

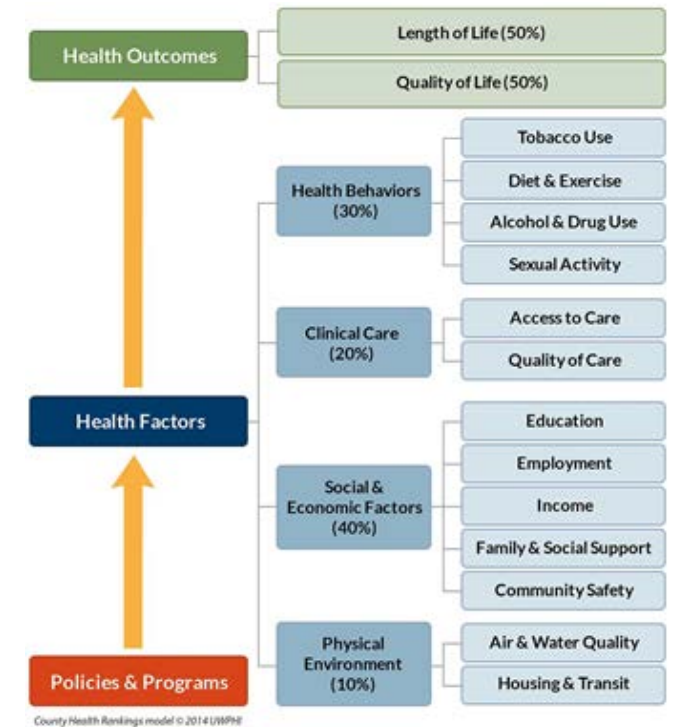
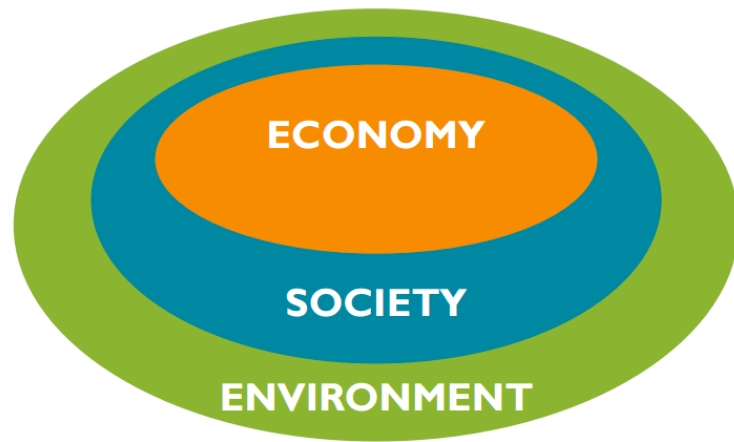
Natural Systems Health Impact Assessment

Prepared by: Ethan Andre, Abigail Cook, and Bridget Faust
PHS 740: Health Impact Assessment of Global Environmental Change

Prepared for: Sustainable Madison Committee
Monday, May 16, 2016

What problem are we addressing with this HIA?

The City of Madison, Wisconsin has invested significant amounts of time and energy into developing its sustainability goals and vision for the City's natural resources. The scope of the actions recommended in the Natural Systems portion of the Madison Sustainability Plan are very broad, prioritization these actions is needed in order to maximize the city's return on investment as well as the benefits afforded to residents.



Ott, K. (2003). "The Case for Strong Sustainability." In: Ott, K. & P. Thapa (eds.) (2003). *Greifswald's Environmental Ethics*. Greifswald: Steinbecker Verlag Ulrich Rose. ISBN 3931483320. Retrieved on: 2009-02-16.

Retrieved from: [Madison Sustainability Plan](#)

Retrieved from: [County Health Rankings and Roadmaps](#)



Criteria for HIA: Narrowing the Scope

Criteria used to Narrow the Scope of our HIA:

1. Clear connection between environmental and human health
2. Actionable
3. Data available
4. Published literature available

Actions Included in Our Impact Assessment:

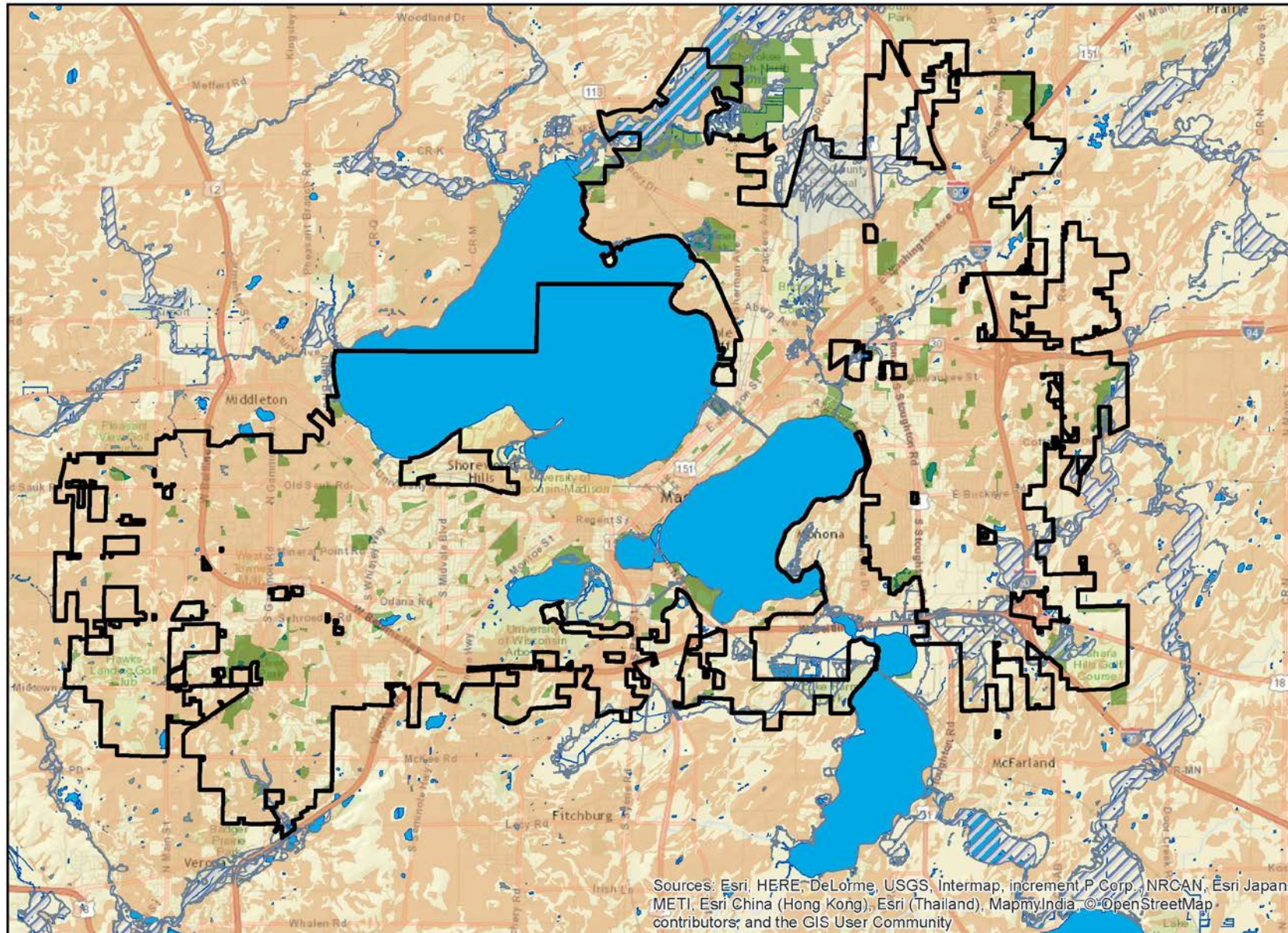
Action 3-3 "Encourage infiltration, where appropriate, through the use of pervious surfaces, the creation of rain gardens, bio-swales and other natural water purification methods."

Action 7-1 "Use linking parks, bike trail system, and stormwater management systems to expand trail recreation, physical activity, and nature study opportunities. Link all parks and open spaces to the maximum extent possible."

Action 7-11 "Promote usage of public rights-of-way (public land) and parks as edible landscapes, sculpture gardens, community gardens, prairie, etc."

Strategy: Geographic Information Systems (GIS) analysis in order to identify locations where health benefits could be maximized.

Findings Action 3-3: "Encourage infiltration, where appropriate, through the use of pervious surfaces, the creation of rain gardens, bio-swales & other natural water purification methods."



Legend

- Wisconsin_Municipal_Boundaries_Spring_2016
- 500 Year Flood Zone
- 100 Year Flood Zone
- City of Madison Parks, Gardens, Zoos, Cemeteries
- Soils**
- NRCS Hydrologic Soil Group A (high in infiltration capacity)
- NRCS Hydrologic Soil Group B (moderate infiltration capacity)

Health Benefits:

- Improved surface water quality
- Reduced risk of exposure to harmful algal blooms
- Reduced flood risk
- Fewer beach closures

Findings Action 3-3: "Encourage infiltration, where appropriate, through the use of pervious surfaces, the creation of rain gardens, bio-swales & other natural water purification methods."



