



City of Madison: UrbanFootprint Scenario Development & Analysis

Madison Area Bus Advocates

October 26, 2015

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Outline

1. What is UrbanFootprint?
2. How does UrbanFootprint work?
3. What is the process for developing UrbanFootprint?
4. What will UrbanFootprint be used for?



WHAT IS URBANFOOTPRINT?

UrbanFootprint is . . .

- Growth scenario modeling tool developed by Calthorpe Analytics, with contributions from Fehr & Peers (traffic) and UD4H (health).



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CALTHORPE ANALYTICS

+ FEHR & PEERS

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- Growth scenario modeling = analysis of the impacts of different styles of growth.

What is UrbanFootprint?

- Impacts to be modeled for Madison UrbanFootprint project:
 - Public health
 - Energy & water use
 - Emissions
 - Fiscal (municipal & household)
 - Transportation
 - Land consumption

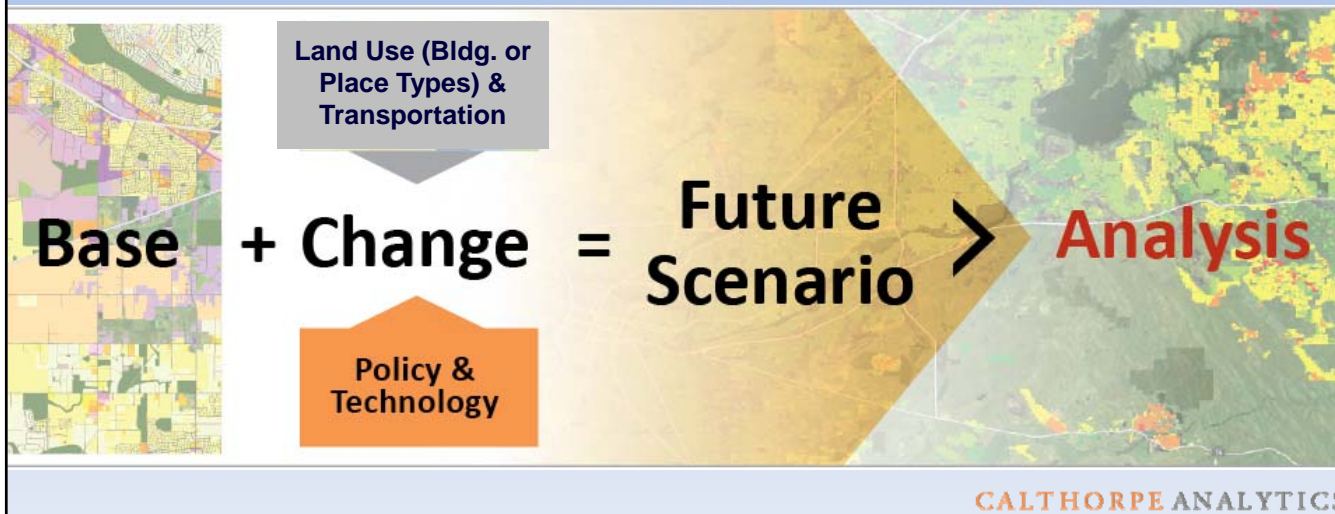
UrbanFootprint Background

- Secured \$300,000 federal TIGER grant; is combined with City matching funds.
- Will be used to create scenarios for BRT station area planning.
- “Municipal Development ProForma”



HOW DOES URBANFOOTPRINT WORK?

How Does UrbanFootprint Work?



Building Types - Examples

Residential

High-Rise Residential
 Urban Mid-Rise Residential
 Suburban Multifamily Apt/Condo
 Urban Townhome/Live-Work
 Standard Townhome
 Garden Apartment
 Very Small Lot (<3,000 sq. ft.)
 Small Lot (3,000-4,000 sq. ft.)
 Medium Lot (4,000-5,500 sq. ft.)
 Large Lot (5,500-7,500 sq. ft.)
 Estate Lot (7,500+ sq. ft.)

Mixed-Use

High-Rise Mixed Use
 Mid-Rise Mixed Use
 Low-Rise Mixed Use
 Main Street Mixed Use (3-5 fl)
 Main Street Mixed Use(1-2 fl)

Commercial/Industrial

High-Rise Office
 Mid-Rise Office
 Low-Rise Office
 Main Street Commercial
 Office Park – High Density

