MULTI-MODAL TRANSPORTATION BOARD
THURSDAY, MARCH 5, 2020
6:00 PM
CITY COMMISSION ROOM
151 MARTIN STREET, BIRMINGHAM

1. Roll Call
2. Introductions
3. Review of the Agenda
4. Approval of Minutes, Meeting of **February 5, 2020**
5. **Review of Draft Master Plan**
6. **Review of SEMCOG Regional Bike Plan**
7. Meeting Open to the Public for items not on the Agenda
8. Miscellaneous Communications
9. Next Meeting – **April 2 , 2020**
10. Adjournment

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Las personas con incapacidad que requieren algún tipo de ayuda para la participación en esta sesión pública deben ponerse en contacto con la oficina del escribano de la ciudad en el número (248) 530-1800 o al (248) 644-5115 (para enos un dia antes de la reunión para solicitar ayuda a la movilidad, visual, auditiva, o de otras asistencias. (Title VI of the Civil Rights Act of 1964).

CITY OF BIRMINGHAM
MULTI-MODAL TRANSPORTATION BOARD
Thursday, February 6, 2020
City Commission Room
151 Martin Street, Birmingham, Michigan

Minutes of the regular meeting of the City of Birmingham Multi-Modal Transportation Board held Thursday, February 6, 2020.

Vice-Chairwoman Lara Edwards convened the meeting at 6:06 p.m.

1. ROLL CALL

Present: Vice-Chairwoman Lara Edwards; Board Members Amy Folberg, Tom Peard, Katie Schafer (arrived 6:07 p.m.), Doug White, Joe Zane

Absent: Chairwoman Johanna Slanga; Board Member Daniel Rontal

Administration: Jana Ecker, Planning Director
Scott Grewe, Police Commander
Austin Fletcher, Assistant City Engineer
Nicole Ciurla, Assistant City Planner
Laura Eichenhorn, Transcriptionist

Fleis and Vandenbrink:
Julie Kroll
Justin Rose

MKSK: Ben Palevsky

2. Introductions

The MMTB welcomed Mr. Peard to the Board.

3. Review Agenda

No changes.

4. Approval of MMTB Minutes of January 2, 2020

Motion by Ms. Folberg
Seconded by Mr. White to approve the MMTB Minutes of January 2, 2020 as submitted.

Motion carried, 6-0.

VOICE VOTE
Yeas: Folberg, White, Schafer, Edwards, Peard, Zane
Nays: None

5. Stop Sign Warrant Studies

Police Commander Grewe presented the item.

a. Glenhurst & Oak

Ms. Kroll recommended a road safety audit (RSA) at this location, and not a stop sign, in order to determine the best course of action for improving safety at this intersection. Ms. Kroll also provided an overview of how an RSA proceeds which can also be found in the agenda packet for this evening's meeting.

Ms. Kroll said she suspected the safety of the intersection is being impacted by the traffic flow at the school drop-off area, and she said an RSA would help clarify exactly what the issue could be and how it could be remedied. She said that on average the cost of an RSA is $15,000. While MDOT could provide some funding to perform the RSA, the funding would not be available until FY 2022.

Dr. Schafer said that Safe Routes to School could be a potential source of funding for this RSA.

Planning Director Ecker said it might be, and that there may be other grants that could also help with the funding.

Motion by Ms. Folberg
Seconded by Mr. White to not install a multi-way stop sign at the Glenhurst and Oak intersection, and to recommend the authorization of a Road Safety Audit by the City Commission for the Glenhurst and Oak intersection.

Police Commander Grewe stated that there have only been three complaints regarding this intersection over the last six months. He noted that there may not be a lot of possibility for other improvements at the intersection. He asked Ms. Kroll whether it might be appropriate to install a stop sign at the intersection on a trial basis in order to see if it resolves some of the issues.

Ms. Kroll said that once the stop sign is installed it would be more difficult to remove it even if the trial determined that would be the best course of action. She said there are new pedestrian guidelines that could be helpful at the intersection to increase pedestrian safety, and that improving the traffic circulation of the school could also have positive results. She cautioned that unwarranted stop signs could increase crashes and speeding, so that it was worth exploring other options before considering putting in the stop sign.

Ms. Folberg noted that whenever a concern about an intersection is raised in Birmingham the first resident request is for a stop sign. She said it could establish a difficult precedent for future intersection discussions if a stop sign were installed at this intersection on a trial basis. Ms. Folberg

noted that flashing lights to indicate a pedestrian was in the crosswalk is consistently very effective, and may be worth considering for this intersection.

Ms. Kroll said the City could consider implementing some of the inroad pedestrian improvements that MDOT is now recommending, which she said could be done inexpensively and immediately. Ms. Kroll said she could return to the MMTB for their March 5, 2020 meeting with recommendations for interim mitigation options. She continued that even though those improvements could help, undertaking the RSA would still be prudent in order to determine the underlying issue in the intersection and to implement a more lasting resolution.

In reply to Dr. Schafer, Mr. Peard said there are no signs to indicate to vehicles coming from the west that they are approaching a school.

Dr. Schafer said putting in such signage could improve the safety in the intersection and the area. She said she would like to see an intermediate option between a stop sign and an RSA that could improve the safety of the intersection. Dr. Schafer explained that a stop sign seemed inappropriate, while an RSA seemed like it could be in excess.

Vice-Chairman Edwards recommended the Board vote on the present motion and then continue their conversation.

Motion failed, 3-3.

VOICE VOTE
Yeas: Folberg, White, Zane
Nays: Edwards, Peard, Schafer

Motion by Ms. Edwards
Seconded by Dr. Schafer to not install a multi-way stop sign at the Glenhurst and Oak intersection at this time.

Motion carried, 6-0.

VOICE VOTE
Yeas: Edwards, Schafer, Peard, Folberg, White, Zane
Nays: None

The MMTB requested that Ms. Kroll return to their next meeting with recommendations for signage that would alert vehicles to the existence of the crosswalk and recommendations for ways to mitigate the pedestrian safety concerns in the area.

b. Bennaville & Edgewood and
c. Bennaville & Grant

Motion by Ms. Folberg
Seconded by Mr. Zane to follow F&V's recommendations to install stop signs at Bennaville and Edgewood and Bennaville and Grant.

Motion carried, 6-0.

VOICE VOTE
Yeas: Folberg, Zane, Edwards, Schafer, Peard, White
Nays: None

6. Bicycle Parking in Public Parking Decks

Planning Director Ecker presented the item to the MMTB.

In reply to a question from Ms. Folberg, Planning Director Ecker said that as more cycling amenities have been installed around the City, cyclists' use of those amenities has been increasing. She said she could not state the exact demand, but that the Planning Department's recommendation would be to start small with any of these solutions and then build from there as demand is determined.

Motion by Mr. Zane
Seconded by Mr. Peard to direct City Staff to research and subsequently present recommended bike parking solutions for each of the City's five municipal parking structures.

Motion carried, 6-0.

VOICE VOTE
Yeas: Zane, Peard, Folberg, Edwards, Schafer, White
Nays: None

In reply to a question from Mr. Zane, Planning Director Ecker said she could look into how Ann Arbor prices access to similar cycling amenities and report back to the Board.

7. Meeting Open to the Public for items not on the Agenda

8. Miscellaneous Communications

Ms. Folberg said she would like to see the Board revisit the topic of reducing the width of finished streets that are being repaired.

Planning Director Ecker noted the draft master plan touches on street width, and suggested the Board wait at least six months to see what the final master plan recommends before trying to approach it at the MMTB level.

Ms. Folberg said she has come to regret the vote she cast during the last round of discussions on street width that were held at the MMTB level.

Ms. Edwards asked whether there had been any further consideration of making a cycling-focused board within the City that could plan out cycling routes and propose solutions to cycling-related issues, such as locations where there may be a higher likelihood of cyclist-pedestrian conflicts.

Planning Director Ecker said that while there was not specific discussion of starting a new board, the Planning Department is considering the recommendation of sharrows along Maple, W. Lincoln, Oak, and Adams to create a full cycling loop. She said they were also looking at completing the neighborhood connector route, installing cycling lanes and shared paths on portions of Cranbrook and N. Adams. She also stated that this spring the Board would be reviewing the findings from the trial changes made to S. Eton.

Planning Director Ecker encouraged the Board members to visit thebirminghamplan.com in order to review the preliminary multi-modal recommendations laid out in the draft master plan. She clarified that the multi-modal discussion in the draft master plan is not as thorough as the discussion in the multi-modal plan, but that there still are new proposals to consider.

9. Next Meeting – March 5, 2020

10. Adjournment

No further business being evident, the board members adjourned at 7:06 p.m.

Jana Ecker, Planning Director

Austin Fletcher, Assistant City Engineer

City of Birmingham
A Walkable Community

MEMORANDUM

Planning Division

DATE: **February 24, 2020**

TO: **Multi-Modal Transportation Board**

FROM: **Jana L. Ecker, Planning Director**
Commander Scott Grewe, Police Department
Austin Fletcher, City Engineer

SUBJECT: **Board Review of Draft Master Plan – Birmingham 2040**

Please see attached memo from Joe Valentine, City Manager, requesting the board's input on the first draft of the master plan, entitled Birmingham 2040. Each City board has been asked to review the draft plan and provide their comments as a group on each of the elements outlined in the draft plan related to their area of expertise.

The attached summary of document includes all recommendations contained in the draft master plan, and each of the recommendations that include multi-modal elements have been highlighted in purple. Please note this document is a summary only, and the full text of the first draft of the master plan can be found at **thebirminghamplan.com**. All board members are encouraged to review the entire draft plan and come to the meeting prepared to discuss the draft collectively as a board.

City of Birmingham
A Walkable Community

MEMORANDUM

Office of the City Manager

DATE: **February 7, 2020**

TO: **City Boards, Commissions & Committees**

FROM: **Joseph A. Valentine, City Manager**

SUBJECT: **Request for Board Review of First Draft of The Birmingham Plan**

Let us hear from you! Over the past year, the DPZ team hired by the City to update our comprehensive master plan has been conducting information gathering sessions with members of the public. The team conducted multiple surveys and stakeholder meetings during 2019 to solicit detailed input on the City's needs, specific concerns and recommendations for the future vision of the City.

While many board/commission/committee members may have participated individually in one or more of the public engagement activities noted above, at this time the City is asking each group to participate together as a board/commission/committee in the review of the first draft of the master plan, entitled "The Birmingham Plan" and provide your collective comments.

Specifically, each group is requested to place a review of The Birmingham Plan on an upcoming agenda and to conduct a public discussion and review as a board/commission/committee at a meeting within the next two months. Each board/commission/committee is asked to review the draft plan with regard to all concepts, findings and recommendations within the scope of their review authority and to use their specific experience and expertise in this area to provide collective comments as a board/commission/committee on the first draft of The Birmingham Plan. For example, the Parks Board should review the findings and recommendations related to City parks, the Advisory Parking Committee should review the findings and recommendations related to parking standards and parking initiatives, and so on. **Each board/commission/committee is requested to provide collective comments to Jana Ecker, Planning Director, on or before April 10, 2010 through your respective staff liasion.**

To assist each board/commission/committee, enclosed you will find a summary of the review process; a detailed list of all recommendations in the draft plan; and key illustrations from the plan. Also enclosed you will find the schedule of meetings dates when the Planning Board will be reviewing specific sections of the plan.

Board/commission/committee members can also go to TheBirminghamPlan.com website and review the full version of the draft master plan for further details.

Thank you for your participation in shaping the future of Birmingham.

Meeting Dates	Areas of Review
February 12, 2020	Master Plan Premises The Future City (Vision)
March 11, 2020	Neighborhood Components
April 7, 2020	Neighborhood Plans
May 13, 2020	Mixed Use Districts Maple & Woodward Market North
June 10, 2020	Haynes Square South Woodward Gateway Rail District

Birmingham Master Plan
Text for Posting/Newsletters/Promotional Materials
2.3.20

INTRO

Residents of Birmingham have recognized the value of planning since 1929, when Birmingham was still a village. The very first master plan was primarily concerned with land use and zoning, but subsequent plans reflected the changing landscape of Birmingham as downtown development, growing neighborhoods, parks and mass transit drew increased focus from planners and residents. In 2020, as we engage in comprehensive planning for Birmingham, input from our residents is essential to success.

The Planning Board has scheduled a series of meetings on key aspects of the master plan draft. Beginning in February with an overview of the City's vision, five meetings will be held to solicit resident input. We invite you to join us for one or all of the meetings. If you are unable to attend in person, all Planning Board meetings are broadcast on the BCTV government access channel and posted to the City's website. You can get full information on the plan and the planning process at www.thebirminghamplan.com. The site includes relevant data, surveys and documents and an email communication option that allows residents to send comments directly to the planning team. Please make sure your voice is heard.

THE FUTURE CITY – February 12, 2020

The first meeting seeks input around the overall vision for Birmingham, its downtown and commercial centers and its neighborhoods. A key concept is the establishment of the **"Neighborhood Unit"** as a structural guide for the City. Neighborhoods are defined and areas within are designated low-, medium- and high-density based on the fabric of the neighborhood, which includes an assessment of housing, residential and "collector" streets, and major arteries. Planning will use the designations to maintain and strengthen the character and appeal of each neighborhood.

The proposal also calls for discussion around the establishment of three land-use categories high-intensity mixed-use (Maple and Woodward), medium-intensity mixed-use (Haynes Square) and low-intensity mixed use (Market North and the Rail District).

Transit proposals include a Neighborhood Loop bicycle boulevard, a potential internal Birmingham bus circulator and a connector to the Troy Transit Center. Automobile traffic proposals under discussion include: adjustments to the Woodward and Old Woodward intersection at Haynes Square, adjustments to both Adams and Elm, and traffic interventions at Maple and Woodward.

There are several proposals around parks and public spaces concerning splash pads, public art and dog runs. The plan proposed that all parks improvements would promote environmentally sustainable best practices, while engaging residents and neighborhood stakeholders in the design and selection of park elements. The plan also recommends that Birmingham develop and implement a master plan for the Rouge River ecosystem in cooperation with Bloomfield and Beverly Hills.

Finally, the overall program outlines a selection of environmental programs including: composting, increased availability of recycling bins, and potential programs to encourage businesses to reduce use of plastics and Styrofoam.

FULL DETAILS ARE AVAILABLE ON OUR WEBSITE AT www.thebirminghamplan.com.

NEIGHBORHOOD COMPONENTS – MARCH 11,2020

The Neighborhood Components discussion will focus on establishing standards and processes to maintain the unique character of each Birmingham neighborhood. Proposals include aligning zoning districts and regulations, incentives to encourage additions to existing homes rather than new builds, increased setbacks and other requirements to ensure new construction better matches existing homes and new requirements around accessory dwelling units (ADU), multi-family units and cottage courts.

Also included under neighborhood components are consistent parking permitting, evaluating open spaces, potential zoning for Neighborhood Commercial destinations to ensure alignment with the character of each neighborhood and establishing a City position of Neighborhood Coordinator to assist and support neighborhood associations.

FULL DETAILS ARE AVAILABLE ON OUR WEBSITE AT www.thebirminghamplan.com.

NEIGHBORHOOD PLANS – APRIL 7, 2020

The Master Plan envisions each Birmingham neighborhood as a community with park and civic spaces and transit options designed to encourage connectivity within the neighborhood and with adjacent neighborhoods. This meeting will discuss the neighborhood components outlined in the March meeting as they apply to individual neighborhoods. Neighborhood components include a variety of topics such as zoning, commercial centers, lighting, parking, green spaces and street improvements.

The Neighborhood Plans discussion will consider each Birmingham neighborhood in the following order: 1) Quarton 2) Holy Name 3) The Ravines 4) Poppleton 5) Derby 6)

Pembroke 7) Torry 8) Kenning 9) Pierce 10) Barnum 11) Crestview 12) Birmingham Farms 13) Lincoln Hills 14) Linden 15) Seaholm.

FULL DETAILS ARE AVAILABLE ON OUR WEBSITE AT www.thebirminghamplan.com.

DOWNTOWN MIXED-USE DISTRICTS, MAPLE & WOODWARD, MARKET NORTH – MAY 13,2020

Birmingham is fortunate to have several, vibrant mixed-use districts in the City. These districts enhance our quality of life, but growth and utilization must be carefully managed to ensure the district functions for all users. In May, discussion will involve the two Downtown mixed-use districts Maple & Woodward and Market North.

Issues for discussion include: branding, signage and streetscape elements to clearly define the districts, new retail frontage and dining deck requirements, park improvements, expanded downtown housing with functional parking solutions and additional public parking solutions. Proposed plans also call for numerous new amenities such as café service in Shain and Booth Parks, a Farmers Market pavilion, additional public art and pedestrian safety and traffic-calming measures.

FULL DETAILS ARE AVAILABLE ON OUR WEBSITE AT www.thebirminghahplan.com.

HAYNES SQUARE, SOUTH WOODWARD GATEWAY, RAIL DISTRICT – JUNE 10, 2020

The three additional mixed-use districts in the City – Haynes Square, Woodward Gateway and the Rail District – are still emerging and will benefit from intelligent planning and development. Residents will be asked to review funding recommendations and siting for additional public parking, zoning standards to encourage development at Adams Square, shared-use alleys, potential access to the Troy Transit Center and the activation of the lower Rail District as an incubator for new and innovative businesses. A number of amenities are outlined in the plan including creating a public square at Haynes Square, enhanced streetscape and landscape improvements, and new pedestrian walkways to improve walkability and connectivity to other mixed-use districts.

FULL DETAILS ARE AVAILABLE ON OUR WEBSITE AT www.thebirminghamplan.com.

CLOSE

All Planning Board meetings are broadcast on the BCTV government access channel and are available on the City's website. Please visit www.thebirminghamplan.com for complete information on the plan and planning process, and an email option that allows residents to

provide comments directly to the planning team. The City will likely host additional round-table discussions and a multi-day drop-in clinic in the months ahead. We encourage residents to attend the meetings whenever possible and we welcome your comments at any and all points of the process. Please sign up for email alerts through the City's Enotify system at www.bhamgov.org/enotify/.

Summary of The Birmingham Plan 2040 (Draft) Recommendations and Dates of Planning Board Review

The Future City (Vision) – February 12, 2020

Adopt an official neighborhood map and names	A.2-03
Adopt official boundaries for each center	
Discuss and evaluate the appropriateness of policies and proposals based upon neighborhoods, centers, and their interactions	
See additional recommendations in Chapter B.1, Associations and Representation	
Adopt the Neighborhood Unit as a structural guide for neighborhoods.	A.2-07
Adopt the following Future Land Use categories: **a. Neighborhood Fabric** **i. Identified as low, medium, and high intensity, neighborhood fabric consists of single-family housing within a narrow range of size and character, arranged in blocks bounded by low speed, pedestrian and bicyclist-centric roads, lined with mature street trees. Neighborhoods may be mapped with a single fabric intensity, protecting its overall character.** **ii. Low Intensity Fabric includes R1-A and R1 zoning districts.** **iii. Medium Intensity Fabric includes R1 and R2 zoning districts.** **iv. High Intensity Fabric includes R2, R3, and R4 zoning districts.** **b. Neighborhood Seam** **i. Identified as low, medium, and high intensity, neighborhood seams consist of a variety of single-family and multi-family housing types, limited according to intensity, home-based businesses, and some size-limited businesses in high intensity seams. Neighborhood seams are located along the edges of neighborhoods, typically at collector and arterial roads like Lincoln, Fourteen Mile, Southfield, Maple, Cranbrook, and similar roads, and along the edges of mixed-use districts where they meet neighborhoods. The intensity of Neighborhood Seams is directly related to the Neighborhood Fabric intensity and the size of the adjacent roadway. High Intensity Seams are very limited in application, only appropriate adjacent to mixed use centers and the intersections of major and Sectionline roads.** **ii. Low Intensity Seams include the TZ-1 zoning district, as amended in this plan.** **iii. Medium Intensity Seams include the TZ-2 zoning district, as amended and defined in this plan.** **iv. High Intensity Seams include the TZ-3 zoning district, as amended in this plan.** **c. Neighborhood Destination** **i. A low intensity commercial center providing services, dining, and places to gather for surrounding neighborhoods. Neighborhood Destinations are limited in total square footage, the size of individual businesses, allowable business types, and the location and size of off-street parking.** **ii. A new zoning district is proposed for Neighborhood Destinations, to be completed in later drafts of the master plan.**	A.2-07
Define, sign, and market three distinct Downtown districts: Market North, Maple and Woodward, and Haynes Square.	A.2-13

Summary of The Birmingham Plan 2040 (Draft) Recommendations and Dates of Planning Board Review

Adopt the following land use categories: **a. High intensity mixed-use district (Maple and Woodward)** **b. Medium intensity mixed-use district (Haynes Square)** **c. Low intensity mixed-use district (Market North and the Rail District)**	
Issue an RFP to overhaul the zoning code, focused on brevity, clarity, and graphics, aligning with the new Future Land Use categories.	
Collapse uses into the broadest categories possible, with detailed use specification only provided where absolutely necessary, and in limited areas.	
Combine the business, office, Downtown, Triangle, and mixed-use districts into a single set of mixed use districts shared between all mixed-use areas. Low intensity mixed-use districts would only include the lower intensity mixed-use zones, and high intensity mixed-use districts the higher intensity zones.	A.2-15
Consider zoning district modifications for residential districts following the character descriptions and analysis for the City's neighborhoods, described in the next chapter of this plan.	
Ensure new zoning language is considered for simplicity and expediency, achieving regulatory goals in a manner clear to the general public	
Issue an RFP to design the Neighborhood Loop bicycle boulevard attributes, like signage and diverters, and pedestrian improvements, like complete sidewalks and crosswalks.	
Prioritize Neighborhood Loop improvements in the next Capital Improvement Plan cycle.	A.2-18
Add benches along the loop where the loop crosses major roads, like Maple, schools, and parks, like Linden Park.	
Add bicycle destination signage along the loop and routes with bike lanes.	
Add bicycle parking and maintenance kiosks like those found in Shain Park to all parks.	
Establish a committee and plan a monthly event along the loop in the summertime which closes the route to traffic and organizes family friendly activities in parks along the route. This will require City funding, but over time it will help solidify social interactions in the community. As with many events of this type, the first few may see fewer participants, but over time participation should grow, provided it	
Study the potential of operating an internal Birmingham Circulator. This should not be a full scale bus, but would require zero entry opportunities. Autonomous circulators currently operating in places like Downtown Las Vegas are appropriate models.	A.2-20
Improve bus stops with shelters along big Woodward.	
Improve bus stops with shelters along Old Woodward (completed in part with Phase 1 streetscape).	
Improve bus stops with shelters along Maple, including stops outside of Downtown.	
Improve bus stops with shelters along Coolidge Hwy. 6. Improve bus stops with shelters along Adams Rd.	
Improve bus stops with shelters along 14 Mile Rd.	

Invest in public parking within the Triangle District / Haynes Square to encourage development	
Adopt policy changes to encourage more housing in Downtown and the Triangle District / Haynes Square	
Secure a connection to the Troy Transit Center from the Rail District for pedestrians and cyclists	
Enhance and expand streetside bicycle parking with parking areas for micro-mobility devices.	
Pilot a shared use street along Merrill Street first from Old Woodward to Shain Park, and in a later phase connecting to the Rouge River trail system through Martha Baldwin Park.	
Increase the number of streetside bicycle and micro-mobility parking spaces throughout Downtown, especially near transit stops.	
Install or convert bicycle lane signage to mobility lane when alternative micro-mobility devices become prevalent.	
Install signage informing micro-mobility users and cyclists of where they are and are not permitted to ride (e.g. not on sidewalks).	
Provide mobility education during summertime activities along the Neighborhood Loop.	
Pursue a speed reduction on Woodward to 35mph within Birmingham through legislative means. (short term)	
Move signage at Lincoln which obscures pedestrian countdown timers. (short term)	A.2-22
Add a signal for the Brown Street crosswalk along the northbound lanes of Woodward. (short term)	A.2-22
Install ADA-compliant ramps at intersections that are not in compliance. (short term)	A.2-22
Review pedestrian crossing times for MUTCD compliance, some may need to be lengthened. (short term)	A.2-22
Continue enhanced median planting beyond Maple and Woodward. (short term)	A.2-22
Add a protected only left turn signal for northbound left turns to Old Woodward. This may be omitted if the Haynes Square street reconfiguration occurs quickly. (short term)	
Reconfigure the Woodward and Old Woodward intersection at Haynes Square as described in later Chapters. (mid-term)	A.2-26
Improve pedestrian and bicycle crossings along Woodward at 14 Mile, Emmons, Lincoln, Haynes, Brown, Maple, Oakland, and Oak. (mid-term)	A.2-22
Divert Adams traffic onto Haynes by angling Adams to intersect perpendicularly with Haynes, taking a portion of the parking lot of The Plant Station. (mid-term)	A.2-26
Adjust Adams to meet Woodward perpendicularly at Ruffner. (mid-term)	A.2-26
Adjust Elm to meet Woodward perpendicularly per the Triangle District plan. (mid-term)	A.2-26
Adjust Worth to meet Woodward perpendicularly per the Triangle District plan. (mid-term)	A.2-26

Study the traffic intervention proposed at Maple and Woodward in coordination with MDOT, including alternates. (mid-term)	
Participate in a traffic study along Woodward, with MDOT, once I-75 reopens fully to determine whether the road can be reduced to 3-lanes in each direction. (mid-term)	
Pending verification of potential lane reductions and an agreeable design, pursue the circle at Maple and Woodward. (long term)	A.2-24
Pending verification of potential lane reductions, fund and implement restriping on Woodward, between 14 Mile and Oakland, potentially to Quarton, converting the outside lane to a buffered bicycle and transit lane. (long term)	
Invest in new facilities for Next. This should be located centrally, potentially part of a public parking investment in the Triangle District or in Barnum Park. Facilities should be combined with other community rooms as a broader community center.	
Revise parking requirements to allow housing in mixed-use districts to park in shared garages (addressed in more detail in a later Chapter).	
Adopt zoning updates to enable Neighborhood Seams.	
Provide sidewalks, trails, and play equipment in all neighborhood parks.	
Add kid-oriented splash pads to community parks.	
Encourage businesses with more informal gathering spaces.	
Pilot a shared use plaza at Bird and Woodward	
Adopt a neighborhood destination zoning district.	A.2-34
Rezone properties identified as neighborhood destinations on the Future Land Use Map to the neighborhood destination zoning district.	
Build a cafe in Booth Park.	A.2.-39
Build a model neighborhood destination at the northeastern corner of Lincoln and Eton.	
Install paved walkways and other necessary enhancements to enable universal access to designated parks (See Reference A).	
Install bicycle racks, civic art, park monument signage, seating, shaded areas, dog runs and way-finding maps and signage in all city parks, open spaces, and nature preserves. Organize park neighborhoods and stakeholders to participate in the design and selection of these elements.	
Implement a community garden program to encourage flower or vegetable gardens in neighborhood parks. Provide an organizational platform to expedite the formation of garden clubs and to help individuals establish gardens near their homes. Install fencing, soil enrichments, sheds, water sources, and other necessary infrastructure for community gardens in designated parks (See Reference B).	
Improve park conditions and management to promote environmentally sustainable best practices.	
Add cafes to community parks and some neighborhood parks where neighborhood destinations are too remote. (See Reference C)	
Retain environmental scientists to inventory and analyze the Rouge corridor's wildlife, ecology, natural systems, and pollution sources.	

Develop and implement a reforestation master plan to restore the Rouge River ecosystem to its natural and sustainable conditions. Establish a phased enhancement timeframe to stabilize riverbanks, remove invasive species, reintroduce native groundcovers, wildflowers, understory and canopy tree species.	
Identify and mitigate potential pollution or chemical sources, including the existing Springdale snow storage dumping area.	
Install pedestrian linkages to the park's surrounding neighborhoods and commercial districts.	
Purchase or secure easements of additional key properties to expand the park area and improve its walkability, for complete ecological restoration, and universal accessibility.	
Extend pedestrian linkages to Quarton Road.	
Work with Bloomfield and Beverly Hills to develop a Rouge River master plan and to expand walkway access.	
Establish a "Friends of the Rouge" foundation to oversee, build support, and raise funding for the park's enhancements. Consider securing corporate or philanthropic funding in exchange for special recognition.	
Provide funding for city staff and resources to permanently preserve and manage the Rouge ecosystem.	
Install an environmentally sensitive, hard-surfaced, and well-lit pathway for pedestrians and cyclists along the Rouge River. Install bridges, ramps and other enhancements to enable access by all ages and abilities.	A.2.-43 A.2.-44
Install bicycle racks, lighting, markers, seating, signage, and comfort stations.	
Implement an overlay building and zoning policy to ensure that private property construction, fencing, landscaping, lighting, etc., are compatible with the park's ecology, its restoration master plan, and overall public welfare.	
Conduct public surveys on a quarterly basis regarding decisions being made in order to obtain a greater accuracy of public opinion.	
Establish a system by which residents are requested to attend meetings where important decisions are made, modeled on the civil jury system.	
Establish a subsidiarity policy by which decisions can be made at the most local level as is appropriate.	
Increase garage restrictions to provide greater setback from the building's primary facade, ideally 15 feet, and a maximum width along street frontages of 3 bays to supplement the existing 50% width restriction.	
The requirement 4.82.A.1 and .2 should be applied to all zoning districts, requiring a pedestrian door facing the front lot line and restricting blank walls.	
Minimum facade glazing requirements should be added for residential districts, similar to 4.82.A.5, ensuring some windows face towards the street for public safety.	
Require adherence to LEED standards within the City's mixed-use districts.	
Consider increasing energy standards for new construction above those of the state energy code, ideally implementing 2030 District goals.	

Investigate the potential to provide food waste compost service for homes and businesses.	
Increase the availability of recycling bins in public spaces like parks, public buildings, and along streets with high pedestrian traffic.	
Consider the best path towards business operations changes to reduce plastics and styrofoam, either through ordinance or first through a voluntary shopping district program which leads to a future ordinance.	
Adopt an action plan to reduce environmental impacts of municipal operations.	

Neighborhood Components – March 11, 2020

Retain the structure of neighborhood fabric, seams, and destinations as Future Land Use categories.	B.1-01 B.1-04
Adopt the terms neighborhood fabric, neighborhood seam, and neighborhood destination in decision-making processes, helping determine the appropriateness of uses, intensities, and lot divisions and combinations.	B.1-01 B.1-04
Align zoning districts and regulations to differentiate neighborhood fabric, seams, and destinations.	B.1-01 B.1-04
Revise neighborhood associations to align with the neighborhood map.	B.1-05
Add a City position of neighborhood coordinator that supports neighborhood associations.	
Re-assign parking restrictions citywide, allowing each neighborhood to select one of the following options: **a. No restriction** **b. 2-hour parking from 9am to 4pm, except by permit (this addresses daytime parking issues from students and downtown workers)** **c. Parking by permit only, 5pm to 10am (this addresses nighttime parking issues from food service)** **d. Neighborhood Parking Benefit District, used in association with (b) or (c) above.**	B.1-07 B.1-08
Establish a consistent residential permit system to service those neighborhoods that choose to use such a system which includes permit fees to cover costs, decals, and visitor rear-view mirror tags purchased separately from the residential permit. The existing permit systems may suffice to operate more broadly. Adopt policy and establish the process for administering Neighborhood Parking Benefit Districts, ensuring that fees collected benefit neighborhood facilities and activities, after covering administrative costs.	
Complete sidewalks where gaps exist in the continuous pedestrian network.	
Along neighborhood seams, establish a minimum 6 foot sidewalk width within the Residential Street Standards.	
Adjust the Residential Street Standards to implement Future Land Use categories.	
Provide a bike facility on Lincoln per the Future Transportation Plan.	
Locate streetside areas where stormwater can be cleaned through bioswales prior to entering the Rouge River.	

Reduce residential speed limits to 20 mph.	
Continue the City's street tree planning and maintenance policies.	
Infill missing street trees where needed in neighborhoods.	
Prevent existing, healthy trees from being removed due to new construction.	
Establish a streetscape improvement program for the Triangle District and Rail District.	
Select large canopy species native to the region, including Basswood, Elms (disease resistant), Horse Chestnuts, Maples, Oaks and Sycamores, along streets and within parks.	
Minimize overly-used or exotic species, such as Crab Apple, Honey Locust and Pear Trees.	
Follow the recommendations of the Unimproved Streets Committee	B.1-20
Review and update site, building, and design codes to prevent increased rainwater runoff and other negative impacts from new house construction.	
Expand the inspection process for new house construction to ensure that they are built per approved plans to minimize negative impacts on surrounding properties.	
Increase required residential setbacks for new construction to better match existing housing in each neighborhood.	
Reduce permitted residential building heights for new construction to better match existing housing in each neighborhood.	
Develop incentives, such as increasing allowable square footage, fast tracking, fee waivers, and tax incentives that promote the expansion of existing houses rather than the construction of new houses.	
Identify and implement preservation protection, such as a historic designation for landmark houses.	
Implement an approval process to review the exterior design and materials for single-family residential additions and for new house construction.	
Add minimum and maximum lot width standards for each zoning district. The current standard based on minimum lot size is not a sufficient measure.	
Revise the Zoning Code and zoning district boundaries to better align with the existing character and scale of houses and their lot size.	
Revise Articles 3 and 5 of Chapter 102 of the Subdivision ordinance to allow for lot combinations and splits as are necessary to implement Neighborhood Seams and Lot Enlargement Areas.	
Once the above recommended zoning changes are made, repeal Articles 3 and 5 of Chapter 102 of the Subdivision ordinance, the intent of the articles having been integrated into the Zoning Ordinance and Future Land Use Map.	
Establish lighting standards for R1A through R3, neighborhoods generally, including maximum intensity and color temperature, shielding and direction, and spillover. Consider the International Dark Sky Association model standards. Lighting intensity restrictions should be associated with the Future Land Use categories for Neighborhood Fabric intensity where High Intensity Fabric justifies higher lighting intensity and Low Intensity Fabric justifies lower lighting intensity. Dark Sky LZ1 may	B.1-21

be appropriate in Low Intensity Fabric and Medium Intensity Fabric areas, LZ2 in High Intensity Fabric areas, and LZ3 in the City's mixed-use districts.	
Prevent healthy, mature trees from being removed due to new construction.	
Permit ADUs where the property owner lives on-site, in the primary home or ADU.	B.1-23
Prohibit two-rental structures on any single-family property.	
Require ADUs to be designed and built to match or exceed the quality of the primary structure.	
Require adequate landscape screening between ADUs and adjacent properties	
Do not require parking for ADUs.	
Increase accessory structure setback requirements when there is a dwelling within it to 5 feet in R2 and above, 10 feet in R1, and 15 feet in R1A.	B.1-23
Increase the allowable height for accessory structures to allow 2 stories when there is a dwelling within it above a garage.	
Exempt the area of interior staircases from the maximum area of accessory structures when there is a dwelling within it.	
Allow accessory structures when there is a dwelling within it by right in MX, TZ1, TZ2, TZ3, and R4 through R8.	
Permit six packs in high intensity neighborhood seams.	B.1.-30
Permit quadplexes in high and medium intensity neighborhood seams.	B.1-41 B.1-38
Permit triplexes in high and medium intensity neighborhood seams.	
Permit duplexes in all neighborhood seams.	B.1-42
Permit cottage courts in all neighborhood seams, requiring a minimum site area per unit to ensure a gentle intensity.	B.1-46 B.1-49
Permit townhouses in high and medium intensity neighborhood seams.	B.1-42
Require design review for new housing within neighborhood seams to ensure compatibility and diversity of character.	
Allow by-right Neighborhood Commercial Destinations of up to 10,000 square feet where identified in the Future Land Use Map.	
Adopt a zoning district for Neighborhood Commercial Destinations, ensuring they are designed in a walkable manner, limited in scale, and of a character befitting their surroundings, including the following: **a. Limit uses to bakeries, banks, bicycle shops, cafés, carry-out foods, coffee shops, exercise studios, florists, hardware, ice cream parlors, mail centers, personal care, medical offices, pharmacies, real estate offices, financial services, small groceries, specialty shops, and other small local service-businesses. Housing should be permitted above the ground floor.** **i. Where located in parks, limit uses to bakeries, cafes, and coffee shops.** **b. Nationally branded chains should be permitted when designed to look local.** **c. Limit evening hours and prohibit excessive noise, including music in the late evenings, and early or late truck deliveries should be restricted. d. Larger restaurants and other potentially intensive commercial should be permitted as special uses, with**	B.1-50 B.1-52 B.1-53 B.1-54

appropriate design, management, and operational conditions geared to minimize their potential impact on surrounding properties. **e. Drive-thru windows should be prohibited.** **f. Loading docks should be minimal or not required.** **g. The neighborhood centers should be well-landscaped and screened from adjacent properties where necessary.** **h. Height. These centers should be allowed to build three floors, provided they match the scale of a two and one-half story structure.** **i. For buildings with 3 stories, the upper floors must be residential.** **ii. For buildings with 2 stories, the upper floor may be office or residential.** **iii. Where located in parks, limit height to one story.** **i. Parking. Parking for these centers should be as minimal as possible, or in some cases provided entirely by the surrounding on-street spaces.** **i. Parking provided, if any, should not exceed 3 cars per 1,000 square feet of non-residential uses and 1 car per bedroom of residential uses.**	
Planning Board review should be required to ensure lighting, signage, trash containers, and all other necessary, but potentially disruptive elements are carefully designed and managed to minimize their impacts to the neighborhood	
Develop Worth Park as quickly as plausible to provide a portion of the needed open space access for Torry.	
Attempt to purchase part of the Adams Square parking lot for park space, and if unsuccessful ensure that redevelopment would require that open space be provided at Adams and Bowers.	
Investigate the potential to replace the post office with a neighborhood park for Torry.	
Evaluate the current open space inventory and 2018 Parks Master Plan, and augment as needed to provide access and activities in or near each neighborhood for: **a. Young children requiring play equipment;** **b. Teenagers requiring autonomy and places to gather;** **c. Younger adults requiring active uses like running and basketball;** **d. Older adults requiring active and passive uses like pickleball and places to rest in open spaces and along the way;** **e. People with disabilities requiring accessible paths and routes to open space, as well as specifically designed amenities;** **f. And dog owners requiring places for their dogs to run and socialize.**	B.1-57
Maintain and support existing civic uses throughout the community.	B.1-60
Require new civic uses to be planned and built as aspirational buildings and landscapes.	
Continue the tradition of designing and constructing Birmingham's civic buildings and parks as iconic structures and landscapes to the highest standards and at a civic scale. This includes authentic durable materials, oversized windows, high ceilings, and Tudor design and detailing	

Develop Worth Park and other civic places in the Triangle District as quickly as plausible.	
Ensure the Community Foundation / Fund is established in a timely manner.	
Develop civic programming as part of the monthly neighborhood loop events.	
Develop additional regular civic events to continue engaging the community throughout the year	

Neighborhood Plans – April 7, 2020

Quarton	B.2-1
Holy Name	B.2-2
The Ravines	B.2-3
Poppleton	B.2-4
Derby	B.2-5
Pembroke	B.2-6
Torry	B.2-7
Kenning	B.2-8
Pierce	B.2-9
Barnum	B.2-10
Crestview	B.2-11
Birmingham Farms	B.2-12
Lincoln Hills	B.2-13
Linden	B.2-14
Seaholm	B.2-15

Summary of The Birmingham Plan 2040 (Draft) Recommendations and Dates of Planning Board Review

Mixed Use Districts, Maple & Woodward, Market North – May 13, 2020

Release an RFP to brand the City's multiple mixed use districts, especially concerning signage and wayfinding, but extending also to elements of the streetscape like tree grates, lights, trash and recycling cans, and public art themes like the recent popcorn painting of a utility box on Old Woodward at the theater.	
Define, sign, and market three distinct Downtown districts: Market North, Maple and Woodward, and Haynes Square. (as identified in Chapter A)	C.1-01 C.2-01 C.3-01
Install business directory and way-finding signage for pedestrians and cyclists throughout all shopping districts, beginning with Maple and Woodward, Market North, and Haynes Square.	C.1-04
Install smart and elegant parking wayfinding signage in Downtown.	C.1-04
As part of a Zoning Code overhaul, collapse zoning within the City's mixed-use districts into as few zoning districts as can meaningfully regulate the intent of the Code and the City's plans.	
Expand activities and special events to attract office workers and residents to shop and dine downtown, including weekly food-truck events at Shain Park.	
Encourage new housing downtown, discussed in a subsequent section.	C.2-12
Reduce the number of permitted dining decks in the Old Woodward, Hamilton, Merrill, Pierce, West Maple area to improve parking for retail shoppers and sidewalk space. Limit restaurants to one deck each, and limit the number of decks to two per block.	
Require a minimum 6 foot sidewalk be retained where dining decks are installed.	C.2-03
Expand the distance of corner curb extensions at street intersections and midblock to accommodate seated dining for restaurants not fronting onto wide sidewalks.	
Install 6-foot-long benches with backs and armrests throughout the downtown area.	
Implement a program to report, regularly inspect, and replace non-working street lighting.	
Increase bike parking within the public streetscape throughout the Maple and Woodward district, especially at corner and midblock bulb-outs where multiple racks can be installed.	
Reserve space for future micro-mobility storage at corner and midblock bulb-outs along with bike parking.	
Pursue a shared space streetscape retrofit for Merrill between Old Woodward and Shain Park.	
Add liner buildings along the south edge of the City Hall property to activate Merrill, housing small and lower cost incubator retail spaces and a few apartments on the upper floor.	

Further study and then adopt the proposed retail frontage plan. **a. Establish two categories of retail frontage:** **i. Primary Retail Frontage (purple) requires a minimum of 70% clear glazing along the sidewalk. Retail or food service must occur within a zone 20 feet deep along the frontage.** **ii. Secondary Retail Frontage (blue) may be exempted by waiver of the City Commission to allow other commercial uses.**	C.2-05
Increase the amount of seating in Shain, Booth, and the City's pocket parks with traditional English garden benches, as specified in the 1996 master plan.	C.2.06
Expand portable café seating in Shain and Booth Parks, in all pocket parks, and on all widened sidewalks.	
Open a café in both Shain and Booth Parks, each with public restrooms and limited food and beverage offerings, per the 1996 master plan's recommendations.	
Expand the civic art program into all parks and implement a timetable for the regular rotation of art.	
Implement an art-mural program for large blank wall surfaces in key locations.	
Expand the Oakland – Old Woodward pocket park by removing the south vehicular lane, per the 1996 master plan recommendations.	
Add paths and seating to the Pierce-Brown pocket park.	
Improve the Library's entrance plaza with seating and murals.	C.2-09
Integrate the Birmingham Museum into the Rouge River trail and park system, including more connections and signage at Maple and Woodward and with wayfinding along trails.	C.2-07
Immediately pilot unbundled residential parking in Downtown and study its progress over a 5-year period (adjusted as necessary for recessions). **a. Offer a limited supply of 500 permits for Downtown housing which is not required to provide on-site parking.** **b. Tie this to an average rental or sales rate of 150% of Area Median Income or less, calculated on a per-building basis to allow for a range of prices.** **c. Establish a residential permit program for Downtown housing, with pricing tiered according to the number of vehicles per residence, increasing in price for each vehicle, and the parking garage residents are permitted to park within.**	
Evaluate the outcomes of the unbundled residential parking pilot, evaluating the average number of vehicles per unit and price incentives over the pilot period as well as usage rates in Downtown structures.	
Establish permanent unbundled residential parking in Downtown.	
Establish permanent unbundled residential parking in other mixed-use Districts as municipal garages are built.	
Build a parking deck in the Triangle District as soon as possible. Ensure that the decks are flat, not sloped, and ceilings are sufficiently high that the structure can be reused should demand fall.	

Study the Bates Street Extension elements that are not parking related, specifically the additional street connections and a plaza and trail connection to the Rouge River trail.	
Study opportunities for expanding downtown parking capacity with the APC, BSD, Planning Board, and City Commission.	
Accommodate more monthly permit users as capacity becomes available.	
Pursue recommendations noted in the mixed-use districts parking section, especially directional and informational signage.	
Pursue technological improvements to ease parking usage, such as parking space occupancy indicators (green and red lights above spaces) to more easily direct users through the garages.	
Use tiered parking meter prices to achieve an average maximum 85% occupancy along district streets.	
Increase monthly parking pass fees.	
Study a tiered parking rate system across all garages, once monthly fees have been increased, to supplement assignment-based management.	
Study opportunities to accommodate secure bike parking and electric vehicle charging stations within parking garages as capacity becomes available.	
Continue pedestrian safety and traffic-calming measures along North Old Woodward and in surrounding neighborhoods.	
Reinforce the distinctive character of the Market District with branding; unique architectural design; and special signage, seating, and streetscape elements that distinguish it from the City's other commercial districts.	
Install additional café and pedestrian seating along Old Woodard.	
Enforce or expand storefront design and signage standards.	
Install street and business way-finding signage throughout the district.	
Install additional pedestrian seating throughout the district.	
Construct a permanent, open-air farmer's market pavilion with public restrooms on the portion of Lot 6 that is along Old Woodward.	C.3-06
Establish a plaza with curb extensions, mid-block crossings, consistent paving, and ample seating at the front of the pavilion, crossing Old Woodward.	
Install ample benches in Booth Park.	
Install a small café and public restrooms in Booth Park along with moveable tables and chairs	
Extend D2 zoning to the multi-family properties along the west side of Old Woodward up to Quarton.	C.3-08
Make streetscape improvements to support additional pedestrians as discussed in the Street Life section	
Make park and plaza improvements to support additional residents as discussed in the Public Space section.	
Research constructing a parking garage in the Lot 6 parking lot.	
Provide additional on-street parking along Old Woodward, north of Harmon including the area north of Oak.	

Summary of The Birmingham Plan 2040 (Draft) Recommendations and Dates of Planning Board Review

Haynes Square, South Woodward Gateway, Rail District – June 10, 2020

Create a parking assessment or incremental tax district as necessary for land purchases and for financing the development of parking structures. Decades ago, a similar process was used to build downtown's five structures.	
Reconfigure the streets around Haynes Square to create the square and fix the acute intersection between Woodward and Old Woodward.	C.4-03
Build the public square with a cafe and trees to block noise from Woodward, seating, a kids play area, and other compelling civic features.	C.4-04
Purchase properties and implement Worth Park and other public realm enhancements, including civic art, streetscaping, traffic calming, and way-finding.	
Build a public parking deck on the east side of Haynes Square, in the Walgreens parking lot as has been negotiated.	
Build Worth Park.	
Create a brand for the Haynes Square, reinforced with special signage, landscaping, street furnishings, and building design standards.	
Install enhanced streetscape and landscape improvements along Bowers, Haynes, and Webster.	
Develop Worth Street as a shared-use streetscape.	
Improve pedestrian linkages to the surrounding neighborhoods, especially along Adams.	
Trade developable land and install a public surface parking lot along the south Old Woodward alley.	
Create a parking district for Haynes Square which allows residences to purchase parking passes in public garages, as discussed for Maple and Woodward.	
Install metered, on-street parking along Adams and Lincoln Roads.	
Create subdivision and zoning standards to encourage redevelopment of the Adam's Square shopping center, offering significant development capacity in exchange for a public open space and public parking.	
Implement pedestrian-walkway improvements along Woodward to improve the walkability to both downtown and the market districts.	
Identify an alley segment to use as a pilot project. This segment should have generally underutilized parking and intermittent buildings, like the segment between Humphrey and Bennaville on the east side, or underutilized parking and businesses that may be willing to open rear entrances, like the segment between Bennaville and Chapin on the east side.	C.5-04
Pilot a shared-use alley at the selected segment by re-paving the alleyway and working with property owners to infill housing along the triangular parcels and open existing buildings to the alley. Power poles should be relocated underground during the alley development.	C.5-04 C.4-05-08

Incentivize redevelopment through increased zoning capacity and reduced parking requirements	
Establish a zoning district to allow for and incentivize redevelopment in this format, including: **a. Requiring storefronts along neighborhood streets.** **b. Requiring parking be located midblock.** **c. Requiring storefronts along the alley.** **d. Requiring housing along the neighborhood-side of the alley, limited to 2 stories.** **e. Permitting townhouses and muse-housing along the neighborhood-side of the alley.** **f. Permitting multi-family housing on the commercial properties.** **g. Permitting 2 stories along the alley and 3 or 4 stories between Woodward and 50 feet of the alley.** **h. Reducing parking requirements and allowing shared parking.**	
Pilot the Neighborhood Sleeve option where the shared-use alley is implemented by: **a. Striping on-street parking.** **b. Constructing chicanes on the neighborhood side of the alley.** **c. Revising the streetscape between the alley and Woodward, paving the planter with pervious pavers and providing seating, trash and recycling cans, pedestrian-scaled lighting, bike racks, and other streetscape elements typical in commercial districts.**	C.5-13 C.5-17 C.5-18
Create an Overlay District for the Lower Rail District that implements the zoning adjustments discussed above and activates more lenient development review decision making.	C.6-08
Construct a shared-use street section along Cole and Commerce Streets.	
Update the 1999 Eton Road Corridor Plan of 1999 for the area south of Palmer Street by including the following: **So long as the buildings--existing or new--are one story, eliminate all requirements of Section 5 of the Site Design Guidelines p 41-46. of the Eton Road Corridor Plan. These include but are not limited to:** **Eliminating building frontage and sidewalk requirements.** **Eliminating parking requirements, except as the on-street parking shall be as determined by the "Immediate Neighbors" of the adjacent Torry or Kenning Neighborhoods.** **Eliminating the signage and landscaping requirements.** **Eliminating building use and aesthetic requirements.**	
Zoning should be modified such that the MX District is exempt from LA-01 (E) and (F), as is true in Downtown, or at a minimum that plantings in the MX District are only required within the streetscape and within open areas of the property, but not based on a minimum number of trees per residential unit as currently defined.	
MX District zoning should be carefully analyzed by contracting two or more architects to complete preliminary building designs for mixed-use buildings on existing sites, small and large, with and without on-site parking, attempting to achieve capacity. The architects should be requested to discuss and present challenges and constraints that	

are faced in the process. While some challenges are part of code design, others may be unknown without testing.	
Update the 1999 Eton Road Corridor Plan for the area south of Palmer Street by including the following: ◊ At the termination of Holland Street, creating a connection to the rail station by purchasing a 30 ft wide corridor or easement.	
Acquire access to the Troy Transit Center from the School District.	C.6-15
Acquire access to the Troy Transit Center from remaining property owners using through negotiation, failing which through eminent domain.	C.6-15
Pursue development of a public parking structure in the Rail District on a site with adequate access to the Lower Rail District and the future connection to the Troy Transit Center.	

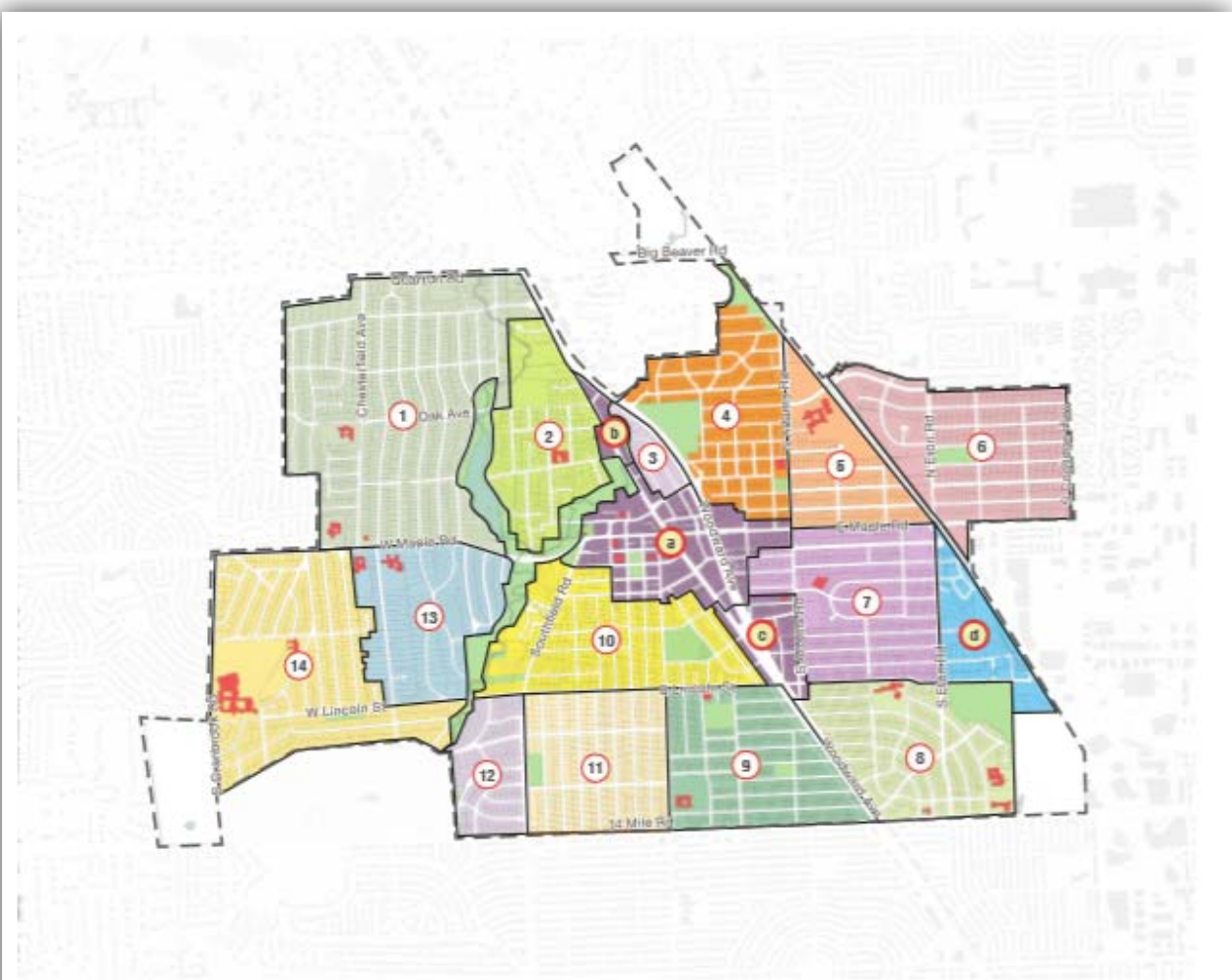


Figure A.2-03.

BIRMINGHAM NEIGHBORHOODS AND CENTERS

Neighborhoods

1. Quarton
2. Holy Name
3. The Ravines
4. Poppleton
5. Derby
6. Pembroke
7. Torry
8. Kenning
9. Pierce
10. Barnum
11. Crestview
12. Birmingham Farms
13. Linden
14. Seaholm

Centers

- a Downtown
- b North Woodward
- c South Woodward
- d Railroad District

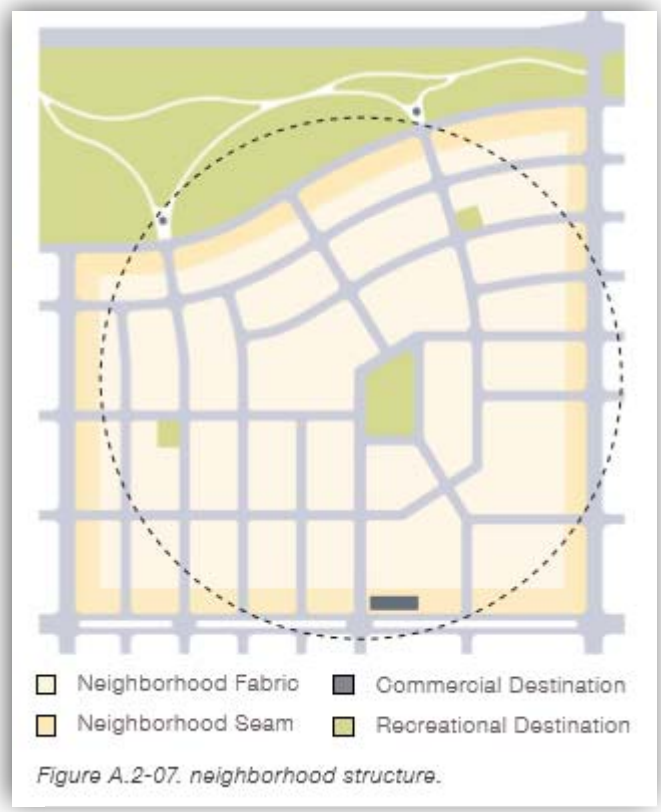


Figure A.2-07. neighborhood structure.

Figure A.2-13. Three districts of downtown.

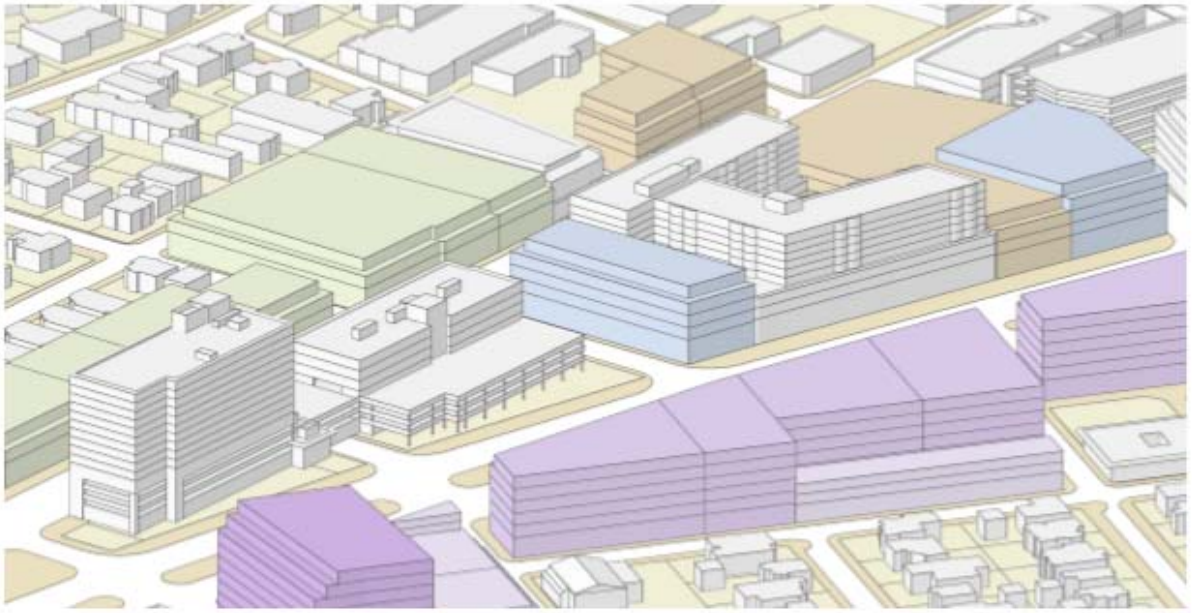
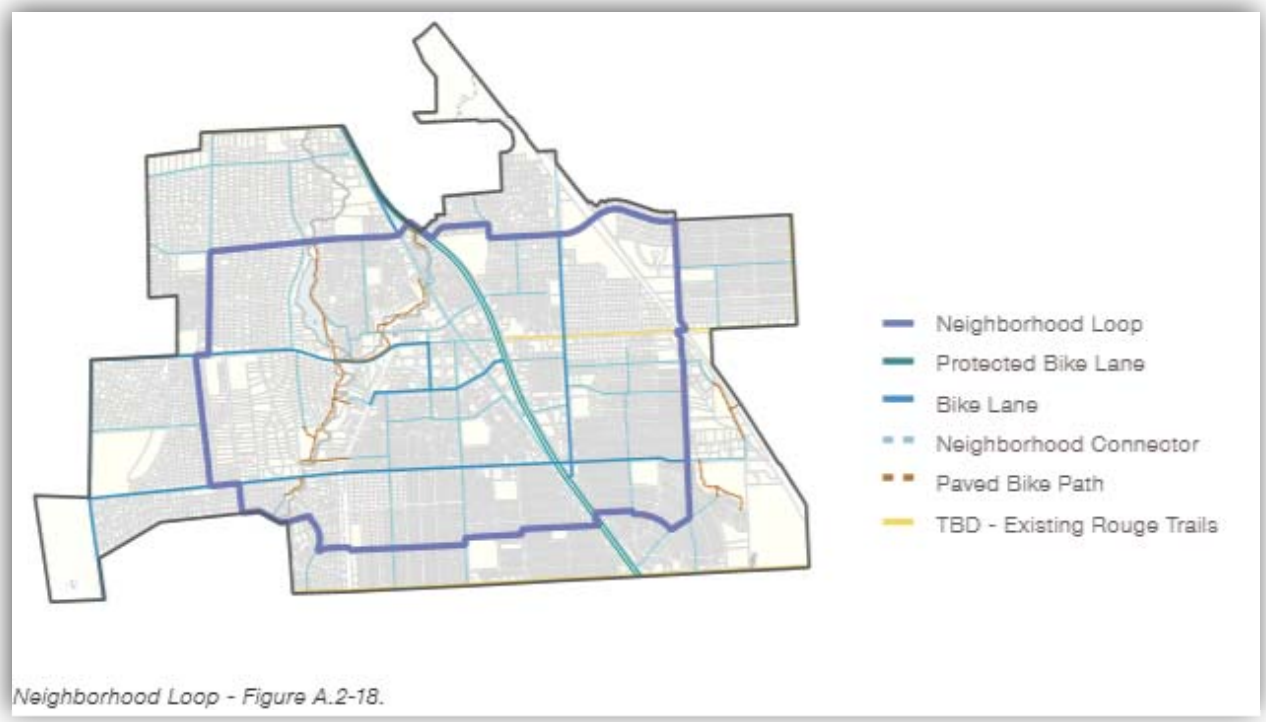
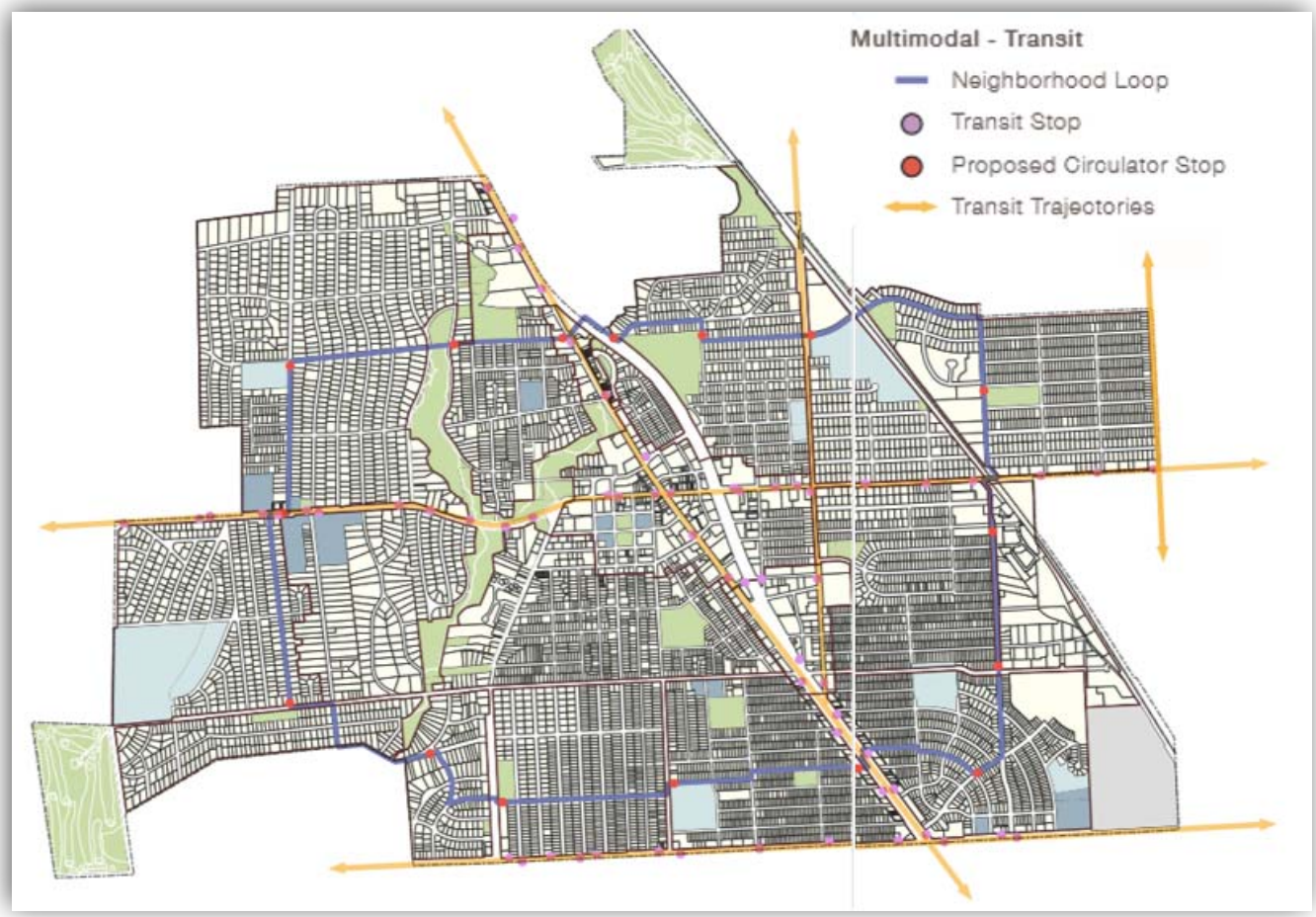


Figure A.2-15. Future potential massing in Triangle district and Downtown.



Neighborhood Loop - Figure A.2-18.



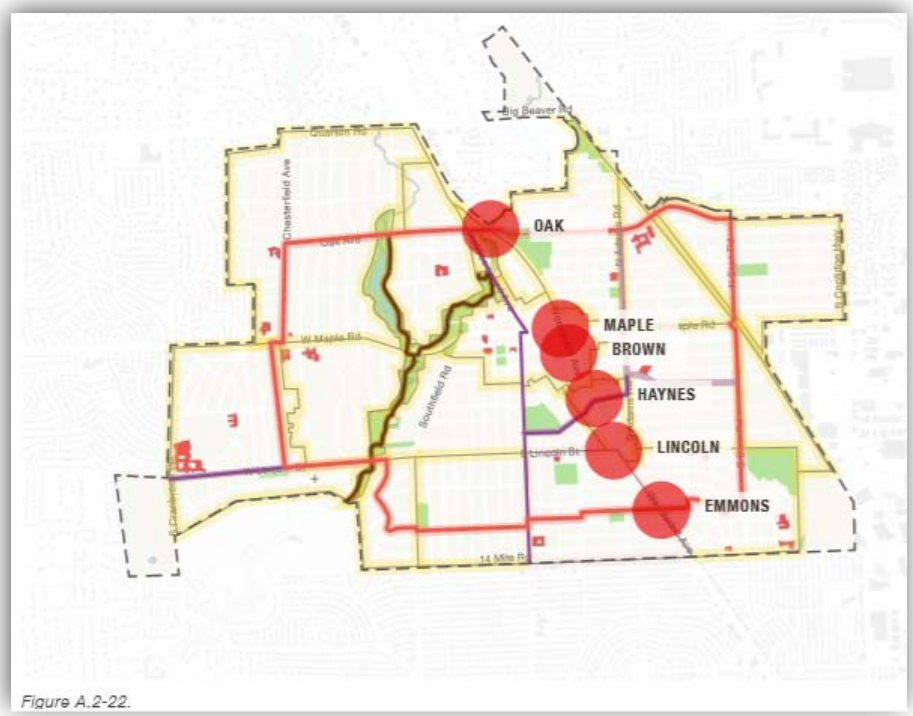


Figure A.2-22.

Figure A.2-22.

KEY CROSSING IMPROVEMENTS

- Key Crossings
- Neighborhood Loop
- Special Connections
- Shared Use Trails
- Proposed Neighborhood Boundaries
- Civic Institutions

Figure A.2-24. Elliptical traffic circle proposed at Woodward crossing at Maple.

Intersection ajustments along Woodward and Adams.

Figure A.2-26. Intersection redevelopment to alleviate traffic issues at Adams and Lincoln.

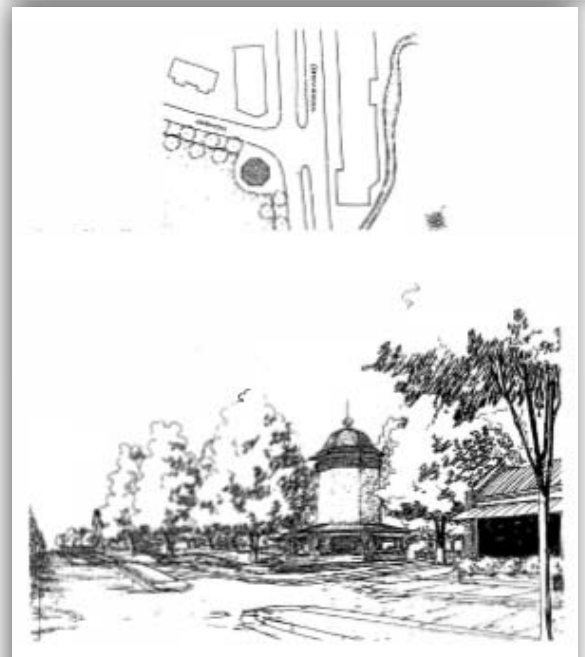


Figure A.2.-39. Downtown 2016 Plan - Proposal of Pavillion at Booth Park.

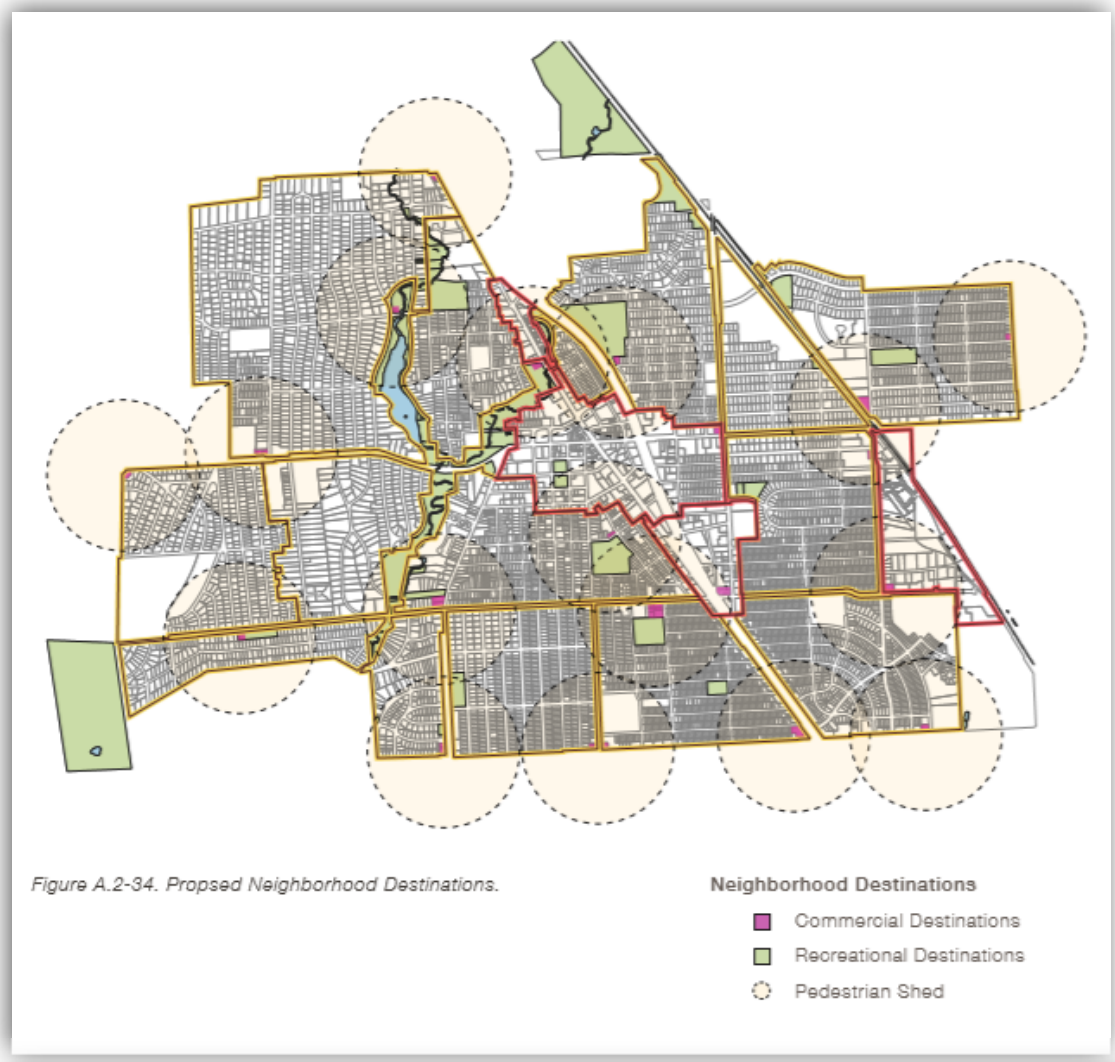


Figure A.2-34. Propsed Neighborhood Destinations.

Image A.2.-43. Rouge Walk.

Image A.2.-44. Rouge Walk.

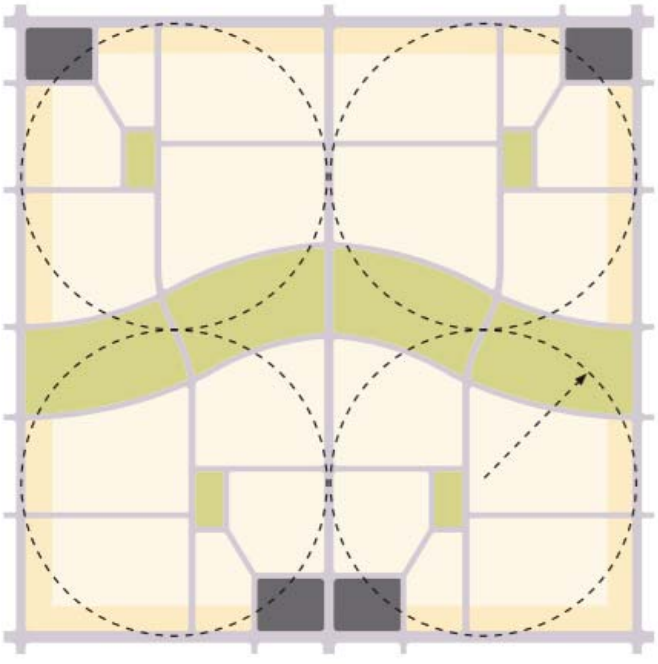


Figure B.1-01. Multiple neighborhood units together forming a larger fabric of the city.

Neighborhood Fabric
Neighborhood Seam
Neighborhood Destination
Recreational Destination

Neighborhood Fabric
Neighborhood Seam
Commercial Destination
Recreational Destination

Figure B.1-04. Neighborhood structure.

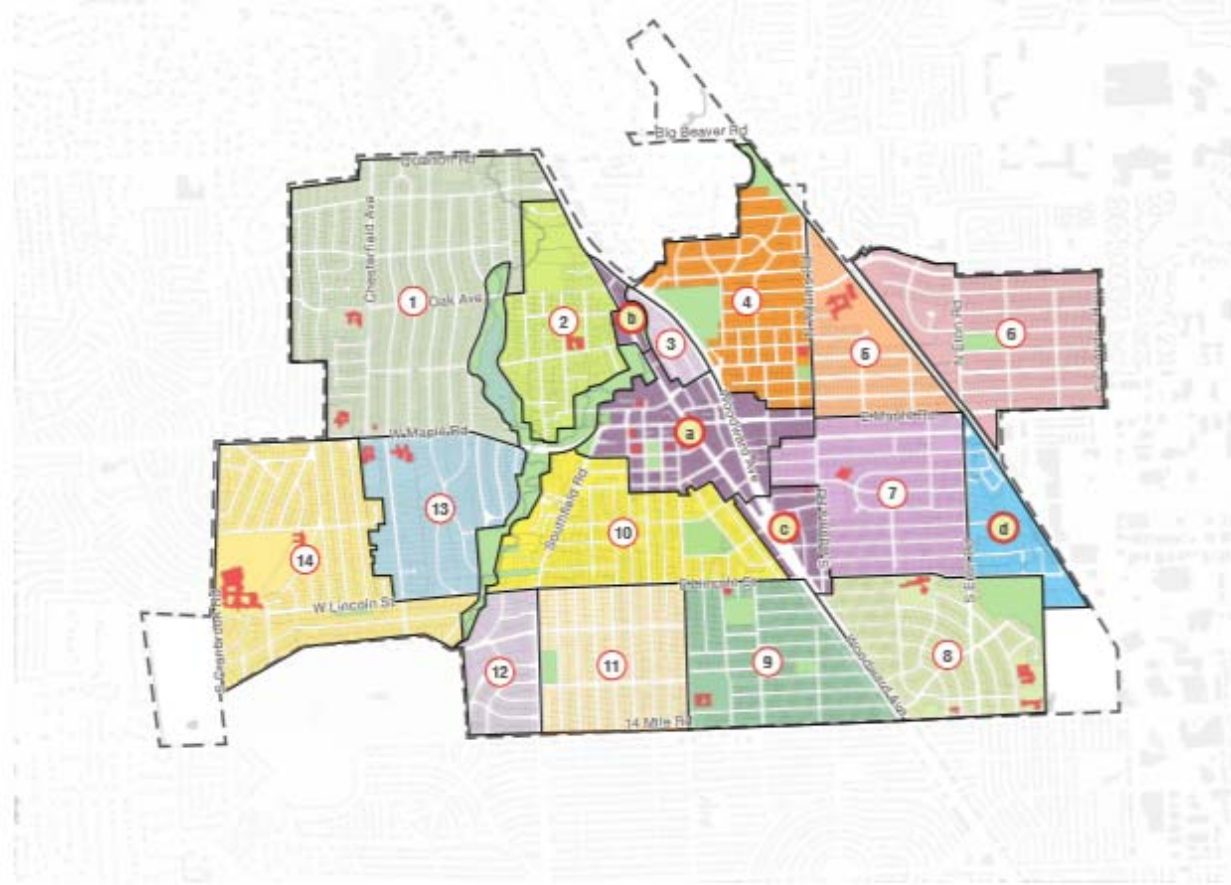


Figure B.1-06.

BIRMINGHAM NEIGHBORHOODS AND CENTERS

Neighborhoods

1. Quarton
2. Holy Name
3. The Ravines
4. Poppleton
5. Derby
6. Pembroke
7. Torry
8. Kenning
9. Pierce
10. Barnum
11. Crestview
12. Birmingham Farms
13. Linden
14. Seaholm

Centers

- a. Downtown
- b. North Woodward
- c. South Woodward
- d. Railroad District

Figure B.1-07.

EXISTING RESTRICTIONS: TORRY NEIGHBORHOOD AND THE RAIL DISTRICT

- 15 Min Parking 8am-9am Except Sun. & Holidays
- 2 HR Parking 6am-4pm Except Sat, Sun., & Holidays
- 2 HR Parking 8am-6pm Except Sun. & Holidays
- 2 HR Parking 9am-6pm Except Sun. & Holidays
- 2 HR Parking Limit
- No Parking Anytime
- Parking Allowed, All Times
- Permit Parking Required at All Times

Figure B.1-08.

EXISTING RESTRICTIONS: SEAHOLM AND LINCOLN HILLS NEIGHBORHOODS

- 2 HR Parking 9am-6pm Except Sat, sun, & Holidays
- No Parking 8am-6pm
- No Parking, 7am-9am Except Sun. & Holidays
- No Parking, 8am-6pm Except Sat., Sun. & Holidays
- No Parking, 8am-6pm Except Sun. & Holidays
- No Parking, M-F 7am-2pm
- No Parking, School Days 7am-3pm
- No Parking, School Days 8am-10am
- No Parking, Sunday 7am-1pm
- Parking Allowed, All Times
- Parking Permit 7am-4pm School Days
- Residential Permit Parking

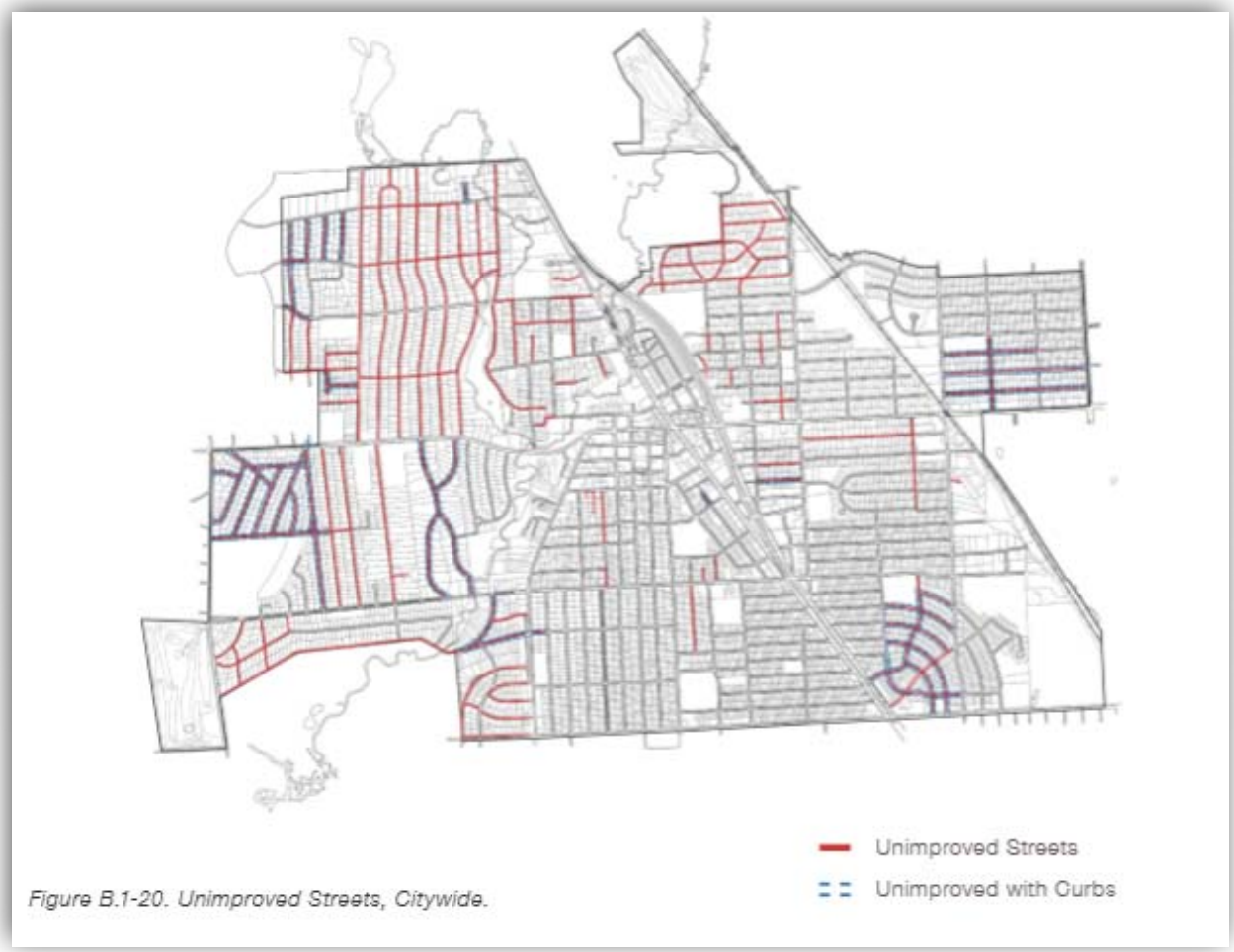


Figure B.1-20. Unimproved Streets, Citywide.

Image B.1-21. A new home too brightly lit, degrading neighborhood character, next to which an appropriately lit porch demonstrates preferred lighting levels.

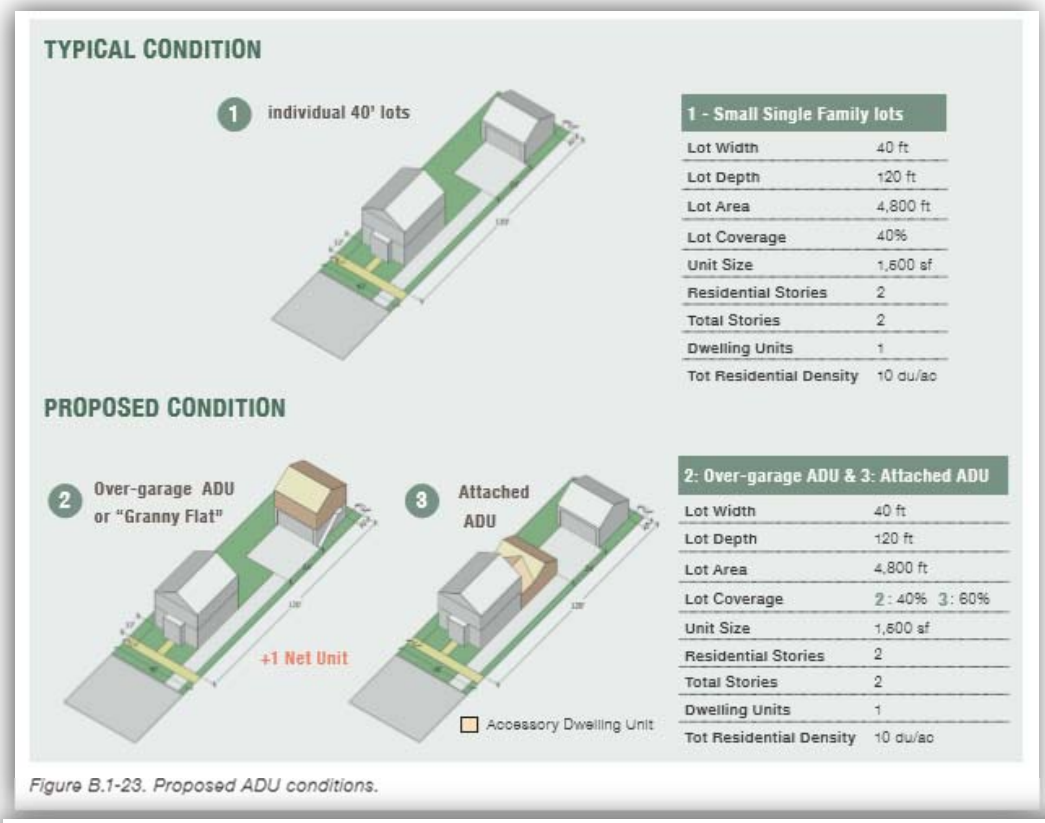


Figure B.1-23. Proposed ADU conditions.

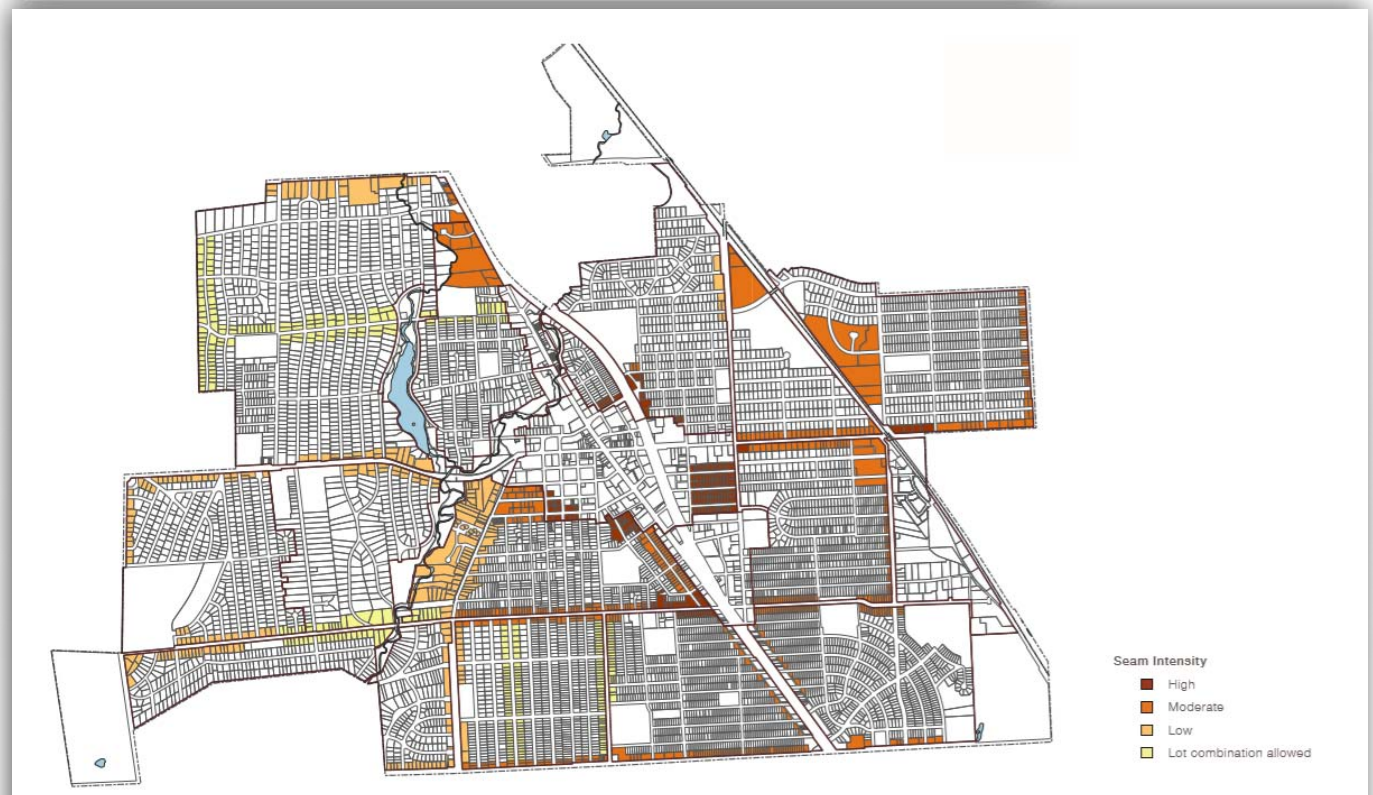


Figure B.1-30. Neighborhood Seams

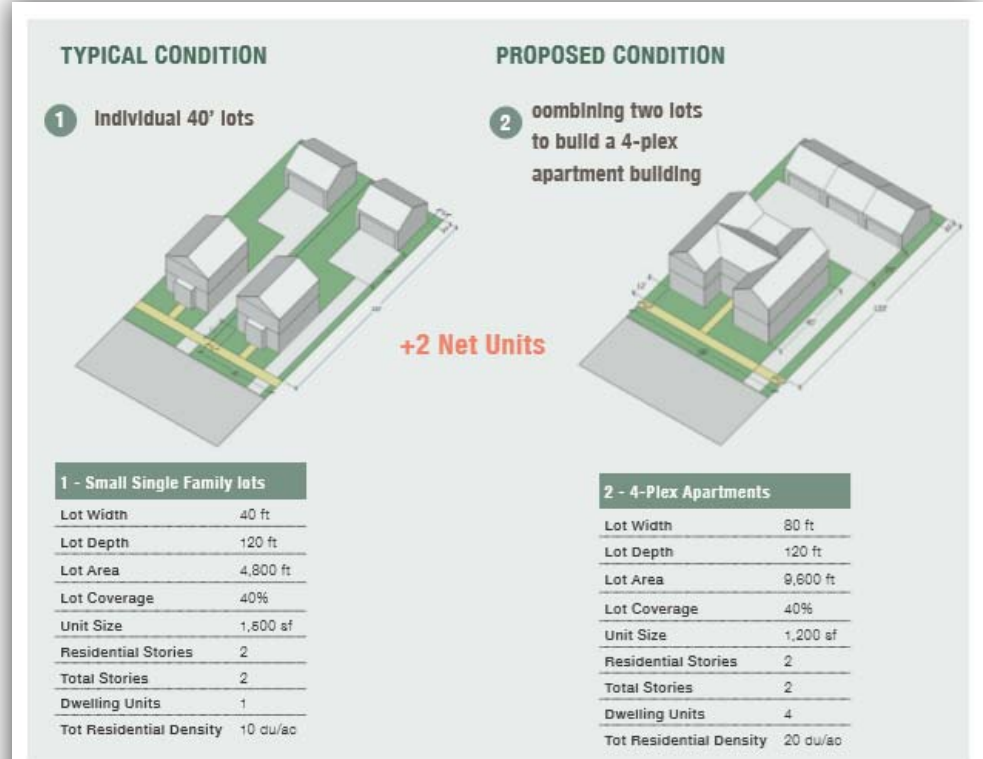


Figure B.1-38. Proposed Small Multi-family buildings.

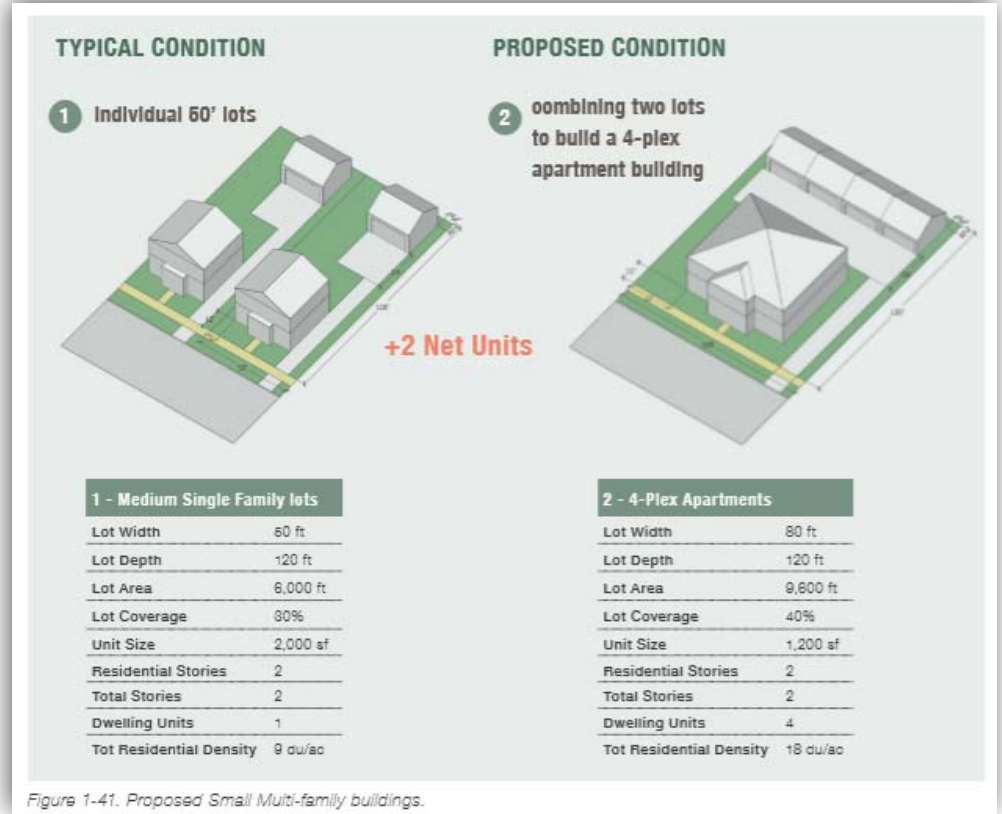


Figure 1-41. Proposed Small Multi-family buildings.

1 - Small Single Family lots	
Lot Width	40 ft
Lot Depth	120 ft
Lot Area	4,800 ft
Lot Coverage	40%
Unit Size	1,600 sf
Residential Stories	2
Total Stories	2
Dwelling Units	1
Tot Residential Density	10 du/ac

2 - Townhouses	
Lot Width	120 ft
Lot Depth	120 ft
Lot Area	14,400 ft
Lot Coverage	60%
Unit Size	1,360 sf
Residential Stories	2
Total Stories	2
Dwelling Units	5
Tot Residential Density	16 du/ac

Figure B.1-42. Proposed Townhouses and Duplexes.

1 - Small Single Family lots	
Lot Width	40 ft
Lot Depth	120 ft
Lot Area	4,800 ft
Lot Coverage	40%
Unit Size	2,000 sf
Residential Stories	2
Total Stories	2
Dwelling Units	1
Tot Residential Density	10 du/ac

2 - Cottage Court	
Lot Width	120 ft
Lot Depth	120 ft
Lot Area	14,400 ft
Lot Coverage	60%
Unit Size	750-1,600 sf
Residential Stories	2
Total Stories	2
Dwelling Units	7
Tot Residential Density	23 du/ac

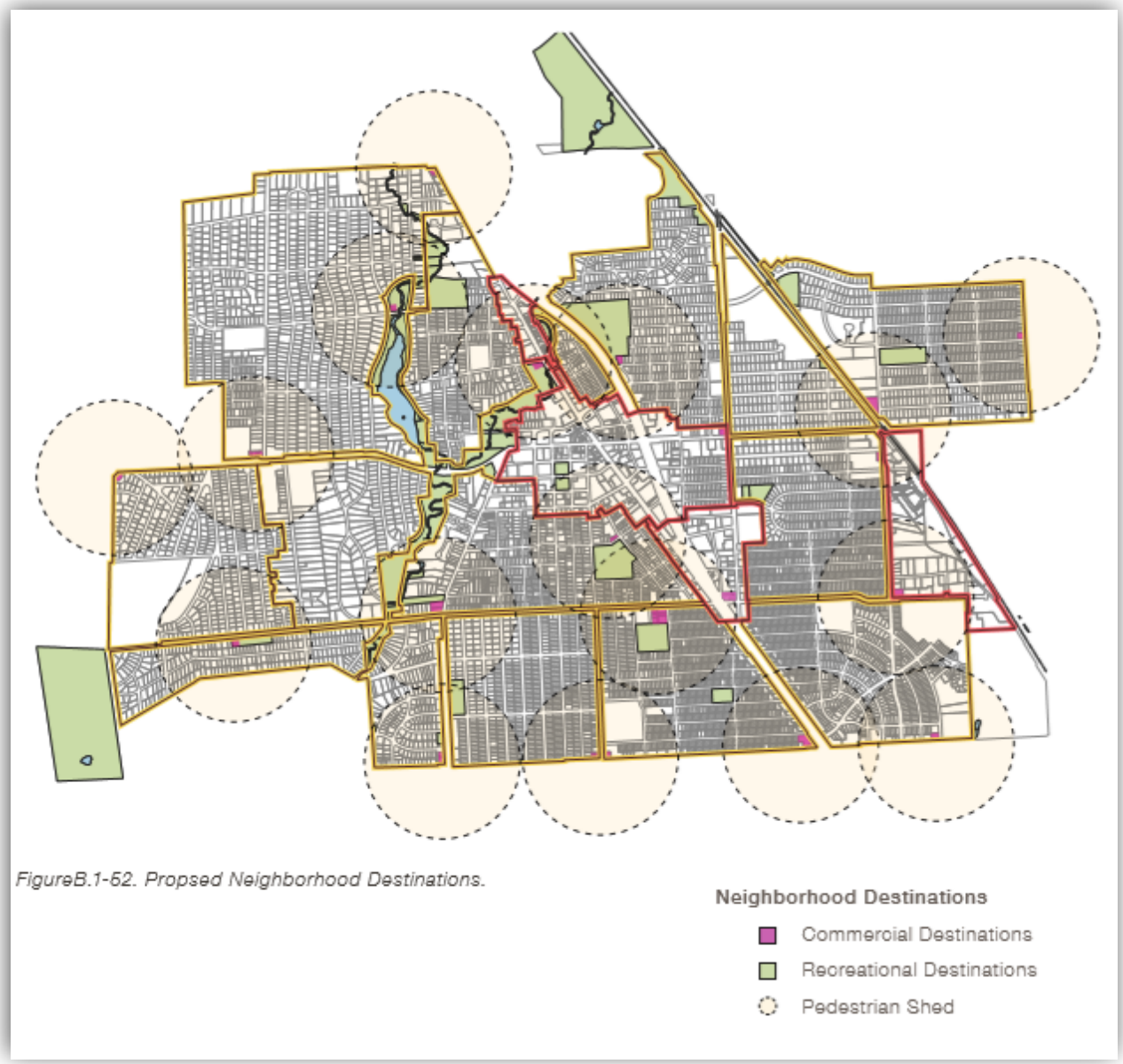
Figure B.1-46. Proposed Cottage Courts.

1 - Medium Single Family lots	
Lot Width	60 ft
Lot Depth	120 ft
Lot Area	6,000 ft
Lot Coverage	30%
Unit Size	2,000 sf
Residential Stories	2
Total Stories	2
Dwelling Units	1
Tot Residential Density	9 du/ac

2- Cottage court	
Lot Width	160 ft
Lot Depth	120 ft
Lot Area	18,000 ft
Lot Coverage	40%
Unit Size	760-1,200 sf
Residential Stories	2
Total Stories	2
Dwelling Units	8
Tot Residential Density	20 du/ac

Figure B.1-49. Proposed Cottage Courts.

Figure B.1-50. A neighborhood destination consisting of a mix of uses and small gathering spaces can greatly enhance the character and identity of a neighborhood, while providing convenient, walkable access to services and amenities.



FigureB.1-52. Propsed Neighborhood Destinations.

Figure B.1-63. Mills Pharmacy destination improvement.

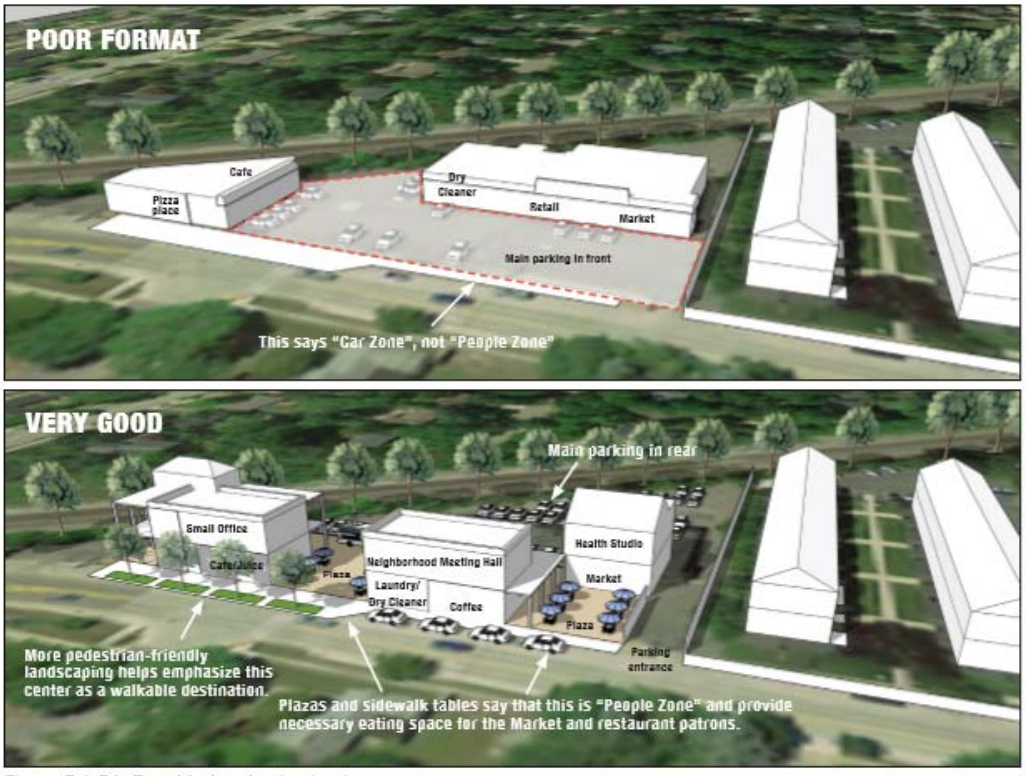


Figure B.1-64. Eton Market destination improvement.

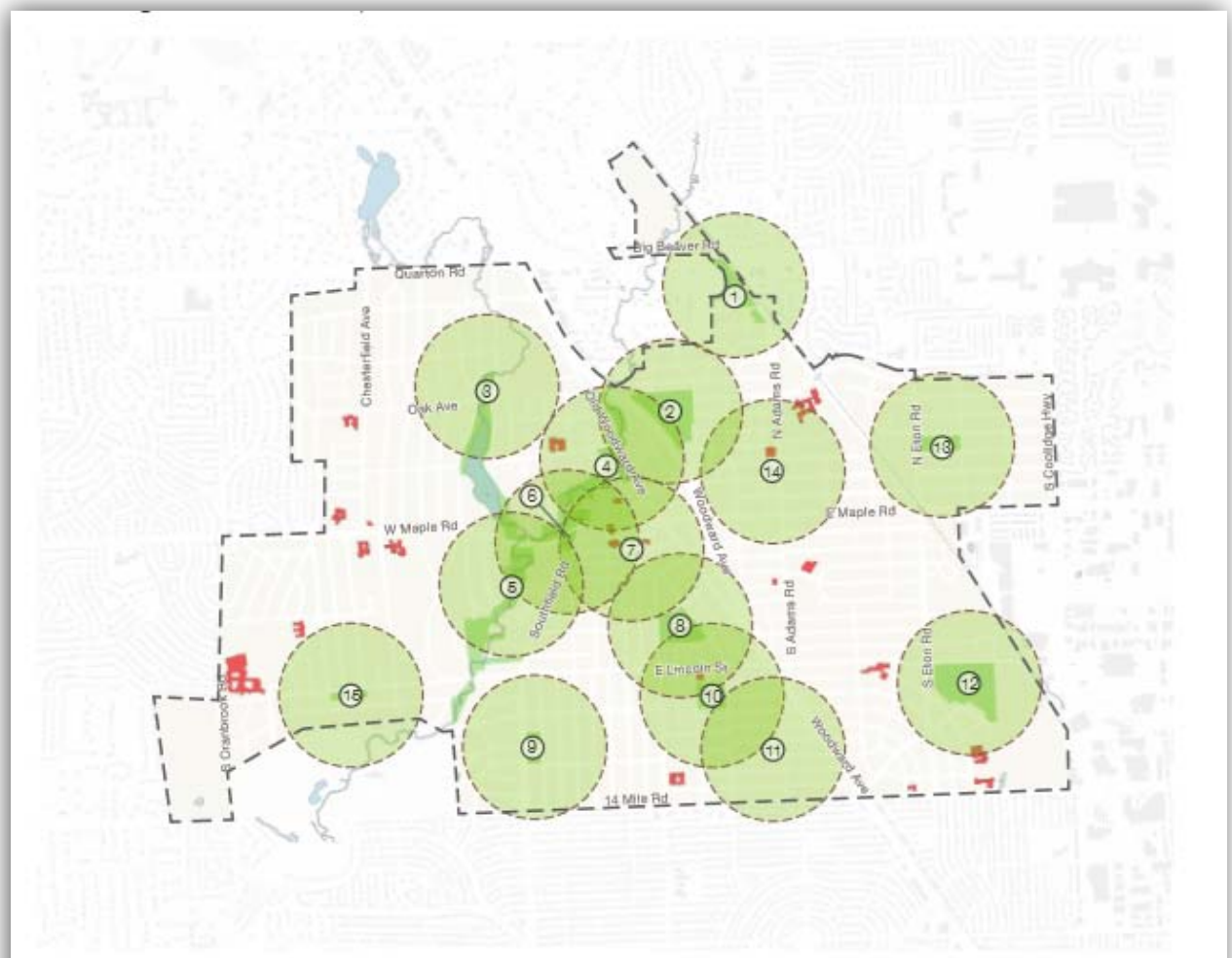


Figure B.1-67. Recreational Destinations.

- Civic Institutions
- Recreational Destinations
- Pedestrian Shed

1. Manor Park
2. Poppleton Park
3. Lower Baldwin Park
4. Booth Park
5. Linden Park
6. Martha Baldwin Park
7. Shain Park
8. Barnum Park
9. Crestview Park
10. St. James Park
11. Howarth Park
12. Kenning Park
13. Pembroke Park
14. Adams Park
15. West Lincoln Well Site

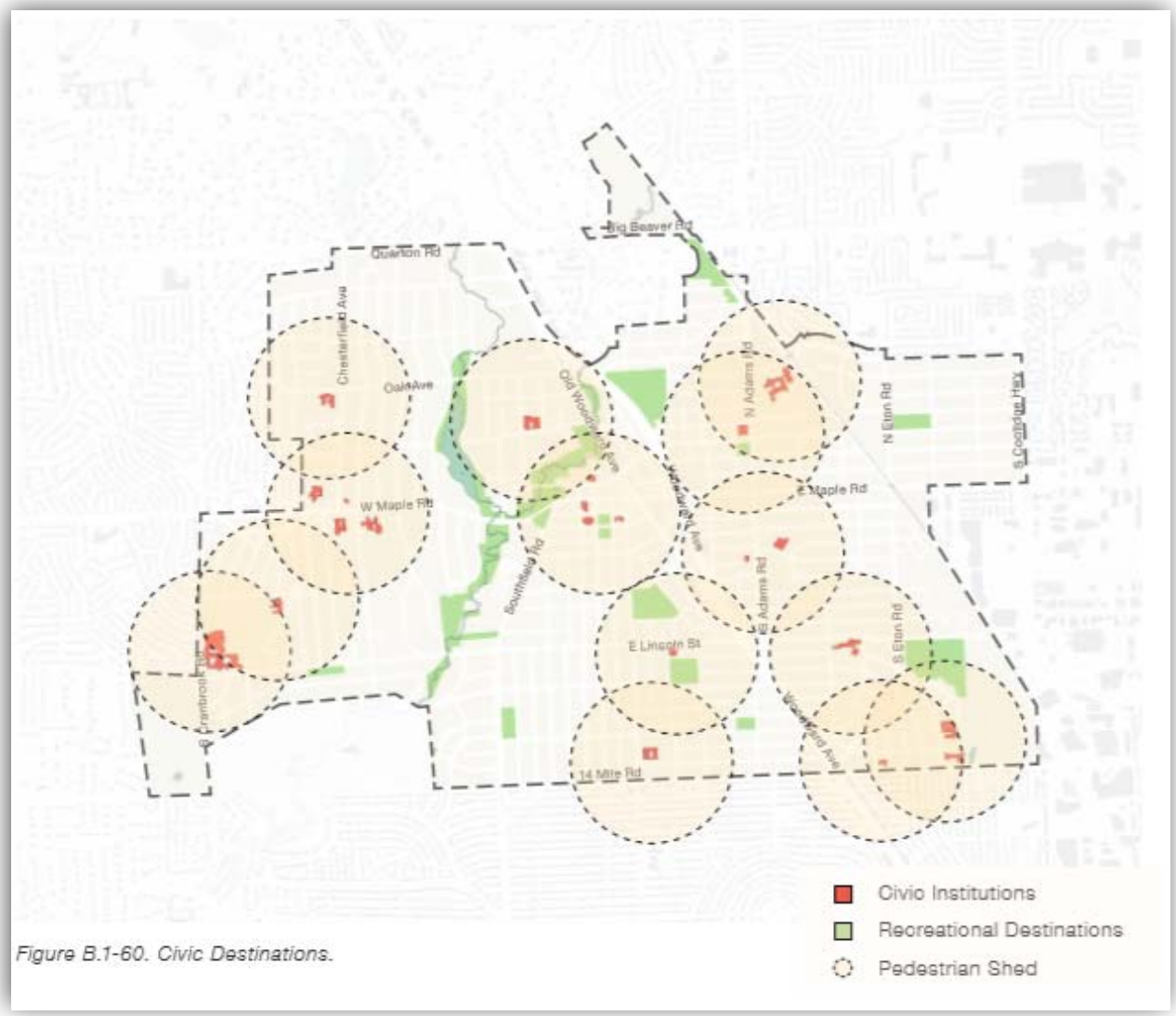


Figure B.1-60. Civic Destinations.

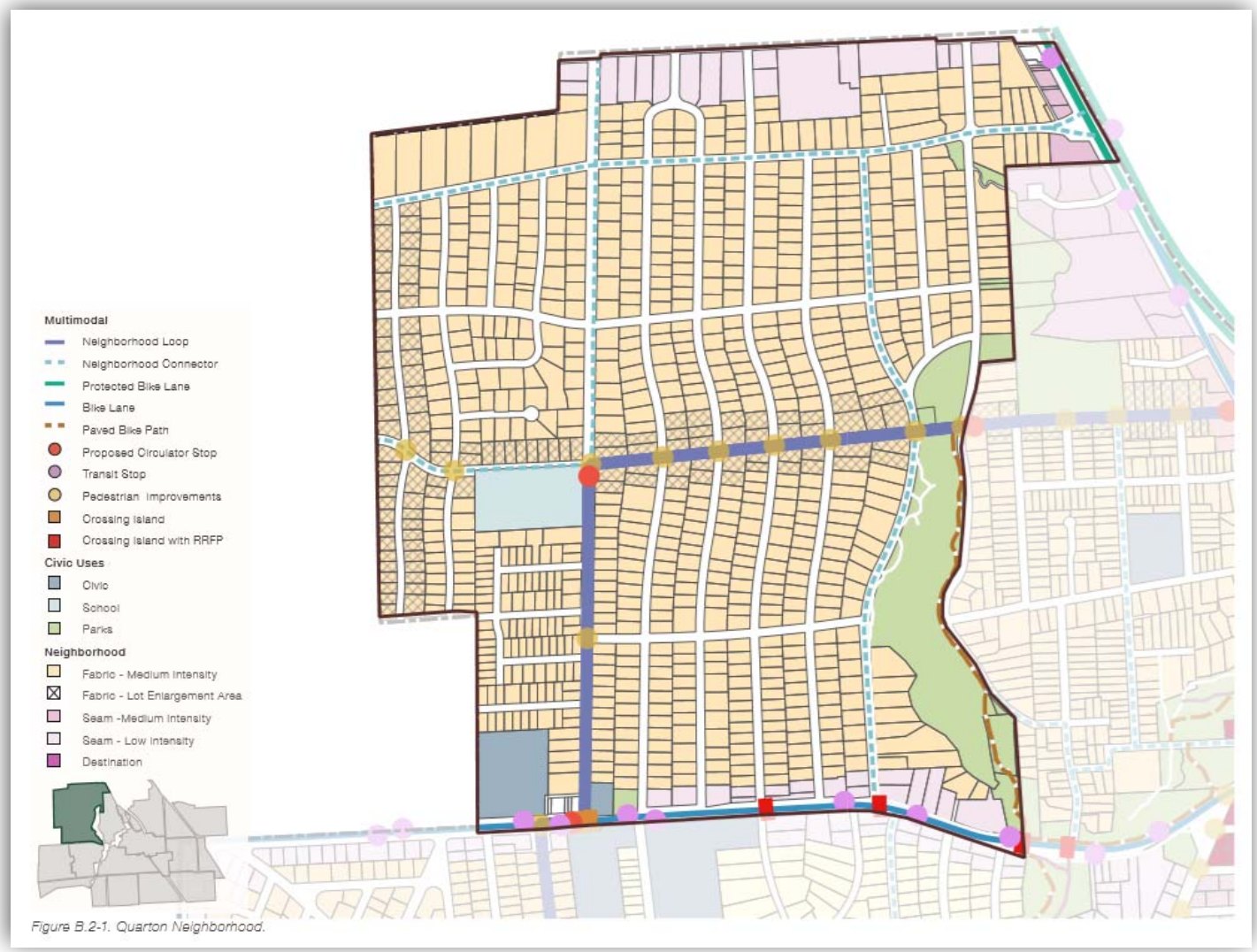


Figure B.2-1. Quarton Neighborhood.

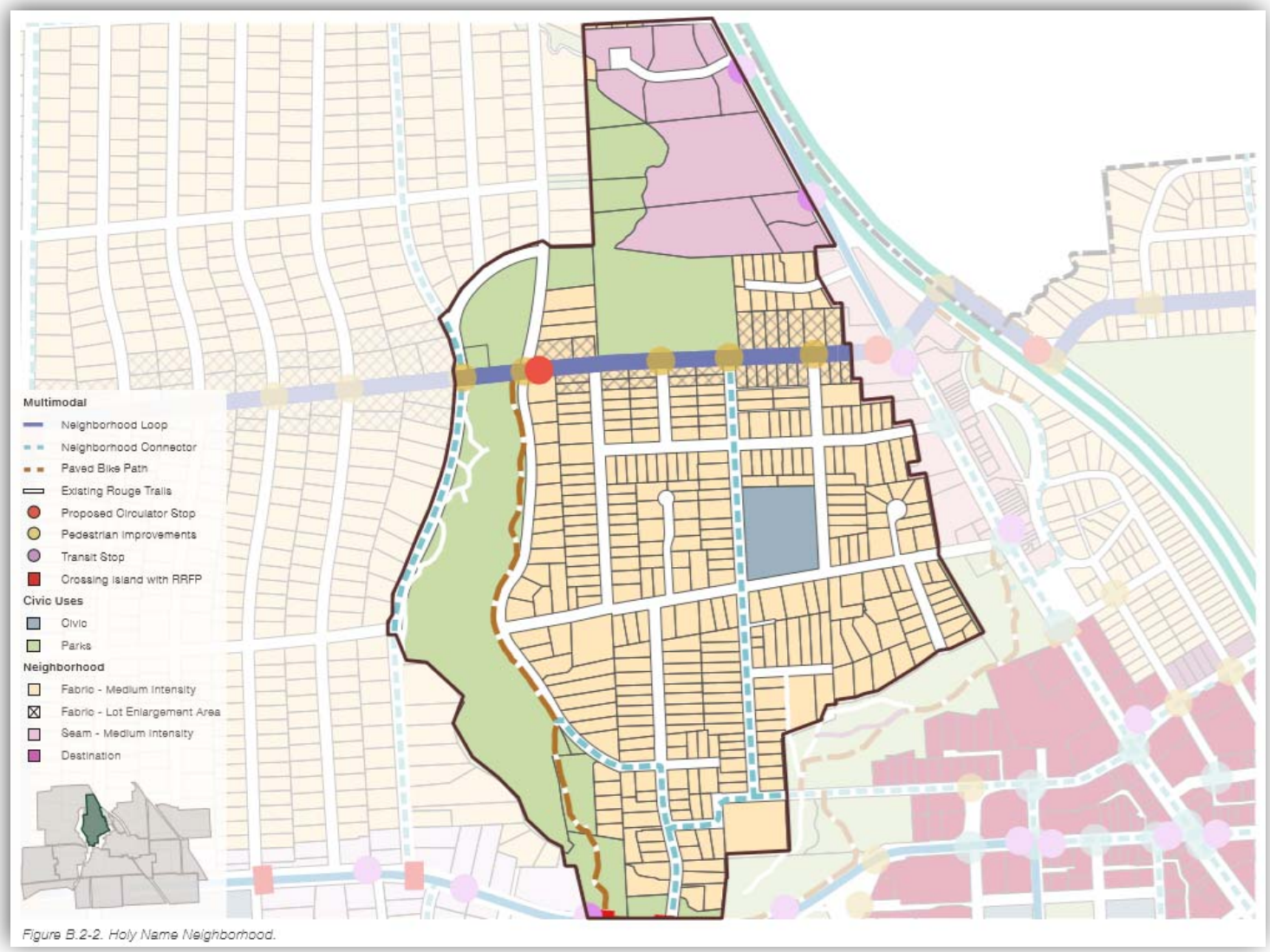


Figure B.2-2. Holy Name Neighborhood.

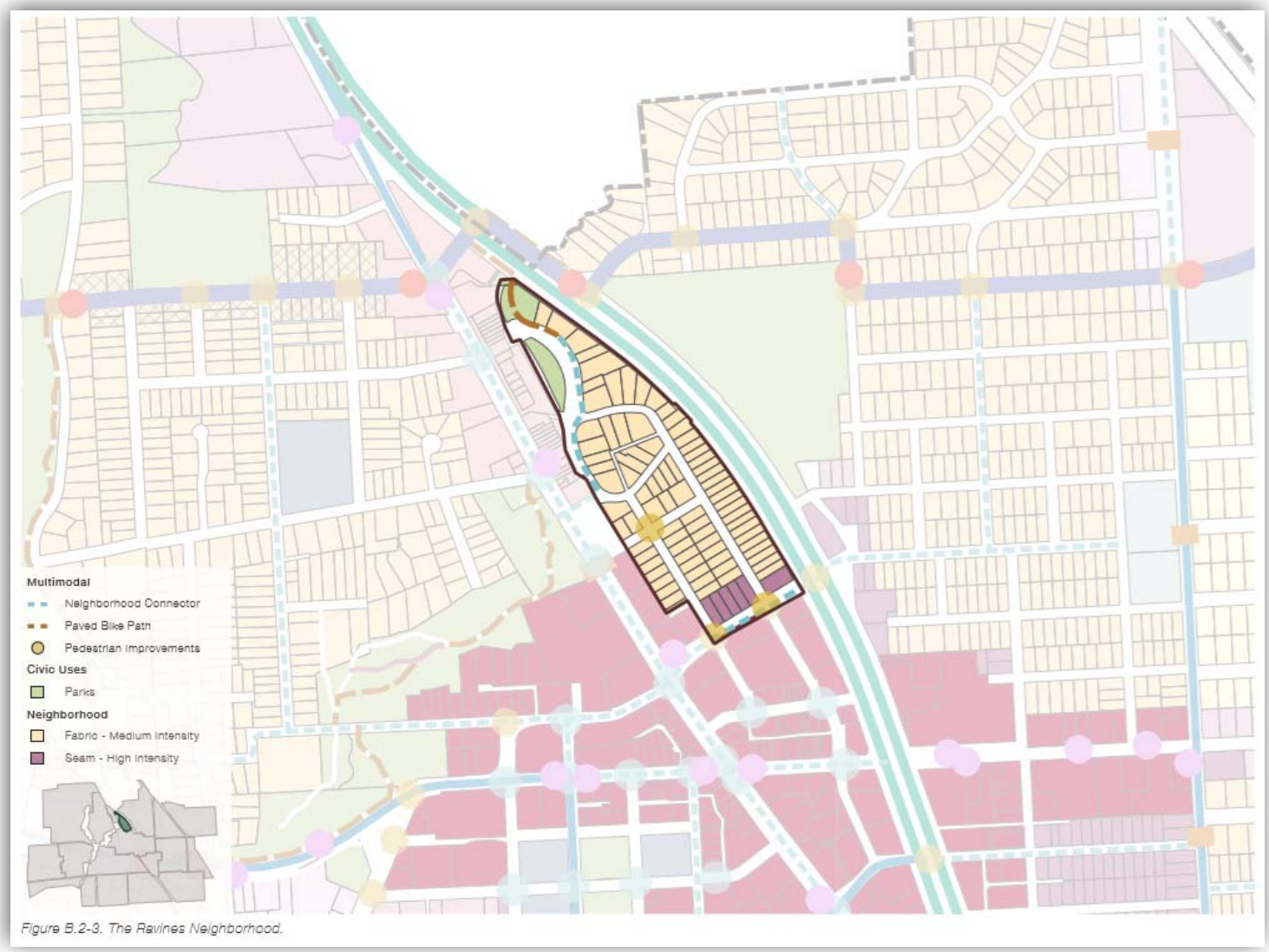


Figure B.2-3. The Ravines Neighborhood.

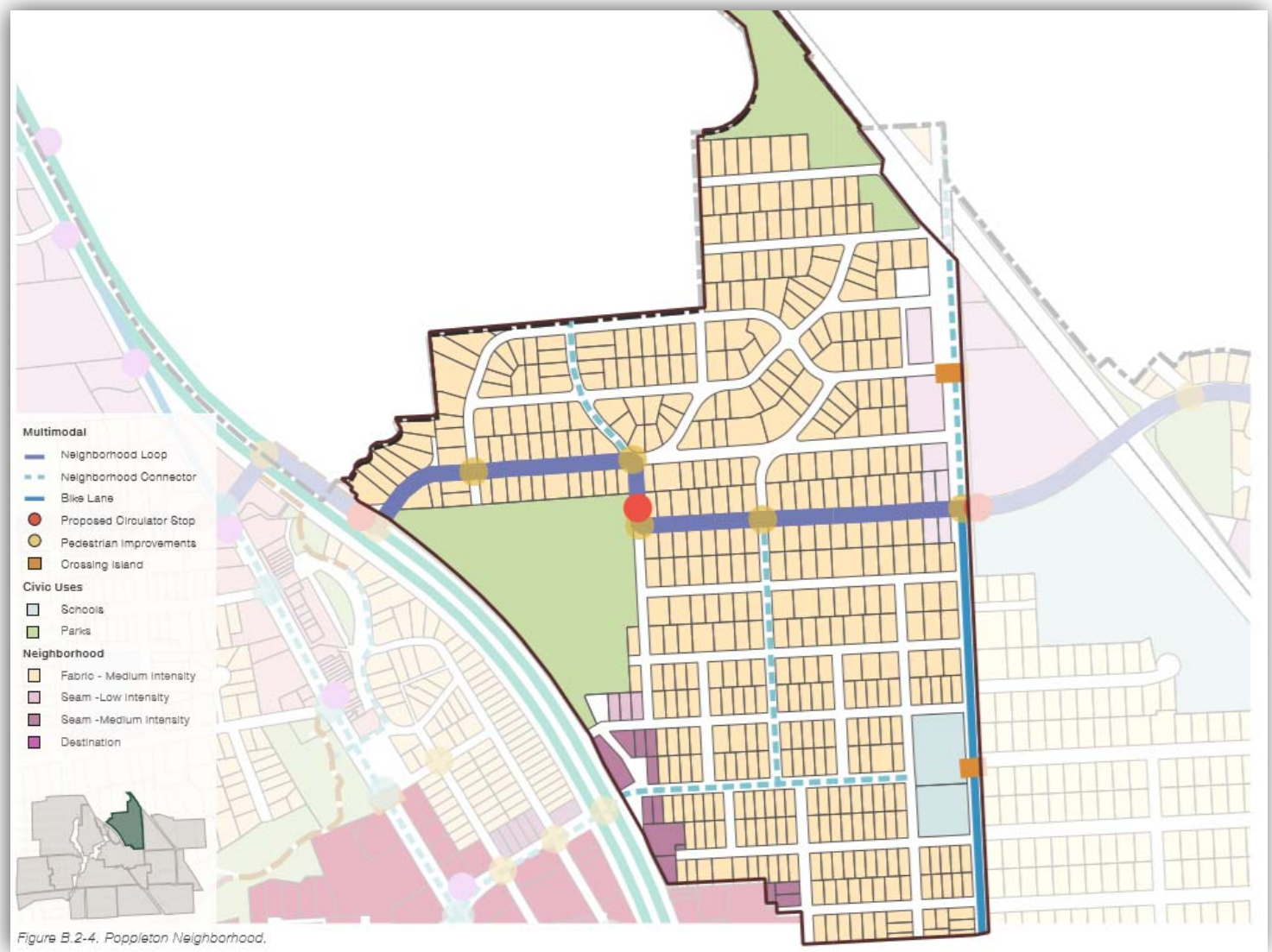


Figure B.2-4. Poppleton Neighborhood.

Figure B.2-5. Derby Neighborhood.

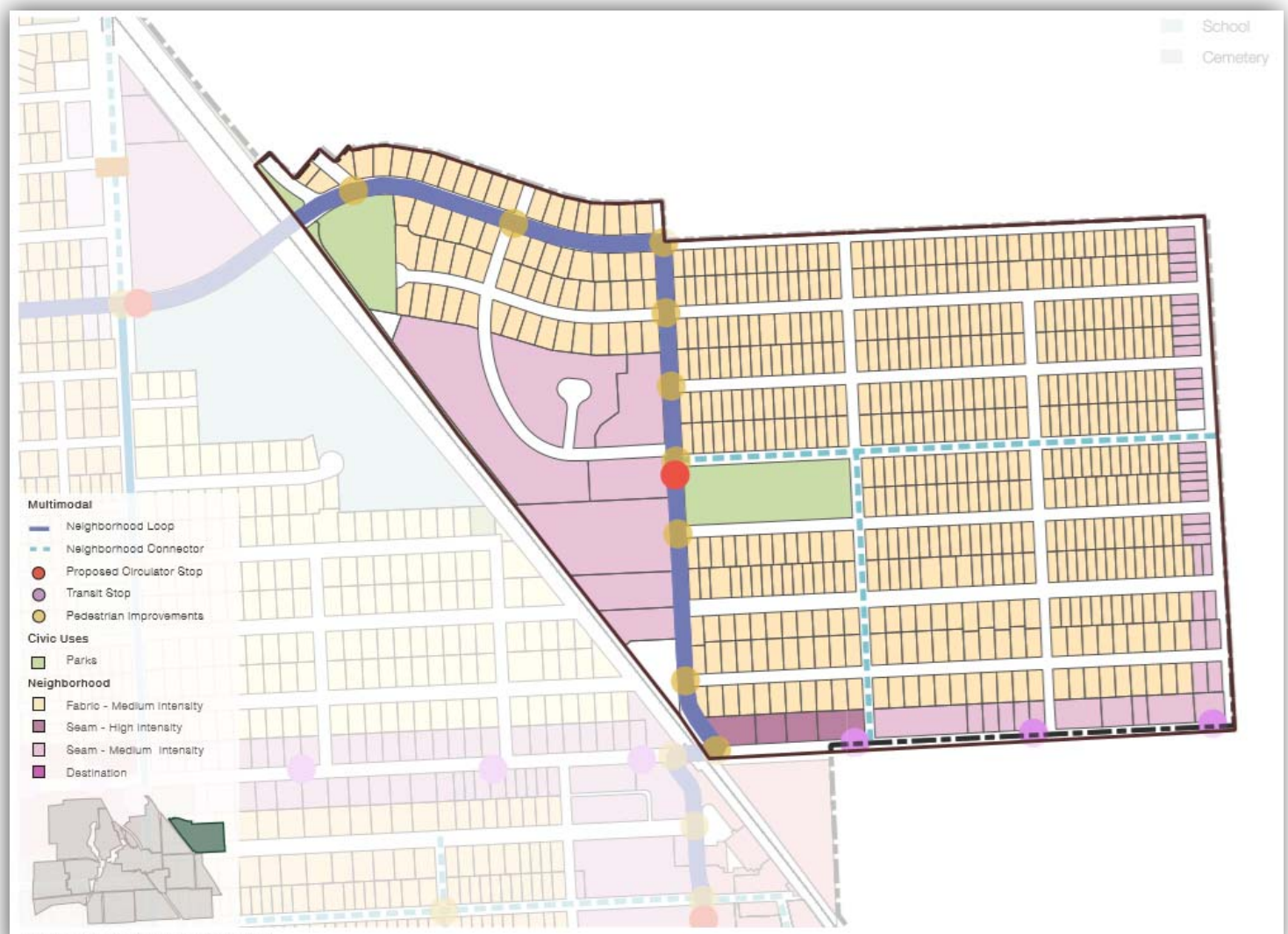


Figure B.2-6. Pembroke Neighborhood.

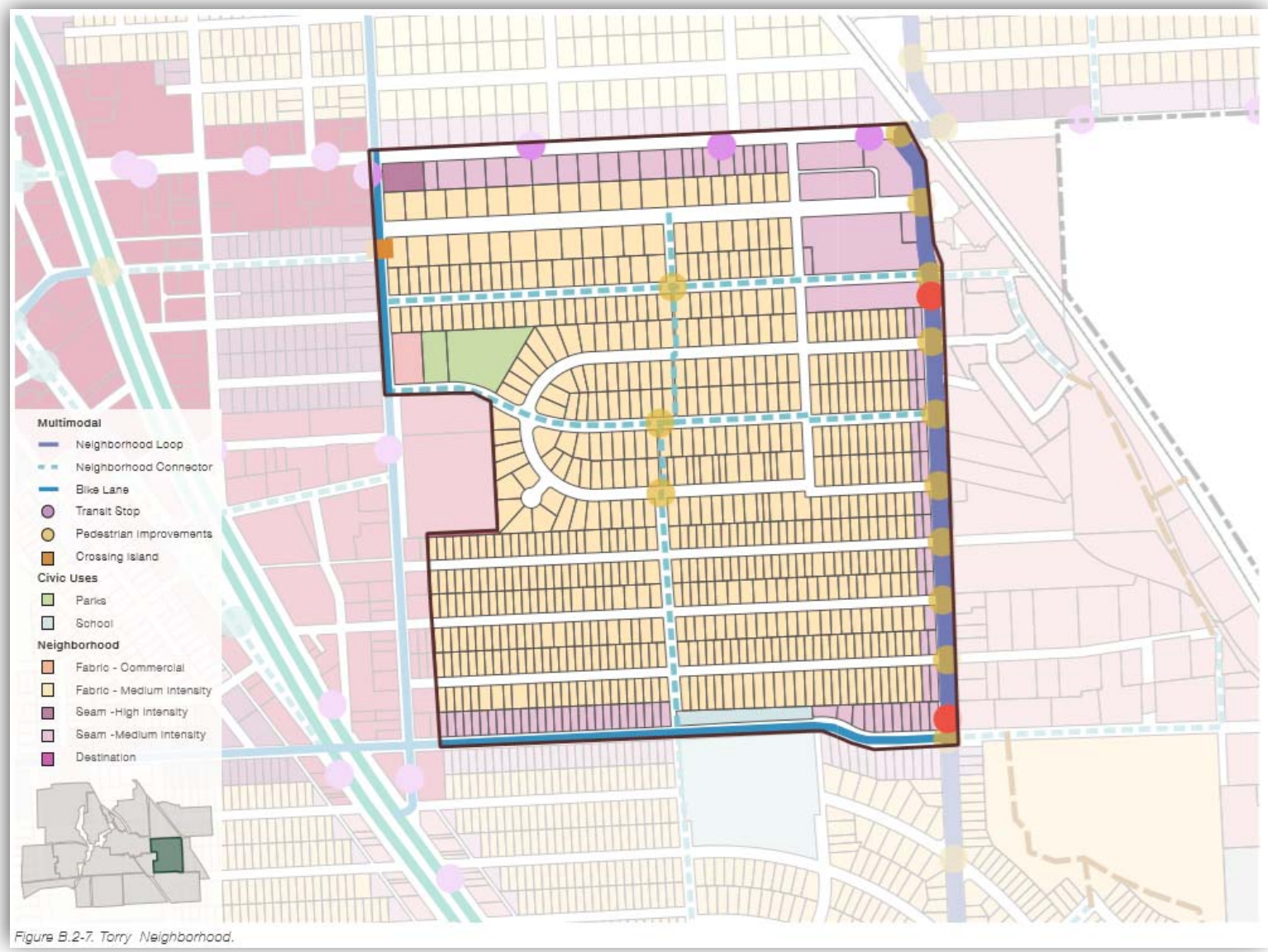


Figure B.2-7. Torry Neighborhood.

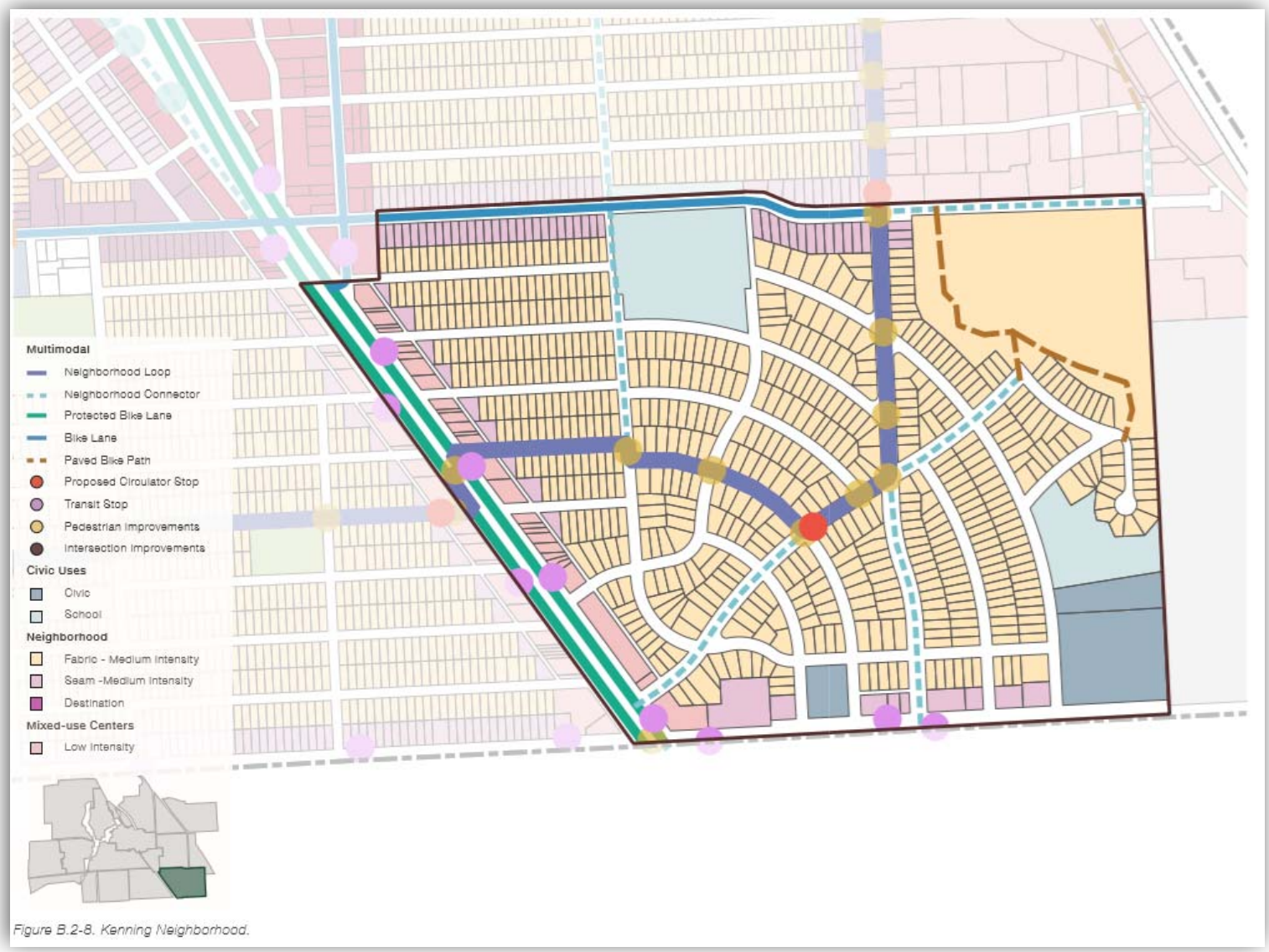


Figure B.2-8. Kenning Neighborhood.

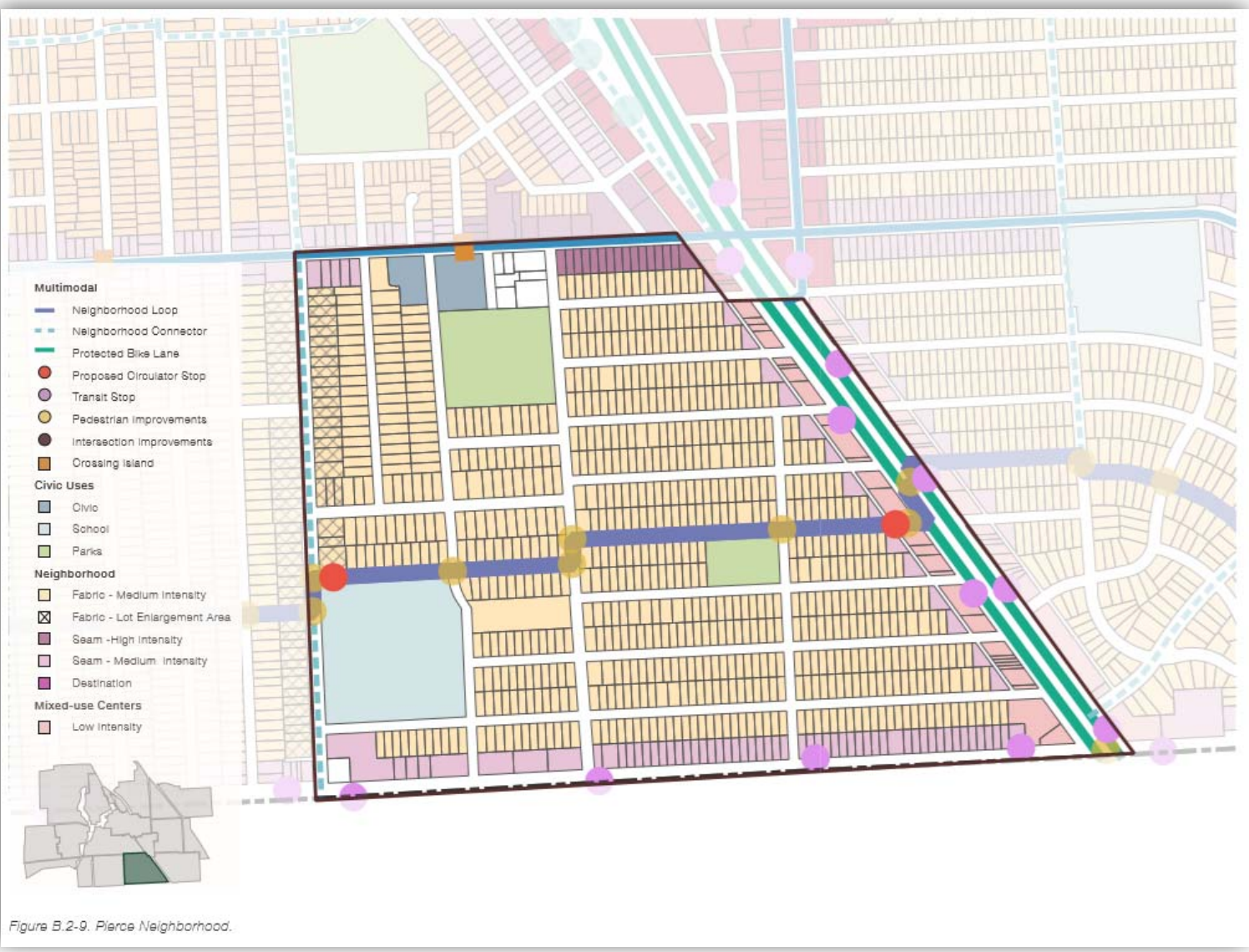


Figure B.2-9. Pierce Neighborhood.

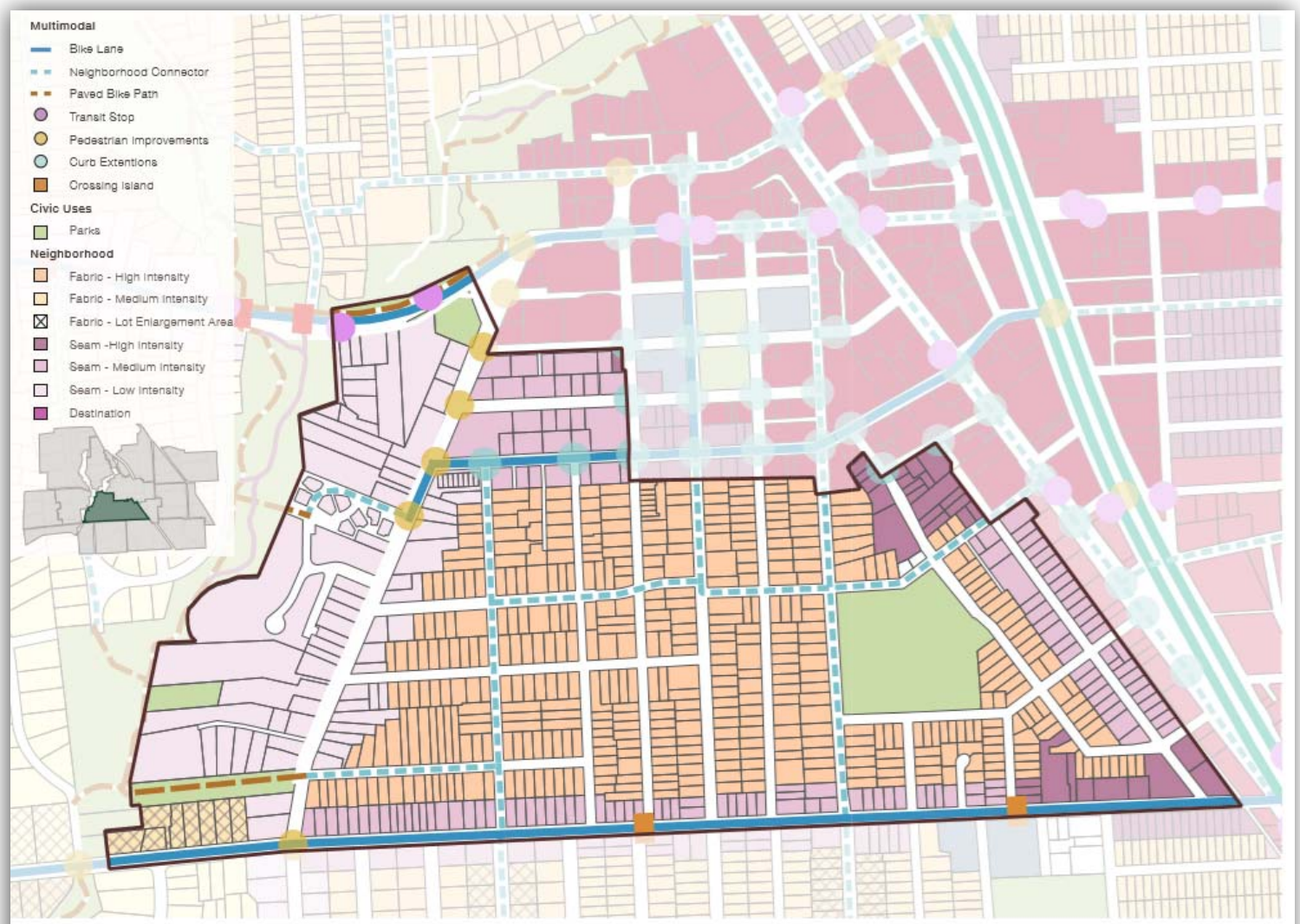


Figure B.2-10. Barnum Neighborhood.

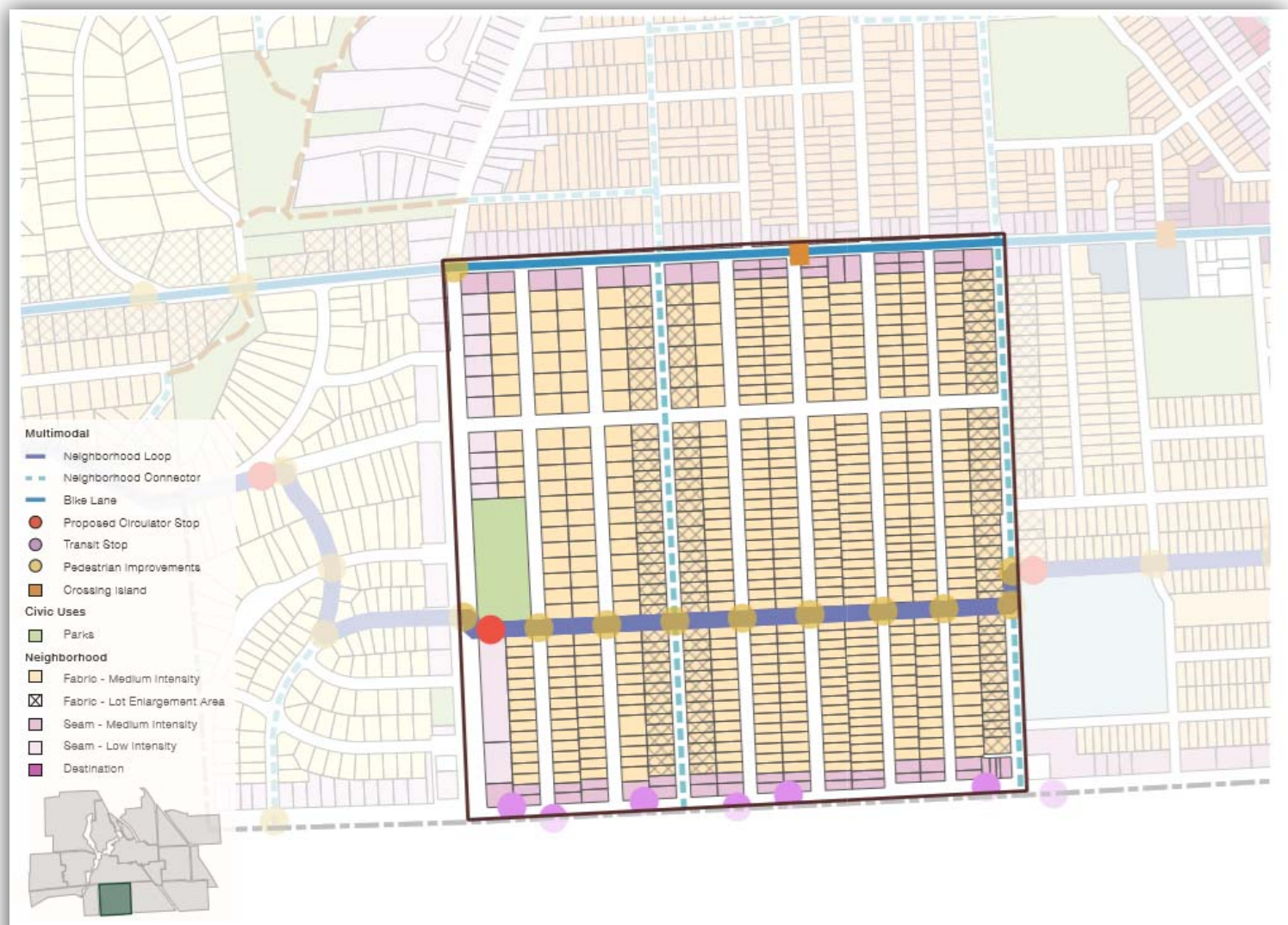


Figure B.2-11. Crestview Neighborhood.

Figure B.2-12. Birmingham Farms Neighborhood.

Figure B.2-13. Lincoln Hills Neighborhood.

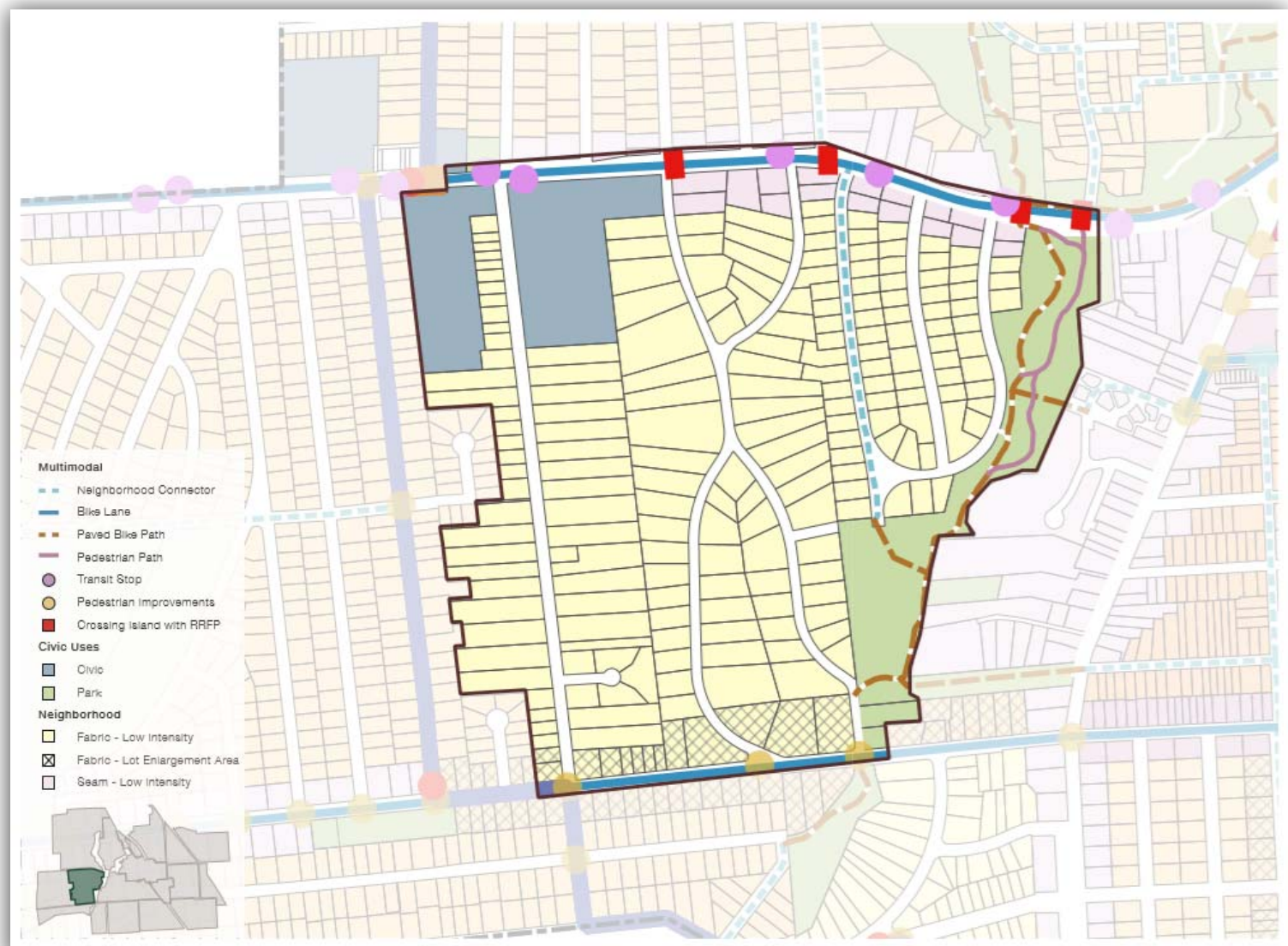


Figure B.2-14. Linden Neighborhood.

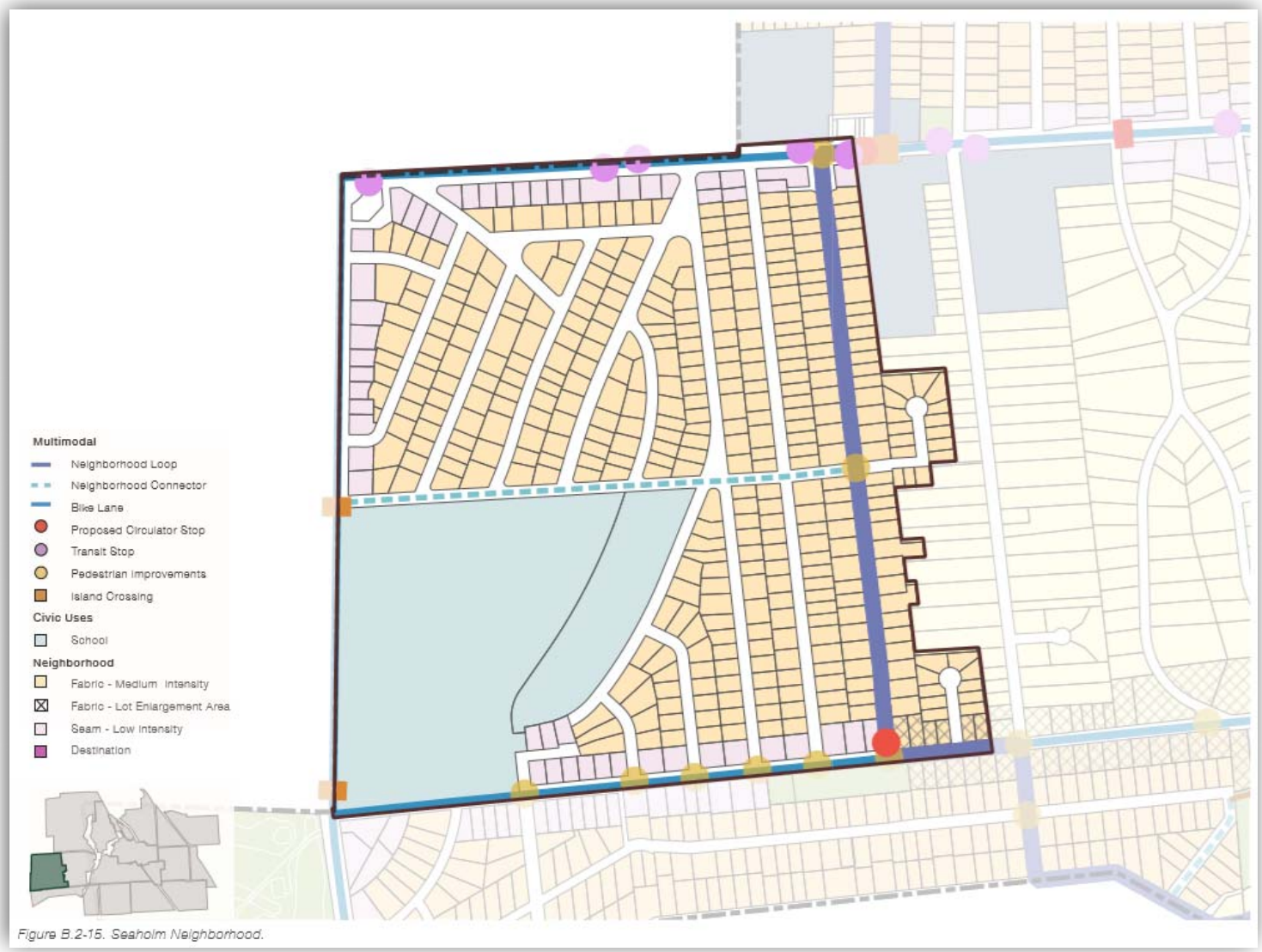


Figure B.2-15. Seaholm Neighborhood.

