

# Financial Analysis Technical Memorandum

Regional Master Transit Plan

**REVISED** August 2016



PREPARED BY: HNTB Corporation

## August 2016 Revision

The Financial Analysis Technical Memorandum for the Regional Master Transit Plan (RMTP) was made publically available following the release of the Draft RMTP in May 2016. It documented the financial modeling process for the plan, the financial assumptions made in that model, and the anticipated long-term costs and funding sources for the RMTP. This revised version of the Financial Analysis Technical Memorandum is a companion to the revised, final RMTP, to be released in August 2016.

### TECHNICAL UPDATES TO THE FINANCIAL MODEL

The financial modeling process began in 2015. Since that time a variety of model inputs, which are released on a monthly or annual basis, became outdated. During the public engagement period these inputs were updated to ensure the financial model's projections of the future are as timely as possible. These technical changes included:

- **Taxable Property Valuations** – Taxable property valuations from the Michigan Department of Treasury were updated. Actual reported valuations from 2016 were added. Previously, 2015 valuations from the Department of Treasury were used as a basis for projected valuations in 2016 and beyond.
- **Inflation** – New data from the Urban Consumer Price Index (CPI-U) and the Congressional Budget Office (CBO) allowed the model to report all figures (historic and projected) in constant 2016 dollars (2016\$). Previously, the model reported figures in constant 2015 dollars (2015\$). Future year inflation forecasts were also updated with the latest available data.
- **Capital Cost Escalations** – The U.S. Army Corps of Engineers Construction Cost Index historical data for Michigan was updated to current values. Future year capital cost escalation is projected based on historical trends, so the forecast was updated as well.
- **Vehicle Cost Escalations** – A separate vehicle cost escalation rate was added to the financial model to better predict future vehicle costs. The vehicle cost escalation rate was based on a historical analysis of vehicle cost growth, as reported by the American Public Transportation Association (APTA). In the previous version of the financial model, vehicle costs were escalated at the same rate as construction costs.

### OTHER CHANGES

Additionally, some text within the document was modified for further clarification.

# 1. Financial Model

A sophisticated, spreadsheet-based financial model was developed to evaluate future transit options and ultimately determine the funding required to implement the Regional Master Transit Plan (RMTP). A financial model is a complex analysis tool using historical trends and assumptions about the future to predict future costs and revenues. A variety of inputs—such as when new service begins, how much new service costs, and how much state and federal funding will be available—were used to define the RTMP in the model. The model forecasts future cash flows for existing and future providers (DDOT, DTC, SMART, AAATA, M-1 RAIL, and the RTA) based on the RMTP's transit service proposal for Southeast Michigan, and assesses the long-term revenue outlook for a corresponding property tax or vehicle registration tax (VRT).

The financial model helps build support for a fiscally constrained RMTP vision that the residents of Southeast Michigan can support to fund transit at higher levels than are currently being provided across the region. A transparent and documented financial analysis process justifies the investment needed to implement the RMTP. This is an essential step for making regional transit in Southeast Michigan a reality.

## Local Funding Mechanism

RTA legislation allows two local funding sources: a property tax millage and a vehicle registration fee (VRF). A property tax millage was selected early in the RMTP process as the most appropriate local funding mechanism to implement the RMTP. It is a more consistent and reliable funding source and can be collected through well-established systems at the state and local level. The financial model estimated the long-term costs of the RMTP and the corresponding millage rate required. While the millage will be RTA's primary source of funding, it will be supplemented by state and federal funding as well as fare revenues. The model assumes the millage will begin generating revenue in 2017 and be applied at a uniform rate going forward.

## Financial Task Force

Recognizing the importance and also the complexity of developing a transparent financial analysis approach, the RTA enlisted a Financial Task Force (FTF) (Table 1.1) to assist in financial model development and give feedback on financial assumptions. The FTF is comprised of representatives from local and state government, the business community, academia, and community foundations throughout all four counties under the RTA jurisdiction. Meetings of the FTF were convened on approximately a monthly basis throughout the development of the financial model and various RMTP options were reviewed with the FTF to solicit feedback on assumptions and preliminary option outcomes. This collaborative process provides a local perspective to help calibrate the financial model by validating the reasonableness of the assumptions, forecasts, and methodology. The FTF also assessed the feasibility of various program options and associated tax rates.

**TABLE 1.1: FINANCIAL TASK FORCE**

<b>Name</b>	<b>Title</b>	<b>Organization</b>
John Blanchard	Director of Local Government Relations	General Motors
Mike Brownfield	Director of Strategy	Governor's Office
Mary Jo Callan	Director of Ginsberg Center	University of Michigan
Dennis Cowan	Managing Partner	Plunkett Cooney
Charles Griffith	Director of Climate and Energy Programs Boardmember, AAATA	Ecology Center
Joe Heffernan	Partner	Plante Moran
George Jacobsen	Senior Program Officer	Kresge Foundation
Ronia Kruse	President and Chief Executive Officer	OpTech
Michael Maher	Executive Managing Director	Talmer Bank
John Naglick	Chief Deputy CFO and Finance Director	City of Detroit
Faye Nelson	VP of Public Affairs	DTE Energy
Susan Pollay	Executive Director	Ann Arbor Downtown Development Authority
Roy Rose	President	Anderson, Eckstein, and Westrick
Melissa Roy	Executive Director	Advancing Macomb
Conan Smith	Executive Director	Metro Matters
Ned Staebler	Chief Executive Officer	TechTown

The FTF provided input to the RTA over a series of five meetings during the RMTP process. The first FTF meeting provided an overview of the RMTP process and the financial model, outlined financial assumptions, and introduced key future transit option questions. The second and third FTF meetings further refined assumptions and evaluated three future transit options that were developed based on the market analysis, public feedback, and prior FTF meeting input. At the fourth meeting, the FTF provided

the following observations about the process for developing a realistic and appropriately conservative funding strategy for regional transit:

- The technical approach appears to be rigorous.
- The analysis appears to reflect the types of revenues and expenditures that the Regional Transit Authority is likely to experience during implementation of the Plan.
- The assumptions on growth rates as communicated to us by the planning team during the meetings appear to be reasonable based on historic trends and the information available at this time.
- Through the use of sensitivity tests, the planning team appears to have considered the relative impacts of a reasonable range of potential deviations from baseline assumptions on the millage needed to implement the plan.

At the fifth and final FTF meeting, the Draft RMTP was presented, along with the proposed millage, and a discussion of next steps followed.

## Multiple Transit Providers

The financial model accounts for all existing transit providers in Southeast Michigan, as well as the newly created RTA and M-1 RAIL organizations. Many of the proposed service improvements in the RMTP are assumed to be operated by these other providers under an arrangement with the RTA. The financial model estimates the financial impact of building and operating transit services at the route or project level and forecasts the cash flow of each agency based on a variety of service options and funding assumptions. It also reflects possible providers of an identified service, simulates the transitioning of service from one provider to another over time, and estimates the costs of subsidizing expanded service provided by the existing operators if the RTA chooses to pursue such a strategy in a given corridor.

Transit agencies accounted for within the financial model include:

- Ann Arbor Area Transportation Authority (AAATA)
- Detroit Department of Transportation (DDOT)
- Detroit Transportation Company/The People Mover (DTC)
- M-1 RAIL (QLINE)
- Regional Transit Authority of Southeast Michigan (RTA)
- Suburban Mobility and Regional Transportation (SMART)

The model incorporates the unique financial situation of each agency. Historical data and annual financial reports, meetings with each provider, and an inventory of agency assets allowed the project team to make assumptions about the future revenue, expenditures, and operating costs structures of each agency. The model also considers the funding sources of each agency, including any existing local millages as well as federal and state funding. It allows for changes to existing millage rates over time, changes to each provider's member municipalities, and the application of a region-wide RTA millage in the future. The RTA's region encompasses the entire four-county region within which the other existing providers operate, including Macomb, Oakland, Washtenaw, and Wayne counties. Any RTA millage or VRF is assumed to be applied to the entire four-county region.

## 2. Model Inputs

The financial model developed by the project team incorporates several economic and financial assumptions in order to develop a realistic and appropriately conservative cash flow forecast. The model assumes a 20-year analysis period following the introduction of a RTA property tax millage or VRT in

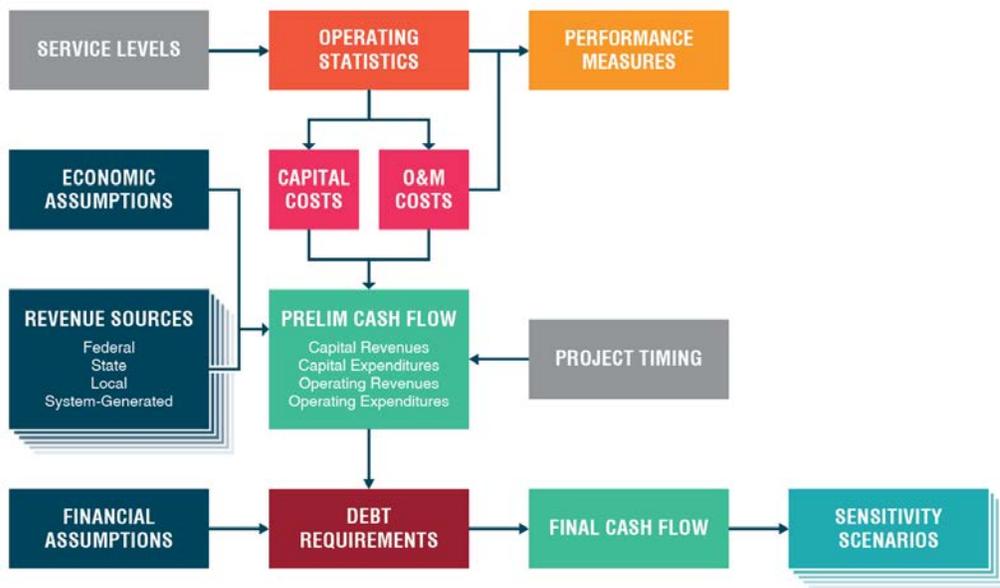
2017. More information regarding sources and how the data is integrated into the model is provided in the following subsections.

The financial model (Figure 2.1) integrates key financial levers such as:

1. **Macroeconomic and financial assumptions** such as inflation, capital cost escalation, and bond interest rates.
2. **Demographic forecasts** provided by SEMCOG
3. Information from each of the existing transit providers, including:
  - a. **Past and current revenue sources**,
  - b. **Existing service levels** and corresponding Operations & Maintenance (O&M) costs by route and mode, and
  - c. **Ridership**.
4. **Future revenue sources** such as a region-wide transit millage and VRT, forecasted based on data provided by the State of Michigan.
5. **Recommended transit services** and corresponding O&M costs by provider, route, and mode based on the transit market analysis.
6. **Capital cost estimates** associated with the recommended transit services.
7. **Implementation schedule** of when recommended transit services begin.
8. **Stakeholder input** gained through the Financial Task Force and meetings with the region's transit providers.

The financial model helps decision makers understand the relative impacts of these inputs, such as fixed-route transit service levels, paratransit service levels, capital investments, the future distribution of state and federal funding, and fare policy, on the local revenues needed to implement the plan.

**FIGURE 2.1: STRUCTURE OF THE FINANCIAL MODEL**



## Economic and Financial Assumptions

### INFLATION

Historical inflation from the Urban Consumer Price Index (CPI-U) was used to convert past year dollars to constant 2016 dollars (2016\$). Forecasted inflation from the Congressional Budget Office (CBO) was used to convert forecasted dollars to 2016 dollars. The forecasted annual average rate of inflation is 2.4%.

### CONSTRUCTION COST ESCALATION

To develop an accurate and conservative estimate of construction costs, the historical U.S. Army Corps of Engineers Construction Cost Index for Michigan was used and adjusted to constant 2016 dollars. Escalated construction figures reflect this 1.0% historical annual growth rate (2000-2015) in excess of inflation.

### VEHICLE COST ESCALATION

For an accurate understanding of how transit vehicle costs have escalated in the past, historical vehicle costs were analyzed. Data from the American Public Transportation Association's (APTA) annual *Public Transportation Vehicle Database*<sup>1</sup> found the cost of standard 40' diesel transit buses grew at a rate of 1.34% annually (2008-2015) above inflation. This rate is assumed to continue in the future.

### COST OF BORROWING

The financial model calculates the amount of borrowing needed in each year for the RTA to maintain a positive cash balance and the resulting principal and interest payment burden on the agency. A debt service coverage ratio (DSCR) of 1.5 is maintained for each year of outstanding debt. This is generally consistent with the high quality ("A") bond ratings maintained by peer agencies.

### LONG-TERM DEBT

Historical rates from the Federal Reserve's 20-year state and local bond index are used to forecast a long-term debt interest rate. The average of monthly rates from 1990 through 2014, adjusted for historical inflation, results in an estimated rate of 2.54% above inflation. An assumed payment period of 10 years is used for long term debt in the financial model. The model only allows RTA to issue long-term bonds that mature by 2036. Given the assumed 10-year payment period, this means 2026 is the final year in which the RTA is permitted to issue long-term debt in the financial model.

### SHORT-TERM DEBT

Historical rates from Moody's for corporate bonds for all industries are used to forecast a short-term debt interest rate. The average monthly rates of BAA rated bonds from 1990 through 2014, adjusted for historical inflation, results in an estimated rate of 4.67% above inflation. An assumed payment period of two years is used for short-term debt in the financial model. The model only allows the RTA to issue short-term bonds that mature by 2036. Given the assumed two-year payment period, this means 2034 is the final year in which the RTA is permitted to issue short-term debt in the financial model.

