STATE OF WALKING AND BIKING

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Project: City of Dayton Active Transportation Plan

Re: DRAFT State of Walking and Biking: Existing Conditions Chapter

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STATE OF WALKING AND BIKING: EXISTING CONDITIONS CHAPTER

This chapter examines several elements of the City of Dayton's transportation system. It presents a demographic profile of Dayton and a plan and policy review summarizing existing active transportation and related efforts to date, framing the current planning process as a logical next step in Dayton's active transportation evolution. This chapter also summarizes existing programs that support active transportation. A set of analyses that examines the active transportation system from various perspectives (e.g., equity, safety, connectivity) is also included.

POPULATION AND HISTORICAL CONTEXT

DEMOGRAPHIC PROFILE

The City of Dayton is a medium-sized city located in the center of the Miami Valley region of Ohio, approximately 50 miles north of Cincinnati. It is the county seat of Montgomery County, Ohio and the sixth largest city in the state. Dayton covers approximately 56.76 square miles[1] and is home to 137,644 residents[2].At its peak in the 1960's, Dayton's population reached 262,332 people[3]. From 2000-2010, the City's population declined by 15 percent, but current trends show a stabilization of Dayton's population loss; according to the 2020 census Dayton's population declined only 3 percent[4] between 2010 and 2020. Such significant population losses impacted Dayton's tax revenue creating challenges for maintaining existing infrastructure and stalling the ability to install comprehensive new trail systems or bike infrastructure. Streets built for 260K+ (wide, fast, few signals) are now serving half that number and create safety challenges as vehicles travel at higher speeds.

Over the past ten years, the city has experienced exciting economic renewal, resulting in new jobs and attracting new residents to the city. New high-tech and creative industries, in addition to a strong foundation of local entrepreneurs, are fueling the revitalization of the downtown area and surrounding historic residential districts. The Active Transportation Plan complements the economic redevelopment of the city by identifying opportunities to increase access to and promote the already abundant outdoor

[1] U.S. Census Bureau (2022). Quick Facts. Retrieved from [https://www.census.gov/quickfacts/fact/table/daytoncityohio,US/LND110220].
[2] U.S. Census Bureau (2020). Decennial Census. Retrieved from [https://data.census.gov/table?g=1600000US3921000].
[3] U.S. Census Bureau (1960). Decennial Census. Retrieved from [https://usa.ipums.org/usa/resources/voliii/pubdocs/1960/Population/Vol1/37749282v1p37_ch02.pdf]. (Page 11).
[4] U.S. Census Bureau (2010). Decennial Census. Retrieved from [https://data.census.gov/table?q=population+in+Dayton+city,+Ohio+in+2010&y=2010].

amenities that exist in the city and regionally. Investing in cycling and walking facilities and amenities will help attract and retain new employers focused on quality of life for their employees and new residents looking for a place where they can work, live, and play.

Compared to State of Ohio averages, Dayton is highly affordable with the median value of owner-occupied housing being $73,300 compared to $159,900 statewide and the median gross rent being $766 compared to $870. In terms of income and poverty in Dayton, there is a significant gap between the average for Ohio and the City with the median household income in Dayton being $37,536 compared to $61,938 and the percentage of persons in poverty being 28.6 percent compared to 13.4 percent statewide[5]. Dayton's affordability is an asset in the age of remote-work and the housing affordability crisis. By improving our transit and recreation amenities and increasing access to existing assets, city advocates and developers can attract new residents to the region.

Table 1: City of Dayton Demographics

	Category	Percent
Race	White	51.8%
	Multiracial	3.8%
	Black	38.9%
	Asian	1.1%
	Native American	0.3%
	Hispanic	4.5%
Age	< 17	20.9%
	18 - 24	15.4%
	25 - 34	15.9%
	35 - 44	10.4%
	45 - 54	11.4%
	55 - 65	13%
	Above 66	13%
Vehicles Available by Household	0	8.1%
	1	30.9%
	2	39%
	3+	22%
Commute Mode Share	Drove alone	71.1%
	Carpooled	9.6%
	Walked	7.5%
	Bicycled	0.3%
	Transit	5.6%
	Other	6%

[5] U.S. Census Bureau (2016-2020). Quick Facts. Retrieved From [https://www.census.gov/quickfacts/fact/table/daytoncityohio,OH,US/HSG495220].

5-year data from the American Community Survey (2020) provides Race[6], Age[7], Car Ownership by Household and Commute Mode Share[8] percentages for Dayton. The results are included in the following figures (Figure 1, Figure 2, Figure 3, Figure 4) and show that Dayton is a diverse and highly auto-oriented city with 8.1 percent of households not owning a car, 7.8 percent of commuters walking or cycling and 5.6 percent utilizing public transit. The low number of cyclists commuting indicates an opportunity to grow the number of active transportation users. Taking time to understand what prevents residents from walking or cycling will help us address those barriers and shift the community's culture.

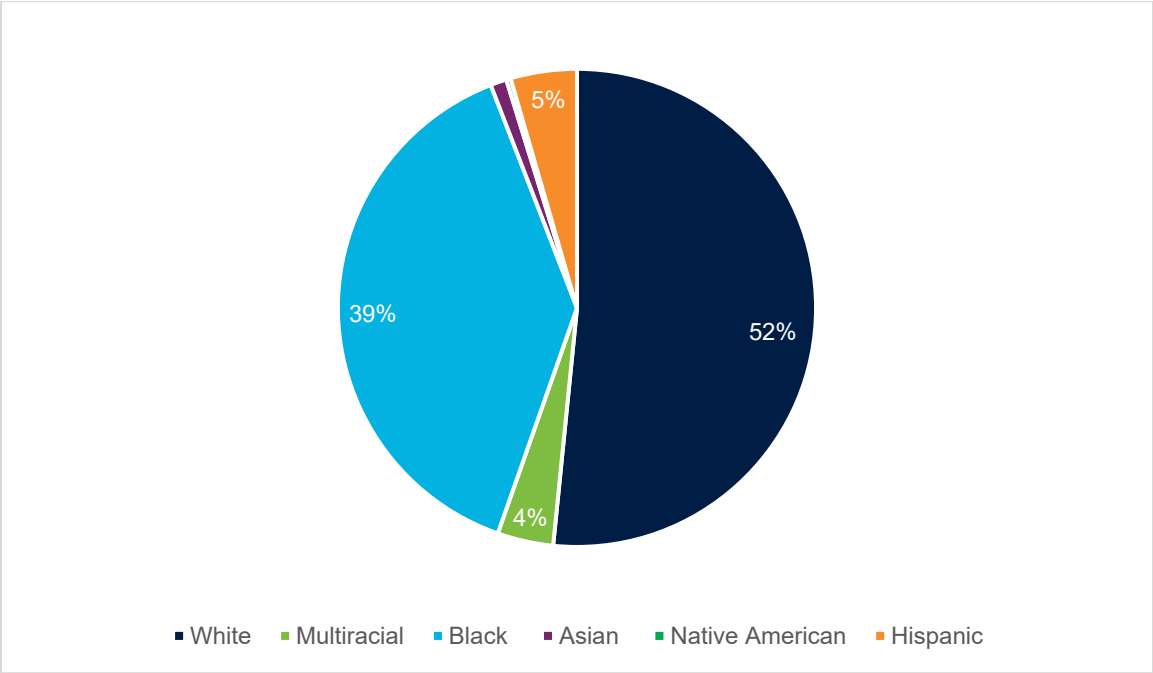

Figure 1. City of Dayton Race

[6] U.S. Census Bureau (2020). ACS 5-Year Estimates. Retrieved from [https://data.census.gov/cedsci/table?q=Dayton%20city,%20Ohio&t=Populations%20and%20People&y=2020&d=ACS%205-Year%20Estimates%20Subject%20Tables&tid=ACSST5Y2020.S0601].
[7] U.S. Census Bureau (2020). ACS 5-Year Estimates. Retrieved from [https://data.census.gov/cedsci/table?q=Dayton%20city,%20Ohio&t=Populations%20and%20People&y=2020&d=ACS%205-Year%20Estimates%20Subject%20Tables&tid=ACSST5Y2020.S0101].
[8] U.S. Census Bureau (2020). ACS 5-Year Estimates. Retrieved from [https://data.census.gov/cedsci/table?q=Dayton%20city,%20Ohio&t=Populations%20and%20People%3A&y=2020&d=ACS%205-Year%20Estimates%20Subject%20Tables&tid=ACSST5Y2020.S0801].

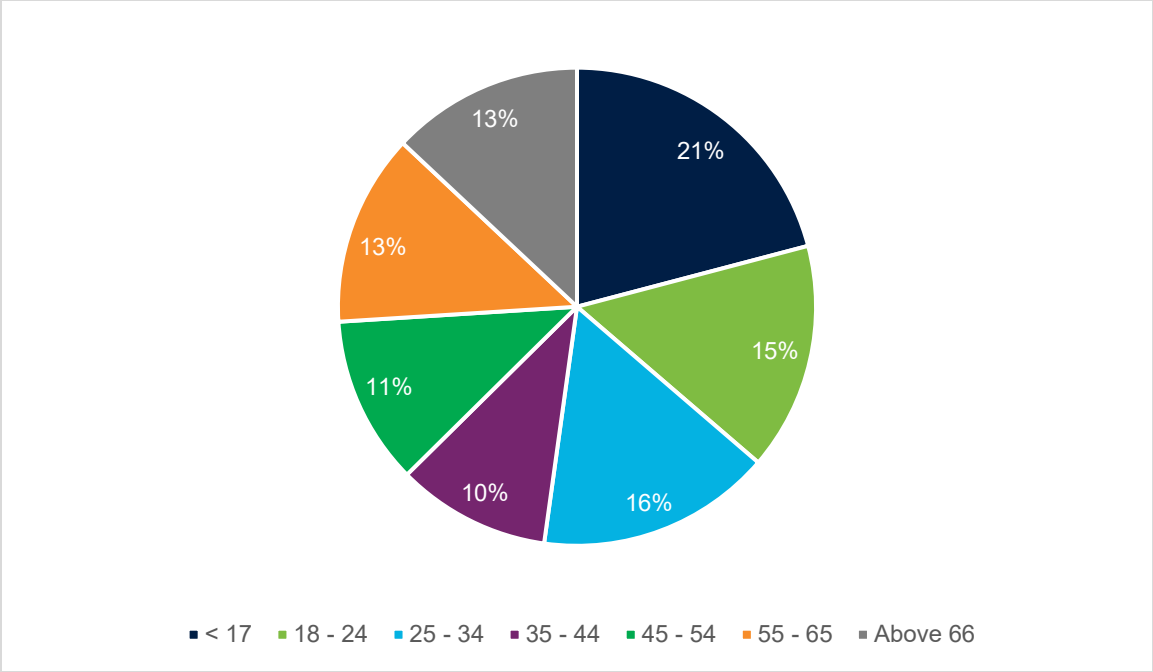

Figure 2. City of Dayton Age

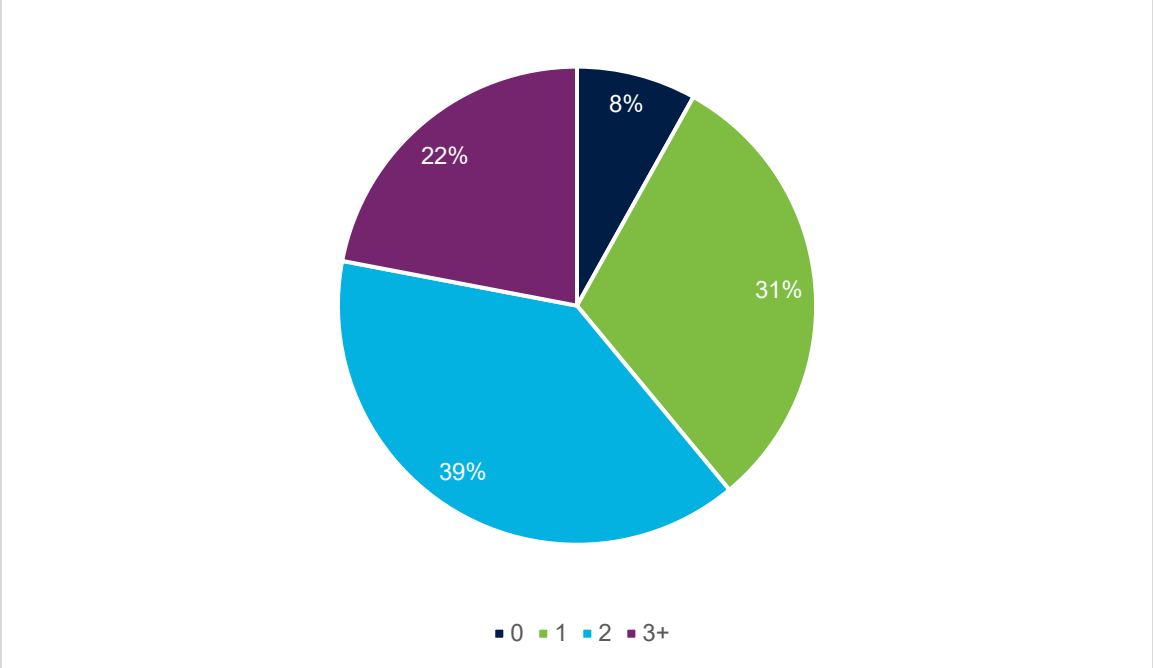

Figure 3. City of Dayton Vehicles Available by Household

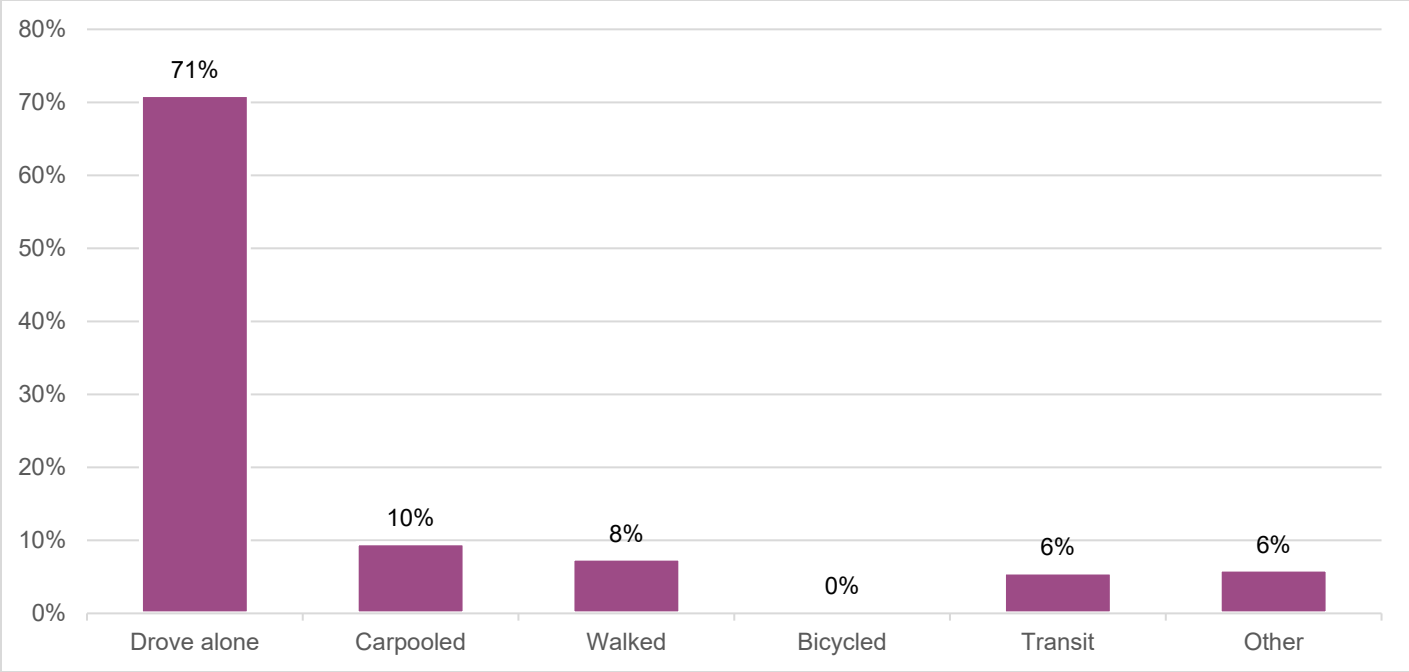

Figure 4. City of Dayton Commute Mode Share

TRANSPORTATION FUNDING AND INVESTMENTS

HISTORIC

The City of Dayton has utilized a wide variety of funding sources for its active transportation projects, from planning through design to construction.

Local and regional partners have also received funding for related projects that serve Dayton. Dayton Public Schools' Safe Routes to School Travel Plan in 2018 is an example of one such planning-level investment.

CURRENT or PLANNED

Dayton has committed funding for nearly 20 active transportation-related projects from 2022 through 2027 (Table 2). The city is focusing on securing safety funding to redesign its primary corridors and to build bicycle lanes.

In general, these projects include the reconstruction of existing and installation of new bicycle and pedestrian infrastructure. Both on- and off-street improvements such as sidewalks, bike lanes, cycle tracks, and bike paths will be funded through city, state, and federal programs. The Surface Transportation Program (STP), Transportation Alternatives (TA) program, and the Congestion Management & Air Quality Analysis Program (CMAQ), are three of the most common federal and state funding streams that Dayton will utilize to build these projects. The remainder of the projects scheduled through 2027 are traffic calming projects funded by the ODOT Safety program or local funding streams such as ballot measures.

Table 2: Funded Active Transportation Projects

Funded Projects	
Frontage Street Improvements ***(recently completed)***	Walk and lighting Improvements along Frontage St from Home Ave to West Terminus
Salem Avenue Bike Lanes ***(recently completed)***	Installation of bike lanes on Salem Avenue from Riverview Avenue to Grand Avenue
East Second Street Cycle Track ***(recently completed)***	Installation of a cycle track on East Second Street from St. Clair Street to Webster Street
Xenia Avenue Bikeway	Installation of bike lanes on Xenia Avenue and installation of a bike ramp from Xenia Avenue to Steve Whalen Boulevard
Great Miami River Trail West Extension, Phase 2	Installation of a bikeway along the Great Miami River from Edwin C. Moses Boulevard to West River Road
West Riverview Bike Path	Installation of a bike path on top of the west levee of the Great Miami River from Monument to Third

Gettysburg Reconstruction	Reconstruction of Gettysburg Avenue from West Third Street to West Second Street
West Third Street Bikeway	Constructing two-way cycle track on West Third Street from Perry Street to Robert Drive
North Main Street Safety Improvements	Road diet with curb extensions, median and street lighting along North Main St from Great Miami Blvd to Shoop Mill Rd
Wolf Creek Bikeway Connector Phase 1	Constructing a bike path along Wolf Creek from Wesleyan Park to Hickorydale Park
Wesleyan Bike Path	Constructing a bike path along the north side of Wolf Creek from Bridge Street to Wesleyan Park
Wayne Avenue Traffic Calming	Traffic Calming Project will add bump outs and repair broken curb, walk, curb ramps and driveways and pedestrian lighting.
Germantown St Bike Lane	Bike Lanes on Germantown Street from Edwin C. Moses Blvd to Euclid Ave.
Findlay Street Reconstruction	Reconstruction of Findlay Street from East First Street to Monument Avenue
West Stewart St Enhancements	Bumpouts on West Stewart St at Conley St and Hopeland St
Smithville Road Reconstruction	Reconstruction of Smithville Road from US Route 35 to Huffman Avenue
West Third Street Reconstruction	Reconstruction of West Third Street from Gettysburg Avenue to Almond Avenue
East Third Street Improvements	East Third Street from Webster Street to North Keowee Street

EXISTING PLANS, POLICIES, AND SUPPORTIVE PROGRAMS

This plan builds on prior plans and initiatives developed by entities within Dayton. It looks to these plans for existing **conditions data, issue identification, and recommendation support** (Table 3 and Table 4).

