

Understanding the Benefits of Investments in Affordable Housing

Literature Review Report
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**CANADIAN CENTRE FOR
ECONOMIC ANALYSIS**

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1.0 INTRODUCTION

According to the Canadian Mortgage and Housing Corporation (CMHC), housing is considered affordable if shelter costs account for less than 30% of before-tax household income (CMHC 2017). Although the definition of affordable housing is very broad and can include a wide range of housing sources (i.e., provided by the public, private, and not-for-profit sectors) and tenures (i.e., rental, ownership, and cooperative ownership), the term is usually synonymous with “social housing”, even though the latter is typically more of a narrow definition that refers to rental housing subsidized by the government (CMHC 2017).

That being said, affordable housing is a major issue in Canada. Almost one in five renters in Canada spend more than 50% of their gross income on shelter costs, with double that spending more than 30% (BCNPHA 2014). Given the fact that affordable housing is such an issue in Canada, it is no surprise that the federal government, through the CMHC, invests approximately \$2 billion annually under various programs and initiatives to help Canadians access the shelter they need (CMHC 2017).

Given the significant numbers of Canadians in core housing need¹, it may be easy to measure the success of investment in affordable housing as the number of units being built or households housed. However, research has consistently shown how the impact of investment in affordable housing extends well beyond these indicators to encompass a range of benefits. Understanding the impact of investment in affordable housing along these measures can provide an idea into the possible rewards that could be realized from investment in affordable housing (or the risk in not doing so).

Given these broad impacts, CANCEA has been tasked with identifying and conducting a review of literature regarding the economic impacts of investment in affordable housing, including identifying the set of indicators used to understand the impact and assess the strengths and weaknesses of the methodologies used. This report provides an overview of the literature review including highlighting the studies evaluated, the limitations and areas where research is lacking, and an outline of the rating criteria used to evaluate the sources.

¹ Core housing need is defined as households who spend more than t they can afford on housing, live in homes in need of major repairs, or live in homes that are overcrowded.

2.0 TYPES OF EFFECTS

Throughout the literature review, almost all the studies reviewed have relied upon input/output modeling as opposed to other methods, such as multivariate regression frameworks or agent-based network analysis. This type of analysis is aimed at estimating the effect of investment on the economy by modeling the relationships between economic sectors at a point in time using a table of input/output multipliers. This decomposition allows the research to break down the economic impact of investment and estimate the three types of economic impacts:

- **Direct Effects:** The direct effects of investment are the impacts directly involved in the development process and/or revitalization of existing or new affordable housing. For example, with affordable housing, the direct effects would be the impacts seen for construction and professional and technical services tasked with developing the affordable housing.
- **Indirect Effects:** The indirect effects of investment in affordable housing are the economic impacts that arise through business to business interactions throughout the supply chain. When one sector of the economy receives a stimulus from the government, this enters the input/output model as a “shock.” An investment of \$1 million, for example, into a sector would enter as a demand stimulus, which would lead to a long chain of expenditures in different sectors of the economy. The sector that receives the stimulus will purchase intermediate inputs, and the producers of those inputs will need to buy the raw inputs from other industries further upstream in the supply chain. These impacts are captured under indirect effects. Only one study (Suttor and Bettencourt-McCarthy 2015) reviewed provided a glaringly different definition of indirect effects, but they simply used indirect effects to mean social and economic development outcomes.
- **Induced Effects:** Induced effects are the economic activity or jobs created through increased spending of those workers receiving incomes from projects (Heintz, Polin and Garrett-Peltier 2009). The literature generally focuses on the direct and indirect effects because induced effects are more difficult to estimate² and are inconsistent among studies. For example, some studies include government expenditure and revenue into induced impacts, while others, specifically as it relates to affordable housing, consider the impact of new households occupying housing and subsequently spending their change in income available, which would normally be considered a system effect, as outlined below (Kotval 2001, Arik 2010, NAHB 2015, Mathur and Parker 2007). Furthermore, it is typically assumed that spending patterns are locally focused and do not leak out into the broader regional economies (Zielenback, Voith and Mariano 2010, HR&A Advisors, Inc. 2012).

² One must estimate a consumption multiplier (the percentage of new income that is spent rather than saved) through the use of a household consumption function. The size of this multiplier is highly dependent on economic conditions, as an individual’s marginal propensity to consume is a function of expectations of future income and the health of the economy as a whole.

In addition to these three, it is important to mention “system impacts”, which are occasionally mentioned in an attempt to take the broader impact of stimulus into consideration. Albeit, most studies analyze system effects in a qualitative frame with very few studies attempting to provide quantitative evidence measurements to these qualitative ideas.

- **System Effects**: System effects are the broadest category of effects, are the hardest to measure and yet represent a bulk of the economic case for affordable housing. They focus on how the asset being developed (e.g., affordable housing) is used and how this use changes behavior and/or the states of residents and the community. For example, in terms of affordable housing:
 - A newly housed household may have additional disposable income equal to the difference in the amount they would normally be paying (market rent or price) with what they are currently paying (affordable rent or price). Their use of this disposable income on consumption and how it impacts the economy would be considered a system benefit.
 - Social and health outcomes such as neighbourhood wealth, crime, and health are other system benefits that can impact a city, province, or country through their systems impacts, which tend to have longitudinal social and economic implications. However, few studies actually expand beyond qualitative reporting. That is, investment in affordable housing improves housing quality and therefore health or the provision of housing allows for increased education attainment. Quantifying the fact that this increased health means reduced government expenditure in the form of healthcare utilization or how increased education attainment may mean advanced job placement and higher income are rarely provided.

Section 3.3 highlights the financial risks and rewards associated with system impacts and why they should become a staple in evaluating the impact of investment in affordable housing.

