Report to the Future Melbourne (Planning) Committee

Agenda item 6.3

Melbourne Planning Scheme Amendment C278 Sunlight to Public Parks

15 May 2018

Presenter: Emma Appleton, Manager Urban Strategy

Purpose and background

1. The purpose of this report is to present Planning Scheme Amendment C278 which will protect sunlight to all parks across the municipality (excluding the Hoddle Grid and Southbank), and to seek endorsement to request authorisation of draft Amendment C278 (refer to Attachment 2).

2. The Government's Amendment C270 introduced changes to Planning Scheme Clause 22.02 Sunlight to Public Spaces Policy. The Amendment adopted a tiered approach for protection of sunlight to parks in the Hoddle Grid and Southbank with a focus on intensity of use, and a shift to a winter solstice test.

3. The city is experiencing a significant increase in its population and in the number, density and heights of new development across the municipality. These factors are placing increased pressure on our existing public parks so protecting the valued qualities of existing public parks and particularly their access to sunlight is of high importance.

Key issues

4. Amendment C278 proposes to introduce a new Design and Development Overlay schedule (DDO8) to protect sunlight access to all parks across the municipality (excluding the Hoddle Grid and Southbank), and an updated Sunlight to Public Spaces Policy to reflect the revised policy position for public parks.

5. Underpinning the policy review is sophisticated 3D modelling providing an accurate picture of the current overshadowing conditions, and cumulative impacts of built form on parks. The model has been used to establish appropriate sunlight protection levels. The analysis (see Attachment 3 for the consultant's report), showed that within low scale areas (four storeys and below), there are good levels of winter sun which will generally remain as new buildings are built within current height controls. In the areas of growth (above four storeys), many parks are vulnerable to winter overshadowing due to current height controls. The modelling also demonstrated that protecting the entire park in the areas of growth in winter would often have an unreasonable impact given support for development intensification. Therefore a balanced approach between protecting winter sunlight and the need to support development growth is required.

6. Based on the report findings, the proposed controls reflect best practice protection of sunlight access to parks balanced with the need to support appropriate development intensification. The proposed controls will:

    6.1. Extend the current approach of maintaining good winter sunlight access to central city parks to all parks across the municipality.

    6.2. Apply a mandatory 'no additional overshadowing' control for all parks.

    6.3. Moderate the impact of the 'no additional overshadowing' control protection within areas of growth (areas with height limits over four storeys) by balancing sunlight protection to parks with support for development intensification in the following circumstances:

        6.3.1. For parks immediately abutting areas with height limits over four storeys, limit any additional overshadowing to that cast by the street wall or the overall building height limit nominated in the planning scheme (whichever is lower). Any part of the building beyond these nominated heights must be set back so as to not add any additional shadow.

        6.3.2. For the large parks east of St Kilda Road and three other smaller parks, sunlight protection should be provided between 10am and 2pm in winter. This acknowledges that after 2pm, winter shadows from tall buildings in Southbank begin to fall across these parks. Considering the scale of development already in, and anticipated for Southbank, it would not be reasonable to require protection from overshadowing after 2pm.

Recommendation from management

7. That the Future Melbourne Committee:

   7.1. Seeks authorisation from the Minister for Planning to prepare and exhibit Melbourne Planning Scheme Amendment C278 (Attachment 2).

   7.2. Endorses the report "*Sunlight access to open spaces modelling analysis report, February 2018*" as a reference document listed in Design and Development Schedule 8. This report outlines the rationale and evidence which underpins the proposed planning scheme changes.

   7.3. Authorises the Director City Strategy and Place to make minor editorial changes to the amendment documentation and reference document prior to public exhibition if required.

Attachments:
1. Supporting Attachment (Page 3 of 139)
2. Draft Melbourne Planning Scheme Amendment C278 (Page 4 of 139)
3. Sunlight Modelling Analysis Report (Page 16 of 139)

Supporting Attachment

Legal

1. Divisions 1 and 2 of Part 3 of the *Planning and Environment Act 1987* address planning scheme amendments.

Finance

2. The costs for preparing and processing Melbourne Planning Scheme Amendment C278 are provided for within the 2017–18 budget

Conflict of interest

3. No member of Council staff, or other person engaged under a contract, involved in advising on or preparing this report has declared a direct or indirect interest in relation to the matter of the report.

Stakeholder consultation

4. The community was consulted on how they use the parks and the importance of sunlight to their use in early 2017. Two hundred and seventy five people responded to an online survey and face to face consultation held in numerous parks around the city.

5. The formal exhibition of Amendment C278 will be undertaken in mid-2018 subject to authorisation being granted by the Minister for Planning. Additional consultation will be undertaken during the exhibition period with key stakeholders and the community.

Relation to Council policy

6. The following Council Plans and policies are relevant:

    6.1. Melbourne Planning Scheme's Municipal Strategic Statement (MSS), specifically Clause 21.05-2 Environment and Landscape Values-Biodiversity includes a strategy to:

    "Protect and enhance the vegetation, biodiversity, habitat, amenity and attractiveness of the city's parklands, the Yarra and Maribyrnong Rivers and the Moonee Ponds Creek"

    6.2. Melbourne Planning Scheme's Sunlight to Public Spaces Policy, Clause 22.02.

Environmental sustainability

7. The proposed amendment will have positive environmental effects by protecting direct sunlight into parks. The proposed amendment has an emphasis on sunlight protection recognising that sunlight is critical to supporting biodiversity particularly in densely built up and populated areas and sunlight exposure to open space is important for the growth of vegetation.

22 LOCAL PLANNING POLICIES

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22.02 Sunlight to Public Spaces

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This policy applies to public spaces throughout the municipality including parks and gardens, squares, streets and lanes, and privately owned publicly accessible spaces within developments, including building forecourts, atria and plazas.

~~The policy does not apply to land within the Docklands Zone and Schedule 5 to the Capital City Zone (City North).~~

22.02-1 Policy Basis

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The State Planning Policy Framework sets out objectives for a high quality public realm. Similarly, the Municipal Strategic Statement sets out objectives for public realm quality. A fundamental feature of Melbourne's character, liveability, comfort and attractiveness is its ability to offer sunlight to its streets and public spaces ~~at the times of the year when the intensity of pedestrian activity is highest.~~

The policy recognises that sunlight contributes to the amenity and useability of public space, public health and well~~-~~being and supports trees and other plants.

~~The policy recognises that not all public spaces have the same sunlight access requirements.~~ Public spaces in the Hoddle Grid and Southbank make a contribution to Melbourne's character and cultural identity, where specific controls are required to maintain sunlight access and prevent additional overshadowing when the spaces are intensively used. Elsewhere in the municipality the city is undergoing transformative change. All parks are of value as the population grows and the usage and the diversity in the the parks are used increases. Specific controls are required to prevent additional overshadowing and to maximise winter sunlight access to provide the opportunity for people to access and enjoy sunlight in all the parks throughout the year.

The policy provides guidance for the consideration of the impact of additional overshadowing on the amenity, quality and useability of the public space.

22.02-2 Objectives

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To achieve a comfortable and enjoyable public realm.

To ensure new buildings and works allow good sunlight access to public spaces.

To ensure that overshadowing from new buildings or works does not result in significant loss of sunlight and diminish the enjoyment of public spaces for pedestrians.

To protect, and where possible increase the level of winter sunlight access to public spaces. ~~during the times of the year when the intensity of use is at its highest.~~

To create and enhance public spaces to provide sanctuary, visual pleasure and a range of recreation and leisure opportunities

22.02-3 Policy

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It is policy that development proposals are assessed against the following requirements:

Key Public Spaces in the Hoddle Grid and Southbank

Development must not cast additional shadow across the following spaces at key times and dates identified in the planning scheme:

- The Yarra River corridor, including 15 metres from the edge of the north bank of the river to the south bank of the river
- Federation Square

- City Square
- State Library Forecourt
- Bourke Street Mall south of the tram tracks
- Shrine of Remembrance and its Northern Forecourt
- Boyd Park

Development should not cast additional shadow across the following spaces at key times and dates identified in the planning scheme:

- Parliament Gardens
- Treasury Gardens
- Flagstaff Gardens
- Gordon Reserve
- Parliament Steps and Forecourt
- Old Treasury Steps
- Flinders Street Railway Station Steps
- Batman Park
- Birrarung Marr
- Sturt Street Reserve
- Grant Street Reserve and the Australian Centre for Contemporary Art Forecourt, south side of Grant Street between Sturt Street and Wells Street
- Dodds Street between Southbank Boulevard and Grant Street
- Swanston Street between south bank of the Yarra River and La Trobe Street
- Elizabeth Street between Flinders Street and Flinders Lane
- Hardware Lane and McKillop Street
- The southern footpath of Bourke Street between Spring Street and Exhibition Street
- The southern building line of Little Bourke Street between Spring and Swanston Streets and Cohen Place/ Chinatown Plaza
- Liverpool Street and Crossley Street
- Market Street between Collins Street and Flinders Lane

Public Parks Outside the Hoddle Grid and Southbank

Development must not cast additional shadow on any public park at key times and dates identified in the planning scheme.

Other Public Spaces within the municipality

Development should not unreasonably reduce the amenity of public spaces by casting additional shadows on any public space, ~~public parks and~~ ~~gardens,~~ public squares, major pedestrian routes including streets and lanes, open spaces associated with a place of worship and privately owned plazas accessible to the public between 11.00 am and 2.00 pm on 22 September.

22.02-4 Policy Implementation

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In considering the impact of additional overshadowing as set out in this policy, the responsible authority will assess whether the additional overshadowing adversely affects the use, quality and amenity of the public space. The following matters will be considered as appropriate:

- The area of additional overshadowing relative to the area of remaining sunlit space compared to the total area of the public space;
- Any adverse impact on the cultural or social significance of the public space;
- Any adverse impact on the natural landscaping, including trees and lawn or turf surfaces in the public space;
- Whether the additional overshadowing compromises the existing and future use, quality and amenity of the public space;
- Whether allowing additional shadows on other public spaces such as streets and lanes ~~,~~ is reasonable having regard to their orientation and shadows cast by adjacent buildings.

22.02-5 Definitions for the Purpose of this Policy

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The south bank is the north edge of the existing physical boundary bordering the south side of the Yarra ~~r~~River.

The north bank is the south edge of the existing physical boundary bordering the north side of the river.

22.02-6 Policy References

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Places for People (1994)

Bourke Hill Heritage, Planning and Urban Design Review, Department of Transport, Planning and Local Infrastructure, September 2014

Central City Built Form Review Synthesis Report, Department of Environment, Land, Water and Planning, April 2016

Central City Built Form Review Overshadowing Technical Report, Department of Environment, Land, Water and Planning, April 2016

Sunlight access to open spaces modelling analysis report, Hodyl+Co ,February 2018

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SCHEDULE 8 TO CLAUSE 43.02 DESIGN AND DEVELOPMENT OVERLAY

Shown on the planning scheme map as **DDO8**

SUNLIGHT ACCESS TO PUBLIC PARKS

1.0 Design objectives

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To protect sunlight access to the parks.

To ensure new developments respond with appropriate building heights and setbacks to protect sunlight access to parks.

To ensure that the amenity of all parks is protected by maximising winter sunlight access

To acknowledge the importance of sunlight access within parks in supporting the health and wellbeing of all park users and the ecological health of the park.

2.0 Buildings and works

2.1 Definitions

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For the purpose of this schedule:

- **park** means the land identified as Shadow Assessment Type 1,2 or 3 in Figure 1.
- **land abutting a park** means land with a common boundary to a park or land separated from the park by a public street or laneway.
- **shadow** means any shadow cast by buildings and works.

2.2 Buildings and works for which no permit is required

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A permit is not required for:

- Buildings and works where the overall building height is 9 metres or less.
- Buildings and works which do not extend the shadow cast by an existing building on the site.
- Buildings and works which would cast a shadow across the Yarra River Corridor between 11.00 am and 2.00 pm on 22 June caused by unenclosed structures associated with the construction of gangways, mooring poles and pontoons which are constructed by or on behalf of Melbourne Parks and Waterways or Parks Victoria under the Water Industry Act 1994, the Water Act 1989, the Marine (Drug, Alcohol and Pollution Control) Act 1988, the Parks Victoria Act 1998, or the Crown Land (Reserves) Act 1978.

2.3 Application requirements

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An application for permit must be accompanied by a 3D model of the proposed buildings and works in a format in accordance with the City of Melbourne 3D Digital Modelling Advisory Note.

The 3D model must show:

- The existing shadow cast on the park during the defined period by existing buildings and works.
- The extent of allowable shadow cast onto a park during the defined period resulting from future built form compliant with nominated requirements in the planning scheme.
- The extent of shadow to be cast by the proposed buildings and works.
- Compliance with the requirements in Table 1 to this schedule.

2.4 Requirements

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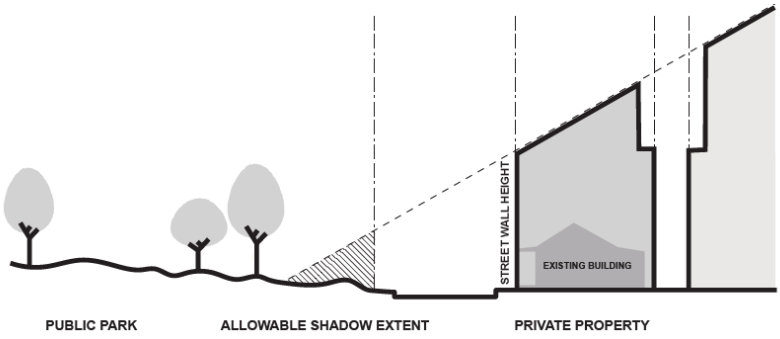
A permit cannot be granted for buildings and works that do not comply with the Mandatory Requirements set out in Table 1and as shown in Figure 1. In the event that buildings and works cast shadow over two or more parks in different categories, the requirement for each respective park must be met.

Table 1 to Schedule 8

Park type shown on Figure 1	Mandatory Requirements
1	For any building or works above 9 metres, buildings and works must not cast additional shadow onto the park between 10am and 3pm on June 21 beyond any shadow cast by existing buildings and works.
2	Notwithstanding any other control or provisions in the planning scheme, buildings and works must not cast additional shadow onto the park between 10am and 3pm at June 21 beyond the existing shadow or allowable shadow (whichever is the greater). The allowable shadow is the shadow that would be cast on the park by a building on land abutting a park between 10am and 3pm on June 21. The shadow is that cast by a wall on the street title boundary, built to the lower of any street wall height requirement or building height requirement specified in the planning scheme. 
3	Any buildings and works must not cast additional shadow onto the park between 10am and 2pm at June 21 beyond any shadow cast by existing buildings and works.

3.0 Subdivision

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A permit is not required to subdivide land.

4.0 Advertising sign

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None specified.

5.0 Decision guidelines

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None specified.

6.0 Reference document

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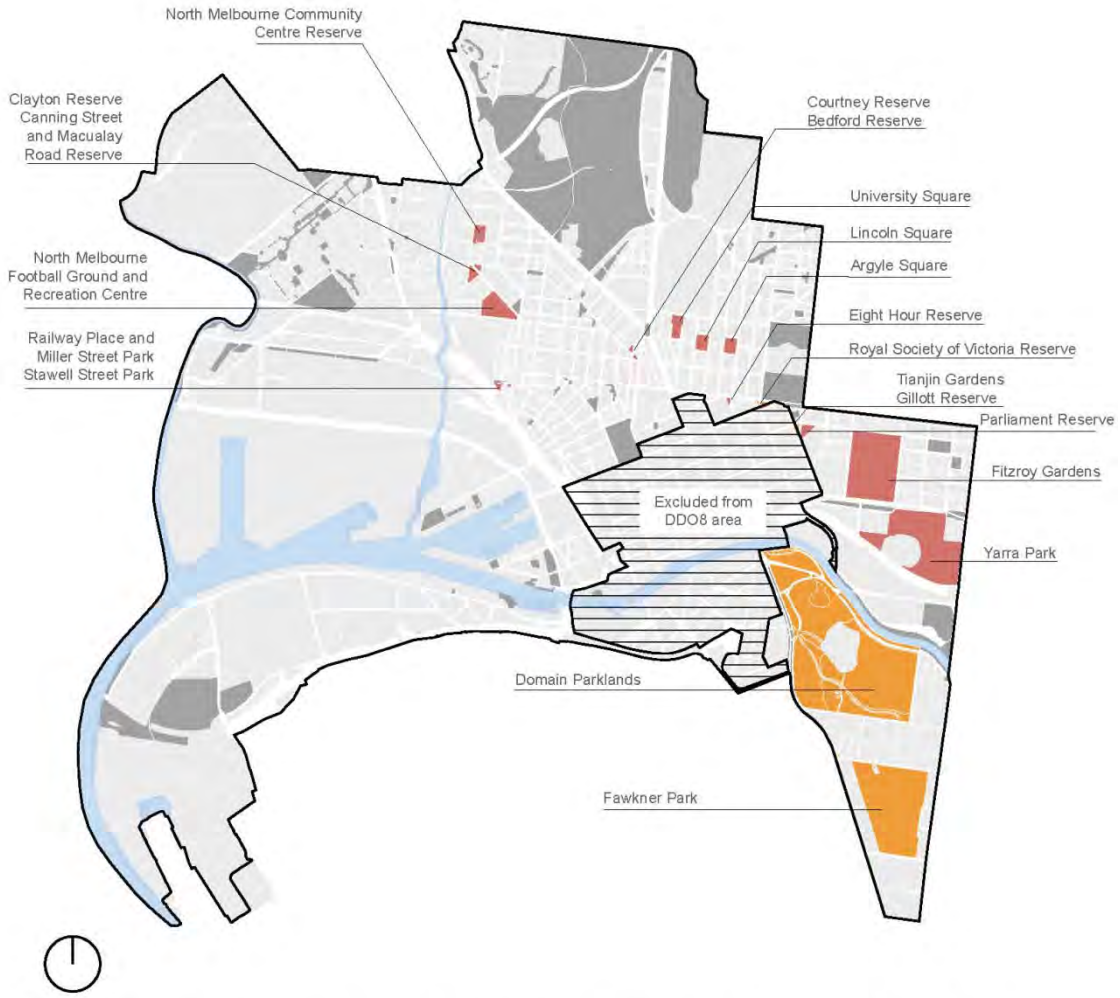
Sunlight Access to Open Spaces Modelling Report, Hodyl +Co, February 2018

Figure 1



Built form taller than 9 metres will be assessed against the following controls for each park (as identified in the above map):

Shadow Assessment Type 1: No additional overshadowing between 10am - 3pm on June 21.

Shadow Assessment Type 2: Shadows cast by existing planning scheme height controls or street wall height controls (whichever is lower) between 10am - 3pm on June 21 are permitted from buildings on sites abutting a park. Any built form beyond these nominated heights must be set back so as to not create any additional shadow between 10am - 3pm on June 21.

Shadow Assessment Type 3: No additional overshadowing between 10am - 2pm on June 21.

Planning and Environment Act 1987

MELBOURNE PLANNING SCHEME

AMENDMENT C278

EXPLANATORY REPORT

Who is the planning authority?

This amendment has been prepared by the City of Melbourne which is the planning authority for this amendment.

The Amendment has been made at the request of the City of Melbourne.

Land affected by the Amendment

The Amendment applies to all land within the municipality as shown on the map below:

What the amendment does

The Amendment implements the findings of the *Sunlight Access to Open Spaces Modelling Analysing Report, February 2018* and introduces new sunlight protection provisions into the Planning Scheme by:

- Amending Clause 22.02 Sunlight to Public Spaces. The proposed policy reflects a shift to maximising winter sunlight access to all public parks across the municipality.
- Introducing a new Schedule to the Design and Development Overlay (DDO8). The proposed DDO8 introduces new planning scheme controls which nominate appropriate levels of sunlight protection for all public parks across the municipality (excluding the Hoddle Grid and Southbank).
- Introducing a new municipal wide Design and Development Overlay Planning Scheme Map (excluding the Hoddle Grid and Southbank) identifying the park controls.

Strategic assessment of the Amendment

Why is the Amendment required?

The City of Melbourne is one of the fastest growing municipalities in Victoria. Significant growth began in the 1990s within the urban renewal areas of the Docklands and Southbank. Local area planning undertaken in the past 5-10 years has identified additional urban renewal areas suitable for growth, such as City North and Arden-Macaulay. This planning has introduced new development controls in each of these areas which support development intensification. When this work was prepared, the accepted practice was to ensure that sunlight access to existing open spaces was provided for the equinox months of March and September.

In the past 2 years, this accepted practice has shifted as awareness of the importance of sunlight within high density urban environments has increased. Access to sunlight in the winter months has been identified as critical. This has resulted in winter sunlight access controls being introduced for parks in the Central City (via Amendments C270 - Central City Built Form Review, and C245 - Queen Victoria Market). This demonstrates that continued support for development intensification together with the protection of winter sunlight access is achievable.

The Victorian Government's Amendment C270 introduced changes to Planning Scheme Clause 22.02 Sunlight to Public Spaces Policy based on the outcomes of the Central City Built Form Review. The Amendment adopted a tiered approach for overshadowing protection of public parks in the Hoddle Grid and Southbank with a focus on frequency and intensity of use and a shift to a winter solstice test.

The City is experiencing a significant increase in its population and in the number, density and heights of new development across many areas outside of the Hoddle Grid and Southbank. These factors are placing increased pressure on the existing public spaces as development intensification is not being matched by a corresponding increase in new parks.

The current planning scheme provisions are not responding to the emerging development challenges. The current practice of including specific sunlight access controls within DDOs can be too easily compromised if a development is proposed outside of that DDO area but which may overshadow a nominated park within the DDO area. This has already occurred in the central city where developments that are not triggered by DDO10 are overshadowing parks that are protected only within the DDO10 control. There is a need to ensure that any development that can overshadow a park is considered, therefore the inclusion of sunlight access controls in a series of separate DDOs is not recommended. As a result development is starting to have adverse impacts on the amenity of residents, workers and visitors to the City in the form of increased overshadowing of public spaces.

Amendment C278 proposes to introduce a new municipal wide Design and Development Overlay schedule (DDO8) to protect sunlight access to all parks across the municipality (excluding the Hoddle Grid and Southbank), and an updated Sunlight to Public Spaces Policy to reflect the revised policy position. While this policy applies to all public spaces being parks and gardens, squares, streets and lanes, the focus of this amendment is only on parks.

Based on the independent 3D modelling and modelling analysis, together with research into related health and ecological data park usage data, Victorian Civil and Administrative Tribunal cases and Australian and International practice, the proposed new planning scheme controls reflect best practice protection of sunlight access to parks balanced with the need to support appropriate development intensification.

The proposed controls will:

- Revise the current 'tiered approach' to protecting sunlight access to parks to a 'flat' protection policy that maximises winter sunlight protection for all parks.

- Apply a "No Additional Overshadowing" winter sunlight access protection control between the hours of 10am and 3pm as the default setting across the municipality (outside of the Central City parks that have had sunlight overshadowing controls applied through recent amendments C245 and C270). A "No Additional Overshadowing" control protects existing sunlight (including that which passes between gaps of existing buildings) to public spaces surrounded by existing development. They explicitly acknowledge that parks may be already overshadowed to a degree. They allow new buildings to be constructed within the shadow of existing buildings as long as they do not further reduce sunlight access to the park.

- Moderate the impact of this control in high growth areas (those with height limits over four storeys) to balance sunlight protection to parks with support for development intensification. A balance between maximising sunlight access to parks to support people's health and wellbeing and supporting policy objectives to intensify land use and activity in urban renewal areas leads to support for this balanced approach.

- Moderate the impact of this control on parks east of St Kilda Road Road (Domain Parklands) and a few parks adjacent to the edge of the Hoddle Grid by reducing the time requirement to 10am to 2pm. This acknowledges that after 2pm, winter shadows from the Hoddle Grid and Southbank, where the highest scale of development is supported in the city, will inevitably fall across these parks. . Considering the scale of development now and that is anticipated, it would be unreasonable to require protection from overshadowing after this 2pm period.

How does the Amendment implement the objectives of planning in Victoria?

The amendment implements the objectives in section 4 of the Planning and Environment Act 1987 (the Act), in particular

- to provide for the fair, orderly, economic and sustainable use, and development of land;

- to balance the present and future interests of all Victorians.

How does the Amendment address any environmental, social and economic effects?

The amendment is considered to have a have positive social impact as it will facilitate the protection of valued attributes of public parks through the protection of sun access protection. The proposed provisions will ensure that new built form positively responds to the outcome of good sunlight access and in doing so provides sunlight access which is is essential for the health and wellbeing of residents and the ecological health of the ecosystem.

It is expected that the amendment will have positive economic outcomes for Melbourne. The proposed sun protection provisions for all public parks across the municipality, excluding the Hoddle Grid and Southbank balances sunlight access protection with the need to support development intensification. The amendment will restrict additional overshadowing to parks with a limited number of exceptions.

The amendment will not have any significant negative natural environments impacts.

Does the Amendment address relevant bushfire risk?

The amendment affects land within inner metropolitan Melbourne which is not a bushfire prone area.

Does the Amendment comply with the requirements of any Minister's Direction applicable to the amendment?

The amendment is consistent with the Ministerial Direction on the Form and Content of Planning Schemes under section 7(5) of the Act, Direction No.9 – Metropolitan Strategy and Direction 11-Strategic Assessment under Section 12(2) of the Act.

How does the Amendment support or implement the State Planning Policy Framework and any adopted State policy?

The provisions implemented by this amendment are generally consistent with the relevant objectives of the State Planning Policy Framework and Plan Melbourne: Metropolitan Planning Strategy (Department of Transport, Planning and Local Infrastructure, 2014) (Plan Melbourne). The amendment supports Clause 15.01 Urban Environment, by ensuring that there is development equity and that key attributes of the public realm and open spaces which underpin Melbourne's liveability are protected.

How does the Amendment support or implement the Local Planning Policy Framework, and specifically the Municipal Strategic Statement?

The provisions provided by this amendment generally support the Local Planning Policy Framework and Municipal Strategic Statement of the Melbourne Planning Scheme.

The Amendment supports the following specific provisions:

Clause 21.05 Environment and Landscape Values states that land use and development activities in the municipality can undermine the health and biodiversity of its flora and fauna ecologies. Protect the open spaces and the waterways that support those systems

Clause 21.06 Built Environment and Heritage states that buildings in the private realm should be coordinated with the development of the streets, paths, parks and places in the public realm. Development must add positively to Melbourne's public realm and contribute to making it safe and engaging for users. Public and private open spaces should be able to support a range of uses including physical movement, communal exercising, social interaction, quiet enjoyment and connections to the natural environment.

Strategy 1.5 Promotes developments that are compatible with the scale, character and amenity of public open spaces, and the environs of the Yarra River.

Strategy 5.9 Ensures that development maximises solar access in public open spaces, and creates microclimatic conditions for a high level of pedestrian comfort.

Clause 21.10 Infrastructure states that growth and development in the municipality will require a matching provision of infrastructure. The expansion and upgrading of roads, utilities, community facilities and public open space will be required to service the growth of resident, worker and visitor populations. Key to this planning is to facilitate the efficient use of existing infrastructure, reinforce those key elements and plan for future needs and requirements.

Clause 21.10-2 Open Space

Objective 1 To maintain, enhance and increase Melbourne's public open space network and promote greening of the City.

Strategy 1.2 Ensure parks, gardens, waterways and open spaces remain a prominent element of the City's structure and character.

Strategy 1.4 Support the maintenance and creation of a variety of public open space to meet the needs of the growing population for formal and informal outdoor recreation.

Strategy 1.5 Ensure that development in and surrounding the City's parks and gardens does not adversely impact on the solar access, recreational, cultural heritage, environmental and aesthetic values, or amenity, of the open space.

Strategy 2.2 Protect and enhance the biodiversity and habitat value of the City's parks, gardens, open space and waterways.

Clause 22.02 Sunlight to Public Spaces Policy

The policy provides guidance for the consideration of the impact of additional overshadowing on the amenity, quality and usability of the public space.

Objectives

- To achieve a comfortable and enjoyable public realm.

- To ensure new buildings and works allow good sunlight access to public spaces.
- To ensure that overshadowing from new buildings or works does not result in significant loss of sunlight and diminish the enjoyment of public spaces for pedestrians.
- To protect, and where possible increase the level of sunlight to public spaces during the times of the year when the intensity of use is at its highest.
- To create and enhance public spaces to provide sanctuary, visual pleasure and a range of recreation and leisure opportunities.

Does the Amendment make proper use of the Victoria Planning Provisions?

The amendment makes proper use of the Victoria Planning Provisions by applying a new schedule to the Design and Development Overlay to influence built form outcomes within the municipality excluding the Hoddle Grid and Southbank.

The Design and Development Overlay is the appropriate and most effective tool to provide the necessary guidance for sunlight protection for assessing planning scheme applications.

How does the Amendment address the views of any relevant agency?

The Amendment will follow the formal planning scheme amendment process and be placed on exhibition where stakeholders and agencies will have the opportunity to comment on the amendment.

Does the Amendment address relevant requirements of the Transport Integration Act 2010?

The amendment does not have any direct impact on the transport system.

Resource and administrative costs

What impact will the new planning provisions have on the resource and administrative costs of the responsible authority?

The amendment is unlikely to have an adverse impact on resource and administrative costs to the responsible authority, however there may be a positive impact on resources of the responsible authority as the policy includes clear guidance that will streamline and assist in the assessment of planning applications.

Where you may inspect this Amendment

The Amendment is available for public inspection, free of charge, during office hours at the following places:

Melbourne City Council

Melbourne Town Hall, Ground Floor

120 Swanston Street

MELBOURNE VIC 3000

The Amendment can also be inspected free of charge at the Department of Environment, Land, Water and Planning website at www.delwp.vic.gov.au/public-inspection.

Submissions

Any person who may be affected by the Amendment [and/or planning permit] may make a submission to the planning authority. Submissions about the Amendment [and/or planning permit] must be received by TBA.

A submission must be sent to: [TBA]

Panel hearing dates

In accordance with clause 4(2) of Ministerial Direction No.15 the following panel hearing dates have been set for this amendment:

- directions hearing: TBA
- panel hearing: TBA

Sunlight access to public parks modelling analysis report

Prepared for the City of Melbourne

February 2018

cities people love

Hodyl+Co

cities people love

Hodyl+Co

Prepared by Hodyl + Co for the City of Melbourne
Project team: Leanne Hodyl, Bec Fitzgerald & Sarah Collie
Health research by Vertex Health
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February 2018
Version G_Final

Contents

Executive summary

The City of Melbourne is one of the fastest growing municipalities in Victoria. Significant growth began in the 1990s within the urban renewal areas of the Docklands and Southbank. Local area planning undertaken in the past 5-10 years has identified additional urban renewal areas suitable for growth, such as City North and Arden-Macaulay. This planning has introduced new development controls in each of these areas which support development intensification. At the time of this planning, the accepted practice was to ensure that sunlight access to existing open spaces was provided for the equinox months of March and September.

In the past 2 years, this accepted practice has shifted as awareness of the importance of sunlight within high density urban environments has increased. Access to sunlight in the winter months has been identified as critical. This has resulted in winter sunlight access controls being introduced for parks in the Central City (via Amendments C270 - Central City Built Form Review, and C245 - Queen Victoria Market). This demonstrates that continued support for development intensification together with the protection of winter sunlight access is achievable.

The overall objective of this study is to establish appropriate sunlight levels for public parks across the remaining areas within the municipality (outside of the Hoddle Grid and Southbank area).

While the current Sunlight to Public Places Policy (Clause 22.02) defines public places as being parks and gardens, squares, street and lanes, the focus of this study is solely on public parks and consideration of streets is outside the scope.

Key questions

This report considers sunlight from a user's perspective. It asks the following key questions:

- What levels of access to sunlight do people need to lead healthy, active lives?
- What are the appropriate policy settings to meet people's needs?
- How can the provision of good sunlight access be balanced with the need to accommodate development intensification to support population growth?

Method

To answer these questions, this report synthesises two sets of evidence:

- Research - including existing literature into the importance of sunlight for health and the environment, park usage data as well as review of VCAT case studies and international and Australian policy settings
- Digital modelling - including a review of cumulative shadowing assessments (provided by the City of Melbourne) and additional testing of the current planning controls (undertaken by Hodyl + Co)

The following definitions are used in this report:

Categorisation of sunlight access	Degree of sunlight access/ overshadowing
High levels of sunlight access	The whole park is in sunlight for the time period nominated. Marginal overshadowing occurs only at the perimeter of the park
Partial overshadowing	Parts of the interior of the park space are overshadowed for a portion of the time period nominated
Significant overshadowing	Large portions of the interior of the park are overshadowed across the time period nominated

Key findings

This research has identified that providing access to winter sunlight is considered international best practice. This builds on the recently adopted approach in the Hoddle Grid and Southbank.

This study investigated sunlight access to 157 open spaces across the municipality and found a clear divide between available sunlight within low-scale areas (those parts of the study area with height controls of 4 storeys or less) and growth areas (areas with height controls over 4 storeys).

The method and findings are illustrated in Figure 1.

Low-scale areas (4 storeys and below)
There are 133 parks located completely within low-scale areas. All of these parks have high levels of winter sunlight access. This will remain as new buildings built according to the existing height controls will generally retain high levels of sunlight access to these parks. Protecting winter sunlight access to these parks is therefore achievable with negligible effects on future development outcomes or capacity.

Growth areas (4 storeys and above)
There are 24 parks located within or immediately adjacent to growth areas. Providing winter sunlight access to these parks requires a more diversified response that considers the context of each park, the extent of existing overshadowing and the potential overshadowing from current height controls.

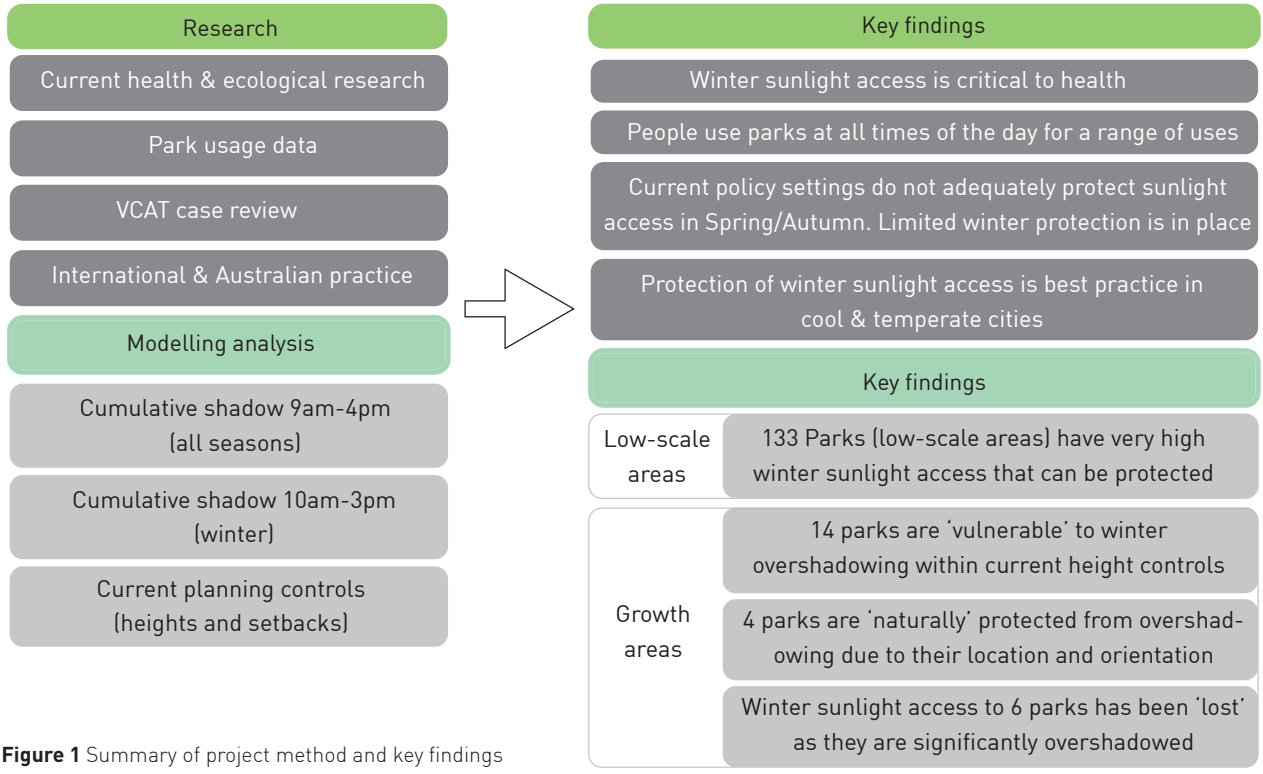


Figure 1 Summary of project method and key findings

Within the 24 parks the following levels of winter sunlight access are present:

High levels of sunlight access in 'Naturally protected parks'
There are 4 parks within the study area which are 'naturally' protected due to their location and orientation - for example waterfront parks in the Docklands that have uninterrupted solar access from the north.

