



# Where We Ride: Bicycle and Pedestrian Networks & Improvements

October 18, 2021

APA-PA Annual Conference - Pittsburgh

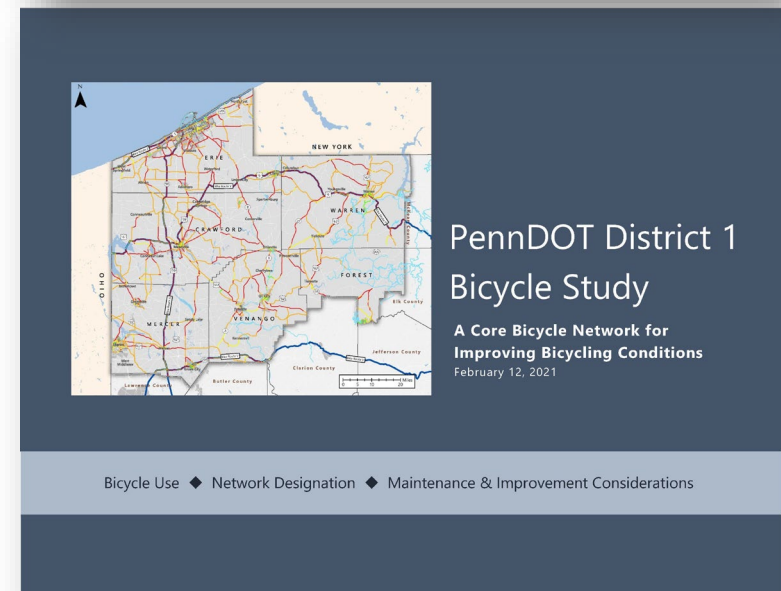
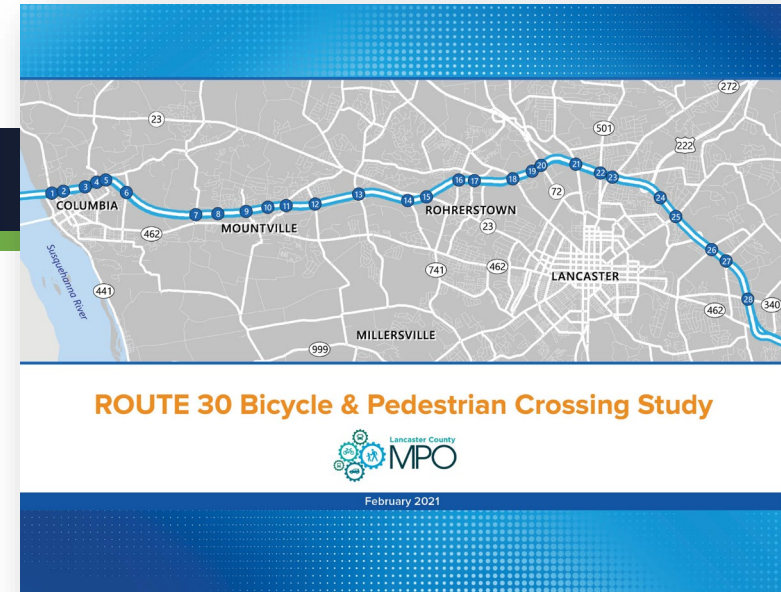


*Excellence Delivered **As Promised***



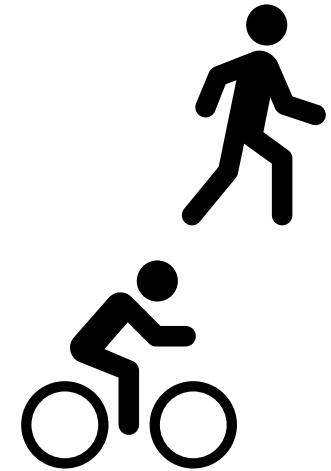
# SESSION BACKGROUND

- Two transportation agencies
  - Working toward systematic improvements
  - With many potential locations for improvement, unequal in demand or investment return
  - Wanting to identify priority locations
- Two studies funded under PennDOT Connects
  - MPO to use priority locations to advance bicycle TIP projects and Connects requests
  - PennDOT District to reference when tailoring maintenance activities by corridor and defining needs for TIP projects

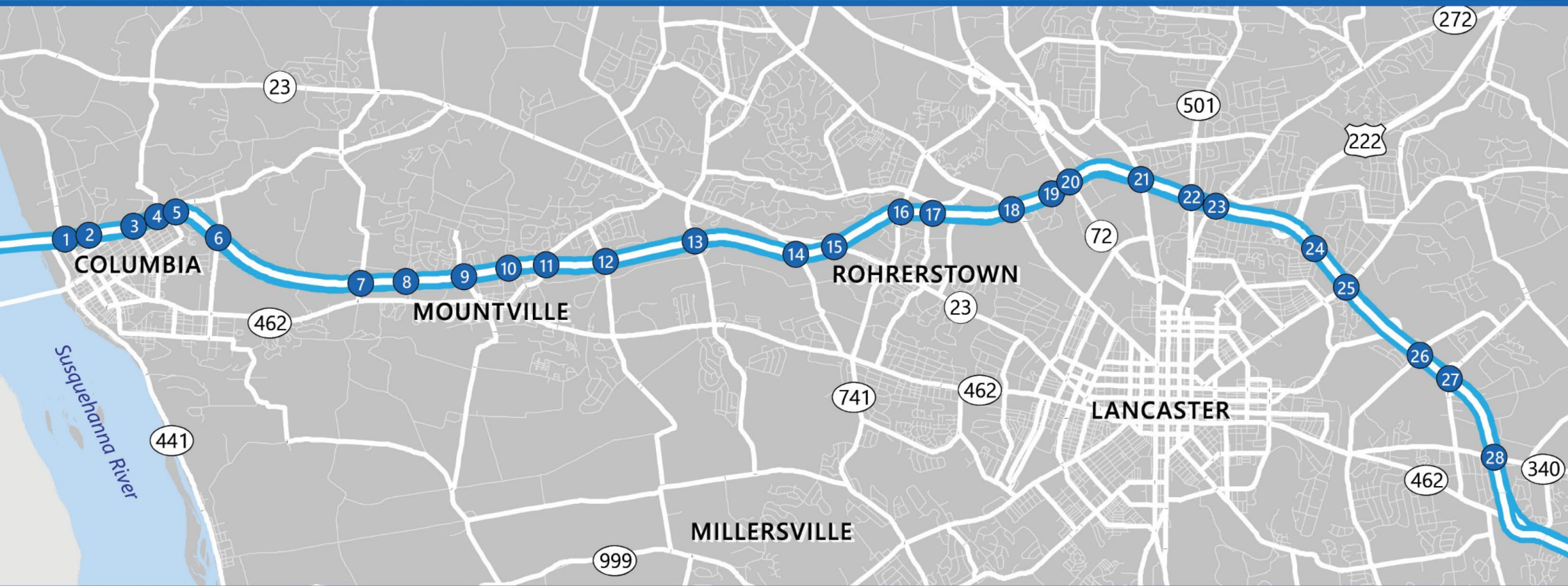


## SESSION DESTINATION (aka OBJECTIVES)

- ◆ Identify data sources that represent existing and planned bicycle and pedestrian use.
- ◆ Explain how analytic tools (pedestrian level of service and bicycle level of traffic stress) can inform decision-making processes
- ◆ Characterize the importance of simple, transparent network designation and improvement prioritization methods





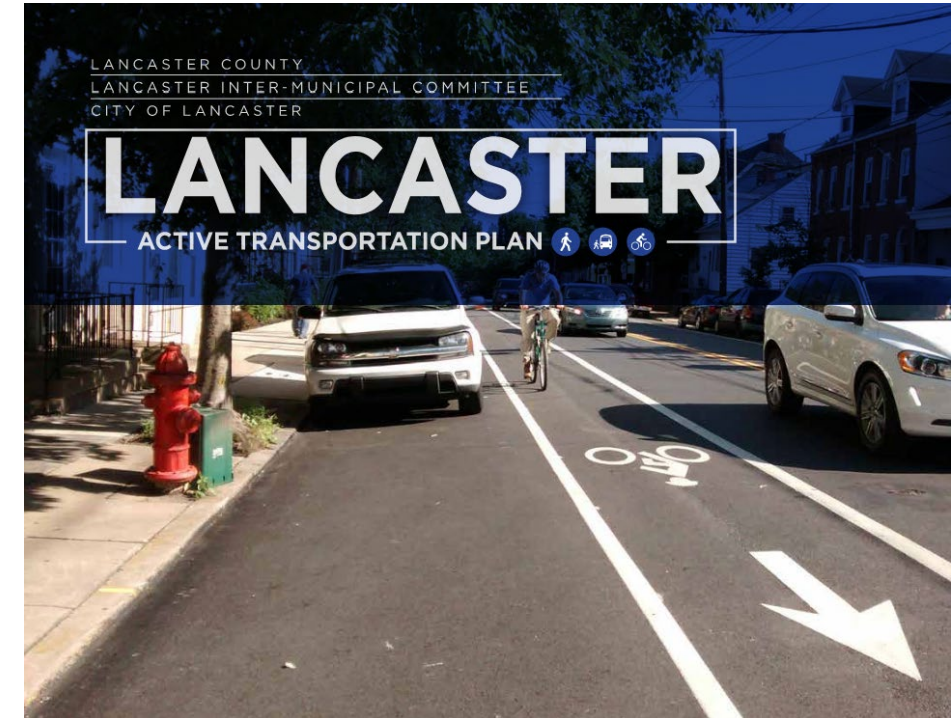


# Route 30 Crossing Prioritization

## for the Lancaster County MPO



# STUDY PURPOSE







## Varying Contexts

## **BASELINE CONDITIONS – WHERE TO BEGIN?**

### **28 Crossings of Route 30 (Limited Access Highway)**

- 8 crossings with an existing sidewalk
- Avg. Daily Traffic range: 2,000 – 40,000
- Cross-sections: 2 lanes to 7 lanes
- Land Use Context: Rural to Suburban





# DEFINING THE ANALYSIS

- What is the current level of stress/comfort?
  - Pedestrian Level of Service
  - Bicycle Level of Traffic Stress
- Defining the goal: what is “comfortable”?
- What improvements would be required to make each crossing a “comfortable” crossing?
- Defining priorities: which crossings have the best cost /benefit for improvement?



