

APPENDIX H
INDIRECT AND CUMULATIVE IMPACTS

DRAFT 10/09/2025

MADISON BELTLINE STUDY

Indirect Impacts and Cumulative Impacts Report 2023-24



Study ID: 5304 02 04

Beltline Planning and Environment Linkages Study

3/29/2024

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1 INTRODUCTION

This report documents the indirect impacts and cumulative impacts analysis for the Madison Beltline Planning and Environment Linkages (PEL) Study. The PEL is the second step in a [three-step process](#), following an [Origin-Destination Study](#), and preceding the National Environmental Policy Act (NEPA) Study or Studies.

1.1 STUDY BACKGROUND

In November 2011, Wisconsin's Transportation Projects Commission authorized the study of long-term solutions for the Madison Beltline from US Highway 14 in the city of Middleton to County Highway N in the town of Cottage Grove. The study is focusing on improving safety, mobility, and accessibility for all modes of travel in light of anticipated continued population growth and development in Dane County.

From 2014 to 2018 many sections of the Beltline had crash rates higher than the state average for similar types of highways. Most sections carry more traffic than can be efficiently accommodated.

Motorists that would prefer to use the Beltline are increasingly using alternate routes, such as the neighborhood street network, during morning and evening peak travel periods. According to Wisconsin's Department of Administration, Dane County is on pace to add about 120,000 residents between 2010 and 2040, and based on 2020 Census data, the population is exceeding that projected growth rate. There is no residual capacity on the Beltline to serve this growth.

The Beltline bridges and pavement are aging and deteriorating in many areas of the corridor. Some features, such as ramps and shoulders, do not meet the current design standards. Replacement of the existing facility will be needed in the future just to address these issues.

To complete the Madison Beltline Study, the Wisconsin Department of Transportation (WisDOT) is using the aforementioned three-step study process.

1. The first phase of this process collected and analyzed origin-destination (O-D) information for motorized vehicles on the Beltline and in the surrounding Dane County area. The O-D data analysis was completed in 2014, and was part of a broader [Existing Conditions Report](#) completed in 2015.
2. The second and current phase, which began in 2012, is a [Planning and Environment Linkages \(PEL\) Study](#). The study was paused in 2016 due to reevaluation of statewide priorities. It was restarted in 2020.
3. Following completion of the PEL Study, WisDOT could begin the third phase of the process, which is the National Environmental Policy Act (NEPA) study or studies, which would include the development of one or more environmental documents. The NEPA environmental analysis for the Beltline could be a detailed investigation of selected strategies developed in the [PEL Study](#) that have the potential to address Beltline long-term needs.

The PEL Study is a planning-level analysis of the Beltline's current and long-term needs; in particular, addressing safety, mobility, and accessibility for all travel modes and addressing poor infrastructure condition and deficiencies.

The outcome of the PEL Study will be a final PEL summary report. This report will include a description of potential long-term improvements considered and documentation showing whether, and to what extent, each addresses long-term Beltline needs.

Potential strategies that do not address long-term Beltline needs or are not reasonable will not be studied in a subsequent NEPA document or documents.

1.2 STUDY ALTERNATIVES

The PEL study considers different types of improvements at specific locations on, near, or across the Beltline that when combined will address the PEL Study objectives. We are calling these "Components," and they include:

- New local road crossings and connections (e.g. constructing a new bridge over the Beltline)
- Improved transit
- Mainline and interchange improvements
- Pedestrians and bicycle connections (e.g. constructing a new path to connect areas near a Beltline interchange)
- New park and ride locations

The Study Team has prioritized and assembled combinations of the various Components into four Strategy Packages, which is the term being used to describe the long-term vision for improvements on and near the Beltline corridor. They are listed below:

- Strategy Package 1 (SP 1): Preserve and Maintain
- Strategy Package 2 (SP 2): Higher Priority Components
- Strategy Package 3 (SP 3): Mid-to-High Priority Components
- Strategy Package 4 (SP 4): All Retained Components

These Strategy Packages propose different levels of improvement that range from a Strategy Package that keeps the Beltline as it is today providing only maintenance to a Strategy Package that implements all improvement components.

Each of the Strategy Packages (those other than Preserve and Maintain) builds on the previous Package. Draft Strategy Package 2 includes only the higher priority components and includes improvements in areas with the largest safety concerns, pavement and structure deficiencies, and mainline and interchange traffic capacity issues in the 2050 design year. Draft Strategy Package 3 builds on Package 2 by adding the mid priority components to address additional study objectives. Draft Strategy Package 4 includes components considered in the PEL study that showed some ability to address study objectives.

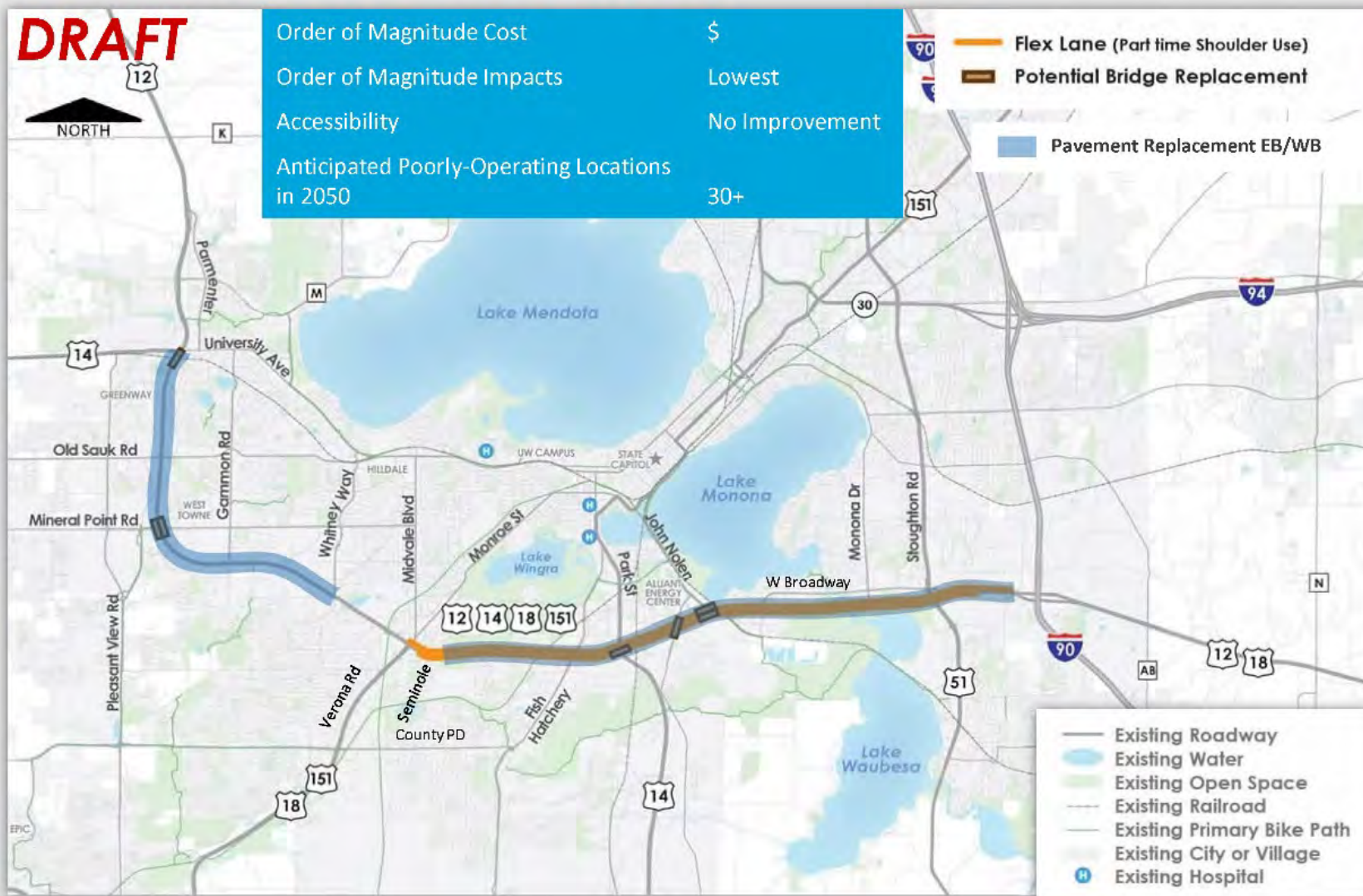
The section of the Beltline from the I-39/90 interchange and east was not reviewed in detail by the PEL study as the area is addressed as part of the County AB interchange project or other future WisDOT studies.

Strategy Package 1: Preserve and Maintain

In SP 1, the Beltline would remain the same as it is today with the Flex Lane maintained between Verona Road and Interstate 39/90. Maintenance would include pavement replacement from approximately University Avenue to Whitney Way, and from just east of Seminole Highway to just west of I-39/90, as well as the replacement of the following structures:

- The Westbound Terrace Avenue overpass just south of US 14/University Avenue in Middleton
- Eastbound and Westbound Beltline structures over Mineral Point Road
- Eastbound Beltline structure over US 14 (Park Street)
- Rimrock Road structure over the Beltline
- Eastbound and Westbound Beltline structures over John Nolen Drive

Map 1 on the following page depicts components included in SP 1.



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Strategy Package 2: Higher Priority Components

Travel Lanes

SP 2 includes: either an extension of the Flex Lane or adding one travel lane in each direction from Parmenter Street to Verona Road. In addition, the existing Flex Lane would be extended to the I-39/90 interchange on the east end.

Weaves

Weaving areas are places where traffic entering the Beltline mixes with traffic wishing to exit at the next off-ramp. These areas often have safety concerns and are where freeway operations frequently break down.

SP 2 includes improvements at the weave locations with the poorest operations for the longest period of time. They are located at:

- The eastbound Beltline between John Nolen Drive and W Broadway, and Monona Drive to Stoughton Road
- The westbound Beltline between Stoughton Road and Monona Drive

Interchange Improvements

Interchange improvements are included at Verona Road and Stoughton Road where operations are currently poor and backups onto the Beltline mainline have been observed.

Crossings and Connections

SP 2 includes two new roadway crossings of the Beltline for pedestrians, bicycles, and motor vehicles:

- A crossing just west of Whitney Way
- A crossing just west of Park Street

Pedestrian and Bicycle Improvements

The highest priority pedestrian and bicycle components included in this Package are, from west to east:

- A Beltline crossing south of Old Sauk Road
- An extension of the West Towne Path between High Point Road and Gammon Road north of the Beltline
- A crossing of Whitney Way north of the Beltline
- A connection between the Beltline Path and Southwest Bike Path on the north side of the Beltline
- A connection between Seminole Highway and Cannonball Path on the south side of the Beltline

Park and Rides

The three highest priority park and ride locations are included in SP 2:

- County M and Mineral Point Road – This location is currently under construction as part of the city of Madison's Bus Rapid Transit improvements
- Verona Road and County PD
- Fish Hatchery Road and County PD

Transit

The interchanges proposed for transit priority in this Package, which are planned to be used by the city of Madison's Bus Rapid Transit service, are:

- Mineral Point Road interchange
- Fish Hatchery Road interchange

Map 2 on the following page depicts components included in SP 2.

SP 2: Higher Priority Components Overall Package



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Order of Magnitude Cost	\$\$
Order of Magnitude Impacts	Moderate
Accessibility	Small Benefit
Anticipated Poorly-Operating Locations in 2050	13-17



A better BELTLINE
Studying Highways 12, 14, 18, 151

Map 2

Strategy Package 3: Mid-to-High Components

Travel Lanes

Travel Lane improvements in SP 3 are the same as those in SP 2. This includes either an extension of the Flex Lane or adding one travel lane in each direction from Parmenter Street to Verona Road. In addition, the existing Flex Lane would be extended to the I-39/90 interchange on the east end.

