



Proposal to include minimum accessibility standards for housing in the National Construction Code

Consultation Regulation Impact Statement

*Prepared for
The Australian Building Codes Board
July 2020*

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CANBERRA

Centre for International Economics
Ground Floor, 11 Lancaster Place
Canberra Airport ACT 2609

Telephone +61 2 6245 7800
Facsimile +61 2 6245 7888
Email cie@TheCIE.com.au
Website www.TheCIE.com.au

SYDNEY

Centre for International Economics
Level 7, 8 Spring Street
Sydney NSW 2000

Telephone +61 2 9250 0800
Email ciesyd@TheCIE.com.au
Website www.TheCIE.com.au

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Executive summary

Background

In 2017, the Building Ministers' Forum (BMF), with the support of COAG, directed the ABCB to undertake a regulatory impact analysis into the possible inclusion of accessibility requirements for housing (Class 1a buildings and Class 2 apartments) into the NCC.¹ The analysis commenced in 2017-18 with the ABCB undertaking extensive research, consultation and technical analysis, which are outlined in the Consultation section of this paper.

The Centre for International Economics (CIE) were recently engaged by the ABCB to develop a Consultation RIS. In line with the direction of the BMF, the regulatory options assessed by the Consultation RIS are based on the Livable Housing Design Guidelines (LHDG) Silver- and Gold-level specifications, as well as a 'Gold-plus' specification developed through stakeholder consultation.

Terminology

In this RIS, the term 'accessible' is used to describe the housing features that are being proposed, which are based on universal design principles.² It is acknowledged that this may not be the most appropriate term given that the changes being proposed are intended for the mainstream housing market, rather than being in any way specialised or separated from that market.

The term 'accessible' has been retained simply to provide for consistent terminology between this RIS and earlier documents issued by the ABCB in relation to the proposal. It is not intended that the term 'accessible housing' would be used in the text of any change to the NCC.

Why a regulatory proposal?

A key element of a RIS is understanding the nature and size of the matter that the government is seeking to address through a regulatory proposal.

¹ Building Ministers' Forum 2017, *Communique*, 21 April 2017.

² Other similar (but not identical) terms include 'visitabile', 'adaptable', 'livable' and 'universal'.

Finding suitable accommodation is important to all Australians and is a prerequisite for a happy, stable and dignified life.³ There is evidence that people with disability and older Australians have trouble finding housing that meets their needs.

- Based on 2018 data (from the ABS Survey of Disability, Ageing and Carers — SDAC), there are around 2.9 million Australians with a mobility-related disability.
- Extrapolating from ABS population projections, we estimate this will increase to around 4.7 million people over the next 40 years, due to population growth and an ageing population.

That said, responses to questions in the SDAC suggest that the housing needs of many people with a mobility-related disability are already being met.

There are a significant number of policies in place to either subsidise, directly provide or encourage private provision of housing that meets the needs of people with disability and older people. Key policies to ensure that people with disability and older people have access to housing that meets their needs include:

- funding home modifications and other support services (through the NDIS and various aged care policies) to support people with mobility limitations to stay in their own home
- funding for residential aged care places
- planning policies put in place by some state and local governments to encourage private provision of accessible housing
- provision of accessible social and community housing.

Despite these policies and other services available, we have identified a range of potential societal costs that could be (at least partly) avoided through increased provision of accessible housing. This includes the community's preference for equitable outcomes for all members of the community.

These are complex problems and the indicators used to identify the number of people affected, and other information relied on to quantify the benefits, are imperfect. As such, there is significant uncertainty around our estimate of the size of the problem and for some problems we have estimated a range.

- Based on the information available, we estimate that the costs associated with a lack of accessible housing could be in a range between \$2.2 billion and \$2.7 billion per year, with a central case estimate of around \$2.5 billion (based on 2018 data) (table 1). As we have primarily relied on data from the SDAC, this mostly includes the costs for people with permanent disabilities (defined as longer than 6 months).
- If these costs increase in proportion to the number of people with accessibility needs, we estimate that these costs could reach around \$4.5 billion over the next 40 years (chart 2.28).

The 'size of the issue' can be thought of as the societal costs — including social and financial costs incurred by people with mobility-related disability and their families and

³ Commonwealth of Australia 2011, *National Disability Strategy 2010-2020: An initiative of the Council of Australian Governments*, p. 32.

friends, costs incurred by governments, as well as broader societal costs — that could be avoided if everyone lived in accessible housing. Given that much of the existing housing stock does not include all relevant accessibility features, it would not be possible to achieve these potential benefits through changes to the NCC, which apply only to new buildings and new building work.

1 Estimated size of the problem

	Low estimate	Central case	High estimate
	\$ million	\$ million	\$ million
Safety-related costs	41.85	57.35	71.30
Additional time in hospital/transition care	234.59	234.59	234.59
Loneliness-related costs	85.78	194.27	302.76
Home modification costs	599.63	599.63	599.63
Additional carer-related costs	699.42	699.42	699.42
Additional moving costs	14.27	28.73	43.18
Premature/inappropriate entry into aged care	170.17	263.04	381.24
Loss to the community	388.82	388.82	388.82
Total	2 234.52	2 465.83	2 720.93

Source: CIE estimates.

Underlying causes of these issues include the following.

- There is some evidence that a range of market imperfections are limiting the uptake of universal design features, including:
 - home buyers failing to foresee future accessibility needs when they make design choices
 - the characteristics of the housing delivery chain, which can make it difficult for some homebuyers to deviate from standard designs to incorporate accessibility features
 - as many apartments are built to be purchased off the plan, they are designed to appeal to average demand, rather than the specific needs of people with accessibility needs
- Landlords are reluctant to allow modifications for private renters, which means that home modifications are often not an option for renters with accessibility needs
- Many households containing people with disability have low incomes.⁴

Objectives

The objective of the regulatory proposal is to ensure that housing is designed to meet the needs of the community, including older Australians and others with a mobility-related disability.

⁴ Based on SDAC data (see chapter 2 for further details).

Options

The Consultation RIS explicitly considers how accessibility could be improved through the following options.

- **Status quo:** No changes to existing policy settings. This option is used as a baseline against which the costs and benefits of the other options are assessed.
- **Option 1:** Accessibility standard, broadly reflecting LHDG silver standard, in the NCC applying to all new Class 1a and Class 2 buildings.
- **Option 2:** Accessibility standard, broadly reflecting LHDG gold standard, in the NCC applying to all new Class 1a and Class 2 buildings.
- **Option 3:** Accessibility standard, broadly reflecting LHDG gold standard (with some platinum features), in the NCC applying to all new Class 1a and Class 2 buildings.
- **Option 4:** Accessibility standard, broadly reflecting LHDG Gold standard, in the NCC applying to all new Class 2 buildings only.
- **Option 5:** A subsidy program to encourage additional availability of accessible rental properties.
- **Option 6:** An enhanced approach to voluntary guidance, which includes turning the current proposals into a non-regulatory ABCB handbook and other measures to encourage additional uptake of universal design principles, including: a search engine for dwellings certified as complying with the LHDGs and provision of information at the point of sale.

Options 1-5 are included in the cost-benefit analysis (CBA) (where the status quo is used as the baseline). Option 6 is considered qualitatively (we do not quantify the costs and benefits).

Estimated impacts

The CIE's approach to measuring the estimated impact of the proposed regulation was based on:

- a review of initial consultation material, and identify data sources and research
- structured interviews with targeted stakeholders⁵ on an issues paper
- addressing data gaps through sensitivity testing and targeted survey and research
- applying quantity surveyors estimates informed through industry consultation to a partial equilibrium model.

In accordance with best practice, the proposed changes to the NCC (and other options) were examined under a CBA framework. The benefit side of the analysis was examined from two perspectives.

- The central approach was based on our estimate of the extent to which we would expect the proposed changes to the NCC (and other options) to improve the accessibility of housing. Under this approach, most of the benefits are only realised

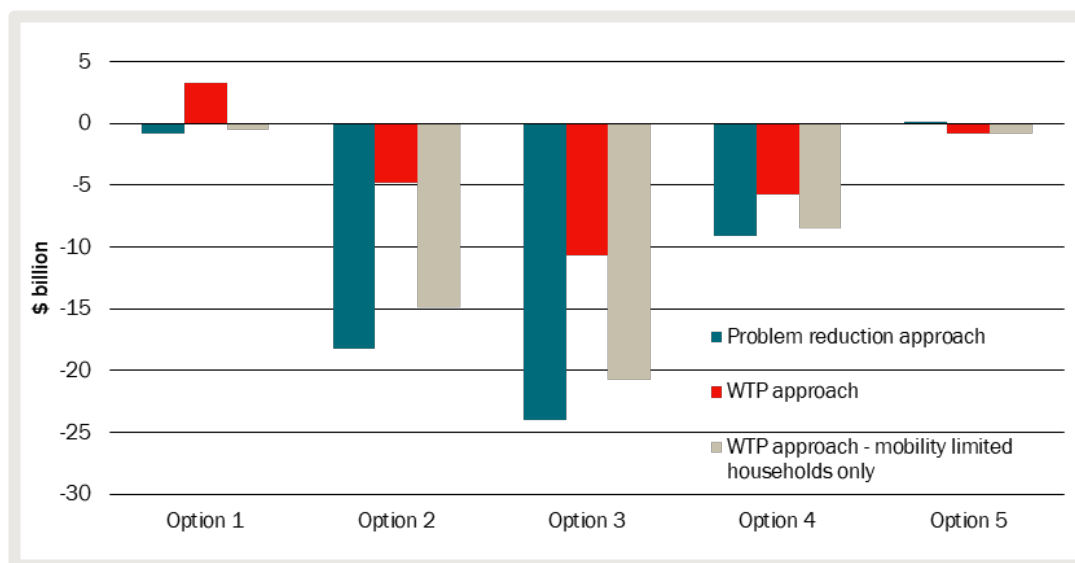
⁵ See consultation summary in Appendix M

when people who require accessible housing occupy the newly built accessible homes (there may also be some benefits from enabling family and friends with accessibility needs to visit).

- The **realised** benefits increase over time as the share of accessible dwellings in the stock increases. By the end of the 10-year regulatory period, the realised benefits reach around 5-6 per cent of the total size of the problem the proposed changes are seeking to address.
- This includes estimates of the societal benefits, reflecting the community’s preference for equitable outcomes for all members of the community.
- The other approach was based on estimates of household willingness to pay (or WTP) for various accessibility features when choosing a home to buy or rent. These estimates were derived from the stated preference survey using ‘choice modelling’ questions that offered hypothetical choices between homes with differing accessibility features and rents.

The CBA results under each of these approaches (including the WTP approach, where only the benefits to households where there is a person with mobility-related disability are included) are shown in chart 2, with further details provided below.

2 Estimated net benefits/costs under various approaches to measuring the benefits



Note: Costs and benefits are presented in net present value terms covering a 10-year regulatory period from 2022 to 2031, using a discount rate of 7 per cent. Benefits are extended out an additional 30 years, reflecting the flow of benefits over the life of dwellings constructed during the regulatory period.

Data source: CIE estimates (see below).

Cost-benefit analysis measuring benefits using the ‘problem reduction’ approach

The CBA results, where the benefits are estimated based on the extent to which each option would address each of the concerns that arise as a result of inaccessible housing are presented in table 3. We use a 10-year regulatory period and a 7 per cent real discount rate, consistent with OBPR requirements.

- The costs reflect the additional construction (and other) costs associated with dwellings constructed over the 10-year regulatory period from 2022.
- As the accessible dwellings constructed over the 10-year regulatory period will provide ongoing benefits over the life of the dwelling, we extend the benefits over an assumed 40-year life. In practice this involves holding estimated benefits constant for an additional 30 years beyond the 10-year regulatory period. Benefits are then tapered to zero over the subsequent 10 years to reflect the lifetime benefits from dwellings built later in the regulatory period.

3 Estimated net benefit/cost – “problem reduction” approach

	Option 1	Option 2	Option 3	Option 4	Option 5
	\$ million	\$ million	\$ million	\$ million	\$ million
Benefits					
Reduced falls	45.68	51.69	54.52	15.13	154.27
Reduced time in hospital/transition care	186.88	211.45	223.04	61.89	631.05
Reduced costs associated with loneliness	154.76	175.11	184.71	51.26	522.59
Reduced home modifications costs	477.67	540.49	570.10	158.20	1 613.01
Reduced carer-related costs	557.17	630.43	664.98	184.53	1 881.44
Reduced incidence of moving	22.88	25.89	27.31	7.58	77.27
Reduced premature/inappropriate entry into aged care	209.54	237.09	250.09	69.40	707.58
Societal benefits	1 031.33	1 106.60	1 106.60	326.25	1 900.96
Total benefits	2 685.92	2 978.76	3 081.34	874.24	7 488.17
Costs					
Construction costs	-1 866.72	-12 384.81	-15 904.40	-3 602.32	0.00
Opportunity cost of space	-1 571.81	-8 831.55	-11 162.57	-6 541.11	0.00
Industry re-training costs	- 28.47	- 28.47	- 28.47	- 28.47	0.00
Subsidy	0.00	0.00	0.00	0.00	-7 455.55
Total costs	-3 467.00	-21 244.83	-27 095.43	-10 171.90	-7 455.55
Net benefit/costs	- 781.09	-18 266.07	-24 014.09	-9 297.66	32.62

^a During targeted consultations, most stakeholders agreed that Gold standard dwellings (under Option 2) would be suitable for most disabilities. Although the Gold + standard (Option 3) provides additional accessibility features (which may provide some benefits), it does not address any additional problem that is not addressed by a Gold standard dwelling. As this approach focuses on addressing identified problems, the estimated benefits of Option 3 are the same as Option 2.

Note: Costs and benefits are presented in net present value terms covering a 10-year regulatory period from 2022 to 2031, using a discount rate of 7 per cent. Benefits are extended out an additional 30 years, reflecting the flow of benefits over the life of dwellings constructed during the regulatory period.

Source: CIE estimates.

We estimate that Option 1 (Silver) is likely to have a small net cost. Sensitivity analysis shows that this Option would broadly ‘break-even’ if either construction costs or space impacts were over-stated by \$538 per dwelling. However, the costs of Option 2 (Gold) and Option 3 (Gold+) would significantly outweigh the benefits under all scenarios tested. A more targeted approach to addressing specific problems (i.e. subsidies to increase the supply of accessible private rental properties) would still be relatively costly, but would also broadly ‘break even’.

Cost-benefit analysis using the economic approach called “Willingness to Pay”

The CBA results, where the benefits are estimated based on survey evidence of the homeowner’s stated WTP for particular accessibility features, are shown in table 4. Consistent with the ‘problem-reduction’ approach, we assume a 10-year regulatory period from 2022, with benefits extended out an additional 30 years to reflect the flow of benefits over the life of the dwelling. All costs, including space-related costs, are the same as those used under the problem-reduction approach.

The WTP approach generally places a higher value on accessible housing than the problem reduction approach. Option 1 (Silver) is estimated to deliver a net benefit, while the other options are estimated to deliver a net cost.

4 Estimated net benefits/costs – ‘willingness to pay’ approach

	Option 1	Option 2	Option 3	Option 4	Option 5
	\$ million	\$ million	\$ million	\$ million	\$ million
Benefits					
Getting in and out	0.00	0.00	0.00	0.00	0.00
Moving around indoors	5 354.20	7 335.76	7 335.76	2 191.92	2 462.30
Living with limited mobility on same level as an entrance	330.27	1 558.63	1 558.63	0.00	605.54
Minimal modification required for ageing in place	0.00	6 423.79	6 423.79	1 919.42	1 685.88
Societal benefits	1 031.33	1 106.60	1 106.60	326.25	1 900.96
Total benefits	6 715.81	16 424.79	16 424.79	4 437.60	6 654.68
Costs					
Construction costs	-1 866.72	-12 384.81	-15 904.40	-3 602.32	0.00
Opportunity cost of space	-1 571.81	-8 831.55	-11 162.57	-6 541.11	0.00
Industry re-training costs	- 28.47	- 28.47	- 28.47	- 28.47	0.00
Subsidy	0.00	0.00	0.00	0.00	-7 455.55
Total costs	-3 467.00	-21 244.83	-27 095.43	-10 171.90	-7 455.55
Net benefit/costs	3 248.81	-4 820.04	-10 670.65	-5 734.30	- 800.87

Note: Costs and benefits are presented in net present value terms covering a 10-year regulatory period from 2022 to 2031, using a discount rate of 7 per cent. Benefits are extended out an additional 30 years, reflecting the flow of benefits over the life of dwellings constructed during the regulatory period. Where benefits reflect zero values, this reflects the element is currently assumed to be provided under that Option.

Source: CIE estimates.

The key difference between the WTP approach and the ‘problem-reduction’ approach is that WTP includes, for Options 1-4, benefits to households that do not currently contain any persons with limited mobility. The survey results suggest that many of these households value accessibility features. Option 5 does not include benefits to these households. For Option 5, the ‘WTP approach includes benefits only to renters with limited mobility, consistent with the ‘problem-reduction’ approach, and arrives at benefit estimates that are of a similar order of magnitude to those for Option 5 under the ‘problem-reduction’ approach.

When WTP benefits in Options 1-4 are aggregated only over households containing a person with mobility-related disability in new homes, the results are similar to those derived using the 'problem-reduction' approach (see table 5).

5 Estimated net benefits/costs – 'willingness to pay' approach applied only to households containing a person with mobility-related disability

	Option 1	Option 2	Option 3	Option 4	Option 5
	\$ million	\$ million	\$ million	\$ million	\$ million
Benefits					
Getting in and out	0.00	0.00	0.00	0.00	0.00
Moving around indoors	1 782.39	2 712.76	2 712.76	810.57	2 462.30
Living with limited mobility on same level as an entrance	125.03	658.68	658.68	0.00	605.54
Minimal modification required for ageing in place	0.00	1 905.69	1 905.69	569.42	1 685.88
Societal benefits	1 031.33	1 106.60	1 106.60	326.25	1 900.96
Total benefits	2 938.75	6 383.73	6 383.73	1 706.24	6 654.68
Costs					
Additional construction costs	-1 866.72	-12 384.81	-15 904.40	-3 602.32	0.00
Opportunity cost of space	-1 571.81	-8 831.55	-11 162.57	-6 541.11	0.00
Industry re-training costs	-28.47	-28.47	-28.47	-28.47	0.00
Subsidy	0.00	0.00	0.00	0.00	-7 455.55
Total costs	-3 467.00	-21 244.83	-27 095.43	-10 171.90	-7 455.55
Net benefit/costs	-528.25	-14 861.10	-20 711.71	-8 465.65	-800.87

Note: Costs and benefits are presented in net present value terms covering a 10-year regulatory period from 2022 to 2031, using a discount rate of 7 per cent. Benefits are extended out an additional 30 years, reflecting the flow of benefits over the life of dwellings constructed during the regulatory period. Where benefits reflect zero values, this reflects the element is currently assumed to be provided under that Option.

Source: CIE estimates.

The differences between the households over which non-societal benefits are estimated and aggregated under the various options and approaches are summarised in table 6. When aggregating benefits over all new homes under the WTP approach, we take account of the fact that the households containing people with mobility-related disability and older persons tend to place a higher value on accessibility features than other households.

6 Summary of main beneficiaries by approach

Approach	Options 1-3	Option 4	Option 5
'Problem-reduction'	Renters with a mobility-related disability, of new homes plus occupants with newly-acquired disabilities in accessible housing	Renters with a mobility-related disability of new apartments plus occupants with newly-acquired disabilities in accessible apartments	Renters with a mobility-related disability of new homes (assumed from year 1 to be all renters with a mobility limitation currently in unsuitable homes)

Approach	Options 1-3	Option 4	Option 5
'Willingness to pay'	All purchasers (other than the first for each home) and renters of new homes	All purchasers (other than the first for each apartment) and renters of new apartments	Renters with a mobility-related disability of new homes (assumed from year 1 to be all renters with a mobility limitation currently in unsuitable homes)

Source: CIE.

Qualitative assessment of enhanced voluntary Guidance

If the results of the WTP study reflect buyers’ true preferences, it suggests that addressing market imperfections, such as information barriers or mismatch, may play a significant role in solving the issue. An enhanced approach to voluntary guidance would help to overcome these imperfections directly and, based on the survey results, may see high uptake of accessibility features under this option.

This option would also have a lower risk of imposing excessive costs, such as dwellings on lots where the costs of complying with the proposed standards are high; or where some buyers have a strong preference for other layouts that do not accord with design elements.

Furthermore, the additional cost of developing a voluntary handbook would be minimal, given the work to underpin a voluntary handbook has already been completed through the development of possible NCC changes.

Conclusions

A key finding is that the CBA results (and the policy conclusions drawn from them) depend on the approach used to measure the benefits.

- Under the approach based on the extent to which the proposed option would address the various ‘problems’ created by housing that does not meet the needs of people with mobility-related disabilities, we estimate that all of the regulatory options considered would impose a net cost on the community.
 - The net cost under Option 1 is estimated to be relatively modest and under some scenarios tested (including a low discount rate), this option is estimated to deliver a net benefit.
 - Option 2 (Gold) and Option 3 (Gold+) would result in a net cost to the community, even when the community’s preference for more equitable outcomes is taken into account.
- Under the approach based on the community’s stated preference for accessible design features, Option 1 is estimated to deliver a net benefit.

A key difference between these approaches is on the issue of whether there are benefits from accessible housing that flow to households that do not have specific accessibility needs.

- Under the ‘problem reduction’ approach, there are implicitly no benefits accruing to households that do not have current accessibility needs, as this does not contribute to reducing an identifiable problem.
- On the other hand, households indicated in the stated preference survey that they have a relatively high ‘willingness to pay’ for accessibility features, even if their household does not contain anyone with a mobility limitation.

However, a relatively high WTP for accessibility features does not align with anecdotal feedback from industry stakeholders. Industry stakeholders noted that although there was growing interest in (and willingness to pay for) accessibility features among older homebuyers, there was little interest from younger buyers. The market failures that prevent households from choosing these design features also appear to be declining over time.

According to OBPR guidance material:

“As a general rule, estimates of individuals’ valuations of goods and services derived from observing their behaviour in markets tend to be more credible than those from survey questionnaires (Boardman et al. 2010). Observing purchasing decisions directly reveals preferences, whereas surveys elicit statements about preferences.”⁶

Given these considerations, it is possible that survey respondents may have overstated their true willingness to pay for accessible design features due to the questions being hypothetical, though it is also possible that willingness to pay revealed by the market is understated due to information barriers. Although every effort has been made to minimise potential biases introduced by the survey design, consistent with best practice approaches, the results from hypothetical choice surveys should always be triangulated with other evidence to check for any bias that may be present.

Furthermore, under the WTP approach, most of the benefits appear to accrue to households that do not have current accessibility needs. This approach therefore implies that the proposed regulatory options deliver a lot of benefits, without solving any immediate problem.

We therefore lean towards the approach based on our estimates of the extent to which the proposed changes to the NCC will address the various issues associated with a lack of accessible housing.

Based on the (in some cases limited) information available, we estimate that the various costs associated with a lack of accessible housing are significant. However, these are complex matters and the indicators used to identify the number of people affected and other information relied on to estimate the size of the issue are imperfect.

Furthermore, including an accessibility standard in the NCC would address these issues relatively slowly, as new accessible housing — as a share of the total housing stock — increases slowly over time. We estimate that the main near to medium-term benefits are due to the increased availability of accessible rental properties.

⁶ Department of the Prime Minister and Cabinet 2016, *Cost-Benefit Analysis*, Guidance Note, Office of Best Practice Regulation, February 2016, p. 11.

Renters are a group that have limited options for meeting their accessibility needs. However, a subsidy program could help to address the particular issues faced by renters in a more targeted way (although the costs of a subsidy program could still be significant). Our estimates suggest that this approach would broadly break-even. That said, subsidised accommodation specifically for members of the community with mobility-related disability would not achieve the broader aspirations of many advocates, including:

- giving members of the community with accessibility needs the same choice of housing available to other members of the community, and
- improving opportunities for people with accessibility needs to visit family and friends.

Although we have not been able to estimate the costs and benefits of an enhanced voluntary approach to guidance, the proposal developed by ABCB could be included in a non-regulatory handbook at minimal cost. Together with some other relatively low-cost measures to overcome barriers to the uptake of universal design principles, this approach could encourage additional uptake, with lower risk of imposing excessive costs on some new dwellings.

Preliminary recommendation

- **Based on the preliminary evidence gathered for the Consultation RIS, the costs associated with including an accessible housing standard in the NCC are estimated to outweigh the benefits under the central estimates for all of the Options tested.**
- **Given the uncertainty around the feasibility of some Options, we recommend that consultation be used to seek feedback and more information on the assumptions, methods and suitability of alternatives.**

Consultation questions

Consultation questions for stakeholders are summarised below.

Chapter 2: Statement of the problem

- Do you agree the problem is adequately established?
 - Does it establish a case for action?
 - Are other problems not identified under the status quo?
- In general, do you agree the RIS adequately describes the extent of these problems, and do you have other evidence which could assist?
- The impact of a lack of accessible housing on equity, dignity and employment outcomes is difficult to fully measure. How does a lack of accessible housing contribute to these issues?
- Are the assumptions made to estimate the costs to the community from a lack of accessible housing (set out in Appendices A to H) appropriate and is there other evidence that could be considered?
- What other information could be used to estimate the costs associated with a lack of accessible housing to make estimates more reliable?
- For home modifications made to improve the accessibility of a home, do stakeholders have data on the type and cost of those home modifications that actually proceed?
- In your opinion, what is the main contributor to a lack of uptake of universal design principles in new dwellings:
 - Buyers failing to think about their future accessibility needs?
 - Volume builders are reluctant to deviate from standard plans?
 - Other barriers?

Chapter 3: Objectives and options

- Which of the options considered in the Consultation RIS in your opinion are feasible?
- Are there other feasible regulatory or non-regulatory options with the potential to meet the objective that should be considered?
 - Applying the accessibility standards to only Class 1a or Class 2 dwellings?
 - Applying the accessibility standards to only a proportion of Class 1a or Class 2 dwellings? How would this be done in practice?
 - Applying a different combination of the LHDG elements?
 - Applying a subset of the LHDG elements (e.g. step-free entry, wider doorways)?
 - Another option?
- Do all of the options, in your opinion, have the ability to meet the objective?
 - How could these be enhanced?
- Are there any less intuitive or unintended consequences likely to arise from any of these options?

- Of the options discussed above, in your opinion which would be most effective at achieving the objective?

Chapter 5: Estimating the costs

- Are the scenarios of possible impact (DCWC descriptions) broadly representative of the scale of the adjustments required for designs to comply with the proposed accessibility standards (Options 1-3)?
- For each of the building types, are the weighted average cost estimates broadly representative of the additional construction costs to comply with the proposed accessibility standards (Options 1-3)?
- Can you provide evidence to inform the cost weightings? (See Appendix I)
- Do you agree with the approach taken to valuing the opportunity cost of the additional space required?
 - What alternative methodologies could be considered?
- Are additional excavation costs likely to be incurred in order to provide homes that comply with Options 1-3?
- Are the cost estimates presented in table 5.12 reasonable? If not, what are your alternative estimates and the basis for the estimates?
- Are there any other costs (e.g. transition costs) not identified for builders in transitioning to a new accessibility standard under regulatory Options 1-3?
- Can you provide any other relevant information on the costs to inform the impacts of the options?

Chapter 6: Estimating the benefits

- Are our assumptions relating to the occupation of accessible housing by owner occupiers and renters over time reasonable? What additional evidence could we consider to make these assumptions more robust?
- Do you agree with the assumption of the extent features are currently not provided in new dwellings?
- Do you have any evidence of the extent that accessibility features similar to those required by Options 1-3 are provided in new dwellings under current arrangements?
- Where dwellings have some accessibility features but not others, would this reduce the size of the problem? In your opinion, by how much? (please provide your reasoning/data for your estimate).
- Do you agree with the assumption that additional features required under accessibility standards in Option 2 and Option 3 would increase the number of beneficiaries compared to Option 1?
- To avoid attributing benefits to accessibility features already installed in dwellings under current arrangements, the impacts of the proposal have been reduced in proportion to those elements assumed prevalence and weighted average cost. What additional evidence could we consider to make this assumption more robust?

- There is a mismatch between the amount of accessible housing being built and the apparent willingness of many survey respondents (including households without any members with limited mobility), to pay above cost for the Option 1. What explanations are there that could explain this mismatch? Is this a reflection of the market failure?

Chapter 7: Cost benefit analysis

- To what extent would better information provision and promotion of an enhanced non-regulatory approach (Option 6) be effective in encouraging additional uptake of universal design principles in new dwellings?
- Which option is your preferred option?

1 *Background and introduction*

Background

In late 2009, the National Dialogue on Universal Housing Design brought together key stakeholders from the residential building and property industry, the ageing, disability and community support sector and all levels of government to discuss how housing could be designed and built to better respond to the changing needs and abilities of people over their lifetime. Members of the Dialogue were:

- Australian Human Rights Commission
- Australian Institute of Architects
- Australian Local Government Association
- Australian Network for Universal Housing Design (ANUHD)
- Building Commission Victoria
- COTA Australia
- Grocon
- Housing Industry Association
- Lend Lease
- Master Builders Australia
- National People with Disabilities and Carers Council
- Office of the Disability Council of NSW
- Property Council of Australia
- Real Estate Institute of Australia
- Stockland.

National Dialogue members:

- recognised that traditionally most homes have not been designed or built in a way that can easily accommodate the changing needs of households over their lifetime
- agreed that there is a need to develop a national approach to the issue of Universal Housing Design. Such an approach would resolve the confusion of definitions and approaches to improving access in and around our homes making them easier and safer to live in for all people, regardless of age or ability
- believed it is important that the community at large is informed and educated about the benefits of Universal Housing Design
- agreed to work together to explain to the Australian community the benefits of Universal Housing Design – that it is about making homes easier and safer for young

families, people who have short or long-term injuries or illnesses, as well as senior Australians and people with disability.⁷

The National Dialogue members also agreed to pursue an aspirational target that all new homes will be of an agreed Universal Housing Design standard by 2020 with interim targets to be set within that 10-year period. A strategic plan was released in 2010 to support the achievement of the aspirational targets — a key milestone in that plan was the release of the Livable Housing Design Guidelines (LHDGs) and Strategic Plan.

ANUHD (a member of the Dialogue) estimated that currently only around 5 per cent new home built comply with the LHDGs, although industry stakeholders have argued that the true proportion is closer to 10 per cent.

During ABCB's consultation process, some stakeholders noted to the role of the United Nations Convention on the Rights of Persons with Disabilities (CPRD) (see box 1.1), in the context of considering a minimum accessibility standard. Australia ratified the CRPD in 2008, reflecting the Australian Government's commitment to promoting and supporting the equal and active participation by people with disabilities in all areas of public life. The obligations under the CRPD with respect to accessible housing are progressively realisable. Australian governments are obliged, therefore, to take steps to the maximum of available resources with a view to progressively realising the right over time. All Australian governments have a range of measures in place to support the provision of housing for people with disabilities.

The *National Disability Strategy 2010-2020*, an initiative of the Council of Australian Governments, provides a high-level policy framework for disability policy in Australia and aligns to the international obligations of the UN CRPD. The National Disability Strategy has six outcomes, each having a number of Policy Directions which governments should have regard to when developing programs. Accessible housing falls under Outcome One and Policy Direction Three:

Outcome 1: Inclusive and accessible communities.

People with disability live in accessible and well-designed communities with opportunity for full inclusion in social, economic, sporting and cultural life.

Policy Direction 3 — Improved provision of accessible and well-designed housing with choice for people with disability about where they live.

The National Disability Strategy discusses the importance of taking a universal design approach to programs, services and facilities as an effective way to remove barriers that exclude people with disability.

⁷ National Dialogue on Universal Housing Design 2010, *Strategic Plan*, July 2010, pp. 1-2.

1.1 United Nations Convention on the Rights of Persons with Disabilities

As set out in the AHRC submission to ABCB's Options Paper,⁸ the general principles of the Convention on the Rights of Persons with Disabilities (set out in Article 3) that are relevant to housing include:

- full and effective participation and inclusion in society
- respect for difference and acceptance of persons with disabilities as part of human diversity and humanity
- equality of opportunity
- accessibility.

The AHRC also noted in its submission other relevant articles of the CPRD:⁹

- State Parties (under Article 4(f)), undertake to:
 - promote research and development of universally designed goods, services, equipment and facilities which should require the minimum possible adaptation and the least cost to meet the specific needs of a person with disabilities
 - promote universal design in the development of standards and guidelines.
- State Parties shall take appropriate measures to ensure persons with disabilities have access to, on an equal basis with others, the physical environment, including housing. These measures shall include the identification and elimination of obstacles and barriers to accessibility (Article 9).
- State Parties recognise the equal right of all persons with disabilities to live in the community, with choices equal to others, and shall take effective and appropriate measures to facilitate full enjoyment by persons with disabilities of this right and their full inclusion and participation in the community. This will include by ensuring that persons with disabilities have the opportunity to choose their place of residence and where and with whom they live on an equal basis with others and are not obliged to live in a particular living arrangement (Article 19).

In mid-2017, the Prime Minister, on behalf of the Building Ministers' Forum (BMF), proposed to the Council of Australian Governments (COAG) that a national Regulation Impact Statement (RIS) be prepared to consider applying a minimum accessibility standard for private new dwellings in Australia through the National Construction Code (NCC).¹⁰ This was subsequently agreed by COAG. The BMF confirmed in October 2017 that the RIS would, in consultation with Disability Ministers, examine the silver and gold performance levels as options for a minimum accessible standard; use a sensitivity approach; and be informed by appropriate case studies. The BMF agreed the analysis will take into consideration the relevant policy objectives such as the National

⁸ Referred to Australian Building Codes Board, Accessible Housing Options Paper, Consultation Report, April 2019, pp. 16-17.

⁹ United Nations website, <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/article-9-accessibility.html>, accessed 6 February 2020.

¹⁰ Building Ministers' Forum 2017, *Communique*, 21 April 2017.

Disability Strategy (NDS), enabling ageing in place, reducing social exclusion and any reduction in providing specialist accommodation.

The accessibility of housing in Australia was recently raised by the Committee on the Rights of Persons with Disabilities (the Committee) in its Concluding Observations on the combined second and third periodic reports of Australia (Concluding Observations), following Australia's appearance before the Committee in September 2019. Concluding Observations are non-binding recommendations that do not extend or amend Australia's obligations under the CRPD. In its Concluding Observations the Committee expressed concerns about the significant proportion of existing inaccessible built environment and the lack of mandated national access requirements for housing in the National Construction Code. Furthermore, the Committee recommended that Australia amend its federal law to include mandatory rules on access for all new and extensively modified housing.

Consultations presented differing views on the extent to which Australia has a legal obligation to implement the Committee's recommendations.

- According to the Australian Government, the Committee's recommendations (including those made as part of the Committee's Concluding Observations in October 2019) are not legally binding rather the committee's views in regard to how Australia is progressing with implementing treaty obligations.¹¹ Nevertheless, the Australian Government considers all recommendations of the Committee, with the RIS contributing to that process.
- Several stakeholders advocated the view that Australia has a legal obligation under the CRPD to implement the Committee's recommendations.

Development of the proposal and stakeholder consultation

In September 2018, ABCB released an Options Paper, which set out a preliminary menu of options and costings to seek broader community and industry input, refine the details of the objectives, options and terminology that will be considered in a formal RIS. ABCB consulted widely with stakeholders, through:

- consultation forums — ABCB held consultation forums in each capital city during October and November 2018
- written stakeholder submissions — ABCB received 179 submissions from a wide range of organisations and individuals between September 19 and 30 November 2018.

ABCB released a Consultation Outcomes Report summarising stakeholder feedback on the Options Paper in April 2019 and related matters.

ABCB has subsequently developed a formal proposal, including 3 options for minimum accessibility standards for Class 1a (houses) and Class 2 (apartments) dwellings that broadly align with the Livable Housing Design Guidelines (LHDG) produced by Livable Housing Australia. Other accommodation types are not considered in scope on the basis

¹¹ Based on the Commonwealth's position found at <https://www.ag.gov.au/rights-and-protections/human-rights-and-anti-discrimination/united-nations-human-rights-reporting>.

that they are subject to D3.1 of NCC Volume One, or are for specific purposes such as caretaker's residences.

- Option 1 is based on the LHDG silver standard
- Option 2 is based on the LHDG gold standard
- Option 3 is based on the LHDG gold standard, plus some additional features from the platinum standard.

The proposals were refined based on feedback from the Options Paper and underwent further period of technical review with a reference group comprised of Building Codes Committee members and other experts, resulting in a final proposal for public consultation. Reference group membership includes:

- Australian Institute of Architects (AIA)
- Australian Institute of Building Surveyors (AIBS)
- Housing Industry Association (HIA)
- Master Builders Australia (MBA)
- Two accessibility consultants.

The RIS process

As with all proposals to change the NCC, the proposal must go through the RIS process. ABCB has engaged the Centre for International Economics (CIE) to prepare a Regulation Impact Statement (RIS). This included a program of targeted consultation with 21 stakeholders covering advocacy groups, industry, governments to establish the current body of knowledge on the nature and extent of the problem and feasible policy alternatives.

The RIS process is designed to ensure that regulatory decisions are consistent with the Principles of Best Practice Regulation agreed by COAG (box 1.2).

1.2 Principles of Best Practice Regulation¹²

COAG has agreed that all governments will ensure that regulatory processes in their jurisdiction are consistent with the following principles:

- 1 establishing a case for action before addressing a problem
- 2 a range of feasible policy options must be considered, including self-regulatory, co-regulatory and non-regulatory approaches, and their benefits and costs assessed
- 3 adopting the option that generates the greatest net benefit for the community
- 4 in accordance with the Competition Principles Agreement, legislation should not restrict competition unless it can be demonstrated that:
 - a) the benefits of the restrictions to the community as a whole outweigh the costs, and

¹² Council of Australian Governments 2007, *Best Practice Regulations: A Guide for Ministerial Councils and National Standards Setting Bodies*, October 2007, p. 4.

- b) the objectives of the regulation can only be achieved by restricting competition
- 5 providing effective guidance to relevant regulators and regulated parties in order to ensure that the policy intent and expected compliance requirements of the regulation are clear
- 6 ensuring that regulation remains relevant and effective over time
- 7 consulting effectively with affected key stakeholders at all stages of the regulatory cycle, and
- 8 government action should be effective and proportional to the issue being addressed.

Several stakeholders advocated for minimum accessibility standards on human rights grounds. These arguments can be summarised as follows.

- People with disabilities should have the same access and housing choices as other members of the community. They should have access to mainstream housing options, rather than segregated housing that specifically caters for those with accessibility needs.
- Australia has an obligation to implement the recommendation of the Committee on the Rights of Persons with Disabilities to introduce a minimum accessibility standard into the NCC.¹³

While respecting these views, it is important to note that a RIS must follow the process set out in the COAG Guidelines.¹⁴ Key elements of this process include:

- clearly identifying the fundamental problem(s) that need to be addressed
- clearly articulating the objectives (that do not pre-justify a preferred solution)
- identifying a range of viable options
- an analysis of the costs and benefits of the feasible options (i.e. a cost-benefit analysis)
- identifying the preferred option by demonstrating that:
 - the benefits of the proposal to the community outweigh the costs, and
 - the preferred option has the greatest net benefit for the community, taking into account all the impacts.

Satisfying these RIS requirements may to some extent seem at odds with a human rights focused view of the problem advanced by some advocates. Nevertheless, as a RIS was requested by the BMF and is required for changes to the NCC under ABCB's Intergovernmental Agreement, we are obliged to follow the approach set out in the COAG RIS Guidelines.

¹³ Note that the CIE is not in a position to offer a legal opinion on whether Australia has an obligation to implement the recommendations of the Committee on the Rights of Persons with Disabilities.

¹⁴ Council of Australian Governments 2007, *Best Practice Regulations: A Guide for Ministerial Councils and National Standards Setting Bodies*, October 2007.

Targeted stakeholder consultation

To further inform the development of the Consultation RIS, the CIE has undertaken a targeted consultation process over the November 2019 to May 2020 period.

Consultations were guided by an Issues Paper setting out the CIE's preliminary views on the issues that need to be addressed in the RIS. Table 1.3 summarises the consultations in the preparation of the Consultation RIS. More details are provided in appendix M.

1.3 Summary of stakeholder consultations

Stakeholder group	Date of discussion
Costing workshop	
Housing Industry Association	29 November 2019
Master Builders Australia	29 November 2019
Galbraith Scott	29 November 2019
Separate discussions	
Australian Network of Universal Housing Design (ANUHD)	26 November 2019
Galbraith Scott	29 November 2019
University of NSW	9 December 2019
Centre for Universal Design Australia	9 December 2019
ADACAS	17 December 2019
Department of Social Services	4 December 2019
Master Builders Australia	12 December 2019
Housing Industry Association	13 December 2019
Occupational Therapists Australia	13 December 2019
Australian Association of Gerontology	18 December 2019
University of Technology Sydney	18 December 2019
Australian Human Rights Commission	18 December 2019 14 May 2020
National Disability Insurance Agency	19 December 2019 31 January 2020
Transport Accident Commission (Victoria)	23 January 2020
Sekisui House	24 January 2020
Royal Commission into Aged Care Quality and Safety	19 May 2020
Young People in Nursing Homes	27 May 2020
The Summer Foundation	28 May 2020

Source: CIE.

This report

This report is a Consultation RIS for the proposal to include accessible housing standards in the NCC. The remainder of this report is structured as follows.

- Chapter 2 sets out the problem
- Chapter 3 specifies the objectives and a range options for achieving the objectives
- Chapter 4 identifies the impacts of the proposed options and sets out the cost-benefit analysis framework used to assess them
- Chapter 5 estimates the costs associated with each option
- Chapter 6 estimates the benefits associated with each option
- Chapter 7 brings together the costs and benefits in a cost-benefit analysis framework
- Chapter 8 concludes.

2 *Statement of the problem*

Summary

A key element of a RIS is understanding the nature and size of the problem (or issue) that government intervention would address through a regulatory proposal.

- Based on 2018 ABS data, there are around 3 million Australians with a mobility limitation due to disability.
- We estimate this will increase to around 5.75 million people over the next 40 years, due to population growth and the effects of an ageing population.

Finding suitable accommodation is important to all Australians and is a prerequisite for a happy, stable and dignified life.¹⁵ There is evidence that people with disabilities and older Australians have trouble finding housing that meets their needs. Housing that is inaccessible for people with mobility limitations can impose various costs on those people and their families and the community more broadly. These costs include:

- safety-related costs where people with mobility limitations remain living in housing that does not meet their accessibility needs, they are at higher risk of falls
- costs associated with additional care needs where people with accessibility needs remain living in housing that does not meet their accessibility needs
- unnecessarily high costs associated with home modifications
- costs associated with avoidable moves to more suitable accommodation
- costs associated with longer stays in hospital and transition care, where discharge is delayed due to their home lacking accessibility features
- costs associated with loneliness, where people with accessibility needs are unable to leave their own house as frequently as they would like or are unable to visit friends and relatives (people without accessibility needs may also be impacted if family and friends with accessibility needs are unable to visit them)
- additional costs associated with inappropriate or premature entry into residential aged care (or other institutional care) due to dwellings lacking accessibility features.

In addition, there is a cost to the community where vulnerable members of the community, such as people with disabilities and older Australians do not have access to housing that meets their needs. This reflects the community's preference for equitable outcomes for these vulnerable members of the community.

There are a significant number of government policies in place to either subsidise, directly provide or encourage private provision of housing that meets the needs of people

¹⁵ Commonwealth of Australia 2011, *National Disability Strategy 2010-2020: An initiative of the Council of Australian Governments*, p. 32.

with disabilities and older people. Key policies to ensure that people with disabilities and older people have access to housing that meets their needs include:

- funding home modifications and other support services (through the NDIS and various aged care policies) to support people with mobility limitations to stay in their own home
- funding for residential aged care places
- planning policies put in place by some state and local governments to encourage private provision of accessible housing
- provision of accessible social and community housing.

Despite these policies and other services available, we have identified a range of costs that could potentially be avoided through increased provision of accessible housing. These are complex matters and the indicators used to identify the number of people affected and other information relied onto to quantify the benefits are imperfect. As such there is significant uncertainty around our estimate of the size of the problem and for some issues, we have estimated a range.

- Based on the information available we estimate that the costs associated with a lack of accessible housing could be in a range between around \$2.2 billion and \$2.7 billion per year, with a central case estimate of around \$2.5 billion (based on 2018 data) (table 2.1). As we have primarily relied on the ABS Survey of Disabilities, Ageing and Carers, these costs mainly relate to people with a long-term disability (defined as longer than 6 months).
 - The estimates of additional time spent in hospital and/or transition care would include people with shorter-term mobility impairments.
 - However, other costs relating to people with shorter-term mobility impairments have not been included, due mainly to data limitations.
- If these costs increase in proportion to the number of people with accessibility needs, we estimate that these costs could increase to between around \$3.4 billion and \$4.1 billion per annum by 2040, with a central case estimate of \$3.7 billion.

2.1 Estimated size of the problem (per year)

	Low estimate	Central case	High estimate
	\$ million	\$ million	\$ million
Safety-related costs	41.85	57.35	71.30
Additional time in hospital/transition care	234.59	234.59	234.59
Loneliness-related costs	85.78	194.27	302.76
Home modifications	599.63	599.63	599.63
Additional carer-related costs	699.42	699.42	699.42
Additional moving costs	14.27	28.73	43.18
Premature/inappropriate entry into aged care	163.61	254.61	370.43
Costs to the community	388.82	388.82	388.82
Total	2 227.96	2 457.40	2 710.12

Source: CIE estimates.

Underlying causes of these issues include the following.

- There appear to be a range of market imperfections, including:
 - some homebuyers (particularly younger homebuyers) are failing to foresee future accessibility needs when they make design choices
 - the characteristics of housing delivery chain, which can make it difficult for some homebuyers to deviate from standard designs to incorporate accessibility features
 - as many apartments are built to be purchased off the plan, they are designed to appeal to the market’s average demand, rather than the specific needs of an individual buyer.
- Landlords are reluctant to allow modifications for private renters, which means that home modifications are often not an option for renters with accessibility needs.
- Many households containing people with disabilities have low incomes.

The need for accessible housing

ABCB define ‘accessible housing’ as any housing that includes features that enable use by people either with a disability or transitioning through life stages.¹⁶ Based on the findings from the literature on accessible housing and consultations with stakeholders, accessible housing can potentially:

- reduce the incidence of falls for people with mobility limitations
- reduce care needs
- reduce costs associated with home modifications
- avoid the need for people who acquire a mobility-related disability to move to more suitable accommodation
- reduce the length of hospital stays
- increase the ability of people with disabilities and the elderly to participate in society
- reduce the inappropriate or premature entry into aged care or other institutional care.

Some stakeholders argued there are also likely to be economic benefits from an increase in employment opportunities for people with mobility-related disabilities. There is related literature that provides relevant insights into this issue; however, we were not able to identify any direct quantifiable evidence to support the qualitative evidence.

Despite these benefits, many new dwellings are not being built to meet the current and future accessibility needs of all members of the community, including people with mobility impairments, such as older people and people with disabilities and other long-term health conditions, as well as those with temporary mobility impairments.

As each individual with a disability (including ageing members of the community) will have specific accessibility needs, it is not possible to design houses that will meet the

¹⁶ ABCB 2018, *Accessible Housing: Options Paper*, September 2018, p. 4.

needs (including accessibility needs) of all members of the community. However, under universal design principles houses are designed for the widest number of people.¹⁷

To meet the needs of members of the community with mobility impairments, housing should be:¹⁸

- easy to enter (and leave)
- easy to navigate in and around
- be capable of easy and cost-effective adaptation
- be responsive to the changing needs of home occupants.

People with mobility impairments don't just have accessibility needs but also have needs and preferences beyond accessibility, including preferences relating to the type of housing they live in, location and other factors.

According to the National Disability Strategy, finding suitable accommodation is important to all Australians and is a prerequisite for a happy and stable life. However, there is evidence that many people with accessibility needs are not able to secure suitable housing.

- The current National Disability Strategy notes there is evidence that people with disability experience substantial barriers in finding a place to live, especially in the private market. Housing designs that do not allow the building structure of the home to change to meet the needs of a person who is ageing or who has a disability without significant expense is identified as a key barrier.¹⁹
- A survey conducted by an advocacy group, the Australian Network for Universal Housing Design (ANUHD), found that 68 per cent of respondents had experienced difficulty in finding accessible housing.
- During the CIE's targeted consultations, multiple stakeholders provided anecdotal evidence of people with disabilities experiencing difficulties in finding suitable accommodation.

Number of people that potentially have accessibility needs

As noted above, under universal design principles, houses should be designed for the broadest group of people. This implies that all people could benefit to some extent from some accessibility features (relative to existing designs that do not incorporate these features). That said, the main group of people that would benefit from more accessible housing are those with mobility impairments.

¹⁷ Bringolf, J. 2011, *Barriers to Universal Design in Housing*, A thesis submitted for the degree of Doctor of Philosophy, Urban Research Centre, College of Health and Science, University of Western Sydney, September 2011, p. 54.

¹⁸ These features are consistent with the Livable Housing Design Guidelines definition of 'livable' housing.

¹⁹ Commonwealth of Australia 2011, *National Disability Strategy 2010-2020: An initiative of the Council of Australian Governments*, p. 32.

There is no definitive source of information available on the number of people with specific accessibility needs in relation to housing. The most comprehensive source of information available on the number of Australians with disabilities is the Australian Bureau of Statistics (ABS) Survey of Disabilities, Ageing and Carers (SDAC). The ABS defines people with a disability as people who have any limitation, restriction or impairment which restricts everyday activities and has lasted, or is likely to last, for at least six months.²⁰

According to the 2018 edition of the SDAC, there were around 2.98 million people (around 12 per cent of the population) with a disability that results in a mobility limitation in 2018 (table 2.2). For around 1.39 million of these people, the mobility limitation is ‘mild’. The remaining 1.59 million people have moderate, severe and profound mobility limitations.

2.2 Number of people with a disability who have a mobility limitation

	0-14 years	15-64 years	65+ years	Total	Share of total
	'000	'000	'000	'000	Per cent
Profound	78.8	168.3	384.9	632.0	2.6
Severe	50.2	248.0	220.3	518.5	2.1
Moderate	1.9	238.7	194.3	434.9	1.8
Mild	99.9	681.9	611.4	1 393.2	5.7
Total	230.8	1 336.9	1 410.9	2 978.6	12.1

Note: TableBuilder randomly adjusts cells to minimise the risk of identifying individuals in aggregate statistics. This means that table totals do not always add exactly and the totals are not exactly consistent across tables.

Source: ABS, Survey of Disabilities, Ageing and Carers, 2018, TableBuilder.

We note that not all people with a mobility impairment will have specialised accessibility needs. On the other hand, several stakeholders noted that SDAC could understate the true number of people with accessibility needs because:

- many people with a long-term health condition that restricts their mobility do not identify as being a person with a disability
- the survey does not capture people with shorter-term mobility impairments (i.e. those with a mobility limitation that is expected to last for less than 6 months).

Users of mobility aids

Although the needs of every individual will vary, the types of mobility aids used may be an indicator of the need for specific accessibility features in the home. In particular, wheelchair users (and to some extent users of other mobility aids with wheels, such as scooters/gophers or walking frames) have specific accessibility requirements in relation to:

- level access

²⁰ See:

<https://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4430.0Main+Features152018?OpenDocument> (accessed January 2020)

- the need for bedroom and bathrooms on the ground floor
- wider doorways and hallways, and
- space requirements in bathrooms, bedrooms etc.

Dwellings that do not meet these accessibility requirements are unlikely to be suitable for a wheelchair user (i.e. a wheelchair user could not practically live in a dwelling that does not meet these requirements).

According to SDAC data there were around 185 300 wheelchair users in 2018 and around 570 100 users of mobility aids with wheels including wheelchairs (table 2.3).

2.3 Types of mobility aids

	0 to 14 years	15 - 64 years	65+ years	Total
	'000	'000	'000	'000
Wheelchairs	4.20	50.40	130.70	185.30
Scooter/gopher	0.00	13.50	40.20	54.00
Walking frame	0.00	46.30	284.00	330.80
Total aids with wheels	4.20	110.20	454.90	570.10
Other aids	3.00	69.60	36.70	107.60
Do not use aids	222.20	1 162.30	919.50	2 304.60
Total	229.40	1 342.10	1 411.10	2 982.30

Note: TableBuilder randomly adjusts cells to minimise the risk of identifying individuals in aggregate statistics. This means that table totals do not always add exactly and the totals are not exactly consistent across tables.

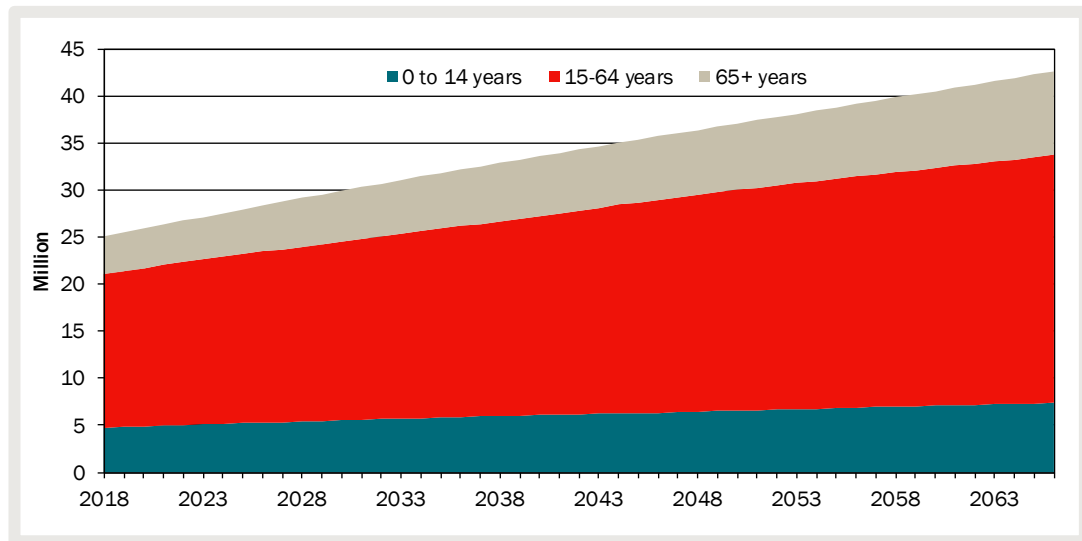
Source: ABS, Survey of Disabilities, Ageing and Carers, 2018, TableBuilder.

Projections of future needs

The number of people with a mobility limitation is expected to increase over time. This will be driven by both population growth as well as an ageing population.

The old-age dependency ratio is one indicator of population ageing. The old-age dependency ratio is currently increasing rapidly as the 'baby boomer' generation (those who were born in the years following the end of World War II through to the early to mid-1960s) reach retirement age. Based on ABS Projections (Series B – see chart 2.4), the old-age dependency ratio is expected to increase from the current level of around 24-25 per cent to around 30 per cent over the next 15 years.

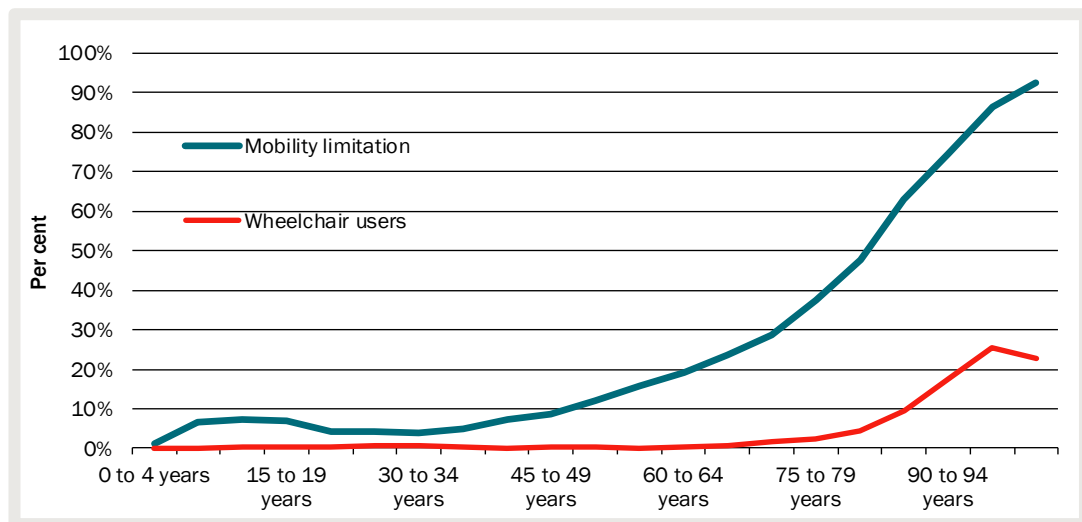
2.4 Population projections



Data source: ABS, Population Projections, Australia, 2017-2066, Catalogue No. 3222.0, Series B.

As the proportion of the population with accessibility needs tends to increase with age (chart 2.5), the ageing population will mean that the proportion of people with accessibility needs (including those with a mobility limitation and those using wheelchairs) will increase at a rate that exceeds population growth.

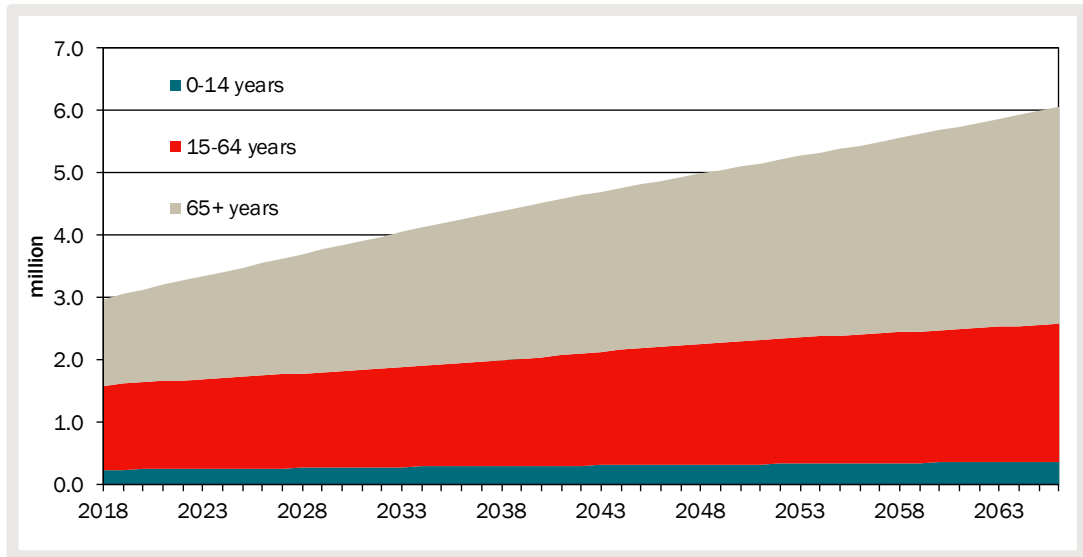
2.5 Mobility limitations and wheelchair users by age – share of population



Data source: ABS, Survey of Disabilities, Ageing and Carers, 2018, TableBuilder; CIE.

We project that the number of people with a mobility limitation will increase from around 3 million to around 5.75 million over the next 40 years (chart 2.6). This assumes that the proportion of the population with a mobility limitation within each age bracket remains constant over time. We then apply these proportions to the population projections.

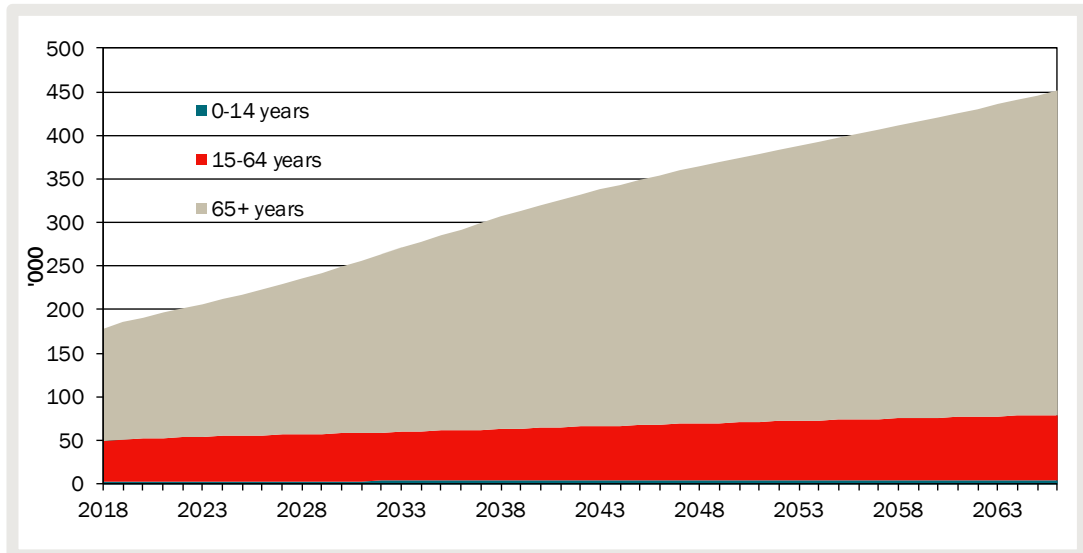
2.6 Number of people with a mobility limitation – projection



Data source: ABS, Population Projections, Australia, 2017-2066, Catalogue No. 3222.0, Series B; ABS, Survey of Disabilities, Ageing and Carers, 2018, TableBuilder, CIE.