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<sup>1</sup>2008-2015 Public Transportation Vehicle Database. American Public Transportation Association. Retrieved from <http://www.apta.com/resources/statistics/Pages/OtherAPTASStatistics.aspx>

## Demographic Assumptions

SEMCOG’s five-year demographic forecasts by city (from 2010 to 2040) were used to forecast population and housing unit growth in Southeast Michigan. These forecasts were interpolated to produce individual year forecasts through 2040. It was assumed the growth rate from the final 5-year period (2035 to 2040) will continue in perpetuity beyond 2040.

### POPULATION

Southeast Michigan’s population is forecasted to grow at 0.03% per year from 2017 to 2036 (Table 2.1). The population over 65 years of age is forecasted to grow at 2.08% annually during the same period (Table 2.2).

**TABLE 2.1: ANNUAL POPULATION GROWTH**

Jurisdiction	Growth Rate
Macomb	0.25%
Oakland	0.08%
Washtenaw	0.39%
Wayne	-0.20%
<b>Region</b>	<b>0.03%</b>

Forecasted 2017-2036  
 Source: SEMCOG Five-Year Forecasts (2010-2040)

**TABLE 2.2: ANNUAL OVER-65 POPULATION GROWTH**

Jurisdiction	Growth Rate
Macomb	2.23%
Oakland	2.20%
Washtenaw	2.93%
Wayne	1.72%
<b>Region</b>	<b>2.08%</b>

Forecasted 2017-2036  
 Source: SEMCOG Five-Year Forecasts (2010-2040)

### HOUSING UNITS

SEMCOG's five-year housing unit forecasts by city (from 2010 to 2040) are used to forecast housing unit growth in Southeast Michigan. SEMCOG's forecasts were interpolated to produce individual year forecasts through 2040. It is assumed that the growth rate from 2035 to 2040 will continue in perpetuity beyond 2040. Overall, housing units in Southeast Michigan are forecasted to grow annually at 0.18% from 2017 to 2036 (Table 2.3).

**TABLE 2.3: ANNUAL HOUSING UNIT GROWTH (PER YEAR)**

<b>Jurisdiction</b>	<b>Growth Rate</b>
Macomb	0.37%
Oakland	0.13%
Washtenaw	0.62%
Wayne	0.03%
<b>Region</b>	<b>0.18%</b>

Forecasted 2017-2036

Source: SEMCOG Five-Year Forecasts (2010-2040)

**PROPERTY VALUATION (PER DWELLING UNIT)**

Past taxable property valuations were obtained from the Michigan Department of Treasury at the municipal level and adjusted to 2016 dollars. It was assumed property values will grow at the rate of inflation in the future.

Overall growth in taxable property valuation is a product of the projected per-unit growth rate (which was held to inflation) and the growth in total housing units. Total property valuation is projected to increase by 0.21% annually (2016\$), from 2017 to 2036 (Table 2.4).

**TABLE 2.4: ANNUAL PROPERTY TAX VALUATION GROWTH**

<b>Jurisdiction</b>	<b>Growth Rate</b>
Macomb	0.39%
Oakland	0.12%
Washtenaw	0.65%
Wayne	0.02%
<b>Region Total</b>	<b>0.21%</b>

Forecasted 2017-2036

**Vehicles Registered per Capita**

Although the property tax was identified early in the financial analysis process as being most appropriate for a referendum in November 2016, the financial model includes the ability to evaluate potential vehicle registration tax (VRT) revenues. Vehicle registrations by county were calculated with data available from the Michigan Secretary of State<sup>2</sup> and the Michigan House Fiscal Agency<sup>3</sup>. The state of Michigan has a number of varying vehicle registration tax types depending on the type and use of a vehicle. The largest share of passenger vehicles is subject to the state's ad valorem VRT, accounting for approximately 86% of all vehicle registrations in 2014. It is assumed that this same group of vehicles would be subject to an RTA VRT.

The Michigan House Fiscal Agency report cited above estimates the total number of vehicles eligible for the ad valorem registration fee statewide. The percentage of registered vehicles eligible for the ad valorem registration fee throughout the state of Michigan was applied to the total number of vehicles

<sup>2</sup> Summary of Fees Collected. Michigan Secretary of State. September 30, 2014.  
[http://michigan.gov/documents/sos/summary\\_of\\_fees\\_collected\\_25683\\_7\\_208911\\_7.pdf](http://michigan.gov/documents/sos/summary_of_fees_collected_25683_7_208911_7.pdf)

<sup>3</sup> Vehicle Registration Primer. House Fiscal Agency. August 2014. Page 7

registered within each county (as reported by the Secretary of State) to estimate the number of ad valorem fee-eligible vehicle registrations within each county. It was assumed future growth in vehicle registration would be equal to overall population growth, which implicitly assumes per-capita vehicle ownership will remain constant. Ad valorem-eligible vehicles registered per capita is shown in Table 2.5.

**TABLE 2.5: VEHICLES REGISTERED PER CAPITA, SUBJECT TO AD VALOREM REGISTRATION FEE**

<b>County</b>	<b>Vehicles per Capita</b>
Macomb	0.71
Oakland	0.80
Washtenaw	0.64
Wayne	0.60

Source: Michigan Department of Treasury

### **AVERAGE VEHICLE LIST PRICE**

The average vehicle list price was estimated based on vehicle registration information from the Michigan House Fiscal Agency<sup>4</sup>. A reported average vehicle registration tax of \$100 was used to determine an assumed average vehicle list price of \$20,500 (2016\$), which is assumed to grow at equal to the rate of inflation in the future.

## **Revenue Sources**

The financial model accounts for a variety of existing and potential future revenue sources. These include system-generated, local, state, and federal funding. The model allows existing revenue streams to be adjusted in the future and new revenue sources, such as a region-wide property tax millage, to be introduced. Assumptions were made about future funding levels for each revenue source based on FTF and stakeholder input, demographic and economic data, and historical funding growth trends.

### **SYSTEM-GENERATED REVENUE**

Local transit agencies receive revenue from fare collection, advertising, purchase of service agreements (POSA), and other agency activities. An estimated \$50.3 million in system-generated revenue was reported by the existing transit agencies in Southeast Michigan in 2014. Table 2.6 summarizes the most recent year's totals for system-generated revenue for each of the existing transit providers. Approximately one million dollars of revenue was collected from advertising and other agency activities, with the remainder coming from fares and POSA revenue.

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<sup>4</sup> Vehicle Registration Primer. House Fiscal Agency. 2013 and 2014 reports available

**TABLE 2.6: SYSTEM-GENERATED REVENUE, 2014**

<b>Provider</b>	<b>Revenue</b>
AAATA	\$6.8
DDOT	\$27.0
DTC	\$2.1
SMART	\$14.4

YOES\$, millions, Sum of agency revenues differs from total due to rounding  
Sources: Agency financial reports and DDOT Plan of Adjustment

**FARE REVENUE**

The existing transit agencies in Southeast Michigan generated an estimated \$44.4 million in fare revenue in 2014. The financial model forecasts fare revenue for the system through the farebox recovery ratio, defined as the percentage of total operating expenses met through fare revenues. Farebox recovery for existing agencies is derived from the National Transit Database (NTD). The farebox recovery assumed for the RTA is assumed to be 20% for most service types, which is slightly higher than existing providers but closer to industry norms of 25% or more. The farebox recovery for each RMTP route corresponds with the recovery ratio of the assigned provider of that route. Table 2.7 describes the assumed farebox recovery of each service and provider. Table 2.8 shows 2014 fare revenues by agency.

**TABLE 2.7: FAREBOX RECOVERY RATIOS BY SERVICE TYPE AND AGENCY**

<b>Mode / Agency</b>	<b>Recovery Ratio</b>	<b>Source</b>
<b>BRT</b>		
RTA	20.00%	Per RTA Guidance
<b>Airport Express</b>		
AAATA	62.97%	2013 NTD
RTA	62.97%	Assume same as AAATA
<b>Regional Rail</b>		
RTA	20.00%	Per RTA Guidance
<b>Cross-County Connector, Commuter Express, and Local Bus</b>		
AAATA	18.18%	2013 NTD
DDOT	18.75%	2013 NTD
SMART	16.73%	2013 NTD
<b>People Mover</b>		
DTC	13.27%	2013 NTD
RTA	13.27%	Assume same as DTC
<b>Streetcar</b>		
M-1	50.00%	M-1 RAIL Business Plan
RTA	35.00%	Per RTA Guidance

**TABLE 2.8: FARE REVENUE, 2014**

<b>Provider</b>	<b>Revenue</b>
AAATA	\$6.0
DDOT	\$24.2
DTC	\$1.7
SMART	\$12.4

2015\$, millions

Sources: Agency financial reports and DDOT Plan of Adjustment

### **PURCHASE OF SERVICE AGREEMENTS**

AAATA, DDOT, and SMART enter into POSA's with local governments and other organizations to provide a range of transportation services based on a community's unique needs. AAATA provided service to Pittsfield Township, Superior Township, the City of Ypsilanti, Ypsilanti Township, and the City of Chelsea through POSA's in 2014. In May of 2014, the City of Ypsilanti and Ypsilanti Township became members of AAATA and transitioned to contribution through the local property taxation system in lieu of a POSA. According to the city of Detroit's Executive Budgets, DDOT has historically entered into POSA agreements with SMART and human service organizations. SMART enters into partnerships that provide a range of transportation services based on a community's unique needs. SMART's annual financial reports present an aggregate operating revenue category that includes POSA information and other sources of system-generated revenue. Funding from these agreements was correspondingly incorporated into the model.

### **LOCAL CONTRIBUTIONS AND MILLAGES**

Southeast Michigan transit agencies receive local contributions for transit service through different types of taxes. Local support is provided to DDOT and DTC through a General Fund subsidy from the city of Detroit. Local funding for AAATA and SMART is provided through local transit millages.

### **LOCAL MILLAGES**

Local transit millages are property taxes levied for transit services. One mill is equivalent to one dollar of tax per thousand dollars of taxable value. The current AAATA and SMART millage rates are shown in Table 2.9. As a baseline assumption, the financial model assumes any 2016 millages funding transit in Southeast Michigan are held in perpetuity. The financial model is capable of raising, lowering, or eliminating these millages over time for any jurisdictions, as well as introducing any new millages, including, but not limited to, the region-wide RTA millage.

**TABLE 2.9: TRANSIT MILLAGE RATES AND REVENUE**

	<b>Millage Rate</b>	<b>Revenue</b>
<b>AAATA</b>		
Ann Arbor	2.756	\$13.2
Ypsilanti	1.679	\$0.5
Ypsilanti Township	0.700	\$0.8
<b>SMART</b>		
Opt-In Communities	1.000	\$65.2

YOES\$, millions

Sources: Agency financial reports (AAATA 2014, SMART 2015)

In 2014, AAATA and SMART received approximately \$54.1 million in revenue from property tax millages. Similar to many local governments, SMART experienced a period of decline in property tax revenue due

to the housing market downturn and corresponding reduction in taxable valuations. In August 2014, voters in the Macomb, Oakland, and Wayne County service areas approved an increase in the property tax millage from 0.59 to 1.0 mill. The increased millage rate increased local SMART funding to \$65.2 million.

### RTA PROPERTY TAX MILLAGE

The State of Michigan granted the RTA authority to seek a millage to fund transit service within Southeast Michigan. If the assessment is approved by seven-ninths of the RTA board (including an affirmative vote from at least one member from each county and the member appointed by the Mayor of Detroit) and a majority of the electors within Macomb, Oakland, Washtenaw, and Wayne counties (including the City of Detroit), the millage would be applied equally over the member counties. The financial model is capable of introducing and modifying this millage at any time in the future. Unlike existing SMART and AAATA millages, the RTA millage would only be applied to the entire four-county region with no ability for communities to opt out or for differential rates to be applied in different jurisdictions. This financial analysis assumes that it would remain unchanged from 2017 to 2036.

To compute millage revenue, the financial model multiplies the millage rate by the projected taxable values in the affected jurisdictions for each year the millage is in effect. The total computed value is reduced by a Millage Reduction factor, which was calculated by comparing the model's computed total millage revenue from past years against the actual millage revenue reported by SMART and AAATA in those years. This reduction factor, which ranges between 3% and 4%, reflects any unpaid or delinquent property taxes, and any costs of collection that would be deducted before the funds are transferred to the agencies. It is applied to future year projections of millage revenue to AAATA, SMART, and the RTA.

### RTA VEHICLE REGISTRATION TAX

The RTA also has the power to generate funds for transit service through a four-county Vehicle Registration Tax (VRT) at a rate of \$1.20 per thousand dollars of assessed value. The financial model can forecast the revenue generated from a VRT in the future. Similar to an RTA millage, a VRT must also be approved by the RTA board and by a majority of voters in the four-county region.

### STATE FUNDING

The State of Michigan's Public Act 51 of 1951 ("Act 51") established the Comprehensive Transportation Fund (CTF) as a state-restricted fund for public transportation purposes. CTF funding is appropriated in the annual state transportation budget. The two primary revenue sources for the CTF are a ten percent Michigan Transportation Fund earmark and an automobile-related sales tax. The Michigan Transportation Fund is funded by motor fuel taxes and vehicle registration taxes. Public transportation agencies in Southeast Michigan receive funding from the CTF through the Operating Assistance Program and the Capital Assistance Program. Table 2.10 provides the total state operating and capital assistance received by each transit agency in 2014. On October 1, 2013, the RTA became the designated recipient for state and federal grants for the region.