Mid-Rise Mixed-Use Example



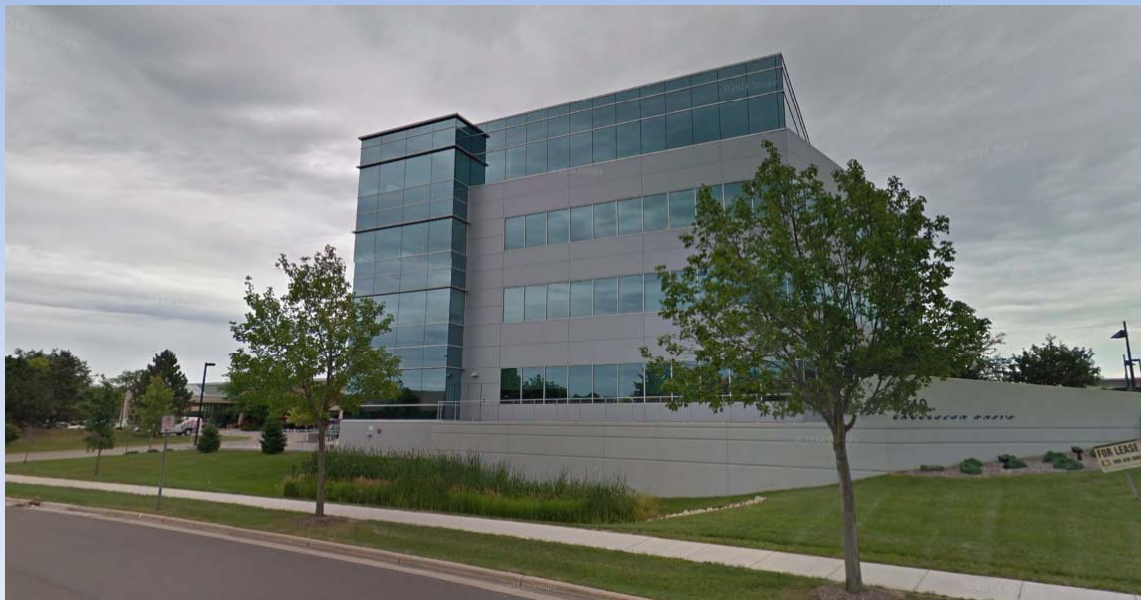
Urban Mid-Rise Residential Example



Medium Lot S.F. Residential



Office Park – High Density



Place Types

Mixed Use Centers and Corridors	1	Urban Mixed Use	Suburban	20	High Intensity Activity Center	
	2	Urban Residential		21	Mid Intensity Activity Center	
	3	Urban Commercial		22	Low Intensity Retail Centered Neighborhood	
	4	City Mixed Use		23	Retail: Strip Mall / Big Box	
	5	City Residential		24	Industrial / Office / Residential Mixed High	
	6	City Commercial		25	Industrial / Office / Residential Mixed Low	
	7	Town Mixed Use		Suburban Residential	26	Suburban Multifamily
	8	Town Residential			27	Suburban Mixed Residential
	9	Town Commercial			28	Residential Subdivision
	10	Village Mixed Use		Rural	29	Large Lot Residential Area
	11	Village Residential			30	Rural Residential
	12	Village Commercial			31	Rural Ranchettes
	13	Neighborhood Residential		Institutional	32	Rural Employment
	14	Neighborhood Low			33	Campus / University
15	Office Focus	34	Institutional			
Employment Areas	16	Mixed Office and R&D		35	Parks and Open Space	
	17	Office / Industrial				
	18	Industrial Focus				
	19	Low-Density Employment Park				

Place Types

- Place types take in to account:
 - Density
 - Mix of Uses
 - Street Connectivity
 - Location/Accessibility



Pioneer Neighborhood Example



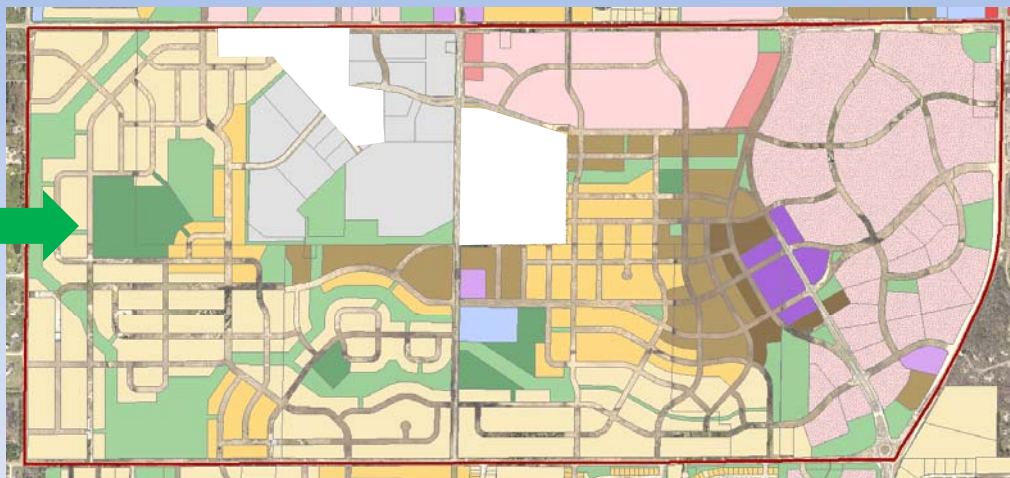
Base Condition: Classified by Building Types

