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Cost tower: residential construction costs for affordable and social housing in Auckland 2015

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About This Report

Title

Cost tower: residential construction costs for affordable and social housing in Auckland 2015

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Abstract

The supply of more affordable housing is a key focus for government and the Auckland Council. This report gathers empirical evidence of the actual costs of residential construction in Auckland, particularly the costs of affordable and social housing. It analyses data from 69 houses, ranging from one to five bedrooms, supplied by five developers / builders to build a framework called the 'Cost Tower'. This comprised seven key cost component areas: Land, Land Development & Infrastructure Costs, Professional fees, Construction Costs, Council and Consenting Costs, Finance, Valuation and Real Estate Costs, and GST.

Reference

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1 Executive summary

The supply of more affordable housing is a key focus for government and the Auckland Council. However, there is little current empirical evidence of the actual costs of residential construction in Auckland, particularly the costs of affordable and social housing.

Objectives of the project

The objectives of the project were:

- to develop and populate a “cost tower” for new residential housing focused on Auckland, in particular, affordable housing sector and construction in Special Housing Areas
- to “unpack” the design/ professional fees, construction and council consenting costs
- to identify barriers to cost reduction with respect to consenting process and building code clauses.

The scope

This report, Cost tower: residential construction costs for affordable and social housing in Auckland 2015, provides an analysis of data that relates to the actual costs of delivering affordable, social and adjacent market housing constructed in Auckland during 2015. The report is based on data from 69 houses, ranging from one to five bedrooms, supplied by five developers / builders.

At the commencement of this project, there was no commonly agreed format for representing the costs of housing; that is, what are the key component cost areas and where do specific costs fall? The lack of consistent available data caused the authors to reflect on the adage that ‘if you can’t measure, you can’t manage.’

Working with the developer / builder data providers, seven key cost component areas were identified:

- Land
- Land Development & Infrastructure Costs
- Professional fees
- Construction Costs
- Council and Consenting Costs
- Finance, Valuation and Real Estate Costs
- GST.

An agreement on where specific costs were allocated in each of the seven areas was also reached (see Appendix One: Components of Cost Tower analysis). This framework became known as the Cost Tower.

The data collection and workshops

A wide range of organisations was invited to participate in the data collection phase. Recruitment of data partners proved problematic as some saw the information as intellectual

property they wished to protect. Others initially volunteered to participate but were later unable to provide the data. The reasons given were that either they were short of skilled labour to compile the information requested, or they were too busy pricing the next job. Securing the next job was, for some, more important than analysing their performance on their last job.

The process was informed by two workshops. The first workshop allowed data providers to challenge the aggregated results and overall analysis as well as giving participants a chance to request more specific data analysis (one / two bedroom houses separate from three plus bedrooms; and a greenfield / brownfield analysis). Further analysis was provided by market segment, separating social housing from market housing.

At the end of the project, a second workshop was held with data providers and a group of stakeholders from across the residential supply chain. At this second workshop, results were presented and stakeholders asked to identify opportunities to take time and cost out of the process. These are presented in Appendix Three: Other opportunities to reduce time/cost identified in external stakeholder workshop.

Results

Results were surprising: land costs amounted to only 25% of total costs and the median Council consenting costs were only 4% of total costs. Unsurprisingly, construction costs dominate the Cost Tower at 51% of total costs. The results also showed that there is wide variation in some of the cost components due to site- or firm-specific characteristics. These include: the experience of the builders; procurement pathways for both materials and houses; and specification levels / quality of fit-out. The median costs were a reflection on the typical cost level or percentage in many cases, but not all cases. For example, land development costs could be higher than median if there were atypical problems with the site that increased costs unexpectedly.

Participating developers / builders saw value in the project and agreed that the sharing of data in a common format (and language) enables comparison of individual developer / builder performance or specific house construction within the sample population and, furthermore, benchmarking enables participants to target areas where their performance is at variance with the rest of the sample.

This comparative data is being used by some participants to start conversations about reductions of time and costs moving forward.

Specific opportunities for reducing cost identified by this research include:

- Government to provide greater certainty regarding future supply intentions of social / affordable housing and to move beyond competitive, repetitive, time / cost consuming RFP processes. It is extremely difficult for providers to develop capacity to supply at scale when there is little future certainty.
- Council / Crown to explore models where they maintain ownership of land and work in partnership with developers / builders to deliver social and affordable housing.

- Address Council density requirements which discourage development of affordable / social housing.
- Provide more equitable allocation of Council development and infrastructure levies, which currently disadvantage smaller dwellings. Move to cost allocation on basis of number of bedrooms per dwelling rather than dollar value of dwelling.
- Base Government housing decisions on whole of life costs, rather than initial capital cost.
- GST represents a significant component of the cost of affordable, social and market housing – 9%. If the government wants to incentivise the delivery of social and affordable housing, options could include deferral or interest free loan mechanisms for targeted groups (e.g. first time homeowners).
- Standardised design will deliver lower cost in both design and construction.

The value in the Cost Tower work will be increased by repeating and refining the process at regular intervals, recruiting additional data suppliers, and by hosting workshops for participants to benchmark performance, share ideas and explore further opportunities to take cost out of the process, thereby improving productivity across the sector.

The authors recommend:

- Continuing to develop the platform for collecting / sharing data to enable participating builders / developers to benchmark their performance and share opportunities for improvement.
- Expanding the sample to include more developers / builders, particularly with respect to affordable housing in greenfields developments.
- Collecting data in other geographical areas where there is significant volume of residential construction and demand for social / affordable housing.