Table 3. Existing Plans and Policies

Plan/ Policy	Lead Agency	Year Completed	Key Takeaways (what proposed projects/policies will impact the active transportation plan?)
City of Dayton Livable Streets Policy	*City of Dayton*	*2010*	*The Policy puts forth a vision, purpose, set of goals, and list of directives to consider when identifying, planning, scoping, and designing all City of Dayton roadway projects, ranging from simple maintenance to comprehensive reconstruction. The Policy additionally, supports other Cityplanning efforts to promote alternative forms of transportation (e.g., the Zoning Code & Urban Design Guidelines).*
City of Dayton 2025 Bicycle Action Plan	*City of Dayton*	*2011*	*When adopted, the Bicycle Action Plan outlined the City's commitment to work with local, regional, state, and national partners to create a culture of bicycling in the City of Dayton. The Plan summarized bicycle-related projects and programs that strove to build on the City's network of intermodal transportation corridors. The document formalized the Bike/Walk committee (now called Bike.Walk.Ride), which is still in existence today but without its original purpose and City Commission leadership.*
Dayton Transportation Plan 2040	*City of Dayton*	*2017*	*The Dayton Transportation Plan is a guide for the design of Dayton transportation projects over the next 25 years, focusing specifically on Complete Streets design. The plan classifies Dayton's entire street network to create Complete Streets Typologies, which shows how Complete Streets treatments can be applied in certain situations depending upon right-of-way and pavement width as well as land use. Appendix B provides guidance regarding the recommended types of pedestrian and bicycling facilities based upon the typology of the street. These guidelines are based on national standards and provide clear direction for how future projects within the city should be designed.*
Dayton Riverfront Plan	*City of Dayton*	*2018*	*The Dayton Riverfront Plan presents a vision for Dayton's riverfronts as a more connected, activated, and healthier resource for the future. Downtown Dayton lies at the center of the riverfront planning area and expands out three miles in four different directions. The Plan includes an overall framework for the greater downtown area and river corridors as well as conceptual designs to improve ten riverfront parks and connectivity into the regional paved trail network.*
Dayton Public Schools Safe Routes to School Travel Plan	*Dayton Public Schools*	*2018*	*In 2018, Dayton Public Schools (DPS) led the planning effort to complete a School Travel Plan (STP), a required document for funding requests through the Ohio Department of Transportation(ODOT) Safe Routes to School (SRTS) program. The STP outlined the community's intentions for enabling students to engage in active transportation (i.e., walking or bicycling) as they travel to and from school. The STP follows the same five E's as the Dayton 2025 Bicycle Action Plan: Engineering, Education, Enforcement, Encouragement and Evaluation.*

Downtown Streetscape Guidelines & Corridor Plan	*City of Dayton*	*2020*	*The Streetscape Guidelines and Corridor Plan centers on Downtown Dayton, creating a street-by- street outline for infrastructure changes that include traffic calming as well as bicycle and pedestrian facility improvements. The document builds on previous plans and sets the placemaking vision for downtown Dayton over the next 15 years. Infrastructure investments already planned for the area include, but are not limited to, the Third Street and Second Street cycle tracks.* *Infrastructure recommendations that are included in the recommendation table: South Main Street road diet, Third Street streetscape and bumpouts from Ludlow to Jefferson, Jefferson Street protected lane and streetscapes extension, Ludlow Street protected bike lane and streetscape upgrades, Fifth Street restriping to add bike lanes and streetscape upgrades, Second Street streetscape upgrades and center median, First Street lane restripe to two-way street and streetscape upgrades, St. Claire Street lane restripe for protected bike lanes and streetscape upgrades.*
Miami Valley Bike Plan Update 2015	*Miami Valley Regional Planning Commission*	*2015*	*The 2015 Miami Valley Bike Plan Update provides an overview of the development and current state of cycling and cycling infrastructure in the Miami Valley Region. The update documents past accomplishments, highlights critical features of the present state of cycling in the region, and points to a future where more people choose to bike more often for more reasons. The update focuses on complete streets, user comfort and safety, and plan implementation.*
Miami Valley Regional Active Transportation Plan	*Miami Valley Regional Planning Commission*	*2021*	*The Miami Valley Regional Active Transportation Plan expands on past planning work for regional bikeways by including, for the first time, examination of walking infrastructure and also how walking and biking infrastructure serves residents accessing public transit. The plan studies the connectivity and accessibility of infrastructure supporting non-motorized modes and recommends projects, policies and implementation approaches. Chapter 6 includes a list of recommended active transportation-related projects, including traffic calming or safety enhancements on Fifth and Burkhardt, traffic calming and a protected bike lane on Third Street from Keowee to Linden, traffic calming on Philadelphia from James H. McGee to N. Main Street, and a shared use path along railroad right-of-way from Creekside Trail to Fourth Street.*

Table 4. Existing Supportive Programs

Program Name	Program lead (organization)	Target Audience	Key Takeaways (how does this program support active transportation?)
Dayton Bike Route Map	*City of Dayton*	*City of Dayton Residents*	*Originally created in 2010, the bike route map identified novice, skilled, and experienced cycling pathways including specific infrastructure (sharrows, bike lanes, and shared-use paths). No current version of this map exists. The goal for the City's bike map is to host an interactive version on the web versus printing annual updates with destinations, city and metro parks, accommodations, libraries, and schools identified.*
Downtown Walking Wednesdays	*Downtown Dayton Partnership*	*City of Dayton Residents; Downtown employees*	*These fun walks feature a different downtown route each week, walking past a variety of landmarks and parts of our city while introducing guests to other downtown workers who like to walk. Walks start at Courthouse Square during its free "The Square Is Where" entertainment. All walking routes are loops, and short enough to complete in 30-45 minutes to easily fit a walk during the lunch hour.*
Dayton Bike Share	*Link*	*Miami Valley Residents*	*Founded in 2015, Link is a Dayton bike sharing system. It is a hub-based system that allows users to access bikes at 37 different locations in Dayton. Users are able to use the bike share system through an app. Since launching, 18,500 users have taken over 140,000 trips. Dayton Bike Share is operated by bike Miami Valley and Greater Dayton RTA.*
Scooter Share	*Spin*	*Miami Valley Residents*	*Spin is a scooter sharing company that operates within the Miami Valley Region and Dayton, Ohio. Users are able to access scooters by downloading an app.*
League of American Bicyclists: Bicycle Friendly Community Program	*League of American Bicyclists*	*City of Dayton Residents*	*The League of American Bicyclists' (LAB) is a national cycling advocacy organization that focuses on four key programs: Bicycle Friendly America which helps provide guidelines for communities as they work to improve cycling conditions; Smart Cycling which certifies trainers to provide bike education; Promoting Bicycling, a national promotional campaign that works to raise awareness and encourage people to ride; and Making Biking Better their advocacy arm that works to make biking better nationwide. LAB also has the Bicycle Friendly Community Program, which provides hands-on assistance and award recognition for communities that actively support bicycling. A Bicycle Friendly Community welcomes bicyclists by providing safe accommodations for bicyclists and encouraging people to bike for transportation and recreation. The City of Dayton was awarded Bronze Medal Bicycle Friendly Status by the LAB in May 2010, becoming one of only two such communities in Ohio to achieve this honorable distinction at the time. Designation is reviewed every four years and the City's Bronze status is current through 2023.*
Miami Valley Trail User Survey	*Miami Valley Regional Planning Commission*	*Residents of Ohio; Visitors using trails*	*Starting in 2009, the Miami Valley Regional Planning Commission (MVRPC) and partners conduct the Miami Valley Trail User Survey (and subsequent counts and reports) every four years. This survey serves as a baseline for understanding how, when, and by whom the Miami Valley Trails are being experienced. Using surveys collected, the MVRPC estimates the trail system's region-wide annual economic impact via hard (equipment) and soft goods (food) purchased and overnight accommodations. It also illustrates the regional draw and tourism impacts of the trails. Previous surveys and reports will be considered in the City of Dayton's Active Transportation Plan effort.*

Program Name	Program lead (organization)	Target Audience	Key Takeaways (how does this program support active transportation?)
Rideshare program	*Miami Valley Regional Planning Commission*	*Miami Valley Residents*	*MVRPC's Rideshare Program is a partner of Gohio Commute, a free service with information on bike commute options for the region. This program allows you to map your route, find others to join your bike commute, and track your CO2 emissions and money saved for each bike trip you take instead of a single-occupancy vehicle. Residents may visit MiamiValleyRideshare.org to register for this free program.*
Walkability Audits	*Miami Valley Regional Planning Commission*	*Miami Valley Residents*	*MVRPC provides assistance to local communities to audit their built environment. A technical review, with criteria established by Federal Highway Administration (FHWA), the audit can assist a community in deciding where to change or improve their streets, intersections, and sidewalks to be more walk-friendly, safer, and accessible. The walking audit is also a great educational tool for school groups, planning commission members, and community advocates to better understand multimodal transportation issues.*
Bicycle Advocacy	*Bike Miami Valley*	*Miami Valley Residents*	*Bike Miami Valley advocates, promotes, and creates opportunities for all forms of cycling in the Miami Valley region. The intention of the group is to help local advocacy groups or chapters spark change faster.*
Bicycles for All	*Bicycles for All*	*Miami Valley Residents*	*Bicycles for All provides community resources that promote biking for recreation, transport, and sport. They are a non-profit organization lead by volunteers.*
Mike's Bike Park	*Mike's Bike Park*	*Miami Valley Residents*	*Mike's Bike Park is an indoor bike park and the City of Dayton's only bike shop. They have been actively involved in the community and provide a compliment to the (city owned) outdoor bike park.*

There are also multiple cycling groups within Dayton that meet on a regular basis including:

- Major Taylor
- Dayton Bike Meet
- Miami Valley Cycling
- Dayton Cycling Club

ANALYSES

After mapping the existing transportation system, the project team performed several analyses to better understand the equity of the network, its connectivity, use of walking and bicycling facilities, safety, and infrastructure conditions. The following section provides a summary of each existing conditions analysis.

DATA LIMITATIONS

Existing conditions analyses were conducted with data from the following sources: City of Dayton, Montgomery County, Miami Valley Regional Planning Commission (MVRPC), ODOT Transportation Information Mapping System (TIMS) and GIS Crash Analysis Tool (GCAT), U.S. Census Bureau, and Streetlight. Analyses were conducted with available data and there are data limitations that should be acknowledged, particularly with crash data. To help fill data gaps, this planning process also relies on stakeholder and general public input.

CRASH DATA LIMITATIONS

Local law enforcement agencies submit the crash reports that provide the raw data for GCAT. Although crash reports are the best way to obtain information about a large quantity of crashes, they have limitations. For example, the total number of crashes may be higher than captured because of unreported crashes. Crashes go unreported for a variety of reasons.

Some people have concerns about interacting with police for reasons unrelated to a crash. Black people and other people of color may have a general fear of police because of concerns around racism. Another reason for unreported crashes is that the police departments often do not have enough officers to respond to high crash volumes during rain, snow, or other inclement weather events. This means even when police are called, they do not have the staff to respond to all crashes. In those situations, a crash report would only be filed if one of the involved parties had the resources and ability to either self-report the crash online or to travel to police headquarters to self-report.

A final limitation of crash reports is that they may underestimate the severity of a crash. Adrenaline at the time of a crash may mask injury or the severity of an injury and cause the severity of the crash to be underestimated. It is useful to keep these limitations in mind when considering what information is presented by crash reports and what information is not documented.

SUMMARY OF FACILITY INVENTORY

Dayton is notable for its unique geography along the Great Miami River and its tributaries, the Stillwater River, Mad River, and Wolf Creek. Due to these natural amenities and relative lack of major elevation change, Dayton is ideal for active transportation pursuits. Dayton is part of the Miami Valley region's 350+ mile network of paved, multi-use recreational trails that connect schools, parks, historic landmarks, and area attractions. By establishing a clear vision and implementation plan for Dayton's Active Transportation

Plan, the city can leverage this network and further cement its reputation as a recreation destination. The following sections describe the existing active transportation infrastructure in the City of Dayton.

EXISTING SIDEWALK INFRASTRUCTURE

The City of Dayton has over 1,800 miles of sidewalks that connect the dense inner downtown to the neighborhoods at the edge of the city limits (Figure 5). As a rustbelt city with a long history of development and expansion, different urban environments can be found across the city including the downtown core, historic inner residential and commercial districts, and the suburban edges. Depending upon the age of the area and when it was built out, the presence and condition of the sidewalk system varies.

The downtown sidewalk network is comprehensive and generally complies with modern accessibility requirements. The 2020 Downtown Streetscape Guidelines & Corridor Plan recommends upgrades in both infrastructure and urban design to specific sidewalk corridors over the next 15 years, to take advantage of the excessively wide streetscapes – sometimes greater than 100 feet in width. Due to heavily auto-centric policies and infrastructure projects completed in the 1960-80s, many of Downtown's streets experience excessive speeds and few pedestrian amenities. To remedy this, multiple road diets are proposed, and new investments made to increase pedestrian safety, such as downtown bumpouts.

Outside of downtown, the sidewalk network is complete in the inner-ring historic neighborhoods and paired with narrow streets that promote walking. However, the conditions of the sidewalks are relatively poor with broken pavement due to tree roots and crumbling curbs. Additionally, ADA compliance is often lacking as this infrastructure was installed prior to modern requirements and has not been updated.

Traveling further out from the city's core reveals a spottier network of sidewalk infrastructure. Built later than the inner-ring neighborhoods, streets are often wider with higher speeds. To address safety concerns related to poor or missing sidewalks and streets that provide more capacity than currently needed, the City is securing safety funding to redesign primary corridors. Two such projects can be found along Salem Avenue and N. Main Street. These projects aim to slow the vehicular traffic as well as widen the sidewalks to make them more pedestrian friendly.

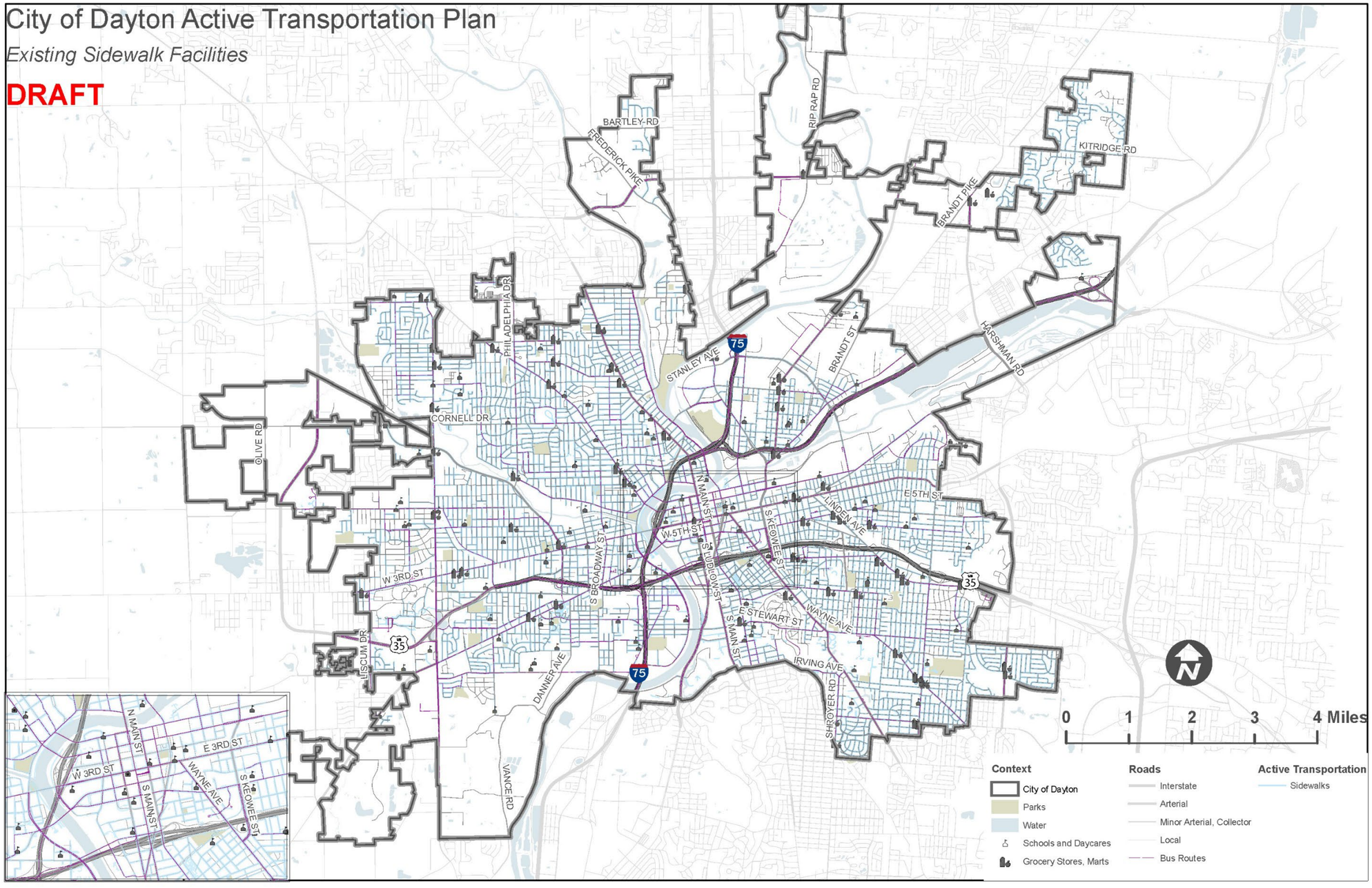

Figure 5: Existing Sidewalks

EXISTING BIKING INFRASTRUCTURE

Ohio's Miami Valley region contains one of the most expansive multi-use trail systems in the country with over 350+ miles of paved trails. In Dayton there are 22 miles of existing bicycle infrastructure in the form of bike lanes, bike paths, and sharrows (bike lines that are shared with motor vehicles) (Figure 6). Primary cycling corridors that connect Dayton to our regional partners include the Creekside Trail, Iron Horse Trail, Mad River Trail, Dayton-Kettering Connector Trail, and Wolf Creek Trail. On-street bike paths also exist but are concentrated downtown. In addition to existing bicycle infrastructure, there are approximately 10 miles of bicycle lanes that are funded but are still in design phases. With a strong regional system and plans for clear on-street connections, Dayton has ample opportunity to increase the connectivity and accessibility of existing bicycle routes.

Dayton Bike Safety Survey

Wright State University Boonshoft School of Medicine conducted a survey on bicycle safety and hazards in the City of Dayton. The survey was conducted in the fall of 2022 and included a questionnaire that asked participants about their personal choice for mode(s) of transportation, their reasons for riding a bicycle, and about bicycle safety. Overall, respondents indicated that they believe a more uniform and consistent active transportation network leads to a safer and more predictable experience for the user. In general, participants felt unsafe transitioning from bike lanes to cycle tracks to sharrows as the riding experience is unpredictable between these different facility types. A large percentage of the participants reported riding on trails and recreation or exercise as one of the primary reasons for riding a bicycle. Approximately 60 out of 180 participants reported a "near miss" incident while riding a bicycle (a "near miss" is an incident where no crash occurred, but the potential for a crash was likely), and 80 percent of the respondents stated if cycling safety is improved in Dayton, they would view the city as a better place to live.

WATERWAY ACCESS

The City of Dayton has five major waterways that run through the city. Most of the trail systems within Dayton follow the waterways. The trail network systems are hosted along the: North Great Miami, South Great Miami, Mad River, Stillwater River, and Wolf Creek. Access to the waterways can be found along all trails within the city of Dayton (Figure 6).

PUBLIC TRANSIT SERVICES

The Greater Dayton Regional Transit Authority (RTA) operates diesel and electric trolley buses in Montgomery County. Overall, the RTA is highly accessible, having over 2,400 stops across the region, 1,164 of which are within Dayton's boundary. The 18 bus routes extend throughout the region, transporting customers for an estimated 6 million trips every year (Figure 7). The RTA provides an exceptional opportunity for multimodal transportation as all RTA buses include bike racks and all vehicles are wheelchair accessible.

