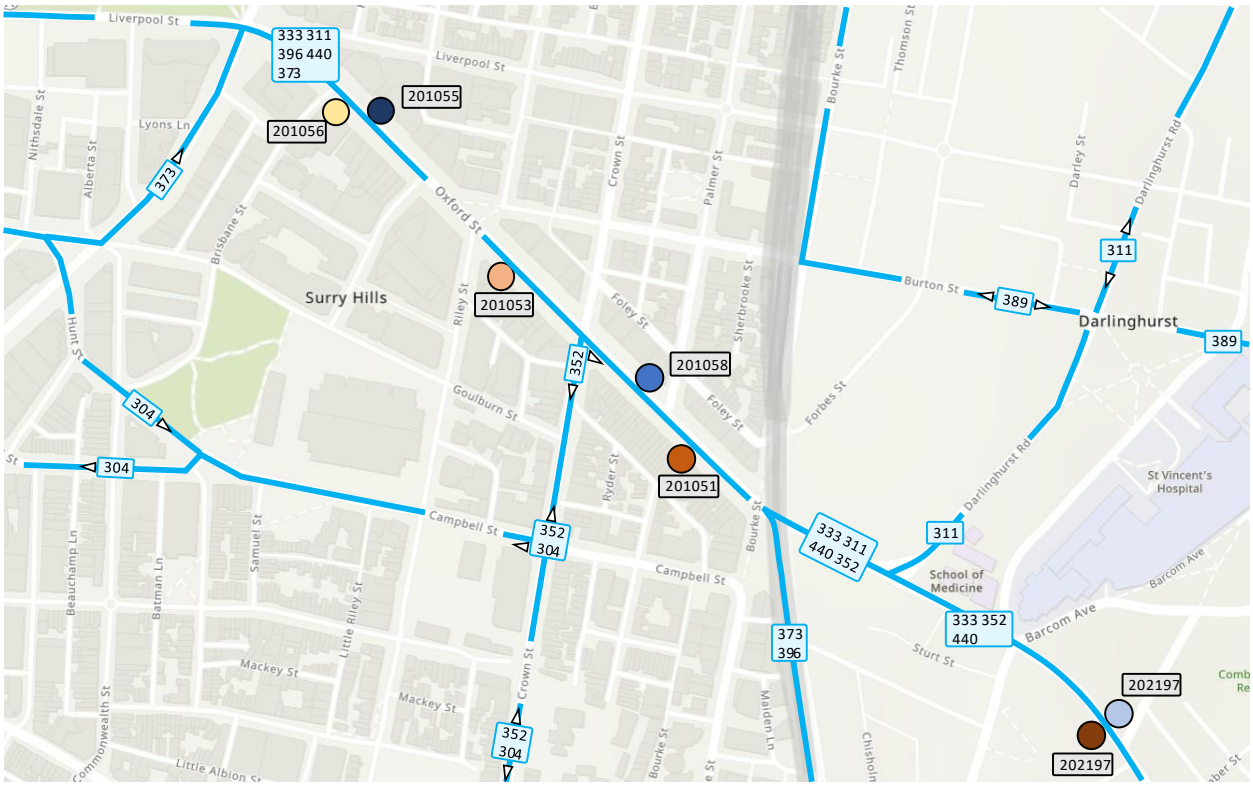
For people walking in the study area, paved footpaths, designated pedestrian crossing points and road narrowing at intersections are observed on the network to make the walking environment accessible, safe and convenient.

Anecdotal observations during a site visit however, indicate the need to consider increased activation and continuous footpath treatments at laneways to provide a more enjoyable walking environment that provides an experience for people.

3.1.5 Bus operations

The study area is well serviced by public buses, particularly with Oxford Street being a trunk route, providing direct routes to/from the Sydney CBD and south-eastern suburbs. The timetable of bus services along Oxford Street was reviewed by Transport for NSW in December 2021. As part of the review, Oxford Street was maintained as a high-frequency route albeit some reduction in overall bus volumes. Some routes however would see increased frequencies. According to Transport for NW's timetables, bus stops located west of Flinders Street can expect buses to arrive every 2–3 minutes, and up to 5–7 minutes east of Flinders Street. The current services are listed and depicted in Table 3.1.

Table 3.1 Bus services within study area



Number	Route
304	City Circular Quay to Green Square (Loop Service)
311	Central Belmore Park to City Millers Point via Darlinghurst and Potts Point
333	North Bondi to City Circular Quay via Bondi Junction
352	Marrickville Metro to Bondi Junction via Oxford Street, Crown Street and King Street
373	Coogee to City Museum (Loop Service)
389	Bondi Junction to Pyrmont
396	Maroubra Beach to City Circular Quay
440	Bondi Junction to Rozelle

3.1.6 Kerbside uses

Several parking restrictions exist along Oxford Street and serve a variety of purposes (e.g. taxi, bus, loading, and mail zones). The kerbside uses are shown in Figure 3.8. Additionally, the local roads in the study area generally serve as time-restricted parking, with allowances for residents to obtain permits to be exempt from these time restrictions in residential areas. Many of these parking areas are ticketed.

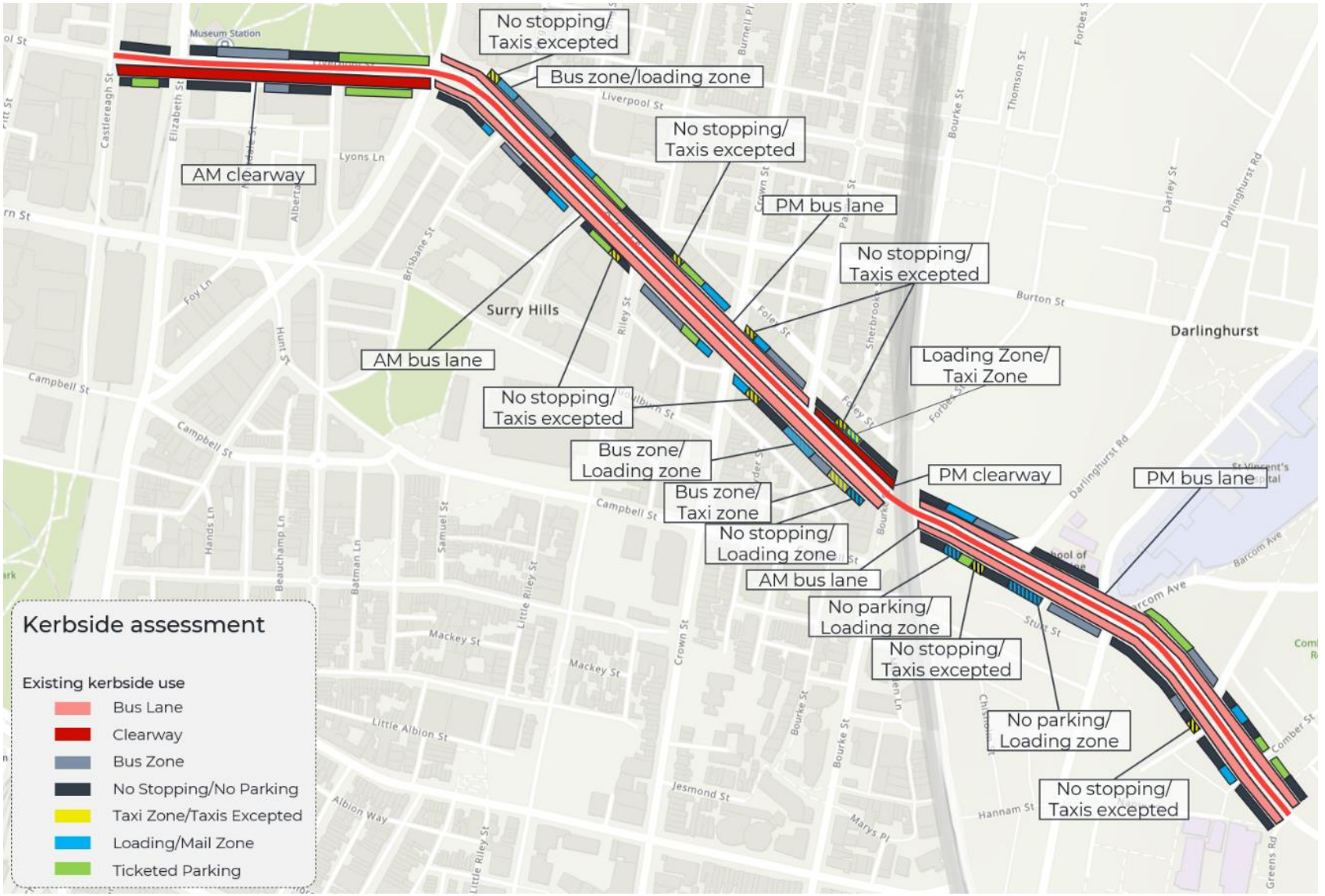


Figure 3.8 Existing parking restrictions on Oxford Street

3.2 Oxford Street travel demand

3.2.1 Existing travel demand

This section describes the existing travel demand along the Oxford Street corridor on a typical weekday and Saturday pre-COVID-19 pandemic which were based of intersection counts undertaken in 2019 and Opal ticketing data from September 2017 which were undertaken by the City of Sydney for the feasibility of the Oxford Street cycleway project.

The dates of the data collection are shown in Table 3.2. The differences in data collection dates for Oxford Street corridor east of Flinders Street compared to the west was due to the different staging for the Oxford Street cycleway project.

Table 3.2 Date of data collected

Intersection	Weekday data	Saturday data
Oxford Street/Riley Street	9 May 2019	11 May 2019
Oxford Street/Crown Street	9 May 2019	11 May 2019
Oxford Street/Palmer Street	9 May 2019	18 May 2019
Oxford Street/Flinders Street	5 November 2019	2 November 2019
Oxford Street/South Dowling Street	5 November 2019	2 November 2019
Oxford Street/Greens Road	5 November 2019	2 November 2019

The peak periods of the road network were found to be between 7.45–8.45 am for the morning peak, 11.15 am–12.15 pm for mid-day peak and 5.15–6.15 pm for the afternoon peak.

The following assumptions are made to estimate the number of people travelling on the corridor from the intersection counts undertaken:

- **Light vehicle occupancy**: 1.26 people per vehicle based on the *TfNSW Household Travel Survey* 2018/19.
- **Heavy vehicles** and **bicycles** consist of one person per vehicle.
- **Bus patronage** from Opal data collected in September 2017 increased based on the increase recorded in TfNSW public transport patronage data up to May and November 2019, by +23.1 per cent and +16.8 per cent respectively. This equated to approximately 23 passengers per bus, with approximately 24 passengers per bus on weekdays and approximately 22 passengers per bus on weekends.

This data was collected prior to the COVID-19 outbreak, thus representing the typical conditions pre-pandemic. Changes in people's travel needs and behaviours to work and leisure were observed since then with various regulations introduced during the pandemic (e.g. mandated stay-at-home restrictions and social distance measures). This was particularly observed in the cycling activity on Oxford Street as discussed in section 3.2.2 below.

Figure 3.9, Figure 3.10 and Figure 3.11 below captures the respective AM peak (7.45–8.45 am), PM peak (5.15–6.15 pm) and weekend peak (12.45–1.45 pm) of the travel demands at the eastern approach of intersections along Oxford Street. The graph shows that there is approximately an equal split of people being transported in light vehicles and buses during weekdays, while more people being moved by car traffic is observed on weekends. Cyclists make up approximately 2–7 per cent of the total transport demand on weekdays, however a lower proportion on weekends. There is a moderate volume of pedestrian movement throughout all assessed periods.

Demand during the PM peak is highest, reaching up to 8,500 people present on the road corridor. While the weekend peak is lowest with up to 5,500 people present on the road corridor. The graphs also shows that Flinders Street is a key corridor, with the number of people on Oxford Street east of Flinders Street being significantly less than those west of Flinders Street.

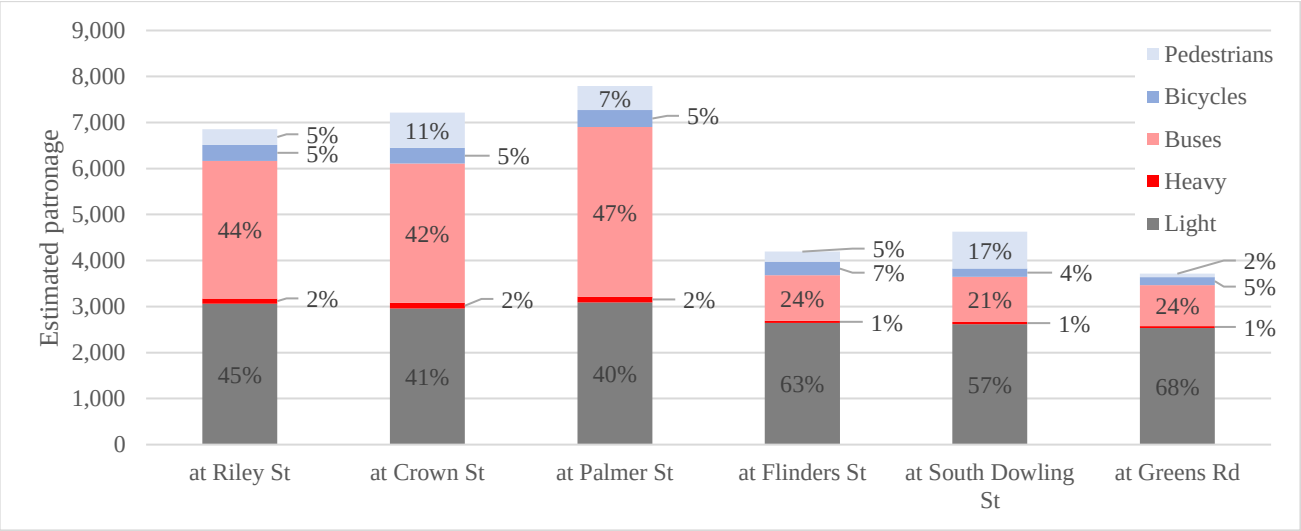


Figure 3.9 Mode share by intersection during the weekday AM peak (7.45–8.45 am)

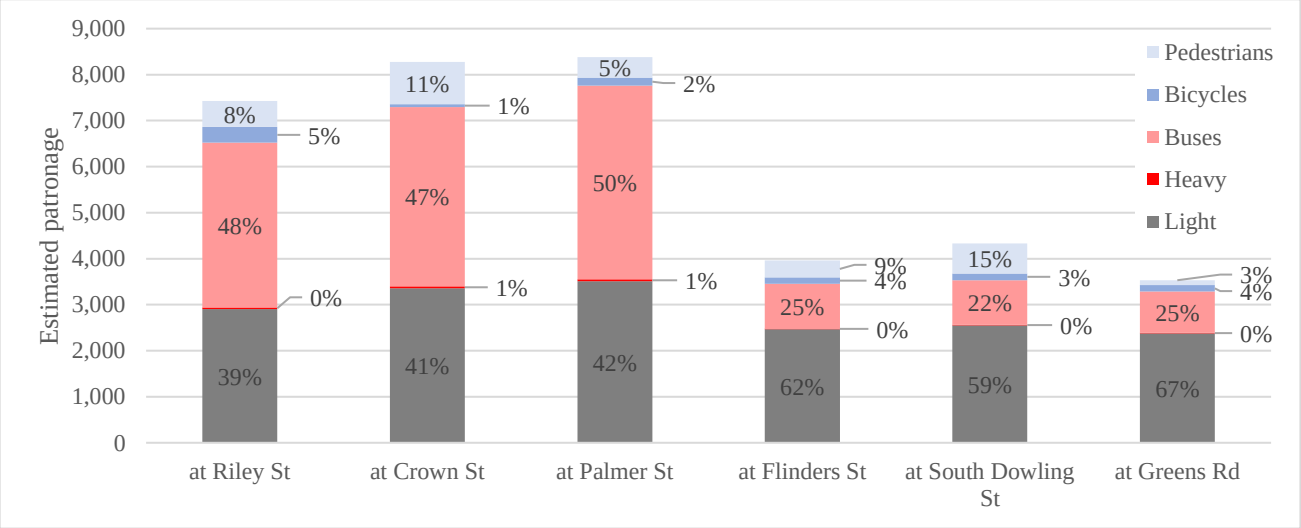


Figure 3.10 Mode share by intersection during the weekday PM peak (5.15–6.15 pm)

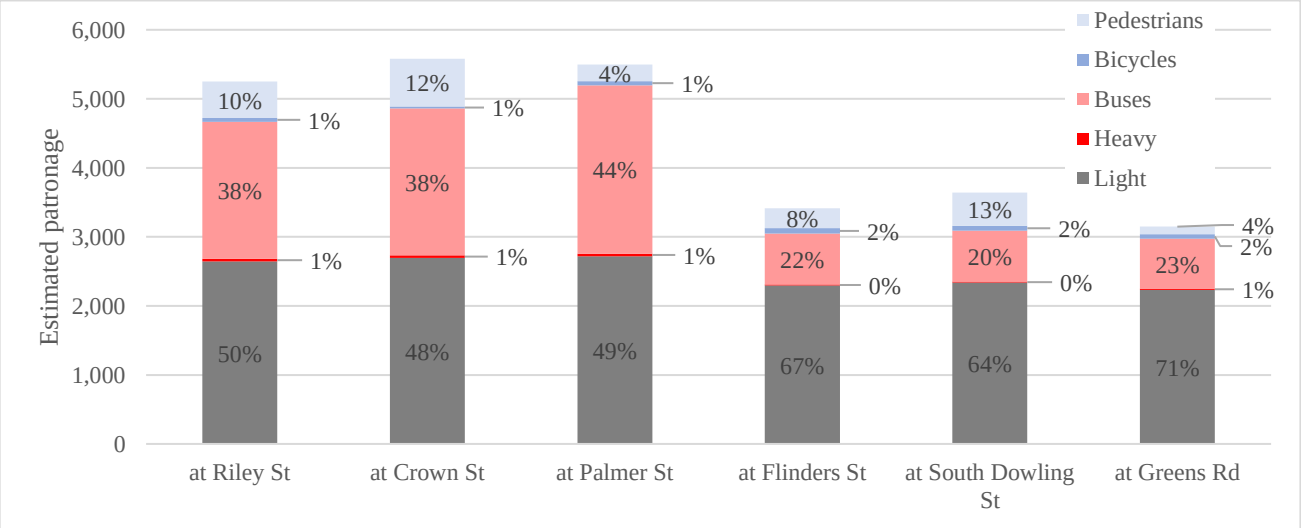


Figure 3.11 Mode share by intersection during the Saturday peak (12.45–1.45 pm)

3.2.2 *Cyclist demand*

Given the current lack of separated cycling infrastructure which cyclists can use on Oxford Street, the demand of people wanting to cycle is relatively high.