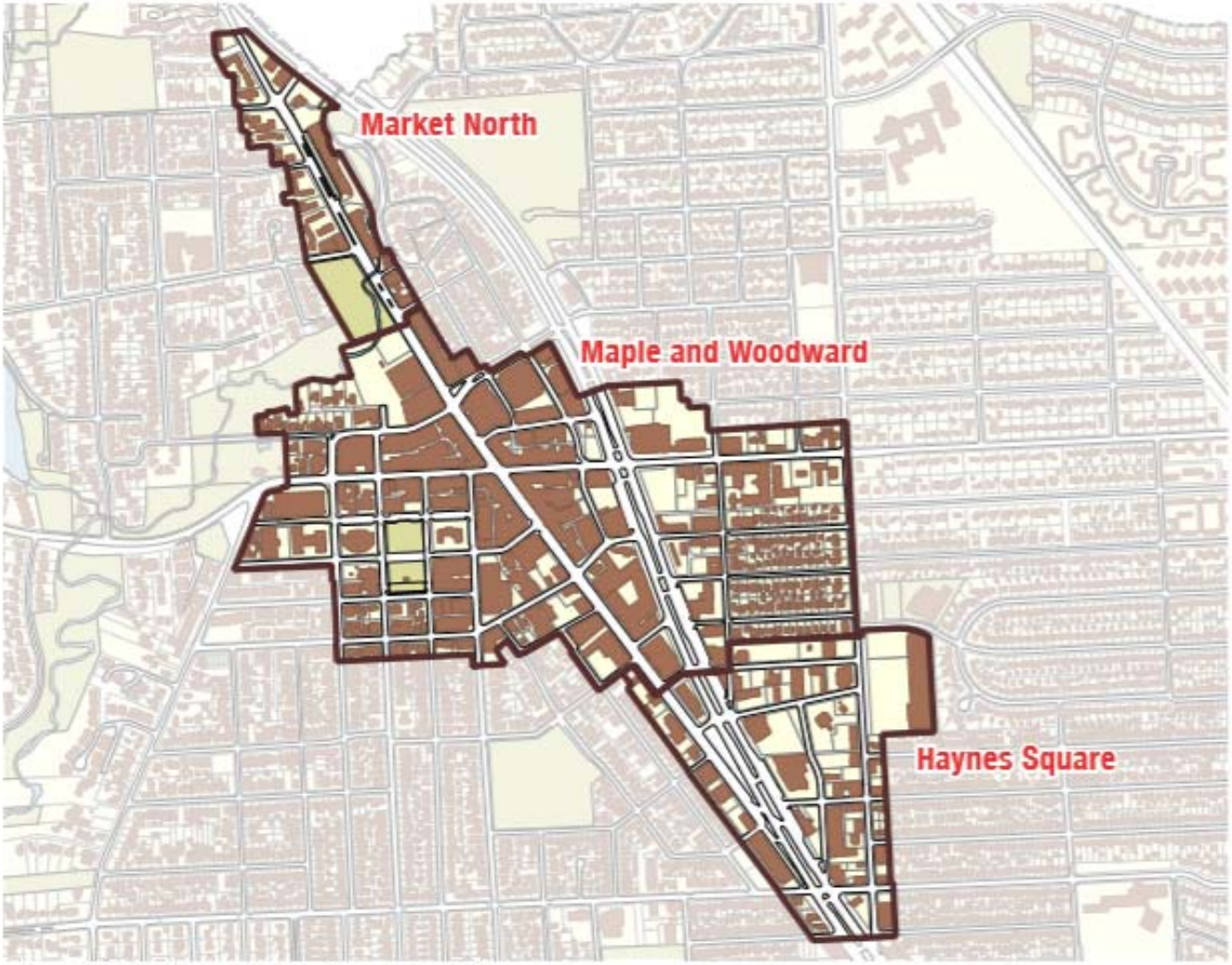


Figure C.1-01. Three districts of Downtown Birmingham.

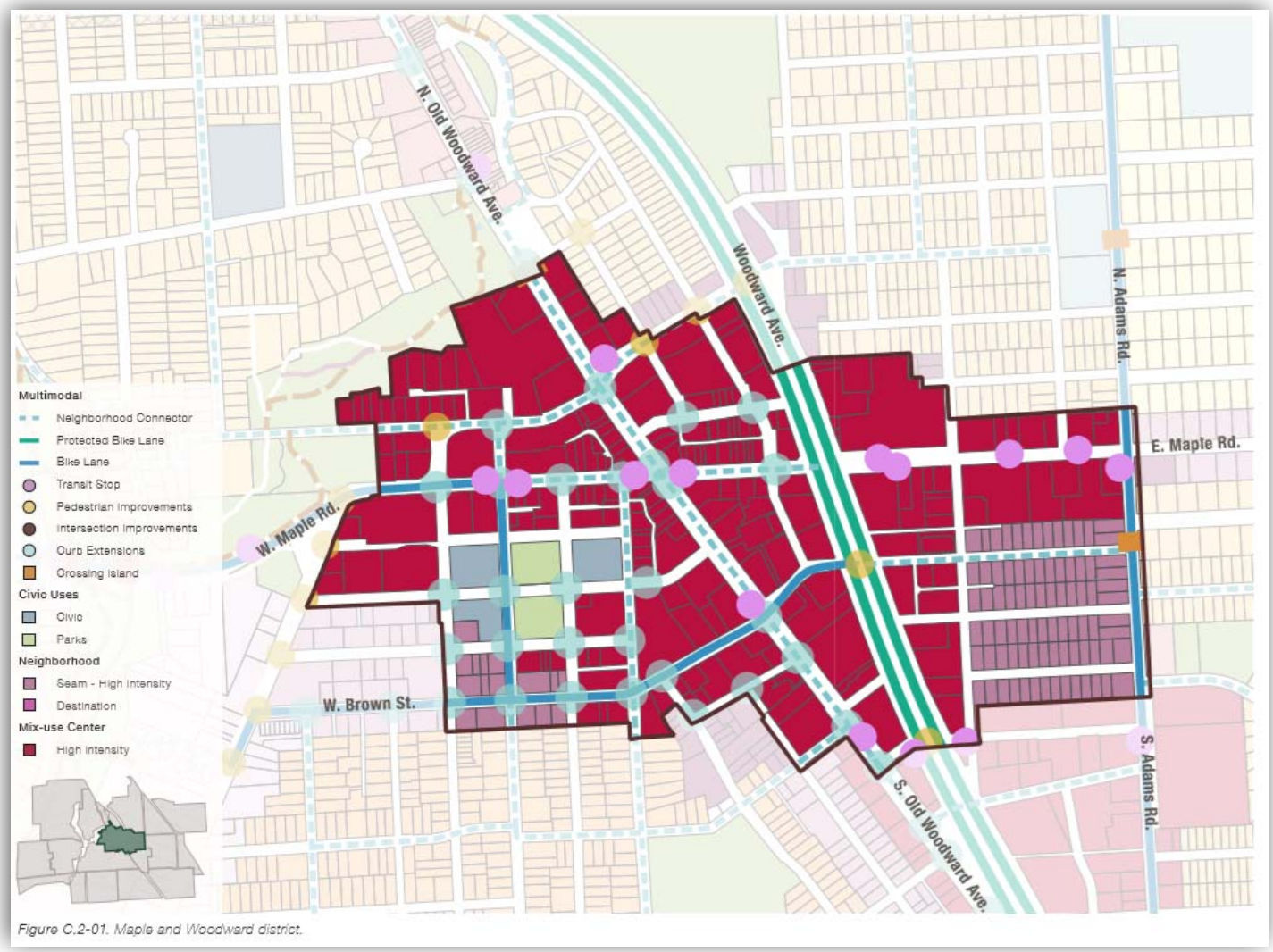


Figure C.2-01. Maple and Woodward district.

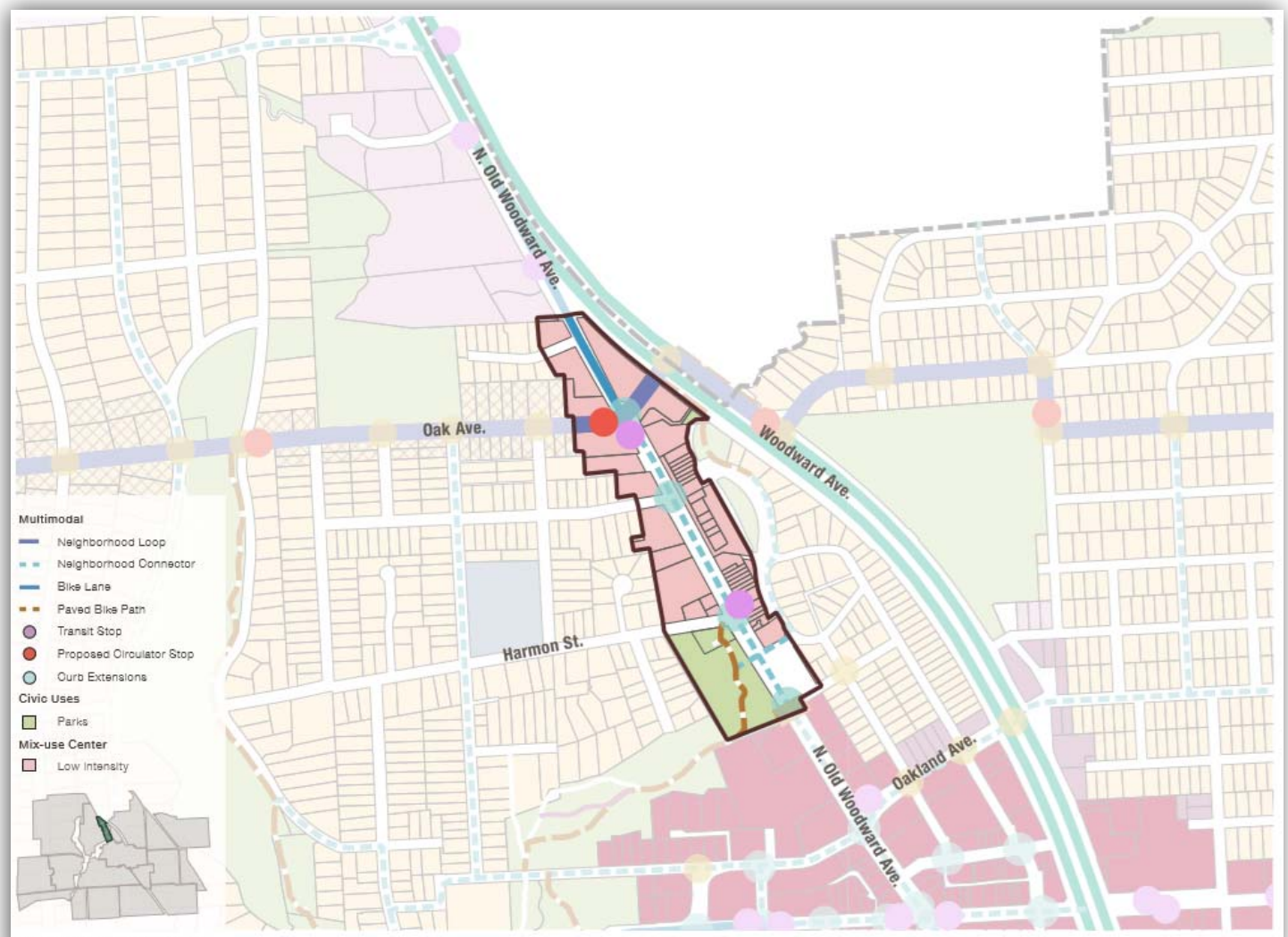


Figure C.3-01. Market North.

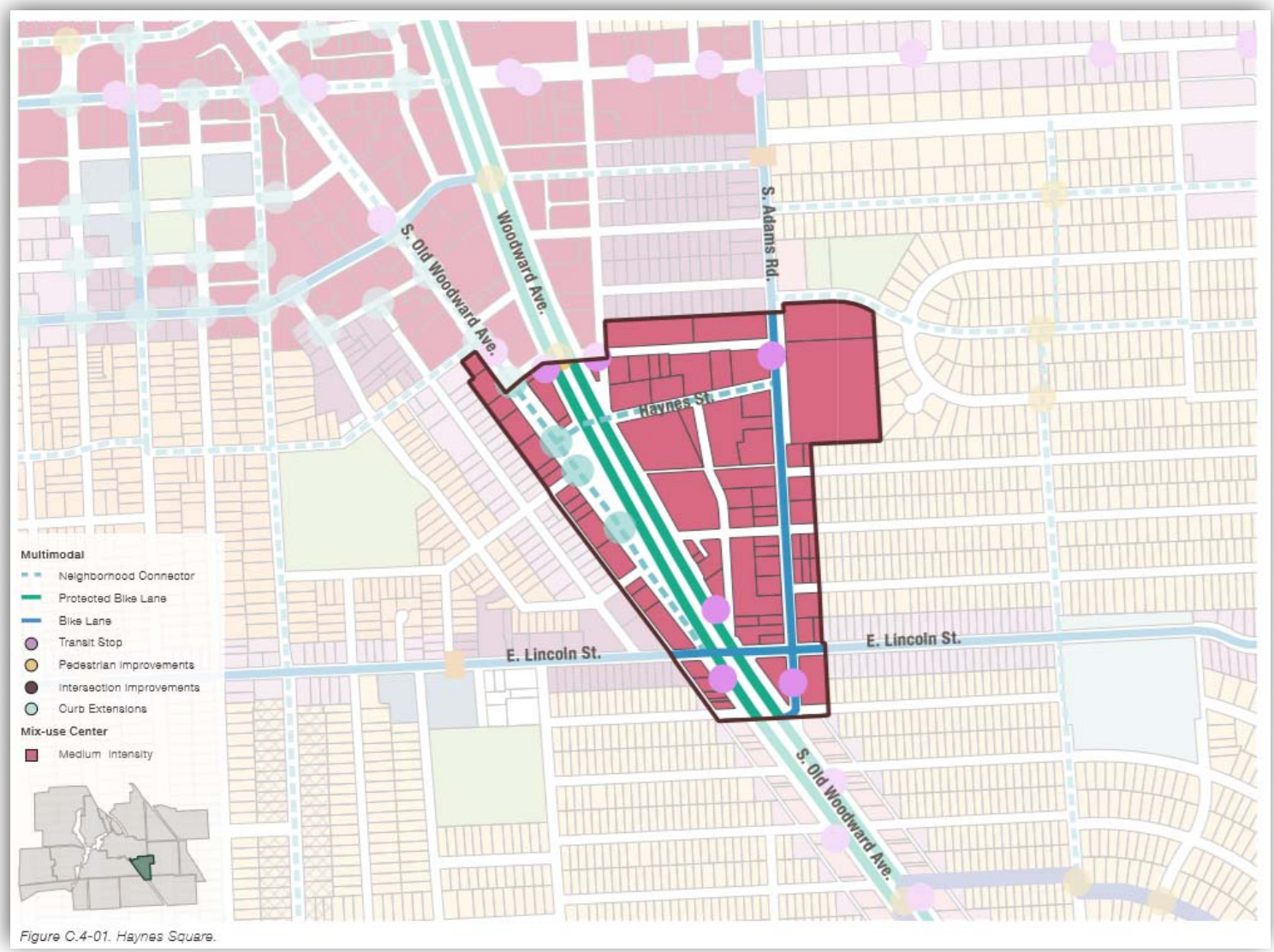


Figure C.4-01. Haynes Square.

Images C.1-02-C.1-04. Wayfinding signage. Business directory signage on the left, general wayfinding at center, and dynamic parking wayfinding on the right.

Image C.2-03. The dining deck at Dick O' Dow's leaves insufficient sidewalk space.

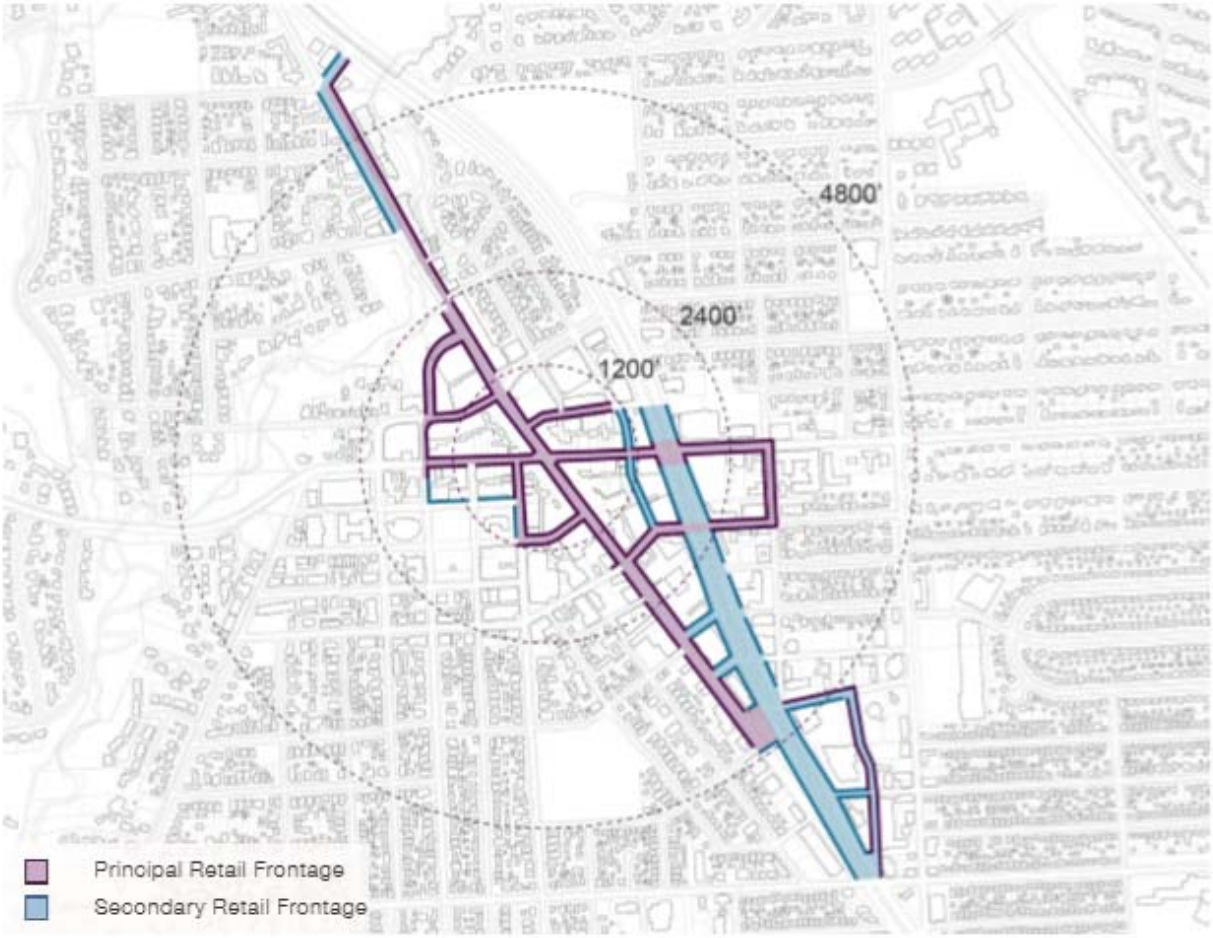


Figure C.2-05. Frontage quality differentiation between the most important and restrictive Principal Retail Frontage and the less restrictive Secondary Retail Frontage.

Image C.2.06. Booth Park's underwhelming entrance is the ideal place for a corner plaza with a cafe and ample seating.

Image C.2-07. The Birmingham Museum is adjacent to the Willits Trail and Route River and should serve as a trailhead, integrated into the system.

Image C.2-09. The Library's entrance plaza lacks seating and has a wide area of plain concrete which lacks visual interest.

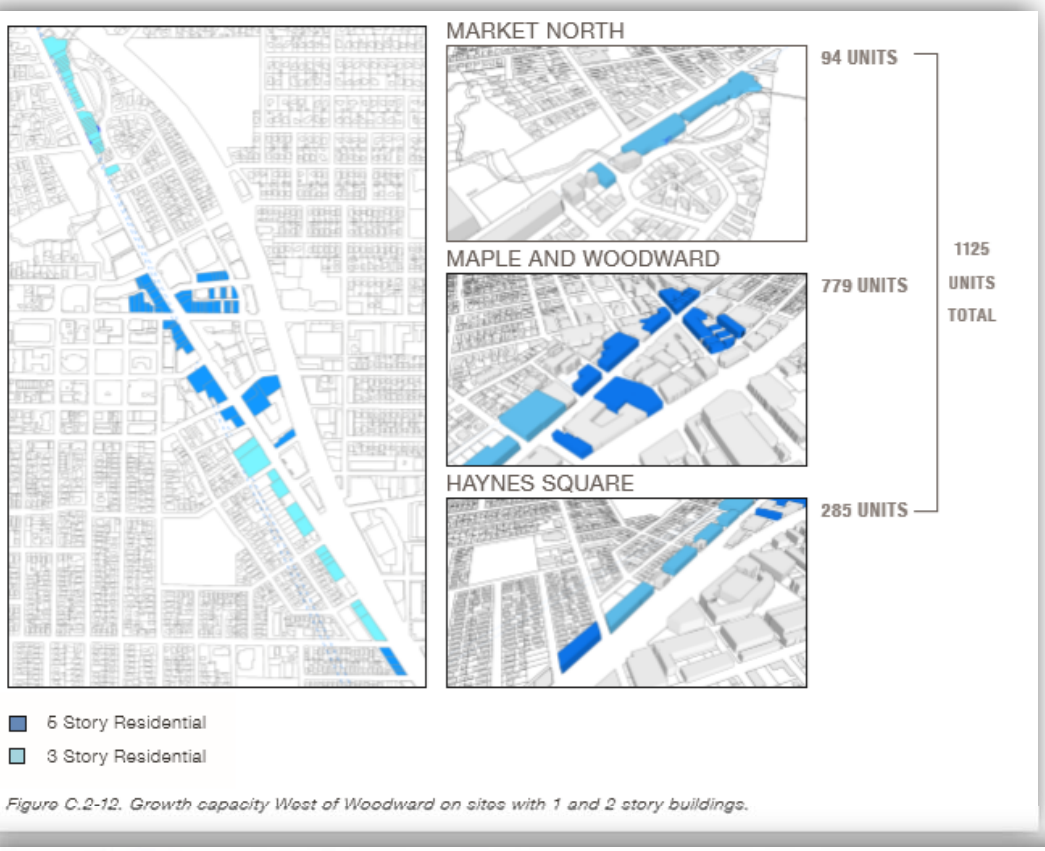


Figure C.2-12. Growth capacity West of Woodward on sites with 1 and 2 story buildings.

Figure C.3-06. Proposed open air market pavillion on municipal parking lot 6.

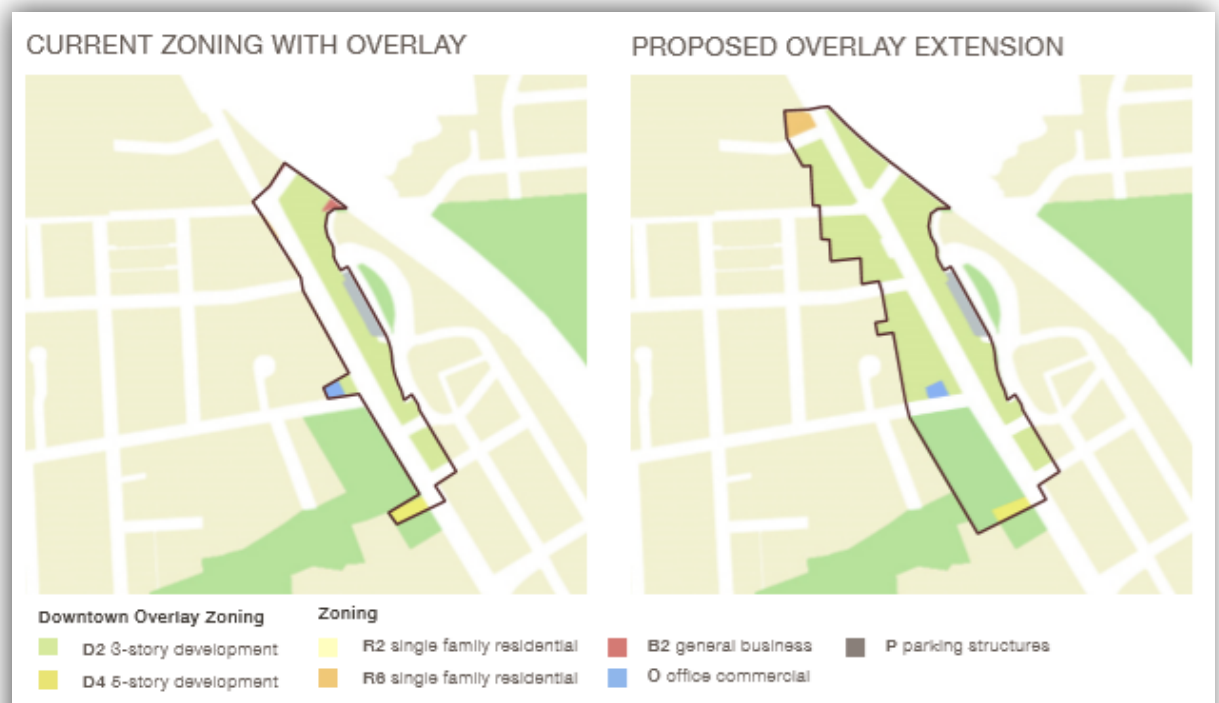


Figure C.3-08. Extension of D2 zoning in Market North.

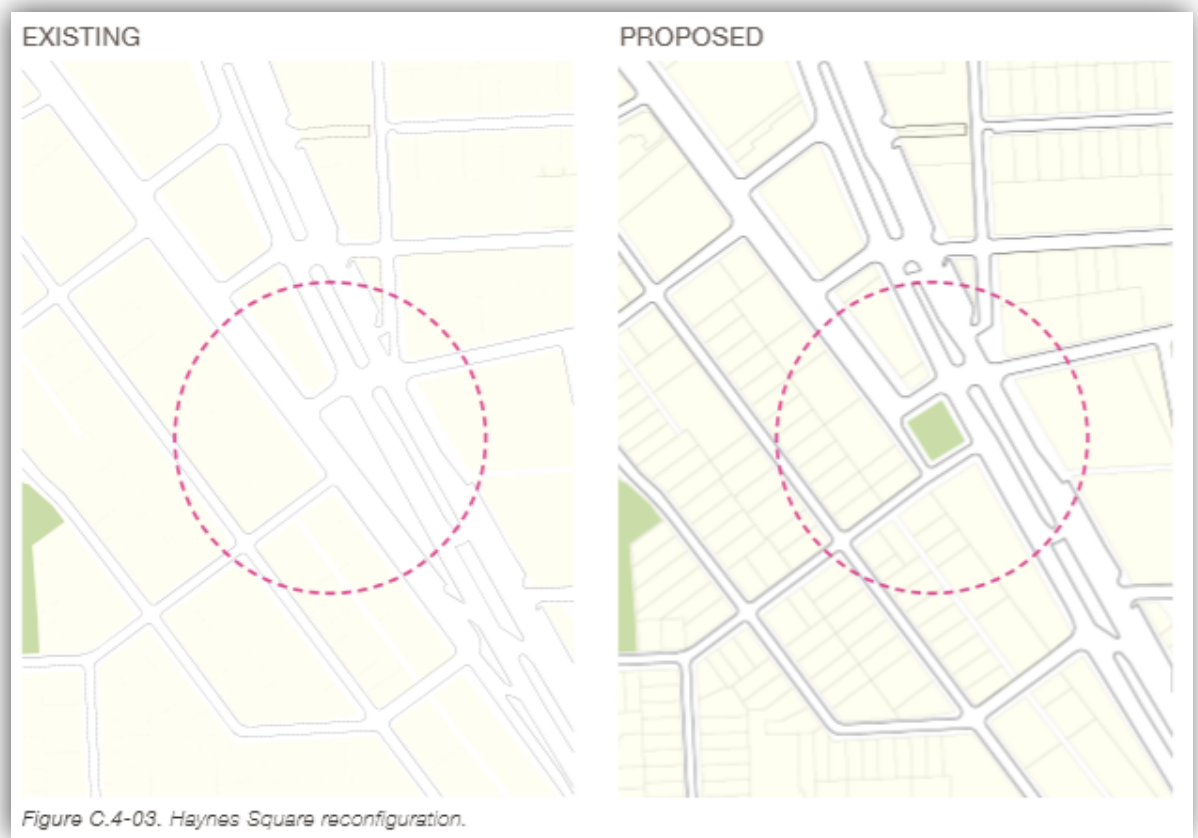
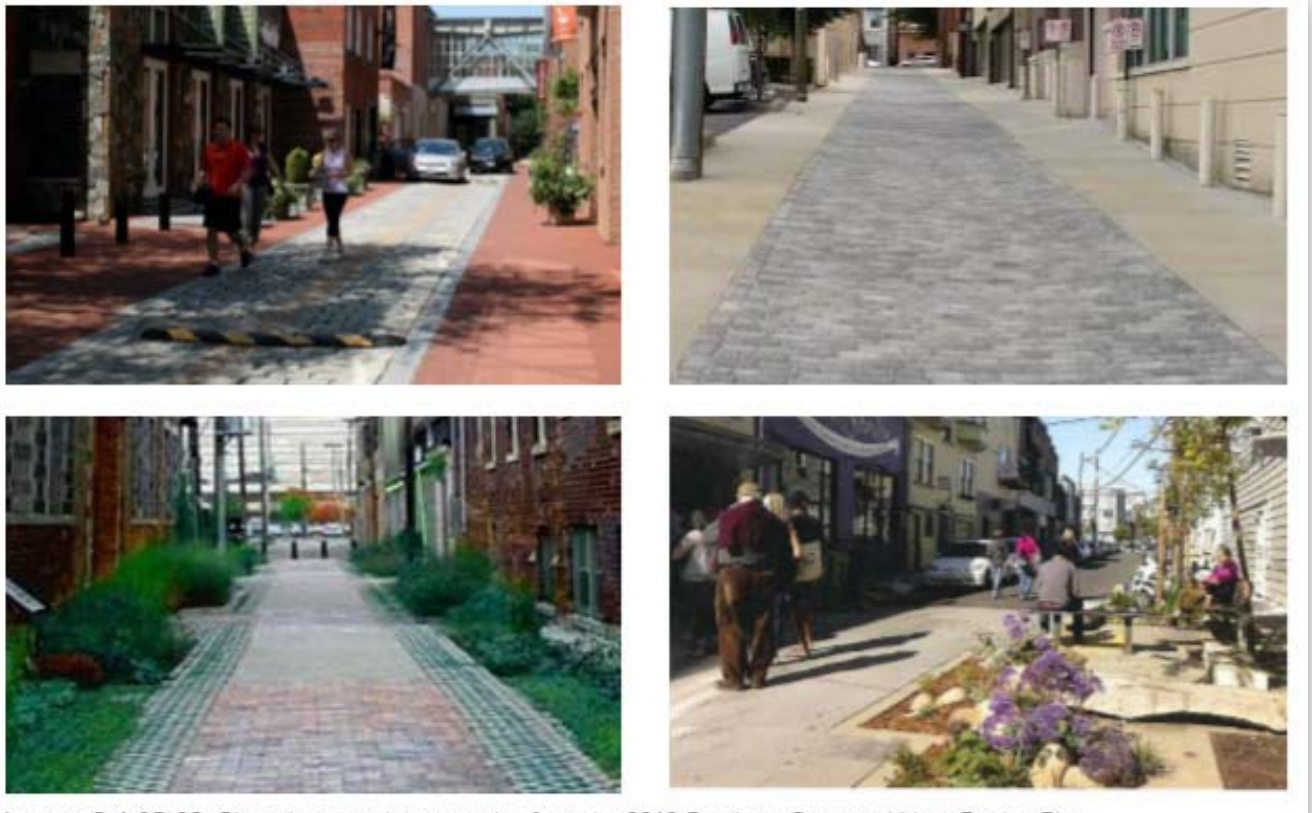


Figure C.4-03. Haynes Square reconfiguration.

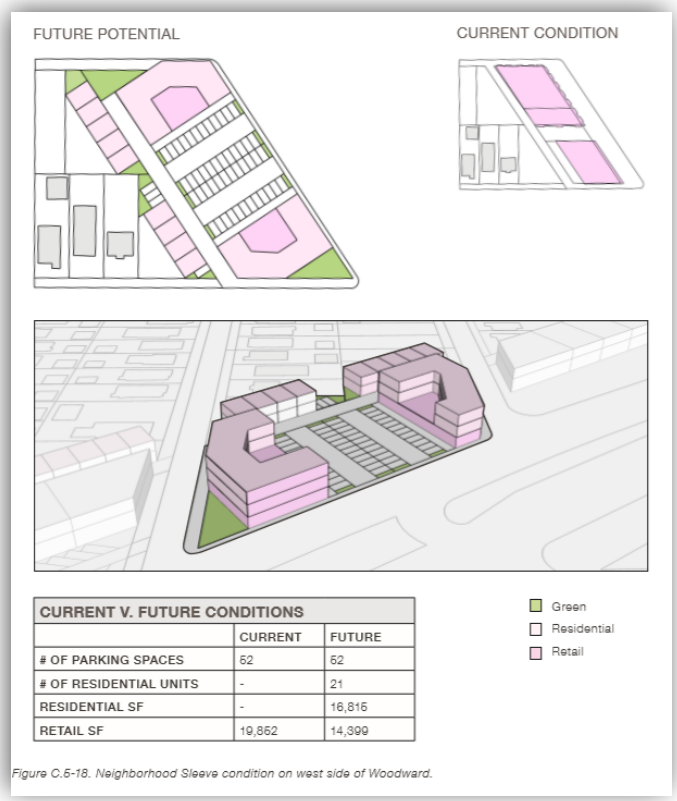
Figure C.4-04. Redevelopment of Haynes Square.

Figure C.5-04. Shared-use alley space.



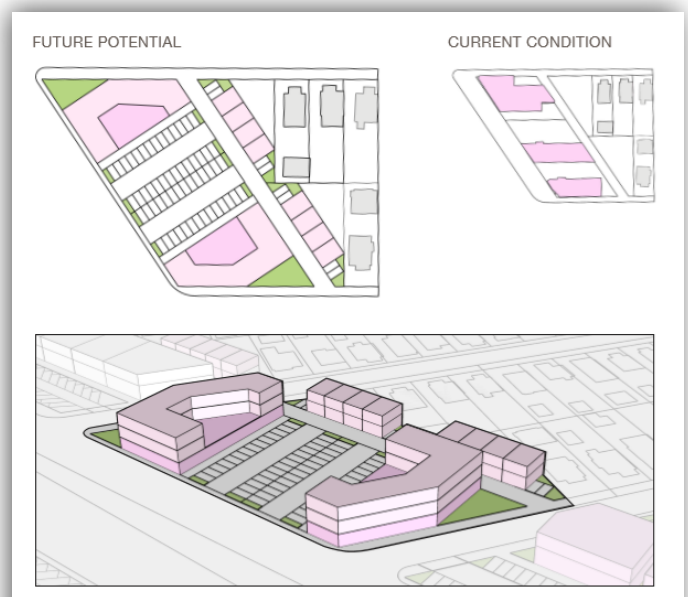
Images C.4-05-08. Shared-use paving examples from the 2013 Southern Gateway Urban Design Plan.

Figure C.5-13. Neighborhood Sleeve block configuration which consolidates parking mid-block and creates small neighborhood-focused nodes along the east-west streets.



CURRENT V. FUTURE CONDITIONS		
	CURRENT	FUTURE
# OF PARKING SPACES	52	52
# OF RESIDENTIAL UNITS	-	21
RESIDENTIAL SF	-	16,815
RETAIL SF	19,852	14,399

Figure C.5-18. Neighborhood Sleeve condition on west side of Woodward.



CURRENT V. FUTURE CONDITIONS		
	CURRENT	FUTURE
# OF PARKING SPACES	41	64
# OF RESIDENTIAL UNITS	-	18
RESIDENTIAL SF	-	16,523
RETAIL SF	15,177	16,559

Figure C.5-17. Neighborhood Sleeve condition on east side of Woodward.

Figure C.6-08. The Lower Rail District.

Figure C.6-15. Existing conditions and future potential of access to Troy Transit Center.

City of Birmingham
A Walkable Community

MEMORANDUM

Planning Division

DATE: **February 24, 2020**

TO: **Multi-Modal Transportation Board**

FROM: **Jana L. Ecker, Planning Director**
Commander Scott Grewe, Police Department
Austin Fletcher, City Engineer

SUBJECT: **Bicycle & Pedestrian Mobility Plan for SE Michigan by SEMCOG**

Please find attached a draft Bicycle and Pedestrian Mobility Plan, and the supporting Appendix, recently prepared for our region by SEMCOG. All board members are encouraged to review the entire plan and come to the meeting prepared to discuss the draft collectively as a board.

Comments from the entire board will be forwarded to SMECOG during the 30 day public comment period that runs through March 14, 2020.

March 2020

Bicycle and Pedestrian Mobility Plan for Southeast Michigan

SEMCOG | SOUTHEAST MICHIGAN COUNCIL OF GOVERNMENTS

SEMCOG. . . *Developing Regional Solutions*

Mission

SEMCOG, the Southeast Michigan Council of Governments, is the only organization in Southeast Michigan that brings together all governments to develop regional solutions for both now and in the future. SEMCOG:

- Promotes informed decision making to improve Southeast Michigan and its local governments by providing insightful data analysis and direct assistance to member governments;
- Promotes the efficient use of tax dollars for infrastructure investment and governmental effectiveness;
- Develops regional solutions that go beyond the boundaries of individual local governments; and
- Advocates on behalf of Southeast Michigan in Lansing and Washington.

Bicycle and Pedestrian Mobility Plan for Southeast Michigan

Abstract

The *Bicycle and Pedestrian Mobility Plan for Southeast Michigan* ensures that the region's nonmotorized system meets the transportation, quality of life, health, and accessibility needs of its residents and visitors, as well as the economic development priorities and goals of the region and local communities.

El *Plan de movilidad de bicicletas y peatones para el sudeste de Michigan* garantiza que el sistema no motorizado de la región satisfaga las necesidades de transporte, calidad de vida, salud y accesibilidad de sus residentes y visitantes, así como las prioridades y objetivos de desarrollo económico de la región y las comunidades locales.

تضمن خطة تنقل الدراجات الهوائية والمشاة لجنوب شرق ميشيغان أن نظام النقل غير المزود بالمحركات في المنطقة يلبي إحتياجات النقل و جودة الحياة والصحة وسهولة إمكانية الوصول لسكانها وزوارها، فضلاً عن أولويات التنمية الإقتصادية وأهداف المنطقة والمجتمعات المحلية

Preparation of this document is financed in part through grants from and in cooperation with the Michigan Department of Transportation with the assistance of the U.S. Department of Transportation's Federal Highway Administration, Federal Transit Administration; and other federal and state funding agencies as well as local membership contributions and designated management agency fees.

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Acknowledgements

Thank you to the stakeholders who provided input into developing the *Bicycle and Pedestrian Mobility Plan for Southeast Michigan,* especially the Bicycle and Pedestrian Task Force.

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Melissa Johnson – Mayor, City of Chelsea and Task Force Vice Chair

Task Force Members:

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John Abraham, Macomb County Road Commission
Mohamed Ayoub, City of Westland
Scott Barb, Livingston County
Alicia Bradford, Wayne County
Florence Buchanan, Monroe County Community College
Terry Campbell, US Senator Debbie Stabenow's Office
Dennis Champine, City of Center Line
Gary Childs, Livingston County
Kevin Christiansen, City of Farmington
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Orin Gelderloos, University of Michigan-Dearborn
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Leah Groya, LivingLab
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Nina Kelly, Huron Clinton Metroparks
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Todd Scott, Detroit Greenways Coalition
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Donna Stallings, City of Lathrup Village
David Struck, St. Clair County
James J. Tighe, Ralph C. Wilson Jr. Foundation
Anita Twardesky, Downriver Linked Greenways
Anne Vaara, Oakland County
Nikki Van Bloem, MDNR
Elizabeth Vogel, Charter Township of Clinton
Lindsay Wallace, St. Clair County
John Waterman, Programs to Educate All Cyclists
Bonnie Wessler, City of Ypsilanti
Jessica Williams, Oakland County Health Division
Kristen Wiltfang, Oakland County
Blaine Wing, City of Rochester
Todd Joseph Zillincik, City of Livonia
Vince Ziols, Detroit River International Wildlife Refuge

Table of Contents

List of Data Displays

Tables

Figures

Executive Summary

Bicycle and pedestrian mobility is critical to the region's transportation system. Almost every trip, including those made by automobiles and transit, is likely to begin or end with walking or biking.

The region as a whole benefits from a connected and safe bicycle and pedestrian network that supports quality of life by increasing access to core services, empowering all people with options beyond automobile travel, and enhancing connections to nature and regional assets such as town centers, downtowns, and commercial and cultural destinations. Locally, communities and residents benefit from bicycle and pedestrian mobility through broadening transportation choices. Those choices can improve health, reduce traffic congestion on roadways, and encourage activity and interaction along corridors that can spur placemaking and economic vitality.

The purpose of *the Bicycle and Pedestrian Mobility Plan for Southeast Michigan* is to establish a common vision for bicycling and walking in the region, and provide guidance on how to increase the connectivity, use, and safety of the system for all residents. This plan builds upon the 2014 *Bicycle and Pedestrian Travel Plan* by taking into account the significant progress achieved and providing an aspirational framework for connecting current and future communities and destinations with a high-comfort bicycle and pedestrian system. In addition, it analyzes shifting trends in mobility patterns and provides guidance on infrastructure design and emerging technologies that may impact bicycle and pedestrian planning.

The research and data analysis in this plan demonstrates:

- There is a growing interest in bicycle and pedestrian mobility throughout the region; the number of people walking and biking is increasing.
- There is desire and need to enhance safety and comfort for people walking and biking through infrastructure improvements.
- The bicycle and pedestrian system is a vital component for increasing access to core services and amenities for people of all ages and abilities.
- There are gaps in the regional system and challenges for connecting existing and planned infrastructure.
- A connected system helps support healthy lifestyles and communities, with recreation, tourism, and economic development opportunities.
- While responsibility for bicycle and pedestrian infrastructure is shared by many, collaboration and coordination is required to develop and sustain a regional system.

Southeast Michigan's Bicycle and Pedestrian Mobility System

By the Numbers

100%
Increase in bicycling trips since 2005

28%
Increase in walking trips since 2005

3,500
Miles of bikeways

24,000
Miles of walkways

500
Miles of regional trails

115
Communities and counties with bicycle and pedestrian plans

To continue enhancing the system and meet the needs of the region, this plan recommends the following regional policies:

- **Connect and expand the network** of walking and biking infrastructure in the region to provide a safe, comfortable, and convenient experience for people of all ages and abilities.
- **Ensure equitable access** to core services and regional destinations for pedestrians and bicyclists, including connections to other transportation modes.
- **Increase safety** for pedestrians and bicyclists with systemic approaches to roadway design, traffic operations, education, and enforcement.
- **Promote healthy lifestyles and vibrant communities** with expanded options for pedestrian and bicycle mobility, recreation, and tourism.
- **Provide education** to encourage broader participation and awareness of walking and biking issues.
- **Ensure the sustainability** of the bicycle and pedestrian network with collaborative planning and adequate funding for development and maintenance.

Structure of the Bicycle and Pedestrian Mobility Plan

This plan's seven chapters provide policy guidance, data resources, and tools for planning and implementation to support Southeast Michigan's bicycle and pedestrian mobility:

- **Chapter 1: Introduction** provides background for SEMCOG's role in bicycle and pedestrian planning. It shows connections to other SEMCOG plans that impact the bicycle and pedestrian system. It outlines the stakeholder outreach and engagement process for developing this plan.
- **Chapter 2: Regional Priorities** establishes regional policies and recommends actions that guide implementation efforts. It also outlines bicycle and pedestrian corridors that connect local networks and meet regional needs, which provide a framework for connectivity based on the data analysis in this plan.
- **Chapter 3: Understanding Current Conditions** provides context for the region's bicycle and pedestrian system with a multi-layered analysis of regional data. This chapter analyzes user input and mobility patterns, existing and planned bicycle and pedestrian infrastructure, demand for walking and biking trips, equity factors, and safety issues.
- **Chapter 4: Local Implementation** provides technical guidance and regional examples for communities looking to enhance bicycle and pedestrian mobility. It features additional information and regional highlights on local policies and practices that support walking and biking, along with emerging trends and technologies.
- **Chapter 5: Infrastructure Guidelines** provides an overview of the many infrastructure components that can enhance the bicycle and pedestrian system. It includes specifications for their application and context, and provides additional resources that may be useful for planning improvements and developing projects.
- **Chapter 6: Funding and Maintaining the System** describes how improvements can be developed and sustained. It includes considerations for funding mechanisms at the local, state, and federal level, along with best practices for different types of maintenance.
- **Chapter 7: Education, Encouragement, Enforcement, and Evaluation** provides information and examples on outreach and coordination with the public or other agencies. It also describes ways to measure progress as improvements are made over time.

Seven appendices supplement the information in the chapters described above; these appendices are available in a separate document, *Bicycle and Pedestrian Mobility Plan for Southeast Michigan - Appendix*. They are:

- **Appendix A:** County profiles providing local planning context, data analysis, and maps for each of the region's seven counties.
- **Appendix B:** A list of existing conditions and gaps in regional corridors.
- **Appendix C:** Results and analysis of a 2019 interactive online public input survey.
- **Appendix D:** Detailed crash report summarizing regional data from 2014-2018.
- **Appendix E:** Information on funding opportunities for bicycle and pedestrian projects from the USDOT.
- **Appendix F:** An overview of the methodology used for the regional equity analysis.
- **Appendix G:** An overview of the methodology used for the regional demand analysis.

Chapter 1: Introduction

SEMCOG Vision

This vision for Southeast Michigan provides the foundation for developing regional plans approved by SEMCOG's elected leadership:

> *All people in Southeast Michigan benefit from a connected, thriving region of small towns, dynamic urban centers, active waterfronts, diverse neighborhoods, premier educational institutions, and abundant agricultural, recreational and natural areas.*

To meet this vision, we must have:

- Unique places that offer various housing choices for a large and diverse population.
- An educated and trained workforce that supports a multi-sector economy and provides opportunities for all.
- Healthy, clean lakes, streams, air, and a connected system of trails, parks, and natural areas that support recreational and cultural amenities.
- Safe, efficient, and coordinated infrastructure systems that embrace advances in technology and focus on access for all.
- Effective local government and engaged citizenry.

A regional approach to bicycle and pedestrian mobility planning is also central to achieving this vision. Planning and developing infrastructure to support pedestrians and bicyclists creates safer and more convenient ways to travel. It improves quality of life in the region by increasing mobility, health, and recreation options for people of all ages and abilities. It also helps spur placemaking efforts that support both local and regional economic vitality.

Background

In 2014, SEMCOG adopted the *Bicycle and Pedestrian Travel Plan for Southeast Michigan*. The 2014 plan documented the existing and planned facilities that support bicycle and pedestrian travel, and analyzed their connectivity as a regional network. It also included strategies to enhance nonmotorized transportation in the region, promoting increased mobility, safety, recreation, placemaking opportunities, economic development, and community health.

This *Bicycle and Pedestrian Mobility Plan* builds on the 2014 plan and takes into account the significant progress achieved. In addition, it analyzes shifting trends in mobility patterns and infrastructure design, and emerging technologies that may impact bicycle and pedestrian planning.

Connection to Other Plans

This plan is supported by other regional and state plans that connect to bicycle and pedestrian mobility, and help implement the policies and actions it recommends:

***2045 Regional Transportation Plan for Southeast Michigan* (RTP),** adopted in March 2019, guides transportation investments in Southeast Michigan by working to make the system safe and more efficient, revitalizing communities, encouraging economic development, and improving the quality of the region's environmental resources through policies and actions.

Three regional bicycle and pedestrian challenges identified in the 2045 RTP are addressed in this plan:

- Identification and prioritization of regional corridors and gaps in the system.
- Preventive maintenance of the bicycle and pedestrian system.
- Continual emphasis on enhanced safety measures, including infrastructure improvements, education, and enforcement.

Access to Core Services in Southeast Michigan, adopted in January 2016, measures and benchmarks accessibility for core services that residents need to access on a regular basis – jobs, health-care facilities, supermarkets, parks, schools, libraries, and fixed-route transit. This analysis measured accessibility across four modes of travel – automobile, transit, walking, and biking. A challenge to this analysis was the lack of a pedestrian network to more accurately assess accessibility for people who walk. This plan addresses that challenge by providing the region's sidewalk network, along with updated on-road infrastructure and regional trails network.

***Green Infrastructure Vision for Southeast Michigan*,** adopted in May 2014, describes long-term goals for the green infrastructure network, along with policies to achieve an integrated regional framework. The vision highlights opportunities for roadway design to make critical contributions to improving regional water quality by reducing stormwater runoff. Since the adoption of this vision, several communities have implemented green infrastructure as part of enhancements to local bicycle and pedestrian projects. This plan continues to emphasize the importance of early planning and identifying ways to integrate stormwater management and green streets practices in transportation projects, including streetscapes, shared-use paths, and traffic calming.

Parks and Recreation Plan for Southeast Michigan, adopted in May 2019, ensures that the region's recreation system, parks, and trails meet the quality of life, health, and accessibility needs of its residents and visitors. The plan also includes a detailed accessibility analysis of all parks and trails in the region by walking, biking, driving, and public transit. This plan's Regional Bicycle and Pedestrian Corridors uses the region's trails and parks system as both connecting greenways and as destinations in themselves.

Partnering for Prosperity: Economic Development Strategy for Southeast Michigan, adopted in February 2016, focuses on 11 broad-based strategies and associated action steps related to advancing community assets, business climate, and talent and innovation. The strategy highlights the important role the region's bicycle, pedestrian, and trail networks play in developing quality places and increasing prosperity. This plan furthers the connection by ensuring bicycle and pedestrian mobility helps to promote healthy lifestyles, enhance tourism, and support placemaking.

Southeast Michigan Traffic Safety Plan, adopted in December 2015, builds on SEMCOG's long-standing goal of improving safety through a data-driven approach to roadway crash analysis. The plan features data analysis and strategies for the region's key crash emphasis areas, including pedestrian and bicycle crashes. The Safety Analysis of this plan and supporting policies and actions further these strategies and support new and emerging challenges.

Regional Master Transit Plan, adopted August 2016 by the Regional Transit Authority of Southeast Michigan (RTA) for Macomb, Oakland, Washtenaw, and Wayne Counties, offers solutions to various mobility issues in the region. The Demand Analysis and Regional Bicycle and Pedestrian Corridors of this plan utilize data and align with priorities from the Master Transit Plan.

Michigan Mobility 2045 is a 25-year plan for transforming Michigan's transportation system. The plan incorporates the state's first statewide nonmotorized plan, by compiling Michigan's eight Regional Nonmotorized Investment Plans, including SEMCOG's 2014 Bicycle and Pedestrian Travel Plan. This plan has been developed in coordination with MDOT to ensure alignment.

Public Input Process and Stakeholder Engagement

To guide development of this plan, SEMCOG established a Bicycle and Pedestrian Task Force, comprised of 70 representatives from local governments, state and federal agencies, nonprofit organizations, research and education institutions, and other organizations and stakeholders. The task force met five times over a 12-month planning process. Members of the task force established the framework for this plan, deliberating on regional priorities, policies, and actions. To complement the work of the Bicycle and Pedestrian Task Force, other existing committees and stakeholder groups were engaged, including the Southeast Michigan Active Transportation Committee and the Southeast Michigan Trails Action Team. Task force members are listed in the Acknowledgements section of this plan.

The public was also engaged, providing input through public forums at the county level. In addition to these public meetings, a public survey on bicycle and pedestrian travel was conducted. Results of the survey are summarized in User Analysis in Chapter 1; complete results are included as Appendix C.

Chapter 2: Regional Priorities

Regional Policies and Actions

The following regional policies provide overall guidance for improving bicycle and pedestrian mobility in Southeast Michigan. The actions listed below each policy provide support for coordinated implementation activities, both locally and regionally.

Connect and expand the network of walking and biking infrastructure in the region to provide a safe, comfortable, and convenient experience for people of all ages and abilities.

- Expand and enhance bicycle and pedestrian infrastructure to connect regional corridors, and in areas with demand to improve comfort levels, safety, equity, and accessibility.
- Work with MDOT and county and local agencies to develop and apply context-sensitive planning tools to assist with implementation.
- Inventory the regional trail system and analyze current conditions to prioritize development on critical gaps for a connected regional network.
- Continue to collect, map, and disseminate data to support the bicycle and pedestrian network.
- Develop minimum design standards for bicycle and pedestrian infrastructure based on road characteristics and community context, and promote consistency across jurisdictions.

Ensure equitable access to core services and regional destinations for pedestrians and bicyclists, including connections to other transportation modes.

- Analyze sidewalk data to understand condition, accessibility, and pedestrian comfort factors.
- Develop criteria for use in prioritizing projects that encourages improved comfort levels and investment in areas identified by SEMCOG's demand and equity analyses.
- Support community-led Americans with Disabilities Act (ADA) transition plans for sidewalks, bikeways, paths, and crosswalks, and promote universal design principles for infrastructure that is accessible to people of all ages and abilities.
- Encourage provision and distribution of micro-mobility options to ensure that they are available for people of all ages, abilities, and incomes.

Increase safety for pedestrians and bicyclists with systemic approaches to roadway design, traffic operations, education, and enforcement.

- Continue to support the state's Towards Zero Deaths (TZD) vision, and further explore opportunities to develop local and regional plans to eliminate traffic fatalities and serious injuries.

- Analyze the region's nonmotorized system based on risk factors for pedestrians and bicyclists to identify focus areas for road safety audits and safety treatments.
- Support development of safe rules and standards for infrastructure related to emerging micro-mobility options.
- Encourage coordination and data sharing on crashes involving bicyclists and pedestrians between health-care providers, public-safety offices, and local communities.
- Support local communities in identifying locations and infrastructure treatments to provide safe routes to schools, parks, and other core services.
- Promote development of community traffic calming implementation plans to reduce the frequency and severity of crashes on a systemic basis.
- Work with legislators, law enforcement, local communities, and advocacy groups to identify enforcement mechanisms that can protect the safety of bicyclists and pedestrians.

Promote healthy lifestyles and vibrant communities with expanded options for pedestrian and bicycle mobility, recreation, and tourism.

- Support the planning, branding, and marketing of regional trails and touring routes.
- Support efforts that increase bicycle and pedestrian mobility and support placemaking to include achieving state and national designations or implementing signage and wayfinding guidance.
- Integrate the linkage of health and nonmotorized travel through partnerships with other organizations, such as health-care providers, recreation organizations, and area agencies on aging.
- Incorporate elements of green streets that help curb stormwater runoff and improve safety with elements that are mutually beneficial for mobility, ecology, and aesthetics.
- Work with county health departments and support public health impact assessments to promote development and enhancement of bicycle and pedestrian infrastructure.
- Assist local communities in identifying planning and zoning regulations that support bicycle and pedestrian mobility.
- Work with employers and business districts on creating incentives or amenities that help promote walking and biking as a viable commuting option.

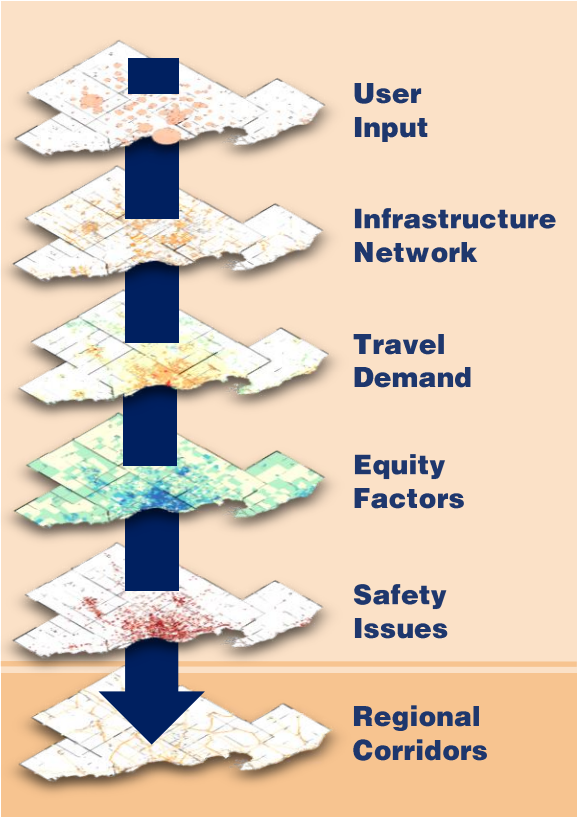
Provide education to encourage broader participation and awareness of walking and biking issues.

- Provide tools, information, and best practices on facility design, emerging trends, and related topics.
- Promote educational opportunities and events to encourage bicycling and walking.
- Promote regional safety education campaigns and align messaging across local, regional, and state agencies, and nonprofit organizations.
- Work with state and local governments and advocacy groups to educate all road users, including more information during driver's training, Safe Routes to School programs, and targeted public information campaigns.

Ensure the sustainability of the bicycle and pedestrian network with collaborative planning and adequate funding for development and maintenance.

- Analyze existing conditions to support maintenance and asset management programs for bicycle and pedestrian infrastructure.
- Coordinate with local, regional, and state on policy efforts related to active transportation and emerging issues such as e-bikes, micro-mobility devices, and data sharing.
- Collect and share data on bicyclists and pedestrians, coordinating with other entities to enhance the count database and understanding of nonmotorized travel.
- Coordinate with local, county, and state agencies to incorporate pedestrian and bicycle considerations early in the road project planning process.
- Work with local road agencies and Federal-Aid Committees to provide training and technical assistance for bicycle and pedestrian infrastructure.
- Promote flexibility in funding programs to ensure that pedestrian and bicycle infrastructure can be adequately funded.

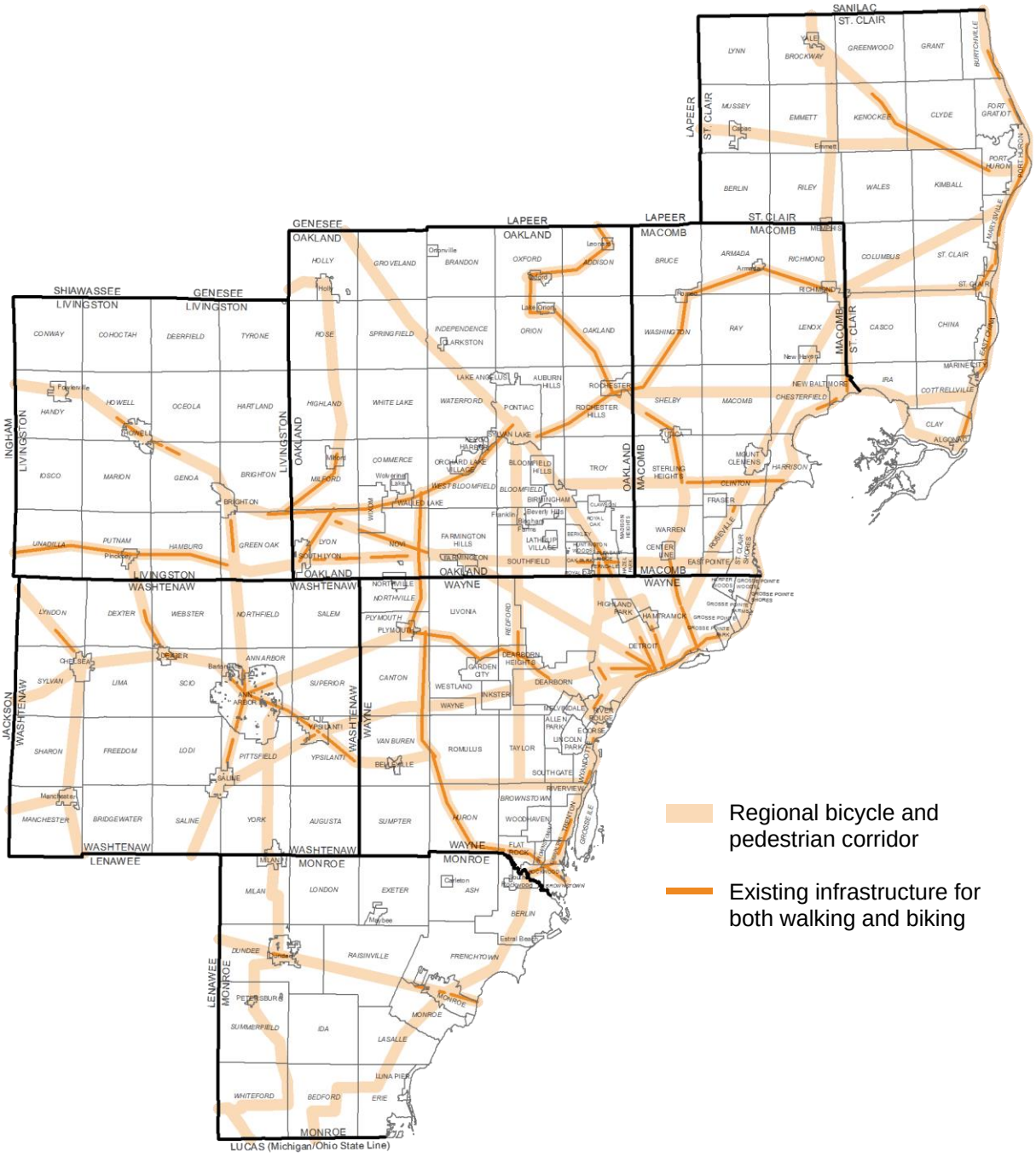
Regional Bicycle and Pedestrian Corridors



The regional policies and analysis included in this plan are the basis for establishing regional bicycle and pedestrian corridors. These corridors serve as the primary routes for longer distance trips, while also connecting local networks. At the regional scale, the bicycle and pedestrian network should seamlessly cross jurisdictional boundaries, connect residents to important destinations, and serve as an attraction that improves quality of life for both residents and visitors. The regional corridors identified in Figure 1 are intended to fill this need.

Currently, the regional corridors identified here may include a range of existing and planned infrastructure types, reflecting components of the regional trail network, designated bike routes, demand centers and equity emphasis areas, along with other aspects of the system. They can be used to facilitate cross-jurisdictional collaboration toward a common vision for bicycle and pedestrian mobility in Southeast Michigan.

Figure 1
Regional Bicycle and Pedestrian Corridors

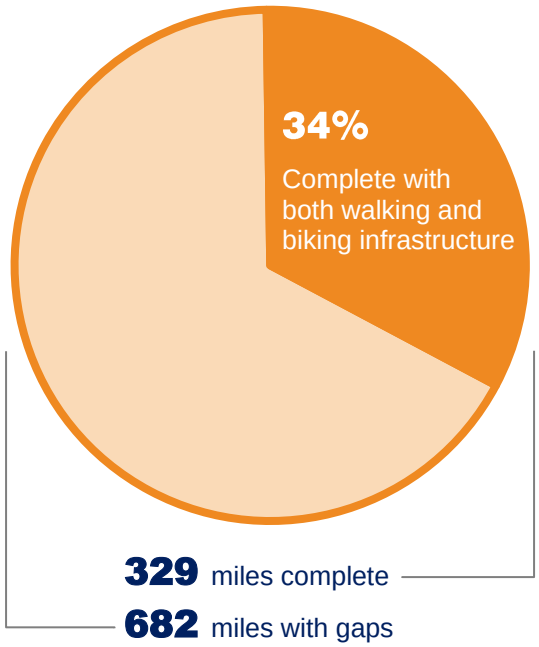


Approximately 34 percent of the regional corridor network is considered complete, with both pedestrian and bicycle infrastructure in place. While some infrastructure may exist in areas identified as gaps, further enhancements will be necessary to accommodate both walking and biking throughout the region. As a supplement to Figure 1, Appendix B includes a list of regional corridors with more information on each.

The corridors identified in this plan are not prescribed to a specific roadway, but are intended to follow the general route in a way that fits with local context. For example, while Woodward Avenue is a key corridor that connects many Southeast Michigan communities, it also experiences heavy vehicle traffic, several transit routes, and other conditions that make it less comfortable for biking. However, there are protected bike lanes in Midtown Detroit one block away on Cass Avenue that run parallel and provide a more comfortable connection along this route. With a robust network of sidewalks in the adjacent area, this is seen as a complete section of the regional corridor.

Local agencies are responsible for identifying the most appropriate route and infrastructure treatments to accommodate walking and biking safely, comfortably, and efficiently on regional corridors in their communities.

Figure 2
Regional Corridor Network Analysis



Chapter 3: Understanding Current Conditions

In recent years, Southeast Michigan has made great progress toward a more comprehensive regional bicycle and pedestrian system. As walking and biking infrastructure continues to expand and connect, so have the plans, programs, and policies that support its use. Current conditions in the region provide a strong foundation for bicycle and pedestrian mobility, however, significant gaps and barriers still exist.

To ensure that the bicycle and pedestrian system continues to grow in a way that meets both local and regional needs, this chapter analyzes current conditions and opportunities. A summary of each analysis is included in Figure 3. Together, these factors represent a layered approach to understanding the state of the regional system.

By looking at these factors together, Southeast Michigan communities can continue to develop infrastructure and programs in a way that is both collaborative and strategic. From a regional perspective, this holistic analysis ensures that bicycle and pedestrian infrastructure connects seamlessly across jurisdictional boundaries, and provides safe and convenient access to core services and destinations.

Figure 3
Current Conditions Analysis Summary

User Analysis
Compiles data about mobility patterns for bicyclists and pedestrians, and the role of their trips from a transportation perspective. This section also summarizes the results of SEMCOG's public engagement and input survey on walking and biking, and how conducting and evaluating user counts can support planning efforts.

Infrastructure Analysis
Identifies the region's existing infrastructure, including components that make up the bicycle network, pedestrian network, and regional trail network. With a primary focus on connectivity, this analysis also examines accessibility, gaps in infrastructure, and the planning or policy approaches that can enhance the network.

Demand Analysis
Identifies areas with demand for bicycle and pedestrian trips. It is based on concentrations of people and destinations, and may be used to understand which areas already support a high level of bicycle and pedestrian mobility, along with where more trips are likely to occur if infrastructure, policies, and programs were in place.

Equity Analysis
Identifies populations within the region through an equity lens based on socioeconomic factors that may impact their mobility. Walking and biking infrastructure can lead to many positive benefits for a community, and this analysis can be used to ensure that the system is accessible for people of all ages, abilities, and backgrounds.

Safety Analysis
Examines traffic crashes involving pedestrians and bicyclists over the past five years. This analysis may be used as a starting point to determine where infrastructure improvements and education would be most effective at solving traffic safety issues.

User Analysis

This section compiles data about mobility patterns for bicyclists and pedestrians, and the role of their trips from a transportation perspective. It also summarizes the results of SEMCOG's public engagement and input survey on walking and biking, and how conducting and evaluating counts can lead to improved planning.

Understanding how people currently use the transportation system is important for planning improvements and addressing challenges. This section analyzes three sets of data:

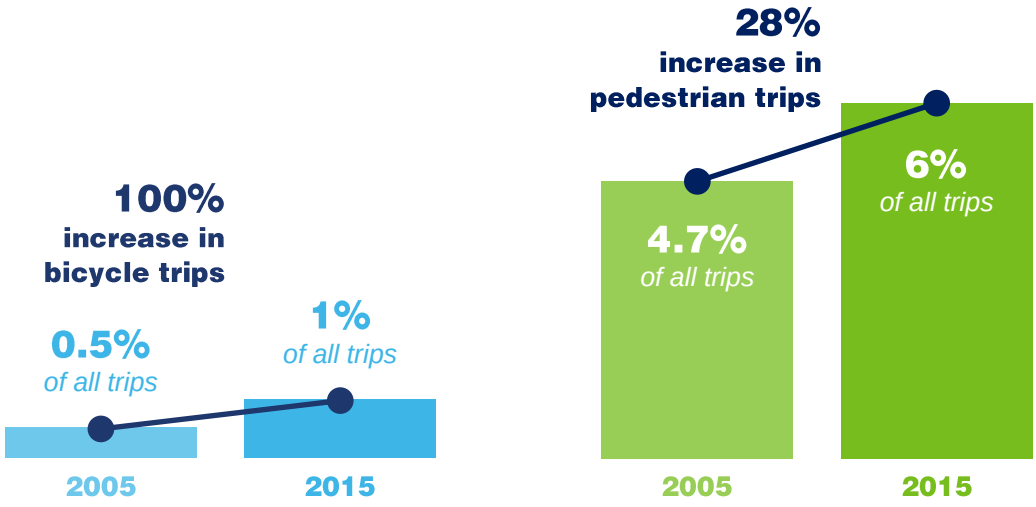
- Mobility patterns for walking and biking since 2005.
- Results of SEMCOG's Bicycle and Pedestrian Survey.
- Two complementary sources of bicycle and pedestrian counts for evaluating usage.

Together, the data provides information on how residents currently use the bicycle and pedestrian network, and the ways in which it could be improved to better meet their needs.

Bicycle and Pedestrian Mobility Patterns

As in many large metropolitan areas, driving is the most common way that people get around in Southeast Michigan. Walking and biking, however, are a part of daily mobility patterns that have grown significantly in recent years. Since 2005, walking trips in the region have increased by 28 percent, and represent six percent of all trips. In the same time period, the amount of biking trips has nearly doubled, from one-half to one percent of all trips. Combined, they currently account for approximately seven percent of all trips in the region, a 35 percent increase from 2005. During that time driving trips have decreased by 2.4 percent.

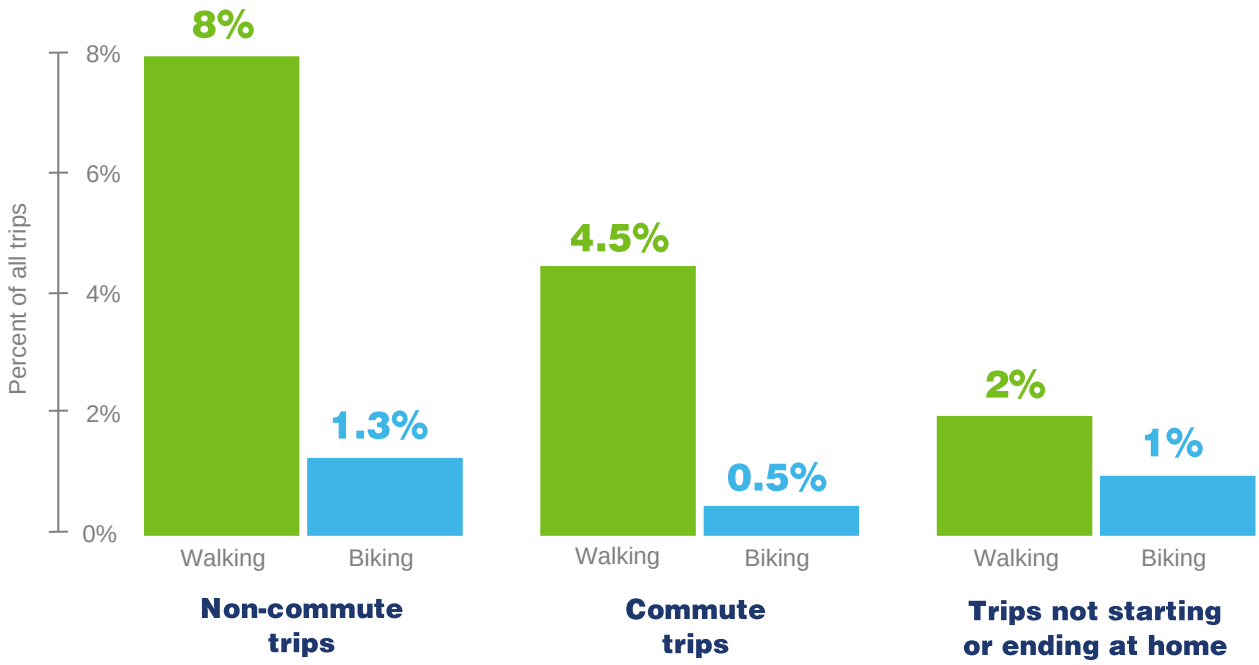
Figure 4
Bicycle and Pedestrian Mobility Patterns since 2005



Source: SEMCOG's 2005 and 2015 Household Travel Surveys

The decision to walk or bike rather than drive or use transit can vary depending on a trip's purpose. As shown in Figure 5, different mobility options represent a combined change of more than 200 percent for different types of trips. While Southeast Michigan commuters are much more likely to drive to work, the likelihood that a person will walk increases nearly four times for non-commuting trips. People making the decision to bike are less impacted by their commuting habits, but appear to be more limited by what they may need to carry, such as shopping bags, or their access to a bicycle for trips that do not start or end at home.

Figure 5
Mobility Patterns by Trip Purpose

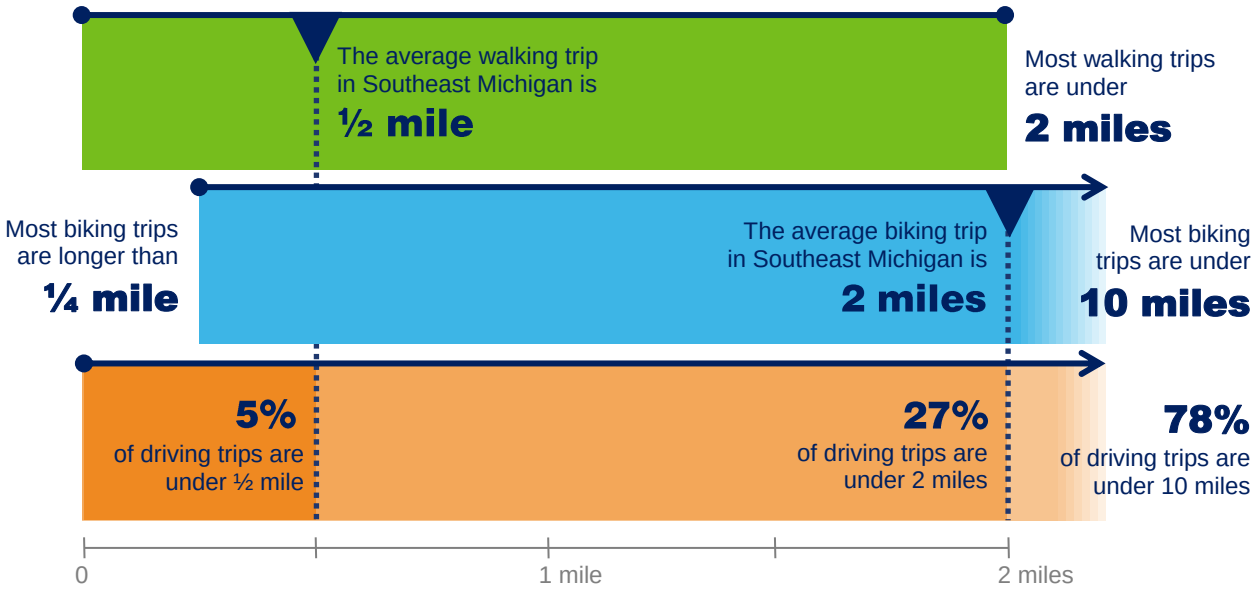


Source: SEMCOG's 2015 Household Travel Survey

These ranges in trip purposes indicate that the region's bicycle and pedestrian network meets some needs better than others. It also shows that there is potential to serve more purposes if certain resources or services were enhanced. For example, programs like Southeast Michigan's Commuter Connect, that promote and incentivize walking or biking as commuting options, could further encourage users who already walk or bike for other purposes to try an alternative way of getting to work. Expanding bikeshare systems could also make it more viable for users to bike between destinations when they are away from home. In all cases, continuing to connect and enhance bicycle and pedestrian infrastructure will increase the convenience of walking and biking and the safety of users, regardless of their trip purpose.

The distance of a trip also influences a user's decision to walk or bike (Figure 6). In Southeast Michigan, the average walking trip is approximately one-half mile; the average biking trip is approximately two miles. While many users make longer trips, particularly for recreational purposes, 98 percent of all walking and biking trips in the region are less than two miles and 10 miles, respectively. In general, the minimum distance for biking trips is approximately one-quarter mile, indicating that walking may be better suited for even shorter trips.

Figure 6
Mobility Patterns by Trip Distance



Source: SEMCOG's 2015 Household Travel Survey

By comparison, approximately five percent of all driving trips in the region are less than one-half mile, or the average distance of a walking trip. More than one-quarter of driving trips are less than two miles, or the average trip distance for biking. These figures indicate that there is significant potential to convert more driving trips to walking and biking, if safe and well-connected infrastructure is provided. Such a change could have a significant impact on congestion and a reduction in emissions. Land use and development patterns that encourage a more concentrated density of core services and destinations can also help accommodate more short trips, and increase accessibility for bicyclists and pedestrians to reach them.

Bicycle and Pedestrian Survey Results

The public survey conducted to help develop this plan supports the mobility patterns data, with 96 percent of residents indicating that they typically use an automobile for daily travel. While driving is the primary choice for most trips, 79 percent of residents walk and 54 percent bike on a daily or weekly basis.

Results show significant interest in walking and biking and a need to continue to support investment and improvements in infrastructure. This is further supported by nearly two-thirds of residents reporting that they would like to walk more often and nearly three-quarters wishing to bike more often.

For both walking and biking, the majority of residents reported that they do so for recreational purposes. Up to 26 percent reported walking and up to 31 percent reported biking for transportation purposes. This shows the continued need to provide infrastructure and facilities that meet both the region's recreational and transportation needs. Residents were encouraged to identify the types and location of places that they most often walk or bike by dropping "map markers" throughout the region. Figure 7 shows that the most popular destinations were parks and recreation, followed by shopping, dining, and other social activities. These destinations accounted for 74 percent of all the markers placed in the region.

Figure 8 shows the locations where people indicated they are currently walking or biking. While there are locations throughout the region that are walking and biking destinations, the highest concentrations are in the City of Detroit, Ann Arbor, and Southeast Oakland County. Appendix C provides detailed maps and analysis of each of the major destinations.

Highlights of the survey results include:

Walking or biking to parks and recreation destinations:

- 36 percent of residents indicated that they could, while 24 percent wished they could;
- Major regional parks identified with the highest level of interest for walking or biking were Belle Isle Park, Hines Park, Island Lake State Recreation Area, Stony Creek Metropark, Kensington Metropark, and Elizabeth Park.

Walking or biking to destinations for shopping, dining, or other social activities:

- 33 percent of residents indicated that they could, while 27 percent wished they could;

Figure 7
Types of Walking and Biking Destinations Selected

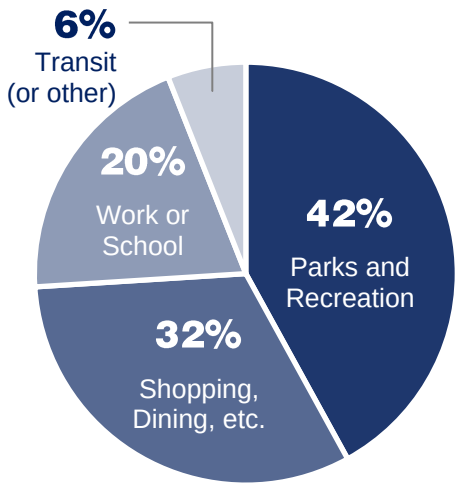
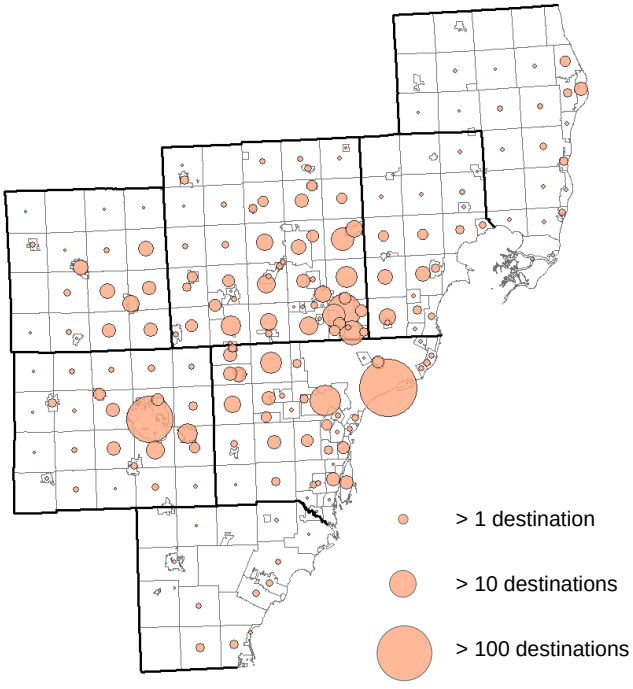


Figure 8
Location of Walking and Biking Destinations Selected



- Communities with the highest number of locations marked for walking and biking were Ann Arbor, Detroit, Ferndale, Rochester, Royal Oak, and Ypsilanti.

Walking or biking to school or work:

- 22 percent of residents indicated that they could, while 33 percent wished they could;
- The region's major job centers received the highest number of locations selected for walking or biking – Ann Arbor, Dearborn, Detroit, Rochester Hills, Royal Oak, and Southfield;
- Of the four destinations, reaching a school or work by walking or biking was reported to be the most challenging.

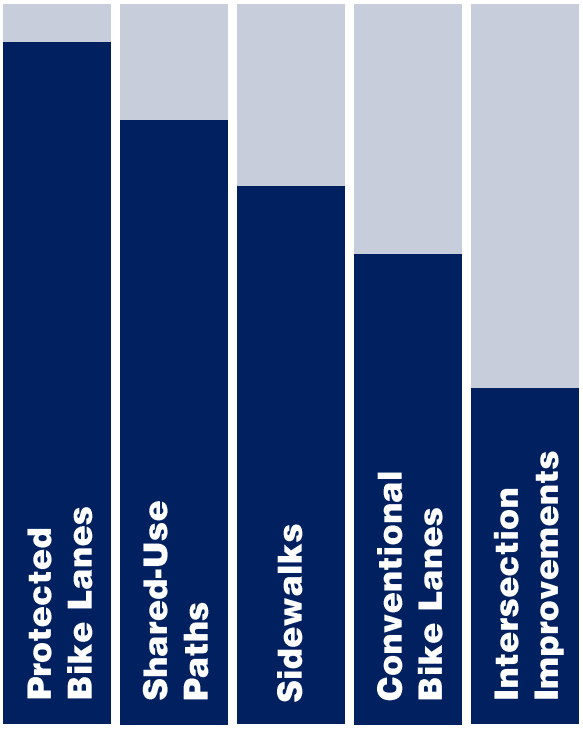
Walking or biking to transit (or other destinations):

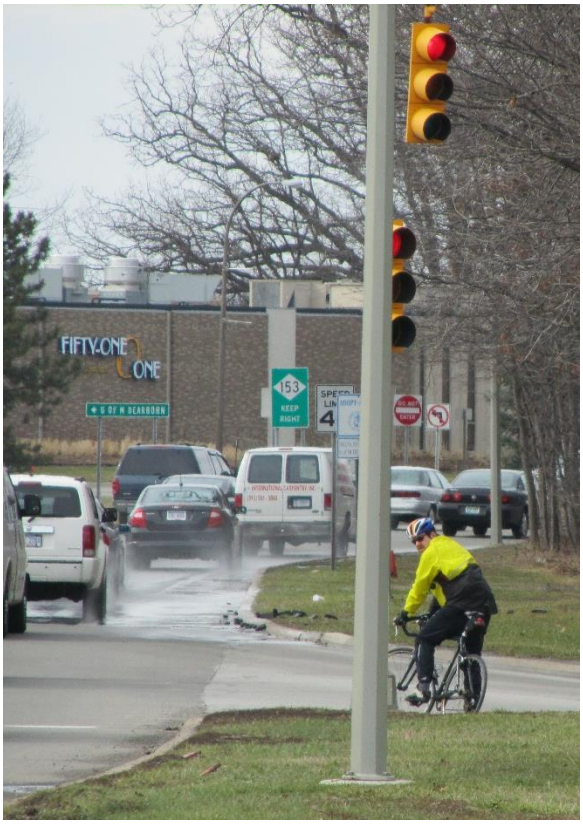
- 33 percent of residents indicated that they could, while 29 percent wished they could;
- Communities with the highest number of locations marked for walking and biking – Ann Arbor, Dearborn, Detroit, and southeast Oakland County communities.

Infrastructure Priorities

The survey also asked residents to rank investment priorities for improving and expanding the region's bicycle and pedestrian network. Residents ranked the types of infrastructure that they support most for investments (Figure 9). Additional infrastructure improvements that received the lowest priority for funding were shared-lane markings and midblock crossings.

Figure 9
Highest Priorities for Investing in Infrastructure Improvements





Challenges and Opportunities

While there is currently growing interest in walking and biking throughout the region, residents noted several impediments that limit their ability to either walk or bike. For walking, the major impediments are weather, distance or time constraints, and lack of sidewalks or paths. For biking, the greatest issue reported was a lack of infrastructure, with weather, personal safety or security, and pavement conditions also cited as challenges.

Regionally, there were several major themes for why residents could not reach desired destinations. For each location cited, the respondent could further describe the challenge as a physical barrier or gap in infrastructure, a safety issue, problems related to maintenance or condition, or other impediment.

Infrastructure Gaps and Barriers

The most commonly cited impediments were physical barriers and gaps, specifically related to a lack of bicycle and pedestrian infrastructure. In suburban and rural areas of the region, a lack of sidewalks and bicycle paths connecting to parks, schools, and regional trails were commonly cited. Across the region, gaps in shared-use paths and trails was a common impediment to walking and biking more often, as they are typically seen as the most comfortable type of infrastructure for most users.

Safety Issues

Safety issues were cited as an impediment across the region. These were mostly site-specific along the region's major road corridors. Common pedestrian safety issues across the region were a lack of safe crosswalks, and locations where existing infrastructure did not provide adequate timing for crossing, particularly in city centers and commercial areas. Poor pavement conditions were commonly noted for sidewalks and paths. Expressways were highlighted as a significant barrier to

pedestrian accessibility, with the following locations of most concern – I-75 and I-696 in Oakland County, US-23 and I-94 in Washtenaw County, and I-94 in Macomb County. For biking, common safety concerns related to sharing the road with drivers that were traveling too fast, distracted, and/or aggressive. In areas with bicycle infrastructure, bike lanes were commonly noted as being too narrow, with many users looking for more separation or protection from vehicle traffic.

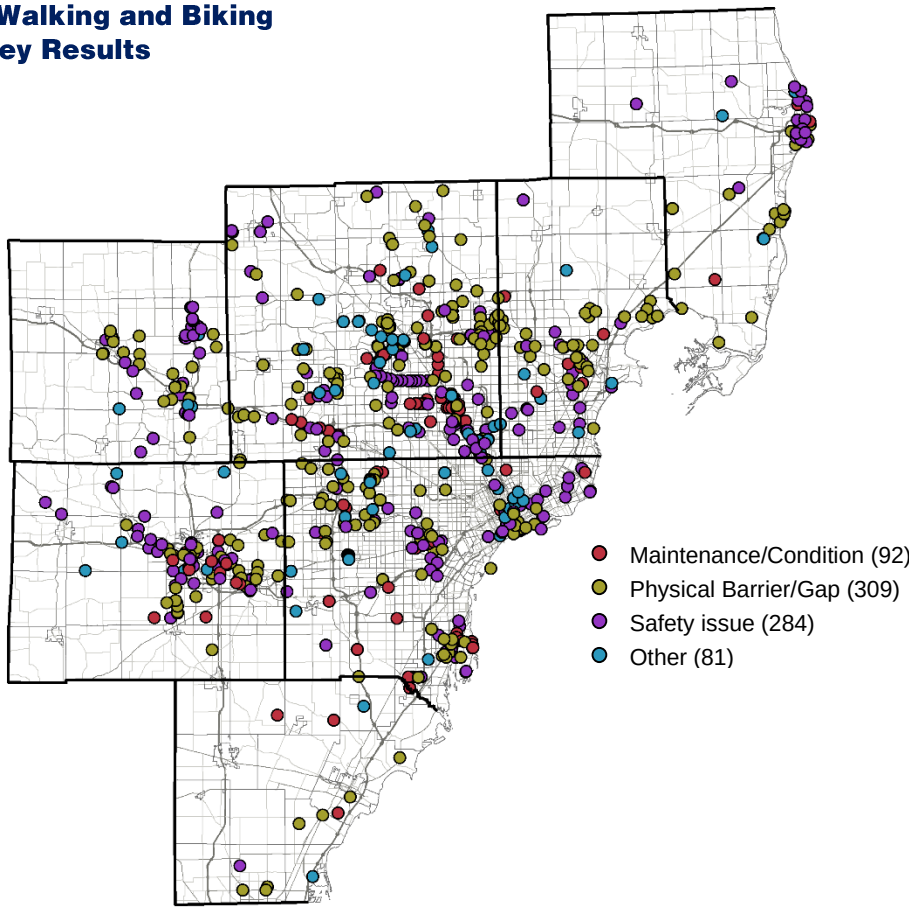
Maintenance and Condition Deficiencies

The general need for improved pavement conditions was by far the greatest need, both within the roadway and on sidewalks and trails. Road maintenance, construction, railroad crossings, flooded streets, and lack of snow removal were common impediments for both bicyclists and pedestrians. Infrastructure that does not accommodate all ages and abilities was another major impediment across the region. These design and maintenance issues limit a person's ability to access core services and connect to other travel modes. For example, while a transit stop may be in close proximity to a destination, the stop may not be accessible or safe to use for people with disabilities.

Figure 10 shows the location of all the impediments noted by survey respondents. The comments and issues cited have been included in SEMCOG's analysis of gaps for this plan and available for further analysis to interested communities and road owners. Additionally, these locations should be reviewed as construction occurs and the region's pedestrian and bicycle network continues to develop.

Figure 10

Impediments to Walking and Biking from Public Survey Results



Bicycle and Pedestrian Counts

Counting bicyclists and pedestrians is another way to evaluate user activity and mobility patterns. In addition to learning more about how many people are walking and biking, counts help to understand the difference in travel patterns and mobility options on weekdays and weekends, or with changes in the seasons. This helps confirm the accuracy of survey data, and diversify the data inputs to SEMCOG's transportation planning. As these tools are enhanced, they also support community planning efforts.

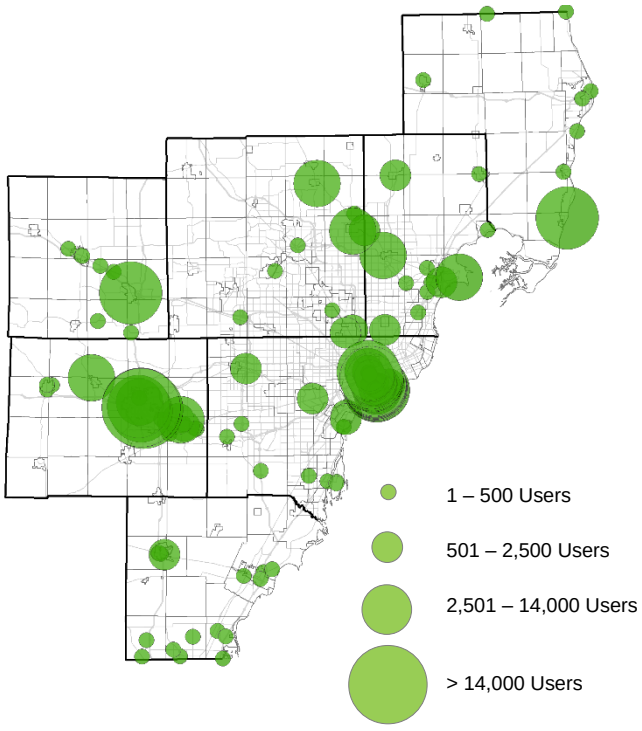
Over the past four years, SEMCOG has conducted nearly 200 counts of bicyclists and pedestrians. These have occurred in more than 50 communities across all seven counties, sampling a variety of roadways, community types, and bicycle and pedestrian infrastructure. Collectively, more than 266,000 pedestrians and 23,000 bicyclists have been counted through this program. Figure 11 shows the location of these counts with the size of each circle representing the scale of the number of users counted.

SEMCOG's bicycle and pedestrian count program is based on short duration counts, which are typically taken over the course of 16 hours on a single day, using video counting technology. Additional counts will continue to build the database and highlight regional trends. Findings from the counts conducted thus far:

- The four highest pedestrian counts in the region were in the City of Ann Arbor, with the most at the intersection of State Street and University Avenue with more than 30,000 pedestrians.
- More than 1,500 people were counted walking or biking in Lake Orion though the intersections of Atwater Street and the Paint Creek Trail.
- In the Village of Dundee, nearly 600 people walked through the intersection of Main Street and Tecumseh Street on a regular weekday.
- In the City of Brighton, more than 2,500 people were counted crossing Main Street to Mill Pond Park.
- More than 100 people were counted along Fred Moore Highway in St. Clair County, where there is currently no walking or biking infrastructure.

SEMCOG's online Bicycle and Pedestrian Count map provides information on counts conducted through this program. While they do not represent daily averages, the counts do include information for specific dates and times. The true number of people walking or biking in these locations may vary depending on time, weather, or special events.

Figure 11
SEMCOG's Bicycle and Pedestrian Count Program Findings



With advances in technology, other resources are available to supplement SEMCOG's surveying, counting, and travel-model methods. Big data sources and smart phone apps include information from cell phone GPS and location services, providing a large sample of frequently updated information. While these are often not created specifically for transportation planning, the information they provide can be useful in understanding general trends, mobility patterns, and route selection.

One such source is STRAVA, a mobile app that is primarily used to track physical activity such as walking, running, and biking. While this may be a limited sample of users, studies have shown it to be generally representative of the overall population, and helpful to understand route selection, and changes in user statistics over time. Figure 12 displays a sample STRAVA heatmap for the Island Lake State Recreation Area and Kensington Metropark. Based on STRAVA user data from 2018, Table 1 summarizes the top 10 locations in the region where pedestrian and biking trips were logged in 2018.

Figure 12
Example of STRAVA Heatmap

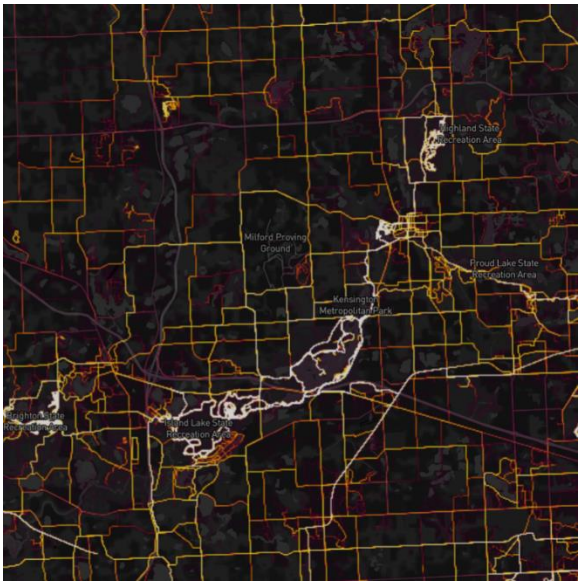


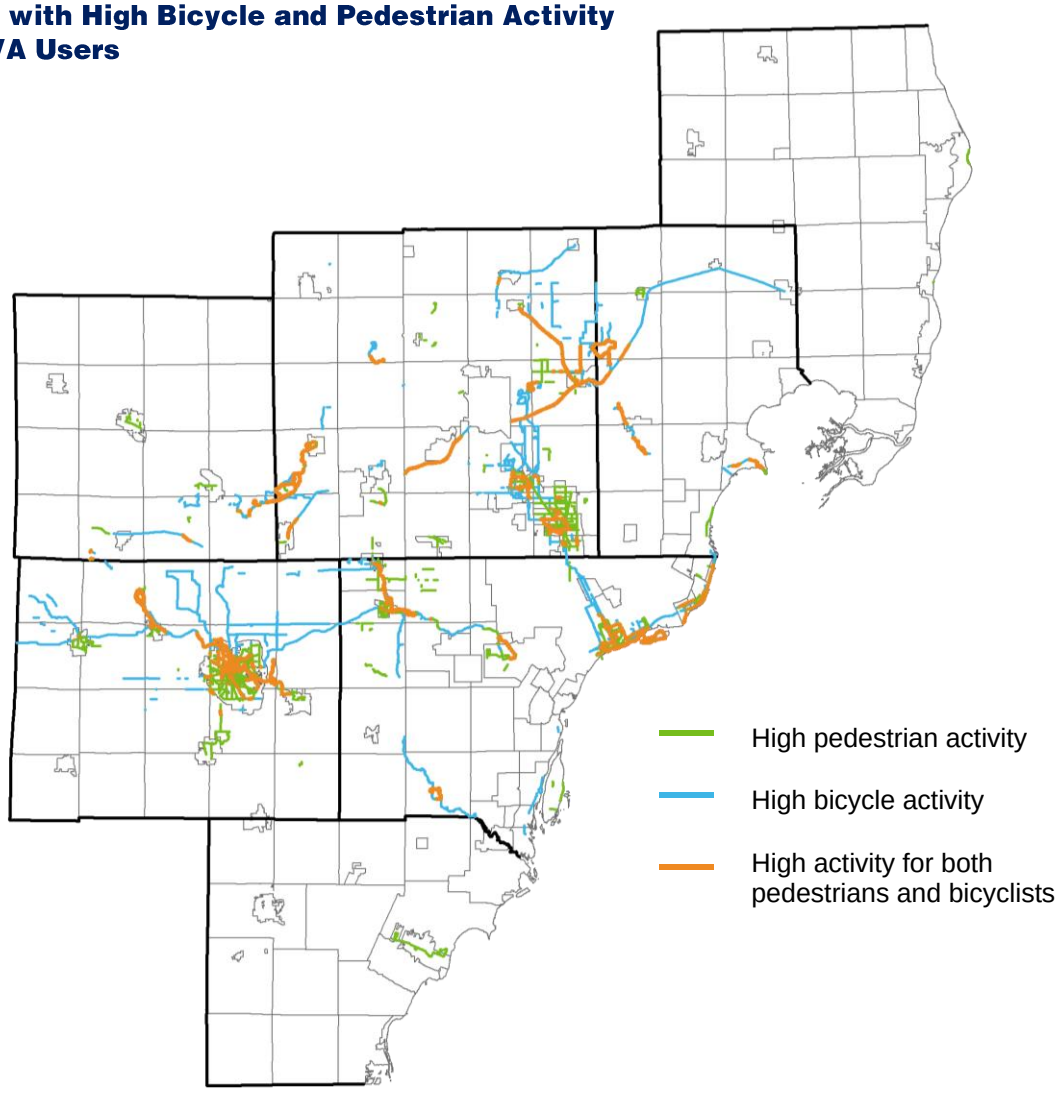
Table 1
Top Walking and Biking Locations for STRAVA Users

	Walking Trip Locations		Biking Trip Locations
1	Border to Border Trail, City of Ann Arbor	1	Island Lake State Recreation Area
2	Detroit RiverWalk, City of Detroit	2	I-275 Metro Trail, Plymouth Township
3	Long Shore Drive, City of Ann Arbor	3	Huron River Drive, Scio Township
4	Barton Drive Boardwalk, City of Ann Arbor	4	Stony Creek Metropark, Shelden Trails
5	Broadway Street, City of Ann Arbor	5	Hines Park Bikeway, City of Livonia
6	Stony Creek Metropark, Hike-Bike Trail	6	Clinton River Trail, City of Rochester
7	Gallup Park Road, City of Ann Arbor	7	Kensington Metropark, Hike-Bike Trail
8	Main Street, City of Ann Arbor	8	Stony Creek Metropark, Park Road
9	Paint Creek Trail, City of Rochester	9	Belle Isle Park, Loop Trail
10	Dequindre Cut, City of Detroit	10	Macomb Orchard Trail, Shelby Township

While further evaluation of STRAVA data is necessary to understand its implications and limitations, here are some highlights:

- 80 percent of bicycle activity and 90 percent of pedestrian activity is within SEMCOG's Bicycle and Pedestrian Demand Areas (see Demand Analysis).
- Cass Avenue, in Detroit, which had a road diet and protected bike lanes installed recently, has experienced a 264 percent increase in bicycle and pedestrian activity since 2014.
- Hamilton Avenue is the primary selected route for bicyclists between the greater downtown Detroit area and southeast Oakland County.
- Huron River Drive in Washtenaw County, a road with no formal bicycle infrastructure, has comparable usage to shared-use path segments of the Border-to-Border Trail.
- Main Street in Royal Oak has some of the highest pedestrian usage in Oakland County.
- Most users of the Macomb Orchard Trail are on the west side of the county in Shelby and Washington Townships.

Figure 13
Locations with High Bicycle and Pedestrian Activity for STRAVA Users



Infrastructure Analysis

This section identifies the region's existing infrastructure, including components that make up the bicycle network, pedestrian network, and regional trail network. With a primary focus on connectivity, this analysis examines accessibility, gaps in infrastructure, and the planning or policy approaches that can enhance the network.

Bicycle Infrastructure

Riding a bike is a flexible, affordable, and healthy way to get around that can be used for both transportation and recreation. While bicyclists may legally ride in vehicle travel lanes, or sometimes use sidewalks, their comfort and safety are often compromised in situations where infrastructure is primarily designed to accommodate other uses.

Dedicated bicycle infrastructure provides a mobility network designed specifically to meet the needs of bicyclists. Also known as bikeways, these components include shared-use paths, bike lanes, and other roadway improvements that complete the network, including shared-lane markings, wide-paved shoulders, and designated bike routes (Figure 15). For more information on these and other infrastructure components, see Chapter 5, Infrastructure Guidelines.

Over the past decade, Southeast Michigan's bikeway network has expanded rapidly. In 2010, the region's only on-road bike lanes were parts of limited, fragmented networks in just a few larger cities. By the adoption of SEMCOG's *Bicycle and Pedestrian Travel Plan* in 2014, the region's bicycle network had grown to more than 200 miles, and expanded its reach with additional types of infrastructure. Table 2 summarizes the change in Southeast Michigan's bicycle infrastructure since 2014; Figure 14 shows the current bicycle network. The region has seen growth in every type of bicycle infrastructure.

Table 2
Change in Bicycle Network

	Lane Miles		Percent Increase
	2014	*2020*	
Shared-Use Paths	1,096	1,233	13%
Bike Lanes	271	357	38%
Shared-Lane Markings	7	110	1,471%
Bike Routes	889	1,346	51%
Wide-Paved Shoulders	379	473	25%
All Bikeways	**2,642**	**3,519**	**33%**

Figure 14
Bicycle Network by Infrastructure Type

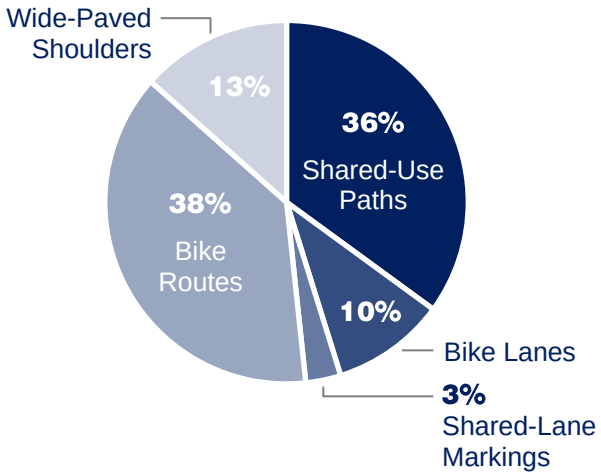
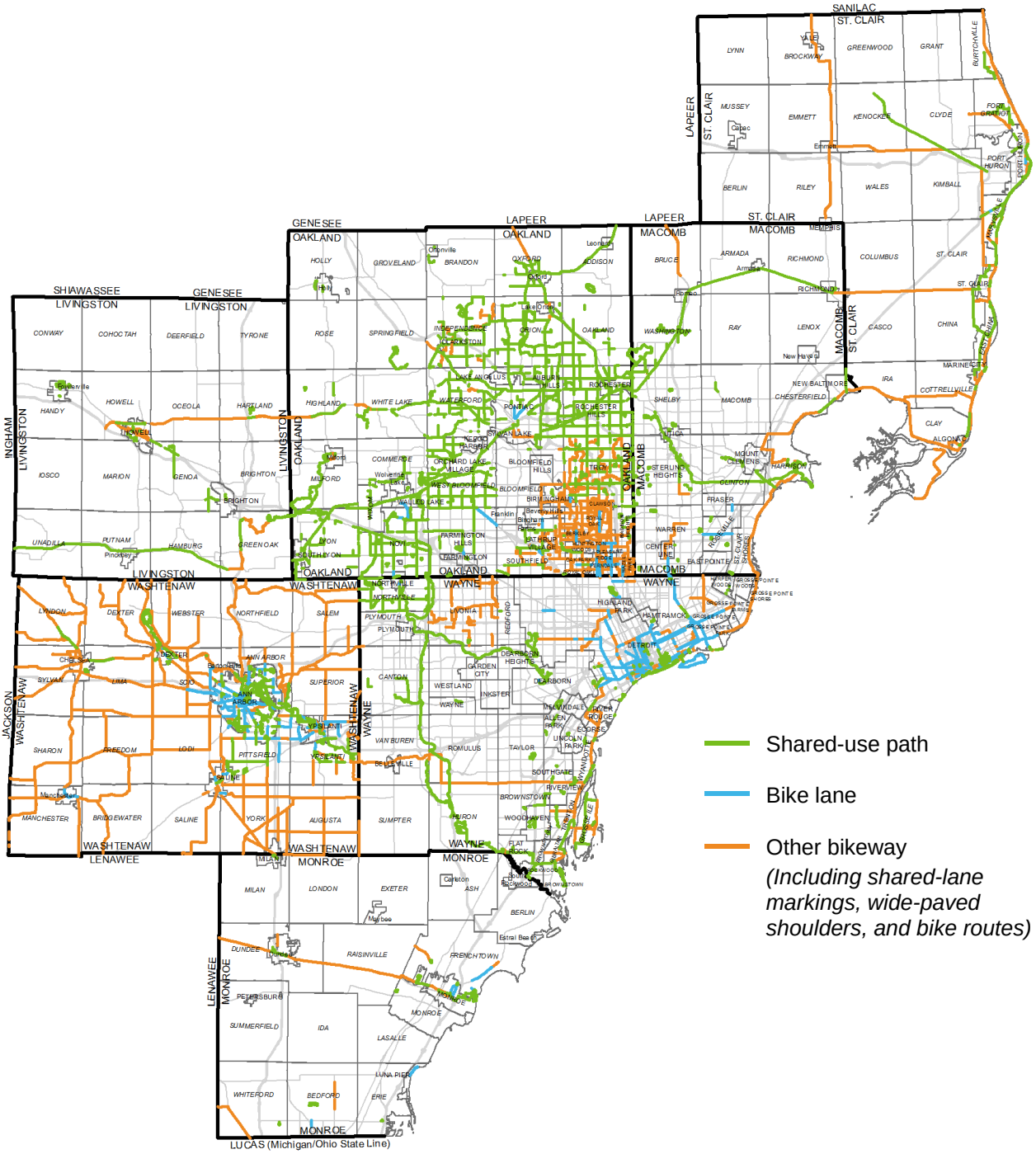


Figure 15
Bicycle Network



Access to Bicycle Infrastructure

While bicycle infrastructure is found throughout Southeast Michigan, it is not always equitably distributed, or accessible to the places where people live or want to go. For many in the region, access to bicycle infrastructure requires biking for some distance on sidewalks or roadways that do not have dedicated facilities in place. To make these connections, bicyclists may encounter conditions that are unsafe, or simply seen as inconvenient enough to deter them from biking altogether. While it is not necessary or suitable for every road to include dedicated bicycle infrastructure, ensuring reasonable access to the network is critical.

Gaps in Bicycle Infrastructure

Addressing gaps in bicycle infrastructure enhances mobility options, and leads to a more complete regional transportation network. As shown in Figure 16, approximately 52 percent of households in the region are within one-half mile of some type of bicycle infrastructure.

For households outside of this range, the analyses in this chapter can be used to understand which gaps may be a higher priority to address. For example, Figure 17 shows areas in the region that are further than one-half mile from bicycle infrastructure, but have some level of demand for bicycle transportation. Similarly, equity factors and safety issues can be considered when prioritizing gap areas.

Bicycle Access to Core Services

Expanding and connecting bicycle infrastructure can improve mobility for many Southeast Michigan residents. SEMCOG's 2016 *Access to Core Services in Southeast Michigan* report established regional benchmarks for bicycle accessibility. Table 3 shows the percentage of households that are within a 10-minute and 30-minute bike ride to core services. While these findings only represent bicycle travel times on the existing road network, regardless of whether or not bicycle infrastructure is in place, they demonstrate the value of bicycle infrastructure for enhancing access to core services, with the potential to connect with the majority of households in the region for the average trip distance.

Figure 16
Households Access to Bicycle Infrastructure

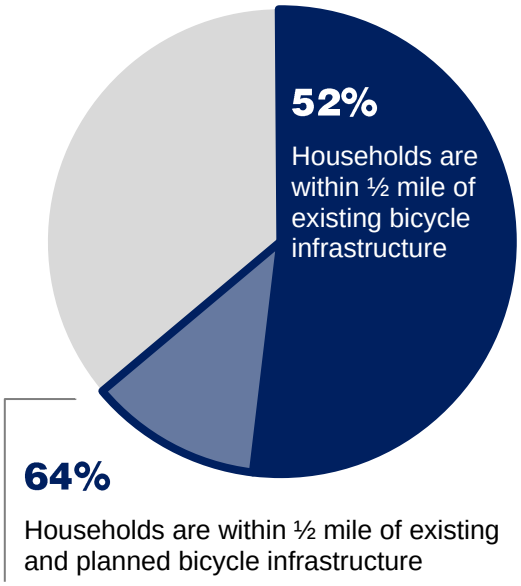
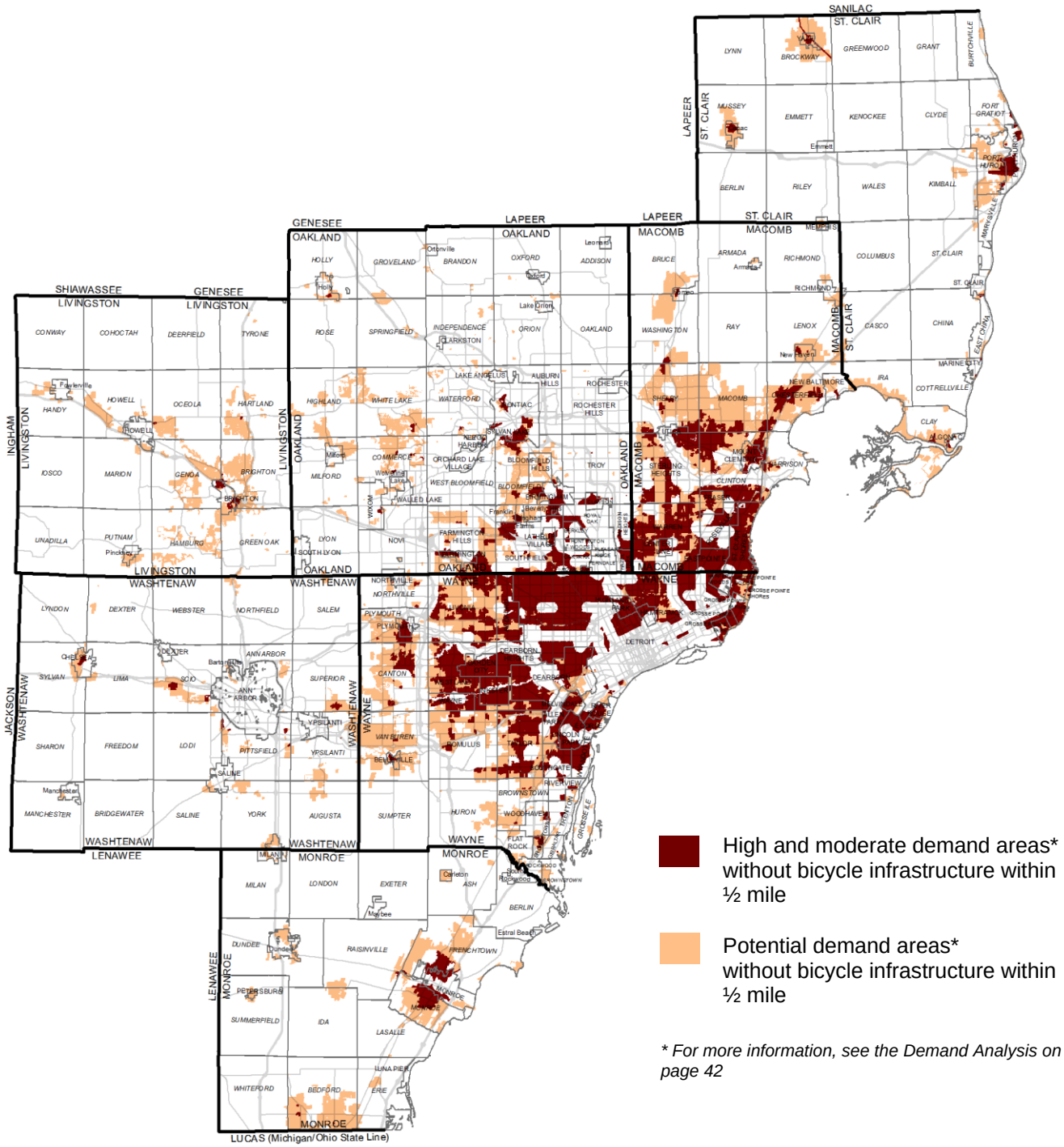


Table 3
Households within Biking Distance to Core Services

	10-minute Bike Ride	30-minute Bike Ride
Fixed-Route Transit	66%	96%
Health-Care Facilities	57%	94%
Libraries	45%	97%
Parks	89%	99%
Supermarkets	70%	96%

Figure 17
Gaps in Bicycle Infrastructure



High and moderate demand areas* without bicycle infrastructure within ½ mile

Potential demand areas* without bicycle infrastructure within ½ mile

** For more information, see the Demand Analysis on page 42*

Planning for Bicycle Infrastructure

At least 110 communities, five counties, and the Huron-Clinton Metroparks have adopted plans for bicycle infrastructure, which identify gaps in the network and strategies to fill them (Figure 18). The types of improvements planned to fill these gaps are summarized in Table 4; planned improvements are mapped in Figure 19.

Oftentimes, local plans identify a route or corridor, but may need to wait to determine the specific infrastructure treatment until the project is ready to be developed. As a result, much of the region's planned bicycle infrastructure is considered "undefined." Once developed, the planned improvements that are documented in local plans would increase access to bicycle infrastructure from 52 to 64 percent of the region's households (Figure 16).

Table 4
Planned Bicycle Infrastructure

	Miles
Shared-Use Paths	925
Protected Bike Lanes	64
Bike Lanes	440
Shared-Lane Markings	75
Designated Routes	314
Wide-Paved Shoulders	38
Undefined Improvements	2,387
All Planned Infrastructure	**4,243**

Figure 18
Local Bicycle and Pedestrian Plans

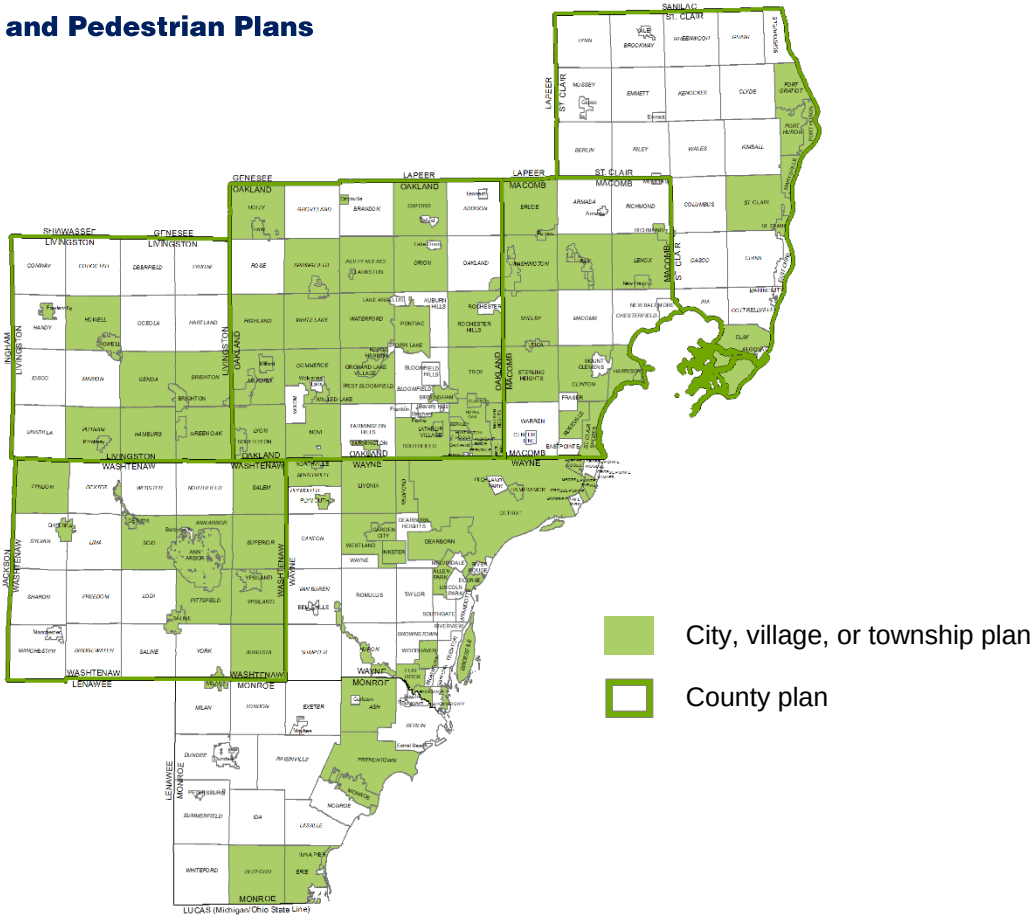
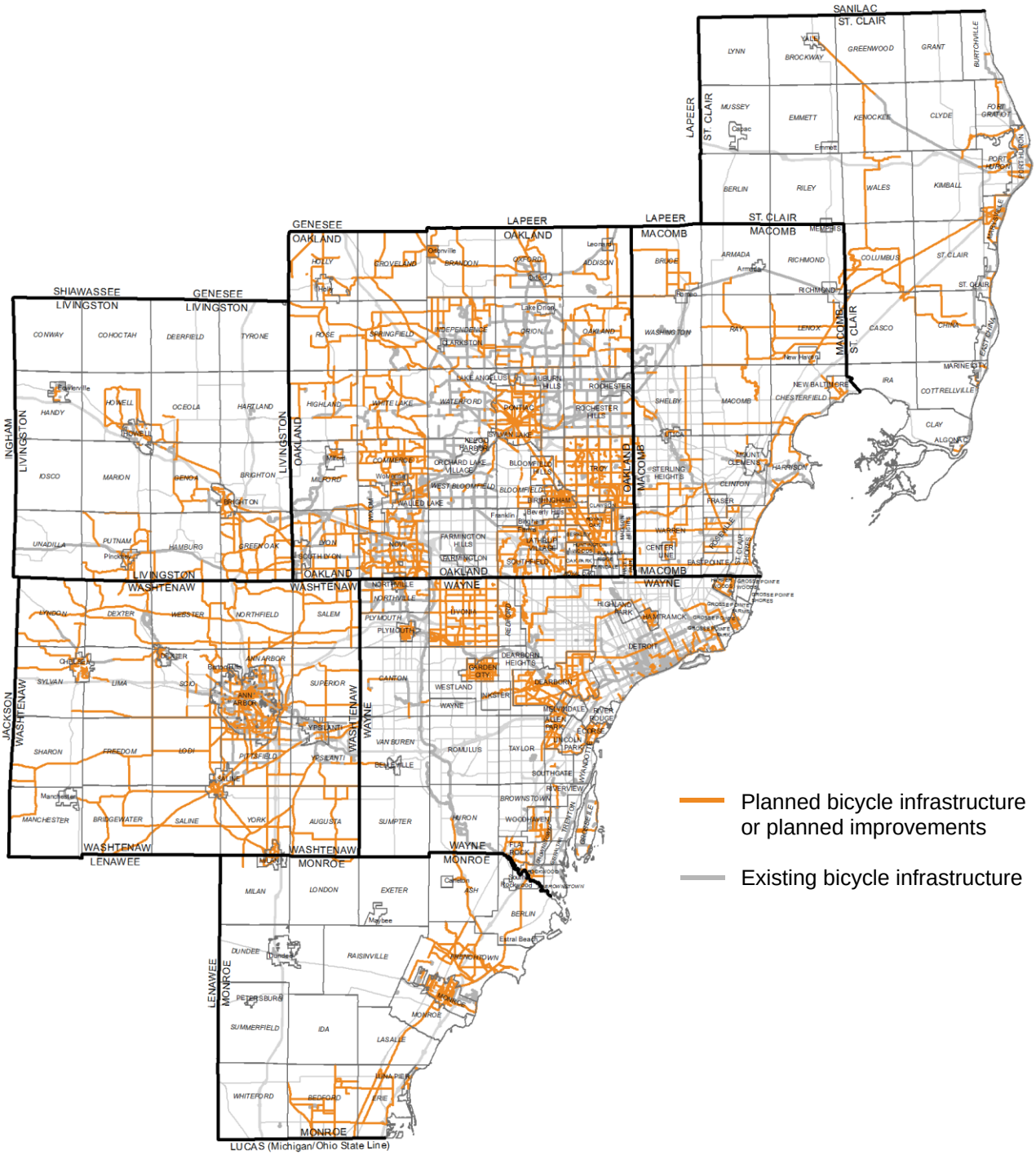
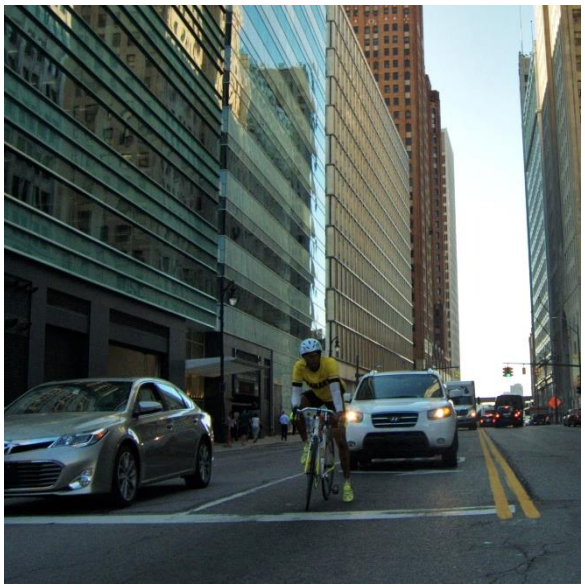


Figure 19
Planned Bicycle Infrastructure



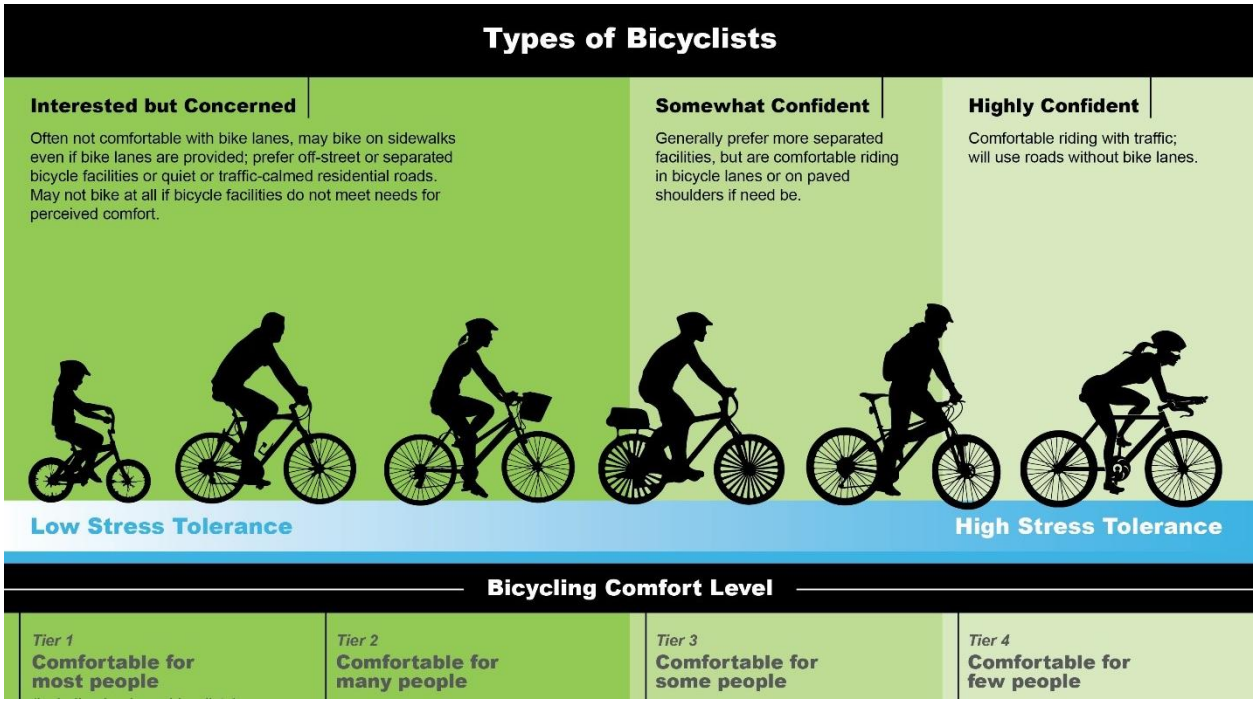
Bicycle Comfort Factors

Not all roadways are equally comfortable or amenable to biking. Factors such as traffic volume, number of lanes, road widths, on-street parking, turning lanes, and the speed at which vehicles travel play a significant role in how comfortable a road may be for bicyclists. Figure 20 shows the relationship between the three types of bicyclists and their likely comfort on different types of roadways. For example, a beginner bicyclist is much more likely to choose to ride on a roadway that provides a relatively high level of comfort (e.g., neighborhood streets with low speed limits), than they are to ride on a road with high speeds and traffic. Based on this understanding, SEMCOG's Bicycle Comfort Level analysis (Figure 20) classifies more than 28,000 miles of roadways into four tiers of comfort based on motorized traffic volumes, the number of travel lanes, posted speeds, and the presence of different bikeway features:



- **Tier 1** – Roadways and pathways that are likely **comfortable for most people**, including all of the Interested but Concerned bicyclists. These roadways are primarily neighborhood streets with low speed limits (25 mph or less) and shared-use paths and independent trails that provide separation between the roadway and are wide enough for bicyclists and pedestrians to safely share the space.
- **Tier 2** – Roadways that are likely **comfortable for many people,** including a majority of the Interested but Concerned adult bicyclists. These roadways may have either protected bike lanes, or buffered/conventional bike lanes with low motor vehicle volumes and posted speed limits. Some roadways with no bicycling facilities also fall into this category.
- **Tier 3** – Roadways that are likely **comfortable for some people**, including the Somewhat Confident bicyclists. These roadways may have buffered or conventional bike lanes along with higher volume and faster traveling vehicles. They may also have wide paved shoulders or shared-lane markings.
- **Tier 4** – Roadways that are likely **only comfortable for a few people**, usually the Highly Confident bicyclists. These roadways generally have no bicycle infrastructure, and will often involve sharing the road with faster-moving vehicles. In some cases, there is bicycle infrastructure, but it was designed primarily for the highly confident, adult touring bicyclists.

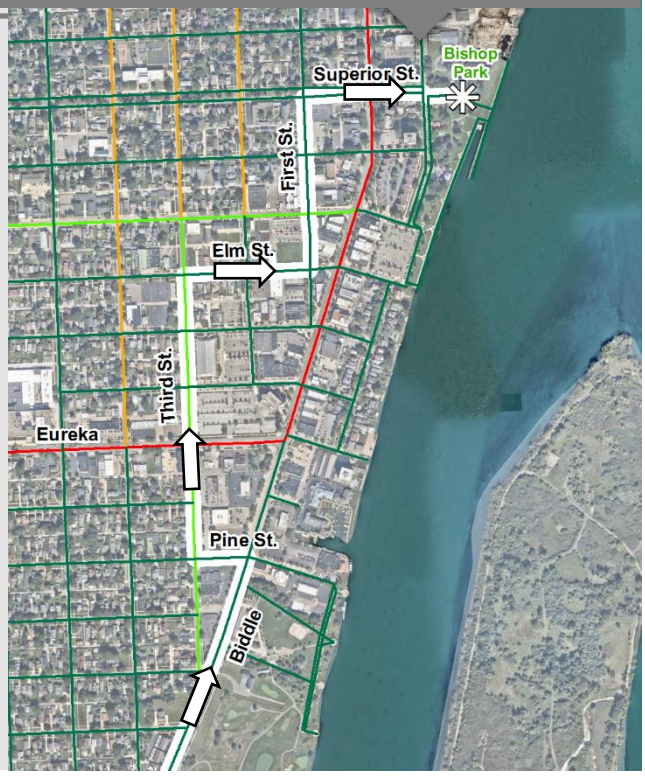
Figure 20
Types of Bicyclists by Comfort Level



Using the Bicycle Comfort Analysis for Route Planning

In the City of Wyandotte, Biddle Avenue is a major north-south corridor, and the city's core downtown. It is also unlikely comfortable for most people bicycling, as indicated in red on the map. Highly confident bicyclists may feel comfortable and choose to ride on the road there, but the majority of bicyclists are likely to choose an alternative route.

In this example, the Bicycle Comfort Analysis can assist with route planning for a bicyclist riding north along Biddle Avenue. A shared-use path provides good comfort until the rider approaches Eureka Road, where the path ends. At this point, signage may be useful in guiding a bicyclist along a more comfortable route, which is shown on the map in shades of green. One such route is along Pine Street, to Third Street, to Elm Street, to First Street, and finally to Superior Street. This route provides a more comfortable ride, and still provides access to local businesses, civic institutions, performance halls, and Bishop Park & Pier.



Pedestrian Infrastructure

Walking is a fundamental form of mobility that is essential to all other modes. Nearly every trip – including those made by car, transit, or bike – requires some amount of walking. Therefore, the function of the region's transportation system depends on a connected network of pedestrian infrastructure that provides safe places to walk. This also contributes to the economic vitality of a community and its residents. Additionally, walking is the most readily available form of exercise with the potential for positive impacts on public health and wellness.

Because walking is so flexible, the pedestrian realm can encompass both walkways and open spaces, and even range from parks to parking lots. While it is important to ensure a safe environment wherever pedestrians are present, this section focuses on dedicated pedestrian infrastructure that is specifically designed to provide access for walking – sidewalks, crosswalks, and shared-use paths. For more information on these and other pedestrian infrastructure components, see Chapter 5: Infrastructure Guidelines.

Since the adoption of the *Bicycle and Pedestrian Travel Plan* in 2014, SEMCOG has made great strides to collect more detailed and accurate information about the region's pedestrian infrastructure. At that time, benchmarks were established for shared-use paths, and areas likely to have sidewalks were estimated based on population and land-use patterns. For this plan, aerial imagery was collected and analyzed to define and understand the region's pedestrian network, including more than 24,000 miles of sidewalks (Figure 21).

Access to Pedestrian Infrastructure

Walkable access to commercial districts, schools, parks, and other destinations enhances the quality of life in a community. Pedestrian infrastructure provides critical access for people who are unable to drive, and also enhances opportunities for active lifestyles. An accessible, walkable environment also contributes to placemaking and economic development efforts.

In areas where sidewalks or walkways are unavailable, pedestrians may have no option but to walk along a roadway with little or no buffer from vehicle traffic, putting their safety at a greater risk. This can also be difficult, if not impossible, for pedestrians with visual or mobility restrictions, as the road surface and gravel shoulders are generally not designed for pedestrian use.

Figure 21
Pedestrian Infrastructure

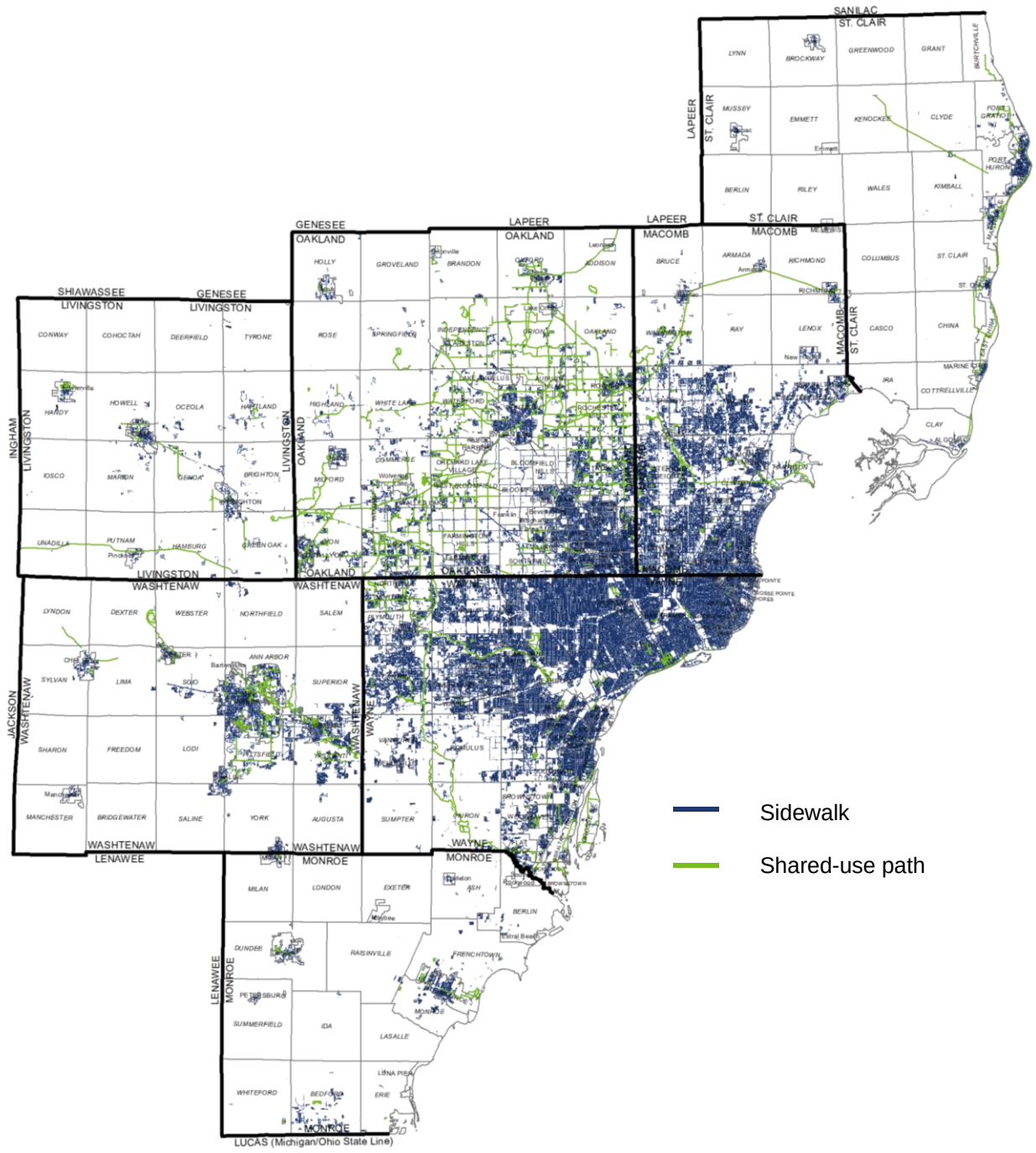


Figure 22
Summary of Crosswalk Markings

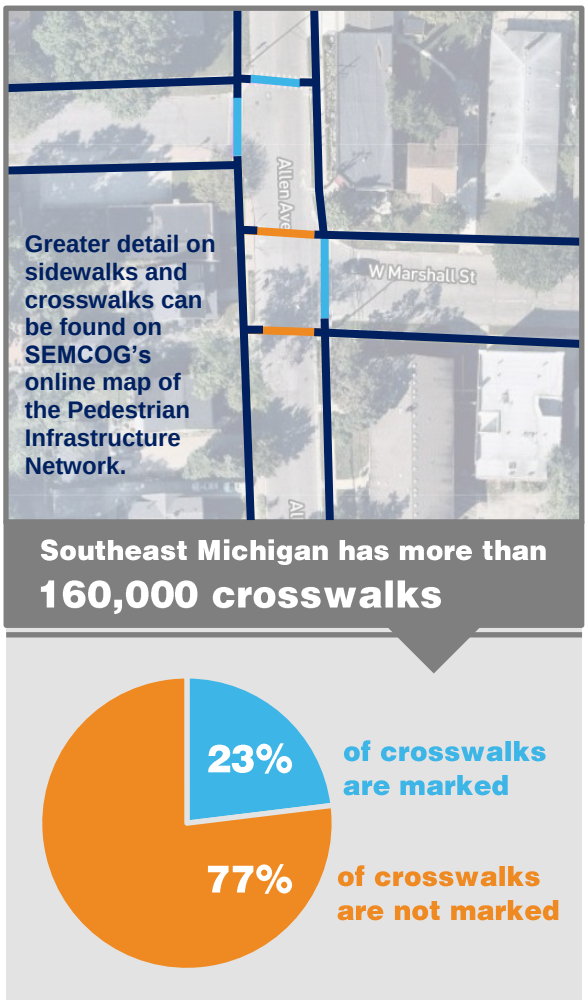


Table 5
Households within Walking Distance to Core Services

	10-minute Walk	30-minute Walk
Fixed-Route Transit	46%	64%
Health-Care Facilities	9%	51%
Libraries	5%	79%
Parks	42%	86%
Supermarkets	13%	64%

Gaps in Pedestrian Infrastructure

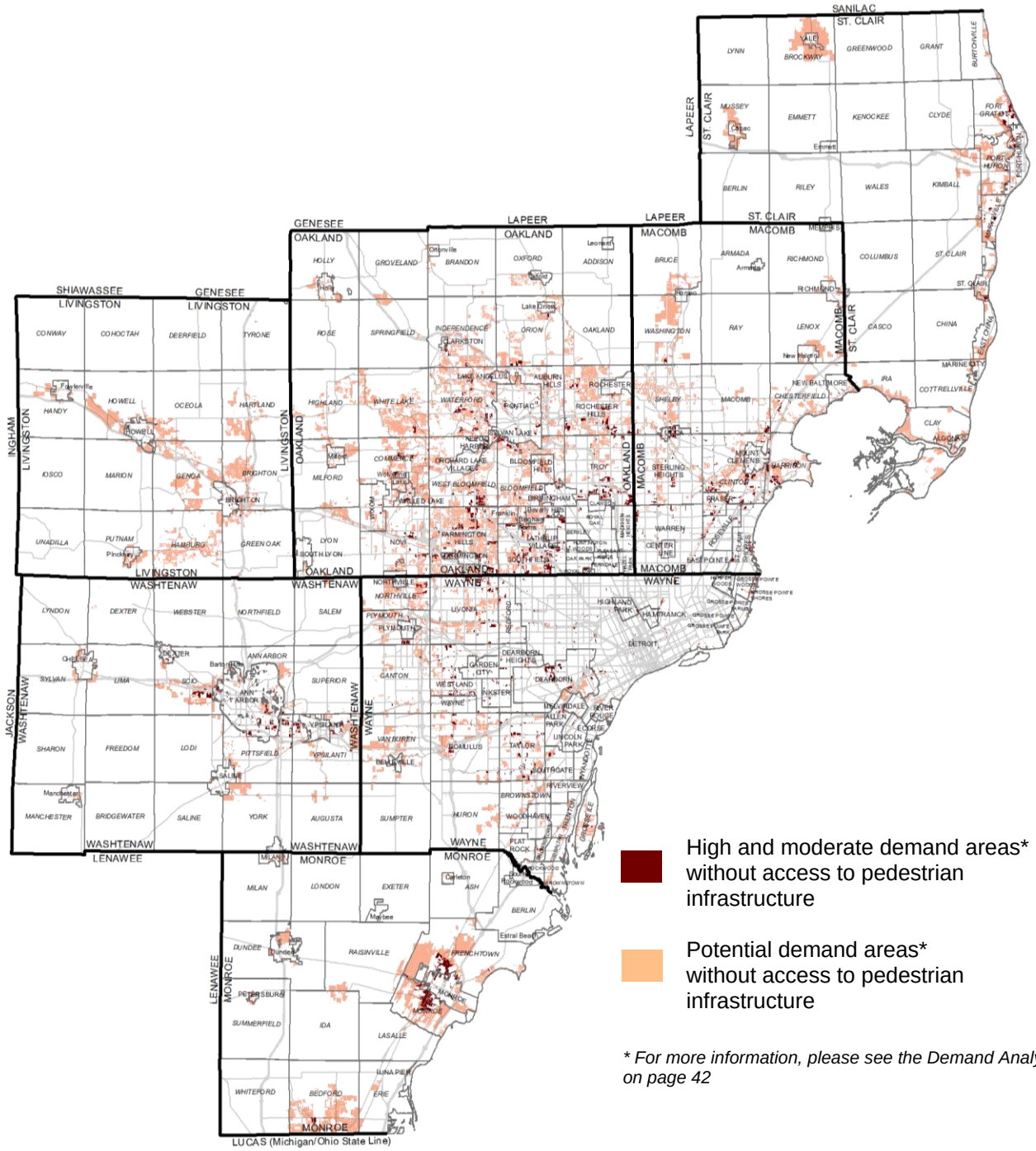
Gaps in pedestrian infrastructure are found in communities throughout Southeast Michigan. They typically exist for a reason, as in areas with lower population or fewer walkable destinations. In some cases, network components may have been developed incrementally, and the lack of connectivity limits their use. Even in areas with a well-connected sidewalk network, a lack of safe and conveniently spaced road crossings can be a significant barrier for pedestrian mobility. Regionally, gaps in pedestrian corridors often remain due to physical barriers such as crossing major roadways or waterways and narrow or insufficient right-of-way.

Due to the nature of walking, pedestrian infrastructure needs to be in close proximity to a household or destination in order to provide access. Approximately 71 percent of Southeast Michigan households have access to pedestrian infrastructure within 100 feet of their home. In addition, approximately 23 percent of the crosswalks in Southeast Michigan are marked (Figure 22). Households that have been determined to have some level of pedestrian demand, but do not have access to walking infrastructure are identified as gap areas (Figure 23). For more information, see the Demand Analysis on page 42.

Pedestrian Access to Core Services

In retrofitting streets that do not have connected or accessible pedestrian infrastructure, the highest priority should be given to locations near transit stops, schools, parks, public buildings, job centers, and other areas with high concentrations of pedestrians. SEMCOG's *Access to Core Services* report established regional benchmarks for pedestrian accessibility to several of these resources. Table 5 shows the percentage of households that are within a 10-minute and 30-minute walk to core services, regardless of whether or not a

Figure 23
Gaps in Pedestrian Infrastructure, based on Demand Areas



sidewalk or other type of pedestrian infrastructure was present. Additional analysis of travel times within the existing pedestrian network should provide a greater understanding of pedestrian accessibility.

Planning for Pedestrian Mobility

Many of the local plans shown in Figure 18 include considerations for pedestrians in addition to bicyclists. To address gaps in the pedestrian network, communities often invest in pedestrian infrastructure directly, or include requirements in their local plans and ordinances. For example, some planning efforts around sidewalk improvements occur through Capital Improvement Programs, while others are required for real estate development projects. In addition to connecting gaps and increasing access, issues related to maintenance, pedestrian behavior, and how comfortable a place is for walking should all be considered in the planning process.

Infrastructure Maintenance

The maintenance or condition of existing pedestrian infrastructure has an impact on how it is used, and how it accommodates users of all ages and abilities. Broken pavement, the absence of needed curb cuts, and unsafe intersections are all barriers to pedestrian access. These limit mobility of people with disabilities and those without access to other means of transportation. Poor infrastructure conditions can make walking less desirable. Evaluating current conditions and addressing maintenance needs will maximize the existing pedestrian networks' ability to meet community needs. For more information on Maintenance, see Chapter 6.

Pedestrian Behavior

When assessing pedestrian accessibility and gaps, it is helpful to consider typical walking distances and existing infrastructure around residential areas and destinations. The average pedestrian trip is around one half-mile, or about a 10-minute walk. Additionally, if it takes more than three minutes to reach a crosswalk (approximately 800 feet), pedestrians are generally more likely to cross along a more direct, but often less safe route. For more information, see the User Analysis on page 15.

Pedestrian Comfort Factors

Other environmental factors play a role in how comfortable a place may be for walking, such as land use and development patterns, lighting, tree canopy, as well as traffic speeds and volumes on adjacent roadways. Further analysis of these and other conditions will lead to better understanding the region's pedestrian network. Such an analysis should be used in route planning and other improvements that enhance walkability and placemaking efforts.

Regional Trails

Regional trails are a critical part of Southeast Michigan's mobility infrastructure. In addition to expanding transportation options and recreational opportunities, trails can generate economic benefits, enhance a sense of place, and help people of all ages and abilities connect to nature in a comfortable, off-road environment. With nearly 500 miles of trails in place, trails also provide connectivity that is integral to defining the network of regional corridors for walking and biking, as outlined in Chapter 2.

For the purposes of this plan, regional trails are a subset of walking and biking infrastructure, as defined previously in this section. In most cases, shared-use paths are physically separated from vehicle traffic. In many instances, however, they may include a connecting route where other walking or biking infrastructure links two segments of off-road trails. In all cases, they are regional in nature, providing linear connections between communities and counties. While the regional trail network outlined in Figure 25 meets this definition and serves as the primary arteries for connectivity, they often also include "spurs" that connect to local networks and destinations.

Regional trails accommodate a range of users in addition to people walking and biking, including runners, skaters, equestrians, and even low-speed electric vehicles. They typically have wayfinding signage and branding, which helps provide navigational resources and a consistent experience for trail users. They also often feature amenities that enhance the trail experience, including trailheads with parking, restrooms, or picnic areas along a route.

Access to Regional Trails

Existing trails can provide greater benefit if they are part of a larger, connected network, allowing more people to access more destinations. While 80 percent of households in Southeast Michigan are currently within a 10-minute drive to a regional trail, far less people live within walking or biking distance. Only five percent of households are within a 10-minute walk to a regional trail, and 25 percent are within a 10-minute bike ride (Figure 24).

Enhancing access to trails with walking and biking infrastructure can increase the likelihood they will be used for recreation or transportation. Expanding the trail network also increases opportunities to be physically active, to socialize, and to connect with nature.

Figure 24
Household Access to Regional Trails

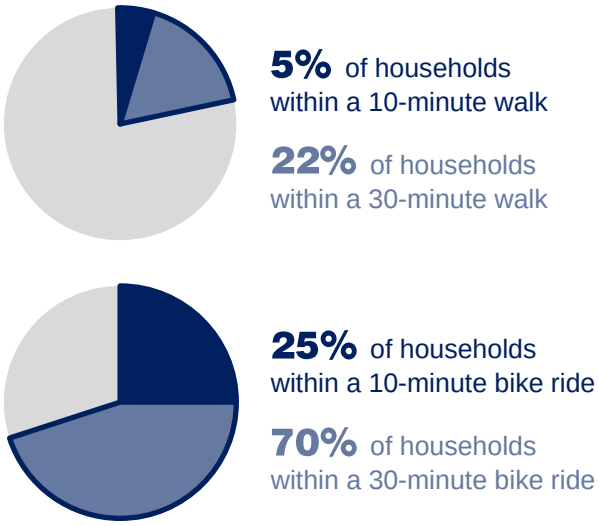
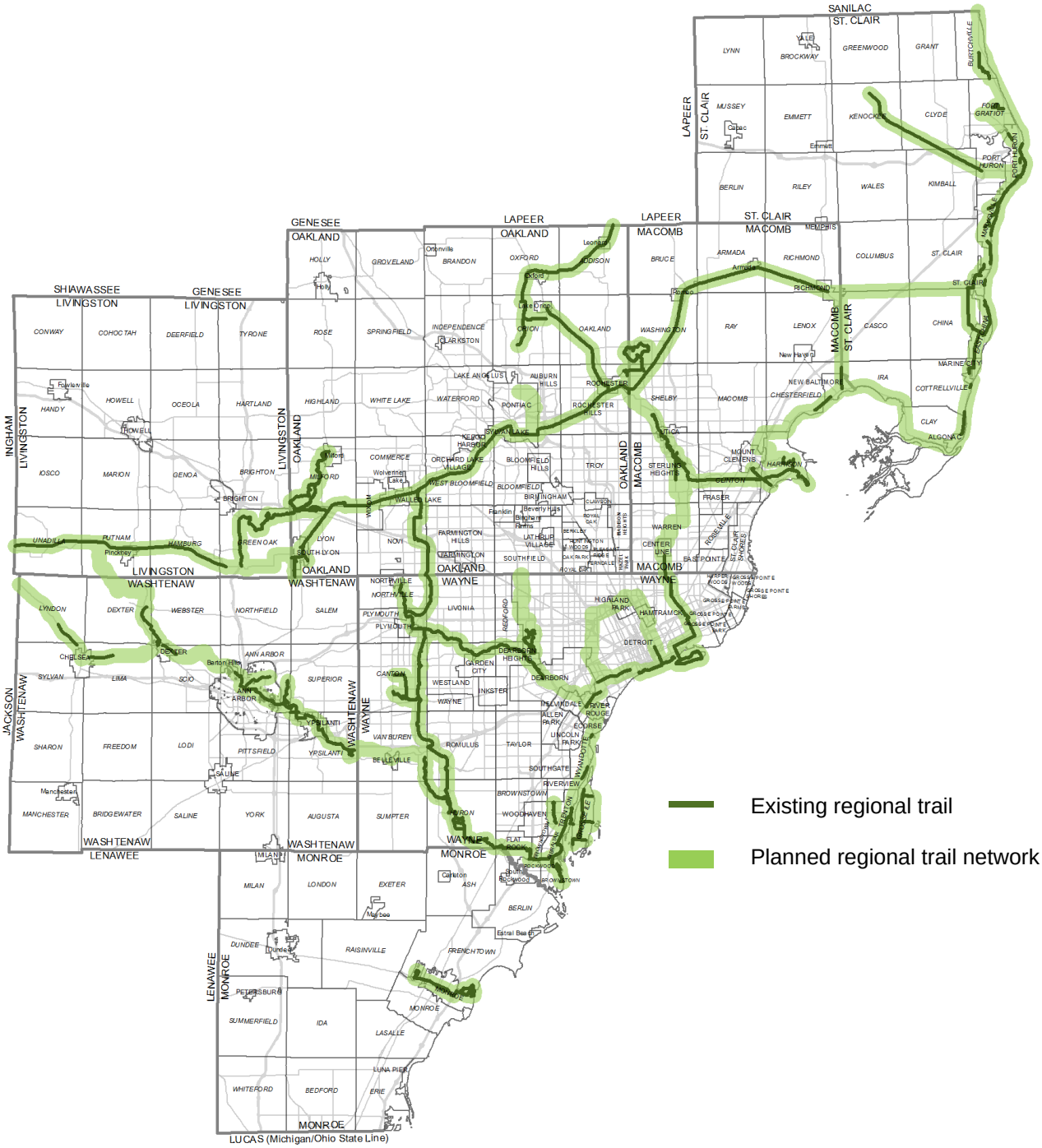


Figure 25
Regional Trail Network



Planning for Regional Trails

Regional trails are routinely cited as a top priority for Southeast Michigan communities, and have been a source of momentum for expanding walking and biking infrastructure. Statewide trail initiatives, such as Michigan's Iron Belle Trail and the Great Lake-to-Lake Trail, have brought increased attention and funding to the region's existing trails, and spurred local and regional initiatives to connect them. Efforts to plan collaboratively across jurisdictions have added to the network as well, with aims to increase access, mobility, and recreation opportunities.

To help guide trail development in the region, SEMCOG's Bicycle and Pedestrian Task Force worked with a group of trail stakeholders from local, regional, and state agencies to identify key challenges and opportunities to support a more connected and unified regional trail system.

Mapping and Planning

The *Bicycle and Pedestrian Mobility Plan* serves as the basis for integrating data and maps from local trail planning efforts in Southeast Michigan. The existing connections and gaps in the regional trail network are shown in Figure 25, and are often major components of the Regional Corridors mapped in Figure 1. In addition, the plan identifies information about local demand, safety concerns, and equity issues, which may be considered among other factors to help support funding opportunities and project prioritization.

To build on this resource, additional information is needed to understand current conditions and long-term maintenance needs on existing trail systems. While these trails are regional in nature, continued public engagement that is robust and accessible will remain important, to ensure they are designed and developed to meet local needs. Similarly, collaborative planning processes present the opportunity to build stakeholder relationships that may bring economic value to communities, such as elevating tourism through trail towns, cultural attractions, and the development of regional destinations.

Branding and Marketing

Many regional trails in Southeast Michigan have well-established, recognizable brands that are used to market them to the public and contribute to the user experience. Some may also be part of a wider-reaching route, such as Michigan's Iron Belle Trail, which brings additional branding and marketing initiatives.

However, it has been observed that many of the nation's most successful regional trail systems take a more coordinated approach, sharing information and resources in a unified way that yields greater collective results. This may take the form of public-facing maps and marketing efforts that are regional in scale, or in common guidelines

for wayfinding signage, design standards, or maintenance practices. For any of these approaches, however, it is paramount for a regional campaign to reflect and highlight existing standards and brands, rather than eclipse them. It may also be beneficial to collect data about the public's impressions of and experiences with the regional trail network, before and after marketing or branding efforts are implemented.

Funding

Regional trails serve both recreation and transportation purposes, which broadens the range of funding opportunities available for planning, development, and maintenance. It also means that the process of securing funding can be a challenge, with various programs and practices that do not offer a streamlined approach that works the same for every project. In order to streamline the process for seeking and improving success in receiving funding, it would be beneficial for funders to align and coordinate their opportunities, and to distribute information about trail funding and grants from a centralized source. In addition, opportunities through public-private partnerships and philanthropic organizations may be leveraged to help meet match requirements and offer more flexible funding solutions.