Using the same approach, we estimate that the number of wheelchair users will increase from around 185 000 to around 370 000 by 2060 (chart 2.7).

2.7 Number of wheelchair users – projections



Data source: ABS, Population Projections, Australia, 2017-2066, Catalogue No. 3222.0, Series B; ABS, Survey of Disabilities, Ageing and Carers, 2018, TableBuilder, CIE.

Policy context

Broadly there are a range of services provided or funded by the government, as well as other services available that are aimed at meeting the housing (and other) needs of those with disabilities and older people. Consistent with the requirements of the COAG Best Practice Regulation Guidelines, it is important to take account of the evidence of impact

of these services in terms of the considerations of including accessible housing standards in the NCC.

Increasing the private supply of accessible housing

Various (mostly state) governments have policies in place to increase the supply of private accessible dwellings, either through planning regulation or through state-based variations to the NCC. Table 2.8 summarises some existing state planning policies and variations to the NCC that aim to increase the supply of accessible dwellings.

2.8 Summary of state and territory government policies that to increase the supply of accessible housing

State	Planning policies aimed at increasing the supply of accessible housing
NSW	<p>In NSW, there are 2 State Environment Planning Policies (SEPPs) relevant to the supply of accessible housing.</p> <ul style="list-style-type: none"> ▪ <i>SEPP No. 65 – Design Quality of Residential Apartment Development</i> has an objective (4Q-1) that universal design features are included in apartment design to promote flexible housing for all community members. The design guidance under this objective is that: developments achieve a benchmark of 20% of the total apartments incorporating LHDG’s silver level universal design features. ▪ The <i>Housing for Seniors or People with a Disability SEPP</i> aims to increase the supply and diversity of residences that meet the needs of seniors or people with a disability by relaxing some local planning controls for developments that meet relevant design principles.
Victoria	<p>Planning Scheme Clause 58 (Better Apartment Design Standards) requires that 50 per cent of apartments in a building of more than 5 storeys are designed and built with LHDG Platinum for path of entry, LHDG gold for main bedroom entry and toilet, and LHGD silver for shower.</p>
Queensland	<ul style="list-style-type: none"> ▪ Accessible housing requirements will apply in Priority Development Areas (PDAs) (but will vary across PDAs) <ul style="list-style-type: none"> – It will be mandatory for 10 per cent of all multiple residential dwellings to be accessible – In some PDAs 20 per cent of accessible dwellings should be provided. ▪ Preference for accessible dwellings to be spread across different house types.
Western Australia	<ul style="list-style-type: none"> ▪ Residential Design Codes for Apartments (under State Planning Policy 7.3) require that: <ul style="list-style-type: none"> – 20 per cent of all dwellings across a range of dwelling sizes, meet Silver Level requirements as defined in the LHDG; or – 5 per cent of dwellings are designed to Platinum Level as defined in the LHDG. ▪ Compliance with AS4299 is required for aged and dependent persons’ dwellings. The relevant decision maker has discretion over where AS4299 applies for other types of housing. All single houses, grouped dwellings and multiple dwellings in areas within activity centres must provide wheelchair accessible connections between buildings and public footpaths and carparking areas.
South Australia	<p>In developments consisting of 20 or more residential sole-occupancy units or dwellings, 5 per cent of the total number of sole-occupancy units or dwellings must meet additional accessibility requirements</p>

State	Planning policies aimed at increasing the supply of accessible housing
ACT	<ul style="list-style-type: none"> ▪ Under the ACT Territory Plan: <ul style="list-style-type: none"> – Multi-unit developments of 10 or more dwellings in RZ2 zone are permitted to increase density where dwellings have accessibility features (such as door handles and hardware to AS1428.1) and meets AS4299 – In Multi-unit developments of 10 or more dwellings, 10 per cent comply with AS4299 housing class C – Granny flats are required to meet AS4299 Class C (on land >500 m²).

Source: SGS 2019 *Planning Schemes Research* July; Western Australian Planning Commission, Residential Design Codes: Volume 2 – Apartments, State Planning Policy 7.3.

In addition, some local governments in NSW and Victoria and Queensland have also introduced policies that aim to boost the supply of accessible housing.

Although we have not explicitly taken into account these local government-based requirements, we have indirectly taken this into account through nation-level assumptions on the extent to which each element of the LHDG standards is already being incorporated into the design of new homes. These assumptions are based on the professional advice of quantity surveyors (see appendix I).

Social housing

State and Territory governments are also a direct provider of housing to people in need, including some with mobility-related disabilities. Some state governments also have accessibility requirements/targets for social housing. These accessibility requirements for social housing are summarised in table 2.9.

2.9 Summary of state and territory government social housing accessibility requirements

State	Policies aimed at increasing the supply of accessible housing
NSW	NSW Government has a policy that 10 per cent of all new public housing must be 'adaptable'. That is the dwelling must be easily converted at minimal cost to be suitable for people who use wheelchairs.
Victoria	The design of new dwellings must, where practical, achieve the standard of Gold level of the <i>Liveable Housing Design Guidelines</i> or <i>AS4299 Adaptable Housing</i> (except for car spaces)
Queensland	<ul style="list-style-type: none"> ▪ 50 per cent of all new Class 1 social housing will be built to LHDG Gold standard ▪ For Class 2 dwellings: <ul style="list-style-type: none"> – Ground floor apartments will be built to LHDG Platinum standard – All lift serviced apartments will be built to LHDG Gold standard
South Australia	The South Australian Housing Trust is committed to providing a minimum of 75 per cent of all new houses to meet Universal Design Criteria.
Tasmania	All new social housing properties will be universally designed and suitably diverse for a range of tenants including the elderly, those living with disability, families or singles (a total of 1155 new home by June 2023).
ACT	10 per cent of new social housing meets AS4299 (124 over 2 years)

State	Policies aimed at increasing the supply of accessible housing
Northern Territory	Urban Public Housing Design Guidelines require all new urban public housing meets silver level (128 units in 2016)

Source: Information provided by ABCB; NSW FACS website, <https://www.facs.nsw.gov.au/housing/policies/acquiring-new-public-housing-policy>, accessed October 2019.

Government assistance for under 65s

The National Disability Insurance Scheme (NDIS) provides funding to assist eligible people under the age of 65 to meet their housing needs.

Specialist Disability Accommodation

Some NDIS participants receive Specialist Disability Accommodation (SDA) as part of their NDIS packages. SDA refers to accommodation for people who require specialist housing solutions, including to assist with the delivery of support that caters for their extreme functional impairment or very high support needs. Funding is provided only to a small proportion of NDIS participants with extreme functional impairment or very high support needs who meet specific eligibility criteria.²¹ SDA funding will not be available to many people with a mobility limitation.

Under SDA, the National Disability Insurance Agency (NDIA) funds private organisations that provide accommodation that meets specified design standards to an eligible participant.

Home modifications

Home modifications are also funded through the NDIS in 2 main ways:

- Participants can choose to fund minor home modifications (up to \$1500) from their core support budget.
- Higher cost home modifications can also be funded through the capital support budget.

Government assistance for over 65s

People over the age of 65 are generally not eligible for NDIS funding. However, they are eligible for government funding through various aged care programs.

Funding for aged care places

Residential aged care, which is partly funded by the Australian Government, is one mechanism through which some older Australians (and some younger Australians) receive accommodation that is suitable for people with mobility (and other) impairments (although some stakeholders noted that not all residential aged care facilities are

²¹ NDIS website, <https://www.ndis.gov.au/providers/essentials-providers-working-ndia/specialist-disability-accommodation>, accessed 11 October 2019.

accessible) . This type of accommodation is generally only suitable for those who need care as well as accessible accommodation.

Given that residential aged care typically goes beyond the provision of suitable accommodation, so designing more houses consistent with universal design principles will not replace the need for aged care. However, more accessible housing may reduce or delay the need for residential aged care to serve the needs of some older Australians who may otherwise be able to stay in their own homes for longer (i.e. ageing in place).

Funding for home modifications

For older Australians, government funding is provided for home modifications through the following programs:²²

- The Commonwealth Home Support Program (CHSP) — this program helps senior Australians access entry-level support to live independently and safely at home. Home modifications to improve safety and access (such as ramps and rails) are among the services offered.
- Home Care Packages (HCPs) — are designed for those with more complex care needs. These packages can include home modifications.

No fault motor accident insurance

Most states have compulsory no-fault accident insurance. This is a funding mechanism to ensure that the needs of people who acquire a disability through a motor accident are met. In many cases, these insurance schemes will fund home modifications, or find suitable alternative accommodation for people who have acquired a disability through a motor accident.

Other government assistance with accommodation-related expenses

Another way that governments assist people with mobility-related disabilities to access housing (including accessible housing) is through direct financial assistance. Some people with mobility-related disabilities may be eligible for Commonwealth Rent Assistance (CRA), which is an income supplement payable to eligible people who rent in the private rental market or community housing.²³

Voluntary certification scheme

Livable Housing Australia administers a voluntary certification scheme whereby homes can be certified as being compliant with LHDG silver, gold or platinum standard.

²² Australian Government My Aged Care website, <https://www.myagedcare.gov.au/help-at-home/commonwealth-home-support-programme>, accessed 13 January 2020.

²³ Department of Social Security website, <https://www.dss.gov.au/housing-support/programmes-services/commonwealth-rent-assistance>, accessed 11 October 2019.

Other services

There are a range of other services available to people seeking accessible housing provided by private organisations, including community groups, some of which may receive some government funding (table 2.10).

2.10 Summary of other services

Organisation	States	Summary of services
Disability Housing	All States	Listings of rental housing, houses for sale and disability housing projects
The Housing Hub	All States	Lists SDA and supported accommodation. Also lists some private rentals.
Nest	All States	Matches people with disability with houses that suit their funding, support and personal needs.
Housing Choices Australia	Victoria Tasmania South Australia	Not for profit group that houses people with disability in city and country areas.
The Endeavour Foundation	Queensland Victoria New South Wales	A range of housing options where people get help to live on their own.
Freedom Housing	All States	Makes it possible for people with a disability to live in a house or apartment with their partner, children, extended family, friends, housemates, or on their own with around the clock support as required.
Accessible Housing	South Australia	Not for profit group that helps people with disability find affordable housing.
E-bility	All States	Advertises wheelchair accessible properties
Home Hunters Relocation	All States	Can assist to find accessible housing

Source: Spinal Cord Injuries Australia website, <https://scia.org.au/accessible-housing/>, accessed 14 October 2019.

Housing outcomes under current policy settings

The type of dwellings that people identified as having mobility-related disabilities are currently residing in is shown in table 2.11. According to the 2018 SDAC, around 92 per cent of people with a mobility limitation are living in private dwellings, including around 75 per cent in separate houses.

2.11 Type of dwelling

	0-14 years	15-64 years	65+ years	Total	Share of total
	'000	'000	'000	'000	Per cent
Establishments					
Hospital (general)	0.0	0.5	2.6	3.2	0.1
Hospital (other)	0.0	0.6	0.1	0.7	0.0
Home for the aged	0.0	3.0	75.2	78.2	2.6
Home (other)	0.0	3.0	1.2	4.0	0.1
Retired/aged accommodation (cared)	0.0	4.6	93.5	98.1	3.2
Retired/aged accommodation (self-care)	0.0	4.7	43.9	49.0	1.6
Total establishment	0.0	16.4	216.5	233.2	7.7
Private dwelling					
Separate house	205.6	1 087.5	984.3	2 278.8	75.1
Townhouse	16.0	149.6	170.6	336.4	11.1
Flat/apartment	8.3	87.6	78.0	178.7	5.9
Other	0.0	5.6	2.7	6.3	0.2
Total private dwelling	229.9	1 330.3	1 235.6	2 800.2	92.3
Total	229.9	1 346.7	1 452.1	3 033.4	100.0

Note: TableBuilder randomly adjusts cells to minimise the risk of identifying individuals in aggregate statistics. This means that table totals do not always add exactly.

Source: ABS, Survey of Disabilities, Ageing and Carers, 2018, TableBuilder.

Private market

There is some evidence below that the market is responding to some extent to the need for accessible housing, in some cases in response to existing policy settings. That said, the accessibility needs of many members of the community are not being met.

As shown above, most Australians with mobility-related disability live in private residences. The proportion of new private dwellings that are accessible is not known. The ABCB Options Paper reported one estimate from 2014 that only around 5 per cent of newly constructed homes met LHDG silver standard.²⁴ This estimate appears to have been based on the number of dwellings certified under the LHA certification scheme.

Industry stakeholders reported that many more homes are built to LHDG standards that are not certified; this is therefore likely to be an under-estimate. Other stakeholders noted that although relatively few new dwellings include all of the accessibility set out in the LHDG standards, most new dwellings incorporate at least some of these features.

²⁴ ABCB 2018, *Accessible Housing: Options Paper*, September 2018

Retirement villages

A subset of the private market response to the growing need for accessible housing for older Australians is through retirement villages. The number of dwellings and residents in retirement villages (in 2014) is shown in table 2.12. Recent data also suggests a strong supply pipeline over the next few years.²⁵

2.12 Retirement village dwelling and resident numbers – 2014

	Penetration rate of over 65s in retirement villages	Number of residents in retirement villages	Number of dwellings
	Per cent	No.	No.
NSW and ACT	4.9	55 413	42 625
Victoria	5.3	43 107	33 159
Queensland	6.4	38 842	29 878
South Australia	8.6	23 236	17 874
Western Australia	6.9	20 599	15 846
Tasmania	3.4	2 883	2 218
Australia	5.7	184 080	141 600

Source: Property Council of Australia, National overview of the retirement village sector, October 2014, p. 5.

Some stakeholders noted that not all retirement villages meet accessibility standards, particularly older retirement villages or retirement villages that have been re-purposed from other buildings.

Moving into a retirement village is often considered a lifestyle choice. However, current or future accessibility needs may be an important factor for some residents.

Some stakeholders noted that some older people that have moved to a retirement village would have preferred to remain in their previous homes had it met their accessibility needs. A 2018 survey found that:²⁶

- 52 per cent of respondents indicated their overall happiness and life satisfaction had increased since moving into a retirement village (including 26 per cent of respondents who indicated a significant increase)
- 34 per cent of respondents indicated that their overall happiness and life satisfaction had stayed about the same since moving into a retirement village
- 15 per cent of respondents indicated their overall happiness and life satisfaction had decreased since moving into a retirement village (including 6 per cent of respondents that indicated a significant decrease).

²⁵ PwC and Property Council 2018, *2018 PwC/Property Council Retirement Census*, November 2018, p. 6.

²⁶ <https://www.villages.com.au/info-centre/post/news/national-survey-shows-retirement-village-residents-happier-than-their-peers>, accessed 5 June 2020.

Home modifications

Another way the market (often supported by policy assistance) responds to the need for accessible housing is through home modifications. According to SDAC data, around 477 800 Australians with a mobility impairment live in dwellings that have been modified because of their condition or age (around 16 per cent of the total) (table 2.13). This proportion was around 25 per cent for people with profound or severe mobility impairments.

2.13 Share of people with a mobility limitation living in modified dwellings

	Dwelling modified	Total	Share
	'000	'000	Per cent
Profound	161.7	632.2	25.6
Severe	123.7	518.9	23.8
Moderate	77.4	434.9	17.8
Mild	117.8	1 394.8	8.4
Total	477.8	2 982.3	16.0

Source: ABS, Survey of Disabilities, Ageing and Carers, 2018, TableBuilder, CIE.

The types of home modifications that have been made (as a share of total home modifications) is shown in table 2.14.

2.14 Types of home modifications – share of total home modifications

	Profound	Severe	Moderate	Mild	Total
	Per cent	Per cent	Per cent	Per cent	Per cent
Structural changes	15.3	12.9	11.5	5.7	11.5
Ramps	30.7	20.9	20.3	13.8	22.3
Toilet, bath or laundry modifications	57.1	50.5	44.3	39.0	49.2
Kitchen modifications	7.4	4.4	2.6	3.1	4.6
Doors widened	9.1	3.6	3.6	1.1	4.7
Handrails or grab rails	66.1	65.6	70.9	63.4	66.5
Remote controls	1.9	2.3	2.3	0.0	1.5
New or changed heating or air-conditioning	11.8	4.8	3.4	3.1	6.0
Installed home automation/smart home or environmental control system	2.4	0.0	0.0	0.0	0.9
Telemonitoring system	3.0	2.3	0.0	1.7	2.0
Other change to dwelling	11.3	14.6	9.4	13.0	12.0

Note: Refers to the percentage of total home modifications.

Source: ABS, Survey of Disabilities, Ageing and Carers, 2018, TableBuilder.

Carnemolla and Bridge (2019) also report information on the types of home modifications based on a sample of 157 home modifications funded under the (previous) Home and Community Care (HACC) Program in NSW.²⁷

2.15 Share of home modifications

Share of modifications	
	Per cent
Bathroom modifications	
Major bathroom modifications	35.0
Grab rail in shower	22.9
Grab rail in bath	4.5
Hand held shower	10.2
Shower screen removal	1.9
Grab rail in toilet	10.8
Access modifications	
Ramp	17.2
Step modifications	4.5
Lift	3.2
Widen doorway/remove wall	9.6
Front/rear handrail entrance	34.4
Kitchen/laundry	
Kitchen/laundry	4.5

Source: Carnemolla, P. and Bridge, C. 2019, *Housing Design and Community Care: How Home Modifications Reduce Care Needs of Older People and People with Disability*, International Journal of Environmental Research and Public Health, p. 7.

In 2018-19, the Australian Government funded 48 842 home modifications for people over the age of 65 through the Commonwealth Home Support Program at a total cost of around \$35.3 million.²⁸ This implies an average cost of around \$723 per modification, although this Program covers only relatively minor modifications. The cost of home modification that are funded privately or through other government programs are not known.

Moving to a more accessible dwelling

Where their current residence no longer meets their needs, one option that may be available to some people with mobility-related disability is to move to a dwelling that better meets their accessibility needs (if available). SDAC data suggests that around

²⁷ Carnemolla, P. and Bridge, C. 2019, *Housing Design and Community Care: How Home Modifications Reduce Care Needs of Older People and People with Disability*, International Journal of Environmental Research and Public Health, p. 7.

²⁸ Australian Institute of Health and Welfare website, <https://www.gen-agedcaredata.gov.au/Resources/Access-data/2019/September/Aged-care-data-snapshot%E2%80%94942019>, accessed 22 December 2019.

10 per cent of people with a mobility-related disability have had to move house at least once as a result of their condition or age (table 2.16). This affects all members of the household, not just the person with accessibility needs.

2.16 Moved house because of condition or age

	Has had to move house once	Has had to move house more than once	Total moved house	Total	Share moved
	'000	'000	'000	'000	Per cent
Profound	63.3	22.8	86.1	632.2	13.6
Severe	61.0	18.2	79.2	518.9	15.3
Moderate	35.3	11.0	46.3	434.9	10.6
Mild	78.8	16.2	95.0	1 394.8	6.8
Total	240.0	67.1	307.1	2 982.3	10.3

Source: ABS, Survey of Disabilities, Ageing and Carers, 2018, TableBuilder.

Social housing

The AIHW reports that around 393 912 households in social housing programs as at 30 June 2017. Of these, 153 422 households (39 per cent) contained a person with a disability. However, no information is provided on:

- the severity of the disabilities
- the proportion that had a mobility-related disability.

According to data from the SDAC, there were around 221 800 people with a mobility-related disability in social housing in 2018 (table 2.17).

2.17 Number of people with a mobility-related disability in social housing

	Profound	Severe	Moderate	Mild	Total
	'000	'000	'000	'000	'000
State or Territory Housing Authority	29.7	28.9	27.4	77.5	166.6
Housing co-operative, community or church group	16.7	7.8	7.7	26.4	55.1
Total	46.3	37.9	35.1	103.7	221.8

Source: ABS, Survey of Disabilities, Ageing and Carers, 2018, TableBuilder.

Aged care

According to SDAC data, there were around 176 300 people with a mobility impairment in residential aged care in 2018 (including homes for the aged and cared retired/aged accommodation).

The Australian Institute of Health and Welfare reports there were 182 705 permanent aged care places funded by the Australian Government in 2019.²⁹

Specialist Disability Accommodation

The NDIS Quarterly Report to the COAG Disability Reform Council reported that as at 30 September 2019:

- there were 13 683 participants with SDA funding in an active NDIS plan (the NDIA has estimated that the number of participants eligible for SDA funding will increase to 28 000 over time)
- the annualised cost of SDA supports in active plans is estimated at around \$48 million³⁰
- there were 3 938 enrolled dwellings, including:³¹
 - 847 Improved Liveability dwellings (broadly aligning the LHDG silver standard)
 - 511 ‘Fully Accessible’ dwellings (broadly consistent with LHDG platinum standard dwellings)
 - 455 High Physical Support dwellings (suitable for people unable to transition without assistance).

Quantifying the problem

The outcomes (including those described above) under current arrangements and policy settings are not necessarily optimal from various perspectives. In particular, housing designs that are not based on universal design principles may not be optimal where:

- the needs of members of the community with a mobility-related disability are not met; and/or
- the cost of meeting the needs of members of the community with a mobility-related disability is unnecessarily high (including both costs incurred by affected individuals and the government).

These sub-optimal outcomes are effectively the ‘problem’ that the proposed changes to the NCC are trying to solve (i.e. the problem that is not already being solved through existing mechanisms). Table 2.18 identifies some sub-optimal outcomes that could arise from a shortage of accessible housing.

²⁹ Australian Institute of Health and Welfare website, <https://www.gen-agedcaredata.gov.au/Resources/Access-data/2019/September/Aged-care-data-snapshot%E2%80%942019>, accessed 22 December 2019.

³⁰ COAG Disability Reform Council 2019, *Quarterly Report*, 31 December 2019, p. 431.

³¹ *ibid*, pp. 437-438.

2.18 Summary of sub-optimal outcomes from a shortage of accessible housing

Outcome	Circumstances where outcome is not optimal	Cost of sub-optimal outcome
Short-term (temporary) outcomes		
Patient remains in hospital/transition care while suitable housing is found	Where patient would not need to be in hospital if accessible housing was available	Additional cost of hospital stay or respite care
Housing without accessibility features (while suitable housing is unable to be found)	Where individual has accessibility needs but temporarily remains in housing without relevant accessibility features while more suitable housing is found.	<p>Accessibility needs not met, possibly leading to:</p> <ul style="list-style-type: none"> ■ Higher care needs (family or other), including: <ul style="list-style-type: none"> – Loss of independence – Cost of carers (including opportunity cost of informal care) ■ Less safe environment, including: <ul style="list-style-type: none"> – Increase in slips, trips and falls for person with impairment – Safety impacts on carers ■ Inability to participate in the community (i.e. unable to easily enter/leave the dwelling) <ul style="list-style-type: none"> – Loss of employment opportunities – Inability to participate in other aspects of community life.
Longer-term outcomes		
Housing without accessibility features	Where individual has accessibility needs but remains in housing without relevant accessibility features longer-term.	<p>Accessibility needs not met, possibly leading to:</p> <ul style="list-style-type: none"> ■ Cost of higher care needs (family or other), including: <ul style="list-style-type: none"> – Loss of independence – Cost of carers (including opportunity cost of informal care) ■ Less safe environment, including: <ul style="list-style-type: none"> – Increase in falls for person with impairment – Safety impacts on carers ■ Inability to participate in the community (i.e. unable to easily enter/leave the dwelling) <ul style="list-style-type: none"> – Loss of employment opportunities – In ability to participate in other aspects of community life

Outcome	Circumstances where outcome is not optimal	Cost of sub-optimal outcome
Residential aged care ^a	<ul style="list-style-type: none"> Where the person does not require specialist housing or the level of care that is provided in aged care (i.e. their only requirement is housing that is physically accessible, and they can only get this by moving into aged care) 	<ul style="list-style-type: none"> Less preferred environment, potentially leading to: <ul style="list-style-type: none"> – social isolation – loneliness Higher financial cost to the government than home-based care.
Institutional care for younger people with a disability	<ul style="list-style-type: none"> This outcome is sub-optimal in all instances. 	<ul style="list-style-type: none"> Less preferred environment, potentially leading to: <ul style="list-style-type: none"> – social isolation – depression – inability to participate in the community (including employment) Possibly higher cost than home-based care. People in institutional care may be more vulnerable to abuse.
Accessible private/social housing in non-preferred location	<p>A person may have accessible private/social housing, but the location does not suit their needs (in terms of proximity to family/friends, schools and employment opportunities)</p>	<ul style="list-style-type: none"> Social isolation/loneliness Lack of employment opportunities Disruption for families (such as school-aged children moving schools)
Home modifications	<p>Home modifications may not be an optimal option where:</p> <ul style="list-style-type: none"> Home modifications only partially meet accessibility needs Home modifications are prohibitively costly. 	<ul style="list-style-type: none"> High cost of home modification.
People with disabilities unable to visit family and friends		<ul style="list-style-type: none"> Social isolation/loneliness

Source: CIE.

In summary, the ‘problem’ that the proposed changes to the NCC is trying to solve includes:

- safety-related costs where people with accessibility needs that remain living in housing that does not meet their accessibility needs are at higher risk of falls
- costs associated with additional care needs, where people with accessibility needs remain living in housing that does not meet their needs
- unnecessarily high costs (i.e. higher than if the initial design of the residence had been consistent with universal design principles) associated with home modifications
- costs associated with moving house
- costs associated with longer stays in hospital and transition care, where discharge is delayed due to their home lacking accessibility features
- costs associated with loneliness, where people with accessibility needs are unable to leave their own house as frequently as they would like or are unable to visit friends

and relatives (there may also be costs for people without accessibility needs, where family members and friends with accessibility needs are unable to visit)

- additional costs associated with inappropriate or premature entry into aged care due to dwellings lacking relevant accessibility features.

Some stakeholders argued that a lack of accessible housing may also be contributing to poorer employment outcomes for some people with mobility-related disabilities. There is related literature that provides relevant insights into this issue; however, we were not able to identify any direct quantifiable evidence to support the qualitative evidence.

To understand the size of the problem, we need to understand:

- the number of people affected, and
- the costs imposed on those affected as a result of a shortage of accessible housing.

Below we estimate the approximate size of each of these problems based on the available (albeit limited) information.

2.19 Questions for stakeholders

- Do you agree the problem is adequately established?
 - Does it establish a case for action?
 - Are other problems not identified under the status quo?
- In general, do you agree the RIS adequately describes the extent of these problems, and do you have other evidence which could assist?
- The impact of a lack of accessible housing on equity, dignity and employment outcomes is difficult to fully measure. How does a lack of accessible housing contribute to these issues?
- Are the assumptions made to estimate the costs to the community from a lack of accessible housing (set out in Appendices A to H) appropriate and is there other evidence that could be considered?
- What other information could be used to estimate the costs associated with a lack of accessible housing to make estimates more reliable?
- For home modifications made to improve the accessibility of a home, do stakeholders have data on the type and cost of those home modifications that actually proceed?

Safety-related costs

Many people with accessibility needs have trouble finding accessible housing that meets their needs.³² When accessibility needs are not met, there is an increased risk of falls. In some cases, falls result in serious injury or even death.

³² Australian Network for Universal Housing Design 2018, *Report on the Survey on the provision of Livable housing design: the costs and benefits to Australian Society*, May 2018, p. 19

We estimate that the cost of additional falls as a result of some people with accessibility needs remaining in housing that lacks relevant accessibility features could range between around \$42 million and \$71 million per year, with a central case estimate of around \$57 million (table 2.20). This includes the costs associated with an increased number of deaths (based on standard economic approaches to valuing the loss of life) and medical costs associated with injuries. However, it does not include morbidity costs associated with fall-related injuries. Further details on our approach to estimating these costs are set out in appendix A.

2.20 Estimated annual safety costs from inaccessible housing

Outcome	Low estimate	Central case	High estimate
	\$ million	\$ million	\$ million
Death	22.56	30.92	38.44
Hospital admissions	15.80	21.66	26.92
Emergency department attendance	1.92	2.63	3.27
Non-hospital treatment	1.57	2.15	2.67
Total	41.85	57.35	71.30

Source: CIE estimates (see appendix A for further details).

The cost of additional assistance

Where people with mobility-related disabilities remain in housing that does not meet their accessibility needs, they may also have an increased need for assistance/care, including both formal care and informal care provided by family and friends.

We estimate that the additional cost of carers — including both formal and informal carers — that can be attributable to inaccessible housing could be around \$700 million per year (table 2.21).

2.21 Annual additional care costs due to inaccessible housing

	Number of people ^a	Average annual cost of additional assistance	Total additional cost
	'000	\$ per year	\$ million
Informal assistance	111.5	-6 040	- 673.50
Formal assistance	21.3	-1 217	- 25.92
Total			- 699.42

^a Based on SDAC 2018, TableBuilder.

Source: See appendix A for details.

This estimate is based on the following assumptions.

- Based on the findings of Carnemolla and Bridge (2019), we assume that an inaccessible home environment:
 - increases the amount of informal assistance/care received by 5.98 hours per week (310 hours per year) compared to an accessible environment

- increases the amount of formal assistance/care received by 0.36 hours per week (18.72 hours per year) compared to an accessible environment.
- The opportunity cost of carer’s time is valued as follows.
 - Informal care is valued at the minimum wage in Australia of \$19.49 per hour. This is consistent with other studies in the literature.³³
 - Formal care is valued at \$65 per hour, broadly based on NDIS rates.
- Our estimate of the number of people that are likely to be receiving additional assistance/care as a result of living in a dwelling that does not meet their accessibility needs is based on SDAC 2018 data.

Further details of our approach to estimating the additional costs of the assistance provided to people with mobility limitations living in housing that does not meet their accessibility needs is provided in appendix B.

Note that these estimates include only the opportunity cost of the carer’s time. We have not been able to quantify the following associated costs based on available information.

- Any costs associated with injuries to carers — the costs associated with injuries to formal carers are at least partly covered as we used the NDIS rates for formal carers as the basis for cost estimates which would include workers’ compensation insurance, reflecting the risk/probability of getting injured during work. Although there is evidence to suggest that carers (particularly informal carers) frequently acquire injuries in providing care to people with a disability, we did not find any empirical studies that explicitly links carer injuries to inaccessible housing that would enable us to quantify these costs.³⁴
- Any loss of dignity associated with a loss of independence and the need to rely on others to carry out household tasks.

Home modifications

As noted above, around 16 per cent people with a mobility-related disability were residing in dwellings that have been modified as a result of their condition or age, including around 25 per cent of people with a profound or severe mobility-related disability.

Although the evidence suggests that home modifications can improve accessibility and lead to better safety outcomes and fewer care needs (see above), it is not always an optimal outcome.

³³ Chakravarthy, U., Biundo, E., Saka, R.O, Fasser, C., Bourne, R. & Little, J. 2017, ‘The Economic Impact of Blindness in Europe’, *Ophthalmic Epidemiology*, DOI: 10.1080/09286586.2017.1281426; Frick, K.D., Gower, E.W., Kempen, J.H. & Wolff, J.L. 2007, ‘Economic Impact of Visual Impairment and Blindness in the United States’, *Archives of Ophthalmology*, vol. 125, no. 4, pp. 544-550

³⁴ See discussion in Davy, L. Adams, T. and Bridge, C. *Caring for the Carer: Home design and modification for carers of young people with disability*, Home Modification Information Clearinghouse, City Futures Research Centre, Faculty of the Built Environment, University of New South Wales, p. 19.

- **The cost of modifications can be high** — of the homes that are modified, the data available to us imply that up to a third require modifications that are relatively substantial (including full bathroom renovations and/or structural renovations), while two thirds of homes only require minor modifications like grabrails.³⁵ Homes that are designed to be consistent with universal design principles, would already have accessible bathrooms, ramps, wider doorways, etc. This implies that only minor modifications would be required.
- **Some modifications take time** — for the third of homes that require substantial modifications, these modifications take up to 3 months to complete.³⁶ However, if the dwelling design incorporated universal design principles, this delay in the modifications should reduce significantly (because only minor modifications are required).

Furthermore, accessibility needs cannot always be met through home modifications. Related to the high cost of some home modifications, some homes cannot practically be modified to meet accessibility needs within a reasonable budget.

AHURI has published the results of a survey on whether people thought they would be able to afford future modifications to make their home accessible/liveable (table 2.22). This survey suggested that only 10 per cent expected not to be able to afford future modifications. That said, around 35 per cent were unsure, suggesting an upper bound of around 45 per cent of homes expect not to be able to afford future home modifications.

In responding to the survey, it is not clear whether respondents were aware of the government assistance available for home modifications. Furthermore, many respondents may not be aware of what making a home accessible entails and therefore the associated cost.

2.22 Expectations of ability to afford future modifications to make home accessible/liveable

	Share
	Per cent
Expect to be able to afford to fund modifications	54.2
Unsure	35.3
Expect not to be able to afford modifications	10.5

Source: Judd et al 2010 (for AHURI), pg 142.

On the other hand, not all home modification costs can be avoided through designing dwellings that are consistent with universal design principles. Modifications such as the

³⁵ Carnemolla and Bridge (2019) report survey data of 157 individuals (average age 72) who have had modifications installed in the last 6 months. In the data set, bathroom modifications are the most significant modifications. There are 55 'full bathroom renovations', which we use to estimate that around one third of homes require substantial modification, while around two thirds require only minor modifications.

³⁶ Substantial modifications can involve full bathroom renovations. Internet commentary suggests bathroom renovations can take up to 7 weeks, including delays (see: <https://www.service.com.au/articles/bathroom/how-long-does-a-bathroom-renovation-take>). Bathroom renovations involving modifications for accessibility are likely to be more complicated than 'normal' renovations

installation of grab rails, home automation and telemonitoring systems may still be required for people who acquire a disability while living in a dwelling that complies with LHDG standards.

We estimate that the weighted-average cost of modifications that could be avoided if dwelling designs were consistent with universal design principles is around \$27 500 per dwelling (table 2.23). This is based on: the estimated cost of retro-fitting accessible design features to LHDG Silver and Gold standard for both Class 1a (separate houses and townhouses) and Class 2 dwellings (apartments) prepared by quantity surveyors DCWC for ABCB's Options Paper; and information from the SDAC on the types of modifications that people with disabilities have made to their homes (see appendix C for further information). This estimate is higher than the estimated retrofitting cost of \$19 400 as reported in Young People In Nursing Homes National Alliance's housing policy discussion paper.³⁷

2.23 Weighted average cost of modifications per dwelling

	Weighting	Cost
	Per cent	\$
Class 1a - Silver level	83.5	23 682
Class 1a - Gold level	12.6	47 880
Class 2 - Silver level	3.0	40 397
Class 2 - Gold level	0.9	57 196
Weighted average		27 524

Source: CIE based on: unpublished estimates prepared by DCWC for the ABCB Options Paper; and ABS, Survey of Disabilities, Ageing and Carers, 2018, TableBuilder (see Appendix C for details).

Comparing the number of modified dwellings reported in the 2018 and 2015 SDAC (and adjusting for deaths) suggests that around 22 000 dwellings are modified to meet the needs of people with disabilities per year (see appendix C for further details).

- **Based on the above information, we estimate that the annual cost of home modifications that could be avoided if dwelling designs were consistent with universal design principles could be around \$600 million (i.e. around 22 000 additional home modifications at a weighted average cost of around \$27 525 per dwelling).**

Moving house

Anecdotal evidence suggests that accessible housing can be difficult to find, due to a lack of availability. Moving house may not be an optimal outcome for many.

- Moving house can be costly and stressful, particularly for older people.
- Many people may have preferred to stay in their previous residence if it had have met their changing accessibility needs.

³⁷ Young People In Nursing Homes National Alliance and Monash University Department of Architecture 2015, *Shaping the Future Today: Transforming Housing Policy for Australians with Disability*, a housing policy discussion paper, Melbourne, p. 20

- A lack of accessible housing may have forced some people with a mobility-related disability (and in many cases their families) to move to a less-preferred location, away from family, friends, schools and employment opportunities.

We estimate that the annual cost of additional moves due to a lack of accessible housing could be between around \$14.3 million and \$43.2 million per year (table 2.24). This includes only the financial cost of moving. Due to data/information constraints, we were unable to estimate: the cost of additional stress associated with moving; search costs; and any loss of amenity from moving to a less preferred dwelling. We have also excluded stamp duties paid by owner-occupiers as these are a transfer from the household to the government, rather than a net cost to the community.

2.24 Estimated cost of additional moves due to inaccessible housing

	Number of avoidable moves	Number of avoidable moves per year	Estimated cost
	'000	'000	\$ million
Lower bound	76.1	5.7	14.3
Upper bound	230.3	17.3	43.2

Source: CIE estimates (see appendix D for further details).

This estimate is based on the following assumptions.

- The assumptions in relation to the number of avoidable moves are as follows.
 - The lower bound assumption is based on the number of people with a mobility limitation who reported in the 2018 SDAC that they had moved house as a result of their age or condition for reasons directly related to accessibility of their previous dwelling.
 - The upper bound assumption is based on the number of people with a mobility limitation who reported in the 2018 SDAC that they had moved house as a result of their age or condition for reasons directly or potentially related to the accessibility of their previous dwelling.
- We assume that around 7.5 per cent of the moves as a result of the disability occurred in the past year.
- The financial cost of moving can vary significantly, depending on the size of the house, distance and other factors. We assume the average financial cost of moving house is around \$2 500.³⁸

Further details on the basis for these assumptions is provided in appendix D.

Longer stays in hospital or transition care

In addition to potentially increasing hospital admissions (through reduced falls), a large share of the housing stock without accessibility features could increase the length of stays

³⁸ See for example: https://www.openagent.com.au/blog/how-much-moving-cost?at=v5&utm_exp=6ZprDALXQh2rpM05ZARdBA.1&utm_referrer=https%3A%2F%2Fwww.google.com%2F, accessed 23 January 2020.

in hospitals or transition care. In some cases, it is not possible to discharge someone from hospital unless they are discharged to a safe environment.

Several studies note that not having a suitable home to return to can be a key issue causing delays and completing successful rehabilitation and return to independence.³⁹ This could apply to anyone with a mobility limitation following a stay in hospital (including temporary or short-term mobility limitations following hospital treatment), not just those with a longer-term disability.

We estimate that the annual cost of delayed discharge from hospitals and transition care as a result of a lack of accessible housing could be around \$234.6 million (table 2.25). This is based on:

- inferences drawn from a small number of Australian studies on the extent and cause of delayed discharge from different types of hospital care
- estimates of the cost per day of different types of care.

Further details of the approach are provided in appendix E.

2.25 Estimated cost of delayed discharge from hospital or transition care

	Admissions	Patient days	Cost per day	Total cost	Share due to lack of accessible housing	Estimated cost due to lack of accessible housing
	No.	No.	\$	\$ million	Per cent	\$ million
Rehabilitation care	93 751 ^a	2 754 ^b	890 ^c	2 451.7	6.7 ^f	163.2
Geriatric evaluation and management	36 676 ^a	643 ^b	878 ^c	565.0	6.7 ^f	37.6
Psychogeriatric care	1 332	84	983	82.8	6.7	5.5
Maintenance care	28 108 ^a	553 ^b	1 055 ^c	583.2	1.8 ^g	10.5
Transition care	24 028 ^d	1 302 ^d	205 ^e	266.7	6.7 ^f	17.8
Total	159 867	5 337		3 949.5		234.6

^a AIHW, Australian Hospital Statistics, 2017-18, Table 4.5. ^b AIHW, Australian Hospital Statistics, 2018-18, Table S4.3. ^c Centre for Health Service Development, Development of the National Subacute and Non-acute Patient Classification Version 4, Final Report, April 2015, pp. 39-49. Data was inflated to 2019 dollars using the national CPI. ^d AIHW Aged Care Data Snapshot. ^e Calculated as the total expenditure on Transition Care divided by the number of patient days. ^f Based on New et. al. (2013). ^g Based on Salonga-Reyes and Scott (2017).

Source: Australian Institute of Health and Welfare, Australian Hospital Statistics, 2017-18; Australian Institute of Health and Welfare, Aged Care Data Snapshot 2018-19; Centre for Health Service Development, Development of the National Subacute and Non-acute Patient Classification Version 4, Final Report, April 2015; New, P.W. Jolley, D.J. Cameron, P.A. Olver, J.H. and Stoelwinder, J.U. 2013, A prospective multicenter study to discharge from inpatient rehabilitations, *Medical Journal of Australia*, 198 (2), pp. 104-108; Salonga-Reyes, A. Scott, I.A. 2017, Stranded: causes and effects of discharge delays involving non-acute in-patients requiring maintenance care in a tertiary hospital general medicine service, *Australian Health Review*, 41, CSIRO Publishing, pp. 54-62; CIE.

Social isolation and loneliness

During targeted stakeholder consultations, various stakeholders noted that a lack of accessible housing can lead to social isolation. According to the Australian Institute for Health and Welfare, social isolation is where an individual has minimal contact with

³⁹ The All-Party Parliamentary Group (APPG) for Ageing and Older People (UK) 2019, *Inquiry into decent and accessible homes for older people*, Summer 2019, p. 4.

others. This is distinguished from loneliness, which is a subjective state of negative feelings about having a lower level of social contact than desired.⁴⁰

According to a 2018 survey by the Australian Psychological Society and Swinburne University of Technology, around 25 per cent of Australians are lonely.⁴¹ Loneliness is a growing concern globally, because of its reported impact on health and wellbeing. Various international studies have estimated that loneliness can impose significant health-related costs on the community. Although social isolation can lead to loneliness, the AIHW notes that the two concepts do not necessarily co-exist.⁴²

A lack of accessible housing may be contributing to social isolation in various ways, including the following.

- Some individuals with a mobility-related disability are unable to easily leave or re-enter their own dwelling. This means that they do not leave the dwelling at all or not as frequently as they would like. This may prevent them from participating in the community, including seeing friends and family and contribute to feelings of loneliness.
- Other people with a mobility-related disability are unable to access the home of friends or relatives (including the ability to use the toilet with dignity), which prevents them from participating in family gatherings or other social occasions.

Based on the (albeit limited) information available, we estimate that the contribution a lack of accessible housing makes to loneliness could be around \$303 million per year (table 2.26). Details on our approach to estimating these costs are outlined in appendix F.

2.26 Estimated cost of loneliness due to a lack of accessible housing

	Identified population ^a	Share that want more contact with family/friends	People that want more contact with family/friends	Unit cost of loneliness ^d	Cost of loneliness
	'000	Per cent	'000	\$ per person	\$ million
Actual estimates	788.6	51.1 ^b	403.0	1 471	592.7
Implied baseline	788.6	25.0 ^c	197.2	1 471	290.0
Cost due to lack of accessible housing			205.9	1 471	302.8

^a The identified population is based on 2018 SDAC data using TableBuilder. The identified population includes: people with a mobility limitation; and indicated they did not leave the house as often as they would like due to their own condition or age; or indicated they had difficult accessing another person’s house over the past year; or had avoided visiting people due to their condition. ^b Based on the share of the identified population that indicated they want more contact with family/friends. ^c The baseline share of the population that suffer from loneliness is based on a 2018 survey by the Australian Psychological Society and Swinburne University of Technology. ^d Based on estimates from McDaid et. al. converted to 2019 Australian dollar terms.

⁴⁰ Australian Institute for Health and Welfare, <https://www.aihw.gov.au/reports/australias-welfare/social-isolation-and-loneliness>, accessed 22 January 2020.

⁴¹ Australian Psychological Society and Swinburne University of Technology, 2018, Australian Loneliness Report: A survey exploring the loneliness levels of Australians and the impact on their health and wellbeing, p. 5.

⁴² Australian Institute for Health and Welfare, <https://www.aihw.gov.au/reports/australias-welfare/social-isolation-and-loneliness>, accessed 22 January 2020.

Source: ABS Survey of Disabilities, Ageing and Carers, 2018, TableBuilder data; Australian Psychological Society and Swinburne University of Technology, 2018, Australian Loneliness Report: A survey exploring the loneliness levels of Australians and the impact on their health and wellbeing, p. 5; McDaid, D. Park, A.L. and Fernandez, J.L. *Reconnections Evaluation Interim Report*, Personal Social Services Research Unit (PSSRU), London School of Economics, June 2016, p. 30; CIE.

Premature or inappropriate entry into residential aged care or other institutional care

During the CIE's targeted consultations, some stakeholders argued that a lack of accessible housing could contribute to premature or inappropriate entry into residential aged care or other institutional care. Although residential aged care is an appropriate form of care for many older Australians (particularly those with high care needs), inappropriate or premature entry in residential aged care would be a sub-optimal outcome from the perspective of both:

- the relatively high cost of residential aged care (relative to home-based care)
- reduced wellbeing — most Australians would prefer to remain at home for as long as possible, rather than enter residential aged care.

In general, it is becoming less likely that someone would be inappropriately or prematurely admitted to residential aged care.

- All entrants into government-funded aged care places undergo an assessment of the most appropriate long-term care option before entry in residential aged care.
- There has been a policy shift towards supporting older Australians to remain at home, rather than entering residential aged care.

Nevertheless, we estimate that the costs associated with inappropriate or premature entry into residential aged care could range between around \$164 million and \$370 million per year, with a central case estimate of around \$255 million per year (table 2.27). This is based on the following assumptions.

- Based on SDAC data and modelling of the extent to which various factors affect the probability of being in residential aged care,⁴³ we estimate that there may be between 2660 and 6023 additional people in residential aged care due to a lack of accessible housing, with a central case estimate of 4140.
- We estimate that the additional cost of aged care (relative to remaining in the home) could be around \$34 700 per year.
- Around 52 per cent of people in residential aged care are reported to have depression, compared to 10-15 per cent of older Australians in the community (although this could possibly be because they have more complex care needs, rather than residential aged care *per se*). The weighted average cost of depression is estimated at around \$67 530 per year based on standard economic approaches to valuing morbidity costs.

Details on our approach to estimating these costs are provided in the appendix G.

⁴³ See Jukic, M. 2017, *Modelling Residential Aged Care in Australia: Entry and Exit*, A thesis submitted for the degree of Doctor of Philosophy of the University of Melbourne

2.27 Estimate costs of inappropriate or premature entry into aged care

	Low estimate	Central case	High estimate
	\$ million	\$ million	\$ million
Additional resource costs	92.29	143.63	208.96
Loss of individual's welfare	71.32	110.98	161.47
Total cost	163.61	254.61	370.43

Source: CIE estimates (see appendix G for details).

Costs to the community

As noted by the (then) Chair of the Royal Commission into the Safety and Quality of Age Care:

“The hallmark of a civilised society is how it treats its most vulnerable people...”⁴⁴

Although this quote specifically referred to older Australians, it could equally apply to younger people with a disability.

It therefore follows that there is a cost to the community where people with disabilities are unable to secure housing that meets their needs.

- **We estimate that the community values these costs at around \$389 million per year.**

This estimate is based on the following.

- We completed a stated preference survey to estimate the community’s ‘willingness to pay’ for all Australians with a mobility limitation to have access to housing that meets their needs. This survey found that the average willingness to pay was around \$40 per household per year (see appendix K for further details).
- This estimate is applied across around 9.9 million households.

Reduced employment opportunities

Some stakeholders suggested that a lack of accessible housing could be reducing employment opportunities for people with mobility-related disabilities. There is related literature that provides relevant insights into this issue; however, we were not able to identify any direct quantifiable evidence to support the qualitative evidence. We have not therefore quantified these costs (see appendix H for further discussion on this issue).

Projections of future size of the problem

As noted above, the number of people with a mobility-related disability is expected to increase over time due to:

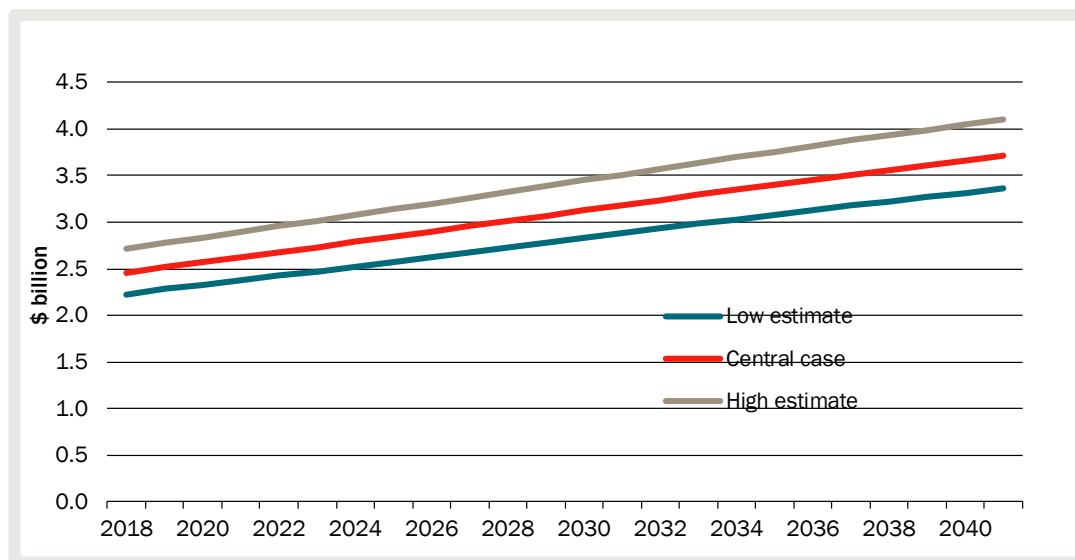
- population growth

⁴⁴ Royal Commission into Aged Care Quality and Safety 2019, *Interim Report: Neglect*, Volume 1, October 2019, p. 20.

- the ageing population.

If the size of the problem increases in proportion to the number of people with accessibility needs, we estimate that the size of the problem could increase to between around \$2.6 billion and \$3.1 billion over the next 20 years (chart 2.28).

2.28 Size of the problem – projections



Data source: CIE; ABS.

Underlying causes

When operating efficiently, markets generally respond to the needs of consumers. To the extent that there is currently a shortage of accessible private housing, this implies that the market response may be falling short of the need. For the RIS, it is important to understand the underlying cause of the problem (i.e. why is the market not providing sufficient levels or types of housing with accessibility features?).

2.29 Questions for stakeholders

- In your opinion, what is the main contributor to a lack of uptake of universal design principles in new dwellings:
 - Buyers failing to think about their future accessibility needs?
 - Volume builders are reluctant to deviate from standard plans?
 - Other barriers?

Market imperfections

Some factors that potentially contribute to a shortage of accessible housing include the following.

Separate houses

In principle, the design of new separate houses should reflect the owner's choice given their current needs/preferences, budget and the associated costs. However, various barriers to universal design have been identified in the literature, which potentially lead to an under-supply of accessible housing.

- The market could potentially under-supply accessible housing where owners/buyers are not able to foresee (or do not give sufficient thought to) their future accessibility needs, or possibly the accessibility needs of future residents if accessibility features are not reflected in market prices (this is referred to as a 'bounded rationality' problem). Some stakeholders suggested that buying a home can be an 'aspirational' decision and nobody aspires to acquiring a disability. This is consistent with the 'lack of education' on universal design identified by Bringolf (2011).
- Bringolf (2011) also identified the housing delivery chain as a barrier to universal design. Many houses (particularly in greenfield areas) are built by 'volume builders'. Under this business model consumers choose from a set of standard designs. Incorporating additional accessibility features into a dwelling would involve deviating from the standard design. Bringolf (2011) provides evidence that it can be difficult to get volume builders to deviate from a standard design. That said, some industry stakeholders noted that some volume builders have included some accessible designs in the standard offerings, although uptake had been limited.
- Bringolf (2011) also identifies the rigid application of planning regulations by local government as a barrier to the uptake of universal design.⁴⁵ This can create an environment where builders are reluctant to deviate from designs that have received approval in the past. In noting this general point, we also note that SGS 2019 provide some specific examples of individual local councils trying to promote accessible housing via planning regulation.⁴⁶

Some industry stakeholders noted a growing awareness of accessibility issues from some consumers, particularly from the age of around 50 onwards. Unpublished analysis of a COTA NSW survey for the *50+ Report* found that the extent to which accessibility features were an important factor that influenced the choice of current home varied.

- More than 80 per cent of respondents indicated that easy access kitchen and storage and easy access bathroom and shower was either important or very important.
- Around 60-70 per cent of respondents indicated that the following features were either important or very important:
 - Minimal steps into home
 - Easy access from garage
 - Single storey.

⁴⁵ Bringolf, J. 2011, *Barriers to Universal Design in Housing*, A thesis submitted for the degree of Doctor of Philosophy, Urban Research Centre, College of Health and Science, University of Western Sydney, September 2011, pp. 45-47.

⁴⁶ SGS 2019, *Planning Schemes Research*, Prepared for ABCB July 2019.

- Only around 50 per cent of respondents indicated that wide hallways and doorways was either important or very important feature.⁴⁷

Apartments

Many apartments are sold ‘off the plan’ and therefore developers aim to appeal to the market’s average demand, rather than the specific needs of an individual buyer. Several stakeholders agreed with the proposition that this common business model was a barrier to the apartment market being more responsive to the growing demand for accessible housing.

Renters

Although meeting accessibility needs through home modifications is often a reasonable option for owner-occupiers, it is not always an achievable option for renters. Owner-occupiers have full control over the decision to make necessary home modifications (subject to funding), while renters must obtain agreement from the landlord.⁴⁸

The ABCB Consultation Report notes the following issues in relation to private renters.⁴⁹

- Landlords are reluctant to have their properties modified even though by law they are required to allow for reasonable modifications. This is reflected in the SDAC data showing that a very small proportion of private rentals are modified to meet the needs of tenants with mobility-related disabilities.
- Tenants are therefore often required to pay for the relevant modifications and then pay again to have them removed when vacating the property. As rental tenancies are often relatively short, the future benefits associated these modifications (that may be specific to a particular tenant) may also be short (and uncertain), which acts as a significant disincentive for both landlords and tenants.

This is reflected in the proportion of people with a mobility-related disability living in modified dwellings. SDAC data shows that the proportion of owners with home modifications is around double the proportion for all renters (chart 2.30). The type of landlord also matters.

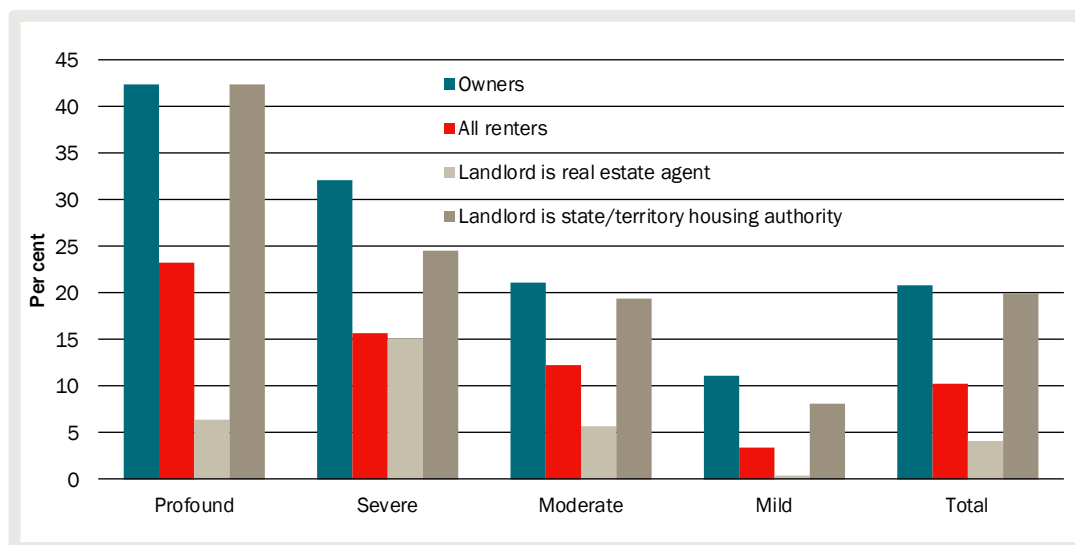
- The proportion of tenants of state and territory housing authorities with a mobility-related disability in modified dwellings broadly aligns with owner-occupiers.
- The proportion people with a mobility-related disability that rent from a real estate agent is around 5 per cent, even for people with a profound mobility-related disability.

⁴⁷ Bringolf, J. 2015, *Let’s Talk About Where You Live*, Incomplete draft by Jane Bringolf based on COTA NSW 2014 survey data for the 50+ Report with a focus on how and when older people are living, unpublished draft.

⁴⁸ ABCB 2019, *Accessible Housing Options Paper*, Consultation Report, April 2019, p. 55.

⁴⁹ *ibid*, p. 55.

2.30 Proportion of people with a mobility impairment with home modifications



Data source: ABS, Survey of Disabilities, Ageing and Carers, 2018, TableBuilder.

This implies that private renters with mobility-related disabilities are less likely to be living in homes that meet their accessibility needs.

Information failures

There is a lack of information, certification and poor matching in the market.

- Some stakeholders noted that when people who require more accessible housing try to locate it, it is very difficult to judge (without physically visiting the property) whether it is accessible. This makes the process of searching and securing accessible housing very costly.
- It was also noted that when builders wish to build accessible housing, it is very difficult to get their plans certified in advance of construction, which means it cannot be marketed as 'accessible' to buyers before the product is completed. Further, sellers of newly completed or existing homes that are accessible cannot get these homes certified as accessible. This significantly reduces the incentive for builders to build accessible housing.

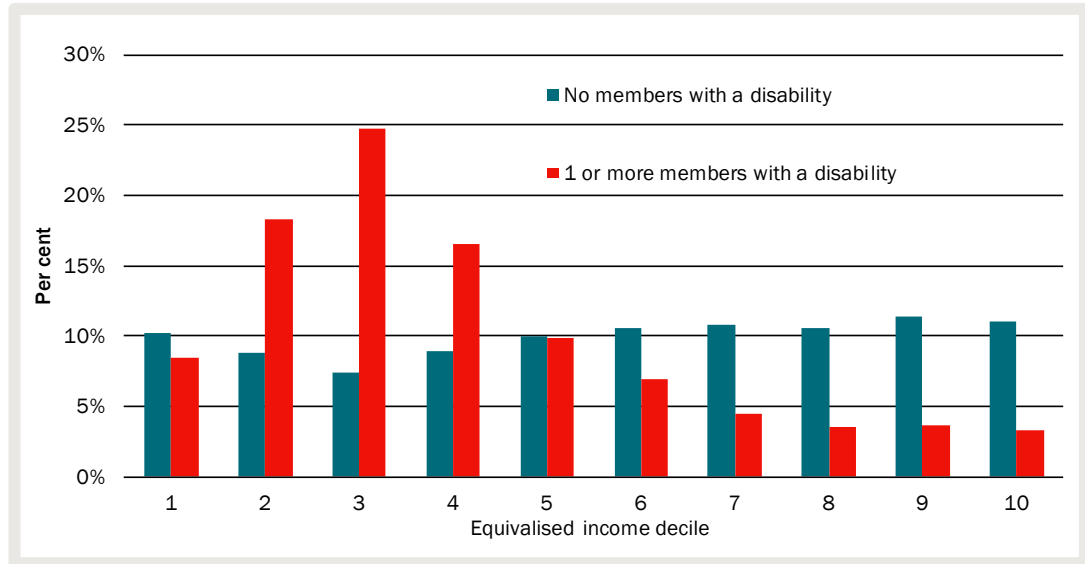
Low incomes

An underlying cause of the problem may be that households containing people with a disability have insufficient income to fund their housing needs. A number of stakeholders stressed the importance of affordability, as well as accessibility and location.

For example, older people may be reliant on a pension, while some people with mobility-related disabilities may have limited employment opportunities. Employment opportunities may also be limited for other members of the household, where they have significant caring duties.

According to SDAC data, the equivalised income of income units containing a member with a moderate, severe or profound disability is concentrated in the lower deciles, with around 78 per cent of income units below the median equivalised income (chart 2.31).

2.31 Equivalised income distribution



Data source: ABS, Survey of Disabilities, Ageing and Carers, 2018, TableBuilder.

3 *Objectives and options*

Objectives

Under the COAG Guidelines, a RIS should clearly articulate the objectives, intended outcomes, goals or targets of government policy.⁵⁰

Broader government policy objectives

Accessible housing issues cut across several policy areas, including disability and aged care policy. In establishing the objectives of the proposed change to the NCC it is important to consider the Government's broader objectives in these policy areas.

Disability policy

The National Disability Strategy adopts the principles set out in Article 3 of the CRPD:

- respect for inherent dignity, individual autonomy including the freedom to make one's own choices, and independence of persons
- non-discrimination
- full and effective participation and inclusion in society
- respect for difference and acceptance of persons with disabilities as part of human diversity and humanity
- equality of opportunity
- accessibility
- equality between men and women
- respect for the evolving capacities of children with disabilities and respect for the right of children with disabilities to preserve their identities.

