



## MELBOURNE PLANNING SCHEME AMENDMENT C278: SUNLIGHT TO PUBLIC PARKS – EVIDENCE OF DR MARCUS SPILLER



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# SUMMARY

## Relevance of cost benefit analysis

1. Cost benefit analysis (CBA) has an important role in determining whether major planning scheme amendments such C278 deliver a net community benefit.
2. CBA assesses whether the marginal benefits gained by the Victorian community in moving from current planning controls to Am C278 would outweigh the marginal costs incurred by the community through such a move.
3. If marginal benefits are found to outweigh the marginal costs when expressed in present value terms, the amendment can be said to produce a net community benefit. In producing a net improvement in community welfare, the amendment is deemed to be an efficient use of the resources – both public and private - consumed in implementing the new controls.
4. As far as possible, CBA should account for externalities as well as costs and benefits which are explicitly traded.
5. Marginal costs and benefits versus the base case (where Am C278 would not apply) are expressed in present value terms using an appropriate discount rate which reflects returns from alternative uses of the resources consumed in adoption and application of the amendment.

## Identified welfare impacts of Am C278

6. The marginal costs and benefits identified for Am C278, and their treatment in the CBA, are shown in the following table.

TABLE 1 OVERVIEW OF COSTS AND BENEFITS

Marginal costs versus retention of current controls	Treatment
Cost incurred in developing the Am C278 controls	Set aside in the CBA on the basis that these resources are now sunk and have no opportunity cost
Transaction costs for Council and proponents in assessing sunlight impacts against the requirements of the amended scheme	Assumed to be negligible given that Council Officers and proponents are already proficient in the preparation and interpretation of shadow diagrams
Foregone development capacity on sites adjacent to or close by the parks in question	Assessed as the cost attaching to a diminished reserve stock of development capacity at the end of the assessment period (20 years). As a result of Am C278 more development capacity will be consumed over the next 20 years than would have occurred in the base case, leaving less spare capacity at the end of the period.
Marginal benefits versus retention of existing controls	Treatment
The value of avoided loss of sunshine in parks for users	Assessed via a willingness to pay (WTP) survey
Retained visual amenity for neighbouring properties and passers-by	Assessed via a willingness to pay (WTP) survey

The value of bio-diversity and ecological services supported by preserved sunshine in parks	Assessed via a willingness to pay (WTP) survey
Avoided health costs caused by diminished visitation to parks associated with greater overshadowing.	Noted but not quantified or monetised

Source: SGS Economics & Planning Pty Ltd

## Findings

7. The monetised costs and benefits of Am C278 are shown in the following table.

TABLE 2 ESTIMATED COSTS AND BENEFITS

<b>Marginal costs versus retention of current controls</b>	<b>Present value using 4% (real) discount rate</b>
Cost incurred in developing the Am C278 controls	Excluded from analysis
Transaction costs for Council and proponents in assessing sunlight impacts against the requirements of the amended scheme	Excluded from analysis
Foregone development capacity on sites adjacent to or close by the parks in question	<b>\$23.9 million</b>
<b>Marginal benefits versus retention of existing controls</b>	
The value of avoided loss of sunshine in parks for users	<b>\$103.9 million</b> (using average WTP assessed via the 'direct question' method) <b>\$43.7 million</b> (using average WTP assessed via the 'choice modelling' method)
Retained visual amenity for neighbouring properties and passers-by	
The value of bio-diversity and ecological services supported by preserved sunshine in parks	
Avoided health costs caused by diminished visitation to parks associated with greater overshadowing.	Not quantified or monetised

Source: SGS Economics & Planning Pty Ltd

8. On this basis, Am C278 is found to generate a net community benefit of either \$19.8 million or \$80.1 million in present value terms, depending on which WTP survey result is applied. This represents a benefit cost ratio of 1.8:1 or 4.4:1.
9. These findings are based on a number of assumptions including the average percentage loss of development capacity on sites affected by Am C278. Sensitivity testing showed that the finding of a net community benefit from Am C278 was robust.

## Distributive versus efficiency effects

10. Am C278 may see some property owners suffer reductions in land value while others enjoy an uplift from the Amendment.
11. Due consideration should be given to distributional impacts, especially when they have a regressive tendency (redistributing from lower income to higher income groups). However, the primary criterion for judging the merits of planning scheme amendments is whether they generate a net community benefit for Melbourne and Victoria as whole. Based on the analysis reported here, there is a high probability that Am C278 would satisfy this criterion.

# 1. INTRODUCTION

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## 1.1 Background

12. In December 2019, the City of Melbourne appointed SGS Economics & Planning Pty Ltd (SGS) to prepare a cost benefit analysis (CBA) of proposed new planning controls to limit additional shadowing of parks in certain parts of the municipality.
13. This report sets out the findings of that CBA.
14. Work on the CBA was conducted by a team of SGS consultants under my supervision and direction.
15. As explained in this report, part of the CBA was populated with data from a willingness to pay (WTP) survey which was separately commissioned by the City of Melbourne on the advice from SGS.

## 1.2 Credentials

16. I am a Principal, Partner and Director of SGS Economics and Planning Pty Ltd (SGS).
17. I hold the following academic qualifications:
  - BTRP(Melb), awarded 1978
  - MCom(Econ)Melb, awarded 1986
  - PhD(RMIT), awarded 2009.
18. I have more than 40 years consulting experience spanning land economics, regional development, housing policy, infrastructure funding, policy co-ordination systems and business planning for cultural institutions. I have taken up secondments as lecturer in urban economics at Melbourne University, adviser to the Minister for Planning and Housing in Victoria and senior executive in the Queensland Department of Housing, Local Government and Planning. I have been appointed an Associate Professor at the University of Melbourne and Adjunct Professor at RMIT University and UNSW. I am a former National President of the Planning Institute of Australia and was made a Life Fellow of the Institute in 2019. I have served on several Government Boards and advisory committees including VicUrban, the Victorian Government's land development company (now called Development Victoria), the National Housing Supply Council, the Ministerial Advisory Committee on Planning Mechanisms for Affordable Housing and the SEQ Housing Experts Panel.
19. My declaration of instructions and sources is provided at Appendix A, together with a summary CV.

## 1.3 Scope of this report

20. This report sets out:
  - The role of CBA in the appraisal of planning regulations like Am C278
  - Details of the CBA method applied by SGS in assessing the net community impact of Am C278
  - Details of the data applied by SGS in completing the CBA, and
  - SGS's findings in respect of the merits of Am C278 from a net community benefit perspective.

## 2. COST BENEFIT ANALYSIS OF C278

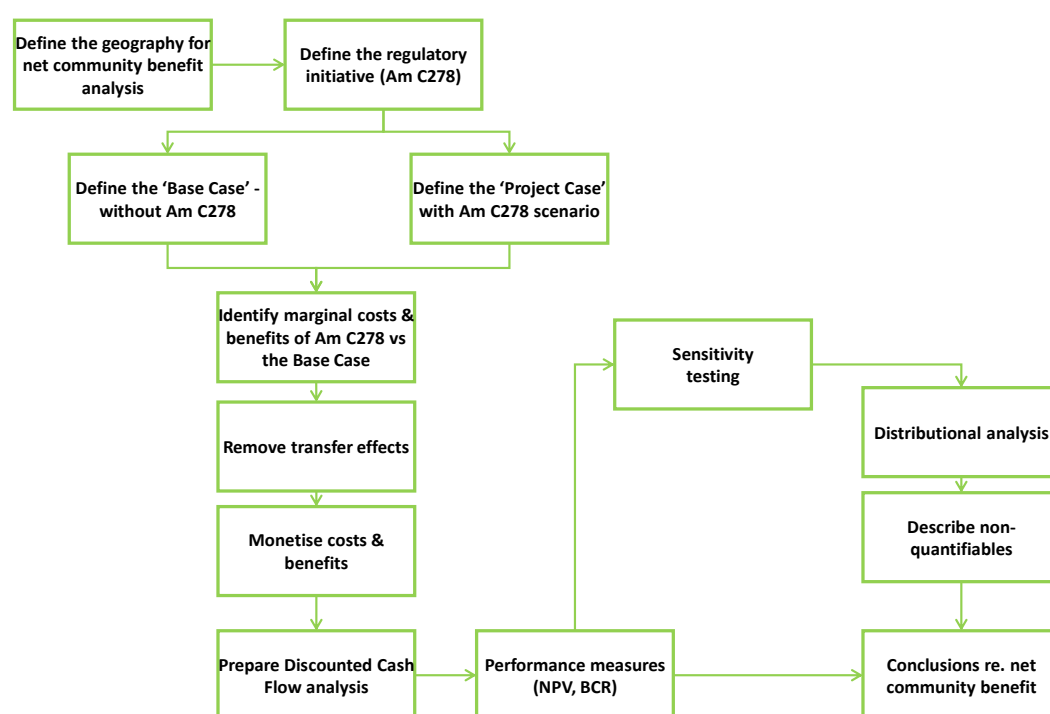
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### 2.1 Appraising net community benefit via cost benefit analysis