**What contextual factors influence**



**comfort/stress?**



## MEASURING COMFORT/STRESS

Existing Sidewalk / Bike Lane

Shoulder Width





Number of travel lanes / parking

Traffic Volume

Speed Limit / Travel Speed



# DEFINING “COMFORTABLE”

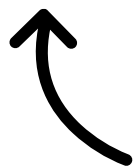
LTS	Comfortable Enough for (cyclist type)	Characteristics
1	 <b>EVERYONE</b>	<ul style="list-style-type: none"><li>• Relaxing</li><li>• Suitable for children</li></ul>
2	 <b>INTERESTED, BUT CONCERNED</b>	<ul style="list-style-type: none"><li>• Suitable for most adults</li><li>• Presenting little traffic stress</li></ul>
3	 <b>ENTHUSED AND CONFIDENT</b>	<ul style="list-style-type: none"><li>• Moderate traffic stress</li><li>• Comfortable for those already riding bikes in American cities</li></ul>
4	 <b>STRONG AND FEARLESS</b>	<ul style="list-style-type: none"><li>• High traffic stress</li><li>• Multilane, fast moving traffic</li></ul>

## BASELINE CONDITIONS – WHERE TO BEGIN?

### 28 Crossings of Route 30 (Limited Access Highway)



2 crossings – A/B for bike and ped



2 crossings – C for both bike and ped



24 crossings – C/D







# OBJECTIVES

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2 crossings – A/B for bike and ped

“Acceptably Comfortable”



2 crossings – C for both bike and ped

“Unacceptably Stressful”



24 crossings – C/D

# OBJECTIVES

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# SIGNIFICANT CHANGES REQUIRED!



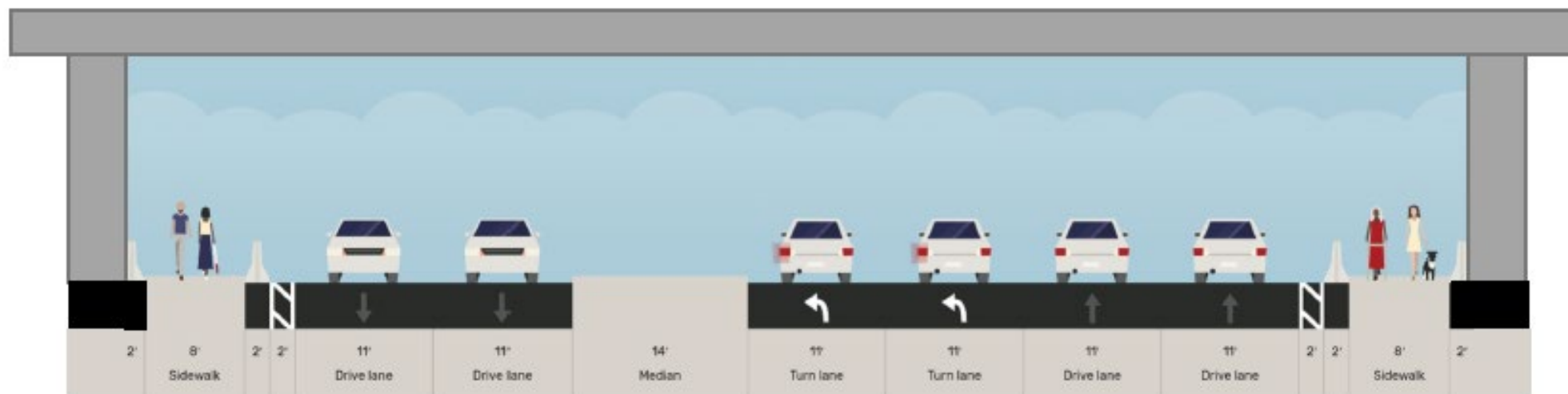


# Schematic Sections

Lititz Pike  
(existing)

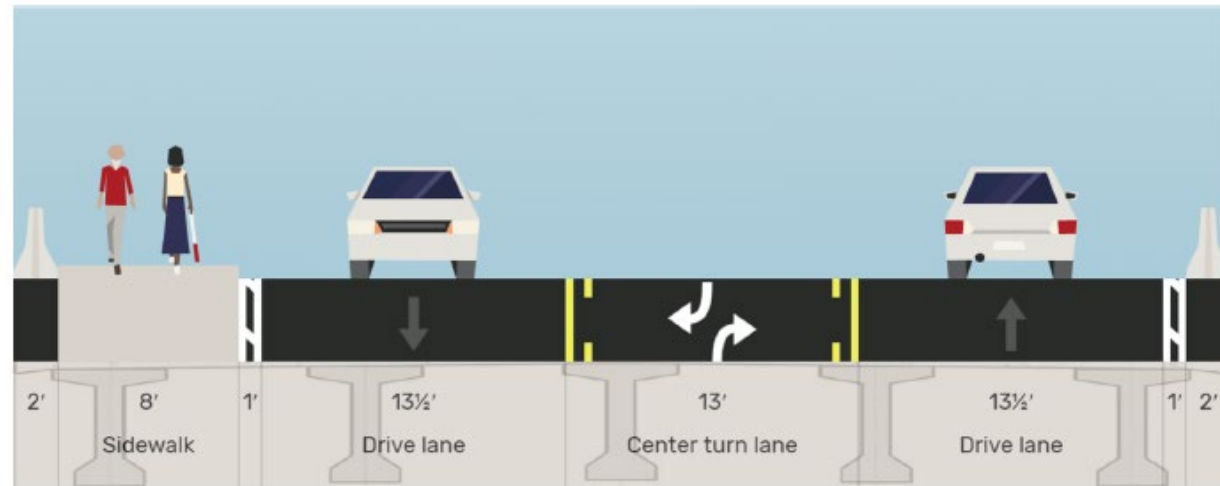


Lititz Pike  
(proposed)



# Schematic Sections

**Good Drive**  
(existing)



**Good Drive**  
(proposed)

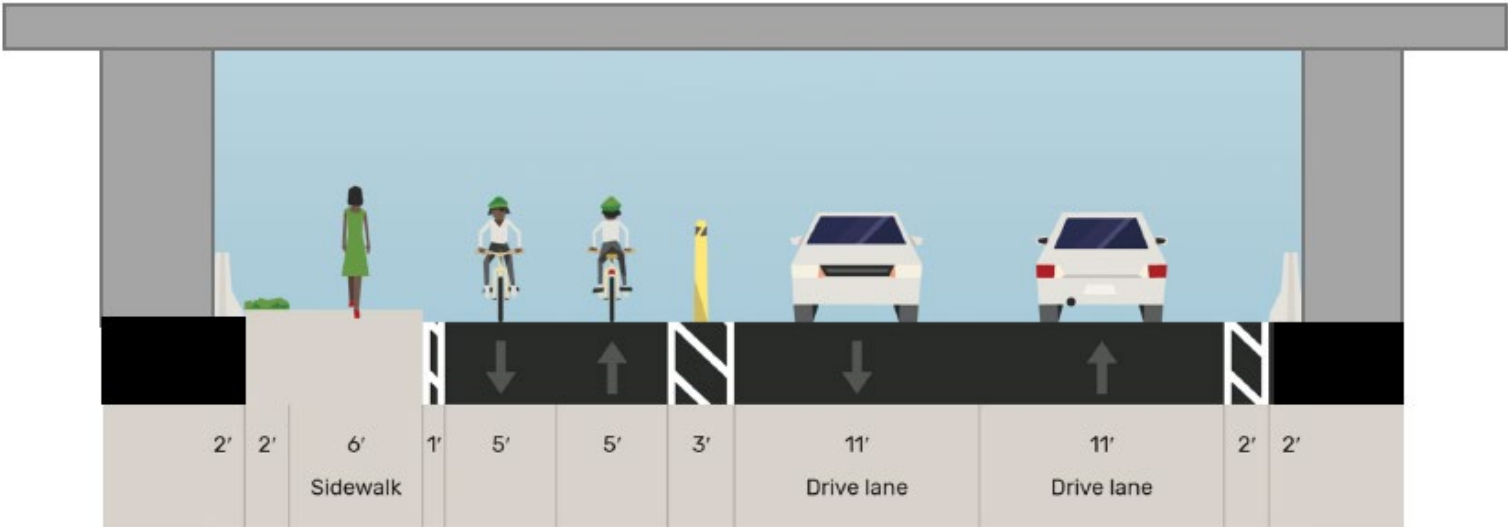


# Schematic Sections

Pitney Road  
(existing)

