

Natural Resources Innovation Cluster

RESEARCH AND ANALYSIS

Roy Street Group

DIALOG®

NATURAL RESOURCES INNOVATION CENTER (NRIC)

JUNE 2024

ACKNOWLEDGEMENTS

We would like to thank the following individuals and groups whose insights and input provided a helpful roadmap for this report:

CIVIC AND INDUSTRY LEADERS: **Dorothy Bullitt,** community advocate; **Bec Chapin,** CEO and Co-founder, Green Canopy NODE; **Rob Dunn,** Vice President, Dunn Lumber Co.; **Kelvin Eder,** entrepreneur/construction expert; **Dan Fulton,** former CEO, Weyerhaeuser; **Luke Harrison,** President, Smallworks; **John Hempelmann,** Cairncross & Hempelmann; **Paul Jarkiewicz,** Executive Director, Port of Port Angeles; **David Leon,** Vice President, Real Estate, Forterra; **Caleb McMahon,** Director of Economic Development, Port of Port Angeles; **Bob Moore,** board member, Habitat for Humanity, Seattle-King County; **Dan Murdoch,** Senior Director Operations, Forterra; **Andrea Newton,** Executive Director, Urban Land Institute Northwest; **Roy Nott,** Natural Resources Innovation Center (NRIC) board member and General Manager, Richland Paper; **Peter Orser,** housing advocate and former President and CEO, Weyerhaeuser Real Estate Company; **Katherine Pelz,** owner, Katherine Pelz Design; **Charlie Roberts,** entrepreneur and ADU owner; **Colleen Robinson,** CEO, Habitat for Humanity of Clallam County; **Elizabeth Scallon,** Director of Incubation Enablement, HP; **Randy Schillinger,** CEO, Hampton Lumber; **Lindsey Schromen-Wawrin,** council member, City of Port Angeles; **Patrick Sullivan,** CEO, Habitat for Humanity Seattle-King County; **Don Tucker,** entrepreneur and ADU/park property owner; **Russ Vaagen,** CEO, Vaagen Timbers.

NATURAL RESOURCES INNOVATION CLUSTER AND COMPOSITE RECYCLING TECHNOLOGY CENTER (CRTC) ACLT ADU ADVISORY GROUP: **Colleen McAleer,** Executive Director, Clallam Economic Development Council; **Ted Sturdevant,** Director of Strategic Initiatives, Center for Sustainable Infrastructure; **Dan Underwood,** Economist, Olympus Consulting; **Una Wirkebau,** Recompete Plan Coordinator, Clallam County; **Cindy Brooks,** Executive Director, EDC Team Jefferson; **Dave Walter,** CEO, Composite Recycling Technology Center. Additionally, **Chris Miller,** Composite Recycling Technology Center, and **Max Crothers** from the Building Innovation Center.

ROY STREET GROUP TEAM: **Roy Mann,** Director; **Caitlin Sullivan,** Lead Analyst; **Christina Gotuaco,** Infographic Designer; **Danny Steiger,** Cost Estimator (President & CEO, Lumber Traders, Hartnagel Building Supply); **David Henry,** Financial Advisor (Senior Vice President, First Federal Bank); **Jennifer Lozada,** Graphic Designer, InsideOut Solutions. Architectural Design and CLT experts from DIALOG Design: **Amit Price Patel,** Partner; **Vance Harris,** Partner; **Ryan McClanaghan,** Associate.

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INTRODUCTION

THE CLALLAM COUNTY ECONOMIC DEVELOPMENT COUNCIL serves as the fiscal sponsor for the Natural Resources Innovation Center. Clallam EDC was awarded a contract through the Washington State Department of Commerce's Securing Federal Funding Initiative (SFFI) to perform market, regulatory, financial, and supply chain analyses relative to a proposed Advanced Cross-Laminated Timber (ACLT) Accessory Dwelling Unit (ADU) which uses thermally modified timber panels. Although the initial scope for this analysis contemplated a 1,000 square foot modular dwelling in new condition (C1) and a quality of construction rating of Q4, subsequent meetings with the team led to a broader range of sizes for review: 400 square feet (SF)–600SF, 601SF–800SF, 801SF–1,000SF, and 1,001SF–1,200SF. This report is primarily referring to detached ADUs rather than built-in or basement ADUs.



MARKET ANALYSIS

Advanced Cross-Laminated Timber (ACLT) ADU and tiny home comparison in pricing and key attributes.



Value of Homes in the 400SF–1,200SF Range

To understand potential markets for ADUs in Clallam and Jefferson Counties, rental and sales data were analyzed throughout the North Olympic Peninsula,[1] the I-5 corridor, and in British Columbia. Comparing the estimated cost of stick-built construction with the sale and rental value of homes in the same size range, construction is predictably higher in areas where profit margins are greatest and where regulations have been enacted to incentivize smaller ADU home building.

Over the last five years, Seattle has dominated the region in construction and sale of detached Accessory Dwelling Units due primarily to programs which facilitated building, such as, the removal of the owner occupancy requirement, allowance of up to two ADUs per lot, and the introduction of pre-approved plans permitted in as little as six weeks which is a fraction of their typical time.

In the last ninety days, 38% of the stand-alone homes sold in Seattle 1,200SF and under were new construction.[2] By comparison, Port Angeles had 3.6% over the last two years. **The passage of House Bill 1337 in 2023, and forthcoming adoptions during the next periodic update to the Growth Management Act** (2024 and 2025 for the counties referenced), **will change the regulation landscape on ADUs throughout the state,** allowing the Seattle-style small home growth to expand beyond city limits.

The current cost of stick-built construction using a pre-approved plan (reduced architectural and engineering cost, faster track to permit) in Seattle is about $350/SF. When this can be done on an existing lot, there is no cost to acquire the land. Anecdotal evidence suggests that, depending on the lot split, there may be up to a 10% loss in the value of the original house when

[1] These data were over 90-720 days, depending on quantity of data points available.

[2] Wages and demand for the Seattle Metro Area have played a part in this growth. Just east of Seattle, housing prices are even higher in Kirkland, Bellevue, Redmond, and Sammamish.

an ADU is added in the back or side yard, and each is sold separately as part of a small (two to three) unit condo complex. However, when looking at sale price per square foot in Seattle, with a median of $692/SF and high of $858/SF, a developer or homeowner is looking at a potential profit margin of between $342K and $508K on construction of a 1,000SF backyard cottage, Seattle's current maximum size.

Developers and investors have shown a clear preference for the pre-approved plans that maximize the allowed square footage for the ADU. The Schooner ADU by FiveDot Architects was the first 1,000SF plan that the city approved and has been built throughout the city. As more ADU plans were permitted, the city increased its pre-approved plan-set base. The Erez ADU by YenDesign is an emerging favorite among developers, due to the addition of a garage, additional bedroom and bathroom.[3]

[3] Though not an exhaustive list, these listings show some of the ways builders have customized plans: Erez ADUs, Schooner ADUs.



Victoria, B.C.

From a population perspective, the North Olympic Peninsula's largest near neighbor is Victoria, B.C., with 95,911 residents, almost five times that of Port Angeles. Additionally, Victoria, B.C.'s current metro area population is 402,000, nearly four times the combined populations of Clallam and Jefferson Counties. The Peninsula's next largest near neighbor to the east in Washington is Oak Harbor with 24,622 residents as of June 2024. Not surprisingly, Victoria, B.C.'s ADU market is growing rapidly, prompted in part by government incentives for forgivable loans. **Here is a glimpse at market performance in the four ADU size ranges:**

	400–600SF	601–800SF	801–1,000SF	1,001–1,200SF
Price/SF (listings)	$917	$0	$717	$591
One-Bed Rental	$1,223	$1,314	$1,314	$1,679
Two-Bed Rental	$1,241	$1,369	$1,606	$1,643
Three-Bed Rental	$0	$1,405	$1,643	$1,898

As a tool to keep the borders wide open for innovation and business, ***the Port of Port Angeles recently established a Foreign Trade Zone which excludes business partners from duties and taxes.*** *The Foreign Trade Zone applies to the whole of Clallam County and may also include a magnate zone for Jefferson County.*

ADU Condo Case Study: 13528 3rd Ave NW, Seattle

"ADU Condoization" has become the most popular investment strategy in Seattle Real estate. In less than 12 months, **one home buyer netted $495,500.** Here's how. After purchasing the original home for $720,000 in July 2023, the new owner fully renovated it with new siding, roofing, windows, insulation, wiring, and plumbing.

