Chapter 8: Pavement Management

Pavement Management is a process in which a network of roads is evaluated and rated to determine a schedule of maintenance to keep the roads in good to excellent condition. The ultimate goal of a pavement management program is to maintain these good to excellent road conditions into the future in the most cost effective manner. Local and state officials must consider public opinion on pavement improvement projects, but ultimately, decisions must be made with regard to cost effectiveness and appropriate engineering standards.

Deterioration of pavement overtime is inevitable because of wear and tear caused by traffic and that the materials that make up asphalt begin to break down and become affected by elements such as rain, sunlight and chemicals that come into contact with the pavement surface. The liquid asphalt binder that is the "glue" of the pavement begins to lose its natural resistance to water, allowing moisture to penetrate into and underneath the pavement.

Deterioration of asphalt pavements can also be due to factors that go beyond just normal wear and tear causing premature deterioration. The premature deterioration of asphalt pavement can be due to failures in construction – or human error. This can be due to a number of factors including

- insufficient or improperly compacted base below the asphalt;
- over or under compaction of asphalt;
- improper temperature of asphalt when applied; and
- poor drainage

The truth is no asphalt is exempt from deterioration no matter how well it is constructed. Asphalt deterioration begins immediately. Even in normal conditions substantial deterioration can begin to take place after 3 to 5 years. It is normal after this amount of time for asphalt to begin to turn gray, become brittle and start cracking. Water begins entering the cracks, freezes and thaws during the yearly cycle and causes larger cracks and potholes to form. When asphalt pavement is constructed and maintained properly it wears out slowly and can last up to 25 years or more. Proper maintenance is vital to protecting it from the external factors that wear it out.

The cost of repairs increase dramatically if not completed at the appropriate time, so it is therefore less expensive to keep presently good roads in good shape. SRPEDD, on behalf of the Southeastern Massachusetts Metropolitan Planning Organization (SMMPO), has been providing pavement management services for member communities since 1984. SRPEDD completed a regional pavement conditions survey of functionally classified, federal-aid eligible roadways as part of our Unified Planning Work Program for 2007 and 2008. Data collected is used to aid in the project selection process for the Transportation Improvement Program (TIP) as well as updating the Regional Transportation Plan.

Local Pavement Management

SRPEDD provides assistance to our communities in developing a local pavement management program. The program provides an evaluation of pavement conditions and recommended improvements for the community's road network. Staff from participating

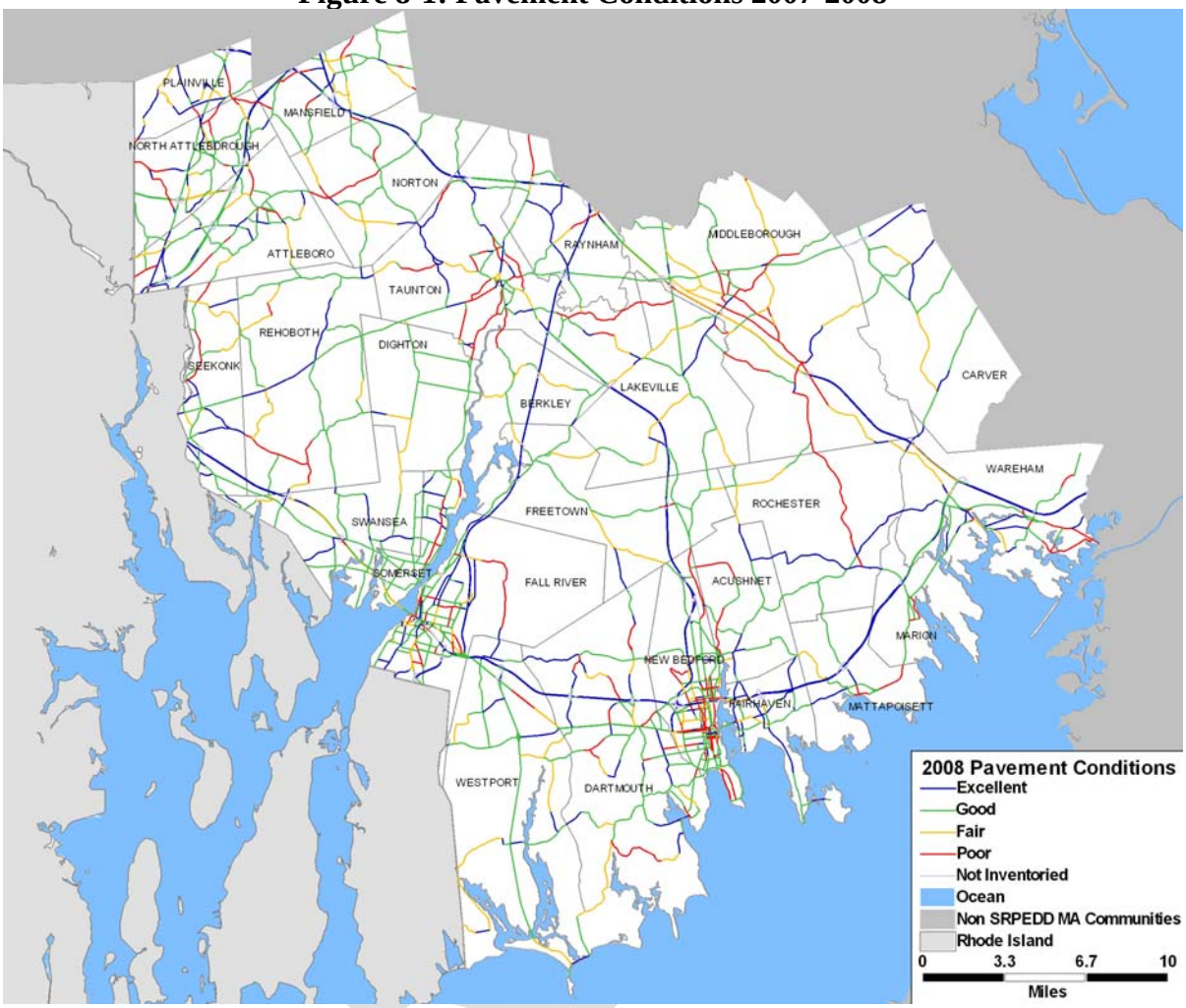
municipalities are instructed on procedures to collect road condition data that is then provided to SRPEDD for analysis. SRPEDD uses the computer software "Road Surface Management System" (RSMS) to analyze the condition data. The final product is a pavement management report that includes a summary of all road conditions, recommended repairs, and a priority list of roads needing repair with cost estimates.

Since its inception in 1984, the following communities have participated in the program: Acushnet, Carver, Dartmouth, Fairhaven, Freetown, Marion, Mattapoisett, New Bedford, North Attleborough, Rehoboth, Rochester, Seekonk, Somerset, Swansea, and Taunton. SRPEDD continues to offer this assistance to our communities with support from the Federal Highway Administration (FHWA) and the Massachusetts Department of Transportation (MassDOT).