Weaves

The two highest priority weave improvements from SP 2 are also included in SP 3:

- Eastbound between John Nolen Drive and W Broadway, and Monona Drive to Stoughton Road
- Westbound between Stoughton Road and Monona Drive

Further, SP 3 includes four additional mid-priority weave improvements:

- Eastbound between Whitney Way and Verona Road, and between Fish Hatchery Road and Park Street
- Westbound between W Broadway and John Nolen Drive, and between Mineral Point Road and Old Sauk Road

Interchange Improvements

The two highest priority interchange improvements from SP 2 are also included in SP 3:

- Verona Road
- Stoughton Road

Further, six additional mid-priority interchange improvements are included in SP 3:

- Greenway Boulevard
- Mineral Point Road
- Whitney Way
- Seminole Highway
- Todd Drive
- Park Street

Crossings and Connections

The two highest priority crossings from SP 2 are also included in SP 3:

- A crossing just west of Whitney Way
- A crossing just west of Park Street

Further, two additional mid-priority crossings for pedestrians, bicycles, and motor vehicles are added in SP 3:

- A crossing west of Gammon Road
- A crossing of Park Street south of the Beltline

Pedestrian and Bicycle Improvements

The highest priority pedestrian and bicycle improvements from SP 2 are also included in SP 3:

- A Beltline crossing south of Old Sauk Road
- An extension of the West Towne Path between High Point Road and Gammon Road north of the Beltline
- A crossing of Whitney Way north of the Beltline
- A connection between the Beltline Path and Southwest Bike Path on the north side of the Beltline
- A connection between Seminole Highway and Cannonball Path on the south side of the Beltline

Further, two additional mid-priority pedestrian and bicycle improvements are added in SP 3:

- A connection through the Capital Springs State Recreational Area
- A connection from Monona Drive to Stoughton Road

Park and Rides

The three highest priority park and ride locations from SP 2 are also included in SP 3:

- County M and Mineral Point Road – This location is currently under construction as part of the city of Madison’s Bus Rapid Transit improvements
- Verona Road and County PD
- Fish Hatchery Road and County PD

Further, one additional mid-priority Park and Ride is added in SP 3:

- US 14/McCoy Road/Lacy Road

Transit

The two highest priority interchanges proposed for transit priority from SP 2 are also included in SP 3:

- Mineral Point Road interchange
- Fish Hatchery Road interchange

Further, five additional mid-priority interchanges proposed for transit priority are added in SP 3:

- University Avenue
- Gammon Road
- Verona Road
- Rimrock Road
- West Broadway

Map 3 on the following page depicts components included in SP 3.

SP 3: Mid-to-High Priority Components

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Order of Magnitude Cost	\$\$\$
Order of Magnitude Impacts	Moderate
Accessibility	Medium Benefit
Anticipated Poorly-Operating Locations in 2050	11-15

Overall Package



A better BELTLINE
Studying Highways 12, 14, 18, 151

Map 3

Strategy Package 4: All Retained Components

Travel Lanes

Like SP 2 and SP 3, SP 4 includes either an extension of the Flex Lane or adding one travel lane in each direction from Parmenter Street to Verona Road and the extension of the existing Flex Lane to the I-39/90 interchange on the east end.

SP 4 also includes adding a general-purpose lane in each direction between the Verona Road interchange and I-39/90.

Weaves

Weave improvements from SP 2 and SP 3 are also included in SP 4:

- Eastbound between John Nolen Drive and W Broadway, and Monona Drive to Stoughton Road
- Westbound between Stoughton Road and Monona Drive
- Eastbound between Whitney Way and Verona Road, and between Fish Hatchery Road and Park Street
- Westbound between W Broadway and John Nolen Drive, and between Mineral Point Road and Old Sauk Road

Further, SP 4 includes four additional low-priority weave improvements:

- On the eastbound Beltline between Old Sauk Road and Mineral Point Road
- On the westbound Beltline between Park Street and Fish Hatchery Road, and between Verona Road and Whitney Way

Interchange Improvements

Interchange improvements from SP 2 and SP 3 are also included in SP 4:

- Verona Road
- Stoughton Road
- Greenway Boulevard
- Mineral Point Road
- Whitney Way
- Seminole Highway
- Todd Drive
- Park Street

Further, SP 4 includes six additional low-priority interchange improvements:

- University Avenue
- Old Sauk Road
- Gammon Road
- Fish Hatchery Road
- Rimrock Road
- West Broadway
- Monona Drive

Crossings and Connections

Crossings from SP 2 and SP 3 are also included in SP 4:

- A crossing just west of Whitney Way
- A crossing just west of Park Street
- A crossing west of Gammon Road
- A crossing of Park Street south of the Beltline

Further, one additional low-priority crossing for pedestrians, bicycles, and motor vehicles is added in SP 4:

- A crossing between John Nolen Drive and West Broadway north of the Beltline.

Pedestrian and Bicycle Improvements

Pedestrian and bicycle improvements from SP 2 and SP 3 are also included in SP 4:

- A Beltline crossing south of Old Sauk Road
- An extension of the West Towne Path between High Point Road and Gammon Road north of the Beltline
- A crossing of Whitney Way north of the Beltline
- A connection between the Beltline Path and Southwest Bike Path on the north side of the Beltline
- A connection between Seminole Highway and Cannonball Path on the south side of the Beltline
- A connection through the Capital Springs State Recreational Area
- A connection from Monona Drive to Stoughton Road

Further, two additional low-priority pedestrian and bicycle improvements are added in SP 4:

- A Beltline crossing North of Old Sauk Road
- A connection between Seminole Highway and the Cannonball Path north of the Beltline

Park and Rides

Park and rides from SP 2 and SP 3 are also included in SP 4:

- County M and Mineral Point Road – This location is currently under construction as part of the city of Madison’s Bus Rapid Transit improvements
- Verona Road and County PD
- Fish Hatchery Road and County PD
- US 14/McCoy Road/Lacy Road

Further, one additional low-priority Park and Ride is added in SP 4:

- US 14/University Avenue just west of the Beltline

Transit

Interchanges proposed for transit priority from SP 2 and SP 3 are also included in SP 4:

- Mineral Point Road interchange
- Fish Hatchery Road interchange
- University Avenue
- Gammon Road
- Verona Road
- Rimrock Road
- West Broadway

Further, one additional low-priority interchange proposed for transit priority is added in SP 4:

- Stoughton Road

Map 4 on the following page depicts components included in SP 4.

Overall Package



Map 4

1.3 STUDY AREA DELINEATION

The same boundary was delineated for both the Indirect Impacts Analysis and Cumulative Impacts Analysis, and the draft study areas were drawn using the following rationale:

1. All municipalities intersecting with the Beltline study corridor:
 - Cities of Madison, Middleton, and Monona
 - Towns of Cottage Grove and Blooming Grove
2. All municipalities contributing greater than 5,000 average daily weekday trips/pass-throughs to the Beltline corridor (per Streetlight data collected 5/1/2021 to 4/30/2022):
 - Cities of Verona, Fitchburg, and Sun Prairie
 - Villages of Waunakee, Cottage Grove, Oregon, and McFarland
 - Town of Middleton
3. Municipalities necessary for a contiguous study area – i.e., those connecting the major commuter contributors in the previous section to the Beltline:
 - Towns of Burke, Westport, and Verona
4. The Towns of Dunn and Pleasant Springs were included due to both their close proximity to the Beltline and because they comprise the bulk of the Yahara River/Lake Waubesa and Yahara River/Lake Kegonsa sub-watersheds. These watersheds collect much of the runoff from the upstream sub-watersheds that the Beltline Corridor runs through.
5. Municipalities were always included in their entirety as policy is often set at the local government level and data for analysis is much more broadly available at the municipal level.

The Indirect Study Area was delineated first, based on guidance provided by the WisDOT document “Guidance for Conducting an Indirect Effects Analysis” (2014), which suggests using commuter-sheds, municipal boundaries, or combinations of the two in delineating a project’s Indirect Study Area (p. 44).

The WisDOT document “Guidance for Conducting a Cumulative Effects Analysis” (2007) was consulted in the delineation of the Cumulative Impacts Study Area. Notably, it states (p. 11) that indirect impacts should be taken into account in the delineation of the Cumulative Study Area. As such, it was determined the Cumulative Study Area boundary should include at least all areas included within the Indirect Study Area. Upon consultation of sub-watershed boundaries, as described in the outline above, it was determined that that draft Indirect Study Area was a suitable boundary to use for the draft Cumulative Impacts Study Area as well.

1.4 EXPERT PANEL

Expert Panel Consultation to Confirm Study Area Boundaries

After creating draft maps of the Indirect Impacts Analysis and Cumulative Impacts Analysis Study Areas, a list of the prospective Expert Panelists were asked to review the maps.

The prospective panelists included representatives from every community in the draft Study Areas, as well as representatives of the Dane County Planning Department, the Greater Madison Metropolitan Planning Organization, Capital Area Regional Planning Commission, 1000 Friends of Wisconsin, the University of Wisconsin, Downtown Madison Incorporated, Wisconsin Department of Natural Resources (WDNR), and the Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP). Representatives from other non-municipal organizations were invited due to their expertise in fields pertaining to the ICI Analysis process such as environmental, land use, and economic issues.

The panelists were provided with the draft maps of the Indirect and Cumulative Study Areas, and the rationale provided above for how the maps were delineated, and were asked to comment on the appropriateness of the Study Areas.

The specific questions asked by WisDOT of the panelists were as follows:

1. Do you believe the draft Indirect Impacts Study Area boundary is appropriate for the Beltline PEL ICI Analysis? Yes or No. If no, please explain why or what you believe should change.
2. Do you believe the draft Cumulative Impacts Study Area boundary is appropriate for the Beltline PEL ICI Analysis? Yes or No. If no, please explain why or what you believe should change.

