



# A BLUEPRINT FOR CHANGE

PREVENTING DEMOLITION WASTE THROUGH  
HOME RELOCATION AND DECONSTRUCTION

## ACKNOWLEDGEMENTS

Co-authors: Rosemary Cooper, Caeleigh Marshall and Gil Yaron.

Funders: Vancity Credit Union and Nickel Bros House Moving Ltd.

Light House recognizes the generous support of Vancity Savings Credit Union and Nickel Bros House Moving Ltd. in funding the creation of this report.

Light House wishes to thank the following individuals for contributing their insights to help inform this report: Jeremy Nickel and Craig Eckman (Nickel Bros. House Moving Ltd.), Glyn Lewis (Renewal Home Developments), Adam Corneil (Unbuilders), Faisal Mirza (City of Vancouver), Brad Badelt (CityStudio Vancouver), Marcos Badra (City of Richmond), Grant Pugsley (TELUS) and Brenda Martens (Aedify). While the contributions of these individuals was invaluable in shaping this report, the views and recommendations presented are solely attributable to Light House.

Graphic Design: Tom Norman, Kapow Creative

Suggested citation: Rosemary Cooper, Caeleigh Marshall & Gil Yaron. *A Blueprint for Change: Preventing Demolition Waste Through Home Relocation and Deconstruction*. Light House Sustainability Society, 2023.

Copyright © April 2023



# TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b>	<b>5</b>
<b>1. INTRODUCTION</b>	<b>9</b>
<b>2. WHAT'S FUELING HOME DEMOLITIONS?</b>	<b>11</b>
<b>3. THE COSTS OF DEMOLITION</b>	<b>13</b>
THE TRIAGE APPROACH	17
<b>4. HOME RELOCATION</b>	<b>18</b>
<b>5. DECONSTRUCTING HOMES</b>	<b>25</b>
<b>6. BARRIERS &amp; POLICY RECOMMENDATIONS</b>	<b>27</b>



**45,000**

HOMES HAVE BEEN DEMOLISHED IN METRO VANCOUVER SINCE 2004.



**9,000**

HOMES DEMOLISHED BETWEEN 2004-2022 THAT COULD HAVE BEEN RELOCATED.



**292,089**

TONNES OF CRD WASTE ARE GENERATED EACH YEAR IN METRO VANCOUVER.<sup>13</sup>



**40%**

OF GLOBAL CO<sub>2</sub> EMISSIONS ASSOCIATED WITH MATERIAL PRODUCTION COME FROM THE CONSTRUCTION INDUSTRY.<sup>17</sup>

**\$300-450 sq. ft**  
FOR NEW BUILD

**\$100-125 sq. ft**  
FOR RELOCATE  
AND RENOVATE



**COST TO RELOCATE VS.**  
**BUILD NEW**



**99%**  
OF BUILDING MATERIALS CAN BE  
SALVAGED THROUGH DECONSTRUCTION.

## EXECUTIVE SUMMARY

Development pressures in urban areas fueled by strong population growth, rising demand for housing, shortage of buildable land, and sky-high property values are spurring region-wide redevelopment of single-family homes to denser multi-family housing. The process of demolishing single-family homes to make way for denser communities has the unintended consequence of accelerating waste generation and undermining climate mitigation strategies. Across Canada, a conservative estimate is that four million tonnes or 12% of all landfill waste is generated annually from construction, renovation and demolition (CRD) waste. Moreover, the Community Energy Association estimates that 70-90% of greenhouse gas emissions associated with a building's lifecycle occur in the up-front stages (i.e., the harvesting, transportation, manufacturing, and installation of construction materials) prior to building occupation.

This report outlines a blueprint for change – a shift away from home demolition and its associated negative impacts to the proven alternatives of house relocation and deconstruction. These alternatives apply a circular economic model to the built environment; prioritizing the highest value and best use of materials, by extending the life of homes and reusing building materials when a house reaches the end of its useful life; generating economic value, avoiding waste, and preserving embodied carbon.

“ Across Canada, a conservative estimate is that four million tonnes or 12% of all landfill waste is generated from construction, renovation and demolition (CRD) waste. ”

“ In Metro Vancouver alone, it is estimated that of the more than 45,000 single family homes demolished between 2004 and 2021, 9,000 of them were high-quality homes that could have provided housing. ”

Home relocation is a viable option for roughly 20 per cent of homes slated for demolition. For the remaining 80 per cent of homes, deconstruction – the piece-by-piece disassembly of a building and its materials – is the next best option to preserve value and prevent demolition waste. In Metro Vancouver alone, it is estimated that of the more than 45,000 single family homes demolished between 2004 and 2021, 9,000 of them were high-quality homes that could have provided housing while a significant percentage of the remainder could have been deconstructed to salvage valuable resources and keep building materials out of landfill.

Relocating existing, habitable homes can also increase housing supply and put the cost of homes in-reach for more first-time buyers and working-wage families and address housing scarcity in remote coastal communities, including First Nations communities. Compared to newly constructed houses, repurposed homes are considerably more affordable. Industry estimates that the cost to relocate a home is approximately \$100 - \$125 / sq. ft., while the cost of new construction, particularly in remote coastal communities where labour and materials are more challenging to secure, can exceed \$450/sq. ft. A high-value relocated home can be ready for occupancy in under three months.

House relocation is a well-established industry in BC and across Canada led by experienced companies that have been moving homes for decades. The first step in relocating a home is securing it. Once a suitable house is identified, the house relocation company works to establish a move corridor, and coordinate logistics for the relocation of the home. At the destination community, land is acquired, local permits are approved, and a buyer is found for the repurposed home. Once the relocated house arrives on the receiving property, a foundation is built, it's connected to water and utilities, and (where feasible) retrofits are implemented, such as insulation upgrades, renewable energy, rainwater harvesting or other desired upgrades.

**The Blueprint for Change envisions a policy framework that triages options for home removal based on circular economy principles reflected in BC's Pollution Prevention Hierarchy and enshrined in BC's *Recycling Regulation*.** By applying a triage approach, municipal building policy can support developers and homeowners to assess the highest and best use of homes slated for removal starting with infilling or retrofitting, then relocation and repurposing, then deconstruction, and green demolition. Traditional machine demolition should be the very last option considered.

## SUMMARY OF RECOMMENDATIONS

This report makes the following recommendations to shift policy and practice toward promoting move house relocation and deconstruction over demolition:

### SECURING HOMES

- Implement outreach activities to raise awareness amongst homeowners and developers about home relocation and deconstruction at or before the development or building permit stage.
- Introduce language in demolition and development permits requiring the applicant to state whether they have explored house relocation and deconstruction as alternatives to traditional demolition.
- Introduce mechanisms to triage homes for relocation or deconstruction early in the permitting process.
- Share Building Permit application information, including applicant contact information, of homes slated for demolition with the home relocation and deconstruction industry.
- Create Early Green Removal Permits.
- Implement meaningful incentives to make home relocation and deconstruction financially attractive , including a tiered permitting fee structure.
- Recognize and promote the provision of charitable tax receipts for house relocation to “qualified donees”.

### MOVING HOMES

- Identify “move corridors” through collaboration with house relocation companies, infrastructure companies, and relevant municipal departments.
- Establish or amend municipal tree policies to be house relocation-friendly.
- Ensure park, public land and waterfront access for house relocation.
- Engage telecom, transportation and utility companies early on to effectively schedule temporary removal of barrier infrastructure.
- Provide land where homes can be temporarily stored if there are delays at their destination location.
- Create economies of scale and efficiency by orchestrating the relocation of groups of homes along key move corridors slated for intensification.

## SUMMARY OF RECOMMENDATIONS CONTINUED

### REPURPOSING HOMES

- Re-evaluate municipal policies that ban the relocation of homes to a region.
- Re-evaluate policies that require an existing building to be brought up to current code standards (aside from necessary life-safety standards).
- Create a “Move-On Permit” that allows a saved home to be relocated to its destination property while the Building Permit application is still being reviewed.
- Allow relocated house recipients to submit “foundation only” permits for faster review, using prescriptive foundation details.

### DECONSTRUCTING HOMES

- Expand existing deconstruction policies to include consideration of all pre-1975 homes.
- Expand deconstruction policies to include commercial buildings.
- Ensure material salvage rates are high enough to incentivize deconstruction.
- Consider banning disposal of certain construction and demolition materials.
- Provide low-cost, centralized spaces for the sorting and storage of salvaged building materials.
- Support the development of re-use markets for salvaged construction materials.
- Bring all parties together into a Home Relocation and Deconstruction Policy Accelerator.
- Create a provincial policy guide for house relocation and deconstruction that is consistent across municipalities.

# 1. INTRODUCTION

Between 2012-2022 in Metro Vancouver, an average of 2,621 ground oriented dwellings were demolished annually<sup>1</sup>, with construction and demolition waste accounting for approximately one-third of waste found in regional landfills.<sup>2</sup> High-value building materials, including rare old-growth lumber, are disposed of or incinerated as quality single-family homes are eliminated to make way for larger developments.