Regional Pavement Management

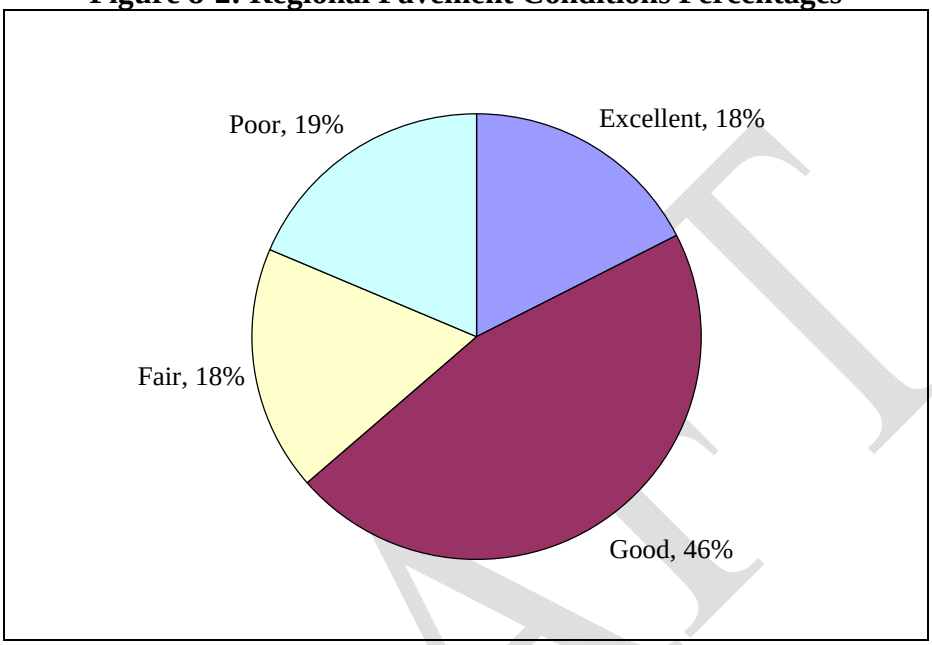
The regional pavement management program consists of collecting, evaluating, and reporting on the pavement conditions of all federal aid eligible roads. These roads provide access to urban centers, government, residential areas, emergency facilities, retail establishments, schools, and places of employment. Many of these roads are U.S. or state-numbered highways. Our survey does not include roads classified as Interstate Highways or roadways that are part of the National Highway System which are surveyed by MassDOT. Results of SRPEDD's 2007-2008 Survey are shown in combination with results from MassDOT's data in Figure 8-1.

Figure 8-1: Pavement Conditions 2007-2008



As of 2008, 18% of STP-funded roadways were found to be in excellent condition, 46% in good condition, 18% in fair condition, and 19% in poor condition (See Figure 8-2). Pavement conditions on locally maintained federal aid eligible roads are broken down by repair category and community in Table 8-1 on the next page.

Figure 8-2: Regional Pavement Conditions Percentages



Roads in excellent condition require no maintenance or routine maintenance. Roads in good condition require relatively inexpensive treatments, such as crack sealing or patching and/or preventative maintenance such as chip sealing to maintain their good condition. In general, roads in fair condition require rehabilitation, while roads in poor condition require reconstruction. Rehabilitation or reconstruction maintenance requires a more durable surface treatment or possibly sub-surface improvement. These repairs are typically more expensive.

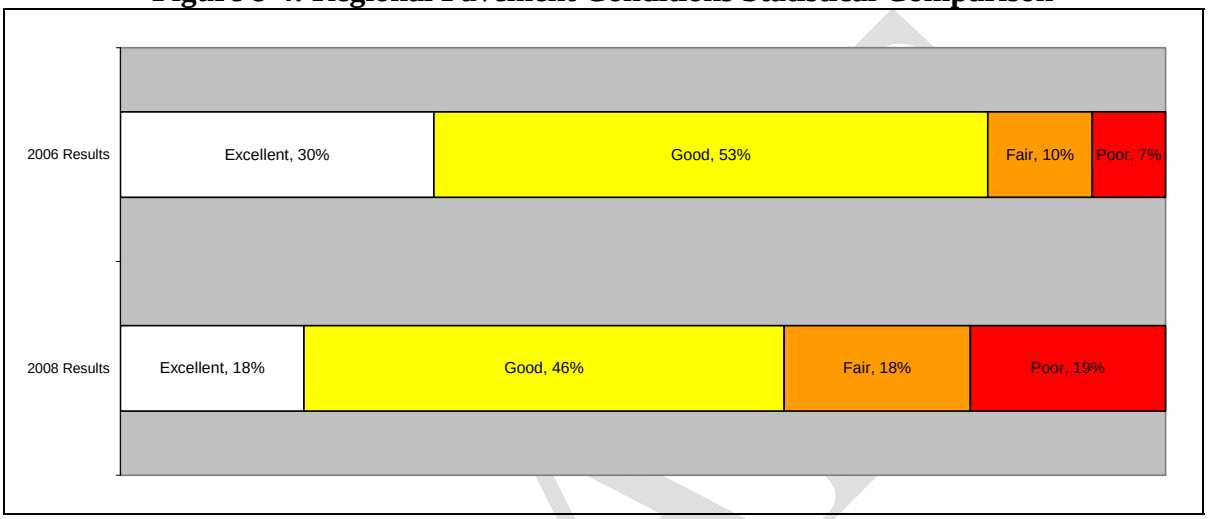
Figure 8-3: Poor Conditions with Improvements

Table 8-1: Pavement Condition Mileage for Locally Maintained Federal Aid Eligible Roads by Community

