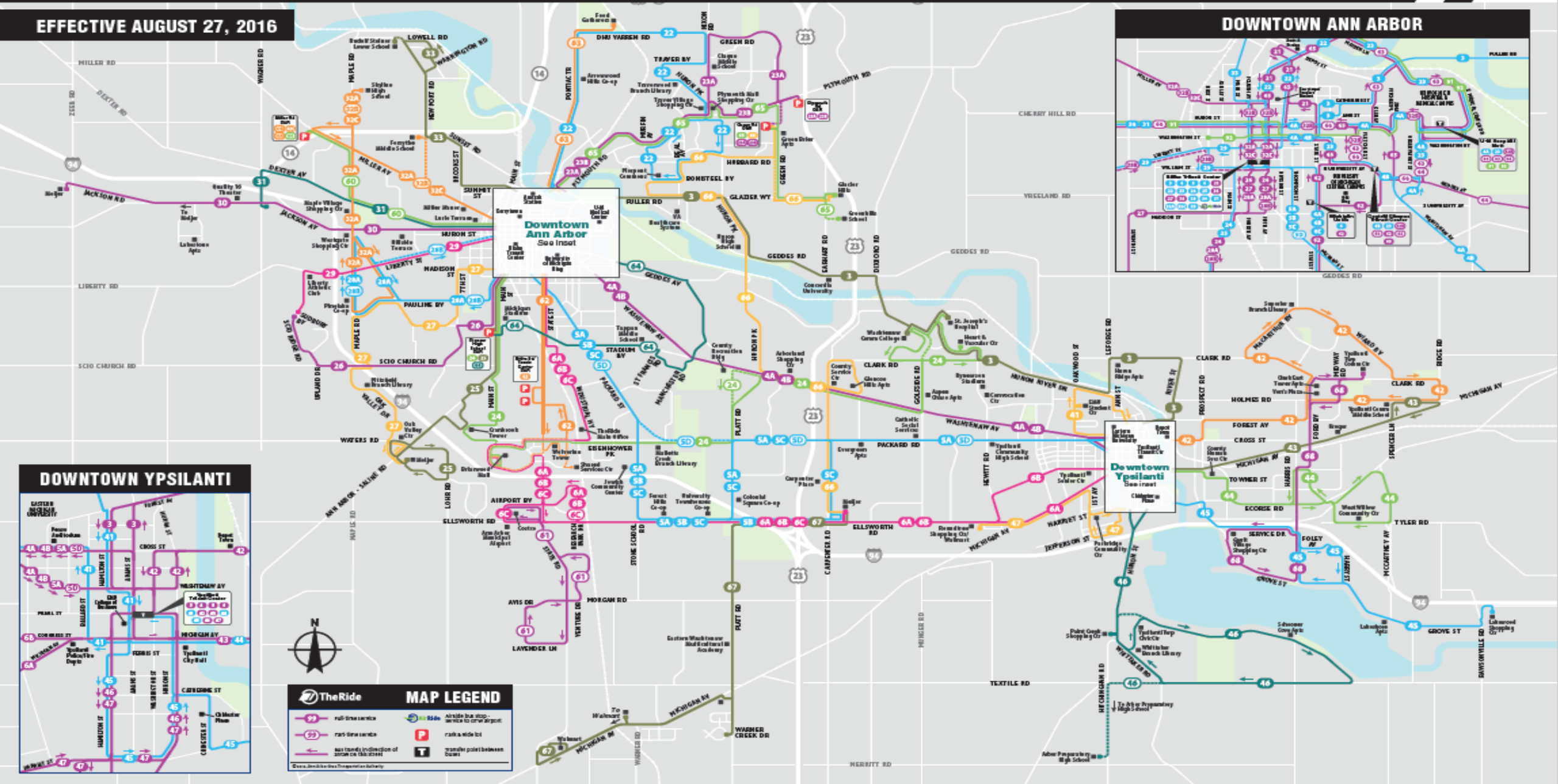
TRANSIT OVERVIEW

Ann Arbor Area Transit Authority (AAATA)/The Ride and GetDowntown

TheRide

SYSTEM MAP

EFFECTIVE AUGUST 27, 2016



Operations

Service for Seniors & Persons with Disabilities

Meeting Our Mission

Benefits Riders & Community

87% ★★★★★★★★½☆

Rider satisfaction

Accessible

100% ★★★★★★★★★★

Fixed-route buses contain accessibility features for people with disabilities

6,572,012 total ridership

Environmentally Responsible

100% ★★★★★★★★★★

Buses use biodiesel fuel

55% ★★★★★½☆☆☆☆

Buses are hybrid-electric or low-emission conventional diesel

Cost-Effective

$4.38 Operating costs per passenger trip (urban fixed-route service)

Reliable

100% ★★★★★★★★★★

Scheduled local fixed-route trips operated

90% ★★★★★★★★★☆

On-time performance *(partial year data)*

Safe

86% ★★★★★★★★½☆

Rider satisfaction with personal safety

"The new Sunday service in Ypsilanti makes it so I can work on Sundays, I couldn't do that before. I use a lot of the later night and weekend service to get to work and back home. The bus always gets me there on time."
Wayne Rankin, Ypsilanti

Other Services

ADA/Paratransit Service

ARide

ADA service throughout Ann Arbor and ¾ mile from fixed route.

ARide goes beyond ADA with same day pick up in Ann Arbor and free fixed route service for people with disabilities.

GoldRide

GroceryRide

Shared-taxi service in Ann Arbor, no advanced reservations required. Weekly bus trips for residents of several Ann Arbor senior housing communities to local grocery stores each Tuesday.

NightRide
After-Hours Door-to-Door

HolidayRide
Holiday Door-to-Door

Shared-taxi service in Ann Arbor/ Ypsilanti after our buses stop running and on holidays

MyRide

Mobility Management service for transit dependent individuals in Washtenaw County and select areas in Jackson, Lenawee, Livingston, Monroe, Oakland, and Wayne Counties.

getDowntown

Commuter Consulting services to businesses in the downtown, including the go!pass

M Ride

Other partnerships

Express commuter routes from Canton and Chelsea to downtown Ann Arbor. **Adding Ypsi Township route in August 2017.**

(contracted) Public-Private partnership offering 13 round trips to DTW. Coaches have wireless internet and restrooms. Parking $2 a day.

(contracted) Commuting option into and within Washtenaw County using 7-passenger van. Monthly fee includes vehicle, insurance and maintenance.

Park free all day at one of TheRide's Park & Ride lots and ride the bus to work or school.

Keeping Promises:
Five Year Transit Improvement Program

Passed May 2014. 40% increase in service over 5 years, including:

- ✓ **Later Weekday Service** on most routes until 11:00 p.m.
- ✓ **New Saturday and Weekday Evening Service** on 18 routes.
- ✓ **New Route 46** started serving residents of Ypsilanti with hourly service 7 days a week.
- ✓ **Expanded A-Ride Service** to include new route and later service.

- ✓ **12 More Routes**
- ✓ **More Frequent Service**
- ✓ **More Direct Service in Ann Arbor and Ypsilanti**
- ✓ **Expanded A-Ride Service** on new Routes 30, 27, 26, and 29.
- ✓ **New Route Names and Numbers** to make them easier to understand and use.
- ✓ **New Service in Scio Township** – Routes 26, 29, and 30.

Ridership: 6.5M Annually

Fixed Route:

- Up 8% in last 5 years
- Biggest Gains
  - 21% Saturdays
  - 31% Sundays

A Ride:

- Up 13% in last 5 years
- Biggest Gains
  - Increased access
  - New applications up 40%

New Rider Tools

Track My Bus

Track your bus in real time by stop or map view.

Routes & Schedules

Get detailed or customized route schedules.

Plan My Trip

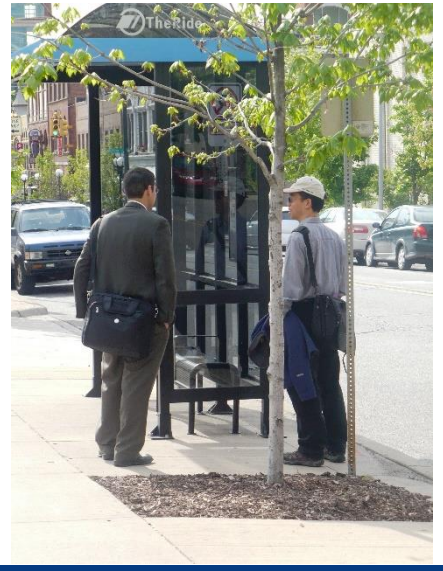
Trip planning is easy using our Plan My Trip tool.