New construction to replace these homes requires the consumption of virgin resources, with an estimated minimum 40 mature pine trees felled to frame and finish an average 2,000 sq. ft. home.<sup>3</sup> Depending on the location, building design and materials, the demolition of a high-quality home of similar size can result in the loss of hundreds of thousands of dollars associated with the value of the home and tens of thousands of kilograms of CO<sub>2</sub>e and material waste<sup>4</sup>. Additionally, new construction comes with an increasingly high financial burden. In some regions, new basic construction costs start as high as \$450 / sq. ft. Home relocation, in contrast, is estimated at \$100 / sq. ft., not including foundation and hook-ups.

Faced with egregious housing costs, the worsening climate crisis, and the high volume of demolition waste produced regionally, these combined issues seem insurmountable. Fortunately, innovative solutions already exist. This report outlines a blueprint for change – shifting away from home demolition and its associated negative impacts to the

“ ... new basic construction costs start as high as \$450 / sq. ft. Home relocation and reuse, in contrast, is estimated at \$100 / sq. ft. ... ”



“ Relocating existing, habitable homes can increase housing supply and put the cost of homes in-reach for more first-time buyers and working-wage families. ”

proven alternatives of house relocation and deconstruction that preserve embodied carbon, reduce landfill waste and disposal costs, and reuse or recycle high-value materials. Relocating existing, habitable homes can increase housing supply and put the cost of homes in-reach for more first-time buyers and working-wage families. Moved houses can also address housing scarcity in remote coastal communities, including First Nations communities. The Lower Mainland is uniquely well situated for home relocation, due to coastal access and the substantial number of quality homes facing demolition.

For lower-value or inaccessible homes that cannot feasibly be relocated, deconstruction is the next best alternative. Deconstruction contractors can salvage up to 99% of building materials, repurposing them for their highest and best use. These low-cost, low-carbon recovered materials can be reused again and again, prolonging their lifespan and reducing the need for primary resource extraction.

A Blueprint for Change details the scope of the problem posed by home demolition and introduces a Triage Approach to dealing with homes slated for removal, as well as highlights some best practices in home relocation and deconstruction. The heart of the report is a set of policy recommendations aimed at prioritizing and incentivizing house relocation and deconstruction, and in doing so, saving high-value homes and building materials while supporting the achievement of civic social and environmental goals. In preparing this report, Light House conducted an extensive literature review, a detailed review of municipal deconstruction policies, and interviewed a number of government and industry representatives, including representatives from Nickel Bros, Renewal Home Development and Unbuilders who are featured in the report.



## 2. WHAT'S FUELING HOME DEMOLITIONS?

From 2016-2021, metropolitan areas in British Columbia were some of the fastest growing in Canada.<sup>5</sup> Vancouver welcomed 179,000 new residents – a 7.3% population increase, while Victoria, Nanaimo, Kelowna and Kamloops all experienced increases between 8.0% - 14.0%. This growth in population, coupled with rising demand for housing, shortage of buildable land, and sky-high property values are putting significant pressure on housing supply and fueling region-wide redevelopment of single-family homes into denser multi-family housing. Municipalities across the province are responding by implementing policies and zoning bylaws to densify neighbourhoods; encouraging the redevelopment of single-family homes into multi-family units to address the pressing need for affordable housing. Recently, the BC government also announced legislation that will override municipal zoning to allow up to four homes on single-family detached lots.<sup>6</sup>

There are many worthy objectives behind the push for densification - addressing the housing shortage, slowing the upward pressure on home prices, building complete communities, and enabling investments in mass transportation. Unfortunately, densification strategies are also

proving wasteful, shortening the lifespan of high-quality homes by demolishing them when they could still be used for decades to come.

These urban transformations are particularly visible in regions experiencing higher population growth and increased densification. Over the last ten years (2011-2021), demolitions in Metro Vancouver have increased by 46.8%, while housing completions increased by 95%.<sup>7</sup> Today, “for sale” and land assembly signs are ubiquitous in major urban corridors, such as Vancouver’s Cambie, Broadway, Granville and Oak streets, the Tri-Cities’ Evergreen Line; and James Bay, Oak Bay and Esquimalt in Greater Victoria.



Increasing development and densification trends show no signs of letting up. The Canada Mortgage and Housing Corporation estimates that 22 million housing units will need to be constructed in Canada by 2030 in order to restore housing affordability.<sup>8</sup> Metro Vancouver alone anticipates a need for 182,000 additional units by 2026 to meet demand across the region.<sup>9</sup> In the majority of cases, existing homes will be torn down to make way for the new units to be created. Without a supportive policy environment for house relocation and deconstruction, this may have the unintended consequence of increasing the number of home demolitions.

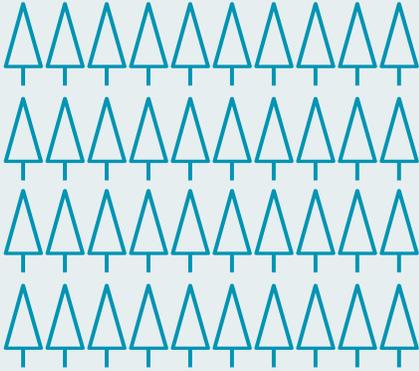
### 3. THE COSTS OF DEMOLITION

The disposal of usable single-family homes reflects a “take-make-waste” linear economic model, which results in the loss of valuable natural resources and produces unnecessary waste and carbon emissions. The transition towards greater reuse and circularity in the built environment is imperative as we continue to experience the impacts of resource depletion and climate change both locally and globally. Applying a circular economic model to the built environment prioritizes the highest value and best use of materials, by extending the life of homes and reusing building materials when a house reaches the end of its useful life; generating economic value, avoiding waste, and preserving embodied carbon. Home relocation and deconstruction are key solutions in this circular economic model.

“Applying a circular economic model to the built environment prioritizes the highest value and best use of materials ...”

#### MATERIAL WASTE

Currently, the construction and demolition of residential buildings generates an enormous quantity of material waste. Approximately 100 billion tonnes of construction, renovation, and demolition (CRD) waste is generated worldwide annually, with 35% destined for direct disposal in landfills.<sup>10</sup> This is not a distant, global issue. Across Canada, a conservative estimate is that four million tonnes or 12% of all landfill waste is generated annually from CRD.<sup>11</sup>



**A COMMON ESTIMATE IS THAT A CONTEMPORARY, 2,000-SQUARE-FOOT, WOOD-FRAMED, SINGLE-FAMILY HOUSE USES UPWARDS OF 16,000 BOARD FEET OF FRAMING OR APPROXIMATELY 40 MATURE PINE TREES.<sup>12</sup>**

**WHEN AN EXISTING HOME IS RELOCATED AND REPURPOSED, OR IF A NEW HOME IS CONSTRUCTED USING SALVAGED WOOD, THE NUMBER OF TREES REQUIRED TO CREATE NEW HOUSING DECREASES SUBSTANTIALLY.**

Across Metro Vancouver, an average of 2,621 ground-oriented dwellings (townhouses, duplexes, row houses, and single detached houses) are demolished every single year<sup>13</sup>, which in 2020, resulted in 292,089 tonnes of CRD waste going to public and private waste facilities.<sup>14</sup>

This waste comes at a high environmental and financial cost. As landfill waste accumulates, it produces methane emissions, contaminates groundwater, and can produce negative health outcomes for residents and workers.<sup>15</sup> Simultaneously, this vast quantity of demolition waste also increases the financial burden to municipalities. The Vancouver Landfill, a single facility, estimates closure and post-closure costs at \$112 million dollars.<sup>16</sup> The cost of failing to implement alternatives to demolition ultimately falls on taxpayers, as landfill waste and toxins accumulate and millions are spent on the closure, maintenance, and development of new waste management sites.

Fortunately, this waste is preventable. Out of necessity, municipalities are making efforts to recycle and divert as much CRD waste as possible, and house relocation and deconstruction are key solutions to add to their toolkits.