During the renovation process, a two-unit condo complex was created on the 8,492 SF lot so a new ADU and the existing home could be sold separately. The owner then constructed a 1,000SF ADU using Yen Design's Erez Plan with 3 bedrooms, 2.5 baths, and a one-car garage for a cost of $325,000.

The newly renovated home sold for $1,200,000 in May 2024,[4] and the new ADU sold for $833,500, creating a total sales price of $2,033,500. After netting out acquisition, remodel, and sales costs, this translates into $495,500 of gross profit for the seller and a **32% Return on Investment.**

The addition of a ADU to an existing lot in Seattle makes sense to a developer or investor for resale, as well as for a homeowner either as investment for sale or as a rental. Working off a stick-built price of $350/SF, even a fully-financed 1,000SF ADU could generate over $1,000 per month in instant cashflow for the property owner as a long-term rental (depending on location). A Schooner in Ballard, for example, easily rents for $3650/mo, substantially higher than the median rental estimate for the 1,000SF–1,200SF homes in Seattle, and representing a 12.5% cash-on-cash return—higher than any other investment in the city offers.

[4] Taxes, utilities, and loan costs/interest were not included in this scenario since those will vary greatly based on hold time and buyer scenarios.



1 *Original Home*

2 *Renovated Home*

3 *New ADU*





Original Home Purchase	$720,000
Renovation Cost and Selling Cost	$445,000
New ADU Costk and Selling Cost	$373,000
TOTAL COSTS	**$1,538,000**
Renovated Home Sale	$1,200,000
New ADU Sale	$833,500
TOTAL SALES	**$2,033,500**
NET GAIN FROM INVESTMENT	**$495,500**

$$\frac{\text{Gain from Investment} - \text{Cost of Investment}}{\text{Cost of Investment}} = \text{Return on Investment (ROI)}$$

ROI = 32%

Momentum and Reluctance in the Seattle Metro Area

In Seattle, Washington, the ADU market is growing faster than any metro area in California. In 2022, the Seattle metro area saw 2,254 applications for ADU permits. Nonetheless, fewer than one-third of ADUs that submit a permit application get constructed. This may represent an opportunity for an easy-to-construct ADU that could be manufactured locally.

One surprise is the lack of take-up in the community. Bec Chapin, CEO and Co-Founder of Green Canopy NODE, emphasized selling to the ADU consumer market can be tough. The company sent out a poll to prospective customers: 100 people signed up in 24 hours, 10 sites were usable, 3 of those 10 could finance, and none were completed.

Another Seattle-based team worked to create a GIS toolkit and a website that walked customers through the cost implications and how equity could be recaptured in the home. Although ADU economics work, the scariness for prospective customers presented a real challenge.

> *A local ADU manufacturing team needs to consider ways to manage the risk associated with something different. Without an adequate sales pitch, there is no incentive to change. People know what they know. For example, there must be 10% less cost and 25% more efficiency schedule-wise.* — *PATRICK SULLIVAN, CEO OF HABITAT FOR HUMANITY SEATTLE-KING COUNTY*

Comparing the Seattle and Port Angeles Markets

The Port Angeles City Council recently took action to adopt House Bill 1337 ahead of schedule and introduced pre-approved ADU plans. Based on this, one might expect the same sort of results in the Seattle market. **Even though Port Angeles has passed quite a few regulatory incentives (including fee waivers for infill housing), these incentives have no impact on the price of construction per square foot in Port Angeles, which is similar to Seattle's.** In the past two years only four homes sold in the City of Port Angeles that were built after 2019. The highest price/SF was a home on Orcas Street, which was built as a short-term rental/Airbnb on a lot that had been short-platted so the cost of land was low. Even so, **the resulting profit was $75k, which is substantially lower than what a developer would make in the Seattle-Metro area.**



Rental income suffers a similar outcome. In the City of Port Angeles, a newly constructed 1,000SF ADU can rent for $2,200. Financed at today's interest rates (7.125%), this is a 7.5% cash-on-cash return and would be cashflow-negative in the initial years of long-term renting. The limited number of homes both for sale and rent in the smaller square-footages (400SF–600SF, especially), as well as the long period of time needed to achieve this small amount of data (two years for sales, four years for rental) makes this somewhat unreliable. Community estimates for the one-bedroom, 480SF pre-approved ADU released by the city late last year is a rental of $1,200–1,500/month. The single-story, stand-alone design is appealing for individuals and couples, with the small space being perfect for workforce housing, downsizing or seasonal residence.

Comparisons to Clallam County and Beyond

Looking elsewhere in Clallam County, the market in Forks will see additional challenges due to lower housing values and lower rents. Sequim offers a similar market to Port Angeles, as does unincorporated Clallam County, though the high sale price and price/SF numbers are somewhat skewed due to small waterfront (lake or beach) cottages.

Expanding to other parts of the Olympic Peninsula, Jefferson County and Port Townsend present a particularly interesting opportunity. **With property prices notably higher in Port Townsend, there is an opportunity for developers and investors to build homes for resale at a profit.** Rents are statistically quite similar to those in Port Angeles but building a rental unit on currently owned land (for landlords) will still yield better return than acquiring a new rental. What makes Port Townsend uniquely attractive is that the aesthetic tends towards Northwest Contemporary (use of natural wood, clean lines, integration with nature) and lends itself to an easy adoption of the visual appeal of an ACLT interior. Port Angeles' smaller homes, by contrast, tend to be either vintage homes or renovated/new build with builder-grade finishes, with one notable exception of the short term rental (STR) on Orcas Street.

Homes in the 1,200SF and under were found throughout Jefferson County, though zero sales were found in the past two years in Quilcene. With the exception of a few sales in Nordland and Port Hadlock, many of the Port Townsend sales were in rough condition or off-grid making them unsuitable comparative sales.

PORT TOWNSEND'S SMALL HOMES

Island County, Bellingham and Whatcom County maintain a similar aesthetic to North Jefferson County. **One common thread among these communities is that they tend to attract educated, artistic, socially minded and well resourced residents.** Port Townsend and South Whidbey are both high on the list of retirement destinations for artists with resources to afford a home there.

ISLAND COUNTY SMALL HOMES

Elsewhere in the region, Bremerton/Kitsap County and Tacoma/Pierce County, there is a high demand for workforce housing coupled with suppressed new home construction 1,200SF or smaller. Of those four markets, Tacoma was the only one that showed new homes (built in the past 5 years) sold and it represented 1.2% of total sales of homes under 1,200SF. In looking at homes currently on the market in these regions, Lennar has developments in Port Orchard and Graham of their "Francis" home (1,047SF, 3 bed/2 bath) which sells for $399,950 and $424,950 respectively (requiring a $75-80K/year income to purchase with 5% down). This suggests that there is both a need for workforce housing and a profit to be made if houses can be built at scale, saving time and cost on infrastructure.