Partial overshadowing in 'Vulnerable parks'
There are 12 parks that are already partially overshadowed in winter. An additional 2 parks (therefore 14 in total) are vulnerable to partial overshadowing in winter if the surrounding development is built to the existing height controls. The introduction of winter sunlight access controls for each of these parks will vary depending on the context and the current built form controls.

Significant overshadowing in 'Lost parks'
Within the growth areas there are 6 parks that are already significantly overshadowed in winter. The priority should be protecting the remaining amount of sunlight. Five of these are in the Docklands and one in Carlton.

Setting priorities

This review has identified four overarching priorities to address sunlight access to existing parks which lead to specific recommendations for revised policy settings.

A fifth priority focuses on the need to identify future park locations so that sunlight protection for new public open spaces can be ensured.

Priority 1: Support healthy, active living by protecting access to winter sunlight

Evidence base - research
While the importance of avoiding overexposure to the sun is well understood, the health impacts of insufficient sunlight exposure are not. Over 50% of Victorians are Vitamin D deficient in winter. This can have significant physical and mental health impacts. Providing people with the opportunity to lead healthy lives means providing them with the opportunities to access sunlight and shade as they need. A growing body of health research indicates that access to sunlight in winter is as important as access to shade in summer. This does not diminish the need for individuals to take responsibility for moderating exposure to UV.

Ensuring health benefits for all means that equitable access to winter sunlight is important. This means that people should be able to access their 'dose' of sunlight within walking distance from their home or workplace.

Evidence base - modelling

The analysis of the modelling demonstrates that within low-scale areas high levels of winter sunlight access are already present and will generally remain.

Within the growth areas the level of winter sunlight access varies from high levels of sunlight access to significantly overshadowed.

Existing policy position

Access to winter sunlight is only prioritised in the Central City. Elsewhere sunlight protection is in place for the Spring/Autumn equinox. In addition, a tiered system is in place with the controls providing certainty of sunlight access for some parks, while others are relatively unprotected from overshadowing. This leads to inequitable access to winter sunlight (see Figure 3).

Proposed policy position - time of year

The following changes are proposed:

- Revise the current policy position to shift from protecting sunlight access at the equinox to maximising winter sunlight access to all parks across the municipality.
- Revise the current 'tiered approach' to protecting sunlight access to a 'flat' protection policy that maximises winter sunlight protection for all parks. This acknowledges that often the most important park is the one closest to where a person lives or works.

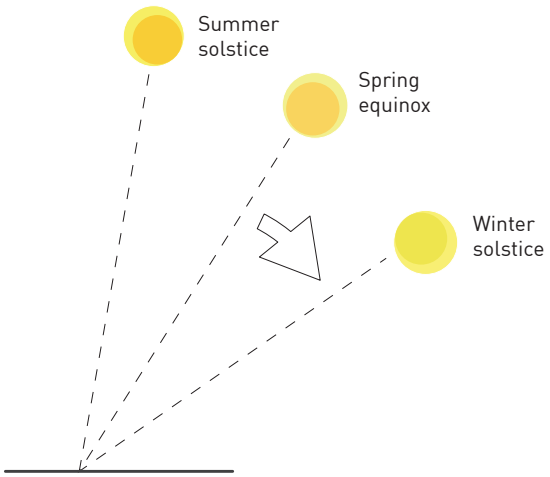


Figure 2 Proposed policy shift from protecting sunlight access at the equinox to the winter solstice

Figure 3 The current policy supports inequity of access to winter sunlight as parks with mandatory sunlight controls are not evenly distributed across the municipality. Some people will live or work within easy walking distance to a sunny park, while others will have to travel greater distances.

Priority 2: Balance winter sunlight access to parks with the need to support development intensification

Access to winter sunlight in growth areas is at the greatest risk and yet is where sunlight is most needed. In these areas, significant population growth is supported. People living in apartments or working in high density environments generally have very limited access to private green open space. As development intensification occurs, overshadowing of existing parks increases at the same time as more people are needing to use these spaces (see Figure 4). This raises a tension between supporting growth and maintaining winter sunlight access to parks.

Delivering new open spaces is difficult, even more so in growth areas where land values are high. It is therefore important that the existing spaces retain high levels of amenity to support this population growth.

Evidence base - modelling

The modelling and testing demonstrates that winter overshadowing is typically a problem for parks located in these growth areas. The modelling also demonstrates that protecting the entire park from overshadowing in winter would often have an unreasonable impact given support for development intensification.

The testing illustrates that in growth areas a balanced approach is appropriate, where overshadowing that is created by the street wall height control or the overall height limit (whichever is lower) is considered acceptable. Any part of the building above this height would then need to be set back so that it does not create any additional shadow.

Parks in low-scale areas (those areas with height controls 4 storeys or lower) are generally well-protected due to the low height limits. Introducing a sunlight access control will ensure that this remains the case while having a negligible effect on development. As the potential overshadowing impact in these areas is minimal, not all buildings will need to be assessed for overshadowing impacts. Requiring a permit applicant to prepare overshadowing testing of a second floor addition on a single storey house, for example, would be overly onerous.

There are, however, a number of parks in low-scale areas that could be overshadowed even within the existing low-scale height limits. This is due to the park being located directly on a property boundary (together with its size or shape and/or orientation). In these instances a park can be overshadowed by the construction of a single storey building. It is unreasonable therefore to protect the entire park from overshadowing. A balanced approach is also needed which considers these parks on a site by site basis.

Existing policy position

Current sunlight access protection is based around a tiered approach that nominates a hierarchy of spaces with graded levels of protection. This is generally related to the frequency of use and perceived importance of the park and is unrelated to the scale of development adjacent to the park.

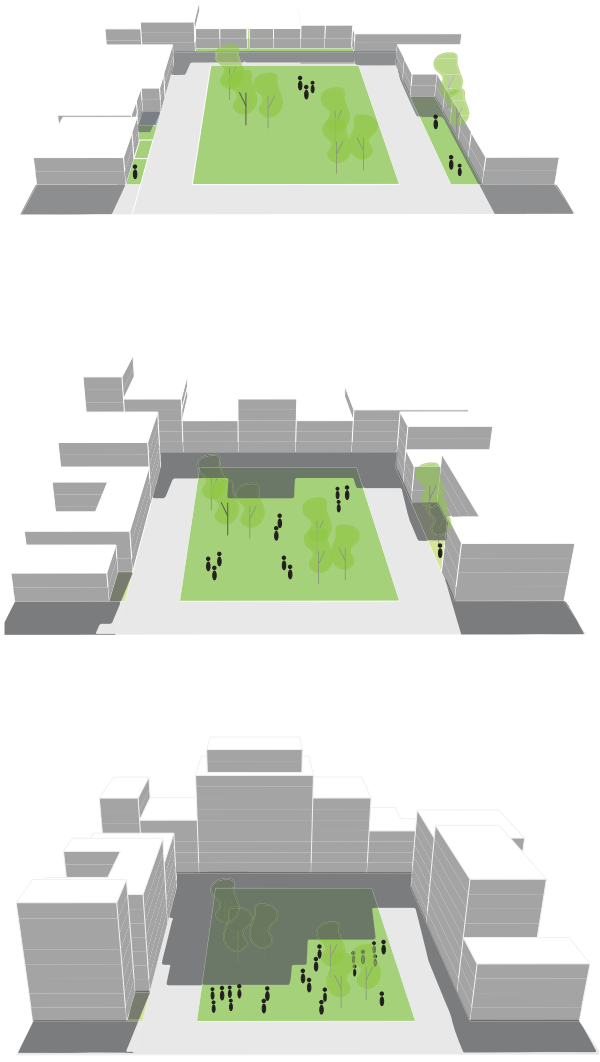


Figure 4 The tension caused by development intensification which can introduce increased overshadowing at the same time as increasing usage of the park

Proposed policy position - acceptable overshadowing
Introduce a sunlight protection policy that is directly related to the scale of development that has already been considered appropriate for the area. This enables a tailored approach that can balance sunlight access with support for development intensification.

For all parks in the study area adopt a No Additional Overshadowing mandatory control in winter. This can be moderated in the following circumstances only:

- Exemption 1: For parks immediately abutting areas with height limits over 4 storeys, limit any additional overshadowing to that cast by the planning scheme street wall height or the overall height limit of adjacent sites (whichever is lower). The extent of overshadowing that this allows applies to all sites, not just those immediately adjacent to the park.
- Exemption 2: Ron Barassi Snr Park - Limit additional overshadowing to within 40 metres offset from the southern boundary of the property line abutting the northern edge of the park

Minimise assessment requirements in all areas by not requiring a shadowing impact assessment for buildings 9 metres or lower in height.

Priority 3: Maximise opportunities for people to access sunlight throughout the day for a variety of uses

Evidence base - park usage data
An analysis of existing park usage data demonstrates that people choose to use parks in a variety of ways throughout the day. The importance of sunlight will vary between activities and between different people undertaking the same activity as a result of personal comfort preferences.

The highest levels of park usage were recorded between 10am and 6pm. Usage varied between the weekday and weekend and was related to the design of the park and the types of facilities within the park (refer to Appendix B).

Evidence base - modelling
The modelling demonstrate, however, that providing sunlight access between 10am and 6pm is not realistic. The modelling shows that this would have a significant impact on development opportunities across the municipality. An analysis of shadow direction and length in winter demonstrates that there is a significant increase in overshadowing before 10am and after 3pm when the sun is much lower in the sky. While peak usage spans from 10am to 6pm, the proposed sunlight access controls are between 10am and 3pm to address this need for a balanced approach (see Figure 5 and Figure 6).

The orientation of existing street grids has a direct effect on the amount of sunlight reaching each park throughout the day. St Kilda Road is approximately aligned with angle of the sun at 2pm in winter. This means that the large parks east of St Kilda Road - Alexandra Gardens, Queen Victoria Gardens, The Domain and Botanical Gardens, are effectively protected from overshadowing up to 2pm. After this time, the shadows from significant buildings in Southbank begin to fall across these parks. Considering the scale of development already in and anticipated for Southbank, it wouldn't be reasonable to require protection from overshadowing after this 2pm period.

Existing policy position
Sunlight access within the study area is generally protected between 11am and 2pm at the equinox.

Proposed policy position - time of day

- Maximise the opportunity for people to access and enjoy sunlight in parks by increasing sunlight protection hours from to 10am - 3pm in winter.

Apply an exemption to the standard No Additional Overshadowing mandatory control in winter for:

- Exemption 3: Parks east of St Kilda Road are an exception where sunlight protection should be provided between 10am and 2pm in winter

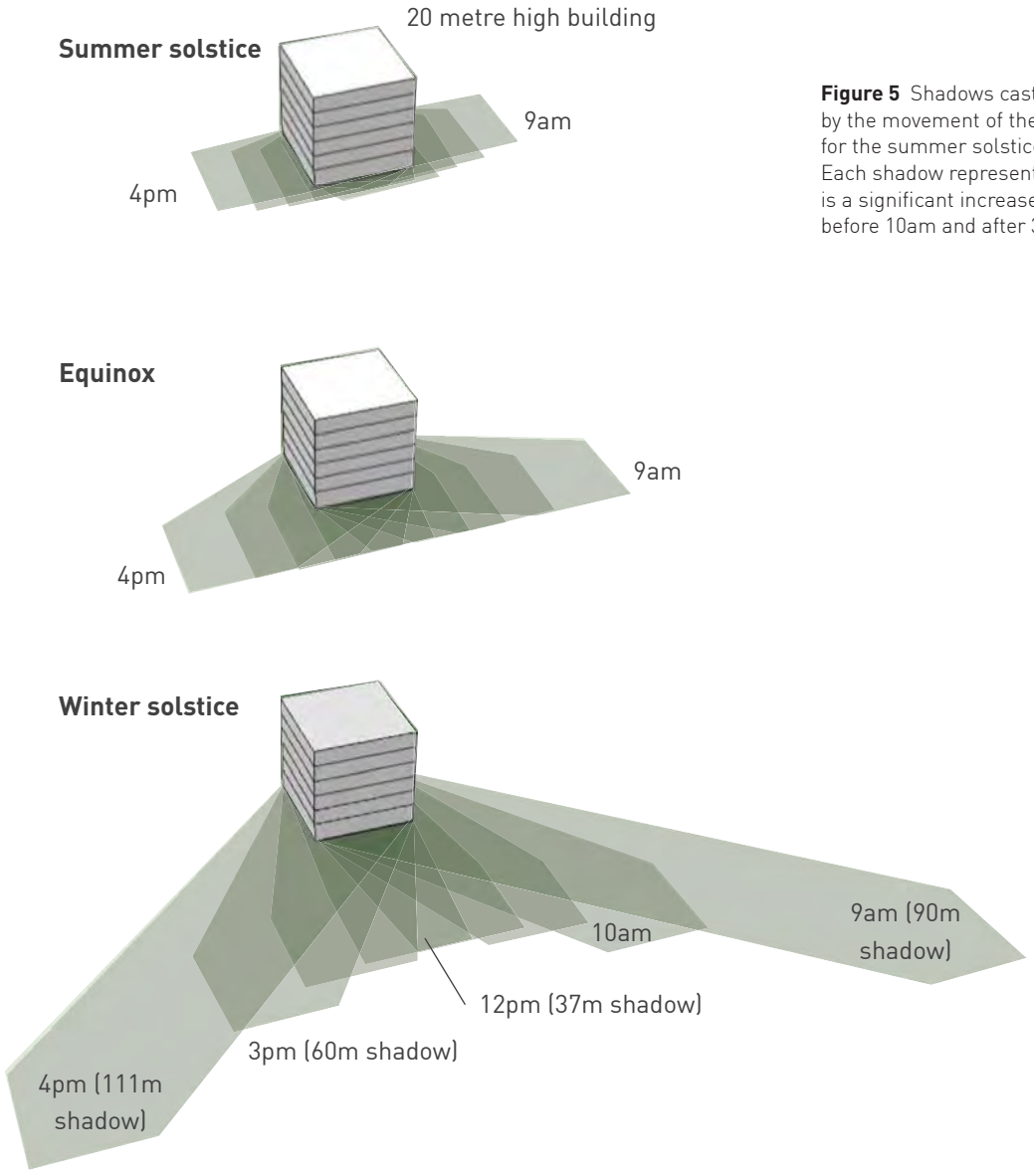


Figure 5 Shadows cast for a 20 metre high building by the movement of the sun between 9am and 4pm for the summer solstice, equinox and winter solstice. Each shadow represents a one hour interval. There is a significant increase in shadow length in winter before 10am and after 3pm.

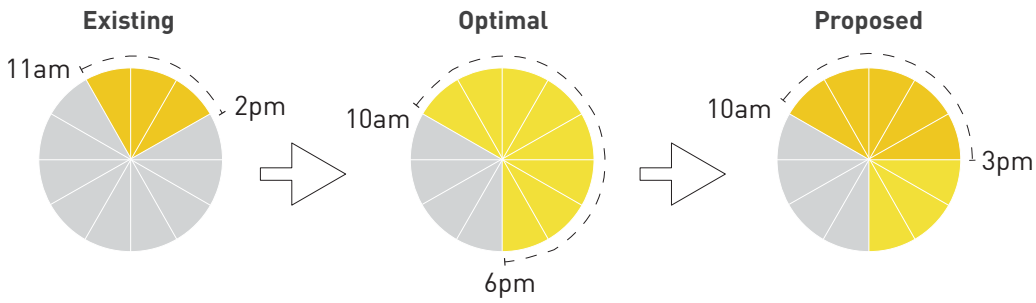


Figure 6 Hours of existing sunlight protection are 11am to 2pm (far left); peak periods of park usage space from 10am to 6pm (centre); taking into account the potential impacts on development capacity, a balanced approach which provides winter sunlight access between 10am and 3pm is proposed.

Priority 4: Update the Melbourne Planning Scheme to establish an effective, easy to use policy that removes current inconsistencies and deficiencies and retains its currency as new parks are introduced

Evidence base and existing policy position

Protection for sunlight access to parks is distributed across a range of policies, zones and overlays. A number of issues have been identified with this current approach which fragments sunlight access policy controls across the Melbourne Planning Scheme. These are:

- An inconsistent policy approach across the municipality, with a mix of winter and equinox controls creating inequity of access to sunlight in parks
- The listing of protection for specific, nominated parks while all others fall under a blanket control. Those in the blanket control are generally regarded as less important and the existing sunlight protection controls are often compromised
- The controls have been developed on an incremental basis and are not supported by the evidence of what people need or want
- Parks that have current sunlight protection are still vulnerable to overshadowing due to the protection being located within a Design and Development Overlay (DDO). The method of applying a discrete sunlight access protection control to a bounded area (as defined by the DDO) means that a building can be approved and constructed outside of this area that may overshadow a park within the area (as the DDO requirements for overshadowing would not apply). This undermines the intention and effectiveness of existing sunlight access controls. It means that even parks with mandatory sunlight protection now are not effectively protected from overshadowing by buildings outside the DDO area
- It is difficult to provide protection for new parks that are created without a complicated and expensive planning scheme amendment process.

Proposed policy position - effective planning mechanisms

- Introduce a simplified, coherent, defensible and effective sunlight to open space policy that is implemented via an overarching policy and one Design Development Overlay that applies to the whole municipality (see Figure 7)

Priority 5 has been identified to highlight the need to consider sunlight access to all parks within the municipality over the longer term.

This priority is not relevant to protecting sunlight access to existing parks.

Priority 5: Identify locations for new parks within the municipality

The City of Melbourne's Open Space Strategy identifies the need for a number of new parks across the municipality.

The largest of these parks are located within growth areas. They are therefore located within areas where the current height limit controls are likely to lead to overshadowing of these future parks in the winter months. This affects 12 proposed parks. The identification of preferred locations for these parks should be investigated as a priority in order to provide guidance for necessary sunlight access protection. The lack of certainty on future locations means that the opportunity to protect winter sunlight access could be lost.

Providing certainty on new park locations is the most meaningful way to influence future development proposals that may overshadow these new public open spaces.

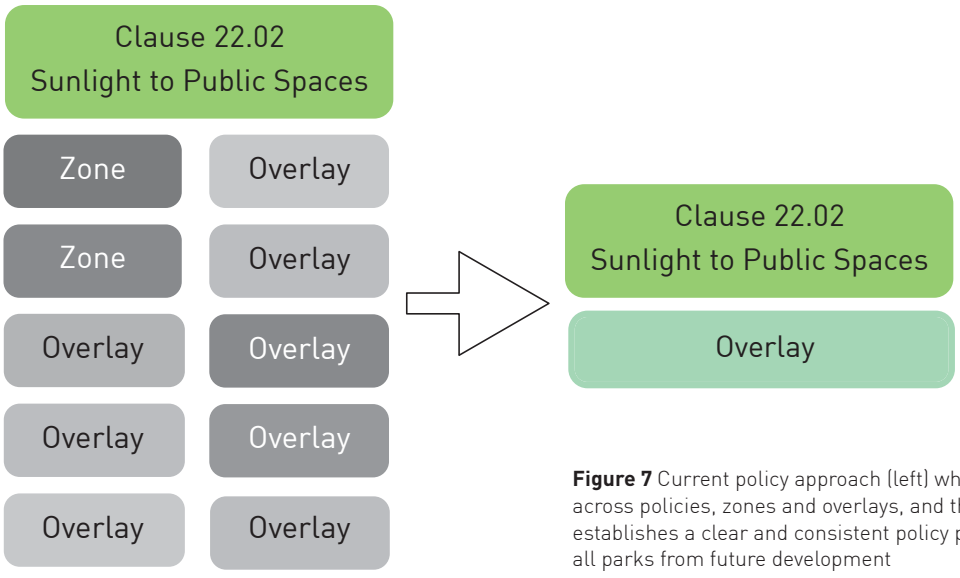


Figure 7 Current policy approach (left) which fragments sunlight protection across policies, zones and overlays, and the proposed approach (right) which establishes a clear and consistent policy position and provides protection for all parks from future development

Summary of proposed policy recommendations

A summary of the proposed policy recommendations are:

- Revise the current 'tiered approach' to protecting sunlight access to parks to a 'flat' protection policy that maximises winter sunlight protection for all parks. This treats all parks as equal and acknowledges that often the most important park is the one closest to where someone lives or works
- Apply a No Additional Overshadowing winter sunlight access protection control between the hours of 10am and 3pm as the default setting across the municipality (outside of the Central City parks that have had sunlight overshadowing controls applied through recent amendments C245 and C270)
- Moderate the impact of this control in high growth areas (those with height limits over 4 storeys) to balance sunlight protection to parks with support for development intensification
- Moderate the impact of this control on parks east of St Kilda Road by reducing the time requirement to 10am to 2pm. This acknowledges that after 2pm winter shadows from the Hoddle Grid and Southbank, where the highest scale of development is supported in the city, will inevitably fall across these parks.

These controls should be incorporated (together with the recently approved Central City controls) into one municipal-wide DDO. This will ensure that all parks are protected from overshadowing regardless of the location of new development.

Assessment process for developers and decision-makers

1. **Assess whether an overshadowing assessment is required:**

- If the overall building height is 9 metres or less - no overshadowing assessment is required
- If the building height is above 9 metres - overshadowing assessment is required

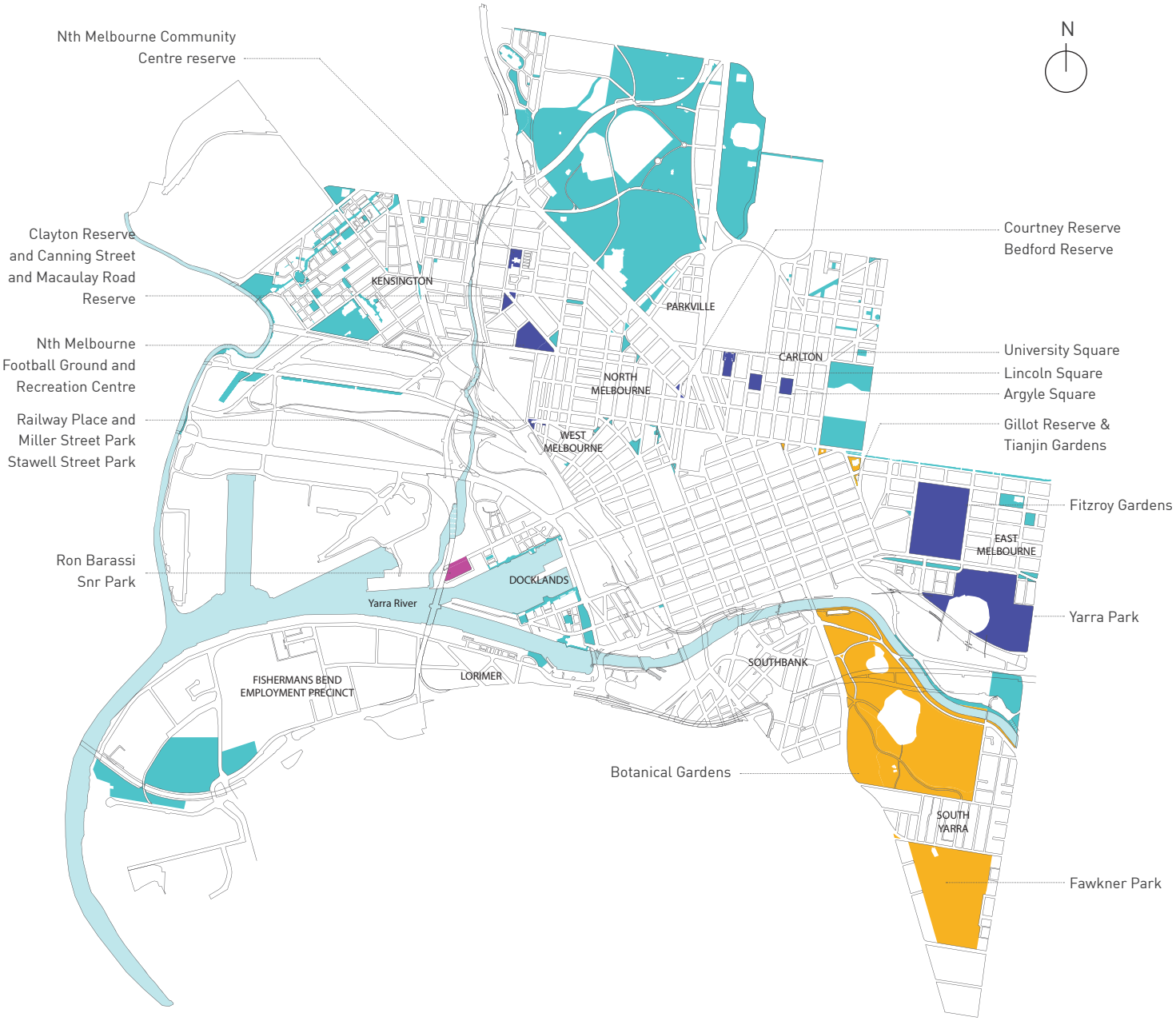
2. **Identify category of control that applies to a park that may be affected by the development:**

A mandatory No Additional Overshadowing control in winter is proposed between the hours of 10am and 3pm. This can be moderated in the following circumstances only (See Map 1):

- Exemption 1: For parks immediately abutting areas with height limits over 4 storeys, limit any additional overshadowing to that cast by the planning scheme street wall height or the overall height limit of adjacent sites (whichever is lower).
- Exemption 2: Ron Barassi Snr Park - Limit additional overshadowing to within 40 metres offset from the southern boundary of the property line abutting the northern edge of the park
- Exemption 3: Parks east of St Kilda Road No Additional Overshadowing applies between 10am and 2pm

3. **Developer to test the overshadowing impact of their development proposal to ensure that it complies with the designated control for the affected park.**

Proposed sunlight access controls for all parks



Any building 9 metres or below across the municipality is not subject to an overshadowing assessment

Buildings taller than 9 metres will be assessed against the following controls for each park (as identified in the map above):

- Standard condition: No additional overshadowing between 10am - 3pm on June 21
- Exemption 1: Reduced time period - no additional overshadowing between 10am-2pm on June 21
- Exemption 2: Partial overshadowing allowed for shadows cast by planning scheme height control or street wall height control (whichever is lower) between 10-3pm on June 21
- Exemption 3: Rob Barassi Snr Park - Partial overshadowing allows shadow to 40 metres within the park (measured from northern property boundary) between 10-3pm on June 21

Map 1 Proposed sunlight access controls for all existing parks in the municipality

Carlton Gardens, September 2017

1. Introduction

1.1 Project scope

This project has the following scope:

- Analyse the current level of sunlight in parks using the cumulative solar map and the solargraphic contours investigative material prepared by Harrison and White (HAW)
- Analyse the level of sunlight that would result from existing planning controls compared to the current levels of sunlight access
- Discuss appropriate levels of sunlight access for public spaces across the municipality (outside of the Amendment C270 area - Hoddle Grid and Southbank) and recommend a justified level of sunlight protection across the municipality (times and dates)
- Based on the above analysis, discuss options for statutory planning controls that can best achieve the preferred level of sunlight access protection and recommend overshadowing provisions for all public spaces (excluding Hoddle Grid and Southbank).

This is illustrated in Map 2.

This work excludes consideration of sunlight to streets and lanes and focuses solely on public parks.

Drivers of this policy review

The last comprehensive review of the Sunlight to Public Places policy occurred in 1999. The city has undergone transformational change since this time. This has included:

- A significant increase in residential population
- A significant increase in the number of workers
- A significant increase in the number of overall visitors to the municipality
- A significant transition in the scale of developments delivered across the municipality, in regards to density and height of buildings, in particular within identified urban renewal areas

Key Council reference documents

The following City of Melbourne adopted strategies have been reviewed and assessed to ensure that this report considers established policy positions and the broader economic, social and environmental objectives sought by Council for the municipality.

- Open Space Strategy, 2012
- Open Space Strategy, Technical Background Report, 2012
- Homes for People: Housing Strategy, 2015
- Local areas plans, including:
  - Arden-Macaulay Structure Plan, 2012
  - City North Structure Plan, 2012
  - Southbank Structure Plan, 2010
  - West Melbourne Structure Plan, 2018
- Urban Forest Strategy, 2014

Parks within scope of this review

Parks outside of scope of this review. These parks were reviewed recently through the Central City Built Form Review (Amendment C270) and the Queen Victoria Market Review (C245). Both of these amendments introduced winter sunlight access controls to parks

Map 2 Project scope - parks within and outside of this review

1.2 Key resource material

The following material has been provided by the City of Melbourne to inform this report.

Minimum Solargraphic Contour Height
Prepared by Harrison and White (Architect consultants)
This shows the profile of allowable built form that would be possible if no shadows were cast onto existing public spaces (excluding streets) between 9am and 4pm between the 22 of April and the 22 September). In effect, this considers the impact of protecting sunlight access to parks on development.

Composite Shadow Maps - 9-4pm
Prepared by Harrison and White (Architect consultants)
This communicates the cumulative effect of overshadowing within the municipality on existing public spaces at 22 April, 22 June, 22 September and 22 December. It illustrates the composite effect of all shadows that fall on the municipality between 9am and 4pm on these dates. In effect, this considers the impact of development on parks.

Composite Shadow Maps - 10-3pm
Prepared by City of Melbourne
This communicates the cumulative effect of overshadowing within the municipality on existing public spaces at 22 June. It illustrates the composite effect of all shadows that fall on the municipality between 10am and 3pm on this date. In effect, this considers the impact of development on parks.

Demographics Projections
Prepared by the City of Melbourne
Population projections for the municipality have been provided (based 2017 data). Additional information has been drawn from: http://melbournepopulation.geografia.com.au/.

Consultation findings
Prepared by the City of Melbourne
Consultation findings from March-April 2016 outlining what was heard in the community engagement activities related to the Sunlight to Public Spaces Policy Review.

Limitations of data provided
The data has some limitations which influence the key findings provided in this report. These include:

- The Composite Shadow Maps have been generated from a 3d model that is based on 2015 data. This means that it does not incorporate development that has been constructed since this time. Considering the scale of development in the city in the past 2 years this could have a significant impact on understanding the degree to which parks are currently overshadowed.
- The Composite Shadow Maps do not model the overshadowing impact of development outside of the municipality. This is particularly relevant for the northern and eastern boundaries of the municipality, as Royal Park, Princes Park, Carlton Gardens and Yarra Park all have direct interfaces to development and may be overshadowed to a greater extent than what is shown in these maps.

Additional research
Research prepared by Hodyl + Co to inform this report includes:

- Review of existing scientific evidence for the relationship between sunlight and health
- Review of comparative Australian and international cities sunlight protection policies
- Review of recent VCAT cases in the City of Melbourne in regards to sunlight access protection
- Research into the relationship between sunlight and ecological health

Carlton Gardens, September 2017

2. What level of sunlight access is wanted and needed?

2.1 Consultation findings

The community was consulted on how they use parks and the importance of sunlight to their use in early 2016. 275 people responded to an online survey with the highest number of respondents aged 30-39.

The key messages that came through from this consultation were:

- An overwhelming number of participants consider sunlight in public spaces across various times of the day to be extremely important
- If the sun is out, people want to have the opportunity to enjoy it
- Access to parks should be available year round for smaller and larger parks
- No more sunlight should be lost
- The degree of sunlight in parks greatly influences people's level of enjoyment and the likelihood of spending time in public spaces. Enjoyment of public spaces is diminished by overshadowing caused by buildings, but sun protection from trees is very important in summer.
- People want the choice of sun or shade to meet their preferred levels of personal comfort in response to the temperature
- Being outside in the fresh air and sunlight has powerful physical health and mental wellbeing benefits

2.2 Health impacts: the need for a balanced policy approach to sunlight exposure

The health impacts from sunlight are due to exposure to one type of ultraviolet (UV) radiation. Sunlight is made up of three types of UV radiation – UVA, UVB and UVC. The ozone layer effectively filters out UVC and most of UVB radiation preventing it from reaching the earth's surface, however UVA and some UVB pass through.

Most Australians understand that too much time in the sun is bad for their health. It causes sunburn, premature ageing, eye damage and, more devastatingly, can lead to skin cancer. Australia has one of the highest rates of melanoma in the world: each year, skin cancer kills nearly 2,000 Australians and over 12,000 new diagnoses of melanoma are made.

Recognition of these negative effects has led to global recommendations to minimise sun exposure during hours when the UV radiation index is highest. In Australia, this typically translates to between 10am and 3 pm, and/or when the UV radiation index reaches 3.

Fortunately, skin cancer is preventable. Skin protection can be provided through clothing, a hat, wrap-around sunglasses, using sunscreen and seeking shade. This has been the key message of the Cancer Council's SunSmart campaign which has been effective in improving policy, promoting awareness and changing behaviour and attitudes towards sun exposure (Cancer Council Victoria).

Exposure of unprotected skin to the UVB in sunlight is the principle way our bodies produce Vitamin D, a hormone with many important roles in maintaining and promoting good health. While the health risks of too much sun exposure are well known, far less is known of the risks of too little sun exposure. This can

The consultation demonstrated that sunlight was considered of paramount importance to the way people use and enjoy the city's parks.

Some exposure to UVB is essential for our health

Sensible sun exposure strategies are required to balance Vitamin D production without increasing the risk of skin cancer.

50% of Victorians are Vitamin D deficient in winter which can have serious health consequences

People need 30-60 minutes a day of direct exposure to UV light in winter to maintain healthy levels of vitamin D.

lead to Vitamin D deficiency which is associated with a number of poor physical and mental health outcomes. The negative and positive health impacts of sunlight exposure are outlined in greater detail in Appendix A.

While skin protection is and should remain a priority, some direct exposure of the skin to sunshine is needed for optimal health. The length of this exposure varies across seasons and latitude, and with skin colour and age.

This highlights the need for sensible sun exposure strategies that provide options for individuals to moderate their own behaviour in the sun. Planning policies should be developed that support these strategies.

Adequate levels of Vitamin D

Vitamin D adequacy is assessed according to serum levels of 25-OHD. In a combined consensus statement, leading medical bodies of Australian and New Zealand outlined definitions for Vitamin D status (Nowson et al., 2012). This statement defined Vitamin D adequacy as serum 25-OHD levels greater than 50nmol/L at the end of winter (Nowson et al., 2012).

Vitamin D status of Victorians

Low vitamin D is a significant health issue in Australia, with over 30% of adults demonstrating Vitamin D deficiency (Daly et al., 2012). In Victoria, this figure increases to over 50% in winter and spring (Daly et al., 2012). This represents a major public health concern given that an increasing number of health conditions are associated with low Vitamin D levels. These include poor bone health, cardiovascular disease, cancer, diabetes, severe asthma, sleep problems, cognitive function and mental health.

Direct exposure of UVB to unprotected skin is the best source of Vitamin D. UVB cannot penetrate through glass, sunscreen and most clothing. Shade provided by trees and umbrellas cuts down exposure to UVB by

approximately 50% (Turnbull, Parisi, & Kimlin, 2005), providing some protection from excessive UV radiation.

