Overview

The purpose of this analysis is to identify potential built form overshadowing impacts on the banks and waters of the Yarra River based on the current mandatory height and setback requirements found within DDO1 of the Yarra Planning Scheme. This analysis includes:

- outlines the existing and proposed policy approach to protecting the Yarra River from overshadowing;
- an analysis of overshadowing impacts for areas between 11am and 2pm on 22 June (winter solstice);
- discussion of options and approaches to mitigating existing and future overshadowing impacts; and
- recommended adjustments to the existing DDO1 schedule.

Prohibiting overshadowing

In December 2015, Amendment VC121 implemented a revised Yarra River protection policy at Clause 12.05-2 of the State Planning Policy Framework. The policy identifies the need to:

- “Avoid overshadowing of the river its banks and adjacent public open space to ensure that the amenity of the public realm is maintained year round”

Overshadowing of the banks and waterway of the Yarra River has been a long held state policy affecting the central business district of Melbourne given the scale of built form and its proximity to the Yarra River.

To date this policy has, to date been expressed as a prohibition within the Capital City Zone Amendment C270 to the Melbourne Planning Scheme currently being progressed by the Minister for Planning has sought to further strengthen this overshadowing prohibition, as follows:

A permit must not be granted for buildings and works which would cast any additional shadow across the Yarra River corridor, including 15 metres from the edge of the north bank of the river to the south bank of the river between 11.00am and 2.00pm on 22 June.

The “Yarra river corridor” is defined within the proposed DDO control by a map which defines the corridor.

Melbourne’s growth over the last 20 years has created a demand for change within a number of inner city areas. Within the Yarra River corridor (Richmond to Warrandyte) land within the City of Yarra has experienced ongoing and increasing pressure away from traditional industrial use areas to a more commercial and mixed use residential land use. This change has and is continuing to result in taller and more dense urban form affecting the Yarra River. As development become larger, overshadowing of the banks and waters of the Yarra River and adjacent open space becomes a greater issue beyond the central business district of Melbourne.

Approach

The Department of Environment, Land and Water Planning (DELPWP) has undertaken an analysis to identify potential impacts of overshadowing of the banks and waters of the Yarra River based on the current mandatory control requirements within DDO1. This overshadowing analysis has used DELWP’s Urban Engine 3D platform. A three dimensional model was constructed to replicate the mandatory built form requirements within DDO1 for the following ex-industrial and motorway precinct areas:

- Trenery Crescent, Collingwood;
- Victoria Crescent, Abbotsford;
- CUB Brewery Precinct, Abbotsford;
- Victoria Street, Abbotsford;
- River Street, Burnley; and
- Mote wyay Precinct, Cremorne and Burley.

Overshadowing has been assessed using hourly increments between 11:00am and 2:00pm on 22 June (winter solstice). Each illustration shows the impact of overshadowing for different height and setback requirements within DDO1. Where overshadowing has been identified options have been analysed to determine an appropriate pathway forward to inform reforms.

It is important to note that this assessment has not assessed the additional 15 meter requirement as set out for areas within the central business district. The ability to achieve a 15 meter additional prohibition on overshadowing from the banks of the Yarra River within the City of Yarra is difficult to realistically achieve for the following reasons:

- The narrow nature of the waterway corridor within the City of Yarra provides limited ability for additional development setbacks;
- The relatively steep elevated edges to the corridor (crest line) are within close proximity to the edge of the river which exacerbates overshadowing;
- Current built form pattern and their location close to the crest line (e.g. Victoria Crescent) casts shadow over the banks and waters of the Yarra River; and
- The Monash Freeway forms a considerable built form barrier from the river’s edge to urban areas with the elevated segments of the freeway overshadowing the banks and water of the Yarra river in some locations.

Proposed planning control approach

To further support and enforce the policy of avoiding overshadowing, the proposed replacement DDO-control will contain a mandatory requirement to the following effect:

New buildings not cast any additional shadow over the banks and waterways of the Yarra River as measured between 11am and 2pm on 22 June (winter solstice).

The banks and waterways of the Yarra River is challenging to define accurately as the precise relationship between both varies considerably along its length. To avoid confusion or debate, the “Setback Reference Line” (SRL) has been used to define this.

The SRL provides a cadastral based line that related to a property line. The SRL generally reflects the location of the intersection of the banks and waterway of the Yarra River.

The term ‘additional shadow’ refers to an existing building envelope’s current overshadowing impact on the banks and waterway of the Yarra River.

The potential for overshadowing based on the current interim height and setback requirements where identified for the following precinct areas:

- Trenery Crescent;
- Victoria Crescent;
- River Street; and
- Monoway Precinct, Cremorne/Burley.

