

COMPREHENSIVE OPERATIONS ANALYSIS (COA) PLAN

Executive Summary



AECOM



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INTRODUCTION AND SERVICE OVERVIEW

SMART Path is an intensive, year-and-a-half-long study that identifies, analyzes, and prioritizes a series of transit improvements to create a more efficient bus system in Metro Detroit. The study included a thorough technical analysis of SMART's transit services and regional transportation and mobility characteristics. In addition, a thorough public engagement effort was completed that included a focus on existing and new riders' needs through on-vehicle surveys, in person meetings within all three counties, and digital engagement through an online MetroQuest survey. The intent of the SMART Path Plan is to create the best possible transit network for SMART riders within SMART's available budget. This Plan outlines and explains the SMART Path recommendations for fixed route service to be phased in over the next five years. The goal of these recommendations is to maximize the impact of taxpayer funding for transit by improving system efficiency, heightening quality of service, and piloting new service delivery options to address existing challenges.

SERVICE AREA

SMART is responsible for transportation to the counties of Macomb, Oakland, and Wayne. Communities in Oakland and Wayne counties may opt into or out of SMART services individually through the decision of their municipal governments, while communities in Macomb County opt into or out of services on a county-wide level. The service area of 1,074 square miles has a population of 3,424,477 people¹. **Figure I** shows the current SMART system, and **Table I** shows all of SMART's current opt-in communities.

¹ Federal Transit Administration. (2017). *2017 Annual Database Agency Information*. Retrieved from National Transit Database: <https://www.transit.dot.gov/ntd/data-product/2017-annual-database-agency-information>

RIDE SMART

SYSTEM MAP

Effective: January 7, 2019

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RideSMART-FAST.org

North Macomb Services
Some North Macomb residents who reside outside of the Road to connect you to many Macomb County communities and beyond. These services include:
• Limited service routes to major destinations.
• Local operation exclusively for local destinations.
• Limited service routes to major destinations.
• Local operation exclusively for local destinations.

For the most up-to-date route and schedule information, customers should call (866) 962-5515 or visit smartbus.org. Need help planning your trip? Visit us on the web and let the SMART Trip Planner do it for you!

SMART Routes		
125 Fort Street / Eureka Road	445 Maple & Telegraph Limited	610 Kearsarge / Harper
140 Southshore	450 Woodward Loop / Pontiac	615 Jefferson
160 Downriver	460 Woodward Loop / Sonoma	620 Charlotte
200 Michigan Avenue Local	461/462 FAST Woodward	635 Jefferson Express
250 Ford Road	465 Auburn Hills Limited	710 Nine Mile Crossdown
255 Ford Road Express	494 Dearborn	730 Ten Mile Crossdown
261 FAST Midtown	495 John R	740 Twelve Mile Crossdown
275 Telegraph	510 Van Dyke Limited	750 Pontiac / North Hills Farms
280 Middlebelt South	515 Van Dyke Limited	753 Pontiac / Baldwin Road
330 Grand River / Beach Daily	530 Schoenherr	756 Pontiac / Perry / Opdyke
400 Southfield / Orchard Ridge	550 Orchard	760 Thirteen Mile / Fourteen Mile Crossdown
405 Northwestern Highway	560 Garfield Local	760 Fifteen Mile Crossdown
415 Greenfield	561/562/563 FAST Oriskany	805 Grand River P & R
420 Southfield	567 New Baltimore/Oriskany	830 Downriver P & R
430 Main Street / Big Beaver	580	849 Northland Loop P & R
		851 W. Bloomfield / Farmington Hills P & R

(866) 962-5515 M-F 6:30 a.m. to 6:00 p.m.
Sat 7:30 a.m. to 4:00 p.m. • smartbus.org

This bus system map serves as a general guide to bus routes operated by SMART. Consult individual schedules for detailed route information. Changes may occur on routes without notice.

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Table 1: Opt-In Communities by County

Macomb County	Oakland County	Wayne County
Macomb County is opt-in at a countywide level; all its communities are part of SMART's service area.	Auburn Hills Berkley Beverly Hills Bingham Farms Birmingham Bloomfield Township Clawson Farmington Farmington Hills Ferndale Franklin Hazel Park Huntington Woods Lathrup Village Madison Heights Oak Park Pleasant Ridge Pontiac Royal Oak Royal Oak Township Southfield Troy Walled Lake West Bloomfield	Allen Park Dearborn Dearborn Heights Ecorse Garden City Grosse Pointe Grosse Pointe Park Grosse Pointe Shores Grosse Pointe Woods Grosse Pointe Farms Hamtramck Harper Woods Highland Park Inkster Lincoln Park Melvindale Redford Township River Rouge Riverview Romulus Southgate Taylor Trenton Wayne Westland Wyandotte

MARKET ANALYSIS

Public transportation is most efficient and effective in areas of high population and employment density. Where greater concentrations of people and jobs exist, ridership is likely to be higher. However, most transit agencies also strive to provide comprehensive service to the communities in their jurisdiction and to residents who have no other means of transportation.

This market analysis identifies the areas of Wayne, Oakland, and Macomb counties that have the highest potential for transit ridership as well as the areas that have the highest need for transit services.

TRANSIT POTENTIAL

High transit ridership is most likely to be found where high concentrations of population and employment exist. In the SMART service area, these areas include central Detroit, Dearborn, freeway corridors in Troy, Southfield, and Farmington Hills, as well as other commercial corridors in Warren and Sterling Heights. Livonia is another area with high concentrations of population and employment which lies just outside the SMART service area.

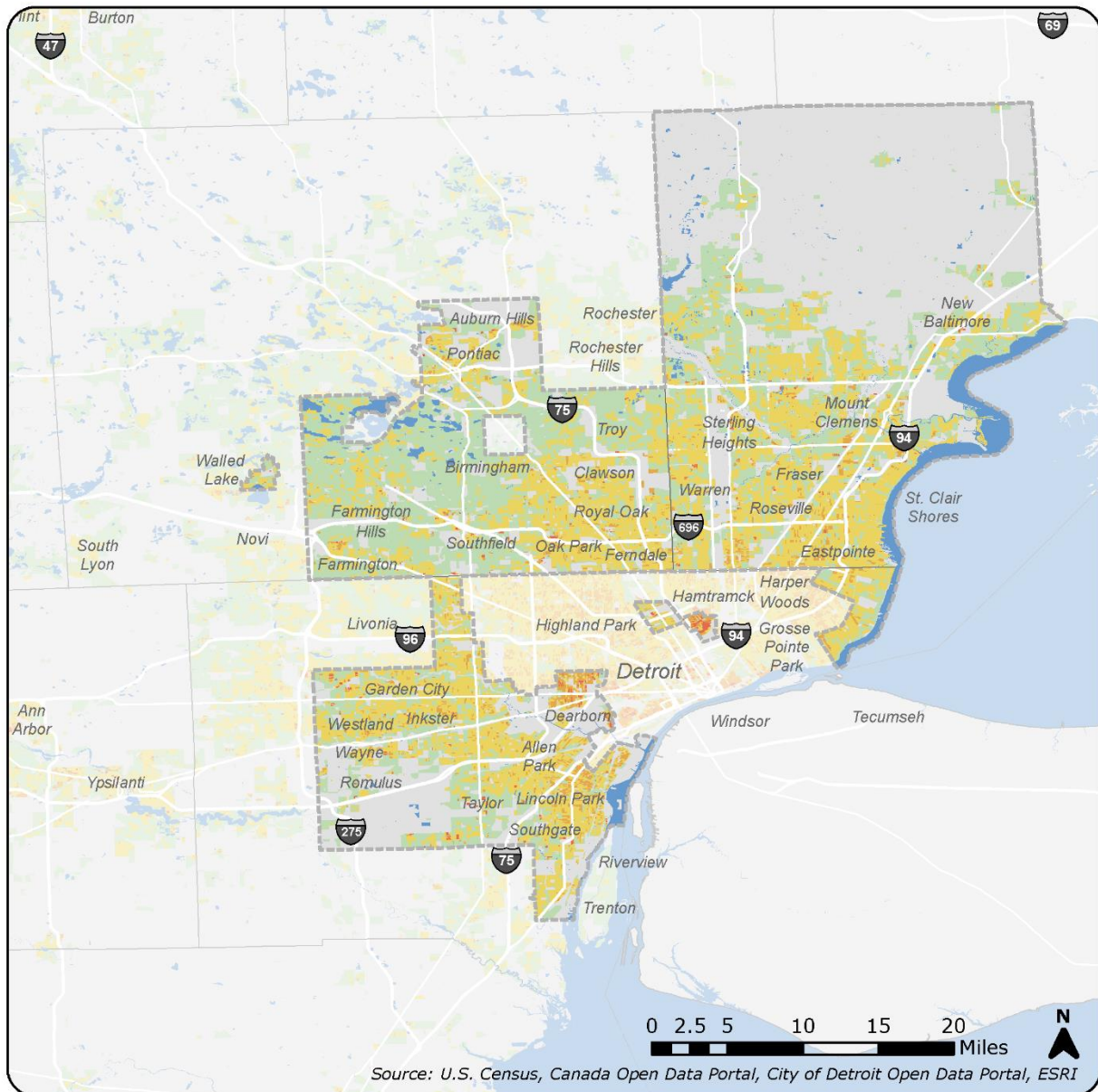
Population Density

Most public transportation customers will access bus services by walking to a bus stop. Thus, the geographic areas served by transit are generally those within a quarter- or half-mile distance from a bus stop, or a ten-minute walk. As a result, the size of the market for transit is a function of the density of the population living in these areas. In general, at least six persons per acre are needed to support hourly service on fixed-route transit. **Figure 2** illustrates the population density of the SMART service area. Areas in yellow are able to support hourly service, with areas shaded in darker colors able to support higher levels of service.