2 Background to the project

For developers and builders to improve the efficiency of housing delivery, and for central and local government to draft robust policy to facilitate the increase in supply of housing (particularly affordable and social housing), it would be helpful to have actual data on land, development, construction and council costs.

Beacon and NZIER have been exploring a framework to understand the costs of delivering residential new build in the affordable / social housing sector. A contract with the Ministry of Business, Innovation and Employment (MBIE) has enabled the two organisations to develop and populate a “cost tower” for new residential housing in Auckland, working with developers / builders who can be characterised as delivering to the affordable housing sector and building in Special Housing Areas. MBIE, through this research, is interested in identifying opportunities to reduce the cost of residential construction. This includes an examination of the barriers to cost reduction and developer risk management, particularly with respect to building consent processes, building code clauses and consenting documents.

The aim of this work is to provide a platform for all stakeholders to understand where costs fall and therefore where there might be opportunities for reduction. This project serves as a pilot to validate the concept and explore a potential business model to enable builders / developers to collaborate, share data, benchmark performance and improve costing / efficiency in the delivery of affordable and social housing.

It should be noted that this work is not representative of **all** market housing supplied across Auckland. Rather, it is a sample of social, affordable and adjacent market housing built in Auckland in 2015 in Glen Innes, Avondale, Papatoetoe, Sunnyvale, New Lynn, Hobsonville, Mt Wellington, Papakura, Weymouth and West Auckland.

Finally this work explores the *costs* of social, affordable and adjacent market housing as opposed to the final *price* that might be paid for a dwelling on a site (which may, for instance, incorporate both a profit margin as well as significant price increase based on what the market will pay). *Price* is inherently determined by market conditions and influenced by supply and demand factors as well as other variables outside the scope of delivering more affordable *costs* for housing.

2.1 Definitions

During this project (in conversations with developers / builders and in workshops), the terms ‘social housing’, ‘affordable housing’ and ‘market / private housing’ were used to describe housing market segments for which data is collected / analysed.

These three housing segments appear across the housing continuum (Figure 1)

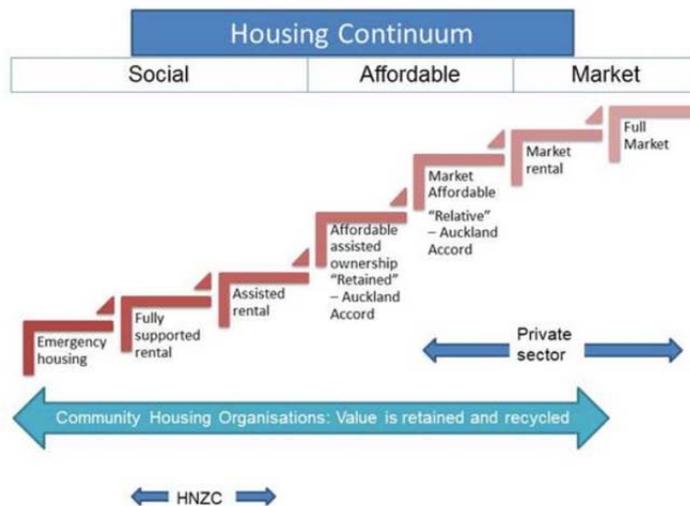


Figure 1: Housing continuum¹

Social housing

In the context of this report, this refers to houses built for HNZC or community housing providers to house tenants (or prospective owners) who rely on assistance or some form of subsidy; either from the Government's IRRS payments, or another financial mechanism (e.g. rent to buy or shared ownership scheme provided by the community housing provider).

Affordable housing

The term 'affordable', in the context of this work, refers to housing which is built either for, or by, community housing providers who are assisting low income households to enter into home ownership (through a variety of financial mechanisms), or provided at subsidised rental rates (at less than current market rates). In many cases, these will be built by builders / developers and are subject to Council's relative affordability requirements in SHA's or are in areas such as Hobsonville where a percentage of houses need to be delivered at 75% of Auckland's median house price.

Market housing

The term Market housing refers to houses built for sale on the open market with no subsidy attached.

¹ Community Housing Aotearoa website - <http://www.communityhousing.org.nz/about-us/what-community-housing/>

2.2 Developing the Cost Tower framework

The Cost Tower initially had five main components:

- Land, Land Development & Infrastructure Costs
- Design & Construction Costs
- Council and Consenting Costs
- Finance, Valuation and Real Estate Costs
- GST

It was seen as useful to include an analysis of GST as a government seeking to incentivise new build for social and affordable housing might consider a deferment or other mechanism to incentivise first time homeowners.

The Cost Tower, and where respective costs fall, was built up with input from five developers / builder partners who offered to contribute data, either providing their files or completing and returning the Excel spreadsheet (Appendix One: Components of Cost Tower analysis).

As the project progressed, it became apparent that there was value in separating costs further

- Land costs separately from Land Development Costs
- Design / Professional fees separately from Finance, Valuation and Real Estate Costs

The end result is a Cost Tower with seven component parts:

- 1) Land
- 2) Land Development & Infrastructure Costs
- 3) Professional fees
- 4) Construction Costs
- 5) Council and Consenting Costs
- 6) Finance, Valuation and Real Estate Costs
- 7) GST

3 Methodology

3.1 Recruitment of partners

Partners were recruited from known contacts who have participated in Beacon projects and were building affordable / social dwellings, or referrals from known contacts.

Some potential partners declined to participate for a number of reasons including lack of resource to collate data and not being willing to share proprietary costing information.

3.2 Data collection

Data was collected for houses completed in the 12 months prior to November 2015, either by Beacon staff working in partner offices with their job files, or by partners providing data in an Excel spreadsheet format.