3.0 LITERATURE REVIEW

This literature review includes 24 studies across academic and grey resources investigating the economic impact of investment in affordable housing. The average publication date of the studies reviewed was 2011 (with a range of 2001-2017). The research was primarily “grey” research (i.e., non-academic studies) primarily focused on investment in affordable housing in the United States (U.S.). The most frequent methodology used in assessing the impacts of investment in affordable housing was input/output models, with only a few studies providing alternative means of measuring the impacts. The sections below provide an overview of the studies reviewed, their limitations, and the impact areas that should be considered when discussing the benefits of investment in affordable housing.

3.1 Overview³

Study	Investment Type	Effect	Metric	Study Description	Model	Notes
1. (Suttor and Bettencourt-McCarthy 2015)	Construction	<ul style="list-style-type: none"> • Direct, Indirect, and Induced • System Benefit of Asset 	<ul style="list-style-type: none"> • Employment • Social 	<ul style="list-style-type: none"> • For every one residential unit developed, between 2-2.5 new Ontario jobs are created. • For every \$1 million invested, 10-12 new Ontario jobs are created. • Those who graduate high school or receive a postsecondary degree earn \$5,000 more than those who do not. Hypothetically, this value would also increase throughout one’s career. 	Literature Review	<ul style="list-style-type: none"> • Canada • Although the study doesn’t provide quantitative evidence, it does provide an overview of what literature outlines as the economic and social impacts of investment into affordable housing. • Rating: 11/24

³ Note that when effects are listed individual, this means that the reported study provided the effect separately (e.g., “direct” would mean that only the direct effects were provided). When together, this means that the reported study provided the effects in a combined value (e.g., “indirect and induced” provided one value summarizing the combination of those two impacts).

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2. (Boarnet, et al. 2017)	Construction	<ul style="list-style-type: none"> • System Benefit of Asset 	<ul style="list-style-type: none"> • Transportation 	<ul style="list-style-type: none"> • Literature review that sought to evaluate the impact of affordable housing on transportation, measured in vehicle miles travelled (VMT). • Households living within half-mile of a Los Angeles rail transit station drive, on average, 16 miles less per day, take 0.19 more daily rail transit trips, and 0.4 more bus transit trips. 	Literature Review	<ul style="list-style-type: none"> • United States of America (USA) • No quantitative analysis. • Provides a good overview of the possible mode switch that could be realized through placing affordable housing in transit-oriented developments (TODs). • Rating: 12/24
3. (Econsult, Assessing the Economic Benefits of Public Housing 2007)	Construction, Revitalization, and Operation	<ul style="list-style-type: none"> • Direct • Indirect and Induced • Direct, Indirect, and Induced 	<ul style="list-style-type: none"> • Employment • Expenditure • Multipliers 	<ul style="list-style-type: none"> • This study estimated the quantitative economic impacts of investment in affordable housing across 8 cities in the USA • On average, every \$1 of public housing association (PHA) spending on capital and maintenance generates \$2.12 in total regional spending. Each \$1 of PHA spending on operation results \$1.93 in total regional spending. • The average PHA in the study generated \$75 million in local spending and supported 1,400 local jobs. 	RIMS II ⁴	<ul style="list-style-type: none"> • USA • The study provides local indirect and induced impacts across different forms of investment, including the regional multipliers used. • However, the study does not separate the indirect and induced outcomes and does not evaluate the economic impacts outside of the studied regions (i.e., state-wide or nation-wide impacts). • Rating: 11/24
4. (Frontier Economics Ltd. 2014)	Construction and Revitalization	<ul style="list-style-type: none"> • System Benefit of Asset 	<ul style="list-style-type: none"> • Government Spending 	<ul style="list-style-type: none"> • Provides a literature review of the various socio-economic impacts of affordable housing. • The government is estimated to save £26,000 per homeless person who is housed. • Furthermore, health, crime, and education are other system areas for which literature supports a role of affordable housing. 	Literature Review	<ul style="list-style-type: none"> • United Kingdom (UK) • Although the study provides a good overview of the literature supporting a role for affordable housing in government spending, health, and other social domains, no quantitative values were provided. • Rating: 8/24

⁴ Regional Input-Output Modeling System II (RIMS II)

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5. (Zon, Molson and Oschinski 2014)	Construction and Revitalization	<ul style="list-style-type: none"> • Direct • Indirect • Direct and Indirect • System Benefit of Asset 	<ul style="list-style-type: none"> • Employment • GDP Multiplier • Disposable Income • Health • Social 	<ul style="list-style-type: none"> • Each \$1 million of investment in affordable housing generates 5.66 direct Ontario jobs and 2.83 indirect Ontario jobs (8.49 in total). • Each \$1 invested generates \$1.52 in Ontario GDP. • Affordable housing could provide an additional \$9,532.50 per year in employment income (based on part-time wages). • Affordable housing could provide households with \$5,169.63 in additional disposable income. • Reduction in healthcare utilization based on the fact that 55% of vulnerably housed use the ER at least once and increased disposable income results in increased healthcare expenditure on medical related expenses. • Government could reduce social assistance spending. 	I/O Model ⁵	<ul style="list-style-type: none"> • Canada • This study is very comprehensive, in the sense that it provides a broad overview of the economic impact of affordable housing including health, social, and disposable income. • The study does not provide the induced impact of the impact of investment, nor does it delve into the local or federal level impacts. • Furthermore, the additional health and social impacts are very limited and don't take into consideration other system impacts of operating the asset (i.e., the housing) or other healthcare resources such as general practitioners or hospitals. • Rating: 15/24
6. (Nguyen 2005)	Construction and Revitalization	<ul style="list-style-type: none"> • System Benefit of Asset 	<ul style="list-style-type: none"> • Property Value 	<ul style="list-style-type: none"> • It is difficult to make a direct association between affordable housing and property values. • One study reviewed found that quality of the housing, as opposed to its use, that impacts property value. • Another study found no change in property value when social housing was constructed properly. • Furthermore, two studies found that rehabilitating properties and proper ongoing maintenance was associated 	Literature Review	<ul style="list-style-type: none"> • USA • Provides a comprehensive (17 articles) review of the literature surrounding affordable housing and property values. • Study was qualitative in nature and does not provide any novel quantitative analysis. • Rating: 14/24