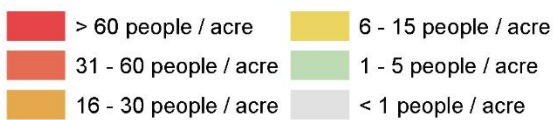
Areas with moderate to high concentrations of population density include:

- Dearborn in the area north of Michigan Avenue and east of Greenfield Road
- Portions of Oak Park, Ferndale, and Royal Oak in Oakland County near I-696 and I-75
- Roseville, Eastpointe, Warren, and St. Clair Shores in Macomb County along Gratiot Avenue and Van Dyke Avenue
- Communities in northeastern Wayne County such as Harper Woods and Grosse Pointe Park
- The City of Hamtramck
- Outside the SMART service area: the City of Detroit, especially neighborhoods in and around downtown, Midtown, Elmwood Park, Lafayette Park, Springwells, and other portions of southwest Detroit

Figure 2: Population Density



Population Density by Census Block



SMART Opt-In Communities

Water



Source: Decennial Census (2010)

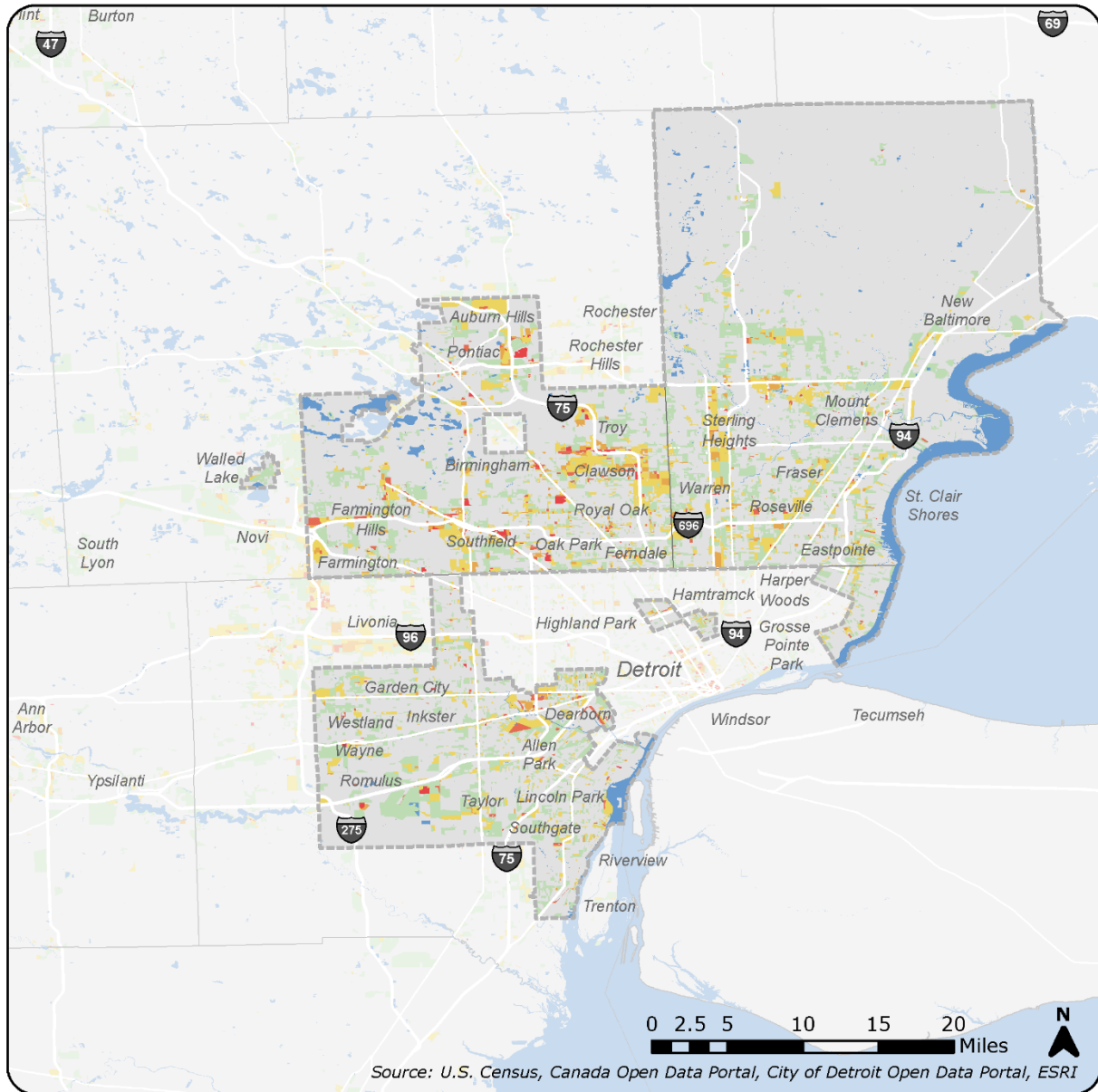
Employment Density

Employment density is a strong indicator of demand for transit, as most trips by public transportation begin or end at work. Serving employment centers also provides access to job opportunities for residents. As with population density, at least six jobs per acre are typically required for an area to support fixed-route transit service. In **Figure 3**, areas above this threshold are shown in yellow, orange, and red, with darker colors corresponding to higher densities. Areas with higher densities can also support greater transit frequencies.

The most significant concentration of employment density served by SMART is found in Downtown Detroit. Other areas with significant employment density include:

- Dearborn along Michigan Avenue, Southfield Freeway (SR-39), and Ford Rd (SR-153)
- Auburn Hills, Troy, and Clawson along I-75
- Southfield along the John C. Lodge Freeway (SR-10) and Telegraph Road (US-24)
- Sterling Heights and Warren along Van Dyke Avenue (SR-53)
- Other communities in Oakland County, including Pontiac, Farmington Hills, Royal Oak, and Birmingham
- Outside the SMART service area:
 - Livonia along I-96
 - Rochester

Figure 3: Employment Density



Job Density by Census Block



SMART Opt-In Communities

Water



Source: LEHD (2015)

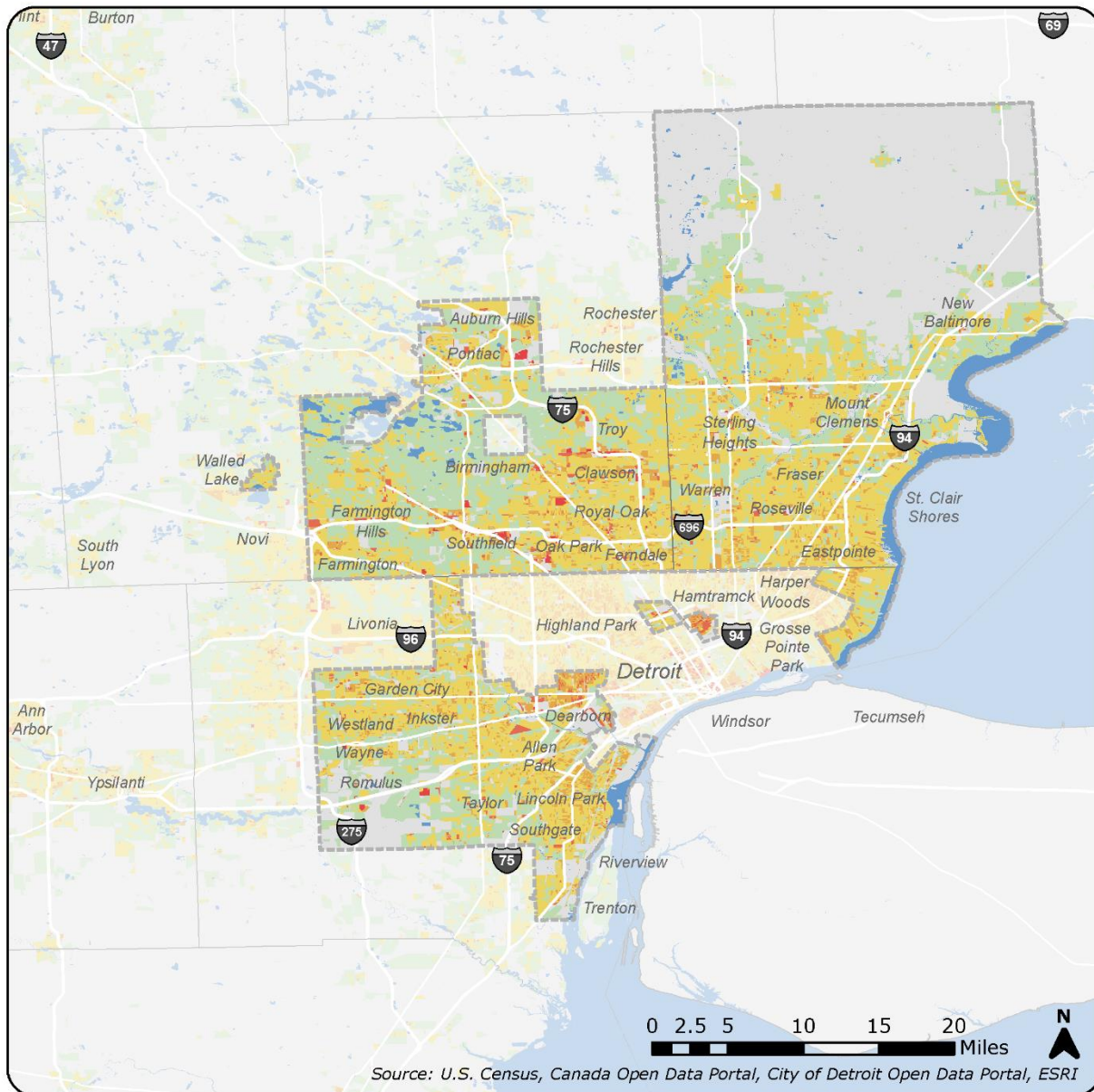
Transit Potential

The transit potential index, shown in **Figure 4**, combines population and employment densities at the Census block group level to indicate the overall viability of transit service in each area.

