

DRAFT 100523

**REPORT OF THE TASK FORCE
TO DEVELOP A ROAD PLAN
2010**



CHEBEAGUE ISLAND
MAINE

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1. Introduction

The purpose of this report is to assess the current status of the road network in the Town of Chebeague Island and to develop a strategy for maintaining it. The maintenance strategy is implemented as a *road plan* and is presented in the final section of this report (Section Appendix D). The intent is that this section will become a stand-alone document in subsequent years and will be used and modified for planning, budgeting and developing future road maintenance strategies.

2. Methodology

In 2009 a task force comprised of Mark Dyer, Beth Howe and Herb Maine began a road assessment. After several visits from Maine Department of Transportation (MDOT) officials the task force began to implement the methodology described in the Road Surface Management System (RSMS). RSMS is a system developed for Maine roads by MDOT that guides municipalities in collecting qualitative assessments of the road surface and analyzing them to address maintenance and repair.

It is important to remember that RSMS is primarily a planning tool and not a tool that makes road engineers out of municipal officials. The implementation of the plans may well differ from the plan and the plan will likely be adjusted on an ongoing basis.

RSMS is developed and supported by MDOT's Maine Local Roads Center (MLRC) whose web page at the MDOT site says: "*The Maine Local Roads Center provides training, technical assistance, and information to those municipal people who are responsible for constructing, maintaining, and managing local roads and bridges in Maine.*"

The RSMS methodology includes the following tasks:

- Taking an accurate inventory of the network (paved and unpaved)
- Assessing the condition of the network
- Developing maintenance and rehabilitation alternatives
- Weighing the alternatives
- Prioritizing maintenance needs
- Generating custom reports that support budgets, work schedules and work orders

3. Inventory

The methodology begins with a road inventory. In 1999 the Town of Cumberland had a pavement management study done by Casey & Godfrey Engineers of Gardiner, Maine. The 1999 study contained an inventory of mainland and island roads. This list forms the basis for the inventory that the Town has used to value its road network for the annual audit. Appendix A is the list of paved and unpaved town-owned roads from the 1999 study. It shows that Chebeague's existing

network of town-owned roads includes about 10 miles of paved roads and about 3 miles of unpaved or gravel roads.

The task force did a windshield survey of the paved roads using the Road Surface Management System (RSMS).

a. Road Sections

The RSMS method allows each road to be divided up into segments. The Task force divided roads into segments based on the existing surface or condition. This was often determined by locating the beginning and ending points of previous paving efforts. Each segment is rated for predefined conditions on a subjective scale. The software will calculate a road condition that is applied to various strategies to develop cost options for each segment. The inventory of paved roads is in Appendix B.

As part of the long-term goal the road sections should be reviewed each year and potentially combined or split to provide an optimal maintenance schedule. For example it may be desirable to develop a ten year plan that has 1 mile of paved maintenance each year. It may be advantageous to try to define road sections that align with that plan (i.e. 10 1-mile road sections).

b. Road Use

The RSMS method categorizes each road section based on the amount and kind of *traffic* and the *importance* of the section. In the RSMS methodology these are subjective assessments, arrived at by consensus of the surveyors. There are no traffic studies or hard numbers associated with this assessment.

The task force used the 5-level scale of the RSMS to rate the *traffic* load on each road section. The amount and quality of the traffic were taken into consideration. For example, each section on the entire route that the solid waste trucking company uses from Bennett's cove to the transfer station was identified as either 'high' or 'medium-high'. Even though the number of vehicles using this route is relatively small the consistent heavy-load traffic of the trucks moving our solid waste off the island represents a higher level of road use than other routes.

The *importance* of a road is also subjectively measured on a 5-level scale. The task force gave higher values to road sections that had public service centers on them such as North Road near the public safety building and transfer station, Stone Wharf road and the school. Cul de sacs serve a smaller segment of the public and so were given a lower importance rating.

c. Road Condition

The MLRC Field Manual used in association with the RSMS methodology gives the non-engineer a crash course in road defects or distress conditions. The task force acted as the windshield surveyors driving each road section in the inventory and assessing the severity and extent of each type of distress. The distress conditions defined in RSMS are: 1) *alligator cracking*, 2) *longitudinal and transverse cracking*, 3) *edge cracking*, 4) *patch/pothole*, 5) *roughness*, 6) *rutting* and 7) *drainage*. Figure 1 and Figure 2 show some examples of the distress conditions found on the island.