Residential
Small Lot Single-Family
Urban Mid-Rise Residential
Suburban Multifamily Apt/Condo
Urban Townhome/Live-Work
Etc.
Mixed-Use
High-Rise Mixed Use
Mid-Rise Mixed Use
Low-Rise Mixed Use
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Commercial/Industrial
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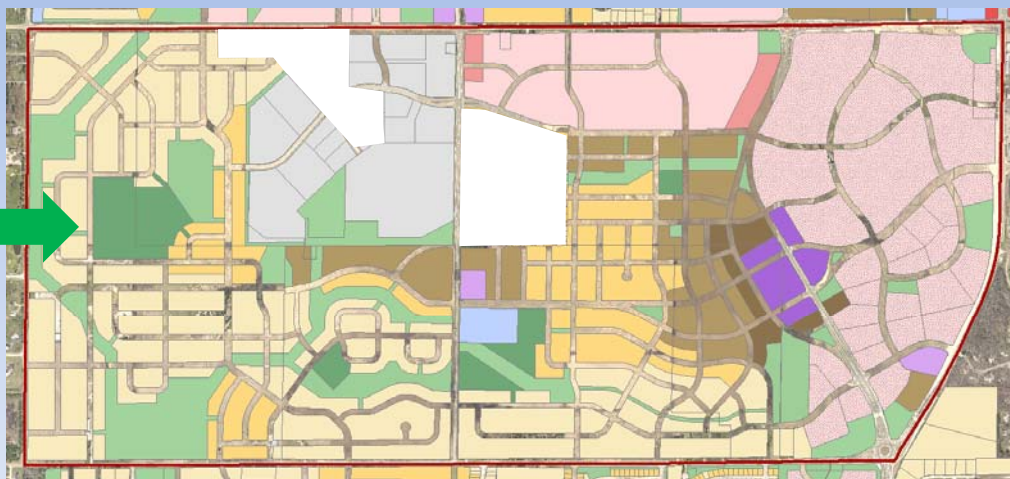
New growth (or redevelopment) applied with Building Types