		400–600SF	601–800SF	801–1,000SF	1,001–1,200SF
PORT TOWNSEND	Numbers Sold	2	8	8	21
	Built Post 2019	0	1	1	1
	Average Bedrooms	1	1.375	2.125	2.52
	Mode Bedrooms*	1	2	2	3
	Low Price	$405,000	$394,000	$354,000	$350,000
	High Price	$450,000	$615,000	$522,500	$730,000
	Median Price	$427,500	$435,050	$427,500	$525,000
	Avg. Price/SF	$936	$698	$485	$502
	High Price/SF	$1,148	$935	$622	$648
	Rental Price	$1,365	$1,388	$1,782	$2,178
BREMERTON	Numbers Sold	3	8	22	27
	Built Post 2019	0	0	0	0
	Average Bedrooms	1	1.625	2.136	2.85
	Mode Bedrooms*	1	2	2	3
	Low Price	$232,500	$251,000	$299,000	$284,000
	High Price	$232,500	$450,000	$560,000	$615,000
	Median Price	$232,500	$275,000	$392,125	$421,250
	Avg. Price/SF	$581	$507	$440	$385
	High Price/SF	$581	$622	$583	$513
	Rental Price	$1,295	$1,800	$2,029	$2,356
BELLINGHAM	Numbers Sold	2	3	10	20
	Built Post 2019	0	0	2	0
	Average Bedrooms	1.5	2	2.1	2.5
	Mode Bedrooms*	1, 2	1,2,3	2	2,3
	Low Price	$300,000	$303,000	$385,000	$380,919
	High Price	$504,550	$525,000	$720,000	$880,000
	Median Price	$402,275	$385,000	$498,750	$551,250
	Avg. Price/SF	$728	$566	$605	$552
	High Price/SF	$543	$492	$474	$420
	Rental Price	$1,691	$1,750	$1,868	$2,300

*Most common number

Jefferson County and Port Townsend present a particularly interesting opportunity. With property prices notably higher in Port Townsend, there is an opportunity for developers and investors to build homes for resale at a profit.



Cost comparison and return on investment of ACLT ADU units to similar conventionally built units.

When comparing ACLT construction to stick-built, including the total cost to construct a dwelling unit, some of the costs will remain fixed and some are variable. Whereas costs such as toilets, appliances, lighting and cabinets remain fixed, costs such as framing materials and labor, siding, insulation, drywall and painting will vary greatly between ACLT ADUs and stick-built.

The following spreadsheet can be used as a jumping-off point for the CRTC to evaluate the cost of construction for a 1,000SF ACLT ADU and how it compares to stick-built.

ADU CONSTRUCTION BUDGET AND SCOPE | SEATTLE, WA | PRODUCT: 3 BED, 2.5 BATH, 1000 SF WITH GARAGE

CONSTRUCTION PLAN	DETAILED DESCRIPTION	EST. COSTS	PRICE PER SF
Architect, Plans, Engineering & Permits		**$8,918**	**$8.92**
Insurance		$500	$0.50
Survey		$4,000	$4.00
Site work (clearing, excavation, clean-up)		$17,000	$17.00
Footings, Foundation & Slab	Foundation per plans	$30,000	$30.00
Dump Fees		$1,500	$1.50
Utilities	Private water meter, new electrical, meter base, sewer	$35,000	$35.00
Honey Bucket	**Rental for duration of job, 8 months total**	**$1,700**	**$1.70**
Roof Trusses	**Manufactured trusses per plan**	**$7,500**	**$7.50**
Framing, Material and Hardware	**Per plan, lumber and hardware**	**$20,000**	**$20.00**
Roofing, gutters and downspouts	30 year composite architectural shingles	$7,100	$7.10
Framing Labor	**Includes window install**	**$17,500**	**$17.50**
Windows, Exterior Doors, Garage Door	Windows and exterior doors. Materials only. Install included with framing labor (BLACK color). Front Door and French doors.	$14,000	$14.00
Plumbing + Fixtures	Rough in, trim	$12,700	$12.70
Electrical + Fixtures	Rough in, trim	$22,000	$22.00
HVAC	Vent out all bath fans, range hood, Ductless mini splits- 4 heads	$18,500	$18.50
Siding - Materials & Labor	**Per Plan**	**$14,000**	**$14.00**
Driveway		$5,000	$5.00
Exterior Painting	2 colors	$3,500	$3.50
Insulation	**Anywhere needed—attic blow in with flat trusses, R38 abtt with sloped ceiling**	**$4,500**	**$4.50**
Drywall / Tape / Texture	**All new drywall, light orange peel texture**	**$13,000**	**$13.00**
Cabinets + Counters + Installation	Kitchen and bath cabinets	$9.500	$9.50
Tile + Shower Doors + Installation	Tile one full bath with shower. Tile 2nd bathtub and floor. Powder and utility get LVP	$8,300	$8.30
Interior Doors / Millwork - Materials only	10 interior doors, standard trim out 1x3/1x4 and 1/2x4 baseboard, grab rails, etc Includes window trim	$5,000	$5.00
Finishing Carpentry Labor, Finish Hardware	Install doors, millwork, cabinets, appliances, finish hardware (doorknobs, stops, mirrors, bath accessories, brackets, mailbox, etc.)	$8,000	$8.00
Interior Painting		**$4,500**	**$4.50**
Landscaping and Fencing		$20,000	$20.00
H20 Heater	Tankless	$3,000	$3.00
Flooring	Whole house LVP. 14 stair treads. Approx 1000sqft materials w/ waste. $4/sqft allowance	$6,500	
Appliances	Basic appliance package	$4,000	$4.00
Cleaning Fees – including windows	Professionally cleaned, including interior and exterior windows	$1,000	$1.00
Contingency		$22,000	$22.00
TOTAL		**$349,718**	**$350**

Bold green text indicates variable cost items which differ for ADUs versus conventional stick-built construction.

ADU Return on Investment

Return on investment is based on estimated capital cost for purchasing and placing ACLT ADU units relative to market rental rates and resale value.

The return-on-Investment calculation below is based on market information received from experienced ADU owners on the North Olympic Peninsula. Various aspects of the overall cost structure will change in each instance. This calculation assumes no rent (i.e., buying the land, permitting and placing the structure, and then selling the land and structure). Existing owners who have a low land basis would be able to produce a higher Return on Investment.

Land		$100,000
Manufactured/ADU Structure 1,200SF		$90,000
Sales Tax, Transport, Blocking, Skirting, and Utilities	+	$50,000
TOTAL COST OF INVESTMENT		**$240,000**
GAIN FROM INVESTMENT		**$375,000**

$$\frac{\text{Gain from Investment} - \text{Cost of Investment}}{\text{Cost of Investment}} = \text{Return on Investment (ROI)}$$

ROI = 56%



Who Wants ACLT?

If ACLT can enter the market at a price that is the same as stick-built construction or lower, but with a faster construction timeline, then the value speaks for itself. However, if the price is not competitive with stick-built, the market narrows, and education becomes an even more essential component. Among the values of ACLT Construction are:

- **Unique, modern style**
- **Carbon capture**
- **Increased energy-efficiency**
- **Increased durability over stick-built**
- **Faster construction**

These are values that would appeal greatly to communities in Port Townsend, Vashon, South Whidbey and other areas where a higher concentration of eco-minded, well-resourced people[5] with artistic sensibilities can be found. These could be guest cottages (used as Airbnb rentals, short-term rentals, or long-term rentals), beach or mountain cabins, or even art studios in these communities.

[5] As a point of note, where this discussion has been primarily centered around the values of ACLT as an ADU or small home product, ADUs do have a market in luxury homes as well. That market is highly customized, so the CRTC would need to be able to work with architects and engineers to create custom panels that suit the build. For design inspiration: Fourteen homes where cross-laminated timber creates cozy interiors (dezeen.com).

