



MAY 15 2025 | DENVER
RESILIENCE SUMMIT

FROM CRISIS TO OPPORTUNITY: AFFORDABLE HOUSING AS A CLIMATE SOLUTION

May 15, 2025

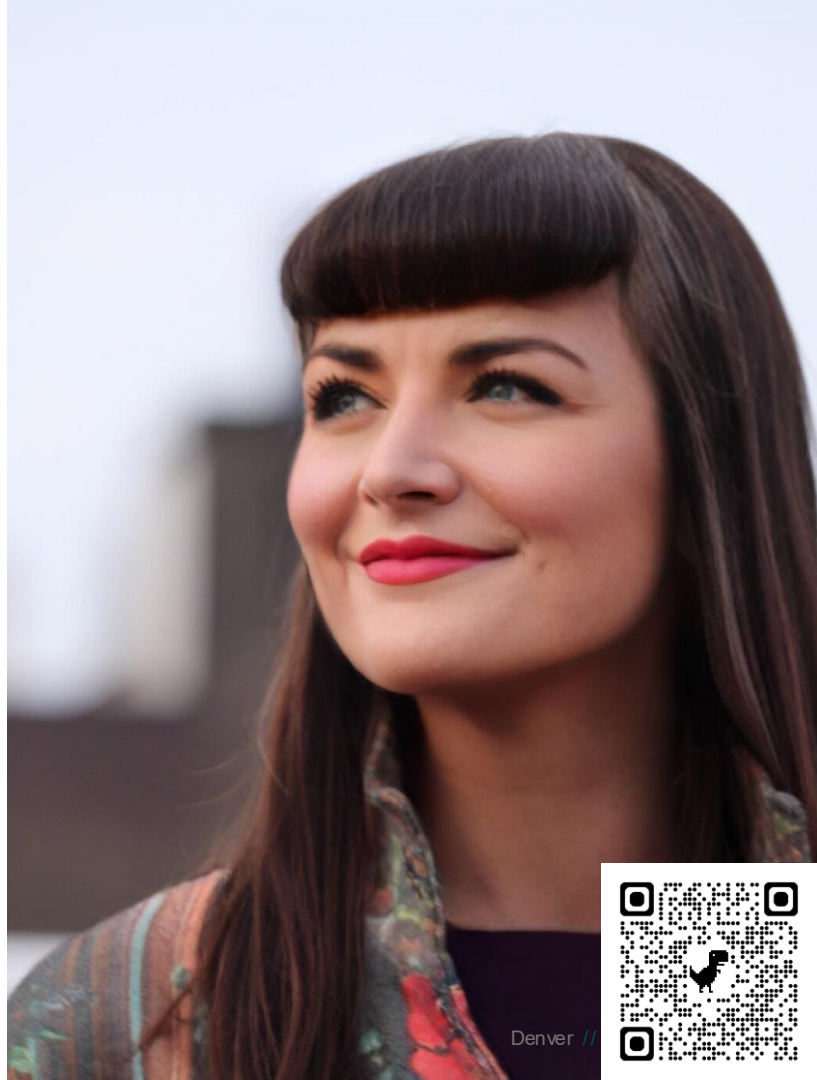
Hi, I'm Brandy

I'll be your moderator today

I'm part of Avison Young



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Denver //



**Avison Young creates
real economic, social, and
environmental value,
powered by people.**

**AVISON
YOUNG**

We're all about
purpose

You know it's pronounced **eh**-vison
because we're Canadian, eh?



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Denver // May 12-14, 2025



**We're global commercial
real estate advisors
who share a commitment
to making great
places for people.**

**AVISON
YOUNG**

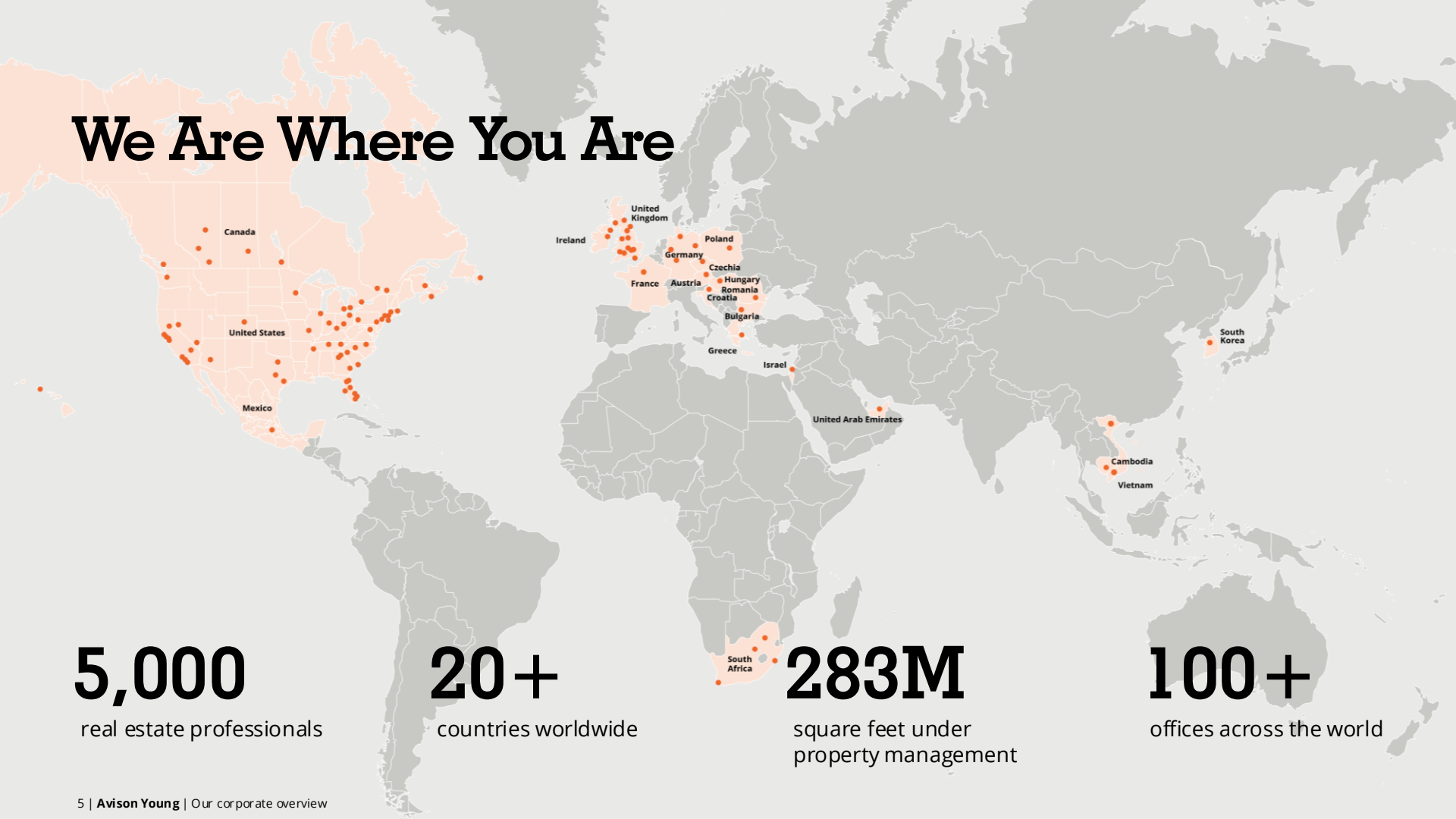
We put people
at the centre of
every decision



