

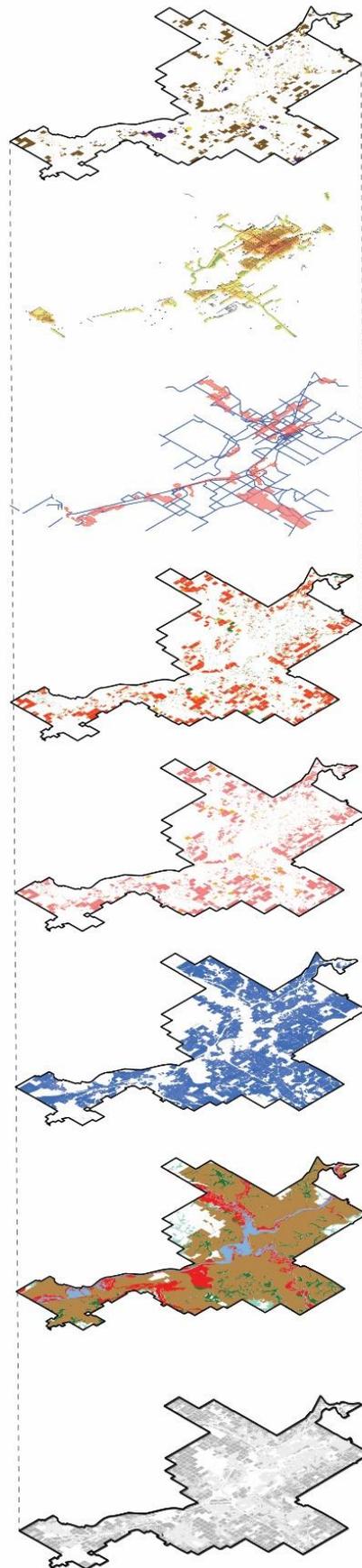
# INVENTORY AND ANALYSIS OF RESIDENTIAL INFILL AND REDEVELOPMENT OPPORTUNITIES WITHIN THE WAUSAU MPO

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PROFESSIONAL PROJECT REPORT  
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## I. ACKNOWLEDGEMENTS

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### III. EXECUTIVE SUMMARY

The goal of this report is to provide the communities within the boundaries of the Wausau Metropolitan Planning Organization (WMPO) a starting point to consider **why, where, what, and how** residential infill and redevelopment may **benefit, be located, look like, and be encouraged** in their community.

The report briefly addresses the consequences of sprawl development placed on residents and local governments and examines **why** infill and redevelopment is a useful strategy to mitigate the environmental and fiscal costs of sprawl while providing benefits and new opportunities to community members. Additionally, the project provides a condensed examination of the spatial and demographic context within the WMPO to inform communities **why** they might want to consider exploring the opportunities of residential infill and redevelopment. While infill and redevelopment can be residential, commercial, or mixed-use, this report focuses on the potential of residential infill and redevelopment within the WMPO.

The project locates **where** residential infill and redevelopment could take place by conducting a GIS inventory and analysis that identifies underutilized privately owned parcels which are defined as being vacant or having low improvement value to land value ratios of 30% or less. Following the identification of these parcels, further GIS analysis is conducted to calculate the buildable area per parcel by subtracting the total area of a parcel within various environmental constraints from the total area of a parcel within the sewer service area. Next, three overlay layers – walkability, major corridors, and Tax Increment Financing Districts – are created in the GIS to better understand the locational dynamics of the identified parcels. By utilizing the buildable area per parcel in tandem with the overlay layers, the project infers **what** scale of residential infill or redevelopment could potentially be developed based on the size and location of the identified parcels.

The findings of the inventory and analysis are displayed using maps and tables and are discussed at the WMPO scale. These maps, tables, and discussions inform **where** and **what** residential infill and redevelopment may take place given the unique context of each municipality in the WMPO.

Recommendations of strategies, tools, best practices, and future steps are briefly discussed to inform how residential infill and redevelopment might be successfully implemented through the WMPO.

## IV. INTRODUCTION

### PROJECT OBJECTIVES

This project seeks to inform municipalities in the WMPO:

1. **Why** residential infill and redevelopment warrants attention (**Introduction/Background**),
2. **Where** underutilized parcels are located within the WMPO (**Methods/Findings**),
3. **What** potential scale of residential infill and redevelopment projects could be developed on identified underutilized parcels (**Methods/Findings**),
4. **How** residential infill and redevelopment can be successfully promoted (**Recommendations**).

While all four objectives are covered in this report, its primary focus is to conduct extensive GIS inventory and analysis to identify **where** and **what** types of infill and redevelopment are possible throughout the WMPO. It is hoped that this report can begin discussion and provide initial guidance for municipalities interested in residential infill and redevelopment.

### SPRAWL DEVELOPMENT AND ITS CONSEQUENCES

The development of communities and infrastructure across America for the past century has been characterized by expansive and poorly connected low-density development, otherwise known as urban sprawl (Barrington-Leigh and Millard-Ball 2015). Cultural preferences and public policies have encouraged the low-density and automobile-oriented sprawl development seen throughout the United States (OECD 2018).

According to the OECD, sprawl development has negative consequences that affect the environment, quality of public services, and housing options available to residents. Sprawl negatively affects the environment as it creates spread out low-density communities where multi-modal transportation becomes impractical, forcing residents to rely on individual car use for transportation which increases greenhouse gas emissions. Additionally, sprawl development causes expansion into open spaces and productive agricultural lands, harming the natural environment. Sprawl places strain on the ability of municipalities to provide and maintain public services like electricity, water, sanitation, road repair, and waste management as low-density expansion increases the size and costs of these services yet lacks an adequate tax base to effectively fund them. Finally, sprawl development reduces housing options for renters and homeowners alike as strict zoning and land use regulations tend to only allow single-family homes or multi-family developments in certain areas of communities, creating a housing stock shortage commonly referred to as the missing middle (Wegmann 2020).

The strains on the environment and agricultural practices, the burdens on public services, and the lack of housing options are reasons that highlight why mitigating and reversing sprawl development is beneficial to the overall well-being of residents and their communities. One tool for mitigating sprawl and providing sustainable development is the practice of infill and redevelopment.

## **INFILL AND REDEVELOPMENT**

The American Planning Association’s “Smart Growth Policy” outlines several sustainable land development and redevelopment practices that can mitigate the effects of sprawl on residents and their communities (2012). One such practice is infill and redevelopment, where communities locate and encourage the infill of vacant parcels and the redevelopment of underutilized parcels in already built up areas (Maryland Department of Planning 2001).

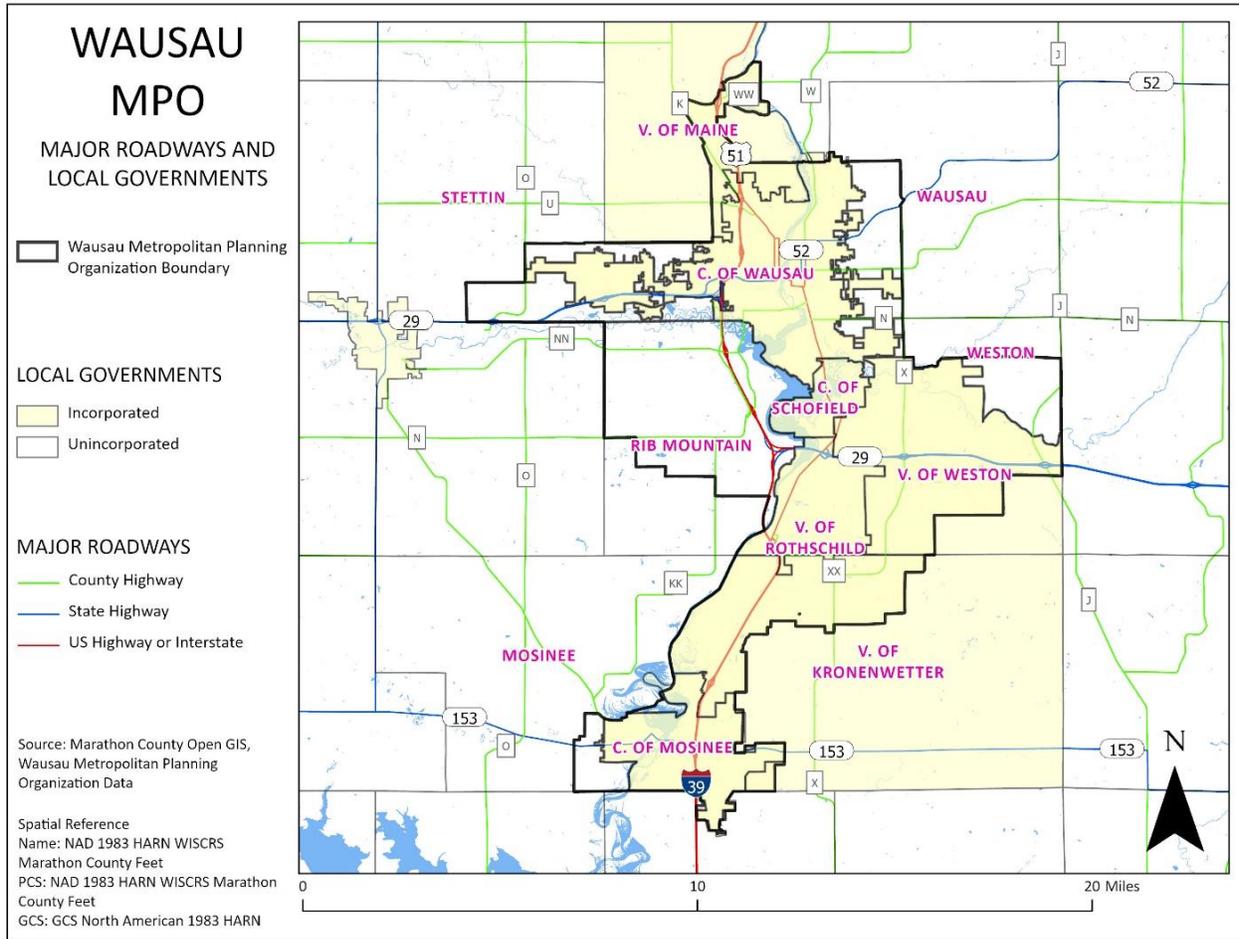
Infill and redevelopment promotes sustainable development by utilizing existing public services and infrastructure, nurturing the revitalization of underinvested neighborhoods, encouraging multi-modal transportation, and providing suitable population density. New infill or redevelopment may consist of different types of residential, commercial, or mixed-use development which create pleasant, walkable, and compact communities. Municipalities seeking to create a sense of place, enhance the vitality of their neighborhoods, increase their tax base, and improve the efficiency of their public services should consider pursuing strategies and tools to promote infill and redevelopment (Maryland Department of Planning 2001).