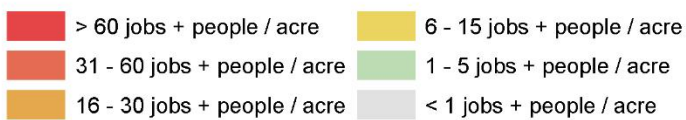
Areas with consistently high levels of transit potential include:

- Dearborn's job and housing clusters in the central and northeastern portion of the city
- Oakland County's communities along I-696 and I-75
- Commercial corridors along Van Dyke Avenue (SR-53) and Gratiot Avenue (SR-3) in Macomb County
- Cities in Wayne County such as Hamtramck, Lincoln Park, Harper Woods, and Grosse Pointe Park
- Outside the SMART service area:
 - Detroit, especially the city's downtown and midtown
 - Livonia

Figure 4: Transit Potential



Population and Job Density by Census Block



SMART Opt-In Communities

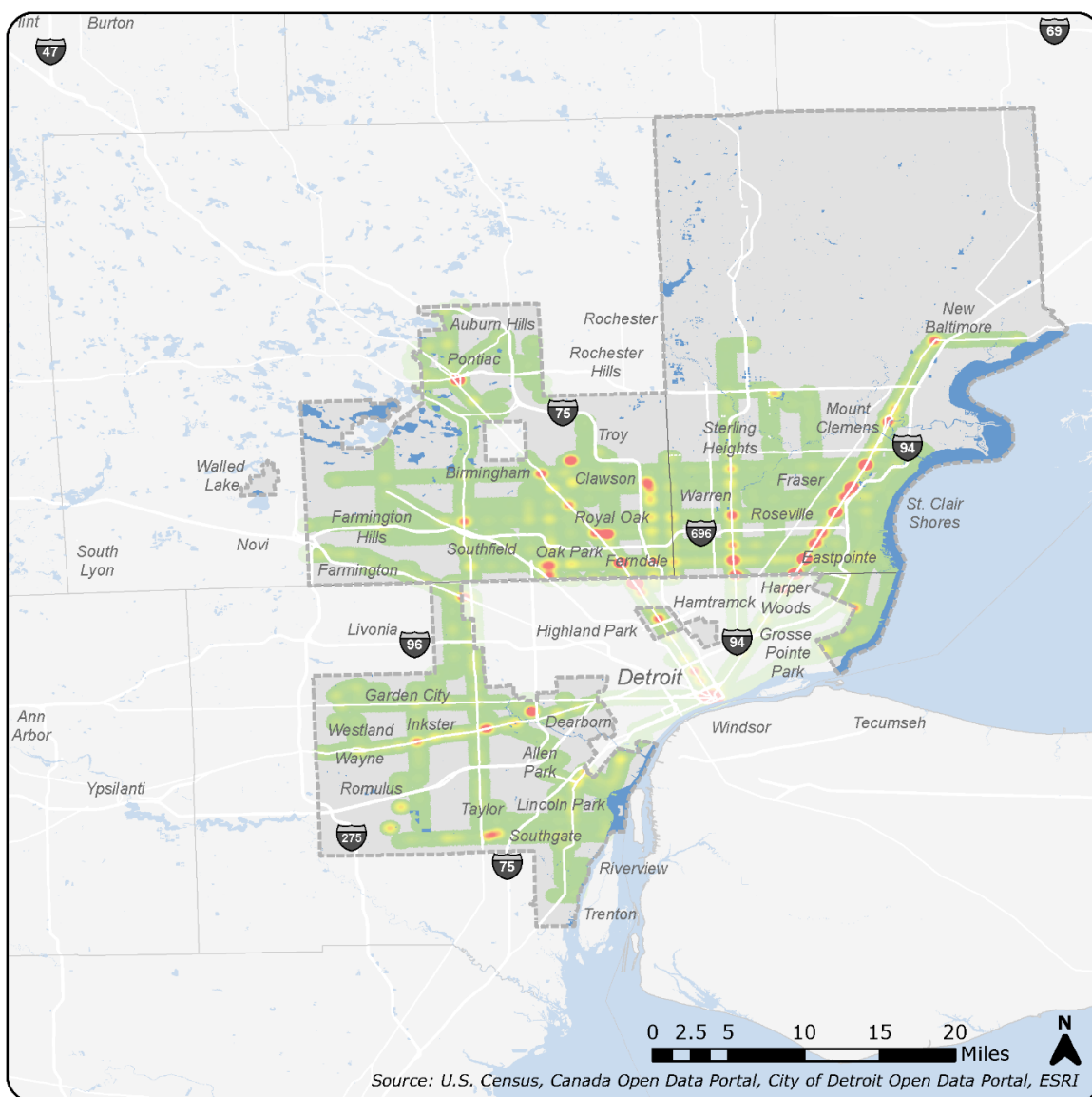
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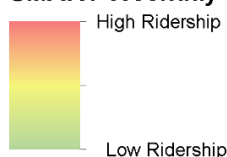
Source: LEHD (2015), Decennial Census (2010)

Figure 5 shows a heatmap of SMART ridership collected via automated passenger counters (APCs) in April 2018. While actual ridership is a function of where service is available, **Figure 5** illustrates that on corridors with transit service, there is a clear correlation between high ridership and high transit potential (see **Figure 4**) particularly along the Gratiot Avenue (SR-3), Woodward Avenue (SR-1), and Van Dyke Avenue (SR-53) corridors and in Dearborn and Pontiac job centers.

Figure 5: SMART Ridership Heat Map



SMART Weekday Ridership Heatmap



Source: SMART Ridership (2018)

- SMART Opt-In Communities
- Water



TRANSIT NEED

Transit-Oriented Populations Index

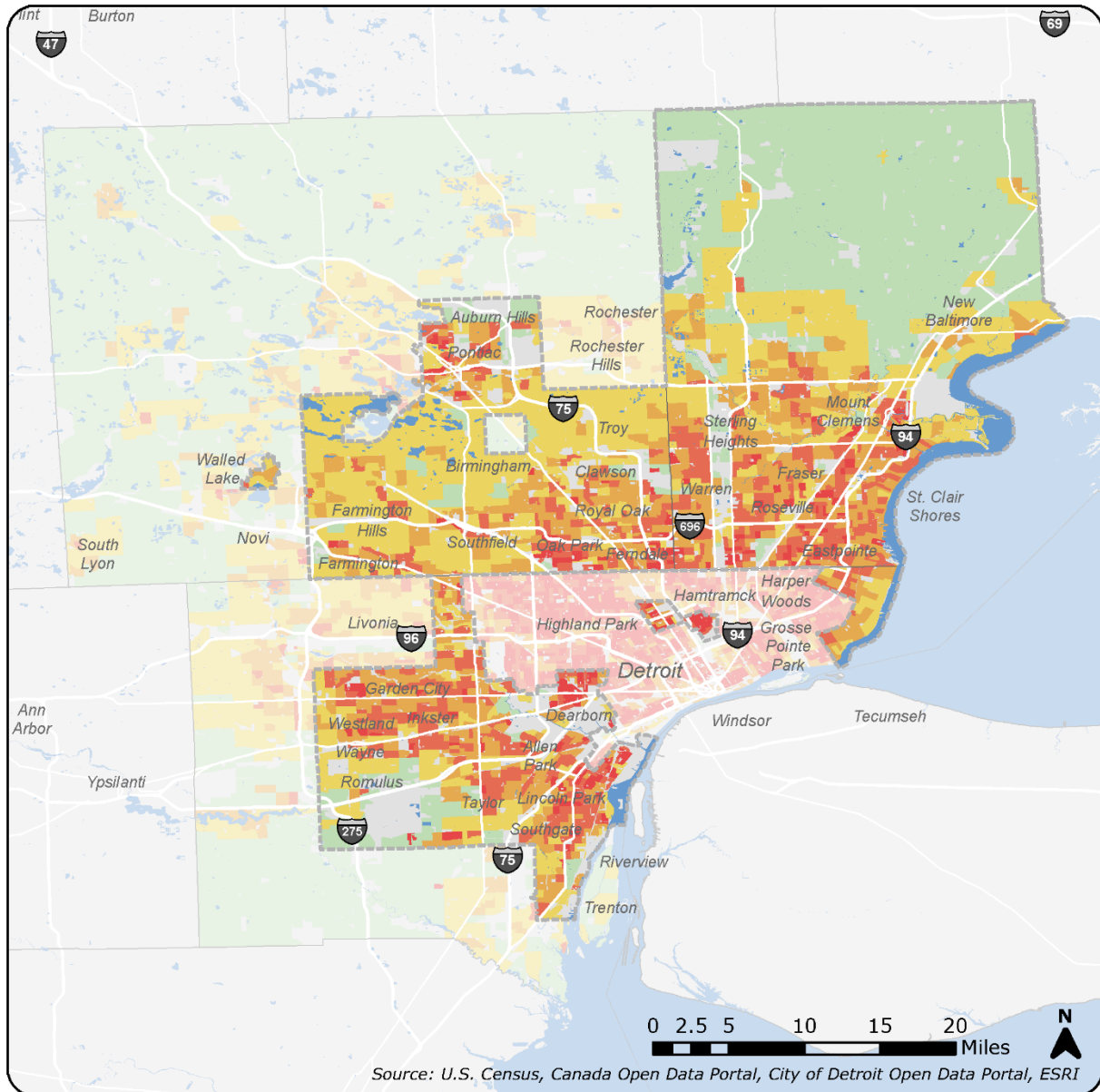
The Transit-Oriented Populations Index (**Figure 6**) shows the composite transit-oriented population score for each block group based on the sum of scores in each individual demographic measure. If a block group falls in the highest density category for each of the five demographic measures, it will receive a Transit-Oriented Populations Index score of 25 points (5+5+5+5+5). The lowest possible Transit-Oriented Populations Index score is 5 points (1+1+1+1+1).