⁵ Input/Output Model

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				with an increase in property value for surrounding properties.		
7. (Woods 2012)	Construction, Revitalization, and Vouchers	<ul style="list-style-type: none"> • Direct, • Direct, Indirect, and Induced • System Benefit of Asset 	<ul style="list-style-type: none"> • Employment Multiplier • Income Multiplier • Government Revenue 	<ul style="list-style-type: none"> • For every \$1 million invested 19.47 and 11.87 direct, indirect, and induced jobs are generated through investments in construction/revitalization and vouchers, respectively. • For every \$1 million invested 0.753 and 0.226 direct, indirect, and induced income are generated through investments in construction/revitalization and vouchers, respectively. • Government revenue through state and local taxes are estimated to be 9.17% of the total earnings generated (i.e., the amount of state and local taxes households pay). 	RIMS II	<ul style="list-style-type: none"> • USA • The study provides direct and indirect/induced breakdowns for the investment across two different investment policies, in addition to the multipliers. • However, it does not breakdown indirect and induced impacts, nor does it expand beyond Utah in assessing the impacts. • Rating: 12/24
8. (HR&A Advisors, Inc. 2012)	Construction and Operation	<ul style="list-style-type: none"> • Direct, Indirect, and Induced • Also provides the above effects individually 	<ul style="list-style-type: none"> • Economic Spending • Employment • Income 	<ul style="list-style-type: none"> • Construction: the local economic impact of a typical 100 unit project includes \$30 million in economic spending, 175 new jobs, and \$10 million in income. • Operation: the local economic impact of an operating a typical 100 unit project includes \$3.6 million in economic spending, 30 new jobs, and \$1.2 million in income. 	IMPLAN I/O Model	<ul style="list-style-type: none"> • USA • The study provides in-depth breakdown of the direct, indirect, and induced impacts at local and state levels for spending, employment, and income. • No system benefits of the housing asset are provided, however. • Rating: 12/24
9. (Zielenback, Voith and Mariano 2010)	Construction, Revitalization, and Operation	<ul style="list-style-type: none"> • Direct, Indirect, and Induced • System Benefit of Asset 	<ul style="list-style-type: none"> • Economic Output • Employment • Income • Government Revenue 	<ul style="list-style-type: none"> • Despite the expenses associated with HOPE VI, the redevelopments generate significant net social welfare benefits. In most cases, the collective tenant and neighborhood 	RIMS II	<ul style="list-style-type: none"> • USA • Provides a comprehensive net benefit analysis into the impact of HOPE VI developments, including economic indicators as well

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			<ul style="list-style-type: none"> • Social 	<p>benefits exceed the net public costs of redevelopment.</p> <ul style="list-style-type: none"> • In addition, the redevelopments spark additional regional economic activity and contribute to an increase in the local tax base. • Effects are not guaranteed and depend on the location of the redeveloped property, the characteristics of project funding, the strength of the local real estate market, and the presence of other development pressures. 		<p>as system impacts like crime, health, and rental impacts.</p> <ul style="list-style-type: none"> • However, the study is very locally focused and does not represent possible gains to the greater regions or country. • Moreover, no multipliers or differentiated indirect and induced impacts are provided. • Rating: 15/24
10. (Mathur and Parker 2007)	Subsidy	<ul style="list-style-type: none"> • Direct, Indirect, and Induced • System Benefit of Asset 	<ul style="list-style-type: none"> • Multipliers: economic activity, private capital, and employment • Government Revenue • Health • Social 	<ul style="list-style-type: none"> • For every \$1 of subsidy, \$2.50 in private investment will be attracted, generating \$5.31 in economic activity --- comparable to transportation investment (\$1 generates \$5.2). • For every \$1 million in annual housing subsidy, 47.5 jobs are created and \$0.515 million in local and state government tax revenue will be generated. 	IMPLAN I/O Model	<ul style="list-style-type: none"> • USA • This study provides the impact of housing investment (subsidy) at a local and state level. • However, no breakdowns by individual effect, nor the multipliers are provided. • Furthermore, the system benefits are purely qualitative. • Rating: 11/24
11. (AECOM 2011)	Construction and Revitalization	<ul style="list-style-type: none"> • Direct and Indirect • Induced • Direct, Indirect, and Induced 	<ul style="list-style-type: none"> • Employment • GDP Multiplier • Government Revenue 	<ul style="list-style-type: none"> • For every \$1 invested by the SHQ, \$2.3 of GDP were generated. • The \$608 million investment generated 7,300 direct and indirect person-years of work and 6,458 induced person-years of work. • Another \$257 million of tax revenue was generated for Quebec 	I/O Model	<ul style="list-style-type: none"> • Canada • Although the study provides a multiplier, the full report was unavailable, therefore the methodology and any breakdowns were unavailable. • Rating: 10/24
12. (Hank, et al. 2015)	Revitalization	<ul style="list-style-type: none"> • Direct, Indirect, and Induced • System Benefit of Asset 	<ul style="list-style-type: none"> • Employment Multiplier • Economic Output • Income 	<ul style="list-style-type: none"> • For every \$1 invested, 5.8 direct jobs, 1.02 indirect jobs, and 2.3 induced jobs are generated. • \$42 million investment generates a total of \$57.5 million in economic 	IMPLAN	<ul style="list-style-type: none"> • USA • Provides a breakdown of the type of economic metrics by effect and provides the impact across the top 10 industries.