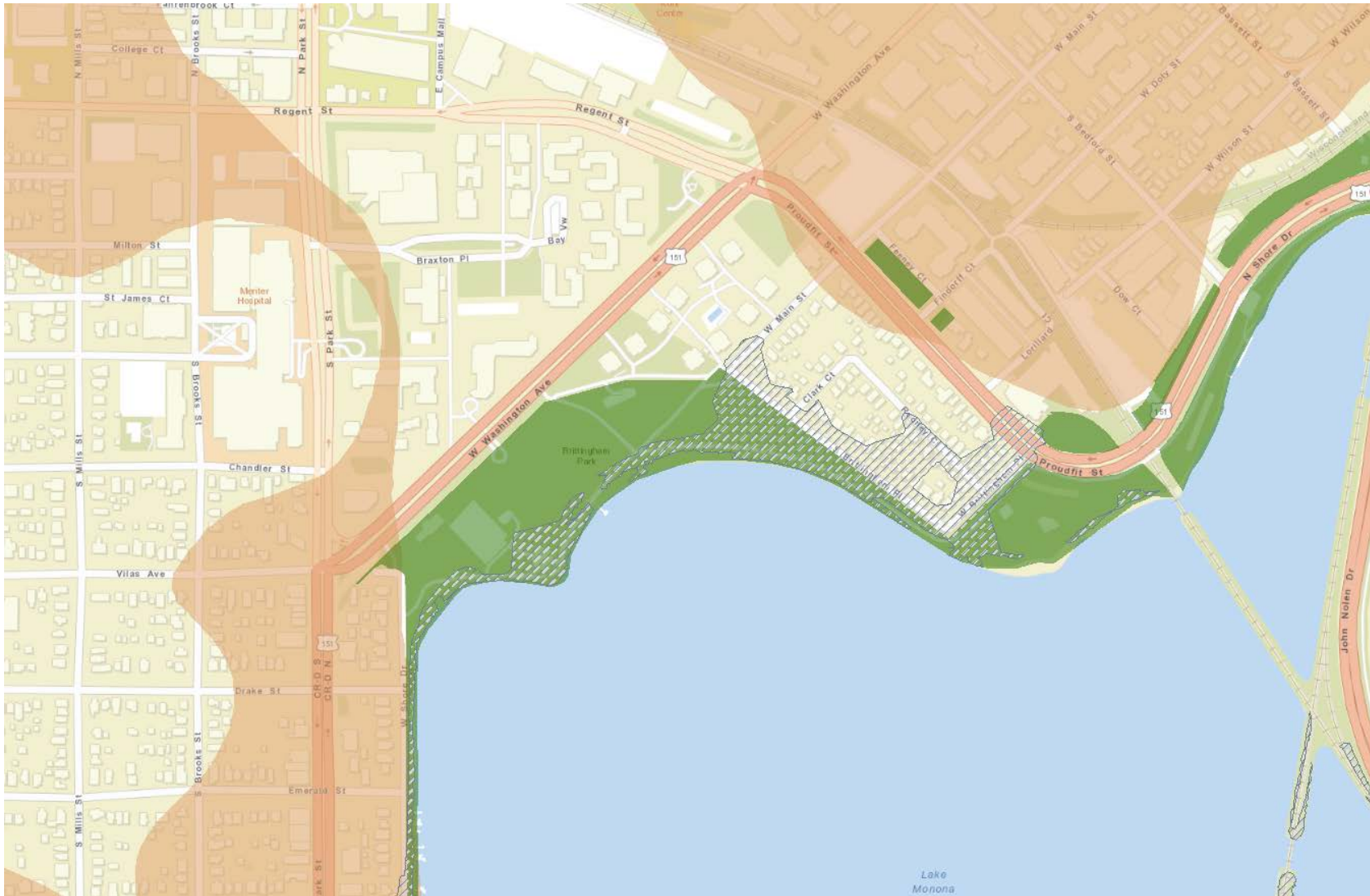
Legend

- Wisconsin Municipal Boundaries Spring 2016
- 500 Year Flood Zone
- 100 Year Flood Zone
- City of Madison Parks, Gardens, Zoos, Cemeteries
- Soils**
- NRCS Hydrologic Soil Group A (high infiltration capacity)
- NRCS Hydrologic Soil Group B (moderate infiltration capacity)

Health Benefits:

- Improved surface water quality
- Reduced risk of exposure to harmful algal blooms
- Reduced flood risk
- Fewer beach closures

Findings Action 3-3: "Encourage infiltration, where appropriate, through the use of pervious surfaces, the creation of rain gardens, bio-swales & other natural water purification methods."



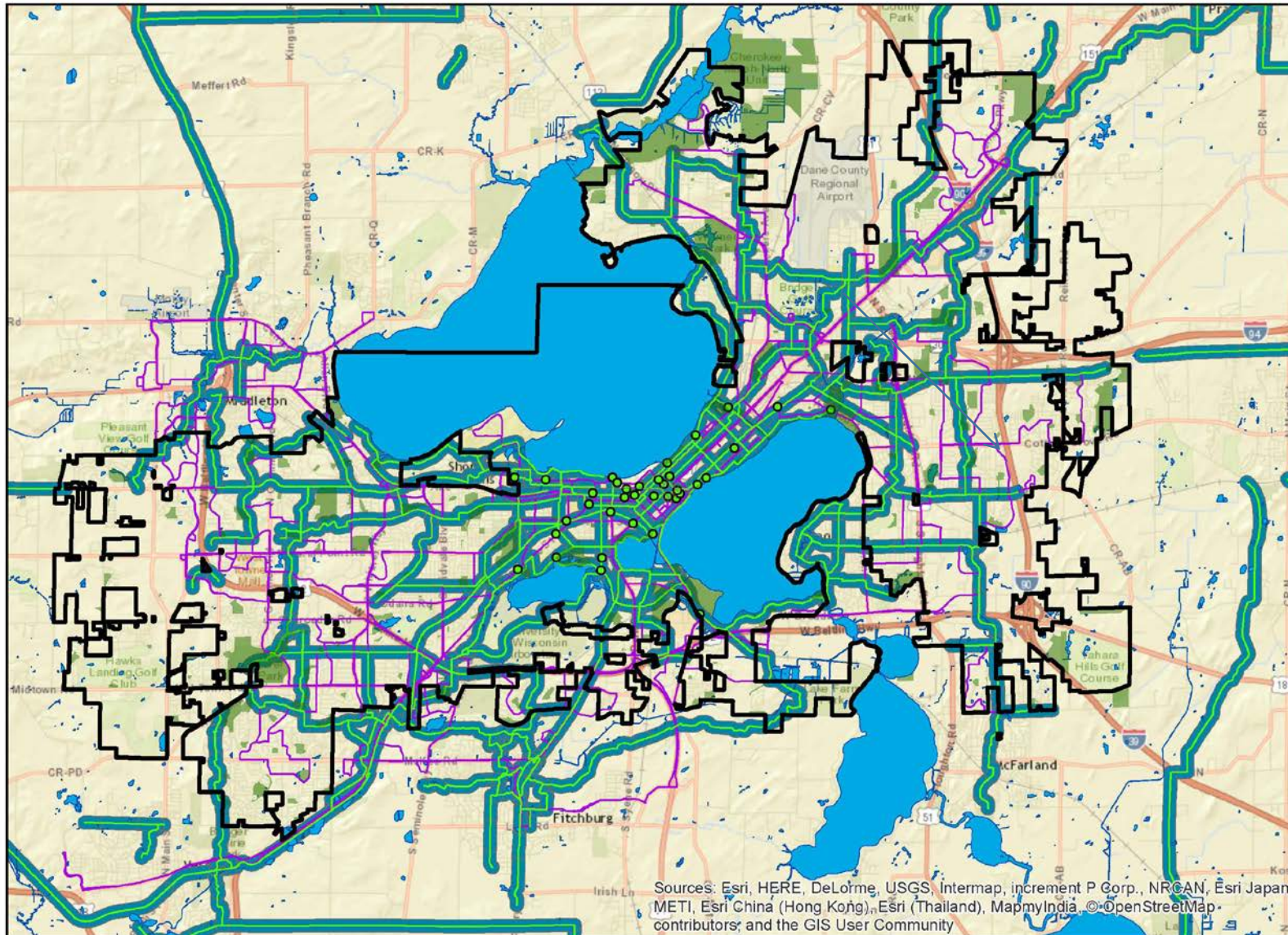
Legend

- Wisconsin Municipal Boundaries Spring 2016
- 500 Year Flood Zone
- 100 Year Flood Zone
- City of Madison Parks, Gardens, Zoos, Cemeteries
- Soils**
- NRCS Hydrologic Soil Group A (high infiltration capacity)
- NRCS Hydrologic Soil Group B (moderate infiltration capacity)