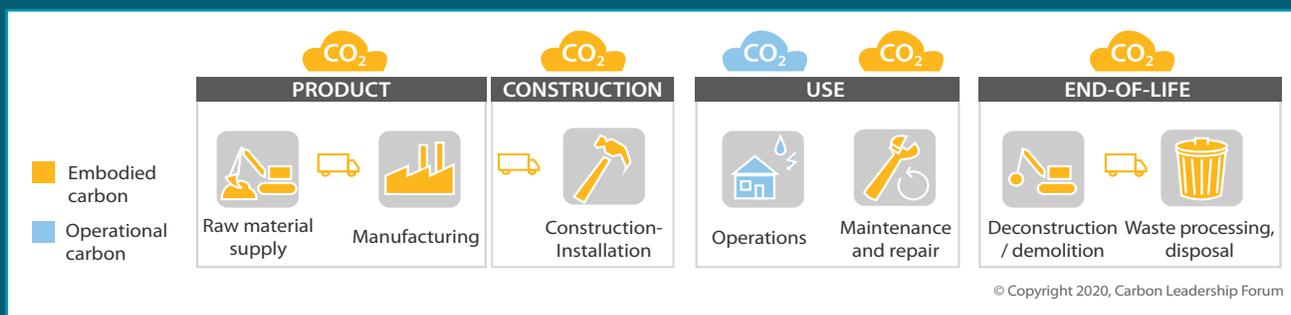
## EMBODIED CARBON & EMISSIONS

Currently, development prioritizes the use of new materials during construction and the demolition of buildings and disposal of associated materials at end-of-life. Reducing raw material use in construction is critical, as the construction industry is responsible for 40% of the greenhouse gas emissions resulting from global materials production.<sup>17</sup> In addition to generating vast quantities of waste, demolition also results in the loss of embodied carbon and the emission of greenhouse gases from the decomposition of organic building materials. Preserving housing stock and the associated embodied carbon should be a central component of municipal climate strategies.

A professor at the University of British Columbia has developed a “Teardown Index”, which investigates the carbon dioxide emission payback period for newly constructed, efficient single-family homes. Their research found that “the carbon dioxide emission payback period for new homes meeting current efficiency standards in Vancouver averages 168 years, despite forty percent increases in operational efficiency over existing single-family homes.”<sup>18</sup> This demonstrates that when we consider both embodied and operational carbon, replacing older single-family homes with high-efficiency homes in Vancouver adds to—rather than reduces—overall emissions.

Consistent with these findings, the Community Energy Association estimates that 70-90% of emissions associated with a building’s lifecycle occur in the up-front stages (i.e., the harvesting, transportation, manufacturing, and installation of construction materials) prior to building occupation.<sup>19</sup> These “upfront embodied emissions” could be reduced by repurposing existing homes facing demolition, or by using more salvaged and recycled materials in new construction. By repurposing a house locally, many of the up-front embodied emissions from resource extraction and construction are mitigated, as well as the emissions that would have come from the home’s disposal.

**THE CARBON LEADERSHIP FORUM DEFINES EMBODIED CARBON AS “THE GREENHOUSE GAS EMISSIONS ARISING FROM THE MANUFACTURING, TRANSPORTATION, INSTALLATION, MAINTENANCE, AND DISPOSAL OF BUILDING MATERIALS.” IT IS TYPICALLY MEASURED FOR ITS GLOBAL WARMING POTENTIAL IN KILOGRAMS OF CO<sub>2</sub> EQUIVALENT (KG CO<sub>2</sub>e).**



Source: Carbon Leadership Forum, <https://carbonleadershipforum.org/embodied-carbon-101/>.

## RESOURCE EXTRACTION

Home relocation and deconstruction not only eliminate waste from demolitions and preserve embodied carbon, these strategies can also reduce the need for primary resource extraction. Building materials such as cement, wood, gypsum, steel and glass are produced from the extraction of raw materials. Unfortunately, the extraction of these crucial resources leads to harmful environmental impacts including resource scarcity, habitat destruction, biodiversity loss, and pollution. Without significant change, these impacts will worsen, as global demand for raw materials is set to more than double by 2060.<sup>20</sup>

Extending the life of a building or reusing existing building materials will reduce demand for virgin resources used in construction. In an environment like B.C. with double-digit population growth requiring hundreds of thousands of new housing units, relocating and repurposing a home in a new location - instead of demolishing it - significantly reduces the quantity of resources that would have been required to build a new home there from scratch. When a home is not a candidate for relocation, deconstruction still allows for building materials to be salvaged and repurposed, thereby reducing the demand for raw materials.

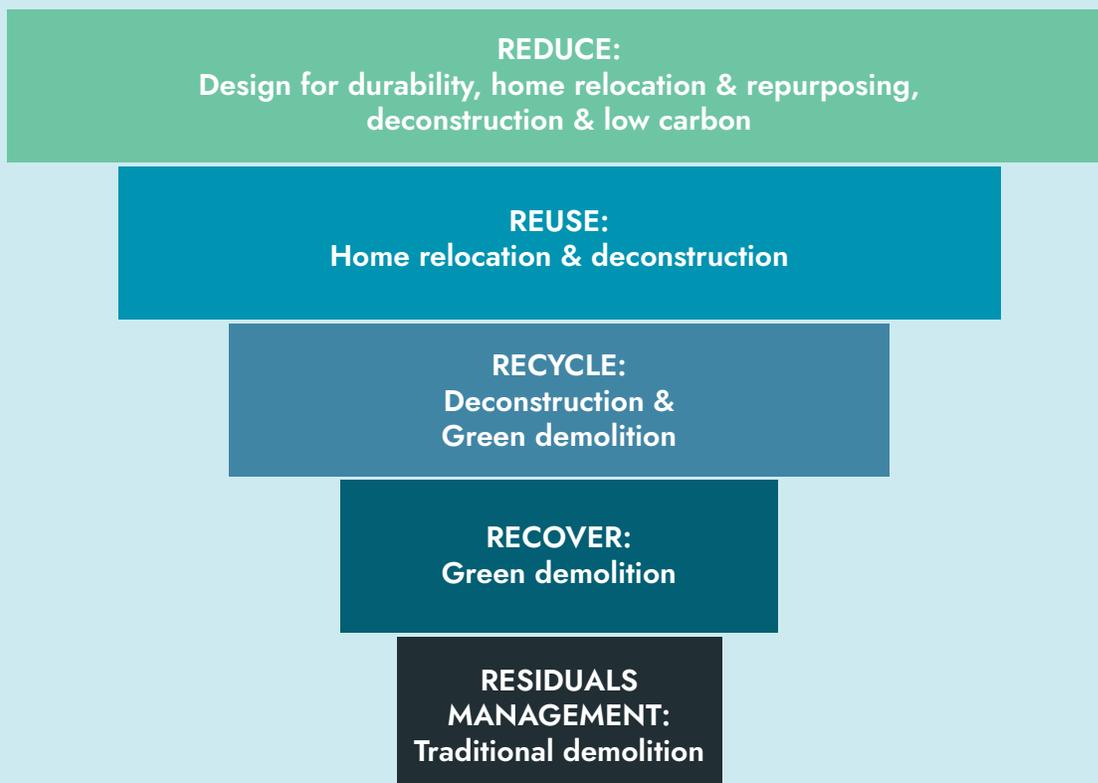
## HOUSING

Aside from the environmental costs associated with demolition, destroying existing housing is counter-productive to addressing the current housing crisis. In Metro Vancouver alone, more than 45,000 single family homes have been demolished since 2004. Based on the house relocation industry's estimation, approximately 20 per cent of demolished homes are high-quality homes that have not reached the end of their useful life. Had these homes been relocated and not demolished, they could have provided up to 9,000 high quality houses to coastal communities, including First Nations. Based on a cursory review of Housing Needs Reports prepared by BC coastal communities in 2019, those 9,000 homes could have made a serious dent in the demand for housing in BC's coastal communities. With thousands of homes slated for demolition in urban centres in the coming years, the opportunity remains to relocate and re-purpose these high-quality homes, and to salvage and reuse materials from thousands more.



## THE TRIAGE APPROACH

Tearing down high-quality, usable homes should be the last resort amid Canada's housing crisis, widespread labour and material shortages, and the climate crisis. Saving and repurposing homes and building materials through home relocation and deconstruction requires that we collectively reframe the current paradigm around construction waste and redevelopment. **The Blueprint for Change envisions a policy framework that triages options for home removal based on circular economy principles reflected in BC's Pollution Prevention Hierarchy and enshrined in BC's *Recycling Regulation*.**<sup>21</sup> In this way, the highest value circular economy strategies with the strongest embodied carbon and waste reduction outcomes are achieved by extending the life of existing goods.



*Figure 1: The Triage Approach to Home Removal*

By applying a triage approach, with appropriate financial incentives, municipal building policy can support developers and homeowners to assess the highest and best use of homes. When an existing home is slated for removal, it should first be assessed for possible infilling or retrofitting. The second option should be relocation and repurposing, which is viable approximately twenty per cent of the time. A home that does not qualify to be moved should then be assessed for deconstruction in order to salvage high-value building materials. Building materials that cannot be reused or recycled can still be recovered and used for energy, aggregate, or other useful purposes. Traditional machine demolition should be the very last option.

## 4. HOME RELOCATION

“ Home relocation is a well-established industry in BC and across Canada ... ”

Home relocation is a well-established industry in BC and across Canada led by experienced companies that have been moving homes for decades. Despite the challenges home relocation experts have experienced in recent years, some municipalities and permitting authorities are beginning to embrace this circular housing model and integrating circular principles into building policy. Applying a circular lens to home removal provides the opportunity for jurisdictions to lead by example as they encourage their communities to embrace new solutions that meet their housing and sustainability goals.