The following section provides an overview of the impacts of overshadowing and potential options and approaches for addressing this issue for each of the areas outlined.

Findings and recommended changes

For the majority of areas assessed, overshadowing of the banks and waters of the Yarra River during the policy period is unlikely to be an issue due to built form being on the southern banks or like orientation of the river.

Middle Yarra River Corridor Study Banyule Municipal Toolkit November 2016.
Figure 1: Overshadowing assessment area denoted by white dashed box. LiDAR coverage shown in blue grid layout.
Trenerry Crescent, Abbotsford

This area is a popular visitor location. Dights Falls is located 200m to the east with the Merri Creek and Capital City Trail joining up in this area. The topography of the northern bank is relatively steep and intermittently vegetated. Setbacks for existing built form vary in distance of between 25m and 30m. Current built form does not overshadow the bank or waterway of the Yarra River. Only minimal overshadowing of the public open space exists.

The analysis suggests that the current mandatory control requirements within DDO1 will lead to some overshadowing between 1pm and 2pm of the policy period based from 126-142 Trenerry Crescent with some overshadowing potential from 112-124 Trenerry Crescent (see figure 2).

The overshadowing impact is considered minimal and can be ameliorated through a mix of design response measures and adjustments to the mandatory requirements of the existing DDO1.

A ‘no overshadowing’ future scenario (figure 3) has been prepared to understand the required parameters. The analysis suggests an increase in all mandatory setback arrangements to move overall building massing height from the MSL and a limit on overall height.

This approach is not recommended to be applied in full as it is likely to create unnecessary restriction to built form where an appropriate site specific design response would work better to deliver no overshadowing of the bank and water of the Yarra River and also reduce or avoid overshadowing impact on areas of public open space.

A minor increase to the MSL from 25m to 30 will ensure that development is located behind the crest line which will assist to reduce overshadowing impact. A proposed mandatory maximum would also assist to remove unnecessary impacts and provide other benefit in terms of design consistency with existing development within this precinct.

**Recommendation**

It is proposed that the following changes be made to DDO1:

- Extension of the current MSL from 25 metres to 30 metres as measured from the setback reference line;
- Maintain the existing maximum height of 11m within 5m of the MSL;
- Extending the existing the minimum setback of the mandatory maximum 18m height requirement an additional 5m; and
- Establish a mandatory maximum height of 25 metres beyond 20m metres of the MSL.

A future, site specific design response should consider the impact of overshadowing on the Yarra River and on the public open space environment avoid impacting on the amenity of this popular location.
Figure 2

Trenergy Cr, Abbotsford - Part 1 - Overshadowing on 22 June
Current DDO1 Mandatory height & setback requirements

1. Setback reference line
2. 18m height from natural ground level setback 30m from ‘setback reference line’
3. 11m height from natural ground level setback 25m from ‘setback reference line’
4. Area boundary
5. Overshadowing parcel
6. Overshadowing on the Yarra River
Trenerry Cr, Abbotsford - Revised - Overshadowing on 22 June
No Overshadowing (Future Scenario)

1. Setback reference line
2. 25m height massing setback 65m from ‘setback reference line’
3. 18m height massing setback 49m from ‘setback reference line’
4. 11m height massing setback 33m from ‘setback reference line’
5. Area boundary
Victoria Crescent, Abbotsford

Analysis of the Victoria Crescent precinct (figure 4) indicates a significant overshadowing impact will occur based on current setback and mix of mandatory and height requirements within the DDO1. The analysis suggests built form if built to these limit will impact the Yarra River in the following way:

- public open space, northern banks and the bulk of the waterway will be in total shadow during winter months;
- extent of shadow cast is likely to reach the southern bank of the Yarra River in this location; and
- the range of shadow that will be cast would extend from Clarke Street to Collins foot bridge.

A ‘no overshadowing’ future scenario (figure 5) has been prepared which would suggest that the following requirements would need to be established to completely avoid overshadowing:

- increasing the MSL from 30 to 45m from the setback reference line;
- reducing the current 11m mandatory maximum height to 6m and increasing its distance for a further 15m from the MSL; and
- an overall mandatory maximum height lowered from 18m to 11 metres commencing 10 metres from the MSL for the remainder of the site.

This scenario is not considered realistic as properties within the existing Industrial 1 Zone abutting the Yarra River have limited depth and are irregularly shaped making increasing the mandatory setback impractical when the required street and side setbacks are taken into account.

A ‘Managing existing Development’ scenario (figure 6) has been prepared to better understand the current overshadowing impact. This Development setbacks currently vary between 25m and 35m from the north bank of the Yarra River. Building heights nearest to the Yarra River frontage average between 6 and 8 metres with the tallest building at approximately 13 metres. Under existing conditions it is estimated that there is overshadowing of the Yarra River with the greatest impact between 1pm and 2pm.