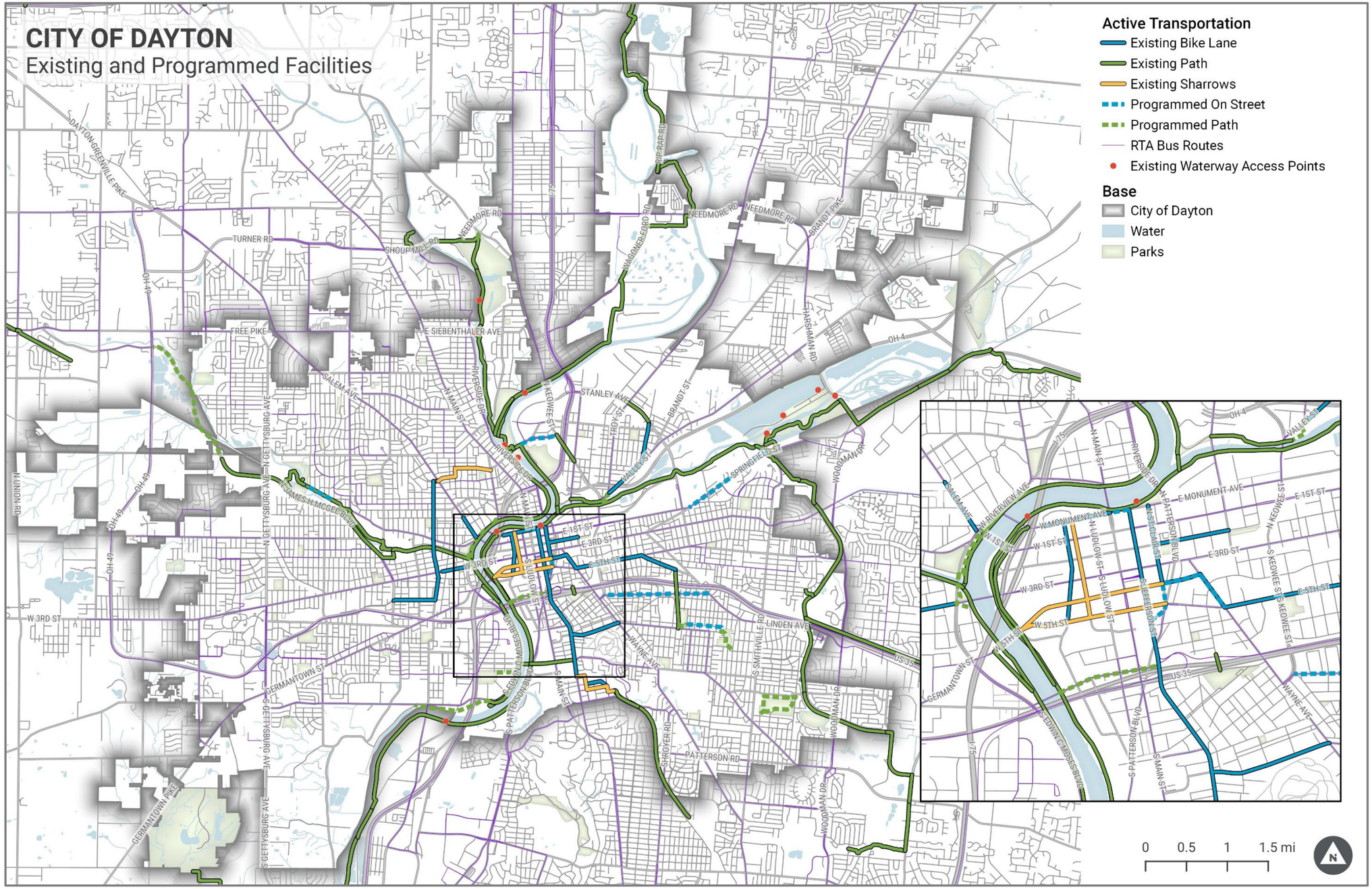

Figure 6: Existing and Programmed Facilities

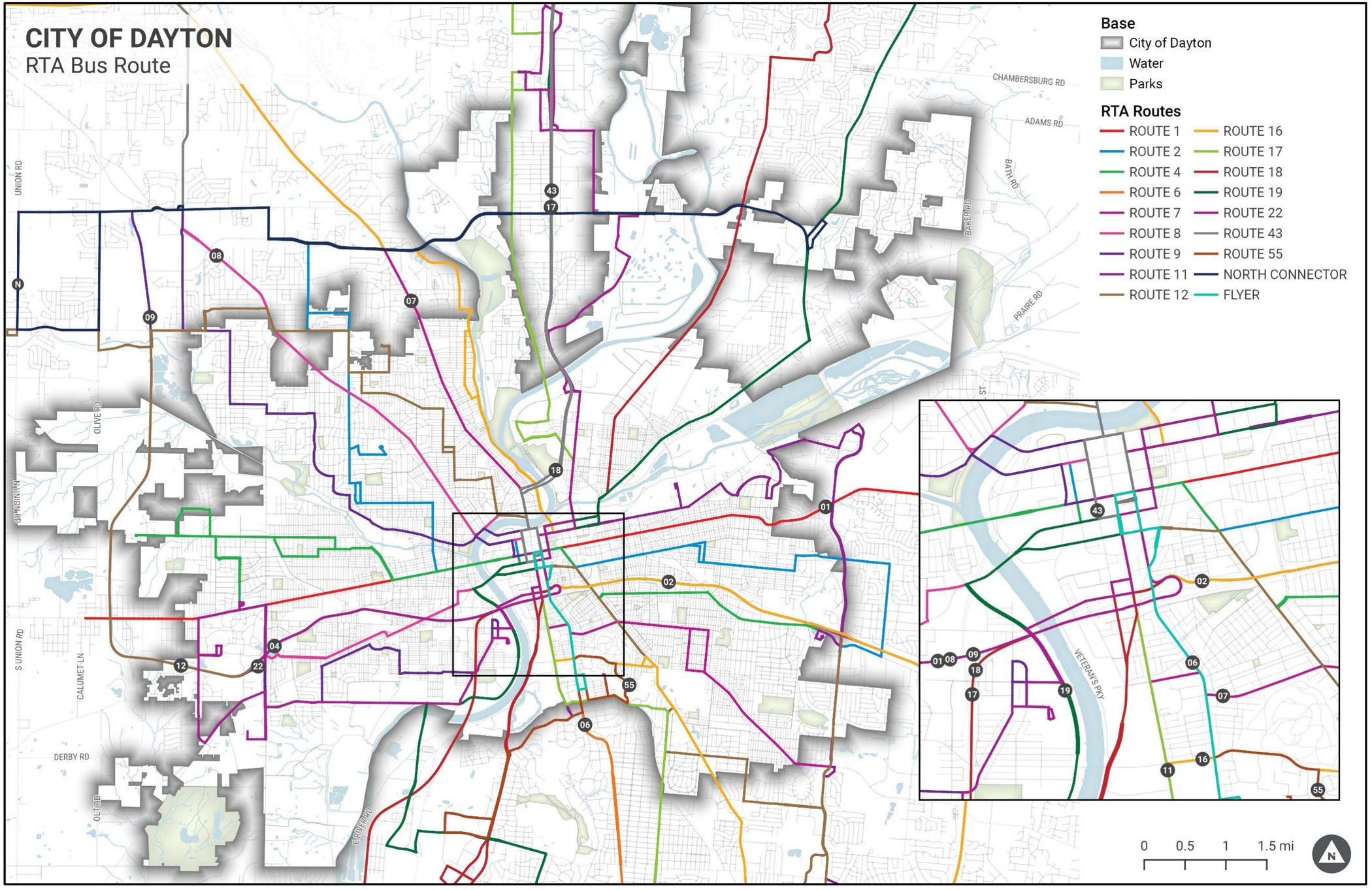

Figure 7: RTA Bus Map

ROADWAY NETWORK

The City of Dayton has about 1,472 lane miles of roadway within the city limits, excluding alleys and private roads. The roadway network is dense and well-connected in the central part of the city but becomes sparce near the northwest, southwest, and northwest boundaries. Ohio Department of Transportation (ODOT) owns 23 lane miles of interstate and 48 lane miles of expressway within Dayton city limits. The interstate, I-75, runs north-south through the center of the city. There are two expressways: US-35 runs east-west just south of the downtown area, and OH-4 starts just north of downtown and runs northeast. The remaining 1,401 lane miles of roadway are owned and maintained by the City of Dayton:

- Major arterials (113 lane miles)
- Minor arterials (202 lane miles)
- Urban collector (170 lane miles)
- Residential (916 lane miles)

NETWORK CONNECTIVITY

Completeness of active transportation system

Active transportation facilities that connect people to jobs, schools, parks, and other destinations form a complete network. Filling in missing connections expands access and mobility for people walking and bicycling and providing multiple route options accommodates people of all ages and abilities. Evaluating network connectivity provides an understanding of where gaps in the network exist and whether low comfort or high comfort walking and bicycling facilities exist.

Gaps and Generators Mapping

Public input

The public was asked several questions, including identifying issues or concerns and ideas or suggestions for walking and biking throughout Dayton via a survey (online and paper) and an online map during June and July of 2022. Numerous respondents throughout the city participated in the survey (Figure 8). Survey results are summarized in Figure 9.

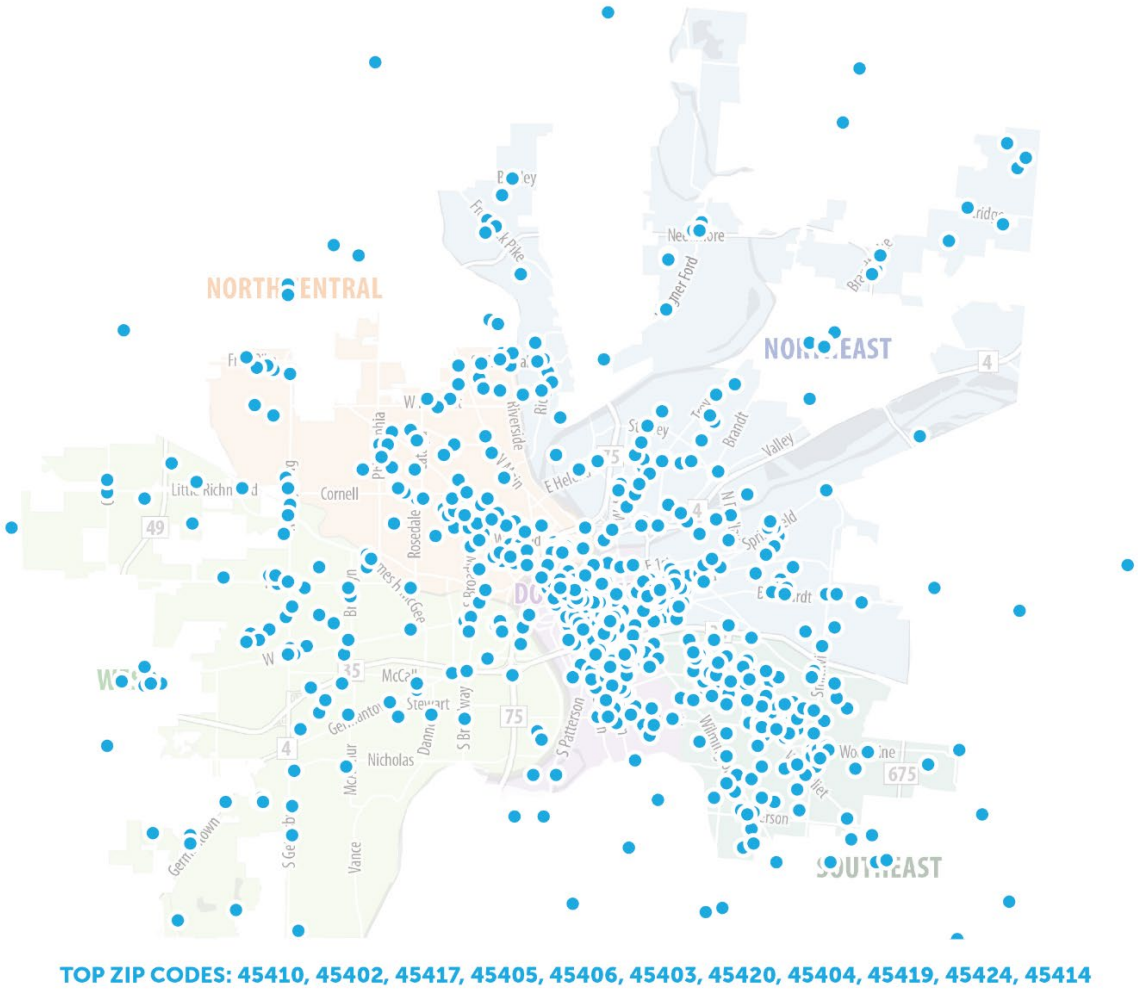

Figure 8: Survey Respondents

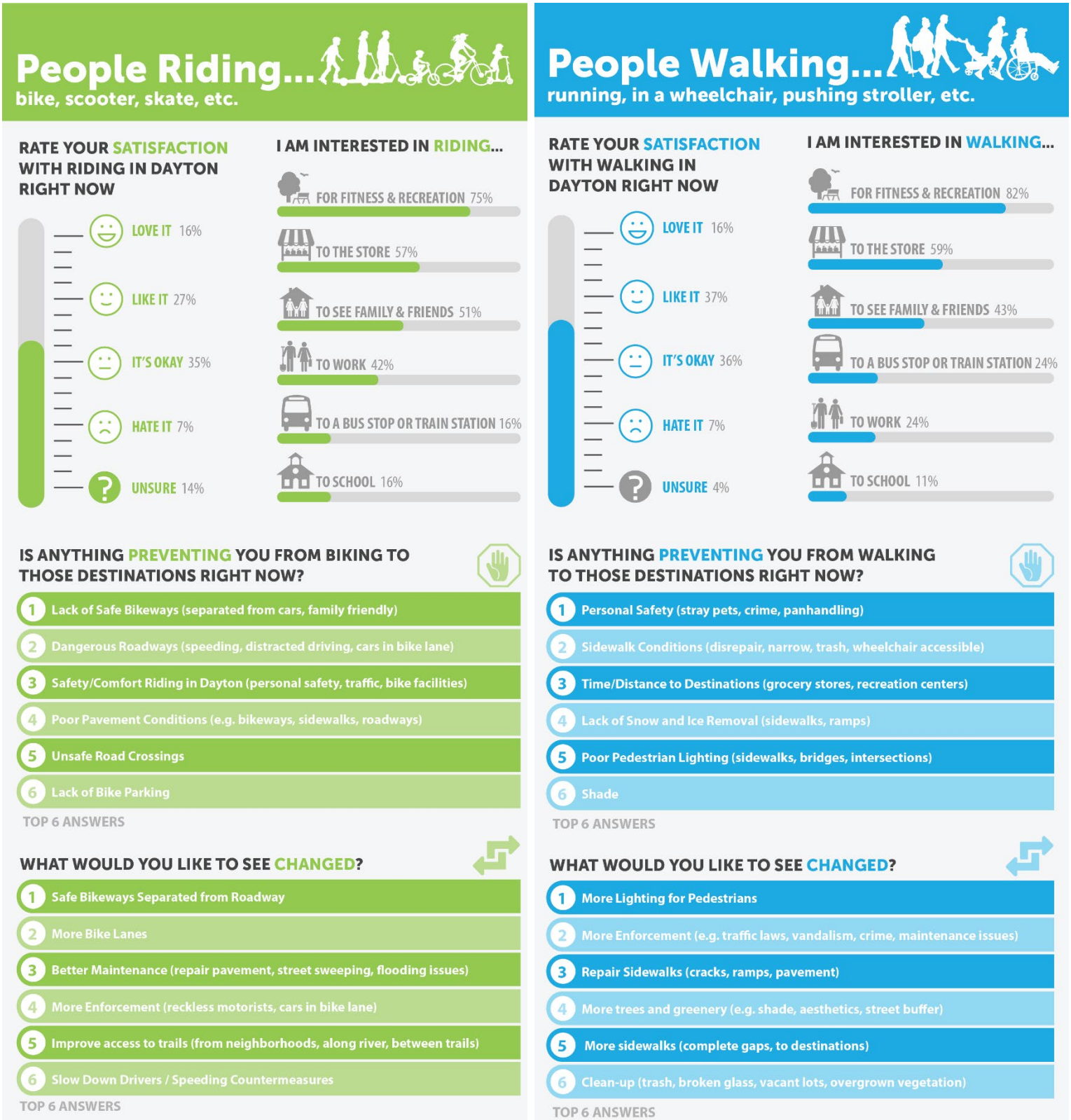

Figure 9: Summary of survey results

General key takeaways regarding concerns and suggestions from the public survey are shown in Figure 10 and summarized below:

- Overarching identified issues/concerns:
  - Motorists parking in bike lanes.
  - Underpasses, for example Warren, Buckeye, and the pedestrian bridge near South Green Park, generally feel unsafe and unmaintained.
  - Sidewalks throughout the city are in need of repair.
  - Crossing at intersections can feel unsafe.
- Overarching suggestions:
  - Desire to turn one-way streets downtown into two-way streets.
  - Increase in bike parking throughout the city.
  - Improve crosswalks such as adding leading pedestrian interval and no turn on red.
  - Additional time be provided at intersections to cross the street.
  - Road diets on major roads such as Keowee Street, 3rd Street, Wayne Avenue, and James H McGee Boulevard.
  - Continue road closures in the Oregon District.
  - Support to pursue the Flight Light, proposed rails-to-trails project.
- Specific areas of issue/concern:
  - Issues with Broadway bike lanes.
  - Speeding along Riverside Drive and Phillips Avenue.
  - Lack of pedestrian safety measures along Troy Street from Chapel Street to Leonhard Street.
  - Lack of protection and lane width for bike lanes on N. Main Street.
  - Barriers and difficulties for pedestrians on Gettysburg Avenue.
  - Difficulty crossing Stewart Street.
  - Intersection at Monument and Main streets is difficult for pedestrians crossing.
- Specific suggestions for new connections include:
  - Along the Mad River from Findley to Eastwood Lake.
  - Third Street across town.
  - Riverside Drive north of downtown to Shoop Mill Road.
  - Rosedale Drive south of Cornell Drive.
  - Along Salam Avenue.
  - Along James H McGee Boulevard.
  - Along Wayne Avenue.
  - Broadway Street south of Third Street.
  - Connect to the bike network around Louise Troy Elementary, Wogaman Middle School, and the Boys and Girls club.
  - N Main Street from Shoop Mill Road to Stewart Street.
  - Apple Street from Brown Street to the Great Miami Recreational Trail.
  - Wyoming Street from the existing path to Steve Walen Boulevard.

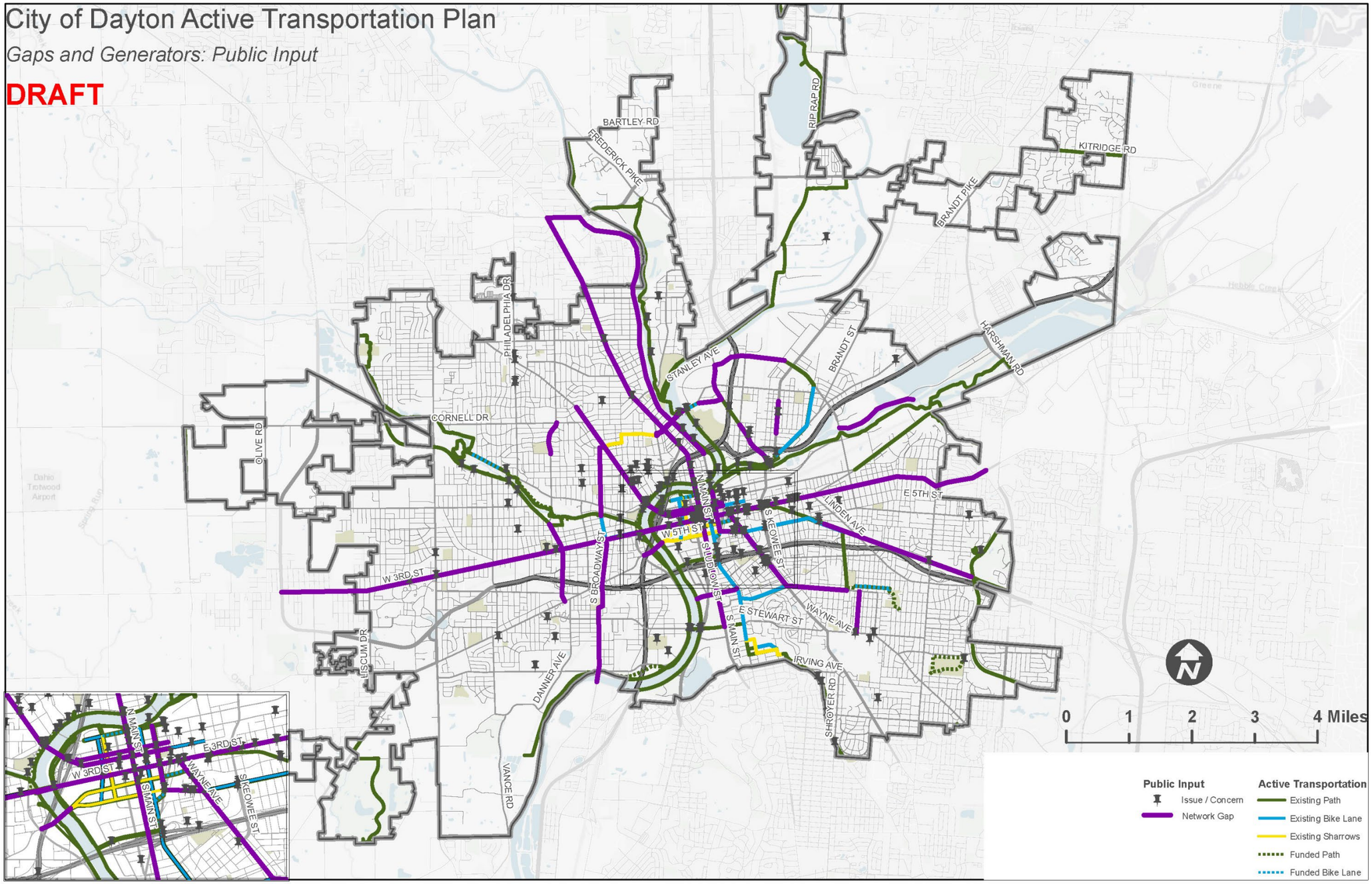

Figure 10: Gaps and Generators – Public Input

Stakeholder Input

At the first Steering Committee meeting on November 3, 2022, the project team facilitated a gaps and generators exercise with stakeholders. A gap analysis examines physical breaks in an active transportation network, such as sidewalk gaps or missing connections between bicycle facilities as well as generators to biking and walking trips. Participants also identified walking and bicycling routes that connect the generators or destinations. Routes are intended to overcome or avoid gaps and barriers. Results from the exercise are displayed in Figure 11 and summarized below:

- Identified gaps and barriers:
  - Bridges over the Miami River in the downtown area, including 5th Street, 3rd Street, 1st Street, Monument Avenue, Stewart Street, and Riverside Drive.
  - Locations where the bike facility suddenly ends:
    - Bike lane along Wyoming Street.
    - Stillwater River Recreation Trail ends at Shoup Mill Road and Riverside Drive.
    - The bike lane that runs parallel to Riverview Avenue ends at Philadelphia Drive.
    - Wolf Creek Trail ends at James H McGee Blvd and Little Richmond Road.
  - Intersections including James H McGee Boulevard and W Third Street, Gettysburg and James H McGee Boulevard, Keowee Street and Wayne Avenue, Salem Avenue and Philadelphia Drive, and Abbey Avenue and OH-4/US35.
- Identified generators/destinations:
  - Destinations such as, Gem City Market, Welcome Stadium, Hollywood Gaming at Dayton Raceway, libraries (specifically Dayton Metro Library West Branch and Northwest Branch), Miami Valley Golf Club.
  - Downtown destinations including, Sinclair Community College, Oregon District, and Dayton Arcade.
  - Parks, including Eastwood MetroPark, Wegerzyn Gardens Park, Belmont Park, Woodman Fen, Kettering Field, Woodland Cemetery and Arboretum, Carillon Historical Park, Possum Creek MetroPark, Triangle Park, Princeton Park, and Riverscape MetroPark

Digital Inventory: Pedestrian and Bicycle Facilities

In addition, to discussing gaps in the network with the public and stakeholder, the project team conducted a digital inventory of existing sidewalks, crosswalks, bike paths, bike racks, and LINK stations using data provided by the City of Dayton and MVRPC, as well as ESRI aerial imagery. The inventory helped the team understand the completeness and connectedness of the current active transportation system (Figure 11).