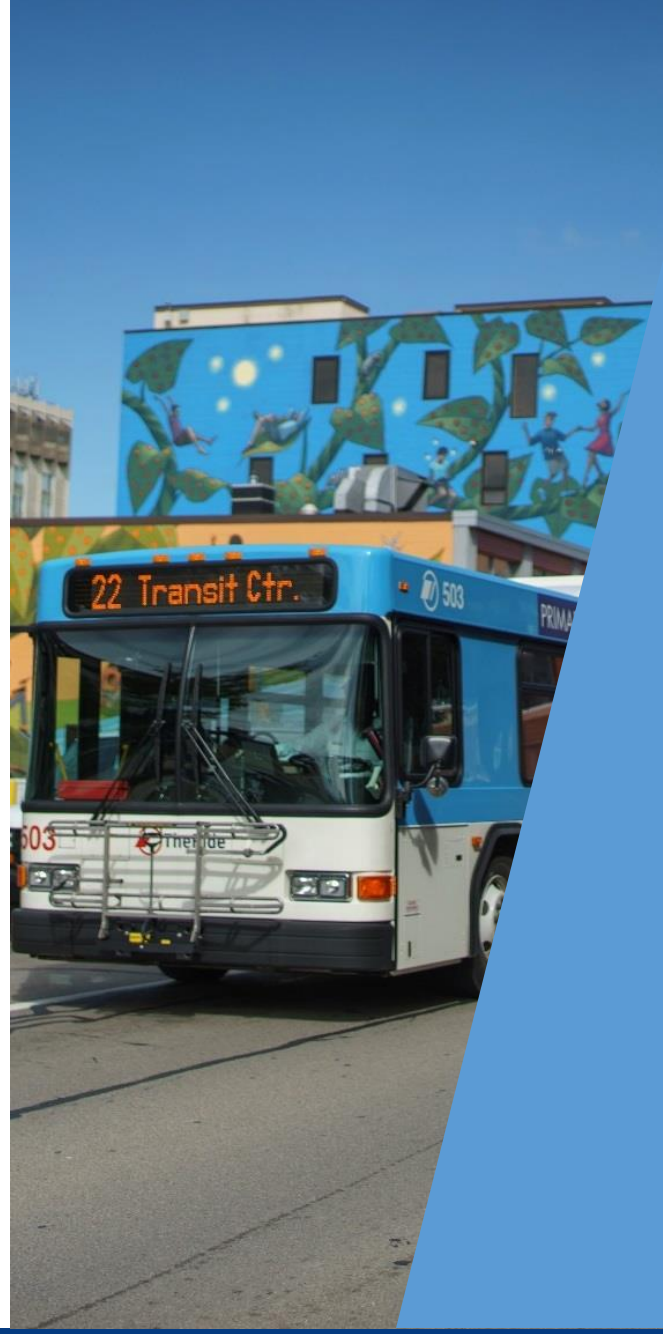
Text My Bus

Text AAATA and your bus stop number to 41411 and get information on when your bus will be arriving at your stop.

What's Ahead?

- Final phase of Plan Implementation—August 2017:
  - Route 93: Ypsilanti Township Express
  - On-demand Pilot in southern Ypsilanti Township
  - WAVE route on Jackson Rd extended to Baker, weekday frequency
  - Fine-tuning
- Millage Renewal
- Planning projects
- Continued regional conversation





THANK YOU

University of Michigan Transit

University of Michigan Transportation Overview

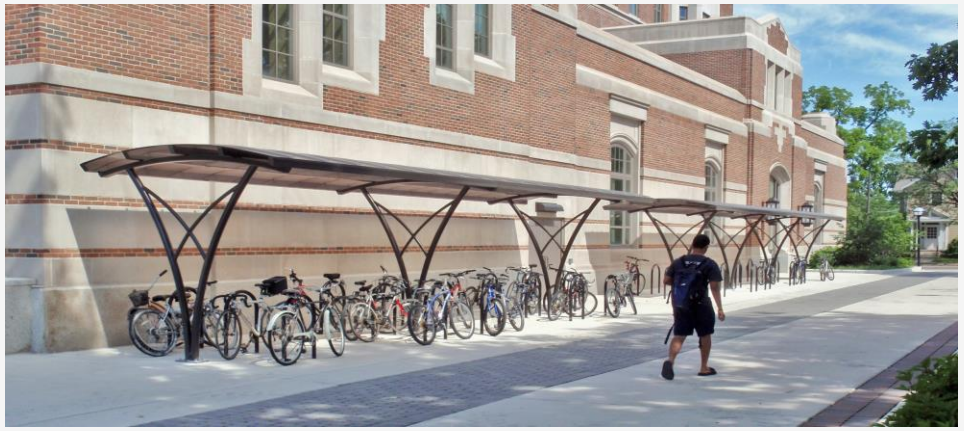
Transportation Commission

June 21, 2017

University of Michigan Facilities & Operations

Parking

- Approximately 28,000 spaces
  - 16 structures and over 100 surface lots
  - 110 docks and service centers
- Over 8,000 bike parking spaces



Demographic Trends (where employees live)

Ann Arbor Campus			Michigan Medicine		
City	**No. of Employees**	**% of Total**	**City**	**No. of Employees**	**% of Total**
Ann Arbor	14,953	56%	Ann Arbor	4,050	22%
Ypsilanti	2,587	10%	Ypsilanti	2,477	13%
Dexter	667	2%	Canton	867	5%
Saline	642	2%	Brighton	613	3%
Canton	584	2%	Belleville	541	3%
Brighton	370	1%	Howell	516	3%
Chelsea	353	1%	Saline	490	3%
Pinckney	349	1%	Pinckney	479	3%
Belleville	327	1%	Dexter	452	2%
Plymouth	288	1%	South Lyon	432	2%
Other	5,784	21%	Other	7,914	42%
TOTAL	**26,904**	**100%**	**TOTAL**	**18,831**	**100%**

Source: U-M Human Capital Report, FY16

Transit Services

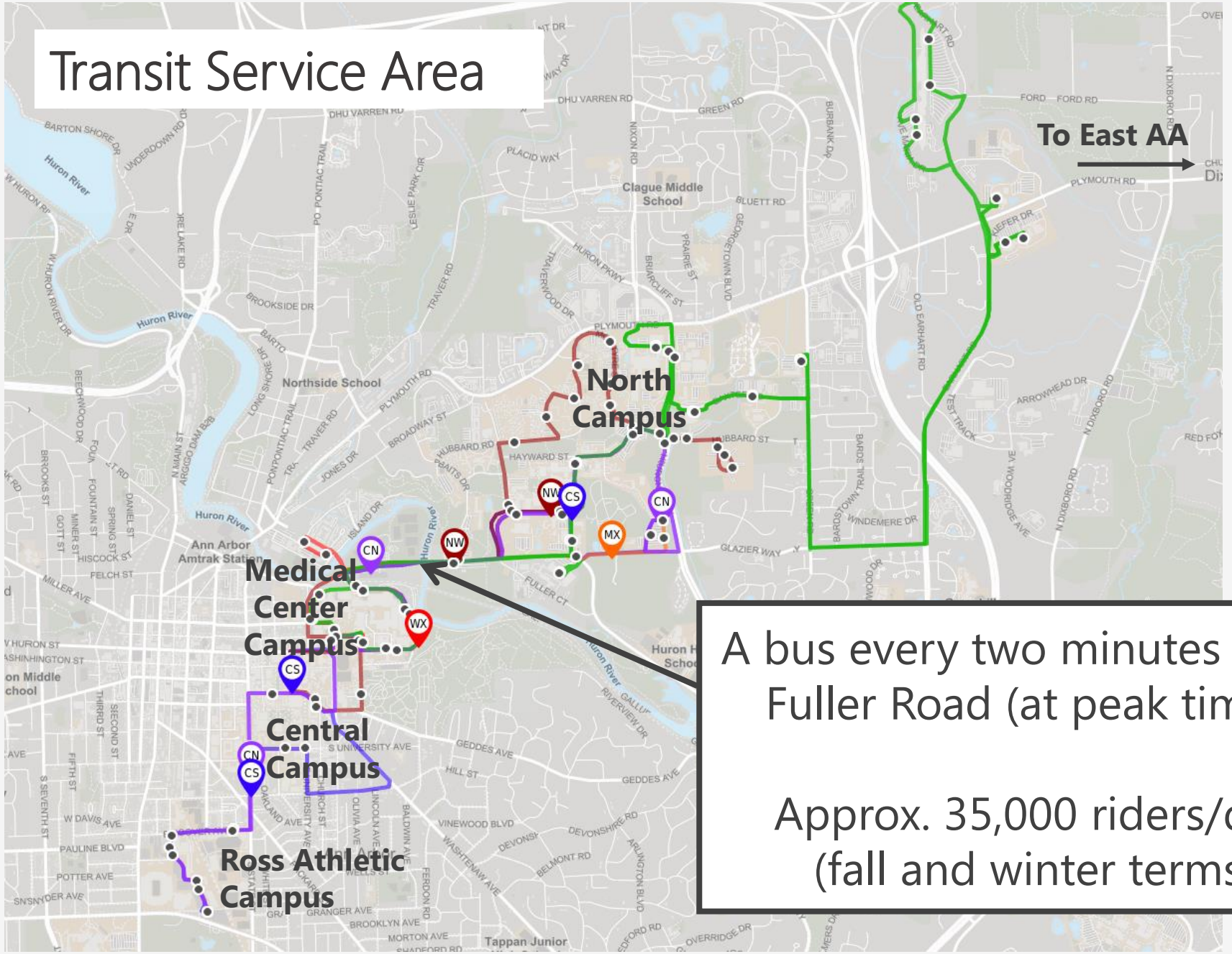
- 55 transit vehicles
- 150 operators and staff
- 12 fixed routes with over 7 million riders annually
- Paratransit with over 11,000 annual rides
- Charters (U-M departments and organizations)
- After-hours service — SafeRide
- Bio-Research shuttle