More specifically, Outcome 1 of the National Disability Strategy is:

“People with disability live in accessible and well-designed communities with opportunities for full inclusion in economic, sporting and cultural life.”⁵¹

Policy Direction 3 under Outcome 1 refers to:

⁵⁰ Council of Australian Governments, Best Practice Regulation, A Guide for Ministerial Councils and National Standard Setting Bodies, p. 10.

⁵¹ Commonwealth of Australia 2011, *National Disability Strategy 2010-2020: An initiative of the Council of Australian Governments*, p. 32.

“Improved provision of accessible and well designed housing with choice for people with disability about where they live”.⁵²

Similar themes — including equity and fostering independence — were raised in submissions to ABCB’s Options Paper, although the Consultation Report noted that these objectives were generally not well defined.

- According to the Consultation Report, a definition of ‘equity’ can be gleaned from the existing NCC provisions that address accessibility of public buildings. One of the objectives of those provisions is to provide people with ‘safe, equitable and dignified’ access to buildings. In that context, the use of the term ‘equitable’ is explained as follows:

“One of the primary intentions of the [Disability Discrimination Act] is to provide people with a disability with the same rights as the rest of the community.

The word ‘equitable’ refers to concepts of fairness and equality. It does not mean that all people must be able to do the same thing in the same way. However, if some people can use a building for a particular purpose, then most people should be able to use the building for that purpose.”⁵³

- Based on the broader body of literature, ABCB inferred that the objective of ‘fostering independence’ refers to the potential for accessible housing to lead to increased ability for people (with disability) to minimise their dependence on others to carry out household tasks.⁵⁴

Aged care policy

A key focus of aged care reforms over recent years has been to improve support for people to remain at home for as long as possible.⁵⁵ This aligns with the preference of many older Australians, as well as having the potential to reduce the cost of care met by the Australian Government.

Objectives of the proposed changes to the NCC

ABCB’s Consultation Report notes that equity and fostering independence can both be considered as relevant objectives.⁵⁶ That said, there are a range of other policies in place that are already intended to address these objectives directly.

Some stakeholders have also suggested that the objective is to ‘mainstream’ universal design principles. However, under the COAG RIS Guidelines, the objectives should not pre-justify a preferred solution.⁵⁷

⁵² *ibid*, p. 32.

⁵³ ABCB 2019, *Accessible Housing Options Paper*, Consultation Report, April 2019, p. 24.

⁵⁴ ABCB 2019, *Accessible Housing Options Paper*, Consultation Report, April 2019, pp. 24-25.

⁵⁵ ABCB 2019, *Accessible Housing Options Paper*, Consultation Report, April 2019, p. 20.

⁵⁶ ABCB 2019, *Accessible Housing Options Paper*, Consultation Report, April 2019, p. 25.

⁵⁷ Council of Australian Governments, *Best Practice Regulation, A Guide for Ministerial Councils and National Standard Setting Bodies*, p. 10.

Given that the proposal is based on universal design principles (that aims to meet the needs of the largest number of people), rather than the specific needs of people with disabilities, we propose an objective that applies more generally to the broader community, but is also specifically related to dwellings as follows.

- **To ensure that new housing is designed to meet the needs of the community, including older Australians and others with mobility limitations.**

Options

The COAG Guidelines require that a RIS identifies a range of viable options including, as appropriate, non-regulatory, self-regulatory and co-regulatory options.⁵⁸

Options to include accessible housing standards in the NCC

The proposed changes to the NCC are broadly based on the Livable Housing Design Guidelines produced by Livable Housing Australia, although there are some variations.

- Option 1 is based on the silver standard
- Option 2 is based on the gold standard
- Option 3 is based on the gold standard, with some additional features from the platinum standard.

The proposed standards are summarised in table 3.1. These options have been based on universal design principles, focusing mostly on design improvements that have broad benefits across many future residents (including future residents without a mobility-related disability), rather than design features specific to those with a mobility-related disability.

These requirements would apply to all Class 1a (houses) and Class 2 (apartments) dwellings.

3.1 Key requirements to be added to NCC under different stringency options considered by ABCB

Required element	Option 1:	Option 2:	Option 3
Dwelling access: option A OR	Step-free access from the allotment boundary, an associated class 1a building or at least one car-parking space provided for the exclusive use of the dwelling	Step-free access from the allotment boundary, an associated class 1a building or at least one car-parking space provided for the exclusive use of the dwelling	Step-free access from the allotment boundary, an associated class 1a building or at least one car-parking space provided for the exclusive use of the dwelling

⁵⁸ Council of Australian Governments 2007, *Best Practice Regulation: A Guide for Ministerial Councils and National Standard Setting Bodies*, October 2007, p. 10.

Required element	Option 1:	Option 2:	Option 3
<i>Cases where new dwellings are not required to have step-free access</i> OR	<i>There are various exclusions, where new dwellings are not required to have step free access; these are described in a separate section (below); further, ABCB are allowing for the possibility the requirement may be made less stringent from 'step free' to 'not more than one step' (we are calling this option B)</i>		
Dwelling access: option B (less stringent requirement) AND	Access with not more than one step from allotment boundary, an associated class 1a building or at least one car-parking space provided for the exclusive use of the dwelling	Access with not more than one step from allotment boundary, an associated class 1a building or at least one car-parking space provided for the exclusive use of the dwelling	Access with not more than one step from allotment boundary, an associated class 1a building or at least one car-parking space provided for the exclusive use of the dwelling
Width of access path	1000mm	1100mm	1100m
Ramp lengths	9m (1:14 ramp), 15m (1:20 ramp)	9m (1:14 ramp), 15m (1:20 ramp)	9m (1:14 ramp), 15m (1:20 ramp)
Entry to dwelling	At least one step-free entrance door	At least one step-free entrance door	At least one step-free entrance door
Clear opening width of entry door	800mm	850mm	850mm
Max. transition/threshold height of abutting surfaces	5mm	5mm	5mm
Clear opening width of internal doors	820mm	850mm	850mm
Width of internal corridors	1000mm	1200mm	1200mm
Required toilet location ^a	Ground floor or entry level	Ground floor or entry level	Ground floor or entry level
Circulation space between front edge of toilet and arc of door	1200mm	1200mm	1200mm
Walls either side of closet toilet ^a	900mm	1200mm	1200mm
Location of toilet, where it is combined with bathroom	Corner	Corner	Corner
Required shower location	-	Ground floor or entry level	Ground floor or entry level
Shower design	Removable shower screen, flat entry	Removable shower screen, flat entry	Removable shower screen, flat entry
Minimum size of shower	-	Recess of 900 mm ² , with adjacent space of 900 mm ²	Recess of 900mm ² , with adjacent space of 1200mm ²
Construction of toilet & bathroom walls	So as to enable future installation of grabrails in a way that min. removal of existing linings (specific requirements noted)	So as to enable future installation of grabrails in a way that min. removal of existing linings (specific requirements noted)	So as to enable future installation of grabrails in a way that min. removal of existing linings (specific requirements noted)
Internal stairways	-	No winders in lieu of landing, adjacent to wall capable of supporting a handrail	No winders in lieu of landing, adjacent to wall capable of supporting a handrail

Required element	Option 1:	Option 2:	Option 3
Clearance in front of fixed benches and appliances (ex handles) in kitchen		1200mm	1500mm
Clearance in front of basin, fixed benches and app. (ex handles) in laundry	-	1200mm	1550mm
Space for washing machine ^d	-	600mm in depth	600mm in depth
Required space for a bedroom ^a	-	Ground floor or entry level,	Ground floor or entry level
Bedroom design	-	Min size of 10m ² (ex wardrobes, linings, etc.), natural light and ventilation, bed space (1520mm*2030mm) plus travel space	Min size of 10m ² (ex wardrobes, linings, etc.), natural light and ventilation, bed space (1520mm*2030mm) plus travel space
Height of light switches above floor level ^c	-	900mm-1100mm	900mm-1100mm
Height of power outlets	-	300mm	300mm
Height of door handles above floor level	-	900mm-1100mm	900mm-1100mm
Maximum height of window sill	-	-	1000mm
Window operating controls	-	-	Internal controls must be operable with one from a sitting or standing position

Notes:

^a Except in garage top dwellings

^b 'minimum requirements' are based on 'deemed to satisfy requirements'; (which are common method of compliance in the residential building industry) as opposed to the Performance Requirements.

^c There are various exclusions, where new dwellings are not required to have step free access; these are described in a separate section (below);

^d In some cases, requirements are more nuanced than what is implied here. The listed requirements are intended to capture the most important constraints.

Source: ABCB; CIE.

Under the ABCB's proposed changes to the NCC, all new dwellings are required to have proposed accessibility features, other than proposed features that relate to step-free access. However, in cases where it is not practicable to include step-free access, a new dwelling is excluded from the step-free access requirement (set out below). Therefore, there are some dwellings that will not have step-free access but will have other accessibility features. This is intended to stop new home builders from trying to avoid accessibility requirements all together by deliberately building homes where step-free access is not practicable.

3.2 Cases where step-free access would not be required, or where exclusions apply

Case	Exception	Discussion
Class 2 dwellings	<p>Class 2 dwellings are dwellings that sit on-top of another structure; it mostly covers:</p> <ul style="list-style-type: none"> All types of apartments (buildings of 4 or more stories, which include lifts, and 3 or fewer stories, which do not or usually do not include lifts) Townhouses (or single level apartments) that sit on-top of an underground, shared carpark (as the carpark itself is a structure) 	<p>The proposed changes to the NCC do not alter the 'status quo' for Class 2 dwellings, as existing NCC Table D3.1</p> <p>This means where there is no lift (townhouses on top of shared carparks, apartment buildings of 3 or fewer stories), only dwellings on the entry level require step-free access to dwellings (via ground level entrance; not via carpark); dwellings on other stories do not require step-free access</p> <p>Where there is a lift (generally in buildings of four or more stories) dwellings require step-free access (if the lift serves all 4 storeys)</p>
Class 1A dwellings	<p>1a dwellings are detached houses and attached houses (including: townhouses, row/terrace houses, etc)</p> <p>There are six cases where 1a houses do not require step-free access:</p> <ul style="list-style-type: none"> Where the slope of the path of entry is steeper than 1:14 High floor homes e.g. 'Queenslanders' 'Smaller blocks' 'Dwellings on top of garages' The dwelling is located in a flood hazard area The dwelling is located in an alpine area 	<p>Queenslander style homes are raised for ventilation; where the required ramping would exceed the interval limits set-out in the proposed changes, this ramping is not required (step-free access is not required)</p> <p>'Smaller blocks' (usually inner-city) where dwelling access is via a step that is right on the edge of the lot (required by planning authorities), ramping is not practicable and is therefore not required (step free access is not required)</p> <p>Where the ground floor of a dwelling is a garage, step-free access to the rest of the dwelling is not required</p>

Source: CIE.

Other options

As identified above, there are a range of existing programs to address the aspects of the problem identified above. To the extent that existing measures do not fully address the issues, it is possible that expanding some existing programs could reduce the extent of the problem.

A key question raised by industry stakeholders during targeted consultations is whether there is a need to apply accessibility standards to **all** new dwellings.

Other options through the NCC

As the NCC applies to all new buildings, there is generally limited scope to impose accessibility standards on only a proportion of new dwellings through the NCC. The proposed options currently include some exemptions; however, these generally apply where it is either not possible or impractical to apply all of the accessible design elements.

Some alternative policy options for addressing the problem, include applying accessibility standards to either:

- Class 1a dwellings only, or
- Class 2 dwellings only.

Planning requirements

As noted above, some states increase the supply of accessible dwellings through mandated planning requirements or incentives through the planning system.

- Mandated requirements generally apply to a proportion of dwellings and as such, can only be applied to multi-dwelling developments.
 - One potential advantage of this approach (compared with the NCC) is that applying accessibility requirements to a proportion of dwellings can reduce compliance costs (as it is more targeted not all dwellings would need to comply).
 - On the downside, this approach will be less effective in increasing the stock of accessible dwellings.
 - Variations across LGAs can also increase costs for builders and designers.
- Other incentives through the planning system could include:
 - exemptions from infrastructure charges
 - preferential approval pathways
 - density bonuses (or similar).

Unlike the intention of the NCC, planning requirements vary across states and in some cases local government areas (LGAs). Planning frameworks vary significantly across states, making national consistency difficult to achieve. For example, in some states accessibility requirements for multi-dwelling developments are applied through apartment design guidelines. However, not all states have apartment design guidelines.

There is currently no mechanism to apply nationally consistent planning requirements. Implementing this approach would therefore require each state governments to reach agreement and apply the agreed nationally consistent requirements through each state or territories' own planning framework.

Social housing

One approach to improving the availability of accessible housing for people with a mobility-related disability is through expanding accessible social housing.

- A key advantage of this approach is it is potentially more targeted at addressing the problem as state and territory housing authorities would be able to ensure that new accessible housing is allocated to people with a mobility impairments.
- However, increased provision of accessible social housing would address only one aspect of the problem — the lack of accessible rental properties for those who are eligible for social housing.

Direct subsidies

During ABCB's consultations, some stakeholders expressed a preference for direct subsidies to build accessible dwellings. Presumably, this approach would involve either the Commonwealth or state governments funding developers or individuals to build dwellings that meet a specified accessibility standard.

While regulatory options would generally apply to all new buildings (unless specifically exempt), subsidies can have the advantage of being a more targeted approach to achieving the objectives. In particular, a subsidy program can potentially ensure that accessible dwellings are allocated to households with accessibility needs through an administrative process.

Providing subsidies to owner-occupiers would not make additional accessible housing available to households with accessibility needs in the short-term. Any owner-occupiers that are encouraged to apply universal design principles as a result of the subsidy are unlikely to have current accessibility needs. Logically, if they had current accessibility needs they would have incorporated accessible design features into the housing design, even without the subsidy. Consequently, additional accessible housing would not become available to those with accessibility needs, unless offered for rent, or until the original owner moved out (or a household member acquires a disability). For these reasons, subsidising owner-occupiers to incorporate universal design principles into their dwelling design would not be a targeted approach to achieving the objectives.

Given the different nature of the barriers to the uptake of universal design principles for apartments, there is more logic in subsidising developers to build accessible apartments; however, there is unlikely to be an effective mechanism to ensure that these apartments are actually occupied by people with accessibility needs over the longer-term.

The most targeted approach would be to provide a subsidy to landlords that provide rental accommodation to households with specific accessibility needs. This is similar to the approach used for SDA, although presumably these subsidies would apply to some households that are not eligible for SDA (SDA is an insurance scheme that has stringent eligibility requirements).

- This approach would be specifically targeted at addressing the issue associated with a lack of accessible private rental properties.
- As there are already policies in place to support low income households with accessibility needs (i.e. social housing) and households with care needs (i.e. SDA), this subsidy could be targeted at ensuring accessible rental stock is available, implying that rents could be charged at rates reflecting rents charged for similar properties (which may not have relevant accessibility features). That is, the subsidy would be designed to stimulate the market for accessible rental properties and would only cover the additional cost of the relevant accessibility features.
- A subsidy on accessible rental properties is a way of providing assistance to renters that in many cases are unable to access the subsidies on home modifications provided to owner-occupiers.

Enhanced voluntary Guidance

During the targeted consultations, some stakeholders argued that options for encouraging voluntary uptake of accessible housing designs had not yet been fully explored. In particular, few resources have been allocated to:

- promoting the LHDG to both:
 - builders/developers, and

- potential buyers
- promoting the existing certification scheme.

An enhanced voluntary option could include the following elements.

- A voluntary ABCB handbook — some stakeholders argued that this would raise the profile of accessible housing and encourage uptake. Furthermore, where state or local government do apply accessibility requirements, there is no consistency in the standards applied. If a voluntary ABCB handbook was developed, any state or local government requirement could refer to the voluntary standard. This could improve the consistency of the standards applied.
- Information provision at the point of sale — more information on the benefits of accessible housing could be provided at the point of sale to encourage more demand for accessible housing.
- Better matching services — although there are some services available, matching buyers/sellers nevertheless has been identified as a problem. Options to improve these services could include the following.
 - Developing a specialised web-based search facility.
 - Working with mainstream websites (such as realestate.com or domain) to enable people to search for certified accessible dwellings. This would also help to encourage better awareness and greater uptake of the certification scheme.

Summary of options to be considered

A range of options have been developed based on those proposed through stakeholder consultation, including some not within ABCB's broad area of responsibility (e.g. Option 5 and the information provision and matching aspects of Option 6) and non-regulatory alternatives as required under best practice guidelines. The Consultation RIS explicitly considers the impacts of the following options (measured from the status quo baseline).

- **Status quo**
- **Option 1:** Accessibility standard, broadly reflecting LHDG silver standard, in the NCC applying to all new Class 1a and Class 2 buildings.
- **Option 2:** Accessibility standard, broadly reflecting LHDG gold standard, in the NCC applying to all new Class 1a and Class 2 buildings.
- **Option 3:** Accessibility standard, broadly reflecting LHDG gold standard (plus some platinum features), in the NCC applying to all new Class 1a and Class 2 buildings.
- **Option 4:** Accessibility standard, broadly reflecting LHDG gold standard, in the NCC applying to all new Class 2 buildings.
- **Option 5:** A subsidy program to encourage additional availability of accessible rental properties to LHDG Gold standard.
- **Option 6:** An enhanced approach to voluntary guidance, including:
 - a non-regulatory ABCB handbook
 - information provision at the point of sale
 - better matching services.

We include options 1-5 in the CBA. We consider Option 6 qualitatively, but do not quantify the costs and benefits.

3.3 Questions for stakeholders

- Which of the options considered in the Consultation RIS in your opinion are feasible?
- Are there other feasible regulatory or non-regulatory options with the potential to meet the objective that should be considered?
 - Applying the accessibility standards to only Class 1a or Class 2 dwellings?
 - Applying the accessibility standards to only a proportion of Class 1a or Class 2 dwellings? How would this be done in practice?
 - Applying a different combination of the LHDG elements?
 - Applying a subset of the LHDG elements (e.g. step-free entry, wider doorways)?
 - Another option?
- Do all of the options, in your opinion, have the ability to meet the objective?
 - How could these be enhanced?
- Are there any less intuitive or unintended consequences likely to arise from any of these options?
- Of the options discussed above, in your opinion which would be most effective at achieving the objective?

4 *Impacts*

This chapter identifies the impacts of the proposed options and sets out the cost-benefit analysis framework used to quantify these impacts.

Impacts

The impacts (including costs and benefits) of the proposed options are identified below.

Proposed changes to the National Construction Code

Under the options involving changes to the NCC, there would be an increase in the number of accessible dwellings and therefore an increase in the proportion of the stock of dwellings that are accessible for people with mobility limitations, including older people and people with disabilities.

Benefits

The benefits of the proposed changes to the NCC essentially involve reducing the size of the problem estimated in chapter 2. This includes:

- reduced costs associated with falls
- reduced carer needs
- reduced cost of home modifications
- reduced stays in hospital and transition care
- reduced costs associated with social isolation and loneliness
- reduced premature and unnecessary entry into residential aged care
- reduced costs associated with moving
- societal benefits.

Costs

The costs of the proposed changes to the NCC (Options 1-4) could include the following (where not subject to exclusions).

- The additional costs associated with complying with the proposed accessibility standards – these costs include:
 - Additional construction costs
 - Loss of space – where some areas of a dwelling (such as bathrooms and hallways) expand to meet the proposed standards, this space must come from either:

- ... expanding the footprint of the building, which means either expanding lot sizes or loss of outdoor/garden space, or
- ... loss of living and/or bedroom spaces where the additional hallway and bathroom space is accommodated within the existing building footprint (such were the scope to expand the building footprint is limited due to lot size).
- Potentially costs associated with additional excavation work on sloped lots.
- Transition costs – this includes:
 - Transition costs for volume builders, including the costs associated with re-designing the standard offering and rebuilding display homes
 - Other industry transition costs — this includes the cost of various industry professionals familiarising themselves with the new NCC requirements. This would include:
 - ... architects/building designers
 - ... builders
 - ... certifiers.

Subsidy scheme

The proposed subsidy (Option 5) would be provided to providers of accessible rental accommodation.

- The benefits of this approach are the extent to which a subsidy scheme would address the problem (see above). However, as the subsidy scheme would apply only to renters, this approach would address only the proportion of the problem relating to renters.
- The costs of this approach include the additional cost of providing accessible accommodation, either through building new dwellings or through refurbishing existing dwellings to meet the standard. One indicator of these additional costs is the subsidy required to encourage private landlords to provide the service.

Enhanced voluntary Guidance

As well as a voluntary handbook, this option would include measures, such as:

- a centralised search engine for (certified) accessible housing
- information provision on accessible housing at the point of sale.

Costs

Costs associated with this option would include the following.

- The costs associated with developing a voluntary handbook would be relatively low. The proposals (based on LHDG) could be reproduced (subject to permission of LHA), as a voluntary handbook at minimal cost.
- There would be costs associated with developing a new search engine specifically for certified accessible housing or working with an existing provider to include the relevant functionality in their existing search engines. There may also be ongoing operating costs (or an increase in operating costs).

- There may also be modest costs associated with developing information material to be provided at the point-of-sale, as well as modest costs associated with providing the relevant material (whether on a voluntary or mandatory basis).
- To the extent that these measures encourage additional uptake of universal design principles, there would also be the associated costs, including construction costs, the opportunity cost of space (where relevant) and possibly additional excavation costs. However, these costs would be incurred on a voluntary basis. A potential advantage of this approach, relative to a mandatory requirement, is that there is scope for consumers to make their own choices; where some consumers have a strong preference for non-compliant designs or the cost of complying with the standard is higher than average (due to the specific characteristics of the lot) they would be able to choose not to include accessible design features.

Benefits

To the extent that this approach encourages additional uptake of universal design principles, it could potentially reduce the size of the problem outlined previously to some extent. As uptake would be significantly lower than under the mandatory requirements, the benefits would be commensurately smaller.

Cost-benefit analysis framework

Cost-benefit analysis is the COAG Guidelines recommended tool for weighing up the costs and benefits of a regulatory (or other) proposal in a systematic way. Where possible, all financial, social and environmental costs and benefits are estimated in a common metric (usually monetary terms) so they can be readily compared. The stream of future costs and benefits are 'discounted' back to their present value to ensure costs and benefits incurred in different periods are on a comparable basis.

Baseline

A key element of a CBA is establishing a 'baseline' against which the costs and benefits of each of the policy options are assessed. A typical baseline is a 'business-as-usual' case; that is, the scenario without the policy (or policies) in question.

As set out in chapter 2, there are a significant number of policies aimed at ensuring that older Australians and people with a disability have access to housing that meets their needs. The baseline scenario assumes that these policies will continue.

The CBA is therefore assessing the incremental benefits and costs of each of the proposed options relative to existing policies.

As for the construction costs and space requirement, DCWC takes a two-step approach to define the baseline, reflecting the complexity of building type and design.

First, for each design element, various scenarios are defined to reflect the different baselines. For example, some designs may already be compliant under the baseline, and

thus the required changes incur zero cost. Some designs are not compliant in the baseline, and thus require changes to meet the standard, which incur additional construction costs. Furthermore, the compliance may be achieved through different designs solutions. For example, to meet the toilet circulation space requirement, a design replacing a side hung door with a cavity sliding door would mean minimal cost, while in some cases this design is not feasible and bigger space is required to meet the standard, and thus higher costs. For Gold and/or Gold+ standards, more scenarios may be needed to define the baselines for those already met lower standard.

In the second step weightings are given to each scenario to define the baseline for relevant elements and building types in the market.

Time periods

According to OBPR, the time period for a CBA needs to be long enough to capture all of the potential costs and benefits. As for previous ABCB RISs a 10-year regulatory period has been adopted. However, as buildings are long-lived assets, accessible dwellings constructed over the 10-year regulatory period will provide housing (and therefore benefits) over a much longer period. The benefits of the dwellings built over the 10-year regulatory period have in the past been assessed over the life of the dwelling (generally assumed to be around 40 years).

One challenge with this approach in the context of the current RIS, is that (one of) our approach(es) to quantifying benefits assumes that the extent to which the proposal addresses the problem (estimated in chapter 2) is related to the share of accessible dwellings in the overall stock, rather than estimating the benefits for an individual dwelling and then extrapolating across the stock built under the new code. This is because most (but not all) of the benefits depend on whether a person with specific accessibility needs resides in the dwelling.

Our approach therefore involves estimating the additional upfront costs associated with the dwellings constructed over the 10-year regulatory period. The benefits escalate as the share of the stock that is accessible increases. We then hold the benefits at the end of the 10-year regulatory period constant for an additional 30 years.

Discount rate

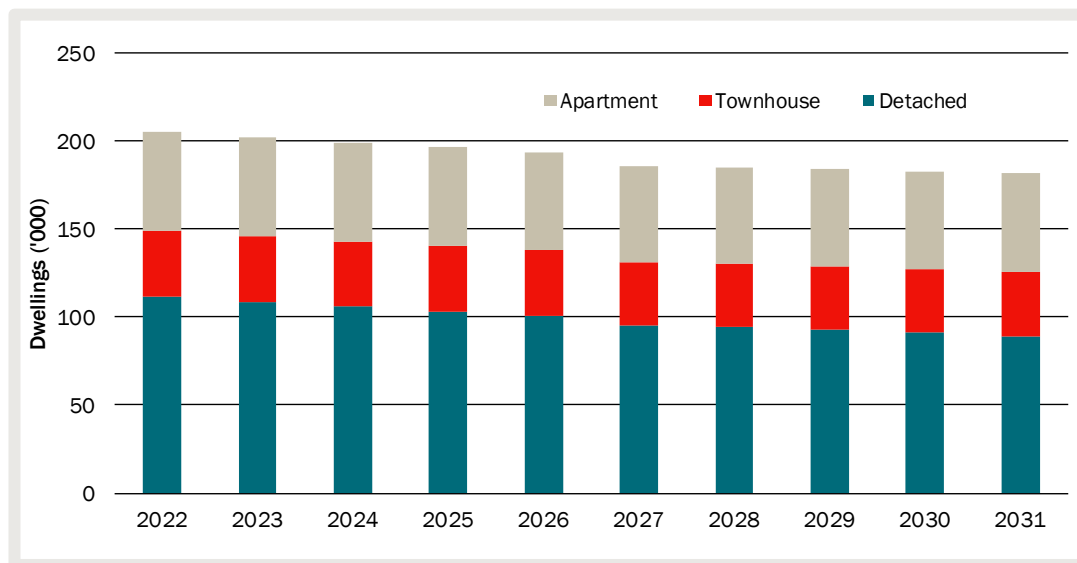
As required by the Office of Best Practice Regulation (OBPR), all costs and benefits are discounted using an annual real discount rate of 7 per cent.⁵⁹ Alternative discount rates of 3 per cent, 5 per cent and 10 per cent are used in sensitivity testing.

⁵⁹ Department of the Prime Minister and Cabinet 2016, *Cost-Benefit Analysis*, Office of Best Practice Regulation, February 2016, pp. 7-8.

Projected dwelling construction

A key driver of both the benefits and the costs is the level of new dwelling construction over the regulatory period. The CIE’s dwelling projection sees completions declining gradually from just above 200 000 in 2022 to around 182 000 by 2031 (chart 4.1).

4.1 Projections for dwelling completions in Australia

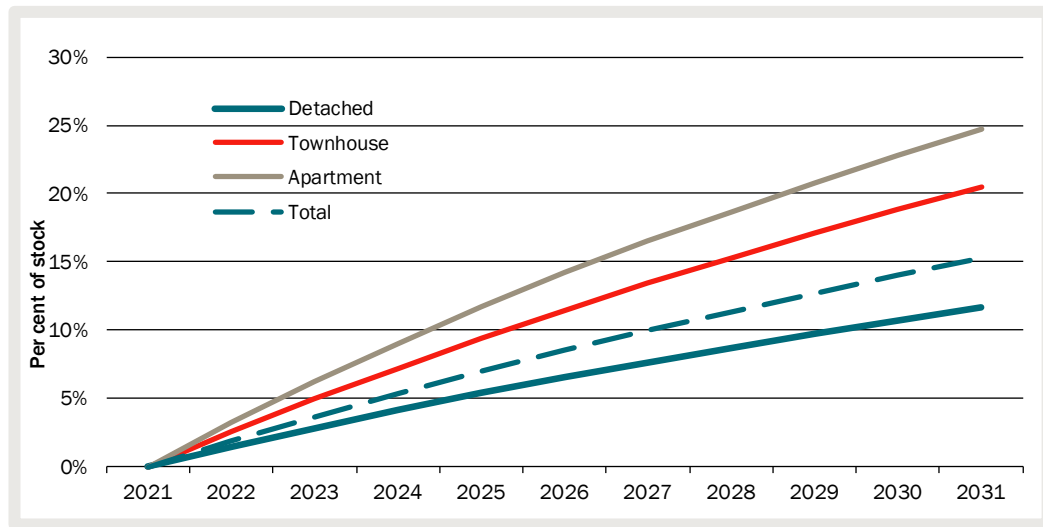


Data source: CIE.

The underlying drivers of completions are population growth, the ratio of the dwelling stock to population and a demolition rate (see discussion in Appendix C). The ratio of the dwelling stock to population has been derived from state government projections for population and dwellings, and aggregated to the national level.

New dwellings constructed under a revised NCC would become an increasing share of the stock over time (chart 4.2). The share of accessible housing will increase accordingly.

4.2 Share of the dwelling stock (by type) constructed under the new Code



Data source: CIE estimates.

5 *Approach to estimating costs*

In this chapter, we estimate the costs (as outlined above) associated with each of the options.

Additional cost of complying with proposed standards

The impacts of the proposed standards on construction costs will vary across dwellings based on factors, such as: the type of dwelling, design choices, the approach to achieving compliance, the size and topography of the lot.

The additional costs associated with complying with the proposed standards (including both additional construction costs and the opportunity cost of space) are estimated in Table 5.1.

- DCWC, quantity surveyors, have provided estimates of the additional construction costs of incorporating the proposed changes to the NCC into new builds. A summary of these costs is provided in the construction cost column of Table 5.1.
- DCWC have also provided an estimate of impact on space of the changes (for example, where new homes need to expand to incorporate the changes). The net effect of the space is the opportunity cost of the additional land required (developers have to buy more land for each new dwelling they create), offset by the value the new home-owner places on the additional space. Our assumptions for the net effect of these impacts are noted in table 5.1.

The summary cost results for the three building types in tables 5.1 and 5.2 are aggregated from DCWC's cost estimates for the five 5 different dwelling archetypes using the following shares:

- Apartment buildings consist of 8 per cent of walk-up blocks and 92 per cent of 4+ storey building (which would generally require a lift), according to building approval data from ABS (Cat. 8731); and
- Detached houses consist of 57 per cent of volume builds and 43 per cent of custom builds according to DCWC.

5.1 Estimated additional compliance costs

	Estimated construction costs	Opportunity cost of space	Total
	\$ per dwelling	\$ per dwelling	\$ per dwelling
Option 1 (Silver)			
Separate house	903	281	1 185
Townhouse	1 839	629	2 467
Apartment	1 611	2 828	4 439
Option 2 (Gold)			
Separate house	7 080	1 822	8 902
Townhouse	12 398	3 302	15 700
Apartment	8 595	15 607	24 202
Option 3 (Gold+)			
Separate house	9 566	2 412	11 977
Townhouse	14 976	3 963	18 938
Apartment	10 804	19 668	30 472

Note: Reported construction costs assume Option B ('1-step path') is chosen for Design element 1.

Note: Reported opportunity of space costs are derived with assumptions noted in Tables 5.7 and Table 5.8 (below). They are noted in Appendix I as total impact unit costs

Source: CIE estimates.

The aggregate costs over time are estimated by multiplying these per dwelling cost estimates by the dwelling construction profile shown above (chart 4.1).

Additional construction costs

A key challenge in estimating the additional costs associated with complying with the proposed standards is sufficiently capturing this variation across dwellings. It is unlikely to be possible to capture all of the variation; however, it is important that the estimates are broadly representative of the additional costs across dwellings.

Approach to costings

The CIE engaged quantity surveyors Donald Cant Watts Corke (DCWC) to prepare estimates of the additional cost of meeting the proposed accessibility standards. DCWC have estimated the additional costs for 5 different dwelling archetypes:

- 2 separate houses, including:
 - a 'custom built' house
 - a typical volume builder house
- a townhouse
- 2 apartments, including
 - an apartment in a 3-storey 'walk-up'

- an apartment in a 4+ storey building (which would require a lift).

To account for the variation across buildings within each building type, DCWC have estimated the weighted average cost of complying with each design element covered by the relevant standard. DCWC:

- identified a range of scenarios (reflecting the different levels of compliance under the baseline, e.g. non-compliant at all, Silver compliant already, or Gold and Gold+ compliant already, and different ways to achieve the compliance)
- estimated the cost of complying with the relevant standard under each scenario
- estimated the share of dwellings that would fall under each scenario (these estimates were used as weightings to estimate the weighted average cost across the various scenarios).

Options for Design element 1

As noted in table 5.2, the proposed changes to the NCC include various design elements (corresponding to different elements of the LHDG standards). For the first element (dwelling access), ABCB are considering two options:

- Option A is to require new builds to have ‘step-free access’ to the dwelling
- Option B would allow new dwellings to have ‘single-step access’ to the dwelling.

To estimate costs for this project, DCWC note that most or all new-builds have single-step access, which means ‘Option B’ is, in effect, status-quo. This means requiring ‘Option B’ for Design element 1 does not add to the costs of complying with the proposed changes to the NCC (this is documented in Appendix I).

- **In this Consultation RIS, cost estimates assume the final standard would require Option B (one step).**

Under Option A compliance costs would be larger than what has been presented in the Consultation RIS. The additional construction costs, per dwelling, are noted in table 5.2. Choosing Option A does not impact space costs (relative to Option B).

In estimating additional construction costs for Option A, DCWC assumes a majority of buildings would choose the front entry solution for compliance which incur a small cost, while a small proportion require garage access with a larger cost increase (see Appendix I of this report and DCWC report for details).

5.2 Additional compliance costs from selecting Option A for Design Element 1 (dwelling access): construction cost per dwelling

LHDG Standards	Additional construction cost per dwelling
	\$
Detached house	
Silver	522
Gold	705
Gold+	705
Townhouse	
Silver	501
Gold	681
Gold+	681
Apartment	
Silver	4 012
Gold	7 077
Gold+	7 077

Source: CIE.

Overall, the additional construction costs associated with Option A (relative to Option B) for design element 1, for each policy option, in net present value terms (using a discount rate of 7 per cent) are shown in table 5.3. The data in table 5.3 are a subtraction from the net benefit of each policy option, should option A be adopted over option B for design element 1.

5.3 Additional compliance costs from selecting Option A for Design Element 1 (dwelling access)

	Option 1	Option 2	Option 3	Option 4	Option 5
	\$ million	\$ million	\$ million	\$ million	\$ million
Additional cost	2 215	3 688	3 688	2 966	0

Note: Additional compliance costs are estimated in net present value terms over the 10-year regulatory period, using a discount rate of 7 per cent.

Source: CIE.

DCWC cost estimates

DCWC's cost estimates are provided in detail in Appendix I, with further details provided in the accompanying report.

Other cost information gathered

DCWC's cost estimates appear relatively conservative relative to cost estimates provided by industry. One stakeholder estimated that accessibility features could add \$10-20 000 to

the cost of each dwelling (the difference may partly be explained by additional excavation costs — see below).

5.4 Questions for stakeholders

- Are the scenarios of possible impact (DCWC descriptions) broadly representative of the scale of the adjustments required for designs to comply with the proposed accessibility standards (Options 1-3)?
- For each of the building types, are the weighted average cost estimates broadly representative of the additional construction costs to comply with the proposed accessibility standards (Options 1-3)?
- Can you provide evidence to inform the cost weightings? (See Appendix I)?

Space-related costs

Several accessible design elements have the effect of widening entry passages and increasing garages and bathroom sizes, compared to existing practice.

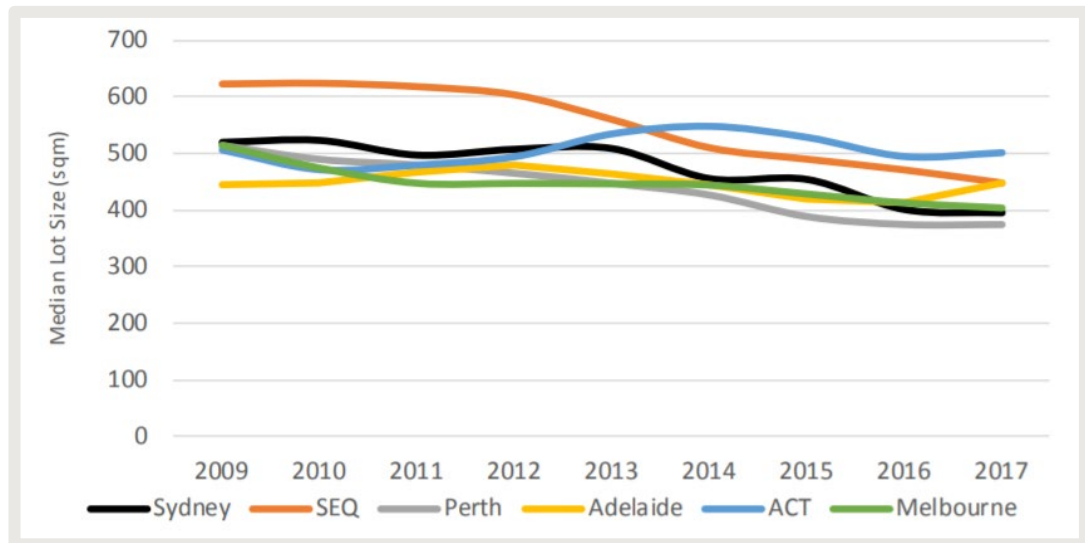
There are 2 ways that these additional space requirements could be accommodated:

- Expanding the footprint of the building – this means the additional space must come from either:
 - a loss of outdoor (garden) space, or
 - an increase in lot size/width, which implies fewer lots in any given development area. This would mean that the value of the additional lots would be foregone.
- Accommodating the additional space requirements within the existing footprint of the building — this implies a loss of living (or bedroom space).

For Class 1a separate dwellings, increasing the building footprint to accommodate accessible design elements may be possible on larger lots. However, there may be more significant impacts on some smaller lots.

- There has been a recent trend towards smaller lots for greenfield housing (chart 5.5).
- Modern subdivisions have lot sizes at 4.5, 6.2, 9 or 12.5m wide.
- Side setbacks are often zero on one side and 900 on other side
- It is usual for homes to be designed to span the whole width of the block up to the setbacks.

5.5 Median lot size



Data source: Urban Development Institute of Australia, State of the Land 2018, National Residential Greenfield and Multi-Unit Market Study, p. 11.

Consequently, it may not always be possible (or straightforward) to increase the building footprint.

- This could mean that some commonly used dwelling designs may not be possible on smaller lots, resulting in less-preferred designs, such as designs with smaller living (or other) areas to offset increased floorspace elsewhere (to meet the minimum standards).
- Alternatively, developers and planning authorities may need to widen lot sizes to accommodate accessible dwellings, leading to fewer lots on a given subdivision (this could also reduce the viability of some developments).
- Even when it is possible to expand the footprint of the building on a smaller block, this would reduce the (already limited) outdoor space.

These space requirements may also affect some apartment developments and multi-dwelling townhouse developments. As with separate Class 1a buildings, any additional space in some parts of the dwelling to comply with the minimum standards would require either:

- offsetting reduction in floor space in other interior spaces (such as living areas), reducing amenity (and possibly prices);
- fewer dwellings within a given building envelope (for apartments) or subdivision area (for townhouses). As above, this could affect the viability of some developments.

Estimated impact on space

Our estimates for the space impacts are noted in Table 5.6, derived from estimates and data provided by DCWC. Further details are provided in Appendix I.

5.6 Estimated space impacts of complying with proposed changes to NCC

	Estimated space impacts	Share of dwelling footprint
	m ²	Per cent
Option 1 (Silver)		
Separate house	0.6	0.4
Townhouse	1.2	1.2
Apartment	0.6	0.5
Option 2 (Gold)		
Separate house	3.6	2.4
Townhouse	6.5	6.5
Apartment	3.5	2.8
Option 3 (Gold+)		
Separate house	4.8	3.2
Townhouse	7.8	7.8
Apartment	4.4	3.6

Source: CIE estimates.

Valuing the space impacts through the marginal value of land for Class 1a buildings

One way the additional internal space requirements to comply with the proposed standards could manifest is through a loss of outdoor/garden space. These space impacts can be valued through estimating the marginal value of land. The marginal value of land reflects the willingness to pay for an additional square metre of land.

- A recent Reserve Bank of Australia (RBA) Research Discussion Paper estimated the price elasticity of demand for land with respect to lot size in Sydney, Melbourne, Brisbane and Perth. These elasticities can be interpreted as the percentage increase in the sale price of a property for a 1 per cent increase in the size of the lot.
- Based on approximate median greenfield lot sizes in capital cities reported in the Urban Development Institute of Australia's State of the Land 2019 report, a 1 m² increase in the footprint of the building is equivalent to a 0.2 to 0.3 per cent reduction in the median lot size.
- This implies a 0.05-0.06 per cent reduction in property values. Based on the median house prices, this implies a weighted average opportunity cost of land equivalent to around \$500 per m² (table 5.7).

Note that the implied cost per square metre is significantly lower than the average price of land in some cities. The RBA attributes this gap to land use restrictions (such as zoning).

5.7 Estimated marginal cost of land

	Elasticity	Median greenfield lot size ^c	1 m ² reduction in lot size	Implied reduction in property value ^e	Median property value ^f	Cost of lost space
		m ²	Per cent	Per cent	\$'000	\$ per m ²
Sydney	0.24 ^a	379	- 0.26	- 0.06	1 142.2	- 723
Melbourne	0.25 ^a	400	- 0.25	- 0.06	902.0	- 564
Brisbane	0.21 ^a	385	- 0.26	- 0.05	577.7	- 315
Perth	0.24 ^a	375	- 0.27	- 0.06	537.0	- 344
Adelaide	0.24 ^b	425	- 0.24	- 0.06	542.9	- 300
Hobart	0.24 ^b	507	- 0.20 ^d	- 0.05	530.6	- 246
Canberra	0.24 ^b	507	- 0.20	- 0.05	788.6	- 366
Darwin	0.24 ^b	507	- 0.20 ^d	- 0.05	509.5	- 236
Weighted average						- 506

^a From 'Large Equation' reported in Kendall and Tulip (2018, p. 9). ^b As Kendall and Tulip (2019) estimated the elasticities for Sydney, Melbourne, Brisbane and Perth only, the elasticities for the other cities were based on the average across Sydney, Melbourne, Brisbane and Perth. ^c Approximate values taken from UDIA (2019, pp. 14-15). ^d Median lot sizes were not reported for Darwin or Hobart. We assumed median lot sizes would be similar to Canberra. ^e Reduction in lot size multiplied by the elasticity. ^f From Domain House Price Report – December 2019, <https://www.domain.com.au/research/house-price-report/december-2019/#sydney>, accessed 29 January 2020.

Source: Kendall, R. and Tulip, P. The Effect of Zoning on Housing Prices, Reserve Bank of Australia Research Discussion Paper RDP 2018-03, March 2018, p. 9; Urban Development Institute of Australia, State of the Land 2019, National Residential Greenfield and Apartment Market Study, pp. 14-15.

As noted above, rather than expanding the building's footprint, the additional space requirements for functional space could be accommodated within the existing building footprint through reducing the size of living areas or bedrooms. This is an effective loss of internal space.

Some stakeholders argued that the loss of internal floor space can be overcome through better design. That is, the loss of amenity associated with a loss of internal floor space in living areas can be minimised through better design. Although this is a reasonable argument, we consider it unlikely that these amenity costs can be completely 'designed away'. In our view, the loss of space is a real cost that should be included in the CBA.

We argue that it is reasonable to infer that the costs associated with an effective loss of internal space would be of a similar magnitude to the increase in construction costs and the loss of garden space in the scenario where the building footprint expands.

- The footprint of the building relative to the size of the lot is effectively a trade-off between indoor and outdoor space. Subject to planning constraints (such as setback requirements) we would expect that an owner would choose a building footprint to the point where the marginal benefit of additional internal floor space (i.e. the additional value from the last square metre of floor space) is equal to the marginal cost (the marginal cost of additional floor space is the associated construction costs plus the value placed on the loss of outdoor space).
- If the marginal cost of the last square metre of internal floor space (i.e. construction costs plus the loss of external space) was much higher than the marginal benefit of

that last square metre of internal floor space, this implies that the building owner could have made themselves better off by reducing the size of their house.

- This implies that if the balance between internal and external space is optimised under the baseline (i.e. under status quo requirements), the total cost of expanding the building's footprint to meet the proposed standards would be similar to the loss of amenity associated with smaller living spaces.
- **The additional construction costs plus the value of land in the scenario where the building footprint expands is likely to be a reasonable indicator of costs, regardless of whether the building footprint expands or additional space requirements are absorbed internally.**

Valuing the loss of living space in apartments

For apartments, it is likely that the footprint of the building would occupy as much of the lot as is permitted by planning restrictions. Consequently, there is likely to be little scope to expand the overall footprint of the building, implying that additional space requirements for functional spaces (bedrooms, kitchen and bathrooms) would come at the expense of living space.

One way to value the loss of living space in apartments is to treat it as an effective reduction in the size of the apartment (assuming that the initial balance between living and functional spaces is optimised under the baseline scenario). Based on current apartment prices and estimated on the average size of a new apartment, we estimate that the weighted average price per square metre (weighted by apartment completions) is around \$4 500 (table 5.8).

5.8 Average price per square metre - apartments

	Median apartment price ^a	Average apartment size ^b	Average cost per square metre
	\$	m ²	\$ per m ²
Sydney	735 387	130	5 679
Melbourne	549 701	131	4 196
Brisbane	377 549	126	3 008
Perth	342 708	123	2 786
Adelaide	306 327	152	2 011
Hobart	441 104	130	3 398
Canberra	455 537	96	4 755
Darwin	286 249	155	1 853
Weighted average			4 517

^a From Domain House Price Report – December 2019, <https://www.domain.com.au/research/house-price-report/december-2019/#sydney>, accessed 29 January 2020. ^b CommSec, Australian home size hits 20-year low: CommSec Home Size Trends Report, Economic Insights, 17 November 2017, https://www.commsec.com.au/content/dam/EN/ResearchNews/ECORreport.20.11.17_Biggest%20homes_size-fall.pdf, accessed 30 January 2020.

Perhaps a better measure of the amenity costs of losing living space would be the *marginal* value of floor space, rather than the *average* value. However, there are few relevant studies that estimate the marginal value of floor space in apartments.

Two studies by the Secret Agent (a buyers advocate based in Melbourne) for a broader study on the economic impacts of Melbourne's apartment design guide (by SGS Planning and Economics)⁶⁰ estimated the marginal value of apartment space for apartments in inner Melbourne.

- The first study estimated that the marginal value of additional floor space was around \$6 200 per m².
- A second study, where the sample was restricted to apartment buildings that were 4 storeys or less, estimated the marginal value of additional floor space was around \$3 900 per m².

The lower estimate was broadly consistent with the average price per square at the time, suggesting that the average price per square meter is a reasonable indicator of the marginal value of apartment space.

5.9 Questions for stakeholders

- Do you agree with the approach taken to valuing the opportunity cost of the additional space required?
 - What alternative methodologies could be considered?

Additional excavation cost

The Housing Industry Association (HIA) argued that in addition to the construction costs, there would be additional excavation costs associated with complying with the proposed standard for detached homes on sloped lots and provided some estimates of the potential additional costs.

- **The estimated excavation costs provided by HIA are being considered, but have not been included in the central case cost estimates at this stage.**

In weighted average terms, the HIA estimated these costs would be around \$2 320 per lot (table 5.10). Further details on the HIA's approach to estimating these costs is set out below.

⁶⁰ SGS Economics and Planning 2016, *Economic analysis of the Better Apartments initiative*, Final report, Prepared for Department of Environment, Land, Water and Planning and the Office of the Government Architect, Appendix C: Secret Agent Study Part 1 and 2, 18 November 2016.

5.10 Weighted average excavation costs

	Weighting	Cost ^a
	Per cent	\$ per lot
Small lots	20	1 311
Regular lots	60	2 415
Large lots	20	3 036
Weighted average		2 318

^a See table 5.12 below.

Source: HIA estimates.

The costs include: the additional cost of site works; and fill disposal. These costs depend on the type of earth (rocky, mixed or cleanfill). Rocky terrain can require heavy machinery to break up large boulders and comes with higher cost for both site work and disposal. Based on the estimated share of each type of material, these costs are estimated at around \$138 per m³ in weighted average terms (table 5.11).

5.11 Weighted average cost per m³

	Weighting	Site work costs	Fill disposal costs	Total costs
	Per cent	\$ per m ³	\$ per m ³	\$ per m ³
Rocky	10	60	200	260
Mixed	40	30	150	180
Cleanfill	50	10	70	80
Weighted average		23	115	138

Source: HIA estimates.

The amount of additional excavation required varies depending on the size of the lot and the slope (table 5.12).

- In general, lots with steeper slopes will require more excavation to make it possible to build an accessible home on the site.
- HIA also assumes that sites for small lot homes are more likely to be on flatter terrain, while steeper sloping sites are likely to have larger house.

5.12 Estimated cost per lot

	Weighting	Volume per lot	Site work costs per lot ^a	Fill disposal costs per lot ^b	Total cost per lot
	Per cent	m ³	\$	\$	\$
Small lot (~280 m²)					
Steep	0	0	0	0	0
Moderate	10	15	345	1 725	2 070
Low	80	10	230	1 150	1 380
Flat	10	0	0	0	0
Weighted average		10	219	1 093	1 311
Regular lot (~450 m²)					
Steep	20	25	575	2 875	3 450

	Weighting	Volume per lot	Site work costs per lot ^a	Fill disposal costs per lot ^b	Total cost per lot
	Per cent	m ³	\$	\$	\$
Moderate	40	20	460	2 300	2 760
Low	30	15	345	1 725	2 070
Flat	10	0	0	0	0
Weighted average		18	403	2 013	2 415
Large lot (~650 m²)					
Steep	30	30	690	3 450	4 140
Moderate	40	25	575	2 875	3 450
Low	15	20	460	2 300	2 760
Flat	15	0	0	0	0
Weighted average		22	506	2 530	3 036

^a Based on a weighted average cost of site works of \$23 m³ (table 5.11 above). ^b Based on a weighted average fill disposal cost of \$115 per m³ (see table 5.11 above)

Source: HIA estimates.

5.13 Questions for stakeholders

- Are additional excavation costs likely to be incurred in order to provide homes that comply with Options 1-3?
- Are the cost estimates presented in table 5.12 reasonable? If not, what are your alternative estimates and the basis for the estimates?

Transition costs

Transition costs include:

- The cost incurred by volume builders, such as re-designing their standard offerings
- Costs associated with industry professionals learning and understanding the new requirements.

Transition costs for volume builders

Volume builders typically have a 'standard offering' of a range of designs for consumers to choose from. Industry stakeholders noted that most standard offering designs do not comply with the proposed standards. Consequently, volume builders will need to re-design their standard offerings. Additional costs include:

- The costs associated with re-designing the standard offering
- Costs associated with re-building compliant display homes.

5.14 Questions for stakeholders

- Are there any other costs (e.g. transition costs) not identified for builders in transitioning to a new accessibility standard under regulatory Options 1-3?
- Can you provide any other relevant information on the costs to inform the impacts of the options?

Retraining costs for industry practitioners

As the proposed changes to the NCC are significant, both government and industry would incur some one-off costs associated with raising awareness of the changes and re-training. We estimate total retraining costs to be around \$28.47 million (as follows).

Costs to government

Transition costs to government are estimated to be \$721 000 (see Table 5.15)

- These costs reflect: (1) to assist with the transition to the new code, we assume the ABCB would prepare a range of guidance material, and (2) the cost to the ABCB or other government bodies for organising and running seminars that educate relevant stakeholders on the changes, which we assume will occur.
- For a Decision Regulatory Impact Statement for proposed changes to the NCC relating to energy efficiency in buildings, we estimated total transition costs to government of \$355 000. In that analysis, we estimated that around 26 000 individuals would require retraining.
- For the current changes to the NCC relating to accessibility, we estimate that around 53 000 individuals would require retraining. We therefore estimate government transition costs of \$721 000 (\$355 000 multiplied by the ratio of 53 000 to 26 000)

5.15 Transitional costs to government

Changes to NCC	Estimate (\$000)
Estimated costs for accessibility changes (current)	721

Source: CIE.

Costs to industry

Industry stakeholders will also incur one-off costs associated with familiarising themselves with the new code requirements. We estimate the time costs associated with familiarising themselves with the relevant aspects of the new code

These costs are estimated at \$27.745 million (see table 5.16), which are based on assumptions that follow.

5.16 Estimated number of individuals to be retrained, and retraining costs

Profession/trade	People to be retrained		Total time costs
		'000	
Construction managers	41	23 560	
Architects/building designers	11	3 522	
Certifiers/surveyors	2	663	
Total	53	27 745	

Source: CIE estimates.

Assumptions underpinning estimated industry retraining costs

Stakeholders that will require retraining due to changes in the code include individuals in the following professions/trades, who work in (or provide services to) the residential building industry:

- Construction managers
- Architects/building designers
- Certifiers/surveyors

Number of construction managers who require re-training

We estimate there are 40 876 construction managers in 2019 who require retraining, as follows (see table 5.17).

- There were 71 817 construction managers September 2016, according to Census data. Using employment growth in the equivalent occupation in ABS Cat. 6291, we grow these data to 2019.
- Census data tells us whether these individuals work in: residential construction, non-residential construction, heavy & civil engineering construction or construction services. We assume individuals who work in residential construction and the sub-sector of construction services that services residential construction require retraining. The share of individuals who work in construction services which services residential construction is assumed to be employment in residential construction as a share of residential construction, non-residential construction and heavy & civil engineering construction. These is 40 876 construction managers.

5.17 Construction managers

	Total in 2016	Total in 2019	Who do not require training ^a	Who do require training
	Census data	CIE estimates (using ABS Cat 6291)	CIE estimates (using Census data)	CIE estimates (using Census data)
Construction managers	71 817	75 442	34 566	40 876

Source: CIE estimates, sources as noted.

Number of architects and certifiers and surveyors that require retraining

The occupation detail in the Census data are not sufficient to count architects and Certifiers/surveyors (the Census only provides data on 'architects and landscape architects' and 'Architectural, Building and Surveying Technicians').

ABCB data indicate there are 32 905 architects and 5 731 certifiers/surveyors who are subscribers to the NCC.

We cannot use Census data to estimate how many of these individuals provide services to residential construction or to other types of construction (only data on their industry of employment is provided).

Data in the ABS Input-Output Tables (Cat. 5209) suggest that the industry 'Professional, Scientific and Technical Services' (which employs architects and certifiers) provided \$2 931 million dollars of output to the residential construction, non-residential construction and heavy engineering and civil construction industries in 2016-17, of which \$940 million (32 per cent) was provided to residential construction. Therefore, we assume that 32 per cent of architects (10 533 individuals) and 32 per cent of certifiers/surveyors (1 723 individuals) provide services to residential construction and would therefore require retraining.

Time costs incurred by individuals who require retaining

We estimate that each individual who requires retraining would require 9.5 hours of retraining (attending a 2 hour seminar/webcast, 3.75 hours of continuing professional development, and 3.75 hours of self-paced learning). Even where there are individuals who do not attend seminars in person, we assume they spend the equivalent amount of time by themselves becoming familiar with changes to the code.

We assume that these time costs are additional to other training that occurs. This can be interpreted literally: this retraining time is added onto any other training that would occur anyway. Alternatively, where the retaining *replaces* other training that would have occurred, we retain these time costs as the value of the training which is lost.

Opportunity cost of time

Our estimates of the hourly earnings of individuals in the relevant professions/trades, excluding taxation, are shown in table 5.18. We have adjusted the underlying ABS data.⁶¹ We assume these data represent the opportunity cost of the relevant individuals' time. Implicitly, this implies we assume these individuals work as many hours as they

⁶¹ From ABS Cat. 6306, data for May 2018 on total hourly cash earnings is available for the occupations: construction, distribution and production managers (which we use for construction managers), architects, designers, planners and surveyors (architects), and building and engineering technicians (certifiers). We grow these data forward to 2019 using nationwide WPI. ABS Cash earnings data is a gross amount that includes superannuation and taxation. We wish to exclude taxation as it is a transfer to government (not a cost). We multiply the data by 0.8, which is equivalent to assuming each of these individuals has an average tax rate of 20 per cent.

would like, implying they are indifferent to allocating time to training (essentially: allocating more time to work) and time to leisure activities.

5.18 Assumptions for hourly earnings in relevant occupations

Profession/trade	Hourly earnings
	\$/hour
Construction managers	61
Architects/building designers	35
Certifiers/surveyors	41

Source: CIE estimates.

Total time costs

The cost of the time of individuals of require retraining is the estimated hours for retaining multiplied by the opportunity cost of the individuals time.

Subsidies

One indicator of the subsidy that would be required to encourage the private sector to offer more accessible rental properties is the pricing for SDA.

We estimate the subsidy required as follows.

- We start with SDA rates for different types of residences (averaged across new buildings and existing stock).
- We then add the rental payment SDA participants would be required to pay (based on 25 per cent of the Disability Support Pension).
- As we assume that participants in the proposed subsidy program would pay market rent, we subtract the estimated market rent (based on the weighted average median rent across capital cities).

5.19 Estimated subsidy

	Average SDA subsidy ^a	SDA subsidy plus rent ^b	Market rent ^c	Subsidy
	\$	\$	\$	\$
Separate house	19 563	28 117	23 052	5 065
Townhouse	19 711	28 265	23 052	5 213
Apartment	40 016	48 570	21 838	26 732

Source: National Disability Insurance Scheme, Specialist Disability Accommodation, Price Guide (2019-20), 28 October 2019.

The subsidy is targeted at private renters whose accessibility needs are not currently met. According to SDAC data, there are around 150 800 private renters who either require assistance or have difficulty moving around their residence (an indicator of whether their accessibility needs are being met).

6 *Estimating the benefits*

In this chapter we estimate the benefits of each of the options.

Approaches to estimating the benefits

We estimate the benefits generated by each of the options using two different approaches.

- The central approach was based on our estimate of the extent to which we would expect the proposed changes to the NCC (and other options) to address the extent of the various issues estimated in chapter 2. In addition, this approach included estimates of benefits to the wider community from seeing better outcomes for Australians with limited mobility. These societal benefits were derived from a stated preference survey, which measured the extent to which households were willing to pay to improve these outcomes.
- The alternative approach was based on estimates of household willingness to pay for various accessibility features when choosing a home to buy or rent. These estimates were derived from the stated preference survey using questions that offered hypothetical choices between homes with differing accessibility features and rents.

Each of these approaches is outlined below.

Problem reduction approach

Some key factors that will reduce the size of the problem and therefore determine the benefits generated by the various options, include:

- the extent to which new accessible housing built under the new code is allocated to households with accessibility needs
- the extent to which dwellings with accessibility features would have been provided under the baseline scenario (i.e. the extent to which the accessibility features in dwellings built under the new code are 'additional' and therefore can be attributed to the new code).

Allocation of accessible housing

New housing is generally allocated through the market (rather than through an administrative process) so it is not necessarily the case that new accessible housing will be allocated to those with accessibility needs.

There are 2 ways that increasing the stock of accessible housing would reduce the size of the problem (estimated above) over time.

- The proportion of the population who acquire a disability already living in accessible housing will increase over time.
- For people who acquire a disability (or have a pre-existing disability) not already living in accessible housing, there will be greater options available to move to an accessible dwelling.
 - Nevertheless, we assume that the proposed changes to the NCC would have minimal impact on owner-occupiers due to a range of factors outlined below.
 - On the other hand, we assume that the proposed changes will significantly increase the proportion of renters moving.

Based on the assumption outlined below.

- The process through which an increasing share of the population are already living in accessible housing when they acquire a disability is estimated to take some time to have an impact. As newly acquired disabilities are around 4-5 per cent of total disabilities in any given period and the new accessible dwellings are initially a small share of the stock, this pathway is unlikely to significantly reduce the size of the problem in the near to medium term.
- The impact on renters also starts slowly, but would then increase much more rapidly given the higher propensity to move to a more accessible dwelling.

The assumptions underlying these assumptions are outlined below.

People living in accessible housing when they acquire a disability

As noted above, as accessible housing increases as a share of the stock over time, a greater proportion of people (including both owner-occupiers and renters) will already be living in accessible housing when they acquire a disability.

We estimate that around 4.5 per cent of the total number of people with mobility limitation due to disability have newly acquired the disability in the past year. This estimate is based on:

- the growth in the number of people with a mobility limitation each year
- **plus:** the estimated number of deaths (based on weighted-average mortality rates by age).