Factors affecting Vitamin D levels from sun exposure include:

- Skin pigmentation - darker skin has higher amounts of melatonin, which impedes production of Vitamin D
- Proportion of skin covered by clothing - clothing prevents Vitamin D production through blocking UVB access to skin
- Age - the ability to produce Vitamin D from UVB decreases with age

How much sun exposure is needed to provide adequate Vitamin D levels in Melbourne?

Estimates have been generated to determine the duration of sunlight exposure required to achieve sufficient Vitamin D levels in Melbourne at different times of the year. These figures were derived through modelling 11 years of retrospective hourly UV radiation data with a measure of vitamin D synthesis.

While in the Melbourne summer, less than 30 minutes of exposure was required to obtain minimal Vitamin D synthesis between 8am and 6pm, this period co-occurred with the UV radiation index exceeding 3 (the recommended threshold to minimise skin cancer risk). Outside of these hours, when the UV index was less than 3, more than 60 minutes of sun exposure was required to produce adequate Vitamin D levels.

In winter, 30-60 minutes of sun exposure was required between 11 and 2pm to produce adequate Vitamin D levels (see Figure 8). Outside of these hours more than 60 minutes is required.

It is important to note these estimates were modelled for people with fair skin and assuming 11% of skin exposure (equivalent to one side of the hands, arms and neck). These figures therefore represent an underestimate of the minimal length of sun exposure required for people with darker skin and those whose clothes provide greater skin coverage (Stalgis-Bilinski et al., 2011).

Figure 8 Duration of sun exposure estimated for adequate Vitamin D production in Melbourne, based on fair-skin and 11% body exposure. Colour code refers to minimum time required: red less than 30 minutes, orange 30-60 minutes, green greater than 60 minutes. Figure adapted from Stalgis-Bilinski, 2011.

Sunlight is critical to supporting biodiversity within the city. As urban areas become more densely built up and populated, biodiversity typically declines.

Sunlight exposure to open spaces is important for the growth of vegetation, particularly vegetables (important for community gardens) and flowers.

Urban landscapes with full sun exposure are shown to attract and generate a greater diversity of bees and butterflies (Matteson and Langellotto, 2010).

Is it Sunlight or Vitamin D that affects health?
While sunlight is the most efficient method of Vitamin D production, different methods exert independent effects on health. Vitamin D supplementation in patients with Vitamin D deficiency can improve some health conditions (e.g. bone health, upper respiratory tract infections and asthma), but has no effect on a number of other conditions, including cardiovascular disease, glucose metabolism, type 1 diabetes, most cancers (Autier et al., 2017) and multiple sclerosis (Kampman, Steffensen, Mellgren, & Jorgensen, 2012). These studies support a dual benefit of adequate sunlight exposure and sufficient Vitamin D levels for optimal health.

Increased exposure to sunshine has indirect health benefits

Sunshine is associated with greater engagement in healthy lifestyle behaviours, including increased physical activity. This in turn leads to reduced Body Mass Index (BMI), decreased risk of metabolic and cardiovascular disease and cancer, and increased bone health and muscle mass. Increased physical activity also improves mental health, reducing symptoms of anxiety and depression (Penedo & Dahn, 2005).

Physical activity also increases Vitamin D levels, irrespective of exposure to sunlight (Al-Othman et al., 2012; Daly et al., 2012). Vitamin D deficiency is 1.3 times more likely in those who are physically inactive versus active (Wanner, Richard, Martin, Linseisen, & Rohrmann, 2015). One study suggests the combination of increased activity and exposure to sunlight increases Vitamin D levels in children and adolescents higher than either exposure alone (Al-Othman et al., 2012).

2.3 Ecological health

Biodiversity in urban environments

Natural habitats in cities are increasingly eroded resulting in an extreme form of habitat loss for plants and animals. The remaining pockets of natural and semi-natural habitats such as parks become critical for animal survival as places for food and respite from the urban environment. Typically, built up areas are associated with a reduction in the diversity of plants and animals (Park, 2016). Parks that support diverse plant species create a rich food resource that allows wildlife to survive in the city.

Sunlight and plants

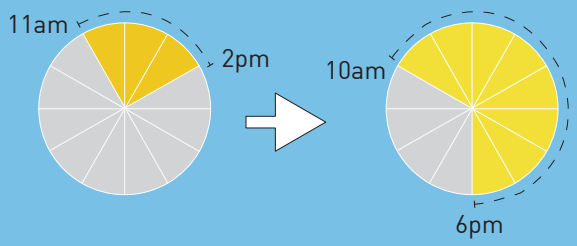
Plants needs sunlight for the process of photosynthesis. During photosynthesis, the energy of sunlight in combination with water and carbon dioxide is used to create glucose. This glucose can be used later by the plant for energy or by the animals that eat them. Without light, plants are not able to produce the energy they need to grow. The number of hours plants require to grow varies depending on the type of species. Most garden vegetables require full sun, which is six to eight hours of direct sunlight daily. To support a diverse number of plant species in the city, variable access to sun is required. Parks in the cities are some of the few places where full sun exposure can be secured for plants. Limiting building overshadowing creates the conditions for plant species that require greater levels of sun exposure.

Bees and sunlight

Bees are important for their role in pollination in which pollen is transferred from plant to plant allowing fertilization to take place. Over the past ten years there has been a reduction in the number of pollinators which has raised concerns about the potential impact on plant reproduction. Direct sunlight and floral abundance are key determinants of bee and butterfly species in urban environments (Matteson & Langellotto, 2010).

Current policy assumes that peak periods of park usage are between 11am and 2pm.

The evidence demonstrates that peak periods of use vary but are generally between 10 and 6pm, depending on the activities supported within the park.



The way people choose to use the city's parks varies significantly and plays an important role in supporting social and physical activity critical to enhancing the city's liveability and people's overall wellbeing.

2.4 How and when are parks currently being used?

The importance of open space

Open space is important for a wide range of reasons which vary for different people's needs. Those identified in the City of Melbourne's Open Space Strategy are:

- Social Connectedness
  - Social contact
  - Community events and festivals
  - Meeting places, particularly associated with high density living
- Mental health and wellbeing
  - Spaces to relax and unwind
  - Restorative places
  - Social development in children
- Physical health and wellbeing
  - Participating in organised sport
  - Exercising informally
  - Contact with nature
  - Being outside in the fresh air and sunlight
- Events and arts
  - Permanent and temporary installations
  - Performances

This diversity of reasons for using open space is demonstrated in the community consultation conducted by Council as part of this policy review, and through the recent audit on park usage commissioned by Council for Flagstaff Gardens, Birrarung Marr and Carlton Gardens. A one hour site visit to Carlton Gardens on September 21st, 2017 provides an effective visual demonstration of the significant diversity of uses of parks even within a limited time period (see Figure 9). It also demonstrates that people choose to undertake the same activity in full sun, dappled sunlight or shade according to personal preference and comfort.

Figure 9 (This page and overleaf): Diverse uses of Carlton Gardens within a one hour period on 21st September, 2017.

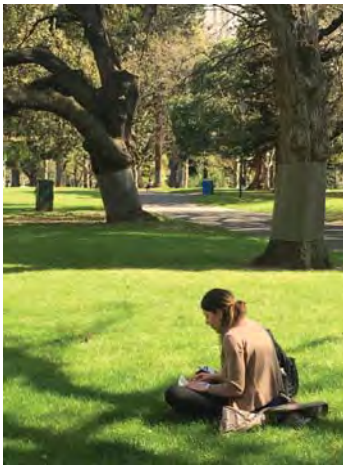

Skateboarding (Sun/shade)


Sitting / lunch alone (Shade)


Group work lunch (Dappled)

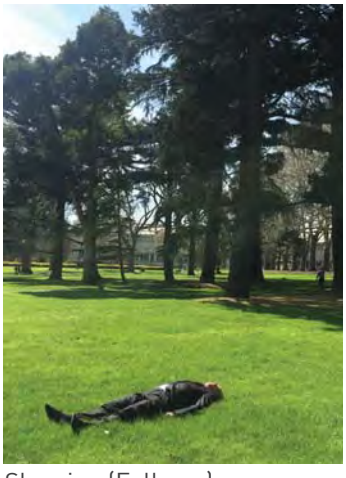

Photography (Mixed)


Photography (Dappled)


Sitting / lunch alone (Dappled)


Group lunch (Full sun)


Sitting (Full sun)


Sleeping (Full sun)

Team sport (Full sun)

Tennis (Full sun)

School trip (Mixed)

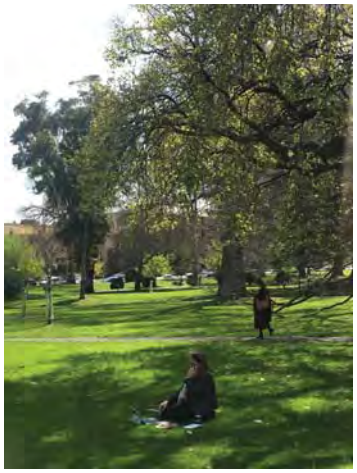
Kid's play (Dappled)

Walking through (Dappled)
Basketball (Dappled)

Fitness camp (Full sun)

Sitting / lunch (Dappled)

Exploring park (Full sun)



Phonecalls / computer work (Dappled)

When are people accessing parks?

Three data sources have been analysed to better understand when people are accessing parks.

Community engagement findings

Respondents to the community engagement survey nominated the highest times of usage between 12 and 6pm.

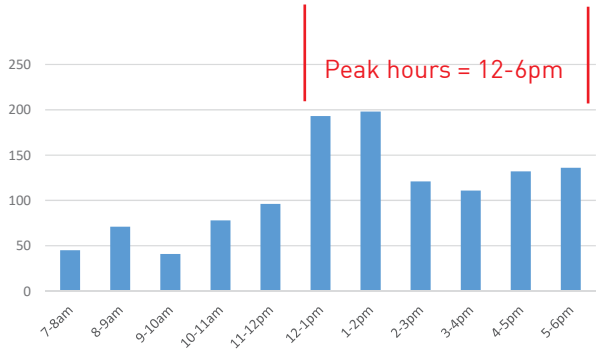


Figure 10 Park usage as reported in community consultation, April 2016 (City of Melbourne, 2016)

Park usage audit

Detailed counts of people using Flagstaff Gardens, Birrarung Marr and Carlton Gardens were conducted in 2017. The patterns of use for Flagstaff Gardens is demonstrated in figure 11. For weekday and weekend data on these three parks see Appendix B.

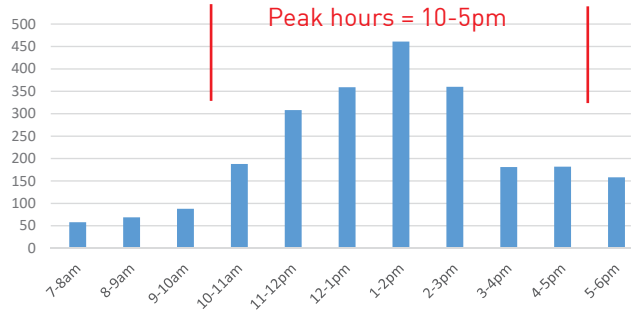


Figure 11 Park usage in Flagstaff gardens - weekday (People Counting and Park Usage, IOSS, 2017)

Online data (google maps)

Google maps provides data that demonstrates the relative popularity of places and the average length of time that someone spends in each place. An example of the data available is illustrated in Figure 12 for Ron Barassi Snr Park. For all available parks in the City of Melbourne see Appendix B.

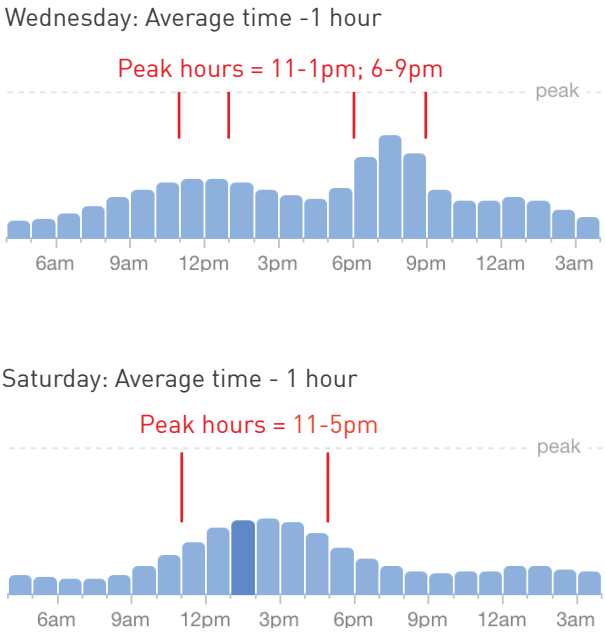


Figure 12 Example of relative usage data provided by Google Maps - Ron Barassi Snr Park - weekday and weekend.

Collective patterns of park usage

Collectively, these three data sets provide insight into the overall patterns of usage. This is demonstrated in Figure 13 and Figure 14.

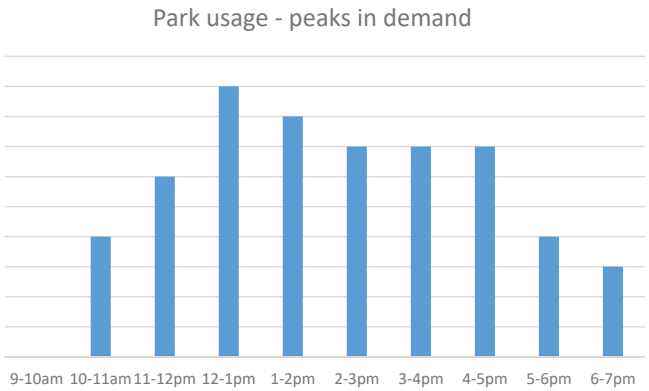


Figure 13 Park usage weekday demand collated from community consultation findings, google data and IOSS People Counting and Park Usage reports

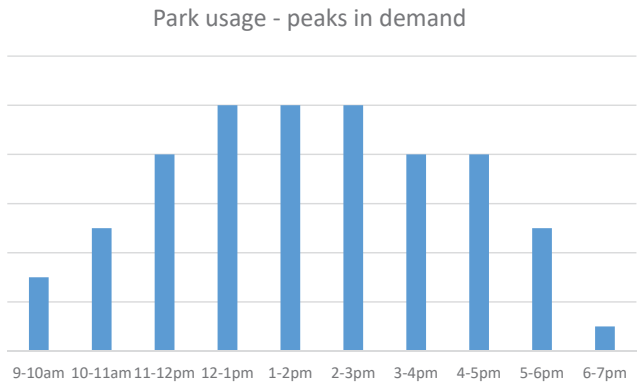


Figure 14 Park usage weekend demand collated from community consultation findings, google data and IOSS People Counting and Park Usage reports

Why are people choosing to be in parks?

The reasons for using parks at different times of the day varied as follows:

Early morning

- Walking the dog
- Training/exercise
- Enjoying the quiet of the park before school
- Work commitments the rest of the day-enjoy the still of the park and the light which is more appealing
- Morning sun is peaceful-a great way to start the day
- Great time to enjoy the sun without the summer heat

Mid- morning

- Fits into work breaks
- Walking the dog
- Community activities in the park
- Taking children to the playground and park
- Best time for kids to play
- Walking on the way to meetings
- Enjoy the crisp air
- More relaxing than later in the day
- Relaxation in group exercise classes-stress relief and time for reflection
- Work from home-reason to get out of the house is to walk in the park

Lunchtime

- Lunchtime escape-place to eat lunch in peace or with friends
- Only chance to get a break from work
- Chance to get out and get some sun and fresh air in the lunch break
- Excited to get outside –improves mood and makes me happy in my lunch break
- Chance to escape from the urban environment
- Late afternoon
- Fits into work breaks
- Fair skinned-looking for shade (dappled light under the trees)
- Sunnier and less crowded with commuters
- Playing competitive sport
- Best time to see the birds in the park
- Nice time to stretch out on the grass and relax/ sleep or read
- Increases alert for the remainder of the day
- Especially in the winter months, spending time outdoors in the sun to increase vitamin D levels and exercise for weight loss

Evening

- Exercise after work
- After work, walking home-relaxing, reflective time-time to unwind
- Great warmth from a summer's evening
- Like to walk the dog
- Great time to socialise
- Like to enjoy the setting of the sun-relaxing

Carlton Gardens, September 2017

3. Existing policy settings

3.1 What sunlight access controls are in place now?

The most recent overarching review of the sunlight to open spaces policy was undertaken in 1999 with the introduction of the new planning scheme format. The strategic basis for the existing policy dates back to the Places for People strategy prepared in 1994.

Sunlight access controls are fragmented across policy, zones and a number of Design and Development Overlays (DDOs) (refer table 1). They are expressed in a number of different ways - as policy, as design objectives, decision guidelines, application requirements and built form outcomes. Each overlay has been developed as local plans for different parts of the city have been prepared, with the Melbourne Planning Scheme (MPS) updated incrementally across the last 18 years.

This has created a complex and inconsistent set of overshadowing regulations which aren't based on a cohesive and overarching policy position on the importance of sunlight (based on people's needs) nor an analysis of how people use open spaces.

The current approach is also inconsistent with the objectives and recommendations of the City of Melbourne's Open Space Strategy. The Technical Report for the Open Space Strategy 2012 establishes assessment criteria for sunlight access for new parks as "a minimum of 3 hours direct sunlight between 9am and 3pm during mid-winter and at least 5 hours of direct sunlight between 9am and 3pm on September 22' (sections 6.3.1). This establishes the importance of winter sunlight access to parks within the municipality.

There are some complications in implementing this approach. Requiring a minimum number of hours of sunlight access to be met establishes a 'first in, best served' basis, where once one development overshadows the park within this time, no other development can increase overshadowing of the space. This approach was not adopted within the recently introduced sunlight access controls for the Central City.

The recent Central City Built Form Review and the Queen Victoria Market Development Plan Overlay have introduced winter sunlight access controls. Elsewhere in the municipality sunlight protection is largely provided in spring and summer months only.

The current controls incorporate a three tiered scale of protection. Winter sunlight access to Tier 1 parks (all in the central city) are well-protected. Sunlight access at the equinox is relatively well-protected for Tier 2 parks.

Tier 3 parks are relatively unprotected and include most parks across the municipality, including those in high growth areas.

Existing Sunlight to Public Spaces Policy

The overarching policy setting is provided in the Sunlight to Public Spaces Policy at Clause 22.02 of the Melbourne Planning Scheme.

This policy applies to 'public spaces throughout the municipality including parks and gardens, squares, streets and lanes, and privately owned publicly accessible spaces within developments, including building forecourts, atria and plazas'.

The policy is based on the recognition that 'a fundamental feature of Melbourne's character, liveability, comfort and attractiveness is its ability to offer sunlight to its streets and public spaces at the times of the year when the intensity of pedestrian activity is highest'.

The objectives established in the policy include:

- 'To achieve a comfortable and enjoyable public realm
- To ensure new buildings and works allow good sunlight access to public spaces
- To ensure that overshadowing from new buildings or works does not result in significant loss of sunlight and diminish the enjoyment of public spaces for pedestrians
- To protect, and where possible increase the level of sunlight to public spaces during the times of the year when the intensity of use is at its highest
- To create and enhance public spaces to provide sanctuary, visual pleasure and a range of recreation and leisure opportunities'

Factors influencing this policy position

From this it can be concluded that this policy position is determined by the inter-relationship within a public space between the following factors:

- The amount of sunlight access provided
- The experience of that sunlight in terms of comfort, enjoyment and delight (visual pleasure)
- The usage of the park in terms of intensity (overall numbers of people)
- The usage of the park in terms of times of year (when are the people there)
- The usage of the park in terms of types of use - respite (sanctuary) and active uses (recreational and leisure) - and how important sunlight is to these uses

Design and Development Overlays (DDOs)

Specific protection for parks from overshadowing is provided across a range of DDOs across the municipality (refer table below).

The current policy approach distinguishes three tiers of public space. The highest tier includes specific mention of public spaces and includes mandatory provision for the protection of sunlight to open space at the winter solstice. These parks are all located within the Central City. The second tier includes specific mention of public spaces and includes a range of discretionary protection controls that vary according to the space at the equinox.

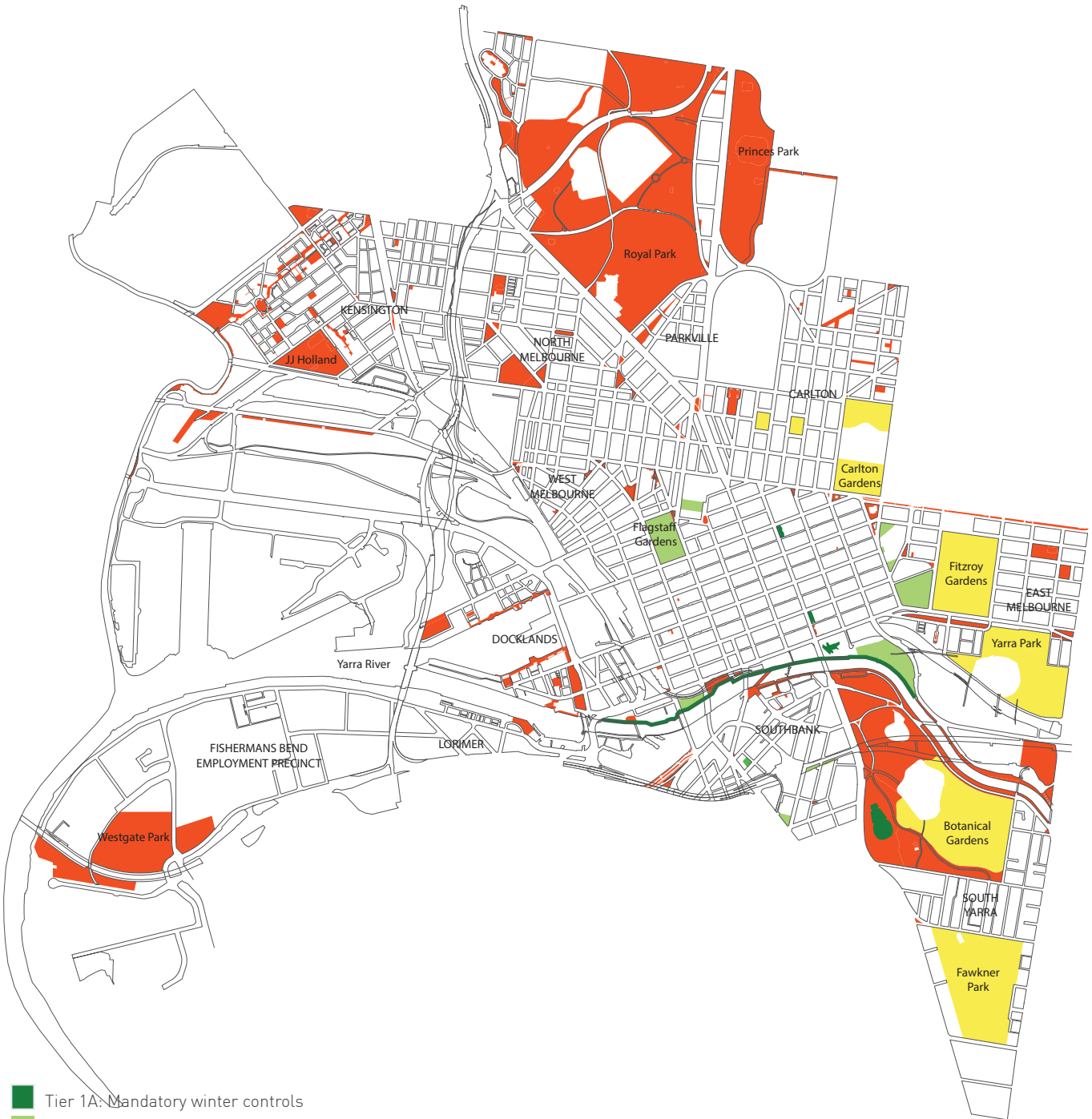
The third tier captures the remaining public spaces without mentioning them by name and provides a blanket discretionary protection between 11 and 2pm at the equinox. This has created a hierarchy of perceived importance between different public spaces, with those in the third tier considered the least important. Refer to Map 3.

Table 1: Current protection for sunlight access to parks across the Melbourne Planning Scheme

Reference in Melbourne Planning Scheme	Overview of sunlight/overshadowing controls included	Current status
Local Policy		
Clause 22.02 Sunlight to Public Spaces	General Development should not unreasonably reduce the amenity by casting additional shadow between 11am and 2pm on 22 September (discretionary) Key Spaces - Policy and DDO10 No additional shadow on Yarra River (11am-2pm, 22 June), Federation Square, City Square, State Library Forecourt, Bourke Street Mall, Shrine, (11am-3pm, 22 April to 22 September) Boyd Park (12am-2pm, 22 April to 22 September) (mandatory)) No additional shadow in key CBD sites- various 11am- 3pm, 22 April to 22 September and 11am-2pm, 22 April to 22 September (Discretionary)	Recently reviewed through C270
Zones		
Docklands Zone Schedule 2 (Victoria Harbour Precinct)	The construction of buildings and works which would cast a shadow across the south bank of the Yarra River between 11.00am and 2.00pm on 22 June is prohibited (mandatory)	Review required
Docklands Zone Schedule 3 (Batman Hill)	The construction of buildings and works which would cast a shadow across the south bank of the Yarra River between 11.00am and 2.00pm on 22 June is prohibited (mandatory)	Review required
Design and Development Overlays		
Schedule 2 to the Design and Development Overlay (Hoddle Grid)	Overshadowing provisions-numerous areas: Yarra River corridor Federation Square City Square State Library Forecourt Bourke Street Mall Flinders Street Station Steps Batman Park Birrarung Marr Swanston Street, Elizabeth Street, Hardware Lane and McKillop Street	No review required (recently revised through C270 amendment)
Schedule 9 to the Design and Development Overlay (Fawkner Park)	Built form outcome-the amenity of Fawkner park should be protected from additional overshadowing between 11am and 2pm on 22 March and 22 September	Review required
Schedule 10 to the Design and Development Overlay-General Development Area-Built Form Central City	A permit must not be granted for buildings and works which would cast any additional shadow across the spaces listed during specified hours (Clause 2.3)	No review required (recently revised through C270 amendment)
Schedule 13 to the Design and Development Overlay (Parliament Area)	Clause 2.1 The amenity of the Fitzroy Gardens is protected from additional overshadowing between 11am and 2pm on 22 March and 22 September	Review required

Table 1: Current protection for sunlight access to parks across the Melbourne Planning Scheme

Reference in Melbourne Planning Scheme	Overview of sunlight/overshadowing controls included	Current status
Schedule 15 to the Design and Development Overlay	Royal Botanic Gardens are protected from shadow between 11am and 2pm on 22 March and 22 September Royal Botanic Gardens are protected from shadow between 11am and 2pm on 22 March and 22 September	Review required
Schedule 17 to the Design and Development Overlay	Must adhere to the Shrine Vista Height Control Formula which does not translate to site specific setback controls, but rather a calculation on a precinct scale	No review required - not related to sunlight controls
Schedule 21 to the Design and Development Overlay (Wellington Parade and Clarendon Street)	No overshadowing of Fitzroy Gardens and Yarra Park between 11am and 2pm on 22 September and 22 March	Review required
Schedule 22 to the Design and Development Overlay	No additional overshadowing of Yarra Park between 11am and 2pm on 22 September and 22 March	Review required
Schedule 33 to the Design and Development Overlay (CBD Fringe)	No overshadowing of Flagstaff gardens between 11am and 2pm on 22 September and 22 June	Currently under review through the West Melbourne Structure Plan
Schedule 40 to the Design and Development Overlay (Special Character Areas-Built Form-River Environs)	No additional shadow of the Yarra River corridor at 11am to 2pm (22 June), Federation Square 11am-3pm (22 April to 22 September), Flinders Street steps, Batman Park and Swanston Street 11am-3pm (22 April to 22 September)	No review required (recently revised through C270 amendment)
Schedule 45 to the Design and Development Overlay	Development that does not overshadow Lincoln Square between 11am and 2pm on 22 September and 22 March	Review required
Schedule 47 to the Design and Development Overlay (Central Carlton South)	Development that does not overshadow Argyle Square, Carlton gardens or the Royal Society of Victoria Gardens between 11am and 2pm on 22 September and 22 March	Review required
Schedule 60 to the Design and Development Overlay (Special Character Area-Built Form-Southbank)	With the exception of minor works or minor changes to existing buildings within that defined space, a permit must not be granted for buildings and works which would cast any additional shadow across a space listed below and shown in Figure 2 of this schedule during the hours and dates specified (Shrine, Boyd Park, Sturt Street Reserve) General provision 11am-2pm September 22	No review required (recently revised through C270 amendment)
Schedule 61 to the Design and Development Overlay (City North)	Buildings and works should not cast a shadow between 11.00 am and 2.00 pm on 22 March and 22 September over public space, public parks and gardens, public squares, major pedestrian routes including streets and lanes, and privately owned plazas open to the public. A permit may only be granted if the overshadowing will not prejudice the amenity of those areas (general provision)	Review required
Schedule 62 to the Design and Development Overlay (Special Character Area Bourke Hill)	Clause 2.3-listed places, dates and times	No review required (recently revised through C270 amendment)



Map 3 Existing protection from overshadowing by tiered category

Public open space contributions - sunlight provisions for future parks

This policy applies to all development applications that include an application for subdivision that would trigger an open space contribution. It outlines the circumstances in which the Council would accept a land contribution instead of a cash contribution towards the delivery of open space. This policy therefore provides guidance on the City of Melbourne's expectations of 'adequate' sunlight provision for future parks as follows:

> *'whether the open space area receives adequate levels of sunlight (a minimum of 3 hours of direct sunlight between 9am and 3pm on June 22 and at least 5 hours of direct sunlight between 9am and 3pm on September 22)'*

This is drawn from the Open Space Strategy Technical Report 2012 which states in regards to the appropriate amenity and function of the open spaces that:

> *'The open space must receive a minimum of 3 hours of direct sunlight between 9am and 3pm during mid-winter and at least 5 hours of direct sunlight between 9am and 3pm on September 22. Where this minimum is not currently met, the development must not create additional shadowing of the open space.'*
> *(Section 6.5.1)*

Key reasons for the inclusion of these controls were the recognition that one of the key values of open space, particularly where people are living in multi-storey buildings without much or any private outdoor spaces, is access to natural sunlight and vitamin D. The requirement for 3 hours of sunlight access was set to align with the current general provisions in Clause 22.02.

It also recognised that the period in time when people mainly experience Vitamin D deficiency is in winter, hence the inclusion of a winter control, rather than only an equinox control.

Height limit controls

While not driven by an overarching objective to protect sunlight access to open spaces, the current height limit controls have a significant and direct impact on the degree of sunlight access provided to parks.

There are a wide variety of height controls that apply across the study area, with the tallest buildings allowed within the growth areas, including City North, Docklands and Arden-Macaulay. Map 3 illustrates the range of height limits that currently apply across the municipality as well as those proposed by the Draft West Melbourne Structure Plan.

Parks that are located in immediate proximity to potentially tall buildings are the most likely to be subject to overshadowing.

There is currently one solar carve control in the Melbourne Planning Scheme which applies to the northern edge of Fitzroy Gardens. While the DDO has an objective to provide sunlight access at the equinox between 11am and 2pm, the built form control actually designates winter sunlight protection. This is a discretionary control.

There are 24 parks that are immediately adjacent to growth areas (height limits over 4 storeys). These have been identified (see Map 4) and investigated in more detail in the modelling.

No. of storeys (range in metres)

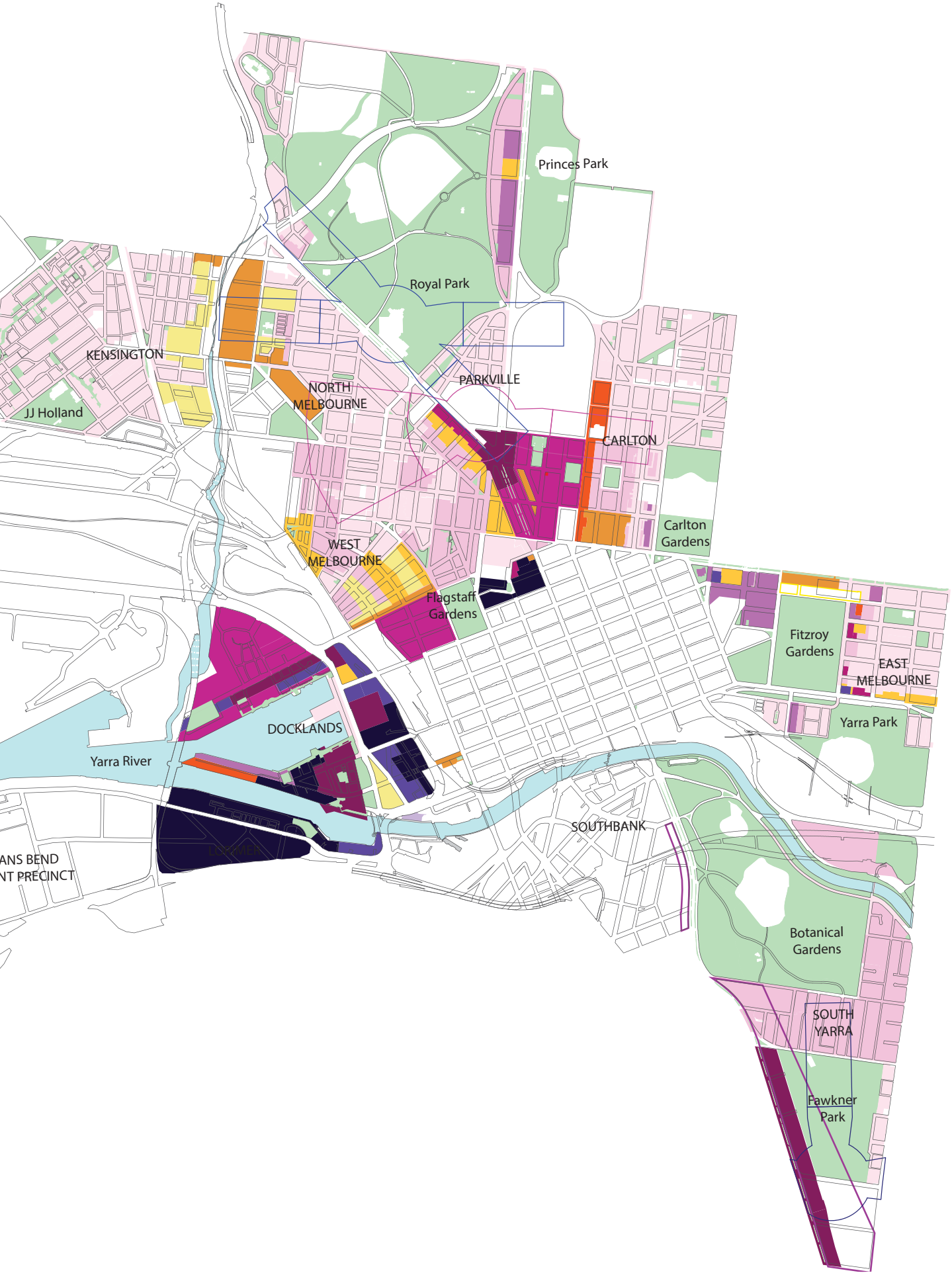
- 3 (7-11m)
- 4 (12-14m*)
- 5 (15-17.5m)
- 6 (20m)
- 8 (24-25m)
- 9-10 (30-32m)
- 11-12 (35-36m)
- 13-17 (40-52m)
- 19 (60m)
- 22-28 (70-90m)
- 33-59 (100-180m)

- Shrine vista controls
- Alfred Hospital (helicopter path)
- Royal Children's Hospital (helicopter path)
- Royal Melbourne Hospital (helicopter path)
- Sunlight access plane to Fitzroy Gardens

- Open space adjacent to a height limit greater than 4 storeys
- Open space adjacent to a height limit of 4 storeys or below

*Includes 4 storey areas where commercial only buildings can increase to 16 metres

Map 4 Current and proposed height limits and existing parks


Princes Park
Royal Park
KENSINGTON
JJ Holland
NORTH MELBOURNE
PARKVILLE
CARLTON
Carlton Gardens
WEST MELBOURNE
Flagstaff Gardens
Fitzroy Gardens
EAST MELBOURNE
Yarra Park
DOCKLANDS
Yarra River
SOUTHBANK
Botanical Gardens
SOUTH YARRA
Fawkner Park

3.2 How are the sunlight access controls being implemented?

The following four VCAT cases (2013-2017) have been reviewed to gain insights into how Clause 22.02, Sunlight to Public Spaces, of the Melbourne Planning Scheme is being implemented and challenged (further detail in Appendix C).