Price point at which ACLT ADUs become competitive in the marketplace

There is wide variation in CLT ADU and kit home manufacturer pricing, thus making it difficult to identify the competitive point of entry. In the analysis above, **the most competitive pricing for ACLT ADUs is in the small (400SF–600SF) range if basing the decision off the median price of home sales in Port Angeles, Washington.**

ACLT ADU COMPETITOR PRICING

COMPANY	CONSTRUCTION TYPE	COST
Backcountry Hut	CLT	$166,000 CAD/$121,180 USD for 185SF
Boxable – The Casita	Light Wood	$60,000
Bungalow in a Box	Structural Insulated Panel (SIP)	—
EcoHouse Mart	CLT	$60,950 for 620SF Wall only
Kanga Room Systems	Light Wood	Shell $68,000 for 432SF
kitHaus	Aluminum frame + SIP	$128,000 for 490SF
Masaya Homes	Teak	$190,000 for 600SF
Mighty Small Homes	SIP	—
MyKabin	SIP	—
PrefabADU	Panelized Kit	—
Shelter Kit	Light Wood	$44,000 for 432SF
Tieton Cabins	CLT	—
Zip Kit Homes	Panelized Shell	$49,000 for 600SF

PORT ANGELES HOME SALES AND RENTAL PRICES

	400–600SF	601–800SF	801–1,000SF	1,001–1,200SF
Numbers Sold	2	16	36	56
Built Post 2019	0	0	0	4
Average Bedrooms	1.5	1.75	2.11	2.55
Mode Bedrooms*	1.2	2	2	3
Low Price	$223,000	$189,900	$229,000	$250,000
High Price	$309,000	$357,000	$400,000	$451,000
Median Price	$266,000	$295,000	$300,000	$349,475
Avg. Price/SF	$460	$405	$341	$326
High Price/SF	$543	$492	$474	$420
Rental Price	$1,030	$1,442	$1,854	$2,266

*Most common number

ADU Tradeoffs

	MORE PRECISION/ QUALITY	EASIER TO SELF-BUILD	DURATION OF CONSTRUCTION: MORE SPEED MORE CONSTRUCTION IMPACT	LESS COST	MORE WOOD MASS/ CARBON CAPTURE
Stick-Built Conventional	1	3	1	4	1
Light Wood* Prefabricated	1	2	1	4	1
Light Wood Volumetric	3	1	3	2	1
CLT + Light Wood	3	2	2	2	3
CLT Panels	3	1	2	1	4
ACLT	3	2	2	1	3
CLT Volumetric	3	1	3	0	3

RANKINGS	Poor	Fair	Good	Very Good	Excellent
Number Value	0	1	2	3	4

*See “Light Wood” in glossary.

New Processes vs. Established Methods

Stick-built and light wood frame construction in the Pacific Northwest of the United States and Canada is the predominant construction method for low and mid-rise residential buildings, particularly in the construction of single-family homes, small apartment buildings, and ADUs.

When considering newer modular and prefabricated wood construction types, these more novel processes must overcome the status quo of stick-built frame and market/consumer familiarity with this tried and tested way of building. New advanced construction types like CLT, ACLT, and prefabricated/volumetric construction bring great promise for providing high-quality housing at scale.

This study was prepared using DIALOG's extensive real world project experience having designed and delivered buildings in stick-built construction, light wood prefabricated panels, light wood volumetric, CLT and light wood frame, and CLT panel construction.

STICK-BUILT FRAME



LIGHT WOOD PREFAB



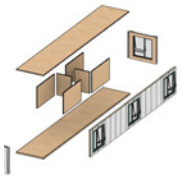
LIGHT WOOD VOLUMETRIC



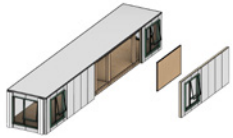
LIGHT WOOD AND CLT



CLT PANELS



ACLT



CLT VOLUMETRIC



Key Takeaways from the Analysis

Panelized and prefabricated construction is more successful when greater scale is introduced through increasing the volume of construction, repetition and standardization. It is also more feasible for multi-story or larger buildings.

Off-site construction (e.g. panelized light wood frame, light wood frame volumetric, CLT and light wood frame, CLT panels, ACLT, CLT volumetric) **has a series of trade-offs associated with it:**

- faster and quieter to install in the field
- currently there are limited suppliers compared to commodity building components like wood studs and plywood
- often more expensive in current market conditions
- CLT performs better in fire situations and can be used as a firewall allowing zero-lot line construction to be possible
- can perform better acoustically than stick-built frame if designed and built properly
- digital technologies incorporated in these construction processes can allow mass customization and support variation in building designs. Buildings can be fully productized.
- requires a higher level of construction skill to install
- generally higher quality than on-site construction

Some of these challenges to mass timber construction can be mitigated by:

- more companies producing CLT to de-risk the supply chain
- CLT manufacturers have an opportunity to be direct-to-consumer but need to create designs with building-as-product
- decreasing cost of CLT for the consumer
- more innovation in CLT panel types by manufacturers optimized for small structures like ADU's (e.g. thinner panels, different layups, etc.)
- more CLT projects will also help increase builder/trade familiarity with this construction type
- incentives for CLT construction from the public sector
- fast-track approvals for CLT construction from the public sector



Photo: Courtesy of Forterra

ADUs are the future of housing.
— DON TUCKER

CLT should be cheaper for construction and in the long term, for operations and maintenance.
— DAN FULTON

It's not super difficult to manufacture CLT. There's lots of interest. What's hard is generating enough consistent business to make the investment work.
— RANDY SCHILLINGER

Just start building. Build the prototype and have it be messy.
— KATHERINE PELZ

Precise fit is critical for shipping off the Peninsula
— LINDSEY SCHROMEN-WAWRIN

We are all about even flow throughput to get 200 units per year on the books and be profitable.
— BEC CHAPIN

An ADU accessory dwelling unit can help circumvent zoning codes.
— PATRICK SULLIVAN

This is going to come down to marketing and brand recognition.
— ELIZABETH SCALLON

REGULATORY AND FINANCIAL ANALYSIS

Financing options for ACLT ADUs and tiny homes.



After several years of historically low mortgage rates and record refinances, many homeowners are locked into mortgages with low rates (2–3% range) which few would give up for a contemporary 7%+ rate.

Traditionally, the options for financing are to cash-out refinance or take a home equity line of credit (HELOC) out on the house. The cash-out refinance works well for homeowners who have no underlying mortgage, or high equity with an existing high-interest mortgage. Where the homeowner has ample equity in the home and a low interest rate, a HELOC is the better option between the two.

The drawback of the HELOC, however, is that the interest rate is not fixed, and it cannot take rental income or full value of the new-construction unit into account when calculating the debt-to-income and loan-to-value ratios for the loan. To solve this, **First Federal Bank is working on new second-lien position product specifically geared towards ADU construction** which will allow existing homeowners (investment or primary residence) to take the post-construction value of the ADU and estimated rental income into account when qualifying for the loan. This loan will not require refinancing of an underlying existing mortgage and represents a unique value proposition and opportunity for partnership in the promotion of new ADU build incentives.

Secondary Market Perspective

From a secondary markets' perspective, there are no specific barriers for the use of ACLT materials in the construction of ADUs. Key attention is paid to the roles of the Government Sponsored Entities (GSEs), specifically Freddie Mac and Fannie Mae, which are exemplary indicators of mortgage market guidelines due to their estimated underpinning of 70% of all mortgages in 2023. The U.S. Department of Agriculture (USDA) has been a very active proponent of CLT, which is evidenced by the programs and grants that are detailed below. Included with each initiative is commentary on what the relative impact may be on residential construction.

Each of these programs and grants plays a role in promoting the use of CLT in Single Family Residence construction *by providing financial support, fostering innovation, and encouraging sustainable practices, thereby potentially transforming the landscape of residential construction with environmentally friendly and efficient building solutions:*

FANNIE MAE

Fannie Mae allows for the construction of ADUs that can be site-built or factory-built, including modular units. If an ADU is present, the primary dwelling must be either site-built or a modular home. Specific standards must be met, especially if the ADU is a manufactured home, including compliance with federal construction and safety standards and local and state codes.

FHA

The FHA does not provide specific guidelines directly relating to CLT or modular ADUs but requires that any ADUs, including manufactured homes used as ADUs, meet the highest and best use standards. They must appear structurally sound and marketable, and the FHA emphasizes the necessity for the property to blend with the local landscape and type of construction.

FREDDIE MAC

Freddie Mac's guidelines accommodate the inclusion of ADUs in properties secured by mortgages. They specify that a manufactured home ADU must meet certain size and HUD code requirements and be classified as real property. The ADU should be legally part of the property and fulfill specific property eligibility criteria.

VA

The VA guidelines do not explicitly mention modular ADUs or CLT. However, like other entities, the VA requires that all properties, including those with ADUs, be safe, sound, sanitary, and adhere to local building codes and standards. This ensures the property is eligible for VA lending, though specific mentions of modular construction or CLT were not found in the provided documents.

USDA

USDA GRANT OPPORTUNITIES FOR CLT PROJECTS

- *Overview:* This page provides a collection of various grants aimed at promoting sustainable building practices, including the use of CLT.
- *Importance for SFR Construction:* These grants can help builders and developers offset the costs of integrating CLT into SFR projects, making it a more viable option. Financial support might cover aspects like the purchase of materials or the training of workers on new construction techniques involving CLT.

