Economic advice prepared to assist with responses to the Consultation Regulation Impact Statement on minimum accessibility standards for housing in the National Construction Code

Prepared for
The Melbourne Disability Institute, University of Melbourne and the Summer Foundation

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1.1. Introduction and overview

We were engaged by the Melbourne Disability Institute and the Summer Foundation in late July 2020 to assist them in responding to a Regulatory Impact Statement (RIS) Consultation document released by the Australian Building Codes Board (ABCB) at the request of the Australian Building Ministers Forum. More specifically, our task was to advise on the economic credentials of a possible regulation to include minimum accessibility standards in the National Building Code, particularly because the ABCB consultation documents included an extensive 292-page social benefit cost analysis prepared by the Centre for International Economics (CIE), an independent consultancy firm.

In our view the CIE has provided a comprehensive and helpful analysis of a complex set of issues. Two key sets of cost/benefit results are presented in the Report; namely those based on: i) 'a problem reduction approach' targeted on those with housing accessibility needs; and ii) a broader societal approach based on 'willingness-to-pay' analysis, which includes benefits to the general community from improved design and accessibility.

Based on our assessment, we conclude that there are important methodological issues associated with the benefit-cost results reported in the CIE report that warrant further consideration. First, we cover four key issues that impact substantially on the results and their associated policy implications. We start with the 'problem reduction approach' favoured by the CIE, then cover the broader WTP approach that we favour. After that we briefly mention a range of other considerations that have smaller impacts, but which taken together would also impact the overall economic credentials of the proposed regulation. Of the four key issues, two relate to the principle of symmetry in the presentation of benefits and costs for a specified research question, study perspective and context. One issue relates to the elements included in the opportunity cost of space, while the last relates to the discount rate used in the net present value calculations, having regard to published reviews of appropriate methodology and practice.

It is also important to note that maximising 'societal welfare' with available resources is at the heart of the economics discipline, reflecting its origins as a part of philosophy. Defining what 'societal welfare' means raises the normative foundations of economics, but simply put, it involves what kind of society we want to live in. Inclusion of social justice, fairness and equity is very much part of what we have called 'big E' efficiency in Section 2. We were pleased, therefore, to see that the CIE Social Benefit Cost Analysis included a measure of societal benefit in both its 'problem reduction' and broader 'willingness-to-pay' approaches to net benefit. In Section 2 of our report, however, we conclude that the method they applied, focused on individual altruism, was unlikely to have captured the societal benefit from a government perspective in meeting its policy commitments in the housing and social welfare area. To the extent the CIE estimate under-estimates the true societal benefit, it further under-estimates the economic credentials of the regulation.

1.2 The principle of symmetry in the reporting of costs and benefits

In social benefit cost analysis analysts are strongly encouraged to identify all costs and all outcomes across all stakeholders and to be transparent in their inclusion/exclusion decisions and associated measurement/valuation steps. The principle of symmetry requires that benefits and costs are reported in a way that avoids bias or confounding. If all the costs are counted then all the benefits should be counted, commensurate with the study viewpoint adopted. If only some of the benefits are counted, then costs should be presented in a symmetrical way – that is, calculated in full, but apportioned between those receiving the benefits. If only some of the costs are counted, then similar

care is required to include only symmetrical benefits. In making these methodological choices, due regard must be given to viewpoint(s) from which the analysis is conducted. To do otherwise would not fairly represent the balance between benefits and costs inherent in the role of economic analysis.

Of the two approaches they present, the CIE prefers the 'problem reduction approach'. The CIE did not favour their broader WTP approach as they argued that:

> *"…this approach implies that the proposed regulatory options deliver a lot of benefits without solving any immediate problem."* (Extract, p10, CIE Report)

As set below, we argue that the CIE results do not provide a symmetrical view of the benefits and costs inherent in the two approaches. With this in mind, we prefer the broader WTP approach. We initially consider the 'problem-reduction approach', but then focus our re-analysis on the broader WTP approach.

1.3   Problem 1: The CIE 'problem reduction approach' over-counts the cost side

In the 'problem reduction approach' all costs of the options are included, but only those benefits that result from improved access for those with housing access needs – both direct (problem reduction) and indirect (altruistic benefit). In this approach significant benefits that flow directly from improved design and functionality to the general community are not included (shown in Table 7.3 of the CIE report). In our view, it is problematic to count all the costs of implementing each option, but only a component of the associated benefits. So if the boundary around benefits[1] is confined to those that flow from assisting a target sub-group, then the cost side needs to be apportioned accordingly between this target sub-group and the general population. To do otherwise would bias the benefit-cost relationship against the economic credentials of the target sub-group.

Set out below in Table ES1 are the benefit cost ratios for each option with this adjustment applied. Options 1 and 5 are now showing a ratio >1 (i.e. benefits > costs), while options 2, 3 and 4 remain with a ratio <1 (i.e. benefit < cost).

Table ES1: Benefit-cost ratios adjusted to achieve symmetry in 'problem reduction' approach

Dalton/Carter re-analysis of benefit-cost ratios	Option 1 Silver	Option 2 Gold	Option 3 Gold +	Option 4	Option 5 Subsidy
Problem-Reduction Base case benefit-cost ratios in CIE report	0.77	0.14	0.11	0.09	**1.00**
Cost apportionment reduced by 60% to reflect benefits flowing to the general community from improved design	**1.29**	0.23	0.19	0.14	**1.67**

Table Notes: Refer Section 3 for further detail. Where the benefits in dollar terms are greater than the costs in dollar terms, the benefit-cost ratio is >1. These results are shown with green highlight.

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[1] Assessment of benefits includes three steps: i) identification of benefits relevant to the study perspective(s) and evaluation method; ii) measurement of the extent of the benefit; and iii) valuation in dollar terms. As analysts move through these three steps, some identified elements of benefit may be excluded (e.g. when multiple perspectives are used, insufficient data available to measure, benefit too insignificant to matter, etc.). Principles guiding these three steps include clarity about inclusion/exclusion and time horizon, symmetry across benefits and costs, clarity about attribution and apportionment in the presence of joint or common elements. While social cost benefit analysis is intended to include all benefits irrespective of to whom soever they accrue, it is not unusual for narrower boundaries to be applied. When this occurs the principle of symmetry is particularly important.

1.4   Problem 2: The CIE 'willingness to pay' approach under-counts the benefit side

The CIE report also includes a broader approach focussed on societal net benefit. In a full social cost benefit analysis such as this, the normal expectation is that all costs and benefits are included, irrespective of to whomsoever they accrue. The CIE report explains that:

> "*The key difference between this approach and the problem-reduction approach is that this approach includes, for Options 1-4, benefits to households that do not currently contain any persons with limited mobility*" (p.114, RIS).

Whereas the benefits listed in Table 7.2 describe cost-offsets[2] (savings), particularly to Government, plus society's WTP for altruism arising from more equitable access, the benefits in Table 7.3 describe the benefits of enhanced accessibility plus WTP for altruism. The value attached to altruism for each option is the only item that is clearly duplicated in both Tables 7.2 & 7.3. The remaining items are shown in Table ES2. In our view there is little to suggest that the two sets of benefits are mutually exclusive categories of benefit – rather the reverse is true - that they cover different aspects of societal benefit and are complementary. To the extent that there is no overlap between the 'benefits' listed in Table ES2, they are all additive. That is, a societal perspective should include consideration of both the potential resources savings plus the value of the improved accessibility.

Table ES2: Comparison of reported benefits in Table 7.2 (problem reduction approach) and Table 7.3 (broader WTP approach of the CIE report)

Table 7.2, CIE Report		Table 7.3, CIE Report	
CBA Benefit - Problem Reduction Approach	*Interpretation*	**CBA Benefit – Broader WTP Approach**	*Interpretation*
Reduced falls	*The value of resource savings*	Getting in and out	*Value of aspects of accessibility*
Reduced time in hospital/transition care	*The value of resource savings*	Moving around indoors	*Value of aspects of accessibility*
Reduced costs associated with loneliness	*The value of resource savings*	Living with mobility on same level as an entrance	*Value of aspects of accessibility*
Reduced home modification costs	*The value of resource savings*	Minimal modification required for ageing in place	*The value of resource savings*
Reduced carer related costs	*The value of resource savings*		
Reduced incidence of moving	*The value of resource savings*		
Reduced premature/ inappropriate entry to aged care	*The value of resource savings*		

Table Notes: Table 7.2 is from p.112, CIE Report, while Table 7.3 is from p.113, CIE Report.

Set out below in Table ES3 are the benefit cost ratios for each option with altruism counted once only and different assumptions about the degree of overlap applied. The only apparent area of overlap relates to resource savings from home modifications, which appears in both lists. We favour the no overlap/ 25% overlap results as most items listed are clearly different, but more conservative assumptions are also shown. Options 1 (Silver) and 5 (Subsidy) are now showing significantly improved

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[2] These cost-offsets include reduced falls, reduced time in hospital/transition care, reduced costs associated with loneliness, reduced home modification costs, reduced care-related costs, reduced incidence of moving, and reduced/inappropriate entry into aged care.

ratios >1, while options 2 (Gold), 3 (Gold +) and 4 (Gold, Class 2 only) show improvement but remain with a ratio <1 (i.e. benefit < cost). Option 2 however (Gold standard), which caters for improved wheelchair accessibility and movement, is now much closer to benefits equalling costs.

Table ES3: Benefit-cost ratios adjusted to achieve symmetry in the 'willingness-to-pay' approach

Dalton/Carter re-analysis of benefit-cost ratios	Assumptions re. benefits from CIE Report Tables 7.2 & 7.3				
	Option 1 Silver	Option 2 Gold	Option 3 Gold +	Option 4	Option 5 Subsidy
WTP Base case benefit-cost ratios in CIE report	0.85	0.30	0.24	0.17	0.89
Benefits overlap 75%	**1.18**	0.32	0.26	0.19	**1.16**
Benefits overlap 50%	**1.59**	0.50	0.40	0.29	**1.32**
Benefits overlap 25%	**2.00**	0.68	0.54	0.39	**1.48**
No overlap of benefits	**2.41**	0.86	0.68	0.49	**1.64**

Table Notes: Refer Section 3 for further detail. Where the benefits in dollar terms are greater than the costs in dollar terms, the benefit-cost ratio is >1. These results are shown with green highlight.

Moving from the symmetry principle, we now consider the way in which the opportunity cost of space was assessed. We suggest that key components of benefit were not included in the CIE assessment.