Recommendations

Given the current industrial zoning and site/area constraints, it is recommended that the current controls be adjusted as follows:

- Maintain the MSL at 30m from the setback reference line;
- Reduce the first a mandatory height from 11m to 8m for a distance of 15m from the MSL; and
- Establish a maximum height of 11m from 15 metres of the MSL for the remainder of the area.

The above seeks to provide a realistic balance of expectation versus impact under current Industrial 1 Zone requirements. Longer term, should the land use conditions be altered through an appropriate master or structure planning approach, it is recommended that future design requirements seek to eliminate overshadowing impacts all together over the bank and waterway of the Yarra River.
Victoria Crescent, Abbotsford - Overshadowing on 22 June
Current DDO1 Mandatory height & setback requirements

1. Setback reference line
2. 18m height from natural ground level setback 30m from ‘setback reference line’
3. 11m height from natural ground level setback 25m from ‘setback reference line’
4. Area boundary
5. Overshadowing parcel
6. Overshadowing on the Yarra River
Victoria Crescent, Abbotsford - Overshadowing on 22 June
No Overshadowing (Future Scenario)

1. Setback reference line
2. 11m height massing setback 55m from ‘setback reference line’
3. 6m height massing setback 45m from ‘setback reference line’
4. Area boundary
Victoria Crescent, Abbotsford - Overshadowing on 22 June
Managing Existing Development - INZ1

1. Setback reference line
2. 11m height massing setback 45m from ‘setback reference line’
3. 8m height massing setback 30m from ‘setback reference line’
4. Area boundary
River Street Precinct

The topography of the banks of the Yarra River in this location are relatively steep becoming flat beyond the crest line. There is relatively good vegetation coverage in this area within the bank environment.

Development is current setback a mix of distances with the closest building being approximately 25m from the waterway with a mix of three to four storey buildings.

The analysis (figure 7) indicates that minor overshadowing between 1pm and 2pm of the policy period may occur under current DDO1 conditions is likely to occur during the later part of the policy period.

Within this area minor increases to the initial mandatory setback line, and potentially to the setting back of secondary heights within the control will ameliorate any overshadowing effects.

Recommendations

The following changes are recommended to ameliorate this impact:

• Increase the Mandatory Setback Line from 25 metres to 30 metres as measured from the setback reference line.
• Investigate increasing the setback of both the 11m and 18m mandatory maximum height limit to further reduce overshadowing potential.
River Street, Burnley - Part 1 - Overshadowing on 22 June
25m & 30m Setbacks

Figure 7

1. Setback reference line
2. 18m height from natural ground level setback 30m from 'setback reference line'
3. 13m height from natural ground level setback 25m from 'setback reference line'
4. Area boundary
5. Overshadowing parcel
6. Overshadowing on the Yarra River
Motorway Precincts

The ‘Motorway’ precincts are located on the northern bank of the Yarra River separated by the Monash Freeway within Cremorne and Burnley.

The recommended building heights and spatial extent of DDO1 outlined within the City of Yarra’s ‘Yarra River Strategy 2015’ requires review to ensure the policy of not overshadowing the banks and waterway of the Yarra River are appropriately managed.

Figure 8: Motorway Precinct, Cremorne/Burnley – City of Yarra “Yarra River Strategy 2015”.

<table>
<thead>
<tr>
<th>TYPE</th>
<th>DISCRETIONARY MAXIMUM HEIGHT</th>
<th>OTHER CONTROLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorway A: Swan Street Structure Plan River Edge Commercial (MW A)</td>
<td>36m</td>
<td>On sites with a river frontage &gt;50m measured parallel to the river frontage: 16m for 50% of building mass from shared boundaries above 16m</td>
</tr>
<tr>
<td>Motorway B: Commercial (MW B)</td>
<td>28m</td>
<td>On sites with a river frontage &gt;50m measured parallel to the river frontage: 16m for 50% of building mass from shared boundaries above 16m</td>
</tr>
<tr>
<td>Motorway C: Terminal Station &amp; Parkland (MW C)</td>
<td>16m</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Motorway Precincts (cont.)

Approach
Further to the methodology and general parameters outlined earlier in this report, the three dimensional model builds in consideration of a range of hypothetical building heights for all precincts to test the extent of potential overshadowing on to the northern bank and waterway of the Yarra River. All areas with potential for future redevelopment within land zoned commercial, industrial or mixed use purposes have been included.

An assessment of existing residential and open spaces areas has not been undertaken for the following reasons:
- These areas are generally well set back from the river.
- The current land use requirements place restrictions on development scale and height which will not affect the Yarra River.
- Heritage restrictions within residential areas further limit the scope of development potential.