Capacity Building

These strategies will involve actions from stakeholders at all levels, each with their own capacity for implementation. An inventory of organizational resources and roles can highlight areas of overlap, and identify needs for additional support and technical assistance. This may include planning tools for community engagement, fiduciary agreements for grant-funded projects, or best practices for incorporating trails with economic development strategies. Capacity is a particular concern for trail maintenance, as funding is limited and responsibilities typically span community boundaries.

Demand Analysis

This section identifies areas with demand for bicycle and pedestrian trips. It is based on concentrations of people and destinations, and may be used to understand which areas already support a high level of bicycle and pedestrian mobility, along with where more trips are likely to occur if infrastructure, policies, and programs were in place.

Throughout Southeast Michigan, there is demand for new and enhanced walking and biking infrastructure. Connecting and expanding the region's bicycle and pedestrian network was consistently referenced as a top priority in stakeholder input sessions. It is important for communities to invest in these improvements strategically, with projects that meet local needs and that align with a regional vision. Factors related to population distribution, demographics, destinations, and existing mobility patterns can influence the level of demand for walking and biking. This demand analysis quantifies these and other factors, and may be used to identify locations where bicycle and pedestrian improvements could be most impactful. A detailed methodology for this analysis is included as Appendix G. The following findings highlight areas of opportunity for enhancing the network. In some cases, it illustrates gaps in the network where new connections should be prioritized. In others, it includes areas where it is currently possible to walk or bike, but where there may be opportunities for increased safety measures, promotional efforts, or supporting infrastructure, such as signage, bike parking, or benches. This analysis can also be used to target areas where walking and biking have the potential to serve a greater transportation function, supporting local planning efforts, infrastructure development, and policy-based solutions.

Levels of Demand

Demand has been assessed in three categories – areas of high demand, moderate demand, and potential demand (Figure 26). Table 6 provides context for these areas, and outlines different planning and development considerations based on the level of demand. While the categories shown here cover approximately one-quarter of Southeast Michigan's land area, together they represent 85 percent of the region's households, contain 85 percent of existing biking infrastructure, and 94 percent of pedestrian infrastructure. They also provide access to the majority of the region's core services. It is important to note that while this analysis is calibrated at the regional scale, it may be adjusted for local geographies to provide greater detail and assistance with project planning.

For areas of the region not identified with high, moderate, or potential demand, planning for and providing bicycle and pedestrian infrastructure is still valuable. While the regional bicycle and pedestrian corridors identified previously in Chapter 2 were established in part to connect demand areas, they typically pass through areas of lower demand in order to do so. In fact, many areas with lower demand correspond with gaps in the network, where bicycle and pedestrian improvements will be key to ensuring regional connectivity. As this analysis is based on connecting clusters of people and activities, areas with lower demand may also provide greater opportunities for recreation and regional trails, where connections to remote, natural settings enhance the user experience.

Figure 26
Bicycle and Pedestrian Demand Areas

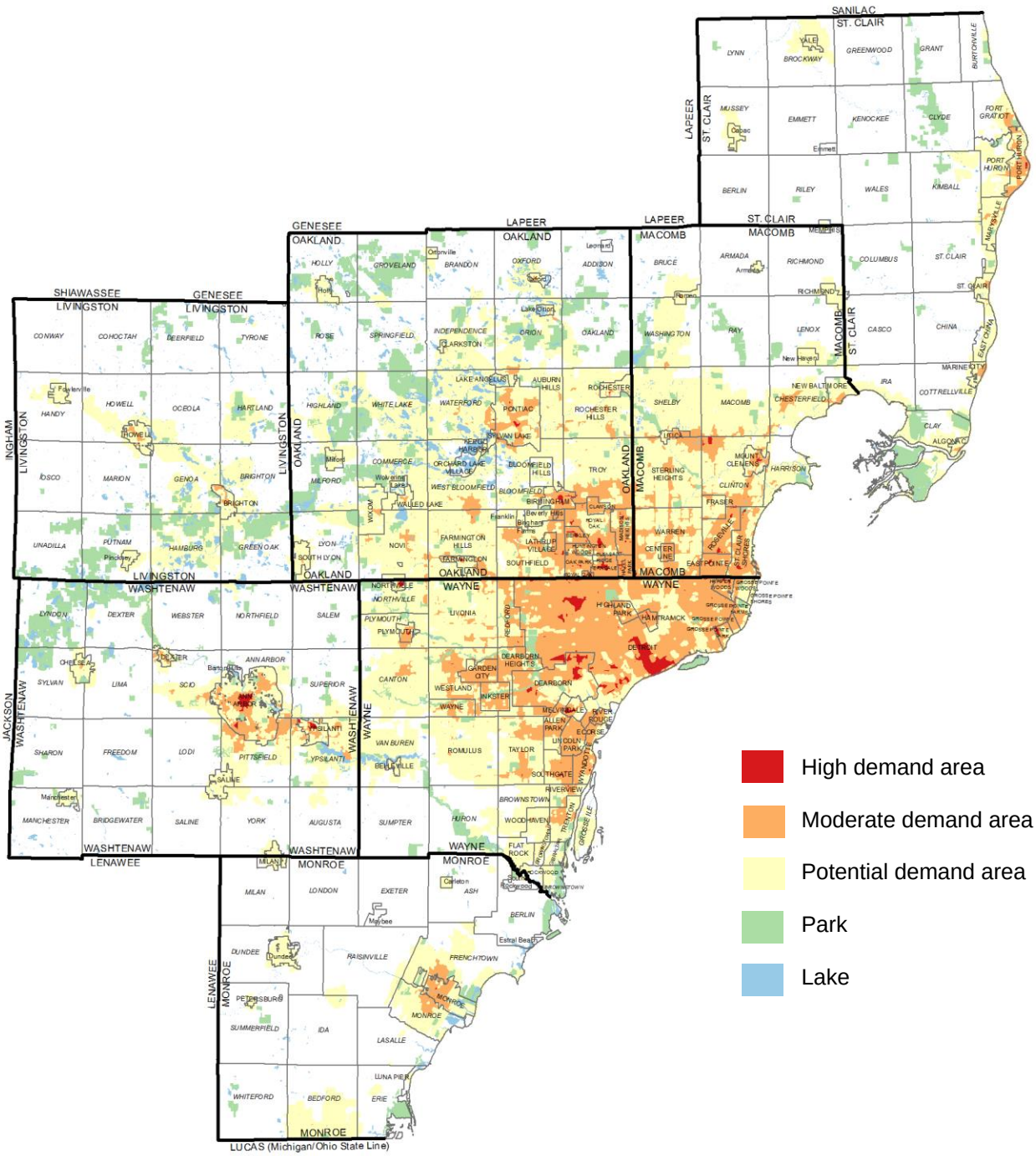


Table 6
Planning and Development Context for Demand Areas

Context	**High Demand Areas** are likely to be the most bicycle and pedestrian friendly parts of the region, or those with the most potential to support more people walking and biking. They include larger downtown commercial districts, employment centers, and most densely populated areas. With higher demand, there is also typically greater competition for space within the right-of-way. In these places, planning, programming, and policies that support walking and biking should be a central part of any transportation project.	**Moderate Demand Areas** include many of the region's smaller town centers, as well as areas adjacent to high demand areas. They are primarily residential areas, with commercial development along major roadways and intersections. These places are likely to support walking and biking, but in many cases driving is still necessary for daily trips. They often include transit services along major roads, and grid-patterned residential streets that provide many options for comfortable walking or biking routes.	**Potential Demand Areas** tend to be less densely populated with people or destinations, but have clusters of activity that may support walking and biking if adequate infrastructure exists. Road networks in these areas may be less developed, making travel times less suited for walking and biking trips, which are typically shorter in distance. These areas are also typically less connected with fixed-route transit, so bicycle and pedestrian mobility is more localized, or recreational in nature.
Implementation Considerations	• Develop on-street bikeways to better accommodate micro-mobility options while making more room on sidewalks for pedestrians and placemaking enhancements. • Prioritize walking and biking travel needs over motor vehicle needs on specific streets or corridors. • Coordinate roadway improvements with transit agencies to ensure timely transit service. • Ensure bicycle parking and other amenities are included with new real estate developments. • Use traffic calming and protected intersections to ensure safety for all roadway users. • Create programs that promote and incentivize workers and visitors to walk, bike, or take transit. • Develop an education and enforcement program that centers on urban biking and walking issues.	• Develop networks of high comfort bikeways that connect residential areas to commercial areas and transit service, including: – Shared-use paths, buffered or protected bike lanes along major arterials roadways; – Conventional bike lanes on collector roadways; – Neighborhood greenways that provide the first and last miles to biking and transit trips. • Ensure connectivity and maintenance of sidewalks, generally on both sides of the street and easy access to signalized crosswalks. • Incorporate bicycle and pedestrian accommodations at transit stops, including shelters, bicycle parking, and nearby crosswalks. • Develop education and encouragement campaigns for all roadway users, especially on the need to share the road, follow crosswalk-yielding laws, and promote nighttime visibility.	• Implement a program to fill sidewalk gaps. • Encourage new subdivisions to develop gridded street networks. • Provide shared-use paths on major roadways when possible. • Use best practices such as pedestrian lanes, shoulder bike lanes, and wide-paved shoulders to fill gaps where other facilities are not feasible. • Provide strategic investments to connect to the regional transit network. • Designate Trail Towns in communities along regional trail routes. • Create access management plans to consolidate driveways and make the roads safer for all roadway users. • Develop education and enforcement campaigns that center on suburban and rural walking and biking issues.

Demand Area Benchmarks

As actions are taken to meet demand for walking and biking throughout the region, progress can be measured based on improvements to current conditions. The following benchmarks (Tables 7, 8, and 9) compare the existing network for each level of demand with factors related to the analyses in this chapter, and the policies and actions recommended in Chapter 2. These are connecting and expanding the network, ensuring equitable access to core services and destinations, and increasing safety for bicyclists and pedestrians.

Table 7

Infrastructure Benchmarks by Demand Area

	High Demand	Moderate Demand	Potential Demand
Bicycle Infrastructure *Percentage of road network with bicycle infrastructure*	 **9%** bikeways **116** miles	 **6%** bikeways **514** miles	 **10%** bikeways **826** miles
High-Comfort Roadways *Percentage and miles of road network determined to be most comfortable for biking*	 **74%** of roads **1,031** miles	 **81%** of roads **7,392** miles	 **79%** of roads **6,986** miles
Sidewalks *Percentage and miles of roadways adjacent to a sidewalk*	 **70%** of roads **1,957** miles	 **66%** of roads **11,932** miles	 **53%** of roads **9,405** miles
Crosswalks *Percentage and number of crosswalks that are marked*	 **36%** marked **6,445** crosswalks	 **19%** marked **19,651** crosswalks	 **27%** marked **11,238** crosswalks
Regional Trails *Percentage of existing regional trail network, compared to potential build-out based on current plans.*	 **4%** of current network **5%** with gaps filled	 **36%** of current network **39%** with gaps filled	 **56%** of current network **59%** with gaps filled

Table 8
Accessibility Benchmarks by Demand Area

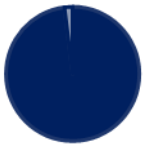
	High Demand	Moderate Demand	Potential Demand
Bicycle Infrastructure *Households within one-half mile of any bikeway*	 **67%** of households	 **60%** of households	 **76%** of households
Pedestrian Infrastructure *Households within 100 feet of sidewalks or shared-use paths*	 **99%** of households	 **95%** of households	 **72%** of households
Employment *Share of regional employment and job density*	 **11%** of regional jobs **7,568** jobs per mi^2	 **41%** of regional jobs **2,613** jobs per mi^2	 **38%** of regional jobs **1,098** jobs per mi^2
Core Services per mi^2 — **Fixed-Route Transit Stops**	**71.3**	**22.7**	**1.6**
Health-Care Facilities	**1.4**	**0.4**	**0.1**
Libraries	**0.8**	**0.2**	**0.1**
Parks	**4.2**	**2.7**	**1.0**
Schools	**3.1**	**1.5**	**0.6**
Supermarkets	**2.6**	**0.9**	**0.2**

Table 9
Safety Benchmarks by Demand Area

	High Demand	Moderate Demand	Potential Demand
Crashes *Percentage of all bicycle and pedestrian crashes in the region*	 **22%** of crashes	 **58%** of crashes	 **16%** of crashes
Crash Severity *Percentage of bicycle and pedestrian crashes resulting in fatalities or serious injuries*	 **16%** of crashes	 **58%** of crashes	 **19%** of crashes

Equity Analysis

This section identifies populations within the region through an equity lens based on socioeconomic factors that may affect their mobility. Walking and biking infrastructure can lead to many positive benefits for a community, and this analysis can be used to ensure that the system is accessible for people of all ages, abilities, and backgrounds.

An equitable transportation system includes bicycle and pedestrian mobility options to connect more people to the places they need to go. There are certain populations with greater social and economic needs that may impact their mobility options. The goal of this analysis is to identify demographic factors that can show populations and neighborhoods which may rely more on walking or biking for daily transportation and, therefore, have a greater need for safe and accessible pedestrian and bicycle infrastructure.

In short, the goal of transportation equity is to facilitate access to opportunities by providing affordable and reliable transportation options based on the needs of the people they serve. The region's bicycle and pedestrian network is key to achieving this goal. For this analysis, populations were grouped into equitable emphasis areas ranging in low to high concentrations. Those areas identified as "High" are likely to include populations that are particularly reliant on the bicycle and pedestrian network, as well as first- and last-mile connections to the region's public transit system. In determining these concentrations, five socioeconomic indicators were used, as shown below. Detailed methodology for the Equity Analysis is in Appendix F.

Concentration of Equity Populations

Children Population
Population aged 17 and under, which accounts for 1,054,290 persons (22 percent of Southeast Michigan's total population).

Low-Income Households
Households in the lowest income quartile for the region. There are 465,635 (25 percent of all households) low-income households in the region.

Minority Population
Persons belonging to any of the following groups – Black; Hispanic; Asian; American Indian and Alaskan Native. The region's minority population is 1,446,089 (31 percent of the total population).

Senior Population
Population aged 65 and older, which accounts for 696,810 persons (15 percent of the region's total population).

Transit-Dependent Households
Combines zero-car households and households with fewer cars available than workers (+16 years of age). There are 143,358 (7.8 percent) households without an automobile; an additional 138,341 (7.5 percent) of households have fewer automobiles available than workers. Transit-dependent households account for 12.5 percent of the region's households.

Figure 27
Concentration of Equity Populations

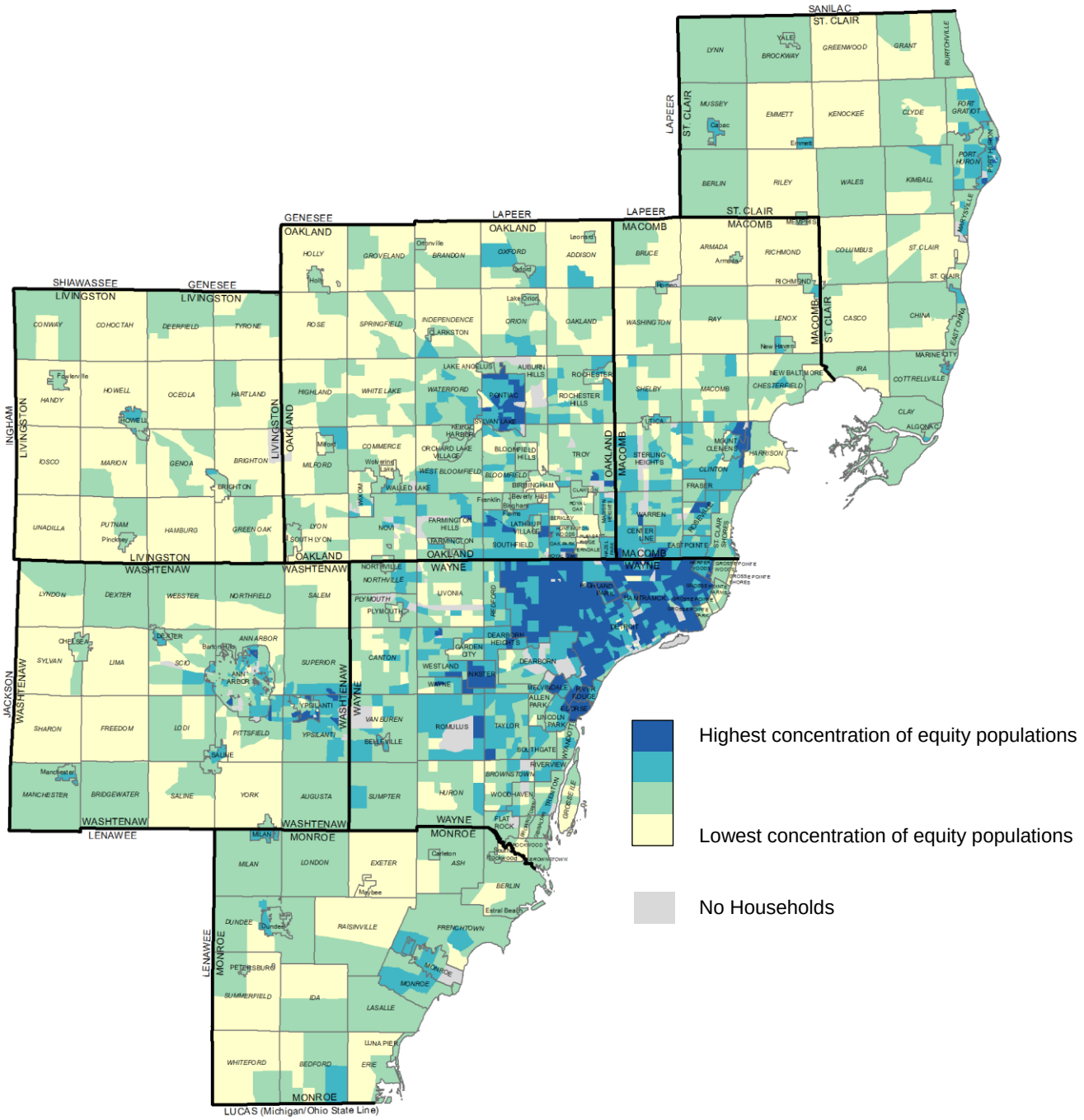


Figure 27 shows the concentration of equity populations based on the cumulative score across all five of the socioeconomic indicators. The darkest blue-shaded areas represent the highest concentration of populations who likely rely more heavily on bicycling, walking, or taking transit to meet their mobility needs. The yellow-shaded areas represent the lowest concentration of populations who likely need these transportation modes to meet their needs.

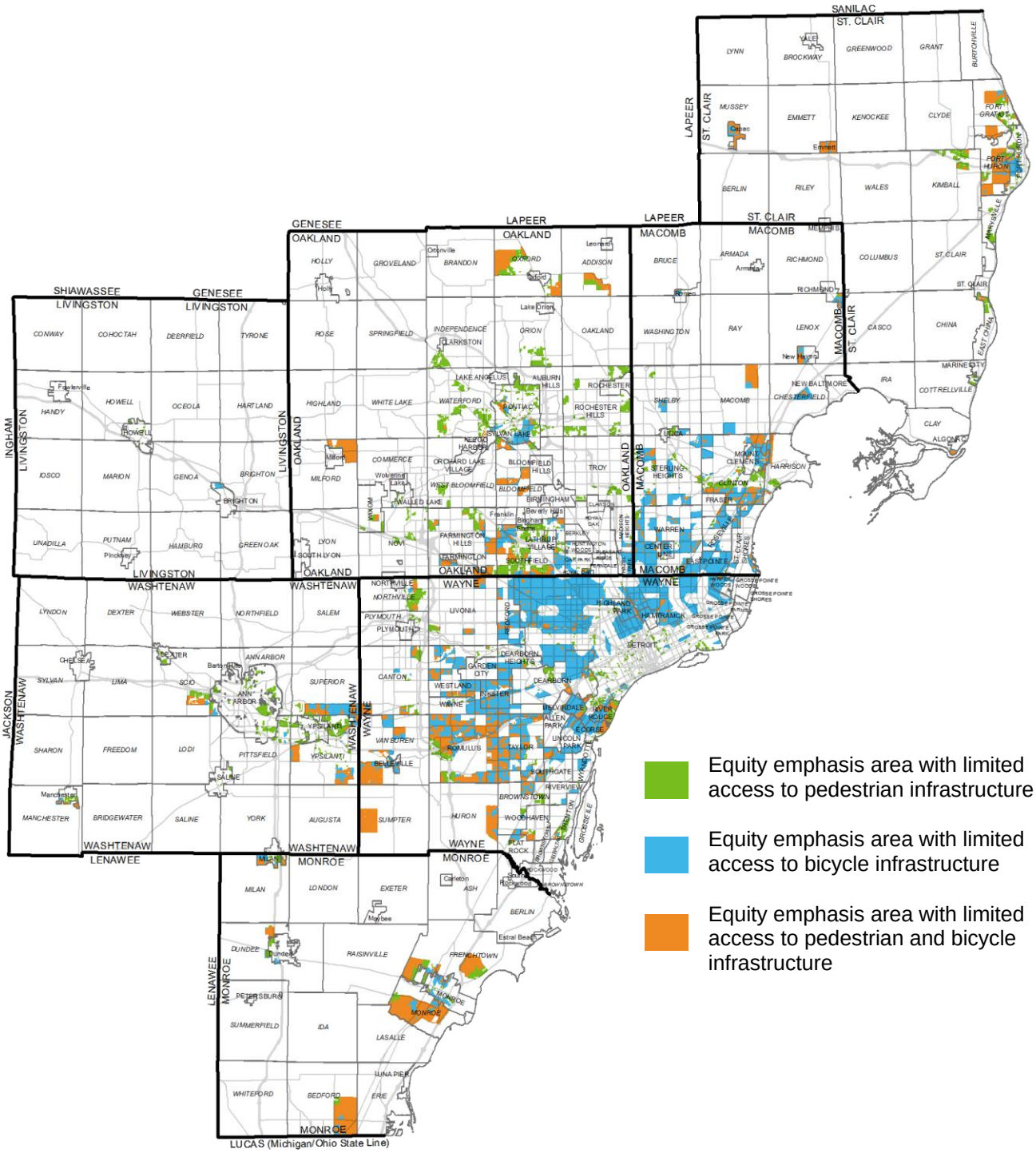
Improving the ability of people in the higher concentration areas, especially those areas shaded dark blue and lighter blue, to safely walk and bike is essential to achieving a transportation system that provides equitable access to jobs, schools, health-care services, social gatherings, and other destinations. While expanding mobility options and infrastructure to better connect people and places is important, it is not the only factor in creating more equitable access. Efforts to better align the location and proximity of core services to meet the needs and demands of residents is needed, especially for those identified by the socioeconomic indicators outlined above. Increased coordination and planning is also needed to decrease barriers to accessing both transportation options and desired destinations.

Figure 28 shows Equity Emphasis Areas in the region based upon the two highest concentrations of populations most likely to rely on biking or walking to meet their daily needs (dark and light blue shaded areas in Figure 27). Within these areas, access to existing pedestrian and bicycle infrastructure was measured to identify areas that are:

- Beyond 100 feet from the nearest sidewalk or shared-use path
- Beyond one-half mile from the nearest bicycle infrastructure
- Beyond both 100 feet from the nearest pedestrian infrastructure and one-half mile from nearest bicycle infrastructure

These emphasis areas, combined with the identified gaps in bicycle and pedestrian infrastructure shown in Figures 17 and 24, highlight opportunities to both plan for new infrastructure, and enhance and maintain existing infrastructure.

Figure 28
Equity Emphasis Areas



Safety Analysis

This section examines traffic crashes involving pedestrians and bicyclists over the past five years. It may be used as a starting point to determine where infrastructure improvements would be most effective at solving traffic safety issues.

Pedestrians and bicyclists are the most vulnerable roadway users in Southeast Michigan. Over the past five years, less than two percent of crashes in the region have involved people walking or biking, but they have accounted for nearly 30 percent of traffic fatalities. On average, more than 100 bicyclists and pedestrians are killed in crashes each year in the region. Furthermore, the Federal Highway Administration identifies the State of Michigan and City of Detroit as a Pedestrian and Bicycle Safety Focus State and City due to the high number of annual fatalities for pedestrians and bicyclists.

Crashes involving pedestrians are more common and pose a greater risk of a fatality or serious injury than those with bicyclists. Of all nonmotorized crashes between 2014 and 2018, approximately 58 percent involved pedestrians and 42 percent involved bicyclists. Of those, approximately 23 percent of pedestrian crashes resulted in fatality or serious injury, compared to eight percent of bicycle crashes. The likelihood of an injury in these crashes is much higher, however, as 84 percent of pedestrian and bicycle crashes resulted in some type of injury or fatality.

Figure 29 summarizes these regional trends since adoption of SEMCOG's *2014 Bicycle and Pedestrian Travel Plan*. While there has been a slight increase in the number of pedestrian crashes, they have resulted in fewer fatalities and serious injuries. For bicyclists, however, crashes have decreased along with fatalities and serious injuries.

Figure 29
Crash Analysis Trends, 2014-2018

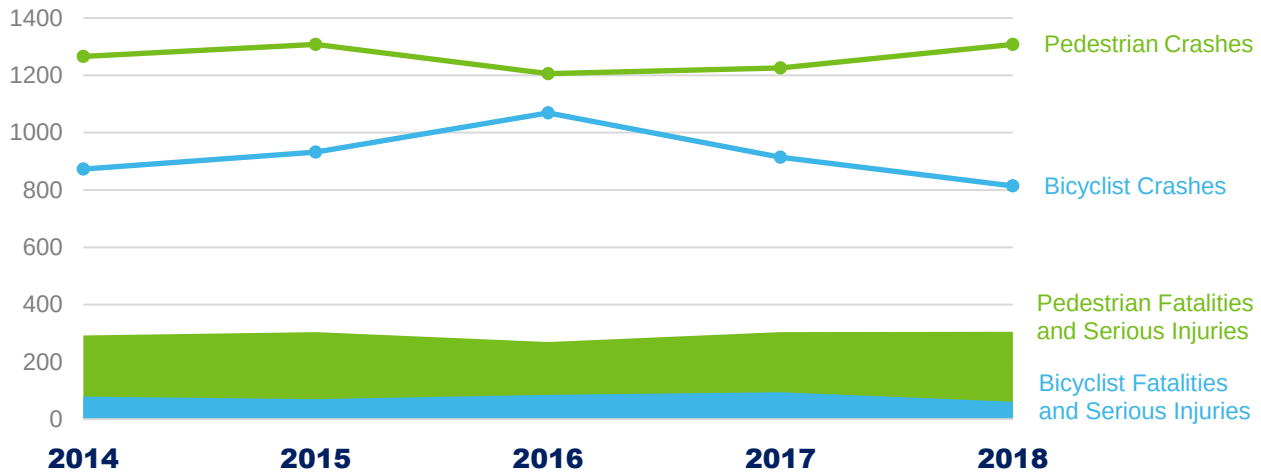


Figure 30

Location of Bicycle and Pedestrian Crashes Resulting in Fatality or Serious Injury, 2014-2018

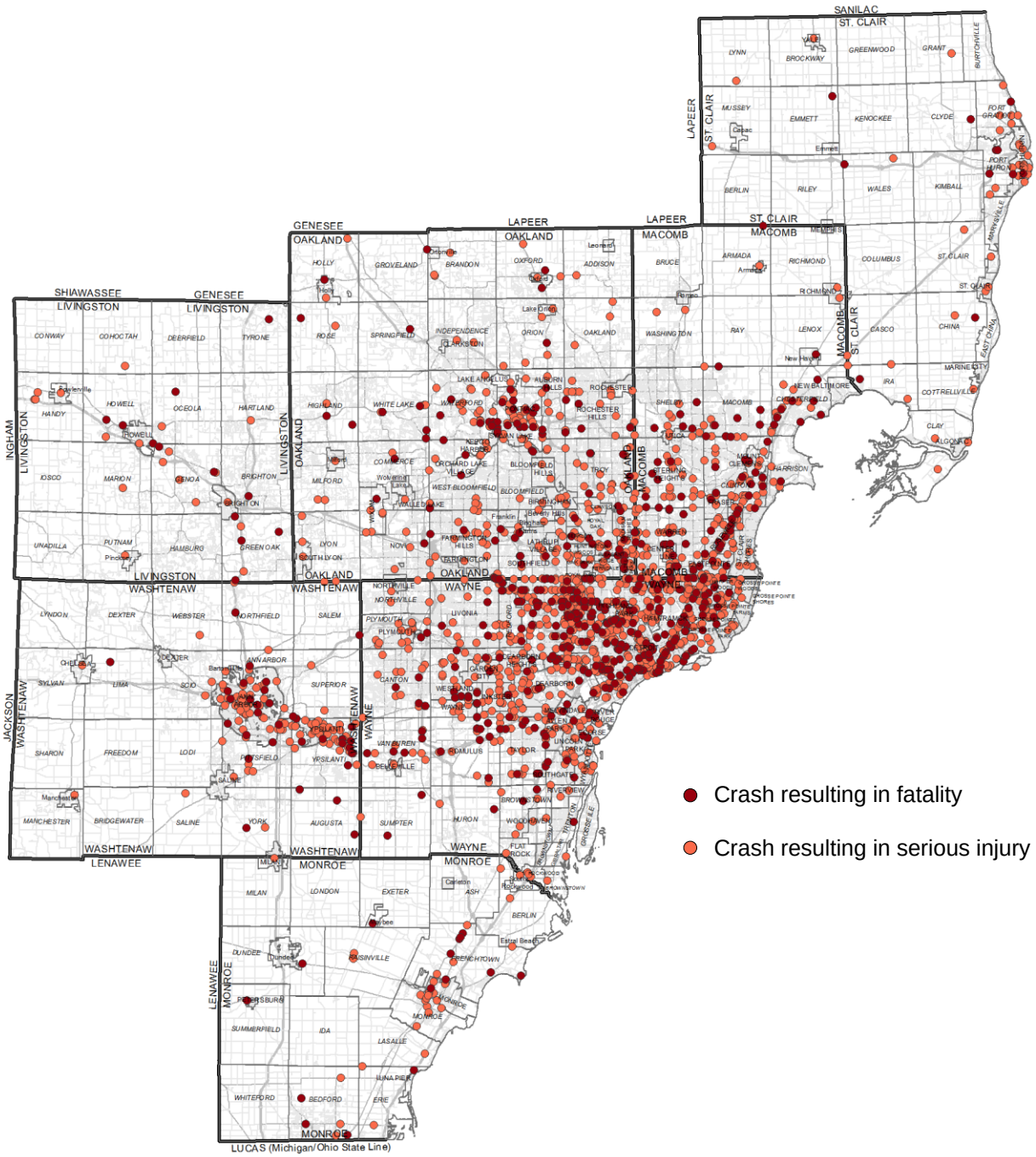
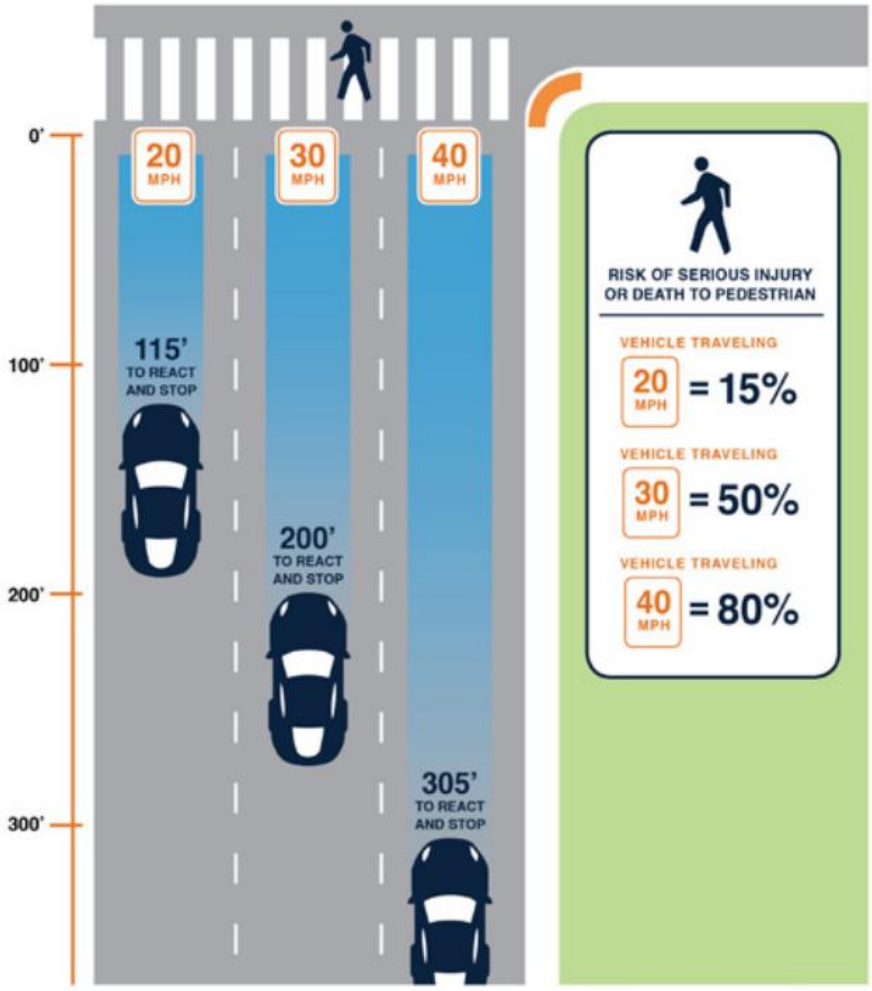


Figure 30 displays the location of all bicycle and pedestrian crashes that occurred in the region between 2014 and 2018. A comprehensive analysis of pedestrian and bicycle crashes can be challenging, as they are typically underreported to law enforcement, and traffic crash reports are only made when a vehicle is involved, excluding incidents between two bicyclists, for example. Crashes are also widely distributed across the transportation network, so trends and treatments will vary depending on local context. As a result, systemic safety programs and risk-based analysis methods are more effective in identifying where to specifically apply engineering focused pedestrian and bicycle safety improvements.

Bicycle and Pedestrian Safety Risks

Walking is generally less safe in areas where vehicles are moving at higher speeds. Approximately 62 percent of crashes resulting in pedestrian fatalities or serious injuries happen on roads with a posted speed greater than 30 miles per hour. Because of their slower travel speed, pedestrians are more sensitive to delays and detours that affect their mobility. This can also lead to risky crossing behavior, as pedestrians are often without dedicated infrastructure to ensure their safety, and may be exposed to traffic longer as they cross. Figure 31 illustrates the impact speed has on the survival rates of pedestrians, supporting the essential role for traffic-calming measures in reducing the frequency and severity of crashes.

Figure 31
Impacts of Vehicle Speed in Pedestrian Crashes



Unlike motor vehicles and bicycles, pedestrians can easily bypass curbs and other typical roadway elements that are designed to deter different road users from interacting at undefined spots. This means a pedestrian can cross a street in almost any spot, posing a greater risk of a crash where motorists might not be expecting them. Regionally, approximately 71 percent of pedestrian crashes happen outside of a crosswalk.

The likelihood of a crash between a bicyclist and a motor vehicle can vary depending on roadway and land-use context, bicyclist and driver behavior, and other conditions. Many drivers have little training on how to interact with new bicycling-related infrastructure or are unaware of bicycle-related traffic laws, like Michigan's three-foot passing law. Often, bicyclists also have little training on best safety practices or are unaware that they must comply with all traffic laws when riding in the road. Lighting is a consistent factor as more than two-thirds of fatal bicycle crashes happen in the dark.

Increasing Bicycle and Pedestrian Safety

Expanding and enhancing the region's bicycle and pedestrian infrastructure network will increase safety for all road users. It is important to provide safe walking and biking access for all people, including treatments that expand mobility options for people with disabilities. Ensuring clear and consistent design of bicycle and pedestrian infrastructure will increase safety and accessibility for people who walk and bike, while encouraging predictable behavior and alerting motorists to their presence.

In addition, it is essential to educate people who walk, bike, and drive about the risks and responsibilities associated with each travel mode. Law enforcement also plays a major role in promoting safe travel practices and increasing awareness of the rules-of-the-road for all travelers.

Regional Highlight: Walk.Bike.Drive.Safe

SEMCOG launched the *Walk.Bike.Drive. Safe* education campaign in 2018. The goal of this campaign is to reduce the number and severity of traffic crashes involving people who walk and bike, while building respect and understanding among all road users. In partnership with local governments and agencies throughout Southeast Michigan, SEMCOG is working to improve traffic safety through education with the media, at community events, and with giveaway materials.

The campaign targets key behaviors based on data and the emphasis areas in the *Southeast Michigan Traffic Safety Plan*. Key messages are staying aware and watching for pedestrians and bicyclists especially before turning, leaving at least three feet when passing bicyclists, being seen especially in dark conditions, and how to walk and cross safely when there are no sidewalks or crosswalks. Additional messaging is about understanding state traffic laws and correctly using infrastructure.

Public service billboards, radio announcements, TV spots, at-the-pump gas station video messages, and social media posts ran across the Southeast Michigan media landscape in the fall and spring. In addition, educational videos, graphics, and safety tips in English, Spanish, and Arabic were made available for downloading and posting on the *Walk.Bike.Drive. Safe* website. With support from 140 member communities and partner agencies, the campaign has had more than 80 million impressions and distributed thousands of safety materials to residents.

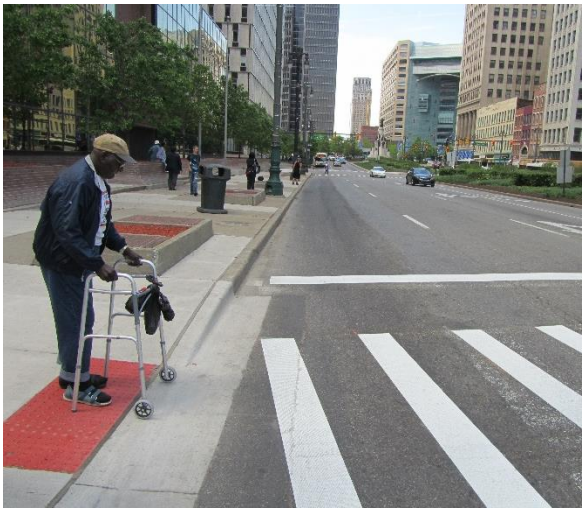
Chapter 4: Local Implementation Resources

Improving conditions for walking and biking in Southeast Michigan will occur largely through local initiatives, and benefit from regional coordination. This chapter serves as a regional guide for local communities on policies, best practices, and emerging trends for advancing bicycle and pedestrian mobility.

Developing a safe, connected transportation system for walking and biking hinges on policies, and practices that include bicycle and pedestrian mobility considerations in routine decision-making processes. Additionally, emerging trends and technologies have the potential to play an important role in bicycle and pedestrian mobility, and transform the region's transportation system. This section provides information and resources on common approaches to implementing bicycle and pedestrian improvements, and includes regional highlights from Southeast Michigan communities. The resources in this chapter are summarized by topic area below in Table 10.

Table 10
Index of Resources for Local Implementation

ADA and Universal Design



Overview

Enacted in 1990, the Americans with Disabilities Act (ADA) prohibits discrimination against people with disabilities. This means new roadways, sidewalks, and shared-use paths must be designed to accommodate the needs of people with disabilities. It also requires that existing facilities be upgraded when a planned project is implemented. Communities and road agencies are required by law to have an ADA transition plan to guide the retrofitting of bicycle and pedestrian infrastructure that does not meet the needs of people with disabilities. Failure to make improvements can result in lawsuits and fines and forfeiture of federal funds for projects.

Universal design is the concept that all elements of the built environment be accessible for people of all ages and abilities. This approach goes beyond the legal requirements of ADA to actively design spaces that are more equitable, flexible, intuitive, and accessible for anyone to use. By implementing universally accessible designs, communities are improving mobility for all, including parents with strollers, travelers with luggage, and freight deliveries.

Regional Context

- In many parts of the region, there is aging infrastructure that predates the passage of ADA, and needs enhancement. Similarly, infrastructure that is ADA compliant must be adequately maintained to ensure its accessibility.
- ADA Michigan provides technical assistance, trainings, and grant opportunities to support ADA transitions and planning.

Implementation Considerations

- ADA defines specific design standards for bicycle and pedestrian infrastructure, including elements such as sidewalk widths, pathway slopes, surface materials, elimination of obstacles, crosswalk indicators, and audible signals. It is required for all public transportation projects and maintenance activities to comply with ADA standards.
- When planning for universal design, it is important to involve community members with disabilities in the process to ensure a project will meet their needs. This level of engagement is also a requirement for some grant programs, such as the Michigan Natural Resources Trust Fund.

Additional Resources

- *Accessibility Standards*; Americans with Disabilities Act
- ADA Michigan

Bicycle and Pedestrian Counts

Overview

Bicycle and pedestrian counts are an important element of transportation planning. By measuring use over specific time periods, communities and road agencies can determine what type of transportation infrastructure is justified at a given location. Counts can also be used to measure the impact of a project, and how new infrastructure has affected the number of people walking or biking. Understanding more about these patterns can help optimize the timing of traffic signals and crosswalks, and determine if new land-use developments will require new transportation infrastructure.

Methods of collecting bicycle and pedestrian counts can vary by community, agency, road, or trail corridor, or be based on the needs of a specific project. Techniques can be as simple as manually counting road users by hand, or as complex as using artificial intelligence software to analyze video footage of traffic. Other common approaches include devices with tubes, plates, pressure pads, magnets, or infrared sensors that are used to count road users. Many agencies are also exploring big data collected from cell phone apps and GPS to supplement these efforts.

Regional Context

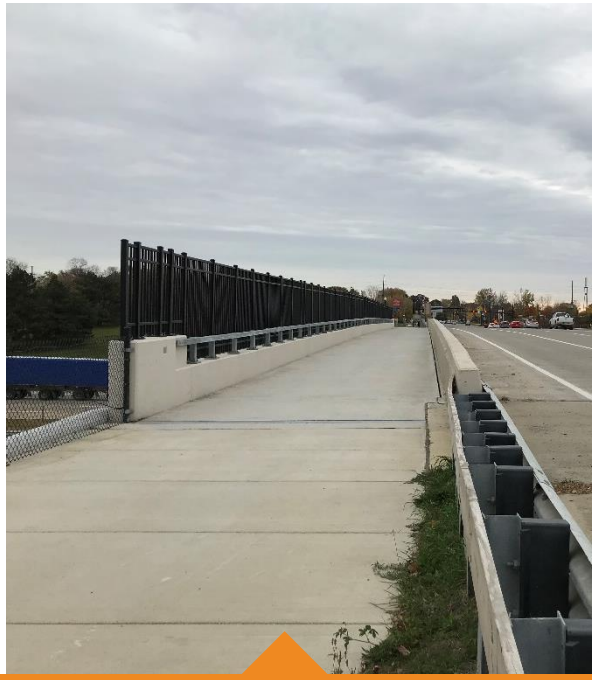
- Through SEMCOG's Bicycle and Pedestrian Count Program, nearly 200 short-duration counts have been conducted in the region. These generally represent a 16-hour period on a single day at a fixed location. As more counts are completed, the results are updated on an online map.

Implementation Considerations

- Similar to conventional traffic counts, bicycle and pedestrian counts should be taken over specific time periods, based on planning needs.
- Short-duration counts may occur over several hours to several days. They are useful to capture specific event traffic, peak-hour use, and project-specific issues. Typically, these need to be adjusted based on other data to understand long-term patterns.
- Medium-duration counts are not permanently fixed, but operate long enough to normalize the volatility in hourly or daily short-duration counts.
- Long-duration counts are usually permanent automatic traffic recorders installed at a select location across a larger geography, and used to record changes in use on a monthly, seasonally, or yearly basis.

Additional Resources

- SEMCOG Bicycle and Pedestrian Counts Map
- *Bicycle and Pedestrian Resources for Transportation Professionals*; MDOT



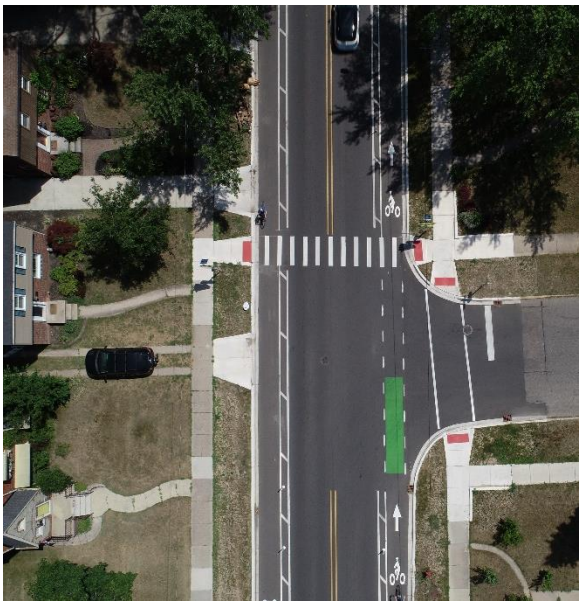
Regional Highlight: Van Buren Township

Van Buren Township is a growing community bisected by Interstate 94. Much of the commercial development is on the north side of the freeway, while regional parks, lake access, core services, and the City of Belleville are on the south side.

Belleville Road is a major north-south corridor with many core services and destinations that were not easily accessible for people walking or biking. The bridge over I-94 did not include any dedicated infrastructure, resulting in people walking along the shoulder or in the travel lanes when crossing the freeway. This included school children, people in wheelchairs, and parents with strollers. By analyzing crash data and using SEMCOG's Bicycle and Pedestrian Count Program over several different time periods, the township was able to show the need for an enhanced and safe crossing of I-94 along Belleville Road.

Through a TAP grant, the township completed a dedicated multi-use connection in 2019 that included a 14-foot-wide path, pedestrian-oriented lighting, and enhanced and marked crosswalks at on-and off-ramps.

Complete Streets



Overview

Complete streets are roadways planned, designed, and constructed to be context-sensitive and address the needs of all travelers, including people who walk, bicycle, take transit, or drive. A complete street can also include greening of the streetscape and managing stormwater runoff from roadways through green infrastructure or "green streets" approaches. Doing so creates sustainability and can improve economic vitality while protecting the environment.

Since complete streets are context-sensitive, there is no one design, or one-size-fits-all solution. The key to any "complete street" is that it aligns with the surrounding area and is safe and accessible for all users. The goal of complete streets is not that every street provides everything to everyone, but that a community's roadways provide a network of connected streets that work as a system. As such, local and state agencies can ensure that the planning, design, construction and maintenance of their streets consider the needs of all transportation system users by adopting Complete Streets policies, resolutions, or laws.

Regional Context

- At least 44 communities, including four counties, have Complete Streets policies, plans, resolutions, ordinances, or guidelines in the region. Examples that show the different contexts and ways communities plan for and address complete street principles include:
  - Road Commission for Oakland County: Complete Streets Guidelines
  - City of Ferndale Complete Streets Ordinance
  - Complete Streets Plan for Washtenaw County
  - City of Ann Arbor Complete Streets Resolution
  - City of Novi Complete Streets Resolution
  - Pittsfield Township Complete Streets Ordinance
  - City of Dearborn Complete Streets Ordinance
  - City of Sterling Heights Complete Streets Resolution
  - Harrison Township Complete Streets Design Plan
  - Complete Streets Pontiac
  - City of Brighton Complete Streets Plan

Implementation Considerations

- Complete Streets requirements can be established locally by adopting policies, resolutions, laws, plans, or design standards.

Additional Resources

- *Complete Streets Policy*; MDOT
- *Great Lakes Green Streets Guidebook*; SEMCOG
- National Complete Streets Coalition

- *Urban Street Design Guide*; National Association of City Transportation Officials
- *Complete Streets: Best Policy and Implementation Practices*; American Planning Association
- *Complete Streets, Complete Networks*; Active Transportation Alliance

Regional Highlight: City of Detroit

For the last decade, the City of Detroit's Traffic Engineering Department has been systematically looking for ways to improve infrastructure for people walking and biking, and has shifted its entire approach in planning and construction of road infrastructure. The goal is to provide better quality of life to its citizens. As a result, more people are riding the bus daily and Detroit has one of the fastest growing share of bike commuters in the nation.

Over the next three years, 16 new complete street and streetscape projects are planned to be completed. The first nine streetscapes will be completed by the end of 2020. The longest complete street project, Livernois Avenue, will include the city's first raised protected bike lanes and widened sidewalks. This project has also, in part, supported the opening of 13 new Black-owned businesses within its boundaries. The city has developed more proactive engagement with the public prior to, during, and after project development by creating multi-department education campaigns. The City of Detroit is also in the process of developing a new Transportation Master Plan that will incorporate Complete Street principles.

Connected and Automated Vehicles

Overview

As technology advances around connected and automated vehicles (CAVs), the transportation system faces both opportunities and challenges for bicycle and pedestrian mobility. Connected vehicles are those that communicate with one another, or with transportation infrastructure systems along a roadway. These can include features such as in-vehicle navigation systems, or the ability to send or receive road condition information. Automated vehicles have features that allow the vehicle to guide itself without human interaction. While CAVs refer to a range of technologies, some increasingly common examples are cruise control, parking assistance, and lane-departure warnings.

These technologies have the potential to impact the number of single-occupant vehicles on the road, and reduce the frequency and severity of crashes. They can also expand mobility options for people who are elderly or disabled, and potentially change the way street space is allocated for other modes like walking, biking, and transit. It is estimated that by 2045, between 20 and 85 percent of vehicles on the road will have some level of connected or automated features.

Regional Context

- Public Acts 332, 333,334, and 335, of 2017, provide a framework for both testing and deployment activities for manufacturers and developers of automated vehicles in Michigan.
- Home to Automation Alley, the University of Michigan, several auto manufacturers, and other industrial innovation groups, Southeast Michigan is a hub for research, development, and testing of CAV technology.

Implementation Considerations

- With CAVs, curbside space for pickup and drop-off will be more valuable than parking spaces. For communities looking to redevelop underused parking areas, opportunities exist to enhance walking and biking.
- While CAVs are expected to improve traffic safety, concerns still exist for vulnerable road users such as pedestrians and bicyclists. As technology advances, safety of all road users should remain a primary performance criterion.

Additional Resources

- *2045 Regional Transportation Plan for Southeast Michigan;* SEMCOG
- *Preparing for the Future of Transportation;* U.S. Department of Transportation
- Michigan Council on Future Mobility
- Intelligent Transportation Society of Michigan
- Planet M

Construction Zone Accommodations

Overview

Construction zones often encroach on sidewalks, crosswalks, or bicycle infrastructure, requiring bicyclists and pedestrians to make detours that are unsafe or difficult to navigate. This can also impact traffic flow for motorists, as displaced users often end up in the road.

All construction projects that impact the public right-of-way require permits that include traffic control plans. Local permitting processes should require and provide guidance for accommodating bicyclist and pedestrian travel through and around work zones.

Regional Context

- The Downtown Detroit Transportation Study includes a Construction Management Policy recommendation that details existing challenges, implementation partners, and short-term actions.

Implementation Considerations

- Accommodations for pedestrians in work zones must comply with the American with Disabilities Act.
- Walkways and bikeways should be kept clear of debris which could present a falling or tripping hazard. There are many considerations that should be given including advance warning/signage, adequate lighting, physical separation between construction and travelers, temporary facilities where appropriate, and warnings about surface irregularities, etc.
- Need commitment to staff permitting and on-site inspection efforts.
- Maintain and inspect pavement markings and signs.

Additional Resources

- *Accommodating Pedestrians*; National Work Zone Safety Information Clearinghouse
- *Manual on Uniform Traffic Control Devices, Part 6: Temporary Traffic Control*; FHWA
- *Work Zone Safety and Mobility Manual*; MDOT

Curbside Management

Overview

As mobility options diversify and travel patterns change, the value of curbside space and demand for accommodation has also changed significantly. Pedestrians and bicyclists now face increased competition for space at the curb, contending with on-street parking, bus stops, loading zones, and rideshare services. The increase in dockless micro-mobility services, such as e-scooters and bikeshare, present additional challenges for space allocation. As the place where these different transportation modes interact, curbs can be managed strategically to ensure that they meet the needs of all users safely and efficiently.

Curbside and curb-lane accommodations for bicyclists may include dedicated space for bike lanes, bike racks, and bikeshare stations. Curbside extensions and parklets further enhance pedestrian safety and comfort. Additionally, dedicated transit lanes and pick-up or drop-off zones for ridesharing services can supplement biking and walking trips by extending the reach of the network for longer trips.

Regional Context

- Some Southeast Michigan communities have dedicated space for ridesharing pick-up or drop-off zones. For example, the City of Ferndale created an online interactive map displaying five designated ridesharing locations (such as Uber and Lyft), as well as the routes that do not allow for pick-up or drop-off.
- The Downtown Detroit Transportation Study includes strategies on how to plan for curbside conflicts and manage different curbside demands.
- Wayne State University created a Lyft pick-up and drop-off zone near a park at the corner of Woodward and Warren Avenues.

Implementation Considerations

- Typically, curbside regulations focus on accommodating a traditional set of uses, primarily short-term parking, loading zones for commercial vehicles, and valet zones. As other uses become increasingly common, there is a greater need for more comprehensive regulations to balance competing demands.
- Designing for the future of curbside sidewalks may include new ways to charge for curb usage, such as technology that adjusts prices based on demand.
- To minimize conflicts for walking and biking, alleys and off-street loading areas can be designated for truck deliveries, separating the use from curbside traffic lanes.

Additional Resources

- *Blueprint for Autonomous Urbanism – Curbside Management*; National Association of City Transportation Officials
- *Curbside Management Practitioners Guide*; Institute of Transportation Engineers
- *Downtown Detroit Transportation Study*; City of Detroit

E-Bikes

Overview

Electric bicycles, known as e-bikes, have pedals that operate like a traditional bicycle, but include an electric motor to increase speed and assist users. As defined by Michigan state law, e-bikes have a maximum motor power of 750 watts.

E-bikes can extend the distance that users feel comfortable riding, and make it easier for people with disabilities to ride a bike. They can also be a great resource and benefit for commuters who may not want to exert as much energy as cycling typically requires, and they can help older cyclists feel comfortable riding a bike for longer distances.

Regional Context

- Public Acts 138, 139, and 140 amended state laws to regulate the operation of e-bikes in Michigan. These regulations establish three classes of e-bikes and where their use is legally permitted unless local laws state otherwise. For example, Class I e-bikes are permitted on paved trails, but local authorities may prohibit or regulate their use. Alternatively, Class II and III e-bikes are prohibited on trails, but local authorities may choose to permit and regulate their use.

Implementation Considerations

- As e-bikes become more common on the road, they may influence the design of future bicycle infrastructure. It may become more appropriate to design infrastructure based on the average speed of users, rather than focus on the needs of specific devices that may evolve or emerge over time.
- Local communities may adopt local laws to regulate, prohibit, or authorize the various classes of e-bikes for their shared-use paths and trails.
- Enforcement of e-bike regulations may prove difficult, and should be considered when establishing local laws.

Additional Resources

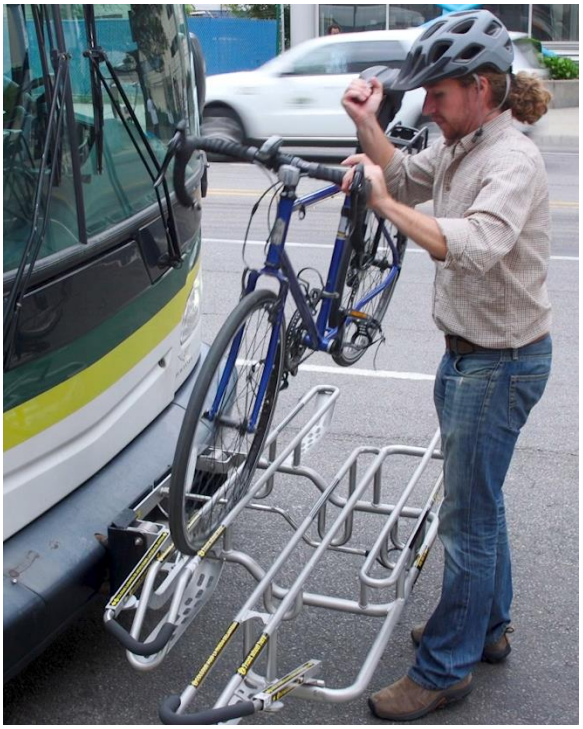
- State of Michigan HB 4781, 4782 and 4783

Regional Highlight: The Paint Creek Trail Commission's E-Bike Policy

Following adoption of Michigan's e-bike laws, the Paint Creek Trail Commission adopted its own policy regarding e-bikes on the trail in April 2018. Based on input at a public hearing on the topic, the majority of e-bike users in the area were older adults or senior citizens who enjoy biking outdoors for exercise, but also appreciated the extra power to cover longer distance trips.

The commission voted to allow Class I and Class II e-bikes on the trail for general use. Class I e-bikes provide motorized assistance only when pedaling, and ceasing function at 20 miles per hour. Class II e-bikes include a motor that propels the bike whether the user is pedaling or not, and has a maximum speed of 20 miles per hour. Class III e-bikes, which function similarly but reach speeds up to 28 miles per hour, are not permitted under the policy.

First- and Last-Mile Connections



Overview

First- and last-mile connections help fill the gap between a person's primary travel mode, and their origin or destination. While it commonly refers to walking or biking trips that supplement public transportation, even vehicle trips often require drivers to walk to and from a parking area and destinations.

Safe and convenient first- and last-mile connection solutions may include walking, biking, micro-mobility services, ride-hailing services, or park-and-rides for carpooling. These systems must work together to function as a complete network. For example, unsafe or uncomfortable conditions for walking and biking may deter transit use, or prevent it altogether.

In addition, wayfinding information is critical for users to navigate the multi-modal system. Successful wayfinding programs present information clearly and simply to accommodate visitors and newcomers who are unlikely familiar with the area.

Regional Context

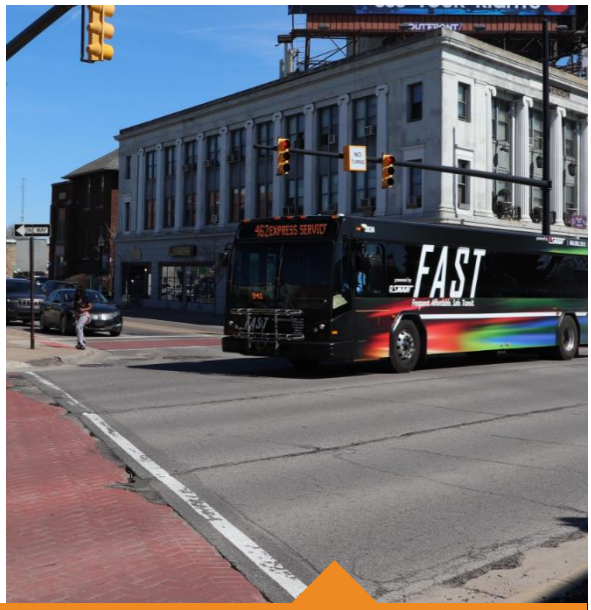
- Several public transit services in the region accommodate bikes, including Blue Water Area Transit in St. Clair County, DDOT, SMART, and The Ride in Washtenaw County.
- Bicycles are currently allowed on all Amtrak trains in Michigan, including the Wolverine Line with stops in Pontiac, Troy, Royal Oak, Detroit, Dearborn, and Ann Arbor.
- Ann Arbor and the University of Michigan coordinate to provide bike lockers that are covered and secured for a nominal fee.
- The Ride used a grant from the Washtenaw Area Transportation Study (WATS) to identify opportunities for sidewalk and ADA improvements to enhance walking and biking accessibility and connections. Through a Mobility Challenge grant, The Ride has also piloted autonomous wheelchair support systems, intended to allow people using mobility devices more independence when boarding buses.
- The Dart App allows riders of DDOT, SMART, and the QLine streetcar to purchase one pass to increase the ease of boarding and transferring between providers.

Implementation Considerations

- Transitional areas such as transit stops and parking lots benefit from wayfinding signage, secure bike parking, and designated parking areas for micro-mobility services such as bikeshare and e-scooters.
- The Federal Transit Administration recommends that infrastructure improvements around transit stations should be considered within a half-mile for pedestrians and within three miles for bicyclists.

Additional Resources

- Manual on *Pedestrian and Bicycle Connections to Transit;* Federal Transit Administration
- *Multi-Modal Development and Delivery Work Plan;* MDOT



Regional Highlight: SMART enhances its service

SMART is making great strides in improving first- and last-mile access to the system. One featured improvement is real-time arrival notifications via the Ride SMART Bus App, which allows an individual with a smartphone to acquire information about when a bus is arriving to better assist with trip planning. For those without smartphones, SMART has been installing real-time arrival screens at designated FAST stops along Gratiot, Michigan, and Woodward Avenues. These FAST stops also contain new shelters and activated light beacons to alert a bus when someone is waiting at the stop.

SMART's entire fleet of buses is equipped with a bike rack that holds two standard bikes, allowing individuals to ride their bike to bus stops and take the bike with them to finish their trip. At key stops around the region, SMART has been working on installing bike racks to provide a safe backup option for riders if the rack on their bus is full. SMART is also committed to improving access for persons with disabilities by installing ADA walkways at bus stops around the region. The focus has been to repair, replace, or add ADA-compliant walkways at higher-use stops.

Land Use and Zoning

Overview

Land-use policies and zoning ordinances have a significant influence on how people get around. While transportation plans and policies are often aimed at connecting walking and biking infrastructure, zoning ordinances and land-use policies can help create a supportive area with a built environment that makes walking and biking more practical and comfortable.

To enhance bicycle and pedestrian travel, local land use, zoning, and subdivision regulations can require bicycle parking and sidewalks, as well as address automobile parking requirements, street design standards, access management, allowable land-use densities, and subdivision design.

Regional Context

- Many communities throughout the region have ordinances, standards, or requirements related to bicycle and pedestrian planning and implementation. These range from sidewalks and bicycle facilities ordinances, bicycle parking ordinances, bicycle or pedestrian friendly street design standards (e.g. sidewalks, paths, bikeways, crossing treatments, maximizing street grid), and form-based codes and special or overlay zoning.
- Examples in the region include:
  - City of Birmingham Overly Districts Sidewalks and Bicycle Facilities Ordinances
  - City of Berkley Bicycle Parking Ordinance
  - City of Ann Arbor Required Bicycle Parking Ordinance
  - City of Ferndale Bicycle Facilities Ordinance
  - City of Taylor Bicycle Facilities Ordinance
  - City of Detroit Sidewalks Ordinance
  - Brownstown Township Sidewalk Ordinance
  - City of Dearborn Heights Sidewalk Ordinance
  - Lyon Township Sidewalk Ordinance
  - City of Howell Form Based Code

Implementation Considerations

- Zoning ordinances can also address the needs of pedestrians and bicyclists through regulations on subdivision layouts, lot coverage, parking requirements, and including bicycle and pedestrian infrastructure in site development.

- The most conducive land use for bicycle and pedestrian activity is one with a higher-density mix of housing, offices, and retail.
- Shared-use-path connections between cul-de-sacs and adjacent streets can improve access for bicycles and pedestrians while maintaining automobile traffic patterns.
- The site-plan review process provides the opportunity to ensure that bicycle and pedestrian facilities are designed in compliance with national standards and ADA.
- Parking areas, entrances and exits to buildings, and connections to transit routes should ensure safe pedestrian access and clear identification of crossings.

Additional Resources

- *Active Transportation and Real Estate*; Urban Land Institute
- *Policy Guide on Surface Transportation*; American Planning Association
- *Using Land-Use Regulations to Encourage Non-Motorized Travel*; Federal Highway Administration

Micro-Mobility Services

Overview

Micro-mobility services provide individual transportation with small, light vehicles such as shared bicycles, electric scooters, e-bikes, or other emerging technologies. In many cases, fleets of micro-mobility devices are deployed for shared use, and may be implemented by local governments, nonprofits, or private companies.

Bikeshare systems may include a fixed network of docking stations, or simply be a collection of dockless bicycles dispersed throughout an area that connect users directly to their destination. Some bikeshare systems include e-bikes and traditional bicycles. Electric scooter sharing systems are typically dockless with electric engines that can travel up to 15 mph.

As a mobility service, these provide alternatives to traditional modes of travel, particularly for shorter trips. In Southeast Michigan, 42 percent of daily trips are under three miles. With advances in technology, and new programs and policies, micro-mobility options could make many of these short trips more convenient and faster.

Regional Context

- Currently, 14 communities in Southeast Michigan have piloted or fully implemented bikeshare systems. The largest is MoGo, covering Detroit and five Southeast Oakland County communities.
- In 2018, the region's first fleets of dockless e-scooters were launched in Detroit and Ann Arbor. Currently, all scooter services in the region are operated by private businesses, such as Bird, Lime, and Spin.

Implementation Considerations

- Micro-mobility services are most successful in areas where high amounts of short trips typically occur. Population factors, the existing mobility networks, and proximity to core services play key roles in success. For more information, see the Demand Analysis on page 42.
- Using scooters on sidewalks is legal under electric scooter laws in Michigan. However, riders must yield the right-of-way to pedestrians and give an audible signal before passing. State law also gives local governments the ability to further regulate the operation of electric skateboards based on the health, safety, and welfare of its citizens.
- Both docked and dockless services present challenges for the streetscape. Dock stations may be competing for space with sidewalks, bike racks, outdoor seating areas, street trees, or on-street parking. Dockless systems often lead to disorder or obstacles in the pedestrian zone. Designating specific parking or docking areas may help reduce conflicts with other uses.

- To reduce conflicts and increase safety, communities can regulate and enforce the locations and speed at which e-scooters can be operated.
- While micro-mobility services pair well with transit, they are particularly useful in areas with lighter service, as they extend the reach of the network for first- and last-mile connections.
- To ensure that dockless mobility and bikeshare in general is equitable and inclusive, local programs can include requirements for vehicle distribution, cash payment options, and accessible or adaptive vehicles.
- Education is particularly important for users of micro-mobility services, as they provide devices to users that may be less experienced.

Additional Resources

- *Guidelines for the Regulation and Management of Shared Active Transportation;* National Association of City Transportation Officials
- Michigan e-scooter laws: MCL 257.13f; MCL 257.33; MCL 658; MCL 660; MCL 662.

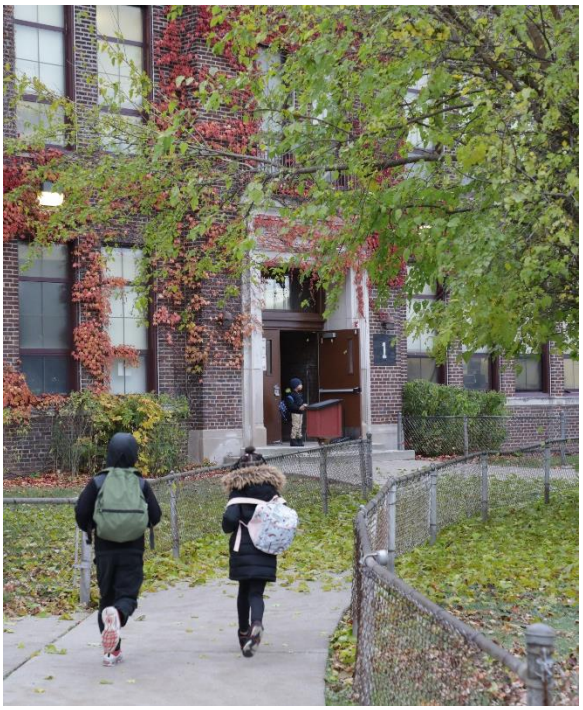
Regional Highlight: MoGo

In 2017, MoGo launched in the City of Detroit, as a nonprofit affiliate of the Downtown Detroit Partnership. With 480 bikes at 44 stations across 10 Detroit neighborhoods, MoGo is the region's largest bikeshare system.

MoGo bikes are built to withstand riding in an urban environment and are designed for comfort for a wide range of riders. In 2018, MoGo introduced 13 different types of adaptive cycles, including handcycles, recumbent bikes, tricycles, and tandem bikes, to provide additional options for riders of all abilities. Through MoGo Boost, the fleet now includes e-bikes that travel up to 15 miles per hour, with battery power that lasts for approximately 40 miles.

MoGo also accepts cash payments and offers a special pricing structure for those who qualify for state benefits programs to provide an option for riders of all incomes. Currently, MoGo is expanding its service into Southeast Oakland County. Once implemented, the system will have 75 stations and more than 620 bikes.

Safe Routes to School



Overview

Over the past several decades, the number of children walking or biking to school has dropped significantly. Safe Routes to School (SRTS) programs allocate funding to infrastructure and non-infrastructure efforts (such as educational and encouragement programs) to make it safe, convenient, and fun for children, including those with disabilities, to walk or bike to school. These programs encourage an active, healthy lifestyle, while improving safety, traffic conditions, and air quality around schools.

SRTS includes a planning process where local stakeholders work together to identify barriers and develop plans to improve safe walking and biking around schools. Since 2003, the Michigan SRTS program has served more than 248 schools across the state, awarding more than $31 million in infrastructure funding and $1.4 million for education and encouragement programs.

Regional Context

The Michigan Fitness Foundation administers mini-grants for SRTS projects. Annually, the program awards up to $10,000 per school or $100,000 per district.

- MDOT administers major SRTS grants, which award up to $200,000 per school for infrastructure and $8,000 for programming. To be eligible, applicants are required to complete the SRTS planning process. This includes registering a school, assembling a SRTS team, surveying students and parents, conducting walking and biking audits, and developing an action plan.

Implementation Considerations

- All K-8 schools are eligible for SRTS grants, and all proposed projects must meet ADA requirements.
- Eligible infrastructure projects include sidewalks, traffic calming and speed reduction, intersection crossing improvements, on- and off-street bicycle facilities, off-street pedestrian facilities.
- Eligible programming projects are awareness campaigns, community outreach, traffic education and enforcement measures, and student training.

Additional Resources

- Safe Routes to School Handbook
- Safe Routes Michigan
- National Center for SRTS

Regional Highlight: Chelsea, Dexter, and Manchester

In Washtenaw County, the communities of Chelsea, Dexter, and Manchester have partnered with the five Healthy Towns Project (5H), the Michigan Fitness Foundation, Michigan State University, and Wayne State University to produce Safe Routes to School action plans for each school district. These plans resulted in identifying coordinators for each district, weekly walking school buses, and TAP grants for each community for infrastructure improvements and programming. These are examples of ongoing programming:

- Enforcement – Portable radar signs that change locations within each school district. Washtenaw County Sheriffs and Chelsea Police Departments maintain these signs.
- Education – Bike rodeos are conducted in all three communities.
- Evaluation – Every five years, participation levels are monitored as part of a regional survey called Behavior Risk Factor Surveillance Systems.
- Encouragement – Walk to School weekly programs, dedicated Facebook pages, coordinated Walking School Bus routes, and purchase of encouragement items.

Streetscaping

Overview

Streetscaping improves the look and feel of a street with trees and landscaping, decorative lighting and pavers, public art, and street furniture such as benches and bike racks. Gateway treatments and wayfinding signage can further enhance bicycle and pedestrian mobility by designating destinations and directing traffic.

These functional and aesthetic improvements enhance the sense of place, safety, and walkability of a street, contributing to a more vibrant corridor or district. While design approaches may vary by street type and local context, streetscaping can be used to support economic development efforts and enhance nearby businesses, or meet environmental goals by incorporating green stormwater infrastructure and increased tree canopy.

Regional Context

- The City of Ann Arbor DDA provides a Street Design Manual to guide construction and maintenance of downtown streets.
- The City of Detroit's Streetscape Program is investing $80 million in bond funding to improve streetscapes and commercial corridors across the city.
- Recognizing the importance of Washtenaw Avenue to their economic base, Pittsfield and Ypsilanti Townships worked together to develop the Re-Imagine Washtenaw Design Guidelines, which facilitates the phased development of a livable, walkable, and workable corridor.

Implementation Considerations

- Streetscape improvements are often focused on established traditional downtowns or historic districts, but may be beneficial in any areas with high pedestrian activity or demand.
- Streetscaping can accomplish multiple goals, such as traffic calming, pedestrian safety, and water quality improvements, while employing creative solutions that reflect a community's history and enhance its identity.

Additional Resources

- *Great Lakes Green Streets Guidebook;* SEMCOG
- *Streetscape Guidance for Downtown Historic Districts;* MDOT and SHPO
- *Designing Walkable Thoroughfares, A Context Sensitive Approach;* ITE

Regional Highlight: Rochester Hills' Auburn Road Streetscape

In 2017, the City of Rochester Hills adopted the Auburn Road Corridor Plan. A major focus of this plan was to enhance the public realm for the city's Brooklands neighborhood to be an inviting place for people to gather, walk, bike, and shop. By early 2020, this half-mile, two-lane road was reconstructed and reimagined using multiple streetscaping, placemaking, and environmental enhancements to not only improve transportation accessibility for all users, but also as a destination for residents to visit and stay. Here are some of the implemented streetscape successes:

- Wide sidewalks that include street furniture, pedestrian-scale lighting, bike racks, street trees and landscaping, phone-charging stations, and space for outdoor dining.
- On-street parking, defined safe midblock and intersection pedestrian crossings, and several street and driveway closures to encourage safer walking and biking.
- A narrow median and two compact roundabouts to calm traffic and enhance the corridor as an attractive place for vehicles and pedestrians.
- Green infrastructure and low-impact design to include roadside rain gardens and bioretention cells for managing stormwater runoff.

Future enhancements along this corridor include gateway and art installations and a splash pad, and other green and gathering spaces.

Traffic Calming

Overview

Traffic calming uses street design features and measures to reduce motor vehicle speeds to improve safety and enhance neighborhoods. The aim of traffic calming is to encourage safer, more responsible travel along roadways for all users – motorists, pedestrians, and cyclists.

There are many strategies and techniques for traffic calming – vertical deflections (speed humps, speed tables, and raised intersections); horizontal deflections (chicanes, curb extensions, and traffic circles); roadway narrowing to reduce speed and enhance the street environment for people who walk or bike; and reallocating space within the roadway for medians, pedestrian crossing islands, bicycle lanes, or on-street parking.

Regional Context

- City of Auburn Hills has implemented a Traffic Calming Program that uses a three-phased approach – identification of the problem; education and enforcement; and engineering and implementation.
- City of Ferndale developed a Neighborhood Traffic Calming Program with several demonstration streets.
- Washtenaw County has implemented a Neighborhood Traffic Management Program (NTMP) which creates a partnership between residents, the road commission, and law enforcement to provide long-term solutions to residential traffic and speed issues.
- City of Detroit has implemented a Traffic Calming Program that enables residents to request speed humps on their residential streets.
- Many communities have begun to evaluate roadway configurations for narrowing or eliminating travel lanes, often referred to as “road diets.” The goal of a road diet is to reallocate at least one vehicle lane for other uses, such as for parking, sidewalks, bicycle lanes, transit use, turn lanes, curb extensions, parklets, or pedestrian refuge islands.

Implementation Considerations

- Traffic-calming policies should include planned bicycle and pedestrian facilities as prioritization criteria.
- Developing criteria for candidate streets and treatment identification can help prioritize local funding.

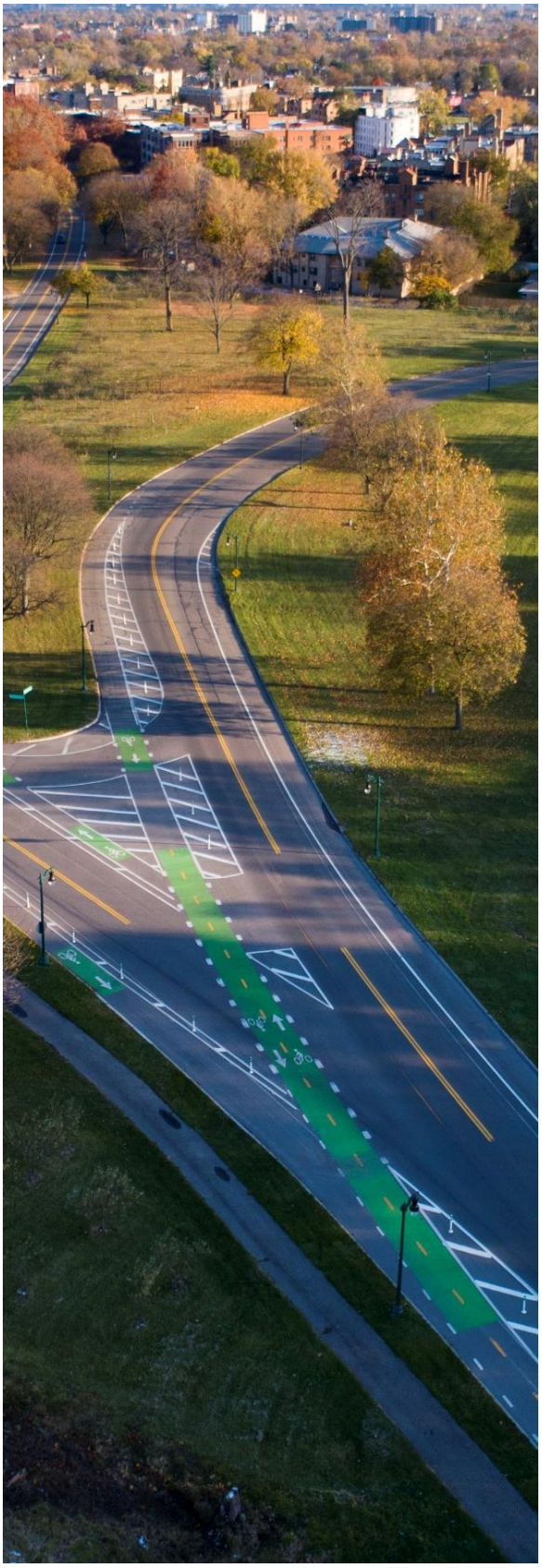
Additional Resources

- *Traffic Calming ePrimer;* Federal Highway Administration
- *Traffic Calming to Slow Vehicle Speeds;* U.S. Department of Transportation
- *Traffic Calming Measures;* Institute of Transportation Engineers
- *Urban Bikeway Design Guide – Speed and Volume Management;* National Association of City Transportation Officials

Regional Highlight: Ann Arbor Traffic Calming Guidebook

In 2019, the City of Ann Arbor developed a Traffic Calming Guidebook that provides a step-by-step process for residents to engage with the city to perform technical analysis of traffic concerns on local streets and explore options for effective solutions.

The guidebook also features detailed qualification criteria, and a traffic-calming device toolkit with detailed descriptions and considerations, including costs of the many different treatments.



Chapter 5: Infrastructure Guidelines

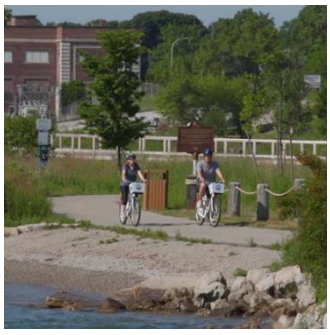
This section provides guidance on selecting, designing, and implementing bicycle and pedestrian infrastructure and amenities that support the network. Communities can use the information provided to select appropriate infrastructure solutions, and communicate about plans and projects.

The information in this chapter, summarized in Table 11, presents both long-standing and new bicycle and pedestrian infrastructure components cited in guidebooks developed by agencies such as the American Association of State Highway and Transportation Officials (AASHTO), the National Association for City Transportation Officials (NACTO), the Federal Highway Administration (FHWA), and the Michigan Department of Transportation (MDOT). While specific recommendations may vary by agency or change over time, a common theme is flexibility – there is no one-size-fits-all solution for developing walkways, bikeways, or roadways, and different treatments may be more appropriate or cost effective depending on local context, traffic volumes, and community goals.

In addition, some treatments are newer and may be considered experimental, or only have interim approval from FHWA or the Michigan Manual for Uniform Traffic Control Devices (MMUTCD). As such, communities should check with MDOT or their county road agencies before planning for these elements especially for projects using federal funding.

Table 11
Index of Bicycle and Pedestrian Infrastructure Components

Bicycle Infrastructure



Shared-Use Paths

Shared-use paths, also known as side paths, trails, or greenways, are paved, off-road facilities for bicyclists and pedestrians that are physically separated from motor vehicle traffic. They provide the most comfortable experience for most bicyclists, while also accommodating pedestrian use.

Shared-use paths that are built within a road's right-of-way are often referred to as side paths. These provide connections between neighborhoods, parks, shopping districts, and other local destinations. In some cases, side paths can function more like sidewalks with several driveways and intersections that interrupt bicycle travel.

Shared-use paths can also be independent of the roadway network, winding their way through parks, along rivers and flood plains, or within rail corridors and utility easements. These are often referred to as trails. With a limited number of intersections and driveway crossings, they allow for relatively unimpeded free-flow travel, acting almost like freeways for bicycles.

To avoid conflicts between users, shared-use paths are wider than typical sidewalks with a minimum width of eight feet, and often feature specialized intersection treatments. Current federal design guidelines require shared-use paths to provide at least two feet on either side as clear buffer zones. In areas with higher volumes of bicyclists and pedestrians, such as riverwalks and downtown areas, they may be 14 feet or wider.

Pavement surfaces should be selected based on the anticipated volumes and needs of various users. For example, while crushed stone may be accommodating for some bicyclists, it is less conducive to pedestrian use or for people in wheelchairs. Similarly, asphalt and concrete surfaces have different installation costs and maintenance needs over time.

Typical design speed for shared-use paths is 12-30 miles per hour, which impacts turning radii and sight distances for path users and vehicles on adjacent roadways. Bi-directional bicycle traffic and frequent driveways and intersections can create unexpected conflicts between users. These can be mitigated by reducing motor vehicle turning speeds, consolidating driveways, and ensuring clear sight lines between side path users and motorists. Conflicts between bicyclists and pedestrians may occur on shared-use paths if adequate width is not provided.

Protected Bike Lanes

Protected bike lanes, also known as separated bike lanes or cycle tracks, are on-street or street-adjacent bike lanes that are physically separated from travel lanes and walkways with vertical elements. They can be one-way or bi-directional. They are intended to provide the same level of comfort as shared-use paths and are similar to side paths but are exclusively for bicycle travel. They are also useful where sidewalks currently exist but where no dedicated space is provided for bicyclists.

A variety of materials can provide physical separation – planters, flexible plastic posts, concrete medians, curbs, and parked motor vehicles. Different types of cyclists, such as those using adaptive equipment, should be considered when determining the width of the bike lane, the height of the vertical elements, and the equipment needed to maintain it. At intersections, separated bike lanes should be designed using signal phasing or intersection geometry to mitigate conflicts between bicyclists and motorists.

There are advantages and disadvantages to both one-way and two-way facilities. While one-way bike lanes are generally safer and easier to implement because they can be developed in phases, they require more space using both sides of a roadway, and may require more education to discourage wrong-way travel. Two-way facilities may be easier to maintain as space is consolidated on one side of the roadway, and can more easily accommodate passing or two-abreast riding. However, they require more traffic-control devices, and present different challenges at intersections and where they connect to other one-way facilities.

Buffered Bike Lanes

Buffered bike lanes provide dedicated space on a road for bicyclists, and include a painted buffer area to the left of the bike lane, providing additional separation between bicyclists and vehicle traffic. This also helps bicyclists navigate around open doors of parked cars.

Where buffers are used, bike lanes can be narrower because the shy distance function is assumed by the buffer. For example, a three-foot buffer and four-foot bike lane next to a curb can be considered a seven-foot bike lane. It is recommended that side-buffered lanes next to on-street parking have a five-foot minimum width to encourage bicyclists to ride outside of the door zone. Buffers should be at least 18 inches wide; in areas where bicyclist volumes are high, bicyclist speed differentials are significant, or where side-by-side riding is desired, the desired bicycle travel area width is seven feet.

Conventional Bike Lanes

Conventional bike lanes dedicate exclusive on-street space to bicycling through signs and pavement markings. Painted buffers can be added to improve the comfort of bicyclists by increasing the distance from travel lanes or on-street parking.

Bike lanes should be signed and marked to discourage motorist use for travel, passing, or parking. Bike-lane markings should extend to intersections to communicate where motorists and bicyclists should be expected to travel and queue. Bike-lane buffers can be narrowed or removed at constrained locations to provide space for turn lanes or intermittent with on-street parking, where appropriate.

On one-way streets, left-side bike lanes are recommended, as they separate transit stops from bicycle travel, and provide greater mutual visibility for cyclists and drivers. In locations with on-street parking, there are less conflicts with opening vehicle doors, since the vast majority of car trips are single-occupant with the driver-side doors opening more often than passenger-side doors.

While conventional bike lanes are pairs of one-way facilities that run in the same direction as adjacent vehicle-traffic lanes, problems arise when trying to provide two-way connectivity on a one-way street. In these cases, contra-flow bike lanes can be installed on the left side of the motor-vehicle lane, allowing bicyclists to travel in the opposite direction of motor-vehicle traffic on a one-way street. A buffer of at least three feet provides adequate separation, especially in the moderate-speed, high-volume conditions that characterize some streets where these may be applied.

Shared-Lane Markings

Shared-lane markings (often called sharrows) are pavement markings within a vehicle traffic lane that alert both drivers and bicyclists where it is safest to ride a bike, which is directly over the markings. This helps the bicyclist avoid curbside conflicts like the doors of parked cars, and lets drivers know there is an expectation that they will be sharing this lane with people on bikes. Sharrows should be placed after every intersection and frequently enough to remind motorists to expect bicyclists in the street.

Sharrows are useful in completing the bicycle network and filling gaps, but are likely less comfortable for many users as compared with shared-use paths and bike lanes. This treatment is only applicable where motor-vehicle speeds are low enough to share the road safely.

Advisory Bike Lanes

Advisory bike lanes are similar to sharrows in their flexibility, but provide a greater level of comfort and protection. They are intended for low-speed, low-volume residential roadways, and feature dashed lines that delineate a shoulder for bicyclists to use when a road is too narrow to accommodate designated infrastructure in addition to two-way vehicle traffic. They allow bicyclists to travel on the sides of the road in the advisory bike lanes, while two-way vehicle traffic is maintained in one center travel lane. When two motorists approach each other from opposite directions, they use the shoulders to pass, yielding to any bicyclists traveling in either direction. Advisory bike lanes are considered “experimental” by FHWA and have yet to be widely implemented in Michigan.

Wide-Paved Shoulders

Wide-paved shoulders are paved portions of a roadway outside of the travel lanes and, while they are not designed for biking, bicyclists often use them where other bikeways are not available. The comfort of bicycling in paved shoulders varies based on shoulder width, traffic volumes, and traffic speeds. In addition, MDOT recognizes shoulder bike lanes as those that are wide enough to accommodate stopped vehicles, but also meets relevant criteria for bike lanes and therefore includes appropriate signage.

Paved shoulders are most appropriate in rural or some suburban environments where traffic speeds and volumes are generally lower. Typically, they should be at least four-feet wide to provide adequate space for bicyclists. Rumble strips on paved shoulders should include occasional breaks to accommodate bicyclist access. When paved shoulders are not marked as bicycle facilities, bike route signs can remind motorists to watch for bicyclists.

Bike Routes

Bike routes are a designation given to a collection of bicycle-friendly roadways and pathways that offer a unique advantage for biking. They typically use roads that have lower-traffic volume, or fewer stops and intersections. Often, they are intended to guide long-distance connections, and are key to the region’s bicycle and pedestrian corridors, as identified in Chapter 2. Bike routes typically have signage and, while they do not always have designated infrastructure, they may include a combination of other bikeways and paths. As such, they cost the least to implement, and are flexible enough to change alignments as needed, or be enhanced with more comfortable infrastructure over time.

Neighborhood Greenways

Neighborhood greenways, also known as shared streets or bicycle boulevards, are on-road routes that are optimized for bicycle travel. More often than not, these routes are designated on residential streets with existing sidewalks that help the corridor function more like a greenway. Signs, pavement markings, and traffic-calming features are used to manage motor-vehicle speeds and volumes to provide a comfortable shared environment between bicyclists and motorists. In many situations, neighborhood greenways can be developed quickly with minimal capital investment compared to share-use paths or protected bike lanes.

Neighborhood greenways function best on streets with very low traffic volumes and where motor vehicle speeds are supposed to be close to bicycle-travel speeds (10-25 mph). SEMCOG's Bicycling Comfort Level Analysis, summarized on Page 31, can be helpful in identifying these routes. Priorities should be given to routes that connect other low-stress bikeways, such as shared-use paths and protected bike lanes.

Neighborhood greenways can also use traffic calming techniques to keep motor vehicles traveling at or below the posted speed. Since an advantage of neighborhood greenways is that they primarily experience lower volumes of traffic, medians or traffic circles can be used to discourage cut-through traffic.

Green Bike Lane Markings

Green bike lane markings are a supplemental treatment used as part of bike-lane projects — protected, buffered, or conventional. Green markings can be made with paint or thermoplastic, but they require a specific color blend for consistent applications. Nationally, some communities are installing green markings for the entire length of a bike lane. In Michigan, they are used primarily at intersections to denote areas of conflict between bicyclist and motor vehicles. Often, the markings are dashed to indicate to drivers that they are allowed to enter this space, similar to other dashed-lane markings.

Bike Boxes

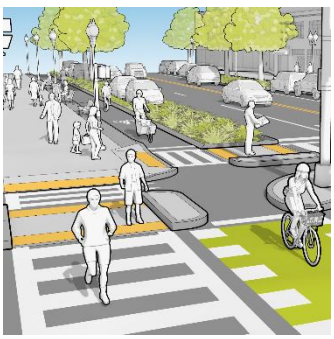
Bike boxes use paint and pavement markings to help people biking make left turns or get a head start on vehicle traffic. They delineate space at signalized intersections that allow bicyclists to position themselves in front of motorists when facing a red signal. Bike boxes are intended to help left-turn movements and facilitate movements where a bike lane does not continue through the intersection. Bike boxes preclude motorists from turning right on red, which should be communicated through signage.

Two-Stage Turn Boxes

Many bicyclists do not feel comfortable putting themselves before cars in a traditional bike box, especially to make a direct left turn. Two-stage turn boxes are more comfortable for bicyclists turning left at intersections by breaking the movement into two steps. Bicyclists travel through the intersection on a green signal, wait in the turn box and cross when presented with a green signal in the perpendicular direction. Two-stage turn boxes also preclude motorists from turning right on red, which should be communicated through signage.

Bicycle Signals

Used most often with protected bike lanes, bicycle signals are traffic signals that provide exclusive phases for bicyclist movements in order to reduce conflicts between motorists and bicyclists at intersections. They can also help protect against pedestrian and bicyclist conflicts. In addition, bicycle signals can be timed and coordinated so bicyclists stop less often.



Protected Intersections

Similar to protected bike lanes, protected intersections separate motorist, bicyclist, and pedestrian movements at intersections through signal operations, physical separation, signage, and pavement markings. They improve safety and comfort by reducing the frequency and severity of motorist right-turn conflicts with bicyclists and pedestrians using corner islands to reduce right-turning speeds and improve sight lines. Protected intersections also provide separate crossing space for bicyclists and pedestrians, in addition to queuing space for bicyclists.

Pedestrian Infrastructure

Shared-Use Paths

As previously discussed in the context of bicycle infrastructure, paths that exceed eight feet in width are typically considered accommodating for both pedestrians and bicyclists. While shared-use paths are generally considered to be the most comfortable type of infrastructure for walking or biking, they can often lead to conflicts between users, in which slower-moving pedestrians are often more vulnerable. To mitigate potential safety issues, signage or pavement markings can be used to indicate pedestrian and bicycle zones or travel directions, which is particularly important on heavily used routes.

Sidewalks

Sidewalks are paved pathways for pedestrian travel. They are the foundation for any pedestrian mobility network, and are sometimes supplemented by shared-use paths. In most cases, sidewalks should be installed on both sides of the street and include a buffer that provides separation from adjacent traffic. This provides added safety and comfort, and can provide space for street trees, plantings, lighting, and street furniture. Sidewalks can also provide access that is independent of a roadway, providing a more connected network between cul-de-sacs or through parking lots.

The Americans with Disabilities Act (ADA) requires sidewalks to provide a minimum width of three feet with unobstructed access. Most sidewalks in the region are a minimum width of five feet, which allows two people to pass comfortably or to walk side-by-side. Higher-pedestrian volumes may warrant wider walkways. For any sidewalk width, the paved surface must be relatively level from side-to-side, and running slopes should generally be less than five-percent grade, unless the adjacent roadway is steeper.

Crosswalks

Crosswalks, marked and unmarked, legally exist at all intersections, unless explicitly prohibited. Accessible curb ramps provide a transition between sidewalks and crosswalks. They are required at all crosswalks on public streets and at transit stops. Detectable intersection warnings, or truncated domes, are a standardized surface feature that alerts pedestrians to a transition between sidewalks and roadways, and required by ADA at all crosswalks.

Marked Crosswalks

Marked crosswalks use pavement markings to delineate a pedestrian crossing area. They increase the safety and comfort of people crossing the street on foot, and alert drivers to potential pedestrian activity. At mid-block locations, pavement markings establish a legal marked crosswalk.

Crosswalks may be marked with transverse lines, which run parallel to pedestrian travel and outline a pedestrian walkway, or continental markings, which run perpendicular to pedestrian travel and enhance visibility. They may also include decorative treatments that define a district and support placemaking, or be physically raised to signal to motorists that they are crossing into spaces intended for other users.

Crosswalk widths should be six feet or the width of the connected curb ramps, whichever is greater. Higher pedestrian volumes may warrant crosswalk widths of eight feet or wider. On multi-lane, high-volume, high-speed roads, crosswalk markings should not be installed without additional treatments such as signage, signals, curb extensions, or pedestrian safety islands.

Pedestrian Safety Islands

A pedestrian safety or refuge island provides space in the roadway for pedestrians to wait for traffic to pass, and reduces the time it takes to safely cross at an intersection. They are generally applied at locations where speeds and volumes make crossings difficult, or where three or more lanes of traffic make pedestrians feel exposed or unsafe in the intersection.

Pedestrian safety islands should be at least six feet wide to accommodate the length of a bicycle or a person pushing a stroller, but have a preferred width of 8-10 feet. They can also be used to connect offset crosswalks to encourage crossing pedestrians to look at oncoming traffic before crossing, and are often enhanced using plantings or street trees.

Curb Extensions

Curb extensions (also known as bulb-outs, neckdowns, or chokers) narrow streets to shorten crossing distances, improve sight lines, manage on-street parking, slow traffic speeds, and reduce effective turning radius. They work best when paired with on-street parking, and can be built to physically enforce parking restrictions near crosswalks and improve visibility. To manage drainage, curb extensions can be used for green infrastructure and bioretention.

Pedestrian Signals

Pedestrian signals enhance crosswalks by displaying a white pedestrian symbol, an orange flashing hand, and a steady orange hand to communicate walk, clearance, and don't-walk phases. Countdown timers showing the time remaining in the clearance phase are required when installing any new pedestrian signal.

Pedestrian signals can be activated by default for every traffic signal cycle or by pedestrians with crosswalk push buttons, which must be accessible by pedestrians with disabilities. Lights and sound cues can be used to confirm pedestrian signal activation for pedestrians with visual and auditory disabilities. Pedestrian phases should be adjusted to ensure adequate time for all users to cross, especially near schools and hospitals.

Leading pedestrian intervals can be used to initiate the pedestrian walk phase three-to-seven seconds before the concurrent motor vehicle phase begins, allowing pedestrians to cross first. This phasing increases pedestrian visibility and reduces conflicts with turning motorists, improving safety and comfort for travelers within the intersection. Leading pedestrian intervals should be considered at intersections with significant pedestrian traffic and turning vehicles. They should be implemented consistently along a corridor to manage pedestrian and motorist expectations. Prohibiting right turn on red can further increase their effectiveness.

Pedestrian Hybrid Beacons

Pedestrian hybrid beacons, also known as High-Intensity Activated Crosswalk Beacons (HAWK beacons), are user-activated traffic signals that require motorists to stop at crosswalks. Pedestrian hybrid beacon operation includes no signal indication until activated, a flashing yellow phase after activation, a solid red phase that is long enough to accommodate crossing pedestrians, and a flashing red phase that permits motorists to proceed after yielding for pedestrians and bicyclists.

Pedestrian hybrid beacons are recommended along multi-lane and high-volume streets. Stop bar markings should be installed in advance of the crosswalk to maintain adequate sight lines.

Rectangular Rapid Flash Beacons

Rectangular rapid flash beacons are user-actuated flashing pedestrian crossing signs that draw motorist attention to pedestrians waiting to cross. Generally, these should only be installed at mid-block crossings or roundabouts, because the flashing beacons may not be visible to motorists turning from side-streets into the crosswalk. Advanced yield markings should be installed to maintain clear sight lines between crossing pedestrians and motorists.

Crosswalk Signs

Crosswalk signs draw motorists' attention to the presence of mid-block crosswalks and crossing pedestrians and bicyclists. They can be placed at mid-block crossings, in a median, combined with stop or yield line markings, and between travel lanes in the crosswalk. Advanced crosswalk signs require installing stop-line markings or yield-line markings.

Stop-Line and Yield-Line Markings

Stop-line markings are wide, white bars in the vehicle travel lane that indicate where motorists should stop in advance of intersections. At intersections, stop bars should be placed no less than four feet and no more than 30 feet from a crosswalk.

Similarly, yield-line markings, also known as "sharks' teeth," are white, triangular markings that indicate where vehicles should yield to crosswalk users. At unsignalized mid-block crosswalks, yield markings should be placed no less than 20 feet and no more than 50 feet from the crosswalk. Yield markings must be accompanied by appropriate signage.

Supporting Infrastructure

Lighting

Lighting can help with nighttime visibility and improve safer travel for pedestrians and bicyclists. Lighting also makes pavement conditions visible to help avoid potential hazards. To avoid creating a silhouetting effect, lighting at crosswalks should be placed to illuminate crossing pedestrians from the side instead of overhead.

Lighting on shared-use paths and heavily traveled bicycle facilities can increase bicyclist comfort and safety, especially during winter months and through underpasses. Installing lighting along regional shared-use paths should begin and end at logical locations to avoid creating intermittently dark sections. Adequately lighted streets can also help motorists see bicyclists in on-street facilities.

Wayfinding

Wayfinding signs, markings, and maps direct travelers to important destinations. In addition to destination names, wayfinding signage should indicate the travel distance or approximate time to reach the destinations they promote. Destinations can include parks, neighborhoods, business districts, schools, shared-use paths and transit stations.

While wayfinding elements are useful for most bicycle and pedestrian infrastructure, they are critically important for regional trails, neighborhood greenways, and bike routes, which all may include connections with different infrastructure types.

Just as numbered state highways might have different names in different jurisdictions, regional trails can have multiple designations to maintain local wayfinding systems. As such, communities should work together so wayfinding is clear and useful, aesthetically pleasing, and preserves both local and regional identities.

Bicycle Parking

There are many different types of bike parking that fit into different contexts – examples include simple bike racks, outdoor bike lockers, and secure bike parking rooms within parking structures. The key to selecting the right type of parking is based on local demand for short, medium, and long-term parking and what space is available within the public right-of-way. The Association for Pedestrian and Bicycle Professionals has published a bike parking guide that can help assess local demand.

Bicycle Repair Stations

Oftentimes, bicycling-related issues arise when users are far away from their homes, motor vehicles, or a local bike shop. Bicycle repair stations have all the tools necessary to perform basic bike repairs and maintenance, from changing a flat tire to adjusting brakes and derailleurs. When located at trail heads, in parks, or other destinations in the network, communities can make biking more convenient and encourage its use.

Green Infrastructure

Green infrastructure can be added to both bicycle and pedestrian projects to accommodate multiple goals of improving water quality and promote better bicycle and pedestrian mobility. Improvements include porous pavement for bikeways and walkways, rain gardens, bioswales within vegetated planting strips, bump-outs, and other traffic-calming devices. In addition, trees can provide a sense of separation and safety, while also enhancing aesthetics and pedestrian comfort. Use *SEMCOG's Green Streets Guidebook* for more information on incorporating green infrastructure into street design.

Access to Transit

One of the benefits of bicycling and walking facilities is providing safe and comfortable access to transit stations and stops. A number of elements may be implemented to provide access. Sidewalks and bikeways provide a basic level of access, but site-specific features such as curb ramps and connections from the street or path network to the station are equally important.

Station wayfinding and amenities such as benches, shelters, trash receptacles, bike parking, and real-time bus arrival information can improve the overall transit experience. Local agencies and transit providers should work together to ensure stations and stops are easily accessible for pedestrians and bicyclists.

Trailheads and Rest Areas

Trailheads and rest areas are primarily features of the regional trail network, but aspects of both should be considered for longer distance local shared-use paths. They typically are located at access and terminus points of trails and may include parking lots, restrooms, picnic and seating facilities, drinking fountains, emergency phone service, and other recreational amenities. If a trail or path has segments of significant incline or grade, rest areas can provide relief.

Interpretive Facilities and Public Art

Connecting trails and pathways to the local environment and community can enhance walking or biking experiences and provide greater understanding of history or uniqueness of the surroundings. Interpretive facilities typically include signage with ample graphics to engage users of all ages and often integrate cultural, historic, or natural resources of the area. Public art can include interpretive activities, but also can also simply add an esthetic to the pathway, enhance community identity, or provide a public place for gathering and meeting.

Chapter 6: Funding and Maintaining the System

This section helps develop strategies for implementing and sustaining the bicycle and pedestrian system. It includes considerations for funding mechanisms at the local, state, and federal level, along with best practices for different types of maintenance.

Funding

Having sufficient funds for developing and maintaining bicycle and pedestrian infrastructure and related programs is critical to achieving a network of mobility options in Southeast Michigan. Unfortunately, funding is often limited. The funding that is available is often highly competitive and reliant on additional resources. Communities that successfully develop and expand their walking and biking systems often need to be creative in leveraging funds from a variety of sources and aligning projects with other, often larger, infrastructure projects.

Another challenge is that while funding sources exist, they can be difficult to navigate. The following sections summarize the funding sources available for bicycle and pedestrian projects. It needs to be noted that often projects will need multiple funding sources due to both limited funds and local matching requirements. Additionally, the size and complexity (e.g., acquisition needs, right-of-way issues, environmental impacts, etc.) of the project will likely determine and impact funding and financing options. Table 12 provides a general guide for various funding options based on projects of varying sizes and available budgets. This table is broken down by estimated budgets/costs and timeframe for project construction. Here are examples of projects for each category:

- **Small Budget – Short-Term:** Placemaking and temporary treatments such as painted bike lanes and shared-lane markings, wayfinding signage, and pop-up pedestrian areas and parklets.
- **Small Budget – Long-Term:** Sidewalk maintenance, and ADA enhancement projects; shared-use paths and trail enhancements such as maintenance, signage, and trailhead amenities.
- **Large Budget – Short-Term:** Sidewalk gap filling and replacement in demand areas and near core services; mid-block and intersection pedestrian safety enhancements such as HAWK signals and countdown devices; protected and separated bike lanes.
- **Large Budget – Long-Term:** Regional trail and shared-use path gap-filling projects; streetscapes including pedestrian lighting; multi-use bridges and boardwalks crossing roadways, rivers, wetlands, etc.

Table 12
Sources of Funding Options

Small Budget – Short Term	Small Budget – Long-Term	Large Budget – Short-Term	Large Budget – Long-Term
• Neighborhood Associations • Nonprofit grants • Local Health Departments • Office of Highway Safety • Main Street and Downtown Development Authority programs • Crowdsourcing (e.g., Patronicity grants) • Local General Funds • Foundation grants • Individual donors	• Federal Transportation Funds (e.g., TAP, SRTS, CMAQ, etc.) • Capital Improvement budget funds • State and Local Programs – Community Development Block Grants; Natural Resources Trust Fund; Recreation Passport; Land & Water Conservation Fund	• Foundation grants • Individual donors • Public-private partnerships • Infrastructure bonds	• Federal Transportation Funds (e.g., TAP, SRTS, CMAQ, etc.) • Foundation grants

Federal and State Funding Sources

Numerous funding opportunities administered at the federal and state levels support bicycle and pedestrian improvements and programs. These programs are generally intended for capital improvements, safety and education programs, and projects that relate to the surface transportation system. Federal funding programs typically require a local match of 20 percent and are often highly competitive.

Federal Highway Administration (FHWA) and MDOT administer programs to fund and implement infrastructure that support bicycle and pedestrian transportation, and to develop safety projects at high-crash locations. A complete list of funding opportunities available through the USDOT is in Appendix E. In addition, the National Parks Service (NPS) and Michigan Department of Natural Resources (DNR) administer funds to improve outdoor recreation opportunities, including walking and biking. Here are a few of the most applicable programs for bicycle and pedestrian projects:

- **Highway Safety Improvement Program (HSIP):** Administered by FHWA and MDOT, HSIP is a core federal-aid program with the purpose of achieving a significant reduction in traffic fatalities and serious injuries on all public roads. This program can be used for road diets, pedestrian and bicycle crossing improvements, traffic calming, and other treatments that improve safety for vehicles, pedestrians, and bicyclists.
- **Land and Water Conservation Fund (LWCF):** Administered by NPS and DNR, LWCF provides grants to states and local governments for acquiring and developing public outdoor recreation areas and facilities. These may include walking or biking trails, or improved connections through parks.
- **Michigan Office of Highway Safety Planning Grants:** Administered by the National Highway Traffic Safety Administration and Michigan State Police Office of Highway Safety

Planning, these grants are awarded for pedestrian and bicycle safety programs. This funding aims to increase safety awareness and skills among pedestrians, bicyclists, and motorists sharing the roadway. Items eligible for funding are public awareness materials, bicycle skills courses, and training for professionals involved with all aspects of pedestrian and bicycle safety.

- **Surface Transportation Block Grant Program (STBG):** Administered by FHWA and MDOT, STBG is a flexible funding program that may be used by states and localities for projects to preserve and improve the conditions and performance on any public road, including bicycle and pedestrian infrastructure.
- **Transportation Alternatives Program (TAP):** Administered by FHWA and MDOT, TAP funds are split between the state and various larger urban areas based on population. MDOT administers an estimated $17.6 million in TAP funding each year, which includes funds for Safe Routes to School programs and projects. The SEMCOG region has received approximately $5 million annually, distributing funds on a competitive basis. TAP funds can be used to expand transportation choices and enhance the transportation experience through implementing a number of improvements – pedestrian and bicycle infrastructure and safety paths, environmental mitigation through green infrastructure, and projects to improve walking and biking to school.
- **Safe Routes to School (SRTS) Major Grants:** MDOT administers major grants for SRTS with funding through TAP. This grant program focuses on helping communities build sidewalks, crosswalks, and any other infrastructure improvements that may be needed to make it possible for students to walk, bike, and roll safely to school. They are supplemented by Safe Routes to School Mini Grants, which are administered by the Michigan Fitness Foundation and more focused on education and encouragement.

State of Michigan Funding Sources

State-level funding for walking and biking projects is available from various sources, including MDOT, DNR, the Michigan State Police. Here are some of these programs:

- **Michigan's Act-51 Funds:** MDOT, county road agencies, cities, and villages all receive state funding from state gas taxes and registration fees that can be used for a variety of roadway projects including bikeways, sidewalks, and crosswalks.
- **Michigan Natural Resources Trust Fund (MNRTF):** Provides grants to local governments and other agencies to secure and develop lands for recreational purposes. Trail projects within and connecting to parks, especially trails that enhance and improve statewide and regional trail networks (e.g., Michigan's Iron Belle Trail and Great Lake to Lake Trail), are priority projects under MNRTF.
- **Recreation Passport Grants:** Provides funding to local governments for developing public recreation facilities, such as developing new facilities and renovating old facilities.

Local Funding Sources

Local revenues, millages, and infrastructure bonds are the primary local public funding sources for pedestrian and bicycle projects. Additionally, some communities use tax-increment financing (TIF) – value capture of the increment tax increase collected and used for improvements within the district. Through local zoning ordinances, communities can encourage and require sidewalk and pathway construction when new development and redevelopment occurs.

Transportation is only successful if users can safely access it by walking or biking. Local governments can set aside portions of general transportation revenue, public school bonds, county health department funding, parking fees, and traffic violation revenue for upgrades to walking and biking facilities.

Private and Philanthropic Funding Sources

Many private funding sources are available for pedestrian and bicycle projects, from small grants for marketing activities to multi-year foundation grants. Small-scale projects and improvements that require land acquisition are often funded primarily from private sources.

- **Safe Routes to School Mini Grants:** In coordination with MDOT, the Michigan Fitness Foundation administers a safe-routes to school mini-grant program that provides funding to schools to develop transportation programs that encourage students in grades K-8 to walk and bike to school. Examples of these programs are walking school buses, bike mechanics clubs, or bike train programs; other programs that encourage more students to walk and bike to school on a regular basis could also be eligible.
- **Parks and Trails Initiative:** Ralph C. Wilson Jr. Foundation's (RCWJF) parks and trails initiative is focused on making connections and eliminating gaps in the regional trails system and supporting local economic vitality.
- **Legacy Funds for Design and Access:** This partnership between RCWJF and the Community Foundation for Southeast Michigan's Greenway's Initiative support projects that serve to increase walkability and bikeability of local communities and/or increase outdoor recreational activities.

Statewide and nationally, funding opportunities for smaller projects and support for planning and encouraging walking and biking activities are available:

- **People for Bikes Community Grants:** Primarily focused on supporting bicycle infrastructure projects and targeted advocacy initiatives that make it easier and safer for people of all ages and abilities to ride. These funds are generally smaller in size and scope and support infrastructure projects such as bike paths, lanes and trails, and end-of-trip facilities such as bike racks, bike parking, bike repair stations, and bike storage.
- **DALMAC Fund:** Funds a variety of bicycling activities in Michigan, ranging from safety and education programs to bicycle trail development.
- **League of Michigan Bicyclists Micro-Grants:** Provides financial assistance to support the implementation of creative projects that promote bicycling and safety on Michigan roadways.

Funding Through Public-Private Partnerships

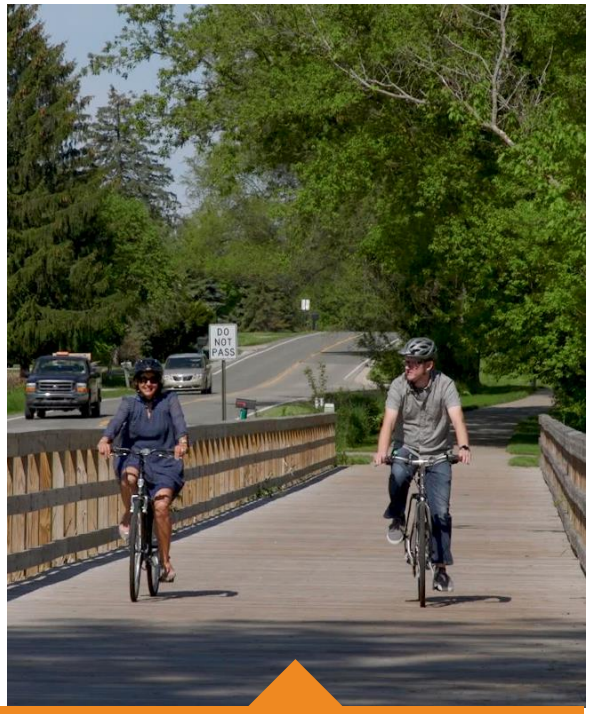
Public-private partnerships are contractual agreements that can leverage funds from both sectors for infrastructure projects and facilities. Where municipal budgets fall short, private revenue can fill the gaps. During project development, seeking opportunities to partner and coordinate with adjacent land owners and stakeholders such as utility owners is a way to leverage available resources and time projects for greatest impact. With an increased emphasis on the health benefits of walking and bicycling, public and private health organizations can be resources for funding and partnerships, and promote the benefits of a project.

Innovative Funding Sources

Increasingly, nonprofit organizations, municipalities, and individual advocates are using crowdfunding for innovative pedestrian and bicycle projects. Crowdfunding uses a large audience for fundraising, typically with the help of Internet donation websites such as kickstarter.com.

The Michigan Economic Development Corporation's (MEDC) Public Spaces Community Places program is a public placemaking initiative using Patrinicity's crowdgranting campaign. Through this program, local residents can use crowdfunding to be part of developing strategic projects, such as those supporting walking and biking in their communities and be backed with a matching grant from MEDC.

Regardless of funding source, continued investment in expanding, maintaining, and closing gaps in walkway and bikeway networks is needed to create complete, connected, convenient, and safe infrastructure for people to walk and bike. Operations and maintenance, including striping, sweeping, snow removal, bridge maintenance, and repaving all should be factored into local budgets. Special attention should also be paid to the potential for requiring specialized maintenance equipment for certain types of trails and bicycle facilities that may be too narrow or delicate for standard maintenance vehicles. Facility design should avoid the requirement of non-standard maintenance vehicles whenever possible to lower the long-term maintenance burden on local jurisdictions.



Regional Highlight: Pittsfield Township Greenways Development

After using SEMCOG technical assistance as part of its Community Master Plan Update, Pittsfield Township has planned and developed nearly 10 miles of shared-use paths and sidewalk projects between 2010 and 2019. These projects fill critical gaps in the township's network and provide direct links to transit access, the county's Border-to-Border Trail, and connect residents to township hall and four parks.

In order to achieve this success, the township needed to be both strategic and collaborative in identifying and securing funding. Through the combination of a township park millage, Washtenaw County Parks and Recreation Commission funds, MDOT Economic Development Category A funding, Transportation Alternatives Program funds, and Washtenaw County's Urban CDBG funds, Pittsfield Township has allocated nearly $6 million for bicycle and pedestrian pathways. Additionally, through a SEMCOG Green Infrastructure grant, in 2020 the township is implementing bio-swales and tree planting along Textile Road adjacent to the Pittsfield Preserve, Marsh View Meadows Park, and Platt Textile Greenway.

Maintenance and Repair

Maintaining pedestrian and bicycle infrastructure is necessary to ensure that it remains safe and usable. Existing facilities such as sidewalks, crosswalks, bike lanes, and trails should be evaluated to determine whether the existing maintenance plan is working, and to make improvements to the plan if necessary. Routine maintenance activities such as street sweeping, surface inspections, and landscaping can help keep existing infrastructure intact and prevent small problems from escalating over time. Seasonal maintenance, such as snow and ice removal, helps preserve both the pavement surface and the system's transportation function by maintaining clear access for pedestrians and bicyclists.

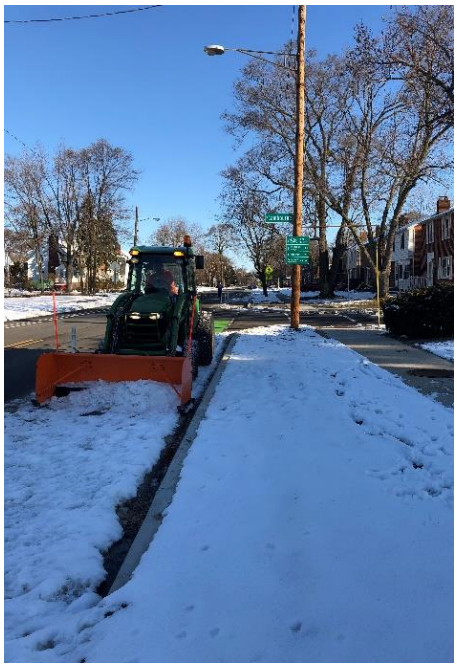
Other maintenance activities require greater investment and should be planned strategically. Capital Preventative Maintenance (CPM) such as crack sealing, seal coating, or renewing pavement markings may occur annually or every few years through a phased approach. Larger infrastructure maintenance projects, such as road reconstruction or bridge repair, are also sometimes necessary to maintain or enhance bicycle and pedestrian mobility networks.

Increasingly, grants that fund development of bicycle and pedestrian infrastructure, such as the Transportation Alternatives Program (TAP), require applicants to identify a plan and budget for long-term maintenance for their project to be eligible. Many communities have implemented proactive sidewalk maintenance and repair programs, including:

- Canton Township's Sidewalk Repair Program
- Ann Arbor's Sidewalk and Ramp Repair Program
- Sterling Heights' Sidewalk Repair and Replacement Program
- Royal Oak's Shovel It Forward program is an innovative and fun approach to both educate and partner with residential and commercial property owners to remove snow from sidewalks

Implementation Considerations

- Funding plans for any project should consider the entire lifecycle of its needs, including ongoing maintenance costs.
- Coordination between public works, parks and recreation, public utilities, and other local departments and divisions can clarify maintenance responsibilities and expectations while improving efficiency.



- Establishing a clear routine assessment by neighborhood for repair and maintenance has proved to be successful in many communities. The goal is to assess the entire community every five years, with a subset of neighborhoods assessed each year so that maintenance and repair is ongoing and no neighborhood is inspected or assessed less than every five years.
- A typical asset management approach to maintaining bicycle and pedestrian infrastructure would be to invest 10 percent of the infrastructural component's value in maintenance/repair each year.
- Similar to the way that road pavement condition is monitored through the PASER system, evaluating and rating bicycle and pedestrian infrastructure can identify maintenance needs and establish quantifiable priorities to ensure that the system stays in good condition.
- Depending on the type of buffer and overall dimensions, some independent paths and protected bikeways may require specialized maintenance equipment for sweeping and snow maintenance. Where there is on-road infrastructure, care should be given to evaluate snow storage needs, ideally with snow stored within the buffer, behind the road curb, or a combination of the two.

Regional Highlight: St. Clair County Trail Conditions Analysis

As part of their countywide trial planning efforts, the St. Clair County Metropolitan Planning Commission completed an analysis of existing conditions throughout their trail network in spring of 2019.

Working in partnership with the St. Clair County Transportation Study, they developed a rating system based on the PASER model, but adjusted the scoring to reflect trail infrastructure issues. They used mobile devices equipped with cameras and a field collection app with GPS, which not only allowed them to understand more about pavement condition, but also more information about wayfinding signage, drainage issues, and other supporting elements like benches or trailheads along a route. The results of this analysis provide a thorough baseline to begin a prioritized trail maintenance program.

Chapter 7: Education, Encouragement, Enforcement, and Evaluation

Creating a bicycle- and pedestrian-friendly community takes more than just new trails, bike lanes and sidewalks. It takes a holistic approach that promotes safe use of bicycle and pedestrian facilities through education, encouragement, enforcement, and evaluation.

This chapter outlines opportunities to educate bicyclists and pedestrians about the rules of the road and encourage more bicycle and pedestrian travel. It includes how to engage and inform drivers and law enforcement about the safest ways to share the road. It also addresses the evaluation of the system and its use.

Education

Educating all road-users – people who walk, bike, and drive – on the laws and best practices in traveling is a vital component to creating a more walkable and bikeable Southeast Michigan. Efforts to increase education for walking and biking include both programming and campaigns that focus on issues such as the use of pedestrian signals, or how to educate children to safely cross the street without an adult. Education may also cover traffic rules for cyclists to deter them from riding against traffic or in unsafe places, and information for motorists about the rights of cyclists and pedestrians.

In educating the public, it is important to develop programs that address both the different groups of road users and their different behavior patterns. For example, public and stakeholder audiences that should be targeted for educational programs and campaigns include parents and teachers; transportation officials, decision makers, and law enforcement officers; as well as road users of various age groups, such as school children, college-age pedestrians and cyclists, and older adults. Nationally and regionally, there are several resources and programs available to encourage bicycle and pedestrian travel and increase education on using and supporting walking on biking.

Active Transportation Education

Providing travel training through education and opportunity for individuals with disabilities is a major component for expanding access and increasing usage of the region's bicycle and pedestrian facilities.

- **PEAC's Active Transportation Program –** A curriculum based, community centered program that trains individuals with disabilities how to travel in their community. This training teaches independence and provides students opportunities to access their community, develops personal agency, and educates about alternative modes of transportation, including how to use and travel by SMART bus.

Bicycle and Pedestrian Safety Campaigns

Bicycle and pedestrian safety campaigns show people how and why to walk and/or bike. Typical programs focus on reducing conflicts with motor vehicles, and provide information on best practices in crossing and sharing the road, as well as local laws.

- **Pedestrian Safer Journey Campaign** – Developed by FHWA, this campaign helps educators, parents, and others who care about pedestrian safety to get the conversation started with children and youth.
- **Ride On Royal Oak –** This public education campaign targets bicyclists and motorists on how best to get around Royal Oak safely and responsibly. It uses PSAs, with a city police officer talking through the importance of bicycle and motorist safety on roadways. The PSAs are shown in movie theaters and on public television.

Bicycle Skills and Riding Education Programs

Bicycle skills and riding education programs teach bicycle skills and provide an opportunity for participants to practice and develop skills to help them ride safely and avoid common crashes. These courses and events often include bike maintenance, traffic safety advice, and laws related to riding on public roads.

- **Livonia Bike Walk: Bike Rodeo –** Using the Livonia YMCA parking lot, the city puts on a bicycle rodeo that includes a series of challenges to help young bicyclists improve their skills. In addition to guidance on skills and best practices such as bike registration and inspection, helmet fitting, exiting driveways, and safe intersection crossing, the Bike Rodeo also provides those who complete the "course" with giveaways such as bike helmets, water bottles, lights, and t-shirts.

Pedestrian and Bicycle Information Center

Pedestrian and Bicycle Information Center (PBIC) is supported by the Federal Highway Administration (FHWA) and the National Highway Traffic Safety Administration (NHTSA). It focuses on improving the quality of life in communities by promoting safe bicycling and walking as a viable means of transportation and physical fitness. PBIC has an online catalog of bicycle and pedestrian education programs, guides, fact sheets, and lesson plans available for organizations and local governments in promoting traffic safety.

Road Safety Programs and Campaigns

Road safety programs and campaigns encourage road users to abide by local and state laws, be courteous to other road users, and promote sensible behaviors and actions.

- **Walk.Bike.Drive Safe –** This traffic safety education campaign for Southeast Michigan was designed to reach as many road users as possible through sharing safety messages via tip cards, public service announcements on radio and TV, and at-the-pump screens at gas stations; billboards and bus posters; community outreach via local governments, schools, and libraries; and coverage in the media.

Safe Routes to School Trainings (SRTS)

Safe Routes to School Trainings are local and regional trainings designed to better understand the SRTS planning process, youth engagement and leadership, asset mapping, and leveraging partnerships.

- **Safe Routes to School Michigan –** Offers multiple trainings and webinars geared towards school champions, principals, transportation officials, planners, and road authorities to gain hands-on training and learn from best practices and success stories.

Encouragement

In addition to educating all road users on best practices for safety, it is important to promote walking and biking through encouragement programs and events that make them more visible and expose new users to biking and walking as a form of mobility.

Bike to Work Day

Bike to Work Day is an annual event that is held in May throughout the country with the purpose of promoting and encouraging bicycling to work as an option for commuting.

- **Detroit Bike to Work Day –** Provides multiple convoys of cyclists to meet up and travel together to Downtown Detroit. The annual event has multiple sponsors and provides those that ride with snacks, refreshments, and giveaways.

Commuter Challenge

Commuter Challenge programs are often annual events that focus on a day, week, month, or longer, encouraging individuals, teams, and workplaces to compete in taking an alternative commute to work. The main goal or "challenge" is for single-passenger drivers to try a new mode of travel to work, such as walking, biking, public transit, carpooling, or telecommuting.

- **Southeast Michigan Commuter Challenge –** Using Commuter Connect, a free alternative commute matching program, the Commuter Challenge is an annual event that encourages single-passenger drivers to try a new mode of travel to work. During May 2019, Southeast Michigan participants reduced carbon dioxide emissions by more than 1,234 pounds.

Open Streets

Open Streets initiatives temporarily close streets to automobiles so people may use them for various activities like walking, jogging, bicycling, skating, dancing, and other social activities. These events are great at bringing the community together and promoting transportation options, placemaking, and public health.

- **Open Streets Detroit –** A free, safe, and inclusive event that brings Detroiters together in the streets by providing opportunities for fitness, recreation, and community building along city streets. The inaugural route was in Southwest Detroit, covering three-and-a-half miles along Michigan Avenue and West Vernor Highway.

Special Events and Festivals

Special events and festivals that raise the visibility of walking and biking are growing in popularity and can range from a handful of participants to thousands. These events are great opportunities for community building and promoting the assets within a community or region. At the local level, block parties, art strolls, walking tours, and neighborhood pride tours are great ways to promote and raise appreciation for pedestrian-scaled environments.

- **Tour De Ville –** Annual family-oriented bike ride that begins and ends in Historic Northville. The routes and lengths vary from a 10-mile family ride to a 54-mile route for the more seasoned rider. Over the last five years, this event attracted more than 2,000 riders and raised more than $90,000 for local charities.

Temporary Pop-Up Demonstrations

Temporary pop-up demonstrations are a great way to show and test the potential success of a project. Temporary installations can be quick and affordable to install and remove, often over the course of a weekend, week, or month. These may include temporary protected bike lanes, painted sidewalks, parklets, pedestrian plazas in vacant spaces, and traffic-calming techniques.

- **AARP's Pop-Up Demonstration Tool Kit –**This toolkit, as part of AARP's Livable Communities Program, provides a step-by-step guide to developing and implementing a pop-up demonstration project that illustrates how a proposal or desired bicycle and/or pedestrian enhancement can be organized, supported, and achieved.

Walk-to-School Day

Walk-to-School Day is a way to encourage students to walk or bike to school. In 2019, 5,129 schools across the country participated in a walk-to-school or bike-to-school event, including 304 schools and more than 88,000 students in Michigan. Walking and bicycling to school enables children to incorporate the regular physical activity they need each day while also forming healthy habits that can last a lifetime.

- **Chelsea Walk-to-School Wednesdays –** This weekly event in the City of Chelsea is facilitated by the Five Healthy Towns coalition, and leads walking groups to two of the city's elementary schools. Parents are encouraged to join if they are interested; the event takes place every Wednesday that school is in session.

Enforcement

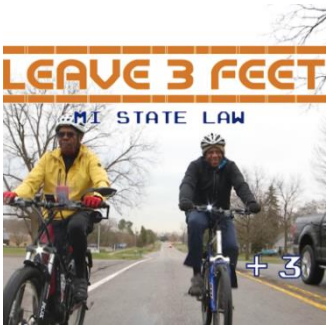
Enforcement strategies primarily focus on how the law enforcement system treats and enforces traffic laws to improve the walking and biking environment and helps ensure the safety of all road users. The examples summarized in this section are aimed at reducing common traffic mistakes that occur along roadways and encouraging everyone to follow the rules of the road.

Enforcement of Traffic Laws

Enforcement of traffic violations can vary from issuing warning citations to ticketing for traffic offenses such as riding against traffic, disregarding traffic signals, etc. In addition to enforcing traffic laws for those who walk and bike, it is important to also make those who drive aware of the latest laws and infrastructure.

Law Enforcement Partnerships

Partnering with police and traffic safety on enforcement is a useful strategy to deter unsafe behaviors of drivers, pedestrians, and bicyclists, and encourage all road users to obey traffic laws and share the road safety. Often enforcement can be included in community training and events (e.g., bicycle rodeos, walking tours); or through law enforcement promoting good user behaviors, such as providing awards or coupons to local stores or shops when good road behavior is observed (e.g., a child wearing a bike helmet, walking a bicycle across a busy intersection, or using hand signals when turning).



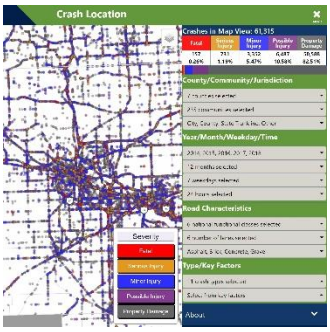
Law Enforcement Training Sessions

Training sessions for law enforcement officers are very important as infrastructure and regulations change over time. They allow communities and the state to support the professional development of its law enforcement officers regarding enforcement of bicycle and pedestrian laws. Newer laws, like the three-feet passing law enacted in 2018, is one example of balancing educating motorists and enforcing the law.

- **League of Michigan Bicyclists' Training Series –** These trainings are geared toward law enforcement and consist of two components: classroom sessions focused on community bicycle safety, and a hands-on afternoon session designed to guide participants on hosting events such as bicycle rodeos.

Evaluation

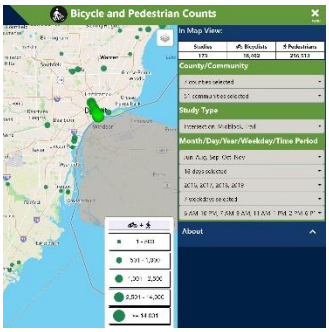
Regardless of the type of bicycle or pedestrian project, there is always a need for evaluating it on a regular basis to gauge its quality and user-friendliness. This may include obtaining feedback from users of bicycle and pedestrian facilities, counting the number of people using new treatments, or making improvements in response to the feedback and data received through surveys or other input.



Annual Crash Data Evaluation

Annual crash data evaluation provides insights on the safety of bicycle and pedestrian facilities and can help identify problem areas. Identifying areas that are exceeding the expected number of pedestrian or bicycle crashes is a way of strategically using crash data to prioritize improvements.

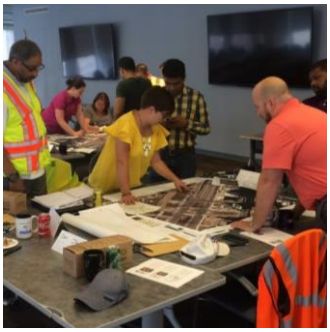
- **SEMCOG's High-Priority Safety Locations Map –** This online tool prioritizes roadways that have a disproportionate number of crashes to assist local agencies in addressing traffic safety needs. The data includes several search features, including crashes involving bikes and pedestrians.



Bicycle and Pedestrian Counts

Bicycle and pedestrian counts in targeted areas can help quantify increases in use for a particular project, or provide support for future improvements. These can be both high- and low-tech, ranging from local groups and volunteers physically counting people with pen and clipboard (or tablet) to permanent electronic counters at high-use locations.

- **SEMCOG's Bicycle and Pedestrian Count Program –** To assist local communities with bicycle and pedestrian planning, SEMCOG developed a bicycle and pedestrian count program, measuring the number of people across the region in urban, suburban, and rural areas using all types of facilities and infrastructure. In 2019, this program included an online map of nearly 200 studies across all seven counties.
- **City of Ann Arbor's Nonmotorized Progress Report –** Since 2006, the city has collected 185 nonmotorized counts on more than 150 corridor segments primarily using observers placed along corridors and at intersections to better understand and document usage.



Public Participation Surveys

Public participation surveys help to understand users and how the bicycle and pedestrian infrastructure is used. Activities like online surveys, community meetings, and block parties are good opportunities to understand and respond to the perspectives and experiences of the community. SEMCOG's *Public Participation Plan* provides resources and examples of ways to engage the public and evaluate results of public participation.

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March 2020

Bicycle and Pedestrian Mobility Plan for Southeast Michigan - Appendix

SEMCOG | SOUTHEAST MICHIGAN COUNCIL OF GOVERNMENTS

SEMCOG. . . *Developing Regional Solutions*

Mission

SEMCOG, the Southeast Michigan Council of Governments, is the only organization in Southeast Michigan that brings together all governments to develop regional solutions for both now and in the future. SEMCOG:

- Promotes informed decision making to improve Southeast Michigan and its local governments by providing insightful data analysis and direct assistance to member governments;
- Promotes the efficient use of tax dollars for infrastructure investment and governmental effectiveness;
- Develops regional solutions that go beyond the boundaries of individual local governments; and
- Advocates on behalf of Southeast Michigan in Lansing and Washington.

Bicycle and Pedestrian Mobility Plan for Southeast Michigan - Appendix

Abstract

The *Bicycle and Pedestrian Mobility Plan for Southeast Michigan* ensures that the region's nonmotorized system meets the transportation, quality of life, health, and accessibility needs of its residents and visitors, as well as the economic development priorities and goals of the region and local communities. Seven appendices complement the plan.

El *Plan de movilidad de bicicletas y peatones para el sudeste de Michigan* garantiza que el sistema no motorizado de la región satisfaga las necesidades de transporte, calidad de vida, salud y accesibilidad de sus residentes y visitantes, así como las prioridades y objetivos de desarrollo económico de la región y las comunidades locales.

تضمن خطة تنقل الدراجات الهوائية والمشاة لجنوب شرق ميشيغان أن نظام النقل غير المزود بالمحركات في المنطقة يلبي إحتياجات النقل و جودة الحياة والصحة وسهولة إمكانية الوصول لسكانها وزوارها، فضلاً عن أولويات التنمية الإقتصادية وأهداف المنطقة والمجتمعات المحلية

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Table of Contents

List of Data Displays

Tables

Figures

Appendix A — County Profiles

Livingston County

Planning Context

Livingston County consists of 16 townships, two villages, and two cities. The county is home to three state recreation areas, two Huron-Clinton Metroparks, two county parks, and the Mike Levine Lakelands Trail State Park. In total, the county has 24,313 acres of parks, or 134 acres per 1,000 residents – more than any other county in the region.

With a population of 186,946, the county has four percent of the region's total population. There are 85,073 jobs in the county with 56 percent of residents commuting outside the county for employment. The average commute time is 30 minutes, which is the longest in the region. The county's advantageous location between three major job markets – Ann Arbor, Detroit, and Lansing – has made it an ideal location for commuters.

Between 2010 and 2019, Livingston County's population increased by six percent. SEMCOG forecasts that the county's population will increase by another 29 percent by 2045. This is the largest forecasted increase of the region's seven counties. Approximately 45 percent of the Livingston County's land is agricultural, open space, or recreational. An additional 34 percent is single-family residential.

Local Highlight: Trail Network Plan

In 2019, Livingston County kicked-off development of a countywide trail network plan that will:

- Identify and map existing trials in Livingston County;
- Analyze conditions of existing trails and capacity of multimodal, nonmotorized use;
- Identify gaps in the trail network; and
- Create a prioritized strategy for future trail linkages, including cost estimates.

A major component to this plan is identifying secondary local trail links to the major regional and state trails in the county – most notably the Mike Levine Lakelands Trail State Park, which is Route #1 of Michigan's Great Lake to Lake Trail.

Plans and Policies

Several local plans identify needed bicycling and walking improvements in Livingston County. See highlights in Table 1.

Table 1

Local Plans that Influence Bicycling and Walking in Livingston County

Plan Title	Highlights
Livingston County Master Plan (2018)	Highlights the benefits of having complete street components in local community master plans, and how the county intends to provide assistance to communities in pursuing these components. The Master Plan also points out the linkage between Complete Streets and parks and recreation planning, since they both focus on the importance of connectivity.
Green Oak Charter Township Master Plan (2014)	Includes the township's nonmotorized pathways and complete streets policies, such as: • Maintaining and expanding the existing trails and pathway system. • Connecting residential areas to recreation, schools, community facilities, and shopping areas. • Creating zoning ordinances that require new developments to provide nonmotorized connections between the development and other uses.
Howell Township Master Plan (2016)	The nonmotorized section identifies potential corridors for nonmotorized connections. These corridors are intended to connect concentrations of existing and planned residential and commercial developments. The plan recommends that township roadways be designed considering Complete Streets design standards.
Village of Pinckney Master Plan (2015)	Includes community transportation and circulation goals and objectives that support: • Development of a safe nonmotorized network, connecting residential, shopping, and offices, to parks, schools, and activity centers. • Coordination efforts between different entities in development of a circulation plan for the Central Business District.
Genoa Charter Township Master Plan (2013)	Identifies locations for pathways within the township and provides design and recommended pathway types. It also has a detailed map for existing and future pathways.
Huron-Clinton Metroparks Master Plans	In Livingston County, the Huron Meadows Metropark Master plan (2018) includes accessibility analysis of the park trails which allows for prioritization of accessibility improvements.

Walking and Bicycling in Livingston County

Existing Facilities

The Mike Levine Lakelands Trail State Park runs through the southern portion of Livingston County, from Unadilla Township to Green Oak Township, providing links for residents to walk, bike, and horseback ride along a scenic and natural trail. Ongoing pedestrian and bicycle pathways are being connected in the county, especially in Green Oak and Genoa Townships. Both of these townships have recently completed multiple shared-use paths connecting to parks and other core services. The cities of Howell and Brighton, and villages of Pinckney and Fowlerville each have foundational and growing pedestrian networks. The county has 347 miles of sidewalks and 133 miles of bikeways.

Figure 1
Livingston County Sidewalk Mileage

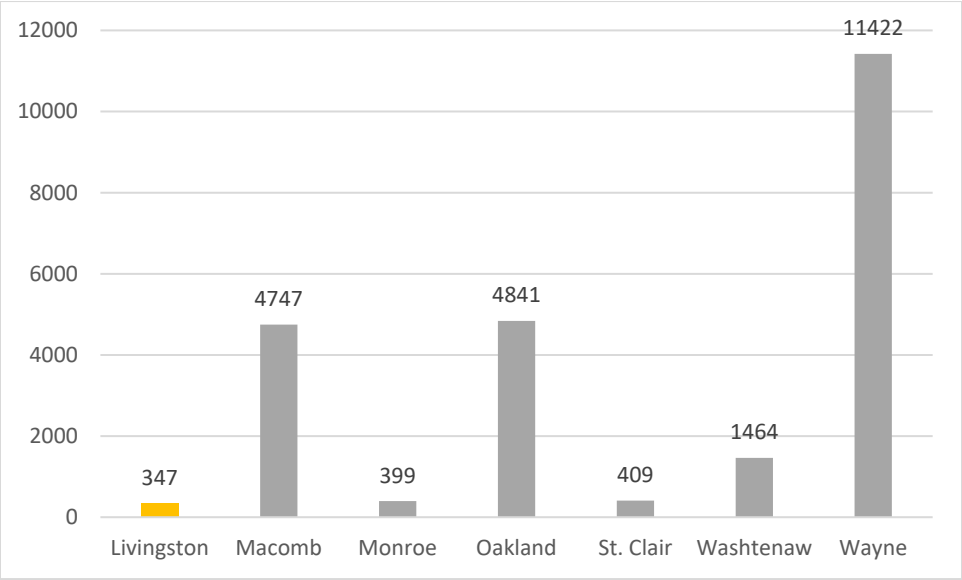


Figure 2
Livingston County Bicycle Network by Type (Miles)

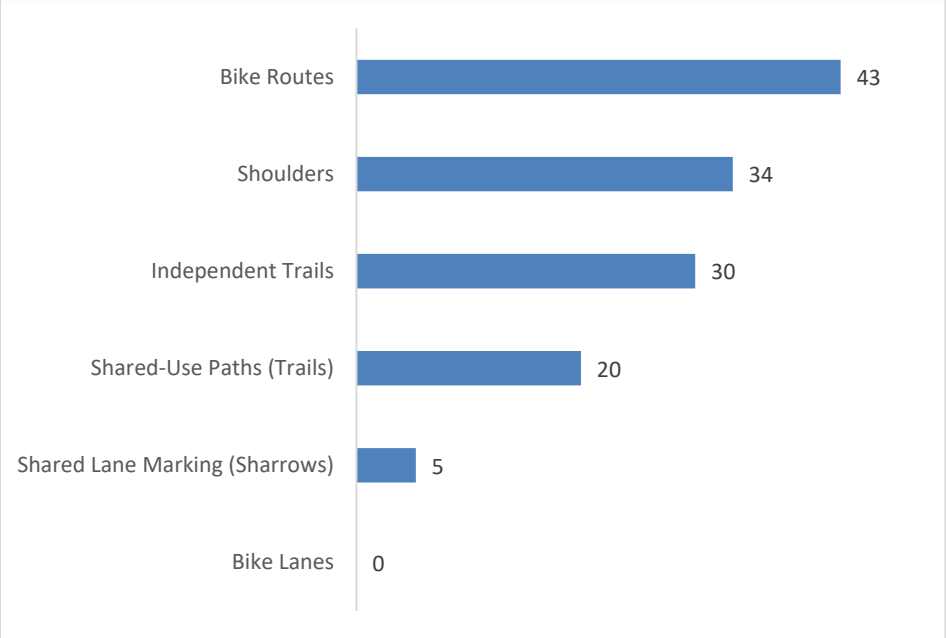
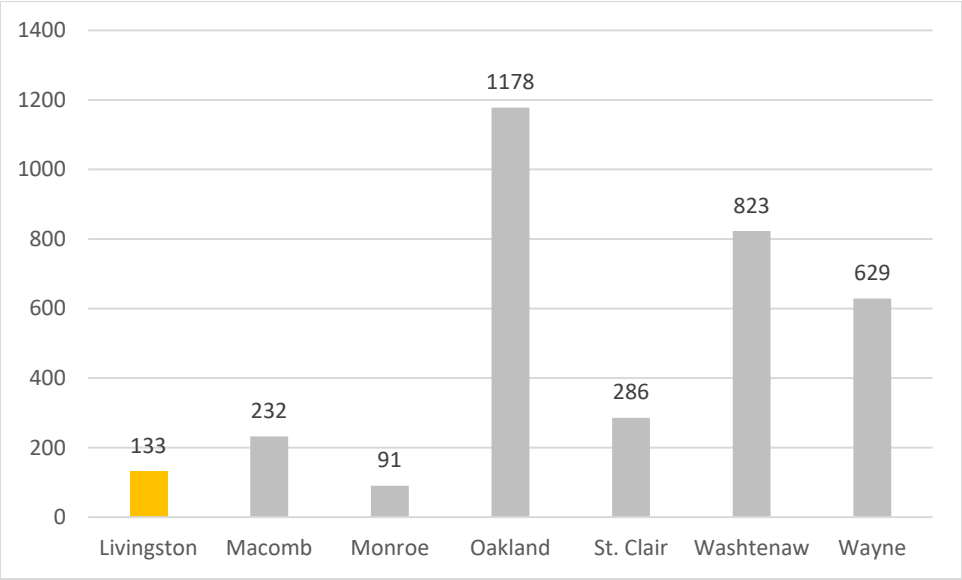
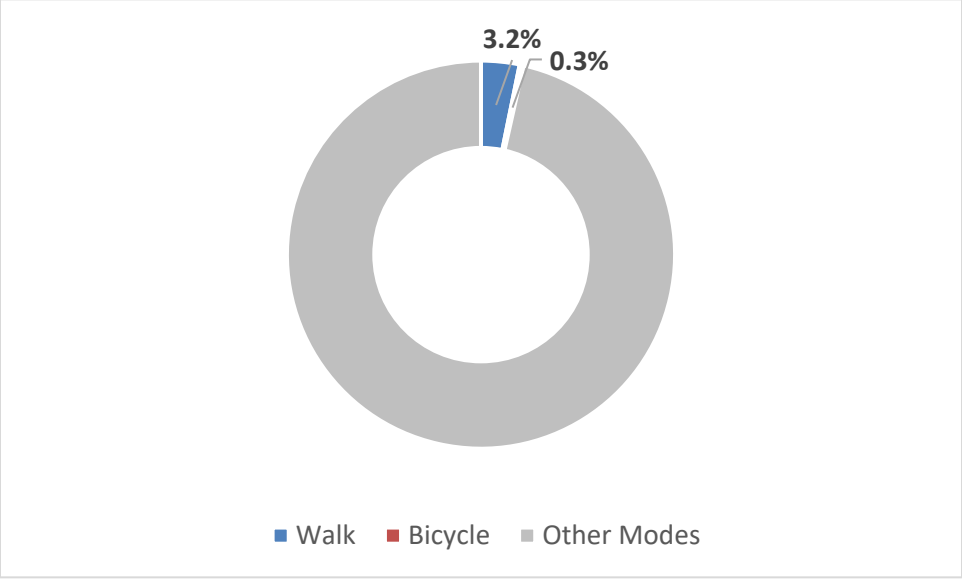


Figure 3
Livingston County Bicycle Network Mileage



Activity Level
Walking and bicycling currently accounts for 3.5 percent of trips in Livingston County. The average travel time to work for residents age 16 and over who live in the county and work outside the home is 30 minutes, and has reduced by 1.5 minutes between 2010 and 2015. Additionally, more than half of workers who live in Livingston County are employed in another county (56 percent), limiting the potential for walking and bicycling as a commute option.

Figure 4
Livingston County Trips by Mode



Crash Data

There were 129 pedestrian and bicycle crashes in Livingston County from 2014-2018; this includes 10 people killed in crashes involving a pedestrian, and two people killed in crashes involving a bicyclist. There were also 18 bicycle and/or pedestrian crashes that resulted in serious injuries in the county.

Even though pedestrian and bicycle crashes account for only 0.5 percent of total crashes in Livingston County, they account for 13 percent of fatalities and five percent of serious injuries. Excluding crashes where the road jurisdiction is not known, the vast majority of bicycle and pedestrian crashes in Livingston County, take place on County and State roads (83%).