1.5   Problem 3: The CIE approach to measuring the opportunity cost of space ignored capital gain and 'utility in use'

The CIE report correctly included the estimated cost of space needed to accommodate the revisions to the National Construction Code (NCC). Our concern is that the 'value' of this space to the occupants only captures the benefits of enhanced functionality. Importantly, the value of the space is the sum of both the enhanced functionality from improved accessibility (as estimated from the CIE WTP exercises), plus the capital value.

Furthermore, a wider hallway improves access for all occupants and visitors (particularly for visitors with a disability. Given that 20% of the Australian population have a disability, many if not most Australians have friends or family members with a disability. Note, this is utility from use as opposed to problem-reduction benefits (e.g. reduced falls) is already estimated. More broadly, the analysis assumes that current designs are exactly what people want and any change from this represents a net cost without any direct utility from use of the space, such as a study nook or laundry cupboard[3].

In our suggested re-analysis we include a minimum combined estimate for capital gain and utility in use as being the retained capital value of the additional space (equal to the market price at the time of purchase). Set out below in Table ES4 are the benefit-cost ratios for each option with this adjustment applied, first as a univariate analysis, and then as a multivariate analysis in combination with the adjustment shown in Table ES3. Adding in a conservative estimate for improved capital gain/utility in use as a stand-alone change in parameter assumptions (univariate analysis), brings minor improvement across all ratios. Adding in both the Table ES3 analysis and the improved capital gain/utility in use brings significant improvement across all options. With both the 'no overlap' and

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[3] It could be argued that the WTP survey has taken this direct utility into account as it estimated the "WTP to avoid transfer of space from living areas and bedrooms to corridors, kitchen, laundry and bathrooms". That is, the survey respondents should have provided a 'net' response after considering costs and benefits. We do not believe, however, that it is evident that they would have factored this in. Nonetheless we have adopted a very conservative approach to the estimation of incremental 'utility in use'.

'25% overlap' assumptions, virtually all options show benefit-costs greater than 1. The Silver option returns benefits almost 3 times cost, while the Gold options now have sound economic credentials.

Table ES4: Benefit-cost ratios adjusted for improved capital value and utility in use in WTP approach in both univariate and multivariate analysis

Univariate analysis	Assumptions re. benefits from RIS Tables 7.2 & 7.3				
	Option 1 Silver	Option 2 Gold	Option 3 Gold +	Option 4	Option 5 Subsidy
WTP Base case benefit-cost ratios in CIE report	0.85	0.30	0.24	0.17	0.89
Add capital value of space to benefits	1.23	0.56	0.53	0.73	1.00
Multivariate analysis [benefits from tables 7.2 & 7.3] + [capital value of space]					
Base case benefits	1.23	0.56	0.53	0.73	1.00
Benefits overlap 75% + Cap value	1.64	0.74	0.67	0.83	1.16
Benefits overlap 50% + Cap value	2.05	0.92	0.81	0.93	1.32
Benefits overlap 25% + Cap value	2.46	1.10	0.95	1.03	1.48
No overlap of benefits + Cap value	2.87	1.28	1.09	1.13	1.64

Table Notes: Refer Section3 for further detail. Where the benefits in dollar terms are greater than the costs in dollar terms, the benefit-cost ratio is >1. These results are shown with green highlight.

While the re-analysis presented so far provides a very different policy picture to that presented in the CIE report, no adjustment has been made to the discount rate. The CIE report itself raises this as an important matter for consideration and includes a sensitivity analysis with 3%, 5% and 10% alternate rates, rather than the 7% adopted by the CIE in their main analyses.

1.6   Problem 4: The discount rate used does not reflect current financial/economic thinking or practice

We argue that the choice of a 7 per cent discount rate in the base run analysis does not reflect current thinking and/or practice in the calculation of net present value (NPV). We note, for example, that the Council of Economic Advisors in the USA issued a brief in 2017 that advised as follows:

> *"Current guidance from the office of management and budget requires using both a 7 percent and 3 percent real discount rate in regulatory benefit-cost analyses. **This issue brief reassesses the current choice of discount rates and methodologies for selecting the 3 percent and 7 percent rates**. Empirical evidence suggests that real interest rates around the world have come down since the last evaluation of the rates, and new theoretical advances considering future uncertainty likely suggest lower long term rates, as well. **In general the evidence supports lowering these discount rates**, with a plausible best guess based on the available information being that the lower discount rate should be at most 2 percent while the upper discount rate should also likely be reduced."* (Extract from Issue Brief Abstract, our emphasis)

A discount rate of 7 per cent, whilst in line with the central recommendation from the Australian Office of Best Practice Regulation in 2016, ignores their comment in their 2016 advice that:

> *"…the preferred approach is to base the discount rate on market-based interest rates, which indicate the value to the current population of future net benefits".*

There are several economic theories that serve as rationales for the use of interest rates in economic and financial appraisal, including the Social Rate of Time Preference and the Social Opportunity Cost of Capital. In reality, irrespective of which theory is favoured, most economists and financial analysts acknowledge that the prevailing bond rate (i.e. rate of return on long term government debt) is the

best 'rule of thumb' for what the discount rate should be. In 2016, the 10 year bond rate in Australia averaged 2.33 per cent, compared with 0.88 per cent today. Unfortunately, 10 year bond rates are the longest term for which there is an historical series from the RBA. This would suggest that, as a maximum, a 5 per cent discount rate would be much more appropriate, although we would argue that even this rate is too high. There is now a 30 year bond rate in Australia, which is close to the economic life of a dwelling, and it is 1.86 per cent. We note, for example, that in the RIS prepared by the Department of Planning and Community Development in Victoria in 2010, entitled *Visitable and Adaptable Features in Housing*, a discount rate of 3 per cent was used. Further the discount rate widely used in the health sector is 3 per cent.

It is important to note that the choice of discount rate is not just an esoteric issue for economists and financial analysts - the choice has a huge impact on the benefit-cost ratios reported for the RIS. Given the time profiles adopted for the receipt of benefits and costs in the RIS, any reduction in discount rate will favour the benefit side more than the cost side, adding further weight to the economic credentials of implementing a compulsory regulation. We illustrate this in benefit-cost ratios, particularly in the multivariate analysis, in Table ES5. These results are further illustrated in Figure ES1, which shows that the majority of results of our re-analyses are above the threshold benefit-cost value of 1.00.

Indeed, in Table 11 (p.23), we demonstrate that there is a strong case to suggest that the benefit-cost ratio for Option 1 is greater than 2.0, or considerably higher than the base case estimate of 0.77, even when a discount rate of 7 per cent is applied. When a societal perspective is adopted from combining the value of reduced costs with WTP for altruism and reduced loneliness (Table 7.2, CIE report), to the WTP for increased accessibility, all options become attractive (>1.0), whether discounted at 3 per cent or not.

Table ES5 Benefit-cost ratios adjusted for lower discount rates

Univariate analysis	Discounted at 3% p.a. (approx.)				
	Option 1 Silver	Option 2 Gold	Option 3 Gold +	Option 4	Option 5 Subsidy
WTP Base case benefit-cost ratios in CIE report	0.85	0.30	0.24	0.17	0.89
Add capital value of space to benefits	**1.50**	0.68	0.64	0.89	**1.22**
Benefits overlap 75%	**1.44**	0.39	0.31	0.23	**1.42**
Benefits overlap 50%	**1.94**	0.61	0.48	0.35	**1.61**
Benefits overlap 25%	**2.44**	0.83	0.65	0.47	**1.81**
No overlap of benefits	**2.94**	**1.05**	0.83	0.60	**2.00**
Multivariate Analysis [benefits from tables 7.2 & 7.3] + [Capital value of space]					
Base case benefits	**1.50**	0.68	0.64	0.89	**1.22**
Benefits overlap 75%+Cap value	**1.99**	0.90	0.81	**1.01**	**1.42**
Benefits overlap 50%+Cap value	**2.49**	**1.12**	0.98	**1.13**	**1.61**
Benefits overlap 25%+Cap value	**2.99**	**1.34**	**1.16**	**1.26**	**1.81**
No overlap of benefits + Cap value	**3.49**	**1.56**	**1.33**	**1.38**	**2.00**

Table Notes: As the CIE economic model revealing the time profile of costs and benefits was not made available for review, the estimate of the impact of reducing the discount rate required assumptions that make these estimates an approximation only. Nevertheless, we demonstrate in Section 3 that our estimations are fit for purpose.

Putting the four key assumptions together, we conclude that the economic credentials for all options considered are considerably stronger than those presented in the CIE report and underpin the case for adding a regulation to the national building code.

1.7   Other Issues that have a smaller impact

There are a range of other issues of an economic nature that are also worth mentioning. Individually these issues will have a minor impact on the CIE results, but taken together they would further improve the economic credentials of the proposed regulation. These issues cover:

1.7.1: Value of a statistical life:

The results of an *in press* systematic review of Value of a statistical life (VSL) with the journal *Health Policy* (Carter is a co-author), suggest that the VSL used in the CIE report ($4.5M) is too low and should be replaced with a value of $7.0M [High: $7.9M; Low: $4.5M).

1.7.2: Value of intangibles:

There is no explicit dollar value placed on the potential for reduced 'pain and anxiety' in the CIE analysis, although it may have entered their analyses indirectly. When intangibles such 'pain and anxiety 'are explicitly costed – such as in burden of disease or cost of illness studies - their magnitude can be quite large. Placing dollar values on such morbidity impacts is not straightforward or uncontested. We raise this issue of intangibles as a point for clarification and to list the range of issues that may not have entered the benefit cost arithmetic. In this context, the generic term 'pain and suffering' would also include increased dignity, an important outcome for those with accessible housing needs.

1.7.3:   Valuation of productivity impacts of premature retirement, premature death and morbidity:

The approach to treatment of productivity impacts for the disabled in the CIE report only considers the direct link between better housing and potential productivity gains, where we agree insufficient evidence exists to enable quantification of impacts - although qualitative evidence certainly exists as indicated in the recent Melbourne Disability Institute survey.

While a direct link between improved housing and improved workforce participation/productivity may be difficult to assess, there are other productivity-related impacts that have been subject to extensive measurement in the health economics literature. These relate to the participation/productivity impacts of premature retirement, premature death, hospital visits, medical/allied practitioner visits, etc. for those in the paid workforce. Omission of these productivity impacts for those with housing accessibility needs in the paid workforce, would have a small impact on the benefit side of the CIE results. Their inclusion, however – given that methods are available – would send a clear message that these impacts are valued.

Further, there is also no provision in the CIE report for productivity impacts for those not in the paid workforce –household production effects - which would pick-up carers and other household-based impacts. Again, precedents for the calculation of these impacts in the health sector (e.g. risk reduction analyses) are available to guide their calculation.

