

ANN ARBOR
MOVING
TOGETHER

TOWARDS VISION ZERO



City of Ann Arbor Comprehensive Transportation Plan

DRAFT FINAL

Above illustrations by Pablo Stanley

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Executive Summary

Ann Arbor’s streets and transportation system are crucial to our city’s day-to-day functioning as well its long-term success. Ensuring that our transportation system runs efficiently today and supports the outcomes we desire in the future requires a long-term plan.

Ann Arbor: Moving Together builds on the city’s success over the past decade in creating a safer more sustainable, accessible, and equitable transportation system for everyone. By bringing together diverse perspectives from across the city and the wider region, this plan defines the city’s mobility values and goals and details our strategy for managing, operating, upgrading, and maintaining our transportation system today and into the future.


Mobility Goals and Values

Thousands of residents, city staff, community groups, advocates, and partner agencies helped identify Ann Arbor’s five mobility values. These mobility values are the foundation for the ideas, actions, projects, and policies described in this plan and will guide the city’s transportation decision making and investments over the next 20 years.




Safety

Ann Arbor is a safe city where everyone participates in creating an environment in which people feel confident and comfortable traveling.



Mobility

Ann Arbor prioritizes moving people and goods efficiently; making it easier for people to choose sustainable modes of transportation.



Accessibility for All

In Ann Arbor, people of all abilities, ages and stages of life, income, races, cultures and ethnicities have equitable access to the places where they live, work, and play.



Healthy People & Sustainable Places

Ann Arbor’s transportation system supports a healthy population, sustainable environment, and robust economy, while celebrating and enhancing a unique quality of place.



Regional Connectivity

Ann Arbor works to expand travel options throughout the region and integrate its transportation system with wider regional networks.

These values will help guide the city’s actions as we progress towards two key critical goals for the City of Ann Arbor:

Vision Zero: No one dies or is seriously injured in crashes on Ann Arbor’s streets.

By 2025, we have all worked together to eliminate fatalities and serious injuries resulting from traffic crashes.

Carbon neutrality: Our transportation system contributes zero emissions towards climate change.

By 2030, we have transitioned to a carbon-neutral transportation system.

Key Mobility Strategies

To achieve these goals, *Ann Arbor: Moving Together* details 22 key strategies we will pursue over the coming years to address our mobility challenges in a sustained, systemic way. We must act at many different scales, focusing on a single intersection or corridor at times while also considering citywide and regional actions. We must upgrade our infrastructure, test new street designs, and craft new policies and programs.

1. Focus transportation investments on corridors and intersections with the most serious crashes.
2. Address dangerous behaviors using design solutions, policy changes, and education efforts.
3. Establish a quick-build improvement program.
4. Address critical gaps in the sidewalk system.
5. Enhance safety and visibility at uncontrolled crosswalks.
6. Build out a safe, comfortable network of bike routes for people of all ages and abilities.
7. Make intersections safer and easier to navigate for biking.
8. Update and complete the American with Disabilities Act (ADA) transition plan.
9. Partner with mobility service providers to expand transportation options in Ann Arbor.
10. Continue increasing transit service to improve frequency and consistency.
11. Prioritize transit reliability and speed along signature service corridors and at key locations.
12. Improve multimodal access to transit stops.



- 13. Expand commuter-oriented transit services.
- 14. Provide reduced fares for transit and shared mobility services for qualified users.
- 15. Price trips according to their impact on the City.
- 16. Develop a citywide transportation demand management (TDM) strategy, building off and expanding the getDowntown program.
- 17. Implement new policies to better align parking supply and demand.
- 18. Ensure that all residents have access to basic daily needs within a 20-minute walk.
- 19. Create shared streets in strategic areas downtown.
- 20. Proactively engage with underrepresented voices around transportation issues and improvements.
- 21. Expand adaptive signal technology and implement connected infrastructure.
- 22. Monitor advances in connected and automated vehicle technology and evaluate impacts on safety and street design.

Ann Arbor: Moving Together also includes detailed information on how the plan’s recommendations can become reality , including funding sources and specific capital projects. The plan also creates a framework, including performance measures and evaluation procedures, for regularly reporting on our progress to ensure transparency and ensure the actions we are taking are leading to our desired outcomes.

Mobility Performance Measures

Safety

- » Annual number of people killed or seriously injured in traffic crashes
- » Share of serious injuries and fatalities incurred by people walking and biking
- » Share of serious injury and fatality crashes related to dangerous driving behaviors
- » Number of safety improvements installed on focus corridors and intersections per year

Mobility

- » Population within a ¼ mile of the all ages and abilities bicycle network
- » Population within a ¼ mile of high-frequency transit (every 15 minutes)
- » Share of trips in the city made by walking, biking, and transit
- » Shared mobility vehicles available (car share, bike share, e-scooters)

Accessibility for All

- » Transportation costs as a % of household income
- » Average number of jobs within 20 minutes via different modes
- » Share of bus stops that are ADA accessible
- » Miles of gaps in the sidewalk network

Healthy People & Sustainable Places

- » Average vehicle miles traveled (VMT) per day
- » Share of the population living in 20- minute neighborhoods
- » Share of the population meeting physical activity guidelines

Regional Connectivity

- » Share of commute trips into/out of Ann Arbor on transit
- » # of go!pass (or equivalent citywide program) holders



Capital Projects

Delivering on Ann Arbor’s mobility goals will require significant investments. The strategies throughout this plan detail infrastructure improvements—from new sidewalks and smart traffic signals to well-lit crosswalks and better bus stops—that are needed to create streets that are safe and work well for everyone in Ann Arbor.

By overlaying infrastructure improvements included in the plan’s strategies, locations where priorities overlap and conditions can be improved for people using all modes were identified (see map on the opposite page). The highest priority locations represent corridors where many needs can be addressed simultaneously. These capital investments are in addition to the city’s ongoing programmatic spending and operations and maintenance needs.

Tier 1 Capital Projects

Total Project Length: 18 miles

Projects include corridors that include near-term sidewalk gaps (see p. 57) and corridors with a safety focus (see p. 33).

Tier 2 Capital Projects

Total Project Length: 24 miles

Projects include additional corridors with a safety focus and address multi-modal needs.

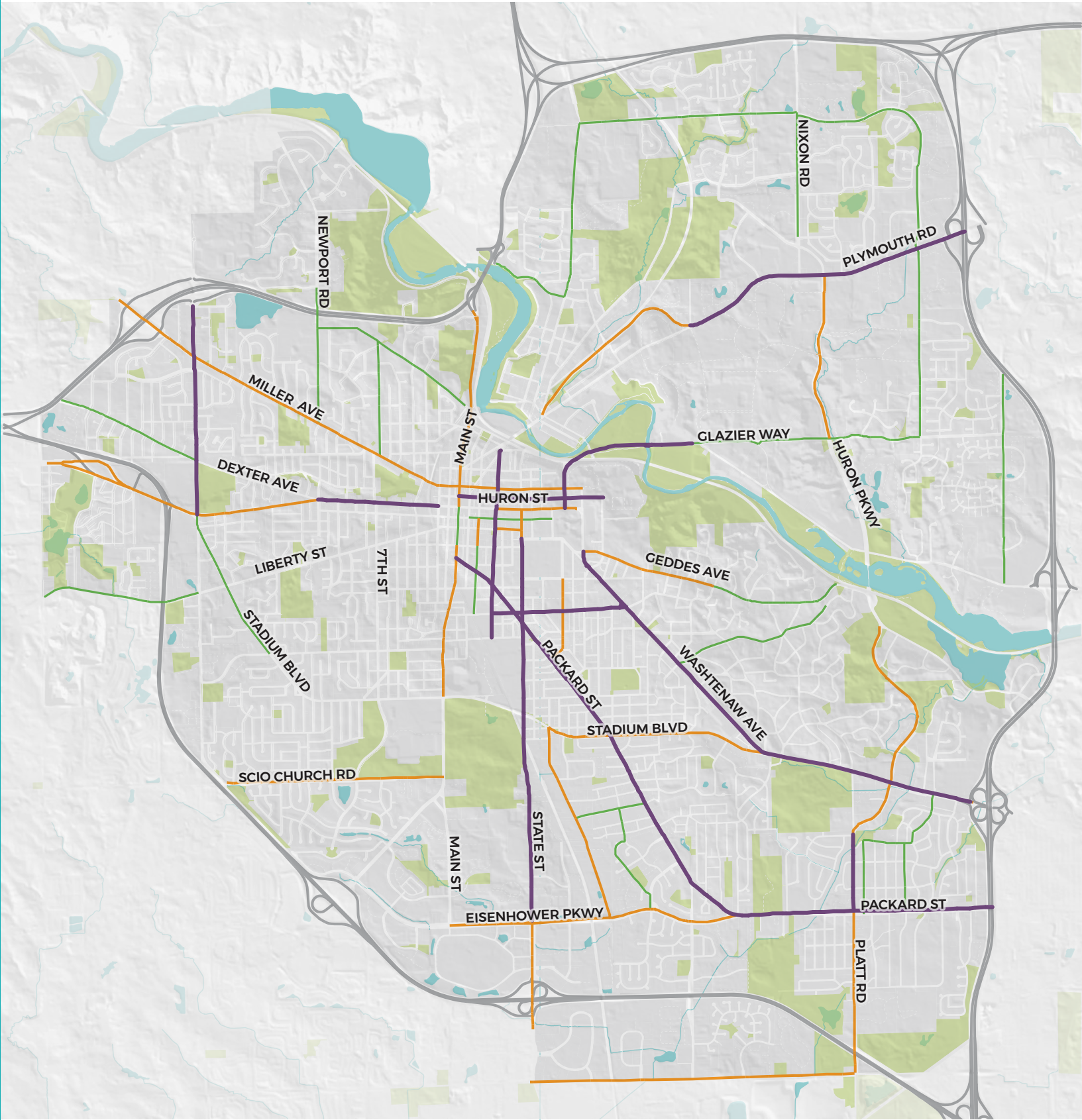
Tier 3 Capital Projects

Total Project Length: 20 miles

Projects include corridors that address multiple modal needs.

Capital Projects

- Tier 1 Capital Projects
- Tier 2 Capital Projects
- Tier 3 Capital Projects





The plan in context

Ann Arbor: Moving Together builds a common understanding of the opportunities and challenges we face in Ann Arbor, so that we can allocate our resources where they will deliver the most benefit to us all.

The plan details a set of strategies, which include individual projects, programs, and policies, and additional actions we will take over the coming years to address our mobility challenges in a sustained, systemic way.

Introduction

Ann Arbor’s streets and transportation system are vital to the city’s daily functions; connecting us to opportunities, services, and to one another. Transportation is an essential element of Ann Arbor’s long-term success, helping shape where and how we grow; attracting talent and investment; keeping our economy moving; and impacting our health, environment, and quality of life. Ensuring that our transportation system runs efficiently today and supports the outcomes we desire in the future requires a long-term plan.

A comprehensive transportation plan sets out what the city wants to achieve related to its transportation system and how it intends to achieve it. Ann Arbor: Moving Together serves as an update to previous comprehensive transportation plans completed in 2009 and 1990 and is a component of the City Master Plan.

By bringing together diverse perspectives from across the city and the wider region, this plan defines the city’s mobility values and details our strategy for managing, operating, upgrading, and maintaining our transportation system today and into the future.

Ann Arbor: Moving Together builds a common understanding of the opportunities and challenges we face in Ann Arbor, so that we can allocate our resources where they will deliver the most benefit to us all. The plan details a set of strategies, which include individual projects, programs, and policies, and additional actions we will take over the coming years to address our mobility challenges in a sustained, systemic way. It also includes detailed information on how the plan’s recommendations can become reality and a framework for regularly reporting on our progress to ensure transparency and accountability.



1

INTRODUCTION



Foundational Policies & Past Work

Ann Arbor has a strong foundation to build upon as we work together to create our future transportation system. Three policies in particular acted as guideposts throughout the process for *Ann Arbor: Moving Together*.

- 1. Complete Streets Resolution
- 2. Vision Zero
- 3. Carbon Neutrality

Complete Streets Resolution (2011)

Ann Arbor’s Complete Streets Resolution emphasizes that the City’s transportation systems “are provided to support mobility for all, regardless of age or abilities, to safely and conveniently travel throughout the city” and that the city must plan, engineer, construct, operate, and maintain its streets in accordance with this imperative. The policy also establishes that 5% of the transportation funding Ann Arbor receives from the state be dedicated towards walking and biking improvements.

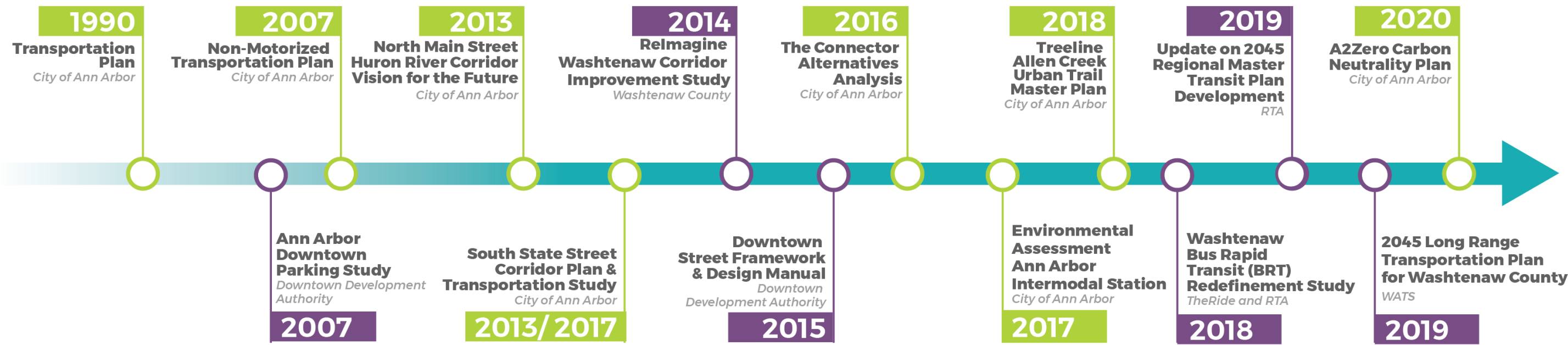
Vision Zero (2015)

Following the City’s Pedestrian Safety and Access Task Force report in 2015, Ann Arbor City Council made it an official city goal to have zero traffic-related fatalities on city streets by 2025. An additional resolution in 2017 reaffirmed the city’s commitment to eliminating traffic fatalities and serious injuries by reducing vehicle speeds and minimizing the consequences of human errors.

Carbon Neutrality (2020)

After City Council declared a climate emergency in 2019, Ann Arbor began developing a plan to achieve community-wide carbon neutrality by 2030. The A2Zero Carbon Neutrality Plan was adopted by City Council in 2020 and centers around six core strategies, including reducing the miles we travel in our vehicles by 50%.

In addition to these three foundational policies, *Ann Arbor: Moving Together* builds off many successful planning efforts the city and its partners have completed in previous years.



What is Vision Zero?

Vision Zero is both the commitment and the approach to eliminating death and serious injury from traffic crashes. Vision Zero puts forward a new vision for safety that differs significantly from traditional approaches and recognizes that:

Safe mobility is a basic right.

Everyone has the right to walk, bike, take public transit, and drive on streets that are safe for everyone, regardless of who they are or where they live.

Traffic crashes are preventable.

By changing how we design, use, and view our streets, we can make them safer for everyone.

Humans make mistakes.

Our streets and policies should be designed so that when people make inevitable mistakes while driving, they don't result in injury or death.

Safety is a shared responsibility.

Vision Zero requires action on many levels, and a diverse partnership of community members, city staff, and stakeholders are necessary to carry out those actions and hold leaders accountable.

How was this plan developed?

Ann Arbor: Moving Together builds on the city's success over the past decade in creating a safer more sustainable, accessible, and equitable transportation system for everyone. By analyzing a variety of transportation-related data, studying successful practices from cities around the world, collaborating with a broad range of stakeholders and community groups, and engaging directly with residents, workers, and visitors, Ann Arbor has created a plan that is rooted in the community's values and will guide the evolution of its streets and transportation system for the next 20 years.

A Technical Advisory Committee and Community Advisory Committee provided invaluable guidance and direction through the *Ann Arbor: Moving Together* process.

» The Technical Advisory Committee (TAC) consisted of staff from city of Ann Arbor units/service areas and relevant transportation agencies, representing a broad spectrum of responsibilities, governance, and interests related to the city's long-range transportation planning. The TAC provided technical consultation and feedback from subject-matter experts on the plan development and served in an advisory capacity during decision-making milestones throughout the planning

process.

» The Community Advisory Committee (CAC) consisted of individuals with a broad spectrum of interests related to the city's efforts to update the comprehensive transportation plan. The CAC provided feedback, from a community perspective, on the plan development, including its scope, content, direction and recommendations. They also provided guidance on the best approaches for engaging stakeholder groups and the broader public over the course of the project.

» Beginning in early 2019, the planning process for *Ann Arbor: Moving Together* occurred across three overarching phases.

Discovery Phase

Goal: Learn about opportunities and challenges around transportation in Ann Arbor using a variety of community engagement tactics and innovative data analysis. Identify a set of mobility values to guide decision making.

Community Engagement:

» Facilitated four focus groups (30 total participants) to ask participants in-depth questions about their comfort level traveling around Ann Arbor, mobility challenges, ideas for the future, and how the city of Ann



Arbor could shape the next transportation plan. Participants were recruited via a short survey that was promoted through the city’s social media channels, emails to residential groups, and emails to project stakeholders. Two sessions were held with the general population, one with seniors, and one with ethnic minorities.

- » Conducted a transportation behavior survey online (1,756 responses) and via in-person intercept surveys at the Blake Transit Center and Central Campus Transit Center (58 responses).
- » Organized one public open house and two pop-up events (91 total people participants). Feedback activities at these events included polling on potential mobility values, ranking examples of great streets across North America, a community mapping activity on opportunities and challenges, and photos of residents’ big ideas for transportation in Ann Arbor.
- » Launched an online survey on biking preferences (1,052 responses).
- » Presented on Vision Zero and progress from the planning process and community engagement findings at two Transportation Commission meetings.

Ideation Phase

Goal: Develop ideas for projects, policies, and programs to achieve the plan’s goals in collaboration with stakeholders and the community.

Community Engagement:

- » Organized one public open house (49 participants). Attendees provided feedback on how they would prioritize walking, biking, transit, and motor vehicles on five key corridors (Washtenaw Avenue, Plymouth Road, Miller Avenue., Main Street, and Fuller Road) and a mapping activity to identify potential new biking routes.
- » Developed an online survey to prioritize modes of transportation on five key corridors (583 responses) which mirrored the open house activity described above.
- » Designed an online survey on pedestrian crossings (954 responses and 3,325 entries on the interactive map). The survey sought to understand how comfortable people feel using mid-block crosswalks, as a pedestrian and as a driver, and identify where additional crosswalks should be marked. Respondents identified new crosswalk requests and existing crosswalks in need of upgrades.
- » Gathered feedback via an online mapping activity for an all ages and abilities bike

network (3,045 entries on the interactive map). Respondents identified missing routes, barriers for people biking, and which routes they would use the most.

- » Presented on plan progress at two Transportation Commission meetings.

Action Plan Phase

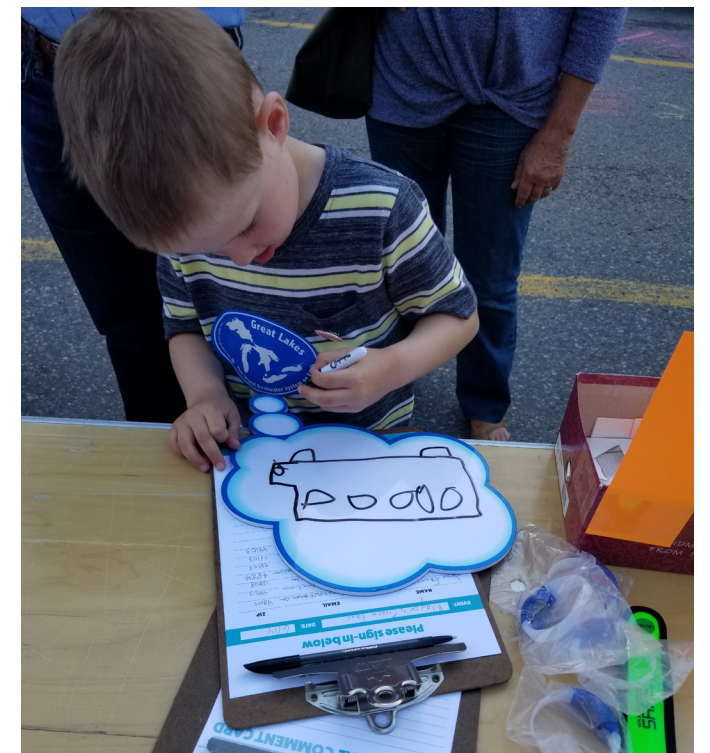
Goal: Organize recommendations into a set of key strategies and prioritize actions into short (0-3 years), medium (4-10 years), and long (more than 10 years) time horizons with stakeholders and community groups. Determine the costs and assess the benefits of the recommendations and identify pathways for implementation.

Community Engagement

- » Gathered feedback on strategy priority and timeline from Transportation Commission members.
- » Virtual open house via Zoom webinar with interactive polling questions and question and answer sessions.



Attendees participate in the first public Open House



A young attendee shares an idea at a Pop Up event



Mobility in Ann Arbor: Today

Over the last decade, Ann Arbor has made significant investments in its streets and transportation system: constructing new sidewalks and mid-block crossings for pedestrians; building bike lanes, paths, and trails; expanding and increasing transit service; modernizing traffic signals, and welcoming new ways of getting around, like shared bikes and electric scooters, to the city.

What have these investments yielded?

Transit ridership has reached record levels.

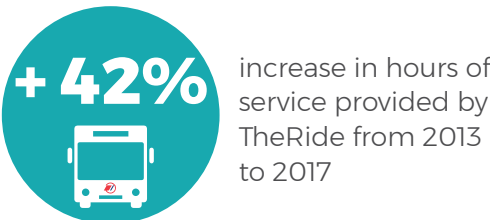
More people are walking and biking.

Emissions from transportation are falling.

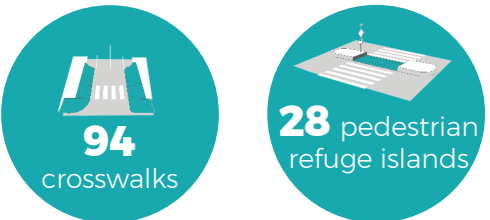
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Mobility in Ann Arbor: Today

Our Investments



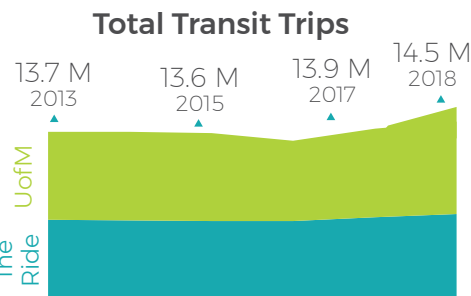
Since 2007, the city has installed...



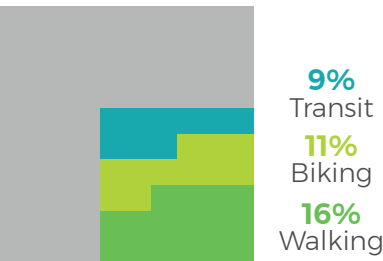
The Results

14.5 million

combined bus ridership (TheRide + University of Michigan) in 2018 (*National Transit Database*)



Trips within Ann Arbor



36%

of all trips within the city made by walking, biking or transit (2019 *Transportation Habits Survey*)

-13%

decrease in emissions from transportation since 2000 (*City of Ann Arbor data*)

Transportation Emissions (MTCO2e)



Our collective actions are yielding progress,

but we still face urgent challenges.

Creating safer streets.

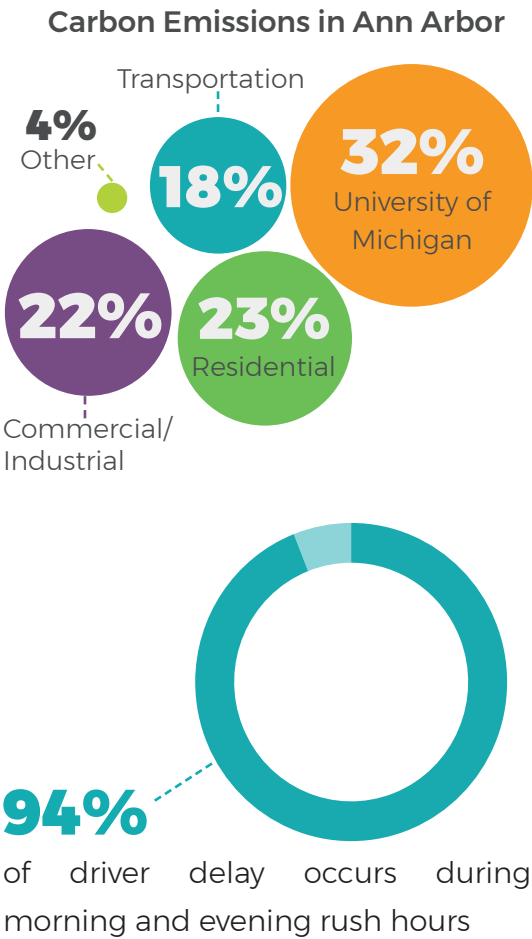
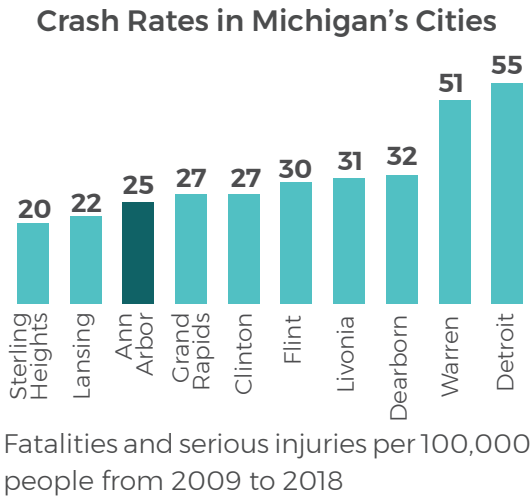
Ann Arbor has one of the lowest rates of deaths and serious injuries from traffic crashes among cities in Michigan, but even one life lost in a crash is unacceptable. From 2009 to 2018, 23 people were killed in traffic crashes in Ann Arbor and 276 people suffered life-altering injuries. People walking and biking in Ann Arbor are disproportionately affected by traffic crashes; over the last five years, the majority of people killed in traffic crashes were walking or biking. Most crashes occur on streets with higher relative speed limits, despite these streets being a small portion of the overall network.

Tackling the climate emergency.

Emissions from transportation (including private vehicles, trucks, buses, and motorcycles) in Ann Arbor have fallen, but transportation still accounts for nearly one-fifth (18%) of the city's emissions. With continued job and population growth, emissions from transportation are projected to increase over the coming years without further action.

Managing the demand on our streets.

Ann Arbor is a regional job center. One out of every 43 people in Michigan work in Ann Arbor, and more than 83,000 people commute into the city on weekdays. This influx of workers places major strains on the city's and region's transportation systems during rush hour. As a result, 94% of all the delay drivers experience in Ann Arbor occurs between 7-9 a.m. and 3-6 p.m.

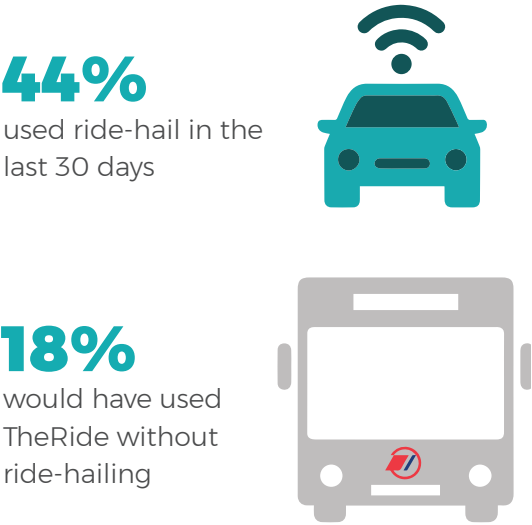
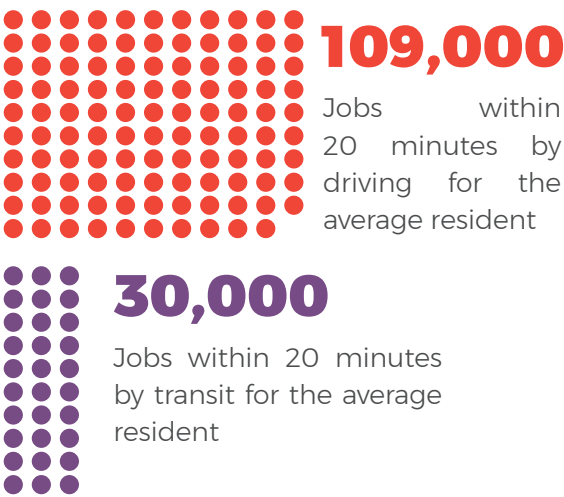


Equitably connecting people to opportunities.

The ability to access employment opportunities via reliable, affordable transportation is a crucial ingredient in enabling social mobility. Today, people living in Ann Arbor who drive have superior access to jobs compared to the 12% of households that don't have access to a vehicle and those that rely on other modes of transportation. The average resident can reach 109,000 jobs in the city within a 20-minute drive, while the average transit user has access to 72% fewer jobs (30,000) within 20 minutes.

Putting new technologies in service of our goals.

The previous decade saw the arrival and rapid adoption of new services like ride-hailing (such as Uber/Lyft), bike share, and shared electric scooters (e-scooters). There will undoubtedly be more new arrivals on our streets in the next two decades, whether they are autonomous vehicles, delivery robots, or something unforeseen. The University of Michigan and private companies in Ann Arbor are leading the way on many of these innovations. The city is committed to fostering a climate that encourages innovation while also ensuring that new technologies deployed on our streets align with our values and help improve safety, reduce emissions, and expand access for all of our citizens.





Bold Vision

Ann Arbor: Moving Together sets out a path to address our mobility challenges head-on and achieve two critical goals for the city of Ann Arbor: Vision Zero and carbon neutrality.

3

**Ann Arbor's
Mobility Goals & Values**

Mobility Goals & Values

1. Vision Zero: No one dies or is seriously injured in crashes on Ann Arbor's streets.

By 2025, we have all worked together to eliminate fatalities and serious injuries resulting from traffic crashes.

2. Carbon Neutrality: Our transportation system contributes zero emissions towards climate change.

By 2030, we have transitioned to a carbon-neutral transportation system.

We are committed to achieving these goals while adhering to the community's values and prioritizing equitable outcomes.

MOVING TOGETHER TOWARDS...

ZERO DEATHS

AND

ZERO EMISSIONS



Ann Arbor's Mobility Values

Thousands of residents, city staff, community groups, advocates, and partner agencies helped identify Ann Arbor's five mobility values. These mobility values are the foundation for the ideas, actions, projects, and policies described in this plan and will guide the city's transportation decision making and investments over the next 20 years.

The strategies laid out in this plan reflect one or more of these values, with many addressing several values at once.

1 Safety

Ann Arbor is a safe city where everyone participates in creating an environment in which people feel confident and comfortable traveling.



2 Mobility

Ann Arbor prioritizes moving people and goods efficiently; making it easier for people to choose sustainable modes of transportation.



3 Accessibility for All

In Ann Arbor, people of all abilities, ages and stages of life, income, races, cultures and ethnicities have equitable access to the places where they live, work, and play.



4 Healthy People & Sustainable Places

Ann Arbor's transportation system supports a healthy population, sustainable environment, and robust economy, while celebrating and enhancing a unique quality of place.



5 Regional Connectivity

Ann Arbor prioritizes moving people and goods efficiently; making it easier for people to choose sustainable modes of transportation.



Planning in a pandemic






The COVID-19 pandemic imposed a public health crisis on the city and the country in a way that is unprecedented in our lifetimes. The onset of the crisis upended our daily lives and routines, drastically changing how we get around in the short-term, among other disruptions. While the pandemic will eventually recede and activity levels will increase, the long-term impacts of these disruptions are unknown.

However...

We do know the values that the Ann Arbor community holds dear and the overarching goals of this plan continue to set the long-term vision for mobility in Ann Arbor. The strategies set forth in this long-range transportation plan update will guide the city through the pandemic recovery towards a transportation system that is more adaptable, inclusive, and resilient.

Impacts on mobility and travel patterns

The pandemic and associated restrictions on travel, business operations, and gatherings, has impacted who travels and how they get around. Nationwide trends show:

-  Traffic volumes plummeted, but have since rebounded to near normal levels.
-  Use of ride-hailing services, such as Uber and Lyft, dropped and has stayed down.
-  Transit ridership fell drastically and has only partially rebounded.
-  Freight and truck volumes fell slightly and have since risen above pre-COVID levels.
-  Shared mobility services (bikeshare, scooter share) have experienced inconsistent results in different cities.

Transit impacts in Ann Arbor

Throughout the pandemic, people have been encouraged to take the bus only for essential trips, in order to reduce the number of passengers on each bus and allow them to physically distance themselves from other riders. This drop in ridership, coupled with other response measures, has significantly impacted TheRide’s revenue.

Ann Arbor’s COVID Response

TheRide

Throughout the pandemic, the AAATA has been adaptive, responding to the changing nature of the public health crisis. TheRide has taken several measures to protect the health and safety of its customers and staff, while maintaining the critical service that they provide to essential workers who still need to travel, even through the most stringent of the statewide lockdown requirements.

Timeline of select actions

March - May 2020:

- » Free Fares
- » Transit Center closures
- » Reduced service
- » Measures to promote social distancing and masks

June - August 2020:

- » Temporary shuttle service
- » Service expansion on select routes
- » Fare collection resume

September - October 2020:

- » Contactless fare app, EZFare launched

Healthy Streets

In May 2020, Ann Arbor City Council passed a resolution enabling the city to implement roadway and lane reconfigurations on a temporary basis to provide adequate space for social distancing.

Signs and barricades marked slow streets and shared spaces on neighborhood streets while more intensive reconfigurations were implemented on some downtown streets. All reconfigurations were in support of the city’s broader goals of Vision Zero and carbon neutrality. Downtown reconfigurations are being evaluated for:

- » Traffic volume
- » Traffic speeds
- » Bicycle counts
- » Traffic flow
- » Crash reports
- » Field observations



Iroquois and Packard



4

Moving Together

Achieving Ann Arbor’s bold vision will require a multi-disciplinary commitment and a systematic approach to creating safer and more equitable streets.

More than 70 complementary strategies are presented that, when taken together, will set Ann Arbor on a course to zero deaths and zero emissions.

Ann Arbor’s Mobility Strategies

Mobility Strategies

Creating a transportation system that is safe and accessible for everyone; offers a variety of affordable options for getting around; and helps achieve Ann Arbor’s carbon neutrality goals requires bold action. We must act at many different scales, focusing on a single intersection or corridor at times while also considering citywide and regional actions. We must upgrade our infrastructure, test new street designs, and craft new policies and programs.

The mobility strategies detailed in the following pages organize the many discrete actions Ann Arbor must take to advance its mobility values in the coming years. The strategies were

designed to address the needs of different constituents: people who live in the city and those who work in or visit Ann Arbor; people who rely on different modes of transportation and have different abilities and needs; children, older adults, and everyone in between.

The strategies demonstrate:

- » the community’s **values**;
- » **multi-disciplinary** approach (engineering, education, encouragement, equity, enforcement, evaluation);
- » cross-agency and cross-departmental **collaboration**;
- » a **time-based** action strategy; and
- » **accountability**.

How this plan addresses equity in Ann Arbor

Reversing inequities in transportation investments and policies is an important component of a comprehensive Vision Zero strategy and an important objective in the community of Ann Arbor.

Equitable practices are woven throughout these strategies, including investments in infrastructure as well as programmatic initiatives that expand mobility choices and reduce the economic burden of transportation.

To assist in making strategic investments to reverse inequities, a geographic equity analysis is included in the Mobility Fact Book.

The City of Ann Arbor also recognizes that equitable transportation is not confined to the city’s boundaries and will work closely with Washtenaw County on the strategies included in this plan as well as regional priorities that align with addressing equity and the city’s goals.



1. High Crash Locations

Focus transportation investments on corridors and intersections with the most serious crashes.

Current State

From 2014 to 2018, the vast majority (77%) of fatalities and serious injuries from traffic crashes were concentrated on a select set of 30 corridors.¹ These corridors, referred to throughout the document as focus corridors, include many of the city’s major streets, where there is often more traffic traveling at higher speeds. A subset of seven corridors, referred to as Tier 1 focus corridors, accounted for more than a third (37%) of all traffic deaths and serious injuries. Additionally, one out of eight fatalities and serious injuries occurred at just 17 intersections located along the focus corridors. These focus intersections have also been divided into two tiers (see map on the following pages).

Strategy Description

To achieve Vision Zero by 2025, Ann Arbor must re-design streets and intersections to reduce crashes and ensure that when people make mistakes and crashes happen, those crashes do not result in death and injury. This will entail providing greater protection to people walking and biking and implementing new tools to address specific dangerous driving behaviors.



Safety

Concept designs for several focus corridors and intersections can be viewed in Section 5 and in the Appendix.

Making changes to the focus corridors and intersections can be achieved through several different approaches, including:

- » **Developing new capital improvement projects**, including small to large-scale roadway projects, multi-modal infrastructure investments, or traffic signal modernization.
- » **Coordinating safety improvements** with other planned projects and construction work (e.g., planned construction/resurfacing on Ann Street, Platt Road, Washtenaw Avenue, Miller Avenue, Main Street, and Plymouth Road).
- » **Advancing ongoing corridor studies** that address safety issues (e.g., South State Street Corridor Plan, North Main Huron River Corridor Project, Reimagine Washtenaw, Lower Town Area Mobility Study).
- » **Using the quick-build safety program** to quickly implement changes while long-term improvements are being planned (see p. 52).



Timeline



Short
(0-3 years)

Lead Agency/Stakeholders

- » **Engineering**
- » Systems Planning
- » Public Works
- » Downtown Development Authority (DDA)
- » Michigan Department of Transportation (MDOT)
- » University of Michigan
- » Ann Arbor Area Transportation Authority (AAATA)

Targets

1. Develop plans for safety improvements on all tier 1 corridors and intersections within **2 years**.
2. Identify implementation and funding strategy for all tier 1 corridors and intersections within **3 years**.
3. Develop plans for safety improvements on all tier 2 corridors and intersections within **3 years**.
4. Identify implementation strategy for all tier 2 corridors and intersections within **5 years**.
5. Make improvements on 3 safety focus corridors and/or intersections **each year**.



High Crash Locations

Focus Corridors

77% of all fatalities & severe injuries

37% on 7 Tier 1 Corridors

40% on 23 Tier 2 Corridors

Focus Intersections

12% of all fatalities & severe injuries

7% on 11 Tier 1 intersections

5% on 6 Tier 2 intersections

Tier 1 Focus Corridors

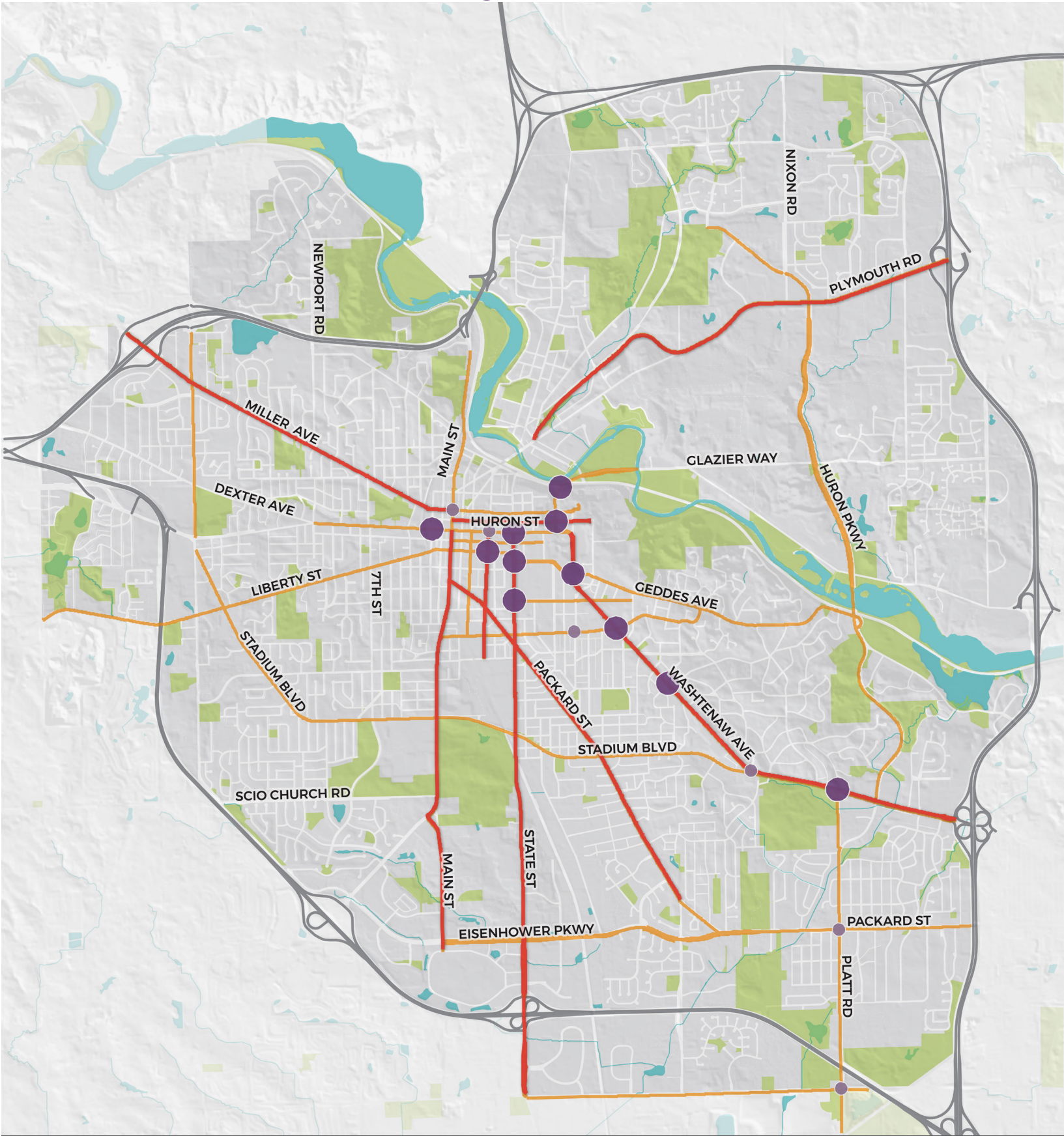
- 1. Plymouth Road (Murfin Avenue to US-23)
- 2. Miller Avenue (Downtown to M-14)
- 3. Washtenaw Avenue (Huron Street to US-23)
- 4. S. Main Street (Huron Street to Eisenhower Parkway)
- 5. S. State Street (Huron Street to Ellsworth Road)
- 6. Packard Street (Main Street to Stone School Road)
- 7. Division Street (Liberty Street to Hoover Street)

Tier 1 Focus Intersections

- 1. Washtenaw Avenue and Platt Street
- 2. Washtenaw Avenue and Devonshire Street
- 3. Washtenaw Avenue and Hill Street
- 4. Washtenaw Avenue and Geddes Avenue
- 5. State Street and Huron Street
- 6. S. State Street and N. University Avenue
- 7. S. State Street and S. University Avenue
- 8. Liberty Street and Division Street
- 9. Fuller Road and Glen Avenue
- 10. Ann Street and Glen Avenue
- 11. 1st Street and Huron Street

Focus Areas

Tier 1 Focus Corridors **Tier 2 Focus Corridors**
Tier 1 Focus Intersections **Tier 2 Focus Intersections**



2. Address Dangerous Behaviors



Safety



Mobility



Accessibility
for All



Healthy People &
Sustainable Places



Regional
Connectivity

Address dangerous behaviors using design solutions, policy changes, and education efforts.

