CHAPTER 15

Photo: South Street in Ware, MA

FINANCIAL ELEMENT

Title 23 CFR Section 450.322 and 310 CMR 60.03(9) requires the RTP to be financially constrained. The financial element must demonstrate which projects can be implemented using current revenue sources and which are to be implemented using proposed revenue sources while the existing transportation system is being adequately operated and maintained. Projects can only be programmed up to the congressionally authorized spending amounts in any individual fiscal year.

The estimate of revenue for the region will be highly dependent upon the funding allocated to Massachusetts as part of future transportation bills. Estimates of the projected revenue sources for highway and transit projects have been made based on past historical trends and information available from the estimated apportionment of the federal authorizations contained in the Fixing Americas Surface Transportation (FAST) Act. Financial constraint will be maintained in the 2020 RTP Update.

A. REVENUE

The overall RTP, and each fiscal year contained herein, is financially constrained to the annual federal apportionment and projections of state resources reasonably expected to be available during the appropriate time-frame. Projections of federal resources are based upon the estimated apportionment of the federal authorizations contained in The FAST Act, as allocated to the region by the State or as allocated among the various MPOs according to federal formulae or MPO agreement. Estimates used to develop the highway component of the financial plan were developed by MassDOT. A summary of the projected highway revenue from 2020 – 2040 is presented in Table 15-1.

Table 15-1 – Estimated Pioneer Valley Region Highway Revenue 2020 – 2040

Year	Target	Other Statewide	Non Interstate	NFA Bridge	Interstate	Total All Funding
	10.8099%	*10.8099%*	*13.0542%*	*10.8099%*	*8.4544%*	
2020 - 2024	$ 134,136,806	$ 121,332,223	$ 47,144,718	$ 54,049,500	$ 13,381,407	**$ 370,044,654**
2025-2029	$ 153,789,263	$ 136,359,264	$ 56,120,172	$ 55,238,590	$ 16,897,096	**$ 418,404,385**
2030-2034	$ 188,833,297	$ 167,431,514	$ 68,908,303	$ 56,453,840	$ 20,747,444	**$ 502,374,398**
2035-2039	$ 209,293,530	$ 185,572,848	$ 76,374,571	$ 57,695,820	$ 22,995,446	**$ 551,932,215**
2040	$ 44,516,326	$ 39,470,984	$ 16,244,722	$ 11,793,026	$ 4,891,087	**$ 116,916,145**
Totals	**$ 730,569,222**	**$ 650,166,833**	**$ 264,792,486**	**$ 235,230,776**	**$ 78,912,480**	**$ 1,959,671,797**

- Federal and state matching funds for the period of 2020 to 2024 reflect current allocations and are inflated 2.2% per year thereafter, beginning in 2025 per MassDOT.
- Deductions for statewide items that cannot be allocated individually to the MPOs - Central Artery GANs repayment, Planning, and Extra Work Orders/Cost Adjustments, and the Accelerated Bridge Program - are taken from total available funding, leaving an amount for the available federal funding to be allocated in the regional plans.
- Statewide Bridge funding is not included in table 15-1, MassDOT did not provide regional breakout (see table 15-2)
- Interstate and Non Interstate funding are attributed to each region based upon formula such as a region's % of the total lanes miles of interstate miles/national highway system miles.
- Funding availability for bridges is based upon the Commonwealth's commitment to a Statewide Bridge Program. The bridge program has two components: federal aid and non-federal aid (NFA) eligible.
- Estimated funding for Other Statewide, NFA Bridge, and Regional Target funding is allocated among the MPOs based upon the existing MARPA TIP targets.
- After 2028 the GANS repayment of the Central Artery and Accelerated Bridge Program is anticipated to be complete. This results in an increase in available transportation revenue. The MassDOT and MARPA agreed to allocate this additional revenue equally between statewide needs and regional discretionary funds.

Table 15-2 – Estimated Statewide Bridge Funding

Year	Statewide Bridges
2020 - 2024	$ 985,237,695.00
2025-2029	$ 1,120,781,229.00
2030-2034	$ 1,376,174,182.00
2035-2039	$ 1,525,283,718.00
2040	$ 324,424,877.00
Totals	**$ 5,331,901,701.00**

The estimates of available 5307, 5310 and 5339 transit revenue shown in this RTP were provided by MassDOT in April of 2019. Estimates of available RTACAP revenue were provided by the PVTA. Information on anticipated farebox and local revenue was developed using the funding total from the most recent data and based on historical data from the PVTA, then aggregated through the life of the RTP. A summary of estimated transit revenue during the 2020-2040 periods is presented in Table 15-3 and 15-4.

Table 15-3 – Estimated Transit Capital Revenue 2020 - 2040

Year	5307	5310	5339	RTACAP	Total
2020-2024	$ 68,180,385	$ 2,933,482	$ 7,224,890	$ 36,688,650	$ 115,027,407
2025-2029	$ 75,572,320	$ 3,253,115	$ 8,718,575	$ 40,357,515	$ 127,901,525
2030-2034	$ 83,765,669	$ 3,607,577	$ 10,521,068	$ 44,393,267	$ 142,287,581
2035-2039	$ 92,847,318	$ 4,000,659	$ 12,696,208	$ 48,832,593	$ 158,376,778
2040	$ 19,744,098	$ 850,992	$ 2,838,307	$ 10,743,170	$ 34,176,567
Total	**$ 340,109,790**	**$ 14,645,825**	**$ 41,999,048**	**$ 181,015,195**	**$ 577,769,858**

- 5307 funding has been inflated 2.08% per year starting in 2021 per MassDOT
- 5310 funding has been inflated 2.09 per year starting in 2021 per MassDOT
- 5339 funding has been inflated 3.83 pear year starting in 2021 per MassDOT
- 5339 funding is a grant based program awarded yearly based on project merit

Table 15-4 – Estimated Transit Operating Revenue 2020 – 2040

	2020-2024	2025-2029	2030-2034	2035-2039	2040	Grand Total
Local Assessments	$ 49,372,389	$ 55,860,326	$ 63,200,831	$ 71,505,940	$ 15,445,284	$ 255,384,770
5307 Federal Urbanized Formula	$ 58,635,131	$ 64,992,195	$ 72,038,475	$ 79,848,693	$ 16,979,925	$ 292,494,419
5339 Federal	$ 7,224,890	$ 8,718,575	$ 10,521,068	$ 12,696,208	$ 2,838,307	$ 41,999,048
5310 Federal Elderly and Disabled	$ 2,933,482	$ 3,253,115	$ 3,607,577	$ 4,000,659	$ 850,992	$ 14,645,825
Fare box	$ 45,399,763	$ 50,125,006	$ 55,342,057	$ 61,102,103	$ 13,198,054	$ 225,166,983
Advertising, other revenue	$ 3,255,020	$ 3,593,805	$ 3,967,851	$ 4,380,829	$ 946,259	$ 16,143,764
Available Operating Funds for Programming in the RTP	**$166,820,675**	**$186,543,022**	**$208,677,859**	**$233,534,432**	**$ 50,258,821**	**$ 845,834,809**

- Local assessments escalated 2.5% annually as allowed by statute based on previous RTP.

- Federal grant program contributions (5307, 5339, and 5310) escalated 1.5% annually based on previous RTP.
- Farebox revenue estimate based on actual FY15 amount of $7.9 million and escalated 2% annually per PVTA.
- Advertising and other revenue assumed to be $566,516 per year in FY16 and escalated 2% annually per PVTA.
- Actual RTACAP contracted (and FY16 contracted numbers are known) were arrived at and entered 2021-2040 used 10% escalation based on previous RTP

The estimated revenue from both highway and transit sources is summarized in Table 15-5.

Table 15-5 – Total Estimated Revenue 2020-2040

Total Estimated Highway	$1,959,671,797
Total Estimated Transit Capital	$577,769,858
Total Estimated Transit Operating	$845,834,809
Grand Total	**$3,383,276,464****

**Total Estimated Revenue does not include statewide bridge

B. FINANCIALLY CONSTRAINT PROCESS

The Pioneer Valley MPO used the following methodology to populate the Operating and Maintenance Expenditure Tables. Projects were assigned to an estimated construction year based on project readiness, TEC Score, RTP Priority, and project cost unless otherwise specified.

Operating and Maintenance expenditures were developed separately for the areas of Highway and Transit planning. Cost estimates for each of the priority projects included as recommendations of the RTP were assigned a construction year for planning purposes. An inflation factor of 4% per year was applied to each project to reflect anticipated increases in construction materials over the life of the plan. Inflation factors were not applied to projects included as part of the current TIP as all of these projects have a 25% contingency applied to their current cost estimate. Each project was assigned to the appropriate federal funding category to correspond with the revenues estimated in Table 15-1. The total cost estimates for each category were then compared to the recommended investment as developed by MassDOT.

