

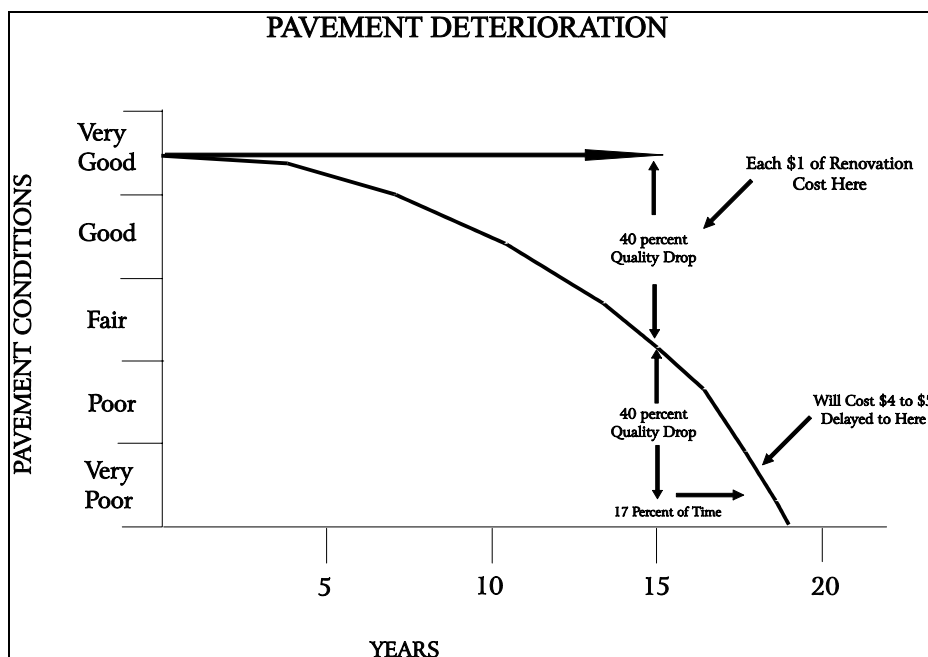
Chapter 8 : Pavement Management

The ultimate goal of a pavement management program is to bring all roadways up to good to excellent condition and maintain that condition into the future in the most expeditious and cost effective manner.

Unfortunately, local roadway improvements are often made based on public pressure. Sometimes those suggestions get implemented without regard to cost effectiveness or engineering standards. Decisions on improvements ultimately must be made incorporating sound engineering judgment. Local and state officials must listen to the general public's opinion on roadway improvement needs; but ultimately, decisions on improvements must be made with regard to engineering judgment. SRPEDD, on behalf of the Southeastern Massachusetts Metropolitan Planning Organization (SMMPO), has been providing pavement management services for member communities since 1984. SRPEDD has just completed a regional *Pavement Management Program* of functionally classified, federal-aid eligible roadways as part of our Unified Work Program. This effort was carried out over a three-year period (2004 – 2006).

The strategy considered to be the most cost-effective is referred to as the “Best First” approach, which initially concentrates investment on routine and preventative maintenance to the roads currently in fair to good condition. This approach extends the useful life of roads by preventing rapid deterioration. Spending money on routine maintenance now will prevent the need for more expensive repairs in the future (See Figure 8-1 below).

Figure 8-1



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 addressing severely deteriorated roads. The result is ever worsening road conditions that will lead to unsafe driving conditions and more expensive repairs.

Local Pavement Management

The local pavement management program is offered to all communities. It 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.