WOOD INNOVATIONS GRANT PROGRAM

- *Overview:* Supports projects that expand wood product markets, with a focus on enhancing the health of forests and creating economic opportunities.
- *Importance for SFR Construction:* By funding the development and utilization of wood products like CLT, this program can encourage their adoption in SFR construction, supporting innovation in building materials that are both sustainable and locally sourced.

FOREST SERVICE'S MASS TIMBER GRANT

- *Overview:* Aims to advance the construction of mass timber, helping to fund research and development projects that improve the performance of mass timber products.
- *Importance for SFR Construction:* This grant supports the technological and application advancements needed for wider acceptance and use of CLT in residential buildings, particularly in enhancing structural integrity and optimizing construction practices.

COMMUNITY WOOD ENERGY AND WOOD INNOVATION PROGRAM

- *Overview:* Funds projects that implement wood energy systems and create innovative wood products, boosting forest management and local economies.
- *Importance for SFR Construction:* The program's support for innovative wood product development includes applications in SFR construction, where CLT can be utilized for energy-efficient homes due to its insulative properties and carbon sequestration benefits.

RURAL BUSINESS DEVELOPMENT GRANTS FOR CLT PROJECTS

- *Overview:* Targets rural businesses, helping small enterprises grow through the expansion of new and existing products and services.
- *Importance for SFR Construction:* These grants can help small manufacturers and builders in rural areas develop and integrate CLT in local construction projects, promoting regional economic growth and the adoption of sustainable building practices in SFR development.

Banking Rules for Lending and Home Insurance Options

Lenders will look at several factors including market perception and familiarity, construction costs and pricing, durability and maintenance, and sustainability and energy efficiency. **Because appraising is typically a function of available data, it would be ideal to provide comparable sales information for ACLT and CLT ADUs.**

In the absence of that, the cost approach to value could be employed. The cost approach[6] is more common in non-conventional housing. A log home or a cordwood house,[7] for example, would be insured as a wood frame structure and appraisers would look at similarly sized houses. **Until CLT becomes more widespread and insurers make a category, appraisers would choose wood frame for the residential building style.**

Insomuch as the ACLT ADU price point is competitive with stick-built construction, there would be less need for comparable CLT structures in each market to perform an appraisal for financing. However, if a borrower wants to get financing based on a higher price point due to ACLT's superior durability, fire retardancy, and other attributes, then **appraisers would need to have like-kind CLT structures and other supporting data for comparison. Thus, getting some ACLT ADU prototype "front-runners" into each distribution market will further enable product adoption.**

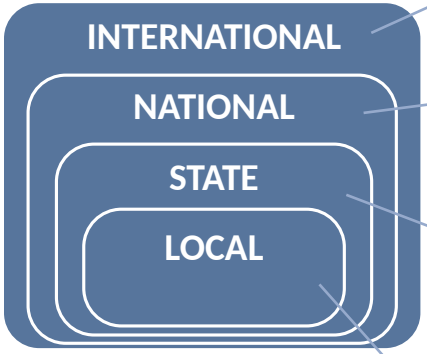
Typically, two properties on the same parcel will be insured under the same policy, regardless of address,[8] and the ADU would be insured as an accessory structure using its replacement value. **As the market for ACLT grows and more data becomes available, any perceived challenges will likely diminish,** making the appraisal process for such properties more straightforward.



[6] The cost approach estimates a property's valuation based on the cost to replace or reconstruct the property, minus any accumulated depreciation.

[7] Cordwood home construction is a natural building method where short logs are stacked horizontally to create walls. The logs are secured with mortar or a similar bonding agent.

[8] PEMCO Insurance provides a single policy if the primary residence and the ADU have the same address. If the ADU has a separate address, however, then a separate policy is required.



Building code and regulatory requirements across Washington

In 2023, the Washington State Department of Commerce Growth Management Services produced its first "Guidance for Accessory Dwelling Units in Washington State". Because several jurisdictions across Washington are in the process of updating their regulatory codes to be consistent with the provisions of HB 1337, this study focuses chiefly on regulatory codes and approaches to ADU development within the primary and secondary distribution areas for ACLT ADU market expansion.

INTERNATIONAL | codes.iccsafe.org
The International Residential Code (IRC) establishes minimum requirements for one-and-two family dwellings and townhouses using prescriptive provisions. Founded on broad based principles, the code makes it possible to use new materials and new building designs.

FEDERAL

ANSI A119.5 Park Model Recreational Vehicle (RV) Standard that covers fuel systems, health, fire and life safety provisions, plumbing systems, and construction requirements in RVs and tiny homes.
www.ansi.org

ANSI/APA PRG 320 Standard for Performance-Rated Cross-Laminated Timber
www.apawood.org/ansi-apa-prg-320

STATE | HB 1337 | www.ezview.wa.gov
Passed in 2023, Washington HB 1337 requires jurisdictions to allow two ADUs per lot within urban growth areas (UGAs) by six months after the next periodic update due date.

THE WASHINGTON STATE DEPARTMENT OF LABOR AND INDUSTRIES (L&I)
is responsible for inspecting mobile homes, park trailers, and factory-built housing including tiny homes. Governing codes are Housing and Urban Development (HUD) standards for manufactured homes, and ANSI 119.2 and 119.5 standards for mobile homes. Local jurisdictions will still be tasked with inspecting and enforcing regulations regarding setbacks, lot coverage, side/rear yard, property line and land use requirements.

LOCAL

CLALLAM COUNTY
Chapter 33.50 Accessory Dwelling Units (ADUs)
www.clallamcountywa.gov/1252/Accessory-Dwelling-Units-ADUs

Forks: County code.

Port Angeles: Chapter 17.21
library.municode.com/wa/port_angeles

Sequim: Chapter 18.66
www.codepublishing.com/WA/Sequim

JEFFERSON COUNTY
Chapter 18.20.020 Accessory Uses and Structures
www.codepublishing.com/WA/JeffersonCounty

Port Townsend:
Chapter 17.16.020
www.codepublishing.com/WA/PortTownsend

Quilcene: County code.

Regulation: Adopting Change

As discussed, the forthcoming adoption of HB1337 throughout many counties in Washington State will remove barriers in creating ADUs/ backyard cottages. However, this is only one component of what is needed for widescale adoption of the ACLT product.

Creating relationships with jurisdictions so that the ACLT ADU is one of the first pre-approved plan sets is both free publicity for this product and will shorten the timeframe for consumers from permit application to completion. Having a variety of sizes, including one that maximizes the square footage allowed in each jurisdiction (1,000 is required by HB1337, though some jurisdictions may allow a larger square footage) while being mindful of footprint restrictions appeals to the goals and objectives of developers and investors.

New Incentives

In jurisdictions where workforce housing is in dire need and the price of housing is so low that new construction is severely constrained, such as the City of Port Angeles, governments could consider other methods of incentivizing building beyond creating pre-approved plans and fee waivers. These alone will not be enough to attract building at the scale needed to dent the housing crisis. **If communities want to attract more tourism by increasing short-term rentals within their jurisdictions, they can do so by reserving short-term rental permits only for those who add new construction small housing units, including ADU multi-housing, to the market.** This will help offset the cost of building the new construction, eliminate depletion of the already constrained housing market, and add additional rental units to the market.