Transportation Options

- MRide (free rides on AAATA fixed routes)
  - Roughly 40% of AAATA ridership (>2.3M annual rides)
- ExpressRide (Chelsea and Canton)
- Park & Rides
- RideShare
  - Vanpools (>100 vanpools, 580+ members)
  - Carpools
  - Car-sharing: GM Maven and Zipcar
- Bike Program
  - Bike Rentals and ArborBike Bike Sharing
- Emergency Ride Home
- Electric Vehicle (EV) Charging

Equates to eliminating a parking structure (600+ spaces)

Transit Service Area



A bus every two minutes along Fuller Road (at peak times)

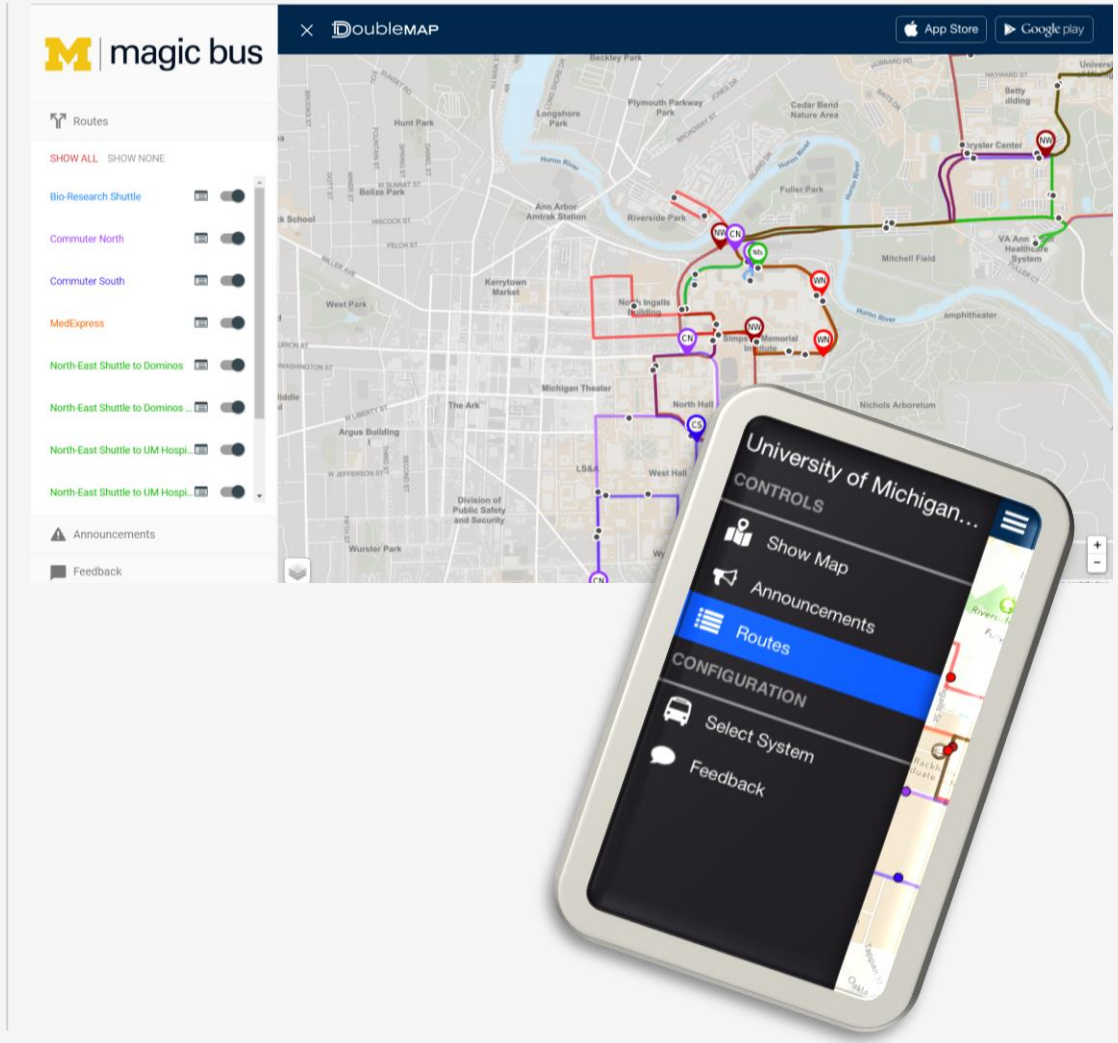
Approx. 35,000 riders/day (fall and winter terms)

Fleet

- 1,027 Vehicles (FY2016)
  - Electric vehicles
  - E85 fueled vehicles
  - Hybrid sedans
  - Unleaded gas sedans
  - Unleaded gas trucks
  - Biodiesel trucks
  - Biodiesel buses
  - Biodiesel hybrid-electric buses

Technologies

- Fleet-wide GPS
  - Reduces idle time
  - Right-sizes fleet
- DoubleMap live tracking (Magic Bus)
- Automatic Voice Annunciation (AVA) announcements
- Automatic People Counters (APC)
- Head sign integration
- Paratransit online scheduling
- TapRide—on-demand ride requests (SafeRide and Bio Research Shuttle)



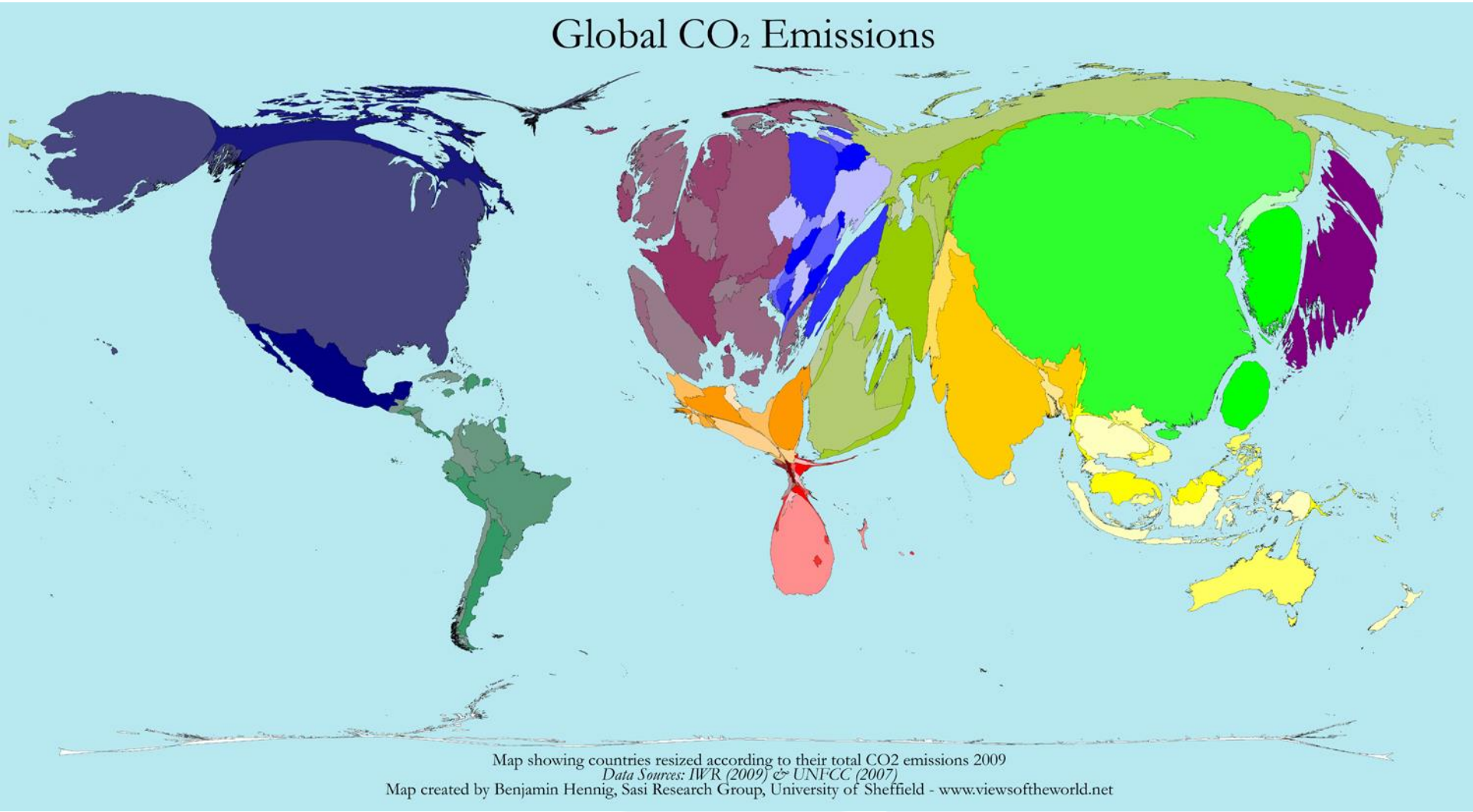
Future Planning

- High Capacity Transit
- College of Engineering/Midas Project On-Demand Solution (First-Mile/Last-Mile)
- Signal integration and connected autonomous vehicles
- V2X