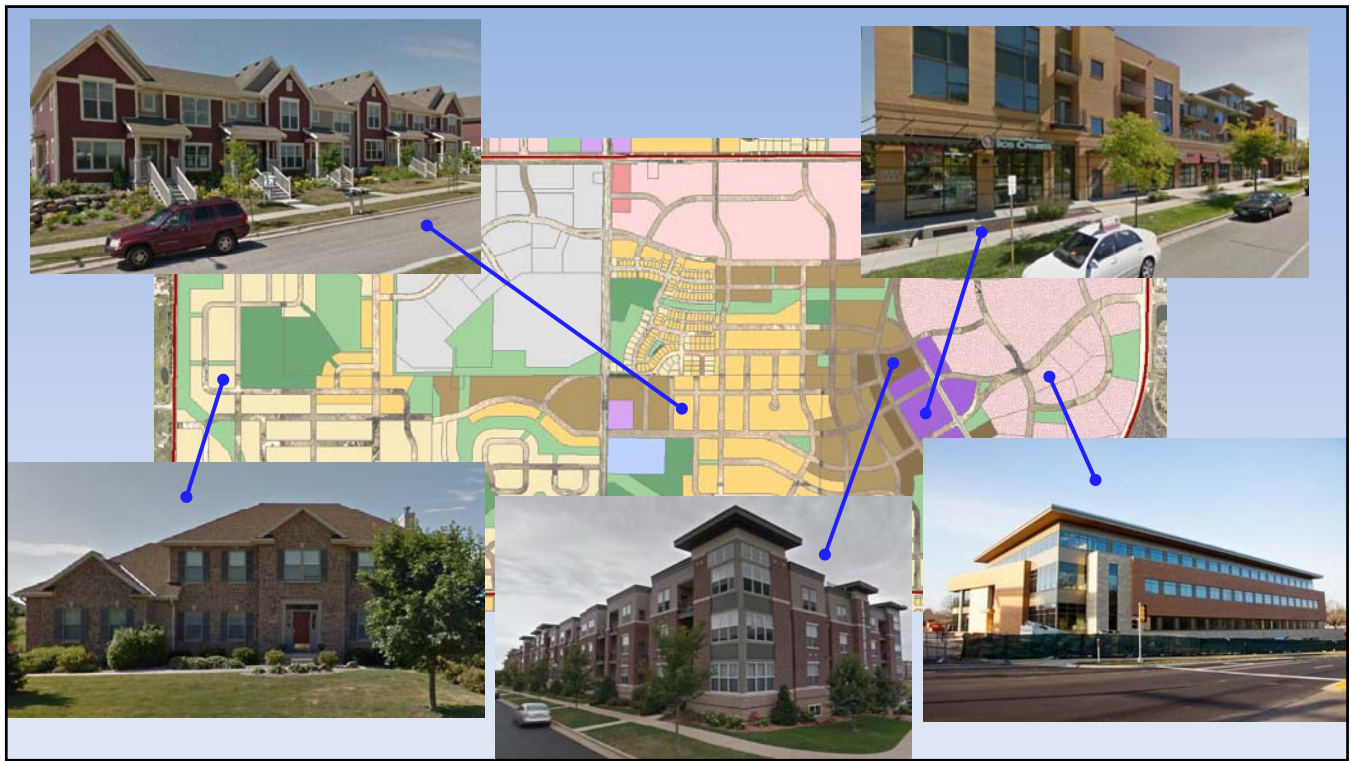
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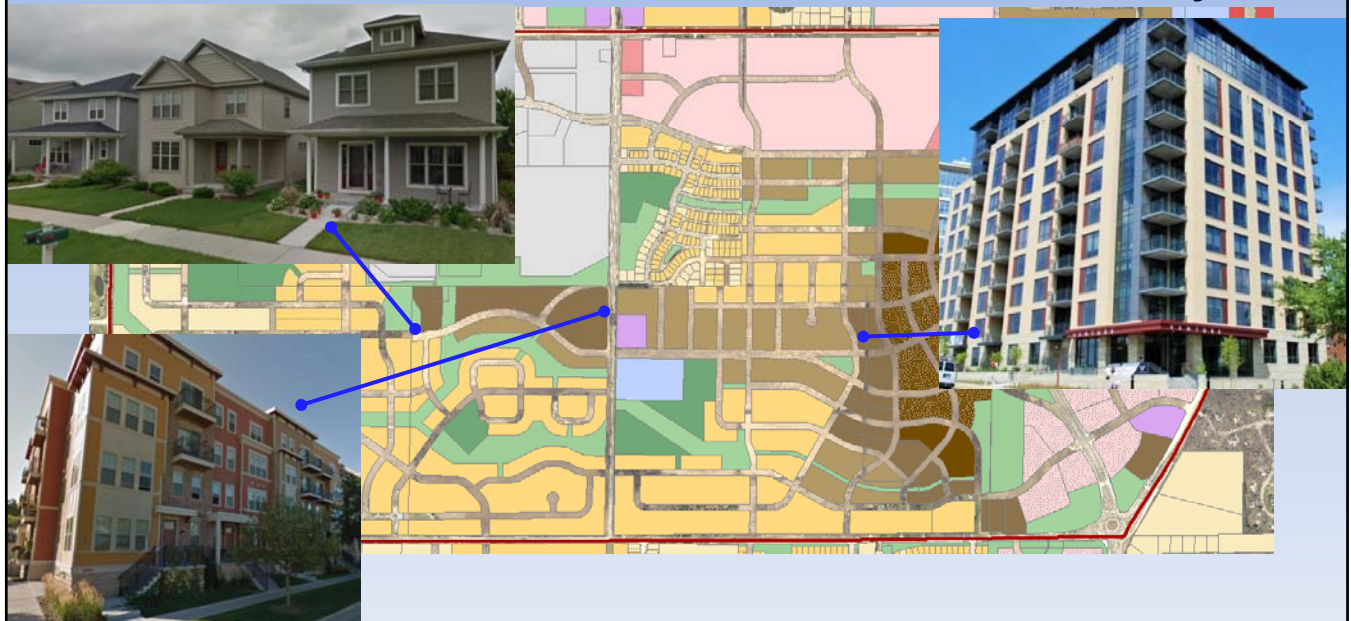
Change Merged With Base Condition