Collection of data relating to costs was relatively straightforward, with the following exceptions:

- Previously, there has been no commonly agreed format; for example, some parties included GST in their analysis while others were GST exclusive.
- Difficulty in separating out professional fees where multiple disciplines were provided by one multidisciplinary practice; and distinguishing whether fees related to construction design or to land development.
- Construction overhead costs and finance costs tended to be identical over multiple houses in each of developers specific developments as most prorated these costs across each development.
- Finance costs were often not recorded in the main construction cost figures as finance costs may be recorded elsewhere in business (for example, as interest on a loan or overdraft facility).
- It was not possible to source detailed building / labour costs on an element-by-element basis (e.g. plaster board material, plaster board labour) as most of the partners contracted construction out to contract builders and had a single construction cost, and those builder partners were guarded about their material costs.
- Building Consent (BC) fees often not identified separately as they are part of building contract (i.e. construction costs) and, where this occurred, BC costs were estimated (using online calculator and checked against other similar sized / cost houses in the sample), were deducted from construction costs, and recorded as BC fees,
- Collection of data for time (total development period and individual house construction) was not accurately recorded by most participants.
- Most data providers had not compared their own data in this way before, so compiling the information involved considerable time and resources.

Each house data set was allocated a random number to protect confidentiality.

3.3 Data analysis and stakeholder participation

Initially, the project managed to collect data from 49 separate houses and the sample was analysed on gross cost per component (Land, Land Development, Professional fees, Construction, Council fees, Finance, Valuation and Real Estate and GST).

As part of the project, Beacon undertook to hold two stakeholder workshops. The first workshop was with data providers, MBIE and Auckland Council representatives. The aim of the workshop was to share, test and validate the cost tower framework and some early analysis of the costs.

During the first workshop, the participants confirmed the value of the cost tower work, expressing a view that it provided a useful common language / framework to compare their costs. This enabled participants to commence a conversation, based on the benchmarking comparison, on where there were opportunities to remove time / cost.

In addition, participants requested more detailed analysis, splitting sample between:

- One , two bedroom and three plus bedrooms,
- Greenfield and brownfield development
- Detailed component analysis on a per square metre basis for each of the components.

A further twenty houses were then added to the sample which enabled detailed analysis of one, two and three bedroom houses. Greenfield / brownfield comparison was limited owing to the small sample of greenfield houses available.

Further analysis by market segment (social, affordable and market housing), was constrained owing to the small sample of affordable houses and data providers (only 15 houses between two data providers). Maintaining confidentiality was an important issue for the data providers for commercial reasons.

A second workshop was held with a broader group of stakeholders at the end of the project to validate the data and explore opportunities to reduce costs of residential construction. The high level outcomes of this workshop were:

- Validated cost tower process and provided analysis from a broad stakeholder group including professions, council and sector representative groups.
- Showed that sharing of data in a common format facilitates benchmarking of performance and enables participants to target improvements.
- Provided a forum for stakeholders to explore opportunities to take time / cost out of the process.

4 The sample

The sample is comprised of 69² houses. The combined total floor area for these houses was 9,349 m². The land area was 20,260 m². The total value of construction costs, including the land and development costs amounted to \$40.3 million from across Auckland. The construction of the sample houses has been completed in the last 12 months.

Houses were constructed in Glen Innes, Avondale, Papatoetoe, Sunnyvale, New Lynn, Hobsonville, Mt Wellington, Papakura, Weymouth and West Auckland.

The breakdown by number of bedrooms is shown in Table 1. The most common dwellings in the sample are two bedroom (40%) which is largely social housing, and four bedroom (35%) which is the most common configuration in market-provided new build.

Table 1: Sample composition by number of bedrooms

Number of bedrooms	Sample size
1	3
2	28
3	11
4	24
5	3
Total	69

The breakdown of houses by the number of storeys is shown in Table 2.

Table 2: Sample composition by number of storeys

Storeys	Sample size
1	17
2	52
Total	69

² The actual sample size is 95 dwellings - two developments had a mix of standardised one / two bedroom units which, for the purposes of this analysis, were treated as single one and two bedroom units to avoid bias in the sample.

The breakdown by market segment is shown in Table 3.

Table 3: Sample composition by market segment

Market segment	Sample size
Social	30
Affordable	15
Market	24
Total	69

The split between greenfields and brownfield is shown in Table 4.

Table 4: Sample composition split by development type

Development type	Sample size
Greenfield	16
Brownfield	53
Total	69

4.1 Sample dominated by brownfield houses

The sample was dominated by houses built in brownfield developments (Table 4) reflecting that, while Special Housing Areas (SHA) and provision of affordable housing were legislated for in the 2013 Housing Accord, it has taken some time for council and the development community to respond. As recently as 6 November 2015, Auckland Council could only identify 102 houses as being built in SHAs.³

³ Refer <http://www.stuff.co.nz/business/73771016/Special-housing-areas-in-Auckland-spectacular-flop-Labour>

5 Results

The project provided two sets of learning. Firstly, specifically, what the data told us; and, secondly, at a project / process level, how the sector manages costing data.

Throughout the analysis, the median value is reported rather than the average. The presence of significant outliers in the sample distorted the average costs. In this case, the median is a better reflection of the typical costs. The median is the middle number from the sample for each cost category.

5.1 Overall Cost Tower

Initially, data was analysed in gross dollar terms across the seven cost category areas. At the first workshop, data providers requested unit analysis on a per metre square basis and the unit analysis is presented in section 5.1.5 below.