Figure 5

Livingston County Fatalities by Mode, 2014-2018

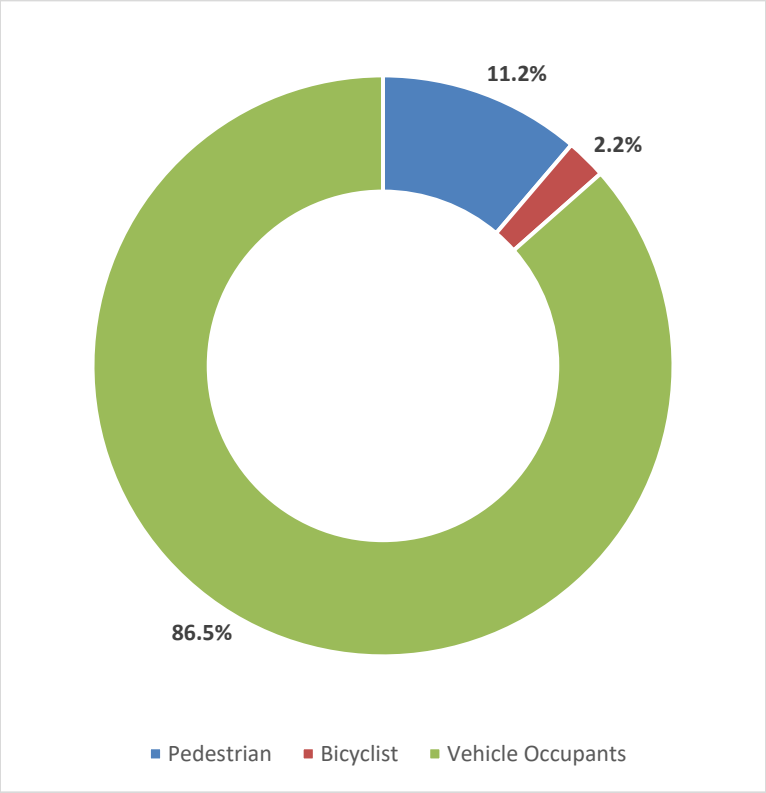


Figure 6
Livingston County Serious Injuries by Mode, 2014-2018

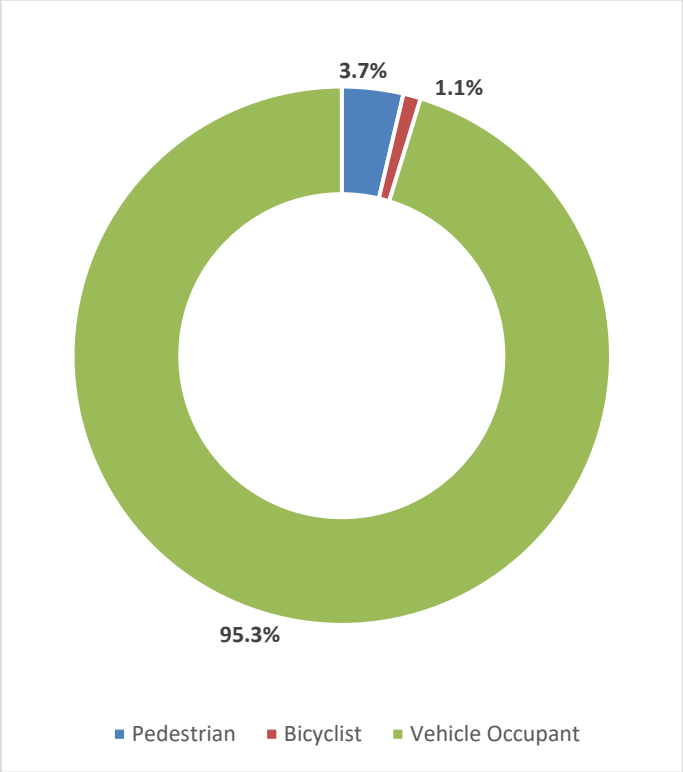


Figure 7
Livingston County Pedestrian and Bicycle Crashes by Road Jurisdiction, 2014-2018

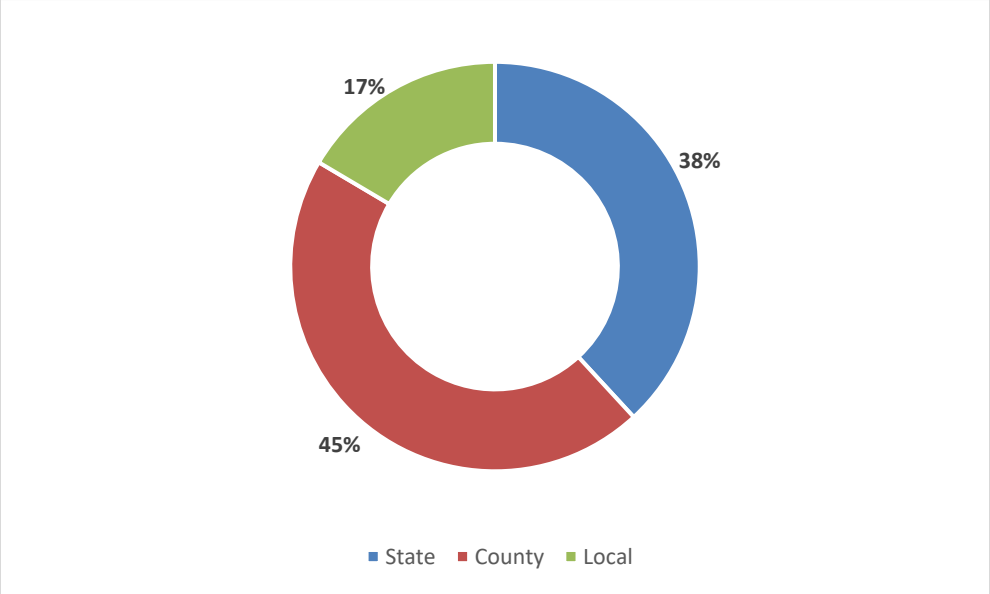


Figure 8
Livingston County Bicycle Network

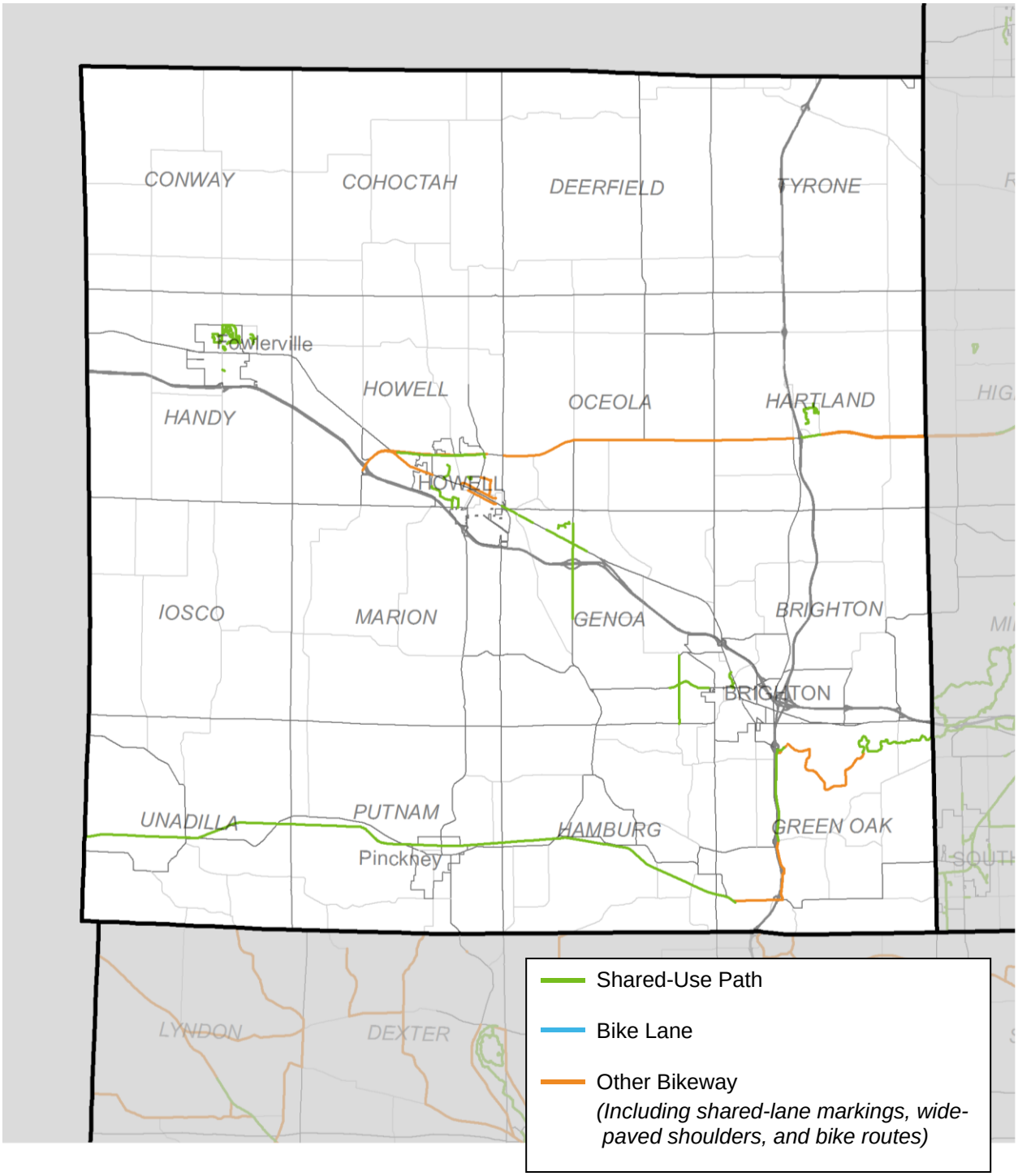


Figure 9
Livingston County Pedestrian Infrastructure

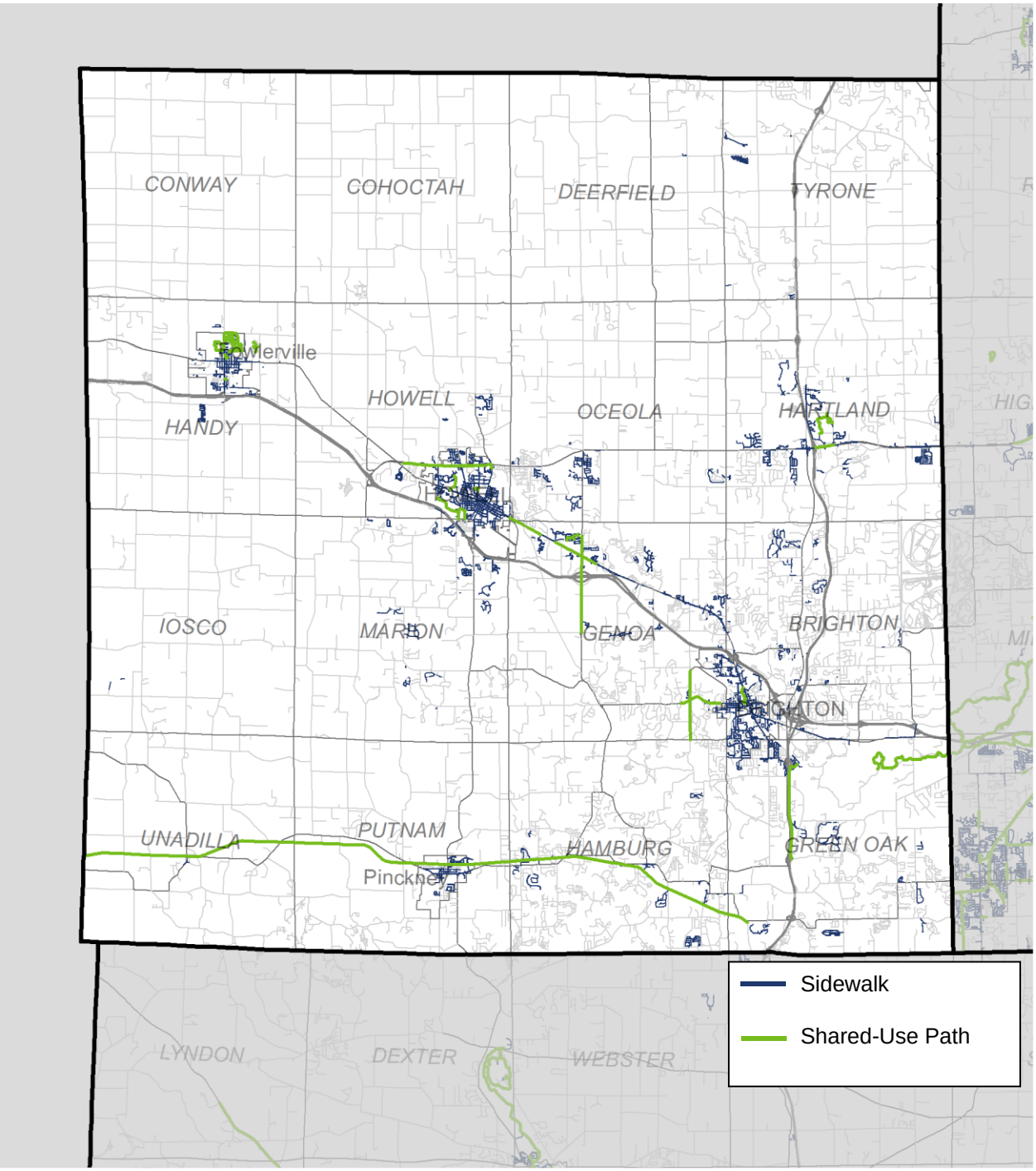


Figure 10
Livingston County Bicycle and Pedestrian Demand Areas

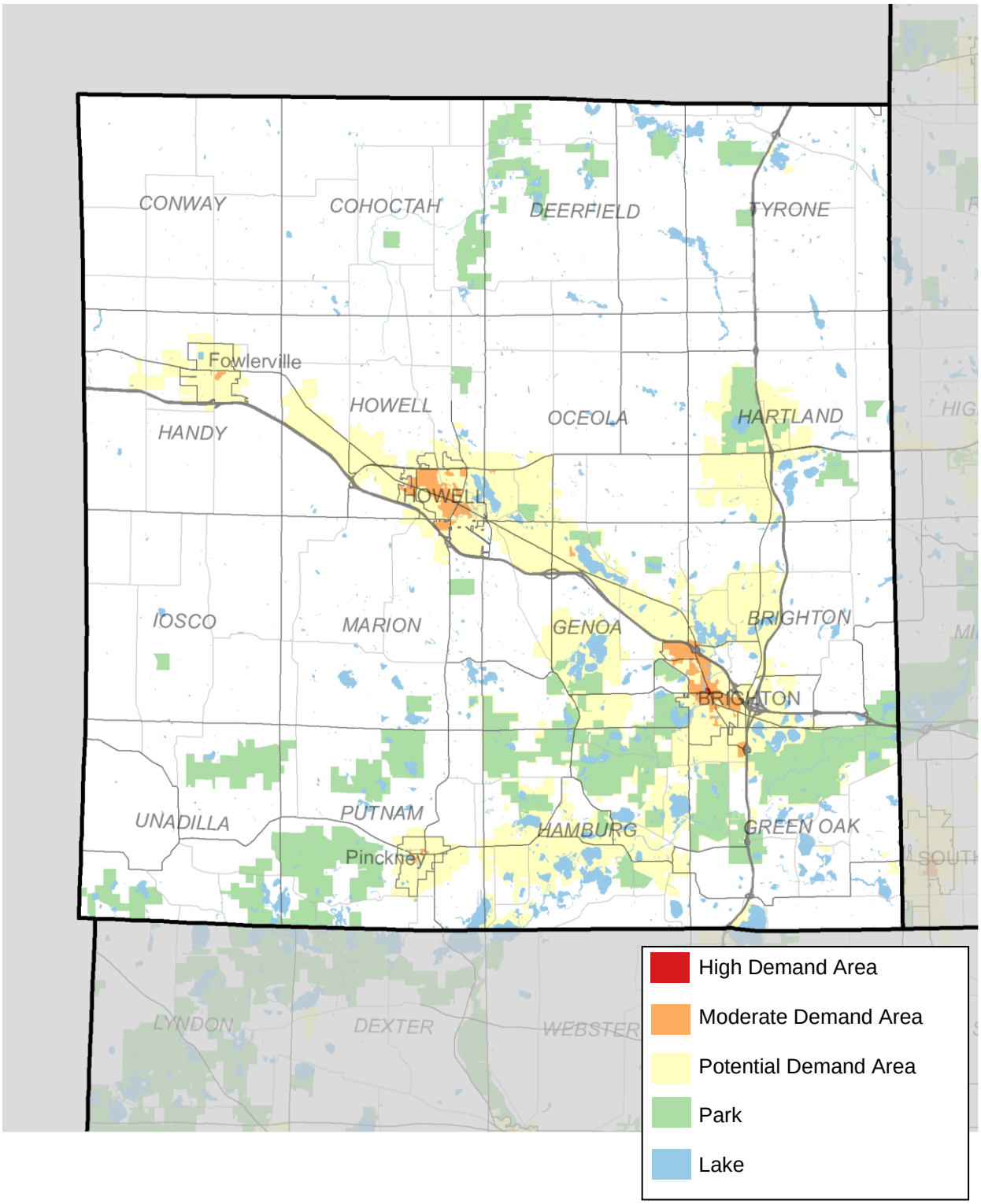


Figure 11
Livingston County Gaps in Pedestrian Infrastructure Access by Demand Area

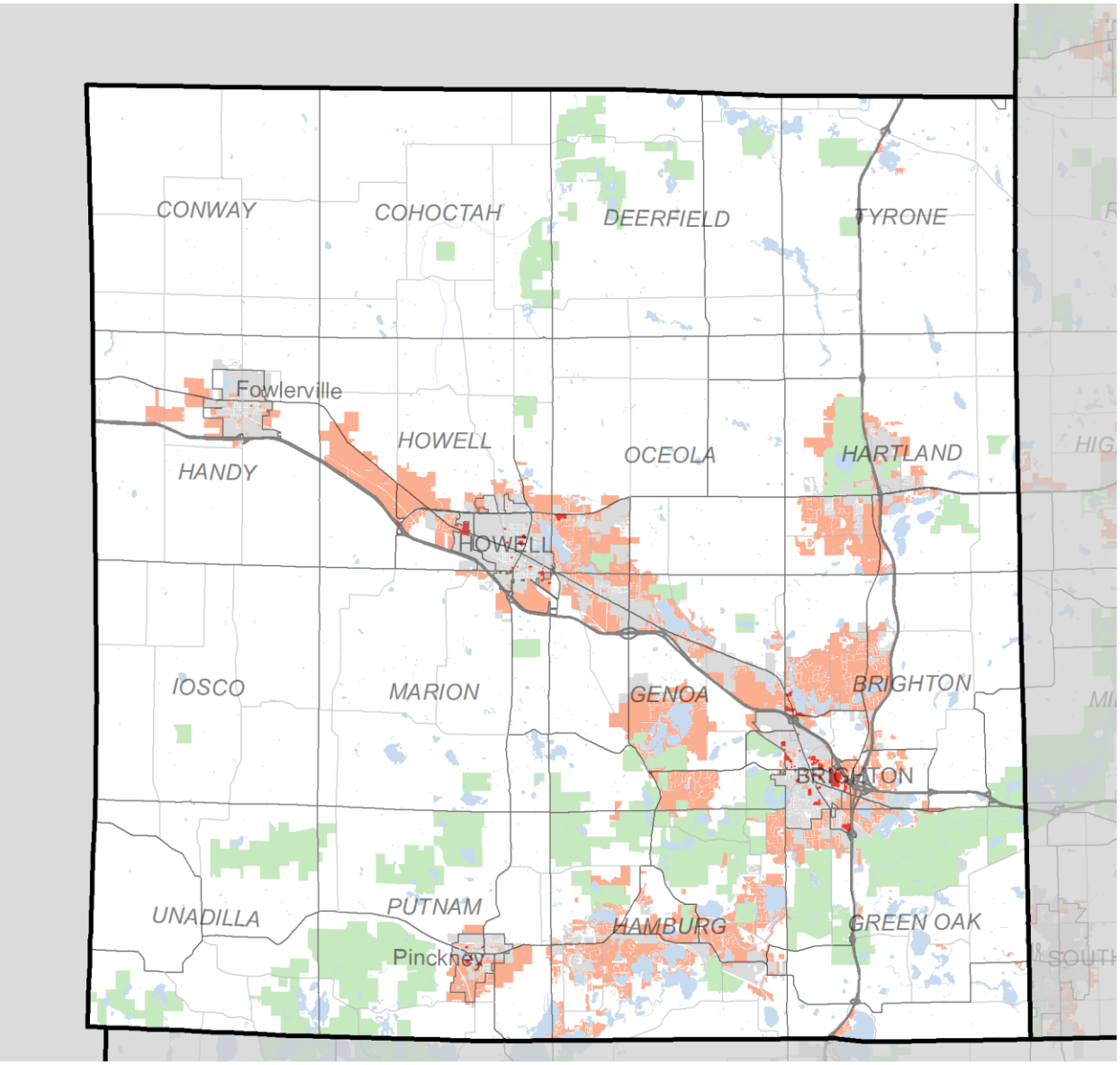


Figure 12
Livingston County Gaps in Bicycle Infrastructure Access by Demand Area

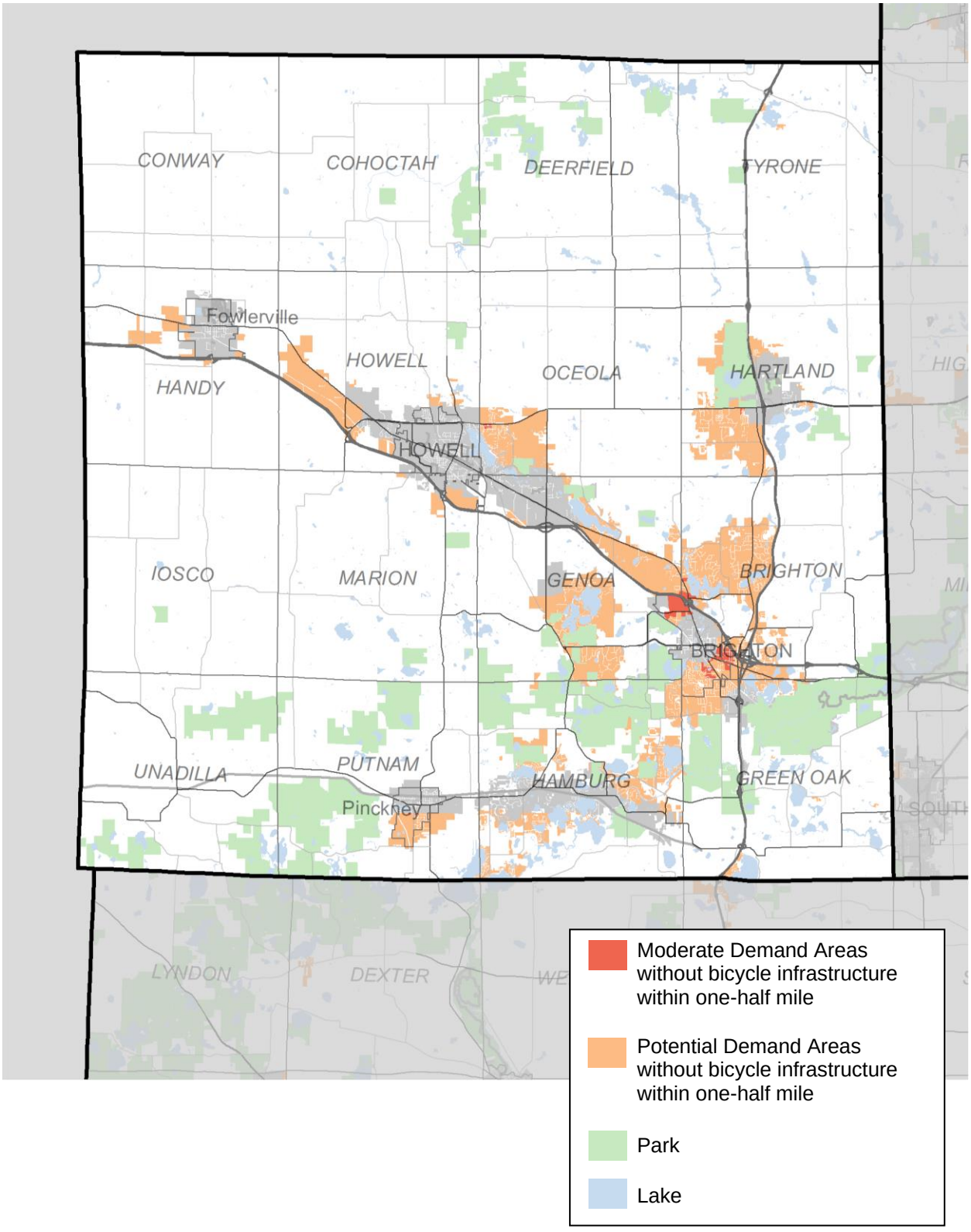
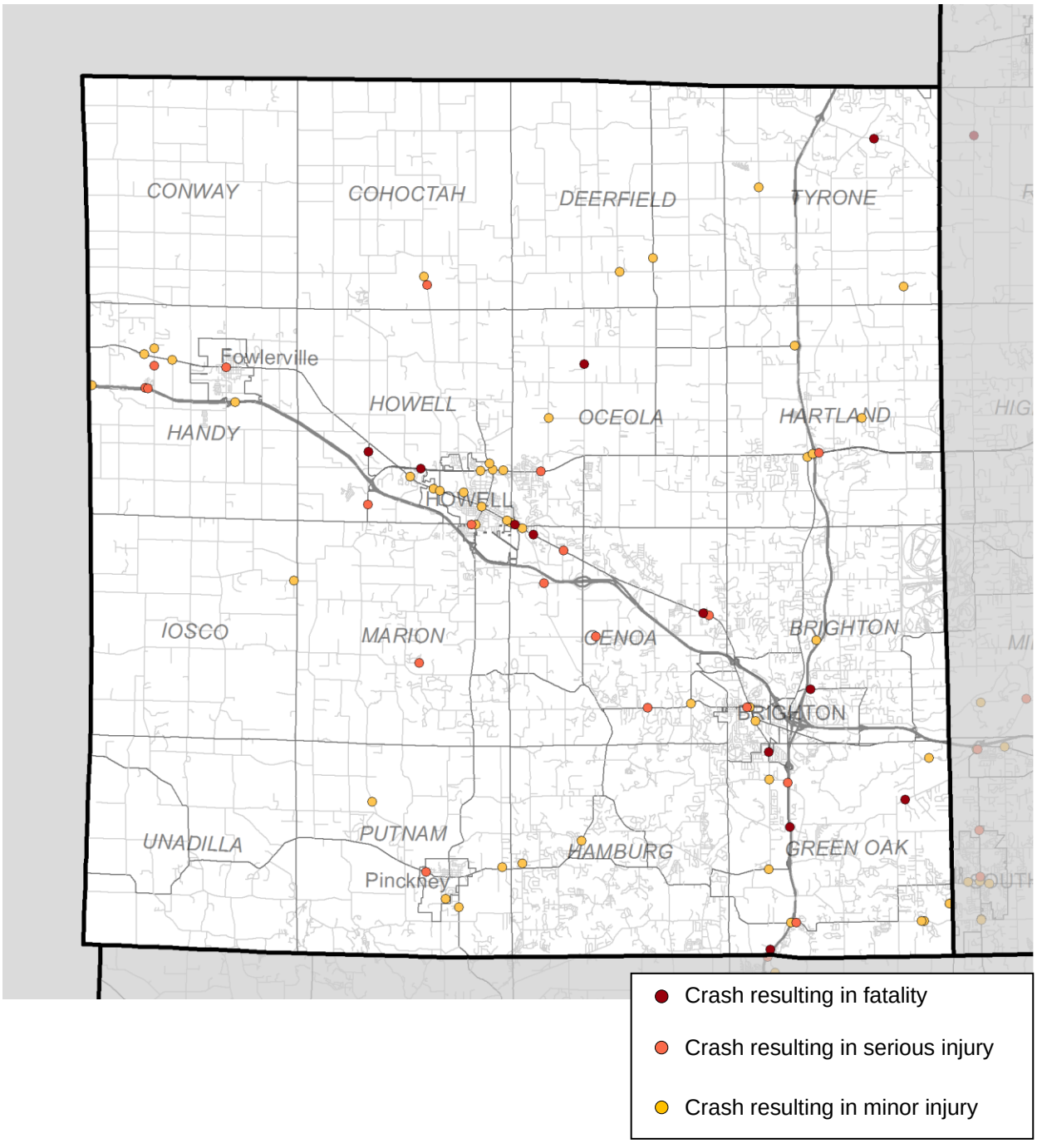


Figure 13
Livingston County Bicycle and Pedestrian Crashes, 2014-2018



Macomb County

Planning Context

Macomb County consists of 13 cities, 11 townships, and three villages. The county is home to three Huron-Clinton Metroparks, one state recreation area, one county park, and several regional trails, including the Macomb Orchard Trail, Freedom Trail, and completed portions of the Iron Belle Trail in Sterling Heights, Utica, and Shelby Township. In total, the county has 19,070 acres of parks, or 23 acres per 1,000 residents.

With a population of 864,019, the county has 18 percent of the region's total population. There are 421,450 jobs in the county with 57 percent of residents commuting within the county for their place of employment. While the majority of workers work within the county, 40 percent work in either Oakland or Wayne Counties. The average commute time is 27 minutes. The county is served by multiple freeways and major corridors including I-94, I-696, M-53, M-59, and M-3, and is home to multiple job centers in Clinton Township, Mount Clemens, Sterling Heights, and Warren.

Between 2010 and 2019, Macomb County's population increased by four percent. SEMCOG forecasts that population will continue to increase by another seven percent by 2045. Approximately 32 percent of the county's land is agricultural, open space, or recreational. An additional 31 percent is single-family residential.

Local Highlight: Connecting the Iron Belle Trail

Macomb County, in partnership with the cities of Center Line, Sterling Heights, and Warren, developed a comprehensive routing and feasibility study to address a critical gap in the Iron Belle Trail. Beginning at the southern border of Warren at 8 Mile Road, and stretching north to Dodge Park in Sterling Heights, the study comprises seven segment analyses, each with cost estimates, alternatives, and most suitable grant opportunities. To determine these priorities, the county held multiple public engagement sessions, including an interactive website with the complete plan and maps. The study was completed in 2019, and the county expects to begin funding identification and implementation in 2020.

Plans and Policies

Several local plans identify needed bicycling and walking improvements in Macomb County. See highlights in Table 2.

Table 2
Local Plans that Influence Bicycling and Walking in Macomb County

Plan Title	Highlights
Mobilize Macomb Non-motorized Plan (2017)	Developed seven types of network gaps and priority links; identifies a set of regional goals and action items to promote and achieve implementation.
Complete Streets Design Plan: Charter Township of Harrison Downtown Development Authority (2017)	Highlights the various benefits of Complete Streets in different areas including, safety, economic development, public health, environment, accessibility, access to funding, and agency coordination. It provides goals, objectives, an action plan, design recommendations, and funding sources for creating Complete Streets.
Romeo-Washington-Bruce 2017-2021 Parks and Recreation Master Plan (2017)	The Romeo-Washington-Bruce Recreation Commission was formed to promote, plan, coordinate, and operate a system of parks and recreation for all residents. Plan identifies bicycle and pedestrian facility developments and improvements as items in the five-year Capital Improvement Projects, and includes cooperative agreements for the maintaining recreational facilities.
Shelby Township 2017 Master Plan (2017)	The Land Use and Transportation section focuses on Complete Streets implementation; maps and strategies to make the township more walkable and bikeable. It also includes design guidelines for the township's major corridors.
City of Sterling Heights Parks, Recreation and Nonmotorized Master Plan (2016)	Includes an assessment of nonmotorized existing conditions, actions steps, and recommendations to improve and expand walking and biking facilities. Provides details of several planning initiatives, including the city's sidewalk removal/replacement and gap programs.
Huron-Clinton Metroparks Master Plans	In Macomb County, the Wolcott Mill Metropark Master Plan (2016) includes an accessibility analysis of the park's nature trails and recommends actions to enhance the access for trail users.

Walking and Bicycling in Macomb County

Existing Facilities

The southern communities of Macomb County (south of M-59) have a foundational network of pedestrian facilities, and a growing network of bicycle facilities. The communities adjacent to and north of M-59 are adding more and more facilities for both biking and walking. Shelby, Macomb, and Chesterfield Townships continue to add sidewalks and make connections between neighborhoods and core services. The county's northern cities and villages have established sidewalk networks, as do clusters of neighborhoods in Washington Township. The northern portions of the county are served by the Macomb Orchard Trail, stretching east to west from

Richmond to Shelby Township, and connecting to the Clinton River Trail in Oakland County. The Freedom Trail begins at Lake St Clair Metropark in Harrison Township, links to trails and pathways in Sterling Heights along the Clinton River, and heads north through Dodge Park, downtown Utica, and Riverbends Park in Shelby Township. The county has 4,747 miles of sidewalks and 232 miles of bikeways.

Figure 14
Macomb County Sidewalk Mileage

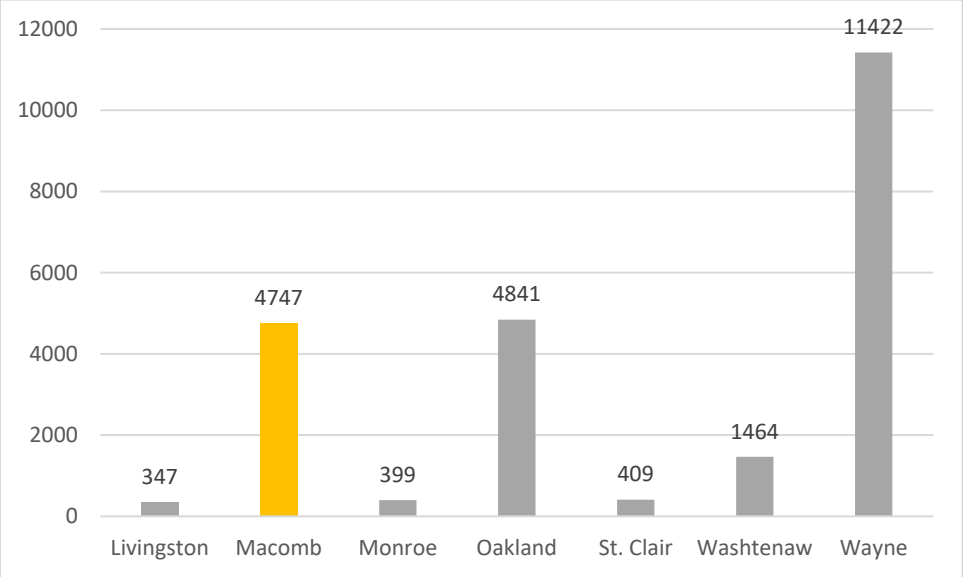


Figure 15
Macomb County Bike Network by Type (Miles)

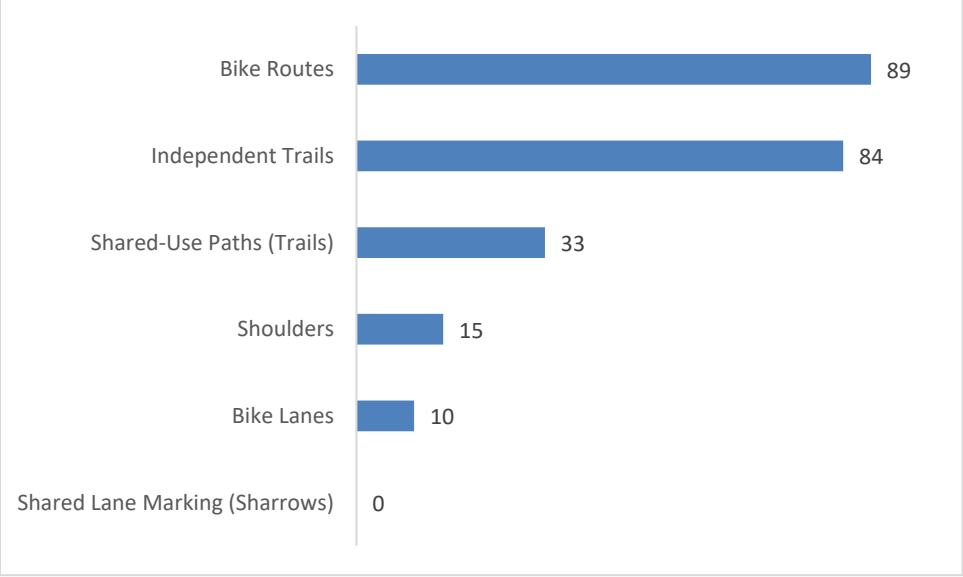
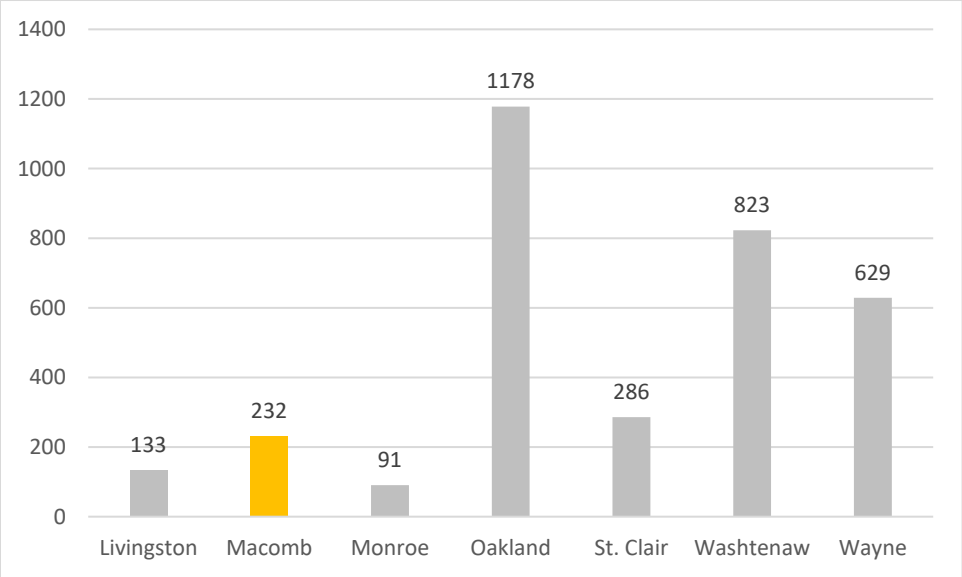
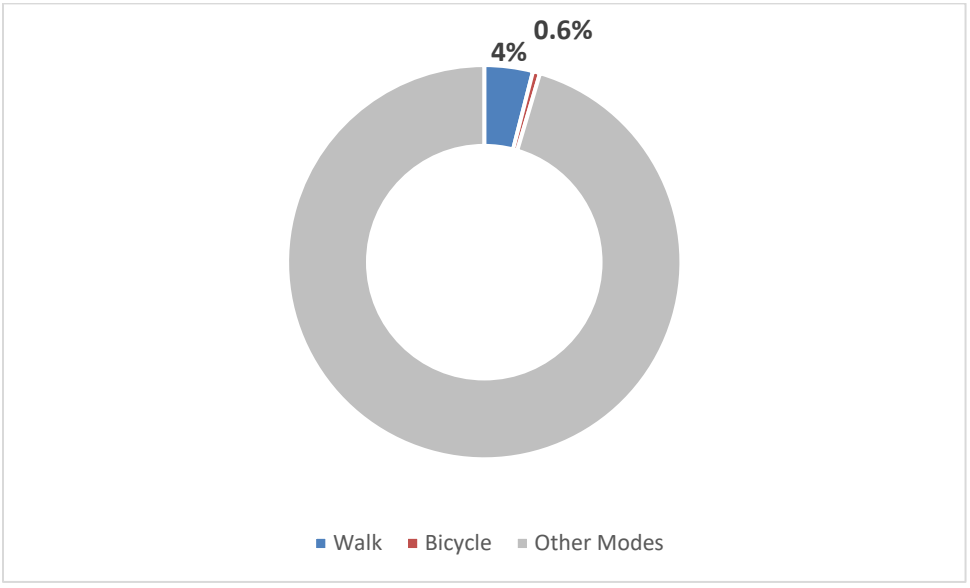


Figure 16
Macomb County Bicycle Network Mileage



Activity Level
Walking and bicycling currently account for five percent of trips in Macomb County. The average travel time to work for residents age 16 and over who live in the county and work outside the home is 27 minutes, and has reduced by about 0.5 minute between 2010 and 2015. Additionally, four out of 10 workers who live in Macomb County are employed in another county (43 percent), limiting the potential for walking and bicycling as a commute option.

Figure 17
Macomb County Trips by Mode



Crash Data

There were 1,699 pedestrian and bicycle crashes in Macomb County from 2014-2018; this includes 69 people killed in crashes involving a pedestrian, and 10 people killed in crashes involving a bicycle. There were also 183 serious injuries from bicycle and/or pedestrian crashes in the county. Macomb County had 16 percent of the region's pedestrian and bicycle crashes.

Even though pedestrian and bicycle crashes account for only one percent of total crashes in Macomb County, they are responsible for 30 percent of fatalities and 11 percent of serious injuries. Excluding crashes where the road jurisdiction is not known, the largest shared of bicycle and pedestrian crashes take place on the County roads (42%).

Figure 18

Macomb County Fatalities by Mode, 2014-2018

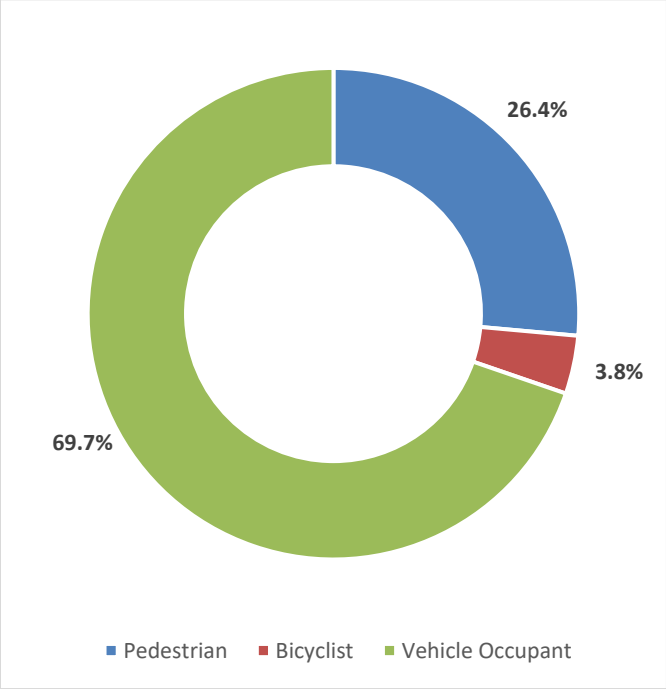


Figure 19
Macomb County Serious Injuries by Mode, 2014-2018

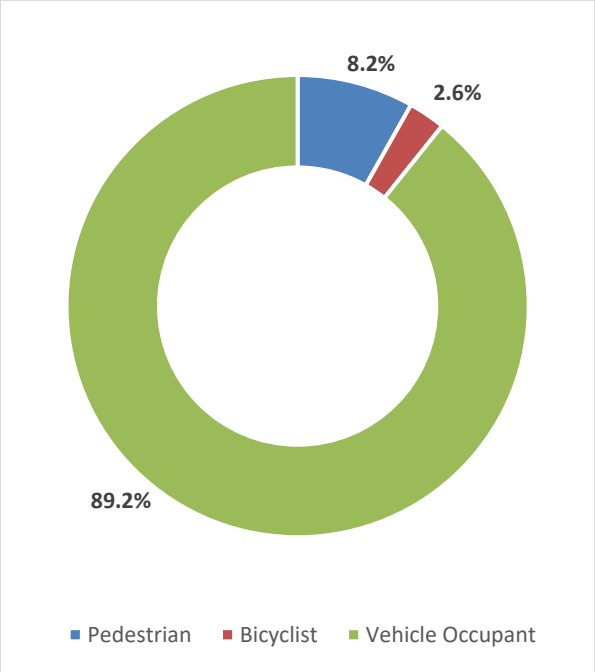


Figure 20
Macomb County Pedestrian and Bicycle Crashes by Road Jurisdiction, 2014-2018

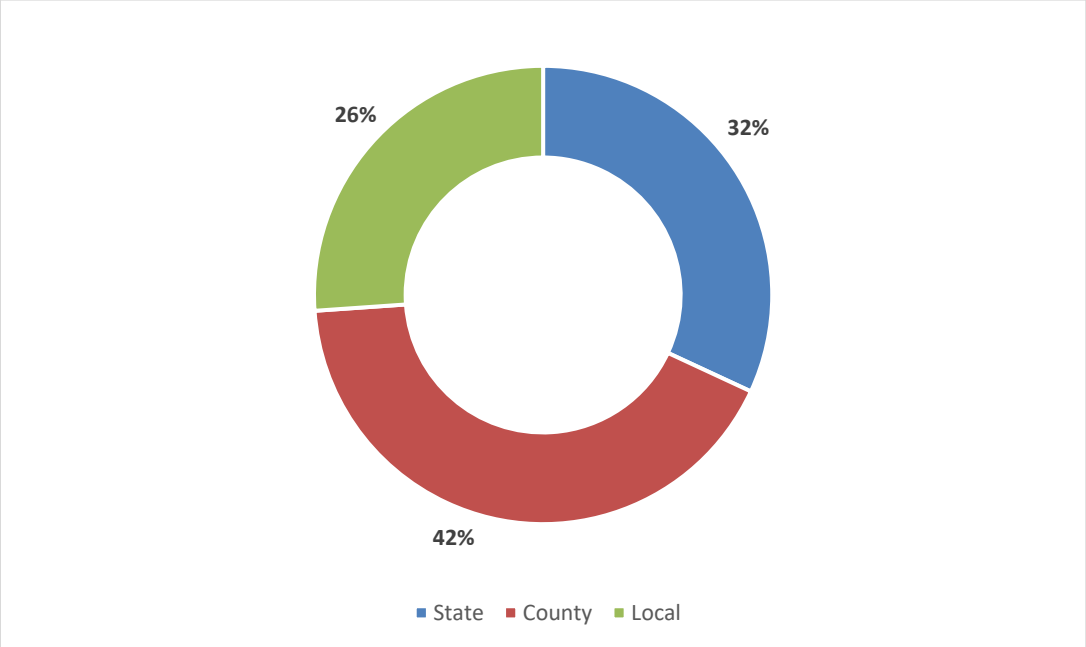


Figure 21
Macomb County Bicycle Network

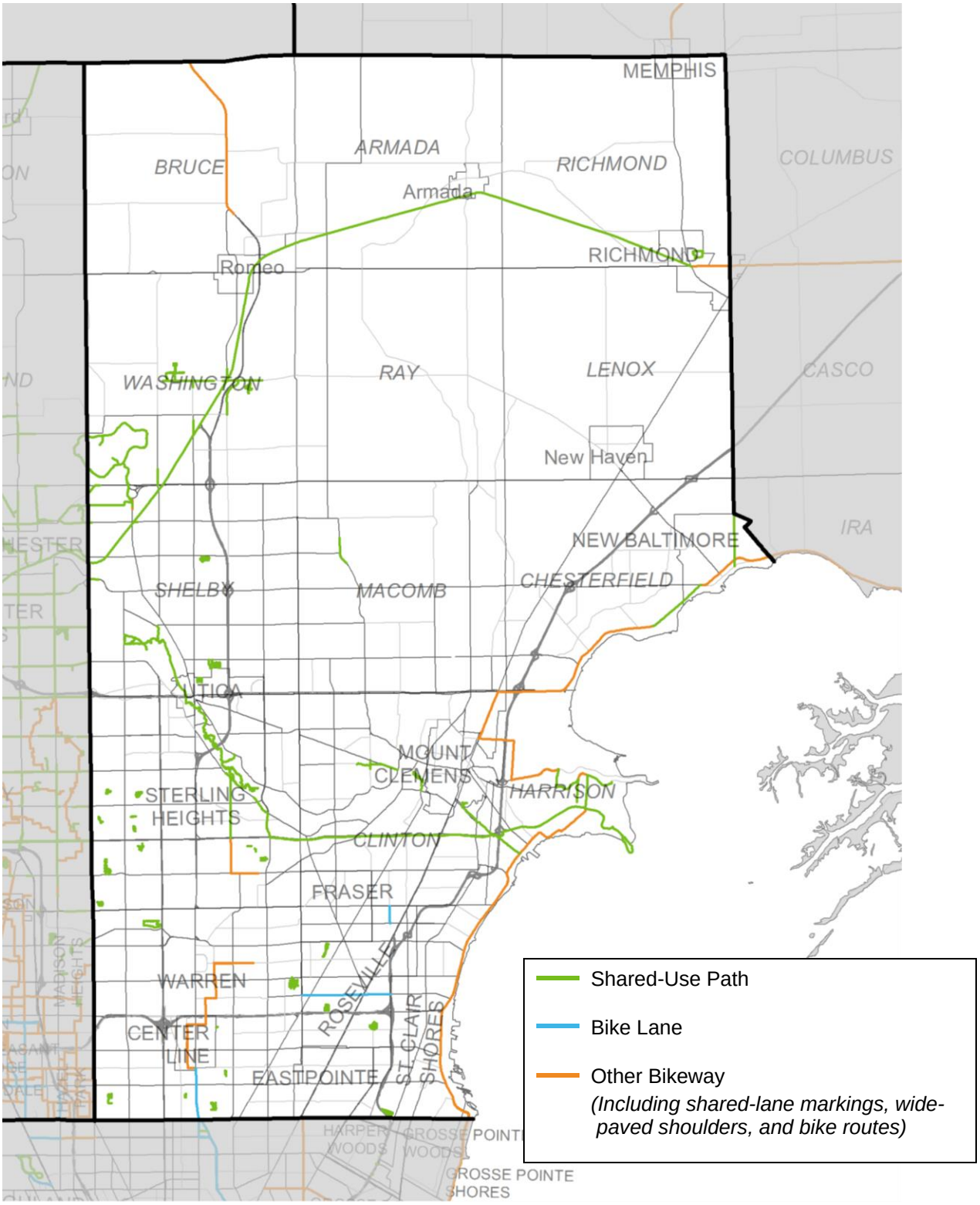


Figure 22
Macomb County Pedestrian Infrastructure

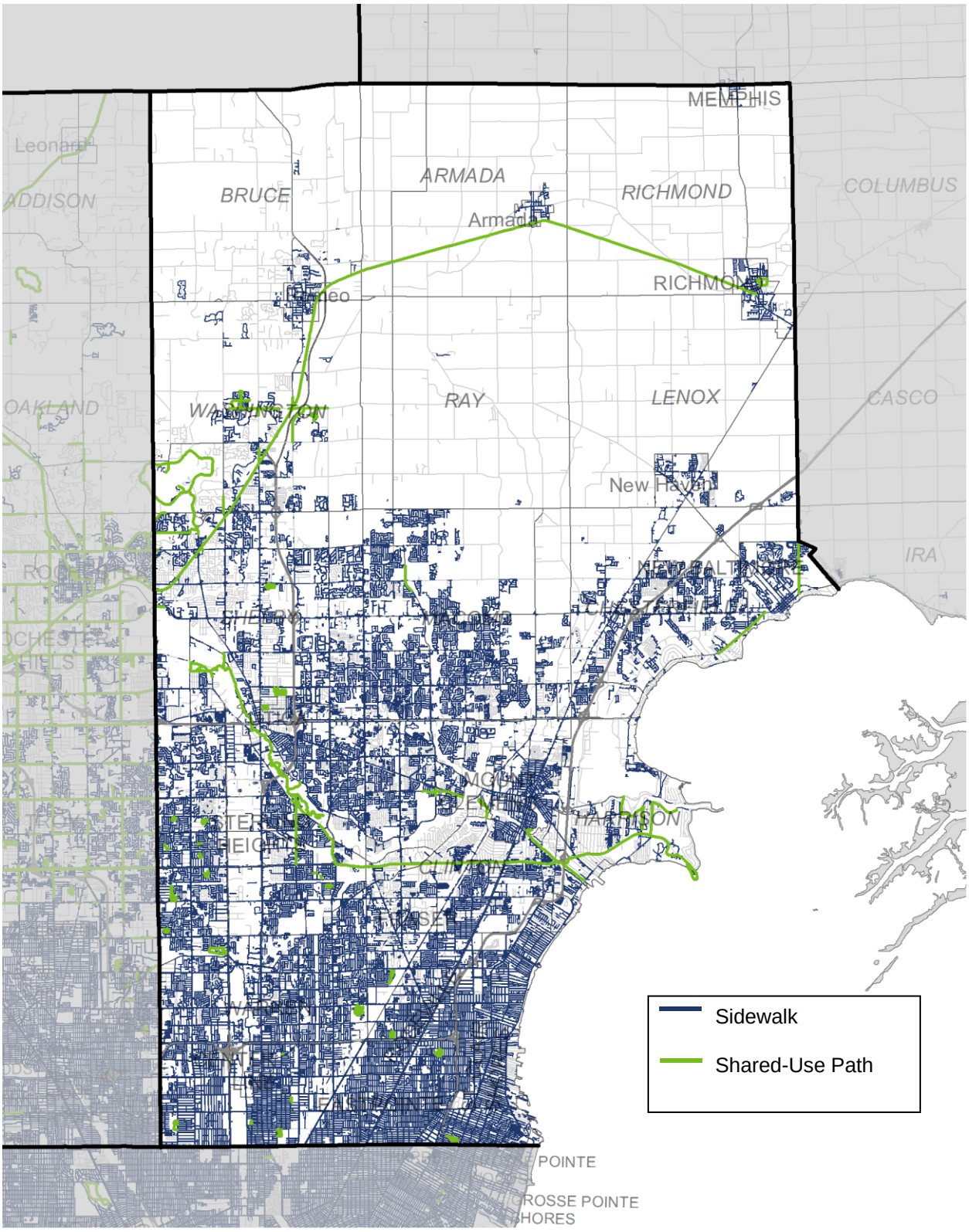


Figure 23
Macomb County Bicycle and Pedestrian Demand Areas

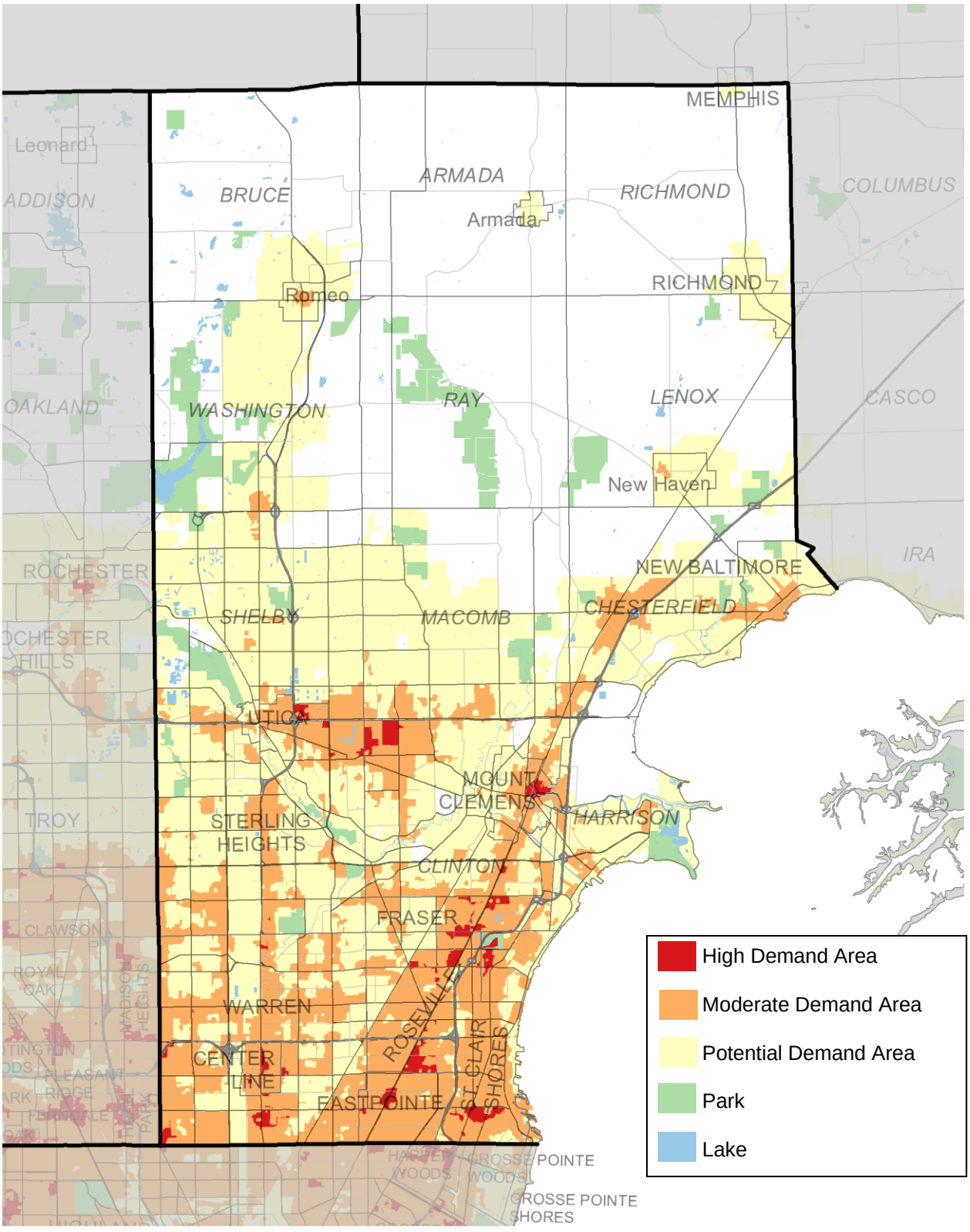


Figure 24
Macomb County Gaps in Pedestrian Access by Demand Area

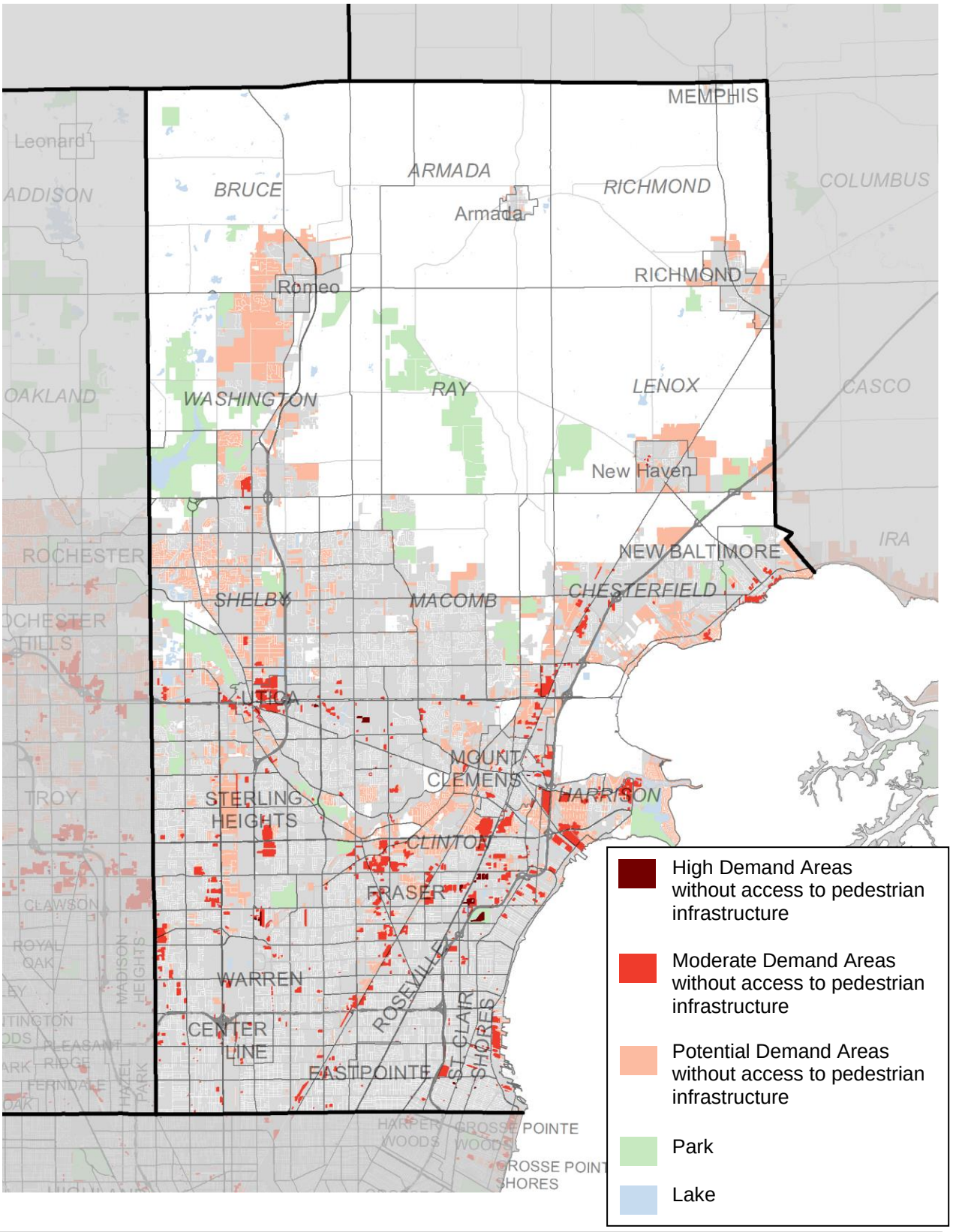


Figure 25
Macomb County Gaps in Bicycle Infrastructure Access by Demand Area

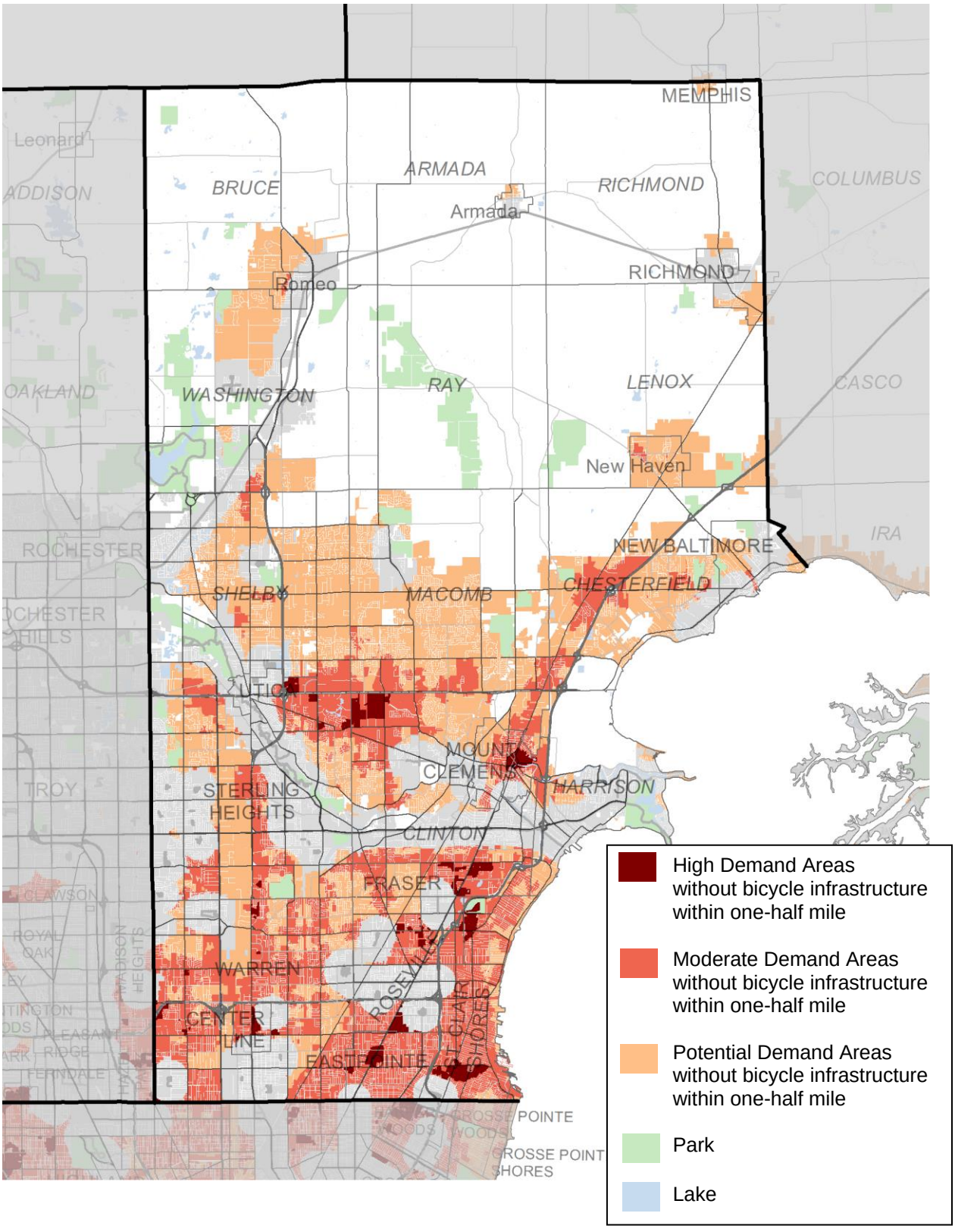
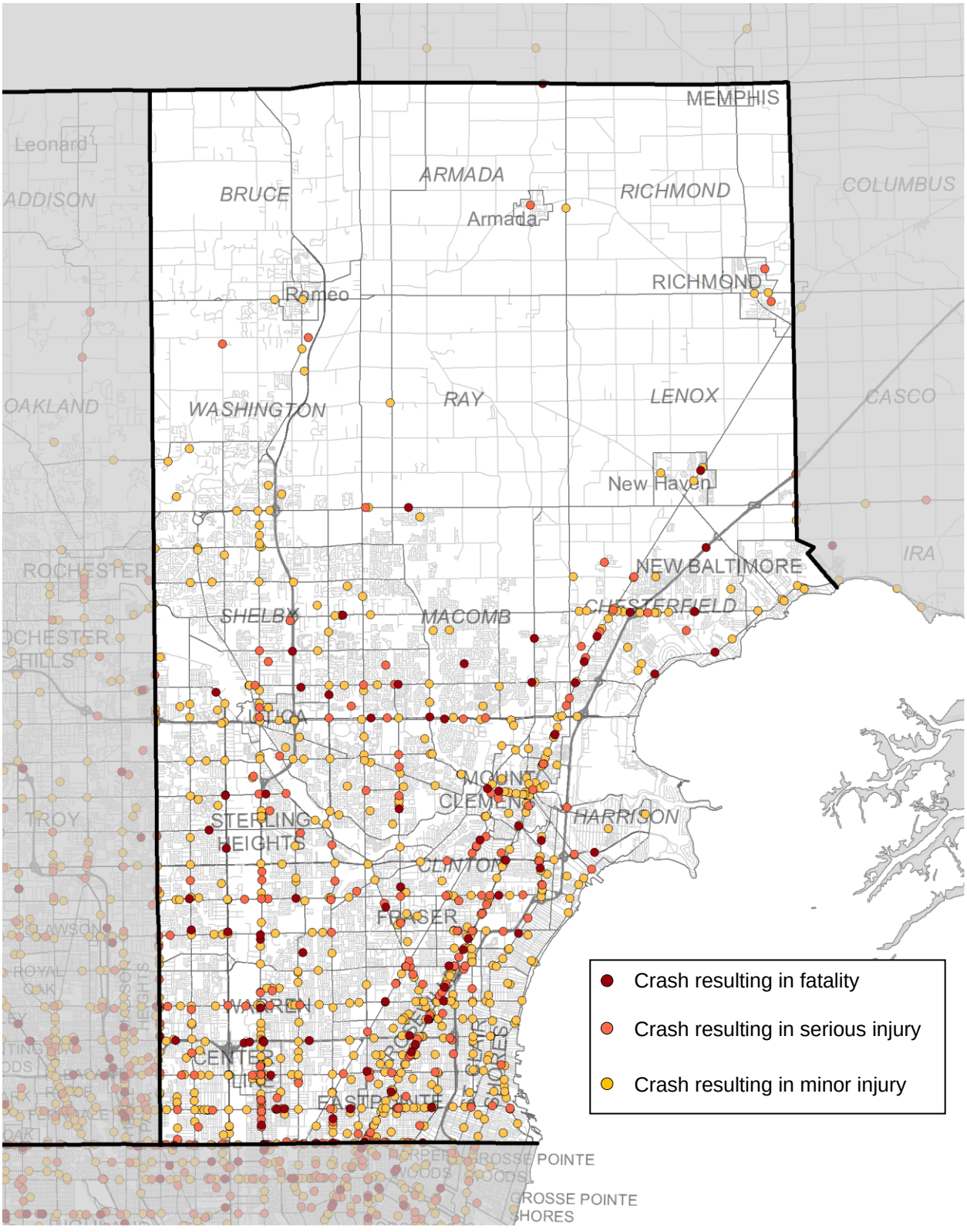


Figure 26
Macomb County Bicycle and Pedestrian Crashes, 2014-2018



Monroe County

Planning Context

Monroe County consists of 15 townships, five villages, and four cities. The county is home to the region's only national park – the River Raisin National Battlefield Park – one state park, five county parks, and the River Raisin Heritage trail, which connects Sterling State Park to Munson Park in the City of Monroe. In total, the county has 10,297 acres of parks, or 68 acres per 1,000 residents.

With a population of 149,619, the county has three percent of the region's total population. There are 58,452 jobs in the county, with 51 percent of residents commuting outside of the county for employment. Outside of the county, the two largest locations where residents work is north in Wayne County and south in Lucas County, Ohio. The average commute time for the county is 24 minutes, the second shortest in the region. The county is located between the major job centers in Ann Arbor, Detroit, and Toledo, and is served by the north-south corridors of I-75 and M-23.

Between 2010 and 2019, Monroe County's population decreased by 0.5 percent. SEMCOG forecasts that the population will increase by five percent between 2019 and 2045. Approximately 66 percent of the county's land is agricultural, open space, or recreational. An additional 18 percent is single-family residential.

Local Highlight: River Raisin Heritage Trail System

The River Raisin Heritage Trail in Monroe is a unique destination in the region, connecting visitors to the rich history of the area, highlighting the natural beauty of historic Monroe, the River Raisin, and Lake Erie. The seven miles of the Heritage Trail showcase both the history and cultural significance of the area during the War of 1812. The crown jewel of the trail is the River Raisin National Battlefield Park, which provides trail users an opportunity to step back in time and experience the marshes and wetlands that the early French settlers first explored, hunted, and called home. In 2020, Monroe County, in partnership with the City of Monroe, Frenchtown Township, and Monroe Township, will conduct a feasibility study to extend the trail and make important bicycle and pedestrian connections to local core services.

Plans and Policies

Several local plans identify needed bicycling and walking improvements in Monroe County. See highlights in Table 3.

Table 3
Local Plans that Influence Bicycling and Walking in Monroe County

Plan Title	Highlights
Erie Township Master Plan (2018)	Includes a concept plan for nonmotorized transportation in Erie Township with the intention of linking community features, population centers, and water trails. Emphasizes the importance of working with the County Road Commission and regional planning organizations to explore funding opportunities that expand the nonmotorized network.
Frenchtown Township Master Plan (2017)	The Transportation Action section of this plan has recommendations to update the Zoning Ordinance to require developments along several corridors to include sidewalks and bike paths, where appropriate. It also identifies abandoned railroad corridors for nonmotorized trails.
Resilient Monroe: Master Plan (2017)	Recommends integrating Complete Streets philosophy into street design and construction, plus linking existing nonmotorized routes to Lake Erie Transit access points in the City of Monroe.
City of Monroe Parks and Recreation Master Plan (2019)	Recommends developing a city-wide nonmotorized plan containing a network of trails and facilities connecting city parks to community facilities. This plan also recommends supporting adoption of Complete Streets policy for the city.
River Raisin Heritage Corridor-East Master Plan (2013)	Proposes an interconnected network of nonmotorized transportation options, connecting the River Raisin National Battlefield Park with ecological and historic sites and several City waterfront parks.
Monroe County Parks, Trail & Recreation Master Plan (2018)	Recommends developing a concept for a county-wide interconnected network of water and land trails which by connecting parks, community facilities, and points of interest would promote active lifestyles, and enhance the well-being of residents. Identifies priority corridors for nonmotorized connections.

Walking and Bicycling in Monroe County

Existing Facilities

The City of Monroe has the county's most extensive pedestrian and bicycle facilities with an established sidewalk network and the majority of the River Raisin Heritage Trail extending from Sterling State Park west through the city. Frenchtown, Monroe, and Bedford Townships each have growing pedestrian networks and continue to add more miles of sidewalk to connect neighborhoods to core services. The county's cities and villages each have pedestrian facilities, especially near their historic downtowns. The Village of Dundee and City of Milan each have a solid foundation of sidewalks in neighborhoods and core business areas. The county has 399 miles of sidewalks and 91 miles of bicycle infrastructure & bikeaways.

Figure 27
Monroe County Sidewalk Mileage

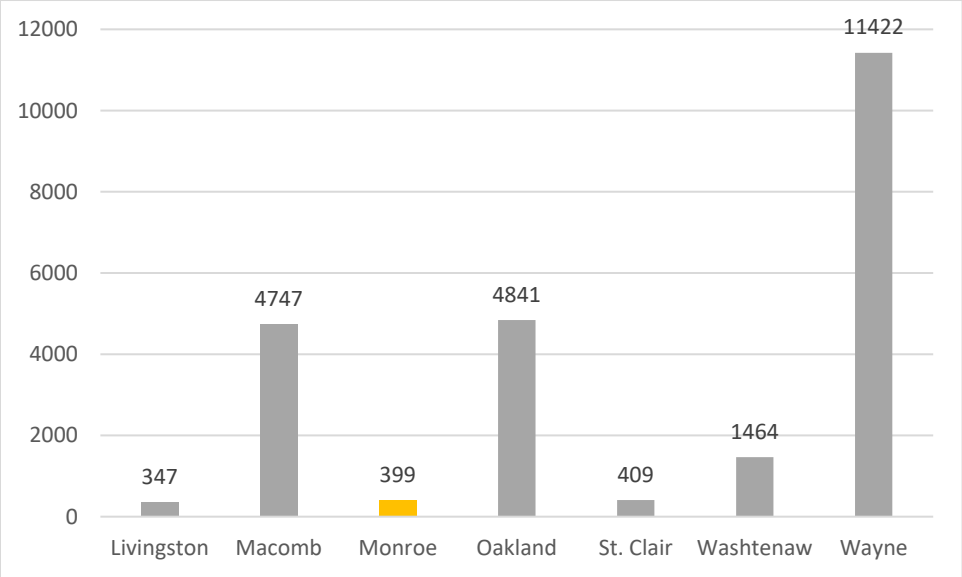


Figure 28
Monroe County Bicycle Network by Type (Miles)

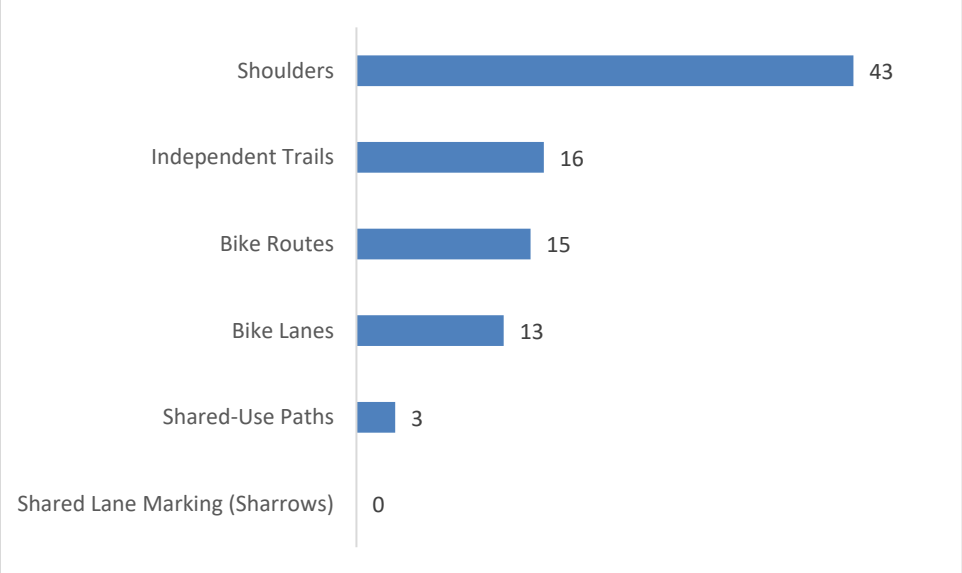
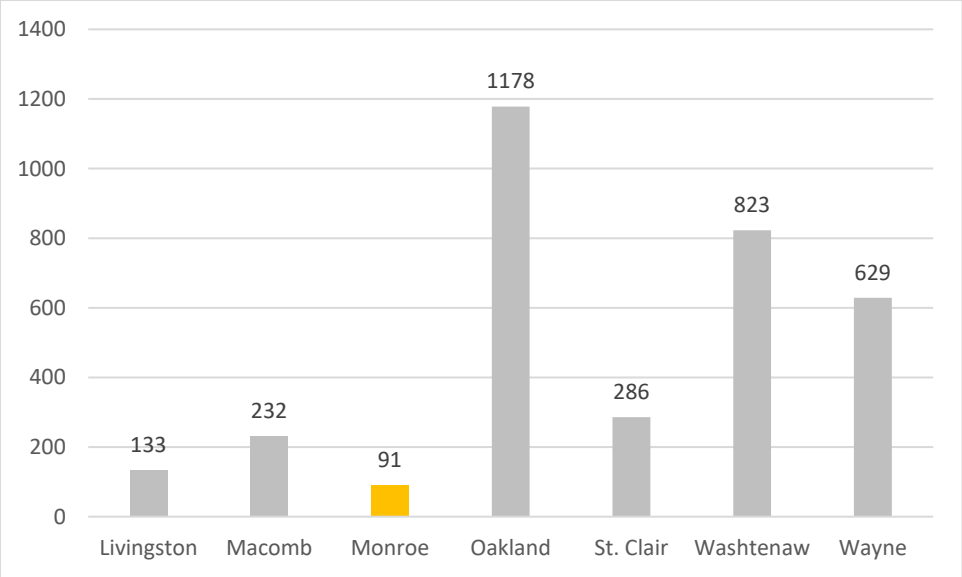
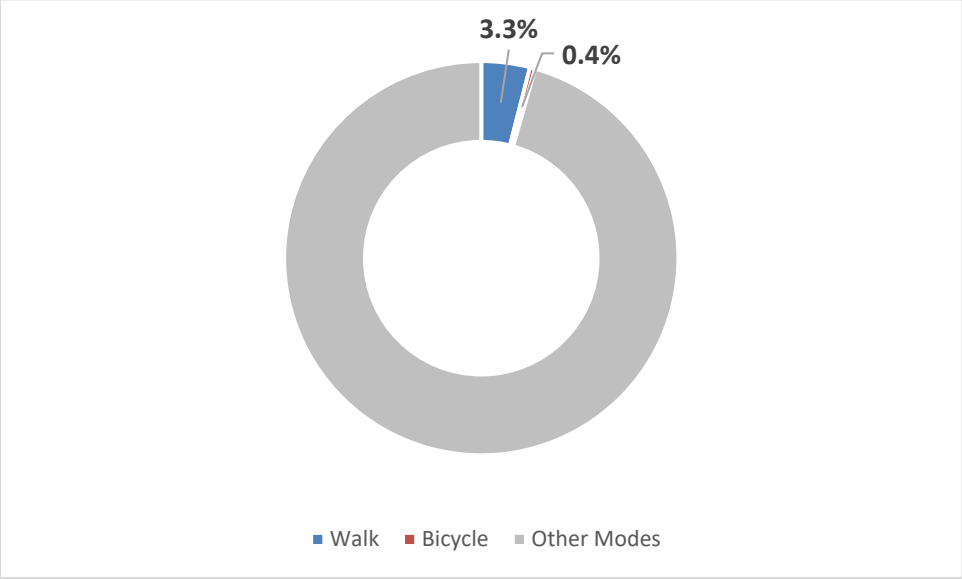


Figure 29
Monroe County Bicycle Network Mileage



Activity Level
Walking and bicycling currently accounts for four percent of trips in Monroe County. The average travel time to work for residents age 16 and over who live in the county and work outside the home is 24 minutes. Additionally, half of workers who live in Monroe County work in another county (51 percent), limiting the potential for walking and bicycling as a commute option for many workers.

Figure 30
Monroe County Trips by Mode



Crash Data

Monroe County experienced two percent of the region's pedestrian and bicycle crashes; 222 pedestrian and bicycle crashes occurred there from 2014-2018. Thirteen people were killed in crashes involving a pedestrian, and two were killed in crashes involving a bicycle. There were 31 serious injuries from bicycle and/or pedestrian crashes in the county during the same period.

Even though pedestrian and bicycle crashes account for only one percent of total crashes in Monroe County, they are responsible for 14 percent of fatalities and eight percent of serious injuries. Excluding crashes where the road jurisdiction is not known, the vast majority of bicycle and pedestrian crashes in Monroe County, take place on the State and County roads (74%).

Figure 31

Monroe County Fatalities by Mode, 2014-2018

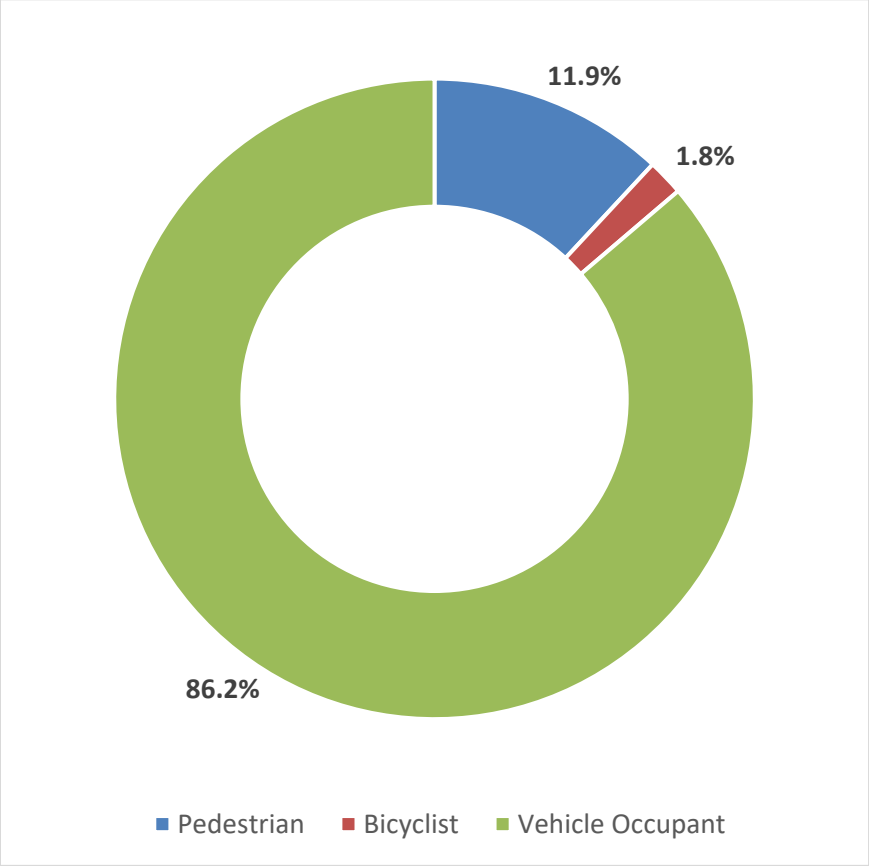


Figure 32
Monroe County Serious Injuries by Mode, 2014-2018

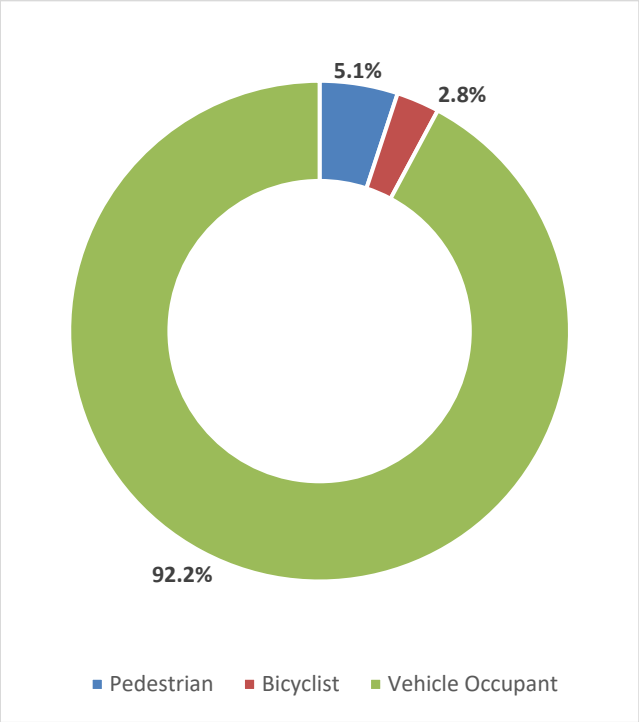


Figure 33
Monroe County Pedestrian and Bicycle Crashes by Road Jurisdiction, 2014-2018

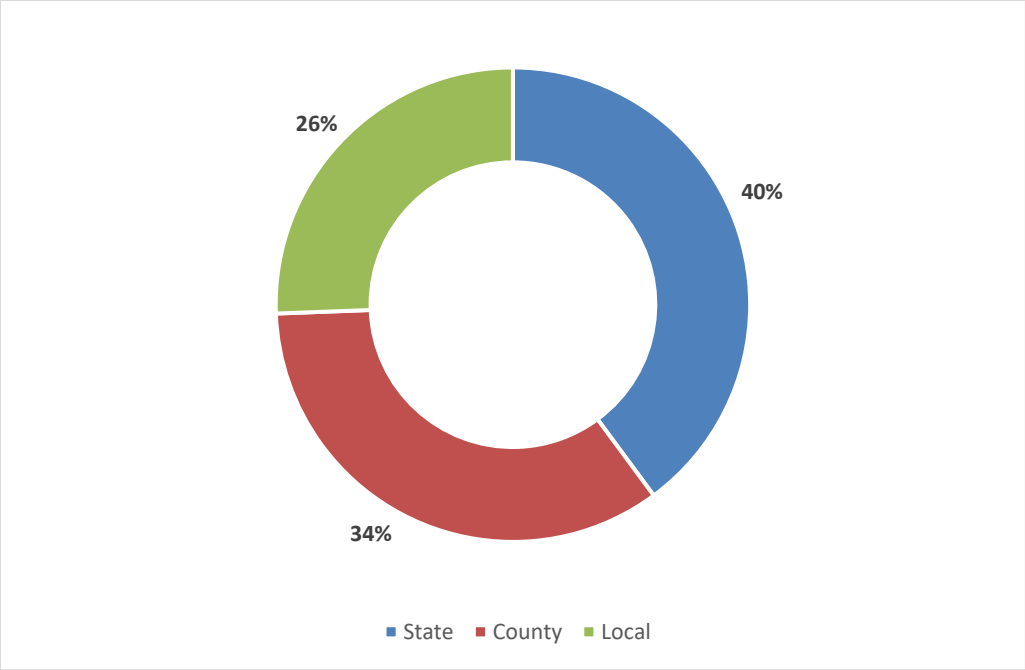


Figure 34
Monroe County Bicycle Network

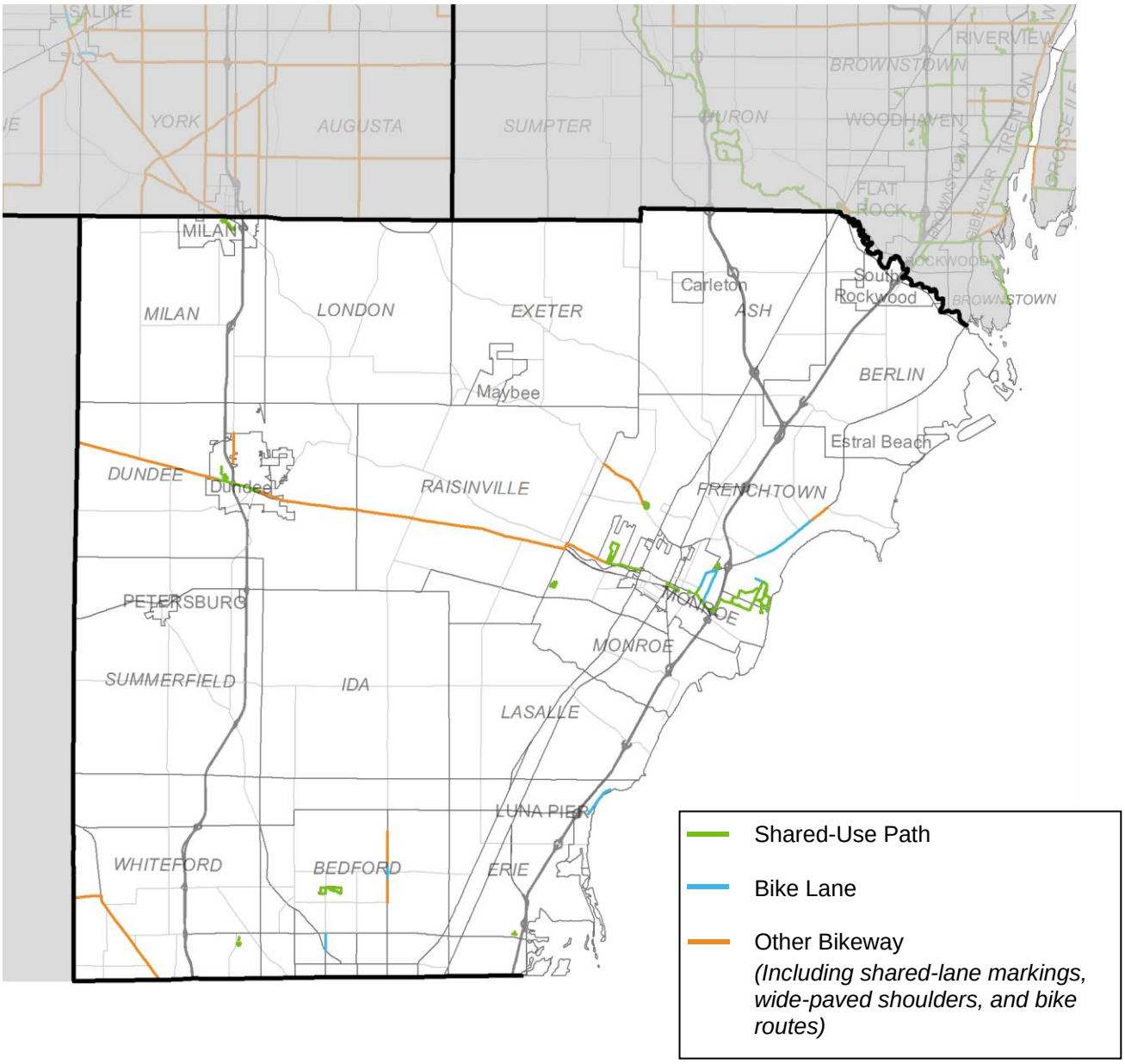


Figure 35
Monroe County Pedestrian Infrastructure

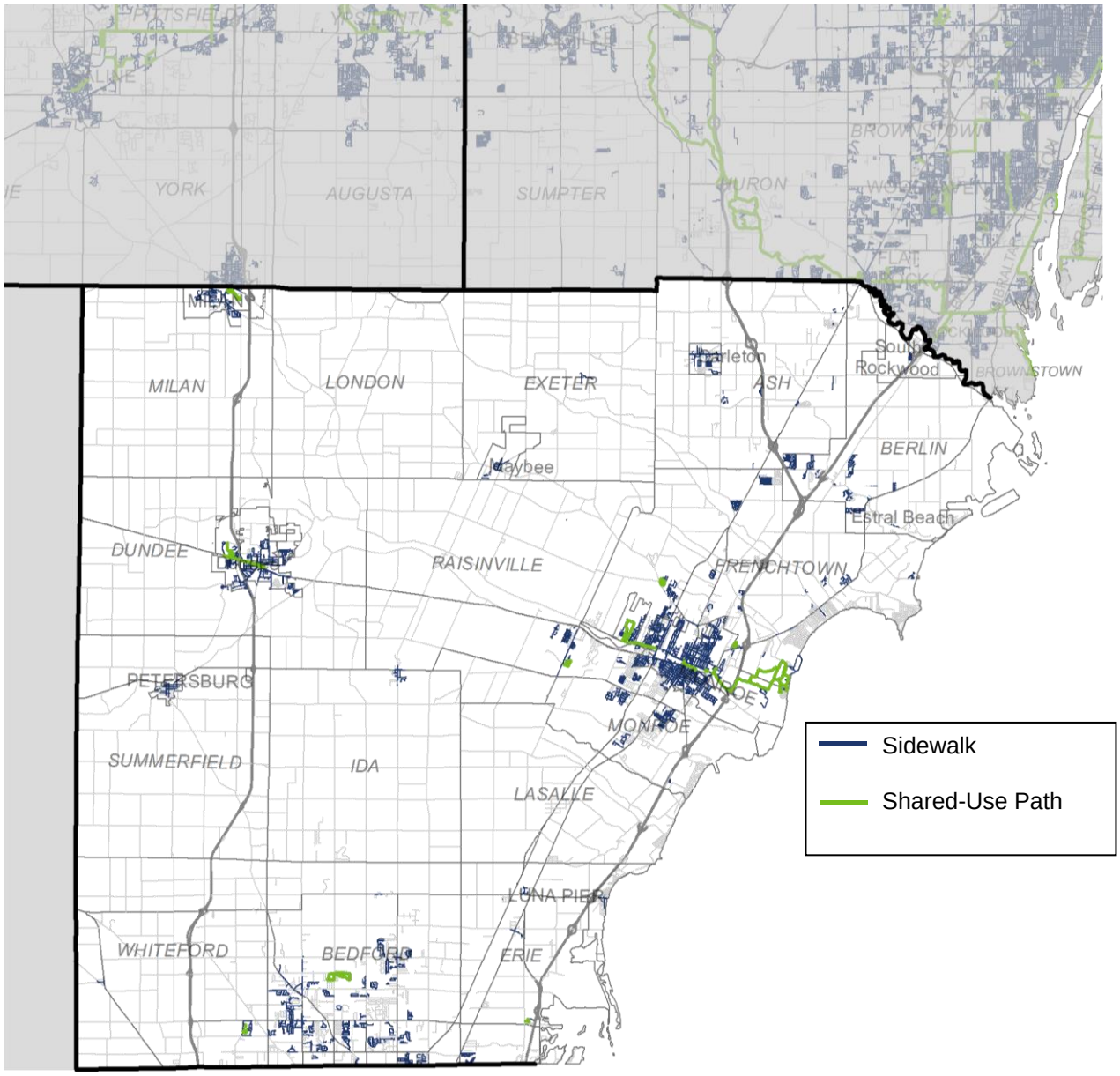


Figure 36
Monroe County Bicycle and Pedestrian Demand Areas

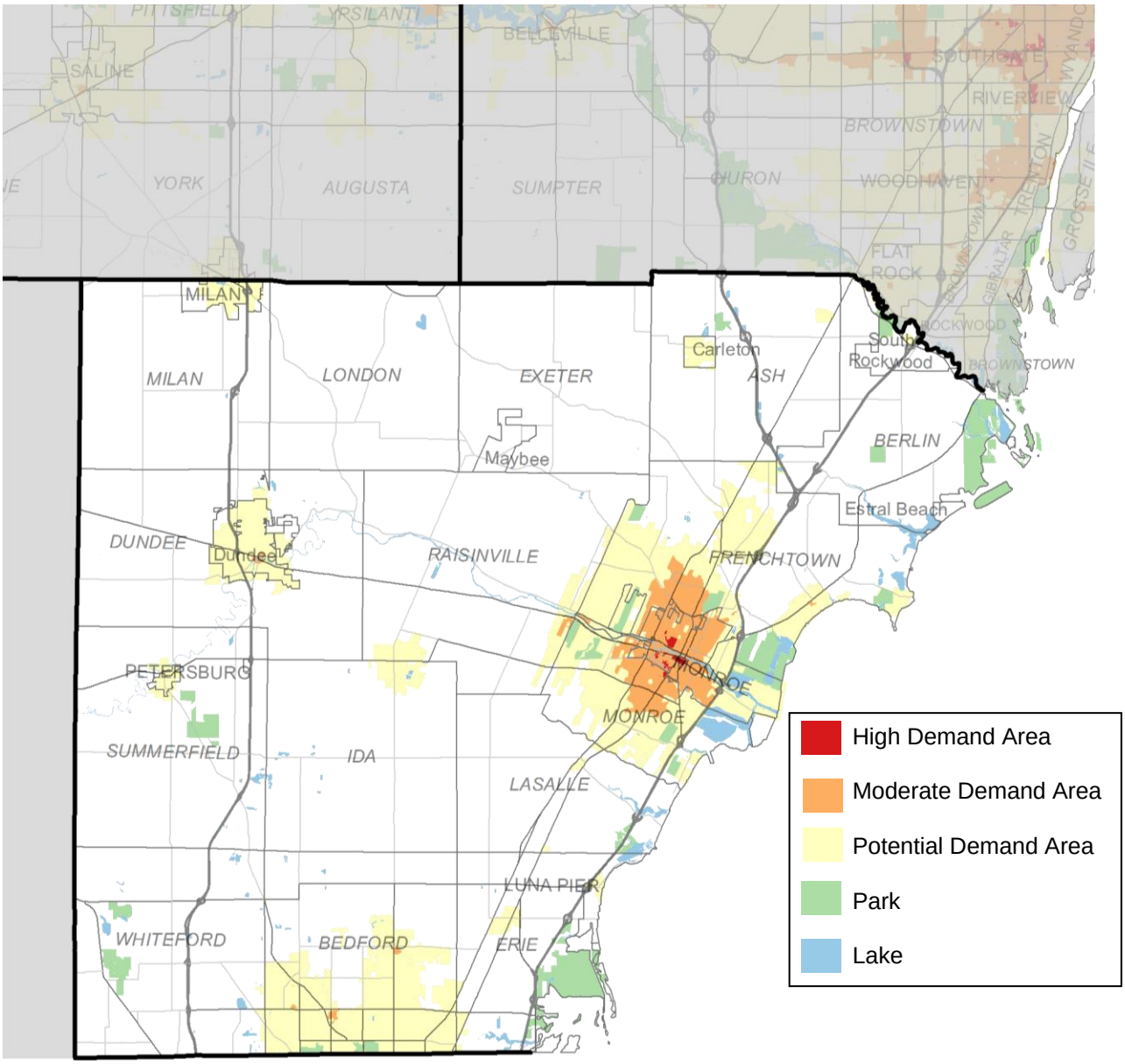


Figure 37

Monroe County Gaps in Pedestrian Infrastructure Access by Demand Area

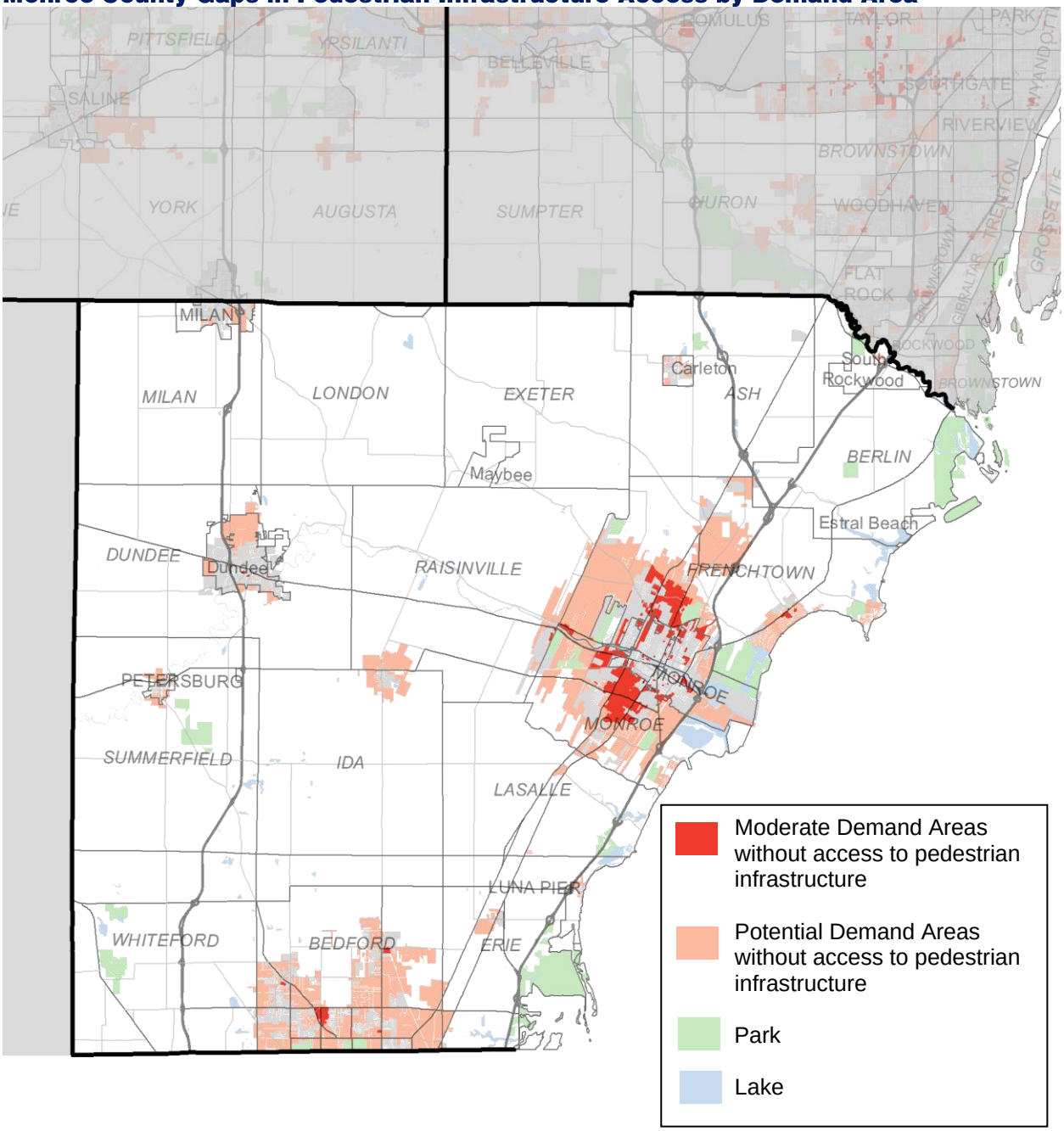


Figure 38

Monroe County Gaps in Bicycle Infrastructure Access by Demand Area

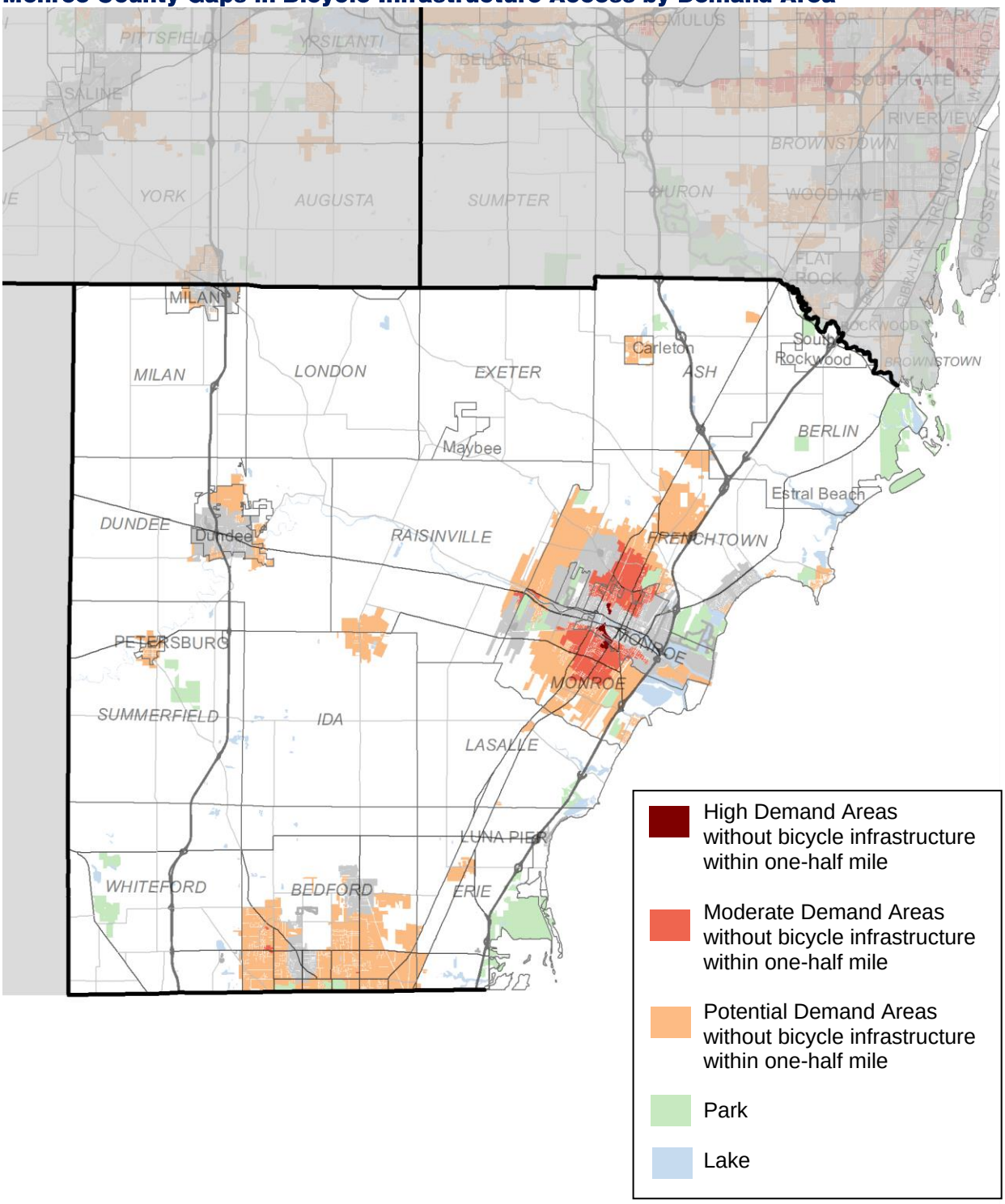
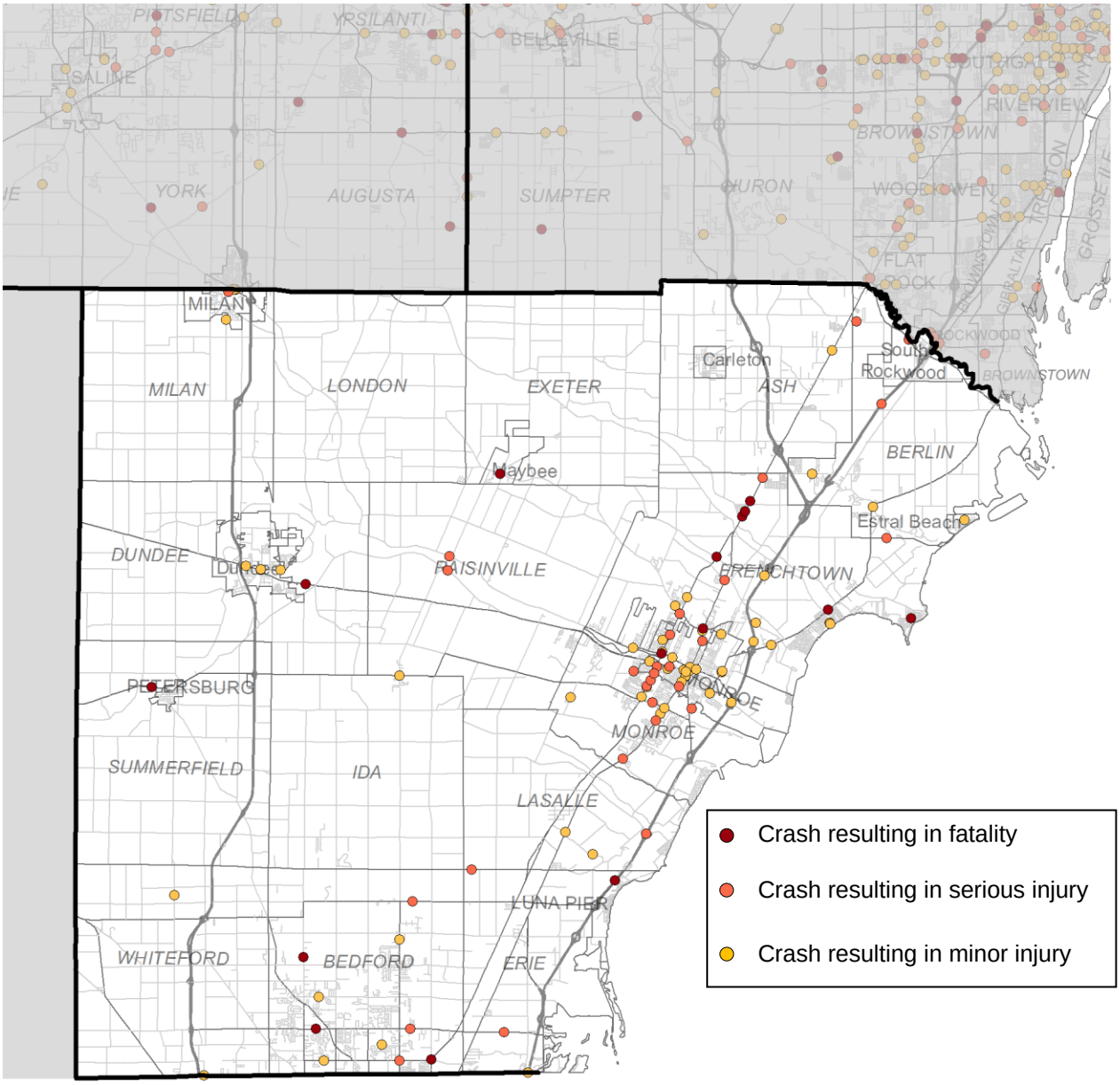


Figure 39
Monroe County Bicycle and Pedestrian Crashes, 2014-2018



Oakland County

Planning Context

Oakland County consists of 31 cities, 21 townships, and 10 villages. The county has 14 county parks, eight state recreation areas, three Huron-Clinton Metroparks, and several regional trails, including the Clinton River Trail, Huron Valley Trail, Milford Trail, Paint Creek Trail, Polly Ann Trail, West Bloomfield Trail, and I-275 Metro Trail. Together, these trails make up large segments of both the Iron Belle Trail and Great Lake to Lake Trails. In total, the county has the region's greatest amount of parkland, with 66,754 acres, or 56 acres per 1,000 residents.

With a population of 1,241,860, the county is home to 26 percent of the region's total population. There are 960,562 jobs in the county, which is the most of any county in the region. The vast majority of workers – 69 percent – work in the county. Wayne County is the largest commuting destination with 18 percent of workers. The average commute time is 25 minutes. The county is served by multiple freeways and major corridors including I-75, I-696, I-275, Woodward Avenue, M-59, M-10, and Telegraph Road, and is home to multiple job centers.

Between 2010 and 2019, Oakland County's population increased by five percent. SEMCOG forecasts that the county's population will continue to increase by another six percent by 2045. Approximately 23 percent of the county's land is agricultural, open space, or recreational. An additional 37 percent is single-family residential.

Local Highlight: The Michigan Airline Trail

In 2019, the Michigan Airline Trail officially opened, filling a seven-mile gap in the Great Lake to Lake Trail through the communities of Wixom, Walled Lake, and Commerce Township in southwest Oakland County. The trail also connects three major regional trails – the West Bloomfield Trail, Huron Valley Trail, and M-5 Metro Trail. The next phase of the trail is to connect to downtown Wixom and extend the trail further west along the rail corridor north of Pontiac Trail Road.

Plans and Policies

Several local plans identify needed bicycling and walking improvements in Oakland County. Highlights from plans in Oakland County shown in Table 4.

Table 4
Local Plans that influence Bicycling and Walking in Oakland County

Plan Title	Highlights
City of Birmingham Multi-Modal Transportation Plan (2013)	Includes an ADA Transition Plan, which outlines existing conditions, and identifies barriers that limit accessibility and proactive and reactive strategies. Outlines a framework for addressing and improving accessibility.
Charter Township of Commerce Parks, Recreation + Trails Master Plan (2019)	Recommends supporting and encouraging accessibility to and within parks, as well as development of the local and regional nonmotorized systems to increase the connectivity. Identifies seven nonmotorized priorities and projects to be implemented over the next five years.

Ferndale Moves! On-Line Transportation Dialogue and Resource Center (2014)	Provides a vision for the city to promote and implement multi-modal transportation projects. Includes detailed maps of completed and planned projects and FAQs on new infrastructure and ongoing studies.
City of Novi Non-Motorized Master Plan (2011)	A sidewalk quality rating system and a road-crossing-difficulty assessment system were designed to help identify a pedestrian's level of comfort. Includes a map for roadside pathway conflicts and an on-road bicycling quality assessment.
City of Oak Park Complete Streets Plan (2018)	Guidelines and ideas on how to address nonmotorized transportation and Complete Streets issues through policies, programs, and design guidelines. Four priority corridors were identified for nonmotorized transportation improvements and for developing a regional bike share program.
Complete Streets Pontiac (2017)	Includes several policy recommendations including developing a sidewalk gap prioritization methodology, enhancing and promoting issue reporting tools, and a local direct road funding mechanism. Recommends partnering with Oakland University on tasks such as before and after pedestrian and bicycle counts, permanent counts, and yearly crash analysis.
City of Troy 5 year Parks & Recreation Plan (2015)	Identifies developing a comprehensive trail pathway system throughout the city. Establishes a framework for organizing, planning, designing, funding, and constructing a system of recreational trails. Recommends adoption of a Complete Streets approach to transportation planning.
Huron-Clinton Metroparks Master Plans	Kensington Metropark Master Plan (2017) includes accessibility analysis of the park's hike-bike trail.

Walking and Bicycling in Oakland County

Existing Facilities

The communities of Southeast Oakland County have a comprehensive network of pedestrian facilities. Over the last few years, communities along the Woodward Avenue corridor have been working together to substantially expand the bicycling network. MoGo bike share is expected to launch in Spring 2020, which will use this expanding bicycle network by adding 31 stations and 140 bikes in Berkley, Ferndale, Huntington Woods, Oak Park, and Royal Oak. Most of the county's cities and villages have established networks of sidewalks, especially in the central business and historic downtowns of Birmingham, Rochester, Farmington, Milford, and South Lyon. Additionally, the cities of Auburn Hills, Novi, Rochester Hills, and Troy, and Orion and West Bloomfield Townships each have eight-foot-wide safety paths (shared-use) along their major roadways, in addition to a growing number of neighborhoods with sidewalks. Oakland County has the region's most miles of shared-use paths and independent trails, with several of the region's most popular trails. The county has 4,840 miles of sidewalks and 1,178 miles of bikeways – the most of any county in the region.

Figure 40
Oakland County Sidewalk Mileage

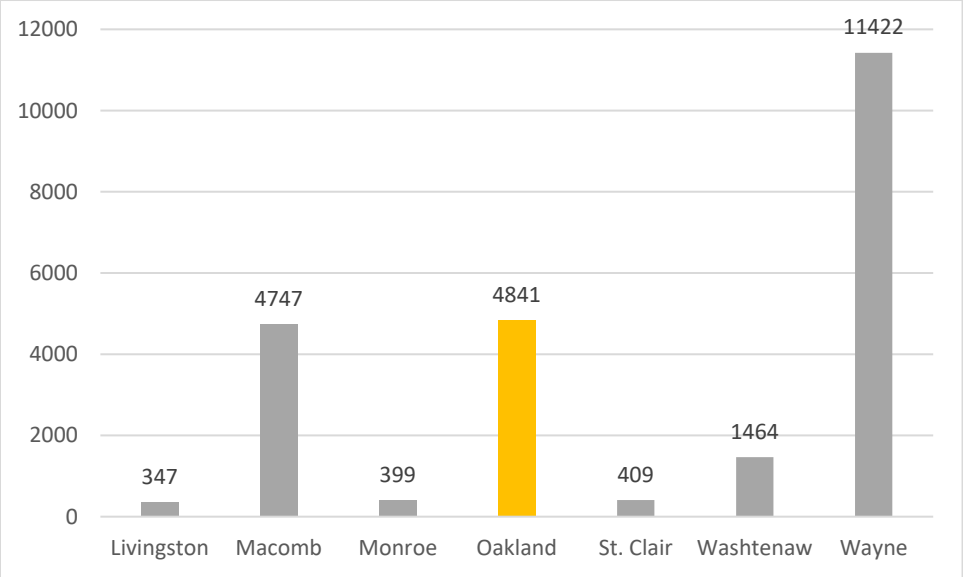


Figure 41
Oakland County Bicycle Network by Type (Miles)

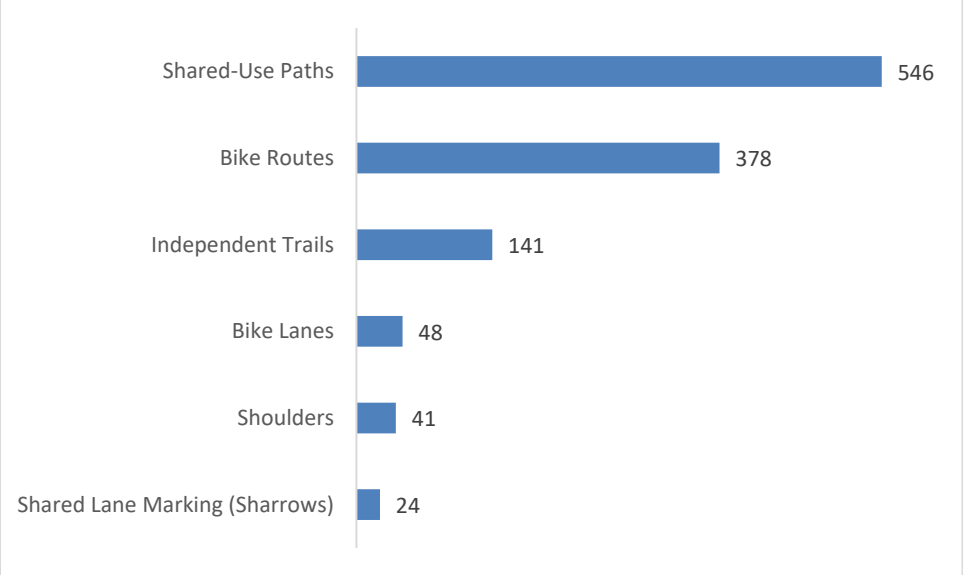
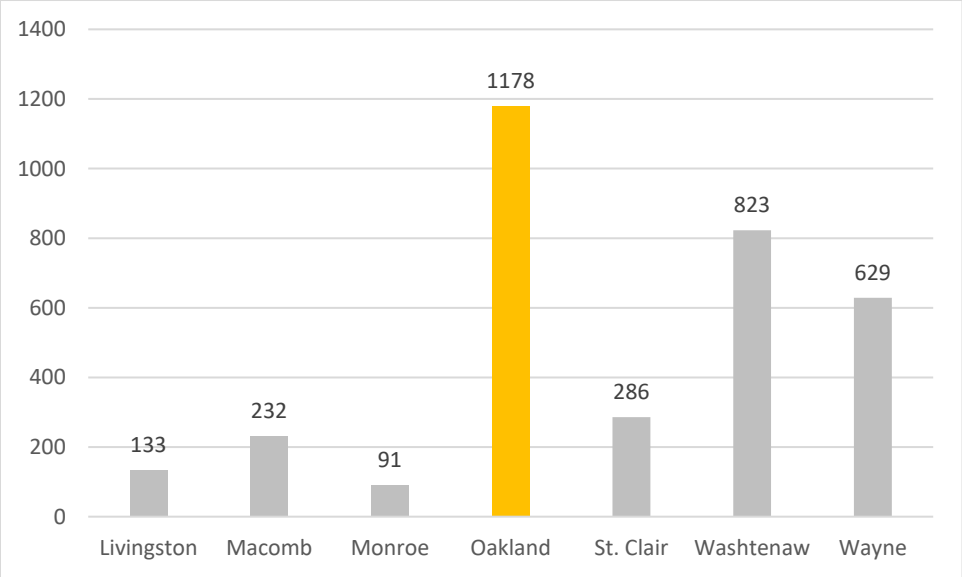
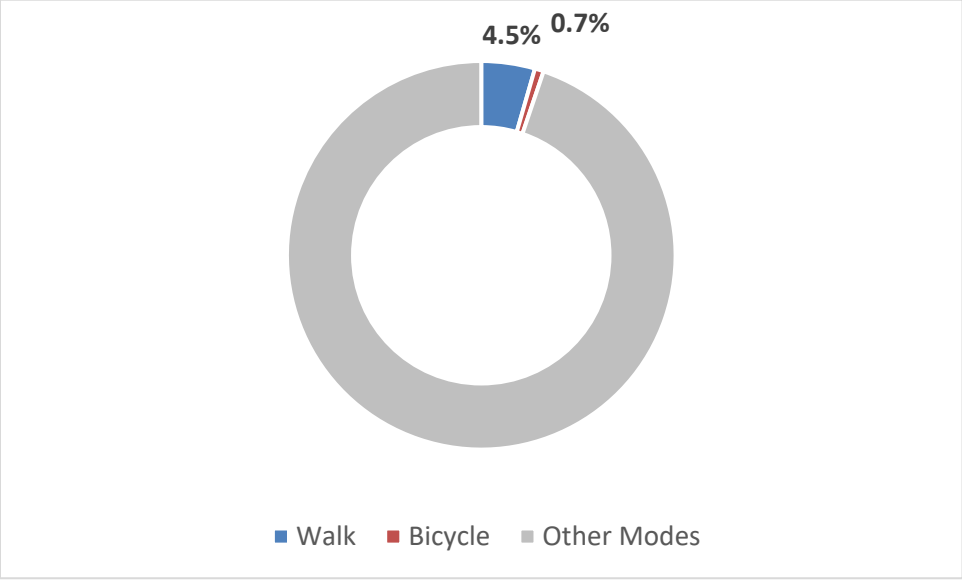


Figure 42
Oakland County Bicycle Network Mileage



Activity Level
Walking and bicycling currently accounts for five percent of trips in Oakland County. The average travel time to work for residents age 16 and over who live in the county and work outside the home is 25 minutes. Additionally, 30 percent of workers who live in Oakland County are employed in another county (31 percent), indicating the potential for walking and bicycling as a commute option for some workers.

Figure 43
Oakland County Trips by Mode



Crash Data

There were 1,990 pedestrian and bicycle crashes in Oakland County from 2014-2018; 81 people were killed in crashes involving a pedestrian and 11 people were killed in crashes involving a bicycle. There were 265 serious injuries from bicycle and/or pedestrian crashes.

Even though pedestrian and bicycle crashes account for less than one percent of total crashes in Oakland County, they are responsible for 28 percent of fatalities and 12 percent of serious injuries. Excluding crashes where the road jurisdiction is not known, the largest share of bicycle and pedestrian crashes in Oakland County, take place on the local roads (39%), followed by County roads (37%).

Figure 44

Oakland County Fatalities by Mode, 2014-2018

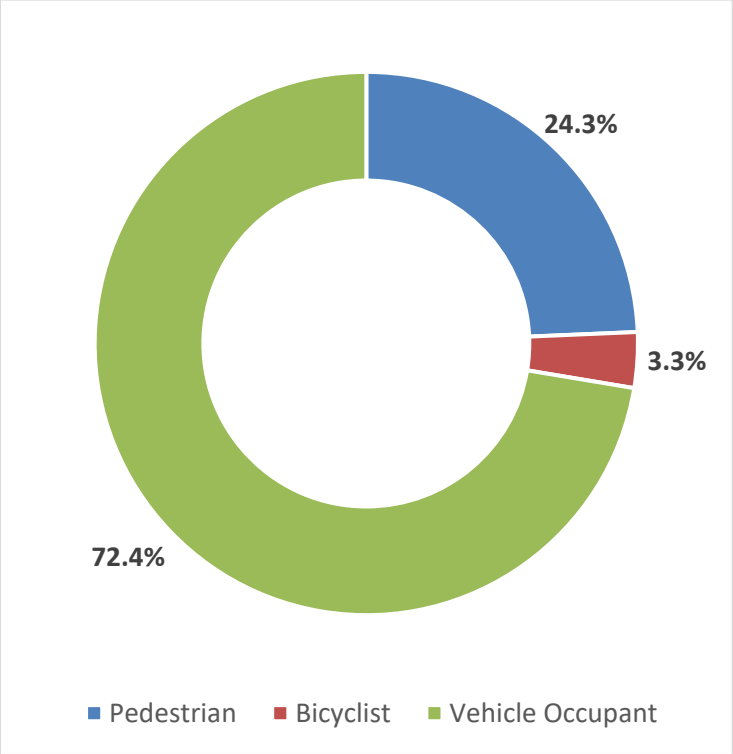


Figure 45
Oakland County Serious Injuries by Mode, 2014-2018

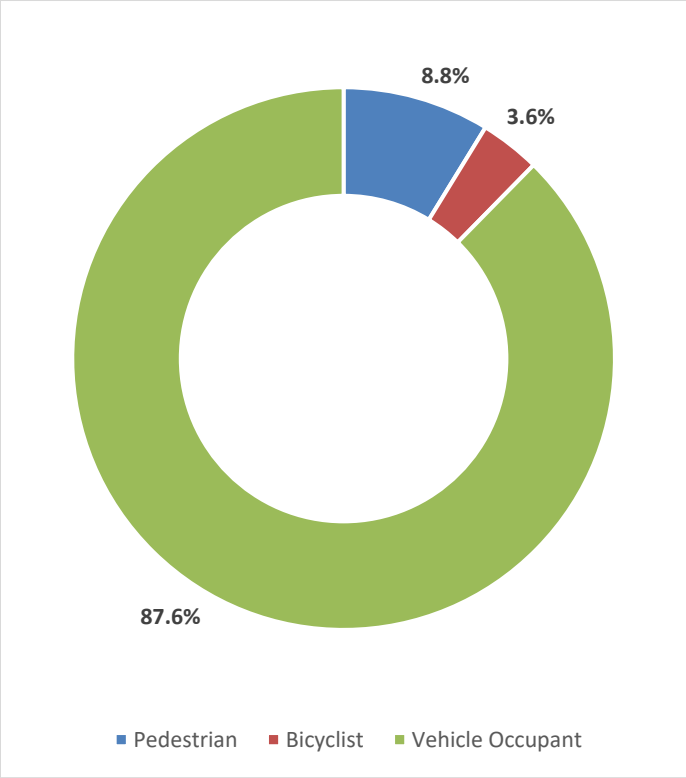


Figure 46
Oakland County Pedestrian and Bicycle Crashes by Road Jurisdiction, 2014-2018

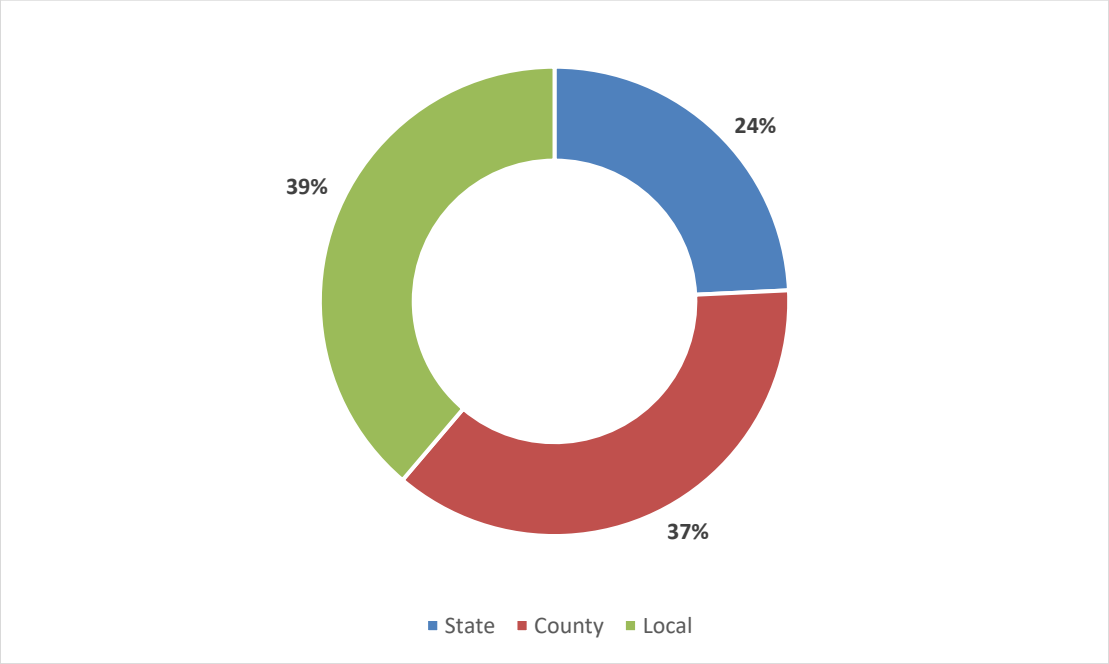


Figure 47
Oakland County Bicycle Network

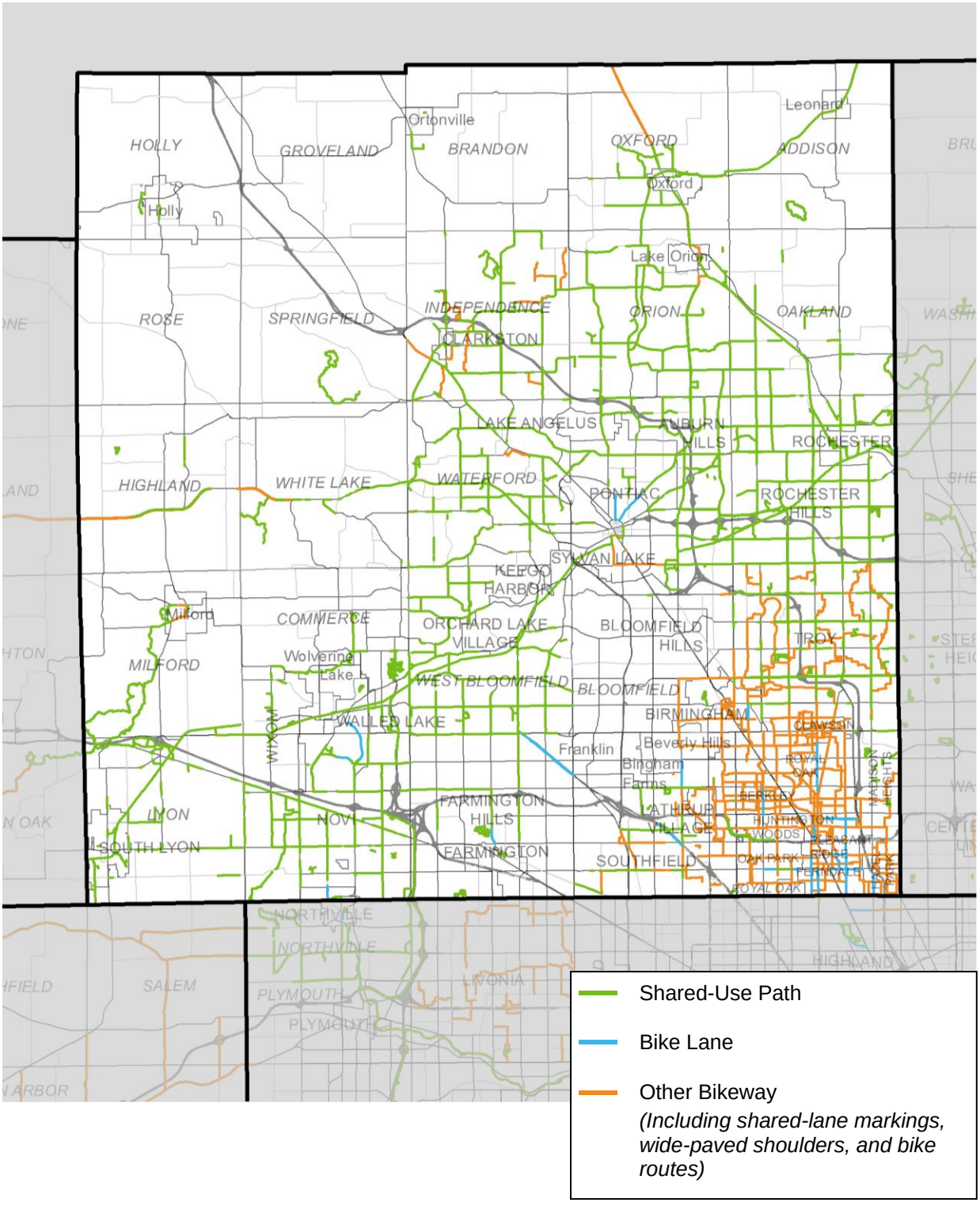


Figure 48
Oakland County Pedestrian Infrastructure

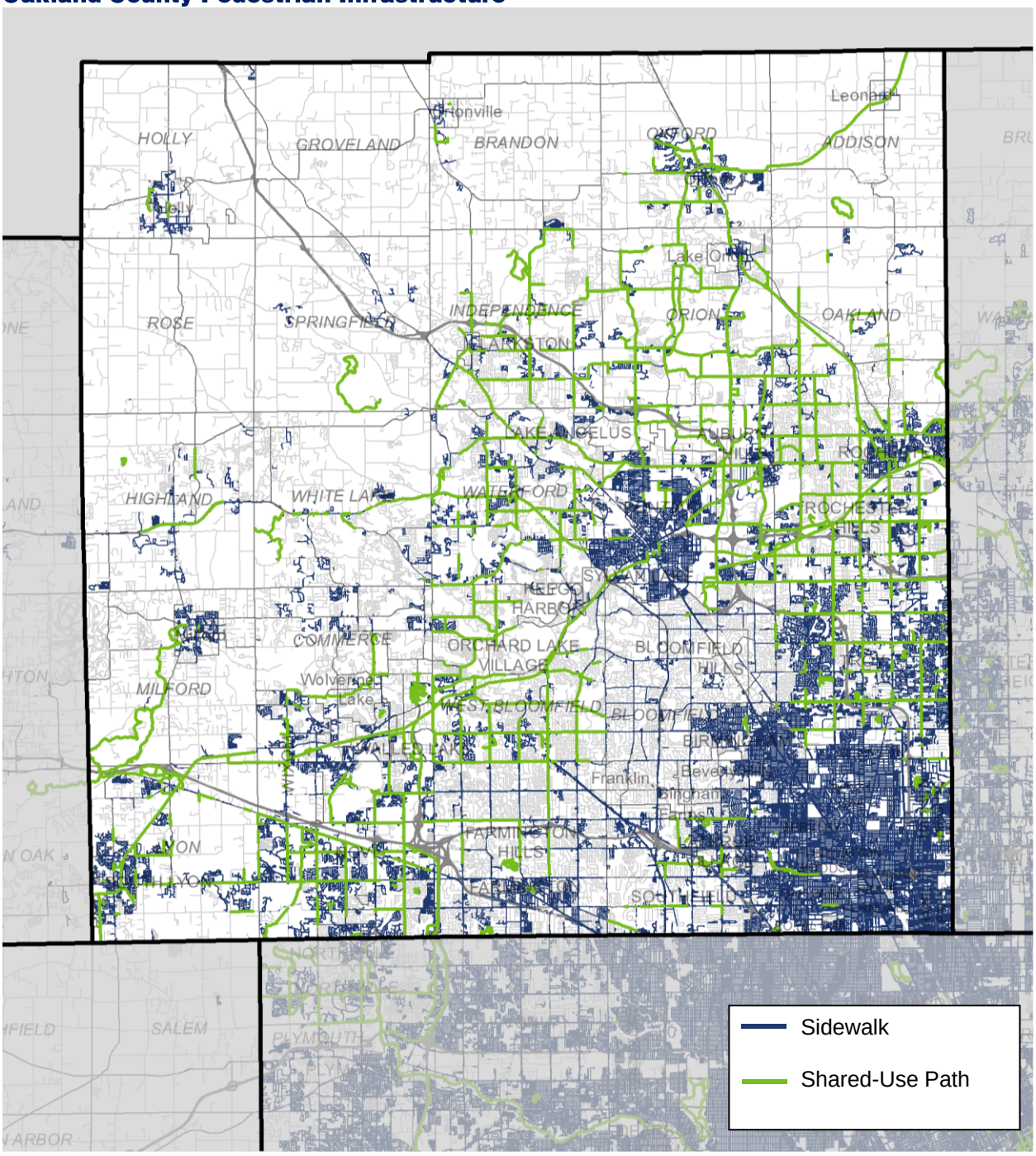


Figure 49
Oakland County Bicycle and Pedestrian Demand Areas

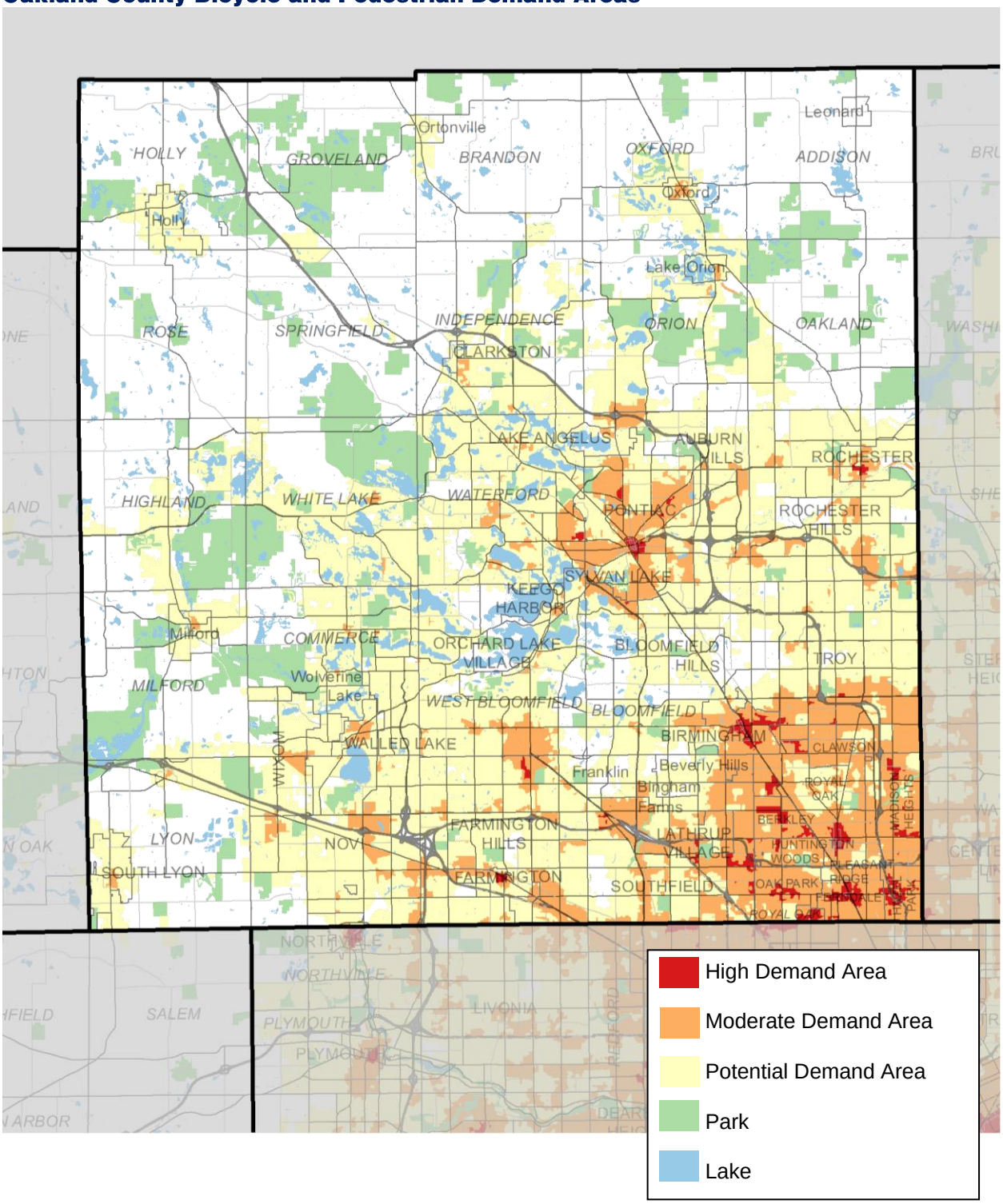


Figure 50
Oakland County Gaps in Pedestrian Infrastructure Access by Demand Area

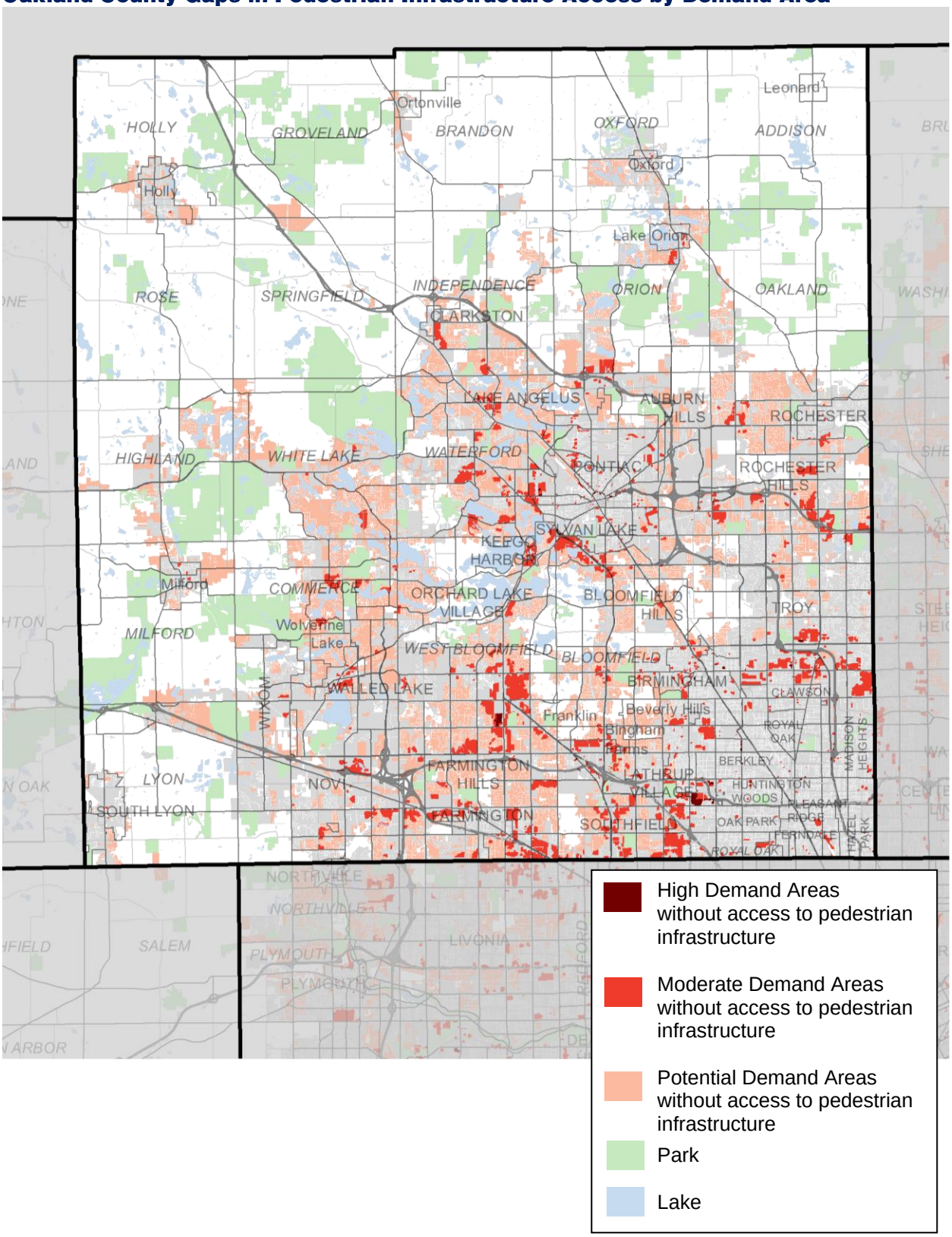


Figure 51
Oakland County Gaps in Bicycle Infrastructure Access by Demand Area

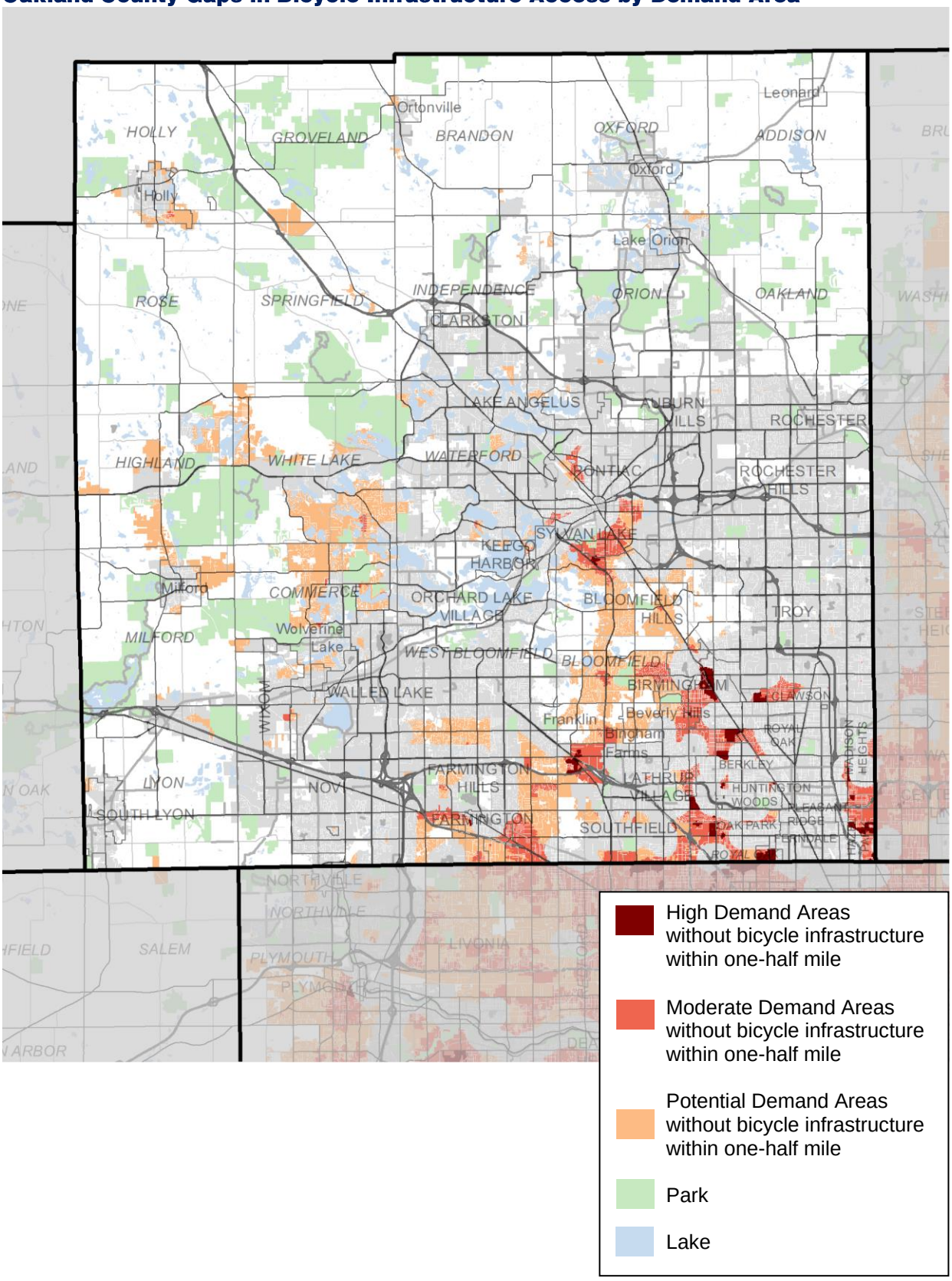
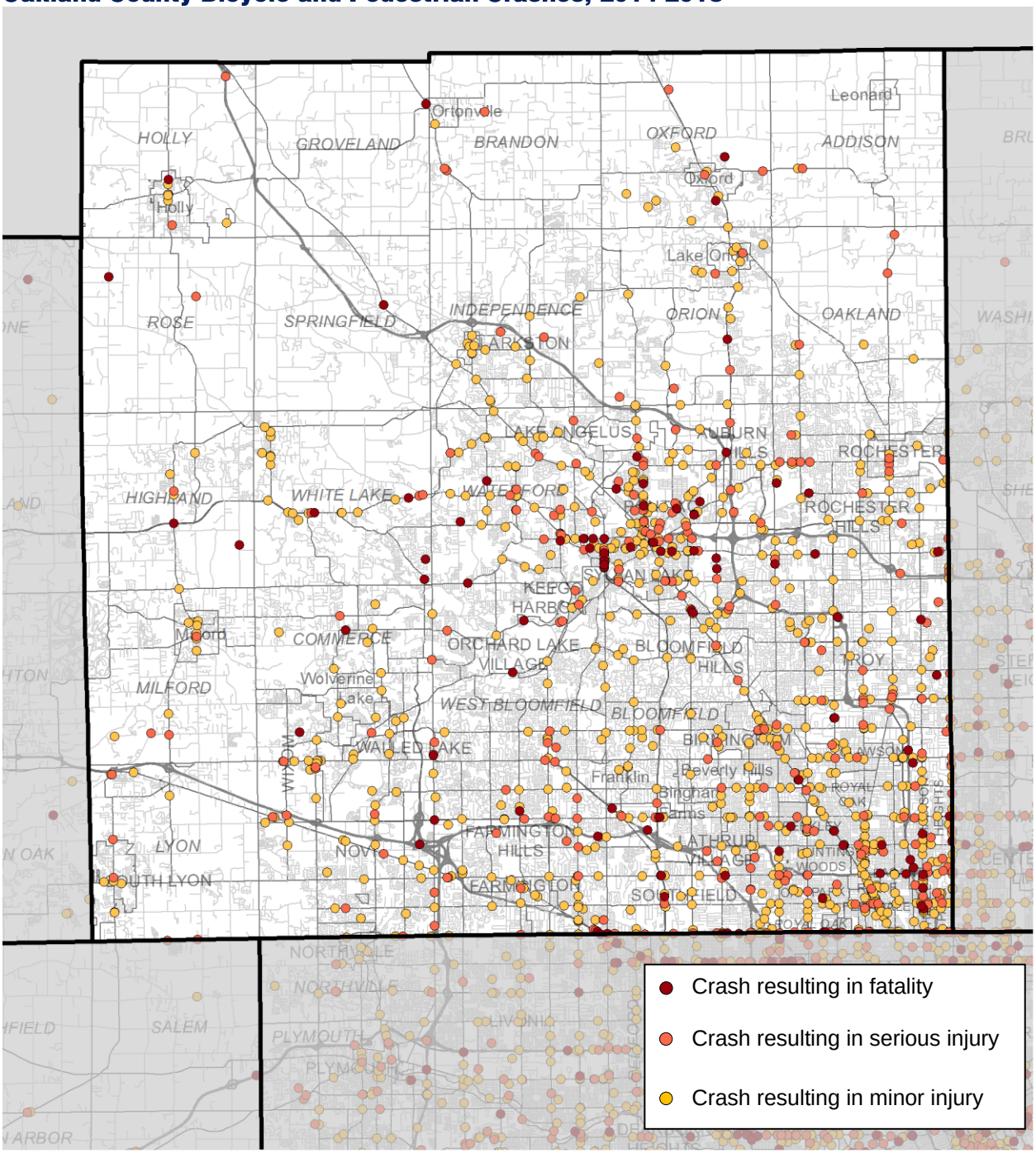


Figure 52

Oakland County Bicycle and Pedestrian Crashes, 2014-2018



St. Clair County

Planning Context

St. Clair County consists of eight cities, 23 townships, and two villages. The county has five county parks, two state parks, three state game and recreation areas, and several regional trails, including the Wadhams to Avoca Trail, Blue Water River Walk, and Bridge to Bay Trail. Known as the Blue Water Area because its eastern and southern boundaries are formed by the waters of Lake Huron, the St. Clair River, and Lake St. Clair, the county has 140 miles of shoreline and 16 designated water trails. In total, the county has 16,312 acres of parks, or 100 acres per 1,000 residents.

With a population of 159,761, the county has three percent of the region's total population. There are 64,236 jobs in the county. The majority of workers – 63 percent – work in the county. Macomb County is the largest commuting destination with 24 percent of workers. The average commute time is 28 minutes, the second longest in the region. The county is served by multiple freeways and major corridors including I-94, I-69, M-25, and Gratiot Avenue Road, and has job centers and cultural destinations in communities along the shoreline, such as Fort Gratiot Township, Marysville, Port Huron, and St. Clair.

Between 2010 and 2019, St. Clair County's population decreased by two percent. SEMCOG forecasts the county's population will increase by four percent between 2019 and 2045. Approximately 68 percent of the county's land is agricultural, open space, or recreational. An additional 18 percent is single-family residential.

Local Highlight: Blue Water River Walk

Through coordination of multiple stakeholders, including St. Clair County, City of Port Huron, and Community Foundation of St. Clair, more than one mile of shoreline along the St. Clair River was redeveloped into the Blue Water River Walk. This unique regional destination consists of:

- A multi-use trail with historic and educational interpretive signage and kiosks, public art, and placemaking amenities;
- Restored and rehabilitated shoreline, featuring a shallow-water habitat, off-shore reefs, and native plants and wildlife habitat;
- A restored 1900s railroad ferry dock; and
- A three-acre county wetland park, with habitat for reptiles, amphibians, and migrating waterfowl.

The Blue Water River Walk is part of the county's Bridge to Bay Trail which, when complete, will be a 54-mile paved trail from Lakeport State Park to New Baltimore.

Plans and Policies

Several local plans identify needed bicycling and walking improvements in St Clair County. Highlights are shown in Table 5.

Table 5
Local Plans that Influence Bicycling and Walking in St. Clair County

Plan Title	Plan Idea
St. Clair County: Economic Impact of Trail Development (2019)	Highlights the importance of establishing a group of trail-oriented organizations which guide aspects of trail development. Recommends focusing on forming consensus strategies and robust engagement that provide a strong foundation to both developing and sustaining a trail system.
St. Clair County Trails Plan (2019)	A trail framework identifies feasible and actionable trail projects that support plan goals: • Creating a connected regional trail network • Driving economic development and reinvestment • Encouraging collaborations and partnerships • Enhancing public health, safety, and green infrastructure The framework is built through a three-step process of gap identification, gap alternatives, and project prioritization.
Parks and Recreation Master Plan for Fort Gratiot Township (2018)	Identifies a strategic action item to use public right-of-way along streets, roads, abandoned railroads, or along drain easement for a nonmotorized path network.
2018-2022 City of Port Huron Master Plan	Recommends providing design guidelines that include areas for rideshare programs, public transportation, nonmotorized transportation, autonomous vehicles or future technologies in commercial districts. It sets transportation goals and objectives for transportation designs and functions that integrate with Complete Streets concepts.

Walking and Bicycling in St. Clair County

Existing Facilities

St. Clair County has two major existing regional trails, the Wadhams to Avoca Trail and the Bridge to Bay Trail. There are plans to fill gaps and enhance both of these trails, in addition to connecting Port Huron to the Macomb Orchard Trail in Macomb County as part of the Great Lake to Lake Trail. The county's cities, especially those along the St. Clair River – Algonac, Marine City, Marysville, Port Huron, and St. Clair – all have significant pedestrian networks and growing bicycle facilities. The county has 409 miles of sidewalks and 286 miles of bikeways.

Figure 53
St. Clair County Sidewalk Mileage

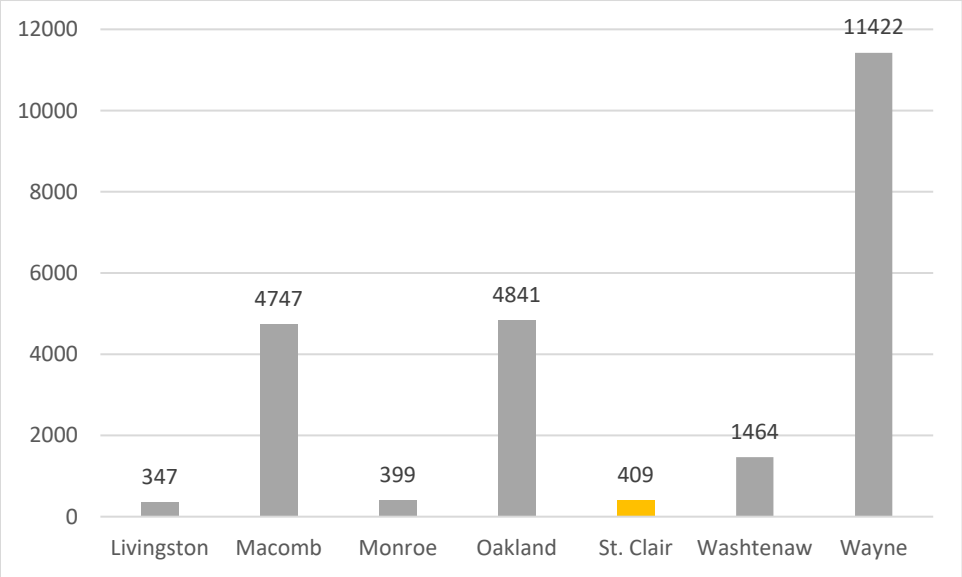


Figure 54
St. Clair County Bicycle Network by Type (Miles)

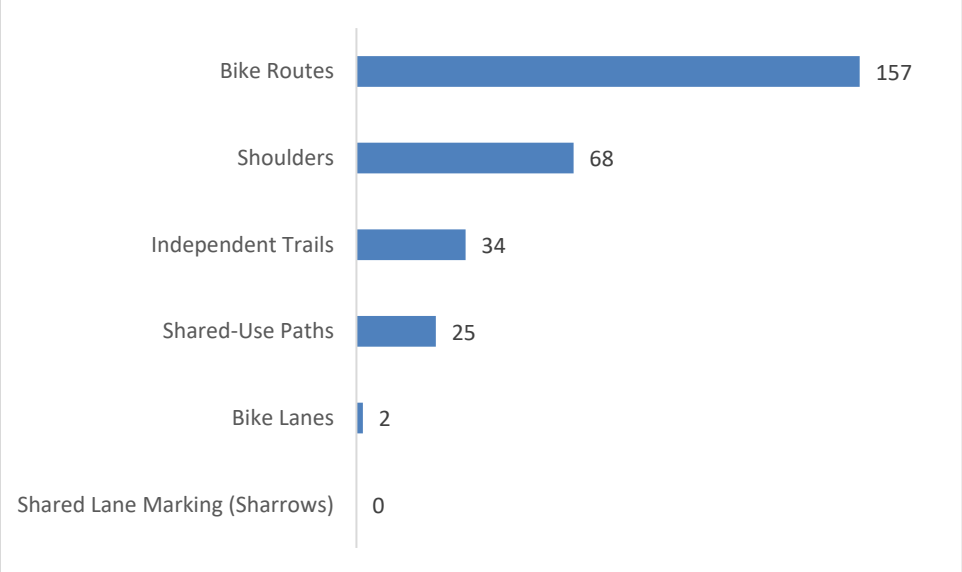
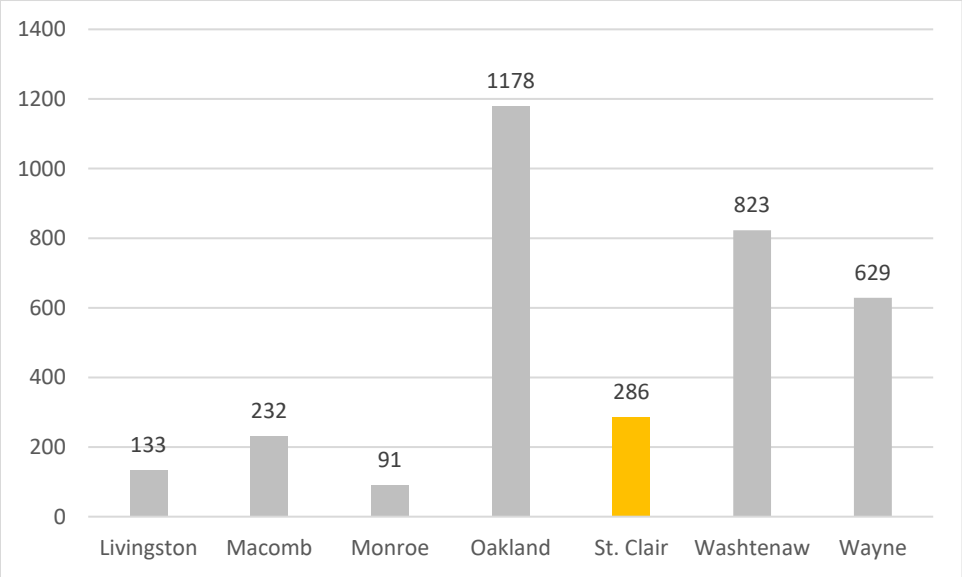
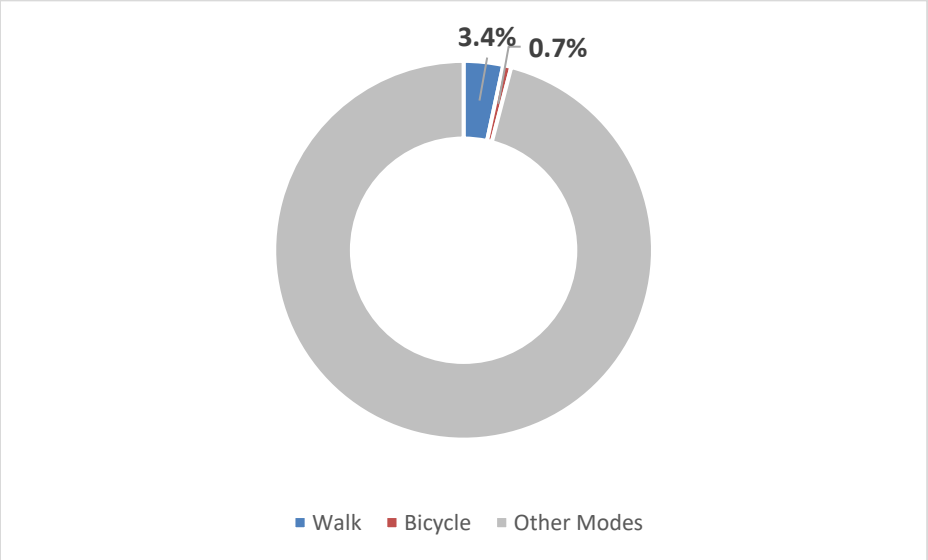


Figure 55
St. Clair County Bicycle Network Mileage



Activity Level
Walking and bicycling currently accounts for four percent of trips in St. Clair County. The average travel time to work for residents age 16 and over who live in the county and work outside the home is 28 minutes. Additionally, 37 percent of workers who live in St. Clair County are employed in another county, leaving the potential for walking and bicycling as a commute option for many workers.

Figure 56
St. Clair County Trips by Mode



Crash Data

There were 244 pedestrian and bicycle crashes in St. Clair County from 2014-2018; eight people were killed in crashes involving a pedestrian, and three people killed in crashes involving a bicycle. There were 40 serious injuries from bicycle and/or pedestrian crashes in the county during the same period. St. Clair County has two percent of the region's pedestrian and bicycle crashes.

Even though pedestrian and bicycle crashes account for only one percent of total crashes in St. Clair County, they are responsible for 12 percent of fatalities and 10 percent of serious injuries. Excluding crashes where the road jurisdiction is not known, the majority of bicycle and pedestrian crashes in St. Clair County, take place on the local roads (38%).