1. Regional Target Funding

The PVPC reviewed historic spending by project type to assist in identifying future regional transportation needs. This information is summarized in Table 15-6.

Table 15-6– Summary of Highway Spending by Project Type 2015 - 2019

Expenditure by Improvement Type 2015-2019						
Improvement Type	**# of Projects**	**Expenditure**	**% Maintenance**	**Adjusted Expenditure**	**Actual %**	**2016 RTP Scenario**
Roadway Maintenance	15	$ 59,546,307.00	100%	$ 77,317,334.80	72.2%	70%
Congestion Improvement	7	$ 20,422,908.00	50%	$ 10,211,454.00	9.5%	12.50%
Bike Infrastructure	3	$ 10,881,382.00	50%	$ 5,440,691.00	5.1%	1.25%
Safety	6	$ 7,330,958.00	25%	$ 5,498,218.50	5.1%	12.50%
Transportation Alternative Program	6	$ 3,426,569.00	0%	$ 3,426,569.00	3.2%	0%
Air Quality Improvement	5	$ 2,861,433.00	10%	$ 2,575,289.70	2.4%	2.50%
Pedestrian Infrastructure	2	$ 2,564,842.00	0%	$ 2,564,842.00	2.4%	1.25%
Freight Infrastructure	0	$ -	50%	0	0.0%	0%
Total	**44**	**$ 107,034,399.00**		$ 107,034,399.00	100%	

- Values based on passed 5 year regional discretionary expenditures in the PV Region.

Over the last 5 years on average the region has spent 56% (up from 50% in the 2016 RTP) of its transportation improvement dollars on roadway maintenance projects. Table 15-6 shows a break of the projects funded by improvement type. Each improvement type was then weighted to reflect the % the improvement that included maintenance as part of the improvement. This represents the Actual % column in the table. Table 15-6 was presented to our Joint Transportation Committee (JTC) and feedback was provide on how estimate the highway needs over the life of the RTP. Table 15-7 shows the % of expenditure by project type for our Regional Discretionary funding.

Table 15-7 – Regional Discretionary Funding Project Allocation

2016 RTP	2020 RTP	
70%	67%	Roadway Improvement Projects
12.5%	8%	Congestion improvement Projects
12.5%	12.5%	Safety Improvement Projects
1.25	5%	Bicycle Improvement Projects
1.25	5%	Pedestrian Improvements Projects
2.5	2.5	Air Quality Improvement Projects

The Pioneer Valley MPO used the 2020-2024 Transportation Improvement Program (TIP) to populate target projects in the 2020-2024 targets bin. Starting in the 2025-2029 RTP bin, projects were programmed based on TEC score, project readiness,

and project cost. Table 15-8 shows the breakdown of any reaming Regional Discretionary dollars for the FY2025-2029, FY2030-2034, FY2035-2039, and FY2040 funding periods. This breakdown was developed using the historical spending data, Cartegraph pavement condition forecasting software analysis, and through consultation with the JTC. Table 15-8 gives the distributions of the regional discretionary funds based on available funding.

Table 15-8 - Regional Discretionary Funding Breakdown

	2020 - 2024	2025-2029	2030-2034	2035-2039	2040	Totals
Target	$ 134,136,806	$ 153,789,263	$ 188,833,297	$ 209,293,530	$ 44,516,326	$ 730,569,222
Programmed	$ 133,715,699	$ 153,789,263	$ 188,833,297	$ 209,293,530	$ 44,516,326	$ 730,148,115
Difference	$ 421,107	$ -	$ -	$ -	$ -	$ 421,107
Roadway Maintenance Projects = 67%	$ 100,535,091	$ 103,038,806	$ 126,518,309	$ 140,226,665	$ 29,825,938	$ 399,609,719
Congestion Improvement Projects = 8%	$ 15,453,664	$ 12,303,141	$ 15,106,664	$ 16,743,482	$ 3,561,306	$ 47,714,593
Safety Improvement Projects = 12.5%	$ 12,976,945	$ 19,223,658	$ 23,604,162	$ 26,161,691	$ 5,564,541	$ 74,554,052
Bicycle Improvement Projects = 5%	$ 2,200,000	$ 7,689,463	$ 9,441,665	$ 10,464,677	$ 2,225,816	$ 29,821,621
Pedestrian Improvement Projects = 5%	$ 2,050,000	$ 7,689,463	$ 9,441,665	$ 10,464,677	$ 2,225,816	$ 29,821,621
Air Quality Improvement Projects = 2.5%	$ 500,000	$ 3,844,732	$ 4,720,832	$ 5,232,338	$ 1,112,908	$ 14,910,810
Constraint	$ 421,107	Constraint	Constraint	Constraint	Constraint	Constraint
Total Expenditures	$ 133,715,699	$ 153,789,263	$ 188,833,297	$ 209,293,530	$ 44,516,326	$ 730,148,115

C. FINANCIAL CONSTRAINT

The estimated available funds for the region must be greater than or equal to the financial needs of the region over the life of the plan in order to maintain financial constraint. As can be seen from Table 15-9 and 15-10, the Pioneer Valley Regional Transportation Plan is financially constrained over the life of the plan.

Table 15-9 - Highway Fiscal Constraint Summary

	2020 - 2024	2025-2029	2030-2034	2035-2039	2040	Grand Total
Total Estimated Highway Revenue	**$ 493,112,924**	**$ 418,404,385**	**$ 502,374,398**	**$ 551,932,215**	**$ 116,916,145**	**$ 2,082,740,067**
Interstate	$ 13,381,407	$ 16,897,096	$ 20,747,444	$ 22,995,446	$ 4,891,087	$ 78,912,480
Statewide Bridge	$ 61,534,135	$ -	$ -	$ -	$ -	$ 61,534,135
NORTHAMPTON– BRIDGE REPLACEMENT, I-91 OVER US ROUTE 5 AND B&MRR, BRIDGE REPLACEMENT, I-91 OVER HOCKANUM ROAD AND IMPROVEMENTS TO I-91/INTERCHANGE 19 (605552)	$ 61,534,135	$ -	$ -	$ -	$ -	$ 61,534,135
NFA Bridge	$ 54,049,500	$ 55,238,590	$ 56,453,840	$ 57,695,820	$ 11,793,026	$ 235,230,776
Non Interstate	$ 47,144,718	$ 56,120,172	$ 68,908,303	$ 76,374,571	$ 16,244,722	$ 264,792,486
Other Statewide	$ 121,332,223	$ 136,359,264	$ 167,431,514	$ 185,572,848	$ 39,470,984	$ 650,166,833
Target	$ 134,136,806	$ 153,789,263	$ 188,833,297	$ 209,293,530	$ 44,516,326	$ 730,569,222
Majore Regional Projects Funded with Target Funds						
HADLEY- RECONSTRUCTION ON ROUTE 9, FROM MIDDLE STREET TO MAPLE/SOUTH MAPLE STREET (605032)	$ 24,849,741	$ -	$ -	$ -	$ -	$ 24,849,741
WEST SPRINGFIELD - RECONSTRUCTION OF MEMORIAL AVENUE (ROUTE 147), FROM COLONY ROAD TO THE MEMORIAL AVENUE ROTARY (1.4 MILES) (608374)	$ 24,384,803	$ -	$ -	$ -	$ -	$ 24,384,803
AGAWAM - RECONSTRUCTION ON ROUTE 5 CONNECTOR TO ROUTE 57, INCLUDES A-05-013 & A-05-014 (603372)	$ -	$ -	$ -	$ 25,572,465		$ 25,572,465
WEST SPRINGFIELD - BRIDGE REPLACEMENT, W-21-006, CSX RAILROAD OVER UNION STREET (604746)	$ -	$ -	$ -	$ 26,131,364		$ 26,131,364
WILLIAMSBURG - CONSTRUCTION OF THE "MILL RIVER GREENWAY" SHARED USE PATH (608787)	$ -	$ -	$ -	$ 21,315,518		$ 21,315,518
Total of Programmed Highway Projects in the 2020 RTP	**$ 492,691,817**	**$ 418,404,385**	**$ 502,374,398**	**$ 551,932,215**	**$ 116,916,145**	**$ 2,082,740,067**
Difference	$ 421,107	$ -	$ -	$ -	$ -	$ 421,107