Health Benefits:

- Improved surface water quality
- Reduced risk of exposure to harmful algal blooms
- Reduced flood risk
- Fewer beach closures

Findings Action 7-1: "Use linking parks, bike trail system, and stormwater management systems to expand trail recreation, physical activity, and nature study opportunities. Link all parks and open spaces to the maximum extent possible."



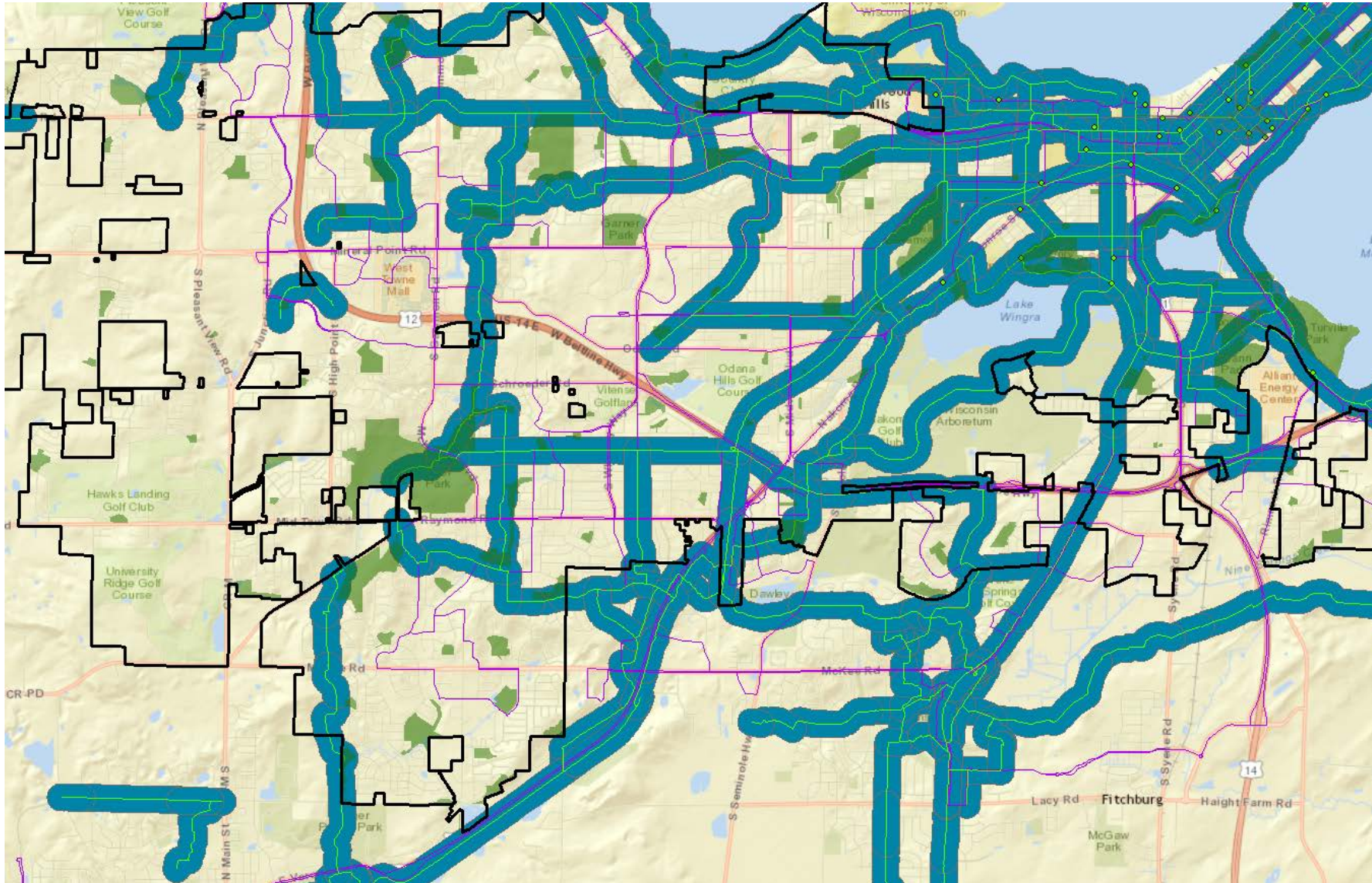
Legend

- Wisconsin Municipal Boundaries Spring 2016
- City of Madison Parks, Gardens, Zoo, Cemeteries
- Bicycle**
 - Existing Bike Routes
 - City of Madison B-cycle Stations
 - 0.1mi Buffer Around Existing Bike Routes
- Bus**
 - Existing Bus Routes

Health Benefits:

- Increased exercise
 - Physical health
 - Mental health
- Increased connectivity with nature
- Foster social/community involvement

Findings Action 7-1: "Use linking parks, bike trail system, and stormwater management systems to expand trail recreation, physical activity, and nature study opportunities. Link all parks and open spaces to the maximum extent possible."