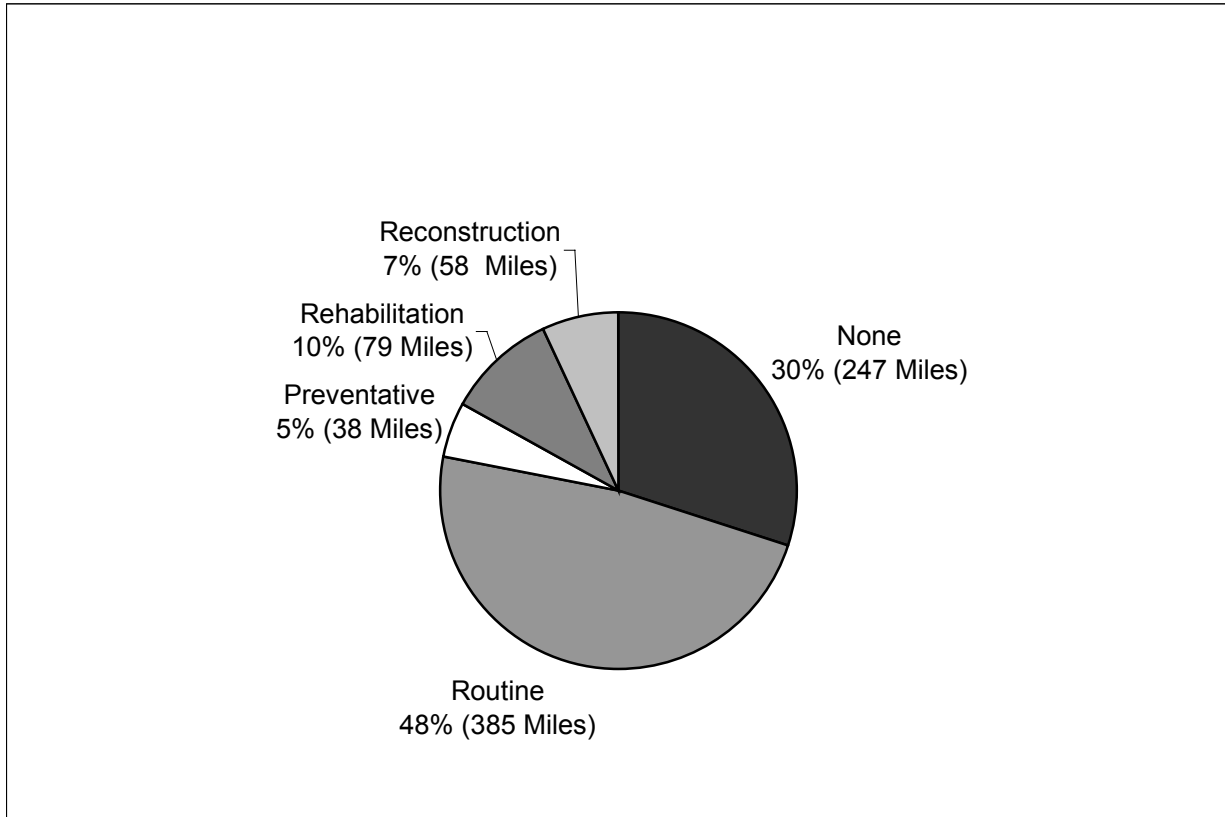
Municipalities that have participated in the program include: Acushnet, Carver, Dartmouth, Fairhaven, Freetown, Marion, Mattapoissett, New Bedford, North Attleborough, Rehoboth, Rochester, Seekonk, Somerset, Swansea, and Taunton. SRPEDD continues to offer this assistance to communities free of charge with support from the Federal Highway Administration (FHWA) and the Massachusetts Highway Department (MassHighway).

Regional Pavement Management

The regional pavement management program consists of collecting, evaluating, and reporting on the pavement conditions of all roads eligible for funding from the Surface Transportation Program (STP). These roadways account for 26% of the total STP and State & Local roadway mileage in our region. 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. SRPEDD is annually committed to updating the pavement condition data to determine where repairs are needed.

Currently, 30% of STP-funded roadways require no maintenance, 48% are in good condition, 5% need preventive maintenance, 10% require rehabilitation, and 7% are in need of reconstruction (See Figure 8-2 on the following page). Roads requiring no maintenance or routine maintenance are considered to be in excellent condition. Roads in good condition require inexpensive, preventive surface treatments to maintain their condition. Roads requiring rehabilitation or reconstruction are considered to be in fair and poor condition. These roads require a more durable surface, possible sub-surface improvements, are typically more expensive to repair, and frequently require a longer time frame for implementation.