The weekday temporal demand for cyclists along Oxford Street, east of Riley Street and west of Greens Road, based on the intersection counts undertaken in 2019 is depicted in Figure 3.12. It shows a number of peaks in cycling demand throughout a typical weekday, with sizeable peaks occurring in the AM and PM periods which is typical of commuting demand during weekdays.

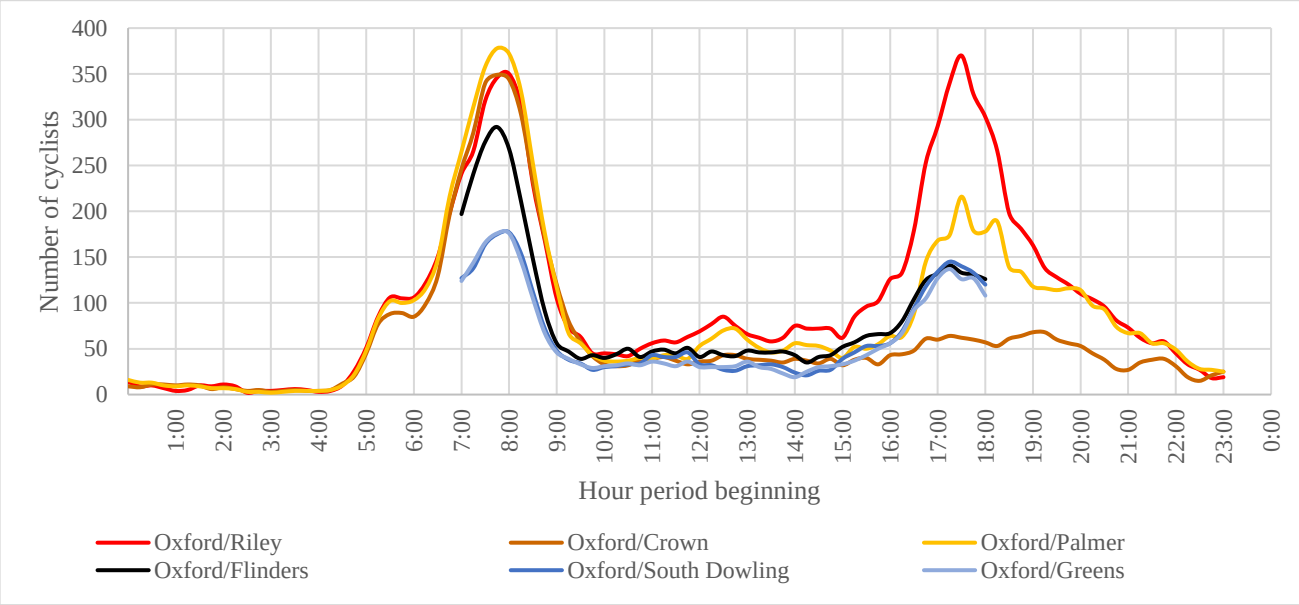


Figure 3.12 Weekday cyclist activities along Liverpool Street and Oxford Street

Figure 3.13 depicts cycling activities on a typical weekend pre-pandemic. It shows that demand is generally sustained between 9.00 am–7.00 pm to up to 100 cyclists per hour.

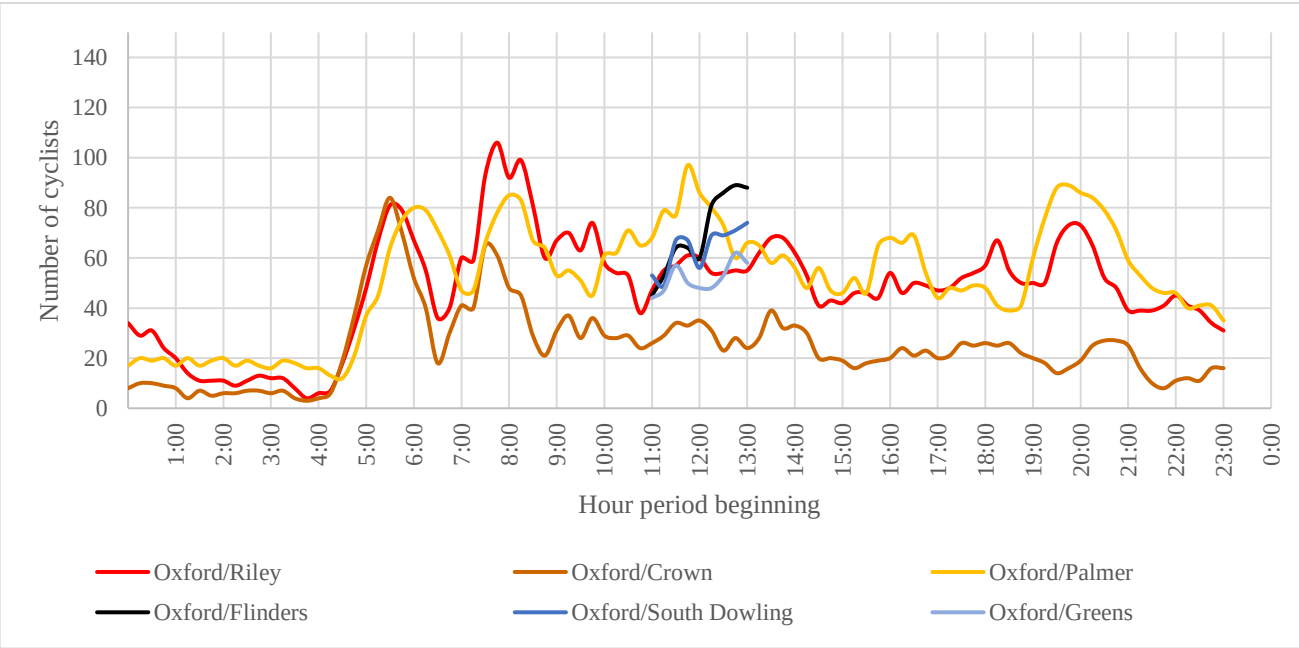
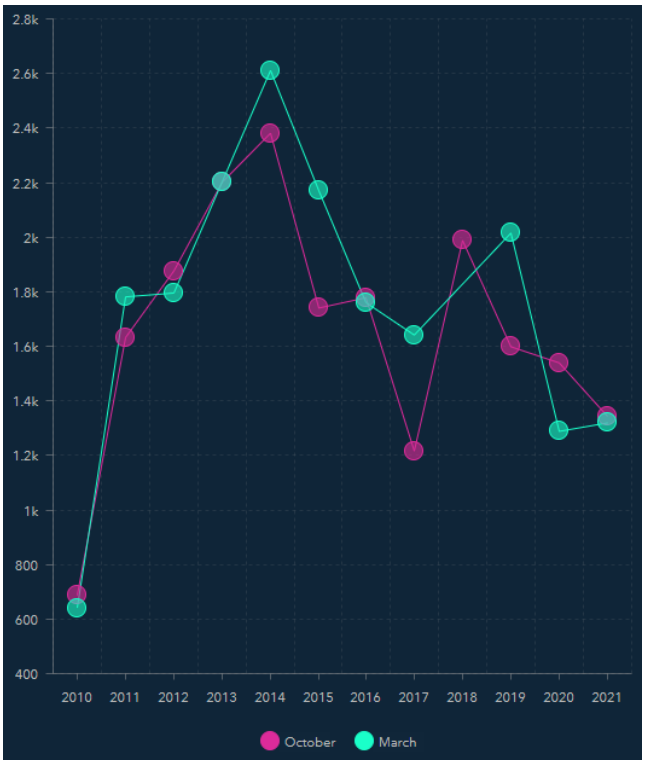


Figure 3.13 Saturday cyclist activities along Liverpool Street and Oxford Street

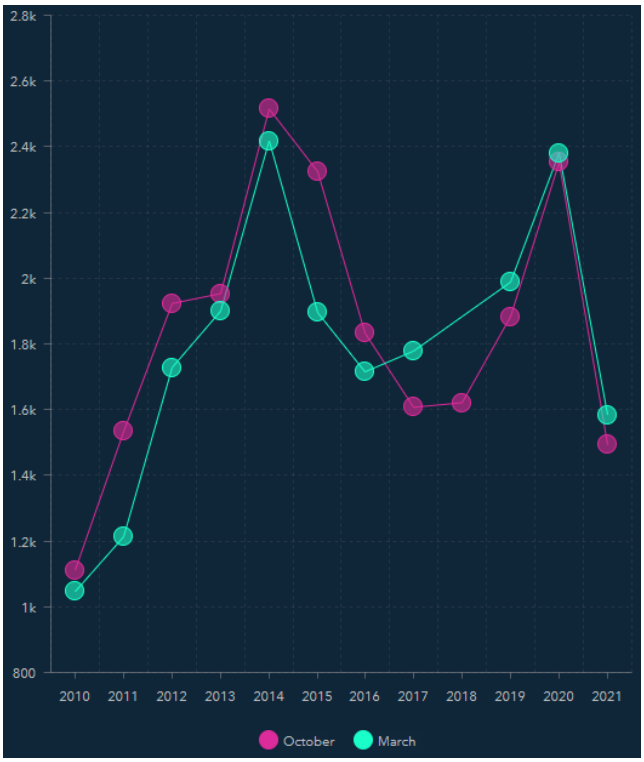
During the pandemic, changes in people's travel needs and behaviours to work and leisure were observed including an increase in cycling activities in metropolitan areas.

A research paper titled '*Cycling Behaviour as a Result of COVID-19: A Survey of Users in Sydney, Australia'* (Lock, 2020) identified a key theme of the survey participants, observing more cyclists paired with a reduced amount of traffic than usual. This finding was also observed in the City of Sydney's average daily bicycle counts in the study area at the intersections of Oxford Street with College Street (Figure 3.14) and Flinders Street (Figure 3.15).



Source: data.cityofsydney.nsw.gov.au, visited in January 2022

Figure 3.14 College Street/Oxford Street/Wentworth Avenue/Liverpool Street intersection



Source: data.cityofsydney.nsw.gov.au, visited in January 2022

Figure 3.15 Oxford Street/Flinders Street intersection

The above figures indicate an overall increase in daily bicycle activities along the length of the corridor in both March and October of 2020, the initial year of the COVID-19 pandemic, and is more significantly observed at the intersection of Oxford Street/Flinders Street. Sensitivity to people's place of work and commuting behaviour as the pandemic continued in 2021 may impact the cycling demand in this period.

As part of the City's Cycling Strategy and Action Plan, a separated bi-directional cycleway along the northern kerbside of Oxford Street has been planned to provide a safe and direct cycling facility for the increasing cycling demand on Oxford Street. A high-quality cycling facility may also induce the demand respectively.

3.2.3 Pedestrian demand

This section plots and discusses pedestrian demand travelling along and across Oxford Street, which will be useful to understand the capacity and level of service particularly to service the existing and future peak demands.

This temporal pedestrian demand along Oxford Street (between College Street and Greens Road) based on the intersection counts undertaken in 2018 and 2019. are shown in Figure 3.16 (weekday survey) and Figure 3.17 (weekend survey). It is to be noted that the intersections at Palmer Street, Flinders Street, and Greens Road are T-intersections and thus only have one pedestrian crossing for travel along Oxford Street, and thus may not capture the demand at the continuing section of the intersection.

Limited peak-hour only data was available for the intersection of Liverpool Street — College Street — Wentworth Avenue, as such this intersection has been excluded from the graphs. It has however been considered in the capacity assessment in Figure 3.21.

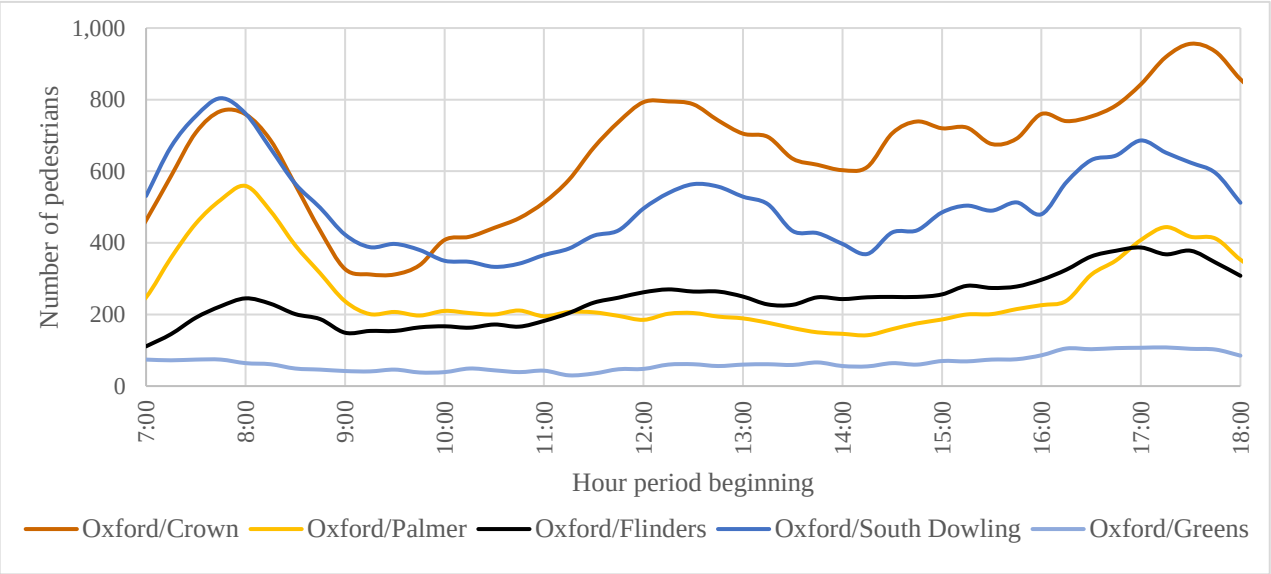


Figure 3.16 Weekday pedestrian activities along Liverpool Street and Oxford Street

The weekday graph above shows notable peak periods in the morning, mid-day and sustained demand thereafter until an increased peak during the afternoon period from approximately 5.00 pm to 6.00 pm; the demand significantly lowers after 6.00 pm indicating a lack of night-time pedestrian traffic on weekdays. The graph also shows that pedestrian activities at existing major trip attractors are typically higher (e.g. Crown Street demand is sensitive to activities from Oxford Village).

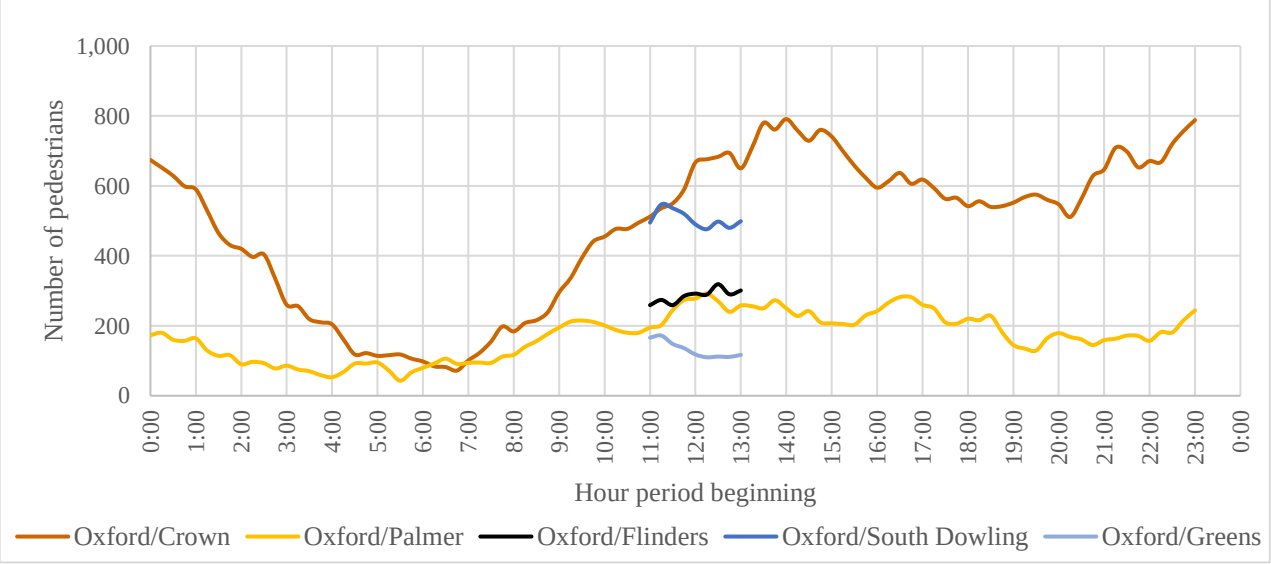


Figure 3.17 Saturday pedestrian activities along Liverpool Street and Oxford Street

The weekend was surveyed for a longer period at two intersections (Crown Street and Palmer Street), capturing the activities across 24-hours. This shows that pedestrian activity increases after mid-morning, peaks at approximately lunch time and is sustained throughout the afternoon and until late hours of the night. This indicates a town centre with an active night time economy. The demand at its peak is comparable to the demand during weekdays.