**TABLE 2.10: STATE PUBLIC TRANSPORTATION FUNDING, 2014**

<b>Provider</b>	<b>Funding</b>
AAATA	\$10.4
DDOT	\$45.2
DTC	\$4.8
SMART	\$41.0

YOES\$, millions

Sources: Agency financial reports and DDOT Plan of Adjustment

**Local Bus Operating Assistance Program (LBO)** is the largest annual CTF appropriation, accounting for the majority of operating assistance funding allocated to providers in Southeast Michigan. Urbanized areas with populations over 100,000 receive state operating assistance for up to 50 percent of eligible expenses. Non-urbanized areas, and urbanized areas with populations below 100,000, receive assistance for up to 60 percent of eligible expenses.<sup>5</sup> Based on CTF available funds, the Office of Passenger Transportation's FY 2015 budgeted distribution of statewide operating assistance equal to 30 percent for urbanized areas and 36 percent for non-urbanized areas.<sup>6</sup> According to annual financial reports, the existing transit agencies within the region received an estimated \$98.6 million in state operating assistance funding in 2014. Of this, \$81.4 million was from the LBO program.

The financial model reflects expected increases in LBO funding for Southeast Michigan region as a result of 2015 legislative changes related to transportation funding. By 2021, the state operating assistance is expected to rise to \$136.0 million (\$119.9 million 2016\$). Of this, \$116.2 million is expected to come from LBO funding (\$102.5 million 2016\$).

Going forward, the financial model assumes AAATA, SMART, and DTC are held harmless at their current funding levels, which would grow at the rate of inflation. DDOT would be held harmless as well, but the RTA did model some growth to help account for the City of Detroit's capability to shift state road funding to support transit, which would help towards restoring recent service cuts. All remaining growth in LBO funding above the rate of inflation would be allocated to the RTA to help fund the RMTP.

**Capital Assistance Program** provides matching funds for projects receiving funding through federal programs.<sup>7</sup> According to annual financial reports, the existing transit agencies spent an estimated \$2.9 million in capital assistance from the State of Michigan in 2014. State capital assistance revenue data was obtained from available annual financial reports and estimated based on aggregate reporting of state operating and capital funding. It is also important to note that funding originally intended for capital projects has been used to cover operating cost shortfalls in the past and this proportion was estimated and carried forward in the model. Forecasts of Capital Assistance Program funding from the State of Michigan reflect a historical average for each agency based on the annual financial report data available. The region is estimated to receive \$3.6 million in state capital assistance in 2016.

## FEDERAL FORMULA PROGRAM GRANTS

Federal transit support is provided through a variety of grant programs that apportion resources based on designated criteria and a distribution formula.

**Section 5307 Urbanized Area Formula Grants** provide funding for public transportation capital, planning, and job access and reverse commute projects. The formula incorporates population, number of low-income residents, vehicle revenue miles, and passenger and route miles<sup>8</sup>.

**Section 5337 State of Good Repair Formula Grants** provide funding to ensure fixed-guideway rail and high-intensity motorbus systems continue safe, efficient, and reliable operations. Eligible expenses

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<sup>5</sup> The Comprehensive Transportation Fund and State Support for Local Public Transit Agencies. House Fiscal Agency. April 2013. <http://house.michigan.gov/hfa/transportation.asp>

<sup>6</sup> State Operating Formula Distribution handout. Office of Passenger Transportation. Received in 2015.

<sup>7</sup> Local Bus Capital and Operating Assistance Programs. Michigan Department of Transportation. Accessed September 2015. [http://www.michigan.gov/mdot/0,4616,7-151-11056\\_11266-26940--,00.html](http://www.michigan.gov/mdot/0,4616,7-151-11056_11266-26940--,00.html)

<sup>8</sup> Federal Transit Administration. Accessed September 2015. Fact Sheet: Urbanized Area Formula Grants Section 5307 & Section 5304. Retrieved from [http://www.fta.dot.gov/documents/MAP-21\\_Fact\\_Sheet\\_-\\_Urbanized\\_Area\\_Formula\\_Grants.pdf](http://www.fta.dot.gov/documents/MAP-21_Fact_Sheet_-_Urbanized_Area_Formula_Grants.pdf)

include the maintenance, replacement, and rehabilitation of capital assets. Southeast Michigan has no fixed-guideway transit apart from the People Mover, but as projects like Regional Rail between Ann Arbor and Detroit and Bus Rapid Transit begin operations, the region can expect to receive Section 5337 funding.

**Section 5339 Bus and Bus Facilities** grants provide funding to replace and rehabilitate buses, bus-related facilities, and related equipment. Each state and territory receives an equal allocation and then the remaining funds are apportioned based on a formula considering population, vehicle revenue miles, and passenger miles. A 20 percent local match is required<sup>9</sup>.

Historical federal formula funding was estimated from aggregate federal formula and discretionary grant totals in the agency annual financial reports. The financial model reflects that funding originally intended for capital projects has been used to cover operating cost shortfalls in past years.

Reflecting potential increases in Southeast Michigan's share of the national total as its system grows; the financial model assumed federal formula funding will increase with the rate of inflation each year when regional transit service levels are stable and 1% above inflation in years when significant service increases are implemented.

In addition to assumed growth in formula funding that already benefits Southeast Michigan, the financial model accounts for new funding for which the region would become eligible as a result of the expanded BRT and Regional Rail projects planned as part of the RMTP. Specifically, it is assumed the region would begin receiving Fixed Guideway Tier funding under the Section 5307 program in 2028 in the amount of \$9.6 million (2016\$). In addition, the region would also become eligible for State of Good Repair Grants, with the assumed funding at \$3 million in 2028, \$5 million in 2029 through 2031, and \$7 million in 2032 and annually thereafter (2016\$).

The Detroit and Ann Arbor urbanized areas (UZAs) combined received an estimated \$59.1 million in federal formula grant funding in 2014, according to financial reports provided by AAATA, DTC, and SMART and DDOT's Plan of Adjustment. Refer to Table 2.11 for the federal formula grant revenue received by each agency.

**TABLE 2.11: FEDERAL FORMULA GRANT REVENUE, 2014**

<b>Provider</b>	<b>Funding</b>
AAATA	\$8.3
DDOT	\$32.1
DTC	\$0.7
SMART	\$18.1

YOE\$, millions

Sources: Agency financial reports and DDOT Plan of Adjustment

As of March 2013, the RTA sub-allocated Detroit UZA Section 5307 funding as follows: 51.5 percent to SMART, 47.5 percent to DDOT, and one percent to DTC. Federal formula funding was previously sub-allocated 35 percent to SMART and 65 percent to DDOT. AAATA currently receives all of the Ann Arbor UZA Section 5307 funding. As anticipated federal funding to the region grows, the model holds the existing providers harmless, increasing their federal formula funding at the rate of inflation. The RTA would retain all federal funding growth above the rate of inflation to help fund the RMTP.

<sup>9</sup> Federal Transit Administration. Accessed September 2015. Fact Sheet: Bus and Bus Facilities. Retrieved from [http://www.fta.dot.gov/documents/MAP-21\\_Fact\\_Sheet\\_-\\_Bus\\_and\\_Bus\\_Facilities.pdf](http://www.fta.dot.gov/documents/MAP-21_Fact_Sheet_-_Bus_and_Bus_Facilities.pdf)

## FEDERAL DISCRETIONARY PROGRAM GRANTS

The federal government supports transit investment projects through competitive, discretionary programs that evaluate individual projects. Discretionary funding can be unpredictable. Forecasts for the region are estimated based on a multi-year historical average for each agency that was calculated from the available annual financial report data.

In addition to formula funding, the Federal Section 5339 Bus and Bus Facilities program also includes discretionary grant funding. In 2016, the FTA made \$211 million available for this competitive grant. This program in particular could fund the replacement of transit vehicles and upgrades to maintenance facilities. This is one example of the federal discretionary program grants available to the RTA to fund regional transit.

An estimated \$11 million in federal discretionary grant funding was received by the existing transit agencies in 2014 (Table 2.12). Discretionary funding can be unpredictable; therefore forecasts for the region are estimated based on a multi-year historical average for each agency that was calculated from the available annual financial report data.

**TABLE 2.12: ESTIMATED 2014 FEDERAL DISCRETIONARY FUNDING**

Provider	Funding
AAATA	\$1.2
DDOT	\$1.4
DTC	\$5.0
SMART	\$3.5

YOES, millions

Sources: Agency financial reports and DDOT Plan of Adjustment

The RTA is also assumed to receive an increased level of federal discretionary funding for capital projects it will facilitate. The share is not a fixed percentage but rather is tied to specific projects for which federal support is likely. The assumed levels of federal capital assistance were determined based on stakeholder feedback that established a funding probability and likely federal share for capital projects.

## FEDERAL SECTION 5309 FIXED GUIDEWAY CAPITAL INVESTMENT GRANTS

The Fixed Guideway Capital Investment Grant program funds new fixed-guideway, extensions to fixed-guideway, mixed traffic bus rapid transit (BRT), projects of substantial investment, and projects improving capacity on an existing fixed-guideway system. The Fixing America's Surface Transportation Act (FAST Act) of 2015 allocates over \$2.3 billion annually to the program from FY 2016 to FY 2020. Funding is distributed through four categories:

**New Starts** projects are new fixed guideway projects or extensions to existing fixed guideway systems with total estimated capital costs of \$300 million or more, or are seeking \$100 million or more in Section 5309 funding. The maximum federal funding share for New Starts projects is 60 percent.

**Small Starts** projects are new fixed guideway projects, extensions to existing fixed guideway systems, or corridor-based bus rapid transit projects with total estimated capital costs of less than \$300 million and are seeking less than \$100 million in Section 5309 funding. The maximum federal funding share for Small Starts projects is 80 percent.<sup>10</sup>

<sup>10</sup> Federal Transit Administration. Accessed June 2016. Fact Sheet: Fixed Guideway Capital Investment Grants. Retrieved from [https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/5309\\_Capital\\_Investment\\_Grant\\_Fact\\_Sheet.pdf](https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/5309_Capital_Investment_Grant_Fact_Sheet.pdf)

**Core Capacity** projects are substantial corridor-based capital investments in existing fixed guideway systems that increase capacity by at least 10 percent in corridors at capacity either today or in the next five years. Core capacity projects may not include elements designed to maintain a state of good repair.

**Programs of Interrelated Projects** are comprised of any combination of two or more New Starts, Small Starts, or Core Capacity projects. The projects must have a logical connection to one another and all must begin construction within a reasonable timeframe.

## **SURFACE TRANSPORTATION PROGRAM**

The Federal Highway Administration (FHWA) and the FTA also administer the Surface Transportation Program (STP). This formula grant program is intended to provide a source of flexible funds that are controlled by states, regional Metropolitan Planning Organizations (MPO's), or local governments. The funds can be used for the improvement of highways, bridge projects, facilities for nonmotorized transportation, transit capital projects, and public bus terminals and facilities. A state must set aside a required proportion of STP funds for the transportation alternatives program, planning and research, and off-system bridges. Fifty percent of a state's STP apportionment, after set-asides, is to be dispersed based on population. The remaining 50 percent may be used in any area of the state. Because formula funding originates with a federal source, it cannot be used as part of the local match funds.<sup>11</sup>

## **CONGESTION MITIGATION AND AIR QUALITY PROGRAM**

Similar to the STP, the Congestion Mitigation and Air Quality (CMAQ) formula grant program is jointly administered by the FHWA and FTA. The funds are controlled by states and local governments and a portion must be set aside for the transportation alternatives program and planning and research. CMAQ funds are distributed to state and local governments to help nonattainment and maintenance areas meet the requirements of the Clean Air Act. Funding may be used for technology systems, alternative fuel facilities, emergency communications equipment, and workforce development, training, and education activities. In states, such as Michigan, that do not have any areas with nonattainment status, CMAQ funding can be used for any STP eligible project.<sup>12</sup> Table 2.13 includes the estimated 2015-2020 local funding allocation, after set-asides, for each county based on population.

**TABLE 2.13: ESTIMATED CMAQ ALLOCATION, 2015-2020**

<b>County</b>	<b>Funding</b>
Macomb	\$3.3
Oakland	\$4.7
Washtenaw	\$1.4
Wayne	\$6.9

2016\$, millions

Source: Michigan Department of Transportation. FY 2016-2020 Estimated Funding Allocation Table.  
[http://www.michigan.gov/documents/mdot/MDOT\\_2015-2019funddistribution\\_438791\\_7.pdf](http://www.michigan.gov/documents/mdot/MDOT_2015-2019funddistribution_438791_7.pdf)

## **OTHER DISCRETIONARY FEDERAL GRANTS**

While the financial model has the ability to account for existing and future discretionary federal grants like the TIGER Program, none were assumed to be coming to the region as part of the delivery of the core RTA program.

<sup>11</sup> Federal Highway Administration. Retrieved from: <http://www.fhwa.dot.gov/map21/summaryinfo.cfm>

<sup>12</sup> Federal Highway Administration. Retrieved from: <https://www.fhwa.dot.gov/map21/factsheets/cmaq.cfm>

## Operations and Maintenance Costs

Unit operating costs were developed for the RTA and existing agencies so a variety of future transit options could be modeled. The unit costs were developed for vehicle operations, fuel, vehicle maintenance, non-vehicle maintenance, and administration. Paratransit costs were treated differently to account for an aging population. More information about O&M costs is provided in the following subsections.

### FUEL PRICES

The U.S. Energy Information Administration (EIA) Energy Outlook was used to project future fuel prices in constant 2016 dollars. Diesel fuel prices are forecasted to grow 1.3% annually above inflation, and the cost of electricity is forecasted to grow 0.9% annually above inflation. To reflect the uncertainty of future energy markets and develop a conservative financial plan for implementation of the RMTP, all forecasted fuel costs were increased by a 50% contingency factor in the financial model.

### UNIT OPERATING COSTS

Unit operating costs were estimated for each provider and type of transit service (Table 2.14). Operating costs are determined from up to ten years of historical operating costs, as reported by the existing providers to the NTD. Provider operating costs are broken into five categories (vehicle operations except fuel, fuel, vehicle maintenance, non-vehicle maintenance, and administration). Each cost category is associated with one of three “cost drivers”: vehicle revenue-hours (VRH), vehicle revenue-miles (VRM), and vehicles operated in maximum service (VOMS). Historical total cost data was divided by historical cost drivers to develop estimated unit costs. Growth in these unit costs was separately forecasted by mode for each transit agency, and adjusted to constant 2016 dollars. Operating costs for BRT services were provided by the BRT corridor studies.