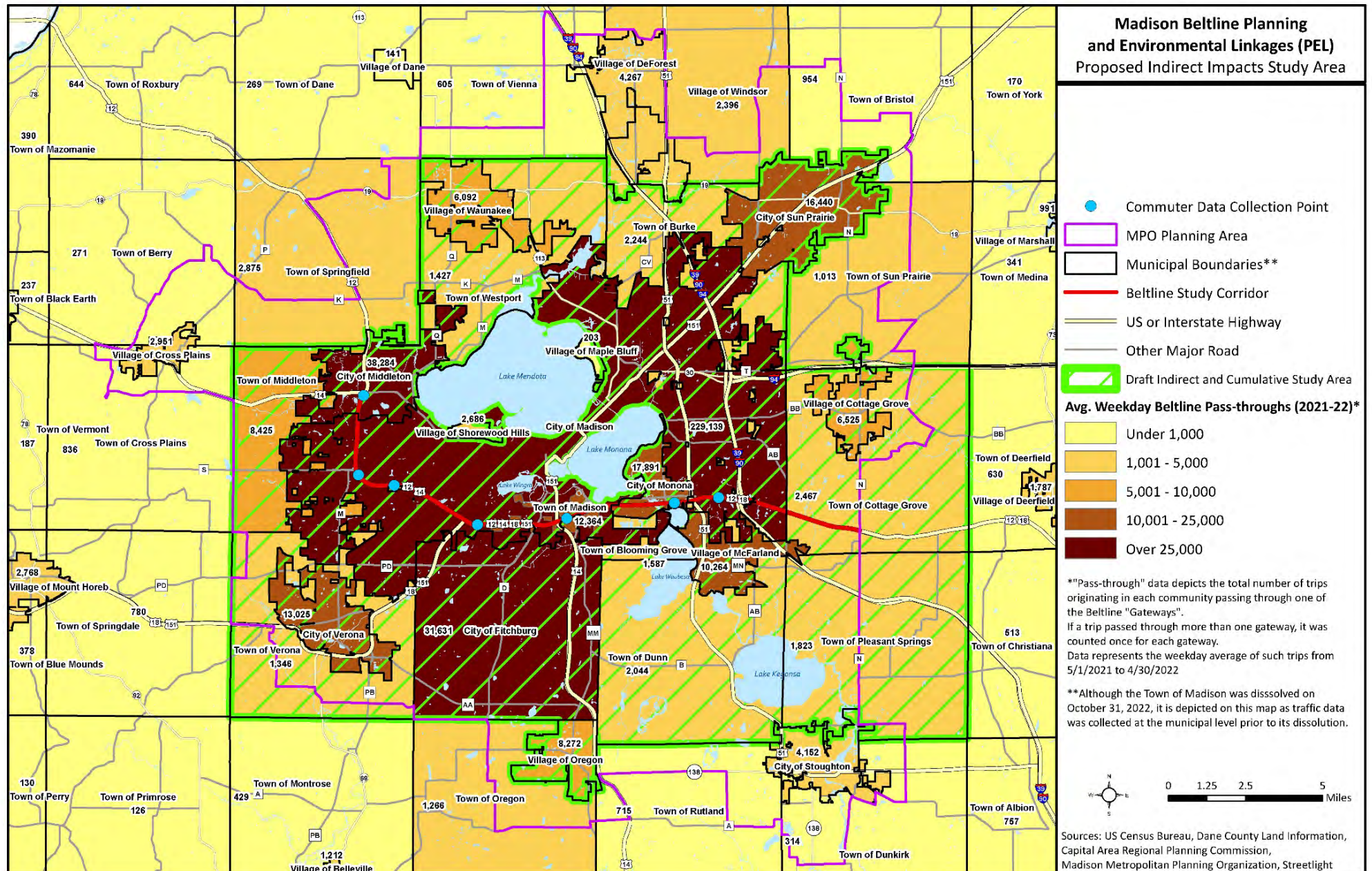
Panelists were given over two weeks to respond and sent multiple follow up messages in advance of the survey's closing date. Of the 28 panelists queried, six responses were received (21% response rate). The respondents unanimously selected "Yes" for both questions.

The representative for the town of Middleton was the only panelist who provided any additional comments. Those comments are shared here:

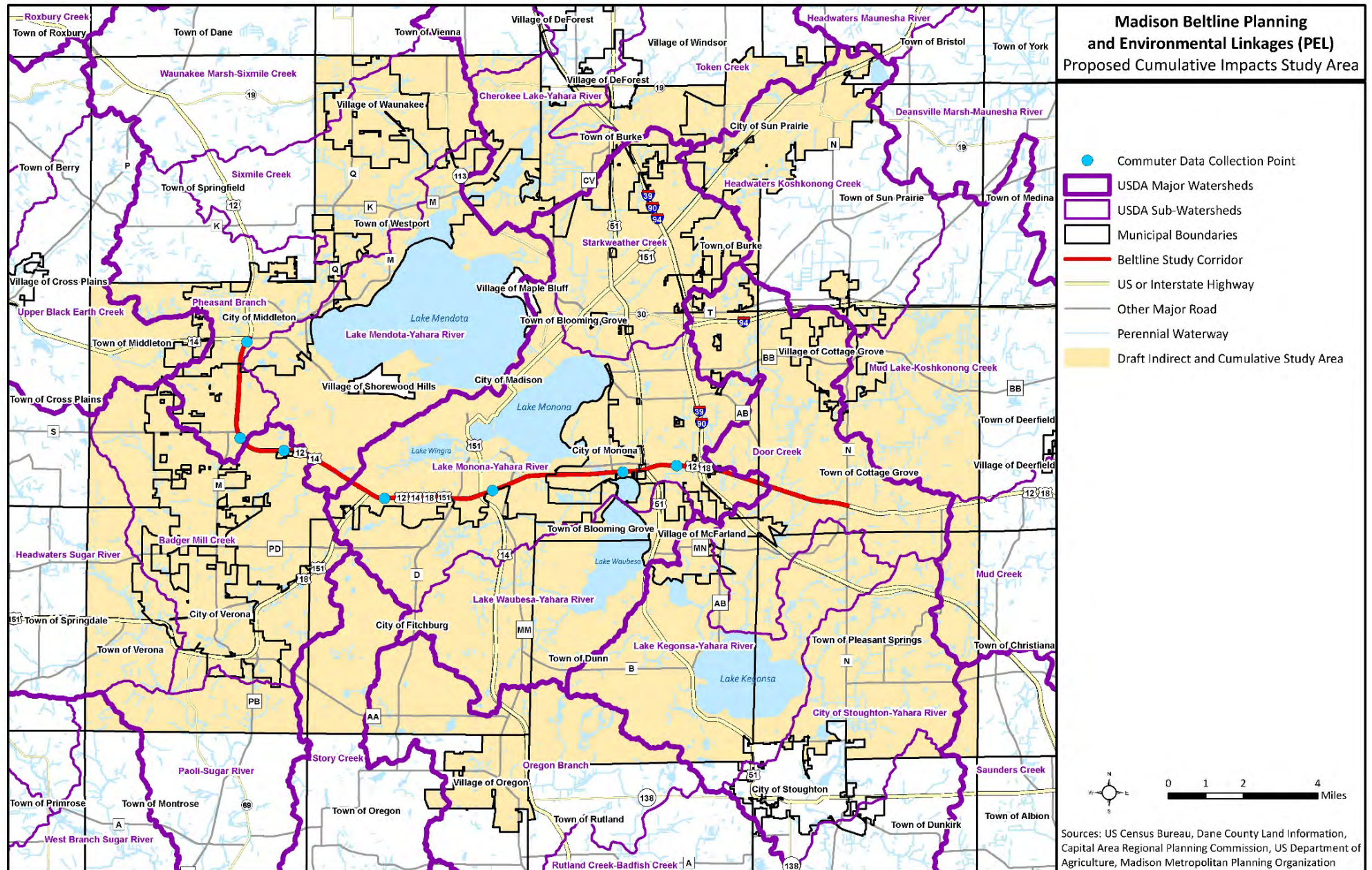
"I have reviewed the maps for both the Indirect Impacts and Cumulative Impacts Analysis from the standpoint of the town of Middleton. I have taken the "Survey" and responded "yes" to both. The town of Middleton is a significant provider of trips into and out from Madison, especially on the west side and downtown Madison. The town of Middleton contributes from primarily single family residences both personal trips taken and all the support trips for services to support the residences although there still are farming, small businesses, and mineral extraction dependent on a good countywide transportation system. The town is also a source of recreational trips for those both in and outside the town (Pope Farm, Blackhawk Ski Jumping, extensive trail systems, parks, Pioneer Pointe Golf Course, etc.). The Madison Beltline provides many links to getting to and from the Town. From a watershed perspective the town has three major areas with the Yahara System, Black Earth and Sugar River all being impacted with Beltline decisions. Mineral Point Road, Old Sauk Road, USH 14, and Airport Road are major links through the town that interchange with the Beltline. The suggested impact PEL boundaries cover the whole town (at least what is left of it) and the various town islands we still have. We feel this is appropriate."

Given the unanimity of the responses affirming the appropriateness of the boundaries, the draft Indirect and Cumulative Study Area boundaries were adopted as final ICI Study Area boundaries to utilize for the ICI Analysis. Additionally, the list of panelists to invite to the Expert Panel was also finalized given that no additional communities were added or removed from the draft Study Areas.

A full list of the Expert Panelists and results from this survey are included in the Appendix of this report. Maps depicting the Indirect Impacts and Cumulative Impacts Study Areas are included on the following pages (**Maps 5 and 6**).



Map 5



Map 6

Expert Panel Mapping Exercise

With the Study Area boundaries finalized, two web-based mapping exercises were developed and shared with Expert Panelists (one for Indirect Impacts and one for Cumulative Impacts). The full instructions provided to Panelists on how to use the maps are included in the Appendix.

The maps included layers that could be toggled on or off, to show all of the various improvements proposed to the Beltline corridor under each of the four Strategy Packages.

They also included a number of additional layers depicting relevant background information to help inform Panelists' insights on where potential impacts may occur. These background layers were the result of extensive data collection by the Study Team and included the following information grouped into three broad categories.

Land Use and Transportation:

- **Existing Land Use** from Dane County's 2020 Land Use Inventory.
- **Planned Development from Adopted Land Use Plans** from all communities in the Study Areas.
- **Planned transportation projects** from the Madison MPO's latest 5-year Transportation Improvement Plan (2023-2027), as well as existing bicycle/pedestrian infrastructure is also included.

Environmental Justice:

- **Areas of Persistent Poverty** – Census Block Groups with a poverty rate greater than 20 percent (2017-2021 American Community Survey). Users could click on an area to see its specific poverty rate.
- **Historically Disadvantaged Communities** – Census Tracts that meet an index score based on a multi-factor analysis. This USDOT analysis looked at multiple data sets from the CDC, EPA, and Census Bureau to assess transportation insecurity, environmental burden, health vulnerability, social vulnerability, and climate & disaster risk burden to identify locations that support the Justice40 Initiative. The data allows practitioners to screen project locations to see if they support Title VI, and environment justice.
- **Low Income % Exceeding Dane County Average** - Block Groups with a low-income population percentage exceeding the overall Dane County percentage (27.7%) based on the U.S. Department of Housing and Urban Development (HUD) 2019 Low-income limits. Unlike the Census Bureau's poverty thresholds used in the "Areas of Persistent Poverty" measure, these are based on a locally adjusted cost-of-living calculation specific to Dane County.

Natural Resources:

- **Natural Resources or Development Constraints.** This was a combined layer of FEMA 100 and 500 Year Floodplains, DNR Wetlands, Slopes over 20%, and Environmental Corridors delineated by the Capital Area Regional Planning Commission (CARPC). Most of the individual components of this layer could also be toggled on independently.
- **Agricultural Enterprise Areas.** Landowners within designated AEAs are eligible to enter into voluntary farmland preservation agreements. By signing the agreement, a landowner agrees to keep their land in agricultural use for 15 years and to meet state soil and water conservation standards. This program is run through DATCP.
- **USDA Watersheds**
- **Capital Area Regional Planning Commission (CARPC) Environmental Corridors**
 - Defined by CARPC as “continuous systems of open space in urban and urbanizing areas. These corridors include environmentally sensitive lands, natural resources requiring protection from disturbance and development, and lands needed for open space and recreational use.”
- **DNR Wetlands**
- **FEMA 100 and 500 year Floodplains**

Once created, links to the interactive web maps were sent to the Expert Panelists two weeks prior to convening the Expert Panel meeting. Panelists were also notified they would have two weeks following the Expert Panel event to map additional potential impacts.