The extent of survey at Flinders Street, South Dowling Street and Green Street were shorter, however the finding is similar to those observed on weekdays, where pedestrian activities are sensitive to the location of major trip attractors.

The pedestrian counts across Oxford Street are shown in Figure 3.18 (weekday) and Figure 3.19 (weekend).

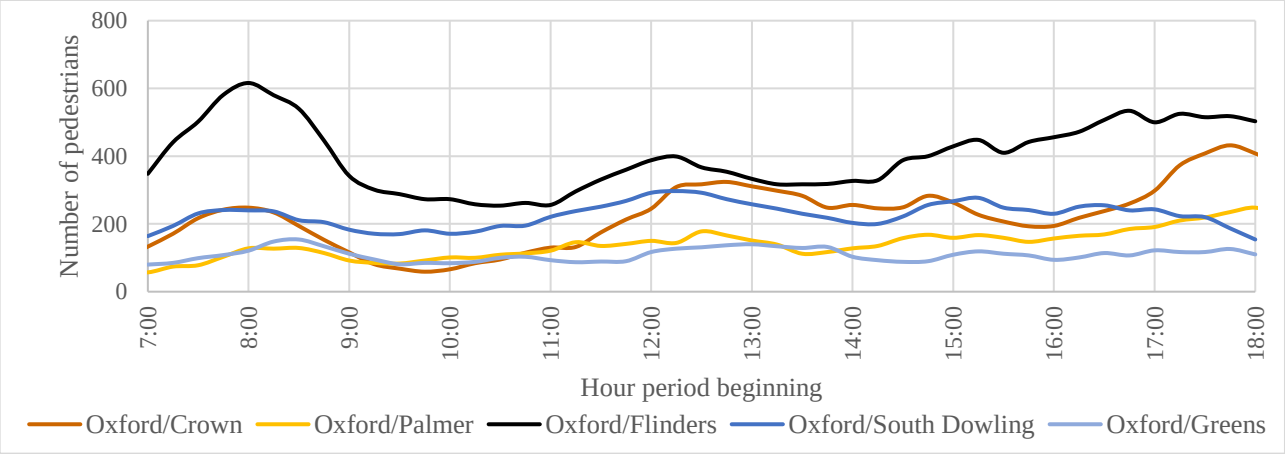


Figure 3.18 Weekday pedestrian activities across the Liverpool Street and Oxford Street corridor

The pattern found in the pedestrian activities crossing Oxford Street is similar to those found for activities travelling along Oxford Street. However, the demand is generally lower, indicating that most of the pedestrian movement is in the east-west direction.

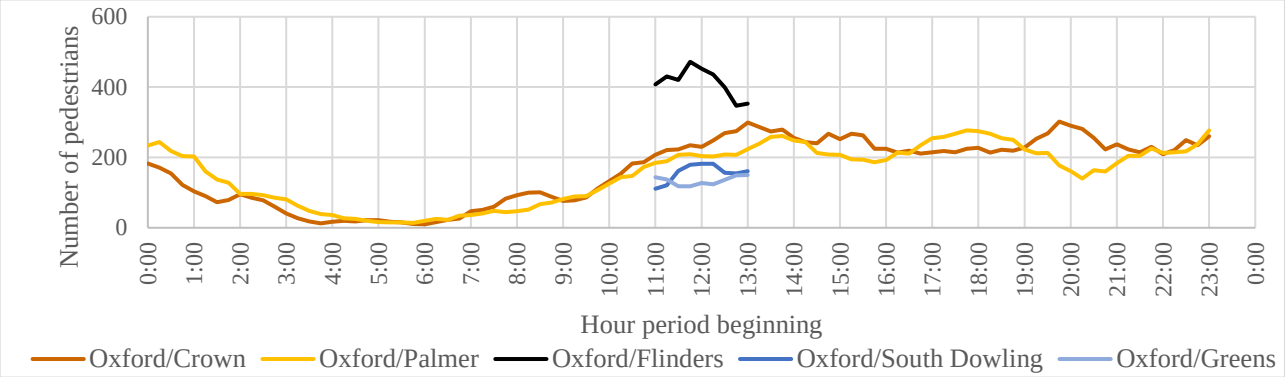
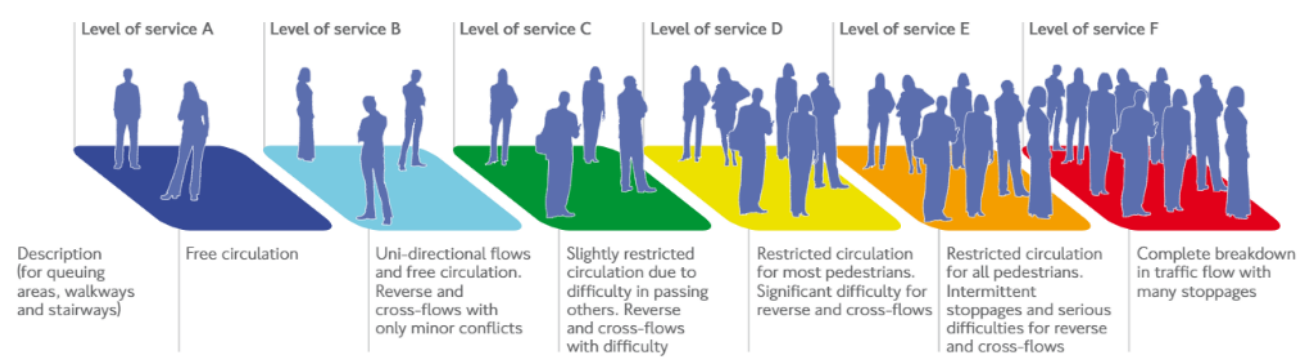


Figure 3.19 Saturday pedestrian activities across the Liverpool Street and Oxford Street corridor

To determine the existing level of service and capacity at the existing pedestrian crossing facilities at intersections, the peak hour demands were assessed against Fruin Level of Service which criteria are included in Figure 3.20 presented with a figure taken from Transport for London's *Station Planning Standards and Guidelines*.



Level of Service	**A**	**B**	**C**	**D**	**E**	**F**
Flow upper limit (ped/min/metre)	7	23	33	49	82	>82

Source: Designing for pedestrians: A level-of-service concept (Fruin, 1971)

Figure 3.20 Fruin level of service

From the Fruin Level of Service (LoS) criteria for pedestrians, an estimated capacity of 3450 ped/h along Oxford Street is assumed based upon a LoS B and application of the narrowest clear path of 2.5 m along the length of the corridor. Note that wider footpaths are available along the corridor, particularly approaching key public domains such as Taylor Square and Hyde Park.

Figure 3.21 below shows the hourly peak pedestrian volume during the surveyed period, corresponding to Figure 3.16 to Figure 3.19 above. The assessment was done to look at the level of service of footpaths as the worst-case peak hour found on a typical week.

The figure below shows the total number of pedestrians for footpaths on both sides of the road as the overall activity at this section of footpath. It also shows the pedestrian flow in ped/min/metre on the footpath area that has the highest flow rate per metre in the given direction.

Level of Service A are generally found on footpaths along Oxford Street, based on the surveyed volumes at intersections, indicating ample capacity on the footpath.

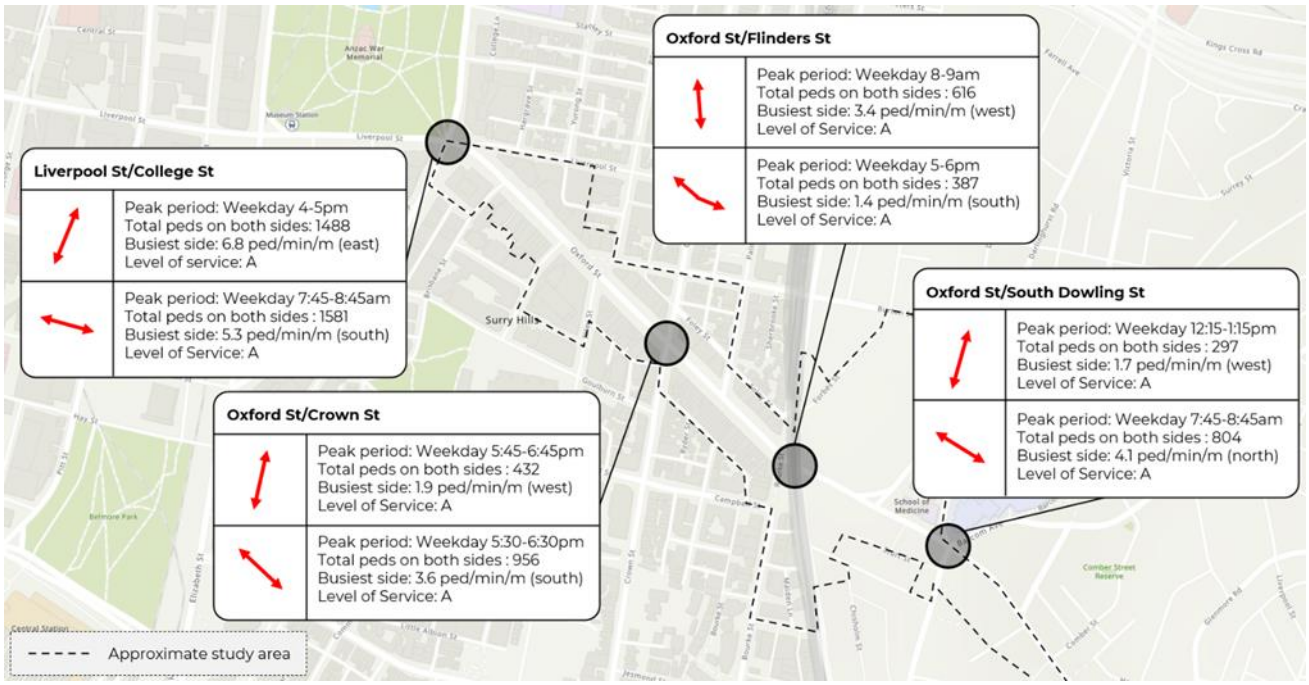


Figure 3.21 Pedestrian level of service based on intersection crossing data

3.2.4 Bus demand

The temporal results of the bus onboard data collected between 10 September 2017 to 16 September 2017, inclusive, through the Opal ticketing system are shown below in Figure 3.23 and Figure 3.24. These locations indicate the number of passengers travelling through the Oxford Street corridor on public buses. Figure 3.22 provides the location of the bus stops along the corridor where the Opal data was collected from. It is important to note that the time periods 0.00–7.00 pm and 9.00–0.00 am were both represented by a single value each to cover the entire 7-hour and 3-hour period, respectively. In the figures, the values for these time periods were an average of this value across the entire period.

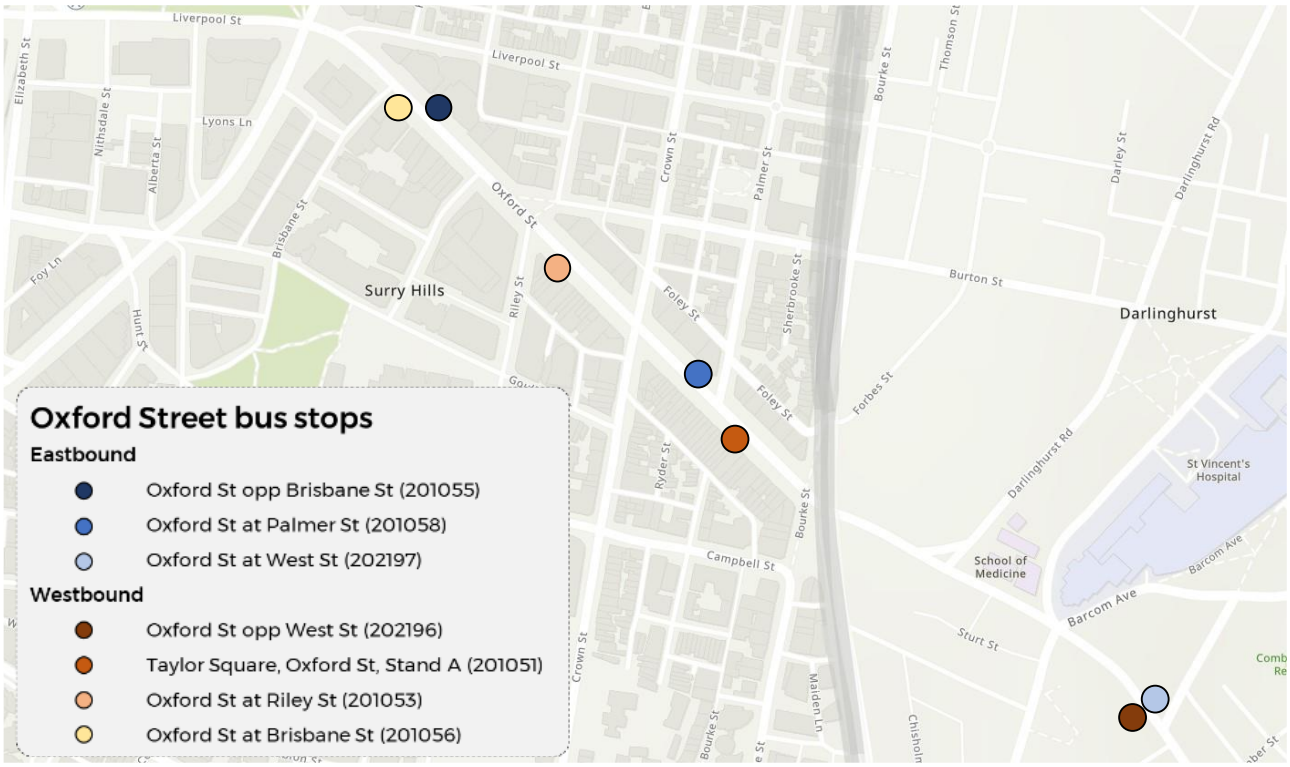


Figure 3.22 Location of bus stops along Oxford Street

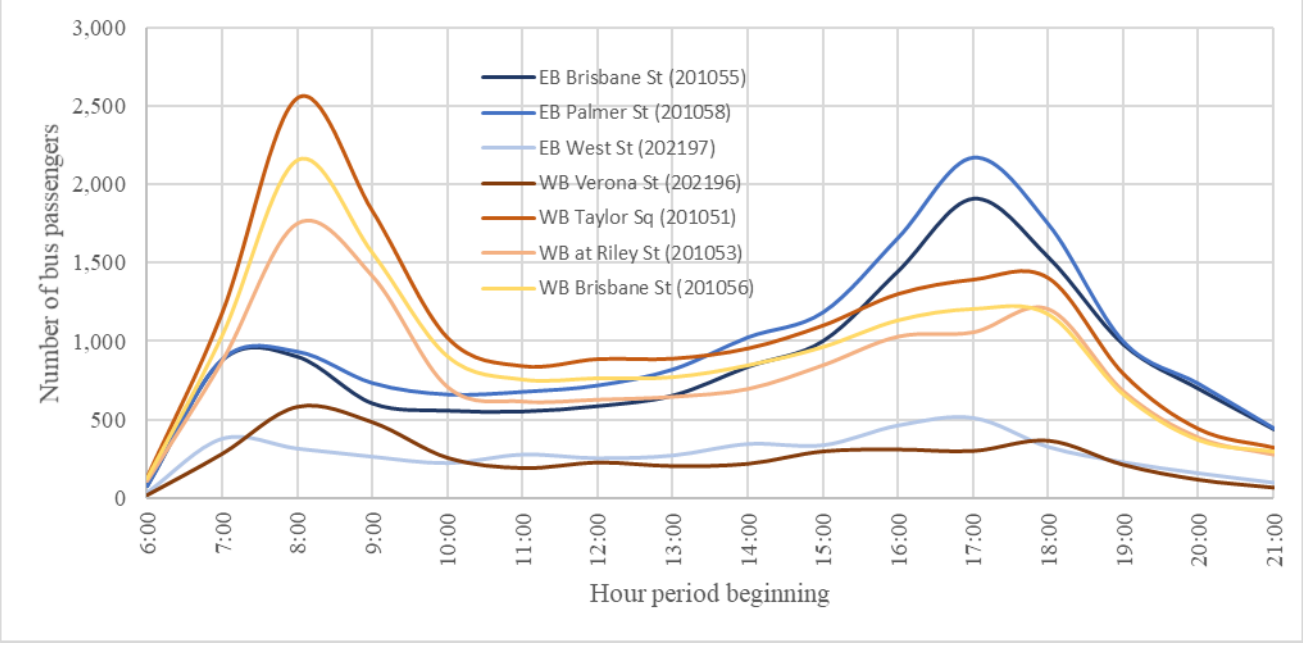


Figure 3.23 Weekday bus passengers onboard at arrival at specific bus stops

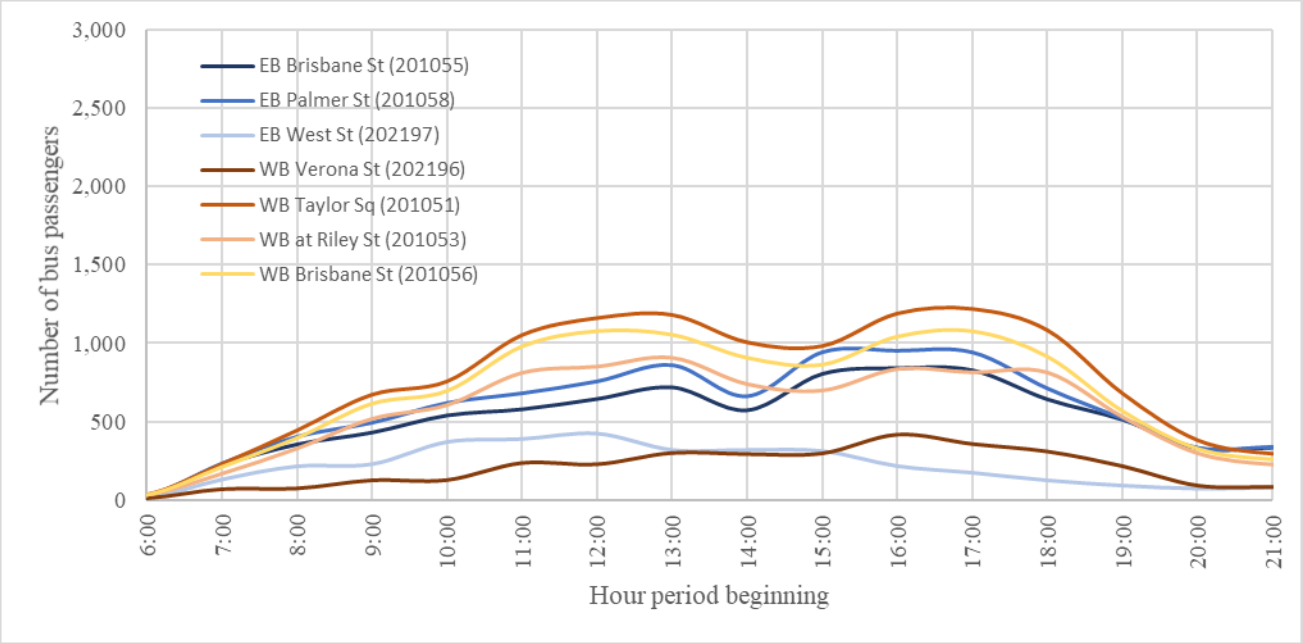


Figure 3.24 Weekend bus passengers onboard at arrival at specific bus stops

There appears to be two distinct peaks in the AM and PM on a typical weekday, and generally no peak on a typical weekend. Demand appears to much lower at bus stops to the east of Oxford Street/Flinders Street, likely due to fewer bus routes in that segment of the corridor.