Current State

Dangerous driving behaviors accounted for a large share of crashes that resulted in death and serious injury in Ann Arbor between 2014 and 2018. Seventy percent of all crashes that resulted in a fatality or serious injury during that time involved one or more of the following dangerous behaviors:²

1. Speed

Speed is a major determinant of both the likelihood and severity of traffic crashes. As driving speeds increase, drivers need more time to react to potential conflicts, their field

of vision narrows, and the distance required to come to a complete stop dramatically increases. Higher speeds also increase the likelihood that a crash will result in a serious injury or death, especially if a person walking, biking, or rolling is involved. The majority (55%) of all crashes where someone was killed or seriously injured in Ann Arbor occurred on streets with speed limits of 35 miles per hour (mph) or higher. No one was killed in a traffic crash on streets with 25 mph speed limits, even though those account for 81% of Ann Arbor’s street network.

2. Failure to yield

Half of all the traffic crashes where a person walking or biking was killed or seriously injured involved a driver failing to yield. Ann Arbor has been working to address these issues by

standardizing crosswalk design and signage; improving street lighting; educating residents, workers, and visitors about applicable laws; and using smart enforcement strategies. These efforts are having a positive impact, as the number of serious crashes where the driver failed to yield has been significantly decreasing.

3. Impaired driving

There were 362 crashes that involved drugs or alcohol, 38 of which resulted in a death or serious injury. Ann Arbor is focused on preventing impaired driving through a combination of education, treatment, and programs that prevent people from driving under the influence of drugs or alcohol.

4. Disregarded traffic signs/signals

Traffic signs and signals provide everyone using the street instructions on safe behavior. When people disobey a traffic sign or signal, they put themselves and other road users in serious danger of crashes and injury. Eleven percent of crashes where someone was killed or seriously injured involved disregarding traffic signs or signals.

5. Reckless/careless driving

Reckless and careless driving involve negligent and unsafe driving. Reckless driving involves

the intention to drive dangerously while careless driving may not be intentional and is often a result of distraction. Both reckless and careless driving, however, are dangerous behaviors that put all nearby road users at risk for crash and injury. Five percent of crashes where someone was killed or seriously injured involved reckless or careless driving.

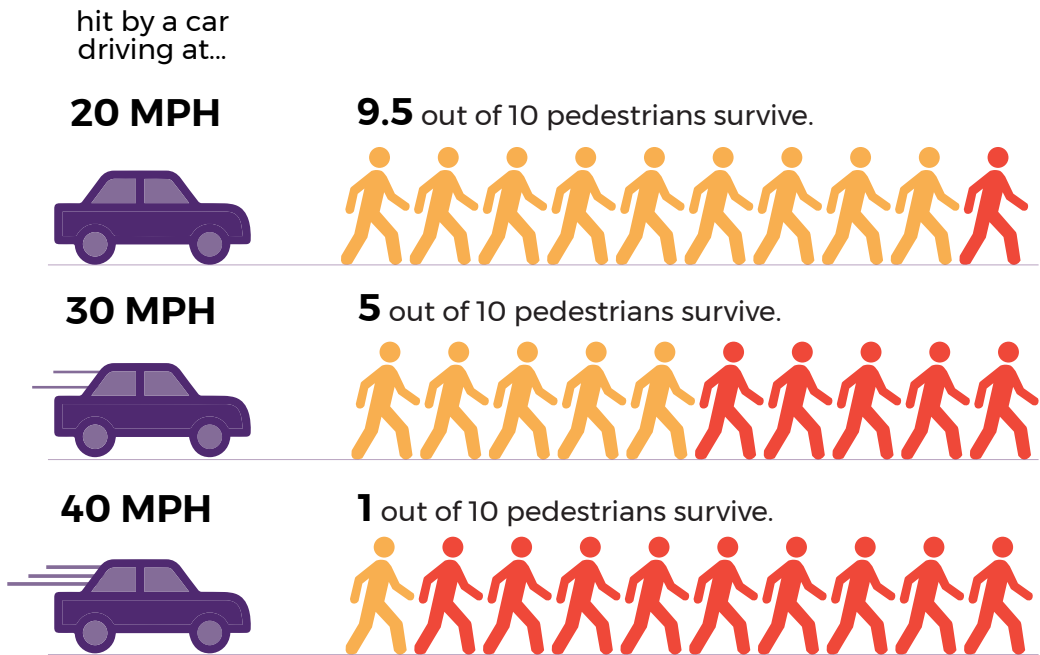
Strategy Description

Decreasing the prevalence of these dangerous driving behaviors will require a systematic approach combining infrastructure and street design changes, new policies and programs, and new education and marketing efforts.

Timeline



Short
(0-3 years)



Address Dangerous Behaviors

Tools by Dangerous Behavior

Tool	Speeding	Failure to Yield	Impaired Driving	Disregard Traffic Control	Reckless/ Careless Driving
Setting safe speeds and matching design speed	✓				
Major Street Traffic Calming	✓				
Local Street Traffic Calming	✓			✓	✓
Street Reconfiguration	✓				
Lane Width	✓				
On-Street Parking	✓				
Automated Enforcement	✓	✓		✓	
Signal Timing	✓				
Street Trees and Streetscaping	✓				
Lagging Left Turn Phase		✓			
Left Turn Traffic Calming	✓	✓			✓
LPI & accessible pedestrian signals	✓	✓			
Curb Extensions	✓	✓			
Minimal Curb Radii	✓	✓			
Street Lighting	✓	✓			
Raised Intersections	✓	✓			✓
Simplified Intersections	✓	✓			
Messaging Campaign	✓	✓	✓	✓	✓
Education and Enforcement	✓	✓	✓	✓	✓
Update/Expand Driver Education	✓	✓	✓	✓	✓
Drug, alcohol, & mental health prevention & treatment services			✓		
Pre-payment morning parking			✓		
After hours subsidized ride hail			✓		

Targets

1. Adopt the following policies:

- » Set 25 mph default speed limit downtown and on local residential streets within 1 year
- » Adopt a major street traffic calming program within 2 years
- » Adopt a policy to install curb extensions by default on streets with on-street parking within 1 year
- » Adopt policy to use smallest feasible curb radii within the next 3 years

2. Install 10 curb extensions (either temporary or permanent) per year

3. Install 5 centerline hardening/slow turn wedge treatments per year

4. Reduce serious and fatal injury crashes that result from dangerous behaviors by 50% within 3 years

Lead Agency/Stakeholders

- » Engineering
- » AAATA
- » Ann Arbor Fire Department (AAFD)
- » Ann Arbor Police Department (AAPD)
- » City Council
- » DDA
- » Fleet and Facilities
- » MDOT
- » Public Works
- » State Representatives
- » Systems Planning
- » Transportation Commission
- » University of Michigan
- » Washtenaw Area Transportation Study (WATS)
- » Washtenaw Bicycling & Walking Coalition (WBWC)
- » Washtenaw County Health Department

SETTING SAFE SPEED LIMITS

Reducing vehicular speeds throughout Ann Arbor is likely the most effective, singular approach to improving safety on Ann Arbor’s streets. The city must work with MDOT to fully achieve this objective, as many streets are under state jurisdiction.

However, there are actions that the city can take right away. Recognizing that many cities do not have full control over setting speed limits on streets that travel through them, guidance from NACTO suggests the following tools to systematically reduce speeds:

- ✓ Set **default speed limits** on many streets at once.
- ✓ Designate **slow zones** in sensitive areas
- ✓ Set corridor **speed limits on high priority major streets** using a Safe Speed Study

Address Dangerous Behaviors

Street Design and Operations Tools

Setting Safe Speed Limits and Matching Design Speed

Dangerous Behaviors Speed

Description

Setting safe speed limits is essential for reducing crashes; particularly for eliminating the crashes and the crash severity of those that do not have a design solution. Numerous studies have demonstrated that reducing speeds leads to a reduction in crashes.^{3,4,5,6}

Michigan state law requires cities to use the 85th percentile speed to determine speed limits, which forces engineers to match speed limits to existing driver behavior rather than trying to align driver behavior with safety goals. Both the National Transportation Safety Board (NTSB) and National Association of City Transportation Officials (NACTO) recommend alternative methods to the 85th percentile speed.^{7,8}

It is also critical that a street’s design speed (the speed at which drivers are intended to travel based on design factors) does not exceed the targeted safe speed, to reinforce the posted speed limit and establish an intuitive roadway design.

Ann Arbor Action

Ann Arbor has designated several school zones and reduced speed limits surrounding schools.

Next Action Steps

- ✓ Expand school zones with reduced speed limits to all schools around the city.
- ✓ Lobby for authority to set 20 mph limits for school zones.
- ✓ Establish 25 mph or lower as the default speed limit in downtown (per Michigan Vehicle Code Act 300 of 1949, 257.627(b)).
- ✓ Establish 25 mph or lower as the default speed limit on local residential streets (per Michigan Vehicle Code Act 300 of 1949, 257.627(e)).
- ✓ Join with other cities to advocate for changes to state law that enable cities to set safe speed limits that reduce crashes, deaths, and injuries, per NACTO and NTSB. Once in place, establish maximum speed limit of 30 mph on city streets.
- ✓ Conduct a safe speed study on focus corridors to determine a coordinated and complementary approach to reducing speeds through design solutions that match the target speed and posted speed limit.

Major Street Traffic Calming

Dangerous Behaviors Speed

Description

Major street traffic calming is a method of slowing traffic through physical treatments to major streets.

Major street traffic calming tools:

- » Lane optimization
- » Lane width reduction
- » Raised intersections, designed to ensure compatibility with emergency vehicles
- » Adding street trees and streetscaping elements
- » Converting turn lanes into pedestrian safety islands or curb extensions
- » Simplified intersections
- » Left-turn traffic calming including hardened centerlines and slow-turn wedges
- » Signal timing
- » Roundabouts
- » Minimal curb radii
- » Speed limit reduction
- » Micro-roundabouts
- » Chicanes

Ann Arbor Action

The city has a Traffic Calming Guidebook & Traffic Calming Program which provides a process and design information about various traffic calming tools. However, the current

Street Design and Operations Tools

program is only approved for use on local streets.

Next Action Steps

- ✓ Adopt a major street traffic calming toolkit that identifies appropriate traffic calming treatments on major streets, an appropriate engagement process for major street project areas, process for identifying issues and appropriate treatments, and approval thresholds for implementation.

Lane Width

Dangerous Behaviors Speed

Description

Vehicle speeds are influenced by how fast a driver feels they can safely travel. Narrower travel lanes require greater caution to maintain the lane and avoid conflicts and may lead to lower vehicle speeds and improved safety.

Next Action Steps

- ✓ Formally adopt the city’s practice of using 10’ as the default lane width on all city streets (with exceptions for transit and truck routes).
- ✓ Reassess lane width in all reconstruction projects.



Address Dangerous Behaviors

Street Design and Operations Tools

Local Street Traffic Calming

Dangerous Behaviors
Speed, Disregard signs/ signals, Reckless/careless driving

Description
Local street traffic calming is a method of slowing traffic through physical treatments to local streets.

In order to address traffic calming more equitably and comprehensively, the existing traffic calming program could be expanded to take a neighborhood-based approach, addressing a small network of streets together. Priority for areas should be given to areas with demonstrated need due to crashes, records of speeding, and/or resident complaints. Consideration for traffic calming treatments should factor in the All Ages and Abilities Bike Network (see p. 65).

Ann Arbor Action
The city has a Traffic Calming Program that provides residents a formal process for engaging the city to perform technical analysis of traffic concerns on local streets and explore options for effective solutions.

Next Action Steps

☒ Pilot a neighborhood-based approach to traffic calming.

Street Reconfiguration

Dangerous Behaviors
Speed

Description
Street reconfiguration, or road diets have demonstrated safety benefits, often reducing travel speeds and making it easier and safer for people walking to cross the street by simplifying the crossing. A road diet reduces the overall number and/or size of travel lanes on a street and repurposes that space for other uses, such as bicycle infrastructure, dedicated transit facilities, or public space.

Ann Arbor Action
Street reconfigurations on Green Road, Jackson Avenue, Packard Street, Platt Road all led to reductions in crash rates.

Next Action Steps

☒ Implement roadway reconfigurations where opportunities have previously been identified.

☒ Evaluate opportunities for lane reductions in corridor reconstruction projects.

Signal Timing

Dangerous Behaviors
Speed

Description
Traffic signals along a stretch of road should be timed for the desired safe vehicle speed and for efficient travel by pedestrians and bicyclists at a comfortable speed.

In the downtown area, signals should be timed for a comfortable walking speed. If there is no dominant direction for pedestrian travel, signal cycle lengths should be between 60 and 90 seconds, per NACTO guidance.

Along corridors outside of downtown, consideration should be given to bicycle travel when timing signals, particularly along key bike routes. A speed of 12-15 mph should be assumed for bicycle travel. Adjustments to signal timing along any corridor should also be aligned with changes to the posted speed limit to allow for the efficient progression of bicyclists and vehicles with the same timing plan.

Next Action Steps

☒ Evaluate signal timing in the downtown.

☒ Evaluate signal timing along key bike routes.

On Street Parking

Dangerous Behaviors
Speed

Description
On street parking helps reduce effective curb-to-curb widths, provides a form of separation between the travel way and sidewalk, and requires drivers to be more alert. These factors can lead to safer driving speeds and increase comfort and safety for people walking. Time restrictions can vary by time of day.

The addition or retention of on-street parking should always be evaluated alongside other objectives for corridor. There may be cases where the space dedicated for on-street parking could be instead allocated to installation or upgrades to pedestrian and/or bicycle infrastructure that would have an even greater impact on safety and mobility.

Next Action Steps

☒ Assess opportunities for on-street parking.



Address Dangerous Behaviors

Street Design and Operations Tools

Automated Enforcement

Dangerous Behaviors
Speed, Failure to yield, Disregard signs/ signals

Description
Automated safety cameras identify and ticket motorists who are exceeding the speed limit or going through a red light. Considerations can be made for penalties and equitable fines on a sliding scale.

Next Action Steps

- ✓ Advocate for changes to Michigan Vehicle Code Act 300 of 1949, 257.742 to permit “automated traffic enforcement safety device” to identify marked license plates for speeding and red lights.
- ✓ Identify automated enforcement device and prepare infrastructure where possible, such as communication needs, device support, and back end processing needs.

Street Lighting

Dangerous Behaviors
Failure to Yield

Description
Adequate lighting is critical for drivers to be able to see people crossing the road. Street lighting should be consistent along both sides of the street and special attention should be paid to lighting levels and contrast lighting, which is achieved by installing lighting in advance of uncontrolled crosswalks from each direction.

Pedestrian-scale lighting focuses light on the sidewalk and should be used in addition to street lighting in areas of high pedestrian activity, such as throughout downtown and at transit stops.

Ann Arbor Action
The Capital Improvements Plan includes funding for capital maintenance and street lighting on Ann Arbor-Saline Road, Liberty Street, and Packard Street.

Next Action Steps

- ✓ Evaluate lighting at all uncontrolled marked crossing locations and plan for upgrades where needed.
- ✓ Consider pedestrian-scale lighting in future streetscape projects

Street Trees & Streetscaping

Dangerous Behaviors
Speed

Description
Street trees are trees planted within the right-of-way, either adjacent to sidewalks or in landscaped medians. They provide comfort, safety, shelter and joy, all qualities that draw more people to a space and contribute to a higher quality of life. Street trees have the added benefit of narrowing perceived street width, slowing drivers. Street trees also provide numerous ecosystem services. They sequester carbon, mitigate the urban heat island effect, manage and filter rain and stormwater, and much more. Street trees and other landscaping must be designed and installed so as not to obstruct sight lines

Ann Arbor Action
Each year, the city strives to plant as many trees as possible with the Street Tree Planting Plan. For residents interested in planting a tree on a street not part of the plan, they can participate in the Resident/Contract Tree Planting Program.

Street Design and Operations Tools

Next Action Steps

- ✓ Continue the Street Tree Planting Plan
- ✓ Promote the Resident/Contract Tree Planting Program



Yost Boulevard and Parkwood Avenue

Address Dangerous Behaviors

Street Design and Operations Tools

Lagging Left-Turn Phase

Dangerous Behaviors
Failure to Yield

Description

At intersections with a protected left turn phase, a lagging left turn phase – where left turn arrows are provided after the green signal in the same direction instead of before the green signal – allows pedestrians to cross first. This minimizes conflicts between pedestrians and turning vehicles.

Next Action Steps

- ✓ Evaluate existing signals with leading left turn phases for conversion to lagging left turns.
- ✓ Incorporate routine evaluation of a lagging left turn phase into all future traffic signal projects.

Left-Turn Traffic Calming

Dangerous Behaviors
Speed, Failure to Yield, Reckless/
careless driving

Description

Hardened centerlines are typically created by installing low plastic barriers and flexible delineators on top of centerlines at intersections. They discourage left-turning vehicles from crossing over the centerline of the receiving street, forcing a tighter and slower turn. Hardened centerlines should only be used on streets where a centerline is marked.

A **slow-turn wedge** uses paint, low plastic barriers and plastic flexible delineators to create a tighter turn radius. Slow-turn wedges are an appropriate short-term solution before permanent curb work can be completed or can be a long-term solution that allows emergency vehicles, buses and garbage trucks to still make a turn.

Next Action Steps

- ✓ Add hardened centerlines and slow turn wedges to the Traffic Calming Guidebook and Major Streets Traffic Calming Guidebook.

Leading Pedestrian Intervals & Accessible Pedestrian Signals

Dangerous Behaviors
Failure to Yield

Description

Leading Pedestrian Intervals (LPI) are signals that allow pedestrians to start crossing the street before vehicular traffic in the same direction is given the green light. The walk signal is lit before the vehicle signal, giving pedestrians a head-start on crossing the street, which improves visibility and reinforces the need for drivers to yield.

LPIs should be considered at all locations where signals are being transitioned from protected left turns (where drivers can turn only on a left-turn arrow) to a permissive-protected left turn (where drivers may turn on a green signal or flashing yellow arrow).

Accessible pedestrian signals (APS) provide auditory and/or tactile guidance to aid visually impaired pedestrians in crossing. New or modernized traffic signals should incorporate APS technology. Where a leading pedestrian interval is being added to an existing signal, APS should also be installed.

Ann Arbor Action

The city recently updated all intersections with pedestrian signals under city jurisdiction to use LPIs.

Next Action Steps

- ✓ As Ann Arbor installs additional pedestrian signals around the city, all of these should be programmed with LPIs and APS.
- ✓ Continue working with MDOT to upgrade signals on state routes to include LPIs.



Pedestrian Signal Head



Address Dangerous Behaviors

Street Design and Operations Tools

Curb Extensions

Dangerous Behaviors Failure to Yield

Description

A curb extension (bump-out) extends the sidewalk and aligns pedestrians with a parking lane. Curb extensions often occur at corners but can be implemented mid-block too. Curb extensions reduce crossing distances, slow turning vehicles, and improve pedestrian visibility.

In permanent form, curb extensions require rebuilding the curb and sidewalk. However, curb extensions can be extremely effective with much less construction and cost. Paint, bollards and planters can create an immediate but effective curb extension.

Ann Arbor Action

The DDA has identified curb bump-outs as a tool for all types of streets except transit emphasis streets.

The city uses bump-outs for school safety improvement projects, and they are included in the Traffic Calming Program.

Next Action Steps

- ✓ Bump outs should be considered in Capital Improvements Planning streetscape projects.
- ✓ Implement a policy to install bump-outs by default on streets with on-street parking.



Curb Extension

Minimal Curb Radii

Dangerous Behaviors Failure to Yield

Description

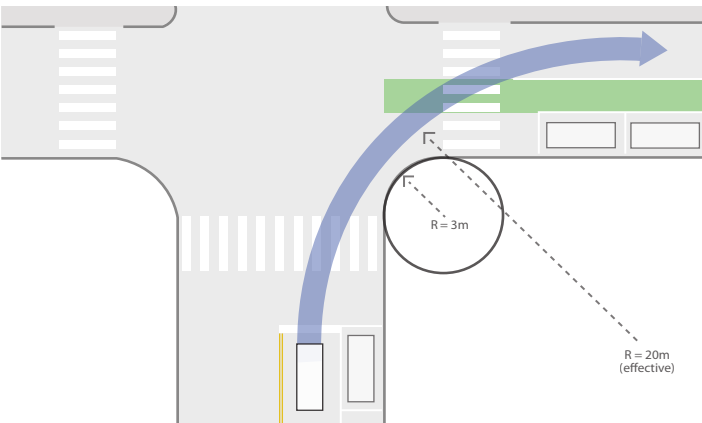
The curb radius (the radius created by two sidewalks on perpendicular streets connecting at a corner) impacts the speed of turning vehicles and the length of the crosswalk. Smaller curb radii encourage safer speeds for turning vehicles and create shorter crossing distances for people walking. Slower turning speeds enable drivers to better recognize people walking and react and stop more quickly, making it easier to avoid a crash. Permanent changes require reconstructing the curb, but changes can be made immediately using low-cost materials. Larger-turning vehicles may require wider turn angles.

On streets with on-street parking and/or bike lanes, the effective radius can be much larger than the radius, allowing the street design to include a small curb radius while still accommodating turns by large vehicles. The effective radius should be considered when designing corners.

Street Design and Operations Tools

Next Action Steps

- ✓ Implement a policy to use smallest feasible curb radii. On roads with significant truck volumes, use truck aprons to enable turns for large vehicles while maintaining a small radius for regular vehicles.



Curb Radius and Effective Curb Radius



Address Dangerous Behaviors

Street Design and Operations Tools

Raised Intersections

Dangerous Behaviors

Failure to yield, Reckless/ careless driving

Description

Raised intersections elevate the entire area of an intersection, including crossings, to the level of the sidewalk. This vertical shift signals to motorists that they are approaching an area they should treat with caution, gives pedestrians more visibility and forces motorists to slow down or risk damaging their vehicles. Raised intersections may benefit from flexible delineators at corners in high-traffic areas to prevent vehicles from encroaching on the sidewalk when turning.

Ann Arbor Action

Raised crossings and intersections are included in the Traffic Calming Program Guidebook.

Next Action Steps

- Expand use of raised intersections to major streets; work with Ann Arbor Fire Department and Public Works to identify routes where raised intersections should be avoided.
- Work with streetscaping and resurfacing projects in Capital Improvements Plan.

Simplified Intersections

Dangerous Behaviors

Failure to Yield

Description

Simplified intersections eliminate excessive or confusing intersection legs, with intersecting streets as close to perpendicular as possible. Complex intersections feature more than two streets crossing at the same point, streets crossing at offset points or streets crossing at odd angles. These intersections often feature wide turning radii (which increase vehicle speeds), excessive pavement (which increases pedestrian crossing distances) and additional crossings required to reach the other side of the street.

Paint, flexible delineators and planters can simplify intersections effectively in the short-term and at low cost. If proven successful, these tactics can inform long-term, permanent reconstruction.

Next Action Steps

- Inventory complex intersections and develop quick-build design solutions.
- Evaluate effects of quick-build solutions and develop permanent interventions.

Messaging Campaign

Dangerous Behaviors

All

Description

In order to make the lasting behavior changes that are needed to eliminate fatalities and serious injuries on our streets, investments made in physical changes to the city's infrastructure should be paired with education and messaging. Messaging campaigns should employ a multi-channel approach (e.g., social media, billboards, and earned or paid media) to reach broad audiences and/or key groups.

As past examples such as Click It or Ticket have demonstrated a positive impact on behavior. However, research has shown that traffic safety campaigns are much more effective when paired with education and enforcement.⁹ Effective campaigns test messages and images through focus groups or similar strategies before rolling out a full campaign.

Messaging campaigns could include messages to educate drivers as well as bicyclists and pedestrians, such as messaging about the 3-foot passing law and how to be conspicuous and seen when walking and bicycling, including the use of front and rear lights on bicycles. These campaigns should be coupled with initiatives such as bike light giveaways as

a chance to interact with and educate bicyclists and remove the disincentive of purchasing the lights. Similar models can be used for other desired behavior changes.

Ann Arbor Action

The city has rolled out the education program A2 Be Safe to promote safety.



A2 Be Safe Campaign

Next Action Steps

- Continued outreach and education should be paired with other efforts being pursued by the city, such as reduced speed limits, or new infrastructure treatments.
- In addition, coordination with upcoming campaigns by SEMCOG and the Michigan Office of Highway Safety Planning will provide a consistent message and amplify those efforts.



Address Dangerous Behaviors

Education and Encouragement Operations Tools

Education and Enforcement

Dangerous Behaviors
All

Description

» **Targeted Education:** Targeted education focuses on specific behaviors that are a safety concern and complements enforcement efforts with education. Often, the enforcement does not result in ticketing or fines, but instead focuses on the educational value of addressing specific behaviors. Police officers can disseminate informational materials and media coverage can help publicize the enforcement efforts to extend the reach of the educational messages.

» **Safety Zones & Automated Enforcement:** Some communities identify safety zones around schools and parks and use enhanced signage and automated safety cameras to identify and ticket motorists who are exceeding the speed limit.

Next Action Steps

✓

To ensure transparency, any ticketed or fined enforcement should be posted on an open data source (with potential identifying information redacted) and reviewed quarterly for potential disparities.

Update and Expand Driver Education

Dangerous Behaviors
All

Description

The transportation landscape has been changing rapidly in the past 5-10 years. As communities introduce new infrastructure treatments to increase safety and new modes of transportation emerge, driver education needs to be updated to stay current and teach drivers how to navigate safely within these new contexts.

At the same time, emerging mobility options, such as scooters, bike share, and other shared mobility, offer many people the opportunity to get around without ever driving and obtaining a driver's license. "Driver" education should be expanded to reach everyone, so that even those who do not intend to get a driver's license learn how to use a variety of modes safely and learn how to safely navigate public streets.

Next Action Steps

✓

Partner with other cities or interested organizations or agencies (such as public health organizations) to advocate for updated and expanded driver education at the state level that focuses on all modes of transportation and safety of the most vulnerable users.

Education and Encouragement Operations Tools

Drug, alcohol, and mental health prevention and treatment services

Dangerous Behaviors
Impaired Driving

Description

Allocating a portion of marijuana/alcohol tax to drug, alcohol, and mental health prevention and treatment services will enable the city to better address the root causes of impaired driving.

Next Action Steps

✓

Work with Washtenaw County health department to discuss mental health prevention and treatment services.

Pre-payment Morning Parking

Dangerous Behaviors
Impaired Driving

Description

Work with the DDA to allow and advertise pre-payment for morning parking so impaired drivers can leave their vehicle behind.

Next Action Steps

✓

Collaborate with DDA to allow pre-payment morning parking.

After Hours Subsidized Ride Hail

Dangerous Behaviors
Impaired Driving

Description

Work with bar owners, ride hail services (Uber/Lyft), TheRide, taxis, University of Michigan, and others to develop an impaired driving prevention program, including subsidized rides home from drinking establishments and free transit on days with high rates of impaired driving.

Ann Arbor Action

University of Michigan provides several afterhours options for their students

» **Ride Home:** Free shared-ride taxi service for students, faculty and staff to their residence halls, vehicles parked in U-M operated lots or structures, or local residence (within a one-mile radius of Central and North Campuses). This service is available after U-M transit buses conclude daily service, seven days a week.

» **Night Ride Home:** Shared-ride taxi service within Ann Arbor (when regularly scheduled AAATA bus service is not available). Fee is \$5 per person.

Next Action Steps

✓

Continue to expand after hours options for residents and not just students.

3. Quick-Build

Establish a quick-build improvement program.

Current State

The process of planning and designing safety improvements then finding funding, gaining approvals, and re-constructing a street can take years. While a project works its way through this process, unsafe conditions may persist.

Strategy Description

Quick-build projects address safety issues using paint or other pavement markings, signs, and other low-cost materials that are easy to install, adjust, and remove. Cities around the country, including smaller cities with northern climates, are using quick-build tactics to create safer streets much faster than typical processes allow. With quick-build projects, cities can introduce new street designs and gather feedback, evaluate the impact of different tools, and work with the community to refine a project’s final design.

A program that includes a set of quick-build safety interventions and establishes standard designs and materials will enable Ann Arbor to stock the necessary materials, train in-house crews or set up an on-call contract for installation, and make safety improvements in



Safety



Mobility

a matter of months rather than years. Quick-build projects can be implemented as stand-alone projects or can be coordinated with other street work, such as street resurfacing. Ann Arbor should establish a process for quick-build projects that allows for administrative approval. A quick-build safety program could be funded with revenues from the Major/Local Streets Funds, County Millage, Street Millage Fund, and/or the General Fund. Quick-build safety projects have very low costs, typically ranging from \$5-\$30,000, but do require staff time (or funds for contractors) for engagement, design, installation, maintenance, and evaluation. After identifying a specific location and issues to be addressed, the following steps should be incorporated into the process for quick-build safety projects:

1. Engage the public.
2. Set clear goals.
3. Gather relevant data before installation.
4. Consider project timing and opportunities for coordination.
5. Finalize project design.
6. Inform nearby residents and businesses.
7. Establish a maintenance plan.
8. Install improvements.
9. Gather relevant data following installation. Refer to “Implementation Pathways” on p. 173.



Accessibility
for All



Healthy People &
Sustainable Places

10. Gather feedback from the community.
11. Publicize project outcomes.
12. Adjust project design based on data/feedback or begin planning for permanent solution.

Commonly used quick-build materials:

- » Flexible delineator posts
- » Armadillos (Zicla Zebra system)
- » Recessed pavement markers
- » Plastic bollards (K-71 bollards)
- » Planters
- » Wheel/parking stops
- » Raised lane separators
- » Concrete/plastic barriers
- » Pavement markings/colored pavement
 - Tempera paint (less than one month)
 - Latex or acrylic paint with slip resistant additive (up to three years)
 - StreetBond, methyl methacrylate (MMA), thermoplastic (up to five years)



Zicla Zebra

Timeline



Short
(0-3 years)

Lead Agency/Stakeholders

- » Engineering
- » Public Works
- » DDA
- » Transportation Commission
- » City Council

Targets

1. Install at least three quick-build safety projects per year, prioritizing focus corridors and intersections.



Flexible delineator posts

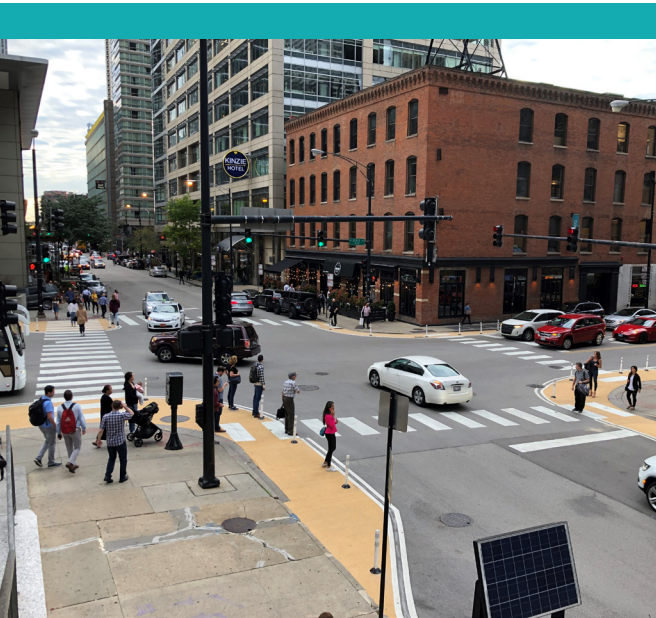


Quick-Build

Quick Build Safety Design Tools

Curb Extensions

Location: Chicago, IL



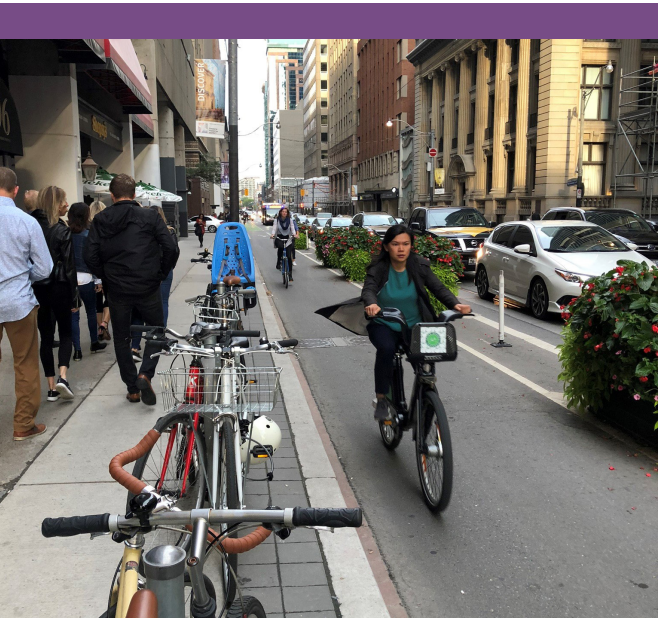
Pedestrian Refuge Islands

Location: Chicago, IL



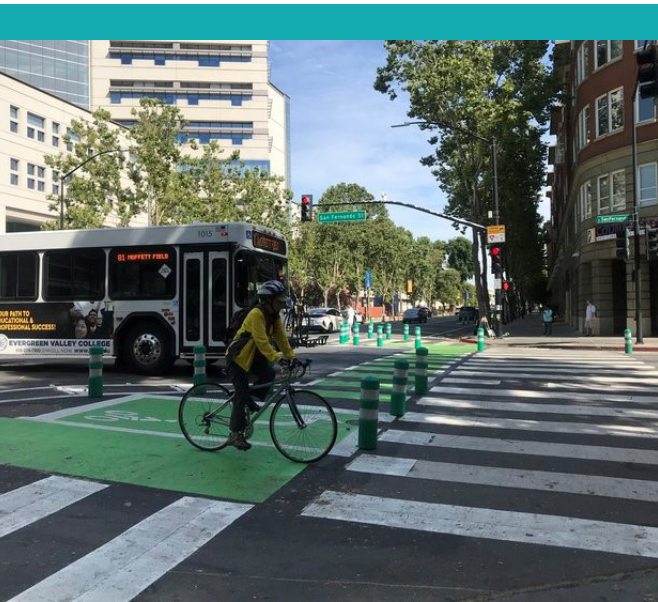
Protected Bike Lanes

Location: Toronto, Canada



Bicycle Intersection Improvements

Location: San Jose, CA



Mini Roundabouts

Location: Sao Paulo, Brazil



Hardened Centerlines

Location: Washington, D.C.



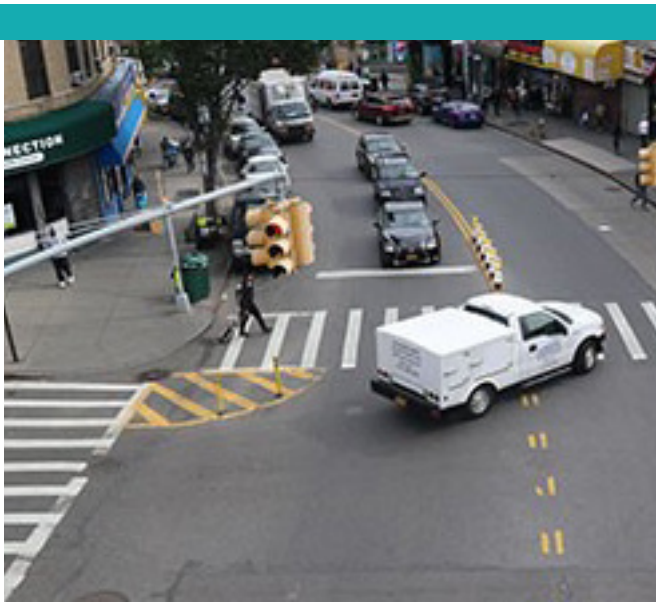
Diverter

Location: Rogers, AR



Slow Turn Wedges

Location: New York, NY



4. Sidewalks

Address critical gaps in the sidewalk system

Current State

Ann Arbor has one of the highest rates of people walking to work of any city in the country—19% in 2018. The city’s 2013 Non-Motorized Transportation Plan identified 25 miles of sidewalk gaps that were crucial to fill in the near-term and to-date 15 miles of these gaps have been addressed. In addition to completing the remaining 10 miles of near-term sidewalk gaps, there are an additional 18 miles of sidewalk gaps on major streets around the city.

Strategy Description

Filling the remaining near-term sidewalk gaps, plus the remaining sidewalk gaps along major streets, is essential for creating a connected, accessible system of sidewalks covering all areas of the city.

Prioritization

The city uses a variety of criteria, including proximity to schools, transit, and affordable housing, to identify the highest priority sidewalk gaps the city should work to address first. Ann Arbor has been systematically installing new sidewalks based on the prioritization results from the 2013 Non-



Safety



Mobility

Motorized Transportation Plan and should begin prioritizing the remaining gaps along major streets.

Funding

Ann Arbor’s City Code specifies that all first-time public improvements, including sidewalks, be specially assessed to the adjacent property owners.¹⁰ This requirement places a burden on property owners, can negatively impact the equitable distribution of sidewalks, and fails to recognize the role each segment of sidewalk plays in creating a connected sidewalk system that benefits all city residents, workers, and visitors.

To ensure that steady, recurring funding is available, the city should pursue a dedicated funding source for new sidewalk construction and amend the City Code to eliminate the reliance on private property assessments as the primary financing mechanism. With a dedicated funding stream, the city can conduct long-term planning around how to best address sidewalk gaps and accelerate the timeline for installation.

Interim Solution

Where sidewalks cannot be constructed on a reasonable schedule, gaps in sidewalk coverage can be filled by providing interim



Accessibility
for All



Healthy People &
Sustainable Places

sidewalks at the grade of the street, using physical separation elements such as parking stops, edge markings, and pavement color and/or texture. This approach could be applied to lower priority gaps so that safety is improved in the short term while waiting for permanent upgrades.



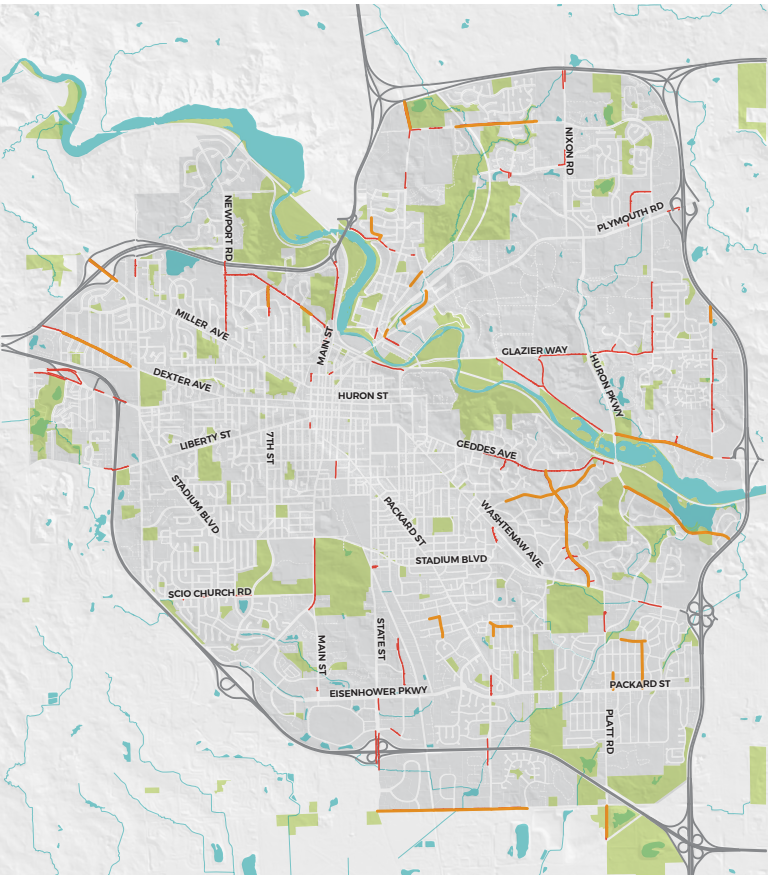
Timeline



Lead Agency/Stakeholders

- » Engineering
- » Public Works
- » System Planning
- » City Council
- » MDOT
- » Private Developers

Critical Sidewalk Gaps



- Near-Term Sidewalk Gaps
- Sidewalk Gaps along Major Streets

Targets

1. Approve new sidewalk construction funding sources and update City Code within 1 year.
2. Complete all remaining near-term sidewalk gaps within 3 years.
3. Complete all sidewalk gaps on major streets within 7 years.



5. Crosswalk Safety

Enhance safety and visibility at uncontrolled crosswalks.

Current State

Uncontrolled crosswalks are crosswalks located between intersections (mid-block) or at intersections without a traffic signal, stop sign, or yield sign (uncontrolled intersections). Designated crosswalks increase safety and convenience for people walking by providing markings and/or signs at desired crossing locations, facilitating direct routes for people walking. On corridors with long spacing between existing crossings, installing additional crosswalks mid-block or at uncontrolled intersections can save people walking significant amounts of time and reduce the likelihood of people trying to cross at unmarked locations. Since 2007, the city has installed 94 uncontrolled crosswalks along with 49 rectangular rapid flashing beacons (RRFBs) and 28 pedestrian refuge islands.¹¹

Ann Arbor’s crosswalk ordinance mandates drivers to stop for pedestrians standing at the curb or within a crosswalk, but tragically 44% of all crashes where a person walking was killed or seriously injured from 2014-2018 were a result of the driver failing to yield.¹² It is critical that uncontrolled crosswalks are accompanied by the appropriate safety features, and the city



Safety

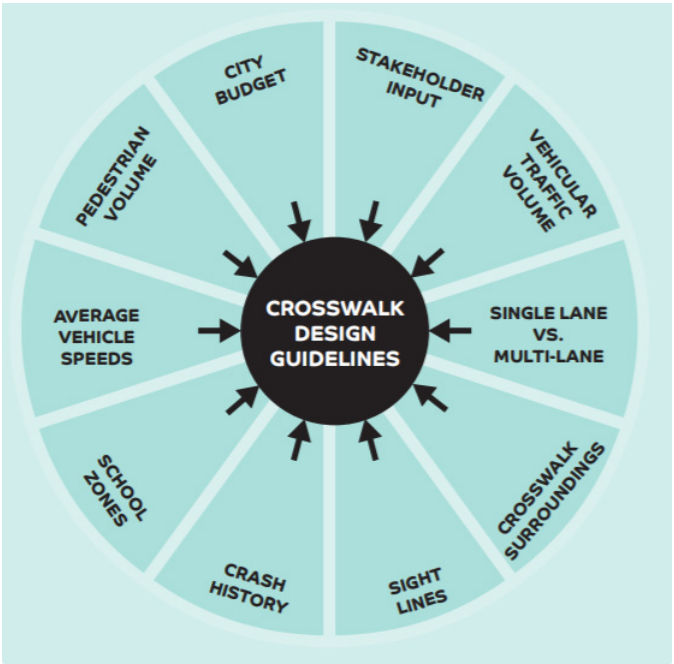


Mobility

has developed crosswalk design guidelines that detail the appropriate treatments for different locations. Drivers also need to be made aware of the law and practice of stopping for pedestrians in crosswalks (see p. 50). According to the online Pedestrian Crossing Survey (n=954), both people walking and people driving find crosswalks with an RRFB or pedestrian hybrid beacon and enhanced lighting to be the most clear and comfortable.

