H+T® INDEX

THE CONCEPT, MODEL AND WEBSITE

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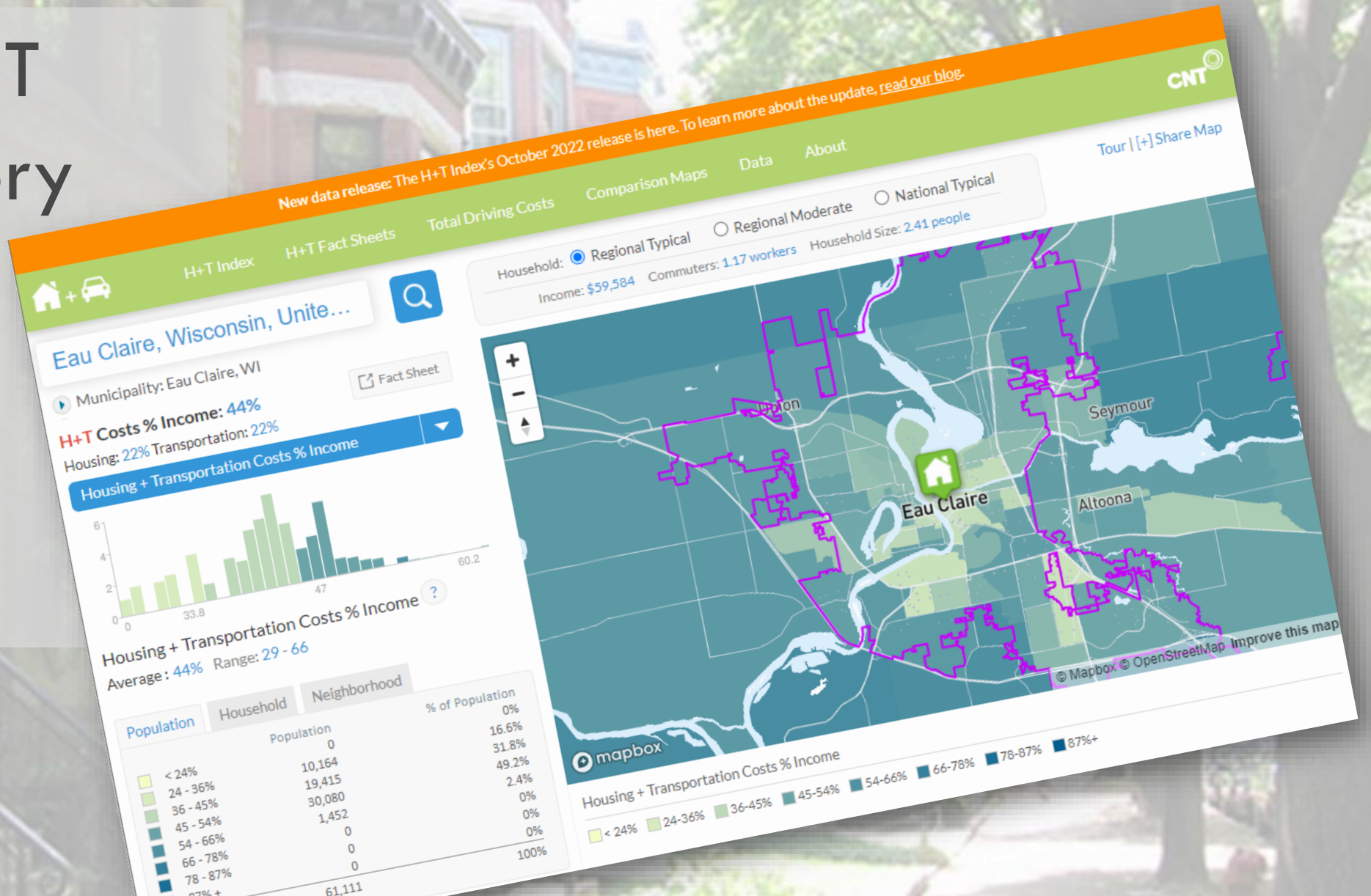
Center for Neighborhood Technology
December 1st, 2022

H+T INDEX – TODAY'S AGENDA

- About CNT
- H+T History
- Concept
- Model
- Tool
- Discussion



About CNT

- CNT is a national hub for research, strategies and solutions to help cities use resources more efficiently and equitably.
- We believe solving problems like poverty, climate change and urban sprawl starts with making neighborhoods, cities and regions work better.
- Committed to evidence-based solutions supported with rigorous analysis.

Mission:

CNT delivers innovative analysis and solutions that support community-based organizations and local governments to create neighborhoods that are equitable, sustainable, and resilient.

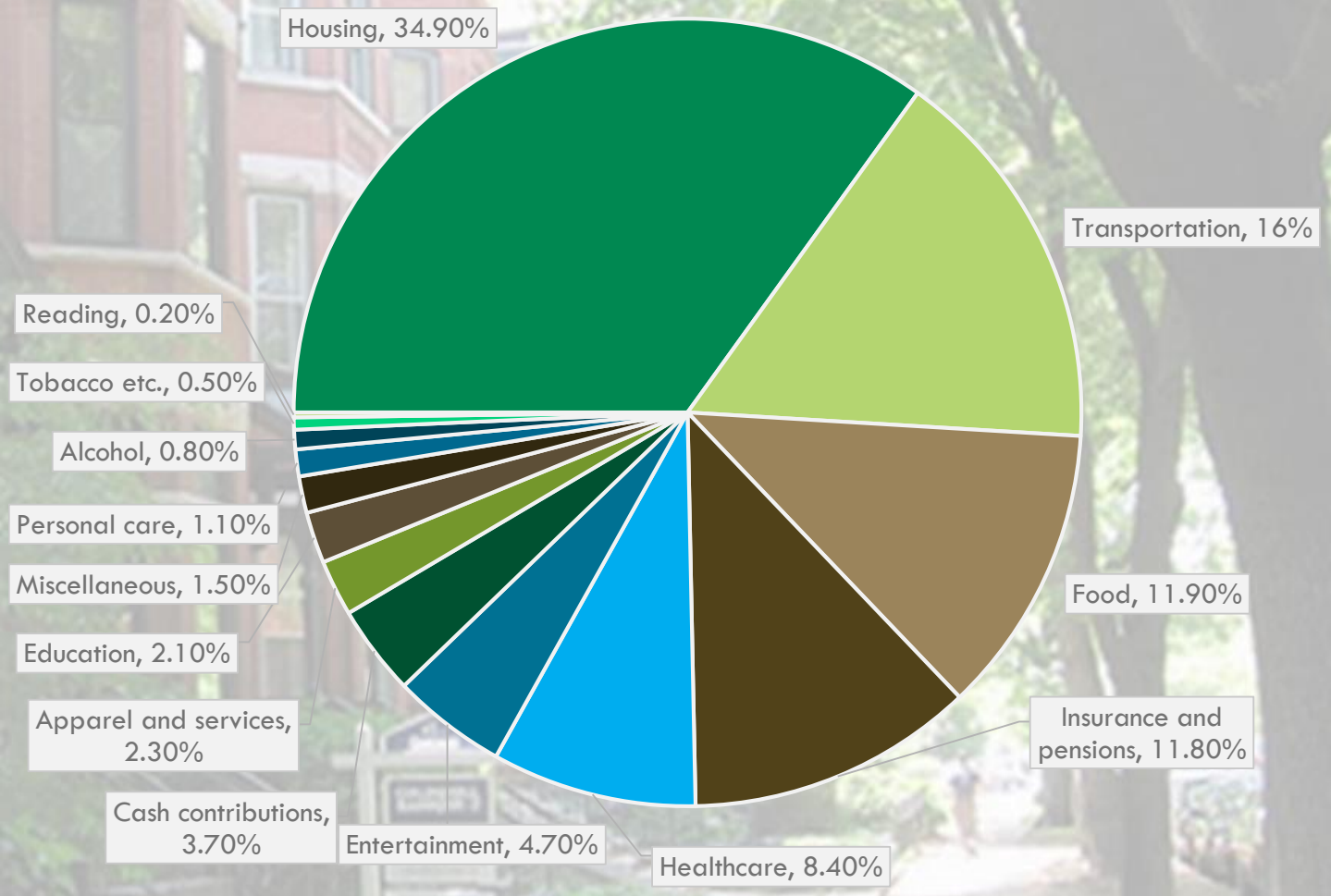
CNT

CNT'S H+T AFFORDABILITY INDEX: HISTORY

THE H+T CONCEPT

Housing is on average the number one expense for households in the US, transportation is next.

Percent distribution of total annual expenditures by major category for all consumer units, 2020



https://www.bls.gov/news.release/cesan.nr0.htm

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Transportation Costs: Are Driven by year Choices

$37,900

10 years later $9,000

You just blew $28,900 in 10 years
Or more than $2,890/year on a car!

Drive 12,000
mile/year

28 miles/gallon with gas @ $2.95/gallon
You burn about $1,265
Plus, insurance $850, maintenance $350, etc.…
$2,500/car/year

$50/month

$600/year

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Transportation Choices: are driven by your options

Transportation Costs: And your options are driven by place!

TRANSPORTATION MODEL

Neighborhood Characteristics

- Block Size
- Job Gravity
- Job Mix Index
- HH Density
- HH Gravity
- Percent Single Family Detached (SFD)
- Percent Rental
- SFD Gravity
- Renter Gravity
- Bus TCI
- Other TCI
- TAS Jobs
- Peak Service

Household Characteristics

- Median Household Income
- Commuters/HH
- HH Size

- Auto Ownership
- Auto Use
- Percent Transit Commutes

Transportation Costs

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TRANSPORTATION COSTS

- Auto Ownership/Use – When we developed the LAI, using the CEX found the cost (in 2010 USD) of the service flow cost of auto ownership and use. (see: https://files.hudexchange.info/resources/documents/LAI-Auto-Cost-Research-Synthesized.pdf)

income_bin	service_flow_value	finance_cost	fixed_ownership	drivability	fuel	max_income
1	2,396	73	657.3	400.8	1,182	20,000
2	2,478	133	732	421.1	1,369.5	40,000
3	2,586	182	755.6	458.8	1,494.2	60,000
4	2,727	211	758.6	477.6	1,552.8	100,000
5	3,139	201	836.6	593.1	1,635.6	999,999,999

- We then inflate these number using the Consumer Price Index for Urban Consumers (CPI-U), automobile expenditure, relative to 2010.
- And back out fuel cost, then use average "local" gas price for the year along with modeled household VMT and average MPG.
- Transit – use NTD farebox revenue, by agency, prorate this across counties using number of stops relative to agency's total, then allocate that to households using percent of commuters using transit by Census Block Group.

CNT

New data release: The H+T Index's October 2022 release is here. To learn more about the update, read our blog.

H+T Index | H+T Fact Sheets | Total Driving Costs | Comparison Maps | Data | About | CNT

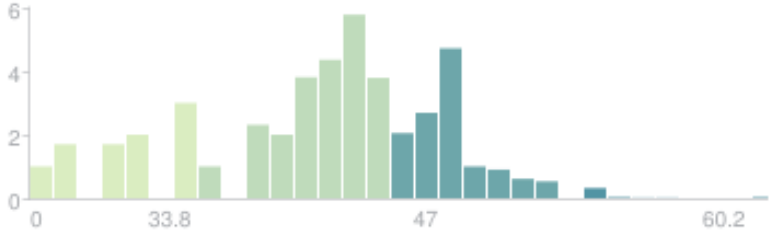
Eau Claire, Wisconsin, Unite…

Municipality: Eau Claire, WI

H+T Costs % Income: 44% Fact Sheet

Housing: 22% Transportation: 22%

Housing + Transportation Costs % Income



Housing + Transportation Costs % Income ?

Average : 44% Range: 29 - 66

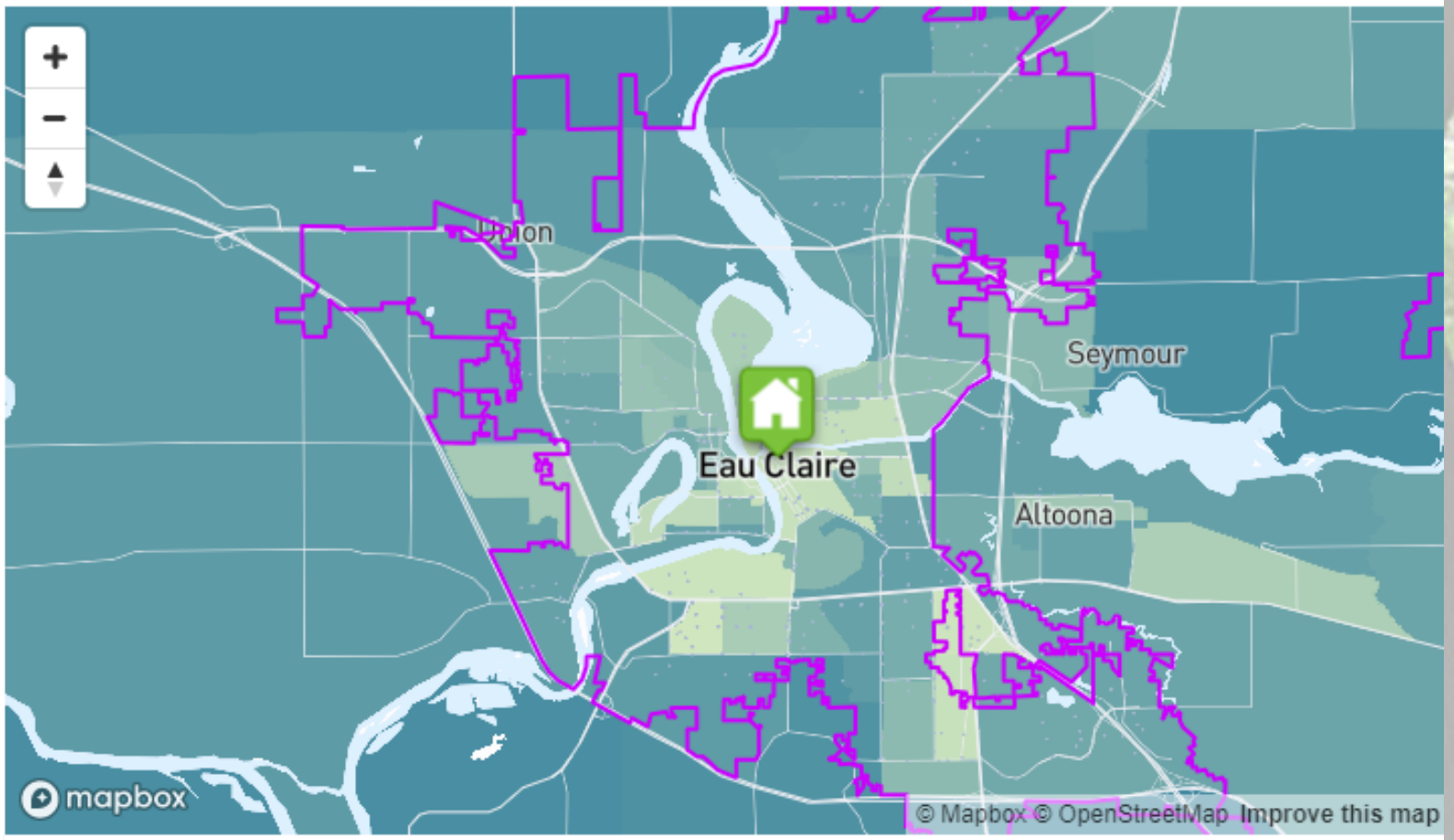
Population | Household | Neighborhood

	Population	% of Population
< 24%	0	0%
24 - 36%	10,164	16.6%
36 - 45%	19,415	31.8%
45 - 54%	30,080	49.2%
54 - 66%	1,452	2.4%
66 - 78%	0	0%
78 - 87%	0	0%
87% +	0	0%
Total	61,111	100%