While these reasons provide a broad basis for why infill and redevelopment can be beneficial to residents and communities alike, understanding the current spatial and demographic context of a given community can also grant a greater appreciation for the necessity of infill and redevelopment.

## **V. BACKGROUND**

### **SPATIAL CONTEXT WITHIN THE WMPO**

There are a total of twelve local governments that have some portion of their jurisdiction within the boundaries of the Wausau Metropolitan Planning Organization. There are three cities – Mosinee, Schofield, and Wausau – four villages – Kronenwetter, Maine, Rothschild, and Weston – and five towns – Mosinee, Rib Mountain, Stettin, Wausau, and Weston (Figure 1). Each local government has unique ordinances, zoning codes, and organizational structures which may influence the desirability and scope of infill and redevelopment projects.



**FIGURE 1: Incorporated Areas and Major Roadways within the WMPO**

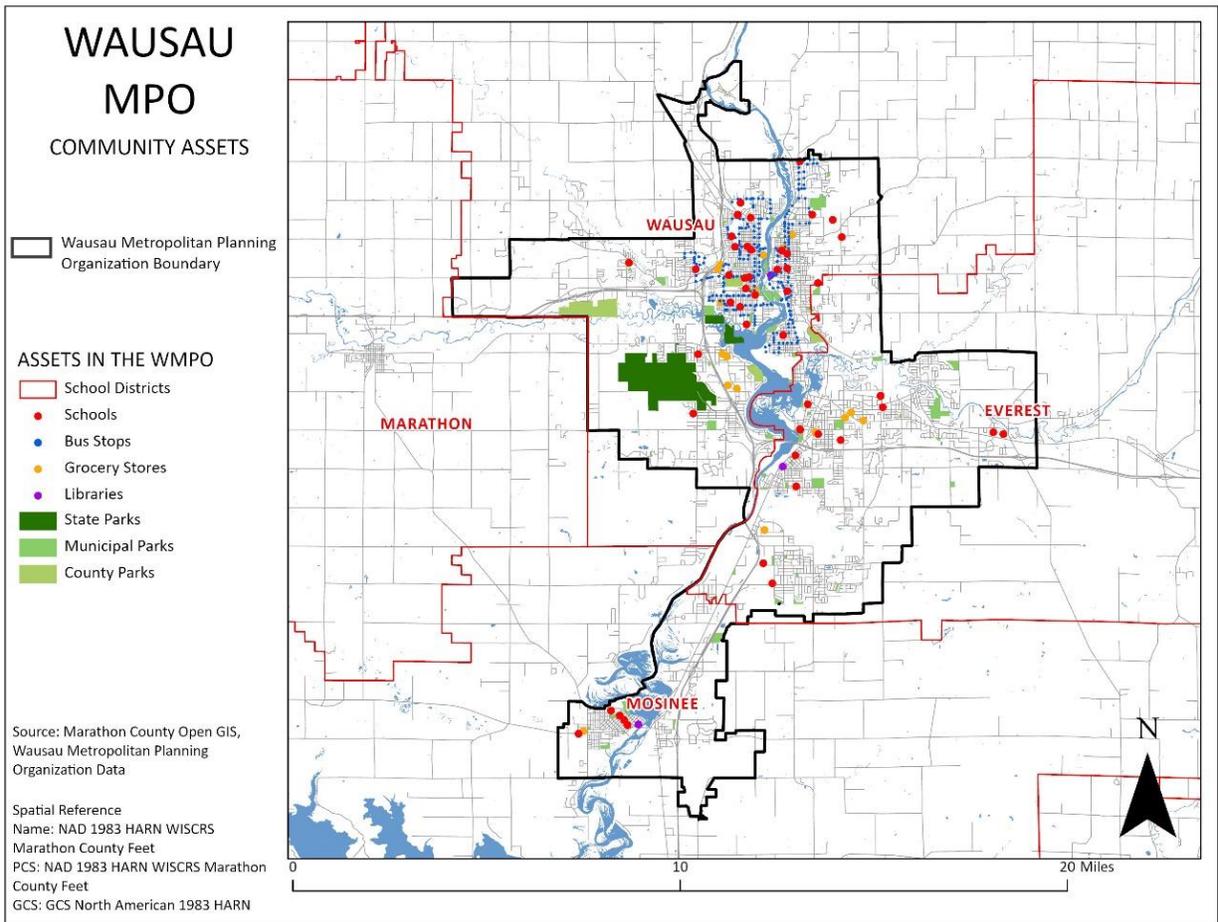
Several important county, state, and federal highways connect the communities within the WMPO to each other, the county, and the state (Figure 1). These include over a dozen County Highways, State Highways 29, 52, and 153, US Highway 51, and Interstate 39. Interstate 39 and State Highway 29 provide quick access to locations within the WMPO as the mean travel time to work for those living in the City of Wausau was 15.3 minutes, 22.1 minutes for those in the Village of Kronenwetter, and 16.1 minutes for those in the Village of Weston as a few examples (United States Census 2021).

Bus routes, bike routes, and sidewalks are also important elements of connectivity. There are several dedicated bike routes in the WMPO, and sidewalks are typically found in older areas of communities, such as in Wausau, Mosinee, and Schofield. Bus routes only exist in the City of Wausau. Unfortunately, most suburban areas have poor sidewalk and bike connectivity and lack access to bus routes, resulting in a lack of multi-modal options and causing many to rely on automobiles as their primary mode of transportation (NCWRPC 2014, 42).

Given the extent of roadway connectivity and limited multi-modal connectivity, the WMPO is a very automobile focused region that could certainly benefit from residential infill and redevelopment. Well planned residential infill and redevelopment could increase the use of multi-modal transportation which

would reduce road congestion, carbon emissions, and the need for new road projects all while improving better links between residents and community assets.

There are many types of community assets that provide essential live, work, and play opportunities to residents in their communities. Community assets can be physical places like community centers, parks, educational institutions, and even industrial and commercial businesses, or can be associations like non-profits, public institutions, or religious organizations that provide programming and assistance (Garcia 2021). This report considers the location of physical assets of parks, schools, libraries, and grocery stores as some of the most important community assets to the daily lives of residents (Figure 2). These assets foster a sense of community and are vital to the daily needs of residents, and it is important to locate residential infill and redevelopment near these locations.



**FIGURE 2: Selected Community Assets within the WMPO**

## DEMOGRAPHIC CONTEXT WITHIN THE WMPO

In the 2010 Census there were approximately a total of 89,368 residents in the twelve communities within the WMPO and is projected to be 102,225 by 2040 (Egan-Robertson 2013). The City of Wausau and Village of Weston made up about 60% of the 2010 total population in the WMPO, with other municipalities ranging from populations of several hundred to several thousand. All municipalities but the City of Schofield are projected to have some degree of population growth by 2040, with the Town of Weston, Village of Kronenwetter, and Village of Weston expected to grow their population by 41%, 39%, and 36% respectively (Table 1).

**TABLE 1: 2010-2040 Population Change Projections in the Wausau MPO**

Municipality	2010 Census	1/1/2013 Estimate	2020 Projection	2030 Projection	2040 Projection	Percent Change
T Mosinee	2,174	2,181	2,310	2,440	2,490	14.5%
T Rib Mountain	6,825	6,854	7,055	7,190	7,080	3.7%
T Stettin	2,554	2,559	2,780	3,030	3,180	24.5%
T Wausau	2,229	2,231	2,340	2,445	2,455	10.1%
T Weston	639	656	735	835	905	41.6%
V Kronenwetter	7,210	7,291	8,185	9,295	10,070	39.7%
V Maine	2,337	2,343	2,430	2,500	2,485	6.3%
V Rothschild	5,269	5,280	5,525	5,755	5,790	9.9%
V Weston	14,868	15,052	16,770	18,890	20,330	36.7%
C Mosinee	3,988	4,018	4,160	4,270	4,235	6.2%
C Schofield	2,169	2,168	2,205	2,205	2,135	-1.6%
C Wausau	39,106	39,180	40,460	41,490	41,070	5.0%
WMPO Total	89,368	89,813	94,955	100,345	102,225	16%

*Source: Wisconsin Department of Administration, Wisconsin's Future Population, 2013*

These growth projections showcase the growing demand for not just housing, but also the many other resources and opportunities that are available to households within the WMPO. Residential infill and redevelopment is one strategy that can help accommodate the potential 12,000 new residents by efficiently utilizing existing public services and infrastructure, bringing new life into neighborhoods, and acquiring new sources of revenue for municipal budgets.

## VI. METHODS

The following sections briefly explain the general methodology and logic of the processes undertaken to collect data, identify underutilized parcels, create overlays, and suggest the potential scale of residential infill and redevelopment. These sections do not elaborate on every tool used or step taken during the GIS analysis, instead the key decisions and steps during the analysis are justified and explained. Appendix 1 provides figures of all models created to conduct the analysis.