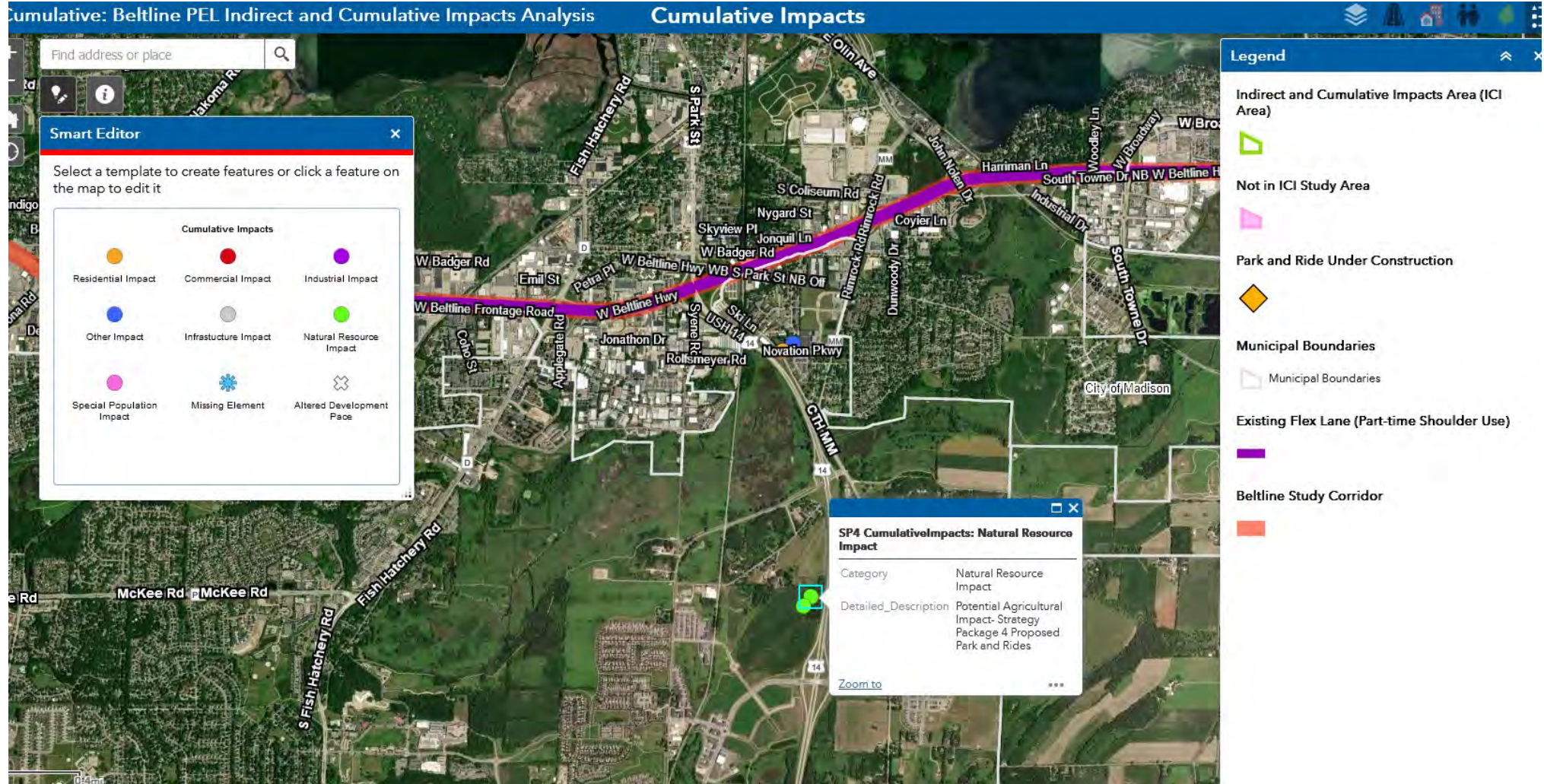
It was requested that Panelists provide comments on the location and type of impact within the Study Areas, and identify which Strategy Packages any impacts may occur under. A PDF document with detailed instructions on how to use the interactive maps was provided, as well as a video demonstrating how to add comments to the maps. Panelists were also able provide input on hard copies.

Types of impacts Panelists could map using the Indirect and Cumulative Maps included:

- Residential
- Commercial
- Industrial
- Infrastructure
- Natural Resource
- Special Population (i.e. Environmental Justice Population)
- Altered Development Pace (indicating the same type of land use as is depicted in adopted plans is likely to occur but may occur more or less quickly than originally anticipated due to implementation of one or more Strategy Packages).
- Other
- Missing Element (for Panelists to identify background information or elements not included in the maps)

The maps also enabled Panelists to include detailed descriptions of their mapped impacts via a text field.

Map 7 on the following page depicts a screenshot of the Cumulative Impacts interactive map, with potential impacts from one of the panelists mapped.



Map 7

Expert Panel Meeting

Background

The Expert Panel was convened on August 28th, 2023. Panelists were given the option of attending in-person or remotely via virtual log-in. Eight expert panelists attended the meeting, representing seven different communities or organizations (city of Fitchburg, city of Sun Prairie, town of Middleton, village of McFarland, 1000 Friends of Wisconsin, DATCP, and the Greater Madison MPO), as well as representatives from WisDOT, FHWA, and the Beltline PEL study consultant team.

The WisDOT Study Team reviewed the overall timeline of the study, including what work has been done to date (developing goals and objectives, screening components, and compiling Strategy Packages), and what remains to be done (identifying Preferred Strategy Package(s)). Overall issues and objectives were summarized, and a summary of the safety and operations data in the Flex Lane area of the Beltline was provided. Brief overviews of the four Strategy Packages were then presented.

Indirect Impacts and Cumulative Impacts (ICI)

Next, definitions and examples of Indirect Impacts and Cumulative Impacts were detailed by the Study Team.

The Council on Environmental Quality (CEQ) defines **Indirect Impacts** as impacts “caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable,” such as a change in the rate of an area’s population growth or decline.

These can include two general types of impacts:

- **Induced-Growth Impacts.** Induced-growth impacts are changes in the location, magnitude, or pace of future development that result from changes in accessibility caused by the project. An example of an induced-growth impact is commercial development occurring around a new interchange and the environmental impacts associated with this development.
- **Encroachment-Alteration Impacts.** Encroachment-alteration impacts are physical, chemical, or biological changes in the environment that occur as a result of the project but are removed in time or distance from the direct impacts. An example of an encroachment impact is a long-term decline in the viability of a population of a particular species as a result of habitat fragmentation caused by the project.

CEQ defines **Cumulative Impacts** as impacts “on the environment which results from the incremental impact of the action when added to other... actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.”

For example, the air quality of an area today is in a measurable condition, relative to the National Ambient Air Quality Standards. In the past, the quality of the air may have been worse, the same, or better than it is today depending on a number of factors such as automobile use, industry, residential development (fireplaces), and climatic conditions. The condition of the air today is the result of these factors, which constitute the past effects of the Cumulative Impact question. Add the impacts of the proposed project, other occurring activities, and the positive and negative reasonably foreseeable impacts from any source, and the result equates to the air quality Cumulative Impact.

Mapping Exercise

The Study Team reviewed the comments received to date on the web maps and provided another demonstration of how to use the maps and add comments or potential impacts.

Group Discussion

The meeting was then opened up for a group discussion about potential Indirect Impacts and Cumulative Impacts. The Study Team added comments suggested by panelists in real time to the maps during the meeting. A synopsis of comments received from representatives of the listed municipalities or organizations is shared below:

City of Fitchburg

Ross Kahler, city of Fitchburg Public Works Engineer, noted there's a potential impact to existing affordable housing east of Hwy 14 near Novation Pkwy where a planned road crossing in Strategy Packages 3 and 4 seems to overlap with footprint of existing affordable housing and a church. The city likes the crossing, but would like it realigned to avoid building conflicts.

He stated he has not heard much discussion of rail in the PEL study, and noted it's something the city is keeping in mind regarding potential development in western Fitchburg. Jeff Held of the Study Team noted that commuter rail was looked at early on as a standalone strategy, but has not been analyzed further since the city of Madison decided to move forward with Bus Rapid Transit (BRT) instead.

Mr. Kahler noted the Uptown Neighborhood of Fitchburg, though it has pretty good access to Madison via Hwy 14 now, would have a more direct route into Madison via a Syene Road Crossing of the Beltline in Strategy Packages 3 and 4 – especially combined with the City's planned reconfiguration of the Syene/McCoy Road intersection in 2025. He stated little additional development is likely along Syene Road as it's mostly marsh, but noted it could hasten the relatively slow pace of commercial development in the Uptown area.

Mr. Kahler indicated affordable housing along Fish Hatchery Road could see beneficial impacts from planned Transit Improvements in Strategy Package's 2 through 4.

Greater Madison MPO

Colleen Hoesly of the Greater Madison MPO suggested the Study Team should consider new road improvements around Epic. In particular: Dairy Ridge Road (west of Epic), Nine Mound Rd (southeast of Epic), and possible signalization of County G. Jeff Held of the Study Team noted WisDOT is certainly aware of Epic's growth and will incorporate it into the demand model.

Ms. Hoesly asked if Madison Region Economic Partnership (MadREP) was invited to participate in the Panel to provide an economic development perspective. The Study Team noted that Downtown Madison Inc was, but MadREP was not. After the Expert Panel meeting the Study Team e-mailed an invitation to MadREP to provide comments and/or participate in the mapping exercise on 8/30/23. (The town of Burke's representative was also included in this e-mail as they were erroneously left off the initial e-mail invitation).

Ms. Hoesly asked if potential removal of some lanes, or the lack of planned capacity expansion, on nearby arterial routes such as John Nolen Drive is being factored into analysis. Mr. Held responded that the Study Team attempted to incorporate those plans into the Demand Model. It was noted that the planned North-South BRT along Park Street could be another major project that impacts the Demand Model, and that if capacity reductions on John Nolen would certainly have an impact on demand.

Town of Middleton

John Haverberg, town of Middleton Plan Commission, noted the town of Middleton has islands scattered throughout southwestern portions of the city of Madison that will be absorbed into Madison by 2042 east of Pioneer Road.

Mr. Haverberg asked if the Study Team was reflecting the Town’s most recent Comprehensive Plan land use plans from 2019 in the web maps. It was confirmed later that the maps did include the 2019 Plan.

Mr. Haverberg asked whether capacity demand for specific high-profile events like the Dairy Expo, hosted annually at the Alliant Energy Center, is factored into demand models. Jeff Held and Jeff Berens of the Study Team responded that in general they are not, but that the Flex-lane provides an opportunity to alleviate excess traffic on the Beltline driven by individual events.

Jackie Mich of the Study Team spoke with Mr. Haverberg further after the meeting. He noted there has been growth in the town of Middleton, but that should already be reflected in the 2019 Comprehensive Plan. He also noted the Mineral Point Park & Ride (being constructed as part of the Madison Metro Transit’s Bus Rapid Transit (BRT) project) has a positive impact for town residents who do not want to drive on the Beltline.

It should also be noted that based on Mr. Haverberg’s comments, the Study Team closely examined all recent development in the town of Middleton and discovered that one small subdivision, along the 4600 block of Ox Trail Way, did not appear to comply with the Town’s 2019 Comprehensive Plan Future Land Use map. This parcel is depicted as “Public Recreation” on the Town’s 2019 map, but has been developed as a low-density single-family residential subdivision with approximately 14 homes. This development was reflected in the “Existing Land Use 2020” layer included in both the Indirect and Cumulative web-maps.

1000 Friends of Wisconsin

Carl Glasemeyer, Transportation Policy Analyst for 1000 Friends, asked if there had been a change in annual average daily traffic (AADT) with the introduction of the Flex Lane. Jeff Held said the Beltline as a whole is roughly back to pre-pandemic traffic volumes, but noted no analysis of Origin-Destination data has been done to see if commuters are actually changing their routes based on the Flex Lane. It might still be a bit early to analyze that given how new the Flex Lane is but it is something that should be looked into. Mr. Glasemeyer is curious to see how much of an impact Flex Lane has on AADT vs. a full general purpose lane.

Mr. Glasemeyer supported the decision to have additional multi-modal improvements added between SP 2 and SP 3, but not an additional general purpose lane or other “mainline improvements”. He also complimented the PEL process to date.

Wrap Up

Following the group discussion, the Study Team went over the upcoming study timeline again, mentioning that the next step was selecting a preferred Strategy Package.

2.0 Summary of Comments and Mapping Exercise Results

Including all potential impacts mapped before, during, or after the Expert Panel meeting, a total of 23 comments were mapped (17 on the Indirect Impacts map and six on the Cumulative Impacts, some of which were reclassified by the Study Team as deemed necessary). Eleven of these comments were not potential impacts but rather categorized as “Missing Elements”.