Table 5 below summarises data from the 69 homes across the seven cost component areas in gross dollars.

What is immediately obvious is that land costs for are only 25% of the total costs for the sample in this study. The relatively low land development cost reflects that either building partners are purchasing developed land or that development costs may have been part of a single build / development cost (therefore not enabling simple separation of land development and construction costs). Likewise, the median Council costs were only 4% of build costs. This, in part, may reflect a high proportion of brownfields developments where there is a credit available for development and infrastructure charges for every dwelling removed.

GST is only 9% as land sales are zero rated for GST.

Construction costs dominate the Cost Tower, with the median construction cost comprising 51% of total costs.

Table 5: Cost component analysis of all houses

Cost component	Lower Quartile	Median	Upper Quartile	Median component % of Median total cost
Land	\$115,916	\$147,811	\$200,000	25.8%
Development	\$8,111	\$10,064	\$24,503	1.8%
Construction	\$184,644	\$294,265	\$378,418	51.4%
Council fees	\$17,662	\$22,624	\$32,111	4.0%
Professional fees	\$11,148	\$23,684	\$26,122	4.1%
Finance, valuation, and real estate	\$8,152	\$21,969	\$29,469	3.8%
GST	\$37,272	\$51,607	\$70,627	9.0%
Total	\$382,905	\$572,024	\$761,251	

Source: NZIER analysis of participant data

5.1.1 Comparison of one / two bedrooms with three plus bedrooms

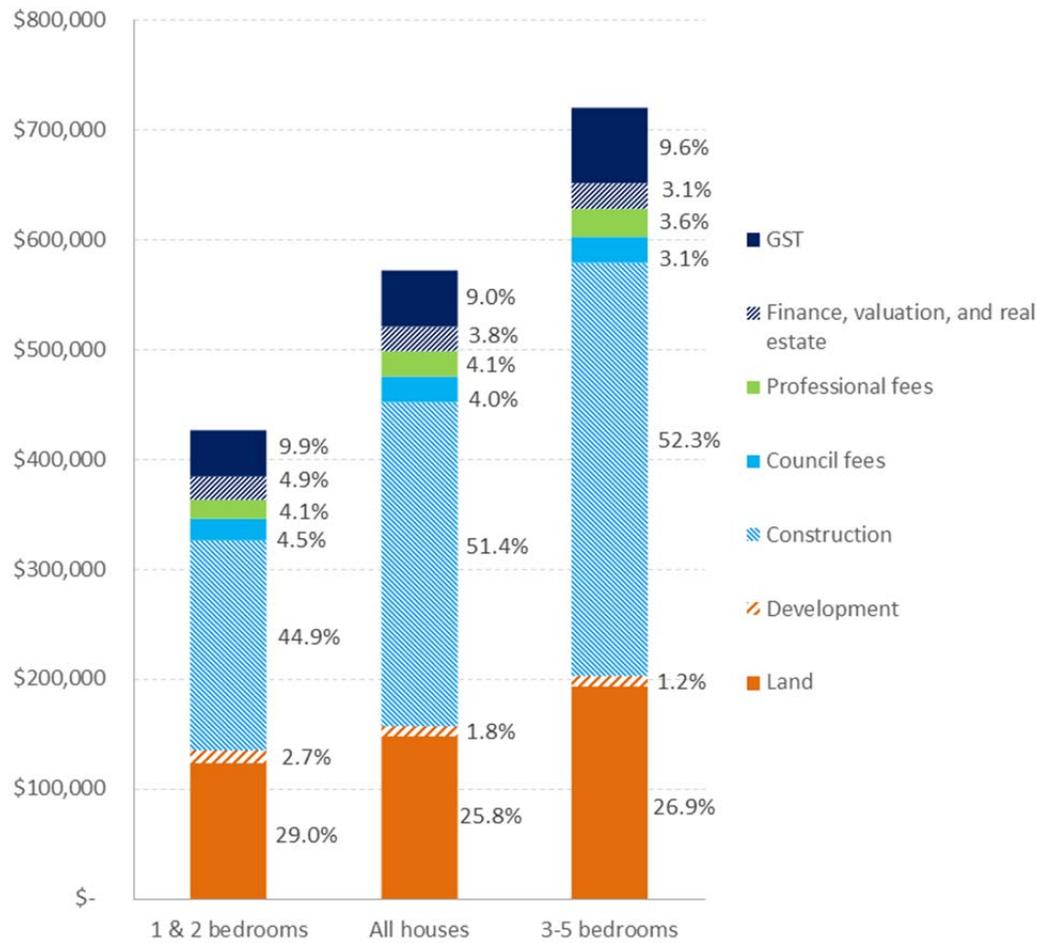
It is not possible to interpret the variance in costs between one, two and three-plus bedrooms (Table 6). Land cost for one and two bedroom houses are only slightly greater than the rest of the sample and construction costs marginally lower.

Table 6: Comparison of one, two and three plus bedrooms

Cost component	1 & 2 bedrooms	%	3+ bedrooms	%	All houses	%
Land	\$123,549	29.0%	\$193,725	26.9%	\$147,811	25.8%
Development	\$11,438	2.7%	\$8,968	1.2%	\$10,064	1.8%
Construction	\$191,304	44.9%	\$376,646	52.3%	\$294,265	51.4%
Council fees	\$19,370	4.5%	\$22,626	3.1%	\$22,624	4.0%
Professional fees	\$17,648	4.1%	\$26,122	3.6%	\$23,684	4.1%
Finance, valuation, and real estate	\$20,901	4.9%	\$22,347	3.1%	\$21,969	3.8%
GST	\$42,227	9.9%	\$69,435	9.6%	\$51,607	9.0%
Total	\$426,438		\$719,867		\$572,024	

Source: NZIER analysis of participant data

Figure 2: Cost tower comparison



Source: NZIER analysis of participant data

5.1.2 Houses on brownfield sites

Table 7 reveals a similar pattern to the sample as a whole (refer Table 1). Land costs in brownfields appear slightly less than the sample as a whole, but do not reflect the credit value of development and infrastructure cost credits, which result in lower Council costs.