1.7.4:   Several areas where incremental costing is not applied:

For example, the approach taken to transition costs (CIE Report, p84), seems over-stated to us, in work environments where staying up-to-date with government codes and regulations would be a routine and ongoing aspect of work. A 'separable cost approach' – where only those costs saved by not implementing the regulation – would seem to be a more appropriate approach. Put another way, if

the approach adopted in the CIE report were applied to each and every regulation, then one suspects the costs would be recovered several times over. These costs could be subject to sensitivity analysis. Further, the report also relies on costs, today, of wider doors versus current standard doors. Once wider doors become the standard, the incremental costs will be minimal.

1.8   Summary and Conclusions

We conclude that the economic credentials for all options considered by the CIE are considerably stronger than those presented in their report. While the CIE favoured continuation of a voluntary code, we conclude that a social benefit code analysis based on our four key recommendations would underpin the case for adding a regulation to the national building code for all new Class 1a and Class 2 buildings. The additional methodological or social justice issues in Sections 2 and 3 of our report have less impact individually than those highlighted here, but the net effect of their application would be to further strengthen these conclusions. Our inability to access the model meant that it has not been possible to estimate the cumulative impact of these remaining issues.

We appreciate that the choice of which particular option to specify in a regulation will reflect factors in addition to these benefit cost ratios, including functionality for the elderly and those with disabilities, particularly for those in wheelchairs. Option 2 (Gold standard) has particular merit in this regard, as the most cost-effective of the options that achieve functionality for those in wheelchairs.

Further, we note that encouraging a match between the stock of accessible housing and those with accessible housing needs is central to the calculation of net benefit and therefore suggest that a combination of options could be highly desirable. In particular, combining Option 5 (a subsidy program to encourage availability of accessible rental properties) with Option 1 (Silver standard) and Option 2 (Gold standard) should be assessed. A consideration here is that many of those with accessible housing needs may have insufficient income to compete for accessible housing as it enters the marketplace. As noted above the benefits of the subsidy option exceed the costs, based on our revised analysis, but there will be overlapping benefits with Options 1 or 2 and these should not be double counted. Further analysis of this point should therefore be undertaken utilising the CIE model, to which we do not have access.

An additional option that might be considered for analysis, is a policy package that also included an enhanced matching service between suitable housing and those with housing needs. This will call into play the time profiles of cost and benefit inherent in the CIE report.

Figure ES1: Results for Dalton/Carter re-analyses illustrated graphically
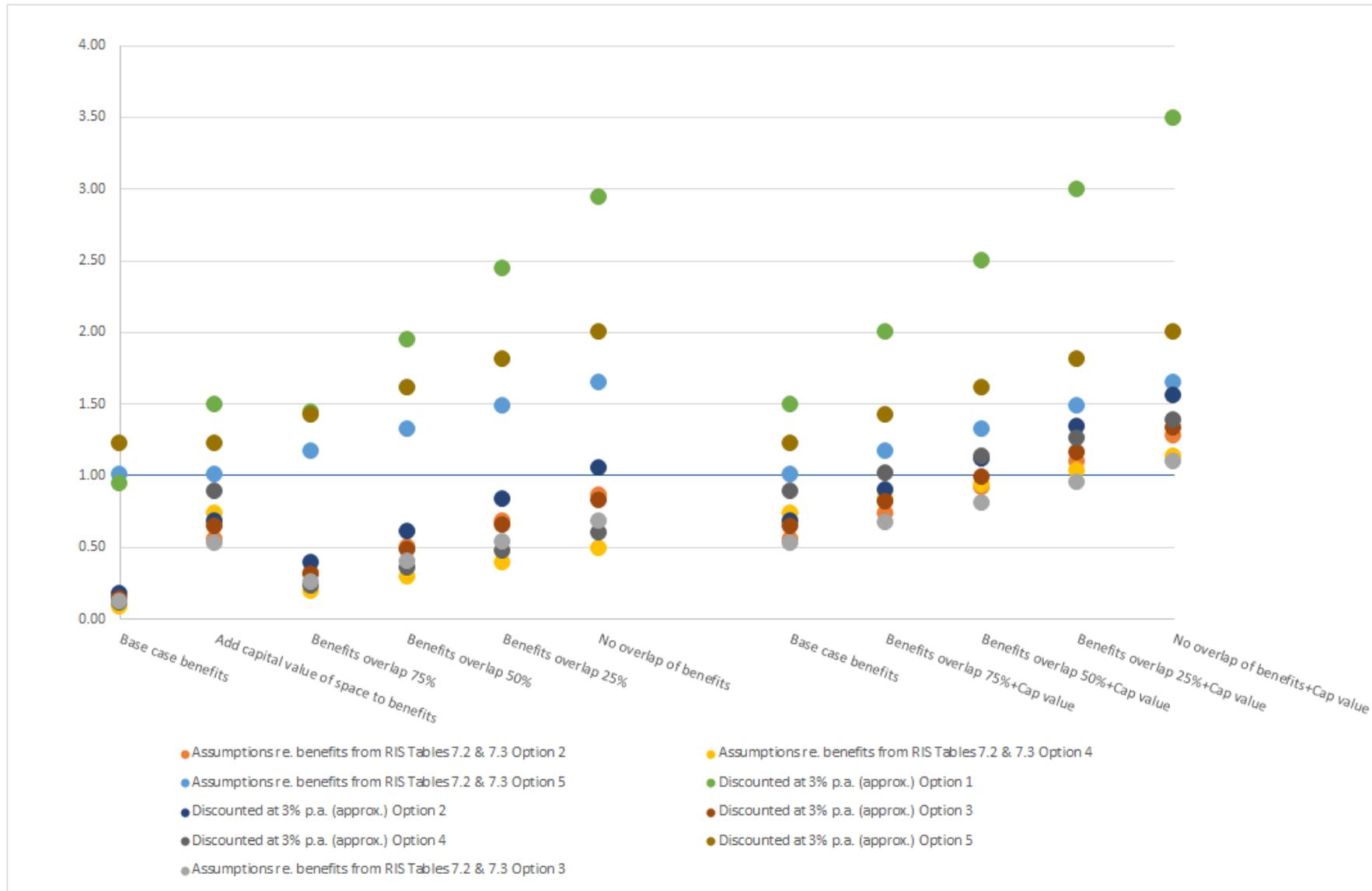
2. Background and Introduction

2.1. Introduction

We were engaged by the Melbourne Disability Institute and the Summer Foundation in late July 2020 to assist them in responding to a Regulatory Impact Statement (RIS) Consultation document released by the Australian Building Codes Board (ABCB) at the request of the Australian Building Ministers Forum. More specifically, our task was to advise on the economic credentials of a possible regulation to include minimum accessibility standards in the National Building Code, particularly because the consultation documents included an extensive 280 page social benefit cost analysis conducted by the Centre for International Economics (CIE), an independent consultancy firm. While the inclusion of a social benefit cost analysis is a requirement of the RIS decision process in Australia, it is not always an easy document for those unfamiliar with economics to critically assess. Hence our role was to assist by critiquing the CIE study, particularly in relation to methodological or data choices that might impact the benefit cost results reported.

In our view the CIE has provided a comprehensive and helpful analysis of a complex set of issues. Their report is well structured and nicely crafted, particularly for those stakeholders familiar with economics. Importantly, it clearly flagged areas of uncertainty and issues for further discussion. While comprehensive model-based analysis was undertaken, we were unfortunately not able to obtain the model(s) they used and so had to approximate some of the calculations they undertook.

Given the tight timetable for responses to be prepared, we have focussed our report on issues with the potential to have a major impact on the economic credentials of the regulation under consideration, and simply noted other matters of method or valid alternative assumptions to those taken. The cost benefit results in Tables 7.2 to 7.4 (p110-112) of the CIE Report provide key summary information on the balance between benefits and costs for each option considered and are central to policy considerations. Two key sets of cost/benefit results are presented in the CIE Report; namely those based on: i) 'a problem reduction approach' targeted on those with housing accessibility needs; and ii) a broader societal approach based on 'willingness-to pay' analysis, which includes benefits to the general community from improved design and accessibility.

In our view, there are important methodological issues associated with these benefit-cost results that warrant further consideration. First, we cover four key issues that impact substantially on the results and their associated policy implications. We then briefly mention a range of other considerations that have smaller impacts, but which taken together would also impact the overall economic credentials of the proposed regulation. Of the four key issues, two relate to the principle of symmetry in the presentation of benefits and costs for a specified research question and context. One issue relates to the elements included the opportunity cost of space, while the last relates to the discount rate used in the net present value calculations.

It is also important to note that maximising 'societal welfare' with available resources is at the heart of the economics discipline, reflecting its origins as a part of philosophy. Defining what 'societal welfare' means raises the normative foundations of economics, but put simply, it involves what kind of society we want to live in. We were pleased, therefore, to see that the CIE Social Benefit Cost Analysis included a measure of societal benefit in both its 'problem reduction' and broader 'willingness-to-pay' approaches to net benefit. We consider this issue further in this section of our report. We conclude that to the extent the CIE estimate under-estimates the true societal benefit, it further under-estimates the economic credentials of the regulation.

2.2   Background: a brief economic perspective on government intervention

Putting the fundamental role of defence, law and order to one side, governments intervene in the marketplace for two basic reasons – to pursue social justice policies and/or to correct market failure. Both rationales are applicable for this RIS on minimum access standards. It is important to note that both rationales involve economic reasoning and concepts of efficiency. Social justice considerations go to the heart of what constitutes 'societal welfare' – that is, what kind of society do we want to achieve with our available resources – while the marketplace provides an important mechanism by which this can be achieved. The first provides what might be called 'big E' efficiency (maximising the social welfare function), while the second provides what might be called 'small E' efficiency (allocative and technical efficiency). Both are important and interact in ways that help define the role and contribution of government.

The principle of solidarity – looking after those less able to care for themselves - is highly valued in many societies. It is reflected in social welfare policy and the importance given to the notion of equity and ethical outcomes. The achievement of well informed and competitive markets is also important. Fundamental decisions related to: i) what to produce (allocative efficiency); ii) how to produce it (technical efficiency); and iii) who receives the goods and services produced (distributive justice) are all answered by a well-functioning market, with consumption based on willingness-to-pay principles. A market failure rationale for government intervention tends to involve marketplace roles i) and ii), while a social justice rationale tends to involve role iii), replacing 'willingness-to-pay' as the basis for distribution with needs-based approaches from an individual perspective (e.g. ability-to-pay) or societal perspective (e.g. merit goods such as education and health).