In this section, we describe how the practices of house relocation are conducted and some of the challenges faced in order to set the context for policy solutions featured in this report. We also share the stories and perspectives of solution providers providing house relocation services.



## SECURING HOMES

The first step in relocating a home is securing it. Publicly available municipal permit data, construction knowledge, mapping tools, and community outreach are key to identify eligible homes for relocation. Well-constructed, high-value homes are suitable for relocation and repurposing if they have a crawlspace or basement (so they can be jacked up) and if they are located near “move corridors”. Identifying homes slated for demolition early in the Building Permit/Development Permit application stage, as opposed to the Demolition Permit stage, is important to allow enough time to coordinate the relocation. In addition to the cost of home relocation often being less than a demolition, encapsulated HAZMAT materials are not disturbed during the relocation process, frequently saving owners / developers the additional costs of abatement. Not only is home relocation a financially preferable option to demolition, the process also maintains a safer atmosphere for crews and neighbors.



## RENEWAL HOME DEVELOPMENT

Renewal Home Development seeks to save, relocate, and repurpose high-value homes in coastal communities across the Pacific Northwest. Renewal aspires to save as many homes as possible from demolition and, ultimately, to create the world's largest community of relocated homes - a green, affordable, and alternative transportation hub in a coastal exurban community in the Pacific Northwest.

In their quest to repurpose homes and prevent unnecessary demolition, Renewal commonly encounters the myth that these buildings are old and not worth saving. Renewal estimates that, of the approximately 3,600+ homes destroyed across Metro Vancouver and Vancouver Island annually, 20% (720) are in good-to-excellent condition. Some of the single-family homes being bulldozed are charming, well-maintained character homes built over 80 years ago. Others are well-renovated bungalows and ranchers from the 1950s and 1960s. Some are brand new modern homes built within the last 10 years. Renewal carefully selects livable homes that have been well-maintained and have decades of life remaining. Before a home is relocated a hazmat and engineering assessment is conducted.

**“ENABLING HOME RELOCATION AND HOME REPURPOSING IS AN ENORMOUS ENVIRONMENTAL, DEVELOPMENTAL, AND ECONOMIC OPPORTUNITY. THESE HOMES DON’T NEED TO BE DEMOLISHED. WE CAN SAVE THEM, WE CAN RELOCATE THEM, AND WE CAN REPURPOSE THEM AND PROVIDE LOW-CARBON HOUSING IN COMMUNITIES WHERE SINGLE-FAMILY HOMES STILL MAKE SENSE. OUR MISSION IS TO HELP SHIFT THE PARADIGM AWAY FROM ‘DEMOLITION FIRST’ AND PROVE THE POSSIBILITIES OF SUSTAINABLE COMMUNITY-BASED DEVELOPMENT.”**

— Glyn Lewis,  
Renewal Home Development



*Renewal’s proof-of-concept: A Coquitlam low-rise rancher was given a new life in Gibsons, B.C., and now features solar panels, higher-efficiency windows and insulation, a lush garden, rainwater harvesting and new owners. Read more details at <https://www.renewaldevelopment.ca/bluemountainrancher>*



## MOVING HOMES

Once a suitable house is identified, the house relocation company works to establish a move corridor, and coordinate logistics for the relocation of the home. This stage involves coordination with multiple stakeholders, including local and provincial governments, infrastructure companies (responsible for trolley and utility lines), parks departments, port and transit authorities and barge companies – each who may require various permits, fees, access permissions or may be actively involved in the house moving process. At the destination community, land is acquired, local permits are approved, and a buyer is found for the repurposed home.

In urban centers where single-family home demolitions are common, moving a home can involve navigating overhead wires, narrow streets, street trees, and securing water access, which can be through a municipal park. Trees and tree limbs can block move corridors for house relocations, however, they usually only require trimming rather than full removal.

**MOVE CORRIDORS ARE PRE-PLANNED PATHWAYS THAT ARE WIDE AND UNOBSTRUCTED ENOUGH TO ALLOW THE SAFE MOVEMENT OF A HOUSE BY TRUCK, AND LATER BY BARGE, TO ITS DESTINATION COMMUNITY. COMMON CONSIDERATIONS INCLUDE TREES, BRANCHES, ROAD WIDTHS AND MEDIANS, OVERHEAD WIRES (E.G. ELECTRICAL, TROLLEY, OR COMMUNICATIONS), AND COASTAL ACCESS, WHERE RELEVANT.**



*Waste not, want not. Crowds observe a house relocation in their neighbourhood. This beautiful home would have otherwise been demolished.*

## NICKEL BROS HOUSE MOVING LTD.

“In the last twelve years, we’ve lost five house relocation companies in the Pacific Northwest region, due to municipal regulations restricting or prohibiting houses being moved. Some larger house relocation companies have turned entirely to industrial structural moving to remain solvent, and have abandoned house relocation altogether due to the rising costs and the sheer fatigue of fighting government regulations to do the right thing, and save these homes.”

- *Jeremy Nickel, President of Nickel Bros House Moving Ltd.*

Nickel Bros House Moving Ltd. has been successfully relocating homes in British Columbia and Washington State for more than 65 years. Nickel Bros staff liken the complex process of relocating a home to “putting a cork into a bottle.”

First, an eligible home is identified: typically, one that is physically accessible and has been well-maintained, with a structurally sound roof and envelope. Once the owner/developer is on-board, appropriate permits are secured and a buyer in a receptive municipality is found. Trained experts then carefully assess the building’s structure to determine how best to physically support it and plan a detailed route or “move corridor” to get the home from its existing location to its new owners. The move requires coordination with multiple partners to trim trees, if necessary, and safely detach or move electrical, communications, and trolley wires - and also to allow access to the shoreline. The company then applies specialized equipment to lift the house, transfer it onto a barge, and ship it to its destination.

Unfortunately, in recent years, the feasibility of relocating homes has greatly diminished as a result of municipal policy, tight development timelines, insufficient coordination and awareness, and increasing fees to manage infrastructure.

**THE CITY OF RICHMOND HAS CREATED A ONE-STOP DEMOLITION, MOVING OR SALVAGE PROGRAM THAT ENCOURAGES HOMEOWNERS TO RELOCATE OR DECONSTRUCT THEIR HOUSES. OWNERS CAN POST THEIR HOUSE FOR MOVE OR SALVAGE.**

**OWNERS ONLY NEED TO COMPLETE A FORM AND SUBMIT IT TO THE CITY. THROUGH THE CITY’S WEBSITE, HOMEOWNERS OR DEVELOPERS CAN LEARN WHAT IS REQUIRED TO MOVE A HOME, LIST THEIR PROPERTY AND APPLY FOR THE NECESSARY TREE REMOVAL, UTILITY DISCONNECTION AND TRANSPORTATION PERMITS.**

**RICHMOND’S PROGRAM COULD BE ENHANCED BY MAKING LISTINGS MANDATORY AND BY PROVIDING INCENTIVES TO HOMEOWNERS OR DEVELOPERS WHO PARTICIPATE; INCREASING THE NUMBER OF HOMES RELOCATED OR DECONSTRUCTED. VISIT [RICHMOND.CA/DEMOMOVEANDSALVAGE](http://RICHMOND.CA/DEMOMOVEANDSALVAGE).**