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			<ul style="list-style-type: none"> • Government Revenue • Social 	<p>output, \$25.5 million in income, and \$1.7 million in local tax revenue.</p> <ul style="list-style-type: none"> • 81% of the jobs created would go to individuals who have no education attainment past high school. 		<ul style="list-style-type: none"> • However, it does not provide multipliers or any analysis beyond local impacts, such as state-wide or national level impacts. • Rating: 15/24
13. (Donjek, Inc. 2009)	Construction and Revitalization	<ul style="list-style-type: none"> • Direct, Indirect, and Induced 	<ul style="list-style-type: none"> • Employment • Expenditure • Government Revenue • Income 	<ul style="list-style-type: none"> • Across different types of investment (i.e. construction, revitalization), each \$1 million invested results in between \$1.62-2.28 million in economic expenditure, 14-20 jobs, and \$520,000-730,000 income. • Each \$1 million invested generates \$82,000-116,000 in state tax revenue. 	RIMS II	<ul style="list-style-type: none"> • USA • Provides a breakdown of the direct, indirect, and induced impacts across employment, expenditure, and income. Furthermore, industry breakdowns are also provided. • The study only focuses on the state level impacts and does not provide local or national impacts. Furthermore, the type of effects are not differentiated. • Rating: 14/24
14. (CANCEA 2015)	Construction and Revitalization	<ul style="list-style-type: none"> • Direct, Indirect, and Induced • System Benefit of Asset 	<ul style="list-style-type: none"> • Employment • Government Revenue • GDP • Health • Private Capital • Social 	<ul style="list-style-type: none"> • As a result of investment in TCHC (\$2.6 billion), the Canadian economy can expect: <ul style="list-style-type: none"> ○ The creation of an additional 220,000 employment years as new jobs, with 35% of the employment impact remaining after the capital repair and revitalization programs are complete; ○ The creation of an additional \$18 billion in GDP over the course of thirty years, with 68% of this effect occurring within the 10 years of the capital plan; ○ The provincial and federal governments will collectively 	Agent-Based Modeling	<ul style="list-style-type: none"> • Canada • CANCEA's Prosperity at Risk (PaR) agent based simulation platform expands on the traditional I/O models and considers the whole economy as a system, capturing the direct, indirect, induced, and system benefits at the same time. • This also allows the results to be broken to different levels (i.e., city, province, or federal). • The health and social impacts are captured

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				<p>benefit from an additional \$4.5 billion dollars in tax revenue, nearly three times their initial contribution of \$1.7 billion</p> <ul style="list-style-type: none"> o this additional economic activity will generate opportunities for financial profit for industry, this investment can be expected to attract roughly \$5 billion in private capital investment • In addition, there are estimated to be 544,000 less disease cases among TCHC residents, 2.1 million fewer healthcare cases, and \$3.8 billion in healthcare costs prevented. Social outcomes include 9% lower GHG emissions, reduced social assistance of up to \$6.8 billion, 15% decrease in neighborhood crime, and \$4.27 billion more neighborhood rental income. 		<p>through risk factor analysis and behavioral changes in the population due to the improved housing.</p> <ul style="list-style-type: none"> • Also provides a longitudinal evaluation of how the impacts accumulate over time • Ability to expand beyond traditional I/O models depends on data availability. • Rating: 20/24
15. (Miller and Ofrim 2016)	Construction and Revitalization	<ul style="list-style-type: none"> • System Benefit of Asset 	<ul style="list-style-type: none"> • Disposable Income • Government Revenue • Health • Social 	<ul style="list-style-type: none"> • This study provides an alternate framework for evaluating the social returns on investment in affordable housing using financial proxies for typical social benefits of housing. • For example, disposable income is calculated by the reduced energy costs of quality housing, government revenue is realized through taxation and permits, and health and social findings each have their own specific proxies. 	Social Return on Investment	<ul style="list-style-type: none"> • Canada • This method of evaluating the impact of affordable housing is very promising in that it attempts to capture the broad system impacts of affordable housing, such as health and social impacts, and relay them back to stakeholders. • This methodology is very data dependent and financial proxies may not be the best measures for the impacts. • Furthermore, no longitudinal evaluation is possible.

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						<ul style="list-style-type: none"> • Rating: 14/24
16. (NAHB 2015)	Construction and Revitalization	<ul style="list-style-type: none"> • Direct, Indirect, and Induced 	<ul style="list-style-type: none"> • Employment • Government Revenue • Income 	<ul style="list-style-type: none"> • Provides the number of jobs generated by the completion of 100 single family homes, 100 rental homes, or \$1 million in renovations. • Government tax revenue from income and permits are also provided. • Income generated is also provided. 	I/O Model	<ul style="list-style-type: none"> • USA • The model by the NAHB is touted as one of the most widely used models in the USA. • It provides breakdowns by industries where income and jobs are created as well as where government revenue are created. • However, it does not provide an easily discernible breakdown of the direct, indirect, and induced impacts, by usually combining different categories. • Furthermore, there are no quantitative results at different resolutions (i.e., state or national level). • Rating: 10/24
17. (Shelter Scotland 2015)	Construction	<ul style="list-style-type: none"> • Direct, Indirect, and Induced • System Benefit of Asset 	<ul style="list-style-type: none"> • Economic Output Multiplier • Employment Multiplier • Health • Social 	<ul style="list-style-type: none"> • For an affordable housing project making 12,000 homes per year, an estimated €2.6 billion economic output could be generated and 19,000 jobs created. • The financial cost of a case of homelessness to the government is estimated to range from £15,000-38,000. 	I/O Model	<ul style="list-style-type: none"> • Scotland, UK • The study provides multipliers for economic output and employment, as well as a qualitative section on system benefits such as health and social. • However, no methodology is provided on the quantitative outcomes. • Furthermore, the multipliers of the study are difficult to