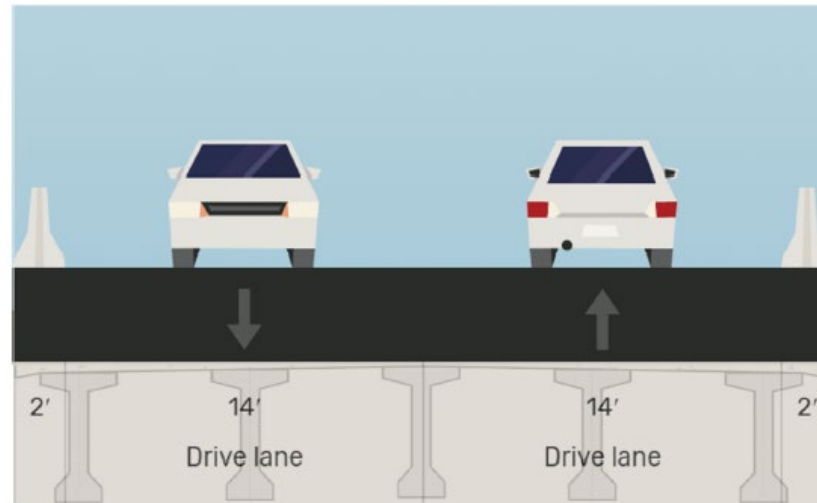


Pitney Road  
(proposed)



## Schematic Sections

Druid Hill Road  
(existing)



Druid Hill Road  
(proposed)





# OBJECTIVES

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# Crossing Prioritization Analysis

## User Benefit

Planned Lancaster ATP Network  
Planned Greenway  
Designated BicyclePA Route  
(bike only)  
Serves low-income and minority  
populations  
Existing / Projected Usage

**Benefit Score (max bike) = 33**

**Benefit Score (max ped) = 30**



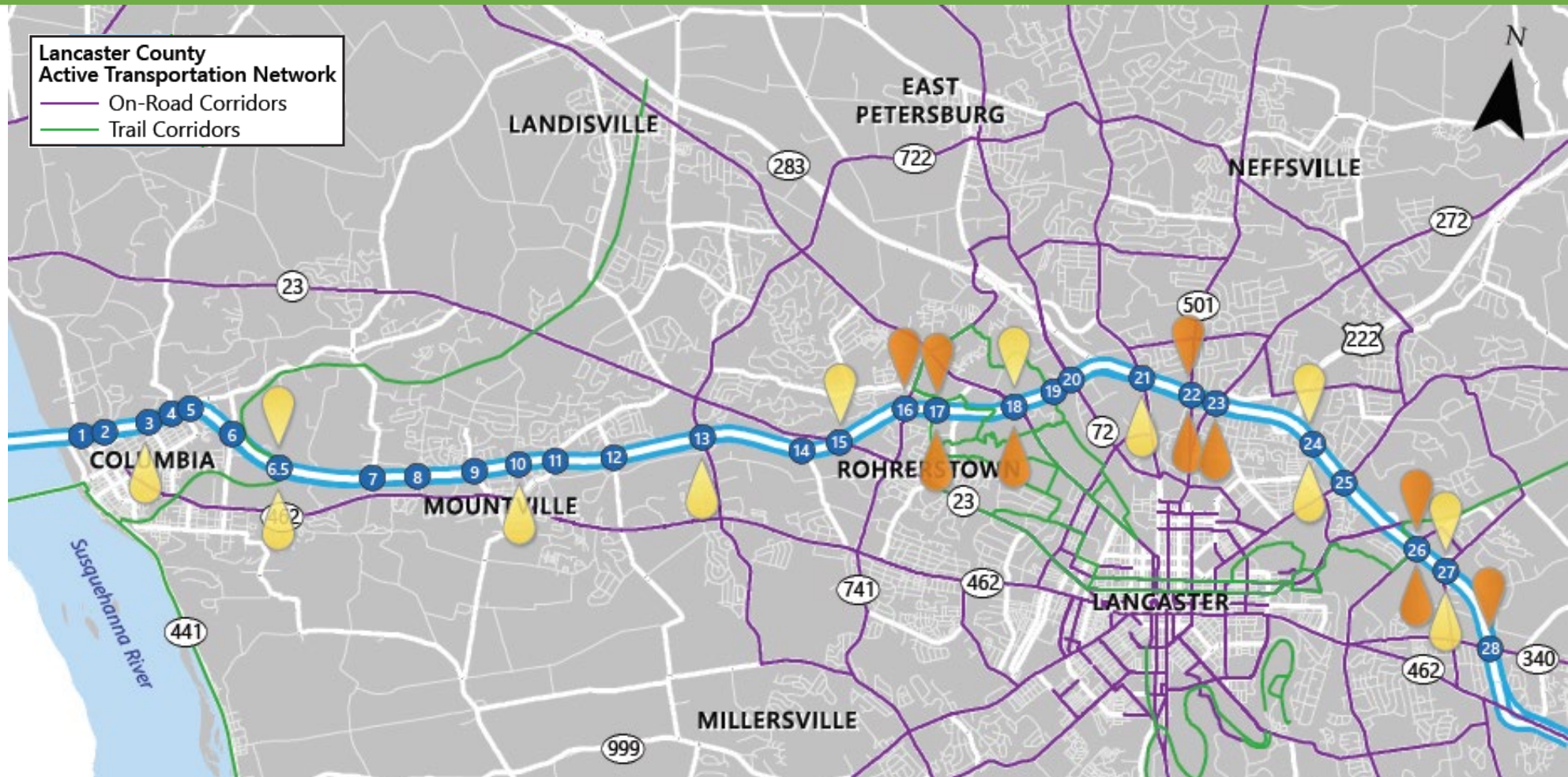
## Improvement Cost

Less than \$100,000  
\$100,000 to \$500,000  
\$500,000 to \$1,000,000  
\$1,000,000 to \$3,000,000  
Greater than \$3,000,000