Table 7: Cost component analysis of houses on brownfield sites

Cost component	Lower Quartile	Median	Upper Quartile	Median component % of median total cost
Land and development	\$125,201	\$141,969	\$209,115	22%
Construction	\$321,777	\$372,154	\$414,513	57%
Council fees	\$19,370	\$22,128	\$22,752	3%
Professional fees	\$24,538	\$26,122	\$35,742	4%
Finance, valuation, and real estate	\$21,384	\$22,700	\$41,142	3%
GST	\$58,557	\$68,225	\$75,422	10%
Total unit cost	\$570,828	\$653,296	\$798,685	

Source: NZIER analysis of participant data

5.1.3 Houses on greenfield sites

As identified in Section 4 The sample, the small number of greenfield houses does not provide a large enough sample for detailed analysis and is not reproduced in the report to protect the confidentiality of the data providers. This reflects the small number of social / affordable houses built to date in greenfield SHAs (refer Section 4.1 Sample dominated by brownfield houses).

5.1.4 Analysis by market sector

Affordable houses are excluded, owing to small sample size (only 15 dwellings). Median costs (land & development and construction) for market houses are 50% greater than for social houses, reflecting the larger section sizes and predominantly larger number of bedrooms in market houses. It may also reflect a preference for high value sites for market houses to make them more attractive to private buyers, whereas providers of social housing are willing to trade environmental benefits, such as better views, for a lower cost site. The direction of the cost variation was in line with our expectations.

Table 8: Comparison of social with market housing

Median cost comparison

Cost component	All	Social	Market
Sample size	69	30	24
Land and development	\$157,777	\$140,607	\$210,120
Construction	\$294,265	\$247,111	\$376,646
Council fees	\$22,624	\$22,625	\$20,528
Professional fees	\$23,684	\$22,451	\$26,122
Finance, valuation and real estate	\$21,969	\$20,901	\$39,855
GST	\$51,607	\$45,550	\$71,677
Total	\$571,926	\$499,245	\$744,947

Source: NZIER analysis of participant data

5.1.5 Cost component analysis on a per square metre basis

The following section explores the cost by component on a square metre basis. Land and development costs were divided by the land area. All the other cost components were divided by the dwelling floor area because they are primarily related to the size of the house.

Table 8 shows the overall median unit cost per square metre for the whole sample. There is wide variation in the land value unit costs. The reason for this is that land value is only partly related to the site area. Other factors such as location, views, amenities and orientation influence land values.

Table 8: Overall unit cost comparison

Per square metre

Cost component	Lower Quartile	Median	Upper Quartile
Land	\$401	\$618	\$855
Development	\$22	\$32	\$107
Construction	\$1,617	\$2,165	\$2,569
Council fees	\$139	\$175	\$252
Professional fees	\$109	\$181	\$222
Finance, valuation, and real estate	\$85	\$149	\$243
GST	\$308	\$429	\$481
Total unit cost	\$2,680	\$3,749	\$4,728

Source: NZIER analysis of participant data

5.1.6 Cost component analysis on a per square metre basis, one / two bedroom compared to three plus bedrooms

Table 9 and Table 10 show the unit costs on square metre basis for two groups of houses by the numbers of bedrooms. The land and development costs on a square metre basis for one and two bedroom houses are higher than those for three plus bedroom houses. This result is somewhat counter intuitive but is likely to reflect that the area of the site is only one component of the value of land. Other factors such as location and views influence the cost of land. The median land area was 200m² and 290m² for one and two bedroom houses and three plus bedroom houses respectively. The cost per square metre will be higher for the smaller median site if the total cost these two median site areas were similar.

Table 9: Unit cost component analysis of one and two bedroom houses

Per square metre

Cost component	Lower Quartile	Median	Upper Quartile
Land	\$405	\$647	\$880
Development	\$30	\$53	\$142
Construction	\$1,587	\$2,007	\$2,651
Council fees	\$175	\$254	\$316
Professional fees	\$109	\$213	\$241
Finance, valuation, and real estate	\$82	\$188	\$304
GST	\$386	\$461	\$507
Total unit cost	\$2,773	\$3,823	\$5,042