Figure 57
St. Clair County Fatalities by Mode, 2014-2018

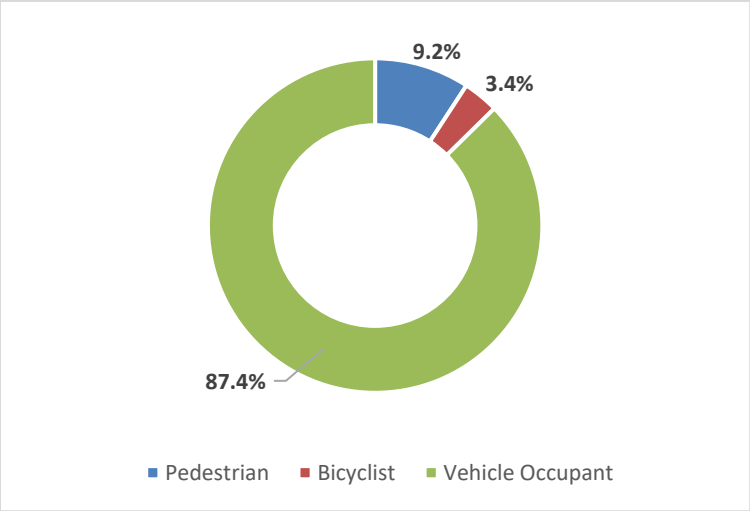


Figure 58
St. Clair County Serious Injuries by Mode, 2014-2018

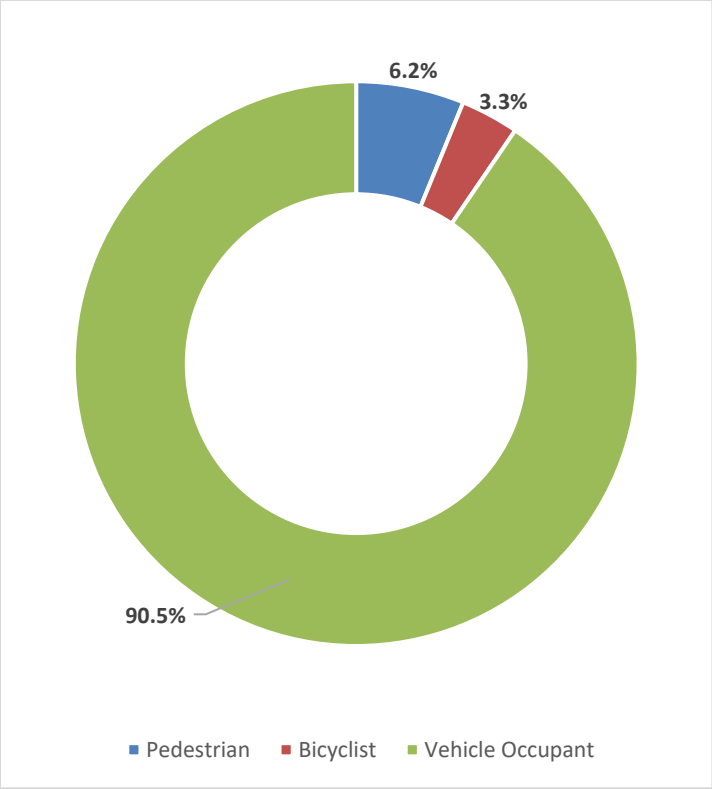


Figure 59
St. Clair County Pedestrian and Bicycle Crashes by Road Jurisdiction, 2014-2018

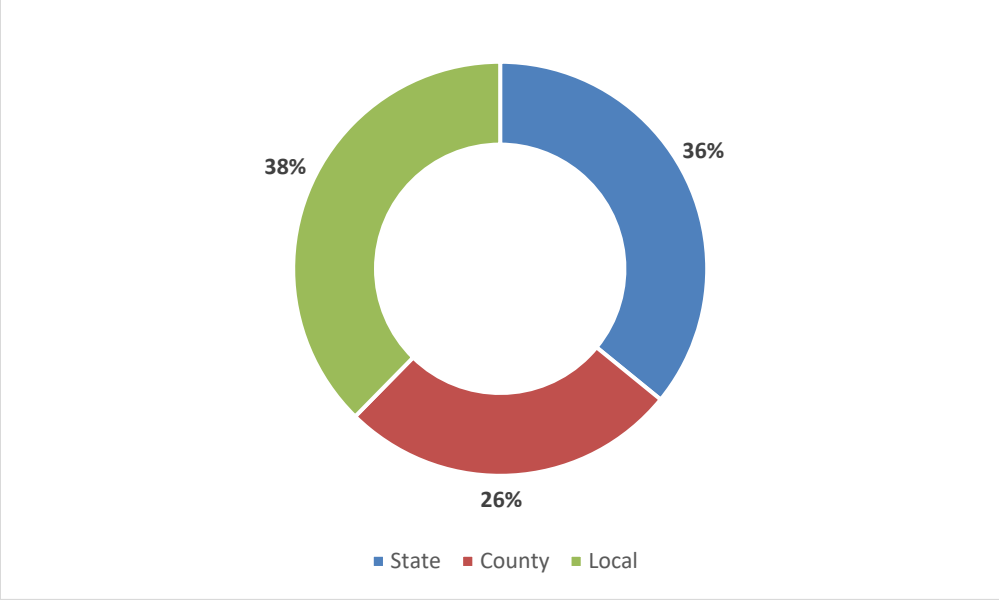


Figure 60
St. Clair County Bicycle Network

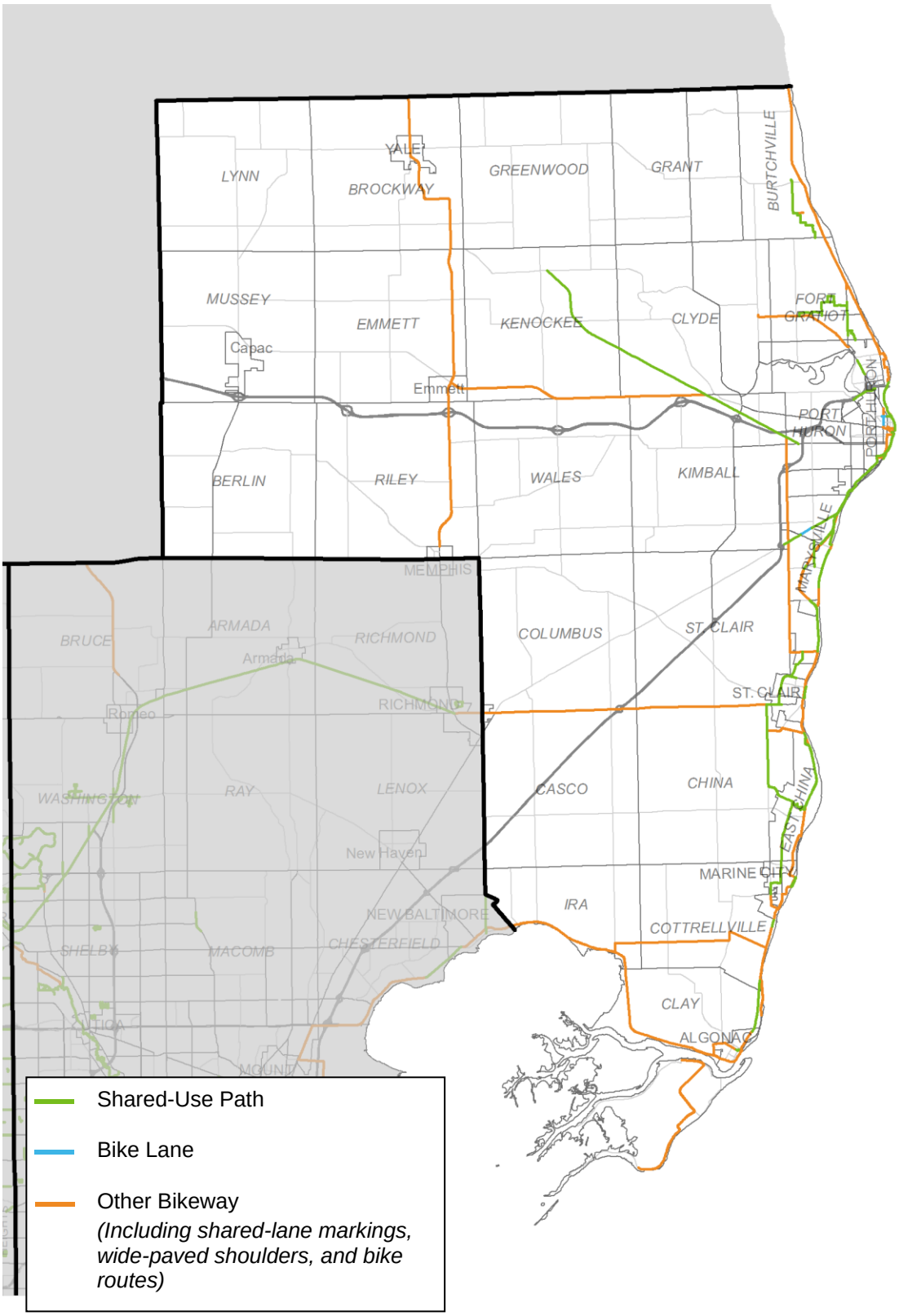


Figure 61
St. Clair County Pedestrian Infrastructure

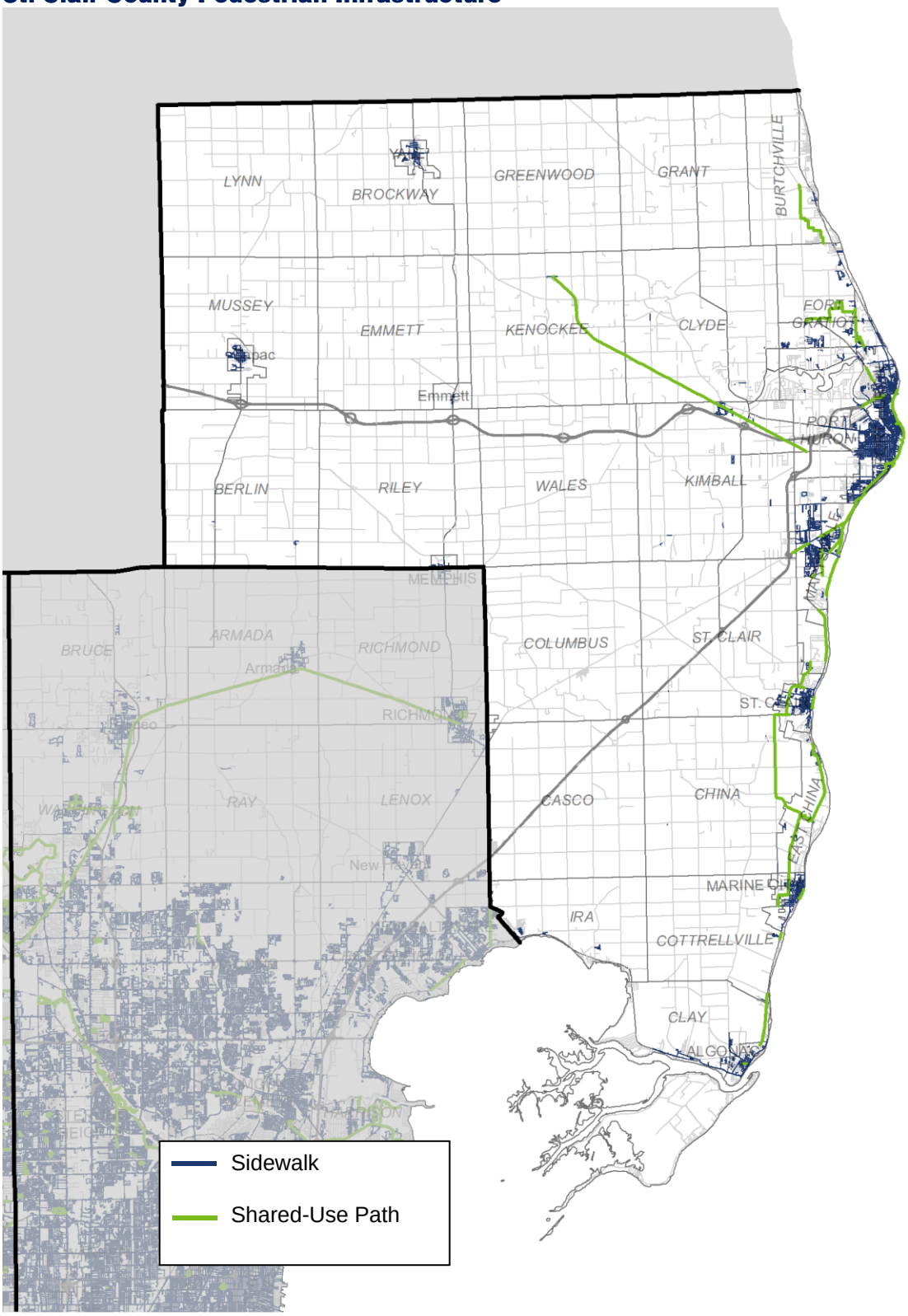


Figure 62
St. Clair County Bicycle and Pedestrian Demand Areas

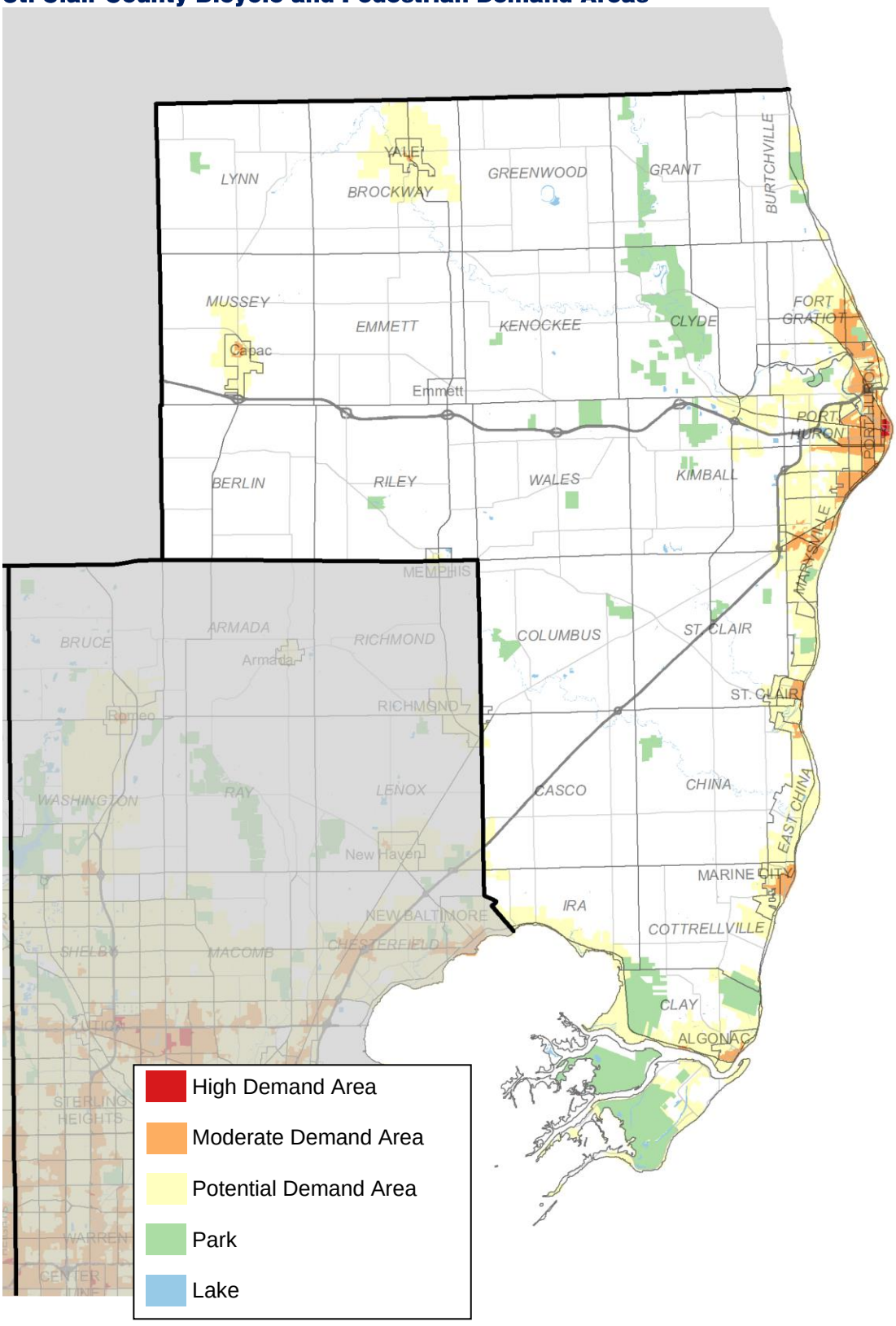


Figure 63
St. Clair County Gaps in Pedestrian Infrastructure Access by Demand Area

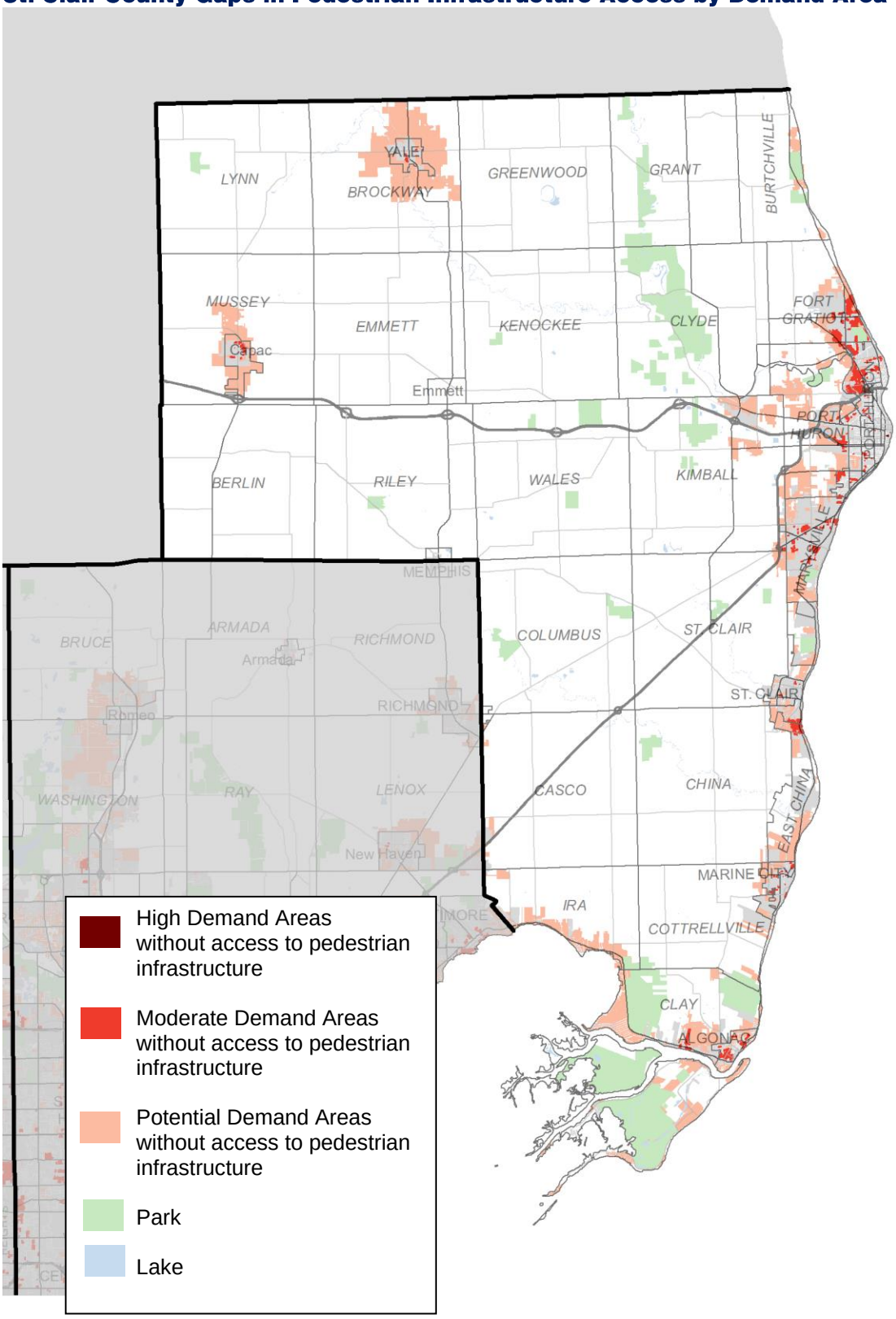


Figure 64
St. Clair County Gaps in Bicycle Infrastructure Access by Demand Area

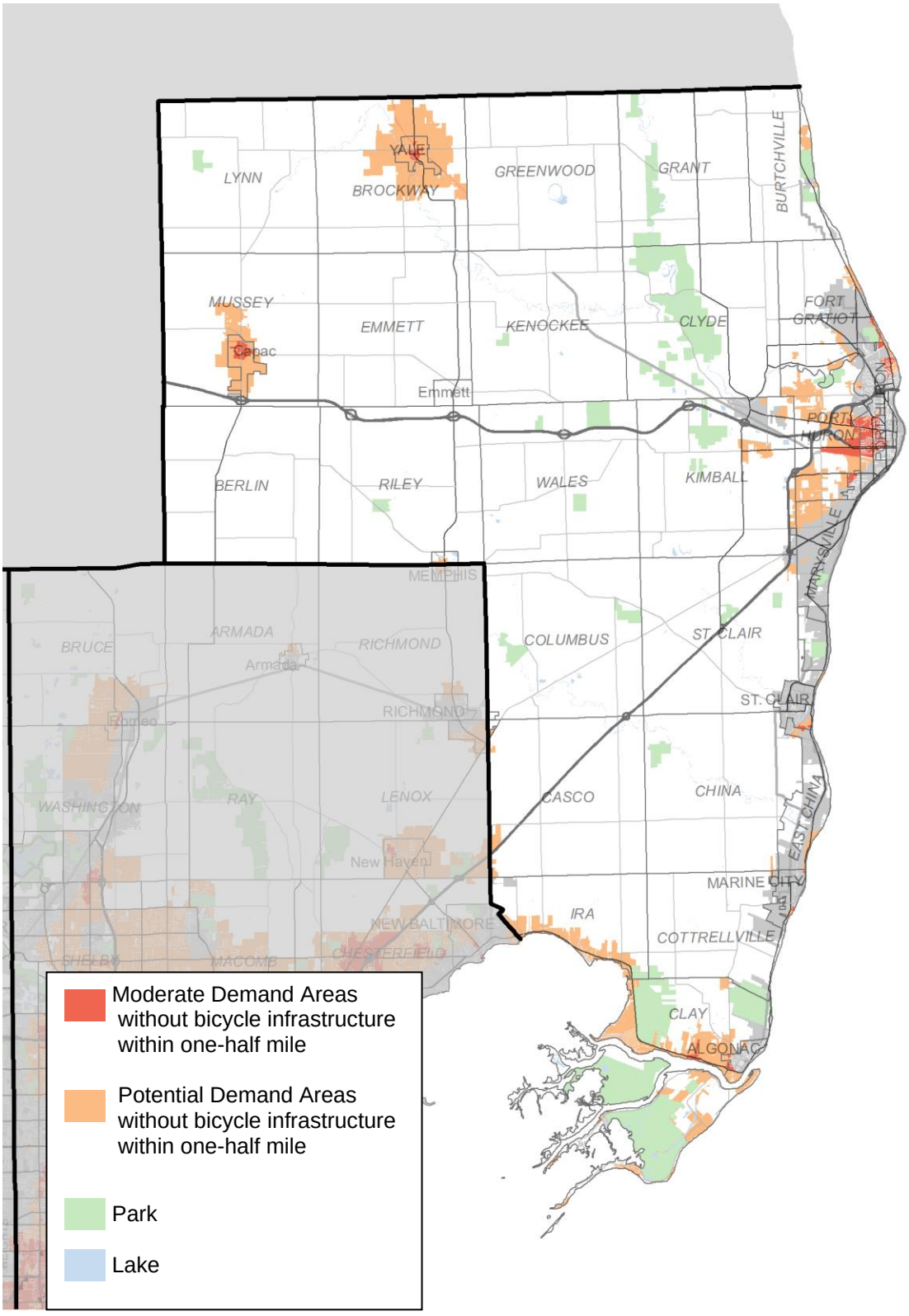
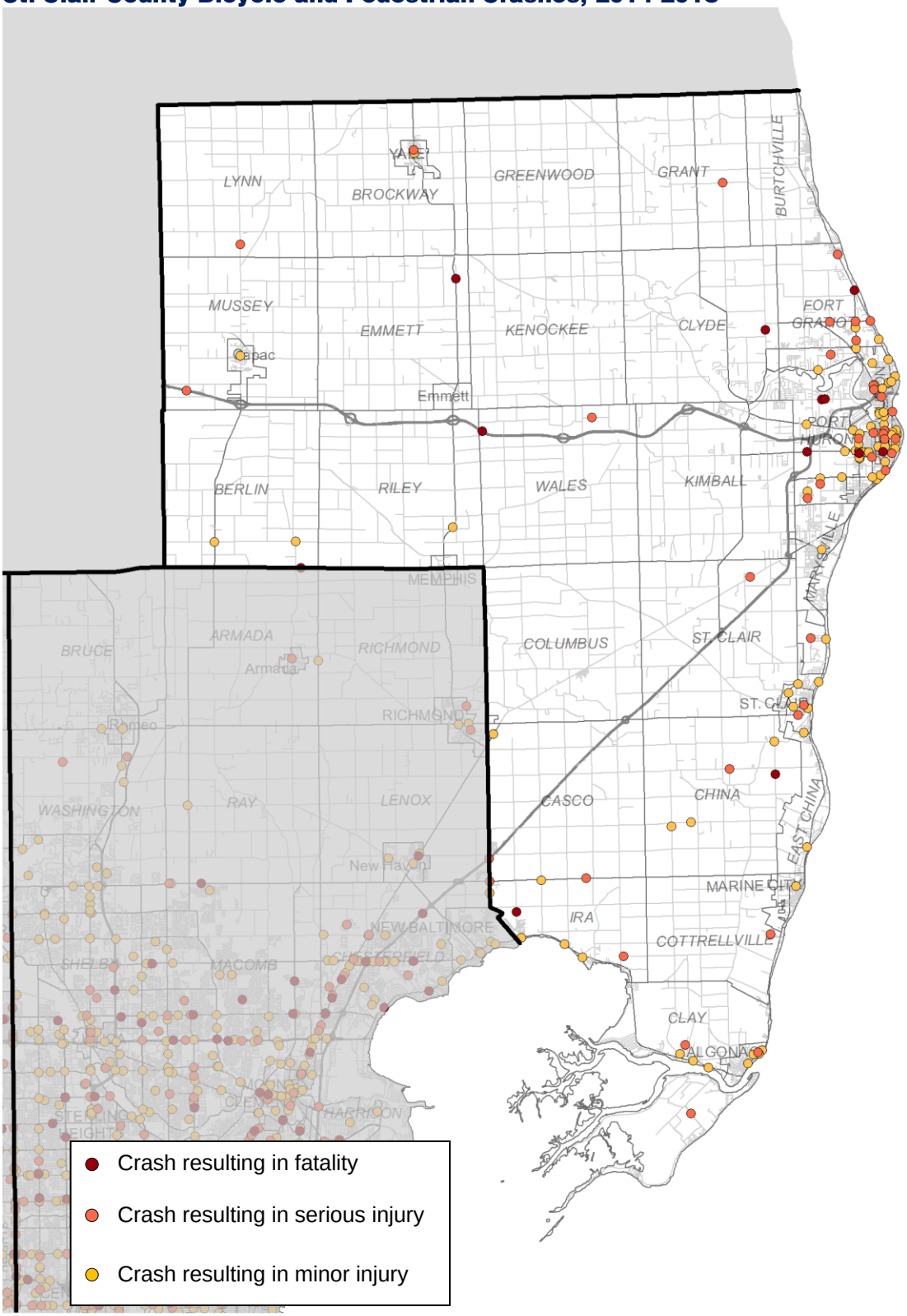


Figure 65
St. Clair County Bicycle and Pedestrian Crashes, 2014-2018



Washtenaw County

Planning Context

Washtenaw County consists of six cities, 20 townships, and two villages. The county is home to 11 county parks, eight state parks, three Huron-Clinton Metroparks, and the Border to Border Trail/Iron Belle Trail. When complete, this county-wide trail will connect to 70 percent of the county's population and includes multiple major "spurs," such as the Matthaei Botanical Gardens Trail. The county is also bisected by the Huron River, which provides an array of water recreation opportunities, especially at Argo Canoe Livery and Cascades and Gallup Park. In total, the county has the region's second greatest amount of parks, with 38,695 acres, or 112 acres per 1,000 residents.

With a population of 361,509 the county is home to eight percent of the region's total population. There are 256,651 jobs in the county. The vast majority of workers – 78 percent – work in the county. Wayne and Oakland Counties are the largest commuting destinations with 16 percent of workers. The average commute time is 22 minutes, which is the shortest for any county in the region. The county is served by multiple freeways and major corridors including I-94, US-14, M-23, and M-12. Ann Arbor and the University of Michigan are the county's largest job centers, but significant employment can also be found in the surrounding communities of Pittsfield Township, Ypsilanti, and Ypsilanti Township. Between 2010 and 2019, Washtenaw County's population increased by eight percent. SEMCOG forecasts the county's population will continue to increase by another 27 percent by 2045. This is the second largest forecasted population increase for any county in the region. Approximately 58 percent of the county's land is agricultural, open space, or recreational. An additional 21 percent is single-family residential.

Local Highlight: Border-to-Border Trail (B2B)

The Border-to-Border Trail is a nonmotorized pathway connecting cities, parks, and destinations throughout Washtenaw County. Currently, more than 40 miles of trail exist, with 70 more miles planned. Through coordination and partnership with the Huron Waterloo Pathway Initiative, an additional 29-mile paved, shared-use path connecting Dexter, Chelsea, Stockbridge, the Lakelands Trail, and Pinckney is underway. A major goal of B2B is to route the trail away from roads to create a safe and fun experience for as wide a range of users as possible.

Plans and Policies

Several local plans identify needed bicycling and walking improvements in Washtenaw County. Highlights are shown in Table 6.

Table 6
Local Plans that Influence Bicycling and Walking in Washtenaw County

Plan Title	Highlights
City of Ann Arbor Non-Motorized Transportation Plan (2013)	Highlights importance of incorporating nonmotorized best practices into all relevant policies, and all aspects and stages of planning. Recommends increasing awareness of nonmotorized transportation opportunities and benefits, and also provides information to all users on safe ways to integrate all transportation modes. Provides policies and programs addressing bicycle and pedestrian travel, including road-crossing guidelines.

City of Chelsea Master Plan (2019)	Nonmotorized section identifies nonmotorized connections for active transportation between various areas of the city and opportunities to connect the city's pathways and biking system with regional paths.
Pittsfield Township Sustainable Vision for Parks and Recreation (2017)	Sets a goal of participating in establishing a township-wide nonmotorized transportation system. Action item identifies expansion of nonmotorized sidewalks, bike lanes, greenways/pathways amenities.
City of Saline Non-Motorized Transportation Plan (2017)	Map of proposed nonmotorized transportation routes for the city was developed to serve as a guide for future nonmotorized funding, design, and implementation. Also includes proposed safe pedestrian crossings locations throughout the city.
City of Ypsilanti Non-Motorized Transportation Master Plan (2010)	Emphasizes linkage between land use and zoning to nonmotorized transportation planning. Recommends that any future zoning amendments do not reduce vital transportation options; and policies to determine how appropriate infill development, neighborhood-scaled businesses, and other land-use options can support nonmotorized transportation.
Non-Motorized Transportation Plan Washtenaw Area Transportation Study (2018)	Highlights the importance of adopting context sensitive solutions in improving or maintaining safety, mobility, and infrastructure conditions. Includes creative funding sources necessary to implement the plan's vision. Emphasizes the importance of adopting a set of performance measures and targets to measure plan progress.
Huron-Clinton Metroparks Master Plans	The Hudson Mills Metropark Master Plan (2017) highlights the importance of B2B and Iron Bell Trail connections to county and state leaders; identifies development of Border-to-Border (B2B) hike-bike trail extension to Lakelands Trail and Livingston County as key projects. The Dexter-Huron & Delhi Metroparks Master Plan (2018) includes supporting the extension of Border to Border in both parks as action items.

Walking and Bicycling in Washtenaw County

Existing Facilities

Washtenaw County has an extensive network of pedestrian and bicycling facilities. With the largest number of miles of bicycle routes and wide-paved shoulders in the region, the county provides significant access between the more rural townships and villages and cities. The county's cities and villages have significant pedestrian networks, especially in and near the historic downtowns and business districts. The City of Ann Arbor provides a wealth of facilities for both walkers and bicyclists, and continues to grow annually. Pittsfield and Ypsilanti Townships are planning for facilities for both pedestrians and bicyclists, along with enhancements that connect both to the county's Border-to-Border Trail. In the northwest part of the county, the Huron Waterloo Pathways are making significant progress to connect the Border-to-Border Trail west to Chelsea and north through Lyndon Township. The county has 1,464 miles of sidewalks and 823 miles of bikeways.

Figure 66
Washtenaw County Sidewalk Mileage

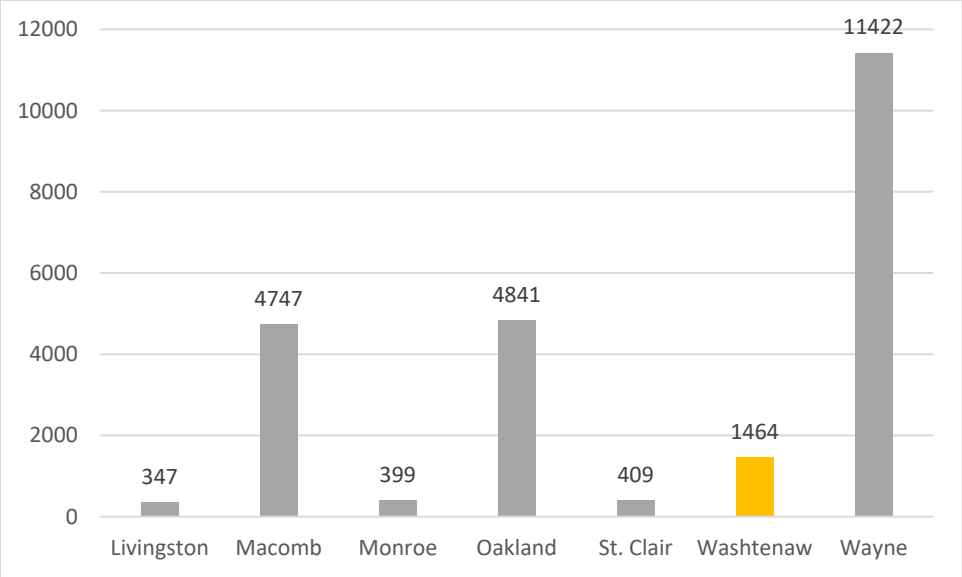


Figure 67
Washtenaw County Bicycle Network by Type (Miles)

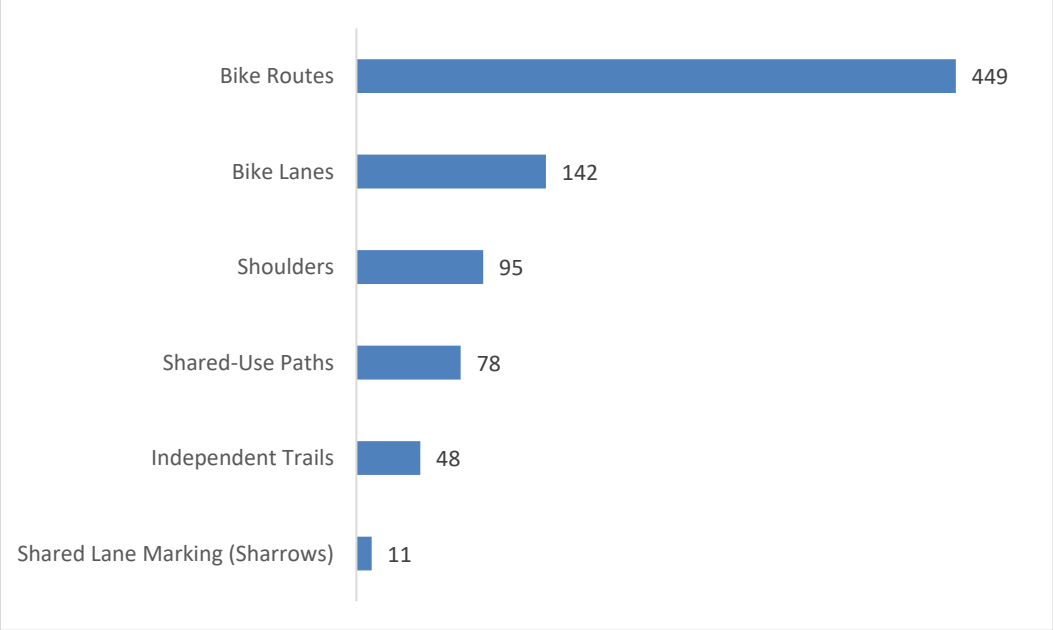
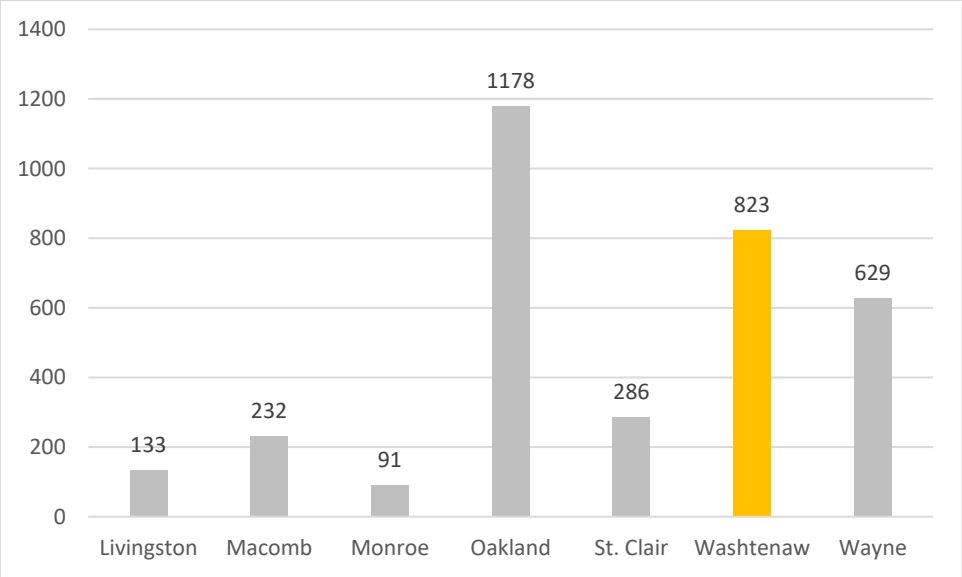


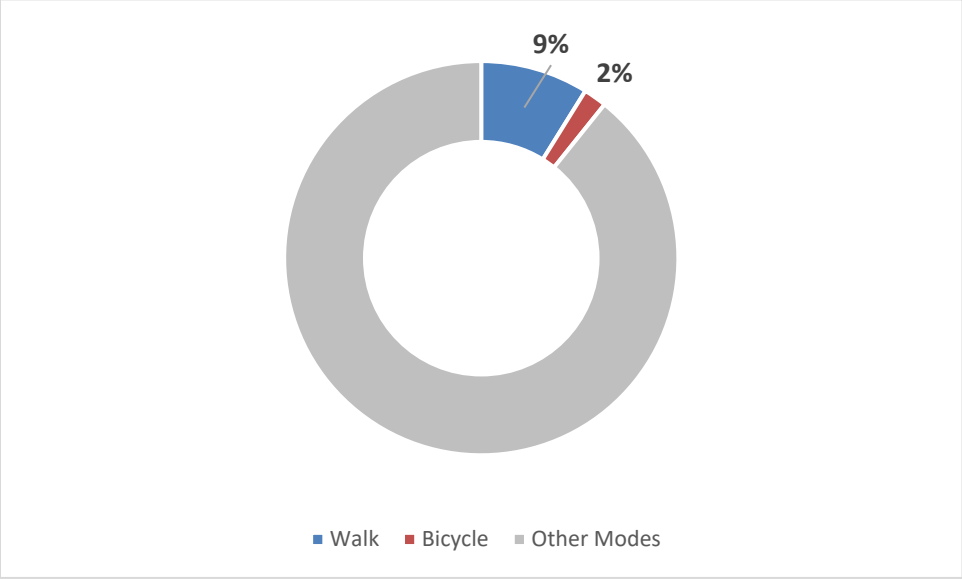
Figure 68
Washtenaw County Bicycle Network Mileage



Activity Level

Walking and bicycling currently accounts for 11 percent of trips in Washtenaw County. The average travel time to work for residents age 16 and over who live in the county and work outside the home is 22 minutes. Additionally, the majority of workers who live in Washtenaw County are also employed in Washtenaw County as well (78 percent), creating the potential for walking and bicycling as a commute option for many workers.

Figure 69
Washtenaw County Trips by Mode



Crash Data

There were 995 pedestrian and bicycle crashes in Washtenaw County from 2014-2018; 23 people were killed in crashes involving a pedestrian, and 10 people were killed in crashes involving a bicycle. There were 118 serious injuries from bicycle and/or pedestrian crashes in the county during the same period. Washtenaw County had nine percent of the region's pedestrian and bicycle crashes.

Even though pedestrian and bicycle crashes account for only two percent of total crashes in Washtenaw County, they account for about of 22 percent of fatalities and 16 percent of serious injuries. Excluding crashes where the jurisdiction is not known, more than 50 percent of bicycle and pedestrian crashes in Washtenaw County, take place on local roads.

Figure 70

Washtenaw County Fatalities by Mode, 2014-2018

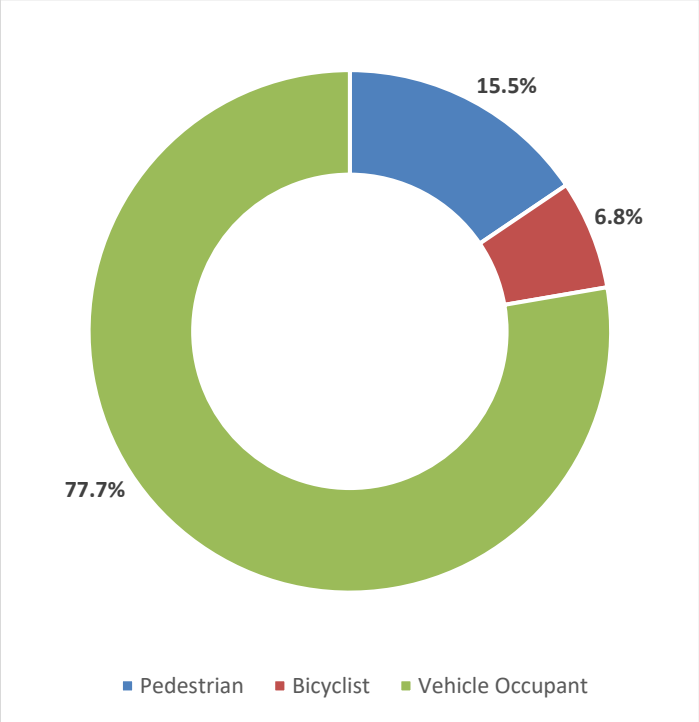


Figure 71
Washtenaw County Serious Injuries by Mode, 2014-2018

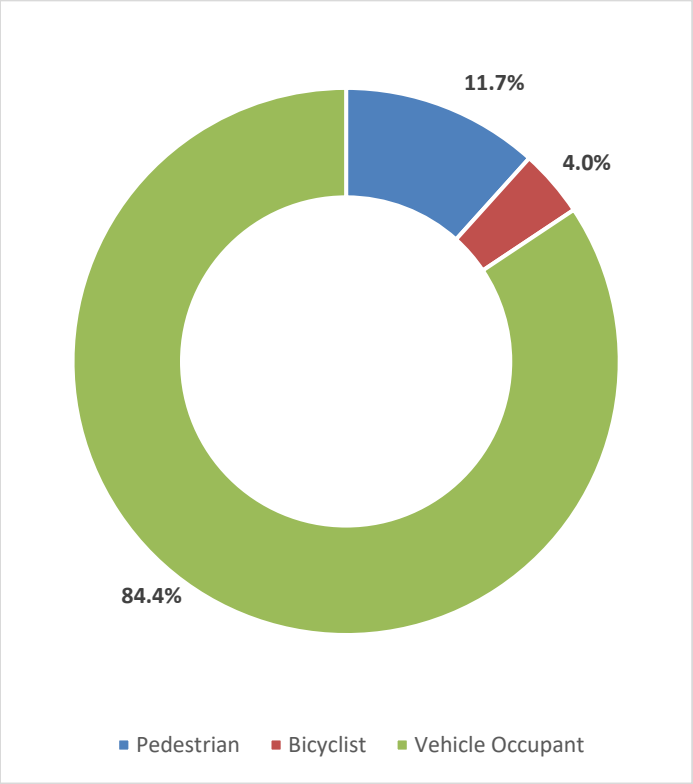


Figure 72
Washtenaw County Pedestrian and Bicycle Crashes by Road Jurisdiction, 2014-2018

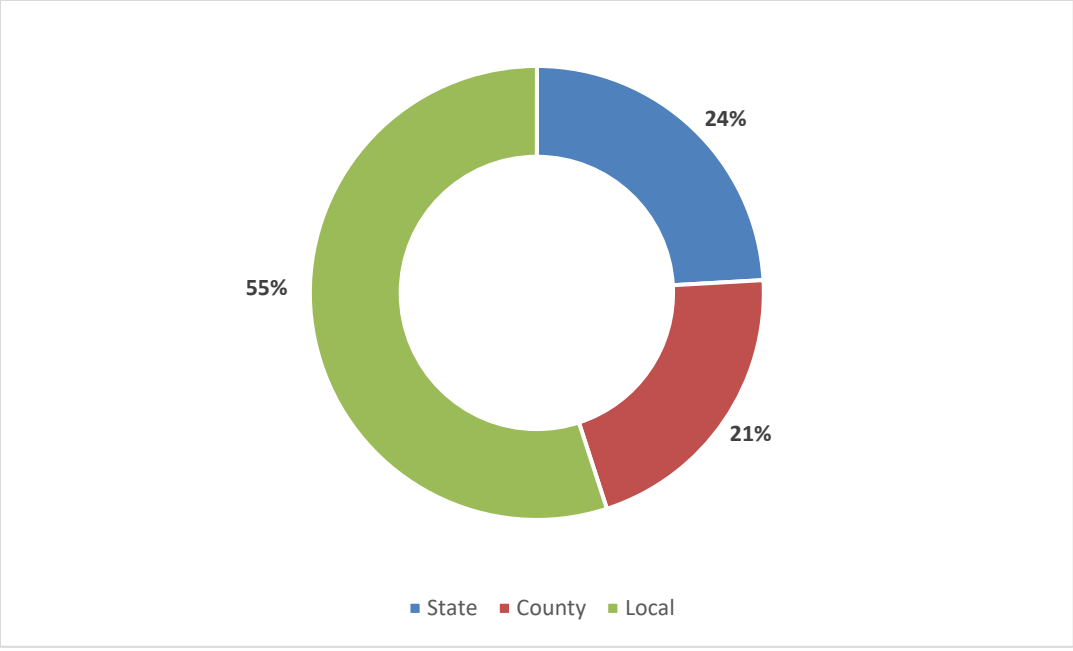


Figure 73
Washtenaw County Bicycle Network

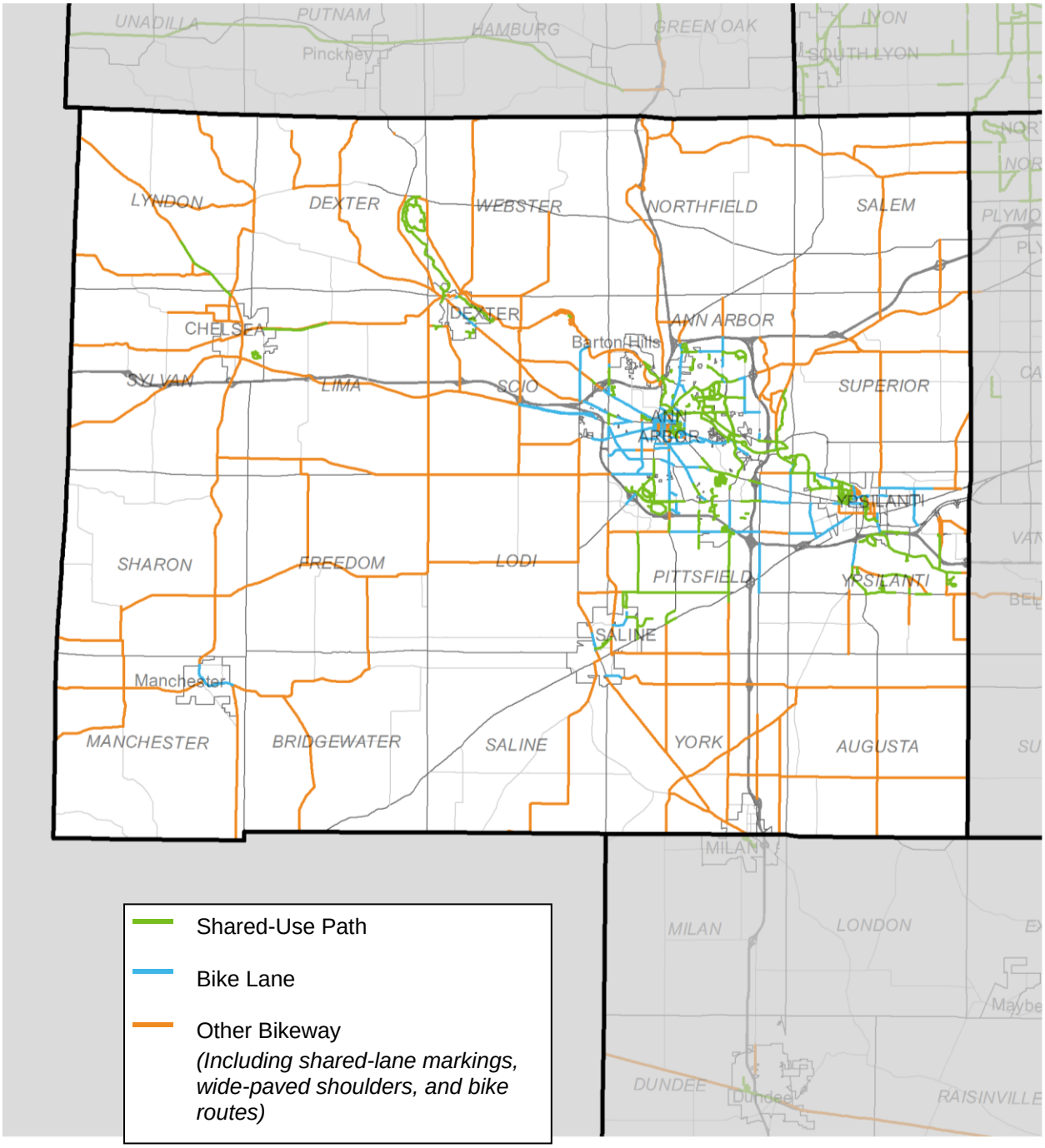


Figure 74
Washtenaw County Pedestrian Infrastructure

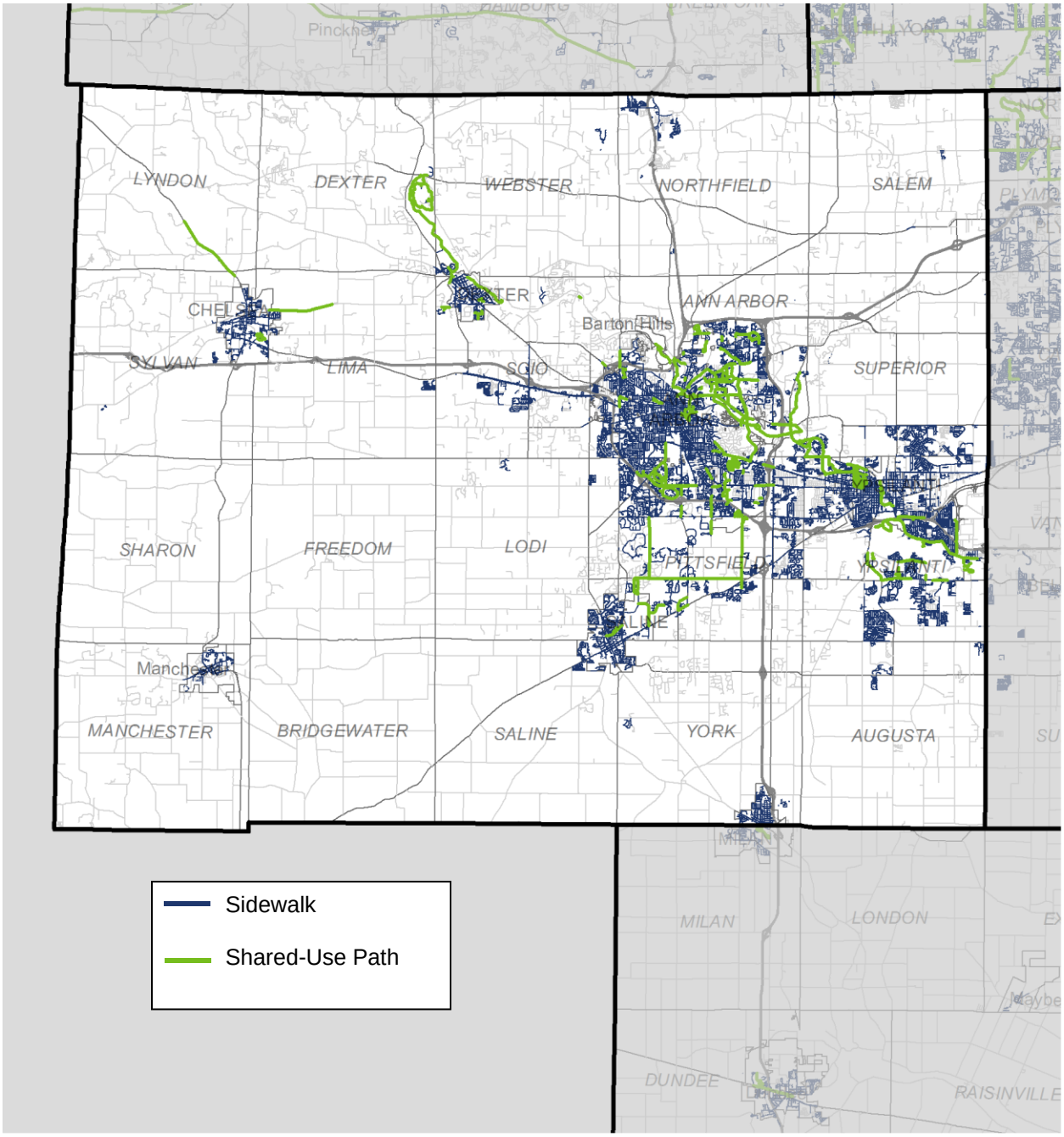


Figure 75
Washtenaw County Bicycle and Pedestrian Demand Areas

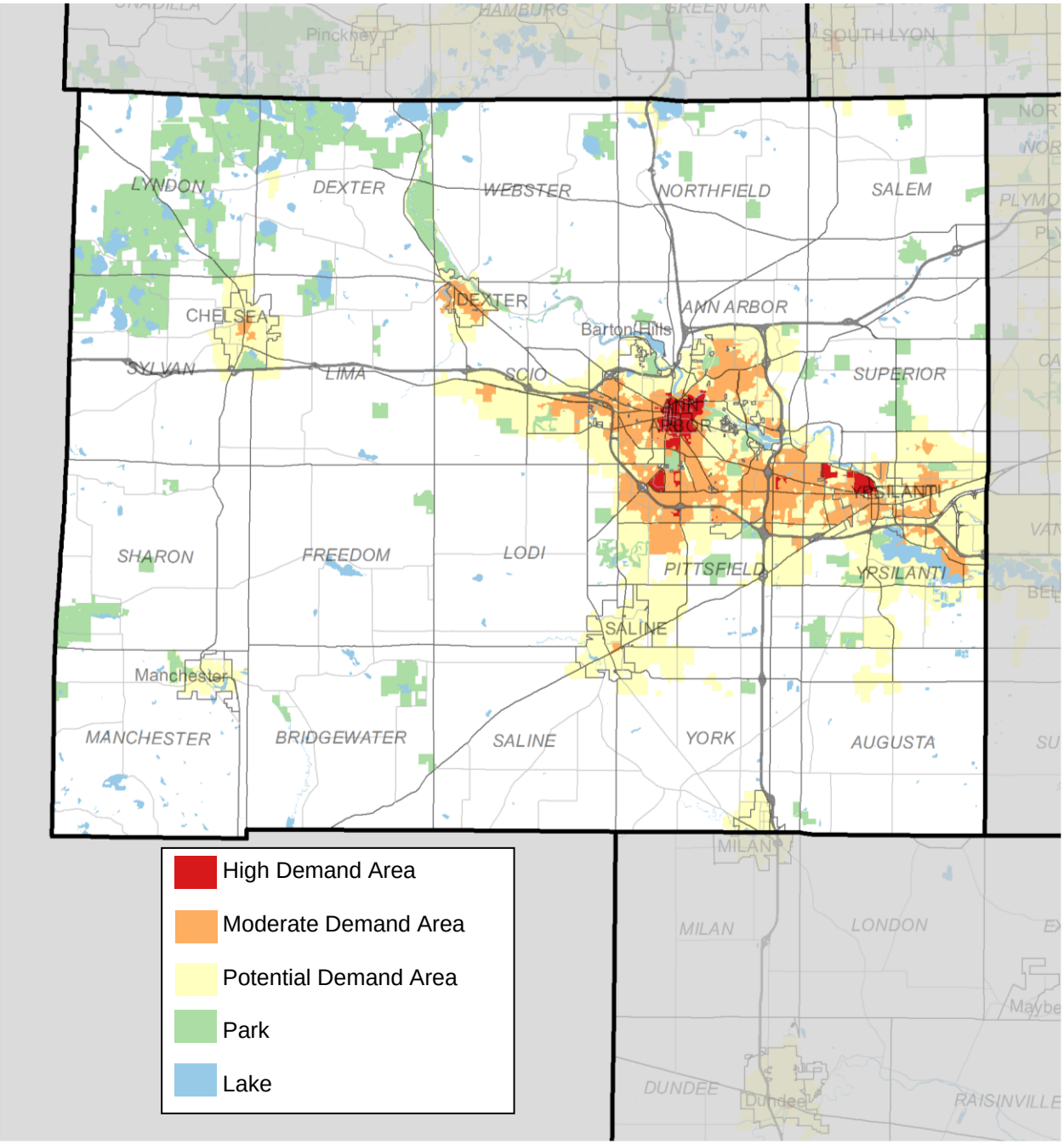


Figure 76
Washtenaw County Gaps in Pedestrian Infrastructure Access by Demand Area

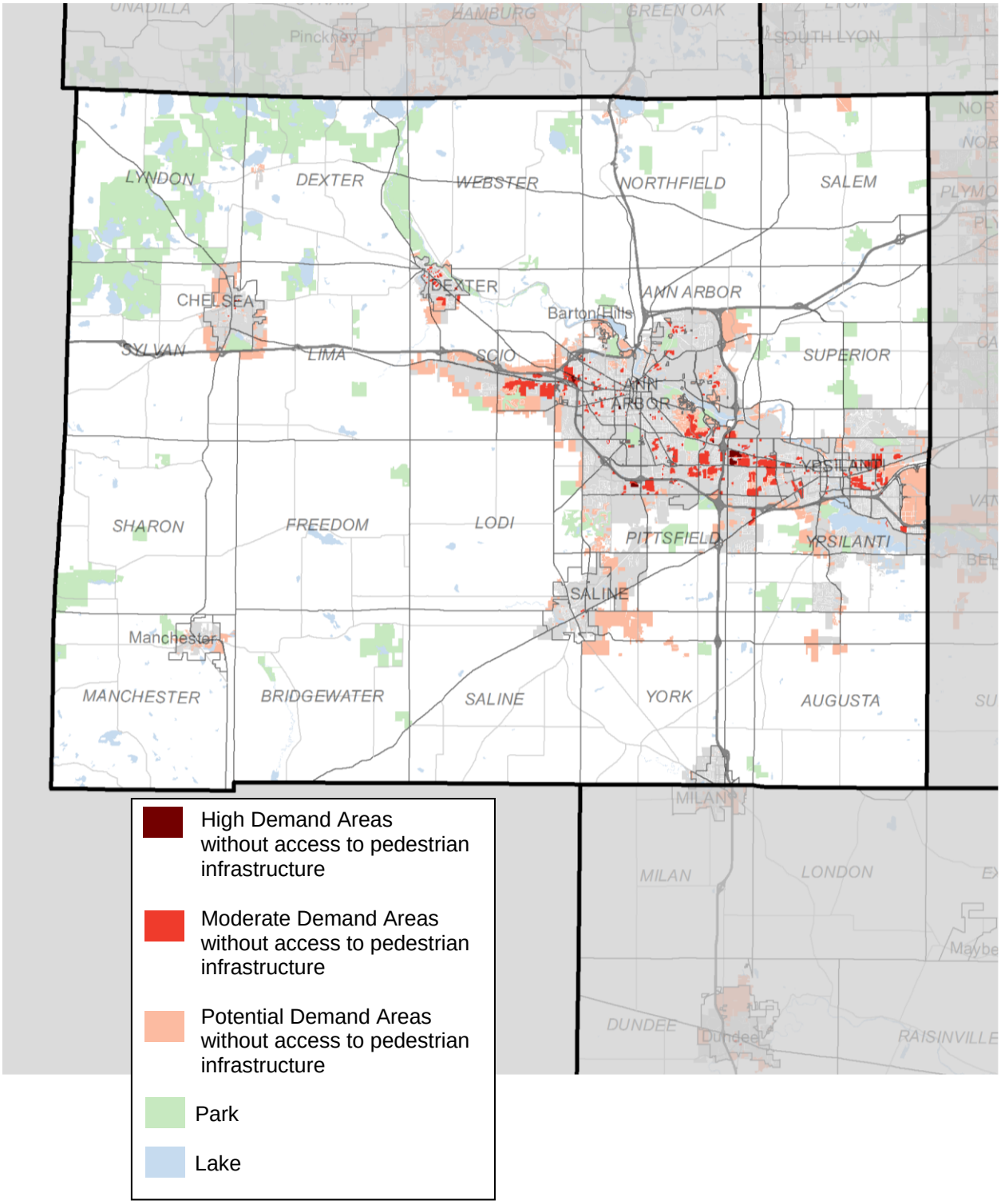


Figure 77

Washtenaw County Gaps in Bicycle Infrastructure Access by Demand Area

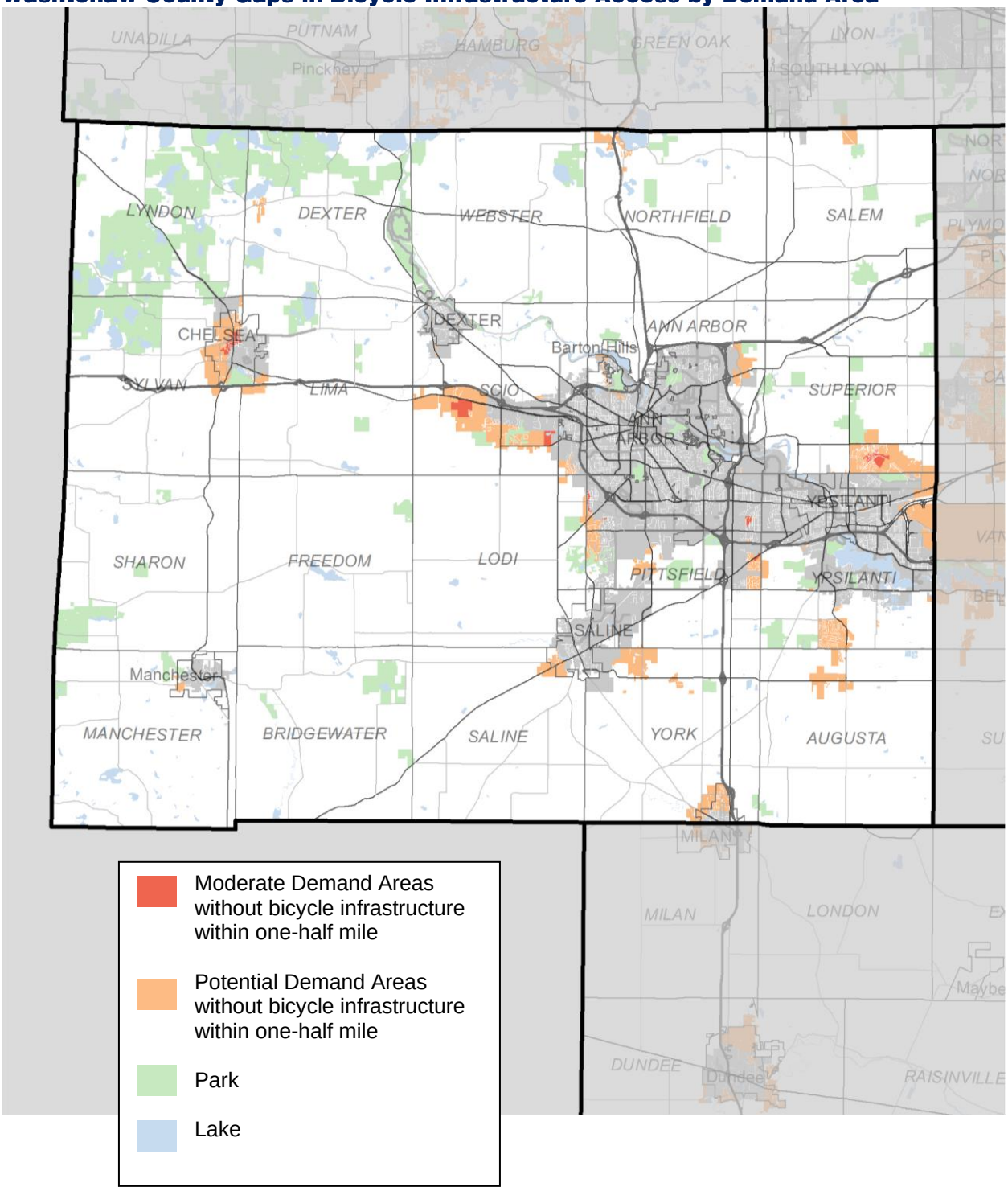
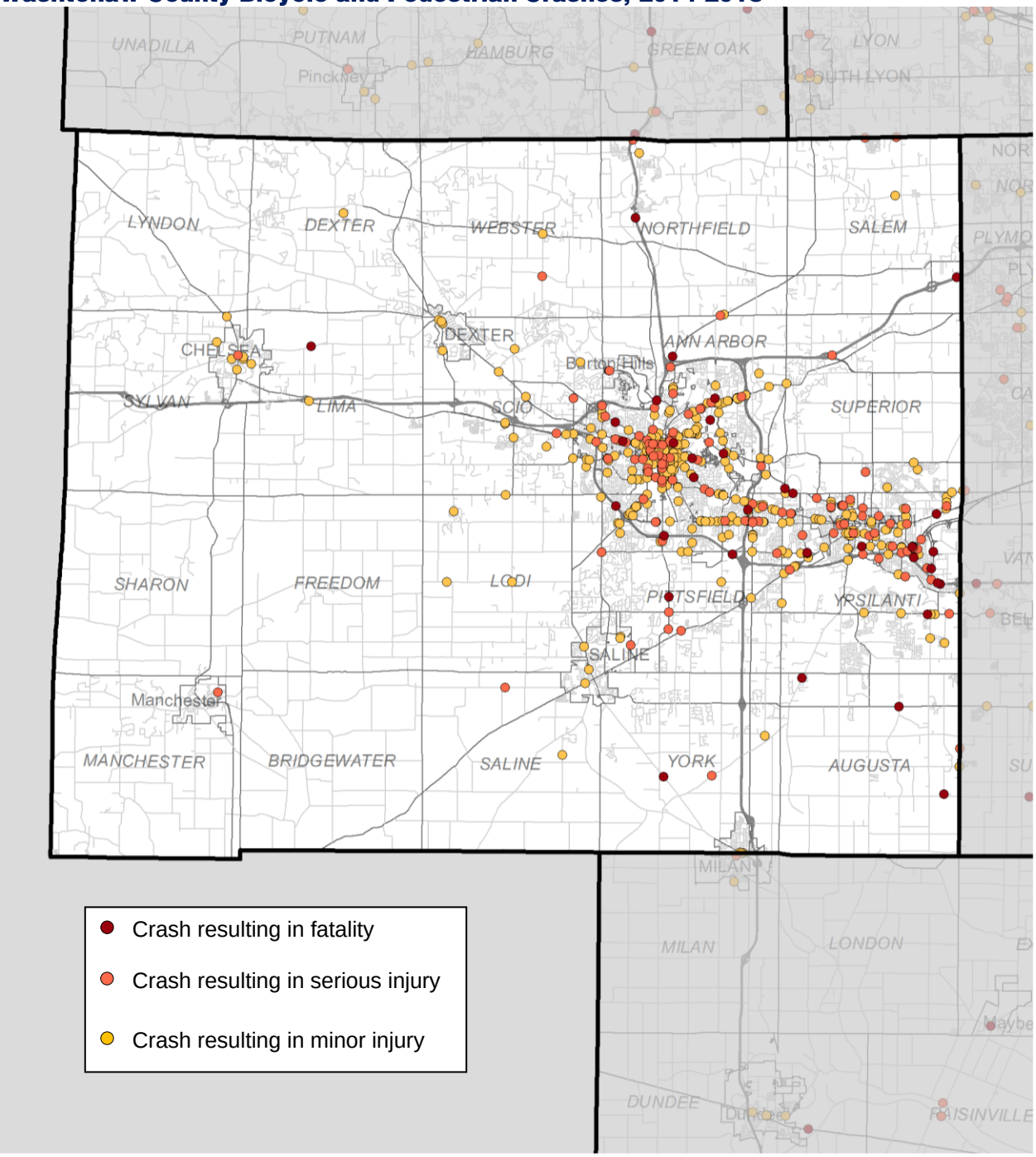


Figure 78

Washtenaw County Bicycle and Pedestrian Crashes, 2014-2018



Wayne County

Planning Context

Wayne County consists of 33 cities and nine townships. The county is home to three state parks, four Huron-Clinton Metroparks, and eight county parks, including Hines Park which features 24 distinct recreation areas and trails. Wayne County has multiple trails connecting downtowns and cultural destinations, including the Detroit RiverWalk, Dequindre Cut, I-275 Metro Trail, and the Downriver Linked Greenways, which includes trails through each of the four Metroparks in the county – Huron, Lake Erie, Oakwoods, and Willow. In total, the county has 28,962 acres of parks, or 16 acres per 1,000 residents.

With a population of 1,763,822, the county is the most populous in the region, accounting for 37 percent of the region's total. There are 927,801 jobs in the county. The vast majority of workers – 68 percent – work in the county. Oakland and Macomb counties are the largest commuting destinations, with 23 percent of workers. The average commute time for the county is 25 minutes. The county is served by multiple freeways and major corridors that primarily originate or pass through the City of Detroit. Detroit is the county's and region's major job and cultural center, with 336,795 jobs and regional attractions from sporting stadiums, to museums, concert halls, and theaters.

Between 2010 and 2019, Wayne County's population decreased by four percent. SEMCOG forecasts that the county's population will increase by five percent by 2045. As the region's most developed county, the major land uses are Transportation/Communication/Utilities and single-family residential. Combined, these two land uses account for 62 percent of the county's land. The county also has the region's highest population density (persons/acre) at 4.47.

Local Highlight: Downriver Linked Greenways

Since 1998, the Downriver Linked Greenways has helped to facilitate over 75 miles of trails and pathways through the Downriver region. The goal is to help transform this area into a healthier community for all residents and visitors by creating a network of trails and green spaces. These trails traverse many different types of places, including rural, urban, and over 7,000 acres of parkland.

Plans and Policies

Several local plans identify needed bicycling and walking improvements in Wayne County. Highlights are shown in Table 7.

Table 7
Local Plans that Influence Bicycling and Walking in Wayne County

Plan Title	Highlights
City of Dearborn Multimodal Plan (2019)	Includes several innovative and implementable recommendations, including adopting a Complete Streets and vision zero ordinance, establishing a multimodal transportation board, identifying where shared and autonomous vehicles can be parked, developing a multimodal information website, and deploying real-time transit information.

Livonia Bike Walk (2015)	Arterial Sidewalk System Gaps were identified, defined as areas recommended for installing either sidewalks or a shared-use path to complete the arterial sidewalk network. Identifies priority crossing improvements within the community, and includes a bikeway preferred facility map.
City of Northville Non-Motorized Plan (2013)	Six priority routes were proposed for establishing nonmotorized facilities for short- and long-term developments. Includes recommendations to improve awareness of bicycle and pedestrian facilities and opportunities to promote bicycling and walking, and providing funding source options to ensure implementation.
City of Plymouth Master Plan (2018)	The five sub-area plans provide detailed directions on design principles, and proposed pedestrian amenities. Sets goals for nonmotorized improvements, including creating a comprehensive nonmotorized plan, creating a bicycle network that connects neighborhoods and community destinations, improving pedestrian crossing at seven identified intersections, and exploring funding options for future projects.
City of Woodhaven Parks and Recreation Master Plan (2016)	Includes the city's pathways plan, which establishes a continuous city-wide walkway system connecting neighborhoods to community destinations and is also tied into the regional greenway system. Includes a project schedule, which outlines the cost estimate and timeframe for proposed projects.

Walking and Bicycling in Wayne County

Existing Facilities

Wayne County has the region's most extensive network of pedestrian facilities. The majority of cities have sidewalks connecting neighborhoods to core services; most residential streets have sidewalks on both sides of the street. The City of Detroit has the most miles of pedestrian and bicycle facilities in the region. The city also provides some of the region's most-used facilities with the Detroit RiverWalk and Dequindre Cut, and is currently developing the Joe Louis Greenway which, when complete, will be a 32-mile trail connecting the city with Highland Park, Hamtramck, and Dearborn. Multiple trails provide access and connectivity to core services and neighborhoods including the I-275 Metro Trail, Hines Park Trail, and Lower Huron to Lake Erie Trail System. Canton Township has invested significantly in connecting the township's pedestrian network and has used ITC corridors with great success to connect into the Lower Rouge River Trail and I-275 Metro Trail. The county has 11,422 miles of sidewalks (most of any county in the region) and 629 miles of bikeways.

Figure 79
Wayne County Sidewalk Mileage

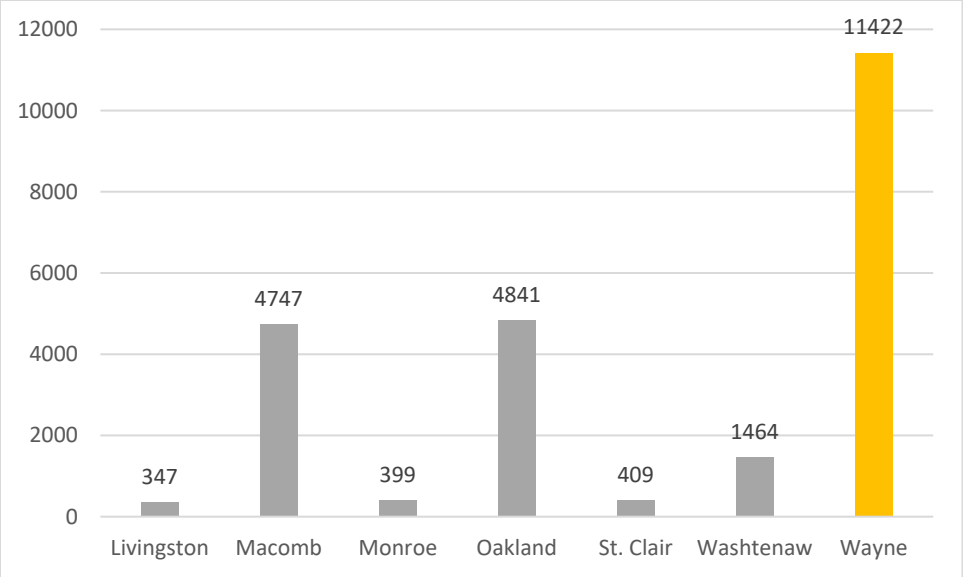


Figure 80
Wayne County Bicycle Network by Type (Miles)

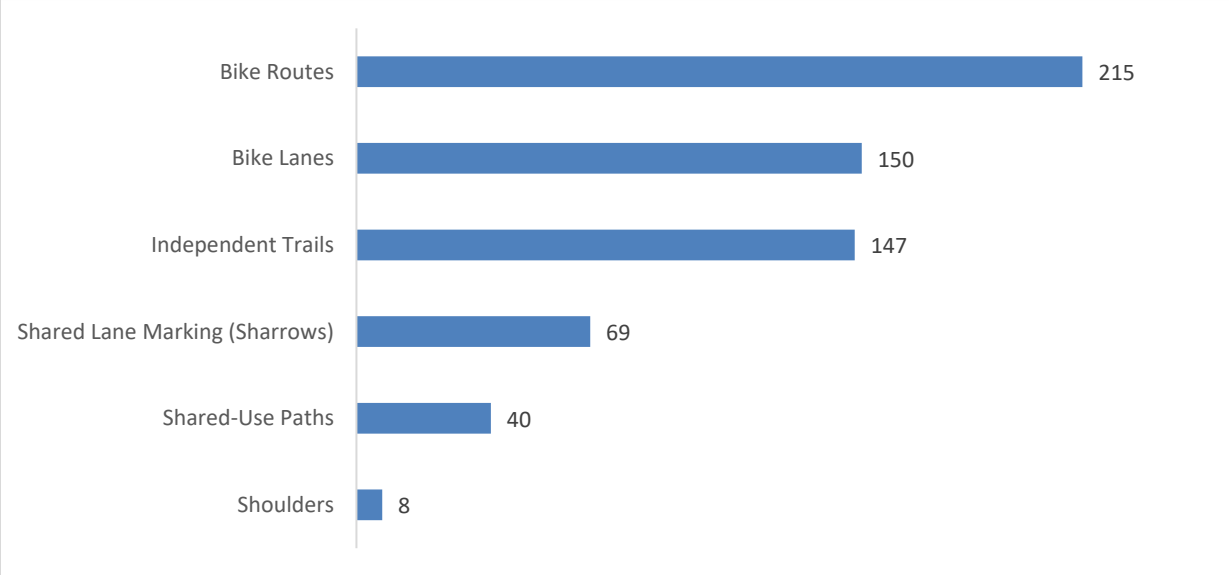
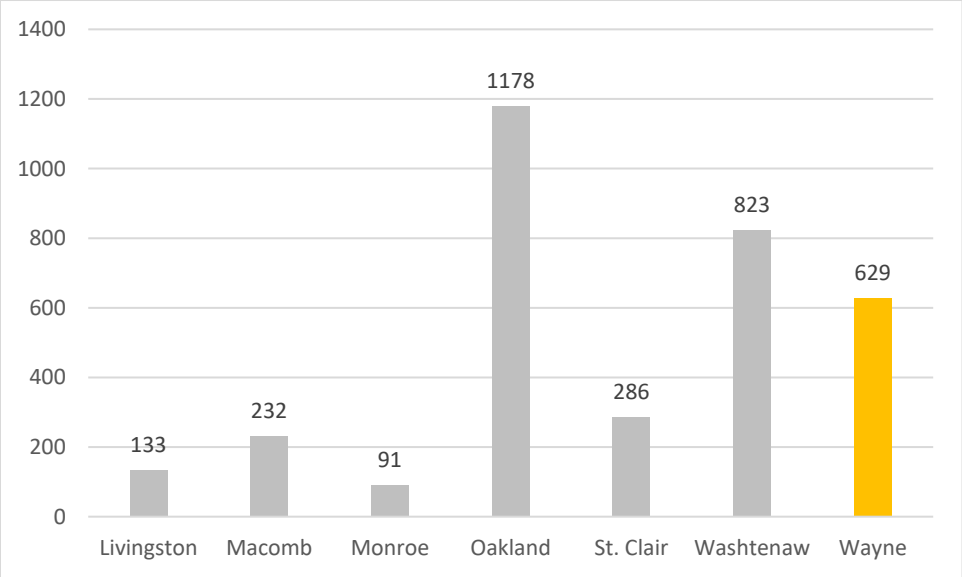


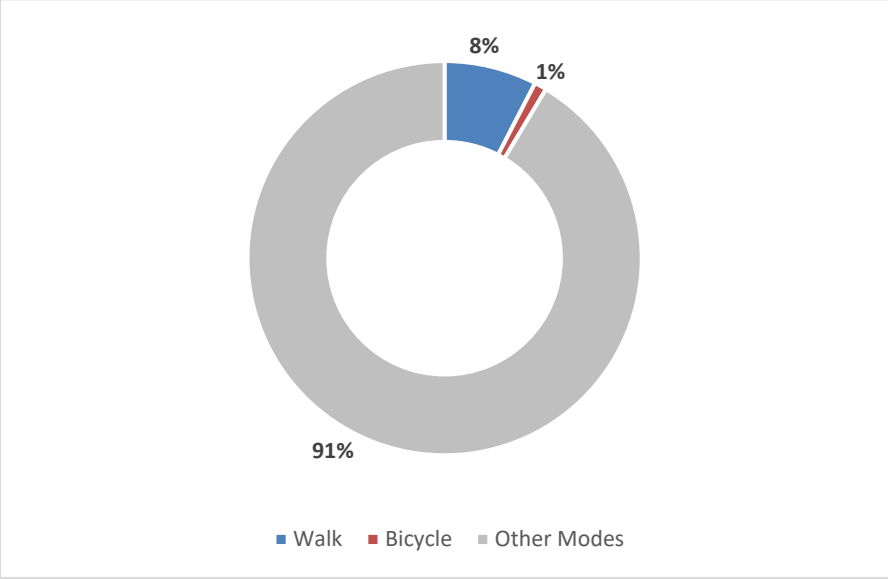
Figure 81
Wayne County Bicycle Network Mileage



Activity Level

Walking and bicycling currently accounts for nine percent of trips in Wayne County. The average travel time to work for residents age 16 and over who live in the county and work outside the home is 24 minutes. Additionally, 74 percent of workers who live in Wayne County are employed in the county, creating the potential for walking and bicycling as a commute option for many workers.

Figure 82
Wayne County Trips by Mode



Crash Data

There were 5,635 pedestrian and bicycle crashes in Wayne County from 2014-2018; 258 people were killed in crashes involving a pedestrian, and 18 people were killed in crashes involving a bicycle. There were 690 serious injuries from bicycle and/or pedestrian crashes in the county during the same period. Wayne County had 52 percent of the region's pedestrian and bicycle crashes.

Even though pedestrian and bicycle crashes account for only two percent of total crashes in Wayne County, they account for more than 31 percent of fatalities and 15 percent serious injuries. Excluding crashes where the road jurisdiction is not known, the largest share of bicycle and pedestrian crashes in Wayne County, take place on the local roads (43%).

Figure 83
Wayne County Fatalities, 2014-2018

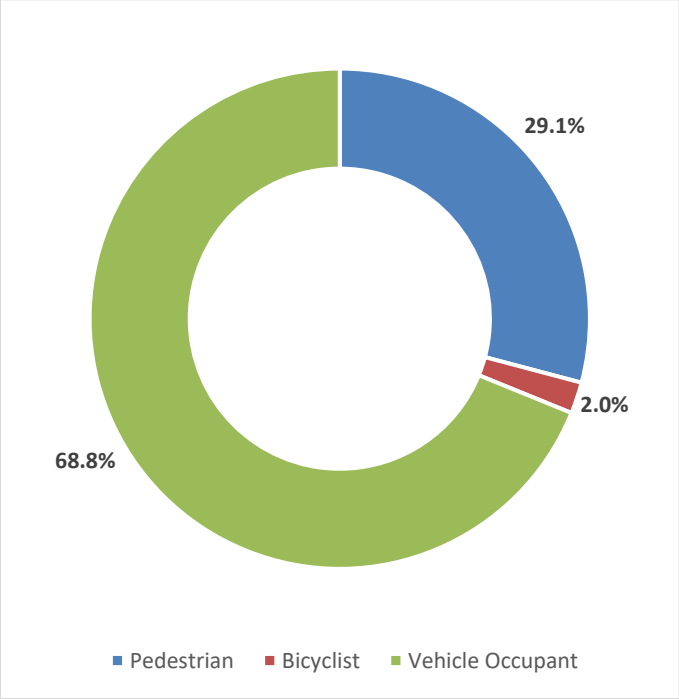


Figure 84
Wayne County Serious Injuries by Mode, 2014-2018

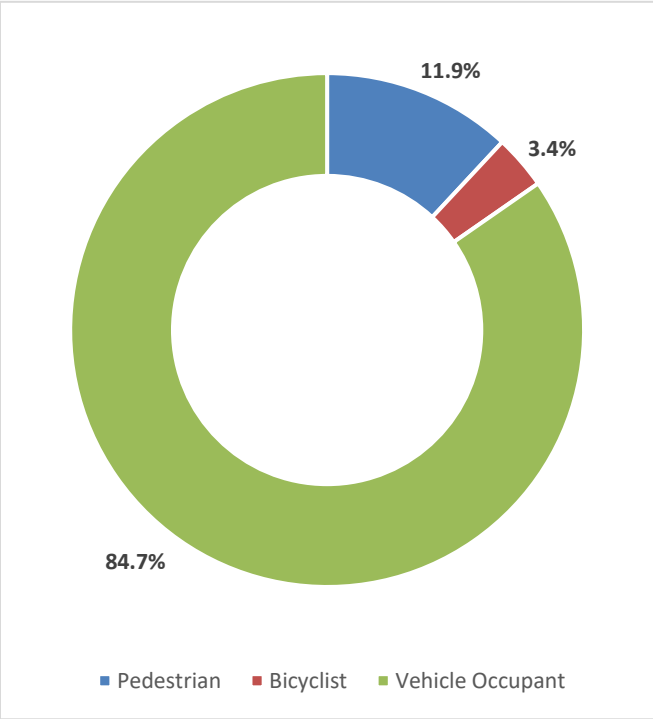


Figure 85
Wayne County Pedestrian and Bicycle Crashes by Road Jurisdiction, 2014-2018

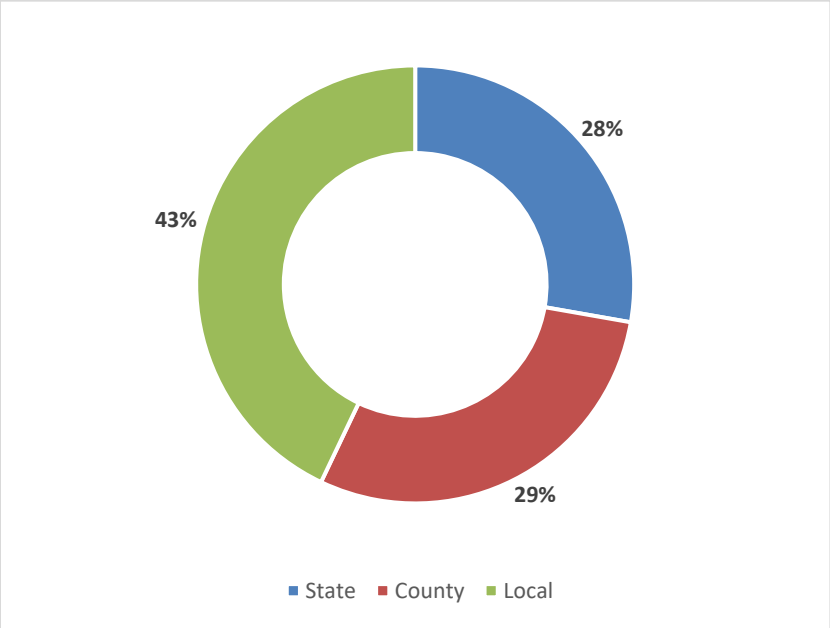


Figure 86
Wayne County Bicycle Infrastructure & Bikeways

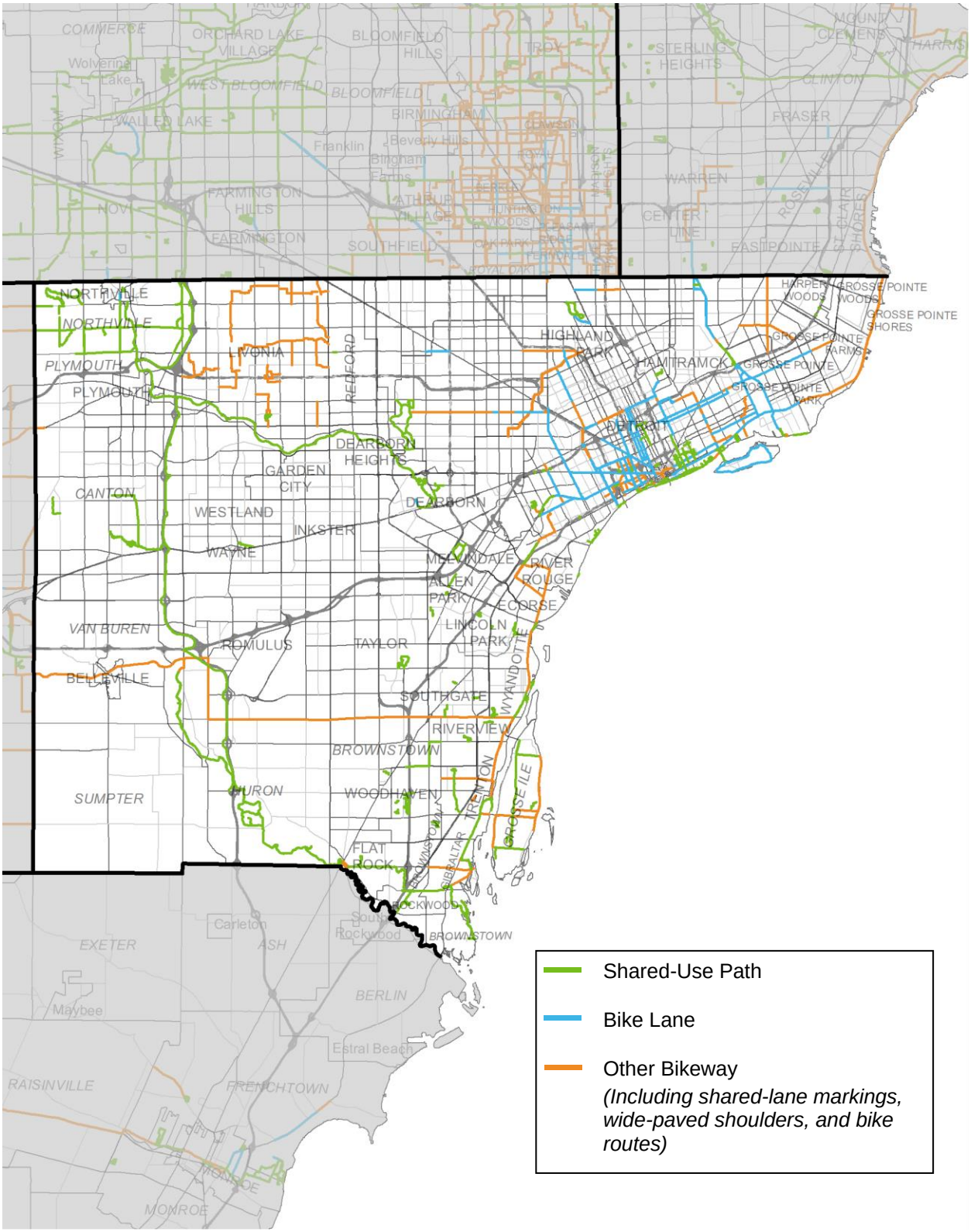


Figure 87
Wayne County Pedestrian Infrastructure

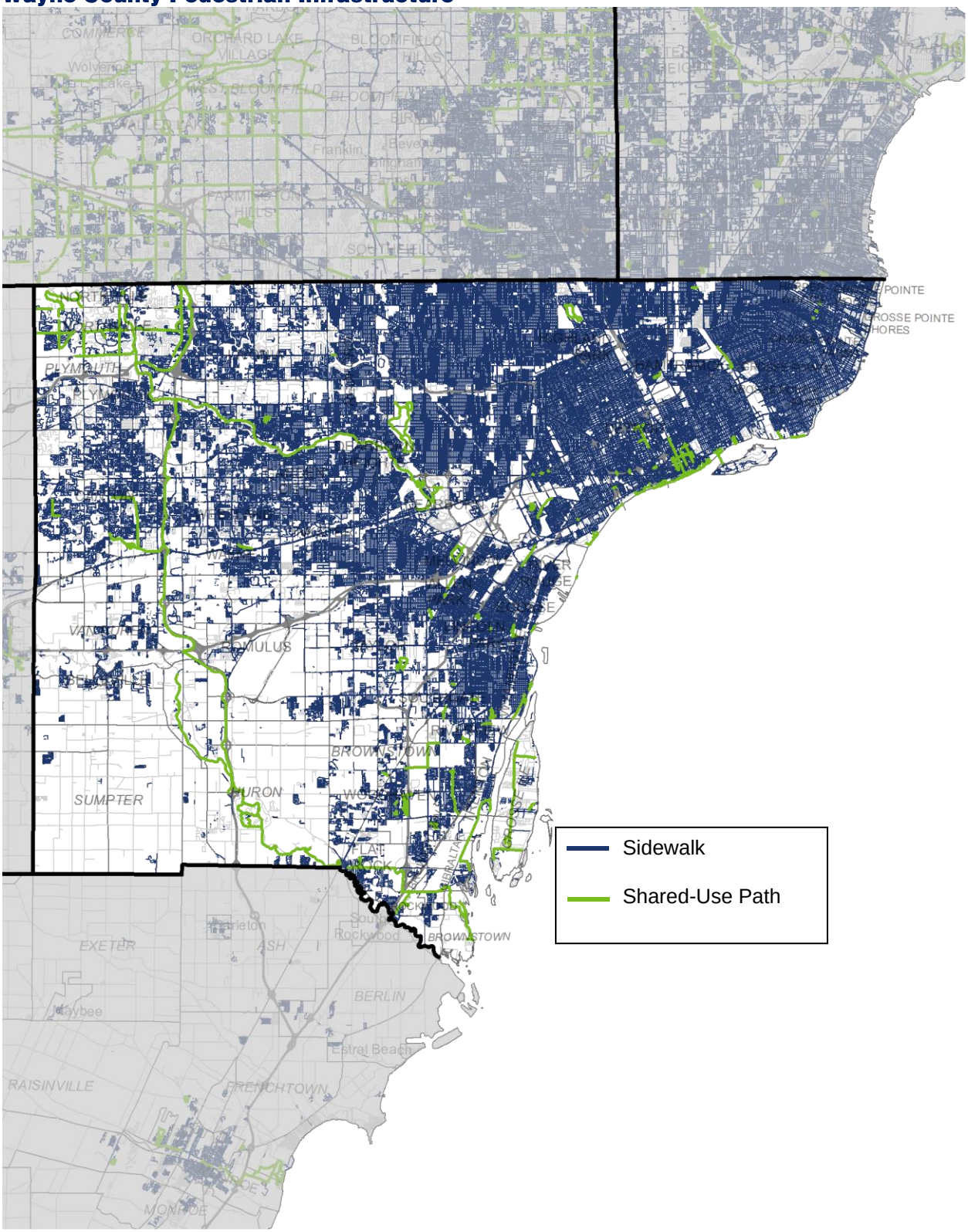


Figure 88
Wayne County Bicycle and Pedestrian Demand Areas

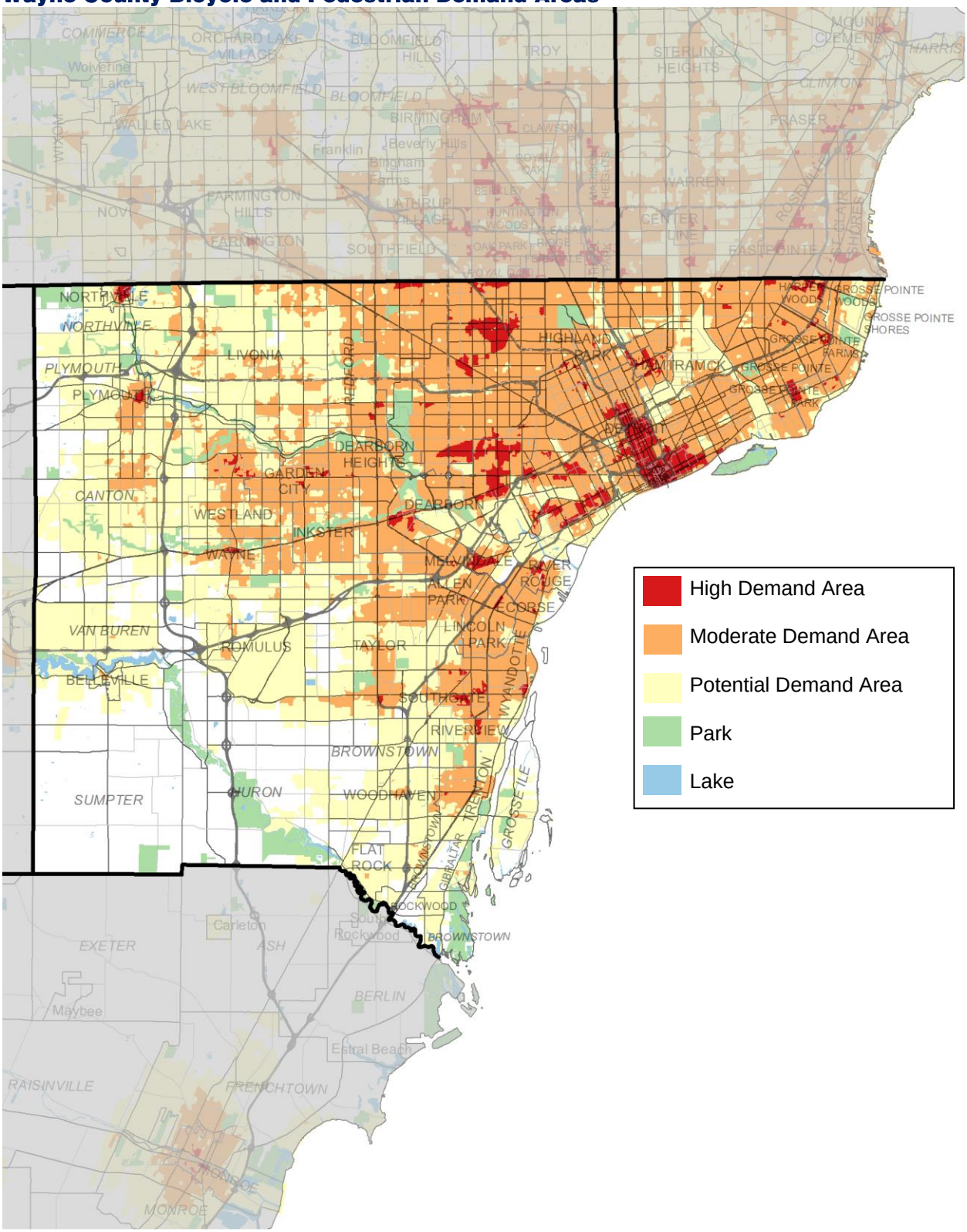


Figure 89

Wayne County Gaps in Pedestrian Infrastructure Access by Demand Area

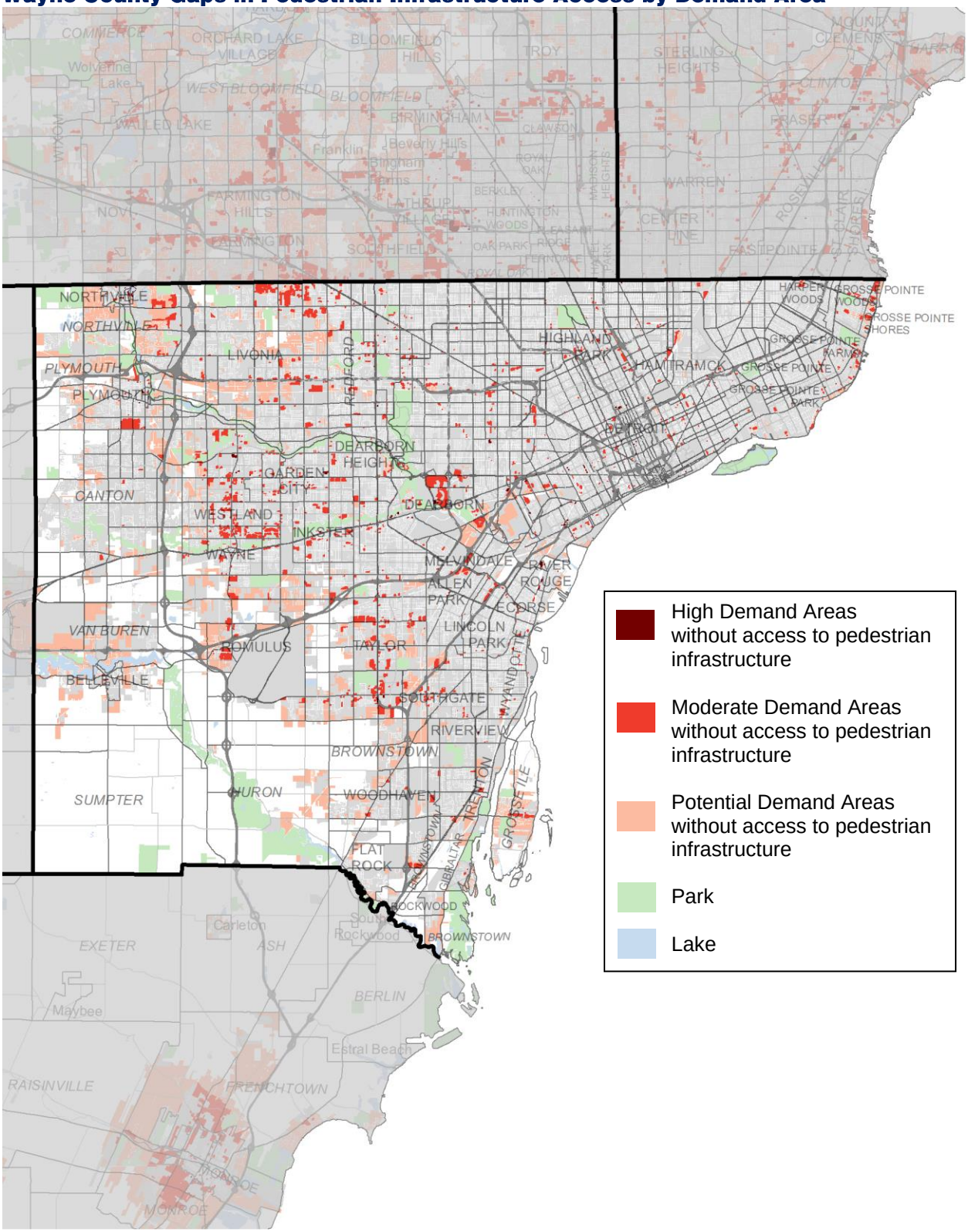


Figure 90

Wayne County Gaps in Bicycle Infrastructure Access by Demand Area

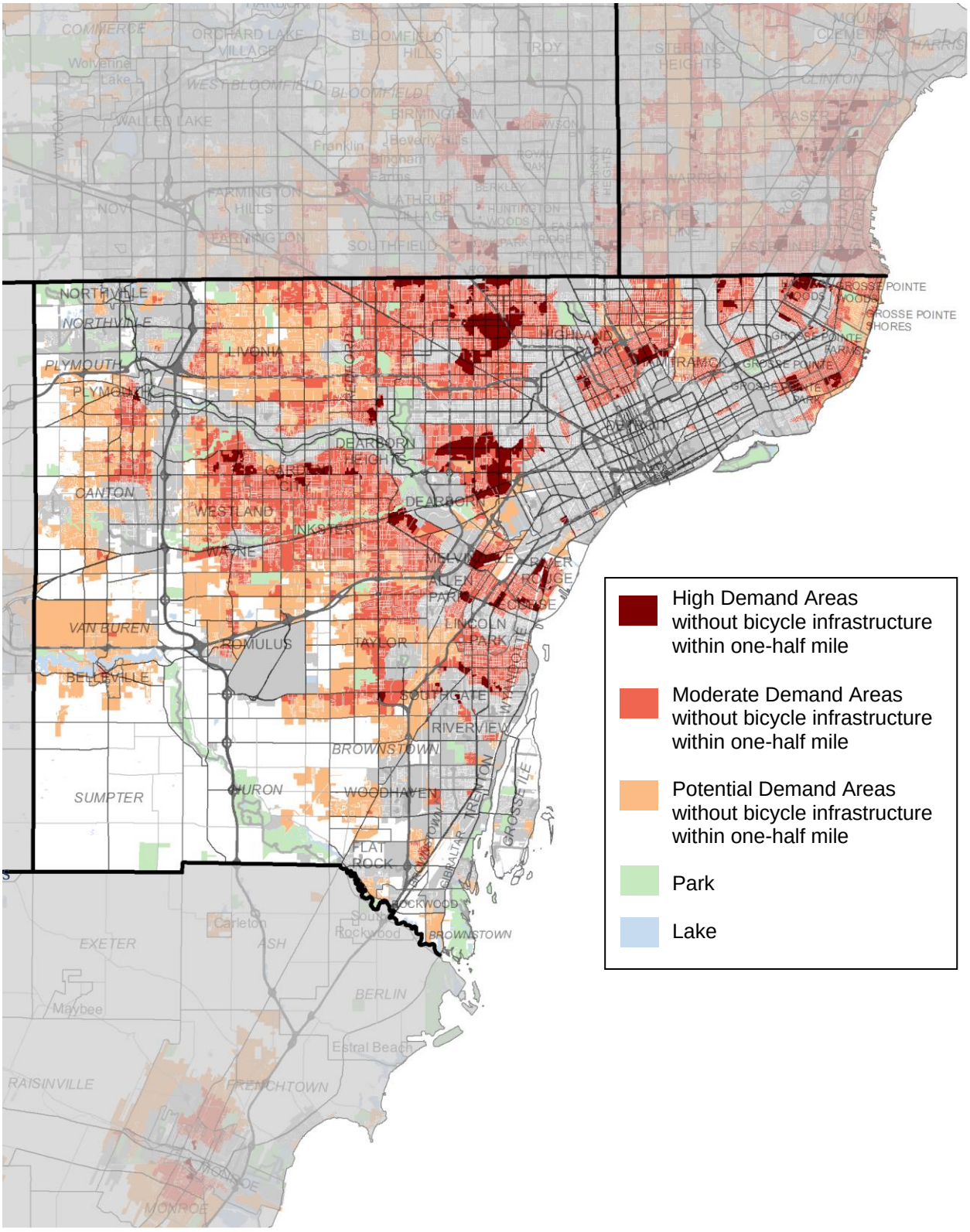
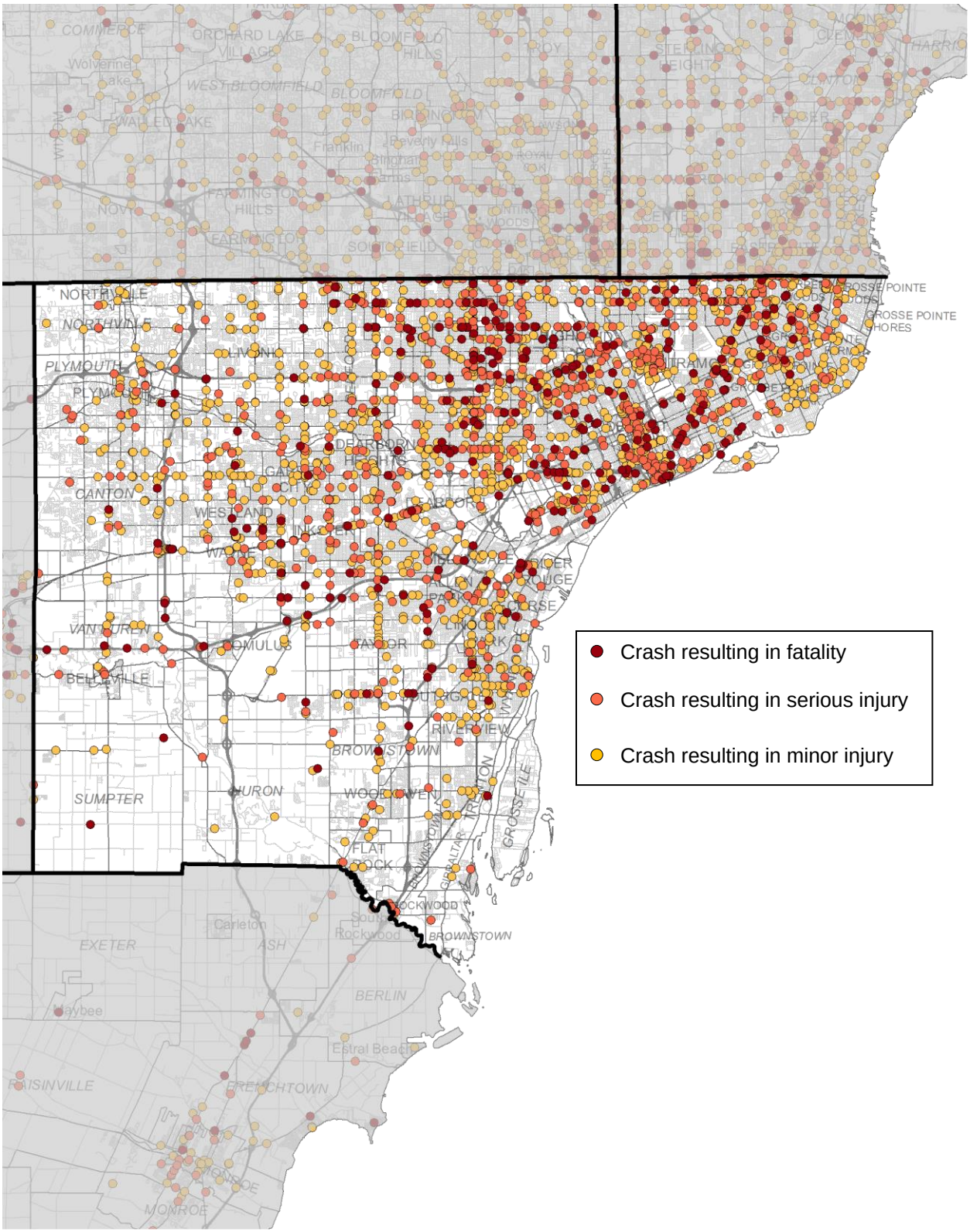


Figure 91
Wayne County Bicycle and Pedestrian Crashes, 2014-2018



Appendix B — Regional Bicycle and Pedestrian Corridors

The Bicycle and Pedestrian Mobility Plan identifies 26 Regional Corridors that serve as the main mobility connections and include a range of existing and planned infrastructure types, reflecting components of the regional trail network, state and national bike routes, demand centers and equity emphasis areas, along with other aspects of the system. They are intended to be used to facilitate cross-jurisdictional collaboration toward a common vision for bicycle and pedestrian mobility in Southeast Michigan.

Figure 92 provides a regional map of the corridors that corresponds with each of the identified 26 Regional Corridors. The naming for each corridor is to provide a general guide to where the corridor approximately begins and ends, and in some cases extends beyond the community named. The descriptions provided for each Regional Corridor are primarily to familiarize the reader with the corridor and the general communities, roadways, trails, parks, and amenities it connects.

1. Fowlerville to Detroit Corridor

- Connects demand areas in Fowlerville, Howell, Brighton, Lyon Township, Novi, Farmington, and Detroit
- Primarily follows the Grand River Avenue corridor where there are existing and planned sidewalks, shared-use paths, rural wide-paved shoulders and shared lane markings
- Corridor coordinates with MDOT University Region to link Southeast Michigan to Ingham County communities, including Lansing

2. Huron Waterloo Pathway Loop Corridor

- Connects demand areas in Chelsea, Dexter, and Pinckney to Stockbridge in Ingham County
- Utilizes the Mike Levine Lakelands State Park Trail between Pinckney and Stockbridge
- Utilizes existing and planned shared use paths between Chelsea and Waterloo Recreation Area, Chelsea and Dexter, and Dexter to Hudson Mills Metropark
- Part of Washtenaw County's Border-to-Border Trail, Michigan's Iron Belle Trail, and the Great Lake to Lake Trail, Route 1

3. Pinckney to St Clair Shores Corridor

- Connects demand areas in Pinckney, South Lyon, Novi, Farmington, Southfield, Oak Park, Ferndale, Hazel Park, Warren, Eastpointe, and St Clair Shores
- Utilizes the Mike Levine Lakelands Trail State Park between Pinckney and Green Oak Township
- Primarily aligns with existing infrastructure and high demand areas along 10 Mile and 9 Mile Roads
- Nine Mile Road has the highest utilized east-west SMART bus route connecting pedestrians and bicyclists in Macomb and Oakland Counties

4. Chelsea to Manchester Corridor

- Connects the demand areas of Chelsea and Manchester
- Primarily follows the M-52 corridor and Washtenaw County Bike Route
- Corridor coordinates with MDOT University Region to link Southeast Michigan to Jackson County and the cities of Jackson and Napoleon to the west, and Lenawee County and the cities of Tecumseh and Adrian to the south

5. Dexter to Wyandotte Corridor

- Connects demand areas in Dexter, Ann Arbor, Ypsilanti, Belleville, Romulus, Taylor, Southgate, and Wyandotte
- Utilizes Washtenaw County's Border to Border Trail, the Iron Belle Trail, the I-275 Metro Trail, and Underground Railroad Bicycle Route and primarily follows the Eureka Road corridor in Wayne County

6. Brighton to Saline Corridor

- Connects demand areas in Brighton, Green Oak Township, Ann Arbor, Pittsfield Township, and Saline
- Utilizes existing pathways and routes along the Whitmore Lake Road and Lohr Road corridors, as well as existing pedestrian and bicycle infrastructure in Ann Arbor and Saline
- Part of the Underground Railroad Bicycle Route
- Corridor coordinates with MDOT University Region to link Southeast Michigan to Lenawee County and the communities of Tecumseh, Adrian and Blissfield

7. Ann Arbor to Detroit Corridor

- Connects demand areas in Ann Arbor, Plymouth, Westland, Garden City, Dearborn Heights, Dearborn, and Detroit
- Utilizes the Hines Park Bikeway, and existing pedestrian and bicycle infrastructure, including shared-use paths and routes along the Plymouth Road corridor, and sidewalks and protected bike lanes along Michigan Avenue in Detroit
- Connects to the Gordie Howe Bridge, which when complete links Southeast Michigan to Canada's 14,864 mile "The Great Trail"

8. Saline to River Rouge Corridor

- Connects demand areas in Saline, Pittsfield Township, Ypsilanti, Wayne, Inkster, Dearborn, Detroit, and River Rouge
- Primarily follows the Michigan Avenue and Outer Drive corridors that have significant pedestrian infrastructure, but limited bicycle infrastructure
- Michigan Avenue has some of the highest bus ridership within the region and is a planned rapid transit and commuter rail corridor.
- Trail Planning efforts are in place to link communities and parks within the Lower Rouge Corridor

9. Ann Arbor to Whiteford Corridor

- Connects demand area in Ann Arbor, Pittsfield Township, Milan, Dundee, and Petersburg
- Primarily follows along Platt Road, Sylvania-St Petersburg Road and Memorial Highway corridors
- Corridor coordinates with TMACOG and Ohio DOT to link Southeast Michigan to Northern Ohio communities including Sylvania and Toledo, and with MDOT University Region linking to Lenawee County to the west
- Part of the Underground Railroad bicycle route

10. Dundee to Monroe Corridor

- Connects demand areas in the cities of Dundee and Monroe
- Utilizes existing bicycle and pedestrian infrastructure in Dundee and the River Raisin Heritage Trail in Monroe
- Primarily follows routes and wide paved shoulders along Custer Road and M-50, and connects to River Raisin National Battlefield Park and Sterling State Park
- Corridor coordinates with MDOT University Region to link Southeast Michigan to Lenawee County and the City of Tecumseh

11. Bedford to Detroit Corridor

- Connects demand areas in Bedford Township, Monroe Township, Monroe, Frenchtown Township, Gibraltar, Trenton, Riverview, Wyandotte, Ecorse, River Rouge, and Detroit
- Utilizes existing bicycle and pedestrian infrastructure in Bedford Township, following the Telegraph Road and Dixie Highway corridor through Monroe, and pathways and routes along Dixie Highway, Biddle Avenue, and Jefferson Avenue
- Provides connection to Lake Erie Metropark, Detroit River International Wildlife Refuge, Elizabeth Park, Historic Fort Wayne, the Detroit RiverWalk, and to pedestrian connections to Grosse Ile Township
- Corridor coordinates with Ohio DOT plans to become the preferred route for proposed US Bike Route 20, connecting Southeast Michigan to major Ohio cities including Toledo

12. Holly to Brighton Corridor

- Connects demand areas in Holly, Highland Township, Milford, and Brighton
- Utilizes the Milford Trail and connects to and through Kensington Metropark, Highland State Recreation Area, and Island Lake State Recreation Area
- Primarily follows the Milford Road and E. Grand River Avenue corridors

13. Clarkston to Detroit Corridor

- Connects demand areas in Clarkston, Waterford Township, Pontiac, Bloomfield Hills, Birmingham, Royal Oak, Huntington Woods, Pleasant Ridge, Ferndale, Detroit, and Highland Park
- Primarily follows the Dixie Highway and Woodward Avenue corridors

- Utilizes existing pedestrian and bicycle infrastructure throughout the corridor, with gaps primarily in Bloomfield Hills and north of Clarkston
- Woodward Avenue is one of the most used bus corridors within the region and is a planned RTA Rapid Transit Corridor
- Northern section should align with ongoing Iron Belle Trail planning efforts

14. South Lyon to St Clair Corridor

- Connects demand areas in South Lyon, Wixom, Walled Lake, West Bloomfield, Pontiac, Rochester Hills, Rochester, Romeo, Armada, Richmond, and St Clair
- Utilizes several regional trails including the Huron Valley Trail, Michigan Airline Trail, West Bloomfield Trail, Clinton River Trail, Macomb Orchard Trail, and Bridge to Bay Trail
- Is part of the Great to Lake Trail, and follows the proposed connection along Fred Moore Highway between Richmond and St Clair

15. Pontiac to Brownstown Corridor

- Connects demand areas in Pontiac, Bloomfield Township, Southfield, Redford Township, Detroit, Dearborn Heights, Dearborn, Taylor, and Brownstown Township
- Primarily follows the Telegraph Avenue corridor - a significant cross-town SMART bus route
- Connects to and through Hines Park Bikeway and Rouge Park Trails

16. Walled Lake to Lake Erie Metropark Corridor

- Connects demand areas in Walled Lake, Novi, Northville, Plymouth, Canton Township, Van Buren Township, and Flat Rock
- Utilizes the M-5 Metro Trail, Meadowbrook Pathways, I-275 Metro Trail and Downriver Linked Greenways, including trails through Lower Huron, Willow, and Oakwoods Metroparks, and the HCMA East-West Connector
- Connects to Lake Erie Metropark and is part of the Iron Belle Trail

17. Joe Louis Greenway Corridor

- Connects demand areas in Detroit, Highland Park, Hamtramck, and Dearborn
- Utilizes existing and planned bicycle and pedestrian infrastructure, including the Dequindre Cut, Detroit RiverWalk, and the former Conrail Rail Corridor
- Part of the Iron Belle Trail

18. Ferndale to River Rouge Corridor

- Connects demand areas in Ferndale, Detroit, and River Rouge
- Utilizes existing and planned bicycle and pedestrian infrastructure along the Livernois Avenue and Fort Street corridors

19. Leonard to Detroit Corridor

- Connects demand areas in Oxford, Lake Orion, Orion Township, Rochester, Rochester Hills, Shelby Township, Utica, Sterling Heights, Warren, Center Line, and Detroit

- Utilizes several regional trails including the Polly Ann Trail, Paint Creek Trail, Rochester Riverwalk, River Bends Park trails, and the Clinton River Park Trail
- Part of the Iron Belle Trail
- Corridor coordinates with MDOT Bay Region plan to connect Southeast Michigan with Lenawee County, including the communities of Dryden and Lapeer

20. Birmingham to Lake St. Clair Metropark Corridor

- Connects demand areas in Birmingham, Troy, Sterling Heights, Fraser, Clinton Township, and Harrison Township
- Utilizes the Freedom Trail and its connection to Lake St Clair Metropark
- Primarily follows the Big Beaver/16 Mile/Metropolitan Parkway corridor, connecting to several commercial, residential, and employment centers

21. Rochester to Marine City Corridor

- Connects demand areas in Rochester, Shelby Township, Macomb Township, Chesterfield Township, New Baltimore, and Marine City
- Primarily follows the 23 Mile Corridor through Macomb County and portions of the Underground Railroad Bicycle Route and Bridge to Bay Trail in St Clair County

22. Detroit to Port Huron Corridor

- Connects demand areas in Detroit, Eastpointe, Roseville, Clinton Township, Mount Clemens, Chesterfield Township, New Haven, Richmond, Marysville, and Port Huron
- Primarily follows the Gratiot Avenue corridor, which is a heavily utilized SMART FAST transit route and an RTA proposed rapid transit corridor.

23. Capac to Port Huron Corridor

- Connects demand areas in Capac, Port Huron Township, and Port Huron
- Utilizes US Bike Route 20 along Brandon Road and Lapeer Road, and the southern portions of the Wadhams to Avoca Trail

24. Yale to Port Huron Corridor

- Connects demand areas in Yale, Port Huron Township, and Port Huron
- Utilizes the Wadhams to Avoca Trail and existing and planned bicycle and pedestrian infrastructure in Yale, Port Huron Township and Port Huron
- Corridor coordinates with MDOT Bay Region plan to connect Southeast Michigan with Sanilac and Lapeer Counties

25. Yale to New Baltimore Corridor

- Connects demand areas in Yale, Memphis, Richmond, and New Baltimore
- Primarily follows the M-19 corridor utilizing existing and planned infrastructure in Yale, Memphis, Richmond, and New Baltimore
- Includes signed US Bike Route 20, which stretches across the entire state to Ludington

- Both Macomb County and St Clair County plan for enhanced infrastructure along County Line Road

26. Fort Gratiot to Detroit Corridor

- Connects demand areas in Fort Gratiot Township, Port Huron, Marysville, St Clair, Marine City, Algonac, New Baltimore, Harrison Township, St Clair Shores, Grosse Pointe communities, and Detroit
- Primarily follows the Jefferson Avenue corridor, utilizing the Bridge to Bay Trail in St Clair County
- Corridor coordinates with MDOT Bay Region plan to connect Southeast Michigan with Sanilac Communities, including Lexington and Port Sanilac

Figure 92
Regional Bicycle and Pedestrian Corridors

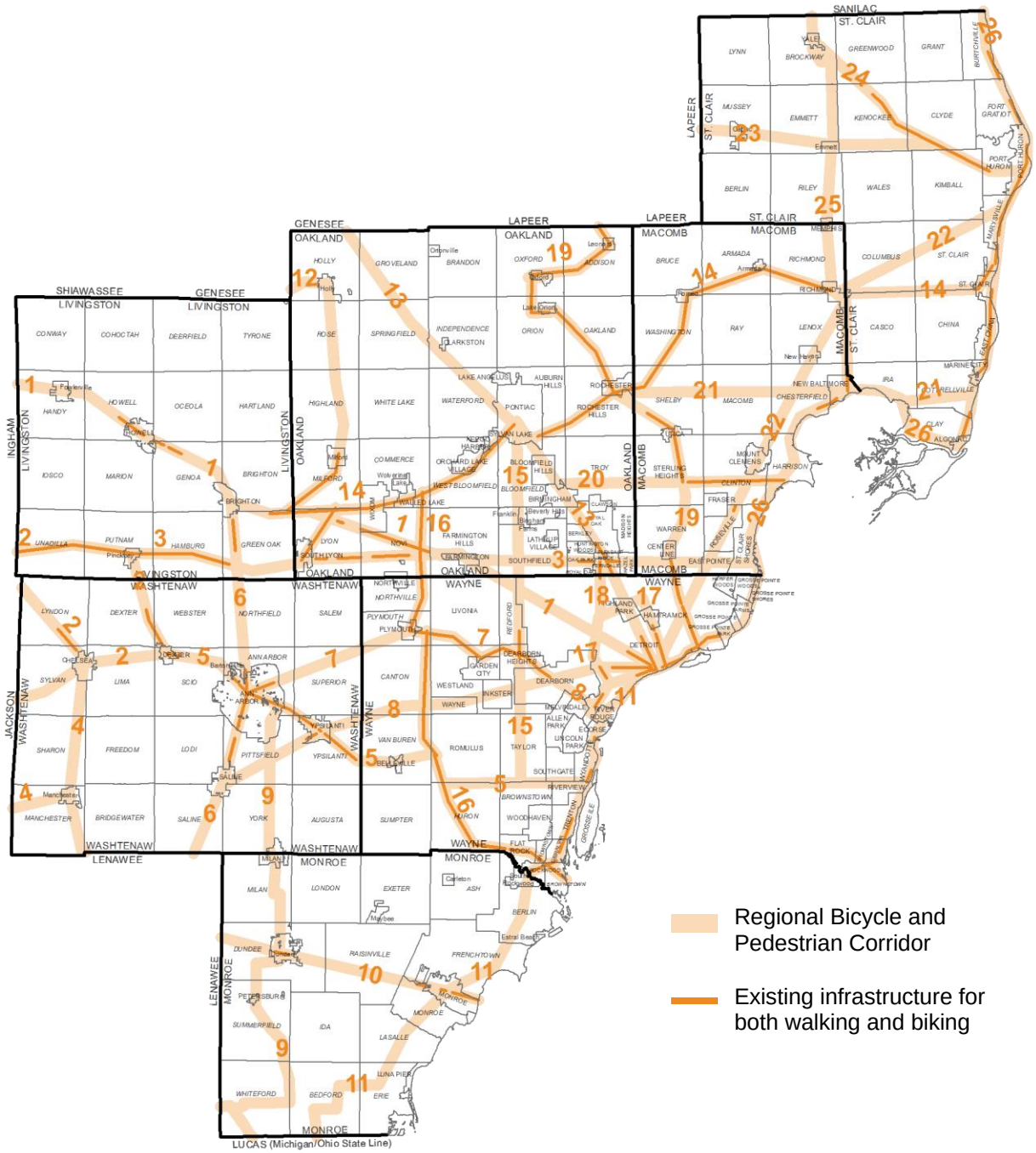


Table 8
Regional Bicycle and Pedestrian Corridors by County

	Livingston County	Macomb County	Monroe County	Oakland County	St. Clair County	Washtenaw County	Wayne County
1 Fowlerville to Detroit	■			■			■
2 Huron Waterloo Pathway Loop	■					■	
3 Pinckney to St. Clair Shores	■	■		■			
4 Chelsea to Manchester						■	
5 Dexter to Wyandotte						■	■
6 Brighton to Saline	■					■	
7 Ann Arbor to Detroit						■	■
8 Saline to River Rouge						■	■
9 Ann Arbor to Whiteford			■			■	
10 Dundee to Monroe			■				
11 Bedford to Detroit			■				■
12 Holly to Brighton	■			■			
13 Clarkston to Detroit				■			■
14 South Lyon to St. Clair		■		■	■		
15 Pontiac to Brownstown				■			■
16 Walled Lake to Lake Erie Metropark				■			■
17 Joe Louis Greenway							■
18 Ferndale to River Rouge				■			■
19 Leonard to Detroit		■		■			■
20 Birmingham to Lake St. Clair Metropark		■		■			
21 Rochester to Marine City		■		■	■		
22 Detroit to Port Huron		■			■		■
23 Capac to Port Huron					■		
24 Yale to Port Huron					■		
25 Yale to New Baltimore		■			■		
26 Fort Gratiot to Detroit		■			■		■

Appendix C — Bicycle and Pedestrian Public Survey Results

Introduction

Public engagement is one of the core elements in regional planning. SEMCOG is committed to providing opportunities for the public to be involved in developing and implementing its planning work. Public engagement results in development of better plans, and most importantly increases the likelihood of implementation.

In developing the Bicycle and Pedestrian Mobility Plan for Southeast Michigan, SEMCOG conducted an interactive public online survey to better understand people's preferences in walking and bicycling in the region, as well as to identify the opportunities, challenges, availability, and quality of infrastructure and facilities.

This interactive public online survey (total participation: 3,073) was conducted during May 2019. Its purpose was to educate and collect data on prevailing experiences and priorities for walking and bicycling in the region. The survey was available to all residents. It was extensively shared among the biking community. Although not part of a scientifically derived sample, the feedback provides an important perspective.

The Bicycle and Pedestrian Public Survey was promoted through several methods including:

- Social media – Including SEMCOG's Facebook, Twitter, Instagram, and LinkedIn.
- SEMCOG's website – www.semcog.org. It was also featured on the Metropolitan Affairs Coalition's website. MAC is SEMCOG's partner organization.
- *Regional Update* – SEMCOG's bi-weekly newsletter sent to regional stakeholders, leaders, local government staff, and the media.
- SEMCOG's internal and external meetings and presentations at the Bicycle and Pedestrian Task Force, SEMCOG Executive Committee, and General Assembly meetings.

Demographics

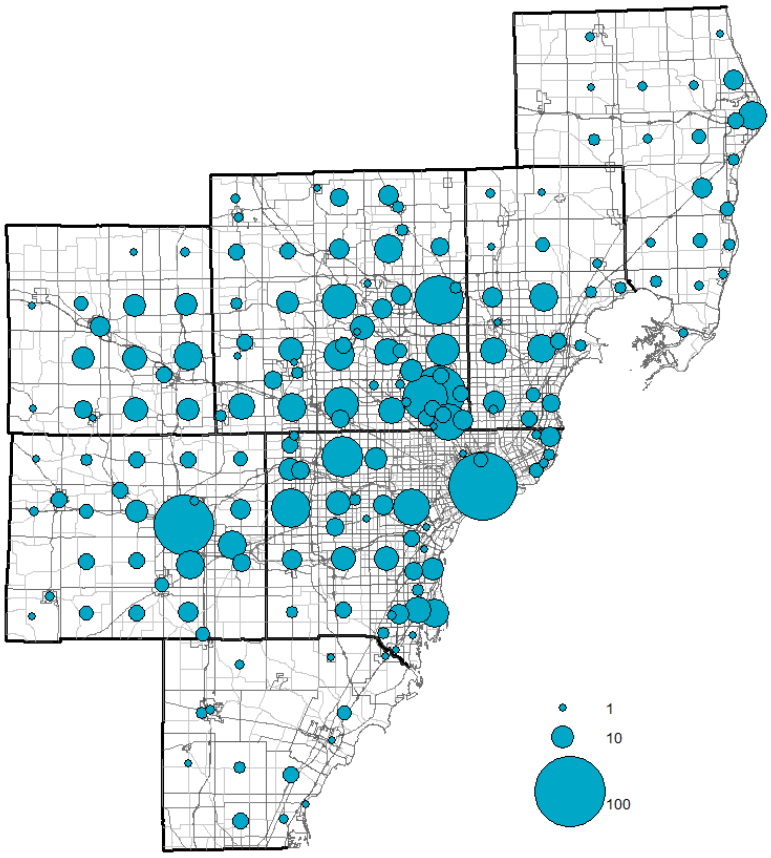
Participation in the survey occurred in all seven counties of Southeast Michigan, with the greatest participation in Oakland County, and the least in Monroe County. Additionally, three percent of all survey participants were from outside the region, with the greatest concentrations in the Toledo, Ohio area and Windsor, Canada. Table 9 displays survey participants by county.

Table 9
Participants by County

County	Percentage
Oakland	39%
Wayne	25%
Washtenaw	13%
Macomb	8%
Livingston	5%
St. Clair	5%
Monroe	2%
Out of Region	3%

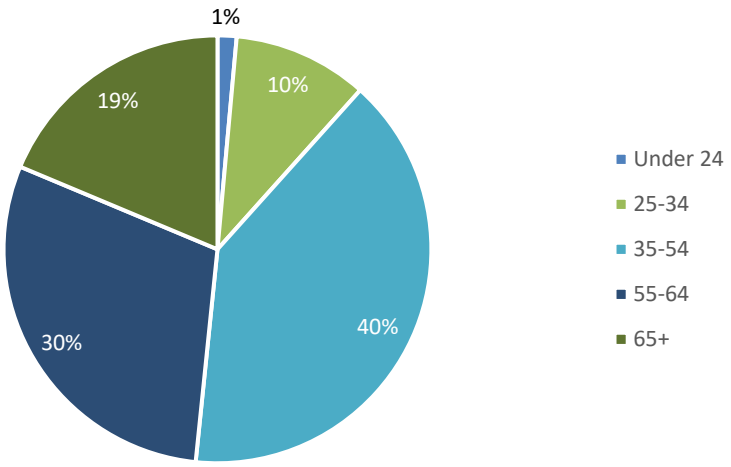
Figure 93 displays the home location of survey participants, by community. While nearly every community in the region had at least one participant, the greatest concentration of participants were from Southeast Oakland County, Detroit, and Ann Arbor.

Figure 93
Participants by Community



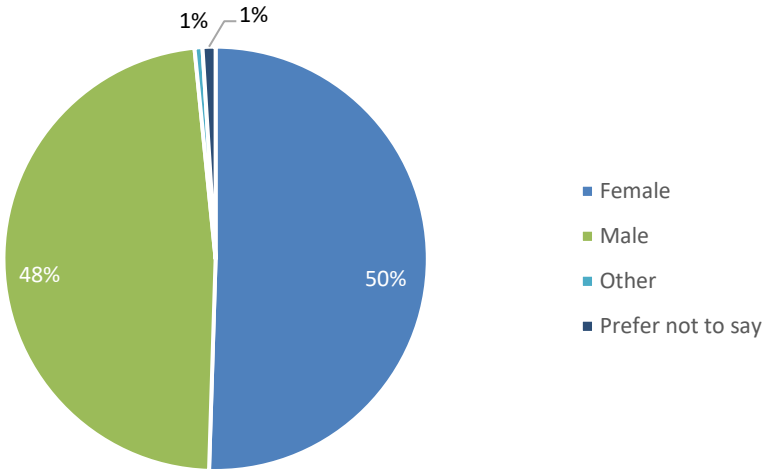
The majority of survey participants were age 35 and older. Those participants under age 35 represented 11 percent of all participants, while nearly half (49 percent) of participants were over age 55. Figure 94 illustrates the survey participants by age.

Figure 94
Participants by Age



The survey received a nearly equal participation rate of both female and male respondents. Figure 95 illustrates the survey participants by gender.

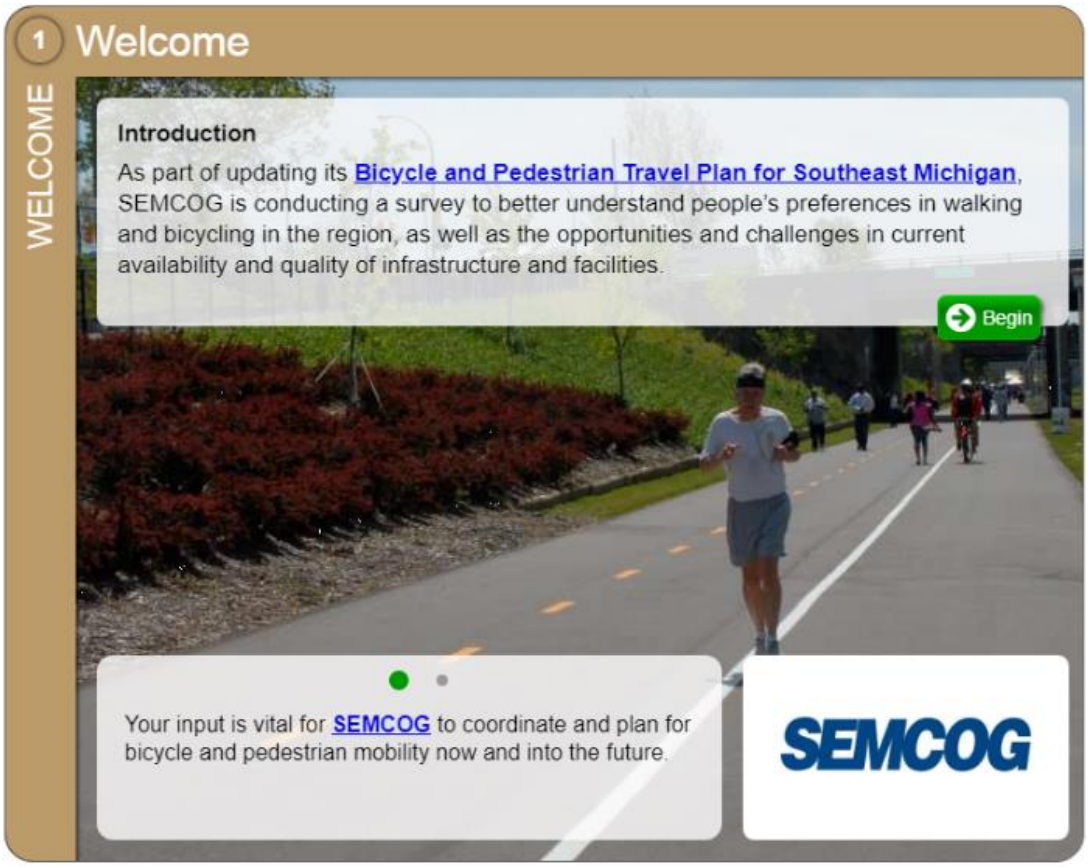
Figure 95
Participants by Gender



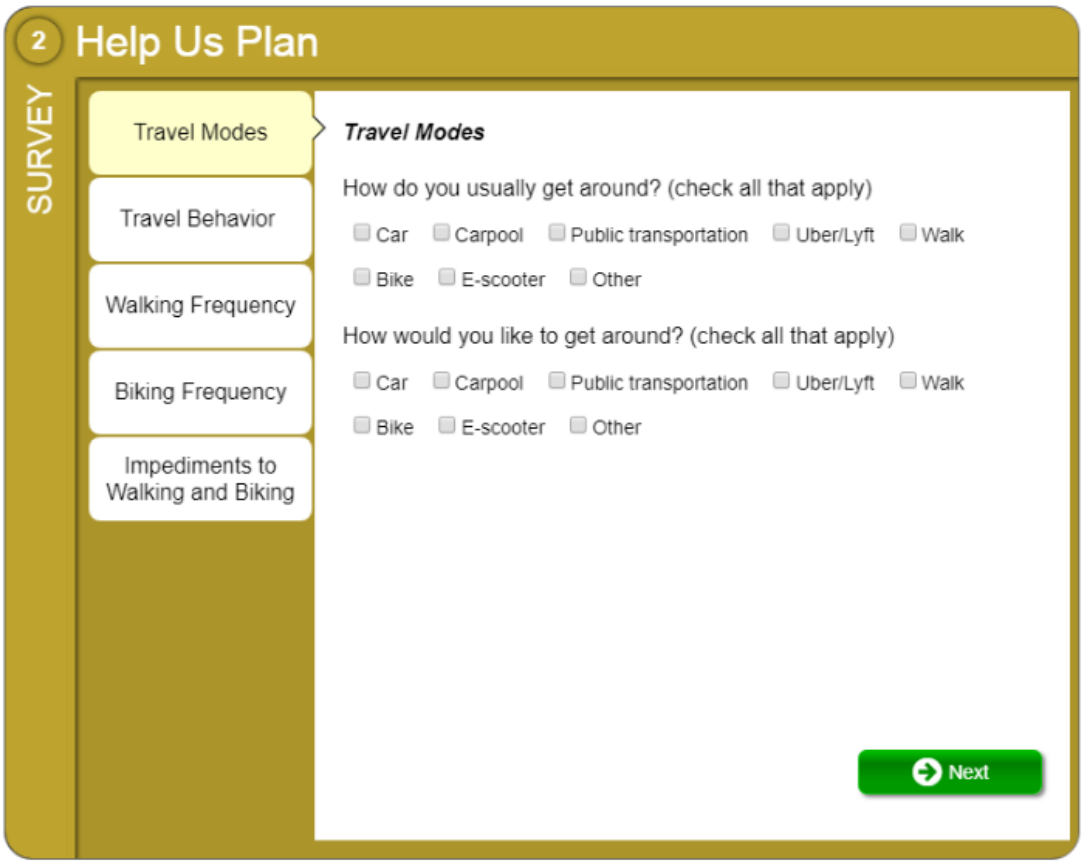
Methodology/Approach

This public survey featured the following five functions or “screens:”

1. **Welcome & Introduction** – Including how the survey results will be used and educational messages about the purpose of the survey.

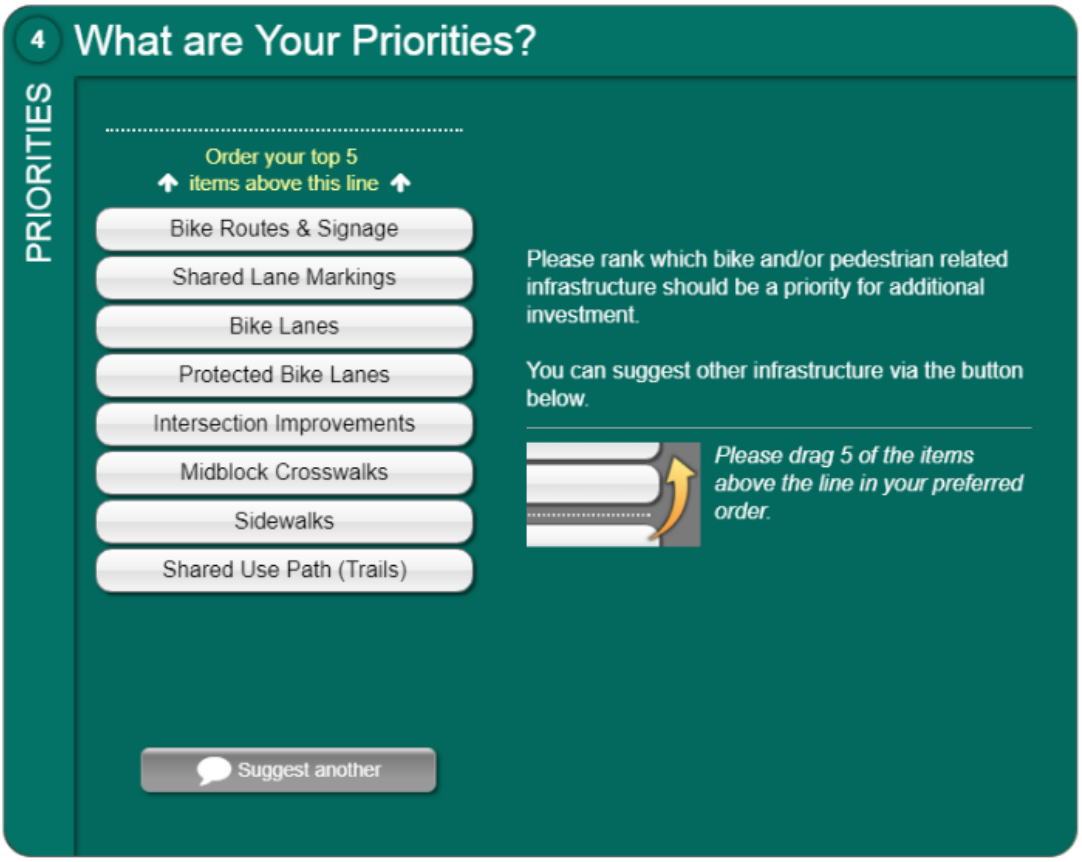


2. **Survey Questions: Help Us Plan** – This screen was divided into five topics: “Travel Modes,” “Travel Behavior,” “Walking Frequency,” “Biking Frequency,” and “Impediments to Walking and Biking.” For each topic, multiple questions were asked.

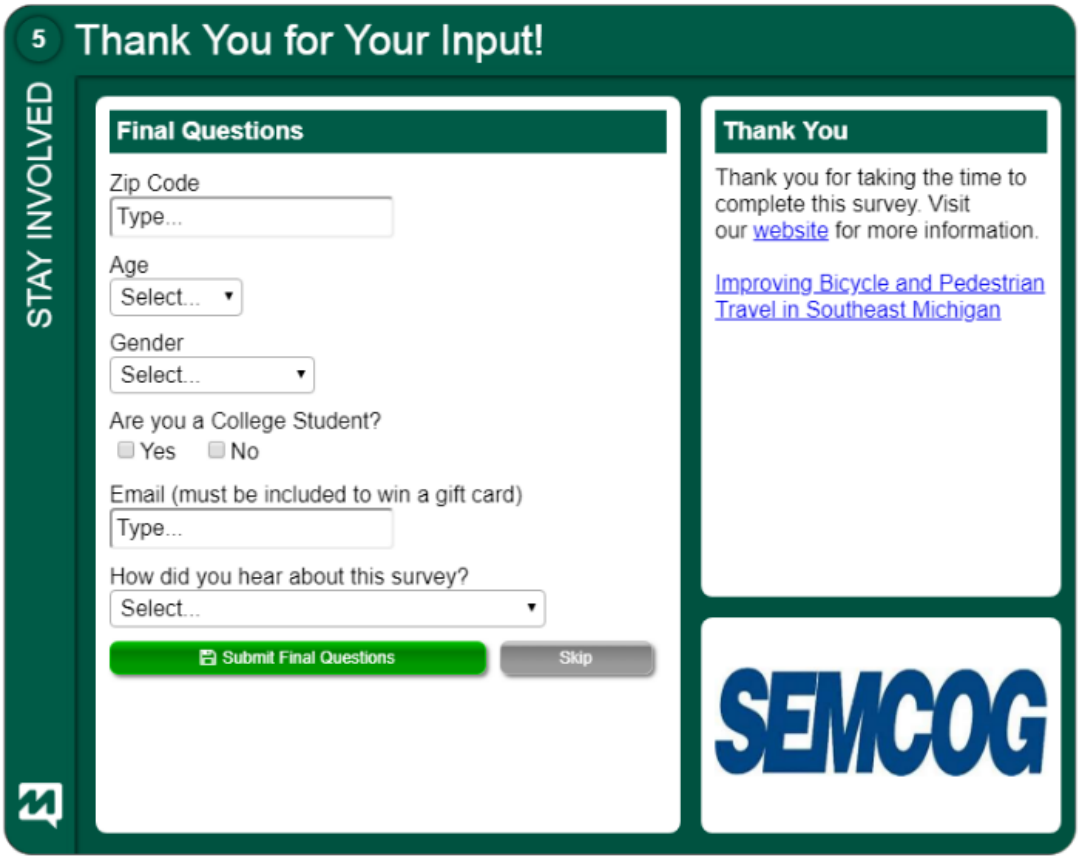


3. **Mapping**: **Where Do You Want to Walk/Bike** – Using a "map marker tool," the survey allowed participants to drag and drop markers to areas of interest or concern across the region, as well as providing space to add comments for each marker. This interactive map included a set of optional map markers: "Home," "School/Work," "Shop/Dine/Fun," "Park/Recreation," "Transit/Other," and "Impediment."

4. **Priorities** – Using the "priority ranking tool," the survey allowed participants to rank their top five priorities for bike- and/or pedestrian-related infrastructure investment.



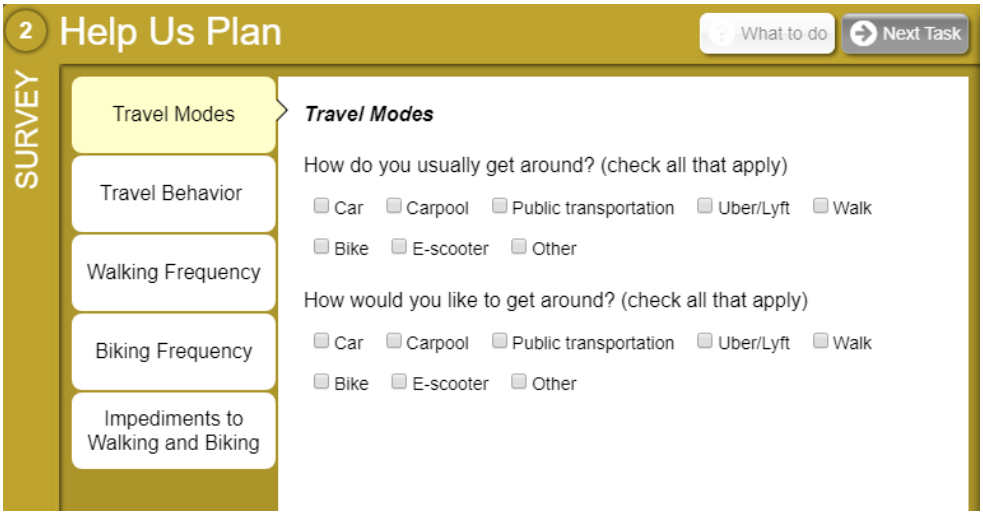
5. **Wrap up: Stay Involved** – The final screen collected participants' demographic information and encouraged them to stay involved in development of the Bicycle and Pedestrian Mobility Plan for Southeast Michigan.



Findings

The first survey questions were under the **Help Us Plan** screen. These questions focused on providing a greater understanding of survey participants' travel mode preferences, travel behavior, walking and biking frequency, and the impediments they encounter when walking and/or biking.

Travel Modes



These were the major findings for survey participants' preferences to travel by mode:

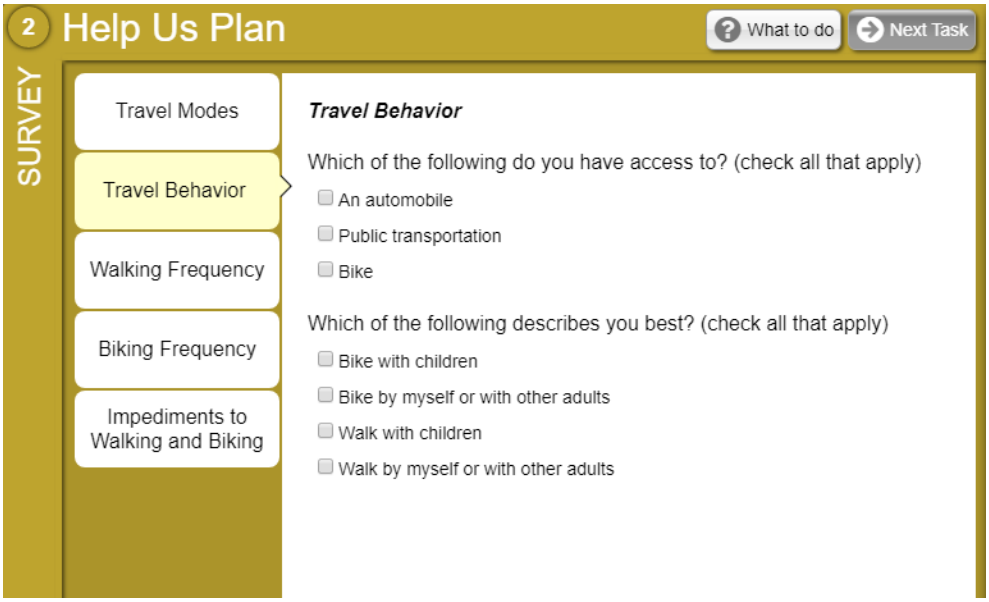
How do you typically get around (for this question participants were allowed to choose more than one option)?

- 96 percent usually get around by car.
- 46 percent rely on walking and biking to get around, typically in conjunction with other modes.
- Eight percent usually get around by public transportation. However, none indicated they rely on public transportation as the *only* mode they use to get around.

How would you like to get around (for this question participants were allowed to choose more than one option)?

- While 96 percent of people typically drive, approximately one-third of respondents would prefer to use other modes more often.
- While just under half of the respondents said they typically walk or bike, nearly two-thirds would like to walk more, and three-quarters would like to bike more.
- More than any other mode, people said they would prefer to use public transportation more often, with more than five times the amount of current users saying they would like to use it.
- There is a small but growing interest in e-scooters, with less than one-and-a-half percent of people having used them, but seven percent saying they would like to do so.

Travel Behavior



These were the major findings for survey participants' travel behavior:

Which transportation mode (car, bike, and/or public transportation) do you have access to (for this question participants were allowed to choose more than one option)?

- 10 percent indicated they only have access to a car, while less than one percent only had access to either a bike or public transportation.
- About one-third of participants indicated they have access to all three modes – car, bike, and public transportation.
- The majority of those who participated in the survey indicated that they have access to both a car and bike.

What describes your travel behavior best (for this question participants were allowed to choose more than one option)?

- More than half indicated that they bike and walk by themselves or with other adults.
- Walking and biking with children were among the least selected option/s.

Walking Frequency

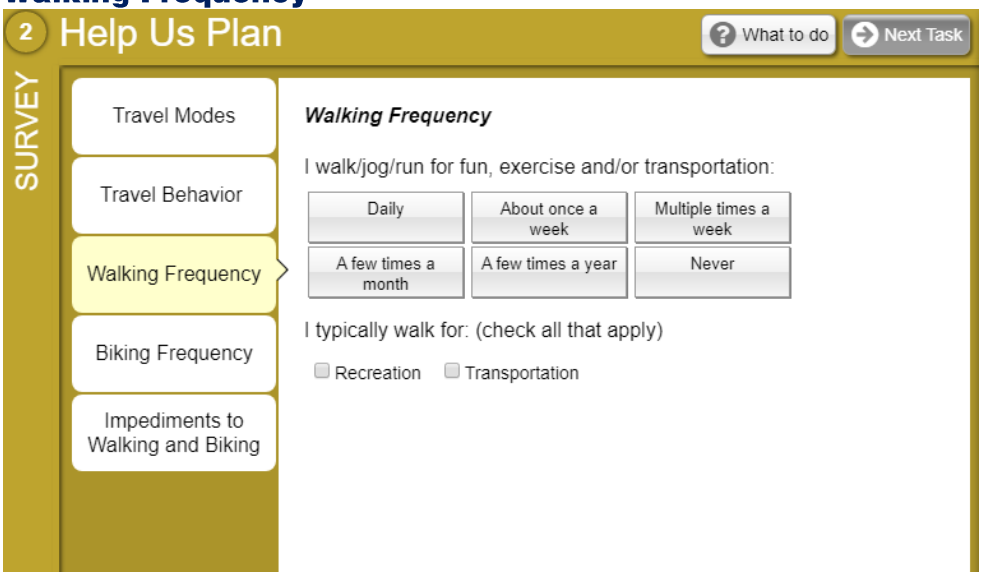


Figure 96 provides the results of survey participants' walking frequency, divided by **most often** (daily, multiple times a week, or about once a week), **least often** (a few times a month or a few times a year), and **never**.

The major finding is that:

- Eight in 10 participants walk on a weekly basis, with about one-third indicating that they walk/jog/run on daily basis.

Figure 96
Walking Frequency

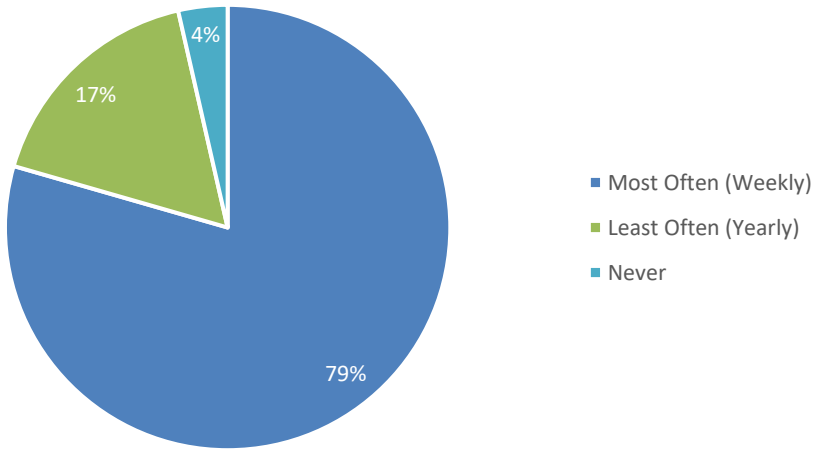
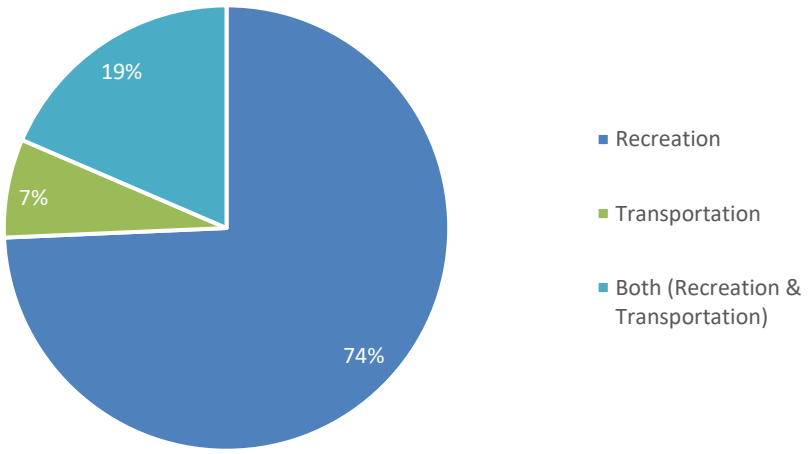


Figure 97 provides the results of survey participant's purpose (transportation and/or recreation) for making walking trips.

The major finding is that:

- Nine in 10 participants typically walk for recreational purposes, with up to 26 percent of trips also serving as transportation.

Figure 97
Walking Purpose



Biking Frequency

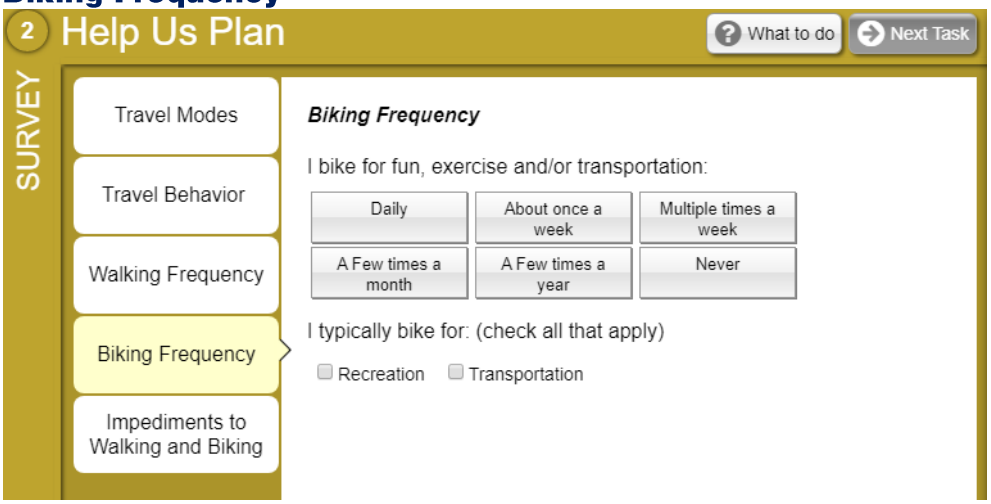


Figure 98 provides the results of survey participants' biking frequency, divided by **most often** (daily, multiple times a week, or about once a week), **least often** (a few times a month or a few times a year), and **never**.