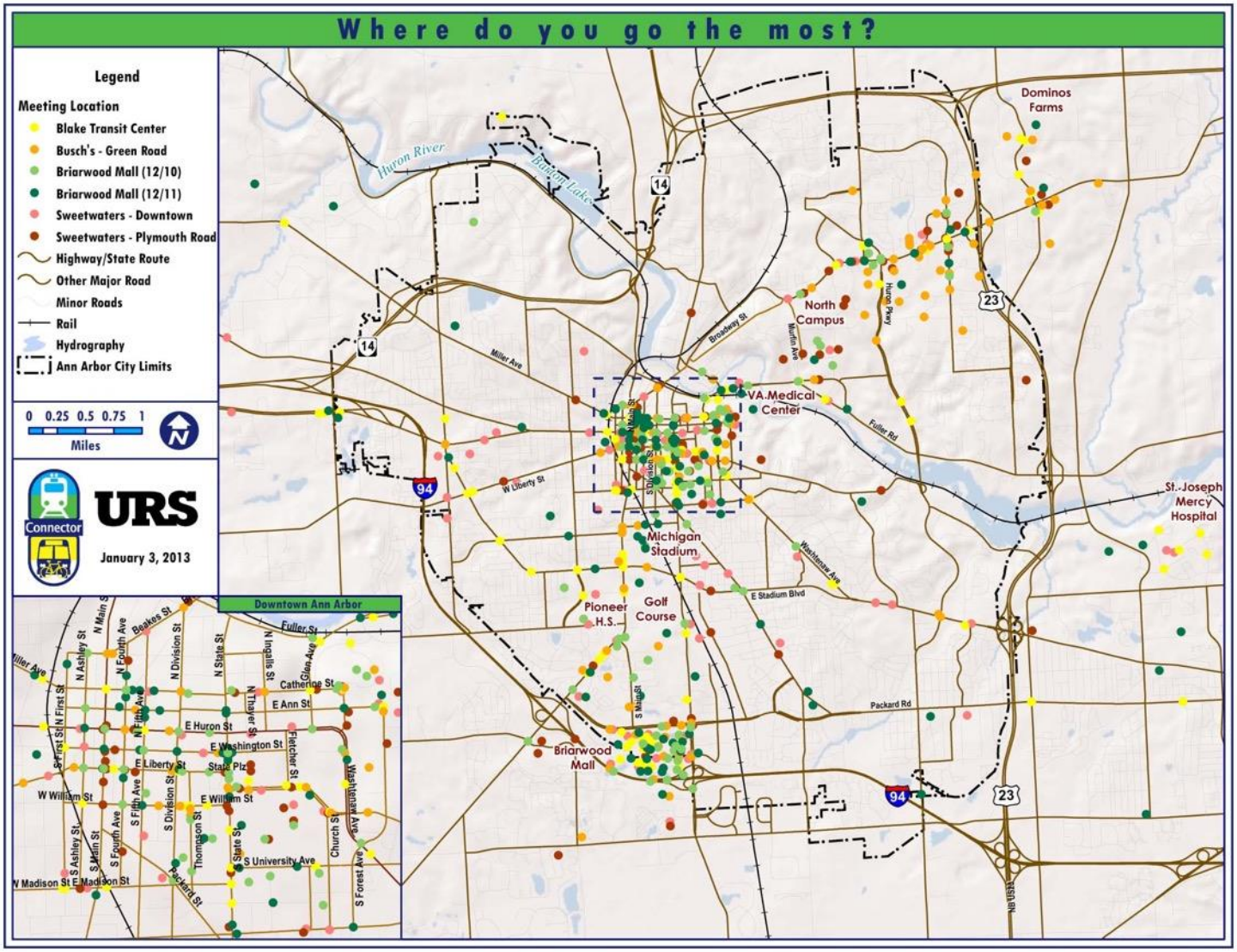
Clean Energy Coalition/ArborBike

City of Ann Arbor
Transportation Commission
June 21, 2017

Clean Energy Coalition Mission



Why? Because…


Where do you go the most?
Legend
Meeting Location
Blake Transit Center
Busch's - Green Road
Briarwood Mall (12/10)
Briarwood Mall (12/11)
Sweetwaters - Downtown
Sweetwaters - Plymouth Road
Highway/State Route
Other Major Road
Minor Roads
Rail
Hydrography
Ann Arbor City Limits
0 0.25 0.5 0.75 1
Miles
Connector
URS
January 3, 2013
Downtown Ann Arbor
Huron River
Barton Lake
Dominos Farms
North Campus
VA Medical Center
Michigan Stadium
Pioneer H.S.
Golf Course
Briarwood Mall
St. Joseph Mercy Hospital
Miller Ave
Broadway St
Huron Pkwy
Fuller Rd
W Liberty St
E Stadium Blvd
Washtenaw Ave
Packard Rd
Beakes St
Fuller St
N Ashley St
N Main St
N Fourth Ave
N Division St
N State St
N Ingalls St
Glen Ave
Catherine St
E Ann St
N First St
N Fifth Ave
N Thayer St
E Huron St
E Washington St
E Liberty St
State Plz
Fletcher St
W William St
E William St
S Fifth Ave
S Division St
Washington Ave
S Ashley St
S Main St
S Fourth Ave
Thompson St
S State St
S University Ave
Church St
S Forest Ave
W Madison St
E Madison St
Packard St
14
23
94

ArborBike Partners

Owner / Operator: Clean Energy Coalition

Program Partners:

City of Ann Arbor

Ann Arbor Area Transportation Authority

University of Michigan

A2 Downtown Development Authority

getDowntown Program

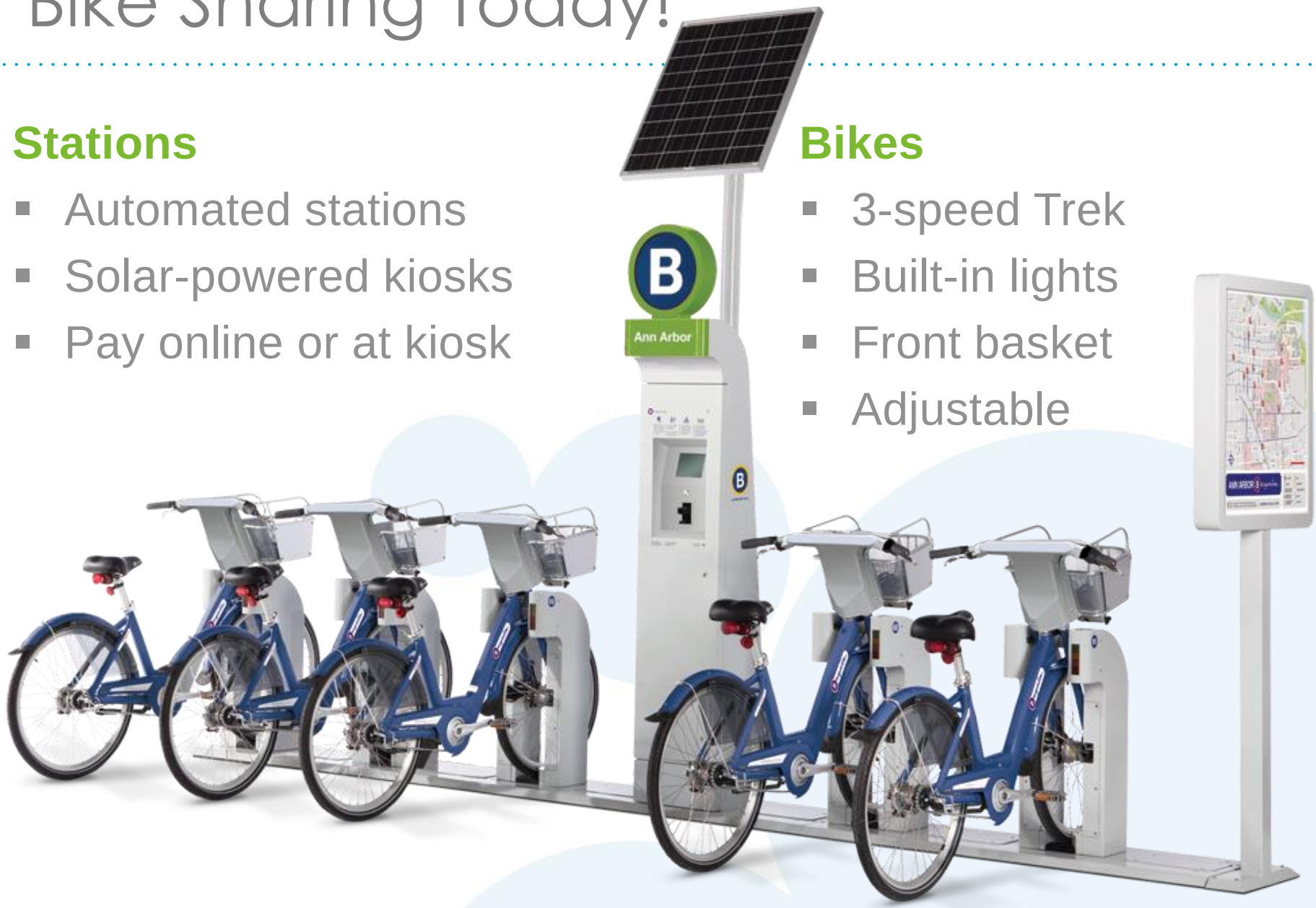
Bike Sharing Today!

Stations

- Automated stations
- Solar-powered kiosks
- Pay online or at kiosk

Bikes

- 3-speed Trek
- Built-in lights
- Front basket
- Adjustable



How Bike Sharing Works

Join

on-line or at any station.