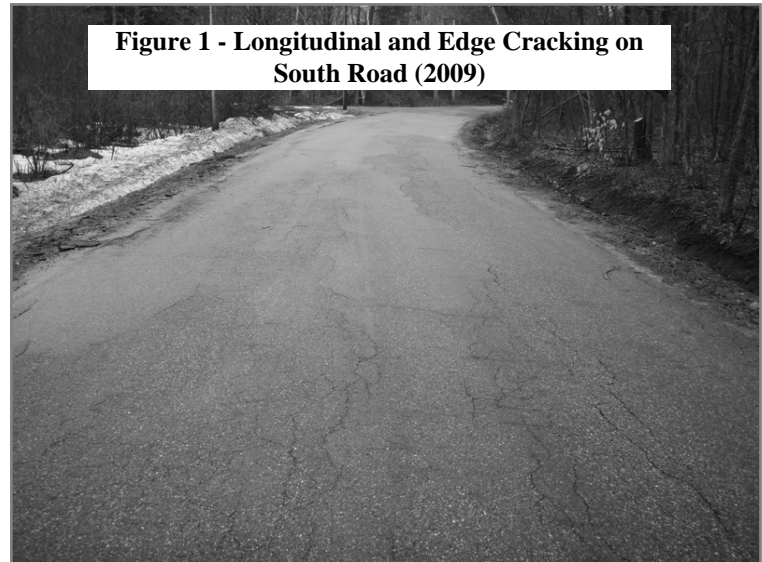


Figure 1 - Longitudinal and Edge Cracking on South Road (2009)

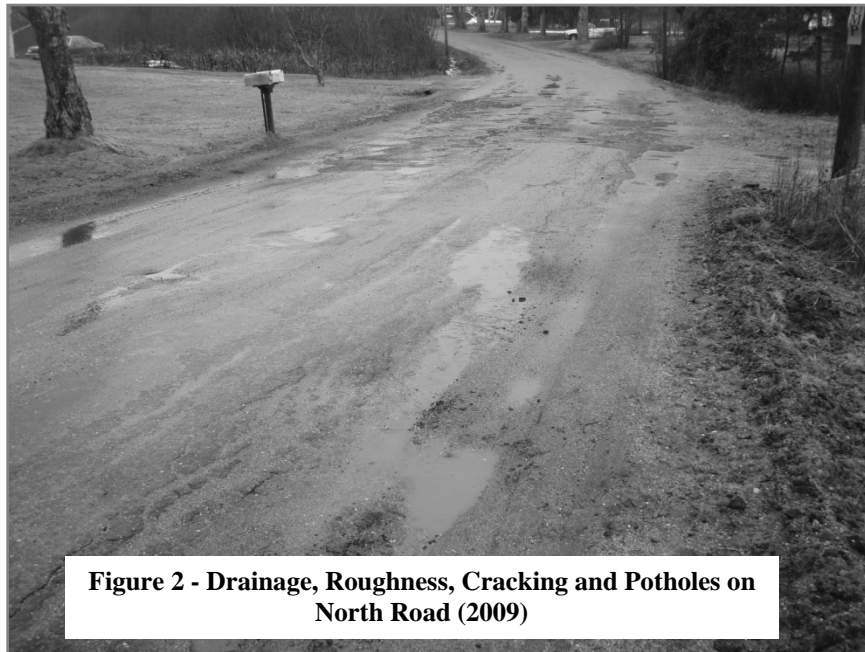


Figure 2 - Drainage, Roughness, Cracking and Potholes on North Road (2009)

Figure 3 is an example of a field sheet completed by the task force. The members of the task force collaborate to fill this sheet out after driving each road section. The data from the sheets are then entered into the RSMS software.