Market failure can occur for many reasons, particularly in health, but common reasons include externalities (positive or negative), compromised consumer sovereignty where the consumer is not the best judge of their own welfare (e.g. 'agency' relationship in health care and supplier-induced demand), asymmetry of information and undue market power that compromises workable competition. Market failure, however, in and of itself is not sufficient reason for government action, as intervention may be ineffective and/or lead to adverse effects worse than the original failure. One consideration is whether the type of government intervention (i.e. provide funding, provide goods/services, provide information, regulate the market, invoke tax/subsidy) matches the source of the market failure. Each type of intervention has its own role and pros/cons that is beyond the scope of this brief background note. The need to assist government where they were the major decision-maker (e.g. defence) and the need to avoid 'government failure', led to the development of the decision sciences, including social cost benefit analysis.

2.3   What is the role of Social Cost Benefit Analysis (CBA) – what should it cover?

2.3.1   *Government commitments to social justice in housing*

There are various international treaties/conventions and domestic policies that need to be considered as part of the RIS decision-making process, including the extent to which they are covered by the CIE Social Benefit Cost Analysis. The audit table in Appendix 1 of this paper lists human rights frameworks related to housing for persons with disabilities and older peoples. Included are: i) the Universal Declaration of Human Rights (UDHR); ii) the International Covenant on Economic, Social and Cultural

Rights (ICESCR); iii) the UN Convention on Rights of Persons with Disabilities (CRPD), 2007; iv) the Principles for Older Persons (POP); v) the Australian Action Plan on Human Rights (NAP); vi) the COAG-endorsed National Disability Strategy, 2011 (NDS); vii) the Disability Discrimination Act, 1992 (DDA); and viii) the National Disability Insurance Scheme (NDIS))

It is also noteworthy that the Victorian Government issued a RIS on Visitable and Adaptable Housing, in 2010. The Victorian government has a policy commitment to ensuring that people with a disability or limited mobility will not be excluded from participating in social life and work based on principles of equity and fairness. Their policy also recognises that the whole community benefits socially and economically when all its members are able to participate and to contribute. Other relevant recognition of the need for social justice in housing include: i) the Productivity Commission report on disability care and support in 2011; and ii) government action to address the societal and economic consequences of the COVID 19 pandemic.

There is also the important COAG recognition that the viability of the NDIS was contingent on complementary mainstream policy, services and amenity, including inclusive and accessible built environments. Complementing this, we also know that in the Australian community there is a strong preference for older people to live in their own home, playing a vital role in supporting family life and enriching community life.

2.3.2   The CIE calculation of 'societal benefit'

It is important to acknowledge in this aspect of our review, that the CIE report included a separate WTP survey to assess 'societal benefit' – defined as household willingness to pay to improve housing accessibility for other people – in both their problem reduction and broader WTP assessments. This was an innovative and important step to take and we commend them for it. That said, it is now a matter for consideration as to whether assessing household WTP captures the government's commitment to social justice, evident in all the activities listed above. It is a well-known characteristic in the decision-making literature that individuals will make very different decisions depending on whether they are taking decisions to maximise their own welfare (including a caring utility or altruism-based decision), taking decisions wearing a 'veil of secrecy' where they know the range of impacts but not how they personally will be impacted, or whether they are taking decisions from an explicit government or community-wide perspective. Libertarian and egalitarian ideologies on government would take different positions on this, but both would agree that it is only in the world of perfect competition – which rarely if ever exists - that summing individual welfare maximised through the marketplace, is a legitimate approach to maximising community welfare. To use economic terminology, there are arguments in the social welfare function other than individual utility; these include equity, solidarity, consumption of merit goods like education and health, law and order, etc. Most would recognise that there is an obligation on national governments to create the kind of society their citizens want through the implementation of their electoral mandate. While this is rather an esoteric presentation, it goes to the heart of the interplay between achieving social justice (big 'E' efficiency) and avoiding government failure (small 'e' efficiency). It brings us back to the central point of whether the CIE Social Benefit Cost Analysis gives explicit recognition to government policy on accessible housing, and if, does it capture the benefit adequately?

Having considered this broader interplay between notions of efficiency, it is our view that the full extent of these broader social justice considerations would not have been captured in the CIE willingness-to-pay survey that assessed the altruism benefit. The extent of any shortfall here, which is reflected in the qualitative survey undertaken by the Melbourne Disability Institute, should therefore be considered as increasing the economic credentials of the proposed regulation.

3 The CIE Social Benefit Cost Analysis

3.1 The principle of symmetry in the reporting of costs and benefits

An important principle in the conduct of economic analysis is symmetry in the identification, measurement and valuation of benefits and costs, in order to avoid biased results. There are guidelines for each of these three steps, which guide inclusion/exclusion, measurement practice and valuation procedures[4]. In social benefit cost analysis, analysts are strongly encouraged to identify all relevant costs and outcomes and to be transparent in their inclusion/exclusion decisions and associated measurement/valuation steps. CIE have followed this practice admirably, but there are important issues for discussion in the choices made.

The first relates to the way in which costs and benefits are assembled in the reported cost/benefit results. Complexity in real world analysis means that: i) costs sometimes overlap across multiple projects (e.g. overheads, common reception area, capital used across multiple projects, etc.); ii) that benefits can flow to multiple population groups from the same capital asset (e.g. mammographic equipment used for both screening and diagnostic roles, our road system used by heavy trucks as well as passenger vehicles, homes with excellent accessibility features sought by multiple potential buyers, etc.); and iii) that choices exist as to how these joint or common elements are attributed and reported in cost benefit results. More specifically, if the benefit side of a benefit cost analysis is restricted to a subset of all those who receive a benefit, then the cost side needs to be apportioned accordingly between the beneficiaries so as to avoid bias in reporting the balance between benefits and costs. Note the notion of efficiency is fundamentally about the relationship between benefits and resource use (costs), with resource use being the metric for assessing benefit gained/ benefit lost from resource use decisions.

The existence of joint effects – both on the benefit and cost side - gives rise to important methodological issues associated with developing and applying *apportionment criteria* for assessing costs and benefits. Particularly important is that apportionment criteria are clearly specified, both in regard to the criterion adopted and the basis for selection. The latter could vary from simplicity of calculation (e.g. percentage of floor space utilised), to the pursuit of policy goals that reflect efficiency, equity or cost recovery objectives. These can be based on a 'benefits received', a 'costs inflicted' or an 'ability-to-pay' criterion. The willingness-to-pay survey work provided by the CIE enables a 'benefits received' approach to be adopted here. Relevant considerations include the study perspective and rationale for conducting the analysis. It is not unusual for multiple formulations to be considered, reflecting nested study perspectives and the range of stakeholders impacted.

Next, we consider the two issues that arise in the CIE report in relation to the symmetry principle. In the CIE report the 'problem reduction approach' is preferred so we will start with those cost/benefit results.

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[4] Well known guidelines in the health sector include: i) Drummond et. al. Methods for the Economic Evaluation of Health Care Programmes, 3rd Edition, Oxford University Press, 2005; ii) Gold et. al. Cost-effectiveness in Health and Medicine, Oxford University Press, New York, 1996 [Washington Panel]; iii) Drummond et.al. Guidelines for authors and peer reviewers of economic submissions to the BMJ, British Medical Journal, 8 (4), 671-682 [CHEERS Statement]; iv) Sugden & Williams The Principles and Practice of Practical Cost-Benefit Analysis, Oxford University Press, 1978. There are many other useful texts that could be listed.

3.2   Problem 1: The CIE 'problem reduction approach' over-counts the cost side:

In the 'problem reduction approach' all costs for each of the five options are included, but only those benefits that result from improved access for those with housing accessibility needs. These benefits include a comprehensive set of cost offsets (such as injury from falls, time in hospital/transition care, etc.), as well as an altruistic benefit to society for improved equity/social justice outcomes. At first glance this seems like a balanced analysis from a targeted problem-reduction viewpoint; but then the principle of symmetry suggests this may not be the case. As the CIE report makes very clear, there are significant benefits from improved functionality and design for the general community that are not included from this perspective (shown in Table 7.3 of the CIE Report). In our view, it is problematic to count all the costs of implementing each option, but only a component of the associated benefits, ignoring those benefits that flow directly from the intervention to the general community[5].

So if the boundary around benefits included is confined to those that flow from assisting a target sub-group, then the cost side needs to be apportioned accordingly between this target sub-group and the general population. If we take a 'benefits received' approach to the apportionment of costs (with benefits as valued by the CIE report WTP tables), then costs should be reduced by a factor of 60%! This factor alone takes the net benefit/cost result of option 3 from -$24,015M to -$6,572M. Set out below in Table ES1 are the benefit cost ratios for each option with this adjustment applied. Options 1 and 5 are now showing a ratio >1 (i.e. benefits > costs), while options 2, 3 and 4 remain with a ratio <1 (i.e. benefit < cost).

Table 6: Benefit-cost ratios adjusted to achieve symmetry in the 'problem reduction' approach

Dalton/Carter re-analysis of benefit-cost ratios	Option 1	Option 2	Option 3	Option 4	Option 5
Problem-Reduction Base case benefit-cost ratios in CIE report in RIS	0.77	0.14	0.11	0.09	**1.00**
Cost apportionment reduced by 60%	**1.29**	0.23	0.19	0.14	**1.67**

Table Note: Results where benefits are higher than costs are shown in green highlight.

Next we go to the more complete representation of benefit in the "willingness-to-pay" approach, where a reciprocal problem exists. Rather than costs being over-attributed to the target group, benefits are being under-counted. We understand the CIE preference for the 'problem-reduction approach', but see this as a consequence of the way in which they have defined benefits, rather than any inherent limitation of a broader approach to measuring social benefit-cost. In our view, the adoption of the 'problem reduction approach' as the primary outcome would present only a partial picture of the benefit cost impacts of the proposed regulation. The remaining re-analyses we present, therefore are all based on the broader WTP approach.

3.2   Problem 2: The CIE 'willingness to pay' approach under-counts the benefit side

In a social cost benefit analysis the normal expectation is that all costs and benefits will be included, irrespective of to whomsoever they accrue. This is the point of adopting a social perspective as opposed to narrower perspectives – such as 'health sector', 'government as 3rd party funder', 'client and caregiver', 'provider, etc. Accordingly, we favour the broader approach that includes all the benefits flowing from the proposed regulation, as well as all the costs. The need to include all benefits,

[5] Only the benefit to society attached to an improvement in equitable access to housing is included. Other benefits to the general community valued in the WTP survey are excluded from these benefit-cost results.

as well as all costs, gives rise to our second concern that not all relevant benefits are included in the CIE WTP approach.

In reference to their two approaches, the CIE report explains that:

> "*The key difference between this approach and the problem-reduction approach is that this approach includes, for Options 1-4, benefits to households that do not currently contain any persons with limited mobility*" (p.114, CIE Report).