Overall, the sidewalk network within the City of Dayton is established and provides connections in and throughout most neighborhoods in the city while the bike network is primarily established in downtown and the surrounding neighborhoods. Due to a large portion of the city experiencing gaps in the bike network, the gaps identified illustrate major north/south and east/west routes that if established will create major connections in the city. A map of neighborhoods is provided as a reference (Figure 12).

- The following neighborhoods are experiencing gaps in the sidewalk network:

- Deweese
- Eastern Hills
- Greenwich Village
- Hearthstone
- Highview Hills
- North Riverdale
- Northern Hills
- Northridge Estates
- Philadelphia Woods
- Westwood

» Major gaps in the bike network include:
- Philadelphia Drive
- Riverside Drive
- W Third Street
- E Third Street
- Germantown Pike
- Linden Avenue
- Troy Street
- Keowee Street
- Brandt Pike

» Major destinations not connected to the bike network:
- Dayton Metro Library - Electra C. Doren Branch
- Dayton Metro Library - Burkhardt Branch
- Dayton Metro Library - Southeast Branch
- Dayton Metro Library - West Branch
- Dayton Metro Library - Northwest Branch
- La Michoacana Mexican Market at 748 Troy Street
- Kroger at 1555 Wayne Avenue

Additionally, the Dayton Public Schools Safe Routes to School (SRTS) Travel Plan (2018) includes a comprehensive list of gaps and barriers to walking and biking to school within a certain distance of elementary and middle schools in the district*. The SRTS Travel Plan lists recommended infrastructure improvements ranked in order of priority (page 40, Table 20 in the SRTS Travel Plan). A large number of recommended projects include adding or improving crosswalks at identified locations (see the SRTS Travel Plan for locations).

» Schools identified in the SRTS Travel Plan* that have gaps and or barriers in the bike and pedestrian network include:
- Belle Haven Elementary
- Cleveland Elementary
- Eastmont Elementary (outside of city limits, but connections to the school may still be considered within the city limits)
- Edison Elementary
- Edwin Joel Brown Elementary/Middle
- Fairview Elementary
- Horace Mann Elementary
- Kemp Elementary
- Kiser Elementary
- Louise Troy Elementary
- Ruskin Elementary
- Westwood Elementary
- Wogaman Middle School
- Wright Brothers Middle

» ODOT Safety Funds Crosswalk Implementation:
- Brown Street and Jasper Street
- Midblock Third Street bump out
- US Route 35 and Abbey Avenue

- Patterson Boulevard and Monument Avenue
- Edwin Moses at McIntosh Park
- Midblock Second Street bump out
- West Riverview Avenue and N Main Street
- South Main Street and Apple Street
- Third Street and Williams
- Third Street and Broadway
- Gettysburg Avenue and Free Pike
- Edwin C Moses and Stewart Street
- Brown Street and Irving Avenue
- Patterson and Stewart Street
- Monument and Ludlow
- Monument and Main
- Monument and St. Clair
- First and Ludlow
- First and Jefferson
- Second and Patterson
- Third and County Garage
- Third and Perry
- Third and Wilkinson
- Third and St. Clair
- Third and Patterson
- Third and Wayne
- Third and Madison
- Third and Webster
- Fourth and Perry
- Fifth and Wilkinson
- Fifth and Jefferson
- Second and Ludlow bumpouts
- Third and Ludlow bump outs
- Smithville and Woodbine
- Fourth and Ludlow bump outs
- Irving Avenue at Day-Ket Trail
- Gettysburg and Lakeside
- Gettysburg and Germantown
- Gettysburg and Lakeside
- Gettysburg and James H. McGee
- Gettysburg and Hillcrest
- Third and Westown
- Third and Gettysburg
- Third and Abbey
- Smithville and Tuttle

*The 2018 SRTS Travel Plan did not analyze gaps and barriers around high schools.

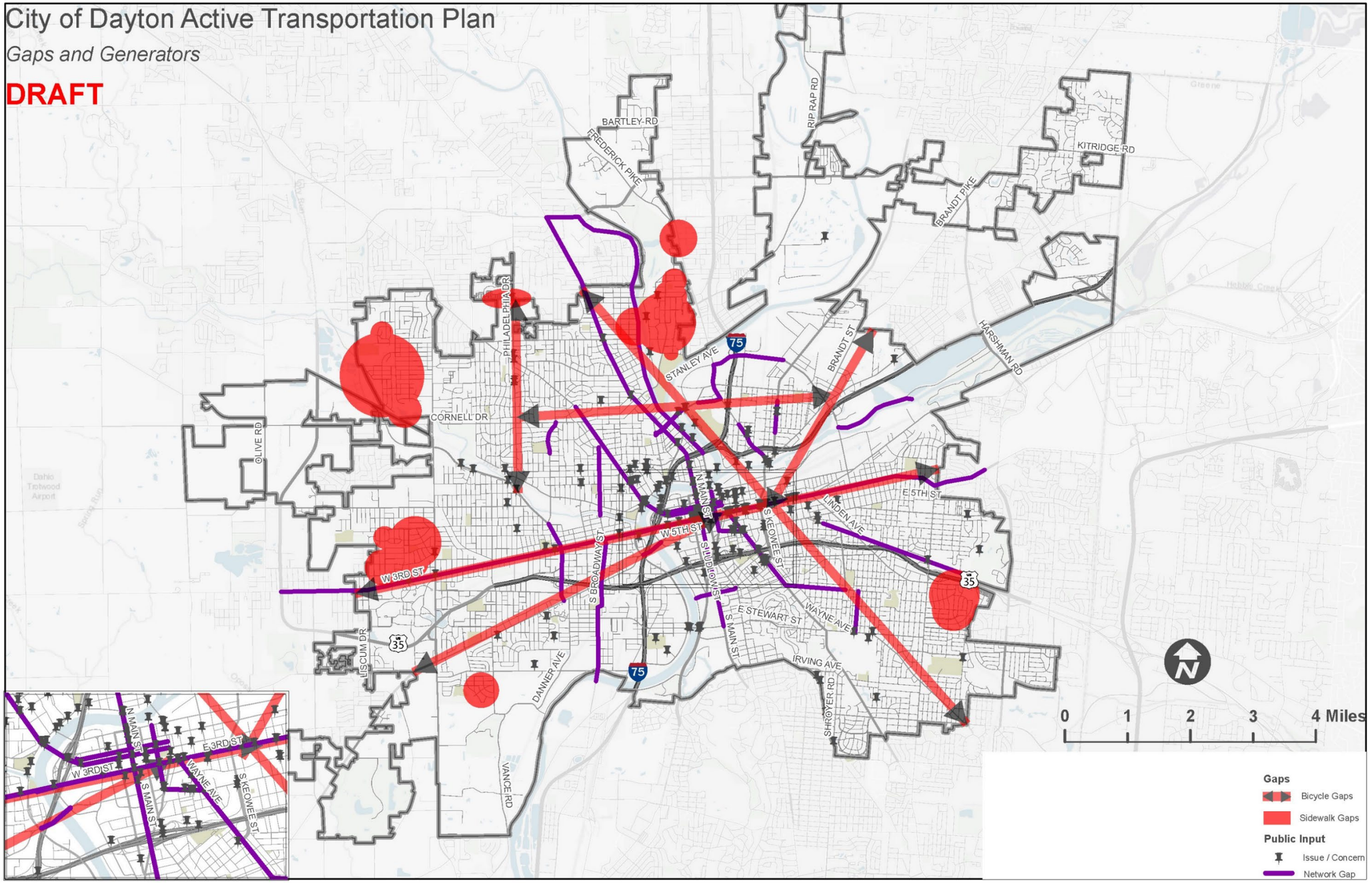

Figure 11: Gaps and Generators

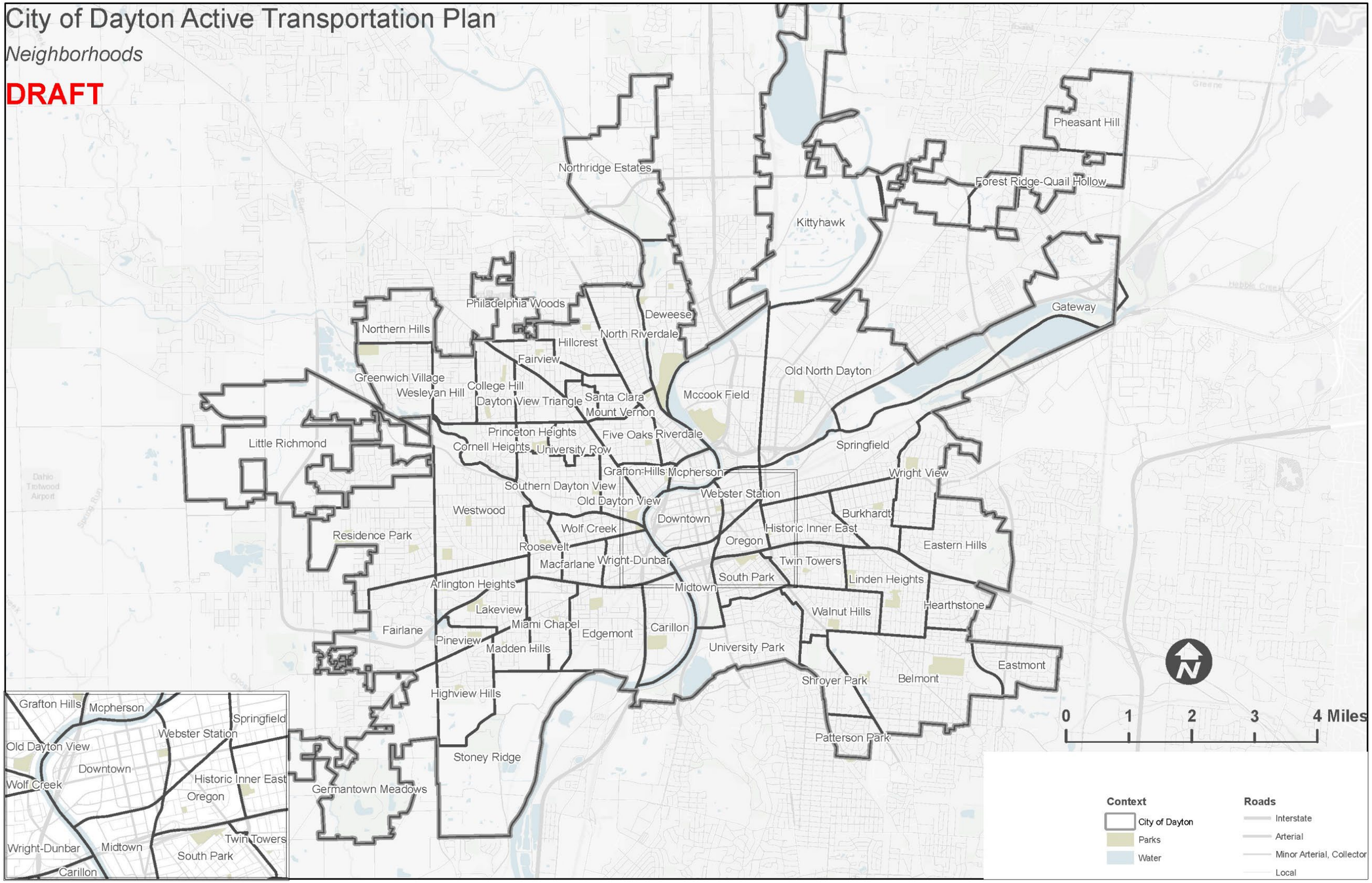

Figure 12: City of Dayton Neighborhoods

LOCAL CRASH TRENDS ANALYSIS: CAPE TOOL

Evaluating crash trends and patterns

Evaluating crash trends and patterns identifies where crashes are currently occurring and provides a better understanding of what factors may be contributing to crashes. Understanding these crashes can lead to projects that have the greatest likelihood of improving safety for pedestrians and bicyclists. These analyses are especially important because Ohio is not trending in the right direction for bicyclist and pedestrian safety.

Crash Analysis

The Crash Analysis and Planning Evaluation (CAPE) Tool is provided by the Ohio Department of Transportation (ODOT) and provides a crash trend analysis of the local area. During the time period reviewed (2017-2021), there were 552 crashes involving bicyclists and pedestrians in the City of Dayton, 99 of which resulted in serious injuries, and 24 of which resulted in fatalities (Figure 13).

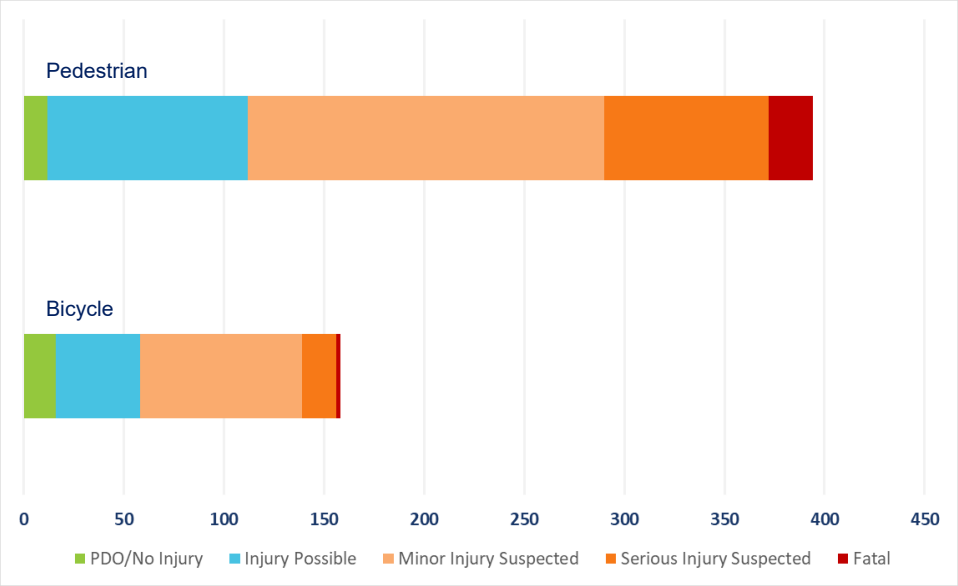

Figure 13. Injury by Non-motorist Type (2017-2021)

In the City of Dayton, both fatality and serious injury trends have been generally declining since 2017 with the exception of a spike in fatal crashes in 2020. In 2019, no fatalities occurred within city limits, while in 2021 there were 3 fatalities and 12 serious injuries reported within the City of Dayton (Figure 14 and Figure 15).

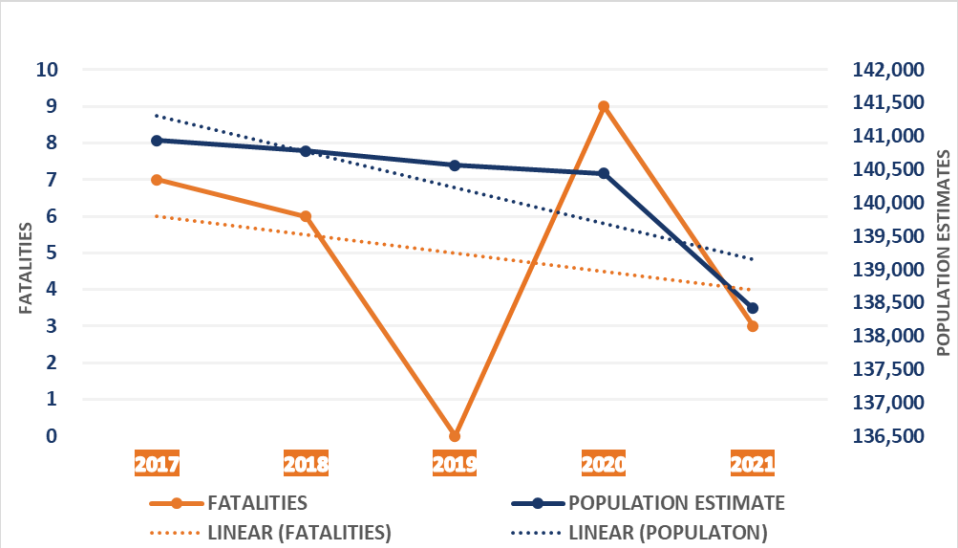

Figure 14. Fatality Trends by Year (2017-2021)

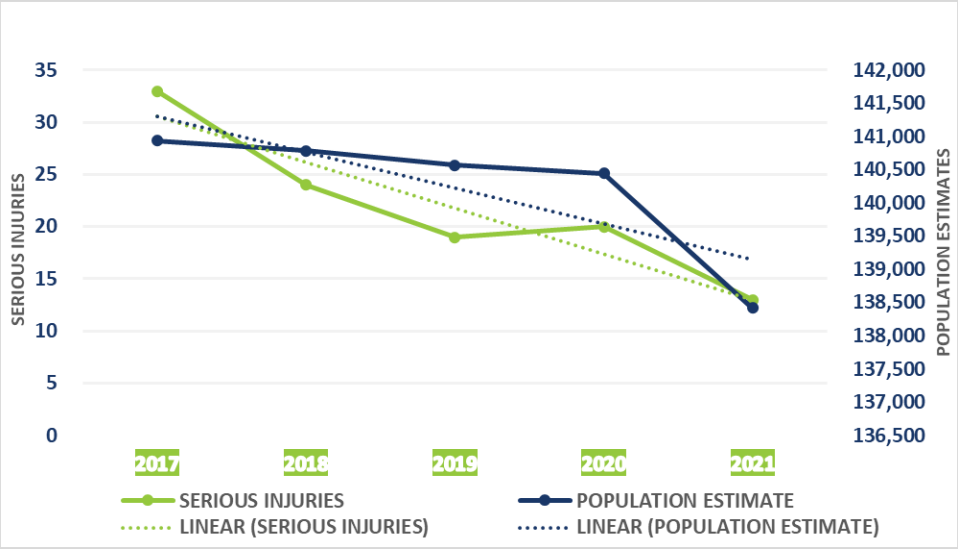

Figure 15. Serious Injury Trends by Year (2017-2021)

In comparison, Dayton ranks 5th for both average annual fatal and severe injury pedestrian (19.7 crashes) crashes and average annual fatal and severe injury bicycle (6.5 crashes) crashes (Figure 16 and Figure 17). Columbus ranks as first for both average annual fatal and severe injury pedestrian (73 crashes) crashes and average annual fatal and severe injury bicycle (15.5 crashes) crashes. The ten counties that have the highest number of fatal and severe injury pedestrian crashes are where major urban areas are located, while highest rates of bicycle crashes are in areas with relatively low populations and are in rural areas, such as Holmes, Defiance, and Van Wert. While these rural counties do not have the highest number of crashes overall, they have relatively low populations, which translates to a high crash rate per population.[9,10]

FSI Pedestrian Crashes: Top Ten Ohio Cities

Rank	City	Average Annual FSI Pedestrian Crashes*	Population (2010)	Average Annual Crash Rate per 100,000 population*	Area (Square Miles)	Average Annual Crash Density per square mile*
1	Columbus	73.0	787,033	9.3	244	0.30
2	Cincinnati	51.5	296,943	17.3	80	0.64
3	Cleveland	39.5	396,815	10.0	78	0.51
4	Toledo	29.9	287,208	10.4	84	0.35
5	Dayton	19.7	141,527	13.9	57	0.35
6	Akron	18.8	199,110	9.4	63	0.30
7	Canton	7.8	73,007	10.7	26	0.29
8	Hamilton	6.8	62,477	10.9	22	0.31
9	Youngstown	5.9	66,982	8.8	34	0.17
10	Euclid	5.2	48,920	10.6	11	0.48

Note: Shaded cells indicate the highest value for each metric.

Figure 16: FSI Pedestrian Crashes: Top Ten Ohio Cities (Walk.Bike.Ohio Pedestrian Safety 2020) *Crashes from 2009-2018

FSI Bicyclist Crashes: Top Ten Ohio Cities

Rank	City	Average Annual FSI Bicyclist Crashes*	Population (2010)	Average Annual Crash Rate per 100,000 population*	Area (Square Miles)	Average Annual Crash Density per square mile*
1	Columbus	15.5	787,033.0	2.0	244	0.06
2	Cleveland	12.1	396,815.0	3.0	78	0.16
3	Toledo	10.7	287,208.0	3.7	84	0.13
4	Cincinnati	8.2	296,943.0	2.8	80	0.10
5	Dayton	6.5	141,527.0	4.6	57	0.11
6	Akron	5.9	199,110.0	3.0	63	0.09
7	Canton	4.1	73,007.0	5.6	26	0.16
8	Hamilton	3.7	62,477.0	5.9	22	0.17
9	Cleveland Heights	2.6	46,121.0	5.6	8	0.32
10	Newark	2.4	47,573.0	5.0	22	0.11

Note: Shaded cells indicate the highest value for each metric.

Figure 17: FSI Bicycle Crashes: Top Ten Ohio Cities (Walk.Bike.Ohio Bicycle Safety 2020) *Crashes from 2009-2018

[9] https://transportation.ohio.gov/static/Programs/WalkBikeOhio/Walk.Bike.Ohio.BicyclistSafetyAnalysis.pdf
[10] https://transportation.ohio.gov/static/Programs/WalkBikeOhio/Walk.Bike.Ohio.PedestrianSafetyAnalysis.pdf

To achieve a 5 percent reduction (aggressive reduction) in fatalities and serious injuries by 2032, fatalities should be reduced to less than 3 per year, and serious injuries to less than 12 per year (Figure 18 and Figure 19). The projected reduction is similar to the reduction of serious injuries and fatalities already in the last five years in the city.