RSMS Inventory and Condition Identification
Asphalt Surface Road Sections

Inspected by: _____

Inventory
 Date: 3/21/2010 RIN: _____
 Road Name: School House Road Road Section: SP-133
 Seq. No.: _____ Maintenance Div.: _____
 From St.: North Road Jurisdiction: My Town
 To St.: in front of school State Maintained State, City Maintained
 No. Lanes: 2 Width: 20 Private
 Shoulder Width: _____ Class: _____
 Surface: Unpaved Asphalt Traffic: 1 2 3 4 5
 Shoulder: Natural Gravel Importance: 1 2 3 4 5
 Paved, Asphalt Curbed, Granite Class: _____
 Curbed, Concrete Curbed, Asphalt U.S. Units Metric
 Paved, Concrete _____
 Mile Post: _____ Inventory Year: 2009
 End Post: _____ Current Year: _____
 Comments: Segment Length (mi) = 0.19 Concrete curb on both sides
on north side

Condition

			None	← Low	Extent Medium	→ High
			No Defects	10%	10-30%	30%
Alligator Cracking	Severity	Low	0	1	2	3
		Medium		4	5	6
		High		7	8	9
Long Trans Cracking	Severity	Low	0	1	2	3
		Medium		4	5	6
		High		7	8	9
Edge Cracking	Severity	Low	0	1	2	3
		Medium		4	5	6
		High		7	8	9
Patch/Pothole		No Defects	0	1	2	3
Roughness				Good	Fair	Poor
				1	2	3
Rutting				None	0-1 inch	1 inch
				1	2	3
Drainage				Good	Fair	Poor
				1	2	3

Maine Local Roads Center
1-800-498-9133

Figure 3 - Example Field Sheet

4. RSMS Output

The methodology described in section 2 above yields a *road network inventory* and a *condition survey*. RSMS assigns a *maintenance status* and *repair options* based on the inputted survey results. These are primary tools used to develop the road plan.

a. Road Section Maintenance Status

The RSMS software assigns each road section a maintenance status. The status categories are: *No Maintenance*, *Routine*, *Preventative*, *Rehabilitation* and *Reconstruction*. The Road Network inventory report in Appendix B shows the status of each of the road sections in our inventory under the column labeled 'surface status'.

Figure 4 shows how roads in each of these maintenance status categories tend to deteriorate with time. The steeper the curve, the faster the deterioration and the