Community	Excellent		Good				Fair		Poor		Total
	No Maintenance Req.		Routine		Preventative		Rehabilitation		Reconstruction		
	Mileage	Percent	Mileage	Percent	Mileage	Percent	Mileage	Percent	Mileage	Percent	
Acushnet	1.3	8%	8.9	52%	2.8	16%	0.5	3%	3.8	22%	17.3
Attleboro	5.1	18%	13.6	47%	2.3	8%	3.7	13%	4.3	15%	29.0
Berkley	0.0	0%	3.6	59%	0.3	4%	1.5	24%	0.8	13%	6.1
Carver	4.4	18%	14.6	60%	0.0	0%	5.1	21%	0.0	0%	24.1
Dartmouth	14.0	23%	26.8	44%	0.6	1%	8.9	15%	11.1	18%	61.3
Dighton	0.6	8%	4.5	57%	0.0	0%	2.8	35%	0.0	0%	7.9
Fairhaven	11.0	63%	6.0	34%	0.5	3%	0.1	0%	0.0	0%	17.5
Fall River	13.5	21%	28.2	44%	2.0	3%	8.2	13%	12.4	19%	64.3
Freetown	1.9	10%	9.7	50%	0.0	0%	7.6	39%	0.3	1%	19.5
Lakeville	0.4	2%	6.3	37%	0.0	0%	8.4	49%	1.9	11%	16.9
Mansfield	1.3	7%	4.5	22%	7.2	36%	2.6	13%	4.4	22%	20.0
Marion	0.0	0%	1.3	50%	0.0	0%	0.0	0%	1.3	50%	2.5
Mattapoisett	0.7	9%	4.0	49%	0.5	6%	2.0	24%	1.0	12%	8.2
Middleborough	3.4	8%	7.3	17%	3.7	9%	12.7	30%	15.3	36%	42.6
New Bedford	3.8	5%	30.2	41%	8.3	11%	6.6	9%	24.3	33%	73.2
North Attleborough	4.7	15%	12.7	41%	3.4	11%	3.3	11%	6.6	21%	30.8
Norton	1.2	7%	9.6	52%	1.3	7%	5.2	28%	1.3	7%	18.7
Plainville	7.7	49%	2.8	18%	0.0	0%	3.6	23%	1.7	11%	15.6
Raynham	5.6	46%	4.8	40%	0.0	0%	1.0	8%	0.8	6%	12.1
Rehoboth	1.0	3%	15.5	53%	0.3	1%	6.8	24%	5.4	19%	28.9
Rochester	3.0	16%	3.6	19%	3.7	20%	3.5	19%	5.0	27%	18.9
Seekonk	6.0	31%	3.8	20%	2.2	11%	4.2	21%	3.3	17%	19.6
Somerset	3.4	18%	13.3	72%	0.0	0%	0.9	5%	0.9	5%	18.6
Swansea	5.9	27%	10.9	50%	2.2	10%	2.7	12%	0.0	0%	21.7
Taunton	11.1	20%	12.0	22%	3.7	7%	7.6	14%	20.9	38%	55.3
Wareham	6.4	31%	7.2	35%	1.1	5%	1.5	8%	4.3	21%	20.5
Westport	5.9	19%	6.0	19%	5.0	16%	14.1	45%	0.0	0%	31.0
Total	**123.3**	**18%**	**271.7**	**39%**	**51.0**	**7%**	**125.1**	**18%**	**131.1**	**19%**	**702.2**

A comparison of results from the last pavement management survey completed in 2006 and the latest 2008 survey shows significant deterioration of the roadway system. As shown in Figure 8-4, the percentage of the region's roadways that are in excellent condition has dropped 12%, good condition has dropped 7%, fair condition has increased 8%, and the percentage in poor condition has increased by 12%. This indicates that the region's pavement conditions are deteriorating, and current maintenance programs fall short of adequately maintaining the existing road condition of the road network.

Figure 8-4: Regional Pavement Conditions Statistical Comparison



TRIP, a national transportation research group, released a report in September 2010 entitled "Hold the Wheel Steady: America's Roughest Rides and Strategies to Make our Roads Smoother" in which they report that 24% of the nation's metropolitan roads – interstates, freeways and other critical routes have pavements in poor conditions. They also state that this poor condition results in rough rides and cost the average urban motorist $402 annually in additional vehicle operating costs by accelerating vehicle deterioration and depreciation, increasing the frequency of needed maintenance and increasing fuel consumption and tire wear.

It is estimated that a one time cost of $176 million is needed to improve all federal aid eligible roads in the SRPEDD region to excellent condition and of which, $167 million is necessary to repair roads in fair or poor condition. An additional $9 million is needed to maintain roads in good or excellent condition. Average costs of repairs are shown in Table 8-2 and were determined by reviewing project costs from proposed and completed projects and by surveying the highway departments in participating communities. These estimates take into account costs often associated with a project such as drainage, safety and congestion improvements and a police detail or flagger; however, this is a general cost estimate and does not consider specific project needs. Cost estimates can vary considerably based on specific needs and the level and extent of distress.

Table 8-2: Breakdown of Costs by Repair Category for Locally Maintained Federal-Aid Eligible Roads in the SRPEDD Region

Repair Category	Repair Cost Estimates (per Square mile)	Condition (miles)	Total Costs
No Maintenance Required	$0	123.3	$0
Routine Maintenance	$2,323,200	271.7	$2,869,000
Preventative Maintenance	$24,780,800	51.0	$5,748,000
Rehabilitation	$92,928,000	125.1	$52,834,500
Reconstruction	$192,051,200	131.1	$114,484,000
	Totals	702.2	$175,935,500

Annual investments to maintain a road network in good to excellent condition are necessary. Allowing roads to deteriorate beyond the point at which normal maintenance is effective will double, and more often triple, the cost for corrective measures.

The reality is that the region has not been able to financially keep up with the normal deterioration of pavement. The ideal goal of pavement management is to repair as many road miles as possible resulting in upgrades to the "excellent" and "good" category. If that could be accomplished, in the long run we would require less tax dollars to maintain the existing road network. However, because of the extremely high rehabilitation and reconstruction costs, this is fiscally and physically impossible to attain under current funding constraints.

Estimated 5-year and 10-year investment plans to bring all the locally maintained federal-aid eligible roads up to maintainable levels were developed using a forecasting model that takes into account pavement deterioration and are shown in Table 8-3. The 5-year plan recommends a "Best First" approach (concentrates on preventative maintenance) with an estimated $40 million investment per year for 5 years. After the initial 5-year investment, the network would require an estimated $2 million per year to maintain. The 10-year plan recommends a best-first approach with an estimated $21 million per year for 10 years. After the initial 10-year investment the network would require an estimated $2 million per year to maintain.

Table 8-3: Pavement Management Strategies for Locally Maintained Federal-Aid Eligible Roads in the SRPEDD Region

Years	5-Year Plan	10-Year Plan
1	$40,000,000	$21,000,000
2	$40,000,000	$21,000,000
3	$40,000,000	$21,000,000
4	$40,000,000	$21,000,000
5	$40,000,000	$21,000,000
6	$2,000,000	$21,000,000
7	$2,000,000	$21,000,000
8	$2,000,000	$21,000,000
9	$2,000,000	$21,000,000
10	$2,000,000	$21,000,000
After	$2,000,000	$2,000,000

The Chapter 90 program reimburses municipalities for documented expenses allocated to roadway projects. Communities within the region are given an apportionment, which can be spent immediately or saved up over time. Table 8-4 shows a breakdown of 2010 Chapter 90 Apportionment by community. Chapter 90 funds can also be used to build bikeways, purchase equipment, construct salt sheds and garages, pay for design needs, etc.