Table 15-10 - Transit Fiscal Constraint Summary

Estimated Transit Operating Funds 2020 - 2040						
	2020-2024	2025-2029	2030-2034	2035-2039	2040	Grand Total
Local Assessments	$ 49,372,389	$ 55,860,326	$ 63,200,831	$ 71,505,940	$ 15,445,284	$ 255,384,770
5307 Federal Urbanized Formula	$ 58,635,131	$ 64,992,195	$ 72,038,475	$ 79,848,693	$ 16,979,925	$ 292,494,419
5339 Federal	$ 7,224,890	$ 8,718,575	$ 10,521,068	$ 12,696,208	$ 2,838,307	$ 41,999,048
5310 Federal Elderly and Disabled	$ 2,933,482	$ 3,253,115	$ 3,607,577	$ 4,000,659	$ 850,992	$ 14,645,825
Fare box	$ 45,399,763	$ 50,125,006	$ 55,342,057	$ 61,102,103	$ 13,198,054	$ 225,166,983
Advertising, other revenue	$ 3,255,020	$ 3,593,805	$ 3,967,851	$ 4,380,829	$ 946,259	$ 16,143,764
Available Operating Funds for Programming in the RTP	**$ 166,820,675**	**$ 186,543,022**	**$ 208,677,859**	**$ 233,534,432**	**$ 50,258,821**	**$ 845,834,809**
Estimted Transit Capital Funds 2020 - 2040						
	2020-2024	2025-2029	2030-2034	2035-2039	2040	Grand Total
RTACAP	$ 36,688,650	$ 40,357,515	$ 44,393,267	$ 48,832,593	$ 10,743,170	$ 181,015,195
5307	$ 68,180,385	$ 75,572,320	$ 83,765,669	$ 92,847,318	$ 19,744,098	$ 340,109,790
5310	$ 2,933,482	$ 3,253,115	$ 3,607,577	$ 4,000,659	$ 850,992	$ 14,645,825
5339	$ 7,224,890	$ 8,718,575	$ 10,521,068	$ 12,696,208	$ 2,838,307	$ 41,999,048
Available Capital Funds for Programming in the RTP	**$ 115,027,407**	**$ 127,901,525**	**$ 142,287,581**	**$ 158,376,778**	**$ 34,176,567**	**$ 577,769,858**
Total Programmed Transit Funding	**$ 281,848,082**	**$ 314,444,547**	**$ 350,965,440**	**$ 391,911,210**	**$ 84,435,388**	**$1,423,604,667**
Difference	$ -	$ -	$ -	$ -	$ -	$ -

State Contract Assistance is funding determined each year by the Massachusetts Legislature through coordination with MassDOT. This funding is used to support each region's Transit Authority. The following identifies the historical level of funding received by PVTA with a suggested percentage of growth. The MPO is hopeful that such growth will occur based on the findings associated with the RTA Task Force.

	2020-2024	2025-2029	2030-2034	2035-2039	2040	Grand Total
State Contract Assistance	$ 145,747,760	$ 168,961,600	$ 195,872,803	$ 227,070,262	$ 46,776,474	$ 784,428,899

D. NEEDS

1. Operating and Maintenance

a) Highway Needs

The values in Table 15-11 are based on the financial data provided by MassDOT for use in the Financial Plan in Table 15-1. The funding identified as Non Interstate, Other Statewide, and Target where summed and then portioned based on historic TIP funding. The estimated highway needs were summarized in five year increments and are shown in Table 15-11. As shown in section C of this chapter – Alternative Funding Scenario, PVPC believes that it would take 100% of these funding categories to reasonably maintain our existing federal aid eligible roadway system near its current condition. Although table 15-11 does not commit 100% of the funding to Maintenance, many of the improvements would include maintenance as a significant amount of the work completed.

Table 15-11 – Summary of Estimated Highway Needs over the Life of the RTP

Improvement	2020 - 2024	2025 - 2029	2030 - 2034	2035 - 2039	2040	Totals
Congestion	$ 15,013,160.36	$ 17,178,953.56	$ 21,093,529.97	$ 23,379,030.22	$ 4,972,674.19	**$ 81,637,348.30**
Maintenance	$ 130,838,538.18	$ 149,713,259.37	$ 183,828,491.80	$ 203,746,450.74	$ 43,336,473.23	**$ 711,463,213.33**
*CMAQ	$ 7,192,445.51	$ 8,230,025.15	$ 10,105,404.94	$ 11,200,333.36	$ 2,382,289.09	**$ 39,110,498.05**
Safety	$ 28,105,490.19	$ 32,159,978.25	$ 39,488,287.96	$ 43,766,874.44	$ 9,309,128.95	**$ 152,829,759.78**
Bike	$ 10,953,773.92	$ 12,533,961.47	$ 15,390,081.29	$ 17,057,608.48	$ 3,628,120.10	**$ 59,563,545.26**
Transit	$ 2,980,106.36	$ 3,410,015.44	$ 4,187,057.30	$ 4,640,728.19	$ 987,073.85	**$ 16,204,981.15**
Bridge	$ 107,530,232.49	$ 123,042,505.76	$ 151,080,260.73	$ 167,449,923.56	$ 35,616,272.59	**$ 584,719,195.13**
Total Investmer	**$ 302,613,747.00**	**$ 346,268,699.00**	**$ 425,173,114.00**	**$ 471,240,949.00**	**$ 100,232,032.00**	**$ 1,645,528,541.00**

- *CMAQ funding does not include funds which were allocated to Bike, Congestion, Safety, or Transit projects under the CMAQ funding category.
- The total investment required over the life of the RTP based on financial information provided by MassDOT.

For the purposes of operations and maintenance, the financial plan shall estimate the costs that are reasonably expected to be needed to maintain the federal aid highways and public transportation system (23 CFR 450.324(7)(h)). In an attempt to comply with this requirement, the total estimated needs from Table 15-10 were added to the estimated regional discretionary funding from Table 15-1 and compared to the total estimated highway revenue from Table 15-1. This information is presented in Figure 15-1.

As can be seen in figure 15-1 the estimated highway revenue exceeds the estimated highway needs over the life of the RTP. However it is not feasible to spend over 80% of all funding on maintenance, State and Federal standards require funding to be allocated to different types of projects as show in Table 15-11. It should be noted that while Figure 15-1 indicates available funding to support needs based on historic spending, there is still a large need for additional funding to keep the transportation system in a state of good repair over the long term.

b) Transit Needs

Secure funding for transit operations and projects in the region is a key concern. In 2014 Massachusetts Legislation approved forward funding for the Regional Transit Authorities (RTA's). Forward funding allows the RTA's to pay for needs up front rather than being required to borrow money to pay for needs, which results in interest payments. In the short term, this along with increased operating assistance allowed PVTA to make both service and capital improvements system wide. Over the past couple of years, funding has not matched the cost increases that occur on a yearly basis at all RTA's. As a result RTA's have been forced to reduce both service and capital projects. A summary of the estimated transit needs over the life of the RTP is presented in Table 15-12.