Strategy Description

Treating - and maintaining - all existing and new crosswalks consistently, in line with the crosswalk design guidelines will help drivers to recognize crosswalks.



Guidelines Factors



Accessibility
for All

Uncontrolled Crosswalk Assessment Program

In order to address uncontrolled crosswalk inconsistencies, the city should develop a program to review which existing uncontrolled crosswalks meet the crosswalk design guidelines and which require upgrades. Selection for upgrading existing uncontrolled crosswalks should take an equitable approach that prioritizes locations with a high incidence of serious crashes, areas with vulnerable populations, locations near schools or parks, and locations where the public wants to see crossings improved based on results from the Pedestrian Crossing Survey.

New Uncontrolled Crosswalk Locations

In addition to enhancing existing uncontrolled crosswalks, there are still locations around the city that require new uncontrolled crosswalks to increase convenience and safety for people walking. The Pedestrian Crossing Survey included a map-based activity where respondents could identify places where new crosswalks are needed. Using this input, 23 priority locations for new uncontrolled crosswalks were identified based on the location’s distance from an existing crosswalk or signalized intersection and crash history.

Timeline



Short
(0-3 years)

Lead Agency/Stakeholders

- » Engineering
- » Systems Planning
- » Public Works
- » MDOT
- » University of Michigan
- » DDA
- » Parks
- » Ann Arbor Public Schools Transportation Safety Committee
- » Ann Arbor Housing Commission (AAHC)
- » AAATA

Targets

1. Assess all existing uncontrolled crosswalks and identify necessary enhancements within 3 years.
2. Enhance 25 uncontrolled crosswalks per year.
3. Install 10 new uncontrolled crosswalks per year.
4. Establish a regular maintenance plan for crosswalks by 2022.



Crosswalk Safety

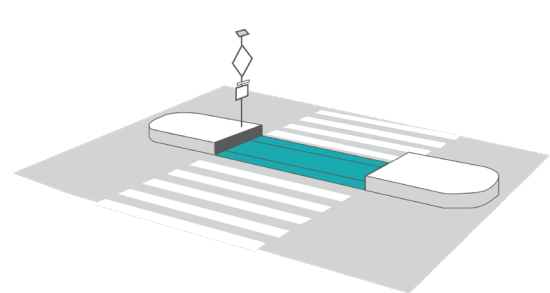
Features at Mid-Block Crosswalks in Ann Arbor

Mid-block crosswalks are important for providing convenient pedestrian access. Depending on the type of street and context, different features are necessary to ensure people walking are visible and safe.

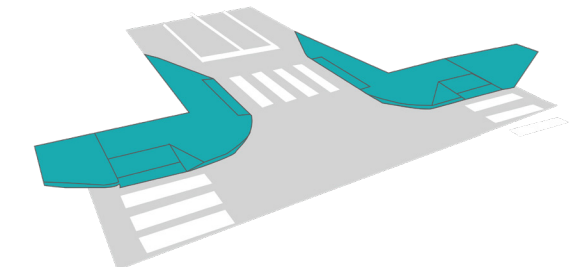
Functional Classification	# of Crosswalks	% with Signage	% with Lighting	% with Island	% with RRFB	% with Gateway	% with Bumpout
Local	31	39%	32%	39%	39%	0%	13%
Collector	53	58%	14%	14%	14%	2%	3%
Minor Arterial	88	24%	23%	24%	24%	10%	4%
Principal Arterial	57	17%	16%	17%	17%	2%	2%
Total	229	59%	57%	59%	59%	14%	10%

Examples of Crosswalk Features

Pedestrian Island



Curb Bumpout

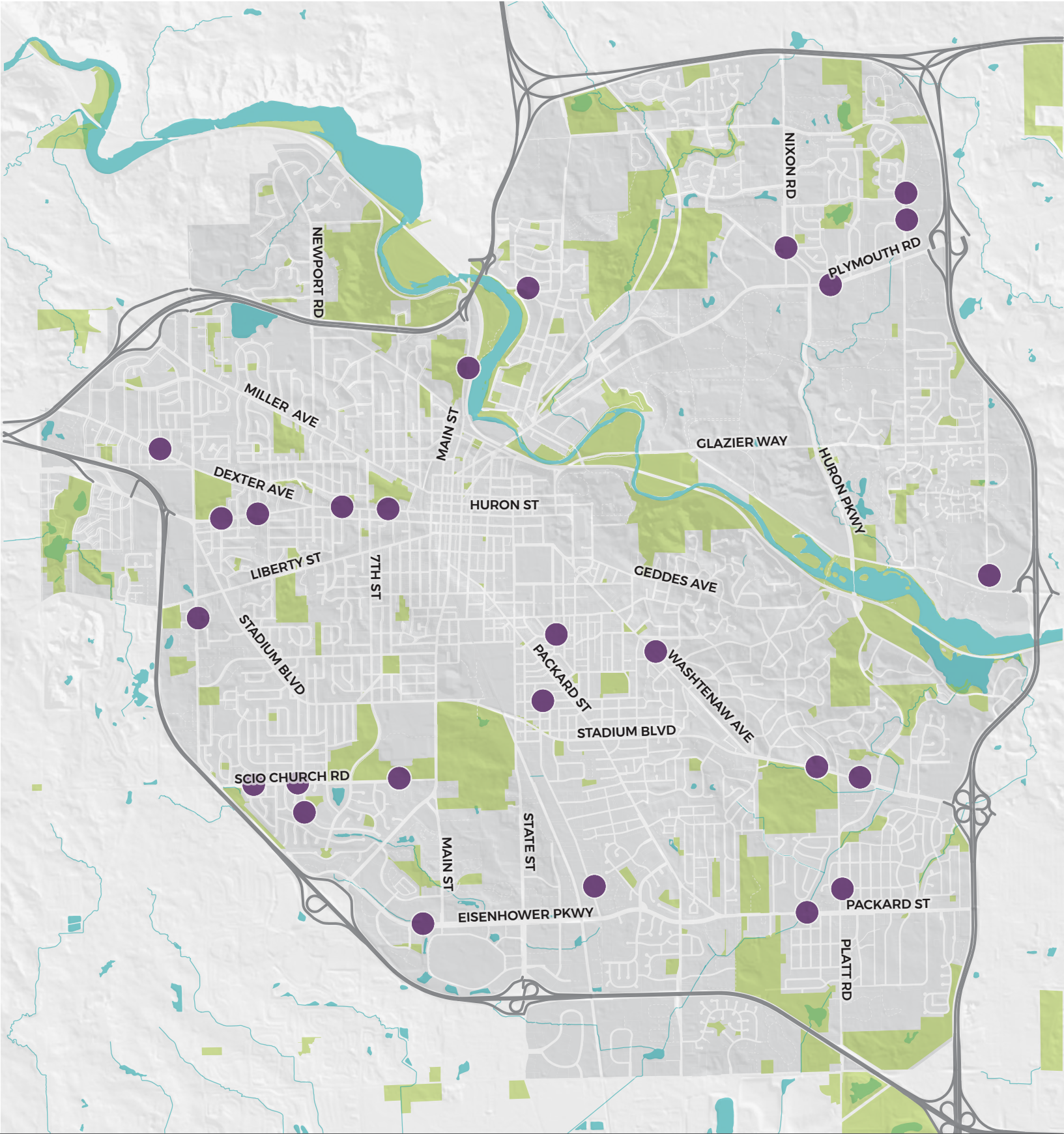


RRFB



Priority of Locations for New Uncontrolled Crosswalks

New Uncontrolled Crosswalks



6. Bike Routes

Build out a safe, comfortable network of bike routes for people of all ages and abilities.

Current State

Ann Arbor has been working to create an environment and culture that supports biking for more than a decade. Since 2007, Ann Arbor has nearly doubled the total length of designated bikeways, installing 78 miles of new bike lanes and shared use paths.¹³ These investments have led to more people biking to get to work (36% increase from 2009 to 2018)¹⁴ and for everyday trips around the city (37% increase in bicycle counts on select streets).¹⁵

However, biking on many streets can still be stressful due to the volume and speed of traffic and lack of separation between people biking and cars. An evaluation of the level of traffic stress experienced by people biking rated the majority of non-local streets around the city as high stress. Nearly three-quarters (72%) of all crashes involving a person biking occurred on these high stress streets.¹⁶ Findings from the online Bike Level of Comfort Survey (n=1,041) indicate that 79% of respondents would ride a bike more if they felt safer and more comfortable on streets. Building safe, comfortable bike routes is especially important for encouraging more women, older adults, and children to bike. While biking has increased significantly in



Safety



Mobility

Ann Arbor over the years, the number of men who bike to work is still more than three times greater than the number of women.

Strategy Description

To continue increasing the number of people biking in Ann Arbor, the city needs to build bike routes that are safe and comfortable for people of all ages and abilities, to achieve a complete all ages and abilities bike network. The routes or segments that make up the network may range from local streets with traffic calming, enhanced wayfinding, and design features that improve safety and comfort for people biking, to major streets with physically separated bike lanes. The National Association of City Transportation Officials (NACTO) provides useful resources like the Urban Bikeway Design Guide and Designing for All Ages and Abilities: Contextual Guidance for High-Comfort Bicycle Facilities.

The recommended all ages and abilities network, which was developed based on an analysis of bicycling conditions and feedback from the public, consists of 102 total miles of bike routes across Ann Arbor. Of those 102 total miles, 26 miles (25%) are already in place, 28 miles (27%) of existing bike routes need to be enhanced (e.g., adding a barrier between the bikeway and cars or adding traffic calming



Healthy People & Sustainable Places

elements), and 48 miles of new bike routes (48%) are needed. Once completed, 97% of the population would live within a ¼ mile of the all ages and abilities bike network. This network reflects conditions and information available at the time of this plan's adoption. Consideration should be given to alternative routes should a need or opportunity arise in the future.

The toolbox outlined in the following pages includes design strategies to make biking more comfortable and enjoyable considering specific street characteristics. Intersections are also an important component of creating all ages and abilities bike routes and are addressed on p.72.

An important addition to a bike network is a comprehensive wayfinding system to allow people to confidently navigate the bike network. Wayfinding should be installed at predictable intervals along bike routes to help people confirm they are on a designated route and at turns or decision points along the route. Signs should indicate the direction people should follow and the distance to important destinations.

Creating a tailored wayfinding system for Ann Arbor's all ages and abilities bike network, including unique branding and a curated list of local destinations, could further encourage biking.

Timeline



Short
(0-3 years)

Lead Agency/Stakeholders

- » Engineering
- » Systems Planning
- » Public Works
- » MDOT
- » WATS
- » WBWC
- » Bike Alliance of Washtenaw
- » University of Michigan
- » DDA
- » Parks

Targets

1. Install 4 miles of new or upgraded, all ages and abilities routes each year.
2. Complete the full all ages and abilities bike network by 2030.
3. Implement a complete wayfinding system by 2025.

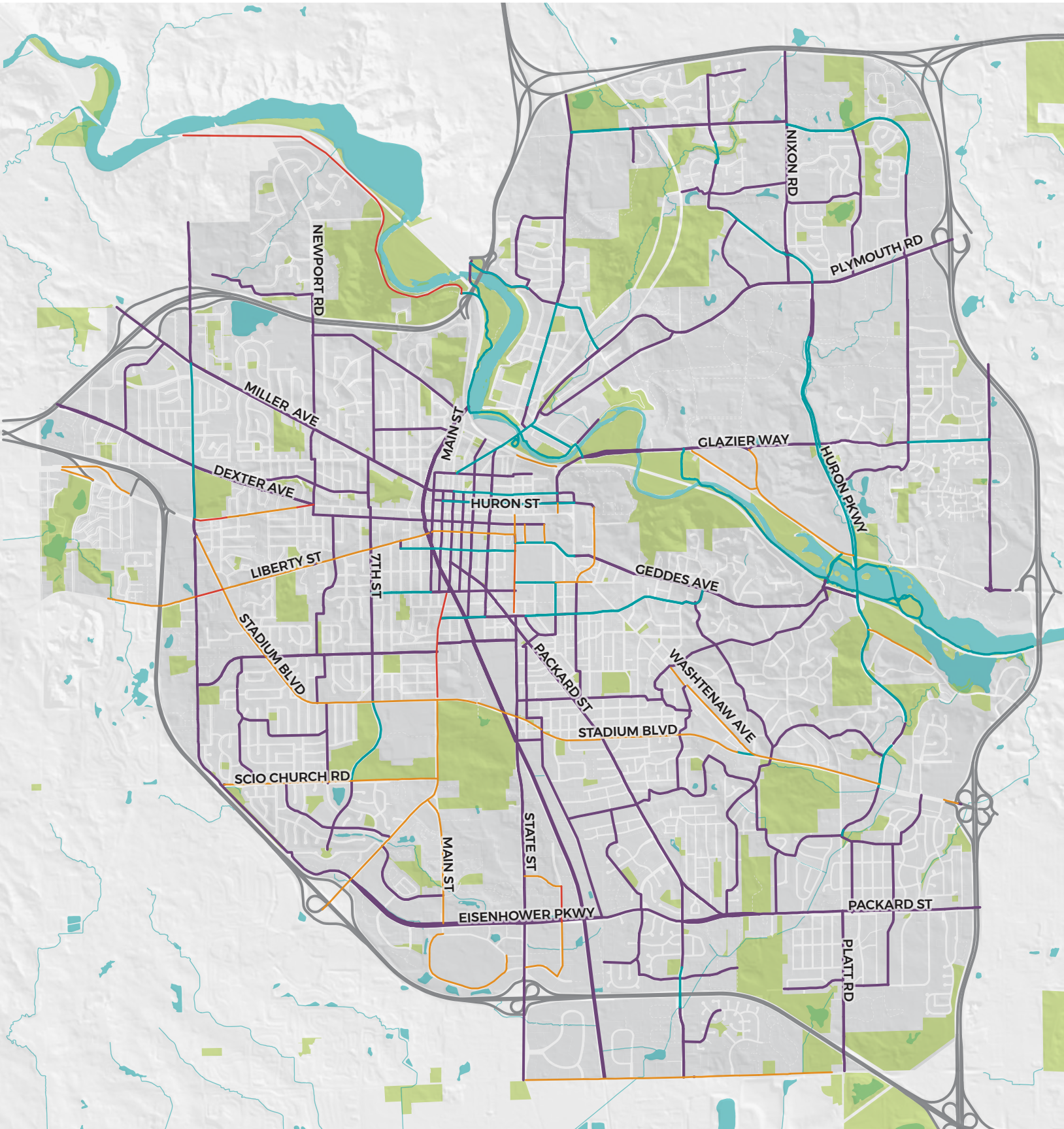


Proposed Bike Network

- Existing All Ages and Abilities Routes

Proposed All Ages and Abilities Routes
- Existing Routes

Proposed Routes

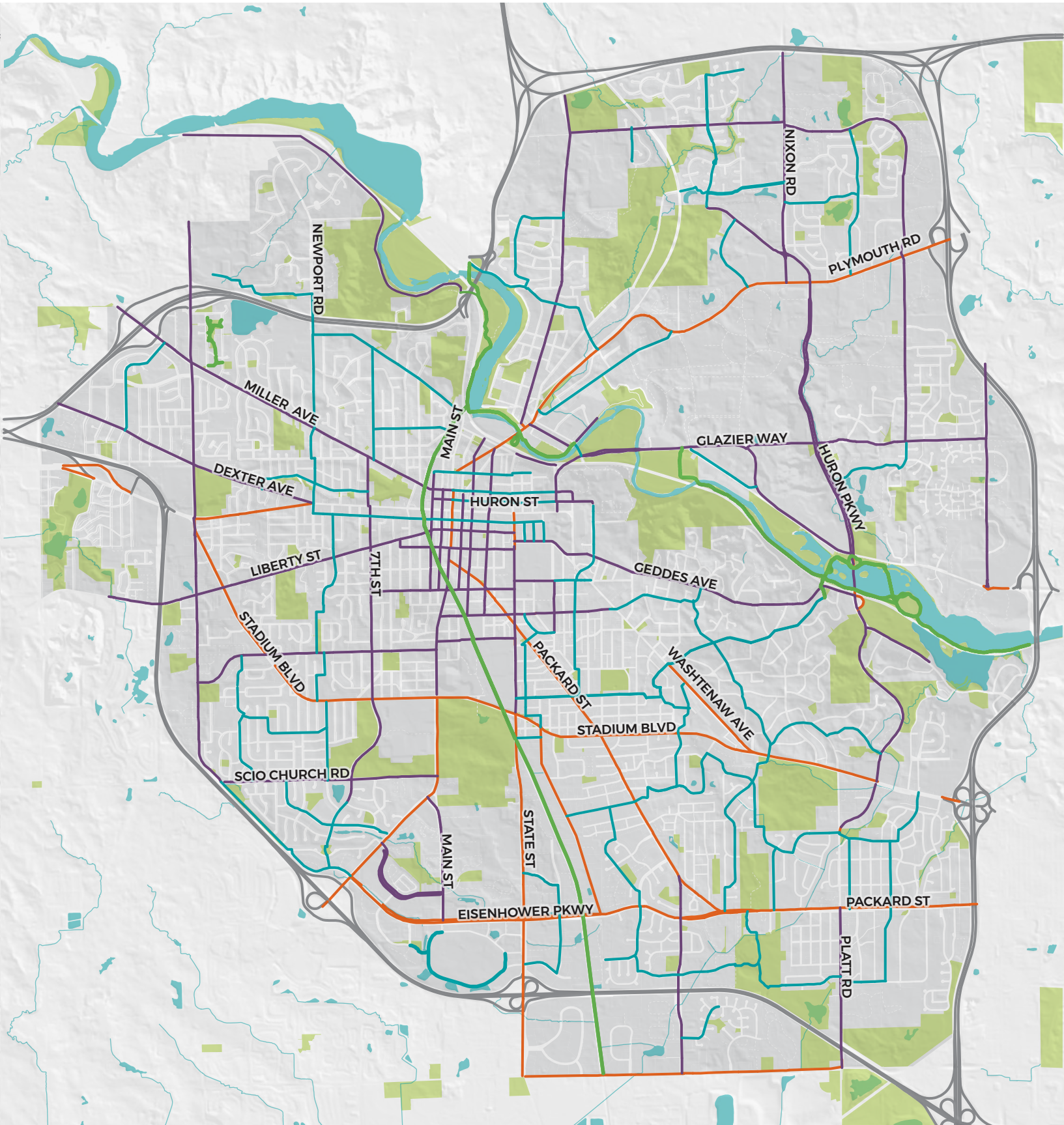


Proposed All Ages and Abilities Network by Route Type

- Trail

Local
- Minor

Major



0.5 1 2
Mile

0.5 1 2
Mile



Bike Routes

All Ages and Abilities Bike Routes Tools

Tools for Local Streets

(25 mph or less AND less than 3,000 vehicles/day)

Bike Boulevard

Bike boulevards are low-volume neighborhood streets that are designed to prioritize travel for people biking and create a comfortable environment for people of all ages and abilities. Four key elements for creating bike boulevards that are safe and easy to navigate are:

1. **Clear signage and markings**, which can include unique branding, that communicate to all street users that they are on a bike boulevard (and indicate that drivers should proceed with caution) and assist people biking with wayfinding.
2. **Design features that discourage vehicular through trips**, such as diverters that are designed to allow bicycles and pedestrians to continue traveling through. For example, they can be installed at intersections to require vehicles to turn left or right rather than continuing straight, helping eliminate cut-through traffic and disrupting lengthy vehicle straightaways that can lead to high speeds. Because traffic is diverted, an assessment of resulting traffic flow may be necessary.
3. **Design features that encourage safe speeds**, like those in the city’s Traffic Calming Program.

4. **Design features that facilitate a clear, comfortable experience** for people biking, particularly measures that enable safe crossings of major streets.

Routes that are longer than one mile, provide an alternative to biking on a major street, and/or connect with other all ages and abilities routes or key destinations are good candidates for bike boulevards.

Suggested Location: Devonshire Road (from Washtenaw Avenue to the Border-to-Border Trail)



Bike Boulevard in Vancouver, Canada
Photo credit: Payton Chung

Shared Lane Markings

Shared lane markings, also known as sharrows, signify to vehicles and bicyclists that bicycles can share the lane and indicate the proper riding position for people biking. In the downtown and roundabouts, sharrows may be installed in the middle of the travel lane (and no less than 11’ from the curb if on-street parking is present or 4’ from the curb if there is no on-street parking) and accompanied by “Bikes May Use Full Lane” signs. Sharrows can help raise driver awareness of people biking and designate a preferred route for bicyclists.



Bike Routes

All Ages and Abilities Bike Routes Tools

Tools for Minor Streets (25-30 mph AND less than 10,000 vehicles/day)

Striped/ Painted Bike Lane

Striped and painted bicycle lanes demarcate a portion of the street that is specifically designated for people biking. The addition of green paint can draw attention to the bicycle lane or specific conflict points. Because striped/painted bicycle lanes do not provide physical separation between vehicles and people biking, they are most appropriate on streets with low to moderate travel speeds and volumes (ideally 25 mph and less than 5,000 vehicles/day).



Geddes Ave near Gallup Park Pathway

Buffered Bike Lane

Buffered bicycle lanes demarcate buffer space on one or both sides of the bicycle lane to create greater separation between bicyclists and passing vehicles and/or on-street parking. While buffered bicycle lanes provide more separation between people biking and vehicles than standard painted bicycle lanes, they are still most appropriate on streets with low to moderate travel speeds and volumes. On minor streets, buffered bike lanes should be the default choice if space is available.



Maple Road and Haisley Drive, Ann Arbor

Contra-flow Bike Lane

Contra-flow bike lanes provide two-way bicycle travel on one-way streets. Protective elements, such as curbs or flexible delineators, are necessary to ensure oncoming vehicles do not cross over into bicycle lanes. One-way streets with high rates of two-way bicycle flow indicate a need for legalized two-way bicycle travel. Contra-flow bicycle lanes are most appropriate

on streets with very few driveways or other turning conflicts across the bicycle facility. Contra-flow lanes may require bicycle and turn signals.



Chicago, IL



Bike Routes

All Ages and Abilities Bike Routes Tools

Tools for Major Streets

(35 mph or greater OR >10,000 vehicles/day)

Protected Bike Lane

Protected bike lanes, also referred to as cycle tracks, run at street level but are physically separated from vehicular travel lanes. Separation can be achieved through a variety of treatments, including: a) flexible delineators or bollards; b) parking lanes; c) curbs or concrete medians; or d) planters with landscaping. Protected lanes prevent vehicles from entering bicycle facilities. Special attention should be given to designing areas where protected lanes intersect with vehicular or pedestrian traffic and to bus stops where a protected bike lane parallels a bus route. On major streets with significant traffic and transit vehicles, a raised bike lane or off-street path may be preferred for both safety and efficient mobility.



Fourth Street and William Street, Ann Arbor

Raised Bike Lane

Raised bike lanes are located at sidewalk level, vertically separated from vehicular travel lanes. Separation between bicyclists and pedestrians can be achieved through planters or other furniture, hardscape, or landscaping. When raised bike lanes run adjacent to sidewalks, distinct materials or surface colors are used, as well as a buffer, in order to maintain separation between people walking and biking. Paint and signals are implemented at points where vehicular or pedestrian traffic crosses the raised bike lane (intersections, driveways, etc.).

Suggested Location: Plymouth Road (from Murfin Avenue to US-23)



Raised Bike Lane in Denver, CO

Off-Street Shared Use Path

An off-street, shared use path, also referred to as a sidepath, is a bicycle and pedestrian facility that is physically separated from vehicular traffic by an open space or barrier and can be either within the street right-of-way or within an independent right-of-way. Off-street shared-use paths work well for corridors not well served by the on-street bikeway network as well as for sections within the network that facilitate long-distance commuting. Off-street paths are also recommended for corridors with high vehicle speeds and/or volumes. On paths with high levels of activity, it may become necessary to provide differentiated spaces for people walking and biking to maintain safety and comfort.

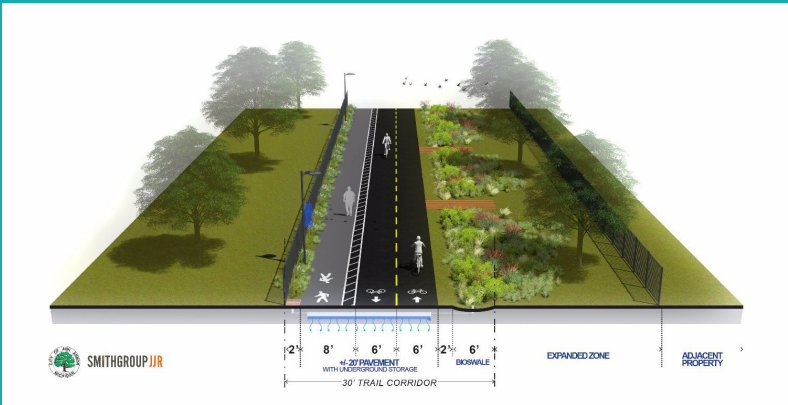


Border to Border Trail

TREELINE URBAN TRAIL

The Treeline Urban Trail will create an important spine in the all ages and abilities bike network, providing a safe and comfortable connection for people walking and biking from many neighborhoods to downtown Ann Arbor and the Huron River. It will make important connections to the broader trail system by connecting to the Border to Border Trail and the Iron Belle Trail. Yet, it is also much more than a simple bike facility. The Treeline Urban Trail will connect many cultural and recreational assets in Ann Arbor and serve as a cultural amenity of its own, bringing with it the potential for economic development along its path.

After decades of research and planning, the Treeline Urban Trail (originally named the Allen Creek Greenway) is moving forward to the land acquisition and trail development phases. A Treeline Urban Trail Master Plan, adopted in 2017, will guide the trail development, with the city working closely with the Treeline Conservancy to bring the trail to fruition.



Trail Design Concept from Treeline Urban Master Plan

7. Intersections for Biking

Make intersections safer and easier to navigate for biking.

Current State

Between 2014 and 2018, 80% of crashes where a person biking was killed or seriously injured occurred at an intersection.¹⁷ Nearly one-third of participants in the Transportation Habits Survey reported they would choose to get around by bike if safety were not an issue, compared to the 11% who currently bike to work or school and 8% who bike for other trips. Making intersections safer and easier to navigate for people biking is essential to making biking more comfortable and attractive, especially to a broader audience including children and older adults.



Protected intersection



Safety



Mobility



Accessibility for All



Healthy People & Sustainable Places

Strategy Description

Step 1: Identify key intersections

The first step in making these improvements is to identify locations where interventions will have the biggest impact on improving the overall bike network, both in terms of safety and connectivity. Key intersections (11 high priority intersections and 68 secondary priority intersections) along the proposed all ages and abilities bike network were identified based on:

- 1. Safety issues, measured by:
 - » Number and severity of crashes involving

- people biking
 - » Data on perceived comfort, captured by surveys and other forms of community engagement¹⁸

- 2. Existing and potential bike volumes:
 - » Bike counts
 - » Data on locations where people would like to bike, captured through surveys and other forms of community engagement

Step 2: Select countermeasures

Once key intersections have been identified, the next step is to determine the most appropriate countermeasures based on the types of safety issues and specific context of each intersection. Some intersections may require a full reconfiguration to improve safety and navigability for people biking; other intersections may only require simple improvements, like additional pavement markings and signage, that can be added to the existing intersection.

Timeline



Short
(0-3 years)

Lead Agency/Stakeholders

- » Engineering
- » Public Works
- » Office of Sustainability & Innovation (OSI)
- » MDOT
- » WATS
- » WBWC
- » University of Michigan
- » DDA

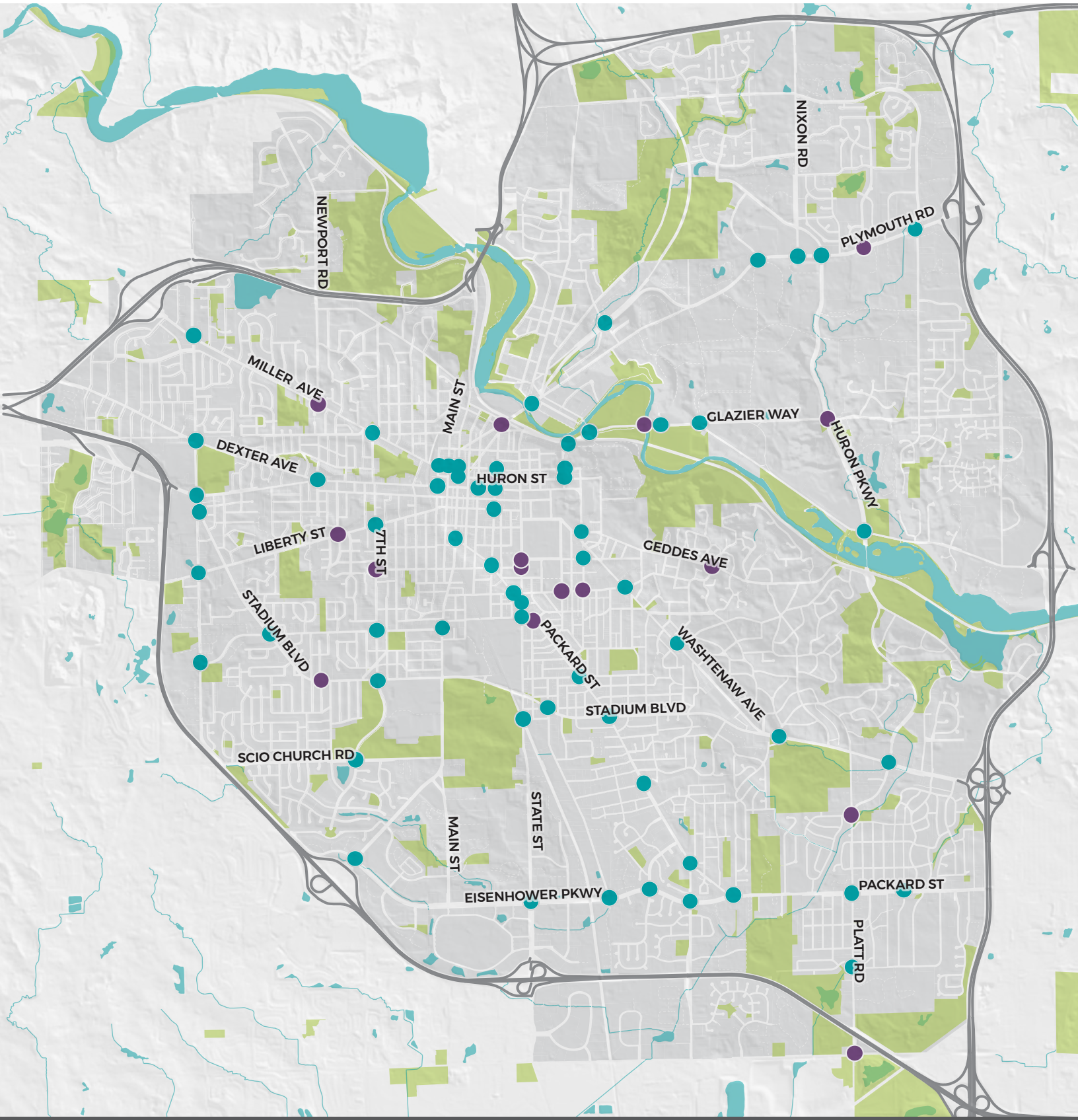
Targets

- 1. Review safety data every 2 years to identify key intersections to be upgraded.
- 2. Upgrade at least 4 intersections per year.



Key Intersections for People Biking

- Signal
- No Signal

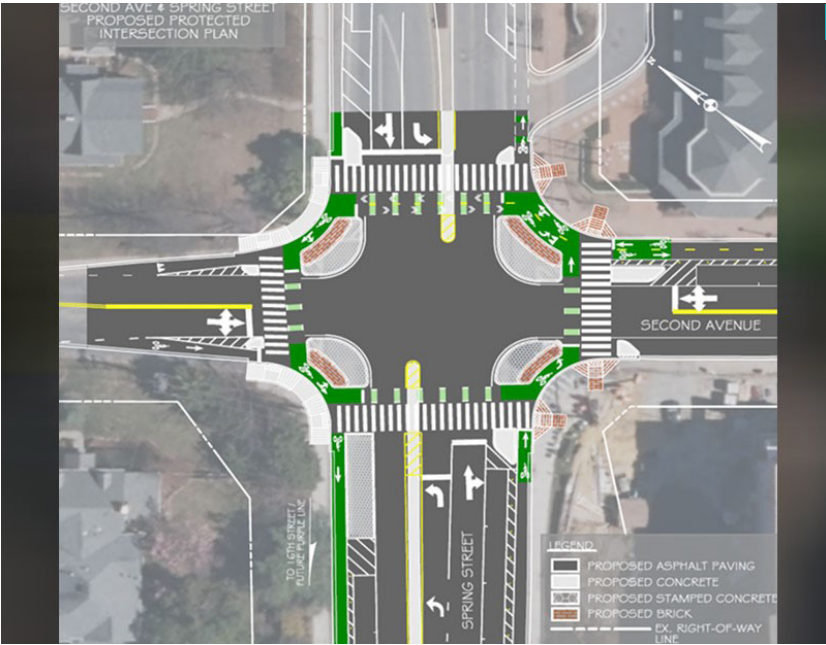


Intersection Biking Tools: Configurations

Intersection Configurations to Prioritize Biking¹⁹

The following intersection configurations combine multiple design tools to make people biking more visible and mitigate unsafe behaviors that lead to crashes, such as reducing turn conflicts by reducing vehicle turning speeds.

Protected Intersection



- » Bikeway setback
- » Corner islands
- » Bike queue areas
- » Waiting zone
- » Pedestrian islands
- » Bicycle intersection markings

Silver Spring, MD
Source: Montgomery County Division of Transportation Engineering

Purpose

Physically separates bicyclists and motor vehicles up until the intersection; creates shorter, simpler crossings, more predictable movements, and better visibility between people on bikes and people driving.

Recommended Locations

- At major intersections with existing or planned buffered/protected bike lanes, including:
- » Fuller Road & Maiden Lane
 - » Glazier Way & Huron Parkway
 - » Plymouth Road & Nixon Road
 - » Plymouth Road & Huron Parkway



Intersections for Biking

Intersection Biking Tools: Configurations

Dedicated Intersections



San Jose, CA
Photo: Peter Bennett / NACTO

Purpose

Gives people biking a dedicated path through the intersection even where there is not enough space for a full bike setback provided by a protected intersection

Recommended Locations

- At intersections (either with a traffic signal or without) along major or minor streets, including:
- » Division Street & Huron Street
 - » Packard Street & Stadium Boulevard
 - » Ann Street & Glen Avenue
 - » Fuller Street & Depot Avenue
 - » Division Street & Washington Street

Minor Street Crossing



Seattle, WA
Photo: Tom Fucoloro / Seattle Bike Blog

Purpose

Gives everyone — people driving, biking, and walking — a clear indication that bikes and pedestrians have the priority when crossing the minor street

Recommended Locations

- At minor intersections along streets with bike lanes or separated bikeways, including:
- » Geddes Street & Hill Street
 - » Packard Street & Colony Road
 - » Packard Street & Granger Avenue
 - » Division Street & Ann Street
 - » Division Street & Carey Street



Intersections for Biking

Intersection Biking Tools: Configurations: Countermeasures

Intersection Coutermeasures for Biking

The following intersection countermeasures have the most positive potential benefits for bicyclists’ operations, user comfort, and safety.

Bicycle Intersection Markings

Type
Infrastructure

Description & Purpose

Green pavement markings alongside the pedestrian crosswalk outlining the path for bikes to cross in (includes high-visibility crosswalk markings for bikes called “cross-bikes”).

Tells drivers to expect bicycles and improves the visibility of bicycles that are crossing.

Cost²⁰
\$200 to \$1,500 per intersection



Carbondale, Illinois and Davis, CA
Photos: Steve Buhman / SIU and City of Davis

Two-Stage Turn Box

Type
Infrastructure

Description & Purpose

Green-paved area at corner of intersection.

Designates an area outside of vehicle conflicts for bicyclists to wait for traffic to clear before proceeding in a different direction of travel.

Cost
\$1,000 per box



Salt Lake City, UT
Photo: NACTO

Bike Box

Type
Infrastructure

Description & Purpose

Green-paved area in front of vehicle stop bar.

Provides space for bicyclists to position themselves in front of vehicles while stopped at a signalized intersection.

Cost
\$5,000 per box



Portland, OR
Photo: NACTO

No Turn on Red Sign

Type
Infrastructure

Description & Purpose

A sign posted at the signalized intersection for each approach where the restriction is desired.

Eliminates conflicts between turning vehicles and pedestrians and/or bicyclists during a concurrent walk (or bike) signal phase.

Cost
\$200 (\$3,000 for electronic sign)



Chapel Hill, NC
Photo: Jon Gardiner / UNC-Chapel Hill



Intersections for Biking

Intersection Biking Tools: Configurations: Countermeasures

Intersection Biking Tools: Configurations: Countermeasures

Curb Radius Reduction

Type
Infrastructure

Description & Purpose
Altered geometry at intersection corner.

Reduces turning speeds for vehicles, increases visibility of people crossing, and creates larger waiting areas for people crossing.

Cost
\$15,000 to \$40,000 for permanent reconstruction (can be achieved using temporary materials for much less)



Raised Crossing

Type
Infrastructure

Description & Purpose
Crossing designed with ramps on each vehicle approach to elevate the entire crosswalk to the level of the sidewalk.

Slows drivers and increases visibility between pedestrians, bicyclists, and drivers.

Cost
\$2,000 to \$20,000



S. Forest Street

Street Reconfiguration

Type
Infrastructure

Description & Purpose
Reduction of the number and width of lanes on a roadway.

Reduces crossing widths, slows vehicles, and provides space to implement additional pedestrian and bicyclist safety treatments.

Cost
\$20,000 to \$40,000 per mile

Before



After



Intersections for Biking

Leading Bike Interval (LBI) & Lagging Left Turn

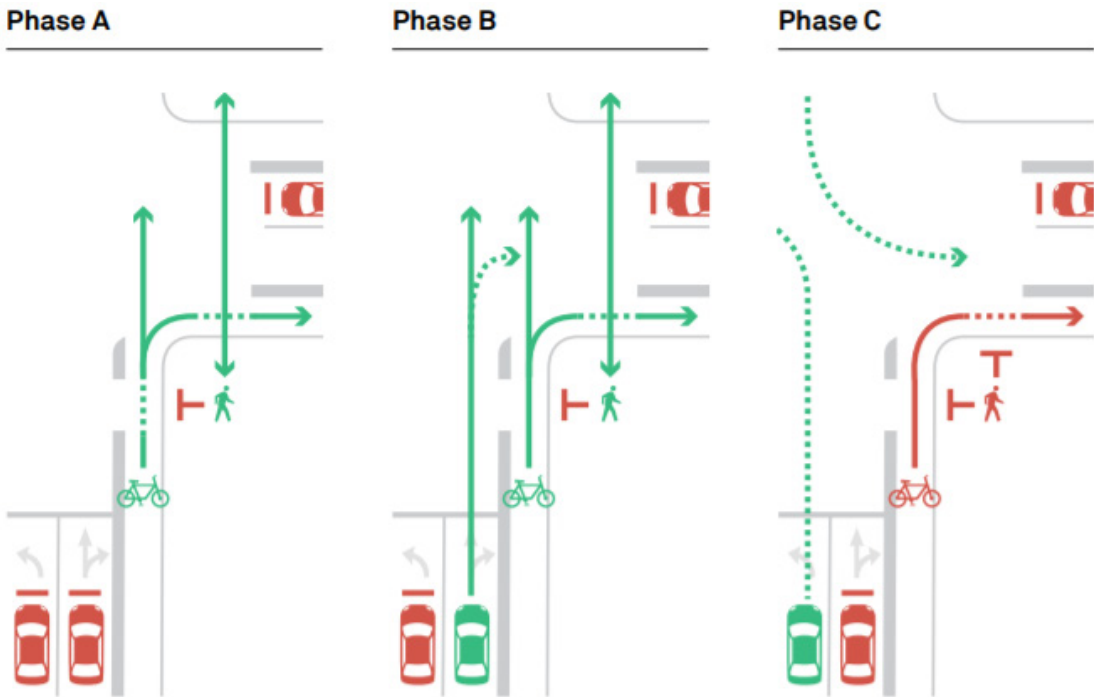
Type
Signal Phasing

Description & Purpose

LBI and LPI, as described on p.45, gives bikes and pedestrians the green before parallel vehicular traffic, giving them a head start on crossing the intersection and makes them more visible.

These could be used in conjunction with a bicycle detection system.

Cost
Initial signal installation: \$8,000 to \$150,000 depending on context and complexity;
Timing adjustment: a few hours of staff time



Bike/Ped-Only Phase (Scramble)

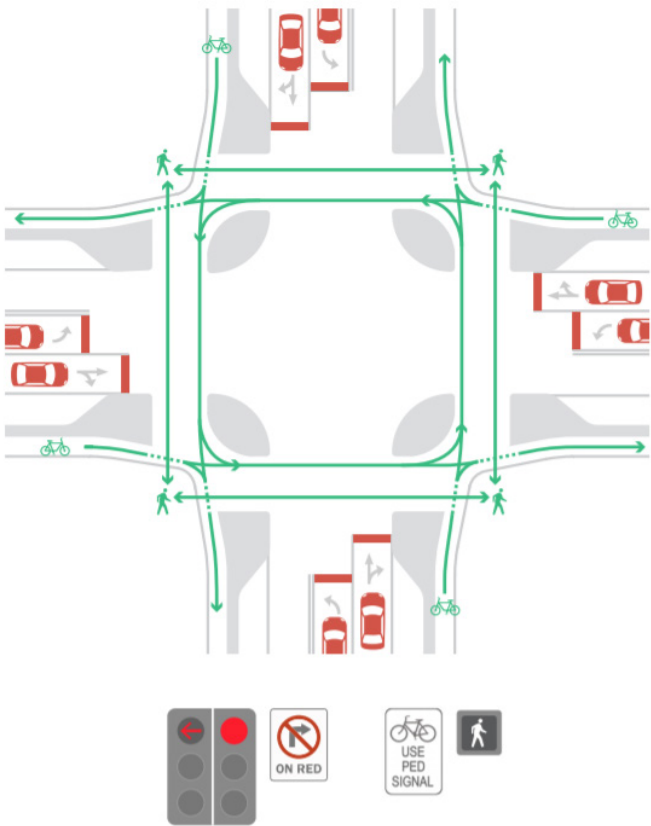
Type
Signal Phasing

Description & Purpose

Only allows bikes and pedestrians to proceed while all vehicular traffic is stopped.

Option at locations with high bicycle and/or pedestrian volumes to allow more time to move through the intersection, especially if diagonal movements are in high demand.