Table 8-4: FY 2010 Chapter 90 Apportionment by Community

Community	FY 2010 Apportionment
Acushnet	$240,035
Attleboro	$908,811
Berkley	$197,840
Carver	$326,707
Dartmouth	$870,381
Dighton	$214,978
Fairhaven	$384,743
Fall River	$1,529,794
Freetown	$303,474
Lakeville	$278,560
Mansfield	$566,860
Marion	$133,450
Mattapoisett	$175,599
Middleborough	$653,947
New Bedford	$1,611,892
North Attleborough	$561,834
Norton	$420,484
Plainville	$205,521
Raynham	$358,035
Rehoboth	$441,706
Rochester	$230,218
Seekonk	$428,375
Somerset	$387,655
Swansea	$435,221
Taunton	$1,057,196
Wareham	$549,196
Westport	$468,808
Regional Total	**$13,941,319**

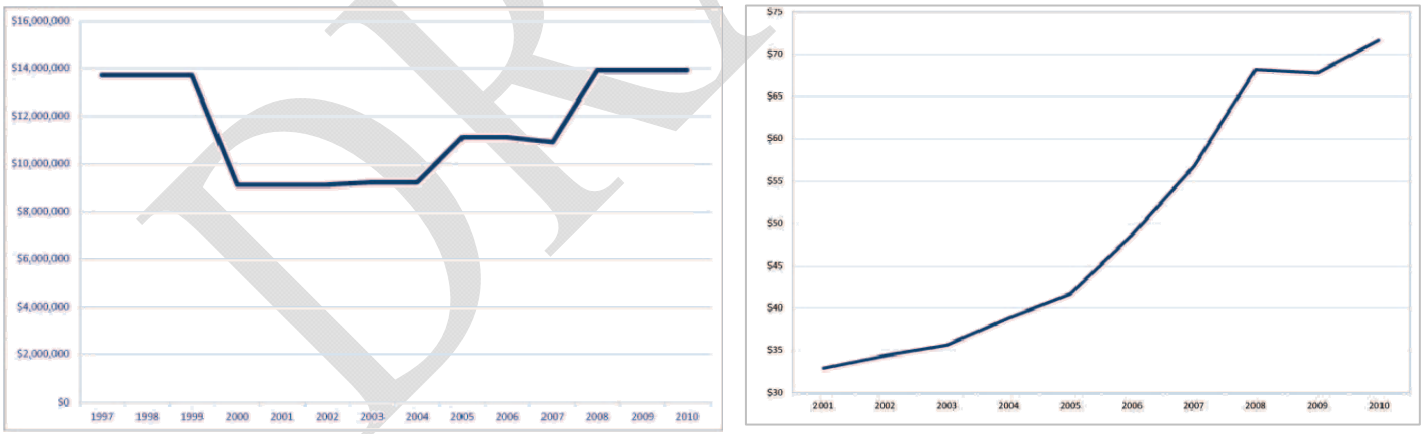
The amount of Chapter 90 funding in the SMMPO region has fluctuated since the late 1990's (See Table 8-5). In 1997, Chapter 90 funding was over $13 million. By the year 2000, the funding had dropped to just over $9 million and has only managed to get back to the 1997 funding level in 2008. While the funding has increased over time, it does not account for recent increases in the cost of materials, specifically asphalt. In 2001, the average market price per ton of asphalt was $33, and by 2010, the average price of asphalt increased to $72 per ton as determined by a survey of SRPEDD communities. Chapter 90 allocation is fairly level when compared to the rapid increase in the average price of asphalt as shown in Figure 8-6.

With these additional, but viable uses for money, communities have to make difficult choices within their own budgets for roadway improvements. Due to the amount of funding and various needs of the communities, many decide to save their yearly allocation over several years to complete a project. Based on the region's existing pavement conditions, it is apparent that the road network cannot be adequately maintained based on the amount of existing funds. Additional funding must be made available at the federal, state, and local levels of government.

Table 8-5: SMMPO Region Chapter 90 Allocation

Year	Ch 90 Allocation
1997	$13,668,583
1998	$13,745,316
1999	$13,668,583
2000	$9,128,160
2001	$9,099,506
2002	$9,128,142
2003	$9,177,413
2004	$9,159,636
2005	$11,072,797
2006	$11,123,094
2007	$10,949,383
2008	$13,941,220
2009	$13,932,182
2010	$13,941,319

Figure 8-6: Chapter 90 Allocations vs. Average Price of Asphalt Community Averages



Based on the SMMPO's FFY 2011-2014 Transportation Improvement Program (TIP), approximately $21 million of Surface Transportation Program (STP) funding is allocated towards reconstruction. The Surface Transportation Program provides flexible funding that may be used by States and localities for projects on any Federal-aid highway, including the NHS, bridge projects on any public road, transit capital projects, and intercity bus terminals and facilities. Using current road conditions and level funding of the TIP at $5.3 million per year for 2011-2016, our analysis estimates that the percentage of STP roads that need reconstruction and rehabilitation will increase from 37% to 66% by 2016.

Communities are currently struggling to maintain their local roadways, which on average account for 69% of the total roadway mileage in our region. Based on limited funding levels and increasing costs, it has become extremely difficult to keep up with maintenance of our road network.

In the selection of highway projects competing for limited funds, it has been the SMMPO's policy to give precedence to projects that address safety and mobility issues, causing a simple reconstruction or rehabilitation project to have less significance and take years to be programmed into the TIP. It has also been our policy to scrutinize proposed projects to identify other needs. For example, a roadway proposed for reconstruction may also have drainage issues that contribute to a more rapid deterioration of the road, and may even contribute to safety problems. Addressing all problems at once, although more costly in the short term, is more cost effective in the long term. Though these roads qualify for federal funding, they are subject to federal design standards. In some cases, waivers are possible, but often these roads are repaired through Chapter 90 funding or non-federal aid programs because of cost effectiveness and less stringent design standards.

Projects

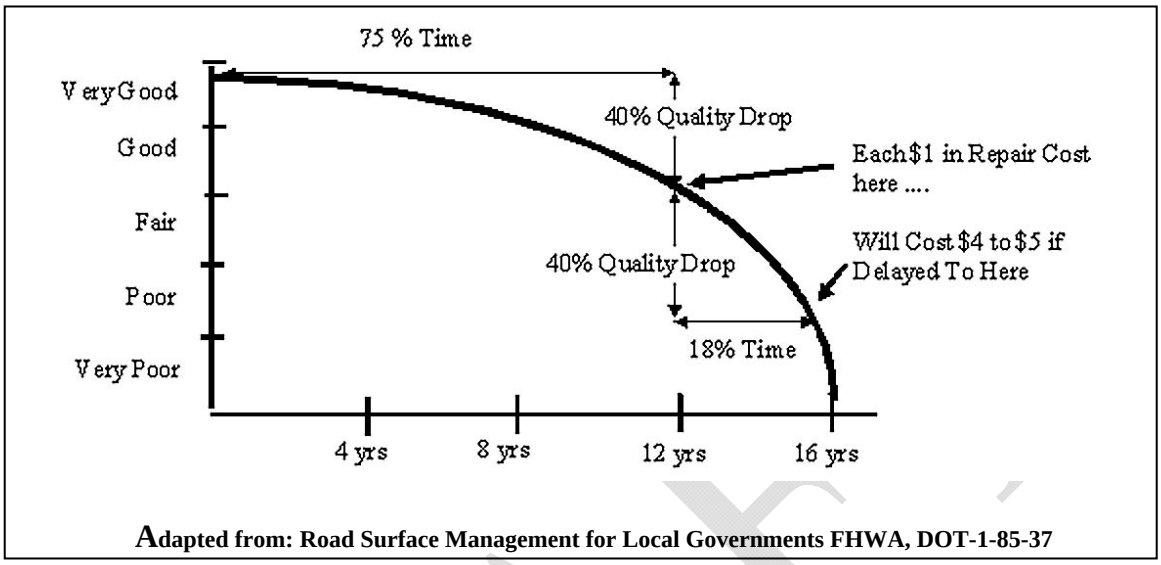
Projects that address pavement improvements only generally do not take precedence over projects that address safety or congestion improvements; however there are roads in our region that are severely deteriorated and deserve consideration for improvement with the limited funds available.