### DATA COLLECTION AND LIMITATIONS

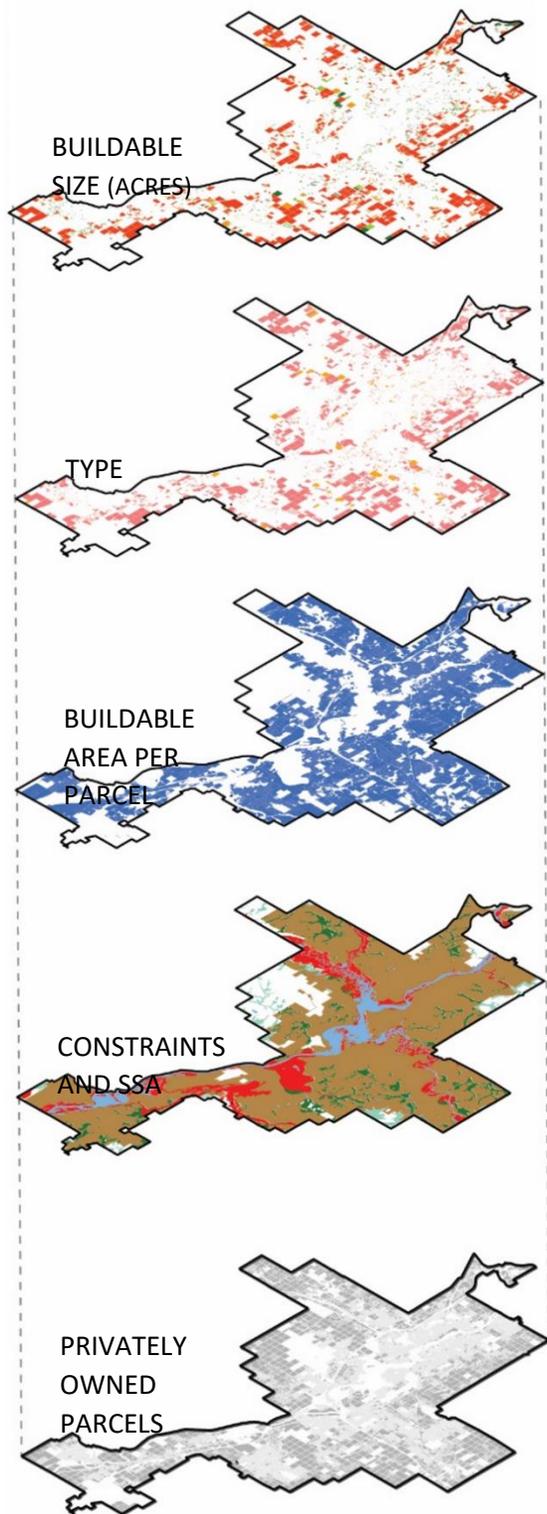
GIS data was primarily collected from the Marathon County Department of Conservation, Planning and Zoning with additional data collected from the Wisconsin Department of Natural Resources. Some new data was created by the author. Table 2 displays all the feature layers collected or created, their role in the project, and their sources.

**TABLE 2: Initial Feature Layers Collected or Created to Begin Analysis**

Feature Layer	Role	Source
WMPO Planning Boundary	Parcel ID & Overlay Creation Processes	Marathon County
Marathon County Parcels	Parcel ID Process	Marathon County
Sewer Service Area	Parcel ID Process	Marathon County
FEMA Flood Plains	Parcel ID Process	Marathon County
Wisconsin DNR Wetlands	Parcel ID Process	Marathon County
Brownfield Remediation Sites	Parcel ID Process	WI DNR
TIF TID Districts	Overlay Creation Process	Marathon County
Parks (State/County/Municipal)	Overlay Creation Process	Marathon County
Libraries	Overlay Creation Process	Marathon County
School Locations	Overlay Creation Process	Marathon County
Bus Stops	Overlay Creation Process	Marathon County
Sidewalk Inventory	Overlay Creation Process	Marathon County
WIDOT WISLR Road Data	Overlay Creation Process	Marathon County
Sidewalk Network	Overlay Creation Process	Author
Grocery Stores	Overlay Creation Process	Author

*Source: Author*

Data availability and data limitations guided the direction and processes of the GIS analysis. During data collection, it was realized that municipal zoning data in GIS format for all twelve municipalities would not be possible to collect. Zoning of underutilized parcels identified in the analysis is unknown. Additionally, the sewer service area (SSA) feature layer identifies both existing sewer areas and areas of potential sewer expansion meaning that underutilized parcels identified as being in the SSA might not currently have access to sewer infrastructure (Wisconsin Department of Natural Resources 2022). Data for existing utilities was not possible to collect as, like zoning, it is found at the municipal level, and it is unknown which underutilized parcels identified in this report have current access to sewer infrastructure. These are examples of limitations with this study, however, by creating overlays and using distinctive selection criteria, the report makes a serious attempt to inform **where** and **what** types of residential infill and redevelopment might take place in municipalities within the WMPO.



**FIGURE 3: Visualization of the Primary Steps Taken to Identify Underutilized Parcels**

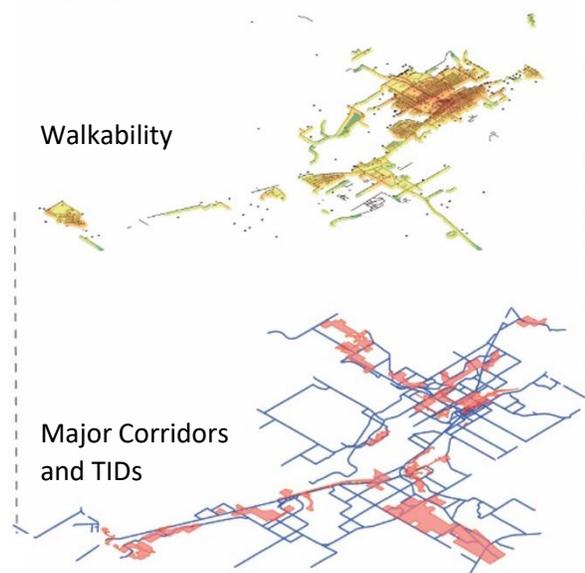
## UNDERUTILIZED PARCEL IDENTIFICATION PROCESS

To identify the location of underutilized parcels in the WMPO, the definition criteria for underutilized parcels had to first be established. Underutilized parcels are defined in this report as privately owned parcels within the WMPO sewer service area (SSA) that are either vacant or have a low improvement value to land value ratio (Low IMPVL/LNDVL) between 1% and 30%. It was decided that only privately owned parcels would be analyzed by the report given that publicly owned parcels are not assessed and have no improvement value or land value, making them unable to be selected.

Before selecting parcels that met the above definition, it was realized that many parcels in the WMPO have some degree of environmental constraint on site where structures should not be built. To discover these areas, the total buildable area of all privately owned parcels within the SSA was calculated by erasing the area of environmental constraints of FEMA 100-year flood plains, Wisconsin DNR wetlands, Environmentally Sensitive Areas (ESAs), and EPA brownfield sites from the total area (in acres) of each parcel. These initial steps are visualized in the bottom three images in Figure 3. A GIS model was built which utilized the necessary tools to identify privately owned parcels within the SSA and calculate the total buildable area of these parcels (Figure A1-1).

Following these initial steps, underutilized parcels were then identified by selecting privately owned parcels that were within the SSA, had more than 4,000 sq ft of buildable land, and had improvement values of zero or between 1% and 30% of land value. This step was conducted using a new model which identified the locations, the type (vacant or low IMPVL/LNDVL), and the buildable size (total buildable area in acres) of underutilized parcels in the WMPO (Figure A1-2). The results of this model are visualized in the top two images of Figure 3.

The next major step was to sort and distinguish the potential of the identified underutilized parcels.



**FIGURE 4: Visualization of Walkability, Major Corridor, and TID Overlays**

## OVERLAY CREATION PROCESS

Three overlays – walkability, major corridors, and TIDs - were created to better understand the spatial context of communities and identified underutilized parcels within the WMPO (Figure 4).

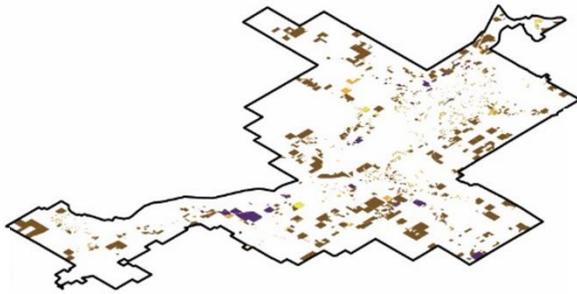
Walkability can identify existing built-up areas, proximity to assets, and can encourage multi-modal transportation. This overlay was created by first identifying the selected community assets of parks, grocery stores, bus stop, schools, and libraries within the WMPO (Figure A1-3). Then, a sidewalk network was constructed by selecting WISLR roads with sidewalks, as identified by a sidewalk inventory layer, and inputting the selection into a model to build the network (Figure A1-4). Next,  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , and 1 mile service area isochrones for the five types of community assets were created using the sidewalk

network and placed into a model to be converted into raster datasets, reclassified, and turned into a mosaic to express the degree of walkability of areas in the WMPO (Figure A1-5). Finally, the mosaic was converted to points which were spatially joined to the underutilized parcels, identifying the degree to which parcels are or are not walkable (Figure A1-6).

Major corridors are roadways that function as main streets and commercial corridors for municipalities in the WMPO and underutilized parcels on these corridors should be distinguished. These corridors were identified by selecting roads with Wisconsin Department of Transportation (2013) functional classifications of rural major collector, rural minor collector, urban minor arterial, or urban collector were selected using a model (Figure A1-3). Underutilized parcels along these corridors were identified using a model (Figure A1-6).

The last overlay created was used to locate underutilized parcels within Tax Increment Financing Districts. These districts can encourage unique development opportunities and residential infill and redevelopment, particularly affordable housing, could be encouraged in these districts (Department of Revenue 2021). Models were built to identify TIDs within the WMPO and the underutilized parcels within them (Figure A1-3 and Figure A1-6)

These three overlays explain the spatial context of identified underutilized parcels which, when combined with the buildable size of the parcels, can suggest the potential scale of residential infill and redevelopment.



**FIGURE 5: Potential Scale of Residential Infill and Redevelopment on Select Underutilized Parcels**

## POTENTIAL SCALE OF RESIDENTIAL INFILL AND REDEVELOPMENT

The report defines the potential scale of residential infill and redevelopment as the practical amount of housing units that could be developed on an underutilized parcel given its buildable size and location within one or more overlay. Potential scale is broken into four categories: small-scale, medium-scale, large-scale, and large-scale affordable. There are many

different forms of small, medium, and large-scale residential infill and redevelopment which vary by the height and number of units. Below are some examples of housing forms based on the number of units loosely interpreted from the City of Edmonton’s *Residential Infill Guidelines Manual* (2009):

- Small-Scale Forms (1-2 Units):
  - Secondary or Garage Suites
  - Single Detached Houses
  - Vertical or Horizontal Duplexes
- Medium-Scale Forms (3-8 Units):
  - Row Houses
  - Cottage Court
  - Small-Lot Neighborhood
- Large-Scale Forms (9+ Units):
  - Low to Mid-Rise Apartments
  - Mixed-Use Apartments
  - Pocket Neighborhoods
- Large-Scale Affordable Forms (9+ Units):
  - Low to Mid-Rise Apartments
  - Mixed-Use Apartments
  - Pocket Neighborhoods

To recommend potential scale, identified underutilized parcels had to meet selection criteria based on their buildable area and location within one or more overlay (Table 3). The selection requirements for each scale category were chosen to identify the best locations for multi-modal, sustainable, and feasible residential infill and redevelopment. Potential scale for underutilized parcels was identified by building a model to apply the selection requirements to underutilized parcels (Figure A1-7). The results of these selections are visualized in Figure 5.