Based on the bus timetables at the time that intersection counts were taken, and the scaled Opal data counts, Table 3.3 presents the approximate bus demand in 2019. The values presented are for services in each direction along Oxford Street between College Street and Flinders Street.

Table 3.3 Approximate bus and average passenger count per bus along Oxford Street in 2019

Time period	Number of buses		Average passengers per bus	
	Eastbound	Westbound	Eastbound	Westbound
AM peak (weekday 7.45–8.45 AM)	44	47	20	39
PM peak (weekday 5.15 – 6.15 PM)	47	43	38	28

In December 2021 there were major changes to the South-Eastern Sydney bus network which affected timetabling. As a result, fewer buses were scheduled to run along Oxford Street. Taking this into account and utilising the approximated 2019 bus demand, Table 3.4 presents the average number of passengers onboard each bus during the peak periods.

Table 3.4 Approximate bus and average passenger count per bus along Oxford Street in 2022

Time Period	Number of buses		Average passengers per bus	
	Eastbound	Westbound	Eastbound	Westbound
AM peak (weekday 7:45 – 8:45 AM)	32	36	27	51
PM peak (weekday 5:15 – 6:15 PM)	34	33	52	36

Comparing the data presented in Table 3.3 and Table 3.4, the combination of maintaining the 2019 demand for bus patronage with reducing bus frequency following the December 2021 bus timetable changes, leads to a sizeable increase in the number of passengers onboard individual buses.

While the average values presented suggest that there is still reasonable capacity on most buses along this corridor, when breaking down the patronage by individual bus stops, buses approach capacity at certain stops along bus routes.

Two bus stops exceed 70 passengers per bus onboard at arrival on average: *Oxford Street at Palmer Street* (201058) and *Taylor Square, Oxford Street, Stand A* (201051). This suggests that some buses on arrival may be at capacity and unable to safely carry additional passengers. Prior to the timetable change, no bus stop had an average patronage higher than 55 passengers per bus on average.

3.2.5 Traffic movements

The turning movements of light and heavy vehicles on and off Oxford Street are shown in Figure 3.25 and Figure 3.26 in the respective westbound and eastbound direction. The figure also shows traffic volumes at selected midblock areas along Oxford Street. Traffic count data from May and November 2019 were used to determine the values, and so there may be flow discrepancies when comparing locations where data was sourced from different time periods.

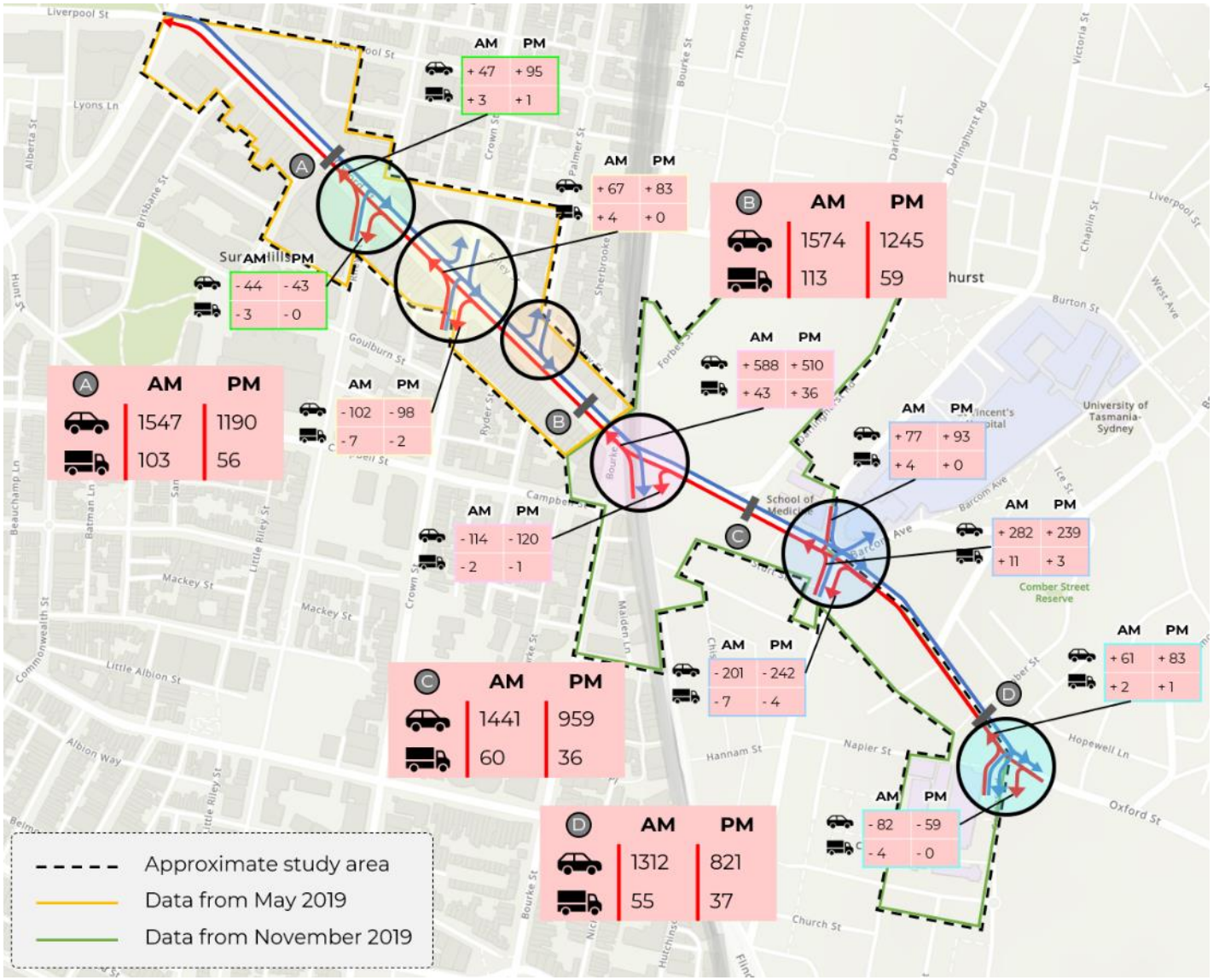


Figure 3.25 Approximate turning movements and traffic volumes along Oxford Street – westbound

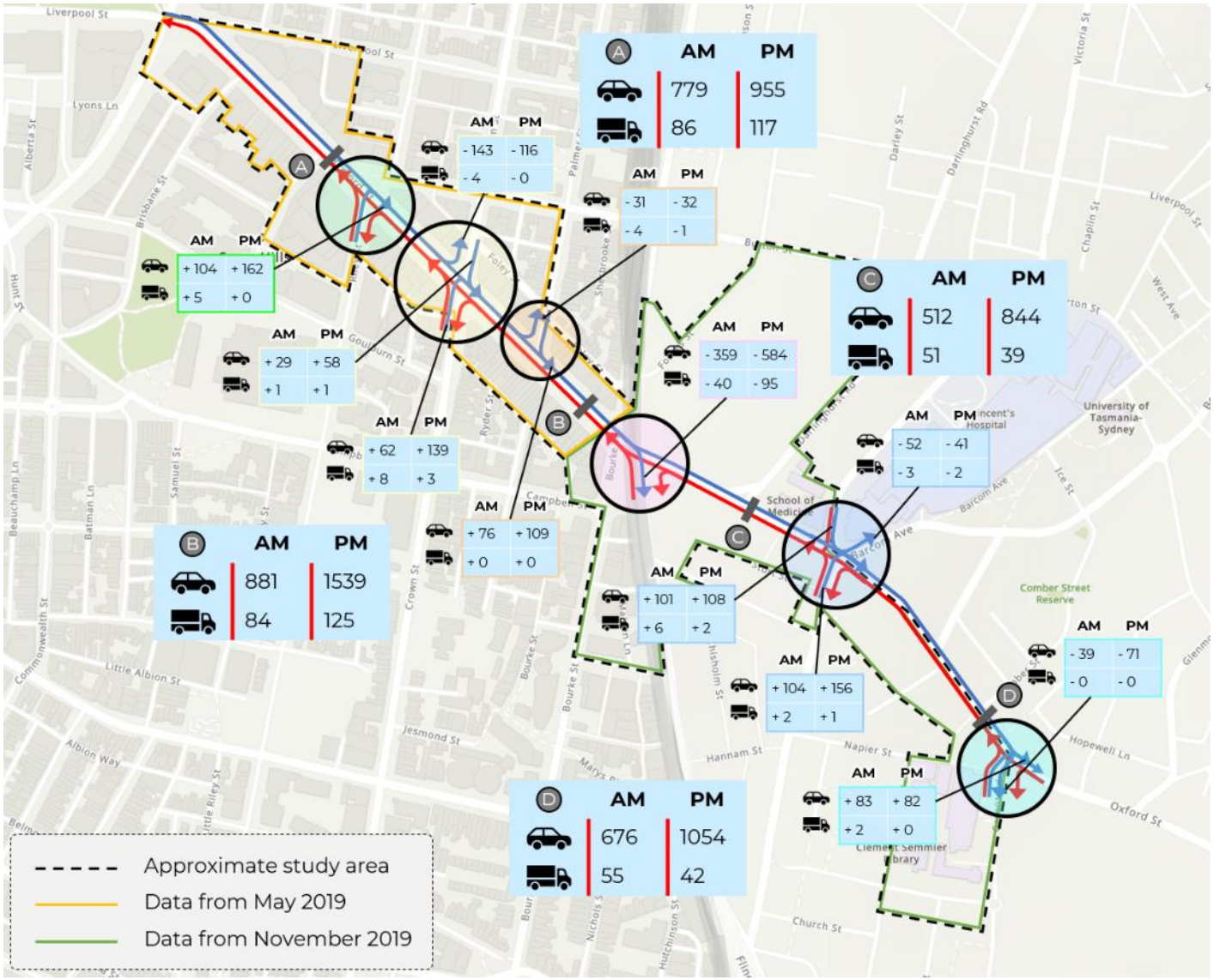


Figure 3.26 Approximate turning movements and traffic volumes along Oxford Street – eastbound

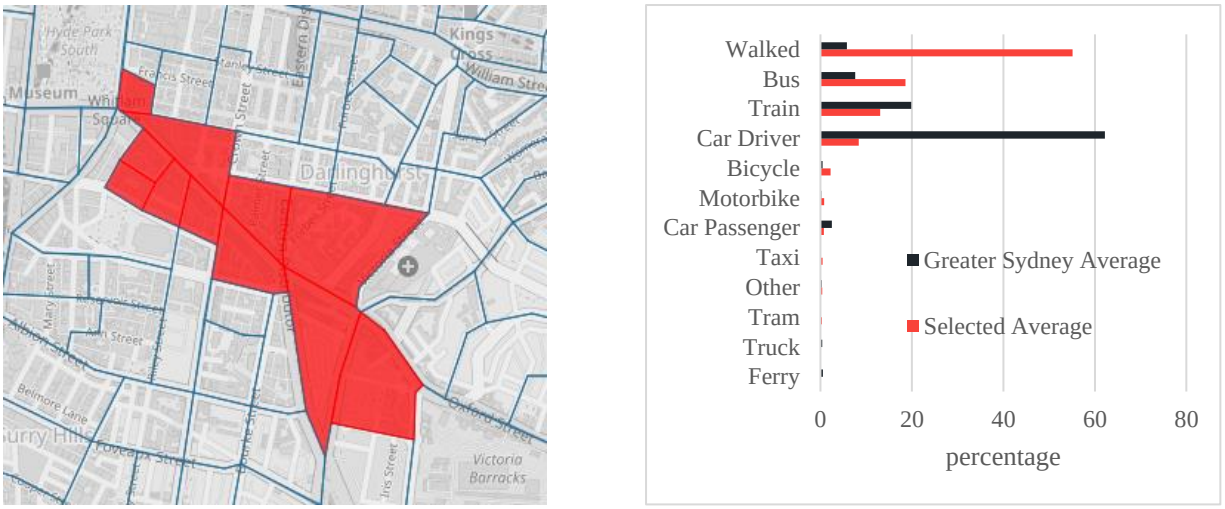
3.2.6 *Journey to work*

The Australian Bureau of Statistics 2016 Journey to Work data was assessed to understand how:

- People that live within and surrounding the study area travel to work (**place of usual residence data**)
- People that work within and surrounding the study area travel to work (**place of work data**).

Both datasets show the accessibility of the study area to public transport, good walking and cycling infrastructure and the influence of local planning on car usage/dependencies.

For the **place of usual residence** data, the data is assessable up to Statistical Area (SA) 2 level, which enables a refined assessment of the residents (Figure 3.27). The data surveyed approximately 2,200 people.

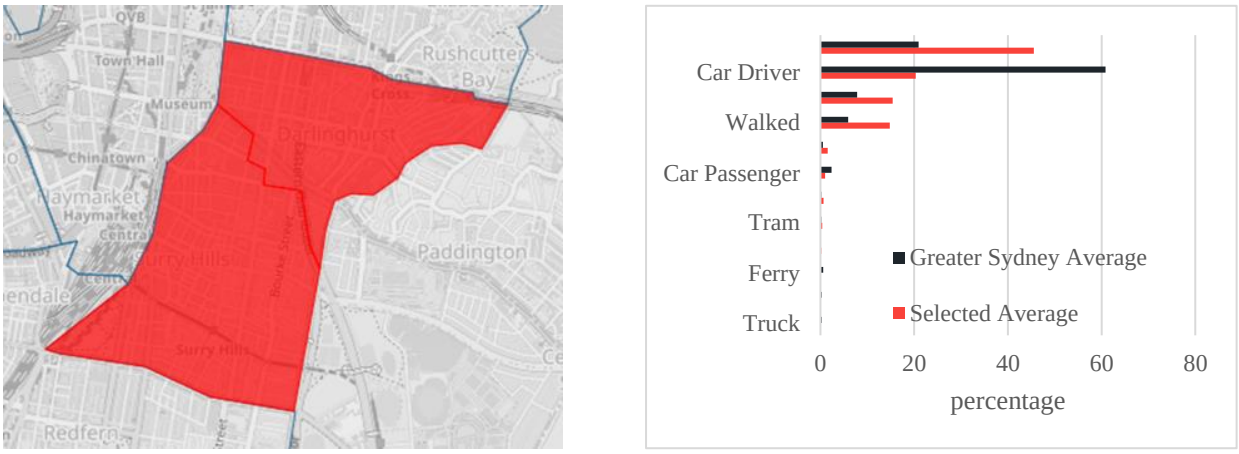


Source: Australian Bureau of Statistics

Figure 3.27 Journey to Work – Place of usual residence

The residents of the statistical area shown on the graph above, depict a community which gets around by walking (55 per cent), bus (19 per cent) and train (13 per cent) for most part. Car trips (as driver and passenger) make up to approximately 9 per cent, and bicycle trips make up to approximately 2 per cent.