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We Are Where You Are



5,000

real estate professionals

20+

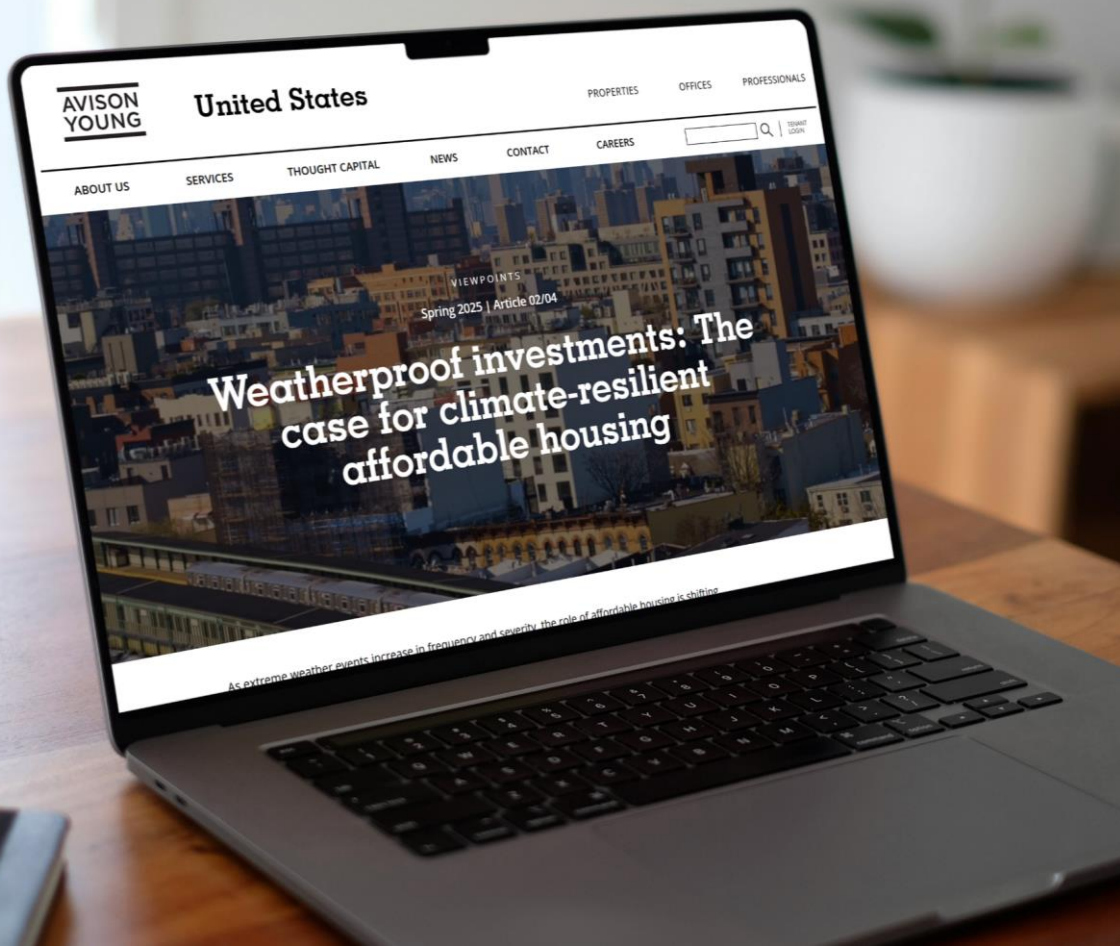
countries worldwide

283M

square feet under
property management

100+

offices across the world



Viewpoints

U.S. | Spring 2025

Weatherproof investments: the case for climate-resilient affordable housing

Investors and communities are integrating climate resilience into affordable housing strategies to mitigate risk, ensure long-term value, and future-proof developments against extreme weather.

Learn more from our experts in Avison Young's Spring 2025 edition of **Viewpoints**.

Read article



Climate Feature

Heat



Risk Mitigation Features

Enhanced insulation
Reflective roofing
Energy-efficient HVAC systems
[Green roofs]
Shading devices

Financial Benefits

For Owners: Reduced energy costs and increased property value

For Investors: Higher tenant retention and lower vacancy rates

For Occupiers: Safer during heat waves, improved comfort, lower utility bills

Climate Feature

Flood



Risk Mitigation Features

Elevated structures
Flood barriers
Permeable pavement
Improved drainage systems

Financial Benefits

For Owners: Reduced repair and maintenance costs

For Investors: Lower insurance premiums and increased asset protection

For Occupiers: Minimized disruption and damage to personal property

Climate Feature

Wildfire



Risk Mitigation Features

Fire-resistant materials
Defensible space landscaping
Advanced fire detection systems

Financial Benefits

For Owners: Lower risk of property loss and reduced insurance premiums

For Investors: Increased asset protection and marketability

For Occupiers: Enhanced safety and peace of mind

Viewpoints

U.S. | Spring 2025

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Viewpoints

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Read article





Impact Report

Global | Spring 2024

Partnering to protect affordable housing

We are in a global affordable housing crisis.

With such a shortage, finding ways to hold onto existing affordable housing stock becomes even more critical.

Learn more from our experts in Avison Young's Impact Report.

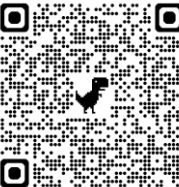
\$70.9M

\$70,865,000 total gross value of
properties acquired/disposed

231

affordable housing units
preserved in the process

Read article





it's nice to
meet you

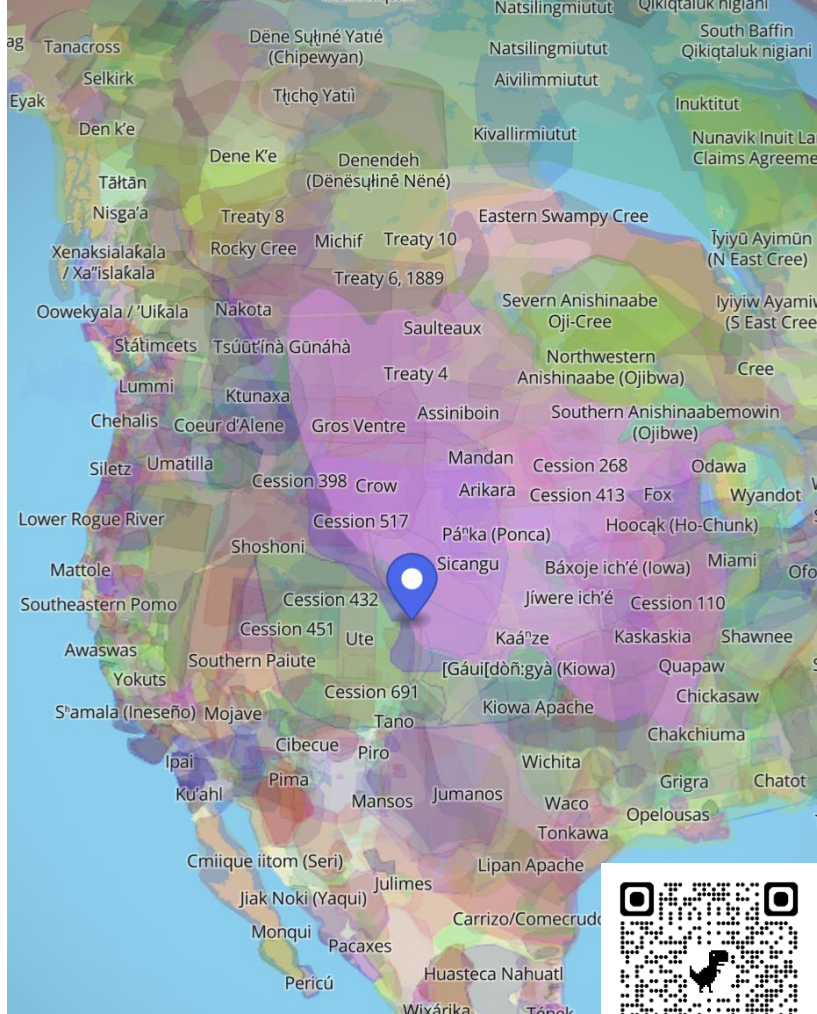
AVISON
YOUNG

 CANADA BEST
MANAGED
COMPANIES

Platinum member

Where are we?

We gather today on the ancestral lands of the Cheyenne, Arapaho, and Ute Peoples, and honor the 48+ First Nations with enduring ties to what is now called Colorado.