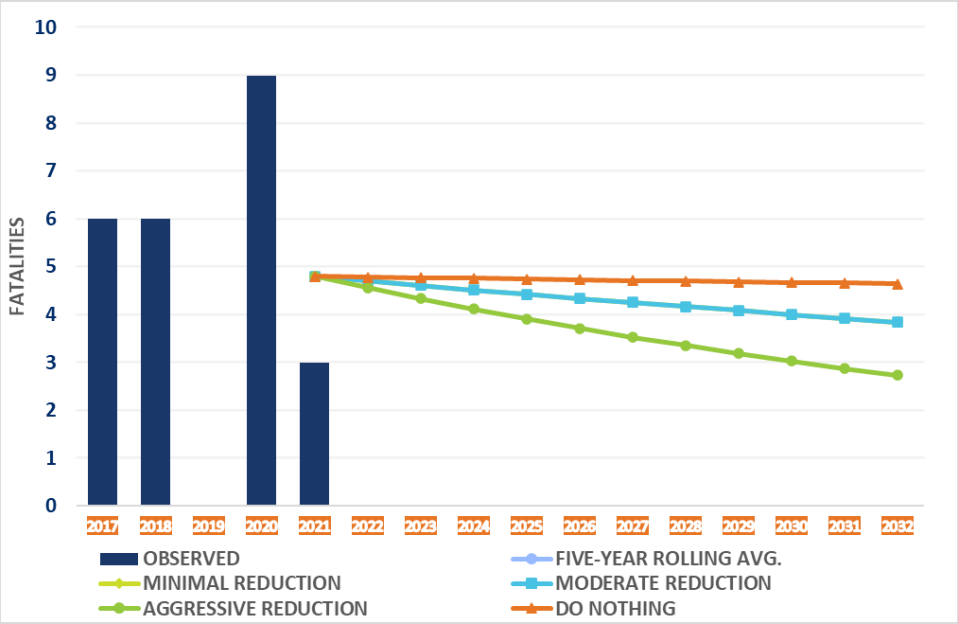

Figure 18. Forecast and Target Setting to Reduce Fatalities (2017-2021)

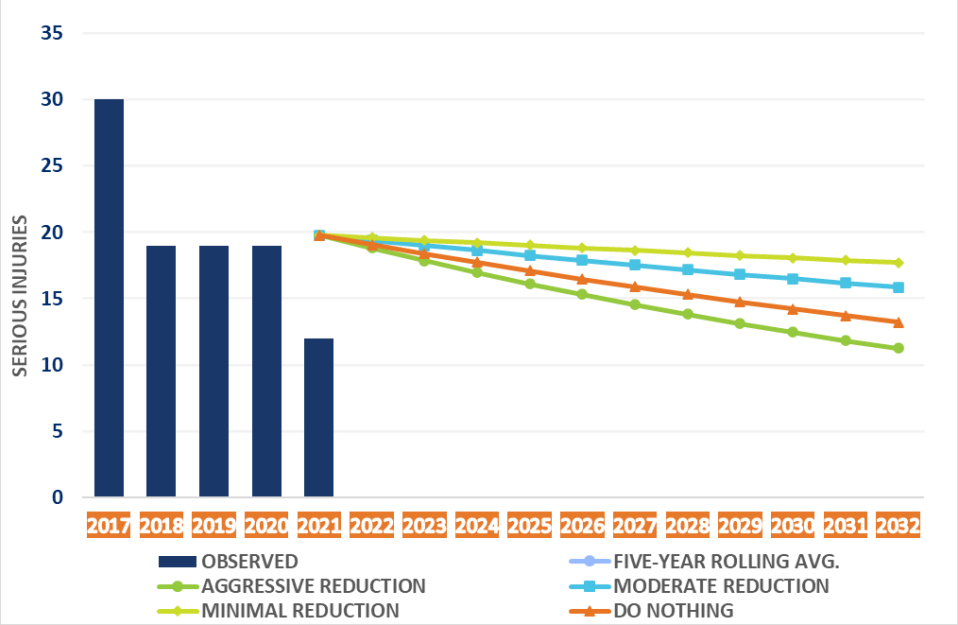

Figure 19. Forecast and Target Setting to Reduce Serious Injuries (2017-2021)

Overall, intersection-related crashes are responsible for the majority of bicycle and pedestrian serious injuries. Young driver-, senior driver-, and alcohol-related crashes also resulted in a large number of serious injuries. Finally, intersection-, young driver-, and alcohol-related crashes were the primary emphasis areas to cause bicyclist and pedestrian fatalities (Figure 20).

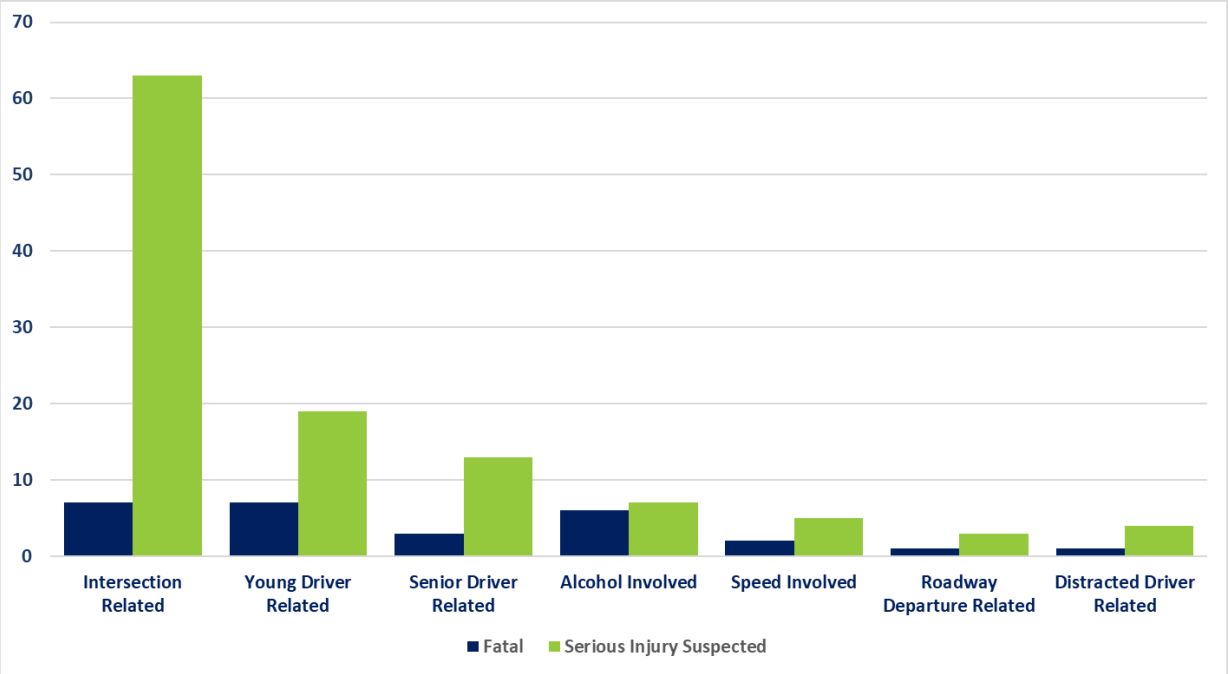

Figure 20. Fatality and Serious Injury Emphasis Areas (2017-2021)

Concentrations (2+) of bicycle crashes are located:

- Near the intersection of Cornel Drive and Philadelphia Drive
- Near the intersection of W Riverview Ave and Philadelphia Drive
- Near the intersection of Salem Avenue and Catalpa Drive
- Along Main Street between W 1st Street and E Siebenthaler Avenue
- At the intersection of Main Street and Delaware Avenue
- Along E 3rd Street between S Ludlow Street and Smithville Road
- At the intersection of N Keowee Street and E 3rd Street
- At the intersection of N Keowee Street and E 5th Street
- Along Troy Street between Keifer Street and Lee Street
- Along Burkhardt Avenue between E 5th Street and S Smithville Road
- At the intersection of S Smithville Road and Huffman Avenue
- Along Watervlient Avenue between Wayne Avenue and Patterson Road
- Along Patterson Road between Smithville Road and Shroyer Road
- Along Wayne Avenue between Buckeye Street and E Stewart Street
- Along Wyoming Street between Wayne Avenue and Steve Whalen Boulevard
- Along Brown Street between Buckeye Street and Caldwell Street
- Along W 3rd Street between N James H McGee Boulevard and N Euclid Avenue

Concentrations (2+) of pedestrian crashes are located:

- Along N Gettysburg Avenue between W Siebenthaler Avenue and Guthrie Road
- Near the intersection of N Gettysburg Avenue and Free Pike
- Along Salem Avenue between W Hillcrest Avenue and W Riverview Avenue
- At the intersection Cornell Drive and Philadelphia Drive
- Along Catalpa Drive between W Hillcrest Avenue and Cornell Drive
- Along N Main Street between E Siebenthaler Avenue and E Great Miami Boulevard
- Along E 3rd Street, N Jefferson Street, and S Ludlow Street in Downtown Dayton
- Along N Findley Street near State Route 4
- Along E 5th Street/Burkhardt Avenue between Wayne Avenue and S Smithville Road
- Near the intersection of E 3rd Street and N Findley Street
- Along S Smithville Road between Burkhardt Avenue and Watervlient Avenue
- Near the intersection of E Stewart Street and Watervlient Avenue
- Near the intersection of Linden Avenue and S Smithville Road
- Along St. Charles Avenue between Linden Avenue and Koenig Court
- Along Wyoming Street between Brown Street and Steve Whalen Boulevard
- Along Wayne Avenue/Wilmington Avenue between Buckeye Street and Patterson Road
- Near the intersection of Xenia Avenue and Wayne Avenue
- Near the intersection of Wyoming Avenue and Wayne Avenue
- Along Brown Street between Burns Avenue and L Street
- Along S Main Street between Wyoming Street and Buckeye Street
- Near the intersection of Nicholas Road and Cincinnati Street
- Along Danner Avenue between Nicholas Road and W Stewart Street
- Near the intersection of Germantown Pike and McArthur Avenue
- Near the intersection of Germantown Pike and N Gettysburg Avenue
- Along Stolz Avenue from Germantown Pile to Nicholas Road

NETWORK SCREENING

NON-MOTORIZED ACTIVITY DATA

Link Bike Share and Spin Scooter Share Activity

Dayton has two bike and scooter shares throughout the city, Link Bike Share (Link) and Spin Scooter Share (Spin). Launched in 2015, Link currently consists of conventional bikes, electric assist bikes, and has 37 hubs throughout the city.[11] Spin was originally deployed in Dayton in 2019 with 100 scooters; in 2021 Spin redeployed between 200-440 scooters.[12] The City's contract with Spin includes data sharing via Populus, an online data platform. Populus tracks Spin's fleet and users' trips, routes, destinations, and origins. One year of data from Link was uploaded to Populus in 2021 as part of a national safety study Populus conducted for USDOT (Figure 21). Spin reported route map data and trip count data from 2020 to 2023, while Link Bike Share reported one year of route map data.

Routes for Spin and Link are constrained by geofenced service areas and hub locations respectively. Service is located mainly throughout the downtown core, and in the following neighborhoods: Webster Station, Oregon, Midtown, Historic Inner East, South Park, and University Park. The highest trip count was to Day Air Ballpark. Most likely people were traveling to/from the Dayton Dragon's baseball games. The inner downtown has a majority "medium" or "medium to high" number of trips taken. Specific locations with a "medium" or "medium to high" ranking include the Riverscape area, Oregon District, Convention Center, Levitt Pavilion, and Brown Street (from Frank Street to Stewart Street where there are numerous restaurants). A "low to medium" number of trips were taken throughout the outskirts of the downtown core, within neighborhoods such as Carillon, University Park, and Shroyer Park. Lastly, neighborhoods further from the downtown core have a "low" number of trips taken, likely because destinations are more spread out and users may choose to use another form of transportation over bike/scooter shares.

[11] Link Dayton. https://www.linkdayton.org/
[12] Franks, Sarah. "Larger fleet of Spin Scooters returns to Dayton." *Dayton Daily News*, April 2021, https://www.daytondailynews.com/what-to-know/just-in-larger-fleet-of-spin-scooters-return-to-dayton/TR3Z6TQ3A5BLPEH4DSZ7OYYUP4/

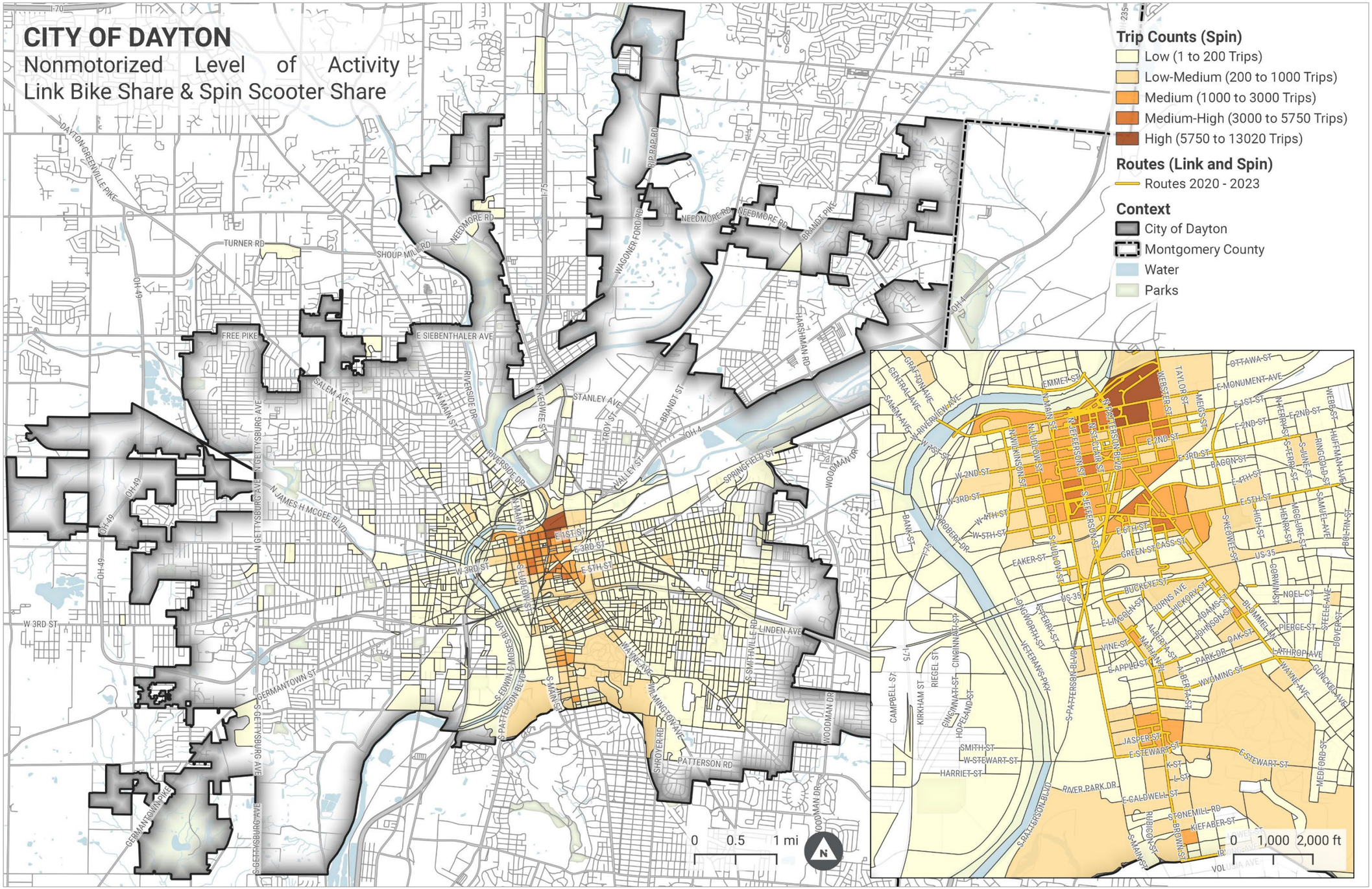

Figure 21: Nonmotorized Level of Activity - Link Bike Share & Spin Scooter Share

Bicycle Activity

The project team utilized StreetLight to run analysis to better understand where residents are biking within Dayton city limits (Figure 22). Based on the analysis the following areas have medium to high levels of bicycle activity in 2021:

- Salem Avenue
- Main Street
- Third Street
- Wayne Avenue
- Smithville Road
- Woodman Drive
- Linden Avenue
- Brown Street/Warren Street
- Streets or portions of streets within University of Dayton and surrounding areas:
  - Stewart Street
  - Irving Avenue
  - Alberta Street
  - Kiefaber Street
  - Caldwell Street
  - Evanston Avenue

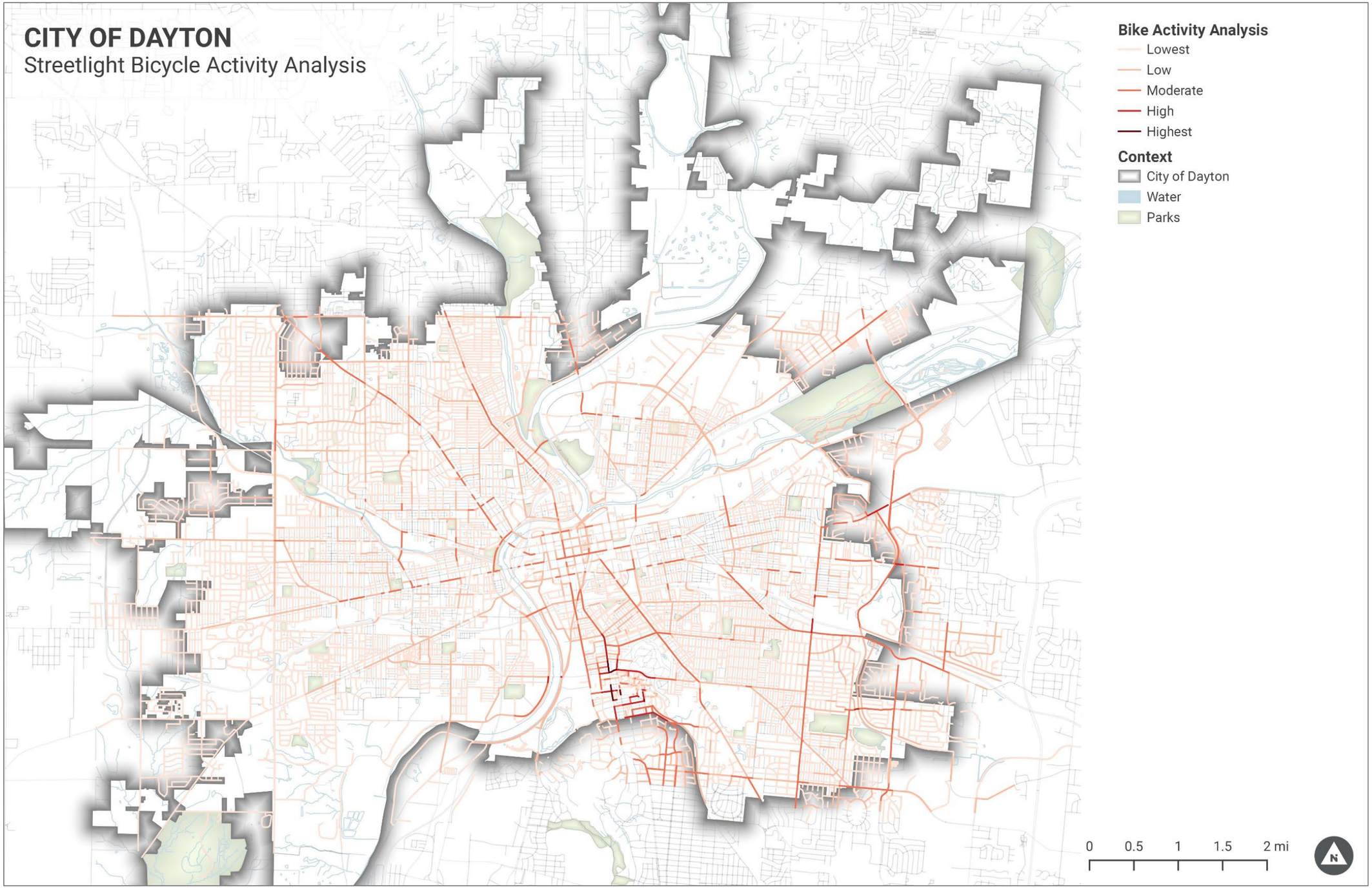

Figure 22: Streetlight Bicycle Activity Analysis (2021)

Pedestrian Activity

The project team utilized StreetLight to run an analysis to better understand where residents are walking within Dayton city limits (Figure 23). Based on the analysis the following areas have medium to high levels of pedestrian activity in 2021:

- Valley Street (Grant Street to Rita Street) – Dayton Children's
- Downtown:
  - N Ludlow Street (W 1st Street to W 3rd Street)
  - Monument Avenue (N Ludlow Street to N Jefferson Street; N St Clair Street to Sears Street)
  - 3rd Street (Ludlow Street to Madison Street)
  - N Jefferson Street (E 4th Street to E 2nd Street)
  - Brown Street/Warren Street (south of Vine Street)
  - Portions of Main Street, 5th Street
- Streets surrounding Miami Valley Hospital:
  - Apple Street
  - Main Street
  - Magnolia Street
  - Wyoming Street
- Streets or portions of streets within University of Dayton and surrounding areas:
  - Stewart Street
  - Alberta Street
  - Kiefaber Street
  - Caldwell Street
  - Evanston Avenue
  - K Street
  - Trinity Avenue
  - Stonemill Road
  - Lawnview Avenue