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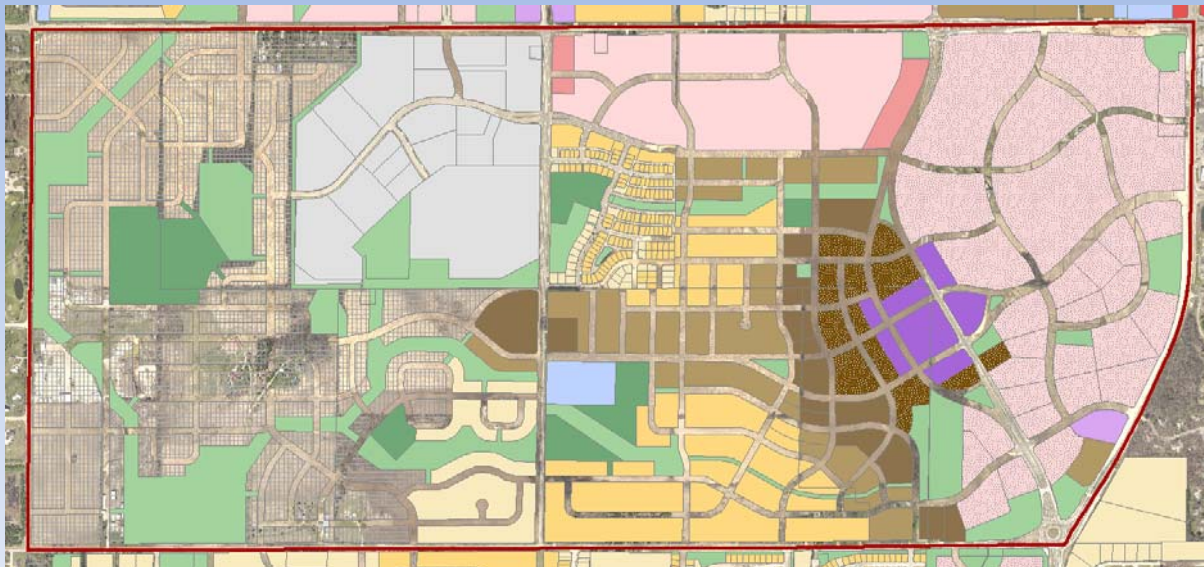




Alternate Scenario: +50% Density



Alternate Scenario: Compact Growth



insight2050 Scenario Metrics Summary

The comparative scenario metrics summarized here are described in more detail in the following sections. For clarity, values are rounded. All costs are expressed in 2014 dollars. Visit www.getinsight2050.org

	Land Consumption Includes all previously undeveloped land that is undeveloped from 2010-2050.	Local Fiscal Impacts Capital and ongoing operations and maintenance (O&M) costs for new local roads, sewer, water, waste-water infrastructure, and select services (2010-2050).	Transportation Miles driven in passenger vehicles in Central Ohio in 2050.	Public Health Costs Annual costs due to health incidences related to auto emissions, including hospitalization, premature mortality, and lost work days in 2050.	Building Energy Use Cumulative energy electricity and gas consumed by new and existing residential and commercial buildings from 2010-2050.	Building Water Use Cumulative water used to serve and maintain new and existing homes from 2010-2050.	Greenhouse Gas Emissions Annual CO2e emissions from passenger vehicles, and residential and commercial buildings, in 2050.	Household Costs Annual automobile transportation (fuel, insurance, maintenance) and home energy and water costs, in 2050.
scenario A <i>Past Trends</i> This scenario extends the land use and transportation investment decisions of the past decades forward to 2050.	495 square miles	O&M Capital \$16.4 billion \$408 Million (Average Annual Cost, Capital & O&M 2010-2050)	15.9 billion miles 8,450 miles/year (per person/year, 2050)	Scenario A used as baseline for comparison	4.27 quadrillion Btu (British Thermal Units) \$78.2 Billion (Cumulative Cost 2010-2050)	3.19 trillion gallons	35.8 MMT/year (Million Metric Tons) Buildings: 29.06, Transport: 6.71	\$13,100 per new household
scenario B <i>Planned Future</i> The housing and job distribution of this scenario reflects the direction of local plans and policies from the cities and townships across the Central Ohio region.	270 square miles	O&M Capital \$15.8 billion \$393 Million (Average Annual Cost, Capital & O&M 2010-2050)	15.4 billion miles 7,450 miles/year (per person/year, 2050)	-\$41 Million	4.23 quadrillion Btu \$77.5 Billion (Cumulative Cost 2010-2050)	3.12 trillion gallons	35.2 MMT/year Buildings: 28.76, Transport: 6.47	\$11,600 per new household
scenario C <i>Focused Growth</i> This scenario seeks to accommodate more growth in infill and redevelopment locations in and around existing cities and towns.	45 square miles	O&M Capital \$13.2 billion \$329 Million (Average Annual Cost, Capital & O&M 2010-2050)	12.0 billion miles 4,450 miles/year (per person/year, 2050)	-\$246 Million	4.15 quadrillion Btu \$76.0 Billion (Cumulative Cost 2010-2050)	3.03 trillion gallons	33.2 MMT/year Buildings: 28.20, Transport: 5.00	\$7,700 per new household
scenario D <i>Maximum Infill</i> This scenario strives to maximize growth accommodated through infill on previously developed lands and within existing urban areas.	15 square miles	O&M Capital \$13.0 billion \$328 Million (Average Annual Cost, Capital & O&M 2010-2050)	11.1 billion miles 3,850 miles/year (per person/year, 2050)	-\$315 Million	4.12 quadrillion Btu \$75.5 Billion (Cumulative Cost 2010-2050)	3.01 trillion gallons	32.7 MMT/year Buildings: 28.03, Transport: 4.67	\$6,800 per new household