Whereas the benefits listed in Table 7.2 of the CIE Report focus on cost-offsets[6] (resource savings), particularly to government, the benefits in Table 7.3 of the CIE report focus on the benefits of enhanced accessibility. The identical value attached to altruism for each option is the only item that is clearly duplicated in both Tables 7.2 & 7.3. The remaining items are shown below in Table 7. From our interpretation of each benefit it appears evident that the two tables cover different aspects of societal benefit that in indeed complementary. The one exception may be home modification costs which is a resource saving that is mentioned in both lists. To accommodate this possibility, we include percentage overlap results to cater for any overlap in this item. To the extent that there is no overlap between in the 'benefits' listed in Table 7, they are all fully additive. **That is, a societal perspective should include consideration of both the potential resource savings plus the value of the improved accessibility.**

Table 7: Comparison of reported benefits in Table 7.2 (problem reduction approach) and Table 7.3 (broader WTP approach) of the CIE report

Table 7.2 (CIE Report)		Table 7.3 (CIE Report)	
CBA Benefit - Problem Reduction Approach	*Interpretation*	**CBA Benefit – Broader WTP Approach**	*Interpretation*
Reduced falls	*The value of resource savings*	Getting in and out	*Value of aspects of accessibility*
Reduced time in hospital/transition care	*The value of resource savings*	Moving around indoors	*Value of aspects of accessibility*
Reduced costs associated with loneliness	*The value of resource savings*	Living with mobility on same level as an entrance	*Value of aspects of accessibility*
Reduced home modification costs	*The value of resource savings*	Minimal modification required for ageing in place	*The value of resource savings*
Reduced carer related costs	*The value of resource savings*		
Reduced incidence of moving	*The value of resource savings*		
Reduced premature/ inappropriate entry to aged care	*The value of resource savings*		

Table Notes: Tables 7.2 and 7.3 are taken from page 112 and p113 respectively, of the CIE Report

Set out below in Table 8 are the benefit cost ratios for each option with altruism counted once and different assumptions about the degree of overlap applied as described above. Options 1 and 5 are

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[6] These cost-offsets include reduced falls, reduced time in hospital/transition care, reduced costs associated with loneliness, reduced home modification costs, reduced care-related costs, reduced incidence of moving, and reduced/inappropriate entry into aged care.

now showing significantly improved ratios >1, while options 2, 3 and 4 show improvement but remain with a ratio <1 (i.e. benefit < cost). Option 2 however (Gold standard) is now much closer to benefits equalling costs at 0.86.

Table 8: Benefit-cost ratios adjusted to achieve symmetry in the 'willingness-to-pay' approach

Dalton/Carter re-analysis of benefit-cost ratios	Assumptions re. benefits from RIS Tables 7.2 & 7.3				
	Option 1	Option 2	Option 3	Option 4	Option 5
WTP Base case benefit-cost ratios in CIE report	0.85	0.30	0.24	0.17	0.89
Benefits overlap 75%	**1.18**	0.32	0.26	0.19	**1.16**
Benefits overlap 50%	**1.59**	0.50	0.40	0.29	**1.32**
Benefits overlap 25%	**2.00**	0.68	0.54	0.39	**1.48**
No overlap of benefits	**2.41**	0.86	0.68	0.49	**1.64**

Table Note: Results where benefits are higher than costs are shown in green highlight.

3.3 Problem 3: The CIE approach to assessing the opportunity cost of space ignore capital gain and utility in use that reduce the net-cost substantially

Moving from the symmetry principle, we now consider the way in which the opportunity cost of space was assessed. It appears that components of benefit were not included in the CIE assessment, viz: i) the re-sale value of the 'capital gain' from the CIE estimate of the additional space; and ii) adequate recognition that in addition to their cost, accessibility features have a 'utility in use' - separate from the consequential problem-reduction benefits.

The CIE report includes the estimated cost of space needed to accommodate the revisions to the NCC. The methods used to estimate the cost of this additional space appear reasonable and are applied in their report to Options 1-4. To estimate the 'value' of this space to the occupier, the CIE reported the results of two conjoint analysis exercises for:

1. The WTP to avoid the transfer of space from living areas and bedrooms to corridors, kitchen, laundry and bathrooms, and

2. The WTP for better outcomes for others (altruism).

Our concern is that the 'value' of this space to the occupants only captures the benefits of enhanced functionality. Importantly, the value of the space is the sum of both the enhanced functionality from improved accessibility (as estimated from the WTP exercises), plus the capital value of the extra space. That is, whilst the opportunity cost is correctly represented by the market value of the additional space, the *minimum* value of that space to the purchaser must be equal to its re-sale value, even if the utility value of accessibility from that additional space is assumed to equal zero.

Furthermore, a wider hallway improves access for all occupants and visitors (particularly for visitors with a disability). Note, this is utility from use as opposed to problem-reduction benefits (e.g. reduced falls) already estimated. More broadly, the analysis assumes that current designs are exactly what

people want and any change from this represents a net cost without any direct utility from use of the space such as a study nook or laundry cupboard[7].

In our suggested re-analysis of these omitted benefits in the CIE report, we include a minimum or floor estimate of the overall benefit as being the retained capital value of the additional space (equal to the market price at the time of purchase). Set out below in Table 9 are the benefit-cost ratios for each option with this adjustment applied, first as a univariate analysis, and then as a multivariate analysis in combination with the adjustment shown in Table 8. Adding a conservative estimate for improved capital value alone brings minor improvement across all ratios. Adding in both the Table 8 analysis and the improved capital value, brings significant improvement across all options. With both the 'no overlap' and '25% overlap' assumptions, virtually all options show benefit-costs greater than 1.

Table 9: Benefit-cost ratios adjusted for improved capital value in WTP approach in both univariate and multivariate analyses

Univariate analysis	Assumptions [benefits from RIS Tables 7.2 & 7.3]				
	Option 1	Option 2	Option 3	Option 4	Option 5
WTP Base case benefit-cost ratios in CIE report	0.85	0.30	0.24	0.17	0.89
Add capital value of space to benefits	**1.23**	0.56	0.53	0.73	**1.00**
Multivariate analysis [benefits from tables 7.2 & 7.3] + [capital value of space]					
Base case benefits	**1.23**	0.56	0.53	0.73	**1.00**
Benefits overlap 75% + Cap value	**1.64**	0.74	0.67	0.83	**1.16**
Benefits overlap 50% + Cap value	**2.05**	0.92	0.81	0.93	**1.32**
Benefits overlap 25% + Cap value	**2.46**	**1.10**	0.95	**1.03**	**1.48**
No overlap of benefits + Cap value	**2.87**	**1.28**	**1.09**	**1.13**	**1.64**

Table Note: Results where benefits are higher than cost are highlighted in green.

3.4 Problem 4: The discount rate used does not reflect current financial/economic thinking or practice

We argue that the choice of a 7 per cent discount rate in the base case analysis does not reflect current thinking and/or practice in the domestic or international settings. We note that the Council of Economic Advisors in the USA issued a brief in 2017, for example, that advised as follows:

*"Current guidance from the office of management and budget requires using both a 7 percent and 3 percent real discount rate in regulatory benefit-cost analyses. **This issue brief reassesses the current choice of discount rates and methodologies for selecting the 3 percent and 7 percent rates**. Empirical evidence suggests that real interest rates around the world have come down since the last evaluation of the rates, and new theoretical advances considering future uncertainty likely suggest lower long term rates, as well. **In general the evidence supports lowering these discount rates**, with a plausible best guess based on the available information being that the lower discount rate should be at most 2 percent while the upper discount rate should also likely be reduced."* (Extract from Issue Brief Abstract, our emphasis)

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[7] It could be argued that the WTP survey should have taken this direct utility into account as it estimated the "WTP to avoid transfer of space from living areas and bedrooms to corridors, kitchen, laundry and bathrooms". That is, the survey respondents should have provided a 'net' response after considering costs and benefits. We don't believe, however, that it is evident that they would have factored this in. Nonetheless we have adopted a very conservative approach to the estimation of utility in use.

While we acknowledge that a discount rate of 7 per cent is in line with the central recommendation from the Australian Office of Best Practice Regulation, it also ignores their own comment in that same 2016 advice, viz:

> *"…the preferred approach is to base the discount rate on market-based interest rates, which indicate the value to the current population of future net benefits".* (Extract from the Australian Office of Best Practice Regulation, 2016 Advice paper)

There are several economic theories that serve as rationales for the use of interest rates in economic and financial appraisal, including the Social Rate of Time Preference and the Social Opportunity Cost of Capital. In reality, irrespective of which theory is favoured, most economists and financial analysts acknowledge that the prevailing bond rate is the best 'rule of thumb' for what the discount rate should be. In 2016, the 10 year bond rate in Australia averaged 2.33 per cent, compared with 0.88 per cent today. Unfortunately, 10 year bond rates are the longest term for which there is an historical series from the RBA. This would suggest that, as a maximum, a 5 per cent discount rate would be much more appropriate, although we would argue that even this rate is too high. We note, for example, that in the RIS prepared by the Department of Planning and Community Development in Victoria in 2010, entitled *Visitable and Adaptable Features in Housing*, a discount rate of 3 per cent was used. Further the discount rate widely used in the health sector is 3 per cent.

It is important to note that the choice of discount rate is not just an esoteric issue for economists and financial analysts - the choice has a huge impact on the benefit-cost ratios reported for the RIS. Given the time profiles adopted for the receipt of benefits and costs in the RIS, any reduction in discount rate will favour the benefit side more than the cost side, adding further weight to the economic credentials of implementing a compulsory regulation. We illustrate this in Table 10 and Table 11 where the key factors for the WTP approach are brought together, namely:

1. providing a complete societal perspective of benefits;
2. estimation of the net-opportunity cost of space; and
3. a more realistic discount rate of 3%

Where the estimated CBA shows a net benefit the cell has been highlighted in green. These results are further illustrated in Figure 1, which shows that many of results of our re-analyses are above the threshold benefit-cost value of 1.00, partitioned in the figure by those results subject to 7 per cent discounting and those subject to 3 per cent discounting.

Indeed there is a strong case to suggest that the benefit-cost ratio for Option 1 (Silver) is greater than 2.0, considerably higher than the base case estimate of 0.77, even when a discount rate of 7 per cent is applied. Similarly, the economic case for Option 2 (Gold) is backed by benefit-cost ratios > 1, even with a 7 per cent discount rate, for both the no overlap and 25 per cent overlap formulations.