## REPURPOSING HOMES

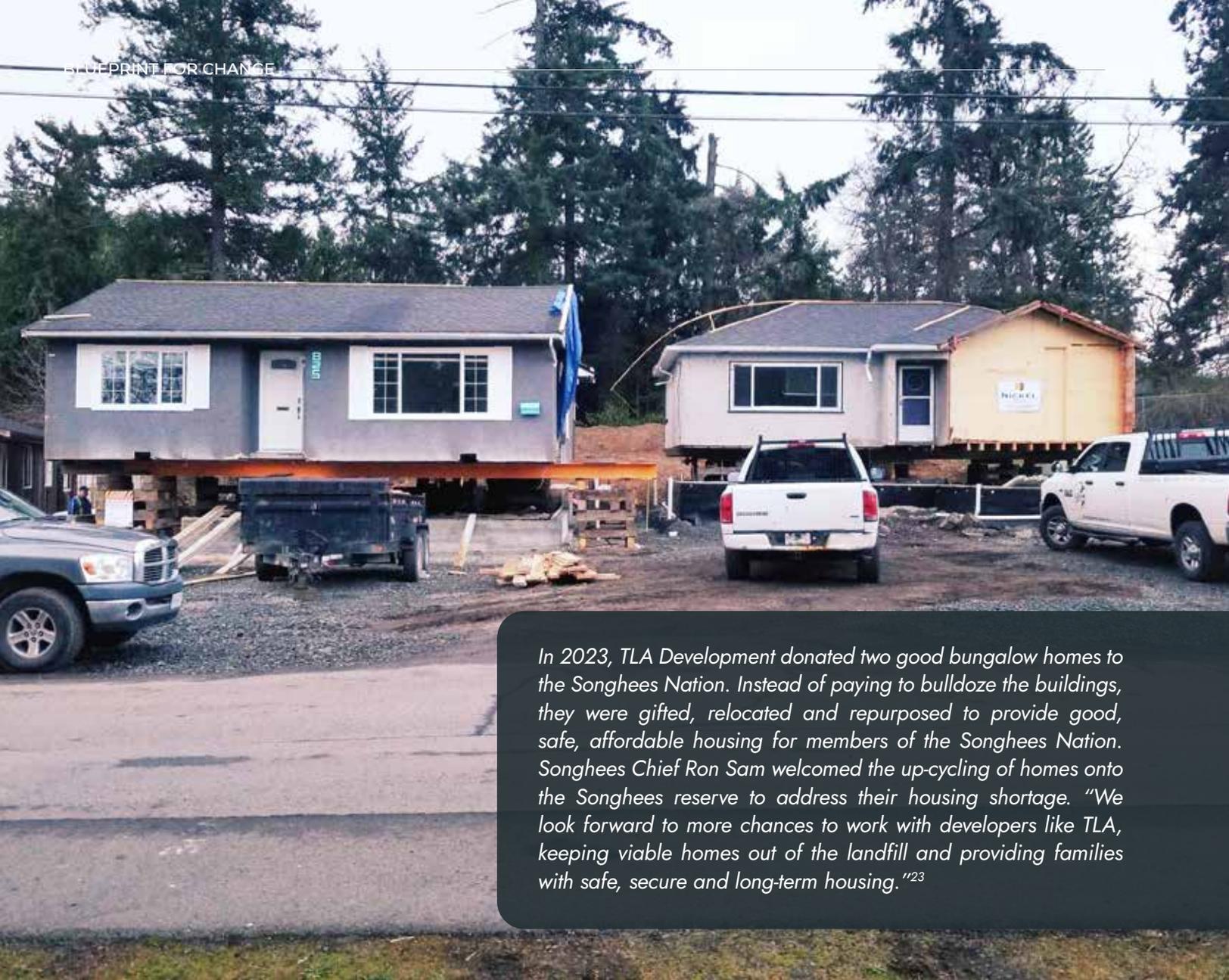
Once the relocated house arrives on the receiving property, a foundation is poured, it is connected to water and utilities, and (where feasible) retrofits are implemented, such as insulation upgrades, renewable energy, rainwater harvesting or other desired upgrades.

Compared to newly constructed houses, repurposed homes are considerably more affordable. Renewal estimates that the cost to relocate a home is approximately \$100 - \$125 / sq. ft., while the cost of new construction, particularly in remote coastal communities where labour and materials are more challenging to secure, can exceed \$450/sq. ft. The speed at which they can make housing available is also worth considering, as a high-value relocated home can be ready for occupancy in under three months.

In recent years, logistical and financial barriers have increased, impacting the feasibility of house relocation. Despite the obstacles, the result is well worth it. The new owners can enjoy a well-crafted, comfortable home at potentially less than a third of the cost of a newly constructed house - with the knowledge that they prevented its destruction. In addition, no demolition waste is generated, minimal new materials are needed (life safety upgrades and a new foundation), and carbon emissions associated with constructing a new home are avoided.

“ The speed at which they can make housing available is also worth considering, as a high-value relocated home can be ready for occupancy in under three months. ”

**THE BC BUILDING CODE 2018 TREATS MOVED HOMES AS EXISTING HOMES. “IT IS NOT INTENDED THAT THE BRITISH COLUMBIA BUILDING CODE BE USED TO ENFORCE THE RETROSPECTIVE APPLICATION OF NEW REQUIREMENTS TO EXISTING BUILDINGS OR EXISTING PORTIONS OF RELOCATED BUILDINGS, UNLESS SPECIFICALLY REQUIRED BY LOCAL REGULATIONS OR BYLAWS... RELOCATED BUILDINGS THAT HAVE BEEN IN USE IN ANOTHER LOCATION FOR A NUMBER OF YEARS CAN BE CONSIDERED AS EXISTING BUILDINGS, IN PART, AND THE SAME ANALYTICAL PROCESS CAN BE APPLIED AS FOR EXISTING BUILDINGS.”<sup>22</sup>**



*In 2023, TLA Development donated two good bungalow homes to the Songhees Nation. Instead of paying to bulldoze the buildings, they were gifted, relocated and repurposed to provide good, safe, affordable housing for members of the Songhees Nation. Songhees Chief Ron Sam welcomed the up-cycling of homes onto the Songhees reserve to address their housing shortage. “We look forward to more chances to work with developers like TLA, keeping viable homes out of the landfill and providing families with safe, secure and long-term housing.”<sup>23</sup>*

## FIRST NATIONS & NON-PROFIT HOUSING ASSOCIATIONS

Historically, the traditional model for moving homes has been predicated on an interested individual purchasing a home and having it moved to a desired location to inhabit. More recently, a new mechanism has been identified that could facilitate the relocation of homes for use by First Nations communities and Non-Profit Housing Associations.

Under charitable law, organizations that are considered “qualified donees” can issue official donation tax receipts for gifts they receive from individuals and corporations. Among the list of organizations deemed “qualified donees” are First Nations, municipalities, registered charities, and “registered housing corporations constituted exclusively to provide low-cost housing for the aged”. This makes it possible for a homeowner or developer to donate the home to a qualified donee and receive a tax receipt in return equivalent to its fair market value.

Renewal and Nickel Bros are piloting this donation model with First Nations communities and non-profit housing associations. Learn more about this donation model at <https://www.renewaldevelopment.ca/charitabledonations>.

“ THE DISTRICT OF NORTH VANCOUVER’S DEMOLITION WASTE REDUCTION BYLAW REQUIRES SINGLE-FAMILY HOMES BUILT PRIOR TO 1950 TO BE DECONSTRUCTED AND 3.5KG (2.6 BOARD FEET) OF LUMBER PER SQUARE FOOT OF FINISHED FLOOR SPACE TO BE SALVAGED. PROJECTS ARE REQUIRED TO PAY A \$15,000 DEPOSIT, WHICH IS REFUNDED IN PROPORTION TO THE AMOUNT OF LUMBER SALVAGED. THE DEPOSIT IS WAIVED ENTIRELY FOR HOMES THAT ARE RELOCATED. ”

## 5. DECONSTRUCTING HOMES

Many houses are ineligible for relocation and continued reuse due to age, structure, inaccessible location, infrastructure challenges, or unsuitability for continued habitation. For these homes, deconstruction is the next best option to preserve value and prevent demolition waste. Deconstruction is the piece-by-piece disassembly of a building and its materials, which are salvaged for reuse or recycling wherever possible.

Every deconstruction starts with a site visit. The building is inspected and a “salvage audit” is conducted to determine the value of components and materials that can be sold or re-used. After providing a quote and gaining the owner’s approval, deconstruction begins, which involves taking the building apart, layer by layer, to maximize material salvage. As the building is dismantled, materials are sorted and separated on-site to minimize waste. Common salvaged materials include finished goods (cabinets, appliances, fixtures and finishes), drywall, clean wood, treated wood, concrete, metal, glass, asphalt shingles, and plastics.

Once a building is deconstructed, the materials are sorted on site and prepared for transport. Some deconstructions can include full building components that are shipped for dismantling off-site. The reclaimed



*Deconstruction prevents waste by ensuring that building materials are properly sorted for reuse and recycling.*

wood is processed on or off site - de-nailed, cut to length, sorted by type - and prepared for resale and remanufacturing. The recyclable materials are taken to the appropriate depots. Intact building components such as windows, doors, and cabinets are donated to charity (Habitat for Humanity or The ReUse People) who sell it through their stores. A tax receipt is provided for the appraised value of the goods donated, which is usually substantial. The small amount of remaining waste is disposed of.

Cost is a key barrier as the up-front cost of deconstruction is typically higher than for demolition; recovering materials is more time-consuming and labour intensive. Fortunately, with a combination of provincial and federal tax credits, a homeowner or developer can ultimately save *more* by deconstructing a house than if they had pursued demolition, and feel good about the associated environmental and societal benefits. Recently, numerous municipalities in the Lower Mainland and Vancouver Island have introduced policies that prioritize deconstruction over demolition, but there is a great deal of variation across jurisdictions making it difficult for developers to navigate and most only apply to homes of a certain age and with respect to specific building materials.

Unbuilders Deconstruction and Heritage Lumber are vertically integrated companies disrupting the demolition and construction industry. Their vision is a construction industry in which deconstruction & remanufacturing replaces demolition & disposal. Founded in Vancouver in 2018, Unbuilders unbuilds buildings, salvaging almost everything, including Old Growth lumber, windows, doors, cabinets, fixtures, and appliances. In 2021, they diverted 3,135 tonnes of waste and recovered 250,000 board feet of lumber.