Note that this somewhat simplistic approach: assumes that people with a mobility-related disabilities have the same age-specific mortality rates as the broader community; effectively assumes that all people with a mobility-related disability have that disability until their death (i.e. ignores the possibility that a disability is resolved); and ignores the net impact of migration. It is however, likely to be a reasonable approximation of the number of newly acquired disabilities in each period.

- **We assume that the proportion of people already living in accessible housing when they acquire a disability will reflect the share of new accessible housing built under a revised NCC in the total dwelling stock.**

As the proportion of new accessible dwellings (i.e. those that would comply with the proposed accessibility requirements) being built under the current code is not known, this issue is addressed separately (see below).

Owner-occupiers not living in accessible housing

For owner-occupiers who already have a mobility-related disability or acquire a mobility-related disability and are not already living in accessible housing when they acquire it, the benefits of the proposed changes to the NCC are less clear. In principle, the stock of accessible housing would increase over time as a result of the proposed change to the NCC. This would give these people (and their families) greater choice of accessible dwellings should they choose to move to a dwelling that better meets their needs.

However, the following factors would limit the impact of the proposed changes to the NCC on the available stock of accessible housing.

- First, the option of building an accessible house that meets their specific needs is already available to people who acquire a mobility-related disability (subject to affordability). The proposed regulation would not affect this choice. That said, there are a range of reasons why many people do not choose this option (including financial constraints, the location of greenfield areas etc.).
- Second, to the extent that the regulation encourages additional accessible dwellings to be built, it is reasonable to infer that the initial owner would not have accessibility needs (if they did, they would have chosen to build an accessible home anyway). The regulations are therefore unlikely to benefit the initial owner (unless they acquire a disability while still living in the dwelling – see above). Additional accessible dwellings would become available to people with accessibility needs only when the initial owner moves out.

Furthermore, even if more accessible dwellings become available, there are a range of factors that suggest that the number of people who would choose to move to a more accessible dwelling would likely be relatively low for owner-occupiers.

- SDAC data suggests that only around 10 per cent of owner-occupiers have moved because of their condition. That said, the reason that some people have not moved may have been a lack of available accessible dwellings.
- Several stakeholders, as well as a number of studies stressed the importance of factors such as affordability and location, as well as accessibility. Affordability and location issues could reduce the likelihood of people moving to newly built accessible housing.
 - In particular, the new accessible housing may not be in the preferred neighbourhood for many people with a mobility-related disability.
 - ... In NSW, just 11 (out of 131) Local Government Areas account for 50 per cent of all dwelling approvals⁶²
 - ... Currently, only 29 per cent of all people in NSW with a mobility limitation live in these LGAs

⁶² Blacktown, Parramatta, Liverpool, The Hills Shire, Camden, Bayside, Cumberland, Penrith, Canterbury-Bankstown, Sutherland Shire, Campbelltown, Central Coast

- ... Analysis of Census data suggests that more than 80 per cent of all people who moved house over the past 5 years, moved within the same LGA. This proportion increases to more than 90 per cent for people over the age of 65.
- The financial cost of moving house is relatively high for owner-occupiers.
 - ... Many households containing people with disabilities have lower than average incomes (see above).
 - ... Stamp duties are a significant barrier to moving. Stamp duties can amount to tens of thousands of dollars (particularly in the major cities). This means that in many cases home modifications (where possible) may be more cost-effective, particularly as home modifications are subsidised through the NDIS and various aged care programs.
 - ... Some older Australians on a full or part pension could lose their pension if they choose to down-size as the family home is not included in the pension asset test.

People with a pre-existing mobility limitations (i.e. a mobility limitation acquired prior to the commencement of the proposed regulations) are even less likely to be affected by the increased availability of accessible housing.

These people have already made a housing choice at the point that they acquired the disability (although where the disability gets worse over time, these choices may be constantly re-assessed). Furthermore, they may have already made choices to accommodate their disability in their existing home (such as through home modifications).

- **This discussion suggests that including an accessibility standard in the NCC is unlikely to significantly affect owner-occupiers with a pre-existing mobility-related disability or those still living in inaccessible housing when they acquire a disability in the future (in the CBA we assume that the regulation has no benefits for these people), although a small number may benefit from increased choice of accessible dwellings over time.**

Renters not living in accessible housing

Presumably some proportion of new dwellings will be used as rental properties, so the stock of accessible private rental properties available to renters will increase over time. Renters that acquire a disability may be more likely to move as more accessible rental properties become available for several reasons.

- Renters generally move more frequently than owner-occupiers (although the proportion of renters with a mobility-related disability who have moved because of their disability is only slightly higher than owner-occupiers at 15 per cent).
- There are fewer financial disincentives for renters to moving (other than the cost of moving itself).
- Renters are generally less able to have rental properties modified to meet their accessibility needs. This means that renters are less likely to have already made home modifications to meet their accessibility needs.

- As renters tend to have shorter tenure, they may be less likely to have an emotional attachment to a rental property.

Our approach to estimating the share of renters with accessibility needs that are likely to move to accessible rental properties under the proposed regulations, we make the following assumptions.

- When a tenant moves, the probability that the tenant with accessibility needs moves to an accessible property is likely to be related to the share of accessible properties in the rental stock.
- If the probability of a tenant with accessibility needs moves to an accessible rental property reflects the share of accessible properties in the rental stock, this implies 'random allocation'.
- In general, we would expect that tenants with accessibility needs would value accessibility features more highly than those without accessibility needs and would therefore be more likely to be attracted to rental properties with these features.
- However, the evidence from our survey of randomly-selected households is mixed:
 - There is some evidence that households containing a member with a mobility limitation are more likely to have some accessibility features.
 - On the other hand, there were several accessibility features that were just as likely to be present in households that did not include a member with a mobility limitation as those that did.
- Based on our analysis of the survey results (weighting accessibility features by the estimated willingness to pay for them), we estimate that for renters, households that include a member with a mobility limitation are around 12.6 per cent more likely to have accessibility features than rental households that do not contain a member with a mobility limitation.
- **Based on the above discussion, we assume that households with accessibility needs are 12.6 per cent more likely to obtain an accessible rental property, compared with the random allocation approach.**
- **We assume that 47.8 per cent of renters move in any given year (based on the reported tenant turnover rates for residential properties).⁶³**
- **We also assume that once a tenant with accessibility needs moves into an accessible dwelling, they do not move back to housing without accessibility features.**

Additionality

Under the proposed changes to the NCC, all (or most) new dwellings would comply with the relevant standard. However, some proportion of new housing would have included some or all of the accessibility features set out in the standard, even without the proposed

⁶³ <https://www.rentprep.com/legal/average-apartment-turnover-rate/>, accessed 7 February 2020.

changes to the NCC. Previous estimates and stakeholder feedback suggest that around 5-10 per cent of new stock current meets LHDG silver standard.

According to some stakeholders, although relatively few new dwellings incorporate **all** of the design elements in the standard, a significant proportion incorporate at least **some** of these design elements. This is evident in DCWC's cost weightings where scenarios involving 'no impact' had significant weightings across some design elements, indicating that compliance with the standards reflects current practice for these dwellings.

Where the proposed standards reflect current practice for particular design elements, there are no additional costs and benefits from the standard. These costs have been excluded from our cost estimates (through a non-zero weighting on a 'no impact' scenario). Some stakeholders pointed out that these 'baseline effects' should also be excluded from the benefits.

However, these 'baseline effects' are more difficult to take into account on the benefit side. The extent to which each design element reduces the problem is not clear. Furthermore, it is also not clear to what extent a dwelling that includes some, but not all of the accessible design elements set out in the proposed standard, could be considered accessible and therefore achieve some of the benefits.

There may be some circumstances where all accessibility features are needed for the dwelling to be suitable (such as for wheelchair users); however, in most cases there are likely to be some benefits from accessible design features, even when not all of the design features required are present.

As noted above, it is important that the treatment of accessibility features that are already provided under the baseline scenario is consistent for both costs and benefits. As an indicator of the extent to which accessibility features provided under the baseline affect the costs, we estimate that when the 'zero cost' scenarios (implying that the relevant feature is provided under a proportion of existing designs) reduce the weighted average cost by around 16-41 per cent (table 6.1).

6.1 Reduction of costs due to features being provided under the baseline

	Weighted average cost	Weighted average cost (ex zero cost scenarios)	Difference
	\$	\$	Per cent
Option 1 (Silver)			
Separate house	903	1 534	-41
Townhouse	1 839	2 198	-16
Apartment	1 611	2 167	-26
Weighted average			-31
Option 2 (Gold)			
Separate house	7 080	9 740	-27
Townhouse	12 398	14 975	-16
Apartment	8 595	13 000	-37

	Weighted average cost	Weighted average cost (ex zero cost scenarios)	Difference
	\$	\$	Per cent
Weighted average			-27
Option 3 (Gold+)			
Separate house	9 566	12 219	-22
Townhouse	14 976	17 051	-12
Apartment	10 804	15 737	-31
Weighted average			-23

Source: DCWC, CIE.

Although the extent to which the provision of accessible design features under the baseline scenario would reduce the benefits attributable to the proposed changes to the NCC is not known, it may be reasonable to suggest that the benefits would be reduced by around the same magnitude as the costs.

This approach implicitly assumes that the benefits of the various accessibility features are proportional to the cost. Although there is no particular reason why this should be the case, it is also plausible that consumers are choosing features where the benefits are highest relative to cost. This means that reducing the benefits in proportion to cost is more likely to understate the reduction in benefits as a result of baseline effects.

- **To reflect the provision of accessible design features under the baseline scenario, we reduce benefits based on the extent to which the provision of these design features reduces the weighted average cost. Specifically, we reduce the benefits by:**
 - **31 per cent for Silver (Option 1)**
 - **27 per cent for Gold (Option 2)**
 - **23 per cent for Gold+ (Option 3).**

6.2 Questions for stakeholders

- Are our assumptions relating to the occupation of accessible housing by owner occupiers and renters over time reasonable? What additional evidence could we consider to make these assumptions more robust?
- Do you agree with the assumption of the extent features are currently not provided in new dwellings?
- Do you have any evidence of the extent that accessibility features similar to those required by Options 1-3 are provided in new dwellings under current arrangements?
- Where dwellings have some accessibility features but not others, would this reduce the size of the problem? In your opinion, by how much? (please provide your reasoning/data for your estimate).
- Do you agree with the assumption that additional features required under accessibility standards in Option 2 and Option 3 would increase the number of beneficiaries compared to Option 1?
- To avoid attributing benefits to accessibility features already installed in dwellings under current arrangements, the impacts of the proposal have been reduced in proportion to those elements assumed prevalence and weighted average cost. What additional evidence could we consider to make this assumption more robust?

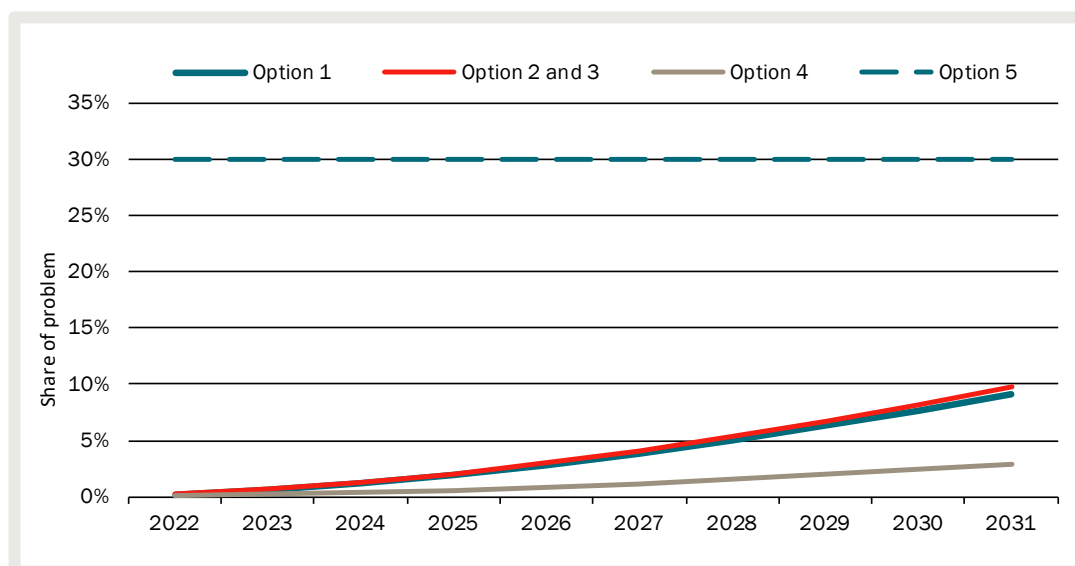
Valuing the benefits of accessible housing

Under this approach, the benefits depend on the extent to which the regulatory options reduce the issues estimated previously. Under the allocation assumptions outlined above, the reduction in the size of the problem under each of the options is shown in chart 6.3.

- Under Option 1B (involving one step access), the accessibility standard specified in the NCC would be broadly consistent with LHDG Silver standard. Discussions with stakeholders (including accessibility consultants and Occupational Therapists Australia) suggested that dwellings built to this standard is unlikely to be suitable for wheelchair users. As wheelchair users make up around 6 per cent of people with mobility limitations, we assume that the share of the problem this option would address is 6 per cent lower than Options 2 and 3.
- Under Option 2, the accessibility standard specified in the NCC would be broadly consistent with LHDG Gold standard. We understand this would be suitable for wheelchair users.
- Under Option 3, accessibility features are upgraded from Gold to Gold+. The key difference here is wider circulation spaces under Gold+ (for example: wider landing space for entry door, more circulation space in front of benches and appliances, etc.). However, as noted, consultations note that Gold is probably sufficient for wheelchair users. Therefore, while we acknowledge that Gold+ may have some benefits from people with mobility limitations, we assume that Gold+ does not create additional benefits relative to Gold. Partially, this reflects our “problem reduction” framework, which focuses on whether people live in housing that is adequate.

- Under Option 4, the accessible housing standard would be applied to apartments in Class 2 buildings only. As only a small proportion of people with mobility limitations live in apartment building, this option is estimated to have minimal impact on the size of the problem.
- Under Option 5, we assume that as the subsidies would target renters whose accessibility needs are not being met by the available rental stock. For illustrative purposes we assume that all renters in housing that does not meet their accessibility needs move to accessible rental accommodation provided under the scheme. As this option is not within ABCB's broad area of responsibility, it is not specifically under consideration. This should therefore be considered an indicative option to establish whether the NCC is a more efficient approach to addressing the problem (or a subset of the problem) than alternative more targeted measures.

6.3 Reduction in the size of the problem



Data source: CIE estimates.

To estimate the aggregate benefits:

- the share of the problem each option would address is multiplied by the estimated size of the problem
- benefits are then reduced by 30 per cent to reflect additionality issues (see above)
- after the 10-year regulatory period, benefits in the last year of the regulatory period are then held constant for a further 30 years, reflecting the flow of benefits over the life of the building.

Societal benefits

A survey was conducted as part of this project of a representative sample of 2062 Australian households. The survey design, data analysis and interpretation of results

have been subject to internal peer review by Professor Riccardo Scarpa – a leading authority internationally on the use of surveys for estimating economic benefits.

The survey included a component designed to estimate household willingness to pay (WTP) to improve housing accessibility for other people. The conservative estimate of average altruistic WTP derived from the survey is around \$40 per household per year for a policy scenario that would increase the amount of accessible housing to 15 per cent by 2035 and “greatly improve the chances of Australians with limited mobility finding suitable homes.” See appendix K for further detail.

This equates to \$389 million annually across all households. Assuming an income elasticity of WTP of 0.42, projected annual real wage growth of 0.25 per cent per year and the ABS Cat No. 3236 Series II household projections (extrapolated beyond 2041 to 2066), this equates to \$6.9 billion in present value terms.

For the purpose of deriving benefit estimates for options that partially solve the problem, we assume that this \$40 amount represents the value households place on solving the problem completely by 2035. Our view is that the limited amount of information provided in the questionnaire would have given respondents the impression that the policy would solve the problem, particularly the comparison between two figures that were provided — the 15 per cent of housing stock that would be accessible by 2035 and the 5 per cent of Australians who have a disability and use a mobility aid. We assume that a partial solving of the problem by 2035 would be valued proportionately to the extent to which the problem is solved. For each of the options, we scale the \$6.9 billion figure above in this way.

Estimated willingness to pay for accessibility features

The survey conducted as part of this project also included a component designed to estimate WTP for accessibility features at the point of purchasing or renting a new home. We use these WTP estimates as an alternative benefit valuation approach to the ‘problem size reduction’ approach.

An advantage of the survey approach is that it can potentially capture WTP for accessibility features for households that do not currently include a person with limited mobility but wish to be prepared for potential future mobility limitation, wish to receive visits from family and friends with mobility limitation and/or value the improved ability to manoeuvre prams or move furniture within their home.

A disadvantage of stated preference survey approach is that it is purely hypothetical and subject to a range of potential cognitive biases in the responses. While we attempted to minimise biases identified in the stated preference literature, the framing of our home choice questions necessarily placed greater emphasis on accessibility features than information typically considered by decision makers in the real market for homes. It is uncertain whether this emphasis caused bias in the stated preferences or overcame a bounded rationality bias in revealed preferences.

To calculate the benefits of increased supply of accessibility features in new housing we:

- project the supply of each feature in new homes under the baseline and the change scenarios for both owner-occupied and rental homes
- project the supply of each feature in the total stock of homes under the baseline and change scenarios for both owner-occupied and rental homes
- project WTP per owner-occupier and rental household for each feature based on projected changes in real income, age and mobility impairment, where WTP is defined as:
 - average WTP across households, on the assumption of a random matching of accessibility features to households, or
 - as a sensitivity test, WTP of the marginal consumer of each accessibility feature, on the assumption that accessibility features have been and will be consumed by those who value them most highly
- project the number of new home completions owner-occupied and rentals and the number of sales of new homes by first-owner occupants to second owners; and
- derive total WTP for increased supply of accessibility features by:
 - multiplying the present value of the total rental cohort WTP by the number of new rental home completions
 - multiplying owner-occupier WTP by the number of sales of new homes by first-owner occupants to second owners (for reasons discussed below), and
 - taking the present value of the sum of the rental and owner-occupant components described above.

Each of these steps is described in more detail below.

Projecting supply of accessibility features

Based on responses to the survey, we have estimated the levels of the accessibility features in the existing housing stock. We have some information on the accessibility features of the new homes in the baseline scenario in DCWC’s cost weightings, however these focus on whether homes meet technical standards, whereas the accessibility features in the survey are less precisely-defined and based more on respondents’ perceptions of outcomes. Given the uncertainty over these assumptions, we are keen to hear from stakeholders regarding their reasonableness.

6.4 Estimated supply of accessibility features in baseline

	Weighted average	Townhouse	Custom home	Volume home	Walk up	Four storey plus	Source in DCWC cost weights
Getting in and out							
Several steps	0%	0%	0%	0%	0%	0%	This feature will tend to be supplied for exempt homes
Single step	100%	100%	100%	100%	100%	100%	Standard practice

	Weighted average	Townhouse	Custom home	Volume home	Walk up	Four storey plus	Source in DCWC cost weights
Step-free	0%	0%	0%	0%	0%	0%	
Moving around indoors							
Regular spaces – Suitable for some mobility aids	87%	95%	70%	90%	90%	90%	
Wide spaces – Suitable for most mobility aids, but not wheelchairs	3%	5%	10%	0%	10%	0	Element 3 – negligible impact increment silver over gold
Extra-wide spaces – Suitable for all mobility aids, including wheelchairs	10%	0%	20%	10%	0%	10%	Element 3 – negligible impact gold
Living with limited mobility on same level as an entrance							
Unsuitable – No toilet or shower on entry level	2%	10%	0%	0%	0%	0%	Element 4 - additional WC
Suitable for short visits – Toilet, but no shower on entry level	14%	70%	0%	0%	0%	0%	Remainder
Suitable for living or overnight visits – Toilet, shower and bedroom on entry level	84%	20%	100%	100%	100%	100%	Element 10 – negligible impact
Weightings							
Supply weighting		20%	21%	29%	2%	28%	

Source: CIE based on DCWC.

The levels of supply of accessibility features under the proposal are based on the relevant standards (e.g. silver or gold), with 5 per cent assumed to be exempt and supplied at the baseline levels (except in the case of path to entrance, where the 5 per cent are assumed to have several steps, as exemptions relating to allotment gradient are expected to be one of the most common exemptions). We assume that significant modifications would be needed to make a home built to the Silver standard suitable for ageing in place and that only minimal modifications would be needed for homes built to the Gold standard. This assumption is made on the basis of our understanding that the Gold level of accessibility would be suitable for using a wheelchair, while the Silver level would not, and the retrofitting costs for upgrading the space and entry-level amenities from Silver to Gold level would be considerable.

The attributes are defined based on consumer outcomes and are not defined with sufficient detail to enable a distinction between the benefits of Option 2 and Option 3. We therefore assume the supply of accessibility features is equal across those two

options. Under Option 4 and Option 5, the standard applies to fewer new homes, so a weighted average is taken between the baseline new home features and the Gold new home features depending on the number of new apartments and rental subsidy recipients, respectively.

6.5 Assumptions for projected supply of accessibility features: Owner-occupants

Feature	Existing stock	New homes Baseline	New homes from 2022 Option 1	New homes from 2022 Option 2,3
	per cent	per cent	per cent	per cent
Getting in and out				
Several steps	33.9	5.0	5.0	5.0
Single step	36.2	95.0	95.0	95.0
Step-free	30.0	0.0	0.0	0.0
Moving around indoors				
Regular spaces – Suitable for some mobility aids	86.5	87.0	4.4	4.4
Wide spaces – Suitable for most mobility aids, but not wheelchairs	9.0	3.0	85.7	0.2
Extra-wide spaces – Suitable for all mobility aids, including wheelchairs	4.5	10.0	10.0	95.5
Living with limited mobility on same level as an entrance				
Unsuitable – No toilet or shower on entry level	11.9	2.0	0.1	0.1
Suitable for short visits – Toilet, but no shower on entry level	13.6	14.0	15.9	0.7
Suitable for living or overnight visits – Toilet, shower and bedroom on entry level	74.5	84.0	84.0	99.2
Modification that would be needed to make home suitable for ageing in place				
Significant	95.6	90.0	90.0	4.5
Minimal	4.5	10.0	10.0	95.5

Source: CIE survey and assumptions.

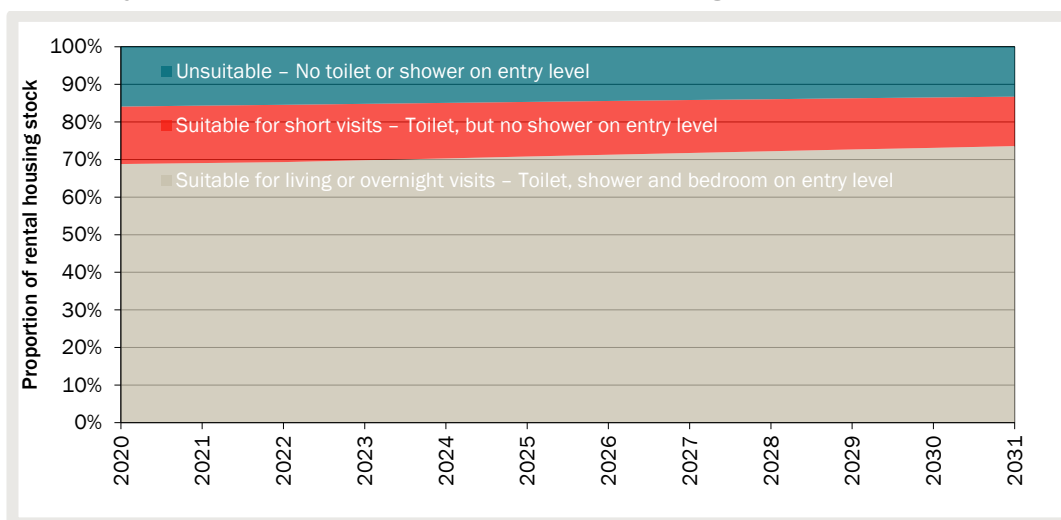
6.6 Assumptions for projected supply of accessibility features: Rentals

Feature	Existing stock	New homes Baseline	New homes from 2022 Option 1	New homes from 2022 Option 2,3
	per cent	per cent	per cent	per cent
Getting in and out				
Several steps	35.8	5.0	5.0	5.0
Single step	30.3	95.0	95.0	95.0
Step-free	34.0	0.0	0.0	0.0
Moving around indoors				
Regular spaces – Suitable for some mobility aids	87.2	87.0	4.4	4.4
Wide spaces – Suitable for most mobility aids, but not wheelchairs	8.5	3.0	85.7	0.2
Extra-wide spaces – Suitable for all mobility aids, including wheelchairs	4.3	10.0	10.0	95.5
Living with limited mobility on same level as an entrance				
Unsuitable – No toilet or shower on entry level	15.9	2.0	0.1	0.1
Suitable for short visits – Toilet, but no shower on entry level	15.3	14.0	15.9	0.7
Suitable for living or overnight visits – Toilet, shower and bedroom on entry level	68.8	84.0	84.0	99.2
Modification that would be needed to make home suitable for ageing in place				
Significant	96.1	90.0	90.0	4.5
Minimal	3.9	10.0	10.0	95.5

Source: CIE survey and assumptions.

These assumptions are combined to project accessibility features in the stock over time.

6.7 Projected entrance-level amenities in rental housing stock: Option 2



Data source: CIE

Projecting willingness to pay for accessibility features

The ‘per household’ estimates of average WTP for changes in each accessibility feature are detailed in appendix K for both owner-occupiers and renters. The estimated averages of these ‘use values’ for various subgroups are described in table 6.8.

6.8 Estimates of average willingness to pay by tenure type and mobility status

Change in housing features	Buyers	Renters	Buyers with mobility limitation	Renters with mobility limitation
	\$ per week	\$ per week	\$ per week	\$ per week
Getting in and out: 'Several steps' to 'Single step'	32.63	25.22	42.96	39.74
Getting in and out: 'Several steps' to 'Step-free'	49.02	37.96	65.65	60.99
Moving around indoors: 'Regular space' to 'Wide spaces'	15.94	12.21	19.39	17.57
Moving around indoors: 'Regular space' to 'Extra-wide spaces'	21.51	16.66	28.78	26.73
Living on same level as entrance: 'Unsuitable' to 'Suitable for short visits'	42.45	32.97	58.18	54.35
Living on same level as entrance: 'Unsuitable' to 'Suitable for living or overnight visits'	62.01	48.42	88.72	83.72
Modification that would be needed: 'Significant' to 'Minimal'	18.59	14.08	20.39	17.90
Total size of home compared to similar homes: 'Same' to '5% larger'	7.23	5.54	8.82	8.00
Space used for corridors, bathroom, kitchen, laundry: 40% to 45%	-3.30	-2.48	-3.33	-2.85
Space used for corridors, bathroom, kitchen, laundry: 40% to 50%	-7.49	-5.68	-8.36	-7.39

Source: CIE.

The appropriate WTP figure to apply to features in new homes depends on assumptions about how closely accessibility features have been and will be matched to consumers with the highest demand (WTP) for those features. While more accessible homes will tend to be purchased by consumers with higher WTP for accessibility features, the costs of moving home and correlation between accessibility and other housing attributes, such as location, may mean that is not the case. Analysis of the accessibility features in the existing homes of survey respondents suggests accessibility features are not well matched to households containing someone with limited mobility, though it seems people with limited mobility are less likely to live in a home with several steps to the entrance and more likely to live in a home with wider doors (table 6.9).

6.9 Characteristics of housing for households with and without limited mobility

	Households without mobility limitation	Households with mobility limitation
There are several features that affect the accessibility of a home. My current home has...		
no steps between street/parking and the entrance	32.0%	35.3%
a single step between street/parking and the entrance	27.9%	44.5%
several steps between street/parking and the entrance	40.1%	20.2%
Moving around indoors. My current home has...		
door openings similar to other homes	85.7%	67.2%
door openings wider than most other homes	8.1%	27.7%
Don't know	6.3%	5.0%
Would you say your current home has enough space for turning a wheelchair in corridors, bathrooms, kitchen and laundry? (If unsure, please make an educated guess)		
All of these spaces are large enough	18.6%	12.6%
Some of these spaces are large enough	49.0%	53.8%
None of these spaces are large enough	25.8%	29.4%
I can't make an educated guess	6.6%	4.2%
Moving around indoors. My current home has...		
Step-free shower entry	21.3%	23.3%
Hob/kerb shower entry	33.9%	38.8%
Stepped shower entry	22.0%	27.1%
Shower over bath	20.8%	10.1%
Don't know	2.1%	0.8%
Does your current home have a toilet on the same level as an entrance?		
Yes	82.8%	74.8%
No	15.0%	23.5%
Don't know	2.1%	1.7%

	Households without mobility limitation	Households with mobility limitation
Does your current home have a shower on the same level as an entrance?		
Yes	71.0%	65.5%
No	25.6%	29.4%
Don't know	3.4%	5.0%
Which type of indoor stairs, if any, does your current home have?		
Straight stairs	10.6%	13.5%
Stairs with a half/quarter turn	12.8%	21.4%
Curved/spiral stairs	2.1%	7.9%
No stairs	74.5%	57.1%

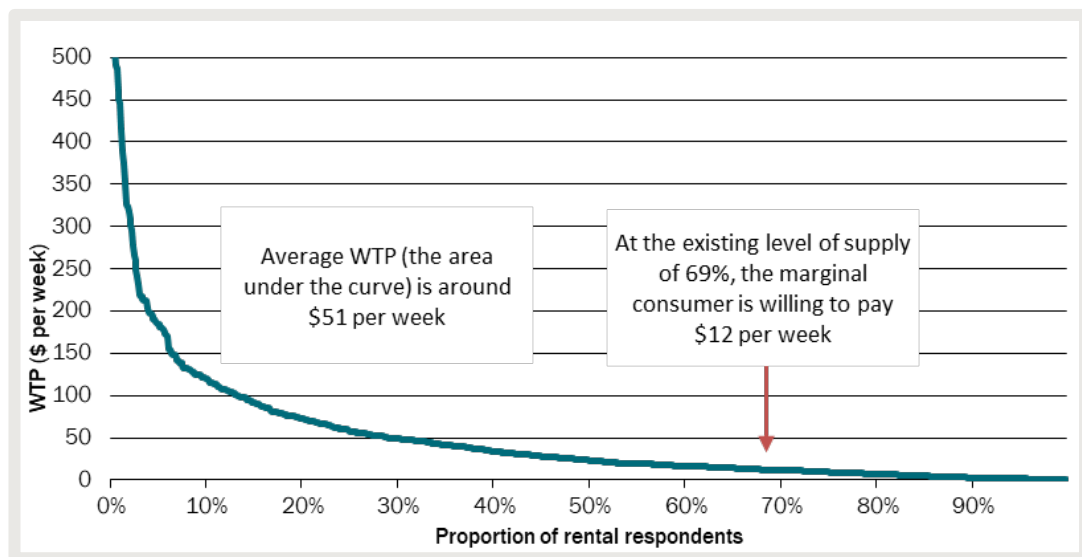
Source: CIE survey.

Given this relatively poor matching in the existing stock, in our central case we derive estimates using average WTP across households, on the assumption of a random matching of accessibility features to households.

As a sensitivity test, we also use WTP of the marginal consumer of each accessibility feature, on the assumption that accessibility features have been and will be consumed by those who value them most highly.

The two approaches are illustrated in figure 6.10. Because the supply of homes with a toilet and shower at entrance level is relatively high in the existing stock, the WTP of the marginal consumer (on the assumption that the existing stock has been matched to consumers with the highest WTP) is below the average.

6.10 Distribution of renter willingness to pay for toilet and shower at entrance level



Data source: CIE survey analysis.

Our model estimated the relationships of WTP to income, age and mobility status. We use these relationships to project changes in WTP over time as the real income, age and mobility status profile of the population is projected to change over time. The elasticities used in this calculation are set out in table 6.11. WTP is projected to increase by 5 per cent in real terms over the first 10 years of the forecast period and by 9.5 per cent in real terms over the first 20 years of the forecast period.⁶⁴

6.11 Assumptions for projections of willingness to pay

Parameter	Value	Note
Forecast real wage growth	0.25 per cent	Based on MYEFO 2019-20 Economic Outlook for 2020-21
Real income elasticity of WTP	0.42	A 1 per cent increase in real income leads to a 0.42 per cent increase in WTP
Average age elasticity of WTP	1.09	A 1 per cent increase in the average age of the adult population (e.g. from 47.00 to 47.47) leads to a 1.09 per cent increase in WTP
Mobility limitation elasticity of WTP	0.10	A 1 per cent proportional (not percentage point) increase in the proportion of the population with limited mobility leads to a 0.10 per cent increase in WTP

Source: CIE.

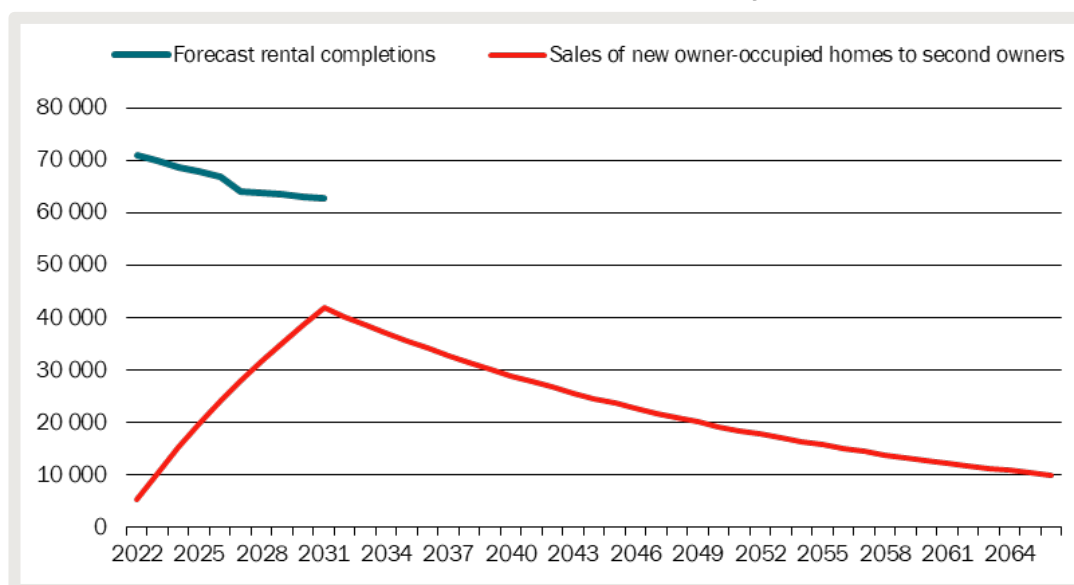
Projecting completions and second-owner purchases

To estimate total WTP, we need to multiply changes in shares of accessibility features by the number of new homes that will be built. We assume the proportion of new homes that are rented is similar to the share in the existing stock of around 34.5 per cent. We assume that renters derive benefits immediately from any change in the supply of accessibility features relative to the baseline scenario. We assume that the benefits to owner-occupants are realised from the point the home is sold to its second owner. The first owner has control over the features of their home and our view is that benefits would be overestimated if we were to assume that these owner-occupants would derive net benefits from an externally-imposed change to the features of their home. The projected number of sales by first-owner occupants to second owners is based on an assumed turnover rate of 4 per cent (see figure 6.13).⁶⁵

⁶⁴ The elasticities were also used to adjust average WTP for the estimated difference in the age and income characteristics of people who move into newly-constructed homes compared with the broader population. We estimated, based on ABS data for a set of local government areas that contain 60 per cent of recent housing completions, that the average age of adults in the former group is 8.2 per cent lower for owners and 1.4 per cent higher for renters, compared to the population. Income is 3.3 per cent lower for owners and 12.8 per cent lower for renters.

⁶⁵ Leal, H., Parsons, S., White, G. and Zurawski, A., 2017, *Housing Market Turnover*, RBA Bulletin, March, pp.21-30.

6.12 Forecast rental completions and sales of new homes by first owner-occupiers



Data source: CIE.

Deriving total willingness to pay

Total rental WTP is derived by multiplying changes in the share of accessibility features in new rental homes by the number of rental home completions and by the present value of rental WTP (weekly WTP * 52 / discount rate).

Total owner-occupant WTP is derived by multiplying changes in the share of accessibility features in new owner-occupied homes by the number of sales to second owners and by the present value of owner-occupier WTP.

Benefits are higher under an assumption of closer matching of accessibility features to households who value them most highly. Within these options some features have marginal WTP below average WTP and for others marginal WTP is above average WTP. In general marginal WTP declines over time as the stock of accessibility features increases. The benefits are higher under the marginal WTP approach due to the relatively low supply of, and therefore high marginal WTP for, homes with wider indoor spaces and minimal modification requirements for ageing in place.

6.13 Present value of total willingness to pay for incremental supply of accessibility features

Matching assumption	Option 1	Option 2	Option 3	Option 4	Option 5
	\$m	\$m	\$m	\$m	\$m
Random matching (average WTP)	13 737.66	37 010.04	37 010.04	10 065.39	8 308.75
Perfect matching (marginal WTP)	18 802.02	63 810.61	63 810.61	23 111.89	22 336.73

Source: CIE.

6.14 Questions for stakeholders

- There is a mismatch between the amount of accessible housing being built and the apparent willingness of many survey respondents (including households without any members with limited mobility), to pay above cost for the Option 1. What explanations are there that could explain this mismatch? Is this a reflection of the market failure?

7 Cost-benefit analysis

In this chapter we bring together the cost and benefit estimates in the previous chapter together in a cost-benefit analysis (CBA) framework. We find that the CBA results depend critically on the approach to measuring benefits, though we favour the cost reduction approach methodology.

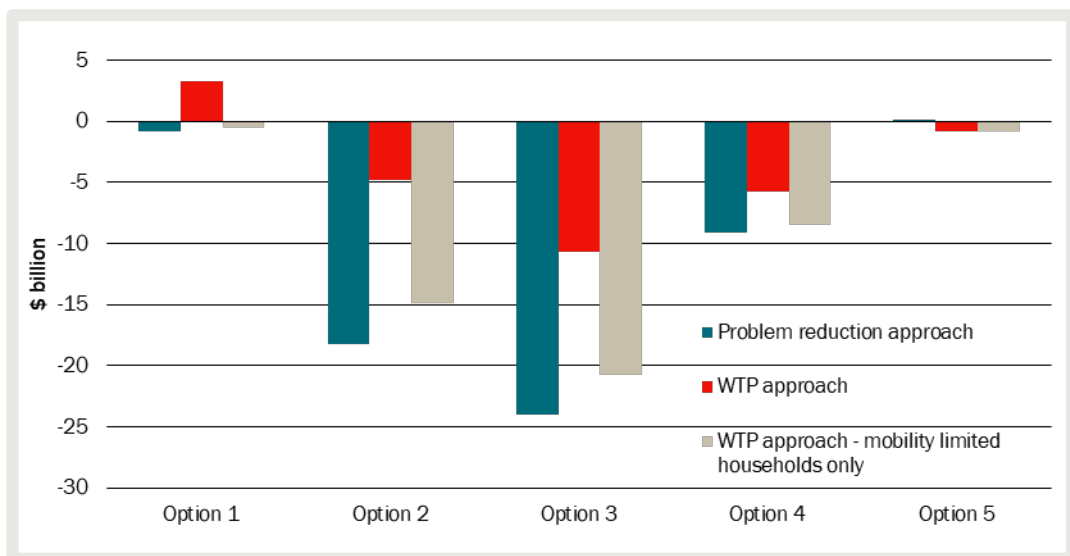
Cost-benefit analysis

As discussed previously, we have estimated the benefits of the proposed changes to the NCC (and other options) using 2 different approaches.

- One approach was based on our estimate of the extent to which we would expect the proposed changes to the NCC (and other options) will address the extent of the various ‘problems’ that arise as a result of a lack of accessible housing.
- The other approach was based on the evidence of a stated preference survey on the community’s willingness to pay for various accessibility features.

The CBA results under each of these approaches (including the WTP approach where only the benefits to mobility limited household are included) are summarised in chart 7.1, with further details below.

7.1 Estimated net benefits/costs under various approaches to measuring the benefits



Note: Costs and benefits are presented in net present value terms covering a 10-year regulatory period from 2022 to 2031, using a discount rate of 7 per cent. Benefits are extended out an additional 30 years, reflecting the flow of benefits over the life of dwellings constructed during the regulatory period.

Data source: CIE estimates (see below).

Cost-benefit analysis measuring benefits using the problem reduction approach

The CBA results, where the benefits are estimated based on the extent to which each option would address the issues that arise as a result of inaccessible housing are presented in table 7.2. Although we have sought to quantify the main benefits of increased accessible housing, some benefits such as the dignity associated with increased independence have not been quantified. The equity benefits associated with people with disabilities having more equal access to housing may be partly, but not necessarily fully captured through the societal benefits.

Costs and benefits are estimated over the 10-year regulatory period from 2022 to 2031, using a discount rate of 7 per cent. The benefits in the last year of the regulatory period are extended for a further 30 years to reflect the flow of benefits over the life of dwellings built during the regulatory period. For consistency, the space-related cost estimates are based on estimates of the marginal value of land (for Class 1a buildings) and the value of apartment space (for Class 2 buildings), rather than survey estimates.

7.2 Estimated net benefit/cost – problem reduction approach

	Option 1	Option 2	Option 3	Option 4	Option 5
	\$ million	\$ million	\$ million	\$ million	\$ million
Benefits					
Reduced falls	45.68	51.69	54.52	15.13	154.27
Reduced time in hospital/transition care	186.88	211.45	223.04	61.89	631.05
Reduced costs associated with loneliness	154.76	175.11	184.71	51.26	522.59
Reduced home modification costs	477.67	540.49	570.10	158.20	1 613.01
Reduced carer-related costs	557.17	630.43	664.98	184.53	1 881.44
Reduced incidence of moving	22.88	25.89	27.31	7.58	77.27
Reduced premature/inappropriate entry into aged care	209.54	237.09	250.09	69.40	707.58
Societal benefits	1 031.33	1 106.60	1 106.60	326.25	1 900.96
Total benefits	2 685.92	2 978.76	3 081.34	874.24	7 488.17
Costs					
Construction costs	-1 866.72	-12 384.81	-15 904.40	-3 602.32	0.00
Opportunity cost of space	-1 571.81	-8 831.55	-11 162.57	-6 541.11	0.00
Industry re-training costs	- 28.47	- 28.47	- 28.47	- 28.47	0.00
Subsidy	0.00	0.00	0.00	0.00	-7 455.55
Total costs	-3 467.00	-21 244.83	-27 095.43	-10 171.90	-7 455.55
Net benefit/costs	- 781.09	-18 266.07	-24 014.09	-9 297.66	32.62

^a During targeted consultations, most stakeholders agreed that Gold standard dwellings (under Option 2) would be suitable for most disabilities. Although the Gold + standard (Option 3) provides additional accessibility features (which may provide some benefits), it does not address any additional problem that is not addressed by a Gold standard dwelling. As this approach focuses on addressing identified problems, the estimated benefits of Option 3 are the same as Option 2.

Note: Costs and benefits are presented in net present value terms covering a 10-year regulatory period from 2022 to 2031, using a discount rate of 7 per cent. Benefits are extended out an additional 30 years, reflecting the flow of benefits over the life of dwellings constructed during the regulatory period.

Source: CIE estimates.

Key findings from the CBA are as follows.

- Under this approach, Option 1 (Silver) has the highest benefit-cost ratio of the regulatory options (around 0.77), though would impose a net cost on the community.
- Option 2 (Gold) and Option 3 (Gold+) are estimated to impose significant net costs on the community.
- A subsidy program (similar in design to SDA under the NDIS) is a more targeted approach to addressing specific elements of the problem, such as the lack of accessible housing for renters is estimated to broadly break-even.

Cost-benefit analysis using the WTP approach

The CBA results, where the benefits are estimated based on survey evidence of the community's stated 'willingness to pay' for particular accessibility features, are shown in table 7.3. Consistent with the problem-reduction approach, we assume a 10 year regulatory period from 2022, with benefits extended out an additional 30 years to reflect the flow of benefits over the life of the dwelling. All costs, including space-related costs, are the same as those used under the problem-reduction approach.

Under the WTP approach, the benefits to the community from accessible housing are significantly higher than under the 'problem reduction approach' (see above).

- Option 1 (Silver) is estimated to deliver a net benefit (relative to baseline). The benefit-cost ratio is 2.39.
- As for the 'problem reduction approach', Option 2 (Gold) and Option 3 (Gold+) are estimated to deliver a net cost to the community.
- Option 4 and Option 5 are also estimated to impose a net cost on the community under this approach.

7.3 Estimated net benefits/costs – willingness to pay approach

	Option 1	Option 2	Option 3	Option 4	Option 5
	\$ million	\$ million	\$ million	\$ million	\$ million
Benefits					
Getting in and out	0.00	0.00	0.00	0.00	0.00
Moving around indoors	5 354.20	7 335.76	7 335.76	2 191.92	2 462.30
Living with limited mobility on same level as an entrance	330.27	1 558.63	1 558.63	0.00	605.54
Minimal modification required for ageing in place	0.00	6 423.79	6 423.79	1 919.42	1 685.88
Societal benefits	1 031.33	1 106.60	1 106.60	326.25	1 900.96
Total benefits	6 715.81	16 424.79	16 424.79	4 437.60	6 654.68
Costs					
Construction costs	-1 866.72	-12 384.81	-15 904.40	-3 602.32	0.00
Opportunity cost of space	-1 571.81	-8 831.55	-11 162.57	-6 541.11	0.00
Industry re-training costs	- 28.47	- 28.47	- 28.47	- 28.47	0.00

	Option 1	Option 2	Option 3	Option 4	Option 5
	\$ million	\$ million	\$ million	\$ million	\$ million
Subsidy	0.00	0.00	0.00	0.00	-7 455.55
Total costs	-3 467.00	-21 244.83	-27 095.43	-10 171.90	-7 455.55
Net benefit/costs	3 248.81	-4 820.04	-10 670.65	-5 734.30	- 800.87

Note: Costs and benefits are presented in net present value terms covering a 10-year regulatory period from 2022 to 2031, using a discount rate of 7 per cent. Benefits are extended out an additional 30 years, reflecting the flow of benefits over the life of dwellings constructed during the regulatory period.

Source: CIE estimates.

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. The survey results suggest that many of these households value accessibility features. Option 5 does not include benefits to these households, since accessibility improvements are targeted at renters with limited mobility. For Option 5, the WTP approach includes benefits only to renters with limited mobility, consistent with the problem-reduction approach, and arrives at benefit estimates that are of similar order of magnitude to those for Option 5 under the problem-reduction approach.

When WTP benefits in Options 1-4 are aggregated only over households containing someone with a mobility limitation in new homes, the ranking of options (including relative to the baseline option) is similar to that derived using the problem-reduction approach.

7.4 Estimated net benefits/costs – willingness to pay approach applied only to households containing someone with limited mobility

	Option 1	Option 2	Option 3	Option 4	Option 5
	\$ million	\$ million	\$ million	\$ million	\$ million
Benefits					
Getting in and out	0.00	0.00	0.00	0.00	0.00
Moving around indoors	1 782.39	2 712.76	2 712.76	810.57	2 462.30
Living with limited mobility on same level as an entrance	125.03	658.68	658.68	0.00	605.54
Minimal modification required for ageing in place	0.00	1 905.69	1 905.69	569.42	1 685.88
Societal benefits	1 031.33	1 106.60	1 106.60	326.25	1 900.96
Total benefits	2 938.75	6 383.73	6 383.73	1 706.24	6 654.68
Costs					
Additional construction costs	-1 866.72	-12 384.81	-15 904.40	-3 602.32	0.00
Opportunity cost of space	-1 571.81	-8 831.55	-11 162.57	-6 541.11	0.00
Industry re-training costs	-28.47	-28.47	-28.47	-28.47	0.00
Subsidy	0.00	0.00	0.00	0.00	-7 455.55
Total costs	-3 467.00	-21 244.83	-27 095.43	-10 171.90	-7 455.55
Net benefit/costs	- 528.25	-14 861.10	-20 711.71	-8 465.65	- 800.87

Source: CIE

The differences between the households over which non-altruistic benefits are estimated and aggregated under the various options and approaches are summarised in table 7.5. When aggregating benefits over all new homes under the WTP approach, we take account of the fact that the households containing persons with limited mobility and older persons tend to place a higher value on accessibility features than other households.

7.5 Summary of benefit recipients by approach

Approach	Options 1-3	Option 4	Option 5
Problem-reduction	Mobility-limited renters of new homes plus newly-acquired disabilities in accessible housing	Mobility-limited renters of new apartments plus newly-acquired disabilities in accessible apartments	Mobility-limited renters of new homes (assumed from year 1 to be all renters with mobility limitation currently in unsuitable homes)
WTP	All purchasers (other than the first for each home) and renters of new homes	All purchasers (other than the first for each apartment) and renters of new apartments	Mobility-limited renters of new homes (assumed from year 1 to be all renters with mobility limitation currently in unsuitable homes)

Source: CIE.

Qualitative assessment of enhanced voluntary guidance

As discussed above, one option under consideration involves enhanced voluntary guidance, including:

- developing the proposed standards into a voluntary ABCB handbook
- provision of information at the point of sale
- better matching services.

A key finding from the stated preference survey is that on average, the community’s willingness to pay for accessibility features is likely to be higher than the cost associated with incorporating these features in the dwelling design. Where the value buyers place on these accessibility features are higher than the cost, we generally expect to see these design features adopted voluntarily. However, this does not align with the reported low uptake of the LHDG; anecdotal evidence from industry stakeholders that even where volume builders offer designs with accessibility features, there is often little interest from buyers (particularly younger buyers).

One interpretation of these findings is that survey respondents overstated their true preferences for accessibility features. As noted in the OBPR guidance material, observed market behaviour is generally considered more credible than preferences elicited from surveys.⁶⁶

⁶⁶ Department of Prime Minister and Cabinet 2016, *Cost-Benefit Analysis*, Guidance Note, Office of Best Practice Regulation, February 2016, p. 11.

An alternative interpretation is that the survey reflects buyers' true preferences, but the various market failures are preventing these preferences from being reflected in housing designs. These market failures include:

- lack of awareness of the benefits of accessible housing
- the characteristics of housing supply.

If the results of the willingness to pay study reflect buyers' true preferences and an enhanced voluntary guidance helps to overcome these market failures directly, we would expect to see high uptake of accessibility features under the enhanced voluntary guidance option.

The voluntary guidance option would also have lower risk of imposing excessive costs, such as; dwellings on lots where the costs of complying with the proposed standards are high; or some buyers have a strong preference for non-compliant design features.

Furthermore, the additional cost of developing a voluntary handbook would be minimal, given that some of the initial work necessary to underpin a voluntary handbook has already been completed. However, the provision of point of sale information and matching services, which are also components of Option 6, falls outside the remit of the ABCB.

7.6 Questions for stakeholders

- To what extent would better information provision and promotion of an enhanced non-regulatory approach (Option 6) be effective in encouraging additional uptake of universal design principles in new dwellings?
- Which option is your preferred option?

Sensitivity analysis

As noted above, there is significant uncertainty around the above estimates, on both the cost and benefits side, due to data limitations and other factors. It is therefore important to test the robustness of the results (and the policy conclusions drawn from them) to alternative assumptions.

- On the cost side, key uncertainties and additional scenarios tested include the following.
 - The weightings underpinning the costings are based on DCWC's professional judgement, rather than objective data. Rather than testing the sensitivity to each choice of weightings, a better way to present the sensitivity of the results to the cost estimates is to estimate the change in the cost per dwelling required for each option to break-even. That said, a significant change to the weightings to reflect greater provision of particular design features under the baseline would also flow through to the benefits (i.e. if accessible design features are already provided, there are fewer benefits from mandating these features).
 - Whether the opportunity cost of additional space requirements has been measured correctly — some stakeholders argued that any loss of amenity could be minimised

through better design. To test the extent to which the opportunity cost of space affect the CBA results, we test a scenario that excludes the opportunity cost of space.

- It is also unclear whether excavation costs to meet accessibility requirements has been fully taken into account. We therefore test the impact of including the excavation cost estimates provided by HIA in addition to the construction cost estimates provided by DCWC.
- On the benefits side, key uncertainties and additional scenarios tested include the following.
 - For some of the problems identified, we provided a range. We therefore test an alternative scenarios, using the low and high estimates.
 - A significant share of the benefits relate to the community’s preference for more equitable outcomes for all members of the community, including those with mobility-related disabilities. We estimate the net benefits under a scenario where these societal benefits are excluded, so the benefits reflect only the tangible improvements in housing-related outcomes.
 - To take into account the fact that a significant proportion of new housing built under the current code will have some accessibility features (although relatively few houses will have all of features in the proposed standard), we also reduced the benefits. However, the extent to which the benefits should be reduced is highly uncertain. We therefore consider two alternative scenarios:
 - ... Where the benefits are reduced by 15 per cent (reflecting a lower bound of the analysis)
 - ... Where the benefits are not reduced at all. This would reflect a view that all of the accessibility features are required to make a dwelling accessible.
 - A significant share of the benefits are from the increased availability of accessible rental properties. However, the extent to which these accessible rental properties would be allocated to renters with accessibility needs is not known. We assumed that the probability that a renter with accessibility needs moves to a new accessible rental property is around 12.6 per cent higher than the share of new accessible rental properties in the stock (based on our analysis of the survey data).
 - ... As a lower bound scenario, we assume the probability of a renter with accessibility needs moving to a new accessible rental property is the same as the share of new accessible rental properties in the stock (implying random allocation).
 - ... As an upper bound scenario, we assume the probability of a renter with accessibility needs moving to a new accessible rental property is 25 per cent higher than the share of new accessible rental properties in the stock.
- Consistent with OBPR requirements, we also calculate the net benefits under alternative discount rates, 3 per cent and 10 per cent.

Table 7.7 shows the estimated net benefit under the alternative input assumptions/parameters.

7.7 Sensitivity analysis – benefit-cost ratio under alternative assumptions

	Option 1	Option 2	Option 3	Option 4	Option 5
Break-even analysis					
Change in cost per dwelling to break-even (\$)	- 538	-12 576	-16 533	-22 184	n.a.
Sensitivity analysis (BCR)					
Central case	0.77	0.14	0.11	0.09	1.00
Opportunity cost of space excluded	1.42	0.24	0.19	0.24	1.00
Excavation costs included	0.47	0.13	0.10	0.09	1.00
Societal benefits excluded	0.48	0.09	0.07	0.05	0.75
Low 'problem' scenario	0.72	0.13	0.11	0.08	0.92
High 'problem' scenario	0.83	0.15	0.12	0.09	1.10
Random allocation for renters	0.71	0.13	0.10	0.08	1.00
High allocation for renters (25% higher than random allocation)	0.84	0.15	0.12	0.09	1.00
Benefits reduced by 15% for baseline effects	0.89	0.15	0.12	0.09	1.00
Benefits not reduced for baseline effects	0.99	0.17	0.14	0.10	1.00
10% discount rate	0.59	0.11	0.09	0.07	0.95
5% discount rate	0.97	0.18	0.14	0.12	1.06
3% discount rate	1.27	0.23	0.19	0.16	1.14

Source: CIE estimates.

Key findings from the sensitivity and break-even analysis are as follows.

- Based on the evidence available, the costs of Option 2 (Gold) and Option 3 (Gold+) are highly likely to outweigh the benefits.
- Although Option 1 (Silver) is also estimated to impose a net cost to the community, there are some scenarios tested (such as using a low discount rate or excluding the opportunity cost of space), where it could possibly deliver a net benefit. Option 1 would also deliver a net benefit if construction costs or associated space impacts have been over-estimated by more than around \$538 per dwelling.
- It is also notable that nearly 40 per cent of the estimated benefits relate to the community's preference for more equitable outcomes. Even under Option 1, the cost of the proposed minimum accessibility standards is likely to significantly outweigh the benefits in terms of tangible improvements in housing outcomes for people with mobility-related disabilities.

8 Conclusions

Interpretation of the CBA results

A key finding is that the CBA results (and the policy conclusions drawn from them) depend critically on the approach used to measure the benefits.

- Under the approach based on the extent to which we estimate that the proposed option would address the various “issues” created by housing that does not meet the needs of people with mobility-related disabilities, we estimate that all of the regulatory options considered, including Option 1 (Silver) are estimated to impose a net cost to the community (although under some scenarios tested, Option 1 was estimated to deliver a net benefit).
- Under the approach based on the methodology used to estimate the community’s stated preference for accessible design features, Option 1 is estimated to deliver a net benefit.

A key difference between these approaches is on the issue of whether there are benefits from accessible housing that flow to households that do not have specific accessibility needs.

- Under the ‘problem reduction’ approach, there are implicitly no benefits accruing to households that do not have current accessibility needs, as this does not contribute to reducing ‘the problem’.
- On the other hand, households indicated in the stated preference survey that they have a relatively high ‘willingness to pay’ for accessibility features, even if their household does not currently contain anyone with a mobility limitation.

However, a relatively high willingness to pay for accessibility features across the broader population does not align with anecdotal feedback from industry stakeholders. Industry stakeholders noted that although there was growing interest (and willingness to pay) for accessibility features among older homebuyers, there was little interest from younger buyers.

According to OBPR guidance material:

“As a general rule, estimates of individuals’ valuations of goods and services derived from observing their behaviour in markets tend to be more credible than those from survey questionnaires (Boardman et al. 2010). Observing purchasing decisions directly reveals preferences, whereas surveys elicit statements about preferences.”⁶⁷

Furthermore, the survey results raise the question: if people place a high value on the various accessible design features, why are they not reflected in market outcomes?

⁶⁷ Department of the Prime Minister and Cabinet 2016, *Cost-Benefit Analysis*, Guidance Note, Office of Best Practice Regulation, February 2016, p. 11.

Various barriers to the adoption of universal design principles have been identified in the literature.

- One set of barriers identified in the literature relates to the characteristics of the home building industry, which mean that homes do not always reflect consumer preferences. Industry stakeholders argued that industry practices are changing, albeit not as quickly as to meet the aspirations of some advocates. Industry stakeholders claim many volume builders are incorporating universal design principles into their designs and offering design options that comply with the LHDGs. This suggests that industry practices are becoming less of an issue over time.
- Another potential barrier relates to a lack of consumer awareness of the benefits of universal design (i.e. bounded rationality). One interpretation of the survey results is that the (limited) information provided in the questionnaire on the benefits of accessibility features and the focus on those features in housing choice questions overcame consumers' bounded rationality and the survey results reflect consumers' true preferences. However, even under this interpretation, non-regulatory approaches, such as providing material on the benefits of accessible housing at the point of sale could help overcome this barrier.

Given these considerations, it is possible that the survey may have overstated willingness to pay for accessible design features due to the questions being hypothetical, though it is also possible that willingness to pay revealed by the market is understated due to information barriers. Although every effort has been made to minimise potential biases introduced by the survey design (consistent with best practice approaches), the home choice questions were necessarily hypothetical and we could not credibly claim that the responses would impact outcomes for respondents. (The question designed to estimate societal altruism was more consequential, since it focussed on a potential change in government policy and rates and taxes).

We therefore lean towards the approach based on our estimates of the extent to which the proposed changes to the NCC will address the various issues associated with a lack of accessible housing.

Based on the (in some cases limited) information available, we estimate that the various costs associated with a lack of accessible housing are significant. However, these are complex issues and the indicators used to identify the number of people affected and other information relied to estimate the size of the problem are imperfect.

Furthermore, including an accessibility standard in the NCC would address these issues relatively slowly, as accessible housing as a share of the total housing stock increases over time. We estimate that the main near to medium terms benefits arise from the increased availability of accessible rental properties.

Renters are a group that have limited options for meeting their accessibility needs. However, a subsidy program (similar in design to the SDA, but targeting a different group) could help to address the particular issues faced by renters in a more targeted way. That said, subsidising accessible housing specifically for people with accessibility needs would not meet the broader aspirations of many advocates of:

- ensuring people with accessibility needs have the same housing choices available to them as other members of the community, and
- increasing the opportunities of people with accessibility needs to visit family and friends.

Although we have not been able to estimate the costs and benefits of an enhanced voluntary guidance, the proposal developed by ABCB could be included in a voluntary handbook at minimal cost. Together with some other relatively low-cost measures to overcome barriers to the uptake of universal design principles, this approach could encourage additional uptake, with lower risk of imposing excessive costs on some new dwellings.

Preliminary recommendation

- **Based on the preliminary evidence gathered for the Consultation RIS, the costs associated with including an accessible housing standard in the NCC are estimated to outweigh the benefits under the central estimates for all of the Options tested.**
- **Given the uncertainty around the feasibility of some Options, we recommend that consultation be used to seek feedback and more information on the assumptions, methods and suitability of alternative.**

A Approach to estimating safety impacts

People at risk of falls due to inaccessible housing

There is no comprehensive source of data on the extent to which accessibility needs are being met in existing dwellings. The SDAC does not explicitly ask respondents with a mobility limitation whether their current residence meets their accessibility needs. Nevertheless, there are some relevant indicators.