Based on this index, the areas with the highest concentrations of transit-oriented populations include:

- Cities in Wayne County along Fort St (SR-85) including Lincoln Park and Southgate, along Ford Rd (SR-153) including Dearborn and Garden City, and along Michigan Ave (US-12) including Inkster and Wayne
- Southeastern Oakland County along I-75 and I-696, including Oak Park, Ferndale, Hazel Park, and Madison Heights
- Portions of Macomb County communities along Van Dyke Avenue (SR-53), Gratiot Avenue (SR-3), and Groesbeck Highway (SR-97), such as Warren, Sterling Heights, Eastpointe, Roseville, and Mount Clemens

While transit-oriented population can be a significant factor to consider when planning fixed-route transit services, concentrations of these populations alone are not sufficient to support transit services. Overall transit potential—adequate population and employment density—remains essential for ensuring a sufficient number of potential riders exist to support fixed-route transit services.

Figure 6: Transit-Oriented Populations Index



Transit-Oriented Populations Index Five Variable Composite Score

- 21 - 25 points
- 16 - 20 points
- 11 - 15 points
- 6 - 10 points
- 1 - 5 points

The Transit-Oriented Populations Index is a five-variable composite score based on the combined density of zero-vehicle households, persons with disabilities, low-income individuals, youth / young adults, and older adults.
Source: ACS (2016), LEHD (2015)

 SMART Opt-In Communities

 Water



FINDINGS

Overall, existing SMART ridership correlates well with areas of high density and transit demand. Additionally, many of the areas with high transit potential also have high transit need based on the findings of the Transit-Oriented Populations, Commuter, and Services Indices. These areas have high concentrations of potential transit riders in densities that can support frequent transit and include many of the major corridors in the region such as SR-153 through Wayne County, I-696 and I-75 in Oakland County, and SR-53 and SR-3 in Macomb County.

Travel patterns in the region include many origin and destination clusters that also have high transit need and potential, such as the I-75 corridor in Auburn Hills, the SR-59 corridor in Sterling Heights, and the SR-153 corridor in Dearborn. Not all major destinations in the region are within the SMART service area, however. For example, communities like Novi, Livonia, and Rochester have major regional destinations with prevalent travel flows but have opted out of SMART service.

Areas with high transit potential should have transit service frequencies that correspond with the level of density. Six people or jobs per acre can generally support hourly frequencies, while 60 or more people or jobs per acre can generally support high frequency service. Areas with these densities that have mismatches with the transit service supplied should be targeted for improvements.

DOCUMENT REVIEW

The communities and stakeholders within SMART's service area have already completed many planning studies which establish goals, recommendations, and strategies relevant to transit planning. In order to understand context and develop suitable recommendations, these studies were reviewed and key findings noted. The full list of planning studies reviewed is shown below, and a link to the full document review can be found in the Appendix. Key findings from these studies include:

- Gratiot, Michigan, and Woodward Avenues are key regional corridors that have been studied in detail with an eye on opportunities to implement rapid transit on those corridors. SMART's implementation of FAST routes on these same corridors speaks to their importance, which will continue to inform future service.
- Many communities throughout the tri-county region are working towards implementing complete streets and transit-oriented development (TOD), which will impact ridership and transit service in those areas. Complete streets recommendations and policies may contain spatial and design regulations for bus stops and transit facilities.
- Better connections between SMART and other transit providers is a regional goal which will continue to impact fare payment, facilities, and service planning.

EXISTING FIXED ROUTE SERVICE

This section analyzes key operating characteristics and ridership trends specific to SMART's fixed route system.

ANNUAL OPERATING AND RIDERSHIP ANALYSIS

This section provides a five-year overview of SMART's fixed route system performance between 2013 and 2017. Data within this section comes from National Transit Database (NTD) Agency Profiles published by the Federal Transit Administration annually. **Table 2** shows the annual operating statistics for SMART fixed-route transit service.

Table 2: Annual Operating Statistics

	2013	2014	2015	2016	2017
Passenger Trips	9,464,558	9,248,599	9,178,939	8,848,567	8,202,341
Operating Costs	\$74,605,079	\$74,062,770	\$77,793,670	\$82,960,901	\$80,885,488
Farebox Revenue	\$12,484,186	\$12,088,882	\$12,251,180	\$11,698,327	\$11,148,687
Revenue Miles	8,624,774	8,711,941	8,695,370	8,788,406	8,845,468
Revenue Hour	519,534	524,287	522,071	528,052	531,559
Vehicles Operated in Maximum Service	229	205	203	203	200
Vehicles Available for Maximum Service	235	214	244	207	241
PERFORMANCE MEASURES					
Passengers per Revenue Hour	18.2	17.6	17.6	16.8	15.4
Passengers per Revenue Mile	1.1	1.1	1.1	1.0	0.9
Operating Costs per Passenger	\$7.88	\$8.01	\$8.48	\$9.38	\$9.86
Operating Costs per Revenue Hour	\$143.60	\$141.26	\$149.01	\$157.11	\$152.17
Farebox Recovery Ratio	16.7%	16.3%	15.7%	14.1%	13.8%
Subsidy per Passenger	\$6.56	\$6.70	\$7.14	\$8.05	\$8.50

Source: National Transit Database, Transit Agency Profiles, February 2019

Key system performance trends include:

- Decreased service efficiency and effectiveness
 - Operating expenses per revenue hour increased six percent from 2013 to 2017
 - Passengers per revenue hour decreased 15 percent, while operating costs per passenger increased 25 percent
- Mismatch between the costs for providing service and revenue generated by the service
- Farebox recovery has decreased from about 17 percent to about 14 percent, contributing to an overall increase in subsidy per passenger

2017 OPERATING AND RIDERSHIP ANALYSIS

This section analyzes operating and ridership data provided directly by SMART at the system-level specifically for 2017. **Table 3** provides a summary of key operating and performance metrics broken down by Weekday, Saturday, and Sunday. The Route Profiles section of the Existing Conditions report included in the Appendix provides detailed operating and ridership profiles for each route in the system.

Key performance metrics for 2017 include:

- SMART operates 48 routes on the weekday for 1,793 revenue hours, and completing over 1,900 trips; Saturdays operate with 28 routes for 982 revenue hours, and over 1,100 trips; Sundays operate with 19 routes and 463 revenue hours, and approximately 600 trips.
- On average, there are about 16 passengers per trip on weekdays, 15 passengers per trip on Saturdays, and 17 passengers per trip on Sundays.
- Passengers per revenue vehicle hour is strongest on the weekends. There may be potential to increase span of service and/or frequencies.

Table 3: Fixed Route System-Level Analysis – 2017 Summary and Averages

Category	Weekday	Saturday	Sunday
Service Days per Year	11,176	1,325	928
Annual Ridership	9,959,848	1,074,045	605,404
Average Daily Ridership	39,212	20,265	10,438
Total Hours per Day (average)	54.9	50.9	39.0
Total Routes Operated	48	28	19
Revenue Hours per Day (average)	40.7	39.3	29.0
Revenue Hours per Day (total)	1,793	982	463
Total Vehicle Miles per Day	37,357	23,852	11,818
Revenue Vehicle Miles per Day	1,047	855	655
Peak Vehicles	203	81	43
Trips per Day	1,922	1,174	599
Average Daily Passengers per Trip	16.1	15.0	16.5
Annual Operating Costs	\$68,719,462.90	\$7,550,493.10	\$4,054,478.40
Annual Farebox Revenue	\$6,010,770.30	\$843,246.30	\$512,455.40
Farebox Recovery Ratio	9%	11%	13%
Average Fare Revenue per Day	\$537.83	\$636.41	\$552.21
Passengers per Trip	16.1	15.0	16.5
Passengers per Revenue Vehicle Hour	17.3	18.3	22.0
Passengers per Revenue Vehicle Mile	0.7	0.9	1.0
Operating Cost per Revenue Hour	\$161.14	\$148.05	\$152.10
Cost per Passenger	\$11.09	\$9.71	\$7.52

Source: SMART, November 2018.

2017 On-time Performance

Table 4 provides a summary of the on-time performance of SMART's fixed route system in 2017. The on-time performance for the system during the week averaged 80 percent, and one in five buses arrived early or late. On the weekends, on-time performance improved and less than one in ten buses arrived late. Buses arriving more than five minutes late may need route adjustments to trim some of the route or add more coverage on the route in order to meet SMART's standard for on-time performance². A detailed description of on-time performance by route is provided in the Route Profiles section of the Existing Conditions Report included in the Appendix.