Increase Return

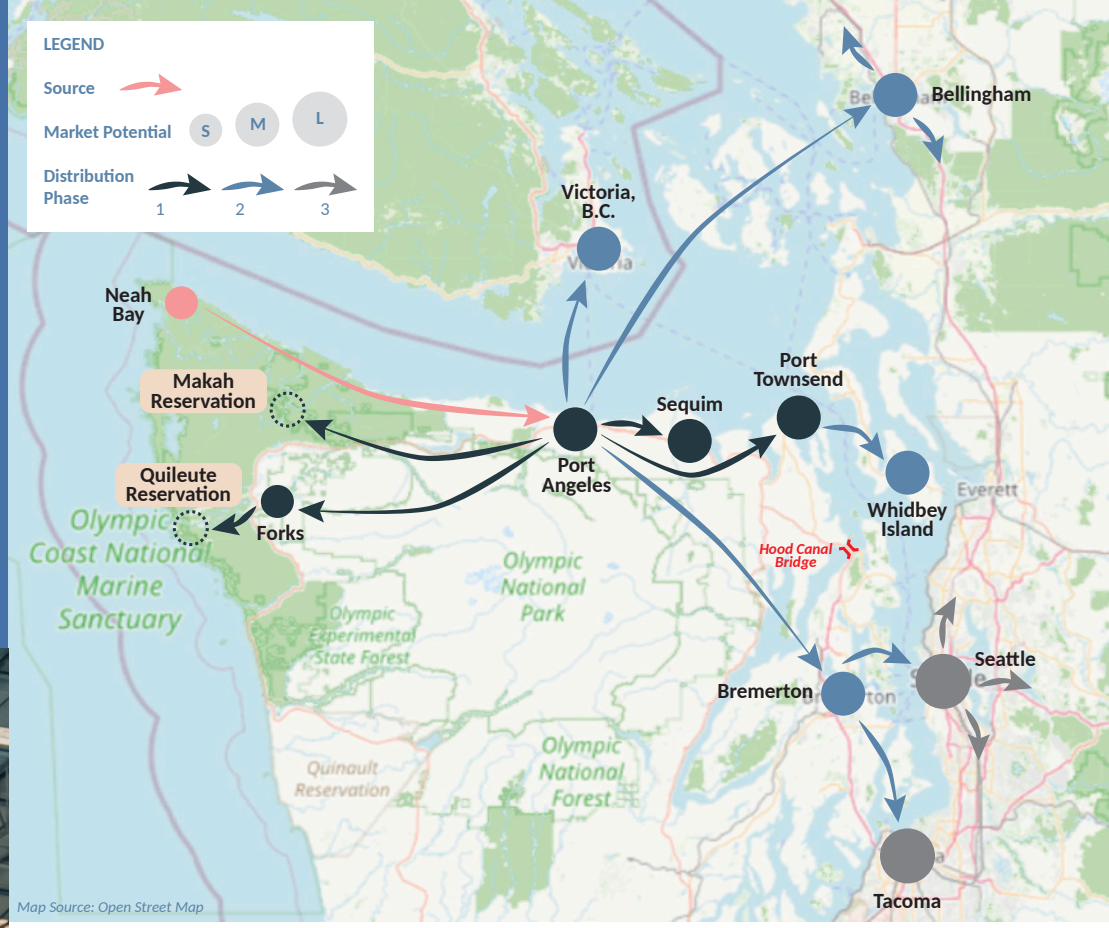
For example, a 1,000SF 2-bedroom rental in Port Angeles will generate $26,400/year on the long-term housing market but $60,000 as a short-term rental. For the same construction cost (estimated $350k). This is a 7.5% cash-on-cash return for long term rentals, and a 17% cash-on-cash return for a short-term rental. If a short-term rental (STR) permit were only issued if the owner built two ADUs—one long-term, one short-term—the combined cash-on-cash return would be 12.3%. **The return suddenly becomes attractive enough that builders and investors can support the community without going out-of-pocket each month.**

For more details on building codes, see page 30 Appendix C: Building Code and Regulatory Code

SUPPLY CHAIN ANALYSIS

The task of manufacturing ACLT ADUs on the Olympic Peninsula.





Completing the Supply Chain

During the initial phase of ACLT ADU production, local vendors like Hartnagel Building Supply (an employee-owned company) can complete the supply chain. The company would flat pack the product, band it together, and use a delivery truck with piggyback style forklifts to offload materials on site for a fee of approximately $500 for one load. Hartnagel's usual delivery range is Forks and Neah Bay to the Port Townsend area going as far as the Hood Canal bridge.

Availability and cost of materials, products, and services needed for ACLT ADU and tiny home construction, such as building materials, fixtures, appliances, and labor.

MATERIAL TAKE-OFFS | PROJECT: CITY OF PORT ANGELES PRE-APPROVED 480SF ADU

CONSTRUCTION PLAN	DETAILED DESCRIPTION	ESTIMATED COSTS	PRICE PER SF
Foundation	Rebar, Tie wire, bolts, visqueen, insulation	$1,873.47	$3.90
Framing	**Sill plates, studs, hardware, sheathing, glulam beams**	**$4,564.31**	**$9.51**
Roof Framing	**Plywood, hardware, bird blocks, 2x4s**	**$1,200.68**	**$2.50**
Roofing	Underlayment, hardware, comp. roofing	$1,465.77	$3.05
Siding	Hardie Plank, trim, fascia, housewrap, tape, bear skins, hardware	$2,254.79	$4.70
Trusses	**Truss package**	**$3,583.15**	**$7.46**
Insulation	**R21 walls/R38 ceilings batts**	**$2,551.81**	**$5.32**
Trim	MDF, caulk, shims, nails	$806.84	$1.68
Drywall	**Wallboard, mud, tape, shims, screws**	**$1,007.35**	**$2.10**
Window/Door Package	Windows and doors	$4,649.15	$9.69
TOTAL		**$23,957.32**	**$49.91**

Bold green text indicates variable cost items which differ for ADUs versus conventional stick-built construction.

Efficiency, predictability and lead times of the supply chain, reaching all the way from sourcing raw materials to delivering finished ACLT ADU components to the final assembly site.

"An Order of Substance"

Peter Orser has served on the boards of Forterra and Green Canopy NODE and is among the most knowledgeable ADU experts in the Pacific Northwest, He described two elements that create the economics of scale:
1) A captive market to prove the point, such as an Indian tribal community interested in 25 or more units. Unlike other jurisdictions where regulatory issues will slow the process, tribal communities as sovereign nations can speed up the process. When there is repetition of the same volume, prices stay the same, leading toward lower costs for consumers. What's needed is an order of substance. **2) Supply chain predictability.** The supply chain needs to organize their resources. For example, known orders of seven per week with an order from the government gives predictability and enables the work with the supply chain to be well-oiled. With cross-laminated timber, and somebody with the presses, an order of substance with capital behind it will unlock adoption of the product in the private sector and in broader markets.

When NRIC Program Director, Ted Sturdevant, met with Quileute Tribe General Manager, Bryan Cramer, for a conversation about advanced cross-laminated timber, they spoke about how to solve a housing challenge in combination with workforce development. **What took hold was the idea of people learning to build and the significance of using wood products from the Washington coast, amidst the existential challenge of sea level rise and climate change.** Similarly concerned, the Makah Tribe—which mills Coastal Western Hemlock for the ACLT ADU—intends to join the larger conversation about creating local housing from local materials and people. Another potential tribal application for ACLT would be to provide materials for the next community project at one of the tribes on the Olympic Peninsula.

What's needed is an application where the team can get volume and have a real market. A public school, housing, and a tribal center could all be done on the same kind of billet. Model number one is the ADU —the LEGO piece—and subsequent stages can be variable. The first design is an ADU, then six different designs can come from that initial design.

PETER ORSER, HOUSING ADVOCATE AND FORMER PRESIDENT AND CEO, WEYERHAEUSER REAL ESTATE COMPANY



Challenges and Opportunities

Potential bottlenecks or constraints in the supply chain that may impact ADU or tiny home development, such as the limited availability of certain materials or skilled labor shortages.

> *At present CLT is only being used in large projects and is cut to specific sizes and shapes at a manufacturing plant. The product is then shipped directly to the job site. There are no wholesale or retail building material businesses stocking CLT for smaller projects. Perhaps that will change in the future.*
>
> ROB DUNN, VICE PRESIDENT, DUNN LUMBER CO.

Distribution often presents a challenge. For vendors to be able to sell on a regular basis, they would need access to materials with a relatively short lead time. This would typically be only a few days for raw lumber, and for some specialty components like trusses four to six weeks can be expected. Most lumber yards get materials through distributors, which product manufacturers typically sell to. For example, an order of studs might originate from Interfor. However, Interfor typically sells to large distributors like Weyerhaeuser which, in turn, sells to lumberyards. It would be more efficient, and less expensive, for lumberyards to buy direct from manufacturers, so long as materials are delivered in a timely manner. If the team can create sufficient inventory for its ACLT ADU product, it would go a long way to improving efficiency, removing disintermediation costs, and achieving its "mill direct, factory direct" goal.