21. A CBA is concerned with estimating the community welfare (or 'wellbeing') impacts of proposed projects, programs or regulations such as Am C278.
22. The principal objective in deploying CBA is to assist decision making that is consistent with 'efficiency' or 'welfare optimisation' in the allocation of resources in areas where, for one reason or another, market forces do not guarantee an appropriate outcome.
23. The value of CBA as a policy analysis tool rests in two main features:
- Costs and benefits are, as far as possible, expressed in monetary terms and hence are directly comparable with one another, and
  - Costs and benefits are valued in terms of the claims they make on, and the gains they provide to, the triple bottom line as a whole, so the perspective is a 'global' or society-wide one rather than that of any particular individual, organisation or group.
24. CBA probes whether a policy initiative will provide a *net community benefit*, taking into account that the resources deployed in implementing the initiative have an opportunity cost, that is, alternative productive uses.
25. A CBA must address the full spectrum of environmental, social and business impacts of the proposal at hand. Positive and negative effects are quantified and monetised (expressed in dollar terms) as far as possible and then compared to arrive at a conclusion as to whether the proposal is likely to make the community better off, or worse off, in net terms compared to a base case scenario where the proposal is not undertaken.
26. The principal steps in the generic CBA method (see Figure 1) include:
- i. Differentiating between the outcomes under the proposed regulation ('project case') and a 'business as usual' (BAU) or 'base case' scenario
  - ii. Identifying the economic, social and environmental costs and benefits that might arise in moving from the 'base case' to the 'project' case
  - iii. Quantifying and monetising these costs and benefits, where possible, over a suitable project evaluation period
  - iv. Generating measures of net community benefit using discounted cash flow techniques over the evaluation period; this requires expression of future costs and benefits in present value terms
  - v. Testing, if necessary, the sensitivity of these measures to changes in the underlying assumptions utilised, and
  - vi. Supplementing this quantitative analysis with a description of costs and benefits that cannot be readily quantified and monetised.
27. To reiterate, all impacts of the proposed project versus the base case should be taken into account, whether or not they are 'traded' effects or 'externalities'.
28. As the name implies, 'traded effects' have a price in the market. Thus, for example, Am C278 may be expected to adversely affect the traded value of properties where development capacity is trimmed, and boost the value of those properties gaining the displaced demand in question.

29. 'Externalities' on the other hand are unpriced costs and benefits sustained by third parties as a result of a market transaction or government intervention. Thus, for example, Am C278 may encourage people to make greater use of public parks compared to the base case because of the continued access to sunshine. This benefit will be enjoyed by the community even though no money changes hands in accessing this value.
30. The CBA must account for these impacts even though they are not directly mediated (bought and sold) in the market. The monetised value of these external effects needs to be imputed using a variety of proven techniques as advised by Victorian Department of Treasury and Finance (DTF) in its Cost Benefit Analysis Tool Kit<sup>1</sup>.

FIGURE 1 COST BENEFIT ANALYSIS METHOD



Source: SGS Economics & Planning Pty Ltd (after DTF)

31. In a CBA, community benefit is typically judged by reference to the 'Kaldor-Hicks' rule. This states that the initiative in question is worth undertaking if the gain in welfare by the beneficiaries is greater than the loss in welfare for those adversely affected. In other words, adoption of Am C278 would be warranted (deemed an efficient use of resources) if the beneficiaries could, if required, compensate those adversely affected and still be better off.
32. This is where the term 'net community benefit' comes from, at least in its usage for regulatory impact assessments and investment business cases in Victorian public finance conventions. Note that whether beneficiaries are actually required to compensate those adversely affected is not material to the finding of net community benefit. The test is whether they *could* compensate and still be better off.
33. CBA is different from 'economic impact assessment' (EIA). Economic impact assessment looks at the initial and flow on effects of a government policy or project on jobs and business activity in a region, State or nation. The welfare gain created as a result of this

<sup>1</sup> See <https://www.dtf.vic.gov.au/funds-programs-and-policies/victorian-guide-regulation>



business stimulation is not the key issue. Rather the focus is on the multiplier effects which are generated.

34. To provide a whimsical example, a Government might spend \$1.0 million in stimulating construction activity in a region by commissioning earth movers to dig holes then fill them again. This will have the same economic impact, that is, flow on effects on suppliers and employees as spending the \$1.0m in commissioning the same earth movers to construct a wetlands park. But while both these projects would have precisely the same stimulus effect taking an EIA perspective, the wetlands option would be shown to represent a more efficient use of resources. CBA would reveal that it delivers ongoing environmental and recreational benefits valued by the community whereas the filled trench does not.

## 2.2 Applicability of CBA in the context of planning scheme amendments

35. As noted, application of CBA is generally required by Victorian Government in respect of business case preparation and regulatory impact assessments. In many cases this requirement is mandated.
36. As far as Planning Scheme amendments are concerned, there is no explicit requirement to carry out a DTF compliant CBA. As I understand it, this is because Panels are expected to perform the role of assessing the net community benefit of proposed amendments through the public hearing process.
37. Nevertheless, it is important, in my opinion, that Panels keep in mind the (government) published disciplines of CBA.
38. The 2013 Inquiry into the Regulatory Impact Statement (RIS) Process undertaken by the Legislative Council Environment and Planning Legislation Committee (Report No. 2, November 2013) agreed that *“subjecting planning scheme amendments to the RIS process would to some extent duplicate the existing assessment and consultation requirements of the PEA and has the potential to add unnecessary delay”* (page 60).
39. However, the Committee also concluded that the process for consideration of scheme amendments within the planning system should be amended to require the preparation of rigorous CBAs, as occurs in the RIS system. More specifically, the Committee recommended:
- “That the Minister for Planning, in consultation with the Victorian Competition and Efficiency Commission, amend Ministerial Direction 11 (Strategic Assessment of Amendments) to require a cost-benefit analysis for significant changes to planning schemes.”* (Recommendation 13, page 60)
40. While this finding was not taken up by the Government of the day, the recommendations of the Legislative Council Environment and Planning Legislation Committee underscore the appropriateness of using CBA to test the net community benefit merits of amendments like Am C278.

## 2.3 Anticipated welfare impacts of Am C278

### Costs incurred versus the base case (without Am C278) scenario

41. I have identified three resource costs associated with the Am C278 initiative including:
- i. Resources consumed in the development of the controls
  - ii. Transaction costs (both for Council and proponents in assessing sunlight impacts against the requirements of the amended scheme), and
  - iii. Foregone development capacity on particular sites adjacent to or close by the parks in question.

42. The costs associated with the development of the Am C278 controls, including the current Panel process, may be significant. Nevertheless, I have set them aside in my analysis as they are largely sunk. These resources are irretrievably committed and, in this sense, have no opportunity cost, that is, no alternative use.
43. I am advised by Council that, once in place, Am C278 is unlikely to generate significant additional transaction costs versus the base case. Proponents are, in most cases, already required to prepare shadow diagrams and Council staff are already proficient at evaluating these.
44. Foregone development capacity on particular sites is likely to be the principal marginal cost arising from the Amendment, if approved.
45. As explained, CBA is concerned with *net* community impacts, not the impact on individual land holders. The loss of development capacity on affected sites due to more stringent park shadowing controls will only be relevant if it can be shown to choke off required housing and employment floorspace supply over a defined evaluation period.
46. I have adopted 20 years for the purposes of the CBA presented here. Twenty years is a sufficiently long period for the impacts of the Amendment to manifest. At the same time, it is not so long as to take the analysis into a future period where analytical inputs, such as projected development, become highly uncertain or speculative.
47. If implementation of Am C278 still leaves the City with sufficient development capacity to meet projected growth, the marginal costs associated with the Planning Scheme amendment will be confined to the reduction in the stock of 'reserve' development capacity at the horizon year.