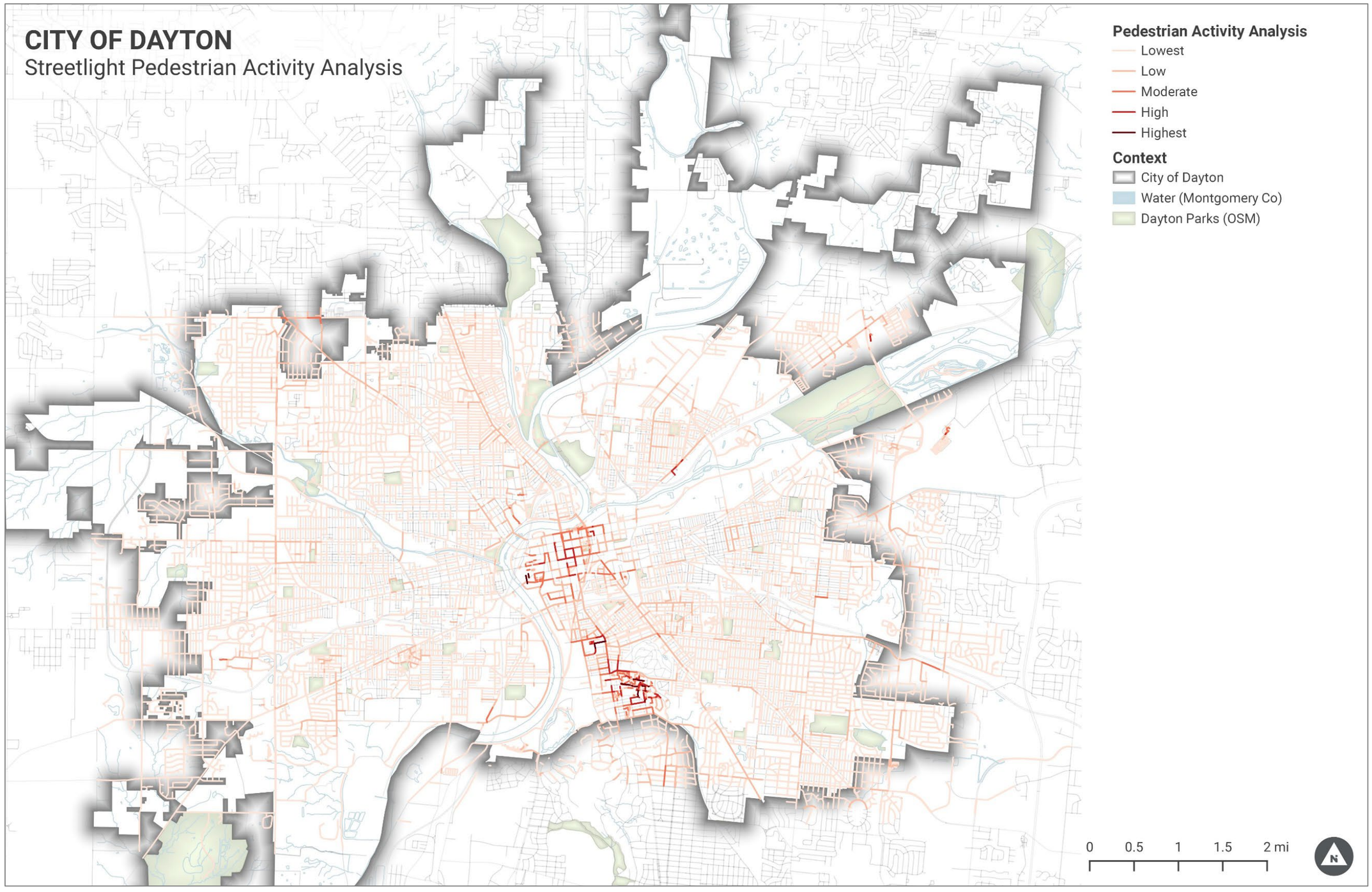

Figure 23: Streetlight Pedestrian Activity Analysis (2021)

SYSTEMIC SAFETY ANALYSIS

Systemic Safety Project Selection Tool

The Federal Highway Administration (FHWA) developed the Systemic Safety Project Selection Tool to build upon current safety management practices for identifying roadway safety problems.[13] The tool provides guidance on how to expand beyond traditional site-specific analysis to system-wide based approach. The tool is a step-by-step process that leads to a systemic safety analysis and determining high-risk roadways in the system. The process includes identifying focus crash types and risk factors, screening and prioritizing candidate locations, selecting countermeasures, and prioritizing projects. A systemic safety analysis was conducted focusing on the first two steps of the FHWA's Systemic Safety Project Selection Tool:

- Identify Focus Crash Types and Risk Factors
- Screen and Prioritize Candidate Locations

For more information on the methodology of this analysis see: **APPENDIX: SYSTEMIC SAFETY ANALYSIS METHODOLOGY .**

Identify Focus Crash Types and Risk Factors

Focus Crash Types

The purpose of this step is to identify crash types that represent the greatest number of severe crashes across Dayton's transportation system. For the purposes of the Active Transportation Plan, the analysis focused on the following AASHTO Emphasis Areas: making walking and street crossing safer and ensuring safer bicycle travel[14]. Based on the emphasis areas, the focus crash types selected for the analysis were bicycle and pedestrian crashes that resulted in serious injury or fatality.

Focus Facilities

Crash data from years 2017 to 2021 was used to determine the facility type at which bicycle and pedestrian crashes resulting in serious injury or fatality most often occur. The majority of crashes for both bicycle and pedestrian crashes occurred along a roadway segment (not an intersection) or at a signalized four-way intersection (Figure 24). Those facility types were further evaluated using the TIMS Roadway Inventory to determine if there was a trend in the number of lanes on those facilities. The results showed that most of the crashes for bicycles and pedestrians along a segment and at a four-way intersection occurred where there were two (i.e., one lane in each direction) or four lanes of traffic. The resulting intersection crashes were then broken down by the traffic control device present at the intersection. The majority of those crashes occurred where traffic signals were present. Therefore, the focus facilities are:

- Two-lane and four-lane roadway segments
- Four-way intersections on two-lane and four-lane roadways with traffic signals

[13] Systemic Safety Project Selection Tool, Federal Highway Administration, https://safety.fhwa.dot.gov/systemic/fhwasa13019/chap1.cfm#chap11
[14] U.S. Department of Transportation Federal Highway Administration. (2013, July). *Systemic safety project selection tool: task 1 select focus crash types.* https://safety.fhwa.dot.gov/systemic/fhwasa13019/element1.cfm#el12task1

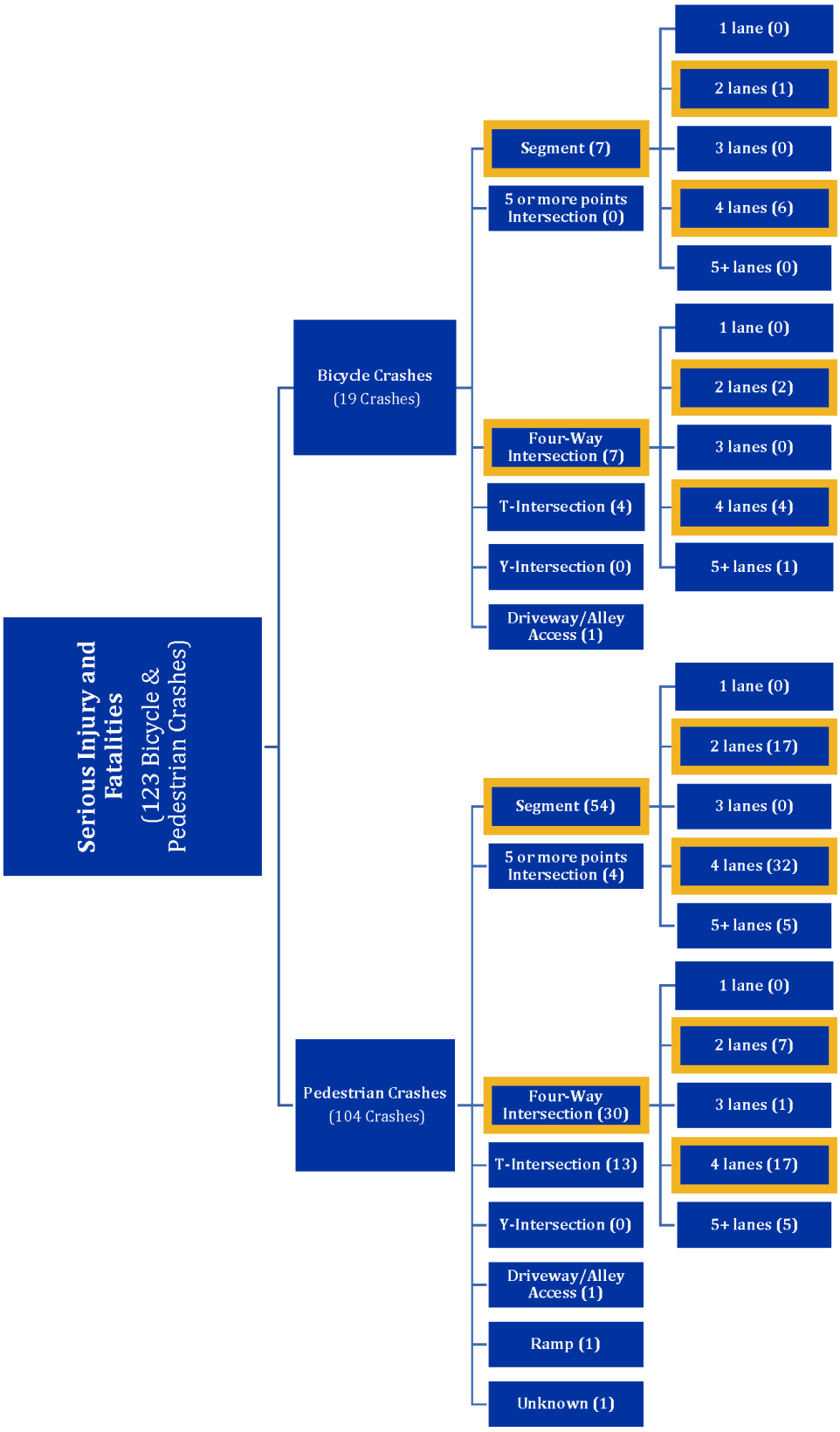

Figure 24. Serious Injury and Fatality Crash Tree (2017-2021 Bicycle and Pedestrian Crash Data)

Identify and Evaluate Risk Factors

In order to define the focus facility types further, potential characteristics of locations where pedestrian and/or bicycle crashes occur were developed and evaluated to determine if they were risk factors for pedestrian and/or bicycle crashes. Upon review of local, regional, and state data available for the City of Dayton, characteristics of facilities found to increase the risk for pedestrian and/or bicycle crashes to occur include the following:

- Risk factors on two-lane and four-lane roadway segments:
    - Pedestrian crashes
        - Average Daily Traffic (ADT) Volume: Roadway segments with 1,001-2,000 ADT, or 6,001-10,000 ADT, or 15,001-20,000 ADT is a risk factor
    - Bicycle crashes
        - Average Daily Traffic (ADT) Volumes: roadway segments with 5,001-6000 ADT is a risk factor
        - Lack of a bicycle facility, such as a separated bike lane or parallel shared use path
- Risk factors at signalized four-way intersections with traffic on two-lane and four-lane roadways:
    - Pedestrian crashes
        - Average Daily Traffic (ADT) Volumes: roadway segments at the intersection with 1,001-2,000 ADT, or 6,001-7,000 ADT, or 15,001-20,000 ADT is a risk factor
        - Close proximity of a transit stop (1/16th of a mile within a transit stop)
    - Bicycle crashes
        - Lack of a bicycle facility, such as a separated bike lane, for bicycle crashes
        - Close proximity of a transit stop (1/16th of a mile within a transit stop)

Additional characteristics evaluated included proximity to a school, proximity to a point of interest, vertical grade, horizontal curvature of a road segment, the lighting level at the time of a crash, and road conditions at the time of a crash. Since those characteristics were determined to not be a common characteristic among pedestrian and bicycle crashes in the City of Dayton, they were not defined as a risk factor and were not included in the analysis to determine the high-risk network.

Screen and Prioritize Candidate Locations

After determining the focus facilities and associated risk factors in the transportation network, a systemwide analysis was conducted to locate and screen all segments and signalized four-way intersections in the system in order to identify the high-risk network locations (Figure 25). Each segment of road and each signalized four-way intersection located along a two-lane or four-lane roadway in the network was evaluated to determine if it had any of the risk factors and given a risk score. Figure 26 illustrates the overall high risk roadway network with priority candidate locations labeled as a “high” safety risk for bicycle and pedestrian safety. Roadway segments identified with two risk factors are illustrated as a “high” safety risk. Figure 26 also illustrates the overall high-risk intersections. Four-way intersections with one to two identified risk factors are labeled as a “medium” safety risk, and intersections with three to four risk factors are labeled as a “high” safety risk for bicycle and pedestrian safety.

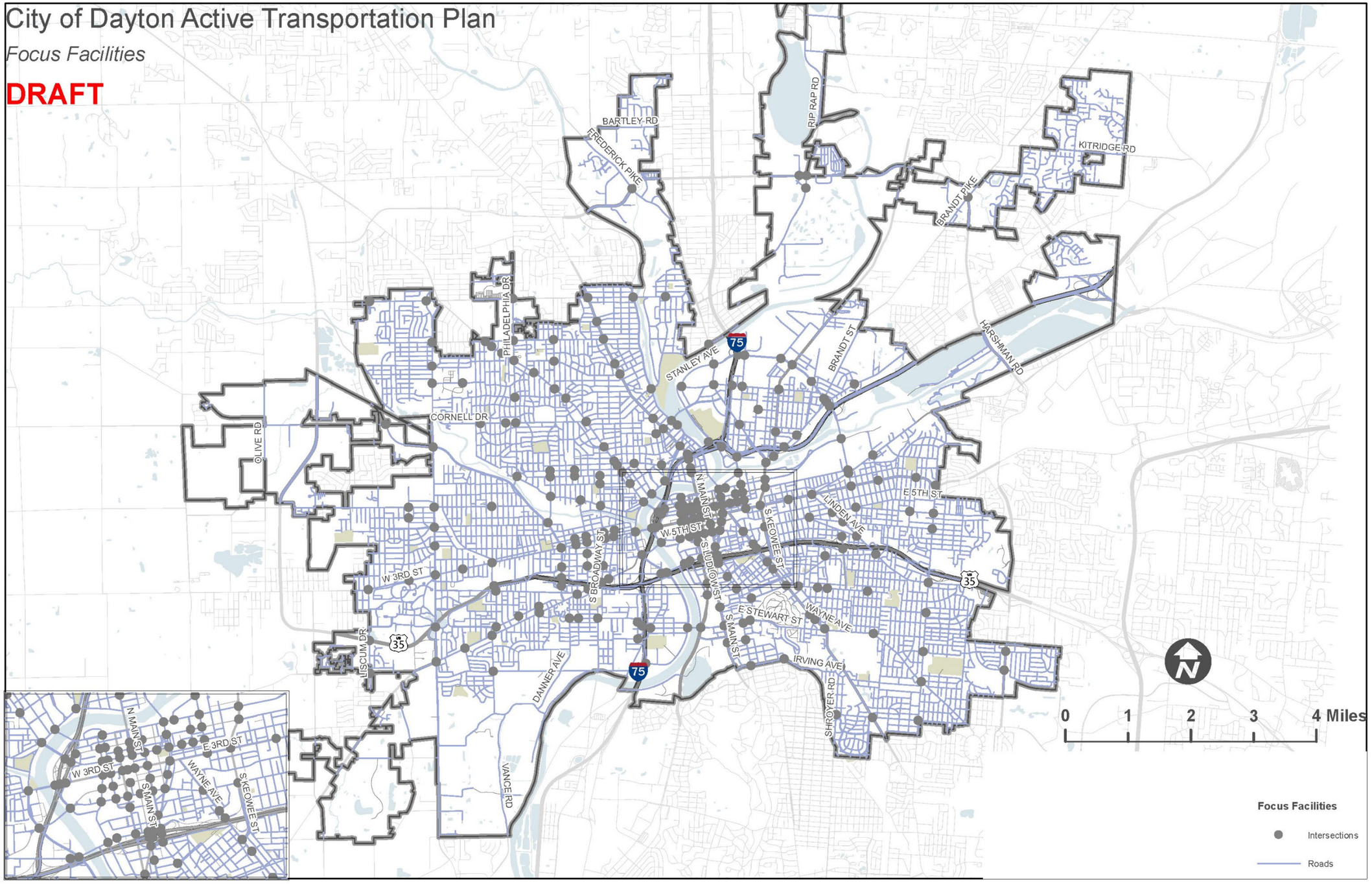

Figure 25: Focus Facilities

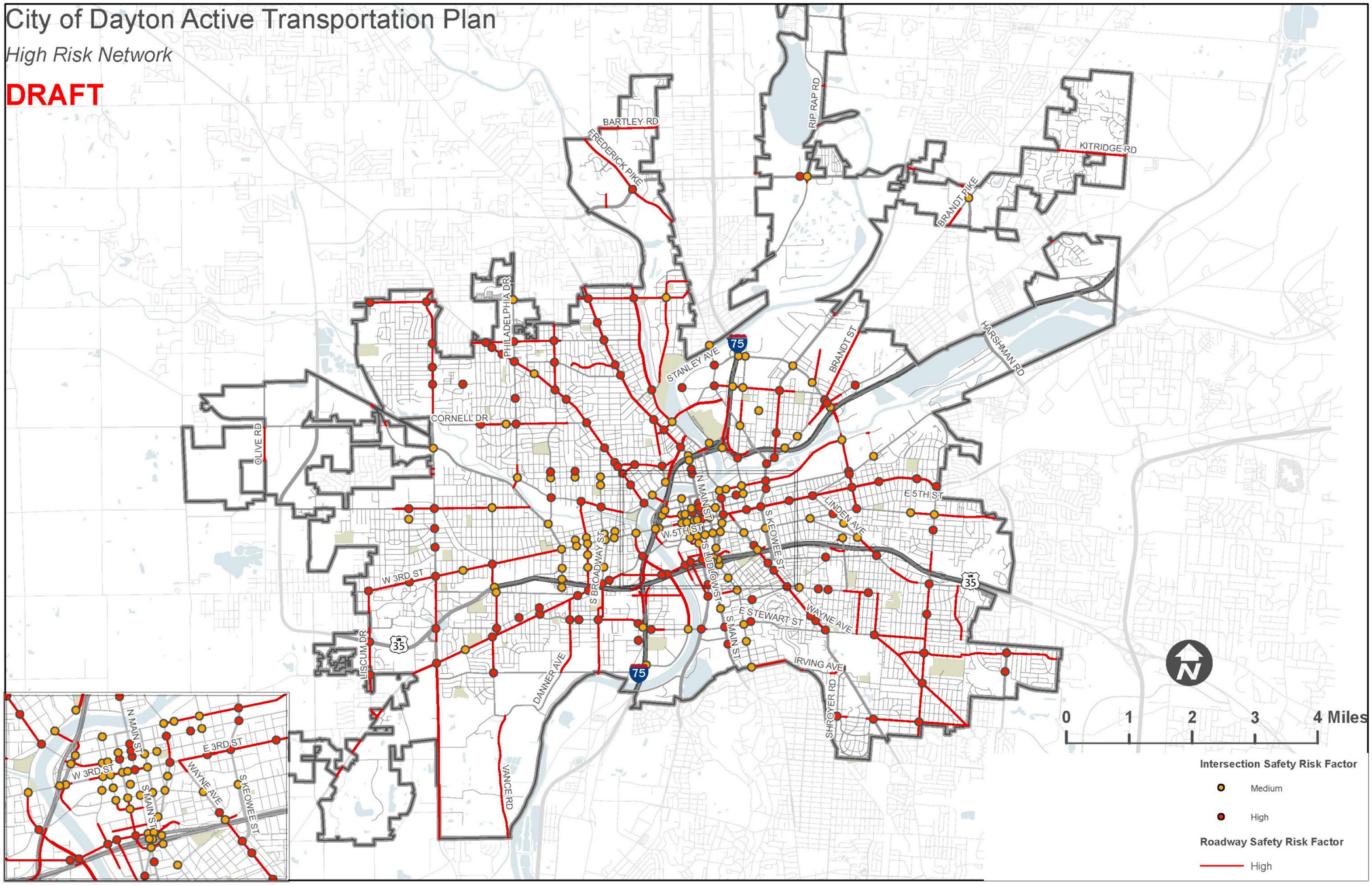

Figure 26: High Risk Roadway Network

ODOT Local Road Systemic Safety Analysis – South-West Ohio Pedestrian Crash Screening

ODOT performed a Pedestrian Safety Analysis for District 8 and included Dayton in the analysis (Figure 27). Risk factors were used to determine locations of high risk for pedestrian-related crashes. The analysis assessed the following risk factors:

- Volume,
- Speed,
- Proximity to bus stops, schools/colleges, libraries, and parks,
- Presence of sidewalk,
- Percentage (>10%) of households without car,
- Number of lanes,
- Intersection signal, and
- Age (20% Pop. < 20 years old).