Operating costs for the RTA were determined based on typical regional rates of the existing providers or, for modes not currently in operation in the region, based on peer system research.

Operating costs for each RMTP service depends on the assigned provider of that service. Because operating costs vary by provider, the assumed operator of a particular RMTP service directly influences its operating cost.

The costs associated with some components of transit operation are anticipated to grow at a rate greater than inflation. Mode-specific operating cost growth rates by agency (Table 2.15) are applied in addition to inflation and like the base unit costs, are based on historical trends. The historical trends were based on the same NTD data used to estimate the current unit costs as shown in Table 2.14. To limit the volatility of future growth and to ensure a financially conservative forecast, the historically computed growth rates were restricted to between 0% and 2% per year. Any computed growth rates outside that range were limited to that range.

TABLE 2.14: MODE UNIT OPERATING COSTS BY AGENCY

Agency/ Mode	Operations (less fuel) (per VRH)	Vehicle Maintenance (per VRM)	Non-Vehicle Maintenance (per VOMS)	Admin. (per VOMS)	Fuel (VRM/gal or VRM/kWh)
<b>Cross-County Connector, Commuter Express, and Local Bus</b>					
AAATA	\$58.90	\$1.65	\$10,856	\$90,798	4.36
DDOT	\$65.02	\$3.74	\$41,259	\$68,027	2.88
SMART	\$71.75	\$1.80	\$7,727	\$65,220	3.98
RTA	\$71.75	\$1.80	\$7,727	\$65,220	3.98
<b>Airport Express</b>					
AAATA	\$48.52	\$0.31	\$16,297	\$168,377	3.13
RTA	\$48.52	\$0.31	\$16,297	\$168,377	3.13
<b>Regional Rail</b>					
RTA	\$406.47	\$4.39	\$55,224	\$382,518	1.36
<b>People Mover</b>					
DTC	\$61.63	\$6.37	\$54,855	\$372,111	0.12
RTA	\$61.63	\$6.37	\$54,855	\$372,111	0.12
<b>Streetcar</b>					
M-1	\$131.21	\$6.33	\$68,880	\$66,000	0.14
RTA	\$131.21	\$6.33	\$68,880	\$66,000	0.14

2016\$

Sources: Regional Rail: Northstar Line commuter rail in Minneapolis, MN; Streetcar: M-1 RAIL O&amp;M Cost Model; People Mover &amp; Bus: NTD

TABLE 2.15: MODE OPERATING COST GROWTH RATES BY AGENCY

Agency/ Mode	Operations (less fuel) (/rev-hr)	Vehicle Maintenance (/rev-mi)	Non-Vehicle Maintenance (/VOMS)	Admin. (/VOMS)	Fuel (rev-mi/gal or rev-mi/kWh)
<b>BRT</b>					
RTA	1.28%	1.28%	1.28%	1.28%	1.42%
<b>Cross-County Connector, Commuter Express, and Local Bus</b>					
AAATA	0.00%	0.00%	0.00%	2.00%	2.00%
DDOT	0.00%	1.53%	2.00%	0.00%	0.42%
SMART	0.88%	0.00%	0.00%	0.00%	1.42%
RTA	1.28%	1.28%	1.28%	1.28%	1.42%
<b>Airport Express</b>					
AAATA	0.00%	0.00%	2.00%	2.00%	0.00%
RTA	1.28%	1.28%	1.28%	1.28%	0.00%
<b>Regional Rail</b>					
RTA	1.28%	1.28%	1.28%	1.28%	0.00%
<b>People Mover</b>					
DTC	0.42%	0.00%	0.00%	0.00%	2.00%
RTA	1.28%	1.28%	1.28%	1.28%	2.00%
<b>Streetcar</b>					
M-1	0.00%	0.00%	0.00%	0.00%	0.00%
RTA	1.28%	1.28%	1.28%	1.28%	0.00%

Growth in constant 2016 dollars or real values above inflation

## PARATRANSIT SERVICE

It was assumed each agency's future costs (Table 2.16) for providing paratransit service within their existing service areas will grow from existing levels in proportion to growth in the over-65 population. Fleet requirements for providing paratransit service were also assumed to grow in proportion to the overall quantity of service provided.

**TABLE 2.16: ESTIMATED PARATRANSIT OPERATING COSTS AND GROWTH RATES BY AGENCY, 2016**

Agency	Total Costs (\$ millions)	Costs/ rev-hr	Compound Annual Growth Rate (2017-2036)
AAATA	\$8.3	\$51.22	2.8%
DDOT	\$5.6	\$7.67	1.5%
SMART	\$22.7	\$94.70	2.1%

2016\$

Source: National Transit Database reports, 2013, SEMCOG 2040 population forecast

## Capital Costs

### CAPITAL PROJECTS

The financial model estimated the cost of capital projects for each transit service. Capital costs were estimated on a per-mile basis for corridors projects, per-unit for garages and vehicles, and lump sums from project studies or peer research for specific projects (e.g., call center, Regional Rail, BRT corridors, etc.) for which such data was available. Additionally, the independent corridor studies developed detailed capital cost estimates for the BRT and Regional Rail projects.

### CAPITAL COST ASSUMPTIONS

Depending on the capital project, some costs were broken down into a cost per unit or cost per mile, while others were entered as sum totals for the project. The assumptions below describe how costs were derived. These costs are expressed in 2016 dollars and reflect the estimated cost of construction based on current unit costs. Projects should be expected to have somewhat higher costs at the time of construction due to both inflation and construction cost escalation.

- **Airport Express** – A total of \$2.5 million (\$500,000 per route) was assumed to fund station facilities.
- **Bus Rapid Transit** – The following assumed investment levels were provided by the corridor study teams and do not include vehicle costs:
  - **Gratiot Avenue** – \$232.4 million
  - **Michigan Avenue** – \$99.8 million
  - **Washtenaw Avenue** – \$45.6 million
  - **Woodward Avenue** – \$318.0 million
- **Commuter Express** – For each Commuter Express corridor, \$1 million was budgeted for capital costs associated with stations and parking facilities.
- **Regional Rail** – Capital costs are assumed to be \$120 million and split evenly between 2020, 2021, and 2022. It is assumed passenger coaches would be leased and therefore do not have any upfront capital cost. Locomotives would be purchased for the start of service, and a \$3 million cost for mid-life refurbishment of locomotives is assumed as a capital cost in 2032.
- **Cross-County Connector** – Cross-County Connector service is assumed to carry a capital cost of approximately \$335,000 per mile. These investments are not intended to be spread evenly

among each route. Instead, this funding will allow improvements at strategic locations in the Cross-County Connector network. These improvements could include upgraded passenger facilities at high ridership locations, ancillary pedestrian improvements, and potential running-way improvements such as transit signal priority and queue jump lanes.

- **Fare Integration** – Based on the ongoing fare integration study, a capital cost of \$22.8 million was set aside for regional fare integration.
- **Local Bus** – Capital costs are assumed to be \$3 million for new and expanded local bus service. These funds will primarily go toward the installation of signs and shelters at new transit stops.
- **Streetcar** – Capital construction costs for the M-1 RAIL streetcar were not included in the financial model. The project is currently under construction and will be completed prior to implementation of the RMTP. It is anticipated the RTA will assume ownership of the M-1 RAIL project in 2024 and will incur costs associated with ongoing operation and maintenance of the project at that time. No RTA-funded capital costs are assumed within the 20-year planning horizon (2017-2036).
- **Transit Centers and Facilities** – \$76 million was budgeted for transit support facilities, which is intended to supplement the facilities costs included in the BRT capital cost estimates as well as support needed garage expansions to accommodate the C3 and Local service increases. In addition, \$15 million is included for improvements to regional transit centers.

The financial model allows for the adjustment of the share of federal and state funding available to individual capital projects. The estimated capital costs by project type, and assumed federal, state, and local share of costs are shown in Table 2.17.

**TABLE 2.17: CAPITAL COSTS AND STATE/FEDERAL FUNDING ASSUMPTIONS**

<b>Project</b>	<b>Total Cost</b>	<b>Federal Share</b>	<b>State Share</b>	<b>RTA Share</b>
Airport Express	\$0.5 / route	13%	0%	87%
BRT – Gratiot	\$232.4	50%	10%	40%
BRT – Michigan	\$99.8	50%	10%	40%
BRT – Washtenaw	\$45.6	50%	10%	40%
BRT – Woodward	\$318.0	60%	10%	30%
Regional Rail	\$120.0	0%	33%	67%
Cross County Connectors	\$0.335 / mile	13%	0%	87%
Commuter Express	\$1.0 / route	13%	0%	87%
Local Bus	\$3.0	13%	0%	87%
Transit Centers	\$15.0	19%	0%	81%
Transit Facilities	\$76.0	26%	0%	74%
Fare Integration	\$22.8	0%	0%	100%

2016\$, millions

## VEHICLE COSTS

Because the financial model assumes capital costs to be one-time occurrences while vehicles must be replaced on a regular cycle, vehicle costs were treated separately from other capital costs. Estimated vehicle purchase costs were determined through peer system research, APTA vehicle cost data, the BRT corridor studies, and RTA guidance (Table 2.18). Standard bus and BRT bus costs were determined for conventional diesel, hybrid, CNG, and electric propulsion. The share of vehicle propulsion systems by agency were assumed to remain approximately the same as current usage: AAATA operates a 100%

hybrid fleet, while SMART's fleet is 50% hybrid and 50% conventional. DDOT's fleet is 100% conventional. RTA is assumed to operate a 100% hybrid fleet for directly operated BRT service.

Vehicle costs for Regional Rail coaches are not included because it was assumed these vehicles would be leased, and ongoing lease costs are included as an operating cost for these modes. Commuter Express service was assumed to be provided using standard buses, while Airport Express service will be provided through a fully contracted arrangement, with the contractor providing the vehicles. Vehicle service lives were identified based on FTA guidance (Table 2.19).

**TABLE 2.18: ASSUMED VEHICLE COSTS**

<b>Vehicle</b>	<b>Cost</b>
Automated Guideway <sup>1</sup>	\$1,793,450
BRT – Diesel <sup>2</sup>	\$862,530
BRT – CNG <sup>2</sup>	\$1,022,258
BRT – Hybrid <sup>2</sup>	\$1,213,931
BRT – Electric <sup>2</sup>	\$1,533,387
Bus – Diesel <sup>1</sup>	\$406,937
Bus – CNG <sup>1</sup>	\$483,237
Bus – Hybrid <sup>1</sup>	\$559,538
Bus – Electric <sup>1</sup>	\$1,017,341
Regional Rail – Locomotive <sup>3</sup>	\$2,200,000
Demand Responsive <sup>1</sup>	\$85,149
Demand Taxi <sup>1</sup>	\$26,921
Streetcar <sup>4</sup>	\$5,417,824

2016\$

Source: 1. Peer system research, 2. BRT corridor teams, 3. RTA guidance, and 4. M-1 RAIL press release

**TABLE 2.19: ASSUMED VEHICLE SERVICE LIFE**

<b>Vehicle Type</b>	<b>Service Life</b>
Bus (Standard and BRT)	12 years
Regional Rail Locomotive	25 years
Paratransit Vehicle	4 years
People Mover Vehicle	25 years
Streetcar	25 years

The financial model contains assumptions regarding the planned replacement of existing and new vehicles (Table 2.20). Existing and expanded bus and paratransit fleets are assumed to be replaced on a rolling basis, wherein the entire fleet is replaced over the course of one life cycle. For example, with an assumed 12 year service life for buses, an agency is assumed to replace 1/12 of its bus fleet each year. For modes with smaller fleets of more expensive vehicles, such as the streetcar, Regional Rail, and People Mover, it was assumed the entire fleet would be replaced at once, with the timing of replacement based on the age of the current fleet (or the assumed startup year for modes not currently in operation).

**TABLE 2.20: ASSUMED VEHICLE REPLACEMENT SCHEDULE**

Vehicle Type	Year
Bus (Standard and BRT)	Rolling cycle
Regional Rail Coach	2044
Regional Rail Locomotive	2047
Paratransit Vehicle	Rolling cycle
People Mover Vehicle	2020
Streetcar	2042

## Service-Specific Assumptions

In addition to global financial assumptions, the financial model allowed for a wide array of service-specific assumptions. These inputs collectively defined the scope and timing of services included in the RMTP.

### FIXED-ROUTE SERVICE

Existing, expanded, and new fixed-route transit service may include expansion of the existing providers' services, transfer of existing services and vehicles from one provider to another, or new service operated by an existing provider or the RTA. The model also allowed for the establishment of operating subsidies wherein an existing transit provider will operate a service while the RTA will cover some or all of the cost of that service.

Future fixed-route transit service inputs included which agency will operate each component of the system, what (if any) RTA subsidies will be provided to the existing agencies, and when changes are implemented.

### CAPITAL PROJECTS

Capital projects, including the opening year of a project, estimated costs, and assumed levels of state and federal funding, are defined in the model.

### PARATRANSIT SERVICE

Paratransit service inputs included determining who will operate the existing system in the future, what if any expansion will occur (and by who), and when these changes may occur.

# 3. Regional Master Transit Plan

The RMTP was developed based on market analysis, financial model analysis, and stakeholder involvement. It reflects a fiscally constrained approach that prioritizes Southeast Michigan's transit needs within the context of historical funding sources and the resources that a successful property tax referendum is expected to make available.