Heritage Lumber (HL) is a reclaimed wood broker and product manufacturer that acquires lumber from Unbuilders and the demolition industry. The lumber is sourced from buildings of all types and sizes - commercial, residential, barns, public buildings, etc. HL brokers the reclaimed wood through wholesale buyers, sells it from its Vancouver showroom or makes building products (flooring, cladding, beam wrap) and furniture from it. HL acquired Western Reclaimed Timber in September 2022 allowing it to manufacture in-house and expand its customer base. HL has over 550,000 board feet of reclaimed wood in inventory.

Unbuilders, together with other deconstruction companies, are reimagining a construction industry where usable building materials are valued and repurposed. As Adam often says: "It's not waste — it's just wasted." With the right policy environment and support, the deconstruction and materials re-use industry can grow exponentially, creating thousands of jobs, billions in value and reducing waste and embodied carbon impacts at the same time.



**IN A PARTICULARLY SUCCESSFUL EXAMPLE, UNBUILDERS ACHIEVED A 99% SALVAGE & RECYCLE RATE (BY WEIGHT) ON A 1930S VANCOUVER HOME. WOOD SALVAGED DIRECTLY FROM THE SITE WAS LATER MANUFACTURED INTO BARS, FLOORS AND TABLETOPS AT A LOCAL RESTAURANT.**

## 6. BARRIERS & POLICY RECOMMENDATIONS

To develop a circular economy in BC, demolition can no longer be the default option for existing buildings. Instead, it is imperative to transition to a model that prioritizes whole-building and materials reuse using house relocation and deconstruction. By doing so, we preserve the materials, embodied carbon, skilled labour and time that went into a home's construction, create affordable repurposed housing, salvage valuable materials for reuse and reduce waste going to landfill.





This section identifies the barriers to home relocation and deconstruction and outlines a set of preliminary policy recommendations to enable and scale these practices to realize their full potential. Further dialogue is required amongst house relocation and deconstruction businesses, policymakers, cities, developers, homeowners and infrastructure organizations to ensure the final policy choices advance benefits for all parties involved:

**DEVELOPERS** can reduce waste and carbon across the development process and support affordable housing in a timely and financially effective manner that generates a positive brand story.

**POLICYMAKERS** can help developers to prioritize house relocation and deconstruction while advancing their goals around carbon emissions reduction, waste prevention, historic preservation, housing affordability, parks management and tree conservation.

**HOMEOWNERS** can choose house relocation or deconstruction to preserve the sentimental and/or heritage value of their homes while saving on demolition costs.

**INFRASTRUCTURE ORGANIZATIONS**, including utility and telecommunications companies, can be involved in a manner that is cost efficient for them while honouring union and safety agreements, and maintaining service levels.

**NON-PROFIT HOUSING ORGANIZATIONS AND FIRST NATIONS** communities can access more affordable, high-quality housing faster.

## SECURING HOMES

As noted earlier, there are hundreds of homes in the Lower Mainland alone that are prime candidates for house relocation and hundreds more that could be deconstructed to salvage and reuse valuable resources. However, there are a number of barriers that make it challenging for house relocation and deconstruction companies to identify appropriate homes to save before they are torn down. The key barriers are **lack of industry awareness**, **unsupportive permitting schemes**, **tight timelines** and a **misalignment of incentives**.

Homeowners, realtors, and developers lack awareness of house relocation and deconstruction as feasible and desirable alternatives

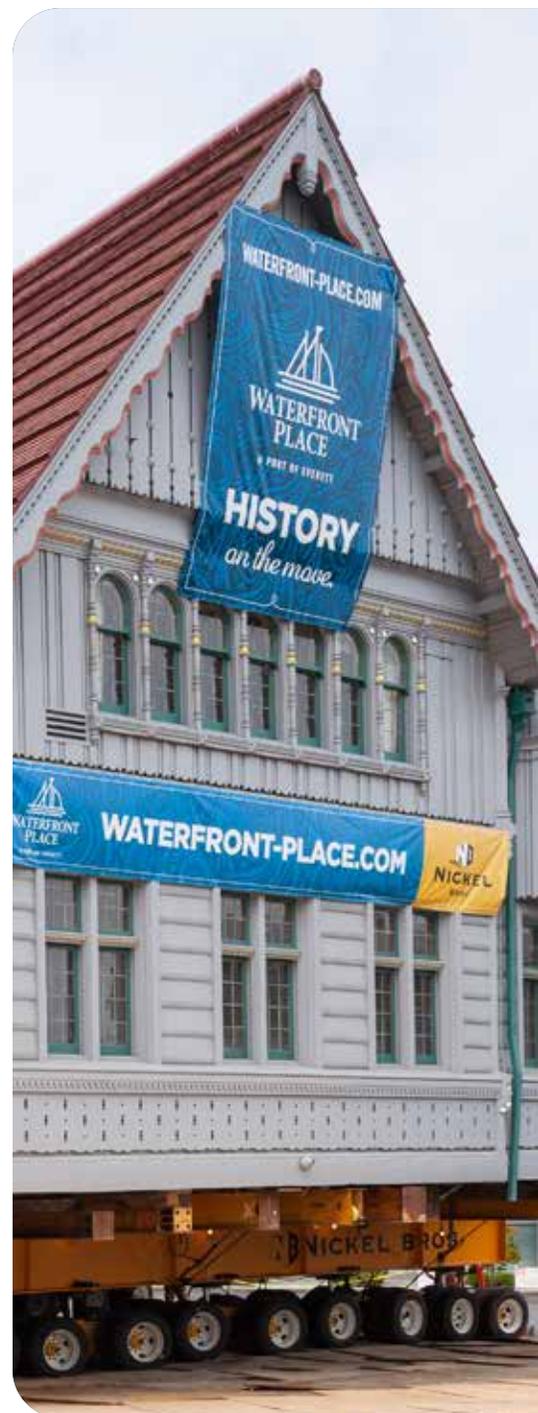
to demolition. Easy-to-access information is needed at key touchpoints throughout the development process.

Redevelopment and permitting timelines are tight. Once a new building is approved on-site, and a demolition permit for an existing building is issued, contracts are quickly awarded for the work. At this point, there is little recourse for the existing structure to be relocated or deconstructed. Many municipalities do not provide a demolition permit until a building permit is issued. Unfortunately, this does not leave enough time for the many steps in a house relocation to be worked out.

Finally, developers take the shortest and least costly path to prepare a construction site for a new build. Existing drivers, such as landfill tipping fees, point developers toward demolition. House relocation and deconstruction are newer practices competing with demolition whose adoption needs to be better supported with appropriate incentives.

The following are recommendations for amendments to current policy that support the *timely* identification of homes eligible for relocation or deconstruction at an earlier stage in the redevelopment process thus saving more homes from going to the landfill.

- **Implement outreach activities to raise awareness amongst homeowners and developers about home relocation and deconstruction at or before the development or building permit stage.** Provide information on municipal websites, in waste management educational materials, through public outreach, and with green demolition or demolition permits outlining the benefits and available incentives for *both* house relocation and deconstruction.
- **Introduce language in demolition and development permits requiring the applicant to state whether they have explored house relocation and deconstruction as options.** Add an opt-in option on the building permit application for an owner to publicly list an existing house as eligible for relocation or deconstruction.



VERIFIED INFORMATION ON THE ENVIRONMENTAL BENEFITS OF HOUSE RELOCATION AND DECONSTRUCTION COULD SUPPORT UPTAKE OF BOTH PRACTICES. THIS COULD BE ACHIEVED THROUGH COMPARING THE LIFECYCLE COSTS, WASTE AND EMBODIED CARBON FOR DEMOLITION VERSUS HOUSE RELOCATION VERSUS DECONSTRUCTION FOR A TYPICAL RANGE OF HOME TYPOLOGIES.



- **Introduce mechanisms to triage homes for relocation or deconstruction early in the permitting process.** Following the triage model detailed earlier in this report, require that the existing structure on site be assessed for suitability for relocation as a first triage choice, and then deconstruction, prior to approving a demolition or development permit. Consider a “Salvage Audit” at the Hazmat Material Report (HMR) stage where a structure is assessed, based on simple criteria, to see if it would be eligible for house relocation or deconstruction. Commensurately, develop a new role (i.e., a “Salvage Auditor”) with the requisite knowledge, and possibly certification, to evaluate buildings for relocation potential or salvage value.
- **Create an online database of available homes suitable for relocation and share this with the home relocation and deconstruction industry.**
- **Create Early Green Removal Permits.** Create a new “Early Green Removal Permit” that is decoupled from the building permit and issued earlier (six weeks for residential properties and six months for commercial properties) in order to afford house relocation and deconstruction companies enough time to save homes and valuable material resources. These longer timelines will make it possible to plan and execute a move earlier, which has multiple advantages including minimizing vandalism, saving developers anywhere from four to eight weeks in the redevelopment process and allowing maximum time to coordinate the move along “move corridors.” Early Green Removal Permits would create a powerful incentive for developers to seek relocation and deconstruction as an alternative to demolition. According to industry representatives, the savings realized on holding costs along would provide sufficient incentive to move or deconstruct a home, thereby avoiding the need for subsidies to kick start the transition.
- **Implement meaningful incentives to make home relocation and deconstruction financially attractive,** such as increasing allowable floor space (FSR) for new developments when the existing structure is relocated or deconstructed, not demolished.
- **Create a tiered fee structure for permitting that incentivizes house relocation and deconstruction.** Following the lead of many Lower Mainland and Vancouver Island municipalities, apply a refundable deposit onto “demolition permits” or “move-off permits” and “deconstruction permits” where they exist for house relocation and deconstruction respectively. Waive the deposit entirely for relocated homes. For

deconstruction, refund the deposit in proportion to the materials salvaged and reused.