As the “Missing Elements” category was meant to capture background information the Study Team might not be aware of that could impact both Indirect Impacts and Cumulative Impacts, these elements are not considered specific to either the Indirect or Cumulative analysis but were considered as part of the data collection efforts of both analyses.

2.1 Indirect Impacts

Indirect Impacts mapped were three residential impacts, one special population impact, one other impact, one altered development pace, and 10 missing elements.

All mapped Indirect Impacts comments can be viewed in **Map 8**. Corresponding descriptions, and potential mitigation measures, for each impact are detailed in **Tables 1 and 2**.

Indirect Residential Impacts

Two of the mapped residential impacts involved the potential impact in the town of Middleton from two proposed Park and Rides. First it was stated the Park and Ride under construction near the intersection of Mineral Point Road, Junction Road, and the Beltline, a component of all four Strategy Packages, could speed up build out of residential subdivisions southwest of Mineral Point and Pioneer Roads by providing bus transit service to commuters who would prefer to avoid driving on the Beltline. Second: the Park and Ride proposed under Strategy Package 4 at USH 14 and the Beltline, could speed up buildout of residential subdivisions in that vicinity, though it was noted an even bigger impact of this potential Park and Ride could be reduced traffic on University Avenue. This second item was clarified in an e-mail from John Haverberg of the town of Middleton following the Expert Panel.

A corresponding comment for “Altered Development Pace” was also added to the Map for the Mineral Point Park and Ride, and both of these comments could also be considered to fall under the “Altered Development Pace” impact category.

The third anticipated residential impact was in the city of Fitchburg and was mentioned previously in the Expert Panel section. It involves the current depicted alignment of a road crossing from Novation Parkway to Syene Road over USH 14 in Strategy Packages 3 and 4 appearing to overlap with the footprint of an existing affordable housing development near Novation Parkway. This could be construed as more of a direct impact than an indirect impact.

Indirect Special Population Impacts

In the city of Fitchburg, a potential impact to lower income populations residing in affordable housing along Fish Hatchery Road just south of the Beltline was mapped. It was noted this housing development could see beneficial impacts from planned Transit Improvements in Strategy Packages 2 through 4 near Fish Hatchery Road, by providing greater and/or more rapid bus transit there.

Indirect Other Impacts

In the city of Fitchburg, it was noted that the current depicted alignment of a road crossing from Novation Parkway to Syene Road over USH 14 in Strategy Packages 3 and 4 appears to overlap with an existing church. This could be construed as more of a direct impact than an indirect impact.

Indirect Altered Development Pace

See discussion of anticipated impacts in the town of Middleton in the “Indirect Residential Impacts” section.

Missing Elements

Seven “Missing Elements” were mapped within the town and city of Middleton. Some of these involved new residential and commercial structures built within the past few years that were not visible on the aerial photograph used in the web map exercise but which the Study Team was aware of.

The other comments in the Middleton vicinity noted that:

- 15 lots are planned for residential development in 2023 in the Evans subdivision at the southwest corner of Pioneer Road and Mineral Point Road
- Pioneer Pointe subdivision, near Pioneer Pointe Golf Course southwest of Pioneer Road and Mineral Point Road, is planned for 92 single family residential lots.
- The Glacier Trails subdivision, north of Saracen Way, is planned for 33 residential lots on 50 acres in 2024 or beyond.
- Pope Farm Elementary School, part of the Middleton-Cross Plains School District, opened in fall 2023 on Schewe Rd.

Three other “Missing Elements” were mapped in other portions of the Study Area. These included:

- The Greater Madison MPO just awarded a Surface Transportation Block Grant for the final West Towne Path trail segment between Zor Shrine Place and S. Gammon Road.
- The Greater Madison MPO just amended its Transportation Improvement Program to include, at US 18/151 (County G to WIS 69), a Ramp/Auxiliary Lane and Bridge Widening in the city of Verona
- The Greater Madison MPO Regional Transportation Plan shows a future arterial connecting Dairy Ridge Rd/G into Country View Rd/Epic Lane in the town of Verona, possibly in the near term.

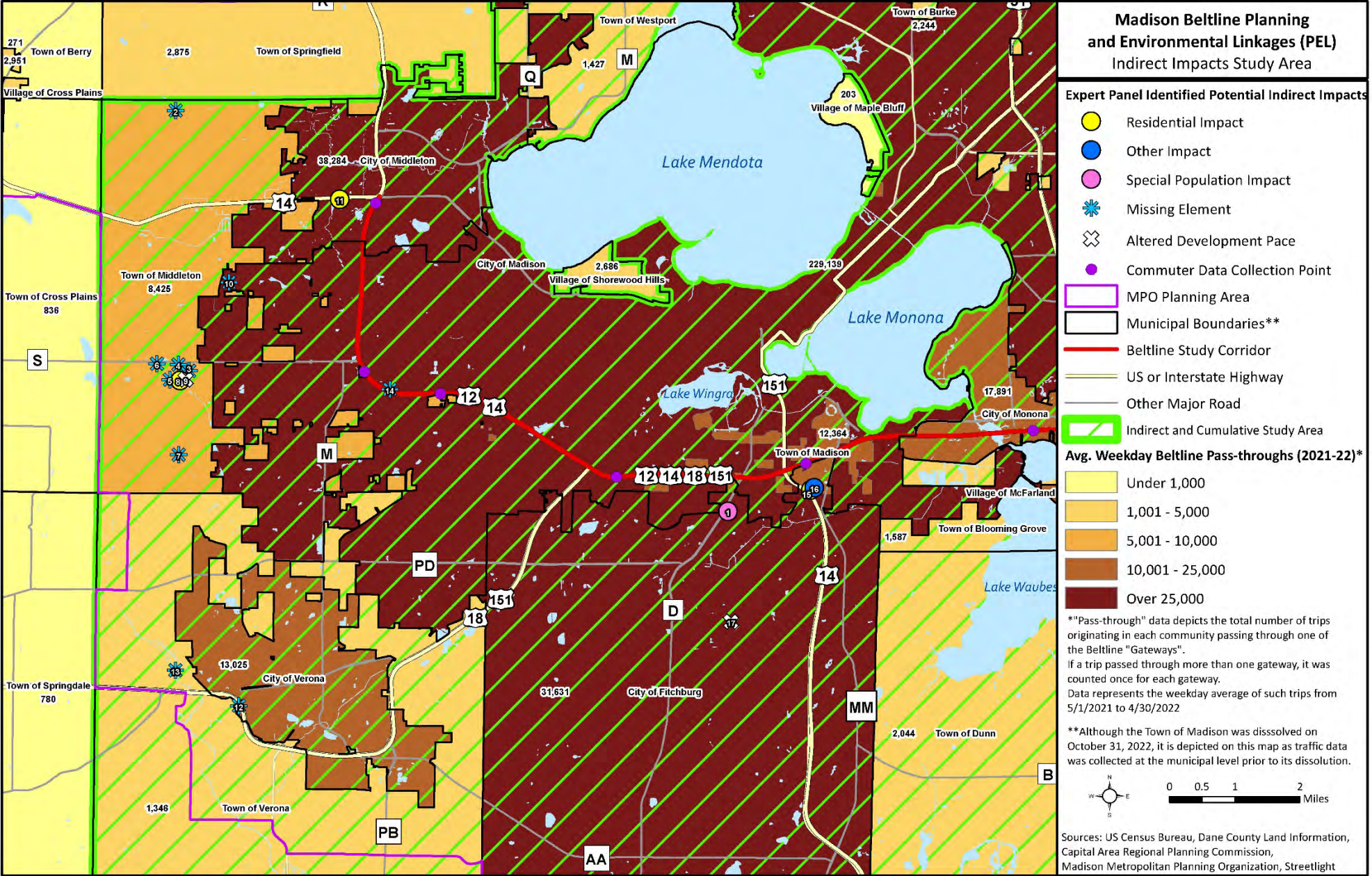
For reference, a map of Existing Land Use and Planned Development is provided as Appendix A.5. The map displays the aggregated planned land use and development changes as compiled from adopted municipal plans and noted by the Expert Panelists during the mapping exercise.

Other Comments

The Study Team also received a non-map comment via e-mail from a representative of the village of Cottage Grove. Erin Ruth, Director of Planning and Development for the village of Cottage Grove, stated:

“Generally speaking, any improvements to the Beltline that make it easier for our residents to get to jobs in Madison or elsewhere, and for those employed in the Village to get to work, will benefit the growth and development of the Village. However, given our distance from the Beltline itself, I don’t think the specific improvements presented (intersection improvements, pedestrian/bike crossings, flex lanes) create specific impacts on the Village. For example, if the flex lane was extended to Middleton as opposed to ending where it does that’s probably generally helpful for our residents, but I don’t think I can realistically point to a place on our map and say there will be more or less development in that area because the lane was added.”

The Study Team categorized this comment as an Indirect Impact.



Map 8

Table 1: Indirect Impacts Mapping Exercise Results

ID#	Category	Detailed Description	Notes
1			
2		Daybreak Valley Subdivision -	
3		Evans Crossing Subdivision - 15 lots planned for 2023	
4		K&A Greenhouse - replaced by larger building & grounds 2020 on 10 acres	
5		Existing golf course changing to 14 hole course & 92 lot Pioneer Point subdivision	
6		Club house/restaurant and pool(s) - tennis courts, new 2023	
7		Glacier Trails subdivision - 33 lots on 50 acres 2024+	
8		Providing Park and Ride lot at Mineral Point / Beltline may speed up build out of subdivisions south of Mineral Point.	
9		Park & Ride and improved bus service west of Beltline may speed up subdivision build out	
10		Pope Farm Grade School - Constructed and open fall of 2023	
11		SP 4 - Park & Ride lot proposed only at USH 14 (west) & the Beltline may speed up build out of nearby residential subdivisions.	Detailed description added to reflect e-mailed comments from town of Middleton.
12		Just added by amendment to MPO TIP-USH 18/151 (CTH G to WIS 69) Ramp/Auxiliary Lane and Bridge Widening	
13			
14			

ID#	Category	Detailed Description	Notes
15			During live Expert Panel was accidentally coded as Cumulative rather than Indirect Impacts. And in reality, they're likely closer to Direct Impacts, as the City's concern was Planned Road Crossing seemed to overlap with existing housing and church buildings. Comment from city of Fitchburg.
16		SP 3 and 4, Proposed Hwy 14 Road Crossing, connecting Syene Rd to Novation Pkwy, could cause impact to church along Novation Pkwy.	
17			Added after Panel based on reviewing notes from live Panel. Comment from city of Fitchburg.

2.1.1 Indirect Impacts: Assess Consequences and Identify Mitigation Activities

Table 2: Indirect Impact Assessment and Mitigation

Category	Impact Causing Activity	Description of Indirect Impact	Potential Mitigation
Residential Impact			
Residential Impact	Under SP 4: US 14 Park and Ride in Middleton.	May speed up build out of nearby residential subdivisions, reduce traffic on University Avenue.	
Residential Impact	Under SP 3 and SP4: New crossing of US 14 connecting Syene Road to Novation Parkway.	Could cause encroachment impact to lower-income residential housing along Novation Pkwy.	Reroute the high-level draft alignment of the road crossing, which currently overlaps with the described housing.
Special Population Impact	Under SP 2, SP3, and SP 4: Transit Priority interchange improvements near Fish Hatchery Road.	Potential beneficial impact to lower income populations residing in nearby affordable housing as a result of Transit improvements.	No mitigation required.
Other Impact	Under SP 3 and SP4: New crossing of US 14 connecting Syene Road to Novation Parkway.	Could cause encroachment impact to church along Novation Pkwy.	Reroute the high-level draft alignment of the road crossing, which currently overlaps with the described church.