## Existing Transit Service

AAATA, DDOT, DTC, and SMART will continue operating their existing services after the RMTP is implemented, with the exception of Cross-County Connector corridors that are currently served by more than one provider, which will be consolidated under a single provider as part of the RMTP. The financial model also accounts for an increase in AAATA service from a voter-approved millage increase in 2014.

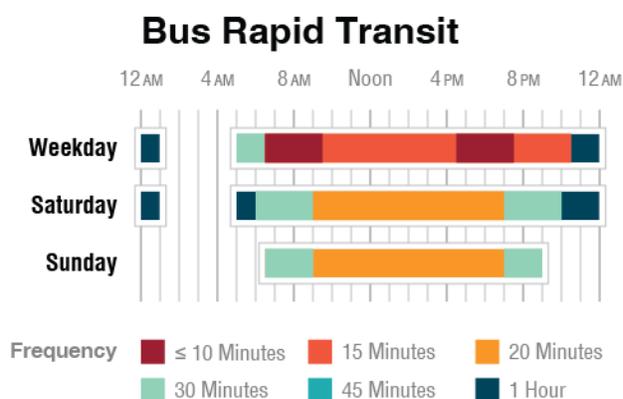
DDOT’s funding and service levels are assumed to increase above 2015 levels to pre-recession levels according to the City’s Plan of Adjustment. Following this increase in service, DDOT’s funding and service levels are assumed to be held constant in the future. SMART’s service levels are assumed to remain constant in the future.

## Bus Rapid Transit

BRT projects will be built and operated by the RTA. BRT projects include:

- **Woodward Avenue** (2022) between downtown Detroit and Pontiac
- **Gratiot Avenue** (2023) between downtown Detroit and M-59
- **Washtenaw Avenue** (2024) between downtown Ann Arbor and downtown Ypsilanti
- **Michigan Avenue** (2026) between downtown Detroit and the Detroit Metropolitan Airport

**FIGURE 3.1: ASSUMED BRT SERVICE LEVELS**



Based on the planned opening years of the BRT projects, the estimated actual construction costs are shown in Table 3.1. These differ from the corridor team-provided costs discussed in Chapter 2, because they account for construction cost escalation above the rate of inflation that is assumed in the financial model.

**TABLE 3.1: BRT PROJECTS SUMMARY**

	Opening Year	Capital Costs
Woodward	2022	\$330.6
Gratiot	2023	\$244.1
Washtenaw	2024	\$48.4
Michigan	2026	\$108.0
<b>TOTAL</b>		<b>\$731.1</b>

2016\$, millions

Notes: Capital costs do not include the cost of vehicles. Capital costs include construction cost escalations above inflation based on the year of completion.

### EARLY IMPLEMENTATION: DDOT/SMART COORDINATED SERVICE

Before BRT services are operational on Woodward and Gratiot avenues, RTA will work with DDOT and SMART to coordinate service in these corridors by increasing service levels, aligning schedules, and eliminating required transfers. Coordination on these corridors will be a first step towards regional transit

in Southeast Michigan. The lessons learned implementing coordinated service will help the RTA more efficiently deliver BRT and cross-county service throughout the region.

Prior to Regional Rail service between Detroit and Ann Arbor,, RTA will operate a Commuter Express or other regional service with stops in Ann Arbor, Ypsilanti, Dearborn, and Detroit.

Early implementation service is expected to phase in beginning with limited “Reflex” service on Woodward and Gratiot Avenues, and Michigan Avenue Commuter Express service, in 2017. Service in the Woodward and Gratiot corridors will be further expanded in 2020. By 2021, \$12.9 million per year in annual funding is planned to support early implementation service in these corridors. These interim services will be phased out as the BRT and Regional Rail projects enter service.

## Cross-County Connectors

The Cross-County Connector (C3) service will consolidate and replace existing separate DDOT/SMART service operating in some corridors and will also introduce entirely new or extended service in other corridors. Each C3 corridor will be operated by a single agency (either SMART or DDOT) for the entire length of the corridor, crossing into and out of the City of Detroit without the need to transfer between providers. The selection of one provider or the other in the Plan was based on the desire to balance operating costs between the two agencies, while also minimizing deadhead distances for each provider.

C3 routes to be operated by DDOT:

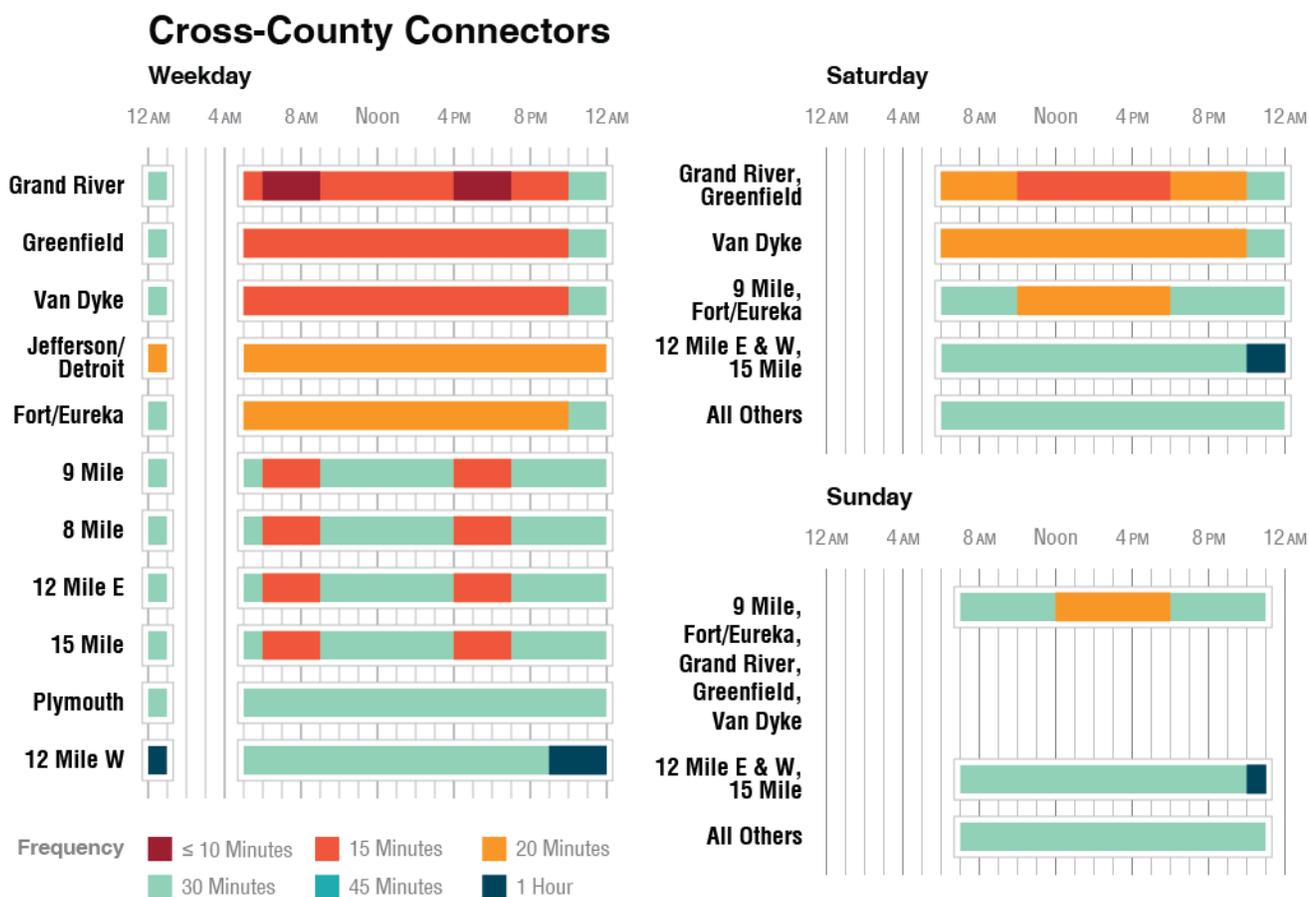
- Grand River (2018)
- Greenfield (2018)
- 8 Mile (2019)
- Fort/Eureka (2019)
- Plymouth (2021)

C3 routes to be operated by SMART:

- 12 Mile – East (2018)
- 12 Mile – West (2018)
- 9 Mile (2019)
- Van Dyke (2019)
- 15 Mile (2020)
- Jefferson/Detroit (2020)

RTA will subsidize the full *incremental* cost of increased service beyond what exists in each corridor today, including the cost of purchasing any additional buses required. The RTA will also provide funding for station upgrades and other capital projects along these corridors. Routes will operate at increased frequencies (Figure 3.2) and will allow cross-county travel with no midday, evening, or weekend transfers required.

FIGURE 3.2: ASSUMED CROSS-COUNTY CORRIDOR SERVICE LEVELS



Capital investments will enhance user access, service quality, and transit facilities throughout the Cross-County Connector network. The RMTP budgets capital costs of \$335,000 per mile, resulting in a total capital cost of \$83.3 million (2016\$) (not including vehicles). RTA will partner with local municipalities to coordinate these enhancements and leverage transit investments with other local improvements within these corridors. Improvements might include sidewalks, curb extensions, and crosswalks to improve station accessibility or enhanced shelters, lighting, and travel information to improve the passenger experience. These investments will not necessarily be spread evenly along each corridor and may be concentrated on certain corridors and segments more than others. Additional planning will be needed to identify the most effective capital investments.

## Regional Rail

Detroit to Ann Arbor Regional Rail service will offer the first rapid, reliable connection to regional job centers in Washtenaw and Wayne counties. Eight daily trips in each direction will connect stations in Ann Arbor, Ypsilanti, Wayne, Dearborn, and the Detroit New Center Amtrak station. Regional Rail, along with two feeder bus lines in Ann Arbor and Ypsilanti, is assumed to open in 2022.

The feeder buses will connect stations in Ann Arbor and Ypsilanti with nearby employment centers and is assumed to be operated by AAATA (fully funded by the RTA). Daily service will be coordinated with Regional Rail arrivals/departures.

## Commuter Express

Commuter Express service will be limited-stop peak-hour service connecting key employment centers beyond of the downtowns of Detroit and Ann Arbor. The RTA will operate the I-75 and M-59 corridors, while the two Ann Arbor-based Commuter Express corridors will be operated by AAATA.

- Ann Arbor-Plymouth-Livonia (2019)
- Canton Express upgraded service to AAATA's existing route between Ann Arbor and Canton (2018)
- I-75 with stops at Great Lakes Crossing Outlets, Oakland University, Somerset Collection, Oakland Mall, GM Hamtramck Assembly Center, and downtown Detroit (2019)
- M-59 with stops in Pontiac, Troy, Utica, and Mt. Clemens (2019)

Routes will connect key employment centers with non-stop, premium, weekday service every half hour. Except for M-59 which will operate all day, routes will only run at peak periods. The RMTP includes \$1 million in capital funding for each new Commuter Express service for improved station facilities. No capital expenditures are assumed for the Canton Express corridor, because this is an existing service.

## Airport Express

- Ann Arbor via Ypsilanti (RTA takes over existing service in 2017)
- Downtown Detroit (2017)
- Macomb County via WSU (2018)
- Oakland County - via Dearborn, Troy, and Northland Mall (2018)
- Oakland County - I-275 via Wayne (2018)

Routes will connect Detroit Metropolitan Airport with daily premium express service. Routes will operate hourly for 13 hours except for the Downtown Detroit route, which will operate every half hour for 16 hours. The RMTP includes a \$500,000 allowance for the capital costs of stations facilities for each Airport Express route.

## New/Extended Local Service

The following new or extended local services are also included in the RMTP. All would be operated by AAATA, DDOT, and SMART, with the RTA subsidizing the new or incremental cost.

Routes operated by AAATA:

- Ypsilanti-Michigan BRT Connector (2018)
- Ypsilanti-Livonia (2022)

Routes operated by DDOT:

- Groesbeck Highway (2021)
- Northville (2020)

Routes operated by SMART:

- Canal (2018)
- Ford Road (Route 250) extension to Sheldon (2019)
- Middlebelt South (Route 280) extension to Farmington Hills (2019)
- Dequindre (Route 494) extension to Rochester (2020)
- Highland (2021)

New routes will operate every hour. Route extensions will maintain service levels of existing routes. RTA will subsidize the full cost of new services and the incremental cost of extending existing routes. The plan includes funding for the cost of bus stop signs and shelters.

## Streetcar

The QLINE (M-1 RAIL) streetcar is assumed to be absorbed by the RTA in 2024. No capital costs are assumed during the analysis period.

## ADA Paratransit and Mobility Management Program

A flexible program will fund new paratransit and mobility management services. The program will be funded at \$10 million in 2017. The RMTP includes program funding that will grow in proportion to the region's over-65 populations each year. For purposes of setting a baseline for assigning funds by county in the Master Plan the funding for this program was be distributed based on the senior populations in each county. The RTA anticipates this program will invest \$266 million into these needs over the 20-year plan. The program will include:

- ADA Paratransit Service – operated by DDOT in Detroit; SMART in Oakland, Macomb, and Wayne Counties, and AAATA in Ann Arbor and Ypsilanti
- Flexible Transit Services – operated by small providers like NOTA, WAVE, and People's Express.
- Regional Services – operated by the RTA
- Innovative Mobility Solutions – operated by the RTA

## Regional Fare Integration

Regional fare integration will unify the regional transit system through a consistent fare policy and a regional fare card. A regional fare card will allow for seamless regional travel and easier transfers between different providers and include the installation of upgraded fare boxes within AAATA, DDOT, and SMART buses. A capital cost of \$22.8 million is assumed for regional fare integration.

## Regional Facilities

The RMTP includes funding for construction, upgrades, and maintenance of new and existing regional facilities. This includes new or upgraded maintenance facilities and passenger facilities.

- **RTA Facilities Program** – \$76 million regional facilities, such as maintenance and administration facilities, is assumed. The costs would be spread between 2018 and 2023.
- **RTA Transit Centers Program:** \$15 million is assumed.