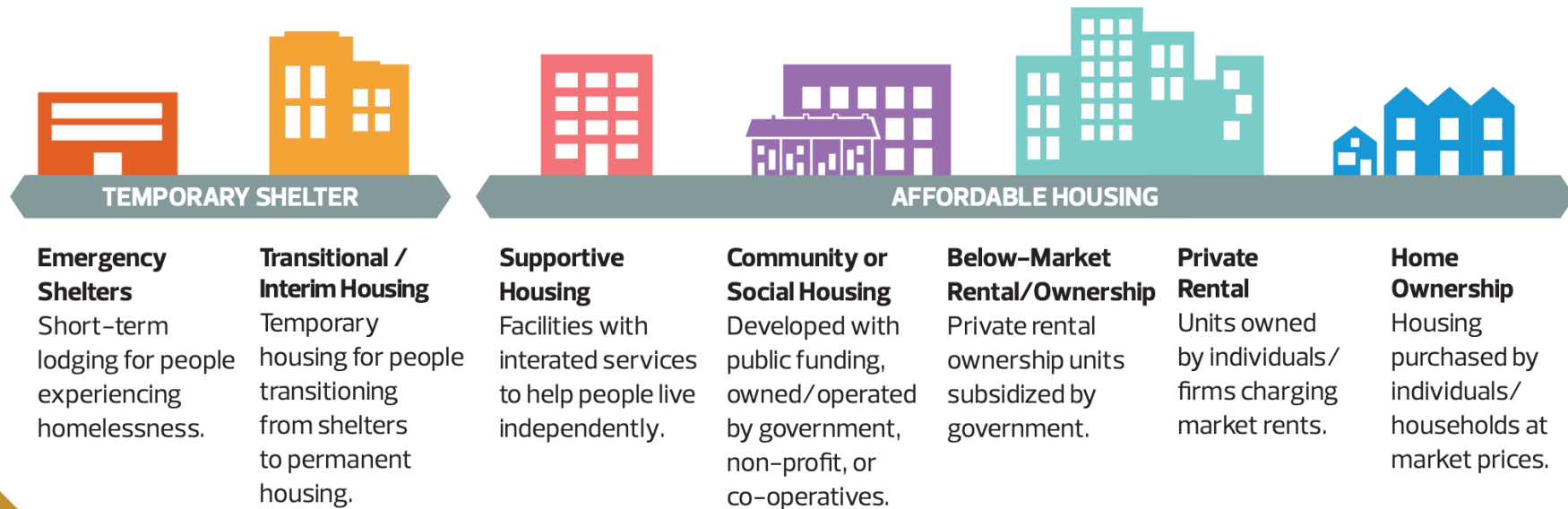


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native-land.ca



Affordable housing is a spectrum





Who's in the Room?

- Real Estate
- Finance
- Insurance
- Urban Planning
- Architecture/Engineering
- Construction
- Policy Makers/ Government
- Student/Academic



Who's working on affordable housing

- Yes
- No, but interested
- No, not involved, I was peer pressured by Brandy to be here :)



**What are you trying
in the next 12
months?**

- Electrification
- Energy efficiency
- Renewable energy
- Mass Timber
- Reducing carbon emissions
- Completing climate risk assessments
- Pursuing green building certifications (LEED, WELL, etc.)

Let's meet our panel



Brandy Burdeniuk
Avison Young



Ozzie Gonzalez
P3 Consulting



Dez Edwards
Urban Pulse
Commercial Group



Ryan Zizzo
Mantle
Developments



How did we get here

Dez Edwards



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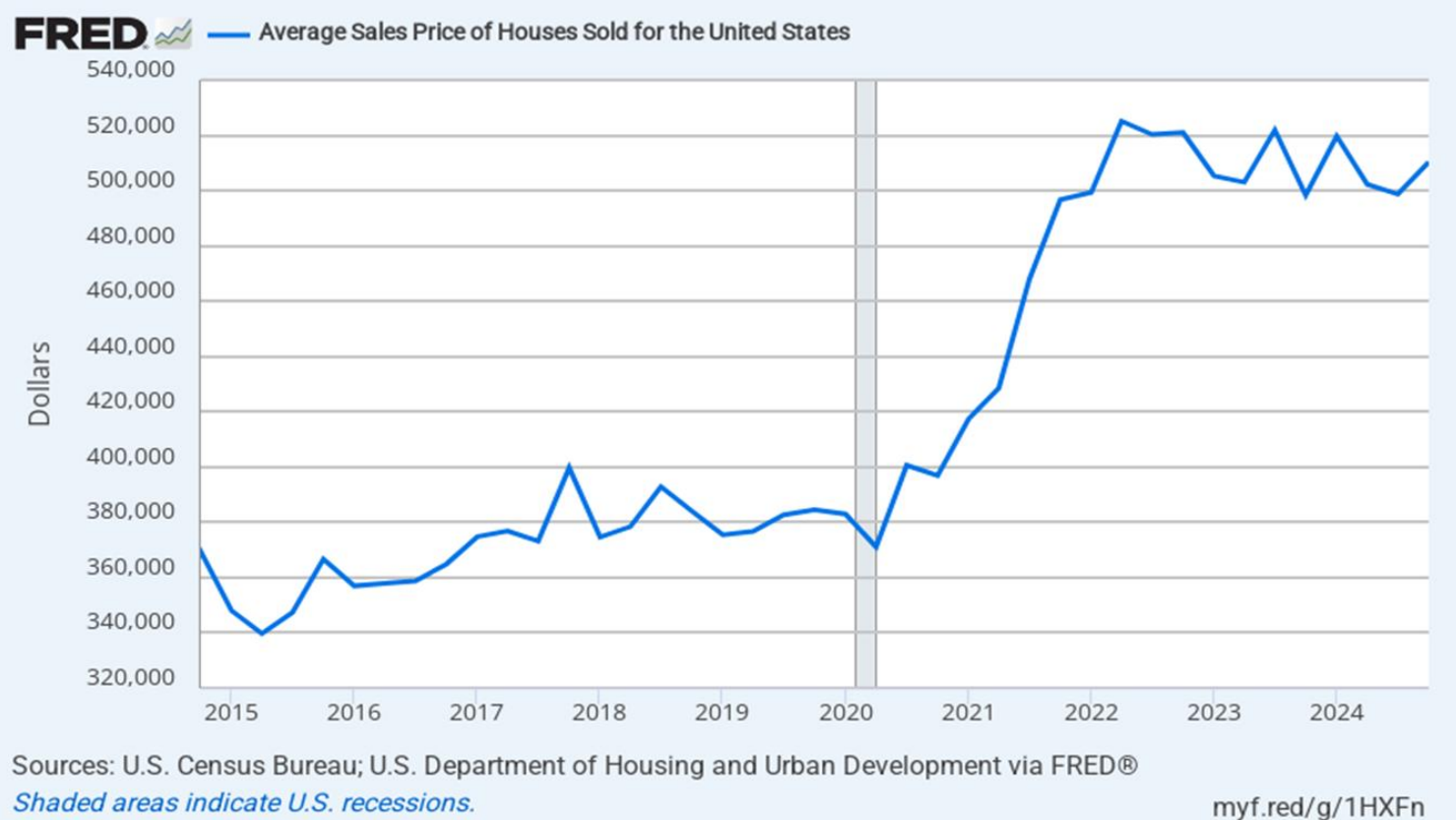
More than one crisis