Figure 8-2
Regional STP Road Conditions, 2004-2006 Results



It is estimated that it would cost over \$89 million dollars to bring all of the region's STP fair to poor roadways to a good condition. This amount does not take into consideration the cost of routine maintenance. It is difficult to estimate the cost associated with routine maintenance because the amount of required material is dependent on the level and area of distress. 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 cannot 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 "none required" and "routine maintenance" category. If that could be accomplished, the end result 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. **Additional funding for rehabilitation/reconstruction is necessary to achieve the goal of a good, sound road network that will last for many years.**

Based on our existing 2007–2010 Transportation Improvement Program (TIP), approximately \$25 million is allocated towards Reconstruction and Rehabilitation projects over the four year period. Using pavement management forecasting software with current road conditions and level funding of the TIP at \$8.5 million per year for 2010-2016, our analysis estimates that the percentage of STP roads that need reconstruction and rehabilitation will increase from 17% to 53% by 2016. This increase in substandard roads needs to be avoided. The pavement management software recommends a yearly investment of \$30 million in order to maintain the existing conditions of STP roads with the same 17% reconstruction and rehabilitation ratio.

If this increase is not implemented, the burden of maintenance on these roadways will be passed onto individual communities. Communities are currently struggling to maintain their local roadways, which account for 69% of the total roadway mileage in our region. Using what limited amount of Chapter 90 funding that they are receiving, it is unfair to require them to supplement and maintain additional roadways, which are eligible for federal funding. The amount of state and federal funding alone does not allow communities to keep up with pavement maintenance needs.

It has been the MPO’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. Although these roads qualify for federal funding, they are subject to federal design standards and restrictions. 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 strict design standards.

The amount of Chapter 90 funding in our region has decreased since the late 1990's (See Table 8-1 below). In 1997, Chapter 90 funding was over \$13 million. If annual Chapter 90 funding had simply kept pace with inflation and rising costs, the yearly allocation would be at \$17 million. At the present level (\$11 million), this region’s funds have dropped approximately 20% in the last ten years.

**Table 8-1
SMMPO Chapter 90 Allocations**

Year	Ch 90 Allocation (SMMPO Region)
1997	\$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

In addition to roadway construction improvements Chapter 90 funds can also be used to build bikeways, purchase machinery and equipment, construct salt sheds and garages, etc. With these additional, but viable uses for money, communities have to make difficult choices within their own budgets for roadway improvements.

The amount of Chapter 90 funding allocated to the SRPEDD communities for 2007 is approximately \$11 million, which averages approximately \$405,000 per community. This average amount of funding is insufficient to reconstruct one mile of roadway. It is apparent that the region's road network cannot be adequately maintained solely by means of existing funds. Additional funds must be made available at the federal, state, and local levels of government.

Projects

The reconstruction of a deteriorated roadway generally does not take precedence over a roadway requiring safety improvements or the rehabilitation of a structurally deficient bridge, however there are roadways in our region that are seriously deteriorated and deserve consideration for the limited funds available.

These roads are deteriorated to the extent that they are adversely affecting the safety of motorists. Roadways with deep potholes are causing motorists to weave into oncoming lanes to avoid them, making driving conditions unsafe. Severe pavement distress hinders the ability of drivers to travel at the speed limit, causing congestion and inefficient (stop and go) operation of the motor vehicle, increasing the amount of pollution deposited into the air. Frequently, motorists seek alternate routings on less distressed roads, adding vehicle miles traveled and increased exhaust emissions. Poor pavement condition also places a financial burden on local communities, as motorists file claims for vehicle and tire damage.

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. However, due to this region's severe weather conditions and rapidly deteriorating roadways, communities may need to focus their efforts on roads requiring immediate reconstruction.

Based on roadway condition surveys and the Road Surface Management System program evaluation the following tables provide recommended maintenance options for numerous roadways in our region. In many instances these recommendations are only for specific segments within each roadway. It is also important to note that some of these roads may have already been repaired due to the fact that some of the surveys date back to 2004. These listing are intended to be used primarily as a guide. It is the responsibility of each community's highway superintendent and/or engineer to determine if these repair categories are appropriate for each individual roadway.