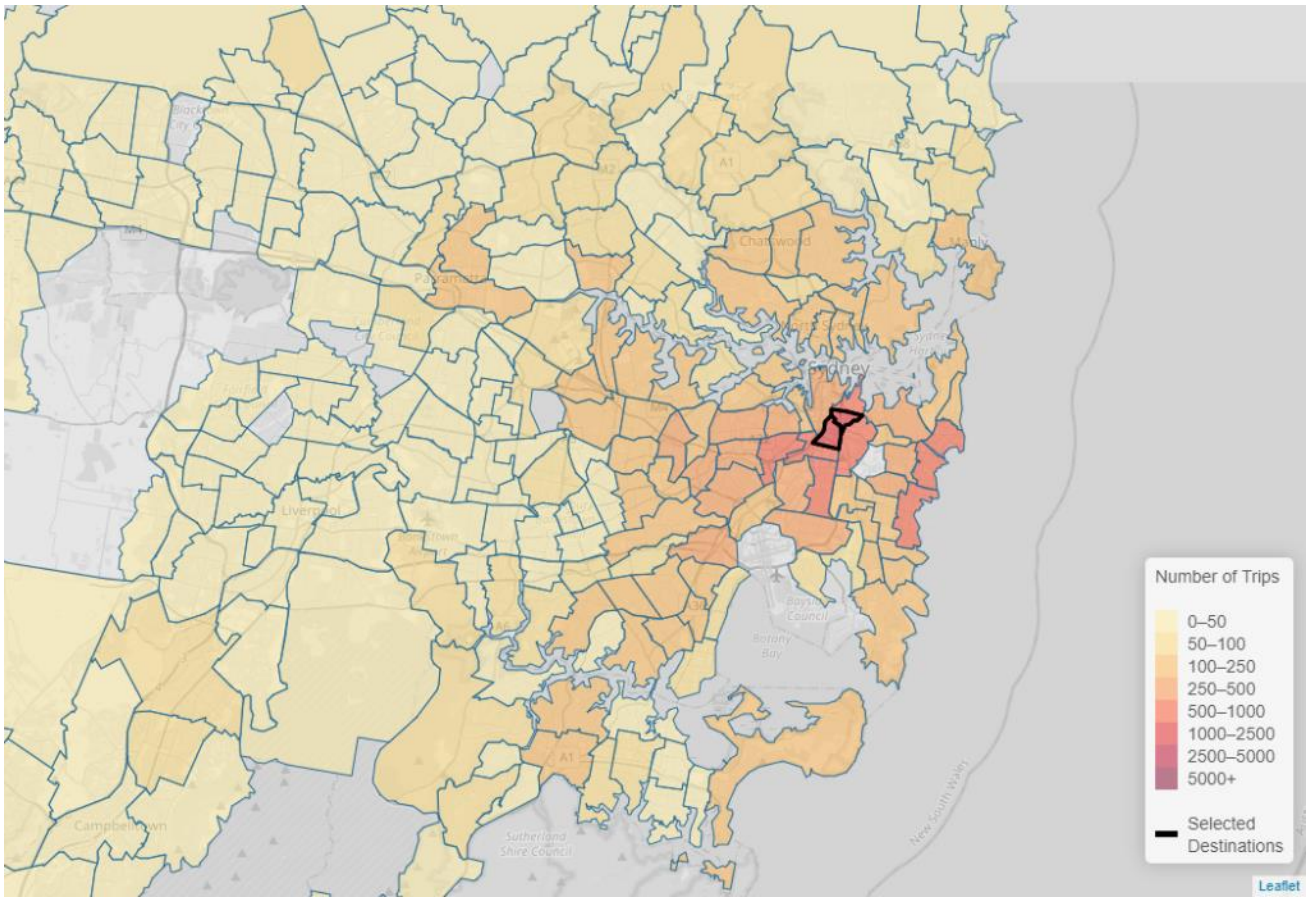
The place of work data covers a larger SA 3 study area and surveyed approximately 24,700 people for those working in Darlinghurst (117031329) and Surry Hills (117031336). The assessed statistical area and mode share is shown in Figure 3.28. The use of train (46 per cent), car driver (20 per cent), bus (15 per cent), walking (15 per cent) and cycling (2 per cent) tops the travel to work mode share in the study area. Both data sets contrast the car-dependent mode share observed for the greater Sydney area.



Source: Australian Bureau of Statistics

Figure 3.28 Journey to Work – Place of work

The origin of people travelling to Darlinghurst and Surry Hills SA3 were plotted and shown in Figure 3.29, indicating trips generated from all across metropolitan Sydney. However a larger proportion of trips were made from within the assessed SA3 and immediate surrounds (e.g. Moore Park, Redfern, Zetland, Waterloo, Camperdown and Newtown), eastern suburbs (Bondi, Bronte, Coogee) and inner west area.



Source: Australian Bureau of Statistics

Figure 3.29 Place of Work map of trip origins

Table 3.5 simplifies the split of travel direction by various modes to the study area from the general easterly and westerly direction as an indication how trips to Oxford Street would arrive.

Overall, the trips are split 25:75 between east and west. Trips by trains are skewed towards the west, due to the lack of train services generally in the eastern suburbs area. Trips made by car, bus and bicycle are approximately equally split.

Walking trips are skewed towards the west by a split of approximately 80:20.

Table 3.5 Estimate of direction of travel split by mode

Origin	Overall	Train	Car	Bus	Walked	Bicycle
Easterly direction	25%	7%	41%	58%	17%	47%
Westerly direction	75%	93%	59%	42%	83%	53%

3.3 Crash data and road safety review

The road safety review includes a review along Oxford Street which would be affected by the planning proposal.

The latest five-year crash data available for this assessment has been obtained from TfNSW Centre for Road Safety for the reporting period 2016 to 2020. It is to be noted that the speed limit on Oxford Street was reduced from 50 km/h to 40 km/h on 5 June 2020 to provide a safer road environment. As such, the crash data was collected during a period when the speed was 50 km/h.

During this period, there were 82 crashes recorded on Oxford Street between College Street and Greens Road. A high proportion of the crashes involved pedestrian and off-path/loss of control crashes. The breakdown of crashes and location are shown in Table 3.6 and Figure 3.30 respectively.

Table 3.6 Crash severity and type along Oxford Street in the study area

Degree of crash	Pedestrians	Intersection	Head-on	Rear-end	U-turn and parking	Off-path/loss of control	Total
Fatality	0	0	0	0	0	0	0
Serious injury	8	2	0	0	1	10	21
Moderate injury	10	3	1	8	2	13	37
Minor/Other injury	4	2	0	6	0	4	16
Non-casualty	0	3	0	2	0	3	8
Total	**22**	**10**	**1**	**16**	**3**	**30**	**82**

Source: Centre for Road Safety, viewed in January 2022

Several key findings following a review of the data are listed below:

- **Oxford Street/Crown Street:** Six pedestrian crashes have been recorded at this intersection. Additionally, there are also a high number of rear-end and on-road loss of control crashes on the southern approach (Crown Street) which may be caused due to the topography of the road.
- **Oxford Street/Flinders Street:** The left turn from Oxford Street onto Flinders Street at this intersection is a sharp left turn, and the majority of rear-end incidents at this intersection occur at this left turn, as well as there being a higher number of left turn sideswipe and loss of control crashes at this turn.
- **Oxford Street/Darlinghurst Road:** Right through crashes make up the vast majority of incidents at this intersection, with seven of the 10 incidents attributable to this accident type. This may be due to the filter right turn treatment currently exist from Oxford Street eastbound to Darlinghurst Road.
- **Oxford Street/South Dowling Street:** All pedestrian crashes at this intersection occur on the west approach where vehicles turning left from South Dowling Street onto Oxford Street turn onto. These crashes are all classified as nearside accidents, and so it is the most likely scenario that vehicles turning left from South Dowling Street onto Oxford Street are involved in these accidents. From aerial imagery, it appears that due to the geometry of the intersection, drivers generally do not have adequate line of sight to the beginning of the pedestrian crossing until they reach the stop-line and enter the intersection.
- **Forbes Street:** There were two off-path into object crashes in one year along a stretch of this road, where there is 60-degree angled parking. These parking spots may be too tight and be a contributing factor to these incidents.

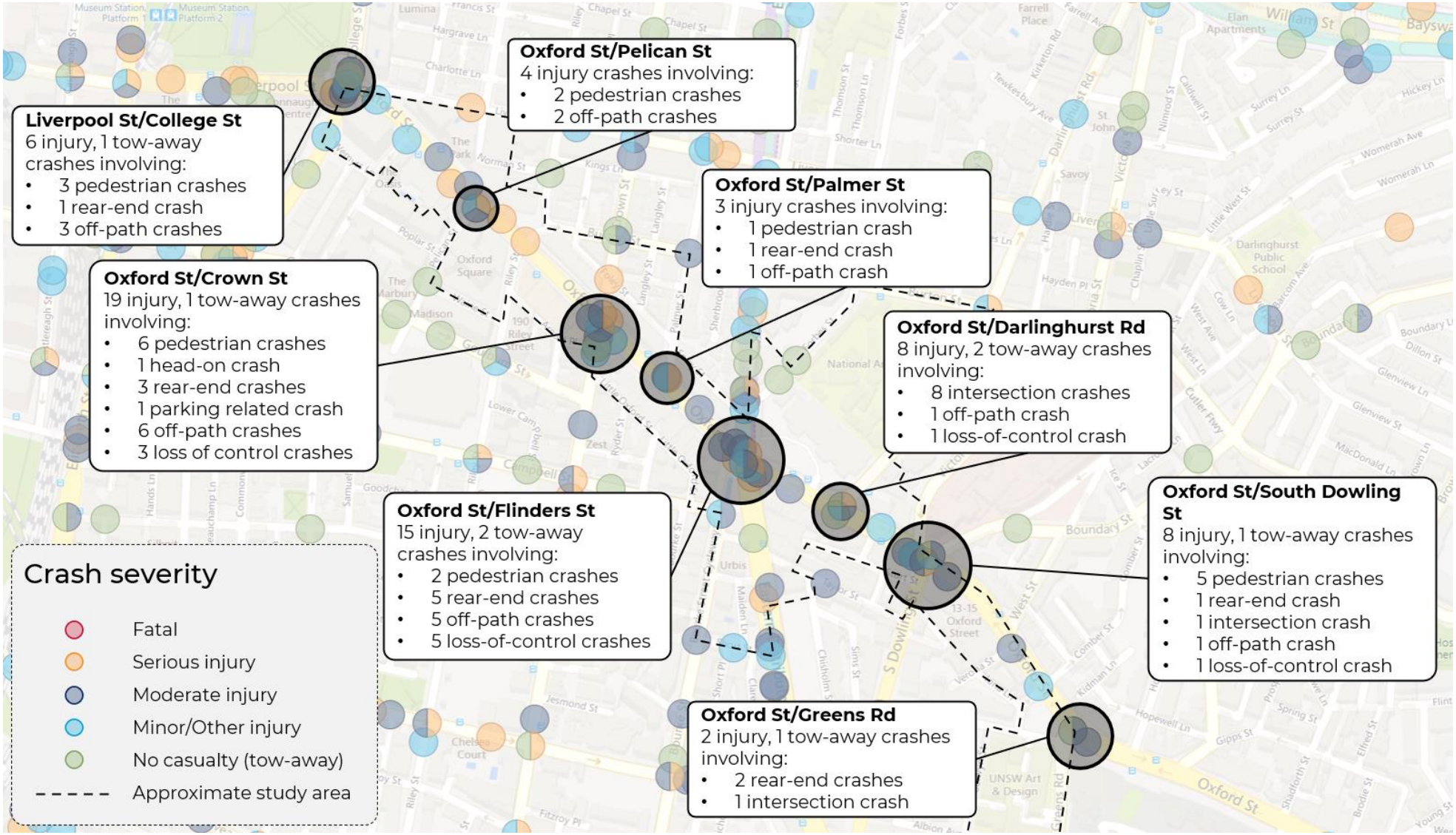


Figure 3.30 Crash type and degree of severity by location

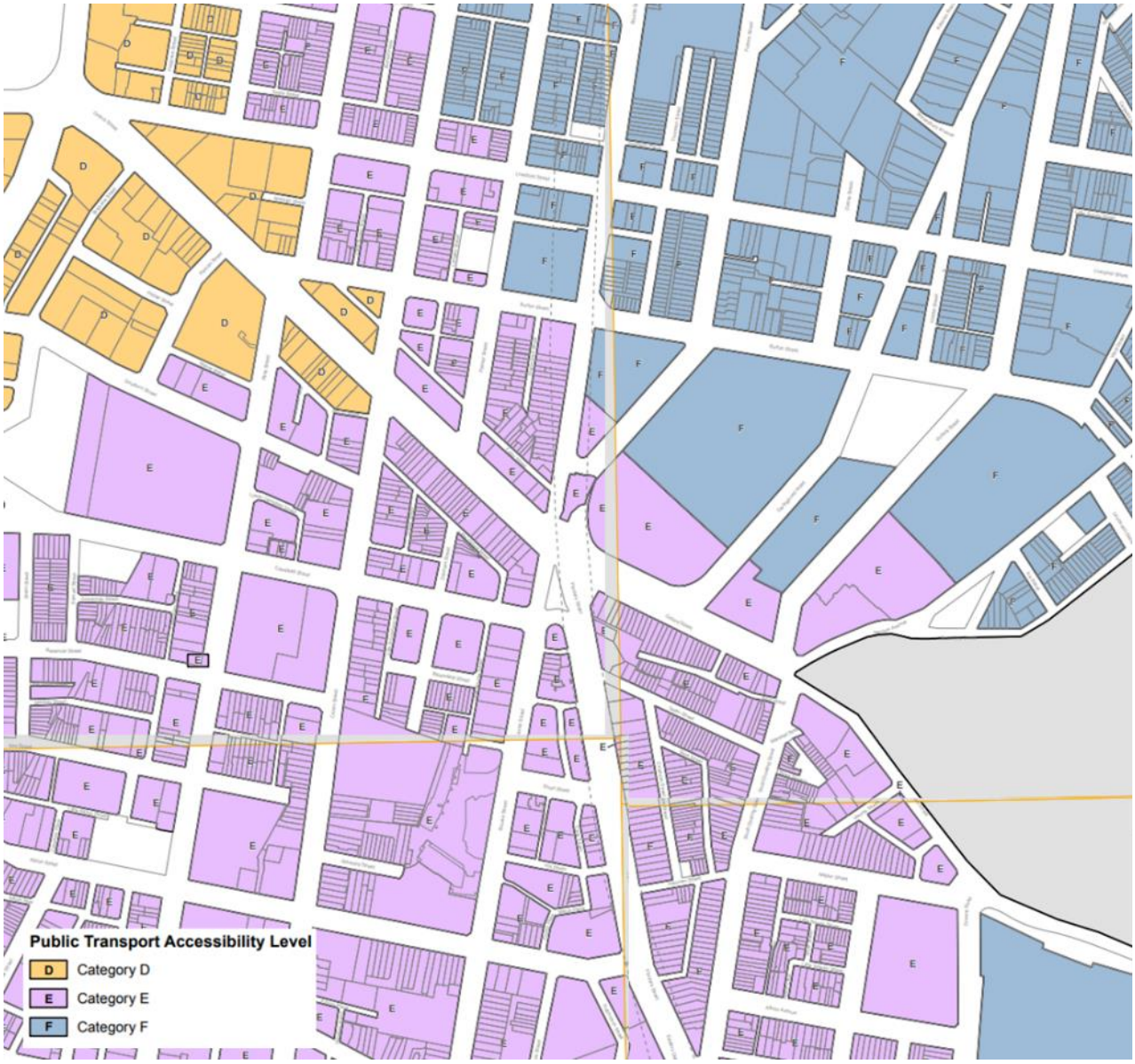
3.4 Existing planning controls

3.4.1 Sydney Local Environmental Plan 2012

Division 1: Car parking ancillary to other development in Part 7 (Local provision – general) of Sydney Local Environmental Plan (LEP), 2012 has the objective to:

- Identify the maximum number of car parking spaces which may be provided to service particular uses of land
- Minimise the amount of vehicular traffic generated because of proposed development.

To estimate the maximum number of car parking spaces permitted for the development, the LEP has provided a rate of car parking provision along with a map of public transport accessibility level (Figure 3.31) which determines the appropriate rate to be used (refer to Table 3.7).



Source: Sydney LEP 2012

Figure 3.31 Public transport accessibility level map

Table 3.7 Maximum parking space rate for office, business, retail, industry and warehouse

Category	Office and business premises	Retail premises	Industry	Warehouse or distribution centres
D	FSR ≤ 3.5:1 maximum of 1 space per 175 m^2	FSR ≤ 3.5:1 maximum of 1 space per 90 m^2	1 space per 150 m^2	1 space per 500 m^2
E	FSR ≤ 2.5:1 maximum of 1 space per 125 m^2	1 space per 60 m^2	1 space per 125 m^2	1 space per 400 m^2
F	FSR ≤ 1.5:1 maximum of 1 space per 75 m^2	1 space per 50 m^2	1 space per 100 m^2	1 space per 300 m^2

Source: Sydney LEP, 2012

FSR exceeding the above limit for office, business and retail premises require a calculation using a formula provided in the DCP. However, this typically does not exceed the rate for maximum parking space provision stated above.