- Affordable Housing
- Climate Risk
- Shortage of Construction Laborers

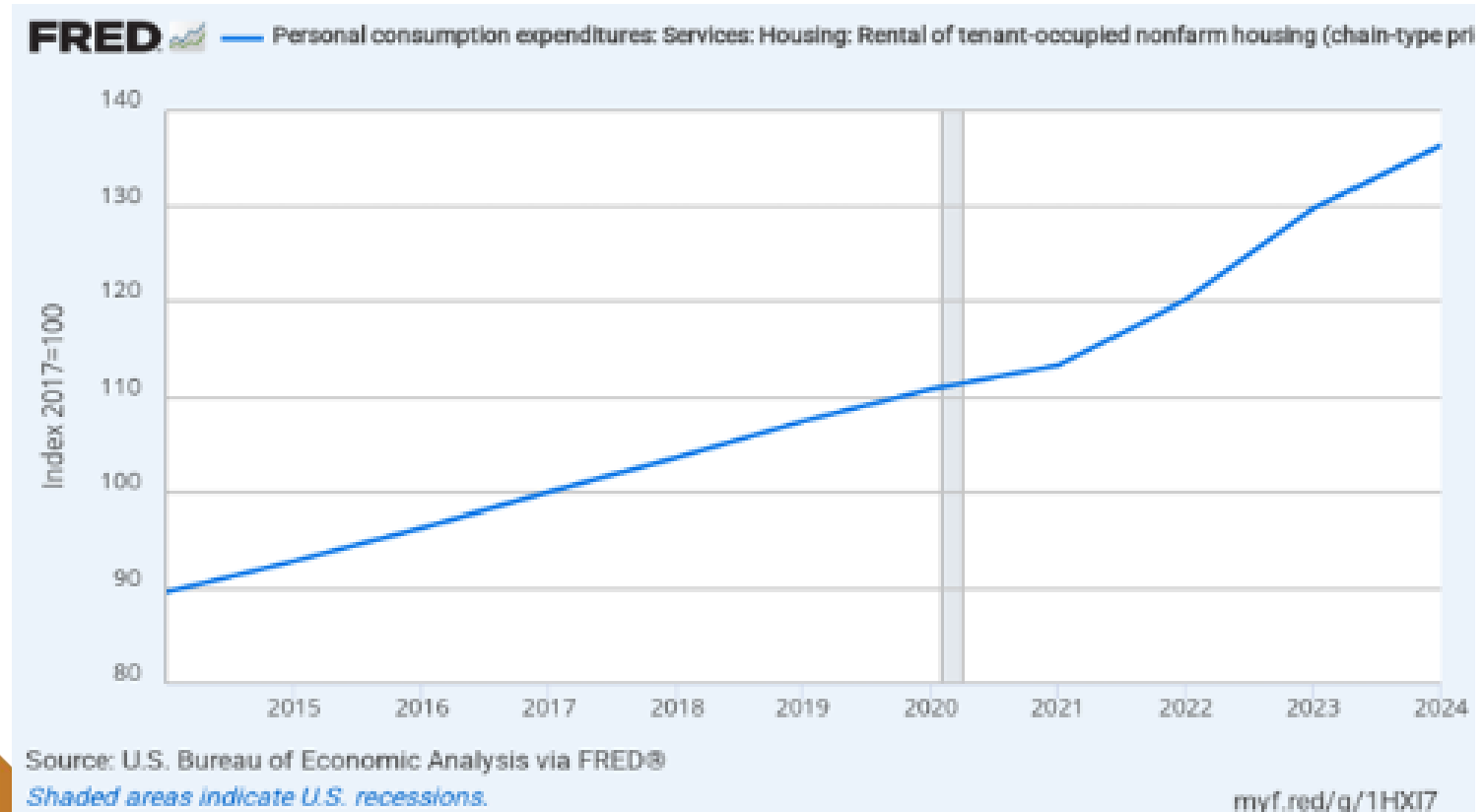


**How did we
get here?**

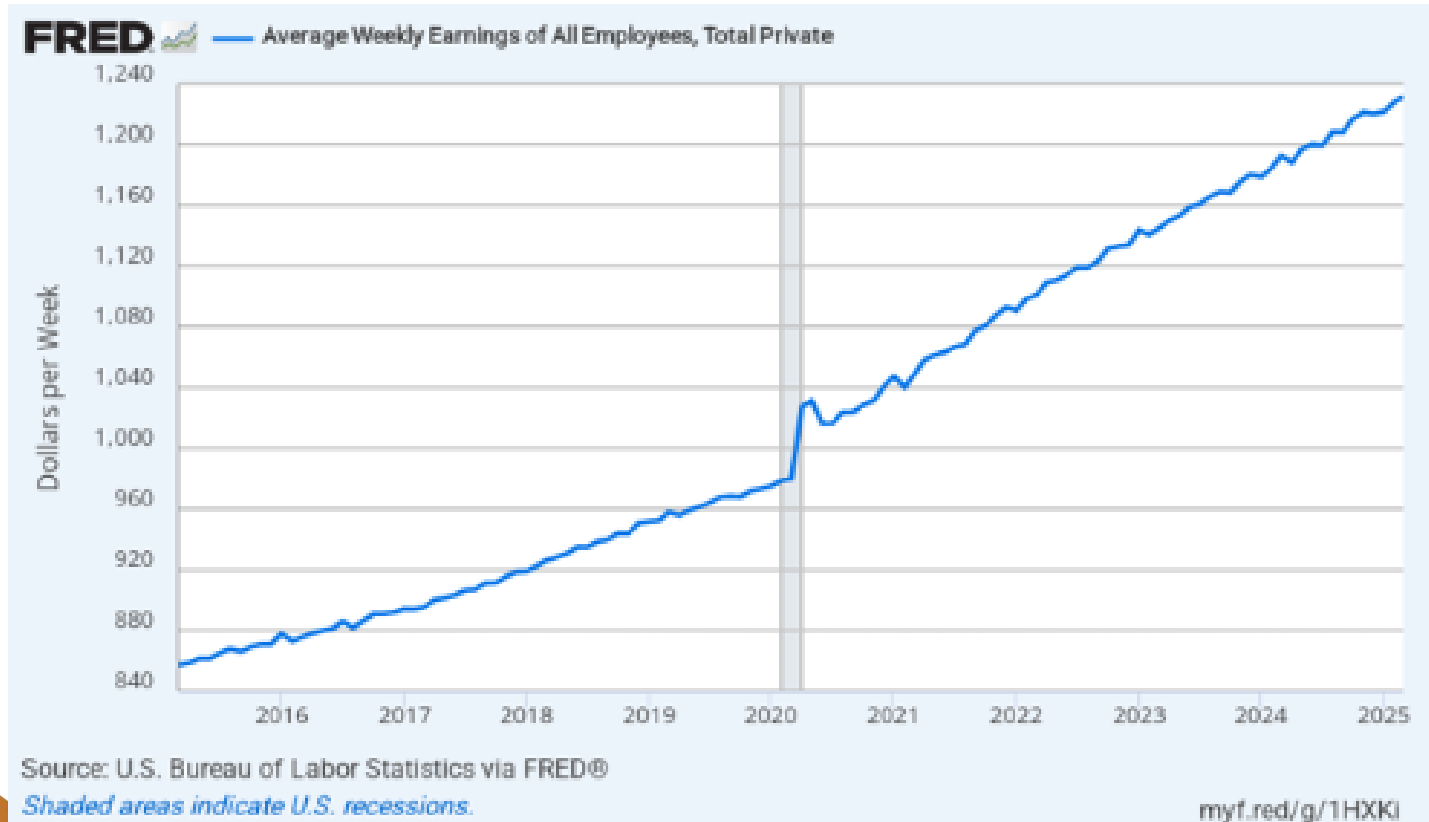
Average Home Sales Price Last 10 Yrs



Average Rent Prices Last 10 Yrs



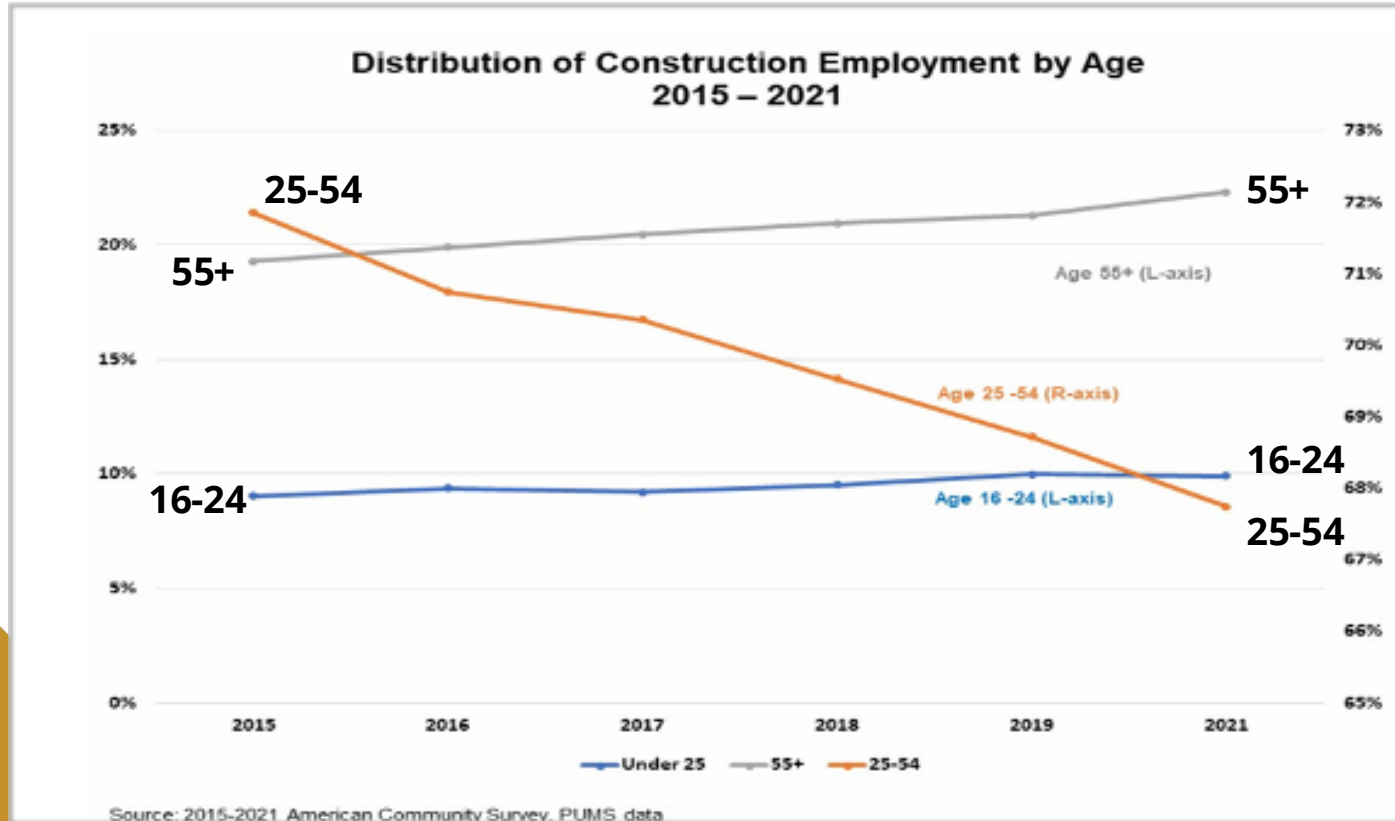
Wage Growth Last 10 Yrs



Cost of materials: spiked in 2020 and have remained elevated



Aging construction workforce: Avg age of a construction worker is 42



The share of older workers ages 55+ rising from 19.3% in 2015 to 22.3% in 2021.

Over the course of 2024-2026, there is a need for an additional 2.17 million adjusted net hires for construction.

(Source: National Home Builders Association)

So...what's the solution?

INTENTIONALITY

Climate Resilience for Vulnerable Communities

- Building/ developing near public transit, jobs, and essential services. This can drastically cut transportation-related greenhouse gas emissions.
- Housing can be built to withstand climate risks—heatwaves, flooding, storms—offering safe shelter to people who are often hit hardest by climate disasters

Resilient buildings = fewer climate-related displacements.

INNOVATION

Smart Design

- Energy-Efficient Design
- Reuse and Retrofit Buildings
- Unique buildings processes and materials

Lower utility bills = long-term affordability for tenants.

PARTNERSHIPS

Government Buy In

- Governments play a critical role in the development of affordable housing.
- Using both policy and incentives go a long way in developing green affordable housing.

Atlanta leading the way

- **Mayor's Office of Sustainability and Resilience** - Focused on clean energy, climate resilience, and urban agriculture.
- **Atlanta Housing Authority is enhancing energy efficiency** in affordable housing units. Partnered with Southface Energy Institute to weatherize and electrify 200 low - income multifamily homes.



“The Melody” Atlanta’s first Rapid Housing community. 40 micro-units constructed from repurposed shipping containers. This innovative project provides temporary housing for individuals experiencing homelessness, offering amenities such as communal garden and on-site support services. The project is located next to a MARTA station granting easy access to public transportation.