	VCAT cases reviewed
1	DEXUS Property Group Ltd v Minister for Planning (18 May 2017), 32-44 Flinders Street, Melbourne VCAT reference number P1979/2016 Minister for Planning application number TPM-2014/70139
2	10 Wellington Parade Pty Ltd v Melbourne CC (24 August 2015), 10 Wellington Parade, East Melbourne VCAT reference number P73/2015 Planning application number TP-2014-579
3	CBUS Property West Melbourne Pty Ltd v Melbourne CC (19 October 2015), 9 Dryburgh Street, West Melbourne VCAT reference number P811/2015 Planning application number TP-2014-843
4	Australian Hotel Developments Pty Ltd v Melbourne CC (28 May 2013), 33-35 King Street, Melbourne VCAT reference number P2675/2011 Planning application number TP-2011-377

In summary, the review of the above relevant VCAT cases identifies the following implications regarding how Clause 22.02, Sunlight to Public Spaces, of the Melbourne Planning Scheme is being implemented and challenged:

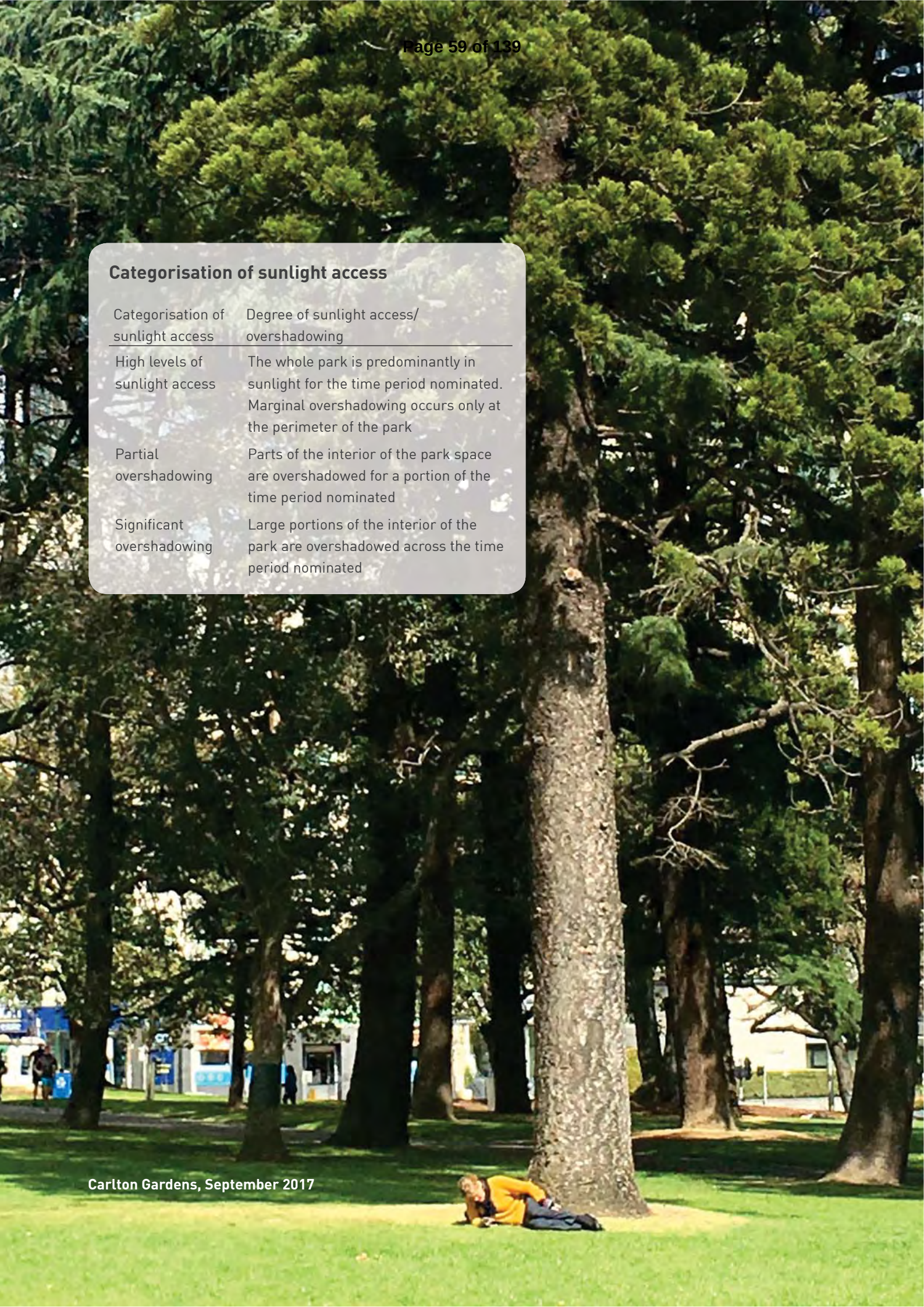
- The first tier of key public space with mandatory controls, including the Yarra River corridor, are well protected under the current (Amendment C270) version of Clause 22.02 and DDO10 as illustrated by Case 1. However, this protection currently appears to rely on the subject site being included within DDO10, as Clause 22.02 does not include the key times and dates identified for the first tier of public space.
- VCAT is also likely to implement the requirements of the current (Amendment C270) version of Clause 22.02 and DDO10 as they relate to the second tier of key public space including Birrarung Marr with discretionary controls due to the statement 'unless the overshadowing will not unreasonably prejudice the amenity of the space'. However, again, this protection currently appears to rely on the subject site being included within the DDO10, as Clause 22.02 does not include the key times and dates identified for the second tier of public space.
- Cases 2 to 4 indicate that VCAT is less likely to protect the sunlight to the more general third tier or 'Other Public Spaces within the municipality' defined as 'any public space, public parks and gardens, public squares, major pedestrian routes including streets and lanes, open spaces associated with a place of worship and privately owned plazas accessible to the public'. It is noted that the current Clause 22.02 does not apply to land within the Docklands Zone and Schedule 5 to the Capital City Zone (City North).
- In terms of this third tier of public space, cases 3 and 4 indicate that VCAT values recreational public

open space, such as public parks and gardens, ahead of streets, lanes and public squares and plazas, such as that at the front of the North Melbourne Train Station.

- Finally, the more general third tier makes no mention of proposed public open spaces, which was evident in the VCAT decision for Yarrabank Developments Pty Ltd v Melbourne CC (22 June 2017) in relation to the shadow impact of the proposed development at 405-421 Spencer Street, West Melbourne, over a potential public space at Batman Street under the future West Melbourne Structure Plan. In this case, the proposed development overshadowed a potential new park within the street. As there was no certainty that the park would be in this location, it was not given significant regard.

Categorisation of sunlight access

Categorisation of sunlight access	Degree of sunlight access/ overshadowing
High levels of sunlight access	The whole park is predominantly in sunlight for the time period nominated. Marginal overshadowing occurs only at the perimeter of the park
Partial overshadowing	Parts of the interior of the park space are overshadowed for a portion of the time period nominated
Significant overshadowing	Large portions of the interior of the park are overshadowed across the time period nominated



Carlton Gardens, September 2017

4. Existing conditions

4.1 Cumulative overshadowing modelling analysis method

The following steps were taken to assess the cumulative impact of overshadowing in the study area.

Step 1: Assessment of cumulative shadow modelling for 9am to 4pm.
A desktop assessment of every park within the study area to consider extent of overshadowing from 9am-4pm for the summer solstice, the equinox and the winter solstice was undertaken. This identified the following levels of sunlight access.

Summer solstice
Sunlight access at the summer solstice is generally high with most parks receiving sunlight across the majority of the park for the full 7 hour period. Partial overshadowing occurs in parks immediately adjacent to high-rise areas (see Map 5).

April 22 / Spring Equinox
The modelling demonstrates that sunlight access to parks is generally high at the April 22 / Spring equinox for parks within the low-rise areas. Within mid-high rise areas partial overshadowing occurs across a number of parks (see Map 6).

Winter solstice
Sunlight access to parks in winter varies. Between the hours of 9am and 4pm the cumulative impact seems significant. The greatest shadowing impact, however, occurs between the hours of 9am-10am and 3pm-4pm as the angle of the sun drop significantly outside of the 10-3pm period (see Map 7).

This identified the need to re-run the cumulative overshadowing assessment for a reduced time period.

Step 2: Assessment of cumulative shadow modelling for 10am to 3pm
The modelling was re-run by the City of Melbourne to demonstrate the cumulative overshadowing impact between 10am and 3pm (reduced from the 9am to 4pm testing). The method for developing the mapping was altered and this time considers both direct and diffused light (see Map 8).

Winter solstice
A second desktop assessment was undertaken to determine which parks are affected by winter overshadowing within this reduced timeframe.

There were 24 parks identified through the policy context review adjacent to areas with an existing height control of 4 storeys or greater.

The modelling analysis is demonstrated on the following pages.

4.2 Cumulative overshadowing modelling analysis findings

What is the extent of overshadowing now (9am - 4pm)?

Summer solstice

Current sunlight access to most parks in the study area in summer is high.

Partial overshadowing of parks occurs in a small number of parks immediately adjacent to high-rise areas. This is caused predominantly by the afternoon sun. This is evident in:

- Docklands Park
- Point Park
- Treasury Gardens
- Gordon Reserve
- Fawkner Park
- Flagstaff Gardens (morning sun)

Map 5 December 22 (summer solstice) 9am - 4pm: Extent of overshadowing from existing built form (as at May 2015), base map provided by the City of Melbourne

What is the extent of overshadowing now (9am - 4pm)?

April 22

Current sunlight access to parks in the study area within low-rise areas is high.

Overshadowing is evident across a high number of parks in high growth areas. The extent varies from partial to significant when taking into account the 9am-4pm period.

Overshadowing is evident in the following parks:

- Clayton Reserve
- Macaulay and Canning Reserve
- Flagstaff Gardens
- Bedford Street Reserve
- Courtney Street Reserve
- University Square
- Lincoln Square
- Argyle Square
- Carlton Gardens
- Neill Street Reserve
- Fitzroy Gardens
- Parliament Gardens
- Fawkner Park
- Docklands Park
- New Quay
- Victoria Garden
- Buluk Garden

Map 6 April 22 9am - 4pm: Extent of overshadowing from existing built form (as at May 2015), base map provided by the City of Melbourne

What is the extent of overshadowing now (9am - 4pm)?

Winter solstice

When considering sunlight access from 9am-4pm the overshadowing of all parks is significant with every park in the study area subject to overshadowing to some extent.

For many parks the severity of shadow is due to the impact of shadows cast between 9am-10am and 3am-4pm.

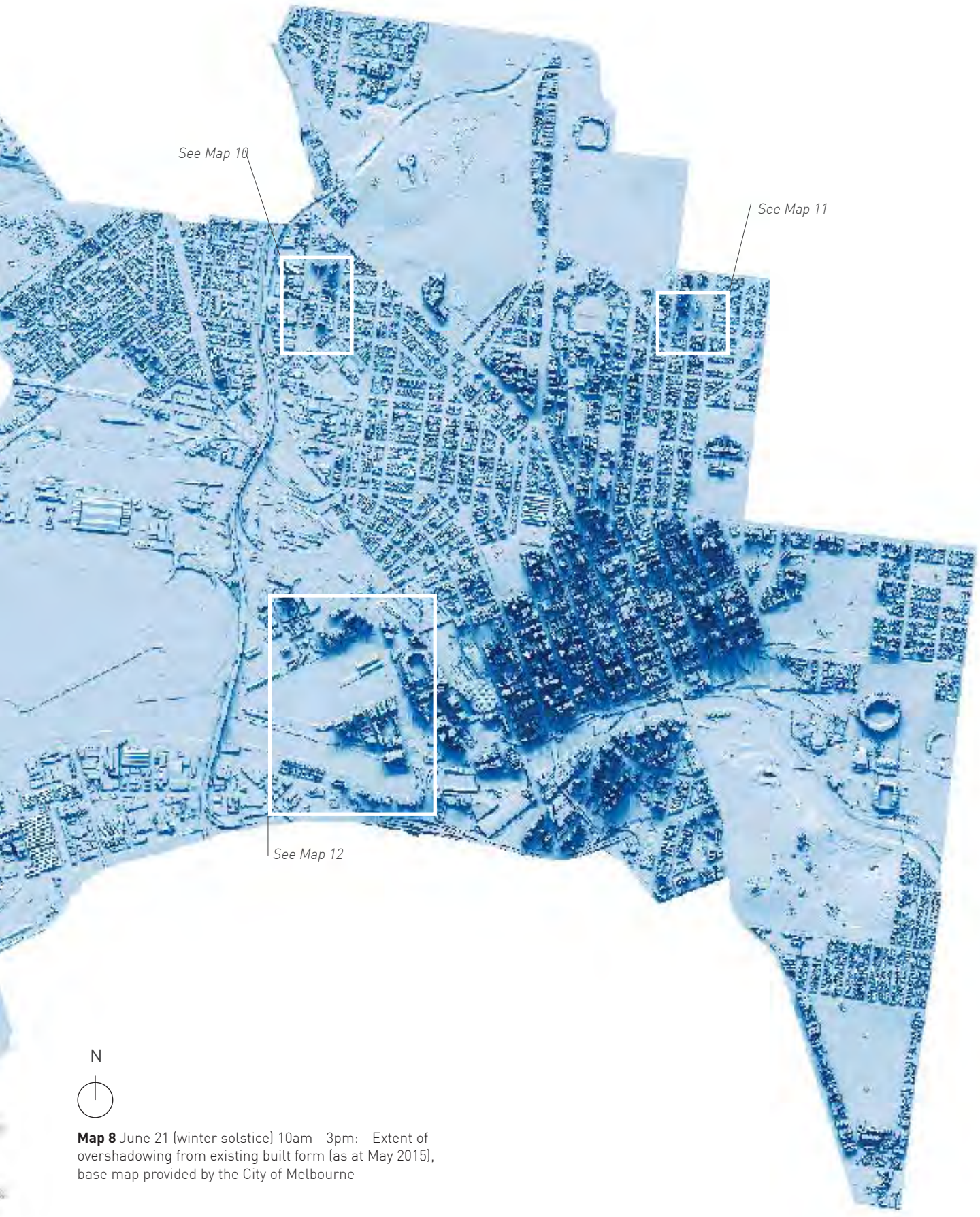
N

Map 7 June 22 (Winter solstice) 9am - 4pm: Extent of overshadowing from existing built form (as at May 2015), base map provided by the City of Melbourne

What is the extent of overshadowing now (10am - 3pm)?

Winter solstice

The cumulative overshadowing modelling was re-run to assess the impact of overshadowing between 10am and 3pm (removing the overshadowing impact between 9-10am and 3-4pm when a significant increase in shadow length is observed).



Map 8 June 21 (winter solstice) 10am - 3pm: - Extent of overshadowing from existing built form (as at May 2015), base map provided by the City of Melbourne

Generally winter sunlight access to parks is high outside of the Hoddle Grid and Southbank areas. Detailed plans of parks with significantly compromised sunlight access are illustrated in maps 9-11 (locations noted above)

What are the findings from the cumulative overshadowing modelling?

There were 24 parks identified through the policy context analysis as adjacent to areas with height limits above 4 storeys.

'Lost' parks already significantly overshadowed
Of these the modelling demonstrates that five parks have significant overshadowing from existing buildings that means access to winter sunlight has been lost. These are all in the Docklands:

- Quay Park
- New Quay promenade
- Victoria Park
- Collins Landing/Australia Wharf
- Buluk Park

The modelling identified an additional park, Neil St Reserve in Carlton, which is subject to significant overshadowing by the existing housing towers. If these were to be redeveloped, the opportunity to reinstate winter sunlight access may be possible. The situation in the Docklands is different, where relatively recent private developments (typically strata-titled apartment buildings) are unlikely to be redeveloped.

'Vulnerable' parks partially overshadowed
There are 12 parks which have partial overshadowing including 8 where partial overshadowing occurs within some part of the park across all five hours and 4 where partial overshadowing occurs for 1-3 hours within the park (see table 2).

An additional 2 parks are vulnerable to partial overshadowing within the existing height controls.

'Naturally protected' parks with high levels of sunlight access
There are 4 parks where the modelling illustrates that the orientation of the street grid means that they are protected from winter overshadowing.

Two of these parks are protected for the full time period between 10am and 3pm:

- Victoria Harbour Promenade (10am-3pm)
- Point Park (10am-3pm)

Two of these parks are protected for the full time period between 10am and 2pm:

- The Domain/the Botanical Gardens (10am-2pm)
- Fawkner Park (10am-2pm)

This is illustrated in Map 9.

Map 9 Parks that are potentially subject to winter overshadowing due to current proximity to building height controls above 4 storeys

Low-Scale Area - Generally not subject to winter overshadowing

Growth Area - 'Lost parks' - Open space with significant overshadowing of park in winter

Growth Area - 'Vulnerable parks' - Open space adjacent to a height limit greater than 4 storeys and subject to partial overshadowing in winter

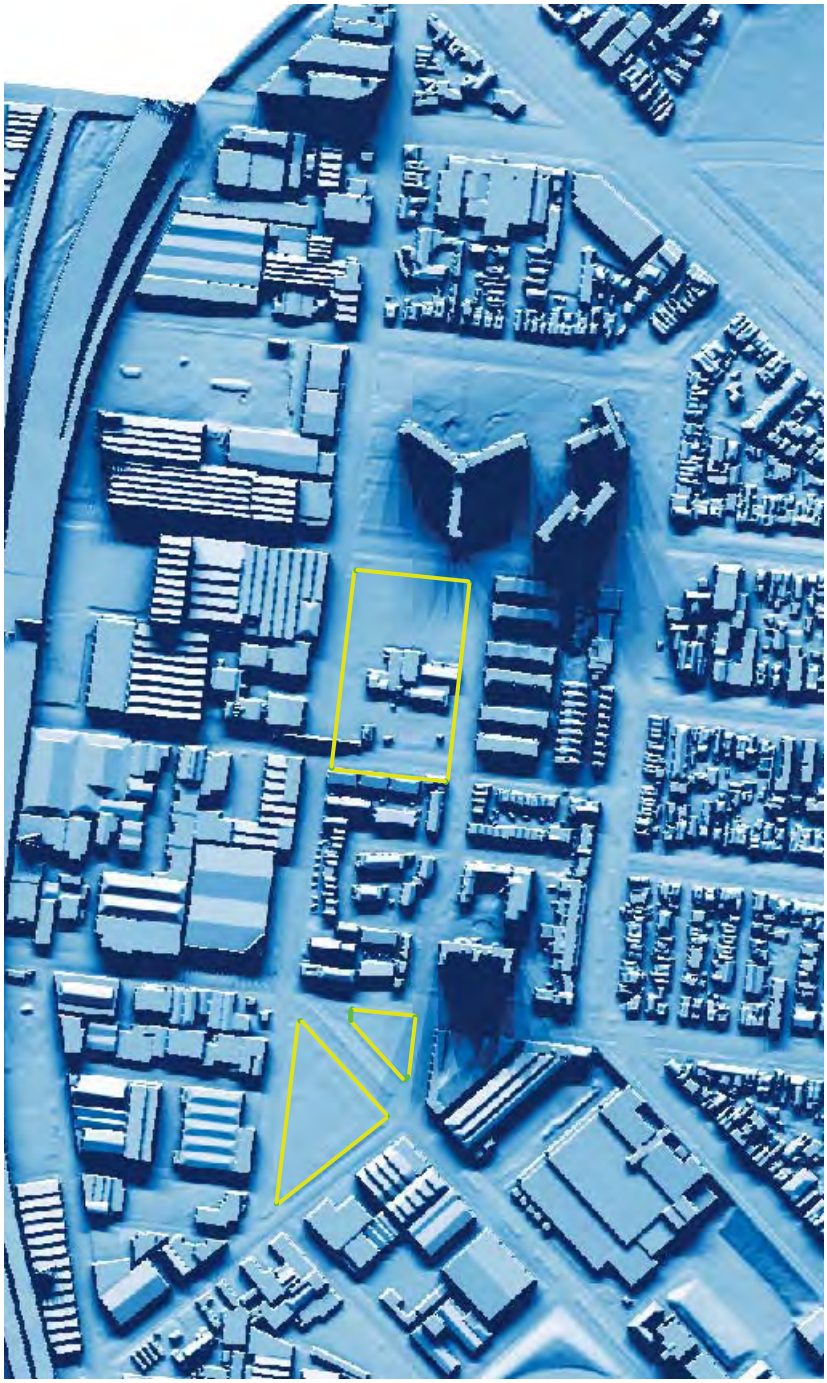
Growth Area - 'Naturally protected' - Open space adjacent to height limits over 4 storeys but with sunlight access generally protected in winter due to orientation of park

Table 2: Review of 14 parks identified as vulnerable to overshadowing at the winter solstice

List of 14 parks currently identified as 'at risk' from partial winter overshadowing	What type of growth area is the park in?	Is any part of the park overshadowed by existing buildings between 10am and 3pm on 22nd of June?	Is this park vulnerable to overshadowing in winter between 10am and 3pm on the 22nd of June within the current discretionary height controls (assuming they are applied as maximum height controls)? *Height limits proposed in West Melbourne Structure Plan ** C190 amendment - Part 2
1. University Square	Urban Renewal Area	Yes, across all 5 hours	Yes, across all 5 hours
2. Lincoln Square	Urban Renewal Area	Yes, across all 5 hours	Yes, within a 3 hour period
3. Ron Barassi Senior Park	Urban Renewal Area	No, 0 hours (excluding freeway overshadowing)	Yes, across all 5 hours
4. North Melbourne Community Centre/ Buncle Street Park	Urban Renewal Area	Yes, across all 5 hours	Yes, across all 5 hours
5. Canning Street and Macaulay Road Reserve	Urban Renewal Area	Yes, within a 2 hour period	Yes, across all 5 hours
6. Clayton Reserve	Proposed Urban Renewal Area	Yes, within a 1 hour period	Yes, across all 5 hours
7. Gardiner Reserve	Proposed Urban Renewal Area	Yes, within a 2 hour period	Yes, within a 3 hour period
8. North Melbourne Football ground / North Melbourne Recreation Pool	Proposed Urban Renewal Area	No, 0 hours	Yes within a 2 hour period**
9. Railway Place/ Miller Street Reserve	Proposed Urban Renewal Area	Yes, across all 5 hours	Yes, across all 5 hours*
10. Stawell Street Park	Proposed Urban Renewal Area	Yes, across all 5 hours	Yes, across all 5 hours*
11. Fitzroy Gardens	Other Area of Incremental Growth	Yes, across all 5 hours	Yes, within a 1 hour period
12. Yarra Park	Other Area of Incremental Growth	Yes, across all 5 hours	Yes, across all 5 hours
13. Belford Street Reserve	Other Area of Incremental Growth	Yes, within a 3 hour period	Yes, within a 4 hour period
14. Courtney Street Reserve	Other Area of Incremental Growth	Up to 5 hours	Yes, across all 5 hours

within a 1 to 2 hour period within a 3 hour period within a 5 hour period

The following maps illustrate the parks which have been identified as significantly overshadowed.



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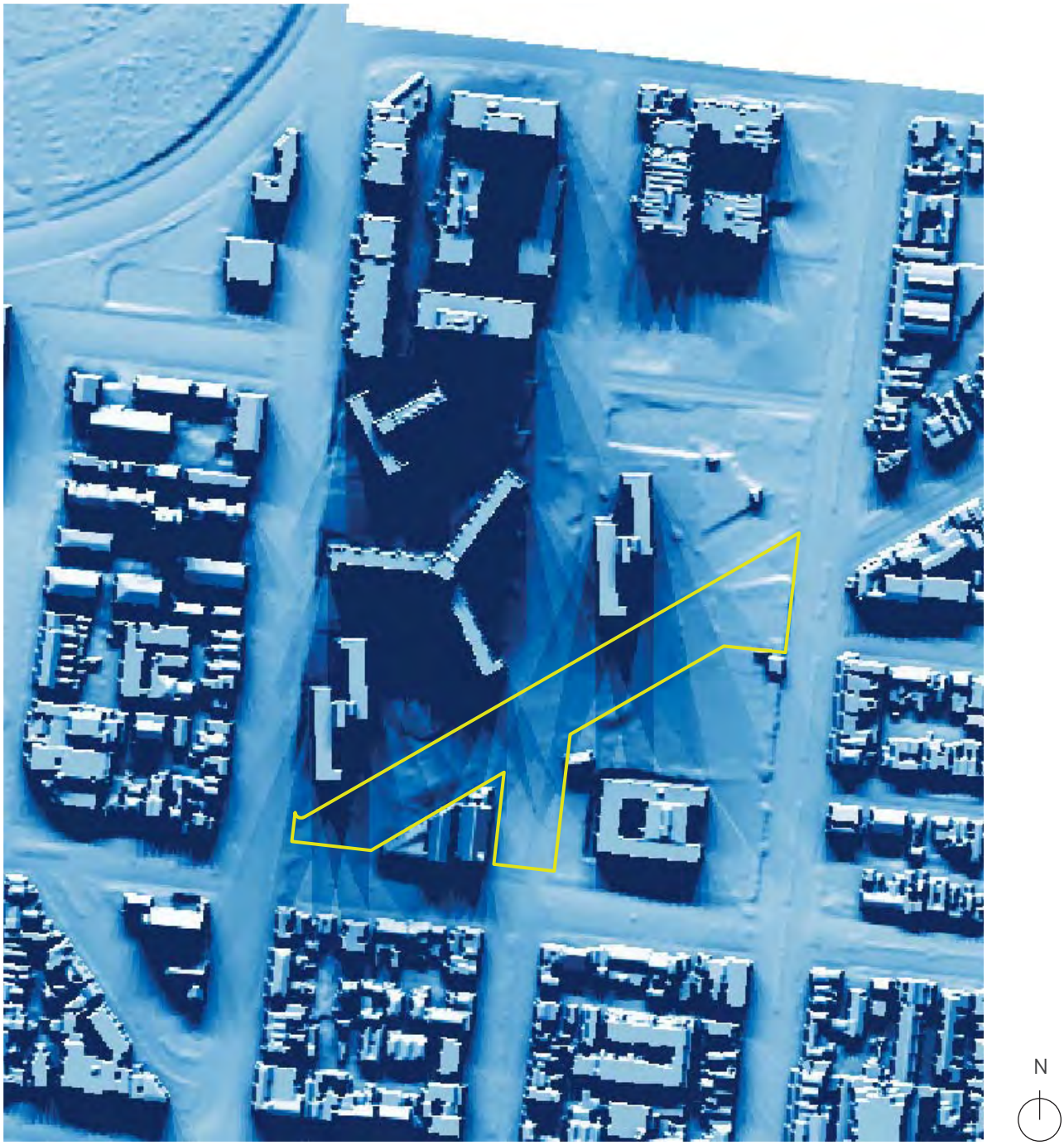
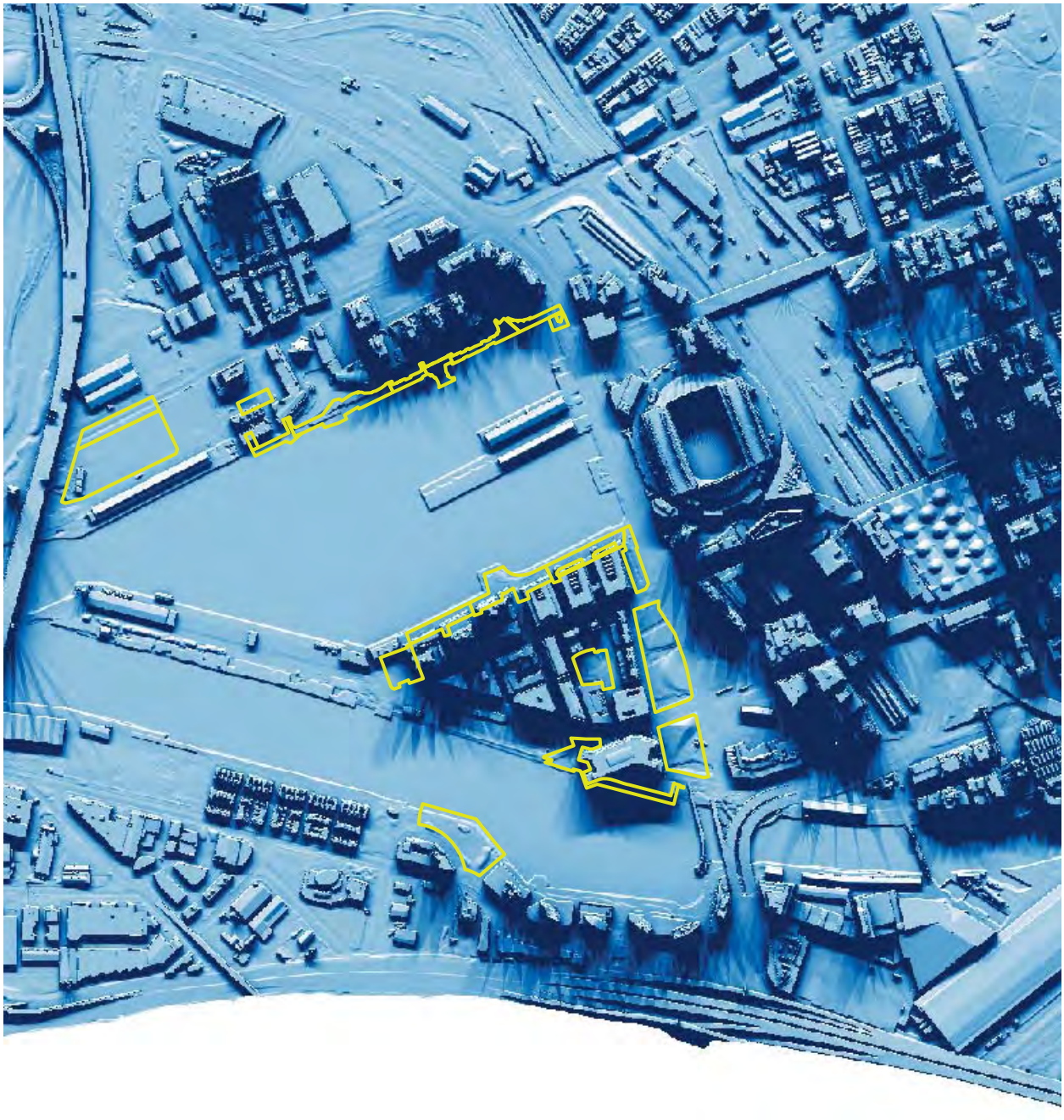
Map 10 North Melbourne - June 21 (winter solstice) 10am - 3pm - Extent of overshadowing from existing built form on parks (as at May 2015)

Partial overshadowing of the Buncle Street reserve and Canning Street and Macaulay Road reserve occurs from the existing high-rise towers



Map 11 Carlton - Neill Street reserve - June 21 (winter solstice) 10am - 3pm - Extent of overshadowing from existing built form (as at May 2015)

Existing overshadowing of Neil Street Reserve which illustrates that across the park most areas are in shadow at some point in time within this 5 hour window. The shadows of the towers, however, move quickly across the park area.



Map 12 Docklands - June 21 (winter solstice) 10am - 3pm - Extent of overshadowing from existing built form (as at May 2015)

Existing overshadowing of open space in the Docklands varies considerably. New Quay waterfront, Victoria Green and Collins Landing are all significantly overshadowed. In particular, New Quay is significantly overshadowed. Victoria Harbour Promenade, Yarra's Edge promenade and Point Park and Docklands Park all generally have good winter sunlight access.

Carlton Gardens, September 2017

5. Setting priorities

The City of Melbourne is one of the fastest growing municipalities in Victoria. Significant growth began in the 1990s within the urban renewal areas of the Docklands and Southbank. Local area planning undertaken in the past 5-10 years has identified additional urban renewal areas, such as City North and Arden-Macaulay. This planning has introduced new development controls in these areas which support development intensification. When this work was prepared the accepted practice was to ensure that sunlight access to open spaces was provided for the equinox months of March and September.

In the past 2 years, the accepted practice has shifted as awareness of the importance of sunlight within high density urban environments has increased. Winter sunlight access controls have recently been introduced for parks into the Central City (via Amendments C270 - Central City Built Form Review, and C245 - Queen Victoria Market). This demonstrates that supporting significant redevelopment while providing winter sunlight access is achievable.

The overall objective of this study is to establish appropriate sunlight levels for public parks across the remaining areas within the municipality (outside of the Central City area).

Key questions

This report considers sunlight access from a user's perspective. It asks the following key questions:

- What levels of access to sunlight do people need to lead healthy, active lives?
- What are the appropriate policy settings for sunlight access that can meet people's needs?
- How can the provision of good sunlight access be balanced with the need to accommodate development intensification to support population growth?

These questions have been considered through:

- Analysis of existing policy controls
- Analysis of the modelling
- Evidence on health needs
- Modelling of specific parks to understand potential future overshadowing
- Review of VCAT case studies
- Review of international and Australian case studies

This has led to the establishment of the following 5 priorities:

1. Support healthy, active living by providing access to winter sunlight
2. Balance sunlight access to parks with the need to support development intensification in these areas
3. Maximise opportunities for people to access sunlight through the day for a variety of uses
4. Update the Melbourne Planning Scheme to establish a simple, easy to use policy that removes current inconsistencies and deficiencies
5. Identify locations for new parks within the municipality

Considering policy options

The following six case studies have been reviewed, in addition to the City of Melbourne, to investigate alternate approaches into managing sunlight access in central city environments through planning mechanisms:

	Cities and jurisdiction reviewed	Current policy approach
1	City of Sydney (Central City)	Prescriptive and performance-based with identification of specific public spaces
2	New York City	Performance-based but for amendments to the Zoning Resolution rather than for each individual development application
3	City of London, Towers Hamlet	Performance-based
4	Brisbane City Council (City Centre)	Performance-based with consideration for sunlight and shade
5	City of Toronto (Downtown)	Performance-based with identification of a hierarchy of public space and some flexibility
6	City of Melbourne	Performance-based planning mechanisms that are either mandatory or discretionary depending on the hierarchy (tier 1, 2 or 3) of public space
7	City of Port Phillip	Performance-based with identification of specific public spaces

These cities demonstrate a range of policy approaches in managing sunlight access to open space. The key variables within each policy and the key tools for managing sunlight access to open spaces are as follows.

Variables in sunlight policies

Time of day

Sunlight access policies typically nominate a period of time within a day in which an overshadowing impact needs to be assessed. The time of day varies however, in general, is centred on middle of the day. This is based on both a practical response (the sun is highest in the sky) and assumptions about when the use of these spaces occurs and therefore when the sunlight is most valued.

Time of year

The application of varying dates within the year determines the extent to which the surrounding development will be constrained by the need to protect spaces from overshadowing. Setting sunlight protection controls to winter ensures that the public spaces will remain protected throughout the remainder of the year when the sun is higher in the sky.

Consideration of existing overshadowing

The existing degree of overshadowing must be considered. There is no benefit in introducing a new sunlight access control for a particular time of day or year if the public space is already overshadowed at these times. The only exception would be if there was a reasonable expectation and clear guidance in the planning scheme that the buildings which are causing the overshadowing were to be demolished at some point in time and replaced with lower built form.

