
SANDOWN ROAD SYSTEM ACTION PLAN - 2008

Prepared for:

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INTRODUCTION

In 2003 the Town of Sandown developed a Road System Improvement Plan. That Plan, which was prepared by the Town Engineer on behalf of the Board of Selectmen, identified a series of improvements to be made to a limited number of the Town's principal Class V public streets. Since 2003, the Road System Improvement Plan has served as a tool for the planning of prioritized annual expenditures made by the Town for capital improvements to the Town's streets. Over the past five years, the Town has funded recommendations made in the 2003 Plan and correspondingly, under the guidance and direction of the Road Agent and Board of Selectmen, have accomplished several of the goals and objectives outlined in the 2003 Plan. Specific accomplishments made since 2003 include reconstruction of Hampstead Road, Little Mill Road, North Road, Odell Road and Stagecoach Road.

While the Town should be commended for the accomplishments made since 2003, it must be recognized that the maintenance of its public roads and streets will continue to be an on-going fiduciary responsibility of the Town of Sandown in perpetuity. In recognition of that fact, in May of 2008, the Sandown Road Agent commissioned an expansion of the 2003 Road System Improvement Plan in order to create a more comprehensive planning document entitled the Sandown Road System Action Plan - 2008. In the text which follows, the Sandown Road System Action Plan for the years 2009 through 2018 will be presented. This Action Plan includes recommendations for a prioritized program of systematic improvements, which the Road Agent and Town Engineer (the Project Team) believe to be warranted over the coming decade. In preparing the Sandown Road System Action Plan for 2009 to 2018, the Project Team completed a comprehensive inventory and inspection of all Class V streets within the Town of Sandown; and based on this level of review, identified a series of betterments warranted at this time. Through implementation of the current Action Plan, the Project Team believes the Town of Sandown will be in a position to pro-actively manage its public road system in an efficient and fiscally responsible manner over the next decade.

METHODOLOGY AND RECOMMENDATIONS

As an initial step in preparation of the Action Plan update, the Project Team inspected and assessed each foot of public street presently maintained by the Town of Sandown. In completing this assessment, the Project Team carefully inspected each street in order to determine the extent of improvement, if any, which appeared to be warranted in order to properly improve and/or maintain the Town's streets over a ten-year period commencing in 2009 and continuing through 2018. In completing the initial assessment function, the Project Team relied heavily on "the data base" of personal knowledge possessed by the Road Agent and Town Engineer as a result of their collective years of service to the Town of Sandown, as well as the notes and recollections of the Town Engineer remaining from preparation of the 2003 Road System Improvement Plan. In short, at the time of assessment, the Project Team classified each street into one of three broad categories. These categories included:

- Category No. 1: Streets placed in this category are those which appear to require no significant capital improvement between 2009 and 2018. More than one-half of all Class V public streets in the Town were placed in Category No.1.

- Category No. 2: Streets placed in this category are those which will require resurfacing with hot bituminous asphalt pavement, with a preparatory shim course, between 2009 and 2018. In many instances streets placed in Category No. 2 are those streets which “have not been touched” for a decade or more.
- Category No. 3: Streets or segments thereof placed in this category also represent streets which “have not been touched” for many years and correspondingly warrant rehabilitation or reconstruction between 2009 and 2018 due to obvious pavement distress.

Of the sub-set of streets placed in Categories No. 2 and No. 3, the Project Team also considered the urgency of completing such repairs. In cases where proper road surface management necessitates the recommended improvement be completed in the first three years of the current Action Plan (2009 through 2011), those streets were ranked as Priority-1. Those streets which warrant improvement during an intermediate time frame were ranked Priority-2. Correspondingly, improvements to those streets have in most cases been scheduled to occur between 2012 and 2014. Lastly, streets identified as requiring improvement in the program’s later years were ranked Priority-3, meaning the recommended improvements to those streets would most efficiently be scheduled for 2015 through 2018.