**Table 8-2
Roadways Requiring Reconstruction**

Community	Roadway	Functional Class	Length
Acushnet	Main Street	Urban Minor Arterial	0.862
Dartmouth	Bakerville Road	Urban Minor Arterial	0.290
Dartmouth	Old Westport Road	Urban Minor Arterial	1.560
Fairhaven	Howland Road	Urban Minor Arterial	0.300
Fairhaven	Huttleston Avenue	Principal Arterial	0.750
Fairhaven	Main Street	Urban Minor Arterial	0.250
Fall River	Central Street	Urban Minor Arterial	0.320
Fall River	Jefferson Street	Urban Minor Arterial	0.260
Fall River	Seventh Street	Urban Minor Arterial	0.100
Middleborough	East Main Street	Urban Minor Arterial	0.470
Middleborough	North Main Street	Urban Minor Arterial	0.390
Mansfield	East Street	Urban Collector	0.670
Mansfield	Pratt Street	Urban Principal Arterial	0.370
North Attleborough	East Washington Street	Urban Minor Arterial	0.390
New Bedford	Acushnet Avenue	Urban Minor Arterial	3.570
New Bedford	Brock Avenue	Urban Minor Arterial	1.460
New Bedford	Coffin Avenue	Urban Minor Arterial	0.190
New Bedford	Cottage Street	Urban Minor Arterial	0.470
New Bedford	County Street	Urban Minor Arterial	2.920
New Bedford	Cove Road	Urban Principal Arterial	0.460
New Bedford	Deane Street	Urban Minor Arterial	0.110
New Bedford	Mill Street	Urban Minor Arterial	1.250
New Bedford	Nash Road	Urban Minor Arterial	0.740
New Bedford	Penniman Street	Urban Minor Arterial	0.300
New Bedford	Sixth Street	Urban Minor Arterial	0.320
New Bedford	Summer Street	Urban Minor Arterial	0.440
Plainville	South Street (Rt. 1A)	Urban Minor Arterial	0.250
Raynham	North Main Street	Urban Minor Arterial	1.640
Somerset	High Street	Urban Minor Arterial	0.230
Swansea	GAR Highway	Urban Minor Arterial	1.040
Taunton	Broadway	Urban Minor Arterial	0.530
Taunton	Myricks Street (Rte. 79)	Urban Principal Arterial	1.520
Taunton	Railroad Avenue	Urban Minor Arterial	0.140
Taunton	Somerset Avenue	Urban Minor Arterial	1.550
Westport	GAR Highway	Urban Minor Arterial	1.490

**Table 8-3
Roadways Requiring Rehabilitation**

Community	Roadway	Functional Class	Length
Attleboro	County Street	Principal Arterial	1.140
Attleboro	County Street	Urban Minor Arterial	2.370
Attleboro	Holden Street	Urban Minor Arterial	0.200
Attleboro	Lathrop Road	Urban Minor Arterial	0.650
Attleboro	Maple Street	Urban Minor Arterial	0.210
Attleboro	Oakhill Avenue	Urban Principal Arterial	0.310
Attleboro	Park Street	Urban Principal Arterial	0.100
Attleboro	Pleasant Street	Principal Arterial	0.070
Attleboro	Robert F Toner Blvd	Urban Minor Arterial	0.170
Attleboro	South Main Street	Urban Minor Arterial	0.110
Attleboro	Starkey Avenue	Urban Minor Arterial	0.100
Dartmouth	Dartmouth Street	Urban Minor Arterial	0.670
Dartmouth	Faunce Corner Road	Urban Minor Arterial	1.360
Dartmouth	Gulf Road	Urban Minor Arterial	0.370
Dartmouth	Hawthorn Street	Urban Minor Arterial	0.580
Dartmouth	Old Fall River Road	Urban Collector	1.790
Dighton	Warner Blvd	Urban Minor Arterial	0.170
Fairhaven	Howland Road	Urban Minor Arterial	0.330
Fairhaven	Main Street	Urban Minor Arterial	1.060
Fall River	Brayton Avenue	Urban Minor Arterial	1.510
Fall River	Broadway	Urban Minor Arterial	0.630
Fall River	Globe Street	Urban Minor Arterial	1.310
Fall River	Hartwell Street	Urban Minor Arterial	0.260
Fall River	Mariano Bishop Blvd	Urban Minor Arterial	0.140
Fall River	North Main Street	Urban Minor Arterial	1.850
Fall River	Second Street	Urban Minor Arterial	0.770
Fall River	Stafford Street	Urban Minor Arterial	0.270
Middleborough	Centre Street	Urban Minor Arterial	0.440
Middleborough	East Grove Street	Urban Minor Arterial	2.670
Middleborough	Everett Street	Urban Minor Arterial	0.830
Middleborough	West Grove Street	Urban Minor Arterial	0.540
Mansfield	Chauncy Street	Urban Principal Arterial	0.110
Mansfield	Eastman Street	Urban Principal Arterial	0.410
Mansfield	Oakland Street	Urban Minor Arterial	0.050
Mansfield	Pratt Street	Urban Principal Arterial	0.500
North Attleborough	Hickory Road	Urban Minor Arterial	0.110
New Bedford	Church Street	Urban Minor Arterial	1.660
New Bedford	Cottage Street	Urban Minor Arterial	1.090
New Bedford	Dartmouth Street	Urban Minor Arterial	0.740
New Bedford	Kempton Street	Urban Minor Arterial	1.080
New Bedford	Mount Pleasant Street	Urban Minor Arterial	1.120
New Bedford	Nash Road	Urban Minor Arterial	0.050
New Bedford	New Plainville Street	Urban Minor Arterial	1.570
New Bedford	Park Avenue	Urban Minor Arterial	0.040