The higher the risk, the higher the priority to address the pedestrian safety along the segment or intersection. High priority intersections are concentrated in downtown as well as along Main Street, Wayne Avenue, and Keowee Street. High priority segements include:

- 3rd Street
- Salem Avenue
- Main Street,
- Monument Avenue
- 1st Street
- Wayne Avenue
- Brown Street
- Smithville Road
- Linden Avenue
- Edwin C Morses Boulevard
- Germantown Pike
- Stewart Street

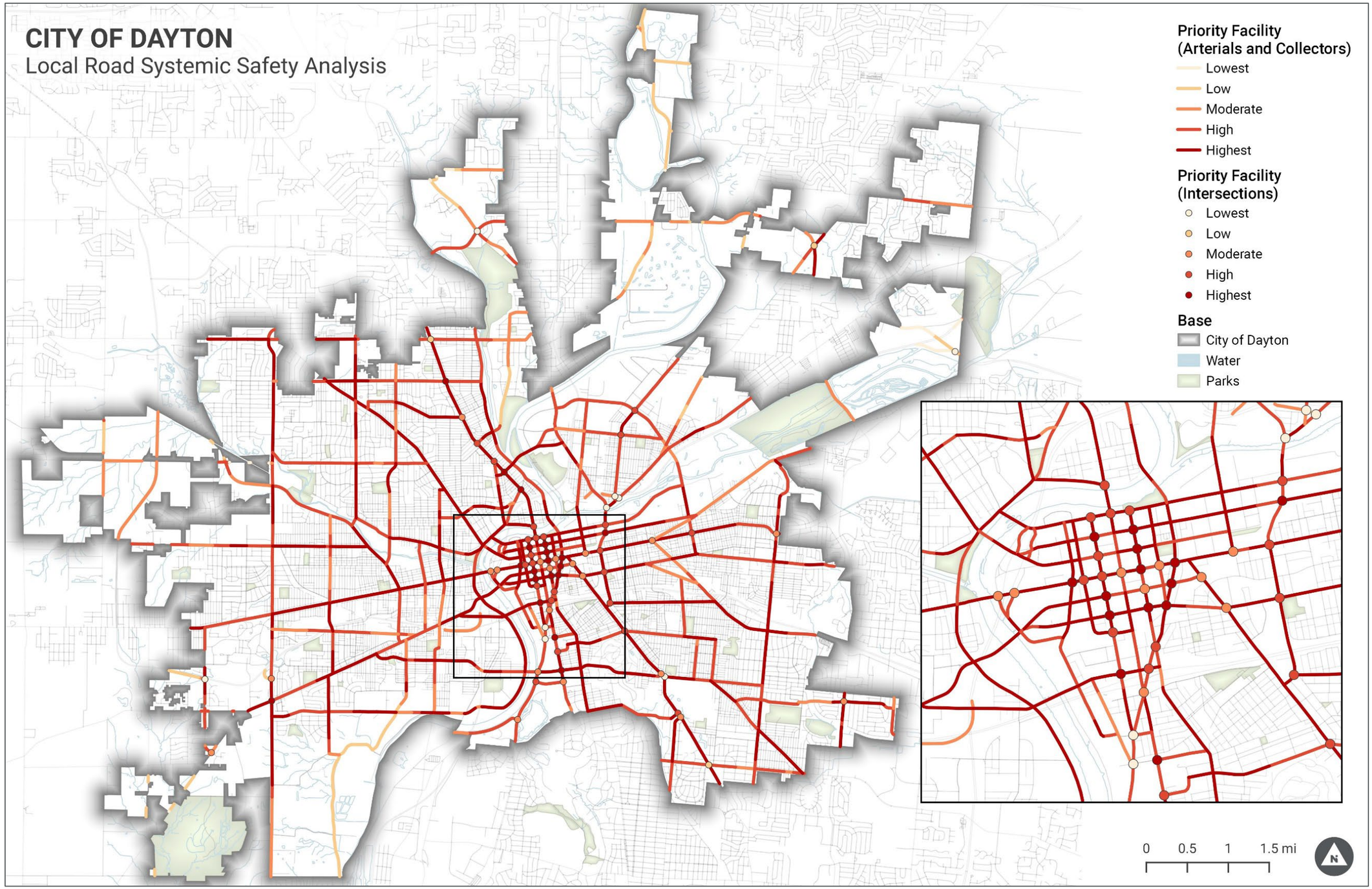

Figure 27: Local Road Systemic Safety Analysis

ACTIVE TRANSPORTATION NEEDS/EQUITY ANALYSIS

Incorporating Equity in Active Transportation Planning

Active transportation options contribute to a more equitable transportation system by reducing barriers for people who do not use a motor vehicle. Many people do not drive because of ability, income, age, or a combination of these factors. The cost of owning and maintaining a vehicle can be a major burden, especially on low-income families. People without a vehicle need to access employment, school, grocery shopping, and a variety of other activities to fully participate in society. Transit, walking, and bicycling play a vital role in the overall transportation system by offering increased mobility, independence, and access to opportunity for people without vehicles.

National statistics point towards the need for equity in active transportation planning and design. Across the country and in Ohio, a disproportionate share of walking and bicycling fatalities occur among communities of color, older adults, and low-income populations.[1] Connected and accessible active transportation infrastructure for these groups results in better access to daily physical activity and improved quality of life.

1. *Ohio Department of Transportation. (2020), Walk.Bike.Ohio Safety Analysis Reports. https://www.transportation.ohio.gov/wps/portal/gov/odot/programs/walkbikeohio/existing-future-conditions-analysis/safety-analysis-reports*

Walk.Bike.Ohio

As part of its statewide bicycle and pedestrian plan, Walk.Bike.Ohio, the Ohio Department of Transportation (ODOT) performed an Active Transportation need analysis for the entire state. It created a composite need score for every census tract in the state, with scores assigned based on the presence of non-white groups, youth, older adults, poverty, low educational attainment, limited English proficiency, and low motor vehicle access. Higher scores correspond to a higher presence of underserved groups and indicate a greater need to increase equitable outcomes.

There are numerous key components within the Walk.Bike.Ohio plan that would be beneficial for developing the City of Dayton's Active Transportation Plan. Walk.Bike.Ohio provides an overview and analysis for how local governments can development and implement Walk.Bike.Ohio in their community. Their analysis states that the role of the local government is:

- Developing an ATP and supporting policies,
- Leveraging funding,
- Overseeing construction and development,
- Encouraging events and education around active transportation,
- Maintaining and overseeing operations, and
- Evaluating active transportation systems through performance measurements.

ODOT's Demand Analysis provides an overall analysis for the types of active transportation that are in demand around the state. Darker areas on the map represent a higher demand for walking and cycling opportunities (Figure 28). Demand indicators include employment density, population density, walk/bike commute mode share, park density, presence of college/universities, retail employment density, and number of people 200% below poverty line.

ODOT's Need Analysis identifies where active transportation is needed based on concentrations of vulnerable populations. Darker areas on the map represent a higher need for walking and cycling opportunities based on concentrations of vulnerable populations and need indicators (Figure 29). There are a total of seven need indicators: minority groups, youth, older adults, poverty, no high school diploma, limited English proficiency, and no access to a motor vehicle.

Areas of high need and high demand should be prioritized for bicycle and pedestrian improvements because residents in these areas likely rely more heavily on active transportation options for getting around. The following neighborhoods in the City of Dayton have their entire neighborhood identified as an area of high demand:

- Carillon
- Downtown
- Grafton Hills
- MacFarlane
- McCook Field
- McPherson
- Midtown
- Old Dayton View
- Oregon
- Patterson Park
- Roosevelt
- South Park
- Webster Station
- Wolf Creek
- Wright-Dunbar
- Wright View

All but one of those neighborhoods is located in central Dayton. Most of the neighborhoods east of Downtown Dayton and a few of the neighborhoods northwest of Downtown also have portions with high demand.

Areas of high need are located within the large majority of the neighborhoods in the City of Dayton. Only nine of 66 neighborhoods in the City of Dayton have no areas of high need. Those neighborhoods are primarily located in central Dayton. The following neighborhoods in the City of Dayton have their entire neighborhood identified as an area of high need:

- Arlington Heights
- Burkhardt
- Carillon
- College Hill
- Dayton View Triangle
- Deweese
- Edgemont
- Fairlane
- Gateway
- Greenwich Village
- Highview Hills
- MacFarlane
- Madden Hills
- Miami Chapel
- Mount Vernon
- Old Dayton View
- Old North Dayton
- Pineview
- Riverdale
- Roosevelt
- Santa Clara
- Southern Dayton View
- Stoney Ridge
- Twin Towers
- Wesleyan Hill
- Wolf Creek
- Wright-Dunbar

Areas with overlapping high demand and high need are key areas to invest in pedestrian and bicycle infrastructure (Figure 30). There are six neighborhoods in the City of Dayton that have both high demand and high need throughout their entire neighborhood:

- Carillon
- MacFarlane
- Old Dayton View
- Roosevelt
- Wolf Creek
- Wright-Dunbar

There are also nine neighborhoods in northwestern Dayton and 11 neighborhoods in eastern Dayton that have portions with both high demand and high need.

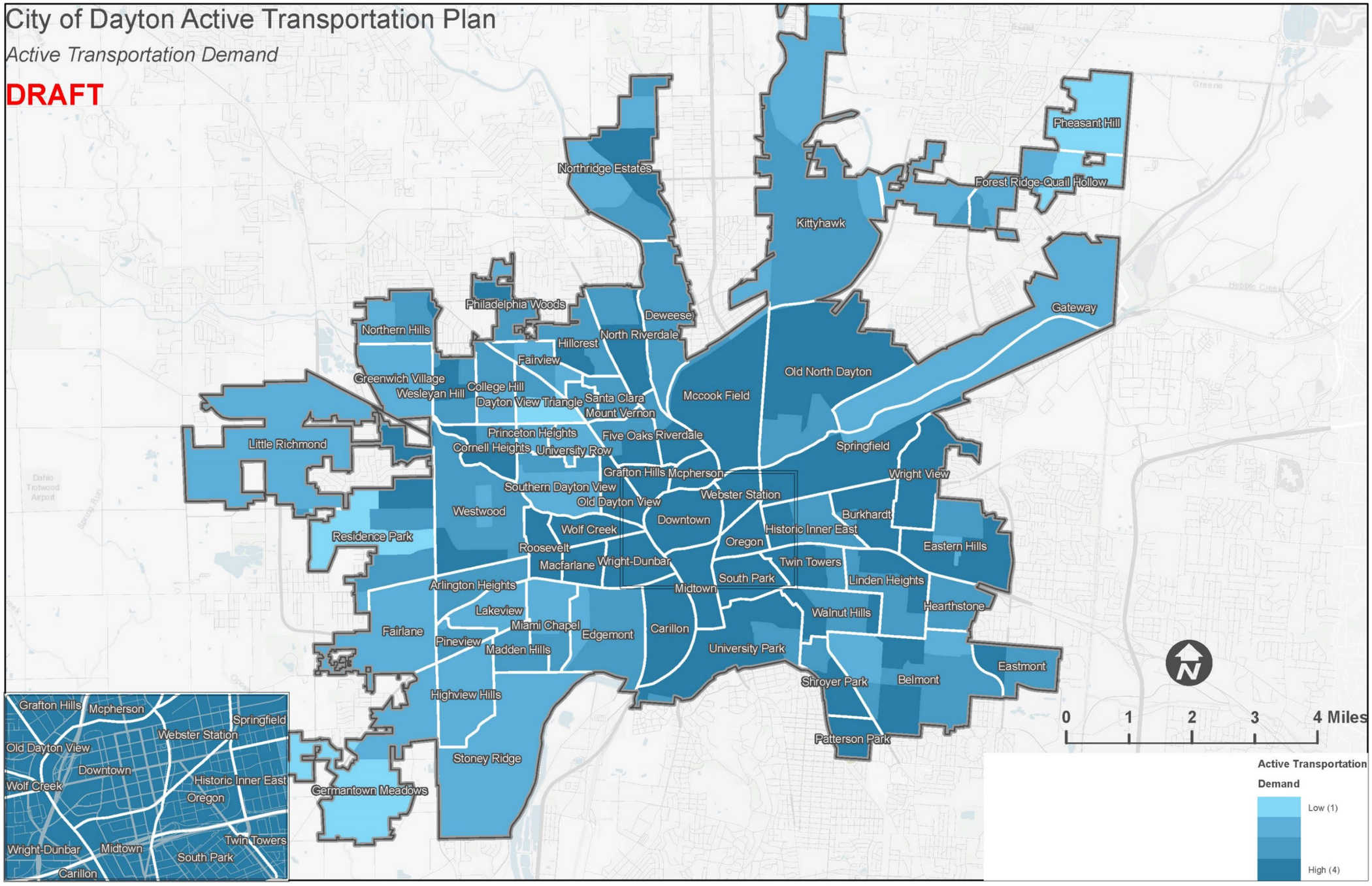

Figure 28: Active Transportation Demand Analysis

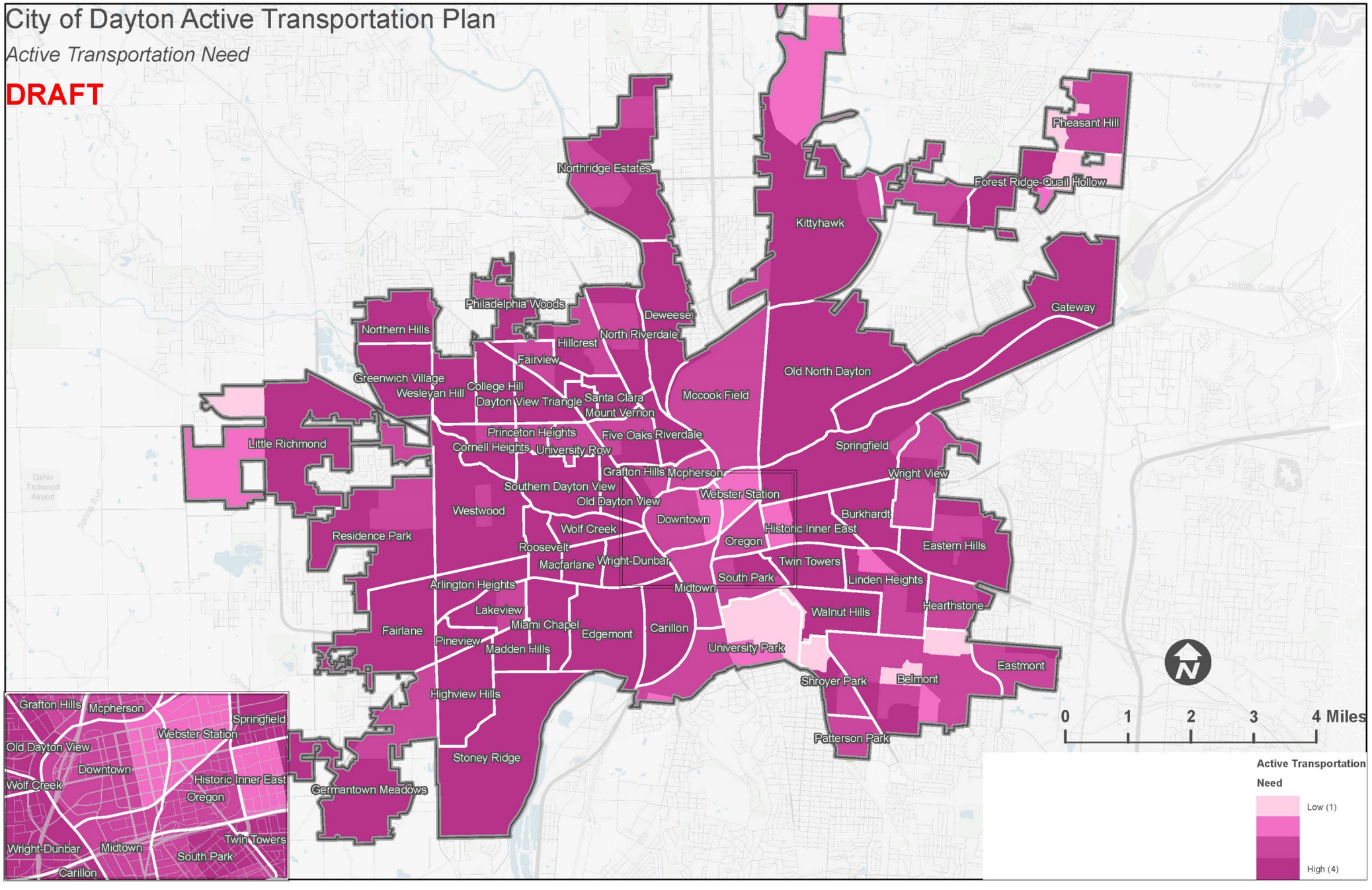

Figure 29: Active Transportation Need Analysis

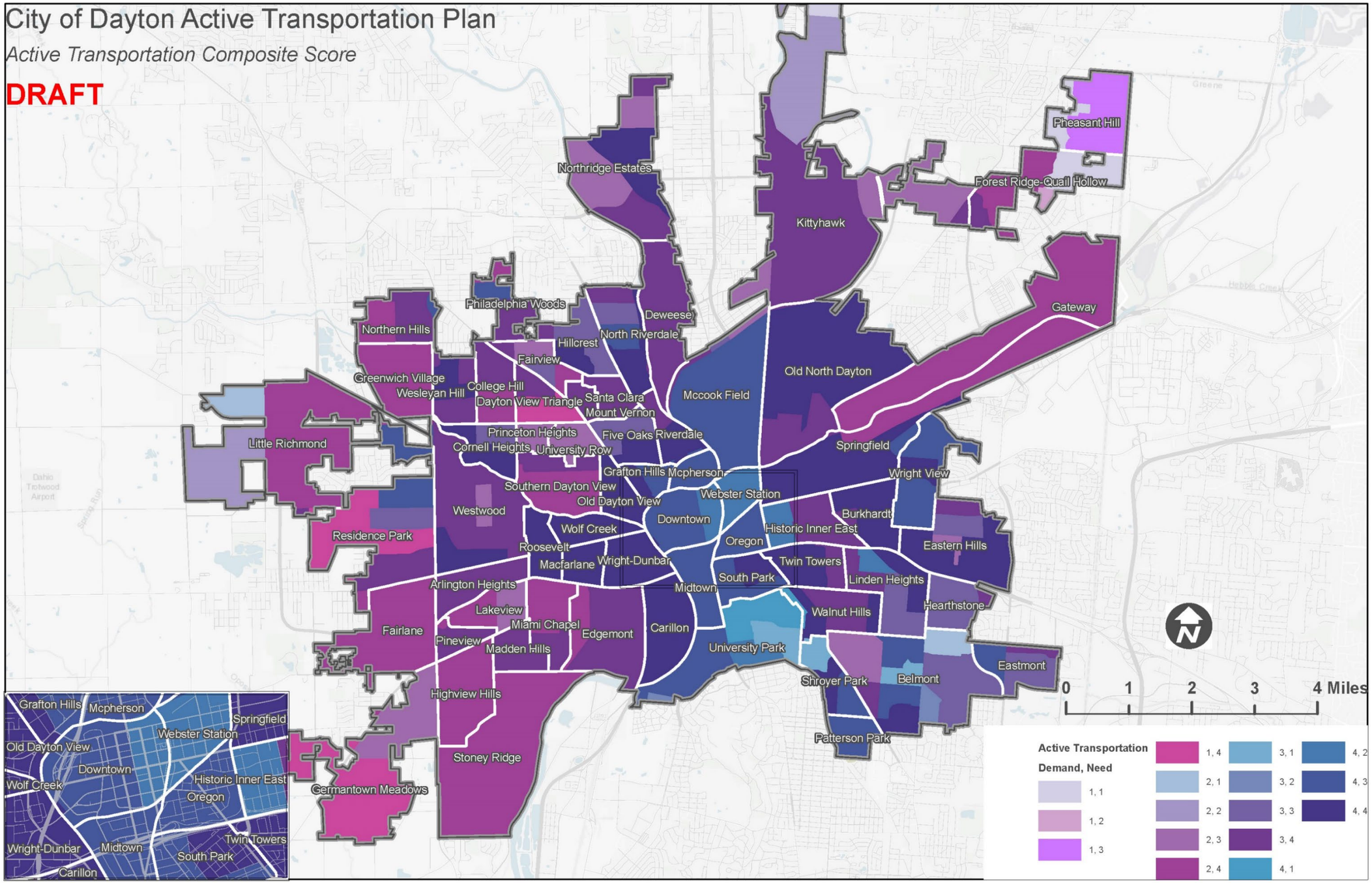

Figure 30: Active Transportation Composite (Demand + Need) Analysis

Equity Index

The City of Dayton created an equity index that includes indicators and measures in four categories to develop a composite score. The index illustrates levels of disparity (Figure 31) in the city, and it may be used to assist in project prioritization as areas with higher levels of disparity may benefit from additional investment. Each of the four index categories include multiple indicators, and a composite score value is assigned to each geography based on the impact values of each indicator. Lower composite scores indicate a higher level of disparity in the area.