These were the major findings:

- While the frequency of bike trips tends to be more varied than walking, one-third of respondents reported biking multiple times per week.
- 54 percent bike on a weekly basis, with one-third of them reporting biking multiple times per week.

Figure 98
Biking Frequency

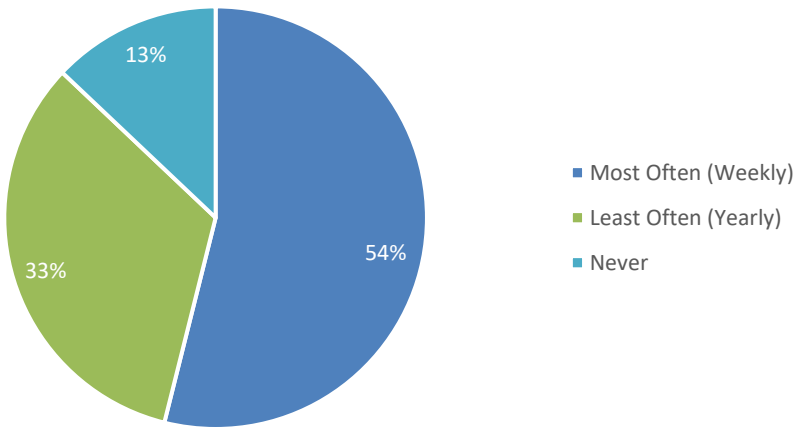
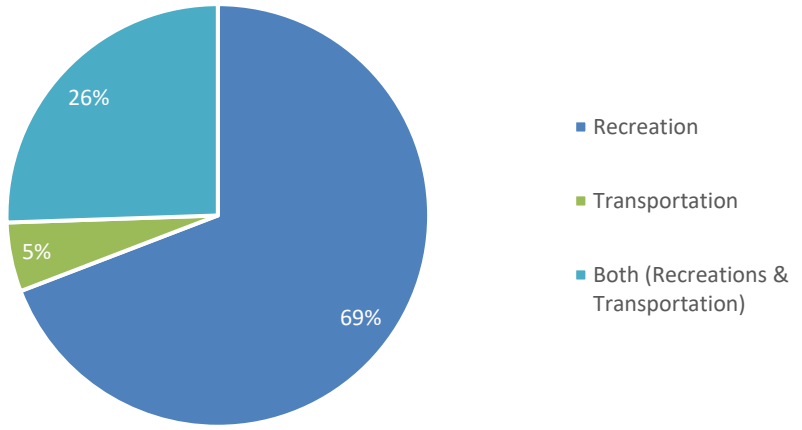


Figure 99 provides the results of survey participants' purpose (transportation and/or recreation) for making biking trips.

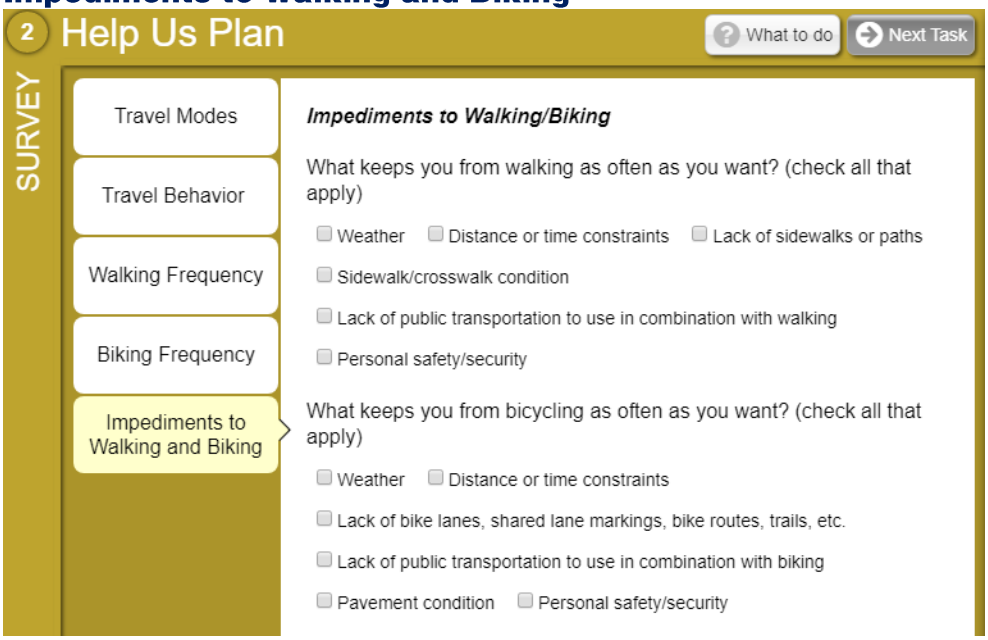
The major finding is that:

- Comparable to walking purpose results, 95 percent of people who took the survey indicated that they typically bike for recreational purposes, with up to 31 percent of trips also serving as transportation.

Figure 99
Biking Purpose



Impediments to Walking and Biking



Figures 100 and 101 show the results of survey participants' top impediments to walking and biking, respectively. These are the major findings across both modes of travel:

- The top four impediments to walking were weather (63 percent), distance or time constrains (52 percent), lack of sidewalks or paths (43 percent), and personal safety/security (25 percent).
- Lack of facilities or infrastructure was identified as the greatest impediment to biking, followed closely by weather.
- Based on the responses of those who took the survey, distance is more of an impediment to walking than biking.
- About six in 10 of those who took the survey identified weather as one of the top impediments to both walking and biking.
- Lack of adequate infrastructure is more of an impediment to biking than walking.
- Personal safety and security was among the top reported impediments to biking, and it appears to be more of an impediment to biking than walking.

Figure 100
Top Impediments to Walking

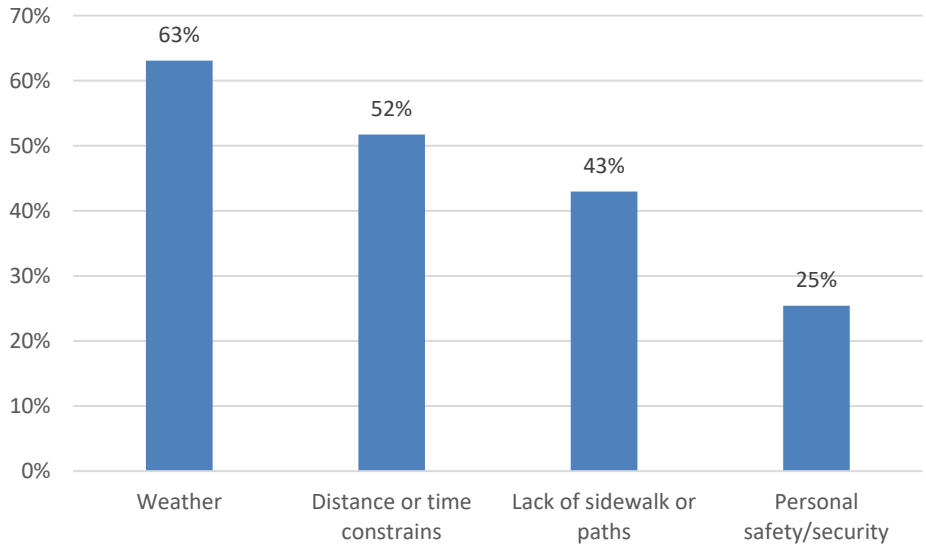
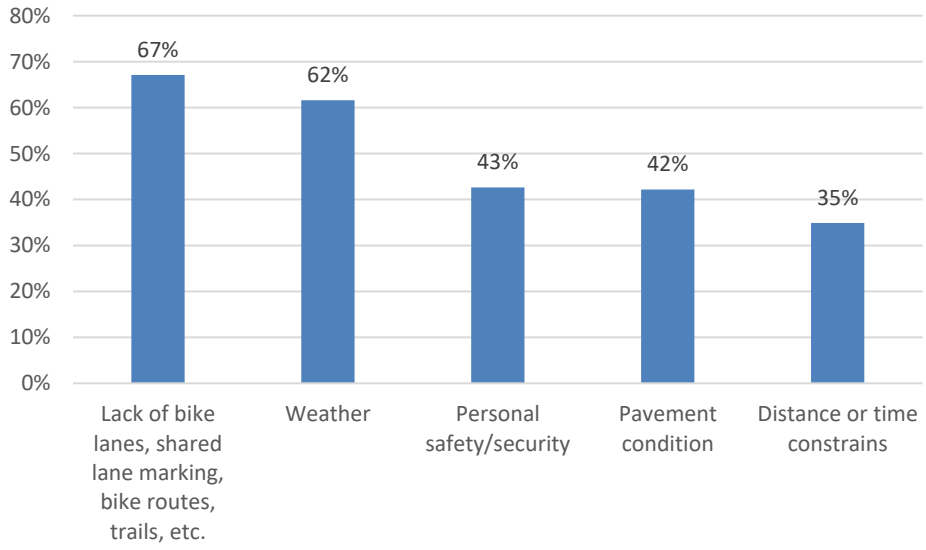


Figure 101
Top Impediments to Biking



Mapping

The next major section of the survey was a mapping exercise in which participants were asked to mark the locations to which they walk and/or bike as well as where they wish they could walk and/or bike to. The markers for various destinations were classified in four groups: “School/Work,” “Shop/Dine/Fun,” “Park/Recreation,” and “Transit/Other.” Participants were allowed to drag and drop multiple markers on the map for each category.

Table 10 shows the destinations participants marked, by both count and percentage. The most popular destination participants identified was park and recreation locations, followed by shopping, dining, and fun locations.

Table 10
Map Markers by Destination Type

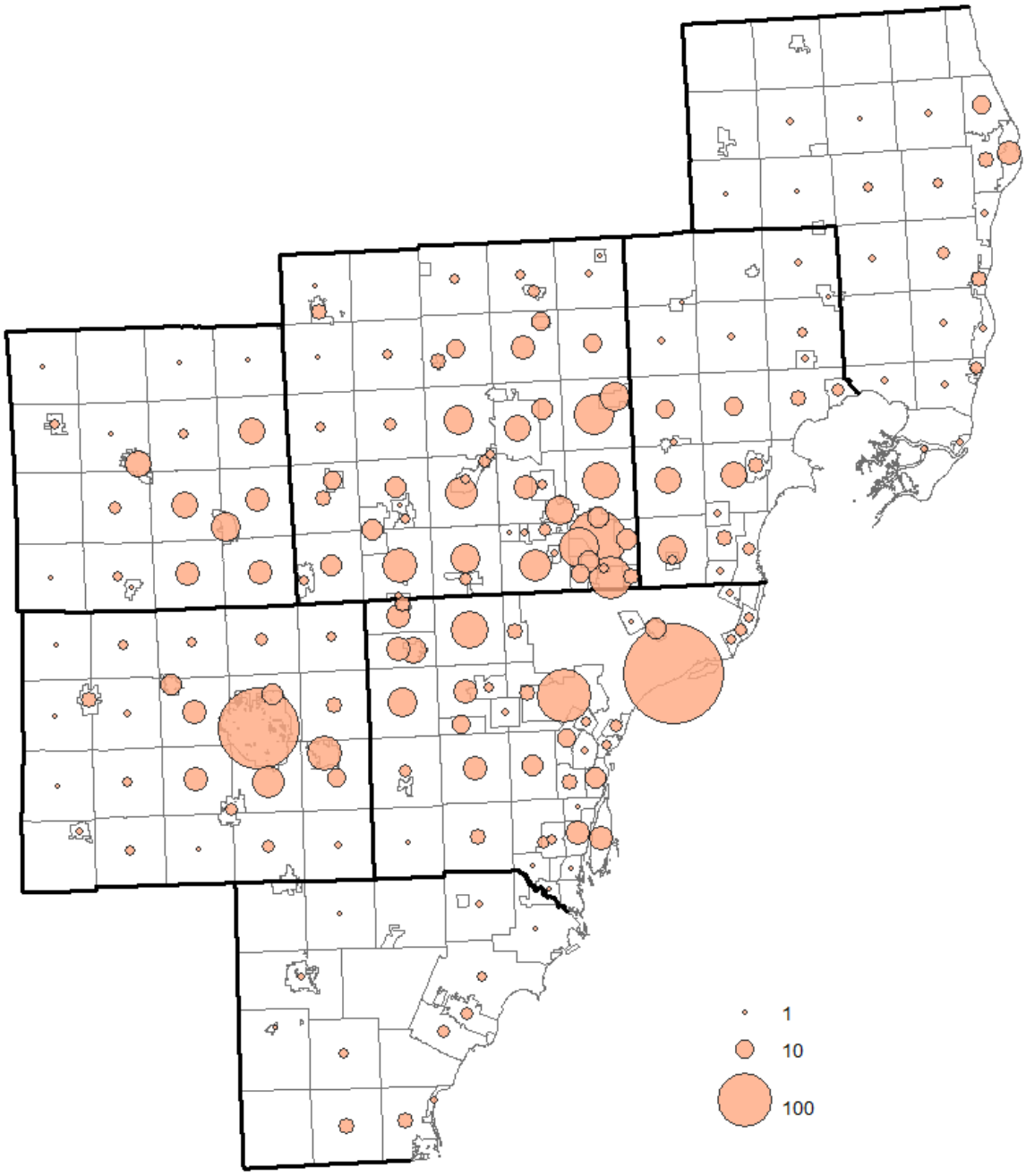
Map Marker Type	Count	Percentage
Work/School	934	20%
Shop/Dine/Fun	1490	32%
Park/Recreation	1990	42%
Transit/Other	283	6%

Figure 102 shows the concentrations by community of where survey participants either currently walk and/or bike and where they wish they could walk and/or bike to reach the following destinations:

- Work or school;
- Shopping, dining, or fun
- Transit/Other

Locations with the highest concentrations include the City of Detroit, Southeast Oakland County, and Ann Arbor. The cities of Dearborn, Livonia, and Rochester Hills also show fairly high concentrations.

Figure 102
Map Marker Concentrations



"Work/School" Markers

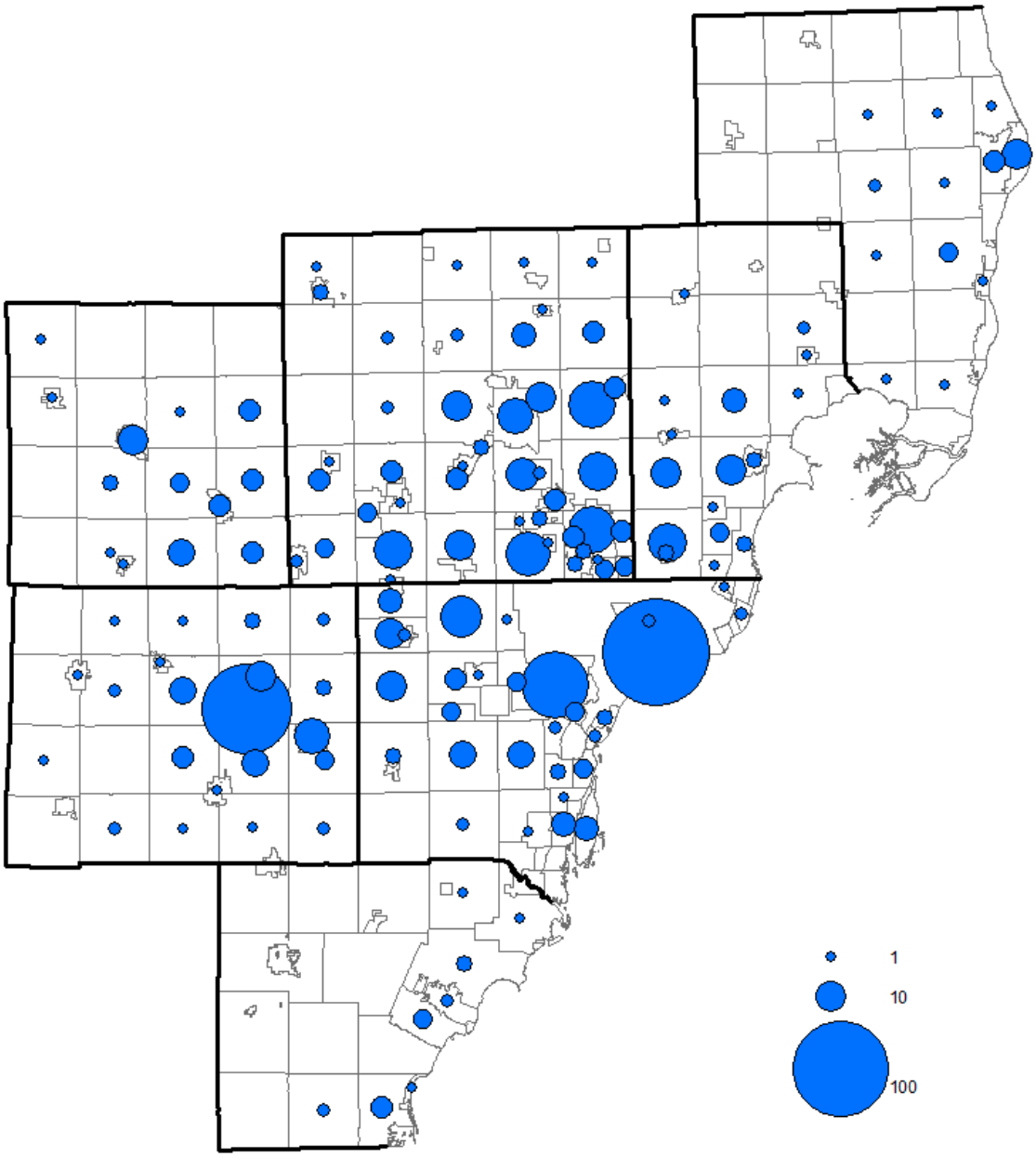
Based on the analysis of where survey participants placed "Work/School" markers:

- 144 communities in the region had a at least one work/school marker
- 23 communities had 10 or more work/school locations

Figure 103 shows the concentrations by community of where survey participants either currently walk and/or bike and where they wish they could walk and/or bike to reach work or school. Locations were spread out across the region with three major centers, including Detroit, Ann Arbor, and Dearborn.

Figure 103

Map Marker Concentrations for Work/School



Under each Work/School marker, participants were asked if they can walk or bike to that destination, choosing from two options (I can walk or bike here, I wish I could walk or bike here). The analysis for this question shows:

- The majority of universities across the region have good access.
- Of the four marker categories, work/school destinations were least accessible.
- 22 percent of those who placed a map marker indicated they currently can walk or bike to their "Work/School" destinations.
- 33 percent of those who placed a map marker indicated they wish they could walk or bike to their "Work/School" destinations.

Choosing from three mode options (Walk, Bike, Combination of walking and biking), participants' response by mode in reaching work and/or school destinations, included:

- 16 percent could walk.
- 48 percent could bike.
- 36 percent indicated they could use a combination of walking and biking.

Choosing from three mode options (Walk, Bike, Combination of walking and biking), participants' response by mode in "wishing they could" reach work and/or school destinations, included:

- Four percent indicated they would like to walk.
- 26 percent indicated they would like to bike.
- 71 percent indicated they would like to use a combination of walking and biking to get to their school and/or work.

Table 11 shows the map marker analysis for the top 10 communities receiving the highest number of "Work/School" map markers.

Table 11
Top 10 Highest Number of Markers for Work/School Destinations

Community	Total "Work/School" Map Markers	I Can Walk/Bike Here (Percentage)	I Wish I could Walk/Bike Here (Percentage)
Detroit	126	25%	34%
Ann Arbor	90	40%	23%
Dearborn	49	18%	41%
Royal Oak	25	20%	28%
Rochester Hills	24	38%	38%
Southfield	22	14%	50%
Livonia	19	11%	68%
Novi	18	17%	50%
Troy	17	6%	41%
Warren	17	18%	47%

General “comment” themes reported by participants:

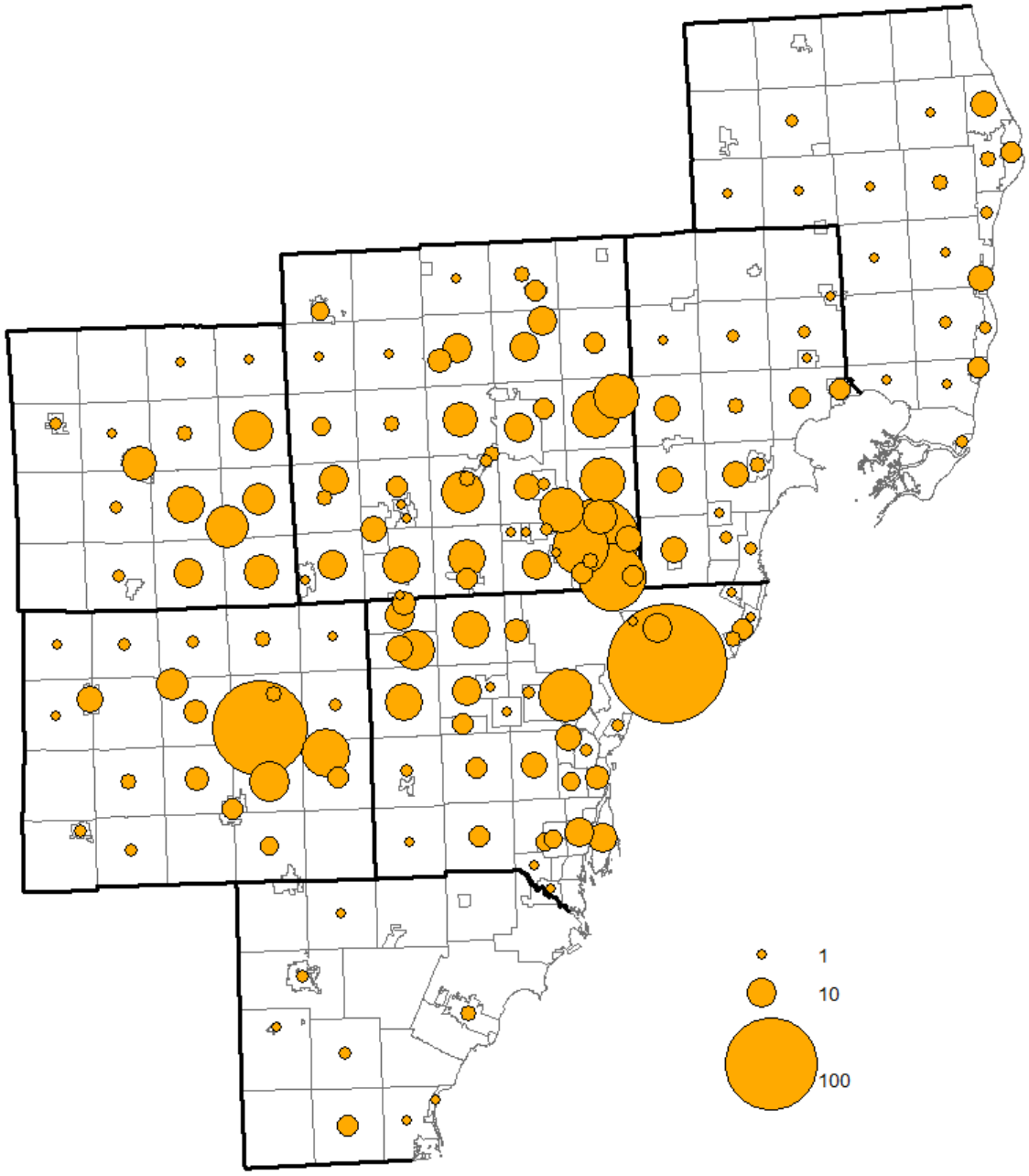
- Lack of infrastructure or gaps in the network, prevent people from walking and biking
- Need for better public transportation in combination with walking and biking
- Surface condition of the existing infrastructure prevents people from walking and biking
- Distance restrictions
- Safety concerns
- Weather restrictions

“Shop/Dine/Fun” Markers
Based on the analysis of where survey participants placed “Shop/Dine/Fun” markers:

- 69 communities in the region had a at least one shopping/dining/fun marker
- 40 communities had 10 or more shopping/dining/fun locations
- six communities had more than 30 markers

Figure 104 shows the concentrations by community of where survey participants either currently walk and/or bike and where they wish they could walk and/or bike to reach shopping, dining, or fun destinations. Communities with the highest concentrations included Ann Arbor, Berkley, Dearborn, Detroit, Ferndale, and Royal Oak.

Figure 104
Map Marker Concentrations for Shop/Dine/Fun



Locations with generally "good" access, as reported by survey participants in reaching destinations by walking, biking, or a combination of the two were:

- Greater downtown Detroit, Southeast Oakland County (Berkley, Ferndale, and Royal Oak)
- Smaller cities/villages (Chelsea, Dexter, Farmington, Lake Orion, Northville, Plymouth, and Rochester)

Locations with generally "limited" access, as reported by survey participants in reaching destinations by walking, biking, or a combination of the two were:

- Riding east/west through Detroit. Desire to access Eastern Market from westside and Corktown from eastside
- Shopping centers in townships (in particular – Genoa Twp., Green Oak Twp., Hartland Twp., Lyon Twp., and Pittsfield Twp.)

Under each Shop/Dine/Fun marker, participants were asked if they can walk or bike to that destination, choosing from two options (I can walk or bike here, I wish I could walk or bike here). The analysis for this question shows:

- 33 percent indicated they currently can walk or bike to their *Shop/Dine/Fun* destinations
- However, 27 percent indicated they wish they could walk or bike to their *Shop/Dine/Fun* destinations

Choosing from three mode options (walk, bike, combination of walking and biking), participants' response by mode in reaching shop/dine/fun destinations, included:

- 20 percent could walk
- 43 percent could bike
- 36 percent indicated they could use a combination of walking and biking

Choosing from three mode options (walk, bike, combination of walking and biking), participants' response by mode in "wishing they could" reach shop/dine/fun destinations, included:

- Eight percent indicated they would like to walk
- 52 percent indicated they would like to bike
- 39 percent indicated they would like to use combination of walking and biking

Table 12 shows the map marker analysis for the top 10 communities receiving the highest number of "Shop/Dine/Fun" map markers.

Table 12
Top 10 Highest Number of Markers for Shop/Dine/Fun Destinations

Community	Total "Shop/Dine/Fun" Map Markers	I Can Walk/Bike Here (Percentage)	I wish I Could Walk/Bike Here (Percentage)
Detroit	171	42%	19%
Ann Arbor	108	49%	22%
Royal Oak	82	34%	29%
Ferndale	57	47%	19%
Berkley	39	33%	8%
Dearborn	36	44%	19%
Rochester Hills	28	64%	21%
Ypsilanti	27	63%	33%
Troy	26	19%	12%
Rochester	24	63%	13%

General “comment” themes reported by participants:

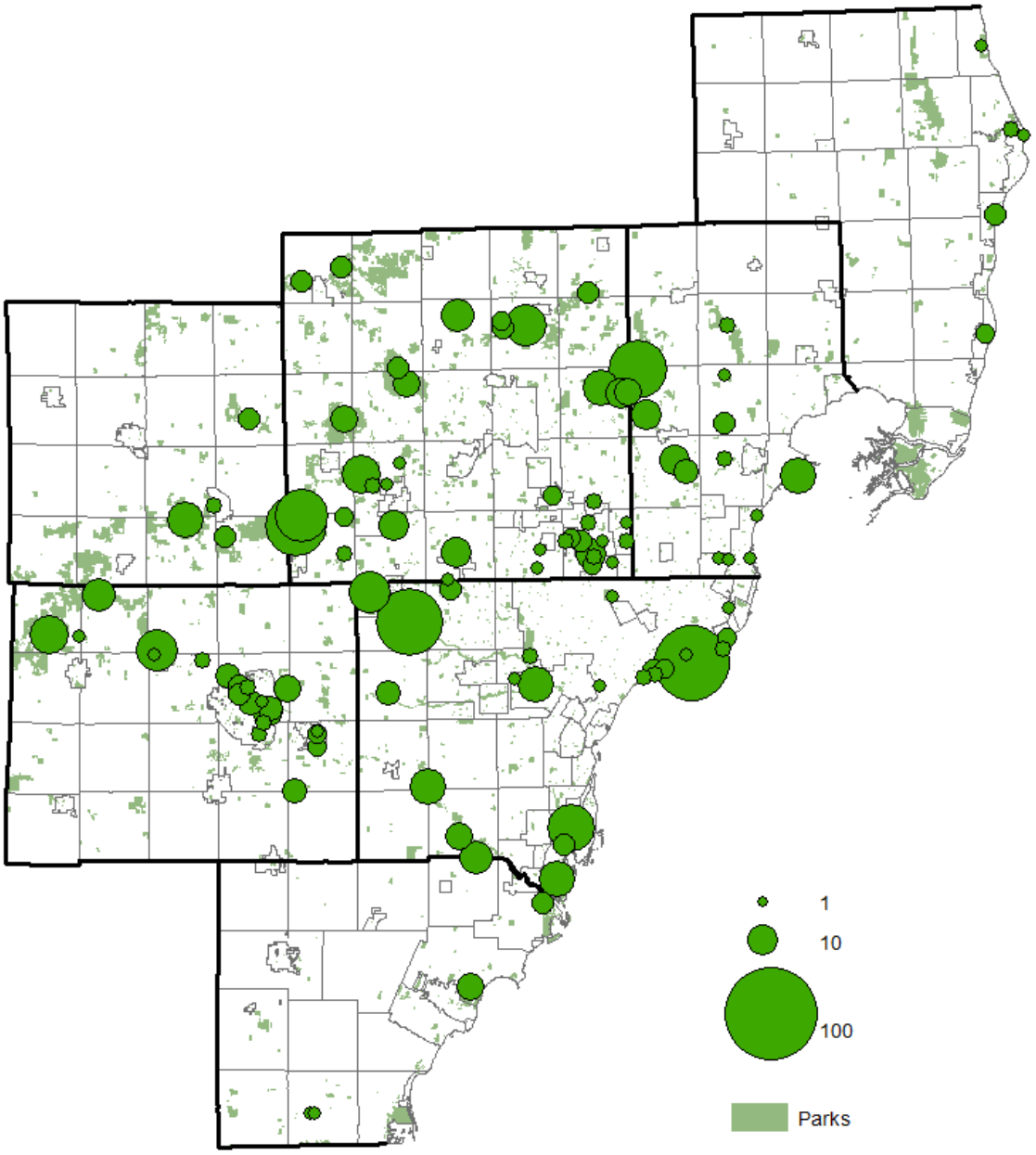
- Safety concerns (highway/road crossing, roundabouts, high traffic volume, high speeds, unprotected bike facilities)
- Lack of dedicated infrastructure
- Need for surface improvements
- Gaps in the network
- Need for public transportation to be used in combination with walking and biking
- Distance and weather restrictions
- Lack of bike rack/parking

“Park/Recreation” Markers
Based on the analysis of where survey participants placed “Park/Recreation” markers:

- All sizes of parks are visited
- The most visited are the larger county parks, state parks, and Metroparks

Figure 105 shows the concentrations by park of where survey participants either currently walk and/or bike and where they wish they could walk and/or bike to reach park/recreation destinations.

Figure 105
Map Marker Concentration for Parks and Recreation



Parks and recreation locations with generally “good” access, as reported by survey participants in reaching destinations by walking, biking, or a combination of the two were:

- Large urban parks (Belle Isle, Elizabeth Park, and Rochester Municipal Park)
- Large parks connected with regional trails (Bloomer Park, Hines Parkway, Lake Erie Metropark, Lower Huron Metropark, and Lower Rouge)

Parks and recreation locations with generally "limited" access, as reported by survey participants in reaching destinations by walking, biking, or a combination of the two were:

- Largest parks in northern portion of the region (Kensington Metropark, Lake St. Clair Metropark, Proud Lake State Recreation Area, and Stony Creek Metropark)
- Even if these parks were on regional trails, there seems to be a limit as to how far people will travel for parks

Under each Park/Recreation marker, participants were asked if they can walk or bike to that destination, choosing from two options (I can walk or bike here, I wish I could walk or bike here). The analysis for this question shows:

- 36 percent indicated they currently can walk or bike to their *Park/Recreation* destinations
- 24 percent indicated they wish they could walk or bike to their *Park/Recreation* destinations

Choosing from three mode options (walk, bike, combination of walking and biking), participants' response by mode in reaching park/recreation destinations, included:

- 15 percent could walk
- 49 percent could bike
- 36 percent indicated they could use a combination of walking and biking

Choosing from three mode options (walk, bike, combination of walking and biking), participants' response by mode in "wishing they could" reach park/recreation destinations, included:

- Five percent indicated they would like to walk
- 58 percent indicated they would like to bike
- 37 percent indicated they would like to use combination of walking and biking

Table 13 shows the map marker analysis for the top ten parks receiving the highest number of "Parks/Recreation" map markers.

Table 13
Top 10 Highest Number of Markers for Park/Recreation Destinations

Park	Total "Park/Recreation" Map Markers	I can Walk/Bike Here (Percentage)	I wish I could Walk/ Bike Here (Percentage)
Belle Isle	64	34%	17%
Hines Park	51	53%	24%
Island Lake Recreation Area	44	50%	23%
Stony Creek Metropark	38	26%	37%
Kensington Metropark	34	21%	38%
Elizabeth Park	25	52%	16%
Bald Mountain State Recreation Area	21	29%	19%
Maybury State Park	20	25%	30%
Hudson Mills Metropark	19	58%	16%
Proud Lake State Recreation Area	18	33%	50%

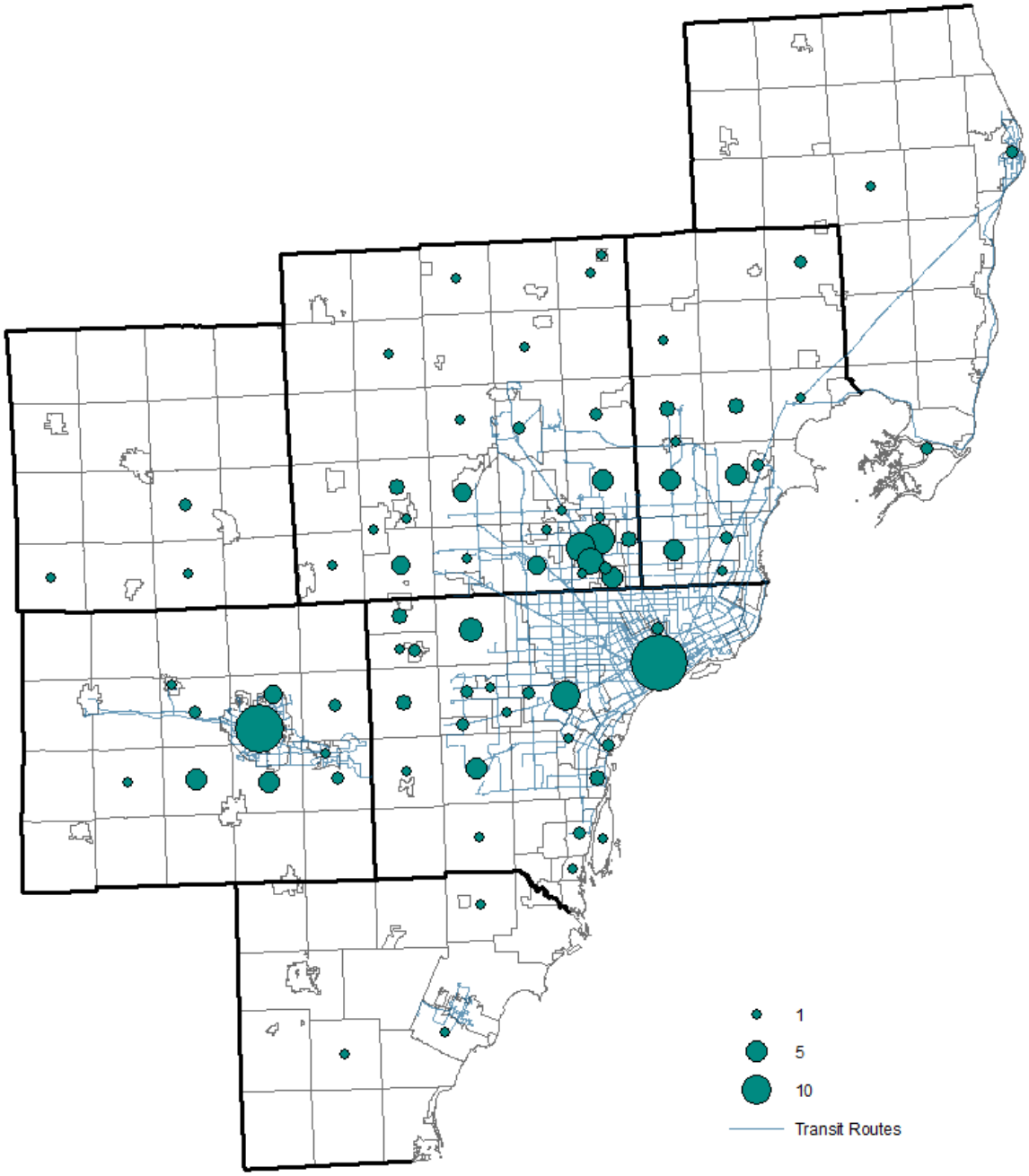
General “comment” themes reported by participants:

- Walk/bike to parks with kids and friends
- Safety concerns
- Lack of dedicated facilities
- Gaps in the network
- Concern about the pavement quality
- Need for paved trails
- Need for accessibility improvements to parks
- Distance restriction
- Need for public transportation to use in combination with walking and biking
- Need for bike parking/racks

“Transit/Other” Map Markers
Based on the analysis of where survey participants placed “Transit/Other” markers seven out of 10 markers were within a half-mile of a transit line.

Figure 106 shows the concentrations by community of where survey participants either currently walk and/or bike and where they wish they could walk and/or bike to reach transit/other destinations.

Figure 106
Map Marker Concentration for Transit/Other



Under each Transit/Other marker, participants were asked if they can walk or bike to that destination, choosing from two options (I can walk or bike here, I wish I could walk or bike here). The analysis for this question shows:

- 33 percent indicated they currently can walk or bike to their *Transit/Other* destinations
- 29 percent indicated they wish they could walk or bike to their *Transit/Other* destinations.

Choosing from three mode options (walk, bike, combination of walking and biking), participants' response by mode in reaching transit or other destinations, included:

- 36 percent could walk
- 29 percent could bike
- 34 percent indicated they could use a combination of walking and biking

Choosing from three mode options (walk, bike, combination of walking and biking), participants' response by mode in "wishing they could" reach transit or other destinations, included:

- Five percent indicated they would like to walk
- 49 percent indicated they would like to bike
- 45 percent indicated they would like to use combination of walking and biking

Table 14 shows the map marker analysis for the top 10 communities receiving the highest number of "Transit/Other" map markers.

Table 14
Top 10 Highest Number of Markers for Transit/Other Destinations

Community	Total "Transit/Other" Map Markers	I Can Walk/Bike Here (Percentage)	I Wish I Could Walk/Bike Here (Percentage)
Detroit	40	50%	18%
Ann Arbor	29	62%	7%
Royal Oak	13	46%	38%
Dearborn	11	36%	36%
Berkley	10	30%	40%
Huntington Woods	8	38%	25%
Livonia	7	29%	43%
Warren	6	33%	17%
Lodi Twp	6	33%	33%
Romulus	5	0%	20%
Ferndale	5	60%	40%

General "comment" themes reported by participants specific to transit:

- Need for covered bike racks/parking at bus stops
- Lack of connection between bike/pedestrian network to transit system
- Safety concerns
- Proximity to bus stop

General "comment" themes reported by participants specific to "other:"

- Friends/family member's house
- Church

Impediments

The mapping exercise also included an "impediment" marker in which participants were able to identify specific locations of impediments, as well as specify the type by choosing from three options (physical barrier, safety issue, maintenance issue). If desired, participants could also provide comments for each marker.

Table 15 shows the impediments participants marked, by both count and percentage. The most common impediment was Physical Barrier/Gap, accounting for 40 percent, followed by safety issues (37 percent), and Maintenance/Condition (12 percent).

Table 15

Map Markers by Impediment Type

Impediments Type	Count	Percentage
Maintenance/Condition	92	12%
Physical barrier/Gap	309	40%
Safety issue	284	37%
Other	81	11%

Figure 107 shows the concentrations, by community, of where survey participants marked an impediment.

Figure 107
Map Marker Concentration for Impediments

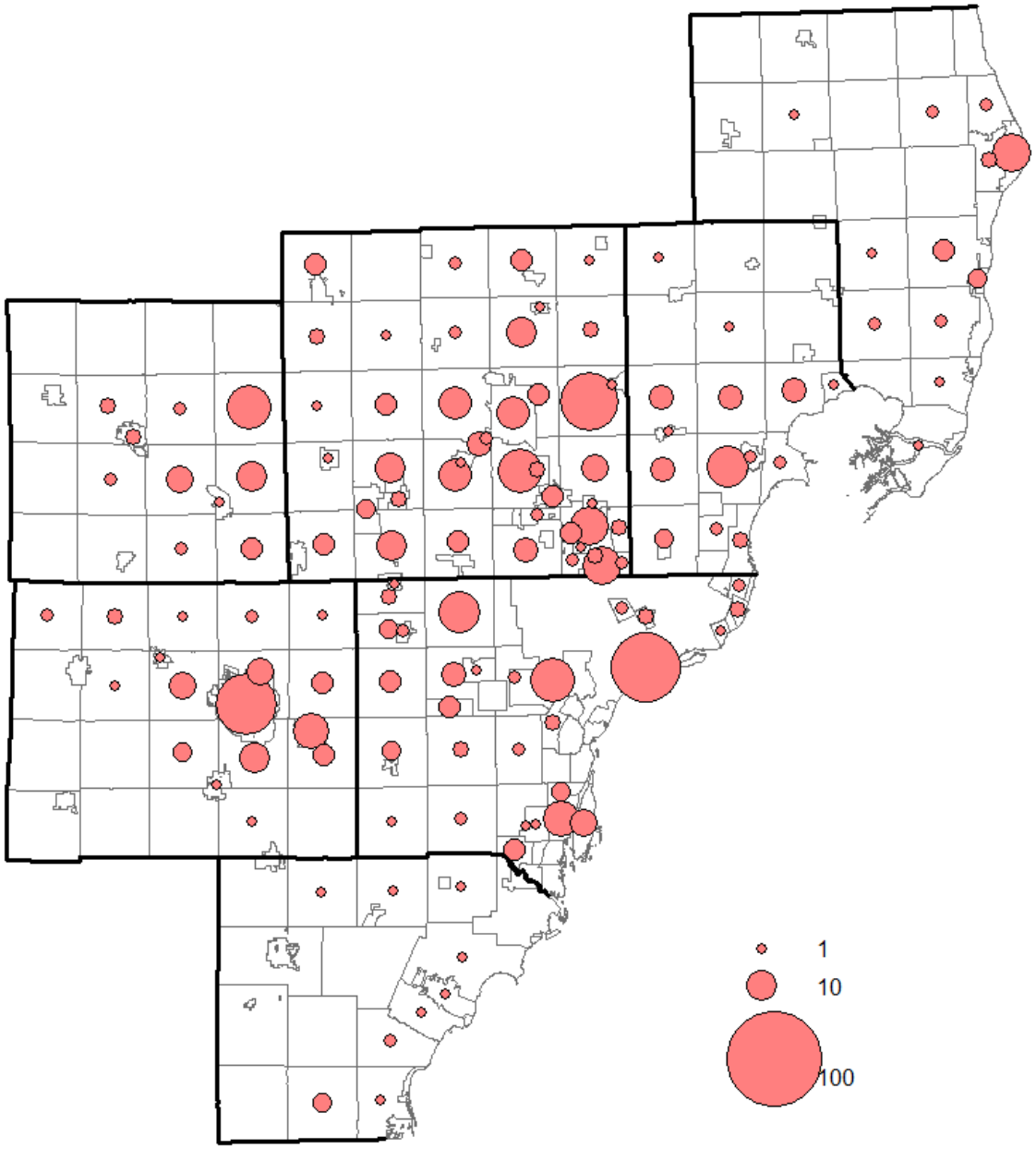


Figure 108 displays the location of impediment by type (physical barrier/gap; safety issue; maintenance/condition; other). For each impediment type, participants were able to provide comments. General “comment” themes by impediment type included:

Physical Barrier/Gap

- In suburban and rural areas of the region, there is a lack of sidewalks and bicycle paths to amenities such as parks, schools, and regional trails

- In urban areas, there is a desire to connect to densely populated areas
- Incomplete shared-use paths

Safety Issue

- Cars travel too fast to want to ride in streets
- Bike lanes are too narrow to feel safe
- Too many driveways to conflict with pedestrians
- No crosswalk
- Not enough time at crosswalk
- Driver aggression

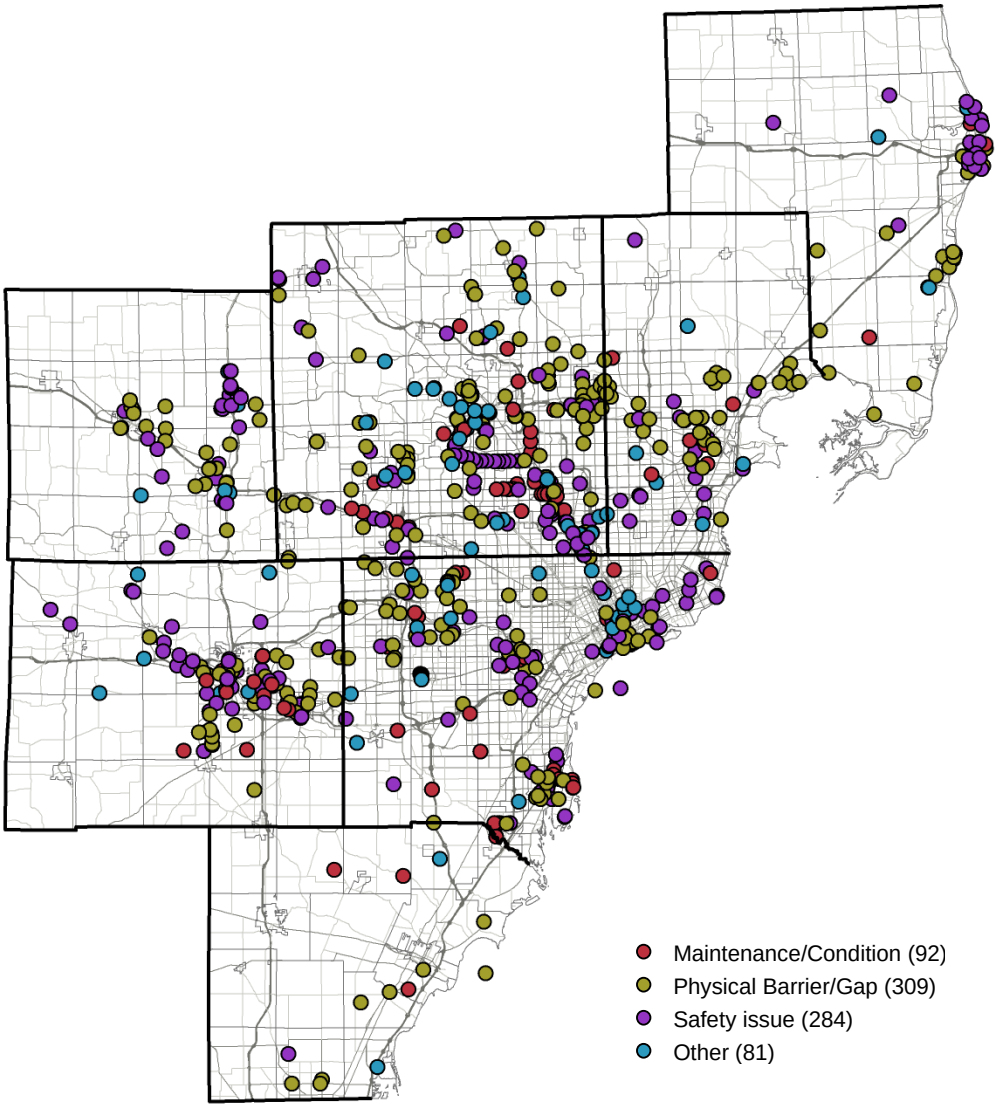
Maintenance/Condition

- Region-wide, road construction, railroad crossings, and flooded streets resulted in less pedestrian and bicycle travel
- Infrastructure needs to be cleaned – street sweeping
- Need better winter maintenance

Other Comments

- Physical disability

Figure 108
Impediment Map Markers by Type

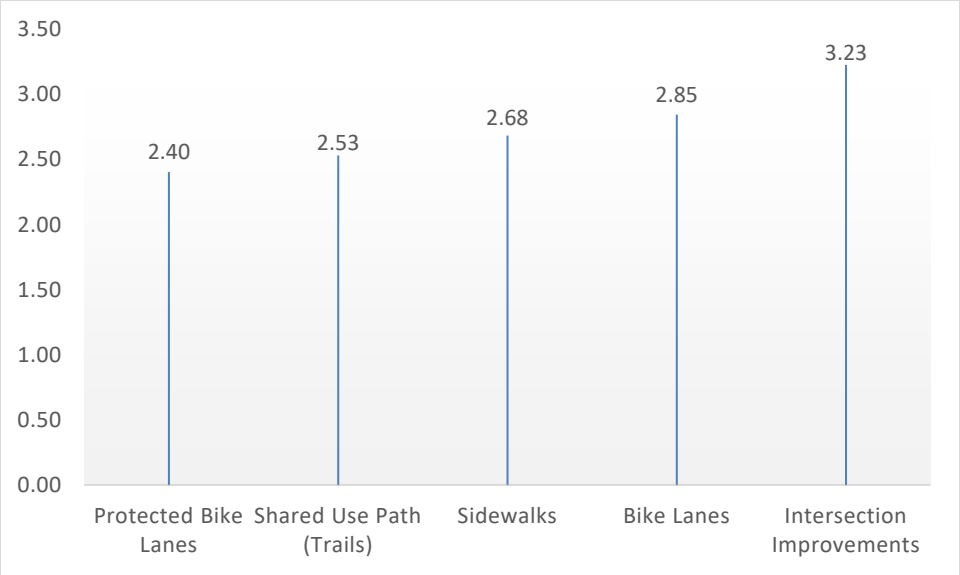


Ranking Priorities

The third major section of the survey was a ranking of priorities exercise in which participants were asked to rank the top five bike- and/or pedestrian-related infrastructure priorities for additional investment.

Figure 109 displays the top five investment priorities (the smaller average rank, or closer to one, the higher the priority).

Figure 109
Top Five Investment Priorities (Average Rank)



Below is the list of investment priorities in order of ranking by survey participants, along with the summary of comments received for each item. (The ✓ icon next to comment summary represents the comments in favor of investments vs. the × icon, which represents the comments not in favor of investments.)

1. Protected Bike Lanes (Average Rank 2.40)
   - Comments received for this item:
     - ✓ It provides higher safety, especially in areas with higher traffic volume.
     - × Cost and weather restrictions.

2. Shared-Use Path (Trails), (Average Rank 2.53)
   - Comments received for this item:
     - ✓ Support for off-road walking and biking facilities
     - ✓ Demand for amenities along shared-use paths
     - ✓ Safety
     - ✓ Great for recreation purposes
     - ✓ Demand for security improvements along shared-use paths, such as lighting, cameras, safety patrols.
     - × Concern about the maintenance

3. Sidewalks (Average Rank 2.68)

- Comments received for this item:
    - ✓ Improve the surface condition and ADA accessible
    - ✓ Winter maintenance
    - ✓ Improve the sidewalk network connectivity, especially in suburban areas
    - ✓ Sidewalks should be wide enough to accommodate multi-modes
    - ✓ Improve the access to core services via sidewalks
    - × Concern about the bike and pedestrian conflict on sidewalks

4. Bike Lanes (Average Rank 2.85)

- Comments received for this item:
    - ✓ Cost effective
    - ✓ Improve the winter maintenance
    - ✓ Improve the surface condition
    - × Safety concerns
    - × Not in support of having bicyclists on road (lane reduction), since they do not pay registration fees

5. Intersection Improvements (e.g., bicycle and pedestrian crosswalk improvements at major roadway intersections and traffic signals, including high visibility crosswalk markings, countdown pedestrian signals, and curb extensions) (Average Rank 3.23)

- Comments received for this item:
    - ✓ Would encourage more walking
    - ✓ Consider all abilities (people with disabilities, elderly) in intersection improvements such as in signal's crossing time
    - ✓ Need for more educational campaigns as well as crosswalk enforcement
    - ✓ Improves the safety of bicyclists and pedestrians
    - ✓ Need for improvements in highway crossings
    - ✓ Need for surface improvements

6. Bike Routes and Signage (Average Rank 3.29)

- Comments received for this item:
    - ✓ Need for intersection signage improvements
    - ✓ Support for bike routes since they help the user navigation
    - × Safety Concerns

7. Midblock Crosswalks (Average Rank 3.51)

- Comments received for this item:
    - ✓ Improves sidewalk and trails network connectivity
    - ✓ Improves safety in wide roads and also in roads with high traffic volume
    - ✓ Support for midblock crossing with signals and median islands

8. Shared Lane Markings (Average Rank 3.94)

- Comments received for this item:

- Need for more driver education
- Safety concerns
- Not practical

Among all the eight items listed for investment, Shared Lane Marking (3.94) was ranked as the least preferred item for additional investment.

Other priorities pointed out by survey respondents were classified in different groups, including:

- Enforcement and public education
- Facilities maintenance and surface improvements
- Connectivity of the network
- Bike parking/Racks
- Facilities safety and security improvements, including lighting
- Public transportation

From those who used the “Suggest another” option in this screen to comment on bicycle and pedestrian related infrastructure for investment, there were respondents who were not in favor of investing in more bike facilities, explaining that not every road should have biking facilities

Appendix D — Bicycle and Pedestrian Safety Analysis

This Appendix is an analysis of bicycle and pedestrian-involved traffic crashes between 2014 and 2018 in Southeast Michigan. Traffic crash data used in this analysis is from the Michigan State Police, Criminal Justice Information Center (CJIC).

Injury Severity

Table 16 and Table 17 illustrate the severity of injury to pedestrians and bicyclists across five levels of injury for 2014 through 2018. Over this five year period there were 460 pedestrian crashes resulting in a fatality and 57 bicycle crashes resulting in a fatality.

Figure 110 shows that 88 percent of pedestrian crashes resulted in some level of injury and 23 percent resulted in either a fatality or serious injury. Figure 111 shows that 79 percent of bicycle crashes resulted in some level of injury and 8 percent result in either a fatality of serious injury.

Table 16

Pedestrian Crashes by Severity, 2014-2018

Year	Fatal Crashes	Serious Injury Crashes	Minor Injury Crashes	Possible Injury Crashes	No Injury Crashes
2014	94	194	363	477	138
2015	102	192	385	501	128
2016	99	167	372	400	168
2017	84	218	390	371	163
2018	81	218	397	429	183
Total	460	989	1,907	2,178	780

Table 17
Bicycle Crashes by Severity, 2014-2018

Year	Fatal Crashes	Serious Injury Crashes	Minor Injury Crashes	Possible Injury Crashes	No Injury Crashes
2014	12	67	282	341	171
2015	15	54	311	366	186
2016	16	68	370	376	239
2017	5	89	362	284	174
2018	9	52	299	266	188
Total	57	330	1,624	1,633	958

Figure 110
Distribution of Pedestrian Crashes by Severity, 2014-2018

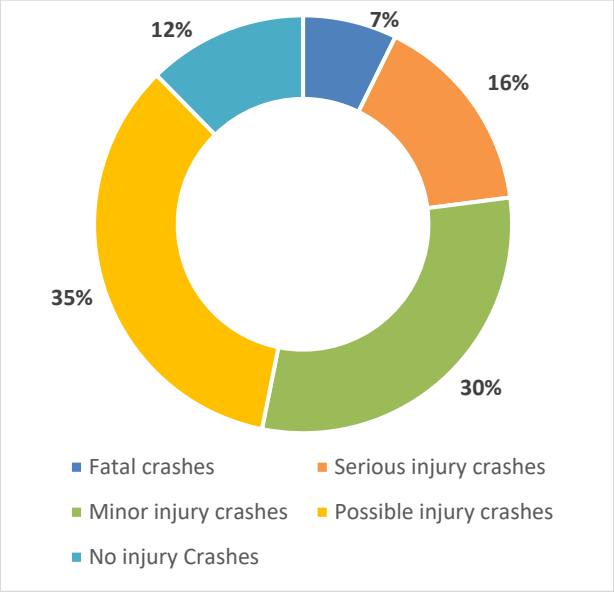
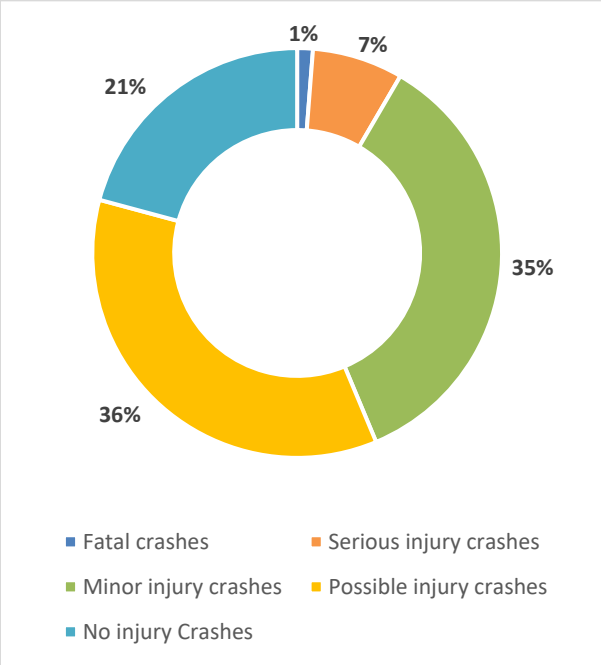


Figure 111
Distribution of Bicycle Crashes by Severity, 2014-2018



Average Rate of Crashes

Tables 18 and 19 show the annual average rate of pedestrian and bicycle crashes, fatalities, and serious injuries for the region and by county, using SEMCOG's latest population estimates. Over the five year period (2014-2018), nearly two pedestrians were killed and more than four were seriously injured for every 100,000 residents in the region. Over the same period, 0.23 bicyclists were killed and another 1.4 were seriously injured for every 100,000 residents.

Wayne County's pedestrian fatality rate was 52 percent higher than the regional average. Three counties exceeded the region's average bicyclist fatality rate, with Washtenaw more than doubling the average.

Table 18
Annual Average Pedestrian Crash, Fatality, and Serious Injury Rate per 100,000 Residents by County, 2014-2018

County	Crashes	Fatalities	Serious Injuries
Livingston	7.79	1.04	1.45
Macomb	19.57	1.57	3.17
Monroe	14.68	1.72	2.64
Oakland	16.96	1.28	2.98
St. Clair	15.43	1.00	3.26
Washtenaw	28.65	1.23	4.72
Wayne	40.44	2.95	6.13
SEMCOG Average	26.49	1.94	4.25

Table 19
Annual Average Bicycle Crash, Fatality, and Serious Injury Rate per 100,000 Residents by County, 2014-2018

County	Crashes	Fatalities	Serious Injuries
Livingston	5.61	0.21	0.42
Macomb	19.20	0.23	1.00
Monroe	14.68	0.26	1.45
Oakland	14.58	0.17	1.22
St. Clair	15.18	0.38	1.76
Washtenaw	24.74	0.54	1.61
Wayne	23.89	0.21	1.75
SEMCOG Average	19.31	0.23	1.40

Fatalities and Serious Injuries by Age and Gender

Figures 112 and 113 illustrate the distribution of pedestrian and bicyclist fatalities and serious injuries by age group. Serious injuries were highest among younger age groups, age 20-24 for pedestrians and 15-19 for bicyclists, and then peak again for people age 55-59. Fatalities increased with age, peaking at age 55-59 for pedestrians and 50-54 for bicyclists.

Figure 112
Pedestrian Fatalities and Serious Injuries by Age, 2014-2018

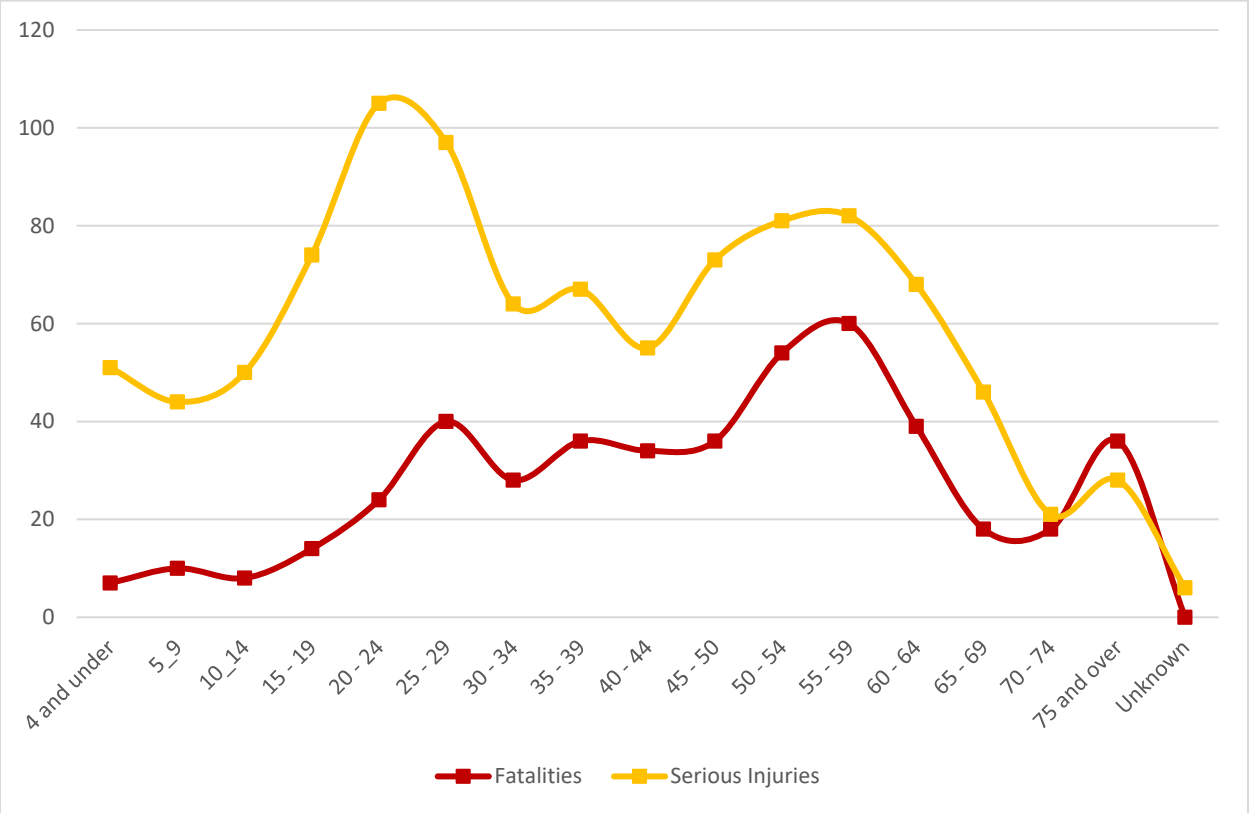
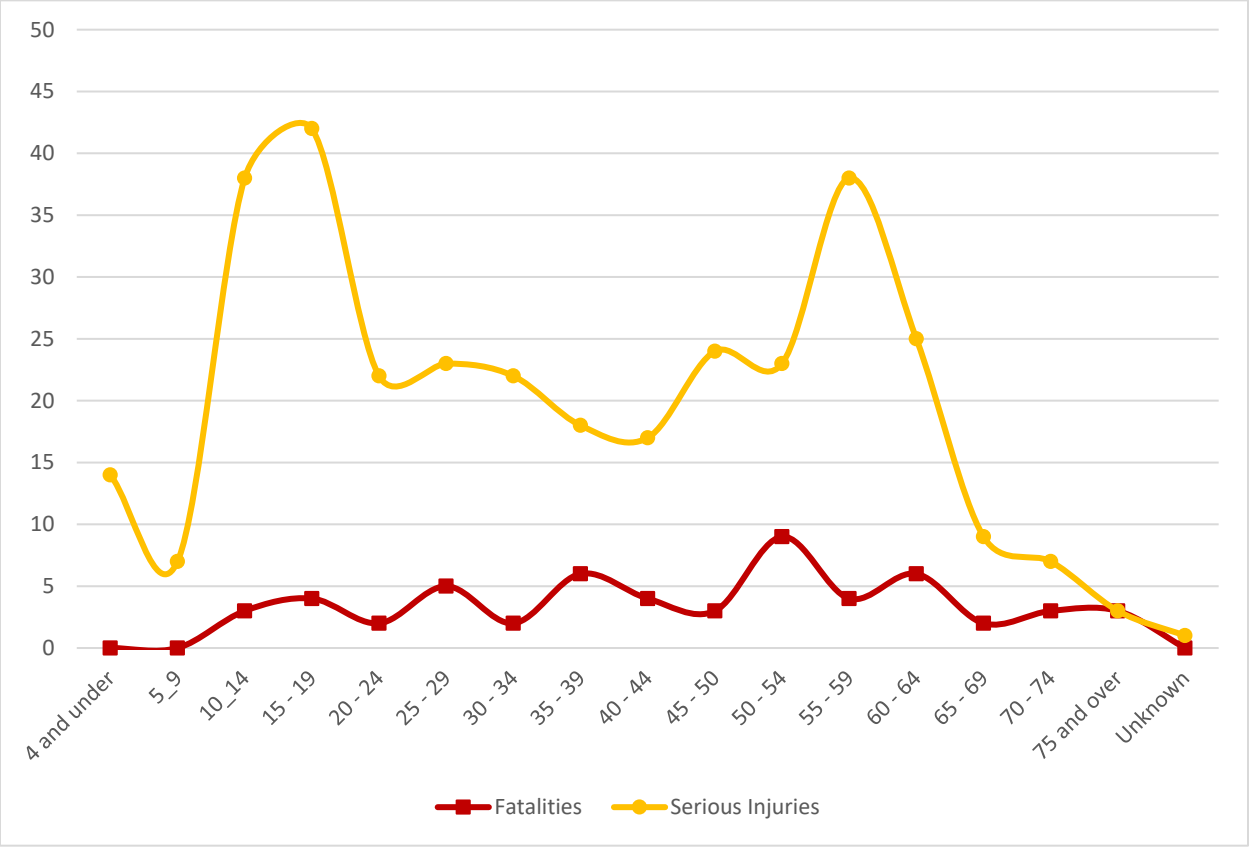


Figure 113
Bicycle Fatalities and Serious Injuries by Age, 2014-2018



Figures 114 and 115 illustrate the distribution of pedestrian fatalities and serious injuries by gender. The majority of both pedestrians and bicyclists killed were male. The share of female pedestrians killed or seriously injured from 2014 to 2018 was more than double the share of female bicyclists killed or seriously injured in the same time period.

Figure 114
Distribution of Pedestrian Fatalities and Serious Injuries by Gender, 2014-2018

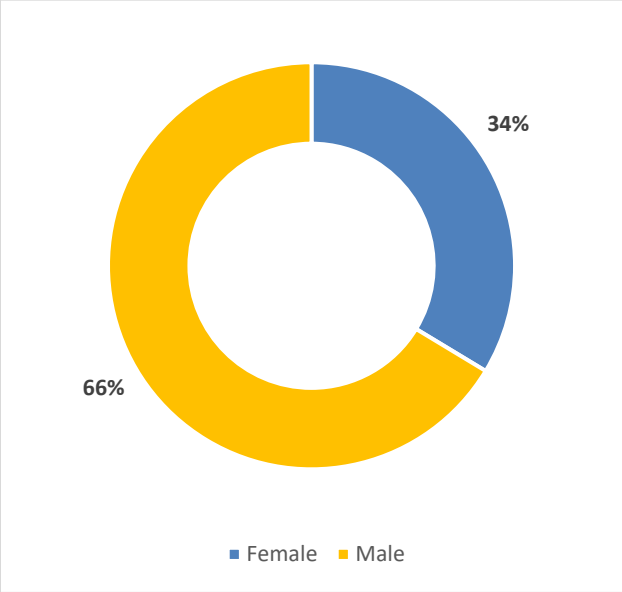
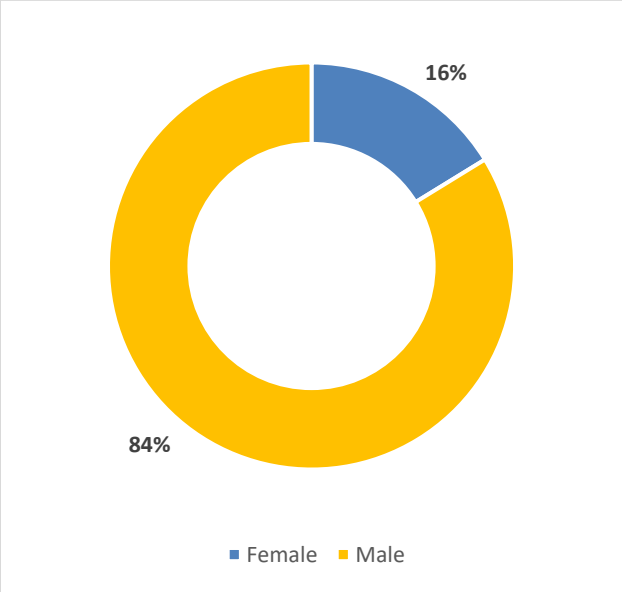


Figure 115
Distribution of Bicycle Fatalities and Serious Injuries by Gender, 2014-2018



Crashes by Road Jurisdiction

Figures 116 and 117 show the distribution of pedestrian and bicycle crash severity for crashes where road jurisdiction is known. Crashes that occurred on state-owned roads were more likely to result in a fatality or serious injury compared to county and locally-owned roads. Local roads, on the other hand, had the highest share of no-injury crashes.

Figure 116
Distribution of Pedestrian Crashes by Severity and Road Jurisdiction, 2014-2018

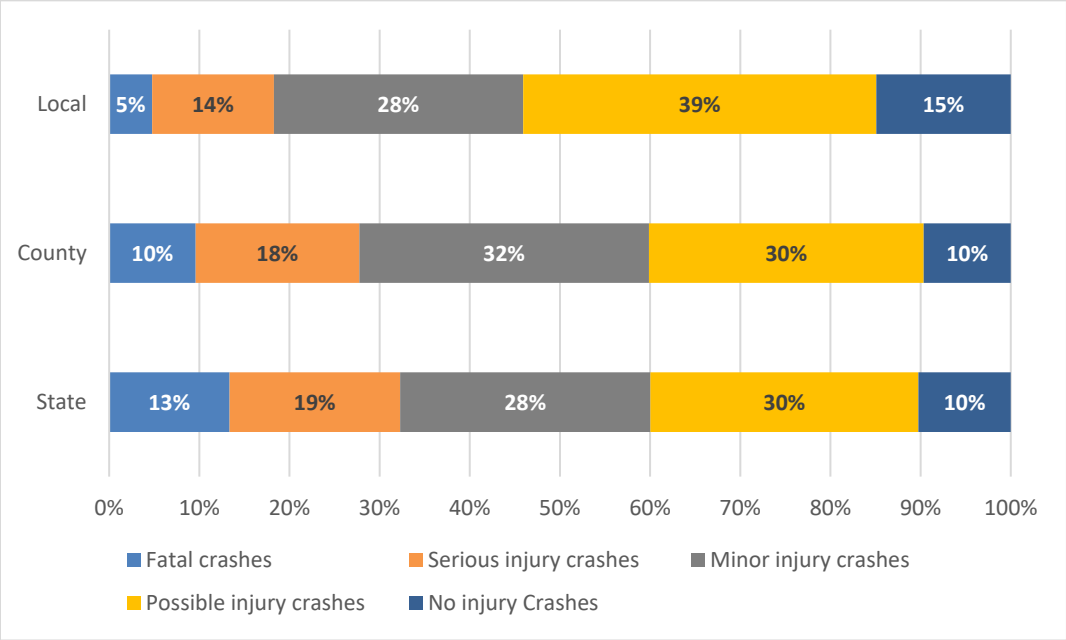
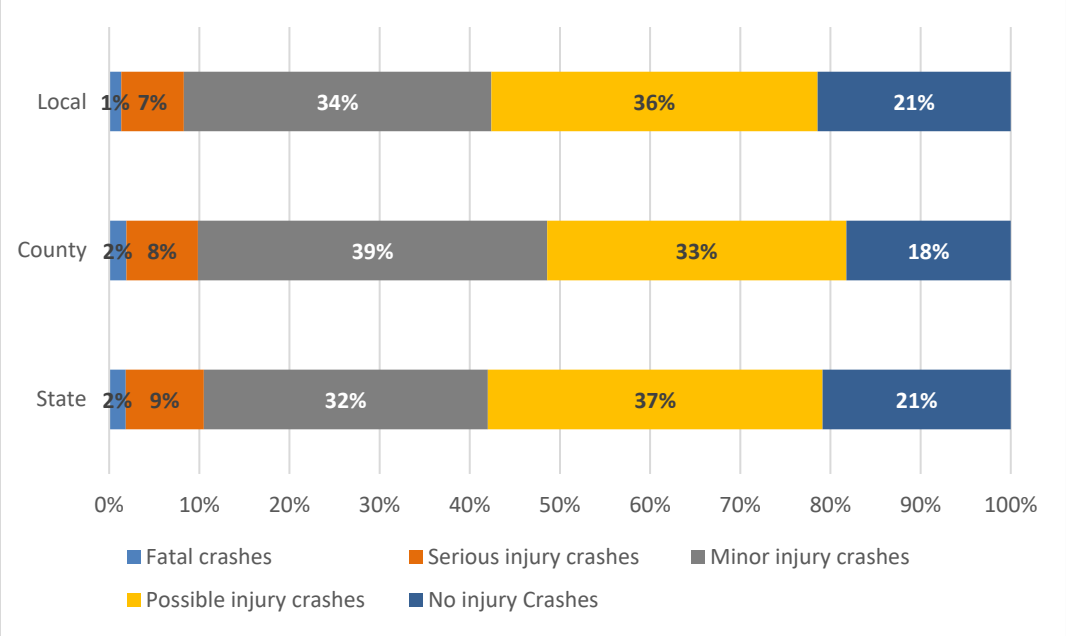


Figure 117
Distribution of Bicycle Crashes by Severity and Road Jurisdiction, 2014-2018



Crashes by County

Tables 20 and 21 show the share of all traffic crashes, fatalities, and serious injuries that involved pedestrians and bicyclists for the region and by county. Less than one percent of all crashes involved a pedestrian, though over 24 percent of all people killed and nearly 10 percent of people seriously injured were pedestrians. Bicyclists also made up a higher percent of people killed and seriously injured than their share of traffic crashes. Furthermore, pedestrians and bicyclists made up a larger portion of the people killed and seriously injured on the roads in Southeast Michigan compared to the State.

Table 20
Distribution of Pedestrian Crashes and Injuries by County, 2014-2018

County	Crashes	Fatalities	Serious Injuries
Livingston	0.3%	11.2%	3.7%
Macomb	0.7%	26.4%	8.2%
Monroe	0.6%	11.9%	5.1%
Oakland	0.5%	24.3%	8.8%
St. Clair	0.6%	9.2%	6.2%
Washtenaw	1.0%	15.5%	11.7%
Wayne	1.4%	29.1%	11.9%
SEMCOG Average	0.9%	24.2%	9.8%
Michigan Average	0.7%	16.0%	7.3%

Table 21

Distribution of Bicycle Crashes and Injuries by County, 2014-2018

County	Crashes	Fatalities	Serious Injuries
Livingston	0.2%	2.2%	1.1%
Macomb	0.7%	3.8%	2.6%
Monroe	0.6%	1.8%	2.8%
Oakland	0.4%	3.3%	3.6%
St. Clair	0.6%	3.4%	3.3%
Washtenaw	0.8%	6.8%	4.0%
Wayne	0.8%	2.0%	3.4%
SEMCOG Average	0.6%	2.9%	3.2%
Michigan Average	0.6%	2.7%	2.7%

Appendix E — USDOT Pedestrian and Bicycle Funding Opportunities

Pedestrian and Bicycle Funding Opportunities
U.S. Department of Transportation Transit, Highway, and Safety Funds
Revised August 9, 2018

This table indicates potential eligibility for pedestrian and bicycle projects under U.S. Department of Transportation surface transportation funding programs. Additional restrictions may apply. See notes and basic program requirements below, and see program guidance for detailed requirements. Project sponsors should fully integrate nonmotorized accommodation into surface transportation projects. Section 1404 of the Fixing America's Surface Transportation (FAST) Act modified 23 U.S.C. 109 to require federally-funded projects on the National Highway System to consider access for other modes of transportation, and provides greater design flexibility to do so.

Key: $ = Funds may be used for this activity (restrictions may apply). ~$ = Eligible, but not competitive unless part of a larger project. $* = See program-specific notes for restrictions.

	Pedestrian and Bicycle Funding Opportunities U.S. Department of Transportation Transit, Highway, and Safety Funds															
Activity or Project Type	BUILD	INFRA	TIFIA	FTA	ATI	CMAQ	HSIP	NHPP	STBG	TA	RTP	SRTS	PLAN	NHTSA 402	NHTSA 405	FLTTP
Access enhancements to public transportation (includes benches, bus pads)	$	~$	$	$	$	$		$	$	$						$
ADA/504 Self Evaluation / Transition Plan									$	$	$		$			$
Bicycle plans				$					$	$		$	$			$
Bicycle helmets (project or training related)									$	$SRTS		$		$*		
Bicycle helmets (safety promotion)									$	$SRTS		$				
Bicycle lanes on road	$	~$	$	$	$	$	$	$	$	$		$				$
Bicycle parking	~$	~$	~$	$	$	$		$	$	$	$	$				$
Bike racks on transit	$	~$	$	$	$	$			$	$						$
Bicycle repair station (air pump, simple tools)	~$	~$	~$	$	$	$			$	$						$
Bicycle share (capital and equipment; not operations)	$	~$	$	$	$	$		$	$	$						$
Bicycle storage or service centers (example: at transit hubs)	~$	~$	~$	$	$	$			$	$						$
Bridges / overcrossings for pedestrians and/or bicyclists	$	~$	$	$	$	$*	$	$	$	$	$	$				$
Bus shelters and benches	$	~$	$	$	$	$		$	$	$						$
Coordinator positions (State or local)						$ 1 per State			$	$SRTS		$				
Crosswalks (new or retrofit)	$	~$	$	$	$	$*	$	$	$	$	$	$				$
Curb cuts and ramps	$	~$	$	$	$	$*	$	$	$	$	$	$				$
Counting equipment				$	$		$	$	$	$	$	$	$*			$
Data collection and monitoring for pedestrians and/or bicyclists				$	$		$	$	$	$	$	$	$*			$
Historic preservation (pedestrian and bicycle and transit facilities)	$	~$	$	$	$				$	$						$
Landscaping, streetscaping (pedestrian and/or bicycle route; transit access); related amenities (benches, water fountains); generally as part of a larger project	~$	~$	~$	$	$			$	$	$						$
Lighting (pedestrian and bicyclist scale associated with pedestrian/bicyclist project)	$	~$	$	$	$		$	$	$	$	$	$				$
Maps (for pedestrians and/or bicyclists)				$	$	$			$	$		$	$*			
Paved shoulders for pedestrian and/or bicyclist use	$	~$	$			$*	$	$	$	$		$				$

Key: $ = Funds may be used for this activity (restrictions may apply). ~$ = Eligible, but not competitive unless part of a larger project. $* = See program-specific notes for restrictions.

	Pedestrian and Bicycle Funding Opportunities U.S. Department of Transportation Transit, Highway, and Safety Funds															
Activity or Project Type	BUILD	INFRA	TIFIA	FTA	ATI	CMAQ	HSIP	NHPP	STBG	TA	RTP	SRTS	PLAN	NHTSA 402	NHTSA 405	FLTTP
Pedestrian plans				$					$	$		$	$			$
Recreational trails	~$	~$	~$						$	$	$					$
Road Diets (pedestrian and bicycle portions)	$	~$	$				$	$	$	$						$
Road Safety Assessment for pedestrians and bicyclists							$		$	$			$			$
Safety education and awareness activities and programs to inform pedestrians, bicyclists, and motorists on ped/bike safety									$SRTS	$SRTS		$	$*	$*	$*	
Safety education positions									$SRTS	$SRTS		$		$*		
Safety enforcement (including police patrols)									$SRTS	$SRTS		$		$*	$*	
Safety program technical assessment (for peds/bicyclists)									$SRTS	$SRTS		$	$*	$		
Separated bicycle lanes	$	~$	$	$	$	$	$	$	$	$		$				$
Shared use paths / transportation trails	$	~$	$	$	$	$*	$	$	$	$	$	$				$
Sidewalks (new or retrofit)	$	~$	$	$	$	$	$	$	$	$	$	$				$
Signs / signals / signal improvements	$	~$	$	$	$	$	$	$	$	$		$				$
Signed pedestrian or bicycle routes	$	~$	$	$	$	$		$	$	$		$				$
Spot improvement programs	$	~$	$	$			$	$	$	$	$	$				$
Stormwater impacts related to pedestrian and bicycle projects	$	~$	$	$	$		$	$	$	$	$	$				$
Traffic calming	$	~$	$	$			$	$	$	$		$				$
Trail bridges	$	~$	$			$*	$	$	$	$	$	$				$
Trail construction and maintenance equipment									$RTP	$RTP	$					
Trail/highway intersections	$	~$	$			$*	$	$	$	$	$	$				$
Trailside and trailhead facilities (includes restrooms and water, but not general park amenities; see program guidance)	~$*	~$*	~$*						$*	$*	$*					$
Training						$	$		$	$	$	$	$*	$*		
Training for law enforcement on ped/bicyclist safety laws									$SRTS	$SRTS		$			$*	
Tunnels / undercrossings for pedestrians and/or bicyclists	$	~$	$	$	$	$*	$	$	$	$	$	$				$

Abbreviations

ADA/504: Americans with Disabilities Act of 1990 / Section 504 of the Rehabilitation Act of 1973
BUILD: Better Utilizing Investments to Leverage Development Transportation Discretionary Grants
INFRA: Infrastructure for Rebuilding America Discretionary Grant Program
TIFIA: Transportation Infrastructure Finance and Innovation Act (loans)
FTA: Federal Transit Administration Capital Funds
ATI: Associated Transit Improvement (1% set-aside of FTA)
CMAQ: Congestion Mitigation and Air Quality Improvement Program
HSIP: Highway Safety Improvement Program
NHPP: National Highway Performance Program
STBG: Surface Transportation Block Grant Program
TA: Transportation Alternatives Set-Aside (formerly Transportation Alternatives Program)
RTP: Recreational Trails Program
SRTS: Safe Routes to School Program / Activities
PLAN: Statewide Planning and Research (SPR) or Metropolitan Planning funds
NHTSA 402: State and Community Highway Safety Grant Program
NHTSA 405: National Priority Safety Programs (Nonmotorized safety)
FLTTP: Federal Lands and Tribal Transportation Programs (Federal Lands Access Program, Federal Lands Transportation Program, Tribal Transportation Program, Nationally Significant Federal Lands and Tribal Projects)

Program-specific notes: Federal-aid funding programs have specific requirements that projects must meet, and eligibility must be determined on a case-by-case basis.

- BUILD: Subject to annual appropriations. See https://www.transportation.gov/BUILDgrants for details.
- INFRA: See https://www.transportation.gov/buildamerica/infragrants for details. Focus on projects that generate national or regional economic, mobility, and safety benefits.
- TIFIA: Program offers assistance only in the form of secured loans, loan guarantees, or standby lines of credit, but can be combined with other grant sources, subject to total Federal assistance limitations.
- FTA/ATI: Project funded with FTA transit funds must provide access to transit. See Bicycles and Transit and the FTA Final Policy Statement on the Eligibility of Pedestrian and Bicycle Improvements under Federal Transit Law.
  - Bicycle infrastructure plans and projects funded with FTA funds must be within a 3 mile radius of a transit stop or station, or if further than 3 miles, must be within the distance that people could be expected to safely and conveniently bike to use the particular stop or station.
  - Pedestrian infrastructure plans and projects funded with FTA funds must be within a ½ mile radius of a transit stop or station, or if further than ½ mile, must be within the distance that people could be expected to safely and conveniently walk to use the particular stop or station.
  - FTA funds cannot be used to purchase bicycles for bike share systems.
  - FTA encourages grantees to use FHWA funds as a primary source for public right-of-way projects.
- CMAQ projects must demonstrate emissions reduction and benefit air quality. See the CMAQ guidance at www.fhwa.dot.gov/environment/air_quality/cmaq/ for a list of projects that may be eligible for CMAQ funds. Several activities may be eligible for CMAQ funds as part of a bicycle and pedestrian-related project, but not as a highway project. CMAQ funds may be used for shared use paths, but may not be used for trails that are primarily for recreational use.
- HSIP projects must be consistent with a State's Strategic Highway Safety Plan and (1) correct or improve a hazardous road location or feature, or (2) address a highway safety problem.
- NHPP projects must benefit National Highway System (NHS) corridors.
- STBG and TA Set-Aside: Activities marked "$SRTS" means eligible only as an SRTS project benefiting schools for kindergarten through 8th grade. Bicycle transportation nonconstruction projects related to safe bicycle use are eligible under STBG, but not under TA (23 U.S.C. 217(a)).
- RTP must benefit recreational trails, but for any recreational trail use. RTP projects are eligible under TA and STBG, but States may require a transportation purpose.
- SRTS: FY 2012 was the last year for SRTS funds, but SRTS funds are available until expended.
- Planning funds must be used for planning purposes, for example:
  - Maps: System maps and GIS;
  - Safety education and awareness: for transportation safety planning;
  - Safety program technical assessment: for transportation safety planning;
  - Training: bicycle and pedestrian system planning training.
- Federal Lands and Tribal Transportation Programs (FLTTP) projects must provide access to or within Federal or tribal lands:
  - Federal Lands Access Program (FLAP): Open to State and local entities for projects that provide access to or within Federal or tribal lands.
  - Federal Lands Transportation Program: For Federal agencies for projects that provide access within Federal lands.
  - Tribal Transportation Program: available for federally-recognized tribal governments for projects within tribal boundaries and public roads that access tribal lands.
- NHTSA 402 project activity must be included in the State's Highway Safety Plan. Contact the State Highway Safety Office for details: http://www.ghsa.org/html/about/shsos.html
- NHTSA 405 funds are subject to State eligibility, application, and award. Project activity must be included in the State's Highway Safety Plan. Contact the State Highway Safety Office for details: http://www.ghsa.org/html/about/shsos.html

Cross-cutting notes

- FHWA Bicycle and Pedestrian Guidance: http://www.fhwa.dot.gov/environment/bicycle_pedestrian/
- **Applicability of 23 U.S.C. 217(i) for Bicycle Projects:** 23 U.S.C. 217(i) requires that bicycle facilities "be principally for transportation, rather than recreation, purposes". However, sections 133(b)(6) and 133(h) list "recreational trails projects" as eligible activities under STBG. Therefore, the requirement in 23 U.S.C. 217(i) does not apply to recreational trails projects (including for bicycle use) using STBG funds. Section 217(i) continues to apply to bicycle facilities other than trail-related projects, and section 217(i) continues to apply to bicycle facilities using other Federal-aid Highway Program funds (NHPP, HSIP, CMAQ). The transportation requirement under section 217(i) is applicable only to bicycle projects; it does not apply to any other trail use or transportation mode.
- There may be occasional DOT or agency incentive grants for specific research or technical assistance purposes.
- Aspects of DOT initiatives may be eligible as individual projects. Activities above may benefit safe, comfortable, multimodal networks; environmental justice; and equity.

Appendix F — Equity Analysis Methodology

Equity is important to SEMCOG. A major indicator of how well a transportation system functions is measuring the equitable level of service provided to all segments of the population. The goal of this equity analysis is to understand where there are concentrations of various populations in the region. Of particular focus are areas in the region that have high concentrations of populations who are likely reliant on an accessible bicycle and pedestrian network to meet their needs. In determining these concentration areas, five-socio-economic indicators were used:

Concentration of Equity Populations

Children Population
Population aged 17 and under, which accounts for 1,054,290 persons (22 percent of Southeast Michigan's total population).

Low-Income Households
Households in the lowest income quartile for the region. There are 465,635 (25 percent of all households) low-income households in the region.

Minority Population
Persons belonging to any of the following groups – Black; Hispanic; Asian; American Indian and Alaskan Native. The region's minority population is 1,446,089 (31 percent of the total population).

Senior Population
Population aged 65 and older, which accounts for 696,810 persons (15 percent of the region's total population).

Transit-Dependent Households
Combines zero-car households and households with fewer cars available than workers (+16 years of age). There are 143,358 (7.8 percent) households without an automobile; an additional 138,341 (7.5 percent) of households have fewer automobiles available than workers. Transit-dependent households account for 12.5 percent of the region's households.

In developing this Equity Analysis the percentage of each of the five socio-economic indicators for every Traffic Analysis Zone (TAZ) in the region was calculated and mapped. TAZs are geographic areas dividing the region into relatively similar areas of land use and land activity, and are primarily used in SEMCOG's travel demand forecasting model. There are 2,811 internal TAZs in the SEMCOG region. Following the calculation and mapping for the five socio-economic indicators, every TAZ was classified into one of five bins:

1. well above average;
2. above average;
3. average;
4. below average; and
5. well below average.

Each bin was then given a score ranging from zero to four based on which quantile the TAZ fell into. For example, TAZs that scored significantly below the regional average received a score of 0; those below average, a score of 1; those near the average, a score of 2; those above the average, a score of 3; and those significantly above average, a score of 4. A summary score of all five indicators for each TAZ (ranging from 0-20) is used to show regional concentrations of equity populations.

Then a cumulative numeric score of 0 to 20 is calculated for every TAZ on the concentration of a population identified in each of the five socio-economic indicators. Each of the region's 2,811 TAZs was scored with the maximum possible score of 20 since there are 5 indicators and a maximum bin score of 4 per indicator.

Appendix G — Demand Analysis Methodology

SEMCOG's Demand Analysis identifies areas of bicycle and pedestrian demand, based on concentrations of people, destinations, and specific trip-making characteristics. Its goal is to highlight where bicycle and pedestrian improvements could be most impactful from a mobility perspective. Levels of demand have been assessed in three demand area categories:

- **High Demand Areas** – locations in the region that are likely the most bicycle and pedestrian friendly, or those areas with the most potential to support people walking or biking. They include the region's major downtowns and town centers, and locations with high density of people and destinations.
- **Moderate Demand Areas** – locations that are likely to support walking and biking, but in many cases driving is still necessary for some daily trips. They include many of the region's smaller town centers, as well as areas adjacent to high demand areas. Outside of town centers, they are primarily residential areas, with commercial development along major roadways and intersections. They often include transit services and grid-patterned residential streets that could provide more direct walking or biking routes.
- **Potential Demand Areas** – less densely populated locations that have clusters of activity that may support walking and biking if adequate infrastructure exists. Road networks in these areas may be less developed, making travel times less suited for walking and biking trips, which are typically shorter in distance. These areas are also typically less connected to fixed-route transit, so bicycle and pedestrian mobility is more localized, or recreational in nature. In many cases, some of the potential demand areas could become moderate demand areas with improvements in one or two component categories such as transit service or street intersection density.

Places outside of these three areas may have bicycle and pedestrian activity, but trips are more likely to be recreational in nature, and the distance between common destinations is longer than most people would reasonably walk or bike.

Components of Demand Analysis

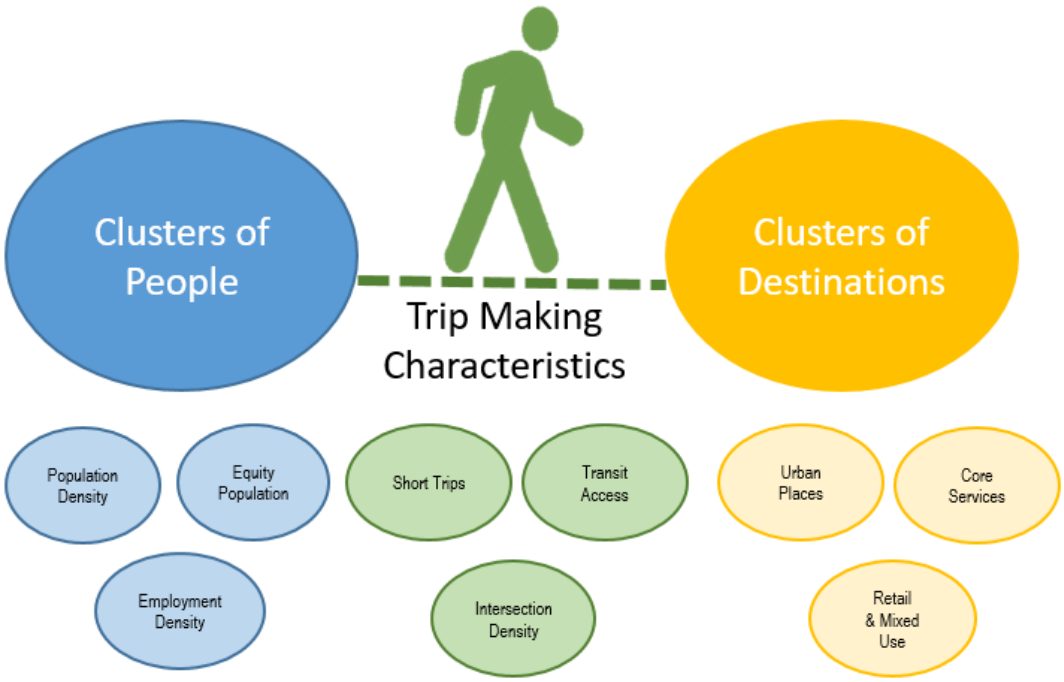
SEMCOG's Demand Analysis is based on region wide geographic datasets that center on the following components:

1. Clusters of People
2. Clusters of Destinations
3. Trip Making Characteristics

Each of these components play a crucial role in measuring demand based on specific data variables at the parcel or Travel Analysis Zone (TAZ) level. TAZs are geographic areas dividing the region into relatively similar areas of land use and land activity, and are primarily used in SEMCOG's travel demand forecasting model. There are 2,811 internal TAZs in the SEMCOG region. These datasets were analyzed using Geographic Information Systems (GIS), to create sub scores for each topic area that were eventually combined into one composite score.

Figure 118 displays how these three components work, the specific data sets, and basic principles for the analysis.

Figure 118
Demand Analysis Diagram



1. Clusters of People

At the center of the analysis are people. Where there are few people, there will be fewer pedestrians or bicyclists. SEMCOG's analysis measures three different datasets to identify concentrations of people who could be walking or biking. Datasets to identify clusters of people are: Population Density; Equity Populations; and Employment Density. In total, these three datasets for clusters of people can award an area a maximum score of 30 points.

Population Density – Where there are more people in closer proximity to each other, there is a greater pool of people who may choose to walk or bike to reach commercial, civic, or core service destinations. They are also more likely to walk or bike in reaching one another since the distances are often shorter.

Scoring: 5 points were awarded to census blocks where population density exceeds 1,500 people per square mile.

Equity Populations – Certain populations are likely to be more reliant on walking and biking to get reach destinations. These populations include:

- Households with low income

- Households with no access to a motor vehicle
- Minority populations
- Senior populations

Scoring: 2.5 points were awarded to census blocks that have 1.5 times the regional average of any of the four equity populations. A census block could receive a maximum award of 10 points if it had higher averages across all four equity populations.

Employment Density – Similar to population density, areas where there are many people working increases the opportunity to walk and bike. This density analysis includes the following employment sectors:

- General Employment, regardless of sector;
- Retail Employment; and
- Leisure/Hospitality Service Employment.

Scoring: Utilizing SEMCOG's Employment Density Map areas of "high" employment density were awarded 5 points, while areas of medium employment density were awarded 3.5 points for each of the three employment categories. A census block could receive a maximum of 15 points if each of the three employment sectors were high.

2. Clusters of Destinations

Identifying destinations is important to understanding demand since most walking and biking trips that are not recreational are likely taken to reach a desired location. In identifying destinations, this analysis included three categories — core services; retail, entertainment and commercial land use; and Walkable Urban Places. In total, these three destination clusters can award an area a maximum score of 20 points.

Core Services - Core services are major destinations that residents need to access on a regular basis including, jobs, health care facilities, supermarkets, parks, schools, and libraries. SEMCOG's Access to Core Services report provides more information, including maps and data analysis for accessibility gaps. For this Clusters of Destinations analysis, parcels that had access to multiple core services within a 10-minute and 30-minute walk and bike ride were identified.

Scoring: 5 points were awarded to areas where three of more core services were accessible within a 10-minute walk or bike ride. 2.5 points were awarded where three or more core services were accessible within a 30-minute walk or bike ride. A parcel could receive a maximum score of 15 points if it met all the four thresholds for both walking and biking.

Retail, Entertainment, and Commercial Land Use – Beyond core services, people are likely to walk or bike to other destinations that are near to their home, such as neighborhood hardware stores, convenience stores, and restaurants.

Scoring: 5 points were awarded to parcels where at least 1,500 square feet of retail, entertainment, or commercial land uses were within ¼ of a mile.

Walkable Urban Places - Walkable Urban Places or WalkUps are existing or emerging areas of walkability anchored by a mix of real-estate products, similar in nature to pre-WWII urban development. In 2015, Smart Growth America's LOCUS coalition and the George Washington School of Business partnership with Michigan State University's Land Policy Institute to develop the WalkUP Wake-Up Call: Michigan Metros report, which identifies the Walkable Urban Places and neighborhoods within the state, including Southeast Michigan. Areas designated as either an "established WalkUP", an "emerging WalkUP, or a "walkable neighborhood" in this report were overlaid as either High Demand or Moderate Demand to ensure consistency with this statewide analysis.

3. Trip Making Characteristics

Within the region there are certain transportation related trip making characteristics or variables that help promote demand for walking and biking trips. These variables are: the number and percentage of short trips occurring within an area; the street intersection density; and access to transit. In total, these three trip making characteristic variables can award an area a maximum score of 50 points.

Number and percentage of short trips
Trip length is a critical part of trip making, as shorter lengths or distances can be better suited for walking or biking trips. The shorter the trip distance the more likely walking or biking may be convenient methods of travel.

SEMCOG's Travel Demand Forecast Model was used to identify where there are high numbers of short trips occurring within the region. This model is based on SEMCOG's Household Survey data and shows all the trips occurring on a given day from one part of the region to another, regardless of mode (e.g. motor vehicle, transit, carpooling, walking, biking, etc.). It is calibrated using real world traffic counts, on-board transit survey data, and household and employment demographics to show how many trips are generated by a TAZ and what routes these trips will take to get people to their chosen destinations. Based on the model, the average trip length within Southeast Michigan is 8.9 miles (roughly a 14 minute car-trip). This is the average across all trip purposes with some types of trips being much shorter and others much longer.

Using the model, SEMCOG classified trip distances between TAZs into the following categories, which relate to the general trip distances for walking or biking:

- **Under ½ Mile:** This is the shortest distance reported in the Travel Demand Forecast Model. Trips under ½ mile are likely to be bikeable and walkable. These distances translate to less than a 5 minute bike ride or less than a 10 minute walk.
- **½ Mile to 1 Mile:** Trips between ½ mile and 1 mile are likely to be bikeable and may be walkable. These distances translate to a 5 to 10 minute bike ride or a 10 to 20 minute walk.
- **1 to 3 Miles**: Trips between one and three miles may be suitable for biking but less suitable for most walking trips. These distances translate to a 10 to 18 minute bike ride or a 20 to 60 minute walk.
- **3 to 5 Miles:** Trips between three and five miles may be bikeable but likely near the edge of what most people will travel. This distance is beyond a reasonable walk for most people. These distances translate to an 18 to 30 minute bike ride or a 60 to 100 minute walk.

- **5 to 10 Miles:** Trips between five and ten miles are the upper limit for most people biking and unlikely practical for walking. Some long distance riders may be interested to ride this far to reach a regional park or trail, but many others may not. These distances translate to a 30 to 60 minute bike ride or a 100 to 200 minute walk.

SEMCOG ranked each TAZ based on the total number and the percentage of short trips beginning or ending within that zone. A maximum of 30 points could be awarded to any one zone.

Each zone was ranked based on its number of short trips compared to all other zones within the region and then divided into four distant quartile groups for each of the five short trip ranges mentioned above. These quartile groups are designated as:

- Very high number of short trips
- High number of short trips
- Moderate number of short trips
- Low number of short trips

Scoring: Zones were given points for the top three quartiles (very high to moderate), with the highest quartiles receiving the most points. Should a zone have very high number of short trips for all five ranges, it would be awarded 22.5 points (75% of the total short trip score). Table 22 displays the points awarded for each range of the three quartiles.

Table 22
Scoring Criteria for Number of Short Trips

Distance	Trip Threshold	Points
	Very High Number Short Trips Zone (75th - 100 percentile)	
Under Half Mile	706 trips or more	6
Half Mile to 1 Mile	702 or more	4.5
1-3 Miles	2,844 or more	4.5
3-5 Miles	1,735 or more	4.5
5-10 Miles	2,103 or more	3
	High Number of Short Trip Zone (50th – 74th percentile)	
Under Half Mile	346-705 trips	4.8
Half Mile to 1 Mile	360-701	3
1-3 Miles	1674 - 2844	3
3-5 Miles	1014 - 1734	3
5-10 Miles	1,226 - 2,102	1.2
	Moderate Number of Short Trip Zone (25th – 49th percentile)	
Under Half Mile	120 - 345 trips	2.4
Half Mile to 1 Mile	127-359 Trips	1.6
1-3 Miles	740 - 1,673	1.6
3-5 Miles	446-1,013	1.6
5-10 Miles	537 - 1,225	0.6

To ensure the analysis was inclusive of smaller town centers, zones were also ranked by the percentage of short trips occurring within each zone compared to the rest of the region.

Scoring: Similar to the ranking by number of trips, zones were grouped into quartiles, but points were only given for the highest quartile for each of the five short trip ranges, potentially giving a zone a maximum of 7.5 points (25% of the total short trip score).

Table 23
Scoring Criteria for Percentage of Short Trips

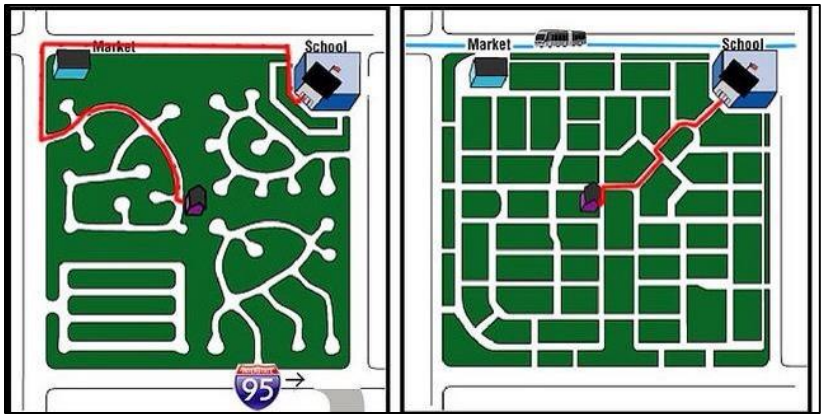
Distance	Trip Percentage	Points
Under Half Mile	8%	2.4
Half Mile to 1 Mile	8%	1.5
1-3 Miles	32%	1.5
3-5 Miles	20%	1.5
5-10 Miles	25%	0.6

Street Intersection Density

A gridded street network with a high number of intersections holds advantages for people walking or biking. A dense grid of streets minimizes circuitous travel, while providing people walking and biking more route options due to the likelihood of parallel roadways. It also gives drivers more options, reducing traffic volumes and often increasing pedestrian and bicycle comfort.

Figure 119 illustrates the benefits of street intersection density through a gridded network. This diagram displays the difference in travel options between a low intersection density network (on the left) and a higher density network with a variety of direct routes to local destinations (on the right).

Figure 119
Street Network Intersection Density Diagram



To identify street intersection density, the proximity of each parcel to four-legged intersections was analyzed. In examining the region's street network, SEMCOG determined that 12 four-legged intersections per ¼ mile was the minimum needed to support a gridded street network.

Scoring: 10 points were awarded to each parcel that contained at least 12 four-legged intersections per ¼ mile.

Access to transit
Access to transit helps to expand the reach of people walking and biking to and from destinations. Conversely, walking and biking infrastructure is vital to extending the reach of a transit network. The Federal Transit Administration (FTA) has determined that bicycle and pedestrian projects up to ½ mile away from fixed route transit is deemed eligible for transit related federal funding. Based on this determination, SEMCOG conducted a buffer analysis of the region's transit network to identify areas within ¼ mile and ½ mile of fixed-route transit.

Scoring: 10 points were awarded to areas within ¼ mile of fixed-route transit service. 5 points were awarded to areas within ½ mile of fixed-route transit service.

Results

Adding the awarded points for the three components of demand – clusters of people (maximum of 30 points), clusters of destinations (maximum of 20 points), and trip making characteristics (maximum of 50 points) – results in a possible 100 point demand analysis scale. The three demand area categories were determined by the following ranges of point totals:

- **High Demand** – areas scoring between 75 and 100 points;
- **Moderate Demand** – areas scoring between 50 and 74 points; and
- **Potential Demand** – areas scoring between 25 and 49 points.

The remaining areas of the region scored between 0 and 24 points. While demand areas are an important component to bicycle and pedestrian planning, areas outside of the three demand areas may still have infrastructure and programming needs, especially in relation to regional connectivity. Communities with areas outside of demand areas should consult the Regional Corridors map, and Appendix B to learn more about their potential role in implementing regional bicycle and pedestrian corridors.

Walkable Urban Places and Walkable Neighborhoods were also added to the high and moderate demand areas to ensure continuity with The Walk-up Michigan Metros.

Table 24 shows the three Bicycle and Pedestrian Demand Areas by total acres, land percentage of the region, and land percentage of demand areas.

Table 24
Bicycle and Pedestrian Demand Areas

Bicycle and Pedestrian Demand Areas	Total Acres	Percentage of Region	Percentage of Demand Areas
High Demand	21,721	1%	3%
Moderate Demand	241,741	9%	30%
Potential Demand	524,255	19%	67%
Outside of Demand Areas	*1,935,118*	*71%*	-

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Mobility-Oriented Development Study

EXISTING CONDITIONS SUMMARY: WOODWARD AVENUE CORRIDOR

Image Source: Crain's Detroit Business

February 2020

INTRODUCTION

The Woodward Avenue Corridor Existing Conditions Summary of the Mobility-Oriented Development Study is a compilation of existing conditions data for the entire study corridor and its related station areas. The report provides an overview of the demographic, employment, and travel characteristics of the Woodward Avenue corridor, and provides snapshots of each station area's context, existing land use, zoning, and mobility conditions. These snapshots establish key points of comparison between station areas and identify measures by which station area typologies and TOD/MOD readiness will be determined in the following phases of the Study.

ABOUT RTA

The RTA (Regional Transit Authority) of Southeast Michigan was created in 2012 to plan for and coordinate public transportation in the 4-county region of Washtenaw, Wayne, Oakland, and Macomb counties. Its 10-member board is appointed for three-year terms by the county executives of Wayne, Oakland, and Macomb counties, the chair of the Washtenaw County Board of Commissioners, the Mayor of Detroit, and the Governor of Michigan. The Southeast Michigan region is currently served by five transit providers: Ann Arbor Area Transportation Authority (AAATA), Detroit Department of Transportation (DDOT), Detroit Transportation Corporation (DTC, or the Detroit People Mover), M-1 Rail (or the QLine), and Suburban Mobility Authority for Regional Transportation (SMART).

MOBILITY-ORIENTED DEVELOPMENT STUDY

Transit-Oriented Development (TOD) is a type of urban development that maximizes the amount of residential, business, and leisure space within walking distance of public transport. For Southeast Michigan, while TOD has been a key planning framework for corridors such as Woodward Avenue (in Detroit and Oakland County) and Washtenaw Avenue (in Washtenaw County), there has not been a region-wide understanding of and commitment to this strategic opportunity. Rather than replacing TOD, the concept of Mobility-Oriented Development (MOD) can build upon and expand the impact of TOD planning principles by creating not only vibrant station areas but also "mobility hubs" that can facilitate needed connections in a broader geography via a variety of different transportation modes.

TABLE OF CONTENTS

WOODWARD CORRIDOR: OVERVIEW

DRAFT

MOD Study

Stations & Communities

Blue shaded areas behind some stations indicate where that station location might shift to in the future.

WOODWARD CORRIDOR: DEMOGRAPHICS

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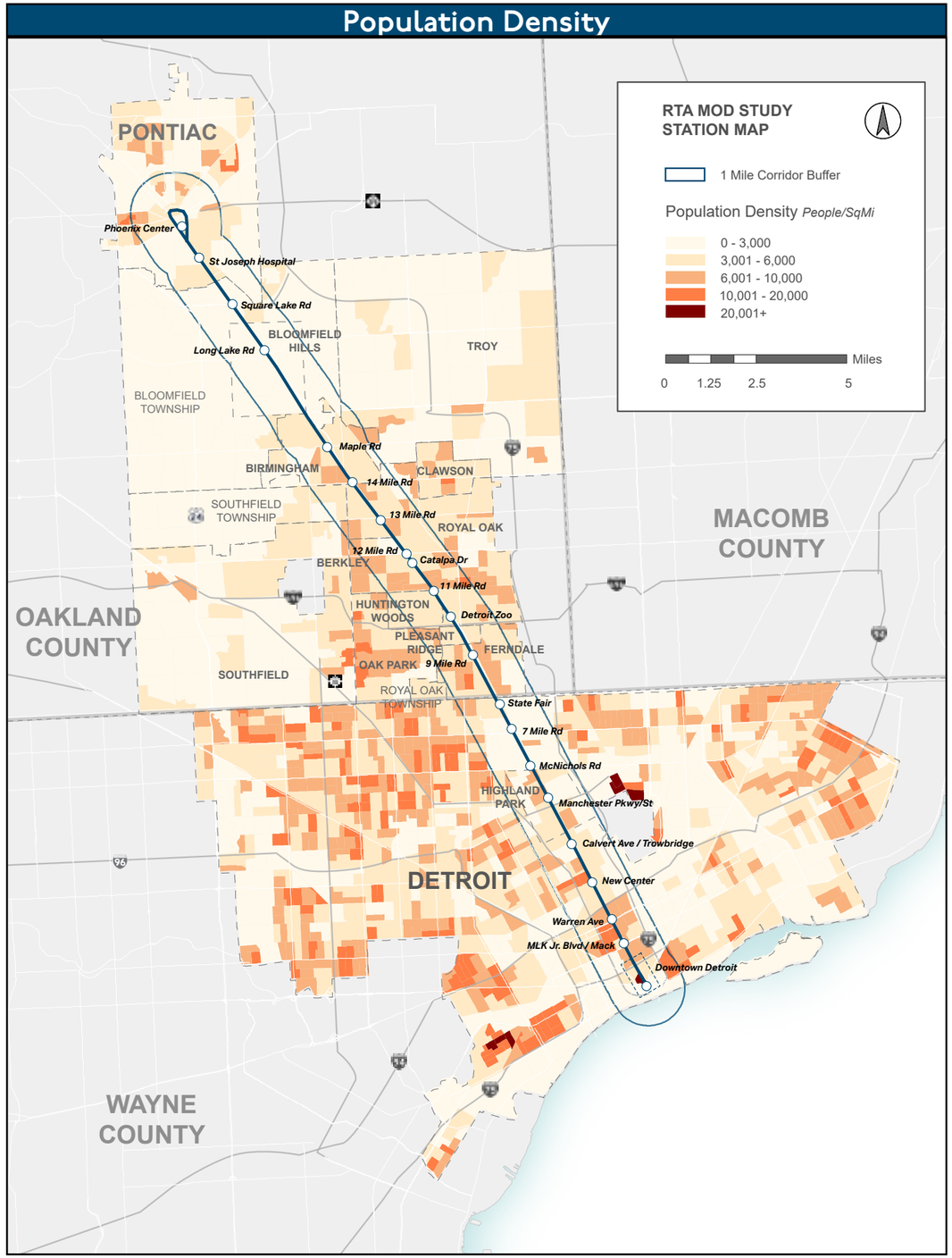
Population Density



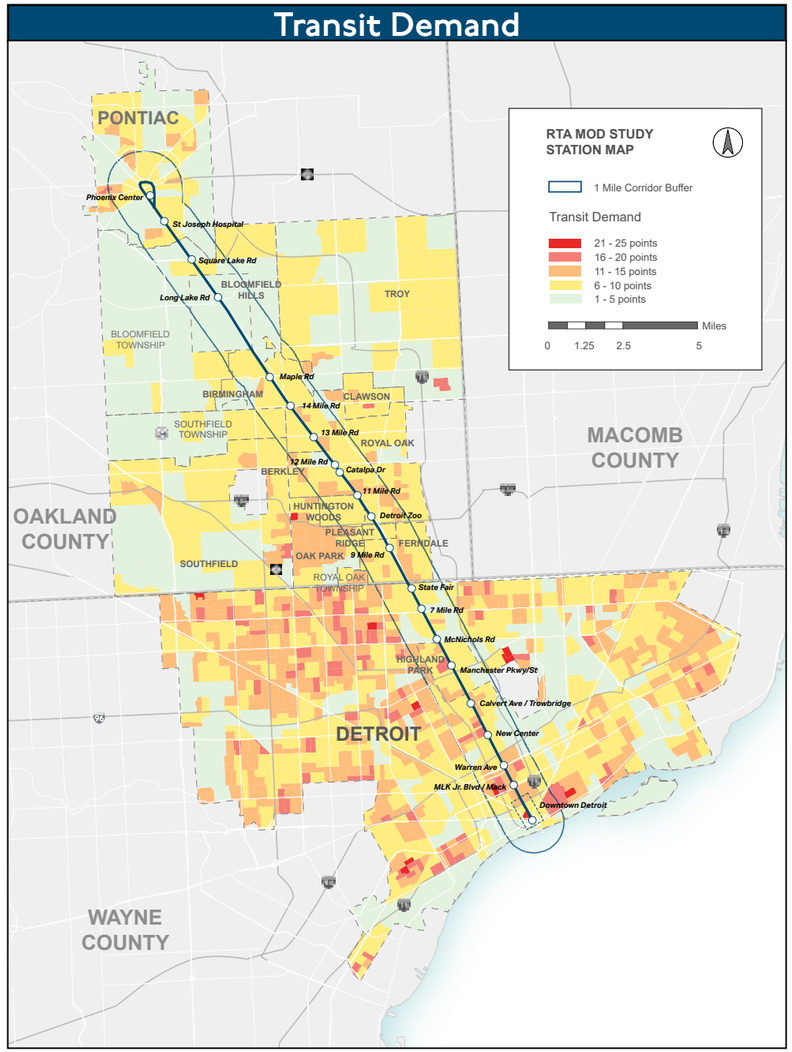
Source: American Community Survey 2013-2017

Population Change Over Time

	2010	2017	% Change 2010-2017	2045 Projection	% Change 2017-2045
WITHIN 1 MILE OF THE CORRIDOR					
Population	187,261	190,155	+1.5%	240,615	+26.5%
People per Square Mile	3,384	3,437	+1.5%	4,349	+26.5%
WITHIN THE CORRIDOR COMMUNITIES					
Population	1,158,243	1,133,344	-2.1%	1,167,464	+3.0%
People per Square Mile	3,934	3,850	-2.1%	3,966	+3.0%

Source: 2010 Census, American Community Survey 2013-2017

Transit Demand



Source: American Community Survey 2013-2017

This map shows the relative density of populations with a higher propensity to use transit as their primary means of transportation:

- Households without access to a vehicle
- Persons with disabilities
- Low-income individuals
- Individuals age 10 to 24
- Individuals age 65 and older

The methodology for the Transit Demand Index used to create this map is in the Appendix.

WOODWARD CORRIDOR: EMPLOYMENT

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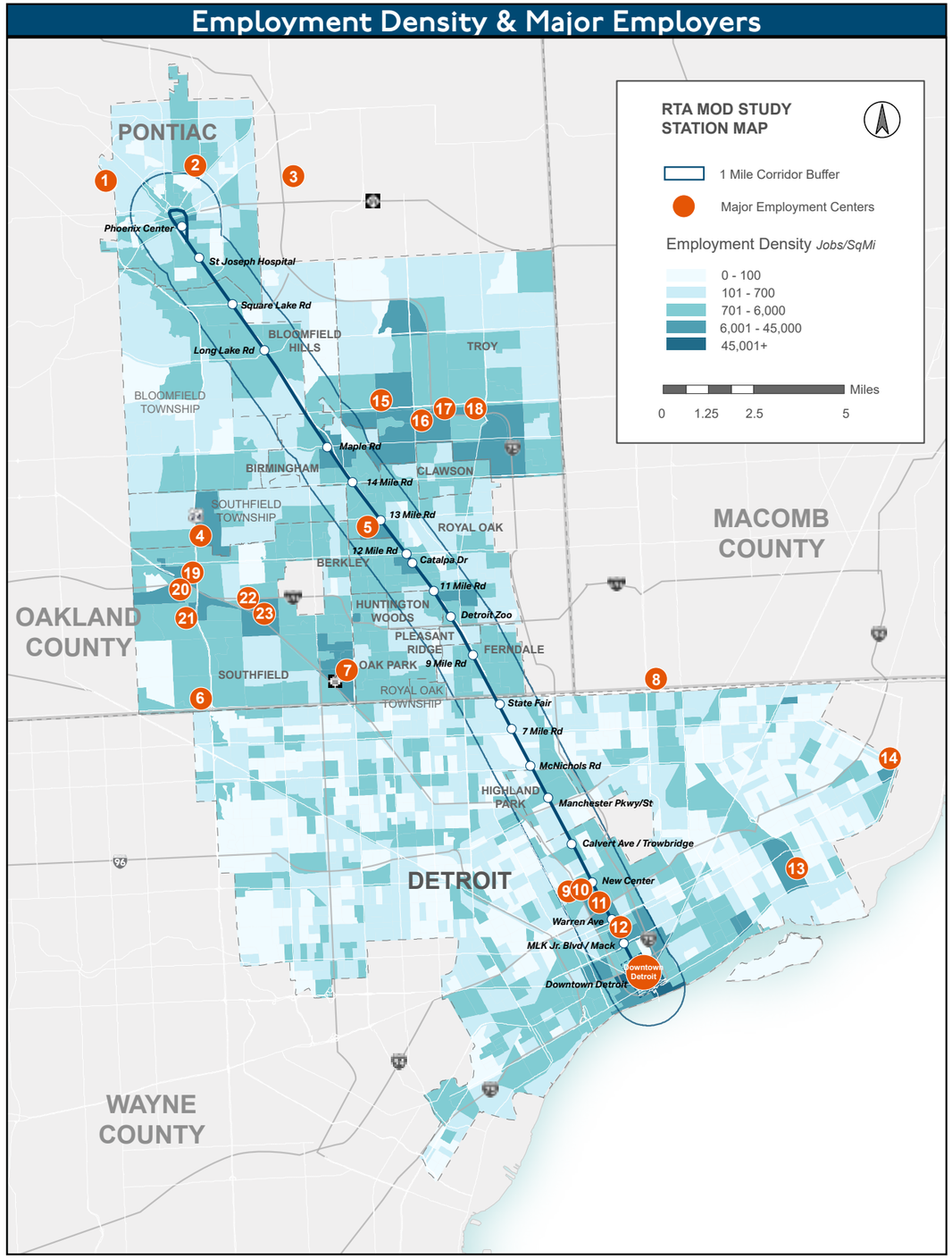
MOD Study

Employment Density & Major Employers



Source: Longitudinal Employer-Household Dynamics 2017

Employment Change Over Time

	2010	2017*	% Change	2045 Projection	% Change 2017-2045
WITHIN 1 MILE OF THE CORRIDOR					
Jobs	227,192	230,107	+1.3%	219,620	-4.6%
Jobs per Square Mile	4,106	4,159	+1.3%	3,969	-4.6%
WITHIN THE CORRIDOR COMMUNITIES					
Jobs	563,439	605,884	+7.5%	840,124	+38.7%
Jobs per Square Mile	1,914	2,058	+7.5%	2,854	+38.7%

Source: Longitudinal Employer-Household Dynamics 2010 and 2017
*Does not include federal workers

Major Employment Centers

Number on the Map	Major Employment Center	Number of Jobs
1	Oakland County	4,142
2	GM (Global Propulsion Systems)	3,991
3	Chrysler Group	11,975
4	Somerset Collection	6,118
5	PNC Building	3,416
6	Columbia Center	3,303
7	PentaCentre	3,973
8	Bingham Center Business Park	7,373
9	Beaumont Hospital (Royal Oak)	13,770
10	Essex Center	3,396
11	Hantz Group	6,772
12	Denso International America, Inc	3,034
13	Southfield Civic Center	7,483
14	Southfield Town Center	4,699
15	Millcraft Paper Company	3,085
16	Providence Hospital	4,710
17	Chrysler (Warren Truck Assembly)	7,290
18	Henry Ford Hospital	11,693
19	Fisher Building	6,998
20	Wayne State University	6,212
21	DMC Detroit	15,720
22	Chrysler Group (Jefferson North Assembly Plant)	4,531
23	St. John Hospital	5,772

Downtown Detroit: Major Employment Center	Number of Jobs
MGM Grand	3,534
DTE Energy	3,263
Quicken Loans (One Campus Martius)	3,760
Guardian Building	4,957
City of Detroit (Municipal Building)	7,752
General Motors (Renaissance Center)	5,003

Source: Longitudinal Employer-Household Dynamics 2017 (does not include federal workers)

WOODWARD CORRIDOR: TRAVEL

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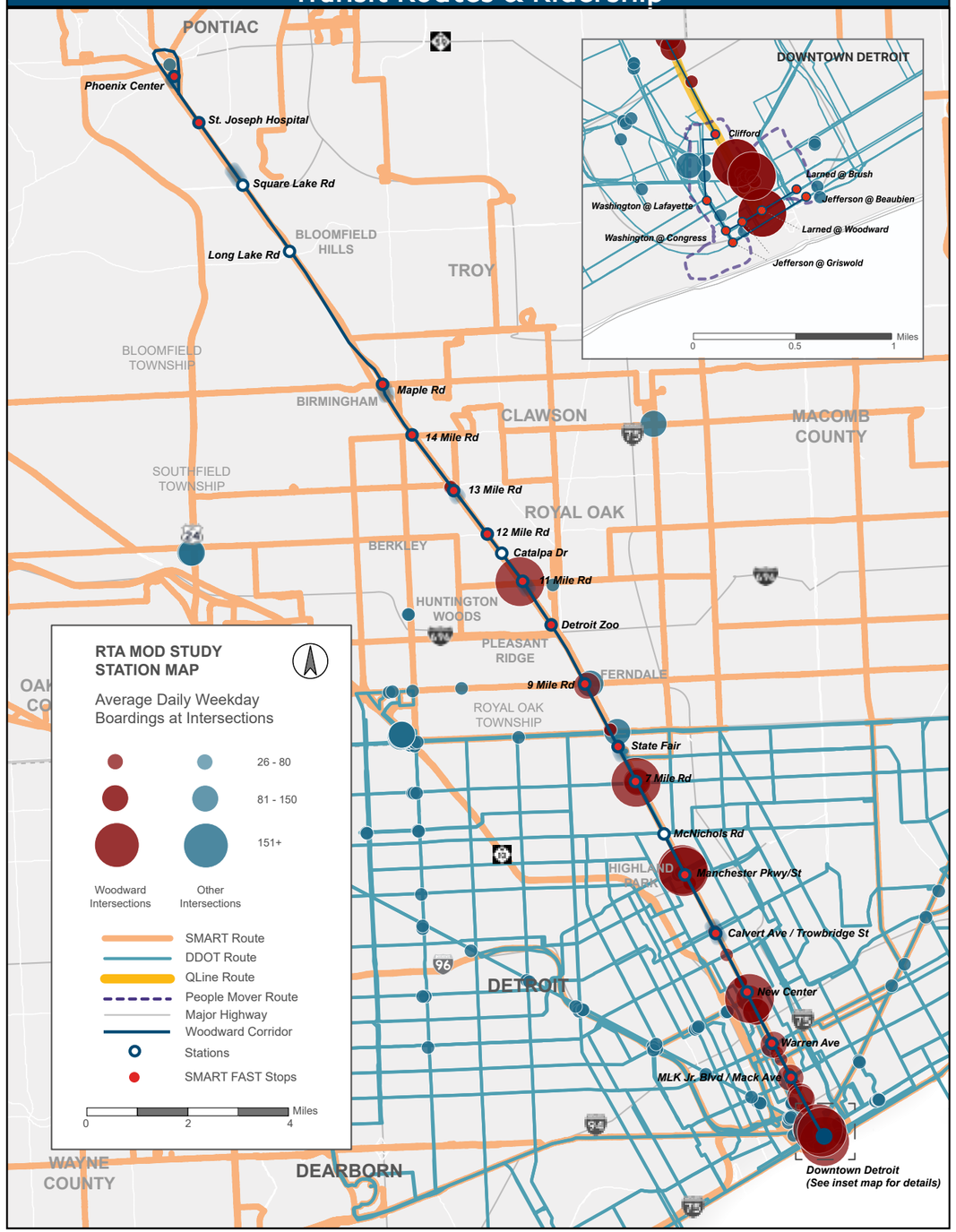
MOD Study

Transit Routes & Ridership



Source: SMART October 2017, DDOT Feb-April 2018, M-1 Rail October 2019

Transit

DDOT

The Woodward Avenue corridor is served by DDOT Route 4, part of the ConnectTen network which provides 24/7, higher-frequency bus service. Most DDOT routes intersect Woodward Avenue, facilitating many transfers both within the system and to other transit systems described below.

SMART

Route 450/460 is SMART's local Woodward route which splits at Maple Road with one branch going to Downtown Pontiac and one to Somerset Collection in Troy. Route 461/462 is SMART's FAST Woodward route with limited stops and higher frequency, operating 7 days per week for most of the day. Unlike other routes, FAST routes never require a transfer at the Detroit city boundary; both boardings and alightings are allowed at all FAST bus stops, no matter the route direction. Route 461/462 splits at Big Beaver Road with one branch to Downtown Pontiac and one to the City of Troy civic center. Woodward Avenue north of 8 Mile Road is intersected by many SMART routes, facilitating many transfers.

QLine

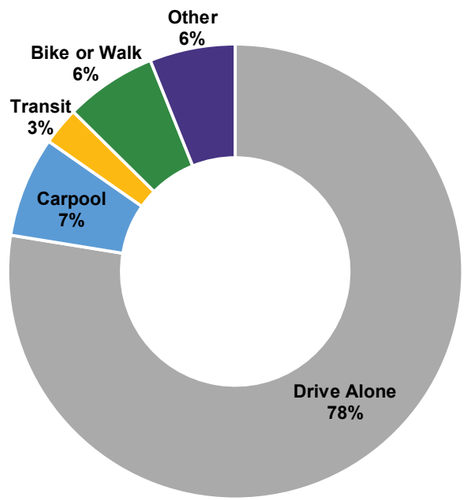
In New Center, Midtown, and Downtown Detroit, the Woodward corridor is also served by the QLine streetcar from Grand Boulevard to Congress Street. The streetcar operates in mixed traffic and is mostly edge-running with some center-running stops.

Woodward Transit Routes	Peak Hour Frequency	Average Daily Weekday Boardings
SMART 450/460 Woodward Local	15-min (30 in branches)	1,963
SMART 461/462 FAST Woodward	15-min (30 in branches)	3,223
DDOT 4 Woodward	10-min	3,702
QLine	20-min	3,073
TOTAL	**--**	**11,961**

Source: SMART June 2019, DDOT Feb-April 2018, M-1 Rail October 2019

Commute Mode Share

RESIDENTS WITHIN 1 MILE OF THE CORRIDOR



A detailed explanation of Commute Mode Share is in the Appendix.

Source: American Community Survey 2013-2017

PHOENIX CENTER: CONTEXT

DRAFT

MOD Study

Existing Land Use

Source: SEMCOG 2015

About the Station Area

The future transit node in at the Phoenix Center is located near the existing Amtrak and Greyhound stations on the southern edge of Downtown Pontiac. The blocks around the Phoenix Center inside the Woodward Loop are taken up by patches of historic urban fabric, surface parking lots, and vacant land. Outside the Woodward Loop lie single-family residential neighborhoods with clusters of vacant parcels. Several surface lots and vacant parcels immediately around the Phoenix Center and outside the Woodward Loop are publicly owned. The Phoenix Center, a large parking structure with a rooftop plaza that used to host events and concerts, has not hosted a large event in several years. Three large towers -- two with state government functions and one apartment building -- surround the monlith. There is a lack of housing inside the Woodward Loop.

Roadway Configuration

The existing bus station at the Phoenix Center on Water St is located approximately 100 ft east of the intersection of Water St and Saginaw St. Water St has two travel lanes in each direction. Both Water and Saginaw St dead-end at the intersection with access to off-street parking. There are stop signs at both crossing locations. East of the bus stop there are no east-west stop signs or north-south pedestrian crossings to provide access to Perry St and Mill St.

Population & Employment

	Within 0.5 Miles	Within 1 Mile
Population	2,097	8,790
Jobs	4,375	6,060

Source: American Community Survey 2013-2017; Longitudinal Employer-Household Dynamics 2017 (does not include federal workers)

Views of the Potential Station Area

Source: Google Earth

PHOENIX CENTER: LAND USE & ZONING

DRAFT

MOD Study

Land Use Planning

The 2014 Pontiac Master Plan employs the key principles of "Smart Growth" and encourages dense residential and mixed use development Downtown, specifically within 1/4 mile of a future transit hub. It also encourages the creation of density incentives for TOD in the downtown district.

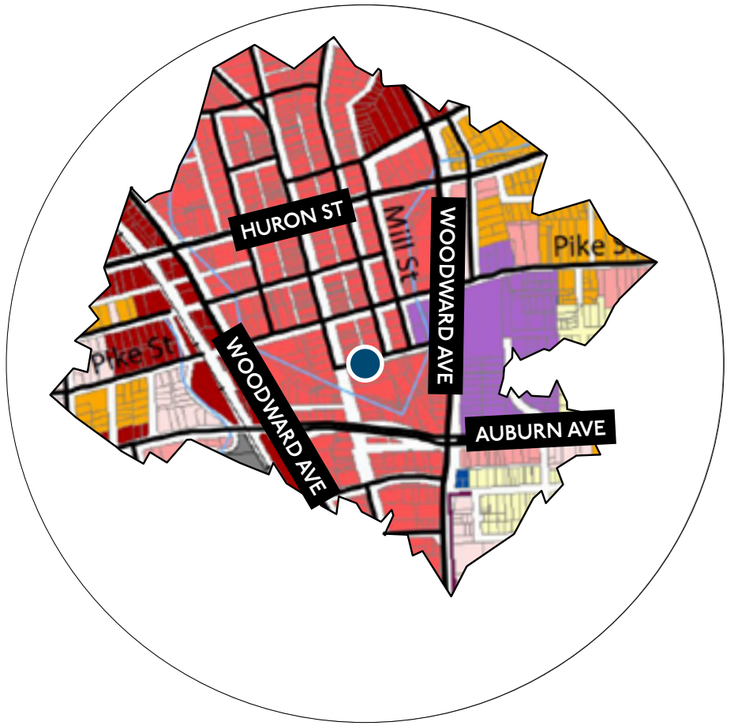
The lots between the southbound Woodward loop and the rail viaduct are designated as Entrepreneurial: Industrial, Commercial & Green (redevelopment with environmental sustainability in mind). This strip of land has been earmarked as a future innovation zone where development will be catalyzed by reinvestment in Downtown and the transformation of the Woodward Loop.

The area west of the rail viaduct is also designated as Mixed Use in the future land use plan.

Future Land Use

- Potential Station Location
- Residential
- Commercial
- Office
- Mixed Use
- Institutional
- Cemetery
- Park and Open Space
- Recreation
- Golf Course
- Industrial
- Parking
- Transportation/Communication/Utilities
- Water

Source: SEMCOG 2010



Pontiac Zoning
- R-1
- R-2
- R-3
- C-0
- C-1
- C-2
- C-3
- C-C
- M-1
- P-1

Zoning

The majority of the station area (inside the Woodward Loop) is designated as Downtown Mixed Use, which permits mixed use buildings and has no limitations on building height.

Other zoning districts in the area are either medium density residential or commercial focused. Pontiac's commercial districts promote vertical and horizontal mixed uses and a variety of uses. While Corridor Commercial is similar to the Downtown Mixed Use District, it does allow for additional uses like light industrial. However, it limits building heights to 35 ft.

Maximum off-street parking limitations and shared parking provisions help promote a more walkable environment.

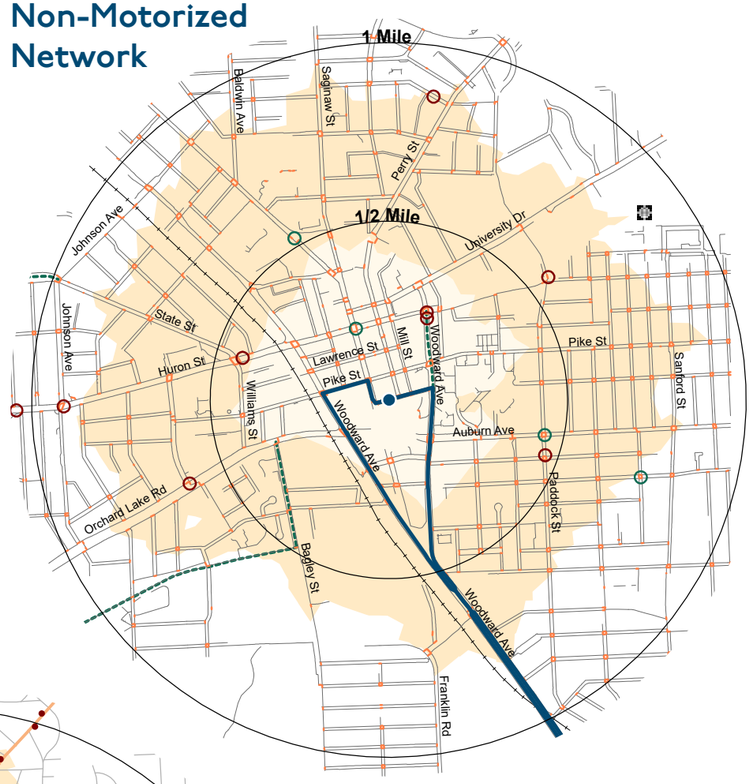
Metric	C-2 Downtown Mixed Use	C-O/C-1/C-3 Corridor Commercial Mixed Use	R-2/R-3 Two Family and Terrace Family/ Multiple Family Residential
Promotes Mixed Use	Yes	Yes	No
Building Height	no limit	35 ft	35 ft or 2.5 stories
Parking	• Shall not exceed 200% of minimum requirements • Shared parking permitted within 500 ft of building • Mixed Use Districts: Lower requirements for residential,		
Bike Parking	• Required for lots with >25 parking spaces • One bike space required per every 20 car spaces		

PHOENIX CENTER: MOBILITY

DRAFT

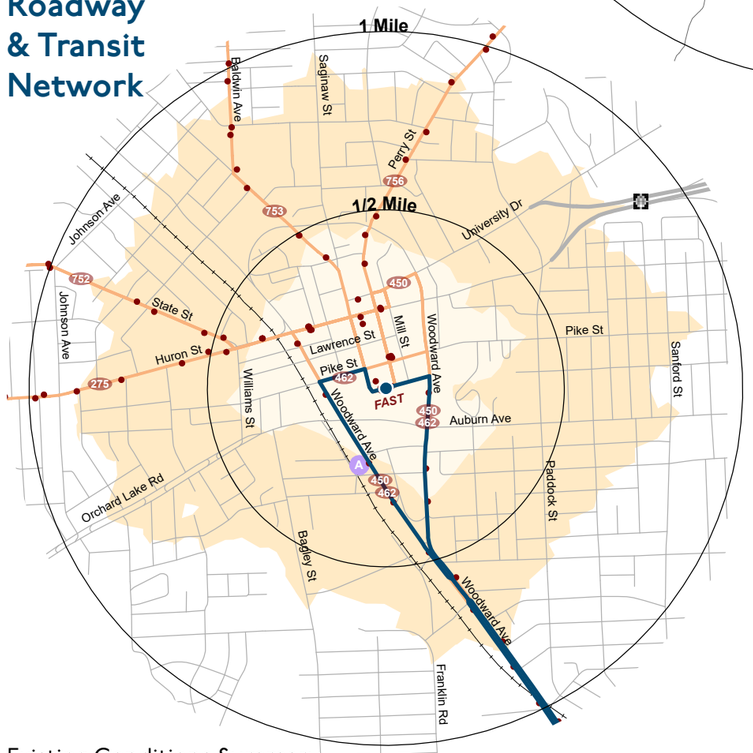
MOD Study

Non-Motorized Network



Station
Woodward Corridor
Railroad
1/2 Mile Walkshed
1 Mile Walkshed

Roadway & Transit Network



Non-Motorized Network

2018 Pedestrian Crash
Sidewalk
Crosswalk
2018 Bicycle Crash
Bikeshare Station
Planned Bikeshare Station
Shared Use Path (off-road)
Bike Lane (on-road)
Shared Lane (on-road)

Transit Network

SMART Bus Stop
SMART Bus Route
Amtrak Station

Mobility Planning

The Phoenix Center Station is proposed along Water Street within the Woodward Avenue Loop a few blocks from the McLaren Oakland Hospital. The Woodward Avenue Loop separates downtown Pontiac from the adjacent communities. The one-way loop was identified by the community as a major barrier to access downtown Pontiac. Pontiac's transportation network designed primarily for vehicular travel the wide streets and roads creates a challenge for pedestrian access. The Phoenix Center Station is proposed along Water Street within the Woodward Avenue Loop a few blocks from the McLaren Oakland Hospital. The Woodward Avenue Loop separates downtown Pontiac from the adjacent communities. The one-way loop was identified by the community as a major barrier to access downtown Pontiac. With Pontiac's transportation network designed primarily for vehicular travel the wide streets and roads create a challenge for pedestrian access. The Woodward Avenue Loop Alternative is a proposed transportation network that includes a street, sidewalk, and bike path system that will improve livability, long-term economic health, and adequate connection of the downtown surrounding neighborhoods for all users. Eleven Woodward Avenue Alternatives were developed but Alternative 10 was chosen as the preferred alternative for the redevelopment of the Woodward Loop. This Alternative consists of a two-way conversion of the loop: (1) a four to five lane cross section on the west side serving as a through route, (2) a two-to-three lane cross section with parking (where appropriate) on the east side serving as a local street, (3) enhanced bicycle and pedestrian amenities that include the completion of the sidewalk network, two-way on-road cycle track on east side, and two-way shared use path on the west side, (4) connection of Wesson Street across Woodward Avenue, and (5) the creation of a "Gateway" at the southern end of the Woodward Loop. Other improvements that correlate with the loop configuration includes the Pontiac Complete Streets Ordinance and the Pontiac Non-Motorized Plan that provides non-motorized facilities, amenities, and other transit options.

Transit

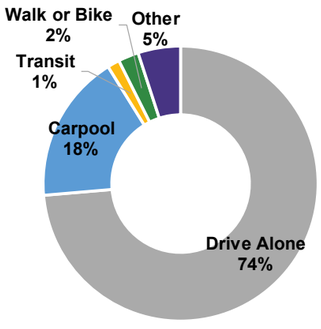
The current end-of-the-line stop for the northern branch of the FAST bus route is located at the Phoenix Center on Water Street in Downtown Pontiac. Connections to SMART Routes 275 (crosstown with 25- to 60-minute frequency), 752 (community route with 60-minute frequency), 753 (community route with 60-minute frequency), and 756 (community route with 60-minute frequency) can also be made at the Phoenix Center.

	Within 0.5 Miles	Within 1 Mile
Sidewalk & Crosswalk Mileage	30.4	107.8
Intersection Density (intersections per sq mi)	182.1	160.7
2018 Pedestrian Crashes	4	8
Bikeway Mileage	0.8	1.4
2018 Bicycle Crashes	2	0
TRANSIT ACTIVITY	**Average Weekday Boardings**	
SMART	664	737

Sources: SEMCOG Open Data, SMART October 2017

Commute Mode Share

RESIDENTS WITHIN 1 MILE



Source: American Community Survey 2013-2017

ST. JOSEPH HOSPITAL: CONTEXT

DRAFT

MOD Study

Existing Land Use

Source: SEMCOG 2015

- Potential Station Location
- Single Family Housing
- Attached Condo Housing
- Multi-Family Housing
- Retail; Retail-Residential
- Office; Office-Residential
- Institutional; Medical
- Hospitality; Hospitality-Residential
- Industrial
- Cemetery; Golf Course; Park and Open Space; Recreation
- Parking
- TCU
- Water
- Vacant
- Publicly Owned
- 1/2 Mile Walkshed

About the Station Area

The future transit node at the intersection of Woodward and MLK Boulevard is located in Pontiac, just north of the city's southern border with Bloomfield Township. This node is centered around St Joseph Hospital, which is a major trip generator and destination in the area. Much of the property immediately around the intersection is occupied by large surface parking lots serving the hospital and commercial establishments.

Beyond Woodward Ave and the Bloomfield Hills Townhouses development, the area is almost exclusively detached single family homes and churches. Homes and parcels in Pontiac and smaller and laid out on a uniform street grid with some vacant land. Larger homes in Bloomfield Twp exist on a warped street grid. Across the train tracks to east of the transit node is a large industrial park.

Roadway Configuration

Woodward Avenue has four lanes in each direction plus a nourthbound right turn lane onto MLK Blvd. Southbound vehicles must drive 1,000' south of the MLK Blvd intersection for the nearest crossover to access MLK Blvd.

MLK Blvd dead ends at Woodward. It has two lanes in each direction plus a right turn lane onto Woodward. There are sidewalks on both major roads. However, besides a pedestrian bridge over Woodward connecting to surface parking, there are no pedestrian crossings over Woodward in a mile in each direction.

Population & Employment

	Within 0.5 Miles	Within 1 Mile
Population	1,303	5,579
Jobs	1,197	5,767

Source: American Community Survey 2013-2017; Longitudinal Employer-Household Dynamics 2017 (does not include federal workers)

Views of the Potential Station Area

Source: Google Earth

ST. JOSEPH HOSPITAL: LAND USE & ZONING

DRAFT

MOD Study

Land Use Planning

Bloomfield Township

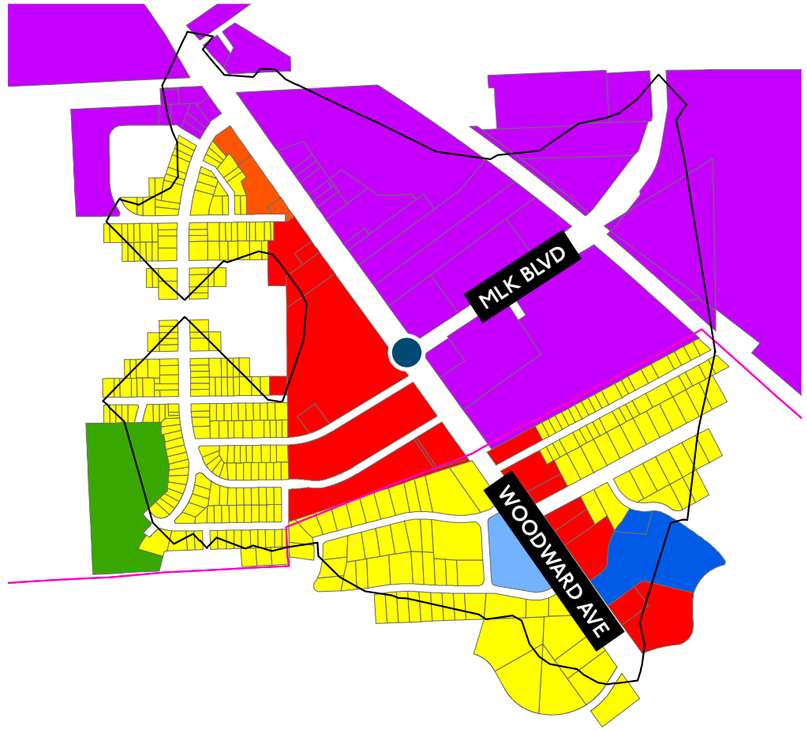
Bloomfield Township updated its Master Plan in 2015. The Future Land Use designations along Woodward align with current zoning and existing land uses. Office and Single Family Residential are the primary Future Land Use designations fronting Woodward near this future transit node. The township's Mixed Use future land use designation is not used on this segment of Woodward.

Pontiac

The 2014 Pontiac Master Plan employs the key principles of "Smart Growth" and provides flexible future land use designations that provide more guidance on physical form than types of uses allowed.

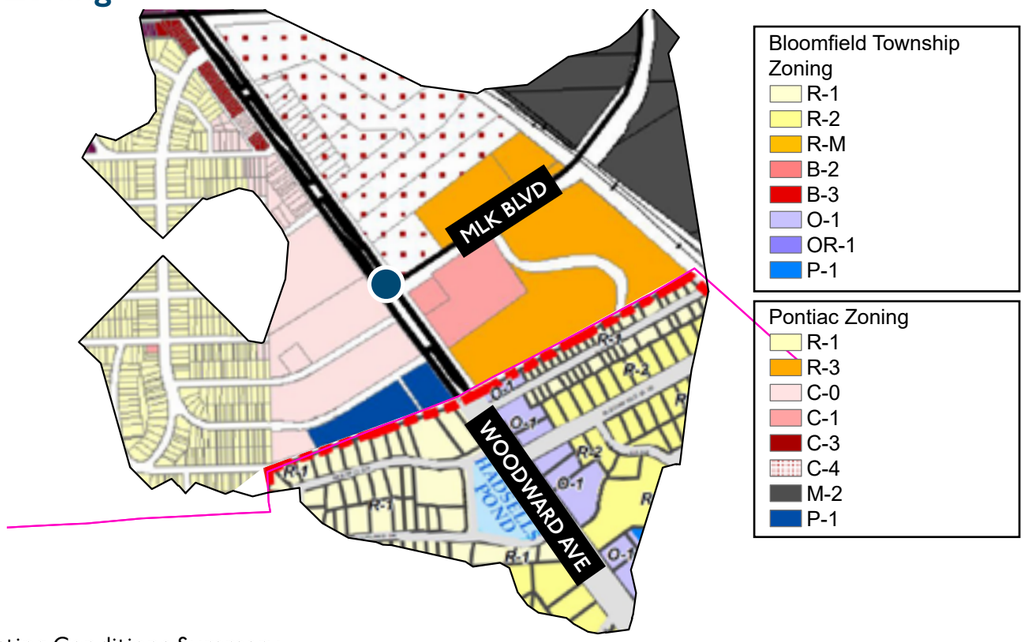
All of the land in Pontiac east of Woodward is designated as Entrepreneurial: Industrial, Commercial & Green (redevelopment with environmental sustainability in mind) in the future land use plan. Some of this land is occupied by the Bloomfield Hills Townhouses and Fox Pointe apartments today.

Future Land Use



Source: SEMCOG 2010

Zoning



Zoning

Bloomfield Township

Uses are primarily separated by zoning district classifications in Bloomfield Township, with the more diversified business types located in the B-3 General business district at the core of the area. Overall density and building heights are relatively low as the majority of this area is zoned for low and medium density residential uses. Zoning does not promote mixed uses. Building heights are limited to 2.5 stories in the districts represented in the half-mile walkshed.

Pontiac

The area around St Joseph Hospital in Pontiac is zoned primarily for multiple family and commercial mixed use. The mixed use designations generally support a mix of low density residential, low-intensity office, and neighborhood services. Only one of the several surface parking lots is currently zoned as Parking.

	Pontiac			Bloomfield Township	
Metric	R-3 Multiple Family	C-0 Residential Office Business	C-1 Local Business/ Residential Mixed Use	O-1 Office Building District	R-1/R-2 One Family Residential
Promotes Mixed Use	No	Somewhat	Yes	No	No
Building Height	35 ft			24 ft	2.5 stories
Parking	• Shall not exceed 200% of minimum requirements • Shared parking permitted within 500 ft of building			1 space per 175 sq ft for most uses	2 spaces per unit
Bike Parking	• Required for lots with >25 parking spaces • One bike space required per every 20 car spaces			N/A	

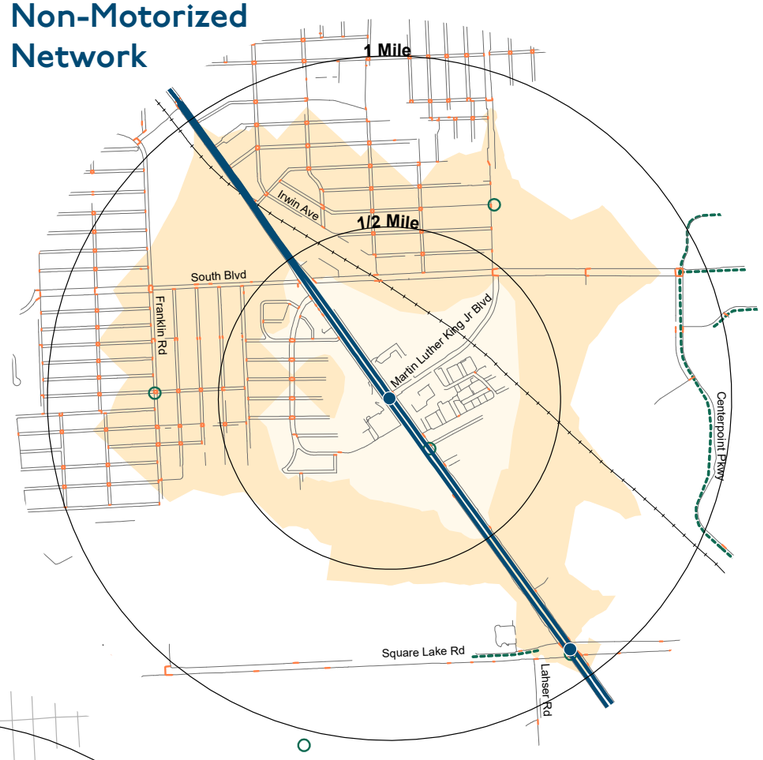
ST. JOSEPH HOSPITAL: MOBILITY

DRAFT

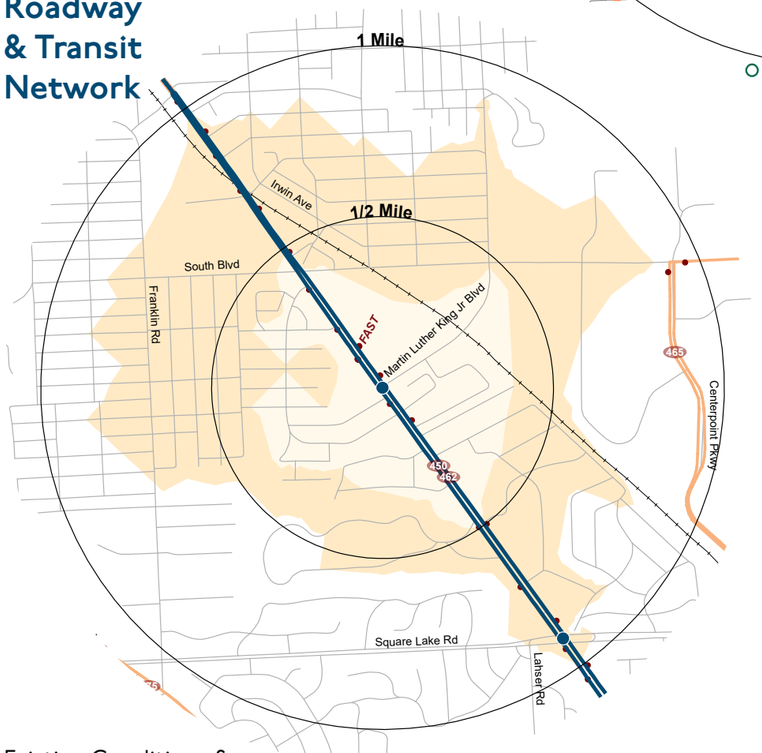
MOD Study

Station
Woodward Corridor
Railroad
1/2 Mile Walkshed
1 Mile Walkshed

Non-Motorized Network



Roadway & Transit Network



Non-Motorized Network

2018 Pedestrian Crash
Sidewalk
Crosswalk
2018 Bicycle Crash
Bikeshare Station
Planned Bikeshare Station
Shared Use Path (off-road)
Bike Lane (on-road)
Shared Lane (on-road)

Transit Network

SMART Bus Stop
SMART Bus Route

Mobility Planning

Woodward Avenue is a principal arterial and with 67,800 vehicles per day, it is the fifth busiest road in the Bloomfield Township. A proposed recommendation to help reduce crash potential is to manage access points by consolidating and redesigning driveways to reduce the number of access points and permitting vehicular access where possible. To help relieve congestion, improve accessibility throughout the community, and to promote a healthy lifestyle, there are plans to improve non-motorized paths such as sidewalks, multi-modal paths, and bike lanes, as well as adopt Transit-Oriented Development (TOD) standards that consists of land use patterns that promote travel by transit, biking, walking, and ridesharing. The desire the development along transit routes be able to support transit by increased intensity of development, improved pedestrian connections, and appropriate locations of buildings and parking.

Transit

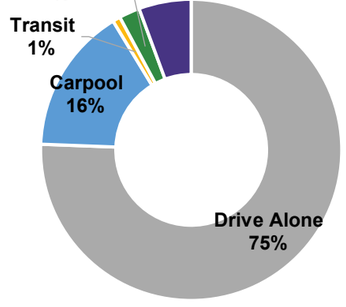
A FAST bus stop is located north of the hospital's main entrance which is served by the northern branch of the FAST bus route. Besides the Woodward Local and FAST routes, there are no other transit connections available at this location.