Category	Impact Causing Activity	Description of Indirect Impact	Potential Mitigation
Altered Development Pace	Under all Strategy Packages: Mineral Point Rd Park and Ride (currently under construction). Under SP 2, SP3, and SP 4: Transit Priority interchange improvements near Mineral point Road.	May speed up build out of subdivisions south of Mineral Point Rd in town of Middleton.	Local governments may exercise land use controls via zoning, comprehensive planning, and land division ordinances to direct the character, nature, and density of development. Capital improvement plans can be used by local governments as an effective way to plan for future infrastructure such as roads, sewers, water systems, equipment, buildings and parks. These plans help local governments determine if its available financial resources are consistent with their land use and development plans.
Altered Development Pace	Under SP 3 and SP4: New crossing of Beltline at Syene Road.	Potentially faster rate of commercial development in Fitchburg Uptown Area due to more direct connection to Madison.	Local governments may exercise land use controls via zoning, comprehensive planning, and land division ordinances to direct the character, nature, and density of development. Capital improvement plans can be used by local governments as an effective way to plan for future infrastructure such as roads, sewers, water systems, equipment, buildings and parks. These plans help local governments determine if its available financial resources are consistent with their land use and development plans.
Altered Development Pace	Under SP 2, SP 3, and SP4: General improvements expanding access to and capacity of the Beltline. An example would be the proposed flex-lane extension.	Could increase rate of growth and development in village of Cottage Grove.	Local governments may exercise land use controls via zoning, comprehensive planning, and land division ordinances to direct the character, nature, and density of development. Capital improvement plans can be used by local governments as an effective way to plan for future infrastructure such as roads, sewers, water systems, equipment, buildings and parks. These plans help local governments determine if its available financial resources are consistent with their land use and development plans.

2.2 Cumulative Impacts

Cumulative Impacts mapped were four natural resource impacts, one infrastructure impact, and one missing element.

All mapped Cumulative Impacts comments can be viewed in **Map 9**. Corresponding descriptions, and potential mitigation measures, for each impact are detailed in **Tables 3 and 4**.

Cumulative Natural Resource Impacts

A potential impact to agriculture resulting from the Park and Ride proposed in Strategy Packages 3 and 4 near the intersection of USH 14 and Lacy Road was mapped. An additional explanation was not provided. This comment may indicate the potential Lacy Road Park and Ride, when combined with other factors such as the already rapid growth of development in the vicinity, could lead to additional loss of farmland to development in the Fitchburg area.

A potential impact to agriculture resulting from the proposed Flex Lane extension or addition of a General Purpose Lane in Strategy Packages 3 and 4 was mapped just west of where the Beltline and Parmenter Road intersect at the northern edge of the city of Middleton. As with the previous comment, additional explanation was not provided, but the comment may indicate the proposed Flex Lane extension or added General Purpose Lane in Strategy Packages 3 and 4, when combined with other factors such as the already rapid growth of development in the vicinity, could lead to additional loss of farmland to development in the Middleton area.

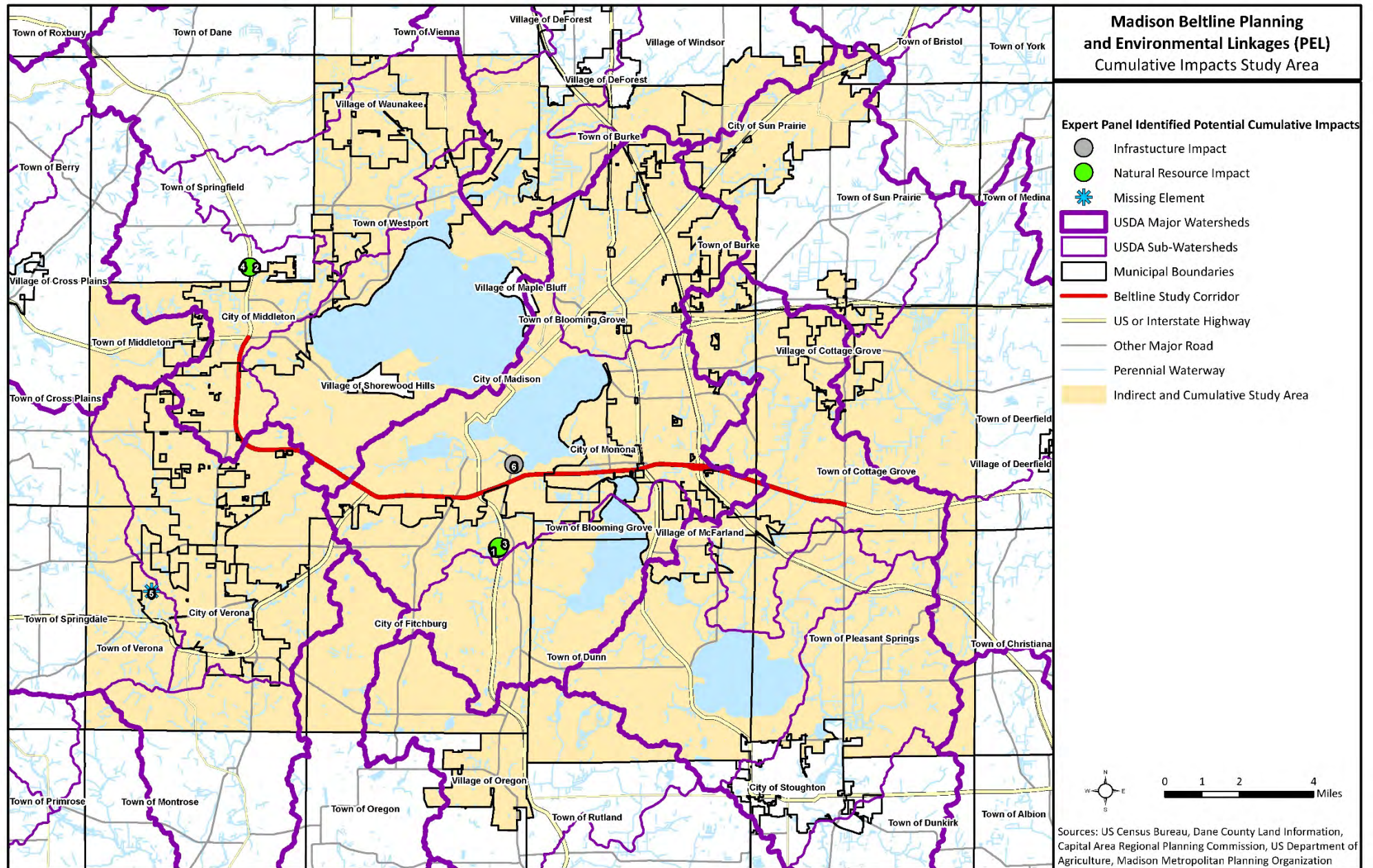
Cumulative Infrastructure Impacts

A potential cumulative transportation impact was noted on John Nolen Drive just north of the Beltline under all Strategy Packages. The comment noted concerns about potential traffic congestion on John Nolen Drive if capacity on John Nolen is reduced or even simply held steady while capacity is expanded on the adjacent Beltline.

The cumulative impacts would likely be greatest under Strategy Package 4, which proposes a new General Purpose lane on the Beltline running by the John Nolen Drive interchange between Verona Road and Interstate 39/90, though improvements proposed under Strategy Packages 2 and 3 could also lead to increased traffic volume.

Missing Elements

One “Missing Element” was mapped on the campus of Epic Systems in the city of Verona, noting that Epic plans to continue expanding both their physical campus and number of employees, with an additional 1,700 employees expected by the end of 2024. This could drive additional traffic on the Beltline, particularly around the Verona Road interchange.



Map 9

Table 3: Cumulative Impacts Mapping Exercise Results

ID#	Category	Detailed Description	Notes
1			
2		Potential Agricultural Impact- Strategy Package 3- Proposed Flex Lane Extension or General Purpose Lane	
3		Potential Agricultural Impact- Strategy Package 4 Proposed Park and Rides	
4		Potential Agricultural Impact- Strategy Package 4- Proposed Flex Lane Extension or General Purpose Lane	
5		Epic campus continues to expand, add jobs, and parking https://www.ibm.adison.com/epic-continues-expansion-plans-for-5-5-acre-underground-parking-ramp-five-new-buildings/	Reclassified as "Missing Element." Was mapped originally as "Other Impact"
6			Added after panel. Paraphrased from comments provided by MPO.

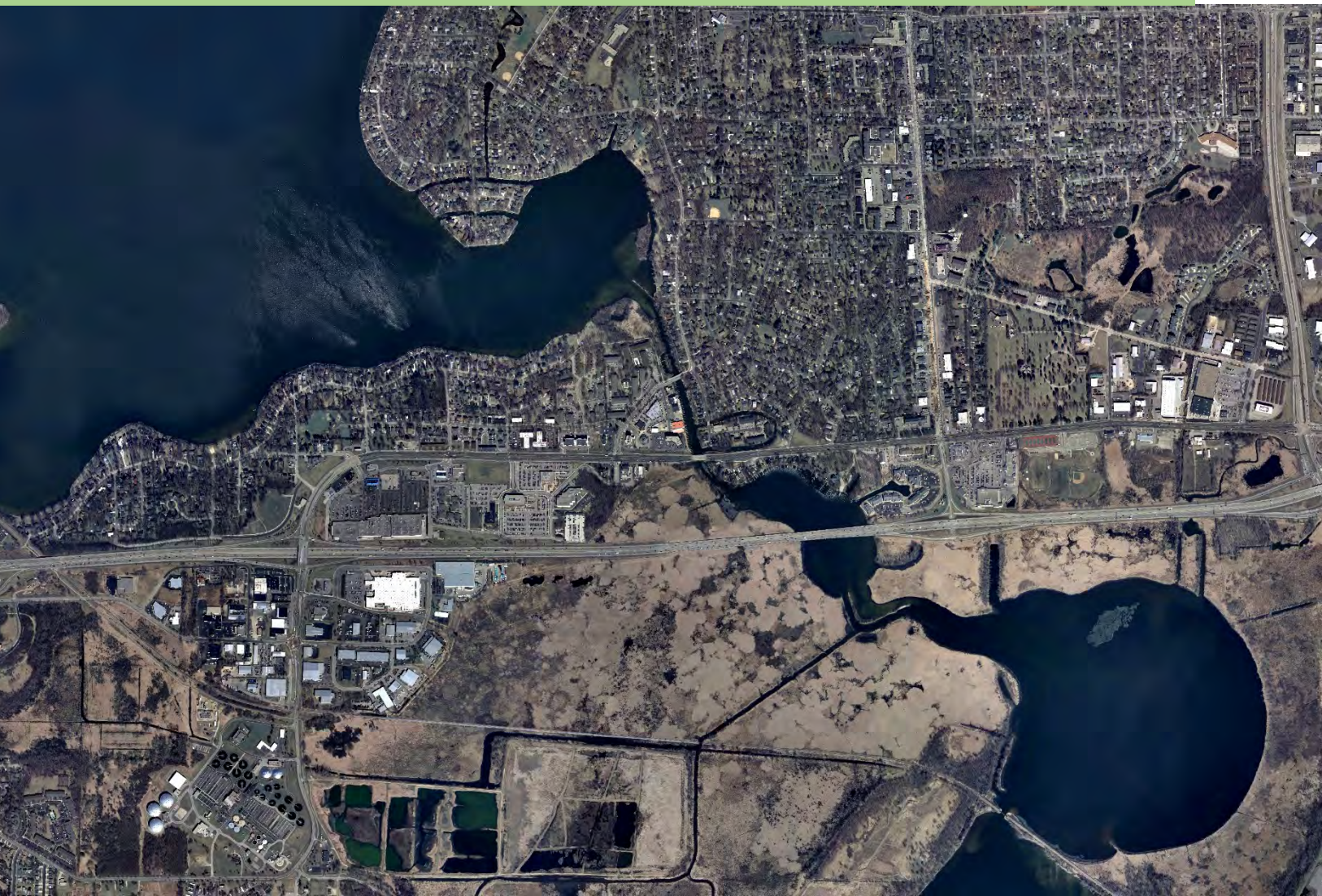
2.2.1 Cumulative Impacts: Assess Consequences and Identify Mitigation Activities

Table 4: Cumulative Impact Assessment and Mitigation

Category	Impact Causing Activity	Description of Indirect Impact	Potential Mitigation
Natural Resource Impact		Potential loss of Agricultural areas near northern city and town of Middleton.	Development of farmland zoned for agriculture would require a change in zoning and permits from local governments.
Natural Resource Impact	Under SP 3 and 4: Proposed Flex Lane Extension or General Purpose Lane	Potential loss of Agricultural areas in city of Fitchburg.	Development of farmland zoned for agriculture would require a change in zoning and permits from local governments.
Infrastructure Impact	Under SP 2, 3, and 4: Proposed Flex Lane Extension or General Purpose Lanes	Potential restricted transportation flow on John Nolen Drive, if John Nolen Drive doesn't also increase capacity.	

