

# Building a Resilient Pittsburgh

A Climate-Aligned Urbanism Approach to Land Use and Development

Anna Zetkulic - Urban Transformation June 2, 2022

## What does the RMI Urban Transformation Program do?

- Support cities bridge the gap between climate commitment and climate action.
- Provide techno-economic analysis and direct support to cities.
- Organize knowledge exchange and trainings for local governments, community-based organizations, and other stakeholders.
- Focus on the core areas cities struggle to decarbonize:
  - 1) the grids they don't control
  - 2) how people and goods travel
  - 3) housing, especially owned or rented by low and medium-income communities.

#### Some of the initiatives we're working on...

#### **Cool Cities**

 $\left( \mathbf{b} \right)$ 

- Super-efficient air conditioning
- Thermally efficient buildings
- Cool surfaces (roads, sidewalks)
- Heat-resilient city planning
- Urban nature

#### **Climate-Aligned Urbanism**

- Smart growth, urban land use, housing policy
- Clean transportation portfolios ("reduce," "shift," "electrify")
- Fighting highway expansions (Shift Calculator)
- Rational road and vertical pricing





#### **City Renewables Accelerator**

- Rooftop solar
- Community solar+
- Large-scale renewables PPAs
- DER-led pathways to 100% renewables
- Utility and regulatory engagement
- Building electrification

#### **Urban Nature**

- Reducing building energy loads
- Managing water (and minimizing grey infrastructure)
- Encouraging mode-shift
- Sequestering carbon
- Protecting/enhancing biodiversity
- Improving health









## We are moving in the wrong direction.







70%

of today's buildings will still be here in 2050.

Being on the right course means addressing both how and where retrofits and new construction occur.

## What is Climate-Aligned Urbanism?



A new RMI initiative working with cities globally to accelerate equitable climate action through:

1) land use,
 2) housing, and
 3) transportation.

RMI – Energy. Transformed.

Image: Living in Indianapolis

# What is Climate-Aligned Urbanism?



## Why does this matter?

- Climate-aligned housing requires considering the emissions generated by the resident not just by occupying their homes, but also in traveling to and from them.
- 2. Climate-aligned housing can also **contribute to equitable outcomes** when it is 1) affordable and 2) sited in neighborhoods that already have low VMT (meaning accessibility to jobs, services, and leisure).
- 3. Where development occurs can have an even greater impact on climate than the building construction and performance.

# Why does this matter?

Transportation is the largest source of U.S. emissions – and it's growing.



2020 U.S. Emissions by Sector

To maintain alignment with 2030 1.5° target, the U.S. will need 70M electric vehicles and 20% reduction in how much we drive (vehicle miles traveled or VMT).

Decarbonization path that limits cumulative US emissions to 57 Gt C02e from 2020 onwards



EPA Fast Facts on Transportation Greenhouse Gas Emissions

## What does that mean in practice?





Fortera Evergreen Carbon Capture Program's Carbon Calculator

# 5 strategies to reduce VMT by 20%



- How we price vehicle use: 5-15%.
- Ending metro highway expansions: 1-3%.
- <u>Redesigning streets</u> for bikes, pedestrians and buses: 3-6%
- Providing mobility options and teleworking (or <u>transportation demand</u> <u>management</u>): 4-8%.
- Where we build <u>housing and services</u> (AKA <u>land use</u>): 5-20%.

# Modelling where and what types of smart growth alone could lead to 20%+ regional VMT reduction

Austin



Zones in purple show commercial, industrial and vacant parcels highly viable for residential redevelopment



Zones in yellow show exclusively single-family parcels highly viable for 4-6 plex development Denver



Zones in green show highly viable new development on existing transit corridors

Source: Pending RMI analysis with support from Urban Footprint

## Location is important to equity and the environment.

US Household GHG Footprint vs. Income by Zip Code



- Where housing is built can be as impactful to emissions reduction as how it is built and operated.
- For local governments, building housing in <u>low-VMT, medium-</u> <u>income and above neighborhoods</u> can be the most impactful strategy available for emissions reduction – and a key strategy for equity and inclusion.