Household: Regional Typical | Regional Moderate | National Typical

Income: $59,584 Commuters: 1.17 workers Household Size: 2.41 people

Tour | [+] Share Map

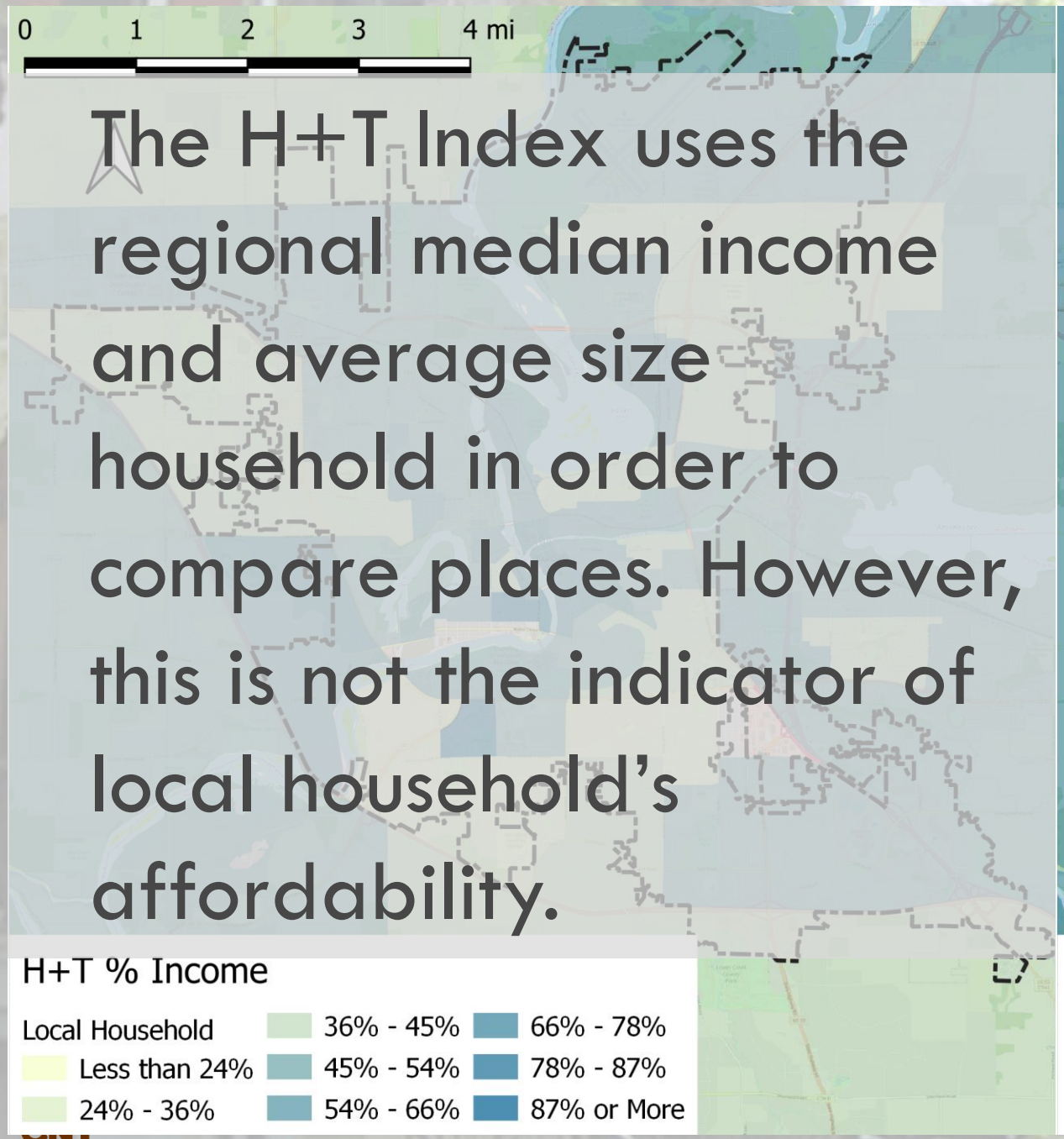


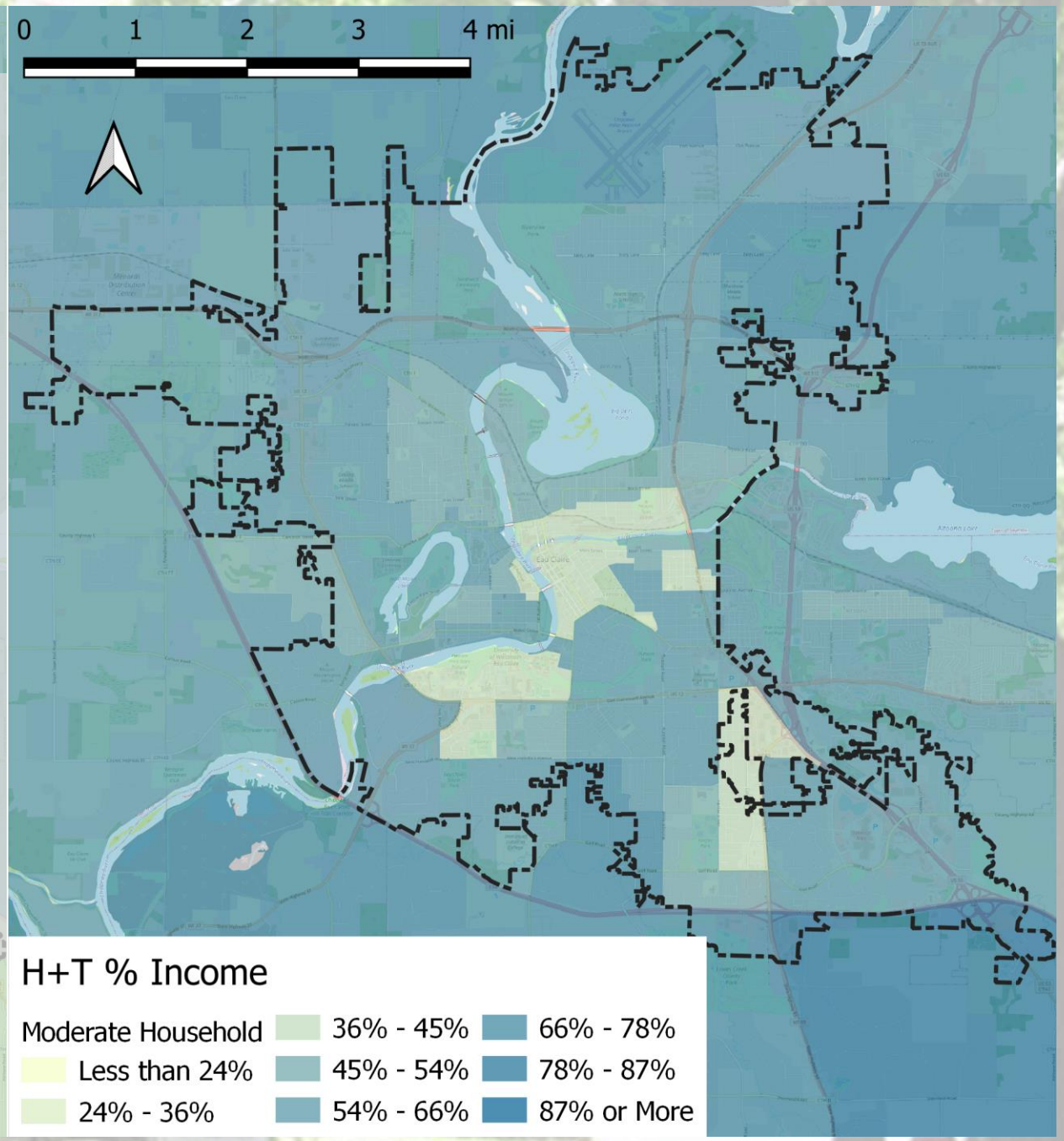
Housing + Transportation Costs % Income

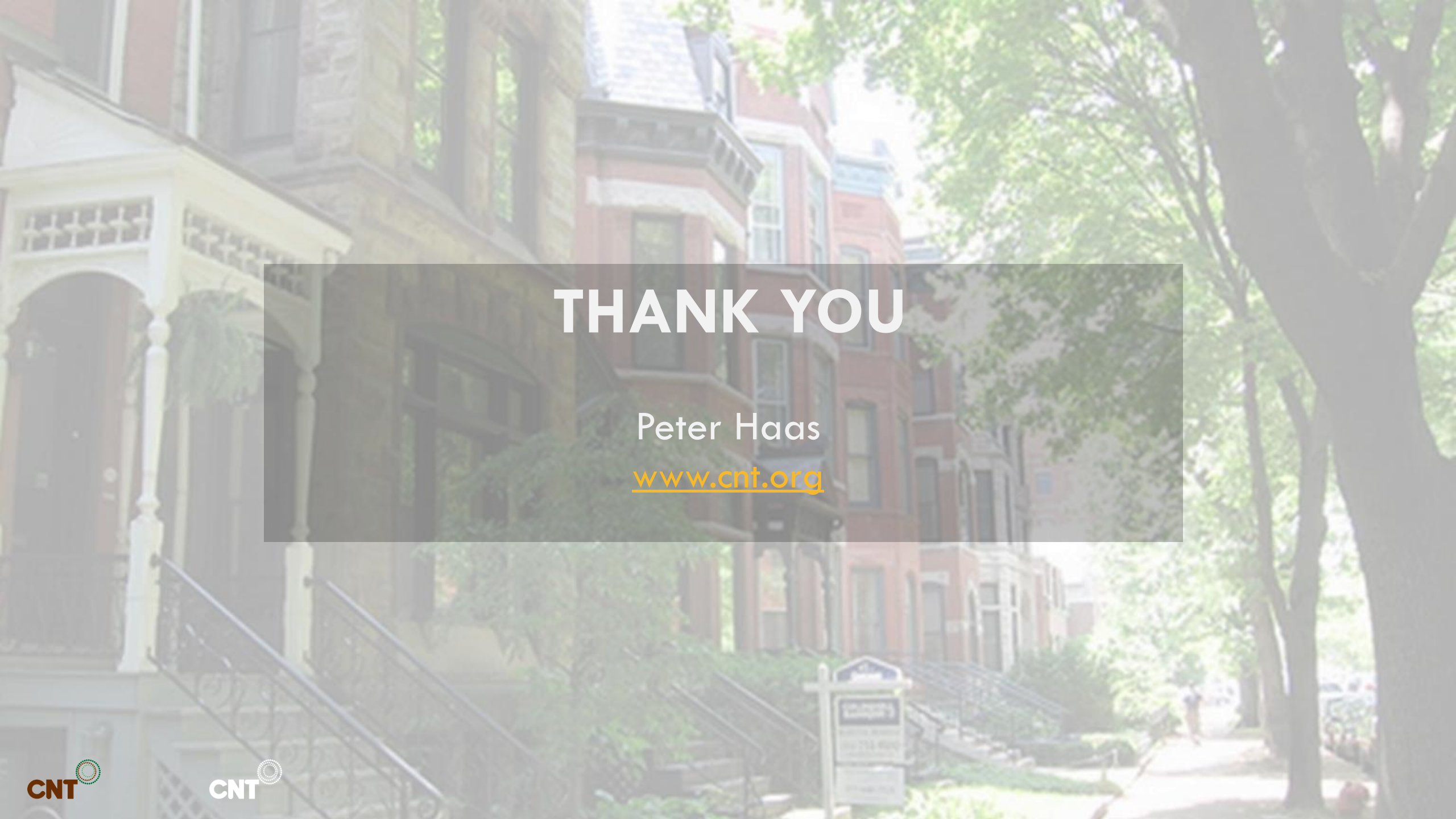
< 24% | 24-36% | 36-45% | 45-54% | 54-66% | 66-78% | 78-87% | 87%+

https://htaindex.cnt.org/map

The H+T Index uses the regional median income and average size household in order to compare places. However, this is not the indicator of local household's affordability.







THANK YOU

Peter Haas

www.cnt.org

LOCATION AFFORDABILITY, HOUSEHOLD DYNAMICS, AND URBAN CHARACTERISTICS

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THE URBAN FORM /TRAVEL BEHAVIOR DEBATE

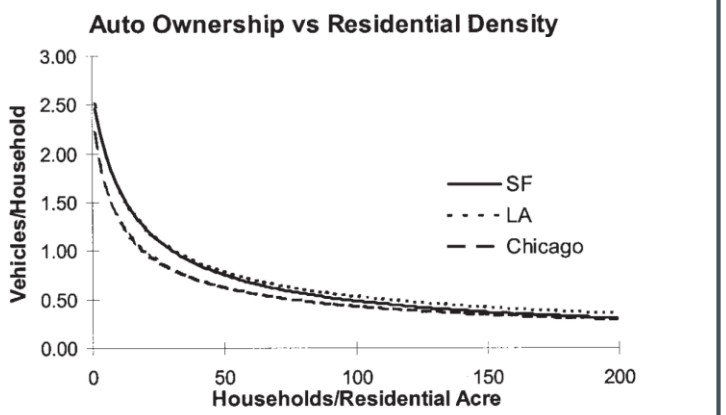


FIGURE 4 The reduction in vehicles per household as residential density increases.