Table 4: On-time Performance System-level Average

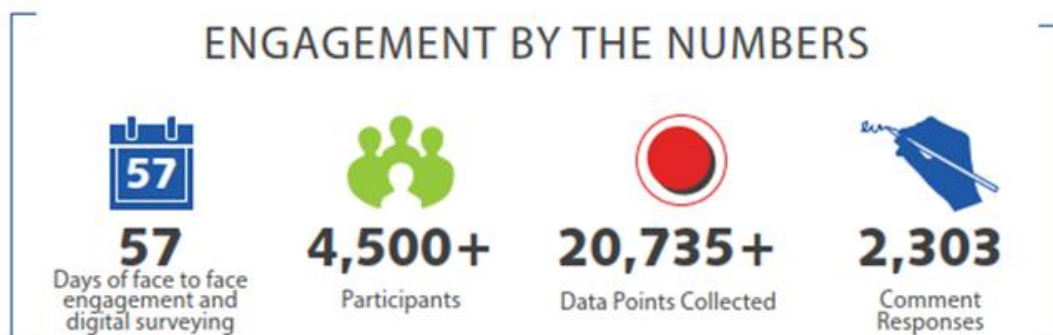
Category	Weekday	Saturday	Sunday
Percent On-Time	80%	83%	85%
Percent Early	10%	9%	8%
Percent Late	10%	8%	7%

Source: SMART, October 2018.

PUBLIC ENGAGEMENT

Feedback from the general public was gathered through a public meeting process in the Fall of 2018, throughout 2019, and through online surveys. Transit operators provided input at a series of meetings with drivers. Stakeholder interviews were also conducted to solicit comments from community representatives.

- On-board Rider Survey (September 2018)
- Stakeholder Interviews (Fall 2018)
- Operator Meetings (October 2018)
- Public Meetings (November 2018)
- Online Public Survey (MetroQuest) – (Feb – March 2019)
- Operator Meetings (October 2019)
- Public Meetings (October 2019)



² SMART Title VI 2017 Report

KEY FINDINGS

From Drivers

- On average, there are 60 minutes between crosstown buses, which creates long wait times for passengers who are transferring from other routes.
- In terms of connections to DDOT, mismatched bus frequencies, a complicated fare system (before the DART fare system was implemented), and bus stop congestion in Downtown Detroit where limited space is shared with DDOT buses create difficulty for both passengers and drivers.
- Most SMART routes do not have a designated layover area, and many do not have enough time built into the schedule at their endpoints before turning around, causing buses to run much later than scheduled.
- Passengers must cross wide, high-speed roads with large gaps between crossings, stop locations require drivers to pull across several lanes of traffic, and some routing requires diversions onto alternative streets.

From Stakeholders

- Strong support for public transportation exists among the stakeholders. There was nearly universal agreement that southeast Michigan will need more and better transit service in the future to accommodate trends in changing demographics and people's preference for smaller housing and an easier commute.
- Many stakeholders also expressed frustration with the availability of public transportation in Metro Detroit.
- The local transportation system has not kept pace with regards to infrastructure and technology. SMART needs to enhance public transportation systems and stimulate more economic growth with technological amenities.
- Lack of funding is an on-going problem and public transportation lacks strong political backing for additional funding.
- There is an impression among many community leaders and individuals that public transportation is only for people with low income and older adults. It is necessary to cultivate a new perception of transit by creating a positive message that transit is for a broader group of people including those who can drive and choose to use transit.
- More multi-county or regional services and better service coordination across jurisdictional boundaries are needed.

From Riders

- Walking is the primary means to access bus stops. Over 90% of riders walk to access their bus stop before boarding and walk from the bus stop to their final destination after alighting.
- Transit is an important service that many riders rely upon. 47% of riders do not have a car, and ¼ of riders would not be able to make their trip without SMART.
- Riders between 25 and 34 years old make up ⅓ of total passengers.
- SMART's ridership is largely commute-based. Almost half of SMART's passenger trips are linked to home, and almost 30% are linked to work.
- More than half of riders take one bus for their whole trip (do not have to transfer) and pay with cash.
- Most riders are satisfied with their trip experience, especially with drivers and the cost to ride.

From the Public



- Requested destinations for new services included Metroparks, Livonia, Downtown Detroit, Mile Roads, Novi, Canton, and Cranbrook.
- Bus route schedules, a beacon (to alert bus drivers), and lighting inside bus shelters were selected as the most important bus stop features, in addition to shelters themselves, signage, and real time tracking.
- Route 562, Route 250 and Route 430 are the top 3 picked routes to run on Saturdays; Route 275, Route 730 and Route 250 are the top 3 picked routes to run on Sundays.
- 461/462 FAST Woodward, Route 275 and Route 740 are the most picked routes to increase in frequency. Participants would mostly like to see the increase in frequency happen during weekday peak travel periods, mid-day weekdays, and Sundays.
- 12 Mile Road, Telegraph Road and Van Dyke Avenue are the top 3 corridors picked for future FAST service, and over half of participants are specifically interested in the higher frequency and suburbs-to-Downtown Detroit-connectivity aspects of FAST service.
- 461/462 FAST Woodward and Route 275 are the most picked routes for extended hours of operation. Over half of participants preferred to see extended hours on weekday mornings and evenings.
- “More frequent bus service” was favored over “longer service hours”. Responses on both sides prioritize expansion of weekday evening hours, and more service during weekday peaks is prioritized by those who favor frequency.
- “More weekend service” was favored over “more weekday service”, and those who prioritized weekend service also prioritized Saturday service on Telegraph and 10 Mile.
- “Fewer bus stops (and faster routes)” was favored over “more bus stops (and shorter distance between stops)”. Grand River Avenue was more highly prioritized as a FAST route, and the suburb-to-downtown aspect of FAST service was more important to those who prioritized fewer bus stops.
- “Bus running more frequently but on fewer roads” was favored over “bus running on more streets but less frequently”, and more frequency on weekday peaks was prioritized.
- “Improve existing services” was favored over “serve new areas”. With a difference margin of 18%, this is the most clear trade-off compared to other trade-off questions.

OTHER COMMENT TYPES



FIXED ROUTE RECOMMENDATIONS

The recommendations for Phases 1 - 3 are outlined in the following sections and they are based on these guiding principles developed for the COA:

Service should be simple! For people to use transit, service should be designed so that it is easy to use and intuitive to understand.

Service should operate at regular intervals. In general, people can easily remember repeating patterns but have difficulty remembering irregular sequences.

Routes should operate along a direct path. The fewer directional changes a route makes, the easier it is to understand. Circuitous alignments are disorienting and difficult to remember.

Routes should be symmetrical. Routes should operate along the same alignment in both directions to make it easy for riders to know how to get back to where they came from.

Routes should serve well-defined markets. The purpose of a route should be clear, and each should include strong anchors and a mix of origins and destinations.

Service should be well coordinated. At major transfer locations, schedules should be coordinated to the greatest extent possible to minimize connection times for the predominant transfer flows.

Service should be reliable. Routes should have enough recovery time built into their schedules to maintain on-time performance.

PHASE 1 RECOMMENDATIONS – COST NEUTRAL

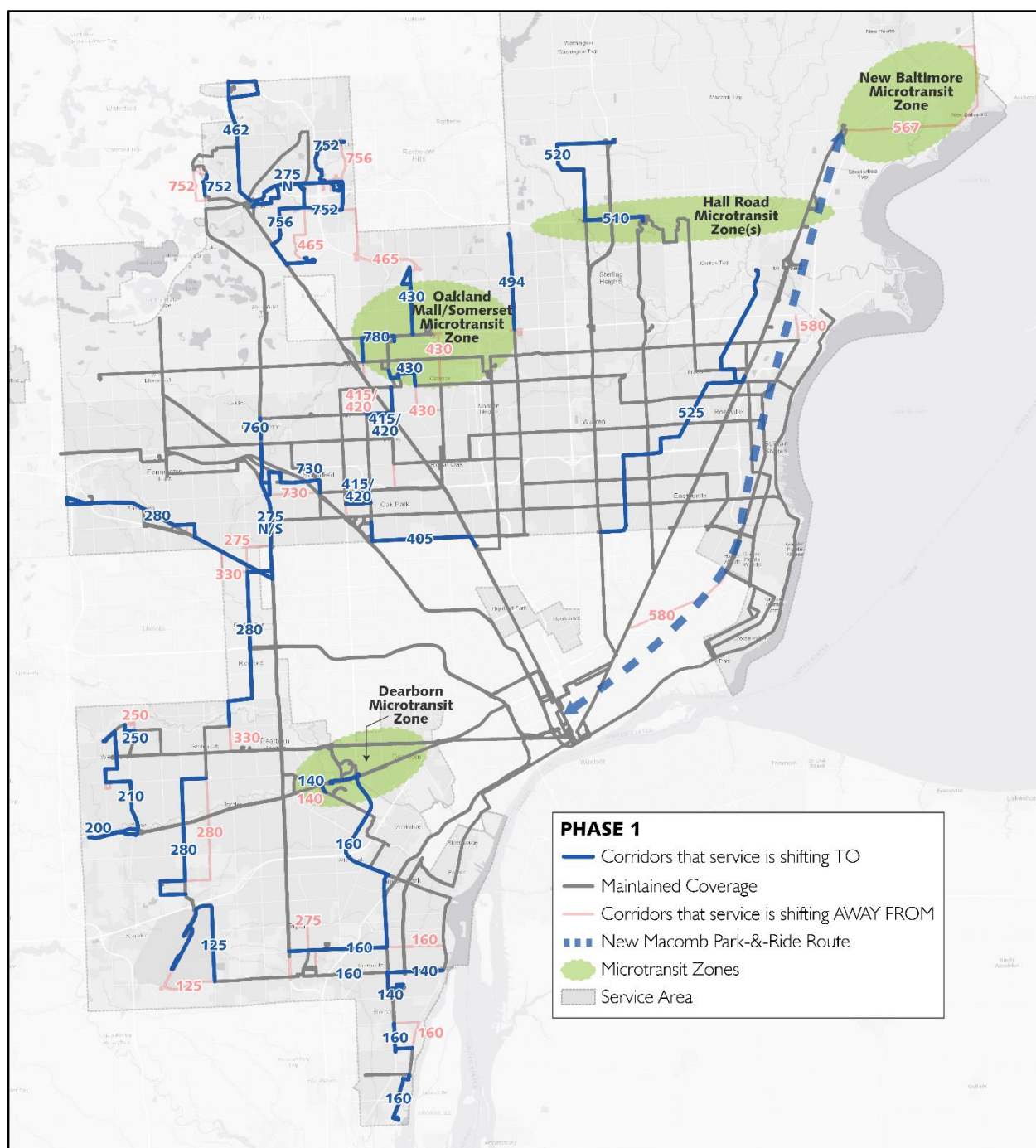
The recommended short range plan to be implemented in the first year responds to the core issues of productivity and reliability of service. The recommendations can be implemented without net increases in operating cost and minimal capital costs for new bus stops. Major features of the service recommendations include:

- Route realignments for more efficient and productive geographic coverage
- Schedule modifications for improved on-time performance and legibility to riders
- Microtransit pilot projects for enhanced on-demand transit service

Some routes in the Plan will be interlined to allow for greater efficiency of service and more one-seat trips.

The following section provides explanations of the recommended changes for each route. Route-specific maps are provided only for those routes whose alignment is recommended to change. The Phase 1 route network is shown in **Figure 7**.

Figure 7: Phase I Recommendations



Microtransit

Microtransit is a transportation service which includes smaller vehicles with flexible, “on-demand” routing; partnerships between transit agencies and technology providers; and mobile apps for ride hailing, navigation, and payment. Microtransit can provide improved access to transit for people and places that fixed bus routes do not serve well, more directly matched supply of service to the demand for rides, shorter wait times, and greater flexibility to hail a ride when you need one via an app or phone call.

To complement the fixed route network and its Phase I service changes, microtransit pilot projects are recommended for the following zones:

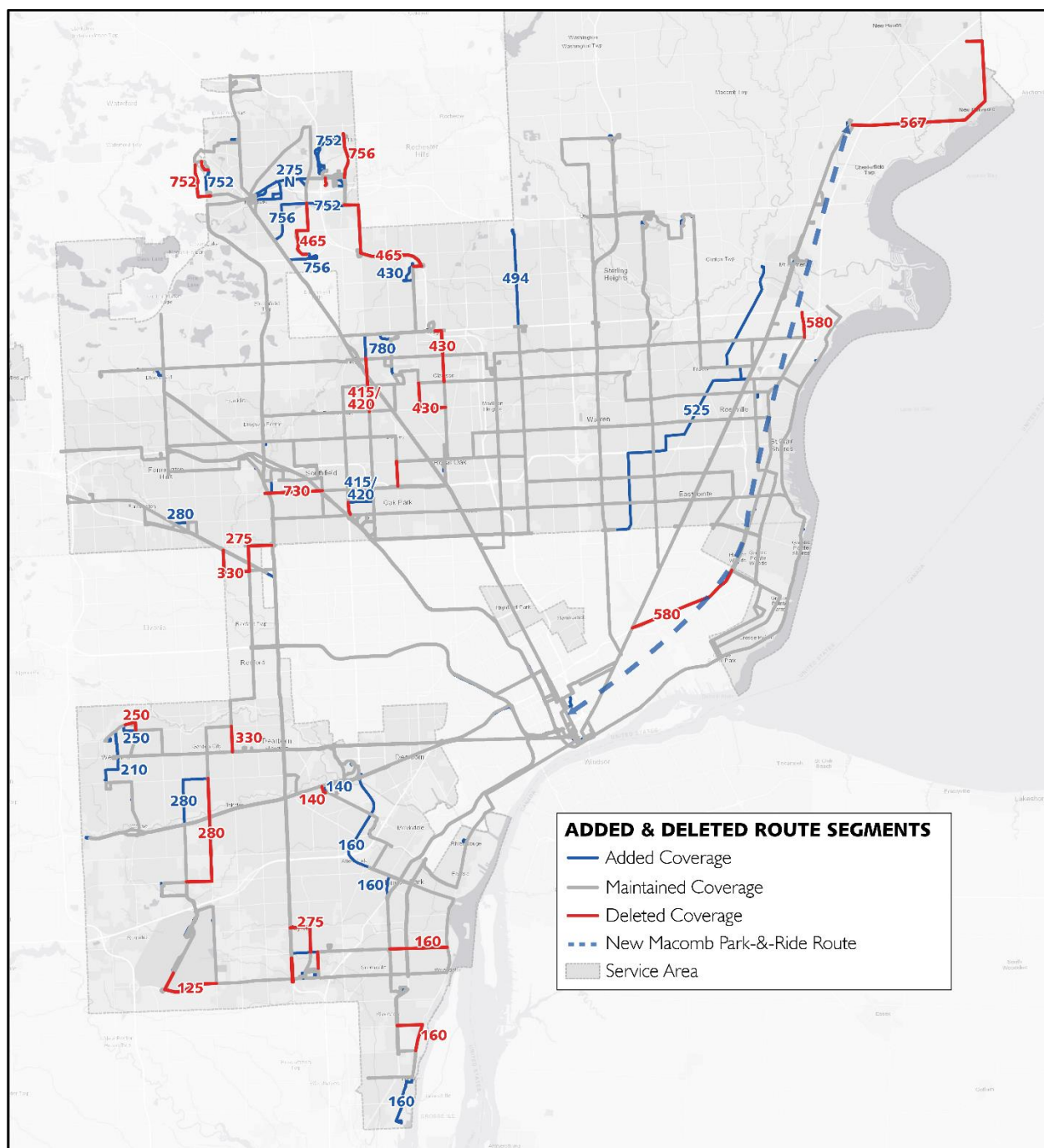
- Dearborn – connecting riders to Dearborn’s two downtowns, Fairlane Town Center, Dearborn Transit Center, Henry Ford College, University of Michigan - Dearborn, and The Henry Ford. A stop-to-stop service, which would pick up and drop off riders from designated stop locations instead of directly at the door, could be successfully deployed in this zone for better trip pooling and shorter wait times. The familiarity of stops also fosters more efficient behavior from drivers and riders.
- Oakland Mall/Somerset – connecting riders to Somerset Collection, Oakland Mall, Beaumont Health & Wellness Center - Coolidge, Walsh College, International Academy of Design & Technology, and their surrounding areas.
- Hall Road – connecting riders to destinations along the corridor between Ryan Road and I-94 including Walmart, Lakeside Center, the Mall at Partridge Creek, Macomb Community College Center Campus, and Henry Ford Macomb Hospital.
- New Baltimore – connecting riders to the shopping center at Gratiot Avenue and 23 Mile Road, the Meijer at County Line Road and 26 Mile Road, and their surrounding areas. A stop-to-stop service could be successfully deployed in this zone.

SMART plans to employ a turnkey operational model, meaning a contractor would provide the technology, drivers, and vehicles needed for microtransit service.

Geographic Coverage Impacts

As shown in **Figure 8**, route segments will be added and deleted per the Phase I recommendations. The primary areas that will no longer be directly served by a fixed route will have service through a new microtransit pilot route or will be within a half-mile walk catchment zone of fixed route service. A half mile is considered the reasonable walking distance to a fixed route bus stop. The service changes are not expected to extend the existing ADA coverage area as the new routing will not be outside a $\frac{3}{4}$ mile of the existing service.

Figure 8: Phase I Geographic Coverage Impacts



Service Impacts

Overall, the Phase I recommendations add about 22,000 annual revenue hours to existing service, an increase of about 4% (see **Table 5**). The additional hours represent improved frequency on some routes and added recovery time on many routes to improve the systemwide reliability of service and on-time performance. **Table 5** does not include the service impacts of microtransit service.

Table 5: Phase I Impacts to Revenue Hours

Route	Weekday Revenue Hours	Saturday Revenue Hours	Sunday Revenue Hours	Total Annual Revenue Hours
125	77.4	54.2	24.8	23,968.1
140	24.1	0.0	0.0	6,109.2
160	44.9	14.4	0.0	12,162.9
200/210	66.4	31.7	28.6	20,192.7
250	20.8	0.0	0.0	5,285.2
255	10.7	0.0	0.0	2,718.6
261	77.8	73.1	42.8	26,111.5
275 N	30.5	28.7	0.0	9,257.5
275 S	44.9	38.0	0.0	13,408.7
280/330	40.1	39.0	31.7	14,097.0
400	15.1	0.0	0.0	3,835.4
405	36.3	30.0	0.0	10,804.1
415/420	58.2	50.7	21.7	18,725.1
430	13.5	0.0	0.0	3,419.1
445	8.3	0.0	0.0	2,108.2
450/460	124.2	75.8	55.3	38,771.6
461/462	159.1	148.6	101.0	54,156.3
494	38.3	24.0	0.0	10,992.6
495	21.5	13.5	14.5	7,022.0
510/520	112.7	62.5	50.6	34,879.1
515	9.1	0.0	0.0	2,301.9
525*	22.0	0.0	0.0	5,596.8
530	7.9	0.0	0.0	2,011.8
550	20.9	0.0	0.0	5,300.6
560	147.3	63.8	46.9	43,515.8
561/563	142.5	99.2	55.0	44,642.6
562	5.6	0.0	0.0	1,422.4
580	9.2	0.0	0.0	2,336.8
610	54.0	30.0	22.0	16,582.0
615	18.9	0.0	0.0	4,789.7
620	7.6	0.0	0.0	1,930.4
635	9.9	0.0	0.0	2,514.6

710	72.6	40.5	22.5	21,891.9
730	37.9	32.5	0.0	11,358.3
740 W	57.9	28.2	22.9	17,515.3
740 E	43.5	28.2	22.9	13,859.0
752	37.8	17.6	14.3	11,364.1
756	24.0	11.3	0.0	6,693.9
760	54.0	34.3	0.0	15,525.1
780	43.4	35.6	0.0	12,919.0
805	21.0	0.0	0.0	5,334.0
830	14.1	0.0	0.0	3,581.4
849	6.0	0.0	0.0	1,524.0
851	20.9	0.0	0.0	5,308.6
Total Phase I	1,890.4	1,105.3	577.5	572,248.0
Total Existing Service	1,840.5	1,017.9	493.6	550,064.5
Difference	2.7%	8.6%	17.0%	4.0%

*Not included in the Total Phase I revenue hours due to replacement of the Groesbeck Flex Route.