Legend

- Wisconsin_Municipal_Boundaries_Spring_2016
- City of Madison Parks, Gardens, Zoo, Cemeteries

Bicycle

- Existing Bike Routes
- City of Madison B-cycle Stations
- 0.1mi Buffer Around Existing Bike Routes

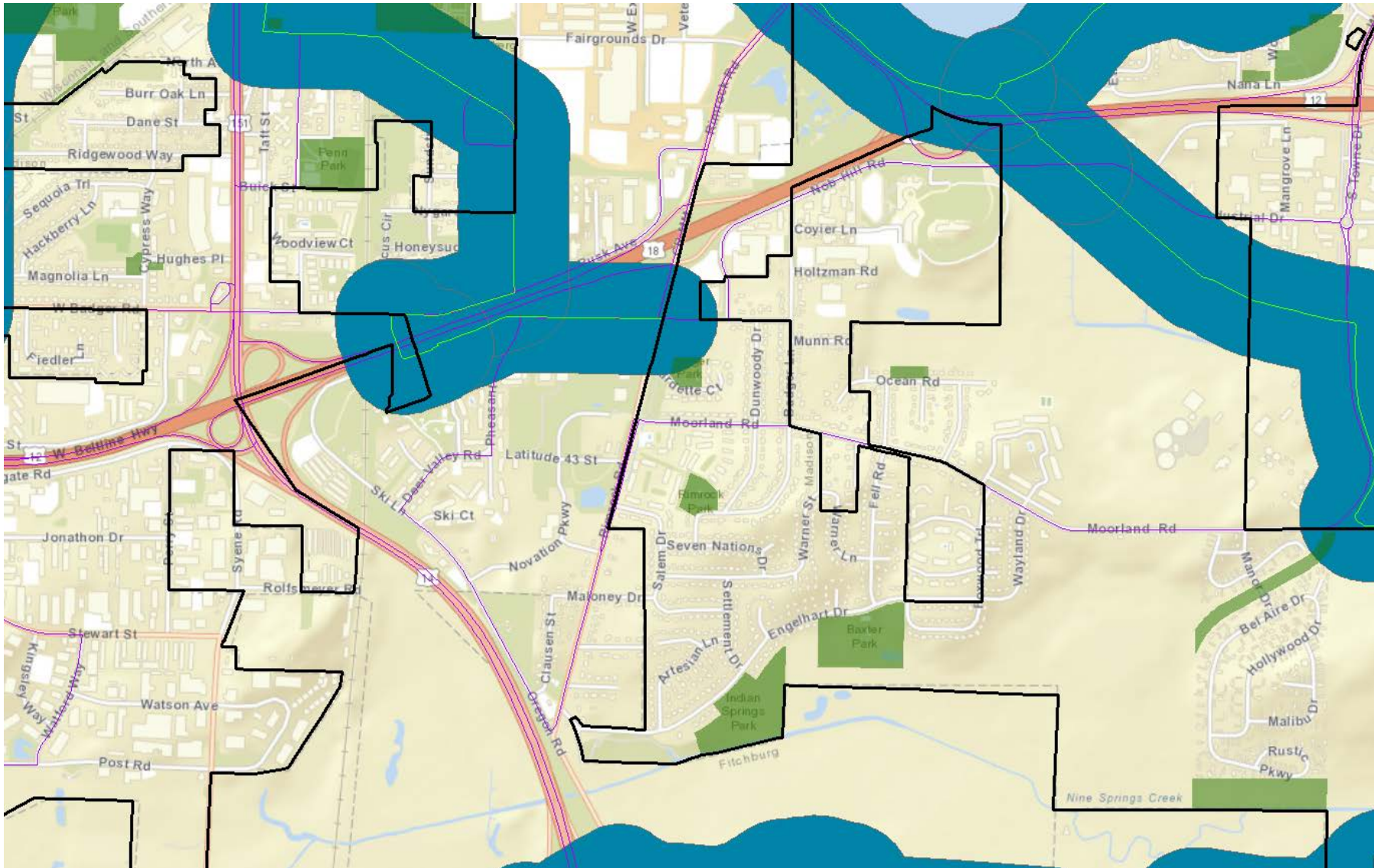
Bus

- Existing Bus Routes







Health Benefits:

- Increased exercise
 - Physical health
 - Mental health
- Increased connectivity with nature
- Foster social/community involvement

Findings Action 7-1: "Use linking parks, bike trail system, and stormwater management systems to expand trail recreation, physical activity, and nature study opportunities. Link all parks and open spaces to the maximum extent possible."