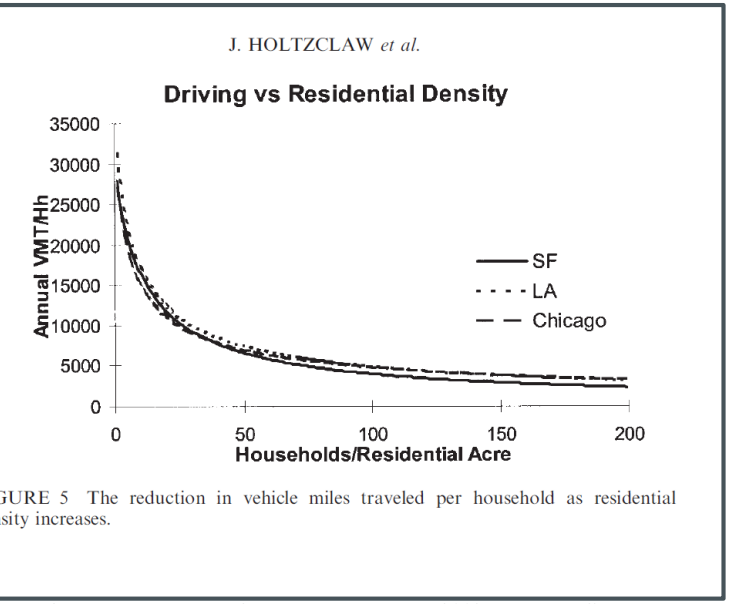


FIGURE 5 The reduction in vehicle miles traveled per household as residential density increases.

Extensive research on UF in relation to travel behavior TB:

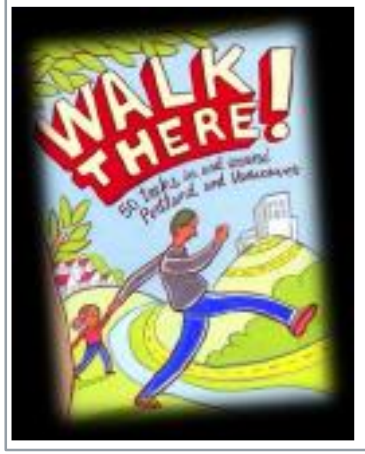
- Urban Form *can* affect car ownership, VMT, commute times, employment options, and travel choice, e.g., ability to walk, bike, or take transit

Holtzclaw, J., R. Clear, H. Dittmar, D. Goldstein, and P. Haas. 2002. Location Efficiency: Neighborhood and Socio-Economic Characteristics Determine Auto Ownership and Use-Studies in Chicago, Los Angeles and San Francisco. *Transportation Planning & Technology* 25 (1):1-27.

ACCEPTANCE OF UF/TB RELATIONSHIP

Cities and regions have adopted goals to reduce household transportation costs through LU and transport plans

Drive less. Save more.
www.DriveLessSaveMore.com



drcog
DENVER REGIONAL COUNCIL OF GOVERNMENTS

Metro Vision Performance Metric

Population Residing in Areas with Housing and Transportation Costs Affordable to the Typical Household in the Region

Description:	Share of the region's population living in areas with housing and transportation costs that do not exceed 45 percent of the annual income of the typical household in the region, where the typical household earns the median income for the region, with both the average household size and average number of commuters per household for the region
Lead/Lag:	Lag. Improvements in this measure rely on changes in development patters (e.g. increased housing density, as well as growth in urban centers and/or near high frequency transit) and changes in travel (e.g. increasing non-single occupancy vehicle mode share to work).
Frequency:	Irregular. The Center for Neighborhood Technology (CNT) plans to update the index every two years, depending on funding.

Portland Metro, 2040 Long Range Transportation Plan

BUT THE UF/TB RELATIONSHIP IS NOT LINEAR

Nuances in both UF and reason for TB matter:

- Household characteristics: most research focuses on income, household size, number of commuters, but number and age of children, older adults, and other household members matter
- Some self-selection bias: where people choose to live and how they prefer to travel ***can*** be more important than the UF itself
- Measures of UF must be detailed: variables should represent walkability, transit, access to work, goods and services, and at the smallest scale possible and weighted appropriately (Handy 2017).
- Race also matters but is rarely taken into accuont: people may respond to UF differently based on race, ethnicity, culture, and income due to racism and other structural inequities, experiences, barriers, and biases (Adkins, Makarewicz, et al., 2017)

Also, advocates of "Cars for Poor People" worry it will result in reduced access

- Car-access advocates think promotion of sustainable and affordable travel is anti-car, but it's really about allowing households to own fewer (or zero, if possible) cars and to drive them less, not to eliminate or restrict car access

AN EXAMPLE OF THE DEBATE/CRITIQUE

SMART & KLEIN: "COMPLICATING THE STORY OF LOCATION AFFORDABILITY" (2018)

"COMPLICATING THE STORY OF LOCATION AFFORDABILITY" (SMART & KLEIN, 2018, HPD)

Authors used multiple years of **panel data** (Univ. of Michigan's Panel Study of Income Dynamics, PSID) to determine whether movers changed their transport expenditures when they moved in and out of places with different levels of transit access.

"Our results suggest that changes in access to transit have a weak influence on transportation expenditures, whereas changes in income and household composition have a strong influence."

(Smart & Klein)

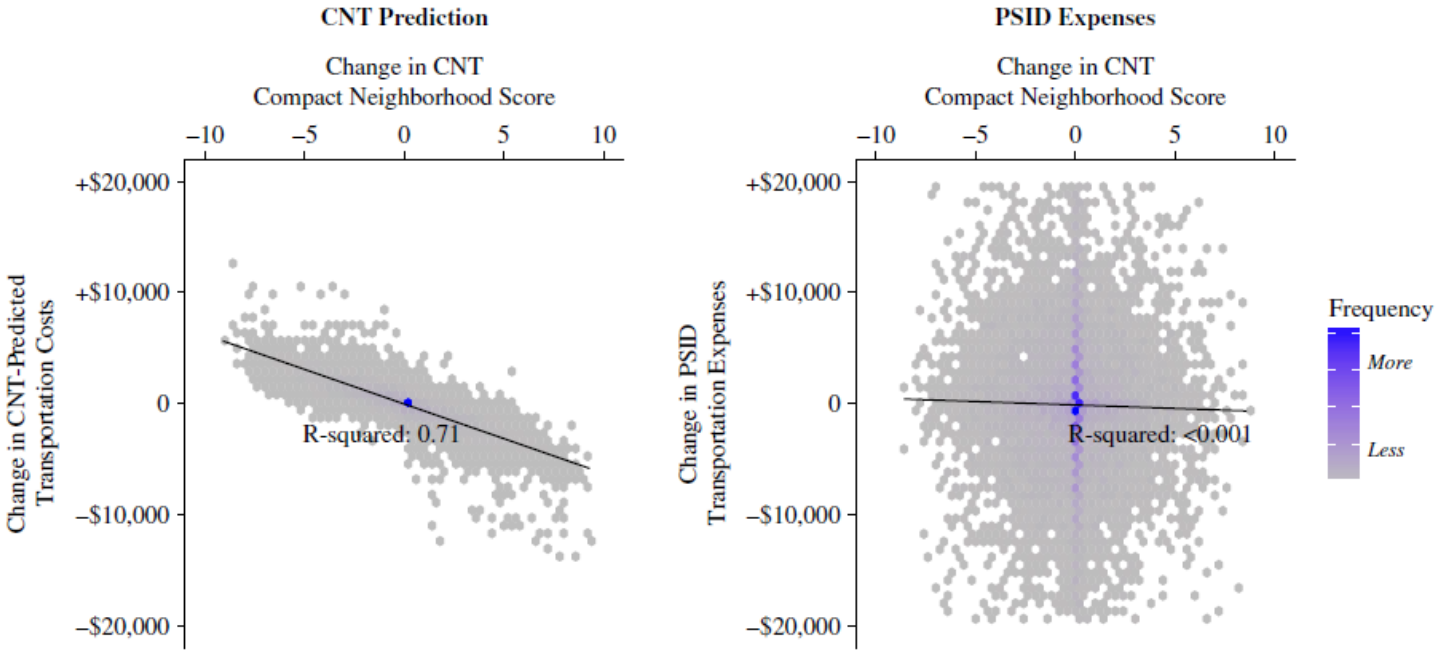
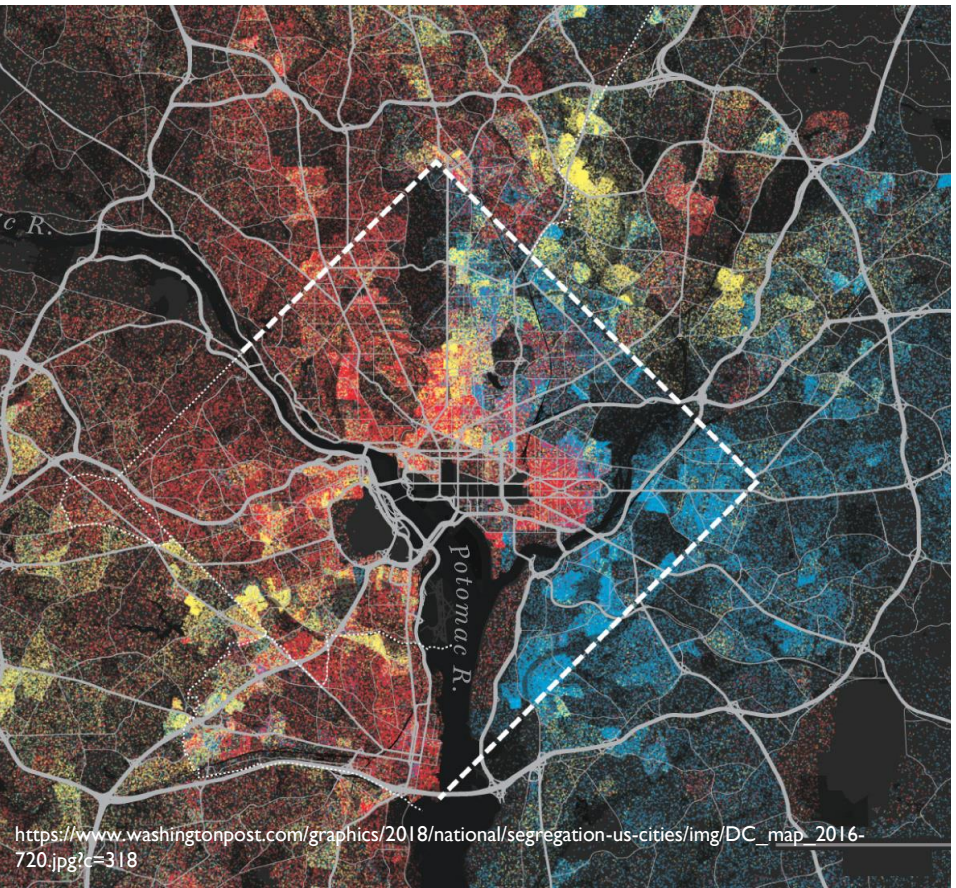


Figure 7. Comparison of Center for Neighborhood Technology (CNT) and Panel Study of Income Dynamics (PSID) changes in transportation expenses, CNT Housing + Transportation (H+T) Index 2017, PSID 2003–2013.

Why? They didn't follow the research:

- **Used Census Tracts**: this scale is too large; UF can change from block group to block group within a tract
- **Just 2 income groups**: > and < poverty
  - **And** no other household specifics
- **Just 1 measure of UF:** "transit access to jobs in 30 minutes" relative to the *region's* transit quality, not true quality
  - **And** no other measures, e.g., walkability, residential density (which influences retail), housing types, other transit details



https://www.washingtonpost.com/graphics/2018/national/segregation-us-cities/img/DC_map_2016-720.jpg?c=318

We confirmed the UF/TB Relationship:

***Using the PSID, h**ow do various family characteristics combine with neighborhood characteristics to influence housing and transportation expenditures, i.e., location affordability?*

Carrie Makarewicz , Prentiss Dantzler & Arlie Adkins (2020): Another Look at Location Affordability: Understanding the Detailed Effects of Income and Urban Form on Housing and Transportation Expenditures, Housing Policy Debate

OUR APPROACH USING THE PSID

- 3 Data Sets at the Census **Block Group**
  1. Housing and Transportation (H+T) Affordability Index (2015)
     - Center for Neighborhood Technology (CNT): uses ACS, GIS, national household travel survey
  2. Panel Survey of Income Dynamics (PSID) (2015)
     - Institute for Social Research, University of Michigan: detailed household reported data to demographic, financial, and social questions
  3. American Community Survey (ACS) 2013 – 2017 5-Year Estimates at the block group
     - U.S. Census Bureau (retrieved from Social Explorer Professional): race, detailed income, population, housing
- **PSID Sample Size**: 9,048 family units in 6,843 block groups, 51 states, and 1,150 counties

METHODS

- Descriptive Analyses
  - Two-Step Cluster Analysis to create an "Urban Form Typology":
    - Urban Mid-Urban Suburban
  - Mean comparisons in transport expenditures by race, urban form typology, household types, income, education

- OLS Multivariate Regressions, Robust Standard Errors
  - **Dependent Variable:** Household Transportation Expenditures (reported by PSID participants)
  - Model 1: Household Dynamics
  - Model 2: Household Dynamics + Urban Form
  - Model 3: Household Dynamics + Urban Form + Car Ownership*

VARIABLES

3 Urban Form Types

- Block Density (walkability)
- Jobs [gravity model]
- Transit Connectivity Index (frequency, route intersection and density)
- Gross household density

Suburban
Midurban
Urban

Household Dynamics

- Race of head of house
- Number of Working Adults (full or part time)
- Number of Adults
- Number of Children and Dependents
- Family Income as Percentage of Area Median Income (5 bins)

Transportation

- Car ownership
- Total Commute time to and from work
- Use of transit

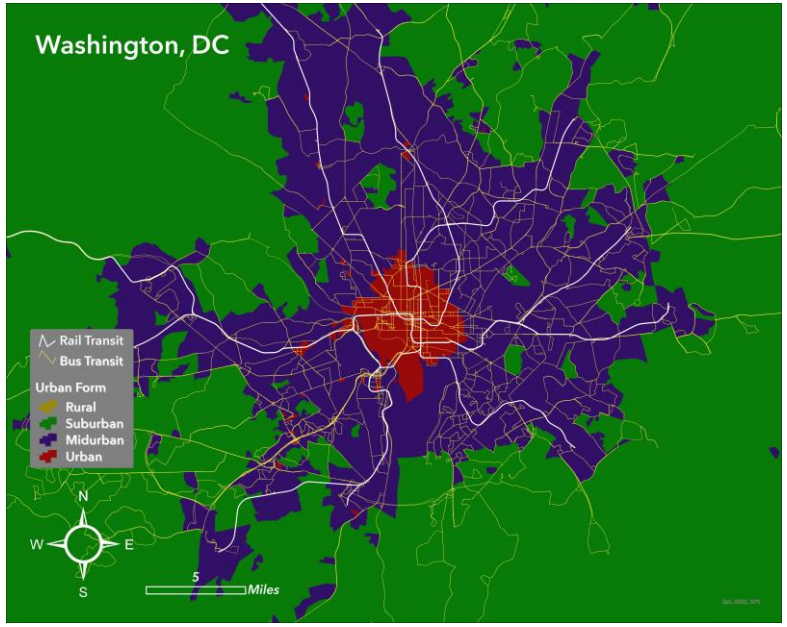
SAMPLE REPRESENTATIVENESS: ALL U.S. BLOCK GROUPS VS. BLOCK GROUPS IN PSID