A cadastral based Setback Reference Line has been identified which follows the southern edge of the Monash Freeway. This line generally identifies the boundary between the banks and waterway of the Yarra River.

Key Considerations
The elevation and width of the Monash Freeway varies throughout its length across the study area. The freeway is at its most elevated west of Charles Evans Reserve as it progresses over Punt Road. Between the South Yarra Rail Bridge and the Church Street Bridge, the Monash Freeway is at or below grade as it passes under these bridges. The Monash Freeway gradually becomes elevated again as it approaches Burley Harbour. It returns to grade as it meets the exit of the Burley Tunnel and becomes elevated once more as it approaches the Yarra River and follows Gardiners Creek alignment.

An analysis using available LiDAR information has been undertaken to determine the effects of existing overshadowing (see figure 9). This analysis has found that some additional overshadowing from built form occurs between Punt Road and Cremorne Street as a result of the elevated segment of the Monash Freeway and the existing grain silos and illuminated Nilex sign situated above. The overshadowing is irregular in extent and occurs predominately between 11am and 3pm during the policy period. All other existing built form would appear to not overshadow the Yarra River beyond the extent of the Monash Freeway’s current shadow.

The Cremorne area is well close to the city and has access to a variety of road, rail and tram transport infrastructure. There are several large redevelopment sites within the current commercial, industrial and mixed use areas. It is likely that future development in this area will result in larger taller buildings as the area’s potential is realised.

Built form (both buildings and infrastructure) presents a dominant form when viewed from the broader Yarra River corridor. The generally flat topography of the area means that areas closest to the river are usually most dominant when viewed from Yarra’s southern bank and from longer range.

Analysis
Figures 9 and 10 illustrate a hypothetical assessment of a range of building heights which seek to avoid overshadowing of the banks and waterway of the Yarra River during the policy period. This analysis does not take into consideration existing overshadowing by built form.

The shadow analysis shows that a lower range of heights should ideally be established for those properties closest to the Yarra River, immediately adjoining the Monash Freeway. The relatively flat topography of land within this area means that overall building height potential is relative to its distance from the Yarra River.

Determining an appropriate extension to DDO1 to capture an area that is relative to the Yarra River is challenging given the mix of existing land uses, overall depth of the area open to potential change, and limited clear strategic direction generally for this area.

The City of Yarra’s ‘Yarra River Strategy 2015’, the ‘Swan Street Structure Plan’ and existing land use planning controls (e.g. Comprehensive Development Zone Schedule 3 and Commercial 2 Zone) provide some direction to help define an area of interest. The Swan Street Structure plan preferences an upper limit of 30m with taller built form located away from existing residential areas and closer to the Monash Freeway.

Height limits within these existing strategies and controls indicate a range of preferred height of between 16 to 36 meters, all discretionary in form. The upper limit of this range provides some strategic direction to assist in defining an approximate area which a reformed DDO1 control should

In revising DDO1, an option to establish mandatory height controls was considered (in addition to the mandatory overshadowing prohibition) but determined to be impractical for the following reasons:
- a range of site specific heights which would be required to give effect;
- consideration of overshadowing by existing built form would not be taken into account;
- the need to establish mandatory heights would be based on overshadowing alone and not respond to other land use challenges within these areas which would influence built form outcomes.

Recommendations
It is recommended that DDO1 be extend further north to capture areas within figure 9 zoned for commercial, industrial and mixed use that are likely to fall within the hypothetical height range of between 10 metres and 60 metres with boundaries to be defined by the existing road network.

The extension of DDO1 will require future development applications to meet the mandatory overshadowing requirements to be contained within the reformed DDO1 control and other design interface matter which relates to the Yarra River considered relevant in addition to other requirements associated with interaction with local residential environment.

It is proposed that a discretionary height control environment overall be maintained within this precinct. The discretionary height could be set at between a maximum of 30 meters across this area.

To determine more accurate and desired strategic height requirements, Council is encouraged to undertake a structure plan to determine a preferred future urban development environment.

...
Monash Freeway Existing Overshadowing

Figure 8
Cremorne Overshadowing Envelope

Note: This illustration shows hypothetical building heights to determine potential overshadowing of the Yarra River by built form. The heights demonstrated in this illustration do not relate to any existing and/or endorsed strategic plan or planning control for this area. Site specific assessment of overshadowing impacts should be undertaken to determine current and future overshadowing impacts.
Cremorne Overshadowing Envelope

Note: This illustration shows hypothetical building heights to determine potential overshadowing of the Yarra River. The heights demonstrated in this illustration do not relate to any endorsed strategic plan or planning control for this area. Site specific assessment of overshadowing impact should be undertaken to determine current and future overshadowing impacts.