Source: NZIER analysis of participant data

Table 10: Unit cost component analysis of houses with three plus bedrooms

Per square metre

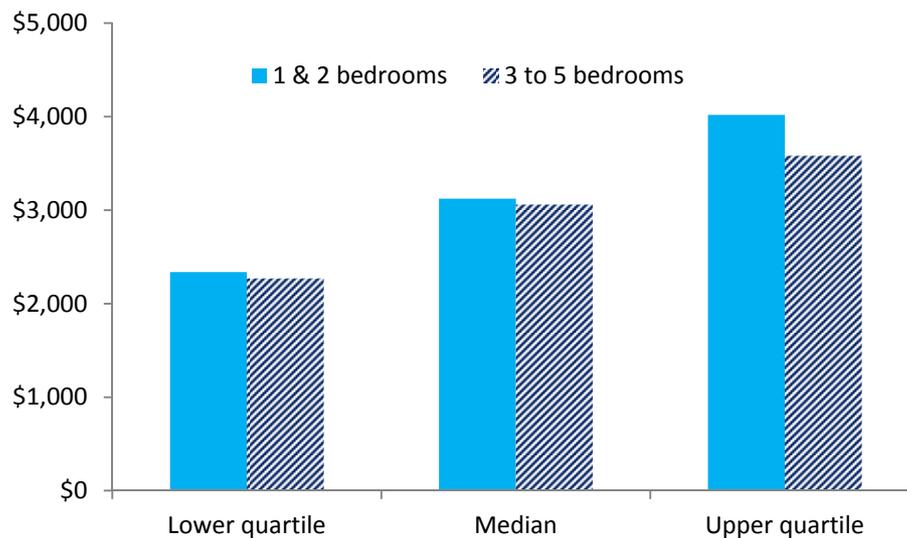
Cost component	Lower Quartile	Median	Upper Quartile
Land	\$385	\$401	\$688
Development	\$18	\$25	\$38
Construction	\$1,629	\$2,202	\$2,488
Council fees	\$112	\$142	\$188
Professional fees	\$113	\$167	\$211
Finance, valuation, and real estate	\$107	\$131	\$240
GST	\$308	\$418	\$456
Total unit cost	\$2,672	\$3,487	\$4,307

Source: NZIER analysis of participant data

When land and development costs are excluded from the per unit analysis, the unit cost ranges for above ground costs are very similar (refer Figure 3).

Figure 3: Dwelling only unit costs

Per square metre, Land and development costs are excluded



Source: NZIER analysis of participant data

5.1.7 Cost component analysis on a per square metre basis, greenfields, brownfields

The sample for greenfield was limited to only 16 houses, a relatively small sample. More were sought but not provided in the time available for the study. The data was provided by two participants. To complicate matters further, one of them was only able to provide a combined land and development cost. As a result, land and development costs for both sets of data have been combined to ensure consistency and maintain confidentiality.

The greenfield sample also exhibited considerable variation. For example, the largest greenfield site was 3.7 times larger than the smallest. The small size of the sample, as well as the fact that it is limited to only two providers, is problematic. Further research to establish a larger sample for greenfield would help us understand whether the sample we originally obtained is representative of the greenfield construction market in Auckland. For example, we expected the land and development costs of brownfields⁴ would be larger than greenfields; our results show the opposite.

⁴ *The land cost for brownfields is traditionally higher, owing to location / proximity to central city and include the value of the development contribution for each existing house*

Table 11: Unit cost component analysis of houses on greenfield sites

Per square metre, two storey only

Cost component	Lower Quartile	Median	Upper Quartile
Land and development	\$687	\$979	\$1,120
Construction	\$1,393	\$1,646	\$1,899
Council fees	\$137	\$188	\$215
Professional fees	\$40	\$44	\$101
Finance, valuation, and real estate	\$40	\$102	\$212
GST	\$253	\$303	\$405
Total unit cost	\$2,550	\$3,262	\$3,952

Source: NZIER analysis of participant data

Table 12: Unit cost component analysis of houses on brownfield sites

Per square metre, two storey only

Cost component	Lower Quartile	Median	Upper Quartile
Land and development	\$424	\$433	\$674
Construction	\$2,245	\$2,516	\$2,657
Council fees	\$135	\$155	\$175
Professional fees	\$181	\$212	\$225
Finance, valuation, and real estate	\$131	\$188	\$263
GST	\$427	\$460	\$495
Total unit cost	\$3,543	\$3,966	\$4,489

Source: NZIER analysis of participant data

5.1.8 Unit cost by market sector

Per unit costs by market sector reflect house size / number of bedrooms. Social houses are predominantly two bedroom dwellings. Development and infrastructure costs (Council fees) have, in the past, been fixed on per unit basis, rather than number of bedrooms.

Table 13: Median unit cost component by market sector

Unit cost component	All	Social	Market
Dwelling area (m ²)	135	111	159
Land and development	\$618	\$513	\$462
Construction	\$2,165	\$2,243	\$2,435
Council fees	\$175	\$224	\$133
Professional fees	\$181	\$213	\$207
Finance, valuation and real estate	\$149	\$130	\$242
GST	\$429	\$431	\$453
Total cost per m²	\$3,717	\$3,865	\$4,091

Source: NZIER analysis of participant data

5.2 Observations from the project

Opportunities for developers / builders of residential construction to improve productivity are limited without accurate data and agreed definitions of measures of cost and time.

Data / formatting and collection process

At commencement of the project, the developer / builder data providers all collected and analysed their cost data in a different manner. Beacon proposed a structure of five cost components (refer section 2), which, with input from the data providers, was extended to seven sections. Some are working on GST inclusive data, others GST exclusive.

The quality of data for construction time, both for development and construction, was extremely variable and, in some cases, was not routinely recorded by the data providers. This research project did not start with agreed definitions for total development time and actual build time on site. Providing clear definitions for each of the time elements may have helped, but, in some cases, the records weren't available – though many of the data providers agreed that this would be useful comparative information moving forward.

Overall, seven parties were approached to provide data. One was not prepared to share their intellectual property. Another, having committed to provide data, was then unable to provide it owing to shortage of staff and demands of their current commitments. A further two were only

able to provide small samples of data, owing to time required to collate and present in a common format.

In conversation, it became apparent that, for some partners / potential partners, providing actual cost data was a time consuming exercise. The project team suspects that some builder developers do not systematically collate and analyse costs on a completed house or construction project. This may be because the current market pressures have them focused on pricing the next job, rather than analysing costs (and ways to reduce them) from the last job.