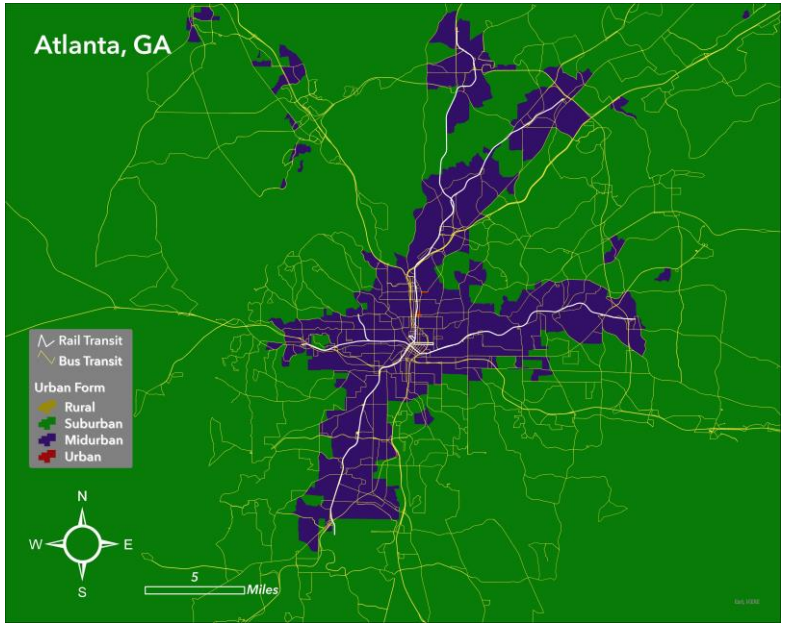
Because of the PSID restrictions (sample size, protected enclave), we were limited in UF nuances

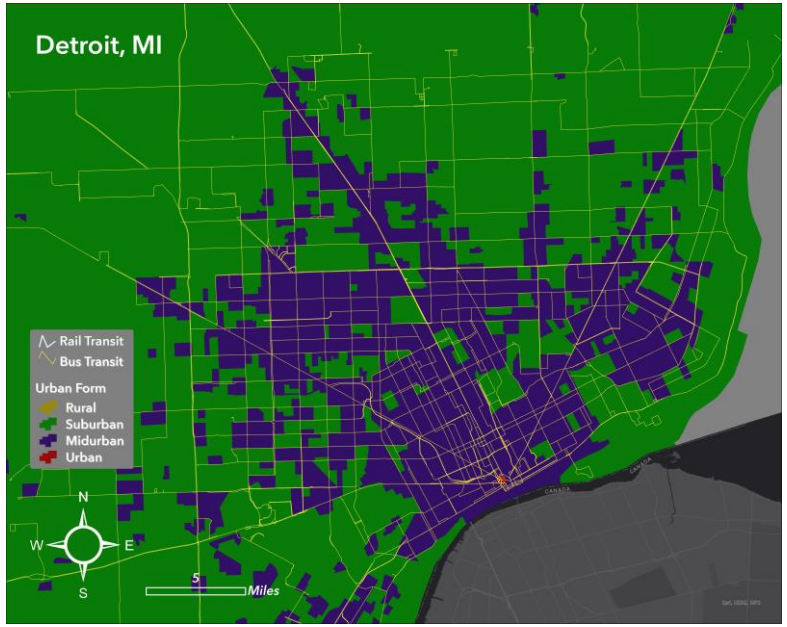
2015	*U.S. 2011-2015 ACS*	*2015 PSID*
States	***51***	***51***
Urban	30	15
Mid-urban	51	47
Suburban	51	51
Counties with UF Types	***3,074***	***1,134***
Urban	87 (3%)	23 (2%)
Mid-urban	1,660 (54%)	208 (18%)
Suburban	3,073 (100%)	1,113 (98%)
Block Groups (N)	***217,182***	***6,843***
Urban	9,794 **(4.5%)**	141 **(2%)**
Mid-urban	48,960 **(22.5%)**	1,307 **(19%)**
Suburban	158,428 **(72.9%)**	5,395 **(79%)**

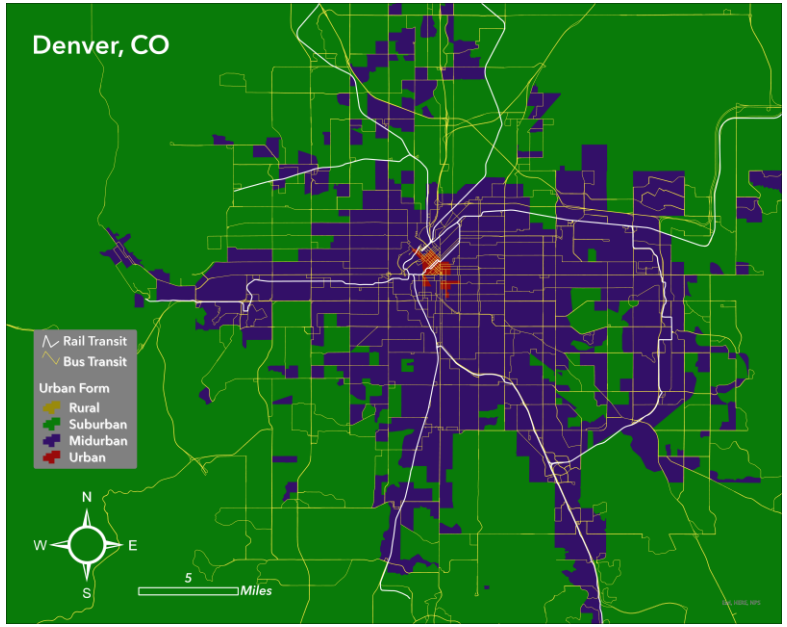
Suburban Bias in place types

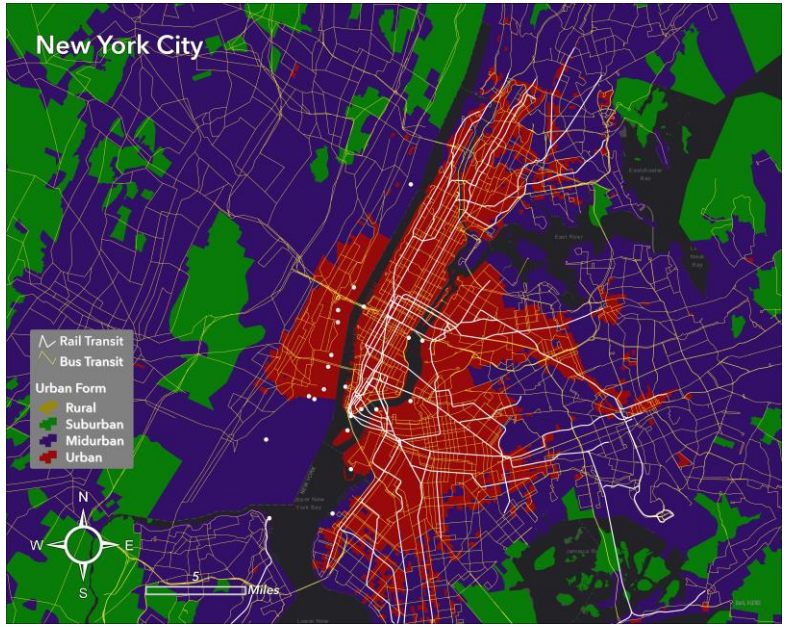
3 URBAN TYPES IN 6 METROS: URBAN, MID-URBAN, SUBURBAN











RESULTS: SINGLE WITH CHILDREN BY RACE AND URBAN FORM

Black households, on average, with and without children, tend to live near more jobs (except in urban areas) and slightly better transit, and have similar or shorter commute times

Single / No Children	Transit Access Shed (TAS) Jobs		Commute Time (minutes)		TCI (square root)	
	Black	White	Black	White	Black	White
Suburban	50,285	38,785	29	28	1.05	0.77
Midurban	290,392	275,325	34	34	3.38	2.79
Urban	1,156,730	1,761,484	42	43	6.10	6.49

Single with Children	TAS Jobs		Commute Time (minutes)		TCI (square root)	
	Black	White	Black	White	Black	White
Suburban	51,800	27,762	36	45	1.06	0.63
Midurban	267,656	184,591	39	45	3.32	2.09
Urban	995,316	2,202,428	81	120	6.04	4.92

RESULTS

TRANSPORTATION EXPENDITURES

By Place

Race and:

Presence of Children

Income

Marital status

Education

RESULTS: T-COSTS BY PLACE, RACE, AND **PRESENCE OF CHILDREN**

All households	Transportation Expenditures	
	Black	White
Suburban	$7,688	$9,919
Midurban	$4,988	$7,106
Urban	$4,991	$5,367

Both Black and White households in Urban areas, on average spend less on Transport than households in Midurban and Suburban areas

Households with Children	Transportation Expenditures	
	Black	**White**
Suburban	$8,909	$11,908
Midurban	$5,875	$9,674
Urban	$6,019	$12,317

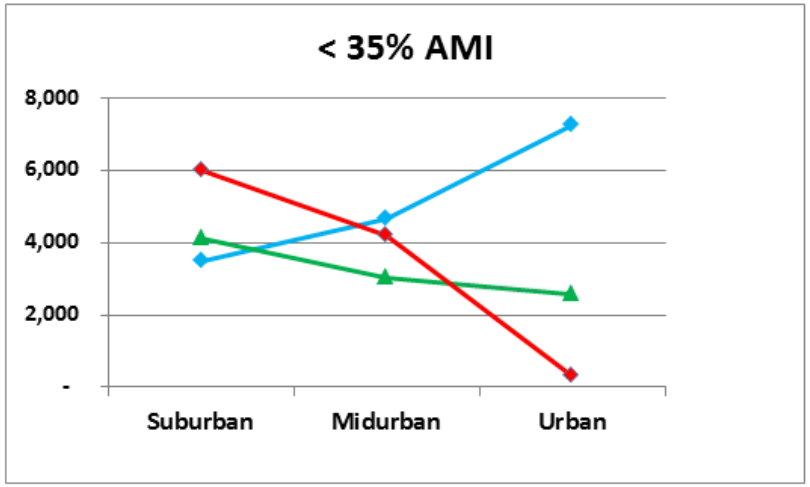
Households with children spend more, and Black households still spend less, on average, in Urban areas

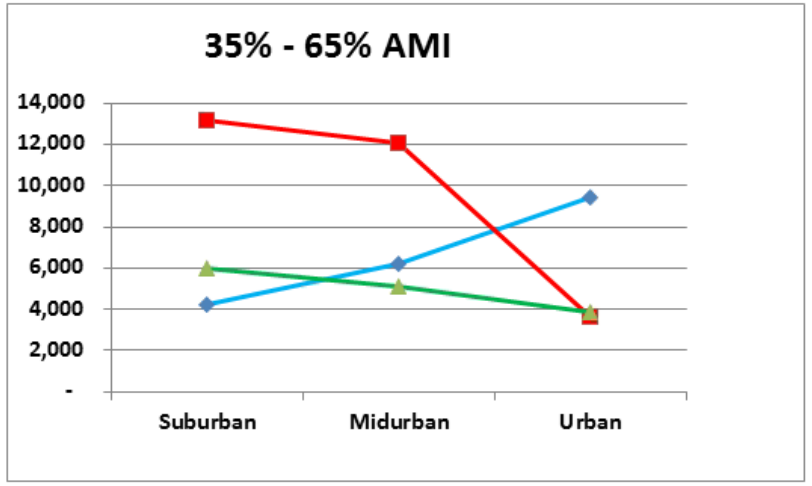
No Children		
	Black	**White**
Suburban	$6,718	$8,696
Midurban	$4,376	$6,025
Urban	$4,493	$4,522

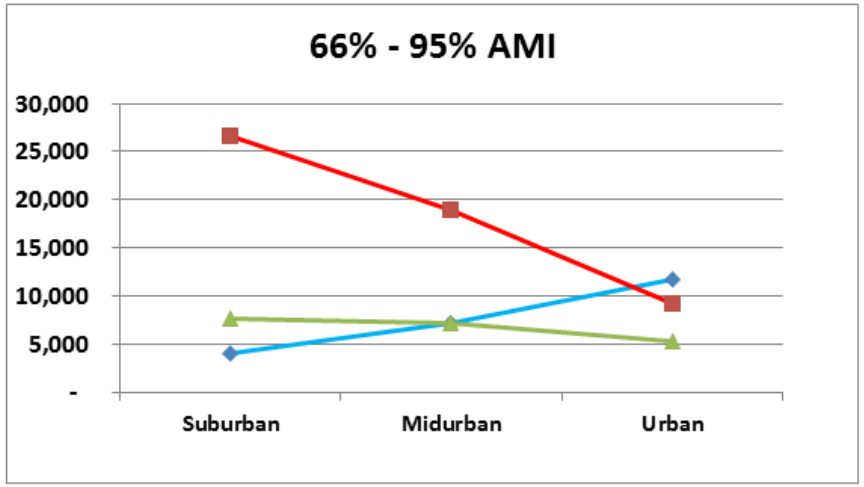
Black and white households without children spend less in Urban areas, about $2200 less

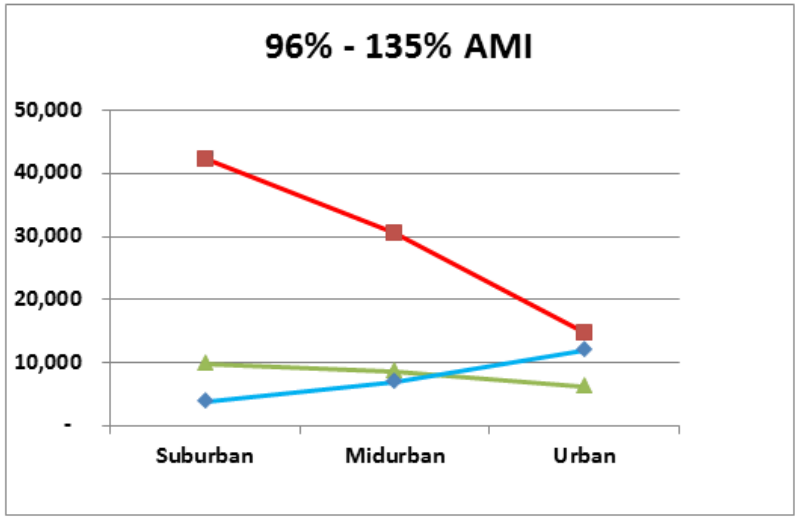
ANNUAL RENTS, MORTGAGES, AND TRANSPORT COSTS BY INCOME IN 3 URBAN CONTEXTS

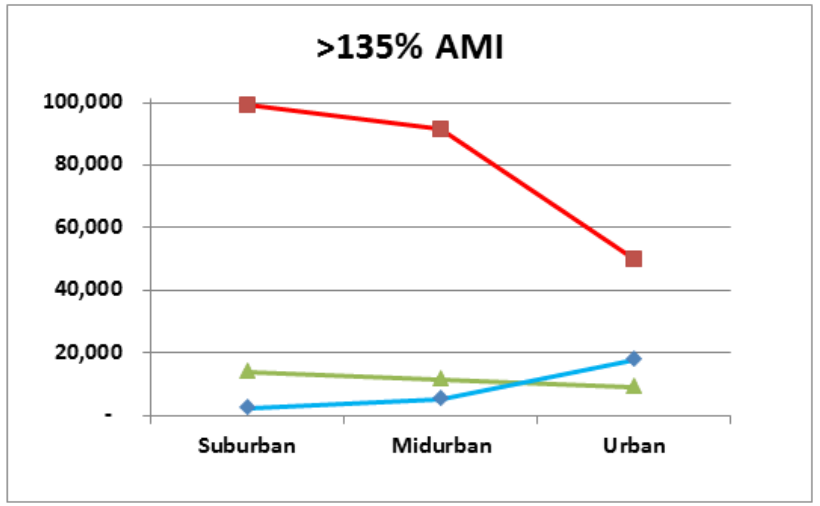
Households **in all 5 income bins save** between $1,000 to $5,000 on transport in **midurban and urban areas**, but rents are higher in urban areas