Figure 15-1 – Comparison of Estimated Highway Needs and Revenue

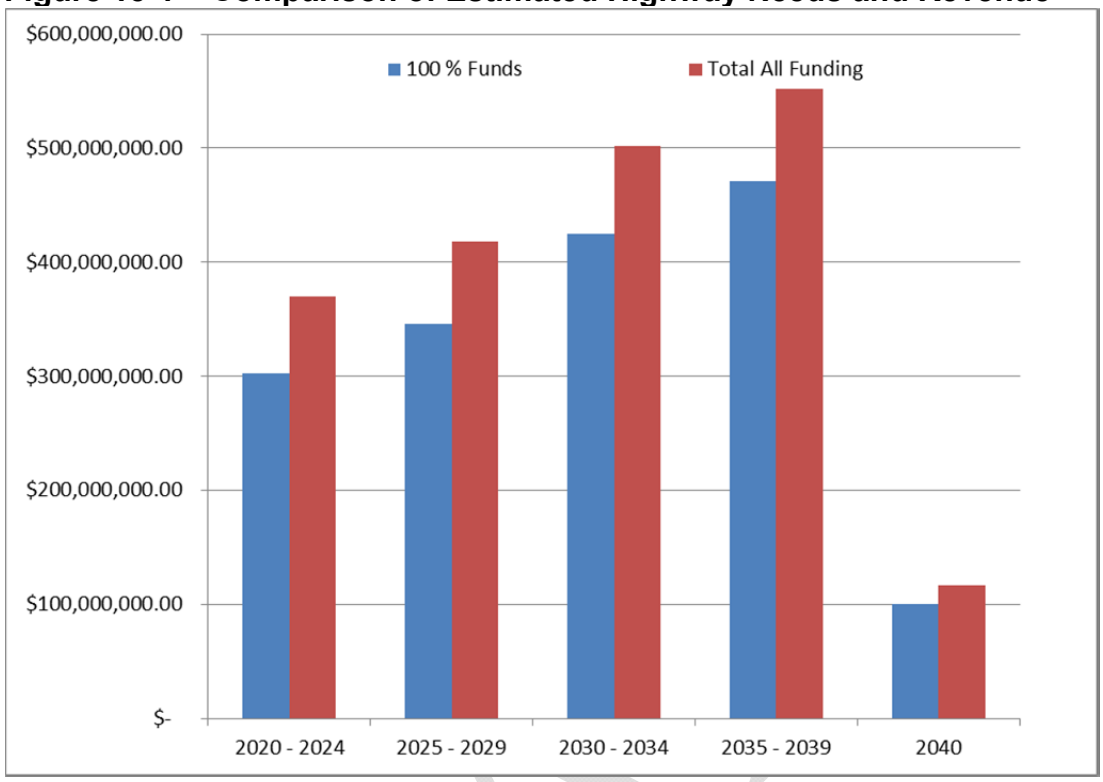


Table 15-12 – Estimated Transit Need 2020 – 2040

	2020-2024	2025-2029	2030-2034	2035-2039	2040	Grand Total
SATCO Rehabilitation to Paratransit Facility	$ 4,275,000					$ 4,275,000
Northampton Garage rehabilitation	$ 9,975,000					$ 9,975,000
Northampton Intermodal Center		$ 10,740,000				$ 10,740,000
UMTS Maintenance Facility		$ 24,304,000				$ 24,304,000
PVTA Facility maintenance/Environmental	$ 4,878,466	$ 8,338,181	$ 10,144,672	$ 12,342,545	$ 2,962,211	$ 33,787,609
PVTA Fleet Replacement Program	$ 44,916,297	$ 48,653,279	$ 59,194,153	$ 72,018,738	$ 17,284,497	$ 197,150,667
Vehicle Maintenance	$ 39,749,580	$ 48,361,442	$ 58,839,089	$ 71,586,749	$ 17,180,820	$ 195,968,100
Bus Shelters	$ 1,370,675	$ 1,667,636	$ 2,028,934	$ 2,468,509	$ 592,442	$ 6,757,521
Bus stop sign replacement	$ 532,037	$ 140,824	$ 171,334	$ 208,454	$ 50,029	$ 570,641
ITS/AVL and communication equipment	$ 14,678,720	$ 15,988,258	$ 17,481,787	$ 19,186,055	$ 4,062,383	$ 56,718,482
MAP van program	$ 5,977,051	$ 6,929,041	$ 8,032,657	$ 9,312,051	$ 2,234,892	$ 26,508,641
Total Capital Need	**$ 126,352,826**	**$ 165,122,661**	**$ 155,892,626**	**$ 187,123,101**	$ 44,367,274	**$ 517,461,661**

Estimated Transit Operating Needs 2020-2040

	2020-2024	2025-2029	2030-2034	2035-2039	2040	Grand Total
PVTA Fixed Route	$ 203,498,118	$ 235,696,575	$ 273,091,741	$ 316,544,615	$ 73,438,351	$ 1,102,269,400
PVTA Paratransit	$ 51,416,110	$ 59,551,416	$ 68,999,730	$ 79,978,592	$ 18,555,033	$ 278,500,881
PVTA Administration	$ 29,268,023	$ 33,898,951	$ 39,277,293	$ 45,526,883	$ 10,562,237	$ 158,533,386
FRTA Paratransit	$ 4,415,643	$ 5,114,307	$ 5,925,734	$ 6,868,604	$ 1,593,516	$ 23,917,804
Total Operating Need (4% annual Escalation)	**$ 288,597,894**	**$ 334,261,249**	**$ 387,294,497**	**$ 448,918,694**	**$ 104,149,137**	**$ 1,563,221,472**
Grand Total of Needs	**$ 414,950,721**	**$ 499,383,910**	**$ 543,187,123**	**$ 636,041,795**	**$ 148,516,411**	**$ 2,080,683,133**

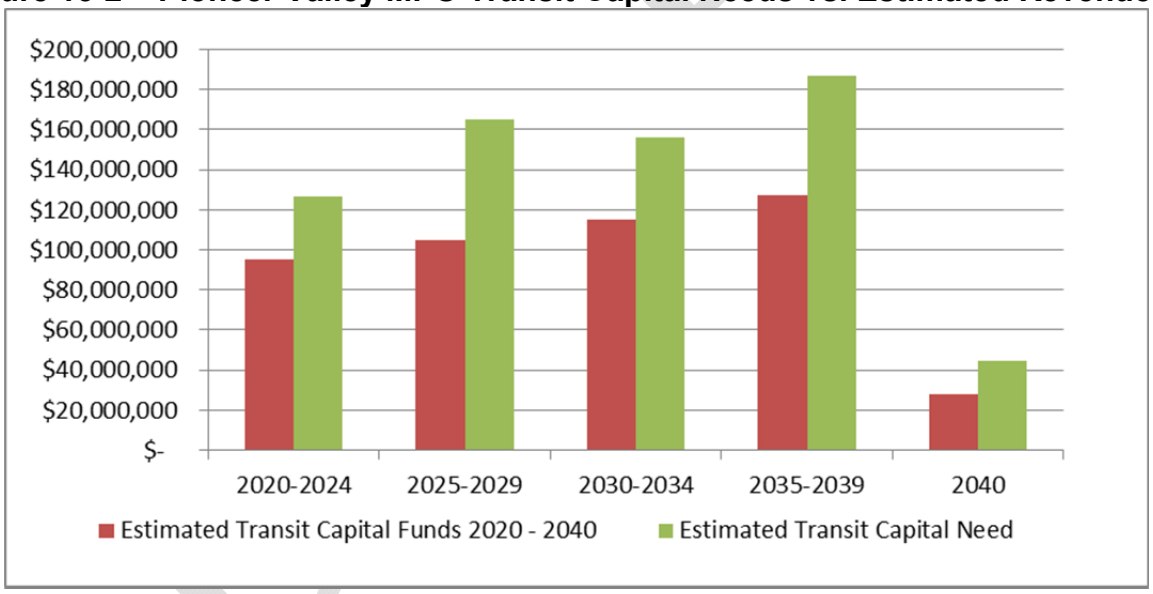
% of TIP Increase above	13%	12%	12%	12%	12%
Plus 4% Escalation	17%	16%	16%	16%	16%

Note: FRTA data based on FRTA Financial Statement and supplementary information http://www.pvtaapps.com/opengov/pdfs/frta/FRTAfinal.pdf

In addition, operating funding needs also include $100,000 per year (escalated 4% annually) for FRTA paratransit in 14 outlying towns in the PVPC region that are not served by PVTA. FRTA anticipates that the cost of providing paratransit van service in the 14 PVMPO municipalities not served by PVTA will increase at a rate greater than 4% in the 2016-2020 timeframe due to the growing need to replace volunteer drivers with professional drivers in many communities.

The funding outlook with respect to capital project needs is also a significant concern. Figure 15-2 shows the anticipated transit capital project needs versus estimated revenues (2016-2040) for the region. It shows that over the life of this plan, the gap between estimated capital needs ($784,421,506) and anticipated revenue ($517,968,332) would be $206 million. Therefore, transit capital needs are 50% greater than the amount of funds that are expected to be available.

Figure 15-2 – Pioneer Valley MPO Transit Capital Needs vs. Estimated Revenue



c) Rail Needs

Similar to highway and transit needs, an estimate was developed of the regional rail needs based on completed study recommendations advocating for expanded passenger rail service. This information is shown in Table 15-13. It should be noted that these estimates are presented for informational purposes only as these projects are not currently part of the financially constrained RTP. Enhanced passenger rail service does however remain a high regional priority that is recommended should an adequate funding source be identified.