- **Recognize and promote the provision of charitable tax receipts for house relocation to “qualified donees”.** Some salvaged building materials are eligible to receive a federal tax credit equivalent to fair market value, however, this practice is not commonly applied to house relocations.

TAX RECEIPTS FOR THE FAIR MARKET VALUE OF THE HOME CAN BE ISSUED TO THE HOMEOWNER FROM RECIPIENTS OF HOMES THAT ARE CONSIDERED “QUALIFIED DONEES” UNDER CHARITABLE TAX LAW, INCLUDING MUNICIPALITIES, SOCIAL HOUSING ASSOCIATIONS AND FIRST NATIONS, MAKING HOME RELOCATION A FINANCIALLY ATTRACTIVE OPTION.

## MOVING HOMES

Companies with decades of experience have mastered the art of moving homes. While the physical act of moving a home is straightforward, policy and operational barriers continue to undermine efforts and, in the process, counter civic objectives to reduce carbon emissions, waste and secure more housing in remote communities. These include the **absence of move corridors, tree policies that prevent home relocation, lack of accessible waterfront and challenges with the complexities of utilities infrastructure along move corridors (e.g., new fibre optic lines).**

In the absence of established move corridors, there is always uncertainty about whether a house can be moved and the necessary permissions granted. This translates into more time and resources required to complete a feasibility assessment before a decision can be made to move a home.

Tree policies established to preserve urban landscapes lack the flexibility to weigh the benefit of preserving lumber against the moving and replanting of trees and shrubs along street meridians.

Access to water via boat launches, municipal parks, and shorelines is a barrier to loading houses on barges for relocation to coastal communities.

Finally, the lack of formal communications channels and policies with utility and telecommunications companies make it difficult to plan home relocations within the tight timelines current permitting structures require.





The following are policy recommendations to support efficient and cost-effective house moves so that usable homes can be repurposed instead of being demolished.

- **Identify “move corridors” through collaboration with house relocation companies, infrastructure companies, and relevant municipal departments.** Establishing routes that have been approved in advance by the municipality, utility and telecommunication companies to accommodate house moves makes it easier to determine whether a house move is feasible and expedites the time involved in coordinating logistics.
- **Establish or amend municipal tree policies to be house relocation-friendly.** Allowing the trimming or replacement of a limited number of trees to save homes from demolition ensures that the trees and old-growth lumber in the homes can be preserved. Where appropriate, municipalities could consider house relocation exemptions from tree protection by-laws, under the condition that all removed trees be replaced.
- **Ensure waterfront access for house relocation.** Increasing collaboration and communication between municipal/city policy makers and parks departments to allow for nighttime use of these areas would increase corridor options for house relocations. Past projects have demonstrated that houses can be safely moved through public parks and onto barges via public water access with no damage to public spaces, sensitive marine ecosystems, or historically significant areas. Allowing the occasional use of public spaces to reduce demolition waste is arguably in the public interest and has shown strong public support in the past.
- **Engage telecom, transportation and utility companies.** Establishing specific procedures and protocols with organizations responsible for municipal infrastructure is critical that honour union, safety and other requirements and support participation in house relocation in a cost-effective manner while providing consistent service. Certainty about move-out corridors, the size of homes to be moved and the schedule are important for these infrastructure organizations.
- **Provide land where homes can be temporarily stored if there are delays at their destination location.** Providing interim storage for homes being moved will ensure development timelines at the current site are not held up by logistical delays or permitting wait-times at the destination site. This land is best provided in the origin community.

## REPURPOSING HOMES

Successful house relocation requires finding a willing buyer in a community that is supportive of house relocation and repurposing. Some municipalities in BC currently ban the relocation of a house to their jurisdiction, or require a relocated house to be brought up to current code. Another challenge is that relocated homes still need a building permit application for design of the new foundation and utility hookups. These can face delays, which means that homes can be demolished in the origin community before approval in the new community. These factors greatly reduce the feasibility of a house relocation. However, they also have simple solutions that, if implemented, would enable rapidly delivery of existing single-family homes.

- **Re-evaluate municipal policies that ban the relocation of homes to a region.** In the face of a provincial housing crisis and pressures to reduce carbon emissions and waste, municipal policies that ban the relocation of homes run contrary to climate change mitigation and waste reduction strategies, and undermine housing objectives.
- **Re-evaluate policies that require the existing building to be brought up to current code standards** (aside from necessary life-safety standards). As detailed above, the BC Building Code explicitly states that it is not intended to be applied to existing buildings or homes that have been relocated.
- **Create a “Move-On Permit”** that allows a saved home to be relocated to its destination property while the Building Permit application is still being reviewed (i.e., the design of the new foundation, footprint and utility hookups). With tight timelines this can save the home from demolition in its existing location.
- **Allow relocated house recipients to submit “foundation only” permits for faster review, using prescriptive foundation details.** Many municipalities already have prescriptive foundation details available for end-customer use. By separating out the foundation permits, review time can be shortened considerably as long as they meet prescriptive code requirements.





## DECONSTRUCTING HOMES

Policy supporting deconstruction has advanced considerably amongst many municipalities in the Lower Mainland and Vancouver Island. Nevertheless, policy is inconsistent across municipalities and a number of barriers persist discouraging wide-scale building deconstruction, including **lack of awareness, the absence of drivers to make deconstruction more attractive than demolition, storage space for salvaged materials** and **insufficient end markets for used building materials**.

Municipal policy mandating deconstruction does not exist in all municipalities. Where it does, it often misses homes from the 1960s and 1970s that could be deconstructed, focuses on specific materials only, or the policy does not apply to commercial properties. These are loopholes in some existing municipal deconstruction policy that need to be addressed to ensure material salvage occurs before recycling and landfill.

Physical and logistical constraints on the industry exist as well. During deconstruction, materials are sorted and sent for recycling or reuse. Due to space limitations, materials cannot always be separated on-site, and so secondary spaces for sorting are required. Additionally, for materials to attain their highest and best use, they typically must be shipped to separate salvage and recycling companies, requiring additional coordination and cost for delivery. To support deconstruction, centralized, low-cost locations for sorting and recycling could be implemented.

Additionally, end-use markets are underdeveloped for many building materials. The range of usable products from reclaimed wood, for example, is still being developed. In other cases, centralized infrastructure is lacking to recycle others materials like gypsum and asphalt to support their reuse.

The following are key recommendations that could support the growth of deconstruction as a mainstream practice:

- **Expand existing deconstruction policies to include consideration of all pre-1975 homes.** Most municipal deconstruction policies currently only cover single-family homes built prior to 1950 or 1960.
- **Expand deconstruction policies to include commercial buildings.** Commercial redevelopment projects can more easily cover the cost of deconstruction, and commercial buildings facing demolition are often storing the largest old-growth timbers.

- **Ensure material salvage rates are high enough to incentivize deconstruction.** Most municipal deconstruction policies require the permit holder to put down a refundable deposit, which is refunded in degree based on the project achieving specific salvage targets. While these policies are too recent to determine their efficacy, initial observations suggest that the deposit rates are not significant enough to incentivize deconstruction; some developers are choosing to absorb the deposit as a cost of doing business as usual.
- **Consider banning disposal of certain construction and demolition materials.** Imposing material bans can promote deconstruction provided facilities exist to receive the material. For example, banning gypsum disposal at landfill requires a building to be stripped by hand, which inadvertently encourages deconstruction. Banning materials in regions without suitable alternatives could result in illegal dumping so care needs to be taken when imposing bans.
- **Provide low-cost, centralized spaces for the sorting and storage of salvaged building materials.** To increase deconstruction efficiency and lower costs, governments can help by providing the industry with spaces where this work can be done. Space might be found at transfer stations, receiving yards or at new zero waste demonstration sites or circular hubs under development in some cities.
- **Support the development of re-use markets for key construction materials.** Cultivating markets for salvaged building materials is essential and can be supported in a variety of ways, including (1) assessing current capacity for CRD materials reuse and recycling to identify where more innovation and support is needed; (2) creating centralized outlets for the sale of salvaged building materials; (3) implementing minimum reuse requirements on new developments (e.g., e.g. five per cent of non-structural wood used in new construction must be sourced from salvage); and (4) conducting market research and support participation in innovation challenges to explore the development of construction and materials waste reuse. For example, the Guelph Circular Opportunity Innovation Launchpad (COIL) is running relatively affordable new single-family housing to be building secondary market demand and infrastructure for key construction waste materials.