Common data provides opportunity for fact-based discussion and benchmarking to improve performance

At the first workshop, some of the developer / builder partners initiated conversations about how their own data compared with the sample, which then led them to exploring opportunities to reduce costs and improve efficiency with others.

Some individual builder / developers have also taken the opportunity to use the sample data in their discussions with government agencies seeking increased provision of social housing to present independent evidence for decision makers as to where costs lie.

Limitations of the data

The sample of 69 houses was chosen from houses completed in the last 12 months. Owing to development horizons, the actual land / land development costs and the contracted construction costs may have been fixed two to three years previously. Since that time, Auckland has experienced significant cost increases in land and recent construction pricing suggest material cost increases of the magnitude of 15–25%⁵.

Limitations of external stakeholder engagement

The second stakeholder workshop, which was designed to engage with and seek input from the sector while sharing the project learning, may have been premature. Whilst a summary of learning (along with tables and graphs) was circulated prior to the workshop, much of the discussion, as well as the opportunities presented to reduce time and construction costs, were unrelated to the specific data presented. This appeared to reflect the professional and/or practising background and experience of participants, who brought pre-conceived notions of problems and solutions to the table as opposed to examining lessons from the data.

The sharing of data and an open discussion of individual performance requires trust. In the first workshop, the builder / developer participants started to share some of their challenges and, following the first workshop, some started to have more detailed conversations with their peers and other data providers regarding their costs and comparative processes. By contrast, conversation at the second workshop was largely dominated by external stakeholders.

■ _____
⁵ According to participant feedback from Workshop 1

6 Identifying opportunities to take time and cost out of the process

6.1.1 *If you can't measure, you can't manage*

Data providers agreed that the sharing of data in a common format enables comparison of individual developer / builder performance or specific house construction within the sample population and, furthermore, benchmarking enables participants to target areas where their performance is at variance with the rest of the sample.

6.1.2 *Lack of future certainty of supply*

For providers of social housing, the lack of certainty from government regarding future supply intentions for social housing and government's repetitive, competitive RFP processes create a lack of future certainty for social housing providers and add considerable cost. A number of the developers expressed the view that it is extremely difficult to develop capacity to deliver at scale when there is no future certainty.

The Cost Tower research identified opportunities to take time and cost out of the housing development process. In addition, participants at the second stakeholder workshop presented additional opportunities, which are not necessarily supported by data from the project and the authors have chosen to present the two groups of opportunities separately.

6.2 Opportunities to reduce time/cost arising from this research

Specific opportunities in each of the cost component areas.

Land and land development costs

- Planning regulations place an unfair cost burden on one / two bedroom units, as subdivision requirements (and associated development costs) relate to number of units, rather than a metric which represents the expected number of inhabitants and their impact on infrastructure, such as and occupancy rate assumed from the number of bedrooms.
- The Crown and local councils seeking to achieve market value on the sale of land to facilitate development of affordable housing may not necessarily deliver affordable housing. Developers suggested that this was because the developer then carries land and development risk and will seek a market return accordingly. Council / Crown could benefit from a model whereby they maintain ownership of the land and work in partnership with the developer to deliver affordable housing.
- Density requirements in the District Plan (and the proposed Unitary Plan) reward developers who build the largest possible dwelling on a section maximising economic return.

- Development contributions could be structured as a targeted rate shifting burden of cost from developer (and one time cost) to a targeted rate borne by homeowner, acknowledging that this could disincentivise the purchase of new homes if it means rates on new homes are proportionately more expensive than older homes.

Design & Construction

- Predominantly, the sector is not delivering size of dwelling required (one and two bedrooms) and there is a market perception that four bedroom standalone dwelling is what maximises resale values.
- Some developers have indicated that designing Homestar™ requirements (required for Special Housing Areas) into existing house designs is not a cost-effective solution. There is a need for a design-led solution from the commencement of the land development and through the house design process, rather than increasing the specifications on last century's housing designs.
- Reduce the often high cost of variations which can arise from a lack of upfront understanding of site-specific geotechnical and foundation requirements.
- Standardisation of design will deliver lower cost in both design and construction.

Council fees

- Participating developers proposed that Development Contributions and Infrastructure Charges should be levied on the basis of a metric representing the expected occupancy, such as the number of bedrooms. Levying dwellings or dollar value (the current system) unfairly discriminates against providers of small one and two bedroom units (refer section 5.1.6). Expected occupancy is a more equitable way to determine future load on infrastructure.
- They also felt that Development contributions and infrastructure charges need to reflect actual cost / value to future residents in the locality where development is happening, not a blanket charge across the City.

GST

- GST represents a significant component of the cost of affordable, social and market housing – 9%. Exempting GST for affordable / social housing will reduce cost.
- It was suggested that there is an opportunity for a tax sharing mechanisms between central and local government? For example, in order to meet demand for specific housing in specific geographical areas, could GST on new homes be diverted to Council to offset cost of infrastructure development?

6.3 Other opportunities

Other opportunities to reduce cost were raised at an external stakeholder meeting in December 2015. As these are not directly related to the data presented, they are written up separately in Appendix Three: Other opportunities to reduce time/cost identified in external stakeholder workshop.

7 Next steps

The current developer / builder data providers see value in the process and have expressed a desire to continue to participate in the sharing of data.