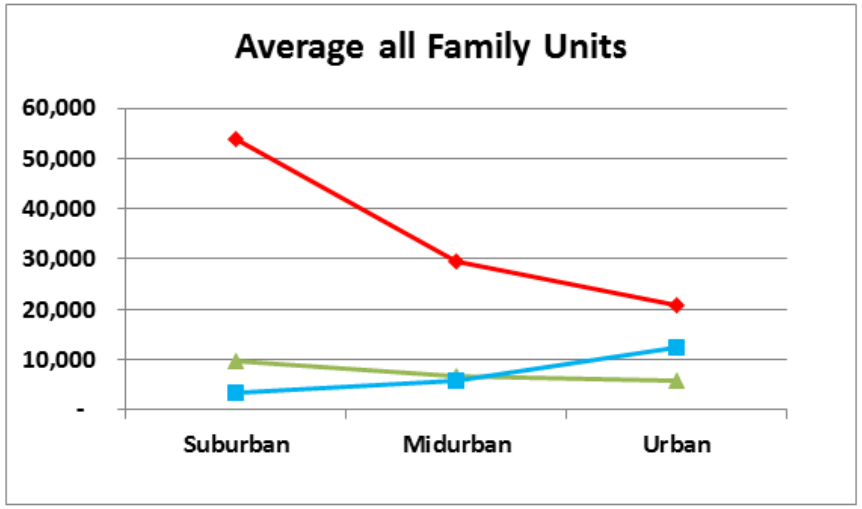










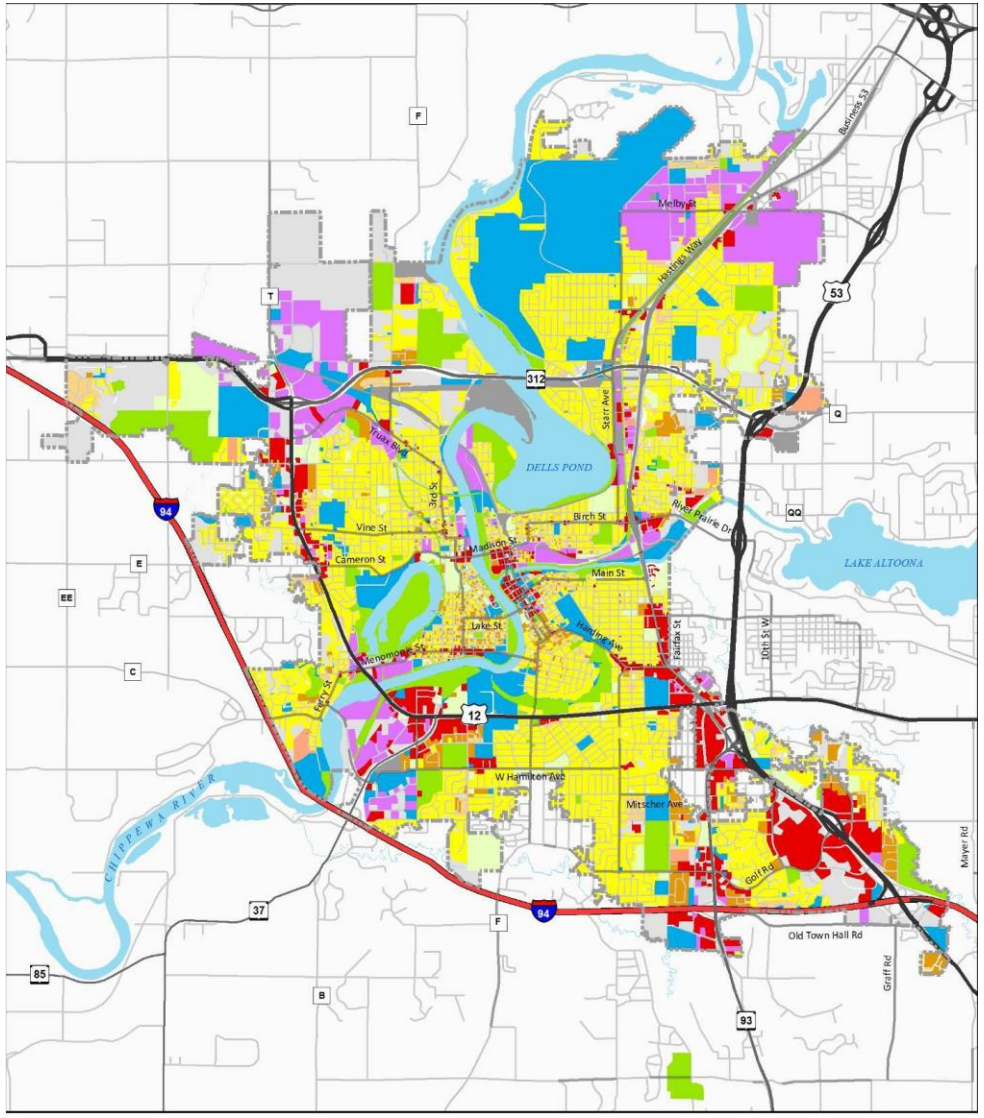


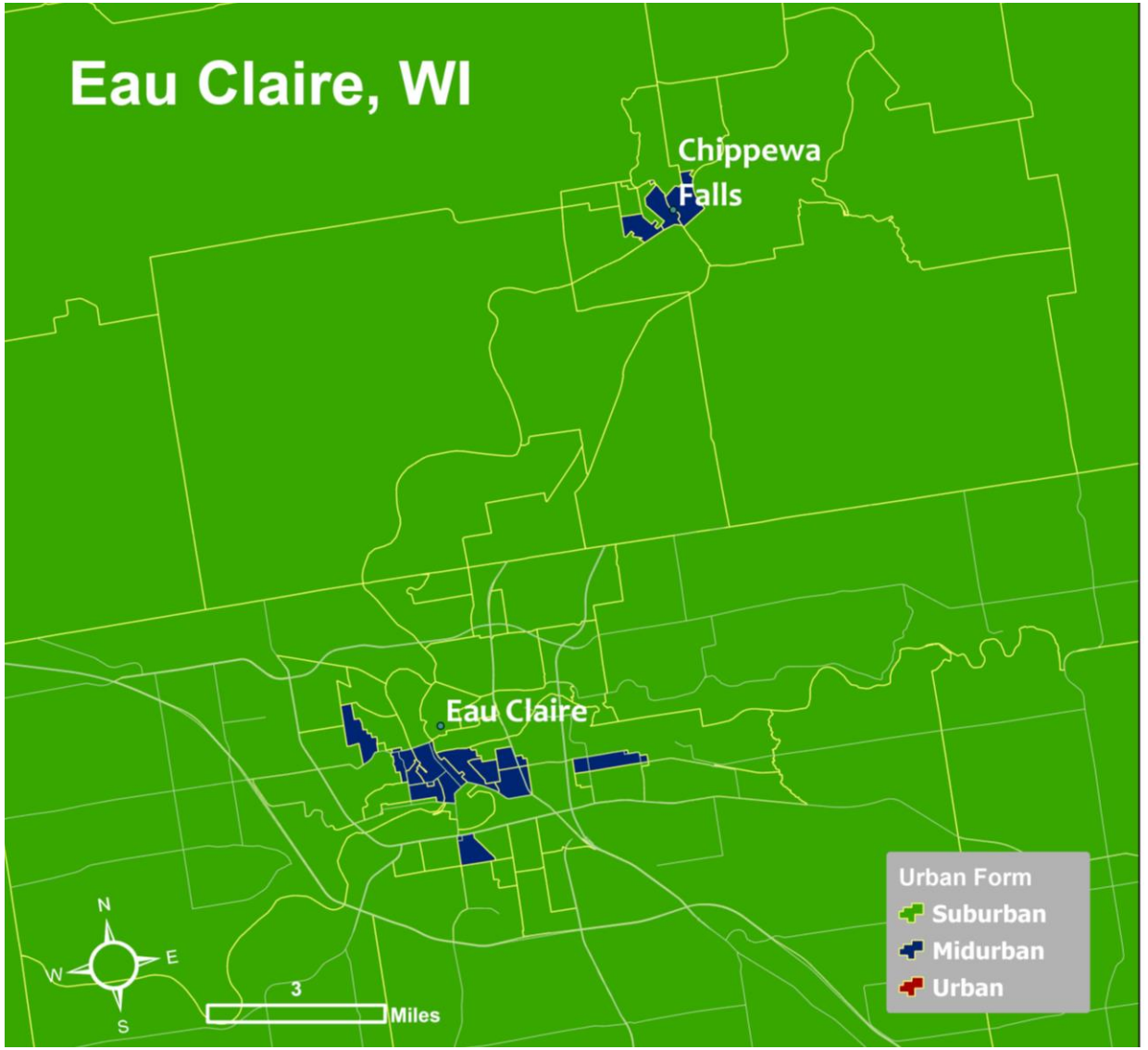
Annual Transport Annual Rent Annual Mortgage