## Other Planned Increases in Local Services

Aside from the RMTP, other increases in local bus service are planned in Southeast Michigan.

- **AAATA** – Funded through a voter-approved millage increase in 2014, planned service improvements are being phased in through 2018.
- **DDOT** – DDOT service is assumed to increase above 2015 levels to pre-bankruptcy levels; however no specific service increases have been planned.
- **SMART** – No increases in SMART services are assumed.

# 4. RMTP Costs

## Regional Transit Millage

The RMTP will require a regional transit millage of 1.20. It is assumed the millage will begin in 2017 for a period of 20 years. The regional transit millage will be collected in addition to the existing transit millages in the SMART and AAATA service areas. If the millage is approved by voters, all property owners within the four county RTA jurisdiction will pay the millage. Communities will not have the option to “opt out” of the millage.

## Operating Costs

Operating and Maintenance (O&M) costs were estimated for all of Southeast Michigan at full build-out of the RMTP. This includes existing services operated by the current transit providers and any new operating projects and support services included in the RMTP. In 2036 transit operating and maintenance costs for Southeast Michigan will total just under \$600 million (2016\$) (Table 4.1 and Table 4.2). The expenditures in Table 4.2 are listed by *provider*, meaning that services such as the M-1 RAIL streetcar (to be taken over by RTA in 2024), Regional Rail, BRT, Airport Express, and some other services are listed as RTA expenses, while all existing local service, plus RTA-funded Cross-County Connector, expanded local service, and some Commuter Express service are allocated to the region’s existing providers, who will operate those services.

**TABLE 4.1: REGIONAL ANNUAL O&M COSTS (2036) BY MODE OR EXPENSE**

Mode	Expense
RTA Administration	\$5.9
BRT	\$81.9
Bus	\$371.0
Airport Express	\$14.5
Regional Rail	\$12.6
Paratransit	\$91.1
People Mover	\$14.0
Streetcar	\$7.1
<b>Total</b>	<b>\$598.1</b>

2016\$, millions

**TABLE 4.2: REGIONAL ANNUAL O&M COSTS (2036) BY PROVIDER**

Provider	Fixed Route	Paratransit	Total
AAATA	\$50.9	\$16.1	<b>\$67.0</b>
DDOT	\$184.0	\$9.3	<b>\$193.3</b>
DTC	\$14.0	\$0.0	<b>\$14.0</b>
M-1 RAIL	\$0.0	\$0.0	<b>\$0.0</b>
RTA	\$129.4	\$17.1*	<b>\$146.5</b>
SMART	\$128.7	\$48.7	<b>\$177.4</b>
<b>Total</b>	<b>\$507.0</b>	<b>\$91.1</b>	<b>\$598.1</b>

2016\$, millions

Note: RTA paratransit costs are from ADA Paratransit and Mobility Management Grant Program. It includes ADA- and non-ADA paratransit services.

## Capital Costs

Capital and vehicle costs were estimated for projects included in the RMTP through the 20-year analysis period of the RMTP. Total capital and vehicle costs for all of the projects included in the RMTP is just under \$1.4 billion (2016\$) (Table 4.3). These total costs include portions of the costs that may be covered by state and federal grants. The RTA millage-funded cost will be lower, as discussed further in Chapter 5.

**TABLE 4.3: RTA PROJECTS CAPITAL COST, 2017-2036**

Project	Facility Costs	Vehicle Costs	Total Costs
Airport Express	\$2.5	n/a	\$2.5
BRT	\$731.1	\$150.0	\$881.1
Local Bus	\$3.1	*	\$3.1
Commuter Express	\$3.1	*	\$3.1
Regional Rail	\$128.5	\$7.1	\$135.5
Mobility Management	n/a	n/a	n/a
Cross-County Connector	\$83.3	*	\$83.3
Regional Services	\$118.2	\$0.0	\$118.2
Streetcar	n/a	\$0.0	\$0.0
RTA-Purchased Buses*	n/a	\$147.8	\$147.8
<b>Total</b>	<b>\$1,069.7</b>	<b>\$304.8</b>	<b>\$1,374.5</b>

2016\$, millions

Note: Sum of totals may differ due to rounding. Airport Express is assumed to be fully contracted to an outside provider who would provide vehicles for the service. The RTA would not be required to purchase vehicles for this service.

\*RTA-Purchased Buses would be shared between Local Bus, Commuter Express, and Cross-County Connector services.

## VEHICLE PURCHASES

Overall fleet requirements are calculated based on the sum of all route-level VOMS totals, multiplied by an assumed spare ratio. The spare ratio for all modes and agencies was assumed to be 20%, which is an industry standard. Vehicles are assumed to be purchased in the year prior to commencement of service, so the first RMTP vehicle purchases would take place in 2017.

Table 4.4 shows the assumed pass-through bus purchases by the RTA for use by the existing transit providers to operate new RMTP services, such as Cross-County Connector and local bus service. It is assumed RTA-purchased buses will be shared between local bus, Commuter Express, and Cross-County Connector services. Table 4.5 shows the assumed vehicles purchased by the RTA for directly operated or contracted services. Based on the timing of previous purchases and input from stakeholders, the model does not include any streetcar vehicle or People Mover vehicle purchases between 2016 and 2035. Regional Rail locomotives would be purchased in 2021 for the 2022 launch of service. Regional Rail coaches are assumed to be leased and are not included as a capital cost.

**TABLE 4.4: ANNUAL PASS-THROUGH BUS PURCHASES**

	2016	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30	'31	'32	'33	'34	'35
AAATA			6	5			6								6	5				6
DDOT		4	13	5	10	7								4	13	5	10	7		
SMART		4	17	12	21	2								4	17	12	21	2		
<b>TOTAL</b>		<b>8</b>	<b>36</b>	<b>22</b>	<b>31</b>	<b>9</b>	<b>6</b>							<b>8</b>	<b>36</b>	<b>22</b>	<b>31</b>	<b>9</b>	<b>6</b>	

Note: For service between 2017 and 2036. The model assumes vehicles are purchased during the year prior to service.

**TABLE 4.5: ANNUAL RTA VEHICLE PURCHASES**

	2016	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30	'31	'32	'33	'34	'35	
Bus		5	22												5	22					
BRT							20	16	8		18									20	16
<b>TOTAL</b>		<b>5</b>	<b>22</b>				<b>20</b>	<b>16</b>	<b>8</b>		<b>18</b>				<b>5</b>	<b>22</b>				<b>20</b>	<b>16</b>

Note: For service between 2017 and 2036. The model assumes vehicles are purchased during the year prior to service.

## Impact to Existing Transit Providers

New or expanded services from the RMTP will impose new costs on the region's transit providers. While some new service will be operated directly by the RTA (via contracted service), other RMTP-funded services will be operated by AAATA, DDOT, and SMART. The RTA will provide subsidies for RMTP services operated by the existing transit providers (TABLE 4.7). These subsidies will offset the impact of the increased O&M costs to these agencies. In some cases, a new service, whether operated by the RTA or an existing agency, will replace an existing service, leading to potential reductions in cost to a provider.

**TABLE 4.6: PROVIDER ASSIGNMENT OF RMTP SERVICES**

Building Block	Assigned Provider
Airport Express	RTA
Bus Rapid Transit	RTA
Commuter Express	AAATA and RTA
Cross-County Connectors	DDOT and SMART
Local Bus	AAATA, DDOT, and SMART
Paratransit, Demand Response, and Mobility Management	RTA*
Regional Rail	RTA
Streetcar	RTA

Note: Commuter Express services will be operated by both AAATA and RTA. AAATA will be responsible for the Ann Arbor-Plymouth-Livonia and Canton Express routes. The RTA will be responsible for the I-75 and M-59 routes.

Note: The RTA will fund new paratransit, demand response, and mobility management services in the region. These new services will be a combination of expanded service by the existing transit agencies, partnerships and grants to other mobility management providers, and regional services provided by the RTA. The cost for all these services is assigned to the RTA.

**TABLE 4.7: ANNUAL RTA SUBSIDY (2036)**

Provider	Subsidy
AAATA	\$5.6
DDOT	\$27.5
SMART	\$27.1

2016\$, millions

## Additional Savings from BRT

The introduction of BRT service on Woodward, Gratiot, Michigan, and Washtenaw avenues will result in significant service increases in these corridors. This could allow AAATA, DDOT, and SMART to reduce their existing local services in those corridors while still providing passengers with a substantial increase in overall service in the corridors. This reduction could allow resources to be reallocated to increase service and frequency elsewhere in the local network. Potential savings to the providers have not been quantified in the RMTP and are not part of the fiscally constrained RMTP or the "hold-harmless" funding approach to the providers.

# 5. Existing and Future Funding

Federal and state funding levels for Southeast Michigan as a whole were estimated based on recent legislation and then distributed to the RTA and providers based on the RMTP. While future federal and state formula funding distributions have been estimated based on the best information available, the actual amount of federal and state formula funding available in the future may vary. Formula funding distributions will be refined as needed in the future. If revenues fall short or costs exceed what is estimated, the RTA will work together with Southeast Michigan's transit providers to adjust formula funding distributions.

## Regional Transit Millage

A regional transit millage of 1.20 will generate \$3.1 billion (2016\$) in local transit funding over 20 years from 2017 to 2036.

## State Funding

The financial model reflects expected increases in LBO funding for Southeast Michigan as a result of 2015 legislative changes related to transportation funding included in the Road Bill package. The Road Bill increases the Comprehensive Transportation Fund (CTF) by \$54.6 million by 2022 and then indexes the growth to inflation. Historically, 65% of the funding in the CTF has gone to support LBO (i.e. between 2009 and 2016 CTF averaged \$254 million annually and LBO averaged \$169 million annually).

The RTA projects this trend will hold steady and therefore the statewide LBO funding will increase from \$167.9 million (2016\$) in 2015 to \$174.7 million (2016\$) in 2036. Southeast Michigan currently receives \$80.6 million annually in LBO funding. With the overall growth from the Road Bill, and with the increase in eligible expenses included from the RTA as an agency (eligible expenses do not include BRT O&M costs per Section 7(6) of PA 387), we expect that amount to increase to \$102.5 million (2016\$) in 2036, a 27% increase above inflation. Total state formula funding for transit in Southeast Michigan is anticipated to increase from \$96.9 million in 2015 to \$118.8 million (2016\$) in 2036, a 23% increase above inflation.

Going forward, it is assumed AAATA, SMART, and DTC will be held harmless at their current funding levels with inflation. It is also assumed DDOT will be held harmless and also receive a boost in LBO funding to match local funding increases the City of Detroit can elect to make by shifting road funding to support transit operations. All remaining growth in LBO funding above the rate of inflation is assumed to be allocated to the RTA to help fund the RMTP. See Figure 5.1 for an overview of the assumed distribution of LBO funding in the RMTP.

Because the RTA will be facilitating capital projects, it is also assumed to receive an increasing level of state capital assistance funding. The share is not a fixed percentage but rather is tied to specific projects for which state support is likely. The assumed levels of state capital assistance were determined based on stakeholder feedback that established a funding probability and likely state share for RMTP capital projects.

## Federal Funding

Federal formula funding is allocated by the FTA to UZAs (Census-defined Urbanized Areas) for transit service. Allocations are based on a complex formula accounting for regional population, types of services offered, and levels of service provided. Projected federal formula funding changes from the RMTP were based on future revenue miles of service, an increase in RTA service, and a reduction in some overlapping service and associated costs for existing providers.

The RTA has assumed conservative increases in federal formula funding available to the region in the future. Federal formula funding allocated to the Ann Arbor UZA is anticipated to increase from \$8.3 million in 2015 to \$8.8 million (2016\$) in 2036, a 6% increase above inflation.

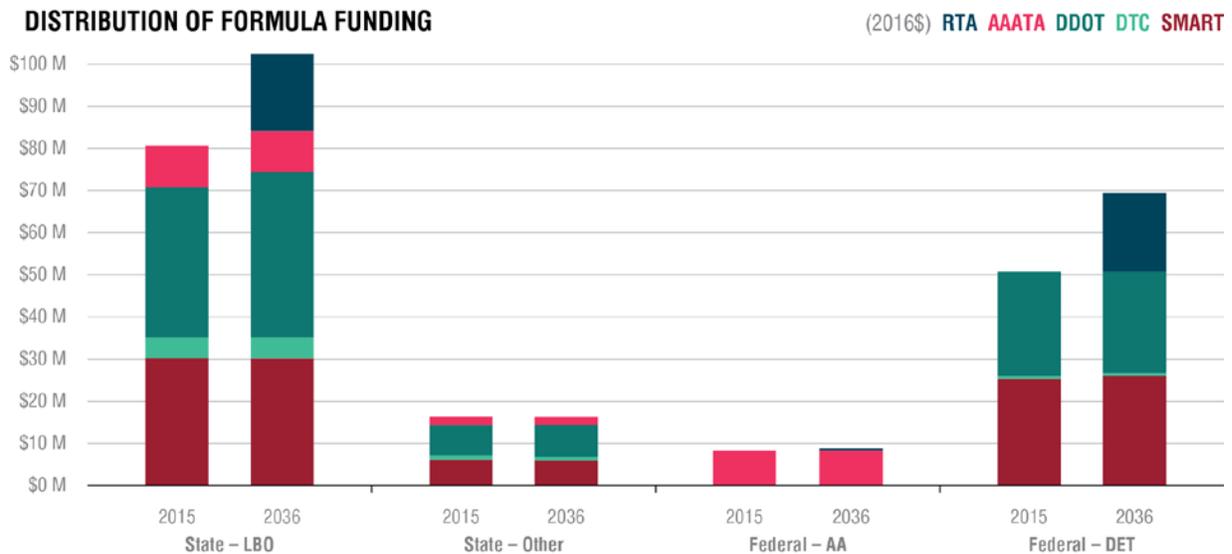
Federal formula funding allocated to the Detroit UZA is anticipated to increase from \$50.8 million in 2015 to \$70.5 million (2016\$) in 2036, a 39% increase above inflation. Much of this increase is due to two new funding categories within the federal formula funding programs resulting from the launch of Regional Rail and BRT service. First, the RTA will become eligible for Fixed Guideway Tier funding within the 5307 program after the Regional Rail service begins operation in 2022. Based on a historical review of funding increases in other regions that have recently launched commuter rail services, it was assumed that \$9.6 million in annual funding (2016\$) will begin flowing to the region in 2028, six years after service commences. \$9.6 million was estimated based on the “Commuter Rail Floor” in the funding formula.