Types of activities that occur

The level of protection (dates and times of the year) often varies to respond to the types of activities that occur in that place that are considered to benefit from sunlight. This is typically based on an understanding of how spaces are currently being used.

Extent of park which is protected
Overshadowing controls can apply to a portion of an open space. This could occur as a percentage of the open space, or to a specified distance measured from the boundary of a park.

Planning tools for implementing protection for sunlight access

The most commonly used methods of implementing sunlight protection include the following:

No overshadowing control
This precludes the development of a building that overshadows a park at all within specified times and dates. It requires the developer to undertake 3D modelling assessments to test whether they are complying with the nominated control.

Solar Access Planes (SAP)
Solar Access Planes (SAP) are planar surfaces at the same angle to the sun at specific dates and time of the year. In effect they deliver the same outcome as a no overshadowing control as they protect the whole park from overshadowing. They provide prescriptive guidance on the built form envelope that can be achieved within a site and therefore determine the maximum height that buildings can reach before they exceed the SAP.

No Additional Overshadowing (NAO) Control
A No Additional Overshadowing (NAO) control protects existing sunlight (including that which passes between gaps of existing buildings) to public spaces surrounded by existing development. They explicitly acknowledge that parks may be already overshadowed to a degree. They allow new buildings to be constructed within the shadow of existing buildings as long as they do not further reduce sunlight access to the park.

Mandatory height limits
While not explicitly a sunlight access control, mandatory height limits can provide certainty that open spaces will not be overshadowed if they are set at heights that protect sunlight access. This is not the case with discretionary controls, where, if no other guidance on sunlight protection is provided, frequently result in very limited protection from overshadowing.

‘Sunlight and shadows affect people and their use of open space all day long and throughout the year, although the effects vary by season. Sunlight can entice outdoor activities, support vegetation, and enhance architectural features, such as stained glass windows and carved detail on historic structures. Conversely, shadows can affect the growth cycle and sustainability of natural features and the architectural significance of built features’

City Environmental Quality Review (CEQR), New York City

Priority 1: Support healthy, active living by providing access to winter sunlight

Enabling people to receive their required ‘dose’ of sunlight each day is critical to their overall physical and mental health.

While the importance of avoiding overexposure to the sun is well understood, the health impacts of insufficient sunlight exposure are not. Over 50% of Victorians are Vitamin D deficient in winter. This can have significant physical and mental health impacts. Providing people with the opportunity to lead healthy lives means providing them with the opportunities to access sunlight and shade as they need. A growing body of health research indicates that access to sunlight in winter is as important as access to shade in summer. This does not diminish the need for individuals to take responsibility for moderating exposure to UV.

It’s not reasonable nor desirable to prescribe to people how and when they should do this as people’s individual needs and livelihoods are varied. Rather, opportunities for them to achieve a good level of wellbeing should be provided to them as much as feasibly possible within walking distance of their place of residence or work.

The current policy settings in the City of Melbourne identify a hierarchy of parks in regards to their relative importance for sunlight access. This sets an expectation that residents and workers will not necessarily have access to sunlight within close proximity to the home or workplace. This approach is not aligned with a needs based assessment and does not focus on ensuring that parks provide for the overall health and wellbeing of people within the municipality.

The Open Space Strategy aims to locate open space within 200 metres of all residents and workplaces. To meet people’s needs, access to winter sunlight should generally be provided for to the same level of access. This means, where possible, winter sunlight access controls should be established for all parks.

This represents a shift from the current policy approach that defines parks according to a hierarchy of importance (typically related to the size of the park). Rather it recognises that the park that is closest to the resident or worker is typically the most important and easiest to access in that person's everyday life.

Existing policy position

Access to winter sunlight is only prioritised in the Central City. Elsewhere protection for winter sunlight is not provided.

Proposed policy position

- Revise the current policy position to shift from protecting sunlight access at the equinox to maximising winter sunlight access to all parks across the municipality.
- Revise the current 'tiered approach' to protecting sunlight access to a 'flat' protection policy that maximises winter sunlight protection for all parks. This acknowledges that often the most important park is the one closest to where a person lives or works.

What do they do in other cities?

Time of year

The application of sunlight access controls varies. Sydney, Brisbane, New York and Port Phillip Council incorporate sunlight access controls for parks in winter. London and Toronto's controls are focused on the equinox. The New York shadow assessment provisions refer to the need to *'demonstrate conditions used during cold-weather when people who do use open spaces rely most heavily on available sunlight for warmth'*

Priority 2: Balance sunlight access to parks with the need to support development intensification in these areas

The City of Melbourne is experiencing significant population growth (see Figure 15). This is primarily focused within identified urban renewal areas, including Docklands, North Melbourne (Arden-Macaulay) and Carlton (City North). Development control settings in these areas support significant building heights which are already compromising sunlight access (in the case of the Docklands) or are likely to (in particular in Carlton and Arden-Macaulay area).

The intensification of these areas has been carefully considered through structure planning and is intended to provide for the establishment of mixed-use, walkable and vibrant precincts. The consideration of sunlight access must be balanced with the need to support growth, while making sure that this growth provides for liveable outcomes and supports people's health and wellbeing, including access to winter sunlight.

The modelling demonstrates that access to winter sunlight in high growth areas is at the greatest risk and yet where sunlight is most needed. As development intensification occurs, overshadowing of existing parks increases at the same time as more people are needing to use these spaces. People living in apartments or working in high density environments generally have very limited access to private green open space. This raises a tension between supporting growth and maintaining winter sunlight access to parks.

Recent introduction of winter sunlight controls to the central city (the Hoddle grid and Southbank), however, demonstrates that supporting significant

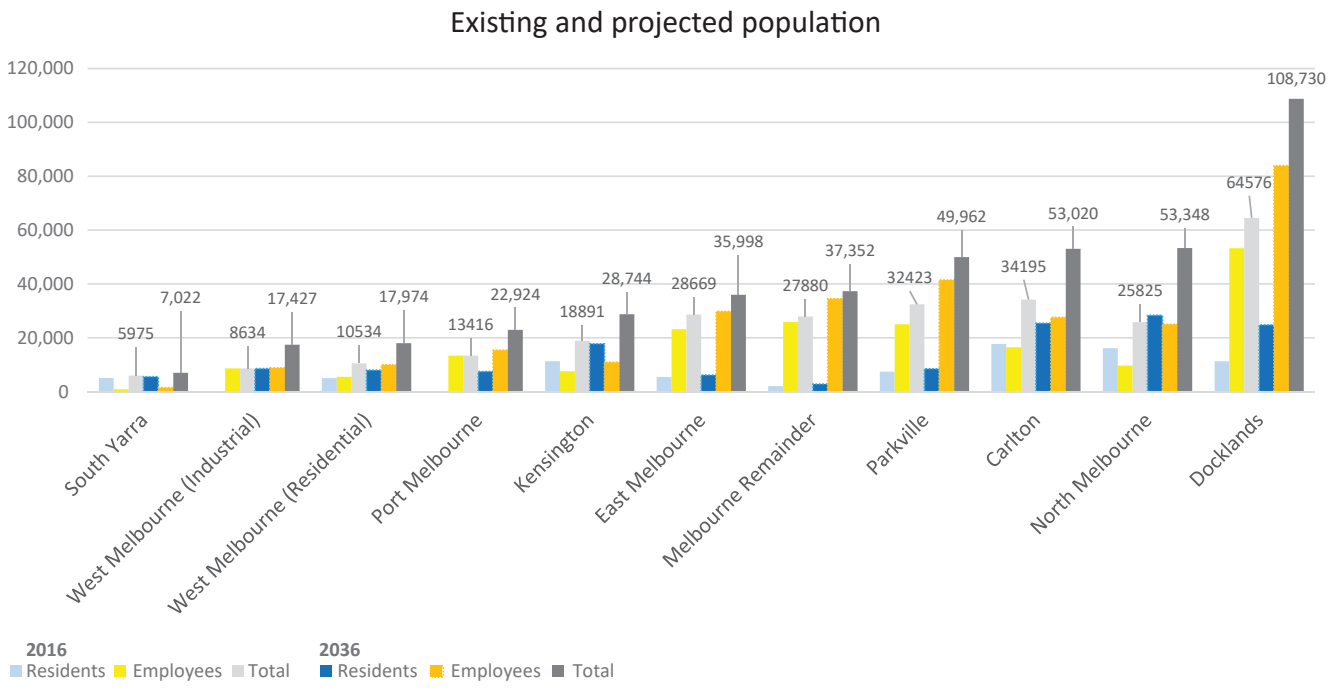


Figure 15 Existing and projected population growth

redevelopment while providing sunlight access is achievable.

Delivering new open spaces is difficult, even more so in high growth areas where land values are high. It is important that the existing spaces retain high levels of amenity to support this population growth.

Three options have been considered:

A. Retain existing policy settings - current height limits and overshadowing controls
B. Solar Carve tool leading to reduced height limits
C. Balanced approach working with existing height limits and introducing winter sunlight access controls

Option A: Retain existing policy settings - current height limits and overshadowing controls

The current height limits will lead to overshadowing of 14 parks within the study area (see table 2 in section 4). This will retain the maximum development capacity identified through the structure plans for each area, however be inadequate to deliver winter sunlight access to these parks. This will diminish the overall amenity of these public spaces in growth areas where they will have the highest levels of usage.

Figure 16 demonstrates the depth of the shadow that would be cast on Lincoln Square if the sites to the immediate north of the park were developed to the building envelope defined in the current planning controls.

Option B: Solar Carve tool leading to reduced height limits

A solar carve mechanism typically applies from the park boundary to ensure that the whole park is protected from overshadowing.

Figure 16 demonstrates the impact on development capacity on the sites north of Lincoln Square if the controls were set to protect winter sunlight access to the entire park. The impact on development yield is significant.

Adopting a solar carve tool across the municipality would have a significant impact on development capacity, particularly in the Central City, Southbank and the Docklands areas.

Option C: Balanced approach working with existing height limits and introducing winter sunlight access controls

The modelling analysis demonstrates that winter overshadowing is typically a problem for buildings over four storeys.

Growth areas with nominated street wall heights
The growth areas across the municipality typically include height controls that are six storeys and higher. These typically, although not always, include street wall height controls that aim to provide a human scale of development that is in proportion to the street. This is the case for 9 of the 14 'vulnerable' parks identified in Map 9 which include:

- University Square
- Lincoln Square
- Buncle St park / North Melbourne Recreation Centre
- Canning St and Macaulay Rd Reserve
- Clayton Reserve
- Gardiner Reserve
- North Melbourne Football Ground / North Melbourne Recreation Pool
- Bedford Street Reserve
- Courtney Street Reserve

Figure 16 demonstrates the depth of the shadow that would be cast on Lincoln Square if an overshadowing control was in place that allowed shadow to be cast by the street wall height only. Any additional storeys above the street would need to be setback to ensure that no additional shadow is created.

Figure 16 also illustrates the extent of development capacity affected by the introduction of such a control. It is confined to the properties immediately fronting the park and has a minimal impact of yield. This example shows the potential setback required on each level, however a 'wedding cake' design as shown is not a preferred design outcome. The building should be designed to consolidate the steps in the building into one or two steps.

Additional 3d modelling illustrates that this balanced approach is appropriate (see figures 20-25), where overshadowing that is created by the existing street wall height controls is considered acceptable and the impact on development capacity is minimised to a small number of sites in the immediate proximity to a small number of parks.

A balance between maximising sunlight access to parks to support people's health and wellbeing and supporting policy objectives to intensify land use and activity in urban renewal areas leads to support for a balanced approach.

Growth areas without nominated street wall heights
There are also 5 'vulnerable' parks in growth areas (see Map 9) where adjacent sites do not have a street wall height nominated in the planning scheme. These include:

- Fitzroy Gardens
- Yarra Park
- Stawell Street Park
- Railway Place and Miller Street Park
- Ron Barassi Snr Park

Fitzroy Gardens
The modelling for Fitzroy Gardens (refer Figure 28) demonstrates that partial overshadowing occurs from two sites along Clarendon St if those sites are built up to the maximum preferred height limit. These two sites have existing buildings that are built to these height limits. This overshadowing only occurs between 10am and 11am and is kept to the perimeter of the park. This is considered acceptable in this instance.

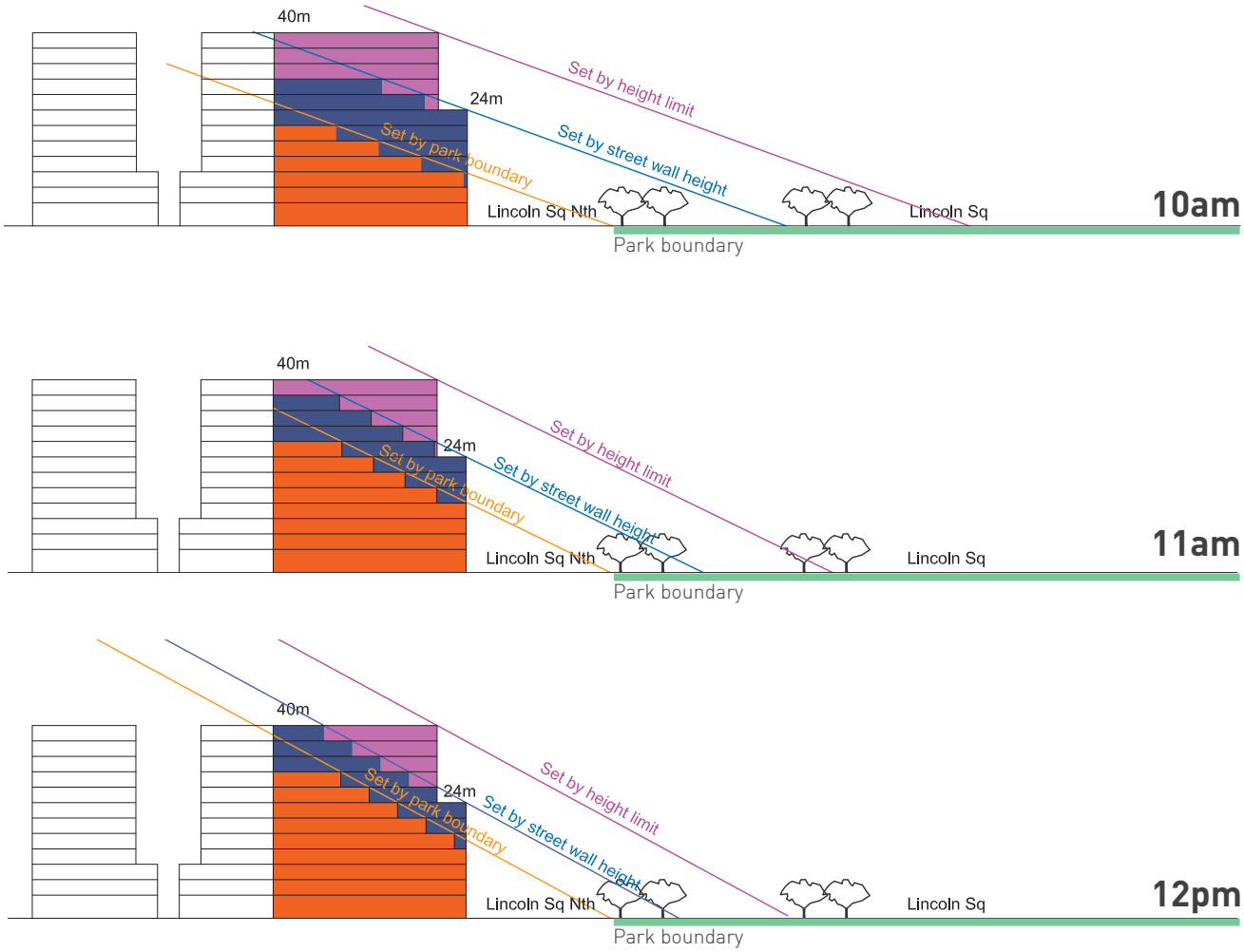


Figure 16 Impact on development capacity of different sunlight access controls in winter

Option A: Shadow cast by existing building envelope controls

Option B: Impact of development if solar carve control was applied at the northern edge of Lincoln Square

Option C: Balanced approach that shows impact on development if shadowing controls are set by the street wall height

Yarra Park

The current height controls north of Yarra Park align with protecting the park from overshadowing at the September equinox. Testing for the proposed winter controls illustrates that the current height limits will result in overshadowing of the park in winter (see Figure 17, Figure 18 and Figure 19). This is caused by two sites on the north side of Wellington Parade between Clarendon and Powlett Streets. As the modelling demonstrates, these two sites already have buildings on them that are built to the existing height limits. Applying an overshadowing control that aligns with the existing building height limits (and planning scheme height control) therefore has limited impact on existing overshadowing within the park. The overshadowing in the model assumes no side or rear setbacks therefore is likely to be less severe than what is illustrated.

Railway Place and Miller Street Park

The current height control of five storeys results in partial overshadowing of the parks in winter. This is exacerbated by the proposed 8 storey height control included in the final West Melbourne Structure Plan (adopted 6th February 2018 - yet to be confirmed through a planning scheme amendment).

There is only one key site, however, which causes the greatest overshadowing impact. This site is already developed as an apartment complex therefore is unlikely to redevelop. This means that this park is already relatively protected from overshadowing in winter. This is demonstrated in Figure 21, Figure 22 and Figure 23).

Stawell Street Park

The Stawell Street Park is a small park that is oriented in an east-west direction. This orientation is most vulnerable to overshadowing. The current 5 storey height control will result in overshadowing of this park. This is exacerbated further by the proposed increase to 8 storeys (see Figure 21, Figure 22 and Figure 23). Importantly, however, the proposed 8 storey control is coupled with a 5:1 plot ratio control. The site immediately to the north of the park has three street frontages and is therefore likely to be designed with 100% site coverage. This means that a 5 storey building is the most likely outcome on this site. While this results in overshadowing on Stawell Street Park, it limits this overshadowing to the current levels of potential impact. This site is effectively an anomaly to the overarching approach in this study.

Figure 17 Yarra Park - Existing shadow and potential overshadowing caused by current height controls (11am, September 22)

Figure 18 Yarra Park - Existing shadow and potential overshadowing caused by current height controls (2pm, September 22)

Figure 19 Yarra Park - Existing shadow and potential overshadowing caused by current height controls (10am, June 21)

Figure 20 Yarra Park - Existing shadow and potential overshadowing caused by current height controls (3pm, June 21)

Figure 21 Railway and Miller Street Park / Stawell Street Park - Existing conditions and overshadowing impact from 5 storey height control shown in yellow at 10am (left), midday (centre) and 3pm (right) for the June 21

Figure 22 Railway and Miller Street Park / Stawell Street Park - Existing conditions, overshadowing impact from 5 storey height control shown in yellow. The potential additional shadow impact at 3-5 Anderson Street (existing apartment building) has been removed - 10am (left), midday (centre) and 3pm (right) for the June 21

Figure 23 Railway and Miller Street Park / Stawell Street Park - Existing conditions and overshadowing impact from proposed 8 storey height control shown in yellow at 10am (left), midday (centre) and 3pm (right) for the June 21

Ron Barassi Snr Park

This large park is located on the southern side of a large site within the Docklands. This site has a current height control of 45 metres. This would significantly overshadow the park in winter (see Figure 24) which is considered unacceptable. This would significantly reduce the amenity of the park.

Considering the fact that the park is located immediately to the south of the potential development site, some overshadowing is going to occur. A balanced approach is required which limits this overshadowing impact, allows development to occur and balances other urban design objectives.

A three storey street wall height will cast a 40 metre long shadow into the park (measured from the southern boundary of the private land). While this still results in significant overshadowing it enables development to occur on the site boundary that can provide an appropriate and positive urban edge to the park. The development site is large and taller elements will be possible further to the north of the site. This must not increase the potential overshadowing beyond the 40 metres (see Figure 25).

Figure 24 Ron Barassi Snr Park - impact of existing height controls which allow a building 45 metres high

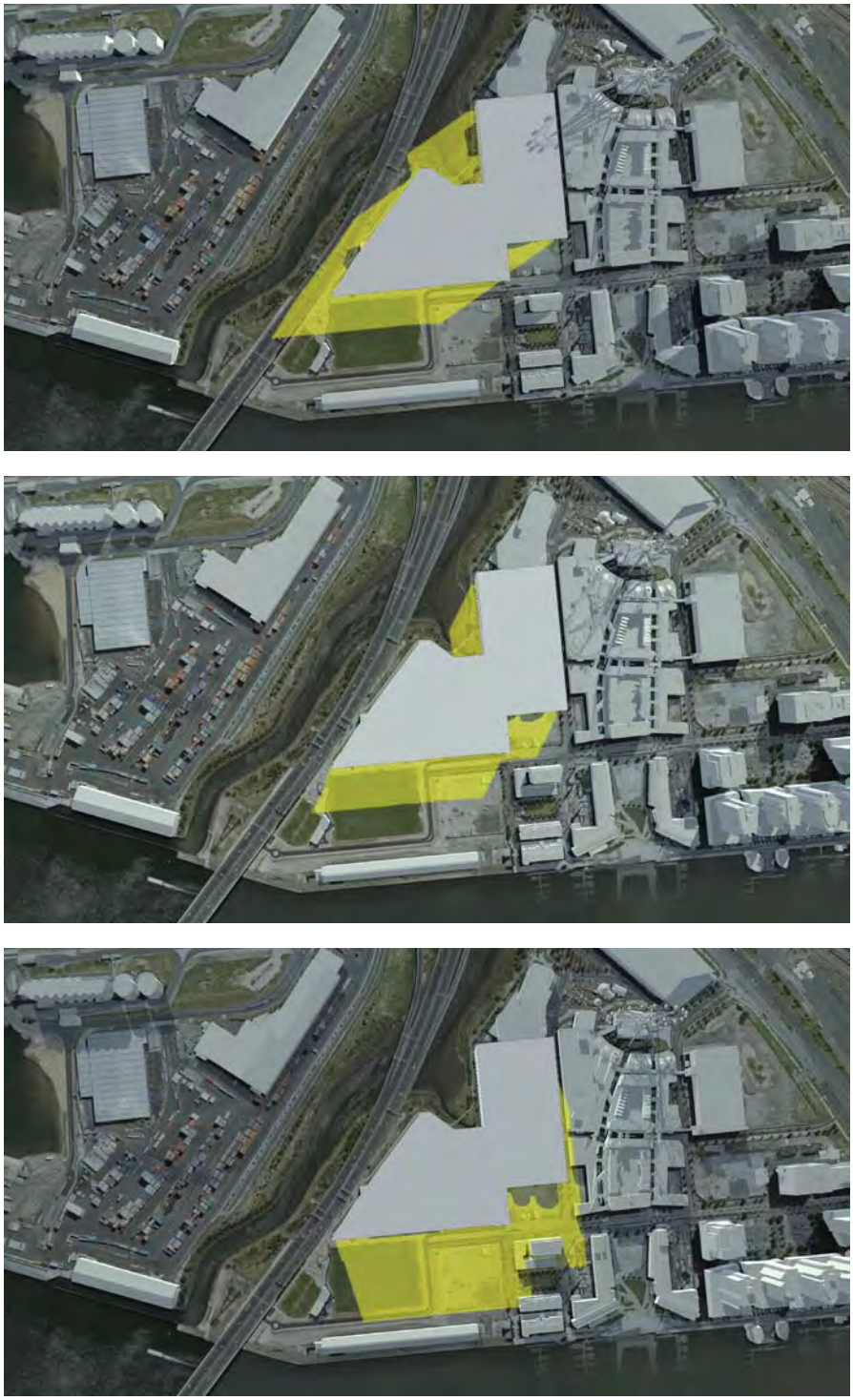
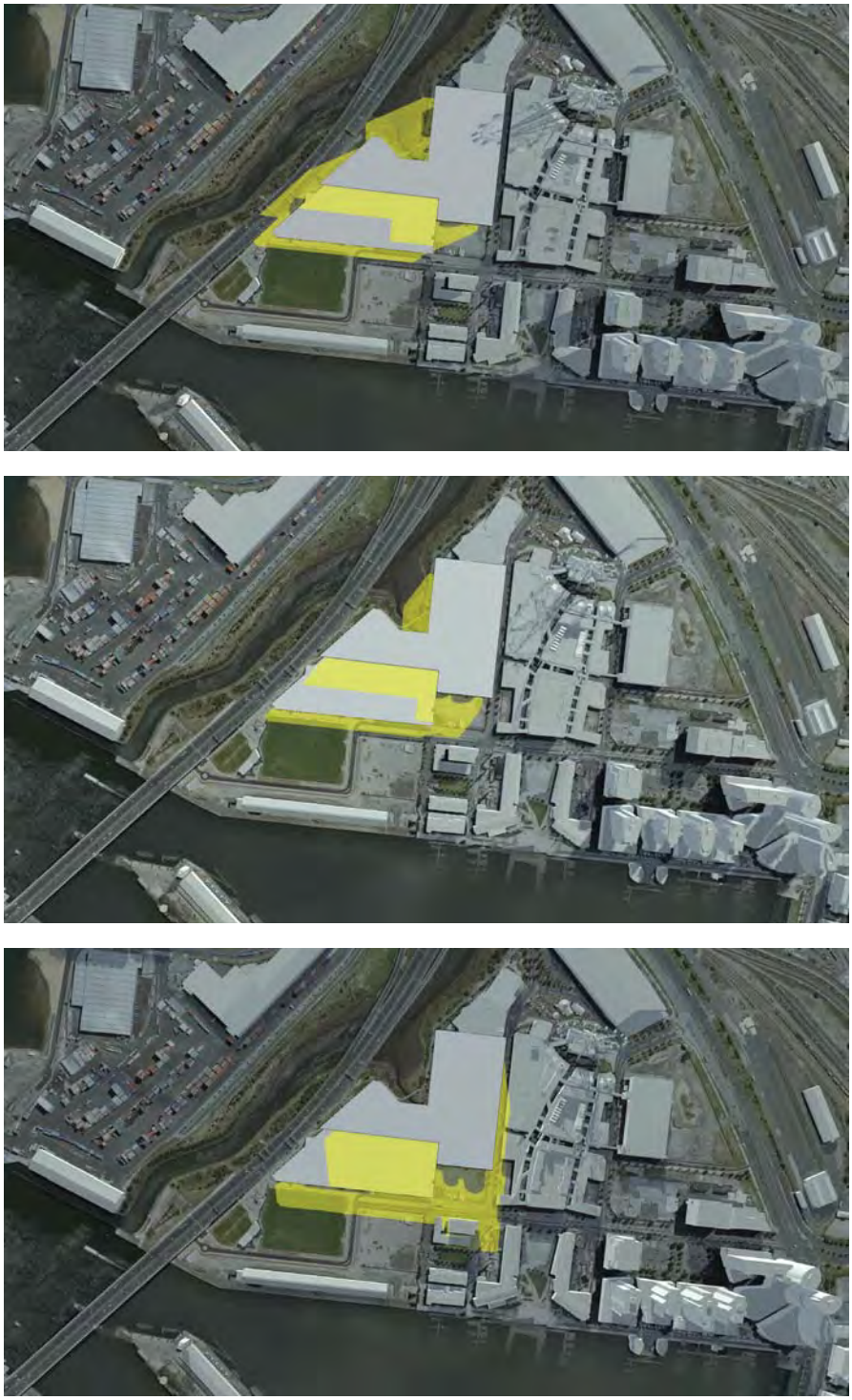


Figure 25 Ron Barassi Snr Park - Degree of overshadowing if a maximum of 40 metres (measured from the southern boundary of the site to the north) is allowed. This depth of shadow only occurs at 3pm.



Further 3d Testing

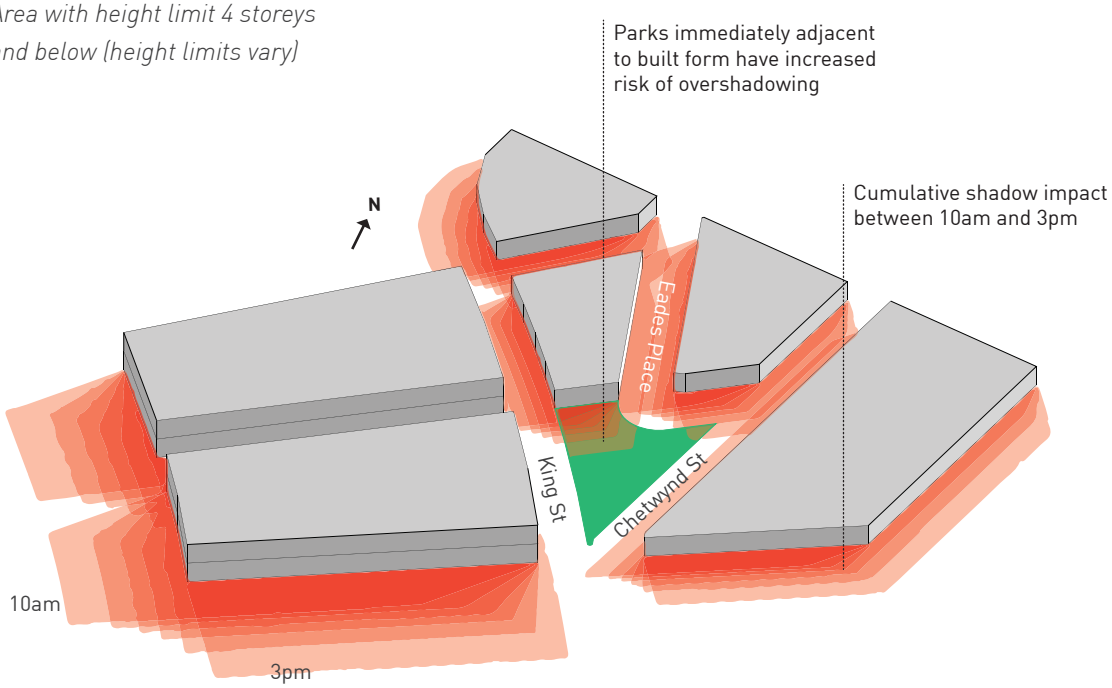
The following testing illustrates the cumulative effect of overshadowing of the proposed balanced approach. The parks include a range of locations across the municipality incorporating different height limits, park size and park orientation.

In each case the existing height limits are modelled and the cumulative overshadowing impact between 10am and 3pm is illustrated.

If the existing height limits significantly compromise winter sunlight access, option 3 (overshadowing limited to the impact of the street wall) has been tested.

Eades Park
Existing controls

Area with height limit 4 storeys and below (height limits vary)



Eades park is located immediately on a property boundary.

Figure 26 Testing of existing height controls on Eades Park which demonstrates that the park is partially overshadowed by the existing development settings which include mandatory controls

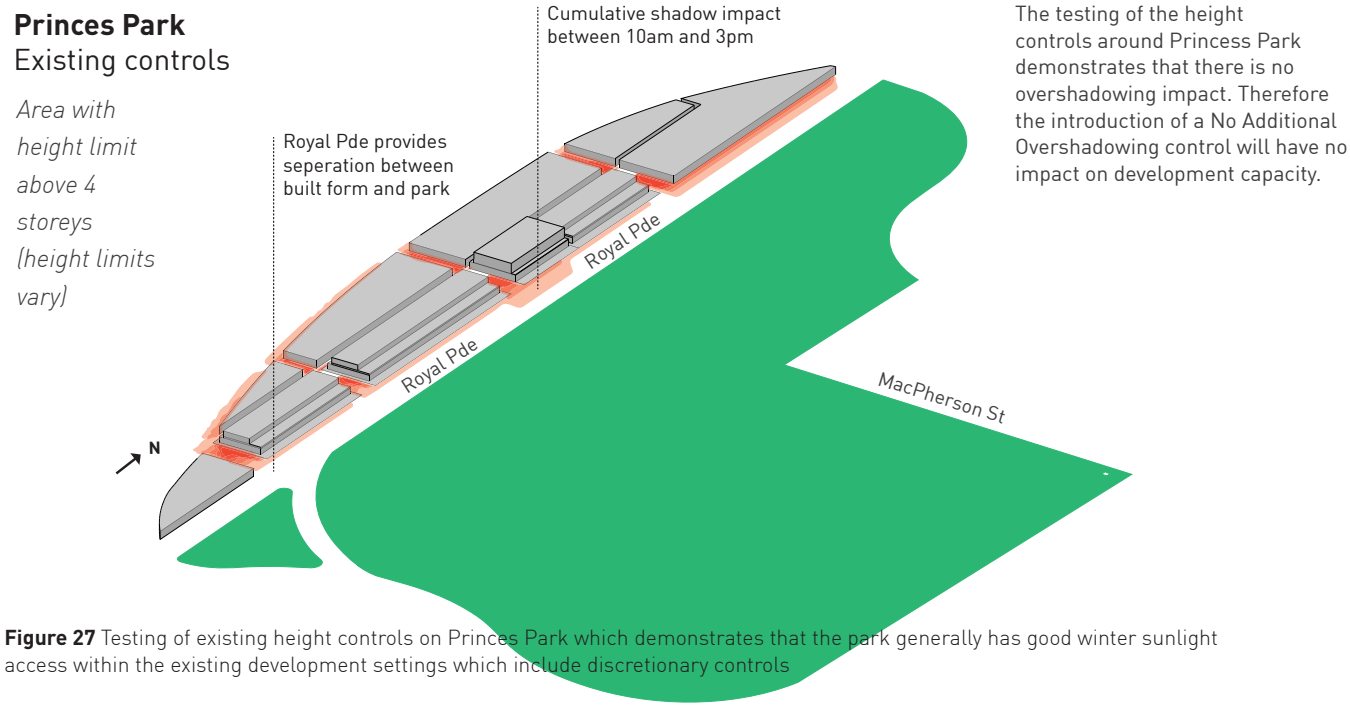
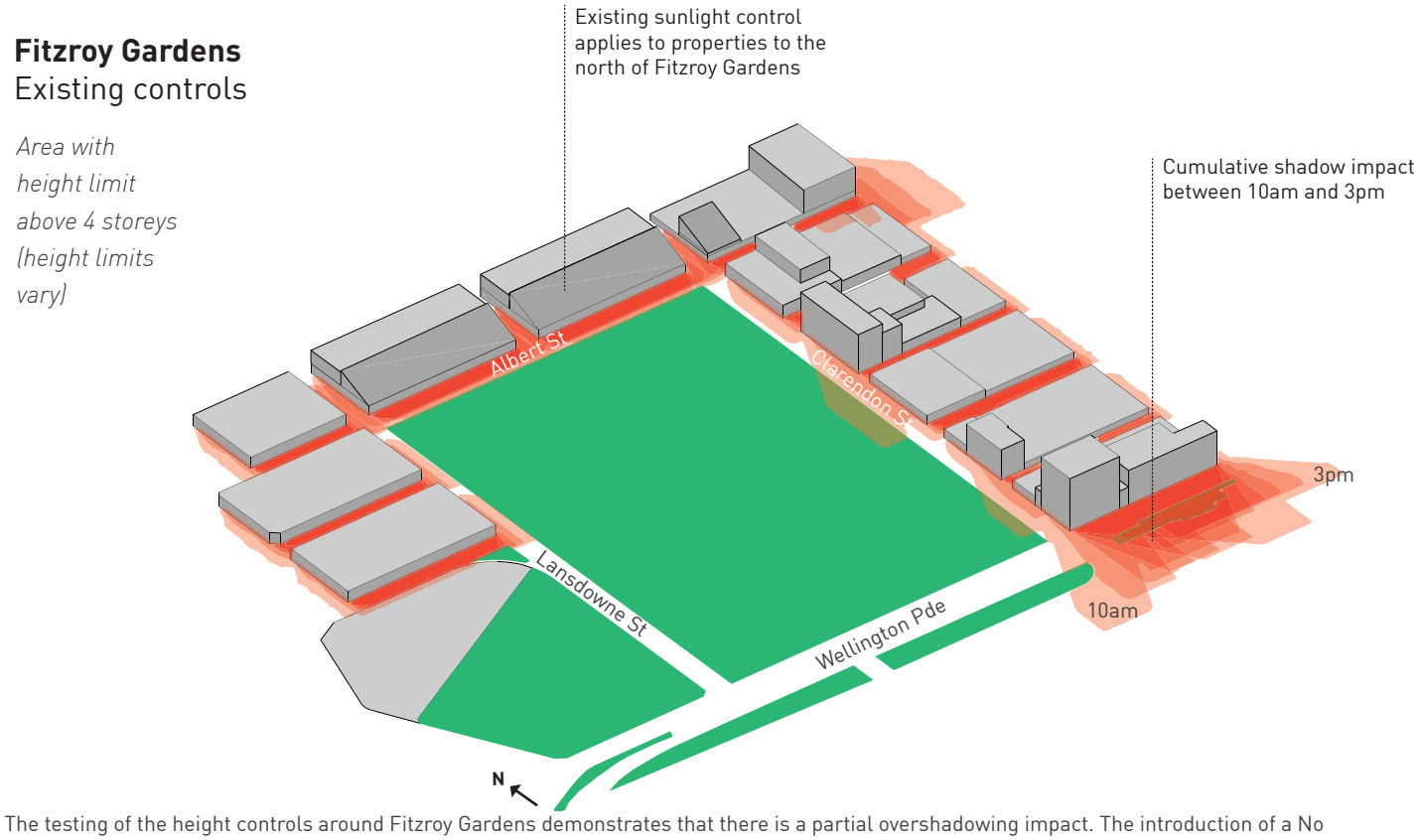


Figure 27 Testing of existing height controls on Princes Park which demonstrates that the park generally has good winter sunlight access within the existing development settings which include discretionary controls



The testing of the height controls around Fitzroy Gardens demonstrates that there is a partial overshadowing impact. The introduction of a No Additional Overshadowing control will affect two development sites only, however these are both multi-storey apartment buildings which are unlikely to redevelop.