The Melody



Climate-smart housing solutions

Ryan Zizzo



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Key Priorities for Future Construction

1. Affordability
2. Speed
3. Low-carbon
4. Climate-resilient



Prioritizing Innovation: Government of Canada

Build homes in factories

"Mr. Carney has promised to provide **\$25-billion in loans and \$1-billion in equity financing** for companies that largely build homes in factories rather than on construction sites"

Restore housing affordability

"It's a big, bold bet that could make it **faster, cheaper and more environmentally friendly** to build a chunk of the 3.5 million homes that official estimates show Canada needs to add by 2030 to restore housing affordability"

Canadian Lumber & Modular construction

Canadian lumber is at the centre of this -- modular construction can reduce build time by up to 50%, costs by up to 20%, and emissions by over 20% compared to traditional methods.

THE GLOBE AND MAIL

ANALYSIS

Mark Carney's bet on prefabricated homes has promise – and big risks

ERICA ALINI >

PUBLISHED YESTERDAY

FOR SUBSCRIBERS



Prime Minister Mark Carney speaks with Oliver David Krieg during a visit to Intelligent City in Delta, B.C., on April 8. Prefabricated construction means building some of the structural elements of a home off site in a factory.

JENNIFER GAUTHIER/REUTERS



Denver

Modular has multiple environmental benefits

Work done inside is easier to electrify and uses less fuel (therefore can be lower carbon)



Modular has multiple environmental benefits

Temporary construction site heating is high carbon (fossil fuels)

Factory heating can be very low carbon (electricity powered heat pumps, solar, etc)

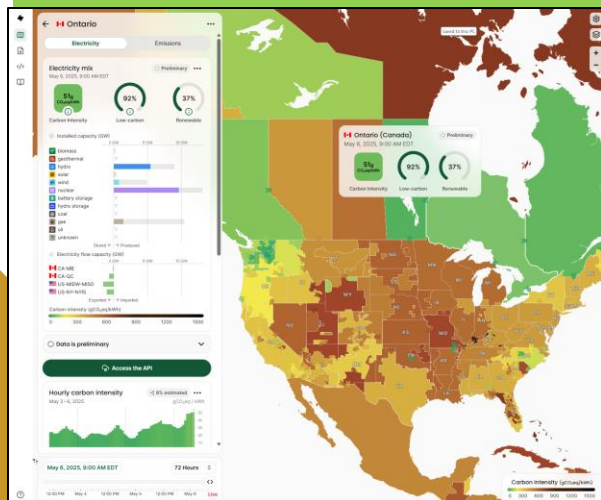


Modular has multiple environmental benefits

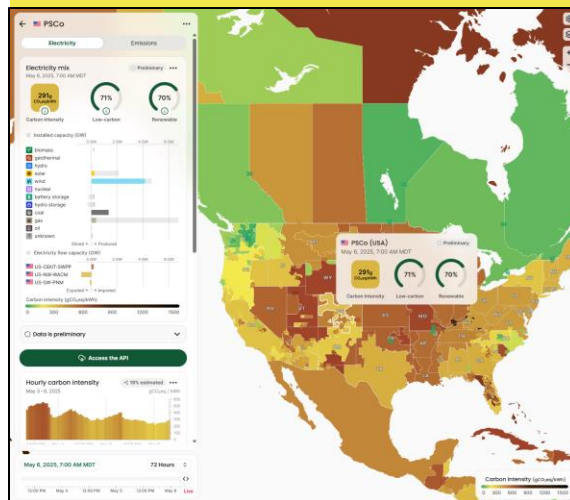
Electricity is lower carbon than fuel, but benefit depends on electrical grid