LESSONS FOR CITY OF EAU CLAIRE, WI

URBAN FORM AND LOCATION AFFORDABILITY

EAU CLAIRE'S LAND USES COMPARED TO 3 URBAN FORM TYPES



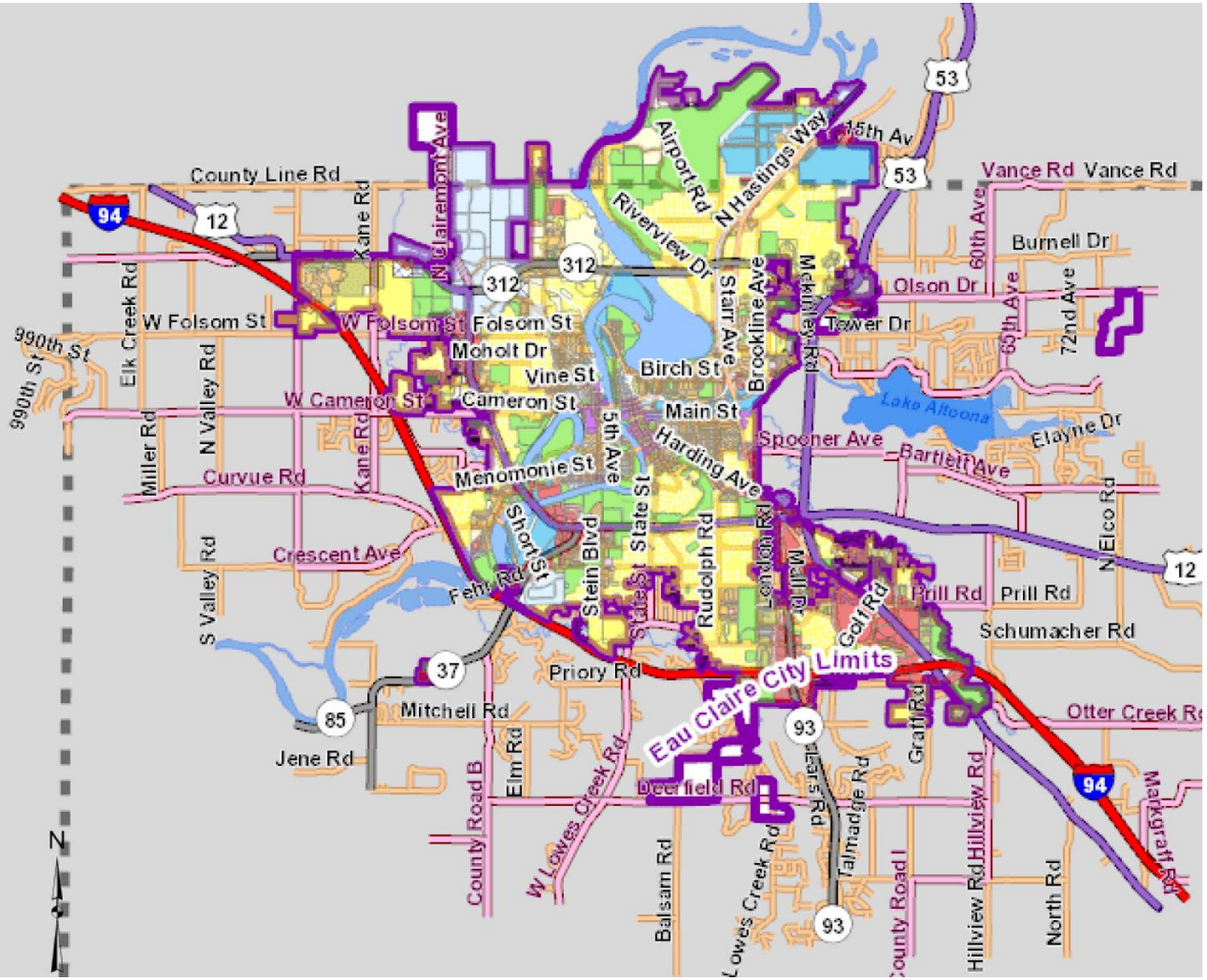


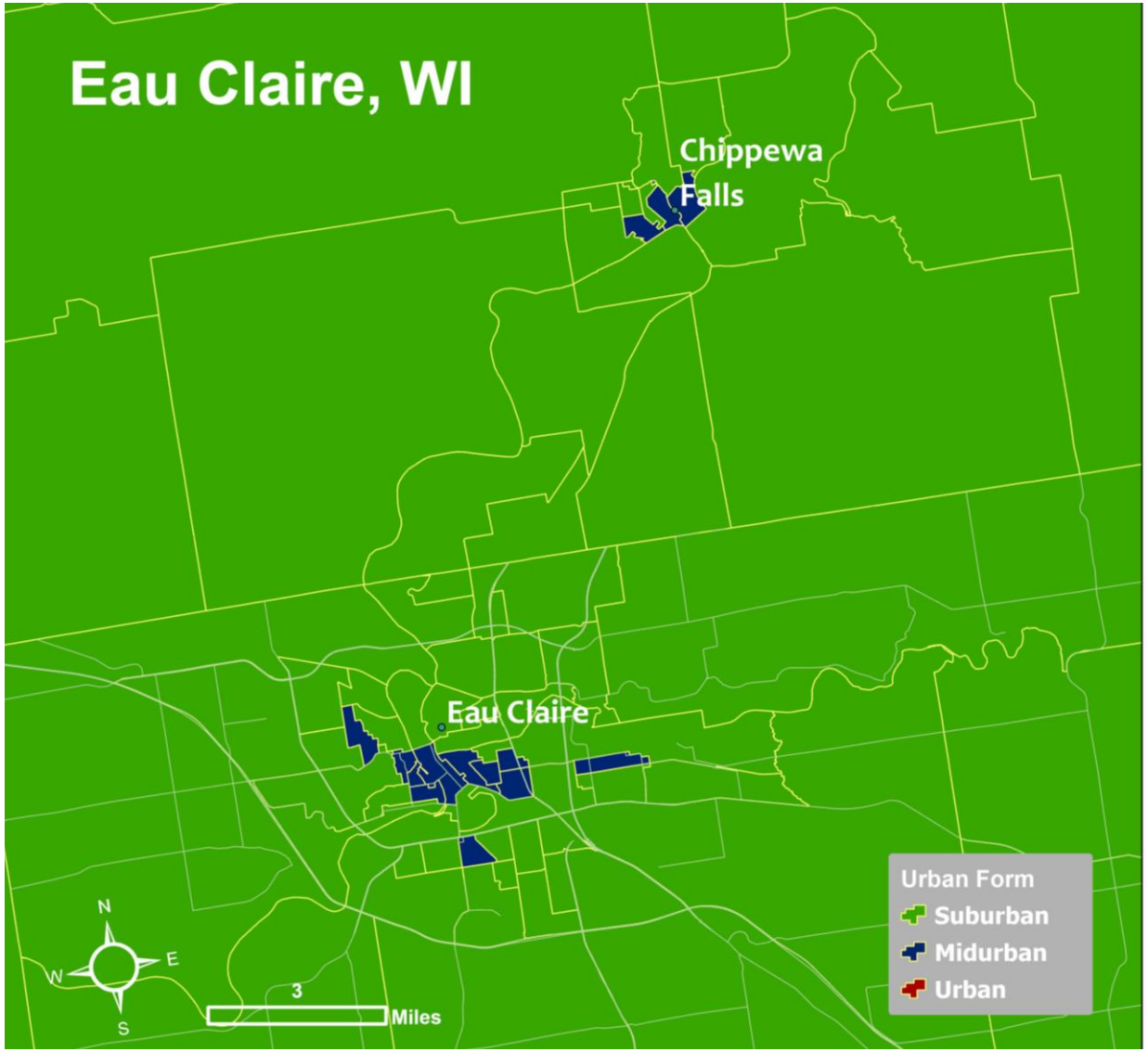
1 Square Mile
160 Acres
0
5,280 ft.

- Single-Family Housing
- Two-Family Housing
- Multiple-Family Housing
- Mobile Home Community
- Commercial
- Industrial
- Park
- Public
- Semi-Public
- Undeveloped/Vacant
- Utility or Transportation

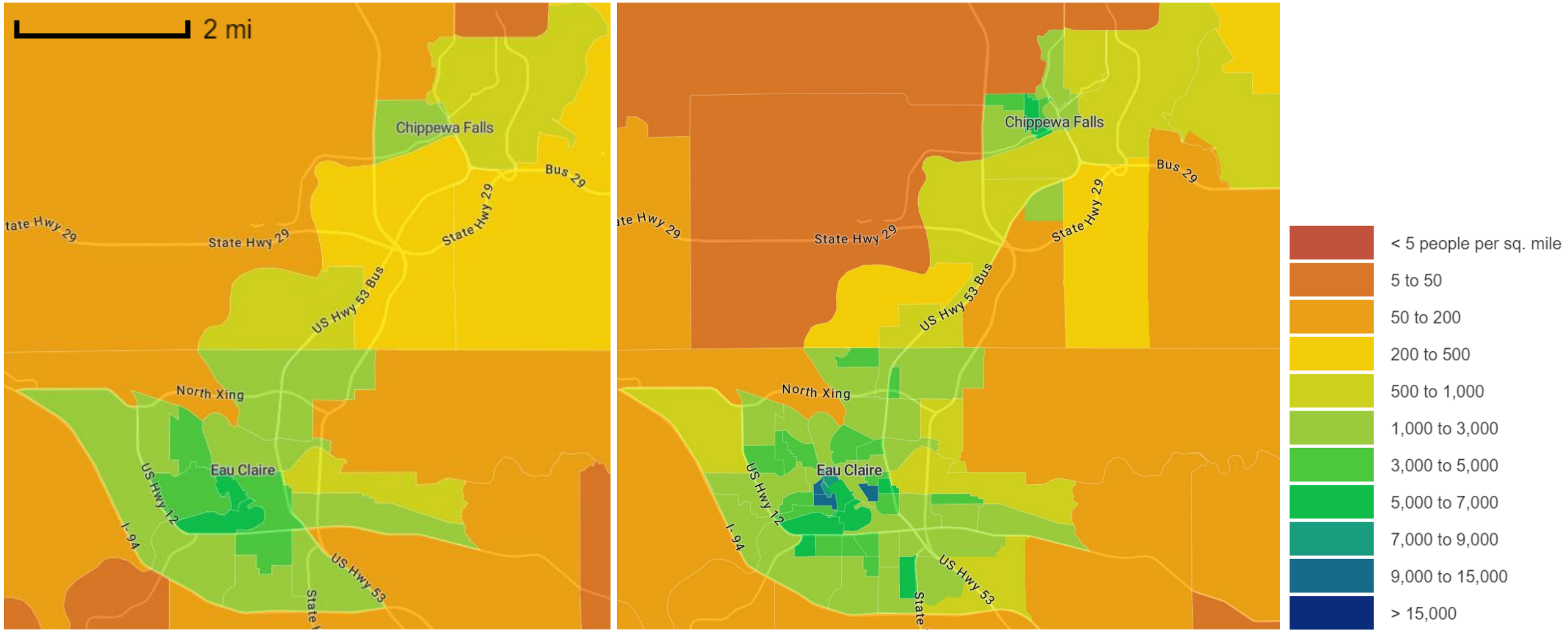
Figure 4-21
Pattern of Land Use, 2014

EAU CLAIRE'S ZONING COMPARED TO 3 URBAN FORM TYPES



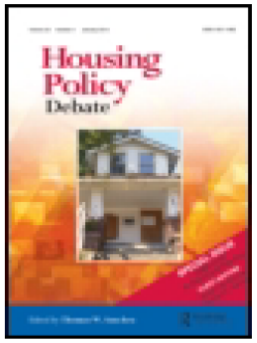


POP DENSITY: CENSUS TRACT VS. BLOCK GROUP



LESSONS FOR EAU CLAIRE

- **Urban form does have an influence,**
  - It does, however, diminish for some households with children: can policies and programs support active and non-auto travel for youth and parents?
  - Can more suburban places morph to mid-urban, and mid-urban become urban?
    - Do pedestrian, bike, and transit networks support transportation choices for all households?
    - Does zoning allow for more density in places with good transport access, jobs, schools, etc?
    - Do affordable transportation places also have affordable housing?
- **Continue to work regionally**
  - Housing and Job markets, and thus travel sheds, are regional
- **Understand and identify differences by race**
  - Understand why these differences exist: is it safe to walk, bike, take transit, especially at off-hours?
  - Is there discrimination in housing costs, both rents and mortgages?



Housing Policy Debate

Routledge
Taylor & Francis Group

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/rhpd20

Another Look at Location Affordability: Understanding the Detailed Effects of Income and Urban Form on Housing and Transportation Expenditures

Carrie Makarewicz , Prentiss Dantzler & Arlie Adkins

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To link to this article: https://doi.org/10.1080/10511482.2020.1792528

THANK YOU!

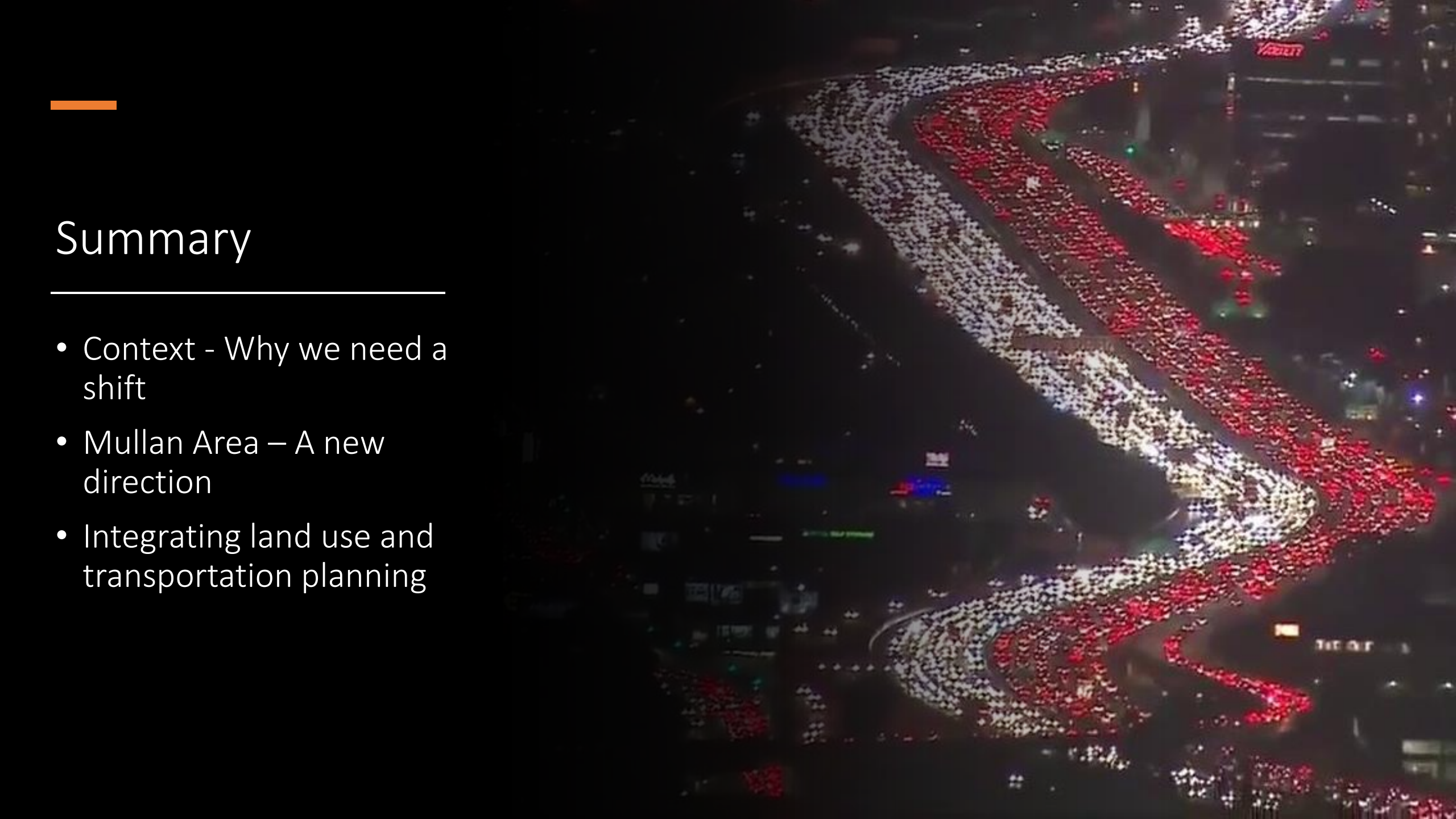
Integrating Land Use and Transportation Planning

Aaron Wilson, AICP, City of Missoula

Andrew Hagemeier, AICP, Missoula County

Summary

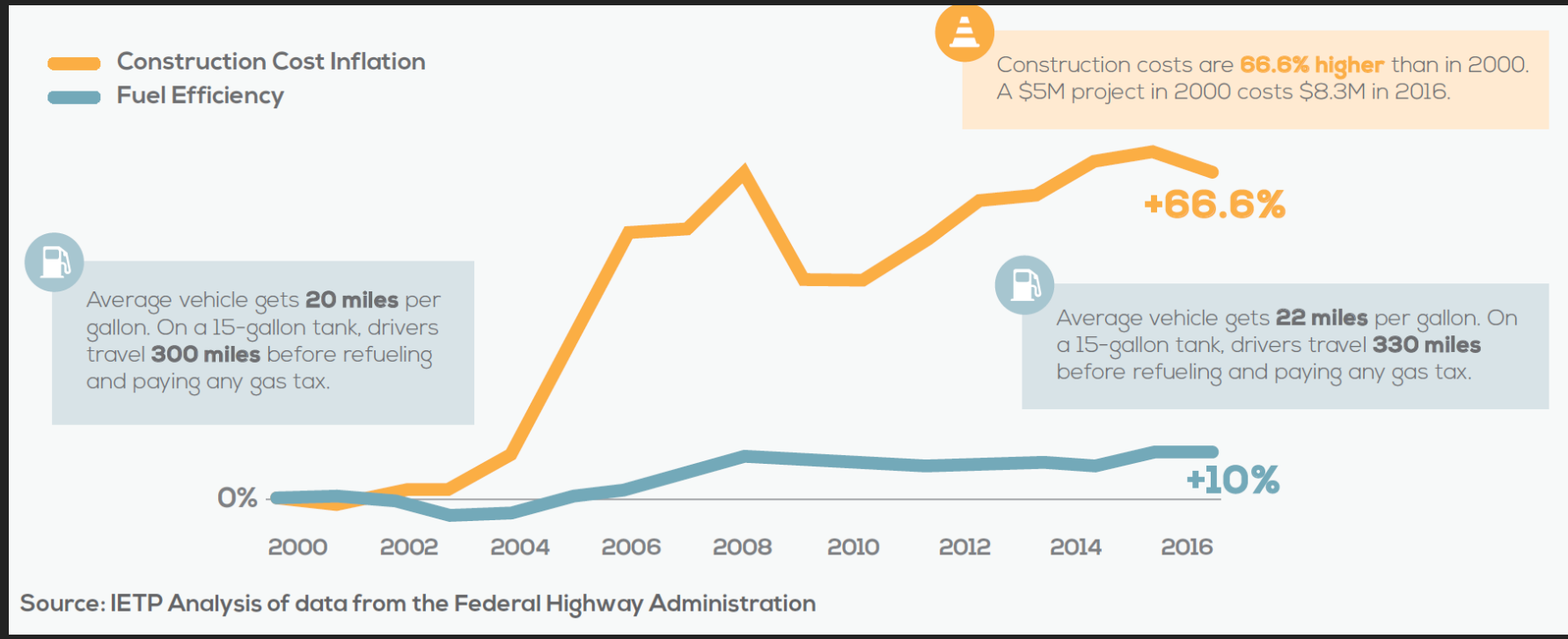
- Context - Why we need a shift
- Mullan Area – A new direction
- Integrating land use and transportation planning

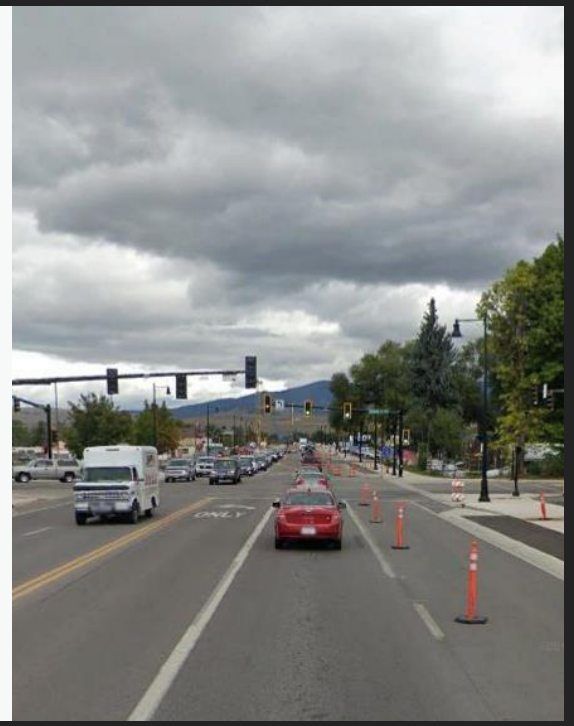


Why do we need a shift?