Table 10: Benefit-cost ratios adjusted for lower discount rates

| Univariate analysis	Discounted at 3% p.a. (approx.)				
	Option 1	Option 2	Option 3	Option 4	Option 5
WTP Base case benefit-cost ratios in CIE report	0.85	0.30	0.24	0.17	0.89
Add capital value of space to benefits	**1.50**	0.68	0.64	0.89	**1.22**
Benefits overlap 75%	**1.44**	0.39	0.31	0.23	**1.42**
Benefits overlap 50%	**1.94**	0.61	0.48	0.35	**1.61**
Benefits overlap 25%	**2.44**	0.83	0.65	0.47	**1.81**
No overlap of benefits	**2.94**	**1.05**	0.83	0.60	**2.00**
Multivariate Analysis [benefits from tables 7.2 & 7.3] + [Capital value of space]					
Base case benefits	**1.50**	0.68	0.64	0.89	**1.22**
Benefits overlap 75%+Cap value	**1.99**	0.90	0.81	**1.01**	**1.42**
Benefits overlap 50%+Cap value	**2.49**	**1.12**	0.98	**1.13**	**1.61**
Benefits overlap 25%+Cap value	**2.99**	**1.34**	**1.16**	**1.26**	**1.81**
No overlap of benefits + Cap value	**3.49**	**1.56**	**1.33**	**1.38**	**2.00**

Table Notes: As the RIS economic model was not made available for review, the estimate of the impact of reducing the discount rate required assumptions that make these estimates an approximation only. Refer methods outlined below.

Table 11 Summary of benefit-cost ratio results for Dalton/Carter re-analyses

Univariate analysis	Assumptions from CIE Report Tables 7.2 & 7.3 (with 7% discount rate)					Discounted at 3% p.a.				
	Option 1	Option 2	Option 3	Option 4	Option 5	Option 1	Option 2	Option 3	Option 4	Option 5
Base case benefit-cost ratios in CIE report	0.85	0.30	0.24	0.17	0.89	1.27	0.23	0.19	0.16	114
Add capital value of space to benefits	1.23	0.56	0.53	0.73	1.00	1.50	0.68	0.64	0.89	1.22
Benefits overlap 75%	1.18	0.32	0.26	0.19	1.16	1.44	0.39	0.31	0.23	1.42
Benefits overlap 50%	1.59	0.50	0.40	0.29	1.32	1.94	0.61	0.48	0.35	1.61
Benefits overlap 25%	2.00	0.68	0.54	0.39	1.48	2.44	0.83	0.65	0.47	1.81
No overlap of benefits	2.41	0.86	0.68	0.49	1.64	2.94	1.05	0.83	0.60	2.00
Multivariate Add [Benefits from 7.2 & 7.3] + [Capital value of space]										
Base case benefits	1.23	0.56	0.53	0.73	1.00	1.50	0.68	0.64	0.89	1.22
Benefits overlap 75%+Cap value	1.64	0.74	0.67	0.83	1.16	1.99	0.90	0.81	1.01	1.42
Benefits overlap 50%+Cap value	2.05	0.92	0.81	0.93	1.32	2.49	1.12	0.98	1.13	1.61
Benefits overlap 25%+Cap value	2.46	1.10	0.95	1.03	1.48	2.99	1.34	1.16	1.26	1.81
No overlap of benefits + Cap value	2.87	1.28	1.09	1.13	1.64	3.49	1.56	1.33	1.38	2.00

Table Notes: Where CBA>1.00; rounding errors may apply. Application of a 3% discount rate is an approximation as the CIE model was not available.

Figure 2: Results for re-analyses
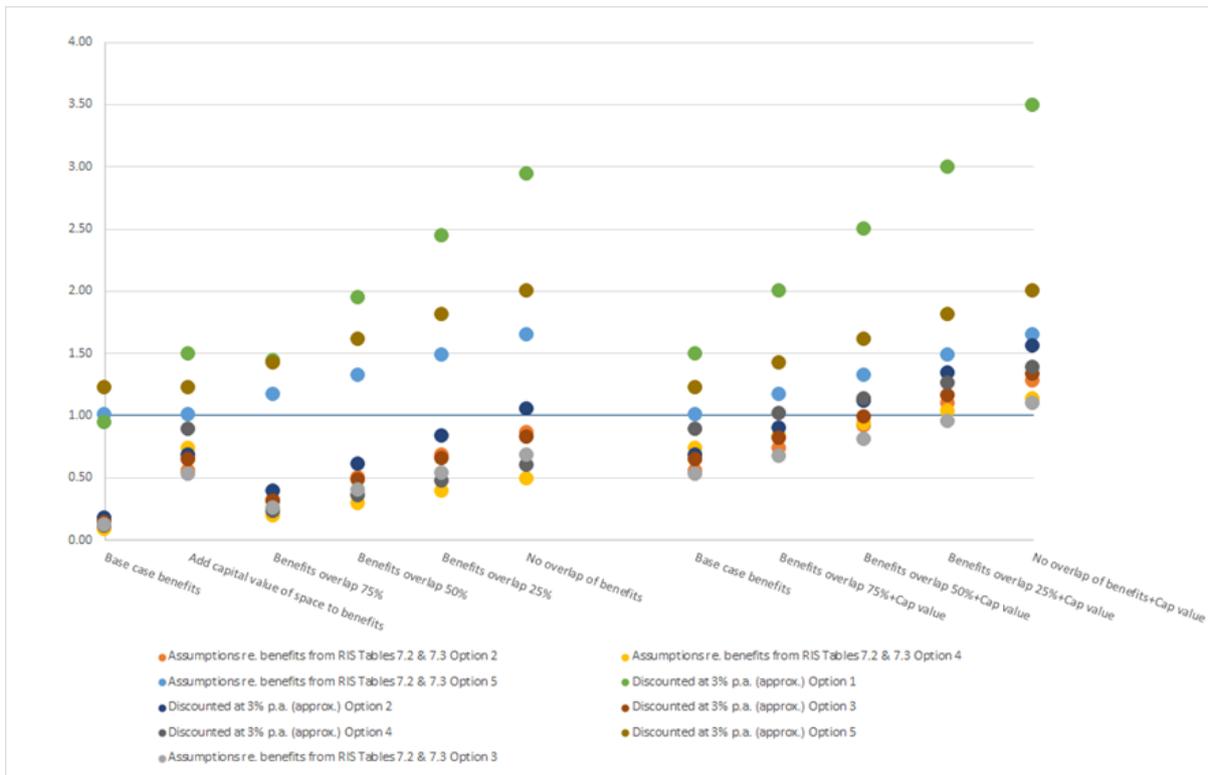
3.4.1 Methods adopted for the re-analysis for a 3% discount rate

The CIE report provides a sensitivity analysis that tests their results at discount rates of 10%, 5% and 3% (refer p.118, Table 7.7 of the CIE Report). As the economic model developed for the CIE report was not made available, it was not possible for us to accurately test the impact of alternative discount rates, particularly when combined with changes to other parameters. This is because the discounted results will vary with the model's predicted distribution of benefits over time. For instance, a discounted left skewed distribution will produce a different and more favourable result to that of a right skewed distribution, where more of the benefits are subject to the effect of discounting over time (***Figure 3: Possible distributions of benefits*** Figure 3). In the absence of knowing the distribution produced by the model, it was necessary to assume a constant or linear distribution (Figure 3).

Figure 3: Possible distributions of benefits

Positive Skew   Negative Skew
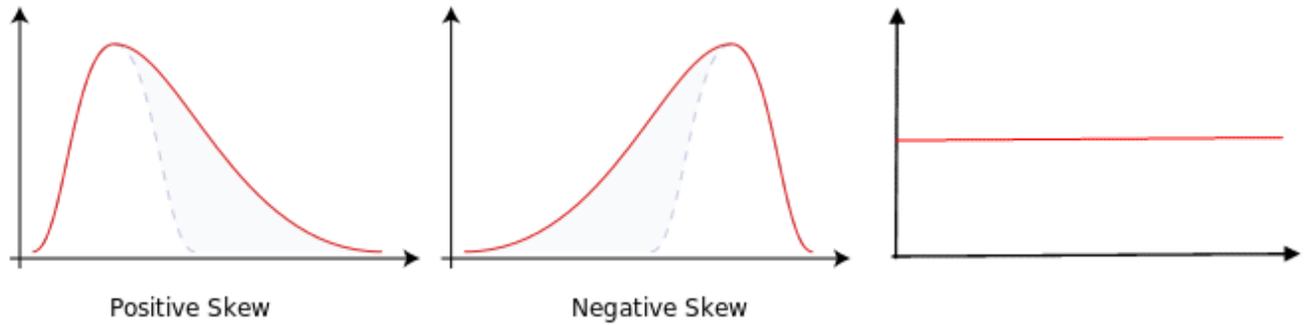
Our methods were derived from the standard formula used to estimate present value:

$$PV = C \times \left[\frac{1 - (1 + r)^{-n}}{r}\right]$$

Where

- C = the benefit ($cash) per period
- PV = present value
- r = discount rate
- n = number of years

To approximate the results of a 3% discount rate upon our re-analyses, we used the following calculations to first determine the present value of benefits and costs per period:

- Using the results reported in Tables 7.2 and 7.3 of the CIE report, the above equation was solved for the present value of payments (PV) using the assumption that the benefit per period (C) was constant. This was performed for each of the Options 1-5, and was performed over a period of 40 years (n) for benefits and 10 years for costs as per the CIE report description of the treatment of benefits and costs in the model.

- The results provided estimates of the undiscounted benefits per period, for each of the 40 years. The calculations were similarly used for costs, but which only accrued for 10 years.

- These results were used to estimate the combined value of benefits from Table 7.3 and Table 7.2 under the different assumptions concerning the degree of overlap of benefits.

To determine the reliability of these methods, our results from our re-construction of the CIE base case model after applying a 3% discount rate were compared to the results reported in the CIE report sensitivity analysis for their 3% sensitivity analysis. This comparison is shown in Figure 4. The comparison suggest that the CIE model may produce a left skewed distribution of benefits as the CBA ratio is less for our reconstruction, however it also suggests that our results are conservative (i.e. the CBA results are likely to be slightly more attractive than what we have estimated). The opposite observation though applies to Option 5 where our results may be more optimistic.