**TABLE 3: Potential Scale Attribute Selection Requirements**

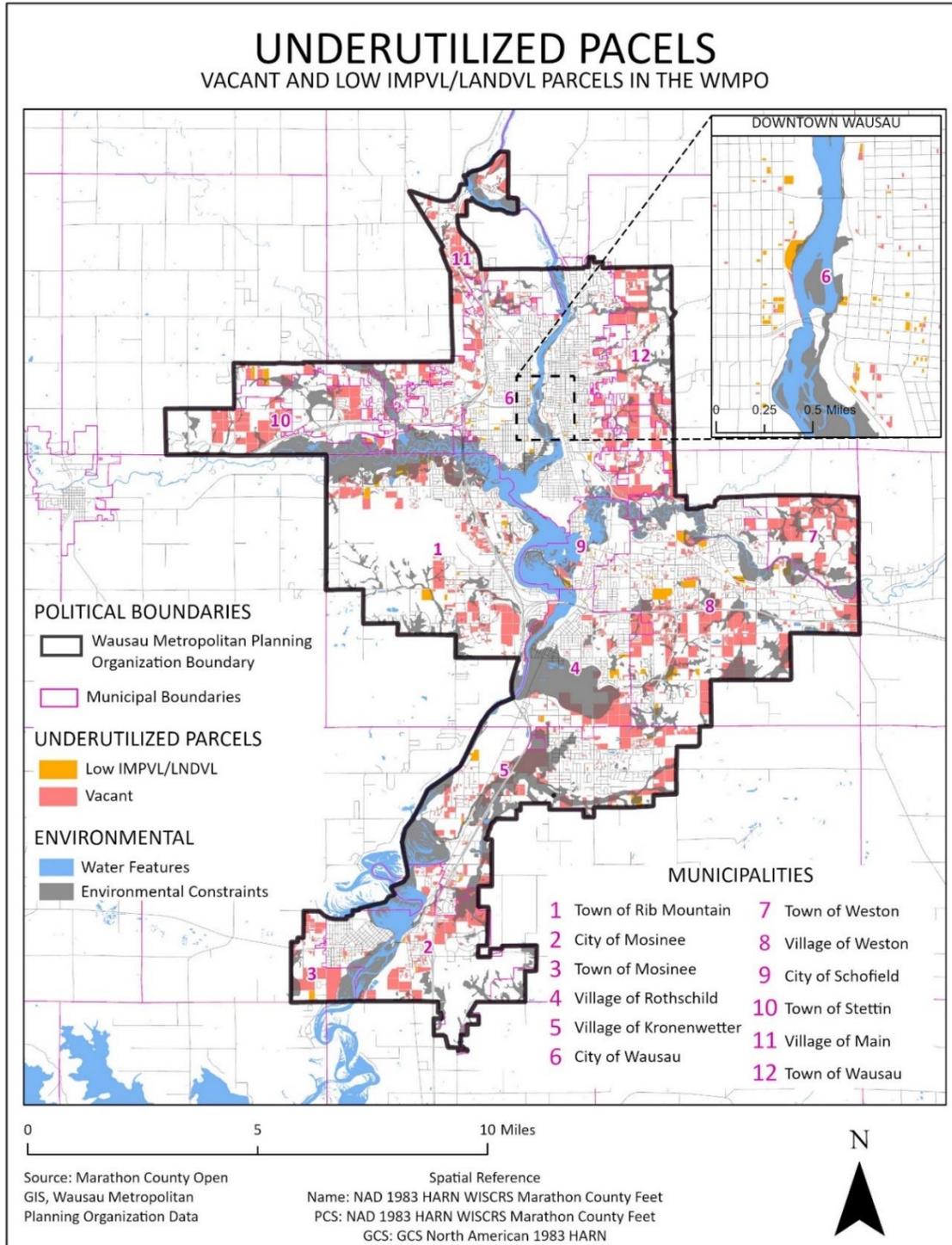
Development Type	Size	Overlay Requirement
Small-Scale	1/2 Acre or less	Walkable overlay
Medium-Scale	1/2 Acre to 1 Acre	Walkable OR major corridor overlays
Large-Scale	1 Acre or more	Walkable OR major corridor overlays
Large-Scale Affordable	1 Acre or more	Walkable AND TID overlays

*Source: Author*

It should be noted that these requirements are merely suggested by the report, and municipalities are encouraged to change these requirements if they are interested in different selections or certain types of scale.

## VII. FINDINGS

### IDENTIFIED UNDERUTILIZED PARCELS BY TYPE



**FIGURE 6: Underutilized Parcels within the WMPO**

**TABLE 4: Underutilized Parcels by Municipality**

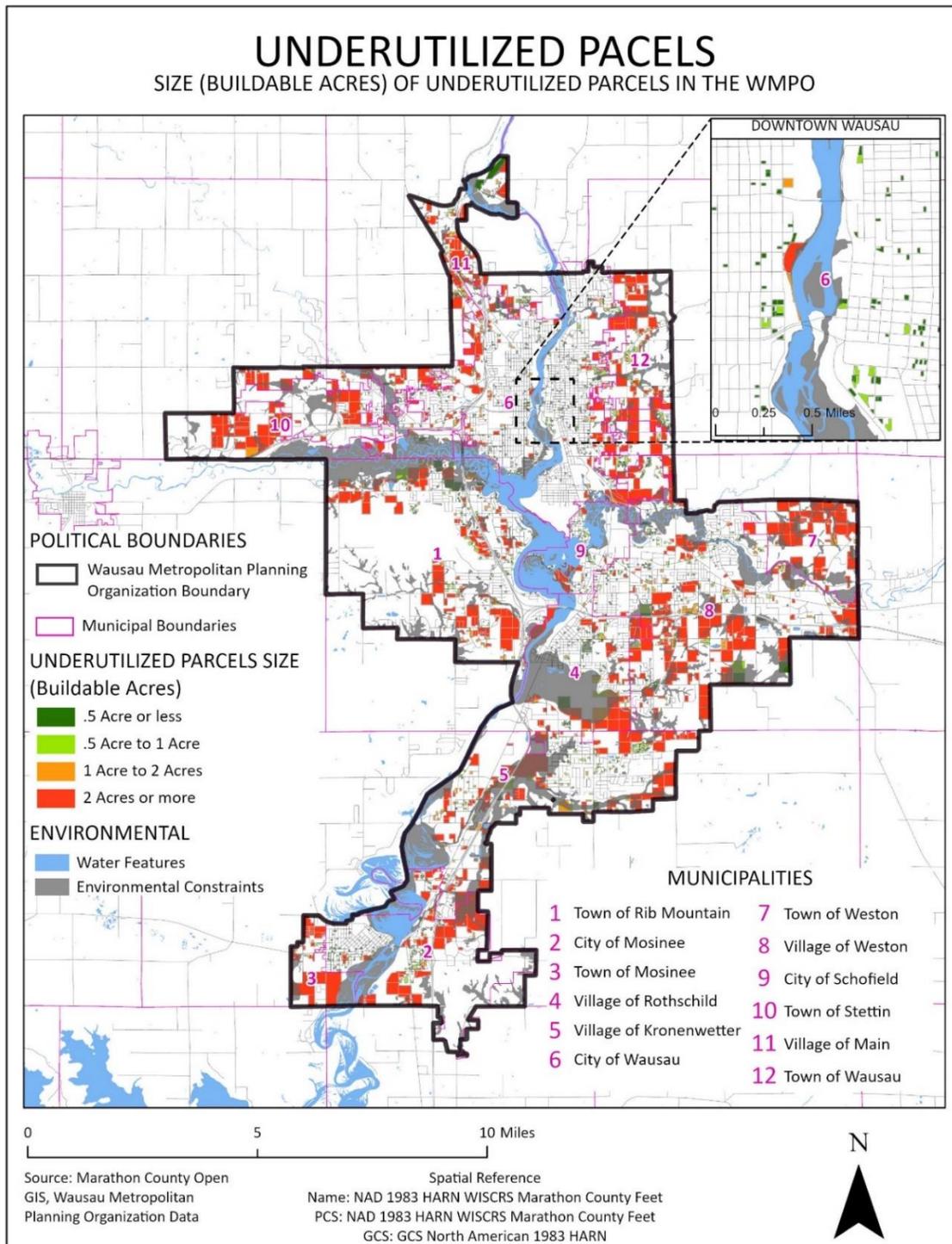
Municipality	Vacant	Improvement Value / Land Value Ratio			Total Underutilized Parcels
		1% to 10%	11% to 20%	21% to 30%	
T Mosinee	37	0	1	0	38
T Rib Mountain	266	9	6	6	287
T Stettin	97	1	0	1	99
T Wausau	155	3	2	2	162
T Weston	105	1	0	0	106
V Kronenwetter	231	9	2	1	243
V Maine	151	1	0	1	153
V Rothschild	156	6	0	5	167
V Weston	417	10	8	11	446
C Mosinee	206	7	5	4	222
C Schofield	65	20	5	6	96
C Wausau	671	43	34	23	771
WMPO Total	2,557	110	63	60	2,790

*Source: Marathon County Department of Conservation, Planning and Zoning, GIS DATA, 2022*

The analysis identified a total of 2,790 underutilized parcels within the WMPO that have access to the sewer service area and have at least 4,000 sq ft or more of buildable area (Figure 6) (Table 4). Of the identified 2,790 underutilized parcels, 2,557 are vacant while 233 have a low improvement value to land value ratio between 1% and 30%. The City of Wausau has the highest number of underutilized parcels with 771 followed by the Village of Weston with 446.

Underutilized parcels can be found in both urban and rural locations and have unique characteristics. Vacant parcels in urban or suburban areas tend to be grass lots found in between single-family houses while vacant parcels in rural areas tend to be agricultural fields, wooded areas, or open land. Low improvement value to land value parcels in urban or suburban areas tend to have existing residential or light industrial storage structures, or existing commercial structures that have been shut down for some time, whereas low improvement to land value parcels in rural areas typically have older farm structures. Vacant parcels are the most common type of underutilized parcel identified by the analysis, with all twelve municipalities having at least 70% or more of their underutilized parcels classified as vacant.