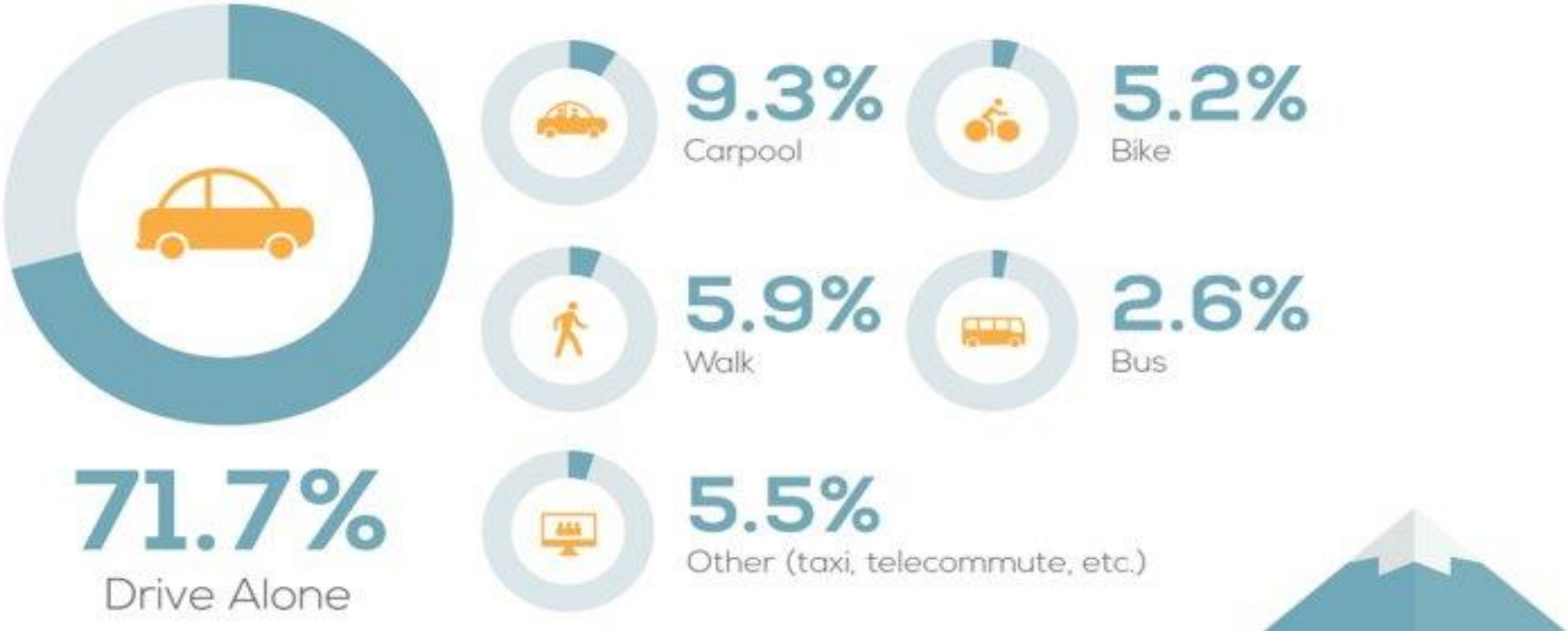
Missoula is Constrained

- Terrain and public lands
- Growing by 3 to 6 people per day





Costs are outpacing revenues



We need a more efficient system

THE RIGHT MIX MATTERS!

BUILDING BLOCKS FOR INCLUSIVE CITIES

TOD STANDARD

Hootlet ITDP

THE RIGHT MIX FOR A NEIGHBORHOOD INCLUDES:

MIX OF ACTIVITIES

HOUSING, JOBS, SCHOOLS AND RETAIL
COMPLEMENTARY USES
so that your neighborhood is vibrant from morning till evening and supports good transit over long hours.

EVERYDAY NECESSITIES
ACCESS TO LOCAL SERVICES
so that you can easily walk to at least an elementary school, health services, and a fresh food market to help meet your daily needs.

GREEN AND OPEN SPACES
ACCESS TO PARKS AND PLAYGROUNDS
so that you can go out play, interact, and maintain your physical and mental health close by.

Illustration: Jimena Estibaliz

MIX OF PEOPLE

HOUSING OPPORTUNITIES FOR ALL INCOME LEVELS
AFFORDABLE HOUSING
so that your neighborhood is diverse and offers housing options for all.

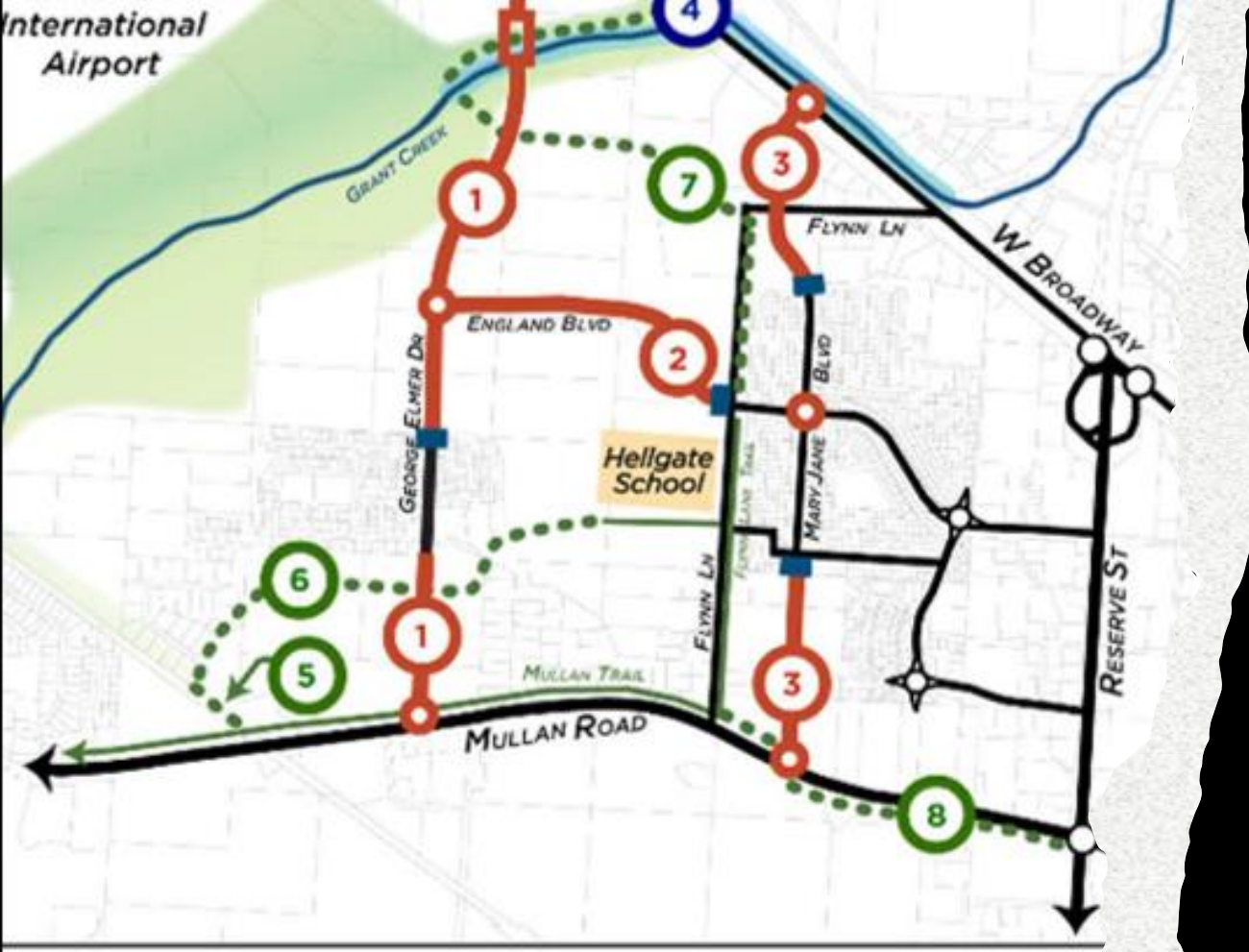
LONG-TERM AS WELL AS NEW RESIDENTS
HOUSING PRESERVATION
so that your neighborhood can grow without uprooting the people who already live there.

OLD LOCAL BUSINESSES AS WELL AS NEW ONES
BUSINESSES AND SERVICES PRESERVATION
so that old businesses continue serving and employing local people while new ones enrich local activity.

Built Environment Influences Transportation

New Direction: Mullan Area


THE SITE
~1,500 ACRES
Airport
West Broadway
Grant Creek
Dougherty Ranch
Flynn Lane
Mary Jane Blvd
England Blvd
Riata Park
George Elmer Dr.
Flynn Ranch
Hellgate School
Hiawatha Farm
Hiawatha Road
Flynn Lowney Ditch
Mullan Rd
Mullan Rd
Reserve Street



STREET IMPROVEMENTS

1. George Elmer Drive
2. England Boulevard
3. Mary Jane Boulevard

TRAIL IMPROVEMENTS

5. Milwaukee Trail
6. Tipperary Way Trail
7. Flynn Lane Trail
8. Mullan Trail

STREAM RESTORATION

B.U.I.L.D. Grant

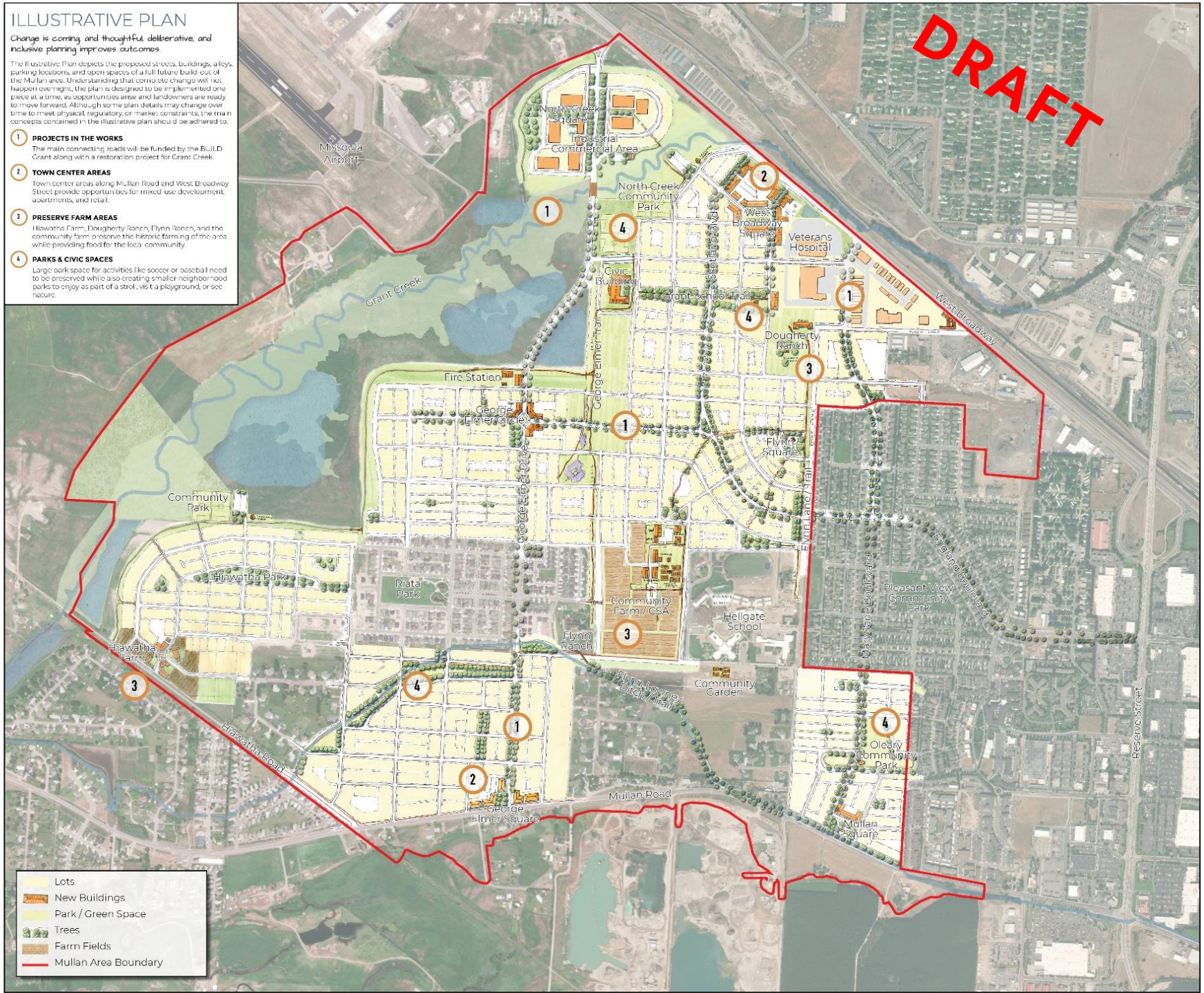
Infrastructure grant for main connections