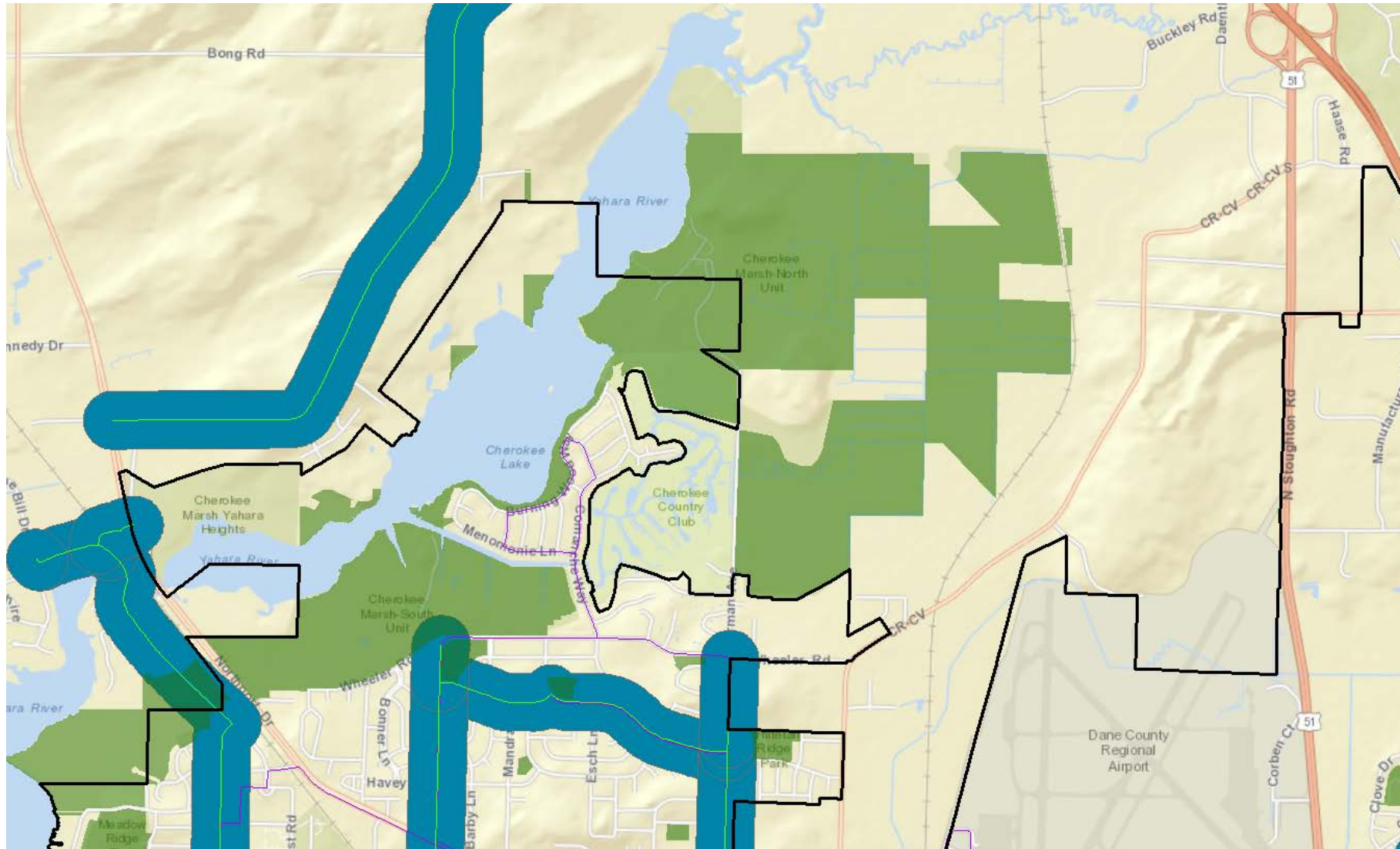
Legend

-  Wisconsin Municipal Boundaries, Spring 2016
-  City of Madison Parks, Gardens, Zoo, Cemeteries
- Bicycle**
-  Existing Bike Routes
-  City of Madison B-cycle Stations
-  0.1mi Buffer Around Existing Bike Routes
- Bus**
-  Existing Bus Routes







Health Benefits:

- Increased exercise
 - Physical health
 - Mental health
- Increased connectivity with nature
- Foster social/community involvement

Findings Action 7-1: "Use linking parks, bike trail system, and stormwater management systems to expand trail recreation, physical activity, and nature study opportunities. Link all parks and open spaces to the maximum extent possible."