Figure 28 Testing of Fitzroy Gardens which demonstrates that if the existing discretionary controls are adhered to, the park is well protected for winter sunlight access

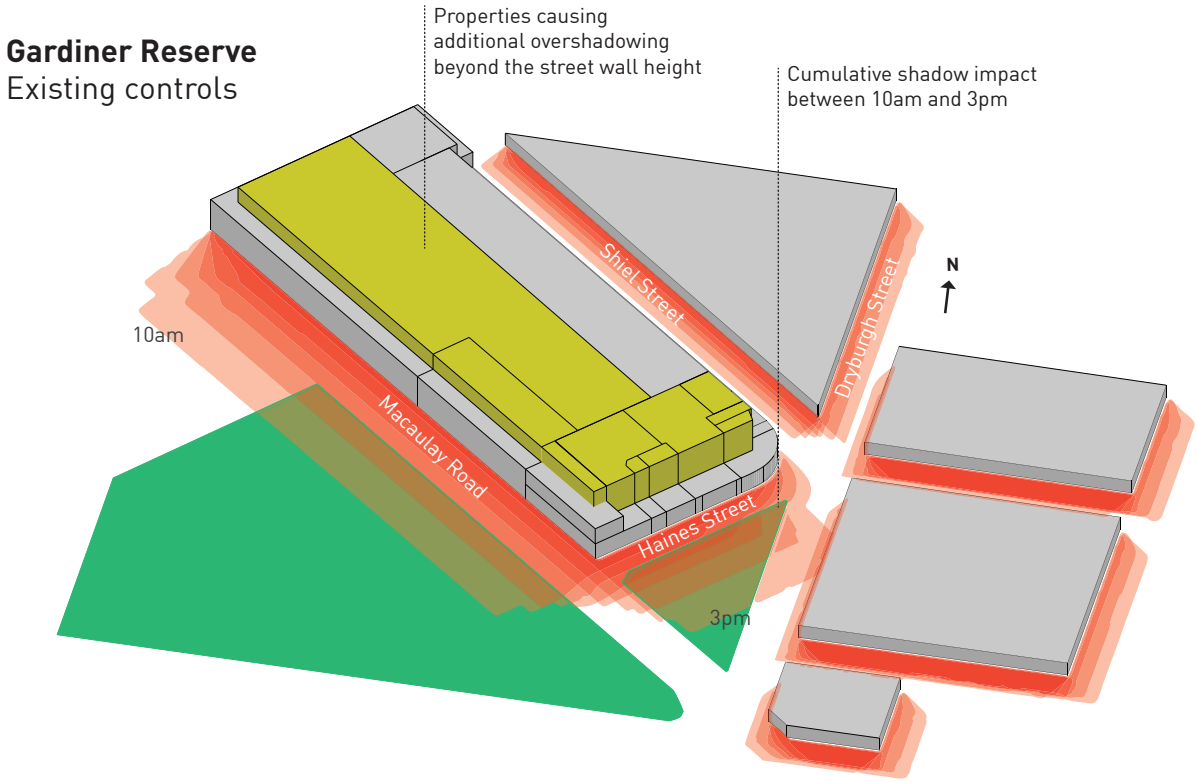


Figure 29 Testing of existing height controls on Gardiner Reserve which demonstrates that the proposed controls included within C190 do not provide good sunlight access to the park in winter

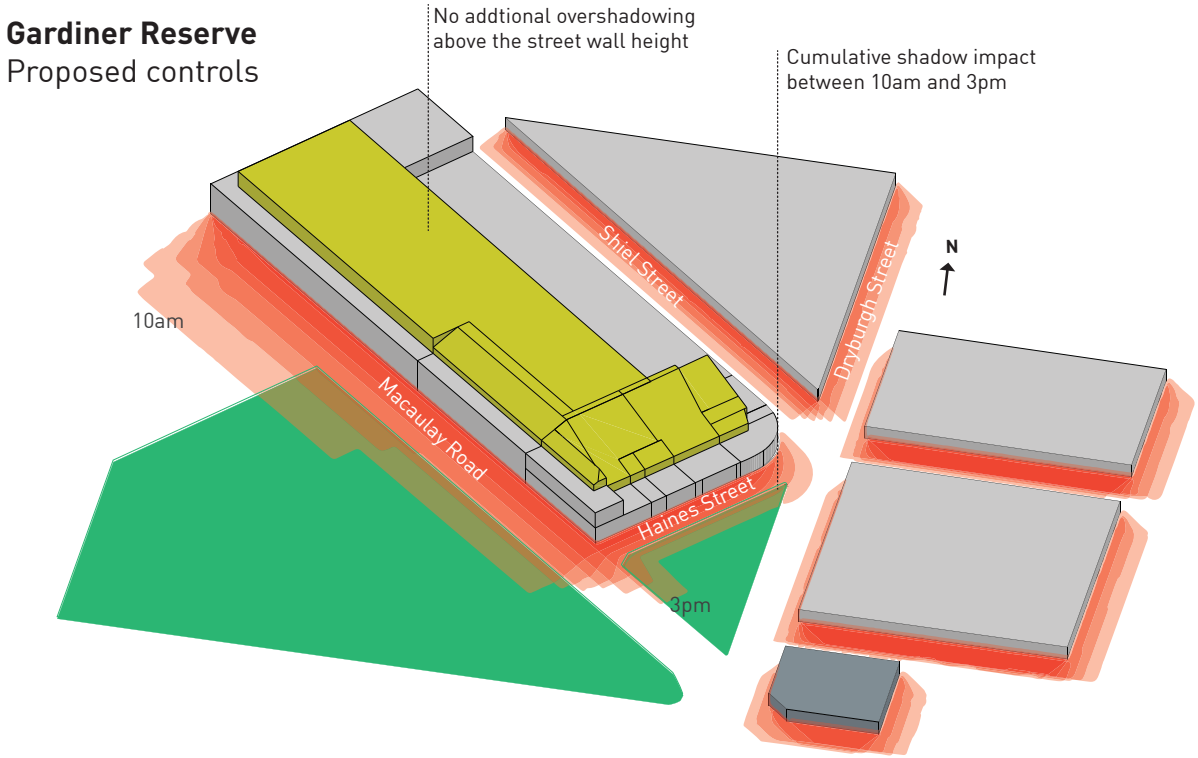


Figure 30 Testing of impact on development capacity around Gardiner Reserve and North Melbourne Recreation Pool with development set back above the street wall to limit overshadowing. This has a significant impact on all sites along Haines Street and Macaulay Road (shown in yellow) however achieves a substantial improvement in winter sunlight access

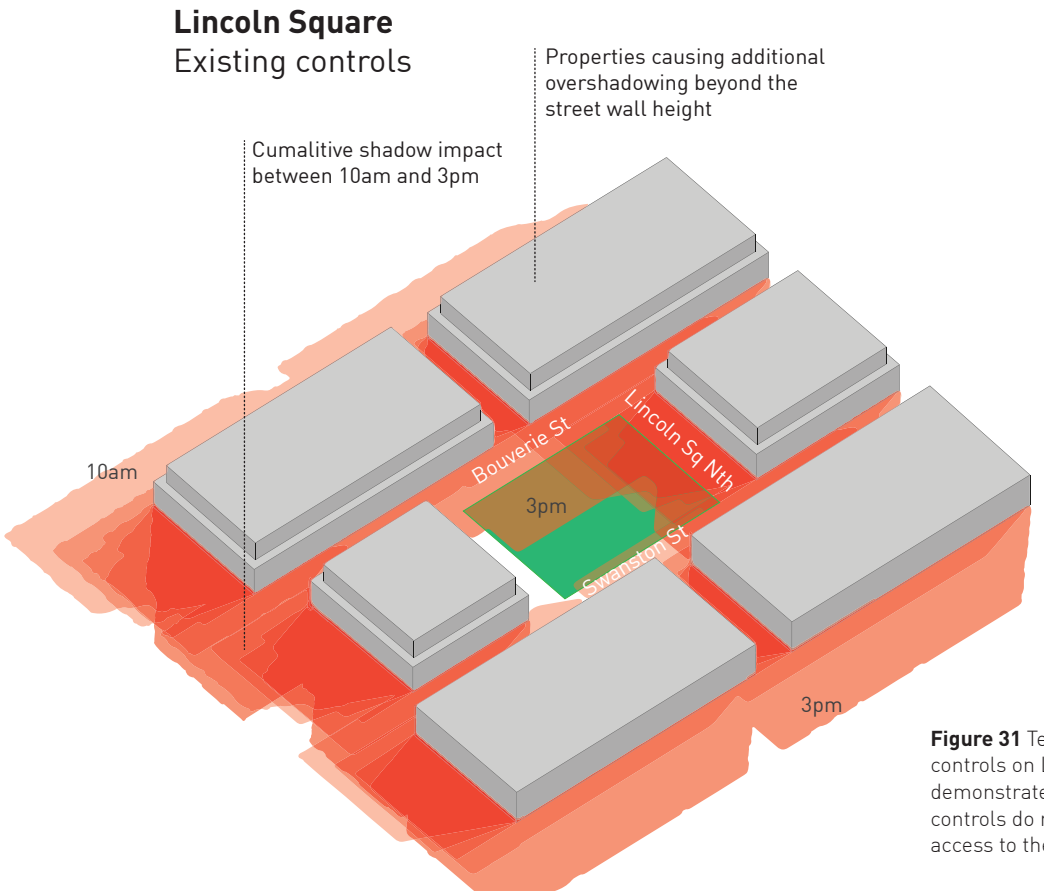


Figure 31 Testing of existing height controls on Lincoln Square which demonstrates that the existing height controls do not provide good sunlight access to the park in winter

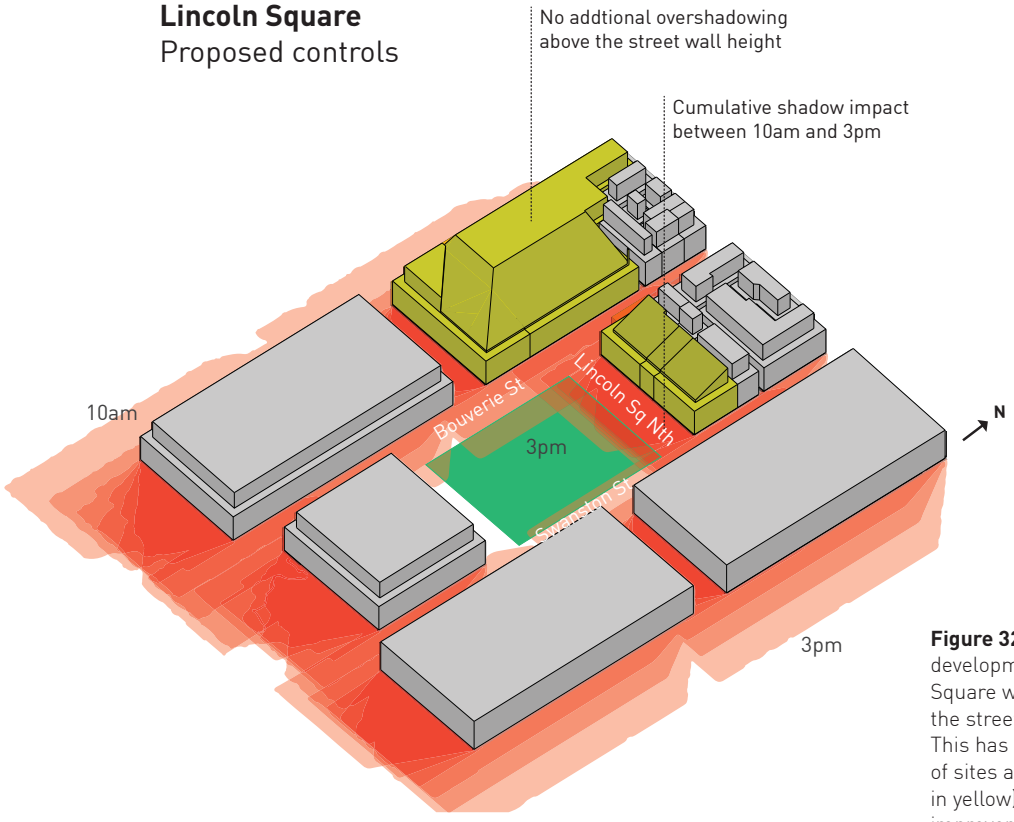


Figure 32 Testing of impact on development capacity around Lincoln Square with development set back above the street wall to limit overshadowing. This has an impact on a limited number of sites adjacent to the park (shown in yellow) and achieves a substantial improvement in winter sunlight access

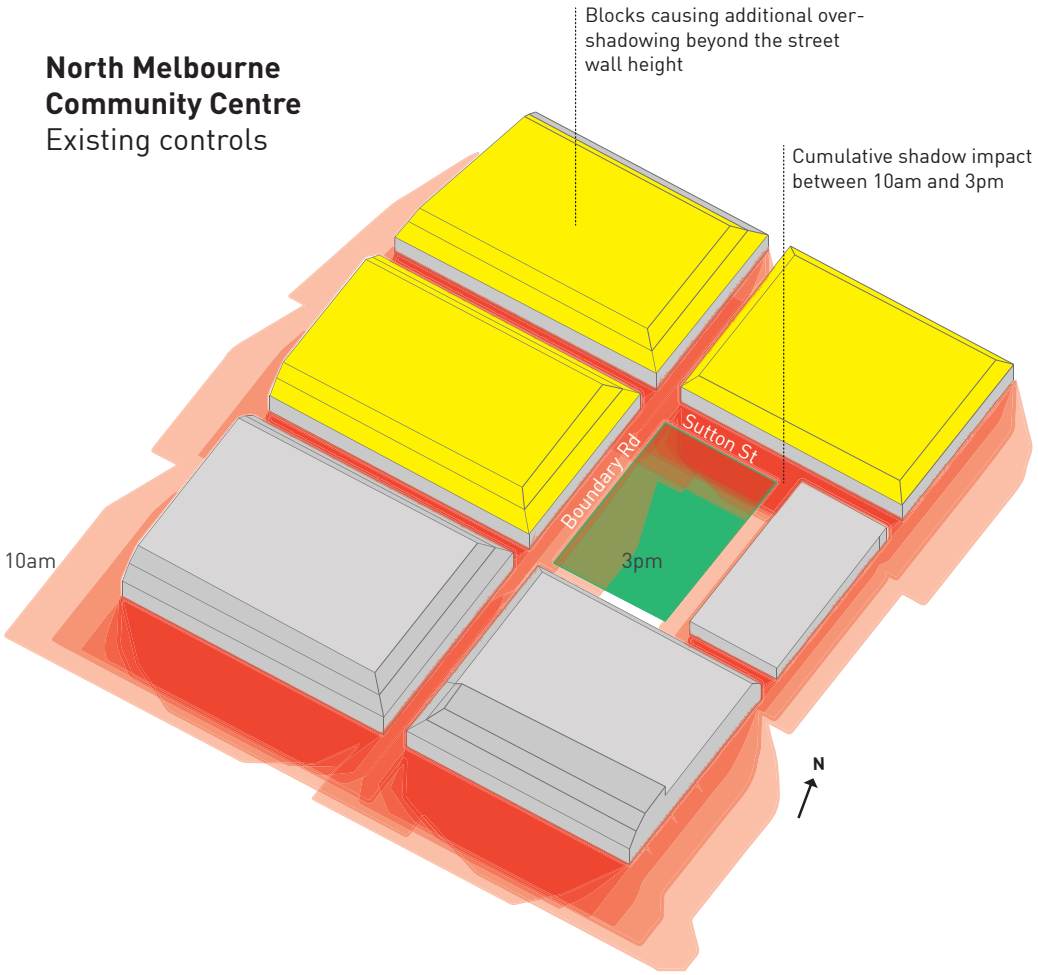


Figure 33 Testing of existing height controls on North Melbourne Community Centre which demonstrates that the existing height controls do not provide good sunlight access to the park in winter

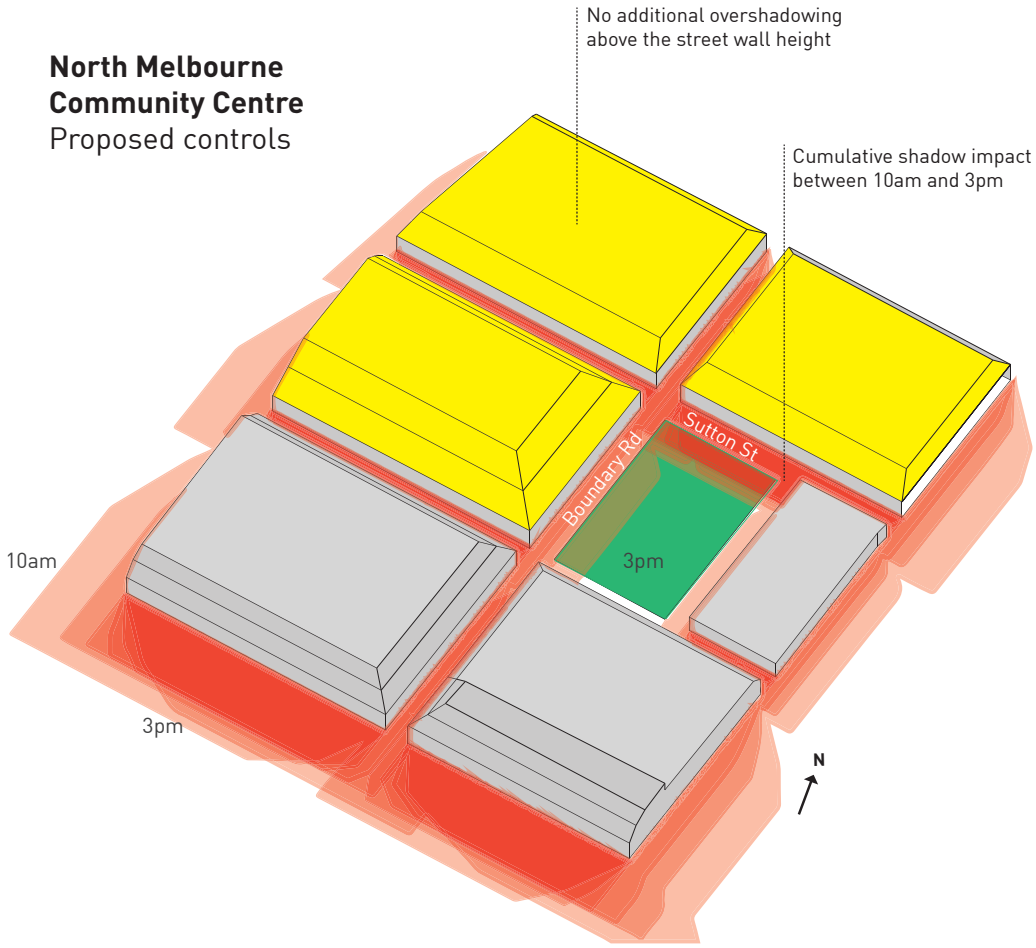


Figure 34 Testing of impact on development capacity around North Melbourne Community Centre with development set back above the street wall to limit overshadowing. This has a moderate impact on a limited number of sites (shown in yellow) and achieves a substantial improvement in winter sunlight access

Existing policy position
Current sunlight access protection is based around a tiered approach that nominates a hierarchy of spaces with graded levels of protection. This is generally related to the size of the park and is unrelated to the scale of development adjacent to the park.

Proposed policy position
Introduce sunlight protection policy that is directly related to the scale of development that has been considered appropriate for the area. This enables a tailored approach that can balance sunlight access with support for development intensification.

A mandatory No Additional Overshadowing control in winter is proposed. This can be moderated in the following circumstances only:

- Exemption 1: For parks immediately abutting areas with height limits over 4 storeys, limit any additional overshadowing to that cast by the planning scheme street wall height or the overall height limit of adjacent sites (whichever is lower).
- Exemption 2: Ron Barassi Snr Park - Limit additional overshadowing to within 40 metres offset from the southern boundary of the property line abutting the northern edge of the park

Minimise assessment requirements within low-scale areas by not requiring a shadowing impact assessment for buildings 9 metres or lower in height.

This response is focused on working with the existing policy objectives for development intensification. It tempers development capacity only in the immediate vicinity of the 9 identified parks where the overshadowing is limited to the street wall height and in Ron Barassi Snr Park.

What do they do in other cities?

Relationship between sunlight access controls and development intensification

They City of Sydney's sunlight access controls acknowledge the proximity of high density development in the immediate parks through the application of No Additional Overshadowing controls that allow shadows to be cast by the street wall of a building up to a defined height. This is a practical response and allows limited overshadowing of parks within defined circumstances.

Priority 3: Maximise opportunities for people to access sunlight through the day for a variety of uses

An analysis of existing park usage data demonstrates that people choose to use parks in a variety of ways throughout the day. The importance of sunlight to these activities will vary between activities and between different people undertaking the same activity as a result of personal comfort preferences.

The highest levels of park usage were recorded between 10am and 6pm. Usage varied between the weekday and weekend and related to the design of the park and the types of facilities within the park.

Providing sunlight access between 10am and 6pm, however, is not realistic and would have a significant impact on development opportunities across the municipality. An analysis of shadow direction and length in winter demonstrates that there is a significant increase in overshadowing before 10am and after 3pm when the sun is much lower in the sky. While peak usage spans from 10am to 6pm, the proposed sunlight access controls are between 10am and 3pm to address this need for a balanced approach (see Figure 5). Due to the orientation of the city grid, parks east of St Kilda Road should be protected up until 2pm when the shadows of buildings within Southbank would begin to impact the park.

Existing policy position

Sunlight access is generally protected between 11am and 2pm at the equinox.

Proposed policy position

- Maximise the opportunity for people to access and enjoy sunlight in parks by increasing sunlight protection hours from to 10am - 3pm in winter.
- Parks east of St Kilda Road are an exception where sunlight protection should be provided between 10am and 2pm.

What do they do in other cities?

Time of day

The time of day varies across the cities with specific locations frequently identified with specific time periods where sunlight access should or must be maintained. In the City of Sydney the times vary but in certain locations are protected as early as 10am and as late as 5pm. Shadow assessments in New York consider shadows occurring between 1.5 hours after sunrise and 1.5 hours before sunset'.

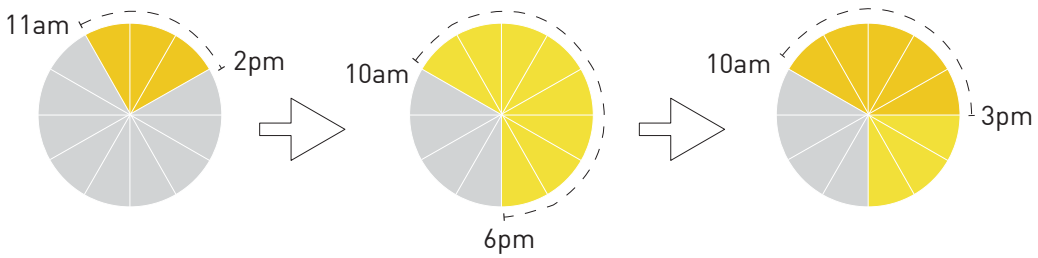


Figure 35 Hours of existing sunlight protection are 11am to 2pm (far left); peak periods of park usage space from 10am to 6pm (centre); taking into account the potential impacts on development capacity, a balanced approach which provides winter sunlight access between 10am and 3pm is proposed.

Priority 4: Update the Melbourne Planning Scheme to establish a simple, easy to use policy that removes current inconsistencies and deficiencies

A number of issues have been identified with the current approach which fragments sunlight access policy controls across the Melbourne Planning Scheme (see figure 6). These are:

- Inconsistent policy approach across the municipality
- The controls have been developed on an incremental basis and are not supported by the evidence of what people need or want
- The method of applying a discrete sunlight access protection control to a bounded area (as defined within a Design and Development Overlay) means that a building can be approved and constructed outside of this area that overshadows a park within the area (as the DDO requirements for overshadowing would not apply). This undermines the intention and effectiveness of existing sunlight access controls.

The current approach to sunlight access across the city varies and is not based on a clear rationale for why higher levels of access should be provided for certain users or spaces.

This, together with the lack of substantial controls for Tier 3 parks, is eroding the importance of sunlight access to parks across the city. A clear overarching policy that outlines the importance of winter sunlight access is needed to set a clear agenda for the whole municipality.

The current practice of including specific sunlight access controls within DDOs can be too easily compromised if a development is proposed outside of that DDO area but which may overshadow a nominated park within the DDO area. This has already occurred in the central city where developments that aren't triggered by DDO10 are overshadowing parks that are protected only within the DDO10 control. There is a need to ensure that any development that can overshadow a park is considered, therefore the inclusion of sunlight access controls in a series of separate DDOs is not recommended.

Existing policy position

Protection for sunlight access to parks is distributed across a range of policies, zones and overlays.

Proposed policy position

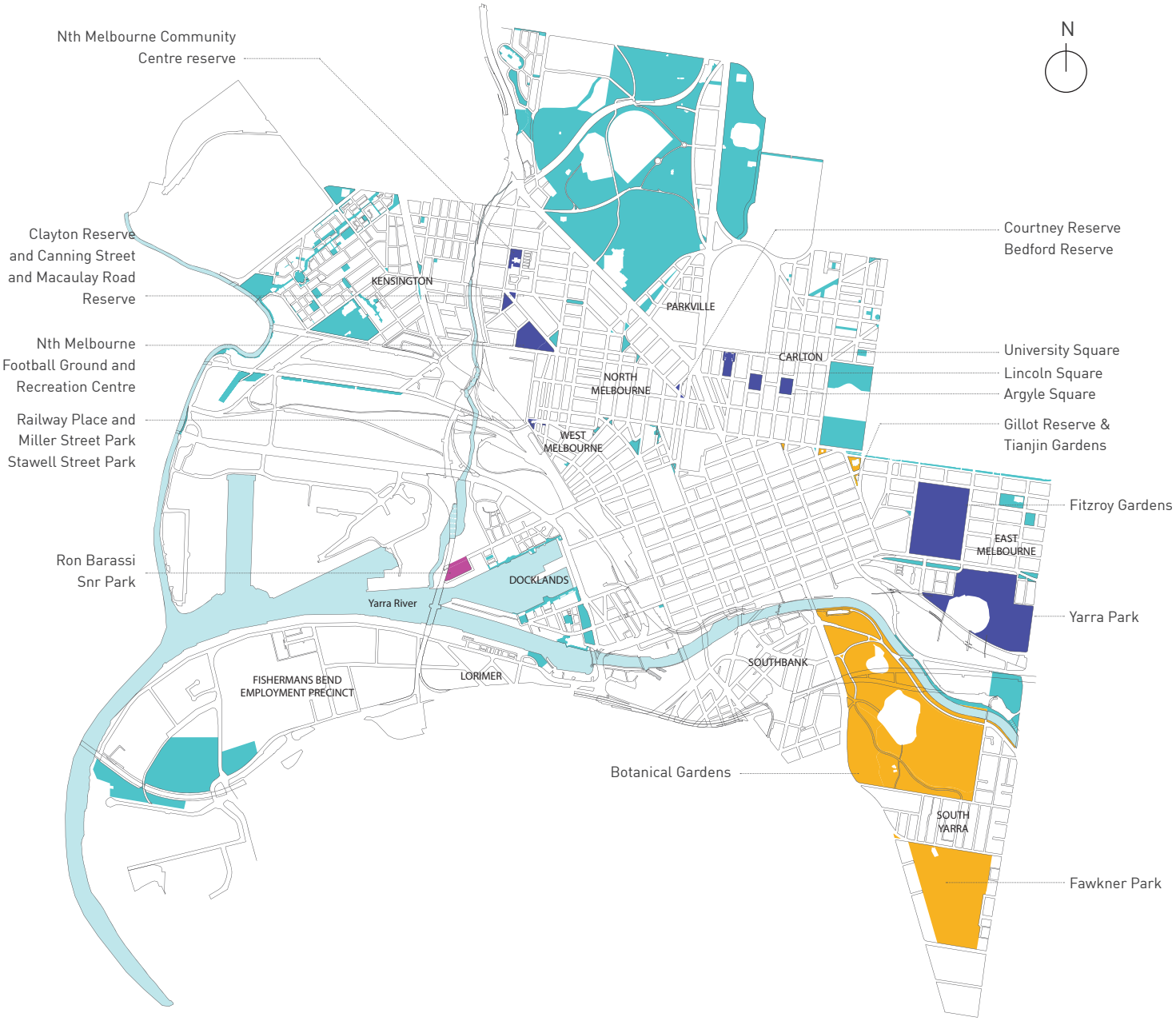
- Introduce a simplified, coherent, defensible and effective sunlight to open space policy that is implemented via an overarching policy and one Design Development Overlay that applies to the whole municipality as per Map 13.

What do they do in other cities?

Certainty of Sun Access Plane and No Additional Overshadowing Controls

Most cities provide a high degree of certainty that parks will not be overshadowed. The strongest controls are Sun Access Planes (SAP) and No Additional Overshadowing controls in central Sydney which provide prescriptive guidance on potential building envelopes. These cannot be varied. Other cities include performances-based controls, however generally provide clear guidance on when and how these can be met.

Proposed sunlight access controls for all parks



Any building 9 metres or below across the municipality is not subject to an overshadowing assessment

Buildings taller than 9 metres will be assessed against the following controls for each park (as identified in the map above):

- Standard condition: No additional overshadowing between 10am - 3pm on June 21
- Exemption 1: Reduced time period - no additional overshadowing between 10am-2pm on June 21
- Exemption 2: Partial overshadowing allowed for shadows cast by planning scheme height control or street wall height control (whichever is lower) between 10-3pm on June 21
- Exemption 3: Rob Barassi Snr Park - Partial overshadowing allows shadow to 40 metres within the park (measured from northern property boundary) between 10-3pm on June 21

Map 13 Proposed sunlight access controls for all existing parks in the municipality

The following priority has been identified to highlight the need to consider sunlight access to all parks within the municipality over the longer term.

It is not required to protect sunlight access to current parks.

Priority 5: Identify locations for new parks within the municipality

The Open Space Strategy identifies the need for a number of new parks across the municipality.

The largest of these parks are located with growth areas, including existing areas where the current height limit controls are likely to lead to overshadowing of the parks in the winter months.

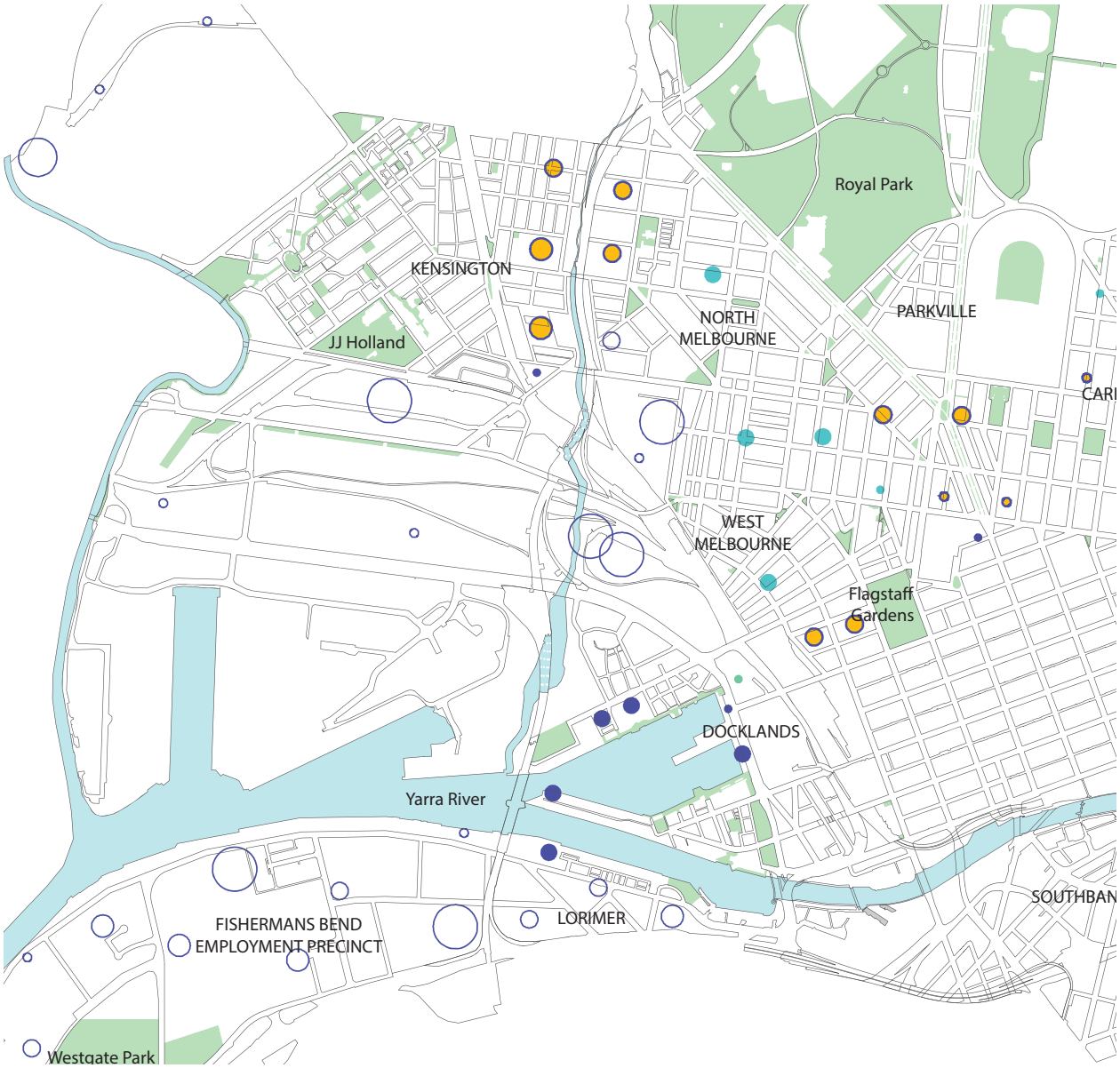
There are 12 parks that are located within urban renewal areas that are in areas where the height limits may compromise sunlight access (see Map 14). This should be investigated and potential locations identified to provide guidance for necessary sunlight access protection otherwise the opportunity to protect winter sunlight access to these parks which are predominantly within high growth areas will be lost.