# IDENTIFIED UNDERUTILIZED PARCELS BY SIZE



**FIGURE 7: Underutilized Parcels by Size (Buildable Acres) within the WMPO**

**TABLE 5: Buildable Acres of Underutilized Parcels by Municipality**

Municipality	Number of Underutilized Parcels by Size (Acres)				Total Underutilized Parcels
	Less Than 1/2 Acre	1/2 Acre to 1 Acre	1 Acre to 2 Acres	Greater Than 2 Acres	
T Mosinee	3	4	7	24	38
T Rib Mountain	87	73	44	83	287
T Stettin	16	14	22	47	99
T Wausau	39	37	26	60	162
T Weston	21	21	13	51	106
V Kronenwetter	40	95	30	78	243
V Maine	48	35	27	43	153
V Rothschild	88	22	20	37	167
V Weston	158	87	70	131	446
C Mosinee	136	28	15	43	222
C Schofield	69	18	3	6	96
C Wausau	484	136	50	101	771
WMPO Total	1,189	570	327	704	2,790

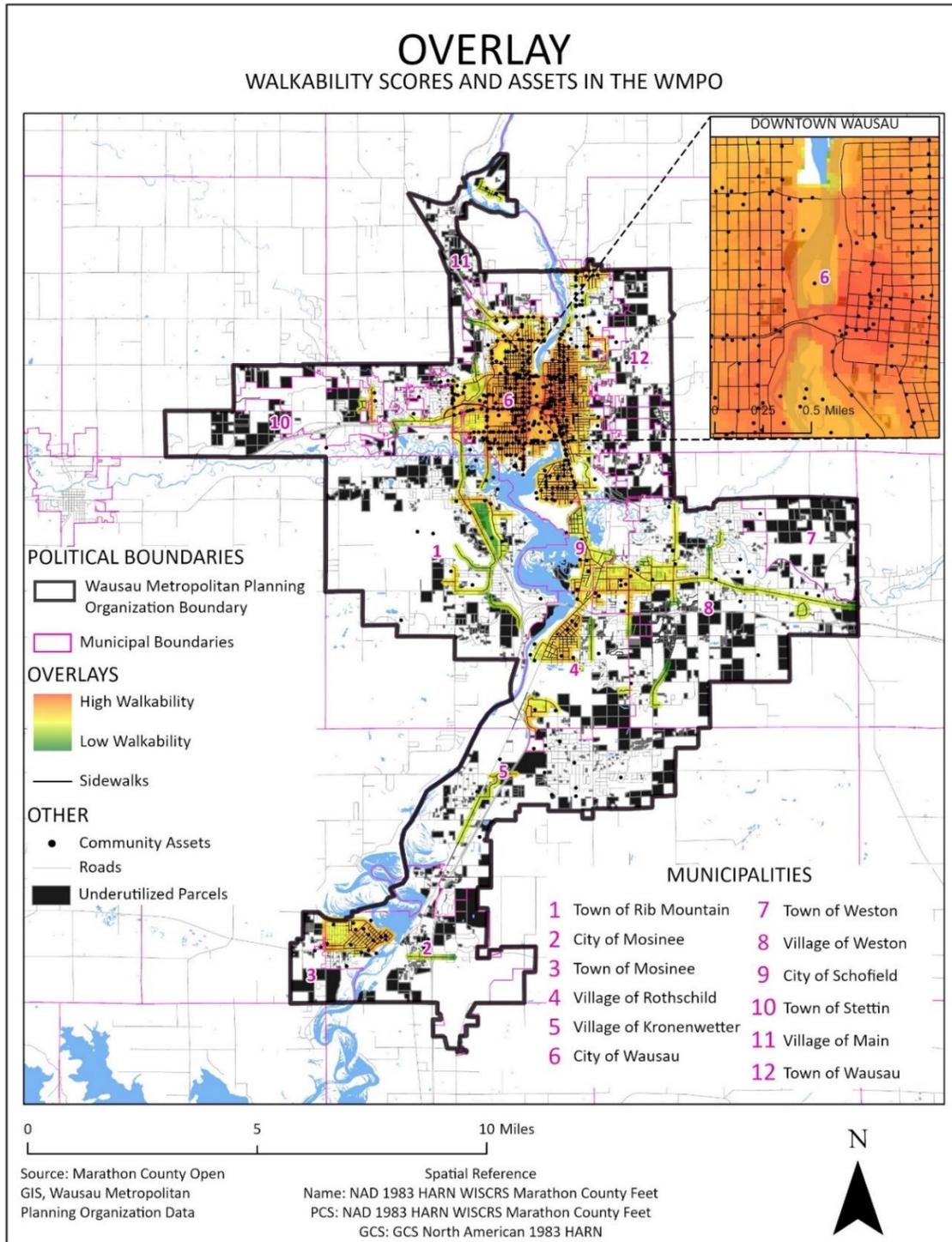
*Source: Marathon County Department of Conservation, Planning and Zoning, GIS DATA, 2022*

In addition to identifying the types of underutilized parcels the analysis calculated the buildable acreage per underutilized parcel and classified the outputs into four size categories: less than ½ Acre, ½ Acre to 1 Acre, 1 Acre to 2 Acres, and greater than 2 Acres (Figure 7) (Table 5). The report identified 1,759 underutilized parcels (63%) that have less than an Acre of buildable area and 1,031 (37%) that have an Acre or more of buildable area.

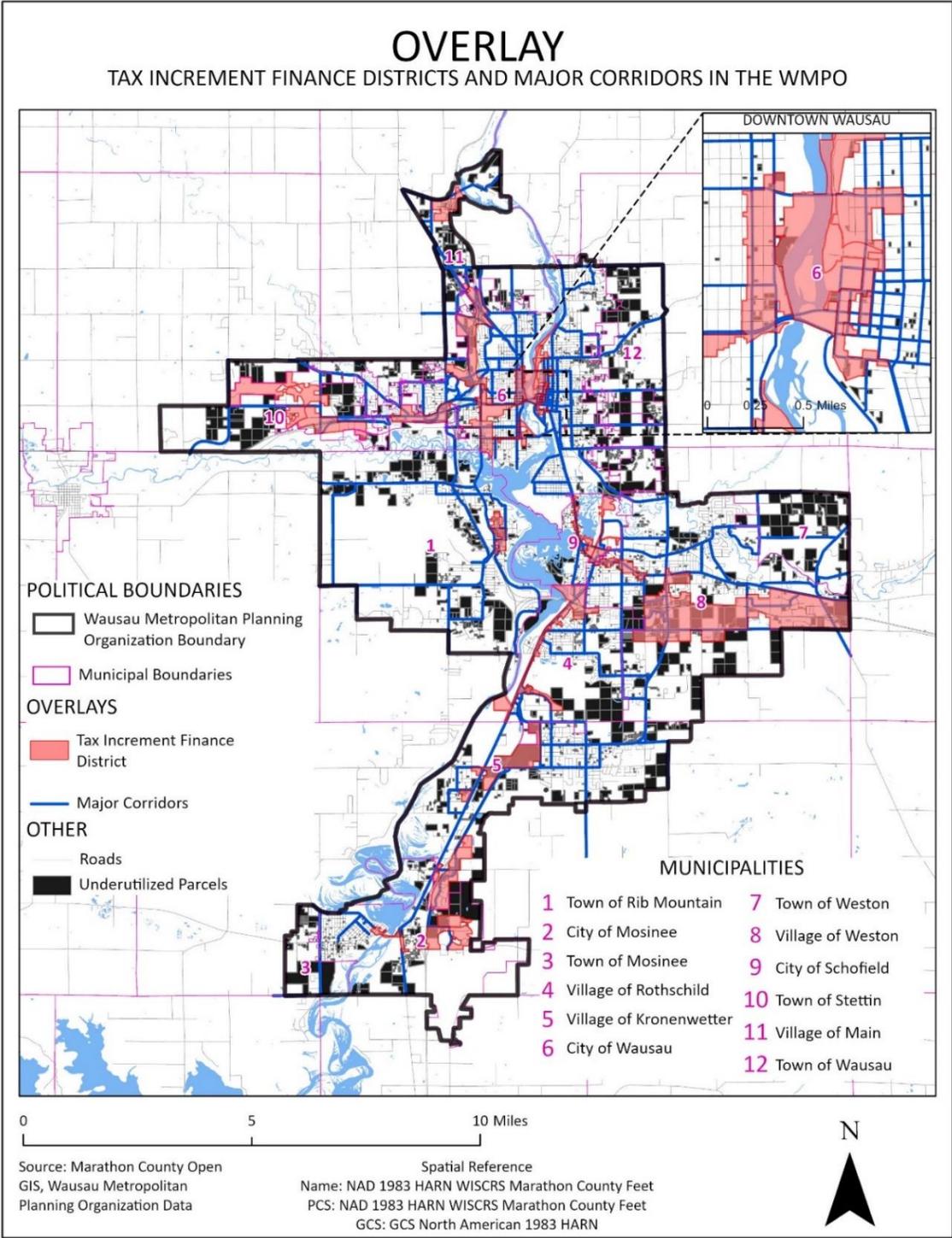
Not surprisingly, underutilized parcels in urban and suburban areas of municipalities tend to be smaller and have few environmental constraints, while underutilized parcels in rural areas are larger but have more environmental constraints on the parcel.

These classifications of underutilized parcel sizes, when combined with the overlays, allow the report to suggest what scale of potential residential infill and redevelopment could occur on certain parcels. Overall, there is a wide range of underutilized parcel sizes, which grants municipalities opportunities for encouraging various types of residential infill or redevelopment.

# OVERLAYS



**FIGURE 8: Walkability within the WMPO**



**FIGURE 9: Tax Increment Finance Districts and Major Corridors within the WMPO**

**TABLE 6: Underutilized Parcels and Overlays by Municipality**

Municipality	Total Underutilized Parcels	Underutilized Parcels in an Overlay		
		Walkable	TID	Major Corridor
T Mosinee	38	4	0	7
T Rib Mountain	287	82	11	97
T Stettin	99	9	0	36
T Wausau	162	16	0	55
T Weston	106	0	0	34
V Kronenwetter	243	18	24	93
V Maine	153	27	11	59
V Rothschild	167	62	12	60
V Weston	446	138	122	188
C Mosinee	222	63	15	35
C Schofield	96	89	21	47
C Wausau	771	456	110	308
WMPO Total	2,790	964	326	1,019

*Source: Marathon County Department of Conservation, Planning and Zoning, GIS DATA, 2022*

The analysis created three overlays – walkability, Tax Increment Finance Districts, and major corridors – to better understand the relationship between the identified underutilized parcels and the spatial dynamics of the WMPO (Figure 8 and Figure 9). Underutilized parcels found within each overlay are broken down by municipality in Table 6. Each municipality has unique combinations and amounts of underutilized parcels within the overlays.