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						determine how they relate to output and employment, as they are not traditional multipliers (as far as can be determined without a methodology section). • Rating: 9/24
18. (MaineHousing 2017)	Construction and Revitalization	<ul style="list-style-type: none"> • Direct • Indirect and Induced • Total⁶ 	<ul style="list-style-type: none"> • Employment • GDP • Income 	<ul style="list-style-type: none"> • A \$180 million investment by MaineHousing could result in 1,429 direct jobs, 1,015 indirect and induced jobs, \$150 million in total GDP, \$259 million in total output, and \$74 million in total wages. 	REMS I	<ul style="list-style-type: none"> • USA • This study provides an in-depth breakdown by state impact and local impact of MaineHousing's investment in affordable housing. As well as, it provides the type of project and how many units are created. • However, it does not breakdown the indirect and induced impacts for employment, output, wages, or GDP. • Rating: 14/24
19. (Minnesota Housing Finance Agency 2009)	Construction, Revitalization, and Subsidy	<ul style="list-style-type: none"> • Direct, Indirect, and Induced 	<ul style="list-style-type: none"> • Economic Output • Economic Output Multiplier • Employment • Government Revenue 	<ul style="list-style-type: none"> • A \$260 million investment will result in a total economic output off \$496 million, 3,692 jobs, and \$22 million in Government revenue. • Breakdowns are provided by direct, indirect, and induced impacts. 	IMPLAN I/O Model	<ul style="list-style-type: none"> • USA • The study provides the breakdown of the impact in investment in affordable housing by direct, indirect, and induced impacts. • Also provides the impacts by different levels of investment (i.e., Minnesota Housing alone, Minnesota Housing with private capital recruitment, and Minnesota

⁶ Note for some studies "total" was used to describe the employment or output or GDP, but does not specify what this includes vis-a-vis direct, indirect, and induced impacts.

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						<p>Housing with private and public capital recruitment).</p> <ul style="list-style-type: none"> • This is solely a state-level analysis and does not provide local level or national level analysis. • Rating: 13/24
20. (NAHB 2010)	Tax Credit	<ul style="list-style-type: none"> • Direct, Indirect, and Induced 	<ul style="list-style-type: none"> • Employment • Income • Government Revenue 	<ul style="list-style-type: none"> • For a typical 100 family tax credit development, the immediate impacts include 122 local jobs, \$7.9 million in local income, and \$827,000 in taxes and other revenue. Recurring annual impacts include 30 jobs, \$2.4 million in income, and \$441,000 in government revenue. • For a typical 100 elderly tax credit development, the immediate impacts include 113 local jobs, \$7.3 million in local income, and \$768,000 in taxes and other revenue. Recurring annual impacts include 32 jobs, \$2.3 million in income, and \$395,000 in government revenue. 	I/O Model	<ul style="list-style-type: none"> • USA • Provides a breakdown of the impact of two different tax credits targeting different groups (families and seniors). • Furthermore, this model provides the industry breakdowns regarding where jobs, income, and tax revenue are generated. • However, it provides only limited scope into the impacts and does not provide the impacts at different levels. • Rating: 10/24
21. (Arik 2010)	Construction, Revitalization, and Subsidy	<ul style="list-style-type: none"> • Direct, Indirect, and Induced • System Benefit of Asset 	<ul style="list-style-type: none"> • Business Revenue (and multiplier) • Employment (and multiplier) • Government Revenue • Income (and multiplier) • Health • Social 	<ul style="list-style-type: none"> • This study outlines the economic impact of investment across the construction of affordable housing, the repair of affordable housing (emergency repairs), and affordable housing with supportive services. • Impacts and multipliers are provided at the local (community) and state level and differentiated by direct and indirect/induced. • Furthermore, the study touches, qualitatively, on the health and social implications of these investments 	IMPLAN I/O Model	<ul style="list-style-type: none"> • USA • This study provides an in-depth study into the quantitative impact across three different affordable housing programs and differentiates the impacts at different levels. • Although it touches on social and health issues, and even their programs include supportive services, no quantitative estimate into these types of impacts are provided.

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						<ul style="list-style-type: none"> • Rating: 14/24
22. (Fujiwara 2013)	Construction	<ul style="list-style-type: none"> • Well-being valuation • System Benefit of Asset 	<ul style="list-style-type: none"> • Employment • Health • Social 	<ul style="list-style-type: none"> • The amount of money an individual would need to be compensated to maintain their life satisfaction if they lost a job is equivalent to £8,700 per year (i.e., the satisfaction they gain from getting a job). This does not include the income. • There are also compensation for health conditions (i.e., relief from asthma) and social benefits (i.e., feeling safe, living in a good neighborhood). 	Well-Being Valuation (Survey and OLS Regression Analysis)	<ul style="list-style-type: none"> • UK • A well-being valuation method is typical used to attempt to capture the social impacts of difficult to measure impacts. • The problem with this method is that it is difficult to capture the economic impacts (i.e., GDP, jobs, and income) as it does not cover those issues. It is useful when considering the system benefits and financial proxies are not available. • Rating: 10/24
23. (Diamond and McQuade 2016)	Tax Credit	<ul style="list-style-type: none"> • System Benefit of Asset 	<ul style="list-style-type: none"> • Property Values 	<ul style="list-style-type: none"> • Low Income Housing Tax Credit (LIHTC) placed in low-income neighborhoods increased housing prices by 6.5%, while LIHTC in higher income areas decreased housing prices by 2.5%. LIHTC in low-income areas cause aggregate welfare benefits of \$116 million. This welfare benefit offsets any losses to other residents in high income areas. 	Econometric and Hedonic Models	<ul style="list-style-type: none"> • USA • Provides a quantitative approach to measuring the impact of affordable housing on surrounding property values and wealth generation. • It only captures local welfare impacts and does not include any indirect impacts from neighborhoods away from the affordable housing sites. • Rating: 13/24