Check out

and select your bike at any station.

Ride

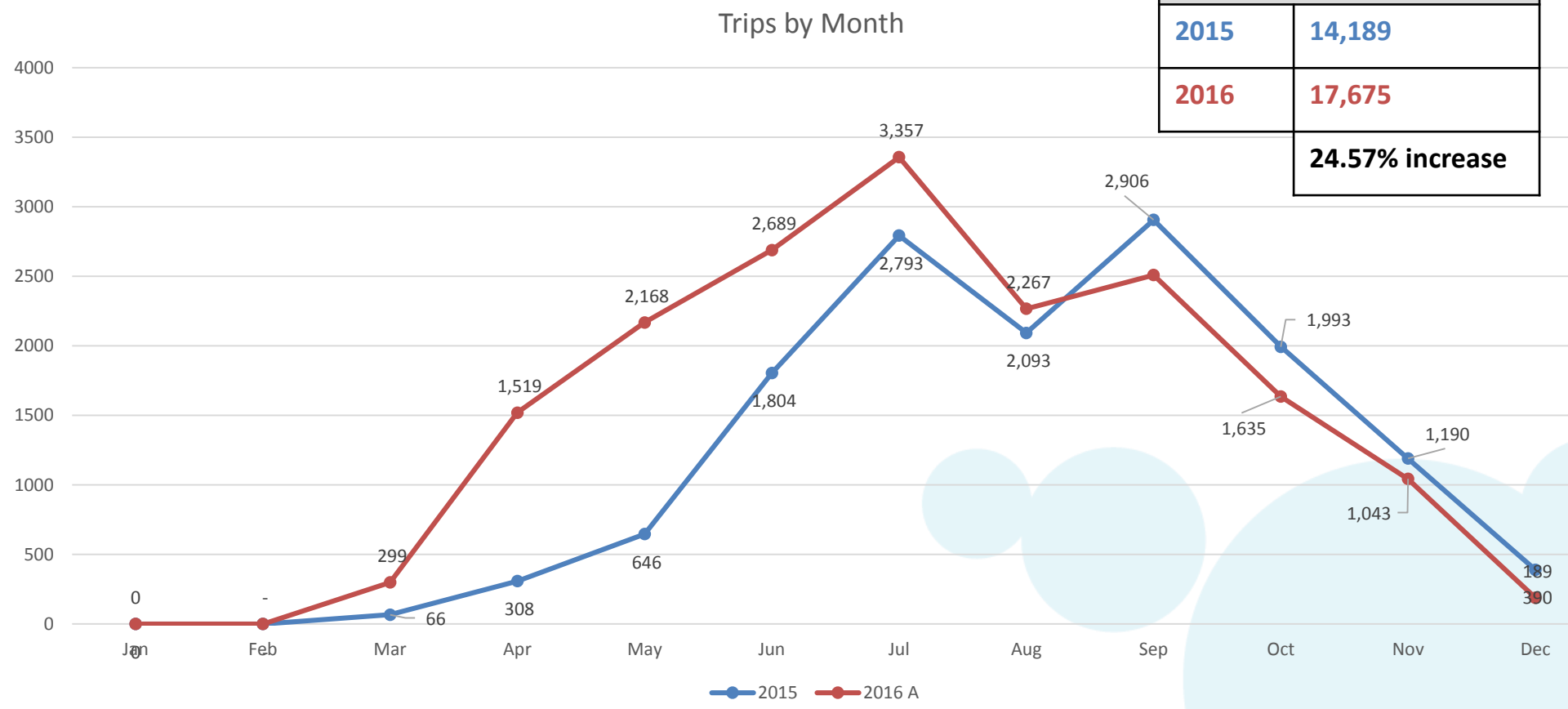
to your destination safely.

Return

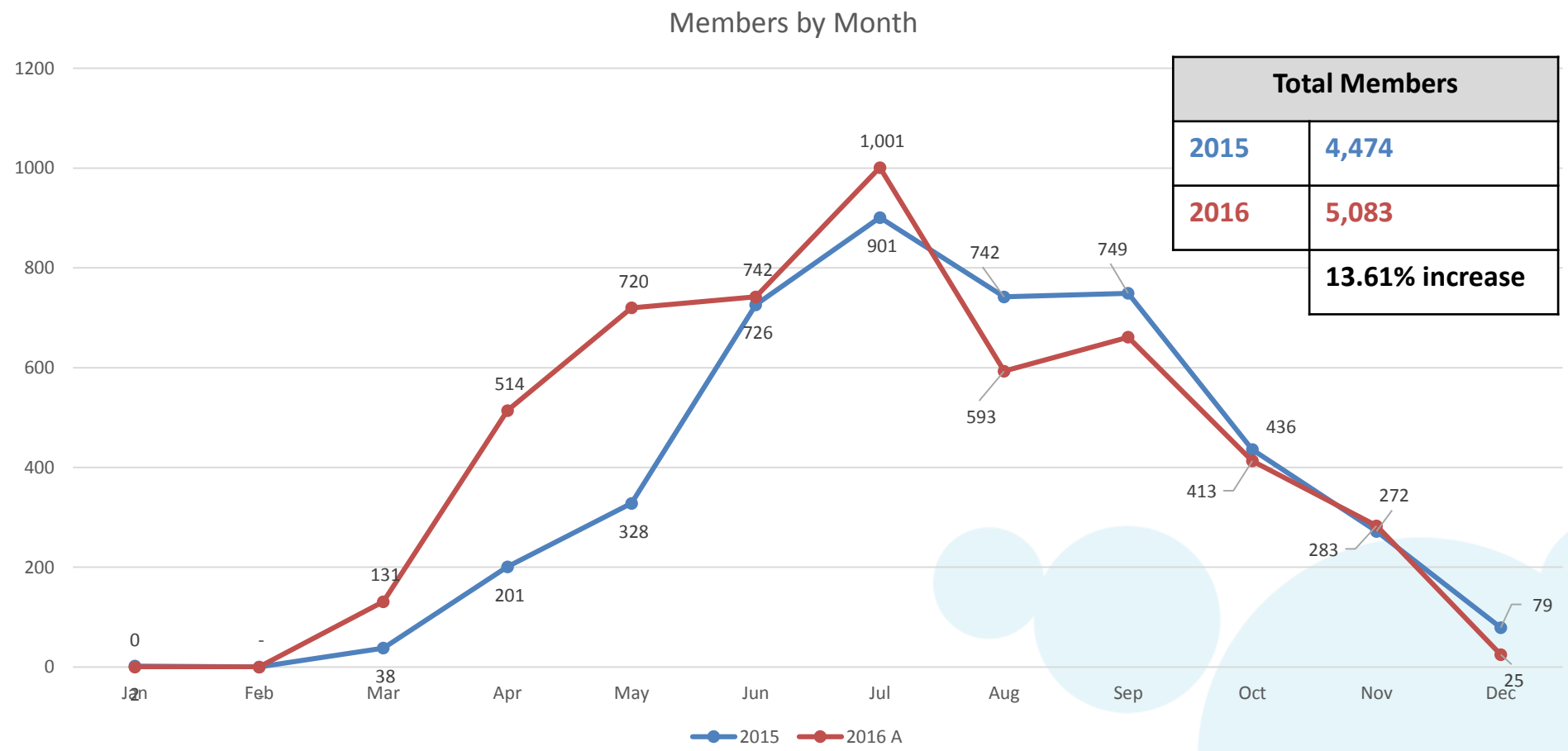
and dock your bike at any station.

System Performance

Total Trips	
2015	14,189
2016	17,675
	24.57% increase



System Performance



Total Members	
2015	4,474
2016	5,083
	13.61% increase

Supporting Ann Arbor's Goals

1. Contributing to a **world class** city.
2. Supporting **climate action**.
3. Supporting **parking management** plan recommended strategies.
4. Maximizing **multimodal transportation** resources.
5. Providing a **cost effective** last mile transit solution.

Ann Arbor Mobility Opportunities

Reducing personal vehicles in Ann Arbor by 10% requires:

Mode	Additional units
Transit commuters Current units: 5,938†	**2,207**
Carshare vehicles Current units: 56	**559**
Shared bikes Current units: 95	**500**
Ridesharers/carpoolers Current units: 3,374†	**1,082**

Results

68,930,400
Fewer miles traveled by personal vehicles

24,700
Fewer metric tons of GHG emissions related to personal vehicle ownership

$24,301,100
Saved in personal vehicle transportation costs


THANK YOU!
Sean Reed, Founder & Executive Director
Clean Energy Coalition
reed@cec-mi.org
planet blue
UNIVERSITY OF MICHIGAN

QUESTIONS

SMART CITIES AND INTELLIGENT TRANSPORTATION SYSTEMS

Topic Overview: Smart Cities and Intelligent Transportation Systems

“Smart Cities”- The Future of Transportation

Intelligent Transportation Systems (ITS)