Figure 4: Re-analysis discount rates; comparison of CIE base case and re-calculated results
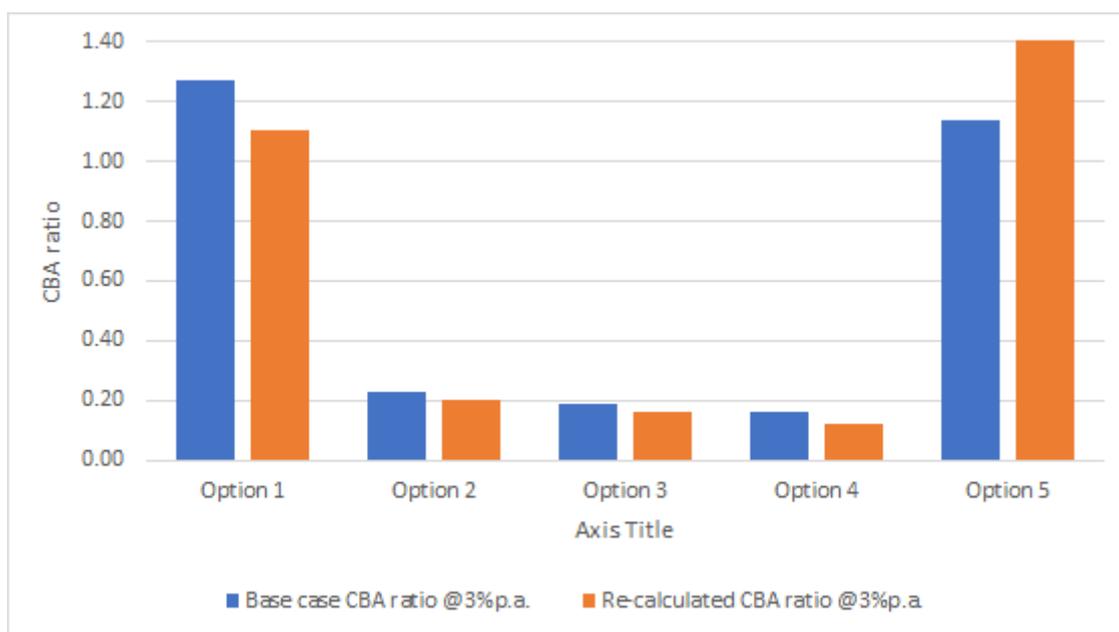
The 3% discount rate results reported for our re-analyses are therefore an approximation, but we believe they provide sufficient precision to demonstrate the order of results that would apply and contribute to policy and regulatory development.

3.5   Other issues

There are a range of other issues that we have not had a chance to incorporate into our assessment, given the limited time available to us and lack of access to the CIE models. We list these issues below as points for clarification and to flag the range of the various implications of the proposed regulation that may not have entered the benefit-cost model. They could be considered, along with the broader social justice considerations raised in Section 2 and other qualitative evidence, as part of a broader social planning balance sheet.

3.5.1: Value of a statistical life:

In estimating the potential offset for premature deaths averted, the CIE utilise the common methodology of applying the value of a statistical life (VSL). One of the doctorate students with Deakin Health Economics has a publication in press on the "Systematic review to establish the value of a statistical life for Australia" with *Health Policy.* The results of this systematic review suggest that the VSL used in the CIE ($4.5M) report is too low and should be replaced with a value of $7.0M [High: $7.9M; Low: $4.5M].

3.5.2: Value of intangibles:

There is no explicit dollar value placed on the potential for reduced 'pain and anxiety' in the CIE analysis, although it may have entered their analyses indirectly. Certainly their problem-reduction approach considered a comprehensive range of issues from a cost offset perspective, but did not seem to cover any associated direct health status impacts for 'pain and anxiety'. Alternatively, 'pain and anxiety' may have entered the conjoint analyses in the WTP approach, but again the scenarios presented and the questions asked don't make this clear. When intangibles such 'pain and anxiety'

are explicitly costed – such as in burden of disease or cost of illness studies - their magnitude can be quite large. Placing dollar values on such morbidity impacts is not straightforward or uncontested. In economic evaluations conducted in the health sector, for example, such health status considerations are often measured through quality of life measurement using a technique called cost-utility analysis (CUA), with results presented as a 'cost per quality adjusted life year (QALY)'. Sometimes analysts convert QALYs to dollar values by applying the decision threshold on what constitutes value-for-money in CUA (such as $50,000 per QALY gained). We raise this issue of intangibles as a point for clarification and to list the range of issues that may not have entered the benefit cost arithmetic.

3.5.3: *Valuation of productivity impacts of premature retirement, premature death and morbidity:*

The approach to treatment of productivity impacts for the disabled in the CIE report only considers the direct link between better housing and potential productivity gains, where we agree that little evidence exists. It is a similar issue in many ways to trying to value "presenteeism", where employees are at work but unproductive for a range of possible reasons. While a direct link between improved housing and improved workforce participation/productivity may be difficult to assess, there are other productivity related impacts that have been subject to extensive measurement in the health economics literature. These relate to the participation/productivity impacts of premature retirement, premature death, hospital visits, medical/allied practitioner visits, etc. for those in the paid workforce. There is also no provision for those not in the paid workforce, which would pick-up carers and other household-based impacts (Household Production Effects).

3.5.4: *Several areas where incremental costing is not applied:*

The approach taken to transition costs (CIE Report, p84), seems over-stated to us, in work environments where staying up-to-date with government codes and regulations would be a routine and ongoing aspect of work. A 'separable cost approach' – where only those costs saved by not implementing the regulation – would seem to be a more appropriate approach. Put another way, if the approach adopted in the CIE report were applied to each and every regulation, then one suspects the costs would be recovered several times over. These costs could be subject to sensitivity analysis.

3.5.5 *Other comments*:

- Safety costs show a very wide range of estimates (refer CIE Report Table 2.20) for hospital, ED and non-hospital treatment but do not appear to be tested in the sensitivity analysis. It would be appropriate to do this using the CIE model given the uncertainty range.

- Benefits in the CIE model continue beyond year 10 for a further 40 years. CIE do not specify the algorithms for doing this and so it is not clear if (and how) they include their estimate of the additional 4-5% of people who acquire a disability **each year**, that is, the population of beneficiaries over the 30-year extension of benefits is not constant.

4 Conclusions

The Consultation RIS prepared by CIE occurs in a complex environment. The regulatory proposal evaluated by CIE is intended to increase the supply of housing that meets the needs of the community, including older Australians and others with a mobility-related disability. The complexity arises from both the diversity of the population with mobility-related disability, and from the variety of programs currently in place that partially meet the needs of people with mobility-related disability. These programs variously subsidise, directly provide or encourage private provision of such housing.

The CIE have made an admirable effort in developing a CBA of the proposed regulatory changes. Given the size and complexity of the task, they are to be commended. Their work provides a sound platform from which to progress and our comments in this report are intended to provide constructive feedback. We nevertheless believe that scope remains for important improvement to more accurately reflect the economic credentials of the proposed regulation. The re-analyses included in this report show that allowance for any one of these improvements would have a significant impact on results. The effect is commensurately greater if their cumulative effect is analysed.

The re-analyses are based upon our four main concerns. The first concern affects the form and construct of the CBA evaluation question, namely:

- **The CIE favours the 'problem reduction approach', but has over-counted the cost side**: The principle of symmetry in the reporting the relationship between costs and benefits is such that if not all the people receiving benefits are counted, then costs should be shared (attributed) in a way that matches the benefit side. To do otherwise would distort the relationship between benefits and costs (i.e. the efficiency in resource use). We wish to note here that the problem reduction approach does have merit. Even if a full societal evaluation of an intervention is shown to be good value (i.e. net benefits), if the intervention only addresses a small part of the problem being addressed, that is important information and provokes consideration of how to address the remaining extent of the problem. This raises the scope for complementary initiatives (such as matching available housing to those with housing needs). So whilst we support retention of the cost reduction approach, we believe the results are given too much weight.

The remaining three issues are either structural or methodological:

- **The CIE 'willingness to pay' approach under-counts the benefit side**: Our Table ES2 (p.6) lists the range of benefits considered in each of Tables 7.2 & 7.3 of the CIE Report. In Section 3.2, we stress the independence of what the benefits are measuring. With the exception of WTP for altruism, Table 7.2 values the benefits of resource savings, whereas Table 7.3 values the improved amenity. These different estimates of benefits are not different ways of measuring the same impacts, but are at least partially if not entirely additive. They should therefore be combined in the CBA.

- **The CIE approach to measuring the opportunity cost of space ignored capital gain**: The monetary value of the additional space required to implement the building code reforms in the CIE report only captures the benefits of enhanced functionality, mainly through increased accessibility. Whereas the purchase cost of the additional space is included in the analysis of costs, the benefits do not recognise the retained value of the asset. The CBA should distinguish between the enduring market value of the asset and the value of the utility from the use of that asset.

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- **The discount rate**: It is understood that the choice of a discount rate of 7% p.a. reflects OBPR guidelines. Whilst the OBPR guidelines provide consistency in the approaches to the evaluation of the impacts of regulatory reforms, there is clearly a consensus amongst economists and financial analysts that 7% is well in excess of the appropriate rate in market circumstances that have prevailed for some time now. We provide indicative results for using a 3% discount rate to all re-analyses.

The cumulative impact of the first two of these methodological issues alone is sufficient to reverse the conclusions of the CIE report. Even allowing for a 7% discount rate and 25% overlap in the benefits contained in Tables 7.2 & 7.3, the CBA ratio ranges from 0.95 for Option 3 up to 2.46 for Option 1. Without overlap, all Options become attractive (>1.00) ranging up to 2.87 for Option 1. If a 3% discount rate is then applied, the CBA ratios increase to between 1.38 and 3.49.

An economic evaluation that takes a full societal perspective would provide a strong case for implementation of Option 1 (Silver) and potentially Options 2 (Gold) & 5 (Subsidy). The additional methodological or social justice issues in Sections 2 and 3 of our report have less impact individually than those highlighted here, but the net effect of their application would be to further strengthen these conclusions. Our inability to access the model meant that it has not been possible to estimate the cumulative impact of these remaining issues.

Thus an economic evaluation that accommodates these changes to the CBA would provide sufficient reason alone to justify adoption of Option 2 (Gold) in the revisions to the building code. It is important to stress that this conclusion derives purely from our re-analysis of the CIE social benefit cost analysis. If the social justice arguments for revisions to the building code discussed in Section 2 are added, the case for reform of the building codes is compelling.

In conclusion, we consider that the economic credentials for all options considered by the CIE are considerably stronger than those presented in their report. While the CIE favoured continuation of a voluntary code, we conclude that a social benefit code analysis based on our advice would underpin the case for adding a regulation to the national building code. We appreciate that the choice of which particular option to specify in a regulation will reflect factors in addition to these benefit cost ratios, including functionality for the elderly and those with disabilities, particularly for those in wheelchairs. Option 2 (Gold standard) has particular merit in this regard, as the most cost-effective of the options that achieve functionality for those in wheelchairs.