Below taken at 9:45am eastern on May 6, 2025

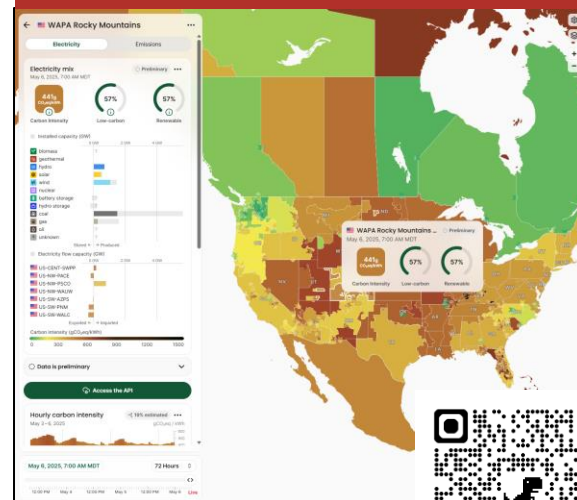
Ontario = 51 g CO₂e/kWh



Denver = 291 g CO₂e/kWh
5.7 x Ontario



Other Colorado = 441 g CO₂e/kWh
8.6 x Ontario



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electricitymaps.com



Modular has multiple environmental benefits

Comparison of CO₂ Emissions Between On-site and Modular Construction

| Item | Construction Methodology | | Difference | Difference (%) |
|-------------------------------------------------------------------------------|--------------------------|--------------|--------------|----------------|
| | Conventional | Modular | | |
| Construction Time (Months) | 10.8 | 6.8 | 4.0 | 37% |
| CO ₂ emissions - construction process (Tonnes of CO ₂) | 98.9 | 56.3 | 42.5 | 43% |
| CO ₂ emissions - Winter Heating (Tonnes of CO ₂) | 431.3 | 247.2 | 184.0 | 43% |
| Total (CO₂) | 530.1 | 303.6 | 226.6 | 43% |

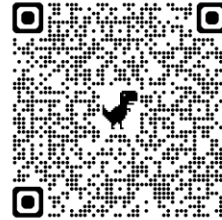
Case study project in Alberta, Canada

Prepared by:

Mohamed Al-Hussein, Juan D. Manrique & Don Mah

Civil & Environmental Engineering, University of Alberta

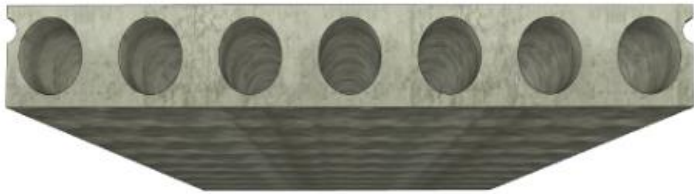
In collaboration with: Integrated Management & Realty Ltd.



Modular has multiple environmental benefits

- Less material waste on site (reduced or no cut-offs)
- Less material use in general
- factory construction can be more materially efficient in the design

Off-site
precast



Hollow-Core Slab

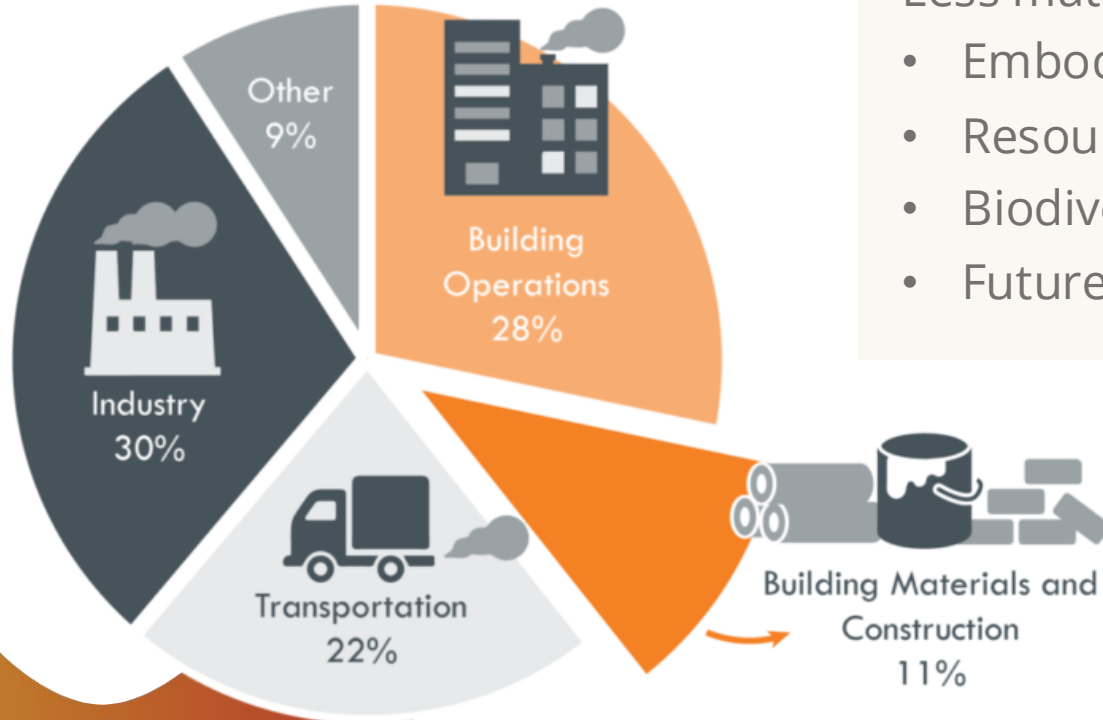
On-site
cast-in-place



Flat Slab

Modular has multiple environmental benefits

Global CO₂ by Sector



Less material means less:

- Embodied Carbon
- Resource Demand
- Biodiversity Impact
- Future Waste / Landfill

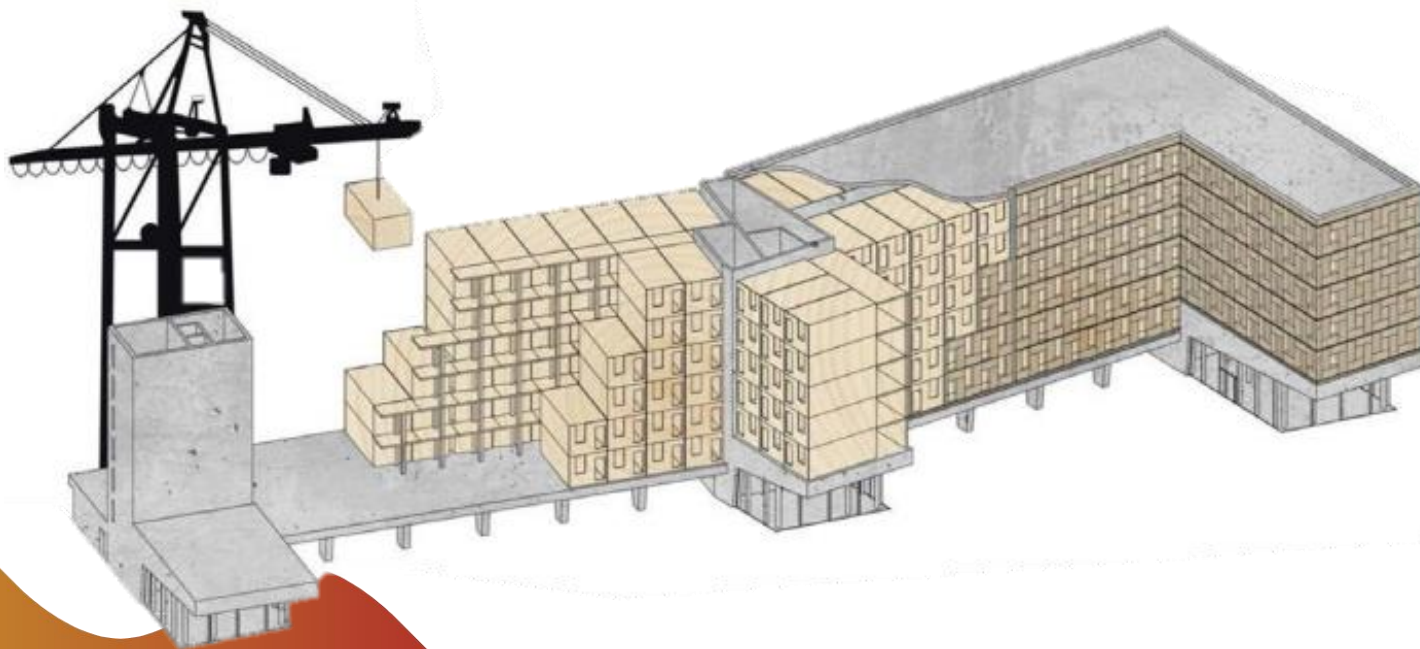
Mass Timber

Environmental
benefits can be
supercharged with
wood



Mass Timber Case Study

Kaufmann Bausysteme's University Housing Project in Hamburg
Studentenwohnheim WOODIE