### Benefits incurred versus the base case (without Am C278) scenario

48. The identified marginal benefits generated by Am C278 include:
  - i. The value of avoided loss of sunshine in parks for users
  - ii. Retained visual amenity for neighbouring properties and passers-by
  - iii. The value of bio-diversity and ecological services supported by preserved sunshine in parks, and
  - iv. Avoided health costs caused by diminished visitation to parks associated with greater overshadowing.
49. A further significant benefit relates to a welfare gain by 'non-users', that is, those unlikely to directly enjoy sunlight preservation as residents or visitors to the parks in question.
50. Non-user benefits are commonly quoted in CBAs for cultural, civic and environmental investments and programs. The literature shows that non-users are typically willing to pay for these outcomes because of three factors:
  - Option value – the opportunity to use the parks in question at some time in the future
  - Existence value – the pride and satisfaction arising from living in a city which shows sound stewardship of its environmental and built form assets
  - Bequest value – a similar benefit relating to leaving a 'better city' for future generations.
51. CBAs completed by SGS, and the literature more generally, support a rule of thumb that non-user benefits will be broadly equivalent to user benefits in monetised terms.
52. However, for the sake of a more conservative test on the welfare merits of Am C278, I have excluded non-user benefits from my analysis below.

## Literature review

53. My office undertook a literature review to source CBAs and similar studies addressing the value of sunshine in parks. This review is attached (Appendix B).
54. While there is a strong theme in the literature that parks are vital to the health and wellbeing of communities, few studies have attempted quantification and monetisation of these benefits.
55. Recognising the limited evidence in the published research, the City of Melbourne commissioned, on SGS's recommendation, a survey to appraise the willingness of Melbourne community members to pay for a range of park improvements including measures by Council to limit overshadowing of parks.
56. Willingness to pay (WTP) for a particular amenity, such as the benefits provided by a park, reflects what an individual is prepared to give up in order to gain the benefit on offer. Naturally, WTP can vary considerably from individual to individual depending on the value that each places on the benefit in question.
57. Where benefits are sold in a market setting, for example, paying the entry fee to Ripponlea or Como Gardens, the value of the benefit on offer can be imputed by multiplying the number of visitors by the entry price, with the proviso that an allowance is also made for 'consumer surplus'<sup>2</sup>.
58. Where there is no market price for the benefit on offer, WTP must be imputed through observed behaviour (for example, the travel time and cost incurred by visitors in getting themselves to the 'free' park) or by canvassing the relevant people on the value they place on the benefit.

## 2.4 Quantification and monetisation of marginal costs associated with Am C278

59. Prior to the COVID-19 pandemic, the City of Melbourne had projected that areas outside of the Am C278 'excluded areas' - that is, the whole City minus the CBD, Docklands and Southbank (see Figure 2) - would be required to generate 2,107 dwellings per annum on average over the next 20 years (2020 – 2040)<sup>3</sup>. This amounts to the addition of 42,136 units in total over this period. At a (nominal) average unit size of 75 sqm this translates to 3.16 million sqm of residential floorspace.

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<sup>2</sup> Some of the fee paying entrants to these parks would have been willing to pay more than the entry price and will therefore enjoy a utility surplus.

<sup>3</sup> <https://forecast.id.com.au/melbourne>

FIGURE 2 CITY OF MELBOURNE SHOWING AREA EXCLUDED FROM AM C278\*



\* Note that the suburb boundaries used by CoM for the purposes of population and dwelling projections do not align precisely with the Am C278 boundaries. However, there is sufficient congruence between these geographies for the purposes of this evidence report

60. I have made the working assumption that the future additions to the development mix in areas outside the exclusion zone will reflect the land use composition across the metropolitan area as a whole. In the metropolitan area non-residential uses account for approximately 25% of all floorspace.
61. On this basis, I estimate that the required expansion in non-residential floorspace over the 2020 – 2040 period in the areas outside of the exclusion zone will be some 1.05 million sqm; meaning that overall (residential plus non-residential) floorspace expansion needs to equal 4.21 million (3.16 million plus 1.05 million sqm).
62. In assessing the extent to which areas outside the exclusion zone have capacity to accommodate this projected growth, SGS made reference to analyses completed by the City of Melbourne in 2018<sup>4</sup>.
63. Council made a count of developable sites by excluding from all lots in the City those which had the following characteristics:
  - lots less than 200 sqm in area
  - all lots subject to heritage overlays (with the exception of HO1, HO2 and HO3)
  - sites where the existing floor space is greater than 75 per cent of estimate of potential floor space
  - lots zoned C1Z, C2Z or Special Use
  - sites with more than 5 owners
  - sites with irregular geometry
  - parks (based on both GIS layers and zoning data), and
  - sites with development activity (in the City's Development Activity Monitor) which were (then) being developed, had been approved for development or had planning permit applications currently under consideration.
64. This count indicated that around 10% of all lots in the City were developable. These had a combined area of 460 ha.

<sup>4</sup> See p 93 in [https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.com-participate.files/2715/8318/6221/SGS\\_Housing\\_Needs\\_Analysis\\_16\\_July\\_2019\\_-\\_API\\_2\\_7.PDF](https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.com-participate.files/2715/8318/6221/SGS_Housing_Needs_Analysis_16_July_2019_-_API_2_7.PDF)

65. Subsequent analysis by SGS showed that over 80% of the developable sites in the City are located outside of the exclusion zone, amounting to around 385 ha.
66. Of this pool of developable land, approximately 78% or about 300 ha, was deemed suitable for residential development.
67. DELWP's Housing Development Data<sup>5</sup> shows that 93% of all housing development in the City was within 400 meters of an activity centre and that this development had an average density of 825 dwellings per hectare. If this density were to be achieved across all developable sites outside the exclusion zone, these areas could be said to have a theoretical capacity for almost 250,000 additional dwellings.
68. However, achievable densities in areas outside of the CBD, Docklands and Southbank are likely to be significantly lower than 825 dwellings per hectare. SGS estimates that based on current floor area ratios outside of the exclusion zone, achievable densities in these areas would be 50% to 60% of the City wide average.
69. A conservative assumption for dwelling density in new developments outside the exclusion zone would be 300 dwellings per hectare. For comparison, the Housing Development Data shows that in the City of Port Phillip, projects within 400 metres of activity centres averaged 224 dwellings per hectare over 2005 – 2016.
70. Applying 300 dwellings per hectare to estimated developable land (for residential) outside the exclusion zone (300 ha) indicates capacity for some 90,000 additional dwellings.
71. As noted, the City of Melbourne anticipates a requirement for around 42,000 additional dwellings in the areas outside the exclusion zone over the 2020 – 2040 period. At this projected rate of housing growth, the areas in question have approximately 40 years supply of developable land for housing, after an allowance for some developable land to be deployed to non-residential uses.
72. It is therefore safe to assume that Am C278 will not imperil fulfillment of the housing and employment projections for the relevant parts of the municipality. Some housing and employment floorspace that would have been built on particular sites now affected by Am C278 will be delivered on the next available site.
73. As noted, this may represent a financial loss for the owners of sites where the development envelope has been reduced by Am C278. However, this may be offset by a gain in site value for the owners of properties that will receive the displaced floorspace demand. In net terms there will be no, or negligible, loss to the Melbourne and Victorian communities.
74. This said, the introduction of Am C278 will mean that more of the spare development capacity in the City of Melbourne will be consumed over the next 20 years than would have been the case in a business as usual scenario. Put another way, the City's reserve stock of development capacity in year 2041 will be lower than it otherwise would have been. In theory, this represents an outright cost to the community.
75. A cost to community welfare arises from the loss of reserve development capacity because of hypothesised housing displacement effects across the metropolitan area. At some point in the long term future, when development capacity becomes scarce in the City, developers will have to resort to the next best available sites outside of the City to fulfill demand for those who would otherwise wish to live in Melbourne LGA. This time will be brought closer by Am C278.
76. The displacement of supply into the next best available site will, in theory, set up a chain reaction under which an additional dwelling, compared to the base case, will need to be

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<sup>5</sup> [https://www.planning.vic.gov.au/\\_data/assets/pdf\\_file/0017/250730/Inner-Metro-HDD-summary-2016.pdf](https://www.planning.vic.gov.au/_data/assets/pdf_file/0017/250730/Inner-Metro-HDD-summary-2016.pdf)

constructed in a greenfield growth area for every dwelling that can no longer be accommodated in the City of Melbourne because of supply constraints.