**Cost Score = 1 to 5**

# Crossing Prioritization

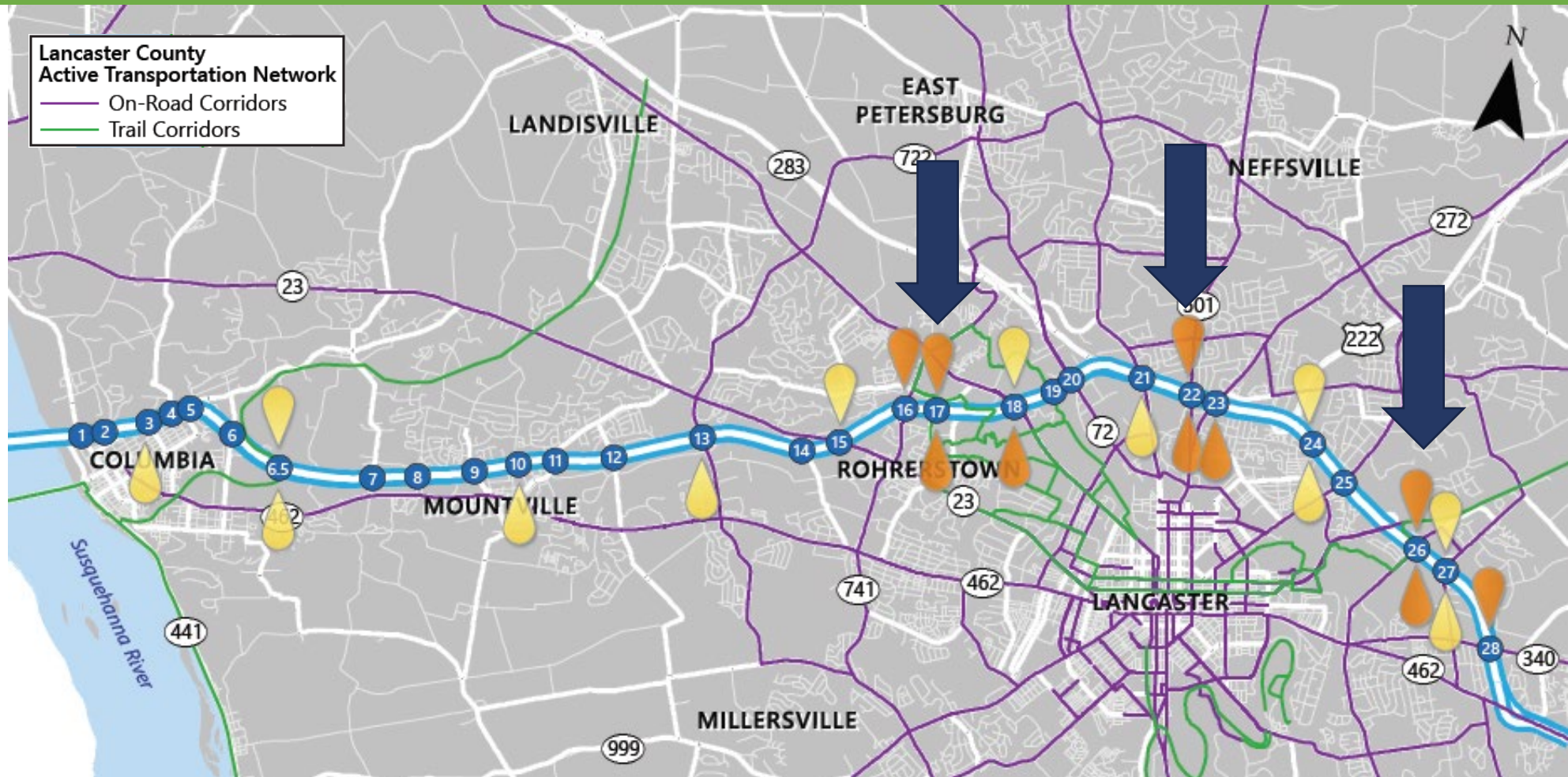
## 3 Tiers for Improvement





# Crossing Prioritization

## 3 Tiers for Improvement



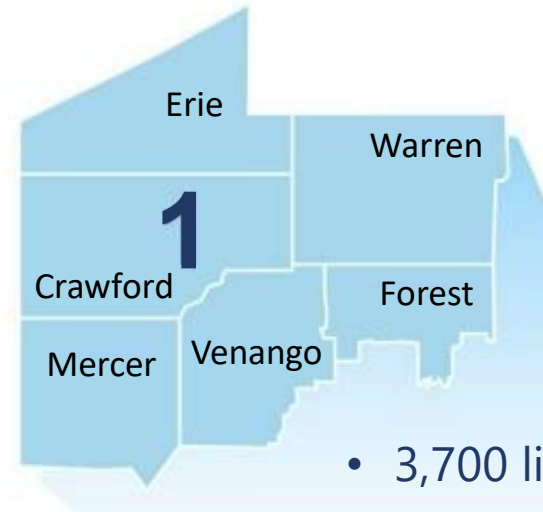




# Bicycle Network for PennDOT Engineering District 1

# Study Objectives

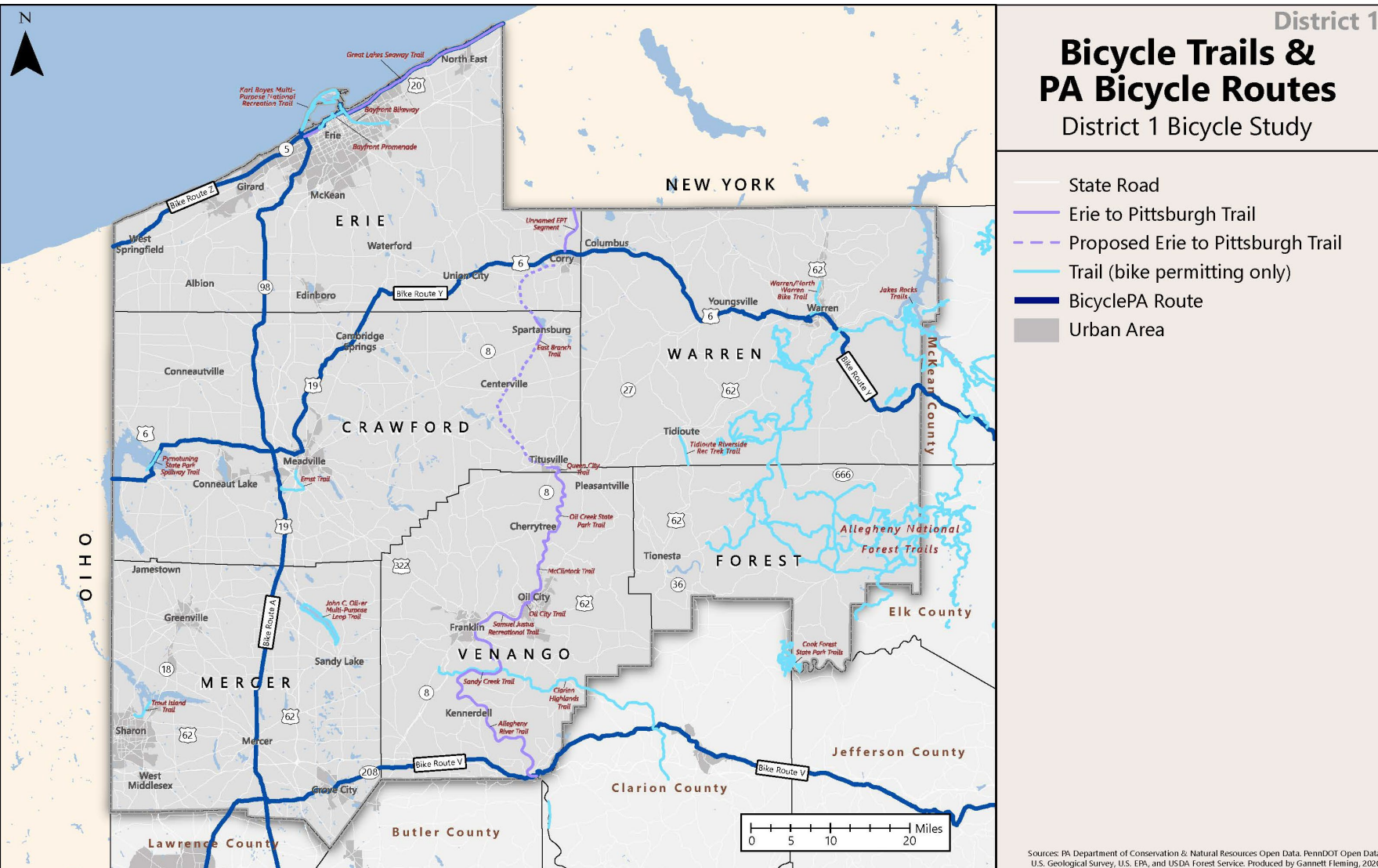
1. Identify formally designated and planned bicycling routes
2. Engage bicyclists in identifying state roads regularly used for bicycling and the conditions that are most important to them
3. Analyze bicyclist stress level on state roads by segment
4. Define a Core Bicycle Network as a District planning and programming tool
5. Develop a bicycle planning toolbox for the District and the region's communities



## District 1 Characteristics

- 3,700 linear miles of state highways
- 6 counties: Crawford, Erie, Forest, Mercer, Venango, and Warren
- Northwest Pennsylvania:
  - Appalachian Plateau – broad, flat uplands; sharp, shallow valleys
  - Erie Lake Plain