One relevant indicator on the extent to which accessibility needs are being met is the level of assistance required moving around the residence. This question is relevant to accessibility features within the home, but not necessarily features relating to entering and leaving the residence (such as level access).

- The 2018 SDAC suggests that around 78 per cent of those identifying as having a mobility limitation report having no difficulty moving around the residence (table A.1).
 - In some cases, the disability may not be severe enough to restrict movement around the residence.
 - Alternatively, this could reflect the home environment already meeting any accessibility needs.
- There are around 653 400 people that either require assistance moving around the residence, or have some difficulty.
 - Of these, around 163 100 live in establishments (including aged care facilities, retirement villages or hospitals).
 - The remaining 490 700 live in households.
 - ... Of these, around 167 900 live in dwellings that have been modified because of the resident's condition or age. This could indicate that the dwelling is accessible, but the disability is severe enough that they require assistance or have difficulty anyway. Alternatively, it is possible that the modifications were inadequate, such that the dwelling did not meet the resident's accessibility needs.
 - ... The remaining 322 300 live in dwellings that have not been modified.

A.1 Assistance required moving around residence

	Living in establishments	Living in households		Total	Total requiring assistance	Share of total
		Dwelling modified	Dwelling not modified			
	'000	'000	'000	'000	'000	Per cent
Always needs help	121.6	32.8	40.1	71.3	194.2	6.5
Sometimes needs help	35.1	58.0	113.0	171.0	205.7	6.9
Does not need help, but has difficulty	6.4	77.1	169.2	248.4	253.5	8.5
Total requiring help or has difficulty	163.1	167.9	322.3	490.7	653.4	21.9
Does not move around residence	9.5	0.0	7.2	4.8	15.6	0.5
Has no difficulty	11.7	309.9	1 992.3	2 301.9	2 313.9	77.6
Total	184.3	477.8	2 321.8	2 797.4	2 982.9	100.0

Source: ABS, Survey of Disabilities, Ageing and Carers, 2018, TableBuilder.

The SDAC survey suggests that for most people with a mobility limitation, their residence meets their accessibility needs (at least internally). A COTA survey of people over the age of 50 provides some support for these findings. An unpublished analysis of the survey data suggests the following:⁶⁸

- 27.6 per cent of respondents did not think their home would meet their needs in the future (although close to 20 per cent indicated that they did not know)
- of the people who indicated that their home would not meet their needs, around 44 per cent indicated that poor access/accessibility was a reason why
- this implies that only around 12 per cent people believed their house would not meet their future needs due to poor access/accessibility.

As these survey results are based on future expectations, rather than actual experience they need to be treated with some caution. Many people may not be able to accurately foresee their future accessibility needs.

- **We assume that the population at greater risk of falling due to housing that lacks accessibility features are those that:**
 - have a mobility limitation
 - live in households
 - live in a dwelling that has not been modified as a result of their age or condition
 - either require assistance or have trouble moving around their residence.

⁶⁸ Bringolf, J. 2015, *Let's Talk About Where You Live*, Incomplete draft based on COTA NSW 2014 survey data for the 50+ Report with a focus on how and where older people are living, unpublished, p. 10.

- Based on these criteria, the 2018 SDAC survey suggests there were around 325 100 people⁶⁹ that are at higher risk of falls due to inaccessible housing).

Safety outcomes

To the extent that the accessibility needs of some members of the community are not currently being met, there is some evidence to suggest that this is likely to be leading to higher rates of falls. Based on a review of the literature, the World Health Organisation (WHO) assessed that the strength of evidence that people with functional impairments have reduced fall and injury rates in homes that have been modified is moderate.

There are a number of Randomised Control Trials that find home modifications (amongst other interventions) reduce falls.

- In the CBA, we assume that the number of falls is around 37 per cent higher in housing without accessibility features (relative to housing that has the relevant accessibility features) based on the average decrease in falls across the studies reviewed.
- As alternative low and high assumptions, we assume:
 - the number of falls is around 27 per cent higher in housing without accessibility features (relative to housing that has the relevant accessibility features) based on the low end of the range of studies reviewed.
 - the number of falls is around 46 per cent higher in housing without accessibility features (relative to housing that has the relevant accessibility features) based on the high end of the range of studies reviewed.

Table A.2 summarises some key studies on the impact of home modifications (and other interventions) on the number of falls.

A.2 Key results of randomised controlled trials that establish that home modifications and other factors reduce falls

Study (location)	Key result ^a	Comment/note
Cumming et al 1999	Falls reduce by 44 per cent.	<ul style="list-style-type: none"> ■ Study for 65yo and above ■ Intervention that drives result: visit and follow-up by OT, including home modifications ■ Result is for sub-group that had a fall prior to study. No significant impact for sub-group that did not have a fall prior to study. ■ Authors attribute reduction in falls to Occupational Therapy in general (including home modifications) not to home modifications specifically, because falls outside home also fell
Palvanen et al 2014	Falls are estimated to reduce by 27 per cent.	<ul style="list-style-type: none"> ■ Study for 70yo and above, who have a high risk of falling

⁶⁹ Note this differs slightly from the number reported above (322 300). This reflects the procedure whereby TableBuilder randomly adjusts cells to minimise the risk of identifying individuals in aggregate statistics. This means that estimates derived from TableBuilder are not always identical.

Study (location)	Key result ^a	Comment/note
		<ul style="list-style-type: none"> Intervention that drives result: 12 months, multifactorial falls prevention program: strength and balance training, medical review and referrals, medication review, proper nutrition, home hazard assessment and modifications
Nikolaus & Bach 2003	Falls are estimated to reduce by 37 per cent.	<ul style="list-style-type: none"> Study of subjects admitted from home to geriatric hospital showing functional decline, especially in mobility Intervention that drives result: diagnostic home visit and home intervention (diagnostic home visit, assessing home for environmental hazards, advice about possible changes, offer of facilities for any necessary home modifications, training on the use of technical and mobility aids); an additional home visit after 3 months to reinforce the recommendations
Pighils et al 2011	Falls are estimated to reduce by 46 per cent.	<ul style="list-style-type: none"> Study of subject 70yo and above, with a history of falls in the previous year. Intervention: environmental falls prevention intervention from OT

^a The key result taken from each study is the rate of falls in an environment with home modifications and other factors, relative to not being such an environment. All noted results are statistically significant. Note: In each RCT, the control group generally receives 'normal' treatment, which does not involve occupational therapy and home modifications. The specific interventions that drive the results are noted.

Source: Cumming et al 1999, *Home visits by an Occupational Therapist for Assessment and modification of Environmental Hazards: A Randomised Trial of Falls Prevention*; JAGS 47:1397-1402; Palvanen et al 2014, *Effectiveness of the Chaos Falls Clinic in preventing falls and injuries of home-dwelling older adults: a randomised controlled trial*, *Injury*. 2014 Jan;45(1):265-71. doi: 10.1016/j.injury.2013.03.010; Nikolaus T and Bach M 2003, *Preventing falls in community-dwelling frail older people using a home intervention team (HIT): results from the randomised Falls-HIT trial*, *J Am Geriatr Soc*. 2003 Mar;51(3):300-5; Pighills et al 2011, *Environmental Assessment and modification to prevent falls in older people*, *J Am Geriatr Soc*. 2011 Jan;59(1):26-33. doi: 10.1111/j.1532-5415.2010.03221

Averaged across the studies in Table A.2, the rate of falls in an accessible environment is around 37 per cent lower relative and inaccessible environment.

Nevertheless, we note the following caveats.

- The results in these studies are driven by occupational therapy interventions in general (which includes home modifications) and not home modifications specifically.
- Some studies find no effect. For example, Day et al 2002 finds that "home hazard reduction" reduces falls in combination with exercise and vision improvement, but does not have a significant impact in isolation.

This implies that the estimated impact of accessible housing on the number of falls is likely to be an upper bound estimate.

Estimating the health-related cost of falls

Various studies report the prevalence of falls among older people (typically over the age of 65), including several Australian studies (including data from NSW, Victoria and Queensland).

Although the way the data is reported across the various reports is not always directly comparable (i.e. based on different time periods, different age brackets etc.), the hospitalisation rates across age groups appear broadly comparable across states (A.3). This suggests that using data from any of these studies should be broadly representative of national outcomes.

A.3 Hospitalisation rates from falls for older Australians

	NSW	Queensland	Victoria
	Rate per 100 000	Rate per 100 000	Rate per 100 000
65-69	841.7	883.0	984.2 ^b
70-74	1 222.4	1 227.8	
75-79	2 293.6	2 164.6	2 917.0 ^c
80-84	4 281.4	4 150.1	
85-89	7 390.1	8 209.0 ^a	7 951.9 ^d
90-94	11 373.3		
95+	13 582.6		13 279.3
Total	2 744.6	2 548.6	2 597.2

^a Relates to 85+ age group. ^b Relates to 65-74 age group. ^c Relates to 75-84 age group. ^d Relates to 85-94 age group.

Source: Stathakis, V. Gray, S. and Berecki-Gisolf, J. 2015, "Fall-related injury profile for Victorians aged 65 years and older", *Hazard*, Edition No. 80, Summer 2015, Victorian Injury Surveillance Unit, Monash University Accident Research Centre; University of NSW, *The Incidence and Cost of Falls Injury Among Older People in New South Wales 2006/07*, A Report to NSW Health, September 2010,

Deaths

Our approach to estimating the cost to the community of additional deaths from falls due to people with accessibility needs living in inaccessible housing is set out below.

Additional fall-related deaths due to inaccessible housing

We estimate that there could be between around 15 and 27 additional deaths from falls per year as a result of people with accessibility needs living in inaccessible housing, with a central case estimate of around 21 additional deaths per year (table A.4). These estimates are based on the following.

- The population at risk of falls due to inaccessible housing are as defined above.
- The incidence of falls causing death is based on Victorian data from the 2010-12 period reported by the Victorian Injury Surveillance Unit (VISU) within the Monash University Accident Research Centre (MUARC).⁷⁰
 - Actual data, as reported by VISU, is used for age groups over 65.
 - The incidence of falls causing death among people under the age of 65 with mobility limitations is not reported. We assumed that the incidence of falls was around the same as for the broader population in the 65-74 year age bracket, as reported by VISU. Adults with disabilities reportedly have the same risk of falling as people in the general population over the age of 65.⁷¹

⁷⁰ Stathakis, V. Gray, S. and Berecki-Gisolf, J. 2015, "Fall-related injury profile for Victorians aged 65 years and older", *Hazard*, Edition No. 80, Summer 2015, Victorian Injury Surveillance Unit, Monash University Accident Research Centre, p. 6.

⁷¹ University of Massachusetts Medical School, Eunice Kennedy Shriver Center, <https://shriver.umassmed.edu/news/2015-07-08-130000/shriver-center-studying-falls-prevention-people-intellectual-and-developmental-disabilities>, accessed 12 February 2020.

- As not all falls occur at home, this was adjusted to take into account the fact that 32.8 per cent of falls resulting in death occur in the home.⁷²

When people with accessibility needs live in inaccessible housing, the incidence of falls is estimated to be:

A.4 Additional deaths from falls due to inaccessible housing

	Population affected ^a	Death rate from falls ^b	Death rate from falls at home ^c	Implied number of falls - baseline	Additional deaths due to inaccessible housing		
					Low estimate ^d	Central case	High estimate ^e
	'000	Rate per 100,000	Rate per 100,000	No.	No.	No.	No.
0-14 years	19.9	10.6	3.5	0.7	0.2	0.3	0.3
15-24 years	14.2	10.6	3.5	0.5	0.1	0.2	0.2
25-34 years	20.3	10.6	3.5	0.7	0.2	0.3	0.3
35-44 years	28.2	10.6	3.5	1.0	0.3	0.4	0.5
45-54 years	48.4	10.6	3.5	1.7	0.5	0.6	0.8
55-64 years	66.6	10.6	3.5	2.3	0.6	0.9	1.1
65-74 years	58.7	10.6	3.5	2.0	0.6	0.8	0.9
75-84 years	44.1	69.6	22.8	10.1	2.7	3.7	4.6
85-94 years	20.7	345.8	113.4	23.5	6.3	8.7	10.8
95+ years	4.0	1 139.2	373.7	14.9	4.0	5.5	6.9
Total	325.1			57.4	15.5	21.2	26.4

^a Based on 2018 SDAC data. Population at risk of falls due to inaccessible housing defined as people that: have a mobility limitation; either require assistance or have trouble moving around their place of residence; live in a household; and live in a dwelling that has not been modified to meet their needs. ^b Based on data from Victoria from 2010-12 reported in Stathakis, V. Gray, S. and Berecki-Gisolf, J. 2015, p. 6. ^c Adjusted based on 32.8 per cent of falls causing death occurring at home as reported in Stathakis, V. Gray, S. and Berecki-Gisolf, J. 2015, p. 2. ^d Assumes falls are 27 per cent higher in inaccessible housing. ^e Assumes falls are 37 per cent higher in inaccessible housing. ^f Assumes falls are 46 per cent high in inaccessible housing. reducing falls by 37 per cent. Source: ABS Survey of Disability, Ageing and Carers 2018, TableBuilder; Stathakis, V. Gray, S. and Berecki-Gisolf, J. 2015, "Fall-related injury profile for Victorians aged 65 years and older", *Hazard*, Edition No. 80, Summer 2015, Victorian Injury Surveillance Unit, Monash University Accident Research Centre, p. 6, CIE.

Valuing deaths and other health-related outcomes

The costs associated with poor health-related outcomes (such as injuries from slips, trips and falls and depression associated with social isolation), include:

- the cost of treatment
- morbidity (and in some cases mortality) costs.

Morbidity costs associated with various health outcomes are typically using the concept of years lost to disability (YLD). This is a measure of the 'healthy' years lost to disability.

⁷² Stathakis, V. Gray, S. and Berecki-Gisolf, J. 2015, "Fall-related injury profile for Victorians aged 65 years and older", *Hazard*, Edition No. 80, Summer 2015, Victorian Injury Surveillance Unit, Monash University Accident Research Centre, p. 2.

This is usually measured by applying a disability weight (a measure of the extent to which a medical condition affects a person's quality of life) to the value of a life year (OBPR recommend using a value of around \$195 500 in 2019 dollars — see box A.5) over the duration of the injury/disability.

A.5 Valuing human health outcomes

A key concept in establishing a monetary value for lives lost is the value of a statistical life (VSL). This is a notional value that individuals place on reducing the risk of death.

A related concept is the value of a life year (VLY), which refers to the notional value an individual places on each additional year of life. The two concepts are related because the VSL should reflect the discounted value of expected future life years. This implies that the VSL will vary depending on age (and other factors), since younger individuals would be expected to have more life years ahead of them. VSL is usually assumed to refer to the life of a young adult with at least 40 years of life ahead of them.

Abelson (2008) reviewed research into VSL and VLY and international guidelines for life and health values for the Commonwealth Office of Best Practice Regulation. Based on this review, Abelson (2008) recommended that public agencies in Australia adopt:

- a VSL of \$3.5 million (in 2007 dollars) for avoiding an immediate death of a healthy individual in middle age (about 50) or younger
- a constant VLY of \$151 000 (in 2007 dollars) which is independent of age

Inflating to 2019 dollars using the national Consumer Price Index (published by the ABS) this equates to:

- a VSL of \$4.5 million, and
- a VLY of around \$195 000.

The VSL recommended by OBPR of around \$4.5 million is based on avoiding the death of a healthy individual in middle age, with around 40 years of life ahead of them. However, those at risk of falls are generally older and therefore would be expected to have fewer years of life ahead of them. We therefore used lower VSL estimates based on the expected future years of life for individuals in each age cohort.

Our VSL estimates (table A.6) are based on the following.

- The average life expectancy for males and females in each age bracket are reported by the ABS.⁷³ We then average across males and females (as females are over-represented in falls and have longer life expectancy this will slightly understate the life expectancy and therefore the cost).

⁷³ ABS 2019, *Life Tables, States, Territories and Australia 2016-2018*, Cat. 3302.0.55.001, <https://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/3302.0.55.001Main+Features12016-2018?OpenDocument>, accessed 15 January 2020.

- Each year of future life is valued at \$195 000 as recommended by OBPR.
- Future life years are discounted using a discount rate of 3 per cent, consistent with OBPR.

A.6 Estimated value of a statistical life for Australians by age group

	Life expectancy - Male	Life Expectancy - Female	Average Life - average	Age group-specific value of a statistical life ^a
	Years	Years	Years	\$'000
0-14 years	74.05	78.16	76.11	5 989.1
15-24 years	61.75	65.79	63.77	5 678.4
25-34 years	52.10	55.94	54.02	5 339.0
35-44 years	42.56	46.19	44.38	4 891.5
45-54 years	33.28	36.65	34.96	4 313.2
55-64 years	24.46	27.46	25.96	3 586.5
65-74 years	16.36	18.74	17.55	2 709.7
75-84 years	9.46	11.03	10.24	1 748.7
85-94 years	4.70	5.35	5.02	924.0
95+ years	2.65	2.74	2.70	512.2

Source: ABS, Life Tables, States, Territories and Australia 2016-2018,

<https://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/3302.0.55.001Main+Features12016-2018?OpenDocument>, accessed 15 January 2020, CIE.

Estimated cost of additional deaths

Bringing together the estimates on the number of additional deaths per year (by age bracket) and the VSL estimates, suggests that the cost to the community from fall-related deaths could range between around \$22.6 million and \$38.4 million, with a central case estimate of \$30.9 million.

A.7 Estimate cost to the community from additional fall-related deaths

	Value of statistical life by age	Cost of additional deaths		
		Low estimate	Central case	High estimate
	\$'000	\$ million	\$ million	\$ million
0-14	5 989.1	1.12	1.53	1.91
15-24	5 678.4	0.76	1.04	1.29
25-34	5 339.0	1.02	1.39	1.73
35-44	4 891.5	1.29	1.77	2.21
45-54	4 313.2	1.96	2.69	3.34
55-64	3 586.5	2.24	3.07	3.82
65-74	2 709.7	1.49	2.05	2.54
75-84	1 748.7	4.75	6.51	8.10
85-94	924.0	5.86	8.03	9.98

	Value of statistical life by age \$'000	Cost of additional deaths		
		Low estimate \$ million	Central case \$ million	High estimate \$ million
95+	512.2	2.07	2.83	3.52
Total		22.56	30.92	38.44

Source: CIE estimates.

Hospital admissions

We estimate there could be between an additional 711 and 1211 fall-related hospital admissions per year due to people with accessibility needs living in inaccessible housing, with a central case estimate of 974 additional hospital admissions. These estimates are based on the following.

- The baseline hospital admission rate from falls is based on NSW data for people living in the community from 2006-07, as reported in a UNSW report to NSW Health.⁷⁴
 - Actual data, as reported by UNSW, is used for age groups over 65.
 - The incidence of falls resulting in hospital admission among people under the age of 65 with mobility limitations is not reported. As above, we assumed that the incidence of falls was around the same as for the broader population in the 65-69 year age bracket, as reported by UNSW.
 - As not all falls occur at home, these hospital admission rates were adjusted based on Victorian data showing that 47.6 per cent of falls resulting in hospital admission occur in the home.⁷⁵
- When people with accessibility needs live in inaccessible housing, the incidence of falls is estimated to be:
 - 27 per cent higher under the low estimate scenario
 - 37 per cent higher under the central case scenario
 - 46 per cent higher under the high estimate scenario (see above).

⁷⁴ University of NSW 2010, *The Incidence and Cost of Falls Injury Among Older People in New South Wales 2006/07*, A Report to NSW Health, September 2010, p. 28.

⁷⁵ Stathakis, V. Gray, S. and Berecki-Gisolf, J. 2015, "Fall-related injury profile for Victorians aged 65 years and older", *Hazard*, Edition No. 80, Summer 2015, Victorian Injury Surveillance Unit, Monash University Accident Research Centre, p. 2.

A.8 Estimated number of additional hospital admissions due to inaccessible housing

	Population affected ^a	Hospital admission rate from falls ^b	Hospital admission rate for falls at home ^c	Estimated hospital admissions - baseline	Additional hospital admissions due to inaccessible housing		
					Low estimate ^d	Central case	High estimate ^e
	'000	Rate per 100 000	Rate per 100 000	No.	No.	No.	No.
0 to 4	7.7	810.67	385.88	30	8	11	14
5 to 9	6.6	810.67	385.88	25	7	9	12
10 to 14	5.6	810.67	385.88	22	6	8	10
15 to 19	8.8	810.67	385.88	34	9	13	16
20 to 24	5.4	810.67	385.88	21	6	8	10
25 to 29	8.4	810.67	385.88	32	9	12	15
30 to 34	11.9	810.67	385.88	46	12	17	21
35 to 39	11.5	810.67	385.88	44	12	16	20
40 to 44	16.7	810.67	385.88	64	17	24	30
45 to 49	23.2	810.67	385.88	90	24	33	41
50 to 54	25.2	810.67	385.88	97	26	36	45
55 to 59	34.8	810.67	385.88	134	36	50	62
60 to 64	31.8	810.67	385.88	123	33	45	56
65 to 69	35.7	810.67	385.88	138	37	51	63
70 to 74	23.0	1 152.33	548.51	126	34	47	58
75 to 79	25.8	2 079.62	989.90	255	69	94	117
80 to 84	18.3	3 726.30	1 773.72	325	88	120	149
85 to 89	13.0	6 246.91	2 973.53	387	104	143	178
90 to 94	7.7	10 392.42	4 946.79	381	103	141	175
95+	4.0	13 590.43	6 469.04	259	70	96	119
Total	325.1			2 633	711	974	1 211

^a Based on 2018 SDAC data. Population at risk of falls due to inaccessible housing defined as people that: have a mobility limitation; either require assistance or have trouble moving around their place of residence; live in a household; and live in a dwelling that has not been modified to meet their needs. ^b Based on hospital admission rates from the community (i.e. excluding residential aged care) in NSW in 2006-07 reported in UNSW, 2010, p. 28. ^c Adjusted based on 47.6 per cent of falls resulting in hospital admission occurring at home as reported in Stathakis, V. Gray, S. and Berecki-Gisolf, J. 2015, p. 2. ^d Based on accessible housing reducing falls by 27 per cent. ^e Based on accessible housing reducing falls by 37 per cent. ^f Based on accessible housing reducing falls by 46 per cent.

Source: ABS Survey of Disability, Ageing and Carers 2018; University of NSW, *The Incidence and Cost of Falls Injury Among Older People in New South Wales 2006/07*, A Report to NSW Health, September 2010; Stathakis, V. Gray, S. and Berecki-Gisolf, J. 2015, "Fall-related injury profile for Victorians aged 65 years and older", *Hazard*, Edition No. 80, Summer 2015, Victorian Injury Surveillance Unit, Monash University Accident Research Centre; CIE.

Based on the above estimates of the number of additional hospital admissions due to people with accessibility needs living in accessible housing, we estimate an additional cost of between \$15.8 million and \$26.9 million per year, with a central case estimate of around \$21.7 million per year.

- Health care costs are based on the average cost reported in UNSW (2010) inflated to 2019 dollar terms, using the national CPI.⁷⁶
- Note that these cost estimates include health care costs only; morbidity costs are not included.

A.9 Estimated cost of additional hospital admissions due to inaccessible housing

	Average cost per hospital admission ^a	Cost of additional hospital admissions due to inaccessible housing		
		Low estimate	Central case	High estimate
	\$	\$ million	\$ million	\$ million
0 to 4 years	17 107	0.14	0.19	0.23
5 to 9 years	17 107	0.12	0.16	0.20
10 to 14 years	17 107	0.10	0.14	0.17
15 to 19 years	17 107	0.16	0.21	0.27
20 to 24 years	17 107	0.10	0.13	0.16
25 to 29 years	17 107	0.15	0.21	0.26
30 to 34 years	17 107	0.21	0.29	0.36
35 to 39 years	17 107	0.20	0.28	0.35
40 to 44 years	17 107	0.30	0.41	0.51
45 to 49 years	17 107	0.41	0.57	0.70
50 to 54 years	17 107	0.45	0.62	0.77
55 to 59 years	17 107	0.62	0.85	1.06
60 to 64 years	17 107	0.57	0.78	0.97
65 to 69 years	17 107	0.64	0.87	1.08
70 to 74 years	22 517	0.77	1.05	1.31
75 to 79 years	22 918	1.58	2.17	2.69
80 to 84 years	26 418	2.32	3.17	3.94
85 to 89 years	27 217	2.84	3.89	4.84
90 to 94 years	25 120	2.58	3.54	4.40
95+ years	22 296	1.56	2.13	2.65
Total		15.80	21.66	26.92

^a Based on average costs reported in UNSW (2010, p. 33) inflated to 2019 dollars using the national CPI.

Source: University of NSW, *The Incidence and Cost of Falls Injury Among Older People in New South Wales 2006/07*, A Report to NSW Health, September 2010; CIE.

Emergency department attendance

In some cases, people who have a fall attend an emergency department (ED) at a hospital, but are not actually admitted. Using a similar approach as above, we estimate there could be between an additional 711 and 1211 fall-related ED attendance per year

⁷⁶ University of NSW 2010, *The Incidence and Cost of Falls Injury Among Older People in New South Wales 2006/07*, A Report to NSW Health, September 2010, p. 33.

due to people with accessibility needs living in inaccessible housing, with a central case estimate of 974 additional ED attendance. These estimates are based on the following.

- The ED attendance rate from falls is taken from NSW data for people living in the community from 2006-07 reported in a UNSW report to NSW Health.⁷⁷
 - Actual data, as reported by UNSW, is used for age groups over 65.
 - The incidence of falls resulting in ED attendance among people under the age of 65 with mobility limitations is not reported. As above, we assumed that the incidence of falls was around the same as for the broader population in the 65-69 year age bracket, as reported by UNSW.
 - As not all falls occur at home, these ED attendance rates were adjusted based on Victorian data showing that 56.3 per cent of falls resulting in ED presentations occur in the home.⁷⁸
- As above, when people with accessibility needs live in inaccessible housing, the incidence of falls is estimated to be:
 - 27 per cent higher under the low estimate scenario
 - 37 per cent higher under the central case scenario
 - 46 per cent higher under the high estimate scenario (see above).

A.10 Estimated number of additional emergency department attendances due to inaccessible housing

	Population affected ^a	ED attendance rate from falls ^b	ED attendance rate from falls at home ^c	Estimated ED attendances - baseline	Additional ED attendances due to inaccessible housing		
					Low estimate ^d	Central case	High estimate ^e
	'000	Rate per 100 000	Rate per 100 000	No.	No.	No.	No.
0 to 4	7.7	975.8	549.4	42.3	11.4	15.7	19.5
5 to 9	6.6	975.8	549.4	36.3	9.8	13.4	16.7
10 to 14	5.6	975.8	549.4	30.8	8.3	11.4	14.2
15 to 19	8.8	975.8	549.4	48.3	13.1	17.9	22.2
20 to 24	5.4	975.8	549.4	29.7	8.0	11.0	13.6
25 to 29	8.4	975.8	549.4	46.1	12.5	17.1	21.2
30 to 34	11.9	975.8	549.4	65.4	17.7	24.2	30.1
35 to 39	11.5	975.8	549.4	63.2	17.1	23.4	29.1
40 to 44	16.7	975.8	549.4	91.7	24.8	33.9	42.2
45 to 49	23.2	975.8	549.4	127.4	34.4	47.2	58.6

⁷⁷ University of NSW 2010, *The Incidence and Cost of Falls Injury Among Older People in New South Wales 2006/07*, A Report to NSW Health, September 2010, p. 28.

⁷⁸ Stathakis, V. Gray, S. and Berecki-Gisolf, J. 2015, “Fall-related injury profile for Victorians aged 65 years and older”, *Hazard*, Edition No. 80, Summer 2015, Victorian Injury Surveillance Unit, Monash University Accident Research Centre, p. 2.

	Population affected ^a	ED attendance rate from falls ^b	ED attendance rate from falls at home ^c	Estimated ED attendances - baseline	Additional ED attendances due to inaccessible housing		
					Low estimate ^d	Central case	High estimate ^e
	'000	Rate per 100 000	Rate per 100 000	No.	No.	No.	No.
50 to 54	25.2	975.8	549.4	138.4	37.4	51.2	63.7
55 to 59	34.8	975.8	549.4	191.2	51.6	70.7	87.9
60 to 64	31.8	975.8	549.4	174.7	47.2	64.6	80.4
65 to 69	35.7	975.8	549.4	196.1	53.0	72.6	90.2
70 to 74	23.0	968.1	545.0	125.4	33.8	46.4	57.7
75 to 79	25.8	1 314.9	740.3	191.0	51.6	70.7	87.9
80 to 84	18.3	1 591.4	896.0	164.0	44.3	60.7	75.4
85 to 89	13.0	2 166.7	1 219.9	158.6	42.8	58.7	72.9
90 to 94	7.7	3 707.6	2 087.4	160.7	43.4	59.5	73.9
95+	4.0	6 117.0	3 443.9	137.8	37.2	51.0	63.4
Total	325.1			2 219.0	599.1	821.0	1 020.8

^a Based on 2018 SDAC data. Population at risk of falls due to inaccessible housing defined as people that: have a mobility limitation; either require assistance or have trouble moving around their place of residence; live in a household; and live in a dwelling that has not been modified to meet their needs.. ^b Based on emergency department attendance rates from the community (i.e. excluding residential aged care) in NSW in 2006-07 reported in UNSW, 2010, p. 28. ^c Adjusted based on 56.3 per cent of falls resulting in emergency department attendance occurring at home as reported in Stathakis, V. Gray, S. and Berecki-Gisolf, J. 2015, p. 2. ^d Based on accessible housing reducing falls by 27 per cent. ^e Based on accessible housing reducing falls by 37 per cent. ^f Based on accessible housing reducing falls by 46 per cent.

Source: ABS Survey of Disability, Ageing and Carers 2018; University of NSW, *The Incidence and Cost of Falls Injury Among Older People in New South Wales 2006/07*, A Report to NSW Health, September 2010; Stathakis, V. Gray, S. and Berecki-Gisolf, J. 2015, "Fall-related injury profile for Victorians aged 65 years and older", *Hazard*, Edition No. 80, Summer 2015, Victorian Injury Surveillance Unit, Monash University Accident Research Centre; CIE.

Based on the above estimates of the number of additional emergency attendances due to people with accessibility needs living in accessible housing, we estimate an additional cost of between \$1.9 million and \$3.3 million per year, with a central case estimate of around \$2.6 million per year.

- Health care costs are based on the average cost reported in UNSW (2010) inflated to 2019 dollar terms, using the national CPI.⁷⁹
- Note that these cost estimates include health care costs only. Morbidity costs have not been included, as the health outcomes associated with falls are not clear.

⁷⁹ University of NSW 2010, *The Incidence and Cost of Falls Injury Among Older People in New South Wales 2006/07*, A Report to NSW Health, September 2010, p. 33.

A.11 Estimated cost of additional emergency department attendances due to inaccessible housing

	Average cost per ED attendance ^a	Cost of additional ED attendance due to inaccessible housing		
		Low estimate	Central case	High estimate
	\$	\$ million	\$ million	\$ million
0 to 4 years	2 832	0.03	0.04	0.06
5 to 9 years	2 832	0.03	0.04	0.05
10 to 14 years	2 832	0.02	0.03	0.04
15 to 19 years	2 832	0.04	0.05	0.06
20 to 24 years	2 832	0.02	0.03	0.04
25 to 29 years	2 832	0.04	0.05	0.06
30 to 34 years	2 832	0.05	0.07	0.09
35 to 39 years	2 832	0.05	0.07	0.08
40 to 44 years	2 832	0.07	0.10	0.12
45 to 49 years	2 832	0.10	0.13	0.17
50 to 54 years	2 832	0.11	0.15	0.18
55 to 59 years	2 832	0.15	0.20	0.25
60 to 64 years	2 832	0.13	0.18	0.23
65 to 69 years	2 832	0.15	0.21	0.26
70 to 74 years	4 366	0.15	0.20	0.25
75 to 79 years	4 237	0.22	0.30	0.37
80 to 84 years	3 581	0.16	0.22	0.27
85 to 89 years	3 343	0.14	0.20	0.24
90 to 94 years	3 522	0.15	0.21	0.26
95+ years	3 140	0.12	0.16	0.20
Total		1.92	2.63	3.27

^a Based on average costs reported in UNSW (2010, p. 33) inflate to 2019 dollars using the national CPI.

Source: University of NSW, *The Incidence and Cost of Falls Injury Among Older People in New South Wales 2006/07*, A Report to NSW Health, September 2010; CIE.

Non-hospital treatment

Three may also be medical costs where people have a fall, but do not attend a hospital. Using a similar approach as above, we estimate there could be between an additional 3573 and 6087 fall-related non-hospital treatments provided per year due to people with accessibility needs living in inaccessible housing, with a central case estimate of 4896 non-hospital treatments per year. These estimates are based on the following.

- The non-hospital treatment rate from falls is taken from NSW data for people living in the community from 2006-07 reported in a UNSW report to NSW Health.⁸⁰

⁸⁰ University of NSW 2010, *The Incidence and Cost of Falls Injury Among Older People in New South Wales 2006/07*, A Report to NSW Health, September 2010, p. 28.

- Actual data, as reported by UNSW, is used for age groups over 65.
- The incidence of falls resulting in non-hospital treatment among people under the age of 65 with mobility limitations is not reported. As above, we assumed that the incidence of falls was around the same as for the broader population in the 65-69 year age bracket, as reported by UNSW.
- The proportion of falls in the home resulting in non-hospital medical treatment was not reported. However, we adjust the total non-hospital treatment rate based on the Victorian data showing that 56.3 per cent of falls resulting in ED presentations occur in the home.⁸¹
- As above, when people with accessibility needs live in inaccessible housing, the incidence of falls is estimated to be:
 - 27 per cent higher under the low estimate scenario
 - 37 per cent higher under the central case scenario
 - 46 per cent higher under the high estimate scenario (see above).

A.12 Estimated number of additional non-hospital treatments due to inaccessible housing

	Population affected ^a	Non-hospital treatment rate from falls ^b	Non-hospital treatment rate from falls at home ^c	Estimated non-hospital treatment - baseline	Additional non-hospital treatments due to inaccessible housing		
					Low estimate ^d	Central case	High estimate ^e
	'000	Rate per 100 000	Rate per 100 000	No.	No.	No.	No.
0 to 4	7.70	5 480.35	3 085.43	238	64	88	109
5 to 9	6.60	5 480.35	3 085.43	204	55	75	94
10 to 14	5.60	5 480.35	3 085.43	173	47	64	79
15 to 19	8.80	5 480.35	3 085.43	272	73	100	125
20 to 24	5.40	5 480.35	3 085.43	167	45	62	77
25 to 29	8.40	5 480.35	3 085.43	259	70	96	119
30 to 34	11.90	5 480.35	3 085.43	367	99	136	169
35 to 39	11.50	5 480.35	3 085.43	355	96	131	163
40 to 44	16.70	5 480.35	3 085.43	515	139	191	237
45 to 49	23.20	5 480.35	3 085.43	716	193	265	329
50 to 54	25.20	5 480.35	3 085.43	778	210	288	358
55 to 59	34.80	5 480.35	3 085.43	1 074	290	397	494
60 to 64	31.80	5 480.35	3 085.43	981	265	363	451
65 to 69	35.70	5 480.35	3 085.43	1 102	297	408	507
70 to 74	23.00	5 990.53	3 372.67	776	209	287	357

⁸¹ Stathakis, V. Gray, S. and Berecki-Gisolf, J. 2015, "Fall-related injury profile for Victorians aged 65 years and older", *Hazard*, Edition No. 80, Summer 2015, Victorian Injury Surveillance Unit, Monash University Accident Research Centre, p. 2.

	Population affected ^a	Non-hospital treatment rate from falls ^b	Non-hospital treatment rate from falls at home ^c	Estimated non-hospital treatment - baseline	Additional non-hospital treatments due to inaccessible housing		
					Low estimate ^d	Central case	High estimate ^e
	'000	Rate per 100 000	Rate per 100 000	No.	No.	No.	No.
75 to 79	25.80	7 808.49	4 396.18	1 134	306	420	522
80 to 84	18.30	8 014.45	4 512.14	826	223	306	380
85 to 89	13.00	18 702.50	10 529.51	1 369	370	506	630
90 to 94	7.70	16 130.17	9 081.29	699	189	259	322
95+	4.00	54 601.06	30 740.40	1 230	332	455	566
Total	325.10			13 232	3 573	4 896	6 087

^a Based on 2018 SDAC data. Population at risk of falls due to inaccessible housing defined as people that: have a mobility limitation; either require assistance or have trouble moving around their place of residence; live in a household; and live in a dwelling that has not been modified to meet their needs. ^b Based on non-hospital treatment rates from the community (i.e. excluding residential aged care) in NSW in 2006-07 reported in UNSW, 2010, p. 28. ^c Adjusted based on 56.3 per cent of falls resulting in emergency department attendance occurring at home as reported in Stathakis, V. Gray, S. and Berecki-Gisolf, J. 2015, p. 2. ^d Based on accessible housing reducing falls by 27 per cent. ^e Based on accessible housing reducing falls by 37 per cent. ^f Based on accessible housing reducing falls by 46 per cent.

Source: ABS Survey of Disability, Ageing and Carers 2018; University of NSW, *The Incidence and Cost of Falls Injury Among Older People in New South Wales 2006/07*, A Report to NSW Health, September 2010; Stathakis, V. Gray, S. and Berecki-Gisolf, J. 2015, "Fall-related injury profile for Victorians aged 65 years and older", *Hazard*, Edition No. 80, Summer 2015, Victorian Injury Surveillance Unit, Monash University Accident Research Centre; CIE.

Based on the above estimates of the number of additional non-hospital treatments avoided due to people with accessibility needs living in accessible housing, we estimate an additional cost of between \$1.6 million and \$2.7 million per year, with a central case estimate of around \$2.2 million per year.

- Health care costs are based on the average cost reported in UNSW (2010) inflated to 2019 dollar terms, using the national CPI.⁸²
- Note that these cost estimates include health care costs only; morbidity costs (if any) are not included. Morbidity costs are likely to be modest, where hospital treatment is not required.

A.13 Estimated cost of additional non-hospital treatments due to inaccessible housing

	Average cost per non-hospital treatment ^a	Cost of additional non-hospital treatments due to inaccessible housing		
		Low estimate	Central case	High estimate
	\$	\$ million	\$ million	\$ million
0 to 4 years	399	0.03	0.04	0.04
5 to 9 years	399	0.02	0.03	0.04

⁸² University of NSW 2010, *The Incidence and Cost of Falls Injury Among Older People in New South Wales 2006/07*, A Report to NSW Health, September 2010, p. 33.

	Average cost per non-hospital treatment ^a	Cost of additional non-hospital treatments due to inaccessible housing		
		Low estimate	Central case	High estimate
	\$	\$ million	\$ million	\$ million
10 to 14 years	399	0.02	0.03	0.03
15 to 19 years	399	0.03	0.04	0.05
20 to 24 years	399	0.02	0.02	0.03
25 to 29 years	399	0.03	0.04	0.05
30 to 34 years	399	0.04	0.05	0.07
35 to 39 years	399	0.04	0.05	0.07
40 to 44 years	399	0.06	0.08	0.09
45 to 49 years	399	0.08	0.11	0.13
50 to 54 years	399	0.08	0.11	0.14
55 to 59 years	399	0.12	0.16	0.20
60 to 64 years	399	0.11	0.14	0.18
65 to 69 years	399	0.12	0.16	0.20
70 to 74 years	469	0.10	0.13	0.17
75 to 79 years	524	0.16	0.22	0.27
80 to 84 years	499	0.11	0.15	0.19
85 to 89 years	576	0.21	0.29	0.36
90 to 94 years	450	0.08	0.12	0.14
95+ years	377	0.13	0.17	0.21
Total		1.57	2.15	2.67

^a Based on average costs reported in UNSW (2010, p. 33) inflate to 2019 dollars using the national CPI.

Source: University of NSW, *The Incidence and Cost of Falls Injury Among Older People in New South Wales 2006/07*, A Report to NSW Health, September 2010; CIE.

B Approach to estimating the cost of additional care

The impact of accessible housing on care received

There is (albeit limited) evidence that housing with accessibility features reduces care needs. The main quantitative evidence on the impact of an accessible home environment is an Australian study comparing the self-reported amount of formal and informal care received by 157 older people and people with disability (average age of 72) living in the community before and after home modifications (Carnemolla and Bridge 2019).⁸³ The home modifications were funded through Home and Community Care (HACC). The type of modifications received are shown in table B.1.

B.1 Type of modifications

	Number of modifications	Share of sample receiving modification
	No.	Per cent
Bathroom modifications		
Major bathroom modification	55	35.0
Grab rail in shower	36	22.9
Grab rail in bath	7	4.5
Hand held shower	16	10.2
Shower screen removed	3	1.9
Grab rail in toilet	17	10.8
Access modifications		
Ramp	27	17.2
Step modification	7	4.5
Lift	5	3.2
Widen doorway/remove wall	15	9.6
Front/rear handrail entrance	54	34.4
Kitchen/laundry		
Kitchen/laundry modification	7	4.5

Note: Where participants received major bathroom modifications, they were not included in the count for other, itemised bathroom modifications. Kitchen and laundry modifications refer to cabinet height/design changes, widening of work areas or mounting of appliances for easier access.

⁸³ Carnemolla, P. and Bridge, C. 2019, Housing Design and Community Care: How Home Modifications Reduce Care Needs of Older People and People with Disability, *International Journal of Environmental Research and Public Health*.

Source: Carnemolla, P. and Bridge, C. 2019, Housing Design and Community Care: How Home Modifications Reduce Care Needs of Older People and People with Disability, *International Journal of Environmental Research and Public Health*, p. 7.

Carnemolla and Bridge (2019) found that there was a statistically significant reduction in both the amount of formal care and informal care received (table B.2).

- The average number of hours of informal care fell by 5.96 hours per week (around 47 per cent).
- The average number of hours of formal care fell by 0.36 hours per week (around 17 per cent).

B.2 Average reduction in hours of care received following home modifications

	Informal care	Formal care	Total
	Hours per week	Hours per week	Hours per week
Before modification	12.88	2.14	15.02
After modification	6.92	1.78	8.70
Change	- 5.96	- 0.36	- 6.32

Source: Carnemolla, P. and Bridge, C. 2019, Housing Design and Community Care: How Home Modifications Reduce Care Needs of Older People and People with Disability, *International Journal of Environmental Research and Public Health*, pp. 7-8.

The relevance of these results to the proposed changes to the NCC are not entirely clear.

- It is not clear whether the sample is representative of the general population with mobility limitations living in inaccessible housing and the amount of care they receive.
- The study relates to home modifications, which are tailored to the specific needs of the recipient. By contrast, the NCC proposal is a general standard that applies to all.
- Not all of the home modifications under HACC align with the changes to the NCC. For example, the installation of grab-rails made up a significant share of the modifications in the sample, but are not included in the NCC proposal.

Nevertheless, this study provides reliable evidence that those that live in a home environment that lacks key accessibility features are likely to receive significantly more care/assistance than they would be if they lived in an accessible dwelling.

If the results reported in Carnemolla and Bridge (2019) are indicative of the average amount of the additional assistance received by those living in inaccessible housing, this implies:

- For those receiving informal assistance, we estimate that the cost of the additional assistance due to inaccessible housing could be around \$6 040 per year, based on the following evidence and assumptions.
 - An additional 5.98 hours of informal care/assistance per week (from Carnemolla and Bridge, 2019), implying an additional 310 hours of care/assistance per year.

- The additional time spent by informal carers is valued at the minimum wage in Australia of \$19.49 per hour.⁸⁴ This approach to valuing informal care is consistent with some other studies in the literature.⁸⁵
- For those receiving formal assistance, we estimate that the cost of the additional assistance due to inaccessible housing could be around \$1217 per year, based on the following.
 - An additional 0.36 hours of formal care/assistance per week (from Carnemolla and Bridge, 2019), implying an additional 18.72 hours of care/assistance per year.
 - Under the NDIS Price Catalogue, the hourly rate for assistance with daily life varies depending on the type of assistance provided, location (non-remote, remote, very remote) and when the service is provided (time of day, weekend/weekday/public holiday). We use a rate of \$65 per hour, which we consider broadly representative of the various rates.⁸⁶ This rate is significantly higher than the average hourly earnings for ‘personal carers and assistants’ is \$34.90 per hour (based on ABS Cat 6306 Employee Earnings and Hours). However, average hourly earnings exclude some on-costs and overheads and possibly some other costs. We therefore, consider the NDIS rates more appropriate.

B.3 Annual cost of additional care

	Additional care per week	Additional care per year	Unit cost	Cost of additional care
	Hours	Hours	\$ per hour	\$ per year
Informal care	- 5.96	- 309.92	19.49	-6 040
Formal care	- 0.36	- 18.72	65.00	-1 217

Source: CIE estimates based on: Carnemolla and Bridge (2019) (see table xx above); NDIS website, <https://www.ndis.gov.au/providers/price-guides-and-pricing>, accessed 24 May 2020; Fair Work Ombudsman website, <https://www.fairwork.gov.au/how-we-will-help/templates-and-guides/fact-sheets/minimum-workplace-entitlements/minimum-wages>, accessed 24 May 2020.

⁸⁴ Fair Work Ombudsman website, <https://www.fairwork.gov.au/how-we-will-help/templates-and-guides/fact-sheets/minimum-workplace-entitlements/minimum-wages>, accessed 24 May 2020.

⁸⁵ Carnemolla, P. and Bridge, C. 2019, Housing Design and Community Care: How Home Modifications Reduce Care Needs of Older People and People with Disability, *International Journal of Environmental Research and Public Health*,

⁸⁵ See for example: Chakravarthy, U., Biundo, E., Saka, R.O, Fasser, C., Bourne, R. & Little, J. 2017, ‘The Economic Impact of Blindness in Europe’, *Ophthalmic Epidemiology*, DOI: 10.1080/09286586.2017.1281426; Frick, K.D., Gower, E.W., Kempen, J.H. & Wolff, J.L. 2007, ‘Economic Impact of Visual Impairment and Blindness in the United States’, *Archives of Ophthalmology*, **125** (4), pp. 544-550

⁸⁶ NDIS website, <https://www.ndis.gov.au/providers/price-guides-and-pricing>, accessed 24 May 2020.

How many people require additional care due to inaccessible housing?

As noted above, the SDAC survey does not explicitly identify whether dwellings have relevant accessibility features. Nevertheless, we can infer the relevant population based on their response to various survey questions.

The SDAC survey reports whether people receive a range of different types of assistance, including, assistance with:

- cognitive and emotional
- communications
- health care
- household chores
- meal preparation
- mobility
- property maintenance
- reading and writing
- self-care
- transport.

The need for assistance (and the amount of assistance received) for many of these tasks is likely to be unrelated to the accessibility features of the home. We therefore assume that the people most likely to be receiving additional assistance/care due to living in housing that lacks accessibility features are those with a mobility limitation living in households, who received assistance with mobility tasks.

We also exclude those living in housing that has already been modified due to disability or age (implicitly this assumes that modified housing is already accessible).

Furthermore, not all assistance with mobility tasks occur in the home. For example, some people require assistance with mobility away from the home. We therefore include only the proportion that indicated they need assistance moving around the place of residence (either always or sometimes). A significant number of people who either: 'do not need assistance moving around the place of residence, but have difficulty' or 'has no difficulty moving around the place of residence' also receive assistance with mobility tasks. However, the assistance received mostly relates to mobility away from home. It is therefore less likely that an accessible home would significantly reduce the amount of assistance these people receive.

The SDAC survey also provides information on how frequently assistance with mobility tasks is received. We exclude people who receive assistance with mobility tasks less than once per week; it is less likely that an accessible home environment would significantly reduce the amount of assistance received by those that currently receive little assistance.

Informal care

Based on the parameters outlined above, SDAC data suggests that there could be around 111 500 people receiving additional informal assistance (i.e. informal assistance that potentially would not otherwise be needed) due to their dwelling not meeting their accessibility needs (table B.4).

B.4 Number of people receiving additional informal care due to inaccessible housing

Frequency of informal assistance	Receives informal assistance only	Receives formal and informal assistance	Total
	'000	'000	'000
6 or more times a day	28.7	7.5	33.3
3 to 5 times a day	25.4	4.6	30.0
Twice a day	12.5	0.0	11.4
Once a day	9.7	1.6	10.6
2 to 6 times a week	20.0	4.6	23.3
Once a week	3.4	0.0	5.6
Total	96.1	19.4	111.5

Source: CIE based on ABS, 2018 Survey of Disabilities, Ageing and Carers, TableBuilder.

Formal care

SDAC data suggests that around 21 300 people could be receiving additional formal care as a result of living in inaccessible housing (based on the parameters outlined above) (table B.5).

B.5 Number of people receiving additional formal care due to inaccessible housing

Frequency of formal assistance	Receives formal assistance only	Receives formal and informal assistance	Total
	'000	'000	'000
6 or more times a day	1.4	2.2	3.5
3 to 5 times a day	0	1.2	1.2
Twice a day	0	0	0
Once a day	0	1.7	1.7
2 to 6 times a week	2.9	9	9.5
Once a week	1.4	1.3	3.2
Total	3.3	15.8	21.3

Source: CIE based on ABS, 2018 Survey of Disabilities, Ageing and Carers, TableBuilder.

C Approach to estimating the avoidable costs of home modifications

Avoidable home modifications

Not all home modifications would be avoidable if dwellings were built to comply with universal design principles. Under universal design principles, dwellings are designed to meet a broad range of needs, rather than the specific needs of people with a disability.

The ABS's SDAC provides data on the types of modifications made to the dwellings of people with disabilities. However, not all of the modifications identified in the SDAC could be avoided if the dwelling is designed to comply with universal design principles. We assume that a sub-group of these modifications (structural modifications, ramps, toilets, baths and laundries, kitchens and doors widened) would be not be needed if dwellings had been designed to comply with universal design principles (table C.1).

C.1 Avoidable modifications

Modifications that could be avoided if dwellings complied with universal design principles	Modifications that would still be needed even if the dwelling complied with universal design principles
<ul style="list-style-type: none"> ▪ Structural changes ▪ Ramps ▪ Toilet bath or laundry, kitchen ▪ Doors widened 	<ul style="list-style-type: none"> ▪ Hand rails & Grab rails ▪ Remote controls ▪ New or changed heating air conditioning ▪ Install home automation ▪ Telemonitoring system ▪ Other change to dwelling,

Note: Modification types are taken form SDAC survey

Source: CIE.

Number of avoidable home modifications

To estimate the number of dwellings that have avoidable modifications annually, we compare the number of people who live in dwellings with avoidable modifications in 2018 with 2015, based on SDAC data (table C.2).

- The 2015 SDAC does not report the number of dwellings with kitchen modifications. However, 2018 data suggests there are relatively few dwellings with a kitchen modification only (i.e. most dwellings with a kitchen modification have also had another modifications).
- The SDAC data suggests that there were around 33 000 more people living in modified dwellings in 2018, compared to 2015. However, this does not take into account the fact that over the 3 year period between surveys, some people that were

living in accessible housing may have moved out of a modified dwelling, due to death or other reasons (i.e. the churn). Furthermore, when a modified dwelling is vacated, it is unlikely that the new resident will have the same accessibility needs. A simple comparison between the survey periods is therefore likely to understate the number of home modifications over the period. To take this into account, we make the following adjustments.

- We assume that 3.6 per cent of people living in modified dwelling die every year (based on the average mortality rates for the age profile living in modified dwellings). We assume that all others remain in their modified dwelling.
 - We assume that when a modified dwelling becomes vacant, the new residents do not have the same accessibility needs.
- With these adjustments, we estimate that around 22 000 dwelling are modified annually to meet the accessibility needs of the resident(s) (table C.2).

C.2 Number of dwellings modified

	Number of modified dwellings - 2015	Number remaining in previously modified dwelling ^a	Number of modified dwellings - 2018	Estimated number of modified dwellings over period	Estimated number of dwellings modified annually
	'000	'000	'000	'000	'000
Total	311.60	279.1	346.20	67.06	22.35
Total (ex kitchens)	311.60	279.1	344.50	65.36	21.79

^a Assumes a mortality rate of 3.6 per cent per year.

Source: CIE based on ABS Survey of Disabilities, Ageing and Carers 2015 and 2018, TableBuilder.

The unit cost of avoidable home modifications

Key factors that will drive the cost of home modifications include:

- the type of dwelling (i.e. Class 1a or Class 2)
- the type of modifications (i.e. what aspects of the dwelling are modified)
- the extent of the modifications (i.e. to what standard the dwelling is modified).

For ABCB's Options Paper, DCWC estimated the cost of retrofitting homes to meet each element of the LHDG Australia to both Silver and Gold standard. We use these estimates to derive unit costs for each of the potentially avoidable modifications.

For each element, DCWC estimate scenarios which includes homes that require no modification to meet LHDG standards and (for some elements) homes that require very substantial costs to meet LHDG standards. As our aim is to calculate the average cost of modifications that actually proceed, we ignore:

- DCWC's scenarios for 'no cost' (because we are focusing on homes that are actually modified), and

- DCWC's scenarios for 'very high cost' for some design elements (because, where these modifications do proceed, the number is likely to be low, implying they will not impact the average greatly).

DCWC's costs estimates vary significantly depending on whether a dwelling is modified to meet LHDG Silver or Gold standard. Based on discussions with stakeholders, LHDG Silver standard would meet the needs of non-wheelchair users with a disability, but wheelchair users would require Gold standard. We therefore assume that:

- the modifications made by non-wheelchair users would meet LHDG Silver standard
- the modifications made by wheelchair users would meet Gold standard.

Based on the above information, we estimate that the weighted average cost of home modifications made to Class 1a dwellings is: around \$23 680 for non-wheelchair users; and around \$47 880 for wheelchair users (table C.3).

C.3 Weighted average cost of modifications for Class 1a dwellings

	Non-wheelchair users		Wheelchair users	
	Share of modifications with relevant feature ^a	Unit cost ^b	Share of modifications with relevant feature ^c	Unit cost ^d
	Per cent	\$	Per cent	\$
Structural changes	16	13 464	29	15 631
Ramps	29	3 781	72	4 442
Toilet, bath or laundry modifications	78	25 687	87	43 872
Kitchen modifications	5	5 040	17	5 040
Doors widened	4	4 750	24	5 500
Weighted average		23 682		47 880

^a Based on the modifications made by non-wheelchair users living in Class 1a dwellings reported in SDAC (2018). Weights add to more than 100 per cent because many dwellings have multiple modifications. ^b Based on DCWC's estimates of the cost of relevant changes to meet LHDG Silver standard prepared for ABCB's Options Paper. ^c Based on the modifications made by wheelchair users living in Class 1a dwellings reported in SDAC (2018). Weights add to more than 100 per cent because many dwellings have multiple modifications. ^d Based on DCWC's estimates of the cost of relevant changes to meet LHDG Gold standard prepared for ABCB's Options Paper.

Note: We assume that the modifications made by non-wheelchair users meet LHDG Silver standard for the relevant design elements and the modifications made by wheelchair users meet LHDG Gold standard for the relevant design elements.

Source: CIE based on: ABS, 2018 Survey of Disabilities, Ageing and Carers, TableBuilder; and DCWC's estimates for ABCB's Options Paper.

For Class 2 dwellings, we estimate the weighted average cost of home modifications for non-wheelchair users is around \$40 400 and around \$57 200 for wheelchair users (table C.4).

C.4 Weighted average cost of modifications for Class 2 dwellings

	Non-wheelchair users		Wheelchair users	
	Share of modifications with relevant feature ^a	Unit cost ^b	Share of modifications with relevant feature ^c	Unit cost ^d
	Per cent	\$	Per cent	\$
Structural changes	12	3 750	50	4 125
Ramps	50	5 450	0	5 900
Toilet, bath or laundry modifications	92	39 212	57	66 376
Kitchen modifications	5	5 040	50	35 040
Doors widened	16	4 750	0	55 000
Weighted average		40 397		57 196

^a Based on the modifications made by non-wheelchair users living in Class 2 dwellings reported in SDAC (2018). Weights add to more than 100 per cent because many dwellings have multiple modifications. ^b Based on DCWC's estimates of the cost of relevant changes to meet LHDG Silver standard prepared for ABCB's Options Paper. ^c Based on the modifications made by wheelchair users living in Class 2 dwellings reported in SDAC (2018). Weights add to more than 100 per cent because many dwellings have multiple modifications. ^d Based on DCWC's estimates of the cost of relevant changes to meet LHDG Gold standard prepared for ABCB's Options Paper.

Note: We assume that the modifications made by non-wheelchair users meet LHDG Silver standard for the relevant design elements and the modifications made by wheelchair users meet LHDG Gold standard for the relevant design elements.

Source: CIE based on: ABS, 2018 Survey of Disabilities, Ageing and Carers, TableBuilder; and DCWC's estimates for ABCB's Options Paper.

These estimates are broadly consistent with confidential data provided through consultations. Our unit costs for toilet, bathroom modifications (the most common type of modification) is a bit higher than the actual data; our estimate for ramps is consistent with actual data; our estimate for kitchens (less common) is lower than actual data.

According to YPINH, retrofitting homes with basic visitability, adaptability and accessible features would cost \$19 400,⁸⁷ which is lower than our estimates.

⁸⁷ Young People In Nursing Homes National Alliance, Monash University Department of Architecture 2015, *Shaping the Future Today: Transforming Housing Policy for Australians with Disability*, Melbourne, p.20

D Approach to estimating the avoidable costs of moving house

SDAC reports the main reason for moving house (table D.1).

- There were 76 100 people who indicated that the main reason they moved was directly related to the accessibility or safety of their previous dwelling. These reasons include:
 - ‘Safer environment’, and
 - ‘To a dwelling more suitable for condition(s)’.
- A further 154 200 gave reasons are potentially related to the accessibility of previous dwelling, including:
 - ‘Due to own age or condition’
 - ‘To improve own health’
 - ‘To live with family or friends’.
- The remaining reasons appear unrelated to the accessibility of the previous dwelling, including:
 - ‘To save money or cheaper’
 - ‘To live closer to family’
 - ‘For more or better personal care at new home’
 - ‘To be closer to medical or support services or facilities’
 - ‘To be closer to other services or facilities (e.g. work, services, leisure)’
 - ‘Family changes or house too big’
 - ‘Carer move or different carer’
 - ‘For other reasons’

D.1 Main reasons for moving

	Profound	Severe	Moderate	Mild	Total
	'000	'000	'000	'000	'000
Reasons directly related to accessibility of previous dwelling					
Safer environment	4.5	3.5	1.4	7.2	16.8
To a dwelling more suitable for condition(s)	16.3	17.1	10.4	15.6	59.3
Total directly related	20.8	20.6	11.8	22.8	76.1
Reasons potentially related to accessibility of previous dwelling					
Due to own age or condition	40.9	29.7	15.0	30.9	116.4

	Profound	Severe	Moderate	Mild	Total
	'000	'000	'000	'000	'000
To improve own health	4.8	4.3	5.4	10.3	21.9
To live with family or friends	5.3	2.7	0.0	5.6	15.9
Total potentially related	51.0	36.7	20.4	46.8	154.2
Total directly or potentially related	71.8	57.3	32.2	69.6	230.3
Reasons unrelated to accessibility of previous dwelling					
To save money or cheaper	1.1	1.9	2.3	2.7	7.3
To live closer to family	1.2	1.7	1.1	1.4	8.6
For more or better personal care at new home	1.2	0.0	1.4	3.2	5.0
To be closer to medical or support services or facilities	3.9	4.9	2.8	4.9	14.2
To be closer to other services or facilities (eg work, services, leisure)	3.2	1.5	0.7	2.2	8.4
Family changes or house too big	3.4	3.1	1.6	7.6	13.7
Carer moved or different carer	0.0	0.0	0.0	0.0	1.7
For other reasons	5.2	6.9	4.6	4.5	22.0
Other reasons for moving	19.2	20.0	14.5	26.5	80.9
Total	91.0	77.3	46.7	96.1	311.2

Source: ABS, Survey of Disabilities, Ageing and Carers, 2018, TableBuilder.