Cost
Initial signal installation: \$8,000 to \$150,000 depending on context and complexity;
Timing adjustment: a few hours of staff time



Intersections for Biking

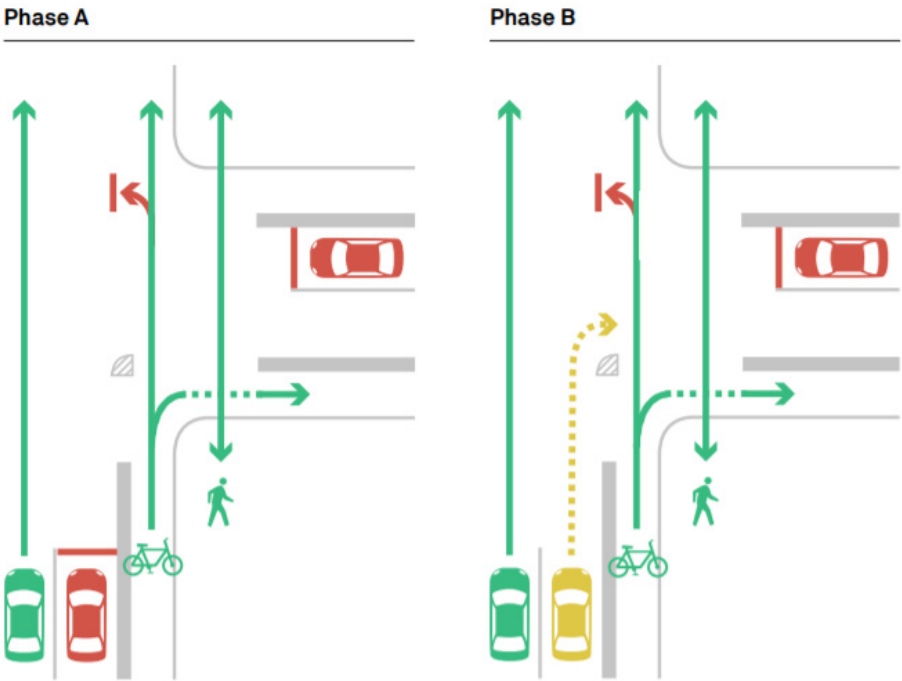
Protected-Permissive Bike Signal

Type
Signal Phasing

Description & Purpose
Allows through-moving vehicles to start at the same time as parallel bikes. Bike and pedestrian movements continue as turning vehicles receive a flashing yellow arrow turn phase.

Reduces the number of conflicts per turning vehicle and allows riders to decide for themselves whether it is safe to go during the vehicle phase, or whether to wait for a protected bike phase.

Cost
Initial signal installation: \$8,000 to \$150,000 depending on context and complexity;
Timing adjustment: a few hours of staff time



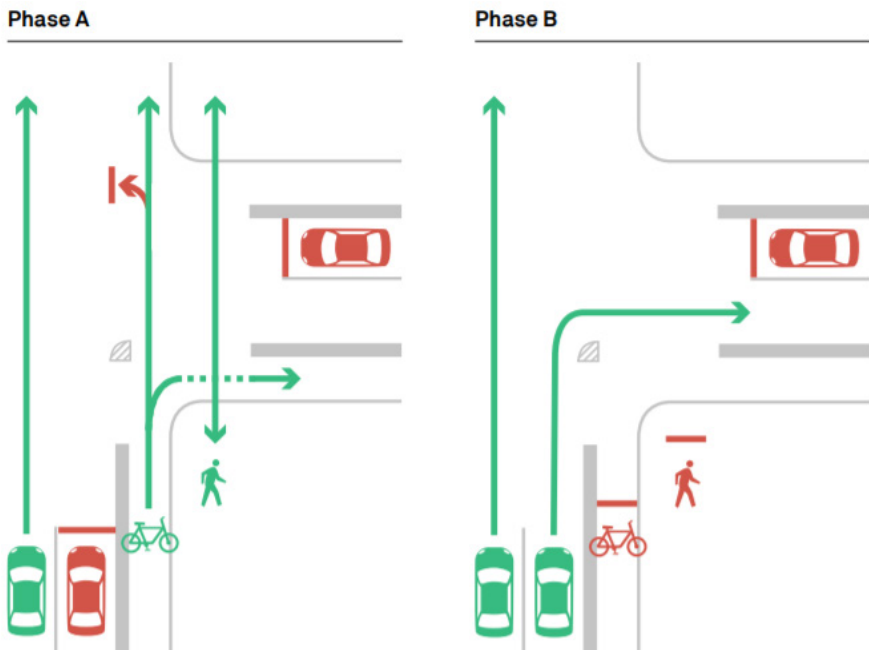
Protected Bike Signal

Type
Signal Phasing

Description & Purpose
Fully separate signal phases for bikes and turning vehicles.

Eliminates conflicts with vehicles.

Cost
Initial signal installation: \$8,000 to \$150,000 depending on context and complexity;
Timing adjustment: a few hours of staff time



8. Accessibility

Update the Americans with Disabilities Act (ADA) transition plan.

Current State

The Americans with Disabilities Act of 1990 (ADA) requires local governments to ensure their activities, programs and services are accessible to persons with disabilities. Cities were also required to develop an ADA Transition Plan that describes the structural changes to city facilities.

The city of Ann Arbor’s current Transition Plan was last updated in 2000 and includes a section on transportation facilities including public parking garages, surface parking lots, curb ramps and sidewalks. Most of the needs identified in the document have been addressed, and the city has embraced accessible design on newly-built transportation projects. Since 2000 though, numerous standards, guidelines and specifications for accessible design have been updated, and the courts have indicated that a broader spectrum of facilities (crosswalks, pushbuttons, signal indicators, bus stops, driveway crossings) are subject to accessibility regulations.



Safety



Accessibility
for All

Strategy Description

The city should update its ADA Transition Plan to incorporate new design standards, conduct a self-evaluation of the community and its facilities, and engage with the community around how the city can go beyond just meeting standards and work towards a universally accessible public realm.

The updated plan should re-prioritize remaining actions, identify necessary changes to existing standards and design guidelines, and include a detailed timeline for completing all planned upgrades. The plan should also establish a policy on routinely implementing Accessible Pedestrian Signals (APS) that would identify priority locations where signals should be upgraded with APS as a stand-alone project, in addition to routinely incorporating APS on new and modernized signals.



Crosswalk on Geddes Ave at Gallup Park Pathway



RRFB on Washtnaw Ave near Tappan Middle School

Timeline



Short
(0-3 years)

Lead Agency/Stakeholders

- » Planning
- » Engineering
- » Public Works
- » Systems Planning
- » MDOT
- » Commission on Disability Issues

Targets

1. Complete self-evaluation and update ADA Transition Plan by 2023.



9. Shared Mobility Options

Partner with mobility service providers to expand shared mobility options in Ann Arbor.

Current State

Owning and operating a vehicle in Michigan is expensive. Ann Arbor residents spend \$8,600 on vehicle costs each year on average.²¹ At the same time, getting around the city alone in a vehicle is not always the easiest, fastest, or most economical option.

Many trips in urban areas are short—47% of all trips in urban areas in Michigan are less than three miles—and could easily be completed by walking, biking, or transit.²² If residents had reliable options through a combination of other shared forms of transportation, they could reduce vehicle trips or forego vehicle ownership altogether lowering household transportation costs, increasing opportunities for physical activity, and helping Ann Arbor meet its climate goals.

Strategy Description

Transportation technologies, services, and business models continue to rapidly evolve and reshape how people move around urban areas. The combination of new transportation options—from ride-hailing to e-scooters—and the ability to easily compare and choose between different modes using a smart phone



Mobility



\$8,600

average annual vehicle cost for Ann Arbor residents



47%

of all trips in urban areas in Michigan are less than three miles



Healthy People & Sustainable Places

can empower people to reduce their reliance on private vehicles and shift towards shared mobility options, including our existing transit system.

By providing a variety of different shared mobility options that complement TheRide, and making it seamless for users to choose between different options, residents will have the freedom to choose the mode of transportation that is best for their trip, their health, their environment, and their wallet.

Bike Share

Bike share has become an increasingly common and popular way to get around in cities of all sizes. At the beginning of the last decade, people across the U.S. took just over 300,000 trips via bike share. By 2019, the

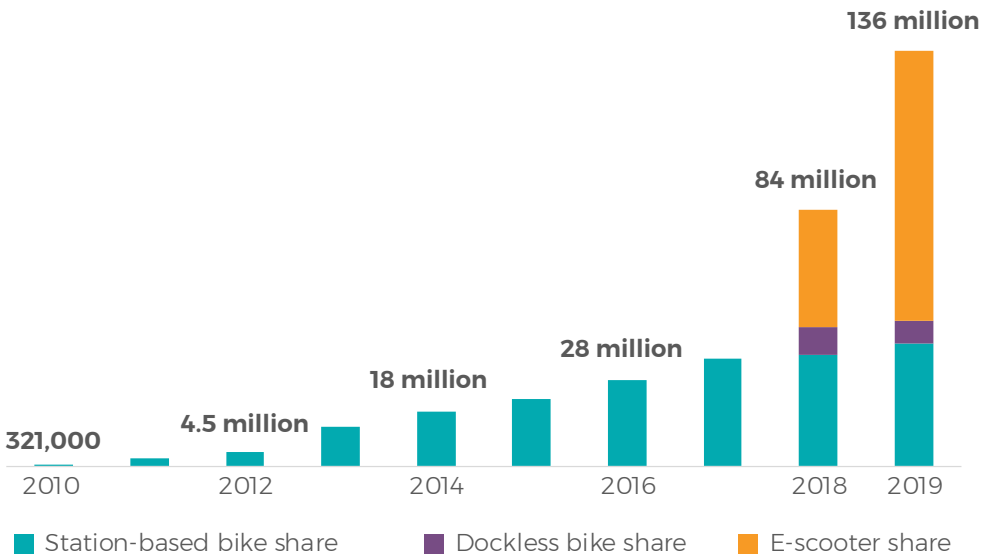


Regional Connectivity

number of bike share trips increased 148 times to more than 47.5 million, and users took 136 million trips on shared bikes and scooters across the country.²³ Bike share gives people a healthy, affordable option for making short trips and can expand the reach of transit service. Cities with bike share also see increases in overall levels of biking and transit use.²⁴

Between the University of Michigan, high levels of activity downtown, and more trails and bike lanes around the city, bike share has the potential to be an attractive and well-used transportation option in Ann Arbor. For bike share to succeed, though, there needs to be a dense network of stations and/or bikes readily available. When users have to walk more than five minutes to find a station or bike, ridership tends to suffer.²⁵ Re-launching and expanding

Growth in Shared Bike and Scooter Trips Across the U.S.



424 X

increase in shared bike and scooter trips across the U.S. over the last decade



Shared Mobility Options

ArborBike or introducing a new bike share service with enough coverage to create a convenient option for getting around the entire city will enable residents, students, workers, and visitors to make more trips via bike.

Shared Electric Scooters (e-scooters)

Since the fall of 2018, shared e-scooters have been available for rent around Ann Arbor. The city launched a dedicated partnership with Spin in 2019, which has been extended through summer of 2021. Shared scooters offer the potential to expand the utility of our existing transit and active transportation networks and replace some short vehicle trips. They also present potential challenges, including user and public safety, accessible and appropriate use of the right-of-way, equity considerations, and requirements upon the City to manage negative impacts.

Within the next year the city should evaluate the results of the scooter pilot to-date, analyzing available data and gathering broad community feedback, and recommend whether to significantly expand the number of scooters in Ann Arbor. The city should also work with Spin to expand the number of parking/charging hubs across the city and evaluate incorporating scooter parking in mobility hubs located at key transit locations (see p.99).

Car Share

Car share gives users the ability to easily rent a car on demand for short errands or longer

trips and forgo the expense of car ownership. Zipcar currently has 21 locations and 30 vehicles in Ann Arbor—mainly centered around downtown and North Campus—and two out of five residents live within a 10-minute walk of these locations.²⁶

Using city-owned property, partnering with private property owners, and adopting incentives that encourage replacing traditional parking with car share locations will help expand this service to the entire city, with the goal of every resident being within a 10-minute walk of car share. Incorporating car sharing into mobility hubs at key transit locations (see p.99) and supporting the operation of peer-to-peer car share services—where individuals can make their personal car available for rent through a third party like Turo or Getaround—will further expand access and convenience for people in Ann Arbor.

Piloting First/Last Mile Solutions across the Region

Making it easier for people across the region to access transit and commute into the city using TheRide will reduce congestion and emissions in Ann Arbor. Ann Arbor is committed to supporting TheRide and surrounding communities in testing innovative strategies and partnerships that make it easier for people to get to and choose to use transit, such as discounted ride-hail trips that start or end at transit stations.

Climate Impact from Shared Mobility



500
shared bikes



500
shared e-scooters



250
car share vehicles



estimated reduction in VMT and carbon emissions from potential increase in shared mobility options in Ann Arbor

Timeline



Short
(0-3 years)

Lead Agency/Stakeholders

- » Engineering
- » DDA
- » AAATA
- » Systems Planning
- » OSI
- » UM
- » Private mobility service providers

Targets

1. Re-launch bike share by 2022.
2. Evaluate shared electric scooter pilot and make recommendation on future expansion by 2022.
3. Expand bike share citywide by 2024.
4. Expand car share so that every Ann Arbor resident lives within a 10-minute walk of car share by 2026.



10. Improve Transit Service

Continue increasing transit service to improve frequency and consistency.

Current State

TheRide, the city of Ann Arbor, and residents have invested significant resources over the past decade to expand transit service across the city and connect to neighboring communities. TheRide offered 42% more hours of service in 2017 than in 2013.²⁷ Currently two routes in Ann Arbor—Route 62: UM-State and Route 4: Washtenaw—offer high-frequency service during peak periods, where buses come every 15 minutes or fewer (effective frequencies along other corridors may be higher than scheduled frequencies due to overlapping routes).



Mobility



Accessibility for All



Regional Connectivity

Many of TheRide’s routes outside of the downtown area have a scheduled service frequency of 30 minutes during both peak and off-peak periods. Most routes begin running between 6 a.m. – 7 a.m. and the last bus services depart between 10:30 p.m. – 11:30 p.m. on weekdays. Service frequency on some routes decreases to every hour during weekday evenings beginning at 7 p.m., while some routes have no available evening services. On weekends, frequency falls to every 30 minutes to an hour on most routes.

The 2009 City of Ann Arbor Transportation Master Plan Update, identified signature service corridors, where overlapping routes

create high capacity and frequent service, offering a higher level of service than one individual route. The signature service corridors created a network, including east-west and north-south corridors. The remaining corridors with transit service (Main Street, Miller Avenue, and Packard Street) make up the secondary corridors.

Strategy Description

When buses come more frequently it reduces the amount of time customers spend waiting, makes connections between different routes

easier, and creates a more useful and reliable transit system. Between the city’s large student population and inflow of commuting workers, there is a significant need for greater all-day frequency and a consideration of longer spans of service on signature transit corridors.

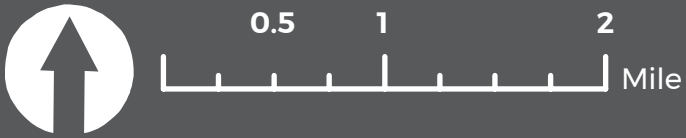
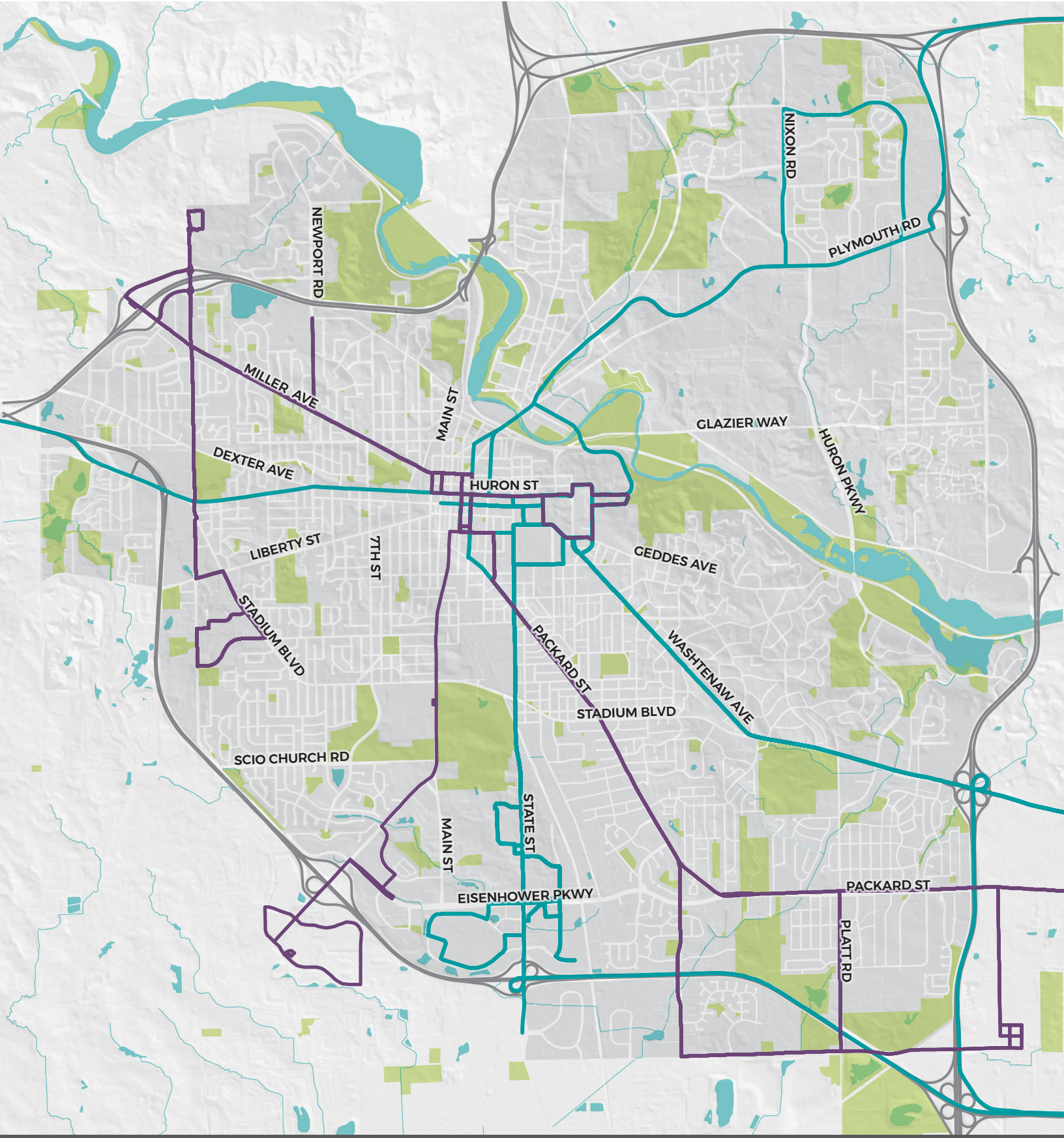
The city should work with TheRide and University of Michigan to ensure that there is a minimum effective frequency of one bus every 15 minutes throughout the day (including off-peak times) on both weekdays and Saturdays along the Signature Service Corridors—creating four all-day, high-frequency transit routes.

Signature Transit Corridor	Weekday Peak	Weekday Midday	Saturday
State Street	15 Minutes or Better	15 Minutes or Better	> 15 Minutes
Fuller Road/Plymouth Road	15 Minutes or Better	15 Minutes or Better	> 15 Minutes
Washtenaw Avenue	15 Minutes or Better	15 Minutes or Better	> 15 Minutes
Jackson Avenue/Huron Street	> 15 Minutes	> 15 Minutes	> 15 Minutes
Secondary Transit Corridor	Weekday Peak	Weekday Midday	Saturday
Packard Street	30 minutes or better	30 minutes or better	> 30 Minutes
Miller Avenue	30 minutes or better	30 minutes or better	> 30 Minutes
South Main Street	30 minutes or better	30 minutes or better	30 minutes or better



Transit Corridors

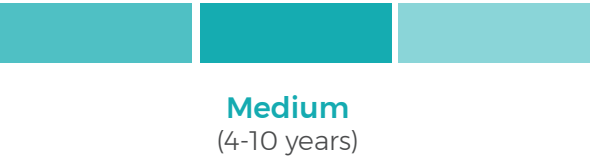
- Signature Transit Corridor
- Secondary Transit Corridor



The city and TheRide should also work to reach a minimum effective frequency of one bus every 30 minutes along secondary corridors throughout the day on weekdays and Saturdays.

Achieving these metrics would require increasing weekday service on Route 30, Jackson-Dexter, and increasing Saturday service levels along all corridors except South Main Street, which includes Routes 24 and 25.

Timeline



Lead Agency/Stakeholders

- » AAATA
- » UM
- » Engineering
- » Systems Planning
- » OSI
- » DDA

Targets

- 1. Achieve 15-minute effective frequency throughout the day on signature transit corridors by 2023.
- 2. Achieve 30-minute effective frequency throughout the day on secondary corridors by 2030.

THE CONNECTOR

Over the past decade, the City of Ann Arbor partnered with the University of Michigan, TheRide, and the Ann Arbor DDA to study a potential investment in a high-capacity transit corridor to connect downtown with the University campuses and park-and-ride facilities at the edges of the City. During peak times of the semester, this highly congested corridor currently sees more than 30,000 daily trips on buses, making it the busiest public transit corridor in the State of Michigan.

The resulting concept for an Ann Arbor Connector (a rapid transit line operating in a dedicated right-of-way) has the potential to significantly increase efficiency compared to the current public transit services, and would also make transit the most attractive and reliable option for short trips in the core of the City.

Additionally, by extending to the outer edges of the City, the Connector could become a key part of the solution for reducing vehicular traffic into the core, by facilitating convenient and timely connections into Ann Arbor’s busiest core areas from other services and satellite park-and-ride locations.

While funding constraints have limited progress on the next steps, the need for more efficient and reliable transit operations has only continued to grow. Each of the project partners remain committed to the Connector’s concept of improving transit capacity and reliability along the Plymouth, Fuller and State corridors.

11. Transit Reliability

Prioritize transit reliability and speed along signature service corridors and at key locations.

Current State

Ann Arbor features two significant transit systems (TheRide and University of Michigan’s Blue Buses) that provide service to most areas of the city. Together TheRide and University of Michigan provided nearly 15 million (14,835,914) passenger trips in 2018. Many of these trips converge on the core areas of downtown and the campuses, where the greatest challenge becomes the speed and reliability of buses, particularly during the morning and evening rush hours. For the final three months of 2019, only 72% of TheRide’s passengers were on-time.²⁸

Strategy Description

Making buses more efficient and enabling more reliable service will help to increase transit ridership in Ann Arbor, thereby reducing the number of vehicles on the road and resulting congestion and delay. These improvements should be targeted on the city’s signature service corridors (Washtenaw, Plymouth-Fuller, State, and Jackson) and in locations where service converges and is often impacted by traffic or operational delays (e.g., downtown



Mobility

near the Blake Transit Center and around the Central Campus Transit Center). Community engagement during this planning process also indicated strong support for prioritizing transit as the major travel mode along corridors such as Washtenaw Avenue, Plymouth Road and Fuller Road. Strategies to improve transit efficiency can offset efforts to slow vehicle speeds along a corridor to improve safety.

Increasing transit speed and reliability will require changes to infrastructure (e.g., bus-only lanes, intersection queue jumps, raised boarding platforms) that speed up bus service and enhancements to signal technology (e.g., transit-signal priority) that help prioritize transit service.

Infrastructure changes can be phased, beginning with the highest priority locations and then measuring impacts to refine and/or expand improvements. These measures should be prioritized where transit reliability is low and along with other focus corridor, focus intersection projects, bike route installations, or special projects such as Major Street Traffic Calming.

Transit-Signal Prioritization

The city should collaborate with AAATA, the University of Michigan and MDOT on the development of software and communications



Healthy People & Sustainable Places

systems that would allow for the implementation of transit-signal prioritization (TSP) along key corridors. Transit signal priority uses these software and communications systems to advance or extend the green light at a traffic signal for upcoming buses, reducing travel times and improving reliability. With the advent of connected infrastructure and signal systems, TSP could be implemented through a combination of on-vehicle devices that can track bus locations and adaptive traffic signals that can adjust signal timing as vehicles approach. Initial investment in development of the back-end technologies and processes along key corridors such as Plymouth or Washtenaw would allow for these systems to be considered on a more city-wide scale in the future.

Bus-Priority Treatments

Based on current operational and congestion data, the initial target for bus-priority treatments (including bus-only lanes and queue jumps) should be downtown, especially on Fourth and Fifth Streets accessing the Blake Transit Center. More reliable east-west connections through the downtown and connecting to campus areas are also a need, with a focus on the Washington Street corridor as a potential transit-priority street (as designated within the DDA’s downtown street framework plan). Outside of the downtown, queue



Regional Connectivity

jumps should be implemented on signature transit corridors, particularly at key intersections on Washtenaw Avenue, Plymouth Road, and South State Street (see concept designs in Section 5).

Timeline



Short
(0-3 years)

Lead Agency/Stakeholders

- » AAATA
- » UM
- » Engineering
- » DDA
- » Public Works
- » Systems Planning
- » OSI

Targets

- 1. Implement transit-priority treatments on Washtenaw Avenue and Plymouth Road/Fuller Road by 2025.**
- 2. Pilot bus-only lanes downtown by 2023.**



12. Transit Access

Improve multimodal access to transit stops.

Current State

The vast majority (89%) of transit riders in Ann Arbor walk to their bus stop, but for those who live further from the bus, figuring out how to get to transit can be difficult and dissuade potential users from choosing transit. The city has also been working with TheRide to upgrade stops to meet Americans with Disabilities Act (ADA) standards; 89% of AAATA stops in the city currently meet ADA standards. However, only 12% of bus stops currently have a transit shelter, and only 65% have lighting.²⁹



Mobility



Accessibility
for All

These amenities contribute to transit riders' safety and comfort as they access and wait at bus stops, which contributes to how willing or likely someone is to use transit.

Strategy Description

Designing transit stops for universal accessibility, including by those with mobility challenges and disabilities, benefits all users. Providing additional amenities for transit users and integrating shared mobility options into transit centers and key stops will improve access to transit, create a seamless, easier to use system, and encourage ridership. The city should work with AAATA to ensure that 100% of transit stops are ADA-compliant.



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Sustainable Places

Fare integration

As a customer, having to use different payment methods and incurring additional charges for each type of use is a disincentive to linking different modes of transportation. Integrating transit fare payment and trip planning with additional shared mobility options in a single user platform removes the burden of having to figure out how to pay for additional services and makes all services more accessible.

Mobility hubs

Similarly, the ease of having different services geographically linked makes transfers between services easier. Mobility hubs integrate shared mobility options like bike share stations, e-scooter parking/charging, and car share along with short- and long-term bike parking, designated pick-up and drop-off locations, payment kiosks, and enhanced wayfinding. Mobility hubs can also incorporate additional community amenities like electric vehicle charging, public gathering space, package storage areas, and complimentary retail. The city should establish mobility hubs at transit centers and key transit stops. Priority locations for mobility hubs include:

- » Blake and UM Central Campus Transit Centers
- » Nixon Road, north of Plymouth Road
- » Pittsfield Boulevard, near Arborland Mall



Regional
Connectivity

Timeline



Medium
(4-10 years)

Lead Agency/Stakeholders

- » AAATA
- » University of Michigan
- » Engineering
- » Systems Planning
- » OSI
- » Regional Transit Authority of Southeast Michigan (RTA)
- » Private mobility service providers

Targets

1. 100% of bus stops meet ADA standards by 2025.
2. Upgrade amenities at all stops on one signature service corridor by 2022 and all signature service corridors by 2025.
3. Establish 1 mobility hub by 2023.
4. Create 3 additional mobility hubs by 2030.



Blake Transit Center



13. Commuter Transit

Expand commuter-oriented transit services.

Current State

More than 100,000 people commute into or out of Ann Arbor every weekday.³⁰ Most of these commute trips are more than 10 miles, meaning that walking or biking are not viable options for most people,³¹ leaving limited options for getting to work besides driving. Expanding options to driving for these commute trips is critical to reaching the bold goals set forth in this plan.

A number of TheRide’s routes connect Ann Arbor to Ypsilanti; however, there are only a handful of commuter bus services operated by TheRide connecting with other cities in the region like Canton, Chelsea, and Detroit.

In addition to TheRide’s services, the Regional Transit Authority (RTA) of Southeast Michigan manages and coordinates regional transportation in Ann Arbor and Detroit. The RTA initiated a pilot express bus service, the D2A2, to provide hourly transit service between Detroit and Ann Arbor. The pilot has been temporarily suspended due to COVID-19.

Data on commuting patterns indicate that commuting trips into Ann Arbor come from all directions, but that the greatest concentration



Mobility



Regional Connectivity

(63%) is from points to the east, including from eastern Washtenaw County.³²

Strategy Description

The city should continue to partner with TheRide, the RTA, MDOT, and other potential service providers to expand the amount and efficiency of transit services into the core areas of the city. Specific initiatives for the city and partners to include:

- » Support the RTA as a coordinator and planning agency of regional transit to push transit issues that impact the region overall.
- » Regular express-bus services from key origin points directly into the core areas of the downtown and campus. These services should focus on areas along the I-94, M-14, and US-23 corridors.
- » Engage MDOT to integrate priority measures for transit or other shared-mobility modes (e.g., high-occupancy vehicle lanes or shoulder-running transit lanes) as part of any future freeway corridor reinvestments.
- » Develop/expand convenient park-and-ride lots at interchanges outside the city limits, in coordination with MDOT.
- » Expand park and ride lots along highly-served transit corridors within the city, coupled with financial incentives to use transit or disincentives (such as parking pricing within the city).

- » Continued support and expansion of existing regional bus service such as AirRide and A2D2.
- » Continued planning for regional rail services operating along the existing Amtrak line connecting Ann Arbor to Detroit and Pontiac.

Timeline



Lead Agency/Stakeholders

- » AAATA
- » RTA
- » University of Michigan
- » MDOT
- » Engineering
- » OSI
- » Systems Planning
- » Livingston Essential Transportation Services (LETS)

Targets

1. Increase share of people commuting into Ann Arbor on transit to 20% by 2030.
2. Expand spaces at park and ride lots to more than 10,000 by 2030.

ANN ARBOR STATION

As outlined in the 2009 Transportation Master Plan, the city has undergone an in-depth planning process to review and plan for a new or enhanced railroad passenger station/intermodal facility in the City of Ann Arbor.

Ann Arbor boasts the busiest Amtrak station in the state of Michigan, serving the Wolverine Line, which runs from Pontiac through Detroit to Chicago.

In addition to directly serving passengers, the train station acts as an important gateway to Ann Arbor, giving visitors their first impression of the city, and presents an opportunity for economic development in the vicinity of the station and a potential source of job growth in the city and the region, as the rail service presents another commuting option.

In June 2019, the city completed a comprehensive planning and review process to analyze alternatives and come to a preferred alternative, in compliance with the National Environmental Policy Act (NEPA). Next steps for this project are pending federal review of the Environmental Assessment (EA), as the culmination of the NEPA process.

14. Fares

Provide reduced fares for transit and shared mobility services for qualified users.

Current State

Over 40% of AAATA riders make less than \$25,000 per year, and around 30% of riders use cash to pay their fare.³³ Providing affordable mobility options for those with financial barriers enables them to access opportunities and benefits us all by creating a more inclusive and resilient economy.

Currently, AAATA offers 50% discounted fares to low-income riders through its Fare Deal low income program. The program requires riders to show bus operators an agency-issued photo ID card upon boarding in order to receive the discount.

Spin, the provider of shared e-scooters in Ann Arbor, also provides reduced ride rates for those with limited incomes through its Spin Access program.



Mobility



Accessibility
for All

Strategy Description

AAATA is ahead of its peers when it comes to low-income fare discounts and Fare Deal program. One result of AAATA's recent fare study is the recommendation to shift enforcement for reduced fare programs offboard by determining eligibility at the time of purchase and not at the time of boarding.³⁴ This change, best accomplished by using an account-based smart card system, would speed up boarding, simplify the administration of discounts, and eliminate any stigma associated with having to present an ID. Enabling users to submit applications online or via mail (rather than requiring them to submit applications in-person) would also streamline the process for qualified users.

Furthermore, TheRide could deepen its discounts or provide free fares for low-income riders through this mechanism. TheRide recently offered free fares in response to the COVID-19 pandemic; evaluating who took advantage of that offer and/or along which routes they were most effective could indicate a population or route in greater need of expanding free fares.

When bike share re-launches in Ann Arbor, the program should include similar discounts for qualified users. One option to improve the

customer experience for all users and simplify the administration of discount programs would be to integrate bike share payments with TheRide's fare system. Allowing users to rent bikes and pay for transit with a single smart card would encourage usage. With an integrated payment system between bike share and transit, 'transfer fees' between bike share and transit could be waived and existing discount programs could be expanded to include bike share.

Ensuring the affordability of ride-hailing (Uber, Lyft, taxis, etc.) for qualified users is more complex. Some transit agencies around the country do this by subsidizing first-mile/last-mile trips to and from transit or by integrating ride-hailing into on-demand services provided by the transit agency. The city should support TheRide in evaluating and testing similar programs.

Furthermore, Ann Arbor could adopt car-sharing programs that are specifically integrated with low-income housing in partnership with companies such as Sway or Envoy.

Timeline



Short
(0-3 years)

Lead Agency/Stakeholders

- » AAATA
- » Mobility Service Providers
- » Engineering
- » Systems Planning
- » OSI
- » DDA
- » University of Michigan

Targets

1. Revise enforcement/payment structure by 2022.
2. Match bikeshare discounts to scooter and/or transit discounts.



15. Pricing

Vehicle Trips

Price trips according to their impact on the city.

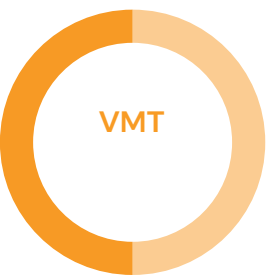
Current State

On an average weekday, more than 80,000 people commute into Ann Arbor, creating an influx of cars on the city’s major corridors during the morning and evening rush hours. Nearly all the delay drivers experience in Ann Arbor (94%) occurs during these peak times.^{35,36} Half of all the miles driven on our streets are concentrated in these five hours (7-9 AM and 3-6 PM).

Projections indicate that a greater share of Washtenaw County’s jobs will be concentrated in Ann Arbor in 2040, but a smaller share of households will live in the city than today.³⁷ Ann Arbor has neither the space nor desire to expand its roads. Without taking action to manage demand and encourage alternative modes of transportation, congestion—and the emissions, air pollution, traffic crashes, and lost productivity it entails—will only worsen over the next 20 years.



Healthy People & Sustainable Places

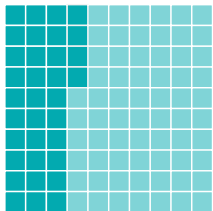


50% of the miles driven in the city and **94%** of the delay drivers experience are during morning and evening rush hours

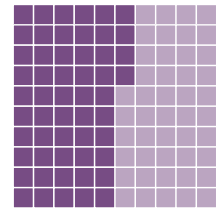


Today

34% of households in Washtenaw County live in Ann Arbor

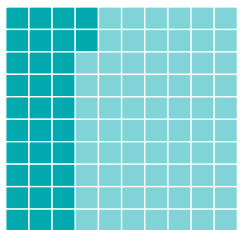


54% of jobs in Washtenaw County are in Ann Arbor

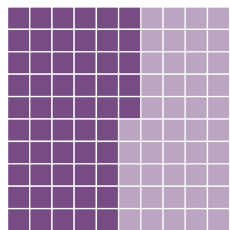


2040

32% of households in Washtenaw County will live in Ann Arbor



55% of jobs in Washtenaw County will be in Ann Arbor



Safety



Mobility

Strategy Description

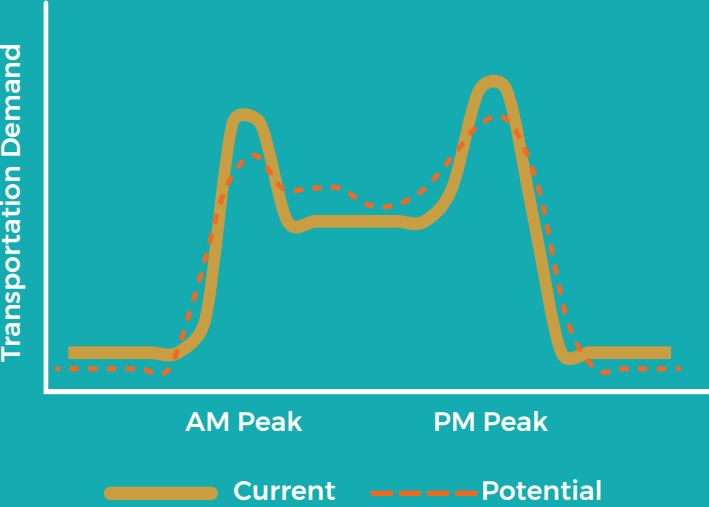
Cost is a critical factor in people’s daily choices about how to get into and around Ann Arbor. Cities around the world and in the U.S. use a variety of tools to better align the price of vehicle trips with their societal costs and adjust pricing based on demand. Pricing trips by carbon-producing vehicles is the most direct way to reduce these trips and their negative impacts, which aligns with the city’s commitment to carbon neutrality.

Parking pricing

The cost of parking is often the only immediate cost drivers face on any given trip and is a readily available tool for managing demand. Varying the price of parking based on the time of day, day of the week, and/or by location can encourage drivers to take transit, carpool, walk, or bike and can shift driving trips to times when demand, and thus prices, are lower. Leveraging data and smart meter technology to calibrate parking pricing also supports local businesses by increasing turnover, which can mean more customers. To limit the impact that parking pricing can have on populations who may not have alternatives to driving, the price of parking can also be tiered so low-income residents, people with disabilities, or other groups pay lower rates. Rates could also be tiered to give discounts to people using



What is demand-based pricing?



Demand-based pricing seeks to tie the price of a good to consumer demand for that good.

When demand is high, the price increases. When demand is low, the price decreases.

Demand-based pricing is particularly useful when supply is fixed. If we can't simply produce more of the good when demand is high, pricing can be used to help ensure the supply isn't depleted.

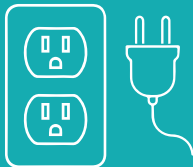
The supply of road space in Ann Arbor is effectively fixed; we can't widen our streets during rush hour then shrink them for the rest of the day.

Charging users to drive on busy roads or pay more to park when demand is high could motivate enough people to shift vehicle trips to less busy times of day or choose a different mode of transportation to significantly reduce congestion and emissions.

There are many examples of demand-based pricing we experience on a daily basis.



Airlines charge more for plane tickets around holidays.



Electricity rates are higher in the evening when most people are home.

Ride-hail pricing

Ride-hailing (e.g., Uber and Lyft) is an increasingly popular transportation option in Ann Arbor, and while these services offer users the convenience of on-demand mobility and may enable people to reduce their reliance on private cars, there is significant evidence that these services divert riders away from public transportation, increase congestion, and lead to more emissions.

To better account for ride-hailing's negative impacts, U.S. cities are adopting ride-hailing fee structures that incentivize users to share trips and use public transportation in areas that are well-served. In Chicago, solo ride-hailing trips include a \$1.25 fee and an additional \$1.75 fee for trips that start or end in downtown. Shared trips have a lower fee of \$.65, and the surcharge

for trips beginning or ending downtown is also lower at \$.65. Fees are reduced for wheelchair-accessible vehicles, and a portion of all the ride-hailing fees is allocated to an Accessibility Fund, which incentivizes taxi and ride-hail drivers to invest in wheelchair accessible vehicles.³⁸

In 2016, Michigan's Transportation Network Company Act pre-empted local governments' authority to regulate ride-hailing within their boundaries and transferred oversight to the state Department of Licensing and Regulatory Affairs.³⁹ Adopting a ride-hailing fee in Ann Arbor would require changes to this legislation and the City should coordinate efforts with other Michigan cities to advocate for more local authority to regulate ride-hailing services within municipal boundaries.

Timeline



Short
(0-3 years)

Lead Agency/Stakeholders

- » DDA
- » Engineering
- » OSI
- » MDOT
- » WATS
- » SEMCOG
- » RTA
- » LARA
- » State Representatives

Targets

1. Pilot demand-based, tiered parking rates in a select area of downtown by 2022.
2. Expand demand-based, tiered parking rates to all on-street parking and City-owned facilities by 2023.
3. Complete a road user pricing study by 2024.



16. Managing Demand

Develop a citywide transportation demand management (TDM) strategy.

Current State

As noted in other strategies, Ann Arbor’s strong job market places significant demands on the city’s streets and transportation system — especially at the busiest times of day. Transportation demand management (TDM) is a concept that aims to reduce congestion by providing people more choices for when and how they commute.

TheRide, the DDA, AA Chamber of Commerce and the city of Ann Arbor partnered to launch the getDowntown program in 1999. The getDowntown program provides commuting programs and services to workers and businesses within the DDA boundary. Key to the program’s success is its go!pass offering, which entitles downtown employees to free rides on all AAATA fixed route services as well as discounts on commuter services (like the ExpressRide from Canton, Chelsea, and Ypsilanti). The getDowntown program typically distributes around 5,000 go!passes to employees at more than 400 downtown businesses each year. By helping more commuters choose transit, the getDowntown program has helped avert the need to construct more than 1,200 additional parking



Mobility

spaces downtown — freeing up approximately five acres of land for alternative uses and saving nearly \$30 million in construction costs.⁴⁰

However, because of the current getDowntown program’s geographic boundaries, major employers outside of downtown, like those around Eisenhower Parkway and State Street, are currently ineligible. With 86% of the jobs in Ann Arbor being located outside the DDA boundary, there is an opportunity to expand the existing TDM program to reduce the strain on the transportation system during commuting hours.⁴¹

Strategy Description

The city and TheRide should work together to establish a citywide TDM program, expanding benefits like free transit passes and commuter services to a larger share of workers across Ann Arbor. As an example, when the Google Ann Arbor corporate office relocated from downtown to a location off Traverwood Drive, the employer wanted to continue offering a transit benefit to employees, leading to a “pilot contract” between TheRide and Google to offer a MyCommuter Card.⁴² Google pays a flat rate of \$1.50 per swipe to TheRide, who supplies Google with the passes. This model could be applied to other major employers outside the DDA boundary. Additional considerations include staggering work hours, providing a



Healthy People & Sustainable Places

parking “cash-out” option to employees who do not park, and encouraging biking through tax deductions for bike-related purchases and services.

TDM strategies that seek to limit private vehicle usage must be balanced by measures that provide comparable level of service through alternate modes. Therefore, implementing complementary strategies from this plan that seek to improve mobility through transit, biking, and walking are critical to the success of a TDM program.



Regional Connectivity

Timeline



Short
(0-3 years)

Lead Agency/Stakeholders

- » Planning
- » AAATA
- » Engineering
- » DDA
- » Systems Planning
- » University of Michigan
- » SPARK
- » AA Chamber of Commerce
- » OSI

Targets

1. Double the number of employer-subsidized transit passes (i.e., go!passes) distributed by 2024.



17. Parking

Implement new policies to better align parking supply and demand.