CALTHORPE ANALYTICS



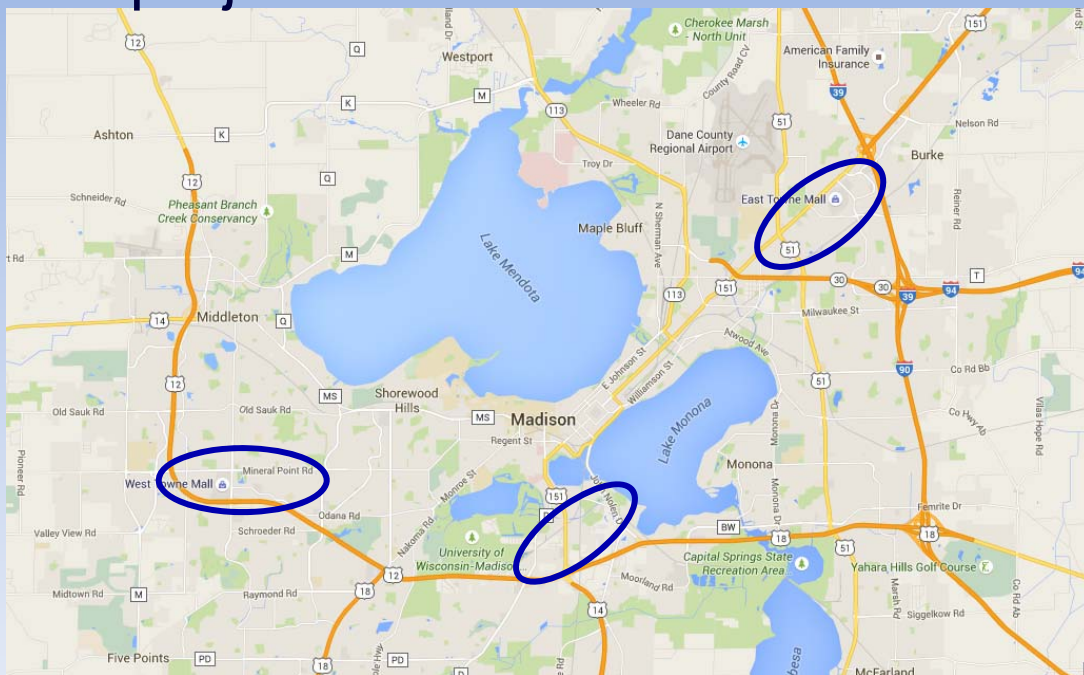
WHAT IS THE PROCESS FOR DEVELOPING URBANFOOTPRINT?

Task	Description	2015						2016			
		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
1	Project Kick-Off & Reconnaissance	█									
2	UF Setup and Base Data Development		█	█	█						
3	Building Type Customization			█	█						
4a	Analytical and Policy Customization				█	█	█				
4b	Local Fiscal Impacts Modeling					█	█	█			
4c	Active Transport-Related PH Modeling			█	█	█	█	█	█		
4d	Travel Calibration & Enhancement			█	█	█	█	█	█		
5	City-Wide Context Scenarios					█	█	█	█	█	
6	Corridor and TOD-Scale Testing								█	█	█