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24. (Kotval 2001)	Construction and Operation	<ul style="list-style-type: none"> • Direct, Indirect, and Induced 	<ul style="list-style-type: none"> • Income • Employment • Government Revenue 	<ul style="list-style-type: none"> • The impact of 100 multifamily homes being built can result in between: <ul style="list-style-type: none"> ○ \$4.5-6.2 million in construction period income and \$2.1-2.8 million in ongoing income; ○ \$0.9-1.3 million in construction period taxes and fees and \$0.7-1 million in ongoing taxes and fees; and ○ 94-131 construction period jobs and 49-64 ongoing jobs. • Economic impacts are greater in suburban areas than in urban or rural areas. 	IMPLAN I/O Model	<ul style="list-style-type: none"> • USA • Although this study does not differentiate between the economic impacts for different effect types (i.e., direct, indirect, and induced), it does provide an overview of the impact in different community types (i.e., urban, suburban, and rural). • As is usual with I/O models there are no local or national level impacts, only state level. • Rating: 12/24
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3.2 Limitations

In reviewing the literature surrounding the economic impact of investment in affordable housing, limitations regarding the current state of research were found, mainly concerning three broad categories:

1. **Depth of the research:** Many of the current studies are unable to provide breakdowns by the type of impact. That is, individualized results by direct, indirect, or induced impacts. Rather, the majority of studies provided combinations of either direct and indirect or direct, indirect, and induced.
2. **Geographical resolution:** Along the same lines, few studies were able to provide the impacts of investment at different geographic levels, with only the evaluation into the impact of investment into Toronto Community Housing by CANCEA (CANCEA 2015) providing the impact of given metrics from a federal perspective. For example, with a Canadian context in mind, that would mean providing the impacts at a local (city/region), provincial, and federal levels. From a U.S. perspective, this would mean going beyond simply providing state-level impacts.
3. **Applicability:** Few studies from this literature review have provided a Canadian context of the impact of investment in affordable housing (Suttor and Bettencourt-McCarthy 2015, Zon, Molson and Oschinski 2014, CANCEA 2015, Miller and Ofrim 2016), with only a select few actually providing impacts at the level of different types of impacts and different geographical levels (CANCEA 2015).

Another limitation of the studies presented focuses on the lack of depth into the impacts of investment in affordable housing that comes about through traditional economic models like input/output models. Input/output models are built on interdependencies in a regional or national economy, whereby the output of one industry becomes the input of other industries in order to estimate multipliers that forecast the economic impact on the broader economy. However, input/output models tend to fail in capturing systemic couplings or benefits that extend beyond the traditional direct, indirect, and induced impacts of investment⁷. System effects, the effects typically missed through a traditional economic lens, transcend the induced effects because they include the analysis of variables that are not traditionally examined, such as health, crime, and other social and health outcomes.

Examples of some broad category of system impacts, or spillover or catalytic effects as they are sometimes referred to as, are further discussed in the section below.

⁷ For an overview of how important this distinction can be, please refer to a report by the Canadian Centre for Economic Analysis (CANCEA) outlining how this shortcoming of input/output models can have substantial difference in the expected returns of investment in infrastructure (<https://www.cancea.ca/?q=node/82>).

3.3 Additional Research Considerations: System Effects

Although traditional economic indicators such as GDP, employment, and income are taken as indicators of the health of an economy or a city, these metrics don't always capture the prosperity and well-being of residents. Non-traditional system impacts, such as social and health, can often translate into financial risks and benefits. As such, it is becoming more common to understand the system impacts, those that transcend traditional economic outcomes (direct, indirect, and induced) and indicators.

This way of approaching investments and decisions is one that has been fairly common in other industries, but has yet to fully become common in affordable housing research. For example, when evaluating the economic impacts of space exploration, “catalytic and wider effects”, beyond direct, indirect, and induced impacts are mentioned. These include market spillovers (i.e., when users of space-derived goods benefit such as through cheaper and more reliable access to space), knowledge spillovers (i.e., when space-derived technologies benefit others, such as through advancement in technology), and network spillover (i.e., when coordination of individuals benefits the whole, such as through development of standardization process and laws) (Sadlier 2016). That being said, recently “Social Return on Investment” (SROI) analysis has become more common when approaching affordable housing. The process of recruiting stakeholders, identifying outcomes and impact measures and assigning financial proxies has been a step in the right direction in drawing attention to the non-traditional impacts of investment in affordable housing (Miller and Ofrim 2016). More advanced models, such as agent-based modeling, have the capabilities of addressing these systemic and longitudinal impacts, as exhibited by CANCEA’s evaluation into the socio-economic impact of investment in TCHC (CANCEA 2015).

Below, we provide some system effect areas that, barring a select few studies, were not quantitatively assessed in the literature review but that are measures that should be considered for any future evaluations.