Current State

The city primarily influences parking supply through regulations in the Unified Development Code that establish parking requirements for different zoning classifications. These regulations typically establish a minimum number of parking spaces a development must include. For example, multi-family residential developments like apartments and townhouses are required to provide 1.5 to 2 parking spaces for every dwelling unit. Two zoning districts covering downtown do not include parking requirements for developments that conform to allowable floor-area-ratios.⁴³

Setting parking minimums can lead to an oversupply of parking, since the number of parking spaces is dictated by a generic standard rather than the actual demand for parking at a specific location. Parking is expensive to build—from \$5,000 per space in a surface lot to \$35,000 per space in an underground parking structure—and requiring developments to include a set amount of parking increases the overall cost of development.⁴⁴ These increased costs are then passed on in the form of higher rents for residents and business owners. A national study on housing affordability



Healthy People & Sustainable Places

estimated that the cost of parking increased rents by 17% on average.⁴⁵

The city also issues residential parking permits for certain areas—mainly residential areas bordering downtown or the university—where on-street parking is highly utilized.



Building parking is expensive.

\$5,000

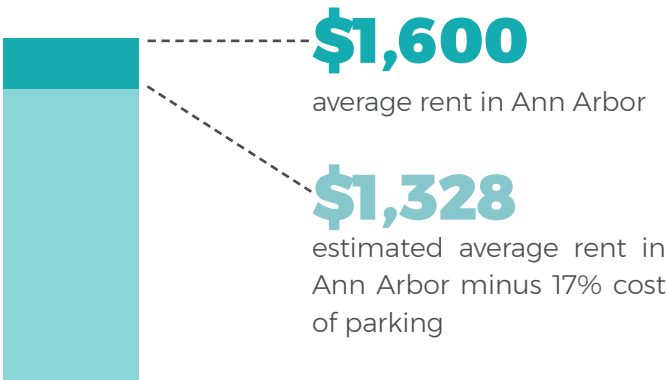
cost to build 1 space in a surface lot

\$25,000

cost to build 1 space in an above-ground garage

+ 17%

additional cost of a housing unit's rent due to the cost of parking



Strategy Description

The city should expand its current policy for downtown and remove minimum parking requirements from the Unified Development Code so that all new developments can determine the proper amount of parking based on existing and forecasted demand. A variety of cities across North America, including Buffalo, New York; Hartford, Connecticut; and Edmonton, Alberta have all eliminated parking minimums.

In addition to removing minimum parking requirements, Ann Arbor should establish maximum parking ratios in downtown and other locations well-served by transit, such as along signature transit corridors (see p.92). Maximum parking ratios set a ceiling for how much parking a development can include, while giving developers the option to provide any amount of parking beneath that threshold.

By removing parking minimums citywide and establishing parking maximums in appropriate locations, the supply of parking will be better aligned with real-world demand. Requiring less land to be set aside for parking can bring a multitude of benefits by increasing housing affordability and freeing up land for alternative uses.

Timeline



Short
(0-3 years)

Lead Agency/Stakeholders

- » **Planning**
- » DDA
- » Engineering
- » Systems Planning
- » OSI
- » A2Y Chamber
- » AAATA

Targets

- 1. Update Unified Development Code to remove parking minimums citywide by 2022.**
- 2. Establish parking maximums along signature transit corridors and in areas well-served by transit by 2022.**

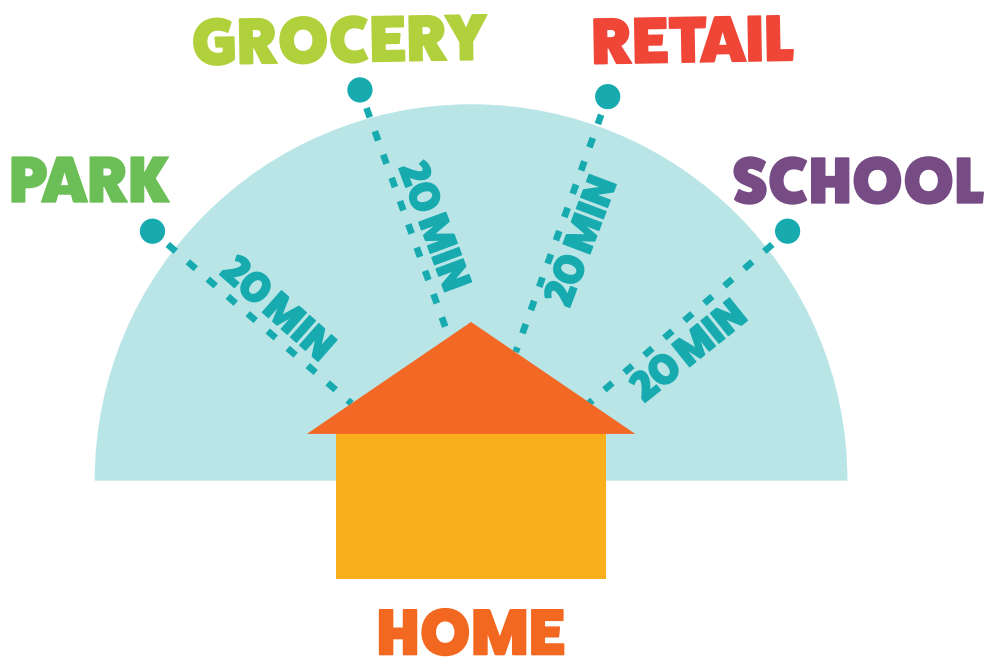


18. 20-Minute Neighborhood

Ensure that all residents have access to basic daily needs within a 20-minute walk.

Current State

A 20-minute neighborhood is a place where residents can meet most of their daily, non-work needs (like shopping, groceries, parks, and schools) within a safe, convenient 20-minute walk. Today, eight out of ten Ann Arbor residents live within a 20-minute walk of a school, grocery store, general retail, and a park. However, people of color are 37% more likely to live in a neighborhood with limited access compared to white Ann Arbor residents.



Mobility



Accessibility for All



Healthy People & Sustainable Places

Strategy Description

By bringing people and the destinations they need to reach closer together, 20-minute neighborhoods offer residents a host of benefits: improved access, more opportunities for physical activity, lower transportation costs, and reduced emissions and air pollution. Ann Arbor residents who live in neighborhoods with poor access to daily essentials spend 8% more on household transportation costs and emit 15% more carbon dioxide each year.⁴⁶ 20-minute neighborhoods also enable older adults to age in place, so that losing access to a vehicle does not result in losing independence.

Ensuring that everyone in Ann Arbor can live in a 20-minute neighborhood and enjoy the associated benefits will require a combination of actions.

- » Improving connectivity for people walking by building out a complete, accessible sidewalk network (see p. 56), establishing criteria for connected street networks in new developments, and by retrofitting existing neighborhoods that have low connectivity with direct links that enable people to walk to more destinations.
- » Updating the zoning code to allow for more mixed uses in residential neighborhoods paired with incentives that encourage mixed use development in areas with less access today.
- » Encouraging more housing units, with a focus on affordable units, in locations with good access to basic daily needs.

Timeline



Medium
(4-10 years)

Lead Agency/Stakeholders

- » Planning
- » Engineering
- » Planning Commission
- » Neighborhood Associations
- » Local Businesses
- » Sustainability
- » Ann Arbor Housing Commission (AAHC)
- » Ann Arbor Historic District Commission
- » AAATA

Targets

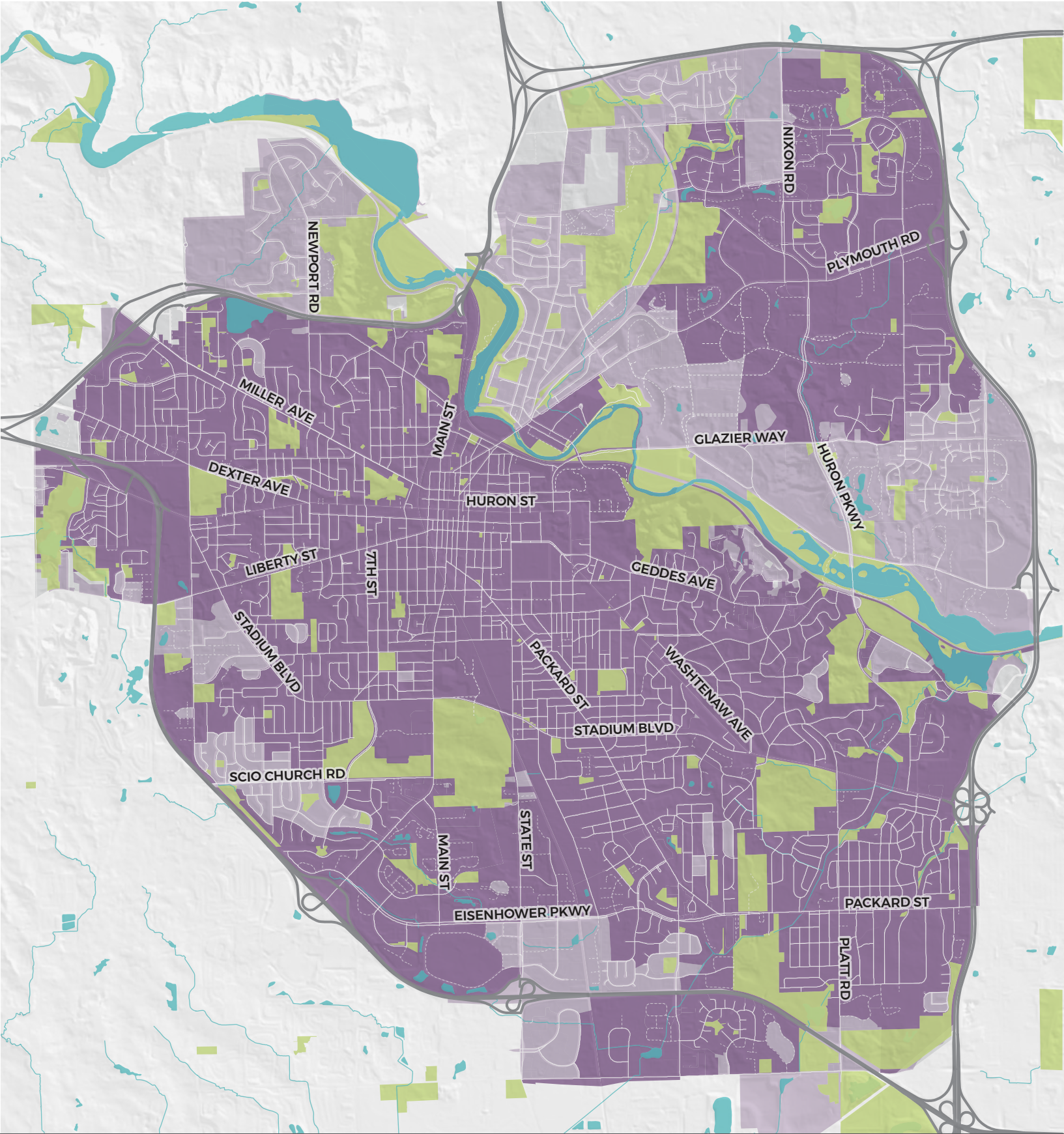
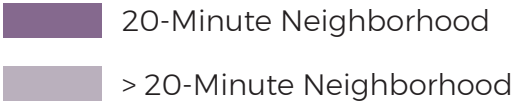
1. Update the zoning code to encourage mixed uses in residential neighborhoods and more housing in locations with good access to basic daily needs by 2025.
2. 100% of Ann Arbor residents live within a 20-minute walk of basic needs by 2030.



20-Minute Neighborhood



20-Minute Neighborhood



19. Shared Streets

Create shared streets in strategic areas downtown.

Current State

A safe, welcoming, and enjoyable pedestrian experience is a crucial ingredient in downtown’s recipe for success. Downtown streets serve many different roles, but chief among those roles is fostering a comfortable pedestrian environment that invites people walking to shop, visit, linger, and interact.



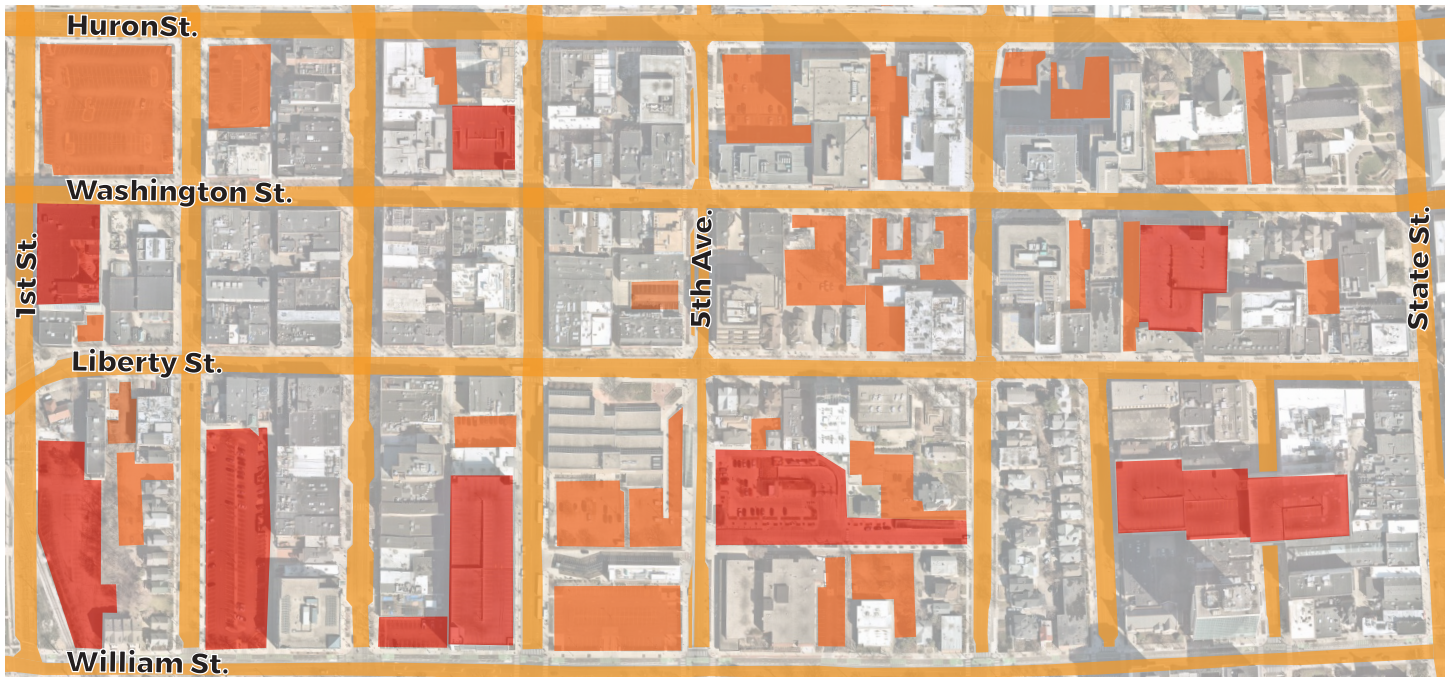
Safety



Mobility

Today thousands of people walk along downtown streets, but vast amounts of space in downtown are dedicated to moving and storing cars. Between travel lanes, on-street parking, surface parking lots, and parking garages, more than one third of all the land in downtown is allocated for cars, which can impede walkability, negatively impact the public realm, and limit opportunities for efforts to enhance the sense of place.

More than 1/3 of all the space in downtown is allocated for cars.



Accessibility
for All



Healthy People &
Sustainable Places

Strategy Description

Creating shared streets in strategic areas in downtown will improve safety and walkability, open up space for people to gather and interact, and encourage commercial activity. Shared streets are designed without many of the typical indicators, like curbs and traditional pavement markings, that demarcate separate space for people walking, biking, and driving on a traditional street. Instead, the street is shared by everyone, and a combination of pavement materials, streetscaping, and traffic calming slow vehicles down to create a safe space for all users.

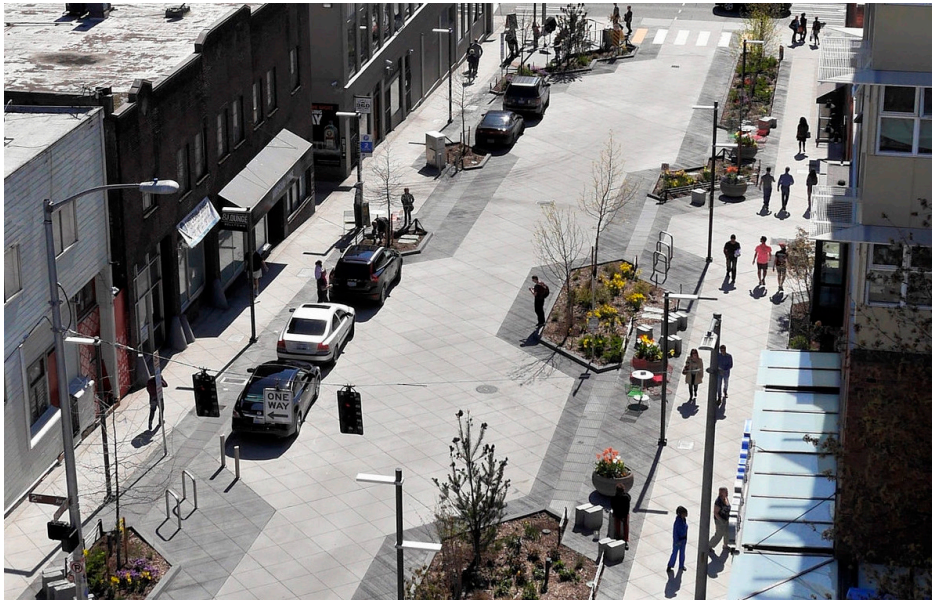
Shared streets prioritize pedestrians throughout the entirety of the right-of-

way, and improve access for people using wheelchairs, other mobility assistance devices, and strollers, but still allow bicycle, vehicle, and loading access.

Shared streets can attract increased foot traffic to businesses and often incorporate additional elements — such as parklets, public art, sidewalk dining, plantings and greenery, and curated programming — that help foster a vibrant public realm.

Shared streets enable flexibility of how the street is used, such as allowing for easy temporary closures for festivals and other special events, adapting to changing street use by time of day or day or week, or expanding pedestrian space to allow for physical distancing.

Benefits of Shared Streets



Bell St. in Seattle (Seattle Department of Transportation)



Shared Streets

Design

Shared streets are designed to give pedestrians continuous priority. In order to maintain safety, it is critical that the street’s design creates implicit cues to people driving to navigate the shared streets slowly and with caution.

The strongest reinforcement of pedestrian priority is a continuous, flush surface across the entire roadway width. Textured pavement or unique paving materials also reinforce pedestrian priority, encourage slow vehicle speeds, and can be used to delineate areas where people walking may mix with slow moving vehicles vs. pedestrian-only spaces. Additional elements like bollards, benches, planters or bicycle parking help define which portions of the street are shared spaces and which areas are only for pedestrians. Shared streets maintain limited, slow vehicle access and may still include on-street parking.

Commercial shared streets should permit easy loading and unloading at designated hours. Where shared streets intersect with traditional streets or where a shared street transitions to a traditional street, a combination of signs, speed management measures like raised crossings, and changes in surfacing should be used to indicate pedestrian priority and slow vehicles.

By removing curbs, shared streets can improve access for people with mobility challenges, but careful design is also required so that people with visual disabilities can still safely and easily navigate the street. Groups that represent people with visual disabilities should be included in the planning and design process, and elements like tactile walking surface indicators, detectable edges, and detectable changes in surface texture should be consistently applied to aid in navigation.



Argyle Street in Chicago

Implementation

Shared streets are best implemented where pedestrian activity is high and traffic volumes are fairly low. The Ann Arbor Downtown Street Design Manual identifies a number of streets where pedestrians should be prioritized.

Four streets that present an opportunity for a shared street approach are:

- » **State Street,**
- » **Liberty Street,**
- » **Main Street,** and
- » **South University Avenue.**

In addition to high levels of pedestrian activity, low traffic volumes, and alignment with the Downtown Street Design Manual, community members also voiced support for shared streets in downtown and these streets as ideal candidates. The temporary street closures implemented in downtown during the summer of 2020 in response to the COVID-19 pandemic offer an opportunity to test certain elements of shared streets and gather public feedback.

Timeline



Lead Agency/Stakeholders

- » **DDA**
- » Engineering
- » Public Works
- » University of Michigan
- » A2Y Chamber
- » AAATA
- » Commission on Disability Issues

Targets

- 1. Identify top priority for shared street in downtown within **by 2022.****
- 2. Implement one shared street project downtown **by 2025.****
- 3. Create shared streets in two additional locations **by 2030.****

Potential Shared Street	Functional Emphasis	Pedestrian Activity	Traffic Volume/Buses
State Street (from Washington Street to N. University Avenue)	Pedestrian & Access	> 6,500 people walking/day	» 4.600 vehicles/day » No bus routes
Liberty Street (from State Street to Division Street)	Pedestrian & Access	> 5,000 people walking/day	» 2.500 vehicles/day » No bus routes
Main Street (from Huron Street to William Street)	Pedestrian & Access	> 5,000 people walking/day	» 10.800 vehicles/day » No bus routes
South University Avenue (from State Street to Forest Avenue)	Balanced/ Pedestrian & Access	> 6,500 people walking/day	» Traffic volume N/A » Route 62



20. Engagement

Proactively engage with underrepresented voices around transportation issues and projects.

Current State

The Ann Arbor community is made up of thousands of active, involved, and interested neighbors. The city has a Community Engagement Toolkit process to assess project impacts and identify affected stakeholders. The city has provided various forms of engagement to capture resident, business, and visitor input, both as part of Ann Arbor: Moving Together and other plans and projects. From in-person open houses and walking tours to online surveys with A2 Open City Hall, the city has consistently valued community voices. Throughout the planning process, online surveys consistently collected over a thousand responses. Moving forward, the city can build on the community engagement conducted as part of this plan and continue working to connect with traditionally underrepresented voices, including low-income residents, people of color, non-English speakers, and youth, and empowering all residents to use existing platforms and programs to request transportation improvements.



Accessibility
for All

Strategy Description

To continue improving the city’s processes for community engagement around transportation, Ann Arbor should:

Reevaluate and reestablish best practices for equitable and just engagement.

- » Evaluate existing, and develop new, outreach opportunities to engage traditionally underrepresented voices. Also consider audiences who are less likely to participate in virtual formats.
- » Expand upon virtual engagement accessibility (e.g., closed captioning, American Sign Language (ASL), second language).
- » Assess how engagement opportunities are advertised and shared and identify additional channels for reaching more diverse audiences.
- » Consider establishing youth-led stakeholder groups to involve children and young adults.

Streamline the process for citizens to request street and transportation improvements.

- » Expand multimodal options in A2 Fix It (e.g., ADA curb ramps, snow/ice removal in bike lanes, bike lane restriping, bicycle/pedestrian access blocked by construction).
- » Develop a simple, online process to request traffic calming and other programs complementary to the Traffic Calming Program (consider incorporating into A2 Fix It).

Educate residents about the city’s transportation priorities, programs, and request processes.

- » Develop educational materials that introduce residents to the city’s transportation values and goals, existing programs, and ways to make requests.
- » Partner with neighborhood associations and community groups to share educational materials. Focus on low-income residents, people of color, and non-English speakers.



A2 Fix It (from A2 Fix It webpage)

Timeline



Short
(0-3 years)

Lead Agency/Stakeholders

- » Systems Planning
- » Communications
- » Engineering
- » OSI
- » University of Michigan
- » DDA
- » Neighborhood Associations
- » Commission on Disability Issues
- » AAHC

Targets

1. Reevaluate engagement practices within one year.
2. Expand multimodal options in A2 Fix It and streamline online request process by 2023.
3. Increase the diversity of engagement participants
4. Consistently use the city of Ann Arbor Community Engagement Toolkit to determine the appropriate engagement strategy for projects, policies, and programs.



21. Signal Technology

Expand adaptive signal technology and implement connected infrastructure.

Current State

The influx of commuters on Ann Arbor’s major streets during weekday rush hours strains available street capacity. Travel times on corridors like Washtenaw Avenue, Plymouth Road, and Stadium Boulevard can more than double during rush hour compared to uncongested times. Nearly all the delay drivers encounter (94%) occurs from 7 - 9 a.m. and 3 - 6 p.m.⁴⁷ With limited options for expanding capacity (as well as a commitment



Mobility

to streets that accommodate all users), the city must find ways move more people using existing street space, including shifting more people towards transit and leveraging new technologies. Improvements in adaptive traffic signal technology and connected infrastructure present the opportunity to better manage traffic on a real-time basis in Ann Arbor. The city has already implemented these technologies in portions of the city with positive results. After upgrading traffic signal technology along Ellsworth Road, average travel times on weekdays decreased 12% and reliability improved.⁴⁸



Regional
Connectivity

Strategy Description

In order to increase efficiency on major corridors, the city should continue the installation of advanced signal and infrastructure technology and develop protocols and systems for actively managing traffic within the city. Both components—the physical infrastructure and protocols for turning data into actions—are necessary to derive the maximum benefits from these investments. Implementation should focus on key corridors and intersections experiencing congestion and other operational issues.

In addition to improved traffic management, connected infrastructure can allow for easier integration of treatments such as transit-signal prioritization. In the longer-term, these investments also prepare the city to incorporate and capture the potential benefits of driverless vehicles, which have the potential of enhancing mobility and safety for many, but which will also need to be balanced against the potential negative impacts related to increased traffic.

Timeline



Medium
(4-10 years)

Lead Agency/Stakeholders

- » Engineering
- » MDOT
- » University of Michigan
- » Michigan Office of Future Mobility and Electrification (OFME)
- » SEMCOG
- » AAATA
- » DDA

Targets

1. Install adaptive signals and additional connected infrastructure upgrade on all corridors with >20,000 ADT by 2030.



22. Vehicle Technology

Monitor advances in connected and automated vehicle (CAV) technology and evaluate impacts on safety and street design.

Current State

CAVs and other innovations that utilize this technology, like delivery robots, are now being tested on city streets across the U.S. and here in Ann Arbor. Leadership from MCity, a CAV research hub on the University of Michigan campus, has made our city a hub for CAV testing. These innovations have the potential to provide significant benefits for our transportation system by reducing crashes, improving transit service, and decreasing the amount of space needed for parking. The introduction of CAVs could also have negative impacts on life in Ann Arbor by encouraging more people to drive longer distances by themselves, increasing congestion, and leading to a deterioration in transit service that burdens low-income residents with long waits and inconvenient routes.

Strategy Description

If CAVs are to help Ann Arbor achieve its climate goals and create safer streets for everyone, their future operations must be guided by policies that are rooted in the community's values: safety, mobility, accessibility for all, healthy people and sustainable places, and regional connectivity. While it is still unknown when CAVs will become widely available, or



Safety



Mobility

whether they will be owned by individuals, it is critical that the City begins establishing smart, equitable guiding policies today. Ann Arbor and other Michigan cities must work with the state to ensure local control over aspects of CAV operations that impact the health and well-being of residents. Examples of policies that would help harness CAV technology to further Ann Arbor's goals include:

- » Requiring CAVs to detect and yield to people walking, rolling, and biking in all conditions;
- » Limiting CAV speeds downtown, near schools, and other locations with high levels of pedestrian activity.

If CAVs are used as part of shared fleets operated by private companies, example policies include:

- » Adopting strategies and standards that encourage shared trips, connections with transit, and service in disadvantaged communities.
- » Requiring that shared CAV fleets use electric vehicles and that an appropriate portion of fleets are ADA accessible.
- » Ensuring that user privacy is protected and the City has access to data about trip characteristics to inform future policies and investments.

For small CAVs like delivery robots, requirements should be implemented that ensure safety



Accessibility for All



Healthy People & Sustainable Places



Regional Connectivity

for people walking and rolling and maintain accessibility such as:

- » Limiting the size and speed of vehicles that are allowed to operate on sidewalks .
- » Ensuring vehicles are conspicuous, especially for people with visual or auditory challenges.
- » Requiring companies to track and report on safety incidents.

Ann Arbor and Michigan are already demonstrating the benefits of public private partnerships in the AV sector. Ann Arbor should work with strategic partners to:

- » Assess the impact of CAVs on key revenue sources such as parking and gas tax and consider replacements like curbside use fees and road user pricing
- » Continue testing AV technology in Ann Arbor's climate, traffic conditions, and urban environment.
- » Determine physical infrastructure needs around sensors, traffic signals, and communication technology.
- » Leverage CAV technology to improve transit operations and ridership.

In order to prepare the City for CAV technology, Ann Arbor should establish a working group with MCity, AAATA, DDA, and other stakeholder agencies to monitor technology developments, identify opportunities for piloting in Ann Arbor, and proactively creating a smart policy framework .

Timeline



Short
(0-3 years)

Lead Agency/Stakeholders

- » Engineering
- » Sustainability
- » MCity
- » University of Michigan
- » AAATA
- » Michigan Council on Future Mobility
- » MDOT
- » WATS
- » SEMCOG
- » Other Michigan cities

Targets

1. Establish a CAV working group within 1 year.
2. Connect with other Michigan cities and develop joint strategy to advocate for local control of certain aspects of CAV regulation by 2024.
3. Publish an annual update on CAVs covering potential impacts, timeframes, and city needs/actions.



Complete List of Actions

While the key mobility strategies detailed above explain many of the critical actions the city will take in the coming years to achieve its goals and uphold the community's mobility values, there are additional

Short-Term Strategies

actions the city must take in the short-, medium-, and long-term to sustain its progress. The tables in the following pages provide a complete list of actions—including the key mobility strategies detailed above.

Strategy	Lead/Stakeholders	Values	6 Es	Targets
+ Focus transportation investments on corridors and intersections with the most serious crashes.	Engineering (for full list of partners, see p. 31)	Safety	Engineering	» Develop plans for safety improvements on all Tier 1 corridors and intersections within 1 year (for full list of targets, see p. 31)
+ Address dangerous driving behaviors using design solutions, policy changes, and education efforts.	Engineering (for full list of partners, see p. 37)	Safety	Engineering Education Encouragement Enforcement Equity	(for full list of targets, see p. 37)
+ Establish a quick-build improvement program.	Engineering Public Works DDA City Council	Safety Mobility Accessibility for All Healthy People & Sustainable Places	Engineering	» City council approves quick-build safety program within 1 year . » Install at least three quick-build safety projects per year , prioritizing focus corridors and intersections.
+ Address all critical gaps in the sidewalk system.	Engineering Systems Planning Public Works MDOT City Council	Safety Mobility Accessibility for All Healthy People & Sustainable Places	Engineering	» Approve new sidewalk construction funding sources and update City Code within 1 year . » Complete all remaining near-term sidewalk gaps within 3 years and all sidewalk gaps on major streets within 7 years .
+ Enhance safety and visibility at mid-block crossings.	Engineering (for full list of partners, see p. 59)	Safety Mobility Accessibility for All	Engineering	» Assess all existing uncontrolled crosswalks and identify necessary enhancements within 3 years . » Enhance 5 uncontrolled crosswalks per year . » Install 5 new uncontrolled crosswalks per year .

+ denotes a key strategy



Short-Term Strategies

Strategy	Lead/Stakeholders	Values	6 Es	Targets
+ Build out a safe, comfortable network of bike routes for people of all ages and abilities.	Engineering (for full list of partners, see p. 63)	Safety Mobility Healthy People & Sustainable Places	Engineering	» Install 5 miles of new, low-stress routes each year . » Upgrade 5 miles of existing bikeways in need of enhancement each year . » Complete the full all ages and abilities bike network within 10 years .
+ Make intersections safer and easier to navigate for people biking.	Engineering (for full list of partners, see p. 73)	Safety Mobility Accessibility for All Healthy People & Sustainable Places	Engineering	» Review safety data every year to identify key intersections to be upgraded. » Upgrade at least 4 intersections per year .
+ Update and complete the American with Disabilities Act (ADA) transition plan.	Engineering (for full list of partners, see p. 87)	Safety Accessibility for All	Engineering Equity	» Complete self-evaluation and update ADA Transition Plan by 2023 .
+ Partner with mobility service providers to expand transportation options in Ann Arbor.	Engineering (for full list of partners, see p. 89)	Safety Mobility Accessibility for All Healthy People & Sustainable Places Regional Connectivity	Encouragement	» N/A
+ Prioritize transit reliability and speed along signature transit corridors and in key locations.	AAATA (for full list of partners, see p. 97)	Mobility Healthy People & Sustainable Places Regional Connectivity	Engineering	» Implement transit-priority treatments on Washtenaw Avenue and Plymouth Road/Fuller Road by 2025 » Pilot bus-only lanes downtown by 2023

+ denotes a key strategy



Short-Term Strategies

Strategy	Lead/Stakeholders	Values	6 Es	Targets
+ Provide reduced fares for transit and shared mobility services for qualified users.	AAATA (for full list of partners, see p. 103)	Mobility Accessibility for All	Equity Encouragement	» Revise enforcement/payment structure by 2022 » Pilot free fares for low-income residents » Match bikeshare discounts to scooter and/or transit discounts
+ Price trips according to their impact on the City.	Engineering (for full list of partners, see p. 107)	Mobility Healthy People & Sustainable Places	Equity Encouragement	» Pilot demand-based, tiered parking rates in a select area of downtown within one year » Expand demand-based, tiered parking rates to all on-street parking and City-owned facilities within two years » Complete a road user pricing study within three years
+ Develop a citywide transportation demand management (TDM) strategy , building off and expanding the getDowntown program.	Planning AAATA (for full list of partners, see p. 109)	Mobility Healthy People & Sustainable Places Regional Connectivity	Encouragement	» Double the number of employer-sponsored transit passes (i.e., go!passes) distributed by 2024
+ Implement new policies to better align parking supply and demand.	Planning AAATA (for full list of partners, see p. 111)	Healthy People & Sustainable Places	Encouragement	» Update Unified Development Code to remove parking minimums citywide and establish parking maximums downtown and in areas well-served by transit by 2022
+ Proactively engage with underrepresented voices around transportation issues and improvements.	Systems Planning (for full list of partners, see p. 121)	Accessibility for All	Education Equity Encouragement	» Reevaluate engagement practices in the next year » Expand multimodal options in A2 Fix It and streamline online request process in the next 3 years

+ denotes a key strategy



Short-Term Strategies

Strategy	Lead/Stakeholders	Values	6 Es	Targets
+ Monitor advances in automated vehicle technology and evaluate impacts on safety and street design.	Engineering (for full list of partners, see p. 125)	Safety Mobility Accessibility for All Healthy People & Sustainable Places Regional Connectivity	Engineering	» N/A
+ Accelerate the adoption of electric vehicles (EV) by expanding charging infrastructure and converting public and private fleets and buses.	Public Works AAATA	Healthy People & Sustainable Places	Engineering Encouragement	» Install a minimum of 100 new electric vehicle (EV) charging stations in public parking lots by 2021 . » Launch a community EV bulk buy program. » Launch a campaign to support private fleets with transitioning to EVs.
Provide Engineering staff a NACTO training program on pedestrian safety, Vision Zero, and bikeway design.	Engineering Public Works	Safety Mobility Accessibility for All	Engineering	» N/A
Establish a protocol for responding to fatal and serious injury crashes and evaluating locations for safety enhancements. Use quick-build safety program to make improvements or develop long-term enhancements when necessary.	Engineering Public Works AAPD Office of Communications MSP MDOT	Safety	Engineering Enforcement	» Establish a fatal and serious injury crash response protocol established within 1 year » 100% of fatal and serious injury crashes follow protocol
Designate a Vision Zero Citizen Advisory Board , as a committee of the Transportation Commission, to be responsible for overseeing implementation of the Vision Zero program and monitoring progress. Community members should be identified to participate on this Board.	Transportation Commission AAPD City Council Systems Planning Engineering	Safety	Evaluation Equity	» Update Transportation Commission ordinance to include overseeing and monitoring Vision Zero within 1 year » Transportation Commission includes assessment of Vision Zero program in its annual report

+ denotes a key strategy



Short-Term Strategies

Strategy	Lead/Stakeholders	Values	6 Es	Targets
Develop public/private partnerships to broaden crash and safety-related data available to the city. Particular areas where more data would be beneficial include speeding, distracted driving, and detailed injury information.	Engineering Systems Planning AAPD U-M Auto Insurance Providers Health Providers	Safety	Engineering Education Encouragement Enforcement Evaluation Equity	» N/A
Expand the A2, Be Safe! Program , including communications and educational materials explaining safety-related infrastructure projects and targeting specific dangerous behaviors.	Communications Office Engineering Systems Planning DDA AAPD	Safety	Education Encouragement	» Provide and widely share educational materials for all major safety projects. » Conduct one multi-channel campaign targeting a specific dangerous driving behavior each year .
Work with the University of Michigan to develop and deliver transportation safety messages and educational materials to employees, students, parents, and visitors . Messages should emphasize local regulations and dangerous driving behaviors. Timing should coincide with events and times of year that see large influxes of out-of-town visitors (e.g., football games, move-in periods, graduation).	UM Communications Office Engineering Systems Planning DDA AAPD	Safety	Education Encouragement	» N/A
Develop and deploy an annual survey to gather feedback on user experience and satisfaction with the transportation system. Survey results can be used to track user attitudes and behaviors from year-to-year and measure the collective impact of new transportation projects. Include key questions that are not answered by existing data sources (e.g., mode of transportation for non-work trips).	Engineering Systems Planning OSI Communications Office DDA U-M	Safety Mobility Accessibility for All Healthy People & Sustainable Places Regional Connectivity	Evaluation	» Deploy survey and publish results each year .
Install bike markings and infrastructure where they are planned during other street construction projects (e.g., street resurfacing or reconstruction, utility projects) . Coordinating improvements for people biking with other construction will reduce costs, limit the disruption the public experiences due to street work, and preserve city assets.	Engineering Public Works System Planning DDA DTE and Utility companies	Safety Mobility Accessibility for All Healthy People & Sustainable Places	Engineering Equity	» Develop formal process to coordinate bicycle improvements with planned construction work within 1 year . » Include 5 miles of bikeway striping in planned projects each year .



Short-Term Strategies

Strategy	Lead/Stakeholders	Values	6 Es	Targets
Continue the annual inventory of bicycle markings and infrastructure condition and prioritize bicycle routes for routine pavement maintenance and begin tracking bicycle detection technology deployment.	Engineering Public Works Systems Planning	Safety Mobility Accessibility for All Healthy People & Sustainable Places	Engineering Encouragement Equity	» Develop prioritization process for routine pavement maintenance including bicycle infrastructure condition within 3 years . » Achieve 80% of bicycle infrastructure (including pavement condition and markings) in good condition within 3 years .
Establish a convenient, low-cost cargo bike rental program for residents and students and a program to provide free bikes to jobseekers and low-income residents.	OSI Systems Planning DDA Common Cycle WBWC Bike Alliance of Washtenaw	Mobility Accessibility for All Healthy People & Sustainable Places	Encouragement Equity	» Establish program for job-seekers and low-income residents within 1 year . » Establish cargo bike rental program within 3 years .
Create a bike and e-bike bulk buy program to make discounted bikes available to all residents. The city will work with local bike shops to organize group purchases of bikes and e-bikes at a discounted rate and pass on these savings to residents.	OSI Engineering Systems Planning DDA WBWC Bike Alliance of Washtenaw	Mobility Accessibility for All Healthy People & Sustainable Places	Encouragement Equity	» Launch first bike and e-bike bulk buy program within 1 year .
Maintain temporary, ADA-compliant, access for pedestrians and bicyclists during all construction projects. Monitor ongoing construction work for compliance with ordinance and issue penalties as necessary. Track number of complaints from residents about bicycle and pedestrian access during construction.	Engineering Public Works Planning AAPD Property Developers	Safety Accessibility for All	Engineering Enforcement Equity	» N/A
Establish a policy to consolidate or eliminate existing curb cuts and minimize new curb cuts during construction and development projects to increase pedestrian safety and reduce congestion.	Engineering Planning MDOT City Council Property Owners & Developers	Safety Mobility Accessibility for All	Engineering	» Establish a policy within 3 years .



Short-Term Strategies

Strategy	Lead/Stakeholders	Values	6 Es	Targets
Design a school commuting survey and launch survey in all public and private schools. Deploy survey every other year to track trends regarding which modes of transportation children use to get to school.	AAPS Engineering Systems Planning Private Schools Washtenaw County Public Health	Safety Mobility Accessibility for All Healthy People & Sustainable Places	Evaluation	» Develop and launch school commuting survey within 3 years .
Develop school commuting programs and designated walking/biking routes for individual schools.	AAPS Engineering Systems Planning Private Schools Washtenaw County Public Health	Safety Mobility Accessibility for All Healthy People & Sustainable Places	Encouragement Education	» Establish individualized commuting programs and walking/biking routes within 10 AAPS schools within 3 years .
Evaluate and improve sidewalks, crossings, bike infrastructure, and traffic calming along designated school walking/biking routes.	Engineering AAPS Systems Planning Private Schools	Safety Mobility Accessibility for All Healthy People & Sustainable Places	Engineering	» Evaluate conditions at all schools within 3 years . » Make improvements at 3 schools each year .
Develop a standard school traffic calming toolkit and work with AAPS to implement.	Engineering AAPS Systems Planning Private Schools AAPD	Safety Mobility Accessibility for All Healthy People & Sustainable Places	Engineering Enforcement	» Develop school traffic calming toolkit within 3 years . » Make improvements at 3 schools each year .
Develop programs to support strategies that contribute to a walkable, pedestrian-friendly environment, such as ground-floor retail. Focus the program on small and local businesses.	Planning DDA Systems Planning A2Y Chamber	Healthy People & Sustainable Places	Encouragement	» N/A



Short-Term Strategies

Strategy	Lead/Stakeholders	Values	6 Es	Targets
Add vegetation to streetscapes to support the comfort, pleasure, safety, and health of people using the streets. Incorporate vegetation as a form of separating bikeways and sidewalks from traffic, around transit stops, and in high volume pedestrian areas.	Engineering Systems Planning Planning OSI Parks Forestry	Healthy People & Sustainable Places	Engineering	» N/A
Develop neighborhood resilience hubs as community-serving facilities augmented to support residents and coordinate resource distribution and services before, during, or after a natural hazard event. For transportation, resilience hubs can be spaces to engage with residents and co-locate transportation options (e.g., bike share, car share, electric scooter share, vehicle charging).	OSI Engineering Systems Planning	Accessibility for All Healthy People & Sustainable Places	Encouragement Education Equity	» Launch first resilience hub within 3 years .
Expand short-term and long-term bicycle parking throughout the city. Build more bike racks and storage facilities at high-demand locations and within parking garages. Add bike parking to transit centers and busy bus stops. Install bike corrals as part of curb management policy/ programs.	Engineering Systems Planning Planning OSI Public Works DDA	Accessibility for All Mobility Healthy People & Sustainable Places	Engineering	» N/A
Focus bicycle infrastructure investments that support regional connectivity. The City should participate in regional planning, advocate for and prioritize investments that maximize the connectivity to regional connections such as the Border-to-Border Trail, and also work to establish new regional corridors such as a potential better connection to Saline and other areas in southern Washtenaw County.	Engineering WATS Systems Planning WBWC MDOT SEMCOG	Regional Connectivity Mobility Accessibility for All Healthy People & Sustainable Places	Engineering Enforcement	» N/A
Expand the City’s bicycle and pedestrian counting program. Collect bicycle and pedestrian counts at more locations and more frequently throughout the year. Coordinate with WATS’ and SEMCOG’s bicycle and pedestrian count programs for consistent data across time periods and geographies.	Engineering Systems Planning WATS SEMCOG	Mobility Healthy People & Sustainable Places	Evaluation	» Increase locations with documented bicycle and pedestrian counts each year . » Install a stationary counter along one priority corridor within 5 years .