Table 15-13 – Estimated Rail Need 2016 – 2040

Project Name	Project Description	Community	2020-2025	2026-2030	2031-2035	2036-2040	2041-2045	Total
Western Mass to Boston Passenger Rail Service Study	East/West high speed rail Capital entire system -Boston to Springfield to Pittsfield	Regionwide	current study					**$0**
Commuter Rail	Commuter Rail - Springfield to Greenfield - Capital	Regionwide	$1,300,000					**$1,300,000**
NECR Track Improvements to accommodate 286K	Freight rail track improvements	Regionwide	$19,200,000					**$19,200,000**
Patriot Corridor	Double Stack freight operations Study	Regionwide	further study					**$0**
Ware River Secondary Projects	1.2 mile connection between MassDOT Ware River line and CSX	Regionwide	$ 9,700,000					**$9,700,000**
Track Expansion	Track Expansion Palmer Ind Park	Palmer		$570,000				**$570,000**
Westfield Industrial Park Track Expansion	Track Expansion Westfield Ind Park	Westfield		$3,025,070				**$3,025,070**
Boston to Springfield to Montreal Passenger Rail Service	East/West and North/South Passenger Rail Service from Boston to Montreal	Regionwide		Further Study				**$0**
		Total Need	**$30,200,000**	**$3,595,070**	**$0**	**$0**	**$0**	**$33,795,070**

Rail Operating Needs

Project Name	Project Description	Community	2020-2025	2026-2030	2031-2035	2036-2040	2041-2045	Total
Passenger Rail Operating Cost	Connecticut State Line to Greenfield - Operating Per $2,980,000 per year	Regionwide	$16,140,641	$19,637,558	$23,892,092	$29,068,383	$35,366,133	**$124,104,807**
Springfield to Greenfield Pilot	Passenger Rail Service between Spr	Regionwide	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	**$5,000,000**
High Speed Rail Operating for entire corridor	East/West high speed rail Operating entire system -Boston to Springfield to Pittsfield	Regionwide	TBD	TBD	TBD	TBD	TBD	**$0**
			$17,140,641	**$20,637,558**	**$24,892,092**	**$30,068,383**	**$36,366,133**	**$129,104,807**

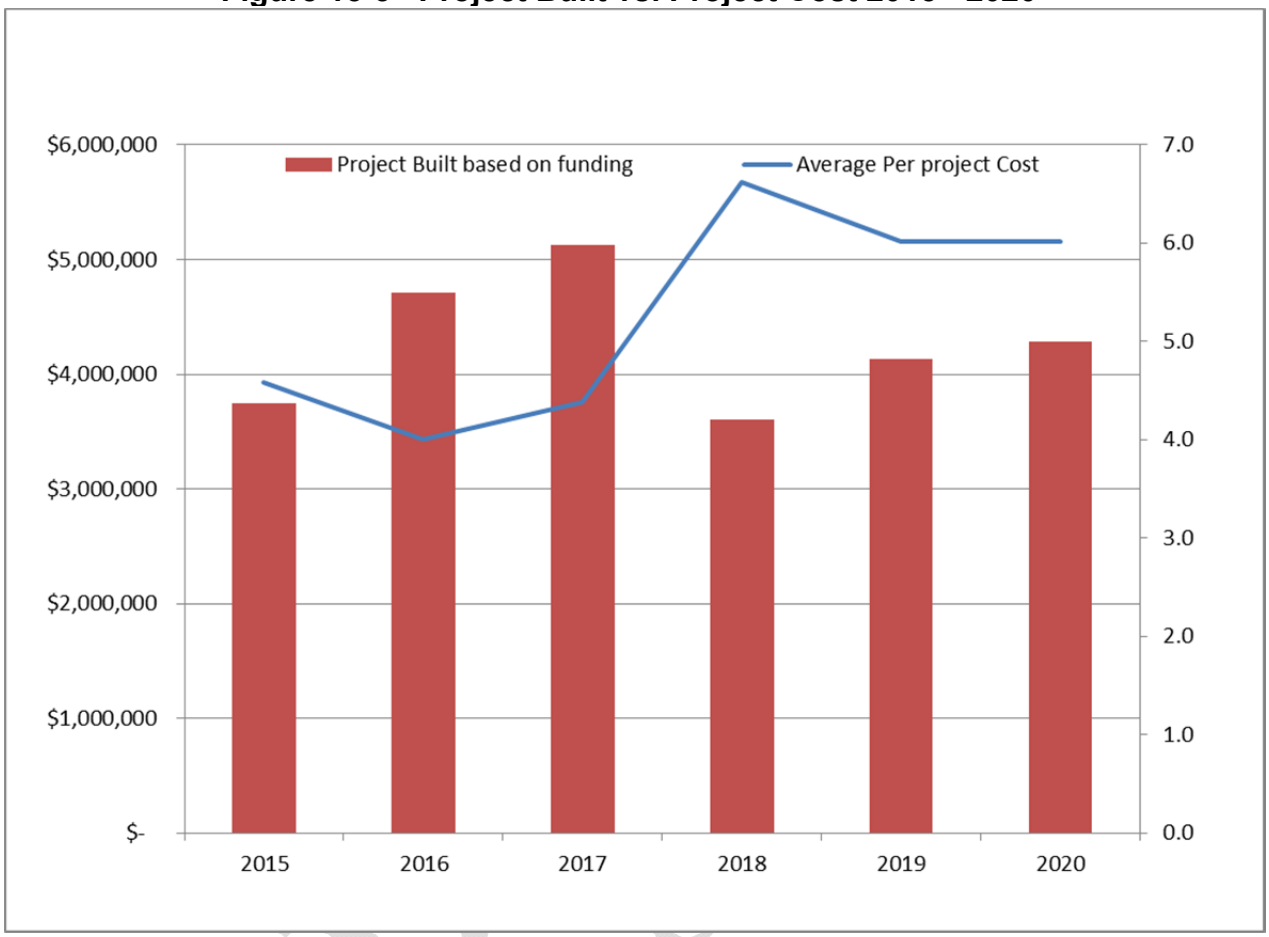
- Knowledge Corridor operating cost are based on Option 1 of the March 23, 2015 HDR Rail Service Analysis
- Operating cost for both projects are inflated by 4% annually

E. ALTERNATIVE FUNDING SCENARIOS

It is estimated it will take 15 years to fund all of the current projects included in the TIP backlog for the Pioneer Valley. This is a growing concern as regional targets have not increased significantly while project costs continue to rise. Inflation plays a big role in the number of projects and cost of projects funded per year as costs rise significantly the further out they are programmed. On average over the past 5 years the PVMPO has been able to fund 5 transportation projects per year using regional discretionary funds. As can be seen in Figure 15-3 the average project cost has been increasing in our region resulting in few projects being built each year.

Based on this information, the region does not have enough money to fund our transportation program in a financially viable time frame. In order to identify the amount of money necessary to fund the transportation program in a financially viable time frame PVPC staff utilized scenario based planning to develop a series of 3 scenarios to identify the funding necessary to maintain our regional overall pavement condition index at or near its average level. This information is summarized in Figure 15-4 and Table 15-8.

Figure 15-3 –Project Built vs. Project Cost 2015 - 2020



1. Summary of Identified Scenarios

a) 70% Scenario – Uses 70% Regional Discretionary Funds, Non Interstate, and Other Statewide Funds to fund pavement maintenance

This Scenario assumes an investment of 70% of all Regional Discretionary funding and 70% of all Remaining Statewide Program funding over the life of the plan be allocated towards pavement maintenance.