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Mass Timber Case Study

Kaufmann Bausysteme's 3D Module Production



Mass Timber Case Study

Studentenwohnheim WOODIE Exterior



Mass Timber Case Study

Studentenwohnheim WOODIE Interior



Mass Timber Case Study

YMCA Vanauley, Toronto



Mass Timber Case Study



Affordable and supportive homes for 2SLGBTQ+ youth

- Prefabricated mass-timber components
- Geothermal space heating
- Air source heat pump water heating

Mass Timber Case Study



Zero Carbon Certified

GHGi = $3.9 \text{ kg CO}_2\text{e/m}^2$

City of Toronto

"stretch goal" = $15 \text{ kg CO}_2\text{e/m}^2$

Embodied Emissions

= $280 \text{ kg CO}_2\text{e/m}^2$

life cycle A-C

City of Toronto

stretch goal = $350 \text{ kg CO}_2\text{e/m}^2$

Social benefits too!

Working in a factory can be more equitable and fit more lifestyles

- More consistent schedules
- Less travel required
- Ability to stay closer to home or move near a factory, not bounce around between job sites

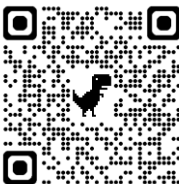


TOD Housing

A Case Study by Ozzie Gonzalez



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A large mural of the Berlin Wall, covered in graffiti and drawings. The wall is made of concrete blocks and is covered in various messages and symbols. Some of the visible text includes "BUILD A LOVE WALL", "NO SYMPATHY FOR ARABIC", "Riders Unite", "LOVE", "PEACE!!!", "FARE YOU WELL", "VIGRACIAS POR TU", "NO THIS V", "TEACH LOVE", "LOVE ALL", "LOVE HEALS ALL", "LOVE WINS", "NEVER THE LESS WE PERSISTED", "TEACH THE CHILDREN", "LOVE WINS", "LOVE HEALS ALL", "LOVE WINS", "LOVE HEALS ALL", "LOVE WINS", "LOVE HEALS ALL". There are also many heart symbols and other drawings. In the foreground, several people are walking past the wall. A man in a plaid shirt and a woman in a black shirt are walking towards the left. A man in a camouflage jacket and a woman in a red shirt are walking towards the right. There are also some flowers and small objects placed at the base of the wall.

[illegible]



我们

que más profundamente

could a flower hesitate to open?

Gray place go to say Konami ut enas-tik 4x

HOLLYWOOD

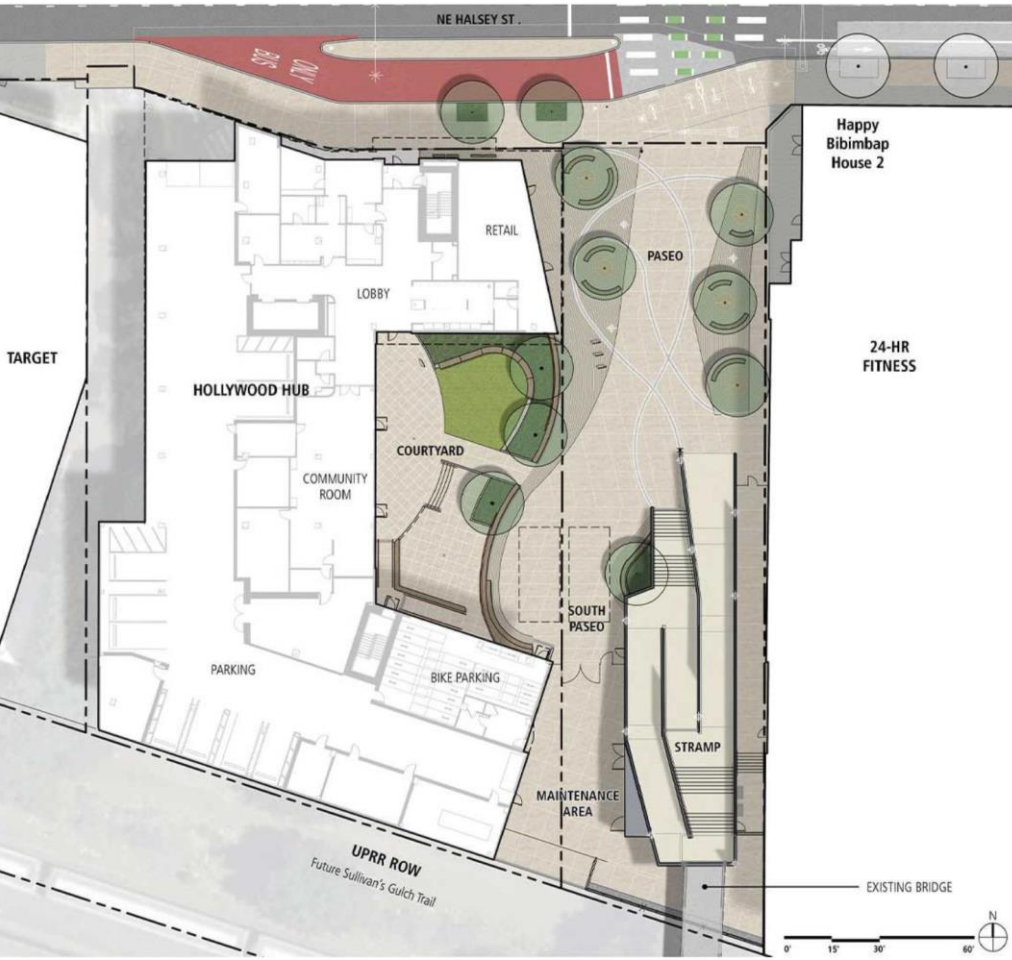
6110 NE Halsey St

An architectural rendering of the Hollywood Transit Hub. The central focus is a tall, modern 13-story building with a dark, textured facade and numerous windows. To its left is a shorter, more traditional brick building. The scene is set on a city street with a crosswalk, where several pedestrians are walking. A traffic light pole stands on the right side of the street. The sky is a clear, light blue. The title 'HOLLYWOOD TRANSIT HUB' is overlaid in large, white, sans-serif capital letters on the left side of the image.