Table 8-3 (Continued)
Roadways Requiring Rehabilitation

Community	Roadway	Functional Class	Length
New Bedford	Parker Street	Urban Minor Arterial	0.900
New Bedford	Rodney French Blvd	Urban Minor Arterial	2.060
New Bedford	School Street	Urban Minor Arterial	0.070
New Bedford	Union Street	Urban Minor Arterial	0.920
New Bedford	Weld Street	Urban Minor Arterial	0.130
Norton	East Main Street	Principal Arterial	0.450
Norton	Eddy Street	Urban Minor Arterial	0.800
Norton	Old Colony Road	Principal Arterial	0.840
Norton	South Worcester Street	Urban Minor Arterial	0.210
Plainville	Messenger Street	Urban Minor Arterial	0.890
Plainville	South Street	Urban Minor Arterial	0.420
Rehoboth	Moulton Street (Rte 118)	Urban Principal Arterial	0.400
Seekonk	Central Avenue	Urban Minor Arterial	0.400
Seekonk	Newman Avenue	Urban Minor Arterial	2.220
Somerset	Dublin Street	Urban Minor Arterial	0.220
Somerset	Pleasant Street	Urban Minor Arterial	0.510
Taunton	South Street	Urban Minor Arterial	0.090
Taunton	Spring Street	Urban Minor Arterial	0.240
Taunton	Washington Street	Urban Minor Arterial	0.680
Taunton	Winthrop Street	Urban Principal Arterial	3.770
Westport	Old County Road	Urban Minor Arterial	0.770

Recommendations

- Because of the value and the effectiveness of pavement management for transportation improvement evaluation, this Regional Transportation Plan recommends the continuous update of pavement conditions for all STP roads in our region. This would entail an update of the region's roadway conditions over a three-year period. This program would commence in the SRPEDD FY 2007 Unified Planning Work Program. The results will continue to provide a tool for planners, engineers, and MassHighway to protect and maintain the investment in our roads now and in the future and to properly prioritize resurfacing projects.
- Communities should consider incorporating safety, congestion, and other elements (i.e. improved drainage, sidewalks and bike paths) into roadway reconstruction and rehabilitation projects in order to make them more competitive for federal funding.
- The amount of state and federal funds made available for the reconstruction and resurfacing of roadways needs to be dramatically increased. If annual Chapter 90 funding had simply kept pace with inflation and rising costs, the yearly allocation would need to be \$17 million. At present level (\$11 million), this region's funds have

actually dropped approximately 20% in the last ten years. This deficiency may require drastic fiscal measures, such as a major increase in the gasoline user fees to be reserved for transportation purposes and not diverted to the general fund during financial shortfalls.

- Consideration should be given for a statewide effort to obtain effective pavement management software that provides ease of use, appropriate results, and the ability for financial programming and prioritization and the ability to forecast pavement deterioration over time.