Build Mixed-Income Housing in Wealthy Urban Neighborhoods

### Developed parcels before 1945



Edgewood

Swissvale

Rankin

Munhall

Source: Urban Footprint

Developed parcels between 1945-1964



Developed parcels between 1964-1980



### Developed parcels between 1980-1995



Developed parcels between 1995-2018



Map depicts annual VMT per household by zip code.

Clear correlation between the more amenities (jobs, essential retail, park space, and housing), the lower the VMT per household.



Map depicts housing + transportation cost burden of households at the neighborhood level.

On average Pittsburgh residents spend 41% of their income on housing + transportation, not bad compared to other U.S. metros.





\*Housing and Transportation (H+T®) The Center for Neighborhood Technology (CNT) CNT's Location Efficiency Hub.

# VMT and emissions rise the further you are from a city center...

Comparo

	VMT per household/year*	Tons of CO <sub>2</sub> eq/year*	national household average <sup>**</sup>	VMT by U.S. Zip Codes
Daly City,	12,000	22	24%	
San Francisco			better	
Sausalito, Marin County	21,000	26	15% better	vozez Mapbox © OpenStreetMar
Richmond, Alameda County	28,000	33	9% better	40,000

\*Christopher M. Jones and Daniel M. Kammen, Spatial Distribution of U.S. Household Carbon Footprints Reveals Suburbanization Undermines Greenhouse Gas Benefits of Urban Population Density. Environ. Sci. Technol., 2014, 48 (2), pp 895–902. \*\*Fortera Evergreen Carbon Capture Program's Carbon Calculator (assumes each mile is in a light duty ICE vehicle at 25MPG [national average])

## ...and so does the housing and transportation cost burden.

	Costs % of Income*	Income**	
Daly City, San Francisco	Housing: 31% Transportation: 16% H+T = <b>47%</b>	\$106,00	United States
Sausalito, Marin County	Housing: 39% Transportation: 16% H+T = <b>55%</b>	\$108,901	- 30% 30%+ Mexico Housing + Transportation Cost Burdened
Richmond, Alameda County	Housing: 22% Transportation: 17% H+T = <b>39%</b>	\$63,764	-United States

< 45% 45%+

\*Housing and Transportation (H+T®)The Center for Neighborhood Technology (CNT) CNT's Location Efficiency Hub.

\*\*Cubit Planning Inc based US 2020 Census Data

# What are the opportunities?

Housing Market Size, Today to 2030



## 85.8 million

# of **Single-Family Home**s in the U.S. Today

# of **Multifamily Homes** in the U.S. Today

31.5 million



# of Housing Units Needed by 2030 to Balance Supply and Demand

US Census American Housing Survey (2019), National Association for Home Builders (2021), National Association of Realtors (2021)

## Where's the market opportunity for Climate-Aligned Urbanism? With homeowners

Homeowners want to build 1-3+ more units on their lots, especially in dense urban areas



## Where's the market opportunity for Climate-Aligned Urbanism? With local homebuilders

Local homebuilders want to redevelop underused lots in high amenity areas with multi-unit infill.



## Where's the market opportunity for Climate-Aligned Urbanism? With national homebuilders

National homebuilders want to build multi-unit, multi-purpose developments in high demand metro areas.



![](_page_26_Figure_3.jpeg)

#### Flexible Land Use Regulations Equitable-Transit Oriented Development

#### **Closing the Skilled Trades Labor Gap**

## Resurrection of the Merchant Class and Small Scale Developer

## It takes a lot to <u>enable</u> inclusive, climate-aligned housing through land use reform, but it comes down to 4 key strategies.

(2)

Policy

Coalitions

(1)

Data

Design

DesegreateCT: Connecticut Zoning Atlas

![](_page_28_Picture_2.jpeg)

CHARLOTTE 2040 FUTURE COMPREHENSIVE

OUR CITY. OUR PLAN. OUR FUTURE.

![](_page_28_Picture_5.jpeg)

![](_page_28_Picture_6.jpeg)

Low-Rise: Housing Ideas for Los Angeles

City of Portland: <u>"City Council hears lots of public testimony on the</u> <u>Residential Infill Project</u>"

## It also takes a lot to <u>realize</u> inclusive, climate-aligned housing through developers, lenders and others scaling up production.

![](_page_29_Figure_1.jpeg)

#### Thank you.