77. The welfare cost associated with this hypothesised chain reaction is two-fold. Firstly, additional network infrastructure will need to be created to accommodate additional outward expansion of the metropolis. This assumes that, in net terms, it costs more to accommodate an additional dwelling on the fringe compared to an infill situation.
78. Secondly, each household forced to take the next best option from their preference in the displacement chain will suffer a utility loss. In aggregate, these losses will amount to the difference in utility between otherwise similar dwellings on the fringe and in the City of Melbourne.
79. This is indicated by the difference in residual land value (for serviced land) per dwelling in the City of Melbourne versus a greenfield location, other things equal.
80. I regard this two part welfare cost associated with Am C278 as more theoretical than real. The trigger for displacement effects would be in the distant future. Housing demand and supply conditions at this future time are, arguably, imponderable. Moreover, as the displacement chain reaches progressively for the urban fringe it must traverse ever increasing pools of development capacity. Thus, the hypothesised cost may never occur. If it did, it may not include network infrastructure costs and the utility loss may be significantly less than the full difference in residual land value between a unit on the fringe and a unit in the City of Melbourne.
81. Nevertheless, I have monetised this theorised welfare cost as follows.
  - The pool of development sites outside of the 'exclusion zone' is forecast to produce about 210,680 sqm of floorspace per year in both residential and non-residential development over the next 20 years
  - As advised by the City of Melbourne, 16% (rounded) of these development sites will be affected by the sunlight controls (see Table 3)
  - Also as advised by the City of Melbourne, these sites will, on average, suffer a 30% loss of height at the boundary (see Figure 3).
  - I have assumed that those properties affected by the Am C278 controls will suffer a development capacity loss of 13% on average. This is based on applying a triangle instead of a rectangle configured to 30% height loss (see Figure 4).
  - Assuming a pro-rata distribution of development capacity across all developable sites, the 16% of sites that would have produced 33,709 sqm between them (210,680 x 16%) per year will now produce 13% less floorspace between them, that is 29,326 sqm, or 4,382 fewer sqm per annum compared to the Base case without Am C278.
  - Even though the City of Melbourne appears to have of the order of 40 years supply of development capacity as described above, I have assumed that commencing from the horizon year in the CBA – 20 years hence – the City's development sector will have to start finding additional development capacity elsewhere to compensate for foregone capacity in the previous period, that is 4,382 sq m for year 21, 4,382 sq m for year 22 and so on for each year to year 40, making a total of 87,640 sqm over 20 years.
  - Through the chain effect described earlier each tranche of additional development capacity of 4,382 sq m that needs to be found outside the City of Melbourne is assumed to be displaced to the urban fringe where additional infrastructure costs will be incurred to accommodate additional outward urban growth compared to the base case.
  - Based on an assumed average apartment size of 75 sq m in the City of Melbourne, the annual displacement of dwellings from the horizon year onwards translates to  $4,382/75 = 58$  units (rounded).



- The net additional infrastructure cost to accommodate each of these units on the urban fringe is assumed to be \$40,000. This is based on a review of the literature<sup>6</sup>. Thus, the hypothesised displacement effect of Am C278 would cost the community some \$2.34 million per annum (in infrastructure costs) for each successive year after the horizon year.
- The net housing utility loss from the displacement of housing from central Melbourne to the urban fringe through the reverse vacancy chain effect was estimated by applying the State Valuer General's report on median apartment prices, a residual land value to median price ratio of 15% and assumed average floor areas of 75 sq m and 100 sq m respectively for City of Melbourne versus urban fringe apartments (see Table 4). This generates a net housing utility loss of \$25,833 for each 'displaced' dwelling (\$344 x 75).
- On this basis the combined additional infrastructure costs in accommodating additional fringe growth and the housing utility loss amounts to \$65,834 per displaced dwelling per year from the horizon year onwards. In aggregate, the loss of 'reserve' development capacity in year 20 will be  $58 \times (\$40,000 + \$25,833) \times 20 = \$76.93$  million (undiscounted).
- Expressed in present value terms (by applying a discount rate of 4% real) and allowing for the fact that the additional capacity will not have to be found at once in year 20 but rather on a year on year basis thereafter, the cost of lost reserve capacity is calculated as \$23.86 million.

TABLE 3 ANALYSIS OF PROPERTIES AFFECTED BY AM C278

Total developable properties (2017) – City of Melbourne	1,462
Total area of developable properties (2017) – City of Melbourne	462 ha
Developable properties located outside of the Am C278 exclusion area (2017)	1,210
Total area of developable properties outside of Am C278 exclusion area (2017)*	389 ha
Developable properties outside exclusion area which are subject to DDO8**	428
Developable properties outside exclusion area which may experience a loss of development potential	198
Percentage of all developable sites outside of the exclusion area which may experience a loss of development potential	16.36%
Average height loss at boundary for properties outside exclusion area which may experience a loss of development potential	30.25%

\* The discrepancy between this figure and that quoted in paragraph 65 is due to boundary differences.

\*\* As described in advice from Council, *these include properties that have the potential to overshadow one or more of the nominated parks. This potential to overshadow is based on a very liberal interpretation of the planning scheme.*

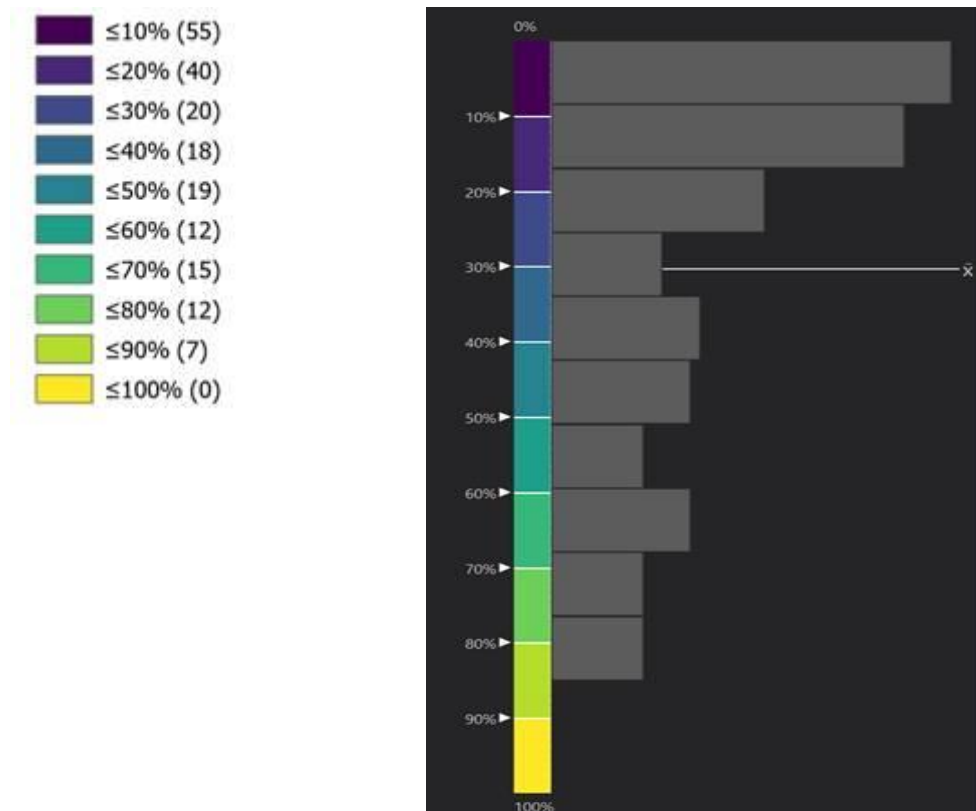
<sup>6</sup> See <http://www.infrastructurevictoria.com.au/wp-content/uploads/2019/04/SGS-Economics-and-Planning-Comparative-costs-of-infrastructure-across-different-development-settings.pdf>