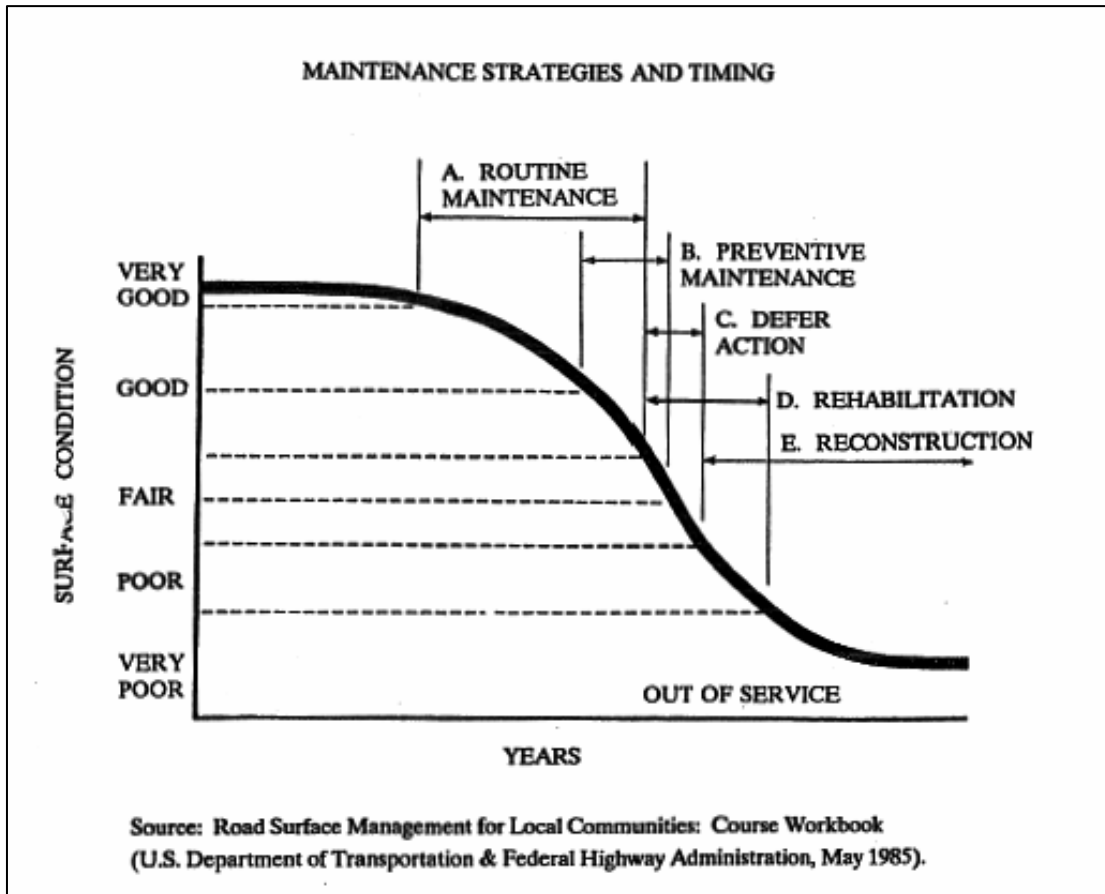


Figure 4 - Cost-Benefit Based on Road Condition

further down the curve you go the more costly it is to bring the road section back to a good condition or even maintain it properly.

The lesson learned is that it isn't necessarily the best policy to just start by fixing the worst roads first. After all they aren't going to get that much worse if you wait whereas roads in the Preventative category are going to get much more costly to repair if you wait.

b. Repair Options and Costs

The RSMS goes further by assigning a set of repair options for each road and an estimated cost (see Appendix C). The cost is assigned by the state. Special costs associated with the work such as what we might affectionately refer to as the "island factor" are accounted for when the budget is constructed in RSMS.

c. Gravel or Paved?

One of the repair options that could play an important role in Chebeague's current strategy is to revert a paved road to gravel. This could be a viable interim strategy especially on paved roads that are in very poor condition since a well constructed gravel road can be paved relatively efficiently. It could also be a permanent change reducing maintenance costs in the future.

Table 1 lists advantages that MDOT has defined for comparing paved and unpaved roads when they are properly constructed and maintained.

Table 1 - Paved vs. Unpaved Advantages

Paved Roads	Unpaved Roads
Carry all water off the surface and into ditches	Have low construction and maintenance costs for very low volume roads
Eliminate dust and Spring mud	Keep vehicles at lower speeds
Accommodate heavy trucks and many vehicles	Can usually be maintained and repaired within a municipal highway department's capabilities
Provide a smoother and safer ride	

<http://www.maine.gov/mdot/community-programs/csd/pavegravelroad.php>

The cost savings is significant. For example, RSMS lists repair options for the short section of pavement on the Landfill Road from the gate to North Road (see Appendix C). The least expensive of 4 paving options is 6.5 times more expensive than reclaiming the pavement and reverting to gravel.

5. Drainage

Drainage is a common thread in MDOT guidance and portrayed as the most important factor in good road design. This is especially true on Chebeague where there is abundant surface water. Firehouse road for example, only about 4/10 of a mile long, has six culverts to

Road Name	Culverts on Section
Bar Point Road	3
Cottage Road	11
Division Point Road	1
East Shore Drive	1
Firehouse Road	6
John Small Road	12
North Road	10
Old Cart Road	1
School House Road	1
South Road	17

carry the water running from the center of the island to the bay. The purpose of ditches, culverts and even paving is to keep water out of the road bed. The repair options for the road surface supplied by the RSMS must be supplemented with a close look at the drainage issues for each road section which should be addressed before resurfacing.

6. Town Owned Gravel Roads

Based on the 1999 Pavement Management Study there are about 3 miles of town owned gravel roads (Table 2). Given the condition of the paved roads the task force made the decision to concentrate of the paved road plan this year. A survey similar to the paved road survey should be conducted next year to complete the Road Plan.

The current maintenance plan is to grade gravel roads as needed and prioritize them based on the usage.

7. Analysis and Strategy

The comprehensive evaluation, assessment and strategic implementation of road maintenance projects can be a very technical process and may require professional engineering skills. The RSMS software along with training, assistance and other resources from MLRC allows non-engineers to make informed decisions and use professional services efficiently.