- The four equity index categories are:
  - Accessibility
  - Livability
  - Economy
  - Education

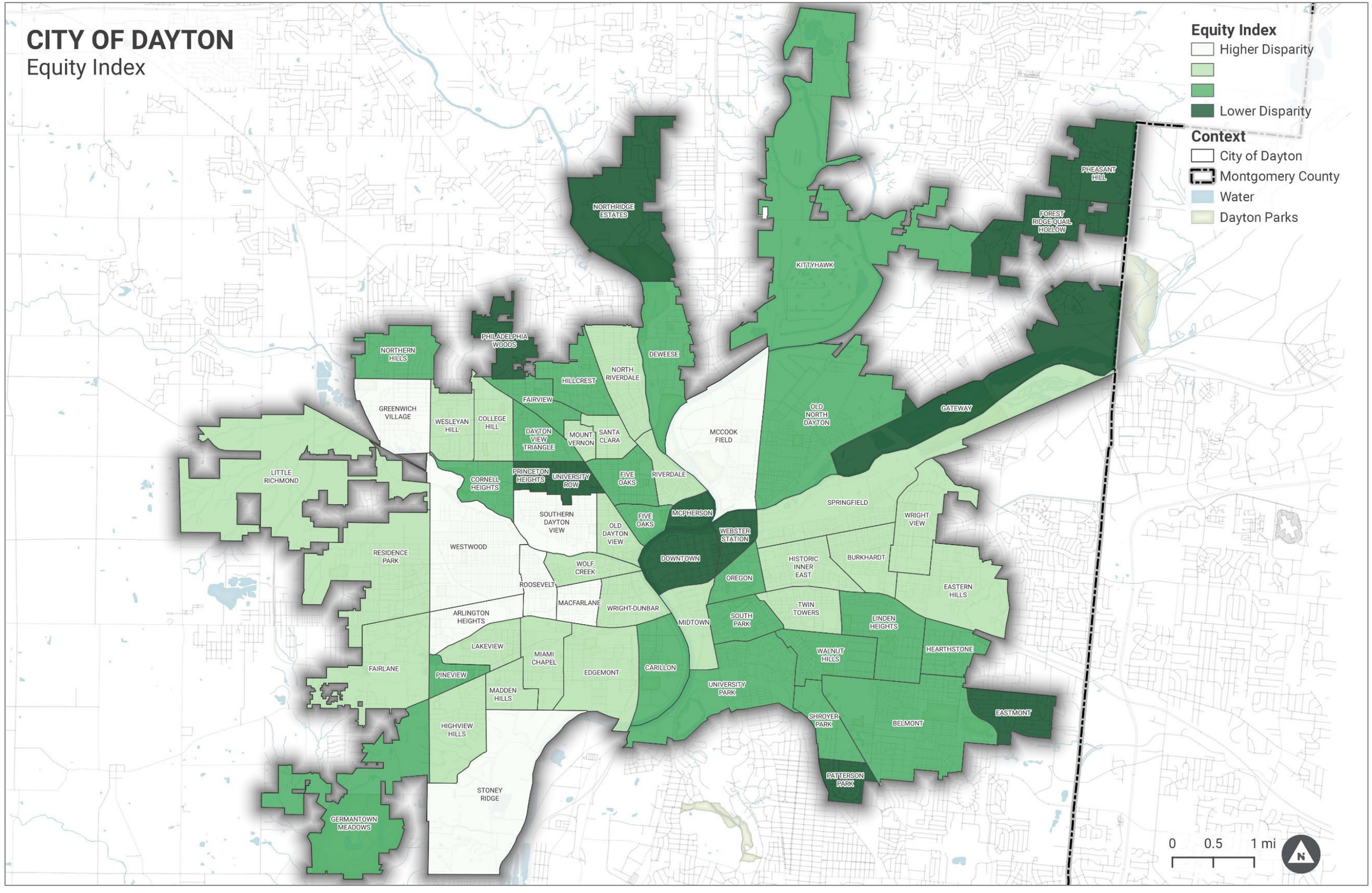

Figure 31: Equity Index (City of Dayton)

LEVEL OF TRAFFIC STRESS

Overview of Level of Traffic Stress

In active transportation planning, a Level of Traffic Street (LTS) analysis uses broadly available road characteristics to classify the experience of riding a bicycle on different streets. A common method was first described in 2012[15], and has been adopted and adjusted for local conditions across the country. An LTS analysis typically groups roads into one of four categories:

- **LTS 1** – A low stress facility suitable for all ages and abilities. These facilities have strong separation from motor vehicle traffic or are well-established on low speed, low volume roads.
- **LTS 2** – A facility suitable for people who are "interested but concerned" about riding a bicycle, which includes most adults and families. These facilities are separated from moderate speed and multilane roads or are shared lanes on lower speed, lower volume roads.
- **LTS 3** – A facility suitable for people who are "enthused and confident" about riding a bicycle. These facilities are shared lanes on moderate speed or separated from multilane, medium to high volume, and higher speed roads.
- **LTS 4** – A high stress facility is uncomfortable for most adults. These facilities are mixed flow on moderate speed or higher volume roads or in close proximity to high speed, high volume, or multilane roads.

LTS Methodology

ODOT developed an LTS tool for the statewide bicycle network, and that method was adopted for this analysis. The inputs for the ODOT LTS analysis are:

- Number of lanes
- Direction of travel (one- or two-way)
- Posted speed limit
- Annual Average Daily Traffic (AADT)
- Bicycle facility type (shared use path, separated bicycle lane, buffered bicycle lane, bicycle lane, paved shoulder, or shared lane)
- Bicycle lane width

The ODOT TIMS roadway inventory provided the inputs for the LTS analysis, combined with bicycle facility data from the City of Dayton. Roadways without ADDT data available where it was required to develop an LTS score, primarily local roads, were not included in the results.

LTS Results

Figure 32 illustrates the results of the LTS analysis. As shown in the figure there are several low stress corridors in Dayton, particularly where the city has built on-street bike lanes or shared-use paths parallel

[15] Mekuria, M. C., Furth, P. G., & Nixon, H. (2012). Low-stress bicycling and network connectivity. Retrieved from [https://transweb.sjsu.edu/research/Low-Stress-Bicycling-and-Network-Connectivity]

to roads. However, those low stress roads are often separated from each other by higher stress roads with an LTS 3 or 4 score, indicating opportunities for better low-stress connections throughout the city. The high stress roads (LTS 4) are primarily the following:

- 3rd Street, west of North Patterson Boulevard (except for the section with bike lanes between North Broadway Street and South Edwin C. Moses Boulevard)
- Liscum Drive
- Ludlow Street
- North Main Street, north of East Monument Avenue
- South Smithville Road, between Greenlawn Avenue and Highridge Avenue
- State Route 49
- Troy Street, between Giles Street and Kuntz Road
- Woodman Drive

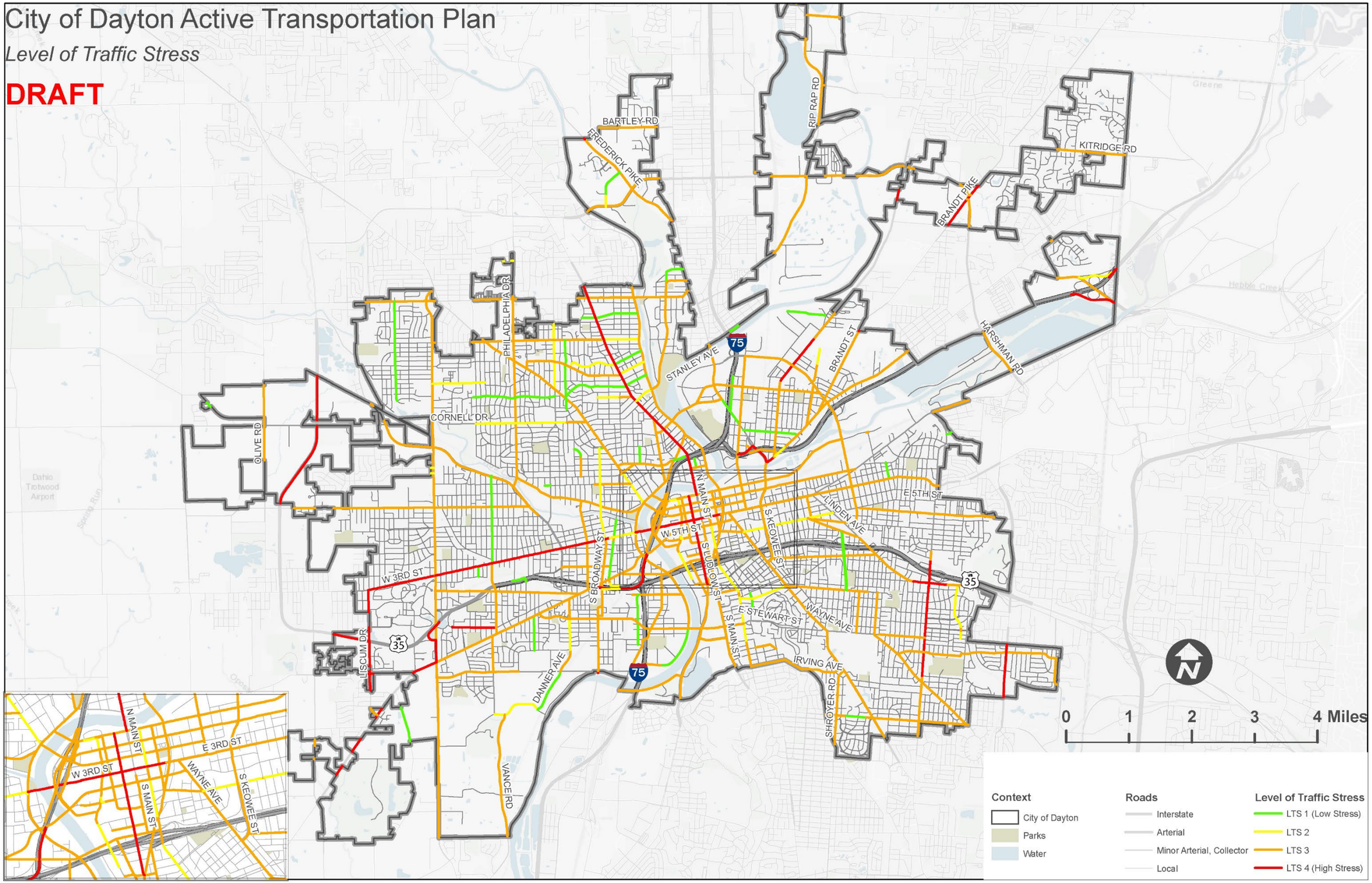

Figure 32: Level of Traffic Stress

CONCLUSION

The City of Dayton, located along the Great Miami River, is an ideal location for active transportation with its low elevation changes and natural amenities. The existing sidewalk network is fairly complete throughout the city with only a few neighborhoods experiencing major gaps in the network. Downtown Dayton and the inner-ring historic neighborhoods benefit from the most comprehensive sidewalk network in the city, however, existing sidewalks outside of downtown are often in substandard conditions due to tree roots and crumbling curbs. The neighborhoods with large gaps in the sidewalk network are generally outside the inner-ring historic neighborhoods. The bicycle network in Dayton provides connections to the region through the Creekside Trail, Iron Horse Trail, Mad River Trail, Dayton-Kettering Connector Trail, and Wolf Creek Trail. However, on-street bike paths are primarily concentrated in or near downtown and there are many opportunities to provide additional connections throughout the city.

The connectivity of the active transportation network is heavily reliant on sidewalks which support a high volume of pedestrians on a daily basis. Gaps in the bicycle network are located in the northeast, northwest, southeast, and southwest quadrants of the city, and two major missing links include the primary east/west and north/south corridors connecting to downtown.

The City of Dayton engaged the public and stakeholders in the summer and fall of 2022 to determine major issues of concern and areas for improvement to support walking and biking in the city. Recommendations received from the public engagement period included requesting improvements to pedestrian crossings, underpasses, and bridges in the downtown area. Residents voiced support for Flight Light and also provided specific recommendations for new pedestrian and bicycle facilities throughout the city.

Conducting a crash trend and network screening analysis for the Dayton active transportation network illustrates a need for improved safety measures for bicyclists and pedestrians. Safety improvements and countermeasures should be focused along two-lane and four-lane roadways where no bicycle lane, sharrow, or shared use paths are present and also at four-way intersections with traffic controls. Additionally, priority consideration should be given to safety and connectivity improvements along the primary east/west and north/south corridors where there is overlap between the high-risk network and major connectivity gaps. Overlap between system gaps and the high-risk network indicates high need for safe connections in these areas.

Finally, the Active Transportation (AT) Demand/Need analysis, conducted by the Ohio Department of Transportation as part of its statewide bicycle and pedestrian plan, Walk.Bike.Ohio, shows there is high demand for active transportation in a large portion of the city. Areas that will benefit the most from additional investment have both high demand and high need for active transportation. New infrastructure or safety improvements should be prioritized in areas with a higher level of disparity (Equity Index), high demand and need for active transportation, and along the high-risk network or as an alternative route to the high-risk network.

The City of Dayton has a comprehensive sidewalk network and has experienced a downward trend in serious injuries and fatalities related to bicycle and pedestrian crashes over the past five years (2017-2021), however; there continue to be many opportunities to make it even safer, and to provide better connections and access for achieving a more equitable transportation system in the future.

APPENDIX: SYSTEMIC SAFETY ANALYSIS METHODOLOGY

SELECT FOCUS CRASH TYPES

This analysis is focused on increasing safety for bicyclist and pedestrians; therefore, the following AASHTO emphasis areas for special users were chosen: (1) to make walking and street crossing safer and (2) ensure safer bicycle travel. Those two emphasis areas were analyzed by looking at bicycle and pedestrian related crashes resulting in serious injury and/or fatality in years 2017 through 2021.

SELECT FOCUS FACILITIES

The selected crash data was used to determine the facility type at which bicycle, and pedestrian crashes most often occur. The majority of crashes for both bicycle and pedestrian crashes occurred along a roadway segment (not an intersection) and at a four-way intersection. Crashes with those facility types were further evaluated using the ODOT TIMS roadway inventory to determine if there was a trend in the number of lanes on those facilities. The results showed that most of the crashes for bicycles and pedestrian along a segment and at a four-way intersection occurred where there were two (i.e., one lane in each direction) or four lanes of traffic. The resulting intersection crashes were then broken down by the traffic control device present at the intersection. The majority of those crashes occurred where traffic signals were present. Therefore, the focus facilities are:

- Two-lane and four-lane roadway segments
- Four-way intersections on two-lane and four-lane roadways with traffic signals

The TIMS roadway inventory data was used for this analysis because it included information not available in the City of Dayton's centerline data, such as Average Daily Traffic (ADT), that would be used in the next steps of the analysis.

IDENTIFY AND EVALUATE RISK FACTORS

Based on research, experience, and characteristics of the identified crash locations, a list potential risk factors for bicycle and pedestrian related crashes resulting in severe injury and/or fatality were identified (**Tables 1 and 2**). Available data was then used to identify a list of verified risk factors, which were used to further define the focus facilities. If no local data was available, the potential risk factor was not assessed. If data becomes available in the future, the city should consider assessing the potential risk to further refine their focus facilities and help identify improvements to high risk facilities.

Table 1. Risk Factors Considered for Segments on Two-Lane and Four-Lane Roads

Potential Risk Factor	Data Available	Verified Risk Factor	
		Bicycle	Pedestrian
Time of day	No		
Average Daily Traffic	Yes	Yes	Yes
Speed limit	No		
Location relative to a school (1/8 mile)	Yes	No	No
Location relative to a point of interest (marts and parks) (1/16 mile)	Yes	No	No
Vertical grade	Yes	No	No
Horizontal curvature	Yes	No	No
Presence of bicycle facility	Yes	Yes	
Lighting levels	Yes	No	No
Lane width	No		
Presence of on-street parking	No		
Road conditions (wet or dry)	Yes	No	No
Pedestrian volume	No (StreetLight data was not available in time for analysis.)		
Bicycle volume	No (StreetLight data was not available in time for analysis.)		
Intersection related	Yes	No	No

Table 2. Risk Factors Considered for Four-Way Intersections on Two-Lane Roads and Four-Lane Roads

Risk Factors	Data Available	Verified Risk Factor	
		Bicycle	Pedestrian
Time of day	No		
Average Daily Traffic Volumes	Yes	No	Yes
Speed Limit	No		
Location relative to a school (1/4 mile)	Yes	No	No
Location relative to a point of interest (marts and parks) (1/16 mile)	Yes	No	No
Vertical grade	Yes	No	No
Horizontal curvature	Yes	No	No
Presence of bicycle facility	Yes	Yes	
Lighting levels	Yes	No	No
Lane width	No		
Presence of on-street parking	No		
Presence of left-turn or right-turn lanes	No		
Allowance of right-turn-on-red	No		
Pedestrian crosswalk presence, crossing distance, signal head type	No		
Road conditions (wet or dry)	Yes	No	No

Pedestrian volume	Yes *Streetlight data not available in time for analysis.*		
Bicycle volume	Yes *Streetlight data not available in time for analysis.*		
Presence of transit stops (within 1/16 mile)	Yes	Yes	Yes
Presence/number of driveways	No		
Traffic control device	Yes	Yes	Yes
Lack of separate turning movements from walk phase at signalized intersections (all red walk phase, or walk and restricted turn phase)	No		
Lack of leading pedestrian interval at signalized intersections	No		

A risk assessment was performed on each focus facility identified within the City of Dayton by determining the presence of each verified risk factor and applying a risk score. **Tables 3 and 4** below show each verified risk factor, their criteria, data used to assess their presence, and the score a focus facility was given if it is present.

Table 3. Verified Risk Factors for Segments on Two-Lane and Four-Lane Roads

Verified Risk Factor	AT Type	Criteria		Data Used to Assess Risk	Risk Score
		Definition	GIS Field and Notation		
Average Daily Traffic	Bicycle	5,001-6,000	ADTGroup1000s = 5 ADTRiskBike = Y	ODOT_TIMS\ RoadInventory_ Dayton	1
	Pedestrian	1,001-3,000 6,001-10,000 15,001-20,000	ADTGroups1000s = 1, 6-9, & 15-19 ADTRiskPed = Y	ODOT_TIMS\ RoadInventory_ Dayton	1
Presence of bicycle facility	Bicycle	Not present	ExistBikeFacility = N	City_ArcPro\ BikePath MVRPC\ RegionalBikeways MVRPC\ Local_Bikeways	1
Focus facility	Bicycle & Pedestrian	Yes	FocusFacility = Y	N/A	1

Notes:

1. The **ADTGroup1000s** field was added to the RoadInventory_Dayton_SystemicSafety shapefile. ADT shown in 1000s (e.g., ADT 2,001-3,000 was shown input as 2).
2. The **ADTRiskBike** field was added to the RoadInventory_Dayton_SystemicSafety shapefile to indicate if the ADT criteria for bicycles as defined in the table above was met. (N=No, Y=Yes)

3. The **ADTRiskPed** field was added to the RoadInventory_Dayton_SystemicSafety shapefile to indicate if the ADT criteria for pedestrians as defined in the table above was met. (N=No, Y=Yes)
4. The **ExistBikeFacility** field was added to the RoadInventory_Dayton_SystemicSafety shapefile to indicate the presence of a bicycle facility. (N=No, Y=Yes)

Table 4. Verified Risk Factors for Four-Way Intersections on Two-Lane Roads and Four-Lane Roads

Verified Risk Factors	AT Type	Risk Factor Criteria (GIS notation)	Source Used to Assess Risk	Risk Score
Average Daily Traffic Volumes	Pedestrian	1,001-2,000 6,001-7,000 15,001-20,000 (ADTRisk = Y)	ODOT_TIMS\RoadInventory_Dayton	1
Presence of Bicycle Facility	Bicycle	Not present (ExistBikeFacility = N)	City_ArcPro\BikePath MVRPC\RegionalBikeways MVRPC\Local_Bikeways	1
Presence of Transit Stops	Bicycle	Present within 1/16 of a mile (TransitStop = Y)	GDRTA\STOPS_JAN_21	1
	Pedestrian	Present within 1/16 of a mile (TransitStop = Y)	GDRTA\STOPS_JAN_21	1
Focus Facility	Bicycle & Pedestrian	Present	City_ArcPro\TrafficSignal	1

Notes:

1. The **ADTRisk** field was added to the TrafficSignal_SystemicSafety shapefile. An intersection with any road meeting the ADT criteria was indicated as meeting risk factor criteria. (N=Criteria not met, Y=Criteria met)
2. The **ExistBikeFacility** field was added to the TrafficSignal_Dayton_SystemicSafety shapefile. (N=Not present, Y=Present)
3. The **TransitStop** field was added to the TrafficSignal_Dayton_SystemicSafety shapefile. (N=Not present, Y=Present within 1/16 of mile)

The scores for the verified risk factors were summed to create the total risk score for a focus facility. The total scores were then assigned to a risk category (low, medium, high), as shown in **Tables 5 and 6**. The total risk score and risk category were added to the RoadInventory_Dayton_SystemicSafety and TrafficSignal_SystemicSafety shapefiles as fields Total_RiskScore and Total_Risk, respectively.

For some roadway segments, the TIMS roadway inventory split the roadway into two features, one for each direction of the roadway (e.g., eastbound and westbound). When this occurred, often only one of the features provided all the roadway data/information and, therefore, the feature without all the information had incorrect individual risk scores. Therefore, the total risk score for the feature with the information was applied to both features. However, the individual risk scores were not revised and, therefore, will not add up to the total risk score for that feature.

Table 5. Risk Scoring for Segments on Two-Lane and Four-Lane Roads

Total_RiskScore	Total_Risk
0[1]	Low
1	
2	Medium
3	High
4[2]	

Notes:

1. A "0" Total_RiskScore indicates the facility was not a focus facility.
2. Total_RiskScore of 4 does not exist in this scoring since none of the ADT risk criteria for bicycles and pedestrians is the same.

Table 6. Risk Scoring for Four-Way Intersections on Two-Lane Roads and Four-Lane Roads

Total_RiskScore	Total_Risk
1	Low
2	Medium
3	
4	High
5	