TABLE 4 ESTIMATED DIFFERENCE IN APARTMENT RESIDUAL LAND VALUE – CITY OF MELBOURNE VERSUS GROWTH AREAS

	Median apartment price 2019/20* <sup>7</sup>	Residual land value (RLV) estimated at 15% of median price	Median unit floor area (sqm) (nominal)	Difference in RLV per sqm of floor area vs Melbourne
City of Melbourne	\$484,000	\$72,600.00	75	0
City of Wyndham	\$415,000	\$62,250.00	100	\$345.50
City of Melton	\$369,000	\$55,350.00	100	\$414.50
City of Casey	\$443,000	\$66,450.00	100	\$303.50
City of Cardinia	\$410,000	\$61,500.00	100	\$353.00
City of Whittlesea	\$441,500	\$66,225.00	100	\$305.75
Ave (growth areas)				\$344.45

FIGURE 3 IMPACT OF C278 ON BUILDING HEIGHT

Distribution of % height impact at boundary for the 198 developable properties expected to experience a loss of development potential

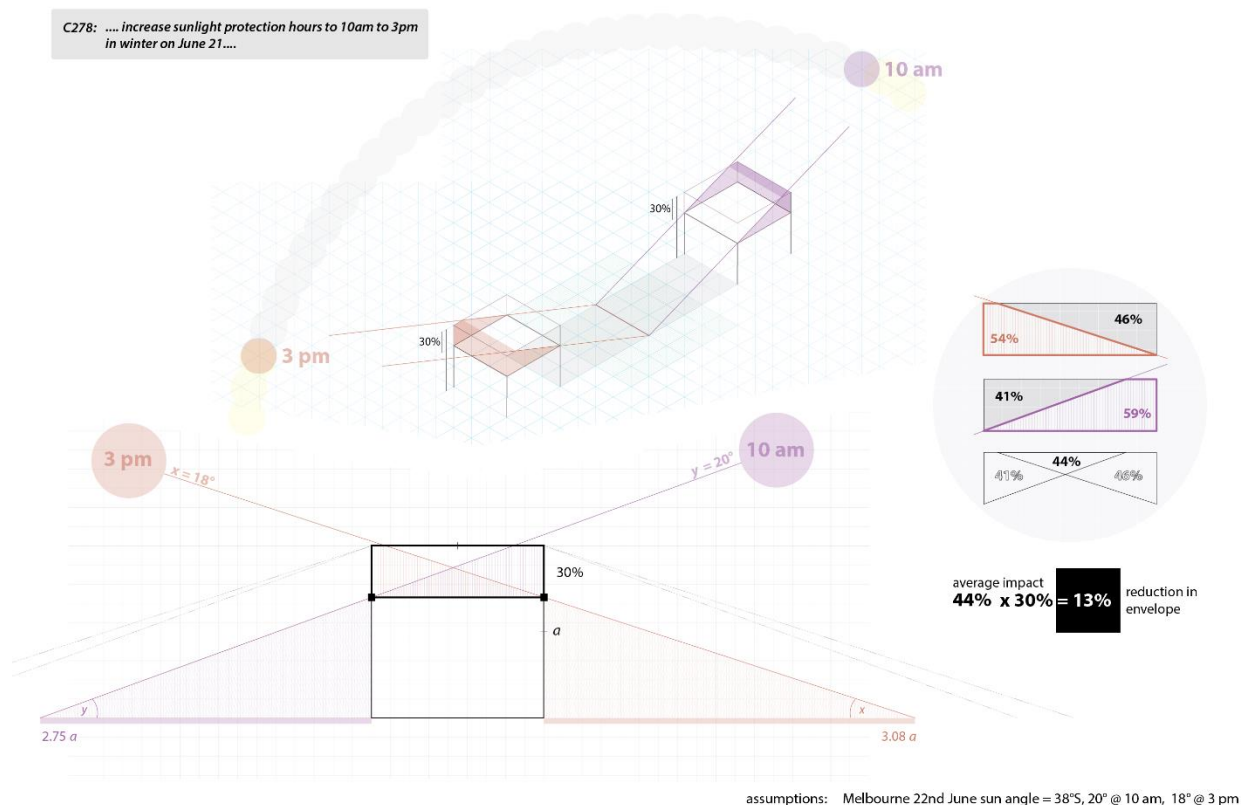


Source: City of Melbourne modelling

<sup>7</sup> [https://www.propertyandlandtitles.vic.gov.au/\\_data/assets/pdf\\_file/0021/478020/GuidetoPropValues2019Merged.pdf](https://www.propertyandlandtitles.vic.gov.au/_data/assets/pdf_file/0021/478020/GuidetoPropValues2019Merged.pdf)



FIGURE 4 ASSUMPTION REGARDING REDUCTION IN DEVELOPMENT ENVELOPE



Source; SGS Economics & Planning Pty Ltd

## 2.5 Quantification and monetisation of marginal benefits associated with Am C278

82. As noted, a WTP survey was commissioned by Council to gauge part of the value created by Am C278. The survey was conducted by Prescience Research. The survey report is attached at Appendix C.
83. In my opinion, it can be reasonably inferred that survey respondents indicating a WTP for measures to preserve sunlight in parks will have had at least benefits (i), (ii) and (iii) cited in paragraph 48 in mind.
84. It is less clear that their WTP will have been influenced by health cost savings to the *wider* community from greater use of parks. Accordingly, the WTP survey may under-report the value of the total benefits cited in paragraph 48.
85. The Prescience Research methodology employed two separate techniques for gauging WTP. One applied 'Choice Modelling'. This avoids questioning respondents directly on their WTP. Rather, respondents are offered a range of choices featuring different mixes of benefits and prices (an annual Council levy). WTP for a particular feature (e.g. controls to prevent overshadowing of parks) is imputed by analysing variations across the survey group in terms of the price/feature trade-offs.
86. The second method simply asked respondents what their WTP for park overshadowing controls was.
87. Both methods are valid and widely used in WTP surveys. Choice modelling is sometimes claimed to be more reliable because respondents are less aware of direct spending scenarios and therefore may be less biased in their responses.

88. The Prescience Research Choice Model produced a household WTP of \$18.48 per annum (average) for the following benefit:

***Maintain sunlight in parks.*** Tall buildings near parks can increase shadows and reduce sunlight in parks and gardens. Councils are considering building planning controls to restrict the height of building developments that border with parks to ensure that existing levels of sunlight in parks is maintained.

89. This translated to \$9.89 per head per year (including children in a household).
90. The direct question method produced a WTP of \$41.30 per household (average) or \$21.17 per head.
91. I have estimated the value of the benefits generated by Am C278 (recognising that the health benefits noted in paragraph 48 may not have been fully reflected in the WTP surveys) by applying the survey results to the resident populations within 400 metres of the 'protected' parks. This includes residents outside of the City of Melbourne.
92. I regard this approach as conservative as it excludes workers in these areas.
93. The resident population in question is estimated to grow from some 126,200 in 2020 to around 238,100 in 2040. On this basis, the present value of the WTP for Council planning action to restrict overshadowing of parks is estimated at \$43.7 million if the choice model estimate of WTP is used and \$103.9 million if the direct question result is applied.

## 2.6 Net community benefit

94. Depending on which WTP estimate is used, Am C278 is found to deliver a net community benefit of \$19.8 million or \$80.1 million in present value terms. This net community benefit is likely to exclude a proportion of health cost savings. It also excludes the WTP for these benefits amongst the population outside that within 400 metres of the protected parks.
95. On the figures outlined above, implementation of Am C278 would deliver a benefit cost ratio of 1.8:1 or 4.4:1 depending on which WTP estimate is used.