Ideally, a pavement management program promotes maintaining roads in good condition rather than allowing pavement to deteriorate to the point where more expensive repairs (i.e. rehabilitation and reconstruction) become necessary.

The strategy generally considered to be the most cost-effective is the "Best First" approach, which initially concentrates investment on routine and preventative maintenance to the roads currently in fair to good condition. As shown in Figure 8-7, in the early years of a pavement's design life, the rate of deterioration is fairly slow. When the pavement reaches approximately 75% of its design life, the rate of deterioration starts to accelerate as the pavement condition quickly drops from fair to poor. The pavement deteriorates another 40 % in the next 18% of its design life. It also shows that for every dollar required to rehabilitate a pavement that has reached 75% of its design life, it will take at least four to five dollars to rehabilitate a pavement if rehabilitation is delayed 3 years. The reason for this drastic

increase in rehabilitation costs in the type of repair necessary to properly upgrade the more distressed pavement.

Figure 8-7: Pavement Deterioration Curve



Adapted from: Road Surface Management for Local Governments FHWA, DOT-1-85-37

According to the TRIP report, transportation agencies can reduce pavement life cycle costs by adopting a pavement preservation approach similar to the "Best First" approach that emphasizes making early initial repairs to pavement surfaces while they are still in good condition and with the use of higher-quality paving materials, which reduces the cost of keeping roads smooth by delaying the need for costly reconstruction.

Although the "Best First" approach is considered the most efficient, current levels of funding do not provide sufficient dollars to effectively carry out a maintenance program while also addressing severely deteriorated roads. The result is an ever worsening road network that will lead to more expensive repairs. The ultimate goal of this program is to improve conditions to a maintainable level. A balance needs to be created between improving the fair to poor condition roads while insuring that roads in good to excellent conditions remain that way.

Whether from wear and tear, weather or construction failures, deterioration of pavement is inevitable. Communities should have a pavement management program to evaluate current road conditions and plan future repair and maintenance. Communities should also have quality control measures in place to insure proper construction techniques, and may even consider hiring a quality control inspector.

Highway preservation projects provide significant economic benefits by improving travel speeds, capacity, load-carry abilities and safety, and reducing operating costs for people and businesses. Roadway repairs can also extend the service life of a road, which saves money by either postponing or eliminating the need for more expensive future repairs. A Federal Highway Administration (FHWA) report: "Highway Infrastructure Investment and Job Generation: A Look at the Positive Employment Impacts of Highway Investment" states that every $1 billion invested in highway construction would support approximately 27,800 jobs,

including approximately 13,800 in the construction sector and supporting industries, and approximately 14,000 other jobs induced in non-construction-related sectors of the economy.

Recent advances in pavement technologies are working to increase the service life of pavement as well as use more environmentally friendly and sustainable methods. Technology advances include the recycling of materials such as shingles and tires, and the reduction of temperatures used in the paving process. The use of recycled materials reduces the amount of asphalt needed and contributes to the overall service life of the pavement and reduces the material costs. The reduction of temperatures associated with the paving process, such as the use of Warm Mixed Asphalt or Half Warm Mixed Asphalt instead of Hot Mixed Asphalt, significantly reduces the amount of energy required and therefore, cost. A policy to incorporate the use of these technologies could significantly improve the overall service life, provide more sustainable and ecologically sound alternatives, and significantly decrease costs associated with paving projects.

Based on the Road Surface Management System results, Table 8-6 and Table 8-7 provide lists of specific roads recommended for reconstruction and rehabilitation. In many instances, these recommendations are for specific segments within each roadway. It is also important to note that some of these roads may have already been repaired since the completion of the roadway surveys. The lists are intended to be used as a guide and it is the responsibility of each community's highway department to determine if these repairs are appropriate.

Table 8-6: Roadways Requiring Reconstruction

Community	Roadway	Functional Classification	Length
Acushnet	Middle Road	Urban Minor Arterial	0.60
Acushnet	Middle Road	Urban Minor Arterial	2.00
Acushnet	Peckham Road	Urban Minor Arterial	1.49
Attleboro	Brown Street	Urban Minor Arterial	1.00
Attleboro	Collins Street	Urban Minor Arterial	0.20
Attleboro	County Street	Urban Minor Arterial	1.60
Attleboro	County Street	Urban Minor Arterial	0.30
Attleboro	North Main Street	Urban Minor Arterial	1.10
Attleboro	Park Street	Urban Principal Arterial	1.09
Attleboro	South Main Street	Urban Minor Arterial	0.12
Berkley	Berkley Street	Urban Minor Arterial	0.80
Dartmouth	Allen Street	Urban Collector	0.47
Dartmouth	Cross Road	Urban Collector	0.65
Dartmouth	Dartmouth Street	Urban Minor Arterial	0.41
Dartmouth	Elm Street	Urban Minor Arterial	0.55
Dartmouth	Faunce Corner Road	Urban Collector	1.30
Dartmouth	Hathaway Road	Urban Minor Arterial	0.44
Dartmouth	Hawthorn Street	Urban Minor Arterial	0.58
Dartmouth	Hixville Road	Urban Collector	0.94
Dartmouth	Hixville Road	Urban Collector	0.31
Dartmouth	Horseneck Road	Rural Major Collector	2.58
Dartmouth	Lucy Little Road	Urban Collector	1.25
Dartmouth	Old Westport Road	Urban Minor Arterial	1.20
Dartmouth	Reed Road	Urban Collector	0.54
Dartmouth	Rock O'Dundee Road	Rural Minor Collector	1.87
Fall River	Blossom Road	Urban Collector	2.980
Fall River	Baylies Street	Urban Minor Arterial	0.08
Fall River	Borden Street	Urban Minor Arterial	0.10
Fall River	Central Street	Urban Minor Arterial	0.10
Fall River	County Street	Urban Collector	0.90
Fall River	Davol Street East	Urban Minor Arterial	0.29
Fall River	Davol Street West	Urban Minor Arterial	0.90
Fall River	Davol Street West	Urban Minor Arterial	0.42
Fall River	Eagle Street	Urban Minor Arterial	0.32
Fall River	Eastern Avenue	Urban Minor Arterial	0.50
Fall River	Hartwell Street	Urban Minor Arterial	0.30
Fall River	High Street	Urban Collector	0.50
Fall River	Jefferson Street	Urban Minor Arterial	0.70
Fall River	New Boston Road	Urban Collector	0.90
Fall River	Oak Grove Avenue	Urban Collector	0.80
Fall River	President Avenue	Urban Principal Arterial	0.50
Fall River	Stafford Road	Urban Minor Arterial	1.10
Fall River	Third Street North	Urban Minor Arterial	0.10