Short-Term Strategies

Strategy	Lead/Stakeholders	Values	6 Es	Targets
Increase amenities at transit stops , beginning with high ridership routes. Upgrade transit stop amenities at transit centers and on signature routes to include shelters, seating, real-time arrival displays, covered bike parking, and lighting.	AAATA U-M Engineering Systems Planning DDA	Mobility Accessibility for All Healthy People & Sustainable Places	Engineering Encouragement	» N/A
Establish curbside management policies downtown , including method for allocating space and determining pricing.	DDA Engineering Systems Planning OSI Planning	Mobility Accessibility for All Healthy People & Sustainable Places	Engineering Encouragement	» Establish curbside management policy within 2 years
Develop a program to allow alternate uses of on-street parking . The City can identify corridors or blocks where street space currently used for parking could be converted to other amenities such as seating, public art, landscaping or bike parking. Start the program downtown, but also consider other neighborhood or commercial zones.	DDA Engineering Systems Planning Planning OSI Public Works	Healthy People & Sustainable Places	Engineering Encouragement	» Adopt guidelines within 2 years » # of parklets installed per year » # of bike parking corrals installed per year
Coordinate with agency partners who own, operate, and manage infrastructure within the city to plan, build and operate at the city’s standards .	Engineering MDOT Washtenaw County U-M AAATA	Safety Accessibility for All	Engineering	» N/A
Work with other departments to deploy a connected network of sensors to increase available data related to heat, air quality, and traffic noise . Obtain the hardware, software and staff needed for data collection and processing, and work with the community to install sensors throughout the city. Make the data publicly available and use it to track indicators like air quality over time.	IT OSI Engineering Systems Planning Planning Public Works	Healthy People & Sustainable Places	Evaluation	» Deploy 50 sensors within 3 years.



Short-Term Strategies

Strategy	Lead/Stakeholders	Values	6 Es	Targets
Create shared street spaces in strategic areas in the downtown.	DDA Engineering OSI Public Works Commission on Disability Issues	Healthy People & Sustainable Places Mobility Accessibility for All Safety	Engineering	» N/A
Publish a public annual update on the Vision Zero program, including actions completed in the previous year, latest crash statistics and safety trends, and key performance metrics .	Transportation Commission Engineering Systems Planning Public Works AAPD Communications	Safety	Evaluation	» Publish an update each year .
Formally review crash data each year to verify focus corridors and intersections, dangerous behaviors, and identify emerging trends .	Engineering Systems Planning AAPD WATS SEMCOG MSP	Safety	Evaluation	» Include results of formal crash review in annual update on Vision Zero program.
Adopt transit-supportive zoning and site design principles that encourage active transportation and transit, particularly along signature transit corridors. Good site design principles could include restricting auto-oriented land uses such as drive-throughs, setting parking maximums, or incorporating bike share stations.	Planning Engineering AAATA	Accessibility for All Healthy People & Sustainable Places	Encouragement Engineering	» Adopt transit supportive zoning by 2022 .
Evaluate the impact of increased freight traffic and local deliveries on the safety, health, and livability of Ann Arbor residents, visitors, and businesses and explore options to lessen the impact of truck traffic to the local community while maintaining the economic support to businesses and convenience to individuals.	Systems Planning Engineering DDA AA Chamber of Commerce WATS SEMCOG	Accessibility for All Healthy People & Sustainable Places Safety	Evaluation	» Study freight impacts by 2022 .



Medium-Term Strategies

Strategy	Lead/Stakeholders	Values	6 Es	Targets
+Continue increasing transit service to improve frequency and consistency.	AAATA U-M Engineering Systems Planning OSI DDA	Mobility Accessibility for All Regional Connectivity	Encouragement	» 15-minute effective frequency throughout the day on signature transit corridors by 2023 » 30-minute effective frequency throughout the day on secondary corridors by 2030 » 66% of Ann Arbor residents within a ¼ miles of a high frequency transit route by 2023
+Improve multimodal access to transit stops.	AAATA (for full list of partners, see p. 99)	Mobility Accessibility for All Regional Connectivity Healthy People & Sustainable Places	Engineering	» 100% of bus stops meet ADA standards by 2025 » Upgrade amenities at all stops on signature transit corridors by 2025 » Establish 1 mobility hub by 2023 » Create 3 additional mobility hubs by 2030
+Expand commuter-oriented transit services.	AAATA (for full list of partners, see p. 101)	Regional Connectivity Mobility	Encouragement	» Increase share of people commuting into Ann Arbor on transit to 20% by 2030 » Expand spaces at park and ride lots to more than 10,000 by 2030
+Ensure that all residents have access to basic daily needs within a 20-minute walk.	Planning (for full list of partners, see p. 113)	Healthy People & Sustainable Places Mobility Accessibility for All	Encouragement Equity	» Update the zoning code to encourage mixed uses in residential neighborhoods and more housing in locations with good access to basic daily needs within 5 years. » 100% of Ann Arbor residents live within a 20-minute walk of basic daily needs within 10 years.
+Expand adaptive signal technology and implement connected infrastructure.	Engineering (for full list of partners, see p. 123)	Mobility Regional Connectivity	Engineering	» Install adaptive signals and additional connected infrastructure upgrades on all corridors with >20,000 ADT by 2030

+ denotes a key strategy



Medium-Term Strategies

Strategy	Lead/Stakeholders	Values	6 Es	Targets
Work with state agencies to refine statewide driver education and testing . Incorporate a greater focus on pedestrian and bicyclist safety and the risks of speeding and other dangerous driving behaviors.	Engineering MDOT MSP State Representatives WATS SEMCOG	Safety	Education	» N/A
Partner with AAPD to improve and refine crash data collection and sharing . Work to improve the speed at which data is shared and standardize how key fields like speeding and distracted driving are entered into crash reports.	Engineering AAPD MSP WATS SEMCOG Systems Planning	Safety	Evaluation	» N/A
Develop a traffic safety ambassador program. Traffic safety ambassadors attend and organize local events to provide education and encouragement around all forms of traffic and transportation. Ambassadors may also develop presentations for schools, senior centers, and other important locations. Programs should pair encouragement with resources, for example helmet give-aways along with education about the importance of wearing helmets.,	Engineering Systems Planning AAPD AAPS U-M Office of Communications	Safety	Equity Encouragement Education	» Hire first cohort of community safety ambassadors within 5 years .
Work with AAPS to establish mobility and sustainability education programs . Develop programs for elementary, middle, and high school students that empower students to walk, bike, and use transit.	AAPS Engineering Systems Planning Safe Kids Private schools U-M, U-M Health	Safety Mobility Accessibility for All Healthy People & Sustainable Places	Education Encouragement	» Launch program in 3 schools within 5 years . » Program operating in all schools within 10 years .
Evaluate additional opportunities (e.g., removing slip lanes, simplifying complex intersections) to reallocate right-of-way for public gathering space . Locations like slip lanes and complex intersections often pose safety challenges and can be redesigned to create more room for public gathering space. These changes can often be made with minimal or no impact on vehicle traffic.	Engineering Systems Planning Planning OSI Parks Public Works U-M DDA	Safety Healthy People & Sustainable Places	Engineering Encouragement	» Complete assessment within 5 years .



Medium-Term Strategies

Strategy	Lead/Stakeholders	Values	6 Es	Targets
Minimize the impact of delivery vehicles on safety and efficiency within the right- of- way. In busy corridors and the downtown, establish temporal restrictions that limit deliveries during peak times, and also clearly sign and re-evaluate dedicated loading zones.	Engineering DDA MDOT Public Works	Safety Mobility	Enforcement Engineering	» N/A
Prioritize street maintenance and facility improvements in vulnerable communities. Incorporate measures of equity and vulnerability, such as % of low-income households, % of minority residents, or % of zero-car households, into the selection criteria for capital projects.	Systems Planning Engineering Planning Public Works	Accessibility for All	Equity	» Update criteria for capital project prioritization to include equity measures within 5 years .
Expand education to residents and businesses on City's sidewalk snow and ice removal ordinance, related standards, and responsibilities, including curb ramp snow clearance. Launch an awareness campaign on winter maintenance of transportation routes, in similar fashion to the City's A2 Be Safe initiative. Provide informational materials on the City's website, on social media, and in-print at relevant locations around the city. Partner with relevant organizations to disseminate informational materials.	Public Works Communications Engineering Systems Planning DDA	Accessibility for All	Education Enforcement	» Launch winter maintenance awareness campaign within 5 years . » Reduced number of complaints/citations related to snow/ice clearance.
Prioritize streets with bicycle routes for snow clearance.	Public Works Engineering	Safety Mobility	Encouragement	» N/A
Address barriers to connectivity for people walking and biking across I-94, US-23, and M-14. Add dedicated bike and pedestrian crossings across I-94, US-23, and M-14, particularly in areas where there are gaps and where there are walkways or bike routes leading up to the highway.	Engineering MDOT Washtenaw County WATS WBWC	Regional Connectivity Safety Mobility	Engineering	» Install improvements for people walking and biking at 5 highway crossings within 10 years .



Medium-Term Strategies

Strategy	Lead/Stakeholders	Values	6 Es	Targets
Re-evaluate, and where possible, make pedestrian phases automatic at traffic signals . Phase out pedestrian crossing signals requiring activation, particularly in portions of the City where pedestrian demand is high.	Engineering Public Works DDA MDOT	Accessibility for All	Engineering	» Convert all pedestrian-activated signals to automatic within 10 years .
Develop an annual Open Streets program that closes streets to cars, and opens them for walking, biking, pop-up shops, restaurants, and public gathering space on select days. Host Open Streets events in different parts of the City each year.	Systems Planning Engineering Planning, DDA, U-M, Neighborhood Associations, WBWC, OSI, Chamber of Commerce	Healthy People & Sustainable Places	Encouragement Education	» Organize 3 Open Streets events per year, distributed throughout the city, within 5 years .
Expand use of pervious pavement in parking lots and plazas and explore use of pervious pavement in alleys and parking lanes. Identify sites best-suited for pervious pavement installation and monitor performance over the pavement's lifetime.	Public Works Engineering DDA U-M	Healthy People & Sustainable Places	Engineering	» N/A
Establish criteria for connected street networks in new developments and connectivity between developments. Criteria may include: » Average/maximum intersection spacing » Maximum block sizes » Discouraged cul-de-sacs, gated communities, and restricted access roads » Required pathway connections » Required multiple access connections » Required minimum connectivity measures or incentive for high connectivity (e.g., links per node, intersections per square mile, block perimeter, block length, % of lots inaccessible if one street is blocked, % of destinations within a distance of nodes) » Required street “stubs” to connect into future developments	Planning Engineering Systems Planning Private Developers	Mobility Accessibility for All Healthy People & Sustainable Places	Engineering	» Amend Unified Development Code to include new criteria within 5 years .



Medium-Term Strategies

Strategy	Lead/Stakeholders	Values	6 Es	Targets
<p>Update transportation impact analysis for developments to better incorporate all modes and prioritize reduction of vehicle trips toward 50% VMT reduction. Revise standards for transportation impact analyses to reduce or eliminate the focus on congestion mitigation and the sufficiency of parking, and instead assess prioritization of access for sustainable transportation modes and evaluate potential impacts and mitigation measures related to any increase in overall vehicle miles traveled.</p>	<p>Engineering Planning</p>	<p>Healthy People & Sustainable Places Mobility Accessibility for All</p>	<p>Evaluation Encouragement Engineering</p>	<p>» Update transportation impact analysis standards within 5 years.</p>



Long-Term Strategies

Strategy	Lead/Stakeholders	Values	6 Es	Targets
Seek opportunities to convert fire and emergency response vehicles to smaller models . Large vehicles pose a greater risk to safety and can present a challenge when attempting to redesign streets with narrower lanes and smaller curb radii (which can improve safety).	Engineering AAFD AAPD U-M Health OSI Systems Planning	Safety Mobility Accessibility for All	Engineering Encouragement	» N/A
Address all remaining gaps in the sidewalk system on local roads.	Engineering Systems Planning Public Works	Accessibility for All Safety Mobility Healthy People & Sustainable Places	Engineering	» Address 95% of sidewalk gaps on local roads by 2040 .
Investigate ‘smart’ technologies for pedestrian crossing systems (e.g., passive detection, data collection, adaptive phases based on presence/demand). Install/utilize sensors and cameras to activate pedestrian phases or signal to other traffic that a pedestrian is crossing.	Engineering OSI DDA U-M	Safety Mobility Accessibility for All	Engineering	» Increase the number of intersections with ‘smart’ pedestrian crossing technology
Digitize regulations and uses of curb space (e.g., parking, loading) and plan for digital communication between the curb and vehicles. Install adaptable signage that can change to allow different uses at different times of the day. Install sensors and use the data collected to provide real-time curb availability information and to set parking prices. Provide curb information via an app such as ePark Ann Arbor.	DDA ePark Ann Arbor Engineering U-M OSI Systems Planning	Mobility	Engineering Enforcement	» N/A



Long-Term Strategies

Strategy	Lead/Stakeholders	Values	6 Es	Targets
Utilize technology in downtown and along commercial corridors to manage the allocation, pricing, and use of curb space . Test different parking occupancy detections solutions including in-ground sensors, automatic license plate readers (ALPRs), and closed circuit television (CCTV) cameras. Establish data collection systems from sources such as detectors, transactions, and citations and use the data to provide real-time parking/curb availability information and to set parking prices.	DDA OSI Engineering U-M	Mobility	Engineering Enforcement	» Track parking utilization rate
Work with TheRide to expand capacity at the Blake Transit Center . Develop additional, conveniently-accessed capacity at and around the Blake Transit Center by repurposing street and sidewalk space around the current facility. Collaborate with TheRide to determine long-term needs for space to accommodate both vehicles and customers.	AAATA Engineering Planning Systems Planning DDA	Mobility	Engineering	» N/A



What Could Our Streets Look like?

Concept plans were developed for four focus corridors and four focus intersections to represent examples of how the city can use many of the tools highlighted throughout this plan to create safer streets, enhance transit operations, and create a better experience for people walking and biking.

The corridors and intersections demonstrated are among the Tier 1 corridors and intersections identified through the safety analysis. A subset of these was selected as areas of focus based on existing characteristics of factors including the pedestrian activity, bicycle level of comfort, transit ridership, and traffic congestion and reliability. The corridors and intersections were also selected to represent a broad base of roadway characteristics and types, so that the treatments demonstrated here could be applied to similar corridors and intersections throughout Ann Arbor. Two of each are included in this section of the plan and the remaining can be found in the Appendix.

The concepts are intended to provide ideas for future improvements, focused on improving the safety of all roadway users. Additional analysis will be necessary in many cases to carry each project forward.

Focus Corridors

1. Plymouth Road (Murfin Avenue to US-23)
2. Washtenaw Avenue (Stadium Boulevard to US-23)
3. Miller Avenue (Downtown to M-14)
4. Main Street (Huron Street to Ann Arbor-Saline Road)

Focus Intersections

1. Washtenaw Avenue and Hill Street
2. Liberty Street and Division Street
3. Ann Street and Glen Avenue
4. Packard Road and Platt Road

Next Steps

- ☐ Conduct traffic analysis, where necessary
- ☐ Review and analyze alternatives
- ☐ Engage community in needs assessment and alternatives evaluation
- ☐ Finalize preferred concept and design
- ☐ Secure funding

A History of Safety-Driven Design

The City of Ann Arbor has long focused on safety and ensuring mobility for pedestrians and bicyclists, maintaining a Complete Streets design philosophy. The following pages provide a brief overview of projects currently underway that are driven by the same goals that have guided this plan.

Imagining Our Streets

Meeting the ambitious goals of zero traffic deaths and injuries and zero emissions from our transportation system will require rethinking how we design our streets and the priorities that guide our decision making. Ann Arbor's number one priority when it comes to our streets is that they are safe and accessible for everyone. We will never place the speed and convenience of cars above the safe movement of people.

5

What Could Our Streets Look Like?



South State Street Corridor: Ellsworth Road to Oakbrook Drive

South State Street is a heavily traveled corridor connecting the City of Ann Arbor to Pittsfield Township to the south, providing regional connections via an interchange at I-94. A Complete Street redesign will address inconsistencies in sidewalk widths and existing configuration of medians, traffic lanes, and access points and achieve the following goals:

- » Provide **safe** conditions for all travelers
- » Create a more attractive **entry** to the city
- » Improve conditions for **pedestrians** along/across State Street
- » Provide a safe place for **bicyclists** separate from travel lanes
- » Enhance **transit** conditions through traffic flow and stop accessibility
- » Maintain reasonable **traffic** operations along the corridor
- » Support planned **land use**
- » Ease **access** to corridor businesses

Timeline: **Short** (0-3 years)

Nixon Road Corridor: Huron Parkway to M-14

The Nixon Road Corridor Study alternatives evaluation culminated in a roundabout corridor concept that will add roundabouts at various locations along the corridor to improve non-motorized conditions, safety, and operations.

Project goals:

- » Improve safety
- » Increase non-motorized facilities
- » Reduce user delays and improve capacity



Project Area 1 Concept: Huron Parkway to Sandalwood Circle

Timeline: **Short** (0-3 years)

North Main Street Corridor: Huron Street to M 14

Main Street is the primary access route into downtown from the north. MDOT, who owns and operates the street, is planning a reconstruction of the corridor, which will incorporate components of the city’s vision for the corridor, set forth by the North Main-Huron River Corridor Task Force. The task force envisioned a corridor that is more inviting to pedestrians and bicyclists, eases traffic congestion, and provides better connections to the Huron River and riverside amenities. Bicycle connections proposed by the task force have been incorporated into the proposed all ages and abilities bike network.

Before and After concepts from the North Main-Huron River Corridor Task Force Report, September 2013



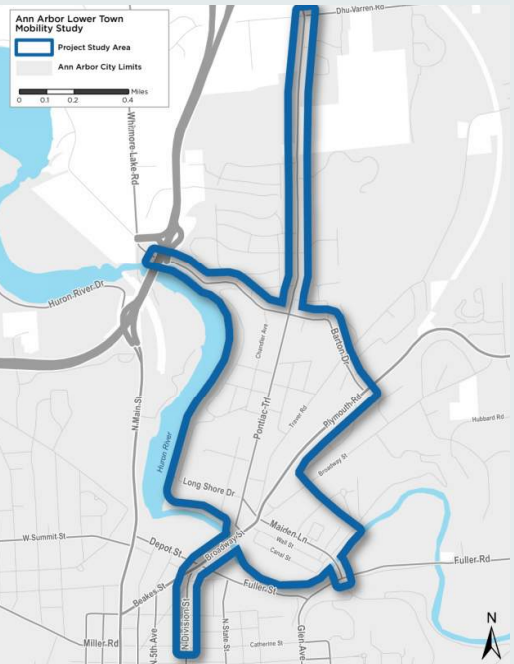
Timeline: **Medium** (4-10 years)

Lower Town Mobility Study

The Lower Town Mobility Study is in the beginning phases, working to understand how the effects of growth and development in the area impact traffic flow and movement of people using all modes – driving, public transit, walking, and biking; and to improve safety and traffic flow for all users. The study began in October 2019 and is anticipated to take 24 months, including a robust public engagement process.

Maintaining safe access for all modes is a key goal of the study.

Timeline: **Short** (0-3 years)



Lower Town Mobility Study Area

Washtenaw & Hill

Objective: Enhance pedestrian and bicycle connectivity on Hill Street crossing Washtenaw Avenue.

Current Conditions

Crashes (2014-2018)

- » 148 crashes (3 involving pedestrians; 2 involving bicyclists)

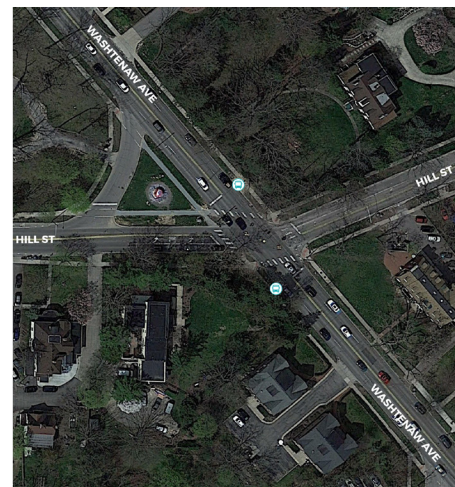
Traffic Volumes

- » 900 pedestrians/day
- » 300 bicyclists/day
- » 16,051 vehicles/day

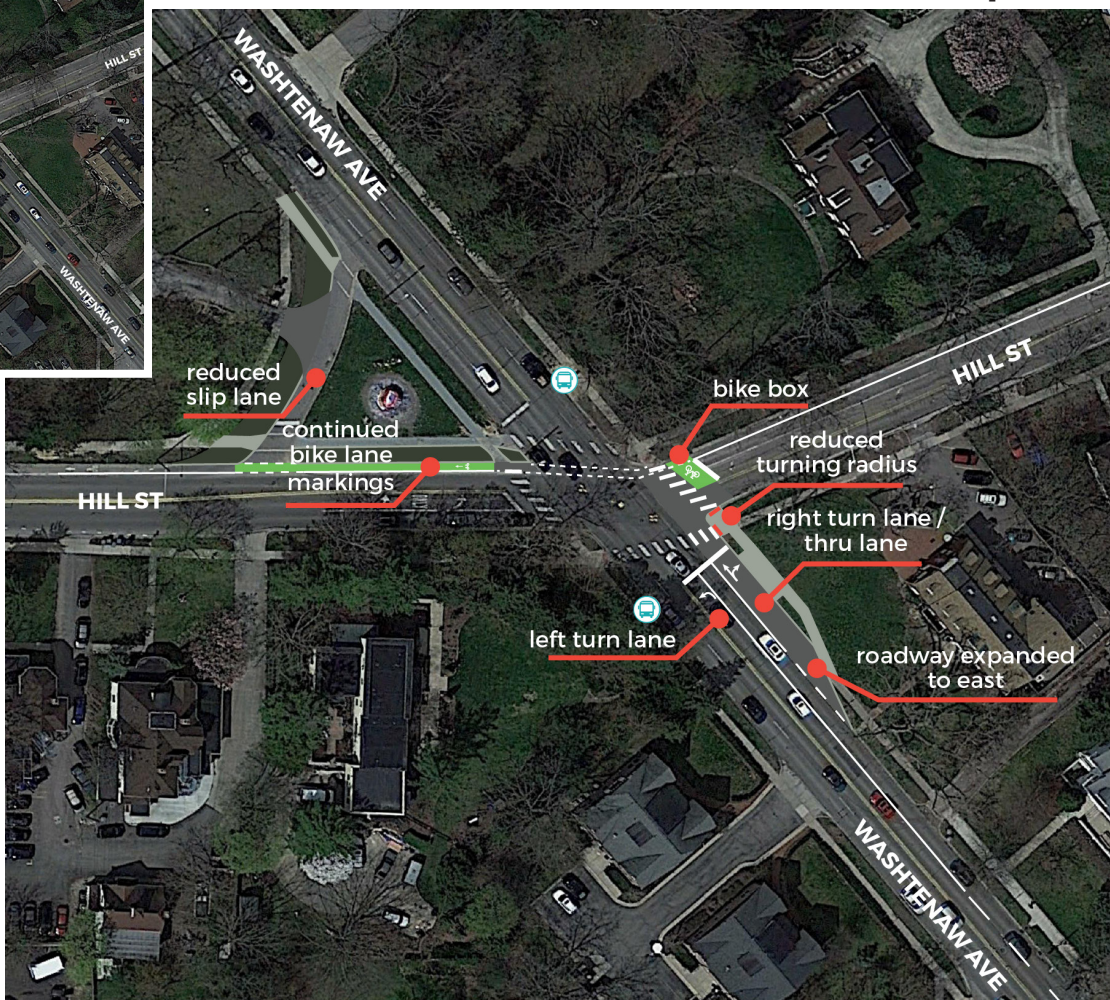
Key Needs

- ✓ Reduced vehicle speeds
- ✓ Safer turning movements from Washtenaw Avenue onto Hill Street
- ✓ Continuous bike route on Hill Street and safe crossing across Washtenaw Avenue

Existing



Proposed



Plymouth Road

Murfin Avenue to US-23

The Plymouth Road corridor, from Murfin Avenue to US-23, is a five-lane arterial with significant transit service activity. There is a shared use path from Broadway Street to Commonwealth Boulevard and a bike lane from Murfin Avenue to Green Road.

The University of Michigan is a significant property owner and stakeholder along much of this corridor. Collaboration with the University on any design along Plymouth Road will be a critical next step in advancing any project.

Primary objectives:

- » Provide a continuous and more comfortable bike route
- » Provide safer and more comfortable connections for pedestrians across Plymouth
- » Improve transit accommodations

Current Conditions

Crashes (2014-2018)

- » 707 total crashes
- » 4 pedestrian or bicyclist serious injuries

Transit Service

- » 3 AAATA Routes (22, 23A/B, 65)

Bicycle and Pedestrian Accommodation

- » Bike lane and/or sidepath
- » Sidewalks
- » Bike Level of Traffic Stress (LTS) 3-4

Traffic Volumes

- » Pedestrian counts range from ~700/day at Murfin Avenue to ~500/day between Nixon to Huron Parkway to ~60/day at Green Road
- » 25,000 - 27,000 vehicles/day

Key Needs

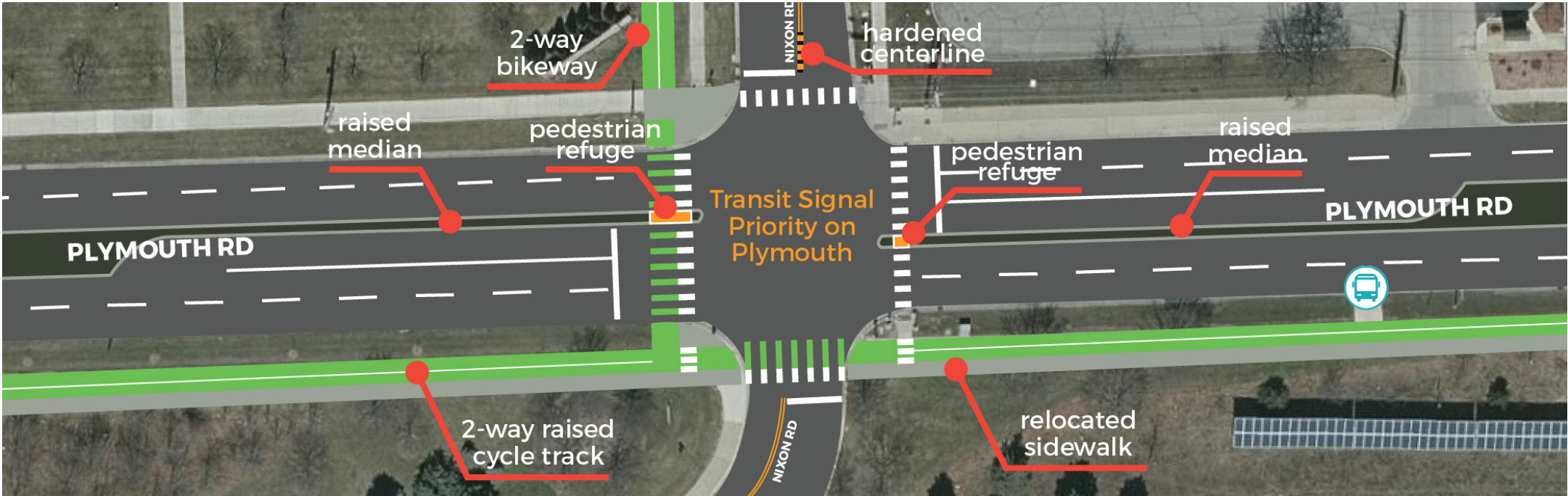
- ✓ Reduced vehicle speeds
- ✓ Additional crosswalks accompanied by appropriate safety measures
- ✓ Continuous bike route that is comfortable and safe for people of all ages and abilities
- ✓ Improved transit travel times and additional amenities for people using transit



Plymouth Road

Murfin Avenue to US-23

Proposed (Plymouth Road at Nixon Road)



Existing (Plymouth Road at Nixon Road)

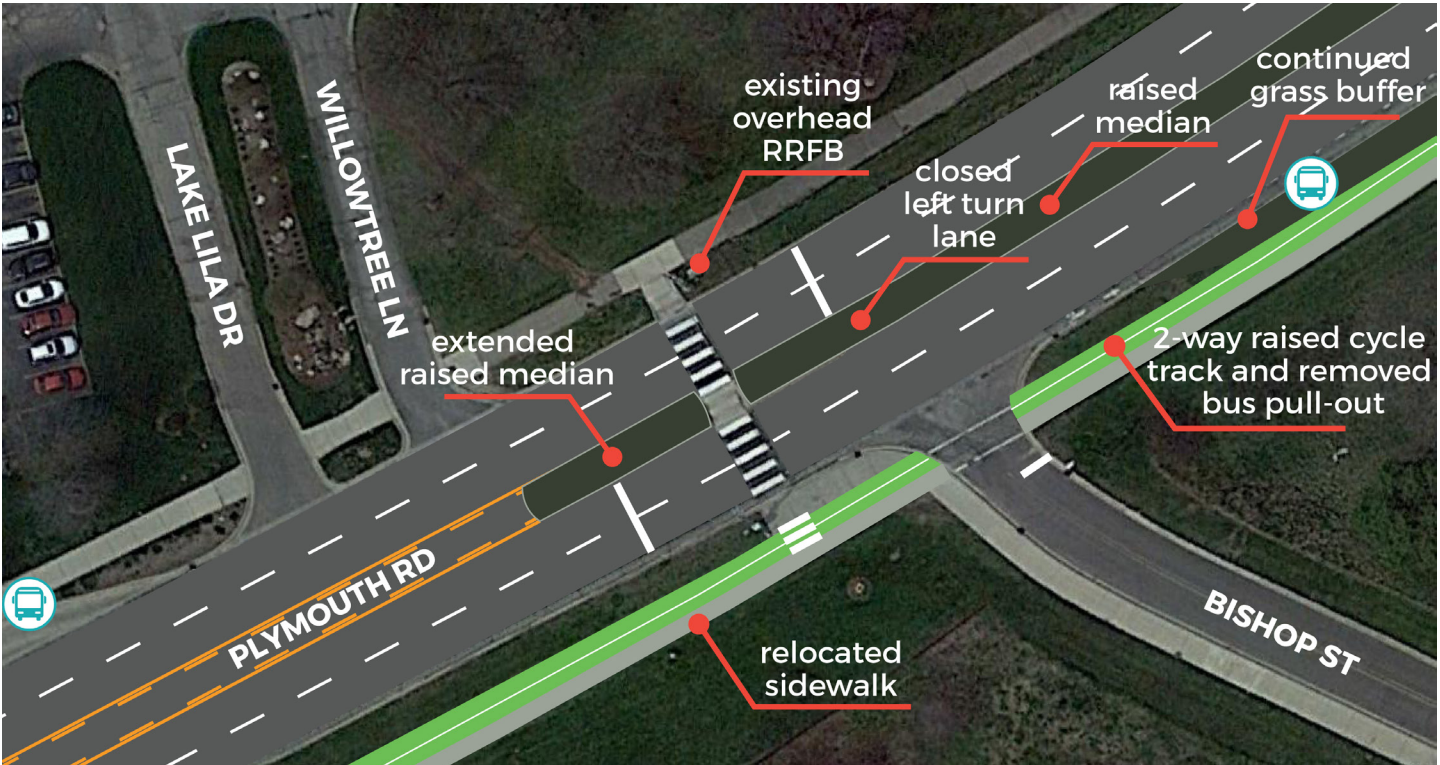


- Additional Improvements
- Establish pre-paid and all-door boarding at hubs
 - Consolidate driveways to minimize conflict points (Prairie - Murfin)
 - Reduce curb radii to shorten crossing distances for pedestrians
 - Additional street trees, landscaping, and street furniture

Existing (Plymouth Road at Bishop Street)



Proposed
(Plymouth Road at Bishop Street)



Washtenaw Avenue

Stadium Boulevard to US-23

Washtenaw Avenue connects Ann Arbor’s downtown to Ypsilanti. Washtenaw Avenue is a Michigan Department of Transportation road with a shared use path from Brockman Boulevard to Huron Parkway. While the entirety of Washtenaw Avenue is an important corridor, the area of focus, from Stadium Boulevard to US-23, captures an area of high stress for people walking, biking, driving, and using transit.

Objectives:

- » Address safety incidents at intersection and non-intersection locations
- » Incorporate transit priority elements
- » Facilitate crossings and alleviate short vehicle trips where possible

Current Conditions

Crashes (2014-2018)

- » 1,056 total crashes
- » 3 pedestrian or bicyclist serious injuries

Transit Service

- » 3 AAATA Routes (24, 4A/B, 66)

Bicycle and Pedestrian Accommodation

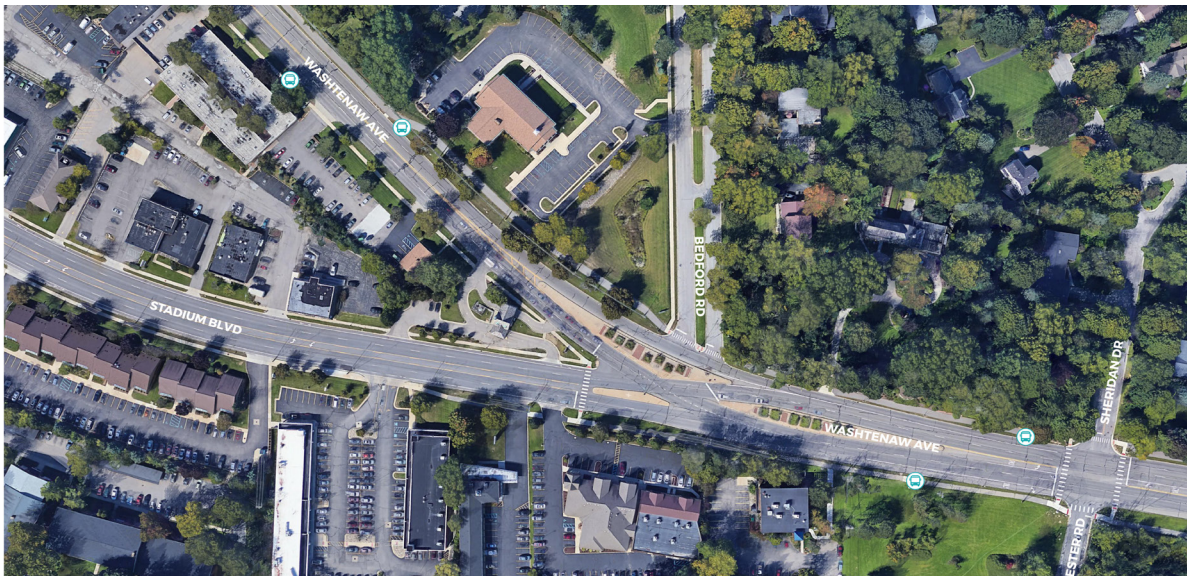
- » LTS 3
- » Sidewalks throughout

Traffic Volumes

- » 15,000 - 31,600 vehicles/day

Key Needs

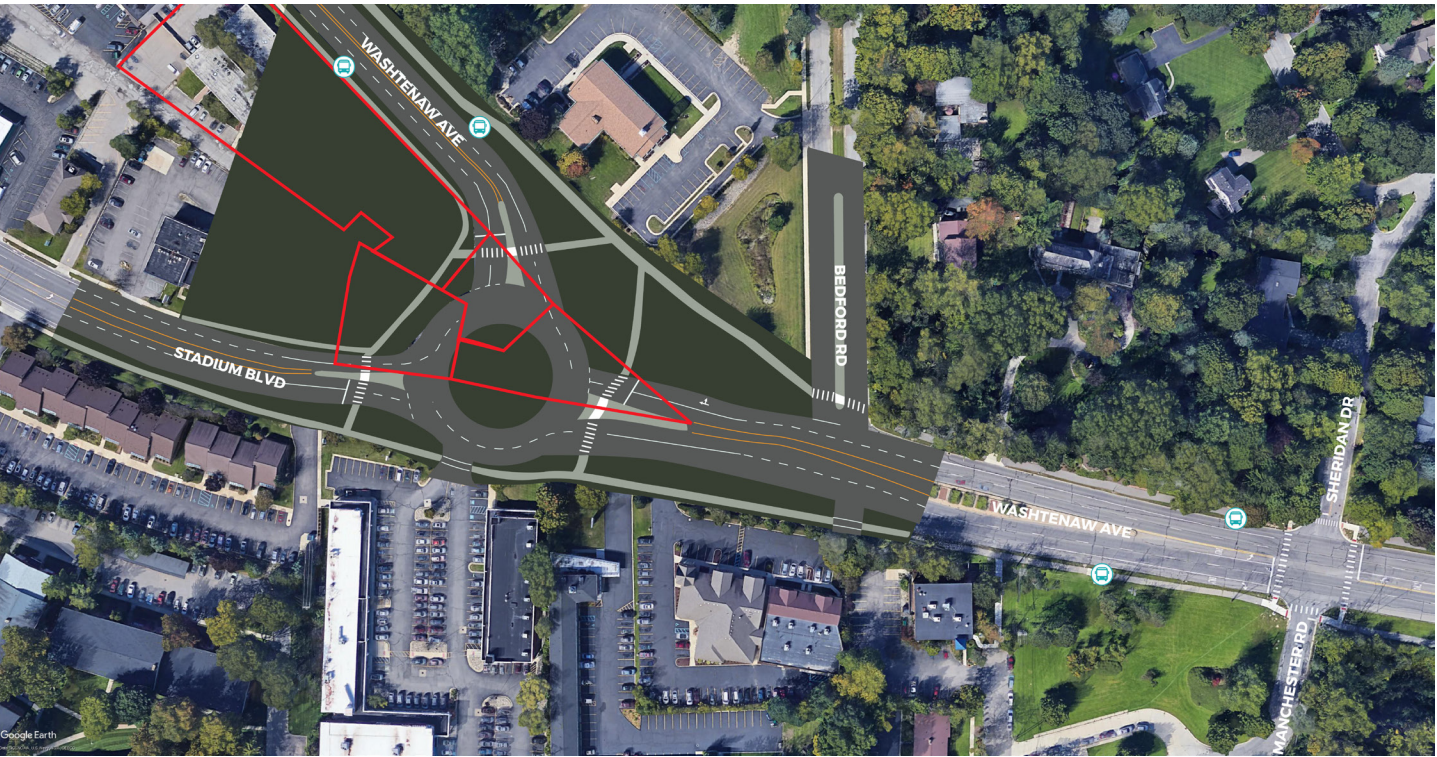
- ✓ Reduce conflicts at driveways
- ✓ Reduced vehicle speeds
- ✓ More crosswalks accompanied by appropriate safety measures
- ✓ Improved transit travel times and additional amenities for people using transit
- ✓ Reduce vehicle delay



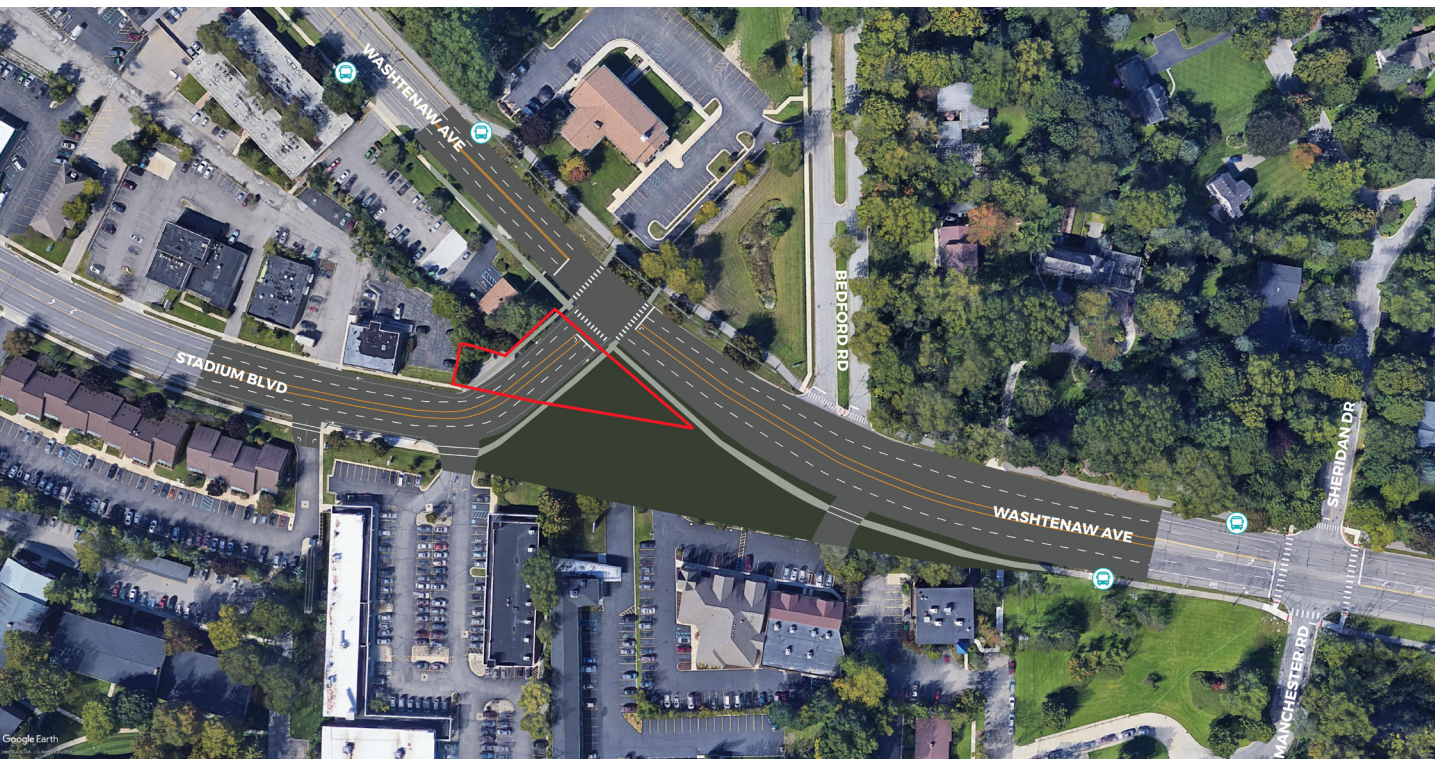
Existing

(Washtenaw Avenue & Stadium Boulevard)

Proposed Roundabout Option (Washtenaw Avenue & Stadium Boulevard)



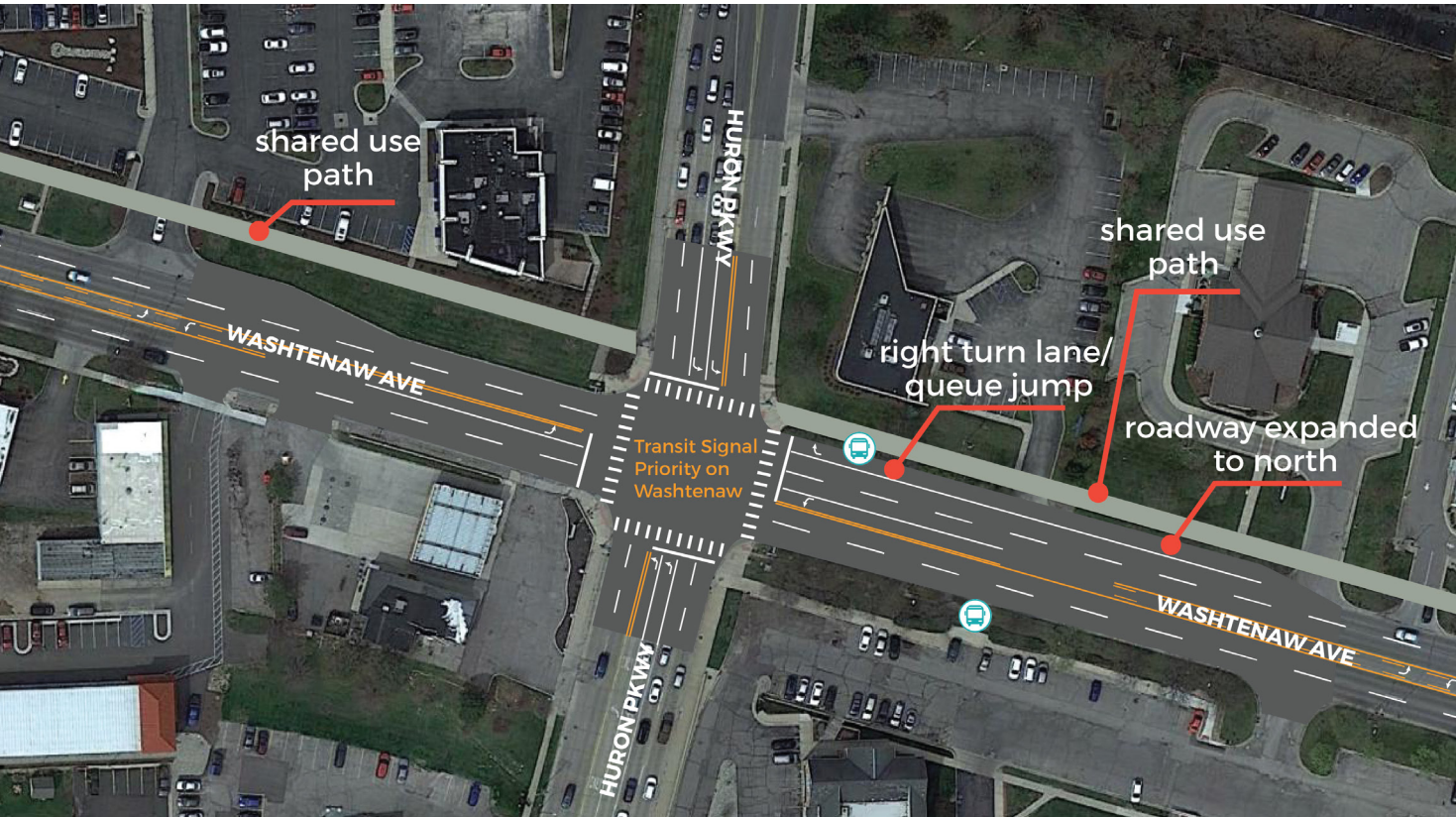
Proposed T-intersection Option (Washtenaw Avenue & Stadium Boulevard)



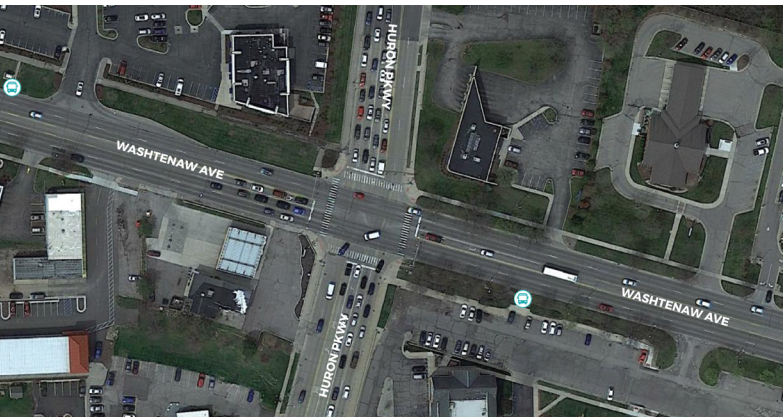
Washtenaw Avenue

Stadium Boulevard to US-23

Proposed (Washtenaw Avenue & Huron Parkway)



Existing (Washtenaw Avenue & Huron Parkway)



Additional Improvements

- ✓ Reduce speed limit to 30 mph
- ✓ Increase bus frequency to at least every 15 minutes throughout the day
- ✓ Provide additional amenities at bus stops (based on ridership):
 - » Shelters and/or benches
 - » Real-time arrival information
 - » Expand Plymouth Road Park and Ride lot
 - » Establish pre-paid and all-door boarding at hubs
- ✓ Consolidate driveways to minimize conflict points

Liberty & Division

Objectives: Slow vehicle speeds; better accommodate bicyclists and pedestrians.