## 2.7 Sensitivity testing

96. I was advised by Council that while the number of sites affected by the Am C278 controls could be estimated, the aggregate loss of developable capacity on these sites was difficult to model. This arises from the design flexibility enabled by the planning scheme.
97. In the absence of detailed capacity modelling I applied the method explained in paragraph 81 to arrive at an estimated average development capacity loss on affected sites of 13%.
98. **Error! Reference source not found.** shows the impact on estimated net community benefit and the benefit cost ratio of varying this estimate upwards, firstly to an average capacity loss of 20% and secondly to an average capacity loss of 25%.
99. The CBA continues to return a positive net community benefit, except for the scenario where there is an average 25% loss of development capacity across all affected sites *and* the lower WTP estimate from the choice modelling survey is used.
100. Bearing in mind the conservative settings applied in the analysis, I regard this as a robust indication that Am C278 will deliver a net community benefit.

TABLE 5 NET COMMUNITY BENEFIT WITH VARIED ASSUMPTIONS RE DEVELOPMENT CAPACITY LOSS

	Net community benefit (\$m)		Benefit cost ratio	
	Choice modelling WTP	Direct question WTP	Choice modelling WTP	Direct question WTP
Base CBA 13% loss of capacity on affected sites	\$19.8	\$80.1	1.8	4.4
Sensitivity variation (1) 20% loss of capacity on affected sites	\$6.9	\$67.2	1.2	2.8
Sensitivity variation (2) 25% loss of capacity on affected sites	-\$2.2	\$58.1	1.0	2.3

### 3. CONCLUSIONS

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101. I conclude as follows:

- The principal resource cost associated with the introduction of Am C278 is the nominal erosion of reserve development capacity.
- Most likely this cost will be outweighed by the benefits generated by Am C278. These include: the value of avoided loss of sunshine in parks for users; retained visual amenity for neighbouring properties and passers-by; the value of bio-diversity and ecological services supported by preserved sunshine in parks; and avoided health costs caused by diminished visitation to parks associated with greater overshadowing.
- While Am C278 may curtail development capacity on particular sites, adversely affecting their value versus the Base case, other property owners may enjoy an uplift in their property value as they will be called upon to accommodate development displaced from sites affected by the Amendment.
- While distributive effects like this are relevant in planning deliberations, they are not material to the essential test of whether Am C278 is 'efficient'. Efficiency in resource allocation is governed entirely by whether a *net* improvement in welfare is achieved versus the Base case.

# APPENDIX A: PLANNING PANELS

## VICTORIA EXPERT WITNESS

### DECLARATION

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**a) The name and address of the expert**

Marcus Luigi Spiller  
Principal and Partner  
SGS Economics & Planning Pty Ltd  
Level 14, 222 Exhibition Street  
Melbourne

**b) The expert's qualifications and experience**

PhD (Global Studies, Social Science and Planning), RMIT University  
Master of Commerce (Economics), University of Melbourne  
Bachelor of Town and Regional Planning, University of Melbourne  
  
Life Fellow Planning Institute of Australia (formerly National President)  
Adjunct Professor RMIT University  
Adjunct Professor UNSW  
Associate Professor University of Melbourne

I have more than 40 years' experience as planner and urban economist

**c) The expert's area of expertise to make the report**

I am a Principal and Partner of SGS Economics & Planning Pty Ltd, a firm I helped to establish almost 3 decades ago. Formally qualified in commerce and urban planning, I have practiced as a consultant for much of my career, though I have also worked as an academic, local government town planner, Ministerial Adviser and senior bureaucrat in State and Commonwealth Government agencies. I am widely published in land economics, regional economic development, housing policy, infrastructure funding and metropolitan governance. This includes writing and co-editing two books on urban management.

I am regularly engaged by universities, local governments and State agencies to teach courses in cost benefit analysis.

**d) Other significant contributors to the report and where necessary outlining their expertise**

Various SGS team members assisted with compilation of data and research for this report. This occurred under my directed supervision.

**e) Instructions that define the scope of the report**

SGS Economics & Planning Pty Ltd was commissioned to prepare a Victorian Treasury compliant cost benefit analysis of Am C278.

My instructions in this matter, provided in writing by the City of Melbourne were as follows:

- *Familiarise yourself with the Amendment and relevant exhibition background documents;*
- *Review relevant submissions;*
- *State whether you are supportive of the Amendment;*

- *Prepare a report setting out your expert opinion in relation to the cost benefit of the Amendment which you have undertaken to establish whether, and the extent to which the Amendment C278 will generate a net community benefit;*
- *Attend the Panel Hearing to present your evidence on a day yet to be confirmed.*

**f) The identity of the person who carried out any tests or experiments upon which the expert relied in making this report and the qualifications of that person**

Part of my evidence relies on a willingness to pay survey. This was commissioned by the City of Melbourne on SGS's advice. It was carried out by Stephen Prendergast, the Managing Director of Prescience Research. Mr Prendergast is highly experienced in market research including choice modelling.

**g) The facts, matters and all assumptions upon which the report proceeds**

These are set out in this evidence report.

**h) Reference to those documents and other materials the expert has been instructed to consider or take into account in preparing the report, and the literature or other material used in making the report**

All reference materials are cited in this evidence report.

**i) Provisional opinions that have not been fully researched for any reason (identifying the reason why such opinions have not been or cannot be fully researched)**

The evidence report reflects all relevant opinions of mine

**j) Questions falling outside the expert's expertise and also a statement indicating whether the report is incomplete or inaccurate in any respect**

To the best of my knowledge, the evidence report is complete and accurate.

I have made all the inquiries that I believe are desirable and appropriate and no matters of significance which I regard as relevant have to my knowledge been withheld from the Panel.

Name Dr Marcus Spiller

Date February 10, 2021

# APPENDIX B – LITERATURE REVIEW

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## Benefits generated by inner city parks

City parks have long been associated with health benefits<sup>89</sup>. The broader benefits of city parks include mitigation of the urban heat island effect, provision of carbon sink opportunities, supporting biodiversity, formation of cultural heritage and character, boosting the visitor economy, providing space for events and arts and fostering social connectedness.

These benefits have been defined, quantified and (very) occasionally monetised in a variety of studies. These address a range of locations and employ different analytical perspectives<sup>1011</sup>.

## Health benefits associated with city parks

### Mental and physical health & wellbeing

The literature suggests that the range of mental and physical benefits associated with city parks is broad and dependent on the facilities available in the park. This includes whether there is enough space for active recreation such as 'kick to kick', soccer, cycling and running as well as children's play space and equipment<sup>12</sup>.

Research has shown that users of open space are three times more likely to meet suggested physical activity levels<sup>13</sup>. Regular exercise is proven to reduce the risk of a variety of diseases as well as improving the general health of individuals. Participation in exercise increases disease survival rates and decreases the risk of lifestyle related illnesses in individuals. This has a subsequent benefit in building resilient communities and reducing healthcare costs.

Significant mental health benefits can be generated by parklands by such simple experiences as appreciating trees and greenery. Parks access has been shown to be linked to reduced stress levels and reduced depression<sup>14</sup>. Research led by Deakin University for Beyond Blue, discovered the restorative quality of the natural environments for mental health, highlighting benefits in improved concentration, productivity and ability to cope with stress. In addition, the study found that people in proximity to nature had a more positive outlook and reported higher life satisfaction<sup>15</sup>.

A 2008 study, by Medibank Private, placed the cost of physical inactivity at \$13.8 billion across Australia.

The opportunity for children to play in parks provides alternatives for sedentary screen time, which can have a moderating effect on behaviour and mood.

### Production of Vitamin D

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<sup>8</sup> Jones, 2018

<sup>9</sup> Ives, Oke, Cooke, Gordon & Bekessy, 2014

<sup>10</sup> Ayala-Azcárraga, Díaz, & Zambrano, 2019; Cohen, Potcher & Schnell, 2014

<sup>11</sup> Ives, Oke, Cooke, Gordon & Bekessy, 2014

<sup>12</sup> Space, C. A. B. E. (2004). The value of public space: How high quality parks and public spaces create economic, social and environmental value, London.

<sup>13</sup> Wolf, Kathleen L., 2008, 'City Trees, Nature and Physical Activity: A Research Review', Arborist News, Vol.17, No. 1.

<sup>14</sup> Healthy Spaces & Places 2009, Design Principle – Parks and Open Space.