	Within 0.5 Miles	Within 1 Mile
Sidewalk & Crosswalk Mileage	16.0	54.2
Intersection Density (intersections per sq mi)	95.5	89.1
2018 Pedestrian Crashes	0	0
Bikeway Mileage	0	1.2
2018 Bicycle Crashes	0	0
TRANSIT ACTIVITY	**Average Weekday Boardings**	
SMART	109	130

Sources: SEMCOG Open Data, SMART October 2017

Commute Mode Share

RESIDENTS WITHIN 1 MILE



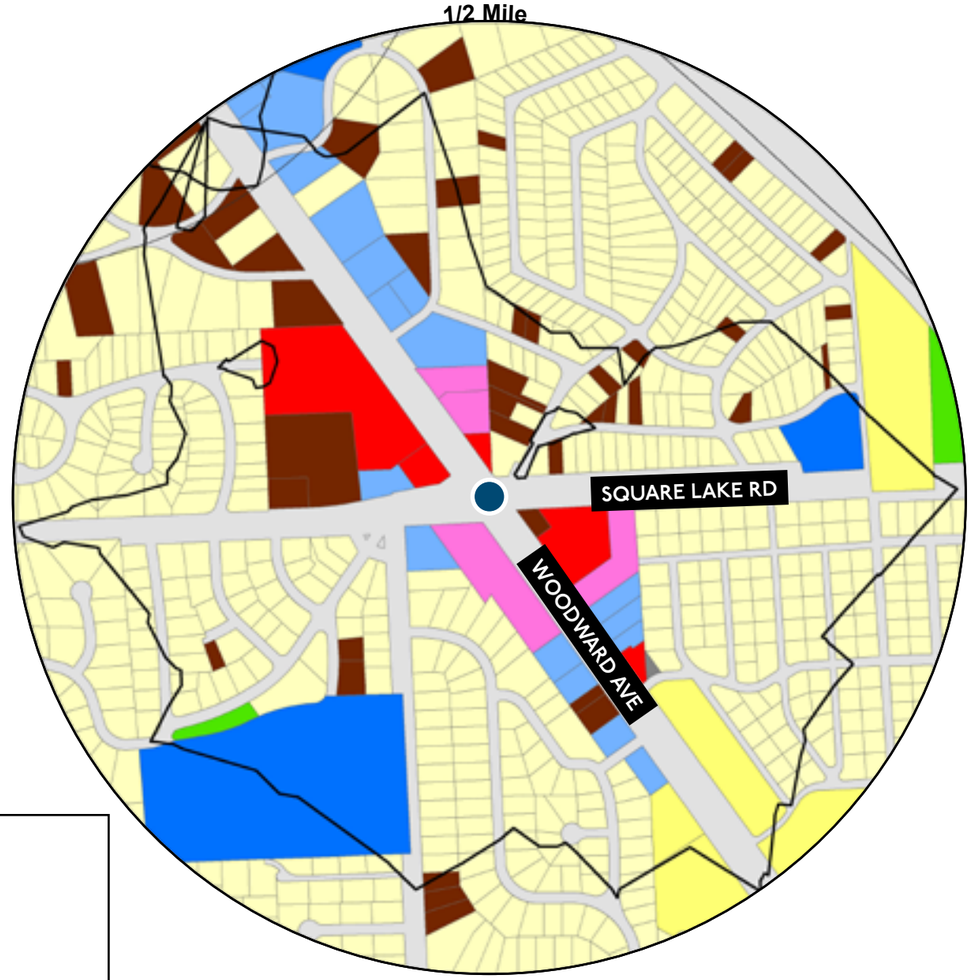
Source: American Community Survey 2013-2017

SQUARE LAKE RD: CONTEXT

DRAFT

MOD Study

Existing Land Use



Source: SEMCOG 2015

About the Station Area

The future transit note at Woodward and Square Lake Road is one of the primary commercial nodes of Bloomfield Township.

All four corners of this intersection are occupied by food and retail outlets with large shared surface parking lots. The land use beyond Woodward Ave is almost exclusively single-family residential on cul-de-sacs and a warped street grid.

Roadway Configuration

Woodward Avenue has four through lanes plus a right turn lane in each direction, and Square Lake Road has three through-lanes plus a right turn lane in each direction. Both roadways have large center medians at this intersection and faded standard crosswalks.

Population & Employment

	Within 0.5 Miles	Within 1 Mile
Population	1,039	4,614
Jobs	1,179	2,884

Source: American Community Survey 2013-2017; Longitudinal Employer-Household Dynamics 2017 (does not include federal workers)

Views of the Potential Station Area

Source: Google Earth

SQUARE LAKE RD: LAND USE & ZONING

DRAFT

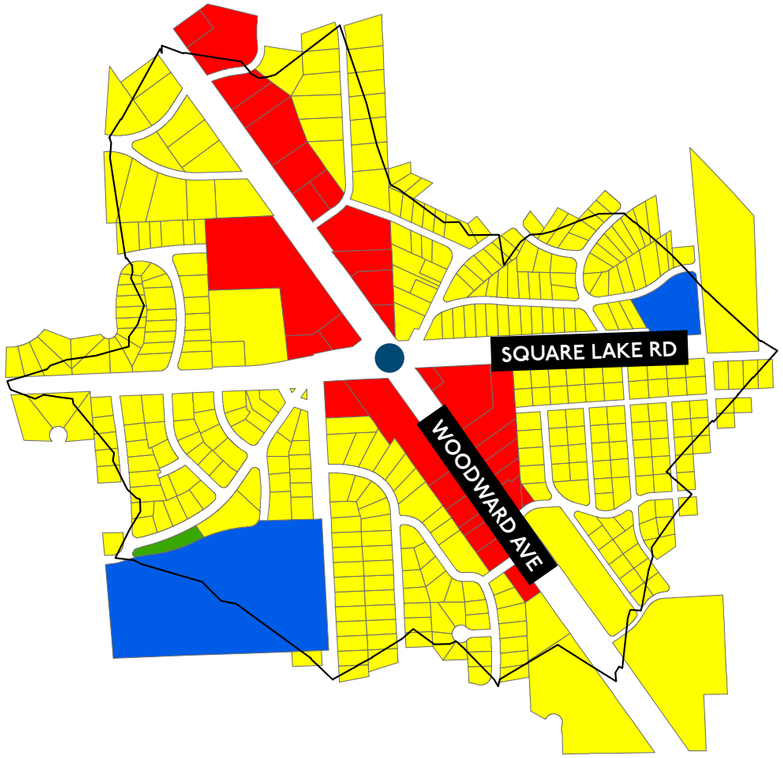
MOD Study

Land Use Planning

Bloomfield Township updated its Master Plan in 2015. The Future Land Use designations along Woodward align with current zoning and existing land uses. Office and Commercial are the primary Future Land Use designations fronting Woodward. The existing apartment complexes south of Square Lake Rd are designated as Multiple Family Residential on the Future Land Use Map. No new Multiple Family Residential is proposed in the Master Plan; however, modernization and redevelopment of existing apartment complexes is encouraged.

The township does have a Mixed Use future land use designation which is only proposed in three locations, none of which are in the vicinity of the future transit node at Woodward and Square Lake Rd.

Future Land Use



Source: SEMCOG 2010

Zoning

Zoning

Uses are primarily separated by zoning district classifications in Bloomfield Township, with the more diversified business types located in the B-3 General business district at the core of the area. Overall density and building heights are relatively low as the majority of this area is zoned for low and medium density residential uses.

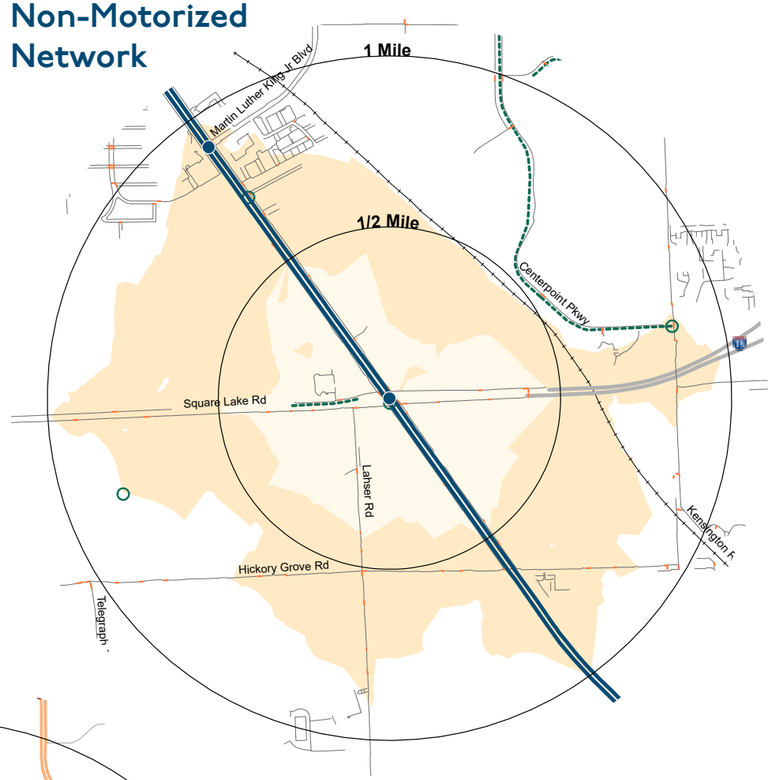
Metric	B3 General Business	O-1 Office Building	R-1/R-2 One Family Residential
Promotes Mixed Use	Somewhat	No	No
Building Height	32 ft	24 ft	2.5 stories
Parking	• Residential: 2 spaces per unit • Retail: 1 space per 200 sq ft		
Bike Parking	N/A		

SQUARE LAKE RD: MOBILITY

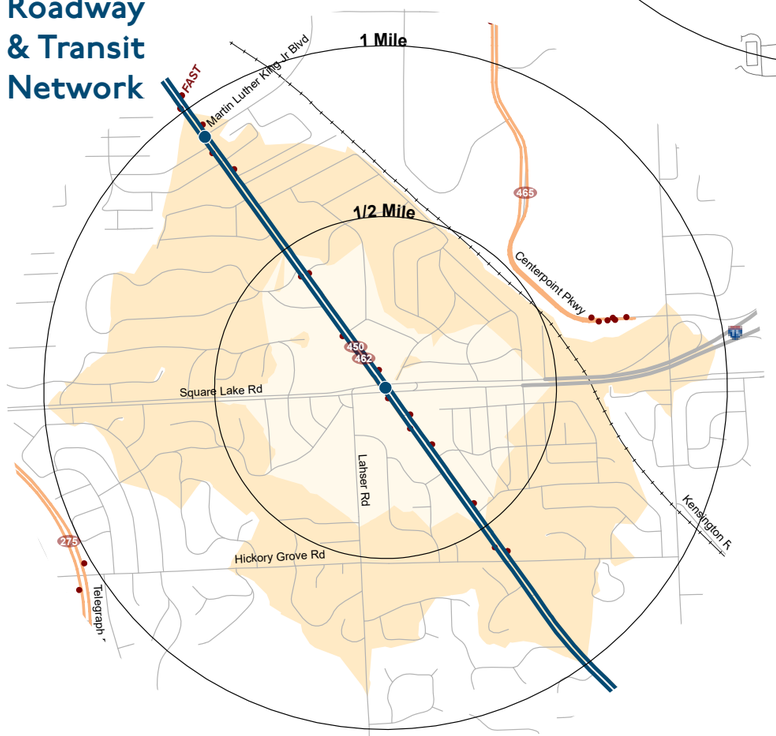
DRAFT

MOD Study

Non-Motorized Network



Roadway & Transit Network



- Station
- Woodward Corridor
- Railroad
- 1/2 Mile Walkshed
- 1 Mile Walkshed

Non-Motorized Network

- 2018 Pedestrian Crash
- Sidewalk
- Crosswalk
- 2018 Bicycle Crash
- Bikeshare Station
- Planned Bikeshare Station
- Shared Use Path (off-road)
- Bike Lane (on-road)
- Shared Lane (on-road)

Transit Network

- SMART Bus Stop
- SMART Bus Route

Mobility Planning

Woodward Avenue and segments of Square Lake Road are principal arterials. Square Lake Road is a major entry point into the township. Woodward Avenue is the fifth busiest road in the Bloomfield Township with an average of 67,800 vehicles per day. Square Lake Road is the fourth busiest road in the Township with an average of 69,300 vehicles per day. The Woodward Avenue and Square Lake Road intersection ranks high in the number of crashes within the Township although crash severity ranks relatively low. A proposed recommendation to help reduce crash potential is to manage access points by consolidating and redesigning driveways to reduce the number of access points and permitting vehicular access where possible. With residential subdivisions located both north and south of Square Lake Road, the vehicular traffic presents many challenges including the difficulty for residents to exit or enter their subdivisions during peak travel times. To help relieve congestion, improve accessibility throughout the community, and to promote a healthy lifestyle, there are plans to improve non-motorized paths such as sidewalks, multi-modal paths, and bike lanes, to adopt Transit-Oriented Development (TOD) standards that consists of land use patterns that promote travel by transit, biking, walking, and ridesharing, to implement traffic calming, and to design development along transit routes that can support transit by increased intensity of development, improved pedestrian connections, and appropriate locations of buildings and parking.

Transit

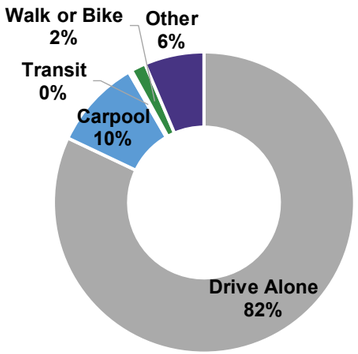
The SMART Woodward Local route is the only route that serves this location; the FAST Woodward route passes through, but does not stop.

	Within 0.5 Miles	Within 1 Mile
Sidewalk & Crosswalk Mileage	4.5	18.1
Intersection Density (intersections per sq mi)	109.5	77.0
2018 Pedestrian Crashes	0	0
Bikeway Mileage	0.2	1.3
2018 Bicycle Crashes	0	0
TRANSIT ACTIVITY	**Average Weekday Boardings**	
SMART	23	42

Sources: SEMCOG Open Data, SMART October 2017

Commute Mode Share

RESIDENTS WITHIN 1 MILE

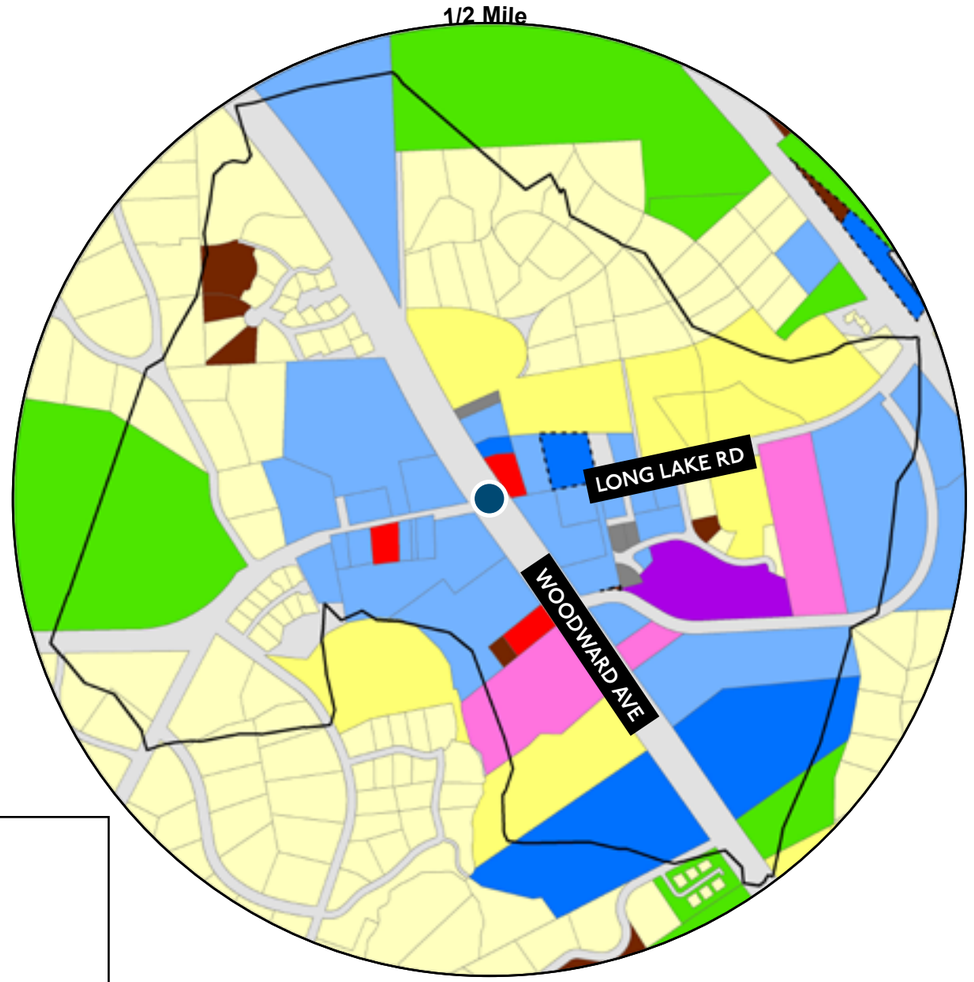


Source: American Community Survey 2013-2017

LONG LAKE RD: CONTEXT

DRAFT

Existing Land Use



Source: SEMCOG 2015

- Potential Station Location
- Single Family Housing
- Attached Condo Housing
- Multi-Family Housing
- Retail; Retail-Residential
- Office; Office-Residential
- Institutional; Medical
- Hospitality; Hospitality-Residential
- Industrial
- Cemetery; Golf Course; Park and Open Space; Recreation
- Parking
- TCU
- Water
- Vacant
- Publicly Owned
- 1/2 Mile Walkshed

About the Station Area

The future transit node at the intersection of Woodward and Long Lake Road is at the center of the City of Bloomfield Hills. The intersection is immediately surrounded by retail, big businesses and institutional uses with large surface lots and planted areas and low lot coverage ratios. There are several multifamily developments in the northeast quadrant of the transit node walkshed and multiple golf courses and country clubs within the study area. The remainder of the walkshed area is filled with large single family homes on large parcels on a meandering street grid.

Roadway Configuration

Woodward has five through-lanes northbound and four through-lanes southbound, one of which is a downstream crossover queue lane that starts before the intersection. Woodward also has right turn lanes leading up to the intersection. Long Lake Rd has one through-lane and a right turn lane in each direction.

Both Woodward and Long Lake Rd lack sidewalks and pedestrian crossings around the intersection. None of the surrounding streets have sidewalks.

Population & Employment

	Within 0.5 Miles	Within 1 Mile
Population	675	3,458
Jobs	3,338	5,915

Source: American Community Survey 2013-2017; Longitudinal Employer-Household Dynamics 2017 (does not include federal workers)

Views of the Potential Station Area

Source: Google Earth

LONG LAKE RD: LAND USE & ZONING

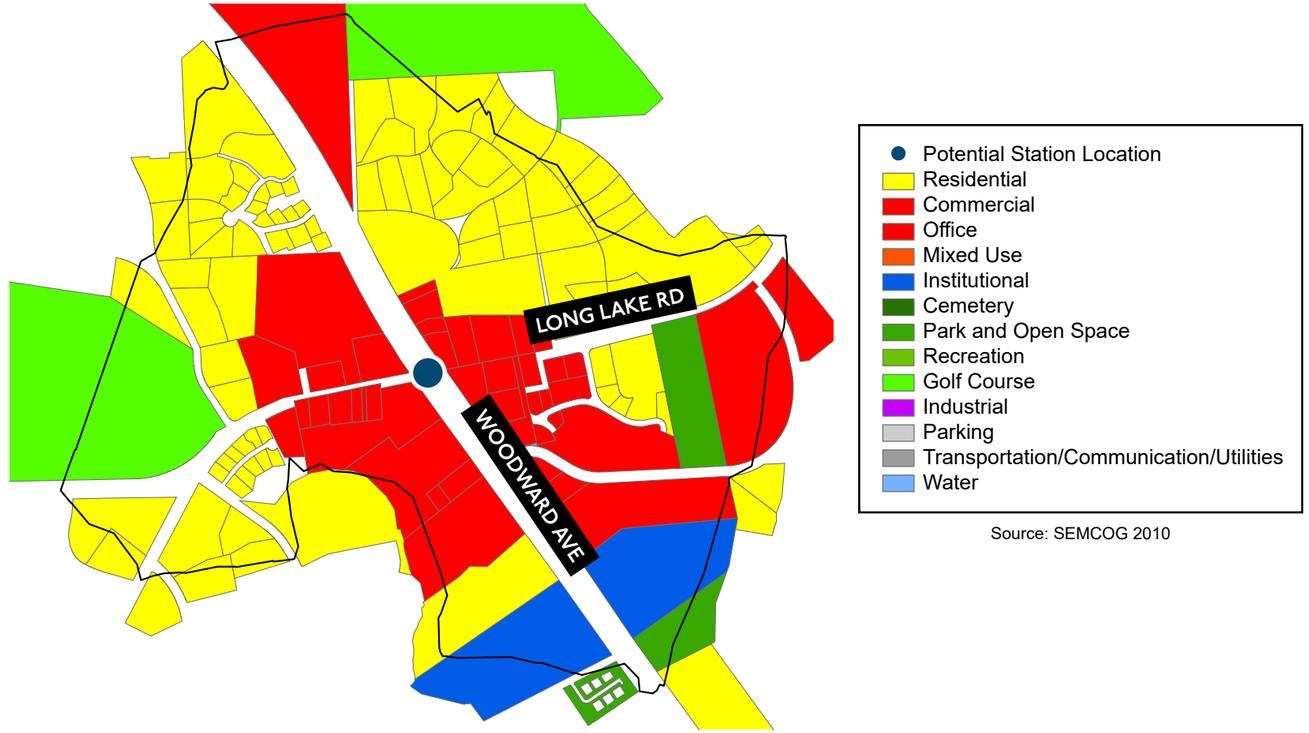
DRAFT

MOD Study

Land Use Planning

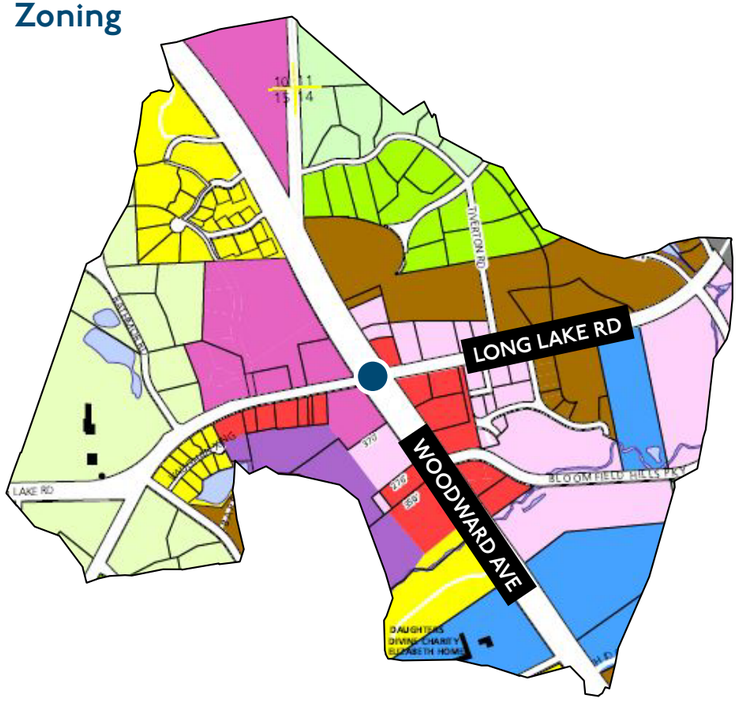
The future land use designations in the 2009 Bloomfield Hills Master Plan does not promote mixed use development. The Multiple-Family Residential future land use designation is used in areas that are already developed. The master plan states that the multiple family designation is intended to permit density of up to just 4.5 units per acre. The area around the Woodward and Long Lake intersection is intended to remain a mix of office and commercial uses.

Future Land Use



Source: SEMCOG 2010

Zoning



Bloomfield Hills Zoning
- A-2
- A-3
- A-6
- B-1
- C-1
- O-1
- O-2
- I-1
- P-1

Zoning

The zoning districts centered around this future transit node do not include a mixture of uses, but rather separate out uses by district, with commercial and office districts being the focal point, surrounded by medium and low density residential. Building heights are relatively low (not exceeding 35 feet) in the area.

Parking requirements are typical of other suburban areas and while front yard parking is permitted, it is generally discouraged and must follow certain design considerations. Reduction of parking requirements is also allowed in the commercial district and in the office districts if certain conditions are met.

Metric	C-1 Commercial	O-1 Office	O-2 Office	B-1 Multiple Family
Promotes Mixed Use	No			
Building Height	30 ft	25 ft	35 ft	30 ft
Parking	• Special use permit required for exceeding 120 percent of required parking • Minimize parking in front yard • C-1: Reduced parking allowed if certain conditions are met			
Bike Parking	N/A			

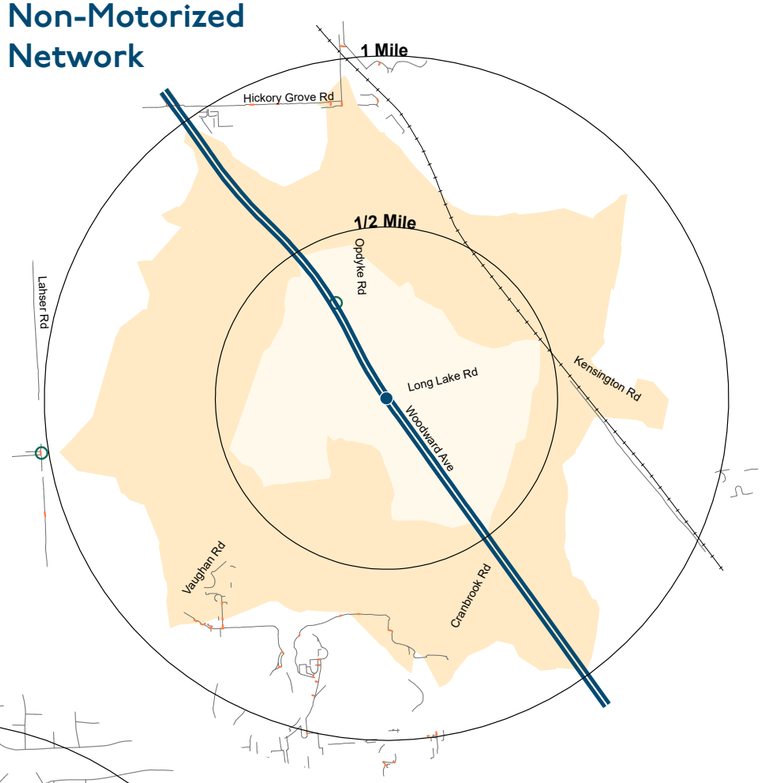
LONG LAKE RD: MOBILITY

DRAFT

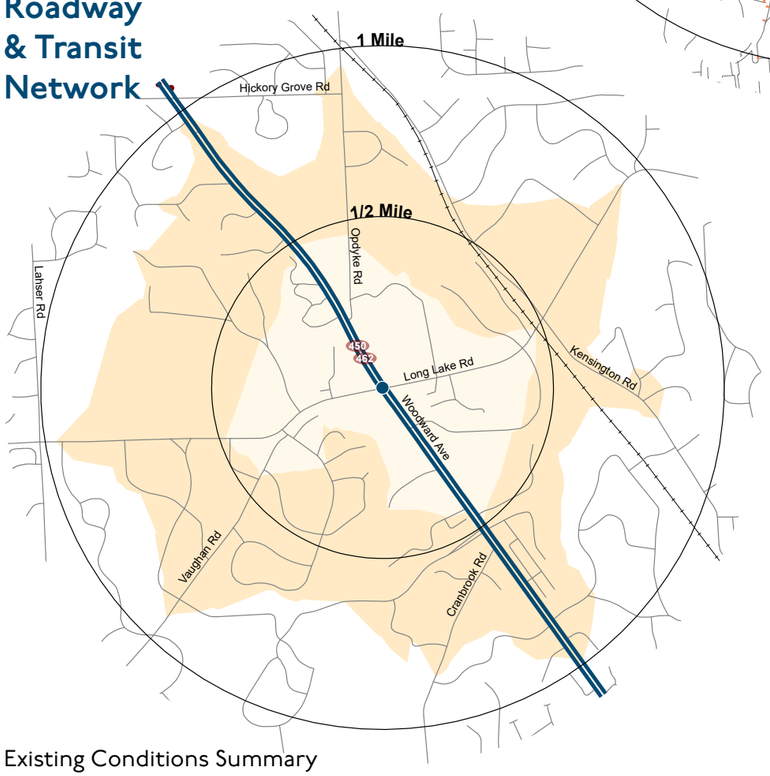
MOD Study

- Station
- Woodward Corridor
- Railroad
- 1/2 Mile Walkshed
- 1 Mile Walkshed

Non-Motorized Network



Roadway & Transit Network



Non-Motorized Network

- 2018 Pedestrian Crash
- Sidewalk
- Crosswalk
- 2018 Bicycle Crash
- Bikeshare Station
- Planned Bikeshare Station
- Shared Use Path (off-road)
- Bike Lane (on-road)
- Shared Lane (on-road)

Transit Network

- SMART Bus Stop
- SMART Bus Route

Mobility Planning

Woodward Avenue and Long Lake Road are principal arterials that have land uses of multiple family residential and commercial and office. The City of Bloomfield Hills wants the intersection of Woodward Avenue and Long Lake Road to maintain its prominence as the City's business node. Woodward Avenue provides a gateway to the city from the north and south. It is the most heavily traveled road in Bloomfield Hills with over 60,000 vehicles per day. Although in terms of a regional perspective the number of crashes in the City is relatively low, most of the high crash locations occur along Woodward Avenue. With limited funding for street and right-of-way improvements, the priority will be on enhancements that benefit safety or restore capacity where appropriate. Capacity management includes control over the number and location of access points that disrupt traffic flow, coordinated signal timing, traffic calming and streetscape improvement, and technology (e.g. in-vehicle alerts or routing information to avoid construction or accident locations). In addition to road improvements for vehicles, there is regional interest to enhance public transit along Woodward Avenue by ways of bus rapid transit or light rail. With a small number of pathways or sidewalks in Bloomfield Hills, some level of safety path system for non-motorized travel has been discussed to provide a travel alternative for short trips, safer facilities for pedestrians and bicyclists, allow transit users to walk to transit stops, and general recreational/health benefits.

Transit

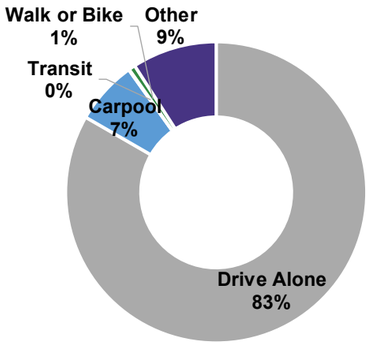
Bloomfield Hills is an opt-out community from SMART and, therefore, does not have any fixed-route transit. The SMART Woodward Local and FAST routes pass through the community on Woodward Avenue, but do not stop within the bounds of Bloomfield Hills.

	Within 0.5 Miles	Within 1 Mile
Sidewalk & Crosswalk Mileage	0	4.7
Intersection Density (intersections per sq mi)	67.5	54.1
2018 Pedestrian Crashes	0	0
Bikeway Mileage	0	0
2018 Bicycle Crashes	1	1
TRANSIT ACTIVITY	**Average Weekday Boardings**	
SMART	0	0

Sources: SEMCOG Open Data, SMART October 2017

Commute Mode Share

RESIDENTS WITHIN 1 MILE



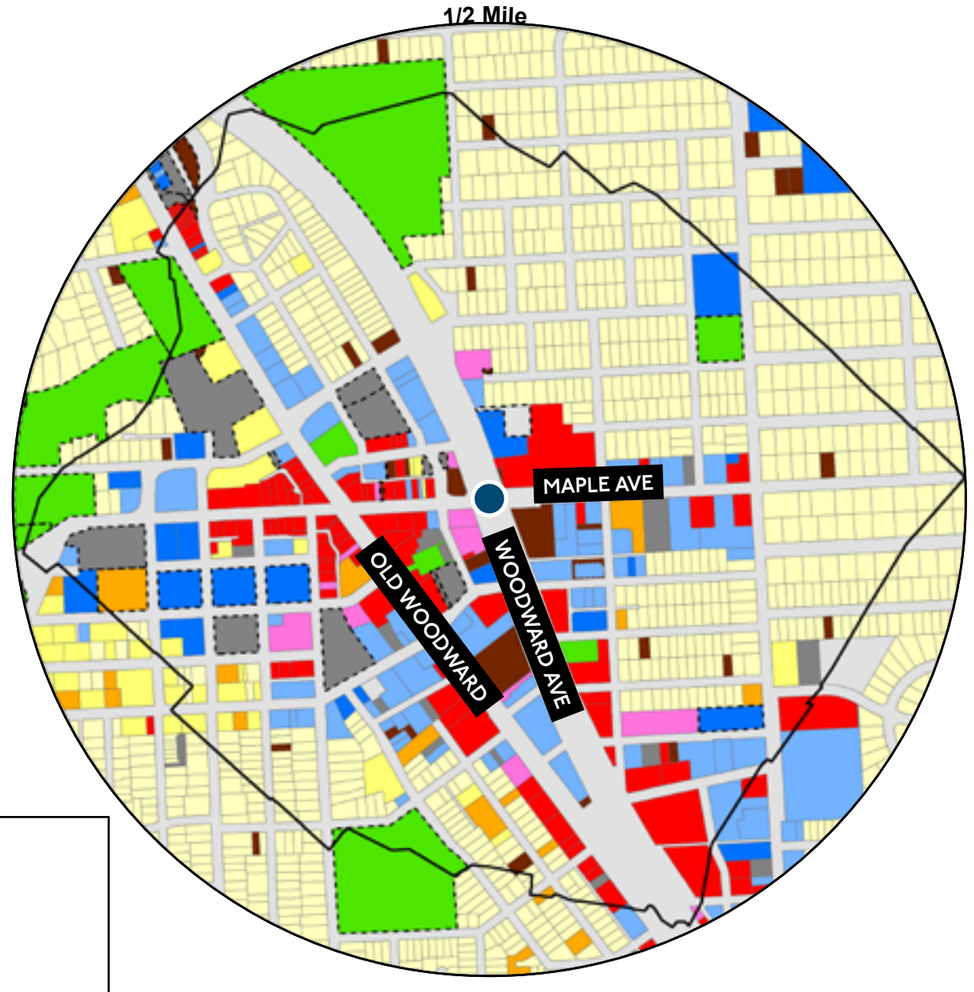
Source: American Community Survey 2013-2017

MAPLE RD: CONTEXT

DRAFT

MOD Study

Existing Land Use



Source: SEMCOG 2015

About the Station Area

The City of Birmingham's Downtown is centered around Old Woodward and Maple Ave, making Woodward and Maple a key transit node. The entirety of Downtown is encompassed in the half-mile walkshed. Outside of Downtown, Birmingham is predominantly made up of single-family neighborhoods.

Downtown Birmingham is largely built out, but the City has several mixed-use infill developments in the pipeline and there is further redevelopment potential along Woodward Ave. The City owns scattered parcels downtown, including one on Woodward, but development in Birmingham is largely driven by the private market.

Roadway Configuration

Woodward Ave has a four through lanes in each direction with a wide landscaped median. Southbound Woodward has an additional right turn lane. Maple Road has two through lanes in each direction. The Woodward and Maple intersection has signalized pedestrian crossings and continental crosswalks at each leg of the intersection.

Population & Employment

	Within 0.5 Miles	Within 1 Mile
Population	3,047	10,167
Jobs	11,038	15,209

Source: American Community Survey 2013-2017; Longitudinal Employer-Household Dynamics 2017 (does not include federal workers)

Views of the Potential Station Area

Source: Birmingham Citywide Master Plan for 2040, Google Earth

MAPLE RD: LAND USE & ZONING

DRAFT

MOD Study

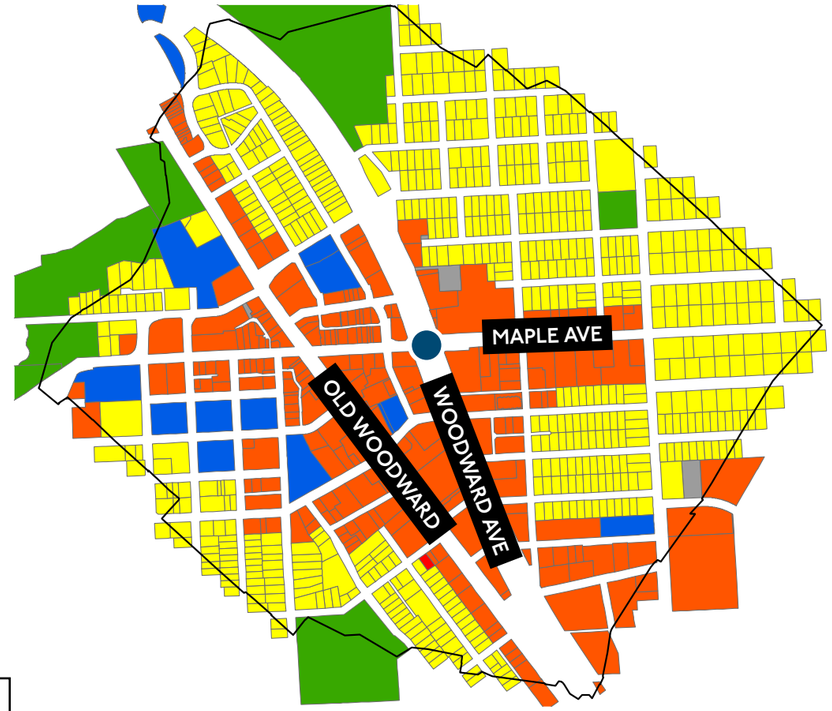
Land Use Planning

The City of Birmingham is in the process of updating its Master Plan. The new Birmingham Master Plan will propose strategies to calm Woodward Ave and improve pedestrian crossings at Maple, inspired by WA3's Woodward Complete Streets Master Plan (2014). Additionally, the City has organized a Woodward Corridor Improvement Authority but has not yet activated the TIFA.

The City has two relevant plans that promote mixed-use development and walkability/bikeability:

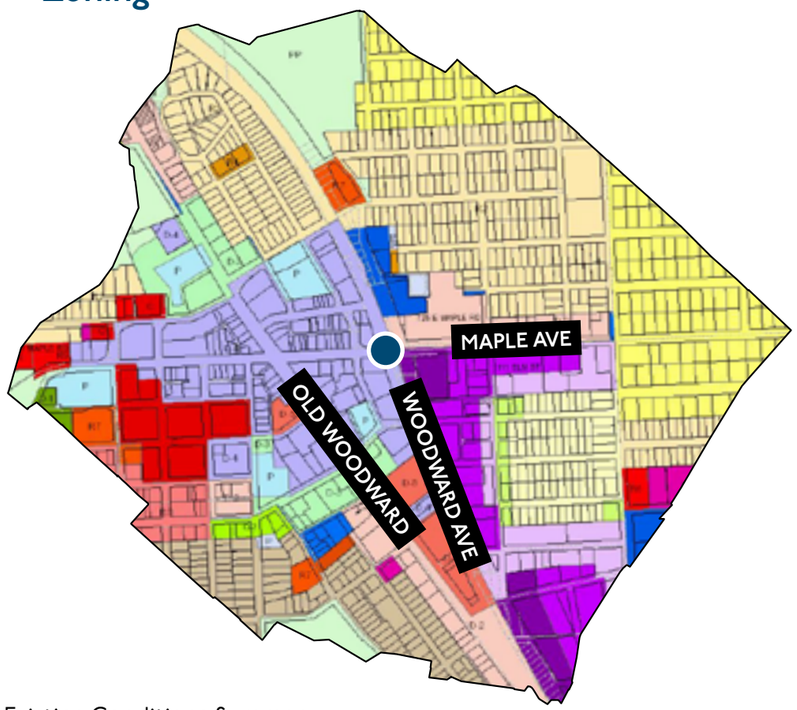
- The 2016 Downtown Plan (1996) was created to guide improvements and redevelopment downtown. It includes a goal to redesign downtown street widths to accommodate pedestrians and calm traffic.
- The Triangle District Urban Design Plan (2007) was created to guide mixed-use and walkable development in the Triangle District, the north and west borders of which are Maple and Woodward. This overlay directly encourages transit-friendly design to support existing bus service.

Future Land Use



Source: SEMCOG 2010

Zoning



Zoning

The half-mile walkshed around the Woodward and Maple transit node encompasses 24 unique zoning and overlay districts. Most of those zoning districts promote mixed uses (with the exception of residential districts). Maximum building heights range from two to seven stories in non-residential districts.

Parking can be reduced up to 50% at the discretion of the Planning Board, and the Transition Zones (TZ-1 and TZ-3) and Triangle Overlay require bike parking.

Outside of the zoning overlays, much of the area around Woodward and Maple is zoned for medium-low to medium-high density residential. The Future Land Use of this area largely consists of mixed use and institutional uses.

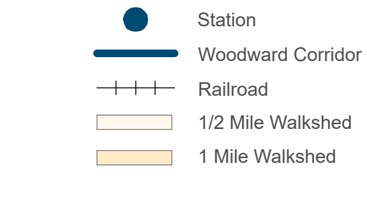
The predominant districts in the area are analyzed by TOD readiness metrics in the table below.

Metric	B2	D3	D4	D5	MU5	MU7
Promotes Mixed Use	Yes	Yes	Yes	Yes	Yes	Yes
Building Height	3 stories max.	4 stories max.	5 stories max.	same as D4	5 stories max.	7 stories max.
Parking	• within 100' of bldg; • can be reduced 50% with approval	• no on-site parking required for non-residential uses; • 2nd/3rd floor residences of landmark bldgs are exempt from off-street parking requirements			• on-street can be credited towards req's; • reduce up to 50% w/ shared parking and/or payment into municipal parking fund	
Bike Parking	N/A	N/A	N/A	N/A	1 per 10 autos or 1 per 3,000 sqft, whichever is greater	

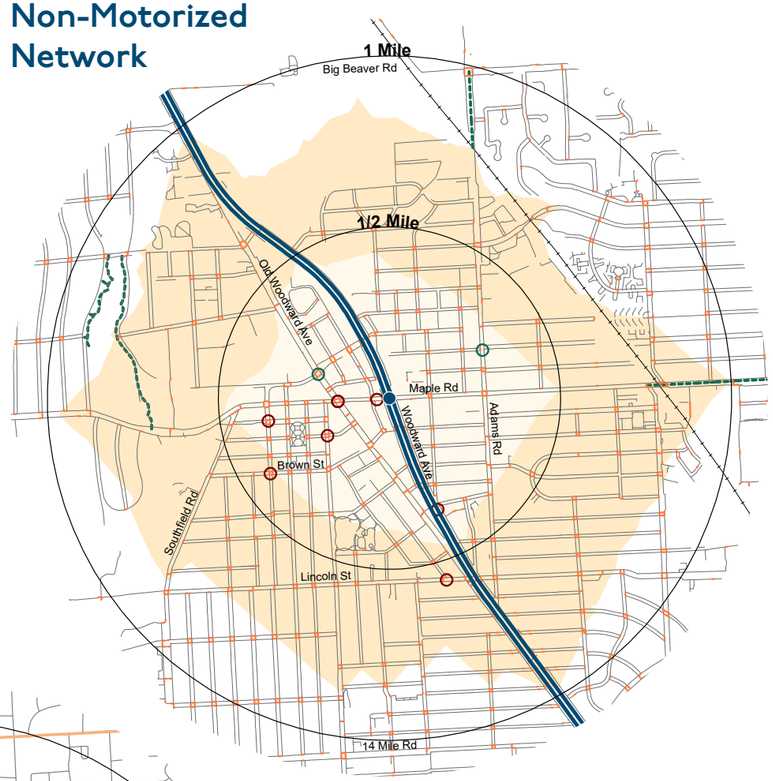
MAPLE RD: MOBILITY

DRAFT

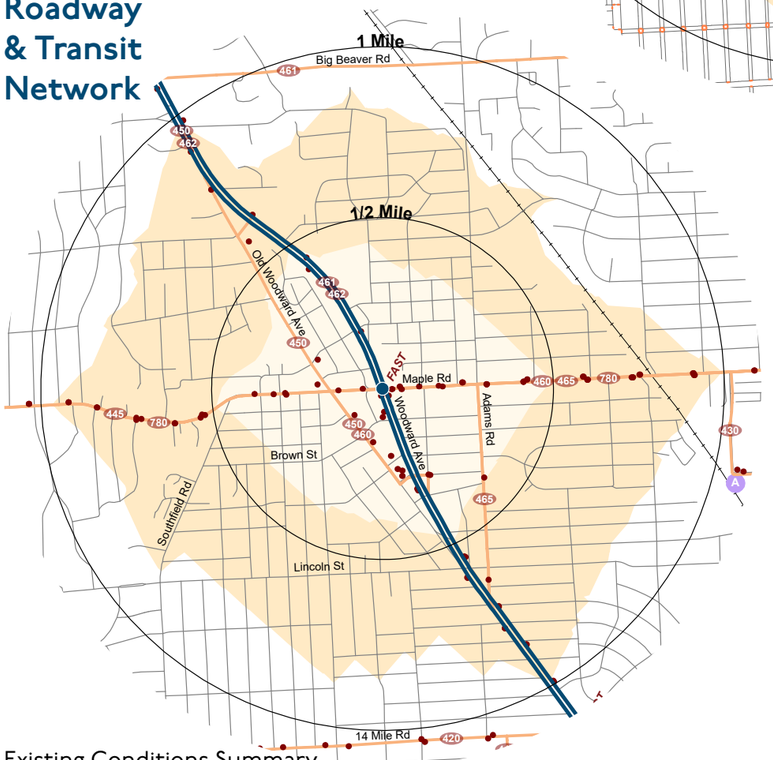
MOD Study



Non-Motorized Network



Roadway & Transit Network



Non-Motorized Network

- 2018 Pedestrian Crash
- Sidewalk
- Crosswalk
- 2018 Bicycle Crash
- Bikeshare Station
- Planned Bikeshare Station
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- Shared Lane (on-road)

Transit Network

- SMART Bus Stop
- SMART Bus Route
- Amtrak Station

Mobility Planning

From 2007 to 2019, the City of Birmingham has completed extensive mobility studies and plans in the vicinity of the proposed Woodward and Maple station area. Woodward Avenue bisects and divides the city, and crossing the wide roadway is very imposing for pedestrians and bicyclists. Birmingham's plans and policies, including the Birmingham Citywide Master Plan for 2040 (currently being prepared), the Downtown 2020 Plan, the 2013 Multimodal Transportation Plan and the 2007 Triangle District Urban Design Plan are all supportive of a robust complete streets vision. The city is currently finalizing design of Maple Road west of Woodward Avenue for reconstruction in 2020 to include wider sidewalks and traffic calming features. The city has supported a wide variety of complete streets policies that have been applied to a number of projects. Maple Road was converted from four lanes to three, with bike lanes, west of the downtown. A similar conversion was studied for East Maple, but traffic volumes were determined to be too high. The City's Non-Motorized Plan proposes the conversion of front yard parking along Woodward Ave to parallel parking to accommodate two-way bikeways. Other projects include protected bicycle and pedestrian infrastructure and amenities, separated bikeways (including along Lincoln Street, which intersects Woodward), cycle tracks, tiered parking rates off-street and on-street, improved transit station amenities, shared use streets, educational community programming, and facilities and amenities for emerging mobility options including bikeshare, scooters, ridesharing, carsharing, and electric and autonomous vehicles.

Transit

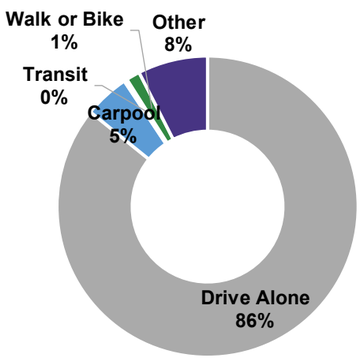
FAST bus stops are located on the near side of the Woodward Avenue and Maple Road intersection for northbound buses and on the far side of the intersection for southbound buses. SMART's Woodward Local route diverges from Woodward Avenue at this location to serve Downtown Birmingham via Old Woodward Avenue and Maple Road to the east. Connections to SMART Routes 445 (limited service with 20- to 40-minute frequency) and 780 (crosstown with 50-minute frequency) can be made at Woodward Avenue and Maple Road.

	Within 0.5 Miles	Within 1 Mile
Sidewalk & Crosswalk Mileage	35.6	112.2
Intersection Density (intersections per sq mi)	239.1	179.9
2018 Pedestrian Crashes	7	8
Bikeway Mileage	0	1.4
2018 Bicycle Crashes	0	0
TRANSIT ACTIVITY	**Average Weekday Boardings**	
SMART	371	412

Sources: SEMCOG Open Data, SMART October 2017

Commute Mode Share

RESIDENTS WITHIN 1 MILE



Source: American Community Survey 2013-2017

14 MILE RD: CONTEXT

DRAFT

MOD Study

Existing Land Use

Source: SEMCOG 2015

- Potential Station Location
- Single Family Housing
- Attached Condo Housing
- Multi-Family Housing
- Retail; Retail-Residential
- Office; Office-Residential
- Institutional; Medical
- Hospitality; Hospitality-Residential
- Industrial
- Cemetery; Golf Course; Park and Open Space; Recreation
- Parking
- TCU
- Water
- Vacant
- Publicly Owned
- 1/2 Mile Walkshed

About the Station Area

The future transit node at Woodward and 14 Mile sits at the border of Birmingham and Royal Oak. The southeast edge of the half-mile walkshed engulfs the northeast corner of Beverly Hills. Woodward Ave along this stretch features mostly small format commercial in shallow diagonal lots with shared access and pull-in parking in the front.

14 Mile west of Woodward is almost exclusively single-family residential. 14 Mile east of Woodward is a mix of commercial and single-family residential. Behind the Woodward and 14 Mile corridors, the typology is exclusively single family residential.

Roadway Configuration

Woodward Ave has four through-lanes in each direction, and a southbound right turn lane. 14 Mile Rd has two through lanes in each direction plus a center turn lane.

Population & Employment

	Within 0.5 Miles	Within 1 Mile
Population	3,752	11,284
Jobs	1,221	7,608

Source: American Community Survey 2013-2017; Longitudinal Employer-Household Dynamics 2017 (does not include federal workers)

Views of the Potential Station Area

Source: Google Earth

14 MILE RD: LAND USE & ZONING

DRAFT

MOD Study

Land Use Planning

Royal Oak

Royal Oak's 2012 Master Plan calls for General Commercial along Woodward and almost exclusively Single Family Residential beyond Woodward.

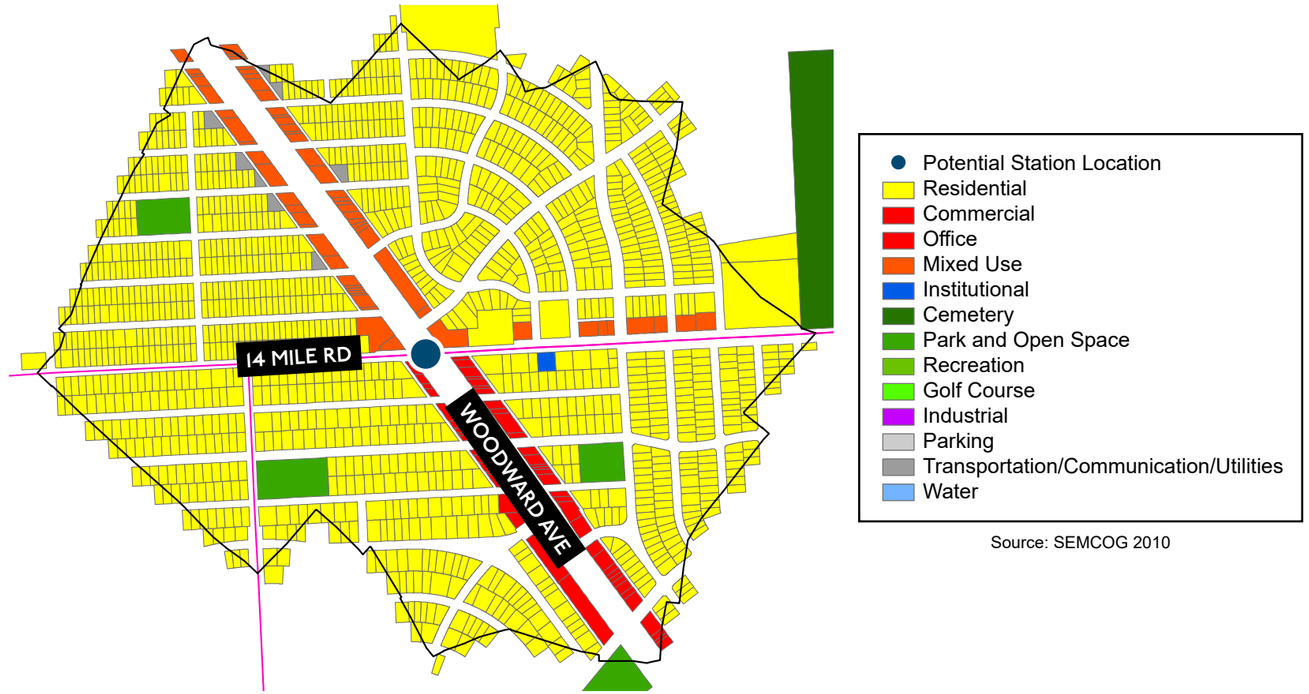
Beverly Hills

The future land use designation within the Woodward and 14 Mile walkshed for the city of Beverly Hills is exclusively single family residential.

Birmingham

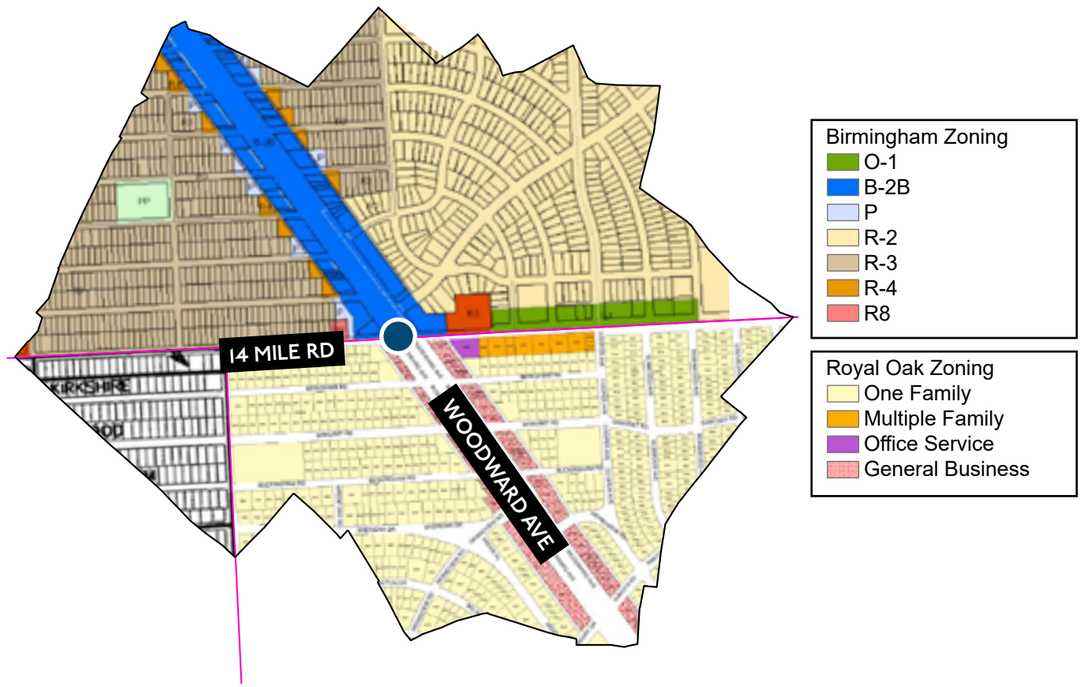
The City of Birmingham is in the process of updating its Master Plan. The current master plan calles for future mixed use along Woodward and along 14 Mile east of Woodward, and single family residential beyond Woodward and 14 Mile.

Future Land Use



Source: SEMCOG 2010

Zoning



Zoning

Royal Oak

The primary zoning districts in this area, General Business and Multiple Family, do not accommodate mixed use development. Multi-family density is limited by a 30 ft height restriction.

Beverly Hills

The area of Beverly Hills included in the transit node walkshed is comprised of two single family residential districts.

Birmingham

The entirety of Woodward Ave in Birmingham in this transit walkshed is zoned as General Business, and parcels fronting 14 Mile on the east side of Woodward are zoned Office. These designations permit medium-to-high density office and commercial uses as well as single family and multi-family housing.

	Birmingham			Royak Oak	
Metric	B-2B General Business	O-1 Office	R-3/R-4/R-5 Two/Multiple Family Residential	General Business	Multiple Family
Promotes Mixed Use	Yes	Somewhat	2/2.5 stories	No	
Building Height	30 ft commercial/mixed use 40 ft residential only	2 stories	25 ft	30 ft	
Parking	• Shared parking is permitted • Requirements may be reduced up to 50% if peak parking demands of uses are at different times.			Parking requirements can be reduced with shared parking or proof that minimum requirements are excessive.	
Bike Parking	1 bike per 10 autos or 3,000 sq ft, whichever is greater			N/A	

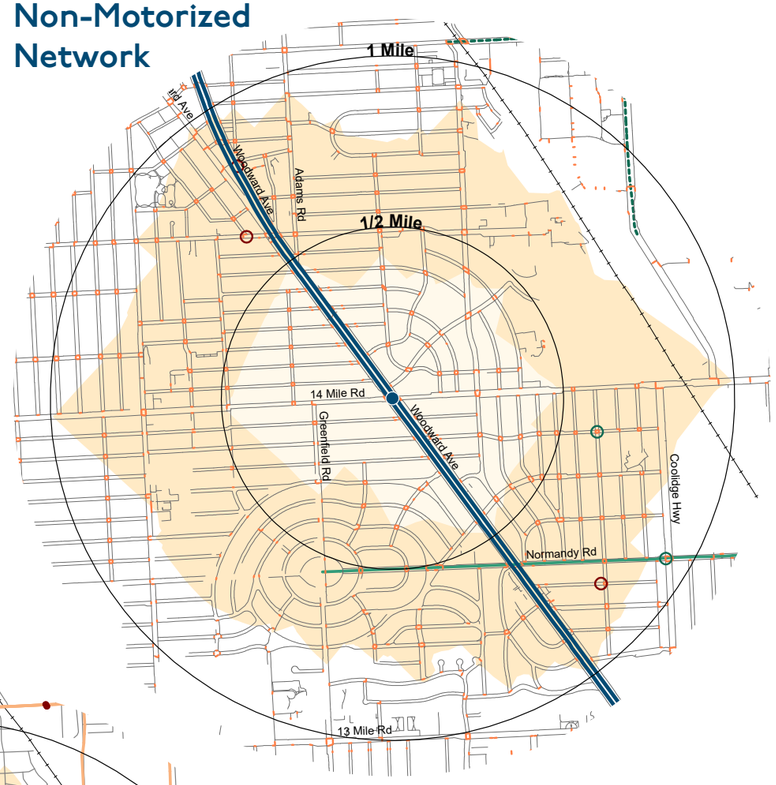
14 MILE RD: MOBILITY

DRAFT

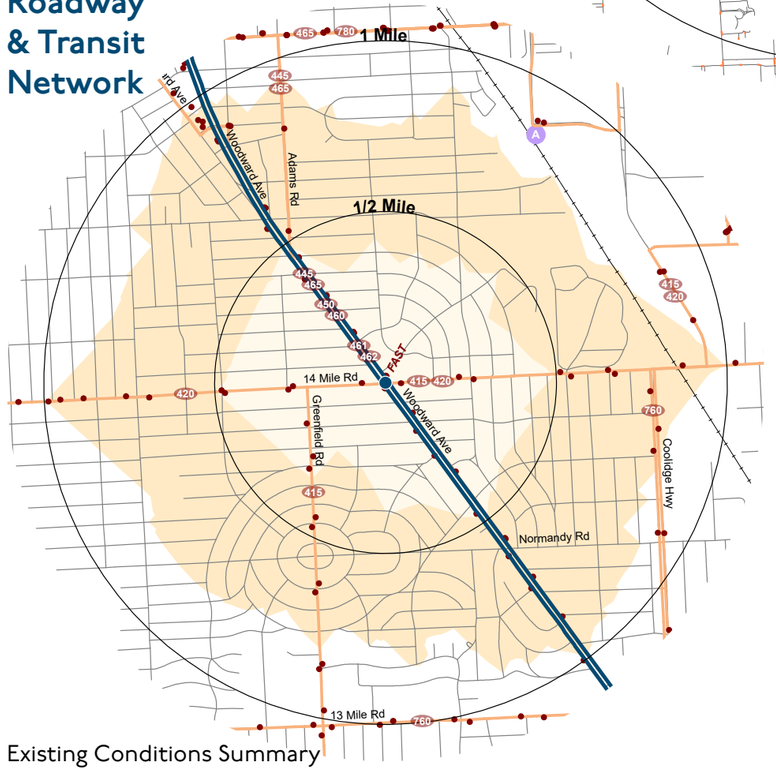
MOD Study

- Station
- Woodward Corridor
- Railroad
- 1/2 Mile Walkshed
- 1 Mile Walkshed

Non-Motorized Network



Roadway & Transit Network



Non-Motorized Network

- 2018 Pedestrian Crash
- Sidewalk
- Crosswalk
- 2018 Bicycle Crash
- Bikeshare Station
- Planned Bikeshare Station
- Shared Use Path (off-road)
- Bike Lane (on-road)
- Shared Lane (on-road)

Transit Network

- SMART Bus Stop
- SMART Bus Route
- Amtrak Station

Mobility Planning

The proposed station area has wide pedestrian crossing distances, lacks mid-block crossings, has narrow sidewalks, lacks bicycle routes and has frequent u-turn lanes through Woodward Avenue's landscaped medians also known as the "Michigan Left". The cities of Birmingham, Southfield, and Royal Oak incorporated complete street principles into their comprehensive plans to address these safety concerns, in accordance with Michigan's Public Act 135 of 2010 in guidance from the Federal Transit Administration (FTA). Specific recommendations and policy guidance in the proposed station area include plans to:

1. Construct a new bicycle route called the Neighborhood Loop four blocks north of the 14 Mile Road and Woodward Avenue intersection. The Neighborhood Loop would consist of a series of dedicated lanes, paths, and trails designed for bicycles and new emerging mobility devices such as scooters. This new neighborhood route would connect residential neighborhoods in the City of Birmingham to parks, schools, libraries and other civic institutions.
2. Pilot "shared space streets" a series of landscaped alleyways with lighting and amenities designed to give pedestrians, shoppers, and service vehicles a safe parallel route to travel along Woodward Avenue. The alleys between Bennaville, Humphrey, and Chapin Avenues parallel to Woodward Avenue are currently being considered for this pilot program due to the underutilized parking lots in this area.
3. Plant shade trees on 14 Mile Road where currently few trees exist. Suggested varieties of trees include Basswood, Elms (a disease resistant tree), Horse Chestnuts, Maples, Oaks and Sycamores.
4. Implement a road diet on Woodward Avenue to address the excess capacity created on this corridor after an almost 1/3 reduction in population after the completion of Interstate 75 in 1973. This would eliminate the far-left vehicle lane, reduce speeds to 35 mph, add a bicycle lane protected by a landscaped median, add on-street parking, expand sidewalks to 8 feet, reduce the width of the center median and narrow the remaining travel lanes.
5. Construct a bus rapid transit (BRT) route with stops along the center median or the landscaped median adjacent to the proposed bike lane on Woodward Avenue.
6. Improve bus stops with shelters along 14 Mile Road. Post on all existing bus stops signs indicating bus routes, timetables, long term bicycle parking locations and instructions on how to use the bicycle racks on the bus.
7. Improve the safety of pedestrian and bicycle crossings at the intersection of 14 Mile Road and Woodward Avenue.

Transit

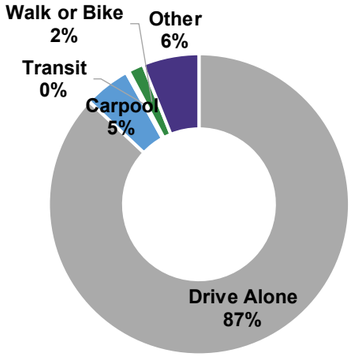
FAST bus stops are located on the far side of the Woodward Avenue and 14 Mile Road intersection for both northbound and southbound buses. Besides SMART's Woodward Local and FAST routes, connections to SMART Routes 445 (limited service with 20- to 40-minute frequency) and 465 (limited service with 30- to 70-minute frequency) can be made at Woodward Avenue and 14 Mile Road.

	Within 0.5 Miles	Within 1 Mile
Sidewalk & Crosswalk Mileage	33.5	116.8
Intersection Density (intersections per sq mi)	149.0	136.6
2018 Pedestrian Crashes	0	3
Bikeway Mileage	0	1.3
2018 Bicycle Crashes	0	2
TRANSIT ACTIVITY	**Average Weekday Boardings**	
SMART	142	197

Sources: SEMCOG Open Data, SMART October 2017

Commute Mode Share

RESIDENTS WITHIN 1 MILE



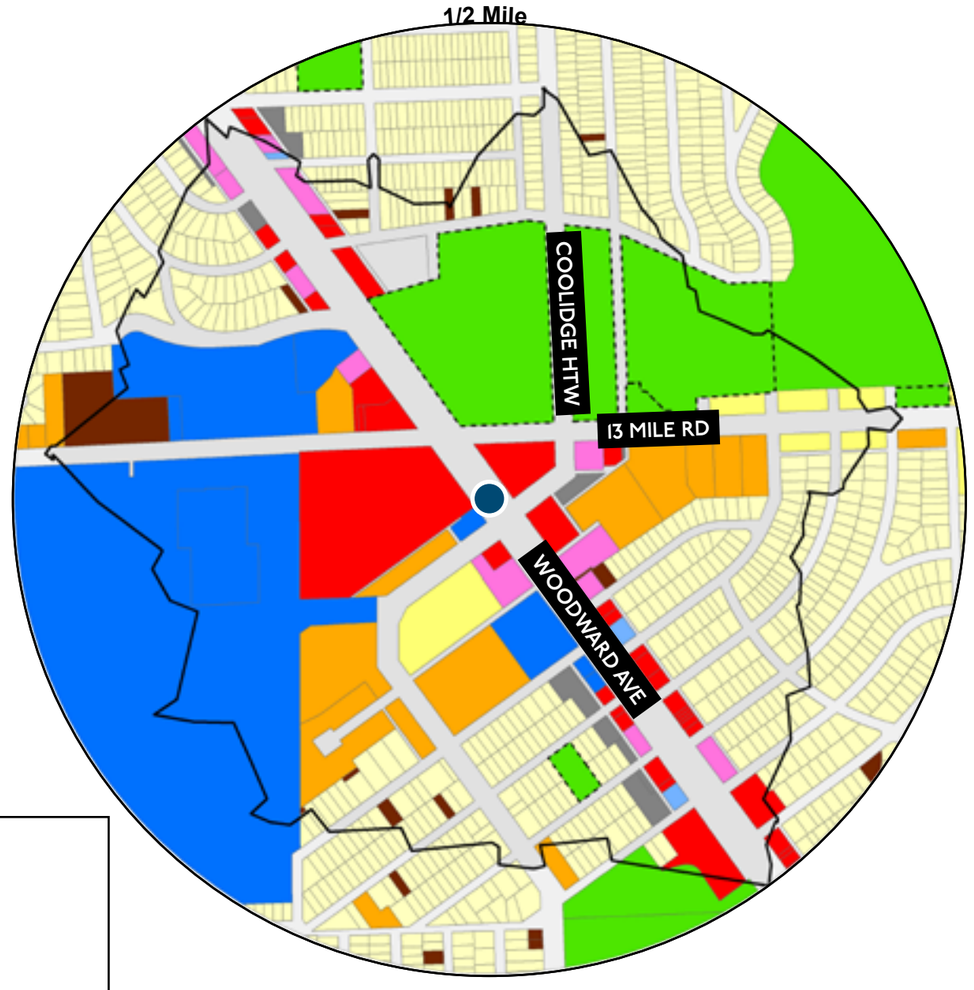
Source: American Community Survey 2013-2017

13 MILE RD: CONTEXT

DRAFT

MOD Study

Existing Land Use



Source: SEMCOG 2015

About the Station Area

The future transit node at the intersection of Woodward, 13 Mile and Coolidge Hwy is in northwest Royal Oak.

Beaumont Hospital is a major employment hub and trip generator in the southwest quadrant of the transit node walkshed. The strip mall bounded by 13 Mile and Coolidge on the west side of Woodward has recently been redeveloped as Woodward Corners by Beaumont. The commercial redevelopment features an urban format Meijer and surface parking, and does not include a residential component. The rest of Woodward within the walkshed is fronted primarily by commercial uses with ample surface parking.

The Shrine Catholic School owns a large amount of land on the northwest side of Woodward and 13 Mile. The northeast quadrant of the walkshed contains Memorial Park and the Royal Oak Golf Course. There are several apartment complexes along both Coolidge and 13 Mile.

Roadway Configuration

Woodward has five through-lanes in each direction. One is an indirect left (Michigan left) turn lane that starts before the intersection, and there are right turn lanes leading up to the intersection. Coolidge and 13 Mile both have two through-lanes and a right turn lane in each direction. Westbound Coolidge has a double left turn lane onto Woodward.

Population & Employment

	Within 0.5 Miles	Within 1 Mile
Population	3,452	14,164
Jobs	15,256	18,847

Source: American Community Survey 2013-2017; Longitudinal Employer-Household Dynamics 2017 (does not include federal workers)

Views of the Potential Station Area

Source: Crain's Detroit Business, Google Earth

13 MILE RD: LAND USE & ZONING

DRAFT

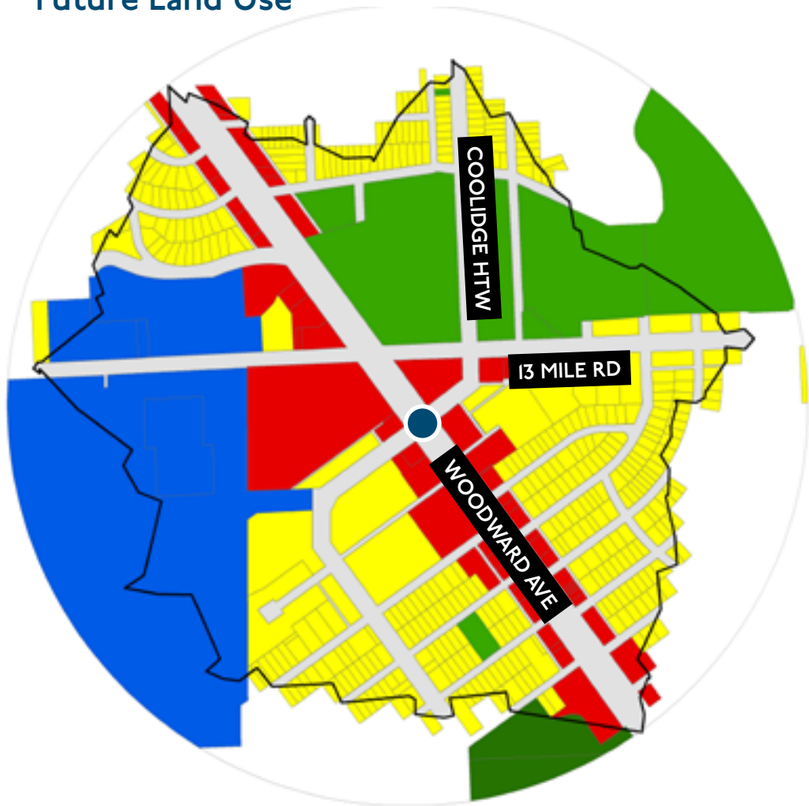
MOD Study

Land Use Planning

Royal Oak's 2012 Master Plan does not designate any future mixed use areas in the Woodward and 13 Mile transit walkshed. The plan designates parcels along Woodward as General Commercial and lots along Coolidge and 13 Mile as Multiple Family Residential. However, multi-family housing already exists where the future land use map designates it.

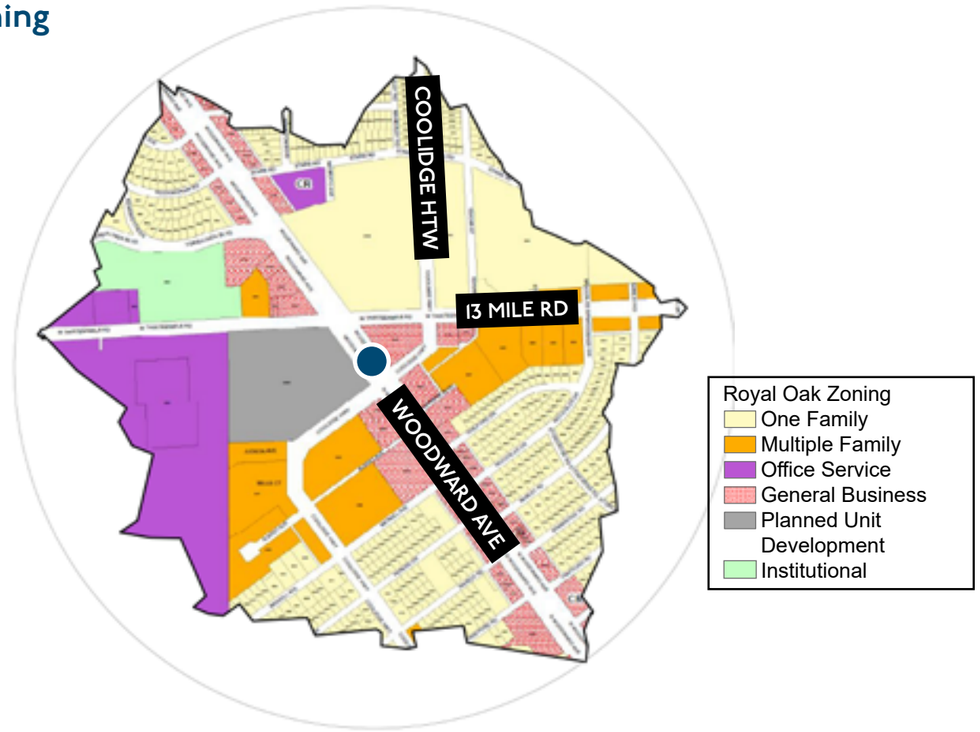
Besides Public/Institutional designations for Beaumont Hospital and the Shrine Catholic School, the rest of the walkshed is designated as Single Family Residential.

Future Land Use



Source: SEMCOG 2010

Zoning



Zoning

The primary zoning district along Woodward Avenue is the General Business district which does not promote mixed use development, but does accommodate for office, business services and retail uses. The maximum height of buildings in this district and immediate surrounding districts is 30 ft (or about 2.5 stories tall).

There are no design incentives or standards in the Zoning Ordinance.

Several parking waivers or standards discourage excessive parking and ensure a more pedestrian-friendly environment (i.e. parking cannot be located in the front yard).

Metric	General Business	Multi-Family	One-Family
Promotes Mixed Use	No		
Building Height	30 ft		
Parking	Parking requirements can be reduced with shared parking or proof that minimum requirements are excessive.		
Bike Parking	N/A		

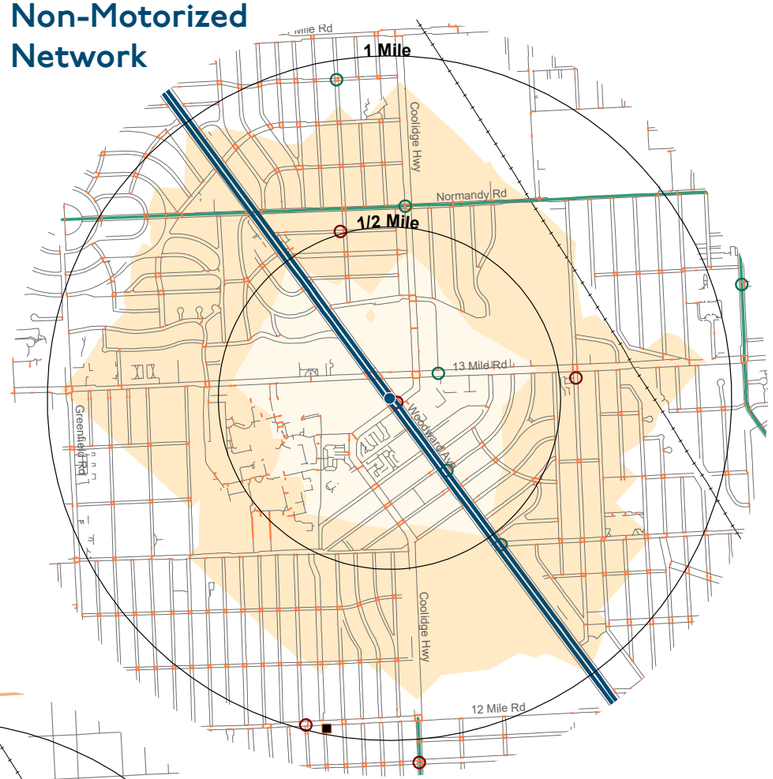
13 MILE RD: MOBILITY

DRAFT

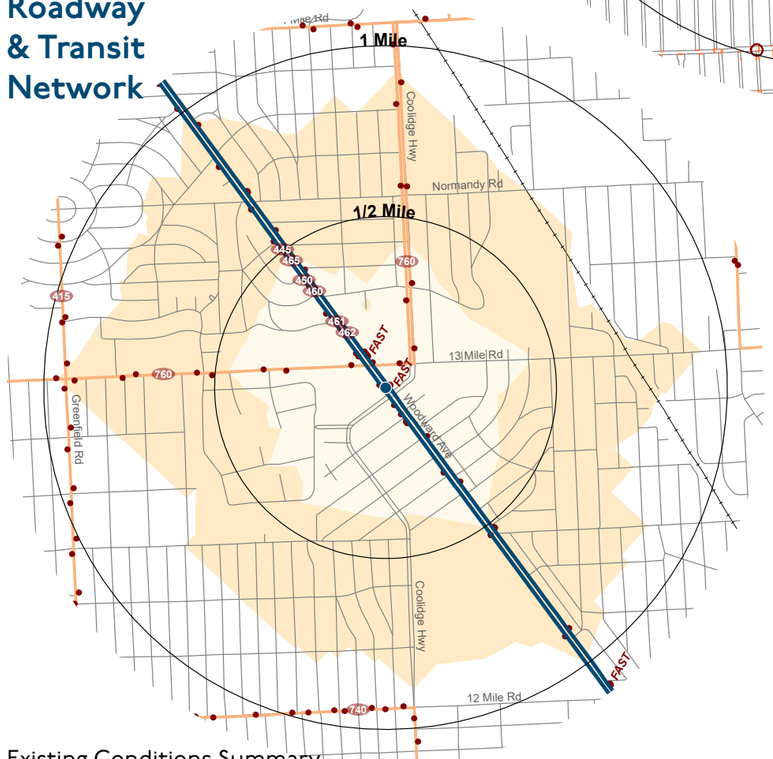
MOD Study

- Station
- Woodward Corridor
- Railroad
- 1/2 Mile Walkshed
- 1 Mile Walkshed

Non-Motorized Network



Roadway & Transit Network



Non-Motorized Network

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- 2018 Bicycle Crash
- Bikeshare Station
- Planned Bikeshare Station
- Shared Use Path (off-road)
- Bike Lane (on-road)
- Shared Lane (on-road)

Transit Network

- SMART Bus Stop
- SMART Bus Route

Mobility Planning

The proposed 13 Mile Station, located at 13 Mile Road and Woodward Avenue, provides access to the City of Royal Oak's largest employer, Beaumont Hospital, as well as Memorial Park, the Royal Oak Golf Course, local businesses, and schools. Pedestrians, bicyclists, and transit users currently have limited access to this station due to the area's walls and fences around private property, wide streets, sparse shade trees and large distances between crosswalks. In order to decrease traffic congestion at this major employment center during shift changes, the following changes were recommended by the City of Royal Oak in 2012, following the complete street principles:

1. Implementing a transportation demand management program with incentives for hospital staff for every trip made on public transit, carpooling, walking, or biking
2. Add a non-motorized rest stop at Memorial Park with bicycle parking, maps, restrooms and lockers.
3. Adding bicyclist safety improvements, such as bike boxes, at 13 Mile Road and Hillside Drive
4. Implementing a road diet on Woodward Avenue to address the excess capacity created on this corridor after an almost 1/3 reduction in population after the completion of Interstate 75 in 1973. This would eliminate the far-left vehicle lane, reduce speeds to 35 mph, add a bicycle lane protected by a landscaped median, add on-street parking, expand sidewalks to 8 feet, reduce the width of the center median and narrow the remaining travel lanes.

The cities of Berkeley and Royal Oak incorporated these recommended changes into their comprehensive plans following complete streets principles outlined in Michigan's Public Act 135 of 2010 in guidance from the Federal Transit Administration (FTA).

Transit

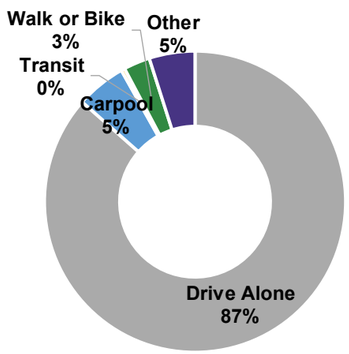
FAST bus stops are located on the far side of the Woodward Avenue and 13 Mile Road intersection for northbound buses and just south of the Woodward Avenue and Albert Avenue intersection for southbound buses. The two stops are about a quarter-mile apart. Besides SMART's Woodward Local and FAST routes, connections to SMART Routes 445 (limited service with 20- to 40-minute frequency) and 760 (crosstown with 45-minute frequency) can be made at Woodward Avenue and 13 Mile Road.

	Within 0.5 Miles	Within 1 Mile
Sidewalk & Crosswalk Mileage	26.6	106.8
Intersection Density (intersections per sq mi)	147.7	127.6
2018 Pedestrian Crashes	2	3
Bikeway Mileage	0	1.7
2018 Bicycle Crashes	2	5
TRANSIT ACTIVITY	**Average Weekday Boardings**	
SMART	305	355

Sources: SEMCOG Open Data, SMART October 2017

Commute Mode Share

RESIDENTS WITHIN 1 MILE



Source: American Community Survey 2013-2017

12 MILE RD: CONTEXT

DRAFT

MOD Study

Existing Land Use

Source: SEMCOG 2015

- Potential Station Location
- Single Family Housing
- Attached Condo Housing
- Multi-Family Housing
- Retail; Retail-Residential
- Office; Office-Residential
- Institutional; Medical
- Hospitality; Hospitality-Residential
- Industrial
- Cemetery; Golf Course; Park and Open Space; Recreation
- Parking
- TCU
- Water
- Vacant
- Publicly Owned
- 1/2 Mile Walkshed

About the Station Area

The future transit node at Woodward and 12 Mile is split between Royal Oak and Berkley. The Roseland Park Cemetary consumes the entire northwest quadrant of the half-mile walkshed. The west side of Woodward and south side of 12 Mile are flanked by 100-120' deep lots with ample surface parking. The east side of Woodward, in Royal Oak, contains multi-family housing, two walkable commercial strips, and The Shrine of the Little Flower basilica and school occupies the northeast and southeast corners Woodward and 12 Mile.

Because of the presence of the cemetery and church on three of the four corners, redevelopment potential at the intersection of Woodward and 12 Mile is limited.

Land use behind Woodward and 12 Mile on both sides of Woodward is predominantly single family residential

Roadway Configuration

At Woodward Avenue and 12 Mile, Woodward has four through-lanes and a right turn lane in each direction, separated by a median. 12 Mile has two through-lanes and a right turn lane in each direction. Brick-look crosswalks provide high-visibility crossings at all four pedestrian crossings.

Population & Employment

	Within 0.5 Miles	Within 1 Mile
Population	3,577	15,745
Jobs	2,852	6,028

Source: American Community Survey 2013-2017; Longitudinal Employer-Household Dynamics 2017 (does not include federal workers)

Views of the Potential Station Area

Source: Google Earth

12 MILE RD: LAND USE & ZONING

DRAFT

MOD Study

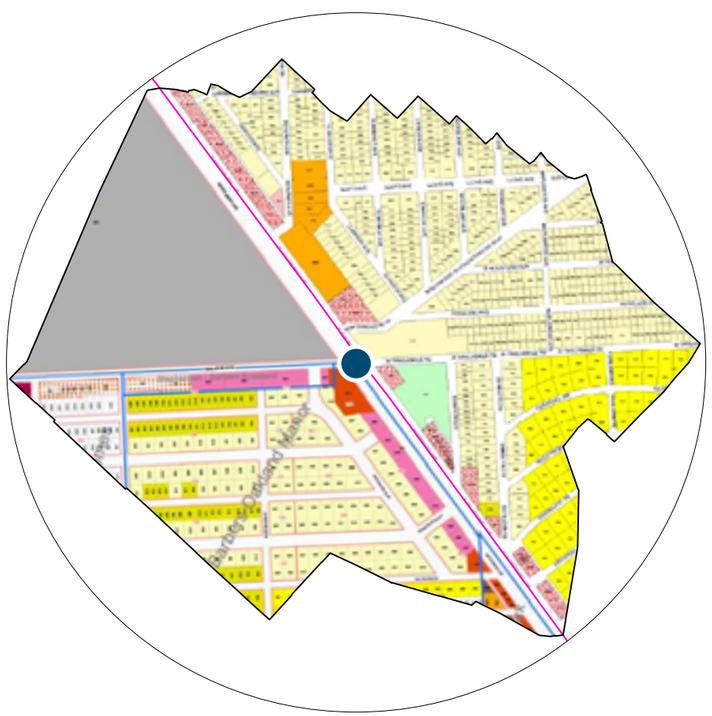
Past/Current Planning Efforts Narrative

Royal Oak:
Royal Oak's 2012 Master Plan identifies 12 Mile Road as a future transit node. The plan calls for General Commercial along Woodward and patches of Multiple Family and Single Family Attached-Detached behind Woodward, almost identical to existing zoning. The area currently occupied by The Shrine of the Little Flower basilica and school are designated to remain institutional use in the future.
Berkley:
Berkley's 2007 Master Plan encourages the adoption of TOD standards will that make Berkley a more transit-friendly environment. However, Berkley's new mixed use future land use designation does not appear on Woodward. The master plan designates parcels near Woodward zoned multiple family as "General Commercial & Service" areas.

Future Land Use

- Potential Station Location
- Residential
- Commercial
- Office
- Mixed Use
- Institutional
- Cemetery
- Park and Open Space
- Recreation
- Golf Course
- Industrial
- Parking
- Transportation/Communication/Utilities
- Water

Source: SEMCOG 2010



Berkley Zoning
- Single Family RI-A
- Single Family RI-B
- Single Family RI-C
- Single Family RI-D
- Two Family
- Multiple Family
- Office
- Local Business District
- Woodward District
- Parking

Royal Oak Zoning
- One Family
- One Family Large Lot
- Two Family
- Multiple Family
- Office Service
- Neighborhood Business
- Neighborhood Business II
- General Business
- Special Redevelopment

Zoning Overview & Statistics

Royal Oak:
The predominant zoning districts on the Royak Oak side of Woodward and 12 Mile are not conducive to mixed use and dense development. Parcels zoned for Multiple Family are already developed as such.

Berkley:
The City of Berkley's "Woodward" zoning designation allows a selective mix of uses but is intended to serve high volumes of vehicle traffic. However, Berkley does allow shared parking and require bike parking with all new parking facilities.

	Royal Oak		Berkley	
Metric	General Business	Multiple Family	Woodward	Office
Promotes Mixed Use	No	No	Somewhat	No
Building Height	30 ft	30 ft	50 ft	30 ft
Parking	• Shared parking permitted • Reduction waivers may be granted		Shared parking permitted	
Bike Parking	N/A		• Required with all new parking • Used to reduce parking minimum	

12 MILE RD: MOBILITY

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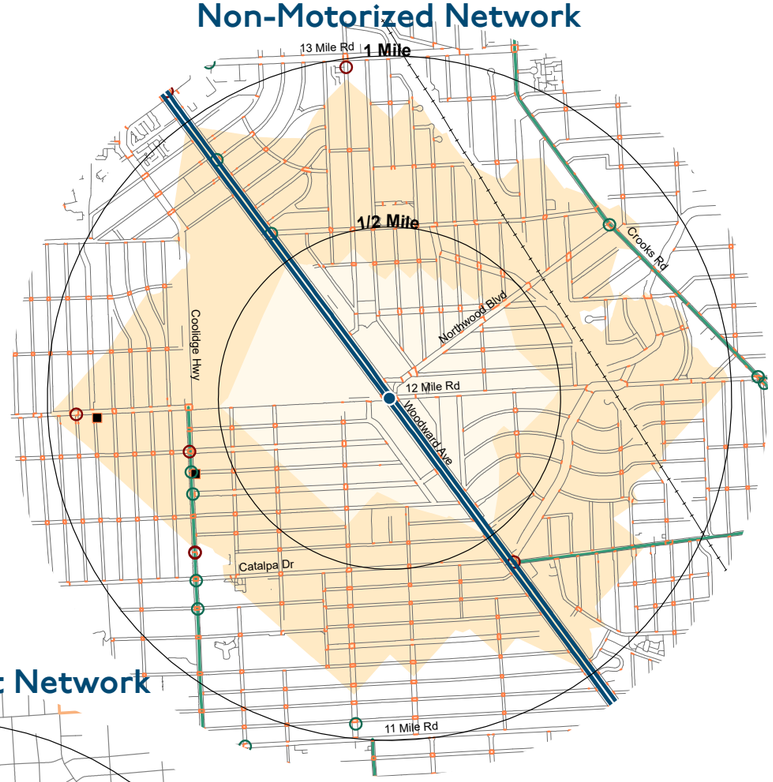
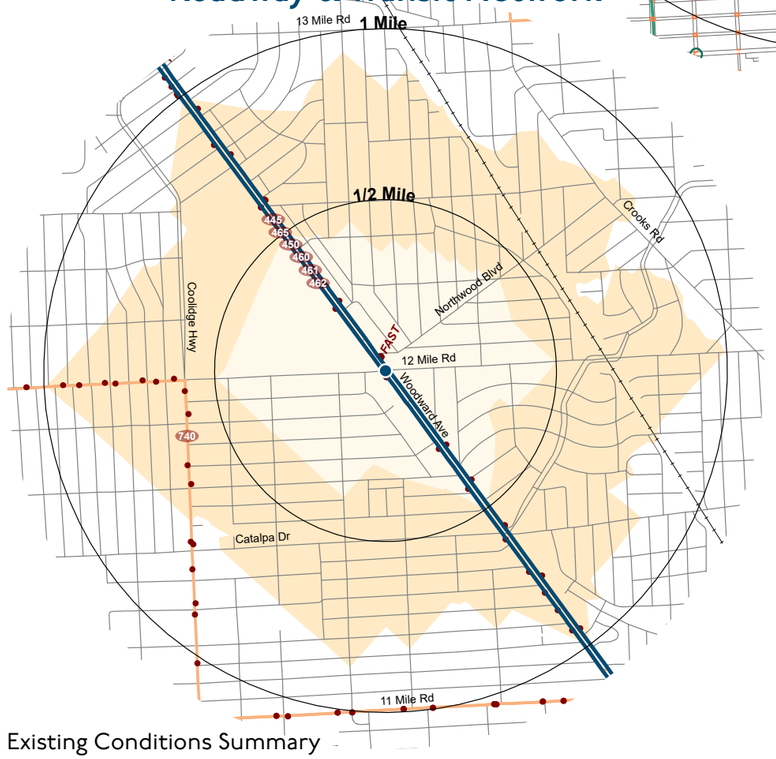
MOD Study

- Station
- Ann Arbor to Detroit Rail Corridor
- Railroad
- 1/2 Mile Walkshed
- 1 Mile Walkshed

Non-Motorized Network



Roadway & Transit Network



Non-Motorized Network

- 2018 Pedestrian Crash
- Sidewalk
- Crosswalk
- 2018 Bicycle Crash
- Bikeshare Station
- Planned Bikeshare Station
- Shared Use Path (off-road)
- Bike Lane (on-road)
- Shared Lane (on-road)

Transit Network

- SMART Bus Stop
- SMART Bus Route

Mobility Planning

The proposed 12 Mile Station, located on 12 Mile Road and Woodward Avenue, provides direct access to single family residences and small businesses in the City of Royal Oak, on the east side of Woodward Avenue, and in the City of Berkley, on the west side of Woodward Avenue. 12 Mile Road is the major east-west corridor for Oakland County, measuring 50-60 feet from curb to curb. Traffic volumes on this corridor have declined since the opening of Interstate 696 one mile south of this station area in the late 1980s. The proposed station area has wide pedestrian crossing distances, lacks mid-block crossings, has narrow sidewalks, lacks bicycle routes and has frequent u-turn lanes through Woodward Avenue's landscaped medians also known as the "Michigan Left". The cities of Berkeley and Royal Oak incorporated complete street principles into their comprehensive plans to address these safety concerns, in accordance with Michigan's Public Act 135 of 2010 in guidance from the Federal Transit Administration (FTA). These plans include general policy guidance to include countdown timers, high visibility crosswalks, curb cuts and pavement markers to accommodate the disabled, pedestrian refuge islands, street furniture, public art and pedestrian-scale lighting as part of all future capital improvements. Specific improvements for this proposed station area include:

1. Add bicycle routes on Northwood Boulevard and Benjamin Avenue just north of the intersection of 12 Mile Road and Woodward Avenue. These bicycle routes would connect to a planned trail along the Amtrak railway.
2. Implement a road diet on Woodward Avenue to address the excess capacity created on this corridor after an almost 1/3 reduction in population after the completion of Interstate 75 in 1973. This would eliminate the far-left vehicle lane, reduce speeds to 35 mph, add a bicycle lane protected by a landscaped median, add on-street parking, expand sidewalks to 8 feet, reduce the width of the center median and narrow the remaining travel lanes.
3. Construct a bus rapid transit (BRT) route with stops along the center median or the landscaped median adjacent to the proposed bike lane on Woodward Avenue.
4. Post on all existing bus stops signs indicating bus routes, timetables, long term bicycle parking locations and instructions on how to use the bicycle racks on the bus.
5. Add amenities, public art and sidewalk cafes for pedestrians and bicyclists along 12 Mile and Woodward Avenue

Transit

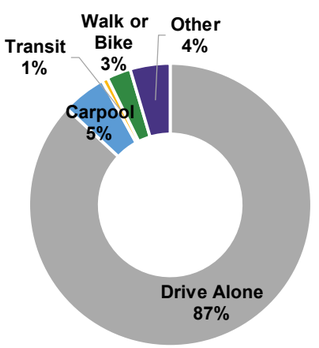
FAST bus stops are located on the far side of the Woodward Avenue and 12 Mile Road intersection for both northbound and southbound buses. Besides SMART's Woodward Local and FAST routes, connections to SMART Route 445 (limited service with 20- to 40-minute frequency) and 465 (limited service with 30- to 70-minute frequency) can be made at Woodward Avenue and 12 Mile Road.

	Within 0.5 Miles	Within 1 Mile
Sidewalk & Crosswalk Mileage	28.5	125.2
Intersection Density (intersections per sq mi)	154.1	146.4
2018 Pedestrian Crashes	0	6
Bikeway Mileage	0.0	2.3
2018 Bicycle Crashes	0	8
TRANSIT ACTIVITY	**Average Weekday Boardings**	
SMART	69	122

Sources: SEMCOG Open Data, SMART October 2017

Commute Mode Share

RESIDENTS WITHIN 1 MILE



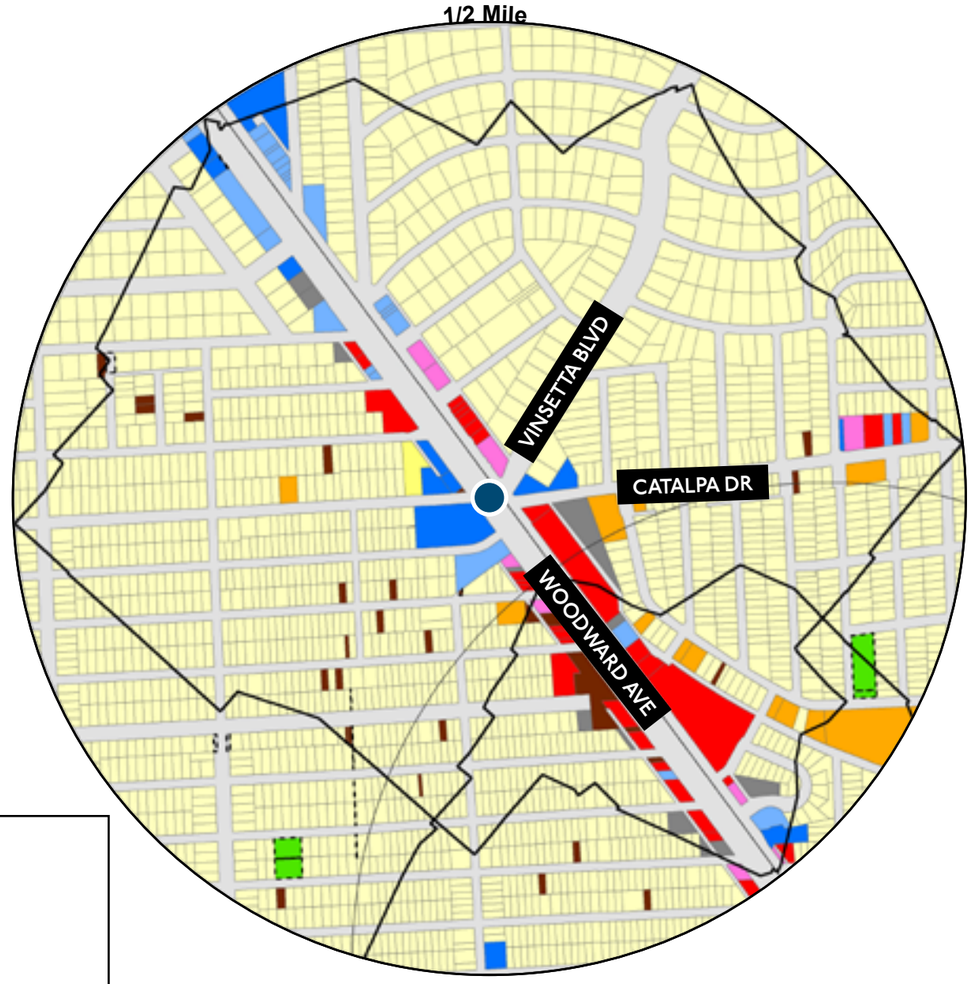
Source: American Community Survey 2013-2017

CATALPA DR: CONTEXT

DRAFT

MOD Study

Existing Land Use



Source: SEMCOG 2015

- Potential Station Location
- Single Family Housing
- Attached Condo Housing
- Multi-Family Housing
- Retail; Retail-Residential
- Office; Office-Residential
- Institutional; Medical
- Hospitality; Hospitality-Residential
- Industrial
- Cemetery; Golf Course; Park and Open Space; Recreation
- Parking
- TCU
- Water
- Vacant
- Publicly Owned
- 1/2 Mile Walkshed

About the Station Area

The future transit node at Woodward and Catalpa Drive is split between Royal Oak and Berkley. The commercial character is similar on both sides of Woodward. The west side of Woodward, in Berkley, is flanked by 100-120' deep lots with ample surface parking. The east side of Woodward, in Royal Oak, contains a walkable commercial strip north of Catalpa and a new commercial development that includes Trader Joe's, a major trip generator, south of Catalpa. There is little vacancy along Woodward, but the large areas devoted to surface parking present an MOD opportunity. Land use beyond Woodward is predominantly single-family residential.

Roadway Configuration

At Woodward Avenue and Catalpa, Woodward has four through-lanes and a right turn lane in each direction, separated by a median. Catalpa has one through-lane in each direction plus a right turn lane on the east approach to Woodward. There are continental crosswalks at all legs of the intersection. The signalized pedestrian crossing at Catalpa is the only marked pedestrian crossing between 11 Mile and 12 Mile.

Population & Employment

	Within 0.5 Miles	Within 1 Mile
Population	4,554	15,936
Jobs	3,048	7,014

Source: American Community Survey 2013-2017; Longitudinal Employer-Household Dynamics 2017 (does not include federal workers)

Views of the Potential Station Area

Source: Google Earth

CATALPA DR: LAND USE & ZONING

DRAFT

MOD Study

Land Use Planning

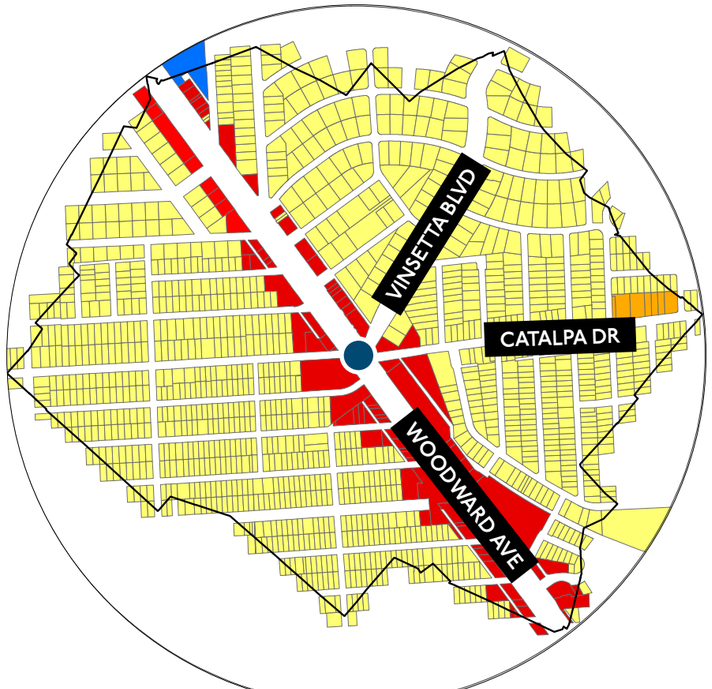
Royal Oak

Royal Oak's 2012 Master Plan identifies Catalpa Drive as a future transit node. The plan calls for General Commercial along Woodward and patches of Multiple Family and Single Family Attached-Detached behind Woodward, almost identical to existing zoning.

Berkley

Berkley's 2007 Master Plan encourages the adoption of TOD standards will that make Berkley a more transit-friendly environment. However, Berkley's new mixed use future land use designation does not appear on Woodward. The master plan designates parcels near Woodward zoned multiple family as "General Commercial & Service" areas.

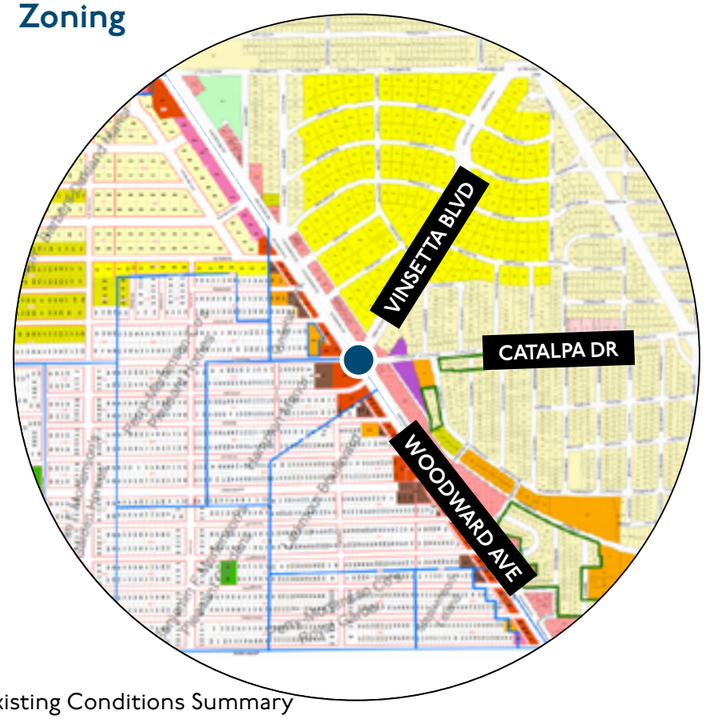
Future Land Use



- Potential Station Location
- Residential
- Commercial
- Office
- Mixed Use
- Institutional
- Cemetery
- Park and Open Space
- Recreation
- Golf Course
- Industrial
- Parking
- Transportation/Communication/Utilities
- Water

Source: SEMCOG 2010

Zoning



Berkley Zoning
- Single Family R1-A
- Single Family R1-B
- Single Family R1-C
- Single Family R1-D
- Two Family
- Multiple Family
- Office
- Parking

Royal Oak Zoning
- One Family
- One Family Large Lot
- Two Family
- Multiple Family
- Office Service
- Neighborhood Business
- Neighborhood Business II
- General Business
- One Family Overlay

Zoning

Royal Oak

The predominant zoning districts on the Royak Oak side of Woodward are not conducive to mixed use and dense development.

Berkley

The City of Berkley's "Woodward" zoning designation allows a selective mix of uses but is intended to serve high volumes of vehicle traffic. However, Berkley does allow shared parking and require bike parking with all new parking facilities.

	Royal Oak		Berkley	
Metric	**General Business**	**Multiple Family**	**Woodward**	**Multiple Family**
Promotes Mixed Use	No	No	Somewhat	No
Building Height	30 ft	30 ft	50 ft	30 ft
Parking	• Shared parking permitted • Reduction waivers may be granted		Shared parking permitted	
Bike Parking	N/A		• Required with all new parking • Used to reduce parking minimum	

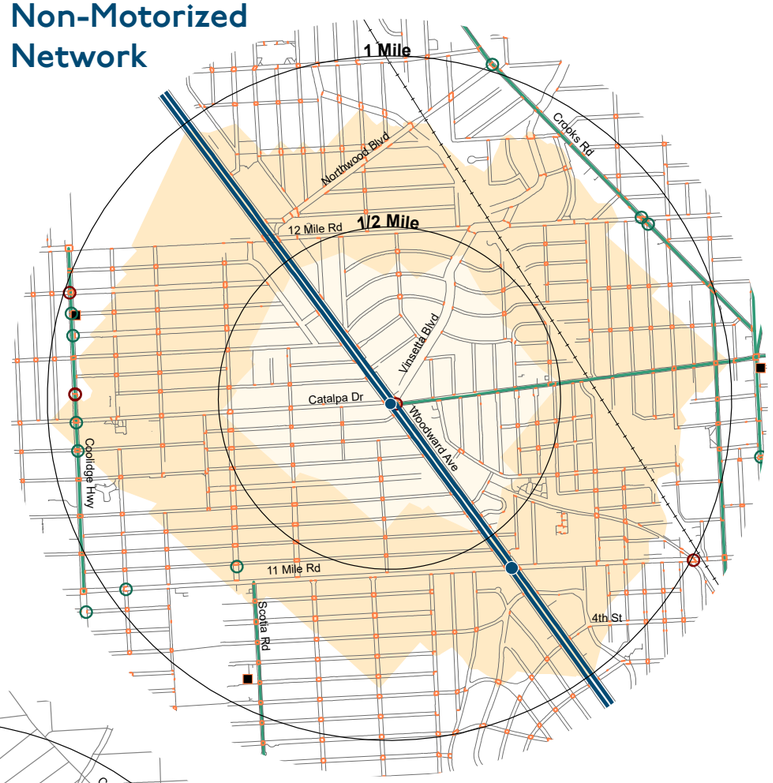
CATALPA DR: MOBILITY

DRAFT

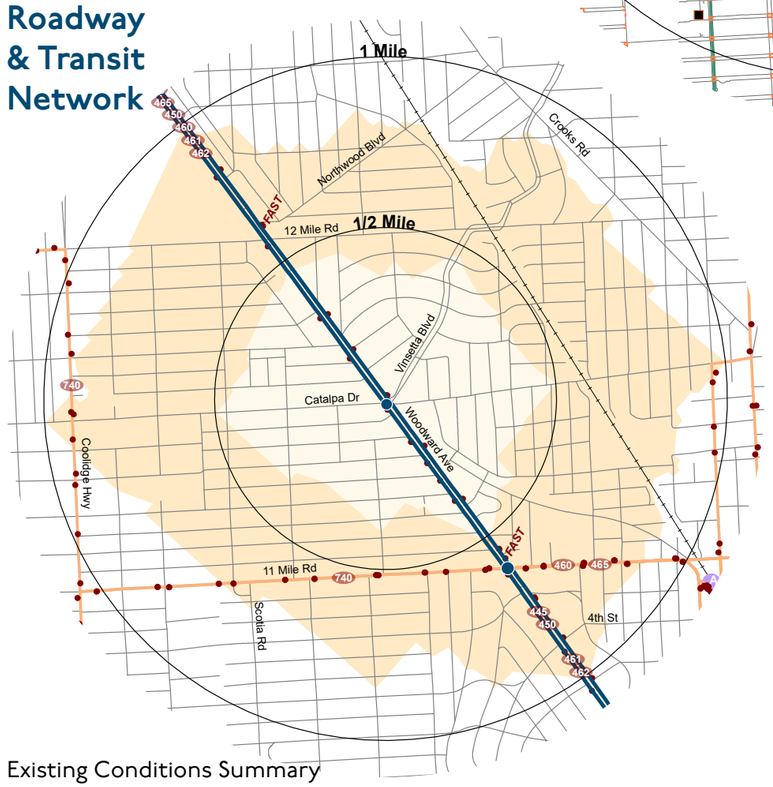
MOD Study

- Station
- Woodward Corridor
- Railroad
- 1/2 Mile Walkshed
- 1 Mile Walkshed

Non-Motorized Network



Roadway & Transit Network



Non-Motorized Network

- 2018 Pedestrian Crash
- Sidewalk
- Crosswalk
- 2018 Bicycle Crash
- Bikeshare Station
- Planned Bikeshare Station
- Shared Use Path (off-road)
- Bike Lane (on-road)
- Shared Lane (on-road)

Transit Network

- SMART Bus Stop
- SMART Bus Route
- Amtrak Station

Mobility Planning

The proposed Catalpa Station, located on Catalpa Drive and Woodward Avenue, provides direct access to single family residences and small businesses in the City of Royal Oak, on the east side of Woodward Avenue, and in the City of Berkley, on the west side of Woodward Avenue. The proposed station area has wide pedestrian crossing distances, lacks mid-block crossings, has narrow sidewalks, lacks bicycle routes and has frequent u-turn lanes through Woodward Avenue's landscaped medians also known as the "Michigan Left". The cities of Berkeley and Royal Oak incorporated complete street principles into their comprehensive plans to address these safety concerns, in accordance with Michigan's Public Act 135 of 2010 in guidance from the Federal Transit Administration (FTA). These plans include general policy guidance to include countdown timers, high visibility crosswalks, curb cuts and pavement markers to accommodate the disabled, pedestrian refugee islands, street furniture, public art and pedestrian-scale lighting as part of all future capital improvements. Specific improvements for this proposed station area include:

1. Add shared lane markings 11-12 feet from the curb on Catalpa Drive and clearly mark where on-street parking is permitted to guide bicyclists to safe areas to ride.
2. Implement a road diet on Woodward Avenue to address the excess capacity created on this corridor after an almost 1/3 reduction in population after the completion of Interstate 75 in 1973. This would eliminate the far-left vehicle lane, reduce speeds to 35 mph, add a bicycle lane protected by a landscaped median, add on-street parking, expand sidewalks to 8 feet, reduce the width of the center median and narrow the remaining travel lanes.
3. Construct a bus rapid transit (BRT) route with stops along the center median or the landscaped median adjacent to the proposed bike lane on Woodward Avenue.
4. Post on all existing bus stops signs indicating bus routes, timetables, long term bicycle parking locations and instructions on how to use the bicycle racks on the bus.

Transit

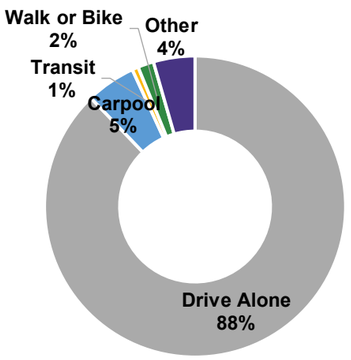
FAST bus stops are located at 11 Mile and 12 Mile Roads, half a mile south and north, respectively, of the Woodward Avenue and Catalpa Drive intersection. Besides SMART's Woodward Local route, connections to SMART Route 445 (limited service with 20- to 40-minute frequency) and 465 (limited service with 30- to 70-minute frequency) can be made at Woodward Avenue and Catalpa Drive.

	Within 0.5 Miles	Within 1 Mile
Sidewalk & Crosswalk Mileage	34.1	131.4
Intersection Density (intersections per sq mi)	154.1	146.4
2018 Pedestrian Crashes	1	5
Bikeway Mileage	0.5	3.6
2018 Bicycle Crashes	0	8
TRANSIT ACTIVITY	**Average Weekday Boardings**	
SMART	36	444

Sources: SEMCOG Open Data, SMART October 2017

Commute Mode Share

RESIDENTS WITHIN 1 MILE



Source: American Community Survey 2013-2017

11 MILE RD: CONTEXT

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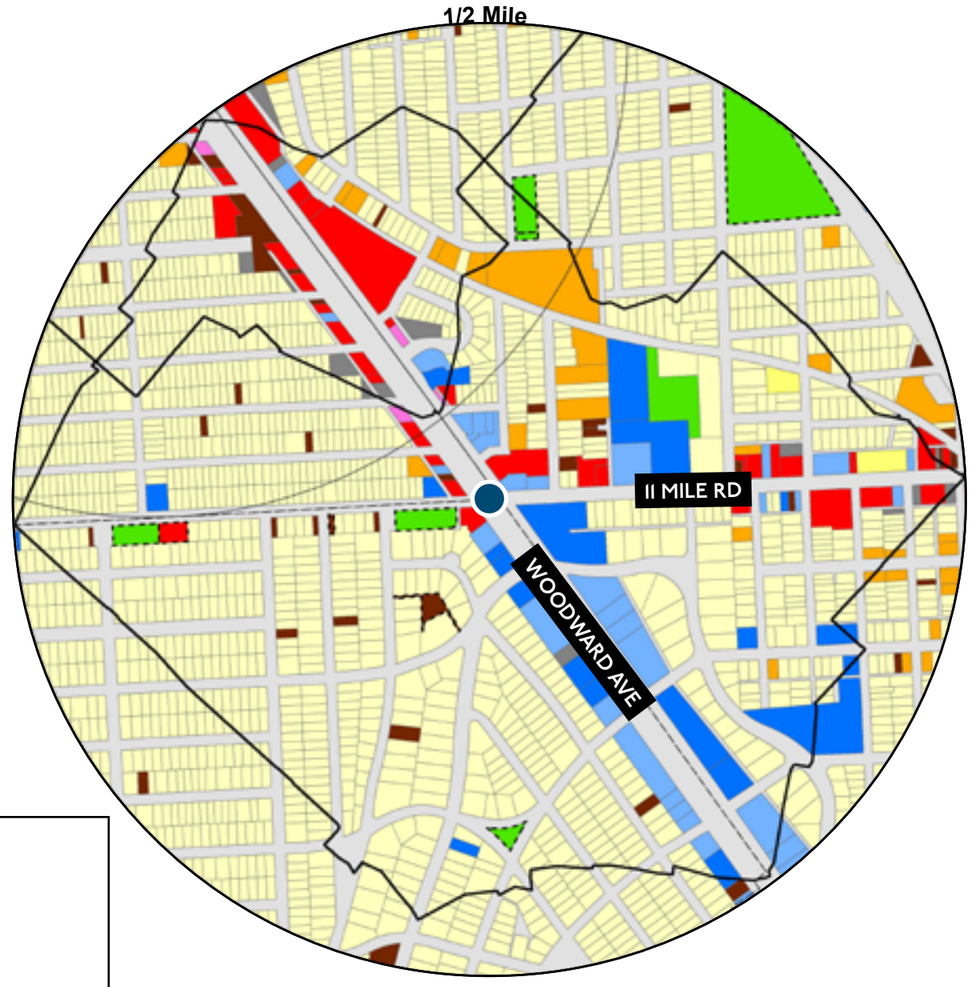
MOD Study

Existing Land Use



- Potential Station Location
- Single Family Housing
- Attached Condo Housing
- Multi-Family Housing
- Retail; Retail-Residential
- Office; Office-Residential
- Institutional; Medical
- Hospitality; Hospitality-Residential
- Industrial
- Cemetery; Golf Course; Park and Open Space; Recreation
- Parking
- TCU
- Water
- Vacant
- Publicly Owned
- 1/2 Mile Walkshed

Source: SEMCOG 2015

About the Station Area

The future transit node at Woodward and 11 Mile straddles the communities of Royal Oak, Berkley and Huntington Woods. This node is within walking distance of Downtown Royal Oak and is about one mile from Downtown Berkley.

Land use to the west of Woodward in Berkley and Huntington Woods is almost exclusively single-family residential. East of Woodward is a mix of single-family neighborhoods and commercial and institutional uses.

On the east side of Woodward, redevelopment schemes are challenging due to shallow diagonal lots and parking requirements. Lots on the west side of Woodward are not as shallow.

Roadway Configuration

At Woodward Avenue and 11 Mile, Woodward has four through-lanes in each direction, right and left turn lanes leading up to the intersection, and crossover queue lanes immediately downstream from the intersection. 11 Mile has two through-lanes and a right turn lane in each direction. There are no sidewalk gaps, although there are large curb cuts and auto-oriented uses on three of the four corners of the intersection.

Population & Employment

	Within 0.5 Miles	Within 1 Mile
Population	3,835	15,908
Jobs	2,443	11,762

Source: American Community Survey 2013-2017; Longitudinal Employer-Household Dynamics 2017 (does not include federal workers)

Views of the Potential Station Area

Source: Huntington Woods Master Plan Update (2015), Google Earth

11 MILE RD: LAND USE & ZONING

DRAFT

MOD Study

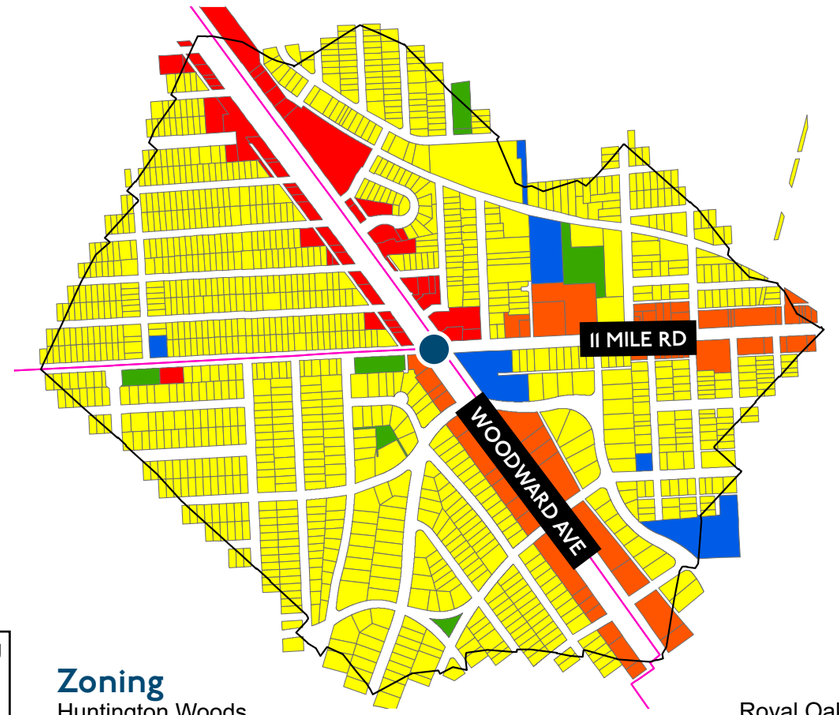
Land Use Planning

Royal Oak's 2012 Master Plan denotes lots along Woodward as General Commercial north of 11 Mile and Mixed Use south of 11 Mile. 11 Mile east of Woodward is a mix of Mixed Use, Public/ Institutional and Single Family Residential. The Single Family designation is predominant between Woodward and the Central Business District. The master plan does not explicitly mention multi-family housing or denser development along the Woodward corridor.

Huntington Woods' 2015 Master Plan Update has designated its entire Woodward frontage as future mixed use. All parcels behind Woodward that are currently single family will remain in the future.

Berkley's 2007 Master Plan calls for auto-oriented commercial along major Woodward Ave and the preservation of the single family character of its neighborhoods behind Woodward.

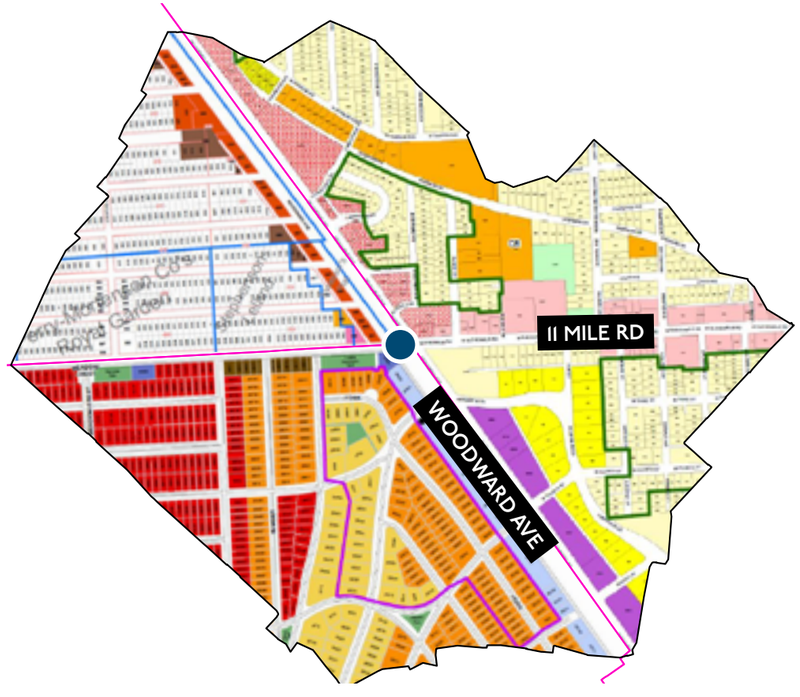
Future Land Use



- Potential Station Location
- Residential
- Commercial
- Office
- Mixed Use
- Institutional
- Cemetery
- Park and Open Space
- Recreation
- Golf Course
- Industrial
- Parking
- Transportation/Communication/Utilities
- Water

Source: SEMCOG 2010

Zoning



Huntington Woods Zoning
- R-1B
- R-1C
- R-1D
- R-1E
- TD
- BD
- PRD
- Hill Historic District

Berkley Zoning
- Single Family R1-D
- Two Family
- Multiple Family
- Office
- Parking

Royal Oak Zoning
- One Family
- One Family Large Lot
- Two Family
- Multiple Family
- Office Service
- Neighborhood Business
- General Business
- One Family Overlay

Zoning

<u>Huntington Woods</u>

The Transitional District along Woodward Avenue encourages a mixture of compatible uses including multi-family, retail, and office. Redevelopment in this district is encouraged to be mixed use and promote transit and non-motorized opportunities.

<u>Berkley</u>

The Woodward zoning district permits primarily office and local business district uses and allows for up to 50 ft tall buildings.

<u>Royal Oak</u>

The primary zoning districts in this area do not accommodate mixed use development, but a few of the categories do provide services and retail for the surrounding residential areas. Several parking waivers or standards discourage excessive parking and ensure a more pedestrian-friendly environment.

	Huntington Woods	Berkley	Royal Oak		
Metric	Transitional District	Woodward	General Business	Neighborhood Business	Office Service
Promotes Mixed Use	Yes	Somewhat	Somewhat	No	
Building Height	40 ft or 3 stories	50 ft	30 ft		
Parking	• Shared parking permitted • May not exceed 120% of requirement	Shared parking permitted	• Shared parking permitted • Reduction waivers may be granted		
Bike Parking	Bike rack required with >10 off-street parking spots.	• Required with all new parking • Used to reduce P. minimum	N/A		

11 MILE RD: MOBILITY

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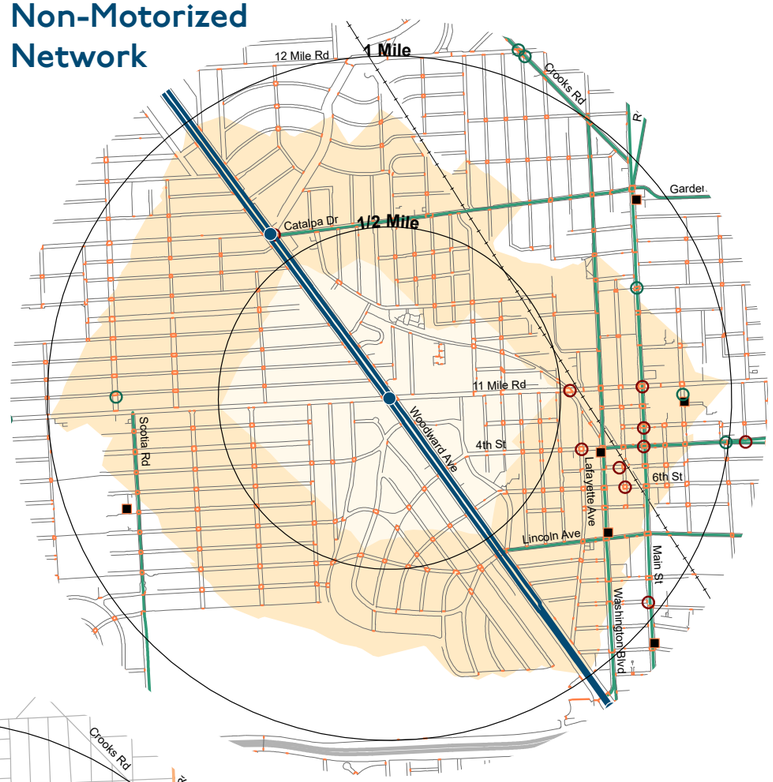
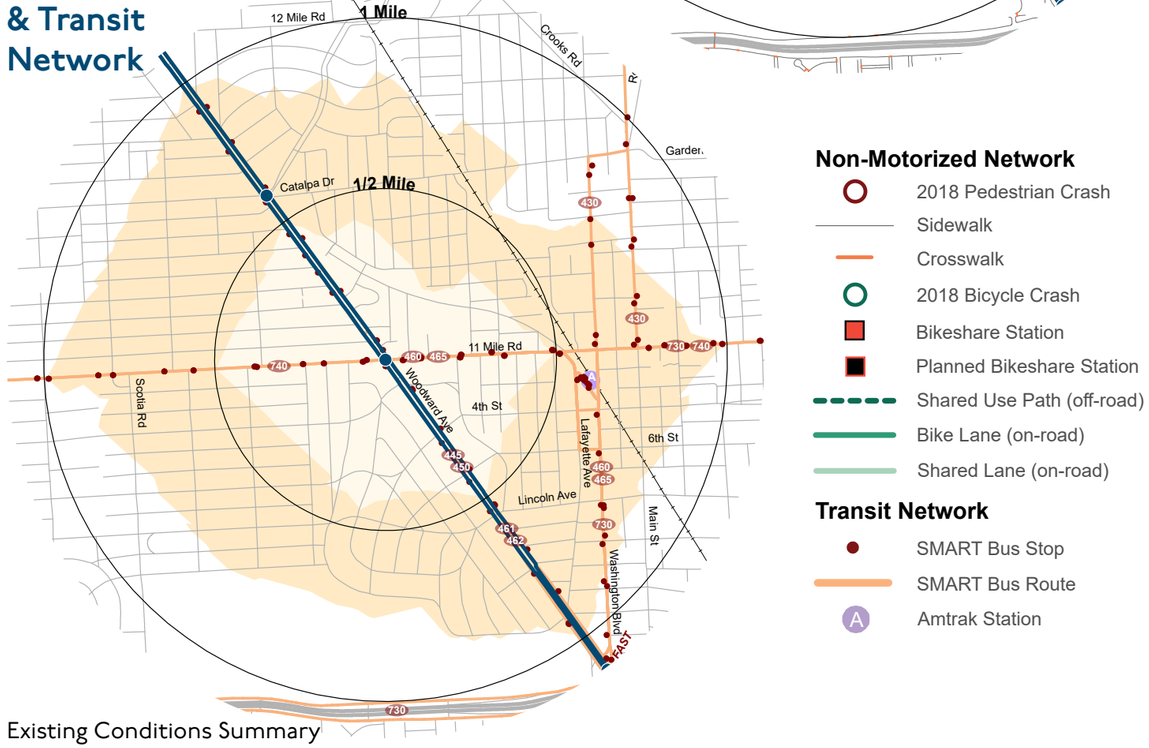
MOD Study



Non-Motorized Network

- Station
- Woodward Corridor
- Railroad
- 1/2 Mile Walkshed
- 1 Mile Walkshed

Roadway & Transit Network



Non-Motorized Network

- 2018 Pedestrian Crash
- Sidewalk
- Crosswalk
- 2018 Bicycle Crash
- Bikeshare Station
- Planned Bikeshare Station
- Shared Use Path (off-road)
- Bike Lane (on-road)
- Shared Lane (on-road)

Transit Network

- SMART Bus Stop
- SMART Bus Route
- Amtrak Station

Mobility Planning

The proposed 11 Mile Station provides connections to Amtrak rail service and SMART bus service via the Royal Oak Transit Center. The station area has wide pedestrian crossing distances, lacks mid-block crossings, and has narrow sidewalks. It also lacks bicycle routes to safely access the small businesses, single family residences, and transit amenities in the area. With the aim of enhancing sustainability, public health and safety, the plans and policies from 2012-2015 in these three cities have set out to:

1. Implement a road diet on 11 Mile Road between Woodward Avenue and Lafayette Avenue, adding a dedicated bicycle lane in each direction, reducing 4 lanes to 3 lanes and adding on-street parking.
2. Implement a road diet on Woodward Avenue to address the excess capacity created on this corridor after an almost 1/3 reduction in population after the completion of Interstate 75 in 1973. This would eliminate the far-left vehicle lane, reduce speeds to 35 mph, add a bicycle lane protected by a landscaped median, add on-street parking, expand sidewalks to 8 feet, reduce the width of the center median and narrow the remaining travel lanes.
3. Construct a bus rapid transit (BRT) route with stops along the center median or the landscaped median adjacent to the proposed bike lane on Woodward Avenue.
4. Post on all existing bus stops signs indicating bus routes, timetables, long term bicycle parking locations and instructions on how to use the bicycle racks on the bus.
5. Add a non-motorized rest stop with bicycle parking, maps, restrooms and lockers at the northern section of the Detroit Zoo within the City of Royal Oak.
6. Improve the safety of pedestrian crossings at Woodward Avenue and 11 Mile Road and Woodward Avenue and Lafayette Avenue
7. Add a pedestrian signal at Mortenson Boulevard and 11 Mile Road to provide safe access to Rogers Elementary School
8. Add dedicated bicycle lanes on Princeton Road, one block north of 11 Mile Road. Also add dedicated bicycle lanes in each direction on Woodward Avenue.
9. The cities of Berkeley, Huntington Woods and Royal Oak incorporated these recommended changes into their comprehensive plans following complete streets principles outlined in Michigan's Public Act 135 of 2010 in guidance from the Federal Transit Administration (FTA).

Transit

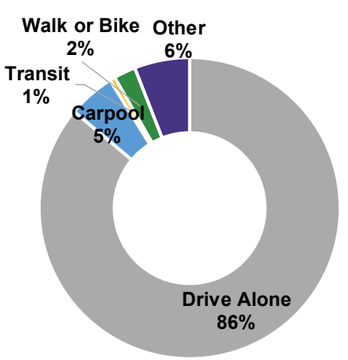
A FAST bus stop is located between Hartrick Avenue and Alfred Avenue to the north of the Woodward Avenue and 11 Mile Road intersection for northbound buses, and on the far side of the intersection for southbound buses. SMART's Woodward local route deviates from Woodward Avenue at this location to serve the Royal Oak Transit Center. Besides the SMART Woodward Local and FAST routes, connections to SMART Routes 445 (limited service with 20- to 40-minute frequency), 465 (limited service with 30- to 70-minute frequency), and 740 (crosstown with 70-minute frequency) can be made at Woodward Avenue and 11 Mile Road.

	Within 0.5 Miles	Within 1 Mile
Sidewalk & Crosswalk Mileage	36.0	125.5
Intersection Density (intersections per sq mi)	145.1	159.2
2018 Pedestrian Crashes	0	9
Bikeway Mileage	0	5.9
2018 Bicycle Crashes	0	4
TRANSIT ACTIVITY	**Average Weekday Boardings**	
SMART	353	798

Sources: SEMCOG Open Data, SMART October 2017

Commute Mode Share

RESIDENTS WITHIN 1 MILE



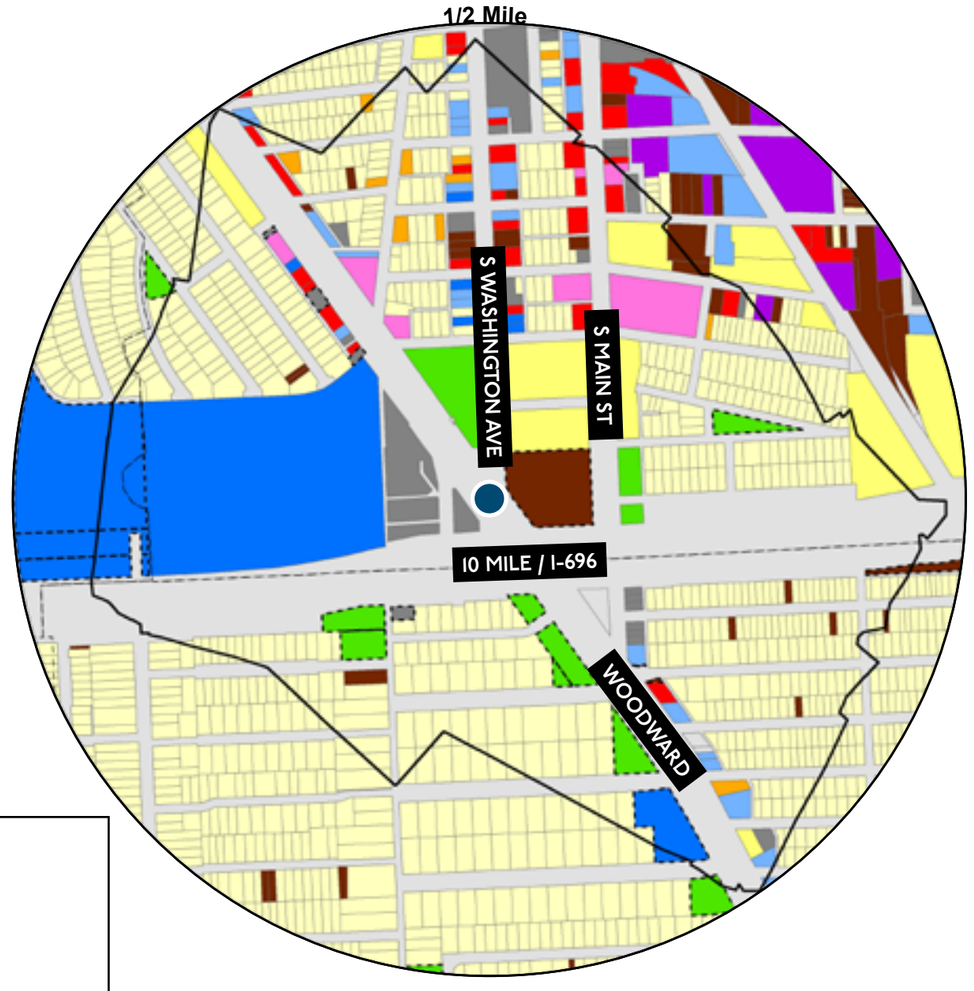
Source: American Community Survey 2013-2017

DETROIT ZOO: CONTEXT

DRAFT

MOD Study

Existing Land Use



Source: SEMCOG 2015

- Potential Station Location
- Single Family Housing
- Attached Condo Housing
- Multi-Family Housing
- Retail; Retail-Residential
- Office; Office-Residential
- Institutional; Medical
- Hospitality; Hospitality-Residential
- Industrial
- Cemetery; Golf Course; Park and Open Space; Recreation
- Parking
- TCU
- Water
- Vacant
- Publicly Owned
- 1/2 Mile Walkshed

About the Station Area

The future transit node at Woodward and 10 Mile, just north of I-696, will directly serve the communities of Pleasant Ridge, Royal Oak and Huntington Woods, as well as provide access to the Detroit Zoo.

Pleasant Ridge is a small city that straddles Woodward Ave. It is bordered by Royal Oak and the Detroit Zoo to the north and Ferndale to the south. Woodward is main thoroughfare and commercial artery through the city and the rest is predominantly residential.

A small sliver of Huntington Woods is engulfed by the half-mile walkshed around Woodward and 10 Mile. The City is predominantly single family residential in character.

The city of Royak Oak spans four miles along the east side of Woodward. Downtown Royal Oak is a half-mile north of the Woodward and 10 Mile intersection.

Roadway Configuration

Woodward Ave has three through lanes in each direction separated by the four-lane Woodward underpass below. Southbound Woodward at the Washington Ave intersection also has two slip lanes that provide access to 10 Mile Rd. The Woodward and Washington intersection has signalized pedestrian crossings and standard crosswalks at each leg of the intersection.

Population & Employment

	Within 0.5 Miles	Within 1 Mile
Population	3,279	16,352
Jobs	2,173	9,390

Source: American Community Survey 2013-2017; Longitudinal Employer-Household Dynamics 2017 (does not include federal workers)

Views of the Potential Station Area

Source: Google Earth

DETROIT ZOO: LAND USE & ZONING

DRAFT

MOD Study

Land Use Planning

Pleasant Ridge

The City of Pleasant Ridge Community Master Plan was published in 2015. One of the Community Expectations in this plan is “quality mixed-use redevelopment along Woodward.” The plan specifically references “The Triangle,” the lone undeveloped site remaining in the city which sits at the node of Woodward and I-696. There are additional parcels at the southeast and southwest corners of Woodward and I-696 with MOD potential.

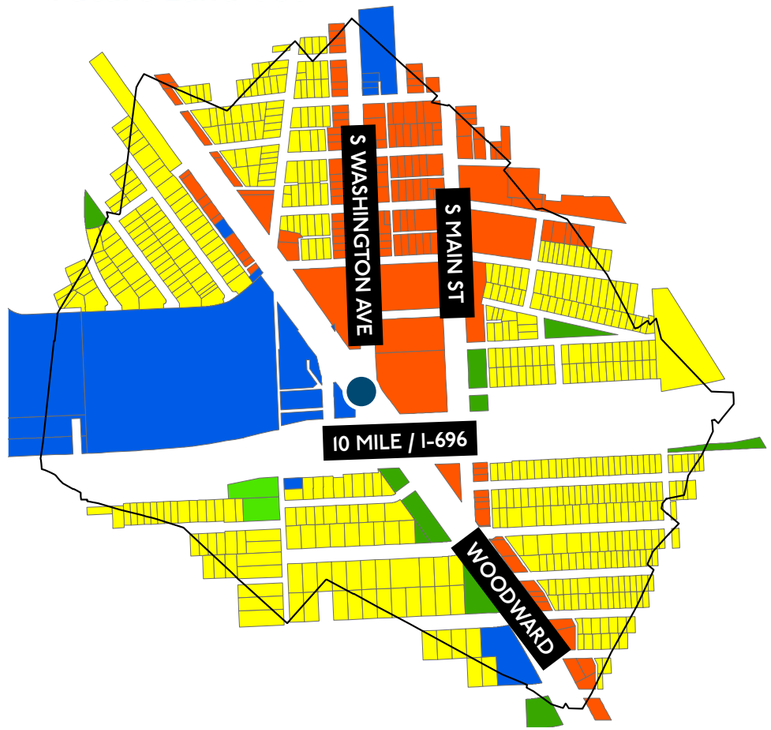
The Master Plan also calls for the creation of a Pleasant Ridge Mixed-Use Corridor Zoning District along Woodward Ave. Three- to three-and-a-half story buildings with a mixture of uses and housing types will be encouraged.

Pleasant Ridge is also working actively with its neighboring Woodward communities to foster a more walkable, bikeable, transit friendly environment along Woodward.

Royal Oak

Royal Oak’s 2012 Master Plan denotes parcels along Woodward, Washington Ave and Main St as mixed use. This designation is intended to encourage walkable, transit-oriented development. Washington and Main are the gateways to Downtown Royal Oak from Woodward and 10 Mile. Beyond these corridors, future land use is predominantly single family residential.

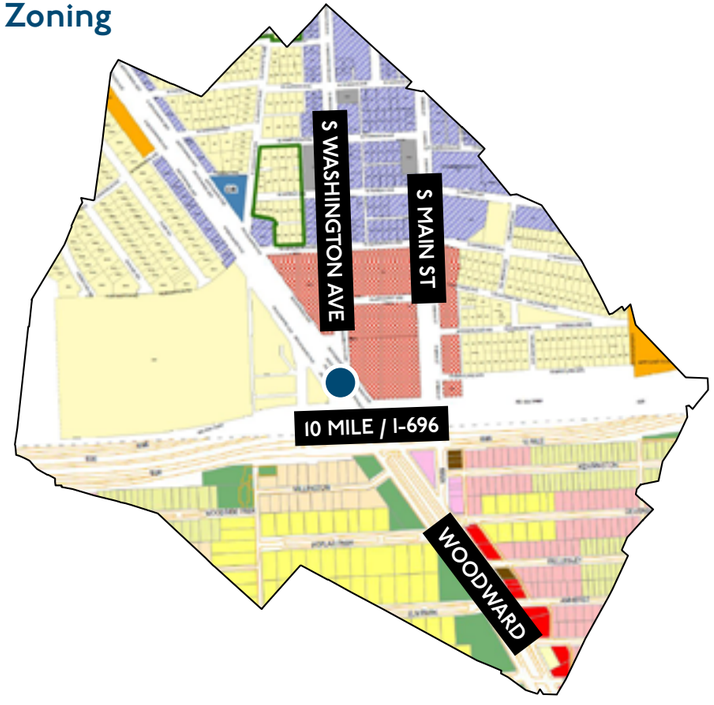
Future Land Use



- Potential Station Location
- Residential
- Commercial
- Office
- Mixed Use
- Institutional
- Cemetery
- Park and Open Space
- Recreation
- Golf Course
- Industrial
- Parking
- Transportation/Communication/Utilities
- Water

Source: SEMCOG 2010

Zoning



Royal Oak Zoning
- One Family
- Multiple Family
- Regional Business
- Mixed Use 2
- General Industrial
- Planned Unit Development

Pleasant Ridge Zoning
- C
- RO
- P
- PRM
- RM
- R-1A
- R-1B
- R-1C
- R-1D

Zoning

Pleasant Ridge

Currently, shallow diagonal lots and minimum parking requirements make redevelopment along Woodward difficult in Pleasant Ridge. Frequent and reliable transit, in additional to improved non-motorized facilities, is needed before zoning can be changed to encourage substantially denser mixed-use development with reduced off-street parking requirements.

As eluded to in the Master Plan, a new Pleasant Ridge Mixed-Use Corridor District along Woodward is forthcoming.

Royal Oak

The primary zoning districts in this area encourage mixed use development; the regional business district also allows for greater density and taller buildings. Several parking waivers or standards discourage excessive parking and ensure a more pedestrian-friendly environment. However, there are no design incentives or standards in the Zoning Ordinance.

	Pleasant Ridge			Royak Oak	
Metric	C	RO	PRM	Regional Business	Mixed Use 2
Promotes Mixed Use	Somewhat	No	No	Yes	Yes
Building Height	40 ft	35 ft	5 stories max.	30 ft	50 ft
Parking	Reduced with proximity to municipal lot.	No reductions to office requirements	N/A	Landbanking up to 20% of required spaces allowed	
Bike Parking	Reduction of 1 space for every 6 bike spaces	N/A	N/A	N/A	

DETROIT ZOO: MOBILITY

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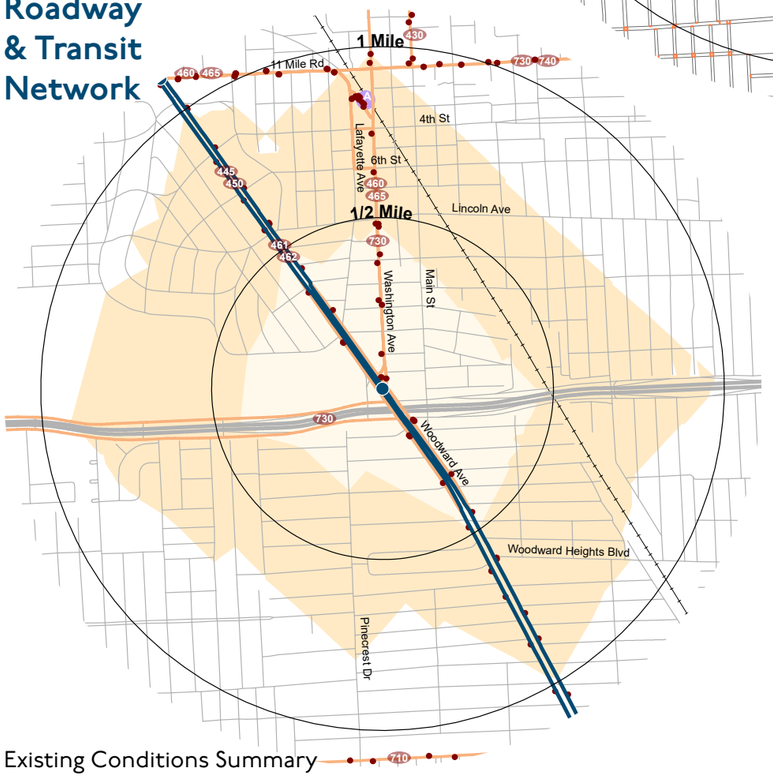
MOD Study

- Station
- Woodward Corridor
- Railroad
- 1/2 Mile Walkshed
- 1 Mile Walkshed

Roadway & Transit Network



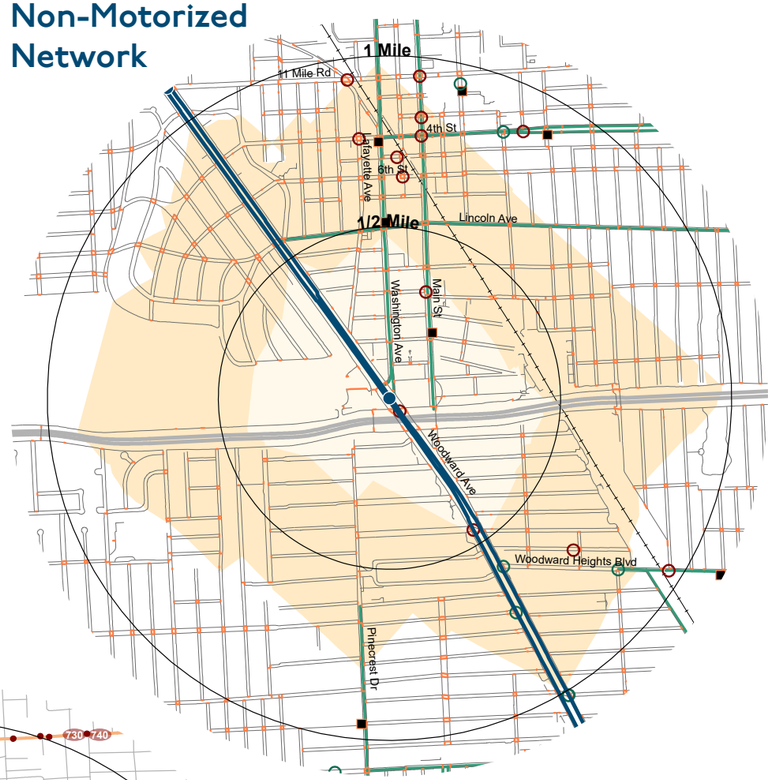
Non-Motorized Network

- 2018 Pedestrian Crash
- Sidewalk
- Crosswalk
- 2018 Bicycle Crash
- Bikeshare Station
- Planned Bikeshare Station
- Shared Use Path (off-road)
- Bike Lane (on-road)
- Shared Lane (on-road)

Transit Network

- SMART Bus Stop
- SMART Bus Route
- Amtrak Station

Non-Motorized Network



Mobility Planning

The proposed Detroit Zoo Station, located at 10 Mile Road (I-696 Service Drive) and Woodward Avenue, features direct access to the zoo and the single-family residences of Pleasant Ridge. The northern and southern halves of the proposed station area are currently divided by an area commonly known as “The Ditch”, where two lanes of Woodward Avenue continue underneath the Interstate 696 underpass, while three lanes remain at grade. Woodward Avenue itself divides the station area from east to west with a 200-foot-wide roadway slanted at a 30-degree angle. These conditions, along with frequent “Michigan Left”, U-turn lanes through Woodward Avenue’s 70-foot-wide landscaped medians, create potentially unsafe crossing conditions and can restrict drivers’ field of vision, especially when parked at intersections. To address this major physical divide in the station area, in the short-term, the cities of Ferndale and Pleasant Ridge propose in their 2019 Safety Audit a series of traffic calming measures including:

1. Two-way separated bicycle lanes on both sides of Woodward Avenue
2. The implementation of new crosswalks timed to accommodate pedestrians
3. The redesign of intersections to reduce crossing distances and improve visibility for all road users.

In the long-term, the cities of Pleasant Ridge, Royal Oak and Huntington Woods plan to remove the I-696 underpass and install a cap or cantilever in its place to reconnect the community with public art, a widened sidewalk and more cycle tracks, according to their 2012 Conceptual Complete Streets Study. This plan was later supported by SEMCOG in 2014, which considered constructing a cap over the I-696 underpass to accommodate a future rapid transit station and provide enhanced east/west pedestrian access in this area.

Transit

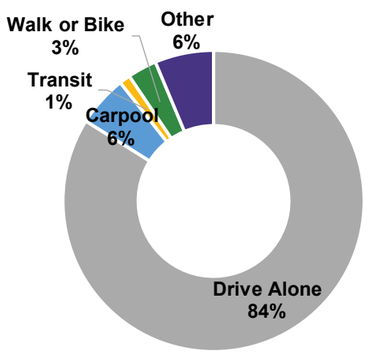
FAST bus stops are located on the far side of the Woodward Avenue and Washington Street intersection for both northbound and southbound buses. Besides SMART’s Woodward Local and FAST routes, connections to SMART Routes 445 (limited service with 20- to 40-minute frequency), 730 (crosstown with 60-minute frequency), and 740 (crosstown with 70-minute frequency) can be made at the Detroit Zoo location.

	Within 0.5 Miles	Within 1 Mile
Sidewalk & Crosswalk Mileage	26.5	117.5
Intersection Density (intersections per sq mi)	145.1	162.7
2018 Pedestrian Crashes	3	13
Bikeway Mileage	1.2	4.8
2018 Bicycle Crashes	0	5
TRANSIT ACTIVITY	**Average Weekday Boardings**	
SMART	80	470

Sources: SEMCOG Open Data, SMART October 2017

Commute Mode Share

RESIDENTS WITHIN 1 MILE



Source: American Community Survey 2013-2017

9 MILE RD: CONTEXT

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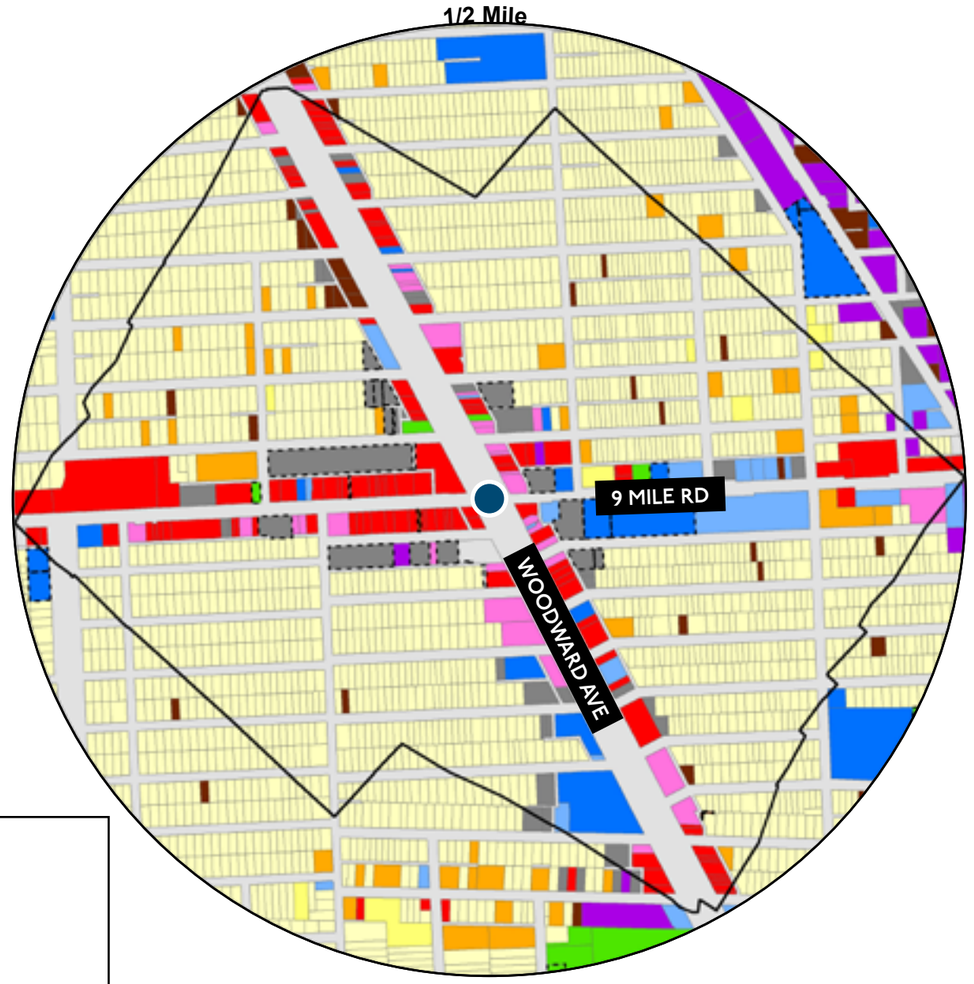
MOD Study

Existing Land Use



Source: SEMCOG 2015

- Potential Station Location
- Single Family Housing
- Attached Condo Housing
- Multi-Family Housing
- Retail; Retail-Residential
- Office; Office-Residential
- Institutional; Medical
- Hospitality; Hospitality-Residential
- Industrial
- Cemetery; Golf Course; Park and Open Space; Recreation
- Parking
- TCU
- Water
- Vacant
- Publicly Owned
- 1/2 Mile Walkshed

About the Station Area

Ferndale is the innermost suburb of Detroit along Woodward. Downtown Ferndale, centered around Woodward and Nine Mile, is known for its walkability and diversity of local businesses. The concentration of commerce and culture around the Woodward and Nine Mile intersection make this location a key transit node.

Despite the walkability in the core of Downtown, surface parking along Woodward becomes more abundant a few blocks north of Nine Mile, presenting an opportunity for MOD. It is worth noting that developers are challenged by the diagonal, shallow lots along Woodward.

Outside of the downtown core, the half-mile walkshed around Woodward and Nine Mile is predominantly made up of single-family neighborhoods.

Roadway Configuration

Woodward Ave has a four through lanes in each direction with a wide landscaped median. The northbound side of Woodward has on-street parking and bump-outs at the westbound pedestrian crossings. 9 Mile has one through lane plus a right turn lane in each direction and on-street parking. It also has bike lanes east of Woodward and sharrows west of Woodward. The Woodward and 9 Mile intersection has signalized pedestrian crossings and red stamped crosswalks at each leg of the intersection.