Table 6 illustrates how these revenue hours are split between the three different counties of SMART's service area.

Table 6: Phase I County Breakdown of Revenue Hours

	Wayne County	Oakland County	Macomb County
Phase I			
Annual County Revenue Hours	134,449.8	230,075.5	207,722.8
Share of Annual Systemwide Revenue Hours	23.5%	40.2%	36.3%
Existing			
Annual County Revenue Hours	127,122.3	221,541.9	201,400.3
Share of Annual Systemwide Revenue Hours	23.1%	40.3%	36.6%
Difference in Share of Service	0.4%	-0.1%	-0.3%

PHASE 2 RECOMMENDATIONS

The goal of Phase 2 is to further improve the operations by extending FAST service to new markets and improving weekend frequencies. Phase 2 adds new FAST service on the Van Dyke corridor and a new microtransit zone in Farmington and Farmington Hills. In addition, Phase 2 will add or improve Saturday service on three routes and add Sunday service on additional routes.

The plan provides important steps towards developing a more user friendly and convenient weekend service. The data shows that weekend ridership continues to grow and that the overall farebox recovery ratio is highest on the weekend. Improved weekend service was also one of the higher priority improvements requested from the public through the outreach meetings and surveys.

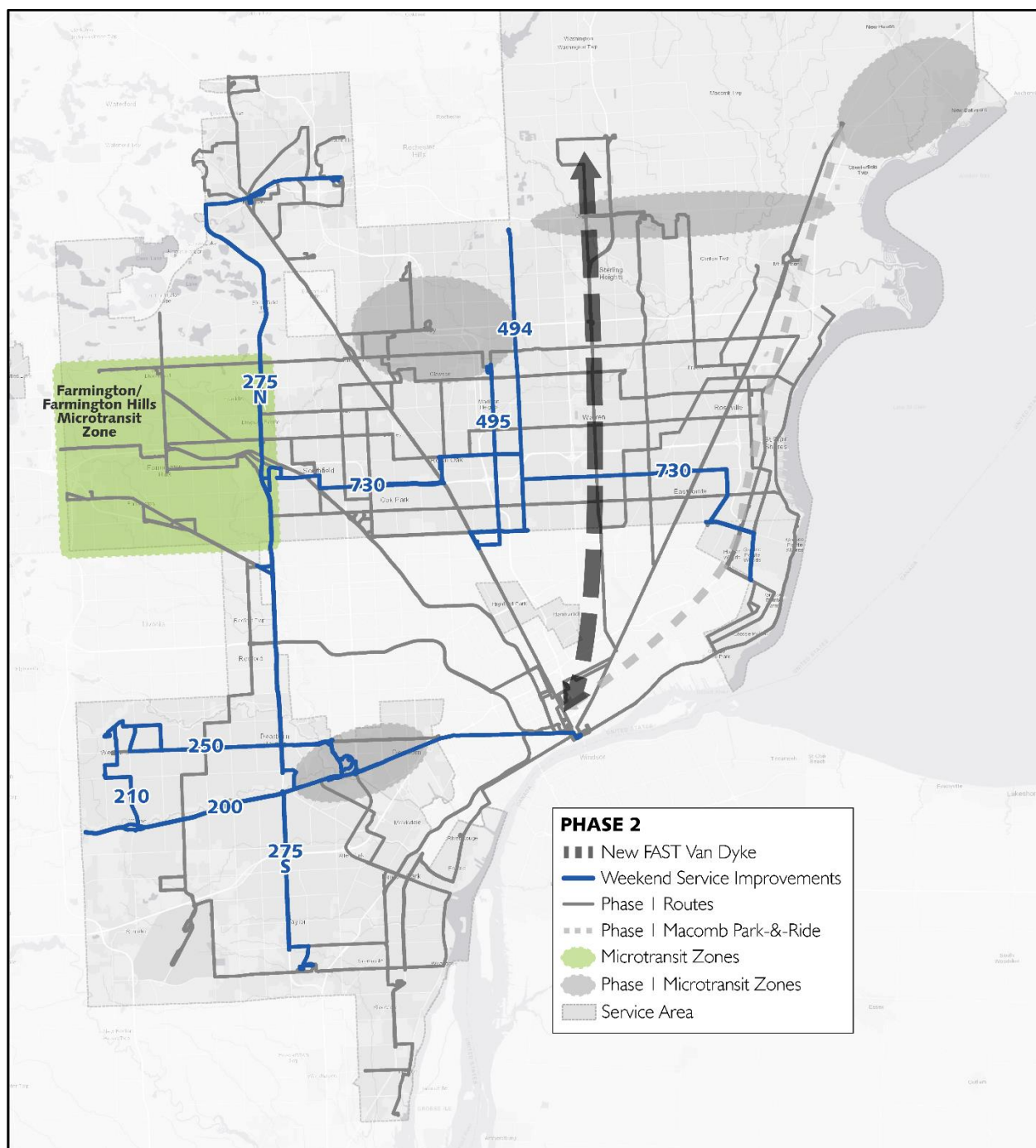
Phase 2 will also provide upgraded service and frequency on the Van Dyke corridor providing another key element to the overall FAST network of routes. With the addition of Van Dyke, the FAST system will become a comprehensive high frequency core network for SMART with connections in all three counties served by the agency. The frequent network will provide the foundation that all other fixed routes and microtransit services can feed into, which will improve overall travel times and level of service.

Phase 2 will continue to build out the microtransit network established in Phase 1. In this Phase, the existing Farmington/Farmington Hills Shuttle will transition to a microtransit zone. The exact boundaries of the zone will be defined during the Phase 2 implementation period, however the focus of the service is to improve the existing shuttle route by providing shorter wait times, dynamic scheduling and more efficient operations.

Phase 2 is planned for implementation in Years 2022 and 2023. Key improvements:

- Expanded and improved weekend service on key routes to continue to build and strengthen the weekend network
- New FAST service in the Van Dyke Avenue corridor
- Additional microtransit pilot projects

Figure 9: Phase 2 Recommendations



Service Impacts

Overall, the Phase 2 recommendations add about 71,000 annual revenue hours to Phase 1 service, an increase of about 10% (see **Table 7**, does not include the service impacts of microtransit service).

Table 7: Phase 2 Impacts to Revenue Hours

Route	Weekday Revenue Hours	Saturday Revenue Hours	Sunday Revenue Hours	Total Annual Revenue Hours
Total Phase 2	2,082.9	1,309.0	774.3	2,082.9
Total Phase 1	1,890.4	1,105.3	577.5	1,890.4
Difference	10.2%	18.4%	34.1%	10.2%

Table 8 illustrates how these revenue hours are split between the 3 different counties of SMART's service area.

Table 8: Phase 2 County Breakdown of Revenue Hours

	Wayne County	Oakland County	Macomb County
Phase 2			
Annual County Revenue Hours	138,847.7	234,257.3	270,236.5
Share of Annual Systemwide Revenue Hours	21.6%	36.4%	42.0%
Phase 1			
Annual County Revenue Hours	134,449.8	230,075.5	207,722.8
Share of Annual Systemwide Revenue Hours	23.5%	40.2%	36.3%
Difference in Share of Service	-1.9%	-3.8%	5.7%