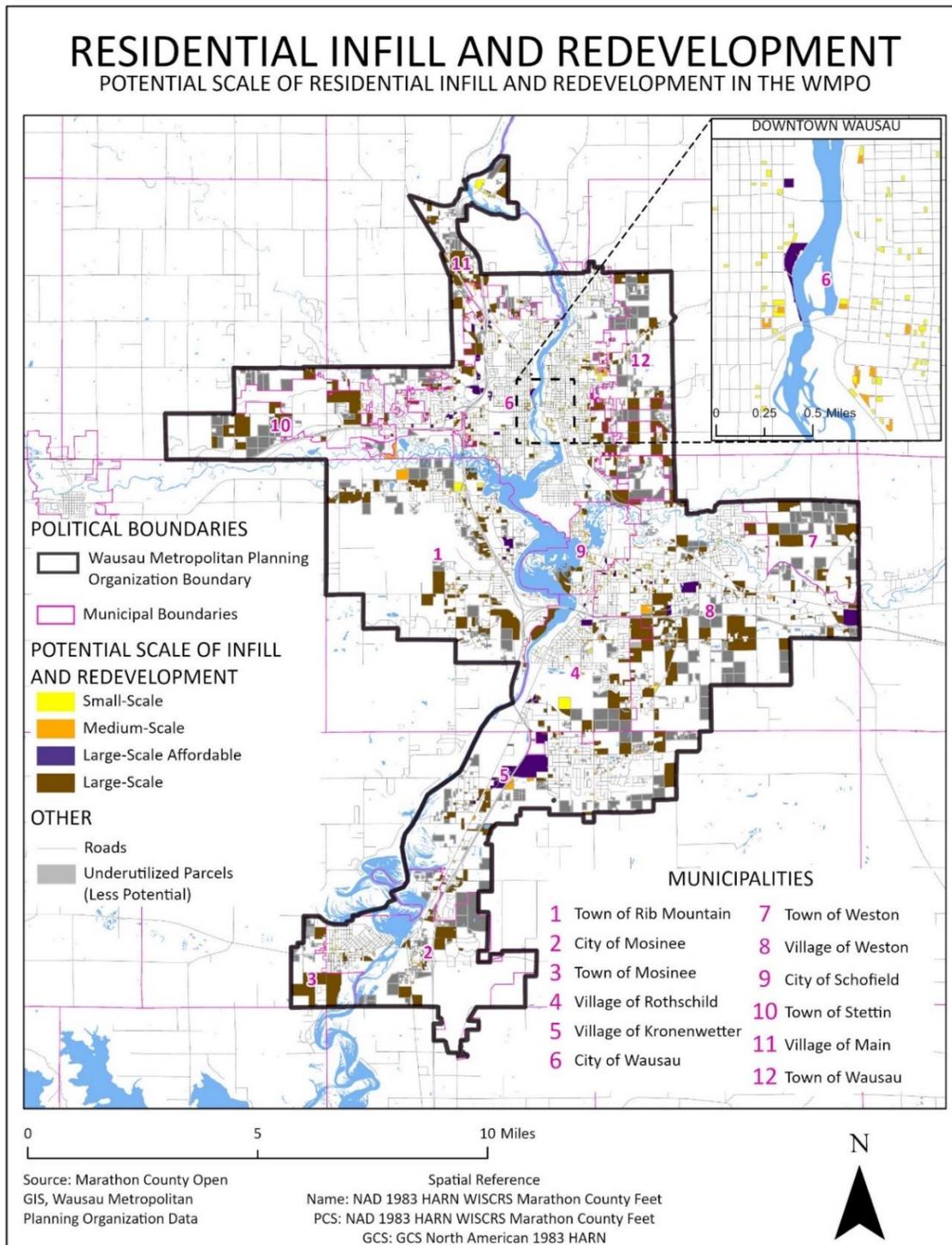
Municipalities that have traditionally designed neighborhoods, like the City of Wausau or City of Mosinee tend to have more underutilized parcels with sidewalk access and greater walkability than municipalities that have suburban designed neighborhoods, like the Town of Weston or Village of Kronenwetter. Underutilized parcels that are in walkable areas can provide important residential infill and redevelopment opportunities.

Excluding the Towns of Mosinee, Weston, Wausau, and Stettin, Tax Increment Finance Districts (TIDs) are found in all municipalities in the WMPO. TIDs can provide encouragement for various types of development and locating underutilized parcels within these districts may allow unique approaches to residential infill and redevelopment.

Major corridors - roads having functional classifications of rural major collector, rural minor collector, urban minor arterial, or urban collector - are found within all municipalities. These major corridors function as main streets and commuter routes for residents across the WMPO and underutilized parcels on these corridors have abundant residential infill or redevelopment potential.

Overall, understanding the locations of underutilized parcels relative to the three overlays across the twelve municipalities can recommend what scale of residential infill and redevelopment may suit certain parcels.

# POTENTIAL SCALE OF RESIDENTIAL INFILL AND REDEVELOPMENT



**FIGURE 10: Potential Scale of Residential Infill and Redevelopment within the WMPO**

**TABLE 7: Potential Scale of Residential Infill and Redevelopment by Municipality**

Municipality	Potential Scale of Residential Infill or Redevelopment for Underutilized Parcels			
	Small-Scale	Medium-Scale	Large-Scale	Large-Scale Affordable
T Mosinee	0	1	8	0
T Rib Mountain	26	30	111	4
T Stettin	3	2	31	0
T Wausau	1	14	42	0
T Weston	0	6	24	0
V Kronenwetter	0	32	49	7
V Maine	21	9	49	0
V Rothschild	36	12	81	7
V Weston	59	47	202	13
C Mosinee	47	9	78	0
C Schofield	65	17	89	2
C Wausau	335	61	490	23
WMPO Total	593	240	1254	56

*Source: Marathon County Department of Conservation, Planning and Zoning, GIS DATA, 2022*

The final output of the analysis considered the size and location of underutilized parcels to suggest the potential scale of residential infill and redevelopment (Figure 10) (Table 7). The scale of development is defined as the practical amount of housing units that could be developed on a parcel given the size and location of the parcel. The suggestions of scale do not consider current site zoning codes and may or may not be possible to develop on certain parcels given their current zoning. Regardless, scale can help visualize the number of units and the form of residential infill and redevelopment that could be possible with new approaches to zoning and community support.

To determine the potential locations of small-scale residential infill and redevelopment, the report selected underutilized parcels that are smaller than ½ Acre and are within the walkability overlay. The walkability requirement eliminates many small, underutilized parcels found in the inventory and three municipalities – the Village of Kronenwetter, the Town of Weston, and the Town of Mosinee - have no small-scale infill and redevelopment opportunities. The Cities of Wausau, Schofield, and Mosinee have great opportunities for walkable small-scale residential infill and redevelopment.

Potential medium-scale residential infill and redevelopment locations selected by the report are underutilized parcels that have between ½ Acre and 1 Acre of buildable land and are either within the walkability overlay or are on a major corridor. Underutilized parcels that meet these requirements are found in many municipalities within the WMPO and their locations in walkable neighborhoods or on major corridors would allow this scale of development to increase neighborhood population density and provide adequate connectivity to new developments.

Selected large-scale residential infill and redevelopment locations are underutilized parcels that have 1 Acre or more of buildable land and are either within the walkability overlay or are on a major corridor. This classification is the most numerous given that there are many large, underutilized parcels in rural areas that are on rural major corridors and within the SSA. These parcels may not be desirable for infill



and redevelopment and municipalities will want to take a closer look to scrutinize whether these large rural parcels meet their definitions of underutilized. Nevertheless, there are still many underutilized parcels in urban and suburban areas that could allow large-scale residential infill and redevelopment projects that warrant the attention of all twelve municipalities.

The report identified large-scale affordable locations that also have 1 Acre or more of buildable land but must be located within the walkability and TID overlays. These requirements ensure that affordable residential infill and redevelopment projects would be located on underutilized parcels that have access to sidewalks and community assets, while also increasing the success of affordable developments given the benefits of TIDs. Half of the municipalities in the WMPO have underutilized parcels that could accommodate large-scale affordable residential infill and redevelopment. The City of Wausau and Village of Mosinee have the most options for large-scale affordable development with 26 and 13 parcels, respectively.

These findings are broad considerations to help municipalities visualize the type of potential residential infill and redevelopment as well as the opportunities granted by such projects. It is recommended that municipalities build community support, consider regulatory strategies, implement best practices, and conduct their own research for integrating, promoting, and sustaining successful residential infill and redevelopment in their jurisdictions.

## VIII. RECOMMENDATIONS

### CONSIDER BARRIERS

Physical, social, and regulatory barriers can make any type of infill and redevelopment difficult, or even impossible, to develop in a municipality (Maryland Department of Planning 2001). Physical barriers encompass environmental constraints or nuisance issues, social barriers can manifest as a lack of community support or even resistance, and regulatory barriers include zoning and building codes that prohibit infill or redevelopment. Physical and regulatory barriers can be overcome through further research and planning while social barriers can be hurdled by nurturing public support.

### CONDUCT FURTHER RESEARCH

Physical barriers are usually easy to identify and manage and the environmental forms of this barrier were considered and accounted for in the analysis. However, municipalities can conduct further research of physical barriers both at the local and individual site level to better understand where or where not infill and redevelopment may take place. The effects of infill and development on traffic, parking, and property value within the community should be studied to identify ideal locations, plan for changes, make projections, and better understand the costs and benefits of infill and redevelopment. Expressing the benefits of infill and redevelopment to existing residents is key to overcoming social barriers and building public support.

### BUILD PUBLIC SUPPORT

Social barriers are perhaps the most significant barrier to infill and redevelopment given that new regulations cannot be implemented without the approval of residents and those who represent them. Opposition to infill and redevelopment by existing residents may stem from worries about increased traffic, crime, strain on existing services, a decrease in property values, or from status quo bias (McConnell and Wiley 2010). This can certainly be a challenge, but ambitious municipalities can gradually increase public acceptance by engaging passive citizens through public participation that brings awareness to the benefits of infill and redevelopment (The Housing Partnership 2003). Municipalities can use public participation to build public support by referencing studies conducted by staff and showcasing national examples of successful infill and redevelopment, while also building rapport with residents by listening to their comments, concerns, and ideas. Once social barriers are addressed and residents feel comfortable with these new concepts, municipalities can implement regulatory changes which allow and encourage private sector infill and redevelopment.