The task force analyzed the RSMS output and worked with knowledgeable people to develop a strategy that work for the Town.

a. Analysis

The analysis of the RSMS output involved prioritizing road segments then choosing a repair option based on budget constraints. The guiding principles are:

1. Public Safety
2. Optimal return on dollar investment (timing and preparation)
3. Proximity to public services (importance and use)
4. Testing alternative road surfaces (reverting to gravel or other surfacing materials as interim or permanent steps)

Table 2 - Gravel Roads

GRAVEL ROAD	Length (mi.)
Rose Point Road	0.4
East Shore Drive	0.3
Indian Point Road	0.3
Jenks Road	0.3
Littlefield Avenue	0.3
South Shore Drive	0.3
Bennett's Cove Road	0.2
Fenderson Road	0.2
Soule Road	0.2
Sunset Road	0.2
Roy Hill Road	0.1
Waldo Point Road	0.1
Willow Street	0.1
Charleston Road	>.01

Step 1: Using the RSMS OUTPUT

First Pass

The task force developed criteria for prioritizing road segment inventory. The criteria are based on the identified *importance* and *traffic* as well as the computed

surface status based on the survey. The importance and traffic are fairly straightforward in that the emphasis should probably be given to the most important and highly used road sections.

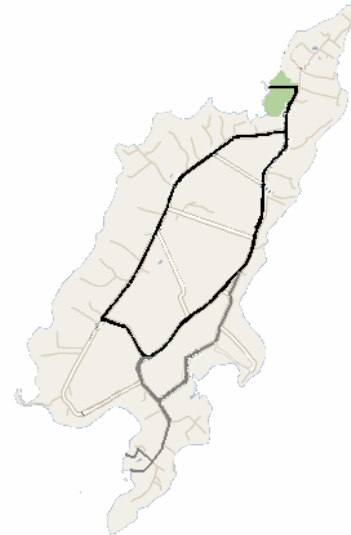
The criteria for prioritizing road sections based on the surface status are a little more complex. Referring back to Figure 4 it is readily apparent that investing in road sections that are in the “Preventative” and ‘Rehabilitate” status categories are probably the best use of limited funding in the long term. However, addressing routine maintenance should not be ignored.

Second Pass

The first pass at prioritizing yielded a list of road sections that the task force reviewed. The major road sections were driven again and compared with each other to see if the survey yielded results that made sense. Some minor adjustments were made to surveys based on this.

Third Pass

In the third pass a primary network of roads was divided into four groups roughly based on the idea of traffic and importance that included two ‘loops’. One loop starts at the Stone Wharf runs south on South Road then over School House Road and North on North Road all the way back to South Road. The second ‘loop’ runs from the State Pier at Chandlers over the Casco Bay Landing Road then North on South Road (past John Small, School House and Littlefield) then back on John Small Road all the back to South Road. These two loops can be considered the main roads of the island. The next set of roads are the crossroads between North and South Roads (including Cottage Road, Littlefield, Roy Hill and Firehouse) . The final group are the *cul de sacs* or *dead end* roads that often terminate at the Shore.



Step 2: Interviewing the Road Crew

Once the road network was prioritized by these relatively academic means it was important to put those results to the “straight face test” by those who know our roads the best; the town road crew. The road crew review serves two important functions: 1) to test the results of the inventory, survey and initial analysis and 2) to identify public safety issues and other issues that might increase the cost of work on a particular section.

Step 3: Review and site visit from MLRC

A review with the MLRC “Road Ranger” will be able to visit specific trouble spots and either provide engineering solutions or advise that the town should engage professional services to address the problem.

Step 4: Task Force/Road Commissioner budget review

Steps 1-3 provided important input that enabled the task force and Road Commissioner to work together to develop a budget for each road section that could potentially be addressed in the next several years.

b. Strategy

The strategy used in maintaining our roads has to take into account the current status of our road network, which is generally very poor. The goal is to bring the status of the entire network up to a sustainable level while protecting the best roads by maintaining them properly.

The strategy must also take into account the fiscal status of the town. Established towns often borrow the funds to accomplish large road projects but given our current secession related debt service (in the range of a half million dollars per year) we may want to consider some more creative approaches.

The strategy requires two phases:

Phase I – Slowly improve the paved roads in poor condition while maintaining the best roads.

Phase II – Once all roads are in good condition implement a plan to sustain the road network within the budget.

The task forces believes that by: 1) selecting moderate repair options (with respect to cost), 2) focusing on preserving the best roads and 3) lowering the maintenance costs on the worst roads the entire road network will slowly improve with time.

8. Schedule

With nearly half our paved road network in the ‘rehabilitate’ and ‘reconstruct’ categories Chebeague will likely be in ‘Phase I’ for some time to come.

However, the short term schedule was relatively easy to determine for this initial review. It is based on the priority, cost and the type of road repair assigned to each road section. Once the repair strategy was selected the base budget is determined by RSMS. By grouping road sections with similar repair strategies and selecting road sections to meet the funds we have saved in our Capital Plan a proposed schedule quickly becomes evident.