In addition, the RTA will become eligible for federal 5337 (State of Good Repair) formula grants approximately six years after rail operations commence. The RTA estimates this funding source will be approximately \$3 million in the first year (2028), \$5 million in the second through fourth years, and \$7 million annually thereafter (all amounts in 2016\$).

In total, federal formula funding to the region (including Detroit and Ann Arbor UZAs) is projected to grow from approximately \$59 million in 2015 to \$79.3 million in 2036 (2016\$).

The RTA is assumed to retain all new federal formula funding above inflation to help fund the RMTP. Figure 5.1 shows the assumed distribution of federal formula funding in the RMTP.

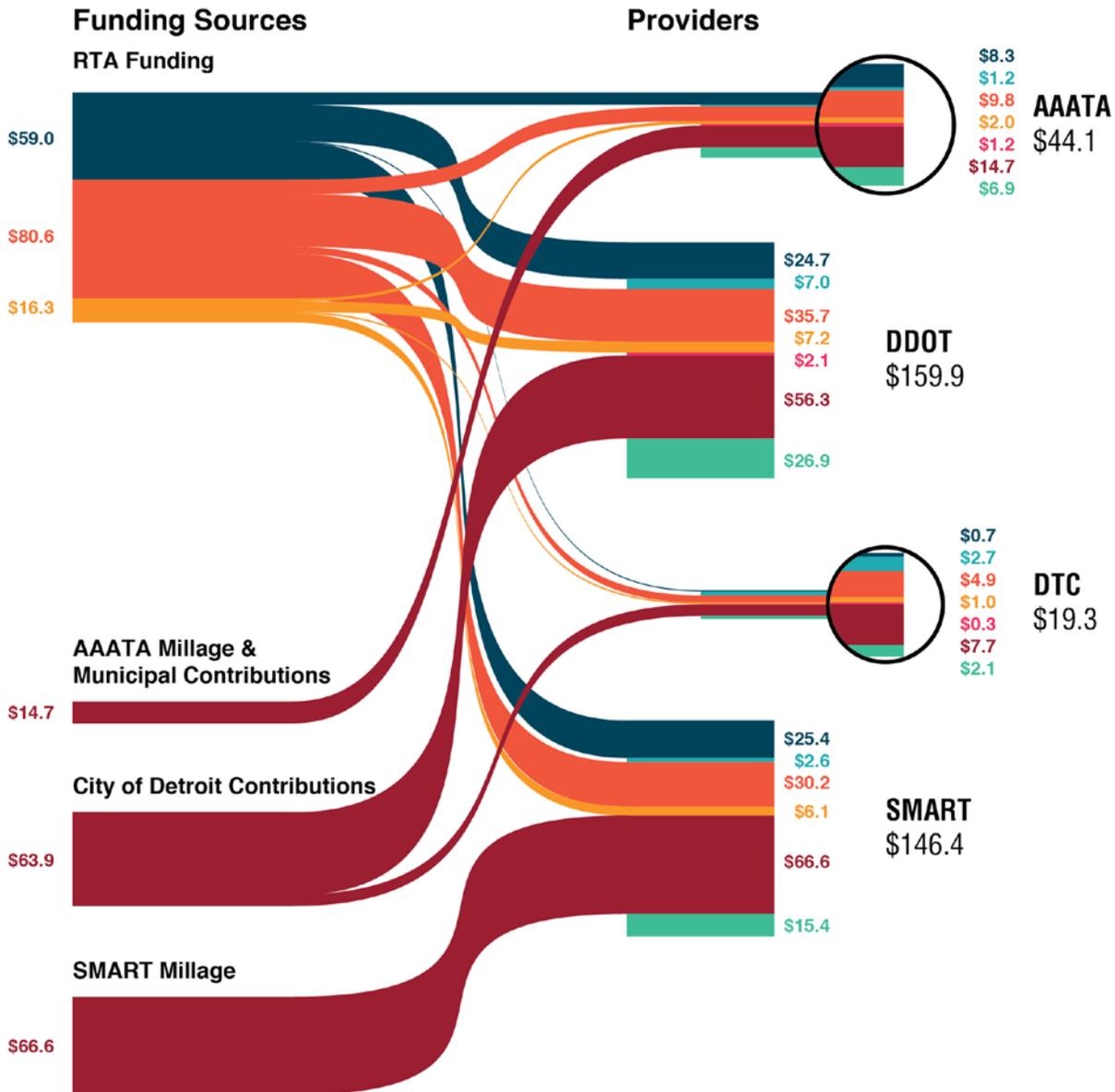
**FIGURE 5.1: DISTRIBUTION OF FORMULA FUNDING**



Note: DDOT’s funding and service levels are assumed to increase above 2015 levels to pre-bankruptcy levels. An increase in formula funding, above current levels, was allocated to account for this future increase in DDOT’s local service not associated with the RMTP.

The distribution of all funding for regional transit in Southeast Michigan is illustrated in Figure 5.2 and Figure 5.3.

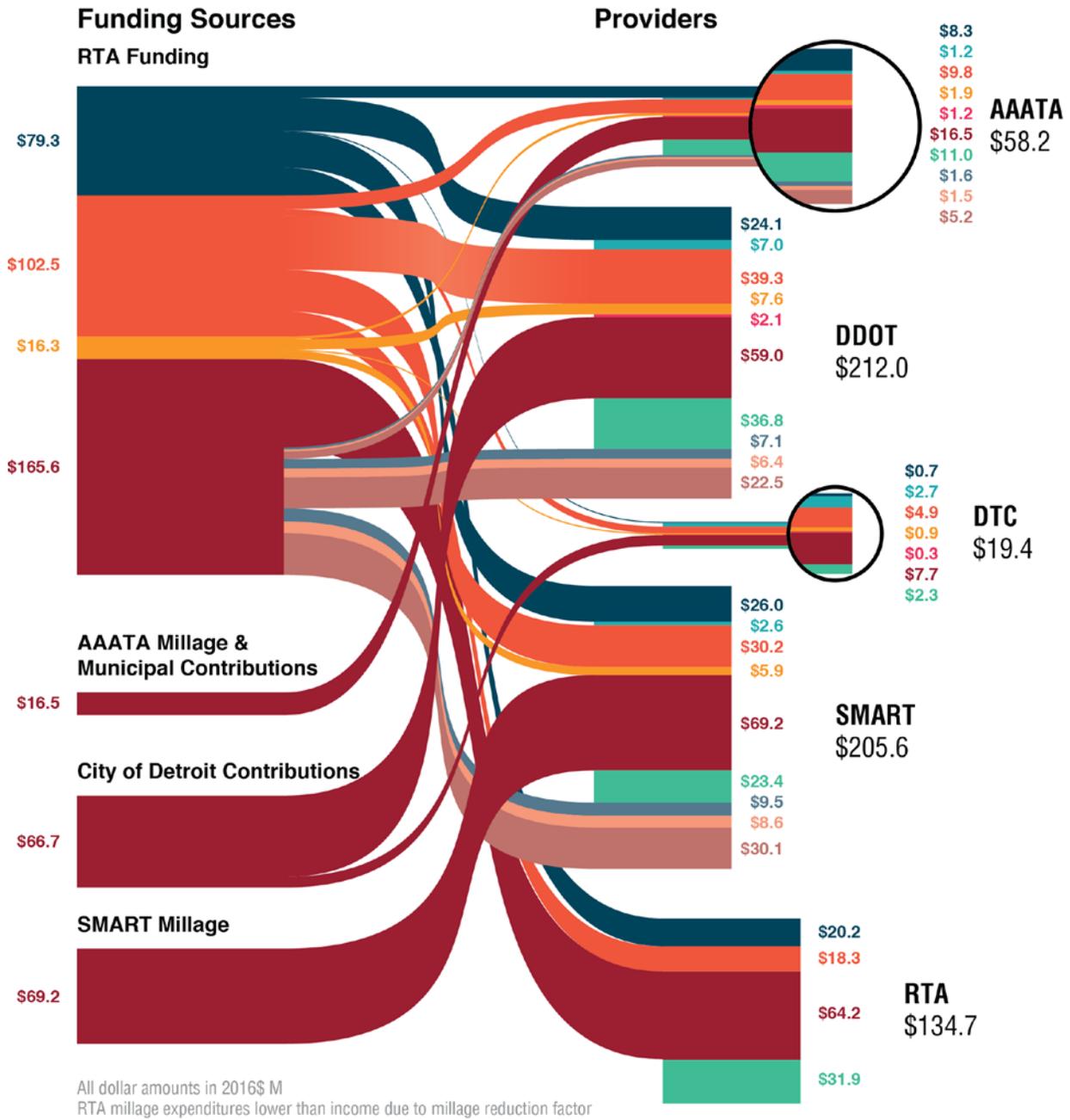
FIGURE 5.2: DISTRIBUTION OF REGIONAL TRANSIT FUNDING, 2015



All dollar amounts in 2016\$ M



FIGURE 5.3: DISTRIBUTION OF REGIONAL TRANSIT FUNDING, 2036



## 6. Regional Growth in Service

The RMTP will significantly increase transit service, vehicles in operation, and O&M expenditures in Southeast Michigan. Vehicle revenue hours (VRH) will increase by 49% (Table 6.1), vehicle revenue miles (VRM) will increase by 54% (Table 6.2), and vehicles operated in maximum service (VOMS) will increase by 29% (Table 6.3) for fixed-route service. This increase in service corresponds with an increase in funding for transit service from the RTA (Figure 6.1).

**TABLE 6.1: VEHICLE REVENUE HOURS (VRH)**

Provider	Existing	Planned Service	RMTP	Total	% Increase
AAATA	208,069	91,072	39,620	338,761	13%
DDOT	759,116	0	201,078	960,194	26%
SMART	518,064	0	248,421	766,485	48%
RTA	n/a	n/a	356,637	356,637	n/a
<b>TOTAL</b>	<b>1,485,249</b>	<b>91,072</b>	<b>845,756</b>	<b>2,422,077</b>	<b>54%</b>

Note: Fixed-route service only, does not include paratransit

Note: Accounts for AAATA planned increase in local service. Does not account for assumed increase in DDOT services, which is only accounted for as an anticipated increase in formula funding to the agency.

**TABLE 6.2: VEHICLE REVENUE MILES (VRM)**

Provider	Existing	Planned Service	RMTP	Total	% Increase
AAATA	2,857,564	1,279,890	308,831	4,446,285	7%
DDOT	9,868,241	0	2,128,700	11,996,941	22%
SMART	8,595,788	0	2,706,036	11,301,824	31%
RTA	n/a	n/a	7,204,371	7,204,371	n/a
<b>TOTAL</b>	<b>21,321,593</b>	<b>1,279,890</b>	<b>12,349,132</b>	<b>34,950,615</b>	<b>55%</b>

Note: Fixed-route service only, does not include paratransit

Note: Accounts for AAATA planned increase in local service. Does not account for assumed increase in DDOT services, which is only accounted for as an anticipated increase in formula funding to the agency.

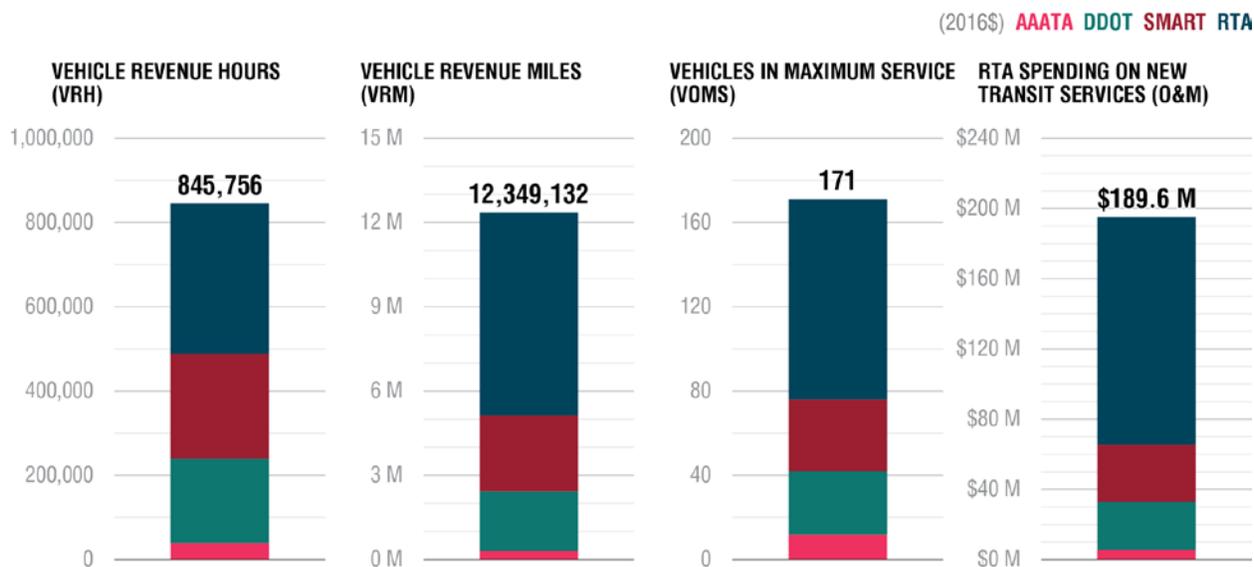
**TABLE 6.3: VEHICLES OPERATED IN MAXIMUM SERVICE (VOMS)**

Provider	Existing	Planned Service	RMTP	Total	% Increase
AAATA	68	19	12	99	10%
DDOT	228	0	30	258	13%
SMART	201	0	34	235	20%
RTA	n/a	n/a	95	95	n/a
<b>TOTAL</b>	<b>497</b>	<b>19</b>	<b>148</b>	<b>664</b>	<b>29%</b>

Note: Fixed-route service only, does not include paratransit

Note: Accounts for AAATA planned increase in local service. Does not account for assumed increase in DDOT services, which is only accounted for as an anticipated increase in formula funding to the agency.