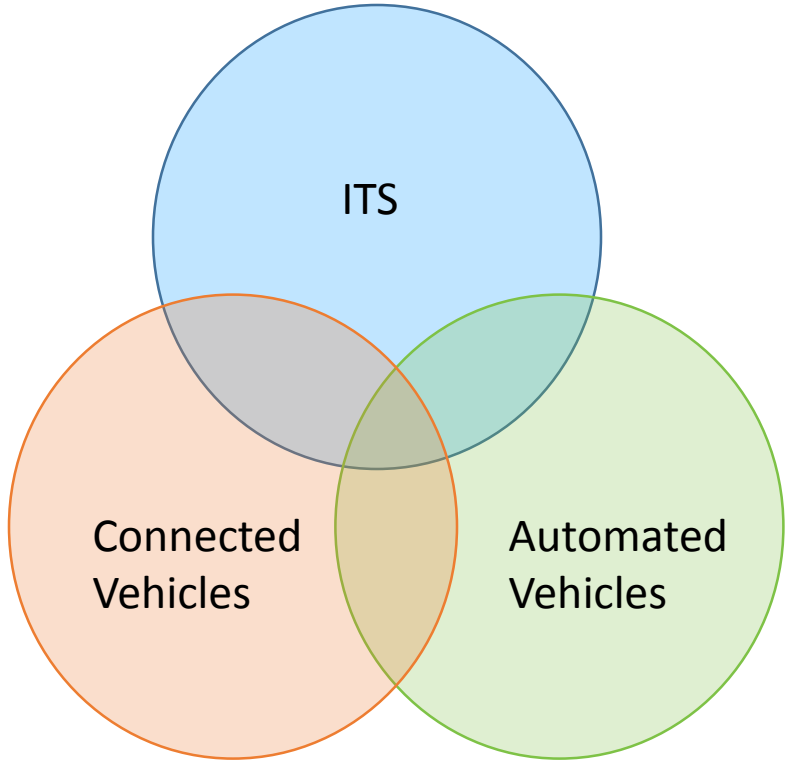
- Traffic signal coordination
- Real time adjustments
- Routing information (incidents, construction, congestion)
- Priority (Fire, emergency and transit)

Connected Vehicle systems

- Systems that enable the exchange of digital information between a vehicle and other vehicles, signals, and infrastructure.

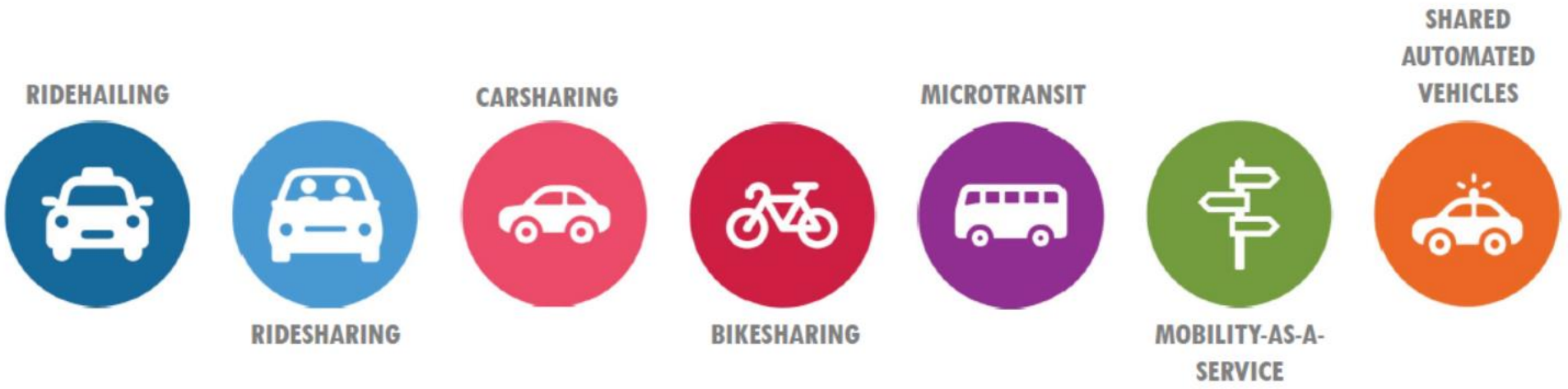
Automated Vehicle systems

- Gradual process to transition aspects of driving from a driver to the vehicle



New Mobility Services

Emerging technologies and wireless connectivity that allow for more convenient efficient and flexible travel.



Safety Improvements

- Reduce crashes and injuries/ fatalities
- Up to a 25% reduction of crashes during winter weather thanks to weather traffic management application on freeways.
- Up to 15% reduction in travel time for emergency vehicles

Automated Vehicles

Potential CV/AV Implications

- Efficiency – Real time travel data by mode so systems can adapt quickly
- Safety – improved safety and capacity, could narrow vehicle lanes
- Transit – better first/last mile connections BUT may reduce transit use
- Congestions and emissions – auto travel/occupancy could be more or less
- Equity – Might exacerbate equity issues and digital divide
- Land Use – more density or more sprawl (free to work during travel)
- Parking – may reduce demand and need for parking lots and garages
- It is important to remain adaptive to new technologies as they become available and tested

Preparing for Technology Changes

- Community and stakeholder education and engagement
- Potential future policy coordination and plan updates:
  - Unified CV/AV policy framework addressing land use, infrastructure, placemaking, parking etc.
  - Incorporation of CV/AV technology and implications into Transportation Plan Update
- Track and monitor federal and state developments
- Plan infrastructure needs; build data and computing capacity

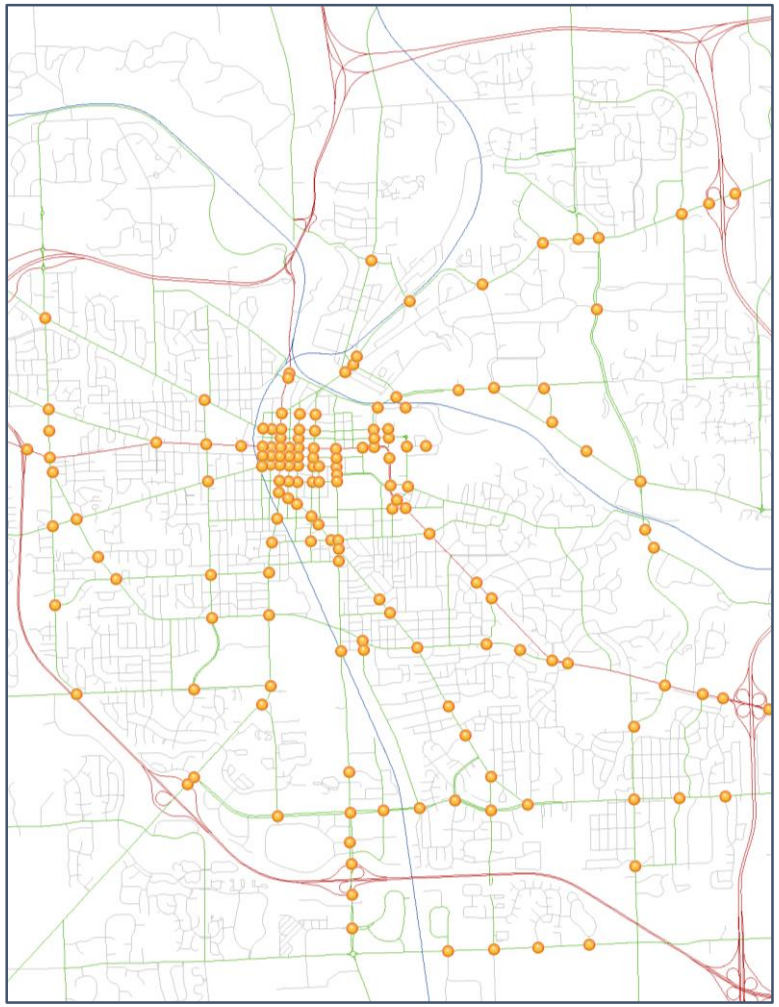
Traffic Signal System Overview

Traffic Signal System – Overview

Pedestrian Count Down, Washington St . & 4th Ave.

- Infrastructure - road user interface
- Infrastructure - backend support
- System operations

Infrastructure – User Interface



City of Ann Arbor Traffic Signal Locations

Currently 162 signalized intersections

- 38 MDOT trunkline intersections
- 2 on U-M properties
- 1 Washtenaw County Road Commission intersection