Any true capital improvement plan, by definition, must not only address the need for a particular improvement, but must also define the scope and anticipated cost of that improvement. In this case, streets placed in Category No. 2 or Category No. 3 effectively identify the scope of recommended improvement by definition. Obviously, any attempt to accurately forecast the cost of future capital expenditures is often frustrated by the lack of predictability of future construction costs. As an example, in 2003 hot bituminous asphalt could be purchased and installed at a unit cost of approximately \$37 per ton. Given the sharp rise in the cost of petroleum products over the past two years, the same ton of hot bituminous pavement now costs approximately \$80. Again, given the fact that Sandown’s Road System Action Plan for 2009 to 2018 can best be described as a road surface management plan, it is estimated that approximately two-thirds of the dollars to be directed to the program will spent on hot bituminous asphalt pavement. Correspondingly, given the present uncertainty relative to the future cost and value of petroleum and petroleum products, the Project Team has developed the projected construction cost budgets identified in this Action Plan based on the presumption that hot bituminous asphalt pavement will cost \$90 per ton over the duration of the program. Correspondingly, it is to be noted that it will be necessary for those relying on those budgetary estimates offered in the current Action Plan to adjust the 2008 construction cost opinions included in the program to “future year dollars” prior to each budget cycle. That is to say, in the event the program identifies a particular future year Category No. 2 improvement with a forecasted budget of \$60,000, based on a unit cost value of \$90 per ton for pavement, that budget sum will need to be increased or decreased in the event the actual future year unit cost of hot bituminous pavement is either higher or lower than the \$90 per ton unit cost upon which the budget estimates are based. Again, given the fact that the current Action Plan includes a series of individual projects with “pavement driven budgets”, we recommend linear adjustment, based on the unit cost of pavement, be made on an annual basis. Correspondingly, the same \$60,000 project budget could be decreased to \$50,000 if the unit cost of pavement in that year were to be \$75 per ton, or increased to \$66,667 if the unit cost of pavement were to increase to \$100 per ton in the “target year” for that particular improvement.

Lastly, based on the scope of recommended improvement for each street, or street segment placed in either Category No. 2 or No. 3, the projected cost of that improvement, in 2008 dollars was calculated. The total sum of the value of all recommended improvements during the ten year

duration of the current Action Plan (\$3,247,300) was then determined and divided by ten in order to arrive at an average cost per year (\$324,730). In an attempt to “balance or equalize” the sum allocated for fulfillment of each recommended improvement on an annual basis, an attempt was made to identify an array of projects targeted for completion during the initial nine years of the program, based on priority, which approximated one-ninth of the total program cost (\$360,081). The tenth year of the program (2018) was held in reserve to enable the Town to either “catch up” in the event full program funding were not available during each of the preceding program years, or in the event an emergency situation, resulting in the need to redirect program funds, were to be encountered during the coming decade. Again, this was done in order to generally equalize the full cost of the overall program on an annual basis so as to avoid “peaks and valleys” in the municipal budget attributable to Road System Action Plan costs. The resulting program is presented in the form of the attached Roadway Improvement Program Summary.

ROADWAY IMPROVEMENT PROGRAM ANNUAL COST SUMMARY	
FISCAL YEAR	ANNUAL PROGRAM BUDGET
2009	\$323,500.00
2010	\$368,700.00
2011	\$341,200.00
2012	\$416,800.00
2013	\$485,200.00
2014	\$346,300.00
2015	\$326,700.00
2016	\$292,800.00
2017	\$292,800.00
2018	TBD

**Note: All estimated construction cost projects are presented in 2008 dollars.*

ROADWAY IMPROVEMENT PROGRAM SUMMARY			
FY 2009			
Street	Length (miles)	Category No.(#)/Repair Strategy	Estimated Cost (2008 Dollars)
Hale True Road	0.424	(3) Reconstruct	\$181,000.00
Celeste Terrace (Old Section)	0.18	(3) Reconstruct	\$67,300.00
Woodland Lane	0.38	(2) Shim & Overlay	\$46,600.00
Lakeview Avenue	0.352	(2) Shim & Overlay	\$28,600.00
Total Program Budget (2009)			\$323,500.00