# Objective 1: Designated and Planned Routes

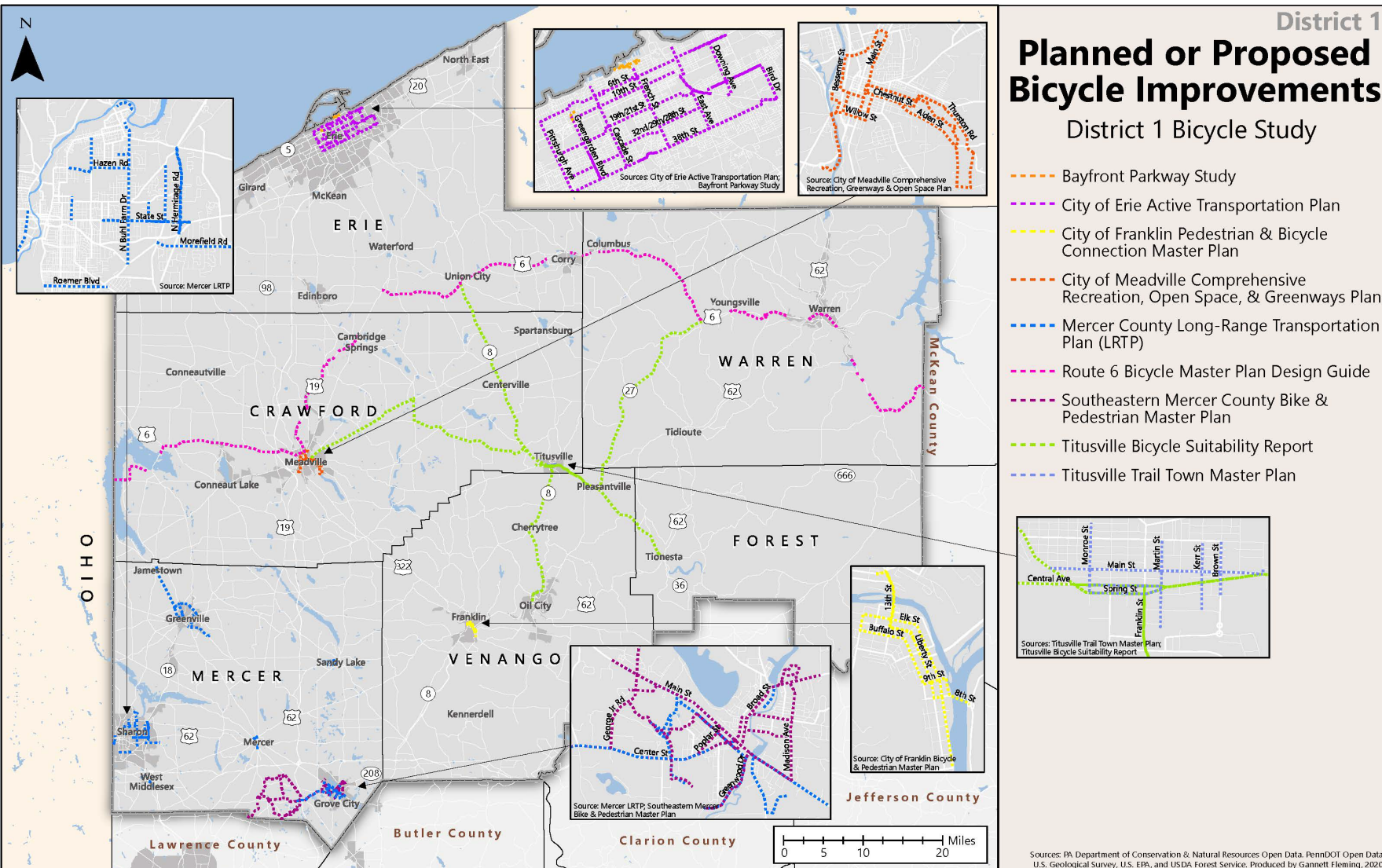


## Secondary data

1. PA Bicycle Routes (A, Y, V, and Z)
2. Off-road Trails



# Objective 1: Designated and Planned Routes

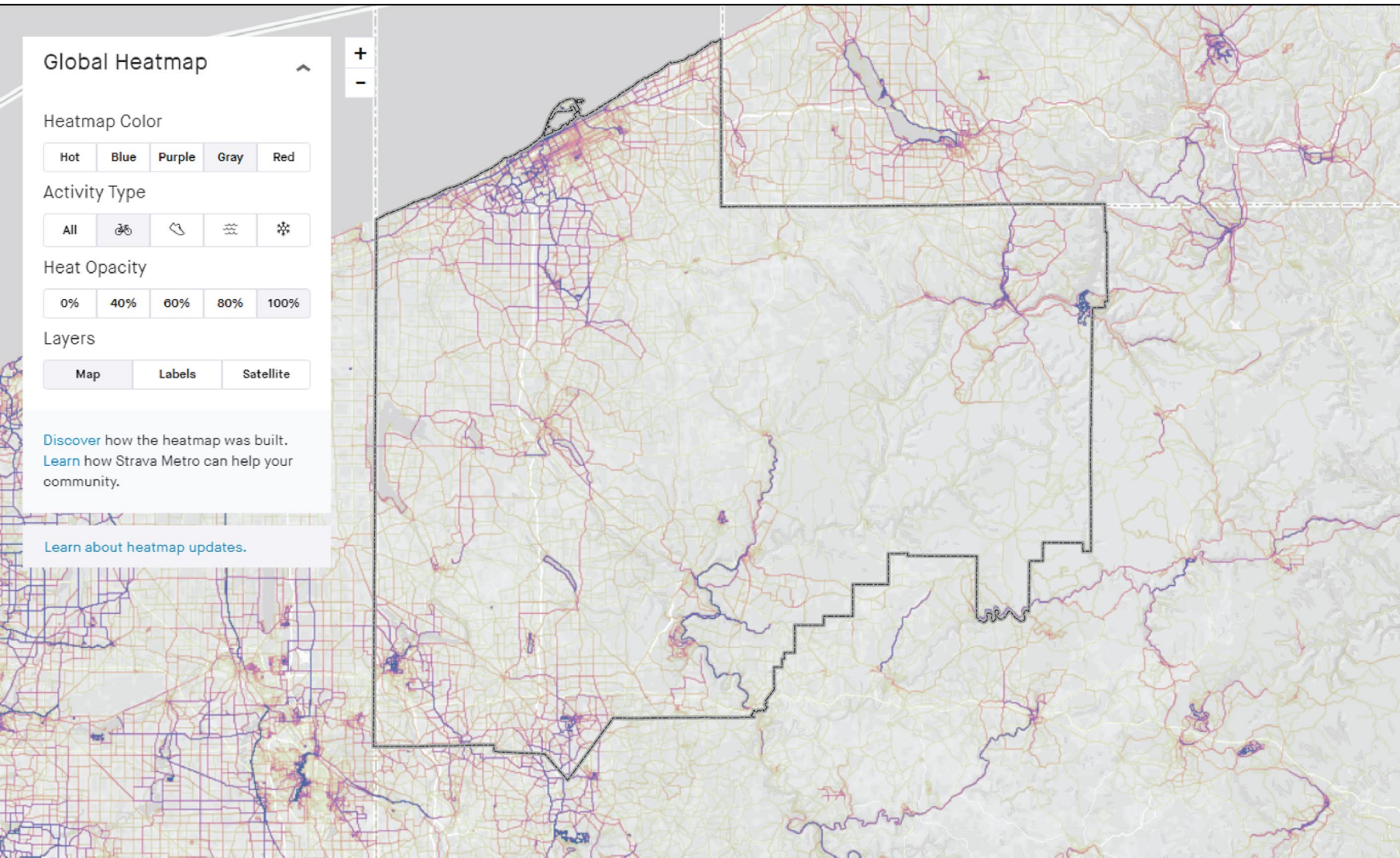


## Secondary data

1. PA Bicycle Routes (A, Y, V, and Z)
2. Off-road Trails
3. Bicycle plans and studies
4. TIP projects with bicycle elements



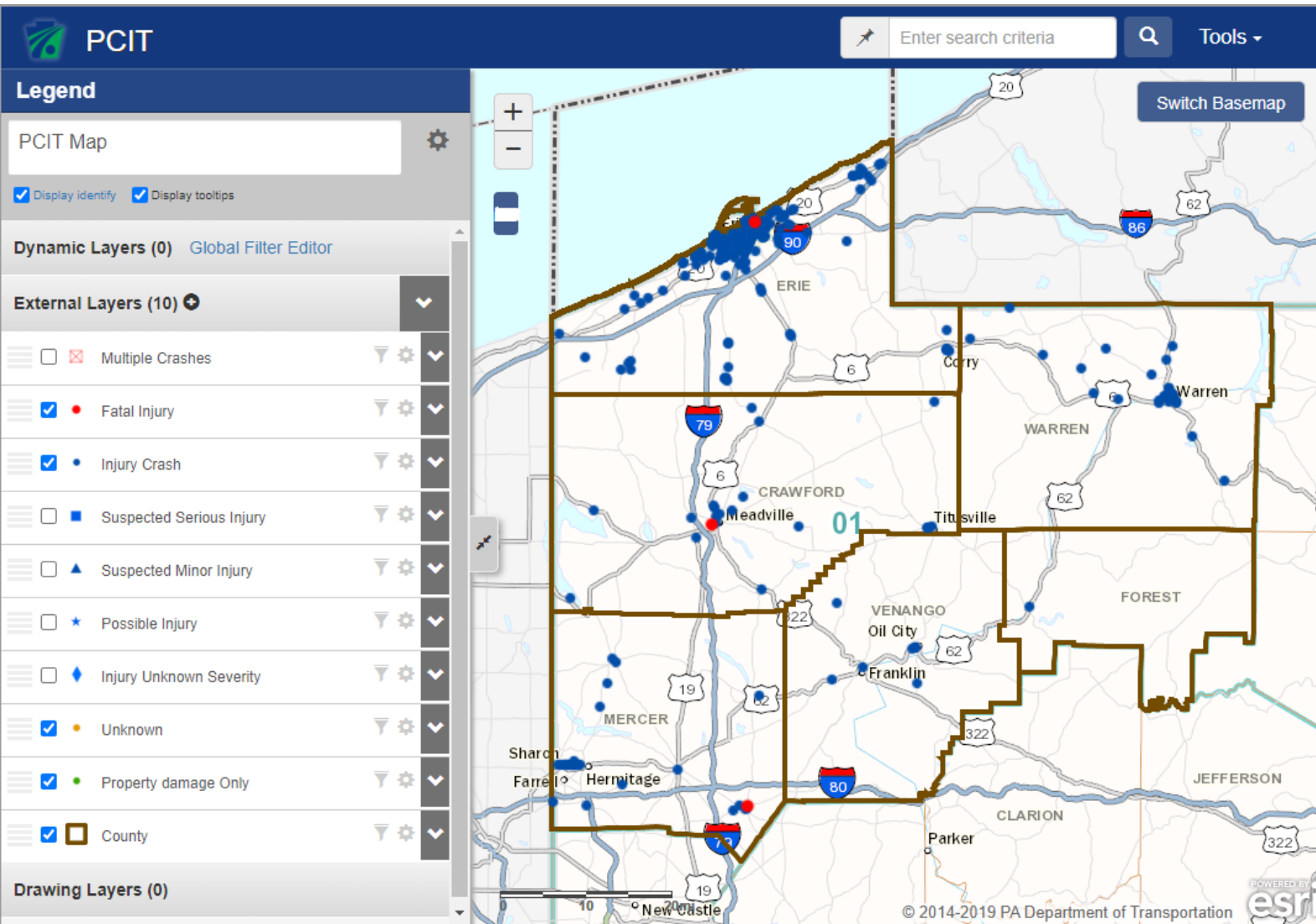
## Objective 2: Engage bicyclists to identify routes uses and conditions of concern



### Other Data Sources

- Strava Global Heatmap
  - Limitations to the data and its access
  - Used as a heads-up reference

## Objective 2: Engage bicyclists to identify routes uses and conditions of concern



### Other Data Sources

- Strava Global Heatmap
- PA Crash Information Tool
  - Filtered to crashes involving a bicycle