Economic

Although the traditional economic indicators, such as GDP, employment, and wages and salaries, can be assessed through the direct, indirect, and induced impacts of investment using input/output models, there are other economic effects that transcend these effects such as:

- Disposable Income: When an individual, who was previously paying a market rent, now pays an affordable rent (i.e., 30% of their gross income or less), they gain disposable income in amounting to the difference between these two rents (Miller and Ofrim 2016). The increased buying power of households allows them to increase consumption of necessities, such as food, clothing, health, and transportation (Cohen and Wardrip 2011).
- Property Values: Property values would impact the wealth of neighbourhood residents. Current research is still ambiguous regarding the association between development of affordable housing and property values changing for the better or worse. Research in this area has provided results

that include conclusions such as no changes occurring or affordable housing in low income areas improving property values while lowering property values when placed in high income areas (Nguyen 2005, Diamond and McQuade 2016). Most studies conclude that it is complicated given the interacting effects of neighbourhood quality, type of affordable housing, and design of affordable housing possibly playing equal, if not larger roles in property values (Nguyen 2005). However, a study that showed that affordable housing increases property values in low income areas but lowers it in high income areas highlights the fact that the wealth benefit as a whole offsets any individual loss brought about by a decrease in property values (Diamond and McQuade 2016).

Health

Investment in affordable housing, including the construction of new units and the revitalization of old ones, means that a greater proportion of tenants will reside in homes that are in good repair, which is conducive to better health, both physical and mental. For instance, it is well documented that homes in poorer condition are associated with dampness⁸, which in turn leads to an increased risk of illnesses, such as:

- Stress (Hopton & Hunt, 1996);
- Depression (Shenassa, Daskalakis, Liebhaber, & Braubach, 2007);
- Asthma (Bornehag, et al., 2001); and
- Comorbid conditions: Depression has been linked to an increased likelihood of stroke (National Institute of Mental Health, 2011), compounding the adverse health effects.

Mental and respiratory illnesses are among the many conditions that may arise from living in homes that are not in adequate living condition, but these studies also demonstrate that even tenants who live in units that are in good repair may face deteriorating health as a result of the potential exposure to neighbouring units in disrepair. Each case of such an illness that is avoided due to maintaining the good repair of homes, represents a source of healthcare cost savings.

For example, a study done by CANCEA into the 10-Year capital investment plan for TCHC (CANCEA 2015) found that better condition housing will:

- Prevent over 544,000 instances of resident illnesses;
- Reduce the healthcare system use by roughly 2.1 million visits, 82 per cent of which represent visits to general practitioners, thereby reducing the wait times faced by other potential patients; and

⁸ Although central heating does mitigate some causes of dampness, dampness can also arise as a result of pipe leaks and overflows, water penetration from the exterior of the building, and poor ventilation of internally produced moisture (Peterborough City Council, n.d.)

- Reduce healthcare costs by \$3.8 billion dollars, representing another source of savings for government.

Environment

Investing in higher quality affordable housing, be it through new developments or revitalization of old developments, has the potential to also provide economic impacts through environmental efficiencies. Reduced energy consumptions means that for:

- Households, they will have more disposable income;
- Housing providers, who bear the responsibility for utilities consumed by some of its residents (e.g., Toronto Community Housing Corporation), reduced energy consumption reduces the energy burden (Tsenkova and Whitty 2013); and
- Society, reduction in energy consumption means a reduction in greenhouse gas (GHG) emissions, which means improved health outcomes⁹.

To date, a number of initiatives to improve the energy consumption of units have been undertaken, including retrofit programs, appliance replacements, and the refurbishment of unit interiors (Tsenkova & Whitty, 2013). While these initiatives and programs are not necessarily linked to the major capital repairs, similar effects can be observed as an indirect impact of performing major repairs. For instance, if poor quality or condition windows are upgraded or replaced in a unit, the amount of energy needed to heat that unit decreases significantly. Case study examples in Toronto were projected to have energy cost savings of between 16-37% (Tsenkova and Whitty 2013).

Furthermore, appropriately placed affordable housing, near or in transit-oriented developments (TODs) provide further GHG emission savings. Studies in Los Angeles (Boarnet, et al. 2017) have found that households living within a half-mile of a rail transit station:

- Drive, on average, 16 miles less per day;
- Take 0.19 more daily rail transit trips; and
- Take 0.4 more bus transit trips than households living beyond a half-mile from a rail station.

⁹ This is especially true for apartment towers, particularly those built between 1945 and 1984, which represent some of the largest contributors to residential greenhouse gas emissions. Relative to a single detached house, such dwellings require 25% more energy per square meter for operation alone, excluding requirements for other household uses of energy (Stewart & Thorne, 2009)

Therefore, placing affordable housing within or near TODs appears to reduce vehicle miles travelled (VMT) as well as provides access to amenities, such as employment opportunities (Boarnet, et al. 2017).

Moral Hazard

Finally, it is important to understand that designating land or housing for the purposes of affordable housing can lead to moral hazard. When an affordable housing provider supplies housing, it takes on the risk of whom they are providing the housing to and that all benefits may not be realized. Although some research associates affordable housing with increased employment among the newly housed residents (Zon, Molson and Oschinski 2014, Frontier Economics Ltd. 2014, Suttor and Bettencourt-McCarthy 2015, Miller and Ofrim 2016), this may not always be the case. It is important to note that recent research suggests that this connection may be variable, with some findings suggesting that housing assistance has a negative impact on hours worked and earnings (similar to the phenomenon of “the welfare wall”), while other finding positive impacts (Pomeroy and Marquis-Bissonnette 2016)¹⁰. Therefore, an affordable housing provider must anticipate and prepare for such risks.

¹⁰ Weak association between employment outcomes and affordable housing have been attributed to selection bias of the population who eventually inhabit the affordable housing and lack of employment support programs (Pomeroy and Marquis-Bissonnette 2016).

4.0 RATING CRITERIA

Part of the literature review required the studies to be rated based on a set of criteria to assess the strengths and weaknesses of the methodological approach and findings. The studies were evaluated based on eight aspects: **Research types, Relevance, Methodology, Applicability, Data Quality, Depth, Breadth, and Reputability**. Criteria were rated on a scale of 3, with “3” being the optimal score and “0” being the least optimal score.