Table 8-6 (Continued): Roadways Requiring Reconstruction

Community	Roadway	Functional Classification	Length
Fall River	Tucker Street	Urban Collector	0.60
Fall River	Turner Street	Urban Minor Arterial	0.03
Fall River	Twelfth Street	Urban Collector	0.09
Fall River	Valentine Street	Urban Collector	0.10
Fall River	Water Street	Urban Minor Arterial	0.31
Fall River	Wilson Road	Urban Collector	0.30
Fall River	Wilson Road	Urban Minor Arterial	0.90
Freetown	Chace Road	Rural Major Collector	0.60
Lakeville	Bridge Street	Urban Collector	0.10
Lakeville	Taunton Street	Urban Collector	1.40
Mansfield	Chauncy Street	Urban Principal Arterial	0.10
Mansfield	Eastman Street	Urban Principal Arterial	0.20
Mansfield	Oakland Street	Urban Minor Arterial	3.31
Mansfield	Plain Street	Urban Collector	0.50
Mansfield	Pratt Street	Urban Principal Arterial	0.50
Mansfield	Reservoir Street	Urban Collector	0.40
Mansfield	School Street	Urban Collector	0.30
Mansfield	West Street	Urban Collector	1.50
Marion	Main Street	Urban Minor Arterial	0.30
Mattapoisett	Beacon Street	Urban Minor Arterial	0.20
Mattapoisett	Marion Road	Urban Collector	1.60
Mattapoisett	North Street	Urban Collector	0.40
Mattapoisett	Water Street	Urban Collector	0.40
Middleborough	Courtland Street	Urban Minor Arterial	0.22
Middleborough	East Grove Street	Urban Minor Arterial	2.90
Middleborough	East Main Street	Urban Minor Arterial	1.50
Middleborough	Everett Street	Urban Minor Arterial	1.32
Middleborough	Highland Street	Rural Minor Collector	2.70
Middleborough	Miller Street	Urban Collector	0.90
Middleborough	Nemasket Street	Urban Collector	0.21
Middleborough	North Main Street	Urban Minor Arterial	0.39
Middleborough	Oak Street	Urban Collector	0.60
Middleborough	Plympton Street	Urban Minor Arterial	0.30
Middleborough	River Street	Urban Minor Arterial	2.20
Middleborough	Rocky Gutter Street	Urban Collector	0.19
Middleborough	Sachem Street	Urban Minor Arterial	0.40
Middleborough	South Street	Rural Minor Collector	0.12
Middleborough	Station Street	Urban Minor Arterial	0.30
Middleborough	Vaughan Street	Rural Minor Collector	1.02
Middleborough	Wareham Street	Urban Collector	0.80
Middleborough	Wareham Street	Urban Minor Arterial	0.30
Middleborough	West Grove Street	Urban Minor Arterial	0.40
New Bedford	Acushnet Avenue	Urban Minor Arterial	3.10
New Bedford	Acushnet Avenue	Urban Principal Arterial	0.10
New Bedford	Airport Access Road	Urban Minor Arterial	0.74

Table 8-6 (Continued): Roadways Requiring Reconstruction

Community	Roadway	Functional Classification	Length
New Bedford	Ashley Boulevard	Urban Principal Arterial	0.70
New Bedford	Bolton Street	Urban Collector	0.30
New Bedford	Brock Avenue	Urban Minor Arterial	1.50
New Bedford	Church Street	Urban Minor Arterial	0.20
New Bedford	Coffin Avenue	Urban Collector	0.70
New Bedford	Coggeshall Street	Urban Collector	1.20
New Bedford	Cottage Street	Urban Minor Arterial	0.10
New Bedford	County Street	Urban Minor Arterial	1.50
New Bedford	Downey Street	Urban Minor Arterial	0.13
New Bedford	Durfee Street	Urban Collector	0.20
New Bedford	Elm Street	Urban Collector	0.15
New Bedford	Fair Street	Urban Collector	0.10
New Bedford	Hawthorn Street	Urban Minor Arterial	0.60
New Bedford	Herman Melleville Boulevard	Urban Collector	0.68
New Bedford	Hillman Street	Urban Collector	0.15
New Bedford	Kempton Street	Urban Minor Arterial	0.50
New Bedford	Kings Highway	Urban Minor Arterial	0.30
New Bedford	MacArthur Drive	Urban Collector	0.70
New Bedford	Mill Road	Urban Minor Arterial	0.40
New Bedford	Mill Street	Urban Minor Arterial	0.80
New Bedford	Mount Pleasant Street	Urban Minor Arterial	0.40
New Bedford	North Front Street	Urban Collector	1.40
New Bedford	North Street	Urban Collector	0.60
New Bedford	North Street	Urban Collector	0.60
New Bedford	Old Plainville Road	Urban Minor Arterial	0.20
New Bedford	Orchard Street	Urban Collector	0.10
New Bedford	Pleasant Street	Urban Minor Arterial	1.40
New Bedford	Potomska Street	Urban Collector	0.20
New Bedford	Rockdale Avenue	Urban Minor Arterial	0.30
New Bedford	Rodney French Blvd.	Urban Minor Arterial	1.30
New Bedford	School Street	Urban Collector	0.30
New Bedford	Second Street	Urban Minor Arterial	0.15
New Bedford	Shawmut Avenue	Urban Minor Arterial	0.79
New Bedford	Shawmut Avenue	Urban Minor Arterial	0.80
New Bedford	Sixth Street	Urban Minor Arterial	0.60
New Bedford	Spring Street	Urban Collector	0.30
New Bedford	Summer Street	Urban Minor Arterial	0.95
New Bedford	Thompson Street	Urban Collector	0.10
New Bedford	Washburn Street	Urban Collector	0.21
North Attleborough	Allen Avenue	Urban Collector	1.20
North Attleborough	Arnold Mills Road	Urban Collector	0.23
North Attleborough	Commonwealth Avenue	Urban Minor Arterial	0.10
North Attleborough	Elmwood Street	Urban Minor Arterial	1.10
North Attleborough	Francis Kelly Boulevard	Urban Minor Arterial	0.30
North Attleborough	Hickory Road	Urban Minor Arterial	1.30