This needs to focus on providing some certainty so that it can meaningfully influence future development proposals that may overshadow these potential park locations.

Method of drafting policy controls for existing parks

At present, any new park automatically becomes a tier 3 park as it is not mentioned specifically within the planning scheme.

The revised policy controls should be drafted to ensure that sunlight protection for any new public open space is automatically provided based on the context (existing height limits) around that park without the need for a planning scheme amendment.



Prioritise investigation of potential locations for 12 future parks in the locations that are subject to overshadowing due to current or proposed height limits. Location should seek to provide sunlight access in winter between 10 and 3pm.

Map 14 Future park locations according to the Open Space Strategy, 2012 and potential sunlight access protection

No additional overshadowing in winter controls to apply to all future parks

- High growth areas: 10-3pm (determined by street wall height control or discretionary height control whichever is lower)
- 10-3pm determined by existing building height controls
- Overshadowing controls part of separate state government process (10-3pm protection to be sought where possible)

Carlton Gardens, September 2017

6. Recommendations

The following recommendations are proposed to deliver on the identified priorities.

Recommendation 1

Update local policies to reflect the revised policy position. This requires updating the Municipal Strategic Statement and Clause 22.02 Sunlight Access to Public Spaces

It is important that the local strategic policy context for the municipality establishes a clear priority for sunlight access. Clause 22.02 should be updated to incorporate:

- The recognition that sunlight is essential for the health and wellbeing of residents and the ecological health of our ecosystem
- The need to provide access to sun in parks in winter when people need it the most
- The need to balance this with support for established development intensification strategies in the inner city
- Removal of the current tiered approach to protection of sunlight access which is based loosely on the scale or regional significance of the park, and establish clear objectives to provide distributed access for all residents and workers to sunlight within a local park in walking distance from their home or workplace.
- Acknowledge the ecological benefits of sunlight access to vegetation, water bodies and wildlife
- Acknowledge that the use of open spaces will increase and change over time, particularly in growth areas
- Acknowledge the importance of sunlight within parks and streets to liveability broadly and the subsequent economic and social benefits of the creation of an attractive and welcoming public realm
- Acknowledgment of the benefit of density controls in supporting the protection of parks from overshadowing. This is because density controls encourage a diversity of design responses and allow the mass of a building to be located within a development site where it will have the least overshadowing impact.

While streets are outside of the scope of this study, they are important public spaces and until further work is undertaken (see Recommendation 5), they should remain with a degree of protection within the local policy.

Recommendation 2

Introduce a municipality wide Design and Development Overlay that manages sunlight access to open spaces

Prepare a consolidated Design and Development Overlay for the municipality that:

- Establishes a consistent approach to overshadowing across the municipality
- Implements the sunlight protection levels as outlined in Map 13) of this report which would replace all existing sunlight access controls within the Melbourne Planning Scheme that apply to the study area
- Brings together these new controls with the sunlight access controls introduced through Amendments C270 and C245 (Central City and QVM) into one Design Development Overlay. This ensures that any development that can impact a park is considered regardless of which DDO the building or park is located within
- Establishes the requirement to prepare a sunlight impact assessment where a park may be overshadowed for all developments over 9 metres in height.

Recommendation 3

Introduce interim controls for the protection of parks vulnerable to winter overshadowing

There are 14 parks that are vulnerable to unacceptable overshadowing in the winter months that would be cause by development built to the existing height controls.

To protect winter access to these parks it is recommended to seek interim controls which put in place the proposed winter access controls on the affected parks which are:

- University Square
- Lincoln Square
- Buncle St park / North Melbourne Recreation Centre
- Canning St and Macaulay Rd Reserve
- Clayton Reserve
- Gardiner Reserve
- North Melbourne Football Ground / North Melbourne Recreation Pool
- Bedford Street Reserve
- Courtney Street Reserve
- Fitzroy Gardens
- Yarra Park
- Stawell Street Park
- Railway Place and Miller Street Park
- Ron Barassi Snr Park

Further work

The following recommendations are outside the scope of this study, however are critical to ensuring the long-term protection of sunlight to public spaces across the study area.

Recommendation 4

Prioritise investigation of potential locations for future parks that are likely to be subject to overshadowing due to current or proposed height limits.

There are 12 parks that are located in urban renewal areas that are in areas where the height limits may compromise sunlight access (see map 13).

This should be investigated and potential locations identified to provide guidance for necessary sunlight access protection otherwise the opportunity to protect winter sunlight access to these parks which are predominantly within high growth areas will be lost.

This needs to focus on providing some certainty so that it can meaningfully influence future development proposals that may overshadow these potential park locations.

Recommendation 5

Investigate other sunlight sensitive resources, in particular streets, within the municipality that should be considered for sunlight protection.

The consideration of sunlight access to streets is not part of the scope of this study, however the current Sunlight to Public Spaces policy provides some protection to streets between 11am-2pm at the September equinox.

The city's streets are important parts of the public realm and provide additional, often incidental, opportunities for people to access sunlight as they move about the city.

Streets form the overwhelming majority of Melbourne's public realm and provide opportunities for people to access sunlight for their general wellbeing and health (to receive their 'dose' of sunlight) and for the ecological health of the city. Streets also provide a critical role in supporting the social life and economic activity of the city. The identification of key streets, such as local activity centres, that already benefit from sunlight access should be addressed.

Many of the city's streets have also been identified as opportunities for future open space and need to be protected for potential overshadowing. The Council has demonstrated a successful program of turning streets into parks - the 'grey to green' program. Maintaining sunlight to streets will be critical in supporting the continuation of this approach.

Sunlight access to streets is also an important part of what makes the city attractive, including sunlight on heritage building facades.

This work should consider:

- Existing active streets within local centres, where sunlight is part of making these streets a success, e.g. local centres, cafes streets
- Significant buildings and building facades where sunlight is an important contributor to character,
- Heritage attributes (e.g. sandstone buildings and stained glass windows) and an appreciation of a place.

This work will need to determine the appropriate level of sunlight protection (time of year and day) for nominated locations.

What do they do in other cities?

Application of sunlight controls

New York considers sunlight access in regards to open space, historic and cultural resources, and natural areas. The City Environmental Quality Review (CEQR) which guides the application of overshadowing controls states: 'Sunlight and shadows affect people and their use of open space all day long and throughout the year, although the effects vary by season. Sunlight can entice outdoor activities, support vegetation, and enhance architectural features, such as stained glass windows and carved detail on historic structures.'

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Appendices

Appendix A: Health impacts

The negative health impacts of too much sun exposure

Skin

Australia has one of the highest rates of melanoma in the world: each year, skin cancer kills nearly 2,000 Australians and over 12,000 new diagnoses of melanoma are made. Sunburn increases the risk for melanoma, while cumulative and intermittent sun exposure increases the risk for non-melanoma skin cancers (squamous cell carcinoma and basal cell carcinoma, respectively) (Byrne, 2014).

Chronic UV exposure can lead to actinic keratoses, which appear as rough scaly growths on the skin and occur more frequently in people with fair skin. These typically require removal to avoid the risk for progression into skin cancer (Lucas et al., 2015). Chronic UV exposure also causes early aging of the skin due to damage of proteins that maintain skin strength and elasticity, such as elastin and collagen (Lucas et al., 2015).

Eyes

Chronic exposure to UVB radiation can cause damage to the eyes and vision. These range from inflammation of the cornea (photokeratitis), inflammation of the conjunctiva (photoconjunctivitis), invasive growths of the conjunctiva (pterygium) and cortical cataracts(Lucas et al., 2015). Greater exposure to the sun also increases the risk for age related macular degeneration (Sui et al., 2013).

Immune function

UVA and UVB both cause DNA damage and can alter immune function(Byrne, 2014). Too much sun exposure can cause innate immune responses to become overactive, while acquired immune (memory) responses become suppressed. This can result in skin reactions (such as polymorphic light eruptions) and reactivation of persistent or latent infections (Lucas et al., 2015), and can contribute to the growth and spread of skin cancers (Bald et al., 2014).

The positive health impacts of moderated sun exposure

Impacts of Vitamin D on physical health

1. Bone Health

Vitamin D is essential for optimising bone health and muscular function through its principle roles in maintaining calcium and phosphate levels. Vitamin D deficiency causes impaired bone mineralisation, resulting in osteoporosis and osteomalacia (bone softening) in adults and rickets in children (Pludowski et al., 2013).

In older people, Vitamin D deficiency predicts falls, fractures, muscle weakness, reduced physical function and accelerated losses in muscle mass and strength (Pludowski et al., 2013).

2. Cancer risk

The risk of malignant melanoma and exposure to UV radiation is reduced with non-burning sun exposure, while sunburn increases the risk (Gandini et al., 2005). The risk of many other types of cancer are reduced with sun exposure and adequate Vitamin D levels. These include colorectal, breast, prostate, non-Hodgkin's lymphoma and bladder cancer (Hoel, Berwick, de Gruijl, & Holick, 2016).

3. Diabetes type 2 and Metabolic syndrome

A recent analysis of Victorian data collected from over 3000 adults found lower vitamin D levels were associated with increased blood levels of two markers indicative of diabetes risk (fasting plasma glucose and glycated haemoglobin), independent of other sociodemographic, dietary and clinical risk factors for diabetes. In adults with the highest (sufficient) Vitamin D levels, the risk of high fasting plasma glucose was

up to 40% lower, indicating decreased diabetes risk (Pannu, Piers, Soares, Zhao, & Ansari, 2017).

A number of other studies show Vitamin D deficiency increases the risk of diabetes type 2 and metabolic syndrome (a cluster of medical conditions associated with the development of diabetes) (Gandini et al., 2005). This increased risk is not related to obesity or other potential factors that could increase the risk of this condition.

4. Cardiovascular disease
Studies report a doubling of the risk of cardiovascular events in people with moderate to severe Vitamin D deficiency (Wang et al., 2012). This is not explained by other risk factors for cardiovascular disease, such as obesity and lack of physical inactivity outdoors, which are also associated with lower Vitamin D levels.

5. Oral health
The formation of healthy teeth and gums and continued oral health require adequate calcium and phosphorus absorption, which is regulated by Vitamin D (Grant et al., 2015). Adequate Vitamin D levels can also help avoid periodontal disease and tooth cavities.

6. Alzheimer 's Disease and Dementia
Moderate to severe Vitamin D deficiency increases the risk of dementia by approximately 50% compared to those with adequate Vitamin D levels, while severe deficiency more than doubles the risk of Alzheimer's disease (Pludowski et al., 2013).

7. Pregnancy and birth outcomes
Vitamin D deficiency in pregnancy occurs in over 50% of Australian women (Daly et al., 2012). Maternal Vitamin D deficiency is associated with poor pregnancy outcomes, including pre-eclampsia and hypertension in pregnancy, gestational diabetes, increased rates of Caesarean section and preterm delivery (Ebeling, 2011).

Low maternal Vitamin D levels result in low levels in the developing fetus and infant as the mother is the only source of fetal Vitamin D. Maternal Vitamin D deficiency increases the risk of a small birth weight and rickets in infancy. These effects are long lasting – these children show reduced bone mineral content at age 9 years (Ebeling, 2011).

8. Immune function
The immune suppression properties of Vitamin D mean that sun exposure and increased Vitamin D levels result in improvements in infections and many inflammatory conditions including asthma, skin disorders (psoriasis, atopic dermatitis), inflammatory bowel disease, infections and type 1 diabetes (Pludowski et al., 2013).

Impacts of Vitamin D on mental health

Low levels of Vitamin D are observed in people with depression, with some studies reporting a doubling of depression risk in groups with low versus high vitamin D levels (Anglin, Samaan, Walter, & McDonald, 2013). Longer periods of sunlight are associated with decreasing levels of symptom distress (Beecher et al., 2016).

Seasonal Affective Disorder (SAD), a clinically-recognised category of depression, is more common in the winter months when sunlight hours are reduced. Symptoms include loss of energy, appetite changes, lethargy, difficulty concentrating, and irritability. While the exact causes of SAD are unclear, reduced sunlight causes changes in normal circadian light-dark rhythms, including the production and actions of many hormones and neurotransmitters that regulate mood, energy, appetite, concentration, memory and sleep cycles (Wirz-Justice, 2017).

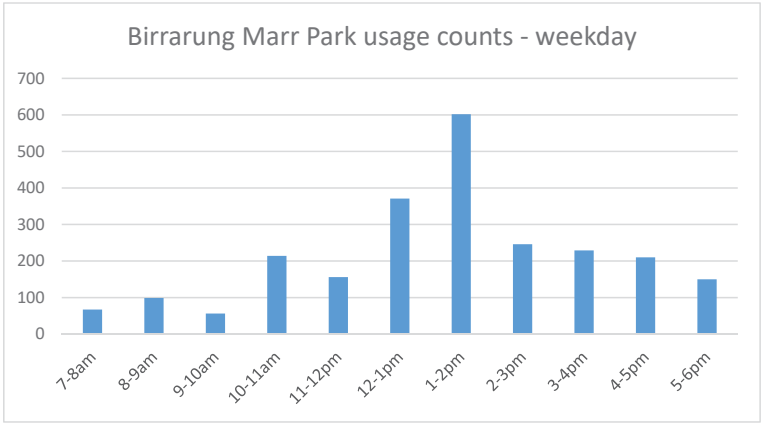
Exposure to bright light is the most effective way to treat SAD, and works faster and without the side effects of pharmacological treatments (Wirz-Justice, 2017). Light exposure in the morning rather than the evening

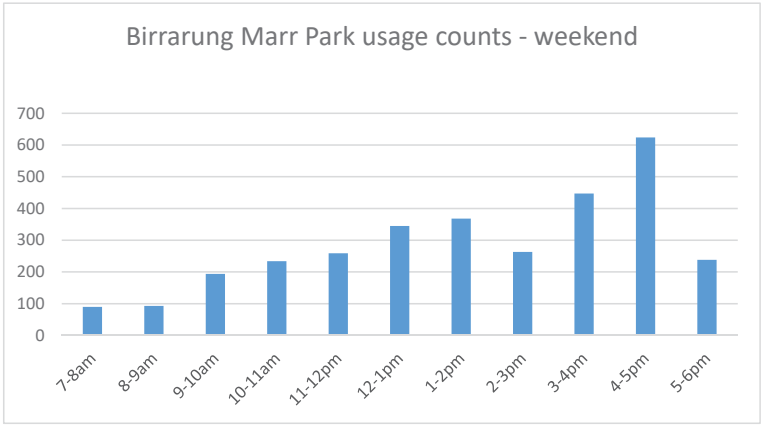
hours is more effective in normalising disrupted circadian rhythms that accompany SAD. One study demonstrated that just one hour of natural outdoor light is effective in reducing the depressive symptoms associated with SAD (Wirz-Justice, 2017).

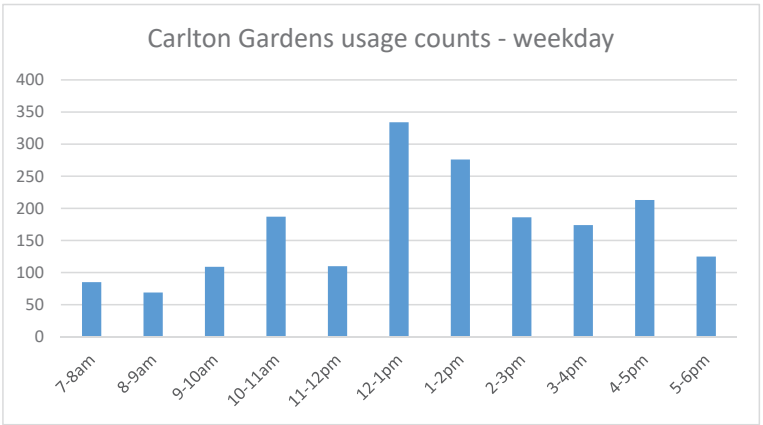
Increased exposure to sunlight has been associated with decreased feelings of tiredness and decreased feelings of irritability, nervousness, hostility, distress and being afraid and upset (Denissen, Butalid, Penke, & van Aken, 2008). In adults working over 20 hours a week, direct exposure to sunlight had a greater positive effect on mood, job satisfaction and commitment to their organisation than exposure to indirect or no sunlight or natural elements alone (An, Colarelli, O'Brien, & Boyajian, 2016).

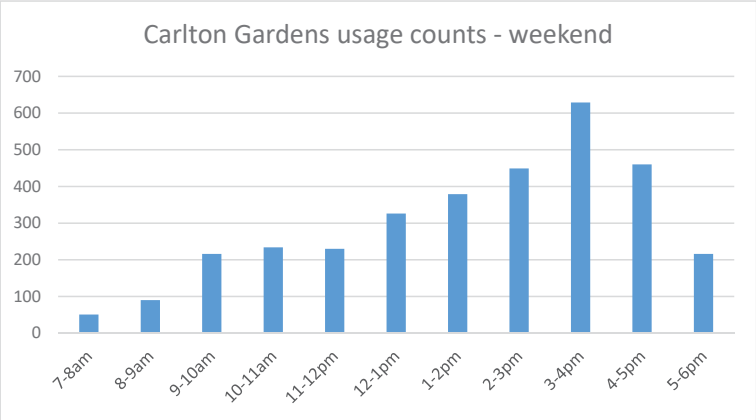
Appendix B. Park usage data

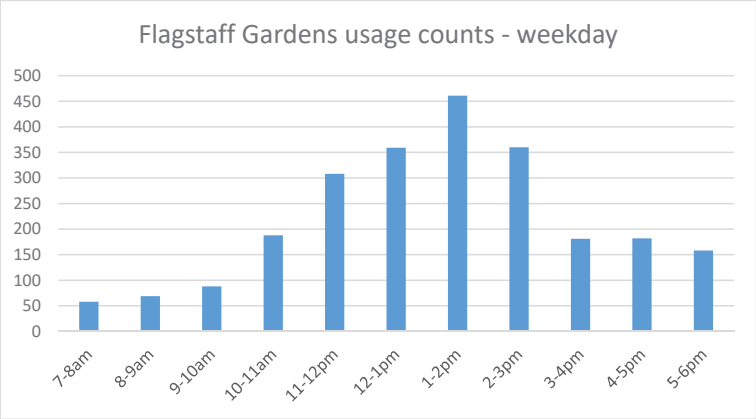
Park usage data - See IOSS 2017.








Carlton Gardens usage counts - weekend
700
600
500
400
300
200
100
0
7-8am
8-9am
9-10am
10-11am
11-12pm
12-1pm
1-2pm
2-3pm
3-4pm
4-5pm
5-6pm


Flagstaff Gardens usage counts - weekday
500
450
400
350
300
250
200
150
100
50
0
7-8am
8-9am
9-10am
10-11am
11-12pm
12-1pm
1-2pm
2-3pm
3-4pm
4-5pm
5-6pm

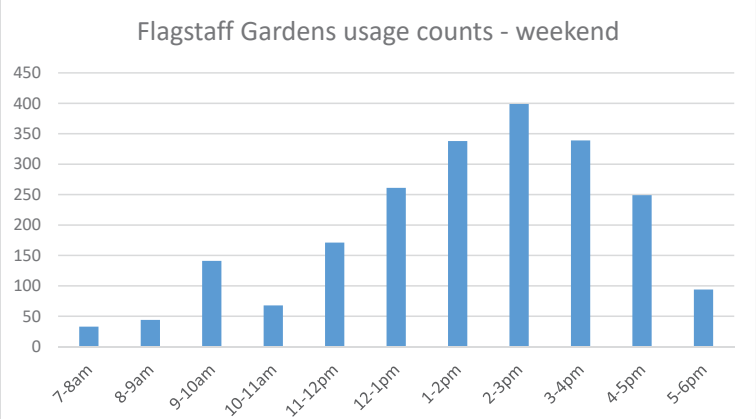
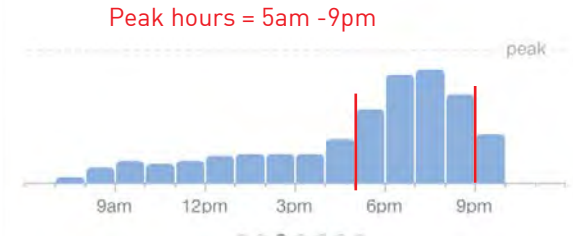

Flagstaff Gardens usage counts - weekend
450
400
350
300
250
200
150
100
50
0
7-8am
8-9am
9-10am
10-11am
11-12pm
12-1pm
1-2pm
2-3pm
3-4pm
4-5pm
5-6pm

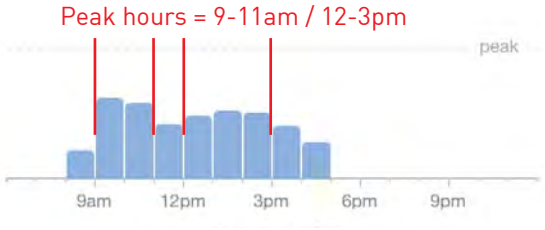
Figure 36 Park usage data sourced from google, August 2017.

Powlett Reserve, East Melbourne

Wednesday: 15 mins to 1.5 hours

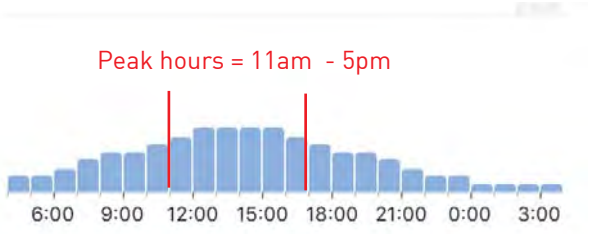


Saturday: 15 mins to 1.5 hours

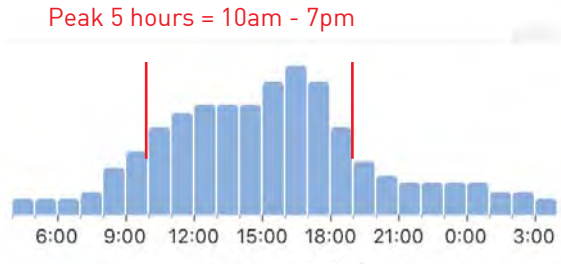


Royal Park

Wednesday: 45 mins

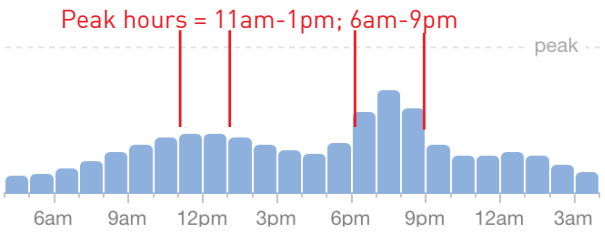


Saturday: 45 mins

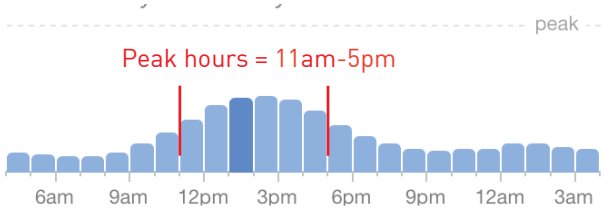


Ron Barassi Snr Park

Wednesday: 1 hour

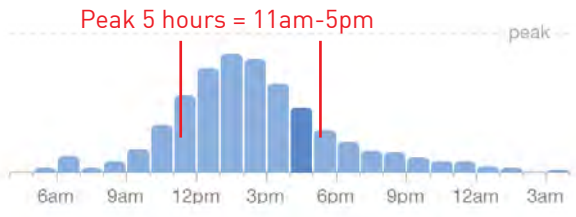


Wednesday: 30 mins

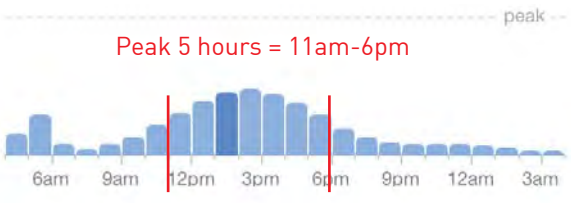


University Square

Wednesday: 30 mins

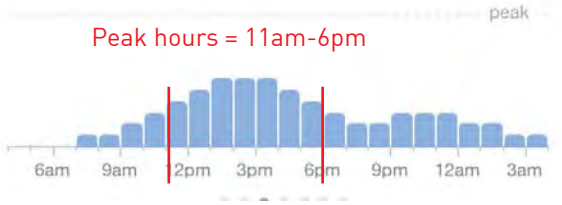


Saturday: 1 hour

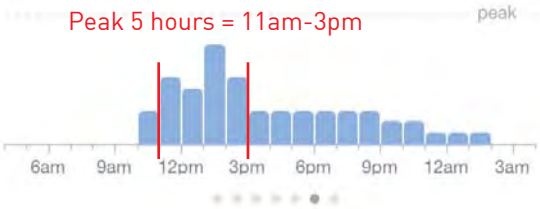


Errol St Park, Nth Melbourne

Wednesday: 30 mins

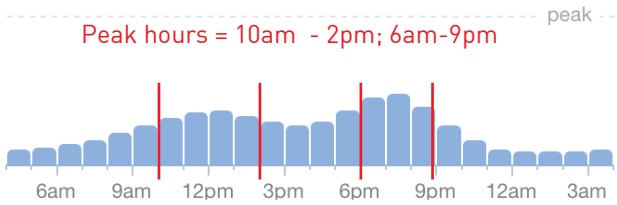


Saturday: 30 mins

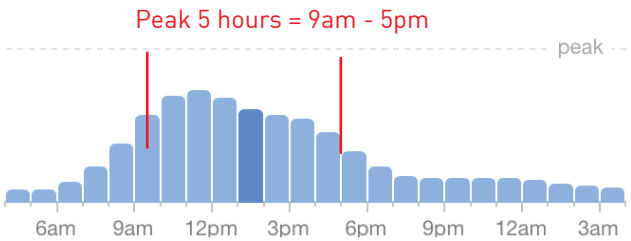


Fawkner Park

Wednesday: 1. 5 hours



Saturday: 1.5 hours



Appendix C: VCAT case studies

Case 1 - DEXUS Property Group Ltd v Minister for Planning (18 May 2017)

Background

The planning permit application sought the demolition of the existing building and the construction of a multi-storey mixed-use building (comprising dwellings, car parking, retail and offices) at 32-44 Flinders Street, Melbourne. It included two towers with the building fronting Flinders Street proposed at a maximum height of 191.5 metres (54 levels).

The planning permit application was lodged before the commencement of Amendment C262 therefore, the pre-Amendment C262 version of Clause 22.02 was considered in the assessment, which required that development proposals are assessed against standards including:

- 'Development should not reduce the amenity of public spaces by casting any additional shadows on public parks and gardens, public squares, major pedestrian routes including streets and lanes (including all streets within the retail core of the Capital City Zone), and privately owned plazas accessible to the public between 11:00am and 2:00pm on 22 September.'

In addition, the pre-Amendment C262 version of Schedule 1 to the Capital City Zone (CCZ1) included the following permit requirement:

- 'To construct a building or construct or carry out works which would cast a shadow between 11.00 am and 2.00 pm on 22 March and 22 September over public space, public parks and gardens, public squares, major pedestrian routes including streets and lanes, and privately owned plazas open to the public. A permit may only be granted if the responsible authority considers the overshadowing will not prejudice the amenity of those areas.'

On the basis of consideration of the pre-Amendment C262 version of Clause 22.02 and CCZ1, the Minister for Planning issued Planning Permit 2014/70139 on 26 July 2016 with the following condition relating to sunlight to Birrarung Marr:

- 1(b) The maximum height of the Flinders Street building lowered to 175 metres to Australian Height Datum (AHD) to reduce overshadowing over Birrarung Marr. The sloping architectural form of the tower's crown must be retained.

The applicant, DEXUS Property Group Pty Ltd (DEXUS) sought a review of condition 1b) at VCAT. In support, DEXUS argued that Birrarung Marr is not highly patronised (particularly in winter) as it functions primarily as a pedestrian thoroughfare, the areas most patronised (such as Art Play) are already overshadowed and the grassed terraces were not used in the winter months due to evapotranspiration levels.

Both the Minister for Planning and the City of Melbourne disagreed with this view and argued that the proposal would have an adverse effect on Birrarung Marr if the Flinders Street building was not lowered in height in accordance with condition 1b).

In addition to the assessment of existing versus proposed overshadowing of Birrarung Marr, the VCAT decision includes considerable discussion regarding the transitional provisions of Planning Scheme Amendment C262 and C270 as they relate to sunlight to public spaces.

VCAT Decision

To assess the opposing views of the function and existing overshadowing of Birrarung Marr, VCAT conducted a site visit at about 12 noon on a sunny 4 May 2017 and found it was well patronised, not primarily functioning as a pedestrian thoroughfare and that existing shadows would not justify additional overshadowing. On the basis of this site visit, the VCAT decision states:

> *'We consider the effect that another shadow will have, adjacent to the current one and extending further than the one already present, will cause unwarranted loss of sunlight to Birrarung Marr particularly at the 191.5 metre height proposed during the winter months. The 175 metre tower will regrettably also cast a shadow, but we believe that it is a more acceptable outcome than the higher form proposed.*
>
> *We concede that city parks are vulnerable to overshadowing, particularly in dense and high cities such as Melbourne. But we do not agree this means that protection of sunlight to open space should not be given priority where possible.*
>
> *The cumulative effects of a wall of towers at Flinders Street is also an issue we believe must be taken into account in making our findings. We do not agree that just because one tower already overshadows the park that another will not make much difference. We go back to the diverging views put forward by the applicant and the Minister and Council about the function of the park.*
>
> *We disagree with DEXUS that Birrarung Marr has the primary function of being a thoroughfare, ostensibly a walkway to the football on cloudy cold winter afternoons where the public is moving through quickly and rugged up against the elements. We believe this argument detracts from the many other uses put forward by others, including experts, as well as what we observed on site. To suggest that the role of the park is limited in this way and it is not an important city park patronised for other passive and active recreation uses is simplistic and unconvincing.*
>
> *The park will experience more overshadowing from development of the review site in any event and we consider the decision to limit this extent by way of condition 1(b) is the right one for the public and for the future of Birrarung Marr as it continues to evolve.'*

It is also noted that despite complications arising from the transitional provisions associated with Amendment C262 and the subsequent Amendment C270, the VCAT decision states that:

> *'When the SPPF and LPPF are considered as a whole, together with the general provisions of clause 65.01 in terms of the orderly planning of the area and the effect on the amenity of the area (with the area in question being the public open space of Birrarung Marr) we find that the inclusion of condition 1(b) represents a balanced and acceptable outcome, which allows some additional overshadowing at Birrarung Marr, but not unreasonable overshadowing.'*

Implications

As noted above, the VCAT decision includes considerable discussion regarding the transitional provisions of Planning Scheme Amendment C262 and C270 as they relate to sunlight to public spaces.
Of current relevance, Amendment C270 removed the above-mentioned pre-Amendment C262 version of CCZ1 permit requirement relating to building or works which would cast a shadow between 11.00 am and 2.00 pm on 22 March and 22 September over public space, public parks and gardens, public squares, major pedestrian routes including streets and lanes, and privately owned plazas open to the public. In addition, the Amendment C270 version of Clause 22.02 states that development should not cast additional shadow

across a list of public spaces including Birrarung Marr at key times and dates identified in the planning scheme. The Amendment C270 version of DDO10 states that a permit must not be granted for buildings and works which would cast any additional shadow across Birrarung Marr between the hours of 11am to 2pm and 22 April to 22 September, unless the overshadowing will not unreasonably prejudice the amenity of the space.

The VCAT decision considered the current provisions since Amendment C270 and stated that:

> *'We find that removing condition 1(b) would result in an outcome in terms of additional overshadowing at Birrarung Marr that would be contrary to the findings of this report and would not now be permitted pursuant to DDO10. In the interests of net community benefit, we do not consider that this additional overshadowing should be permitted. We find it would undermine the achievement of the policy outcomes that Amendment C270 seeks to implement.*
>
> *In fact, if DDO10 was to be applied to this application, the height of the building would need to be reduced much more substantially than required by condition 1(b). Having regard to figures 1 and 2, it can be seen that even at the reduced height of 175 metres, the building will still cast additional shadows over Birrarung Marr between the hours or 10:00am and 2:00pm during some of the time between 22 April to 22 September. Thus, the applicant has, in fact, obtained the benefit of the transitional provision in DDO10 with the grant of the permit even with condition 1(b).'*

This finding indicates that VCAT would implement the requirements of the current (Amendment C270) version of Clause 22.02 and DDO10 despite the statement 'unless the overshadowing will not unreasonably prejudice the amenity of the space'. However, Birrarung Marr is specifically identified whereas some public spaces would fall into the more general third tier or 'Other Public Spaces within the municipality' defined as 'any public space, public parks and gardens, public squares, major pedestrian routes including streets and lanes, open spaces associated with a place of worship and privately owned plazas accessible to the public'.

Case 2 - 10 Wellington Parade Pty Ltd v Melbourne CC (24 August 2015)

Background

Planning permit application TP-2014-579 sought the demolition of an existing building; construction and use of a multi-storey building for dwellings; reduction of three car parking spaces; variation of the bicycle facilities requirements; and use of the land located within the rail reserve (PUZ4) for the purpose of dwellings at 10 Wellington Parade, East Melbourne.

The applicant, 10 Wellington Parade Pty Ltd, sought a review due to the failure to grant a permit within the prescribed time. Prior to the hearing, the City of Melbourne advised that it would have refused the application on the following grounds:

- 'The height, lack of setbacks, scale, form, bulk and external appearance of the building is contrary to the objectives and built form outcomes of the Design and Development Overlay Schedule 21, the purpose and decision guidelines of the Heritage Overlay, and the relevant policies of Clause 15, Clause 21.06, Clause 21.16-2, Clause 22.05, Clause 22.17 of the Melbourne Planning Scheme and is out of context to the character and scale of the surrounding area.
- The proposal would result in unreasonable overshadowing of Weedon Reserve and is contrary to objectives and policies of Clause 22.02 of the Melbourne Planning Scheme.
- The encroachments of the building into the road reserve would exacerbate the bulk of the building and is contrary to the building projections policy of Clause 22.17 of the Melbourne Planning Scheme.
- The proposal represents an overdevelopment of the site, which prejudices the development potential of adjoining land and would set an undesirable precedence for the area.
- The car parking and access arrangements are contrary to the purpose and design standards of Clause 52.06 of the Melbourne Planning Scheme.
- The proposed vehicular access and egress to and from the subject site is unsafe and incompatible with the operation of Hoddle Street.

VCAT Decision

The VCAT decision includes discussion regarding height, scale and form in terms of Design and Development Overlay Schedule 21 (DDO21), heritage, vehicle access and impact on adjoining properties.

In terms of the issue of sunlight to public space, the VCAT decision refers to the following relevant built form outcome for Area 20 of DDO21:

- 'Development that does not overshadow Yarra Park between 11am and 2pm on 22 September and 22 March.'

Whilst the VCAT decision ultimately agrees that the application should be refused, it states that there 'is no dispute that the proposal has no shadow impact on either the Fitzroy Gardens or Yarra Park'. However, the VCAT decision does not reference Clause 22.02 or the above ground of refusal that the 'proposal would result in unreasonable overshadowing of Weedon Reserve and is contrary to objectives and policies of Clause 22.02 of the Melbourne Planning Scheme'.

Implications

This finding is relevant for any site where Clause 22.02 applies together with a Design and Development Overlay (other than DDO10) with a built form outcome relating to overshadowing of public space as the VCAT decision refers only to the built form outcome of DDO21. It is unclear as to the reason that the VCAT decision did not reference Clause 22.02 given that at the time it applied to 'public spaces such as parks

and gardens, squares, streets and lanes, and includes privately owned spaces accessible to the public, such as building forecourts, atria and plazas within the municipality excluding the Docklands Zone'.

Case 3 - CBUS Property West Melbourne Pty Ltd v Melbourne CC (19 October 2015)

Background

Planning permit application TP-2014-843 sought the construction of a 14 storey residential apartment building accommodating 200 apartments with café and commercial premises at the ground floor plus basement car park for 112 car spaces at 9 Dryburgh Street, West Melbourne.