THE CITY OF VANCOUVER'S NEW ZERO WASTE DEMONSTRATION SITE LOCATED ON THE FORMER MATERIALS RECYCLING YARD COULD PROVIDE A SPACE TO WEIGH AND SORT A RANGE OF MATERIALS FROM DECONSTRUCTED HOMES, INCLUDING DRYWALL, CLEAN WOOD, TREATED WOOD, CONCRETE, METAL, GLASS, ASPHALT SHINGLES AND PLASTICS.

## GETTING TO SCALE

Ensuring that house relocation and deconstruction become mainstream practices at scale will require a concerted effort involving a suite of policy options, research, innovation and economic development efforts. The following are four key systems-level recommendations for consideration:

- **Bring all parties together into a House Relocation Policy Accelerator.** Bring house relocation companies together with relevant municipal staff (e.g., sustainability, major developments, parks), with infrastructure organizations to discuss and problem solve all the major steps associated with house moves and come up with strategies that work for all parties.
- **Create a provincial policy guide for house relocation and deconstruction that is consistent across municipalities.** The current patchwork of municipal policies across the province makes it difficult to effect house relocation and deconstruction across municipal boundaries. A policy guide would increase consistency between municipalities and improve ease of collaboration between partners including transit authorities, infrastructure companies, house relocation, deconstruction, and waste management companies.
- **Create a sustainable building removal framework for any capital project funded by the province or local governments.** Whenever a development project, funded in partnership with the province or local governments, requires the removal of a building (schools, offices, homes, etc.) there should be criteria and financial support for the funding partner to assess retention, relocation and deconstruction, in that order, for best first use. Machine demolition should be the last option, not the first.
- **Create economies of scale and efficiency by orchestrating the relocation of groups of homes along key move corridors slated for intensification.** This would be supported by the policy accelerator and guide cited above and would serve to spread relocation fees across several projects. It would also require reconsideration of transportation policies that restrict or prevent the relocation of multiple homes at once.

## ENDNOTES

- 1 Metro Vancouver, *Metro Vancouver Housing Data Book* (December 2022), p.54, [http://www.metrovancouver.org/services/regional-planning/PlanningPublications/MV\\_HousingDataBook\\_2022.pdf](http://www.metrovancouver.org/services/regional-planning/PlanningPublications/MV_HousingDataBook_2022.pdf).
- 2 Metro Vancouver, *Construction & Demolition Waste Reduction and Recycling Toolkit* (Oct 2020), p.4, <http://www.metrovancouver.org/services/solid-waste/SolidWastePublications/DLCToolkit.pdf>.
- 3 *Fremont House Move Study* (2008). The values cited here are conservative. The actual number of trees depends of the size of trees considered. Alternatively, a 2,000 sq. ft. house is calculated to contain 100 trees worth of lumber for smaller, fast-growing “modern” trees measured at 20-inch caliper and 42-linear feet per tree (260 total linear feet per tree).
- 4 Metro Vancouver Demolition Waste Generation Rates Calculator at <http://www.metrovancouver.org/services/solid-waste/wte-and-disposal/construction-waste/Pages/Calculator.aspx>.
- 5 Statistics Canada, *Table 2: Population and population growth rate of census metropolitan areas in Canada, 2011 to 2016 and 2016 to 2021*”, <https://www150.statcan.gc.ca/n1/daily-quotidien/220209/t002a-eng.htm>.
- 6 B.C. to override local authorities to increase housing density” (Globe & Mail, 3 April 2023) at <https://www.theglobeandmail.com/canada/british-columbia/article-bc-to-override-local-authorities-to-increase-housing-density/>.
- 7 See endnote 1 above (Metro Vancouver, *Metro Vancouver Housing Data Book*), p.69.
- 8 Canada Mortgage and Housing Corporation, *Canada’s Housing Supply Shortages: Estimating what is needed to solve Canada’s housing affordability crisis by 2030* (CMHC, June 2022), p.19, <https://www.cmhc-schl.gc.ca/en/professionals/housing-markets-data-and-research/housing-research/research-reports/accelerate-supply/housing-shortages-canada-solving-affordability-crisis>.
- 9 Metro Vancouver, *Metro Vancouver 2040 Shaping our Future* (February 28, 2020), p.69 (Table A.2), <http://www.metrovancouver.org/services/regional-planning/PlanningPublications/RGSAdoptedbyGVRDBoard.pdf>
- 10 Chen et al., *Construction, renovation, and demolition waste in landfill: a review of waste characteristics, environmental impacts, and mitigation measures* (Environmental Science and Pollution Research, 2022), p.1.
- 11 Government of Canada, *Reducing municipal solid waste* at <https://www.canada.ca/en/environment-climate-change/services/managing-reducing-waste/municipal-solid/reducing.html>. This is considered a conservative estimate because sources estimate that the waste from the United States is around 600 million tonnes of waste with a population about 8.6 times that of Canada.

- 12 Mark Piepkorn, *Lumber by the Numbers* (Greensource), <https://continuingeducation.bnpmmedia.com/courses/areditorial/lumber-by-the-numbers/#:~:text=A%20common%20estimate%20is%20that,wood%20materials%2C%20such%20as%20sheathing.>
- 13 See endnote 1 above (*Metro Vancouver Housing Data Book*), p.54.
- 14 Metro Vancouver, *2021 Biennial Report – Integrated Solid Waste and Resource Management Plan* (Metro Vancouver, 11 January 2022), p.11, <http://www.metrovancouver.org/services/solid-waste/SolidWastePublications/2021ISWRMPBiennialProgressReport.pdf>.
- 15 Marc Lee et al., *Closing the Loop: Reducing Greenhouse Gas Emissions and Creating Green Jobs Through Zero Waste in BC* (Canadian Centre for Policy Alternatives, Vancouver, March 2013), <https://policyalternatives.ca/sites/default/files/uploads/publications/BC%20Office/2013/03/CCPA-BC-Zero-Waste.pdf>.
- 16 City of Vancouver, *2021 Annual Report for the Vancouver Landfill* (Engineering Services, 31 March 2022), p.7, <https://vancouver.ca/files/cov/2021-vancouver-landfill-annual-report.pdf>.
- 17 Edgar Hertwich et al., *Resource Efficiency and Climate Change: Material Efficiency Strategies for a Low-Carbon Future* (International Resource Panel, United Nations Environment Programme, Nairobi, 2020), p.15, [https://www.resourcepanel.org/sites/default/files/documents/document/media/resource\\_efficiency\\_and\\_climate\\_change\\_full\\_report.pdf](https://www.resourcepanel.org/sites/default/files/documents/document/media/resource_efficiency_and_climate_change_full_report.pdf).
- 18 Dahmen, J., von Bergmann, J., & Das, “Teardown Index: Emissions of Single-Family Homes in Vancouver” in B. Brownell (Ed.), *Examining the Environmental Impacts of Materials and Buildings* (IGI Global, 2020), pp. 64-101, <https://doi.org/10.4018/978-1-7998-2426-8.ch003>.
- 19 Community Energy Association, *Embodied Emissions Guide* (2023), <https://www.communityenergy.ca/projects/embodied-emissions/>.
- 20 OECD, *Global Material Resources Outlook to 2060: Economic drivers and environmental consequences* (OECD, 2022), p.10, <https://www.oecd.org/environment/waste/highlights-global-material-resources-outlook-to-2060.pdf>.
- 21 BC Government, *Zero waste and the circular economy*, <https://www2.gov.bc.ca/gov/content/environment/waste-management/zero-waste>.
- 22 *BC Building Code 2018*, Division A - Notes to Part 1 (Rev2), s.A-1.1.1.2(1) (Application to Existing Buildings), [https://free.bcpublications.ca/civix/document/id/public/bcbc2018/bcbc\\_2018dap1nr2](https://free.bcpublications.ca/civix/document/id/public/bcbc2018/bcbc_2018dap1nr2)
- 23 Darron Kloster, “Developer donates two houses instead of demolishing as land is prepared for condo project,” *Times Colonist* (Victoria, BC), March 3, 2023. Available at <https://www.timescolonist.com/local-news/developer-donates-two-houses-instead-of-demolishing-as-it-prepares-land-for-condo-project-in-esquimalt-6641437>



#200 - 1575 W Georgia St  
Vancouver, BC, Canada V6G 2V3

Phone 604 677 3126

eMail [info@light-house.org](mailto:info@light-house.org)

**[WWW.LIGHT-HOUSE.ORG](http://WWW.LIGHT-HOUSE.ORG)**