Unpublished analysis of the COTA survey also found that 9.5 per cent of respondents (over the age of 50) indicated that the main reason for their most recent move was 'My property was not accessible/no longer suited'.⁸⁸

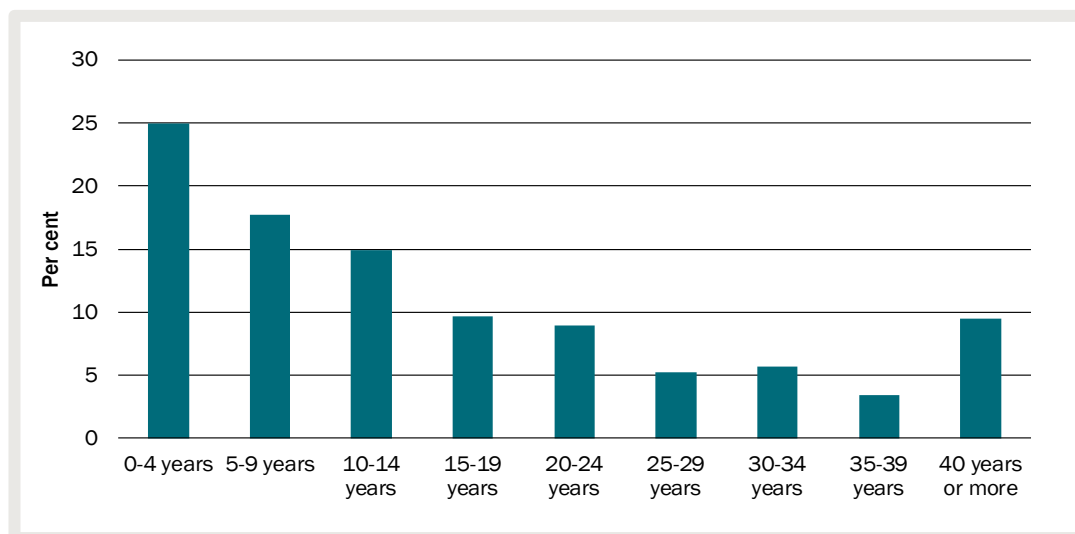
- **For the purposes of the CBA, a conservative assumption would be based on the number of people who reported moving for reasons directly related to the accessibility of their previous residence. This is around 76 100 people (and in many cases their families).**
- **A less conservative assumption would be based on the number of people who reported moving for reasons either directly or potentially related to the accessibility of their previous residence. This is around 230 300 people (and in many cases their families).**

The assumption that 230 300 people were forced to move because of their condition may potentially overstate the number of people who moved, as some of the reasons we identified as being potentially related to the accessibility of the dwelling may not have been. On the other hand, we have not included instances where the person was forced to move more than once.

It is not clear how many of these moves occur each year. Many of the people with a current mobility limitation have their main condition for a significant period of time (chart D.2). This suggests that many of these moves may have happened some time ago.

⁸⁸ Bringolf, J. 2015, *Let's Talk About Where You Live*, Incomplete draft based on COTA NSW 2014 survey data for the 50+ Report with a focus on how and where older people are living, unpublished, p. 14.

D.2 Number of year since accident happened/main condition occurred



Data source: ABS, Survey of Disabilities, Ageing and Carers, 2018, TableBuilder.

SDAC does not report the year since the last move. However, Census data suggest that people who require assistance tend to have relatively low mobility rates (table D.3). This data suggest that around 5-10 per cent of people with a disability (including all disabilities) move every year.

D.3 Mobility rates for people that require assistance

	1 year mobility	5 year mobility
	Per cent	Per cent
All residents in household	6.5	21.9
Some residents in household	4.5	7.2
No residents in household	67.6	52.1
Not stated	5.8	3.2
Not applicable	15.6	15.6
Total	100.0	100.0

Source: ABS, Census of Population and Housing 2016, TableBuilder.

We therefore assume that around 7.5 per cent of the moves as a result of the disability occurred in the past year.

The financial cost of moving can vary significantly, depending on the size of the house, distance and other factors. We assume the average financial cost of moving house is around \$2500.⁸⁹

Together this information suggests that the annual cost of additional move due to a lack of accessible housing could be around \$43.2 million per year.

⁸⁹ See for example: https://www.openagent.com.au/blog/how-much-moving-cost?at=v5&utm_expid=.6ZprDALXQh2rpM05ZARdBA.1&utm_referrer=https%3A%2F%2Fwww.google.com%2F, accessed 23 January 2020.

E Longer stays in hospital or transition care

Evidence on delayed discharge from hospital

There are various international studies that examine various reasons and consequences of delayed discharge from hospitals. The National Health Service systematically reports data on delayed transfers of care in English hospitals, including the reason for the delay. However, given differences in health systems and the characteristics of the housing stock, English (and other international data) data is unlikely to be a good indicator of the extent of the problem in Australia. We are not aware of any similar datasets for Australia.

There are a small number of Australian studies that identify the causes of delayed discharge from various types of care (summarised in table E.1).

E.1 Summary of Australian literature on the causes of delayed discharge

Study	Approach	Key findings relevant to the RIS
New et. al. (2013)	Sample of 360 patients admitted into two inpatient rehabilitation units in Melbourne to examine the occurrence of discharge barriers, their causes and the duration of unnecessary hospitalisation	<ul style="list-style-type: none"> ■ Over the study period, 21 per cent of all bed days were occupied by patients deemed to have a discharge barrier. ■ The causes of the discharge barrier included the following causes that are directly related to the accessibility of the dwelling, including: <ul style="list-style-type: none"> – Accommodation (patient has no available suitable accommodation options), which accounted for 9.1 per cent of all additional unnecessary days in hospital – Home modifications (patient waiting for home modifications that are essential to ensure safe access and care at home after discharge), which account for 22.6 per cent of all additional unnecessary days in hospital.
Salonga-Reyes and Scott (2016)	Sample of 406 patients admitted non-acute maintenance care in a tertiary hospital in Brisbane was used to examine causes and effects of discharge delays.	<ul style="list-style-type: none"> ■ Delays accounted for 90 per cent of non-acute occupied bed days. ■ Among the causes of delay most relevant to this RIS were: <ul style="list-style-type: none"> – Wait for beds in residential aged care facility (43.8 per cent of occupied bed days) – Wait for delivery of home equipment (2.0 per cent of occupied bed days) – Wait for home modifications (0.5 per cent of occupied bed days)
Ou, Chen and Santiano (2009)	A sample of 1958 in a tertiary referral hospital in NSW was used to estimate the reasons and determinants of delay in acute care general ward patients.	<p>Causes listed were mostly not relevant to accessible housing. Identified causes most relevant included:</p> <ul style="list-style-type: none"> ■ Post-hospital problem (8.2 per cent), including: <ul style="list-style-type: none"> – Awaiting equipment (1.1 per cent) – Lack of carer support (3.0 per cent)

Study	Approach	Key findings relevant to the RIS
		<ul style="list-style-type: none"> – Awaiting community nursing (0.8 per cent) – Awaiting allied health (4.0 per cent) ■ Alternative care problems (4.3 per cent), including: <ul style="list-style-type: none"> – Awaiting rehabilitation placement (2.5 per cent) – Awaiting respite care (2.1 per cent).

Source: New, P.W. Jolley, D.J. Cameron, P.A. Olver, J.H. and Stoelwinder, J.U. 2013, A prospective multicenter study to discharge from inpatient rehabilitations, *Medical Journal of Australia*, 198 (2), pp. 104-108; Salonga-Reyes, A. Scott, I.A. 2017, Stranded: causes and effects of discharge delays involving non-acute in-patients requiring maintenance care in a tertiary hospital general medicine service, *Australian Health Review*, 41, CSIRO Publishing, pp. 54-62; Ou, L. Chen, J. and Santiano, N. 2009, Discharge delays in acute care: Reasons and determinants of delay in general ward patients, *Australian Health Review*, August 2009, Vol 33 No. 3, pp. 513-521.

From this limited Australian evidence base, we draw the following inferences.

- Around 6.7 per cent of bed days in **rehabilitation** care (see box E.2 for definitions) can potentially be attributed to a lack of accessible housing, based on the following findings from New et. al. (2013):
 - Over the 21 per cent of all bed days were occupied by patients deemed to have a discharge barrier.
 - Together, accommodation (patient has no available suitable accommodation options) and home modifications (patient waiting for home modifications that are essential to ensure safe access and care at home after discharge) account for 31.7 per cent of additional/unnecessary bed days.⁹⁰
- Around 1.8 per cent occupied bed days in maintenance care can potentially be attributed to a lack of accessible housing, based on the following findings from Salonga-Reyes and Scott (2017).
 - 90 per cent of bed days in maintenance care are due to discharge delays.
 - 2.0 per cent of delays were due to waiting for home modifications.
- We did not identify any reliable evidence to suggest that housing issues are delaying discharge from hospital acute care.⁹¹

⁹⁰ New, P.W. Jolley, D.J. Cameron, P.A. Olver, J.H. Stoelwinder, J.U. 2013, “A prospective multicenter study to discharge from inpatient rehabilitations”, *Medical Journal of Australia*, **198** (2), pp. 104-108.

⁹¹ Ou, L. Chen, J. and Santiano, N. 2009, “Discharge delays in acute care: Reasons and determinants of delay in general ward patients”, *Australian Health Review*, August 2009, **33** (3), pp. 513-521.

E.2 Relevant types of care

- **Acute care** — care in which the intent is to perform surgery, diagnostic or therapeutic procedures in the treatment of illness or injury.⁹²
- **Subacute care** — specialised multidisciplinary hospital-based care in which the primary need for care is optimisation of the patient’s functioning and quality of life. A person’s functioning may relate to their whole body or a body part, the whole person, or the whole person in a social context, and to impairment of a body function or structure, activity limitation and/or participation restriction comprises the following care types:⁹³
 - **Rehabilitation care** — care to improve the functioning of a patient with an impairment, activity limitation or participation restriction due to a health condition.
 - **Palliative care** — care to optimise of the quality of life of a patient with an active and advanced life-limiting illness.
 - **Geriatric evaluation and management care** — care to improve the functioning of a patient with multi-dimensional needs, associated with age related medical conditions. Some examples of conditions in GEM care patients include a tendency to fall, incontinence, reduced mobility and cognitive impairment. The patient may also have complex psychosocial problems.
 - **Psychogeriatric care** — care to improve the functional status, behaviour and/or quality of life for an older patient with significant psychiatric or behavioural disturbance. The disturbance is caused by mental illness, age related organic brain impairment or a physical condition.
- **Non-acute care (also referred to as maintenance care)** — hospital-based care to support patients with an impairment, activity limitation or participation restriction due to a health condition.
- **Transition care** — care to help patients recover after a hospital stay. It provides short-term specialised care and support to help the patient regain functional independence and confidence sooner, and avoid the need for longer term care and support services. Care is tailored to the patient’s specific needs and goals, and can be delivered in an aged care home, the patient’s own home, out in the community, or a mix of these locations, as the needs change with your recovery.⁹⁴

⁹² Australian Institute of Health and Welfare website, <https://www.aihw.gov.au/reports-data/myhospitals/content/glossary>, accessed 21 January 2020.

⁹³ IHPA website, <https://www.ihipa.gov.au/what-we-do/subacute-and-non-acute-care>, accessed 20 January 2020.

⁹⁴ Australian Government, My aged care website, <https://www.myagedcare.gov.au/short-term-care/transition-care>, accessed 20 January 2020.

Estimating the size of the problem

To estimate the size of the problem, we use the following approach.

- Estimate the total cost of the relevant types of care. This includes:
 - Sub-acute care (excluding palliative care)
 - Non-acute hospital care
 - Transition care.
- We then assume the following proportion of these costs can be attributed to the problem of a lack of accessible housing.
 - 6.7 per cent of sub-acute care based on the findings of New et. al. 2013 (although this study only related to rehabilitation care)
 - 1.8 per cent of maintenance care based on the findings of Salonga-Reyes and Scott (2017)
 - As there are no studies on the extent to which lack of accessible housing increases the need for transition care, we apply the estimate relating to maintenance care.

F Approach to estimating the costs associated with loneliness

Estimated incidence of loneliness due to inaccessible housing

A lack of accessible housing could contribute to loneliness in people with a mobility limitation through either:

- their own dwelling restricting their ability to leave and re-enter the dwelling
- their friend's and families dwellings lacking accessibility features that would enable them to visit.

Accessibility of own residence

One way a lack of accessible housing could contribute to social isolation and loneliness for people with mobility limitations is where they are unable to easily enter or leave their own home. The SDAC does not explicitly ask respondents about the ease with which they can enter or leave their residence. However, an indicator relevant to the ease of entering and/or leaving a dwelling is whether the individual leaves home as often as they would like. Although an imperfect indicator, it is reasonable to infer that if a person leaves home as often as they would like, the accessibility of the residence is not a major restriction on their lifestyle.

- SDAC data suggests that in 2018, nearly 2 million people were leaving the residence as often as they would like, around two-thirds of the population with a mobility impairment (table F.1).⁹⁵
- Around 962 200 do not leave their residence as often as they would like or not at all.

F.1 Leaving residence

	Profound	Severe	Moderate	Mild	Total	Share of total
	'000	'000	'000	'000	'000	'000
Does not leave residence	25.9	1.7	1.3	5.4	34.3	1.1
Does not leave residence as often as would like	240.5	241.1	158.7	321.3	961.6	32.2

⁹⁵ This includes people who indicated the question was not applicable. As the question asks for the reason that respondents do not leave the residence as often as they would like, we assume that if the question is not applicable, the respondent is leaving the residence as often as they like.

	Profound	Severe	Moderate	Mild	Total	Share of total
	'000	'000	'000	'000	'000	'000
Leaves residence as often as would like ^a	367.0	276.0	274.3	1 070.2	1 987.5	66.6
Total	633.4	518.8	434.3	1 396.9	2 983.4	100.0

^a Includes not applicable.

Source: ABS, Survey of Disabilities, Ageing and Carers, 2018, TableBuilder.

The SDAC also reports the main reason why respondents do not leave home as often as they would like. Many of these reasons appear unrelated to the accessibility features of the dwelling. On the other hand:

- around 547 600 people identified 'their own disability/condition' as the main reason they do not leave the residence as often as they would like
- around 20 300 people identified 'old age/too old' as the main reason they do not leave the residence as often as they would like (table F.2).

It is possible that respondents living in housing that has inadequate accessibility features may have given one of these responses (implying that some people may not have left the house as often as they would like due to a combination of inaccessible housing and their own disability or old age).

F.2 Reason given for not leaving home as often as one would like

	Profound	Severe	Moderate	Mild	Total	Share of people with a mobility limitation
	'000	'000	'000	'000	'000	Per cent
Could not be bothered/nowhere to go	13.4	6.2	10.4	28.6	58.6	2.0
Cost/can't afford to	5.1	10.6	16	36.5	68.2	2.3
Own disability/condition	154.7	165.7	97.5	129.7	547.6	18.4
Another person's disability/condition	5.1	7.2	7.1	16.4	35.8	1.2
Difficulty using transport	1.4	2.2	0.9	4.6	9.1	0.3
Difficulty obtaining transport	3.6	5.6	1.4	7.6	18.2	0.6
Children too young	5.9	0	1.3	5.8	13	0.4
Old age/too old	5.1	2.8	3.6	8.8	20.3	0.7
Not enough time	0	0	2	9.4	11.4	0.4
No carer to go with	15.7	4.3	0	2.2	22.2	0.7
No one to go with as a companion	6.2	3.4	1.3	10.9	21.8	0.7
Fear/anxiety	16.9	25.7	11.2	38.3	92.1	3.1
Other	7.4	7.4	6	22.5	43.3	1.5
Total	240.5	241.1	158.7	321.3	961.6	32.2

Source: 2018 ABS Survey of Disability, Ageing and Carers.

A relevant indicator of social isolation is the frequency of contact with family/friends outside the dwelling.

- According to 2018 SDAC data, around 60 per cent of people who do not leave the house as frequently as they would like due to their own disability or age, nevertheless had contact with family or friends not living in the same household in the last week.
- Around 80 per cent of these people had contact with family/friends not living in the same household in the last month.
- Around 78 400 had not had contact with family/friends not living in the same household in the last month (table F.3).

F.3 Frequency of contact with family/friends not living in same household

	Number of people	Share
	'000	Per cent
Every day	54.5	9.6
In the last week	285.8	50.5
In the last month	113.4	20.0
In the last quarter	56.2	9.9
Has not seen family or friends not living in same household in the last 3 months	22.2	3.9
Has no family or friends	0.0	0.0
Not applicable	34.7	6.1
Total	566.0	100.0

Source: ABS, Survey of Disabilities, Ageing and Carers, 2018, TableBuilder.

As noted above, feelings of loneliness are not necessarily directly related to the frequency with which people see their social networks. Feelings of loneliness are subjective and some people can feel lonely even if they see their family and friends frequently. Perhaps a better (albeit still imperfect) measure of loneliness is whether people **want** more contact with their family and friends.

According to 2018 SDAC data, there were around 257 400 people (or around 45 per cent of the total) who do not leave the house as often as they would like due to their own age or disability and also want more contact with their family or friends (table F.4).

F.4 Share of identified population who want more contact with family and friends

	Want more contact with family/friends	Total	Share of total
	'000	'000	Per cent
Profound	68.6	161	42.6
Severe	74.9	165.5	45.3
Moderate	52	99.4	52.3
Mild	60.5	138.9	43.6
Total	257.4	566	45.5

Source: ABS, Survey of Disabilities, Ageing and Carers, 2018, TableBuilder.

Residence of family and friends not accessible

A lack of accessible housing could also contribute to social isolation and loneliness where people with a mobility limitation are unable to visit friends and family because the dwellings occupied by the family and friends are inaccessible. The SDAC data also provides some insights into the number of people affected by an inability to access the houses of family and friends.

- In 2018, there were around 113 700 people who reported having difficulty accessing another person's house over the past year. This is the most direct measure of the number people affected by a lack of accessible housing. However, this measure would understate the true impact, as many people with mobility limitations would avoid visiting friends and relatives if they know (or suspect) they will be unable to access the house.
- There were a further 309 000 people who reported avoiding visiting family and friends due to their disability (this excludes the overlap between those that also had difficulty accessing another person's house). However, it is not clear that they avoided visiting family and friends because their housing was inaccessible or for some other reason related to their disability.
- In total up to 422 400 people were not able to access the home of a friend or relative. As noted above, this is likely to be an upper bound estimate because some people may have avoided visiting family or friends for reasons related to their disability, but unrelated to the accessibility of the house.

As above, most people within this group nevertheless see family and friends that live outside the household relatively frequently.

- More than 60 per cent of people who had difficulty accessing another person's house or avoided visiting another people because of their disability still saw a family member or friend who lived outside the house in the last week.
- More than 80 per cent of these people had contact with family and friends in the last month.
- Around 60 400 people had not had contact with family/friends not living in the same household in the last month (table F.5).

F.5 Frequency of contact with family or friends

	People who had difficulty accessing another person's house	People who avoided visiting other people	Total	Share
	'000	'000	'000	Per cent
Every day	14.7	27.3	40.3	9.5
In the last week	58.8	177.2	219.0	51.8
In the last month	19.1	84.0	95.3	22.6
In the last quarter	8.8	36.6	42.4	10.0

	People who had difficulty accessing another person's house	People who avoided visiting other people	Total	Share
	'000	'000	'000	Per cent
Has not seen family or friends not living in same household in the last 3 months	3.2	12.7	15.9	3.8
Has no family or friends	0.0	2.1	2.1	0.5
Not applicable	7.4	0.0	7.4	1.8
Total	113.7	339.9	422.4	100.0

Source: ABS, Survey of Disabilities, Ageing and Carers, 2018, TableBuilder.

Of these people, around 191 500 (or around 45 per cent) wanted more contact with their family and friends (table F.6).

F.6 Share of identified population who would like to see family and friends more often

	Want more contact with family/friends	Total identified population	Share wanting more contact with family/friends
	'000	'000	Per cent
Profound	43.0	100.0	43.0
Severe	50.1	114.6	43.7
Moderate	43.8	82.5	53.1
Mild	61.6	127.7	48.2
Total	191.5	423.0	45.3

Source: ABS, Survey of Disabilities, Ageing and Carers, 2018, TableBuilder.

Total population that may be suffering from loneliness due to inaccessible housing

Taking into account, the overlap between the groups of people identified above, we estimate that there are around 403 000 in the above groups who want more contact with their family/friends (table F.7). This is around 51 per cent of the total.

This compares to around 21 per cent for others with a mobility limitation (i.e. those that did not report that they had difficulty accessing the house of another person, did not report that they had avoided visiting a friend or relative or did not report that did not leave their house as often as they would like due to their age or condition), which is broadly consistent (or slightly lower) than the proportion of Australians that feel lonely, as reported above (around 25 per cent).

F.7 Share of people with a mobility limitation that want more contact with family/friends

	Want more contact with family/friends	Total	Share
	'000	'000	Per cent
Relevant people	403.0	788.6	51.1
Others with mobility limitation	466.3	2 193.7	21.3
All people with mobility limitation	869.3	2 982.3	29.1

Source: ABS, Survey of Disabilities, Ageing and Carers, 2018, TableBuilder.

This data supports the proposition that a lack of accessible housing may be contributing to loneliness.

- That said, some in this group may have been lonely even if their home (and the home of any friends or relatives) were accessible to them. Using the 25 per cent of the population (see above) as a benchmark implies that around 200 000 would have suffered from loneliness anyway.
- This implies that approximately an additional 200 000 may suffer from loneliness as a result of a lack of accessible housing.

The cost of loneliness

Loneliness is associated with a range of health impacts, including:

- an increase in GP Consultations
- unplanned hospital admissions
- increased attendance at an Emergency Department
- an increase in self-harm
- an increase in depression
- an increase in coronary heart disease
- an increase in stroke
- an increase in dementia.

One way the cost of loneliness to the community has been measured in the literature is through these health impacts. Although we did not identify any Australian studies estimating the economic costs of loneliness, there are several UK studies. In particular:

- McDaid et. al. estimated the avoidable costs of loneliness could be around £1700 (2015 values) per person in net present value terms over ten years.⁹⁶
 - The discount rate used in the net present value calculation is not reported. However, using a 7 per cent discount rate, this equates to around £226 per year.

⁹⁶ McDaid, D., Park, A.L. and Fernandez, J.L. 2016, *Reconnections Evaluation Interim Report*, Personal Social Services Research Unit (PSSRU), London School of Economics, June 2016, p. 30.

- Converted to 2019 Australian dollar terms, this is around \$417 per year.
- For those who are lonely most of the time, these costs are estimated at around \$6000 per person in net present value terms over ten years.⁹⁷
 - Assuming a 7 per cent discount rate, this equates to around 798 per year.
 - Converting to 2019 Australian dollar terms, this is around \$1471 per year.

We use the above estimates as low and high estimates, with the midpoint used as the central case estimate.

⁹⁷ McDaid, D., Park, A.L. and Fernandez, J.L. 2016, *Reconnections Evaluation Interim Report*, Personal Social Services Research Unit (PSSRU), London School of Economics, June 2016, p. 30.

G Premature or inappropriate entry into residential aged care

Incidence of people inappropriately or prematurely admitted to aged care

There were:

- around 176 300 people with a mobility impairment in residential aged care in 2018 (including homes for the aged and cared retired/aged accommodation) according to SDAC data
- 182 705 permanent aged care placed funded by the Australian Government as at June 2019, according to AIHW data.⁹⁸

Entry into residential care can be a complex decision, taking into account a range of factors. There is limited evidence on the incidence of people being admitted to residential aged care inappropriately or prematurely. Residential aged care is generally to address care needs beyond accessibility. However, it is possible that some proportion of these aged care residents may have prematurely entered aged care, where their previous home no longer meets their changing accessibility needs and they are unable to secure alternative accommodation that meets their needs. Even where an individual has some care needs, home-based care may be possible with accessible housing.

Based on the limited information available, we estimate that there could be between 2767 and 6199 additional people in residential aged care due to a lack of accessible housing, with a central case estimate of 4277 (table G.1). Details of our approach to estimating the number of additional people in residential aged care is provided below.

G.1 Additional people in residential aged care due to a lack of accessible housing

	Low estimate	Central case	High estimate
	No.	No.	No.
Older people (65+ years)	2 660	4 140	6 023
Younger people (<65 years)	107	137	176
Total	2 767	4 277	6 199

Source: CIE estimates.

⁹⁸ Australian Institute of Health and Welfare website, <https://www.gen-agedcaredata.gov.au/Resources/Access-data/2019/September/Aged-care-data-snapshot%E2%80%94942019>, accessed 22 December 2019.

Older people inappropriately or prematurely admitted to aged care

Some stakeholders suggested it was unlikely that there would be a large number of inappropriate or premature entrants into residential aged care.

- Prospective entrants into government-funded residential aged care place undergo and assessment by an Aged Care Assessment Team (ACAT). ACATs assess the physical, psychological, medical, restorative, cultural and social needs of frail older people to help them and their carers to access appropriate levels of support. Evidence suggests that a range of factors influence the ACAT's recommended long-term care setting, including age, availability of informal care, health conditions and assistance needs.⁹⁹
- There has also been a policy shift towards assisting people stay at home, rather than entering aged care.

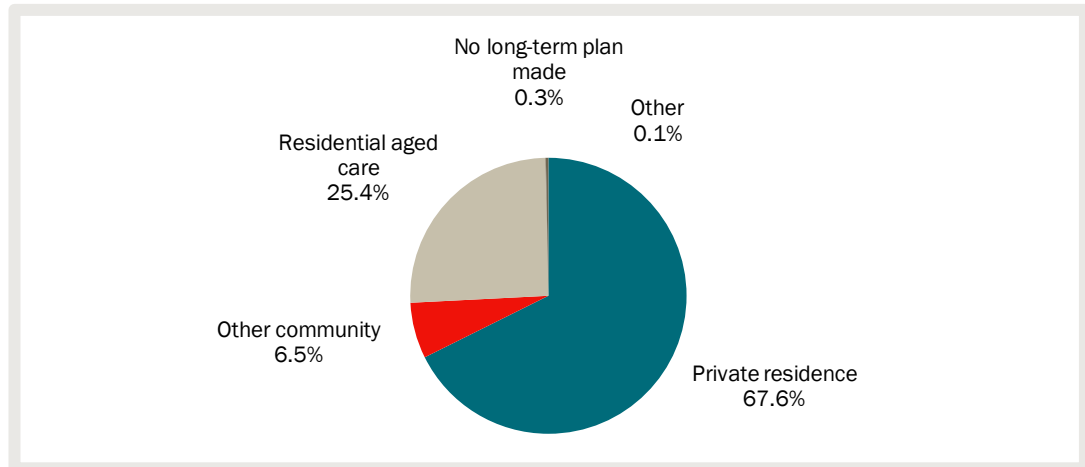
The AIHW reports that in 2018-19, there were 163 047 aged care assessments.¹⁰⁰ Among the issues considered as part of these assessments are any difficulties completing daily tasks and activities around the home and any issues relating to home and personal safety (i.e. issues relating to the accessibility of the home).

- In around 75 per cent of cases, the recommended long-term living arrangement was the private residence or other residential arrangements within the community (including independent living within a retirement village, supported community accommodation, boarding houses and other community settings) (chart G.2). This implies that the client's existing dwelling was assessed as being generally suitable (although it is still possible that more accessibility features could improve the ease of entering/leaving or moving around the dwelling and reduce the risk of falls and care needs).
- In most of the remaining cases, the recommended long-term living arrangement was residential aged care. However, it is not clear to what extent a lack of accessibility features within the existing dwelling contributed to that recommendation.

⁹⁹ Jukic, M. and Temple, J.B. 2018, Recommended long term care settings following aged care assessments in Australia, *PLOS One*.

¹⁰⁰ Australian Institute of Health and Welfare website, <https://www.gen-agedcaredata.gov.au/Resources/Access-data/2019/September/Aged-care-data-snapshot%E2%80%942019>, accessed 22 December 2019.

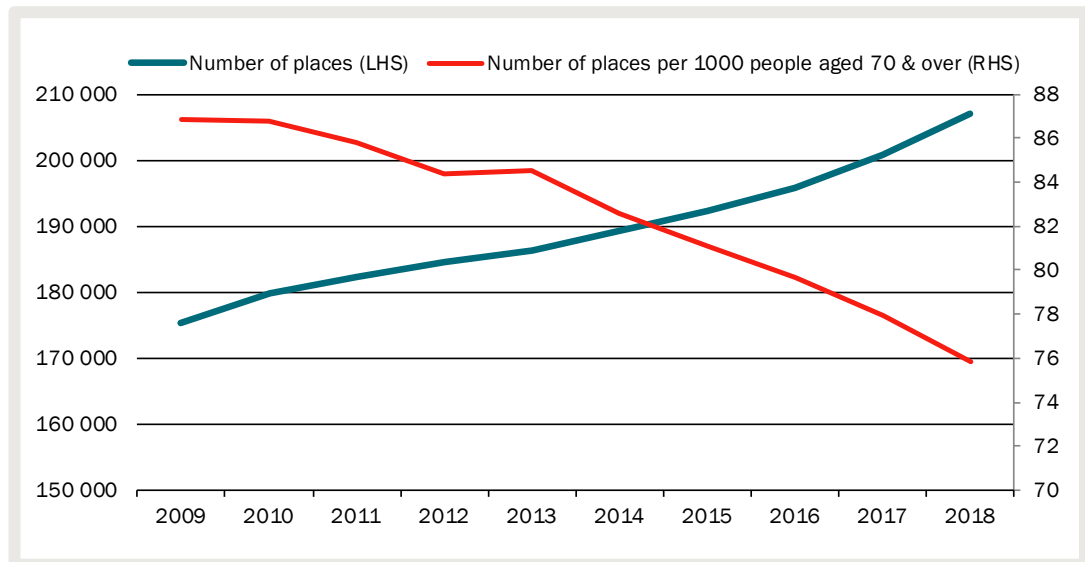
G.2 Recommended long-term living arrangement from aged care assessments



Data source: Australian Institute of Health and Welfare website, <https://www.gen-agedcaredata.gov.au/Resources/Access-data/2019/September/Aged-care-data-snapshot%E2%80%94942019>, accessed 22 December 2019.

Although the number of places in residential aged care has grown over the past decade, the number of places per 1000 people aged 70 years and over declined from around 87 to around 76 over the same timeframe (chart G.3). This reflects the greater focus on home-based care, rather than residential care.

G.3 Operational number of residential aged care places, Australia-wide



Data source: PC Report on Government Services 2019, Chapter 14: Aged Care, Tables 14A.13-14.

There have been several studies that have modelled the extent to which factors contribute to entry into residential aged care, using Australian data. These studies provide useful insights because they use statistical techniques to estimate the impact of each relevant factor, with all other factors held constant.

Of most relevance, Jukic (2017) used SDAC (2012) data to estimate the extent to which various factors (including age, assistance needs and specific conditions) affect the probability (or odds) of being in residential aged care. Jukic (2017) and Jukic and Temple

(2018) also used similar models with alternative data sources (such as ACAT assessment data) to estimate the extent to which various factors contribute to the recommended long-term care setting. However, the model using SDAC data is most relevant for the CBA because it focuses on the number of people in residential aged care, rather than number of new admissions.

The odds ratio for each variable represents the odds that a person will be in aged care with the relevant variable (i.e. when a person has a particular need or condition), compared to the odds of being in residential aged care without the relevant need or condition (table G.4).

- An odds ratio of 1 would imply that a person experiencing this variable has the same likelihood of being in residential aged care as those without the relevant need or condition, holding other characteristics constant.
- An odds ratio of less than 1 implies that it is less likely that those with the relevant need or condition will be in residential aged care.
- An odds ratio greater than 1 implies that it is more likely that those with the relevant need or condition will be in residential aged care.

G.4 Logistic model of probability of being in aged care – 2012

Variable	Odds ratio	P>z	95% confidence interval	
			Lower bound	Upper bound
Age	1.204	0.000	1.136	1.276
Age square	0.999	0.003	0.998	0.999
Married	0.206	0.000	0.165	0.257
Needs help with emotional/cognitive tasks	2.888	0.000	2.112	3.948
Needs help to cope with emotions	2.105	0.000	1.525	2.906
Needs help with understanding	1.955	0.002	1.281	2.985
Needs help with communication	4.310	0.000	3.148	5.901
Needs help with dressing	1.781	0.001	1.275	2.487
Needs help with mobility about residence	2.684	0.000	2.076	3.468
Needs help with toileting	4.371	0.000	3.273	5.836
Head injury	0.580	0.003	0.404	0.831
Dementia	2.541	0.000	1.818	3.551
Diabetes	0.719	0.043	0.522	0.989
Schizophrenia	3.859	0.002	1.612	9.241
Depression	3.172	0.000	2.392	4.206
Retardation	0.433	0.094	0.162	1.154
Epilepsy	2.853	0.013	1.244	6.541
Multiple Sclerosis	2.167	0.028	1.087	4.321
Paralysis	4.786	0.000	2.591	8.841
Heart Disease	1.653	0.000	1.283	2.130
Urinary	1.593	0.052	0.996	2.549
Constant	1.115	0.000	1.420	9.340
Number of resident records				9 787
Pseudo R ²				0.799

Source: Jukic, M. 2017, *Modelling Residential Aged Care in Australia: Entry and Exit*, A thesis submitted for the degree of Doctor of Philosophy of the University of Melbourne, p. 132.

The accessibility of the residence (or previous residence for those that have already moved into aged care) is not one of the variables included in the various models. The variable that is mostly closely related to housing accessibility is whether an individual ‘needs help moving around the residence’.

The modelling results suggest that needing assistance moving around a residence has a statistically significant impact on the odds of being in residential aged care. All else being equal, for those that need assistance moving around the residence, the odds of being in residential aged care is around 2.7 times higher than those without a need for assistance moving around the residence. This could be interpreted as evidence that inaccessible housing is contributing to additional people being in residential aged care.

Based on 2018 SDAC data, the probability/odds of being in residential aged is relatively low (less than 1 per cent) for those over the age of 65 that do not need assistance moving around the residence, but much higher for those that need assistance (including those that do not move around the residence) (table G.5). However, as noted above, those that need assistance moving around the residence often have a range of other risk factors, unrelated to the dwelling, that also contribute to being in residential aged care.

G.5 Probability/odds of being in residential aged care – 2018

	In residential aged care	Total	Probability of being in aged care	Odds of being in aged care
	'000	'000	Per cent	
Does not need assistance	15.9	1 676	0.95	0.0096
Needs assistance	154.4	266	58.11	1.3872
Total	170.3	1 941.2	8.77	0.0962

Source: ABS, 2018 Survey of Disabilities, Ageing and Carers, TableBuilder.

We can use the SDAC data and the modelling results to infer the number of additional people that may be in residential aged care as a result of the need for help with moving around the residence as follows (see table G.6).

- We use the odds (0.0096) of being in residential aged care for those that do not need assistance moving around the residence as a baseline. This implies a baseline of around 2500 people (out of the 266 000 people in total) who need assistance with mobility would have been in residential aged care anyway (i.e. even if they did not need assistance with mobility). This is less than 1 per cent of the total.
- We then apply the odds ratio reported above to estimate the odds of being in residential aged care for those with a need for assistance moving around the residence, **all other variables being equal**. We apply the central case odds ratio (2.684), as well as the lower (2.076) and upper (3.468) bound of the 95 per cent confidence interval.
- The difference between the number of people estimated to be in residential aged care implied by the odds estimated above and the baseline can be interpreted as the impact of needing help with mobility around the place of residence.

- This implies that there are between 2660 and 6023 additional older Australians in residential aged care as a direct result of needing help with mobility around the place of residence, with a central case estimate of 4140 additional people.
- Note that this estimate is far less than the 154 400 people with mobility needs that were reported to be in residential aged care in 2018. This implies that the remaining people were in residential aged care due to other factors unrelated to their need for help moving around the place of residence.

G.6 Estimated number of people in residential aged care due to needing help with mobility

	Odds	Probability	Estimated number of people	Attributable to mobility needs
		Per cent	Person	person
Baseline (people without mobility needs)	0.0096	0.9490	2 521	n.a.
People with mobility needs				
Lower bound estimate	0.0199	1.9501	5 182	2 660
Central case	0.0257	2.5070	6 661	4 140
Upper bound estimate	0.0332	3.2157	8 544	6 023

Source: CIE estimates

- **Many people who need help moving around their place of residence can remain at home if their home has the necessary accessibility features. One possible interpretation of the fact that some people are estimated to be in residential aged care as a direct result of their need for assistance moving around their home is that this is due to their residence lacking relevant accessibility features.**
- **Under this interpretation, the additional people that are in residential aged care as a result of their need for help moving around their place of residence can be attributed to a lack of accessible housing.**
- **This implies that between 2660 and 6023 additional people – with a central case estimate of 4140 additional people – are in residential aged care as a result of inaccessible housing.**

Younger people in residential aged care

According to the COAG Disability Reform Council Quarterly report there were 5468 people under the age of 65 living in residential aged care in the December quarter 2019. Some stakeholders argue it is inappropriate for anyone under the age of 65 to be in residential aged care. According to the Royal Commission into the Quality and Safety of Aged Care:

“For younger people with disability, their friends stop dropping by and rarely visit over time. It is an isolating and daunting experience. It is not a life.”¹⁰¹

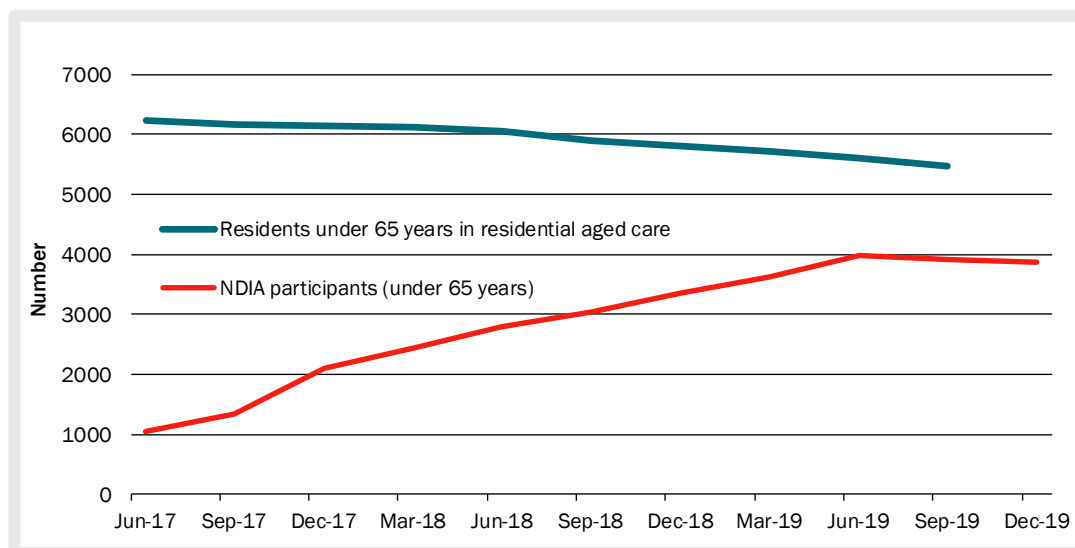
¹⁰¹ Royal Commission into Aged Care Quality and Safety 2019, *Interim Report: Neglect*, Volume 1, October 2019, p. 4.

Minimising the number of younger people in residential aged care, is an important focus of the Australian Government.¹⁰² In March 2019, the Government announced it had developed a national action plan that included a target of halving the number of younger people under the age of 65 entering aged care by 2025. A new strategy to support this target is currently being finalised.¹⁰³

The number of people under the age of 65 in residential aged care (and new entrants under the age of 65) has been declining over recent years as the number of NDIS participants has increased (chart G.7).¹⁰⁴

- The number of residents under the age of 65 has decreased from 6243 at 31 March 2017 to 5468 at 30 September 2019, a 12 per cent decrease.
- The number of new entrants into residential aged care under the age of 65 has decreased from 536 in the June quarter 2017 to 386 in the September quarter 2019, a decrease of around 28 per cent.

G.7 Number of people under the age of 65 in residential aged care



Data source: COAG Disability Reform Council Quarterly Report, December 2019, pp. 26-27.

The national action plan notes that younger people with disability often have complex health needs and identifies the following reasons why younger people are living in aged care facilities:

- difficulty in accessing appropriate health supports in other settings
- the lack of suitable housing - the national action plan identifies a significant gap in the market for highly specialised disability accommodation.

The national action plan also notes:

¹⁰² Department of Social Services website, <https://www.dss.gov.au/disability-and-carers/programmes-services/for-people-with-disability/younger-people-with-disability-in-residential-aged-care-initiative>, accessed 17 February 2020.

¹⁰³ NDIA 2019, *COAG Disability Reform Council Quarterly Report*, December 2019, p. 27.

¹⁰⁴ *ibid*, pp. 26-27.

“Younger people with a disability have been directed to aged care due to a lack of suitable alternative housing and supports. One support that may accommodate the needs of younger people in aged care is SDA...[However, there] is currently a shortfall in the availability of SDA for younger people who require this level of support. The SDA market is not yet mature, with limited supply, lack of demand data for potential investors, and significant lead-time required for construction of new stock.”¹⁰⁵

Key elements of the national action plan are therefore to:

- improve the ability of younger NDIS participants in aged care to access SDA; and
- to encourage the development of a vibrant SDA market.

It is therefore reasonable to expect that the number of younger people in residential aged care will decline as the SDA market develops.

- **There are no data specifically on the number of younger people in residential aged care that would have been able to remain living in the community if more private (non SDA) accessible housing were available.**
- **In the absence of better information, we assume similar shares as for older people, implied by the modelling studies outlined above. Under this assumption, between 1.95 per cent and 3.22 per cent of younger people in residential aged care may have been able to live in the community if more accessible housing were available, with a central case estimate of 2.51 per cent.**
- **Based on 5468 younger Australians currently in residential aged care (as at September 2019) this implies between 107 and 176 of these people may have been able to live in the community if more accessible housing were available, with a central case estimate of 137.**

Impact of inappropriate or premature entry into aged care

The impact of inappropriate or premature or inappropriate entry into aged care includes:

- reduced wellbeing for those people inappropriately or prematurely entering aged care
- additional financial costs associated with residential aged care (relative to other care models).

Reduced wellbeing for premature or inappropriate entrants

As noted above, residential aged care is not the preferred outcome for many older Australians (as well as younger people that are admitted to residential aged care).

The ongoing Royal Commission into Aged Care Quality and Safety (see box G.8) noted that:

¹⁰⁵ Australian Government, Younger People in Residential Aged Care – Action Plan, pp. 4-5.

“People do not usually enter aged care willingly. They often do so with great trepidation. They fear loss of autonomy, of individuality, of control over their own lives.”¹⁰⁶

G.8 Royal Commission into Aged Care Quality and Safety

A Royal Commission into Aged Care Quality and Safety was established on 8 October 2018. The Royal Commission has gathered evidence through a range of methods including: public hearings; notices requiring the production of documents, things, information or statements in writing; public submissions; community forums; expert roundtable discussions; service visits; and research conducted by both the Royal Commission staff and commissioned from external providers.

The Commissioners delivered an interim on 31 October 2019 a will provide a final report by 12 November 2020.¹⁰⁷

The wellbeing of people in residential aged care (relative to remaining at home) is likely to be at least partly related to the quality of the care receive. In the interim report of the Royal Commission, the Commissioners stated:

“The Royal Commission has heard compelling evidence that the system designed to care for older Australians is woefully inadequate. Many people receiving aged care services have their basic human rights denied. Their dignity is not respected and their identity is ignored. It most certainly is not a full life. It is a shocking tale of neglect.”¹⁰⁸

The Royal Commission concluded that substandard care (care that does not meet relevant quality standards or other legislative obligations, or which otherwise does not meet community expectations) is widespread and is more serious than had been anticipated.¹⁰⁹ Discussions with the Disability Discrimination Commissioner also highlighted that people in closed care systems are vulnerable to neglect, abuse and exploitation.

It is reasonable to expect further reforms to address the safety and quality issues in response to the Royal Commission’s recommendations (although the specific recommendations are not yet known).

One study from AIHW report on consumer experiences with residential aged care presents a much more positive view of the quality of care provided in residential aged care facilities.¹¹⁰ For most questions, more than 90 per cent of responses were positive,

¹⁰⁶ Royal Commission into Aged Care Quality and Safety 2019, *Interim Report: Neglect*, Volume 1, October 2019, p. 4.

¹⁰⁷ Royal Commission into Aged Care Quality and Safety website, <https://agedcare.royalcommission.gov.au/Pages/default.aspx>, accessed 29 January 2020.

¹⁰⁸ Royal Commission into Aged Care Quality and Safety 2019, *Interim Report: Neglect*, Volume 1, October 2019, p. 12.

¹⁰⁹ *ibid*, p. 5.

¹¹⁰ Australian Institute of Health and Welfare, 2019, Consumers’ experience of residential aged care Australia 2017-19, p. 30.

although responses across all questions were slightly less positive for those with restricted mobility. The responses for the remaining questions were mostly more than 80 per cent positive. Responses from people with restricted mobility on 'staff to talk to' was the only question with a positive response rate less than 80 per cent.

The findings of the Royal Commission suggest that there may nevertheless be a significant number of people that receive sub-standard care. However, there is currently no publicly available data from the Royal Commission on the proportion of residential aged care users that have receive sub-standard care. The impact of inappropriate or premature entry into residential aged care could be very high for people who receive sub-standard care (and even higher for those that are the victim of violence or abuse).

We also note recent aged care reforms, including:¹¹¹

- a new set of 8 Aged Care Quality Standards that become effective in July 2019
- the establishment of the Aged Care Quality and Safety Commission to protect and enhance the safety, health, well-being and quality of life of people receiving aged care.

That a significant number of people in residential aged care receive sub-standard care (including instances of neglect, violence and abuse) is clearly an important issue. However, this reflects current failings of the aged care system, rather than residential aged care as a type of care. Changes to the NCC can address this issue only to the extent that it may prevent some people for entering residential aged care.

Furthermore, we would hope that the issues identified through by the Royal Commission are addressed in the years ahead. We have therefore not tried to specifically quantify the costs associated with sub-standard care (although sub-standard care may be partly reflected in the increased incidence of depression — see below).

That said, even if the quality of care is of an acceptable standard in all aged care facilities, many older Australians in residential aged care would have preferred to have remained at home if that were possible.

The AIHW reports higher rates of depression among permanent aged care residents relative to older Australians living in the community (although the AIHW acknowledges that this could reflect people in residential aged care generally having more complex care needs).¹¹² Despite this caveat, a comparison of depression rates may provide a reasonable indicator of the cost to those who have been inappropriately or prematurely admitted to residential aged care.

The AIHW reports that around 52 per cent of permanent aged care residents have symptoms of depression, compared to 10-15 per cent of older Australians in the community (table G.9).¹¹³ From this information we infer that around 39.7 per cent of permanent aged care residents have symptoms of depression as a result of living in aged

¹¹¹ Australian Institute of Health and Welfare, 2019, Consumers' experience of residential aged care Australia 2017-19, p. 1.

¹¹² Australian Institute of Health and Welfare 2013, Depression in residential aged care 2008-2012, Aged Care Statistics Series Number 39, p. 6.

¹¹³ *ibid*, p. 6.

care. Note that this is an upper bound assumption because as noted above, higher rates of depression for residents in residential aged care may reflect the fact that aged care residents generally have more complex care needs.

G.9 Incidence of depression

	Permanent residential aged care ^a	Older people in the community	Attributable to aged care
	Per cent	Per cent	Per cent
Mild	23.8	5.7 ^b	18.1
Moderate	15.5	3.7 ^b	11.8
Major	12.9	3.1 ^b	9.8
Total	52.2	12.5 ^c	39.7

^a Reported in AIHW (2013, p. 6). ^b The distribution between severity of symptoms of depression for older people in the community are not reported. These estimates are inferred from the share of the total population with symptoms of depression in permanent residential aged care. ^c The total share of older people in the community with symptoms of depression is based on the mid-point of the 10-15 per cent range reported in AIHW (2013, p. 6).

Source: Australian Institute of Health and Welfare, 2013, Depression in residential aged care 2008-2012, Aged Care Statistics Series Number 39, p. 6; CIE.

Estimates of the annual morbidity cost of depression is shown in table G.10. These estimates are based on:

- disability weights for mild, moderate and major depressive disorders used in the World Health Organisation's Global Burden of Disease study
- a value of a life year of \$195 000 based on OBPR recommendations.

G.10 Morbidity cost of depression

	Disability weight ^a	Annual cost ^b
		\$
Mild major depressive disorder	0.145	28 275
Moderate major depressive disorder	0.396	77 220
Severe major depressive disorder	0.658	128 310

^a From Global Burden of Disease 2017. ^b Uses a value of life year of \$195 000 based on OBPR recommendations.

Source: Global Burden of Disease 2017, <http://ghdx.healthdata.org/record/ihme-data/gbd-2017-disability-weights>, accessed 30 January 2020; Department of Prime Minister and Cabinet, Office of Best Practice Regulation, https://www.pmc.gov.au/sites/default/files/publications/value-of-statistical-life-guidance-note_0_0.pdf, accessed 6 February 2020.

Bringing the above information together suggests a weighted average cost of around \$26 809 per year for each additional person admitted to residential aged care (table G.11).

G.11 Estimated morbidity cost of depression from inappropriate or premature entry into residential aged care

	Share of permanent aged care residents ^a	Annual cost ^b
	Per cent	\$
Mild major depressive disorder	18.1	28 275
Moderate major depressive disorder	11.8	77 220

	Share of permanent aged care residents ^a	Annual cost ^b
	Per cent	\$
Severe major depressive disorder	9.8	128 310
Weighted average cost per person		26 809

^a See table G.9 above. ^b See table G.10 above.

Source: CIE estimates.

Cost impact of inappropriate or premature entry into residential aged care

These cost impacts estimated below relate specifically to older people in residential aged care. Cost impacts may be somewhat different for younger people, reflecting the different services available to different age groups and possibly some other impacts. However, younger people make up a relatively small share of the total.

Government subsidies associated with residential aged care are significantly higher than other types of care.

- AIHW reports that the average annual Australian Government subsidy per client for residential aged care was estimated at \$69 114 in 2018-19.
- By contrast, the average cost for Home Care is around \$23 140 in 2018-19.

However, this does not take into account client contributions. This could significantly distort the relative cost of different types of care. Furthermore, if someone is inappropriately or prematurely admitted into aged care, it is not clear:

- what their care needs would be if they remained at home (i.e. it is not clear if they would need a Home Care Package)
- the extent to which residential aged care costs substitute for other costs or are additional (for example, if a partner or other family members of the person inappropriately or prematurely admitted into aged care remains in the family home, accommodation-related costs in residential aged care are additional).

Estimating the additional resource costs of inappropriate or premature entry into aged care is therefore not straightforward. We estimate these costs could be around \$34 696 per person per year (table G.12).

- The Aged Care Funding Authority reports that in 2017-18, total expenses per resident per day in residential aged care is \$265.62.¹¹⁴ This equates to \$96 951 per year (based on 365 days).
- Around 67 per cent of these costs relate to care and administration. We assume that these care and administration costs are additional (i.e. would not have been incurred had that person remained at home).¹¹⁵ The remaining 33 per cent or \$32 102, largely relate to accommodation and daily living expenses, which we assume would have

¹¹⁴ Aged Care Financing Authority, Seventh report on the Funding and Financing of the Aged Care Industry, July 2019, p. 77.

¹¹⁵ *ibid*, p. 78.

been incurred at home (this implicitly assumes that accommodation and daily living expenses are broadly the same in residential aged care as they are at home).

- Furthermore, data from AIHW indicates that very few people enter residential aged care without first using other aged care programs. The available data suggests that in 2013-14, only around 10 per cent of new entrants into residential aged care had not previously used another aged care program. We therefore assume that someone entering residential aged care, would have required home support had they remained at home and accordingly subtract \$23 141 based on the average cost of a Home Care Package.
- Many people may have also required informal care had they stayed at home. The modelling results presented above suggested that people are significantly less likely to be in residential aged care if they are married (see table G.4 above). This is presumably due to the informal care provided by their spouse. We estimate the value of informal care received by people who remain at home is around \$7000 per year. This is based on:
 - an estimated 6.92 hours of informal care per week, based on the estimates from Carnemolla and Bridge (2019) received by people in accessible homes (although it is not clear whether these estimates are representative of the amount of formal care provided to people at risk of entering residential aged care)
 - informal care is valued at the Australian Minimum Wage of \$19.49 per year.

G.12 Estimated additional financial cost of residential aged care per person

Estimated additional costs	
	\$ per person
Total annual cost of residential aged care per person	96 951 ^a
Less: accommodation and daily living-related expenses	32 102 ^b
Less: Home care package	23 141 ^c
Less: Informal care	7 013
Additional cost of residential aged care	34 696

^a See ACFA (2019, p. 77). ^b See ACFA (2019, p. 78). ^c Data published by AIHW.

Source: Aged Care Financing Authority, Seventh report on the Funding and Financing of the Aged Care Industry, July 2019, pp. 77-78; AIHW, CIE.

H The impacts of accessible housing on employment outcomes

Employment outcomes for people with mobility-related disabilities

There is evidence of poorer employment outcomes for working age (15-64 years) people with a mobility-related disability, relative to the broader economy.

- According to 2018 SDAC data, the unemployment rate (the proportion of people who are either employed or actively looking for work that are unemployed) for people with a mobility-related disability was around 11.3 per cent, more than double the rate in the broader economy (based on 2018 data).
- Perhaps more strikingly, the participation rate (the proportion of working age people that are either employed or looking for a job) for people with a mobility-related disability was 42 per cent, compared with 65.6 per cent for the broader economy (based on 2018 data).

If people with a mobility-related disability had the same employment outcomes as the broader economy, there would have been around an additional 333 000 employed in 2018.

H.1 Key labour force indicators

	People with a mobility limitation	Overall
	Per cent	Per cent
Unemployment rate	11.3	5.3
Participation rate	42.0	65.6

Source: ABS, Labour Force, Australia, Catalogue No. 6202.0; ABS, 2018 Survey of Disabilities, Ageing and Carers, TableBuilder.

Possible linkages between accessible housing and employment outcomes

Several government reports note the importance of housing to support employment and wellbeing and assist people on their path to self-reliance.¹¹⁶ These comments have been generally made in relation to housing assistance more generally, rather than specifically to accessible housing for people with disabilities. That said, the observation is clearly as relevant to people with disabilities as it is to recipients of housing assistance.

¹¹⁶ See for example, Commonwealth of Australia, 2015, *A New System for Better Employment and Social Outcomes*, Report of the Reference Group on Welfare Reform to the Minister for Social Services, Final Report, p. 24.

During consultations, multiple stakeholders stressed the need for housing that is affordable and well-located, as well as accessible. As noted in a previous government paper on welfare reform, affordable housing with access to jobs and services is essential to allow people to participate socially and economically.¹¹⁷

Although we did not identify any studies that look specifically at the links between accessible housing and employment, related literature provides some insights into how a lack of accessible housing could negatively affect employment outcomes for people with mobility-related disabilities.

Direct impact of accessible housing on employment outcomes

As employment mostly occurs outside of the home, the most direct way that living in inaccessible housing could contribute to poor employment outcomes is where a person with a mobility-related disability is able to work, but is unable to leave (and re-enter) their dwelling.

According to 2018 SDAC data, there were around 18 900 working age people that do not leave their house. This is around 2 per cent of the total number of people with mobility-related disabilities that are not employed. All indicated that the main reason they do not leave their house is because they are prevented by their disability or condition or 'fear and anxiety'.

SDAC data also reports requirements that would enable workforce participation (the reported responses) include: training; equipment; working at home; time off; assistance with personal care tasks; other; or could not work at all). All people that do not leave their house are reported as being unable to work at all (or not applicable). That is, they may be unable to work even with the various supports in place.

While it is possible that inaccessible housing contributes to some of these people not leaving their house and therefore the poor employment outcomes for people with mobility-related disabilities, it does not appear to be a major factor.

More people with mobility limitations in social housing

Another way that a lack of private accessible housing (particularly accessible rental housing) could affect employment outcomes is by forcing people with accessibility needs into social housing. If accessible private rental properties are not available, some people with mobility-related disabilities may have few alternative options to social housing.

According to SDAC data, there were around 126 000 people with mobility-related disabilities living in social housing (i.e. where the landlord was either a State or Territory Government housing authority or a housing co-operative or church or community group). This is around 9.4 per cent of the total.

¹¹⁷ Commonwealth of Australia, 2015, *A New System for Better Employment and Social Outcomes*, Report of the Reference Group on Welfare Reform to the Minister for Social Services, Final Report, p. 24.

A Productivity Commission research report identified several ways that social housing might affect the incentives and opportunities to work.¹¹⁸

- **Rent setting models** — for most social housing tenants, rent is linked to income (most pay about a quarter of their income). This has two potential effects on the incentive to work:
 - A ‘price effect’ whereby any increase in income results in a rent increase (and possibly a reduction in welfare payments). This reduces the financial rewards from working (i.e. social housing tenants face high effective marginal tax rates).
 - An ‘income effect’ — with rent set at 25 per cent of income, a tenant might consider they have enough income left after paying for housing to get by, and choose to spend their time on activities other than paid work, for example, caring for a child.
 - The incentives for young people to work might be particularly affected by rent setting approaches in social housing because rents are based on household income.
- **Stability effects** — the longer tenures typically favoured in social housing lease terms (compared to the private market) can provide stability for tenants. This might mean that a person is better able to work (and study) than would be the case in other housing tenures. The stress and uncertainty associated with a lack of stable housing are likely to negatively affect a person’s search for work.
- **Mobility constraints** — as social housing places can be hard to obtain and transferring between social housing properties can be difficult (both within and between states), this can act as a disincentive for social housing tenants to move to take up a job opportunity.
- **Location effects** — the Productivity Commission identified potential location effects associated with social housing.
 - Some social housing might be located in areas with poor access to transport or jobs. A lack of *accessible* transport could exacerbate this issue for people with a mobility-related disability.
 - A concentration of social housing can lead to a concentration of disadvantaged people. The Productivity Commission suggested that employment outcomes might be affected, for example, if high rates of social exclusion in a neighbourhood mean that residents don’t have strong family and social networks to support them in accessing employment opportunities.

Productivity Commission findings

The Productivity Commission’s relevant key findings included the following.¹¹⁹

- The incentive to avoid work to remain eligible for social housing (referred to as a ‘welfare lock’) is not particularly important for employment outcomes (based on data from Western Australia and South Australia).

¹¹⁸ Productivity Commission, *Housing Assistance and Employment in Australia*, Productivity Commission Research Paper — Volume 1: Chapters, April 2015, pp. 5-6.

¹¹⁹ Productivity Commission, *Housing Assistance and Employment in Australia*, Productivity Commission Research Paper — Volume 1: Chapters, April 2015, pp. 50-51.

- Stable housing is associated with better employment outcomes.
- Any disincentive to work is likely to be outweighed by the benefits of stable housing.
- Personal characteristics explain low employment rates among public housing tenants.
- There is little evidence of links between location and employment.

Relevance to accessible housing

The direct relevance of these findings is that, to the extent that a lack of accessible (and affordable) housing forces some people with mobility-related disabilities into social housing (where they may be able to live in a private rental property if an accessible option were available), this is unlikely to have a negative effect on employment outcomes.

More generally, the Productivity Commission found that lower employment rates among social housing tenants is due to the characteristics of individuals in social housing, and not social housing per se. Among the relevant characteristics noted as leading to lower employment rates among social housing tenants was a higher proportion of Disability Support Pensioners.¹²⁰

This finding relates specifically to social housing. However, if this finding applies more generally, the implication is that other factors related to disabilities (such as broader barriers to employment faced by people with disabilities) that are leading to low employment rates, rather than the housing arrangements. This finding tends not to support the proposition that a lack of accessible housing leads to lower levels of employment.

Other possible impacts on employment outcomes

Several of the potential impacts of social housing on employment outcomes may also be relevant to a lack of private accessible housing more generally.

- The mobility constraints described by the Productivity Commission in relation to social housing could potentially apply more generally in the context of a lack of accessible private housing (particularly a lack of accessible rental properties). Difficulties finding accessible housing could discourage people with accessibility needs from moving for employment.
- A lack of private housing that is accessible, as well as affordable and well-located could mean that people with mobility-related disabilities end up living in areas with poor access to accessible transport or jobs.

Mobility constraints

There is evidence to suggest that people with disabilities move less frequently than other members of the community; 2016 Census data suggests that 62 per cent of people with a

¹²⁰ Productivity Commission, *Housing Assistance and Employment in Australia*, Productivity Commission Research Paper — Volume 1: Chapters, April 2015, pp. 50-51.

need for assistance with core activities (not specifically mobility) were living at the same address as they were 5 years ago, compared with 51 per cent of people without a need for assistance with core activities. It is plausible that this is at least partly related to a lack of accessible housing.

The empirical evidence from Australia suggests that moving can improve employment outcomes for unemployed people, although the impact may be relatively small. For example, descriptive analysis of HILDA data (2006) showed that unemployed people who move are more likely to find employment than unemployed persons who do not move (54.5 per cent of unemployed people who moved found employment, compared with 48.7 per cent of unemployed people who did not move).¹²¹ Bill and Mitchell (2006) found that moving is not especially beneficial for the unemployed.¹²²

It should also be noted that people looking for work (i.e. the unemployed) make up a relatively small share of those with a mobility-related disability that are not employed (around 7.6 per cent). A much larger share does not participate in the labour market at all.

Overall, it is plausible that a lack of accessible housing is making some contribution to poorer employment among people with mobility limitations through the 'mobility constraint'. However, there is limited supporting evidence and the impacts are unlikely to be large.

Location effects

As noted above, the Productivity Commission found there is little evidence of links between location and employment, although this was a general finding, not specifically related to people with a mobility-related disability. It is possible that location effects have a more significant impact on employment for people with a mobility-related disability than for the general community given the need for accessible transport.