Furthermore, given that an effective and efficient market of housing for people with disability requires reliable and detailed information on accessible housing stock, an additional option that might be considered for analysis is a policy package that includes an enhanced matching service between suitable housing and those with housing needs. Indeed, encouraging a match between the stock of accessible housing and those with accessible housing needs is central to the calculation of net benefit in practice.

We therefore suggest that a combination of options should also be assessed, namely combining Option 5 (a subsidy program to encourage availability of accessible rental properties) with Option 1 (Silver standard) and Option 2 (Gold standard). A consideration here is that many of those with accessible housing needs may have insufficient income to compete for accessible housing as it enters the marketplace. As noted above the benefits of the subsidy option exceed the costs, based on our revised analysis, but there will be overlapping benefits with Options 1 or 2 and these should not be double counted. Further analysis of this point should therefore be undertaken utilising the CIE model, to which we do not have access.

Appendix 1

Policy Audit of key human rights frameworks related to housing for persons with disabilities and older people

(Prepared by Alicia Yon, University of Melbourne)

In accordance with Article 11 (1) of the UN International Covenant on Economic, Social and Cultural Rights (ICESCR), housing must be conceptualised as 'adequate housing'. 'Adequate shelter [housing] means ... adequate security [**safety**], adequate privacy [**safety/habitability**], adequate lighting and ventilation [**safety/habitability/health**], adequate space [**accessibility/ safety/habitability**], adequate basic infrastructure [**accessibility/habitability**] and adequate location [**accessibility/affordability**] with regard to work and basic facilities - all at a reasonable cost [**affordability**]' (ICESCR, 1991, p. 2). The bold concepts, including **equity** as a key human rights concept, were used as criteria to evaluate the frameworks in relation to housing-related aspects.

The term 'States Parties' relates to all countries who are signatory to cited international frameworks, including Australia.

Note: all source documents have been hyperlinked.

Framework	Accessibility	Health	Safety/ habitability	Equity	Affordability	Notes
International human rights frameworks for disability and ageing, acceded to by the Commonwealth of Australia						
Universal Declaration of Human Rights (UDHR) Article 25 (1) states: *'Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including [...] housing [...].*	Housing is not adequate if the specific needs of disadvantaged and marginalised groups are not taken into account. Universal design should also be considered as a priority for newly built housing, services and facilities. Physical accessibility is an important component of the right to water.	Housing is not adequate if it detrimentally affects the right to health such as a lack of safe drinking water and sanitation. The health domain is supported by the Right to Water Fact Sheet No. 35.	General comments No. 4 on the right to adequate housing: Housing is not adequate if it does not guarantee physical safety or provide adequate space, as well as protection against the cold, damp, heat, rain, wind, other threats to health and structural hazards.	Right to adequate housing principle of non-discrimination.	General comments No. 4 on the right to adequate housing: housing is not adequate if its cost threatens or compromises the occupants' enjoyment of other human rights.	Considers adequate housing as a basic human right. The UDHR is supported by the Right to Adequate Housing Fact Sheet 21 (Rev. 1).
International Covenant on Economic,	Disadvantaged groups, including the	Article 28 (20): (a) To ensure equal	As above.	Article 2 (2) provides that all of the rights in	As above.	It is the **most important** UN

Framework	Accessibility	Health	Safety/ habitability	Equity	Affordability	Notes
Social and Cultural Rights (ICESCR) Article 11 (1) states: *'The States Parties to the present Covenant recognize the right of everyone to an adequate standard of living for himself and his family, including [...] housing [...].*	elderly, physically disabled, persons with persistent medical problems, and the mentally ill, must be given priority consideration and full and access to adequate housing resources.	access by persons with disabilities to clean water services, and to ensure access to appropriate and affordable services, devices and other assistance for disability-related needs; [...]. States Parties should apply the Health Principles of Housing which view housing as the environmental factor most frequently associated with conditions for disease.		the ICESCR must be exercised without discrimination. Right to adequate housing principle of non-discrimination.		instrument that enshrines the right to housing. The ICESCR is supported by the Right to Adequate Housing Fact Sheet 21 (Rev. 1).
Convention on Rights of Persons with Disabilities (CRPD) Article 19: Living independently and being included in the community. Article 28 (1) states: Adequate standard of living and social protection [...] including **housing**.	Article 3 General principles: (6) accessibility. Article 4 General obligations: accessibility. Article 9 – 1 (a): To enable persons with disabilities to live independently and participate fully in all aspects of life, States Parties shall take appropriate measures to ensure on an equal basis with others through the elimination	Article 4 General obligations: mental health and development. The health domain is supported by the Right to Water Fact Sheet No. 35. Relevant provisions include: water and sanitation facilities must be physically accessible and within safe reach for all sections of the population, taking into account the	In order to promote equality and eliminate discrimination, States Parties shall take all appropriate steps to ensure that reasonable accommodation is provided.	Article 3 General principles: (2) non-discrimination; (3) full and effective participation and inclusion in society. Article 4 General obligations: addresses inequality. Article 4 (b): States Parties must take all appropriate measures, including legislation, to modify or abolish existing laws,	Article 4 (f): To undertake or promote research and development of universally designed goods, services, equipment and facilities, as defined in Article 2 of the CRDP, which should require the minimum possible adaptation and the least cost to meet the specific needs of a person with disability, to promote their	

Framework	Accessibility	Health	Safety/ habitability	Equity	Affordability	Notes
	of physical environment obstacles and barriers to accessibility in relation to housing. Article 9 - 2 (a): To develop, promulgate and monitor the implementation of minimum standards and guidelines for the accessibility of facilities and services open or provided to the public.	needs of [...[persons with disabilities [...] and the elderly.		regulations, customs and practices that constitute discrimination against persons with disabilities . Article 5 (3): States Parties shall take all appropriate steps to ensure that reasonable accommodation is provided.	availability and use, and to promote universal design in the development of standards and guidelines.	
Principles for Older Persons (POP)	Principle 1: Older persons should have access [...] shelter [...]. Principle 5: Older persons should be able to live in environments that are [...] adaptable to personal preferences and changing capacities. Principle 6: Older persons should be able to reside at home [life cycle housing] for as long as possible.	Principle 1: Older persons should have access to adequate water [...].	Principle 5: Older persons should be able to live in environments that are safe [...].	Principle 14: Older persons should be able to enjoy human rights and fundamental freedoms when residing in any shelter [...]. Principle 18: Older persons should be treated fairly regardless of age, gender, racial or ethnic background, disability or other status [...].		These UN principles apply in the absence of a convention on the rights of older persons – currently being lobbied.
	National disability and ageing frameworks, enacted by the Commonwealth of Australia					
Australia's National Action Plan on Human Rights (NAP) The NAP states that all Australians should have access to	Access to full range of areas for older people set out in Living Longer Living Better reform package.	Priority area: health, housing [...]. Priority area: aged care (risk to safety, health or wellbeing of care	Priority area: health, housing [...].	It re-affirms a commitment to improving the housing and living conditions of Australian citizens and the [...] social equity [...] of our cities	It re-affirms a commitment to improving the housing and living conditions of Australian citizens and the	

Framework	Accessibility	Health	Safety/ habitability	Equity	Affordability	Notes
affordable, adequate and appropriate **housing**.	Accessibility initiatives: Accessible Communities grants, Livable Housing Design to make local buildings and public spaces more accessible for people with disability.	recipients is identified).		and regional areas. Priority area: freedom from discrimination (e.g. Livable Housing Design, NDIS).	economic efficiency … of our cities and regional areas.	
National Disability Strategy (NDS)	Strong commitment to affordable housing. Policy area 1: Inclusive and accessible communities - the physical environment including […] buildings and housing […]. NDP underpinned by principles including: universal approach, life course approach, person-centred, independent living.	Policy area 6: Health and wellbeing - health services, health promotion and the interaction between health and disability systems; wellbeing and enjoyment of life.	The Strategy seeks to ensure safety of people with disability through universal design principles. Areas for future action include developing innovations to improve security of housing across all forms of tenure.	Policy area 2: Rights protection, justice and legislation — statutory protections such as anti-discrimination measures […].	Strong commitment to affordable housing - Policy Direction 3: Improve access to housing options that are affordable and provide security of tenure. Adequate housing should not be cost prohibitive. Application of universal design principles […] results in greater efficiency without the needs for without the need for costly add-ons or specialised assistance. Areas for future action include developing innovations to improve affordability of housing across all forms of tenure.	Consultations on developing updated strategy have been put on hold due to COVID-19.

Framework	Accessibility	Health	Safety/ habitability	Equity	Affordability	Notes
Disability Discrimination Act 1992 Cth (DDA)	Section 31: Disability Standards in relation to reasonable adjustments relates to the Disability (Access to Premises – Buildings) relating to access to building, lifts, car parking.	Disability (Access to Premises – Buildings) Schedule 1 Access Code for Buildings A1(d)(iii) (B) impacts on the [...] health [including sanitary and other facilities] of the occupants in relation to the provisions of the BCA.	Disability (Access to Premises – Buildings) Schedule 1 Access Code for Buildings A1(d)(iii) (B) impacts on the safety [...] of the occupants in relation to the provisions of the BCA	Direct and indirect discrimination provisions - Section 23: Access to premises (enter and/or use when renting or trying to rent a room in a boarding house, flat, unit or house). Section 25: Accommodation (full suite of provisions relevant to housing). Disability (Access to Premises – Buildings) Schedule 1, Part 1(1.3)(a): to ensure that dignified, equitable [...] access to buildings, and facilities and services within buildings, is provided for people with a disability.	Disability (Access to Premises – Buildings) Schedule 1, Part 1(1.3)(a): to ensure that cost-effective and reasonably achievable access to buildings, and facilities and services within buildings, is provided for people with a disability.	The DDA is supported by the Disability (Access to Premises – Buildings) contained in Schedule 1 of the BCA.
National Disability Insurance Scheme (NDIS) Relevant guidelines relate to the Specialist Disability Accommodation Design Standard and Home Modifications.	Home modifications Section 34 (1)(d): Reasonable and necessary supports: the support will be, or is likely to be, effective [appropriate in terms of access and use] for the participant, having regard to current good practice. Therefore, consideration	SDA Design Standard includes minimum health requirements in relation to heating, sanitation, weather protection, etc.	SDA Design Standard includes minimum safety requirements in relation to siting, access, etc.		Home modifications Section 34 (1)(c): Reasonable and necessary supports: the support represents value for money in that the costs of the support are reasonable [...].	

Framework	Accessibility	Health	Safety/ habitability	Equity	Affordability	Notes
	must be given to any structural constraints such as size, surrounding terrain, or the condition of the building [...]. Accessibility of standard fixtures and fittings in frequently used rooms and spaces. SDA Design Standard includes minimum accessibility requirements for buildings and car parking.					

Table Notes: