TOWER RENEWAL PARTNERSHIP

TOWER RENEWAL AND RETROFIT FINANCE

Supporting the Repair and Renewal of Canada's Aging Apartment Stock

March 28, 2019

Centre for Urban Growth + Renewal
And the Tower Renewal Partnership

For

The Canadian Housing Policy Roundtable

Photo courtesy of Jesse Colin Jackson

TOWER RENEWAL PARTNERSHIP

ABOUT THE CANADIAN HOUSING POLICY ROUNDTABLE

The Canadian Housing Policy Roundtable (CHPR) is a group of leading housing thinkers committed to working across sectors to develop shared solutions to strengthen Canada's housing system.

It comprises perspectives from across the housing continuum, community organizations, foundations and academics and researchers. It is an independent table with diverse membership. Its members work together to advance the policy, research, and practices necessary to achieve the vision of Canada's National Housing Strategy. It contributes to and helps sustain the national conversation on housing system policy.

Current members of the CHPR:

- Canadian Federation of Apartment Associations
- Canadian Home Builders' Association
- Centre for Urban Research and Education (CURE) at Carleton University
- Habitat for Humanity Canada
- Housing Partnership Canada
- Housing Services Corporation
- Ontario Non-profit Housing Association
- Options for Homes
- United Way Centraide
- United Way Toronto & York Region
- Wellesley Institute

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ABOUT THE TOWER RENEWAL PARTNERSHIP

Tower Renewal is a model to transform Canada's remarkable stock of postwar apartment towers and their surrounding neighbourhoods into more complete communities, resilient and healthy places, fully integrated into their growing cities. Led by the Centre for Urban Growth + Renewal and supported by a group of core partners, the Tower Renewal Partnership is a collaborative initiative working to preserve and enhance this key housing through research, advocacy and demonstration projects. The Tower Renewal Partnership's goal is to enable reinvestment into these dynamic neighbourhoods, working toward building lower-carbon, healthier and more complete communities.

TOWER RENEWAL PARTNERSHIP

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INTRODUCTION

On January 22, 2019 an apartment tower in the St. Jamestown neighbourhood of Toronto suffered a burst water supply pipe which caused a mass failure of the building's electrical system. Water, heat and power were shut off, resulting in the displacement of residents. This single building is home to about 1,000 residents who went without power for three days. The building failure was a result of systems reaching end of life – a condition indicative of aging systems found in thousands of buildings of similar type throughout Canada. Built in the apartment housing boom of the 1960 and 70s, these buildings are reaching a critical age. In buildings where major investments have not taken place, more may go offline. Rehousing the residents from one tower in Toronto puts substantial pressure on an already-saturated rental market and shelter system, with many residents required to stay in motels, or double up with family. The loss of two, three, ten or more buildings could prove a disaster.

Postwar apartment housing is the backbone of the purpose-built rental housing system in Canada. In addition to preventing the loss of this housing through managed neglect, this housing must be modernized to meet the changing demands of 21st-century Canada in response to changing demographics, a changing climate and contemporary expectations of resilience and public health.

This paper examines the scope and costs of retrofits that are needed to sustain and enhance this aging building stock. Retrofits range from base state of repair, upgrades to meet contemporary barrier-free and life safety standards, and improvements to comfort and energy performance for low-impact and healthy housing. Moreover, this paper examines the financial capacity of building owners to engage in this work, and discusses considerations in overcoming the gaps currently limiting reinvestment.

Using different building owner types (private non-profit, small, mid-sized, large private investment funds and publicly traded owners) and an assortment of building conditions (rents, repair needs, state of repair/retrofitting), this study constructs 'typical' cases to evaluate. The cases are then modelled to analyse the economic impact of retrofitting on revenues, rents, profits and asset values, and to assess economic motivations and thereby identifying funding shortfalls. Importantly, this study places focus on public policy objectives related to housing, identifies market failures preventing action and proposes tools to close the investment gap.

Image courtesy of Jesse Colin Jackson

A. MOTIVATING TOWER RENEWAL: EXECUTIVE SUMMARY

This study focuses on understanding the costs of engaging in key repair and renewal works, the financial capacity for building owners to engage in these works, and the factors motivating whether they will do so. The scope of repair and renewal works assessed here are directly linked to core federal policy objectives around housing quality, climate change mitigation, social sustainability, and housing affordability. The study looks at a central paradox: much of Canada's affordable multi-unit rental housing is privately-owned, and its affordability is at risk due to deterioration or market forces. Moreover, investments to mitigate deterioration primarily rely on rent increases, further impacting affordability.

The study considers different multi-residential building owner types including private non-profits, small- and mid-sized private owners, large private investment funds and large publicly-traded owners. Different existing building conditions (rents, repair needs, etc.) as well as eight levels of retrofitting are assessed. Retrofit levels assessed include core state-of-repair investments, upgrades to meet current health and safety standards, and a range of energy retrofits from modest to best-in-class (See Section 4 and Appendix A).

By testing different levels of vacancy, debt capacity, available Net Operating Income (NOI), maintenance costs and market zones, this financial modelling has provided a basis from which to understand the challenges of private-sector participation in deep retrofits. By modelling retrofits, debt capacity and the use of National Housing Strategy tools such as the Co-Investment fund, this study illustrates that the ability to finance deep retrofits while maintaining affordability will continue to be a challenge. Economic motivations and financial capacity will limit the for-profit private sector's willingness to undertake retrofits that meet or exceed federal policy goals.

Supported by the Canadian Housing Policy Roundtable, several rounds of consultation engaged multi-residential building owners across Canada, facilitated by the Canadian Federation of Apartment Associations. This provided the opportunity to have the study's financial modelling and owner motivations reviewed by those working in the industry.

Image courtesy of Jesse Colin Jackson

THE CHALLENGE OF RETROFITS: OBSERVATIONS & FINDINGS

Financial Capacity and Performance

1. The financial capacity of buildings vary significantly.
The variables of rent zone, vacancy rate and maintenance costs between otherwise identical buildings result in a wide divergence in financial capacity: some buildings have the financial capacity to engage in retrofit, while others do not.

2. Pre-existing debt significantly impacts ability to raise new capital for retrofit.
Buildings that carry pre-existing debt are limited in their capacity to raise new capital for retrofit on an individual building basis. For most owners, carrying pre-existing debt of 30% of their building value limits their capacity to leverage new debt toward repair and renewal by more than 50%.

3. The capital costs of deep retrofit are beyond the financial capacity of many owners. As a result, most buildings throughout Canada will not engage in retrofit without support.
The financial modelling demonstrates that a significant financial gap exists in most retrofit scenarios. Without additional support to overcome this gap, retrofit activity may be limited. Additionally, the full use of building finance capacity will be limited by for-profit owner motivations, seeking the best Return on Investment (ROI) for their investments.

4. Non-profit owners have a motivation and mandate to use their financial capacity toward repair and renewal, however they may be limited in their financial capacity to do so.
Without the need to create and grow profit, non-profit owners have a unique ability to use a significant amount of free capital funds for repair and renewal.

5. For-profit owners evaluate projects based not only on financial capacity but also financial performance. Retrofits typically do not generate returns commensurate with capital needs and project risks, particularly when not relying on rent increases.
While some for-profit owners may have the ability to raise capital through debt or equity, their motivation for doing so may be limited to investments which meet ROI criteria, rather than public policy objectives. As a result, retrofit activity may be limited in scope and tied to increased rent profiles and work with short payback periods.

Repair and Renewal

1. Engaging in comprehensive repair and renewal work is capital-intensive.
Base state of repair and required enabling works can have a significant impact on the cost and scope of repair and renewal. The degree to which these enabling, abatement and repair works are required is largely dependent on the base state of the building and the nature of the retrofit work undertaken. Buildings with substantive repair backlogs will likely require greater upfront investment for retrofits.

2. Distressed assets often have the least financial capacity to engage in repair and renewal.
Distressed assets require substantial investment to remain viable. In many cases, lack of financial capacity has contributed to the condition of distress, while deferred maintenance as a result of poor financial health compounds.

3. Engaging in accessibility upgrades is highly capital intensive in existing buildings.
Engaging in barrier-free renovations is highly capital intensive, with little ROI. As a result, without government support and regulation, converting units to be barrier-free will be limited.

4. State of repair work can be augmented by repair and renewal scopes for safe, healthy and low-impact housing.
If critical repair work is already being undertaken, there is a unique opportunity to bundle it with a retrofit to achieve low-impact and healthy housing. Since most owners only take on a major renovation once in a maintenance cycle, it is unlikely buildings would undergo additional retrofit measures once a state of repair project has taken place

Maintaining Affordability

1. Rent increases have traditionally been used to fund repair and renewal, which places pressure on affordability.
Rent profiles have a significant impact on the capacity to engage in retrofits. However, using rents as the basis to finance repair and renewal places pressure on households who are currently financially stressed by the existing rent burden. Increases in rents in these buildings would negatively impact lower-income households who are dependent on current rent levels. **Encouraging the use of rent increases to support retrofit activity should be avoided.**

Engaging in NHS Criteria Retrofits

1. Retrofits tied to the thre requirements of the National Housing Strategy require significant construction capital funds beyond the capacity of most owner types without equity support.
Achieving an NHS level of retrofit will be costly. The suppressed financial capacity of buildings resulting from meeting program eligibility criteria may limit uptake. While maintaining affordability is paramount, increasing affordability, particularly in low rent-zone areas may prove difficult.

2. In most cases, substantial equity contributions are required to fully fund retrofits.
In most scenarios tested, a financial gap, often a substantial one, exists in achieving renewal goals (including NHS public policy goals). These financial gaps could be closed through direct owner contribution, and complementary provincial and municipal support, however these will vary from case to case. Federal equity support can provide the backbone incentive for repair and renewal work across Canada.

POTENTIAL SOLUTIONS

Closing the Gap: Tools to engage in repair and renewal

Capital costs for engaging in retrofit work are high, and the finance capacity of building varies dramatically by location, building characteristics and by owner type. Moreover, the motivation for owners to put their financial capacity toward repair and renewal is often evaluated by financial performance.

To bridge these gaps, a suite of tools has been explored. These tools have two purposes: to expand existing financial capacity; and to limit the need for use of existing financial capacity to undergo repair and renewal work.

1. Stretch Existing Debt Capacity

A. Expand Access to Repair and Renewal Low-Interest Finance

Provide widely accessible low-interest longer-term financing to stretch available debt capacity to those engaging in Repair and Renewal. Where debt is used to finance Repair and Renewal, this tool can ensure it is used as effectively as possible.

2. Reduce the Need for Debt Service

Provide capital to Repair and Renewal projects without directly relying on building debt capacity or use of building cash flow for debt service, which is a significant obstacle for many owners. These tools include:

A. Expand Direct Equity Contributions Programs (Grants)

Strategically designed, grants can push investment and best practice when tied to performance requirements. Existing CMHC programs limit equity contribution to 15% of projects for private projects. Expanding this threshold, while calibrating grants to performance, and ensuring ease of access could motivate owner participation in retrofitting.

B. Develop an Energy-Backed Loan Product

An energy-backed loan, which uses capital funds financed by long term energy savings, is an important tool to provide additional capital funds toward retrofit. While insufficient in isolation to finance deep retrofit, it can complement other sources of finance for additional stacked funding. This tool has broad appeal among owner groups, viewed as no cost debt and revenue neutral. These loans are tied to the energy performance of retrofits rather than the financial capacity of an individual building or owner.

C. Develop a Repair and Renewal Mortgage Refinance Tool

A Renewal Mortgage Refinance tool could be an effective mechanism to incent a broad range of private and non-profit owners to engage in Repair and Renewal. Through reduced interest and prolonged amortization rates (2.5% over 35 years for example), a Renewal Mortgage tool will provide an operating incentive and vehicle to convey money towards renewal.

It is recommended that a Repair and Renewal Mortgage tool be made available for owners engaging in retrofit projects in line with public policy goals, and that these projects remain eligible for existing project assistance, such as the NHCF.

It is also recommended that this proposal be further studied by CMHC to determine terms of delivery for ease of use, broad uptake, and efficacy in meeting public policy goals.

D. Ensure Repair and Renewal Tools have Broad Eligibility

To support broad uptake of Repair and Renewal work, ensure tools are broadly available to all owner types, and have clear terms and application processes owners can build into their asset management planning.

ADDITIONAL RECOMMENDATIONS AND AREAS OF FURTHER STUDY:

1. Develop a Portfolio Approach to Repair and Renewal

Access to federal Repair and Renewal tools at a portfolio scale could allow for expanded capacity and the capacity for longer term planning. Expectations related to public policy goals of federal support could be addressed on a portfolio basis, rather than building by building, making eligibility more accessible. Whereas the lead times and planning to access federal funds is, at times, prohibitive on a single building basis, support of a portfolio of buildings could attract more sophisticated owner groups and expand uptake toward meeting federal goals.

2. Grow the Retrofit Industry with Demonstration Projects and Industry Support

Successful renewal projects will be dependent on a capable retrofit industry ecosystem. The public sector is best positioned to lead this industry transformation through complementary initiatives, including:

a. Support of best-in-class demonstration projects;
b. Support of Industry adaptation through identification of products and training gaps for design, construction and building operation professionals and addressing them through industry support.

3. Empower Non-Profits to Acquire and Renew Private Housing Assets

With a mandate to maintain affordability and improve housing assets, non-profits are well suited to be stewards of public policy objectives around affordability, climate change and accessibility. Non-profits could be supported in acquiring existing rental housing assets and conducting deep retrofits.

4. Study Tax Treatment to Support Renewal

A parallel study funded by the the City of Toronto found that refinements to tax treatments at all levels of government can support renewal activity in concert with CMHC programs. The following is recommended:

a. CRA depreciation rates should be calibrated to support renewal projects. For example, depreciation rates for capital work that meets public policy goals (affordability, accessibility, emissions) should be given similar depreciation rates to renewables, providing a tax incentives for this these investments;
b. Federally, harmonizing resilience retrofits' capital cost allowance (CCA) rates with other low carbon investments, such as electrical vehicle charging stations (EVCS), would significantly improve incentives for deep retrofits. The CCA for resilience retrofits in multi-residential towers is 4-5%, while the CCA for EVCS is 30-50%.
c. Property assessment rates post-retrofit should not unduly escalate property taxes. As an alternative, any increased project value created by meeting public policy should be tax increase exempt;
d. Municipal tax rates for post-retrofit buildings should be eligible for residential tax rates, rather than multi-residential tax rates which in some municipalities is as much as three times higher.
(See Analysis of Potential Policy Incentives to Support Resilient Towers in Toronto by Morrison Park Advisors, 2019 for further details)

5. Provide Guidance for Renewal Standards

The approach to altering existing buildings varies significantly across provincial and territorial Building Codes, resulting in a variety of interpretations with potential impacts on health, safety and resilience. Encourage retrofit projects to consult with guidance documents, model national codes, and demonstration case studies to ensure that learnings are shared and best practices are incorporated, tying GHG reduction to comfort, health and resilience, and construction with minimum disruption.

6. Study use of in-force performance standards related to Health, Safety and Environmental impact

Positive incentives alone may not be a sufficient driver for uptake. Meeting repair and renewal goals may require regulatory tools in addition to incentives, though impact on affordability should be carefully examined.

B. SELECTED FIGURES & CHARTS

Image courtesy of Jesse Colin Jackson

Diagram of Table A: Debt Capacity of Case 1 and Case 2 Buildings

Table A: Debt Capacity of Case 1 and Case 2 Buildings

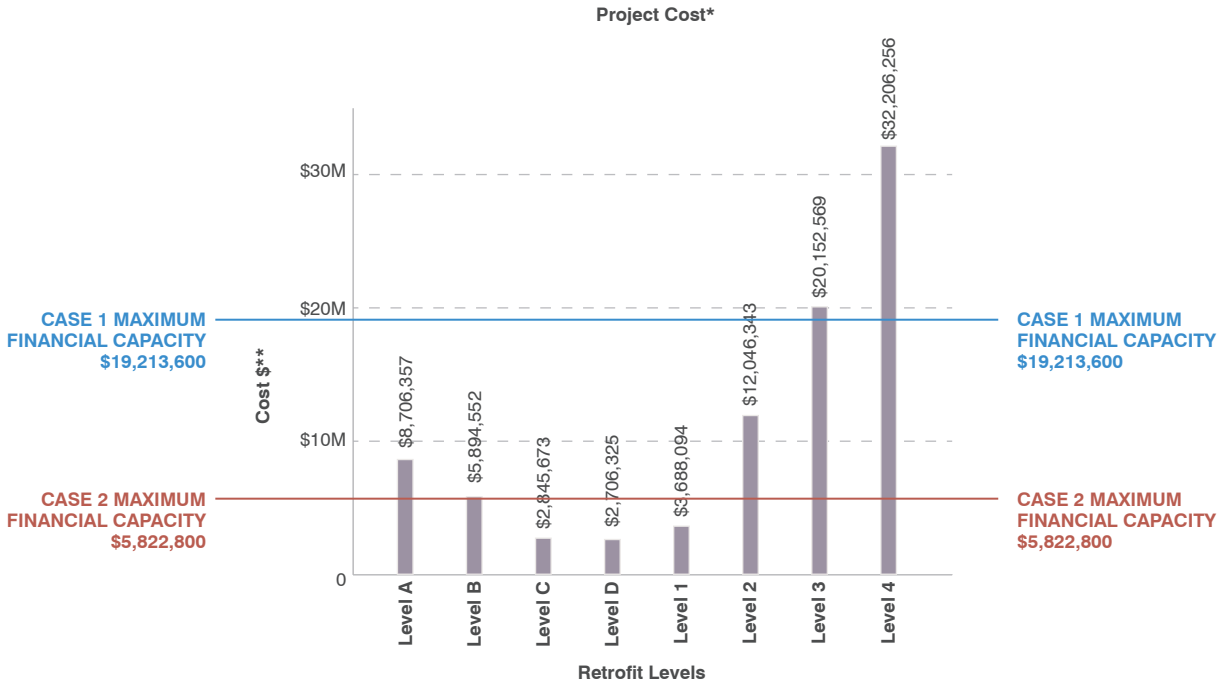
Baseline Debt Capacity: Case 1 and Case 2 at Various Levels of Debt

Debt Capacity (with 1.2 DCR)					
Existing Debt (% Cap Value)	**0%**	**20%**	**30%**	**40%**	**50%**
Loan Product: 3.8% 25 Year Loan					
Case 1: Total Debt Capacity	**19,213,600**	**12,050,300**	**8,480,500**	**4,885,300**	**1,315,600**
(% of Total Income available to leverage new Debt)	83%	52%	37%	21%	6%
Case 2: Total Debt Capacity	**5,822,800**	**3,133,900**	**1,799,900**	**443,500**	**0**
(% of Total Income available to leverage new Debt)	83%	48%	30%	13%	0%

Case Study 1: Higher Financial Capacity is a well managed building with low vacancies, low yearly maintenance expenditures and rents commensurate with 100% of median market rent (MMR) in Toronto's North York Centre, a high market zone.

Case Study 2: Lower Financial Capacity is representative of a building facing challenges: 10% vacancy, higher yearly maintenance costs, and rents commensurate with 100 MMR in Toronto's Scarborough East, among the lowest rent zones in the Toronto CMA.

Diagram of Table B: Capacity to Engage in Levels of Retrofit: Case 1 and Case 2 with No Existing Debt



*Costing includes construction materials and labour costs, contractor mobilization, overhead and fees. Prices exclude construction contingency, project soft cost and applicable taxes. For further details see Appendix A.
** No Existing Debt

TableB: Capacity to Engage in Levels of Retrofit: Case 1 and Case 2 with No Existing Debt

Case 1: Full Debt Capacity

Case 1 (1.2 DCR)								
	Level A	Level B	Level C	Level D	Level 1	Level 2	Level 3	Level 4
Project Cost	8,706,357	5,894,552	2,845,673	2,706,325	3,688,094	12,046,343	20,152,569	32,206,256
Debt Capacity	19,213,600	19,213,600	19,213,600	19,213,600	19,213,600	19,213,600	19,213,600	19,213,600
Gap	0	0	0	0	0	0	938,969	12,992,656

Case 2: Full Debt Capacity

Case 2 (1.2 DCR)								
	Level A	Level B	Level C	Level D	Level 1	Level 2	Level 3	Level 4
Project Cost	8,706,357	5,894,552	2,845,673	2,706,325	3,688,094	12,046,343	20,152,569	32,206,256
Debt Capacity	5,822,800	5,822,800	5,822,800	5,822,800	5,822,800	5,822,800	5,822,800	5,822,800
Gap	2,883,557	71,752	0	0	0	6,223,543	14,329,769	26,383,456

Diagram of Table C: Debt Potential of Energy Backed Loans Considering Carbon Pricing

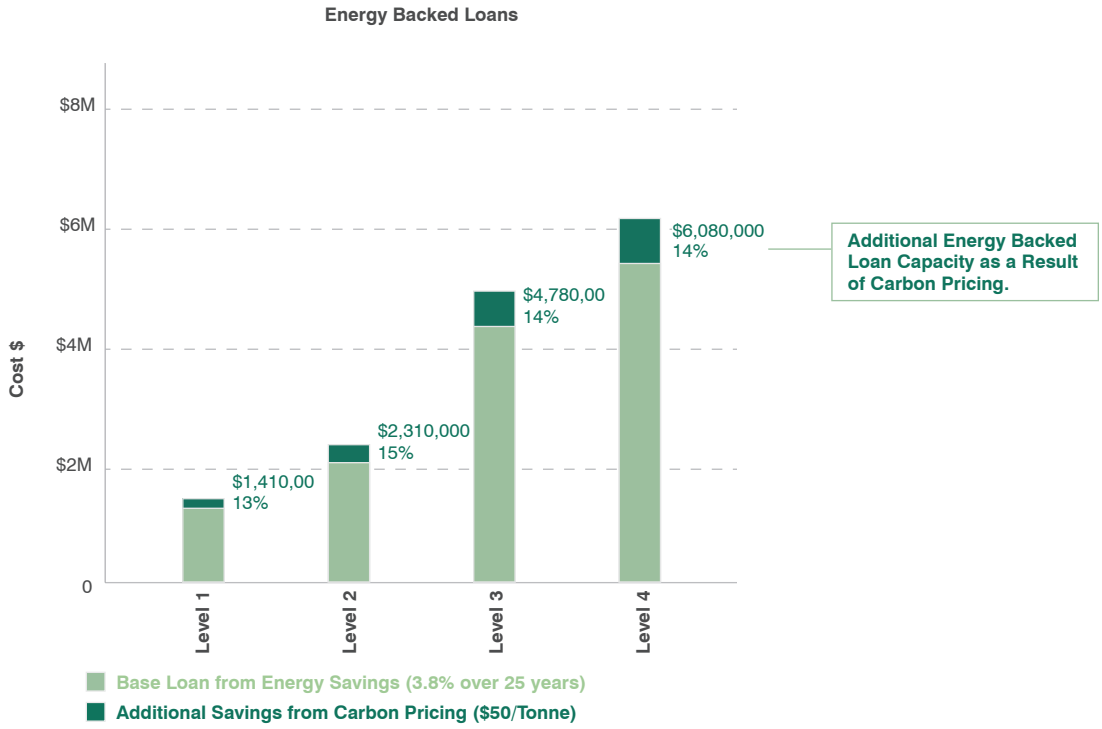


Table C: Debt Potential of Energy Backed Loans Considering Carbon Pricing

Energy Loan - with/without Carbon Pricing ($50/Tonne)

	Level 1	Level 2	Level 3	Level 4
Energy Loan (With Carbon Pricing)	1,410,000	2,310,000	4,870,000	6,080,000
% Change	-13%	-15%	-14%	-14%
Energy Loan (Without Carbon Pricing)	1,250,000	2,010,000	4,280,000	5,330,000

Diagram of Table D: Case 1: Impact of Limiting Use of Financial Capacity by 50%

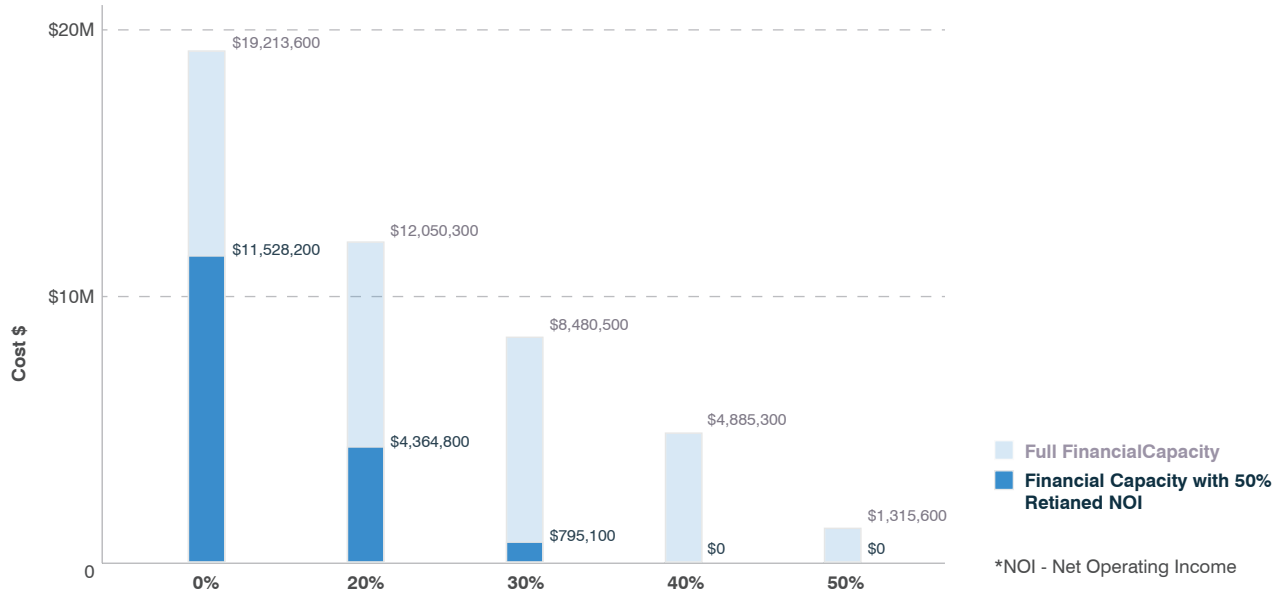


Table D: Case 1: Impact of Limiting Use of Financial Capacity by 50%

Case 1: Impact on Debt Capacity with 50% Retained NOI

Debt (% Cap Value)	**0%**	**20%**	**30%**	**40%**	**50%**
3.8% 25 Year Loan					
Full NOI Used toward Retrofit	19,213,600	12,050,300	8,480,500	4,885,300	1,315,600
(With DRC of 1.2)					
50% of NOI Retained	**11,528,200**	**4,364,800**	**795,100**	**0**	**0**
% Difference	40.00%	63.80%	90.60%	NA	NA

Diagram of Table E: Covering Debt Service for Retrofit Investment Through Rental Increases: Impact on Affordability

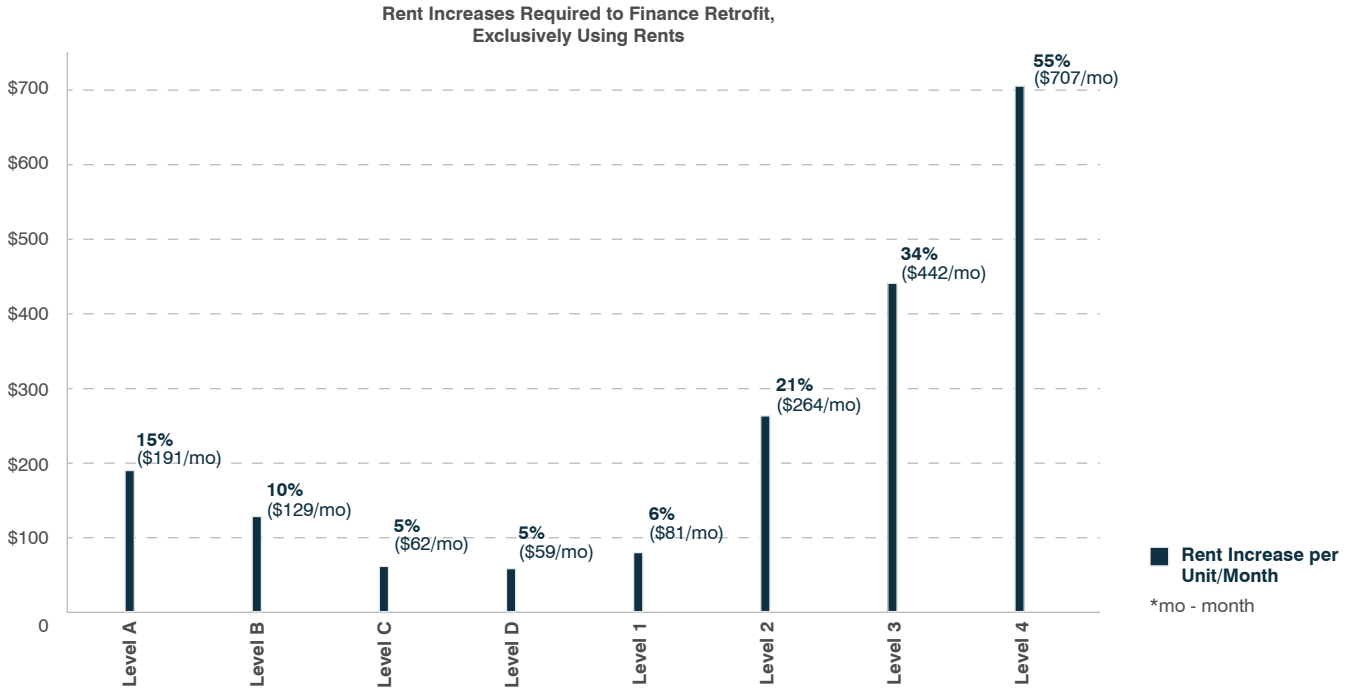


Table E: Covering Debt Service for Retrofit Investment Through Rental Increases: Impact on Affordability

Financing Retrofit - Impact on Rents

Renewal Level	Capital Investment	Annual Debt Service Using Long Term Loans (3.8% / 25 Years)	Impact on Rents (per unit/month)	% Increase from baseline (100 MMR)
Level A	$8,706,356.92	$545,592.08	$191.03	15%
Level B	$5,894,551.52	$369,387.64	$129.34	10%
Level C	$2,845,673.42	$178,326.81	$62.44	5%
Level D	$2,706,324.73	$169,594.40	$59.38	5%
Level 1	$3,688,094.20	$231,117.91	$80.92	6%
Level 2	$12,046,343.00	$754,895.46	$264.32	21%
Level 3	$20,152,569.13	$1,262,879.78	$442.18	34%
Level 4	$32,206,256.20	$2,018,235.47	$706.67	55%

Diagram of Table F: Impact of Use of All Proposed Repair and Renewal Tools

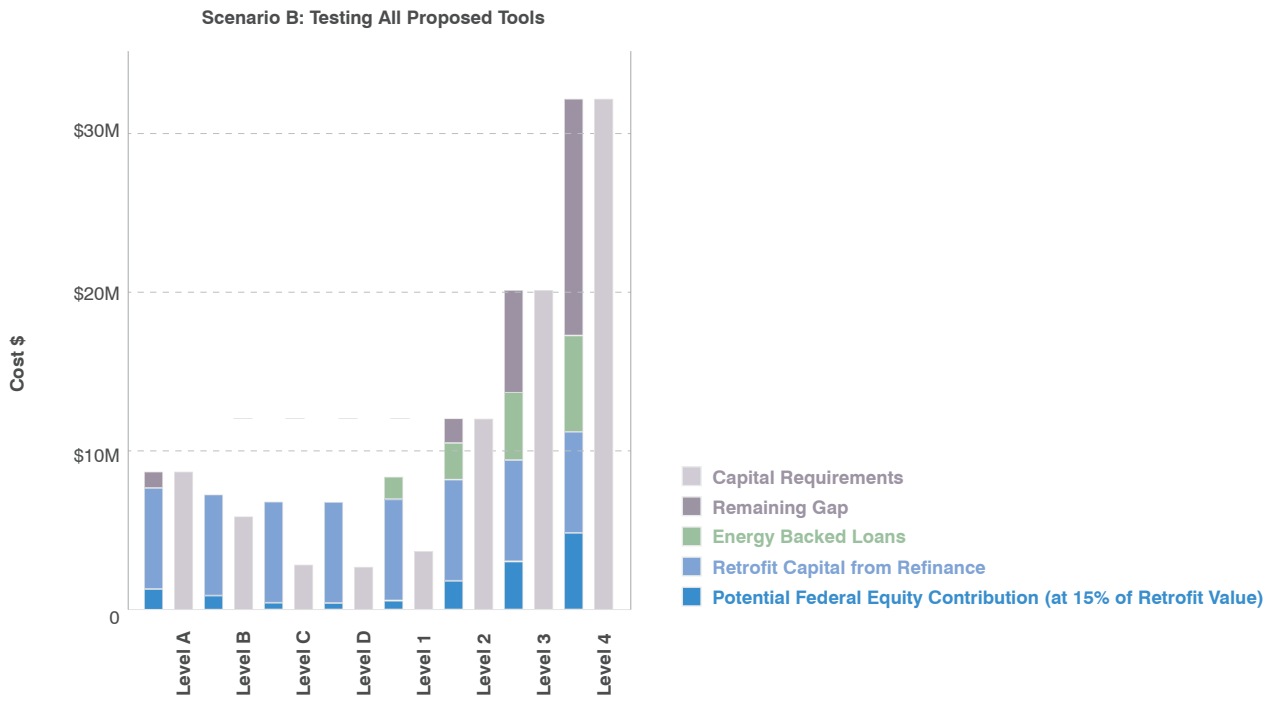


Table F: Impact of Use of All Proposed Repair and Renewal Tools

Scenario B: Testing All Proposed Tools

Retrofit Level	Capital Requirements for Retrofit Levels	Retrofit Capital from Refinance (Assume Debt level as 30% of Cap Value)	Potential Capital for Retrofit Through Energy Backed Loan (Tied to Saving of Level of Retrofit)	Potential Federal Equity Contribution (at 15% of Retrofit Value)	Total Renewal Capital Through Mortgage Refinance, Energy Backed Loans and Equity Contribution	Remaining Gap
Level A	$8,706,357	$6,372,513	$0	$1,305,954	$7,678,467	$1,027,890
Level B	$5,894,552	$6,372,513	$0	$884,183	$7,256,696	None
Level C	$2,845,673	$6,372,513	$0	$426,851	$6,799,364	None
Level D	$2,706,325	$6,372,513	$0	$405,949	$6,778,462	None
Level 1	$3,688,094	$6,372,513	$1,410,000	$553,214	$8,335,727	None
Level 2	$12,046,343	$6,372,513	$2,310,000	$1,806,951	$10,489,464	$1,556,879
Level 3	$20,152,569	$6,372,513	$4,280,000	$3,022,885	$13,675,398	$6,477,171
Level 4	$32,206,256	$6,372,513	$6,080,000	$4,830,938	$17,283,451	$14,922,805

01. STUDY CONTEXT

76% of Canada's purpose-built rental housing is over 35 years old. A substantial amount of this housing takes the form of large apartment 'towers' built in the post-war era in cities throughout Canada. For the most part, this housing inventory is privately owned. A substantial amount of it was developed using federal incentives during the 1960s and 70s. Today, this housing is aging, with significant market barriers to comprehensive reinvestment that maintains affordability. 'Tower Renewal' presents a strategy to provide low-carbon, socially-sustainable, and affordable housing.

Image courtesy of Jesse Colin Jackson

2.1 RESEARCH OBJECTIVES

The research provides information to assist with program design to achieve short- and long-term market penetration through the development of various tools, with parallel focus on both base and best-in-class levels of retrofit. The work assess how best to direct public support in the short term toward Tower Renewal goals, and the broader market transformation required to achieve widespread and high impact Tower Renewal in the long term.

The research builds on the findings of *Financial Tools for Tower Renewal*, a report released by the National Housing Collaborative and Tower Renewal Partnership ("TRP") in 2017 that proposed program design considerations for the National Housing Strategy. This includes further refinement of the base financial model to address: target goals of the NHS related to affordability, energy performance, and accessibility; various market segments and owner characteristics including investment class owners with dividend obligations, impaired debt capacity due to leveraged properties, and variables related to building state of repair. Together, these variables are assessed to outline the required financing conditions and grants required to meet NHS targets.

2.2 RESEARCH METHODOLOGY

This research was created by conducting financial modelling based on reference data for a number of owner types and retrofit types. The scope of the work included:

1. Examine the scope, cost and impact at retrofit levels, from base state of repair to best in class low-impact and healthy housing;
2. Test the financial capacity to engage in Repair and Renewal of various building characteristics related to existing building state of repair to identify gaps;
3. Assess the motivations and financial capacity of not-for profit and for profit owners;
4. Test use of loans, grants, energy backed loans and other tools, such as special mortgage financing, to close financial gaps and stimulate Repair and Renewal activity across a wide range of owner groups.

The process also included extensive consultation. The draft findings were circulated among the Canadian Housing Policy Roundtable member organization and the review resulted in the identification of market segment gaps and additional potential financial tools. A draft report was then circulated among a group of private building owners and their feedback resulted in adjustments that further address owner behaviour. The financial modelling, and its analysis in tandem with stakeholder consultation, resulted in findings that understand and demonstrate the motivations of multi-unit residential building owners around retrofit and renewal.

02. PREVIOUSLY RECOMMENDED TOOLS AND THE NHS

2.1 FINANCIAL TOOLS FOR TOWER RENEWAL

Prior to the launch of the Canadian Federal Government's National Housing Strategy, the **Tower Renewal Partnership** released *Financial Tools for Tower Renewal.* Focusing on aging tower apartments and the economics of implementing Tower Renewal strategies, the study considered the costs and benefits of "deep retrofits" - energy retrofits that significantly reduce carbon emissions, improve the quality of life outcomes, extend the life of a building and are a key component of Tower Renewal.

The *Financial Tools* report reiterates the opportunity and importance of engaging in and accelerating Tower Renewal. In doing so, the report identifies the key barriers to industry-wide uptake of deep retrofits in residential buildings. Not surprisingly, cost is a key impediment. Deep retrofits can be expensive and involve complex construction projects that do not sufficiently increase revenues or reduce costs to the make investments economically viable. Commercial properties, on the other hand, have been subject to sufficient market and regulatory pressure to allow some level of retrofits to become business-as-usual. In apartment tower retrofits, as in the commercial leasing sector, the primary challenge is financial, not technical. Nevertheless, there is an urgent need and a long-term benefit to carrying out these types of deep retrofits.

Image courtesy of Jesse Colin Jackson

Financial Tools for Tower Renewal concluded that a retrofit financing program was required to accelerate the deep retrofit market - not to mention meeting national housing resilience goals and Canada's climate commitments. To enable residential tower owners to pursue deep energy retrofits, the report recommended the introduction of a federal government-backed financial toolkit that included:

- Loans backed by energy savings: "Green loans" use post-retrofit energy cost savings to back a long-term loan. Common in other jurisdictions, this would be an opportunity for the federal government to support the creation of energy saving-backed products that provide a longer-term horizon. Government support is needed: although patient capital can be recovered over the long-term, the real returns on this type of investment will be lower and below market tolerance.
- Alternative debt: Alternative debt products at longer terms and lower interest rates can enable viable investment in housing retrofit that typical shorter term and higher rate commercial products cannot.
- Favourable interest rates tied to performance: The cost of loans has a significant impact on an owner's ability to carry out deep retrofits. Providing low interest loans only to applicants who meet policy objectives (such as maintenance of affordability and a certain level of GHG emission reductions) is another way to incentivize deep retrofits.
- Performance-based grants: In many cases, additional capital support is needed to achieve deep retrofits. Like low interest rates, grants should be subject to a performance tests to ensure policy goals are being met through government investment.

These tools are further tested over the course of this study to assess their efficacy in relation to various owner types and building conditions.

2.2 RENEWAL THROUGH CO-INVESTMENT

The NHS introduced a $40 billion dollar investment in housing across Canada (recently increased to $50 billion.) Housing targets identified in the NHS include:

- 530,000 households removed from housing need
- 100,000 new housing units
- 300,000 existing units repaired and renewed
- 385,000 community housing units protected
- 50% reduction in the number of chronically homeless shelters users
- 300,000 provided with a portable housing benefit

Among other areas, the government has committed to renewing existing community and affordable housing, providing some funding to accelerate Tower Renewal-based deep energy retrofits. Through the National Housing Co-Investment Fund (NHCF), the federal government allocated $5.72 billion over 10 years to repair and renew 240,000 units of community and affordable housing through two primary tools:

- $3.46 billion for low-cost repayable loans
- $2.26 billion for capital contributions (grants)

The funding is available to non-profit community housing providers, the private sector and all lower levels of government (provinces, territories, municipalities and indigenous governments). Qualifying projects must be existing buildings whose primary use is residential and can include existing community and affordable housing (including indigenous community housing), mixed use market / affordable rental housing, shelters and transitional and supportive housing. Applications are accepted on a rolling basis, with funding being dispersed every two months.

To be considered for funding under the current Repair and Renewal Stream, applicants must meet certain levels of affordability, accessibility and energy efficiency:

- A minimum of 30% of units must remain below 80%of the Median Market Rental (MMR) rate for a minimum of 20 years
- A minimum of 20% of units must meet accessibility standards
- Projects must achieve a minimum of 25% decrease in energy consumption and GHG emissions

Available support varies depending on whether the applicant is a for-profit, a non-profit, an Indigenous group or a government entity:

Maximum Loans from CMHC

- Co-operatives, non-profits, Indigenous groups can receive up to 95% of eligible costs (residential component);
- Provincial, territorial, and municipal government, and private sector can receive up to 75% of eligible costs (residential component).
- For all projects containing non-residential space, any borrower type can receive up to 75% of eligible costs related to the non-residential component.

Maximum Contributions from CMHC

- Co-operatives, non-profits, Indigenous groups can receive up to 40% of eligible costs.
- Provincial, territorial, and municipal government can receive up to 30% of eligible costs.
- Private sector can receive up to 15% of eligible costs.

At the anniversary of the launch of the NHS during National Housing week, an update to the terms of the NHCF was released, creating a new category: urgent repairs. This category places focus on single item issues critical to maintaining housing, rather than holistic retrofits.

Detail of NHCF requirements and the recent update can be found in the Appendix E of this document.

These tools are provided as important background: however, the purpose of this study is to test financial capacity and effectiveness of repair and renewal tools generally, rather than a specific assessment of existing programs.

2.3 GETTING TO 240,000 REPAIRED AND RENEWED UNITS

The funding attached to the NHCF will support the delivery of the first tranche of housing currently in need of renewal. The NHS program will kick-start nationwide demonstration projects over the next 10 years. Achieving the goal of renewing 240,000 units will require a broadened set of tools with additional funding. Furthermore, there are up to 800,000 units in apartments built before 1985 that either need renewal immediately or will need it in the near term future.

It is important to note that the majority of Canada's affordable housing is privately operated. Much of this housing was also built through federal support programs in the 1960s and 1970s (see Appendix D). Though the private building operators can qualify for funding from the NHCF, further private market support and incentivization will be required to meet the long-term goals of the NHS by encouraging private sector participation. This study examines gaps and potential tools to help get us to 240,000 units.

03. FINANCIAL MODELLING

3.1 CASE STUDIES AND ASSUMPTIONS

This section explores in detail the capital cost and financial capacity of building owners to undertake Repair and Renewal activity.

This section uses two key sources of data to undertake this analysis:

1. Capital cost information for various levels of Repair and Renewal and states of repair;
2. Financial operations data from representative buildings to evaluate debt capacity to engage in retrofit activity.

Using this data, two representative building cases (case studies) were created and used to test financial capacity; ability to engage in various levels of retrofit, and the impact of existing debt, rent profile, loan conditions and other variables that can play a role in the viability of engaging in building retrofit. These two case studies were developed to characterize a range of typical building conditions representative of those found in CMAs throughout the country.

The scenarios tested and assumptions used in this modelling are outlined below:

The base building used for this study consists of a 238 unit, 20 storey apartment built in the late 1960s. Whereas rent zone, vacancy and annual maintenance costs vary in Case 1 and 2, all other aspects of the building are treated as identical.

Image courtesy of Jesse Colin Jackson


STOP

CASE STUDY SCENARIOS

Building Case Study 1: Higher Financial Capacity Building is a well managed building with low vacancies, low yearly maintenance expenditures and rents commensurate with 100% of median market rent (MMR) in Toronto's North York Centre, a high market zone.

Building Case Study 2: Lower Financial Capacity Building is representative of a building facing challenges: 10% vacancy, higher yearly maintenance costs, and rents commensurate with 100 MMR in Toronto's Scarborough East, among the lowest rent zones in the Toronto CMA.

For each building case study, several scenarios and sensitivities were tested, including:

- Levels of current debt service (from 0 to 50% of current building capital value)
- Levels of desired retrofit (including eight levels described below)
- Total building debt capacity to finance projects using a "retrofit loan" of 25 years amortization at 3.8%
- The use of an Energy Backed Loan debt product (with and without carbon pricing included)

The analysis provides an understanding of:

- The costs of a range of retrofit levels
- Investment thresholds to fund projects using conventional tools, "retrofit loans" and energy backed loans.
- Additional equity support required to achieve various degrees of retrofits
- The potential for revenue increases through rehabilitation
- The impact on rents if retrofits were financed through rent increases (for comparison purposes)

Case Study 1: Higher Financial Capacity is a well managed building with low vacancies, low yearly maintenance expenditures and rents commensurate with 100% of median market rent (MMR) in Toronto's North York Centre, a high market zone.

Case Study 2: Lower Financial Capacity is representative of a building facing challenges: 10% vacancy, higher yearly maintenance costs, and rents commensurate with 100 MMR in Toronto's Scarborough East, among the lowest rent zones in the Toronto CMA.

3.2 RETROFIT LEVELS AND COSTS

To understand the costs of various levels of retrofit, a study was undertaken to model the construction scope required to achieve retrofit outcomes, and the capital costs required to undertake this work. This full study can be found in Appendix A, and is summarized below.

Levels of retrofit are broken into two categories:

1. Base Repair and Resilience; and
2. High Performance and Comprehensive Retrofit

Digaram of Table 1: Levels of Retrofit

Cost / Unit

Level A - $37,854

Level B - $25,628

Level C - $12,372

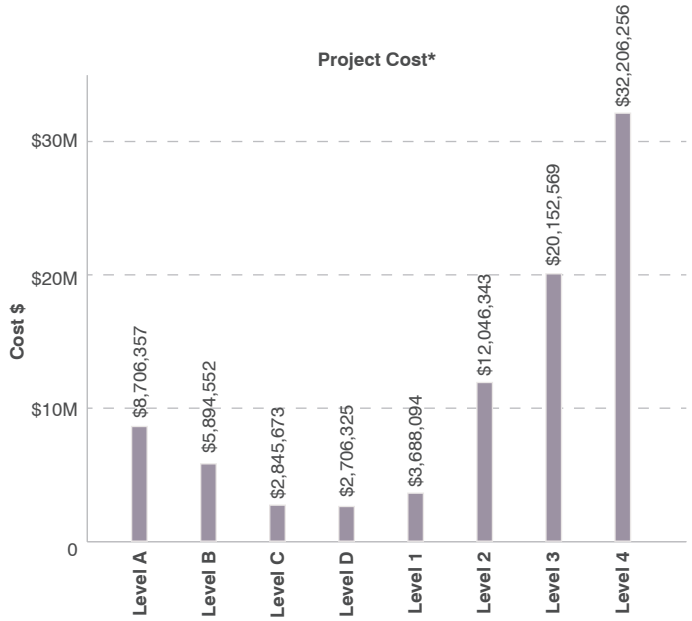
Level D - $11,767

Level 1 - $16,035

Level 2 - $52,375

Level 3 - $87,620

Level 4 - $140,027



*Costing includes construction materials and labour costs, contractor mobilization, overhead and fees. Prices exclude construction contingency, project soft cost and applicable taxes. For further details see Appendix A.

Table 1: Levels of Retrofit

Levels of Retrofit

	Level A	Level B	Level C	Level D	Level 1	Level 2	Level 3	Level 4
Project Cost*	8,706,357	5,894,552	2,845,673	2,706,325	3,688,094	12,046,343	20,152,569	32,206,256
Cost / Unit	37,854	25,628	12,372	11,767	16,035	52,375	87,620	140,027

*Costing includes construction materials and labour costs, contractor mobilization, overhead and fees. Prices exclude construction contingency, project soft cost and applicable taxes. For further details see Appendix A.

Base Repair and Resilience (Levels A - D)

State of repair scenarios place focus on capital upgrades to ensure buildings remain in good service, are upgraded to meet today's expectations of life safety and accessibility, and are improved for resident health and community resilience. These measures exclude improvements toward energy efficiency which are addressed below. These measures are not cumulative but rather outline distinct scopes of work.

The degree to which buildings undergo work described in Levels A-D will largely be dependant on the existing state of the building. In some cases, enabling works will be higher in poorly maintained buildings and less in buildings that have had more routine attention.

Four types of work were tested in this category. They include:

A: Base State of Repair

This scenario accounts for the complete repair and replacement of all major building systems, addressing all "end of life" items in the case study building. Measures include mechanical and electrical system replacement including risers and distribution systems and related enabling works, balcony slab edge repair and balcony guard replacement, mould remediation, underground parking membrane replacement and other critical maintenance and system replacements.
The total cost for this work, including contingency, is **$8,706,357**, or **$37,854** per unit.

B: Accessibility

This scenario anticipates the provision of CMHC expectations of accessibility, providing fully barrier free units for 20% of the building, as well as modernized elevators and entryways to enable barrier free path of travel throughout the building.
The total cost for this work, including contingency, is: **$5,894,552,** or **$25,628** per unit.

C: Life Safety Upgrades:

This scenario accounts for upgrades to life safety to meet contemporary standards, including provision of sprinklers throughout the building and in each suite, a modernized fire alarm system and new back-up generator.
The total cost for this work, including contingency, is: **$2,845,673,** or **$12,372** per unit.

D: Resident Resilience

This scenario engages in measures which improve resident and building resilience, beyond those measures discussed in Levels A-C, as well as excluding measures captured in energy retrofit measures captured below. These include elevator replacements; modernized common areas, including community space upgrade for use as cooling room in extreme weather; the provision of in-suite thermostat controls and ceiling fans to improve summer overheating; and improved outdoor amenity for community activity.

The total value for this work, including contingency, is: **$2,706,325,** or **$11,767** per unit.

Taken together, the total costs of Level A-D is **$20,152,907 or $87,621 per unit.**

Deep Energy and Comprehensive Retrofit (Levels 1 - 4)

These four scenarios describe various degrees of energy retrofits. These levels are cumulative and include selective items from Levels A - D that are required to achieve a comprehensive retrofit to the degree required for the scenario. Scope for these levels include modernizing building envelope and mechanical and electrical systems for enhanced building performance, inclusion of suite thermostat controls and building automation systems, as well as related enabling works and non-energy system modernization such as life safety systems and elevator replacements. These levels are cumulative.

Level 1: Light Energy Retrofit

The Light Energy Retrofits focus on reducing water and electricity consumption, as well as making like-for-like replacements of HVAC equipment for modest reductions in natural gas usage. Scope includes use of LED lighting, water-use reducing fixtures, as well as complete replacement of mechanical air handling units and hydronic system and domestic hot water boilers. Envelope upgrades are limited to re-sealing existing windows and exterior doors.

Level 1 Retrofits achieve GHG reductions in the range of 10-20% This level of retrofit is becoming more common in properties throughout Canada.

The total cost for this work, including contingency, is: **$3,688,094** or **$16,035** per unit.

Level 2: Medium Energy Retrofit

The Medium Energy Retrofit is a combination of maintenance and enhancements, engaging in a comprehensive systems retrofit including provision of direct suite ventilation, the provision of window shading and ceiling fans for passive cooling, and full window and exterior door replacement. This retrofit also includes envelope maintenance and repair items from Levels A and C including balcony guard replacement and life safety upgrades including sprinklers. Level 2 Retrofits achieve GHG reductions in the range of 35% with improvements to resident comfort. Currently, a select but growing number of properties across Canada have undergone or are undergoing a similar level of retrofit.

The total cost for this work, including contingency, is: **$12,046,343**, or **$52,375** per unit.

Level 3: Deep Energy Retrofit

The Deep Energy Retrofit scenario engages in a comprehensive building upgrade, inclusive of building overcladding, high performance windows and the elimination of thermal bridges at balconies for the substantial reduction of heat loads, resized HVAC equipment, the provision of low-temperature in-suite radiators, as well as the provision of direct suite ventilation systems, and passive cooling measures building from Level 2. This scenario engages in life safety measures from Level B as well as elevator upgrades from Level D. This comprehensive retrofit achieves GHG reductions greater than 75% and significant improvements to resident health, comfort and resilience. Across Canada a select number of marquee projects have undergone or are undergoing this level of retrofit.

The total cost for this work, including contingency, is: **$20,152,569**, or **$87,620** per unit.

Level 4: Complete Retrofit

This scenario accounts for a complete building retrofit, combining State of Repair Levels A - D and Energy Retrofit Levels 1 - 3. This scenario represents the transformation of a distressed asset in need of full systems replacement into state of the art housing. While this level of retrofit is currently rare, limited to one known example in Canada, it is used here for the purpose of comparison. This 'complete' retrofit achieves GHG reductions greater than 90% and significant improvements to resident health, comfort and resilience.

The total cost for this work, including contingency, is: **$32,206,256**, or **$140,027** per unit.

Enabling Works and Codependent Retrofit Activities

Engaging in energy retrofits often requires related measures to ensure building components are adequately prepared to successfully implement energy-savings measures. Examples include exterior masonry or concrete remediation prior to window replacements; or exhaust riser refurbishment prior to new heating plant installation or a modernized ventilation system may be required prior to an envelope being retrofitted to be airtight.

Base state of repair and required enabling works can have a significant impact on the cost and scope of repair and renewal. The degree to which these enabling and repair works are required is largely dependent on the base state of the building and the nature of the retrofit work undertaken. Buildings with substantive repair backlogs will likely require greater upfront investment for retrofits, with contingencies required to offset potential site discoveries uncovered during the project. As a result, comprehensive retrofits aimed at energy and GHG reduction can require significant investment prior to realizing energy savings or GHG emission reductions.

The eight scenarios outlined here (Levels A - D, and Levels 1 - 4), are used as the basis for testing the financial viability of engaging in retrofits in Canada. This analysis is outlined in the sections below.

3.3 MODELLING DEBT CAPACITY

Using the Case 1 and Case 2 building scenarios and capital investment values from the eight retrofit scenarios, the following sections examine the viability, opportunities and challenges of engaging in tower retrofit.

The first exercise was to model building debt capacity. A comparison of Case 1 and Case 2 illustrates the significant impact of the rent zone that the building is located within, maintenance expenditures and vacancies on a building's financial health and its ability to finance reinvestment and new expenditures.

The following section examines Case 1 and Case 2 buildings to determine debt capacity testing various scenarios, including level of existing debt, debt products and building rent profiles.

3.3.1 Baseline Debt Capacity

The first part of this analysis modelled Case 1 and Case 2 buildings to determine total debt capacity through use of a low-interest debt product (3.8% with a 25 year amortization). Using a DCR (Debt Coverage Ratio) of 1.2 and assuming various levels of existing debt (0-50% of property capital value) the total potential capital that could be leveraged toward retrofit was modelled.

A comparison of Case 1 and Case 2 buildings illustrates the significant divergence in financial health between the two scenarios. The baseline scenarios of Case 1 and Case 2 assume a rent profile of 100MMR, in North York Centre and East Scarborough respectively. This variation in rent zone, along with variations in vacancy rate (2% vs 10%) and maintenance costs has a significant impact on total revenue available that could be allocated for debt service: $1,204,041 in the case of North York Centre vs. $364,890 in the case of East Scarborough, a difference of 69%.

Location within a metropolitan area (or region within Canada); level of vacancy, existing maintenance costs and existing debt can drastically limit the ability to finance reinvestment and new expenditures.

The following chart outlines the debt capacity possible by using available revenue toward debt service for Case 1 and Case 2 buildings at various levels of existing debt. Testing use of full debt capacity, a Case 1 building with no debt can leverage $19,213,600 toward Repair and Renewal. However, a Case 2 building can only leverage $5,822,800. As pre-existing debt is added to the scenario, the ability to take on new debt diminishes.

Diagram of Table 2: Debt Capacity of Case 1 and Case 2 Buildings

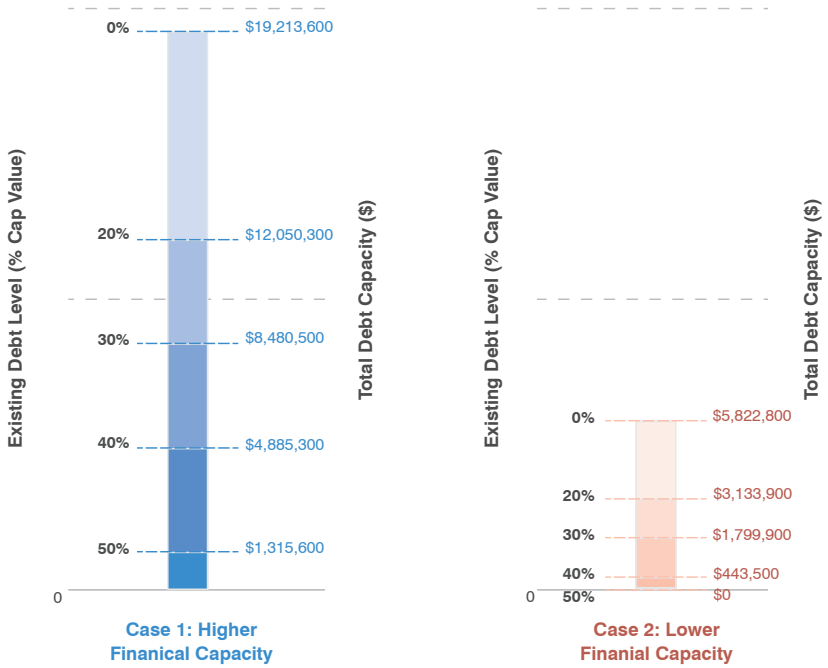


Table 2: Debt Capacity of Case 1 and Case 2 Buildings

Baseline Debt Capacity: Case 1 and Case 2 at Various Levels of Debt

Debt Capacity (with 1.2 DCR)					
Existing Debt (% Cap Value)	**0%**	**20%**	**30%**	**40%**	**50%**
Loan Product: 3.8% 25 Year Loan					
Case 1: Total Debt Capacity	**19,213,600**	**12,050,300**	**8,480,500**	**4,885,300**	**1,315,600**
(% of Total Income available to leverage new Debt)	83%	52%	37%	21%	6%
Case 2: Total Debt Capacity	**5,822,800**	**3,133,900**	**1,799,900**	**443,500**	**0**
(% of Total Income available to leverage new Debt)	83%	48%	30%	13%	0%

3.3.2 Variables in Debt Product

Building from the analysis above, Case 1 and 2 were further modelled using a range of debt products, to determine the impact of interest rates and loan terms in terms of leveraging investments for building retrofit.

The baseline debt product of 3.8% over 25 years is comparable to products currently on offer by CMHC through the National Housing Strategy. A more favourable product of 2.8% of 30 years can increase capital toward retrofit by 26%. Conversely, a more conservative debt product of 4.2% over 20 years reduces retrofit capacity by 16%. In Case 2, the reduction in retrofit capacity using a less favourable product is particularly acute.

Diagram of Table 3: Impacts of Debt Product on Debt Capacity

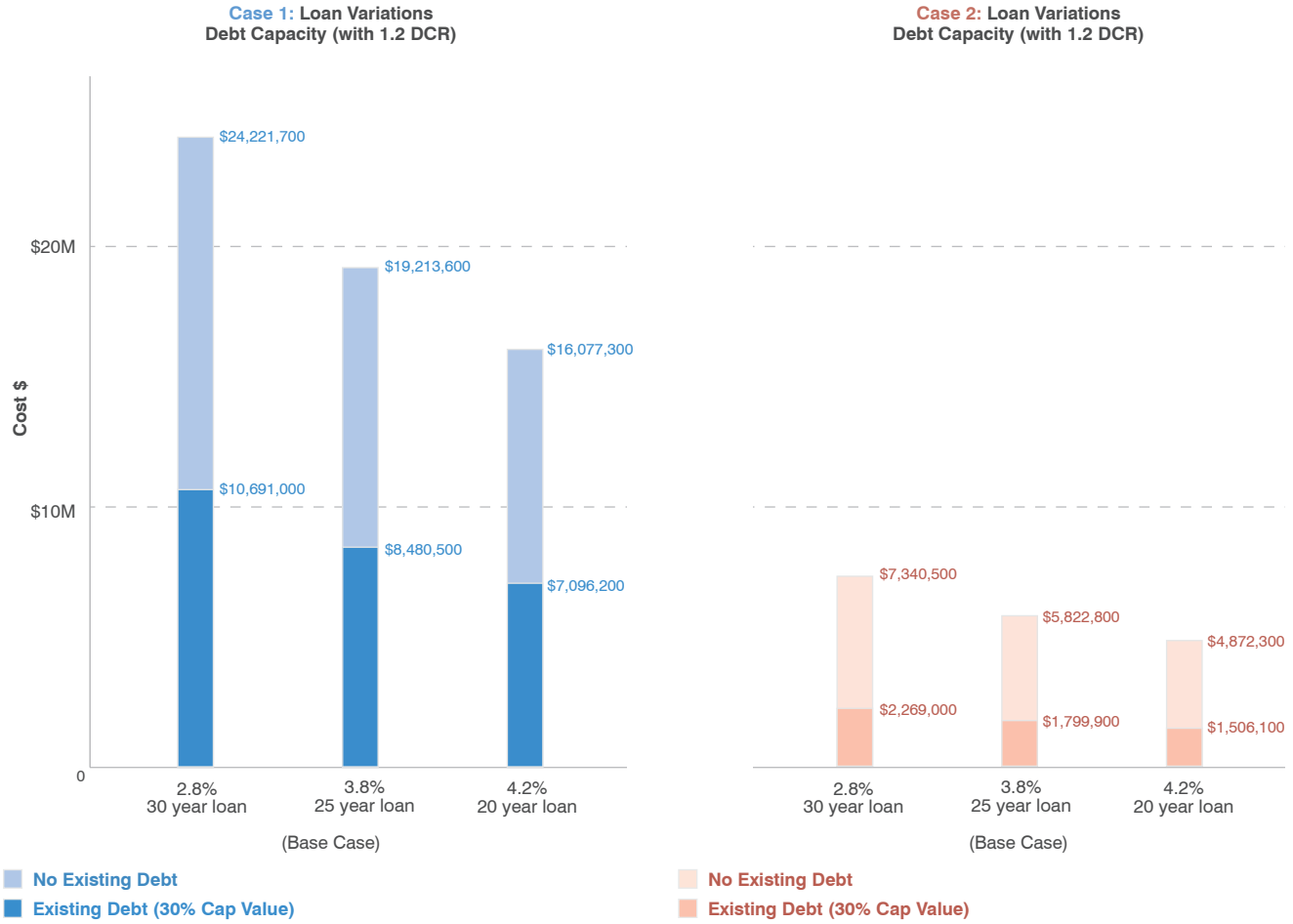


Table 3: Impacts of Debt Product on Debt Capacity

Case 1: Loan Variations

Debt Capacity (with 1.2 DCR)					
Debt (% Cap Value)	**0%**	**20%**	**30%**	**40%**	**50%**
2.8% 30 year loan	**24,221,700**	**15,191,200**	**10,691,000**	**6,158,700**	**1,658,500**
	26%	26%	26%	26%	26%
3.8% 25 Year Loan	**19,213,600**	**12,050,300**	**8,480,500**	**4,885,300**	**1,315,600**
	-16%	-16%	-16%	-16%	-16%
4.2% 20 year loan	**16,077,300**	**10,083,200**	**7,096,200**	**4,087,800**	**1,100,800**

Case 2: Loan Variations

Debt Capacity (with 1.2 DCR)					
Debt (% Cap Value)	**0%**	**20%**	**30%**	**40%**	**50%**
2.8% 30 year loan	**7,340,500**	**3,950,800**	**2,269,000**	**559,100**	**0**
	26%	26%	26%	26%	0%
3.8% 25 Year Loan	**5,822,800**	**3,133,900**	**1,799,900**	**443,500**	**0**
	-16%	-16%	-16%	-16%	0%
4.2% 20 year loan	**4,872,300**	**2,622,400**	**1,506,100**	**371,100**	**0**

3.3.3 Rental Income Variability and Affordability:

To further test variation within a market zone, the rent profiles of Case 1 and Case 2 were analyzed above and below the baseline 100MMR. 110MMR was tested, as was a scenario where 30% of units were considered affordable (80MMR), with the balance remaining at 100MMR.

In Case 1, increasing rents by 10% (110MMR) increased available revenue by $1,484,650 or 24%. If this revenue was used to service debt toward retrofit, a similar increase in capital for retrofit project could be made available. Decreases in revenue as a result of increased affordability reduced revenues by 15%, with a comparable decrease in the ability to leverage retrofit capital.

In Case 2 the results are more dramatic, with 110MMR increasing revenues by 55%, and increased affordability decreasing revenues by 41%.

Diagram of Table 4: Impact of Rent Level to Debt Capacity

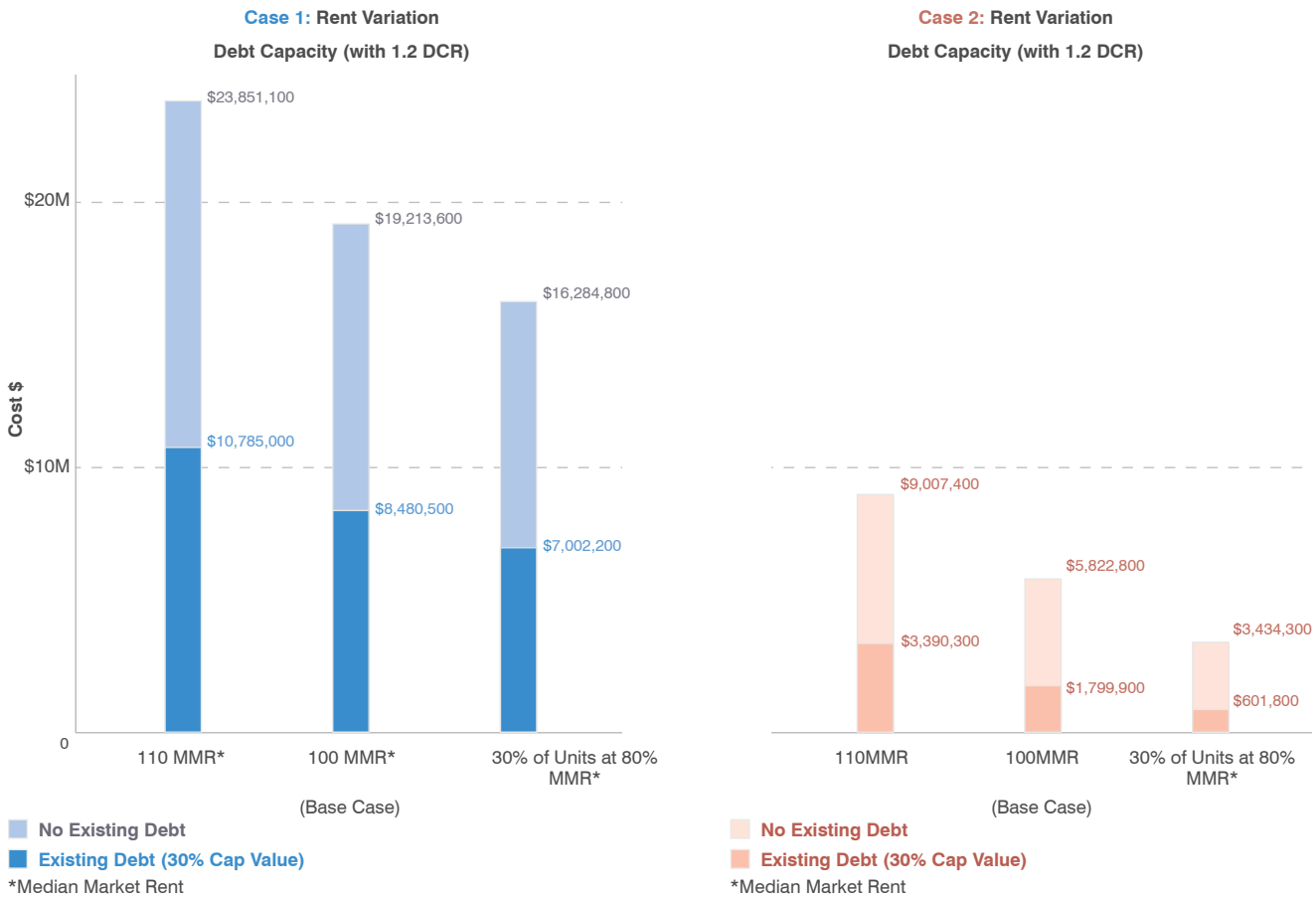


Table 4: Impact of Rent Level to Debt Capacity

Case 1: Rent Variation

Debt Capacity (with 1.2 DCR)						
Debt (% Cap Value)		**0%**	**20%**	**30%**	**40%**	**50%**
	Available Debt Service					
110MMR	**1,494,650**	**23,851,100**	**15,139,800**	**10,785,000**	**6,430,100**	**2,073,700**
% Change	24%	24%	26%	27%	32%	58%
100MMR	**1,204,041**	**19,213,600**	**12,050,300**	**8,480,500**	**4,885,300**	**1,315,600**
30% @ 80% MMR	**1,020,499**	**16,284,800**	**10,096,400**	**7,002,200**	**3,908,000**	**837,800**
% Change	-15%	-15%	-16%	-17%	-20%	-36%

Case 2: Rent Variation

Debt Capacity (with 1.2 DCR)						
Debt (% Cap Value)		**0%**	**20%**	**30%**	**40%**	**50%**
	Available Debt Service					
110MMR	**564,458**	**9,007,400**	**5,247,800**	**3,390,300**	**1,510,500**	**0**
% Change	55%	55%	67%	88%	241%	NA
100MMR	**364,890**	**5,822,800**	**3,133,900**	**1,799,900**	**443,500**	**0**
30% @ 80% MMR	**215,214**	**3,434,300**	**1,554,500**	**601,800**	**0**	**0**
% Change	-41%	-41%	-50%	-67%	NA	NA

3.4 MODELLING RETROFIT SCENARIOS

The following section examines the financial capacity for Case 1 and Case 2 buildings to undertake the eight (8) levels of retrofit described at the beginning of this section. The ability to undertake these levels of retrofit are examined at various levels of existing debt, as well as through use of alternatives debt, namely an Energy Backed Loan. Inclusion of carbon pricing in an energy backed loan tool is also examined.

Retrofit Level and Debt Capacity

Using the debt capacity levels tested in section 6.B, the eight levels of retrofits were tested for Case 1 and Case 2 buildings. Scenarios of both no existing debt, and debt at 30% of building capital value were evaluated.

3.4.1 No Existing Debt

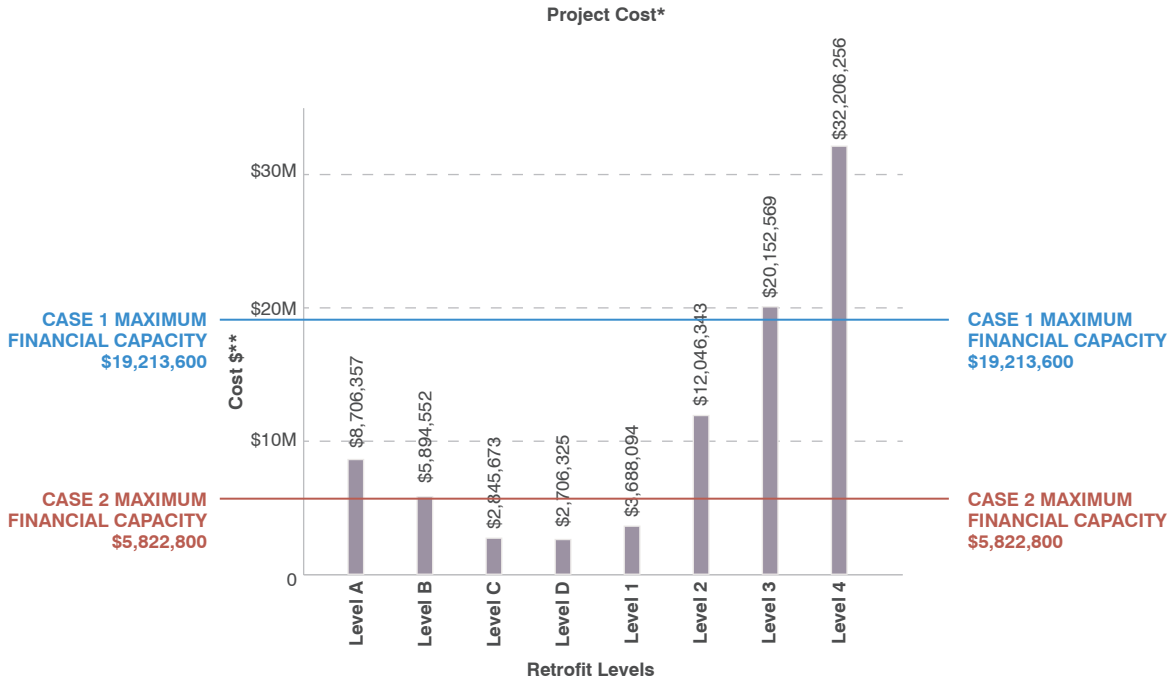
Case 1 with no Existing Debt

For Case 1, available debt capacity is adequate to finance state of repair levels A through D or energy retrofit levels 1 (Light) and 2 (Moderate), individually (but not all combined). Financing Level 3 (Deep Retrofit) and Level 4 (Complete Retrofit) are beyond Case 1 financial capacity by a significant margin, with a gap of $938,969 (Level 3) and $12,992,656 (Level 4)

Case 2 with no Existing Debt

Case 2 only has the potential to finance State of Repair Levels C and D, or retrofit Level 1 (light), individually (but not all combined). All other levels of retrofit are outside the financial capacity of Case 2.

Diagram of Table 5: Capacity to Engage in Levels of Retrofit: Case 1 and Case 2 with No Existing Debt



*Costing includes construction materials and labour costs, contractor mobilization, overhead and fees. Prices exclude construction contingency, project soft cost and applicable taxes. For further details see Appendix A.
** No Existing Debt

Table 5: Capacity to Engage in Levels of Retrofit: Case 1 and Case 2 with No Existing Debt

Case 1: Full Debt Capacity

Case 1 (1.2 DCR)								
	Level A	Level B	Level C	Level D	Level 1	Level 2	Level 3	Level 4
Project Cost	8,706,357	5,894,552	2,845,673	2,706,325	3,688,094	12,046,343	20,152,569	32,206,256
Debt Capacity	19,213,600	19,213,600	19,213,600	19,213,600	19,213,600	19,213,600	19,213,600	19,213,600
Gap	0	0	0	0	0	0	938,969	12,992,656

Case 2: Full Debt Capacity

Case 2 (1.2 DCR)								
	Level A	Level B	Level C	Level D	Level 1	Level 2	Level 3	Level 4
Project Cost	8,706,357	5,894,552	2,845,673	2,706,325	3,688,094	12,046,343	20,152,569	32,206,256
Debt Capacity	5,822,800	5,822,800	5,822,800	5,822,800	5,822,800	5,822,800	5,822,800	5,822,800
Gap	2,883,557	71,752	0	0	0	6,223,543	14,329,769	26,383,456

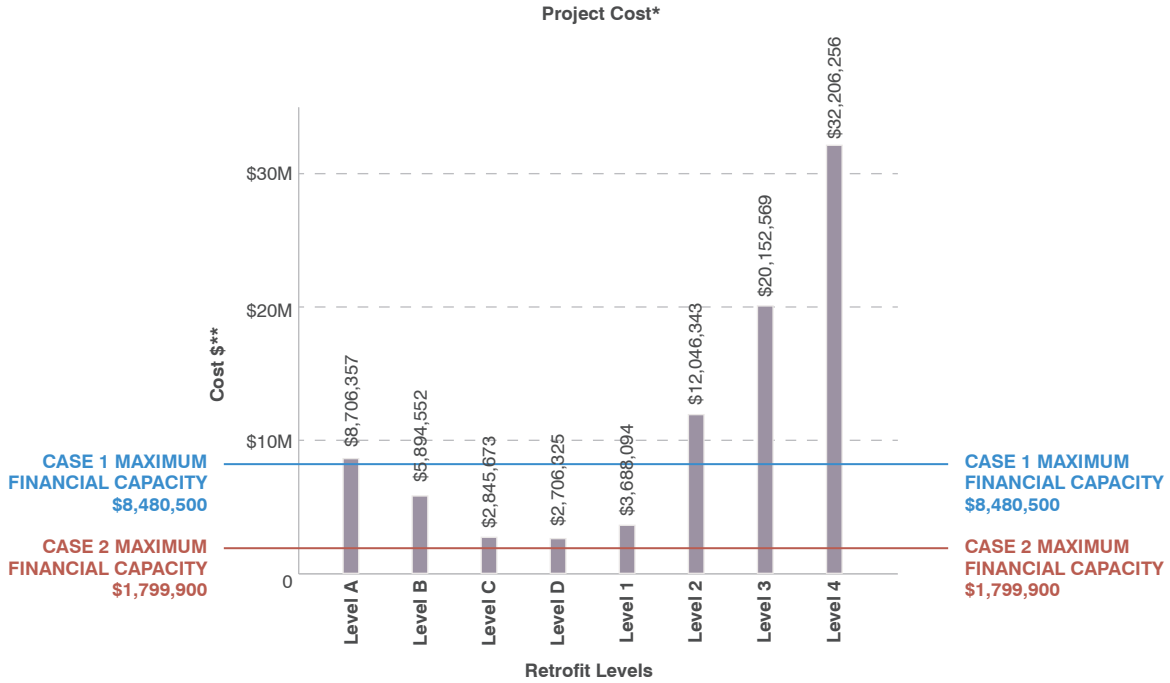
3.4.2 Existing Debt (30% of Cap Value)

Case 1 & 2 with Existing Debt:
Using available debt capacity for Case 1 and Case 2 assuming existing debt valued at 30% of building capitalization rate, the eight retrofit levels were tested.

In this scenario Case 1 buildings have the capacity to finance state of repair levels B, C and D, and energy retrofit level 1 (light), individually (not all combined). All other scenarios are not achievable without additional equity contributions.

For Case 2 buildings, no retrofit levels are achievable.

Diagram of Table 6: Capacity to Engage in Levels of Retrofit: Case 1 and 2 with Existing Debt of 30% Cap Value



*Costing includes construction materials and labour costs, contractor mobilization, overhead and fees. Prices exclude construction contingency, project soft cost and applicable taxes. For further details see Appendix A.
** Wi Existing Debt

Table 6: Capacity to Engage in Levels of Retrofit: Case 1 and 2 with Existing Debt of 30% Cap Value

Case 1: Debt of 30% Cap value

Case 1 (1.2 DCR)								
	Level A	Level B	Level C	Level D	Level 1	Level 2	Level 3	Level 4
Project Cost	8,706,357	5,894,552	2,845,673	2,706,325	3,688,094	12,046,343	20,152,569	32,206,256
Debt Capacity	8,480,500	8,480,500	8,480,500	8,480,500	8,480,500	8,480,500	8,480,500	8,480,500
Gap	225,857	0	0	0	0	3,565,843	11,672,069	23,725,756

Case 2: Debt of 30% Cap value

Case 2 (1.2 DCR)								
	Level A	Level B	Level C	Level D	Level 1	Level 2	Level 3	Level 4
Project Cost	8,706,357	5,894,552	2,845,673	2,706,325	3,688,094	12,046,343	20,152,569	32,206,256
Debt Capacity	1,799,900	1,799,900	1,799,900	1,799,900	1,799,900	1,799,900	1,799,900	1,799,900
Gap	6,906,457	4,094,652	1,045,773	906,425	1,888,194	10,246,443	18,352,669	30,406,356

3.5 ENERGY BACKED LOANS

To expand a building's debt capacity, the use of energy backed loans was modelled and tested for Case 1 and Case 2 buildings, for scenarios with and without existing debt.

Using revenue generated through energy savings as a result of retrofit, energy backed loans enable additional debt capacity unavailable through traditional products. For simplicity, the model developed here does not account for future utility inflation, but rather uses savings on year one as a fixed debt service for the length of the loan. Terms of the loan are similar to the baseline tool: 3.8% with 25 year amortisation, similar to existing Federal loan products.

Carbon pricing at $50/tonne, as mandated by the Federal Government to be in-force by 2022, has been accounted for in utility pricing. Increasing savings and therefore potential debt capacity, carbon pricing increases the ability of Energy Backed Loans to leverage capital toward retrofit.

The potential debt capacities enabled through Energy Backed Loans, with and without Carbon Pricing, for Retrofit Levels 1 through 4 are outlined below.

Diagram of Table 7: Debt Potential of Energy Backed Loans Considering Carbon Pricing

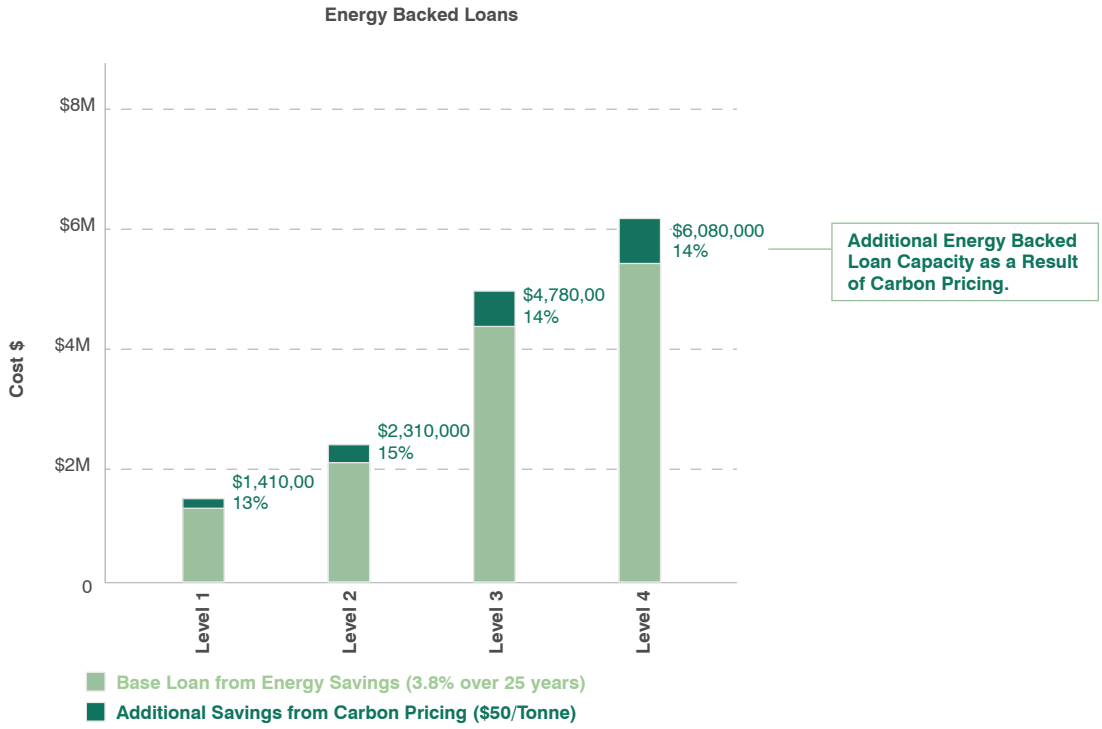


Table 7: Debt Potential of Energy Backed Loans Considering Carbon Pricing

Energy Loan - with/without Carbon Pricing ($50/Tonne)

	Level 1	Level 2	Level 3	Level 4
Energy Loan (With Carbon Pricing)	1,410,000	2,310,000	4,870,000	6,080,000
% Change	-13%	-15%	-14%	-14%
Energy Loan (Without Carbon Pricing)	1,250,000	2,010,000	4,280,000	5,330,000

3.5.1 Energy Backed Loans and Retrofit Levels

Building from the analysis of retrofits levels and debt capacity above, the use of Energy Backed Loans was tested in Case 1 and Case 2 buildings.

Energy Backed Loans add significant retrofit capacity to projects, closing the gap in the level of outside equity contributions required, and in some cases eliminating their need. As the level of financing provided by Energy Backed Loans is determined by the level of retrofit and available debt product, and not the building's initial financial performance, Energy Backed Loans affect Case 1 and Case 2 buildings equally, in absolute dollar terms. In fact, the relative increase in financial capacity via Energy Backed Loans is greater in Case 2 buildings.

As Energy Backed Loans are dependent on energy saving made possible via retrofit, state of repair Levels A, B, C, and D do not benefit from this tool.

Table 8: Impact of Energy Backed Loans: Case 1 and 2 Buildings with No Existing Debt

Energy Loan

Case 1: Full Debt Capacity

Case 1 (1.2 DCR)								
	Level A	Level B	Level C	Level D	Level 1	Level 2	Level 3	Level 4
Project Cost	8,706,357	5,894,552	2,845,673	2,706,325	3,688,094	12,046,343	20,152,569	32,206,256
Debt Capacity	19,213,600	19,213,600	19,213,600	19,213,600	19,213,600	19,213,600	19,213,600	19,213,600
Energy Loan	0	0	0	0	1,410,000	2,310,000	4,870,000	6,080,000
Repair and Renewal Loan	8,706,357	5,894,552	2,845,673	2,706,325	2,278,094	9,736,343	15,282,569	19,213,600
Total Financing	8,706,357	5,894,552	2,845,673	2,706,325	3,688,094	12,046,343	20,152,569	25,293,600
Gap	0	0	0	0	0	0	0	6,912,656

Case 2: Full Debt Capacity

Case 2 (1.2 DCR)								
	Level A	Level B	Level C	Level D	Level 1	Level 2	Level 3	Level 4
Project Cost	8,706,357	5,894,552	2,845,673	2,706,325	3,688,094	12,046,343	20,152,569	32,206,256
Debt Capacity	5,822,800	5,822,800	5,822,800	5,822,800	5,822,800	5,822,800	5,822,800	5,822,800
Energy Loan	0	0	0	0	1,410,000	2,310,000	4,870,000	6,080,000
Repair and Renewal Loan	5,822,800	5,822,800	2,845,673	2,706,325	2,278,094	5,822,800	5,822,800	5,822,800
Total Financing	5,822,800	5,822,800	2,845,673	2,706,325	3,688,094	8,132,800	10,692,800	11,902,800
Gap	2,883,557	71,752	0	0	0	3,913,543	9,459,769	20,303,456

Table 9: Impact of Energy Backed Loans: Case 1 and 2 Buildings with Existing Debt

Energy Loan

Case 1: Debt of 30% Cap value

Case 1 (1.2 DCR)								
	Level A	Level B	Level C	Level D	Level 1	Level 2	Level 3	Level 4
Project Cost	8,706,357	5,894,552	2,845,673	2,706,325	3,688,094	12,046,343	20,152,569	32,206,256
Debt Capacity	8,480,500	8,480,500	8,480,500	8,480,500	8,480,500	8,480,500	8,480,500	8,480,500
Energy Loan	0	0	0	0	1,410,000	2,310,000	4,870,000	6,080,000
Repair and Renewal Loan	8,480,500	5,894,552	2,845,673	2,706,325	2,278,094	8,480,500	8,480,500	8,480,500
Total Financing	8,480,500	5,894,552	2,845,673	2,706,325	3,688,094	10,790,500	13,350,500	14,560,500
Gap	225,857	0	0	0	0	1,255,843	6,802,069	17,645,756

Case 2: Debt of 30% Cap value

Case 2 (1.2 DCR)								
	Level A	Level B	Level C	Level D	Level 1	Level 2	Level 3	Level 4
Project Cost	8,706,357	5,894,552	2,845,673	2,706,325	3,688,094	12,046,343	20,152,569	32,206,256
Debt Capacity	1,799,900	1,799,900	1,799,900	1,799,900	1,799,900	1,799,900	1,799,900	1,799,900
Energy Loan	0	0	0	0	1,410,000	2,310,000	4,870,000	6,080,000
Repair and Renewal Loan	1,799,900	1,799,900	1,799,900	1,799,900	3,209,900	1,799,900	1,799,900	1,799,900
Total Financing	1,799,900	1,799,900	1,799,900	1,799,900	1,799,900	4,109,900	6,669,900	7,879,900
Gap	6,906,457	4,094,652	1,045,773	906,425	478,194	7,936,443	13,482,669	24,326,356

3.6 MODELLING NATIONAL HOUSING STRATEGY RETROFITS

The final analysis tests the means by which retrofitting can achieve the goals of the National Housing Strategy (NHS) Co-Investment Fund Repair and Renewal Stream. This core component of the NHS currently provides the largest sources of retrofit support available through low-interest loans and direct equity contributions. As noted in Section 3, the mandate of this landmark program is the rehabilitation of 240,000 units of affordable housing (both public and private) over ten years.

Using the results from the initial financial modelling around debt capacity, both Case 1 and Case 2 buildings were tested to understand the financial implications of conducting retrofits that meet the NHS Repair and Renewal stream criteria.

As outlined in Section 3, the criteria for NHS eligibility is threefold:

1. The provision of 30% of units at 80% MMR;
2. The provision of 20% of units fully barrier free; and
3. The reduction of GHG and energy use by 25%.

To test these criteria, capital costs from State of Repair Level B (Accessibility) and Retrofit Level 2 (Moderate Energy Retrofit) were used in conjunction with the rental income variability modelled in Section 4.3.3.

To better align the Level 2 (Moderate) retrofit scenarios to the specific requirements of the NHS program, select state of repair and life-safety measures have been removed from this scenario for the purposes of this analysis. While these measures are both recommended and often found to be necessary, only measures specifically related to engaging in or enabling required energy measures have been included here. (Note: the measures required to achieve a 25% reduction in Case 1 and Case 2 buildings have been found to result in 30-35% savings as achieved in Level 2).

Importantly, the NHS retrofit scope of work does not include life safety upgrades such as a sprinklers throughout the building, as this is not required by the NHS. However, these measures are recommended.

The capital cost of an NHS level retrofit as tested here are as follows:

Table 10: Cost to Meeting NHS Criteria

Achieving NHS Level Retrofit

	Level B (Accessibility)	25%+ Energy (Modified Level 2)	Total
Project Cost*	5,894,552	8,420,234	**14,314,786**
Cost / Unit			60,146

*Costing includes construction materials and labour costs, contractor mobilization, overhead and fees and construction and design contingency. Prices exclude project soft cost and applicable taxes

Using the debt capacity modelled in achieving the 30% of units at 80% MMR criteria modelled above (Section 4.3.3), the impact of engaging in NHS level retrofit was modelled below. Modelling includes existing debt levels ranging from 0 - 50% of building capital value, and use of 3.8% over twenty-five (25) year debt product similar to that tested above.

As the cost of achieving these performance goals is significant, and debt capacity has been somewhat limited due to reduced cash-flow as a result of adjusted rent profiles, equity support is required for all tested scenarios for both Case 1 and Case 2 buildings.

Table 11: Case 1: Financial Gap of Achieving NHS Retrofit at Various Levels of Existing Debt

Case 1: Achieving NHS Goals

Debt Capacity (with 1.2 DCR)					
Debt (% Cap Value)	0%	20%	30%	40%	50%
Project Cost	14,314,786	14,314,786	14,314,786	14,314,786	14,314,786
Debt Capacity (30% of Units at 80MMR)	16,284,800	10,096,400	7,002,200	3,908,000	837,800
Gap	0	4,218,386	7,312,586	10,406,786	13,476,986

Table 12: Case 2: Financial Gap of Achieving NHS Retrofit at Various Levels of Existing Debt

Case 2: Achieving NHS Goals

Debt Capacity (with 1.2 DCR)					
Debt (% Cap Value)	0%	20%	30%	40%	50%
Project Cost	14,314,786	14,314,786	14,314,786	14,314,786	14,314,786
Debt Capacity (30% of Units at 80MMR)	3,434,300	1,554,500	601,800	0	0
Gap	10,880,486	12,760,286	13,712,986	14,314,786	14,314,786

Scenarios were also tested with use of an Energy Backed Loan. Increased capital availability through use of this tool reduces the required equity contribution to achieve this level of retrofit, however only Case 1 with 0% debt has the capacity to fully finance the NHS level of retrofit without grant assistance.

Table 13: Case 1: Impact of Energy Backed Loans in Achieving NHS Retrofit at Various Levels of Debt

Case 1: Achieving NHS Goals with Energy Loans

Debt Capacity (with 1.2 DCR)					
Debt (% Cap Value)	0%	20%	30%	40%	50%
Project Cost	14,314,786	14,314,786	14,314,786	14,314,786	14,314,786
Debt Capacity (30% of Units at 80MMR)	16,284,800	10,096,400	7,002,200	3,908,000	837,800
Energy Loan	2,310,000	2,310,000	2,310,000	2,310,000	2,310,000
Total Finance Capacity	18,594,800	12,406,400	9,312,200	6,218,000	3,147,800
Gap	0	1,908,386	5,002,586	8,096,786	11,166,986

Table 14: Case 2: Impact of Energy Backed Loans in Achieving NHS Retrofit at Various Levels of Debt

Case 2: Achieving NHS Goals with Energy Loans

Debt Capacity (with 1.2 DCR)					
Debt (% Cap Value)	0%	20%	30%	40%	50%
Project Cost	14,314,786	14,314,786	14,314,786	14,314,786	14,314,786
Debt Capacity (30% of Units at 80MMR)	3,434,300	1,554,500	601,800	0	0
Energy Loan	2,310,000	2,310,000	2,310,000	2,310,000	2,310,000
Total Finance Capacity	5,744,300	3,864,500	2,911,800	2,310,000	2,310,000
Gap	8,570,486	10,450,286	11,402,986	12,004,786	12,004,786

3.7 RETENTION OF NET OPERATING INCOME

The modelling above has explored the total financial capacity of a building to leverage finance toward retrofit, while holding a debt coverage ratio of 1.2. It does not account for the owner's prerogative to hold net operating income (NOI) generated through the property for other purposes, a theme explored in Section 5 below.

To understand the impact of holding NOI, a Case 1 building was modelled assuming that 50% of NOI would be retained, prior to debt service (in this case $722,425 held by the owner). The remaining financial capacity to leverage debt toward retrofit is outlined below:

Diagram of Table 15: Case 1: Impact of Limiting Use of Financial Capacity by 50%

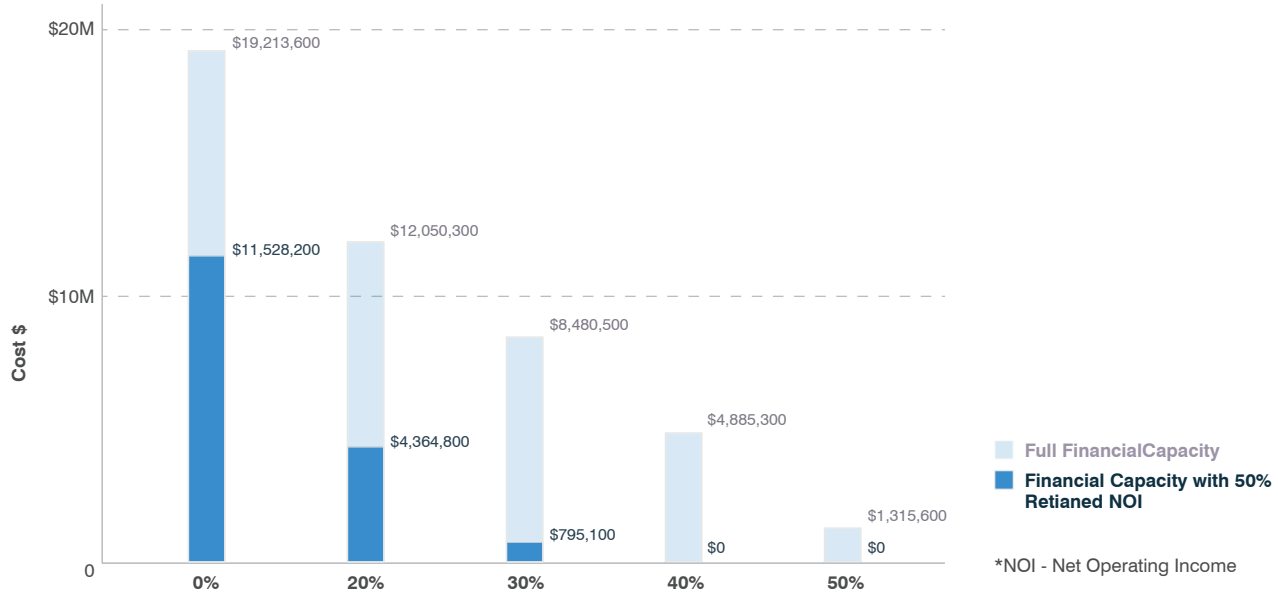


Table 15: Case 1: Impact of Limiting Use of Financial Capacity by 50%

Case 1: Impact on Debt Capacity with 50% Retained NOI

Debt (% Cap Value)	**0%**	**20%**	**30%**	**40%**	**50%**
3.8% 25 Year Loan					
Full NOI Used toward Retrofit	19,213,600	12,050,300	8,480,500	4,885,300	1,315,600
(With DRC of 1.2)					
50% of NOI Retained	**11,528,200**	**4,364,800**	**795,100**	**0**	**0**
% Difference	40.00%	63.80%	90.60%	NA	NA

The retention of 50% NOI (prior to debt service) significantly reduces the financial capacity for retrofit, and eliminates it altogether where large amounts of existing debt exist. While Case 1 buildings show the greatest potential to engage in retrofit activity, the motivations for owners to use this financial capacity will impact whether work is ultimately undertaken. This is explored further in Section 5 below.

3.8 FINDINGS

Through the modelling conducted in this section, the following has been observed:

Capacity

1. The financial capacity of buildings vary significantly:
The variability of rent zone, vacancy rate and maintenance costs between otherwise identical buildings results in wide divergence in financial capacity. While Case 1 buildings have the potential to engage in various degrees of retrofit, Case 2 buildings do not.

2. Pre-existing debt significantly impacts ability to raise new capital for retrofit:
Buildings that carry pre-existing debt are limited in their capacity to raise new capital for retrofit on an individual building basis. As an example,for Case 1 and 2 buildings, carrying pre-existing debt to the level of 30% of their building value limits their capacity to leverage new debt toward Repair and Renewal by more than 50%. It is understood that a large proportion of apartment buildings in Canada carry debt.

3. Most buildings throughout Canada will be unable to engage in retrofit without support:
The case study buildings exhibit a significant financial gap in most scenarios with the greatest need for support coming from Case 2 buildings. Without additional support to overcome this gap, including direct equity contributions, retrofit activity may be limited. While a Case 1 building without debt exhibits the greatest potential to engage in retrofit work without direct equity support, the full use of this potential will be limited by owner motivations, a theme explored further in Section 5 below.

Closing the Gap: Tools to engage in Repair and Renewal

4. Debt Products with favourable rates and longer terms can significantly expand capacity for renewal activity:

The base debt product tested, at 3.8% over twenty-five years exhibits favourable terms, and is inline with products currently offered by CMHC. The analysis of loan variability explored above (Section 4.3.2), outlines the impact rates and terms have on capacity to engage in retrofit work. Debt products supported by the Federal Government, either through underwriting commercial banks or direct lending, could positively impact retrofit capacity nationwide. **Expanding the eligibility and availability of long-term low interest loans will increase capacity for owners to engage in retrofit activity.**

5. Green Loans products, which leverage capital from long term energy savings, can help close the financial gap in engaging in retrofit work:

Energy backed loans (Section 4.4.3) provide increased capacity to engage in retrofit work which is tied to the energy performance of retrofits, rather than the financial capacity of an individual building or owner. **The creation of an Energy Backed Loan product will close gaps to enable retrofits.**

6. Substantial equity contributions are required to fully fund retrofits in most cases:

In most scenarios tested, a financial gap, often substantial, exists in achieving renewal goals (including NHS policy goals). These financial gaps could be closed through direct owner contribution, and complementary Provincial and Municipal support; however, these will vary case by case. Federal equity support can provide the backbone and incentive for retrofit work across Canada. **Expanding the eligibility and availability of equity contributions toward Repair and Renewal will increase capacity for owners to engage in retrofit activity.**

Repair vs. Renewal

7. State of Repair retrofit scenarios require significant investment and are beyond the capacity of many distressed (Case 2) buildings:

As made evident in the building failure noted in the introduction to this paper in Toronto's St. Jamestown, deferred maintenance can be catastrophic and impact the housing security of Canadians. Case 1 buildings have capacity to engage in a wide array of State of Repair work, whereas Case 2 buildings do not. **Eligibility to tools such as retrofit loans and equity contributions should prioritize financially constrained properties to ensure critical work is undertaken.**

8. Renewal Scenarios can augment State of Repair scopes of work, but comprehensive renewal is highly capital intensive:

There is an opportunity to augment critical repair work outlined in State of Repair Levels A - D with the scopes outline in Levels 1 - 4 to achieve low-impact and healthy housing. As a building would only undergo a major renovation once in a maintenance cycle, it is unlikely buildings would undergo additional retrofit measures once a State of Repair project has taken place. **Tools, such as Energy Backed Loans should be created to provide capacity to engage in broader retrofit activity, encouraging projects to build from a repair measures standpoint to a full renewal.**

9. Engaging in Accessibility upgrades is highly capital intensive in existing buildings:

As outlined in Retrofit Level B, engaging in broad barrier-free renovations (in both Case 1 and Case 2 buildings) is highly capital intensive, estimated here as $7,483,851 in construction activity (See Appendix A for full cost breakdown.) This is a result of the concrete shear wall construction typical of buildings of this era, requiring structural changes, as well as significant mechanical and electrical work to transform units to meet today's accessibility standards. As a result, engaging in the full scope of accessibility work will limit the ability to engage in other critical repair and renewal activity. Expanded support should be provided to projects engaging in accessibility activity so as not to limit the capacity to engage in other critical repair and renewal works.

Maintaining Affordability

10. The use of rents to increase financial capacity to fund retrofits will place affordability pressure on residents and should be limited as a tool:

The rent profile of a building has a significant impact on the capacity to engage in retrofit, as exhibited in Case 1 and Case 2 buildings, as well as the rent variation scenarios explored in Section 4.3.3 above.

However, the ability to shift rent profiles is limited by various Provincial regulations, and more importantly, would place unhealthy pressure on many Canadian households living in these buildings who are currently financially stressed by the existing rent burden.

The University of Toronto's Neighbourhood Change Research Partnership found that in the case of the City of Toronto, 48% of households living in Statistic Canada Dissemination Areas (DAs) containing high-rise rental housing are spending more than 30% of their family income on rents. (See Appendix B). This was true for DAs located in rent zones typical of Case 2 buildings, where 100MMR rents are well below the City Average. As a result, increases in rents to these buildings would negatively impact lower income households dependent on current rent levels, and similarly, the ability to leverage more rents from residents may be limited due to the financial capacity of lower income Canadians. **Encouraging the use of rent increases to support retrofits activity should be avoided.**

Engaging in NHS Criteria Retrofits

11. National Housing Strategy Level retrofits require significant construction capital funds beyond the capacity of most building types without equity support:

As outlined in Section 4.5 above, achieving an NHS level retrofit in a Case 1 and 2 buildings requires an estimated construction capital of $18,174,365. A challenge with the NHS scenario is the suppressed financial capacity of buildings resulting from meeting program eligibility criteria. While maintaining affordability is paramount, increasing affordability, particularly in low rent zone areas as characterized in Case 2 may prove difficult. (A further discussion on the the variability and impact of rent zones can be found in Appendix E). **As a result, access to National Housing Strategy Funds should be widened through alternative compliance paths to ensure scopes of repair balance specific building needs and financial capacity.**

This section explored the financial capacity of typical Case 1 and Case 2 buildings to engage in repair and renewal activity, and explore the financial tools that could support closing observed gaps. The following section will discuss the motivations for owners to engage in this work, independent of capacity of available tools.

04. MOTIVATING RENEWAL AND RETROFITTING

The previous section examined the financial capacity of Case 1 and Case 2 buildings in engaging in various levels of retrofit, as well as potential tools to bridge financial gaps. This analysis provided base data to understand the financial mechanics of a Case 1 and Case 2 building on an individual building basis.

The following section will examine how the financial capacity of Case 1 and Case 2 buildings would apply to various owner types, and the motivations impacting engagement in repair and renewal activity.

In this section, two important factors are at play: financial capacity and financial performance. Financial capacity - a building's ability to leverage capital for retrofitting - was calculated and explored in detail in Section 4. Financial performance is about understanding that there are many ways to spend available NOI, or take on more debt, with retrofits being only one option. For many for-profit building owners, allocating free NOI to retrofits may be a negative investment when compared to other investments that could made with that same free NOI. As a result, building owners may elect to not undertake retrofits, despite having the capacity to do so.

Image courtesy of Jesse Colin Jackson

4.1 DESCRIPTION OF FIVE OWNER TYPES

The vast majority of aging purpose-built tower housing in Canada is in private ownership. Ownership ranges in form and scale, from the operation of an individual tower, to large national portfolios; from family run business to publicly traded corporations. This study examines how owner type may impact renewal activities and identifies which types of owner to target for renewal using various incentives. The study breaks down owner types into the following categories:

1. **Private non-profit owners:**
   Representing a small subset of the tower stock, private not-for-profit buildings can house highly vulnerable individuals and families. They are motivated to invest heavily in building assets yet often lack financial capacity. They often lack capacity to engage in large and complex construction projects as well. They often have flexible decision making capacity. NHS programs to date are targeted toward these owners. Note that public owners have not been studied from the perspective of their business case; however, recommendations made in section 3 toward recalibrating the existing incentive performance requirements applies equally to the public sector.

2. **Small private owners:**
   These owners run small portfolios that range from a single to half a dozen buildings. They are often limited in financial capacity, dependent on mortgage finance, and have limited corporate capacity to engage in large and complex projects. However, they often have flexible decision making capacity with private and family run boards.

3. **Mid-sized private owners**
   Operating portfolios of up to several dozen buildings, these private owners have the decision making flexibility of small owners, with greater financial capacity. They are often tied to development corporations.

4. **Large private investment fund owners**
   This class of owner operates large portfolios tied to investment funds. These owners manage assets to enable a rate of return for private investors with both long term and short term horizons, based on the nature of the fund. Decision making is made by a private board of directors, and is tied to fund performance. They come in two classes:
   a. Non-taxable corporations, such as pension funds;
   b. Taxable corporations, such as private investment or insurance corporations

5. **Large Publicly Traded Owners (including REITS)**
   Publicly traded private companies, often in the form of Real Estate Investment Trusts, manage large portfolios of properties. Decision making is tied to quarterly reporting, stock unit performance and dividend expectations. They are able to leverage large sums of capital at low interest rates, yet investment is tied to financial performance as outlined by shareholders.

This summary provides a high level overview of the owner ecosystem, who together own the many thousand aging high-rise rental buildings in Canada. The analysis below will explore factors that may motivate or dissuade owners to engage in repair and renewal across owner types. Where useful for the purposes of illustration, specific owners types are identified; however, the analysis is primarily focused on not-for profit and for-profit private owners in general.

4.2 PRIVATE NON-PROFIT OWNERS

Non-profit buildings have the greatest flexibility to use a building's financial capacity outlined in Section 4 toward retrofit activity. This is a result of surpluses from building operation, or NOI behind held within the non-profit company for use toward improving housing, rather than generating profit. The debt capacity scenarios described in Section 4 for Case 1 and Case 2 buildings, and the tools to overcome gaps to engage in repair and renewal work are well suited to non-profit buildings.

Freedom to maximize the use of free capital toward building improvements without a profit expectation provides opportunity to achieve holistic renewal where access to project financing is available. As a result, the first generation of holistic retrofits currently underway are in the non-profit housing sector.

However, current lack of access to capital beyond mortgage financing is generally a constraint, as is the smaller scale at which many non-profits operate. Providing broad access to favourable debt products, Energy Backed Loans and equity contributions explored in Section 4 could accelerate retrofit activity in this sector.

> *Enabling not for profits to maximize use of public sector funding and support (such as the NHCF) to finance projects where buildings are highly mortgaged is a key challenge and opportunity.*

4.3 PRIVATE FOR-PROFIT OWNERS AND INVESTING IN RETROFITS

Whereas non-profit operators are well suited to engage in retrofit work where financial capacity and favourable tools exist, the situation is more complicated for for-profit owners.

As noted in Section 5.1, for-profit owners come in a range of types, each with specific constraints and motivations, but are united in their judicious use of free funds from building operations for dividends, or for reinvestment into projects and investments which are understood to yield returns outlined by their ownership. (Remember: the distinction between financial capacity and financial performance.)

Investment in deep retrofits that maintain affordability is a challenge, particularly as these investments do not generate returns commensurate with capital outlays and project risk. While buildings may have the financial capacity to engage in repair and renewal work, the owners may simply decide not to use this capacity for such work.

Use of free capital (Net Operating Income - or NOI)

NOI from private buildings can be used for asset investments, extracted as profit or dividends, or invested in other projects. Use of NOI for buildings investment begins with ensuring the housing asset is viable and vacancies are low. Investments beyond these are assessed based on their rate of return, whether they be directed within buildings, or in outside projects (such as in new housing developments). As an example, investments in unit renovations upon tenant turnover allows for higher rents, and therefore attractive return on investment. Investments in retrofits without sufficient ROIs, particularly in buildings that are fully occupied, are unlikely.

How repair and renewal projects compete with higher yield uses of free capital is a key challenge.

Expected Return on Investment (ROI) for typical investments

Investments that are made using free NOI generally have minimum return on investment (ROI) thresholds. Simply stated, investments need to create new net revenues. A 5% annualized return is often considered the base threshold for substantive investment. As example, a 5% annual return on a $10,000,000 investment compounded over ten years would yield over $6.28M of new returns over that period, for an average of $628,000 annually. Investments in the building stock need to complete with other investments that can create these returns, or greater returns.

While energy savings create increased NOI through utility costs reductions, gains are typically modest, commensurate with the cost of borrowing to engage in the retrofit measures themselves (or in part as noted in Section 4 through the Energy Backed Loan tool). For this reason, energy retrofit measures are generally accounted for in terms of payback periods rather than yearly ROI. Base state of repair measures and enabling works for energy retrofits provide no ROI where rents are kept stable. In buildings with high vacancies and high annual maintenance costs, retrofits can lead to new net revenues through expanded rental income through reduced vacancies and reduced maintenance costs. However, competing with other investments at 5% ROI or greater often proves difficult without relying on increases in rents.

Motivating the use of financial capacity of private, for-profit owners to engage in retrofit work that does not provide attractive ROIs is a key challenge.

Debt

As outlined in Section 4 many owners fully leverage their buildings to provide working capital for maintenance, capital investment within the building (such as unit improvements), or investment in other projects, such as new developments. This limits the ability of owners to raise additional debt for additional projects such as retrofits. The amount of debt raised varies across owner types, with larger owners able to leverage debt against several assets in the broad portfolio, and small owners constrained to the capacity of an individual asset. Where additional funds are accessed, the debt position of the primary lender can impact the rate and terms of subsequent debt, making use of additional debt for low yield investments unattractive. In all cases, the cost of financing must be accounted for when determining project ROI, making retrofit activity with limited ROI outside of rent increases less attractive.

How repair and renewal projects address fully leveraged buildings is a key challenge.

Use of equity rather than financing for building investment:
Larger and well capitalized owners sometimes avoid project finance and use equity to fund capital projects, thereby avoiding financing costs. In these cases, projects are fixed within equity capacity and tools for financing are rarely used.

Motivating owners' use of public sector finance tools and programs to engage in renewal and retrofit projects is a key challenge and opportunity.

Meeting Capital Needs Through Rent Increases:

Increased rents are the primary method of increasing revenue in rental buildings, to be used for expanded operations, reinvestment, or profit. Investment in buildings are primarily motivated to increase rental revenue, either through rent increases at turnover (especially in the Ontario and BC context), or through filling vacancies. Programs of lobby renovation, landscape improvements, painting and suite modernization are all specifically aimed at making buildings and suites more attractive to tenants, thereby achieving rent or occupancy increases. Building modernization, outside of ROI through rent or cost reductions, is a considerable challenge in the private sector environment.

For illustrative purposes, the eight State of Repair and Retrofit scenarios used in Section 4 have been analyzed based on the required rent increase to meet the 5% ROI expectations of a typical investment. The chart below illustrates the impact on rent affordability when using 5% compounded annualized rates of return through rents alone to pay for each level of retrofit.

Table 16: Achieving a 5% ROI for Retrofit Investment Through Rent Increases: Impact on Affordability

5% ROI - Impact on Rents

Renewal Level	Capital Investment	5% ROI (Compounded Annualized to Ten Year Investment)	Impact on Rents (Monthly)	% Increase from baseline (100 MMR)
Level A	$8,706,356.92	$547,538.11	$191.72	15%
Level B	$5,894,551.52	$370,705.18	$129.80	10%
Level C	$2,845,673.42	$178,962.87	$62.66	5%
Level D	$2,706,324.73	$170,199.31	$59.59	5%
Level 1	$3,688,094.20	$231,942.26	$81.21	6%
Level 2	$12,046,343.00	$757,588.04	$265.26	21%
Level 3	$20,152,569.13	$1,267,384.24	$443.76	35%
Level 4	$32,206,256.20	$2,025,434.15	$709.19	55%

The chart below illustrates the impact on rent affordability if financing costs (as outlined in Section 4) are covered through rents alone.

Diagram of Table 17: Covering Debt Service for Retrofit Investment Through Rental Increases: Impact on Affordability

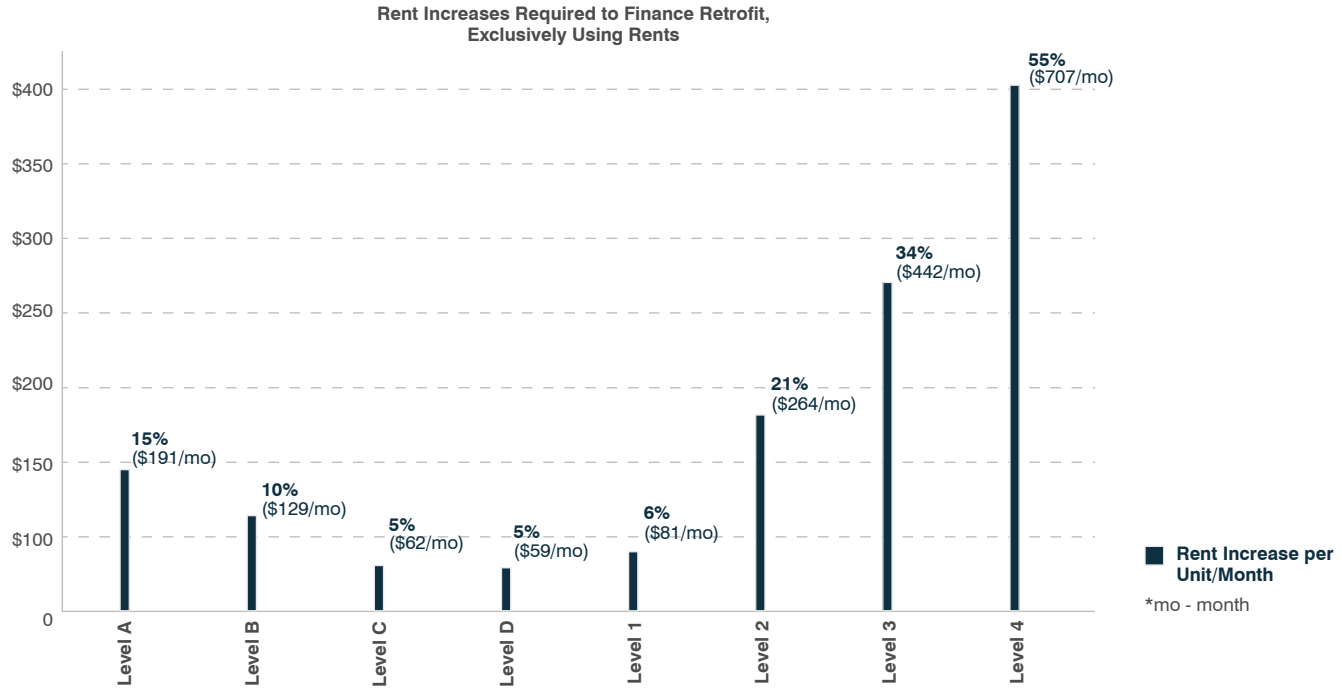


Table 17: Covering Debt Service for Retrofit Investment Through Rental Increases: Impact on Affordability

Financing Retrofit - Impact on Rents

Renewal Level	Capital Investment	Annual Debt Service Using Long Term Loans (3.8% / 25 Years)	Impact on Rents (per unit/month)	% Increase from baseline (100 MMR)
Level A	$8,706,356.92	$545,592.08	$191.03	15%
Level B	$5,894,551.52	$369,387.64	$129.34	10%
Level C	$2,845,673.42	$178,326.81	$62.44	5%
Level D	$2,706,324.73	$169,594.40	$59.38	5%
Level 1	$3,688,094.20	$231,117.91	$80.92	6%
Level 2	$12,046,343.00	$754,895.46	$264.32	21%
Level 3	$20,152,569.13	$1,262,879.78	$442.18	34%
Level 4	$32,206,256.20	$2,018,235.47	$706.67	55%

The value of debt servicing for retrofits when using a lower interest, long terms loan is nearly commensurate with the rate of return expected for an investment by many private owners. As a result, engaging in retrofit financing programs serves as a 'negative' investment where a 5% annual revenue is lost rather than gained. Using less favourable financial tools would make this loss greater. Bridging the gap between expected returns, and costs of debt incurred for retrofit work will take careful consideration.

> *It is critical that means of attracting private sector action toward holistic retrofit is identified, and that rent increases are not relied upon.*

The Financial Performance Challenge

The core challenge of engaging in retrofit work in the for-profit sector relates to the hurdle of financial performance - in addition to financial capacity. Tools to offset negative returns as well as reduce direct owner exposure can motivate increased owner participation and are discussed below. However, a core challenge exists in that engaging in retrofit work without an uplift in rental income will remain largely uneconomic for many building owners. Achieving asset improvement with the maintenance of affordability will require substantial direct and indirect public investment.

4.4 PRIVATE SECTOR CONSIDERATIONS FOR RETROFIT FINANCE TOOLS:

Access to Low-Interest Long-Term Loans

As outlined in Section 4, low-interest loans provide the ability to stretch existing debt capacity. This tool may be attractive to some for-profit owners engaging in repair and renewal work. However many larger and sophisticated owners have access to low rate capital. Further, many mid-sized and large owners use equity for asset investments to avoid finance costs or the use of building NOI for retrofit purposes. Smaller owners with fewer financing options beyond mortgage finance may find this tool particularly attractive.

In cases where financing is utilized, a predictable and accessible tool providing low rate and long term finance would benefit all owner types.

Grants

Grants are always attractive, reducing the amount of direct investment required by the owner for a project. When strategically designed and tied to performance requirements, grants can push investment and best practice. The terms of access to grants will impact participation, with predictability and ease of use paramount for owner participation. As illustrated in Section 4, the amounts of equity contribution required to engage in the eight levels of Retrofits tested are substantial. Existing CMHC programs limit equity contributions to 15% of projects for private projects. Expanding this threshold, while calibrating grants to performance, and ensuring ease of access, could motivate owner participation in retrofitting.

Energy-Backed Loans

As discussed in Section 4, energy-backed loans provide a revenue-neutral form of financing which may be attractive to a large number of owners. A product not currently offered by the public sector or commercial banks, energy-backed loans provide upfront capital for retrofit projects based on projected energy savings. Utilizing new cash flow enabled through retrofit, these products are self-financing, adding additional debt capacity to projects based on performance. The provision of a predictable and accessible Energy Back Loan tool could find broad usage among those engaging in planned energy retrofit works.

Other Tools

Other tools such as tax treatments to incent private sector investment are being examined in a parallel City of Toronto study. For example, property assessment post-retrofit will impact taxation and therefore NOI. Policy alternatives to limit property tax increases post-retrofit could limit this disincentive.

New Mortgage Products

A new mortgage product may be an effective approach to incenting private owners. This tool is discussed in detail below (Section 6)

This research concludes that two tools would provide the most effective incentives to motivate renewal while preserving affordability:

- The current low-interest loan and equity support of the Repair and Renewal program, with expanded eligibility and ease of use.
- An Energy Backed Loan program.

These, and any other tools should be made available for use at a 'portfolio of buildings' scale (discussed below).

4.5 ENGAGING IN REPAIR AND RENEWAL: FOUR SCENARIOS

While expectations of financial performance can limit the extent and scope of retrofit activity, the following explores four scenarios in which supportive tools may enhance owner investment for planned work and expand activity more broadly:

1. **A Distressed Buildings**

   Distressed buildings usually require substantial investment to remain viable. In many cases, lack of financial capacity, such as in Case 2 buildings, contribute to the condition of distress, where deferred maintenance as a result of poor financial health compounds. Smaller owners with less financial capacity may hold buildings with these characteristics.

   Where buildings have been unable to address substantial repair backlogs, access to low-interest loans to stretch financial capacity, and equity contributions to overcome financial barriers may be attractive to building owners to ensure buildings remain viable.

   Federal tools calibrated to suit the constraints of these owners and to the capital levels required to engage in deep repair, could expand repair activity as well as a potential broader scope of renewal and retrofit.

2. **Enhancing Planned Investment**

   Larger and more sophisticated owners are routinely engaging in a suite of upgrades to buildings, often at the point of acquisition, or as part of regular asset management. Access to repair and renewal tools may encourage a broader suite of retrofit activity creating lower impact and healthier housing.

   Federal tools could encourage further investment in deep retrofit during these cycles of investment. Programs with clear guidelines in terms of level of support, have a clear application process and clear timeline to access capital could encourage use, and augment and allow for the planning of regular cycles of investment.

3. **Prestige Projects**

   A limited number of owners are engaging in prestige projects to showcase their portfolio.

   Federal support for showcase projects could expand uptake, drive the retrofit market and encourage owner investment, experimentation and innovation toward retrofits.

4. A Portfolio of Repair and Renewal

Large and more sophisticated owners, such as Real Estate Investment Trusts, Private Investment Funds, Insurance Companies, and larger private owners manage large and complex portfolios of buildings. Asset managers are planning for and engaging in reinvestment at a portfolio scale, rather than building by building.

Access to federal repair and renewal tools at a portfolio scale could allow for expanded capacity and the capacity for longer term planning. Expectations related to public policy goals of Federal support could be addressed on a portfolio basis, rather than building by building. Whereas the lead times and planning to access federal funds is at times prohibitive on a single buildings basis, support of a portfolio of buildings could attract the more sophisticated owner groups and expand uptake toward meeting Federal goals.

However, a key challenge is that cycles of investment by for-profit owners can be tied to asset repositioning with expectations of rent uplift. Federal funds that preserve affordability will require careful calibration to achieve that goal and be attractive to building owners.

05. ALTERNATIVE APPROACHES TO SUPPORTING PRIVATE SECTOR RENEWAL: MORTGAGE FINANCE

The modelling and analysis above illustrates the challenges in incenting private sector investment in deep retrofits. Retrofits that achieve significant increases in health, safety, social inclusion and energy performance do not result in sufficient returns where affordability is maintained. There remains a core paradox of affordability being provided by the private sector. Rent levels that are affordable in the private sector context are often tied to conditions and locations which are unfavourable, which in turn create the affordable rent levels. As noted above, investments in buildings are often tied to rent increases. The ceiling of prospective rent increases is often the limit of investment.

The core question is: How can investment be incentivized without resulting in higher rents? Where rents are to be maintained, or lowered, government support is required.

While one-time capital support on a project-specific basis is well suited to not-for-profit owners, for-profit owners are motivated by long-term net operating income, and incentives for this group should focus instead on this lever.

Image courtesy of Jesse Colin Jackson


HUNTERS LODGE

5.1 MORTGAGE FINANCE: DEVELOPING A REPAIR AND RENEWAL MORTGAGE TOOL

Mortgage finance is linked to CMHC's core business, with roughly 50% of all housing in the postwar apartment stock participating in CMHC mortgage insurance. If a mortgage tool was created to increase operating cash-flow, while also providing capital to engage in retrofits toward public policy goals, a special mortgage product could be an attractive and effective tool to incent for-profit building owners.

A process of refinancing at end-of-term of an existing mortgage by transferring to a Repair and Renewal Mortgage with favourable below market rates, can free capital for retrofit and renewal with zero additional cost, and provide a debt facility for additional capital for retrofits. Coupled with additional tools, such as Energy Backed Loans, and direct equity contributions, a Repair and Renewal Mortgage could be an important tool toward owner participation in retrofit activity, particularly owners who rely on mortgage financing as their primary source of project capital.

The following are high level findings of using a 2.5%, 35-year Repair and Renewal Mortgage Tool instead of an existing 4.7%, 20 year traditional Mortgage:

Table 18: Potential Impact of Use of Repair and Renewal Mortgage

Impact of Refinancing Using Repair and Renewal Mortgage Scenarios at Various Levels of Existing Debt

Estimated Debt as Baseline (% of Buliding Capital Value)*	Value of Mortgage	Annual Debt Service (4.7% at 25)	Annual Debt Service (2.5% at 35 Years)	Debt Service Savings Using New Mortgage Tool	Percentage Reduction Using New Mortgage Tool	New Renewal Capital Extraction Using Surplus Debt Service Level and 2.5% Product)	New Level of Asset Leverage (At Same Debt Service Value)
0%	$0	NA	NA	NA	NA	NA	NA
20%	$7,161,999	$492,990	$309,438	$183,552	37%	$4,248,342	32%
30%	$10,742,998	$739,486	$464,157	$275,328	37%	$6,372,513	48%
40%	$14,323,997	$985,981	$618,877	$367,104	37%	$8,496,684	64%
48%	$17,188,797	$1,183,177	$742,652	$440,525	37%	$10,196,021	76%

*48% Leverage of building capital value is the maximum level of debt a Case 1 building could carry maintaining a DCR of 1.2

Through conversion to a Repair and Renewal Mortgage tool, additional capital can be leveraged toward building retrofit with no impact to building NOI. As an example, a building holding a traditional mortgage of 30% of building value, upon refinancing to a Repair and Renewal Mortgage could leverage an additional $6,372,513 of value for retrofit activities while remaining revenue neutral.

Reducing Use of Building NOI to Enable Repair and Renewal

For the purpose of comparison two scenarios are provided below - Scenario A showing the impact of using an equity contribution in reducing renewal costs; and Scenario B showing the impact of using all proposed tools: Equity contributions; Energy Backed Loans; and Repair and Renewal Mortgage Tool.

Table 19: Impact of Use of Capital Raised from Use of Repair and Renewal Mortgage

Scenario A: Testing Use of 15% Equity Contribution

Retrofit Level	Capital Requirements for Retrofit Levels	Retrofit Capital from Refinance (Assume Debt level as 30% of Cap Value)	Remaining Gap
Level A	$8,706,357	$6,372,513	$2,333,84
Level B	$5,894,552	$6,372,513	None
Level C	$2,845,673	$6,372,513	None
Level D	$2,706,325	$6,372,513	None
Level 1	$3,688,094	$6,372,513	None
Level 2	$12,046,343	$6,372,513	$5,673,830
Level 3	$20,152,569	$6,372,513	$13,780,056
Level 4	$32,206,256	$6,372,513	$25,833,743

Scenario A shows the impact of using the additional capital raised through the proposed Repair and Renewal Mortgage (assuming a mortgage debt level of 30% of building value). This additional value is provided with no impact to building NOI. The remaining gap would need to be covered through project finance capacity as outlined in Section 4, with the amount of debt raised based on asset capacity and owner tolerance for use of NOI.

Scenario B uses all proposed Repair and Renewal tools. Through use of the proposed Mortgage tool, revenue neutral Energy Backed Loans, and the NHCF 15% equity contribution, remaining gaps are reduced and in some cases eliminated.

The Repair and Renewal suite of tools are proposed here with the aim of reducing the dependence on building NOI to finance retrofits and increase for-profit owners who undertake deep retrofits. Using the proposed Repair and Renewal Mortgage tool as the backbone, and augmenting with existing and proposed tools, this broader Repair and Renewal strategy can reduce the impact of engaging in projects by significant margins. While gaps remain, this suite of tools can dramatically reduce owner risk and exposure; and bridge gaps where financial capacity is low (as in Case 2 buildings examined in Section 4), and motivate participation for retrofit action across a greater number of buildings. Considerations for the design and implementation of the Repair and Renewal Mortgage tool are discussed below.

Diagram of Table 20: Impact of Use of All Proposed Repair and Renewal Tools

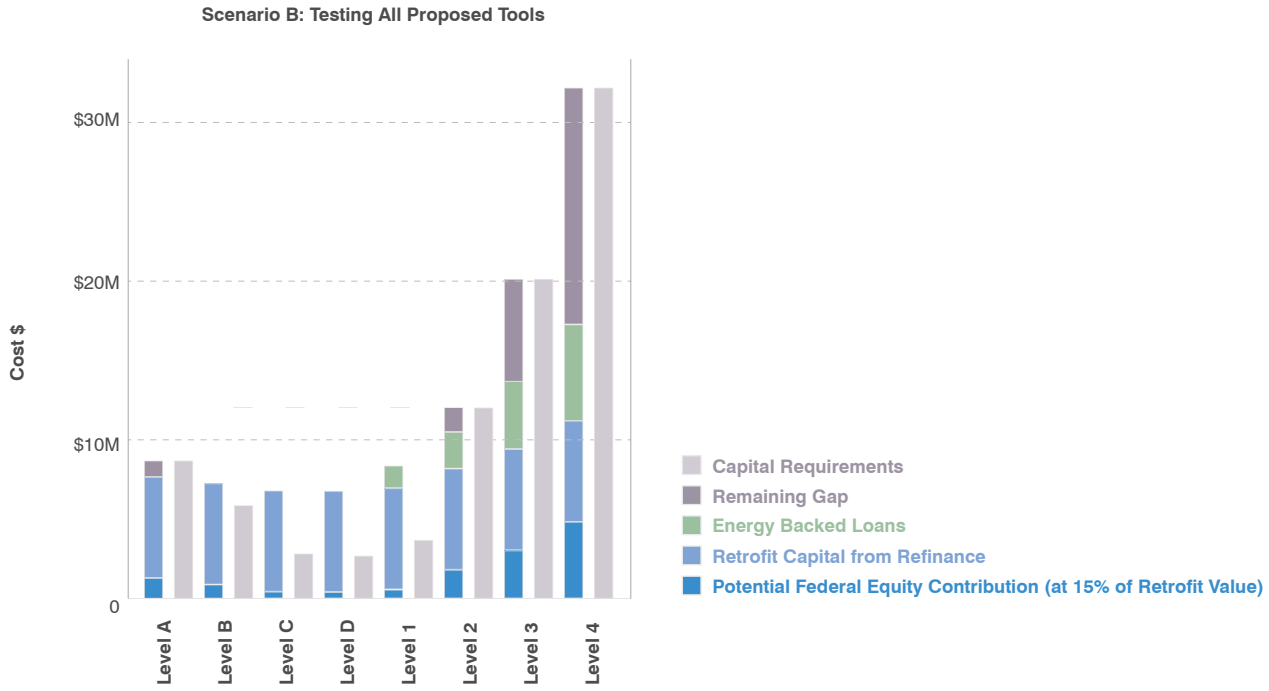


Table 20: Impact of Use of All Proposed Repair and Renewal Tools

Scenario B: Testing All Proposed Tools

Retrofit Level	Capital Requirements for Retrofit Levels	Retrofit Capital from Refinance (Assume Debt level as 30% of Cap Value)	Potential Capital for Retrofit Through Energy Backed Loan (Tied to Saving of Level of Retrofit)	Potential Federal Equity Contribution (at 15% of Retrofit Value)	Total Renewal Capital Through Mortgage Refinance, Energy Backed Loans and Equity Contribution	Remaining Gap
Level A	$8,706,357	$6,372,513	$0	$1,305,954	$7,678,467	$1,027,890
Level B	$5,894,552	$6,372,513	$0	$884,183	$7,256,696	None
Level C	$2,845,673	$6,372,513	$0	$426,851	$6,799,364	None
Level D	$2,706,325	$6,372,513	$0	$405,949	$6,778,462	None
Level 1	$3,688,094	$6,372,513	$1,410,000	$553,214	$8,335,727	None
Level 2	$12,046,343	$6,372,513	$2,310,000	$1,806,951	$10,489,464	$1,556,879
Level 3	$20,152,569	$6,372,513	$4,280,000	$3,022,885	$13,675,398	$6,477,171
Level 4	$32,206,256	$6,372,513	$6,080,000	$4,830,938	$17,283,451	$14,922,805

5.2 DESIGNING A REPAIR AND RENEWAL MORTGAGE TOOL

Findings to date indicate that the tools outlined in the Repair and Renewal Stream of the National Housing Strategy are an effective tool in supporting the non-profit sector, though a financial gap will continue to persist between what many building owners are able to contribute (including public supports) and the cost of retrofits. Private sector participation will be a challenge. A special mortgage program with select grant support has been found to be a potentially powerful tool in supporting renewal activity throughout the private sector rental stock.

Considerations in engaging in this approach are discussed below:

5.2.1 Program Delivery

A special Repair and Renewal Mortgage could be provided via commercial banks through mortgage guarantees provided by CMHC, or through CMHC direct lending. The terms, rates, and volume of lending (i.e. the capital pool) would vary depending on approach, with lower rates possible through direct lending, and a larger program with broader reach possible through commercial banks.

In both cases, performance based grant support to augment base finances could be provided through direct contributions from CMHC as an addition to the contribution provided through the existing NHS Repair and Renewal program.

5.2.2 German Model

A similar program exist in Germany, funded through the KfW Bank, and delivered through the commercial banking sector. Through this program, up to €100,000 per unit for both new construction and retrofits is provided for projects that meet base performance criteria. Projects which surpass base requirements are eligible for a portion of the loan value to be converted to grant support, by as much as 30% of the project value for a peak performing project. In 2016 alone, the KfW supported over €18.4 billion in construction activity impacting over 180,000 homes through this program.

This report concludes the German model should be further explored as an effective means to deliver a Repair and Renewal Mortgage product.

5.2.3 Program Auditing and Retrofit Standards

Delivering retrofits as a condition of a below market mortgage will require clear expectations for retrofit performance while streamlining the application, approval and project review process. An efficient system will increase uptake.

Without full oversight, there is a risk of project funding being misused, and retrofit performance expectations not being met. In fact, there is an implicit motivation for retrofit cost cutting which may threaten project quality.

The paradox between ease of program engagement and ensuring quality execution has been tackled in Germany by creating national retrofit standards with a retrofit designer accreditation system on the front end and an auditing system at the back end.

Projects eligible for special funding through Germany's KfW work with accredited retrofit architects and engineers who follow clear performance guidelines, and submit design and energy performance reports as part of the finance approval process. The review of completed projects is undertaken on a random auditing basis, similar to the CRA, in which a small number of projects are audited in detail to confirm that projects were built as designed and that the performance expectations are met. This provides accountability, without the large scale investment required (by owners or government) to audit each project for individual compliance. Municipal building plans and onsite review is undertaken independent of finance review.

For more information related to KfW programs, see Tower Renewal and German Finance, as well as www.kfw.de.

German national retrofit standards address energy performance, health and safety, and are a well understood set of criteria. **Canadian Retrofit Standards should be developed, in-line with the values and objectives of the National Housing Strategy.**

5.2.4 Safeguarding Affordability

Ensuring affordability is a primary driver for the development of alternative financing for housing retrofit and renewal.

Creating a unique affordability criteria for the retrofit mortgage product, which balances affordability goals with owner uptake should be carefully studied. Considerations should include whether criteria similar to rent regulations in Ontario, with limited increases to sitting tenants, and market prices at turnover sufficiently safeguard affordability goals, or if a percentage of units should be required to be maintained at the level of Median Market Rent in for a period of time.

Affordability program guidelines that balance public policy objectives and program uptake should continue to be carefully studied.

5.2.5 Program Uptake – Considerations of Owner Types

A Repair and Renewal Mortgage tool's aim is to have broad applicability. However, owner types and specific asset characteristics will impact the attractiveness of the tool. The following scenarios reflect the variability that needs to be taken into consideration during detailed program design:

Highly Leveraged Buildings

Highly leveraged buildings make up a sizable portion of the privately held rental stock. The presence of mortgage debt can be a result of several factors, chief among which are owners leveraging the value of existing assets to raise capital for investment within, or outside of, the building. The current low-interest environment has made asset refinancing attractive, freeing capital for high rate of return projects often independent of the housing asset in question. Mortgage debt is also used toward retrofits for asset repositioning, where a building is upgraded in order to increase rents value at unit turnover.

CMHC provides mortgage insurance for a large number of these projects, demonstrating that mortgage refinancing is an attractive finance option for a large segment of this housing stock. The use of mortgages as primary source of finance is often the practice of smaller owners without access to alternative debt.

The use of a Repair and Renewal Mortgage tool would be attractive to owners where the use of mortgage financing is an established practice. However, the terms of refinancing with an existing lender may add to a project's cost and will require careful consideration.

Owners with Ready Access to Debt Facility

Many mid to large scale owners have access to debt facilities independent of mortgage finance, leveraging a portfolio of assets to secure low-interest financing at below commercial mortgage rates.

A Repair and Renewal Mortgage tool would need to be competitive with this class of finance to be considered by owners engaged in this practice. Access to capital grants through use of the mortgage tool could encourage uptake.

Owners Adverse to Use of Debt Tools

Publicly traded Real Estate Investment Trusts (REITs) and private investment firms often place limits on debt levels on asset pools and limit the use of mortgage or debt finance. Other classes of owners avoid all debt for capital projects, instead relying on direct equity from corporate reserves of parent investment companies.

Use of Retrofit Mortgage tool for this class of owner presents challenges for uptake. Portfolio scale access to finance and grants as discussed in Section 5 may be preferable tool for this class of owner.

Asset Repositioning

Housing assets with large repair backlogs, high operating expenses, and vacancies are well suited for investment and repositioning. Investment toward reduced vacancies, decreased operating costs and increased rents can create a viable and attractive asset. This is often undertaken by a new owner, acquiring a struggling building from an owner who lacks financing capacity to undertake repairs. Buildings in this position often house the most vulnerable populations and repositioning can begin a process of up-filtering of rents as vacancies are filled and rents are increased at turnover. While these buildings are perhaps the best suited to comprehensive retrofit, they are also vulnerable to pressures on affordability. Conversely, housing in this condition in markets not attractive to investment often remains in a challenged state. While providing affordable rental housing, the condition of this housing can be substandard.

A Repair and Renewal Mortgage tool would be an effective tool in providing capacity and incentive for the upgrading of buildings in this position, by new or existing owners, while ensuring retrofits and operations meet public policy goals. As one option, the tool may help to enable non-profit providers to acquire properties from private owners, ensuring long term affordability.

06. CHALLENGES, RECOMMENDATIONS AND NEXT STEPS

Retrofitting aging housing stock for health and safety, energy performance, and the maintenance of housing affordability is critical in addressing the core housing needs of Canadians, and meeting CMCH's announced goal to ensuring that everyone in Canada will have access to affordable housing that meets their needs by 2030. The NHS's aim to support the repair and renewal of 240,000 of existing rental units is a critical to achieving this objective.

As discussed throughout this study, building ownership type has a substantial impact on the motivations for using available debt capacity and capital for retrofits. Buildings with the ability to finance repair and renewal may choose not to do so, while those with a mandate for renewal may lack financial capacity. Specifically two paradoxes present themselves:

1. Non-profit owners have a motivation and mandate to use their financial capacity toward repair and renewal; however, they may be limited in their financial capacity to do so;

2. For-profit owners evaluate projects based not only on financial capacity but also financial performance. While they may have the ability to raise capital through debt or equity, their motivation for doing so may be limited to investments which meet ROI criteria and not public policy objectives. As a result, retrofit activity may be limited in scope and tied to increased rent profiles and work with short paybacks periods.

Overcoming these paradoxes and achieving public policy goals for housing will require supportive frameworks for retrofits for both the non-profit and private sectors. As outlined in the analysis above, CMHC has several key opportunities to accelerate these goals through the refinement of existing tools, the creation of new tools such as an Energy Backed Loan or a Repair and Renewal Mortage, and complementary tools related to standards, approvals and supporting tax treatments.