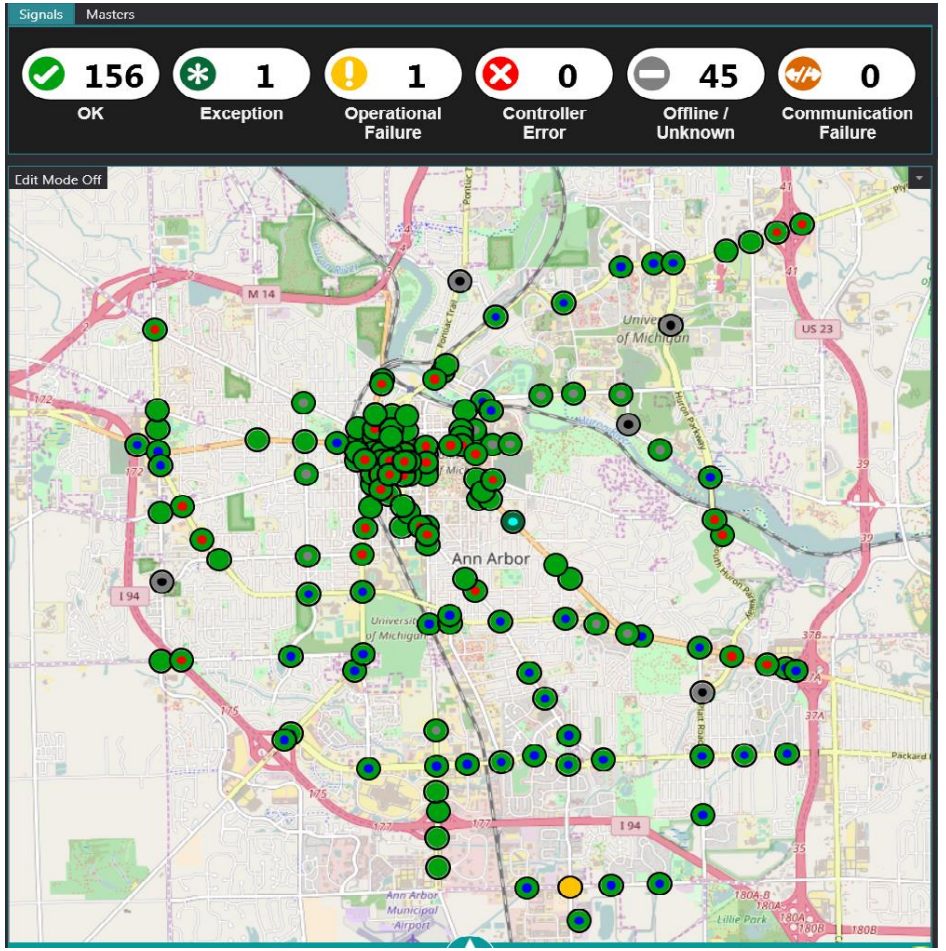
Infrastructure – User Interface

- Detection: passive action for the system to identify a user
- Actuation: user informs the system
- Examples:
  - Push button
  - In-pavement sensor
  - Over-the-road sensor
  - Existing and future technology advancement

Over-the-Road Sensor

Infrastructure – Backend Support

- Traffic signal controller – intersection level
- Central servers – system wide applications
- Communication network and devices
  - All intersections (except four locations) are on network
  - Link to future signalized intersections, data collection sites
- Data from/to other agencies



Traffic Signal Network Server Interface

Signal System Operations

- Recurring congestion (e.g. peak hour timing plans)
- Non-recurring events (e.g. football, crashes, construction)
- Emergency response accommodations
- Pedestrian and Bike accommodations
- Applications
  - Central signal management database
  - Adaptive signal operations – Siemens center of excellence for intelligent traffic technology. SCOOT: Split Cycle Offset Optimization Technique
  - Applications enabled by emerging technology

UM Football Game Traffic, Stadium Blvd.

iNet & Smart Cities Overview

Automatic Vehicle Location (AVL) Project

- Implementing AVL technology into 110 more City vehicles:
- Advantages:
  - Reduced fuel cost
  - Increased response times
  - Improved driver safety and security
- GPS Software upgrades for problem identification:
  - Allows the driver to log a problem into Cityworks (Asset Management System) via the GPS device
  - This will eliminate the need to call dispatch and manually enter a problem into Cityworks

City of Ann Arbor Fiber Network (A2 I-NET)

- Foundation for:
  - Future Connectivity
  - Smart City initiatives
  - IoT initiatives
- Excess capacity for growth
- Eliminates a significant project feasibility barrier/constraint
- Topology supports resiliency, failover, and redundancy
- Proactively placing conduit for future build outs
- Customers: AAATA, Libraries, DDA
- ArcFM software – Map all new A2 I-NET assets and existing Traffic Control assets

IT Department Smart City and IoT Strategy

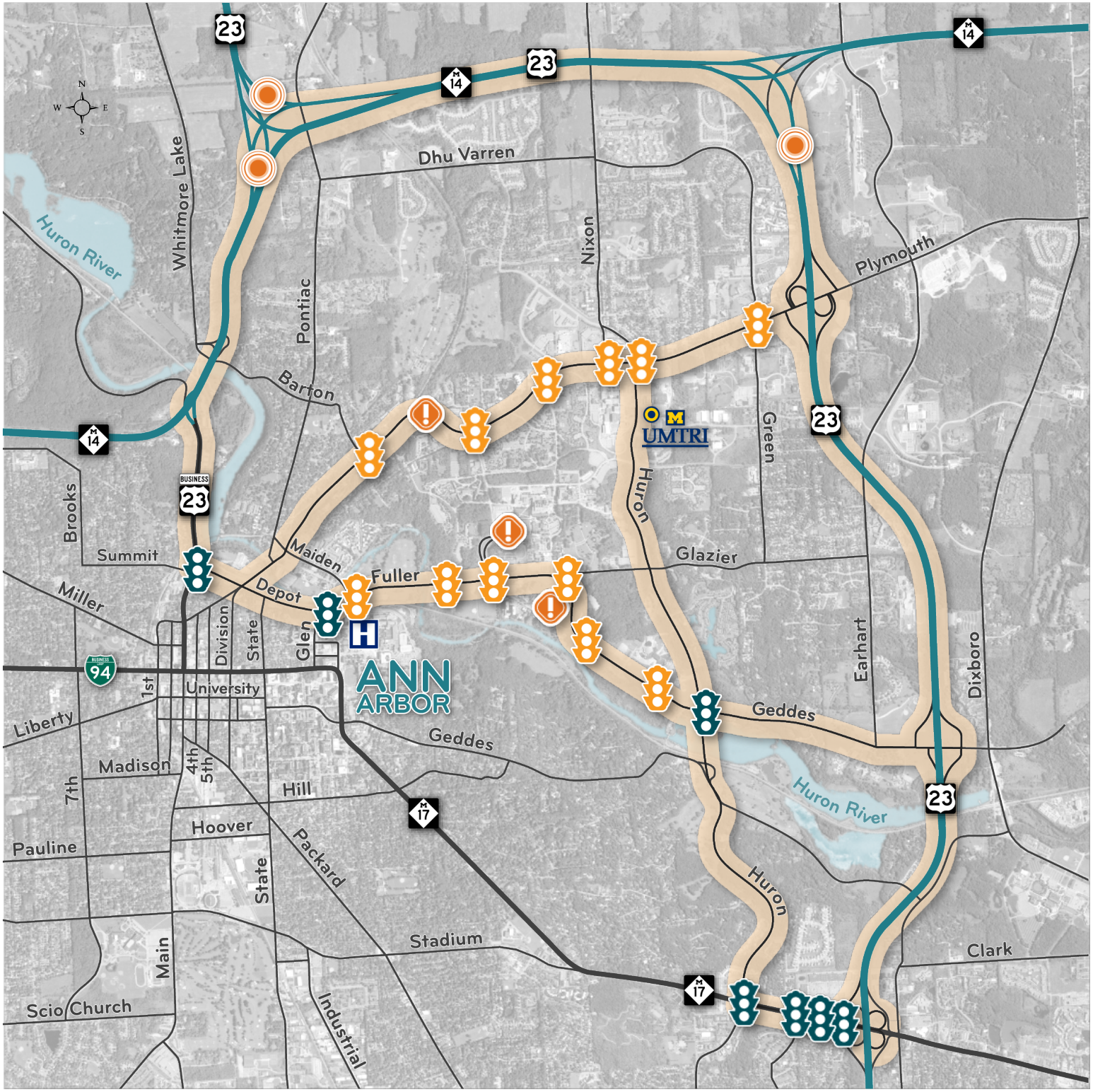
- Enhance and maintain a strong infrastructure foundation
- Proactive communication with City departments to identify operational efficiencies and cost savings through “Internet of Things”(IoT) and Smart City initiatives
- Partner with the community
- Dig once
- Enhance and maintain our infrastructure for the future
- **Must** be secure
- Designing and implement solutions that:
  - meet our customers requirements and needs
  - are sustainable
  - are “Built for the Future”
- Enhance and build our Business Intelligence platform

Connected Transportation Environment

Jim Sayer

Principal Investigator

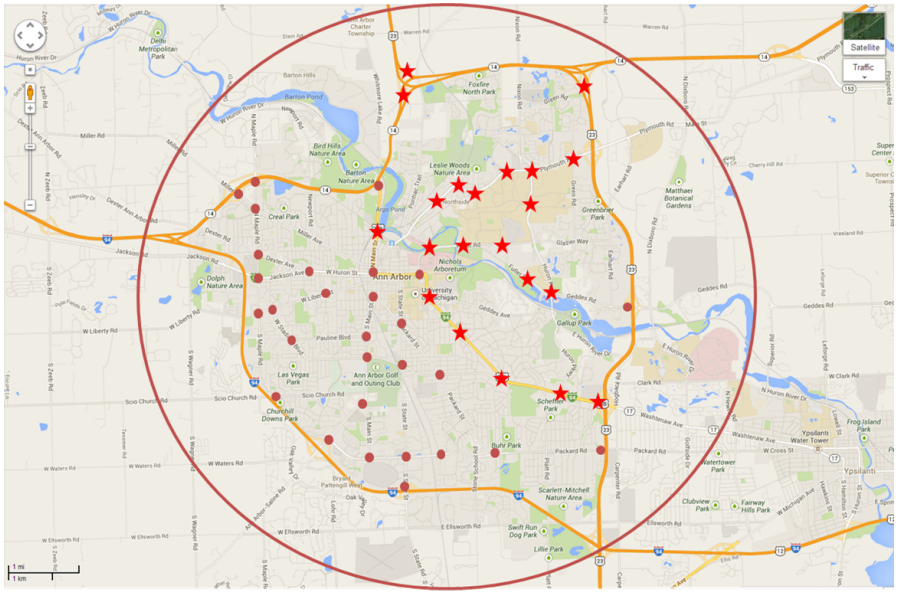

Fulle
DODGE
DAKOTA


N
W
E
S
23
M 14
Dhu Varren
Whitmore Lake
Huron River
Pontiac
Nixon
Plymouth
Barton
UMTRI
Green
Huron
BUSINESS 23
Brooks
Summit
Maiden
Fuller
Glazier
Depot
Miller
Division
State
Glen
ANN ARBOR
BUSINESS 94
1st
University
Liberty
Geddes
Earhart
Dixboro
Madison
4th
5th
7th
Hill
M 17
Hoover
Pauline
Packard
Huron River
Stadium
Main
Scio Church
Industrial
Clark