4.1 Rating Criteria

Table 1 provides a description of the rating criteria and scoring methodology.

Table 1 Rating Criteria

Criteria	Weighting	Score
Research Type (RT)	Is the study from an academic source, grey literature (i.e., literature from a research centre, think tank, or consultancy), or media source (i.e., newspaper article).	<ul style="list-style-type: none"> Academic – 3 points; Grey – 2 points; Media source – 1 point; and Other – 0 points
Relevance	When was the study published?	<ul style="list-style-type: none"> Within 5 years – 3 points; 5-9 years – 2 points; 10-14 years – 1 point; and 15+ – 0 points.
Methodology	What was the methodology used in assessing the impacts? Was it highly advanced systems-based approach, one-off econometric, input/output, or other?	<ul style="list-style-type: none"> System-based – 3 points; Econometric – 2 points; Input/output – 1 point; and Other – 0 points.
Applicability	What was the location/population where impacts of affordable housing were evaluated?	<ul style="list-style-type: none"> Canada – 3 points; U.S.A. – 2 points; European Union/Australia – 1 point; and Other – 0 points.
Data Quality	Does the study use cohort based data, specific local or regional data, or neither? Note, if no data sources were available, it was assumed to get the lowest score.	<ul style="list-style-type: none"> Cohort based, specific local and regional data – 3 points; Not cohort, specific local and regional data – 2 points; and Not cohort, no use of specific local and regional data – 1 point.
Depth	What economic outcomes (i.e., GDP, employment, income, etc...) and type of economic outcomes (i.e., direct, indirect, induced, and system) does the study evaluate? Do they distinguish between the different types of effects and provide them at different geographical levels?	<ul style="list-style-type: none"> Multiple indicators, types of effects, and different geographical impacts – 3 points; Two of Multiple indicators, types of effects, and different geographical impacts – 2 points; One of multiple indicators, types of effects, and different geographical impacts – 1 point; and No differentiation of indicators, effects, or geographical impacts – 0 points.

Breadth	Does the study discuss broader categories of impacts of investment in affordable housing that extend beyond traditional economic impacts?	<ul style="list-style-type: none"> ▪ 3+ categories of impacts (e.g., energy, social, and health) – 3 points; ▪ 2 categories of impacts – 2 points; ▪ 1 category of impacts – 1 point; ▪ No additional categories (i.e., only traditional economic impacts) – 0 points.
Reputability (citations)	Similar to the above category, this criteria was used to determine the use and distribution of the studies reviewed.	<ul style="list-style-type: none"> ▪ 1000+ citations – 3 points; ▪ 100-999 citations – 2 points; ▪ 1-99 citations – 1 point; and ▪ No citations – 0 points.

Finally, the individual scores of each of the nine categories were added up in order to provide a total rating for the study:

$$\text{Total Score} = \text{Research Type} + \text{Relevance} + \text{Methodology} + \text{Applicability} + \text{Data Quality} + \text{Depth} + \text{Breadth} + \text{Reputability}$$

It is important to note that there were a couple exemptions made to the rating criteria. Typical, “grey” research (i.e., non-academic research) does not have any citations and as such would not gain any points in that regard. However, a select few of grey studies (NAHB 2010, NAHB 2015) were mentioned multiple times in other studies, be it just through a reference or mentioning that their model was used. Therefore, these studies were given a citation “bonus” do to the obvious widespread use of their methodology. Furthermore, studies for which they provided multipliers and economic indicator that did not match up with their report findings or where there were inconsistencies in their calculations (or they provided no calculations), they did not score as highly on the “depth” category.

4.2 Rating Criteria – Working Example

As an example, consider the study done by Hank, M.J. et al. in Table 2 (Hank, et al. 2015).

Table 2 Rating Criteria Example

Criteria	Description	Score
RT	The study was published in an academic journal.	3
Relevance	Published in 2015, which is within 5 years of the current year.	3
Methodology	Utilized an input/output model.	1
Applicability	Focuses on HOPE VI in the U.S.	2
Data Quality	The study used local and regional data but no cohort data	2
Depth	Provides a breakdown of the direct, indirect, and induced employment, labor income, and output for a region.	2
Breadth	Briefly touches on socio-economic profile of who the jobs would go to and the effect that would have on the community.	1
Reputability (citations)	According to google scholar, the study has 2 citations.	1
Total		15

5.0 CONCLUSION

Investment in affordable housing provides substantial economic benefits at both the local and regional levels (provincial in Canada or state in the U.S.). Investment in affordable housing has the potential to generate new jobs, wages and salaries, economic activity, and government revenue due to the economic activity generated by the direct construction or revitalization itself, the indirect purchase or sale of goods or services upstream or downstream by firms directly involved in construction, and the induced activity that occurs due to the increased wages and salaries that these previous effects generate. Furthermore, at each of these steps, government revenue is generated through taxation, permits or fees required throughout the process.

That being said, research into these impacts highlights some areas where research is lacking, such as an underrepresentation of Canadian studies, studies investigating the impact of investment at different geographical levels (primarily a lack of understanding into the national impact of investment in affordable housing at the local level), and a quantitative, longitudinal understanding of the system impacts of investment in affordable housing.

It is important to understanding the longitudinal impacts of affordable housing. Not only does this include understanding the impact on the health, wealth, and opportunities of the population through improved housing quality, improved financial stability and reduced financial strain, and increased access to transportation, but also the opportunity costs and moral hazards associated with designating an asset to a given purpose. Incorporating these metrics and indicators into future evaluations would provide a more holistic view of the benefits of affordable housing.

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