Image courtesy of Jesse Colin Jackson

6.1 KEY CHALLENGES AND CONSIDERATIONS:

Engaging in repair and renewal projects creates risks and challenges for owners. Program design of the Repair and Renewal Mortgage tool and supporting programs and incentives must take the following into consideration:

Complexity of Retrofit

Engaging in a deep retrofit project in an existing building with residents in place is a complex undertaking. Site discoveries, schedule delays and underperforming construction teams can add significant costs to projects. Increased competencies in design and construction, a straightforward approvals process and flexible financing that are able to address changes in scope will be required to de-risk projects and increase uptake. In addition to the provision of financing, there is an important opportunity to invest in the retrofit ecosystem to build capacity, expand the industry, and normalize retrofit activity among a broad range of owners.

Tax Treatment

Following retrofit, building valuation will increase, leading to property tax increases. Increased taxation will negatively impact project ROI, be passed onto tenants, or both, presenting a disincentive to engage in retrofit work. Tax treatments at all levels of government should be reviewed to best incent retrofit activity.

Housing Up-Filtering at Turn-Over

Improved building condition will place market pressure on units that become available post retrofit. While an incentive for owners, this will impact overall housing system affordability. As discussed above, potential affordability program requirements and other tools can help mitigate loss of affordability. However, balancing these objectives with parameters that will promote investment will be a challenge.

Attracting All Owner Classes: A Mix of Positive and Negative Incentives

As noted above, uptake, even with Repair and Renewal incentives, may be challenging for groups of owners uninterested in low-interest finance or unwilling to forfeit rent increases as a condition of program participation. Positive incentives alone may not be a sufficient driver for uptake. Meeting Repair and Renewal goals may require regulatory tools in addition to incentives, though impact on affordability should be carefully examined.

6.2 RECOMMENDATIONS AND NEXT STEPS

As explored in Section 4 of this report, the capital costs for engaging in retrofit work is high and the financing capacity of building and building owners varies dramatically by location, characteristics and by owner type. Moreover, the motivation for owners using financial capacity toward Repair and Renewal is often evaluated by financial performance. This presents several challenges for engaging in this work.

To bridge these gaps, a suite of tools has been explored, some existing and some proposed. These tools have two purposes: to expand existing financial capacity; and to limit the need for use of existing financial capacity to undergo Repair and Renewal work.

Stretching Debt Capacity

The first category of tool consists of low-interest longer-term financing to stretch available debt capacity. Where debt is used to finance Repair and Renewal, this tool ensures it is as an effective use of debt as possible.

Reducing Need to For Debt Service

The second category of tools provide capital for Repair and Renewal projects without directly relying on the debt capacity of buildings or the use of building cash flow for debt service, which is a significant obstacle for many owners. These tools include:

1. **Direct Equity Contributions (Grants)**

   Direct equity contributions are Federal grants in support of Repair and Renewal work;

2. **Energy Backed Loans**

   Revenue neutral tools relying on energy savings to finance Repair and Renewal capital;

3. **Repair and Renewal Mortgage**

   Refinancing existing debt under favourable terms, allowing for the leverage new capital from the building toward repair and renewal work without impacting debt service levels.

While grants are often considered the only means of reducing project financial exposure, here Energy Backed Loans and the Repair and Renewal Mortgage tool are used to bring capital to projects and close financial gaps without solely relying on direct government equity support.

The following is a summary of the impact of this cumulative set of tools in reducing project gaps:

Table 21: Closing the Gap: Impact of Proposed Repair and Renewal Tools

Closing the Gap: Impact of Proposed Repair and Renewal Tools

Retrofit Level	Capital Requirements for Retrofit Levels	Use of 15% Equity Contribution (Remaining Gap)	Use of All Proposed Tools: 15% Equity Contribution, Energy Based Loan, and Use of Repair and Renewal Mortgage (Remaining Gap)
Level A	$8,706,357	$7,400,403	$1,027,890
Level B	$5,894,552	$5,010,369	None
Level C	$2,845,673	$2,418,822	None
Level D	$2,706,325	$2,300,376	None
Level 1	$3,688,094	$3,134,880	None
Level 2	$12,046,343	$10,239,392	$1,556,878
Level 3	$20,152,569	$17,129,684	$6,477,171
Level 4	$32,206,256	$27,375,318	$14,922,805

Taken together, these tools can significantly reduce the capital outlay required to engage in Repair and Renewal works, in some cases eliminating them altogether, making projects significantly more viable for both not-for-profit and for-profit owners.

Key findings and recommendations are summarized below:

Financial Capacity and Performance

- **The financial capacity of buildings vary significantly.**
  The variability of rent zone, vacancy rate and maintenance costs between otherwise identical buildings results in a wide divergence in financial capacity. Some buildings have the financial capacity to engage in retrofit, while others do not.

- **Pre-existing debt significantly impacts ability to raise new capital for retrofit.**
  Buildings that carry pre-existing debt are limited in their capacity to raise new capital for retrofit on an individual building basis. For most buildings, carrying pre-existing debt of 30% of their building value limits their capacity to leverage new debt toward Repair and Renewal by more than 50%.

- **The capital costs of deep retrofit is beyond the financial capacity of many owners. As a result, most buildings throughout Canada will not engage in retrofit without support.**
  The financial modelling demonstrated that a significant financial gap exists in most retrofit scenarios. Without additional support to overcome this gap, retrofit activity may be limited. Additionally, the full use of building finance capacity will be limited by for-profit owner motivations seeking the best Return on Investment (ROI) for their investments.

- **Non-profit owners have a motivation and mandate to use their financial capacity toward repair and renewal, however they may be limited in their financial capacity to do so.**
  Without the need to create and grow profit, non-profit owners have a unique ability to use a significant amount of free capital funds for repair and renewal.

- **For-profit owners evaluate projects based not only on financial capacity but also financial performance. Retrofits typically do not generate returns commensurate with capital needs and project risks, particularly when not relying on rent increases.**
  While some for-profit owners may have the ability to raise capital through debt or equity, their motivation for doing so may be limited to investments which meet ROI criteria and not public policy objectives. As a result, retrofit activity may be limited in scope and tied to increased rent profiles and work with short payback periods.

Repair and Renewal

- **Engaging in comprehensive Repair and Renewal work is capital intensive.**
  Base state of repair and required enabling works can have a significant impact on the cost and scope of repair and renewal. The degree to which these enabling, abatement and repair works are required is largely dependent on the base state of the building and the nature of the retrofit work undertaken. Buildings with substantive repair backlogs will likely require greater upfront investment for retrofits.

- **Distressed assets often have the least financial capacity to engage in Repair and Renewal.**
  Distressed assets require substantial investment to remain viable. In many cases, lack of financial capacity has contributed to the condition of distress, while deferred maintenance as a result of poor financial health compounds.

- **Engaging in accessibility upgrades is highly capital intensive in existing buildings.**
  Engaging in broad barrier free renovations is highly capital intensive, with little ROI. As a result, engaging in the full scope of accessibility work will limit the ability to engage in other critical repair and renewal activity.

- **State of Repair work can be augmented with Renewal scopes for safe, healthy and low-impact housing.**
  There is an opportunity to augment critical repair work with retrofitting to achieve low-impact and healthy housing. As a building would only undergo a major renovation once in a maintenance cycle, it is unlikely buildings would undergo additional retrofit measures once a State of Repair project has taken place.

Maintaining Affordability

- **Rent increases have traditionally been used to fund repair and renewal which places pressure on affordability.**
  Rent profiles have a significant impact on the capacity to engage in retrofits. However, using rents as the basis to finance repair and renewal would place unhealthy pressure on many Canadian households living in these buildings who are currently financially stressed by the existing rent burden. Increases in rents in these buildings would negatively impact lower income households dependent on current rent levels. Encouraging the use of rent increases to support retrofit activity should be avoided.

Engaging in NHS Criteria Retrofits

- **National Housing Strategy Level retrofits require significant construction capital funds beyond the capacity of most building types without equity support.**
  Achieving an NHS level of retrofit will be costly. The suppressed financial capacity of buildings resulting from meeting program eligibility criteria will limit uptake. While maintaining affordability is paramount, increasing affordability, particularly in low rent zone areas may prove difficult.

- **In most cases, substantial equity contributions are required to fully fund retrofits.**
  In most scenarios tested, a financial gap, often substantial, exists in achieving renewal goals (including NHS public policy goals). These financial gaps could be closed through direct owner contribution, and complementary Provincial and Municipal support, however these will vary case by case. Federal equity support can provide the backbone and incentive for retrofit work across Canada.

Potential Solutions:

Table 22: Retrofit Cost Summary for a 238-Unit Apartment Building

Retrofit Level	Retrofit Costs	Owner Debt Capacity (Assuming low vacancies, low maintenance and debt level as 30% of Cap Value)	Financial Gap (Excluding all retrofit financing tools)
Level A (Base State of Repair)	$8,706,356.92	$8,480,500	$225,857
Level B (Accesibility)	$5,894,551.52	$8,480,500	none
Level C (Life Safety)	$2,845,673.42	$8,480,500	none
Level D (Resident Resilience)	$2,706,324.73	$8,480,500	none
Level 1 (Light Energy Retrofit)	$3,688,094.20	$8,480,500	none
Level 2 (Medium Energy Retrofit)	$12,046,343.00	$8,480,500	$3,565,843
Level 3 (Deep Energy Retrofit)	$20,152,569.13	$8,480,500	$11,672,069
Level 4 (Best in Class Retrofit)	$32,206,256.20	$8,480,500	$23,725,756
NHS Retrofit (Level B + Modified Level 2, owner debt capacity takes into account 30% units @ 80MMR)	14,314,786	$7,002,200	$7,312,586

Closing the Gap: Tools to engage in Repair and Renewal:

Capital costs for engaging in retrofit work is high and the finance capacity of building and building owners varies dramatically by location, characteristics and by owner type. Moreover, the motivation for owners to put their financial capacity toward Repair and Renewal is often evaluated by financial performance. This presents several challenges for engaging in this work.

To bridge these gaps, a suite of tools has been explored, some existing and some proposed. These tools have two purposes: to expand existing financial capacity; and to limit the need for use of existing financial capacity to undergo Repair and Renewal work.

1. Stretch Existing Debt Capacity:

A. Expand Access to Repair and Renewal Low-Interest Finance:
Provide widely accessible low-interest longer-term financing to stretch available debt capacity to those engaging in Repair and Renewal. Where debt is used to finance Repair and Renewal, this tool can ensure it is as an effective use of debt as possible.

2. Reduce the Need for Debt Service:
Provide capital to Repair and Renewal projects without directly relying on building debt capacity or use of building cash flow for debt service, which is a significant obstacle for many owners. These tools include:

A. Expand Direct Equity Contributions Programs (Grants)
Strategically designed, grants can push investment and best practice when tied to performance requirements. Existing CMHC programs limit equity contribution to 15% of projects for private projects. Expanding this threshold, while calibrating grants to performance, and ensuring ease of access could motivate owner participation in retrofitting.

B. Develop an Energy-Backed Loan Product
An energy-backed loan, which uses capital funds financed by long term energy savings, is an important tool to provide additional capital funds toward retrofit. While insufficient in isolation to finance deep retrofit, it can complement other sources of finance for additional stacked funding. This tool has broad appeal among owner groups, viewed as no cost debt and revenue neutral. These loans are tied to the energy performance of retrofits rather than the financial capacity of an individual building or owner.

C. Develop a Repair and Renewal Mortgage Refinance Tool
A Renewal Mortgage Refinance tool as a mechanism for a broad range of private and non-profit owners to engage in repair and renewal. Through a reduced interest and prolonged amortization rates (2.5% over 35 years for example) a Renewal Mortgage tool will provide an operating incentive and vehicle to convey money towards renewal.

It is recommended that a Repair and Renewal Mortgage tool be made available for owners engaging in retrofit projects in line with public policy goals, and that these projects would remain eligible for existing project assistance, such as the NHCF.

It is also recommended that this proposal be further studied by CMHC to determine terms of delivery in terms of ease of use, broad uptake, and efficacy in meeting public policy goals.

D. Ensure Repair and Renewal Tools have Broad Eligibility
To support broad uptake of Repair and Renewal work, ensure tools are broadly available to all owner types, and have clear terms and applications processes owners can build into their asset management planning processes.

ADDITIONAL RECOMMENDATIONS AND AREAS OF FURTHER STUDY

1. Develop a Portfolio Approach to Repair and Renewal

Access to federal Repair and Renewal tools at a portfolio scale could allow for expanded capacity and the capacity for longer term planning. Expectations related to public policy goals of Federal support could be addressed on a portfolio basis, rather than building by building, making eligibility more accessible. Whereas the lead times and planning to access federal funds is, at times, prohibitive on a single buildings basis, support of a portfolio of buildings could attract more sophisticated owner groups and expand uptake toward meeting Federal goals.

2. Grow the Retrofit Industry with Demonstration Projects and Industry Support

Success in engaging in renewal will be dependent on a capable retrofit industry ecosystem. The public sector is best positioned to lead this industry transformation through complementary initiatives, including:

a. Support of Best-in-Class Demonstration Projects;
b. Support of Industry adaptation through identification of products and training gaps for design, construction and building operations professionals and addressing them through industry support.

3. Empower Non-Profits to Acquire and Renew Private Housing Assets

With a mandate to maintain affordability and improve housing assets, non-profits are well suited to be stewards of public policy objectives around affordability, climate change and accessibility. Non-profits could be supported in acquiring existing rental housing assets and conducting deep retrofits.

Study Tax Treatment to Support Renewal

A parallel study funded by the the City of Toronto found that refinements to tax treatments at all levels of government can support renewal activity in concert with CMHC programs. The following is recommended:

A. CRA depreciation rates should be calibrated to support renewal projects. For example, depreciation rates for capital work that meets public policy goals (affordability, accessibility, emissions) should be given similar depreciation rates to renewables, providing a tax incentives for this these investments; Federally, harmonizing resilience retrofits' capital cost allowance (CCA) rates with other low carbon investments, such as electrical vehicle charging stations (EVCS), would significantly improve incentives for deep retrofits. The CCA for resilience retrofits in multi-residential towers is 4-5%, while the CCA for EVCS is 30-50%.

B. Property assessment rates post-retrofit should not unduly escalate property taxes. As an alternative, any increased project value created by meeting public policy should be tax increase exempt;

C. Municipal tax rates for post-retrofit buildings should be eligible for residential tax rates, rather than multi-residential tax rates which in some municipalities is as much as three times higher. (See 2019 City of Toronto study for further details)

Provide Guidance for Renewal Standards

The approach to altering existing buildings varies significantly across provincial and territorial Building Codes, resulting in a variety of interpretations with potential impacts on health, safety and resilience. Encourage retrofit projects to consult with guidance documents, model national codes (when complete) and demonstration case studies to ensure that learnings are shared and best practices are incorporated, tying GHG reduction with comfort, health and resilience, and construction with minimum disruption.

Study use of in-force performance standards related to health, safety and environmental impact

Positive incentives alone may not be a sufficient driver for uptake. Meeting repair and renewal goals may require regulatory tools in addition to incentives, though impact on affordability should be carefully examined.

APPENDICES

A: Retrofit Levels Costing
B: University of Toronto's Neighbourhood Change Research Partnership Affordability Data
C: Owner Consultation
D: Historical Federal Programs
E: National Housing Strategy Repair and Renewal Steam Analysis and Recommendations

Image courtesy of Jesse Colin Jackson

TOWER RENEWAL PARTNERSHIP

APPENDIX A
RETROFIT LEVELS COSTING

See Levels of Retrofit Primer.

Retrofit Level	Level A: End of life Systems	Level B: Accessibility Upgrades	Level C: Lifesafety Upgrades	Level D: Comfort and Community Resilience	Level 01 Light Energy Retrofit	Level 02 Medium Energy Retrofit	Level 03 Deep Energy Retrofit	Level 04 Complete Retrofit (ALL)
TOTAL (Base Hard Cost)	**$7,303,238.00**	**$4,799,850.00**	**$2,085,393.00**	**$1,961,329.00**	**$2,943,722**	**$10,040,472**	**$17,493,954**	**$28,225,513**
Supervision and Labour	$584,259	$383,988	$166,831	$156,906	$294,372	$1,069,871	$1,399,516	$2,258,041
Permits and Bonding	$484,000	$484,000	$484,000	$484,000	$200,000	$331,000	$484,000	$484,000
GC Fees	$334,860	$226,714	$109,449	$104,089	$250,000	$605,000	$775,099	$1,238,702
TOTAL - No Contingency	**$8,706,357**	**$5,894,552**	**$2,845,673**	**$2,706,325**	**$3,688,094**	**$12,046,343**	**$20,152,569**	**$32,206,256**
COST PER UNIT	$36,581	$24,767	$11,957	$11,371	$15,496	$50,615	$84,675	$135,320
Design Contingency	$1,305,954	$884,183	$426,851	$405,949	$553,214	$1,905,700	$3,022,885	$4,830,938
Construction Contingency	$1,004,889	$680,350	$328,448	$312,364	$425,680	$1,461,000	$2,326,013	$3,717,252
TOTAL	$11,053,781	$7,483,851	$3,612,929	$3,436,009	$4,682,485	$15,463,658	$25,586,142	$40,889,767
COST PER UNIT	$46,444	$31,445	$15,180	$14,437	$19,674	$64,973	$107,505	$171,806

Costing produced by A.W. Hooker Quantities Surveyors with retrofit scope provided by ERA Architects for the Tower Renewal Partnership

APPENDIX B

NEIGHBOURHOODS WITH PRE-1985 RENTAL HIGH RISE APARTMENTS CITY OF TORONTO, 2016

Totals for 741 Dissemination Areas with at least one pre-1985 highrise building	DA Total	DA Percent	Percent of City
Population (any dwelling type/tenure)	886,455		33%
Households (any dwelling type/tenure)	391,570	100%	35%
Highrise Apartments (any tenure)	311,435	80%	63%
Lowrise Apartments/Houses (any tenure)	80,135	20%	13%
Rental Housing (any structural type)	281,060	72%	53%
Homeownership (any structural type)	110,415	28%	19%
Average Monthly Rent (any structural type)	$1,157		93%
Average Monthly Household Income (any dwelling type/tenure)	$74,305		72%
Renters Spending 30% or More of Income on Rent (any structural type)	134,060	48%	55%

Table created by: The University of Toronto's Neighbourhood Change Research Partnership

February 2019
Rental apartment building, five or more storeys in height built before 1985
Non-condominium
Total of 1,716 tower building in the City of Toronto
Source: Statistics Canada, Dissemination Area Profile Series, 2016
Tower Renewal Partnership, ERA Architects

APPENDIX C
OWNER CONSULTATION

In December 2018, the Canadian Housing Policy Roundtable convened building owners from across Canada to review the study's findings and recommend options to aid in motivating uptake in Repair and Renewal.

The following is representative commentary for this discussion:

Maintaining affordability is a concern and a challenge for for-profit owners who are considering participating in federal programs.

- "The private sector is providing accidental affordability"
- "The issue is that they want to come back to the same rent. It's not that you can't do the rent, but it's the economic disconnect between doing [major] work and not being able to reset the rent to the market rent. You're already under market, so you're not going to spend all this money to be further under market."
- "If the landlord has to make the same amount of money with the reduced rent, the other tenants are going to end up paying more, which is just going to increase the average rent in that area. It's great that we're making it affordable, but the housing stock is the issue. But by doing this, it is driving up the rents on "affordable" housing stock."

Reducing emissions across Canada will be different based on existing power generation sources.

- "There are also regional differences and opportunities. For example, we're doing upgrades in Alberta and it's not difficult to get large upgrades because the emission intensity of electricity is so high, we could do things like an LED upgrade. But in BC, I can do all the electricity upgrades I want, and get not GHG credit for anything. So the only thing I can really do is the heating and hot water and ventilation system."

Program participation can be increased through close partnerships and using a portfolio-based approach.

- Portfolio-based approach:
  - "It would make it more worth our time and would streamline the process. It makes it more interesting from a small landlord perspective. I like that idea."
  - "The one potential challenge is how to determine what counts as part of the portfolio. Many of the companies we work with may have 30-40 buildings, but each building is owned by a separate company. Some of the other programs have had this challenge where they won't recognize them as part of the same portfolio. I would hate to see there be so many hoops to jump through just to prove what is part of your portfolio."

APPENDIX D
HISTORICAL FEDERAL PROGRAMS[1]

While the NHS represents the first official ten-year strategy and reshapes the role of the Federal Government in the housing market, it is not the first time the federal government has intervened in the housing market on a large scale. Through its own programs and CMHC, the federal government has played a role in supporting private apartment housing since 1946. These interventions have occurred in the homeownership market, the market rental housing sector and the non-market rental housing sector through tax breaks, subsidies and grants.

Between 1946 and 1980, the Canadian Federal government used a series of programs to incent the construction of apartment towers across the country. Four major rental housing supply subsidy programs included:

The Limited Dividend Program (LD) 1945 - 1975

Until 1975, the LD program acted as the primary means for the Federal Government to stimulate the construction of modest private rental housing for moderate- and low-income households. Although the program ended in 1975, there were many projects still subject to the operating agreements that were part of the program up until 1988. **The LD Program created a total of 65,242 units between 1969 and 1975.**

The program offered low interest loans up to 95% of the construction cost, which would amortize over the course of 50 years. Provided by CMHC, the loans were generally two percent below the rates of conventional lenders. In return for favorable financing, private developers had to adhere to a number of requirements including:

- Reduce the return on investment to a maximum of 5% (approximately)
- Obtain approval from CMHC to increase rents (once a year)
- Ensure units are occupied by tenants who do not have an annual pre-tax income in excess of 4 times the annual rent.

1 (Based on CMHC's The Assessment Report Evaluation of Federal Rental Housing Programs, 1988 and John Chant's The Assessment of Rental Housing Policies: Supply Policies, 1984)

The Assisted Rental Program (ARP) 1975-1978

The objective of the Assisted Rental Program was to provide assistance to entrepreneurs and approved lenders to build and finance moderately priced rental housing. A second objective was to increase the level of employment in Canada. **A total of 122,753 units were constructed as part of ARP**

A total of three different versions of the ARP were introduced between 1975 and 1978. While each version was different, each iteration required landlords to enter into an operating agreement with CMHC and required the following:

- Provide annual audited financial statements;
- Limit the return on equity to an amount stipulated in the Operating Agreement; and
- Limit rents and rental increases to an amount stipulated in the Operating Agreement.

Under the ARP in 1975, landlords were able to receive non-taxable grants up to $75 dollars per unit per month. Over the course of 5 to 15 years, the subsidy was gradually reduced to $0 per unit per month. In return for the subsidy, Owners could increase the rent only by the level of the reduction in the grant. After 15 years, the operating agreement would end and the landlord could rent units at market rent or above.

In 1976 the ARP was updated. The $75 grant was changed to a repayable assistance loan. The amount of the loan was increased to $100 - $180 per unit per month. Similar to the 1975 program, the assistance loan would gradually decrease. Owners could increase the rent only by the level of the reduction in the loan payments. The size of the initial assistance loan was determined based on the size of the development, the interest rate, operating costs and the average market rent in the area. The loan would become repayable 13 months after the end of a 10-year operating agreement

To qualify, developments had to have a minimum of 8 units and an insured mortgage for up to 90% of the value of the project. There were no income limits for tenants. Rents were set in the first year of the agreement. If the market rent would increase faster than the reduction of the loan, this reduction would be accelerated to match the increase in the average market rent in the area. The first year's rent would be established in cooperation with CMHC.