HOLLYWOOD TRANSIT HUB

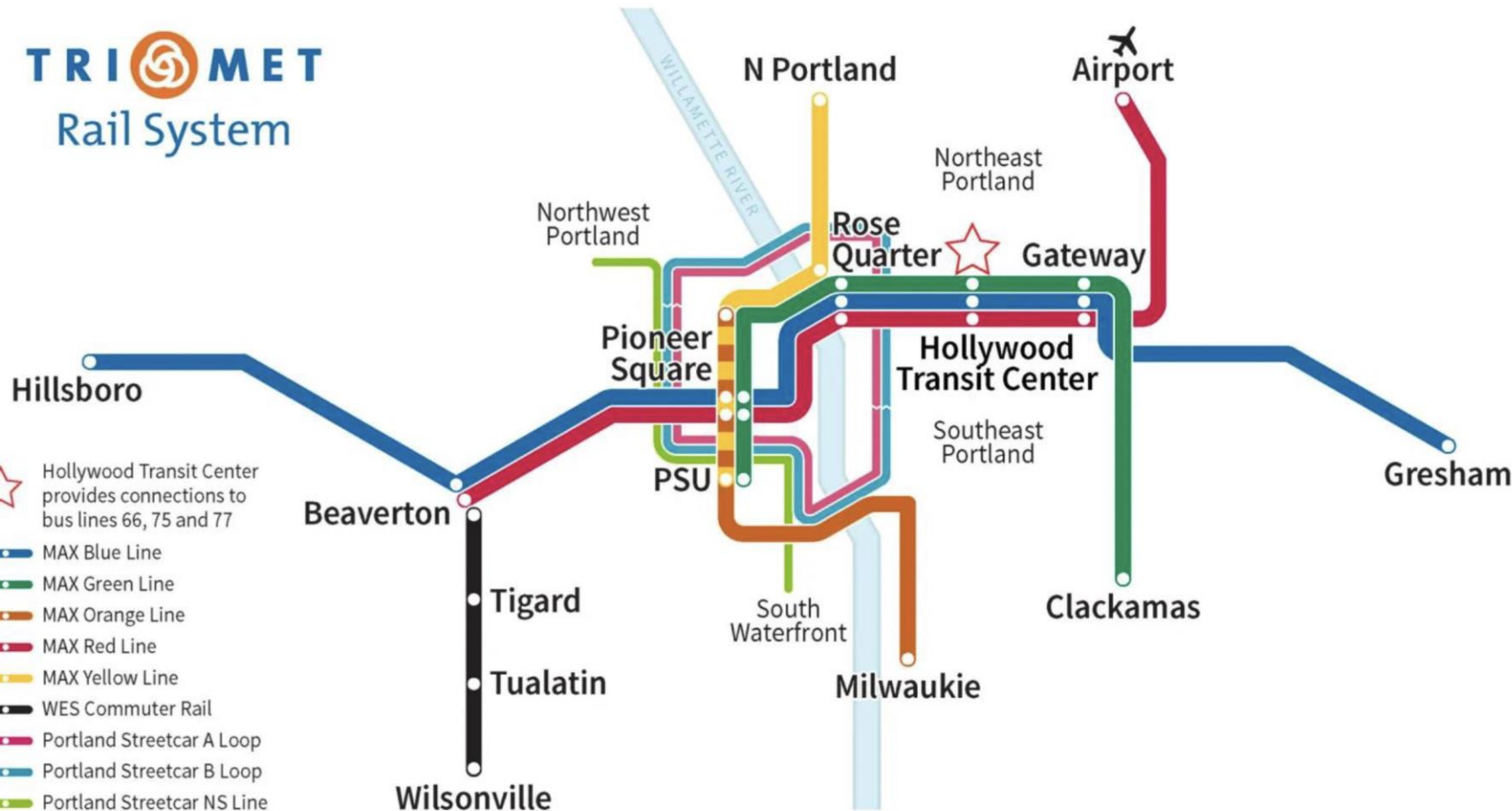
- 13-story with 222 affordable units
- Street & Intersection upgrades
- Multi-modal mobility hub

Site Amenities



TRI MET Rail System

- ☆ Hollywood Transit Center provides connections to bus lines 66, 75 and 77
- MAX Blue Line
 - MAX Green Line
 - MAX Orange Line
 - MAX Red Line
 - MAX Yellow Line
 - WES Commuter Rail
 - Portland Streetcar A Loop
 - Portland Streetcar B Loop
 - Portland Streetcar NS Line



CLIMATE BENEFITS

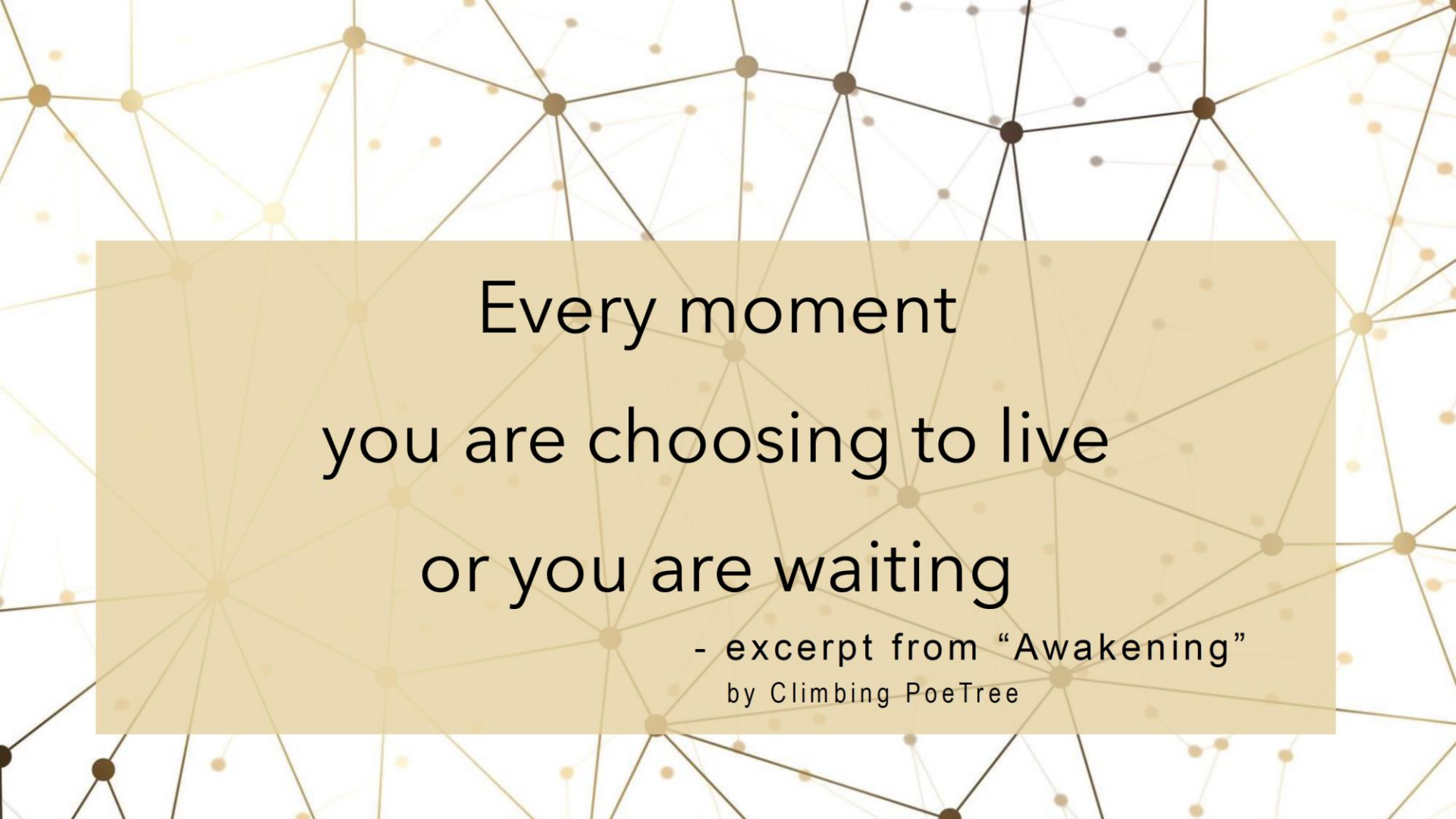




Image courtesy of Trimet



TOD REQUIRES
COLLABORATION

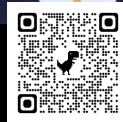
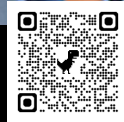
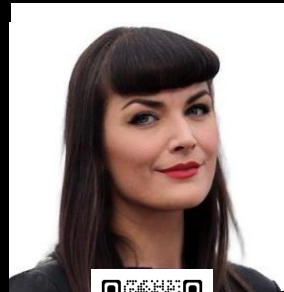


Every moment
you are choosing to live
or you are waiting

- excerpt from “Awakening”
by Climbing PoeTree

Thank you

Be sure to connect by scanning our QR Codes>>>



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