Table 8-6 (Continued): Roadways Requiring Reconstruction

Community	Roadway	Functional Classification	Length
North Attleborough	Hoppin Hill Road	Urban Collector	0.33
North Attleborough	Mount Hope Street	Urban Collector	0.50
North Attleborough	Plain Street	Urban Collector	0.60
Norton	North Worcester Street	Urban Collector	0.70
Norton	Old Colony Road	Principal Arterial	0.80
Norton	Reservoir Street	Urban Collector	0.70
Norton	West Main Street	Principal Arterial	2.40
Plainville	South Street (Route 1A)	Urban Minor Arterial	0.50
Plainville	Taunton Street	Urban Minor Arterial	1.10
Raynham	Broadway	Urban Collector	1.30
Raynham	Old North Main Street	Urban Collector	0.07
Raynham	Pleasant Street	Urban Collector	1.30
Rehoboth	Pleasant Street	Urban Minor Arterial	2.40
Rehoboth	Providence Street	Urban Collector	3.00
Rehoboth	Rocky Hill Road	Urban Collector	0.54
Rochester	Walnut Plain Road	Urban Collector	0.50
Rochester	Walnut Plain Road	Urban Collector	1.60
Seekonk	Central Avenue	Urban Minor Arterial	0.90
Seekonk	Newman Avenue	Urban Minor Arterial	2.20
Somerset	Buffington Street	Urban Minor Arterial	0.26
Somerset	County Street	Urban Minor Arterial	2.90
Somerset	Pleasant Street	Urban Minor Arterial	0.70
Taunton	Arlington Street	Urban Collector	0.60
Taunton	Bay Street	Urban Collector	1.20
Taunton	Caswell Street	Urban Collector	0.90
Taunton	Cohannet Street	Urban Minor Arterial	0.17
Taunton	Dean Street	Principal Arterial	0.60
Taunton	Fifth Street	Urban Collector	0.19
Taunton	Fremont Street	Urban Collector	0.73
Taunton	Joesph E. Warner Boulevard	Urban Minor Arterial	1.20
Taunton	Middleboro Avenue	Urban Collector	4.10
Taunton	Purchase Street	Urban Collector	0.34
Taunton	Somerset Avenue	Urban Minor Arterial	2.25
Taunton	Tremont Street	Urban Minor Arterial	1.60
Taunton	West Britannia Street	Urban Collector	0.40
Taunton	Winthrop Street	Principal Arterial	1.30
Wareham	Cranberry Highway	Urban Minor Arterial	2.50
Wareham	Depot Street	Urban Minor Arterial	0.32
Wareham	Glen Charlie Road	Urban Collector	0.76
Wareham	Onset Avenue	Urban Minor Arterial	2.50
Wareham	Union Avenue	Urban Minor Arterial	0.22
Westport	GAR Highway	Urban Minor Arterial	1.20

Table 8-7: Roadways Requiring Rehabilitation

Community	Roadway	Functional Class	Length
Acushnet	Slocum Street	Urban Minor Arterial	0.48
Attleboro	Adamsdale Road	Urban Collector	0.27
Attleboro	Bacon Street	Urban Collector	0.40
Attleboro	Highland Avenue	Urban Principal Arterial	1.20
Attleboro	May Street	Urban Collector	0.26
Attleboro	North Main Street	Urban Minor Arterial	0.30
Attleboro	Park Street	Urban Principal Arterial	1.20
Attleboro	Pike Avenue	Urban Collector	0.60
Attleboro	South Main Street	Urban Minor Arterial	0.90
Berkley	Bay View Avenue	Urban Principal Arterial	0.25
Berkley	Elm Street	Urban Principal Arterial	1.10
Berkley	Padelford Street	Urban Minor Arterial	1.80
Berkley	Porter Street	Urban Principal Arterial	0.85
Carver	Centre Street	Urban Minor Arterial	1.50
Carver	Crescent Road	Urban Collector	0.16
Carver	Main Street	Urban Minor Arterial	3.50
Carver	Plymouth Street	Principal Arterial	0.73
Dartmouth	Faunce Corner Mall Road	Urban Principal Arterial	0.86
Dartmouth	Faunce Corner Road	Urban Minor Arterial	0.64
Dartmouth	Hixville Road	Urban Collector	1.24
Dartmouth	Horseneck Road	Rural Major Collector	2.58
Dartmouth	Rock O'Dundee Road	Rural Minor Collector	1.46
Dartmouth	Rockland Road	Urban Collector	1.15
Dartmouth	Smith Neck Road	Rural Minor Collector	0.35
Dartmouth	Woodcock Road	Rural Minor Collector	0.72
Dighton	Cedar Street	Urban Minor Arterial	1.01
Dighton	Warner Boulevard	Urban Minor Arterial	0.17
Dighton	Williams Street	Rural Major Collector	1.60
Fairhaven	Green Street	Urban Minor Arterial	0.07
Fairhaven	Huttleston Avenue	Principal Arterial	1.50
Fall River	Airport Road Rotary	Urban Collector	0.15
Fall River	Blossom Road	Urban Collector	2.98
Fall River	Broadway Extension	Urban Minor Arterial	0.60
Fall River	Columbia Street	Urban Minor Arterial	0.42
Fall River	Eastern Avenue	Urban Minor Arterial	0.50
Fall River	Ferry Street	Urban Minor Arterial	0.21
Fall River	Laurel Street	Urban Minor Arterial	0.04
Fall River	Mariano S. Bishop Boulevard	Urban Minor Arterial	0.27
Fall River	Pleasant Street	Urban Minor Arterial	0.22
Fall River	Pleasant Street	Urban Collector	0.37
Fall River	Plymouth Avenue	Urban Minor Arterial	0.73
Fall River	Rhode Island Avenue	Urban Minor Arterial	0.43
Fall River	Sullivan Street	Urban Minor Arterial	0.13
Fall River	William S. Canning Boulevard	Urban Minor Arterial	0.20
Fall River	Williams Street	Urban Minor Arterial	0.22
Freetown	Bullock Road	Rural Major Collector	1.80
Freetown	Chipaway Road	Rural Major Collector	1.82
Freetown	Howland Road	Urban Minor Arterial	2.80
Freetown	North Main Street	Urban Minor Arterial	0.90