3.4.2 Development Control Plan 2012

In line with the LEP, the DCP aims to encourage walking, cycling, public transport and car sharing. It also aims to manage the impacts of private car use by placing controls on parking provision and measures which would otherwise promote car uses. The objective of the DCP on transport and parking are as follows:

- Ensure that the demand for transport generated by development is managed in a sustainable manner. This means taking measures which minimises the need to travel and the length of trips, particularly by car and encourages travel by the most sustainable mode of transport.
- Ensure that bike parking is considered in all development and provided in appropriately scaled developments with facilities such as change rooms, showers and secure areas for bike parking. To do this, the DCP has provided a minimum rate of bicycle parking based on the land use. For art gallery or museum, the DCP requires one space per 1,000 m^2 for employees and 1 space per 200 m^2 for visitors.
- Establish requirements for car share schemes for the benefit of people living and or working within a development.
- Design vehicle access and basement layouts and levels to maximise pedestrian safety and create high quality ground level relationships between the building and the public domain.
- Provide accessible car parking.

The DCP also provides detailed requirements of built forms associated with bus parking, motorcycle parking, vehicle access and footpaths, parking area design, waste collection points among others. Development applications for developments within the Creative and Cultural precinct will be assessed individually with consideration of the LEP and DCP accordingly.

4 Transport impact

4.1 Trip generation

To calculate the potential increase in trips generated by the planning proposal, the estimated increase in employment numbers as detailed in section 2.1.3 and 2.2.5 has been applied. Travel to/from work during the road network peak periods is considered as the trips most applicable to assess the impact of the planning proposal. This includes the trips generated by people working in the Creative and Cultural (i.e. gallery, studio, workshop, live music venue, theatre) uses.

It is noted that the peak visiting time of businesses in the Creative and Cultural uses would also typically extend to after hours and on weekends. Thus, visitors to these venues are more likely to travel outside of the road network peak periods.

For a conservative estimate of the impact of the Oxford Street Creative and Cultural Precinct, it is assumed that all the new trips occur entirely in both the AM and PM peak hours as show in Table 4.1. It is considered conservative as typically journey to work trips are spread across several hours in the peak periods and trips to cultural and creative uses may be more active outside of the traffic peak periods which aligns with their business operating hours.

Table 4.1 Additional jobs by sub-precinct

Sub-precinct	New jobs	AM peak trips	PM peak trips
Whitlam Square to Riley Street	236	236	236
Riley Street to Bourke Street	601	601	601
Taylor Square and Courthouse, Police Station and Gaol	13	13	13
Flinders Street to UNSW Art and Design Campus	542	542	542
Total	**1,392**	**1,392**	**1,392**

4.2 Mode share

To estimate the mode share of the trips generated by the planning proposal, several key items were considered:

- Mode shares recorded from the census Journey to Work data considering both *place of usual residence* and *place of work*.
- There would be minimal increase in the provision of car parking spaces with the planning proposal. The application of maximum parking rate allowable in Sydney LEP 2012 would apply and the uptake of any new car parking is expected to be minimal because:
  - The Oxford Street precinct falls within the high and medium Public Transport Accessibility Level in Sydney LEP 2012 and would be entitled to low parking provision rates for new development.
  - While some additional parking is possible, it is expected to be severely curtailed by the cost and practicalities of providing new basement parking within constrained heritage buildings and small lot sizes.
  - Further, the City's controls provide incentives to use basements as entertainment spaces rather than as parking, which will further reduce the attractiveness of basement parking.
  - Street parking in the area is already at capacity and will not be able to absorb new trips.
  - While minimal new parking is possible, any trips generated would be insignificant compared to existing regional traffic.
- Apply which would likely maintain existing provision of car parking supply in the precinct. Minimising additional car parking spaces supply would also minimise traffic demand to/from the precinct.

- A new separated bi-directional cycleway on Oxford Street which improves capacity, safety, accessibility and attractiveness for people to cycle. This works towards Sustainable Sydney 2030 target of 10 per cent cycling trips. It is considered however, that the increase of mode share from two per cent to ten per cent is significant. The mode share has estimated an increase to six per cent.
- Improvements to the bus services to south-east Sydney, implemented on 5 December 2021, which aims to make bus travel more attractive and reliable particularly affecting the proposed planning proposal.

The mode share estimate for the planning proposal which takes into consideration of the above is shown in Table 4.2.

Trips made by trains would likely arrive to Museum Station and are connected to the Creative and Cultural Precinct by bus or walk as the last mile trip, depending on the travel distance.

Table 4.2 Mode share split estimate

Transport mode	Existing mode share (Place of work)	Proposal mode share	Proposal trip demand	Proposal AM peak demand	Proposal PM peak demand
Train	46%	50%	696	696	696
Car (Driver and passenger)	20%	5%	70	70	70
Bus	15%	18%	250	250	250
Walked	15%	19%	264	264	264
Bicycle	2%	6%	84	84	84
Other (tram, motorcycle, ferry)	2%	2%	28	28	28
Total	**100%**	**100%**	**1,392**	**1,392**	**1,392**

4.3 Active transport

Overall, the role of active transport mode share for trips generated from the planning proposal would increase. This is due to:

- Improvements made to the walking and cycling network by the City as part of the Cycling Strategy and Action Plan. This includes proposed Oxford Street and Liverpool Street cycleway, which will provide high quality cycling experience and work towards the City's plan for 10 per cent of trips to be cycling trips. It will allow cyclists to use a safer dedicated cycleway, rather than existing routes in shared bus lanes and traffic lanes.
- Incentives that minimise the provision of new car parking spaces, which will mean that there is unlikely to be any significant increase in private car trips, and so these trips will be distributed among other mode types.

Future improvements to pedestrian infrastructure and access from other proposed developments will also make walking a more attractive mode choice. Importantly, the addition of the proposed new cycleway and improved pedestrian footpath will service the bulk of the newly generated trips, being in the 'Whitlam Square to Riley Street' and 'Riley Street to Bourke Street' sub-precincts.

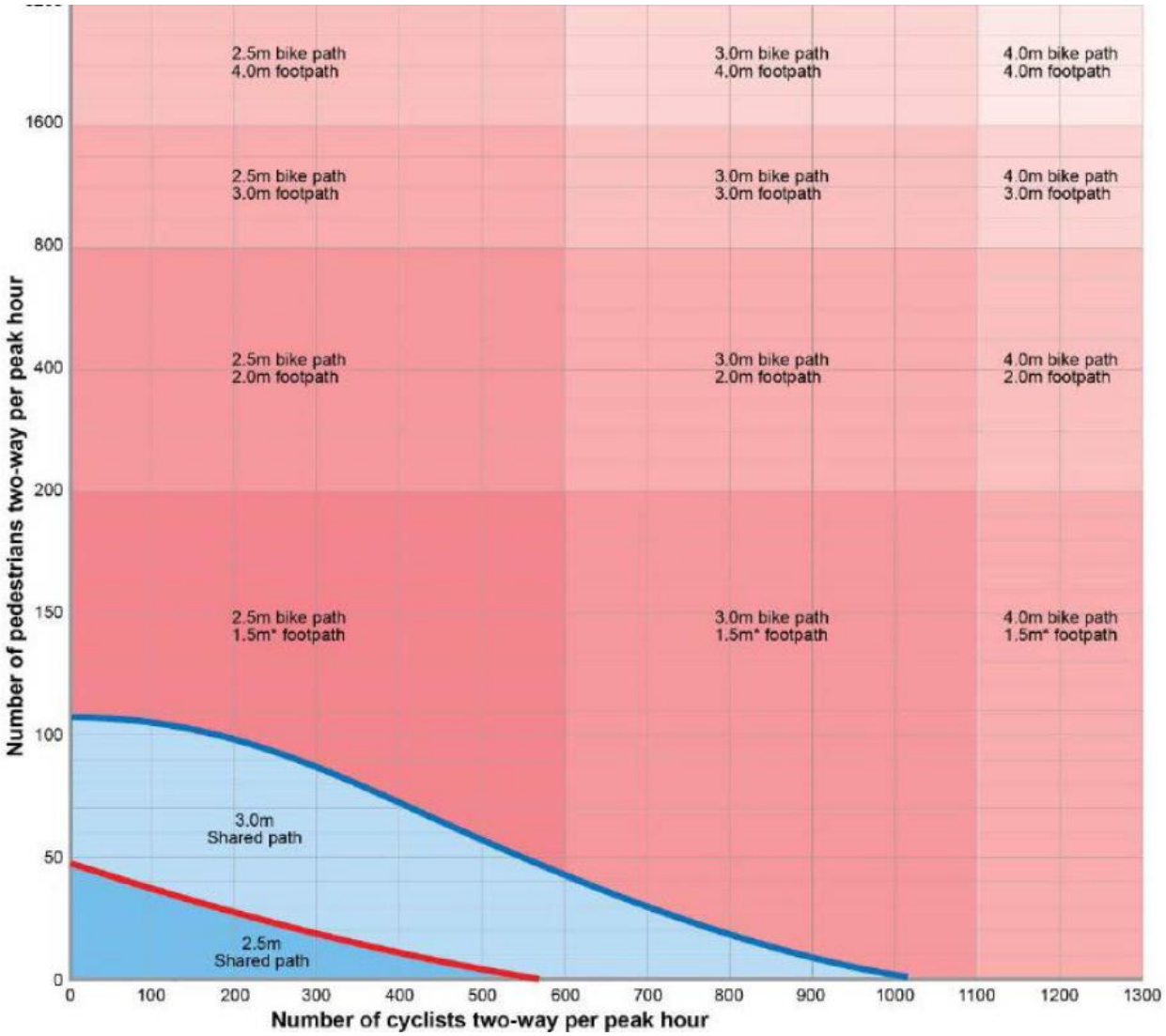
4.3.1 Cyclists

As noted previously, the proposed dedicated cycleway along Oxford Street and Liverpool Street will stretch from Castlereagh Street to Flinders Street. Future cycleways are planned along Flinders Street and Oxford Street which will link up with the proposed cycleway to the east.

The upgrade to cycling infrastructure will greatly improve connectivity to the cycling network for the precinct for trips originating westward. If completed, this will also allow trips originating from the east of the precinct safe and convenient access to the precinct.

Based on the trip generation and mode share assessment, it is estimated that there will be approximately 85 additional cycling trips during the AM and PM peak hours as a result of this planning proposal. With the existing cycling trips, this will require a bidirectional capacity of approximately 450 cyclists/hour in the busiest sections of the cycleway.

To understand the impact to capacity, Figure 4.1 below from the *Austroads Guide to Road Design* has been included to show the capacity limits for dedicated cycleways of different widths. At its narrowest, the proposed cycleway will be 2.4 m wide, which will allow it to accommodate approximately 600 cyclists/hour. The majority of the proposed cycleway will be 3.0 m wide, which will be able to accommodate approximately 1100 cyclists/hour. Based upon these numbers it is evident that these cycleways will in all likelihood be able to accommodate the increase in cycling activity due to the development of the precinct.



Source: Figure 5.4 in Austroads Guide to Road Design Part 6A: Paths for Walking and Cycling

Figure 4.1 Path widths for 50/50 directional split of pedestrians and cyclists

Figure 4.2, below, illustrates the expected cyclist volumes at select intersections along the corridor during the AM and PM peaks. With the exception that:

- The areas covered by the 'Taylor Square and Courthouse, Police Station and Gaol' and 'Flinders Street to UNSW Art and Design Campus' sub-precincts were treated as one sub-precinct given the negligible number of new trips from the former, and for ease of analysis.
- The end destination for trips in this combined sub-precinct are the boundaries of the 'Flinders Street to UNSW Art and Design Campus' sub-precinct.

It assumes that:

- Cyclist numbers as surveyed in 2019 is used as the base volume for analysis.
- 75 per cent of new cycling trips come from west of the study area and the remaining come from east of the study area to reflect the current trip distribution for the study area.
- New AM peak hour trips terminate at the furthest point of the sub-precinct of the desired destination from the direction of travel, and new PM peak hour trips originate from the same location.
- The number of new trips to a particular sub-precinct is proportionate to the number of new jobs generated compared to the entirety of the precinct.

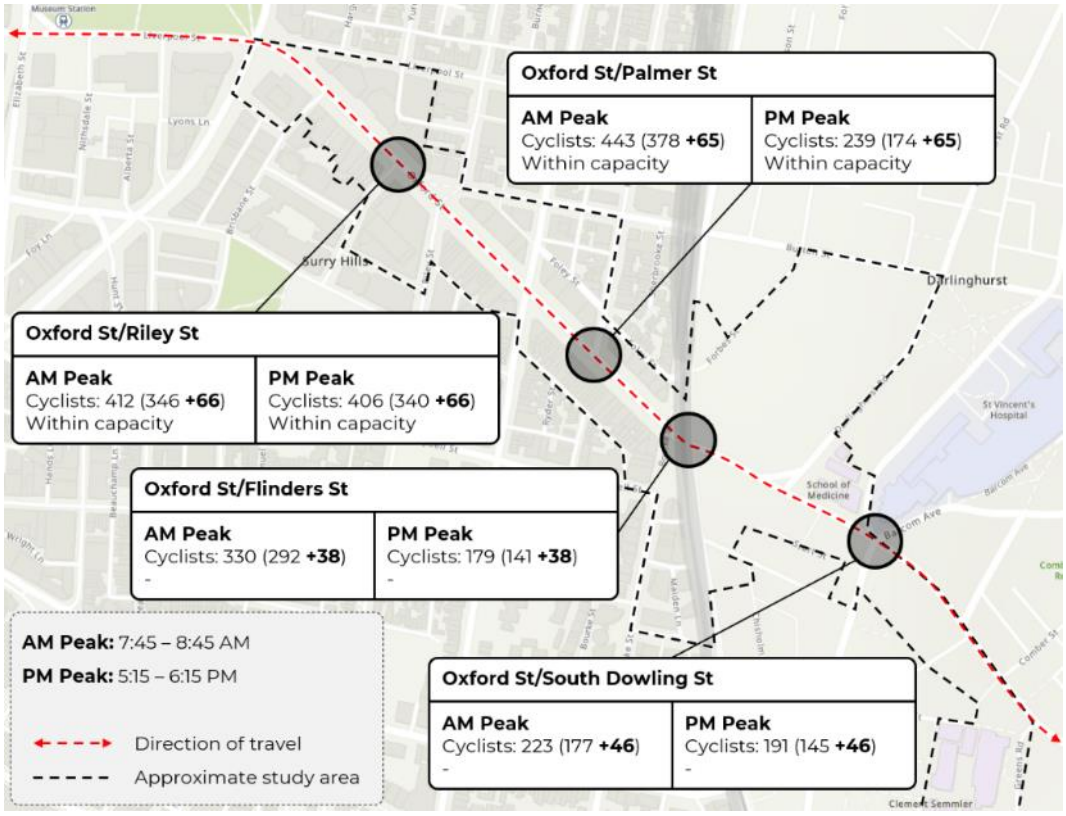


Figure 4.2 Expected cyclist demand with planning proposal assuming expected mode share and no change to existing mode share

Assuming the installation of dedicated cycleways along the corridor is completed before the full potential of the planning proposal, it is not expected that the planning proposal to result in the cycleway exceeding capacity. The busiest intersection, being Oxford Street/Palmer Street during the AM peak hour, will reach only 75 per cent of the minimum expected capacity with approximately 443 cyclists expected.

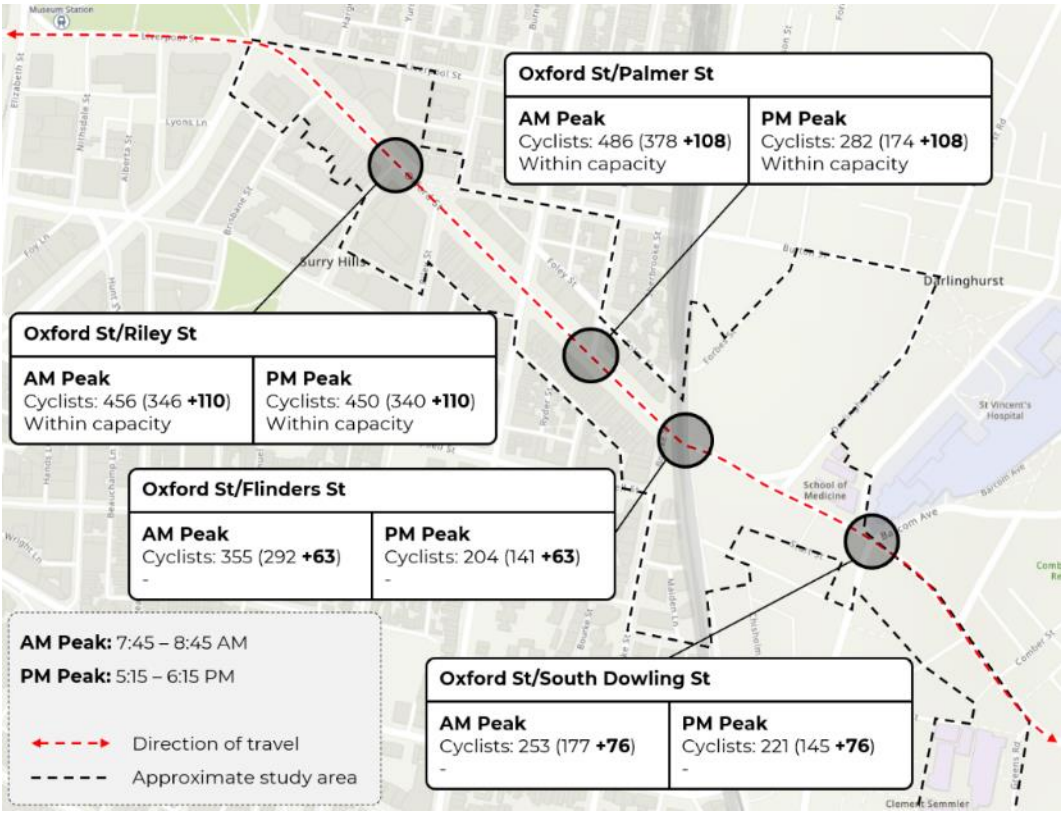


Figure 4.3 Expected cyclist demand with planning proposal assuming Sustainable Sydney 2030 target mode share and no change to existing mode share

Figure 4.3 also illustrates the expected cyclist volumes at select intersections along the corridor during the AM and PM peaks. It follows the same assumptions as for Figure 4.2, except that it assumes that new commutes through Oxford Street have a 10 per cent bicycle mode share, in line with the Sustainable Sydney 2030 target. Existing cycling trips remain the same.