The aim would be to:

- Grow the sample size, particularly greenfields data.
- Provide a tighter definition and a framework for measuring time inputs.
- Undertake further work to establish comparative land costs between greenfields and brownfields nett of development and infrastructure contributions.
- Simplify the data collection process
- Establish a platform for discussion across participating developer / builders with meaningful benchmarks and plans of action to reduce time / cost.
- Target specific opportunities for cost reduction and build a value case based on data. Explore life time / operational costs and how developers, (through design and specification) can deliver lower operational costs for those in affordable and social housing.
- Unpacking the black box that is construction costs: identify specific key costs areas; explore opportunities to reduce those costs; trial with developer / builder partners while continuing to measure performance; share learning with sector.
- Build value case for industry to recognise value in the collection and sharing of data, benchmarking performance and collaborating to improve the affordability of housing.
- Extend process beyond stand alone housing to medium density housing and apartments.

Appendix One: Components of Cost Tower analysis

	Allocated random #
Market segment	Housing type
Size of dwelling	Dwelling area m ²
No. of storeys	Storeys
	# bedrooms
	# bathrooms
	# carports
	# garage
Measure of TIME	Total development time - design / build
	Build time on site
Land cost	Land cost
	Land area m ²
	Land cost a % of total cost
Land development costs	Valuation
	Council LIM
	Offsite infrastructure (e.g. stormwater)
	Excavation / siteworks
	Road works
	Fencing
	Pathways
	Demolition
	Disconnections
	TOTAL DEVELOPMENT COSTS
	TOTAL LAND & DEVELOPMENT COSTS
	Land + development costs as a % of total cost
Professional fees	Urban design / concept design
	Architecture
	Planning
	Engineering / infrastructure
	Landscape design
	Project management
	Other (ecology, acoustic etc..)
	Legal
	Insurances
	TOTAL PROFESSIONAL FEES
Construction costs	TOTAL construction costs

	Builders margin
	TOTAL CONSTRUCTION COSTS
	Developer overhead
	Margin
	TOTAL DESIGN, DEVELOPER & CONSTRUCTION COSTS
	Design, developer and construction costs as a % of total cost
Council costs	Subdivision consent
	Resource Consent
	Development contribution
	Other Council costs
	Watercare/ Veolia
	Building Consent
	224c
	TOTAL COUNCIL COSTS
	Council cost as a % of total costs
Finance, valuation and real estate	Finance Costs
	Sales & Marketing
	Real Estate fees
	Legal / Conveyance
	Valuation
	TOTAL FINANCE, VALUATION & REAL ESTATE COSTS
	Finance, valuation and real estate costs as a % of total costs
	TOTAL ALL COSTS (excl GST)
GST	
	GST %
TOTAL	OVERALL TOTAL COST INCLUDING GST

Appendix Two: Workshop participants

MBIE – Adrian Bennett, Duncan Joiner, Nikki Buckett, David Hermans

Auckland Council – Rohan Bush, Harshal Chitale

Property Council – Alexis Voutratzis

BRANZ – Ian Page

Tamaki Redevelopment Company – Joe Bartley

NZGBC – Alex Cutler

On behalf of NZIA – Dave Strachan (SGA Architects), Blair Johnston (WAM)

Creating Communities - Murdoch Dryden

NZ Housing Foundation – Dominic Foote

CORT Housing – Peter Jefferies

Accessible Properties – Nigel Smith

Classic Homes – Matt Lagenburg

NZIER – Michael Bealing

Beacon Pathway – Verney Ryan, Nick Collins

Invitations were also extended to Community Housing Aotearoa, Master Builders, Certified Builders, IPENZ, ADNZ, NZIQS, Productivity Commission, HNZC.

Appendix Three: Other opportunities to reduce time/cost identified in external stakeholder workshop

Land and land development costs

- Decentralised / local on-site water solutions should be encouraged to reduce Watercare infrastructure charges and time constraints on development, e.g. development to north of Auckland constrained by need for upgraded Watercare infrastructure.
- Development contributions (Council) and infrastructure charges (Watercare, Chorus, Vector) need to be evaluated as part of land development costs rather than council costs.

Design & Construction

- The government is focused on initial capital cost of housing and not on *whole of life* costs which could deliver lowest maintenance for the owner and operational costs for tenants.
- There is a need for more (or better) construction detail on plans for the builder. An absence of construction detail delays projects and creates future potential liability issues.
- Prefabrication creates opportunities, but there is a need to understand the different design and consenting processes along with the potential cost / time advantages (and disadvantages) of off-site fabrication.
- Need to review costly, repetitive sections of Building Code required, e.g. E2.
- The use of Alternative Solutions across multiple house designs could effectively reduce costs.
- Structural Insulated Panels / prefabricated roofing and other non-traditional construction methods / materials can deliver construction cost savings.

Council Costs

- Bonds or compulsory warranty could reduce liability to Council and professional insurance fees. Moving to proportional liability would also assist in reducing professional / council liability for future costs. Both are likely to increase housing costs.
- While building consent applications for simple standalone construction are processed quickly, consents for medium density developments invite a myriad of questions (and time delays) from Council.
- Council fails to appreciate the cost of lost time. Council operates in policing role (where not to act is an easy response), rather than an enabling and Quality Assurance (QA) role. However, it was acknowledged that the Housing Project Office, in bringing together all key Council Officers along with those from Council Controlled Enterprises, was fantastic at speeding up the process and avoiding conflict between Resource Management Act and building consent processes.
- The parallel processing of consents was identified as saving significant time and providing greater certainty.
- Multiple parties attending inspections is unnecessary. There appears to be duplication in inspection processes, particularly when a Council representative is required to inspect an item which has been designed, peer reviewed, and inspected by a qualified engineer.

Appendix Four: Cost Tower analysis summary

Attached as separate Excel file.