Population & Employment

	Within 0.5 Miles	Within 1 Mile
Population	4,710	15,461
Jobs	3,066	6,952

Source: American Community Survey 2013-2017; Longitudinal Employer-Household Dynamics 2017 (does not include federal workers)

Views of the Potential Station Area

Source: Google Earth

9 MILE RD: LAND USE & ZONING

DRAFT

MOD Study

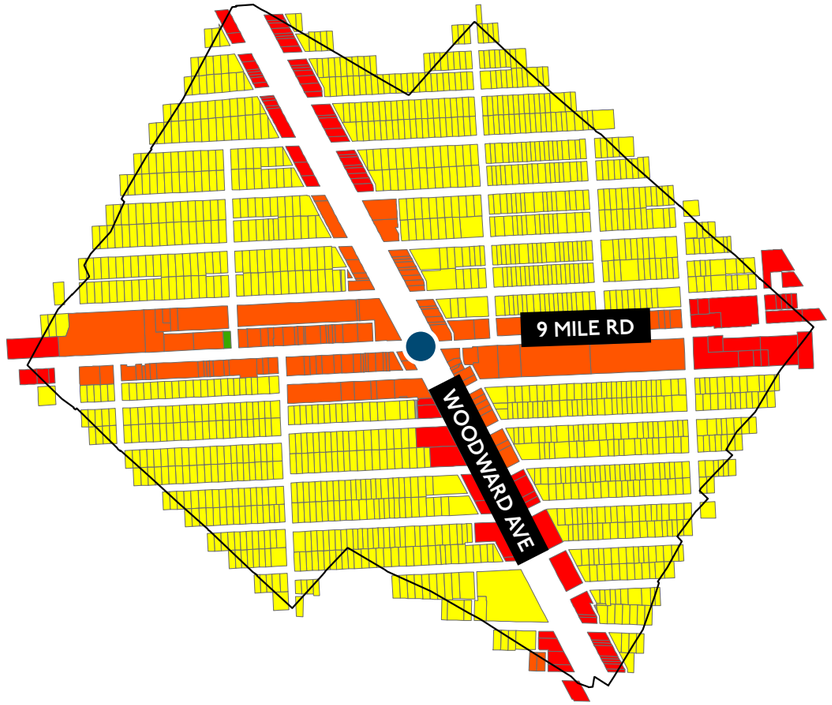
Land Use Planning

Ferndale's most recent Master Plan was completed in 2017, and it will be updated in 2021. The primary future land uses around Woodward and Nine Mile encourage a mix of housing types, medium to high density development, and vertical mixed use. Shared access and parking facilities are encouraged, while auto-oriented uses are discouraged.

The Master Plan provides recommendations for revising residential zoning regulations to promote denser, mixed use development and provide greater housing choice. Additionally, it provides guidelines for the City to identify potential sites for affordable housing and senior housing near transit and services. The Master Plan also identifies two key sites near Woodward and Nine Mile, the Troy and Withington surface parking lots, as key redevelopment sites.

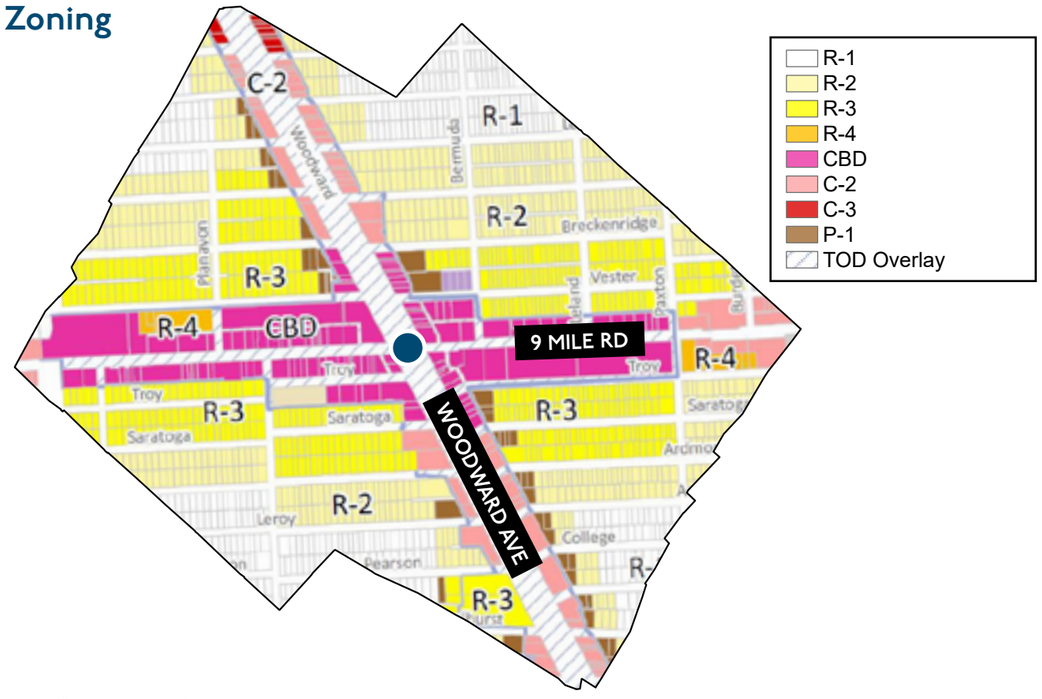
Lastly, the Ferndale Downtown Development Authority (DDA) is very active in its management of the business district and provides various benefits to its members.

Future Land Use



Source: SEMCOG 2010

Zoning



Zoning

Ferndale's zoning ordinance includes requirements that are supportive of MOD, such as bicycle parking requirements, form-based code in the Central Business District, Mixed Use Districts, a Transit Oriented Development (TOD) overlay on Woodward, and the reduction of parking requirements
New developments in the Downtown Core (Central Business District) can receive a height bonus if open or public space is required, which includes pedestrian infrastructure

The Ferndale Transit Overlay District (TOD) puts forth standards to continue the trend of dense, mixed-use, human scale development around Woodward and Nine Mile and furthers the goals set forth by the following plans:

- Master Plan
- Downtown Development Plan
- Ferndale Moves! Multi-Modal Plan
- Woodward Avenue Transit-Oriented Development Corridor Study

Metric	CBD Central Business District	C-2 General Commercial	TOD Overlay
Promotes Mixed Use	Yes	Yes	Yes
Building Height	45-80' min based on street frontages	45-70' min based on street frontages	Minimum height not less than 25 ft or 2 stories
Parking	Payment in lieu of parking if approved by the City	Parking reduction permitted with shared parking, sidewalk & transit connections	
Bike Parking	• Minimum 1 bike/10 cars or 1 bike/3,000 sqft. • Enclosed bike storage is encouraged		

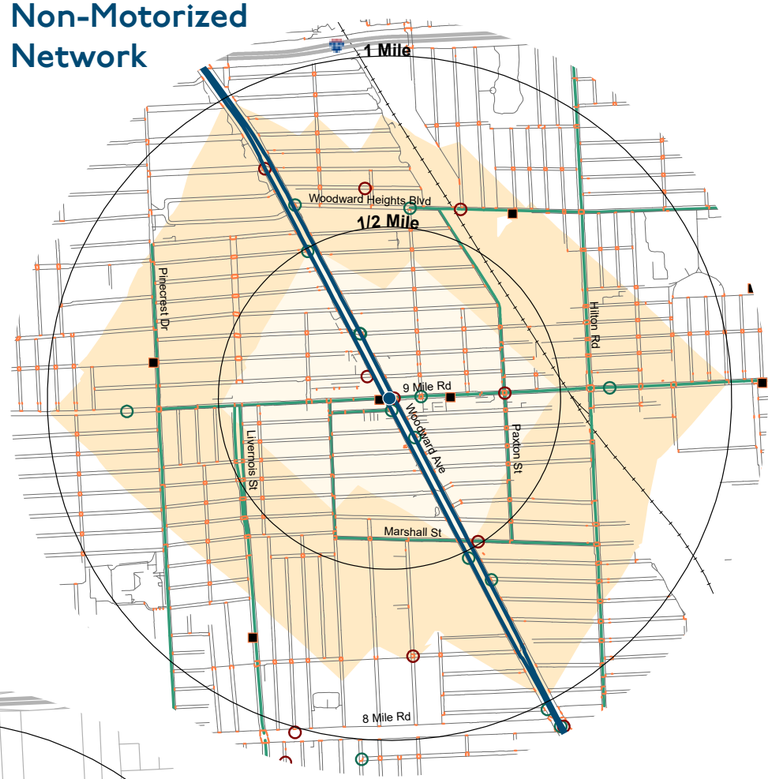
9 MILE RD: MOBILITY

DRAFT

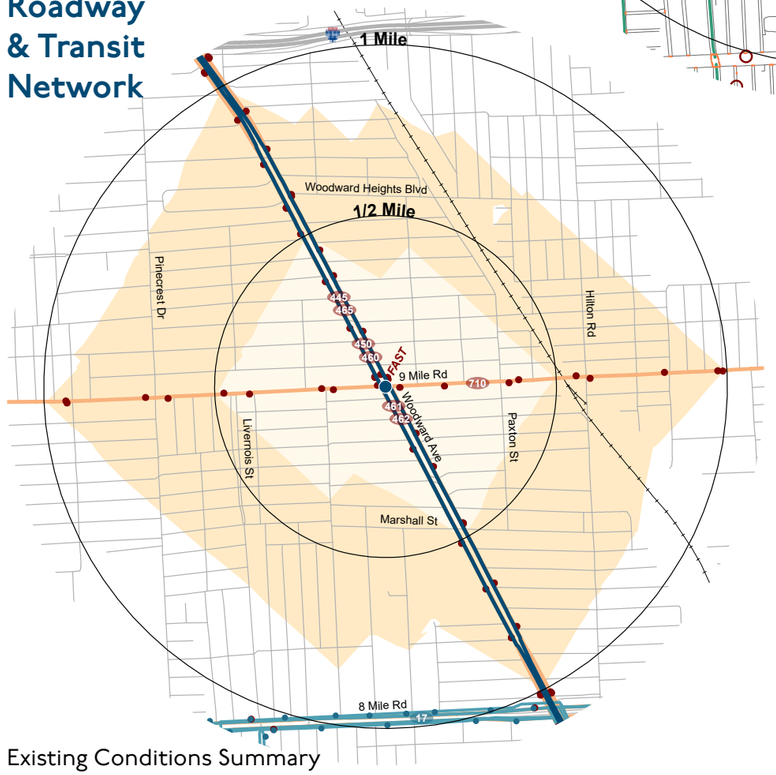
MOD Study

Station
Woodward Corridor
Railroad
1/2 Mile Walkshed
1 Mile Walkshed

Non-Motorized Network



Roadway & Transit Network



Non-Motorized Network

2018 Pedestrian Crash
Sidewalk
Crosswalk
2018 Bicycle Crash
Bikeshare Station
Planned Bikeshare Station
Shared Use Path (off-road)
Bike Lane (on-road)
Shared Lane (on-road)

Transit Network

SMART
DDOT
Bus Stop
SMART Bus Route
DDOT Bus Route

Mobility Planning

The proposed 9 Mile Station has direct access to downtown Ferndale, single-family residential and auto-oriented office and commercial districts. From 2008 to 2012, motorists struck 30 pedestrians and 52 bicyclists in the proposed station area. Around this proposed station, the sidewalks are crowded, the pavement is varied and uneven, the crossing distances are wide across and the intersections are slanted by Woodward Avenue at a 30-degree angle. The City of Ferndale has proposed a series of policies around the concept of complete streets, which culminated in the 2019 Woodward Avenue Bicycling and Walking Safety Audit. General policy guidance for this station area include:

1. Reprogramming the timing of signals to accommodate pedestrians.
2. Restricting right turns at red lights.
3. Prioritizing snow removal from bicycle lanes through the purchase of a narrow snow plow machine.
4. Planting gardens to filter stormwater runoff.
5. Producing educational materials and campaigns to educate road users about new infrastructure.
6. Removing the I-696 underpass completely to install a cap or cantilever in its place to reconnect the community with public art, a widened sidewalk and more cycle tracks, according to a 2012 Conceptual Complete Streets Study approved by the cities of Pleasant Ridge, Royal Oak and Huntington Woods. This plan was later supported by SEMCOG in 2014, which considered constructing a cap over the I-696 underpass to accommodate a future rapid transit station and provide enhanced east/west pedestrian access in this area.

Transit

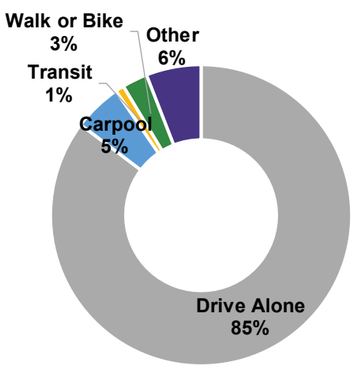
FAST bus stops are located on the far side of the Woodward Avenue and 9 Mile Road intersection for northbound buses and on the near side for southbound buses. Besides SMART's Woodward Local and FAST routes, connections to SMART Routes 445 (limited service with 20- to 40-minute frequency), 465 (limited service with 30- to 70-minute frequency), and 710 (crosstown with 20- to 40-minute frequency) can be made at Woodward Avenue and 9 Mile Road.

	Within 0.5 Miles	Within 1 Mile
Sidewalk & Crosswalk Mileage	33.7	118.6
Intersection Density (intersections per sq mi)	140.1	128.9
2018 Pedestrian Crashes	4	8
Bikeway Mileage	3.3	9.0
2018 Bicycle Crashes	6	12
TRANSIT ACTIVITY (average weekday boardings)	**681**	**766**
SMART	673	756
DDOT	8	10

Sources: SEMCOG Open Data, SMART October 2017, DDOT Feb-April 2018

Commute Mode Share

RESIDENTS WITHIN 1 MILE



Source: American Community Survey 2013-2017

CITY OF DETROIT: PLANNING OVERVIEW

DRAFT

Streets For People (Detroit Transportation Master Plan) (In progress)

The City of Detroit, along with state, county, and regional partners, is currently in the process of creating a Transportation Master Plan to serve as a guide for future infrastructure investment and transportation development that addresses:

- Equity, dignity, and transparency
- Critical safety issues
- Improves people's health and neighborhood air quality
- Increases the number of realistic mobility options
- Strengthens the neighborhoods and advances economic opportunity

ZoneDetroit (In progress)

In 2018, the Detroit City Planning Commission partnered with a team of consultants to undertake revising Detroit's Zoning Ordinance. ZoneDetroit's purpose is to create a revised Zoning Ordinance that is user-friendly, utilizes best practices, reorganizes and consolidates the Ordinance, and removes standards that are outdated or unnecessary. The project is still ongoing, but initial recommendations have been presented to the public as part of the Zoning Analytic document that was released in September, 2019 which includes key recommendations that pertain to right-sizing parking requirements, supporting livable communities (including reevaluating auto-oriented generating uses in commercial corridors), rethinking industrial areas, and zoning for neighborhoods (includes incentivizing affordable housing and encouraging mixed use development). In 2018, the Detroit City Planning Commission partnered with a team of consultants to undertake revising Detroit's Zoning Ordinance. ZoneDetroit's purpose is to create a revised Zoning Ordinance that is user-friendly, utilizes best practices, reorganizes and consolidates the Ordinance, and removes standards that are outdated or unnecessary. The project is still ongoing, but initial recommendations have been presented to the public as part of the Zoning Analytic document that was released in September, 2019 which includes key recommendations that pertain to right-sizing parking requirements, supporting livable communities (including reevaluating auto-oriented generating uses in commercial corridors), rethinking industrial areas, and zoning for neighborhoods (includes incentivizing affordable housing and encouraging mixed use development).

Downtown Detroit Transportation Study (2018)

As a multi-agency collaborative effort, the recommendations in this document are based on evaluation of data, review of existing planning efforts, research of best practices and case studies, and assessments from experts and stakeholders. This study is flexible to adjust to new data and integrate concurrent and future studies into its analysis to include recommendations to improve walking, traffic, parking, transit, biking, and manage curbside throughout downtown. The approach of the study was to ultimately develop a "Complete Network" so there is an effective system for each type of traveler.

Woodward Avenue is categorized as part of the transit priority network in the study and recommendations include:

- Coordinating with SMART and DDOT to assess route consolidation options for key corridors
- Locate bus staging areas along priority routes
- Improve service times and reliability by establishing exclusive transit lanes, using pilot off-board payment stations, and implementing transit signal priority (TSP).

Strategic Plan for Transportation (2018)

The plan provides a roadmap for addressing revitalization in Detroit neighborhoods, which includes giving people more transportation choices to have access to jobs and amenities across the city. The plan has five focus areas to better the transportation system and options in Detroit with the relevant policies as follows:

<u>Economic Opportunity</u>

- Improve transit service for Detroiters
- Make it easier for people to access jobs in Detroit
- Make it more affordable and convenient to get around Detroit
- Make Detroit the global leader in mobility innovation

<u>Public Safety</u>

- Make our streets safer for all modes of travel
- Incorporate safety improvements in all street design projects
- Make walking and biking a safe and pleasant experience

City Master Plan of Policies (2009)

This Master Plan was created to provide visionary long-range city-wide comprehensive strategies and is organized into 17 different elements, which includes City Design, Infrastructure, Neighborhoods and Housing, Retail and Local Services, Transportation and Mobility, and Zoning Concepts. As part of the Master Plan of Policies, a Future Land Use and Transportation Network maps were created to define the urban form and relationship between land uses and the transportation system.

Specifically, the plan addresses the following goals and policies that are relevant to the MOD Study:

<u>Neighborhoods and Housing</u>

- Ensure financing for affordable housing
- Work with local governments and housing professionals to coordinate housing and transportation opportunities

<u>Retail and Local Services</u>

- Established transit and pedestrian links between commercial and tourist destination areas

<u>Transportation and Mobility</u>

- Increase mobility throughout the region
- Increase the diversity of transportation options
- Ensure the safety of transportation systems

<u>Zoning Concepts</u>

- Provide flexible guidelines to accommodate diverse land uses (including encouraging mixed-use developments)
- Along transit corridors, provide incentives to accommodate high-density development

STATE FAIR: CONTEXT

DRAFT

MOD Study

Existing Land Use

Source: SEMCOG 2015

- Potential Station Location
- Single Family Housing
- Attached Condo Housing
- Multi-Family Housing
- Retail; Retail-Residential
- Office; Office-Residential
- Institutional; Medical
- Hospitality; Hospitality-Residential
- Industrial
- Cemetery; Golf Course; Park and Open Space; Recreation
- Parking
- TCU
- Water
- Vacant
- Publicly Owned
- 1/2 Mile Walkshed

About the Station Area

The future transit node at Woodward and the State Fair Transit Center, the northernmost transit node in the city of Detroit, is at the heart of the State Fairgrounds redevelopment area.

The half-mile walkshed on the west side of Woodward is almost exclusively covered by the Woodlawn Cemetery. On the east side of Woodward lies the vacant State Fairgrounds campus and the recently built shopping center fronting 8 Mile that is home to large retailers including Meijer, Marshalls and Petco.

The southern area of the walkshed includes commercial frontage along Woodward and part of the single family neighborhood south of State Fair Ave.

Roadway Configuration

Woodward Ave is five lanes in each direction with a wide center median. Woodward's grade-separated express lanes also start in this vicinity. There is a signalized intersection at the transit center and standard crosswalks across Woodward.

Population & Employment

	Within 0.5 Miles	Within 1 Mile
Population	2,309	10,403
Jobs	431	1,554

Source: American Community Survey 2013-2017; Longitudinal Employer-Household Dynamics 2017 (does not include federal workers)

Views of the Potential Station Area

Source: Google Earth

STATE FAIR: LAND USE & ZONING

DRAFT

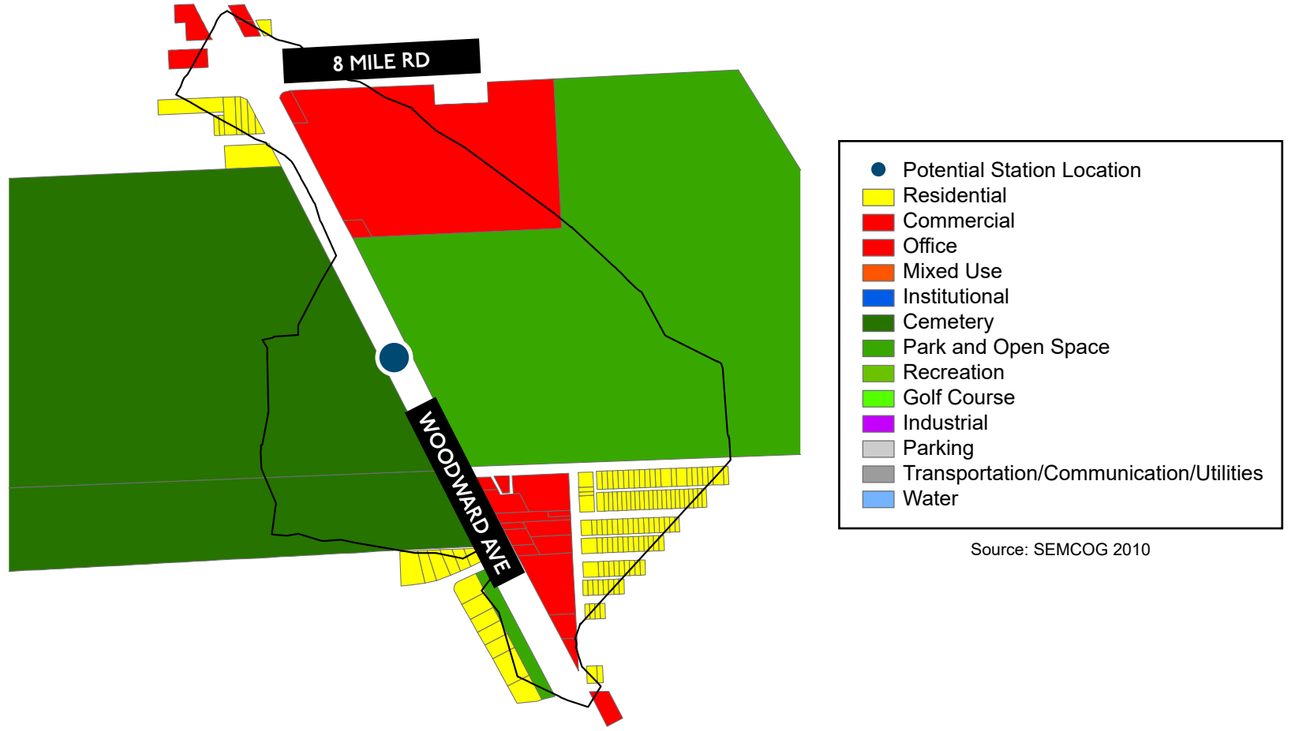
MOD Study

Land Use Planning

The State Fairgrounds has been vacant since 2009. The city has given the developer 18 acres of land around the existing transit center in exchange for a commitment to mixed use redevelopment. The developer plans to create a mixed use community with senior, market rate and affordable housing, commercial amenities, and large medical and/or university tenants. The developer has also agreed to construct a transit terminal structure along Woodward. The developer will submit preliminary designs to the City in early 2020.

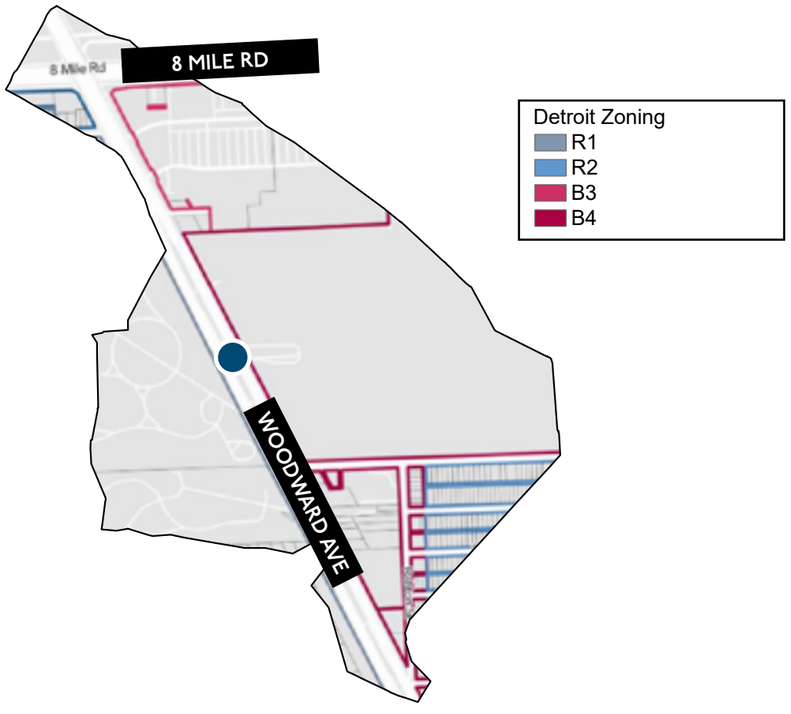
Detroit's future land use shows the fairgrounds as "Park and Open Space" and does not yet reflect the recent redevelopment plans.

Future Land Use



Source: SEMCOG 2010

Zoning



Zoning

The current zoning around the State Fairgrounds is primarily for commercial uses that somewhat promote a mixture of uses. A large portion of this area is part of the State Fairground redevelopment plan. The Major Corridor Overlay applies to parcels along Woodward.

Low-density residential zoning on the outskirts of the walkshed does not promote a mixture of uses or permit denser redevelopment on vacant parcels.

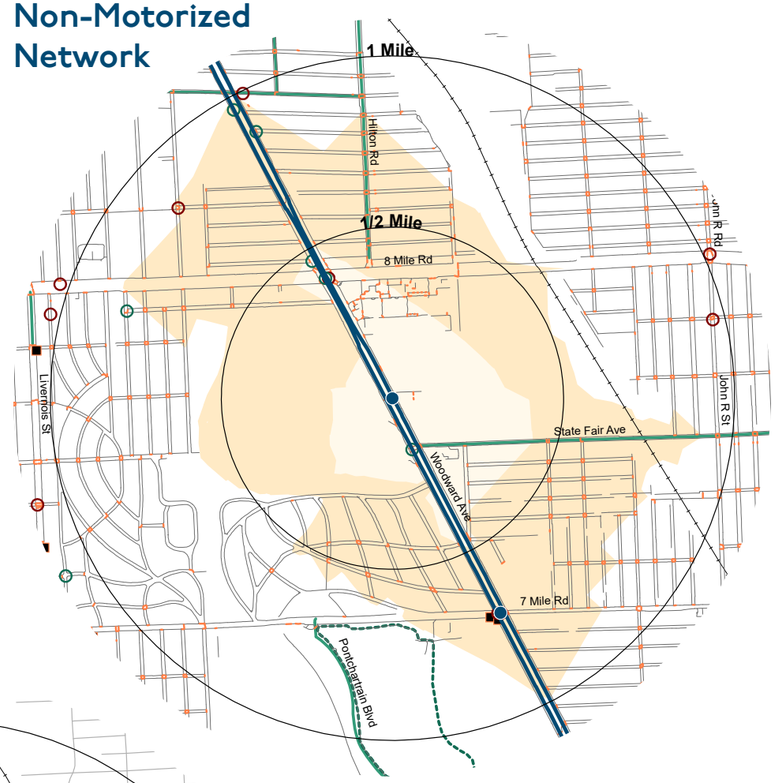
Metric	B3 Shopping District	B4 General Business District	R1/R2 Single/Two Family Residential
Promotes Mixed Use	Somewhat		No
Building Height	35 ft (or 80 ft in some cases)		35 ft
Parking	No reductions considered except for shared parking and buildings under 3,000 sqft		
Bike Parking	No minimum requirements		

STATE FAIR: MOBILITY

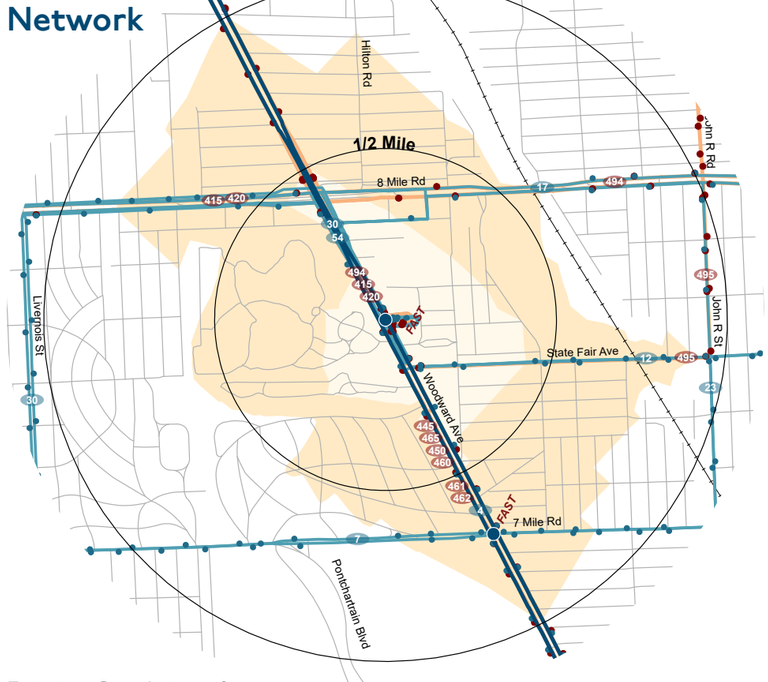
DRAFT

MOD Study

Non-Motorized Network



Roadway & Transit Network



- Station
- Woodward Corridor
- Railroad
- 1/2 Mile Walkshed
- 1 Mile Walkshed

Non-Motorized Network

- 2018 Pedestrian Crash
- Sidewalk
- Crosswalk
- 2018 Bicycle Crash
- Bikeshare Station
- Planned Bikeshare Station
- Shared Use Path (off-road)
- Bike Lane (on-road)
- Shared Lane (on-road)

Transit Network

SMART DDOT

- Bus Stop
- SMART Bus Route
- DDOT Bus Route

Mobility Planning

The proposed State Fair Station, located at Woodward Avenue about ½-mile south of 8 Mile Road, has direct access to the Evergreen Cemetery, the Woodlawn Cemetery, and an upcoming 157-acre redevelopment of the Michigan State Fairgrounds. This new development plans to be a multi-modal transit hub with rapid bus and rail access to a community college, entertainment, residential, and retail destinations. Since 2012, the State Fairgrounds Development Coalition has proposed setting aside 25 acres at the north end of the site along 8 Mile for a future hub for transit and emerging mobility options. In 2019, the City of Detroit purchased 142 acres and Magic Plus LLC, a group affiliated with Magic Johnson, purchased 16 acres of this fairground lot, with the aim of creating a walkable mixed-use community. In 2020, MoGo Bikeshare plans to expand new stations around the 7 Mile and Woodward intersection, about half-a-mile away from this transit station, to improve connectivity and accessibility for pedestrians and bicyclists. Overall, in their Strategic Plan for Transportation, the City of Detroit envisions a variety of complete street repairs for the station area by 2022. Strategic planning policies which guide infrastructure development in the station area include:

1. Implementing a high-frequency, 24-hour bus service along Woodward Avenue, as part of a planned system expansion of 30 new buses along 10 corridors in Detroit.
2. Starting a pilot program where major employers in low-density communities such as the station adjacent Chaldean Town and Palmer Woods could partner with Lyft and MoGo Bikeshare to encourage the use and development of emerging mobility options.
3. Starting a pilot program with variable pricing models for loading zones and parking, with the goal of increasing overall parking transactions by 40%.
4. Improving safety for pedestrians and bicyclists through the replacement 300,000 uneven sidewalks city-wide, the installation of pedestrian lighting, the installation of crosswalks and intersection safety improvements at 100 locations city-wide prioritized by safety.
5. Improving transparency and accountability by creating a database of pedestrian counts on targeted commercial corridors like Woodward Avenue, which runs adjacent to this station.

Transit

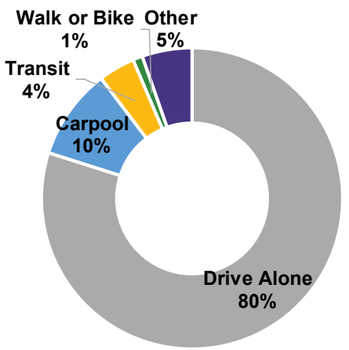
The State Fair Transit Center, located on the east side of Woodward Avenue between 8 Mile Road and State Fair Avenue, is a FAST stop for both northbound and southbound buses, and is the end-of-the-line stop for SMART Routes 415/420 (community route with 20- to 30-minute frequency), 494 (community route with 45-minute frequency), and 495 (community route with 20- to 40-minute frequency), as well as for DDOT's ConnectTen Route 4. Besides the already mentioned routes, connections to SMART Routes 445 (limited service with 20- to 40-minute frequency), 465 (limited service with 30- to 70-minute frequency), and DDOT Routes 12 (neighborhood route with 50-minute frequency), 17 (key route with 15- to 30-minute frequency), 23 (neighborhood route with 40-minute frequency), 30 (key route with 40- to 60-minute frequency), and 54 (neighborhood route with 60-minute frequency) can also be made at the State Fair Transit Center.

	Within 0.5 Miles	Within 1 Mile
Sidewalk & Crosswalk Mileage	15.0	88.6
Intersection Density (intersections per sq mi)	163.0	130.8
2018 Pedestrian Crashes	1	6
Bikeway Mileage	0.5	3.3
2018 Bicycle Crashes	3	6
TRANSIT ACTIVITY (average weekday boardings)	**2,229**	**3,034**
SMART	1,326	1,661
DDOT	903	1,373

Sources: SEMCOG Open Data, SMART October 2017, DDOT Feb-April 2018

Commute Mode Share

RESIDENTS WITHIN 1 MILE



Source: American Community Survey 2013-2017

7 MILE RD: CONTEXT

DRAFT

MOD Study

Existing Land Use

- Potential Station Location
- Single Family Housing
- Attached Condo Housing
- Multi-Family Housing
- Retail; Retail-Residential
- Office; Office-Residential
- Institutional; Medical
- Hospitality; Hospitality-Residential
- Industrial
- Cemetery; Golf Course; Park and Open Space; Recreation
- Parking
- TCU
- Water
- Vacant
- Publicly Owned
- 1/2 Mile Walkshed

Source: SEMCOG 2015

About the Station Area

The future transit node at Woodward and 7 Mile is at the apex of Palmer Park and the neighborhoods of Palmer Woods and Chaldean Town.

On the west side of Woodward and 7 Mile there is no vacant or redevelopable land aside from the green buffer along Woodward in Palmer Woods. The Detroit Golf Course covers the entire southeast quadrant of the half-mile walkshed. The east side of Woodward is characterized by shallow lots along Woodward and 7 Mile and remnants of historic walkable commercial corridor interspersed with vacant land.

The Perfecting Church Cathedral owns a large swathe of land northeast of the intersection. Much of the land in the single family residential neigborhoods east of Woodward is vacant, with some contextual infill in Chaldean Town.

Roadway Configuration

Woodward Ave has a five through lanes in each direction with a wide center median. 7 Mile has two lanes in each direction plus a right turn lane west of Woodward, one generous lane in each direction each of Woodward. The Woodward and 7 Mile intersection has signalized pedestrian crossings and standard crosswalks in each direction.

Population & Employment

	Within 0.5 Miles	Within 1 Mile
Population	1,866	8,147
Jobs	82	1,411

Source: American Community Survey 2013-2017; Longitudinal Employer-Household Dynamics 2017 (does not include federal workers)

Views of the Potential Station Area

Source: AECOM, Google Earth

7 MILE RD: LAND USE & ZONING

DRAFT

MOD Study

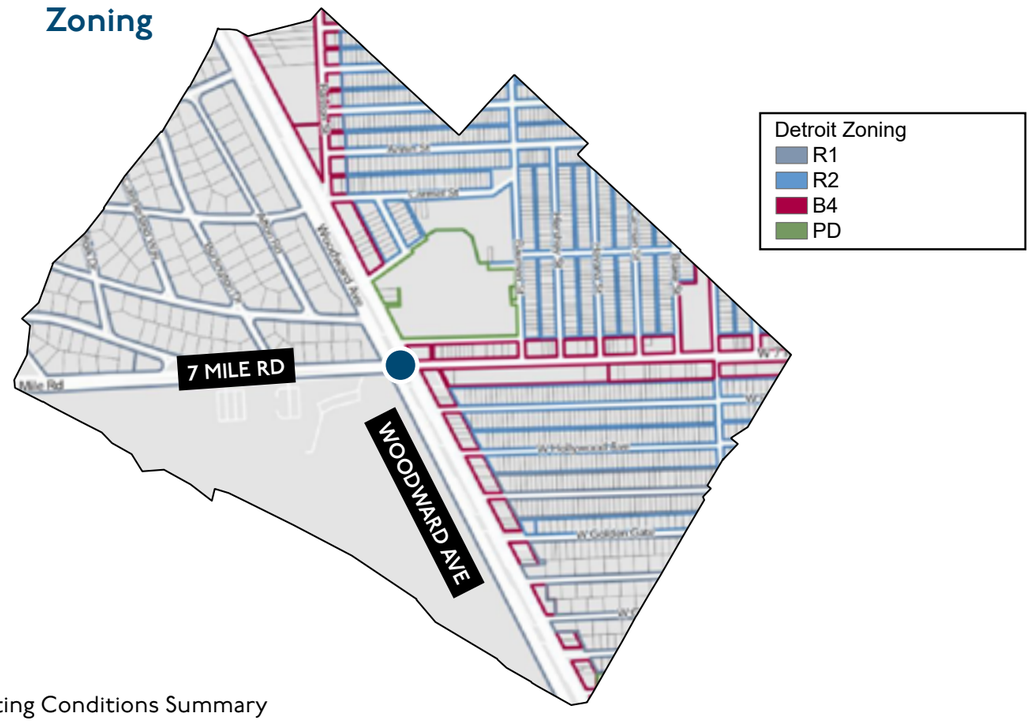
Land Use Planning

Future land use in this area varies between low and low-medium residential areas, as well as land dedicated for institutional uses and an existing cemetery. The residential areas that are low-medium density are characterized by two and four-family dwellings and allow for neighborhood scaled development that serves the daily needs of residents.

Future Land Use

Source: SEMCOG 2010

Zoning



Zoning

Parcels on the east side of Woodward are zoned General Business, with the exception of the Perfecting Church Cathedral. The Major Corridor Overlay Area applies along Woodward. The Traditional Main Street Overlay applies along 7 Mile from Woodward to John R.
Residential areas east of Woodward with clusters of vacant parcels are zoned for single and two family dwellings.

Palmer Woods is zoned for low density single family with little redevelopment potential. These residential districts have 35% maximum lot coverage and do not promote a mixture of uses.
The current zoning makes dense mixed use redevelopment difficult beyond Woodward Ave.

Metric	B4 General Business	R1/R2 Single/Two Family Residential
Promotes Mixed Use	Somewhat	No
Building Height	35 ft (or 80 ft in some cases)	35 ft
Parking	No reductions considered except for shared parking and buildings under 3,000 sqft	
Bike Parking	No minimum requirements	

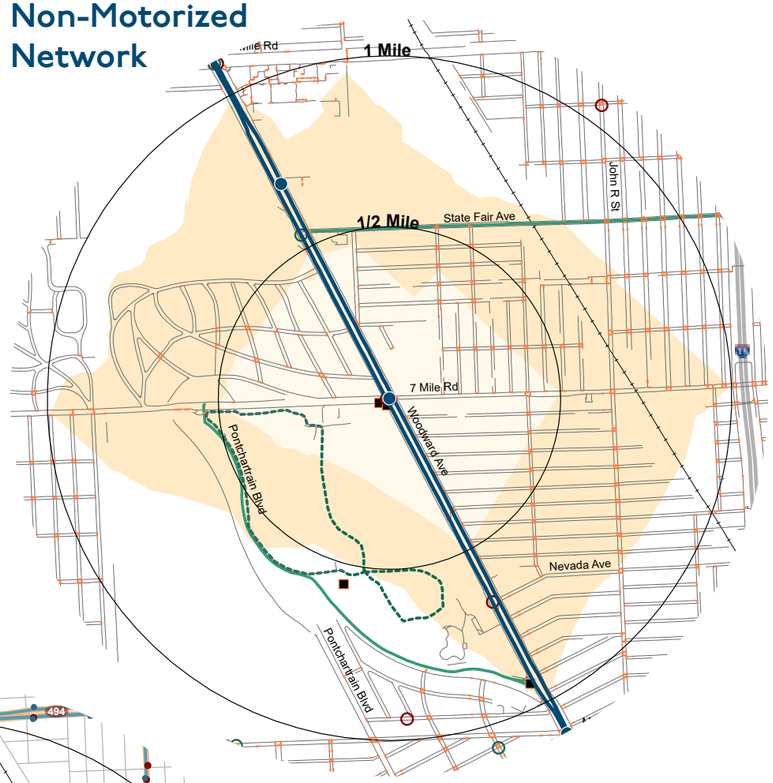
7 MILE RD: MOBILITY

DRAFT

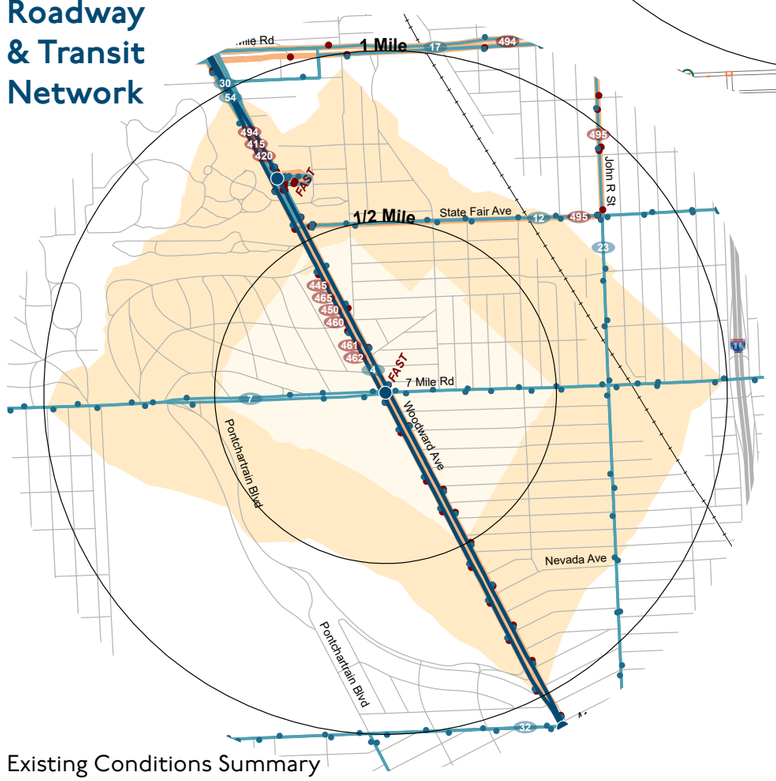
MOD Study

- Station
- Woodward Corridor
- Railroad
- 1/2 Mile Walkshed
- 1 Mile Walkshed

Non-Motorized Network



Roadway & Transit Network



Non-Motorized Network

- 2018 Pedestrian Crash
- Sidewalk
- Crosswalk
- 2018 Bicycle Crash
- Bikeshare Station
- Planned Bikeshare Station
- Shared Use Path (off-road)
- Bike Lane (on-road)
- Shared Lane (on-road)

Transit Network

SMART DDOT

- Bus Stop
- SMART Bus Route
- DDOT Bus Route

Mobility Planning

The existing conditions at the proposed 7 Mile Station, located at the corner of the Woodward Avenue and 7 Mile Road intersection, include wide road crossings, few amenities or safe routes for pedestrians or bicyclists, large surface parking lots and few shade trees around key destinations in this station area, including churches, a police station, small businesses and single family residences. In 2020, MoGo bikeshare plans to expand new stations around the 7 Mile and Woodward intersection to improve connectivity and accessibility for pedestrians and bicyclists. In 2019, the City of Detroit planned a series of complete street policies in their Strategic Plan for Transportation to guide infrastructure development around this station area. Strategic planning policies which guide infrastructure development in the station area include:

1. Implementing a high-frequency, 24-hour bus service along Woodward Avenue, as part of a planned system expansion of 30 new buses along 10 corridors in Detroit.
2. Starting a pilot program where major employers in low-density communities such as Arden Park could partner with Lyft and MoGo Bikeshare to encourage the use and development of emerging mobility options.
3. Starting a pilot program with variable pricing models for loading zones and parking, with the goal of increasing overall parking transactions by 40%.
4. Improving safety for pedestrians and bicyclists through the replacement 300,000 uneven sidewalks city-wide, the installation of pedestrian lighting, the installation of crosswalks and intersection safety improvements at 100 locations city-wide prioritized by safety.
5. Improving transparency and accountability by creating a database of pedestrian counts on targeted commercial corridors like Woodward Avenue, which runs adjacent to this station.

Transit

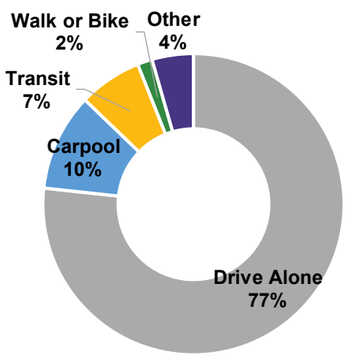
A FAST bus stop is located north of the Woodward Avenue and 7 Mile Road intersection at Woodward Avenue and Larchwood Street for northbound buses, and on the far side of the intersection for southbound buses. Besides the SMART Woodward Local and FAST routes and DDOT ConnectTen Route 4, connections to DDOT ConnectTen Route 7 (15-minute peak frequency) can be made at Woodward Avenue and 7 Mile Road.

	Within 0.5 Miles	Within 1 Mile
Sidewalk & Crosswalk Mileage	23.3	77.6
Intersection Density (intersections per sq mi)	103.1	101.2
2018 Pedestrian Crashes	2	4
Bikeway Mileage	1.1	4.8
2018 Bicycle Crashes	0	1
TRANSIT ACTIVITY (average weekday boardings)	**719**	**2,914**
SMART	259	1,581
DDOT	460	1,334

Sources: SEMCOG Open Data, SMART October 2017, DDOT Feb-April 2018

Commute Mode Share

RESIDENTS WITHIN 1 MILE



Source: American Community Survey 2013-2017

MCNICHOLS RD: CONTEXT

DRAFT

MOD Study

Existing Land Use

Source: SEMCOG 2015

- Potential Station Location
- Single Family Housing
- Attached Condo Housing
- Multi-Family Housing
- Retail; Retail-Residential
- Office; Office-Residential
- Institutional; Medical
- Hospitality; Hospitality-Residential
- Industrial
- Cemetery; Golf Course; Park and Open Space; Recreation
- Parking
- TCU
- Water
- Vacant
- Publicly Owned
- 1/2 Mile Walkshed

About the Station Area

The future transit node at Woodward and McNichols Rd sits at the border of Detroit and Highland Park. The Palmer Park neighborhood of apartment buildings, northwest of this intersection on the Detroit side, is one of the densest pockets of intact multifamily housing in the city. To the north of this neighborhood sits the expansive Palmer Park.

The half-mile walkshed contains much surface parking along Woodward and vacant land throughout. There are MOD opportunities at all four corners of the Woodward and McNichols intersection.

Beyond the commercial uses fronting Woodward and McNichols, the walkshed is predominantly made up of compact single family neighborhoods with similar housing typologies and pockets of vacancy on both the Detroit and Highland Park sides of McNichols.

Roadway Configuration

Woodward Ave has a three through lanes in each direction plus a southbound center left turn lane and right slip lane. McNichols has two lanes in each direction. Neither streets have on-street parking around the intersection. The Woodward and McNichols intersection has signalized pedestrian crossings and standard crosswalks at each leg of the intersection.

Population & Employment

	Within 0.5 Miles	Within 1 Mile
Population	1,992	8,122
Jobs	419	3,646

Source: American Community Survey 2013-2017; Longitudinal Employer-Household Dynamics 2017 (does not include federal workers)

Views of the Potential Station Area

Source: Google Earth

MCNICHOLS RD: LAND USE & ZONING

DRAFT

MOD Study

Land Use Planning

Highland Park

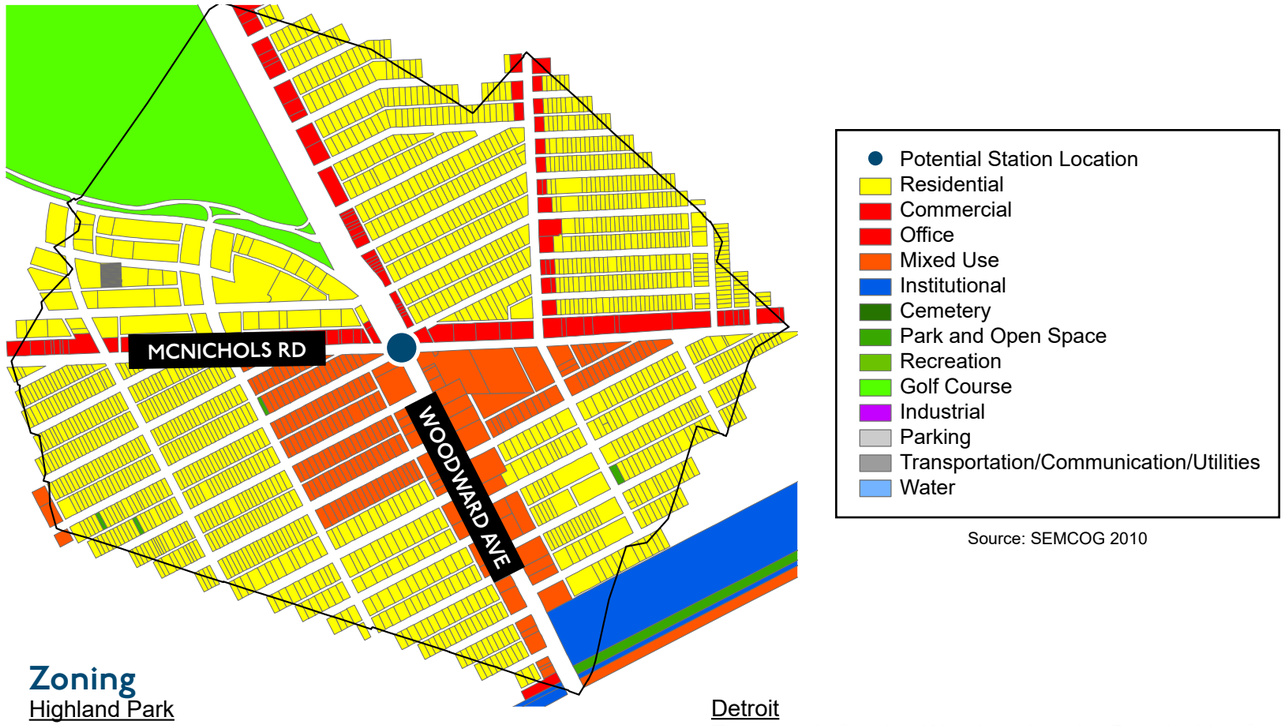
The primary future land use designation in this station area is the TOD Transit Oriented Design land use which indicates that future uses should be complementary to transit and encourage transit use. Buildings can be up to 5 stories tall in this land use designation and mixed uses are encouraged.

The other significant future land use category is Urban Village Residential which plans largely for residential but also allows for other uses that would activate vacant land such as green infrastructure and forestry.

Detroit

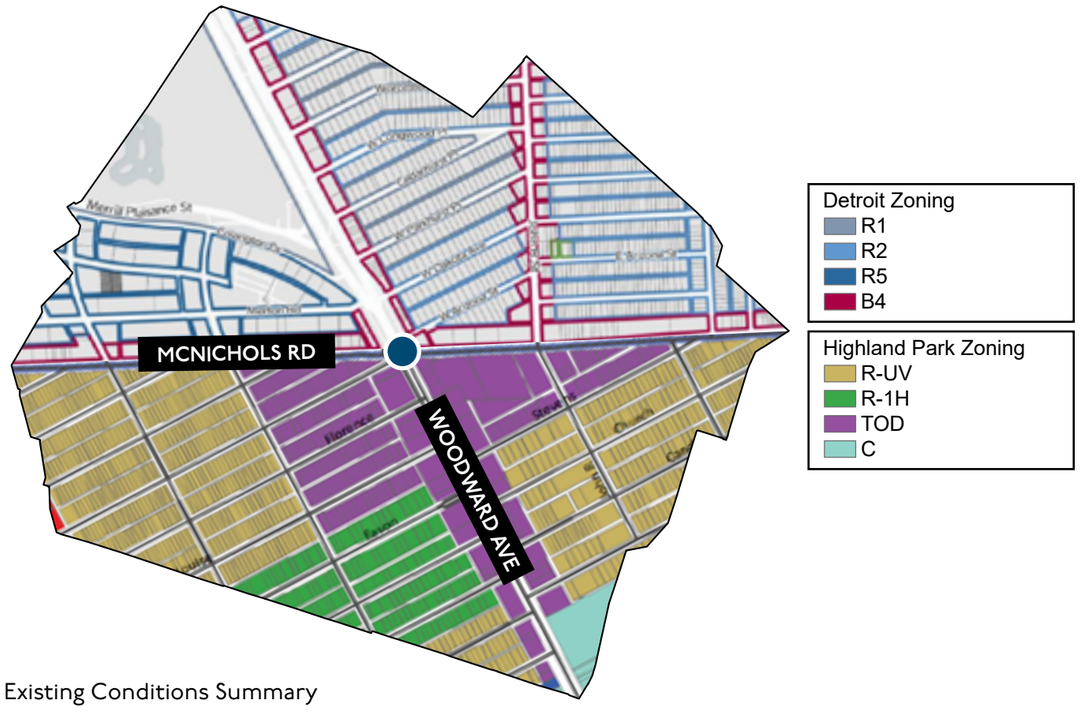
Future land use in this area varies between low, low-medium, and high density residential areas (and a large portion is dedicated as recreation. The residential areas that are low-medium and high density are characterized by two, four-family dwellings and multi-unit apartment buildings. These areas do also allow for neighborhood scaled development that serves the daily needs of residents.

Future Land Use



Source: SEMCOG 2010

Zoning



Zoning

Highland Park

The TOD zoning district is contained around Woodward Ave and allows for a greater density of development for areas within ¼ mile of rapid transit stops and encourages a mixture of uses to provide for self-sufficient neighborhoods surrounding those stops. The Residential Urban Village District designated in the neighborhoods around Woodward provides limits residential density and does not support mixed use development.

Detroit

The parcels fronting Woodward on the Detroit side of McNichols are primarily zoned General Business; the Major Corridor Overlay Areas overlay applies here.

Residential areas with high vacancy and redevelopment opportunity are restricted by single family zoning that does not promote high density or mixed use.

	Highland Park		Detroit		
Metric	**TOD Transit Oriented Design**	**R-UV Residential Urban Village**	**B4 General Business**	**R1/R2 Single/Two Family Residential**	**R5 Medium Density Residential**
Promotes Mixed Use	Yes	No	Somewhat	No	Somewhat
Building Height	60 ft or 5 stories	40 ft or 2 stories	35 ft (or 80 ft in some cases)	35 ft	
Parking	• Required may be reduced by proximity to transit, provision of bike parking, car sharing. • May not exceed 120% of parking minimum.		No reductions considered except for shared parking and buildings under 3,000 sqft		
Bike Parking	No minimum requirements		No minimum requirements		

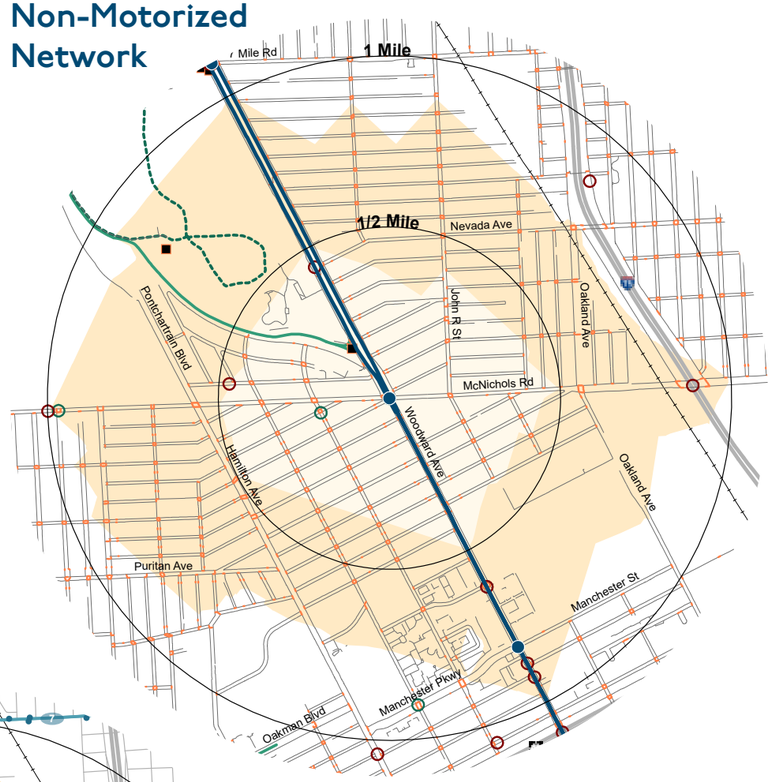
MCNICHOLS RD: MOBILITY

DRAFT

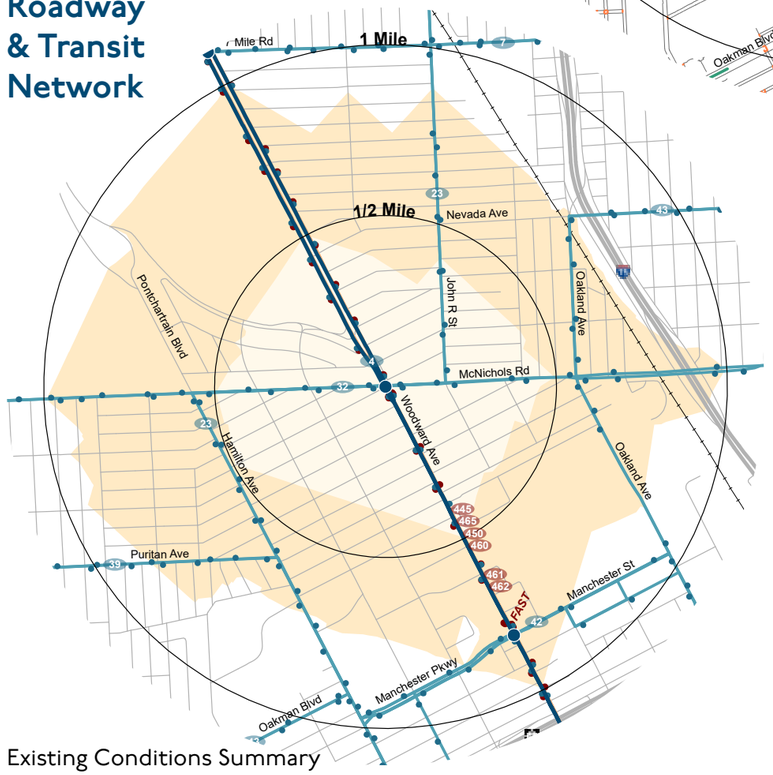
MOD Study

- Station
- Woodward Corridor
- Railroad
- 1/2 Mile Walkshed
- 1 Mile Walkshed

Non-Motorized Network



Roadway & Transit Network



Non-Motorized Network

- 2018 Pedestrian Crash
- Sidewalk
- Crosswalk
- 2018 Bicycle Crash
- Bikeshare Station
- Planned Bikeshare Station
- Shared Use Path (off-road)
- Bike Lane (on-road)
- Shared Lane (on-road)

Transit Network

SMART DDOT

- Bus Stop
- SMART Bus Route
- DDOT Bus Route

Mobility Planning

The proposed McNichols Station area, divided between the cities of Highland Park and Detroit, has wide streets, large surface parking lots, single family homes, broken sidewalks, and a lack of shade trees. Both the City of Detroit and Highland Park have a bold complete streets vision for this area, which include: incorporating amenities, programming and residences that power an active neighborhood core, making pedestrian safety, not vehicular throughput or speed, the top priority and planting trees and installing art along the streets, alleyways and plazas to connect residents to all of Highland Park's history, its future, and its culture. Specific recommendations in the station area include:

1. The completion of a 26-mile multi-use path called the Inner Circle Greenway on what is currently a rail viaduct over Woodward Avenue
2. The planned 2020 construction of separated bike lanes on Hamilton Avenue from Webb to McNichols
3. The expansion of MoGo Bikeshare in Palmer Park (shown in the map at right).

Transit

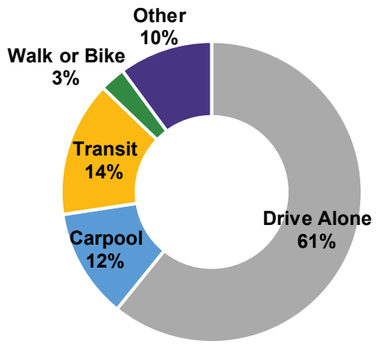
Besides SMART's Woodward Local route and DDOT ConnectTen Route 4, connections to SMART Routes 445 (limited service with 20- to 40-minute frequency), 465 (limited service with 30- to 70-minute frequency), and DDOT Routes 23 (neighborhood route with 40-minute frequency) and 32 (key route with 30- to 40-minute frequency) can be made at Woodward Avenue and McNichols Road.

	Within 0.5 Miles	Within 1 Mile
Sidewalk & Crosswalk Mileage	31.2	101.9
Intersection Density (intersections per sq mi)	128.6	120.6
2018 Pedestrian Crashes	2	7
Bikeway Mileage	0.4	2.1
2018 Bicycle Crashes	3	5
TRANSIT ACTIVITY (average weekday boardings)	**455**	**1,292**
SMART	71	379
DDOT	384	912

Sources: SEMCOG Open Data, SMART October 2017, DDOT Feb-April 2018

Commute Mode Share

RESIDENTS WITHIN 1 MILE



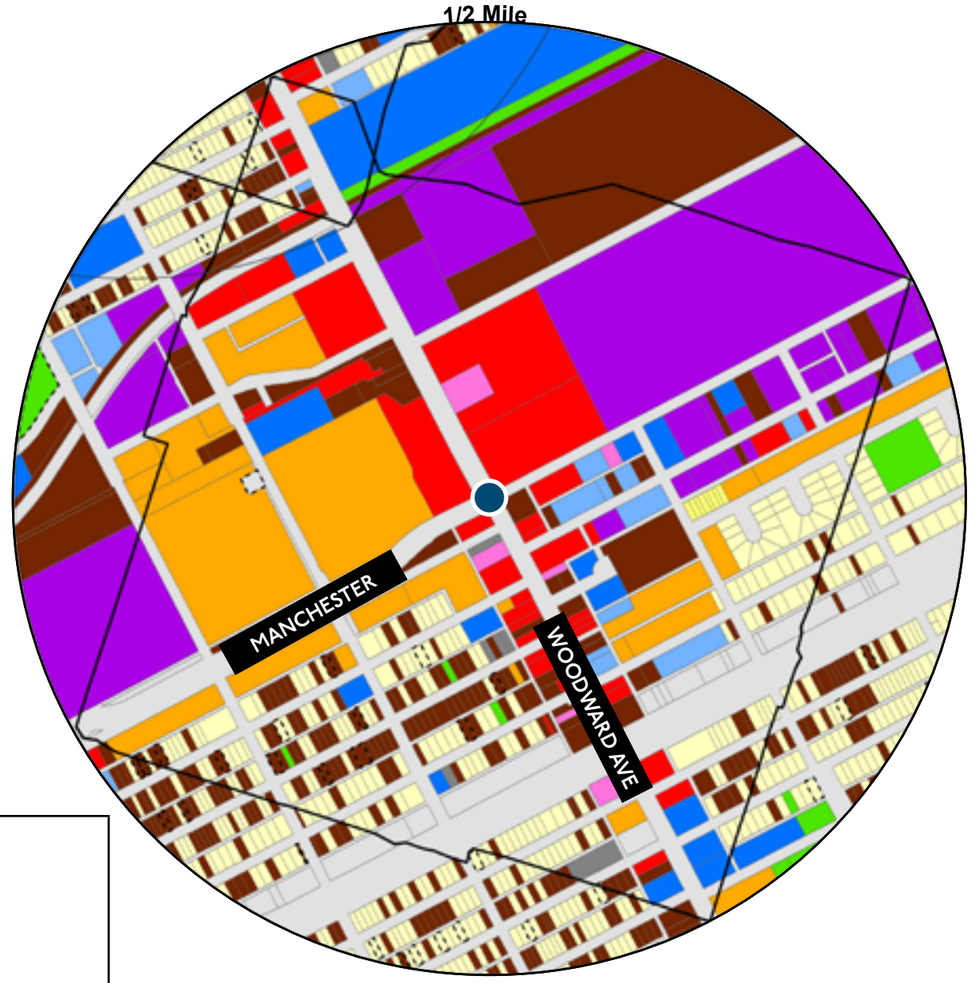
Source: American Community Survey 2013-2017

MANCHESTER PKWY/ST: CONTEXT

DRAFT

MOD Study

Existing Land Use



Source: SEMCOG 2015

- Potential Station Location
- Single Family Housing
- Attached Condo Housing
- Multi-Family Housing
- Retail; Retail-Residential
- Office; Office-Residential
- Institutional; Medical
- Hospitality; Hospitality-Residential
- Industrial
- Cemetery; Golf Course; Park and Open Space; Recreation
- Parking
- TCU
- Water
- Vacant
- Publicly Owned
- 1/2 Mile Walkshed

About the Station Area

The future transit node at the intersection of Woodward Ave and Manchester St sits in the core of the city of Highland Park.

Woodward north of Manchester has been redeveloped into two shopping centers with large setbacks and bountiful surface parking fronting Woodward. Woodward south of Manchester is characterized by neighborhood-scale commercial buildings, many of which are vacant. Northwest of the Woodward and Manchester intersection are multiple multi-family redevelopment projects; southwest sits a historic residential neighborhood with clusters of vacant parcels. East of Woodward is dominated by the Highland Park Ford Plant. Beyond the shopping center are a mix of auto-oriented commercial and industrial uses.

Roadway Configuration

Woodward Ave has a three through lanes plus center left turn lanes in each direction, as well as a southbound right turn lane. Manchester has one receiving lane in each direction, but two eastbound lanes plus right and left turn lanes approaching the intersection from the eastbound side. The Woodward and Manchester intersection has signalized pedestrian crossings and standard crosswalks at each leg of the intersection.

Population & Employment

	Within 0.5 Miles	Within 1 Mile
Population	597	8,300
Jobs	1,596	4,515

Source: American Community Survey 2013-2017; Longitudinal Employer-Household Dynamics 2017 (does not include federal workers)

Views of the Potential Station Area

Source: Google Earth

MANCHESTER PKWY/ST: LAND USE & ZONING

DRAFT

MOD Study

Land Use Planning

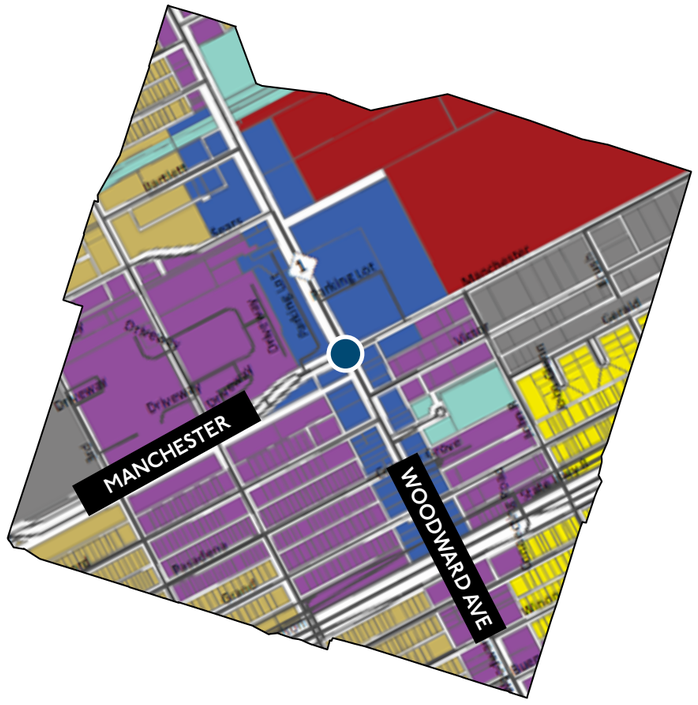
Highland Park is in the process of updating its Master Plan, which will be released in 2020. Transit-oriented and pedestrian friendly redevelopment along Woodward is a focus in the upcoming plan.
The 2017 Highland Park Downtown Strategic Plan focused on redevelopment opportunities along and within close proximity to Woodward Ave, within the TIF (Tax Increment Financing) district. The plan puts forth short, medium and long term strategies to activate vacant land and catalyze reinvestment in the area.
The planning phase of the 32-mile Joe Louis Greenway is concluding in early 2020. The plan will include multiple access points and a trailhead in Highland Park. The greenway will cross Woodward Ave via the Grand Trunk rail viaduct 1/3 of a mile from Manchester St, and there will be direct access to the greenway on Woodward.

Future Land Use

- Potential Station Location
- Residential
- Commercial
- Office
- Mixed Use
- Institutional
- Cemetery
- Park and Open Space
- Recreation
- Golf Course
- Industrial
- Parking
- Transportation/Communication/Utilities
- Water

Source: SEMCOG 2010

Zoning



Highland Park Zoning
- R-1
- R-UV
- TOD
- SP
- CBD
- 1RD
- C

Zoning

Highland Park's zoning ordinance includes requirements that are generally supportive of MOD, such as incentives to reduce off-street parking and parking standards that encourage a more pedestrian-friendly environment.
The Manchester transit node is surrounded by parcels zoned (CBD) Downtown. The Downtown district extends north and south along Woodward and is intended to transition the more auto-oriented strip retail areas to be more pedestrian-friendly.

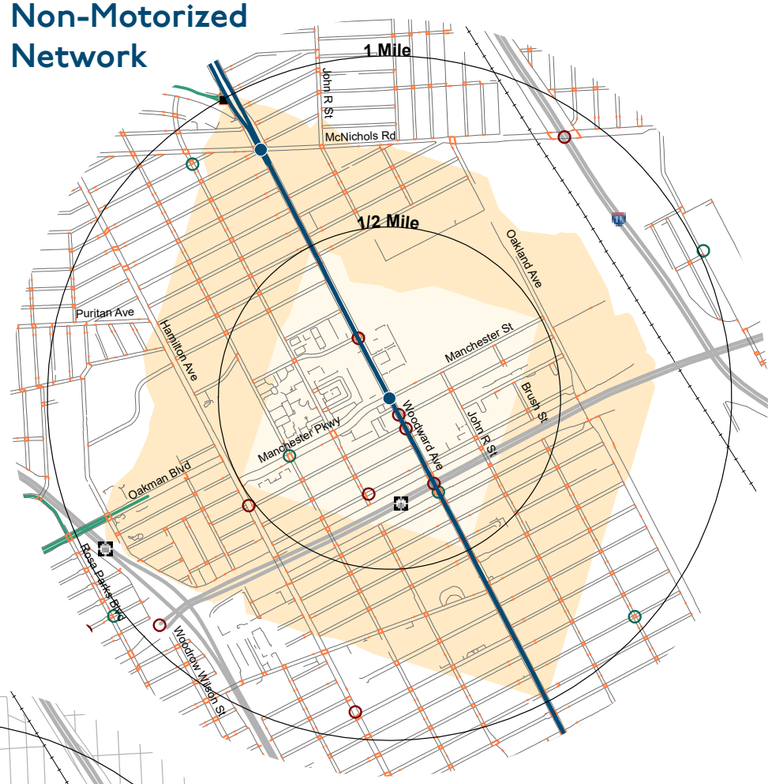
The TOD zoning district borders the Downtown district on all four sides. This district allows for a greater density of development for areas within ¼ mile of rapid transit stops and encourages a mixture of uses to provide for self-sufficient neighborhoods surrounding those stops.
The Ford Highland Park Plant is zoned Special Projects.

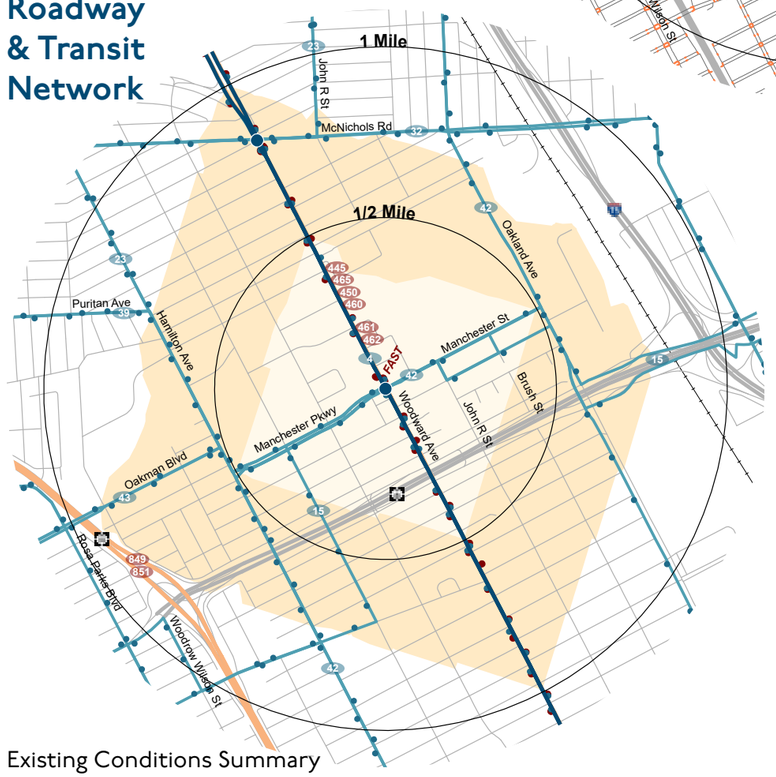
Metric	TOD Transit Oriented Design	CBD Downtown Highland Park	SP Special Projects
Promotes Mixed Use	Yes	Yes	Yes
Building Height	60' or 5 stories	40'	70 ft
Parking	• Required may be reduced by proximity to transit, provision of bike parking, car sharing. • May not exceed 120% of parking minimum.		
Bike Parking	• No requirements • Parking reduced by 1 for every 4 covered bike spots		

MANCHESTER PKWY/ST: MOBILITY

DRAFT

MOD Study





Station
Woodward Corridor
Railroad
1/2 Mile Walkshed
1 Mile Walkshed

Mobility Planning

The proposed Manchester Station, located at the intersection of Manchester Parkway and Woodward Avenue, directly serves Downtown Highland Park. The proposed station area is divided from north to south by the Davison Freeway and the Davison Service Road, which is about 300-feet wide. From east to west, the station area is divided by Woodward Avenue which is about 50-feet wide. Pedestrians, bicyclists, and transit users have limited access to this station due to the area's metal fences around large private parking lots, wide streets, sparse shade trees and large distances between crosswalks. In Highland Park's 2017 Downtown Strategic Plan, the city outlines a bold complete streets vision, which includes recruiting amenities, programming, and residences to power an active neighborhood core, making pedestrian safety, not vehicular throughput or speed, the top priority and planting trees and installing art along the streets, alleyways and plazas to connect residents to all of Highland Park's history, its future, and its culture. In this proposed station area, Highland Park plans to:

1. Create an Aston Alley Arts Walk adjacent to the station
2. Implement a road diet, reducing 4 lanes to 3 on Manchester Parkway, to accommodate a new multi-use path this lightly trafficked road
3. Add transit priority lanes and a two-way cycle track on Woodward Avenue
4. Add a protected bicycle lane on Victor Street
5. Implement a road diet, which would divide the current 75' travel lane on Hamilton Avenue to create 3 new travel lanes, 1 parking lane, widened sidewalks with new trees, and protected bikeways
6. Create a new shared-use street on Gerald Street, which currently ends at a cul-de-sac.
7. Build, in partnership with the Detroit Greenways Coalition, a 26-mile Inner Circle Greenway through Highland Park using an old rail viaduct which passes over Woodward Avenue.

Transit

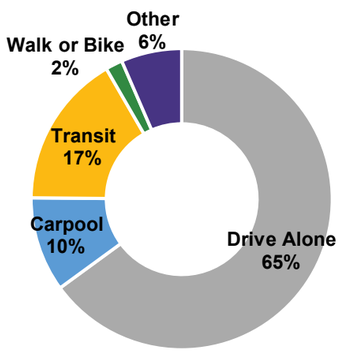
FAST bus stops are located on the far side of the Woodward Avenue and Manchester intersection for both northbound and southbound buses. Besides the SMART Woodward Local and FAST routes and DDOT ConnectTen Route 4, connections to SMART Routes 445 (limited service with 20- to 40-minute frequency), 465 (limited service with 30- to 70-minute frequency), and DDOT Routes 15 (neighborhood route with 20- to 60-minute frequency), 39 (neighborhood route with 60-minute frequency), 42 (neighborhood route with 30-minute frequency), and 43 (neighborhood route with 50-minute frequency) can be made at Woodward Avenue and Manchester Parkway/Street.

	Within 0.5 Miles	Within 1 Mile
Sidewalk & Crosswalk Mileage	26.4	93.5
Intersection Density (intersections per sq mi)	149.0	158.2
2018 Pedestrian Crashes	5	9
Bikeway Mileage	0.0	0.4
2018 Bicycle Crashes	2	6
TRANSIT ACTIVITY (average weekday boardings)	**898**	**1,472**
SMART	328	408
DDOT	569	1,064

Sources: SEMCOG Open Data, SMART October 2017, DDOT Feb-April 2018

Commute Mode Share

RESIDENTS WITHIN 1 MILE



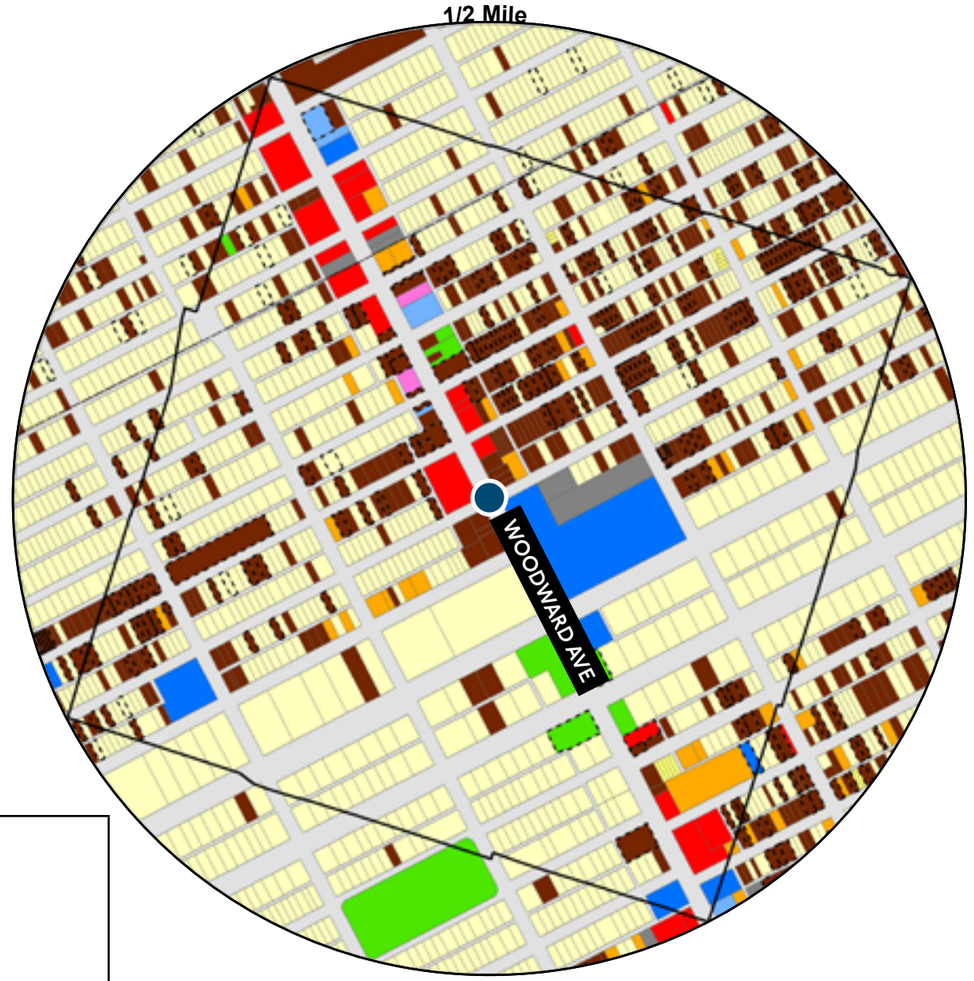
Source: American Community Survey 2013-2017

CALVERT AVE / TROWBRIDGE ST: CONTEXT

DRAFT

MOD Study

Existing Land Use



Source: SEMCOG 2015

- Potential Station Location
- Single Family Housing
- Attached Condo Housing
- Multi-Family Housing
- Retail; Retail-Residential
- Office; Office-Residential
- Institutional; Medical
- Hospitality; Hospitality-Residential
- Industrial
- Cemetery; Golf Course; Park and Open Space; Recreation
- Parking
- TCU
- Water
- Vacant
- Publicly Owned
- 1/2 Mile Walkshed

About the Station Area

The future transit node at the intersection of Woodward and Calvert Ave/Trowbridge St sits at the apex of the North End, Arden Park and Boston Edison neighborhoods. The northernmost three blocks of the half-mile walkshed up Woodward cross the border into the city of Highland Park.

The Cathedral of the Most Blessed Sacrament is one of the only buildings remaining along this stretch of Woodward. The vacancy along Woodward that extends down some of the perpendicular residential streets provides an excellent MOD opportunity for the city of Detroit. Beyond Woodward, the half-mile walkshed is predominantly single family neighborhoods.

Roadway Configuration

Woodward Ave has a three through lanes plus left turn lanes in each direction. Calvert and Trowbridge have one lane in each direction. The Woodward and Calvert/Trowbridge intersection has signalized pedestrian crossings and standard crosswalks at each leg of the intersection.

Population & Employment

	Within 0.5 Miles	Within 1 Mile
Population	3,086	10,652
Jobs	430	2,563

Source: American Community Survey 2013-2017; Longitudinal Employer-Household Dynamics 2017 (does not include federal workers)

Views of the Potential Station Area

Source: Google Earth

CALVERT AVE / TROWBRIDGE ST: LAND USE & ZONING

DRAFT

MOD Study

Land Use Planning

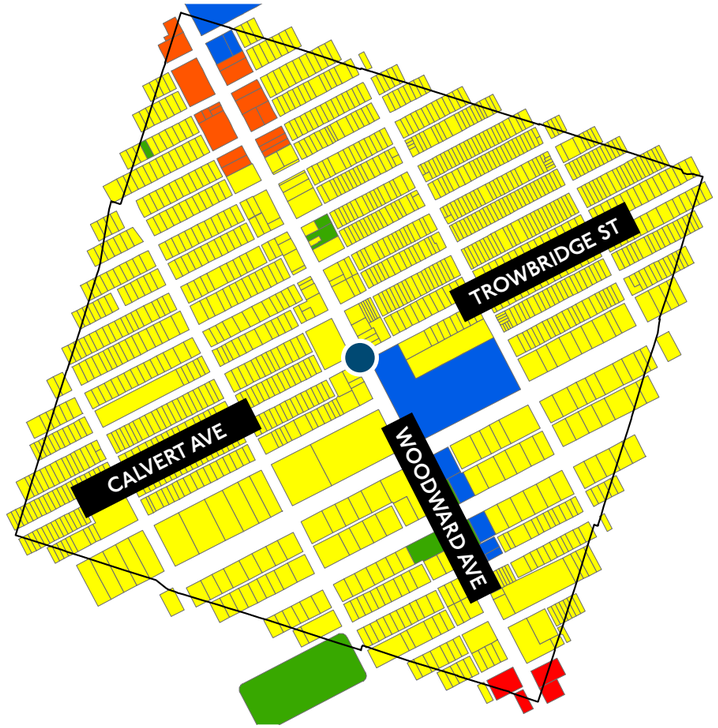
Detroit

The Detroit Planning & Development Department (PDD) has launched the planning process for North End Neighborhood Framework Plan, which will extend up north to the border of Highland Park. Detroit PDD sees a great MOD opportunity around the Calvert/Trowbridge transit node, as real estate values are climbing and many of the vacant parcels along Woodward are publicly owned.

Highland Park

Highland Park is in the process of updating their Master Plan, which will be released in 2020. Transit oriented and pedestrian friendly development along Woodward is a focus in the upcoming plan.

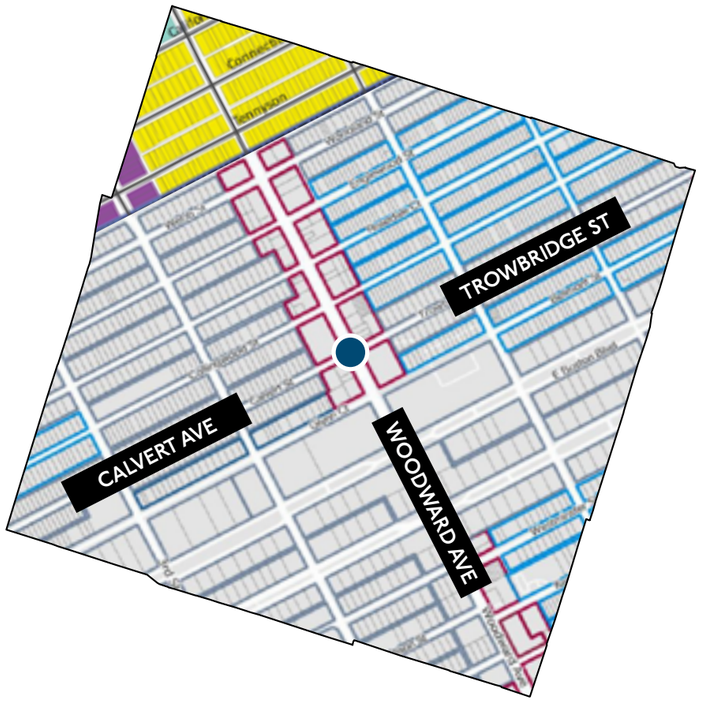
Future Land Use



- Potential Station Location
- Residential
- Commercial
- Office
- Mixed Use
- Institutional
- Cemetery
- Park and Open Space
- Recreation
- Golf Course
- Industrial
- Parking
- Transportation/Communication/Utilities
- Water

Source: SEMCOG 2010

Zoning



Highland Park Zoning
- R-1
- R3
- B3
- B4

Detroit Zoning
- R1
- R3
- R5
- B4

Zoning

Detroit

Parcels fronting Woodward in Boston Edison and Arden Park are zoned for low density single family residential that does not promote density or mixed uses. The rest of Woodward parcels are zoned General Business and fall under the Traditional Main Street Overlay.

Highland Park

The TOD zoning district is contained around Woodward Avenue and allows for a greater density of development for areas within ¼ mile of rapid transit stops and encourages a mixture of uses.

Beyond Woodward, parcels in the transit node walkshed in both Detroit and Highland Park are zoned exclusively residential.

	Detroit		Highland Park
Metric	**B4 General Business**	**R1/R3 Single Family/Low Density Residential**	**TOD Transit Oriented Design**
Promotes Mixed Use	Somewhat	No	Yes
Building Height	35 ft (or 80 ft in some cases)	35 ft	60’ or 5 stories
Parking	No reductions considered except for shared parking and buildings under 3,000 sqft		• Required may be reduced by proximity to transit, provision of bike parking, car sharing. • May not exceed 120% of parking minimum.
Bike Parking	No minimum requirements		No minimum requirements

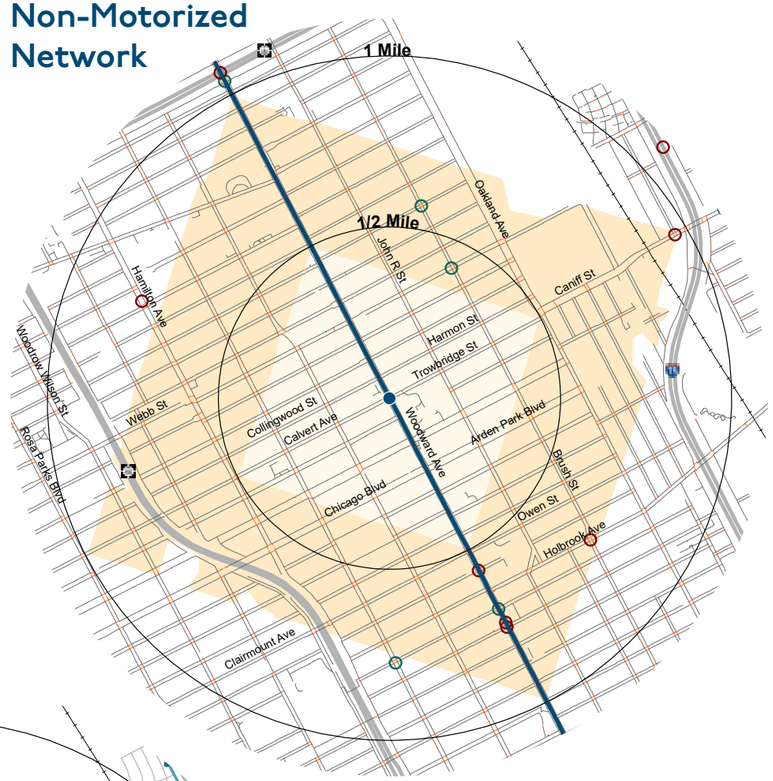
CALVERT AVE / TROWBRIDGE ST: MOBILITY

DRAFT

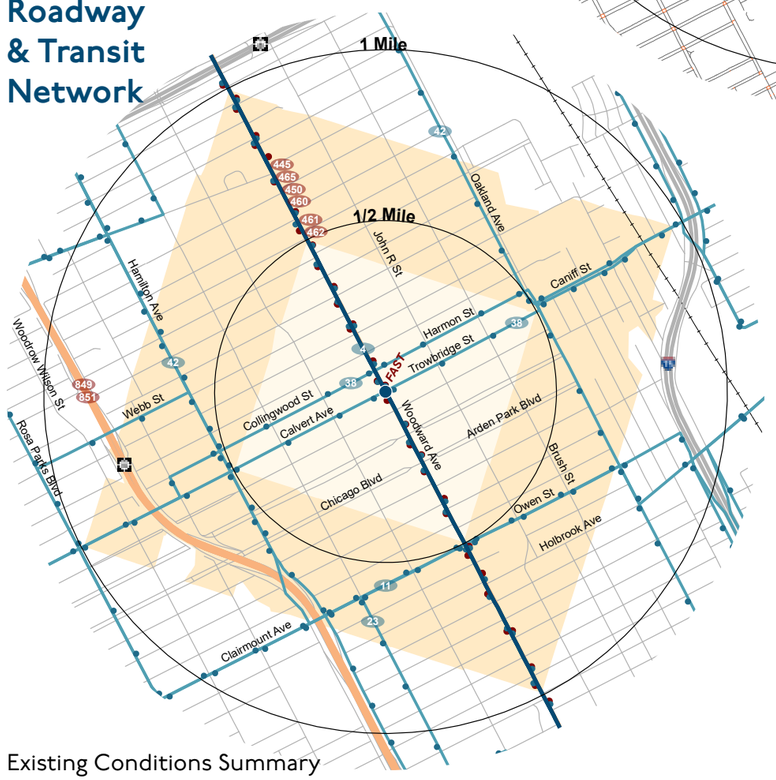
MOD Study

- Station
- Woodward Corridor
- Railroad
- 1/2 Mile Walkshed
- 1 Mile Walkshed

Non-Motorized Network



Roadway & Transit Network



Non-Motorized Network

- 2018 Pedestrian Crash
- Sidewalk
- Crosswalk
- 2018 Bicycle Crash
- Bikeshare Station
- Planned Bikeshare Station
- Shared Use Path (off-road)
- Bike Lane (on-road)
- Shared Lane (on-road)

Transit Network

SMART DDOT

- Bus Stop
- SMART Bus Route
- DDOT Bus Route

Mobility Planning

The proposed Trowbridge Station, located at the intersection of Woodward Avenue and Trowbridge Street, provides direct access to Arden Park, a historic neighborhood with many single-family homes, several places of worship, parks, and schools. The proposed station area is bound by an industrial park and the Lodge Freeway to the west, and by Chrysler Freeway, which spans about 300 feet to the east. Within the proposed Trowbridge station area, there are incomplete and broken sidewalks, wide and fading crosswalks, multiple driveways and large fenced-in parking lots, all which may reduce drivers' ability to see bicyclists and pedestrians on the road. In their Strategic Plan for Transportation, the City of Detroit envisions a variety of complete street repairs for the proposed station area by 2022. Strategic planning policies which guide infrastructure development in the station area include:

1. Implementing a high-frequency, 24-hour bus service along Woodward Avenue, as part of a planned system expansion of 30 new buses along 10 corridors in Detroit.
2. Starting a pilot program where major employers in low-density communities such as Arden Park could partner with Lyft and MoGo Bikeshare to encourage the use and development of emerging mobility options.
3. Starting a pilot program with variable pricing models for loading zones and parking, with the goal of increasing overall parking transactions by 40%.
4. Improving safety for pedestrians and bicyclists through the replacement 300,000 uneven sidewalk slabs city-wide, the installation of pedestrian lighting, the installation of crosswalks and intersection safety improvements at 100 locations city-wide prioritized by safety.
5. Improving transparency and accountability by creating a database of pedestrian counts on targeted commercial corridors like Woodward Avenue, which runs adjacent to this station.

Transit

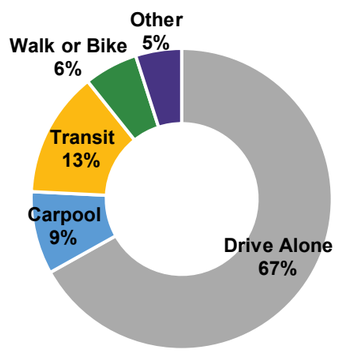
FAST bus stops are located on the far side of the Woodward Avenue and Trowbridge Street intersection for northbound buses, and on the near side of the intersection for southbound buses. Besides the SMART Woodward Local and FAST routes and DDOT ConnectTen Route 4, connections to DDOT Route 38 (key route with 45-minute frequency) can be made at Woodward Avenue and Trowbridge Street / Calvert Avenue.

	Within 0.5 Miles	Within 1 Mile
Sidewalk & Crosswalk Mileage	30.9	118.3
Intersection Density (intersections per sq mi)	99.3	142.9
2018 Pedestrian Crashes	0	6
Bikeway Mileage	0	0
2018 Bicycle Crashes	1	4
TRANSIT ACTIVITY (average weekday boardings)	**402**	**811**
SMART	139	174
DDOT	263	637

Sources: SEMCOG Open Data, SMART October 2017, DDOT Feb-April 2018

Commute Mode Share

RESIDENTS WITHIN 1 MILE



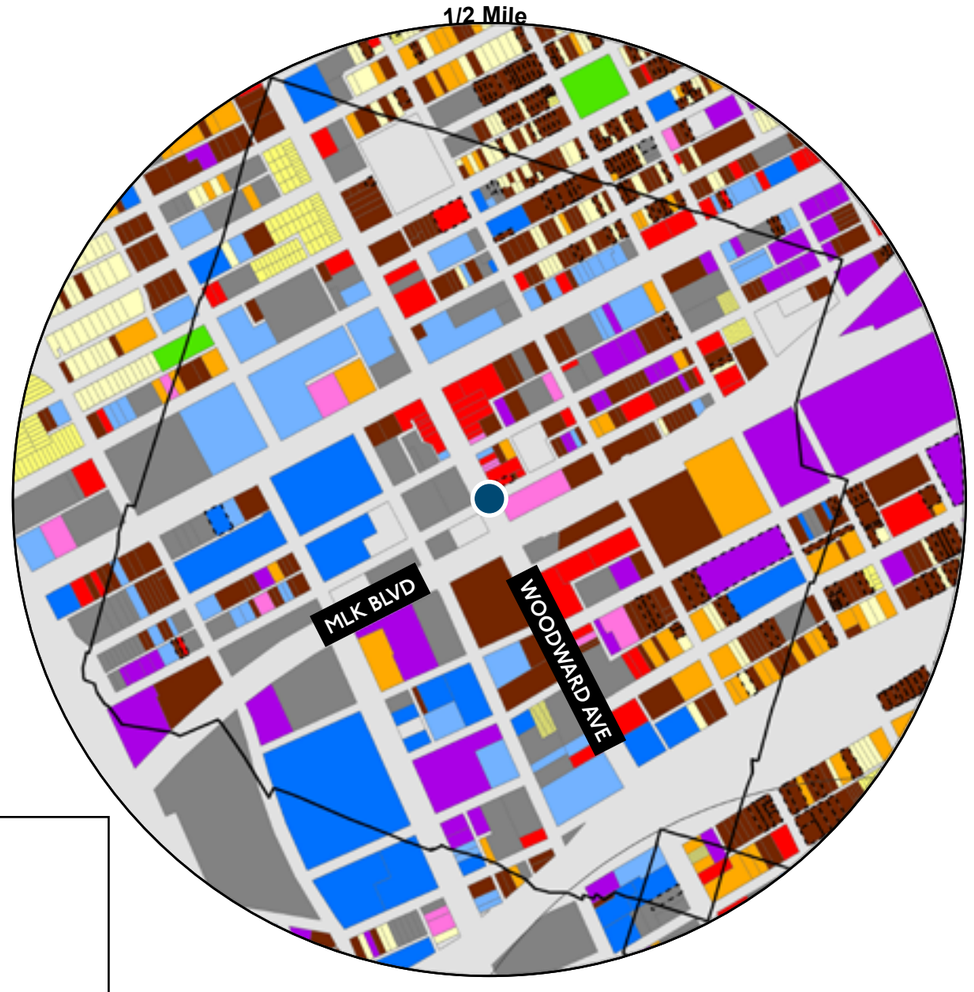
Source: American Community Survey 2013-2017

NEW CENTER: CONTEXT

DRAFT

MOD Study

Existing Land Use



Source: SEMCOG 2015

- Potential Station Location
- Single Family Housing
- Attached Condo Housing
- Multi-Family Housing
- Retail; Retail-Residential
- Office; Office-Residential
- Institutional; Medical
- Hospitality; Hospitality-Residential
- Industrial
- Cemetery; Golf Course; Park and Open Space; Recreation
- Parking
- TCU
- Water
- Vacant
- Publicly Owned
- 1/2 Mile Walkshed

About the Station Area

The future transit node in New Center at the intersection of Woodward Ave and Baltimore Ave will link rapid transit on Woodward to the commuter rail terminus at the existing New Center Amtrak station. The station is located in the revitalizing New Center business district with the Fisher Building, Cadillac Place, Shinola Headquarters, Wayne State University, and other major trip generators just blocks away.

Home values are increasing greatly in the surrounding neighborhoods of New Center, Milwaukee Junction and North End, and infill development is already occurring. Despite the concentration of jobs and multi-family housing and rising property values in this area, much of Woodward along this stretch is vacant and underbuilt. There are dozens of surface parking lots within the half-mile walkshed of this future transit node which present a great MOD opportunity.

Roadway Configuration

Woodward Ave has a two through lanes in each direction plus a northbound center turn lane at the Baltimore Ave intersection. The Q-Line is center-running along this stretch of Woodward, and the existing station provides a pedestrian refuge island on the north crossing of Woodward. Baltimore has one lane of traffic in each direction and on-street parking. The intersection has signalized pedestrian crossings and continental crosswalks at each leg of the intersection.

Population & Employment

	Within 0.5 Miles	Within 1 Mile
Population	3,613	12,547
Jobs	20,328	36,470

Source: American Community Survey 2013-2017; Longitudinal Employer-Household Dynamics 2017 (does not include federal workers)

Views of the Potential Station Area

Source: Google Earth

NEW CENTER: LAND USE & ZONING

DRAFT

MOD Study

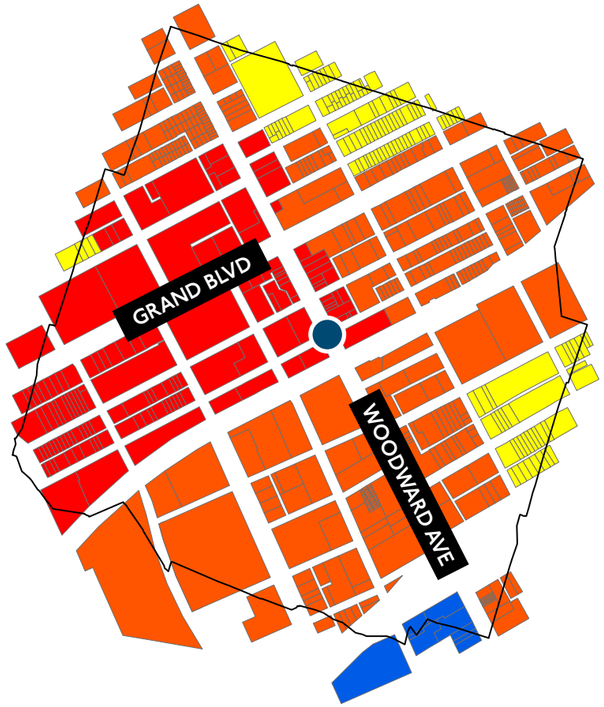
Land Use Planning

MDOT owns the Amtrak station and the entire block bounded by Woodward, Cass, Amsterdam and the rail viaduct (currently a surface lot), and has expressed interested in MOD.

The Wayne State University campus master plan completed in May 2019 calls for future development on multiple sites west of Woodward between I-94 and the rail line, including surface lots owned by the university on the northeast and northwest corners of Cass and Amsterdam Ave.

The Detroit Planning & Development Department (PDD) has launched the planning process for North End Neighborhood Framework Plan, which will reach as far south as Grand Blvd. Detroit PDD sees a great MOD opportunity around the New Center transit node where rapid transit along Woodward and the commuter rail terminus will converge.

Future Land Use



- Potential Station Location
- Residential
- Commercial
- Office
- Mixed Use
- Institutional
- Cemetery
- Park and Open Space
- Recreation
- Golf Course
- Industrial
- Parking
- Transportation/Communication/Utilities
- Water

Source: SEMCOG 2010

Zoning

Detroit Zoning
- B2
- B3
- B4
- M3
- M4
- SD2
- R3
- R6

Zoning

Much of the Amtrak station's walkshed is currently zoned as General Business and Mixed Use Special Development District which promote mixed use development and allow higher densities. However, several large lots with MOD potential directly around the station are zoned as General and Intensive Industrial, which does not encourage mixed use development.

The Traditional Main Street Overlay provides additional provisions and requirements to promote compact, walkable development and applies to all zoning lots abutting Woodward Ave and Grand Boulevard in the Amtrak station walkshed.

Metric	SD2 Special Development District, Mixed Use	B4 General Business	M3/M4 General/Intensive Industrial
Promotes Mixed Use	Yes	Somewhat	No
Building Height	45 ft (non mixed use) 80 ft (mixed use)	35 ft (or 80 ft in some cases)	80 ft
Parking	• Shared/district parking approach encouraged • Reductions allowed	No reductions considered except for shared parking and buildings under 3,000 sqft	
Bike Parking	No minimum requirements		

NEW CENTER: MOBILITY

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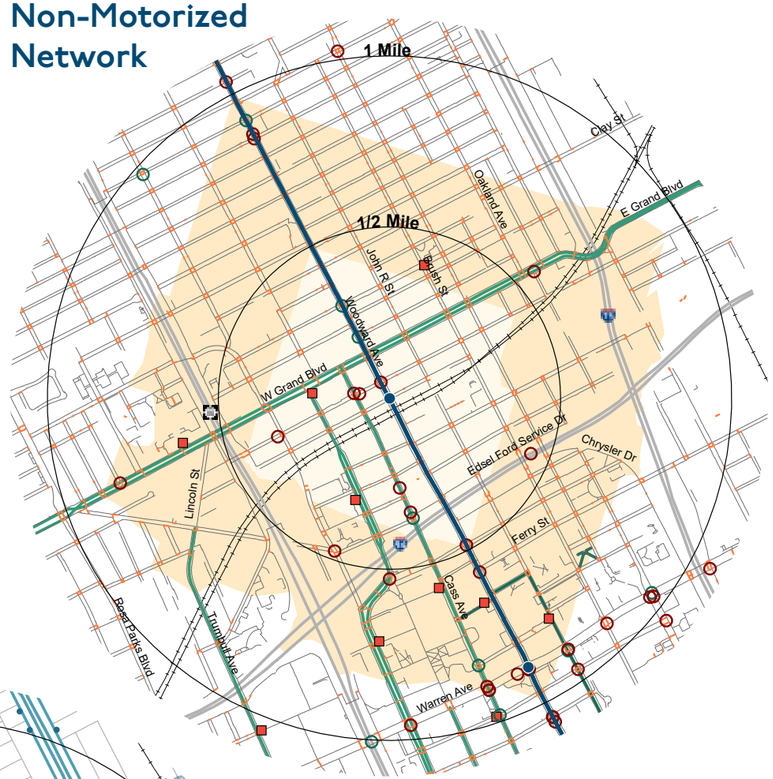
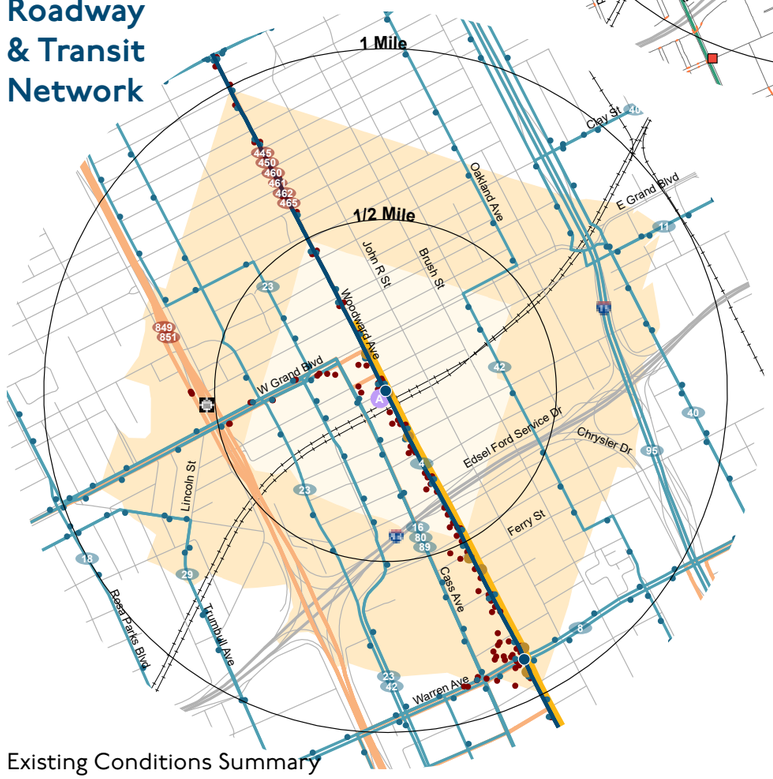
MOD Study

Station
Woodward Corridor
Railroad
1/2 Mile Walkshed
1 Mile Walkshed

Non-Motorized Network



Roadway & Transit Network



Non-Motorized Network

2018 Pedestrian Crash
Sidewalk
Crosswalk
2018 Bicycle Crash
Bikeshare Station
Planned Bikeshare Station
Shared Use Path (off-road)
Bike Lane (on-road)
Shared Lane (on-road)

Transit Network

SMART DDOT
Bus Stop
QLine Station
SMART Bus Route
DDOT Bus Route
QLine Route
Amtrak Station

Mobility Planning

The proposed New Center Station, located at the intersection of Woodward Avenue and Baltimore Avenue, provides direct access to the Detroit Amtrak Station, Q Line streetcar, Henry Ford Medical Center, and a variety of planned and existing mixed-use residential, commercial and cultural developments in the New Center neighborhood. New Center's proposed station area has wide streets, several large, fenced-in surface parking lots, no bicycle lanes or amenities, and few shade bearing street trees. The proposed station area is divided by the Lodge Freeway to the west, the Chrysler Freeway to the east, and the Amtrak railway overpass and Edsel Ford Freeway dividing the northern and southern ends of Woodward Avenue. Following guidance from the State of Michigan's Public Act 135, which, in 2010, envisioned complete streets for all road users throughout the state, current plans and policies include:

1. The Henry Ford Health System's LiveWell Initiative aims to optimize the well-being of Henry Ford employees, patients and community members. The LiveWell Initiative has been a long-time sponsor of Bike to Work Day and the expansion of the MoGo Bikeshare system in New Center.
2. The Cass Avenue bicycle lane, which was created by the FTA and the City of Detroit as a safe alternative bicycle route to Woodward Avenue, provides a key connection between New Center and the Detroit River.
3. A program to provide bicycle amenities for travelers on trains to ferry boats between the US and Canada is currently under discussion by the Detroit Complete Streets Coalition, the Amtrak Wolverine Line and the Detroit/Wayne County Port Authority.

Transit

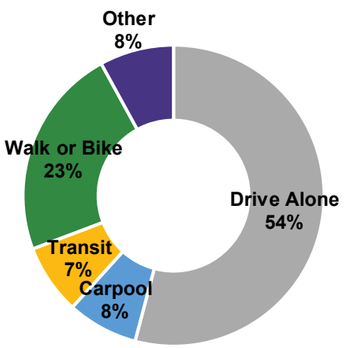
FAST bus stops are located on the far side of the Woodward Avenue and Baltimore Avenue intersection for northbound buses, and on the near side of the intersection for southbound buses. A QLine station is located just north of the intersection, and the Detroit Amtrak station is located just southwest of the intersection. Besides the SMART Woodward Local and FAST routes and DDOT ConnectTen Route 4, connections to SMART Routes 849 (park-and-ride with 18- to 24-minute frequency) and 851 (park-and-ride with 10- to 25-minute frequency) can be made at Woodward Avenue and Baltimore Avenue.

	Within 0.5 Miles	Within 1 Mile
Sidewalk & Crosswalk Mileage	30.0	114.0
Intersection Density (intersections per sq mi)	180.8	187.8
2018 Pedestrian Crashes	9	28
Bikeway Mileage	3.5	8.5
2018 Bicycle Crashes	3	9
TRANSIT ACTIVITY (average weekday boardings)	**1,309**	**2,763**
SMART	149	397
DDOT	463	1,218
QLine	697	1,147

Sources: SEMCOG Open Data, SMART October 2017, DDOT Feb-April 2018, M-1 Rail October 2019

Commute Mode Share

RESIDENTS WITHIN 1 MILE



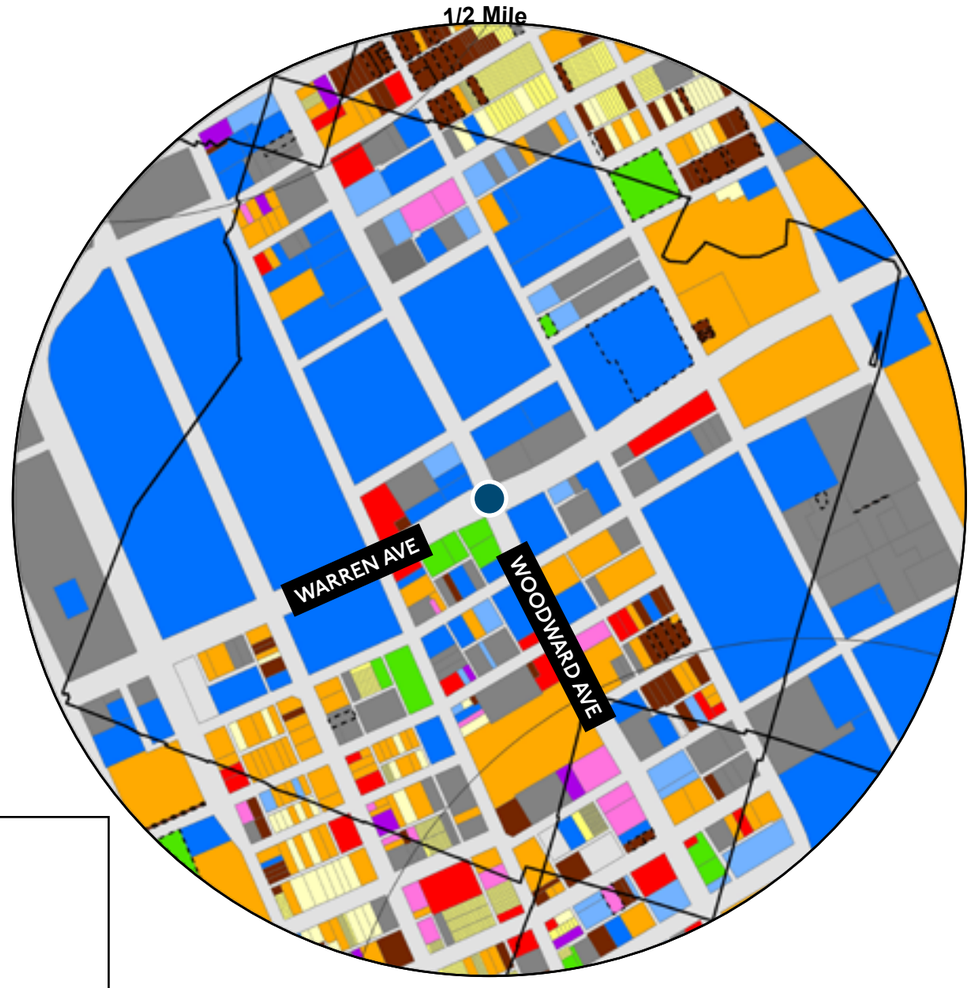
Source: American Community Survey 2013-2017

WARREN AVE: CONTEXT

DRAFT

MOD Study

Existing Land Use



Source: SEMCOG 2015

- Potential Station Location
- Single Family Housing
- Attached Condo Housing
- Multi-Family Housing
- Retail; Retail-Residential
- Office; Office-Residential
- Institutional; Medical
- Hospitality; Hospitality-Residential
- Industrial
- Cemetery; Golf Course; Park and Open Space; Recreation
- Parking
- TCU
- Water
- Vacant
- Publicly Owned
- 1/2 Mile Walkshed

About the Station Area

The future transit node at the intersection of Woodward and Warren Ave is in the heart of Midtown Detroit and Wayne State University's sphere of influence. The half-mile walkshed is bounded by I-94 to the north, I-75 to the east, and the Lodge Freeway to the west.
The Detroit Institute of Arts (DIA) and Detroit Public Library face Woodward north of the intersection. Wayne State's main campus is to the west. The Michigan Science Center, Charles H. Wright Museum of African American History and John D. Dingell VA Medical Center are east of the intersection. Midtown south of the intersection is characterized by mixed use buildings and a bounty of surface parking. The large parcel owned by Wayne State at the southwest corner of Woodward and Warren has excellent MOD potential.

Roadway Configuration

Woodward Ave has a three through lanes plus left turn lanes in each direction. Warren has three lanes plus left turn lanes and parking lanes in each direction separated by a landscaped median. The Woodward and Warren intersection has signalized pedestrian crossings and red stamped crosswalks at each leg of the intersection.

Population & Employment

	Within 0.5 Miles	Within 1 Mile
Population	7,128	13,258
Jobs	20,310	36,803

Source: American Community Survey 2013-2017; Longitudinal Employer-Household Dynamics 2017 (does not include federal workers)

Views of the Potential Station Area

Source: Google Earth

WARREN AVE: LAND USE & ZONING

DRAFT

MOD Study

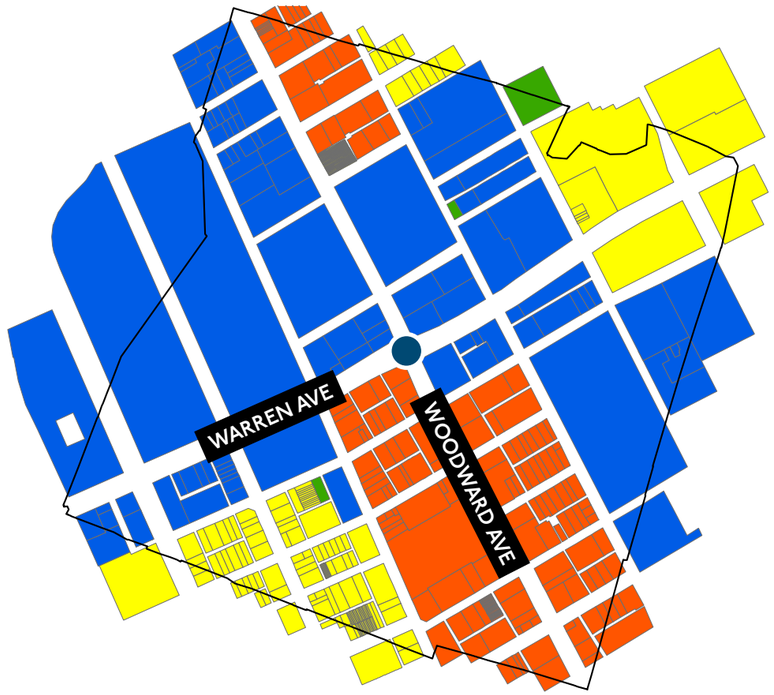
Land Use Planning

The large parcel on southeast corner of Woodward and Warren has been vacant for the past decade. Wayne State University acquired the land and crowdsourced funding to convert it two a two-acre park. The University identifies this corner along with two other locations within the transit node's walkshed as target redeveopment sites in its 2019 Campus Master Plan:

- Warren Gateway: 245,000 square feet of future development on the southwest corner of Woodward and Warren.
- South Gateway: 460,000 square feet (1,600 beds) of student housing on the northwest and northeast corners of Cass and Canfield.
- North Gateway: 540,000 square feet (800 beds) of graduate and professional housing on the northwest and southwest corners of Woodward and Palmer.

In 2017, Midtown Detroit Inc. and the DIA began planning for a cultural campus plan to better connect a dozen local instutions including Wayne State and the DIA. The project will invest $75-85 million into public facilities and public realm improvements that will make the district more walkable and green.

Future Land Use



- Potential Station Location
- Residential
- Commercial
- Office
- Mixed Use
- Institutional
- Cemetery
- Park and Open Space
- Recreation
- Golf Course
- Industrial
- Parking
- Transportation/Communication/Utilities
- Water

Source: SEMCOG 2010

Zoning

Zoning

The four blocks around the Woodward and Warren transit node are all zoned for General Business and Special Development, Mixed Use.

The medium and high density residential districts in this area have F.A.R.'s of just 1.5 and 2.0, allowing for limited density even in high-activity mixed use areas. Parking reductions are limited in these districts.

However, the Traditional Main Street Overlay applies to all lots fronting Woodward and allows for off-street parking to be further from the building.

Metric	SP2 Special Development District, Mixed Use	R5 Medium Density Residential	R6 High Density Residential	B4 General Business
Promotes Mixed Use	Yes	Somewhat	Yes	Somewhat
Building Height	45 ft (non mixed-use) 80 ft (mixed use)	35 ft	N/A	35 ft (or 80 ft in some cases)
Parking	• Shared/district parking approach encouraged • Reductions allowed	No reductions considered except for shared parking and buildings under 3,000 sqft		
Bike Parking	N/A			

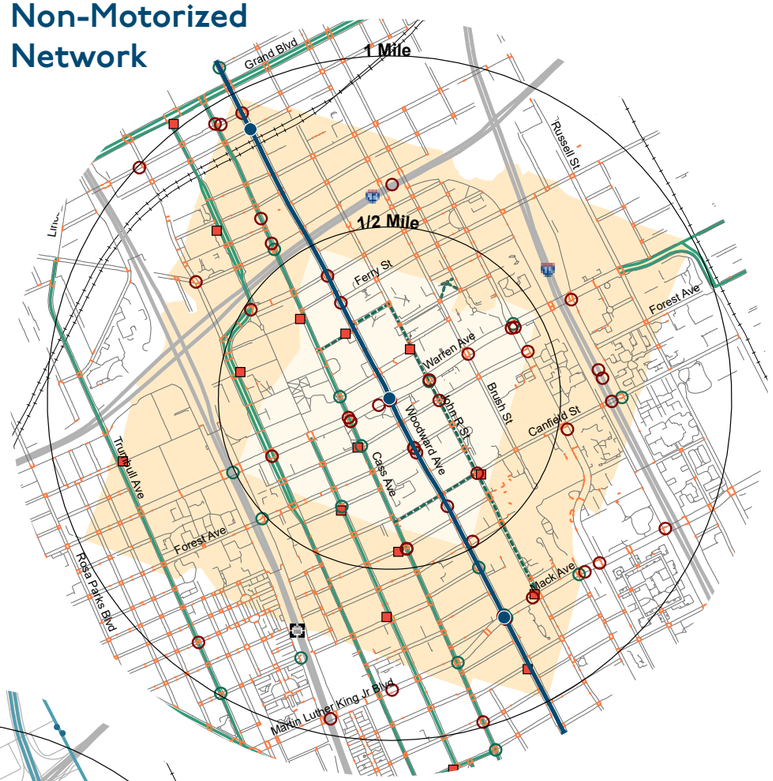
WARREN AVE: MOBILITY

DRAFT

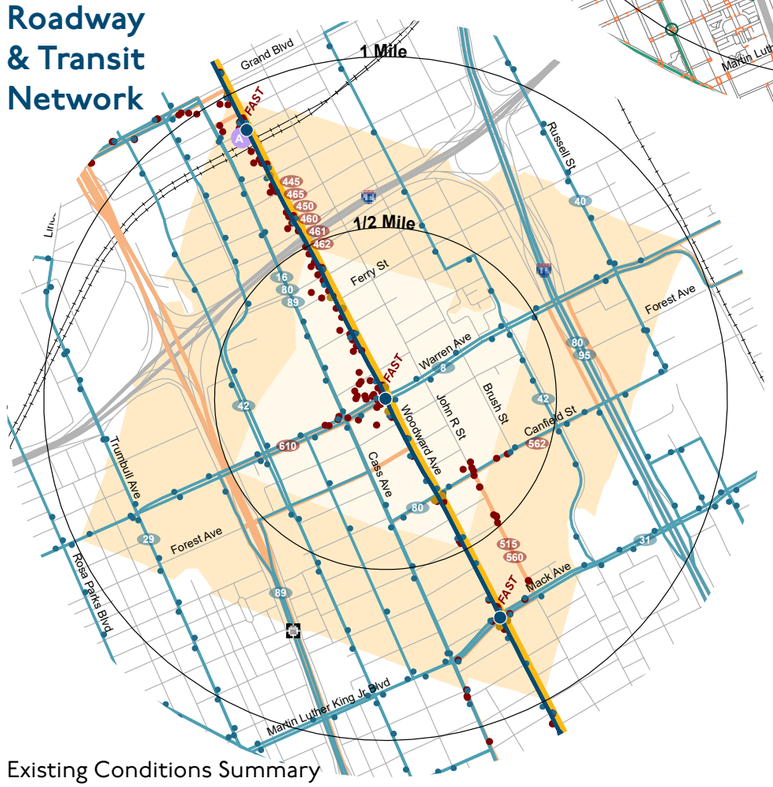
MOD Study

- Station
- Woodward Corridor
- Railroad
- 1/2 Mile Walkshed
- 1 Mile Walkshed

Non-Motorized Network



Roadway & Transit Network



Non-Motorized Network

- 2018 Pedestrian Crash
- Sidewalk
- Crosswalk
- 2018 Bicycle Crash
- Bikeshare Station
- Planned Bikeshare Station
- Shared Use Path (off-road)
- Bike Lane (on-road)
- Shared Lane (on-road)

Transit Network

SMART DDOT

- Bus Stop
- QLine Station
- SMART Bus Route
- DDOT Bus Route
- QLine Route
- Amtrak Station

Mobility Planning

The proposed Warren Station area provides convenient access to Wayne State University and the Detroit Medical Center through the Q-Line, Detroit People Mover, and Midtown Greenway Loop greenway. The proposed station area has wide crossing distances for pedestrians, intermittent bicycle lanes, competing curbside uses and congested parking facilities. Following guidance from the State of Michigan's Public Act 135, which, in 2010, envisioned complete streets for all road users throughout the state, current plans and policies include:

1. Policy guidance that prioritizes pedestrian safety on every street, consolidates transit routes and amenities, completes a network of protected bicycle lanes and implements shared and demand-responsive parking and curbside management facilities. These policy objectives are supported by The Detroit Complete Streets Coalition, Wayne State University's WayneRides program, and the 2014 Woodward Avenue Rapid Transit Alternatives Analysis.
2. Wayne State University has installed bicycle repair stands, MoGo bikeshare stations, Maven and Zipcar carsharing facilities, electric vehicle charging stations, a free on-campus shuttle and reduced fares on the UMICH Connector to Ann Arbor and Dearborn.

Transit

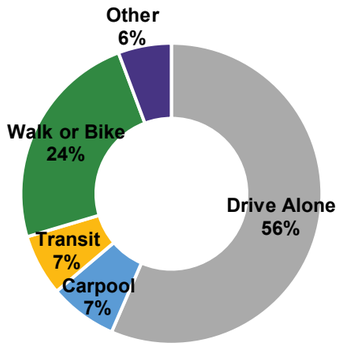
FAST bus stops and QLine stations are located on the far side of the Woodward Avenue and Warren Avenue intersection for both northbound and southbound buses and streetcars. Besides the SMART Woodward Local and FAST routes and DDOT ConnectTen Route 4, connections to SMART Routes 445 (limited service with 20- to 40-minute frequency), 562 (limited FAST service with 130- to 135-minute frequency), and DDOT ConnectTen Route 8 (15-minute peak frequency) can be made at Woodward Avenue and Warren Avenue.

	Within 0.5 Miles	Within 1 Mile
Sidewalk & Crosswalk Mileage	32.7	124.9
Intersection Density (intersections per sq mi)	132.4	182.4
2018 Pedestrian Crashes	24	46
Bikeway Mileage	4.5	9.2
2018 Bicycle Crashes	6	16
TRANSIT ACTIVITY (average weekday boardings)	**1,929**	**3,264**
SMART	280	523
DDOT	829	1,512
QLine	820	1,229

Sources: SEMCOG Open Data, SMART October 2017, DDOT Feb-April 2018, M-1 Rail October 2019

Commute Mode Share

RESIDENTS WITHIN 1 MILE



Source: American Community Survey 2013-2017

MLK JR. BLVD / MACK AVE: CONTEXT

DRAFT

MOD Study

Existing Land Use

- Potential Station Location
- Single Family Housing
- Attached Condo Housing
- Multi-Family Housing
- Retail; Retail-Residential
- Office; Office-Residential
- Institutional; Medical
- Hospitality; Hospitality-Residential
- Industrial
- Cemetery; Golf Course; Park and Open Space; Recreation
- Parking
- TCU
- Water
- Vacant
- Publicly Owned
- 1/2 Mile Walkshed

Source: SEMCOG 2015

About the Station Area

The future transit node at the intersection of Woodward and Mack Ave/MLK Blvd is in the southern half of Midtown Detroit. The north side of this intersection features the University of Michigan Detroit Center, the recently refurbished Hamilton apartment building (formerly Milner Arms Apartments), and the mixed use Whole Foods redevelopment. Both the southeast and southwest corners of the intersection are underdeveloped. There are multiple large scale mixed use redevelopments planned along Woodward both north and south of the intersection.
The walkshed for this transit node also includes the Children's Hospital of Michigan and the Brewster Homes public housing development.
The remainder of the walkshed is predominantly composed of historic mid-rise apartment buildings, single family homes, surface parking, and vacant land.

Roadway Configuration

Woodward Ave has a three through lanes plus left turn lanes in each direction. Mack/MLK have three lanes in each direction separated by a wide landscaped median. The Woodward and Mack/MLK intersection has signalized pedestrian crossings and red stamped crosswalks at each leg of the intersection.

Population & Employment

	Within 0.5 Miles	Within 1 Mile
Population	6,145	18,036
Jobs	21,704	42,518

Source: American Community Survey 2013-2017; Longitudinal Employer-Household Dynamics 2017 (does not include federal workers)

Views of the Potential Station Area

Source: Google Earth

MLK JR. BLVD / MACK AVE: LAND USE & ZONING

DRAFT

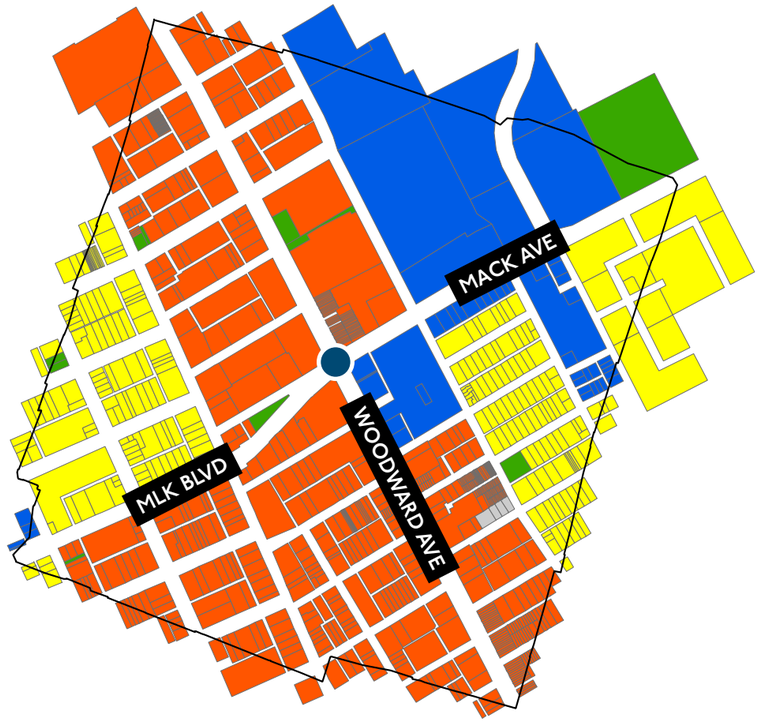
MOD Study

Land Use Planning

This future transit node is located at the northwest corner of the Brush Park neighborhood. The Brush Park Form Based District, finalized in May 2019, encompasses the entire neighborhood excluding the Brewster Homes and properties fronting Woodward. Ongoing planning efforts and the form based code have catalyzed over a dozen new and planned developments and building renovations in Brush Park.

District Detroit, a 50-block development promised by the Ilitch family centered around Little Caesar's Arena, overlaps with the southern portion of this future transit node walkshed.

Future Land Use



Source: SEMCOG 2010

Zoning

Zoning

Parcels fronting the east side of Woodward frontage are zoned for Planned Development. Beyond Woodward, the The Planned Development District areas are primarily associated with the Brush Park Form Based District.

The west side of Woodward is designated a mix of Mixed Use Special Development District, General Business District, High Density Residential, and Planned Development.

The City's High Density Residential designation has no height limit but restricts density with a maximum F.A.R. of 2.0.

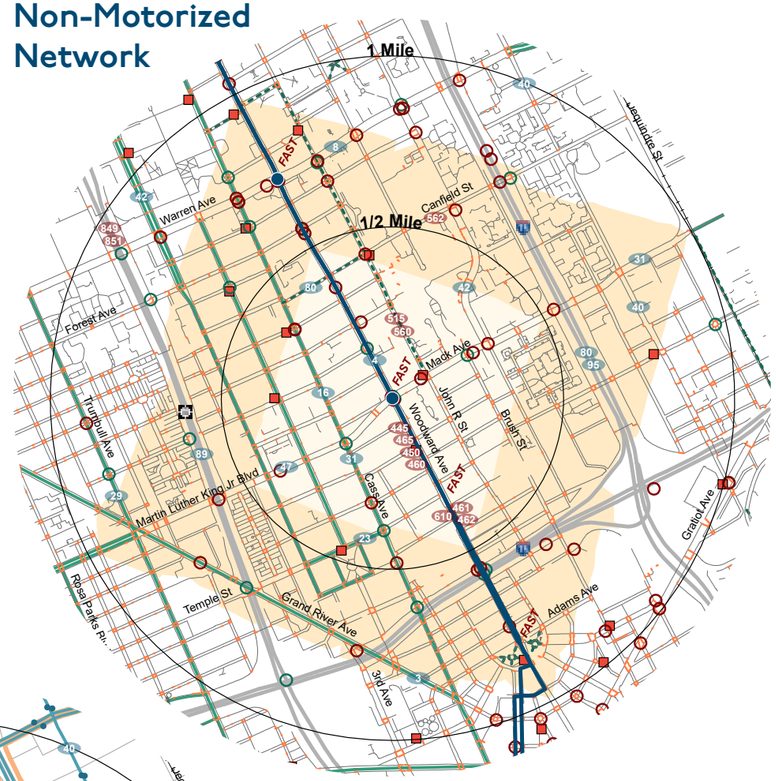
The Mixed Use Special Development District encourages pedestrian and transit-oriented uses. Additionally, the Traditional Main Street Overlay applies to all lots fronting Woodward.

Metric	SP2 Special Development District, Mixed Use	R6 High Density Residential	B4 General Business
Promotes Mixed Use	Yes	Yes	Somewhat
Building Height	45 ft (non mixed-use) 80 ft (mixed use)	N/A	35 ft (or 80 ft in some cases)
Parking	• Shared/district parking approach encouraged • Reductions allowed	No reductions considered except for shared parking and buildings under 3,000 sqft	
Bike Parking	N/A		

MLK JR. BLVD / MACK AVE: MOBILITY

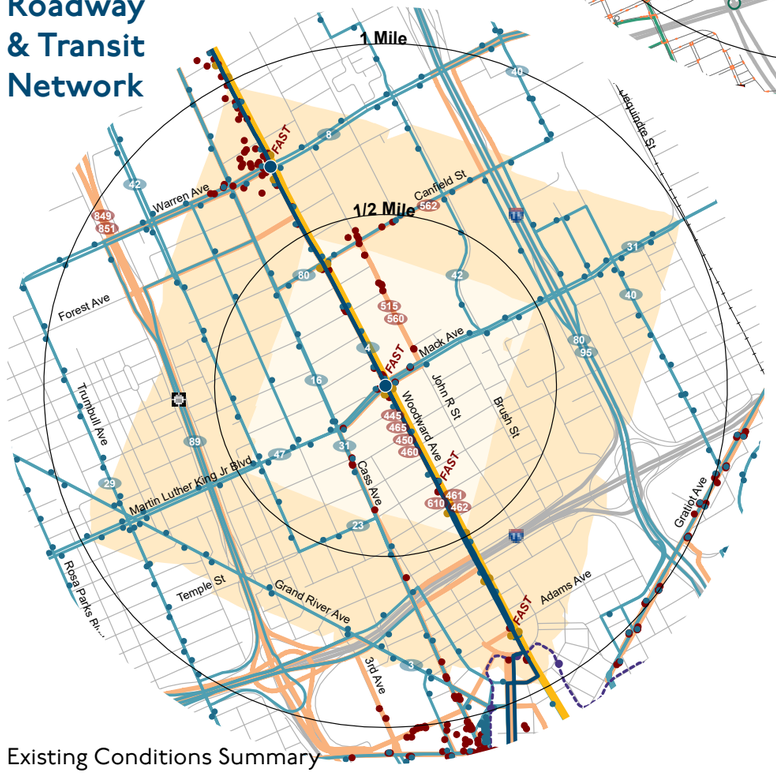
DRAFT

MOD Study



Non-Motorized Network

Roadway & Transit Network



- Station
- Woodward Corridor
- Railroad
- 1/2 Mile Walkshed
- 1 Mile Walkshed

Non-Motorized Network

- 2018 Pedestrian Crash
- Sidewalk
- Crosswalk
- 2018 Bicycle Crash
- Bikeshare Station
- Planned Bikeshare Station
- Shared Use Path (off-road)
- Bike Lane (on-road)
- Shared Lane (on-road)

Transit Network

SMART DDOT QLine People Mover

- Bus Stop
- Station
- SMART Bus Route
- DDOT Bus Route
- QLine Route
- People Mover Route

Mobility Planning

The proposed Mack Station would provide direct access to the Detroit Medical Center, Brush Park Historic District, and adjacent neighborhoods. The proposed station area has wide streets which create long crossing distances for pedestrians, few bicycle lanes and competing curbside uses. The Detroit Complete Streets Coalition, Woodward Avenue Rapid Transit Alternatives Analysis (2014), Downtown Detroit Transportation Study (2018), and proposed Brush Park Form-Based District (drafted in 2019) support a “complete network” approach in the proposed station area, guided by the following principles: prioritize pedestrian safety on every street, consolidate transit routes and amenities, complete a network of protected bicycle lanes, and implement shared and demand-responsive system for parking and curbside management facilities. Specific projects recommended include:

1. Extend Michigan Avenue bike lane to Campus Martius; implement Adams Street and E Lafayette Street bicycle facilities. (Short-term)
2. Implement Fort Street and Third Avenue bicycle lane facilities; extend Cass Avenue bike lane to Fort Street. (Mid-term)
3. Implement Gratiot Avenue, Grand River Avenue, and Brush/Beaubien Street bicycle facilities. (Long-term)
4. Improve crossings and circulations to accommodate increased pedestrian activity at Grand Circus Park at the intersection of Adams Street and Woodward Avenue
5. Support additional development and programming at Grand Circus Park
6. Pilot test Leading Pedestrian Intervals to give people walking and bicycling a head start to cross the intersection. The following intersections are recommended pilot test locations: Jefferson Avenue and Randolph Street; Jefferson Avenue and Beaubien Street; Jefferson Avenue and Griswold Street; Woodward Avenue and State Street; Lafayette Boulevard and Beaubien Street.

Transit

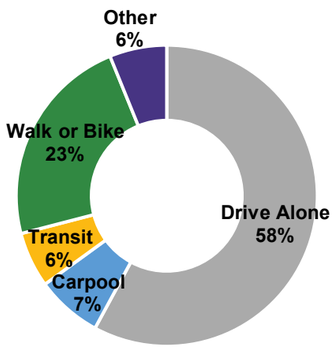
FAST bus stops are located on the far side of the Woodward Avenue and Mack Avenue intersection for both northbound and southbound buses. QLine stations are located on the near side of the intersection for northbound streetcars and on the far side for southbound streetcars. Besides the SMART Woodward Local and FAST routes and DDOT ConnectTen Route 4, connections to SMART Routes 445 (limited service with 20- to 40-minute frequency), 465 (limited service with 30- to 70-minute frequency), 510 (main corridor route with 15- to 25-minute frequency), 515 (commuter route with 15- to 25-minute frequency), 560 (main corridor route with 15-minute frequency), 610 (main corridor route with 30- to 50-minute frequency), and DDOT Routes 31 (key route with 20- to 30-minute frequency), 42 (neighborhood route with 30-minute frequency), and 47 (neighborhood route with 50-minute frequency) can be made at Woodward Avenue and Mack Avene.

	Within 0.5 Miles	Within 1 Mile
Sidewalk & Crosswalk Mileage	33.4	137.6
Intersection Density (intersections per sq mi)	149.0	235.2
2018 Pedestrian Crashes	13	48
Bikeway Mileage	3.2	9.9
2018 Bicycle Crashes	6	23
TRANSIT ACTIVITY (average weekday boardings)	1,726	3,617
SMART	188	559
DDOT	708	1,795
QLine	830	1,240
People Mover	0	24

Sources: SEMCOG Open Data, SMART October 2017, DDOT Feb-April 2018, M-1 Rail October 2019, Detroit Transportation Corporation Feb-April 2018

Commute Mode Share

RESIDENTS WITHIN 1 MILE



Source: American Community Survey 2013-2017

DOWNTOWN DETROIT: CONTEXT

Existing Land Use

- Potential Station Location
- Single Family Housing
- Attached Condo Housing
- Multi-Family Housing
- Office-Residential
- Retail/Office/Hospitality
- Instutional/Medical
- Parking
- Park and Open Space/Recreation
- Transportation/Communication/Utilities
- Vacant
- Publicly Owned Land
- 1/2 Mile Walkshed

Source: SEMCOG 2015

About the Station Areas

Downtown Detroit is the southern terminus of the Woodward Ave transit corridor. The half-mile walkshed around existing FAST bus stations encompasses the entirety of Downtown and includes the western edge of the East Riverfront District and the southern portion of Midtown. Downtown Detroit has remained Metro Detroit's largest and densest employment center through the city's population decline. Many historic and architecturally significant buildings remain in Downtown and Midtown, although the areas have come to be characterized by surface parking lots and vacancy as well.

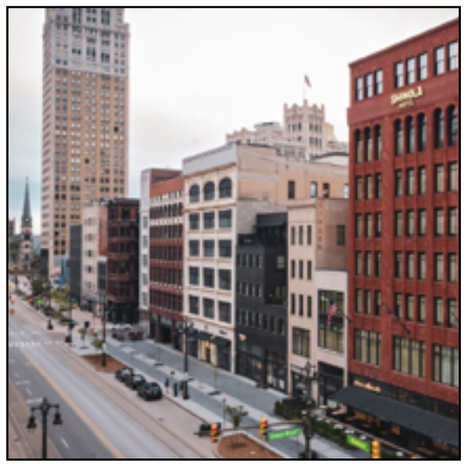
Rapid transit service in Downtown Detroit will provide direct access to several sub-districts and large trip generators in the area including Greektown, the TCF Center, the Renasissance Center, Hart Plaza, the MGM Casino, and all three of Detroit's major sports venues. Hart Plaza is the gateway to Detroit's East Riverfront Park, which connects to the Dequindre Cut Greenway and continues up the river to the MacArthur Bridge to Belle Isle. The Downtown transit walkshed is surrounded by Corktown, West Side Industrial, Brush Park, Lafayette Park, and the East Riverfront District.

Population & Employment

	Within 0.5 Miles	Within 1 Mile
Population	3,844	14,801
Jobs	69,438	98,428

Source: American Community Survey 2013-2017; Longitudinal Employer-Household Dynamics 2017 (does not include federal workers)

Views of the Potential Station Area



Source: Shinola Hotel

Source: Google Earth

DOWNTOWN DETROIT: LAND USE & ZONING

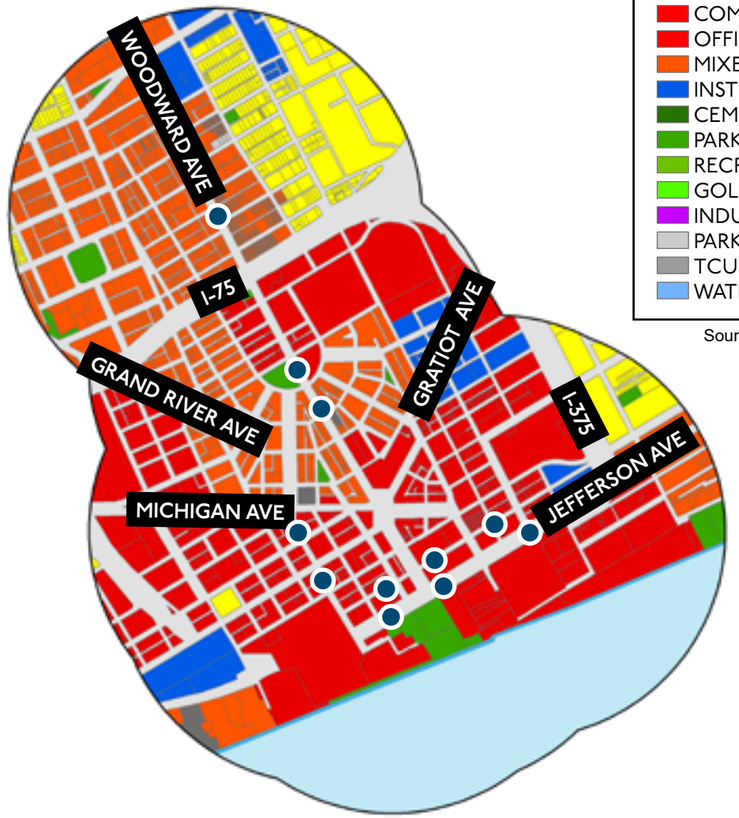
Ongoing Planning Efforts

A series of ongoing planning efforts in Downtown and Midtown are looking to carry the momentum of the hot real estate market into the future. The Greektown Neighborhood Framework Vision (2019) envisions a more walkable Greektown with mixed use development and a robust public realm. The Downtown Detroit Transportation Study (2018) establishes priority networks for bikes, transit and car traffic and recommends a series of streetscape upgrades, one-way to two-way conversions and transit improvement projects. ZoneDetroit and Streets For People will also produce detailed recommendations for Downtown and Midtown. Transit improvements, non-motorized facilities and infill redevelopment in Downtown and Midtown will largely be shaped by the implementation of these plans.

The East Riverfront Framework Plan (2017), the East Jefferson Corridor Enhancement Plan (2019), the Brush Park Plan and FormBased Code (2019), the expansion of the Detroit Riverwalk and plans for West Riverfront Park, the Michigan Ave PEL Study, and the Corktown and North Corktown Neighborhood Framework seek to propagate Downtown's momentum in the surrounding neighborhoods.

On account of these ongoing planning efforts, the Mobility-Oriented Development Study refrains from conducting the same level of existing conditions analysis around potential future station areas in Downtown Detroit as it does throughout the rest of the Woodward Avenue Corridor.

Future Land Use



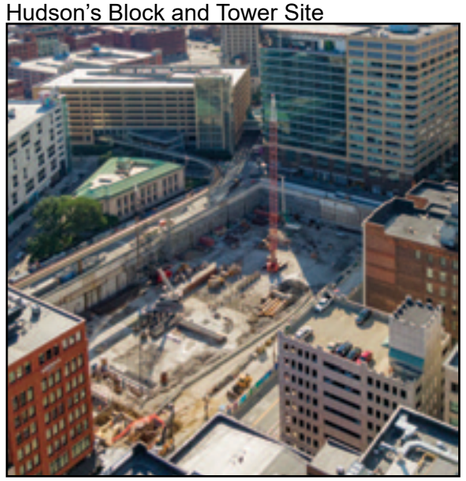
- RESIDENTIAL
- COMMERCIAL
- OFFICE
- MIXED USE
- INSTITUTIONAL
- CEMETERY
- PARK AND OPEN SPACE
- RECREATION
- GOLF COURSE
- INDUSTRIAL
- PARKING
- TCU
- WATER

Source: SEMCOG 2010

Brush Park Development

Source: Curbed Detroit: Detroit Developments Expected to Finish in 2020

Hudson's Block and Tower Site



Source: 2019 Downtown Detroit Development Update

Greektown Rendering

Source: Greektown Neighborhood Framework Vision, 2019

Development Projects

Downtown and Midtown have enjoyed a large share of Detroit's public and private reinvestment dollars since the city declared bankruptcy in 2013. The Downtown Detroit Partnership 2019 Development Update profiles 10 recently completed developments, 16 current developments, and 16 pipeline developments Downtown, the majority of which are Office and Residential. This development has helped transform Downtown Detroit from a nine-to-five district to a vibrant, mixed use destination.

With the help of large city and state subsidies, billionaire Dan Gilbert's development company Bedrock Detroit is responsible for several historic building rehabs and new construction projects including Hudson's Block and Tower, the Detroit Free Press Building, Book Tower, and City Modern in Brush Park.

Olympia, the development arm of the Ilitch family, was given hundreds of millions in tax incentives to redevelop a 50-block district around the new Little Caesar's Arena branded as "District Detroit." Despite the success of Little Caesars Arena, the Ilitches have been slow to deliver on their promises thus far.

DOWNTOWN DETROIT: MOBILITY

DRAFT

MOD Study

- Station
- Woodward Corridor
- Railroad
- 1/2 Mile Walkshed
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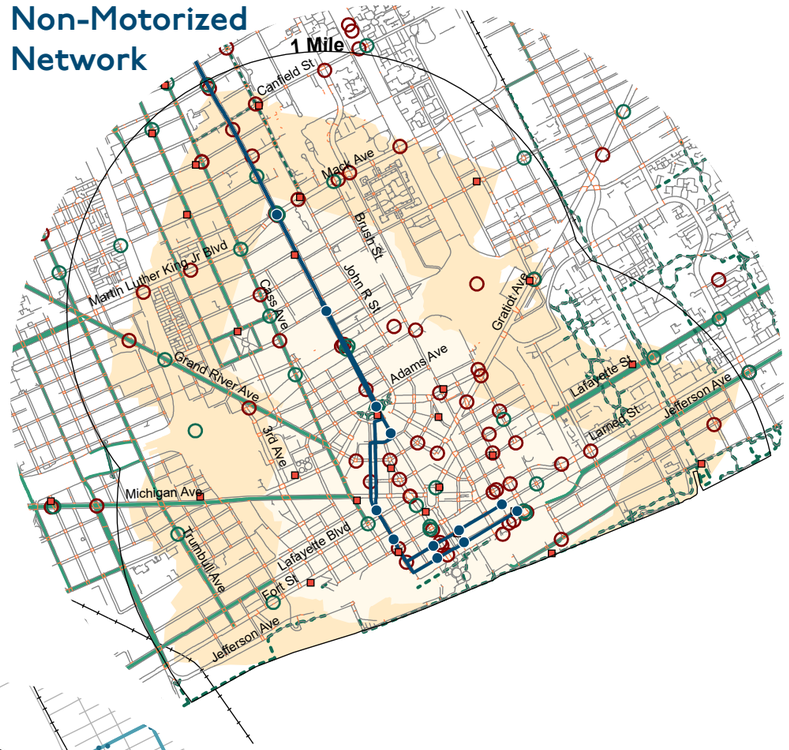
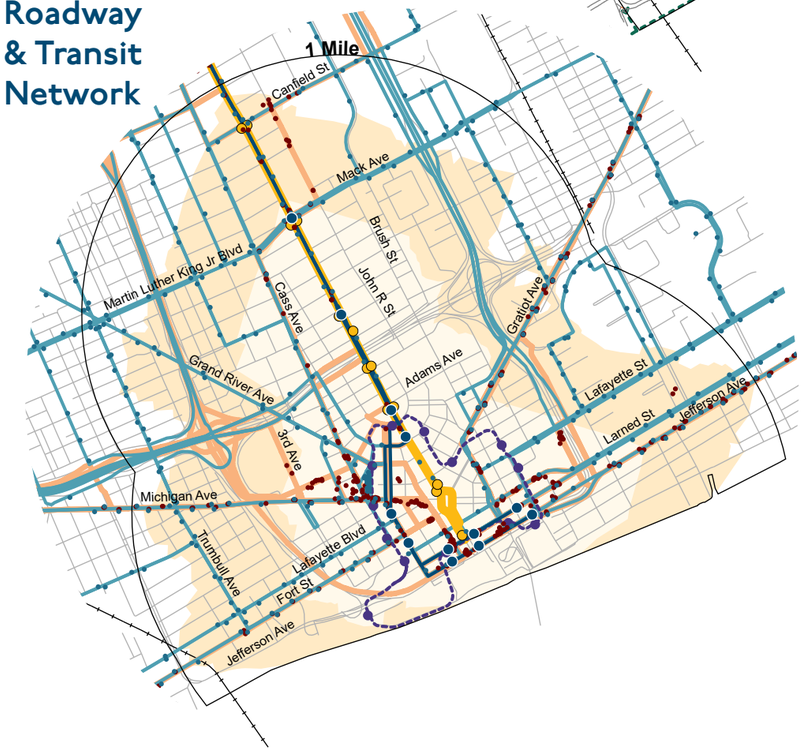
Non-Motorized Network



Roadway & Transit Network



Non-Motorized Network

- 2018 Pedestrian Crash
- Sidewalk
- Crosswalk
- 2018 Bicycle Crash
- Bikeshare Station
- Planned Bikeshare Station
- Shared Use Path (off-road)
- Bike Lane (on-road)
- Shared Lane (on-road)

Transit Network

SMART DDOT — QLine People Mover

- Bus Stop — Station
- SMART Bus Route
- DDOT Bus Route
- QLine Route
- People Mover Route

Mobility Planning

The eleven proposed stations in Downtown Detroit would provide direct connections to FAST buses, the Q Line streetcar, the People Mover, MoGo bikeshare stations, and the DDOT Rosa Parks Transit Center. The planned stations are bound to the north by the Fisher Freeway (I-75), to the west by the Lodge Freeway (M-10), to the east by the Chrysler Freeway (I-375). To the south, the proposed stations are separated from the Detroit River by the 10-lane, 175-foot-wide Jefferson Avenue.

Traffic from expressways converge on major arterials to avoid the area's many one-way streets and access major parking facilities, with spaces for 100 to over 500 vehicles. Sidewalks downtown have been blocked and narrowed by construction and roadway expansions. Pedestrian activity, however, has been increasing in downtown along with new real estate development. Road crossings can be unclear and difficult to navigate for pedestrians. Bus stops do not always provide shade, seating or information to passengers. There are a few protected bicycle lanes on key downtown corridors to the west of downtown and along the riverfront.

The Detroit Complete Streets Coalition, the Woodward Avenue Rapid Transit Alternatives Analysis (2014), the I-375 Alternatives Study Final Report (2016), the Downtown Detroit Transportation Study (2018), the Greektown Framework Vision (2019) and the proposed Brush Park Form-Based District (drafted in 2019) all support a "complete network" approach in the proposed station area, guided by the following principles:

1. Prioritize pedestrian safety, comfort and access on every street
2. Consolidate transit routes and amenities
3. Complete a network of protected bicycle lanes and plan for emerging forms of mobility
4. Implement shared and demand-responsive system for parking and curbside management facilities

Transit

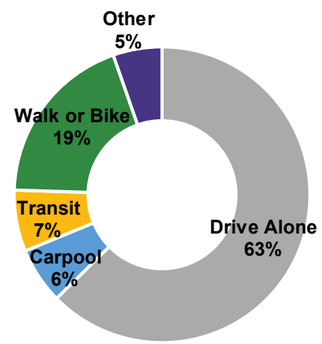
The current end-of-the-line stops for all FAST bus routes are located along Larned and Brush Streets. Connections to many other SMART and DDOT routes are available from these locations as well. The Rosa Parks Transit Center at Michigan Avenue and Cass Avenue, about 0.2 miles away from the Washington Boulevard and Lafayette Boulevard FAST stop, is also a key transfer point between routes and transit systems. QLine stations are located at Sproat Street, Adelaide Street, Montcalm Street, Grand Circus Park, Campus Martius, and Congress Street. People Mover stations are also accessible from all Woodward FAST stops in Downtown Detroit except at Sproat Street / Adelaide Street. A bus connection to Windsor is also available from Downtown Detroit.

	Within 0.5 Miles	Within 1 Mile
Sidewalk & Crosswalk Mileage	84.5	186.5
Intersection Density (intersections per sq mi)	646.8	330.1
2018 Pedestrian Crashes	43	60
Bikeway Mileage	7.2	21.0
2018 Bicycle Crashes	17	28
TRANSIT ACTIVITY (average weekday boardings)	**8,696**	**9,861**
SMART	2,457	2,552
DDOT	4,576	5,276
QLine	1,557	1,926
People Mover	107	107

Sources: SEMCOG Open Data, SMART October 2017, DDOT Feb-April 2018, M-1 Rail October 2019, Detroit Transportation Corporation Feb-April 2018

Commute Mode Share

RESIDENTS WITHIN 1 MILE



Source: American Community Survey 2013-2017

APPENDIX

DRAFT

Transit Demand Index Methodology

Transit Demand per Census block group was calculated based on 5 demographic measures from American Community Survey 2013-2017 data:

- Households without access to a vehicle
- Persons with disabilities
- Low-income individuals (population for whom poverty status is determined)
- Individuals age 10 to 24
- Individuals age 65 and older

For each of these demographic measures, a score between one and five was assigned to each Census block group depending on the relative density of that population within the block group relative to the rest of the block groups (based on Natural Breaks, or Jenks, classification). The thresholds used for each demographic measure are shown in the table at right. The total Transit Demand score for each Census block group is the sum of the scores in each individual demographic measure (highest possible Transit Demand score = 5+5+5+5+5 = 25, lowest possible score = 1+1+1+1+1 = 5).

	PER SQUARE MILE				
Score	Households without access to a vehicle	Persons with disabilities	Low-income individuals	Individuals age 10 to 24	Individuals age 65 and older
1	0 - 708	0 - 491	0 - 2091	0 - 367	0 - 304
2	709 - 1467	492 - 960	2092 - 3856	368 - 806	305 - 815
3	1468 - 2631	961 - 1621	3857 - 5976	807 - 1368	816 - 1748
4	2632 - 4714	1622 - 2835	5976 - 9020	1369 - 2514	1748 - 4168
5	4715+	2836+	9021+	2515+	4169+

Commute Mode Share

Each station's pie chart, created using American Community Survey 2013-2017 data, illustrates what mode residents use to get to work. The "Other" category includes taxi, motorcycle, and working at home.

This data does not capture the mode share of those who do not work, or of those who work in within 1 mile of the station but live elsewhere.