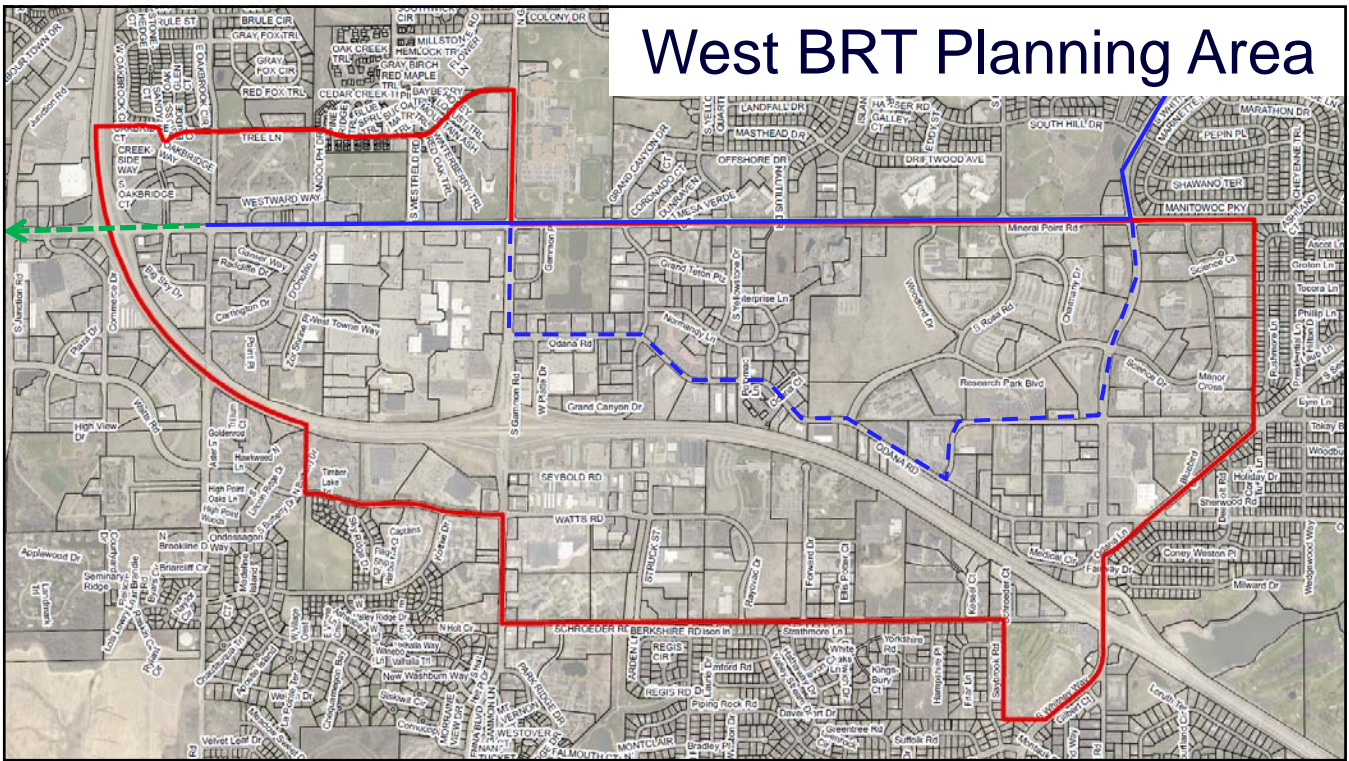


WHAT WILL URBANFOOTPRINT BE USED FOR?

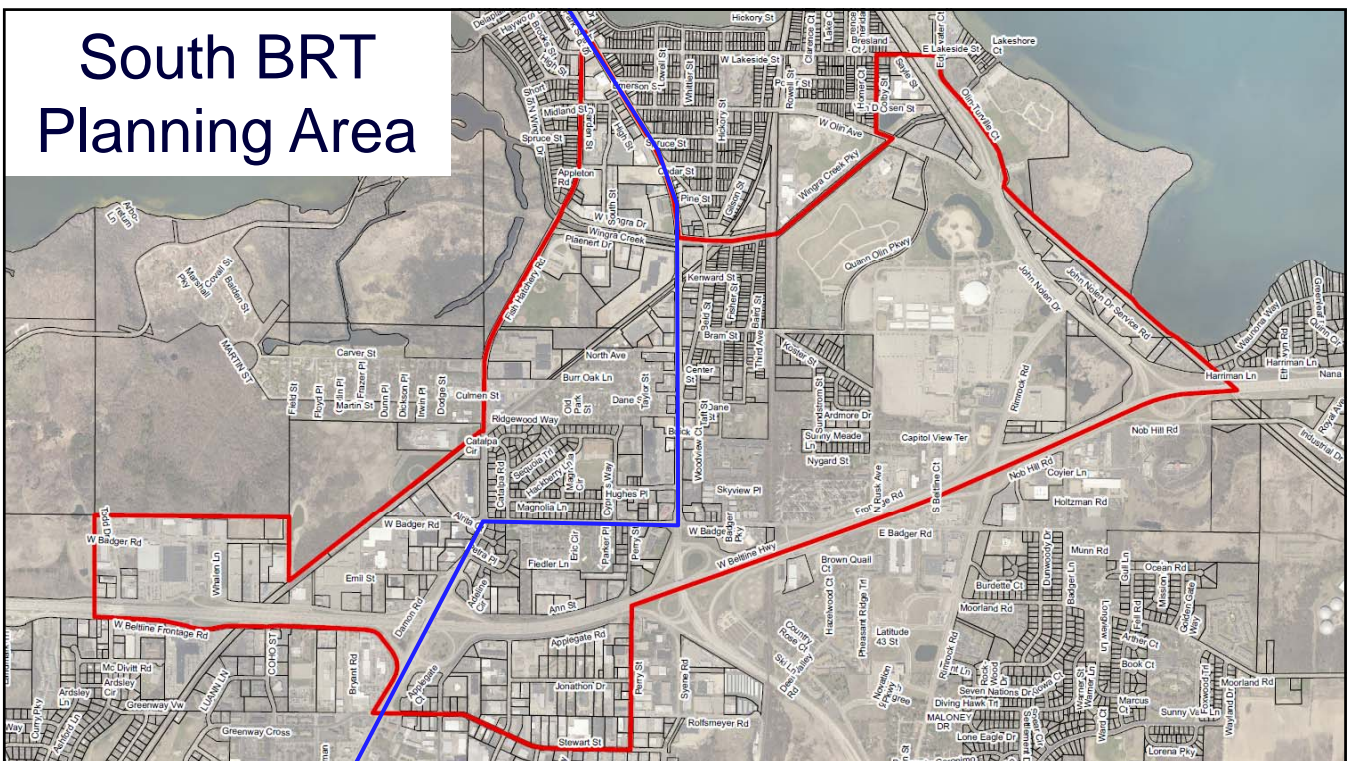
First project: BRT Station Area Planning