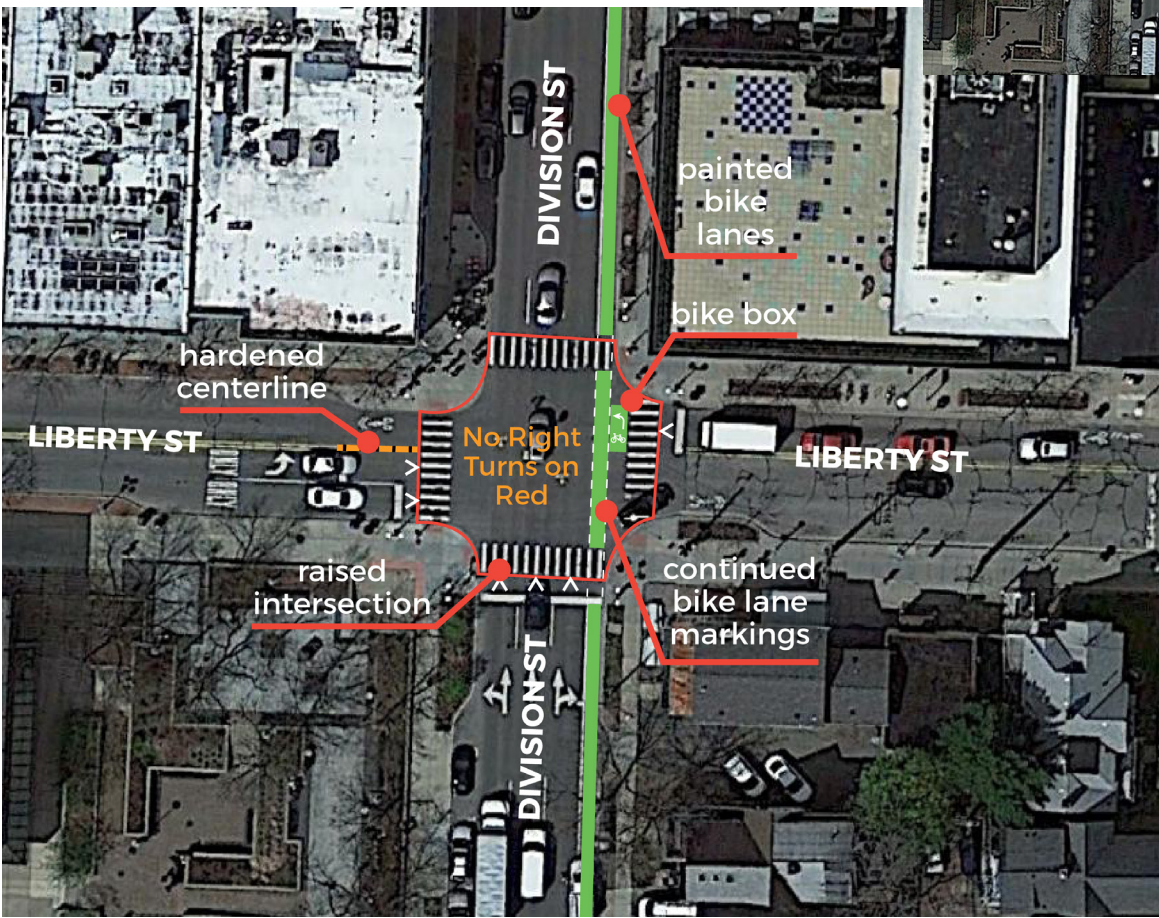
Current Conditions

- Crashes (2014-2018)**
- » 76 crashes (4 involving pedestrians; 4 involving bicyclists)
 - » Most common types: sideswipe-same direction (34%) and angle (26%)
- Traffic Volumes**
- » 5,400 pedestrians/day
 - » 400 bicyclists/day

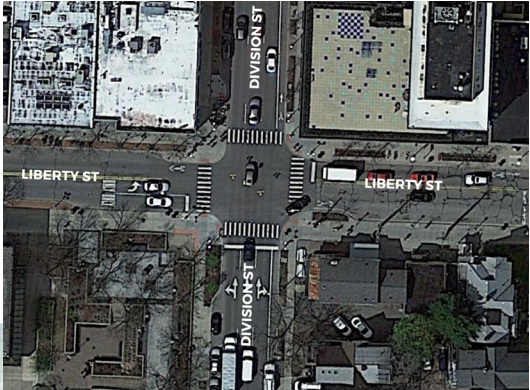
Key Needs

- ✓ Accommodate large numbers of people walking and biking
- ✓ Safer turning movements

Proposed



Existing





How will we make it happen?

Implementation Pathways

Transportation improvements can follow many different avenues to progress from an idea to construction.

Capital Improvement Plan

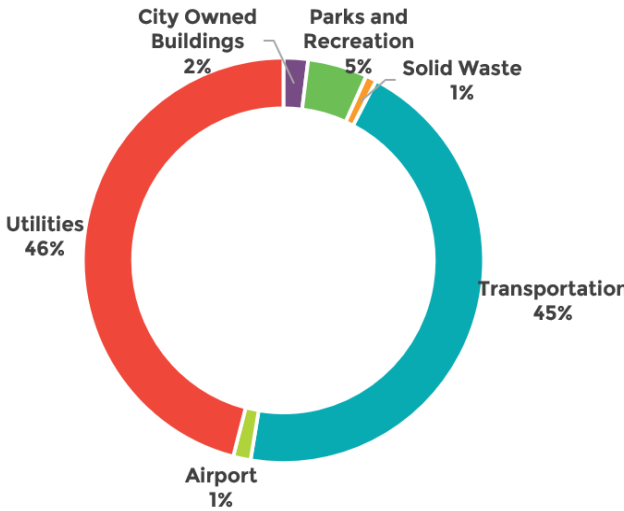
Major projects, like reconstructing a street or adding new sidewalks, typically go through the Capital Improvement Plan (CIP) process, which identifies large (greater than \$100,000) construction or improvement projects that are vital to Ann Arbor. Some projects in the CIP are funded entirely with city money, while others largely rely on outside funding but use city money to meet matching requirements. For example, in the FY2020-2025 CIP 81% of the funding for transit projects came from outside sources.

The city's current CIP runs from the 2021 fiscal year through 2026 and includes more than \$680 million dollars for hundreds of projects. Transportation constitutes a large share of the city's capital funding needs; 45% of the CIP is allocated to active transportation, new streets, parking, street construction, transit, and other transportation projects.

City staff identify potential CIP projects based on citizen requests and input and draw from master plans (like [Ann Arbor: Moving Together](#)).

Potential projects are scored and prioritized based on **8 criteria**:

1. Sustainability framework goals
2. Safety/compliance/emergency preparedness
3. Funding (whether the project has outside funding)
4. Coordination with other projects/agencies
5. Master plan objectives
6. User experience
7. System influence/capacity
8. Operations and maintenance



Asset Group Breakdown in FY2021-2026 Capital Improvement Plan

6

How will we make it happen?



Estimated Capital Investment

The estimated investments outlined here present an order of magnitude cost for each strategy, based on planning-level estimates of the projects, programs, and studies presented throughout this plan. The costs per strategy are then translated into an annual or one-time estimated investment to achieve the stated metrics.

The investments represent an adjustment in the priorities of how resources are currently invested in order to achieve the goals of the community, but are not additive to the

resources already expended. The investments are inclusive of both city and partner agencies, such as MDOT and AAATA.

Additional resources may be needed for select projects.

- \$ <\$100,000
- \$\$ \$100,000 - \$250,000
- \$\$\$ \$250,000 - \$1M
- \$\$\$\$ >\$1M

Note: all costs are based on 2020 dollars.

Strategy & Relevant Metrics	Cost Overview	Estimated Investment
Focus transportation investments on corridors and intersections with the most serious crashes. <ul style="list-style-type: none">» Make improvements on 3 safety focus corridors and/or intersections per year.	\$\$ - \$\$\$\$ per mile \$\$ - \$\$ per intersection	\$3,300,000 annually
Address dangerous driving behaviors using design solutions, policy changes, and education efforts. <ul style="list-style-type: none">» 10 curb extensions per year» Install 5 left-turn traffic calming measures per year» Annual major street traffic calming program	\$ - \$\$ per location	\$500,000 annually
Establish a quick-build safety program. <ul style="list-style-type: none">» Install at least three quick-build safety projects per year, prioritizing focus corridors and intersections.	\$ per location	\$75,000 annually
Address critical gaps in the sidewalk system. <ul style="list-style-type: none">» Complete all remaining near-term sidewalk gaps within 3 years» Complete all sidewalk gaps on major streets within 7 years	\$\$ per mile	\$900,000 annually

Strategy & Relevant Metrics	Cost Overview	Estimated Investment
Enhance safety and visibility at mid-block crossings. <ul style="list-style-type: none">» Enhance 25 per year» Install 10 new per year	\$ per location	\$1,200,000 annually
Plan for and build out a network of low-stress bike routes. <ul style="list-style-type: none">» Install new or upgrade 4 miles of bike routes each year» Develop a wayfinding system	\$\$ - \$\$\$\$ per mile	\$900,000 annually
Make intersections safer and easier to navigate for biking. <ul style="list-style-type: none">» Upgrade at least 4 intersections per year	\$\$ per location	\$600,000 annually
Update and complete the ADA transition plan. <ul style="list-style-type: none">» Complete self-evaluation and update ADA transition plan by 2023.	\$	\$100,000 one time
Partner with mobility service providers to expand transportation options in Ann Arbor.	\$	\$20,000 annually
Continue increasing transit service to improve frequency and consistency.	\$\$\$\$	\$900,000 annually
Prioritize transit reliability and speed along signature service corridors and at key locations. <ul style="list-style-type: none">» Implement transit-priority treatments on Washtenaw Avenue and Plymouth Road/Fuller Road by 2025.» Pilot bus-only lanes downtown by 2023.	\$\$\$\$ per corridor	\$1,500,000 per instance
Improve multi-modal access to transit stops. <ul style="list-style-type: none">» 100% of bus stops meet ADA standards by 2030» Establish 1 mobility hub by 2023» Create 3 additional mobility hubs by 2030	\$ per location \$ per hub	\$100,000 annually



Estimated Capital Investment

Strategy & Relevant Metrics	Cost Overview	Estimated Investment
Expand commuter oriented transit services. » Expand spaces at park and ride lots to more than 10,000 by 2030.	\$ per location	\$75,000 annually
Provide reduced fares for transit and shared mobility services for qualified users.	\$	\$25,000 one time
Price trips according to their impact on the City. » Complete a road user pricing study within three years.	\$\$	\$150,000 one time
Develop city-wide TDM strategy, building off and expanding the GetDowntown program.	\$ per study	\$25,000 one time
Implement new policies to better align parking demand and supplies.	\$ per study	\$25,000 one time
Create shared street spaces in strategic areas in the downtown. » Implement one shared street by 2025 » Create shared streets in two additional locations by 2030	\$\$ - \$\$\$\$ per location	\$1,000,000 per instance
Expand adaptive signal technology and implement connected infrastructure. » Develop ITS Plan by 2024.	\$\$	\$200,000 one time
Monitor advances in automated vehicle technology and evaluate impacts on safety and street design.	\$	\$20,000 annually
Expand commuter oriented transit services. » Expand spaces at park and ride lots to more than 10,000 by 2030.	\$ per location	\$75,000 annually

Strategy & Relevant Metrics	Cost Overview	Estimated Investment
Provide Engineering staff a NACTO training program on pedestrian safety, Vision Zero, and bikeway design. » Training completed within 1 year.	\$ per instance	\$15,000 one time
Expand the A2, Be Safe! Program. » Conduct one multi-channel campaign targeting a specific dangerous driving behavior each year.	\$ per location	\$50,000 annually
Develop and deliver transportation safety messages and educational materials to employees, students, parents, and visitors.	\$	\$15,000 annually
Develop and deploy an annual survey.	\$	\$20,000 annually
Install bike markings and infrastructure with other planned projects. » Include 5 miles of bikeway striping in planned projects per year.	\$ per mile	\$250,000 annually
Establish a convenient, low-cost cargo bike rental program.	\$	\$10,000 annually
Create a bike and e-bike bulk buy program.	\$\$ - \$\$\$\$ per location	\$10,000 annually
Develop school commuting programs. » Establish individualized commuting programs and walking/biking routes at 10 schools within 3 years.	\$ per location	\$25,000 annually
Evaluate and improve sidewalks, crossings, bike facilities, and traffic calming along designated school walking/ biking routes. » Make improvements at 3 schools per year	\$ per location	\$90,000 annually



Estimated Capital Investment

Strategy & Relevant Metrics	Cost Overview	Estimated Investment
Develop a standard school traffic calming toolkit and work with AAPS to implement. » Make improvements at 3 schools per year	\$ per location	\$45,000 annually
Update driver education training for city staff. » 100% of city staff complete training within 3 years » Driver training fo professionally licensed drivers updated within 5 years	\$ per instance	\$20,000 annually
Develop a community safety ambassador program.	\$\$	\$100,000 annually

Project Development & Coordination

Ann Arbor remains committed to following a Complete Streets approach to street design so that street users of all ages and abilities and using any mode of transportation can safely, comfortably travel on city streets. Developing a Complete Streets Checklist will better institutionalize the necessary steps staff must take at various points in the project development and delivery process to ensure that they are properly considering the safety and needs of all street users. A **Complete Streets Checklist** will also act as a tool to standardize and require coordination between staff in different units and departments, which is critical for efficient project delivery. The checklist should apply to all projects over \$100,000. Not every project will include all of the elements listed below, but the process will require staff to identify issues, evaluate a range of potential solutions, and document decisions.

Coordinating safety and other transportation improvements with planned construction work, like street resurfacing and reconstruction or water main replacements, is among the most effective strategies for making important street upgrades cost-effectively.

Complete Streets Checklist
<ul style="list-style-type: none">» Coordination opportunities (city, county, state, utilities, private development)» Functional classification and land use» Existing street cross section and available right of way» Safety» Traffic» Pavement condition» Parking/loading» Traffic signals» Pedestrian infrastructure» Bicycle infrastructure» Transit infrastructure» Freight infrastructure» Urban forestry» Urban design and planning» Stormwater management» Public art

Better coordinating our work in Ann Arbor will:

- » Improve the cost-efficiency of investments;
- » Protect the integrity and life cycle of public assets;
- » Save both the city, other public agencies, and private companies time and money; and
- » Reduce disruption and other impacts from construction for the public.

For example, local street resurfacing in Ann Arbor focuses on one geographic area each year. Bicycle boulevards proposed as part of the bike network for all ages and abilities on local streets, and their installation could be coordinated each year with local street resurfacing. Progressive cities around the U.S. have also begun to consider additional factors, like safety and equity , along with pavement condition when determining which streets to prioritize for resurfacing.



Monitoring & Evaluation

Establishing mobility performance measures for Ann Arbor will enable us to measure progress, guide our investments, identify initiatives in need of refinement, and respond to emerging opportunities and challenges. Potential performance measures were evaluated based on four factors:

- » **Validity**—does the metric accurately measure the result?
- » **Reliability**—is the metric consistent over time?
- » **Simplicity**—does the metric draw on data we can feasibly and affordably collect and analyze?
- » **Meaningful**—if the measure improves, are people’s lives better?

Updated performance measures will be incorporated in an annual report on Vision Zero and transportation in Ann Arbor, which will build transparency and accountability with the community, elected officials, and partner organizations. In addition to the metrics below, the report will also examine general trends in travel patterns, such as commute mode share; transit, scooter, and bike share trips; and survey results from a new annual survey on user experience and satisfaction with the transportation system.

Project Evaluation

In addition to tracking mobility performance measures at a citywide level, evaluating individual projects will provide the city with valuable information to inform the design of future projects and communicate results to the public and elected officials. Ann Arbor should establish a standard process for collecting data before and after major projects are installed in order to measure a project’s outcomes. This process should include:

- » **Developing a formal project evaluation plan** while the project is in the planning/design phase. The project evaluation plan should identify the metrics that will be used to evaluate the project and what data will need to be collected before and after the project is installed, including specific locations where data will be collected, for how long, and when in relation to project installation. Common metrics that may be included in project evaluations include:
 - » Counts of people walking
 - » Counts of people biking and riding location
 - » Transit ridership
 - » Transit speed and reliability
 - » Vehicle volumes
 - » On-street parking utilization
 - » Vehicle speeds (average speed, % of vehicles speeding, % of vehicles speeding > 10 mph, 50% speed, 85% speed)

- » Crash data (number of crashes by mode, number of serious crashes by mode, crash rates by mode, serious crash rates by mode)
- » Yielding rates for pedestrians in crosswalks
- » Equity analysis (demographics of surrounding neighborhood and/or street users, median rent/home price in surrounding neighborhood)
- » Economic benefit analysis (customer spending at surrounding businesses)
- » Air and noise pollution levels
- » Site generated VMT per capita
- » **Collect baseline data** before the project is installed according to the project evaluation plan.
- » **Replicate baseline data collection process** once the project is installed one year following implementation .
- » **Analyze before/after data** to identify project outcomes.
- » **Share findings** with the public, elected officials, and stakeholders





Safety

Annual number of people killed or seriously injured in traffic crashes

- » Baseline: 30 (annual average from 2009-2018)
- » Target: 0 by 2025

% serious injuries and fatalities to people walking and biking

- » Baseline: 36% (2009-2018)
- » Target: 0 by 2025

% of serious injury and fatality crashes related to dangerous driving behaviors

- » Baseline: 70% (2014-2018)
- » Target: 0 by 2025

Number of safety improvements installed on focus corridors and intersections per year

- » Baseline: N/A
- » Target: 3 per year



Mobility

% of population within a ¼ mile of the all ages and abilities network

- » Baseline: 51%
- » Target: 97% by 2030

% of population within a ¼ mile of high-frequency transit (every 15 minutes)

- » Baseline: 26%
- » Target: 66% by 2025

% of trips in the city made by walking, biking, and transit

- » Baseline: 36% (2019 Transportation Habits Survey)
- » Target: 50% by 2030

% of the low-stress bike network complete

- » Baseline: 25%
- » Target: 100% by 2030

of shared mobility vehicles available (car share, bike share, e-scooters)

- » Baseline: 330 shared mobility vehicles (30 car share vehicles, 0 bike share bikes, 300 e-scooters)
- » Target: 1,000 shared mobility vehicles by 2025



Accessibility for All

Transportation costs as a % of household income

- » Baseline: 18%
- » Target: 15% by 2025

Average number of jobs within 20 minutes via different modes

- » Baseline: Driving (109,149), Transit (30,229), Low-Stress Bike Routes (15,231)
- » Target: Transit (50,000), Low-Stress Bike Routes (30,000) by 2030

% of bus stops that are ADA accessible

- » Baseline: 89%
- » Target: 100% by 2025

Miles of gaps in the sidewalk network (on major streets and total)

- » Baseline: 18 miles (major streets), 145 miles (total)
- » Target: 0 miles on major streets by 2027, <8 miles total by 2040



Healthy People & Sustainable Places

Average vehicle miles traveled (VMT) per day

- » Baseline: 2.1 million (2018)
- » Target: 1 million by 2030

% of population living in a 20-minute neighborhood

- » Baseline: 80%
- » Target: 100% by 2025

% of population meeting physical activity guidelines

- » Baseline: 84% (2016)
- » Target: 95% by 2030



Regional Connectivity

% of commute trips into/out of Ann Arbor on transit

- » Baseline: 11% (2019 Transportation Habits Survey)
- » Target: 20% by 2030

of go!pass (or equivalent citywide program) holders

- » Baseline: 5,000 per year
- » Target: 10,000 per year by 2024



Endnotes

1

SEMCOG crash data

2

SEMCOG crash data

3

Insurance Institute for Highway Safety

4

[Pedestrian and Bicycle Information Center](#)

5

[American Association of State Highway Officials](#)

6

[Swedish National Road Administration and National Road and Transport Research Institute](#)

7

[NACTO](#)

8

[National Transportation Safety Board](#)

9

International Association of Traffic and Safety Sciences

10

[City of Ann Arbor Street, Bridge, and Sidewalk Millage](#)

11

Data provided by the City of Ann Arbor

12

SEMCOG crash data

13

Data provided by the City of Ann Arbor

14

American Community Survey

15

Data provided by the City of Ann Arbor

16

SEMCOG crash data

17

SEMCOG crash data

18

[NCHRP Research Report 926: Guidance to Improve Pedestrian and Bicyclist Safety at Intersections \(2020\)](#)

19

[NACTO Don't Give Up at the Intersection design guide \(2019\)](#)

20

NCHRP Research Report 926: Guidance to Improve Pedestrian and Bicyclist Safety at Intersections (2020)

21

[Center for Neighborhood Technology Housing + Transportation Affordability Index](#)

22

National Household Travel Survey, 2017

23

[NACTO](#)

24

[Journal of Policy Analysis and Management](#)

25

[NACTO](#)

26

[Zipcar](#)

27

[National Transit Database](#)

28

[TheRide](#)

29

TheRide

30

Longitudinal Employer Household Dynamics Data

31

American Community Survey, 2017

32

Census Transportation Planning Package, 2017

33

AAATA Fare Study Technical Memo 3: Survey Responses

34

AAATA Fare Study Final Report (2018)

35

Longitudinal Employer Household Dynamics, 2017

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WATS

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WATS

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[City of Chicago](#)

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[State of Michigan](#)

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[GetDowntown](#)

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Longitudinal Employer Household Dynamics, 2017

42

AAATA Fare Study Technical Memos 1 & 2: Existing Fare Structure, Best Practices, and Industry Review

43

[Unified Development Code](#)

44

[American Planning Association](#)

45

[Housing Policy Debate](#)

46

Center for Neighborhood Technology's Housing + Transportation Affordability Index

47

Data from Google Maps

48

[Siemens](#)



Concept Plans

Concept plans were developed for four focus corridors and four focus intersections to represent examples of how the city can use many of the tools highlighted throughout this plan to create safer streets, enhance transit operations, and create a better experience for people walking and biking.

Select concepts are included in Section 5 of this report; all concept plans are included here.

Focus Corridors

1. Plymouth Road (Murfin Avenue to US-23)
2. Washtenaw Avenue (Stadium Boulevard to US-23)
3. Miller Avenue (Downtown to M-14)
4. Main Street (Huron Street to Ann Arbor-Saline Road)

Focus Intersections

1. Washtenaw Avenue and Hill Street
2. Liberty Street and Division Street
3. Ann Street and Glen Avenue
4. Packard Road and Platt Road

7

Appendix



Washtenaw & Hill

Objective: Enhance pedestrian and bicycle connectivity on Hill Street crossing Washtenaw Avenue.

Current Conditions

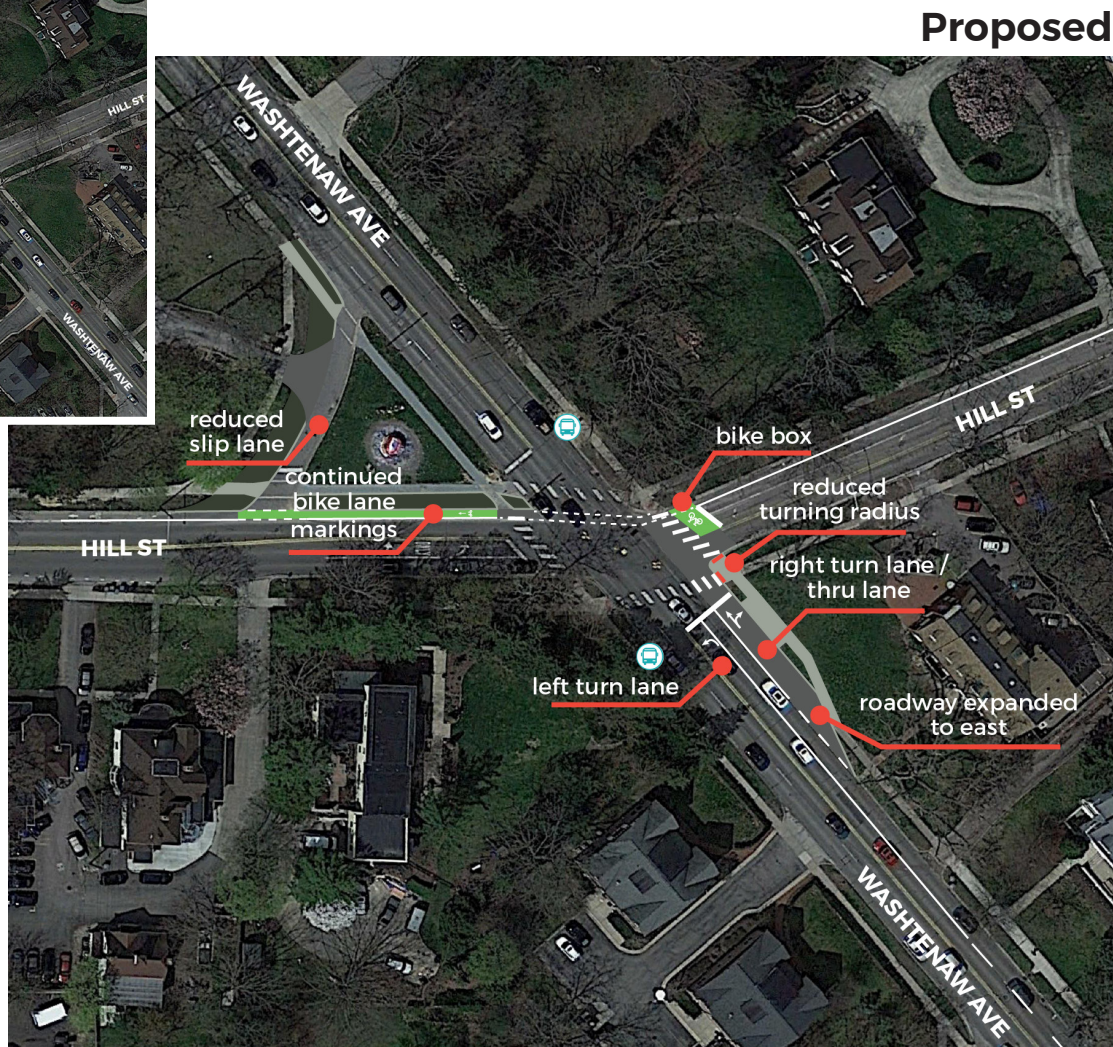
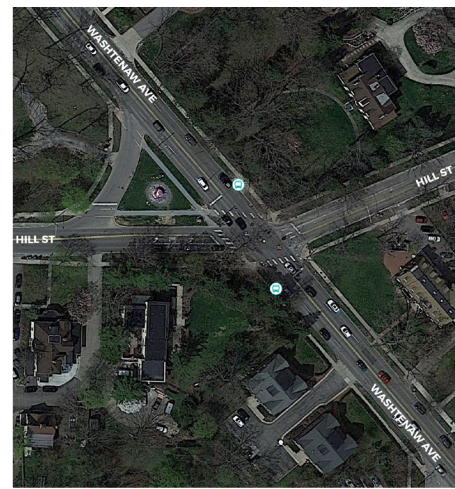
Crashes (2014-2018)

- » 148 crashes (3 involving pedestrians; 2 involving bicyclists)

Traffic Volumes

- » 900 pedestrians/day
- » 300 bicyclists/day
- » 16,051 vehicles/day

Existing



Liberty & Division

Objectives: Slow vehicle speeds; better accommodate bicyclists and pedestrians.

Current Conditions

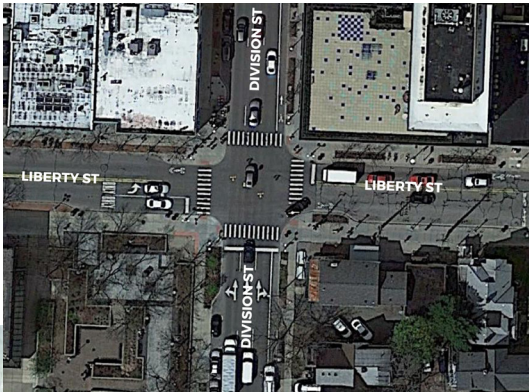
Crashes (2014-2018)

- » 76 crashes (4 involving pedestrians; 4 involving bicyclists)
- » Most common types: sideswipe-same direction (34%) and angle (26%)

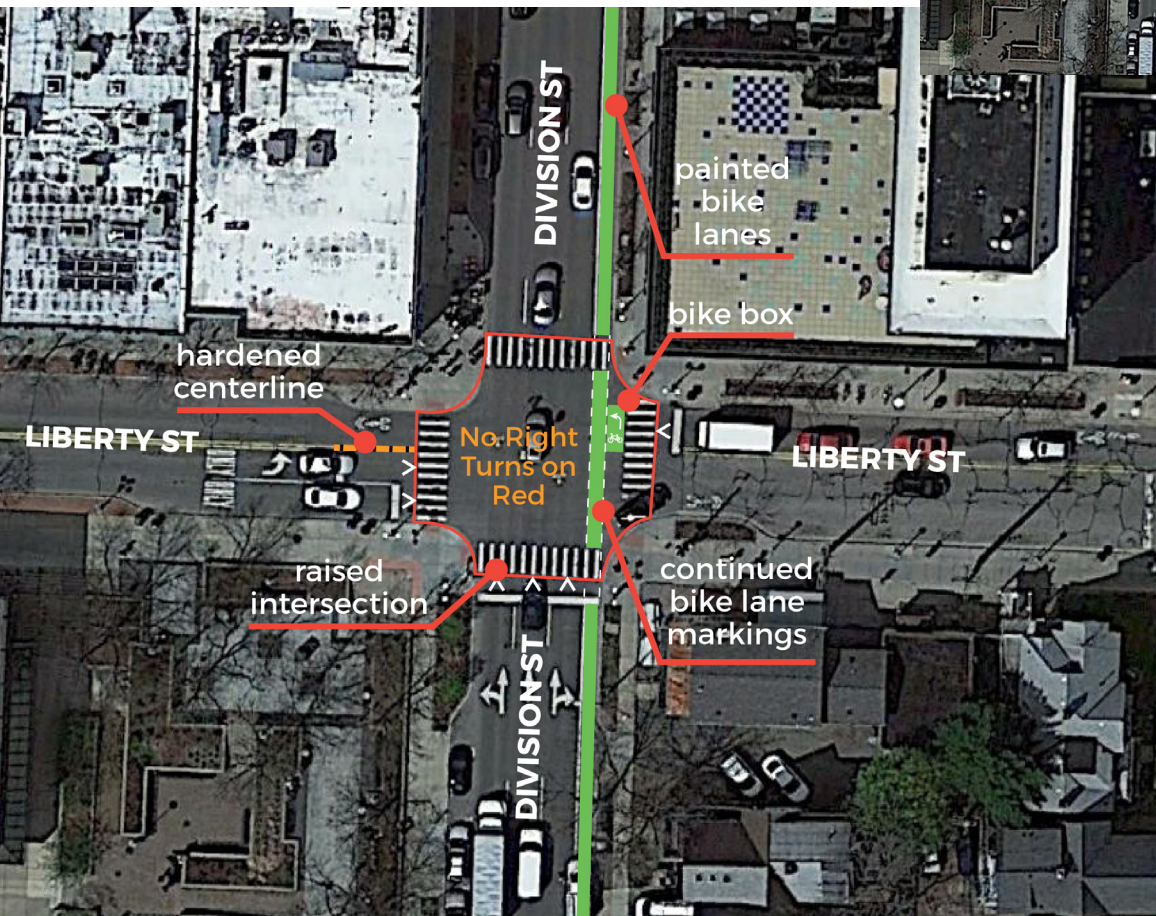
Traffic Volumes

- » 5,400 pedestrians/day
- » 400 bicyclists/day

Existing



Proposed



Ann & Glen

Objective: Slow vehicle speeds; better accommodate bicyclists and pedestrians

Current Conditions

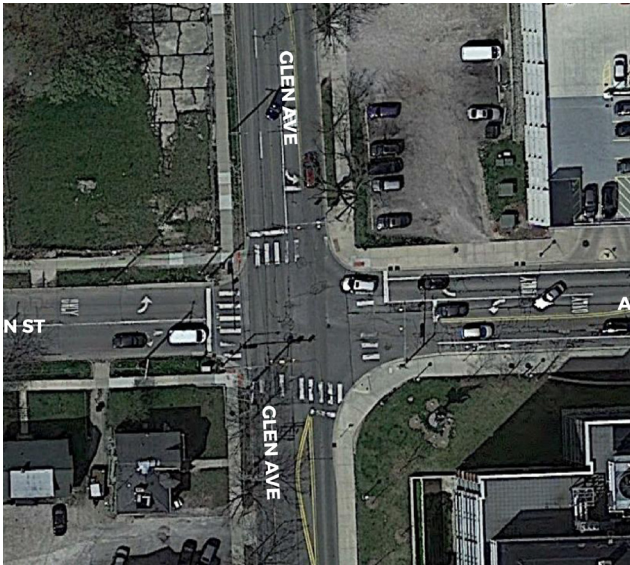
Crashes (2014-2018)

- » 60 crashes (6 involving pedestrians; 6 involving bicyclists)
- » 1 serious injury
- » Most common type: rear ends (30%)

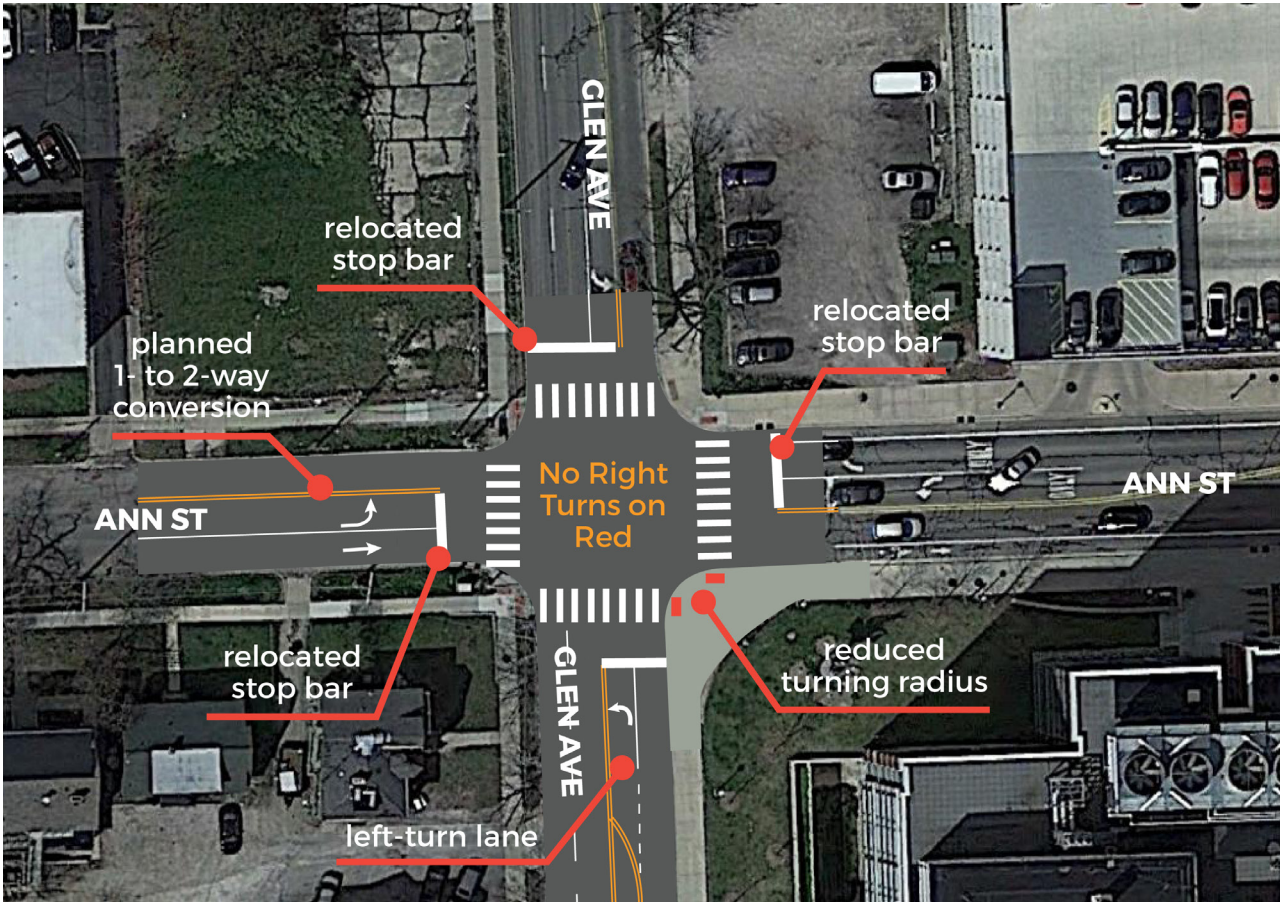
Traffic Volumes

- » 1,400 pedestrians/day
- » 500 bicyclists/day

Existing



Proposed



Packard & Platt

Objective: Simplify crossings; reduce conflict points; connect bikeway along Pratt

Current Conditions

Crashes (2014-2018)

- » 167 crashes (4 involving pedestrians; 1 involving bicyclists)
- » 1 serious injury
- » Most common type: rear ends (45%)

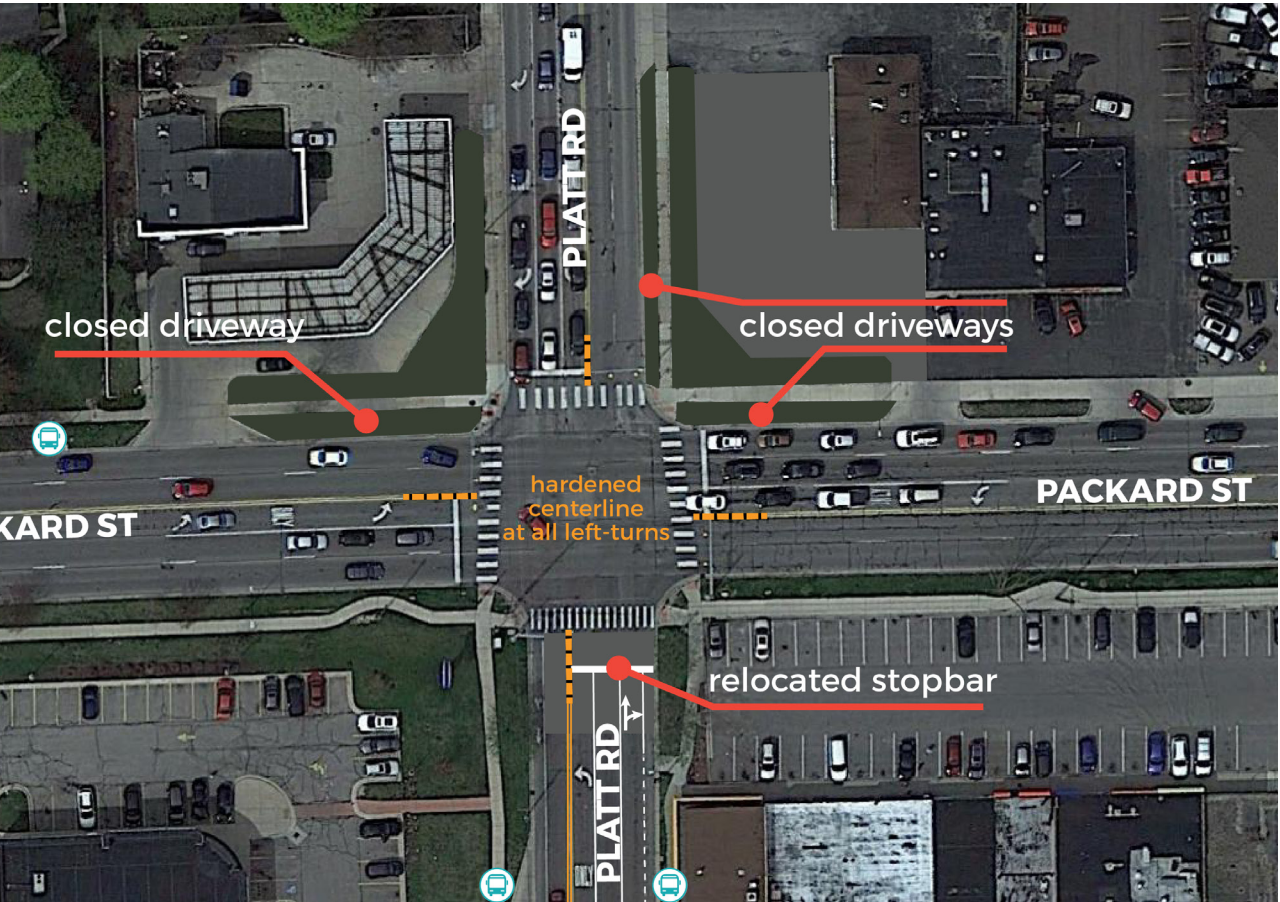
Traffic Volumes

- » 400 pedestrians/day
- » 200 bicyclists/day

Existing



Proposed



Miller Avenue

Downtown to M-14

Objective: Reinforce Miller as a lower-speed, low-stress bike route

Current Conditions

Crashes (2014-2018)

- » 258 total crashes
- » 2 pedestrian or bicyclist serious injuries
- » 1 pedestrian or bicyclist fatality

Transit Service

- » 2 AAATA Routes (32 A/B/C and 60)

Bicycle and Pedestrian Accommodation

- » Bike lane and/or shared lane; LTS 2-4
- » Sidewalks throughout

Traffic Volumes

- » 8,672 vehicles/day @ Wines Dr.