A refusal was issued by the City of Melbourne on grounds relating to inappropriate design, internal amenity issues, traffic, car parking and the shadow impact on the North Melbourne Train Station concourse and main entrance. The applicant, CBUS Property West Melbourne Pty Ltd, sought a review of the refusal to grant a permit at VCAT.

TP-2014-843 was lodged after the adoption of the Arden-Macaulay Structure Plan and Amendment C190, which included consideration of sunlight to public space. However, the VCAT decision states that:

> *'In Melbourne CC v Minister For Planning [2013, VCAT 1277], Members Deidun and Read concluded that they should give Amendment C190 little weight, given its final form is far from certain and it is unclear if a critical element such as mandatory height limits would make their way into the planning scheme. Whilst we agree with this observation, we do find that the Arden-Macaulay Structure plan is a useful document in that it makes observations and sets a vision for the future development of the area'.*

VCAT Decision

The VCAT decision includes discussion regarding planning policy framework including the Arden Macaulay Structure Plan and Amendment C190, built form and sunlight to public space.
In terms of the issue of sunlight to public space, the

VCAT decision refers to Objective 2.3 of the Guidelines for Higher Density Development rather than Clause 22.02. The submitted shadow diagrams indicate that the development will overshadow the North Melbourne Railway Station and Railway Place from 9am through to 1pm on 22 September. In terms of this impact, the VCAT decision states:

> *'There will be an increase in shadow to Railway Place, Dryburgh Street and the North Melbourne Railway Station at different times of the day. We note that if there was a hierarchy of public spaces, recreational public open space would sit at the top and is the most important. The overshadowing does not extend to any recreational public open space. Therefore, in the context of this being an area in change and the fact that a building of 5 to 6 storeys would also cast a shadow on these spaces, we find the extent of shadow acceptable in this context.'*

It also states that the 'railway station, whilst a public space, is an itinerant space where people move from one place to another. It is not a space like a park where people will sit and linger'.

Implications

This finding is relevant for the current (Amendment C270) version of Clause 22.02 as it retains a hierarchy of public spaces. In addition, as identified for Case 2, it is unclear as to the reason that the VCAT decision did not reference Clause 22.02 given that at the time it applied to 'public spaces such as parks and gardens, squares, streets and lanes, and includes privately owned spaces accessible to the public, such as building forecourts, atria and plazas within the municipality excluding the Docklands Zone.'.

Case 4 - Australian Hotel Developments Pty Ltd v Melbourne CC (28 May 2013)

Background

Planning permit application TP-2011-377 sought the demolition of the existing building and the construction of a 43 storey building at 33-35 King Street, Melbourne.

The planning permit application was lodged before the commencement of Amendment C262 therefore, the pre-Amendment C262 version of Clause 22.02 was considered in the assessment, which required that development proposals are assessed against standards including:

- 'Development should not reduce the amenity of public spaces by casting any additional shadows on public parks and gardens, public squares, major pedestrian routes including streets and lanes (including all streets within the retail core of the Capital City Zone), and privately owned plazas accessible to the public between 11:00am and 2:00pm on 22 September.
- Development in the Capital City Zone and Docklands Zone must not cast a shadow across the south bank of the Yarra River between 11.00 am and 2.00 pm on 22 June.
- Development should not cast a shadow across the north bank of the Yarra River between 11.00 am and 2.00 pm on 22 June.'

In addition, the pre-Amendment C262 version of CCZ1 included the following permit requirement:

- 'To construct a building or construct or carry out works which will cast a shadow across the north bank of the Yarra River between 11.00 am and 2.00 pm on 22 June. A permit may only be granted if the responsible authority considers the overshadowing will not prejudice the amenity of the Yarra River corridor.'

A refusal was issued by the City of Melbourne on the grounds that the proposal would be an overdevelopment, dominate the public realm and would overshadow the Yarra River corridor between 11am and 2pm at the winter solstice. The applicant, Australian Hotel Developments Pty Ltd, sought a review of the refusal to grant a permit at VCAT.

VCAT Decision

The VCAT decision includes discussion regarding design given its prominence in the skyline, equitable development opportunities and height in terms of off-site impacts including sunlight to public space. The submitted shadow diagrams indicate that the development will create additional overshadowing of Batman Park at 12.15pm and will cross the north river bank from 1.15pm until 1.45pm. The applicant argued that 'the additional shadow on Batman Park would be minimal and would extend into areas already shadowed by trees in Batman Park'. In response, the City of Melbourne submitted that 'Southbank, the Yarra River and its immediate environs are notable public places that are very important to people living, working or visiting in the City'.

In terms of this impact, the VCAT decision states:

> *'We accept that the additional winter solstice shadow would be limited to an area adjacent to the King Street Bridge for a short period of time. We also accept that this development would provide employment opportunities and additional dwellings within the CAD as sought by policy. However, we are not persuaded that these benefits have to be achieved with additional shadow over these important public spaces. We consider that the public space adjacent to the river is a highly valuable public place and its amenity should be retained.*
>
> *Our attention was drawn to a recent approval of a very tall building at No.568 Collins Street. It will overshadow the river corridor, the riverbank, the river and the south bank, seemingly contrary to those particular planning policies and objectives. We do not know the particular merits and the balancing process that underpins that decision. We are concerned that if more buildings overshadow the river corridor, the combined effect of their shadow is likely to diminish the amenity of the river corridor, contrary to the outcomes sought by the Melbourne Planning Scheme. We think that our support of a building that casts further shadow along the river corridor needs to be based on substantial community benefits that offset the reduced amenity of this important public space. We are not persuaded that the increased height (and additional dwellings) that causes the overshadowing generates such compelling community benefits to justify the diminished amenity along the river corridor.*
>
> *We are satisfied that there is considerable and consistent policy within the Scheme to support this view. State and local policy consistently and strongly encourage the retention of the amenity of public spaces including the parks along the river. The local planning policy framework notes that the Yarra River is a key positive feature of central Melbourne, contributing to attractiveness, lifestyle and recreation. With regard to the interface of development on public spaces such as the Yarra River, the LPPF provides that the Yarra River is an important element of the City. New development should be compatible with the scale, character and amenity of parks and open spaces used by the public, including the environs of the Yarra and adjacent precincts.*
>
> *[..]*
>
> *Secondly, we consider that access to sunshine in Melbourne's grey and cold winter months is highly desirable. We think further reducing people's access to direct sunlight in these cooler times would adversely affect the opportunities for people who live, work and*

visit the city to enjoy some winter sunlight that provide some relief to this season.

Thirdly, there is very limited green public space in the western end of the CBD. We consider that it is both good urban design and consistent with planning policy that the limited areas of green open space with direct sunlight be preserved, particularly if policy is encouraging more people to live and work in this end of the city.
Fourthly, we concur with the responsible authority that the precise provisions of the planning scheme such as the definition of the river bank need to be read within the context of the broader policies that indicates that more intensive development is to be responsive to, and not adversely impact on the amenity of public spaces.

Finally, we consider that other developments at the southwest of the CAD have constrained their height so they do not impose themselves on the river corridor. Approval of this development would establish a new approach that, over time, could encourage be incremental creep that could eventually diminish the amenity of these public spaces through a cumulative loss of sunlight along the river and its environs.

We consider that this development would adversely impact the banks of the river, contrary to policy. We are persuaded that the height of the building should be reduced so it does not impose additional shadow onto the Yarra River's north corridor. We cannot be precise about the changes required to the building to achieve this outcome, but think they are limited and a somewhat lower building would still deliver the "compact city" outcomes sought by the planning scheme without intruding onto the Yarra River corridor.'

Implications

Of current relevance, Amendment C270 removed the above-mentioned pre-Amendment C262 version of CCZ1 permit requirement relating to the construction of building or works which will cast a shadow across the north bank of the Yarra River between 11.00 am and 2.00 pm on 22 June. In addition, the Amendment C270 version of Clause 22.02 states that development must not cast additional shadow across a list of key public spaces including the Yarra River corridor (comprising 15 metres from the edge of the north bank of the river to the south bank of the river) at key times and dates identified in the planning scheme. The Amendment C270 version of DDO10 states that with the exception of minor works or minor changes to existing buildings within that defined space, a permit must not be granted for buildings and works which would cast any additional shadow across the Yarra River corridor between the hours of 11am to 2pm and 22 April to 22 June.

This finding indicates that VCAT would strictly implement the requirements of the current (Amendment C270) version of Clause 22.02 and DDO10. However, the Yarra Corridor is specifically identified whereas some public spaces would fall into the more general third tier or 'Other Public Spaces within the municipality' defined as 'any public space, public parks and gardens, public squares, major pedestrian routes including streets and lanes, open spaces associated with a place of worship and privately owned plazas accessible to the public'.

Appendix D. Australian and international policy approaches

Table 3: Comparative analysis of international and Australian case studies

Jurisdiction	Climate April average temperature June average temperature	Mechanism	Overarching policy	Detailed controls	Method of applying controls
City of Sydney (Inner-city Council)	Humid subtropical April max 23 April min 15 June max 18 June min 10	Prescriptive and performance-based with identification of specific public spaces	Sydney Local Environmental Plan 2012	Division 3, Height of buildings and overshadowing, of Part 6, Local provisions—height and floor space, of the LEP 2012 includes Clause 6.17, Sun access planes	"Solar Access Planes (SAP) - applies to major public ares, e.g. Martin Place, Hyde Park, Pitt Street Mall and No Additional Overshadowing Controls (NAO)" apply to specific places In certain locations, the shadow cast by a defined street wall height is allowed
New York City (Metropolitan-wide)	Humid continental April max 16 April min 7 June max 26 June min 17	Performance-based	New York City's Zoning Resolutions	CEQR Technical Manual (March 2014)	Shadow assessment required for amendments to the Zoning Resolution where the project would either result in new structures of 50 feet or more or are located adjacent to or opposite a 'sunlight-sensitive resource'
City of London, Towers Hamlet (Inner-city Council)	Temperate oceanic April max 16 April min 8 June max 22 June min 14	Performance-based	City of London's Local Plan 2015	Building Research Establishment (BRE) Site layout planning for daylight and sunlight: a guide to good practice (12 September 2011) (BRE's publication)	BRE 's publication provides guidelines to determine the impact of proposed development on daylight and sunlight
Brisbane City Council (Metropolitan-wide)	Subtropical April max 26 April min 17 June max 21 June min 11	Performance-based with consideration for sunlight and shade	Brisbane City Plan 2014	City Centre neighbourhood plan code at Clause 7.2.3.7	Performance outcome PO23 requires that development does not 'impinge upon an equal choice of sunlight or shade at lunchtime in winter months' for a list of specific parks/public spaces

Trigger for assessment	Specific parks/public spaces mentioned and protected	Time of application	Degree of certainty	Considers sunlight and shade
Developer assessment of impact on specified parks.	Yes, map included with varied controls noted	Winter Generally between 14 April and 31 August, generally 12pm-4pm but varies with longer times listed for specific places, e.g. Macquarie Place listed form 12pm-2pm	High, SAP and NAO are both mandatory controls Includes examples of future public spaces where these have been defined, e.g. Future Town Hall Square - 12pm - sunset	No
New structures (or additions to existing) which would result in project 15 metres or higher, or if a site is located adjacent or opposite to a sunlight-sensitive resource	No, all parks defined as 'sunlight-sensitive resources' but the significance of any new incremental shadows is based on the extent and duration of the shadows and the context	Winter Shadow assessment considers shadows occurring between 1.5 hours after sunrise and 1.5 hours before sunset but significance of new incremental shadows considers the context Shadow impact is assessed on representative days across each season	High, development that is compliant with an approved amendment to the Zoning Resolution is 'as-of-right'	No
Developer assessment of impact on all parks	No, general reference to gardens and open space (private and public)	Spring Equinox For gardens and open space (private and public) , BRE references two hours of sunlight on 21 March which should reach 'at least half' of a park. Loss of sunlight should not diminish existing by more than 0.8 times it's former value	Low, guidelines not mandatory. Open to interpretation	No
Developer assessment of impact on specified parks	Yes, King George Square, Queen's Gardens, Anzac Square and Post Office Square	Winter Acceptable outcome AO23 to achieve PO23 references between the hours of noon and 2pm on 21 June	High, AO23 requires that: 'Development does not increase the extent to which sunshine is blocked between noon and 2pm on 21 June from King George Square, Queen's Gardens, Anzac Square and Post Office Square.'	Yes, PO23 references an equal choice of sunlight or shade at lunchtime in winter months

High degree of certainty Low degree of certainty

Jurisdiction	Climate April average temperature June average temperature	Mechanism	Overarching policy	Detailed controls	Method of applying controls
City of Toronto ((Inner-city Council)	Humid continental April max 11 April min 4 June max 24 June min 15	Performance-based with identification of a hierarchy of public space and some flexibility	City of Toronto's Official Plan (June 2015)	Design Guidelines including the Tall Building Design Guidelines (May 2013), which is supplemented by the Downtown Tall Buildings: Vision and Supplementary Design Guidelines (July 2012) for Downtown areas)	Supplementary Design Guideline at Chapter 3.2 requires the location and design of tall buildings to not cast new net shadows on a list of parks/public spaces for various times of application (and a specific control to best mitigate all new net shadowing for a list of specific sites throughout the entire day for all seasons of the year)
City of Melbourne (Inner-city Council)	Temperate oceanic April max 21 April min 12 June max 15 June min 8	Performance-based according to a defined hierarchy of spaces	Melbourne Planning Scheme	Clause 22.02, Sunlight to Public Spaces, which references the overshadowing requirements at Schedule 10 to the Design and Development Overlay (DDO10). In addition, there are other Schedules to the DDO that reference overshadowing (refer VCAT Case Review - Case 3 regarding DDO21)	Performance-based planning mechanisms that are either mandatory or discretionary depending on the hierarchy (tier 1, 2 or 3) of public space
City of Port Phillip (Inner-city Council)	Temperate oceanic April max 21 April min 12 June max 15 June min 8	Performance-based with identification of specific public spaces	Port Phillip Planning Scheme	Clause 22.06, Urban Design Policy for Non Residential and Multi Unit Residential Development, which references the DDO. There are multiple schedules to the Design and Development Overlay (DDO) that include requirements for buildings and works relating to overshadowing of public spaces such as the Port Phillip Bay foreshore, local parks and footpaths (including DDO1, DDO5, DDO6, DDO7, DDO8, DDO12, DDO16 and DDO23)	Performance-based planning mechanisms that are either mandatory or discretionary depending on the specific location

Trigger for assessment	Specific parks/public spaces mentioned and protected	Time of application	Degree of certainty	Considers sunlight and shade
Developer assessment of impact on specified parks	Yes, list included with varied controls noted and a general 'All other parks located within and adjacent to the Downtown Tall Buildings: Vision and Supplementary Design Guideline boundary area'	Autumn Equinox Generally 12pm-2pm, but varies with specific times listed for specific places, e.g. 'Signature Parks/Open Spaces' between 10am-4pm on September 21st	High, Rationale for Supplementary Design Guideline at Chapter 3.2 states that if a proposed tall building casts new net shadow on any park between the hours noted it will have to be redesigned to meet the sunlight protection guideline requirements	No
Developer assessment of impact on specified parks	Yes, list providing for Tier 1 and 2 parks. Tier 3 parks are not specifically mentioned	Winter (Central City) Equinox (elsewhere) Generally middle of the day, but varies with specific times listed for specific places	High to Low, Depending on the hierarchy (tier 1, 2 or 3) of public space (refer VCAT Case Review)	No
	Yes, Schedules to the DDO identify specific locations	Winter Apart from some exceptions, the times of application are generally identified within 10am to 4pm on the winter solstice (21 or 22 June)	High to Low, Depending on whether mandatory or discretionary	Only DDO23 references shade with the objective to 'achieve an appropriate balance of sunlight and shade in the public realm'

Case Study 1 – City of Sydney

Background

The Sydney Local Environmental Plan 2012 (LEP 2012) applies to most of the City of Sydney's local area and is supported by the Sydney Development Control Plan 2012 to provide more detailed controls. The LEP 2012 includes reference to the height of buildings and overshadowing at Division 3.

Sunlight to public space provisions

The LEP 2012 includes the following two planning mechanisms to manage sunlight to public spaces by limiting height of buildings within Central Sydney:

- Sun access planes (SAP)
- No additional overshadowing controls (NAO)

The SAP are planar surfaces at the same angle of the sun at specific dates and times to set the maximum building height. The NAO protect existing sunlight (including that which passes between the gaps of existing buildings) to public spaces surrounded by existing development

Division 3, Height of buildings and overshadowing, of Part 6, Local provisions—height and floor space, of the LEP 2012 includes Clause 6.17, Sun access planes, which seeks:

- 'to ensure that buildings maximise sunlight access to the public places set out in this clause, and
- to ensure sunlight access to the facades of sandstone buildings in special character areas to assist the conservation of the sandstone and to maintain the amenity of those areas.'

Clause 6.17 states that the 'consent authority must not grant development consent to development on land if the development will result in any building on the land projecting higher than any part of a sun access plane taken to extend over the land under this clause'.

The subclauses (5)–(19) describes the SAP for major public areas including Belmore Park, Hyde Park North, Hyde Park West, Macquarie Place, Martin Place, Pitt Street Mall, The Domain, Royal Botanic Gardens and Wynyard Park. Clause 6.18, Exceptions to sun access planes, sets out exceptions such as when two sun access planes apply.

In addition, Clause 6.19, Overshadowing of certain public places, states that 'development consent must not be granted to development that results in any part of a building causing additional overshadowing, at any time between 14 April and 31 August in any year, of any of the following locations (as shown with blue hatching on the Sun Access Protection Map) during the times specified in relation to those locations:

(a) Australia Square Plaza—between 12pm–2pm,
(b) Chifley Square—between 12pm–2pm,
(c) First Government House Place—between 12pm–2pm,
(d) Lang Park—between 12pm–2pm,
(e) Macquarie Place (beyond the shadow that would be cast by a wall with a 35 metre street frontage height on the eastern alignment of Loftus Street)—between 10am–2pm,
(f) Martin Place (between Pitt Street and George Street)—between 12pm–2pm,
(g) Pitt Street Mall (beyond the shadow that would be cast by a wall with a 20 metre street frontage height on the eastern and western alignments of the Mall)—between 10am–2pm,
(h) Prince Alfred Park (beyond the shadow that would be cast by a wall with a 20 metre frontage height on the boundary between the park and the railway land)—between 12pm–2pm,
(i) Sydney Town Hall steps—between 10.30am-4pm,
(j) Sydney Square—between 11am-4pm.

The draft Central City Planning Strategy 2016-2036 released by the City of Sydney on 14 July 2016 includes

amendments to revise and update these two existing planning mechanisms including revisions to SAP and NAO in terms of specified dates and times of protection, addition of controls to protect new and planned public spaces and removal of exceptions to SAP. It states that:

- 'Generally, the times for protection are in the middle of the day when the majority of use occurs and the space is most valued by its users.
- Direct sunlight access to important parks and places is important throughout the year. The dates used to generate these controls are set at the most conservative sun angles, which ensures protection throughout the remainder of the year when the sun is higher in the sky.
- The dates and times of protection vary for each place according to the type of activities occurring in that place that benefits from sunlight, when those activities are likely to occur, and existing levels of sunlight and overshadowing'.

Some examples of specified dates and times that extend beyond the middle of the day:

- Darling Harbour, 11am to 5pm (SAP)
- Future Town Hall Square 12pm to sunset (NAO)
- Observatory Hill, Barangaroo Headland Park, Circular Quay, Walsh Bay Promenade, At all times (NAO)

Implications for the City of Melbourne

Clause 22.02, Sunlight to Public Space, and the overshadowing requirements at Schedule 10 to the Design and Development Overlay (DDO10) includes only performance-based planning mechanisms that are either mandatory or discretionary depending on the hierarchy (tier 1, 2 or 3) of public space. The prescriptive SAP set out in the LEP 2012 would provide more certainty for protection of sunlight to highly-valued public spaces (such as the first tier of key public space with mandatory controls at Clause 22.02). In addition, unlike Clause 22.02 and DDO10, the proposed amendments to the SAP and NAO under the draft Central City Planning Strategy 2016-2036 include more varied times of protection throughout the day and year to take into account the actual usage patterns of specific public spaces. This is particularly relevant for the third tier of public space in Clause 22.02 and DDO10 which is only protected between 11am and 2pm on 22 September. Finally, also unlike Clause 22.02 and DDO10, the proposed amendments to the SAP and NAO include consideration for planned areas of public space.

Case Study 2 – New York City

Background

The New York City's Zoning Resolution provides city-wide regulations on the use of land and built form including building heights and setbacks. Subject to compliance with the Zoning Resolutions, much of the development in New York City occurs as-of-right. Therefore, sunlight to public space is not assessed on a building-by-building basis but rather when amendments to the Zoning Resolution are proposed.

Sunlight to public space provisions

An amendment to the Zoning Resolution could involve amendments to the zoning text or zoning map to allow development at a specific location or area. Both zoning text and zoning map amendments must be approved by the City Planning Commission (CPC) and adopted by the City Council and both are assessed for environmental impacts in accordance with the State Environmental Quality Act (SEQRA) and City Environmental Quality Review (CEQR).

The CEQR identifies 'any potential adverse environmental effects of proposed actions, assesses their significance, and proposes measures to eliminate or mitigate significant impacts'. The CEQR Technical Manual (March 2014) provides guidance to applicants on the environmental analyses required including shadows. Chapter 8, Shadows, focuses on the 'interaction between proposed new and altered structures and the shadows they may cast on open space, historic and cultural resources, and natural areas'. It states on page 8-1 that:

> *'Sunlight and shadows affect people and their use of open space all day long and throughout the year, although the effects vary by season. Sunlight can entice outdoor activities, support vegetation, and enhance architectural features, such as stained glass windows and carved detail on historic structures. Conversely, shadows can affect the growth cycle and sustainability of natural features and the architectural significance of built features.'*

A shadow assessment is required if the project would either result in new structures (or additions to existing structures including rooftop equipment) of 50 feet or more or are located adjacent to or opposite a sunlight-sensitive resource. The assessment consists of the following (refer page 8-3):

> *'The shadow assessment begins with a preliminary screening assessment (Section 310) to ascertain whether a project's shadow may reach any sunlight-sensitive resources at any time of the year. If the screening assessment does not eliminate this possibility, a detailed shadow analysis (Section 320) is required in order to determine the extent and duration of the incremental shadow resulting from the project. The detailed shadow analysis provides the necessary information for the assessment of shadow impacts, which describes the effect of shadows on the sunlight-sensitive resources and their degree of significance. The results of the screening assessment and the detailed shadows analysis should be documented. The effects of shadows on a sunlight-sensitive resource are site-specific; therefore, the screening assessment and subsequent shadow assessment (if required) are performed for each of the sites where a new structure could be built as a result of a project (e.g., for projected and potential development sites).'*

In terms of the assessment required, it is noted that the preliminary screening includes three tiers with the third involving a worst case building envelope including the maximum height, all rooftop equipment and any other parts of the building. In terms of the relevant months of the year, the third tier states the following on page 8-9:

> *'For the New York City area, the months of interest*

for an open space resource encompass the growing season (March through October) and one month between November and February (usually December) representing a cold-weather month. Representative days for the growing season are generally the March 21 vernal equinox (or the September 21 autumnal equinox, which is approximately the same), the June 21 summer solstice, and a spring or summer day halfway between the summer solstice and equinoxes such as May 6 or August 6 (which are approximately the same). For the cold weather months, the December 21 winter solstice is usually included to demonstrate conditions during cold-weather when people who do use open spaces rely most heavily on available sunlight for warmth.'

It also identifies that the 'shadow assessment considers those shadows occurring between 1.5 hours after sunrise and 1.5 hours before sunset'.
If the preliminary screening assessment does not eliminate the need for a detailed shadow analysis, it requires an assessment of new incremental shadows on a sunlight-sensitive resource. The significance of the incremental impact is then determined based on the extent and duration of the shadows and the context. For example, for open space or natural resources, it states the following on page 8-24:

'The uses and features of open space or a natural resource indicate its sensitivity to shadows. Shadows occurring during the cold-weather months of interest generally do not affect the growing season of outdoor vegetation; however, their effects on other uses and activities should be assessed. Therefore, this sensitivity is assessed for both (i) warm-weather-dependent features like wading pools and sand boxes, or vegetation that could be affected by a loss of sunlight during the growing season; and (ii) features, such as benches, that could be affected by a loss of winter sunlight.
Uses that rely on sunlight include: passive use, such as sitting or sunning, and active use, such as using playfields or paved courts, gardening, or playing in children's wading pools and sprinklers. Where lawns are actively used, the turf requires extensive sunlight. Vegetation requiring direct sunlight includes tree canopies, flowering plants, and plots in community gardens. Generally, four to six hours a day of sunlight, particularly in the growing season, is a minimum requirement. Consequently, the assessment of an open space's sensitivity to increased shadows focuses on identifying the existing conditions of its facilities, plantings, and uses, and the sunlight requirements for each.'

The CEQR Technical Manual (page 8-26) also states that the 'shade created by trees and other natural features is not considered to be shadow of concern for the impact analysis; however, incremental shadow on a tree-shaded environment may create a significant impact as the incremental shadow is not redundant with tree shade, and the tree canopy may be considered a sunlight-sensitive resource'.

Implications for the City of Melbourne
Under the Melbourne Planning Scheme, the overshadowing impact of a proposed building is assessed at the planning permit application stage in accordance with Clause 22.02, Sunlight to Public Space, and the overshadowing requirements of DDO10. If mandatory height controls were implemented via a Planning Scheme Amendment, the above comprehensive shadow assessment required under the CEQR Technical Manual for an amendment to the New York City's Zoning Resolution could be implemented.

Case Study 3 – City of London

Background

The City of London's Local Plan (January 2015) sets out the vision, strategy, objectives and policies considered when determining development applications. Policy DM 10.7 Daylight and sunlight seeks:

- 'To resist development which would reduce noticeably the daylight and sunlight available to nearby dwellings and open spaces to unacceptable levels, taking account of the Building Research Establishment's guidelines.
- The design of new developments should allow for the lighting needs of intended occupiers and provide acceptable levels of daylight and sunlight.'

In relation to sunlight to public space, this policy also states:

> *'3.10.40 The amount of daylight and sunlight received has an important effect on the general amenity of dwellings, the appearance and enjoyment of open spaces and streets, and the energy efficiency of all buildings.*
>
> *3.10.41 The Building Research Establishment (BRE) has issued guidelines that set out several methods of assessing changes in daylight and sunlight arising from new developments. The City Corporation will apply these methods, consistent with BRE advice that ideal daylight and sunlight conditions may not be practicable in densely developed city-centre locations. When considering proposed changes to existing lighting levels, the City Corporation will take into account the cumulative effect of development proposals. Where appropriate, the City Corporation will take into account unusual existing circumstances, such as development on an open or low rise site and the presence of balconies or other external features, which limit the daylight and sunlight that a building can receive.'*

The City of London comprises the Square Mile or financial district of London with a concentration of existing and proposed tall buildings. The adjoining borough of Tower Hamlets is currently experiencing significant high-density development and also references the same BRE guidelines in its Local Plan.

Sunlight to public space provisions

The BRE Site layout planning for daylight and sunlight: a guide to good practice (12 September 2011) is used by local authorities including the City of London and Tower Hamlets to determine the impact of proposed development on daylight and sunlight. In terms of gardens and open space (private and public), it recommends the following:

> *'It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21 March. If as a result of new development an existing garden or amenity area does not meet the above, and the area which can receive two hours of sun on 21 March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable. If a detailed calculation cannot be carried out, it is recommended that the centre of the area should receive at least two hours of sunlight on 21 March.'*

Implications for the City of Melbourne

In contrast with the more general mechanisms of the City of London, Clause 22.02 and the overshadowing requirements at DDO10 identifies a hierarchy of public spaces with a first and second tier of public space with

either mandatory or discretionary controls and a more general third tier or 'Other Public Spaces within the municipality' defined as 'any public space, public parks and gardens, public squares, major pedestrian routes including streets and lanes, open spaces associated with a place of worship and privately owned plazas accessible to the public'. As evident in the following VCAT case review (refer Section 2), this hierarchy can result in reduced protection for the third tier.

Case Study 4 – Brisbane City Council

Background

The Brisbane City Plan 2014 was prepared in accordance with the Sustainable Planning Act 2009 and includes the State Planning Provisions, strategic framework and neighbourhood plans. The City Centre neighbourhood plan code at Clause 7.2.3.7 is one of the specific neighbourhood plans and applies to applications for building work within the centre of Brisbane. It includes:

- The overall outcomes of the City Centre neighbourhood plan code
- Performance outcomes that achieve the overall outcomes of the City Centre neighbourhood plan code
- Acceptable outcomes that achieve the performance outcomes of the City Centre neighbourhood plan code

Sunlight to public space provisions

The overall outcomes for the City Centre neighbourhood plan code includes:

- 'Along the river's edge, development is spaced and landscaped to maximise views and public access to the river, and maximise penetration of light and breezes into the city centre.
- Modern towers each contribute to the city's distinctive skyline and provide elevated outdoor spaces. Towers are sited to maintain the openness of street vistas with adequate spacing between buildings to allow for light penetration, air circulation, views and vistas, and privacy, particularly for residential towers.
- Each development is unique and provides an innovative and contextual design that is tailored to its individual circumstances and is appropriate to its context. While designed to accommodate growth that realises the development potential of

the site and makes efficient use of City Centre land, development:

- protects the amenity of adjoining development, public realm and parks;
- respects heritage, important landmarks and significant views and vistas;
- fits responsively into the streetscape and riverscape;
- positively contributes to the overall city skyline.'

Clause 7.2.3.7.3 sets out the table of performance outcomes and acceptable outcomes, In relation to sunlight to public space, performance outcome PO23 requires that:

'Development does not impinge upon an equal choice of sunlight or shade at lunchtime in winter months in King George Square, Queen's Gardens, Anzac Square and Post Office Square.'

The related acceptable outcome AO23 requires that:

'Development does not increase the extent to which sunshine is blocked between noon and 2pm on 21 June from King George Square, Queen's Gardens, Anzac Square and Post Office Square.'

Implications for the City of Melbourne

Unlike the above City Centre neighbourhood plan code for Brisbane, Clause 22.02 and the overshadowing requirements at DDO10 do not reference the protection of shade, which may become an important consideration for public space given the incidence of skin cancer. In addition, these controls reference 21 June rather than 22 September for the third tier of public space in Clause 22.02 and DDO10.

Case Study 5 – City of Toronto

Background

The Toronto Official Plan (June 2015) sets the vision for the growth of Toronto and includes policies to guide development relating to human, built, economic and natural environments. The implementation of the Official Plan is supported by Design Guidelines including the Tall Building Design Guidelines (May 2013), which sets out performance measures for tall building development applications throughout Toronto. In terms of the downtown area, these guidelines are supplemented by the Downtown Tall Buildings: Vision and Supplementary Design Guidelines (July 2012).

Sunlight to public space provisions

The Supplementary Design Guideline at Chapter 3.2 seeks the following:

'Locate and design tall buildings to not cast new net shadows on:

- a. Parks and open spaces identified as "Signature Parks/Open Spaces" between 10:00 AM and 4:00 PM on September 21st. Signature Parks/Open Spaces include: Allan Gardens; Berczy Park; David Crombie Park; Grange Park; Moss Park; Nathan Phillips Square; St. James Park and Queen's Park, and
- b. All other parks located within and adjacent to the Downtown Tall Buildings: Vision and Supplementary Design Guideline boundary area, between 12 Noon and 2:00 PM on September 21st.

Locate and design tall buildings to best mitigate all new net shadowing of:

- c. Jesse Ketchum Park, School Playground and Open Space and Ramsden Park in the Bloor-Yorkville/North Midtown Area and St. James Cathedral's park lawn and spire, throughout the entire day for all seasons of the year.'.

The rationale for this supplementary design guideline states:

'If a Sun/Shadow Study, submitted as part of the City's complete application requirements, shows that a proposed tall building casts new net shadow on any park between the hours noted in the Supplementary Design Guideline #3.2, including parks located adjacent to the Downtown or within the Secondary Plan Areas exclude from the Supplementary Guideline boundary area, the given tower(s) will have to be reduced in height or size and/ or otherwise re-designed and re-oriented to meet the sunlight protection guideline requirements.

Although Supplementary Design Guideline #3.2 provides a minimum sunlight protection guideline requirement for Downtown parks, this should not be interpreted as taking away from the City's ability to require sunlight protection beyond the minimum 2 to 6 hours of sunlight set by this standard or to add new parks/open spaces into the signature park/open space category. Likewise, it should not be interpreted as taking away from the City's ability to obtain sunlight protection for other specified periods of time outside of the 10:00 AM to 4:00 PM or noon to 2:00 PM timeframes set by this standard. Finally, it should not be seen as taking away from the ability to obtain sunlight protection for all seasons of the year and not just the shoulder seasons, for particular local parks or open spaces, if there are good planning grounds for doing so, as determined through a site-specific tall building proposal evaluation and approvals process.'

Implications for the City of Melbourne

As noted above for Case Study 1, Clause 22.02 and the overshadowing requirements at DDO10 do not allow for flexibility in terms of varying the times of protection throughout the day and/or year as identified under the rationale for the above supplementary design guideline in the Downtown Tall Buildings: Vision and Performance Standards Design Guidelines for Toronto. This is particularly relevant for the third tier of public space at Clause 22.02 and DDO10 which is only protected between 11am and 2pm on 22 September.

Case Study 6 – City of Port Phillip

Background

The Port Phillip Planning Scheme, like the Melbourne Planning Scheme, contains strategies, policies and provisions that control land use and development including the local policies in the Local Planning Policy Framework (LPPF).

Sunlight to public space provisions

Clause 22.06, Urban Design Policy for Non Residential and Multi Unit Residential Development, of the LPPF includes policy for non-residential and multi-unit residential development (where Clause 55 does not apply) relating to public spaces at Clause 22.06-3. The relevant policy statements are as follows:

- 'Encourage new development to protect and enhance pedestrian spaces, streets, squares, parks, public space and walkways (see Performance Measure 1).

  Performance Measure 1
  New development may meet the above policy for the public realm if, as appropriate:
  - The building does not exceed 3 storeys in height adjacent to a public space, including a footpath (unless otherwise specified in a DDO),
  - Elements of the buildings greater than 3 storeys in height are set back behind the 3rd storey level (unless otherwise specified in a DDO).'

- 'Ensure that new development does not overshadow public parkland (land included in the Public Park

and Recreation Zone) between the hours of 10.00am and 4.00pm on the 22 June (winter solstice), unless otherwise specified in a DDO.'

- Further to these policy statements, there are multiple schedules to the Design and Development Overlay (DDO) that specify requirements for buildings and works relating to overshadowing of public spaces such as the Port Phillip Bay foreshore, local parks and footpaths (including DDO1, DDO5, DDO6, DDO7, DDO8, DDO12, DDO16 and DDO23). Apart from some exceptions, the times of application are generally identified within 10am to 4pm on the winter solstice (21 or 22 June). In addition, the majority of requirements are discretionary. Exceptions include those relating to footpaths in DDO8, DDO16, DDO21 and Port Phillip Bay foreshore in DDO6.

Implications for the City of Melbourne

The mechanisms to control sunlight to public spaces in the Port Phillip Planning Scheme are comparable to the Melbourne Planning Scheme. However, Performance Measure 1 of Clause 22.06 identifies a preferred (unless otherwise specified in a DDO) street wall height and setback for non-residential and multi-unit residential development throughout the municipality that is adjacent to a public space including a footpath. In addition, the Port Phillip Planning Scheme has stronger controls in relation to sunlight access to footpaths in DDO8, DDO16 and DDO21. As noted above, Clause 22.02 includes footpaths on the streets and lanes of major pedestrian routes in a general third tier or 'Other Public Spaces within the municipality'.

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