According to data from the 2018 SDAC:

- there were around 7200 working age people with a mobility-related disability for whom transport problems (or too far to travel) is given as a reason why they have difficulty finding work (around 0.9 per cent of the working age people with a mobility-related disability who were not employed), and
- transport problems (or too far to travel) was the **main** reason for having difficulty finding work for around 1500 people (0.2 per cent of the total number of working age people with a mobility-related disability who were not employed).

¹²¹ Mitchell, W. 2008, *Mobility and Low-paid Workers*, Report commissioned by the Australian Fair Pay Commission, Centre for Full Employment and Equity, December 2008, p. 46.

¹²² Bill, A. and Mitchell, W. 2006, *Great Expectations – migration and labour market outcomes in Australia*, Working Paper No. 06-08, Centre of Full Employment and Equity, University of Newcastle, p. 24.

Even where transport problems (or too far to travel) is identified as the main reason for having difficulty finding work, it is not necessarily the case that this can be attributed to a lack of accessible housing.

Interpretation of available evidence

There are several ways that a lack of accessible housing could be leading to relatively poor employment outcomes among working age people with mobility-related disabilities. However, we have been unable to identify any specific quantitative evidence on the extent to which a lack of accessible housing limits employment opportunities.

The most plausible impact is through the ‘mobility constraint’ where people with accessibility needs are unable to easily move to pursue employment opportunities. However, there is limited supporting evidence and any impacts are likely to be relatively small.

Overall, there is not sufficient evidence on the employment impacts of accessible housing to include these potential impacts in the CBA.

I Construction cost estimates

DCWC, quantity surveyors, have provided estimates for the additional construction cost that would be incurred if the proposed changes to the NCC are implemented.

These construction costs are the difference between the cost of building new homes where the proposed NCC changes are incorporated, against the baseline of existing practice. They are driven by 4 factors:

- The policy option being considered: in general it is less costly to achieve ‘Silver’ level design than ‘Gold’ or ‘Gold+’ because Silver has fewer or lower requirements.
- The size and the layout of the home where the changes are being implemented: in general (though not always) it is more costly to meet the changes in smaller homes with tighter layouts; it is more costly to meet the changes in two-storey homes relative to one-storey homes (as the requirements are greater for the former).
- The design options that are available for meeting the requirement. These design options reflect the choices that are available to the builder (in some cases, requirements can be met with a relatively low cost option) and the particular constraints of the situation.
- Whether or not the particular requirement is already provided in the baseline (if it is being provided in the baseline, then there is no cost to implementing the corresponding NCC change).

The estimates and their interpretation

Specifically, DCWC’s costings incorporate the following features:

- They have provided separate estimates for: a representative townhouse (with a floorspace of 90sqm-110sqm), a representative ‘volume build’ detached house (with a floorspace of 120sqm), a representative ‘custom build’ detached house (with a floorspace of 170sqm-200sqm), a representative apartment in a walk-up block (with a floorspace of 70sqm-90sqm) and a representative apartment in block with a lift (with a floorspace of 110-140sqm).
- They have provided separate costs for the different policy options: implementing changes to the NCC that are consistent with LHDG Silver, LHDG Gold and LHDG Gold+.
- For each type of house, each policy option, each design element of the LHDG standards (dwelling access, dwelling entry, etc.) they have provided costs for up to 5 scenarios. These scenarios reflect different baselines and different ways to achieve compliance. For example, some may already be compliant in the baseline, and thus the required changes incur zero cost. Some are not compliant in the baseline, and thus

require changes to meet the standard, which incur costs. Furthermore, the compliance may be achieved through different designs. For example, to meet the toilet space requirement, a design to replace a swing door with a cavity slider door would mean minimal cost, while in some cases this design is not feasible and bigger space is required to meet the standard, and thus higher costs. For Gold and/or Gold+ standards, more scenarios may be needed to define the baselines for those already met lower standard.

Example: Implementing Silver and Gold compliant corridors in townhouses

We use this example to show how the construction costs are derived.

To provide internal doors and corridors to LHDG Silver standard (option 1 in this RIS), the doors must be 800mm wide and corridors must be 1000mm wide. DCWC have estimated the cost of providing this requirement in townhouses is, on average, \$659 per dwelling, based on the following assumptions:

- internal doors of (at least) 800mm width are already common practice (they are already part of the baseline)– which means the additional cost of meeting this requirement is zero.
- 30 per cent of townhouse corridors are already at least 1000mm wide, again implying there is no cost to meet this requirement.
- the remaining 70 per cent of townhouse corridors are 900mm wide; additional construction costs of \$942 are required to make these corridors compliant.
- The weighted average cost to provide Silver compliant internal doors and corridors in townhouses is therefore \$659.

To provide internal doors and corridors to LHDG Gold standard (option 2 in this RIS), internal doors must be 850mm wide and internal corridors must be 1200mm wide. DCWC have estimated the cost of providing this requirement in townhouses is, on average, \$2 676, as follows:

- all townhouses will require some changes to meet this requirement (the share of townhouses where ‘zero costs’ are incurred is 0 per cent).
- Of the 30 per cent of townhouses that met the Silver standard:
 - Two thirds (20 per cent of total) require wider doors only, requiring an additional \$509 of construction cost.
 - One third (10 per cent of total) require wider doors and an increase in corridor width from 1000mm to 1200mm, requiring an additional \$2 393 of construction cost.
- The 70 per cent of townhouses that are not compliant with the Silver standard (with 800mm wide doors and 900mm wide corridors) require \$3 335 of additional construction cost
- The weighted average cost to provide gold compliant internal doors and corridors in townhouses is therefore \$2 676.

These assumptions and calculations are documented in table I.1 and I.2 (design element 3: internal doors and corridors).

These tables also show that there are majority (85 per cent) of townhouse buildings would choose front entry solution for compliance while a small proportion (15 per cent) requires garage access.

I.1 Estimated cost to comply with LHGD Silver: townhouse

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Weighted average
	\$	\$	\$	\$	\$	\$
1A. Step-free path to dwelling (option A)	425	931	-	-		501
	(85%)	(15%)				
1B. Single-step access to dwelling (option B)	0					0
	(100%)					
2. Dwelling entrance	0	175				105
	(40%)	(60%)				
3. Internal doors and corridors	0	942				659
	(30%)	(70%)				
4. Toilet on ground level	0	80	2 619	3 537	4 409	951
	(%)	(70%)	(20%)	(8%)	(2%)	
5. Shower	0					0
	(100%)					
6. Reinforcement of bathroom and toilet walls	0	130				124
	(5%)	(95%)				
7. Internal stairways	0					0
	(%)	(%)				
Total (Option A)						2 340
Total (Option B)						1 839

Source: DCWC estimates.

I.2 Estimated cost to comply with LHDG Gold: Townhouse

Design element	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Weighted average
	\$	\$	\$	\$	\$	\$
1A. Step-free path to dwelling (option A)	620	931	1 571	640		681
	(85%)	(13%)	(2%)	(0%)		
1B. Single-step access to dwelling (option B)	0					0
	(100%)					
2. Dwelling entrance	0	100	347	172		253
	(10%)	(10%)	(60%)	(20%)		
3. Internal doors and corridors	0	509	3 335	2 393		2 676
	(%)	(20%)	(70%)	(10%)		

Design element	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Weighted average
	\$	\$	\$	\$	\$	\$
4. Toilet on ground level	0 (%)	1 097 (70%)	4 064 (20%)	4 689 (8%)	6 848 (2%)	2 093
5. Shower	0 (15%)	2 888 (58%)	3 750 (17%)	6 920 (8%)	9 367 (2%)	3 051
6. Reinforcement of bathroom and toilet walls	0 (5%)	130 (95%)				124
7. Internal stairways	0 (10%)	2 974 (90%)				2 677
8. Kitchen	0 (40%)	2 035 (60%)	0 (%)			1 221
9. Laundry	0 (70%)	1 017 (30%)	0 (%)			305
10. Ground-level bedroom space	0 (%)					0
11. Light switches	0 (%)					0
12. Door handles	0 (%)					0
Total (Option A)						13 079
Total (Option B)						12 398

Source: DCWC estimates.

Other data we have used

To generate a central estimate for apartments, we use approvals data (ABS Cat 8731), where apartments built in walk-up blocks make up 8 per cent of approvals and apartments built in lift-blocks make up 92 per cent of apartments.

To generate a central estimate for detached houses, we use estimates from DCWC: volume builds are 57 per cent and custom builds are 43 per cent. Townhouses are treated as a separate category.

Summary of DCWC's cost estimates

Tables I.3 through I.7 report the summary cost estimates for each of the five building types. For details please refer to Appendices A to F of the accompanying DCWC report.

I.3 Estimated cost to comply with LHDG standards: Townhouse

Design element	Silver	Gold	Gold+
	\$	\$	\$
1A. Step-free path to dwelling (option A)	501	681	681
1B. Single-step access to dwelling (option B)	0	0	0
2. Dwelling entrance	105	253	253
3. Internal doors and corridors	659	2 676	2 676
4. Toilet on ground level	951	2 093	2 093
5. Shower	0	3 051	3 051
6. Reinforcement of bathroom and toilet walls	124	124	124
7. Internal stairways	0	2 677	2 677
8. Kitchen	0	1 221	2 848
9. Laundry	0	305	1 136
10. Ground-level bedroom space	0	0	0
11. Light switches	0	0	0
12. Door handles	0	0	0
13. Window sills	0	0	119
Total (Option A)	2 340	13 079	15 656
Total (Option B)	1 839	12 398	14 975

Source: DCWC estimates.

I.4 Estimated cost to comply with LHDG standards: Volume home

Design element	Silver	Gold	Gold+
	\$	\$	\$
1A. Step-free path to dwelling (option A)	501	681	681
1B. Single-step access to dwelling (option B)	0	0	0
2. Dwelling entrance	18	112	112
3. Internal doors and corridors	565	2 154	2 154
4. Toilet on ground level	326	1 284	1 284
5. Shower	0	2 536	2 536
6. Reinforcement of bathroom and toilet walls	124	124	124
7. Internal stairways	0	0	0
8. Kitchen	0	1 221	2 848
9. Laundry	0	305	1 136
10. Ground-level bedroom space	0	0	0
11. Light switches	0	0	0
12. Door handles	0	0	0
13. Window sills	0	0	238
Total (Option A)	1 533	8 417	11 113
Total (Option B)	1 032	7 736	10 432

Source: DCWC estimates.

I.5 Estimated cost to comply with LHDG standards: Custom home

Design element	Silver	Gold	Gold+
	\$	\$	\$
1A. Step-free path to dwelling (option A)	551	738	738
1B. Single-step access to dwelling (option B)	0	0	0
2. Dwelling entrance	0	80	80
3. Internal doors and corridors	283	1 255	1 255
4. Toilet on ground level	326	1 390	1 390
5. Shower	0	2 238	2 238
6. Reinforcement of bathroom and toilet walls	124	124	124
7. Internal stairways	0	0	0
8. Kitchen	0	814	1 831
9. Laundry	0	305	1 136
10. Ground-level bedroom space	0	0	0
11. Light switches	0	0	0
12. Door handles	0	0	0
13. Window sills	0	0	356
Total (Option A)	1 283	6 944	9 148
Total (Option B)	732	6 206	8 411

Source: DCWC estimates.

I.6 Estimated cost to comply with LHDG standards: Walk-up apartment

Design element	Silver	Gold	Gold+
	\$	\$	\$
1A. Step-free path to dwelling (option A)	0	0	0
1B. Single-step access to dwelling (option B)	0	0	0
2. Dwelling entrance	0	80	80
3. Internal doors and corridors	819	2 966	2 966
4. Toilet on ground level	379	1 539	1 539
5. Shower	0	3 063	3 063
6. Reinforcement of bathroom and toilet walls	124	124	124
7. Internal stairways	0	0	0
8. Kitchen	0	1 229	2 948
9. Laundry	0	369	1 372
10. Ground-level bedroom space	0	0	0
11. Light switches	0	0	0
12. Door handles	0	0	0
13. Window sills	0	0	119
Total (Option A)	1 322	9 368	12 210
Total (Option B)	1 322	9 368	12 210

Source: DCWC estimates.

I.7 Estimated cost to comply with LHDG standards: Apartment building with 4 or more storeys

Design element	Silver	Gold	Gold+
	\$	\$	\$
1A. Step-free path to dwelling (option A)	4 373	7 713	7 713
1B. Single-step access to dwelling (option B)	0	0	0
2. Dwelling entrance	0	40	40
3. Internal doors and corridors	819	2 966	2 966
4. Toilet on ground level	695	2 391	2 391
5. Shower	0	1 900	1 900
6. Reinforcement of bathroom and toilet walls	124	124	124
7. Internal stairways	0	0	0
8. Kitchen	0	737	1 720
9. Laundry	0	369	1 372
10. Ground-level bedroom space	0	0	0
11. Light switches	0	0	0
12. Door handles	0	0	0
13. Window sills	0	0	166
Total (Option A)	6 011	16 239	18 391
Total (Option B)	1 637	8 526	10 678

Source: DCWC estimates.

J Space costs estimates

In addition to construction costs, incorporating accessibility standards into the NCC will impact the space of buildings. To estimate these impacts, we use estimates from DCWC, land values data and data from our own survey.

Framing assumptions for understanding these impacts

Based on their professional judgement, DCWC assume:

- Where townhouses and detached houses require more space to incorporate space changes, the footprint of these dwellings expand to incorporate this space. Therefore, we must value the cost of this additional space.
- Where apartments require more space, they are redesigned. In effect this involves space apportioning away from 'living areas' (loungerooms/dining areas, bedrooms) allocating it to 'functional rooms' (bathrooms, laundries, kitchens, etc.). Therefore, we must understand the lost amenity to buyers from having space reallocated in this way.

Where houses and townhouses expand in space, we assume the cost of this expansion is \$506 per square metre (see table 5.7). Where apartments are reallocated, we assume the cost of this is \$4 517 per square metre (see table 5.8).

Underlying assumptions for estimating the space impacts

Based on their professional judgement, DCWC estimates the key drivers of space impacts of LHDG standards for each design element for houses and apartments (see table J.1).

As can be seen from the table, there are multiple entries (lines) for one element (same numbering) which reflect different ways to meet the required standard or different baselines (for example for those Silver compliant entry element, the required space to meet Gold or Gold+ standard is less than those not complying with the Silver standard).

J.1 Potential impact of LHDG standards on the space of new dwellings

	Silver	Gold	Gold +
	sqm	sqm	sqm
House			
1b. Larger car space	0.78	0.78	0.78
1b. Larger space and increased height		0.78	0.78
2. Dwelling entrance - larger landing	0.54	0.92	0.92
2. Dwelling entrance - less larger landing (from Silver compliant)		0.38	0.38
3. Wider doors and wider corridor	0.50	1.50	1.50
3. Wider doors and less wider corridor (from Silver compliant)		1.00	1.00
4. Toilet - additional clear space with slider door design	0.00	0.54	0.54
4. Toilet - additional clear space with swing door design	1.39	2.16	2.16
4. New toilet with slider door design	1.58	2.10	2.10
4. New toilet with swing door design	2.34	3.12	3.12
5. Shower - additional space with slider door design		1.53	1.53
5. Shower - additional space with swing door design		1.99	1.99
5. New shower with slider door design		3.15	3.15
5. New shower with swing door design		4.27	4.27
7. Internal stairways		1.35	1.35
8. Kitchen space		1.08	2.16
8. Kitchen space (from Gold to Gold+)			1.08
9. Laundry space		0.54	1.17
9. Laundry space (from Gold to Gold+)			0.63
Apartment			
3. Wider corridor	0.60	1.80	1.80
3. Wider corridor (form Silver to Gold/Gold+)		1.20	1.20
4. Toilet - additional clear space with slider door design	0.00	0.54	0.54
4. Toilet - additional clear space with swing door design	1.39	2.16	2.16
5. Shower - additional space with slider door design		1.53	1.53
5. Shower - additional space with swing door design		1.99	1.99
8. Kitchen space		1.08	2.16
8. Kitchen space (from Gold to Gold+)			1.08
9. Laundry space		0.54	1.17
9. Laundry space (from Gold to Gold+)			0.63
9. Laundry space		0.72	1.17

Source: CIE.

DCWC consider scenarios for new builds where incorporating the LHDG standards creates different impacts. In these scenarios, accompanying 'scenario weights' or share of new builds, impose different impacts on new builds. For example, these scenarios imply

that for volume houses, only 15 per cent of new build volume houses require larger car space, 10 per cent require more space for entrance, 60 per cent require wider corridors, 10 per cent require additional clear space for toilet to meet LHDG silver (another 80 per cent could meet Silver by replacing a swing door with a cavity slider door, without requiring additional space). This means that the weighted average space impact of LHDG silver on new volume houses is therefore 0.61 sqm (table J.2).

Our assumptions for all new build homes, for Silver, Gold and Gold+ are as follows.

Space impacts: detached houses

J.2 Total impact of Silver standard on space of volume build detached houses

	Scenario weight for space impact	Potential impact	Weighted average impact	Total impact
	Probability	Sqm	sqm	\$
1b. Larger car space	15%	0.78	0.12	
2. Dwelling entrance - larger landing	10%	0.54	0.05	
3. Wider doors and wider corridor	60%	0.50	0.30	
4. Toilet - additional clear space with slider door design	80%	0.00	0.00	
4. Toilet - additional clear space with swing door design	10%	1.39	0.14	
Total impact			0.61	309

Source: CIE.

J.3 Total impact of Gold standard on space of volume build detached houses

	Scenario weight for space impact	Potential impact	Weighted average impact	Total impact
	Probability	Sqm	sqm	\$
1b. Larger car space	13%	0.78	0.10	
1b. Larger space and increased height	2%	0.78	0.02	
2. Dwelling entrance - larger landing	10%	0.92	0.09	
2. Dwelling entrance - less larger landing (from Silver compliant)	10%	0.38	0.04	
3. Wider doors and wider corridor	60%	1.50	0.90	
3. Wider doors and less wider corridor (from Silver compliant)	0%	1.00	0.00	
4. Toilet - additional clear space with slider door design	80%	0.54	0.43	
4. Toilet - additional clear space with swing door design	10%	2.16	0.22	
5. Shower - additional space with slider door design	76%	1.53	1.16	

	Scenario weight for space impact	Potential impact	Weighted average impact	Total impact
	Probability	Sqm	sqm	\$
5. Shower - additional space with swing door design	9%	1.99	0.19	
8. Kitchen space	60%	1.08	0.65	
9. Laundry space	30%	0.54	0.16	
Total impact			3.95	2 000

Source: CIE.

J.4 Total impact of Gold+ standard on space of volume build detached houses

	Scenario weight for space impact	Potential impact	Weighted average impact	Total impact
	Probability	Sqm	sqm	\$
1b. Larger car space	13%	0.78	0.10	
1b. Larger space and increased height	2%	0.78	0.02	
2. Dwelling entrance - larger landing	10%	0.92	0.09	
2. Dwelling entrance - less larger landing (from Silver compliant)	10%	0.38	0.04	
3. Wider doors and wider corridor	60%	1.50	0.90	
3. Wider doors and less wider corridor (from Silver compliant)	0%	1.00	0.00	
4. Toilet - additional clear space with slider door design	80%	0.54	0.43	
4. Toilet - additional clear space with swing door design	10%	2.16	0.22	
5. Shower - additional space with slider door design	76%	1.53	1.16	
5. Shower - additional space with swing door design	9%	1.99	0.19	
8. Kitchen space	60%	2.16	1.30	
8. Kitchen space (from Gold to Gold+)	20%	1.08	0.22	
9. Laundry space	30%	1.17	0.35	
9. Laundry space (from Gold to Gold+)	40%	0.63	0.25	
Total impact			5.26	2 661

Source CIE.

J.5 Total impact of Silver standard on space of custom build detached houses

	Scenario weight for space impact	Potential impact	Weighted average impact	Total impact
	Probability	Sqm	sqm	\$
1b. Larger car space	25%	0.78	0.20	
2. Dwelling entrance - larger landing	0%	0.54	0.00	
3. Wider doors and wider corridor	30%	0.50	0.15	
4. Toilet - additional clear space with slider door design	80%	0.00	0.00	
4. Toilet - additional clear space with swing door design	10%	1.39	0.14	
Total impact			0.48	245

Source: CIE.

J.6 Total impact of Gold standard on space of custom build detached houses

	Scenario weight for space impact	Potential impact	Weighted average impact	Total impact
	Probability	Sqm	sqm	\$
1b. Larger car space	19%	0.78	0.15	
1b. Larger space and increased height	6%	0.78	0.05	
2. Dwelling entrance - larger landing	0%	0.92	0.00	
2. Dwelling entrance - less larger landing (from Silver compliant)	0%	0.38	0.00	
3. Wider doors and wider corridor	30%	1.50	0.45	
3. Wider doors and less wider corridor (from Silver compliant)	0%	1.00	0.00	
4. Toilet - additional clear space with slider door design	80%	0.54	0.43	
4. Toilet - additional clear space with swing door design	10%	2.16	0.22	
4. New toilet with slider door design	9%	0.54	0.05	
4. New toilet with swing door design	1%	0.77	0.01	
5. Shower - additional space with slider door design	67%	1.53	1.02	
5. Shower - additional space with swing door design	8%	1.99	0.17	
8. Kitchen space	40%	1.08	0.43	
9. Laundry space	30%	0.54	0.16	
Total impact			3.13	1 585

Source: CIE.

J.7 Total impact of Gold+ standard on space of custom build detached houses

	Scenario weight for space impact	Potential impact	Weighted average impact	Total impact
	Probability	Sqm	sqm	\$
1b. Larger car space	19%	0.78	0.15	
1b. Larger space and increased height	6%	0.78	0.05	
2. Dwelling entrance - larger landing	0%	0.92	0.00	
2. Dwelling entrance - less larger landing (from Silver compliant)	0%	0.38	0.00	
3. Wider doors and wider corridor	30%	1.50	0.45	
3. Wider doors and less wider corridor (from Silver compliant)	0%	1.00	0.00	
4. Toilet - additional clear space with slider door design	80%	0.54	0.43	
4. Toilet - additional clear space with swing door design	10%	2.16	0.22	
4. New toilet with slider door design	9%	0.54	0.05	
4. New toilet with swing door design	1%	0.77	0.01	
5. Shower - additional space with slider door design	67%	1.53	1.02	
5. Shower - additional space with swing door design	8%	1.99	0.17	
7. Internal stairways	0%	1.35	0.00	
8. Kitchen space	40%	2.16	0.86	
8. Kitchen space (from Gold to Gold+)	10%	1.08	0.11	
9. Laundry space	30%	1.17	0.35	
9. Laundry space (from Gold to Gold+)	40%	0.63	0.25	
Total impact			4.11	2 082

Source: CIE.

Space impacts: townhouses**J.8 Total impact of Silver standard on space of townhouses**

	Scenario weight for space impact	Potential impact	Weighted average impact	Total impact
	Probability	Sqm	sqm	\$
1b. Larger car space	15%	0.78	0.12	-
2. Dwelling entrance - larger landing	60%	0.54	0.32	-
3. Wider doors and wider corridor	70%	0.50	0.35	
4. Toilet - additional clear space with slider door design	70%	0.00	0.00	
4. Toilet - additional clear space with swing door design	20%	1.39	0.28	

	Scenario weight for space impact	Potential impact	Weighted average impact	Total impact
	Probability	Sqm	sqm	\$
4. New toilet with slider door design	8%	1.58	0.13	
4. New toilet with swing door design	2%	2.34	0.05	-
Total impact			1.24	629

Source: CIE.

J.9 Total impact of Gold standard on space of townhouses

	Scenario weight for space impact	Potential impact	Weighted average impact	Total impact
	Probability	Sqm	sqm	\$
1b. Larger car space	13%	0.78	0.10	
1b. Larger space and increased height	2%	0.78	0.02	
2. Dwelling entrance - larger landing	60%	0.92	0.55	
2. Dwelling entrance - less larger landing (from Silver compliant)	20%	0.38	0.08	
3. Wider doors and wider corridor	70%	1.50	1.05	
3. Wider doors and less wider corridor (from Silver compliant)	10%	1.00	0.10	
4. Toilet - additional clear space with slider door design	70%	0.54	0.38	
4. Toilet - additional clear space with swing door design	20%	2.16	0.43	
4. New toilet with slider door design	8%	2.10	0.17	
4. New toilet with swing door design	2%	3.12	0.06	
5. Shower - additional space with slider door design	58%	1.53	0.89	
5. Shower - additional space with swing door design	17%	1.99	0.33	
5. New shower with slider door design	8%	3.15	0.25	
5. New shower with swing door design	2%	4.27	0.09	
7. Internal stairways	90%	1.35	1.22	
8. Kitchen space	60%	1.08	0.65	
9. Laundry space	30%	0.54	0.16	
Total impact			6.52	3 302

Source: CIE.

J.10 Total impact of Gold+ standard on space of townhouses

	Scenario weight for space impact	Potential impact	Weighted average impact	Total impact
	Probability	Sqm	sqm	\$
1b. Larger car space	13%	0.78	0.10	
1b. Larger space and increased height	2%	0.78	0.02	
2. Dwelling entrance - larger landing	60%	0.92	0.55	
2. Dwelling entrance - less larger landing (from Silver compliant)	20%	0.38	0.08	
3. Wider doors and wider corridor	70%	1.50	1.05	
3. Wider doors and less wider corridor (from Silver compliant)	10%	1.00	0.10	
4. Toilet - additional clear space with slider door design	70%	0.54	0.38	
4. Toilet - additional clear space with swing door design	20%	2.16	0.43	
4. New toilet with slider door design	8%	2.10	0.17	
4. New toilet with swing door design	2%	3.12	0.06	
5. Shower - additional space with slider door design	58%	1.53	0.89	
5. Shower - additional space with swing door design	17%	1.99	0.33	
5. New shower with slider door design	8%	3.15	0.25	
5. New shower with swing door design	2%	4.27	0.09	
7. Internal stairways	90%	1.35	1.22	
8. Kitchen space	60%	2.16	1.30	
8. Kitchen space (from Gold to Gold+)	20%	1.08	0.22	
9. Laundry space	30%	1.17	0.35	
9. Laundry space (from Gold to Gold+)	40%	0.63	0.25	
Total impact			7.83	3 963

Source: CIE.

Space impacts: apartments

J.11 Total impact of Silver standard on space of apartments in walk-up blocks

	Scenario weight for space impact	Potential impact	Weighted average impact	Total impact
	Probability	Sqm	sqm	\$
3. Wider corridor	60%	0.60	0.36	-
4. Toilet - additional clear space with slider door design	80%	0.00	0.00	-
4. Toilet - additional clear space with swing door design	10%	1.39	0.14	-
Total impact			0.50	2 252

Source: CIE.

J.12 Total impact of Gold standard on space of apartments in walk-up blocks

	Scenario weight for space impact	Potential impact	Weighted average impact	Total impact
	Probability	Sqm	sqm	\$
3. Wider corridor	60%	1.80	1.08	
3. Wider corridor (form Silver to Gold/Gold+)	0%	1.20	0.00	
4. Toilet - additional clear space with slider door design	80%	0.54	0.43	
4. Toilet - additional clear space with swing door design	10%	2.16	0.22	
5. Shower - additional space with slider door design	76%	1.53	1.16	
5. Shower - additional space with swing door design	9%	1.99	0.19	
8. Kitchen space	50%	1.08	0.54	
9. Laundry space	30%	0.54	0.16	
Total impact			3.78	17 058

Source: CIE.

J.13 Total impact of Gold+ standard on space of apartments in walk-up blocks

	Scenario weight for space impact	Potential impact	Weighted average impact	Total impact
	Probability	Sqm	sqm	\$
3. Wider corridor	60%	1.80	1.08	
3. Wider corridor (form Silver to Gold/Gold+)	0%	1.20	0.00	
4. Toilet - additional clear space with slider door design	80%	0.54	0.43	
4. Toilet - additional clear space with swing door design	10%	2.16	0.22	

	Scenario weight for space impact	Potential impact	Weighted average impact	Total impact
	Probability	Sqm	sqm	\$
5. Shower - additional space with slider door design	76%	1.53	1.16	
5. Shower - additional space with swing door design	9%	1.99	0.19	
8. Kitchen space	50%	2.16	1.08	
8. Kitchen space (from Gold to Gold+)	20%	1.08	0.22	
9. Laundry space	30%	1.17	0.35	
9. Laundry space (from Gold to Gold+)	40%	0.63	0.25	
Total impact			4.97	22 465

Source: CIE.

J.14 Total impact of Silver standard on space of apartments in lift blocks

	Scenario weight for space impact	Potential impact	Weighted average impact	Total impact
	Probability	Sqm	sqm	\$
3. Wider corridor	60%	0.60	0.36	
3. Wider corridor (form Silver to Gold/Gold+)	0%	0.00	0.00	
4. Toilet - additional clear space with slider door design	80%	0.00	0.00	
4. Toilet - additional clear space with swing door design	20%	1.39	0.28	
Total impact			0.64	2 878

Source: CIE.

J.15 Total impact of Gold standard on space of apartments in lift blocks

	Scenario weight for space impact	Potential impact	Weighted average impact	Total impact
	Probability	Sqm	sqm	\$
3. Wider corridor	60%	1.80	1.08	
3. Wider corridor (form Silver to Gold/Gold+)	0%	1.20	0.00	
4. Toilet - additional clear space with slider door design	70%	0.54	0.38	
4. Toilet - additional clear space with swing door design	30%	2.16	0.65	
5. Shower - additional space with slider door design	35%	1.53	0.54	
5. Shower - additional space with swing door design	15%	1.99	0.30	
8. Kitchen space	30%	1.08	0.32	

	Scenario weight for space impact	Potential impact	Weighted average impact	Total impact
	Probability	Sqm	sqm	\$
9. Laundry space	30%	0.54	0.16	
Total impact			3.43	15 481

Source: CIE.

J.16 Total impact of Gold+ standard on space of apartments in lift blocks

	Scenario weight for space impact	Potential impact	Weighted average impact	Total impact
	Probability	Sqm	sqm	\$
3. Wider corridor	60%	1.80	1.08	
3. Wider corridor (from Silver to Gold/Gold+)	0%	1.20	0.00	
4. Toilet - additional clear space with slider door design	70%	0.54	0.38	
4. Toilet - additional clear space with swing door design	30%	2.16	0.65	
5. Shower - additional space with slider door design	35%	1.53	0.54	
5. Shower - additional space with swing door design	15%	1.99	0.30	
8. Kitchen space	30%	2.16	0.65	
8. Kitchen space (from Gold to Gold+)	10%	1.08	0.11	
9. Laundry space	30%	1.17	0.35	
9. Laundry space (from Gold to Gold+)	40%	0.63	0.25	
Total impact			4.30	19 424

Source: CIE.

Space impacts in willingness to pay methodology

As a check on the space cost estimates discussed above, we examined estimates from the survey data of WTP to avoid transfer of space from living areas and bedrooms to corridors, kitchen, laundry and bathrooms.

The WTP model described in appendix K estimated WTP to avoid a transfer of 5 percentage points of floor space of \$3.30 per week for owner-occupiers and \$2.48 per week for renters. The present values of 30-year streams of these 'use values' are \$2126 and \$1598, respectively. The model does not distinguish between dwelling types. Under Option 1 the weighted average impact across dwelling types on the proportion of space used for living areas and bedrooms is 0.6 percentage points, while the impact under Options 2 and 3 are 3.4 and 4.2 percentage points, respectively. Assuming the amenity costs of these impacts are proportionate to the 5 per cent impact, the disamenity from the Silver standard would be \$229 (capitalised in the purchase price) on average and the

disamenity from the Gold standard would be \$1 306, and the disamenity from the Gold Plus standard would be \$1 647.

These estimates are within the range discussed above for detached houses, but are lower than the amounts estimated for other housing types.

K Survey method and results

Introduction

This stated preference study was undertaken for the Australian Building Codes Board (ABCB) for the purpose of informing cost-benefit analysis (CBA) of options for increasing the accessibility of residential buildings in Australia. CBA is a systematic approach to weighing up the costs and benefits of alternative policy options in a common metric. Key steps in a CBA of changes in the accessibility of residential buildings include developing an understanding of the values placed by Australians on accessibility features in their own home as well as altruistic values placed on improvements in outcomes for people with limited mobility. These values, which correspond to the maximum amount that individuals would be willing to pay for an improvement or the minimum amount they would be willing to accept as compensation for a degradation, can be used to estimate the economic benefits of policy options as part of the CBA. The purpose of this study is to estimate these values.

Professor Riccardo Scarpa from University of Waikato has been engaged in a peer review role to provide technical advice in relation to the survey method, estimation of WTP and application of those estimates to the cost-benefit analysis. The approach set out in this appendix has been informed by Professor Scarpa's advice.

Research method

Community preferences for accessible housing features are expressed at least to an extent through their home purchasing and renting decisions. A lack of data on accessibility features for past property sales means it is difficult to use these decisions to understand preferences. Furthermore, these decisions may not reveal the community's willingness to pay for the provision of accessible housing features for other members of the community.

One approach to quantifying the values members of the community place on accessibility features in their own home and in the wider housing stock is through a stated preference survey designed to measure the willingness to pay (WTP) of different members of the community for different outcomes. This is the approach taken in this study.

We conducted two choice exercises consecutively within the same questionnaire:

- asking the respondent to imagine they are at the point of purchasing or renting their next home and asking the respondent to choose between dwellings with differing combinations of accessibility features at different prices/rents; and
- asking the respondent to choose between sets of housing outcomes for people with limited mobility generally.

The former exercise used a choice modelling (also known as a conjoint analysis or discrete choice experiment) approach. Under this technique, consumers respond to a carefully constructed survey instrument designed to elicit preferences. The overall choice modelling technique is well established in marketing and economic research fields. To date, however, there has not been a comprehensive national choice modelling study of demand for accessible housing in Australia that allows consideration of the policy issues now at hand. This component of the study captures the net private benefits or costs of:

- if the respondent has a person with limited mobility in their household, the accessibility and useability of the dwelling
- if the respondent does not have a person with limited mobility in their household, the ability to remain in the home if someone in their household suffers from limited mobility in the future
- any disamenity from accessibility features, and
- ability to entertain visits from friends and family with limited mobility.

The second exercise captures altruism and WTP for better outcomes for others. We used a single 'contingent valuation' question for each respondent, offering an improved accessible housing outcome at a specified increase in rates/taxes. The increases in rates/taxes would be varied across respondents, allowing us to identify the distribution of willingness to pay over the population.

The survey instrument was designed to meet best-practice in stated preference research. It comprised the following:

- a welcome, with instructions and information about privacy
- screening questions to ensure representative samples that exclude respondents with potential conflicts of interest
- questions about mobility limitations within the respondent's household
- factual information about accessibility features and questions about the accessibility features of the respondent's current home
- questions about attitudes towards accessibility features
- questions about the nature of the respondent's next home
- instructions about the choice questions
- six DCE questions – discussed in further detail below
- description of a proposed policy option and a 'cheap talk' script to limit hypothetical bias by reminding respondents of the consequentiality of the survey and their budget constraint
- a contingent valuation (CV) question – discussed in further detail below
- debriefing questions about the motivation behind and approach taken by the respondent to the DCE and CV questions, and
- further questions about the respondent's characteristics.

The questionnaire was developed through several stages of review and testing, including:

- review and input from ABCB and stakeholder consultations in response to the questionnaire structure included in the Issues Paper, and

- a pilot wave of survey fieldwork.

Discrete choice experiment questions

There are several important decisions that must be made when designing a DCE. These include:

- the features or attributes to be included in the choice tasks and how those attributes should be defined
- the number of alternatives to be included in each choice task
- the number of questions to be answered by each respondent
- the levels that the attributes can take in the questions
- the combinations of attribute levels in each question (that is, the experimental design), and
- the information, instructions and/or questions used to prepare respondents for the choice.

Housing attributes

The attributes included in the DCE were:

- Price/Rent
- Getting in and out
- Moving around indoors
- Living with limited mobility on same level as an entrance
- Modification that would be needed to make home suitable for ageing in place
- Total size of home compared to similar homes
- Amount of space used for: Corridors, bathroom, kitchen, laundry
- Amount of space used for: Living areas and bedrooms

These attributes were chosen to focus on the outcomes for people with or concerned about limited mobility.

For respondents indicating they would be likely to buy their next home, the cost attribute was defined as the purchase price. For other respondents, the cost attribute was defined as the weekly rent.

Alternatives per task

Each DCE question comprised two alternative homes. Although decision making is often reference-dependent, we decided against including the current home as a status quo option, as it would introduce the added complication of the value placed on sentimental attachment and avoided moving costs. These values, along with the fact that many respondents consider a move within the next five years as unlikely, mean that a status quo option would likely attract a large number of choices, which would detract from the experiment's ability to isolate the trade-offs respondents are willing to make between

price and accessibility features. To isolate these trade-offs, we asked respondents to imagine they were choosing between two homes at the point of their next home purchase/rent decision. Feedback from pretesting indicated that larger choice tasks involving three or more homes would be too complex.

Number of questions per respondent

The questionnaire included six choice tasks. The risk of respondents dropping out of self-administered questionnaires increases with the number of choice tasks presented. The number of respondents required to obtain statistically significant estimates of WTP reduces with the number of choice tasks presented to each respondent. A sequence of six choice tasks per respondent was judged to strike an appropriate balance between these two considerations.

Attribute levels

The attribute levels used in the DCE questions are set out in table K.1. Prices/rents were calculated using a reference price calculated as the midpoint of the price range that the respondent indicated they would expect to pay for their next home. Most of the price levels were designed below the reference price to ensure they lay within the respondent's budget constraint. In wave 2 of the survey fieldwork, different price levels were used depending on whether the respondent had indicated in a qualitative question they would prefer a home with at least some accessibility features. Analysis of data from wave 1 indicated that WTP varied considerably with the response to this qualitative question. To improve the efficiency of the experimental design, this qualitative question was used as a filtering question to allocate respondents to one of two different designs, each with price levels that covered the range of WTP estimated from Wave 1 data for the best and worst combinations of attribute levels.

K.1 Attribute levels used in discrete choice experiment

Attribute	Levels
Price / Rent	Wave 1: Reference price/rent x 0.868, 0.884, 0.892, 0.896, 0.898, 0.899, 0.9, 0.901, 0.902, 0.904, 0.908, 0.916, 0.932, 0.964, 1.028 Wave 2: Respondents indicating a preference for at least some accessibility features: Reference price/rent x 0.7, 0.85, 0.89, 0.897, 0.903, 0.91, 0.95, 1.1 Other respondents: Reference price/rent x 0.902, 0.938, 0.947, 0.949, 0.951, 0.953, 0.962, 0.998
Getting in and out	Several steps Single step Step-free
Moving around indoors	Regular spaces – Suitable for some mobility aids Wide spaces – Suitable for most mobility aids, but not wheelchairs

Attribute	Levels
	Extra-wide spaces – Suitable for all mobility aids, including wheelchairs
Living with limited mobility on same level as an entrance	Unsuitable – No toilet or shower on entry level Suitable for short visits – Toilet, but no shower on entry level Suitable for living or overnight visits – Toilet, shower and bedroom on entry level
Modification that would be needed to make home suitable for ageing in place	Significant Minimal
Total size of home compared to similar homes	Same 5% larger
Amount of space used for: Corridors, bathroom, kitchen, laundry	40% 45% 50%
Amount of space used for: Living areas and bedrooms	Calculated as 100% minus the level for the attribute above

Source: CIE.

Experimental design

To conduct a DCE, the analyst needs to assign combinations of attribute levels to the various alternatives and questions. These combinations are referred to as the experimental design. The experimental design has a direct impact on the statistical significance of estimates of WTP. If some information about preferences is known, it is possible to generate an experimental design that can elicit statistically significant estimates of WTP from a smaller number of respondents than a randomly generated design.

The experimental design used in the first wave of fieldwork comprised two separate four-block designs – one in which the ‘total size of home’ attribute was held constant across alternatives and one in which it was not. This approach was taken for the initial design to manage risks raised in pretesting that the total size attribute would dominate the choice decision process.

Information on preferences gathered in the first wave of fieldwork was used to generate a design for the second and main wave of fieldwork. The approach minimised the statistical confidence intervals around the estimates of WTP derived from responses to the questions in the design.¹²³

The second and main wave of fieldwork used a design with 16 blocks of six questions, with each respondent answering only one block assigned using least-fill logic. The reason

¹²³ Two designs were combined for the main wave of fieldwork – one for blocks 1-8 and another for blocks 9-16. The designs were generated to minimise D-error (Scarpa and Rose 2008). The prior parameter estimates used to generate the efficiency criteria were based on estimates of WTP from basic multinomial logit models run on the data collected in the first wave of fieldwork. Constraints were included in the design search to preclude illogical alternatives and to set ranges for the number of times each attribute level could appear in the design.

for using multiple blocks was to improve design efficiency and limit the impact of any single choice task on the results.

K.2 Example of choice question

	Dwelling A	Dwelling B
Price	\$665,000	\$628,000
Getting in and out	Step-free	Single step
Moving around indoors	Wide spaces Suitable for most mobility aids, but not wheelchairs	Regular spaces Suitable for some mobility aids
Living with limited mobility on same level as entrance	Suitable for short visits Toilet, but no shower on entry level	Unsuitable No toilet or shower on entry level
Modification that would be needed to make home suitable for ageing in place	Significant	Significant
Total size of home compared to similar homes	5% larger	Same
Amount of space used for:		
Corridors, bathroom, kitchen, laundry	45%	40%
Living areas and bedrooms	55%	60%
If these were my only options, I would choose:	<input type="radio"/>	<input type="radio"/>

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Data source: CIE.

Contingent valuation question

Respondents were shown an accessibility standard, described in terms of the attributes used in the DCE, and told that the proportion of the housing stock meeting this standard is currently very low and is expected to remain low and that it is not enough to provide accessible homes for all Australians with a disability who use a mobility aid (around 5 per cent of households). Respondents were also told:

As a result, some people with limited mobility have difficulty finding an accessible home and instead live in unsuitable housing with a carer. This can lead to health risks from slips, trips and falls and places extra demands on carers.

Some people with limited mobility also experience social isolation due to difficulty visiting homes of friends and family.

Without additional government action, the proportion of housing in Australia that meets the accessibility standard is expected to remain below 5%.

Governments have a range of ways to increase the amount of accessible housing, including building regulations, incentives schemes, land-use planning and public housing. The share of accessible housing could be increased to 15% of overall housing by 2035, which would greatly improve the chances of Australians with limited mobility finding suitable homes.

However, this would come at a cost that would need to be covered by an increase in rates and taxes.

Respondents were then asked a closed-ended, dichotomous-choice contingent valuation question, the form of which is shown in figure K.3. The cost level shown in the question varied across respondents. In Wave 1 fieldwork, the cost levels were \$5, \$20, \$50 and \$200. Analysis of Wave 1 data suggested there could be a ‘fat tail’ problem, with 17 per cent (5 of 41) of respondents shown the \$200 cost indicating they would definitely vote for the policy. In Wave 2 fieldwork, the vector of levels was revised to \$5, \$20, \$100 and \$500 to manage the risk of this problem. A certainty scale was used to mitigate yeasaying bias in accordance with best-practice from the field of environmental valuation. Reminders (a ‘cheap talk’ script) about consequentiality and budget constraints were included to mitigate hypothetical bias.

K.3 Example of contingent valuation question

The screenshot shows a survey interface for Pureprofile. At the top, it says 'Pureprofile' and 'Survey progress: 84%'. The question is labeled 'Q32'. Below the question title is a 'Remember' box containing two bullet points: 'The results of this survey will influence the amount of accessible housing and the rates/taxes you pay' and 'There may be other things you would prefer to spend your money on.' The main question text reads: 'If a policy to increase the amount of accessible housing to 15% by 2035 permanently increased the rates and taxes you pay each year by \$5, would you vote for the policy?'. Below this, it says 'Please select one response.' and lists five radio button options: 'At that cost to me, I definitely would vote for the policy', 'At that cost to me, I probably would vote for the policy', 'At that cost to me, I am not sure whether I would vote for the policy', 'At that cost to me, I probably would not vote for the policy', and 'At that cost to me, I definitely would not vote for the policy'. At the bottom of the question area are 'Back' and 'Next' buttons. The footer of the survey includes 'Powered by Pureprofile', 'Tech Support', and 'Take me back to Pureprofile'.

Data source: CIE.

The cost attribute was defined as an ongoing payment to reflect the ongoing nature of the costs involved in the policy options. We chose a broad payment vehicle of taxes and rates. Alternative, more specific vehicles, such as an increase in the price of new homes, were problematic since they are seen to be avoidable by significant proportions of the population.

Debriefing

Respondents were asked, on a scale of 1 to 10, how much their decision was based on outcomes for other people. The purpose of this question is to enable WTP to be scaled to the altruism-only component to avoid double-counting with WTP for accessibility features in the respondent’s own home.

Debriefing questions were also included on the reasons for their answer to the CV question and the extent to which they believed the survey would affect government action on accessible housing and on the rates and taxes they pay.

The sample

Recruitment

The fieldwork was conducted in December 2019 and January 2020. All respondents were sampled through the Pureprofile online panel and were compensated for their time through Pureprofile's rewards system.

Overall, 2062 respondents completed the questionnaire. There were 66 incomplete responses. Other respondents were screened out because either:

- they did not hold an Australian citizenship or permanent resident visa;
- they or someone else in their household work for the Australian Building Codes Board; or
- the quotas for their age, gender or location categories had already been filled.

Quotas were set using Australian Bureau of Statistics data Cat. No. 3235.0 Table 3 and Cat. No. 3101.0 Table 8.

Characteristics

The sample was representative of the national population of people aged 18 years and over in terms of age, gender and location. People speaking languages other than English at home and the highest-income households were under-represented, while households with income in the range \$78,000 to \$104,000 per year were over-represented. We used raking to generate poststratification weights based on the language, income and age characteristics of the target population. The reweighted sample characteristics are very close to those of the target population, which provides confidence that results can be generalised to the population.

K.4 Characteristics of sample, reweighted sample and target population

	Sample No.	Sample per cent	Reweighted sample per cent	Target population per cent
Survey duration				
Median (minutes)	10.77			
Wave of fieldwork				
Wave 1	163			
Wave 2	1 899			
Age				
18-19 years	64	3.1%	3.2%	3.2%
20-29 years	373	18.1%	18.6%	18.6%
30-39 years	397	19.3%	18.5%	18.5%
40-49 years	320	15.5%	16.8%	16.8%
50-59 years	326	15.8%	15.8%	15.7%

	Sample No.	Sample per cent	Reweighted sample per cent	Target population per cent
60-69 years	282	13.7%	13.2%	13.2%
70-79 years	199	9.7%	8.8%	8.8%
80 years or over	101	4.9%	5.1%	5.1%
Gender ^a				
Male	1 043	50.6%	50.6%	49.6%
Female	1 009	48.9%	49.0%	50.4%
Non-binary	6	0.3%	0.2%	0.0%
Prefer not to say	4	0.2%	0.2%	0.0%
Location				
Metro				
NSW	425	20.6%	22.1%	20.9%
VIC	407	19.7%	21.3%	19.9%
QLD	202	9.8%	9.9%	9.9%
SA	120	5.8%	5.4%	5.4%
WA	175	8.5%	8.4%	8.2%
TAS	24	1.2%	0.9%	0.9%
ACT	36	1.7%	1.8%	1.7%
NT	6	0.3%	0.3%	0.6%
Regional				
NSW	233	11.3%	10.0%	11.0%
VIC	125	6.1%	6.0%	6.0%
QLD	214	10.4%	9.6%	10.2%
SA	34	1.6%	1.6%	1.6%
WA	32	1.6%	1.4%	2.1%
TAS	26	1.3%	1.2%	1.2%
ACT		0.0%	0.0%	0.0%
NT	2	0.1%	0.1%	0.4%
Language other than English spoken at home?				
No, English only	1 763	85.5%	72.7%	72.7%
Yes	299	14.5%	27.3%	27.3%
Tenure type				
Owned outright or with a mortgage	1 355	65.7%	66.2%	67.3%
Being rented or occupied rent-free	678	32.9%	32.4%	31.8%
Other (please specify)	29	1.4%	1.4%	1.0%
Household composition				
Couple/family without children at home	667	32.3%	31.5%	27.0%
Couple/family with children at home	612	29.7%	30.8%	31.9%

	Sample No.	Sample per cent	Reweighted sample per cent	Target population per cent
One parent family	124	6.0%	5.7%	11.3%
Group household	167	8.1%	8.0%	4.3%
Single person household	426	20.7%	20.4%	24.4%
Cared accommodation (e.g. nursing home, aged care hostel)	5	0.2%	0.2%	
Other	61	3.0%	3.4%	1.2%
Income ^b				
Less than \$41,600 per year (less than \$800 per week)	528	25.6%	27.3%	27.3%
\$41,600 - \$78,000 per year (\$800 - \$1,500 per week)	499	24.2%	22.1%	22.1%
\$78,000 - \$104,000 per year (\$1,500 - \$2,000 per week)	353	17.1%	11.3%	11.3%
\$104,000 - \$156,000 per year (\$2,000 - \$3,000 per week)	304	14.7%	16.0%	16.0%
More than \$156,000 per year (more than \$3,000 per week)	186	9.0%	13.9%	13.9%
Do not wish to answer	192	9.3%	9.3%	

^a Sample characteristic is gender, whereas population characteristic is sex

^b Income is household income, except for respondents in group households or cared accommodation. In those cases, income is personal income. Population targets are adjusted to account for this distinction and proportion of respondents not reporting income.

Source: CIE.

Roughly 30 per cent of respondents' households included at least one person with a temporary or permanent mobility limitation.

K.5 Mobility limitation characteristics

	Reweighted sample per cent
Does anybody in your household have difficulty, use aids or require assistance with moving around the home, moving away from home, or getting into or out of a bed or chair?	
Yes, I have a temporary (fewer than 6 months) mobility limitation	4.6%
Yes, I have an ongoing mobility limitation	11.9%
Yes, another person in my household has a temporary (fewer than 6 months) mobility limitation	6.5%
Yes, another person in my household has an ongoing mobility limitation	11.8%
No	69.5%
Prefer not to say	0.9%
Does anybody in your household have difficulty, use mobility aids or require assistance with personal care, including tasks such as showering, bathing, dressing or eating?	
Yes, I have a temporary (fewer than 6 months) personal care limitation	3.5%
Yes, I have an ongoing personal care limitation	8.7%
Yes, another person in my household has a temporary (fewer than 6 months) personal care limitation	5.5%
Yes, another person in my household has an ongoing personal care limitation	9.2%
No	76.3%

Rewighted sample	
	per cent
Prefer not to say	1.2%
Which aids, if any, are used by people in your household?	
Cane	6.0%
Crutches	6.3%
Walking frame	9.1%
Walking stick	10.6%
Wheelchair (manual)	4.7%
Wheelchair (electric)	3.1%
Scooter/gopher	2.9%
Modified car or car aid	2.5%
Other	3.1%
None	3.3%
Prefer not to say	0.2%
Thinking about the person in your household whose mobility is most limited, what is the extent of their mobility limitation?	
Has no difficulty moving around with the use of a mobility aid, but cannot easily walk 200 metres, cannot use stairs wit	12.4%
Has difficulty moving around, even with the use of a mobility aid, but doesn't need assistance from a carer	8.1%
Sometimes needs assistance from a carer to move around, even with the use of a mobility aid	6.3%
Always needs assistance from a carer to move around, even with the use of a mobility aid	2.3%
Prefer not to say	0.4%
Do you have a family member or friend with limited mobility who visits you or would visit you if your home was accessible?	
Yes	29.6%
No	63.8%
Unsure	6.6%

Source: CIE.

Attitudes towards accessible housing

Around half of respondents indicated they considered accessibility to some extent when choosing their current home and 70 per cent indicated they would prefer their next home to have at least some accessibility features.

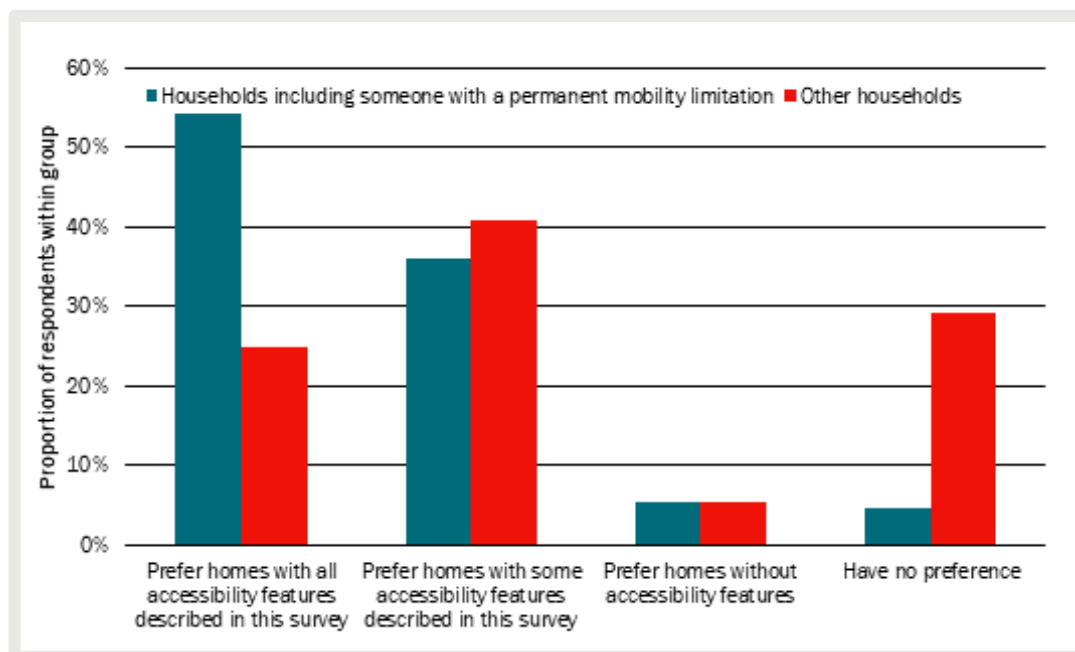
K.6 Attitudes towards accessible housing

	Reweighted sample
	per cent
To what extent did you consider accessibility when choosing your current home?	
It was an important consideration	20.2%
It was a minor consideration	28.5%
I did not consider it at all	51.3%
If you were buying/renting a new home now, would you...	
Prefer homes with all accessibility features described in this survey	29.7%
Prefer homes with some accessibility features described in this survey	40.3%
Prefer homes without accessibility features	5.3%
Have no preference	24.8%
What is your main reason for preferring accessibility features?	
The ease of access and use now	36.7%
To avoid/delay the need to move later	33.3%
To receive visits from family and friends with limited mobility	23.7%
The look and feel of the features	13.1%
Other (please specify)	2.1%
What is your main reason for preferring homes without accessibility features?	
I dislike the look and feel of the features	2.4%
I prefer larger living areas and bedrooms	2.1%
I prefer steeply sloped blocks	0.9%
Other (please specify)	0.1%

Source: CIE.

Households containing someone with a mobility limitation were more likely than other households to prefer a home with all of the accessibility features described in the survey. However, more than half of households that do not contain a person with mobility limitation indicated they would prefer their next home to include at least some accessibility features.

K.7 Preference for accessibility features by current mobility limitation status



Data source: CIE.

Characteristics of the existing housing stock

Most existing homes have a toilet (85 per cent) and a shower (75 per cent) on the same level as an entrance. Around 80 per cent of homes have either no stairs or a straight stairway. Other accessibility features are less common. A step-free entrance and a step-free shower are both reported by around one third of respondents. Roughly one fifth of respondents thought there would be sufficient space for turning a wheelchair in all corridors, bathroom, kitchen and laundry spaces in their home. Around 13 per cent thought that their door openings were wider than most other homes.

K.8 Accessibility features in the existing housing stock

	Reweighted sample
	per cent
Path to entrance	
no steps between street/parking and the entrance	31.6%
a single step between street/parking and the entrance	34.1%
several steps between street/parking and the entrance	34.2%
Door opening width	
door openings similar to other homes	82.1%
door openings wider than most other homes	12.6%
Don't know	5.3%

	Reweighted sample
	per cent
Would you say your current home has enough space for turning a wheelchair in corridors, bathrooms, kitchen and laundry? (If unsure, please make an educated guess)	
All of these spaces are large enough	20.7%
Some of these spaces are large enough	54.3%
None of these spaces are large enough	20.4%
I can't make an educated guess	4.7%
Shower entry	
Step-free shower entry	28.9%
Hob/kerb shower entry	36.1%
Stepped shower entry	24.8%
Shower over bath	13.9%
Don't know	1.5%
Does your current home have a toilet on the same level as an entrance?	
Yes	84.8%
No	13.4%
Don't know	1.7%
Does your current home have a shower on the same level as an entrance?	
Yes	74.6%
No	23.2%
Don't know	2.2%
Which type of indoor stairs, if any, does your current home have?	
Straight stairs	12.4%
Stairs with a half/quarter turn	17.7%
Curved/spiral stairs	4.4%
No stairs	67.6%

Source: CIE.

Willingness to pay for accessibility features in own home

In consultation with our peer review, Professor Riccardo Scarpa, we tested a range of models for different techniques and specifications, which were not ultimately used in our final model, including:

- Models estimated in WTP-space, which would not achieve convergence due to flat log-likelihood functions
- Mixed logit models, which did not appear to capture the bi-modal nature of the distribution of preferences, despite the inclusion of interactions with respondent characteristics to shift the means of random parameters

- Interactions between the price variable and various thresholds related to the respondent reference price and to price itself (a quadratic term), some of which were significant but caused sign reversals and outliers when calculating WTP at an individual respondent level
- Pooling buyers and renters in the same model, with appropriate interaction terms, which was abandoned given the likelihood of differences in scale between the two groups
- Interactions between the accessibility features, which tended to be insignificant, noting that the ‘modifications’ feature is effectively an interaction indicating the provision of all three of the other accessibility features in the model.

The choice questions included prices calculated as a function of the midpoint of the price range in which the respondent indicated they would be shopping for a new home. To overcome concerns about endogeneity, we used an instrumental variable. The price variable included in the final model measures the prices shown in the choice options as a proportion of the reference price midpoint predicted for each respondent using the ordinary-least squares regressions shown in table K.9. The upper and lower bounds of the 95 per cent confidence intervals of the predictions were used to test sensitivity. We use the upper bound in our central model as a conservative approach given the potential for hypothetical bias to inflate WTP estimates.

K.9 Models for predicting respondent reference prices

Variable	Renters		Buyers	
	Coef.	Z value	Coef.	Z value
Age	2.09	4.17	-1 056	-1.31
Age squared	-0.02	-4.46	22	2.75
NSW regional	-47.58	-8.07	-273 329	-29.73
Victoria metropolitan	-30.24	-5.75	-149 886	-20.27
Victoria regional	-101.03	-13.69	-354 320	-30.83
Queensland metropolitan	-57.34	-9.29	-272 443	-28.31
Queensland regional	-51.56	-8.29	-321 848	-34.95
South Australia metropolitan	-78.48	-9.56	-264 691	-24.43
South Australia regional	-93.89	-7.47	-404 450	-20.16
Western Australia metropolitan	-108.55	-15.28	-295 817	-31.45
Western Australia regional	-95.10	-7.31	-397 572	-19.52
Tasmania metropolitan	1.67	0.10	-337 678	-15.59
Tasmania regional	-119.77	-7.98	-490 538	-22.47
Australian Capital Territory	-30.29	-2.33	-292 504	-15.84
Northern Territory	-128.59	-6.46	-310 902	-6.57
Owner-occupier	-59.38	-16.74	118 978	17.08
Detached dwelling	17.71	5.14	56 183	9.56
Couple with children	42.69	8.25	-10 756	-1.77
Single parent	3.80	0.57	-67 950	-5.28
Group household	6.40	1.07	6 048	0.50

Variable	Renters		Buyers	
	Coef.	Z value	Coef.	Z value
Single person household	-24.36	-5.16	-20 454	-2.74
Other household	-32.45	-3.91	-45 962	-2.72
Income: \$41,600 - \$78,000 per year	62.85	14.80	79 840	10.14
Income: \$78,000 - \$104,000 per year	142.94	24.91	177 760	20.82
Income: \$104,000 - \$156,000 per year	103.74	15.35	260 590	29.12
Income: More than \$156,000 per year	254.94	28.58	460 690	46.88
Income: Do not wish to answer	43.36	7.55	224 918	20.99
Constant	268.70	21.14	522 572	26.01
Model fit				
Individuals	10 680		14 064	
R-squared	0.228		0.344	

Note: Dependent variable in the renters model is the midpoint of the range in weekly rent indicated by the respondent. Dependent variable in the buyer model is the midpoint of the range in purchase price indicated by the respondent.

Source: CIE.

The distribution of preferences for accessibility features over respondents appears to be bi-modal, with some people liking the features and others being neutral towards or even disliking the features. To capture this distribution, we use latent class multinomial logit models, which estimate indirect utility functions for a user-specified number of classes along with class membership probabilities.