MADISON BELTLINE STUDY

Appendix



Study ID: 5304 02 04

Beltline Planning and Environment Linkages Study

3/29/2024

A.1. Madison Beltline Study Expert Panel List

Madison Beltline Study Expert Panlists- Indirect and Cumulative Impacts (ICI) Report 2023-24

Study ID 5304-02-04 Beltline Planning and Environment Linkages. Dane County, Wisconsin

NAME	TITLE	FROM
Todd Violante	Senior Planner	Dane County Planning
Pamela Alexandra Andros	Transportation Planning Manager	Greater Madison MPO
Colleen Hoesly	Transportation Planner	Greater Madison MPO
Steve Steinhoff	Agency Director	CARPC
Carl Glasemeyer	Transportation Policy Analyst	1000 Friends of Wisconsin
Carolyn (Carey) McAndrews	Associate Professor, Department of Planning and Landscape Architecture	University of Madison
Jason Ilstrup	President	Downtown Madison Inc.
Heather Stouder	DPCED Planning Director	City of Madison
Tim Voelker	Director of Public Works	City of Fitchburg
Ross Kahler	Public Works Engineer	City of Fitchburg
Mark Opitz	Assistant Planning Director/Zoning Administrator	City of Middleton
Dan Stephany	Director of Public Works	City of Monona
Tom Veith	Engineering Director	City of Sun Prairie
Katherine Holt	Community Development Specialist	City of Verona
Erin Ruth	Director of Planning and Development	Village of Cottage Grove
Lee Igl	Director of Public Works	Village of McFarland
Elise Cruz	Director of Planning and Zoning Administrator	Village of Oregon
Todd Schmidt	Village Administrator	Village of Waunakee
Ron Bristol	Town Chair	Town of Blooming Grove
Kevin Viney	Town Chair	Town of Burke
Mike DuPlayee	Town Supervisor	Town of Cottage Grove
Ben Kollenbroich	Planning & Land Conservation Director	Town of Dunn
John Haverberg	Plan Commission Member	Town of Middleton
David Pfeiffer	Town Chairperson	Town of Pleasant Springs
W. Christopher Barnes	Town Public Works Director	Town of Verona
Kevin Even	Town of Westport Engineer	Town of Westport
Katy Smith	Land and Resource Management Section Manager	DATCP
Eric Heggelund	Transportation Liaison	WDNR
Kathy Collins*	Vice President of Economic Development	MadREP

*Invited to provide input on Expert Panel survey after Expert Panel meeting based on comments received from other Panelists at the meeting.

A.2. Combined Beltline PEL Expert Panel Survey Response Data

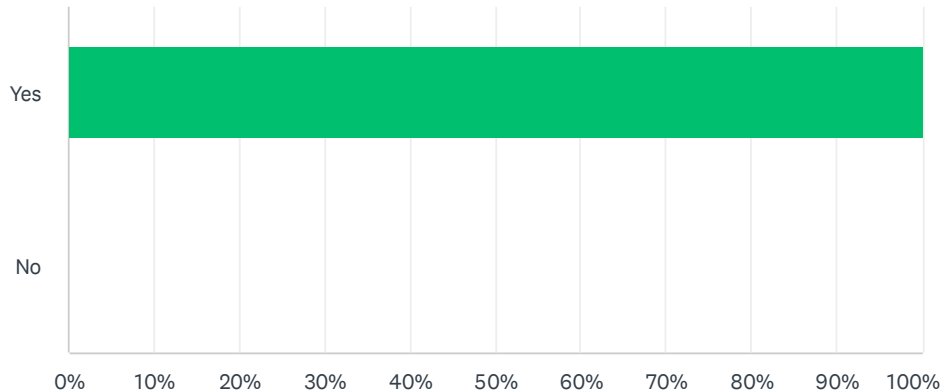
Q1 What organization or community do you represent?

Answered: 4 Skipped: 2

#	RESPONSES	DATE
1	Town of Middleton	6/9/2023 2:40 PM
2	Village of Cottage Grove	6/9/2023 11:44 AM
3	Town of Verona	6/8/2023 11:38 AM
4	Village of McFarland	6/7/2023 7:37 AM

Q2 Do you believe the draft Indirect Impacts Study Area boundary is appropriate for the Beltline PEL ICI Analysis?

Answered: 5 Skipped: 1

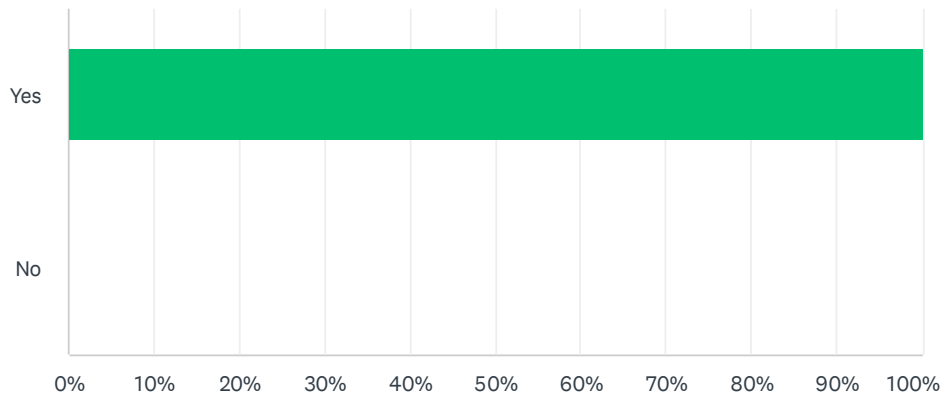


ANSWER CHOICES		RESPONSES	
Yes		100.00%	5
No		0.00%	0
TOTAL			5

#	IF NO, PLEASE EXPLAIN WHY OR WHAT YOU BELIEVE SHOULD CHANGE.	DATE
	There are no responses.	

Q3 Do you believe the draft Cumulative Impacts Study Area boundary is appropriate for the Beltline PEL ICI Analysis?

Answered: 6 Skipped: 0



ANSWER CHOICES		RESPONSES	
Yes		100.00%	6
No		0.00%	0
TOTAL			6

#	IF NO, PLEASE EXPLAIN WHY OR WHAT YOU BELIEVE SHOULD CHANGE.	DATE
	There are no responses.	

A.3. Beltline PEL Indirect Impacts Web Map Instructions

Welcome to the Beltline PEL Indirect Impacts Mapping Tool

The purpose of this map is to collect input on Indirect Impacts that may result from implementation of the proposed improvements that comprise the Strategy Packages of the Beltline PEL study, and to collect information on already proposed developments or resources not mapped here. Due to the large volume of information involved, we wanted to provide Expert Panelists time to review this information and map anticipated impacts here in advance of the Expert Panel meeting, though this application will be available for Panelists to add additional impacts for two weeks **after** the Expert Panel meeting as well.

Using the Map:

A legend of all map layers is viewable using the "Legend" tool in the upper right corner.

The proposed components of all four Strategy Packages are available for review in this map. For reference, a number of other data layers have been included. To avoid cluttering the map, not all layers are turned on by default, but layers may be toggled on or off using the other tools in the upper-right menu bar, which are detailed below.

Base Layers:

Basic background information. Layers include Municipal Boundaries, Sewer Service Areas, etc.

Strategy Packages:

Layers depicting the components of all Strategy Packages may be turned on or off from this menu. There are no improvements proposed east of I-39 because improvements are being completed as part of the County AB interchange project. Additional improvements may be considered by other future WisDOT studies in the area. Detailed information on the proposed improvements may also be viewed at WisDOT's Beltline Study Public Involvement page here: <https://wisconsindot.gov/Pages/projects/by-region/sw/madisonbeltline/public.aspx>



Land Use and Transportation:

The following layers may be turned on or off from this menu:

- **Existing Land Use** from Dane County's 2020 Land Use Inventory.
- **Planned Development from Adopted Land Use Plans** from communities in the ICI Area (Indirect and Cumulative Impacts Area).
- **Planned transportation projects** from the Madison MPO's latest 5-year Transportation Improvement Plan (2023-2027). Existing bicycle/pedestrian infrastructure is also included. Click on individual features for details



Environmental Justice:

These are potential environmental justice populations. Please consider whether impacts to these areas would be disproportionately high and adverse. The following layers may be turned on or off from this menu:

- **Areas of Persistent Poverty** – Census Block Groups with a poverty rate greater than 20 percent (2017-2021 American Community Survey). Click on an area to see its specific poverty rate.
- **Historically Disadvantaged Communities** – Census Tracts that meet an index score based on a multi-factor analysis.
 - This USDOT analysis looked at multiple data sets from the CDC, EPA, Census Bureau to assess transportation insecurity, environmental burden, health vulnerability, social vulnerability, and climate & disaster risk burden to identify locations that support the Justice40 Initiative. The data allows practitioners to screen project locations to see if they support Title VI, and environment justice.
- **Low Income % Exceeding Dane County Average** - Block Groups with a low-income population percentage exceeding the overall Dane County percentage (27.7%) based on HUD's 2019 Low-income limits. Unlike the Census Bureau's poverty thresholds used in the "Areas of Persistent Poverty" measure, these are based on a locally adjusted cost-of-living calculation specific to Dane County. Click on an area to see it's specific low-income percentage.



Natural Resources:

The following layers may be turned on or off from this menu:

- **Natural Resources or Development Constraints.** This is a combined layer of FEMA 100 and 500 Year Floodplains, DNR Wetlands, Slopes over 20%, and CARPC Environmental Corridors. Most of the individual components of this layer may also be toggled on independently.
- **Agricultural Enterprise Areas.** Landowners within designated AEAs are eligible to enter into voluntary farmland preservation agreements. By signing the agreement, a landowner agrees to keep their land in agricultural use for 15 years and to meet state soil and water conservation standards. This program is run through DATCP.
- **USDA Watersheds**
- **CARPC Environmental Corridors**
- **DNR Wetlands**
- **FEMA 100 and 500 year Floodplains**

Background:

The Council on Environmental Quality (CEQ) has defined indirect impacts as project impacts “caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.”

Two types of indirect impacts are commonly recognized: induced-growth impacts and encroachment-alteration impacts.

Induced-Growth Impacts. Induced-growth impacts are changes in the location, magnitude, or pace of future development that result from changes in accessibility caused by the project. An example of an induced-growth impact is commercial development occurring around a new interchange and the environmental impacts associated with this development.

Encroachment-Alteration Impacts. Encroachment-alteration impacts are physical, chemical, or biological changes in the environment that occur as a result of the project but are removed in time or distance from the direct impacts. An example of an encroachment impact is a long-term decline in the viability of a population of a particular species as a result of habitat fragmentation caused by the project.