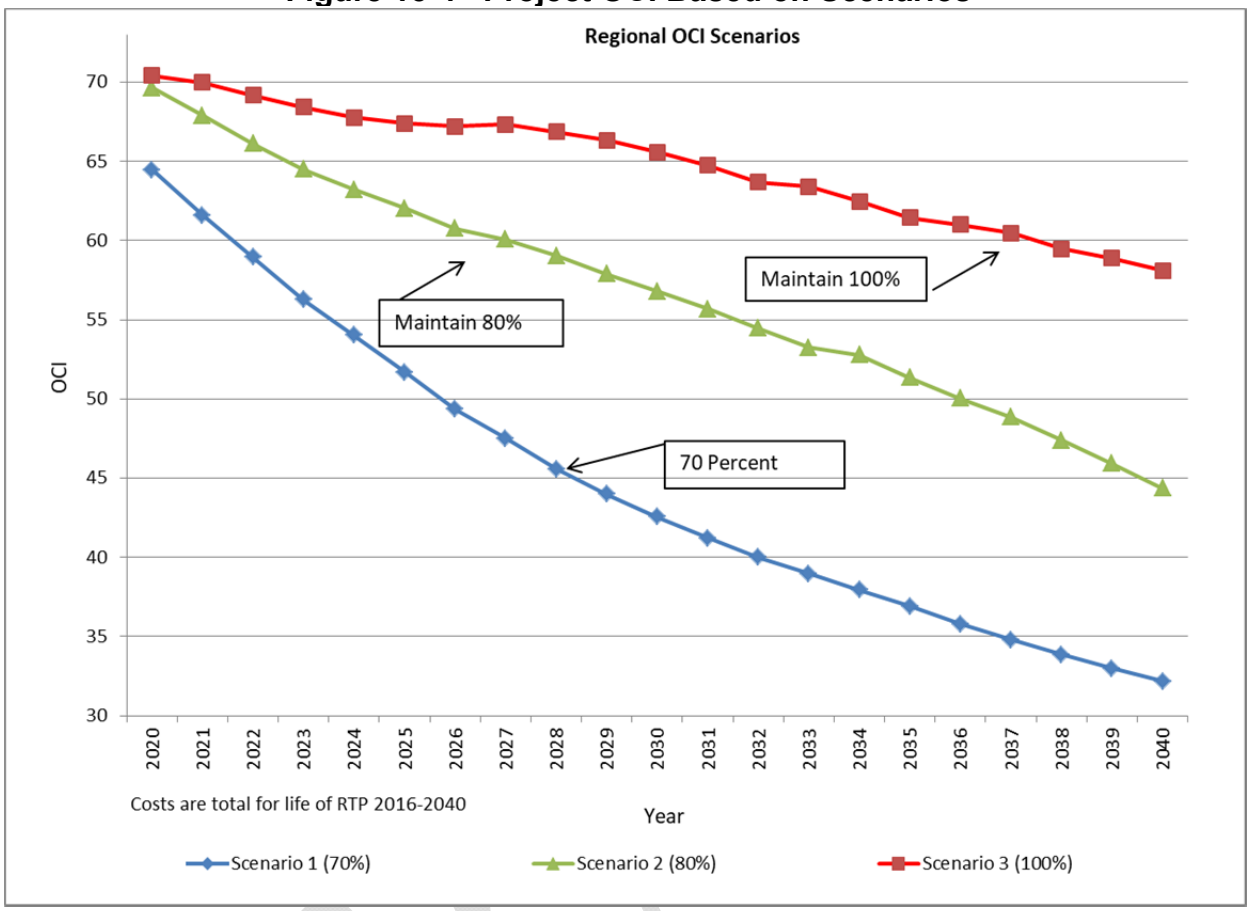
b) 80% Scenario – Uses 80% Regional Discretionary Funds, Non Interstate, and Other Statewide Funds to fund pavement maintenance

This Scenario assumes an investment of 80% of all Regional Discretionary funding and 80% of all Remaining Statewide Program funding over the life of the plan be allocated towards pavement maintenance.

c) 100% Scenario – Uses 100% Regional Discretionary Funds, Non Interstate, and Other Statewide Funds to fund pavement maintenance

This Scenario assumes an investment of 100% of all Regional Discretionary funding and 100% of all Remaining Statewide Program funding over the life of the plan be allocated towards pavement maintenance.

Figure 15-4 –Project OCI Based on Scenarios



Under the 70% Scenario, a significant funding commitment is being made to attempt to bring the roadway system up to a state of good repair. A total of $212 million is being spent in the first five years of the plan under this scenario with limited effects on slowing the deterioration of roadways. A slight decrease in the rate of deterioration can be seen starting in year 2028, this is the result of the GANS payments being complete which will allow for additional funding for roadways.

Under the 80% Scenario, in the first 5 years the investment is $30 million ($242 million) more than the 70% scenario. The results of this scenario show a shallower downward curve, but the OCI trend still shows a significant deterioration over the next 20 years. This scenario is anticipated to have a 2040 network OCI of 44, up from 33 in the 70% scenario.

Under the 100% Scenario, $302 million is committed towards pavement maintenance in the first five years of the plan. As can be seen in Figure 15-4, the deterioration curve is much more gradual. In 2028 we experience a slight improvement in OCI due to additional funding as a result of GANS payments being completed. Although an improvement over the first two scenarios, the results appear to trend in the same direction in the later years as the other scenarios. That

being said, under this scenario the OCI is expected to be significantly better in 2040 than under the other 2 scenarios.

A summary of the investment totals by scenario is shown in Table 15-14.

Table 15-14 - Scenario Funding Summary

RTP Bin	70% Scenario	80% Scenario	100% Scenario
2020 - 2024	$ 211,829,623	$ 242,090,998	$ 302,613,747
2025 - 2029	$ 242,388,089	$ 277,014,959	$ 346,268,699
2030 - 2034	$ 297,621,180	$ 340,138,491	$ 425,173,114
2035 - 2039	$ 329,868,664	$ 376,992,759	$ 471,240,949
2040	$ 70,162,422	$ 80,185,626	$ 100,232,032
Totals	**$ 1,151,869,979**	**$ 1,316,422,833**	**$ 1,645,528,541**

2. Local Revenue Options [7]

The ability to establish a local revenue source to fund transportation improvements in the Pioneer Valley region would first require action by the Massachusetts Legislature. It could also require a successful ballot initiative by local voters. The information below on local revenue options is provided solely to illustrate options that other states have used to raise additional revenue to fund transportation improvement projects.

1. Local Motor Fuel Tax - The revenue base provided by these optional taxes is supplemental in nature because fuel taxes in addition to state and federal fuel taxes would likely cause drivers to purchase fuel outside the local area levying the tax.
2. Local Motor Vehicle Registration Fee - Local counties and municipalities are authorized by many states to levy an additional fee on motor vehicle registration. These fees are typically collected by the state and returned to the locality. Most local registration fees are used for general revenue or directed towards transportation purposes, often for pay-as-you-go routine maintenance or operations. Some specific transportation improvement programs are funded through local registration fees.
3. Local Option Sales Tax - Many states authorize localities to levy local option sales taxes for transportation purposes. The use of a local option sales tax requires a voter referendum. Spending authority varies from state to state, some granting localities the choice of earmarking funding or using it as general revenue. Other states require a specific purpose be attached to the tax, such as roadway improvement projects.

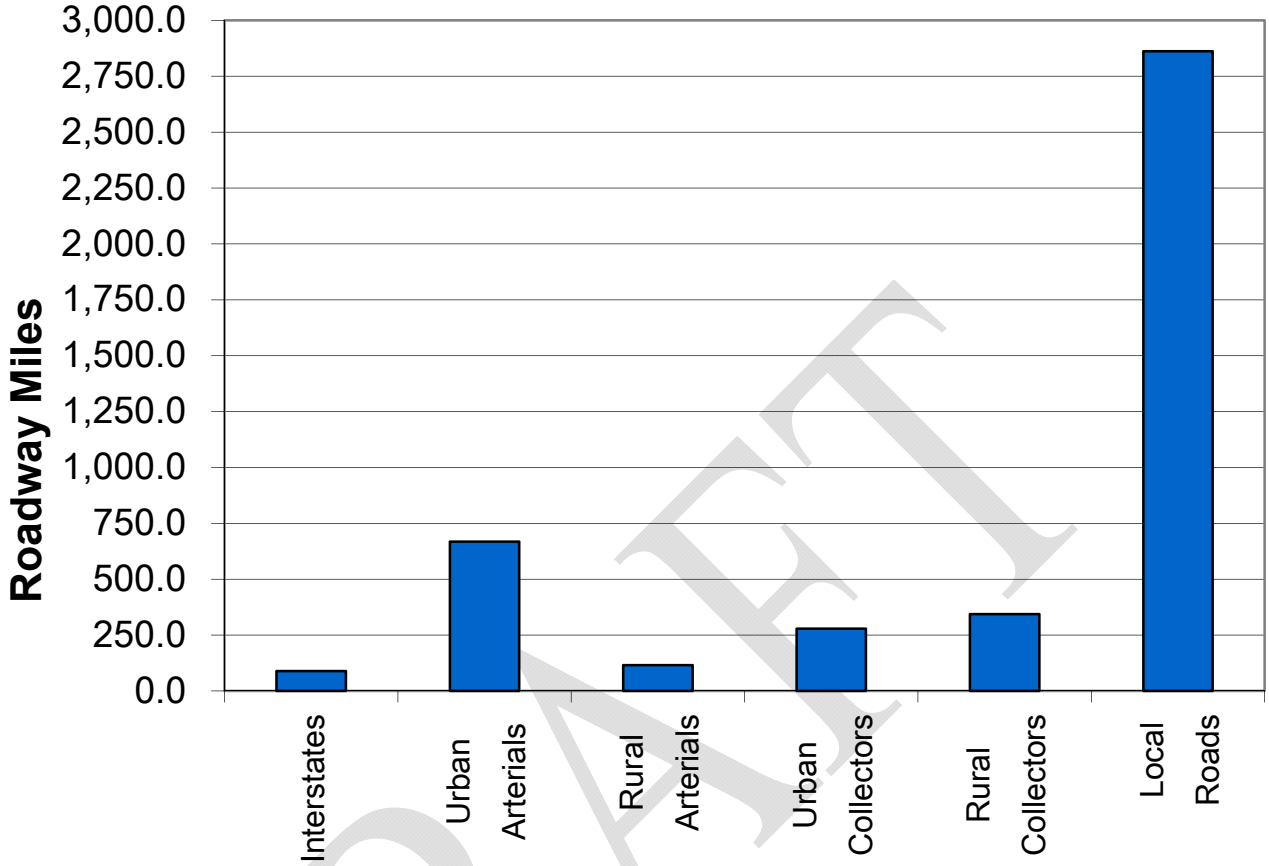
[7] http://www.transportation-finance.org/funding_financing/funding/local_funding/