PHASE 3 RECOMMENDATIONS

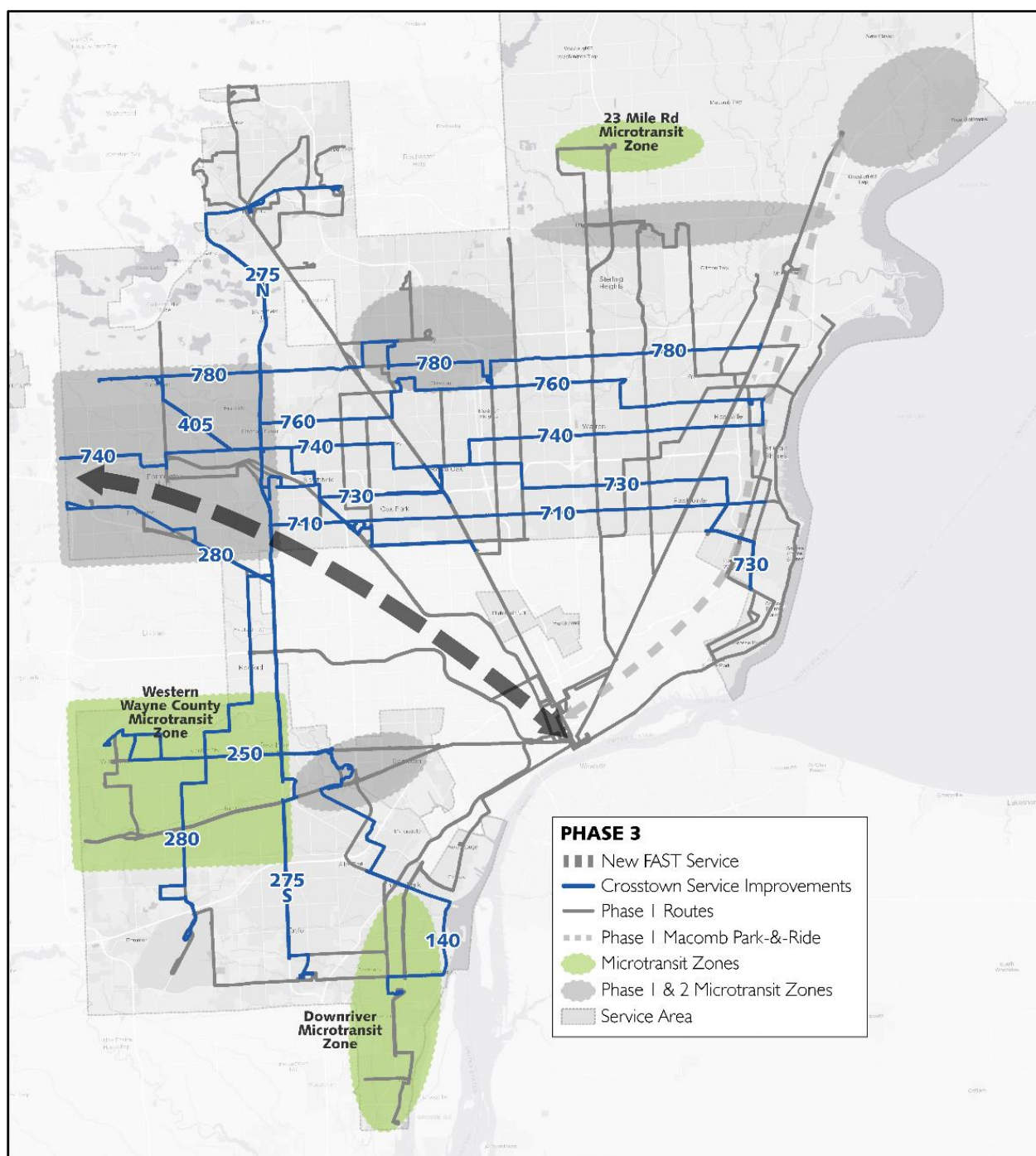
Phase 3 recommendations focus on building out the microtransit service into new areas in Macomb and Wayne counties and doubling the weekday frequencies of the Crosstown service. In addition, a FAST route will be introduced to improve connections to the western part of the service area and possibly to new areas of Oakland County.

The key objectives of Phase 3 are improving system travel times and route connections with more frequent Crosstown routing. The existing service operates at 60-minute frequency on most east – west Crosstown routes which makes transfers between routes challenging if time points do not match up or if a service is running late. The proposed service would improve weekday peak frequencies to between 20 and 30 minutes. The improvements will speed up the system and make it more attractive to current and new riders. The Phase 3 recommendations are shown in **Figure 10**.

Key features of the scenario are as follows:

- Add microtransit zones at 23 Mile Road (near Van Dyke), Western Wayne County and Downriver
- Improve weekday frequencies on all Crosstown routes
- Split Route 760 12 Mile Crosstown at Oakland Mall to improve reliability of service
- Add new FAST service between Downtown Detroit and Farmington/Farmington Hills with potential future connections to Novi

Figure 10: Phase 3 Recommendations



Service Impacts

Overall, the Phase 3 recommendations add about 148,000 annual revenue hours to Phase 2 service, an increase of about 23% (see **Table 9**, does not include the service impacts of microtransit service).

Table 9: Phase 3 Impacts to Revenue Hours

Route	Weekday Revenue Hours	Saturday Revenue Hours	Sunday Revenue Hours	Total Annual Revenue Hours
Total Phase 3	2,622.2	1,431.7	848.0	791,099.8
Total Phase 2	2,082.9	1,309.0	774.3	643,341.5
Difference	25.9%	9.4%	9.5%	23.0%

Table 10 illustrates how these revenue hours are split between the 3 different counties of SMART's service area.

Table 10: Phase 3 County Breakdown of Revenue Hours

	Wayne County	Oakland County	Macomb County
Phase 3			
Annual County Revenue Hours	176,713.7	320,132.1	294,254.0
Share of Annual Systemwide Revenue Hours	22.3%	40.5%	37.2%
Phase 2			
Annual County Revenue Hours	138,847.7	234,257.3	270,236.5
Share of Annual Systemwide Revenue Hours	21.6%	36.4%	42.0%
Difference in Share of Service	0.8%	4.1%	-4.8%

PHASE 4 RECOMMENDATIONS

Phase 4 recommendations are focused on longer term improvements from the years 2026 to 2030. This phase builds on the previous phases with the implementation goal of increasing ridership and improving the passenger experience. The key components of Phase 4 include:

- Monitor and make adjustments to Phases 1 – 3 service
- Continue the transition to clockface headways on all routes
- Improve frequencies on high performing routes
- Implement additional microtransit service as needed
- Continue to improve weekend service coverage and frequencies as ridership increases

The Phase 4 implementation prioritization will be based on the system performance and funding opportunities after the first five years of the COA planning horizon. SMART will continue to monitor the service of the new routes and make updates based on defined service standards and performance measures. As the new services mature, a service prioritization plan can be implemented to better define the agency's goals for the last five years of the plan. For example, if the microtransit zones successfully provide cost effective and efficient service in the first three phases, then additional zones may be the highest priority to meet demand in other areas, including cities that may join the SMART service area. Phase 4 will also provide the opportunity to improve travel times and connections between routes with higher frequency service on weekdays and weekends.

IMPLEMENTATION PLAN

This section outlines the steps that SMART must take to implement the recommendations of the plan and the sequence in which they need to be done. The primary tasks for implementation include the following categories:

Service Planning

Plan refinement: Some changes to the Plan may be required as SMART solicits further feedback on the proposed service changes from stakeholders.

Monitoring service after implementation: Once the new service is in place, service standards should be monitored. Metrics should be compared to the recommended performance standards with the understanding that it may take one to two years to achieve the performance levels.

Operations

Final running times: Preliminary running time calculations were done to establish estimates of bus service hours and the service plans. Additional route testing with a bus is ideal to finalize running times for the development of accurate route schedules.

Bus Stops and Facilities

Bus stop spacing: Consideration should be taken for bus stop spacing on new route segments based on densities, surrounding land uses and type of bus service on the corridor.

Bus facility and terminal needs: There are no additional vehicles needed to operate Phases 1 and 2, however the added frequency of service in Phase 3 may require more buses. In order to accommodate the additional capacity needed for the buses, SMART should consider options such as expansion at existing bus terminals or identifying locations for a new terminal. The SMART Transit Asset Management plan should provide guidance for the planning of capital needs.

Marketing New Service

Information resources and marketing new services: Marketing the Plan and new service types such as microtransit is key to success. SMART already has a robust marketing approach which was successful during the FAST launch. It will be important to continue that success and provide updated information via internet, social media, printed materials and advertising.

The following section outlines the recommended phased approach of the five-year plan.

FY 2021 – Implement Phase 1

- Develop a system to monitor and track data for the Federal Transit Administration's National Transit Database (NTD) and the performance measures for fixed-route
- Prepare Title VI review to ensure that the level and quality of fixed-route are provided in a non-discriminatory manner
- Facilitate public hearings for new service
- Finalize microtransit zone boundaries
- Begin RFP process for microtransit provider

- Identify new bus stop locations and add bus stop facilities
- Test run new routings
- Develop service schedules
- Add pedestrian enhancements to provide safe access to and from new bus stops
- Initiate marketing campaign to promote new service and educate riders about microtransit
- Update marketing materials to reflect changes to the system
- Implement Phase 1 service changes in September 2020

FY 2022-2023 – Implement Phase 2

- Monitor performance of fixed-route service to track the system after the Phase 1 implementation
- Update performance measures based on data collected after Phase 1 implementation
- Facilitate public hearings for new service
- Finalize microtransit zone boundaries
- Test run microtransit and new FAST Van Dyke
- Develop service schedules
- Add bus stop facilities and bus wraps for the FAST Van Dyke route
- Marketing campaign for new service
- Update marketing materials with new weekend and service schedules
- Implement Phase 2 service changes in September 2022

FY 2024-2025 – Implement Phase 3

- Continue to monitor performance to track the system after the implementation of Phase 2
- Monitor fleet needs to plan for adequate inventory to operate Phase 3 recommendations (guidance provided by the SMART Transit Asset Management Plan)
- Monitor facility needs to plan for adequate capacity to accommodate vehicles for Phase 3 (guidance provided by the SMART Transit Asset Management Plan)
- Identify bus terminal expansion or new location if needed
- Update performance measures based on data collected after Phase 2 implementation
- Facilitate public hearings for new service
- Finalize microtransit zone boundaries
- Test run new microtransit and FAST
- Add bus stop facilities and bus wraps for the FAST route
- Develop service schedules
- Marketing campaign for new service
- Update marketing materials with new crosstown headways and service schedules
- Implement Phase 3 service changes in September 2024