ROADWAY IMPROVEMENT PROGRAM SUMMARY			
FY 2010			
Street	Length (miles)	Category No.(#)/Repair Strategy	Estimated Cost (2008 Dollars)
Hawkewood Road	0.716	(3) Reconstruct	\$266,300.00
Morrison Lane	0.23	(3) Reconstruct	\$102,400.00
Total Program Budget (2010)			\$368,700.00

ROADWAY IMPROVEMENT PROGRAM SUMMARY			
FY 2011			
Street	Length (miles)	Category No.(#)/Repair Strategy	Estimated Cost (2008 Dollars)
Chase Road	0.887	(2) Shim & Overlay	\$151,300.00
Tenney Road	0.61	(2) Shim & Overlay	\$104,200.00
Rowell Road	0.48	(2) Shim & Overlay	\$85,700.00
Total Program Budget (2011)			\$341,200.00

ROADWAY IMPROVEMENT PROGRAM SUMMARY			
FY 2012			
Street	Length (miles)	Category No.(#)/Repair Strategy	Estimated Cost (2008 Dollars)
Fremont Road – Segment No. 1 (Fremont Line to Odell Road)	1.095	(3) Reconstruct	\$416,800.00
Total Program Budget (2012)			\$416,800.00

ROADWAY IMPROVEMENT PROGRAM SUMMARY			
FY 2013			
Street	Length (miles)	Category No.(#)/Repair Strategy	Estimated Cost (2008 Dollars)
Fremont Road – Segment No. 2 (Odell Road to Phillips Road)	1.275	(3) Reconstruct	\$485,200.00
Total Program Budget (2013)			\$485,200.00

ROADWAY IMPROVEMENT PROGRAM SUMMARY			
FY 2014			
Street	Length (miles)	Category No.(#)/Repair Strategy	Estimated Cost (2008 Dollars)
Fremont Road – Segment No. 3 (Phillips Road to Main Street)	0.91	(3) Reconstruct	\$346,300.00
Total Program Budget (2014)			\$346,300.00

ROADWAY IMPROVEMENT PROGRAM SUMMARY			
FY 2015			
Street	Length (miles)	Category No.(#)/Repair Strategy	Estimated Cost (2008 Dollars)
Sargent Road	1.1	(2) Shim & Overlay	\$188,000.00
Wells Village Road – Segment No. 1 (Hampstead Road to Pole #15-A)	0.88	(2) Shim & Overlay	\$138,700.00
Total Program Budget (2015)			\$326,700.00

ROADWAY IMPROVEMENT PROGRAM SUMMARY

FY 2016

Street	Length (miles)	Category No.(#)/Repair Strategy	Estimated Cost (2008 Dollars)
Giordani Lane	1.15	(2 & 3) Reconstruct 800' & Shim & Overlay Balance	\$196,800.00
Wells Village Road -- Segment No. 2 (Pole #15-A to Chester Line)	0.948	(2) Shim & Overlay	\$149,300.00
Total Program Budget (2016)			\$346,100.00

ROADWAY IMPROVEMENT PROGRAM SUMMARY

FY 2017

Street	Length (miles)	Category No.(#)/Repair Strategy	Estimated Cost (2008 Dollars)
Reed Road	0.45	(2) Shim & Overlay	\$171,300.00
Bingham Circle	0.15	(2) Shim & Overlay	\$18,500
Highland Avenue	0.32	(2) Shim & Overlay	\$39,300
Cricket Lane	0.52	(2) Shim & Overlay	\$63,700
Total Program Budget (2017)			\$292,800.00