4. Local Income/Payroll/Employer Tax – Local income taxes are levied across a particular municipality. This can create differences in neighboring income tax rates that discourage residents from settling there. Payroll taxes (often referred to as commuter taxes), on the other hand, are based on the total of all salaries paid out by employers, effectively taxing a place of employment rather than a place of residence. One example of the application of these taxes would be to support transit service into a city.
5. Local Severance Taxes - A severance tax is a weight-based charge levied on operators of natural resource extraction operations such as coal, timber, or stone. It is used to fund road improvements in several rural regions of states where heavy truck operations from these activities cause a disproportionate amount of damage to remote roads.
6. Value Capture - Value capture refers to cases where the public sector is able to capture some of the increased value, usually property value that results from public investment. Some transportation investments, such as a new freeway or interchange for example, increase the value of adjacent properties by improving access.
7. Tax Increment Financing - Tax Increment Financing (TIF) allows cities or counties to create special districts to generate extra tax revenue and to use that new income to make public improvements. The legislative process for implementing and utilizing TIF financing is a complicated process involving the creation of the special district and the public agency to act as the administrator of the funds.

3. Local Pavement Maintenance Needs

Currently, roadways classified as “local” roads are not eligible for federal funds. In the Pioneer Valley Region the vast majority of roadways (66%) are classified as local roads, meaning that over two thirds of all roads in the region are being maintained using Chapter 90 funds or other local sources of revenue. See Figure 15-5.

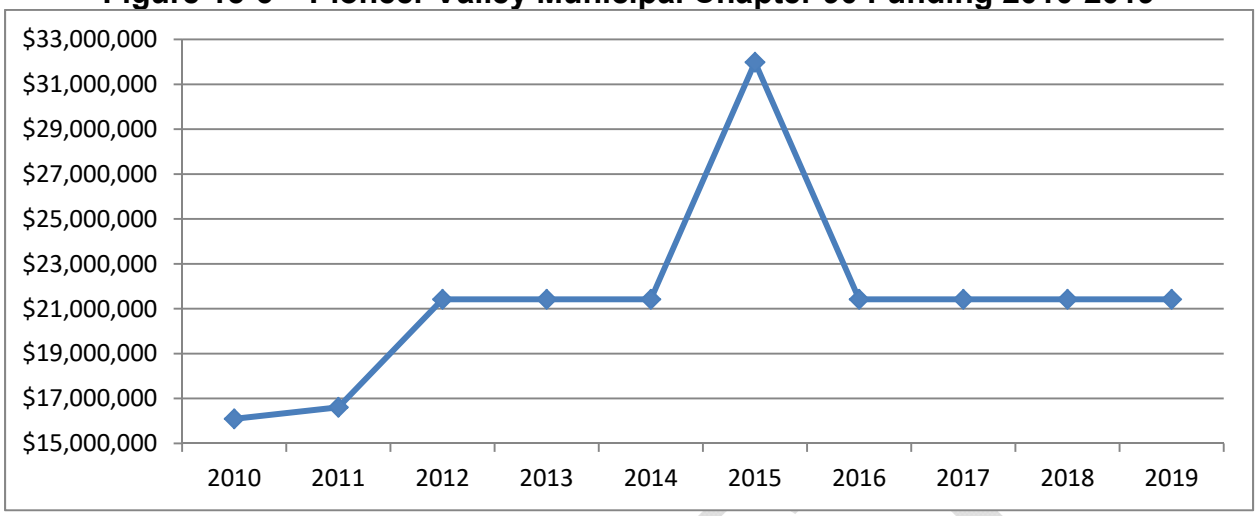
Figure 15-5 – Miles of Roadway by Functional Classification



During the past several years a number of political, social, and economic trends have influenced the form and substance of local highway maintenance practices. Significant among them is the increasing pressure of fiscal austerity on local resources which place constraints on local tax revenues and make it difficult for the local highway superintendent or engineer to adequately meet the maintenance needs of local roads in the community.

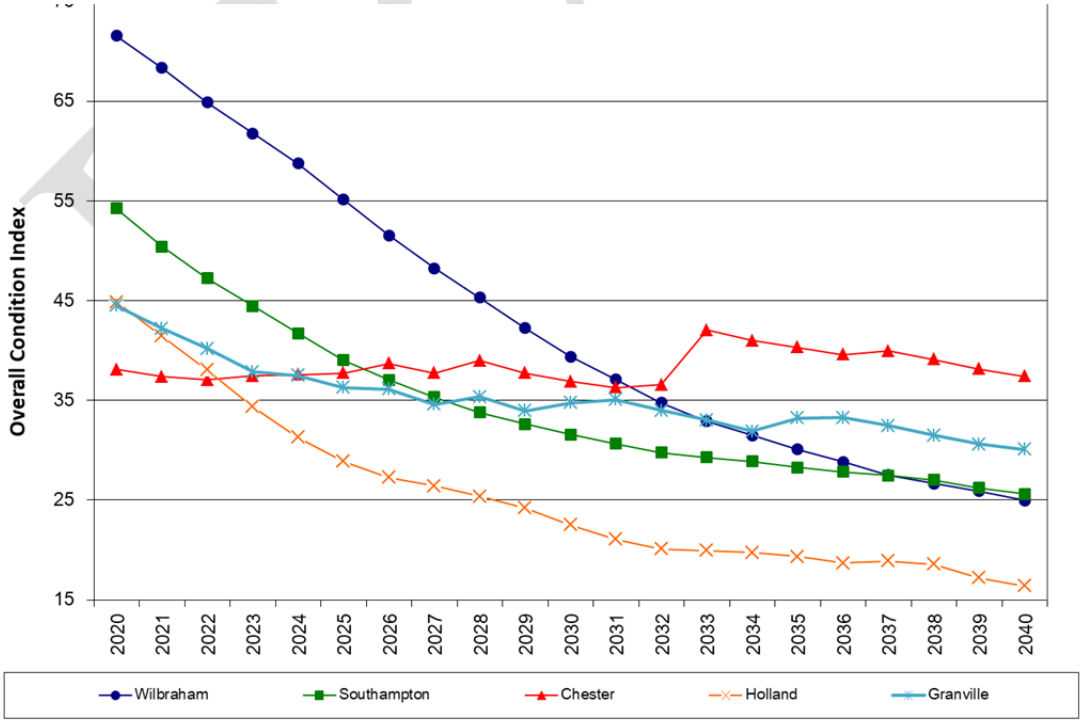
The cost increase to maintain local infrastructure, the loss of local revenue, and the need for more Chapter 90 funding are common concerns of local communities in the region. The state's Chapter 90 allocation had been level funded since the middle of the 1990s. As can be seen in Figure 15-6, in recent years Chapter 90 funding has seen a modest increase. In 2015 the Governor of Massachusetts approved an additional $100,000,000 ($10.5 million to the Pioneer Valley) in Chapter 90 funding. Over the past couple years the Governor has not match the $300,000,000 committed in 2015, instead level funding Chapter 90 at $200,000,000 The (Massachusetts Municipal Association) MMA as well as local officials have been lobbying to tie Chapter 90 funding to inflation to ensure rising maintenance cost do not negate increases in allotments.

Figure 15-6 – Pioneer Valley Municipal Chapter 90 Funding 2010-2019



PVPC reviewed the long term impact of existing Chapter 90 Funding levels on local roadways in five communities. This information, presented in Figure 15-7, shows a clear downward trend over time indicating the current level of funding is not sufficient to maintain the condition of local roadways into the future. As the cost of construction materials continues to increase, the condition of roads will continue to deteriorate. This decline in the average OCI level is the result of the improvement rate being offset by the roadway deterioration rate. Also, the amount of needed repairs (backlog) increases as the average OCI declines.