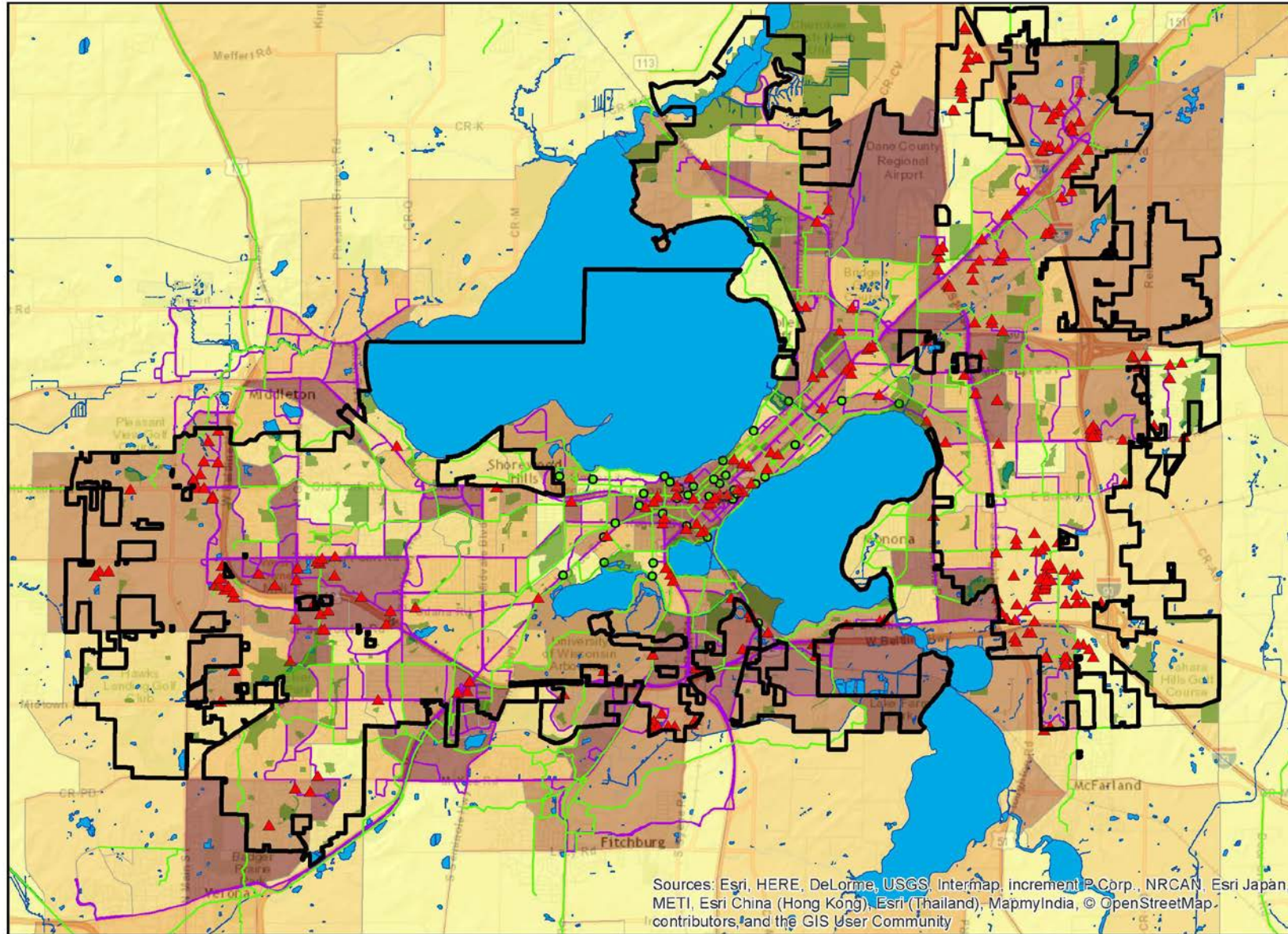
Legend

-  Wisconsin Municipal Boundaries Spring 2016
-  City of Madison Parks, Gardens, Zoo, Cemeteries
- Bicycle**
-  Existing Bike Routes
-  City of Madison B-cycle Stations
-  0.1mi Buffer Around Existing Bike Routes
- Bus**
-  Existing Bus Routes

Health Benefits:

- Increased exercise
 - Physical health
 - Mental health
- Increased connectivity with nature
- Foster social/community involvement

Findings Action 7-11: "Promote usage of public rights-of-way (public land) and parks as edible landscapes, sculpture gardens, community gardens, prairie, etc."



Legend

- Wisconsin Municipal Boundaries Spring 2016
- City of Madison Parks, Gardens, Zoos, Cemeteries
- Madison Vacant Land Sales

Transportation

- Existing Bike Paths
- Madison B-cycle Stations
- Existing Bus Routes

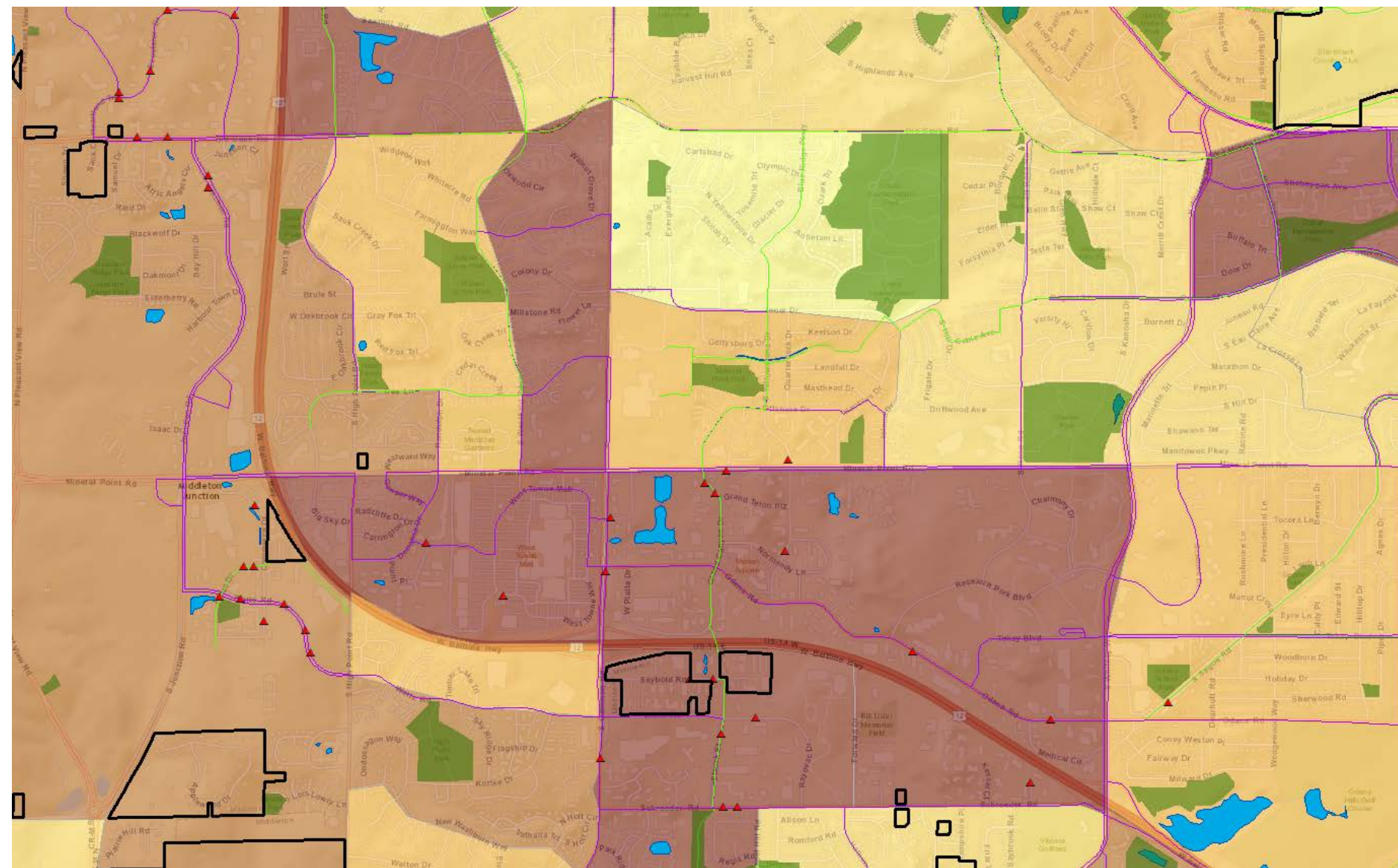
Dane County Heat Vulnerability (county based quantiles)

- Low (bottom 20%)
- Moderate Low
- Moderate
- Moderate High
- High (top 20%)

Health Benefits:

- Reduction of urban heat island effect
- Improved air quality
- Increased food security
- Increased opportunities to recreation/physical activity

Findings Action 7-11: "Promote usage of public rights-of-way (public land) and parks as edible landscapes, sculpture gardens, community gardens, prairie, etc."