<sup>15</sup> Townsend M and Weerasuriya R (2010), Beyond Blue to Green: The benefits of contact with nature for mental health and wellbeing. Beyond Blue Limited: Melbourne

Inner city parks generate short- and long-term health benefits, particularly during winter when access to sun is limited. Parks offer a location to linger and enjoy the minimum of 10-15 minutes of direct sun exposure needed to begin production of Vitamin D within the body. Forty nine per cent of Victorians are considered to have insufficient Vitamin D levels in winter<sup>16</sup>. Known consequences of prolonged Vitamin D deficiency include rickets and osteopenia. Some studies have linked Vitamin D deficiency to increased risk of heart disease, multiple sclerosis, cancer and kidney disease. However, further research is needed to fully understand these links<sup>17</sup>.

## Social benefits

### Social connectedness and inclusion

Social isolation and individuals feeling excluded have emerged as significant global public health issues. If opportunities for people to connect are not available there is a higher risk of a range of negative health outcomes including but not limited to low self-esteem, anxiety and depression, poorer immune responses, cardiovascular disease and increased risk of suicide. One study found a 29% increased risk of mortality over time from social isolation<sup>18</sup>.

There are benefits from having a space to gather for physical activities including walking and sport which bring people together. An Australian literature review found that provision of quality open space fosters greater social connectedness within communities along with a greater sense of place and belonging<sup>19</sup>. Research in the UK has found vegetation and green space enhance a sense of community and neighbourhood<sup>20</sup>.

## Environmental benefits

### Biodiversity

Green open spaces sustain biodiversity in the urban landscape. These spaces, including parks, reserves and corridors, enable the maintenance of populations of species, and often provide vital habitats for fauna including birds.

Open space likewise aids in the protection of remnant indigenous or significant flora. The research literature highlights the importance of open space configuration and size in the protection of biodiversity.

The literature also indicates that the quality of open space should be prioritised to maximise biodiversity benefits.

### Mitigating the *Urban Heat Island* effect

Inner city parks are a location where vegetation can be abundant. Visitors benefit from the temperature regulation that vegetation provides<sup>21</sup>.

The City of Melbourne commissioned an economic assessment of the Urban Heat Island Effect in 2012. This highlighted the cooling effect of trees and showed how maintenance of comfortable levels of temperature are vital to mental health avoidance of lost production through lack of sleep and irritability<sup>22</sup>.

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<sup>16</sup> Australian Health Survey: Biomedical Results for Nutrients, 2011-12 via ABS  
<https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/4364.0.55.006Chapter2002011-12>

<sup>17</sup> Mead, 2008; ABS, 2014

<sup>18</sup> Holt-Luntad et al (2015) as in Singer, C (2018) Health Effects of Social Isolation and Loneliness. Journal of Aging Life Care  
<https://www.aginglifecarejournal.org/health-effects-of-social-isolation-and-loneliness/>

<sup>19</sup> Ives, C, Oke, C, Cooke, B, Gordon, A and Bekessy, S 2014, Planning for green open space in urbanizing landscapes.

<sup>20</sup> Space, C. A. B. E. (2004). The value of public space: How high quality parks and public spaces create economic, social and environmental value, London.

<sup>21</sup> Smardon, 1988, Perception and aesthetics of the urban environment: review of the role of vegetation. Landscape & Urban Planning; Memon, R. A., & Leung, D. Y. C. (2010). Impacts of environmental factors on urban heating. Journal of Environmental Sciences

<sup>22</sup> Aecom, 2012, Economic Assessment of the Urban Heat Island Effect for City of Melbourne



Parks also allow air to circulate; depending on the wind direction this can cool surrounding streets. A UK Study found that “temperatures were 7 degrees cooler where vegetation cover was 50 per cent compared to areas where the vegetation cover was only 15 per cent”<sup>23</sup>.

### **Water sensitive design**

Well-designed inner city parks allow for on-site water storage, integrated stormwater treatment and flood management. There are environmental benefits to reducing the need to use external water for irrigation.

### **Built environment**

#### **Cultural heritage and character**

High quality open space is found to reinforce local identity and civic pride and enhance the local character of a region<sup>24</sup>. Furthermore, open spaces can help conserve and encourage understanding of the historical and cultural value of the region.

They provide the potential to incorporate Aboriginal and Torres Strait Islander cultural heritage values into the urban landscape.

Additionally, open spaces can provide venues for social and cultural community facilities thereby strengthening the character of the district in question.

#### **Providing third spaces**

Parks provide a location outside of workplaces and homes where people can access sunlight which may be lacking at home<sup>25</sup>. Research has found that many “city residents retreat from compact apartments to use the city’s streets and parks as their ‘living room’”<sup>26</sup>. This is particularly important in higher density locations.

### **Economic prosperity and tourism**

Access to high quality parkland increases the economic potential of a region in terms of tourism, leisure and cultural activities<sup>27</sup>. Open space provide visitor destination points and add value to the community. The physical character that is enhanced through high quality open space provision influences future development of the municipality. Proximity to open space, parks and recreation as well as improvements in public space have been shown to increase footfall or lease rates in commercial areas<sup>28</sup>.

## **Why are inner city parks valued by their communities?**

The literature suggests that communities and individuals will value parks differently based on quality, location, vegetation and facilities. This is potentially influenced by the season, for example, with visitors seeking heat relief in summer and greenery and direct sunlight in winter<sup>29</sup>.

Research published in 2011 regarding Western Sydney’s Parklands highlighted a variation in community valuation of parks, depending on a range of household characteristics including

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<sup>23</sup> P17. Space, C. A. B. E., 2004, The value of public space: How high quality parks and public spaces create economic. Social and Environmental Value, London; Whitford, V., Ennos, A. R. and Handley, J. F., 2001, City form and natural process – indicators for the ecological performance of urban areas and their application to Merseyside, UK’.

<sup>24</sup> CABE, 2009, Open space strategies best practice design.

<sup>25</sup> Hodyl, L, 2015. To investigate planning policies that deliver positive social outcomes in hyper-dense, high-rise residential environments.

<sup>26</sup> Page 7 Hodyl, L, 2015. To investigate planning policies that deliver positive social outcomes in hyper-dense, high-rise residential environments.

<sup>27</sup> Byrne, J. & Sipe, N. 2010. Green and open space planning for urban consolidation – A review of the literature and best practice; Jansen-Verbeke, M. 1986. Inner-city tourism: Resources, tourists and promoters

<sup>28</sup> CABE, 2009, Open space strategies best practice design.

<sup>29</sup> Hodyl, 2015; Mead, 2008; Henderson-Wilson, C., Sia, K.-L., Veitch, J., Staiger, P. K., Davidson, P., & Nicholls, P., 2017, Perceived Health Benefits and Willingness to Pay for Parks by Park Users: Quantitative and Qualitative Research.

the age of members, presence of children and whether the household had resided in the same postcode area for over 10 years<sup>30</sup>.

Other than the general benefits outlined above, research into why inner-city parks are valued by their communities is limited.

## How important is sunshine in the delivery of these benefits/values?

As noted, the literature highlights a range of social, economic and environmental benefits of parks. However, there is a gap in the research specifically tying sunlight in parks to these benefits. Studies do link sunlight directly to human health, vegetation and biodiversity benefits but do not refer to the locations where sunlight is being accessed.

A key benefit is direct sunshine exposure, which is linked to positive health benefits including mental health and maintenance of vitamin D levels. Not having opportunities to access direct sunlight in the public realm, especially places to linger can be expected to have long term consequences for the health system and general population<sup>31</sup>. This raises the importance of access to winter sun, when the UV is lower, and people spend less recreation time outside.

Sunlight is obviously linked to vegetation health and maintenance of biodiversity. Water sensitive design may benefit from sunlight reaching parks to evaporate excess water in storm water and flood events.

Future research could explore whether parks in low sunlight cities are utilised less and whether sunlight access is connected to perceived safety within parks.

Consideration has been given to the 'existence value' of sunlight, that it is an expected element of spending time within parks. The available literature on existence value discusses the issue with reference to vegetation and built form rather than focussing on sunlight or the level of sunlight per se. However, it is generally understood that once sunlight access is diminished it is more likely to be desired and valued.