Opportunities for streamlining and improving the supply chain to reduce costs, increase efficiency, and accelerate ACLT ADU and tiny home construction timelines.

Charlie Roberts, a successful ADU builder in Port Angeles, intentionally designed his accessory dwelling units to use materials efficiently, basing everything on standard four-foot panels. He acknowledged that high labor costs can be a real leakage and asserted, **"If two guys in one day could assemble an ACLT ADU, it would be a huge savings. I would be a customer of a product like that."**

Rapid assembly on the build site can be aided by product design as well as by emerging software. By way of example, Vaagen Timbers CEO, Russ Vaagen uses an inhouse software application he calls Timber Sequence Pro to dissect the design. On a 40,000 square foot project, the CLT manufacturer was able to accelerate the construction timeline by optimizing materials placement on the truck for unloading and build one floor per day.

To streamline the supply chain, Vancouver, B.C.-based ADU manufacturer Smallworks utilizes three components readily available from multiple manufacturing sources:

1. A volumetric bathroom pod with a wet wall on the backside for a kitchen, and chases for plumbing stacks—the "brains of the house",
2. An enclosed wall system with conduit for electrical and mechanical, which is necessary for code reasons, as well as insulation, exterior cladding and interior drywall and can be tested off site, and,
3. An innovative helical pile system for foundation support to reduce construction time and to reduce embodied carbon resident in concrete. When construction time is reduced, so are labor costs. Smallworks President, Luke Harrison, also envisions a delivery system a few years away where components are compact enough to be placed in a Sprinter van rather than a flatbed truck.

The City of Port Angeles has been a leader in adopting ADU-friendly codes and incentives in the city. To take it one step further, the city's Planning Commission could consider increasing housing and ADU densities within a half mile of the Gateway Transit Center, where Clallam Transit[9] has a direct connection bus to the Bainbridge Island Ferry and downtown Seattle and the nearby Blackball Ferry line travels daily to Victoria, B.C.

Potential for local sourcing and production of materials and components to support the development of a sustainable and resilient local ACLT ADU and tiny home supply chain.

Recruiting Vendors to "Champion" the Product

To get traction and interest from lumber yards, it would be ideal to select a few vendors in each geographic area to be the "champions" of the product. From a lumber yard perspective, a new product like this takes time and energy to figure out the logistics, as well as training for salespeople. If every yard around "has access", it may be more difficult to reach a critical point where there is potentially enough volume to make it feasible to go through all the training and process creation. If it's one kit a year or even four kits a year, that's hard to get excited about. Limiting the number of vendor champions in selected geographies, at least until volume picks up substantially and the market is receptive to the product, ensures that there is more of a vested interest by the parties.

[9] Clallam Transit's 123 Straight Shot bus provides one of the best public transit experiences in the Pacific Northwest. Each bus provides comfortable seating, power for phones and laptops, and a restroom. The bus exterior features uniquely designed Northwest art in colorful pastels.

CLT CAREERS
Cross-Laminated Timber | Mass Timber

Foreman	Dispatcher
Carpenter	Forester
Ironworker	Swamper
Installer	Designer/Architect
Structural Engineer	Salesperson
Estimator	Inspector
CAD Drafter	Researcher
Geologist	Supplier
Maintenance Supervisor	Distributor
HR Manager	Business Development
Trainer	Product Manager

EMPLOYERS

LUMBER YARD	DISTRIBUTOR	BUILDER
Employees	*Employees*	*Employees*
Open Jobs	*Open Jobs*	*Open Jobs*

Education

Education needs to play an important role in the development of an ACLT ADU program, in part due to the newness of CLT as a product and because people generally appreciate the opportunity to learn something new.

As a proponent of education for generations of customers, **Seattle-based Dunn Lumber Company is actively promoting ADUs for homeowners and small contractors.** Currently, Dunn has three ADU-related links on the company website full of practical considerations, including one entitled, "How to Start an ADU Project". To provide added expertise and insights to their customers, Dunn teamed up with local architect and ADU expert, Katherine Pelz. Similarly, the Natural Resources Innovation Center, in partnership with Peninsula College, could school prospective customers by collaborating with CLT designers and other industry experts to produce something on "How to build tiny homes with Advanced Cross-Laminated Timber, ADU Specifications and Priorities"—and inspire a whole new generation of ACLT do-it-yourselfers.

Education also has an important role to play for the many trades and skilled laborers needed to support the growing mass timber industry. By way of example, the Urban Land Institute (ULI) has a classroom program called Urban Plan where students learn about new products and best practices in urban planning, real estate finance and development. Students can be high school, college-aged or seasoned professionals. ULI also has a Center for Leadership program, a yearlong program where participants learn about different aspects of the real estate industry and evolve leadership skills.



RECOMMENDATIONS

Phase 1 *6–12 Months*

- **Partner with architects and engineers** to draft initial sets of stamped engineering plans. The best way to mitigate the infancy of the product is by leading with design and engineering.
- **Produce 7–8 prototypes and put them in strategic locations** such as, Port Angeles, Clallam County, Port Townsend, unincorporated Jefferson County, Seattle, King County, Island County/South Whidbey Island, Bremerton, and Kitsap County. It would be a way to start—then iterate. Learn what does work, and what doesn't, and refine the product. A common theme from ADU experts was to "Just get started and get messy."
  - Work with local municipalities to "pre-approve" the ACLT ADU plans for each model constructed.
  - Make some protypes available for touring, by appointment or otherwise, to the community so they can experience the quality and aesthetics of ACLT construction. These could be in the CRTC parking lot or in partnership with local land-owners and developers.
  - Coordinate with the lender community to ensure that occupied ADU prototypes form the basis for competitive appraisals and financing.
  - Document the process of construction for ACLT ADU kit educational videos.
- **Create strategic partnerships with building suppliers** (Lumber Traders, Dunn Lumber, etc.) who can fill out the remainder of the ADU kit and deliver direct to consumers in western Washington.

There is a strong need for housing construction in the North Olympic Peninsula and in the Cascadia Corridor. With the current capabilities of the CRTC, including the kiln-drying process, laminating machine and CNC[10] cutting capabilities, creating strategic partnerships to establish a set of "phase 1" ADU plans for market entry would expedite the process. The following recommendations for market entry and expansion.

[10] CNC stands for computer numerical control, the process of using computer software to control the movement and operation of machines to cut and carve materials.

Phase 2 *13–24 Months*

- **Plan carefully for broader market entry.** As Randy Schillinger, CEO of Hampton Lumber, observed, "Generating enough business to make it work is the hard part. A new company needs strong business development and marketing expertise to turn over the rocks."
- **Improve education and public awareness** with training charettes and guest speakers with messages that motivate. Host educational events showcasing quick assembly and other benefits of ACLT ADUs, targeted at the building communities and Do-It-Yourself (DIY) homeowners. Work with others to create "How to Build ALCT ADUs" videos.
- **As capabilities and market saturation expand,** the CRTC can begin to purchase materials, build its own kits in-house, and explore modular build options.
- **To provide continued economic opportunity within the local community,** consider spinning off portions of the business and/or partnering with a private modular manufacturer to attract additional investment opportunities and increase scale. Given the scale of the housing need in Washington, most public and private philanthropy sources are focusing innovative financing on higher density production.

Appendix A: SWOT Analysis

STRENGTHS

Pricing

Transport

Incremental: Small Starter Home with Later Expansion

No Builder/Construction Waste

Speed of Assembly

Fewer Subcontractors Needed

OPPORTUNITIES

Small is Smart

ADU Kit on Flatpack (No Cranes)

Onsite Placement

Regulatory Requirements

Business Sequence: Panels First Phase, Panels with Integrated Systems Second Phase

Buying Consortium When at Greater Scale

WEAKNESSES/THREATS

Newness of CLT/Mass Timber in North America: Adoption Resistance

Supply Chain Disruptions: Wildfire, Drop in Raw Materials Availability

Financing Sources Prioritize Density Over Individual ADUs

Engineering Challenges with Modifications?