Legend

□ Wisconsin_Municipal_Boundaries_Spring_2016

■ City of Madison Parks, Gardens, Zoos, Cemeteries

▲ Madison Vacant Land Sales

Transportation

— Existing Bike Paths

◆ Madison B-cycle Stations

— Existing Bus Routes

Dane County Heat Vulnerability (county based quantiles)

■ Low (bottom 20%)

■ Moderate Low

■ Moderate

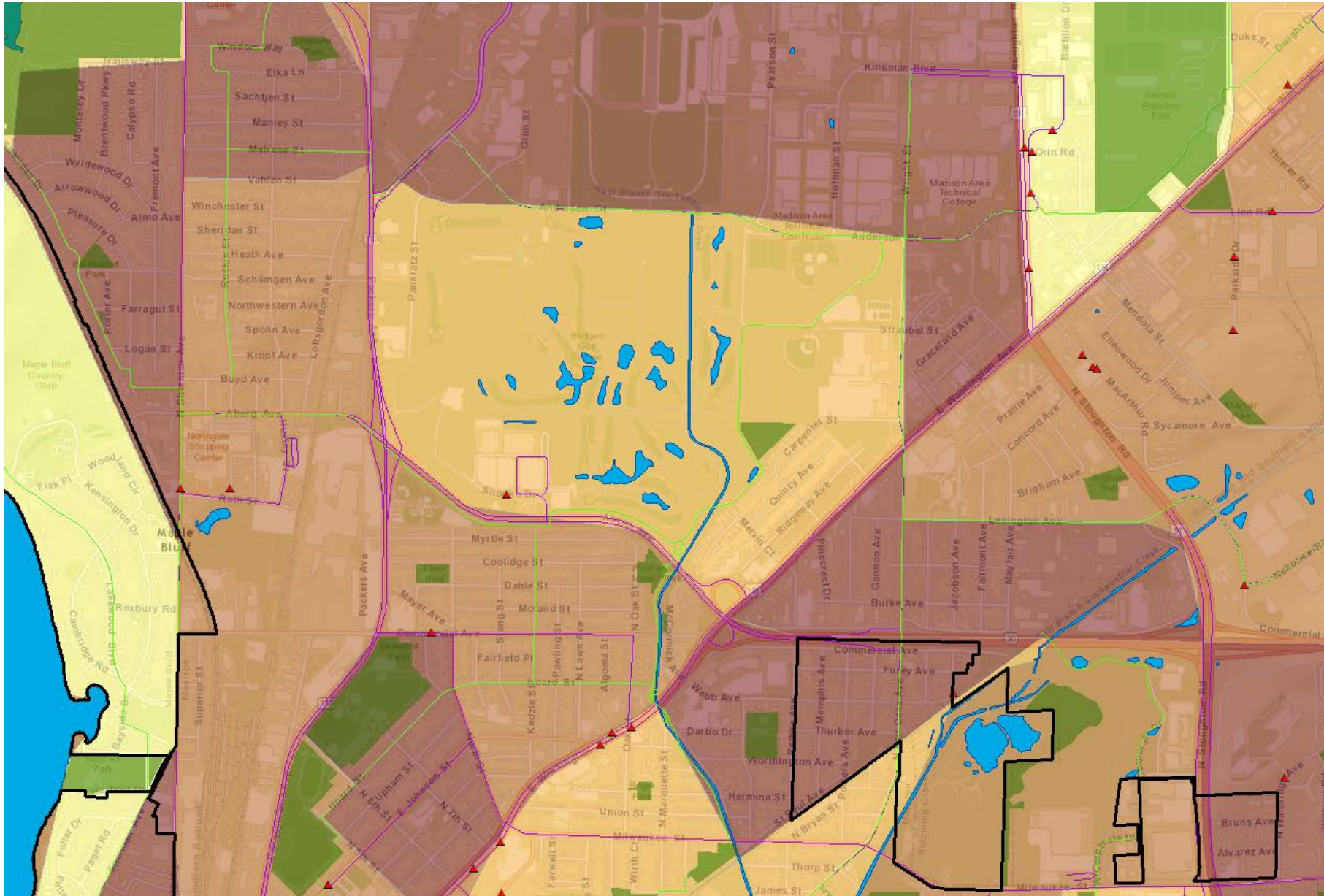
■ Moderate High

■ High (top 20%)

Health Benefits:

- Reduction of urban heat island effect
- Improved air quality
- Increased food security
- Increased opportunities to recreation/physical activity

Findings Action 7-11: "Promote usage of public rights-of-way (public land) and parks as edible landscapes, sculpture gardens, community gardens, prairie, etc."



Legend

- Wisconsin Municipal Boundaries, Spring 2016
- City of Madison Parks, Gardens, Zoos, Cemeteries
- Madison Vacant Land Sales

Transportation

- Existing Bike Paths
- Madison B-cycle Stations
- Existing Bus Routes

Dane County Heat Vulnerability (county based quantiles)

- Low (bottom 20%)
- Moderate Low
- Moderate
- Moderate High
- High (top 20%)

Health Benefits:

- Reduction of urban heat island effect
- Improved air quality
- Increased food security
- Increased opportunities to recreation/physical activity



Recommendations:

- 1) Utilize the spatial assessment to identify vulnerable communities that would best benefit from the establishment and/or expansion of parks.
- 2) Utilize this assessment as a baseline in order to target future investments in parks, open spaces, trails, and green infrastructure.



Thank you!

Questions?