## What are people willing to pay for these benefits?

While studies on people's Willingness to Pay (WTP) for inner city urban parks is limited, a New Zealand Study found that for houses in Wellington, 'each extra daily hour of sunlight exposure is associated with a 2.4 per cent increase in house sale price'<sup>32</sup>.

One of the few studies of WTP for parks has been conducted in Victoria by Henderson-Wilson, Sia, Veitch, Staiger, Davidson and Nicholls (2017). It surveyed 140 people across three parks and undertook a one-on-one interview with some participants. Findings included that 82 per cent of respondents were willing to pay some annual dollar amount to keep parks with the mean figure being \$45.40 (AUD). Rates of income and employment had an effect on the dollar amounts respondents were willing to pay. The survey was limited in its small sample size and bias towards those visiting parks. Findings from the survey also reinforced the importance of general perceived benefits of parks including physical, mental/spiritual and social health benefits<sup>33</sup>.

## Bibliography

ABS, 2014, Australian Health Survey: Biomedical Results for Nutrients, 2011-12. Available at <https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/4364.0.55.006Chapter2002011-12>

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<sup>30</sup> Marshall, N. (2011). Generation After Generation: Why and How We Value Open Space. Retrieved from Analysis and Policy Observatory

<sup>31</sup> van der Rhee, de Vries, & Coebergh, 2016; Mead, 2008

<sup>32</sup> Fleming, D., Grimes, A., Lebreton, L., Mare, D. and Nunns, P., 2017, Valuing Sunshine

<sup>33</sup> Henderson-Wilson, C., Sia, K.-L., Veitch, J., Staiger, P. K., Davidson, P., & Nicholls, P., 2017, Perceived Health Benefits and Willingness to Pay for Parks by Park Users: Quantitative and Qualitative Research.

Aecom, 2012, Economic Assessment of the Urban Heat Island Effect for City of Melbourne. Retrieved from: <https://www.melbourne.vic.gov.au/SiteCollectionDocuments/eco-assessment-of-urban-heat-island-effect.pdf>

Ayala-Azcárraga, C., Diaz, D. and Zambrano, L., 2019. Characteristics of urban parks and their relation to user well-being. *Landscape and Urban Planning*, 189, pp.27-35.

Byrne, J. & Sipe, N, 2010, Green and open space planning for urban consolidation – A review of the literature and best practice; Jansen-Verbeke, M. 1986. Inner-city tourism: Resources, tourists and promoters

CABE, 2004, The value of public space: How high quality parks and public spaces create economic. Social and Environmental Value, London

CABE, 2009, Open space strategies best practice design. Available from: <https://www.designcouncil.org.uk/sites/default/files/asset/document/open-space-strategies.pdf>

Cohen, P., Potchter, O. and Schnell, I., 2014. The impact of an urban park on air pollution and noise levels in the Mediterranean city of Tel-Aviv, Israel. *Environmental Pollution*, 195, pp.73-83.

Fleming, D., Grimes, A., Lebreton, L., Mare, D. and Nunns, P., 2017, Valuing Sunshine, Motu Working Paper 17-13, Motu Economic and Public Policy Research.

Healthy Spaces & Places, 2009, Design Principle – Parks and Open Space. Retrieved from: <https://resources.heartfoundation.org.au/images/uploads/publications/HSP-Overview.pdf>

Henderson-Wilson, C., Sia, K.-L., Veitch, J., Staiger, P. K., Davidson, P., & Nicholls, P., 2017, Perceived Health Benefits and Willingness to Pay for Parks by Park Users: Quantitative and Qualitative Research, *International journal of environmental research and public health*, 14(5), p.529.

Hodyl, L, 2015. To investigate planning policies that deliver positive social outcomes in hyper-dense, high-rise residential environments. Winston Churchill Memorial Trust of Australia. Available from: <https://apo.org.au/node/52757>

Holt-Luntad, J., Smith T.B. and Baker M., 2015, Loneliness and social isolation as risk factors for mortality. A meta-analytic review, *Perspectives on Psychological Science*, 10:2:227-237 as in Singer, C, 2018, Health Effects of Social Isolation and Loneliness. *Journal of Aging Life Care*. Retrieved from <https://www.aginglifecarejournal.org/health-effects-of-social-isolation-and-loneliness/>

Ives, C., Oke, C., Cooke, B., Gordon, A. and Bekessy, S., 2014, Planning for green open space in urbanizing landscapes. National Environment Research Program, Environmental Decisions Hub, Report for the National Government Department of Environment.

Jones, K.R., 2018, 'The Lungs of the City': Green Space, Public Health and Bodily Metaphor in the Landscape of Urban Park History. *Environment and History*, 24(1), pp.39-58. Marshall, N. (2011). Generation After Generation: Why and How We Value Open Space. Retrieved from Analysis and Policy Observatory

Mead, 2008, Benefits of sunlight: a bright spot for human health, *Environmental Health Perspectives*, 116(4), A160.

Memon, R. A., & Leung, D. Y. C., 2010, Impacts of environmental factors on urban heating. *Journal of Environmental Sciences*, 22(12), pp.1903-1909.

Smardon, 1988, Perception and aesthetics of the urban environment: review of the role of vegetation, *Landscape & Urban Planning*, 15(1-2), pp.85-106.

Townsend, M. and Weerasuriya, R., 2010, Beyond Blue to Green: The benefits of contact with nature for mental health and wellbeing. Beyond Blue Limited: Melbourne

Van der Rhee, H.J., de Vries, E. and Coebergh, J.W., 2016. Regular sun exposure benefits health. *Medical hypotheses*, 97, pp.34-37.

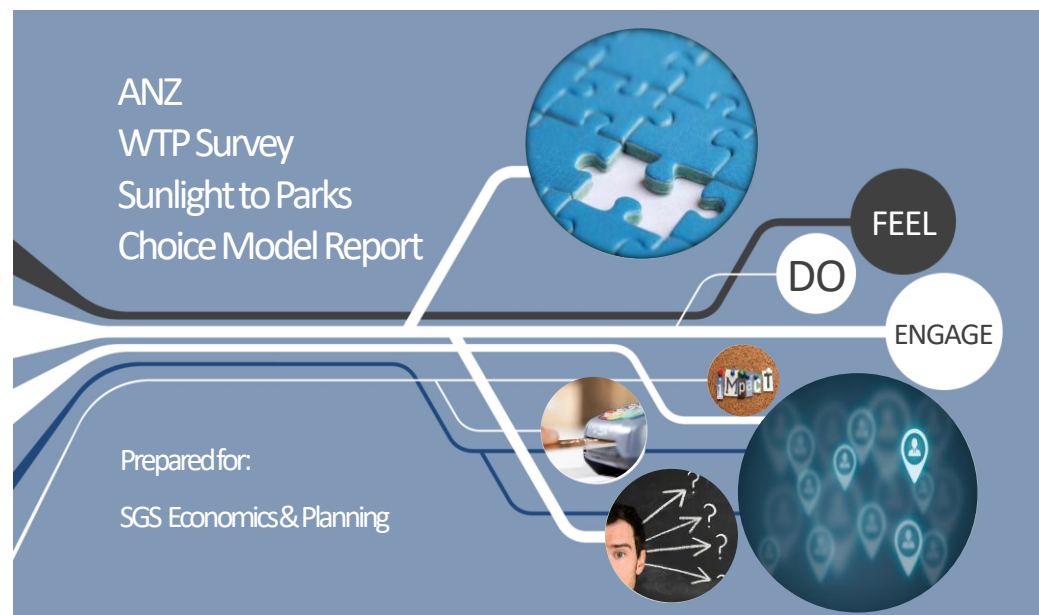
Whitford, V., Ennos, A.R. and Handley, J.F., 2001, "City form and natural process"—indicators for the ecological performance of urban areas and their application to Merseyside, UK. *Landscape and urban planning*, 57(2), pp.91-103.

Wolf, K.L., 2008, City trees, nature and physical activity: A research review. *Arborist News*, 17(1), pp.22-24.

# APPENDIX C WILLINGNESS TO PAY SURVEY

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Please click on the image below.



Prepared by  
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February 2020

 PrescienceResearch

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