FIGURE 6.1: REGIONAL GROWTH FROM RMTP



Note: Fixed-route service only, does not include paratransit

## 7. Performance Measures

The financial model generates performance measures to objectively evaluate the RMTP.

### Debt Coverage

For the RMTP to be viable, funding sources must be sufficient to generate a positive agency cash balance in all years through 2036. If the RTA's cash flows require the agency to take on debt, the agency must be able to maintain a debt service coverage ratio equal to 1.5 or greater in all years in which debt is outstanding. The RMTP meets this requirement.

### 85% Rule Compliance

The RTA's legislation sets forth an "85% Rule," which requires the RTA ensure not less than 85% of the money raised in each member jurisdiction through either an assessment or a motor vehicle registration tax is expended on the public transportation service routes located in that member jurisdiction. The provision was included to ensure to taxpayers in each jurisdiction that 85% of their investment will be returned in the form of public transit service and infrastructure enhancements.

On each proposed route identified in the RMTP, the RTA calculated operating and capital expenditures by route mile within each jurisdiction. Regional investments, like facilities and the seamless fare system, were allocated in proportion to route-specific capital and operating expenditures. Increased investment in Paratransit and Mobility Management were allocated based on the existing over-65 populations in each jurisdiction.

By law, the 85% Rule is met when all money the RTA spends on new transit operations serving each member jurisdiction equals at least 85 percent of the amount of revenue raised by the RTA in that same jurisdiction. This calculation includes all RTA directly generated and non-RTA sources of funding, such as federal and state grants, passenger fares, and other system-generated revenues. The RTA further

ensures compliance with the 85% Rule by managing the expenditure of local dollars so 85 percent of those locally generated dollars are expended within the jurisdiction as well. This secondary calculation only includes RTA directly generated revenue (via property tax millage or VRF), without including non-RTA sources of funding. This is a more restrictive standard than is required by law.

For the RMTP to be viable it must comply with this 85% Rule. The RMTP meets the 85% rule using the most general and strictest interpretations of the law.

Because the RTA's expenditures, particularly for capital facilities, will be focused in some jurisdictions more at some times than others, it is possible the RTA will not comply with the 85% Rule in every jurisdiction when computed on a short-term basis. The RTA will track compliance on a cumulative multi-year basis. The financial model tracks 85% Rule compliance across an aggregate 20-year period from 2017 through 2036.

To comply with the 85% Rule, the RTA worked extensively with a broad cross-section of stakeholders within each jurisdiction. The RTA collaborated with the public, government, and elected officials, existing transit providers, Financial Task Force, and other targeted stakeholder groups throughout the development of the RMTP. This led to a plan that not only fulfilled the requirements of the RTA legislation, but also met the varied needs of stakeholders within each jurisdiction.

The total assumed RTA millage collected and RTA expenditures in each jurisdiction are shown in Table 7.1. Further detailed year-by-year summaries for each jurisdiction, which include route-by-route expenditures, are included in Appendix 1: County Return on Investment Summaries and Appendix 2: Detailed County Return on Investment Tables.

**TABLE 7.1: RTA MILLAGE COLLECTED AND EXPENDITURES (2017-2036)**

<b>Jurisdiction</b>	<b>RTA Millage Collected</b>	<b>RTA Millage Returned</b>	<b>% of Millage Returned</b>	<b>Total RTA Expenditures</b>
Macomb	\$602.8	\$533.7	88.5%	\$790.0
Oakland	\$1,222.3	\$1,039.0	85.0%	\$1,357.2
Washtenaw	\$367.8	\$312.6	85.0%	\$457.6
Wayne	\$892.8	\$1,174.3	131.5%	\$2,054.1
Detroit	\$145.0	\$538.7	371.4%	\$1,188.4
Rest of Wayne	\$747.8	\$635.6	85.0%	\$865.7
<b>TOTAL</b>	<b>\$3,085.8</b>	<b>\$3,085.8</b>	<b>100.0%</b>	<b>\$4,659.0</b>

2016\$, millions

Note: Detailed year-by-year summaries can be found in the appendix

## **POLICIES AND PROCEDURES ON ONGOING 85% COMPLIANCE AND THE PROTECTION OF STATE AND FEDERAL FUNDING FOR EXISTING PROVIDERS**

The RTA recognizes that, over time under the RMTP, the level of RMTP revenue raised in each member jurisdiction may vary from the projections used to determine that the RMTP complies with the 85% Rule. Further, the RMTP is built on the principle that the allocation of state and federal formula funding in support of routes and services in the RMTP will not reduce the amount of state and federal funding currently allocated to existing transit providers within the RTA's transit region, as adjusted for inflation. The RTA has developed policies and procedures (Appendix 3) ensuring the Board will adhere to rigorous and transparent monitoring and adjustment procedures to address potential deviations from the RMTP's financial assumptions and ensure long-term compliance with the 85% Rule. The policies and procedures also provide a structure to ensure the existing providers will not be impacted by reduced state and federal funding from the RTA.

## Transit Spending per Capita

Transit spending per capita is a useful benchmark to measure the overall level of regional transit investment. As the RMTP was developed, peer region per capita spending was used as a guide for identifying an appropriate system size.

### METHODOLOGY

Eight peer regions from throughout the United States were selected for a comparison of transit spending per capita. This included regions with similar populations, a shared industrial heritage, and aspirational transit system. For a comparison of transit operations spending across these regions, data was 2014 NTD was used. At the time of analysis this was the most current data available.

Transit spending was defined as operating expenses reported to the 2014 NTD. Regional transit spending was defined as the sum of operating expenses for all reporting agencies to an Urbanized Area (UZA) region. In some instances, this included public transit agencies, university transit systems, paratransit providers, and vanpool operators. In addition to AAATA, DDOT, DTC, and SMART, Southeast Michigan includes VRide, Inc. – Michigan and the University of Michigan Transportation Services. Reporting agencies with a different primary UZA were excluded from this analysis. Transit spending per capita was calculated by divided total regional transit spending by UZA population. UZA population comes from the 2010 Census.

### PEER COMPARISON

In 2014, Southeast Michigan spent \$69 per capita (\$280.6 million 2016\$ total) on transit operations. This lags far behind regional peers (Table 7.2).

**TABLE 7.2: TRANSIT OPERATIONS SPENDING**

Region	UZA Population	Total Spending	per Capita
Southeast Michigan	4,040,112	\$280,637,179	\$69.46
Atlanta	4,515,419	\$542,172,498	\$120.07
Minneapolis-St. Paul	2,650,890	\$471,224,244	\$177.76
Cleveland	1,780,673	\$317,250,832	\$178.16
Denver	2,374,203	\$512,523,503	\$215.87
Pittsburgh	1,733,853	\$405,031,576	\$233.60
Chicago	8,608,208	\$2,449,079,566	\$284.51
Boston	4,181,019	\$1,502,422,897	\$359.34
Seattle	3,059,393	\$1,451,022,247	\$474.28

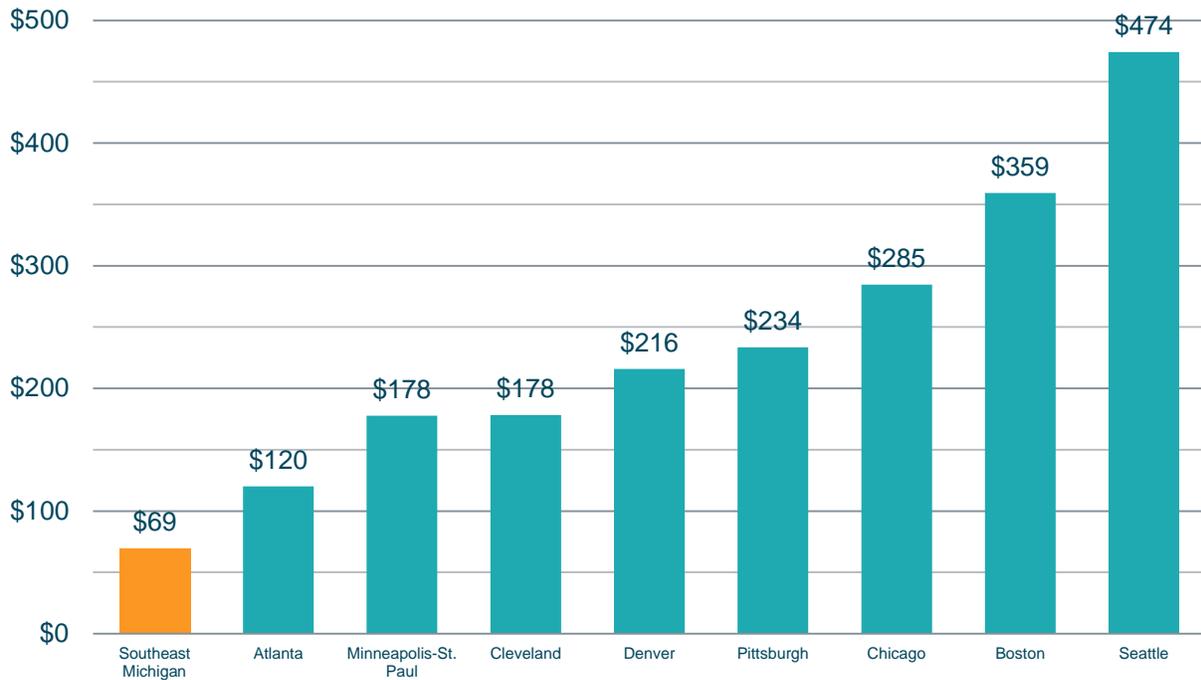
2016\$

Source: 2014 National Transit Database

### RMTP SPENDING PER CAPITA

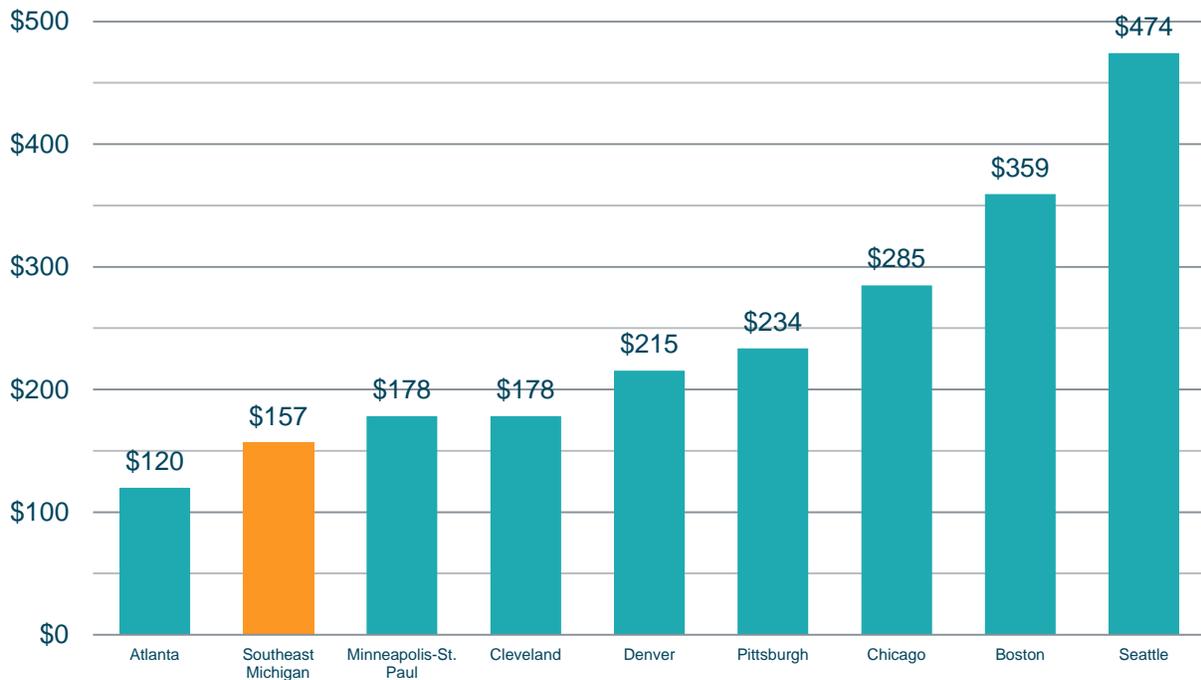
The RMTP will increase regional per capita transit spending from \$69 (Figure 7.1) to \$157 (2016\$) (Figure 7.2). Although transit spending in Southeast Michigan would still fall behind most other peer regions, this represents a significant increase in regional transit investment, and would go a long way toward meeting the needs of a region striving for greater economic resilience and growth.

**FIGURE 7.1: EXISTING TRANSIT OPERATIONS SPENDING PER CAPITA**



2016\$, millions  
 Source: 2014 National Transit Database

**FIGURE 7.2: RMTPT TRANSIT OPERATIONS SPENDING PER CAPITA**



2016\$, millions  
 Source: 2014 National Transit Database