Table 8-7 (Continued): Roadways Requiring Rehabilitation

Community	Roadway	Functional Class	Length
Lakeville	Bedford Street (Route 18)	Rural Major Collector	1.70
Lakeville	Freetown Street	Rural Major Collector	1.30
Lakeville	Highland Road	Urban Minor Arterial	2.60
Lakeville	Rhode Island Road	Urban Minor Arterial	2.60
Lakeville	Chauncy Street	Urban Principal Arterial	0.67
Mansfield	Copeland Drive	Urban Minor Arterial	0.16
Mansfield	East Street	Urban Collector	1.49
Mansfield	Park Street	Urban Minor Arterial	0.03
Mansfield	South Main Street	Urban Minor Arterial	1.21
Mansfield	Willow Street	Urban Collector	1.04
Mattapoisett	Acushnet Road	Rural Minor Collector	1.95
Middleborough	Anderson Avenue	Urban Minor Arterial	0.73
Middleborough	Purchase Street	Rural Minor Collector	1.95
Middleborough	Sachem Street	Urban Minor Arterial	0.42
Middleborough	Thompson Street	Rural Major Collector	3.47
Middleborough	Titicut Street	Urban Minor Arterial	0.33
Middleborough	Wareham Street	Rural Major Collector	2.51
Middleborough	West Grove Street	Urban Minor Arterial	2.10
Middleborough	Wood Street	Urban Collector	2.10
New Bedford	Brownell Avenue	Urban Minor Arterial	0.65
New Bedford	Hathaway Boulevard	Urban Minor Arterial	0.71
New Bedford	Hawthorn Street	Urban Minor Arterial	0.43
New Bedford	Kempton Street	Urban Principal Arterial	0.50
New Bedford	Mount Pleasant Street	Urban Minor Arterial	1.70
New Bedford	Parker Street	Urban Minor Arterial	1.00
New Bedford	Pearl Street	Urban Minor Arterial	0.20
New Bedford	Penniman Street	Urban Minor Arterial	0.05
New Bedford	Quanset Street	Urban Minor Arterial	0.06
New Bedford	Riverside Avenue	Urban Minor Arterial	0.52
New Bedford	Rodney French Boulevard	Urban Principal Arterial	0.14
New Bedford	Shawmut Avenue	Urban Minor Arterial	0.80
New Bedford	Sutton Street	Urban Collector	0.31
New Bedford	Weld Street	Urban Minor Arterial	0.36
North Attleborough	Francis Kelly Boulevard	Urban Minor Arterial	0.93
North Attleborough	Holmes Road	Urban Collector	0.10
North Attleborough	Linden Street	Urban Collector	0.15
North Attleborough	Old Post Road	Urban Collector	0.50
North Attleborough	Reservoir Street	Urban Collector	0.57
North Attleborough	Smith Street	Urban Collector	1.11
Norton	Dean Street	Urban Collector	0.91
Norton	John Bryson Scott	Urban Minor Arterial	2.67
Norton	North Worcester Street	Urban Collector	1.62
Plainville	George Street	Urban Collector	0.62
Plainville	Hawkins Street	Urban Collector	0.30
Plainville	High Street	Urban Collector	2.46
Plainville	School Street	Urban Collector	0.40
Plainville	Walnut Street	Urban Collector	0.96
Raynham	Broadway (Rte. 138)	Urban Minor Arterial	0.64
Raynham	Broadway (Rte. 138)	Urban Minor Arterial	0.10

Table 8-7 (Continued): Roadways Requiring Rehabilitation

Community	Roadway	Functional Class	Length
Raynham	Pleasant Street	Urban Collector	0.97
Rehoboth	Agricultural Avenue	Urban Collector	0.85
Rehoboth	Davis Street	Urban Minor Arterial	0.84
Rehoboth	Homestead Avenue	Urban Collector	1.46
Rehoboth	Reservoir Avenue	Urban Collector	0.94
Rehoboth	Simmons Street	Urban Collector	0.61
Rehoboth	Summer Street	Urban Collector	0.17
Rehoboth	Wheeler Street	Urban Collector	2.02
Rehoboth	Willmarth Bridge Road	Urban Collector	0.60
Rochester	Braley Hill Road	Rural Major Collector	1.61
Rochester	North Avenue	Rural Minor Collector	2.18
Seekonk	Back Street	Urban Collector	0.18
Seekonk	Central Avenue	Urban Minor Arterial	0.40
Seekonk	Fall River Avenue	Urban Minor Arterial	0.66
Seekonk	Pine Street	Urban Collector	2.39
Seekonk	Reed Street	Urban Collector	1.11
Somerset	East County Street	Urban Minor Arterial	0.11
Somerset	High Street	Urban Minor Arterial	0.48
Somerset	North Street	Urban Minor Arterial	0.31
Swansea	Mason Street	Urban Collector	0.24
Swansea	Old Providence Road	Urban Collector	0.76
Swansea	Sharps Lot Road	Rural Major Collector	1.69
Taunton	Broadway (Rte. 138)	Urban Minor Arterial	0.29
Taunton	Burt Street	Urban Principal Arterial	0.19
Taunton	County Street	Urban Minor Arterial	1.23
Taunton	Court Street	Urban Minor Arterial	0.20
Taunton	High Street	Urban Collector	0.22
Taunton	Myricks Street (Route 79)	Urban Minor Arterial	1.29
Taunton	Old Colony Avenue	Urban Collector	0.24
Taunton	South Precinct Street	Urban Collector	1.12
Taunton	Tremont Street	Urban Minor Arterial	1.47
Taunton	Tremont Street	Urban Minor Arterial	1.09
Taunton	Washington Street	Urban Minor Arterial	0.45
Wareham	Cranberry Highway	Urban Minor Arterial	2.10
Wareham	Great Neck Road	Urban Collector	1.16
Wareham	Main Street	Urban Minor Arterial	0.46
Westport	Adamsville Road	Rural Major Collector	2.40
Westport	GAR Highway	Urban Minor Arterial	1.19
Westport	John Reed Road	Rural Major Collector	1.90
Westport	Mullin Hill Road	Rural Minor Collector	0.15
Westport	Old County Road	Urban Minor Arterial	1.02
Westport	Old Harbor Road	Rural Minor Collector	0.28
Westport	Old Harbor Road	Rural Minor Collector	0.55
Westport	Old Horseneck Road	Rural Major Collector	0.38
Westport	Pine Hill Road	Rural Major Collector	2.12
Westport	Reed Road	Urban Collector	1.26
Westport	River Road	Rural Minor Collector	2.35
Westport	Tickles Road	Urban Collector	1.62

Recommendations

The SMMPO recommends the following for improving the pavement conditions in Southeastern Massachusetts:

8-1 A Federal Highway Administration Directive in response to the approval of SRPEDD's UPWP stated that the SMMPOs need to know the cost of maintaining the functionally classified roads not covered under MassDOT Highway Division jurisdiction and to ensure that priority is given to their maintenance. Based on the value and the effectiveness of pavement management for transportation improvement evaluation and the FHWA Directive, this Regional Transportation Plan recommends the continuous update of pavement conditions for all federal aid eligible roads in the SMMPO region. This would include data collection of the region's road conditions over a three-year period, beginning in the SRPEDD FY 2010 Unified Planning Work Program. The results from this effort will continue to provide a tool for local communities, planners, engineers, and MassDOT Highway Division to protect and maintain the investment in our road network for the foreseeable future.

8-2 Communities should consider incorporating safety, congestion, and other elements (i.e. improved drainage, sidewalks and bike paths) into road reconstruction and rehabilitation projects to be more competitive for federal funding. SRPEDD's Geographic Roadway Runoff Inventory Program (GRRIP), Safety Management Program and Congestion Management Program are valuable tools in this effort.

8-3 The amount of state and federal funds available for the maintenance of roads needs to be increased to keep pace with the rising costs of materials and labor. The rate at which roads are currently deteriorating shows a dire need for increased maintenance. This deficiency requires drastic fiscal measures, such as dedicated source of revenue to be reserved solely for transportation improvements throughout the state. **Additional funding for maintenance, rehabilitation and reconstruction is necessary to achieve the goal of a good, sound road network that will last for many years.**

8-4 The incorporation of a policy to integrate the use of advanced pavement technologies to significantly improve the overall service life, provide more sustainable and ecologically sound alternatives, and significantly decrease costs associated with paving projects.

8-5 Communities should consider the implementation of quality control guidelines for all paving projects, and may consider hiring a quality control inspector to guard against premature pavement deterioration due to construction error.