In 1978 the ARP was amended again. The monthly non-interest loan subsidies were removed and instead, a second mortgage interest bearing assistance loan was introduced.

The amount of the loan was the lesser of:

- The actual amount needed to make market rent equate with economic rent (ie. to provide a 5 percent return on equity); or
- $2.25 per month for every $1000 of the first mortgage amount.

Assistance in the second and subsequent years was reduced by five percent of the previous year's payment for principal and interest on the first mortgage debt minus the previous year's PRL (Payment Reduction Loan) assistance.

The operating agreement would run for a maximum of 10 years and the primary mortgage could be a maximum of 90% of the project cost with an amortization rate of 25 – 35 years. The second mortgage had to be insured and rents were established in collaboration with CMHC in the first year. Rents were allowed to be set to market conditions thereafter.

The Multi Unit Residential Building Program (MURB) 1975, 1976 and 1981

Unlike the LD and ARP Programs, the MURB Program was introduced solely to encourage investment in rental housing construction – regardless of the affordability. A second objective was to increase employment. **A total of 344,140 units were constructed under the MURB Program.**

The M.U.R.B program reinstated most of the tax breaks that were removed in the tax reform of 1972. Two new building classes were created that were considered exempt from the 1972 tax reform. Class 31 frame buildings (wood frame buildings), which were allowed to deduct up to 10% of annual CCA and class 32 buildings (concrete frame buildings), which were allowed to deduct up to 5% of annual CCA. When this CCA is applied as an expense, an operating loss can result for tax purposes even though a real loss may not exist.

The 1976 budget re-introduced Capital Cost Allowance. The Capital Cost Allowance enabled owners of rental residential properties to deduct the depreciation of their property from their income. This favoured small and institutional investors (such as pension funds) who relied on larger investment portfolios.

The 1976 budget also reintroduced soft cost deductions on residential investment properties from any income source of an investor. Deducting the soft-cost in the year they were incurred (instead of forcing them to be capitalized into the value of the project), allowed them to be gradually written down via the CCA, which represented another distinct tax advantage.

However, these tax breaks were not reinstated for all investments in rental real estate. A construction had to be at minimum two units in size, and at least 80% of the floor area had to be designated for residential purposes. This particular piece of regulation made this program very well suited for high-rise development.

The Canada Rental Supply Program (CRSP) 1982 - 1984

The objective of the CRSP was to encourage the construction of rental housing, particularly to offset some of the high mortgage rates at the time. The plan was designed to replace the MURB program and prevent further deterioration of vacancy levels. **A total of 24,122 units were constructed as part of this program.**

The CRSP was introduced in the 1981 Federal Budget and extended in the 1982 Budget. Under this program, interest-free second mortgage loans were made available to builders to help bridge the gap between the first mortgage loan and the equity the builder was willing to put into the project.

Assistance under the CRSP program took the form of an interest-free loan calculated as the difference between:

- 75 percent of project cost and GPM first mortgage financing (Graduated Payment Mortgage); or
- 80 percent of project cost and EPM first mortgage financing (Equal Payment Mortgage).

The maximum loan amount was set at $7500 per unit. The loans were in the form of second mortgages with a 15-year term, during which time no principal was payable and no interest was attracted. After 15 years, the owner could opt to either repay the original loan as a lump sum or amortize the repayment with interest. In addition to the above, there were certain other criteria to participate in the program including:

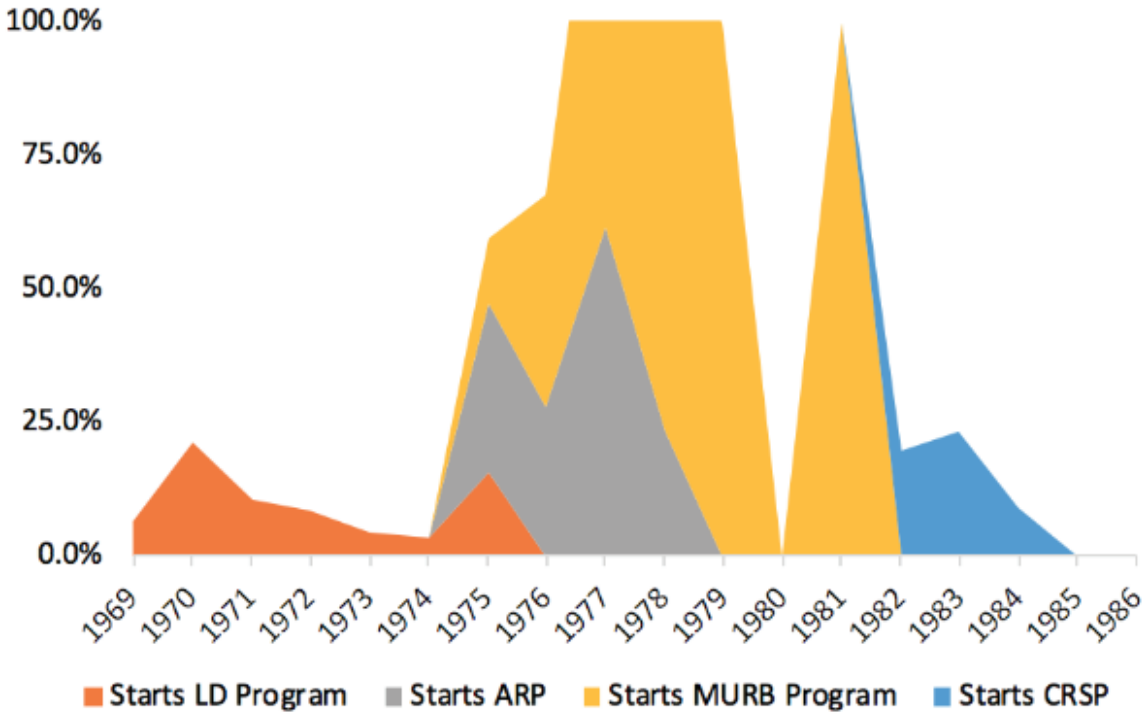
- Only new rental construction was eligible. There were no restrictions on the size or type of units built and there were no limits placed on rents.
- The proponent had to offer 33 percent of the units to the Provinces for rent supplement tenants.
- Projects had to be private rentals, not possess a MURB certificate and construction had to have progressed past the footings.
- Access for the disabled had to be provided and a minimum 5 percent of the units had to meet accessibility standards unless it could be demonstrated that the market could not

support this number.

- Financing had to be by way of an insured mortgage. If the first mortgage was insured privately, the rental project still had to comply with the technical requirements for obtaining NHA mortgage insurance.
- The first mortgage loan plus the CRSP loan could not exceed 85 percent of project cost.
- The proponent had to demonstrate financial capability and technical expertise to successfully

Figure 1: Contribution of Starts by Rental Housing Supply Programs as a Proportion of all Rental Starts between 1969 - 1986

Source: CMHC (1988). Assessment Report Evaluation of Federal Rental Housing Programs



APPENDIX E

CONSIDERATIONS FOR THE NATIONAL HOUSING STRATEGY CO-INVESTMENT FUND REPAIR AND RENEWAL STREAM: RETROFITTING TO IMPROVE QUALITY OF LIFE: AFFORDABILITY, ACCESSIBILITY, EMISSION REDUCTIONS AND MORE

The following is an assessment of the specific criteria of the National Housing Strategy (NHS) Repair and Renewal Stream as it relates to existing buildings engaging in retrofit projects. This assessment uncovered some of the challenges in meeting current requirements in existing buildings as compared to new-builds and suggests that the creation of alternative compliance paths may widen update by providing the means of achieving NHS goals in manner suited to the complexities of retrofitting.

The following areas are discussed below:

A. Accessibility for Existing Buildings
B. Affordability
C. GHG Emission Reductions
D. Projects versus portfolios
E. Renewal standards
F. Tying renewal to complete communities

Specific considerations are listed at the end of this document.

A. Accessibility for Existing Buildings

Meeting NHCF accessibility criteria poses a challenge for existing buildings due to construction disruption and the scale of required expenditure, with costs as high as $117,000 per unit. The full accessibility suite of modification outlined by the NHS was costed as $7,483,851 for the model building studies in this report (Case 1 and Case 2 buildings).

In new construction, the provision of accessible units can be incorporated in early planning. Additional costs are minimal, and can be identified within the project proforma and absorbed through the building's rent mix, with gap support provided through the public sector.

However, in existing buildings, renovations to meet accessibility requirements are more challenging. Retrofitting existing units to meet accessibility standards can be complicated by:

1. Complex construction required within occupied units, which would necessitate temporary displacement of tenants;
2. Modifications to structural walls, plumbing shafts, electrical wiring and millwork within units which can significantly increase the cost of meeting accessibility standards;
3. Common area accessibility upgrades can have impact on building operations in addition to significant costs, such as elevator cab modifications, circulation route modifications, and entryway upgrades.

Using the 238-unit building used as a case study throughout this report, reaching 20% accessibility would require conversion of 48 units. Together with requirements of elevator cab modification as well as upgrades to entry doors and common areas to enable full building accessible access, the capital costs to meet NHS accessibility goals in the case study building are as high as $7,483,851 (As outlined in Retrofit Level B of this report).

These cost estimates listed above are inclusive of project contingencies and contractor fees and overhead, assuming a design-bid-build delivery model. They do not account for the cost of temporarily rehousing tenants displaced by the renovation. A detailed breakdown of costing by Quantities Surveyor A.W. Hooker can be found in the Appendix A and B of this document.

As investments made to improve accessibility are highly capital intensive in existing buildings, significant support through grants may be required to encourage this activity. Further, alternative compliance paths to achieve essential goals of inclusivity should be explored as to not exclude owners from engaging in critical Repair and Renewal projects.

B. Affordability for Existing Buildings

Maintaining or improving affordability can also pose some unique challenges for existing buildings when considering existing tenants and rent profiles. In new construction located in higher market zones, the provision of affordable units can be achieved in part through operating cross-subsidies. The resulting buildings may have varied rent profiles, ranging from 80% Median Market Rent (MMR) to 150% or even 200% MMR. It is this income range that enables the viability of providing new affordable units.

Existing rental buildings often have much flatter rent profiles. While many do not meet 80% MMR rent levels, they often do not have rents significantly above 100% MMR.

Affordability through Cross-Subsidy:
In new construction, provision of 30% of units with rents at 80% of Median Market Rent (MMR) can be incorporated into early project planning. Lost revenue for these units can be identified within the project proforma, and absorbed through the building's rent mix in combination with public funding or financing, including federal, provincial and municipal contributions or incentives.

Existing buildings, unlike new construction, have in-place operating structures, making deviations to existing rent profiles challenging and disruptive. The following scenarios uses 30% of units at 80% MMR as a benchmark for affordability. In most scenarios for existing buildings, this will require a rent reduction for some sitting tenants. One option for an owner in this situation would be to recoup that revenue by increasing rents in other units. However, this creates an equity dilemma, and would result in Above Guideline Rent Increases in provinces like Ontario and British Columbia. Alternatively, if the owner reduces some rents without increasing others, this results in an operating income loss as the result of the renewal investment.

In some atypical cases, an existing building is vacant, which provides an opportunity for asset repositioning, renegotiation of operating agreements (where they exist), and the creation of new mixed-rent profiles. However, in occupied buildings, changes to rent profiles for sitting tenants presents several challenges including the determination of who is eligible for a rent reduction or subject to a rent increase.

Variability of Rent Levels within Urban Regions
As is well documented in CMHC's rental data, the absolute value of MMR rents varies significantly across the county and within urban areas.

The existing supply of purpose-built affordable rental, both public and private, is predominantly located in inner suburbs, where MMRs tend to be lower than city centres. For example, the following chart examines a variety of rents zones in the City of Toronto:

	Median Market Rent				80% Median Market Rent			
	Bachelor	1 Bedroom	2 Bedroom	3 Bedroom	Bachelor	1 Bedroom	2 Bedroom	3 Bedroom
Central Toronto	1,152.00	1,460.00	1,877.00		921.60	1,168.00	1,501.60	
East York	842.00	1,063.00	1,290.00	1,533.00	673.60	850.40	1,032.00	1226.4
Scarborough (East)	840.00	1,028.00	1,150.00	1,318.00	672.00	822.40	920.00	1054.4
North York (Central)	900.00	1,176.00	1,393.00	1,561.00	720.00	940.80	1,114.40	1248.8
Toronto Average	994.00	1,150.00	1,322.00	1,500.00	795.20	920.00	1,057.60	1200

Rents within core market areas, where market forces support the construction of new rental, can vary considerably from outlying areas. The following chart illustrates how 80% MMR in Central Toronto is higher than 100% MMR in Scarborough East.

	Bachelor	1 Bedroom	2 Bedroom
Central Toronto (100MMR)	1,152.00	1,460.00	1,877.00
Central Toronto (80MMR)	921.6	1168	1501.6
Scarborough East (100MMR)	840.00	1,028.00	1,150.00
Scarborough East (80MMR)	672	822.4	920

By comparing these two market zones, it can be observed that 80% MMR in Central Toronto would achieve 100% MMR in Scarborough East. Made up primarily of older private buildings with relatively flat rental profiles, Scarborough East rents at 100% MMR are providing important affordability in the context of the Toronto region today. Achieving 80% MMR in Scarborough East would likely be a challenge for building operators, particularly if they assume new debt to take on retrofit work. For example, lowering rents to meet 30% of units at 80% MMR would reduce operating revenues of a typical 100% MMR building in East Scarborough by $144,800 annually.

Two further examples are found below, comparing Central Toronto to East York and North York Centre:

	Bachelor	1 Bedroom	2 Bedroom
Central Toronto (100MMR)	1,152.00	1,460.00	1,877.00
Central Toronto (80MMR)	921.6	1168	1501.6
East York (100MMR)	842.00	1,063.00	1,290.00
East York (80MMR)	673.6	850.4	1032

	Bachelor	1 Bedroom	2 Bedroom
Central Toronto (100MMR)	1,152.00	1,460.00	1,877.00
Central Toronto (80MMR)	921.6	1168	1501.6
North York Central (100MMR)	900.00	1,176.00	1,393.00
North York Central (80MMR)	720	940.8	1114.4

In each of these scenarios, 100% MMR is at or below 80% MMR of Central Toronto. These areas reflect a condition where a rent zone is dominated by non-profit affordable units and lower rent market units, where 100 MMR would be considered affordable.

As shifting rents for sitting tenants is a challenge, and many existing rental buildings are located in lower rent zones within metropolitan regions, it is recommended that an alternative compliance path for affordability be considered for existing buildings, such as maintaining rather than shifting current rents levels.

C. GHG Emission Reductions for Existing Buildings

GHG emission reductions is a well positioned policy goal for existing buildings. As discussed in previous CUG+R studies, postwar apartment housing is particularly well-suited for retrofit to reduce energy use and GHG emissions. The suite of retrofit measures to achieve various degrees of energy and GHG reductions are well understood, and industry capacity to realize deep retrofits is growing. Energy savings measures often require parallel investments in base state of repair (such as structural repair) and complimentary building systems (such as ventilation). Taken together, a program of holistic renewal can have a substantial impact on quality of life and asset longevity in addition to significant improvements in energy efficiency.

Achieving 25% GHG Emission Reductions

A 25% GHG emission reduction is an achievable standard to use as a benchmark for this study's scenario testing. This target surpasses the 'low hanging fruit' retrofit that is industry standard, which targets like-for-like replacements of lighting, water and heating plants, and typically result in 5%-15% GHG emission reductions. However, a 25% GHG emission reduction goal does not approach the full systems and envelope upgrades which would be required for a 'deep' retrofit scenario of 50%+ GHG emission reductions.

Meeting the 25% reduction target could be achieved in many ways. In some cases, it would require some building envelope improvements, reductions to heat loads and downsizing of heating systems, improved efficiency of all building systems, and a suite of lighting and water conservation measures (where such measures have not already been undertaken). As more retrofits are undertaken, a program of monitoring and verification should be used to track the renewed buildings, creating a database of targets, outcomes, and the measures implemented to achieve these.

Enabling Works, State of Repair, and Codependent Retrofit Activities
Engaging in energy retrofit often requires related measures to ensure building components are adequately prepared to successfully implement energy-savings measures. Examples include exterior masonry or concrete remediation prior to window replacements; or exhaust riser refurbishment prior to new heating plant installation; or modernized ventilation system may be required prior to an envelope being retrofitted to become airtight.

Base state of repair and required enabling works can have a significant impact on the cost and scope of repair and renewal. The degree to which these enabling and repair works are required is largely dependent on the base state of the building and the nature of the retrofit work undertaken. Buildings with substantive repair backlogs will likely require greater upfront investment for retrofits, with contingencies required to offset potential site discoveries uncovered during the project. As a result, comprehensive retrofits aimed at energy and GHG reduction can require significant investment prior to realizing energy savings or GHG emission reductions.

Cost commensurate with this level of investment have been outlined in the full report and detailed in Appendix A.

As Repair and Renewal work often includes enabling and state of repair work, it is recommended that the NHS anticipate and fund these improvements through use of existing tools and others recommended in the full body of this report.

Absolute vs Relative Performance:
Use of relative performance measures is appropriate for existing buildings, as these support improvements to existing conditions, rather than meeting benchmarks more appropriate for new construction (ie: 25% reduction to current building baseline). However, in some situations, buildings may have recently undergone major energy retrofit works, and will look to NHS funding for complementary and important work not related to energy. Exclusion from the program due to the inability to achieve a further 25% reduction may prevent important and needed investment in the housing stock. As a result it is recommended that an alternative compliance path be considered benchmarked to absolute performance measures for higher performing buildings, such as with energy intensity levels (ie: 120 kWh/m2).

It is recommended that CMHC provide an alternative compliance path related to absolute energy performance to ensure that buildings who have recently undergone energy retrofit are not excluded from program participation due to inability to meet energy targets while taking on other important Repair and Renewal work.

Projects versus portfolios
Portfolio-level agreements with larger housing providers have the potential to unlock repair and renewal at scale. Rather than project-by-project applications, a portfolio approach provides an opportunity for owners to plan strategically for larger-scale upgrades, while re-allocating resources which would otherwise be spent on multiple applications toward upgrades.

Portfolio approaches could also allow for performance requirements to be met on average across a portfolio of existing buildings. Some buildings might be best suited to accessibility upgrades due to their configuration, while others might be good candidates for deep energy retrofits due to their state of repair. In these scenarios, owners are able to apply for several buildings together, without being required to apply for their entire portfolio.

Renewal Standards
The approach to altering existing buildings varies significantly across provincial and territorial Building Codes. In many cases, the guidance on retrofits is ambiguous. This can result in a variety of interpretations with potential impacts on health, safety and resilience. In other jurisdictions around the world, building codes have been quickly altered following the launch of large-scale retrofit programs, as guidance was found to be insufficient.

Codes Canada is in the process of developing national model codes for alterations to existing buildings. These, along with voluntary standards, should be promoted for retrofit and renewal projects. Case studies and demonstration projects can also help to disseminate best practice.

Tying renewal to complete communities
Infill development on apartment tower sites is increasingly prevalent in high market zones in city centres. These projects aim to capitalize on land assets, and rarely include improvements to existing buildings on the site. They also predominantly develop market housing with rents well above 100% MMR.

Infill projects provide an opportunity to incent improvements to existing housing on the same site. Municipalities can apply conditions to infill applications (in jurisdictions with Conditional Zoning) which are aligned to federal policy goals. Municipal partners can also encourage infill applicants to retrofit the existing housing using federal and provincial tools.

Additionally, this could provide a more efficient and less costly way of meeting the public policy goals such as accessibility, by permitting infill units to provide all or a portion of the required accessible units.

Specific Considerations for the National Housing Strategy Co-Investment Fund Repair and Renewal Stream are listed Below. These should be read in conjunction with the set of recommendations included in the full report.

1. **Update and Refine NHCF Repair and Renewal Stream to Kickstart Uptake**
   The NHCF Repair and Renewal stream provides a core tool and framework to support investment toward NHS goals. Currently, it is particularly well suited to non-profit operators. Refinement of program requirements and delivery could accelerate uptake toward broad NHS goals.

   The performance criteria can be refined to address the specifics of existing buildings. It is recommended:

   Accessibility:

   a. Adapting units to be barrier-free in existing occupied buildings can be costly, and may require temporarily moving tenants out of their units. For existing buildings where the configuration of units may render barrier-free conversions not feasible with tenants in place, an alternate performance path might be considered which combines 'modified' units with additional social inclusion improvements.
      i. Modified units would meet major barrier-free requirements, but may not be fully compliant with CSA barrier-free requirements for a new-build.
      ii. Supplemental social inclusion goals might be met through alternative means, including community and common space improvements; life safety and resilience improvements such as addition of sprinklers, upgrades to emergency backup systems or flood-control measures, and health measures such as the addition of central cooling to mitigate dangerous seasonal overheating, building ventilation upgrades for improved indoor air quality.

   Affordability:

   a. Achieving 30% of units at 80% MMR within existing buildings presents operational challenges for owners, both in terms of disruptions to cash flow, and altering rent profiles of sitting tenants. Moreover, as rent zones vary within regions and across the country, absolute rent levels of 80 MMR in one rent zone may be greater than 100MMR in another, raising issues of program fairness.
   b. For existing buildings, an alternative path to affordability might be to accept buildings within a set MMR range calibrated to rent zone, with program participation restricting use of above guideline rent increases for a fixed period. This would limit operational disruption of both operators and tenants. It may also result in greater overall affordability than 30% at 80%MMR with the remainder climbing above market.

GHG Emission Reduction:

a. Meeting 25% GHG emission reductions is feasible in most buildings and is in line with other provincial, territorial, and regional policy moves toward more energy-efficient buildings. However, for owners who have already completed energy-efficiency retrofits to their buildings, this relative target may act as an inadvertent penalty for their previous upgrades. For these owners, an alternate path might be considered:
    i. Allow for 'absolute' target, such as Energy Intensity to be met; or
    ii. Allow allow for recent upgrades (within past 5 years) to be counted toward relative baseline.

b. Provinces/Territories will have variation in the relative ease of reducing GHG emissions due to energy source variation (ie: clean electrical grids in BC and Ontario make it more difficult/costly to reduce GHG emissions in a building as compared to P/T that use coal to generate electricity)
    i. Allow for either 25% GHG emission reduction or energy intensity reduction as a baseline target

Portfolios versus Projects:

a. While the program currently targets individual projects, achieving the program's 240,000 goals will require retrofits en masse. To encourage large scale uptake consider making agreements with owners on a portfolio-basis which allow performance requirements to be met on average across the portfolio, with the following structures:
    i. Large providers could aggregate a subset of their buildings to create a portfolio application (ranging from 5-15 buildings per application);
    ii. Multiple small providers could work with a third-party aggregator to create a portfolio.

Application Procedures:

i. Conditional or Phased Approvals: Project planning, approvals from Authorities Having Jurisdiction, and other construction timelines are dependent upon verified budgets early on in the process. Owners pursuing NHCF funding could be provided with a conditional approval of a budget range or envelope at the end of the first review phase, via a letter of intent, to allow for project development to progress while the second phase of approvals is underway.
ii. Phase Two Seed Funding: The reports and documentation required during the NHCF phase two review can represent a substantial cost to an owner for studies that they might not otherwise require. For example, land value appraisals and ESAs would not typically be undertaken as part of a retrofit project. The cost of such reports might be covered by a seed fund portion of the NHCF. Alternatively, required documentation might be modified to suit the due diligence required for retrofit projects, which differs from new construction.

iii. Phase Two Flexibility: Selected documents required for phase two review are unlikely to be available in advance of funding confirmation. For example, at the time of budget determination, projects would typically be 6-18 months away from securing Building Permits.