Figure 15-7 OCI Projections Based on Current Chapter 90 Program

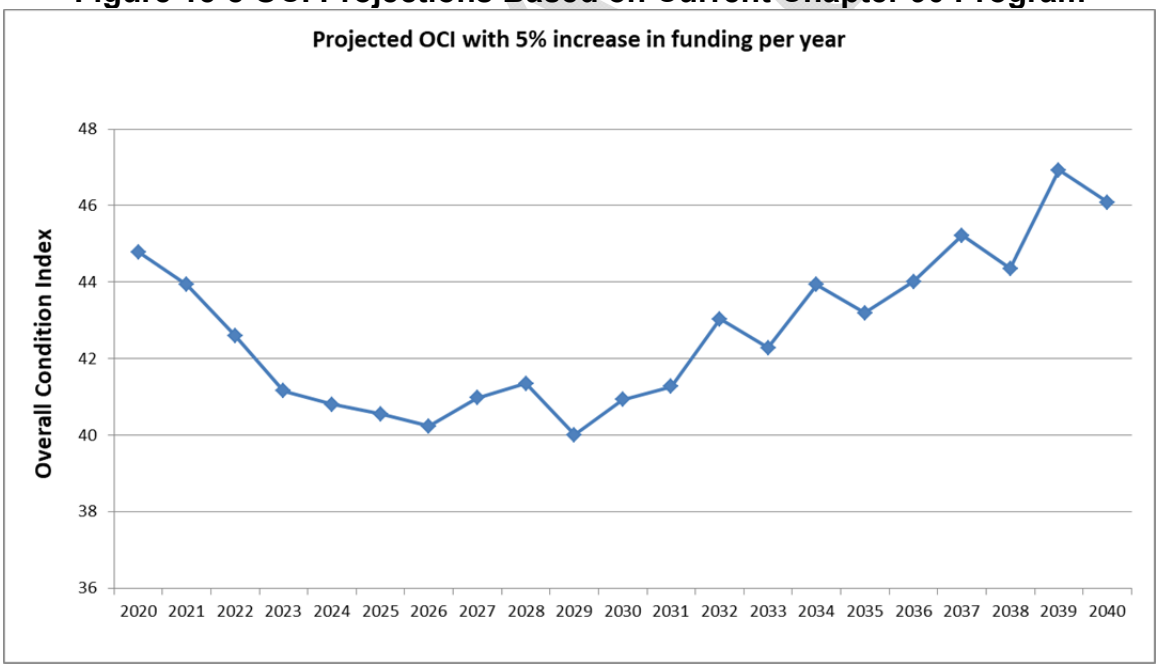


As can be seen in Figure 15-7, overall Condition Index (OCI) is projected to continue to decrease every year over the next 20 years. According to the Massachusetts Municipal Association (MMA), a Chapter 90 funding level of $600,000,000 is needed statewide in order to bring local roads up to a state of good repair. https://www.mma.org/advocacy/chapter-90-funding-is-essential-to-repair-our-roads/

In order to identify the level of funding needed in the Pioneer Valley, PVPC staff developed a scenario to determine how much additional funding would be needed to maintain the current OCI for a municipality. Under the scenarios, it is assumed that 100% of local Chapter 90 funding is being applied to pavement maintenance in one local community in the Pioneer Valley region.

Based on the local funding scenario show in Figure 15-8, a 5% per year increase would allow the sample community to realize an average OCI score in 2040 similar to the estimated average OCI for 2020. As can be seen in the figure, under this scenario the OCI drops for the first couple of years before beginning to shows signs of increasing starting in 2020. In 2040 it is important to note that we begin to see a decline in OCI, it is not clear if this is due to funding or just on continuation in the trend from 2031 to 2038

Figure 15-8 OCI Projections Based on Current Chapter 90 Program



If level funded the Chapter 90 program will provide about $450 million in funding to the PV Region. Based on our scenario the Chapter 90 program would need to experience a 5% per year increase in funding to maintain the current roadway condition. A 5% per year increase would result in a Chapter 90 invest in the PV Region of $800 million over the next 20 years. This would result in a Chapter 90 program in line with the reports released by the MMA.

4. Regional Transit Needs

One of the biggest hurdles for the Regional Transit Authorities (RTA) has been securing funding to maintain current service levels. In 2014 PVTA completed a Comprehensive Service Analysis (SCA). The SCA included recommendations to both enhance existing service as well as expand service. Since the implementation of the original recommendations, PVTA has been forced to cut service twice. The purpose of this scenario is to identify the funding necessary to reinstate service PVTA was forced to cut as well as he funding PVTA would require to expand transit service to better meet the needs of the region.

In order to develop this transit funding scenario, PVPC reviewed the recommendations of the Regional Transit Authority Task Force report and compared those numbers to PVTA's FFY2018 operating budget. The report, released in April of 2019, includes twenty four recommendations. Recommendation #1 - "*The legislature should fund the RTAs in fiscal year 2020 with a base of $90.5 million in state contract assistance (SCA). Each subsequent year increase the SCA by an automatic inflator*" was used to develop this scenario. A 4% per year increase was assumed for the "automatic inflator." This recommendation is intended to provide adequate and consistent funding for RTA's and provides each RTA with the opportunity to provide more consistent service for its riders. In turn, this could result in increased ridership and generate additional revenue for transit operations.

PVTA receives 29% of the SCA released per year. In FFY 2018, PVTA received just over $23 million which accounted for 49% of PVTA's operating budget. According to the Transit Task Force Report, PVTA's FFY 2020 SCA amount should be $26.2 million which would increase each year by the "automatic inflator" (assumed to be 4% for this scenario).

Under this scenario, it was assumed that PVTA would receive a total of $26.2 million in SCA funds in FFY 2020. The operating funding breakdown shown in Figure 15-9 was then used to determine operating funding available over a 5 year range. Figure 15-10 compares the scenario to existing conditions (level funding) as well as PVTA's operating needs. Based on this scenario, PVTA would be able to meet its anticipated operating needs with the first 10 years of funding and exceed its operating needs by 2030. This would allow PVTA to provide additional services for the region.

Figure 15-9 – PVTA Operating Funds Breakdown

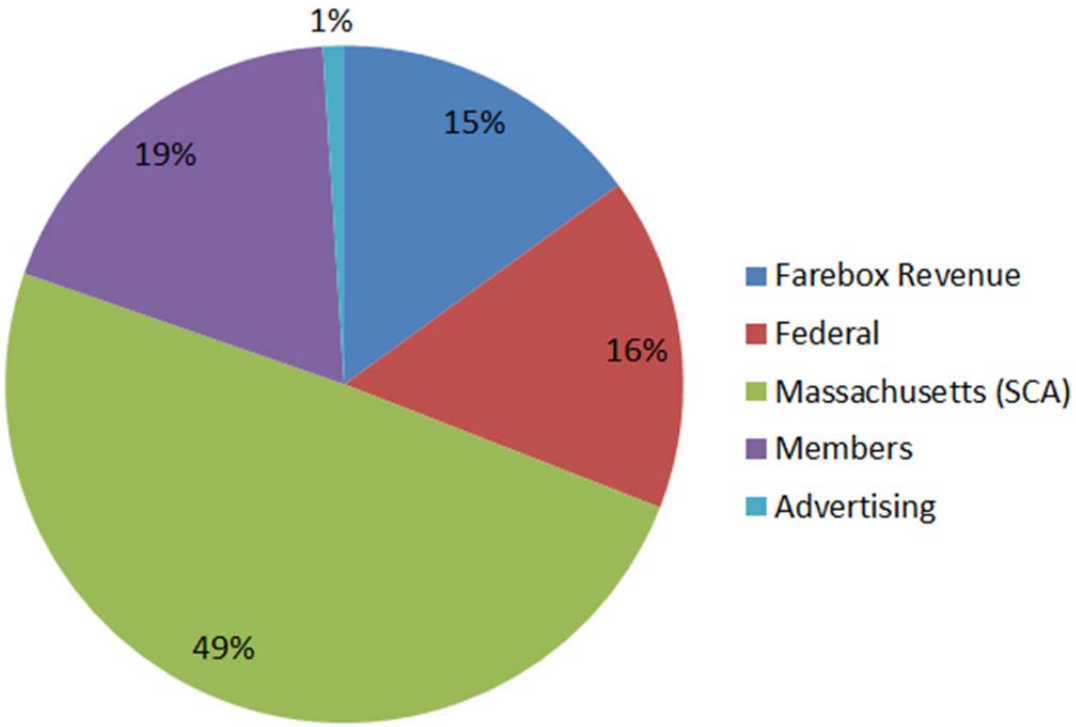


Figure 15-10 – PVTA Operating Funds Scenario