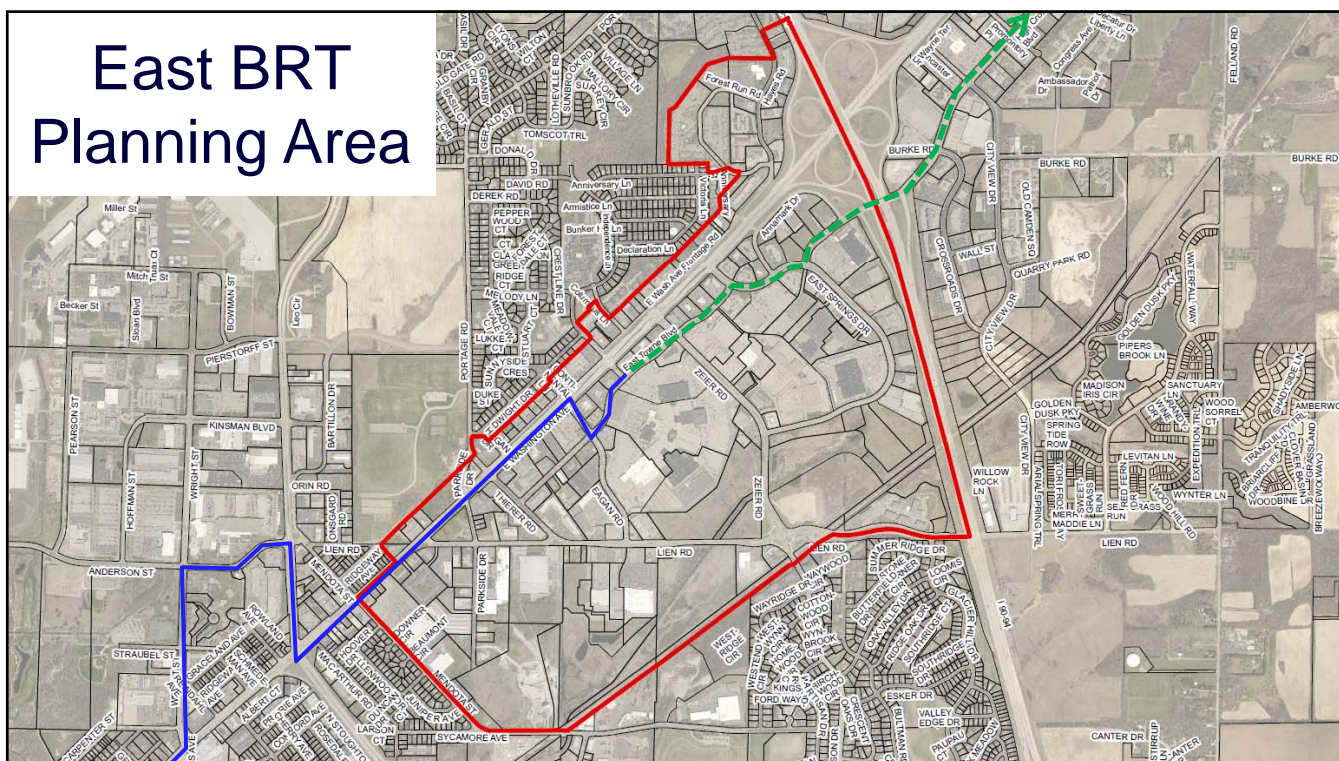


West BRT Planning Area



South BRT Planning Area





Potential Future Use

- Inform City Comprehensive Plan update (especially equity, sustainability, health).
- Could be a consistent way to look at growth across jurisdictions, with regional buy-in.
- Provides hard numbers for comparison – quantifies impacts of growth pattern on fiscal, health, transportation, etc. – increasingly important for engagement and values-based decision-making.

Questions?