## Objective 2: Engage bicyclists to identify routes uses and conditions of concern

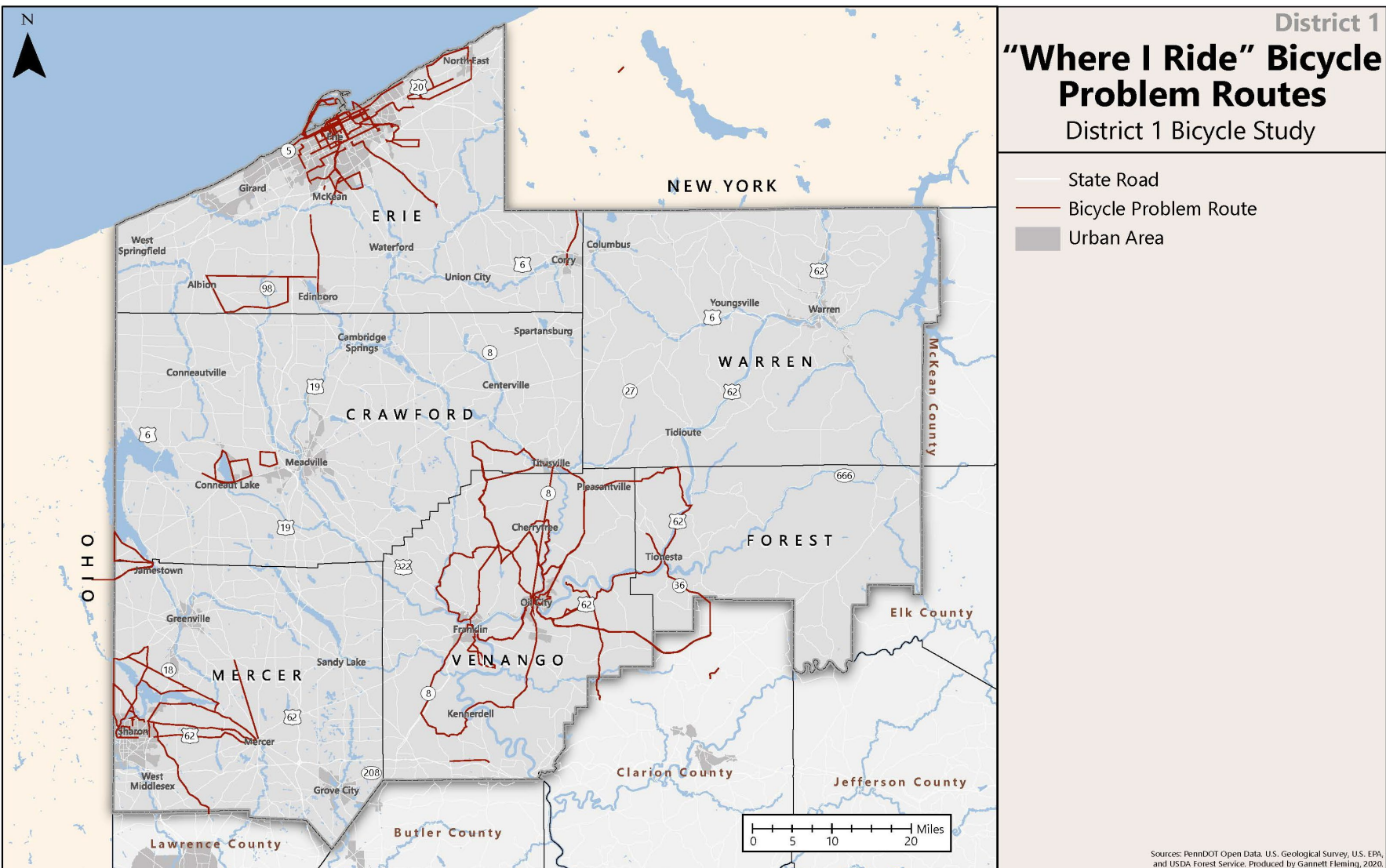
### Notified/Invited bicyclists via:

1. District 1 press release
2. Committee distribution of notice
3. Direct email to a list built from
  - participants listed in past plans and studies
  - bicycle clubs
  - bicycle shops
  - committee contacts
4. Facebook ad targeted to western PA and northeastern Ohio