Directions:

From the Smart Editor tool in the upper left, use the menu to select one of the categories. Map the area of an anticipated Indirect Impact. Use the Description field to add any detailed comments and “Save” the impact you just mapped or choose “Close” to delete the item and try again. **In the comment field please also specify which Strategy Package or Packages your anticipated impact pertains to.** For instance if under both Packages 3 and 4 you anticipate additional commercial development (but not Packages 1 or 2) in a certain area, note that in your comment.

Use the **Other Impact** category to map any anticipated impact that doesn't fit into one of the other categories.

The **Infrastructure Impact** category may be used to map, for instance, an anticipated infrastructure project that might be induced as a result of the proposed Beltline improvements.

Use the **Missing Element** category to map planned developments or existing resources or special populations not depicted on this map. For example, if there is a bridge planned for construction in your community (rather than one that might be induced as a result of the proposed Beltline Strategy Package) and the bridge is not depicted among the other planned transportation projects, you can indicate that using the **Missing Element** category.

Use the **Altered Development Pace** category to indicate where a planned development might occur more quickly or more slowly as a result of this Strategy Package, rather than an area where unplanned development might occur.

Please note: While anonymous, comments added to the interactive digital map will be visible to others.

A.4. Beltline PEL Cumulative Impacts Web Map Instructions

Welcome to the Beltline PEL Cumulative Impacts Mapping Tool

The purpose of this map is to collect input on Cumulative Impacts that may result from implementation of the proposed improvements that comprise the Strategy Packages of the Beltline PEL study, and to collect information on already proposed developments or resources not mapped here. Due to the large volume of information involved, we wanted to provide Expert Panelists time to review this information and map anticipated impacts here in advance of the Expert Panel meeting, though this application will be available for Panelists to add additional impacts for two weeks **after** the Expert Panel meeting as well.

Using the Map:

A legend of all map layers is viewable using the "Legend" tool in the upper right corner.

The proposed components of all four Strategy Packages are available for review in this map. For reference, a number of other data layers have been included. To avoid cluttering the map, not all layers are turned on by default, but layers may be toggled on or off using the other tools in the upper-right menu bar, which are detailed below.

Base Layers:



Basic background information. Layers include Municipal Boundaries, Sewer Service Areas, etc.

Strategy Packages:



Layers depicting the components of all Strategy Packages may be turned on or off from this menu. There are no improvements proposed east of I-39 because improvements are being completed as part of the County AB interchange project. Additional improvements may be considered by other future WisDOT studies in the area. Detailed information on the proposed improvements may also be viewed at WisDOT's Beltline Study Public Involvement page here: <https://wisconsindot.gov/Pages/projects/by-region/sw/madisonbeltline/public.aspx>



Land Use and Transportation:

The following layers may be turned on or off from this menu:

- **Existing Land Use** from Dane County's 2020 Land Use Inventory.
- **Planned Development from Adopted Land Use Plans** from communities in the ICI Area (Indirect and Cumulative Impacts Area).
- **Planned transportation projects** from the Madison MPO's latest 5-year Transportation Improvement Plan (2023-2027). Existing bicycle/pedestrian infrastructure is also included. Click on individual features for details.



Environmental Justice:

These are potential environmental justice populations. Please consider whether impacts to these areas would be disproportionately high and adverse. The following layers may be turned on or off from this menu:

- **Areas of Persistent Poverty** – Census Block Groups with a poverty rate greater than 20 percent (2017-2021 American Community Survey). Click on an area to see its specific poverty rate.
- **Historically Disadvantaged Communities** – Census Tracts that meet an index score based on a multi-factor analysis.
 - This USDOT analysis looked at multiple data sets from the CDC, EPA, Census Bureau to assess transportation insecurity, environmental burden, health vulnerability, social vulnerability, and climate & disaster risk burden to identify locations that support the Justice40 Initiative. The data allows practitioners to screen project locations to see if they support Title VI, and environment justice.
- **Low Income % Exceeding Dane County Average** - Block Groups with a low-income population percentage exceeding the overall Dane County percentage (27.7%) based on HUD's 2019 Low-income limits. Unlike the Census Bureau's poverty thresholds used in the "Areas of Persistent Poverty" measure, these are based on a locally adjusted cost-of-living calculation specific to

Dane County. Click on an area to see it's specific low-income percentage.



Natural Resources:

The following layers may be turned on or off from this menu:

- **Natural Resources or Development Constraints.** This is a combined layer of FEMA 100 and 500 Year Floodplains, DNR Wetlands, Slopes over 20%, and CARPC Environmental Corridors. Most of the individual components of this layer may also be toggled on independently.
- **Agricultural Enterprise Areas.** Landowners within designated AEAs are eligible to enter into voluntary farmland preservation agreements. By signing the agreement, a landowner agrees to keep their land in agricultural use for 15 years and to meet state soil and water conservation standards. This program is run through DATCP.
- **USDA Watersheds**
- **CARPC Environmental Corridors**
- **DNR Wetlands**
- **FEMA 100 and 500 year Floodplains**

Background:

A Cumulative Impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Cumulative Impact analysis may be thought of as a comparison of the past, present, and reasonably foreseeable health or condition of a specific resource.

For example, the air quality of an area today is in a measurable condition, relative to the National Ambient Air Quality Standards. In the past, perhaps

recently, the quality of the air may have been worse, the same, or better than it is today depending on a number of factors such as automobile use, industry, residential development (fireplaces), and climatic conditions. The condition of the air today is the result of these factors, which constitutes the past effects of the Cumulative Impact question. Add the impacts of the proposed project, other occurring activities, and the positive and negative reasonably foreseeable impacts from any source, and the result equates to the air quality Cumulative Impact.

Directions:

From the Smart Editor tool in the upper left, use the menu to select one of the categories. Map the area of an anticipated Cumulative Impact. Use the Description field to add any detailed comments and “Save” the impact you just mapped or choose “Close” to delete the item and try again. **In the comment field please also specify which Strategy Package or Packages your anticipated impact pertains to.** For instance if under both Packages 3 and 4 you anticipate additional commercial development (but not Packages 1 or 2) in a certain area, note that in your comment.

Use the **Other Impact** category to map any anticipated impact that doesn't fit into one of the other categories.

The **Infrastructure Impact** category may be used to map, for instance, an anticipated infrastructure project that might occur as a result of the proposed Beltline improvements in combination with other contributing factors such as independent traffic calming measures or population growth.

Use the **Missing Element** category to map planned developments or existing resources or special populations not depicted on this map. For example, if there is a bridge planned for construction in your community (rather than one that might be induced as a result of the proposed Beltline Strategy Package) and the bridge is not depicted among the other planned transportation projects, you can indicate that using the **Missing Element** category.

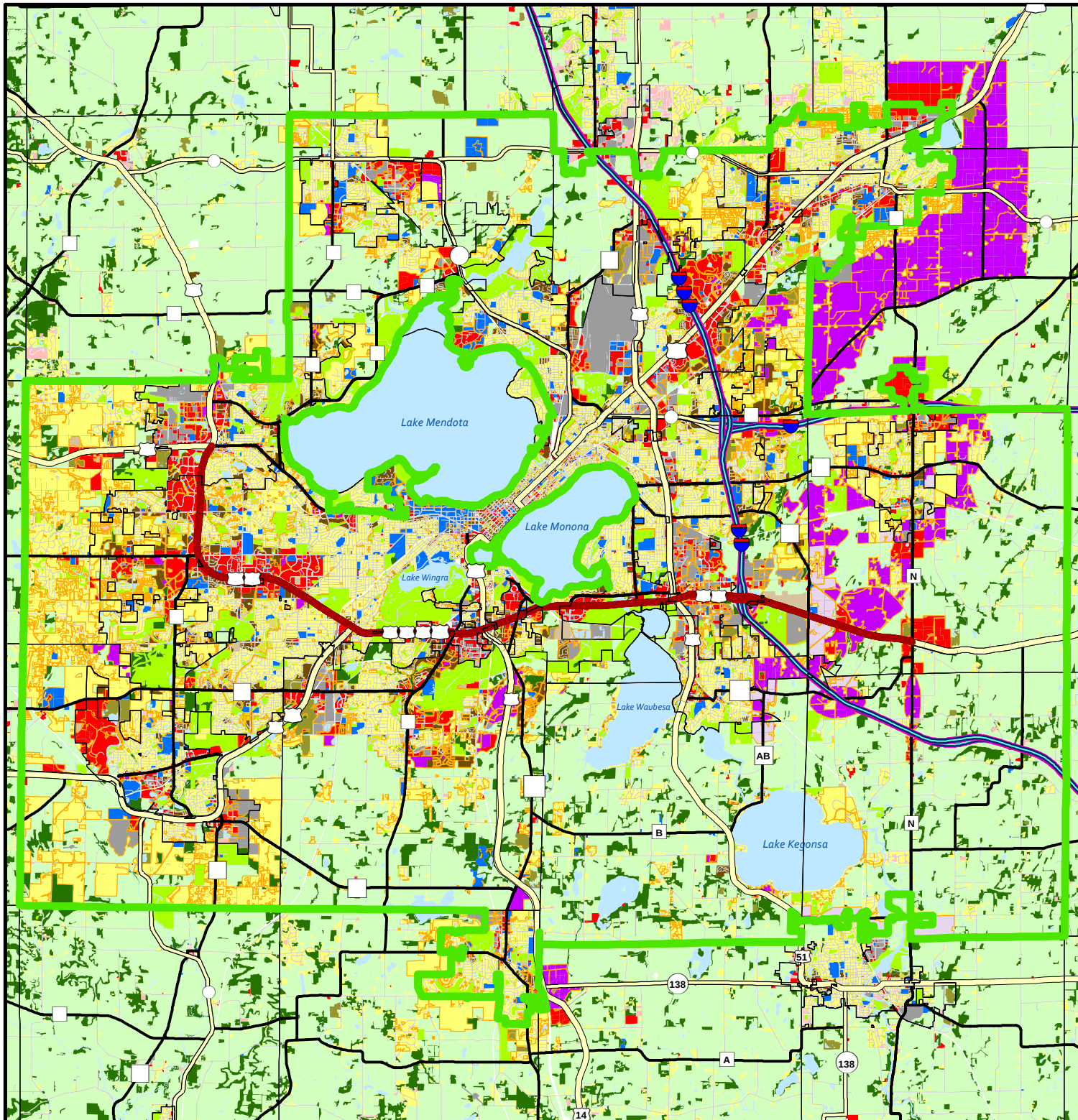
Use the **Altered Development Pace** category to indicate where a planned development might occur more quickly or more slowly as a result of this Strategy Package, rather than an area where unplanned development might occur.

Please note: While anonymous, comments added to the interactive digital map will be visible to others.

A.5. Planned Development and Existing Land Use Map

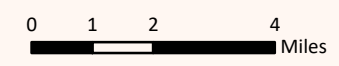
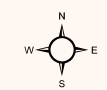
Beltline Highway Study

Planned Development and Existing Land Use



- Indirect and Cumulative Study Area
 - Municipal Boundaries
 - Beltline Study Corridor
 - New Planned Development*
- Land Use***
- Agricultural and Open Land
 - Agricultural Transition
 - Single-Family Residential
 - Two-Family Residential
 - Multi-Family Residential
 - Mixed-Use
 - Commercial
 - Vacant Subdivided Land
 - Industrial
 - Extraction
 - Communication/Utilities
 - Institutional/Governmental
 - Parks and Recreation
 - Water
 - Woodlands
 - Right-of-Way

*In areas outlined as "New Planned Development", the land use category depicted on the map is the type of development planned for the site, rather than the existing land use, based on adopted municipal land use plans.



Sources: US Census Bureau 2020, Dane Co LIO, CARPC, Madison MPO