The assumption was made that the town was willing to sustain a certain level of funding and the prioritized list played out in time accordingly.

When the road plan is reviewed next year it may be necessary or desirable to modify the schedule and associated funding. This discussion will likely be a core topic in the annual review of the capital improvement and maintenance plan and associated budget discussions.

The present schedule recommendation is provided in the Road Plan (Appendix D)

9. Budget

The budget was developed by selecting a strategy from among several options presented by RSMS and examining what measures might need to be taken to prepare for the work. For example, culverts may need replacing or resetting, drainage may need to be improved or other roadbed modifications may be required. These costs as well as the “island factor” are added to the budget within the RSMS program.

10. Financing

Financing road work is accomplished in many municipalities by borrowing money through municipal bonds, reserve funds or a combination the two. Given the town’s substantial debt load financing in the near term will likely be through taxes raised and Annual Town Meeting and placed in reserve accounts.

Fiscal Year	Approved	Balance
2007 -2008	\$15,000	\$15,000
2008-2009	\$15,000	\$30,000
2009-2010	\$30,000	\$60,000
2010-2011	\$52,500 ⁽¹⁾	\$112,500
(1) – Proposed		

Table 3 shows how much the town has saved for road paving beginning with the inception of the town in 2007.

The current plan will require between \$150,000 and \$200,000 dollars in new taxes each year, tens times more than we raised the first year and three or four times the amount proposed for the 2010-2011 budget.

References

Maine Department of Transportation. Road Surface Management System for Maine Towns. Workshop Notebook, Local Technical Assistance Program, 2008.

Maine Department of Transportation. Field Manual, Identification of Road Surface Conditions. Maine Local Roads Center, 2002.

Town of Cumberland. Pavement Management Study for Town of Cumberland, Maine. Casey & Godfrey Engineers, 1999.

Appendix A. Road Inventory (1999 Road Study)

	Road	Paved (miles)	Unpaved (miles)	Road Length	2010 Survey
1	Bar Point Road	0.2		0.2	X
2	Bennetts Cove Road		0.2	0.2	
3	Capps Road	0.1		0.1	X
4	Casco Bay Landing Road	0.1		0.1	X
5	Chandler Cove Road	0.2		0.2	X
6	Charleston Road		0.0	0.0	
7	Cottage Road	0.1		0.1	X
8	Division Point Road	0.4		0.4	X
9	East Shore Drive		0.3	0.3	
10	Fenderson Road	0.0	0.2	0.2	X
11	Firehouse Road	0.4		0.4	X
12	Indian Point Road		0.3	0.3	
13	Jenks Road		0.3	0.3	
14	John Small Road	1.0		1.0	X
15	Landfill Road	0.1		0.1	X
16	Littlefield Avenue		0.3	0.3	X
17	North Road	2.4		2.4	X
18	Old Cart Road	0.2		0.2	
19	Parking Lot Public Safety Bldg				X
20	Parking Lot School				X
21	Rose Point Road		0.4	0.4	
22	Roy Hill Road		0.1	0.1	X
23	School House Road	0.4		0.4	X
24	Soule Road	0.1	0.2	0.2	X
25	South Road	3.3		3.3	X
26	South Shore Drive		0.3	0.3	
27	Stone Wharf Road	0.3		0.3	X
28	Sunset Road		0.2	0.2	
29	Waldo Point Road		0.1	0.1	
30	Willow Street		0.1	0.1	
		9.1	2.9	12.0	