**Where/How do you invite bicyclists to give input or feedback?**

## Objective 2: Engage bicyclists to identify routes uses and conditions of concern



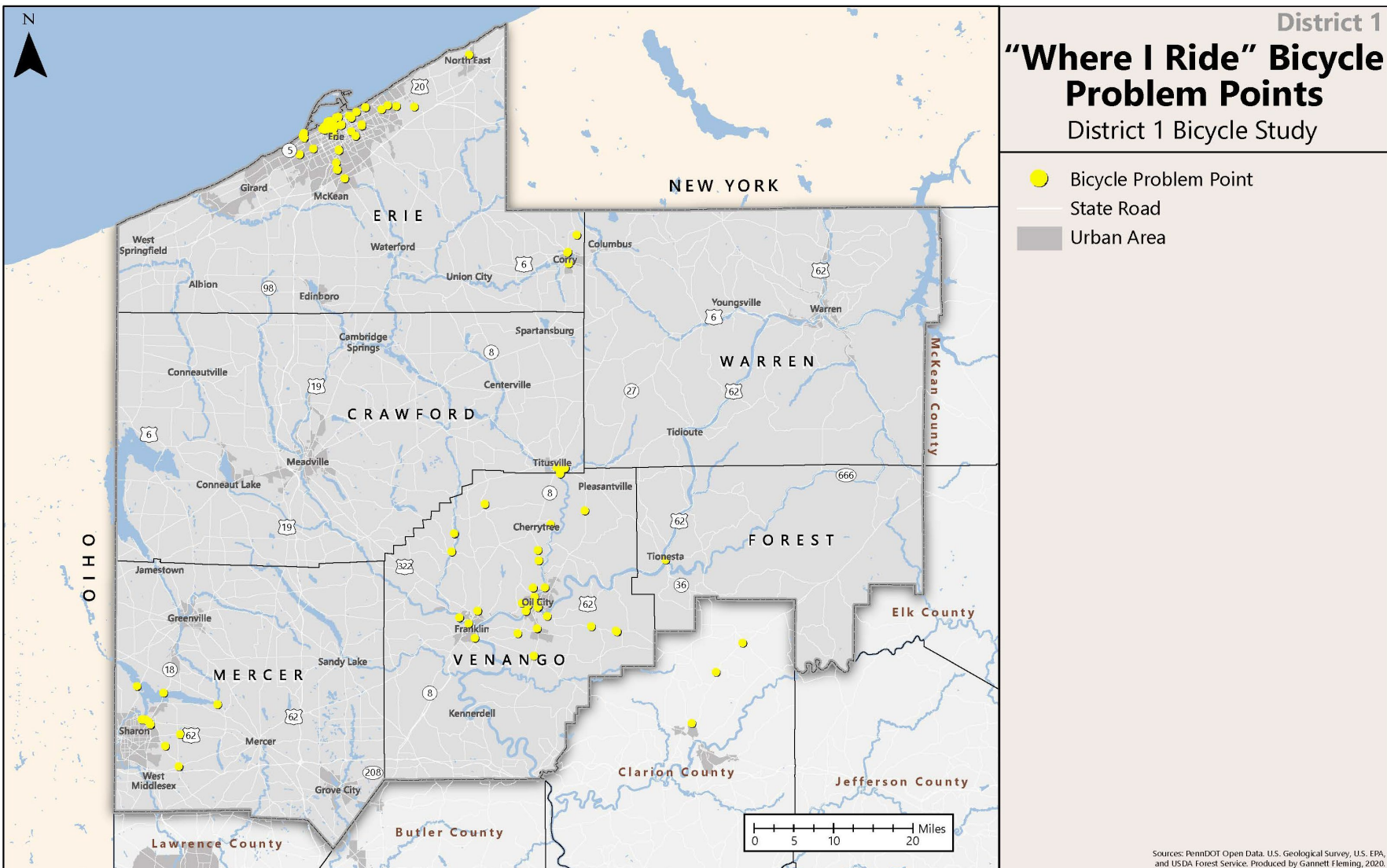
### Engagement Method

Online Interactive Maps

### Outreach 1:

Where I Ride (routes); trip purpose, frequency, group size

## Objective 2: Engage bicyclists to identify routes uses and conditions of concern



**Engagement Method**

Online Interactive Maps

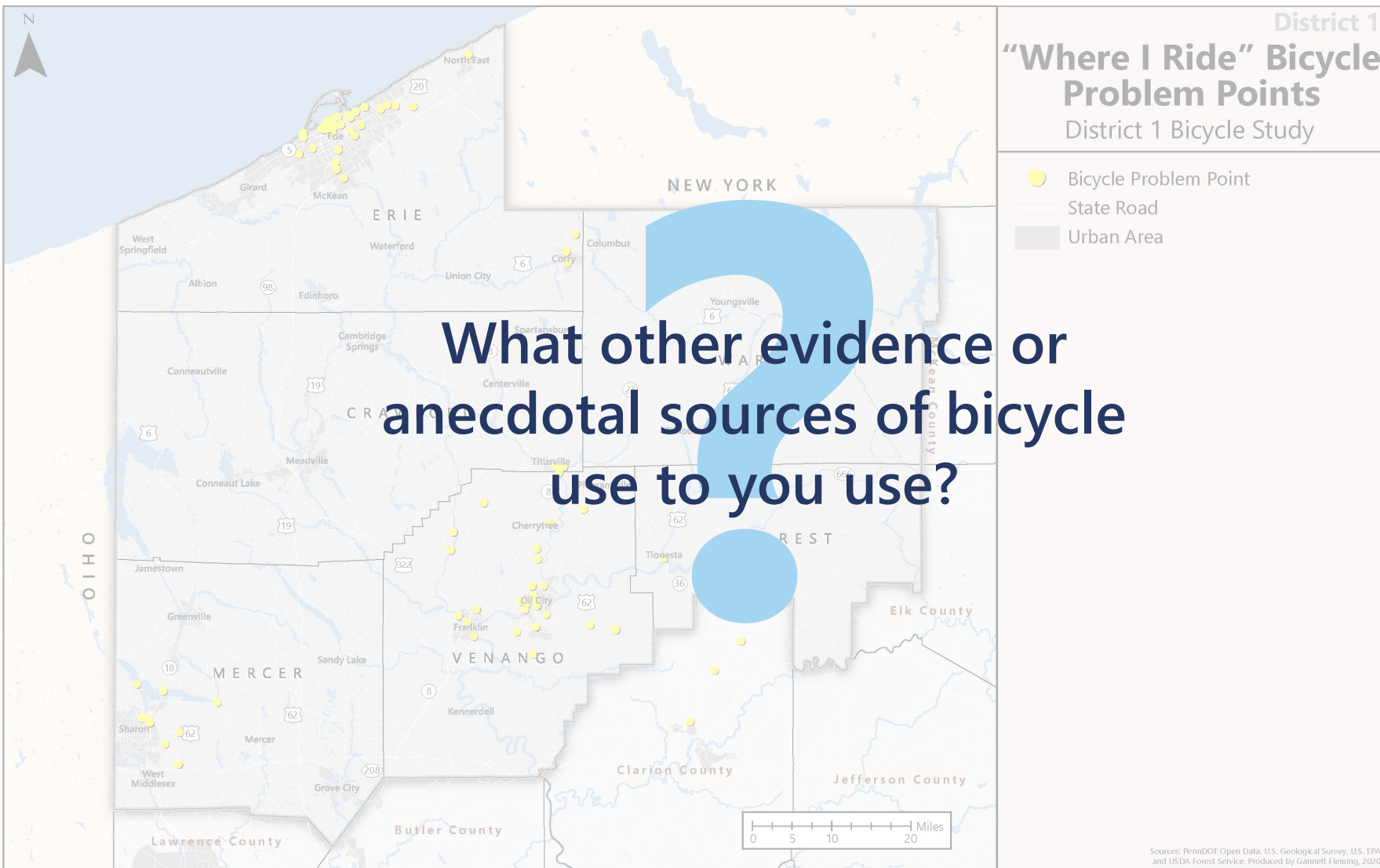
**Outreach 1:**

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Issues by type and description



## Objective 2: Engage bicyclists to identify routes uses and conditions of concern



### Engagement Method

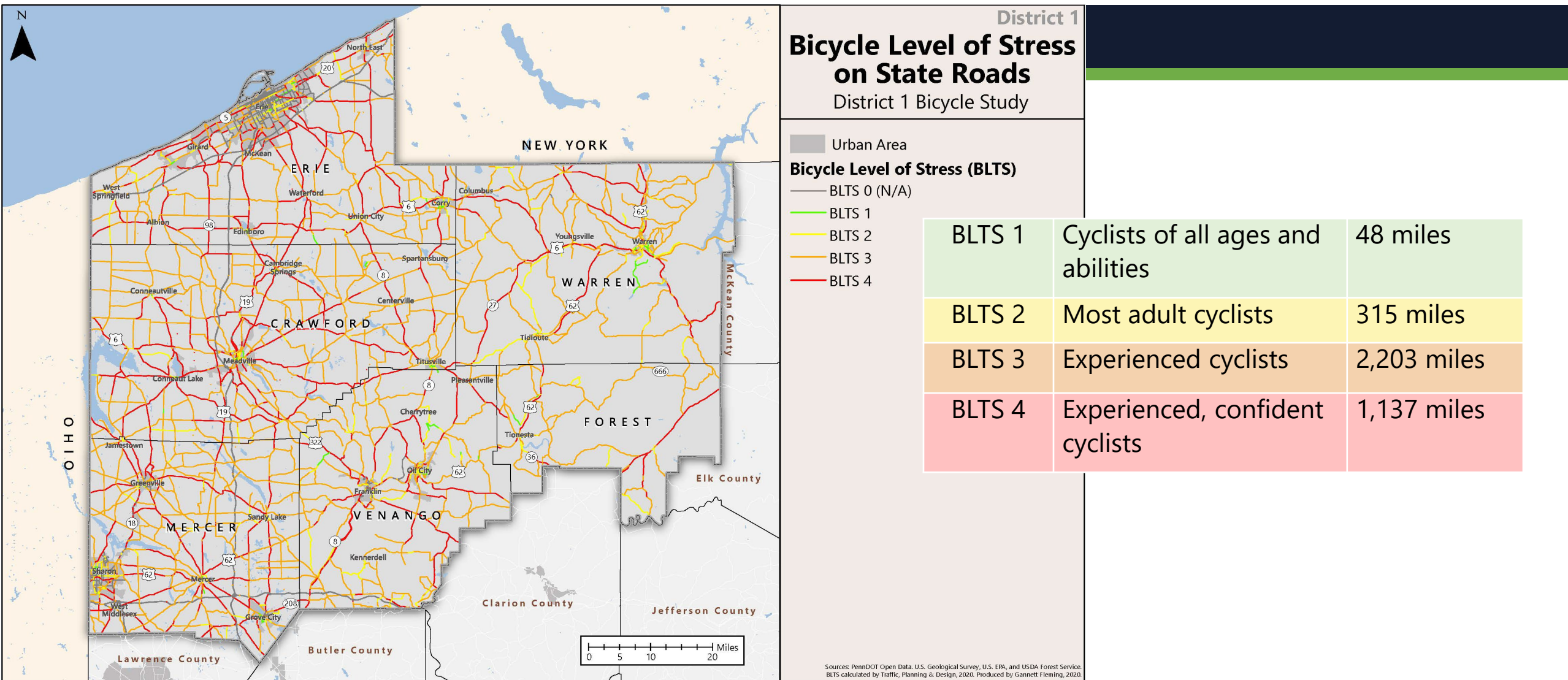
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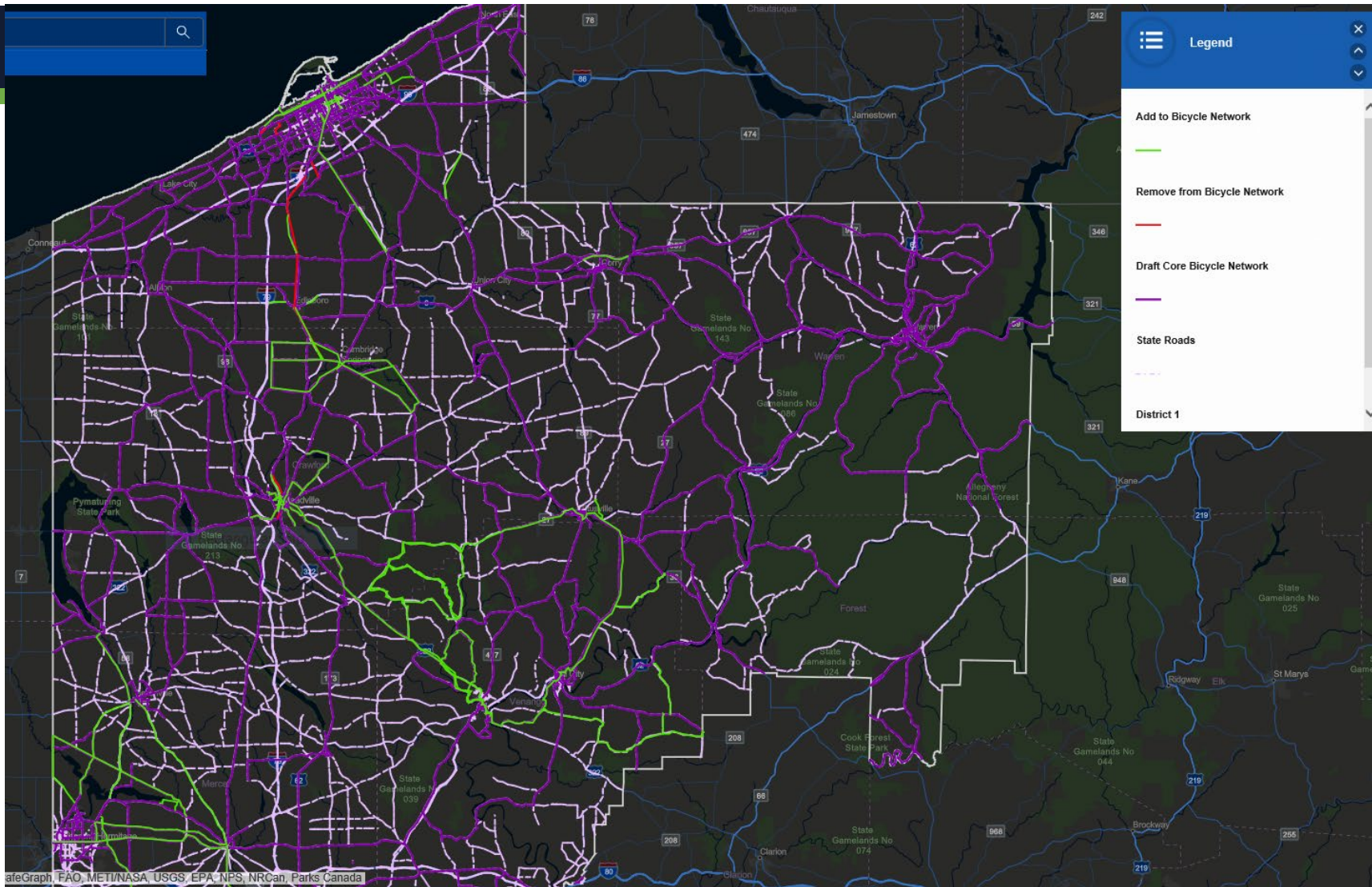
Issues by type and description