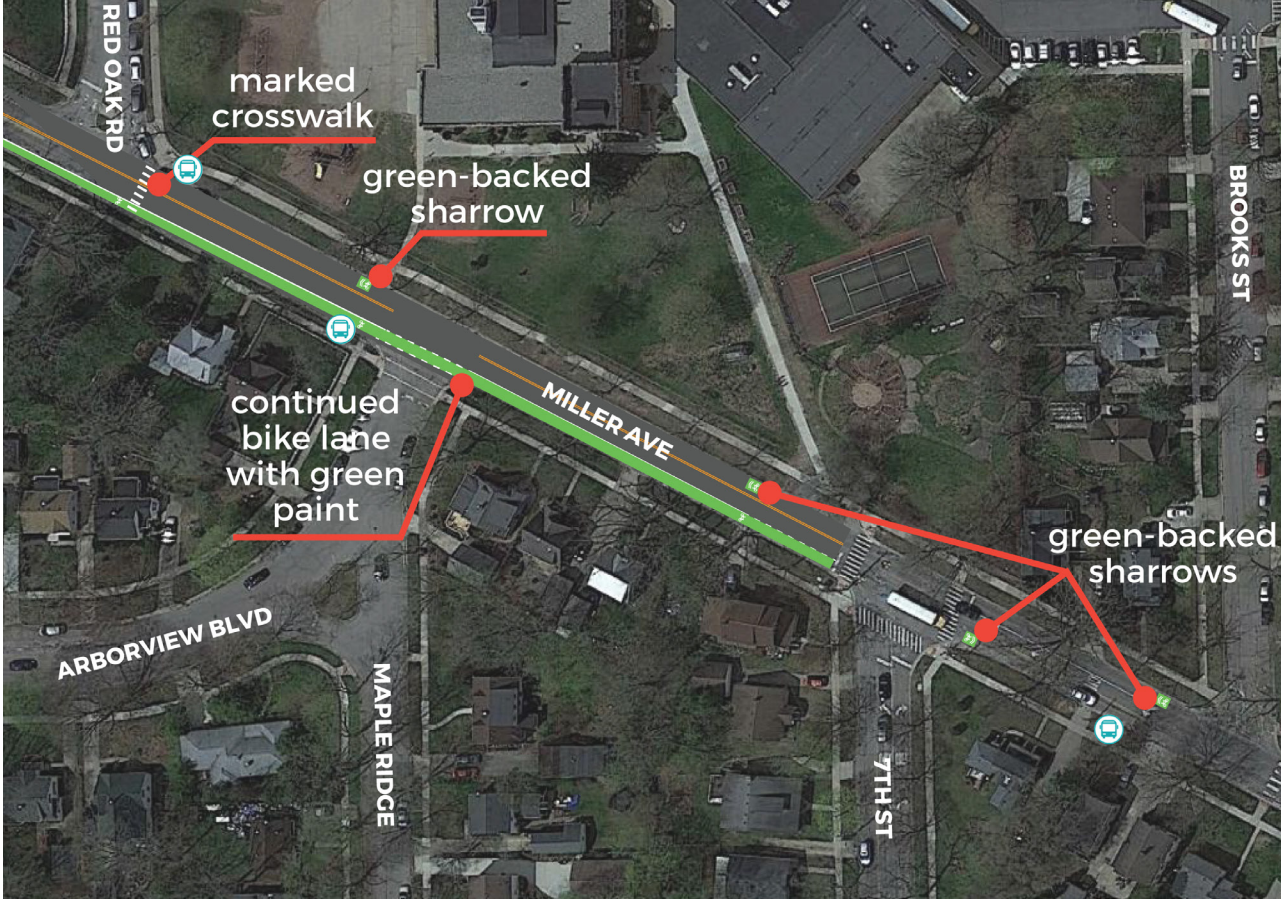
Existing (Miller Avenue at 7th Street)



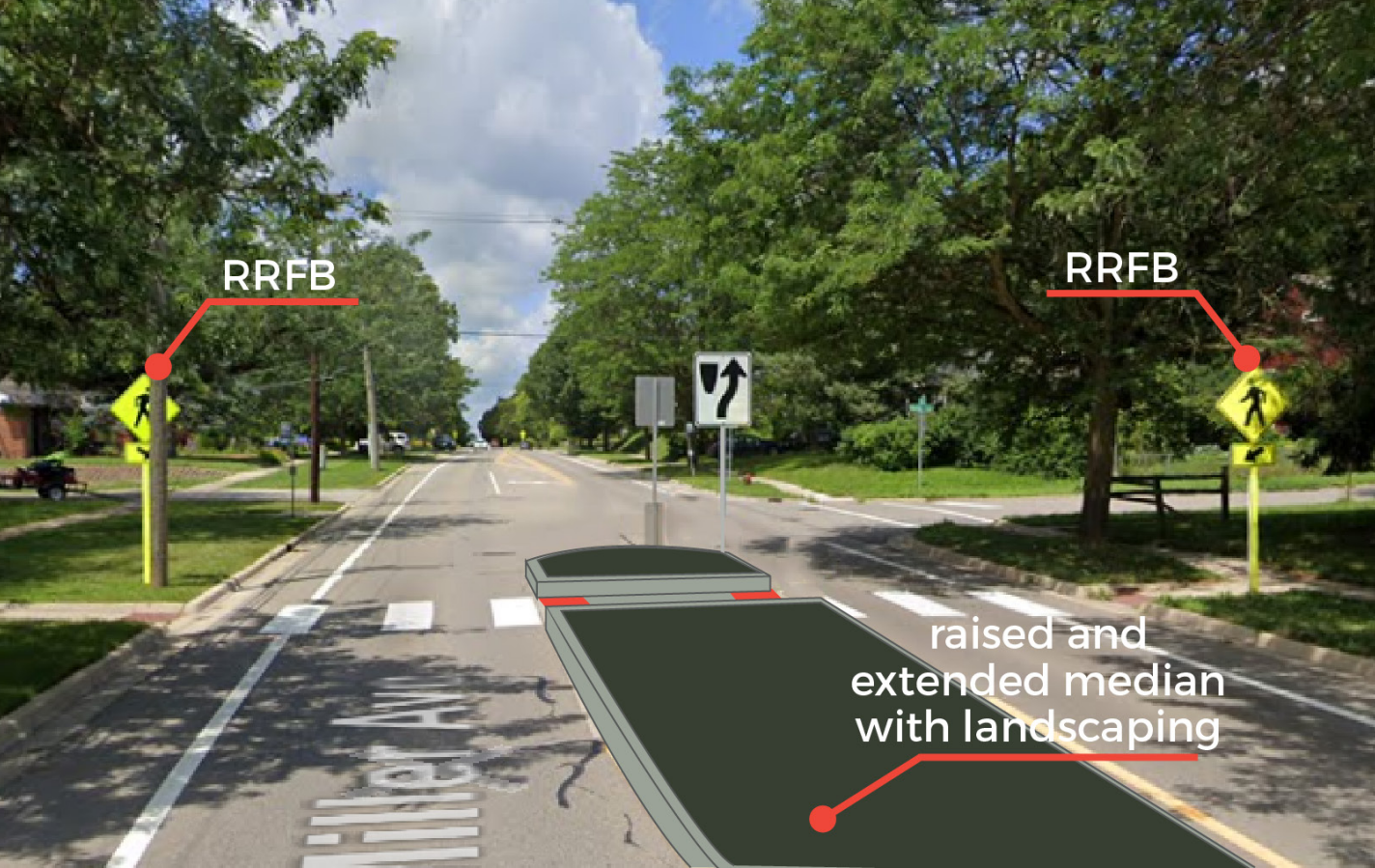
Existing (Miller Avenue at midblock crossing)



Proposed (Miller Avenue at 7th Street)



Proposed (Miller Avenue at midblock crossing)



Washtenaw Avenue

Stadium Boulevard to US-23

Objectives:

- » Address safety incidents at intersection and non-intersection locations
- » Incorporate transit priority elements
- » Facilitate crossings and alleviate short vehicle trips where possible

Current Conditions

Crashes (2014-2018)

- » 1,056 total crashes
- » 3 pedestrian or bicyclist serious injuries

Transit Service

- » 3 AAATA Routes (24, 4A/B, 66)

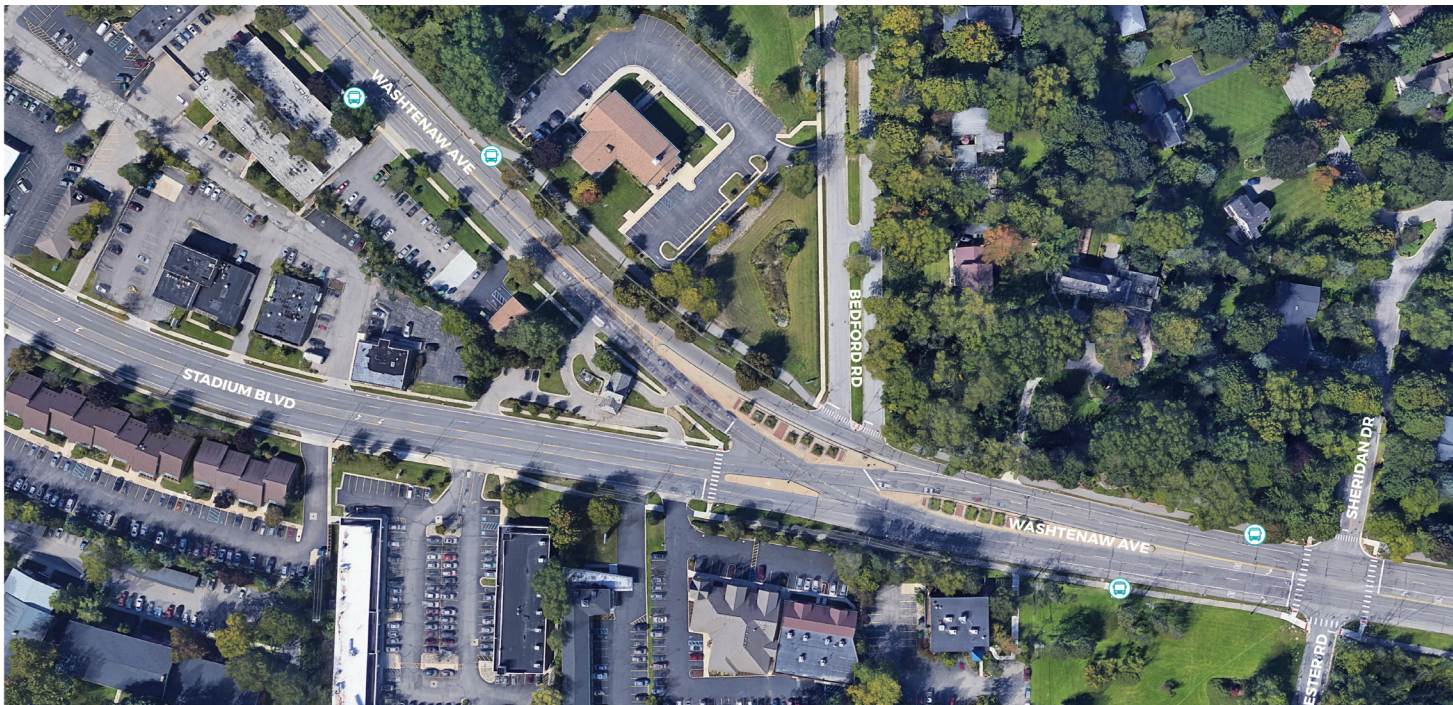
Bicycle and Pedestrian Accommodation

- » LTS 3
- » Sidewalks throughout

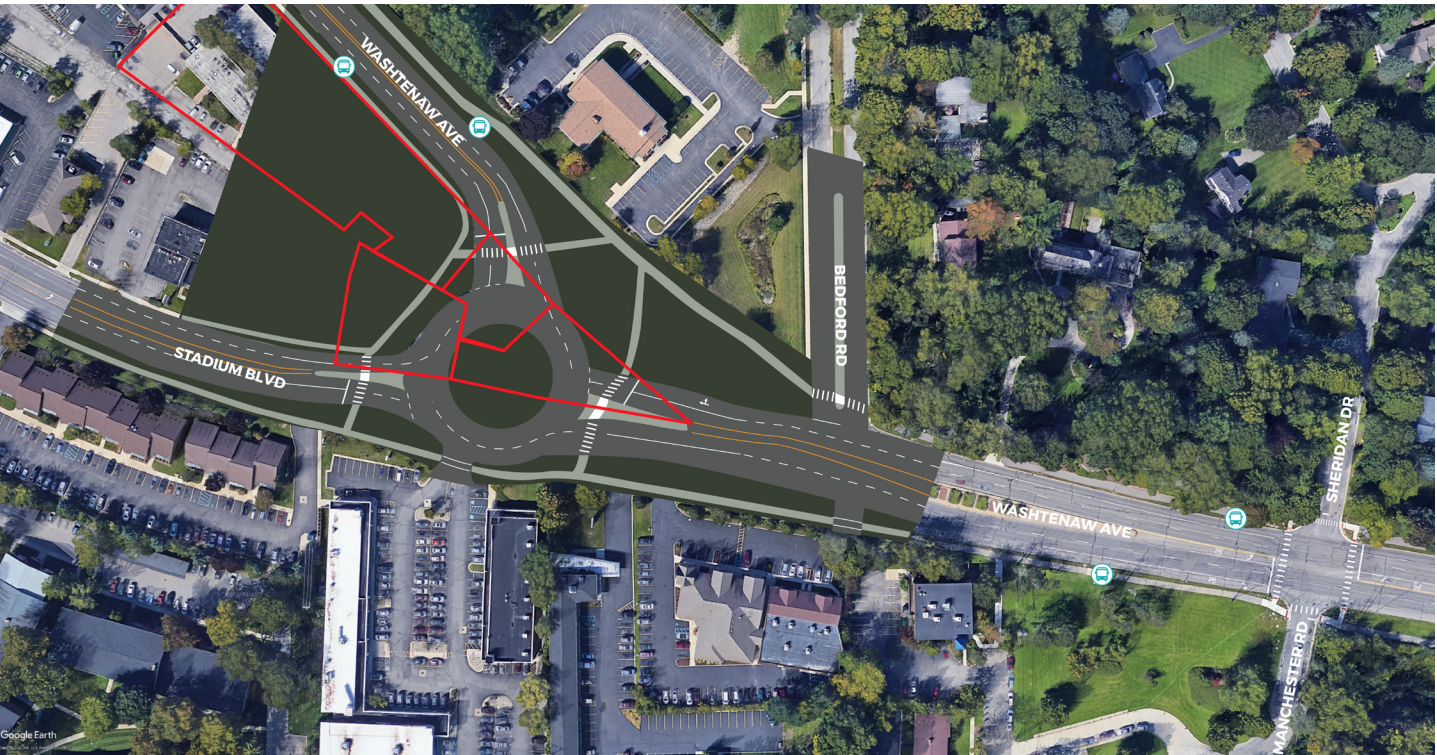
Traffic Volumes

- » 15,000 - 31,600 vehicles/day

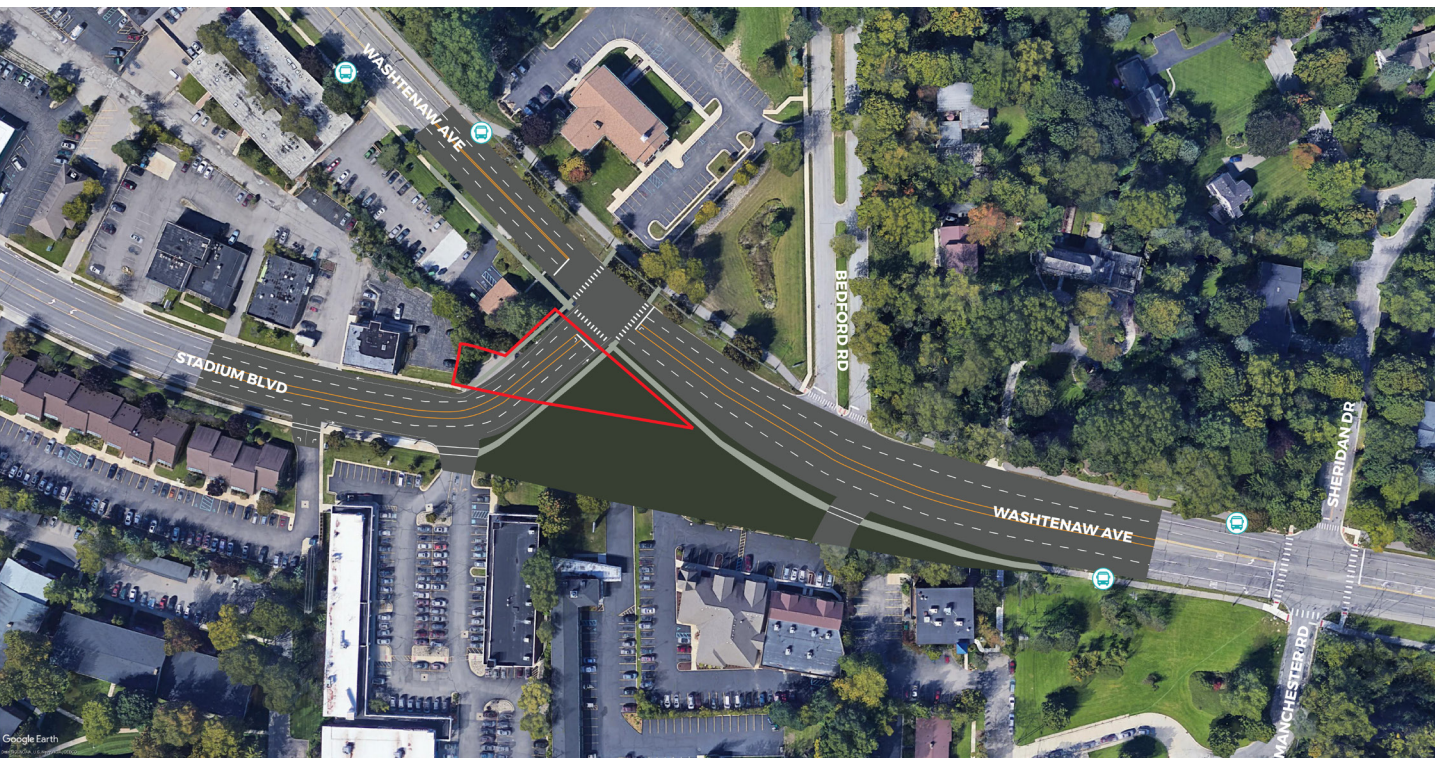
Existing (Washtenaw Avenue & Stadium Boulevard)



Proposed Roundabout Option (Washtenaw Avenue & Stadium Boulevard)



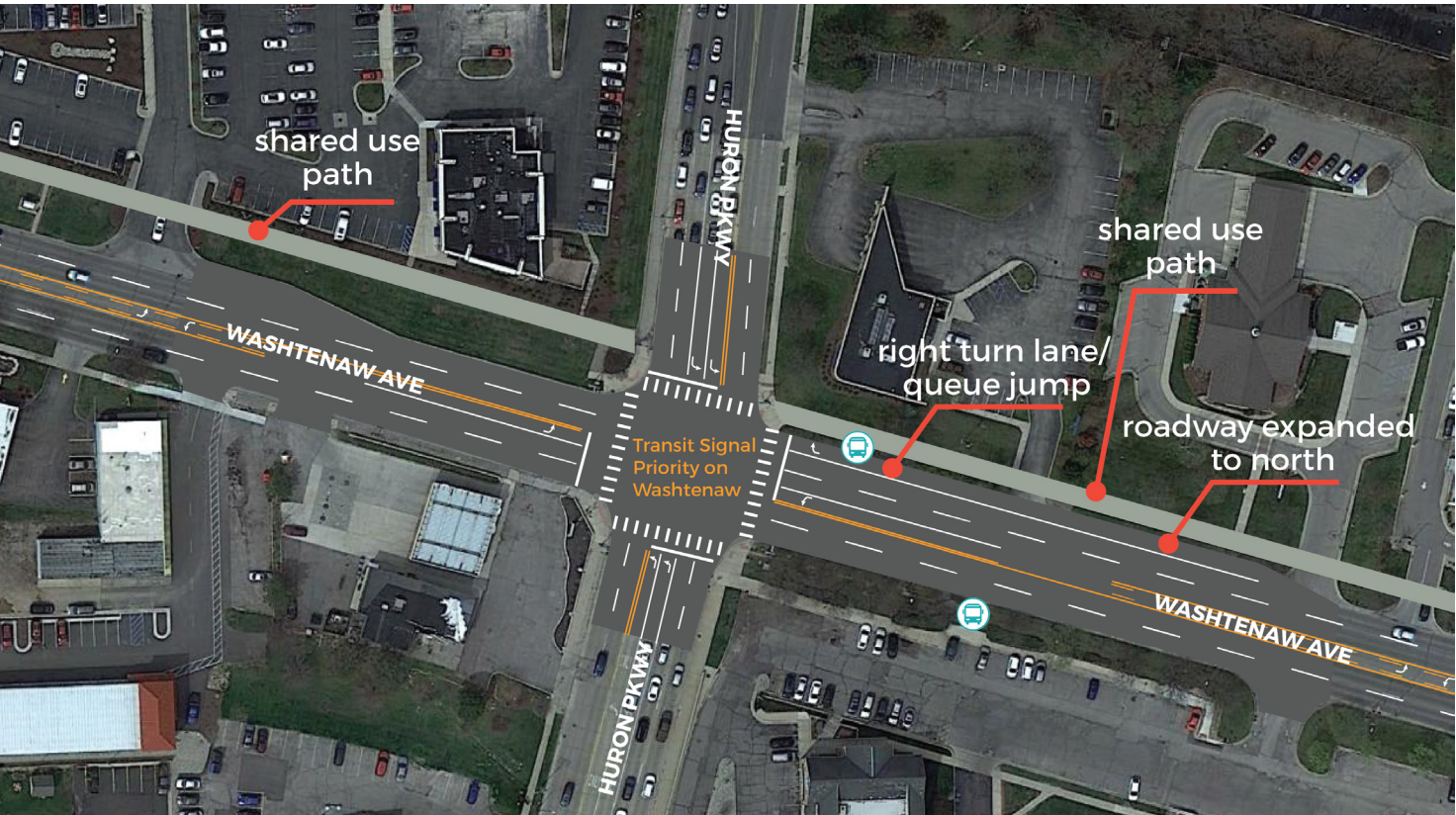
Proposed T-intersection Option (Washtenaw Avenue & Stadium Boulevard)



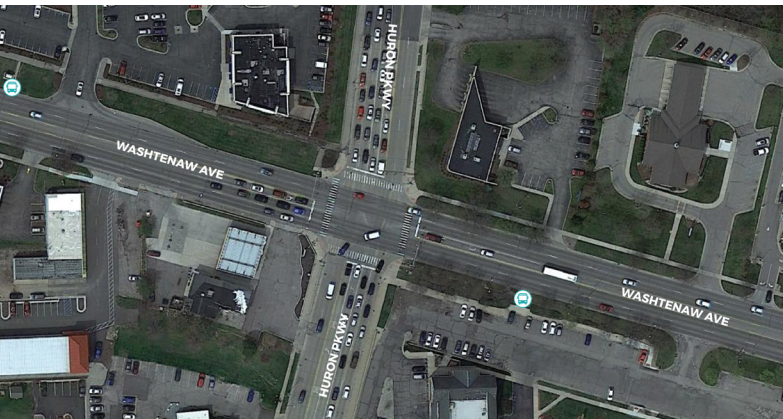
Washtenaw Avenue

Stadium Boulevard to US-23

Proposed (Washtenaw Avenue & Huron Parkway)



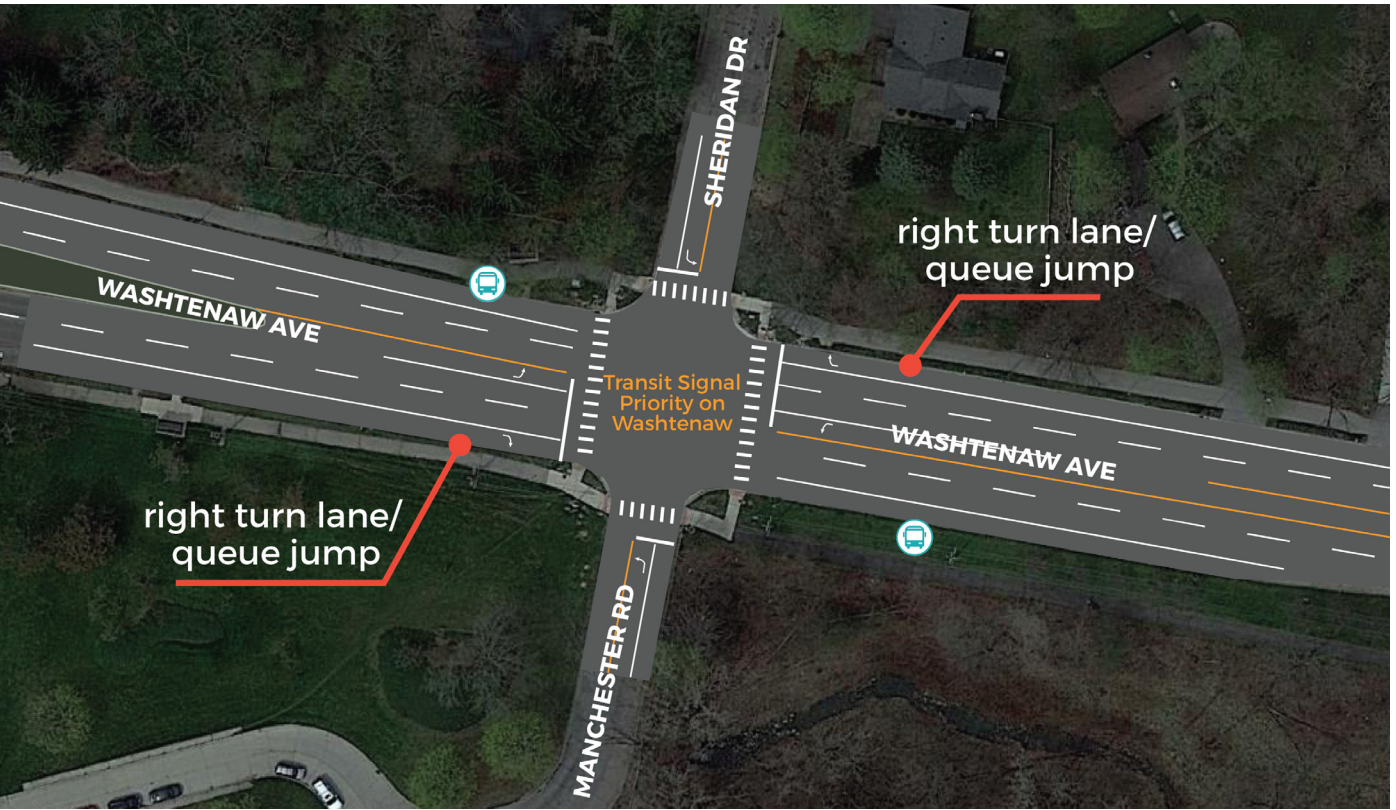
Existing (Washtenaw Avenue & Huron Parkway)



Existing (Washtenaw Avenue & Manchester Road)



Proposed (Washtenaw Avenue & Manchester Road)



Plymouth Road

Murfin Avenue to US-23

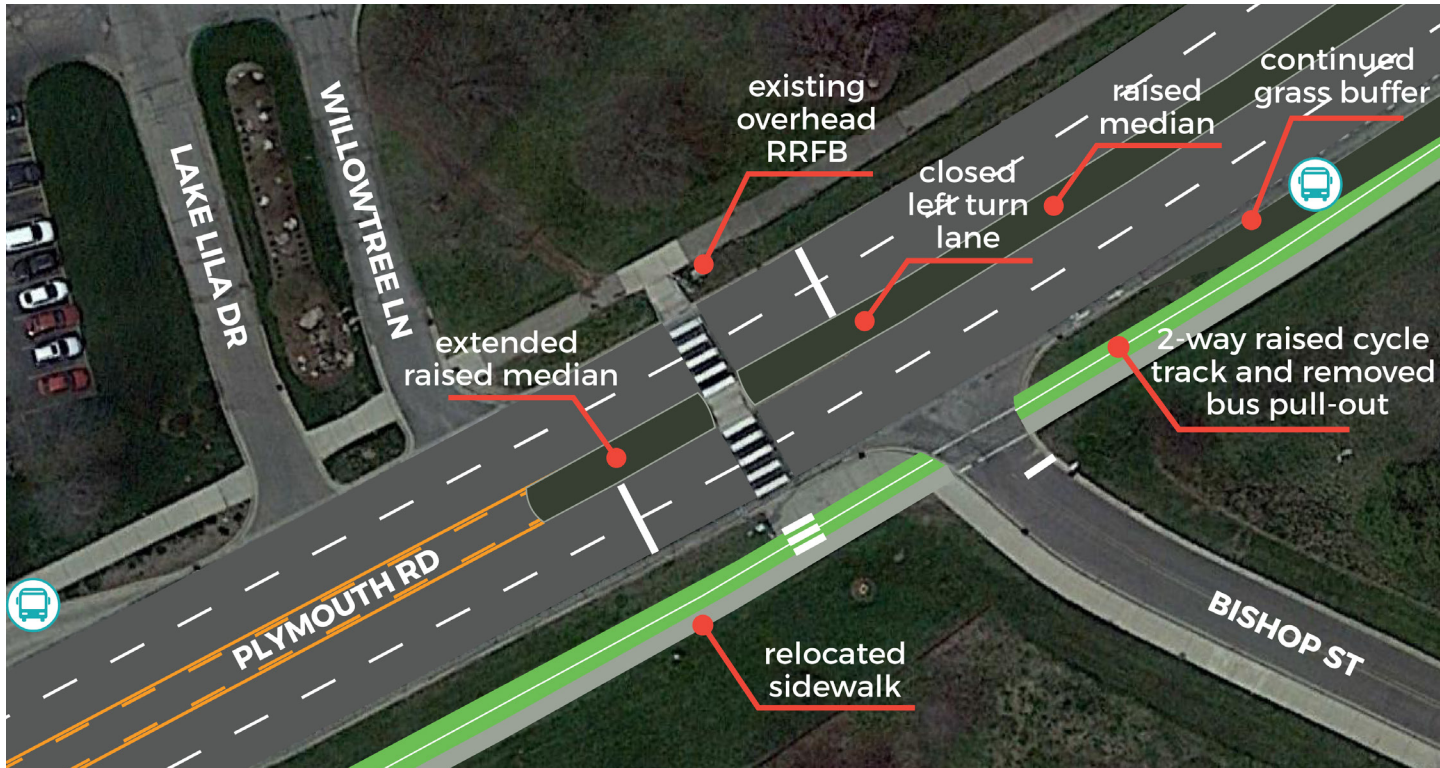
Primary objectives:

- » Provide a continuous and more comfortable bike route
- » Provide safer and more comfortable connections for pedestrians across Plymouth
- » Improve transit accommodations

Existing (Plymouth Road at Bishop Street)



Proposed (Plymouth Road at Bishop Street)



Current Conditions

Crashes (2014-2018)

- » 707 total crashes
- » 4 pedestrian or bicyclist serious injuries

Transit Service

- » 3 AAATA Routes (22, 23A/B, 65)

Bicycle and Pedestrian Accommodation

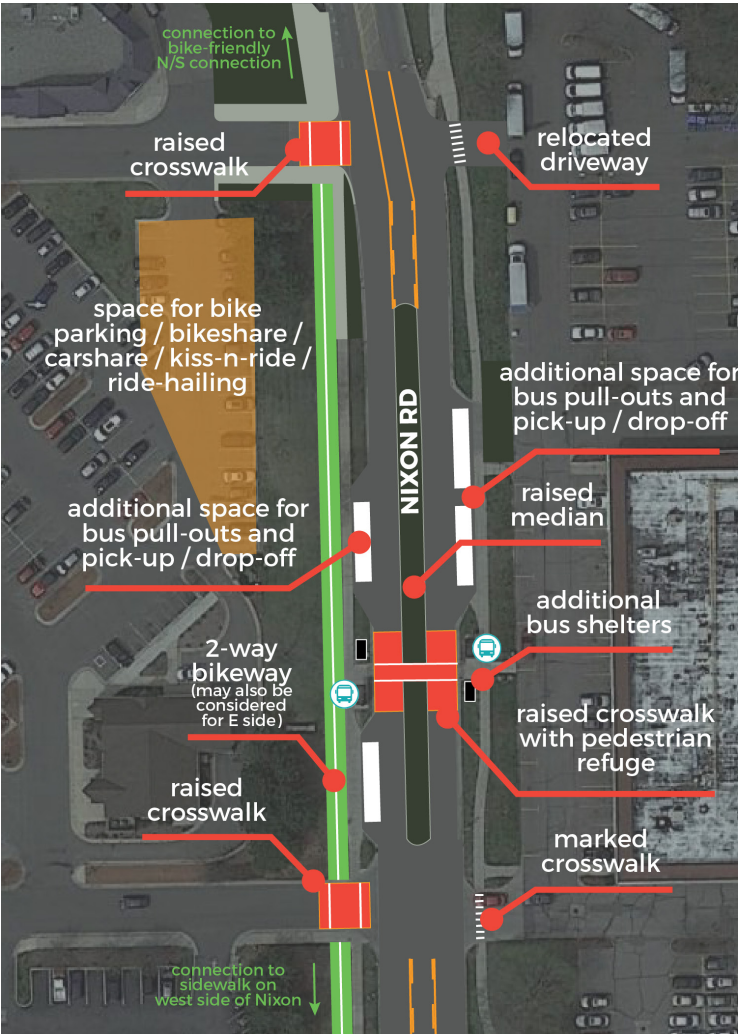
- » Bike lane and/or sidepath
- » Sidewalks
- » Bike Level of Traffic Stress (LTS) 3-4

Traffic Volumes

- » Pedestrian counts range from ~700/day at Murfin Avenue to ~500/day between Nixon to Huron Parkway to ~60/day at Green Road
- » 25,000 - 27,000 vehicles/day



Existing (Nixon Road Bus Stop)

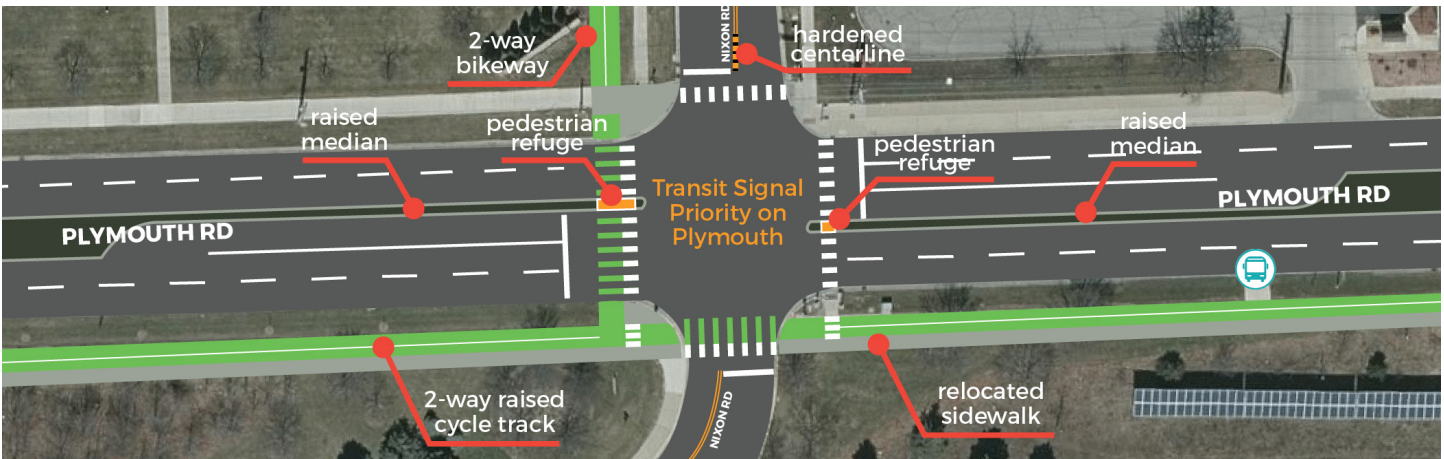


Proposed (Nixon Road Mobility Hub)

Existing (Plymouth Road at Nixon Road)



Proposed (Plymouth Road at Nixon Road)



S. Main Street

Huron Street to Ann Arbor-Saline

Objective: Prioritize completing a bike route and improving pedestrian safety and comfort

Current Conditions

Crashes (2014-2018)

- » 837 total crashes
- » 2 pedestrian or bicyclist serious injuries

Transit Service

- » 5 AAATA Routes (24, 25, 26, 28A/B, 64)

Bicycle and Pedestrian Accommodation

- » Bicycle LTS 3-4
- » Sidewalks throughout

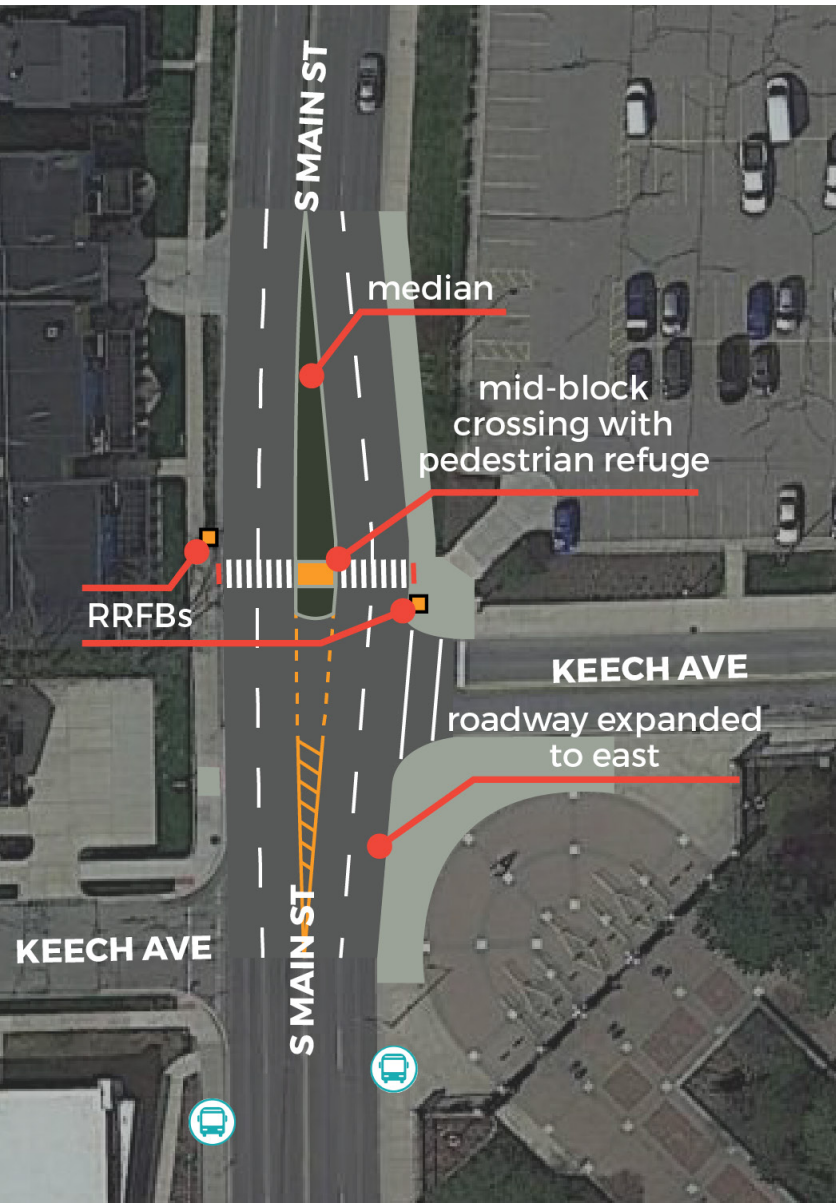
Traffic Volumes

- » 26,948 vehicles/day @ Ann Arbor-Saline Rd.
- » 23,531 @ Stadium Boulevard
- » 11,506 @ William Street

Existing (Main Street at Keech)



Proposed (Main Street at Keech)



Existing (Main Street at Madison)



Proposed (Main Street at Madison)



S. Main Street

Huron Street to Ann Arbor-Saline

Proposed
(Main Street at William)



Existing
(Main Street at William)