### IMPLEMENT REGULATORY CHANGES FOCUSED ON BEST PRACTICES

Residential zoning codes in most municipalities tend to only allow either single-family or large multi-family housing developments, meaning that many forms of residential infill and redevelopment are usually not allowed, requiring innovative regulatory changes (The Housing Partnership 2003). Various regulatory changes can be implemented to ensure that residential infill and redevelopment projects are permitted, and that the application process is logical and efficient for developers. Municipalities can provide a clear regulatory path by modifying the Comprehensive Plan, modifying existing zoning regulations, creating new zoning regulations or overlays, creating design guidelines, streamlining the

review process, and providing incentives which allow and encourage residential infill and redevelopment (Maryland Department of Planning 2001). All new regulations should be rooted in the established best practices for residential infill and redevelopment and should consider form, setbacks, heights, style, connectivity, circulation, parking, and general compatibility within the neighborhood (Maryland Department of Planning 2001). These requirements allow new infill and redevelopment to be practical for developers, comfortable for future residents, and aesthetic to the existing character of the neighborhood (Clegg and Vogt 2010).

## IX. CONCLUSION

Communities within the WMPO should expect and plan for a significant increase in population over the next 20 years. All municipalities within the WMPO have a variety of underutilized parcels available for development and should consider ways to encourage residential infill and redevelopment which can be a useful strategy to reduce sprawl development while creating more sustainable and vibrant communities. While further research is required to better understand the potential of residential infill and redevelopment within each municipality, this report functions to bring awareness to the importance, location, potential, and opportunities for residential infill and redevelopment within the WMPO.

## X. REFERENCES

- American Planning Association Board of Directors. 2012, April 14. "APA Policy Guide on Smart Growth." *American Planning Association*.  
<https://www.planning.org/policy/guides/adopted/smartgrowth.htm>
- Barrington-Leigh, C., & Millard-Ball, A. 2015, June 15. "A Century of Sprawl in the United States." *PNAS*, 11(27). <https://www.pnas.org/doi/10.1073/pnas.1504033112>
- Clegg, E., & Vogt, K. 2010, January. "Quality Infill: Recommendations and Tools." *Idaho Smart Growth*. [https://www.idahosmartgrowth.org/app/uploads/2014/05/quality\\_infill\\_final1.pdf](https://www.idahosmartgrowth.org/app/uploads/2014/05/quality_infill_final1.pdf)
- Egan-Robertson, D. 2013, December. "Wisconsin's Future Population: Projections for the State, Its Counties and Municipalities, 2010 – 2040." *Wisconsin Department of Administration Demographic Services Center*. [https://doa.wi.gov/DIR/FinalProjs2040\\_Publication.pdf](https://doa.wi.gov/DIR/FinalProjs2040_Publication.pdf)
- Fletcher and Company. 2009, September. "Residential Infill Guidelines: A Manual of Planning and Design Guidelines for Residential Infill in Mature Neighbourhoods." *The City of Edmonton Planning and Development*. [https://www.edmonton.ca/public-files/assets/document?path=Residential\\_Infill\\_Guidelines\\_Sept\\_2009.pdf](https://www.edmonton.ca/public-files/assets/document?path=Residential_Infill_Guidelines_Sept_2009.pdf)
- Garcia, I. 2021, December 7. "The Silver Linings of Asset-Based Community Development." *American Planning Association*. <https://www.planning.org/blog/9226680/the-silver-linings-of-asset-based-community-development/>
- Marathon County Department of Conservation, Planning and Zoning. 2022. "GIS Data." *Marathon County Department of Conservation, Planning and Zoning*.  
<https://www.co.marathon.wi.us/Departments/ConservationPlanningZoning/GEOServices/GeographicInformationSystem%28GIS%29/GISData.aspx>
- Maryland Department of Planning. 2001, October. "Models and Guidelines for Infill Development." *Maryland Department of Planning*.  
<https://planning.maryland.gov/Documents/OurProducts/Archive/72195/mg23-Infill-Development.pdf>
- McConnell, V., & Wiley, K. 2010, May. "Infill Development: Perspectives and Evidence from Economics and Planning." *Resources for the Future*.  
<https://media.rff.org/archive/files/sharepoint/WorkImages/Download/RFF-DP-10-13.pdf>
- North Central Wisconsin Regional Planning Commission. 2014, October 14. "Marathon County Transportation Program Needs Assessment." *North Central Wisconsin Regional Planning Commission*.  
[https://www.co.marathon.wi.us/Portals/0/Departments/CPZ/Documents/MCTP\\_NeedsAssess\\_Oct2014.pdf](https://www.co.marathon.wi.us/Portals/0/Departments/CPZ/Documents/MCTP_NeedsAssess_Oct2014.pdf)
- OECD. 2018, June. "Rethinking Urban Sprawl: Moving Towards Sustainable Cities." *Organization for Economic Co-Operation and Development*. <https://www.oecd.org/environment/tools-evaluation/Policy-Highlights-Rethinking-Urban-Sprawl.pdf>

The Housing Partnership. 2003, November. "Filling in the Spaces: Ten Essentials for Successful Urban Infill Housing." *The Housing Partnership*. <https://mrsc.org/getmedia/259C6236-42AD-45F2-8AA6-3465AE1B1D2F/FillingSpaces.aspx>

United States Census. 2021. "QuickFacts: Weston village, Wisconsin; Kronenwetter village, Wisconsin; Wausau city, Wisconsin." *United States Department of Commerce*. <https://www.census.gov/quickfacts/fact/table/westonvillagewisconsin,kronenwettervillagewisconsin,wausaucitywisconsin/PST045221>

Wegmann, J. 2020. "Death to Single-Family Zoning...and New Life to the Missing Middle." *Journal of the American Planning Association*, 86(1), 113-119. <https://www.tandfonline.com/doi/full/10.1080/01944363.2019.1651217>

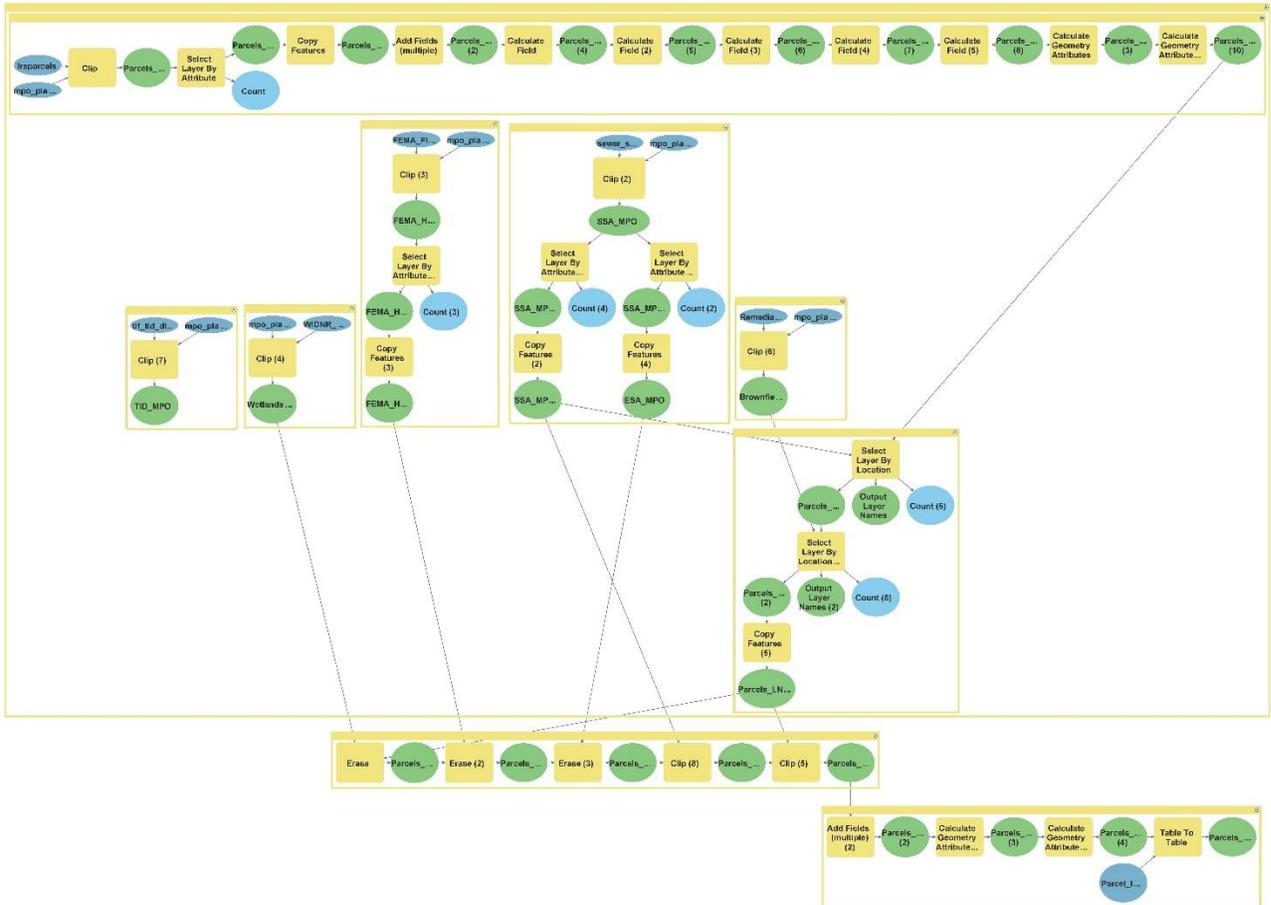
Wisconsin Department of Natural Resources. 2022. "Sewer Service Area Planning." *Wisconsin Department of Natural Resources*. <https://dnr.wisconsin.gov/topic/SurfaceWater/SSAPanning.html>

Wisconsin Department of Natural Resources. 2022. "WI DNR Open Data: Brownfields." *Wisconsin Department of Natural Resources*. <https://data-wi-dnr.opendata.arcgis.com/search?q=Brownfields>