ROADWAY IMPROVEMENT PROGRAM SUMMARY

FY 2018

Street	Length (miles)	Category No.(#)/Repair Strategy	Estimated Cost (2008 Dollars)
Reserved			TBD
Total Program Budget (2018)			TDB

ROADWAY IMPROVEMENTS BY YEAR

STREET	YEAR	STREET	YEAR	STREET	YEAR
Hale True Road	2009				
Celeste Terrace	2009				
Woodland Lane	2009				
Lakeview Avenue	2009				
Hawkewood Road	2010				
Morrison Lane	2010				
Chase Road	2011				
Tenney Road	2011				
Rowell Road	2011				
Fremont Road – Segment 1	2012				
Fremont Road – Segment 2	2013				
Fremont Road – Segment 3	2014				
Sargent Road	2015				
Wells Village Road – Segment 1	2015				
Wells Village Road – Segment 2	2016				
Giordani Lane	2016				
Reed Road	2017				
Bingham Circle	2017				
Highland Avenue	2017				
Cricket Lane	2017				

OTHER RECOMMENDATIONS

- **Undertake Cost-Benefit Analysis for Annual Advanced Maintenance Expenditures:**

With the progress achieved by the Town of Sandown as a result of its roadway rehabilitation efforts over the past five years, coupled with benefits to be realized as a result of completion of the systematic series of improvements to be made to its streets over the next decade, it is recommended that the Sandown Highway Department refocus its maintenance efforts in order to maximize the service life of each street's paved surface. Obviously, all paved streets have a life cycle which is affected by many factors including but not limited to: overall traffic volume, volume of truck traffic, road base quality, and maintenance factors. In any case, once a municipality has reached the enviable plateau of road surface management without further need to consider road base reconstruction or rehabilitation, maximization of road surface life cycle should be the underlying goal of its public works programs. That is to say, it is simply more cost-effective for a municipality to pursue advanced maintenance activities, which extend the service life or life cycle of paved street surfaces, rather than permit streets to degrade to the point where future rehabilitation or reconstruction becomes warranted. Based on a unit price of \$90 per ton for asphalt pavement, shimming and overlaying a 24-foot wide street with a nominal thickness of 1 1/2-inches of pavement would be expected to cost \$20.52 per linear foot of road. If it is assumed that resurfaced street would enjoy a 15-year life cycle with typical or routine maintenance, the cost of that capital improvement would then translate to \$1.37 per-foot-per-year. With advanced maintenance, it would be reasonable to expect the service life of the same paved street could be extended by an average of 3 to 5-years, enabling the municipality to realize a project cost as low as \$1.03 per-foot-per-year. On the other hand, rehabilitation or reconstruction of the same 24-foot wide road surface would be expected to cost \$70.50 to \$77.50 per linear foot based on the same unit price of \$90 per ton for hot bituminous asphalt pavement. Based on a typical 15-year life cycle expectation, this represents an annualized cost of \$4.70 to \$5.17 per-foot-per-year. With advanced maintenance activities such as crack sealing, more frequent shoulder maintenance, installation of edge drain if warranted, more frequent drainage system cleaning and maintenance, and increased general right-of-way maintenance, it should not only be possible to extend the life cycle of pavement surfaces, especially those on low volume residential streets, by a minimum of 3 to 5 years, but also avoid the need to again pursue more costly rehabilitation or reconstruction for several decades. Correspondingly, it is recommended the Town of Sandown undertake a cost-benefit analysis in order to optimize the affect of monies budgeted for advanced maintenance activities on an annual basis. By completing the recommended cost-benefit analysis, it should be possible to insure the level of funding directed towards the Highway Department for advanced maintenance programs represents the most cost-effective balance between maintenance cost and pavement life cycle expectation. With the ever increasing cost of petroleum products, such as hot bituminous pavement, spending additional dollars on advanced maintenance would unquestionably prove to be a cost-effective strategy for the Town of Sandown.