From the figure, it isn't expected for the proposed cycleway to have capacity exceeded if new commutes follow the City's target mode share of 10 per cent. The busiest intersection remains Oxford Street/Palmer Street during the AM peak hour, which will reach about 80 per cent of the minimum expected capacity with approximately 486 cyclists expected.

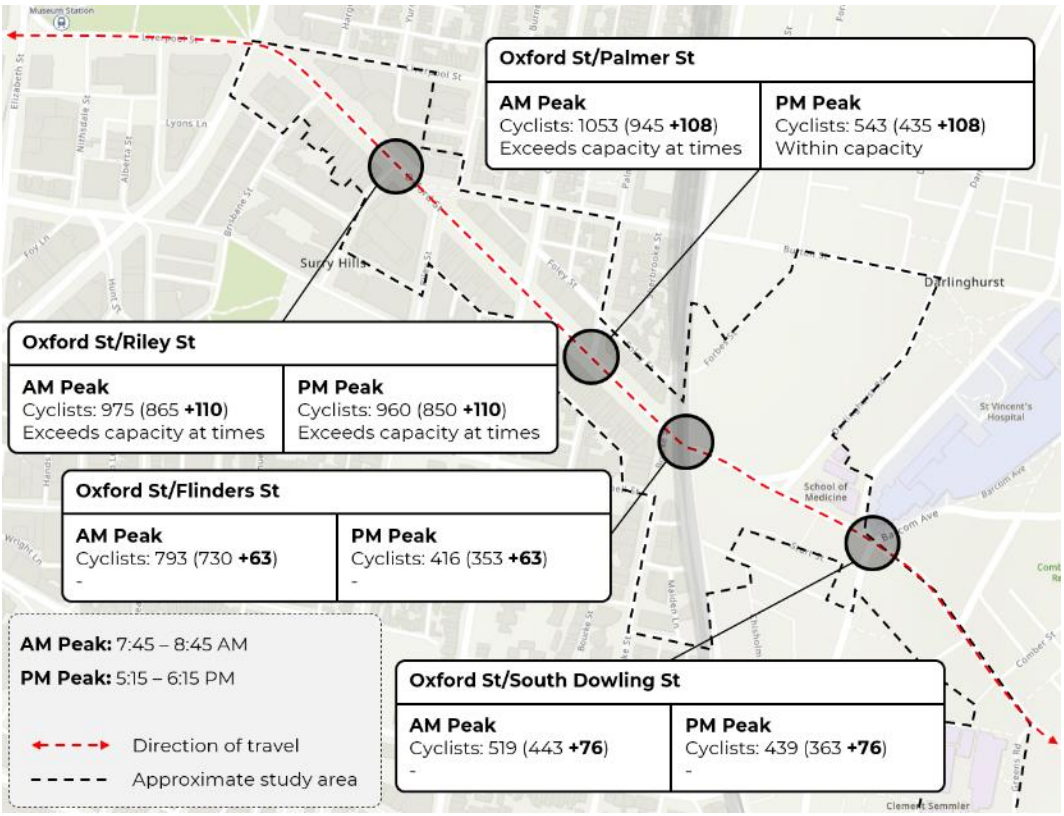


Figure 4.4 Expected cyclist demand with planning proposal assuming Sustainable Sydney 2030 target bicycle mode share is reached for all trips

When assuming an overall change in mode share in line with the City's goal for 10 per cent cycling trips, the proposed cycleway capacity is exceeded in some of its narrower locations which occur infrequently along the cycleway. Figure 4.4 assumes the same assumptions as for the previous bicycle analyses, except that it assumes a 10 per cent mode share for bicycles for both new and existing trips.

This may force some cyclists to use the road network as part of their commute. Along the length of the corridor, demand is not expected to exceed the approximate 1100 cyclists/hour capacity applicable to the majority of the proposed 3 m wide cycleway, even after the new demand from the planning proposal. Of note, the narrow sections of the proposed cycleway where capacity is expected to be exceeded will have its capacity exceeded regardless of the completion of the precinct, assuming a change in cyclist mode share to 10 per cent for existing trips.

4.3.2 Pedestrians

With the planning proposal, it is estimated that there will be an approximate increase in pedestrian trips of 265 during the AM and PM peak hours. This value captures new trips which are entirely done on foot from origin to destination.

Additionally, it is expected that some commuters travelling by train will complete the last mile of their journey as a pedestrian and add to pedestrian demand. This would account for approximately 365 additional pedestrian trips during the AM and PM peak hours. Given the availability of buses as a mode of transport to travel along Oxford Street, it is expected that the proportion of last mile trips done as pedestrians will decrease with distance from Museum train station.

Figure 4.5 shows the expected pedestrian demand following completion of the Oxford Street Cultural and Creative Precinct. With the exception that:

- The areas covered by the 'Taylor Square and Courthouse, Police Station and Gaol' and 'Flinders Street to UNSW Art and Design Campus' sub-precincts were treated as one sub-precinct given the negligible number of new trips from the former, and for ease of analysis.
- The end destination for trips in this combined sub-precinct are the boundaries of the "Flinders Street to UNSW Art and Design Campus" sub-precinct.

The values were calculated with the following assumptions:

- Pedestrian numbers as surveyed in 2019 is used as the base volume for analysis.
- 75 per cent of new pedestrian trips originate from west of the study area, with the remainder from east of the study area. This is for trips where the only mode of transport is walking from origin to destination.
- New pedestrian trips occur along Oxford Street only and not across, so only pedestrian counts for pedestrians along Oxford Street will change. They are evenly split between the north and south sides of Oxford Street.
- New AM peak hour trips terminate at the furthest point of the sub-precinct of the desired destination from the direction of travel, and new PM peak hour trips originate from the same location.
- The number of new trips to a particular sub-precinct is proportionate to the number of new jobs generated compared to the entirety of the precinct.
- The following proportion of commuters arriving at Museum train station will complete their journey to their destination in the precinct on foot – refer to Table 4.3.

Table 4.3 Proportion of commuters alighting at Museum Station that will complete their journey on foot

Destination sub-precinct	Proportion of train passengers (%)
Whitlam Square to Riley Street	95
Riley Street to Bourke Street	65
Taylor Square and Courthouse, Police Station and Gaol	20
Flinders Street to UNSW Art and Design Campus	20

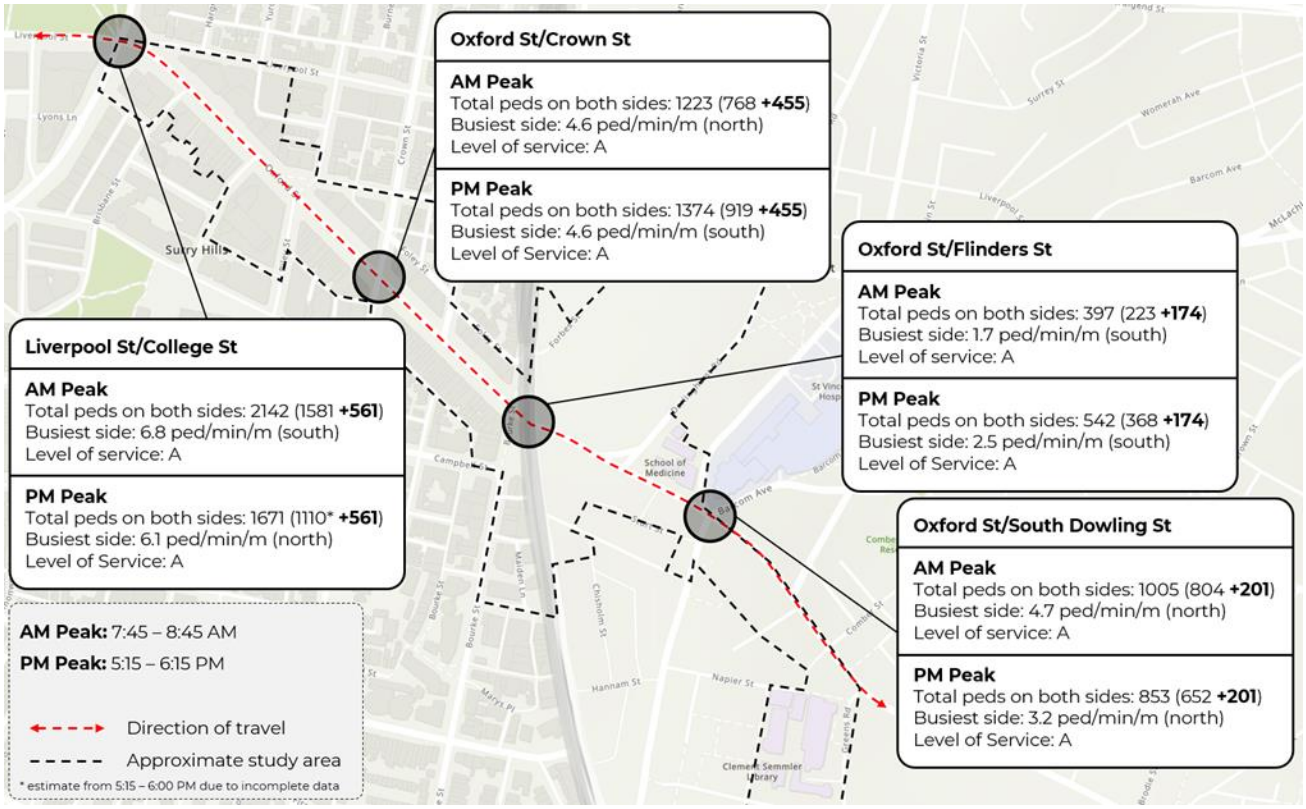


Figure 4.5 Expected pedestrian demand with planning proposal

Figure 4.5 shows the total number of pedestrians travelling along Oxford Street at each intersection as well as the flow. The flow given for each intersection is for the maximum flow of both the pedestrian walkways on either side of Oxford Street.

From the figure, it can be seen that the pedestrian volume along Oxford Street is would not exceed 2142 ped/hour and the maximum flow for any pedestrian walkway is approximately 6.8 ped/minute/metre.

Using the Fruin LoS criteria for pedestrians this still satisfies the LoS A criteria, allowing for pedestrians to freely select their own walking speeds.

A change in mode share from the existing 8 per cent to approximately 12 per cent would be required to change the level of service at half of the intersections in the figure to LoS B during the AM peak hour. A change to approximately 33 per cent would be needed to have any intersection reach LoS C.

Overall, it indicates that there is ample footpath capacity to accommodate the additional trips from the planning proposal.

4.4 Public transport

Public transport trips into and out of the Oxford Street Cultural and Creative Precinct are expected to account for about 68 per cent of new trips, compared to the existing level at 61 per cent. This mode share is for both bus and train mode shares combined.

The impact on the public transport network in the study area is expected to be minimal as a result of this development, with few additional bus services required if any, and no changes to kerbside uses affecting point-to-point public transport. There are no infrastructure changes to the public transport network as a part of this development, and so the expected increase in mode share compared to existing is predominantly a function of displaced private car trips.

4.4.1 Public buses

There are several bus routes along this corridor that will support trips to the precinct, and there will be no changes to bus routes or bus stop locations as a result of this development.

Due to demand from new commuters where taking a bus is the main mode of transport for travelling to the new precinct, it is expected that there will be approximately 250 additional trips during the AM and PM peaks hours.

Further, additional demand is expected from commuters taking train trips to Museum Station and using a bus to complete the trip (last mile). This is expected to create approximately 335 additional trips in the AM and PM peaks hours.

Given that some sub-precinct areas are close to Museum Station, it is expected that most commuters will walk these shorter distances but take a bus to destinations further along Oxford Street. Therefore, it is expected that the proportion of last mile trips taken by bus by train commuters will increase with distance from Museum Station.

Figure 4.6 shows the expected increase in bus passenger numbers. With the exception that:

- The areas covered by the 'Taylor Square and Courthouse, Police Station and Gaol' and 'Flinders Street to UNSW Art and Design Campus' sub-precincts were treated as one sub-precinct given the negligible number of new trips from the former, and for ease of analysis.

It is assumed that:

- The existing bus patronage for 2019 can be determined in a manner similar to as outlined in section 3.2.1, and that it remains unchanged following development of the precinct.
- The number of new trips to a particular sub-precinct is proportionate to the number of new jobs generated compared to the entirety of the precinct.
- 75 per cent of new bus trips originate from west of the study area, with the remainder from east of the study area. This is for trips where the only mode of transport is public bus from origin to destination.
- Passengers use the bus stop within their destination sub-precinct. Where there are multiple suitable bus stops within a sub-precinct, passengers are evenly split among them.
- For bus trips taken by train commuters, trips originating from Museum Station only occur during the AM peak, and trips to Museum station only occur during the PM peak.
- The following proportion of commuters arriving at Museum train station will complete their journey to their destination in the precinct by bus.

Table 4.4 Proportion of commuters alighting at Museum Station that will complete their journey by bus

Destination sub-precinct	Proportion of train passengers (%)
Whitlam Square to Riley Street	5
Riley Street to Bourke Street	35
Taylor Square and Courthouse, Police Station and Gaol	80
Flinders Street to UNSW Art and Design Campus	80

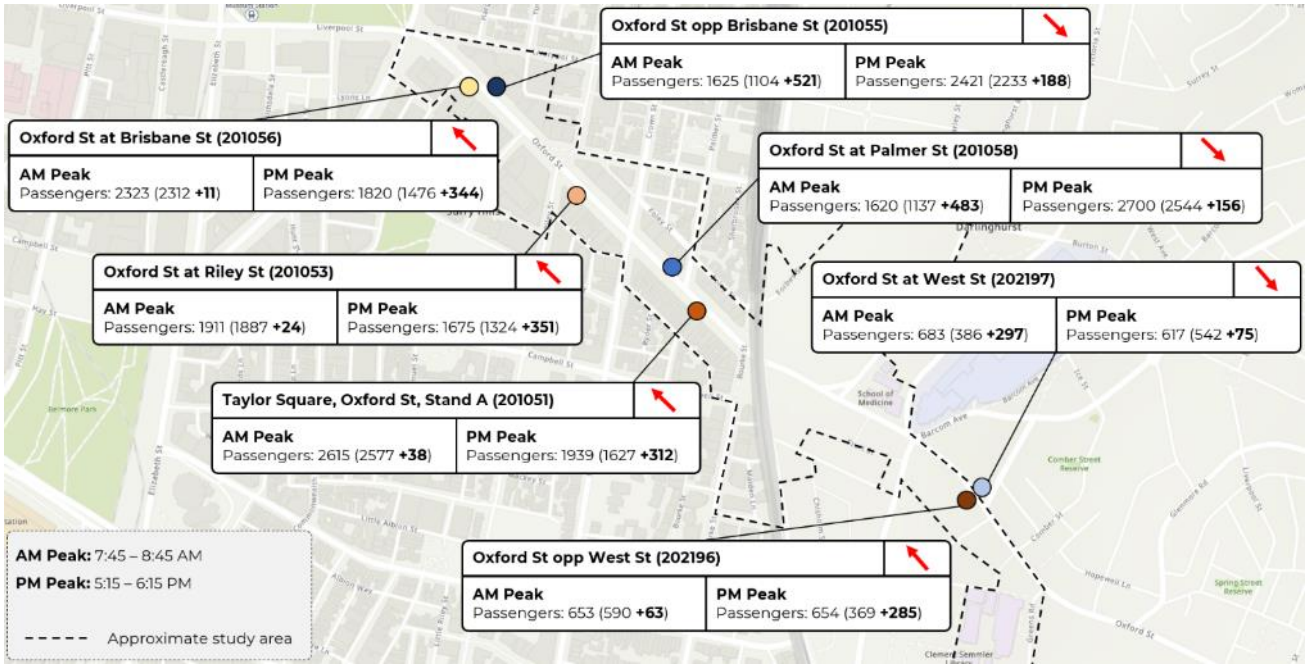


Figure 4.6 Expected bus passenger and vehicle demand with planning proposal

Table 4.5 presents the bus stops where passengers onboard at arrival are 60 or greater, indicating a condition approaching or at capacity.

Table 4.5 Highest average passengers onboard at arrival per bus by selected bus stops

Bus stop	Peak period	Without project		With project	Change	
		2019	2022		2019–2022	2022–future
Oxford Street at Palmer Street (201058)	PM	54	75	79	+21	+4
Taylor Square, Oxford Street, Stand A (201051)	AM	55	72	73	+17	+1
Oxford Street opposite Brisbane Street (201055)	PM	48	66	71	+18	+5
Oxford Street at Brisbane Street (201056)	AM	49	64	65	+15	+1

From Table 4.5, it was found that the bulk of the eastbound increase occurs during the AM peak, and the bulk of the westbound increase occurs during the PM peak. This reflects the location of new job opportunities in relation to the location of place of residence and transport interchange.

In line with existing conditions, it is expected that buses arriving at *Taylor Square, Oxford Street, Stand A* (201051) and *Oxford Street at Palmer Street* (201058) will be most full, and additionally also at *Oxford Street opposite Brisbane Street* (201055).

It is highly likely that several buses arriving at *Oxford Street at Palmer Street* (201058) will be at capacity, an impact that is predominantly due to the timetable change. The introduction of the planning proposal would increase the passenger per bus ratio further by approximately four passengers per bus to 79 passengers per bus.