Appendix B: Financing Options

OPTIONS	MAX LTV	LOAN AMOUNT MAX	REFI REQUIRED/ LIEN POSITION	FIXED INTEREST	ADU OR DADU	ADU/DADU rental income to calculate DTI	COMMENTS
Movement Mortgage HELOC	80%	$500K	No refinance, second lien position	No	Either	No	If the borrower doesn't need the income and they have a current mortgage with a low rate they want to keep, a HELOC to get the funds to build the ADU could be their best option
Cashout REFI (Conventional or FHA)	80%	$766,550 - Conventional in all counties besides high cost areas $977,500 - High Balance Conforming in King, Pierce, Snohomish $498,257 - FHA in Clallam County $977,500 - FHA High Balance Conforming in King, Pierce, Snohomish Other Counties – FHA (different amounts)	Refinance required, first lien position	Yes	Either	No	If the borrower owns a property free and clear (no mortgage), this may be their best option as the rate will be lower than the HELOC
Homestyle (Conventional RENO LOAN	95%	$766,550 - Conventional in all counties besides high cost $977,500 High Balance Conforming in King, Pierce, Snohomish	Refinance required, first lien position	Yes	Either	Yes	Funds from the Renovation loan can be used to build the ADU or DADU and the rental income can be given at 75% of estimate
FHA (Reno Loan)	96.5%	$498,257 - FHA in Clallam County $977,500 - FHA High Balance Conforming in King, Pierce, Snohomish Other Counties – FHA (different amounts)	Refinance required, first lien position	Yes	ADU Only	Yes	Funds from the Renovation loan can be used to build an attached ADU only (no DADUs with FHA reno loans) and the rental income can be given at 75% of estimate
Quorum Reno HELOC	90%	$500K	Second position, no refinance required	No	Either	No	LTV is calculated on post-construction value, including primary loan
CrossCountry Reno HELOC	90% of post-reno, or 125% current value	$500K	Second position, no refinance required	No	Either	No	10-year draw, 20-year repayment
First Fed ADU Loan	TBD	TBD	Second position, no refinance required	Yes	Either	Yes	LTV is calculated on post-construction value of primary + ADU/DADU

Appendix C: Building Code and Regulatory Code

Building Code

The following is an overview of the American National Standards Institute (ANSI) and International Building Code and each entity's inclusion of CLT.

CLT is standardized under ANSI/APA PRG 320, with significant updates made in its 2019 revision, which was approved by the American National Standards Institute (ANSI). This standard, developed by the APA— The Engineered Wood Association,[11] specifies quality and performance criteria for CLT, including mechanical properties, adhesive requirements, and panel dimensions. The 2019 revision specifically addressed enhancements in fire performance standards, introducing more stringent testing protocols to assess the fire resistance of CLT panels.

IBC Recognition and Guidelines

CLT was first recognized by the International Building Code in its 2015 edition. This inclusion was a milestone for CLT, positioning it as a viable material for building construction across various applications:

- 2015 IBC (Section 2303.2.5): This section introduced CLT, defining it and recognizing its use under specified conditions for Type IV construction, outlining requirements for dimensions and fire resistance.
- 2018 IBC (Section 602.4): This revision expanded the application of CLT in Type IV construction, often referred to as "Heavy Timber" construction, detailing the minimum sizes and fire resistance required for structural elements made from CLT.
- 2021 IBC: The code further advanced the acceptance of CLT by allowing its use in buildings up to 18 stories for Types IV-A, IV-B, and IV-C construction, underlining its safety and capability for high-rise construction scenarios.

Integration into U.S. Construction Practices

The formal acceptance of CLT in ANSI standards and the IBC has significantly influenced its adoption in the U.S. construction sector. These standards have helped establish safety and performance benchmarks that have increased confidence among builders and architects, leading to its use in a variety of construction projects from residential to commercial high-rises. The evolution of these codes reflects the industry's response to the growing demand for sustainable and efficient building materials.

Challenges and Prospects

While the adoption of CLT is on the rise in the U.S., challenges such as the need for more manufacturing facilities and broader technical understanding among construction professionals persist. However, the ongoing development and refinement of standards like ANSI/APA PRG 320 and the IBC are crucial in addressing these challenges, facilitating wider acceptance and use of CLT.

This detailed regulatory framework not only ensures the safety and reliability of CLT as a building material but also supports its growth as a sustainable alternative to traditional construction materials, promoting a shift towards more environmentally friendly building practices across the United States.

[11] The American Plywood Association (APA) was initially established in 1933 to represent plywood manufacturers in the United States. Over time, as the association expanded its scope beyond just plywood to include other engineered wood products such as oriented strand board (OSB), engineered wood I-joists, glulam beams, and Cross-Laminated Timber (CLT), it began to use the broader term "The Engineered Wood Association" to reflect this expanded focus. ^[1]

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GLOSSARY OF TERMS

Accessory Dwelling Unit (ADU) – An ADU is a dwelling unit located on the same lot as a single-family housing unit, duplex, triplex, townhome or other housing unit.

Cash-on-Cash Return – Calculated on a pre-tax basis, cash-on-cash return measures the amount of cash flow relative to the amount of cash invested in a property investment.

Cost Approach to Valuation – Also known as income approach, this method estimates a property's valuation based on the cost to replace or reconstruct the property, minus any accumulated depreciation.

Detached Accessory Dwelling Unit (DADU) – A DADU is an accessory dwelling unit that consists partly or entirely of a building that is separate and detached from a single-family housing unit, duplex, triplex, townhome or other housing unit and is on the same property.

Home Equity Line of Credit (HELOC) – A HELOC is a line of credit secured by an owner's home that provides a revolving credit line to use for large expenses or to consolidate higher-interest rate debt on other loans such as credit cards.

Light Wood – Like stick-built, light wood construction can refer to lumber delivered in bulk and assembled at the job site. Unlike stick-built, light wood construction may also refer to prefabricated components assembled off-site. For example, some companies produce prefabricated wall panels that look just like a "stick-built" wall once in place.

Panelization – A construction process in which structural elements like walls, floors, and roofs are built off-site in a controlled environment, and then transported to the job site for installation.

Park Model Home – A regulated temporary living space built to the ANSI standards and designed for a Recreational Vehicle (RV) park setting. Primarily suited for short term, recreational use, park model homes increasingly accommodate a variety of lifestyles.

Prefabricated – Also known as "prefab", refers to a building that is manufactured in sections to enable assembly on site.

Recreational Vehicle (RV) – A motor vehicle or trailer with living quarters, including motorhomes, campervans, travel trailers and campers, truck campers, and "fifth wheel" trailers which connect to a truck via a hitch mounted in the center of the truck bed.

Return on Investment (ROI) – Return on Investment is calculated by subtracting the investment cost from investment gain and dividing it by the investment cost. ROI = (Gain from Investment – Cost of Investment) / Cost of Investment.

Shed – A non-habitable one-story detached accessory structure with floor area less than 200 SF and a height lower than 15 feet.

Short Term Rental (STR) – Also known as vacation rentals, short term rentals are properties that are rented out for short periods, typically 30 days or fewer. Rental homes and units are usually listed on sharing platforms such as Airbnb and VRBO.

Stick-built – In traditional home building, the home is built on site using a wooden frame, or dimensional lumber ("sticks"), to create the roof trusses and walls. The lumber is delivered to the job site in bulk, such as, 500 2" x 4" x 8' studs for wall framing.

Structure Insulated Panels (SIP) – SIPs are a high-performance building system for residential and light commercial construction, consisting of an insulated foam core sandwiched between two structural facings, usually oriented strand board.

Tiny House – A dwelling that may be built on wheels and is no larger than 400 square feet, including a kitchen, bathroom, and a sleeping/living area. They must meet the basic life safety standards of the Washington Department of Labor and Industries and be built to the Washington State Building Code.

Volumetric – A form of off-site construction in which buildings are put together by connecting a series of pre-built sections or modules. The six-sided unit is shipped to the site and combined with other pieces to form a completed building.