Integrating land use and transportation planning

- Multi-modal streets
- Traditional street grid
- Planned for transit
- Mixed housing types
- Mix of uses

THE PLAN

- +6,000 NEW UNITS
- 5 WALKABLE URBAN CENTERS (150K+ RETAIL, COMMERCIAL, OFFICE)
- 6+ MILES OF NEW TRAILS
- RESTORED GRANT CREEK
- 40-ACRE FARM
  (URBAN / PERI-URBAN AGRICULTURE)



Missoula County & City of Missoula Mullan Area

TRADITIONAL NEIGHBORHOOD DEVELOPMENT FORM-BASED CODE

September 11, 2020

(9.11.20 Draft)

THE FORM-BASED CODE

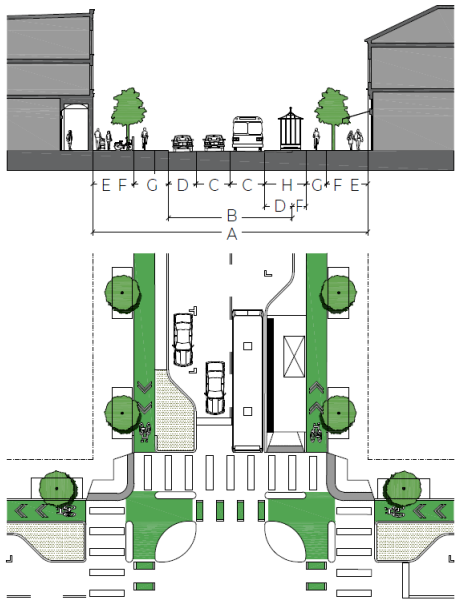




EXAMPLE STREET TYPES

DRAFT

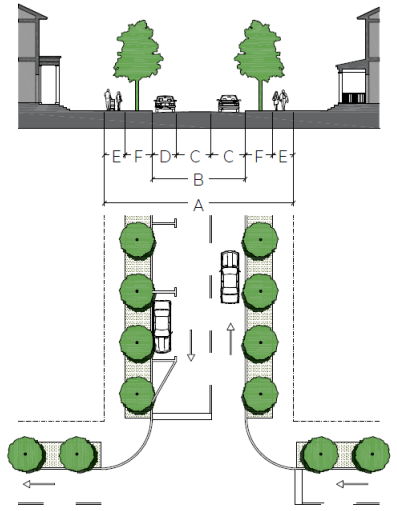
A. Main Street Collector



Thoroughfare Type	Main Street Collector	
Transect Zone Assignment	T5, T4-O, SD-W	
Right-of-Way Width	90 feet	A
Pavement Width	36 feet	B
Traffic Lanes	Two lanes - 10 feet wide	C
Transit	Bus	H
Bicycle / Micro-Mobility Facility	Two - 6' Protected Lanes 3 foot buffer	G
Parking Lanes/Curbside Flex Zone	Both sides @ 8 feet marked	D
Sidewalk: Clear & Frontage Zones	8 feet	E
Landscape Zone - Sidewalk	10' wide x 15' Tree Wells [1]	F
Landscape Type	Trees @ 35' o.c. average	F
Road Edge Treatment	Curb	
Green Infrastructure	Bioswale, Tree Box Filter	F

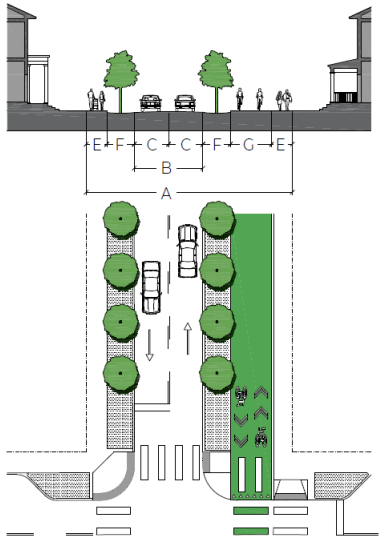
[1] Tree wells smaller than 7' wide by 15' are permitted if suspended pavement system is utilized.

L. Neighborhood Street



Thoroughfare Type	Neighborhood Street	
Transect Zone Assignment	T4-R, T3	
Right-of-Way Width	55-63 feet	A
Pavement Width	27 feet	B
Traffic Lanes	Two - 10 foot drive lanes	C
Transit	n/a	
Bicycle / Micro-Mobility Facility	Shared Travel Lanes	C
Parking Lanes/Curbside Flex Zone	One side @ 7 feet	D
Sidewalk: Clear & Frontage Zones	6 feet	E
Landscape Zone	8 - 12' wide planting strip	F
Landscape Type	Trees @ 35' o.c. average	F
Road Edge Treatment	Curb or Curbless	
Green Infrastructure	Bioswale	F

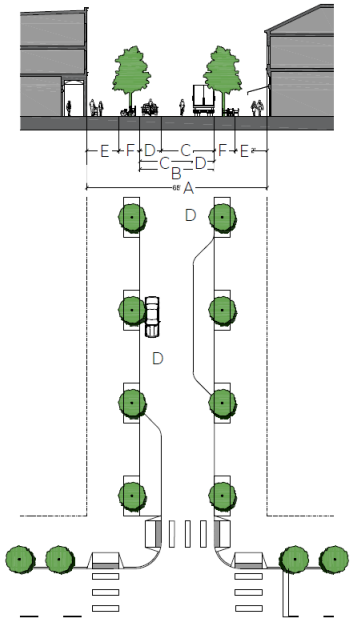
O. Neighborhood Bike Street (Two-Way Track)



Thoroughfare Type	Neighborhood Bike (Two-way Track)	
Transect Zone Assignment	T4-R, T3	
Right-of-Way Width	60 feet min.	A
Pavement Width	20 feet	B
Traffic Lanes	Two - 10 foot drive lanes	C
Transit	n/a	
Bicycle / Micro-Mobility Facility	12 foot min. two-way Cycle Track [1]	G
Parking Lanes/Curbside Flex Zone	None	
Sidewalk: Clear & Frontage Zones	6 feet	E
Landscape Zone	8' min. wide planting strips	F
Landscape Type	Trees @ 35' o.c. average	F
Road Edge Treatment	Curb or Swale	
Green Infrastructure	Bioswale	F

[1] Cycle Track may be located on either side of street

Q. Woonerf

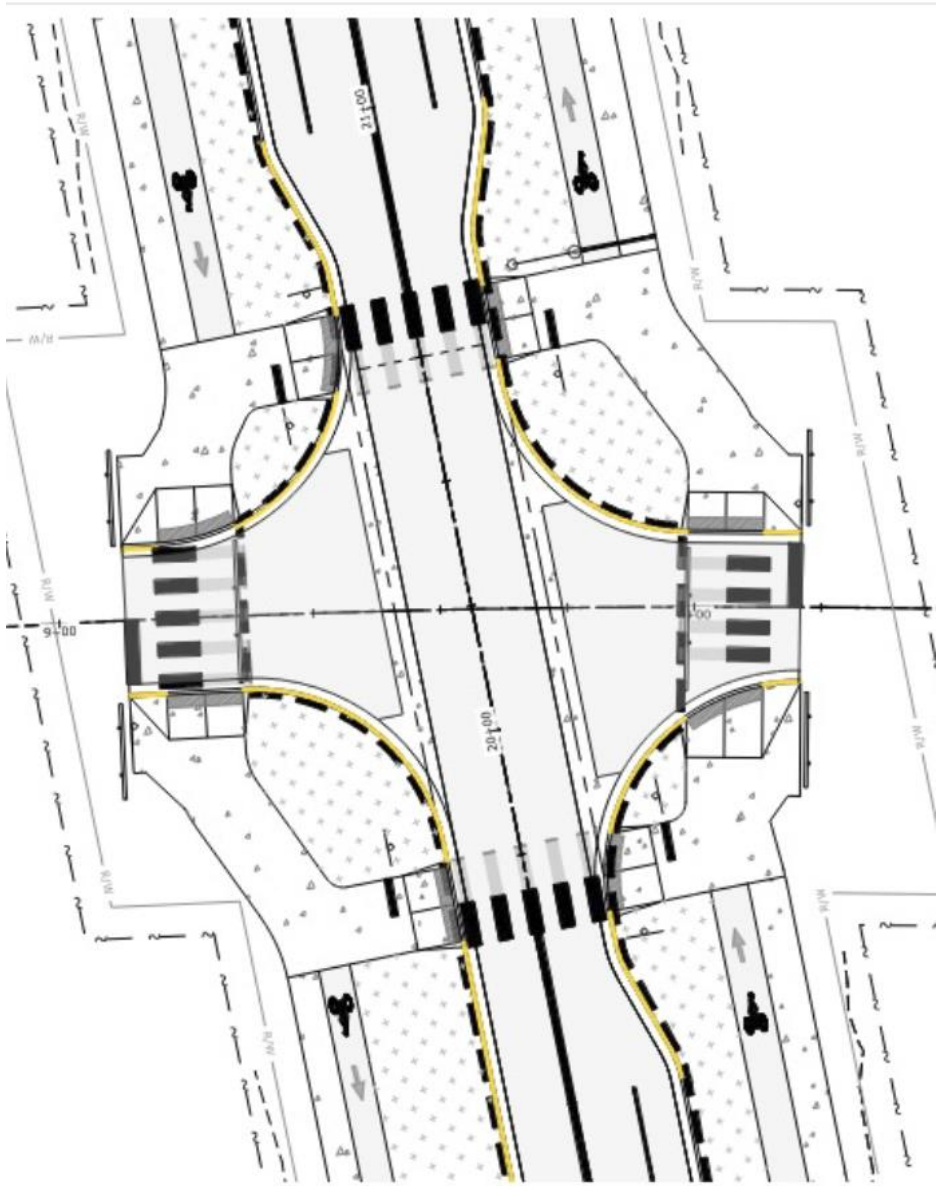


Thoroughfare Type	Woonerf	
Transect Zone Assignment	ALL	
Right-of-Way Width	48-68 feet	A
Pavement Width	28 feet	B
Traffic Lanes	20 feet of Shared Street	C
Transit	n/a	
Bicycle / Micro-Mobility Facility	20 feet of Shared Street	C
Parking Lanes/Curbside Flex Zone[1]	8 feet wide (alternating sides); 40 feet long Typ.	D
Sidewalk: Clear & Frontage Zones	6-12 feet	E
Landscape Zone - Sidewalk	4-8 foot Tree Wells with Soil Cell Support	F
Landscape Type	Trees @ 35' o.c. average	F
	Grasses, Shrubs, Trees	D
Road Edge Treatment	Curbless	
Green Infrastructure	Bioswale	F
	Pervious Pavers	A

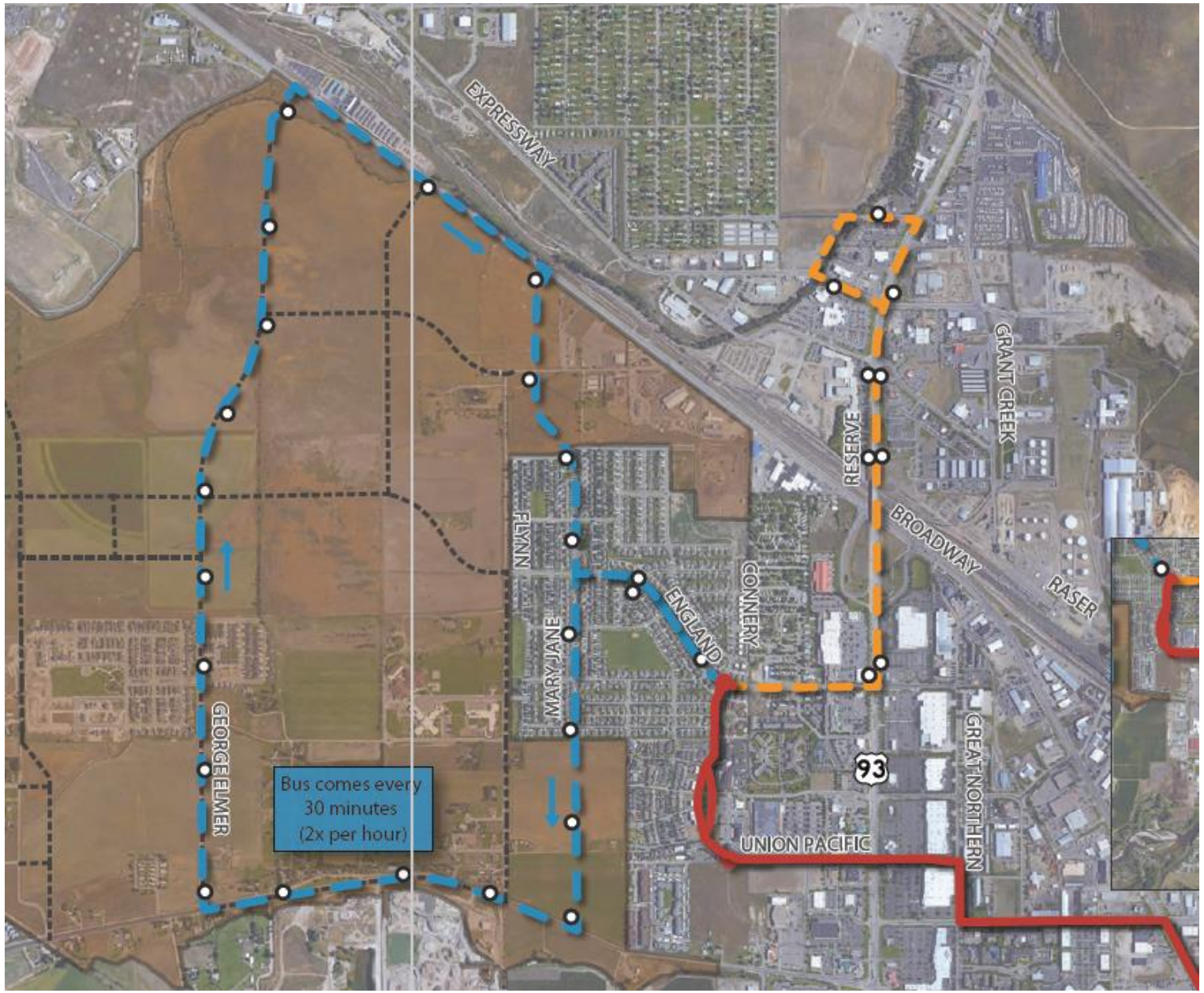
[1] May also be additional landscape or seating area

Road design matters

- Physically separate modes
- Slow speeds
- Connected facilities
- *All ages & all abilities*
- Connect to land use



Transit as a core service



Lessons learned

- Think about land use and transportation differently
- Design a community around cars – you get congestion
- Focus on efficiency – use of land, cost of systems to support growth
- Long-term sustainability: economic, environmental, equitable

Thank You

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