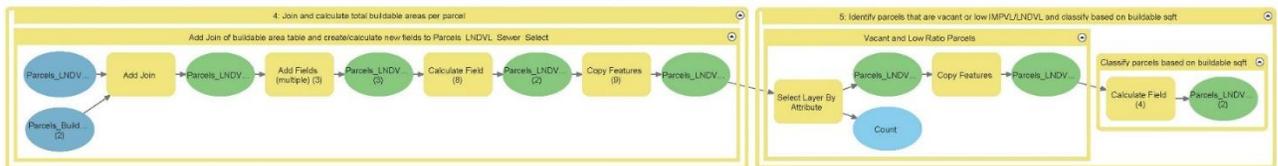
Wisconsin Department of Revenue. 2021. "Tax Incremental Finance (TIF) – General." *Wisconsin Department of Revenue*. <https://www.revenue.wi.gov/Pages/FAQS/slf-tif-general.aspx>

Wisconsin Department of Transportation. 2013, April. "Functional Classification Criteria." *Wisconsin Department of Transportation*. <https://wisconsin.gov/Documents/projects/data-plan/plan-res/fc-criteria.pdf>

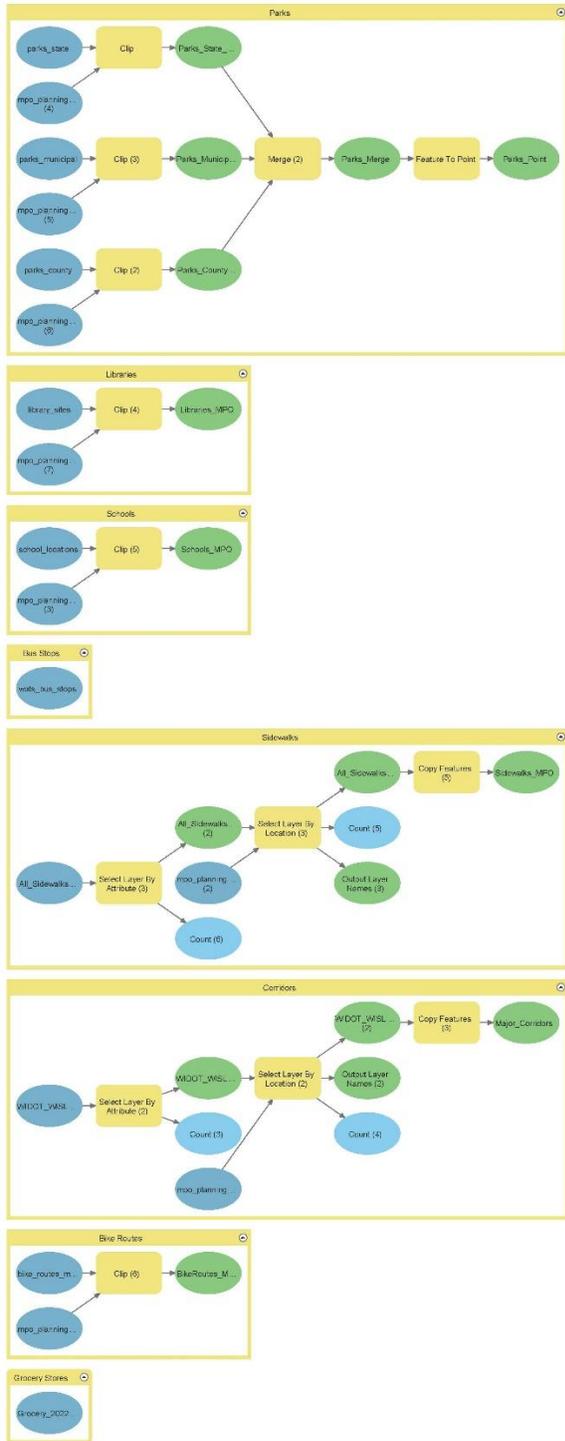
# XI. APPENDIX 1



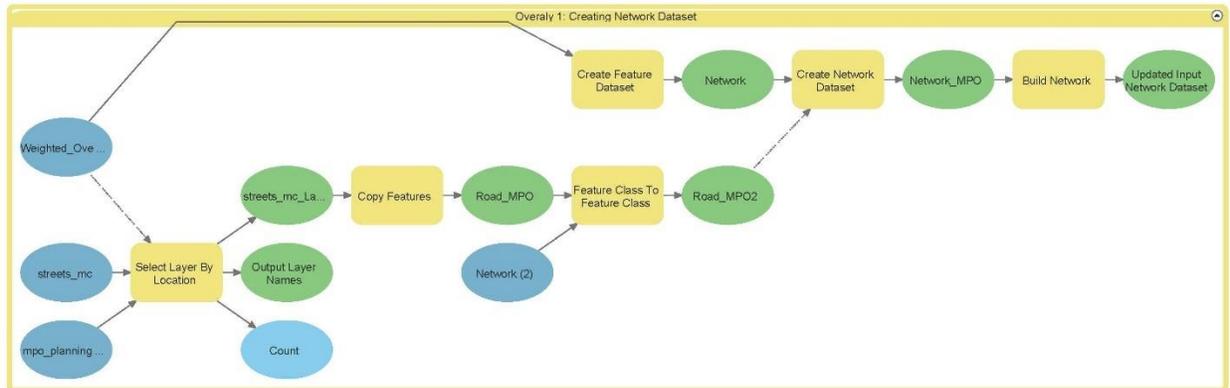
**FIGURE A1-1: Model which Identified Privately Owned Parcels within the WMPPO SSA, and Erased Environmental Constraints to Calculate Buildable Acres per Parcel**



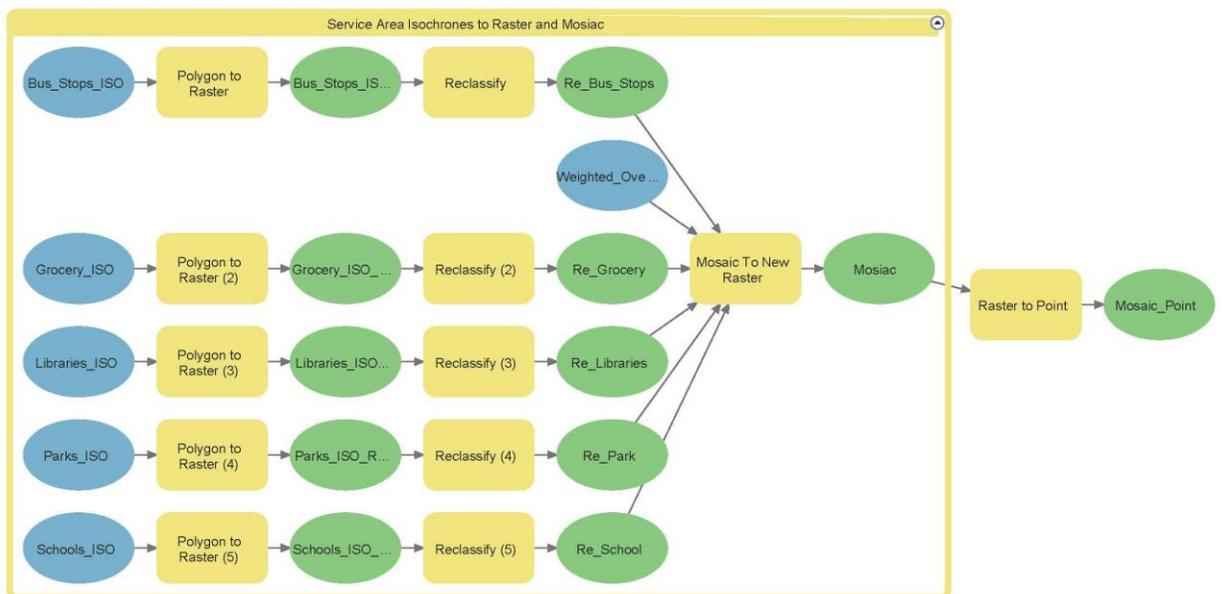
**FIGURE A1-2: Model which Joined Buildable Acres per Parcel to Privately Owned Parcels within the SSA and Identified Underutilized Parcels.**



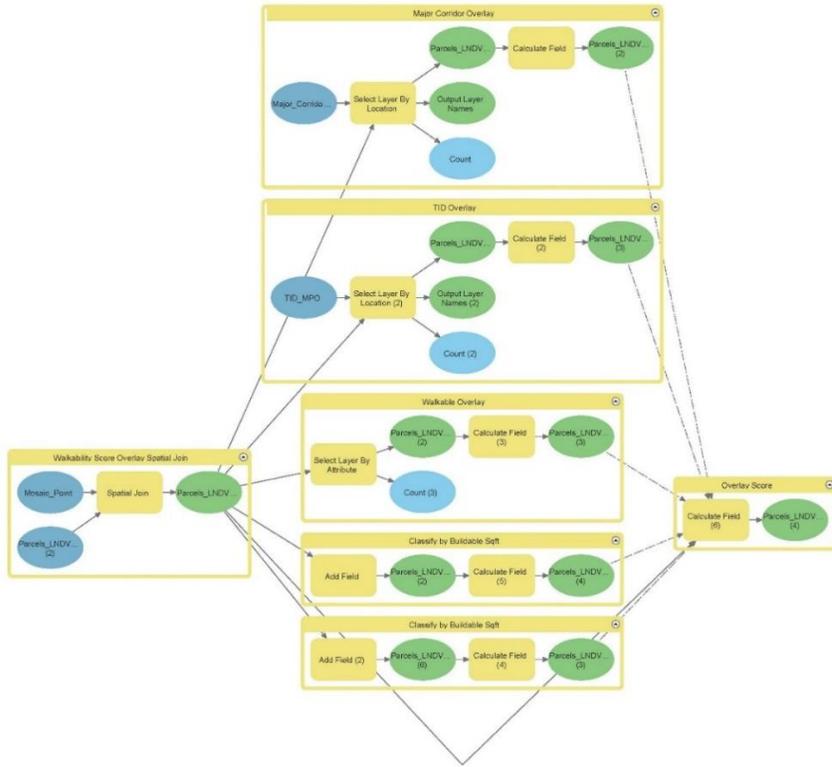
**FIGURE A1-3: Model which Identified Community Assets in the WMPO**



**FIGURE A1-4: Model which Constructed Sidewalk Network Used for Service Area Isochrones**



**FIGURE A1-5: Model which Converted Service Area Isochrones to Raster Datasets, Reclassified, and Created Walkability Mosaic**



**FIGURE A1-6: Model which Joined Mosaic Points to Underutilized Parcel Layer, Calculated Overlay Fields, and Classified Buildable Acres into Categories**



**FIGURE A1-7: Model which Selected Vacant Parcels, Low IMPVL/LNDVL Parcels, and Potential Scale Based on Selection Criteria**