Green

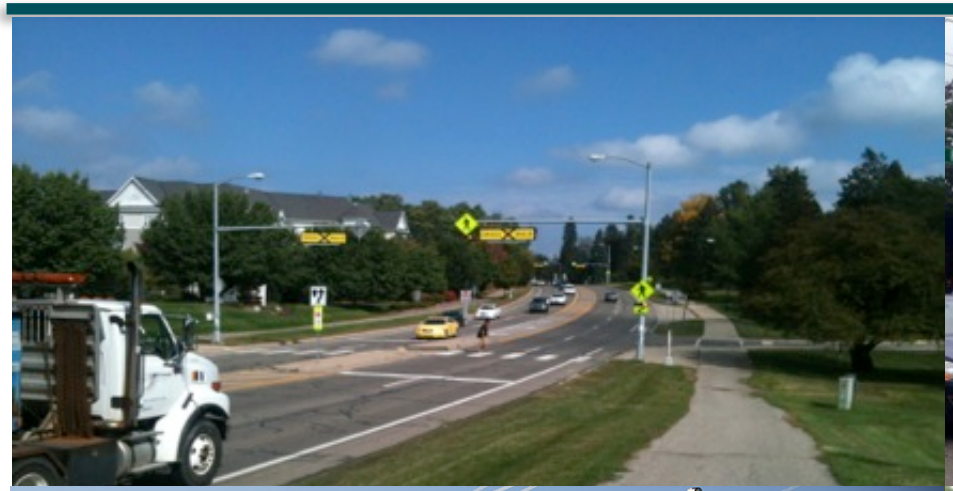
AACVTE Deliverables '17 & '18

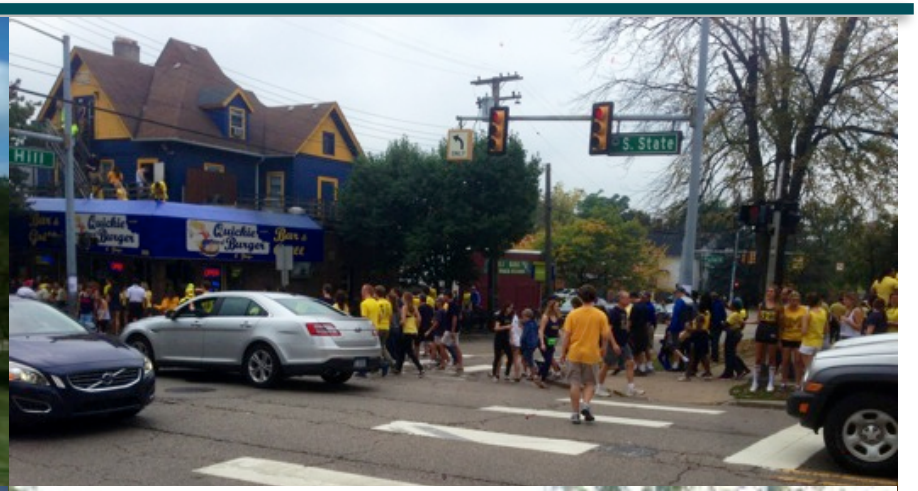
- 70 infrastructure locations:
  - 3 Curve Speed Warning Sites
  - 4 Pedestrian Crosswalks
  - 8 Freeway Sites
  - 1 Roundabout
  - 5 Staging/Testing Sites
  - 49 Intersections

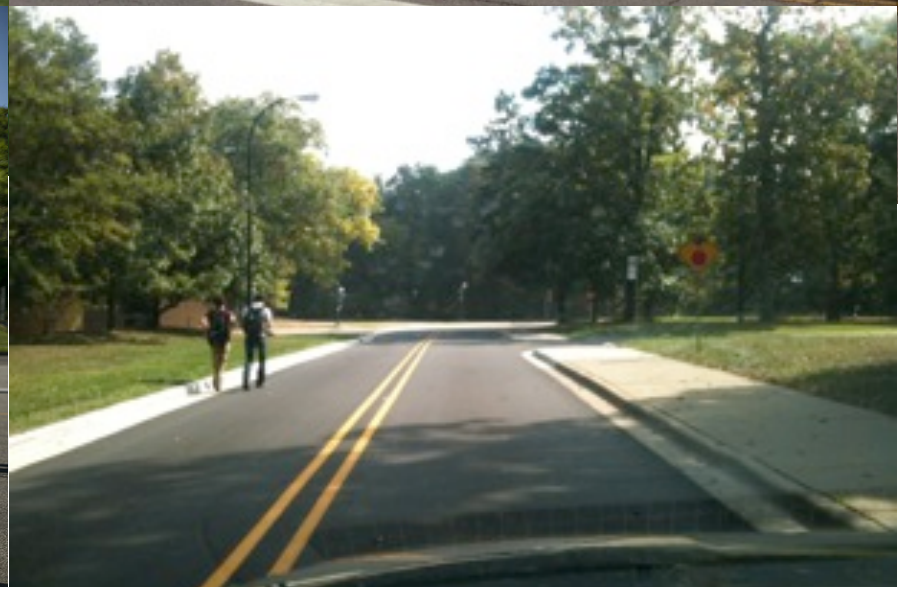


- 2500 minimum Vehicle Deployments
  - 2000 Vehicle Awareness Devices (VAD)
  - 500 Aftermarket Safety Devises (ASD)
- Additional V2V, V2I and V2P Applications
- DOE project: Energy impact of CAVs
  - 500 participants will receive a dongle and a VAD

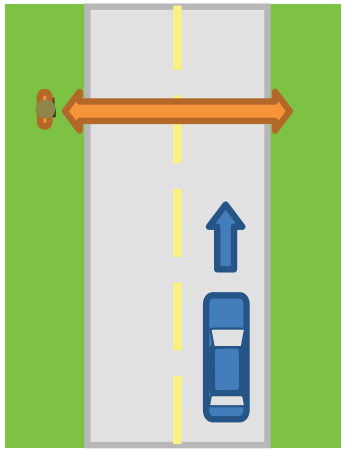
Ann Arbor's Many Road Users

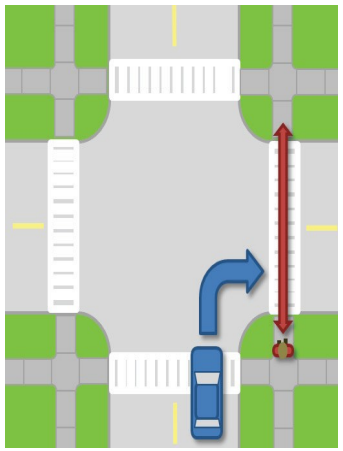


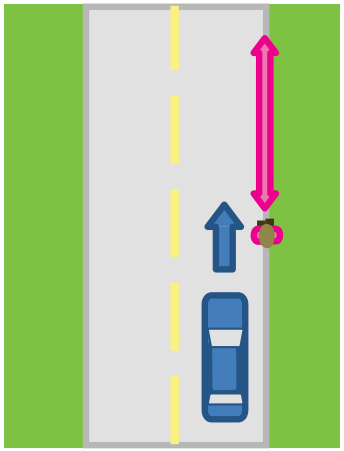


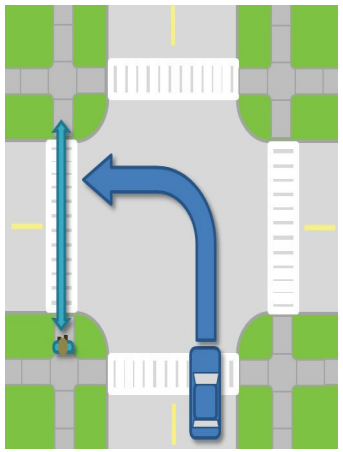


On-Going V2P Research









Testing range and position accuracy of DSRC-equipped phones

V2P for 2017

- Execute V2P Project: Expand Deployment of Applications for Vulnerable Road Users
  - Initially 30 phones will be provided to participants
    - Recruited based on survey responses on walking patterns
    - Our handset used in place of their personal phone
  - 100 After-Market Safety device equipped vehicles
  - 4 infrastructure sites (mid-block crosswalks)
  - 3 systems
- Honda/Qualcomm/Denso technology we have been working with:

  https://www.youtube.com/watch?v=6QdqBWZ-_7E

Future Steps

- Expand to:
  - More equipped pedestrians
  - More equipped vehicles
  - More equipped crosswalks
  - Continued development of the phone-based applications to include bicyclist safety

QUESTIONS