In comparison, a 14.5 m two-door rigid buses have a combined standing and seated capacity of 80, and an 18 m two- or three-door articulated buses have a combined standing and seated capacity of 110.

Passengers onboard at arrival are expected to be slightly less at *Oxford Street opposite Brisbane Street* (201055) and *Oxford Street at Palmer Street* (201058) at 71 and 73, respectively. Given these numbers, it is also likely that some buses will be full on arrival at these stops.

Table 4.6 below captures the number of buses required to return to 2019 conditions prior to the bus timetable changes mentioned previously, and to current conditions prior to the completion of the precinct. For this following analysis, only the western portion is considered as the eastern portion is far from reaching capacity. To accommodate the additional bus passenger demand and return passenger numbers per bus to existing conditions would require an increase to the current number of buses timetabled.

Table 4.6 Bus frequency required to return to existing conditions

Peak period	Current number of buses	Required number of buses to return to		Change in number of buses from current	
		2019 (pre-timetable change)	2022 (before development)	2019 (pre-timetable change)	2022 (before development)
Eastbound					
AM peak	32	64	46	+32	+14
PM peak	34	50	36	+16	+2
Westbound					
AM peak	36	48	36	+12	+0
PM peak	33	53	41	+20	+8

Based on the assessment above, there is moderate impact to the bus service due to the planning proposal. This is particularly apparent in the AM peak, eastbound direction requiring up to 14 new bus services if the passenger/bus ratio is to be maintained pre-development and post-December 2021 timetable change.

It is to be noted however that one of the key driver in the bus timetable review for services to the south-east suburbs is the establishment of the south-east light rail network, and its potential to change land use and connecting services impacting reduced bus passenger demand on trunk services for services to the south-east suburbs.

This change only occurred in December 2021, thus the impact of the changes to the bus network may be premature to be reviewed at the time of writing this report. As such, the assessment above should be approached with caution and regularly reviewed in the future to monitor the level of service acceptable to bus passengers. Gradual increase in bus services may need to occur to accommodate demand from the planning proposal.

4.4.2 Point-to-point

Access to point-to-point public transport services, such as taxis and rideshares, should be minimally impacted by the planning proposal. There are no changes to kerbside use restrictions that will directly impact point-to-point transport, so existing taxi zones and no stopping areas where taxis are allowed to stop for up to one minute will be maintained.

Specific developments that require changes to parking restrictions along Oxford Street, which may impact the availability and accessibility of point-to-point public transport, will need to be assessed individually by the City at the time of Development Application submission.

4.5 Traffic impact

With the precinct subjected to maximum car parking provision planning control and considering its distance to high-quality public and active transport facilities, it is expected that there would be limited increase in additional car trips generated by the developments.

As mentioned in section 4.2, that while some additional parking is possible, this would be restricted by the cost and practicalities of providing new basement parking within constrained heritage buildings and small lot sizes. Further, the on-street parking is at capacity and the City's controls provide incentives to use basements as entertainment spaces rather than as parking, thus reducing attractiveness to provide basement parking.

A low mode share of car trips (both as drivers and passengers) can already be observed in the *Journey to Work – place of usual residence* with people living in the study area opting not to drive to their place of work. This was surveyed at nine per cent in 2016, prior to the pandemic and work from home initiatives. It is likely that this share would reduce further since the COVID-19 pandemic due to flexibility in working arrangements.

Car-pooling initiatives, point-to-point transport and pick-up/drop-off (i.e. car trip as passengers) activities may be an option for those unable to use public transport/active transport. It is expected that car trip as passengers would have low mode share, as is currently observed in the journey to work data.

Considering the above factors, car mode share (as driver or passenger) has been estimated to make up to five per cent of the total trips, which account for approximately 70 car trips during the peak hours which are spread across the length of the precinct. The additional increase in car trips is considered minor and likely to be readily absorbed in the traffic network.

Slight increases in motorcycle use could occur due to the flexibility of this transport mode in terms of access and parking. Based on the trip generation and mode share calculation, it is estimated that approximately 30 additional motorcyclists would be generated on the road network during the AM and PM peak hours. This is considered a minor impact to the road network.

4.6 Property accesses and freight task

Access to existing properties will be maintained as part of the planning proposal, as such resulting in no impact to their accessibility.

Freight task may increase with the additional land use of the precinct which will be accommodated using the existing facilities through buildings' rear-access from laneways and shared on-street loading zones. It is envisaged that this will be considered through the development application process and managed operationally through day-to-day operation of the developments. The impact of the planning proposal to freight task is therefore minor and manageable through operational considerations.

The proposed upgrade of Foley Street will maintain access to servicing of developments. Other laneways including Arnold Place, Iona Lane, Verona Street, Rosebud Lane, and Little Oxford Street would also maintain their function.

5 Mitigation measures and management

There are several risks that come with the development of this precinct which vary in impact and likelihood. There are also several opportunities to manage and mitigate these risks from occurring. While our assessment of the impact that this development will cause is that it will be minimal, we have identified some possible risks that may occur, and have proposed some mitigation and management strategies in Table 5.1.

Table 5.1 Identified risks and opportunities

Risk	Opportunity to mitigate
Capacity of proposed cycleway to accommodate induced demand and Cultural and Creative Precinct demand There will be several contributing factors to why the demand for the proposed cycleway may exceed capacity, including: Trips generated from the planning proposal. Cumulative initiatives by the City through *Sustainable Sydney 2030* and *Cycling Strategy and Action Plan* through infrastructure upgrade increasing cycling demand.	To accommodate additional cycling trips, there are opportunities to investigate improving cycling facilities on local roads within the vicinity Oxford Street to promote sustainable transport for trips to/from the CBD and around Darlinghurst.
Insufficient end of trip facilities available for active transport commuters While the existing DCP has provisions for bike parking and associated facilities, there may be more demand for higher quality end-of-trip facilities (parking, showers, lockers etc.).	During the Development Application stage of specific developments, and through appropriate *Green Travel Plan*, careful consideration will need to be given to the expected future active transport demands, to align with the City's goals for an overall increase in bicycle mode share.
Walking infrastructure quality not corresponding to the likely increase in walking activities generated by the planning proposal Poor walking infrastructure quality reducing the desire for walking in the precinct, increasing reliance on private transport trips which is loaded on to the road network.	Investigate opportunities to improve connectivity, permeability and attractiveness of walking in the precinct. Existing example of these initiatives include: — The activation of Foley Street to improve the attractiveness of these laneways while aligning with the precinct objectives. — as part of the Oxford Street cycleway, the intersection of Palmer Street will be converted to a one-way outbound only. This would ensure that pedestrians can receive green phase in parallel with traffic on Oxford Street, thus reducing dwelling time and improve quality of walking.

Risk	Opportunity to mitigate
Large Cultural and Creative land use as tourist destination resulting in insufficient kerbside allocation for point-to-point transit facilitation. Significant Cultural and Creative land use development (e.g. large art galleries) which have a high attraction for visitors may lead to increases in point-to-point transit demand, such as taxis, rideshare, or dedicated private bus services. Existing allocation for stopping areas may be insufficient to cater for this increase in demand.	The operating hours, operation management and suitability of existing kerbside restrictions should be taken into consideration during the Development Application stage of individual developments. Careful monitoring of existing set-down and pick-up areas to assess the adequacy of these existing zones could be undertaken, with additional kerbside to be allocated if necessary. Any changes must be carefully assessed for their impact on traffic flow.
Insufficient bus capacity to service the increased demand from the planning proposal. Based on the assessment, high accessibility and frequency of the bus services currently exist on Oxford Street. Moderate increase in bus demand may occur as a result of the planning proposal as more people work and visit the area. There may be a risk of the existing bus services being insufficient to provide high-quality service to people living, working or visiting the area.	The uptake of Cultural and Creative land use and the increase of jobs and trips to the precinct as part of the planning proposal will be gradual. Bus serviceability would need to be continually reviewed to plan for staged increase in frequency/ bus capacity to correspond to the demand, which could be experienced from changes outside of the Cultural and Creative precinct.

6 Conclusion

WSP has been engaged to undertake a Traffic and Transport Impact Assessment (TTIA) of the City of Sydney's planning proposal Oxford Street Cultural and Creative Precinct, to encourage uses that support Oxford Street's role as a local centre and an activity street, including cultural and creative, entertainment, education, commercial and tourism sectors in the precinct, aligning its role with the objectives of planning policies on State and Local level.

The Planning Proposal has the potential to deliver 42,500 m^2 of new employment floor space including 11,300 m^2 with a creative and cultural purpose. The proposal would allow greater heights and floor space on Oxford Street if the development provides uses that are strategically important to the local centre and creates more space for creative and cultural activities. It would protect heritage items, public spaces and local characters.

The report's objectives, in summary, is to review the strategic context of the planning proposal, describe existing conditions and capacity of the transport network, estimate the trips generated by the precinct including associated travel mode share, and assess the impact of the transport task from the potential additional trips generated.

To estimate the trip generation, the study used the floor space to job ratio found in the *Oxford Street Floorspace Supply and Demand Study* to estimate the number of jobs generated by the planning proposal which would result in trips to work. The assessment focused on the impact particularly during the road network's peak periods.

The planning proposal would be developed in parallel with key local strategies (e.g. Sustainable Sydney 2030, Cycling Strategy and Action Plan) and state level strategies (Future Transport 2056) to encourage active transport and public transport use on Oxford Street. Initiatives such as Foley Street upgrade, Oxford Street west cycleway and review of the south-east bus network are evident of this. The combination of the precinct's location in the fringes of the CBD and improvements of key public and active transport strategies would increase the attractiveness and reliance of these modes.

Additionally, the planning proposal would use the current LEP's maximum car parking rate and end of trip facility provision. While some additional parking is possible, this would be restricted by the cost and practicalities of providing new basement parking within constrained heritage buildings and small lot sizes. Further, the on-street parking within the vicinity of the precinct is at capacity and the City's controls provide incentives to use basements as entertainment spaces rather than as parking, thus reducing attractiveness to provide basement parking. As such, minimal car trips, mainly used as point-to-point and pick-up/drop off would be generated from the planning proposal.

The capacity of the existing transport network and the impact of the planning proposal been assessed which found that the additional trip demand generated from the planning proposal would generally be able to be accommodated in the existing facility. A number of risks identified and opportunity to mitigate are listed below.

Risk	**Opportunity**
Insufficient capacity of proposed cycleway to accommodate induced demand and Cultural and Creative Precinct demand.	Improve cycling facilities on local roads within the vicinity Oxford Street to provide a complete network.
Insufficient end of trip facilities available for active transport commuters.	Include Green Travel Plan in the review development applications.
Walking infrastructure quality not corresponding to the likely increase in walking activities generated by the planning proposal.	Investigate improved connectivity, permeability and attractiveness of walking in the precinct.
Large Cultural and Creative land use as tourist destination resulting in insufficient kerbside allocation for point-to-point transit facilitation.	Consider operating hours, operation management and suitability of existing kerbside restrictions during the Development Application process.
Insufficient bus capacity to service the increased demand from the planning proposal.	Review bus serviceability and potentially plan a staged increase in bus frequency/capacity.

7 Limitations

This Report is provided by WSP Australia Pty Limited (*WSP*) for the City of Sydney (*Client*) in response to specific instructions from the Client and in accordance with WSP's proposal dated 24 November 2021 and agreement with the Client dated 21 December 2021 (*Agreement*).

7.1 Permitted purpose

This Report is provided by WSP for the purpose described in the Agreement and no responsibility is accepted by WSP for the use of the Report in whole or in part, for any other purpose (*Permitted Purpose*).

7.2 Qualifications and assumptions

The services undertaken by WSP in preparing this Report were limited to those specifically detailed in the Report and are subject to the scope, qualifications, assumptions and limitations set out in the Report or otherwise communicated to the Client.

Except as otherwise stated in the Report and to the extent that statements, opinions, facts, conclusion and/or recommendations in the Report (*Conclusions*) are based in whole or in part on information provided by the Client and other parties identified in the report (*Information)*, those Conclusions are based on assumptions by WSP of the reliability, adequacy, accuracy and completeness of the Information and have not been verified. WSP accepts no responsibility for the Information.

WSP has prepared the Report without regard to any special interest of any person other than the Client when undertaking the services described in the Agreement or in preparing the Report.

7.3 Use and reliance

This Report should be read in its entirety and must not be copied, distributed or referred to in part only. The Report must not be reproduced without the written approval of WSP. WSP will not be responsible for interpretations or conclusions drawn by the reader. This Report (or sections of the Report) should not be used as part of a specification for a project or for incorporation into any other document without the prior agreement of WSP.

WSP is not (and will not be) obliged to provide an update of this Report to include any event, circumstance, revised Information or any matter coming to WSP's attention after the date of this Report. Data reported and Conclusions drawn are based solely on information made available to WSP at the time of preparing the Report. The passage of time; unexpected variations in ground conditions; manifestations of latent conditions; or the impact of future events (including (without limitation) changes in policy, legislation, guidelines, scientific knowledge; and changes in interpretation of policy by statutory authorities); may require further investigation or subsequent re-evaluation of the Conclusions.

This Report can only be relied upon for the Permitted Purpose and may not be relied upon for any other purpose. The Report does not purport to recommend or induce a decision to make (or not make) any purchase, disposal, investment, divestment, financial commitment or otherwise. It is the responsibility of the Client to accept (if the Client so chooses) any Conclusions contained within the Report and implement them in an appropriate, suitable and timely manner.

In the absence of express written consent of WSP, no responsibility is accepted by WSP for the use of the Report in whole or in part by any party other than the Client for any purpose whatsoever. Without the express written consent of WSP, any use which a third party makes of this Report or any reliance on (or decisions to be made) based on this Report is at the sole risk of those third parties without recourse to WSP. Third parties should make their own enquiries and obtain independent advice in relation to any matter dealt with or Conclusions expressed in the Report.

7.4 Disclaimer

No warranty, undertaking or guarantee whether expressed or implied, is made with respect to the data reported or the Conclusions drawn. To the fullest extent permitted at law, WSP, its related bodies corporate and its officers, employees and agents assumes no responsibility and will not be liable to any third party for, or in relation to any losses, damages or expenses (including any indirect, consequential or punitive losses or damages or any amounts for loss of profit, loss of revenue, loss of opportunity to earn profit, loss of production, loss of contract, increased operational costs, loss of business opportunity, site depredation costs, business interruption or economic loss) of any kind whatsoever, suffered or incurred by a third party.

Appendix A

Spatial requirements of specific creative spaces

Table A.1 Examples of Cultural and Creative land uses and relevant requirements

Uses	Description	Floor space	Capacity	Loading bay
Performance space	A purpose-built space for use for theatre and music performance with a large flat stage area, wing space, fixed tier seating, high level of lighting and audio equipment	600 m^2+	500+ with fixed tier seating over a single area or multiple balconies	To suit 43 m^3 box truck
Performance space multipurpose	A flexible performance space with no fixed performance or seating area, with a high level of lighting and audio equipment	300 m^2+	300–500 people in retractable seating	Good rear access for 3 tonne truck, roller door and access into venue; double door access
Performance spaces rehearsal areas	Large lockable sound attenuated space for dance, theatre and music rehearsals. Ventilated with access to natural light. Easily accessible after hours and in weekends.	100–300 m^2	100–200 people	22 m^3 box truck
Gallery spaces – large	Space for large scale exhibitions as one large space or separable with temporary walls. Uninterrupted walls, high ceilings and natural light.	1,000–5,000 m^2	1000 people	43 m^3 box truck
Gallery spaces – small to medium	Space for small to medium scale exhibitions ideally at ground floor with open space, uninterrupted walls, high ceilings and no direct sunlight on exhibitions.	80–1,000 m^2	300 people	9 m^2
Studio space – generic	Large lockable area alone or part of a larger collective for a group of artists.	20–40 m^2	3–4 people	Drop off parking
Studio messy	For large art practices that involve noise and mess with hard wearing floors, roller door access and large ventilated spaces.	200–100 m^2	3–4 people	Truck access to one loading area
Workshop spaces – ceramic	Studio space around sharing tools needed for ceramic work.	20–40 m^2	Clusters of 8–10 studios	22 m^3 box truck
Workshop – printmaking	Studio space around sharing tools needed for printmaking.	20–40 m^2	3–10 people	Drop off parking
Workshop textile/fashion	Group studio space for working but open to public for sales or client appointments.	40–100 m^2	3–10 people	Drop off parking

Uses	Description	Floor space	Capacity	Loading bay
Workshop – sound recording	Contains a tracking room and control room in order to record and mix music. These spaces can be hired casually and be provided with or without equipment.	30 m^2 tracking room; 20 m^2 control room	5 people recording, 3–5 people editing	Drop off parking and unloading
Workshop – photoshoot	Large room with good day lighting and continual backdrops.	25-100 m^2	Site manager desk	9 m^2 to suit van
Workshop – film recording	Sound attenuated space with continuous backdrop for filming sounds and visuals.	50-90 m^2	Soundproof voice over recording room 2 m^2, editing room 15 m^2	9 m^2
Workshop – light manufacturing	Large warehouse space for the manufacture or large items, such as set buildings and furniture. In a noise tolerant area.	30–50 m^2	40 studios	Drive through 5x5 m roller doors and corridor for truck
Live music spaces	Space for a musical experience with audiences. It should accommodate a variety of performance such as intimate gigs, major event, classical recital or community brass band.	200–800 m^2 for major live music events	500–800 people	22 m^3 box truck

Source: Oxford Street Cultural and Creative Precinct Draft Development Control Plan, 2021