# Objective 3: Analyze bicyclist stress level on state roads by segment





## Objective 4: Define a Core Bicycle Network as a planning/programming tool



Engagement Method

Online Interactive Maps

Outreach 1:

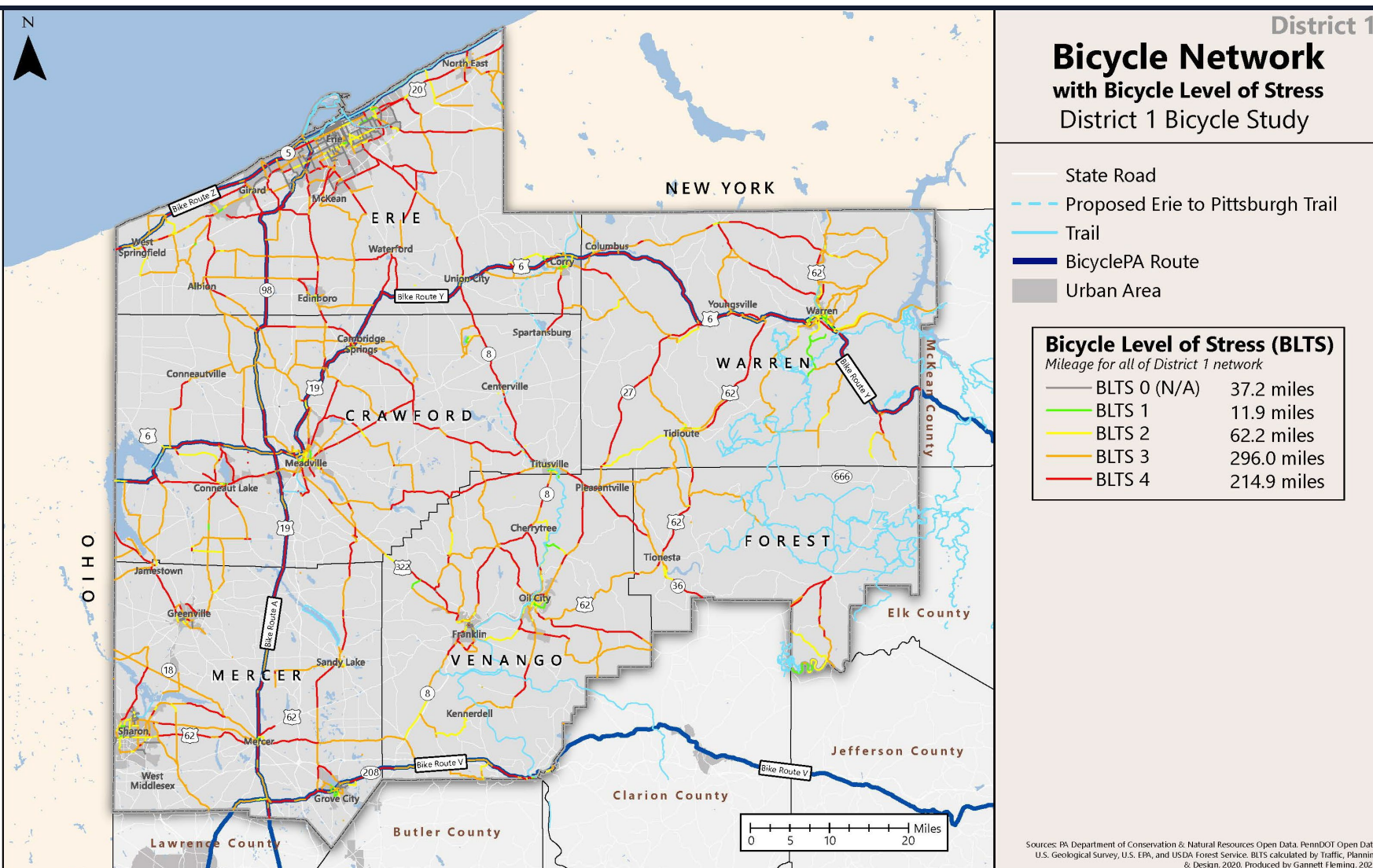
Where I Ride

Outreach 2:

Mark-up of Draft  
Core Bicycle Network  
to **add** or **remove**  
segments



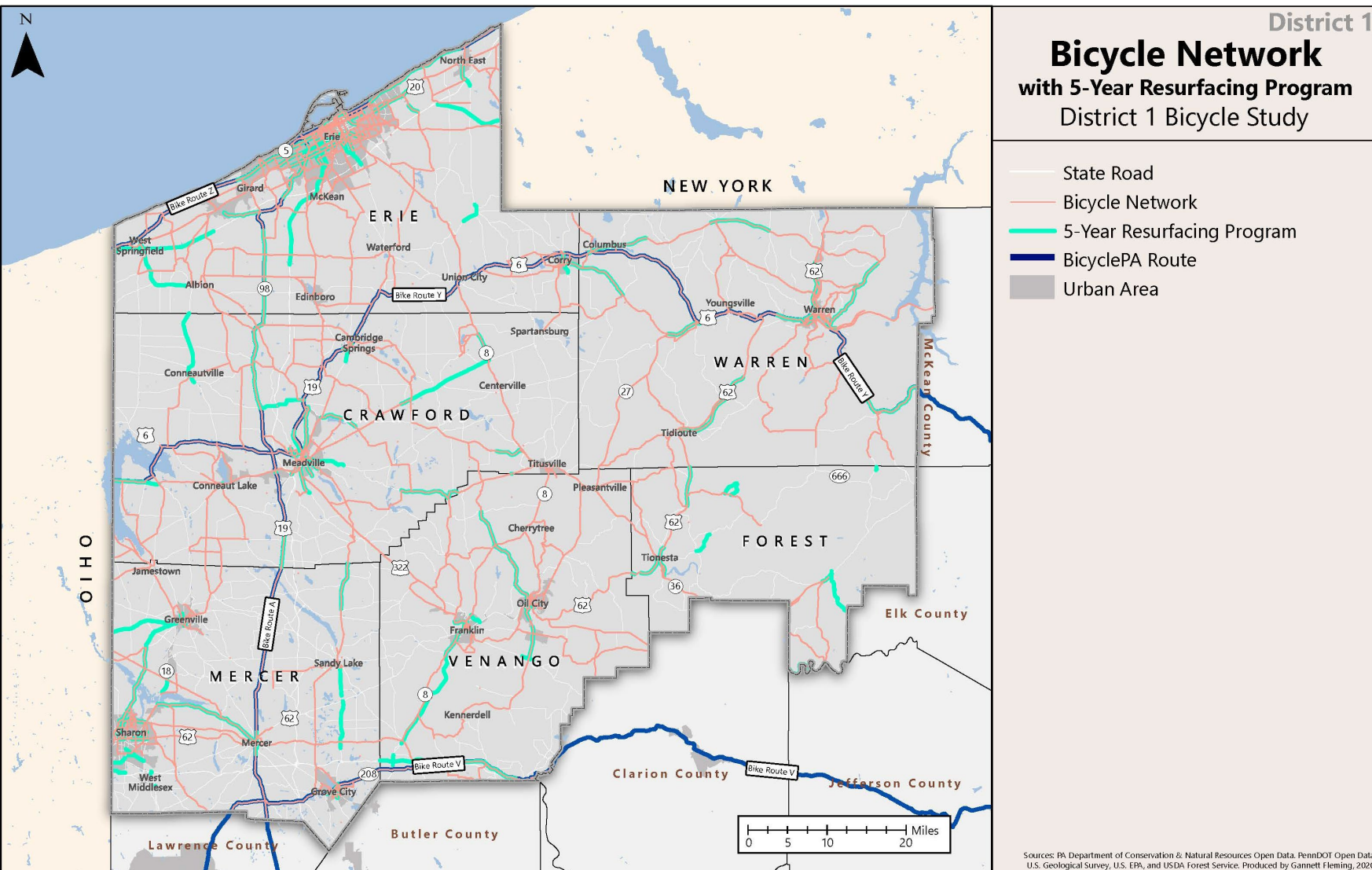
## Objective 4: Define a Core Bicycle Network as a planning/programming tool



**Total Network –  
622.2 miles**

**1 in 6 miles or  
16% of the state  
highway network  
matters to  
bicyclists today**

## Objective 4: Define a Core Bicycle Network as a planning/programming tool



Bicycle Network can be used as a reference for:

- Routine maintenance activities
- Advanced maintenance projects
- TIP candidate purpose and need statements

## Results and Lessons Learned

1. **Targeted invitations were critical to reaching the target audience**
2. **Methods for bicycle use, O/D, and route data are still evolving**
  - Bicycle and pedestrian counts are ideal; online mapping can serve us in the interim
3. **Online mapping was reasonably successful**
  - Simple actions and clear instructions are key
4. **Current and planned use data results in a large network**
  - A large network may be adequate as a planning/programming tool



# WHERE WE RIDE PRESENTERS

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Gannett Fleming, Inc.

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