Our central models estimated on the full samples of buyers and renters respectively are set out in table K.10 and table K.11. Respondents carefully considered the attributes described in the questions, as evidenced by the relatively large Z values (a Z value of around 2 indicates that at the 95 per cent confidence level we can say the coefficient is statistically different from zero).

A high-level examination of the two classes suggests that Class 1 represents respondents who prefer accessibility features and Class 2 represents respondents who do not. Class 2 is much more price sensitive and prefers a smaller share of floor space to be used for corridors, kitchen, bathroom and laundry. The average class probabilities are roughly 50-50.

Consistent with our expectations, the class membership parameters indicate that older respondents and respondents from households containing a person with a permanent mobility limitation are more likely hold Class 1 preferences.

K.10 Renter model of housing choice

	Class 1		Class 2	
	Coef.	Z value	Coef.	Z value
Price/rent as proportion of predicted reference value	-0.9159	-1.69	-10.670	-8.15
Price/rent * low income (dummy =1 if household income <\$41 600 p.a.)	-1.7835	-2.60	-27.127	-3.10
Getting in and out: Single step (dummy)	0.6358	5.99	0.189	1.79
Getting in and out: Step-free (dummy)	1.0035	8.58	0.205	1.83

	Class 1		Class 2	
	Coef.	Z value	Coef.	Z value
Moving around indoors: Wide spaces (dummy)	0.2412	3.27	0.208	2.54
Moving around indoors: Extra-wide spaces (dummy)	0.4389	4.92	0.092	1.00
Living on same level as entrance: Suitable for short visits (dummy)	0.9266	10.72	0.082	0.87
Living on same level as entrance: Suitable for living or overnight visits (dummy)	1.5161	11.04	-0.150	-1.31
Modification that would be needed: Minimal (dummy)	0.1840	0.87	0.404	1.91
Total size of home compared to similar homes: 5% larger (dummy)	0.1104	1.89	0.093	1.46
Space used for corridors, bathroom, kitchen, laundry: 45% (dummy)	-0.0205	-0.27	-0.092	-1.12
Space used for corridors, bathroom, kitchen, laundry: 50% (dummy)	-0.0808	-1.02	-0.152	-1.75
Class membership parameters				
Age (years)	0.0581	9.27		
Household with permanent mobility limitation (dummy)	1.1912	4.85		
Constant	-2.6752	-7.68		
Model fit				
Log likelihood	-3229			
Choice observations	5334			
Individuals	889			

Source: CIE.

K.11 Buyer model of housing choice

	Class 1		Class 2	
	Coef.	Z value	Coef.	Z value
Price/rent as proportion of predicted reference value	-1.5597	-2.61	-5.320	-9.38
Price/rent * low income (dummy =1 if household income <\$41 600 p.a.)	-2.0394	-2.18	-5.388	-2.66
Getting in and out: Single step (dummy)	1.1819	8.83	0.123	1.53
Getting in and out: Step-free (dummy)	1.6405	10.99	0.270	3.14
Moving around indoors: Wide spaces (dummy)	0.3749	4.39	0.229	3.73
Moving around indoors: Extra-wide spaces (dummy)	0.5377	5.35	0.140	2.05
Living on same level as entrance: Suitable for short visits (dummy)	1.4574	13.70	0.133	2.00
Living on same level as entrance: Suitable for living or overnight visits (dummy)	2.6255	15.19	0.037	0.41
Modification that would be needed: Minimal (dummy)	0.4764	1.80	0.415	2.71
Total size of home compared to similar homes: 5% larger (dummy)	0.1677	2.49	0.141	3.03
Space used for corridors, bathroom, kitchen, laundry: 45% (dummy)	-0.0225	-0.25	-0.135	-2.33

	Class 1		Class 2	
	Coef.	Z value	Coef.	Z value
Space used for corridors, bathroom, kitchen, laundry: 50% (dummy)	0.0367	0.43	-0.195	-3.13
Class membership parameters				
Age (years)	0.0594	10.48		
Household with permanent mobility limitation (dummy)	0.8085	3.92		
Constant	-2.9803	-9.67		
Model fit				
Log likelihood	-4092			
Choice observations	7032			
Individuals	1172			

Source: CIE.

Estimates of average WTP were derived from this model by calculating WTP at a respondent level using unconditional class probabilities and taking a weighted average accounting for the poststratification weights. The estimates from the models suggest that buyers are willing to pay a higher proportion of housing costs for accessibility features than are renters. The attributes that matter most to Australians are having amenities on the same floor as an entrance (noting that this feature is present in most of the existing housing stock) and a step-free entrance.

K.12 Average willingness to pay as a proportion of reference price

Change in housing features	Renter model	Buyer model
	per cent	per cent
Getting in and out: 'Several steps' to 'Single step'	8.2	18.9
Getting in and out: 'Several steps' to 'Step-free'	12.4	27.5
Moving around indoors: 'Regular space' to 'Wide spaces'	3.9	8.4
Moving around indoors: 'Regular space' to 'Extra-wide spaces'	5.5	9.7
Living on same level as entrance: 'Unsuitable' to 'Suitable for short visits'	10.9	23.1
Living on same level as entrance: 'Unsuitable' to 'Suitable for living or overnight visits'	16.2	39.0
Modification that would be needed: 'Significant' to 'Minimal'	4.4	12.3
Total size of home compared to similar homes: 'Same' to '5% larger'	1.8	4.3
Space used for corridors, bathroom, kitchen, laundry: 40% to 45%	-0.8	-2.0
Space used for corridors, bathroom, kitchen, laundry: 40% to 50%	-1.8	-1.9

Source: CIE.

Estimates of WTP for accessibility features are higher than our prior expectations, particularly for buyers (as distinct from renters). It is prudent to check the results against reference points from real markets, particularly given the hypothetical and inconsequential nature of the choice exercise and the fact that it focused on a relatively small subset of features for a very high-priced and infrequently purchased good.

We checked the WTP estimates for owner-occupiers with estimated costs of retrofitting the features. The WTP estimates for single step or step-free access, relative to several steps, and the estimates for amenities at entrance level were significantly higher than the estimated cost of retrofitting the features.

K.13 Buyer model WTP estimates compared with retrofitting costs

	Buyer model average WTP	Estimated retrofitting cost
	\$	\$
Getting in and out: 'Several steps' to 'Single step'	130 201	15 631
Getting in and out: 'Several steps' to 'Step-free'	189 553	20 073
Moving around indoors: 'Regular space' to 'Wide spaces'	58 139	95 000
Moving around indoors: 'Regular space' to 'Extra-wide spaces'	66 719	114 000
Living on same level as entrance: 'Unsuitable' to 'Suitable for short visits'	158 919	75 000
Living on same level as entrance: 'Unsuitable' to 'Suitable for living or overnight visits'	268 271	120 000
Modification that would be needed: 'Significant' to 'Minimal'	84 989	Some combination of the above

Source: CIE.

This result could be caused by:

- respondents failing to consider the possibility of purchasing a home without these features at a relatively low price and undertaking a retrofitting exercise
- respondents over-estimating the costs of retrofitting
- respondents rationally factoring in high non-financial costs of retrofitting associated with time, emotional stress and risk, or
- respondents over-stating their true WTP.

The home purchase choice appears more susceptible than rental home choice to potential hypothetical bias, since it involves large sums of money and is a transaction that is conducted infrequently. It is also linked to the enhanced social status associated with home ownership. Home purchase decisions involve not only consideration of one's own use value, but also speculative expectation on capital gains, expectations about others' preferences and future supply and demand and how those factors may impact on the future sale price of the property. It is not possible for us to disentangle these confounding effects on the implied value estimates.

For these reasons, our view is the renter model provides the best estimates of the use value of the accessibility features because it is less confounded by other effects. We derive use values for owner-occupiers from the renter estimation results by accounting for the impact of demographic differences between owners and renters on both the reference price and WTP as a proportion of the reference price. In particular, we calculate a reference price for owner-occupiers by applying the rental reference price model to each respondent's characteristics and we calculate unconditional class membership probabilities (and WTP) using their age, mobility and income characteristics. Their WTP is estimated to be higher than renters' WTP because they tend to be older and shopping

for more expensive rental properties (an average reference price of \$337 per week compared to \$307 per week).

Age is the respondent characteristic that had the most significant impact on WTP. Table K.14 shows the estimated average WTP at different age levels, holding other characteristics, including income and mobility limitation, constant.

K.14 Estimated relationship between age and willingness to pay

Change in housing features	25 year old	40 year old	55 year old	70 year old
	\$ per week	\$ per week	\$ per week	\$ per week
Getting in and out: 'Several steps' to 'Single step'	43	74	104	122
Getting in and out: 'Several steps' to 'Step-free'	67	116	164	193
Moving around indoors: 'Regular space' to 'Wide spaces'	18	29	40	47
Moving around indoors: 'Regular space' to 'Extra-wide spaces'	29	51	72	84
Living on same level as entrance: 'Unsuitable' to 'Suitable for short visits'	60	106	151	178
Living on same level as entrance: 'Unsuitable' to 'Suitable for living or overnight visits'	95	171	245	290
Modification that would be needed: 'Significant' to 'Minimal'	17	25	32	36
Total size of home compared to similar homes: 'Same' to '5% larger'	8	13	18	21
Space used for corridors, bathroom, kitchen, laundry: 40% to 45%	-2	-3	-4	-4
Space used for corridors, bathroom, kitchen, laundry: 40% to 50%	-7	-11	-14	-16

Note: All other respondent characteristics are held constant
 Source: CIE.

The estimates of average use values for accessibility features for buyers and renters are provided in table K.15. The table also provides estimates of the estimated values for respondents in a household with at least one person with a permanent mobility limitation.

K.15 Estimates of average willingness to pay by tenure type and mobility status

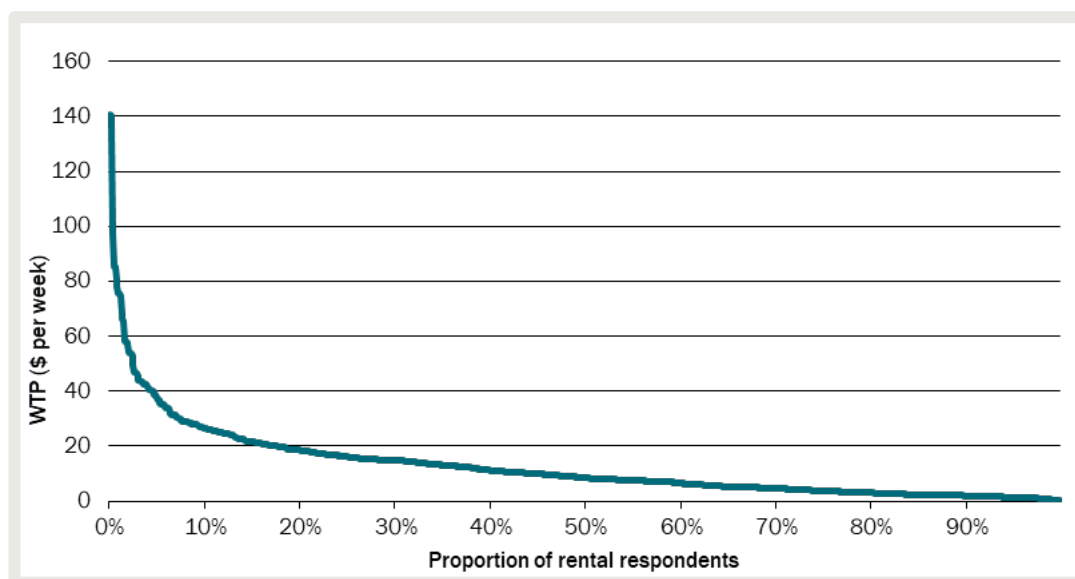
Change in housing features	Buyers	Renters	Buyers with mobility limitation	Renters with mobility limitation
	\$ per week	\$ per week	\$ per week	\$ per week
Getting in and out: 'Several steps' to 'Single step'	32.63	25.22	42.96	39.74
Getting in and out: 'Several steps' to 'Step-free'	49.02	37.96	65.65	60.99
Moving around indoors: 'Regular space' to 'Wide spaces'	15.94	12.21	19.39	17.57
Moving around indoors: 'Regular space' to 'Extra-wide spaces'	21.51	16.66	28.78	26.73
Living on same level as entrance: 'Unsuitable' to 'Suitable for short visits'	42.45	32.97	58.18	54.35
Living on same level as entrance: 'Unsuitable' to 'Suitable for living or overnight visits'	62.01	48.42	88.72	83.72

Change in housing features	Buyers	Renters	Buyers with mobility limitation	Renters with mobility limitation
	\$ per week	\$ per week	\$ per week	\$ per week
Modification that would be needed: 'Significant' to 'Minimal'	18.59	14.08	20.39	17.90
Total size of home compared to similar homes: 'Same' to '5% larger'	7.23	5.54	8.82	8.00
Space used for corridors, bathroom, kitchen, laundry: 40% to 45%	-3.30	-2.48	-3.33	-2.85
Space used for corridors, bathroom, kitchen, laundry: 40% to 50%	-7.49	-5.68	-8.36	-7.39

Source: CIE.

Using the reference price, age, mobility status and income status for each respondent, we can examine the demand curve for each attribute. These can be used in the cost-benefit analysis to identify the WTP of the marginal consumer, given an assumption about how well features are matched to consumer preferences in the market.

K.16 Distribution of renter WTP to move from 'regular spaces' to 'wide spaces'



Data source: CIE.

Other models and robustness checks

Table K.17 shows the estimation results for a model with buyers and renters pooled in the same model, without the use of two-stage least squares (so, the price variable is a proportion of the midpoint of the respondent's stated budget range). It also includes a quadratic term for price in an attempt to capture differences in price sensitivity for price reductions towards or beyond the low end of a respondent's budget range as distinct from price increases towards the top of a respondent's budget range.

K.17 Example of a model of housing choice with alternative specifications

	Class 1		Class 2	
	Coef.	Z value	Coef.	Z value
Price/rent as proportion of reference value (reference = 1)	8.4836	2.2	26.5649	6.3
Price/rent squared	-6.4884	-3.0	-20.3898	-8.2
Price/rent * buy (dummy =1 if intending to buy rather than rent)	1.4371	2.0	2.8920	3.4
Price/rent * low income (dummy =1 if household income <\$41 600 p.a.)	-2.1077	-2.8	-4.8579	-4.0
Getting in and out: Single step (dummy)	1.1082	11.0	0.1398	2.3
Getting in and out: Step-free (dummy)	1.5570	13.8	0.2506	3.9
Moving around indoors: Wide spaces	0.3335	5.3	0.2231	4.8
Moving around indoors: Extra-wide spaces	0.5970	7.6	0.2280	4.2
Living on same level as entrance: Suitable for short visits	1.3589	16.4	0.1015	2.0
Living on same level as entrance: Suitable for living or overnight visits	2.3940	17.9	0.0871	1.3
Modification that would be needed: Minimal	0.4318	2.3	0.3244	2.7
Total size of home compared to similar homes: 5% larger	0.1416	2.8	0.0958	2.6
Space used for corridors, bathroom, kitchen, laundry: 45%	0.0501	0.8	-0.1485	-3.3
Space used for corridors, bathroom, kitchen, laundry: 50%	-0.0065	-0.1	-0.1472	-3.1
Class membership parameters				
Age (years)	0.0576	14.1		
Household with permanent mobility limitation (dummy)	0.9529	6.2		
Constant	-2.9997	-13.2		
Model fit				
Log likelihood	-7 223.8937			
Choice observations	12 366			
Individuals	2 061			

Source: CIE.

The WTP estimates from this model, evaluated at the reference price, are set out in table K.18. As part of the model development process, we tested the robustness of the results across different subsamples, including respondents who indicated they are more likely to move house in the next five years, respondents who indicated they believed the survey would affect outcomes, and respondents who took more than five minutes to complete the questionnaire. WTP estimates for these models are also set out in the table.

K.18 Estimates of average willingness to pay from pooled model with selected subsamples

	Full sample		Respondents >30% likely to move in next 5 years		Respondents >55% likely to move in next 5 years		Respondents believing survey could affect housing		Respondents completing survey in more than 5 minutes	
	Buyers	Renters	Buyers	Renters	Buyers	Renters	Buyers	Renters	Buyers	Renters
	n*=1183	n*=878	n*=853	n*=640	n*=519	n*=393	n*=654	n*=493	n*=1129	n*=832
	\$	\$ per week	\$	\$ per week	\$	\$ per week	\$	\$ per week	\$	\$ per week
Getting in and out: 'Several steps' to 'Single step'	59 588	18.83	60 498	18.27	45 289	16.91	64 900	24.24	58 378	18.33
Getting in and out: 'Several steps' to 'Step-free'	86 104	27.26	86 612	26.24	65 666	24.74	96 371	36.11	83 776	26.35
Moving around indoors: 'Regular space' to 'Wide spaces'	25 884	8.35	28 324	8.86	22 187	8.57	29 711	11.29	25 789	8.25
Moving around indoors: 'Regular space' to 'Extra-wide spaces'	38 807	12.41	46 119	14.17	41 692	15.73	48 084	18.25	37 415	11.86
Living on same level as entrance: 'Unsuitable' to 'Suitable for short visits'	70 001	22.05	75 619	22.55	63 779	23.46	84 280	31.37	69 838	21.89
Living on same level as entrance: 'Unsuitable' to 'Suitable for living or overnight visits'	119 298	37.49	126 576	37.72	103 954	38.16	135 018	50.28	118 080	36.92
Modification that would be needed: 'Significant' to 'Minimal'	35 070	11.34	38 342	12.05	35 835	14.03	36 725	14.04	36 145	11.61
Total size of home compared to similar homes: 'Same' to '5% larger'	11 037	3.56	14 147	4.39	10 204	3.92	8 422	3.12	11 520	3.70
Space used for corridors, bathroom, kitchen, laundry: 40% to 45%	-4 107	-1.45	-5 271	-1.81	-88	-0.08	-2 154	-1.03	-3 664	-1.27
Space used for corridors, bathroom, kitchen, laundry: 40% to 50%	-6 775	-2.28	-8 295	-2.77	-4 130	-1.63	-3 862	-1.51	-7 472	-2.48

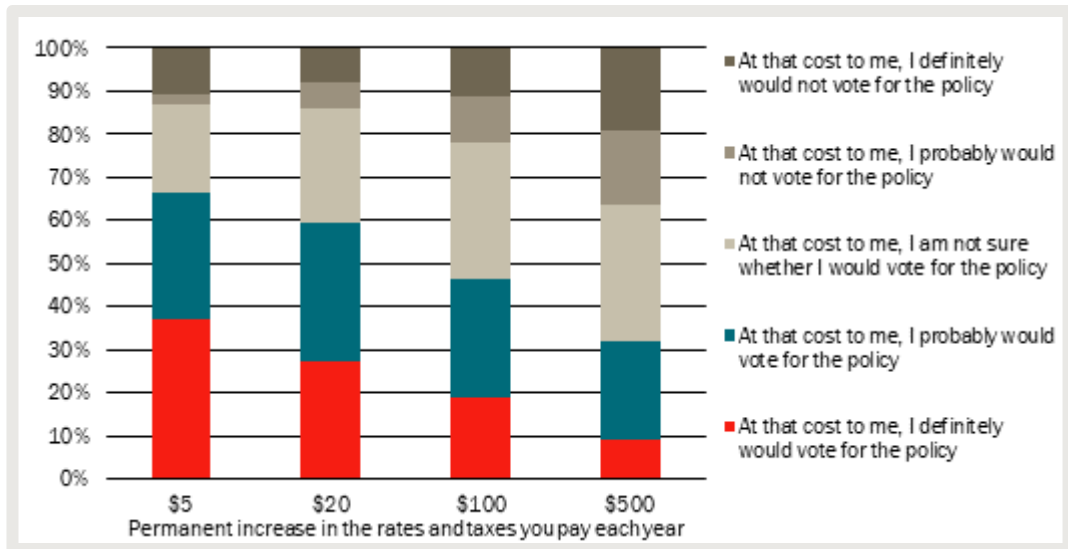
Note: n* denotes sample size with reweighting applied, evaluated at reference price.

Source: CIE.

Willingness to pay to improve housing outcomes for others

Responses to the CV question resulted in a downward-sloping demand curve, with around 37 per cent of respondents asked at the \$5 cost level indicating they would definitely vote for the policy, compared with 9 per cent of respondents asked at the \$500 cost level.

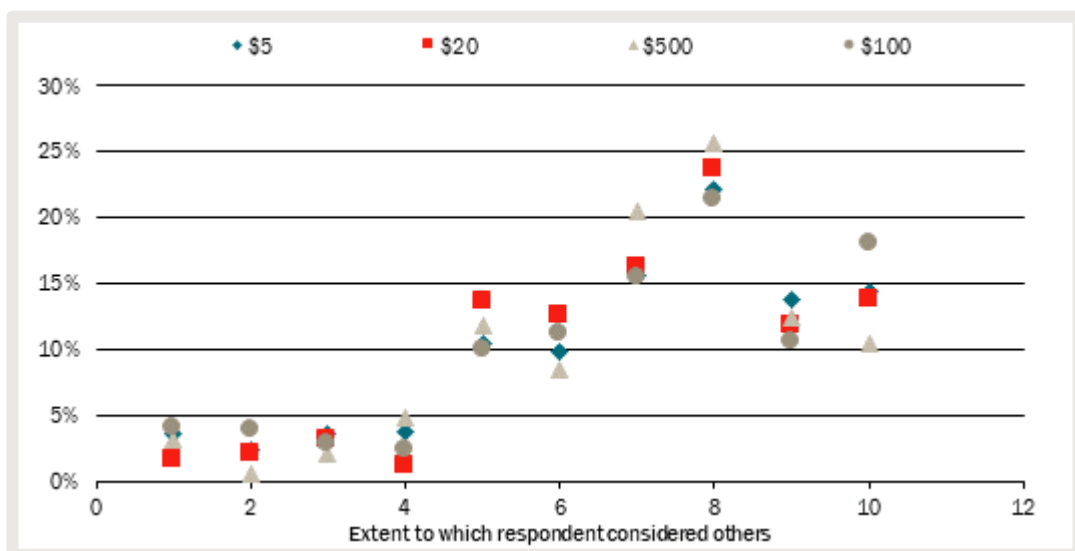
K.19 Responses to contingent valuation question



Data source: CIE.

There was negligible correlation between cost and the extent to which respondents considered others, with average consideration of others of 7.0, 7.1, 7.1 and 7.0 across the \$5, \$20, \$100 and \$500 cost levels. There is therefore no need to apply a scaling factor for extent of consideration of others to individual observations in the calculation of WTP and we can instead apply the scaling factor to the final calculation of average WTP.

K.20 Consideration of others by cost level shown in contingent valuation question



Data source: CIE.

The Turnbull lower bound of expected mean WTP is \$58 per year after accounting for the sample reweighting. This is a conservative estimate calculated by treating 'probably yes' responses as 'no' votes, consistent with the approach typically used for certainty scales in environmental valuation where 'yea saying' is a concern. A less conservative approach in which 'probably yes' votes are treated as 'definitely yes' votes at the next-lowest level in the cost vector gives a Turnbull lower bound expected mean WTP of \$100 per year.

Multiplying the \$58 figure discussed above by the survey completion rate of 97 per cent and the average extent to which responses were based on consideration of others of 71 per cent gives an adjusted estimate of average WTP of \$40 per year.

Debriefing questions

Respondents that did not indicate they would definitely or probably vote for the policy to increase accessible housing were asked the reason for their decision. The most common reasons given were that governments should deliver the outcomes without imposing a cost on the respondent and a concern that governments may not deliver the outcomes. There is a question as to whether the responses to the valuation question by these respondents should be excluded as 'protest responses' that are not a true measure of the respondent's preferences over delivered outcomes. We prefer to retain these responses, as excluding them may bias the results where there is correlation between underlying WTP and mistrust of governments.

K.21 Reasons for not voting for the policy to increase accessible housing

	Sample reweighted
	per cent
What were the main reasons for your decision?	
I would prefer to spend my money on something else	27.4%
The question was confusing	6.5%
I didn't have enough information about the policy	21.5%
I'm concerned that governments might put taxes up without improving accessible housing	37.3%
I think governments should improve accessible housing without increasing taxes	41.5%
Other peoples' housing should not be my problem	15.7%
Other (Please specify:)	6.3%

Source: CIE.

Roughly six in ten respondents believed the survey would be at least somewhat likely to affect government action on accessible housing and the rates and taxes they pay. Models run with and without the respondents that did not believe the survey would be consequential did not find a dramatic difference in stated preferences. The estimated mean WTP was slightly higher for respondents indicating they believed the survey would be at least somewhat likely to affect the rates and taxes they pay.

K.22 Consequentiality of the survey

	Sample reweighted
	per cent
To what degree do you expect the results of this survey will affect government action on accessible housing?	
I believe it is very likely the survey will affect government action	13.3%
I believe it is somewhat likely the survey will affect government action	42.4%
I don't think the survey will affect government action	44.3%
To what degree do you expect the results of this survey will affect your rates and taxes?	
I believe it is very likely the survey will affect my rates and taxes	13.9%
I believe it is somewhat likely the survey will affect my rates and taxes	44.2%
I don't think the survey will affect my rates and taxes	41.9%

Source: CIE.

L Survey questionnaire

FOR COMPLETION ON DESKTOP ONLY

Welcome...

Thank you for participating in this survey, which is being run by Pureprofile and the Centre for International Economics on behalf of the Australian Building Codes Board.

This survey is about housing features. Your input is very important and will affect the ways that houses are built.

This questionnaire will take around 15 minutes to complete.

We wish to reassure you that this is genuine market research and, as always, your individual survey responses will remain confidential and anonymous at all times.

In the unlikely event of any technical difficulties please click on the technical support e-mail link.

Please Keep In Mind...

Do not use your Back or Forward browser buttons while you are taking this survey. Once you answer a question, you will not be able to go back and change your answer.

Before we go through to the main study we would like to ask you some questions to make sure we are interviewing a good cross section of people.

1. Do you or a member of your household work in the market research industry or for the Australian Building Codes Board?
 - a. Yes TERMINATE
 - b. No

2. What is the postcode of your home address? [CHECK QUOTAS](#)

3. Are you... [CHECK QUOTAS](#)
 - a. Male
 - b. Female
 - c. Non-binary
 - d. Prefer not to say

4. What is your age? CHECK QUOTAS
- a. Less than 18 years TERMINATE
 - b. 18-19 years
 - c. 20-29 years
 - d. 30-39 years
 - e. 40-49 years
 - f. 50-59 years
 - g. 60-69 years
 - h. 70-79 years
 - i. 80 years or over

5. IF (b) OR (c) ABOVE For the home I live in, I pay...
- a. Nothing, I live with my parent(s)/guardian
 - b. Nothing, my parent(s)/guardian pay for my accommodation
 - c. Board and lodging
 - d. A share of rent
 - e. Rent
 - f. A share of mortgage repayments
 - g. Mortgage repayments
 - h. I own the home outright
 - i. Other (please specify) _____

6. I have...
- a. Australian citizenship
 - b. an Australian permanent resident visa
 - c. a temporary working visa TERMINATE
 - d. a visitor/holiday/transit visa TERMINATE
 - e. a student/training visa TERMINATE
 - f. none of the above TERMINATE

TERMINATE PAGE

Thank you for your patience in answering these questions. Unfortunately, we do not need you to participate in our research this time, but we sincerely appreciate your time and assistance today.

This questionnaire is about housing features that affect accessibility. More accessible houses may make it easier:

- for parents to manoeuvre prams
- to carry the shopping into the house
- for people with disability or temporary injury to move around without the assistance of a carer
- to move furniture.

The questionnaire has three parts:

- information about the features that make housing more accessible
- questions about the types of dwellings you prefer
- questions about you.

Accessible housing is particularly important for people with limited mobility.

These people have difficulty, use mobility aids (such as crutches, a walking stick or a wheelchair) or require assistance doing one or more everyday tasks, such as:

- moving around the home
- moving away from home
- getting into or out of a bed or chair.

7. Does anybody in your household have difficulty, use aids or require assistance with these tasks? **MULTIPLE RESPONSE OR NO OR PREFER NOT TO SAY**
- a. Yes, I have a temporary (fewer than 6 months) mobility limitation
 - b. Yes, I have an ongoing mobility limitation
 - c. Yes, another person in my household has a temporary (fewer than 6 months) mobility limitation
 - d. Yes, another person in my household has an ongoing mobility limitation
 - e. No
 - f. Prefer not to say

8. Does anybody in your household have difficulty, use mobility aids or require assistance with personal care, including tasks such as showering, bathing, dressing or eating? **MULTIPLE RESPONSE OR NO OR PREFER NOT TO SAY**
- a. Yes, I have a temporary (fewer than 6 months) personal care limitation
 - b. Yes, I have an ongoing personal care limitation
 - c. Yes, another person in my household has a temporary (fewer than 6 months) personal care limitation
 - d. Yes, another person in my household has an ongoing personal care limitation
 - e. No
 - f. Prefer not to say

9. IF a-d IN Q7. Which aids, if any, are used by people in your household?

MULTIPLE RESPONSE OR NO OR PREFER NOT TO SAY

- a. Cane
- b. Crutches
- c. Walking frame
- d. Walking stick
- e. Wheelchair (manual)
- f. Wheelchair (electric)
- g. Scooter/gopher
- h. Modified car or car aid
- i. Other
- j. None
- k. Prefer not to say

10. [IF a-d IN Q7](#) Thinking about the person in your household whose mobility is most limited, what is the extent of their mobility limitation?
- a. Has no difficulty moving around with the use of a mobility aid, but cannot easily walk 200 metres, cannot use stairs without a handrail, or cannot bend to pick up an object from the floor
 - b. Has difficulty moving around, even with the use of a mobility aid, but doesn't need assistance from a carer
 - c. Sometimes needs assistance from a carer to move around, even with the use of a mobility aid
 - d. Always needs assistance from a carer to move around, even with the use of a mobility aid
 - e. Prefer not to say

There are several features that affect the accessibility of a home.

Getting in and out

A step-free entrance and pathway from the street/parking



... rather than a single step



...or several steps

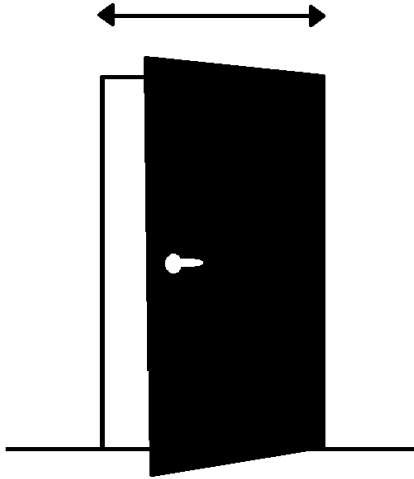


11. My current home has...

- a. no steps between street/parking and the entrance
- b. a single step between street/parking and the entrance
- c. several steps between street/parking and the entrance

Moving around indoors

Wider door openings (at least 850 mm wide, rather than the typical 820 mm for external doors and 720 mm for internal doors)

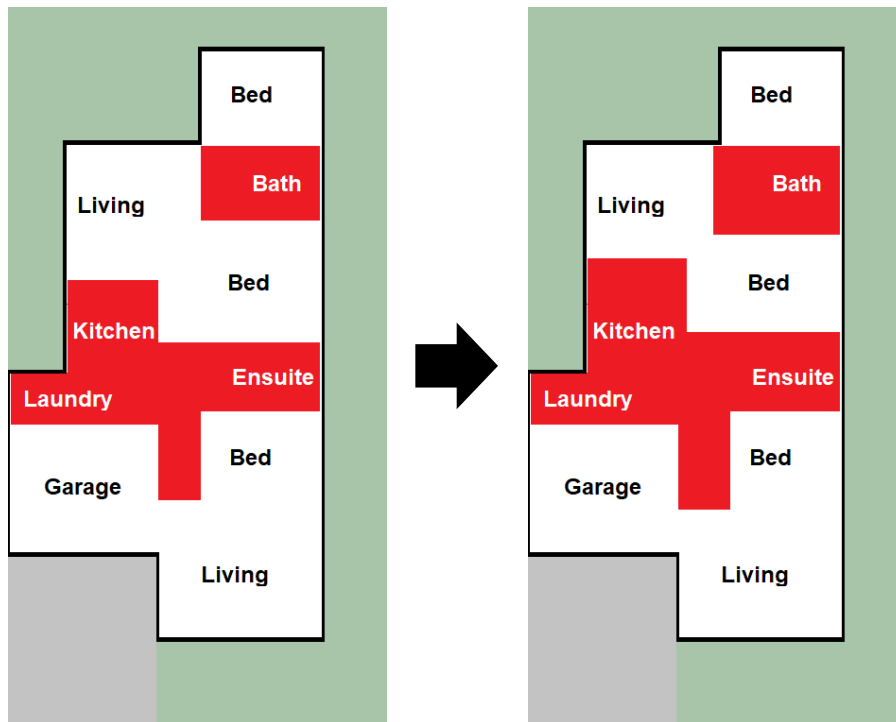


12. My current home has...
- a. door openings similar to other homes
 - b. door openings wider than most other homes
 - c. Don't know

Moving around indoors

Adequate space in corridors, bathrooms, kitchen and laundry to enable circulation in a wheelchair.

Some building designs may need to be changed to achieve this. The changes could include increased building size, a more open-plan design, or decreased space in living areas and bedrooms (see indicative illustration below).



13. Would you say your current home has enough space for turning a wheelchair in corridors, bathrooms, kitchen and laundry? (If unsure, please make an educated guess)
- All of these spaces are large enough
 - Some of these spaces are large enough
 - None of these spaces are large enough
 - I can't make an educated guess

Moving around indoors

A step-free shower entry to enable safe access and prevent trips and falls...



...rather than a hob (kerb)

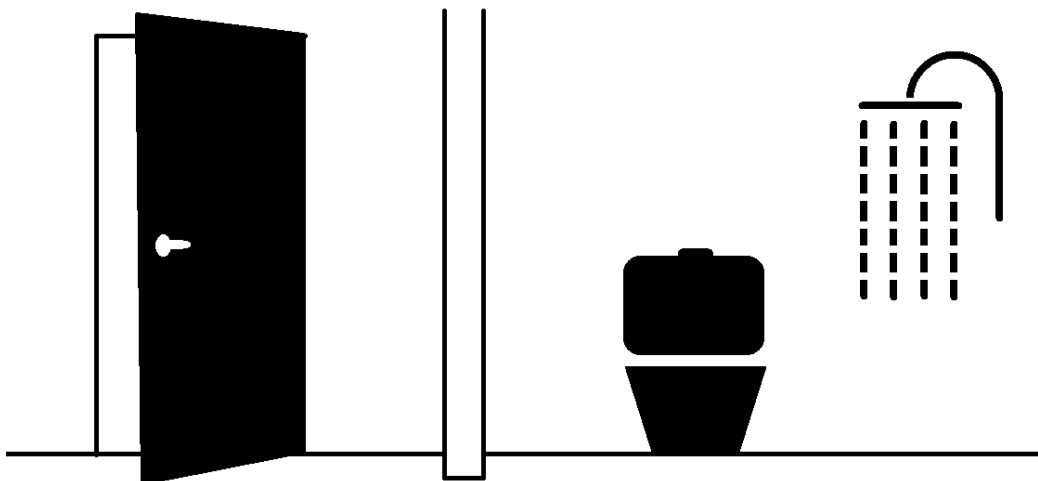


14. My current home has... **MULTIPLE SELECTION**

- a. Step-free shower entry
- b. Hob/kerb shower entry
- c. Stepped shower entry
- d. Shower over bath
- e. Don't know

Living on the same level as an entrance

- A toilet at entrance level to enable people with limited mobility to visit with dignity.
- A shower and bedroom at entrance level to enable people with limited mobility to live on a single level or stay overnight.



15. Does your current home have a toilet on the same level as an entrance?

- a. Yes
- b. No
- c. Don't know

16. Does your current home have a shower on the same level as an entrance?
- a. Yes
 - b. No
 - c. Don't know

- Bathroom walls that are reinforced enable less costly future installation of grab rails
- Stairs that are straight and next to a load-bearing wall enable future installation of a stair lift



17. Which type of indoor stairs, if any, does your current home have? **MULTIPLE SELECTION OR NONE OF THE ABOVE**
- a. Straight stairs
 - b. Stairs with a half/quarter turn
 - c. Curved/spiral stairs
- or
- d. No stairs

Some people like these features, because:

- it makes activities like manoeuvring a pram, carrying the shopping and moving furniture easier
- in the event of someone in the household getting a mobility limitation,
 - their home can be modified at lower cost or to a higher standard
 - they would avoid the need to move house
 - they would delay the need to move into a hostel or nursing home
- they can more easily receive visits from friends and family with a pram or limited mobility

Other people dislike these features, because:

- they prefer home designs with a lower share of space used for kitchen, bathroom, laundry and/or corridors
- they prefer home designs with the toilet and bathroom on a different level to the entrance
- they prefer homes on sloped blocks, with more stairs.

18. To what extent did you consider accessibility when choosing your current home?
- a. It was an important consideration
 - b. It was a minor consideration
 - c. I did not consider it at all

19. If you were buying/renting a new home now, would you...
- a. Prefer homes with all accessibility features described in this survey
 - b. Prefer homes with some accessibility features described in this survey
 - c. Prefer homes without accessibility features
 - d. Have no preference

20. IF (a) or (b) ABOVE What is your main reason for preferring accessibility features? ROTATE EXCEPT 'NO PREFERENCE'
- a. The ease of access and use now
 - b. To avoid/delay the need to move later
 - c. To receive visits from family and friends with limited mobility
 - d. The look and feel of the features
 - e. Other (please specify) _____

21. IF (c) in Q19 What is your main reason for preferring homes without accessibility features? ROTATE EXCEPT 'NO PREFERENCE'
- a. I dislike the look and feel of the features
 - b. I prefer larger living areas and bedrooms
 - c. I prefer steeply sloped blocks
 - d. Other (please specify) _____

22. How likely are you to move home in the next 5 years?

- a. Almost certain (>85% chance)
- b. Highly likely (70%-85%)
- c. Likely (55%-70%)
- d. Neither likely nor unlikely (45%-55%)
- e. Unlikely (30%-45%)
- f. Highly unlikely (15%-30%)
- g. Remote (<15%)

23. Would you be more likely to buy or rent your next home?

- a. Buy
- b. Rent
- c. Don't know
- d. Other (please specify)

24. Given your location, family size and budget, what type of home would you be looking to move into?

- a. Separate house
- b. Semi-detached, row or terrace house, townhouse
- c. Flat or apartment
- d. Other

25. Roughly, how much would you be looking to spend?

IF Q23 = BUY

- a. Less than \$150 000
- b. \$150 000 to \$249 999
- c. \$250 000 to \$349 999
- d. \$350 000 to \$449 999
- e. \$450 000 to \$549 999
- f. \$550 000 to \$649 999
- g. \$650 000 to \$749 999
- h. \$750 000 to \$949 999
- i. \$950 000 to \$1 249 999
- j. \$1 250 000 to \$1 549 999
- k. \$1 550 000 to \$2 000 000
- l. More than \$2 000 000

IF Q23 = RENT, DON'T KNOW OR OTHER

- a. Less than \$50 per week
- b. \$50 to \$149 per week
- c. \$150 to \$249 per week
- d. \$250 to \$349 per week
- e. \$350 to \$449 per week
- f. \$450 to \$549 per week
- g. \$550 to \$649 per week
- h. \$650 to \$749 per week
- i. \$750 to \$949 per week
- j. \$950 to \$1 450 per week
- k. More than \$1 450 per week

We will now ask you six questions about home comparisons. In each of these questions you will be presented with two homes. We want to know which home you would be most likely to choose.

When answering these questions, please try to imagine you are at the point of choosing your next home to live in.

The homes will be described by several features. Your answers will help us understand which features are most important to you. Extra information about each feature can be viewed by hovering your cursor over that feature. Where features are not described in the question, please assume they are the same across the home options.

These six questions are important. They contain a lot of information, so please take your time and consider your answers carefully.

SEE EXPERIMENTAL DESIGN FOR CHOICE QUESTIONS

26. If these were my only options, I would choose:
27. If these were my only options, I would choose:
28. If these were my only options, I would choose:
29. If these were my only options, I would choose:
30. If these were my only options, I would choose:
31. If these were my only options, I would choose:

HOVER TEXT FOR ATTRIBUTE LABELS:

Row	Hover text
Getting in and out	People with a mobility limitation may have difficulty getting in and out of a home with steps between the street/parking and an entrance. A kerb ramp may assist where there is a single step only.
Moving around indoors	People using larger mobility aids, including wheelchairs, may have difficulty using narrower doorways/corridors or narrower spaces in the bathroom, kitchen and laundry
Living with limited mobility on same level as an entrance	People with a mobility limitation may have difficulty getting to amenities that are not located on the same level as an entrance.
Modification that would be needed to make home suitable for ageing in place	This is a guide to the amount of work that would be needed to make the home suitable for a person using a wheelchair
Total size of home compared to similar homes	This refers to the size of the floor space of the home and the land on which it's built
Amount of space used for:	A typical three-bedroom home uses roughly 40% of total space for corridors, bathroom, kitchen and laundry and 60% on living areas and bedrooms

ALLOCATE INTO TWO GROUPS BY LEAST FILL – ‘STANDARD B’ AND ‘STANDARD A’

‘STANDARD B’ ONLY:

There is an accessibility standard, which has the following features:

Getting in and out	Step-free
Moving around indoors	Wide spaces Suitable for most mobility aids, but not wheelchairs
Living with limited mobility on same level as an entrance	Suitable for short visits Toilet on entry level
Modification that would be needed to make home suitable for ageing in place	May be significant

‘STANDARD A’ ONLY:

There is an accessibility standard, which has the following features:

Getting in and out	Step-free
Moving around indoors	Extra-wide spaces Suitable for all mobility aids, including wheelchairs
Living with limited mobility on same level as an entrance	Suitable for living or overnight visits Toilet, shower and bedroom on entry level
Modification that would be needed to make home suitable for ageing in place	Minimal

The share of housing in the total housing stock that meets this standard is thought to be very low. On current trends, it is expected to remain very low. Roughly 5 per cent of new homes are being built to this standard, which increases the share of accessible housing in the total housing stock by just 0.1 per cent each year.

This is not enough to provide accessible homes for Australians with a disability who use a mobility aid (around 5% of households).

As a result, some people with limited mobility have difficulty finding an accessible home and instead live in unsuitable housing with a carer. This can lead to health risks from slips, trips and falls and places extra demands on carers.

Some people with limited mobility also experience social isolation due to difficulty visiting homes of friends and family.

Without additional government action, the proportion of housing in Australia that meets the accessibility standard is expected to remain below 5%.

Governments have a range of ways to increase the amount of accessible housing, including building regulations, incentives schemes, land-use planning and public housing. The share of accessible housing could be increased to 15% of overall housing by 2035, which would greatly improve the chances of Australians with limited mobility finding suitable homes.

However, this would come at a cost that would need to be covered by an increase in rates and taxes.

Remember:

- The results of this survey will influence the amount of accessible housing and the rates/taxes you pay
- There may be other things you would prefer to spend your money on.

32. If a policy to increase the amount of accessible housing to 15% by 2035 permanently increased the rates and taxes you pay each year by \$X, would you vote for the policy?
- a. At that cost to me, I definitely would vote for the policy
 - b. At that cost to me, I probably would vote for the policy
 - c. At that cost to me, I am not sure whether I would vote for the policy
 - d. At that cost to me, I probably would not vote for the policy
 - e. At that cost to me, I definitely would not vote for the policy

[\\$X to be selected based on least fill from \\$5, \\$20, \\$100, \\$500](#)

IF DEFINITELY WOULD OR PROBABLY WOULD

33. On a scale of 1 to 10, how much was your decision based on outcomes for other people?

1 means I thought only about my chances of finding a suitable home in the future

10 means I thought only about outcomes for other people

a. **10-point scale** | | | | | | | | | |

OTHERWISE

34. What were the main reasons for your decision? **MULTIPLE SELECTION**

- a. I would prefer to spend my money on something else
- b. The question was confusing
- c. I didn't have enough information about the policy
- d. I'm concerned that governments might put taxes up without improving accessible housing
- e. I think governments should improve accessible housing without increasing taxes
- f. Other peoples' housing should not be my problem
- g. Other _____

35. To what degree do you expect the results of this survey will affect government action on accessible housing?
- a. I believe it is very likely the survey will affect government action
 - b. I believe it is somewhat likely the survey will affect government action
 - c. I don't think the survey will affect government action

36. To what degree do you expect the results of this survey will affect your rates and taxes?

- a. I believe it is very likely the survey will affect my rates and taxes
- b. I believe it is somewhat likely the survey will affect my rates and taxes
- c. I don't think the survey will affect my rates and taxes

Questions about you

37. Do you have a family member or friend with limited mobility who visits you or would visit you if your home was accessible?
- a. Yes
 - b. No
 - c. Unsure

38. Do you or anyone in your household work in the construction industry (e.g. builder, architect, quantity surveyor)?

- a. Yes
- b. No

39. Do you speak a language other than English at home?

- a. No, English only
- b. Yes

40. Is the place you live in:

- a. Owned outright or with a mortgage
- b. Being rented or occupied rent-free
- c. Other (please specify) _____

41. Which best describes your household:

- a. Couple/family without children at home
- b. Couple/family with children at home
- c. One parent family
- d. Group household
- e. Single person household
- f. Cared accommodation (e.g. nursing home, aged care hostel)
- g. Other

42. What is your work status?

- a. Working full time
- b. Working part time/casually
- c. Student
- d. Not currently employed
- e. Home duties
- f. Retired
- g. Other

43. **IF ANSWERED NOT d or f in Q41** What is your approximate annual household income before tax?
- a. Less than \$41,600 per year (less than \$800 per week)
 - b. \$41,600 - \$78,000 per year (\$800 - \$1,500 per week)
 - c. \$78,000 - \$104,000 per year (\$1,500 - \$2,000 per week)
 - d. \$104,000 - \$156,000 per year (\$2,000 - \$3,000 per week)
 - e. More than \$156,000 per year (more than \$3,000 per week)
 - f. Do not wish to answer
44. **IF ANSWERED d or f in Q41** What is your approximate annual personal income before tax?
- h. Less than \$41,600 per year (less than \$800 per week)
 - i. \$41,600 - \$78,000 per year (\$800 - \$1,500 per week)
 - j. \$78,000 - \$104,000 per year (\$1,500 - \$2,000 per week)
 - k. \$104,000 - \$156,000 per year (\$2,000 - \$3,000 per week)
 - l. More than \$156,000 per year (more than \$3,000 per week)
 - m. Do not wish to answer

45. Finally, is there any feedback you would like to provide on this survey?

Thank you for participating in this survey. Your opinions are very important.

M Consultation summary

The CIE sincerely thanks stakeholders who kindly provided their time and insights.

Overview of consultation process

For this report, The CIE and DCWC conducted two types of consultations.

- 1 On 29 November 2019, at ABCB's offices, we hosted a costing workshop, where stakeholders discussed how the proposed NCC changes will impact construction costs, and DCWC's methodology for estimating these impacts.
- 2 To further inform the development of the Consultation RIS, the CIE undertook a targeted consultation process over the November 2019 to January 2020 period, and again in May 2020. Consultations were guided by an Issues Paper setting out the CIE's preliminary views on the issues that need to be addressed in the RIS.

The participants in these consultations are as follows.

M.1 Stakeholder who were consulted for this project

Stakeholder group	Date of discussion
Costing workshop	
Housing Industry Association	29 November 2019
Master Builders Australia	29 November 2019
Galbraith Scott	29 November 2019
Separate discussions	
Australian Network of Universal Housing Design (ANUHD)	26 November 2019
Galbraith Scott	29 November 2019
University of NSW	9 December 2019
Centre for Universal Design Australia	9 December 2019
ADACAS	17 December 2019
Department of Social Services	4 December 2019
Master Builders Australia	12 December 2019
Housing Industry Association	13 December 2019
Occupational Therapists Australia	13 December 2019
Australian Association of Gerontology	18 December 2019

Stakeholder group	Date of discussion
University of Technology Sydney	18 December 2019
Australian Human Rights Commission	18 December 2019 14 May 2020
National Disability Insurance Agency	19 December 2019 31 January 2020
Transport Accident Commission (Victoria)	23 January 2020
Sekisui House	24 January 2020
Royal Commission into Aged Care Quality and Safety	19 May 2020
Young People in Nursing Homes	27 May 2020
The Summer Foundation	28 May 2020

Source: CIE.

Outcomes from costing workshop

To estimate the cost impacts of the proposed changes to the NCC, DCWC use 5 examples of new builds, called costing models. DCWC note that at the costing workshop: ‘there was broad agreement that these models were an acceptable representation of residential dwellings in the market.’¹²⁴

Outcomes from targeted stakeholder consultations

In general, most stakeholders expressed an opinion as to whether the idea of incorporating accessible housing standards into the NCC was appropriate. Some provided specific pieces or research or data, which we have considered in our analysis.

As noted, our consultations were structured, following an issues paper that was provided to stakeholders in advance of us consulting with them. We have organised the insights provided into themes (theme 1, 2, 3 and other points), which follow. Note these themes reflect the main sections of the issues paper that was provided to consultees before we spoke with them.

¹²⁴ DCWC 2020, *Accessible Housing: Estimated Cost Impact of Proposed Changes to NCC*, Report Revision 5, 22 June 2020

Theme 1: the problem accessible housing is trying to address

Nature of the problem

The need for accessible housing

One stakeholder noted that people who use wheelchairs require homes built to 'gold' level accessibility standards, but added there is a great deal of variation across people. Silver is more appropriate for people with other forms of mobility disability.

Another stakeholder argued: silver is really for visitability, Gold is for liveability and Platinum is for specialist needs.

Stakeholders note that even where they are not strictly *required*, accessibility features can have benefits for people with lower-needs disabilities.

Stakeholders noted that people's needs change as they progress through life. One representative example that was provided was of an elderly lady who was essentially independent, apart from her inability to deal with the step in/out of her house.

Some stakeholders argued the moral case for accessible housing.

- 3 One stakeholder noted that the housing industry is not incentivised or required to provide accessible housing, and that buyers are not incentivised to consider the 'greater good' in their purchasing decisions. These points were noted as problems.
- 4 Other stakeholders noted that providing accessible housing is a human rights issue.

Stakeholders argue the problem is growing, due to the aging population.

Reasons why accessible housing is not being supplied

Stakeholders noted that property development/building is fiercely competitive. Reasons why accessible housing is not provided include:

- Cost pressures – it is too costly for business
- 'Cookie cutter approach' by developers, where it is costly to diverge from established practices. In particular, one stakeholder noted she had particular difficulty getting a volume builder to add accessibility features to a new home.
- Behaviour of buyers: people buy homes with aspiration in mind; they do not imagine themselves as old/disabled in the future. They may have an 'optimism bias.' Alternatively, some people simply don't give enough thought to their future needs when purchasing property.

Some stakeholders note information problems.

- There is no register of accessible homes, so it makes it very difficult and costly for people who need them to find them. People who require these homes have to spend more time and financial resources finding the right home.
- Equally, industry stakeholders noted people who build accessible homes get no credit and/or its difficult to market and certify homes as 'accessible';

- Further it is not possible to certify plans as accessible; homes can only be certified as accessible after they are built; while it was not raised by the stakeholder, this implies that it is particularly difficult to supply accessible townhouses and units, where they are sold ‘off the plan’

Extent of the problem

Where prompted, stakeholders agreed with our characterisation of sub-optimal outcomes which could potentially be avoided if (1) new homes are built with accessibility features and (2) people who require these features occupy these new homes. These sub-optimal outcomes include:

- 5 Households with accessibility needs remain in housing without the necessary features
- 6 Where an individual does not require specialist housing or the level of care that is provided in aged care, but end up there anyway, because they merely require the accessibility features that are provided in these residences
- 7 Where the individual has the capacity to pay for a private rental property, but a property with the required accessibility features is not available
- 8 Where a patient would not need to be in hospital if accessible housing is available
- 9 A person may have accessible private/social housing, but the location does not suit them

One stakeholder notes that the accessibility of retirement villages varies (older ones can be inaccessible).

Other factors and points of complexity

Stakeholders note various factors which mean the link between ‘building more accessible homes’ and ‘desirable outcomes for disabled people/the aged’ is quite complicated. Taken together, these points imply that it may be inadequate to argue that poor outcomes for disabled people and the aged are a problem that only requires building more new, accessible homes. Consistent with this, some stakeholders question the objective of the proposed regulatory changes.

Stakeholders note that low incomes can be a substantial factor in the housing decisions of people with disabilities. (For example, building more new homes that are accessible may be a less effective solution if people with disabilities cannot afford these new homes).

Stakeholders note the share of over-65s who do not own their home is growing, which complicates housing policy.

Stakeholders noted links with other policy areas, including the NDIS, aged care, etc. This complicates the estimation of benefits and costs.

Modifications

From our stakeholder consultations, we learnt the interaction between the policy area of ‘providing accessible housing’ and the policy area of ‘home modifications’ (sometimes

called retrofits) is complicated. This complication may have a significant bearing on our results. We note the following points.

- 10 Stakeholders note there is significant evidence that home modifications can improve the lives of older people and people with disabilities. This includes reduced falls and a reduced requirement for carer hours.
- 11 Usually, the need for modifications and subsequent recommendations are diagnosed/provided by a trained occupational therapist. This means that modifications are bespoke to the user. This is what maximises the effectiveness of modifications.
- 12 Stakeholders argue that home modifications and accessible housing are not necessarily substitutes. This centres on the fact that modifications are bespoke to the user, whereas accessible housing features are generic. Stakeholders did allow that accessible housing may be a substitute for larger home modifications.
- 13 Many home modifications can be very simple and relatively inexpensive including: grabrails and handrails, changing lighting and sound sensors. Some home modifications can be very expensive. The most common type of 'larger scale' home modifications' are modifications to bathrooms.
- 14 Because home modifications can be very effective and (in some cases) inexpensive, some stakeholders argue that subsidising or providing home modifications, where appropriate, can be a highly desirable policy for responding to the aging population and disabilities. To some extent, the net benefits of providing home modifications may reduce the need/desirability of adopting widespread accessible housing standards.
- 15 As explained in our report, we have implicitly assumed that in a narrow and limited way home modifications and accessible housing are substitutes.
 - a) We have used home modifications literature to estimate the impact of accessible housing on falls and safety issues.
 - b) We have assumed that some of the 'bigger ticket' home modifications (including bathrooms, structural changes, wider doorways, kitchens, etc.) will not need to proceed if people already live in accessible housing. We therefore calculated the potentially avoidable cost of home modifications.
- 16 The fact that stakeholders argue that home modifications and accessible housing may not be true substitutes means that our estimates of the safety impacts of accessible housing and our estimates of avoidable home modifications may be overstated. One stakeholder noted, in writing, that our assumptions are 'contestable'. This means we may be overstating the problem that accessible housing could solve, and therefore overstating the estimated net benefits of accessible housing.
 - a) However, stakeholders do note that the structure of some buildings makes it difficult to retrofit (including, for example, toilets that drop through lift shafts). To the extent that accessible housing may alleviate these issues, this mitigates the overstatement of our estimates.

Allocation

Some stakeholders note that allocation is a significant issue. Even once you've built accessible homes, you still have the challenge of ensuring that people who need them actually occupy them.

Sizes

Stakeholders noted that as land blocks and homes get smaller, it is increasingly difficult to make them accessible. Importantly, the trend towards smaller blocks and homes is driven by market forces (in particular: as homes become less affordable, the market is responding by making them smaller). There may be trade-off between 'accessibility' and 'affordability'.

Current market conditions

There is uncertainty as to exactly how the market is responding to the need for more accessible housing. While ABCB have previously noted an estimate that 'around 5 per cent' of new builds are accessible, one stakeholder argued it was more likely to be 10 per cent. One stakeholder argued we cannot be certain about this because getting certification/documentation is not possible or difficult; anecdotally, one builder is building and supplying accessible homes without bothering to get them certified. 5 per cent may be an undercount because it doesn't include uncertified properties.

Stakeholders note that consumer preferences are switching towards accessibility features. There are various factors that sit behind this:

- Consumers becoming more aware of ageing in place and future needs. For example baby boomers are beginning to buy accessible apartments.
- More 'generational living' where more than 2 generations of one family live on one property (this includes duplexes occupied by more than 2 generations of one family)
- The thinking of 'live in one place for whole life' is changing

Theme 2: options for addressing the problem

NCC

One stakeholder noted that a regulatory change is required because the building industry is so fragmented (it is only way to communicate with all players).

Other stakeholders noted that if changes to the NCC are adopted, performance standards are not desirable due to cost (it involves assessment by a professional consultant, reporting, etc.).

On choices available to the ABCB, one stakeholder argued that a no-step requirement is desirable relative to a 1-step requirement. Wheelchair users struggle with 1-step. Elderly can also struggle with just one step. On the other hand, 1-step is fine for people with a walking frame.

Other options

Some stakeholders argued that non-regulatory options have not been explored to a sufficient extent to warrant the consideration of regulatory options. Alternative non-regulatory strategies include:

- Voluntary performance standard or voluntary tool to verify accessibility
- Point of sale/marketing tool/rating scheme
- Best practice guidelines and accreditation scheme
- Compulsory professional development for builders, planners, designers, etc.
- New Zealand option where building code references voluntary standard
- Financial incentives (e.g. Brisbane city council offering lower developer charges if you meet gold)

Stakeholders noted non-regulatory options should be backed up with more accountability measures.

Stakeholders also noted that changes to the NCC could be drafted to limit the number of properties they apply to. For example, the NCC has bushfire requirements that only apply via planning requirements.

Stakeholders noted that more accessible social housing is not really an alternative to more accessible private housing, because the change from private housing to social housing is too big. Further, stakeholders note that social housing turns over very slowly (and therefore may not be the response that people need for this problem). Stakeholders note that social housing tends to be old, which probably means it is not very accessible.

Some stakeholders believe it would be appropriate to offer financial incentives (e.g. tax concessions) to create more accessible housing.

Stakeholders note the Federal government has very few levers to influence this problem (other than the NCC).

One stakeholder noted that (in general) addressing building problems through planning or via local councils can be problematic because it creates the potential for:

- Too much inconsistency across councils,
- Too much regulation (overall)
- Council staff may not understand what they are regulating

On the other hand, another stakeholder noted the advantage of doing via planning is that accessible homes may be built where people who need them want to live.

Theme 3: the impacts of accessible housing

Costs

Stakeholders argued that costs to the building industry of requiring accessibility features are short-term transition costs (for example: once the ‘cookie-cutter’ has been reoriented towards accessible features, over a few years, costs for industry will return to normal).

Stakeholders argued that costs can be minimised with clever design solutions and elimination of less important features. For example, not having walk-in wardrobes or defining spaces with furniture rather than walls.

Stakeholders note that cost for smaller builders/market players will be most significant/difficult.

Stakeholders are concerned the following points may be difficult to fully cost:

- The effect of changing technology/practices
- Changing slab systems
- Losing homes in developments (where homes expand to meet new requirements)
- Excavation costs
- The cost of the loss of choice: for example, new home builders may not be able to build ‘high set’ houses – how should this be costed?

One stakeholder noted that the supply chain for new build homes is so well optimised, it will be costly to change. This includes costs to changing systems within building companies. It also includes the cost of changing products within the supply chain (for example, door and frames are supplied as one product).

One stakeholder noted that as regulation that applies to buildings becomes more complicated, there is a risk that the impact of regulatory changes lessens. (In essence, builders become less able to meet all requirements and may deal with this by ignoring some requirements in cases where they are difficult and this is tacitly accepted by regulators). This is a difficult outcome for everybody involved.

Benefits

Stakeholders commented on the benefits of more accessible housing. General benefits include: general social benefits, participation and inclusion, education, employment and health, more choice in the housing market, lower health-care and caring costs, smoother interaction with the hospital and health system, more amenity from the home environment.

One stakeholder notes that if the NCC is changed to require ‘platinum standard’ for new housing [an option that is not currently considered by the ABCB] this will not reduce the costs of the SDA (specialist disability accommodation) component of the NDIS. This accommodation has higher specifications than platinum.

Other points

Methodology and framework

Stakeholders argued that accessible housing, where it is occupied by people who benefit from it directly, potentially creates benefits for other people including family members, friends and carers. Further the group of people who could benefit directly from accessible housing is quite a large group (it includes people who suffer some forms of cancer and from strokes). Finally, where accessibility features are required, they influence many aspects of a person's life: interaction and participation in the community, enjoying the backyard, right through to easy evacuations by medical personnel when required. Therefore it is necessary for the analyst to think as broadly as possible when considering this issue.

Stakeholders note that the 'framework' for thinking about the benefits of accessible housing is important. For example, there are 'benefits at the point of sale' (to builders/developers, buyers) and then there are 'benefits throughout the lifetime of the dwelling (to future owners, occupiers, etc.)

Context

Stakeholders noted this project is being undertaken in the environment of a Royal Commission into Aged Care and a Royal Commission into Disability abuse and neglect.

Stakeholders noted the 'backstory' to this project is important, including the 2009 National Dialogue on Universal Housing Design.



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