APPENDIX B

Road Network Inventory

2010

<u>Road/Section Name</u>	<u>Sec</u>	<u>From Road/Section</u>	<u>To Road/Section</u>	<u>Length</u>	<u>Import</u>	<u>Traffic</u>	<u>Surface status</u>	<u>Drainage status</u>	<u>Last Survey Date</u>
Bar Point Road	1	Division Point Rd	End	0.06	low	low	Preventive	Good	10/25/2009
Capps Road	1	South Road	Artist Point PvtRd	0.13	low	low	Preventive	Good	03/21/2010
Casco Bay Landing Road	1	State Pier	Chandlers Cove Rd	0.05	med-high	medium	No Maint	Good	03/21/2010
Chandler Cove Road	1	South Road	Casco Bay Landing	0.20	med-high	medium	Reconstruct	Good	03/21/2010
Cottage Road	1	North Road	South Road	0.07	medium	low-med	Reconstruct	Good	10/25/2009
Division Point Road	1	North Road	Shore	0.15	low	low	Reconstruct	Good	10/25/2009
Fenderson Road	1	South Road	Judy Doughty's	0.04	low	low	Reconstruct	Good	03/21/2010
Firehouse Road	1	North Road	South Road	0.37	medium	med-high	Reconstruct	Poor	10/25/2009
John Small Road	1	South Road (West)	Near Brother Ross	0.41	medium	medium	Preventive	Good	06/18/2009
John Small Road	2	Near Brother Ross	Near Ester Knight	0.50	med-high	med-high	Rehabilitate	Poor	06/21/2009
John Small Road	3	Near Ester Knight	South Road (East)	0.04	med-high	medium	Routine	Good	06/21/2009
Landfill Road	1	North Road	Transfer Station	0.06	high	high	Rehabilitate	Good	03/21/2010
Littlefield Ave	1	South Road	Island Commons	0.04	low-med	low-med	Rehabilitate	Good	05/16/2010
North Road	1	South Road	Firehouse Road	0.51	high	high	Reconstruct	Poor	10/26/2009
North Road	2	Firehouse Road	Cemetery	0.69	high	med-high	Reconstruct	Good	10/26/2009
North Road	3	Church	School House Road	0.66	high	med-high	Preventive	Good	10/26/2009
North Road	4	School House Road	Indian Point Road	0.57	medium	low-med	Preventive	Poor	10/26/2009
Old Cart Road	1	North Road	Turn Around	0.20	low	low	Rehabilitate	Good	03/21/2010
Parking Lot Public Safety Bldg	1	North Road	Public Safety Bldg	0.29	high	low	Routine	Good	03/21/2010
Parking Lot School	1	School House Road	School	0.13	high	low-med	Routine	Good	03/21/2010
Roy Hill Road	1	South Road	Geoff Summa	0.13	low-med	low-med	Reconstruct	Poor	05/23/2010
School House Road	1	North Road	in front of school	0.19	high	high	Preventive	Good	03/21/2010
School House Road	2	in front of school	Ralph Munroe	0.16	high	high	Rehabilitate	Good	03/21/2010
School House Road	3	Ralph Munroe	South Road	0.08	high	high	Reconstruct	Good	03/21/2010
Soule Road	1	South Road	Steve Johnson's	0.06	low	low	Reconstruct	Good	03/21/2010
South Road	1	Chandler's Cove Rd	Before John Small	0.41	med-high	high	Reconstruct	Poor	06/21/2009
South Road	2	Before John Small	Cottage Road	0.21	med-high	high	Rehabilitate	Good	06/21/2009
South Road	3	Cottage Road	School House	0.17	med-high	high	Reconstruct	Good	06/21/2009
South Road	4	School House	Littlefield Ave	0.41	med-high	med-high	Reconstruct	Good	06/21/2009
South Road	5	Littlefield Ave	Roy Hill Road	0.63	med-high	med-high	Preventive	Good	06/21/2009
South Road	6	Roy Hill Road	Inn	1.15	med-high	med-high	Routine	Good	06/21/2009
South Road	7	Inn	East Shore Road	0.35	med-high	medium	Rehabilitate	Good	06/21/2009
Stone Wharf Road	1	South Road	Parking Area	0.18	high	high	Preventive	Good	03/21/2010
Stone Wharf Road	2	Parking Area	End of Wharf	0.07	high	high	Preventive	Good	03/21/2010

Costed Repair Options

2010

Bar Point Road-1 From: Division Point Rd To: End (Length: 0.06mi., Width: 20.00ft.)

Surface Status: Preventive	<u>Estimated Cost</u>
Sand Seal	\$ 960
Chip seal (latex modified)	\$ 1,500
Thin (3/4 - 1") overlay	\$ 2,400
Shim with 1" overlay	\$ 3,900
Thick (> 1") overlay	\$ 4,320
Overlay w/ 2" cold mix, top w/ 1" HMA"	\$ 7,020

Capps Road-1 From: South Road To: Artist Point PvtRd (Length: 0.13mi., Width: 18.00ft.)

Surface Status: Preventive	<u>Estimated Cost</u>
Sand Seal	\$ 1,901
Chip seal (latex modified)	\$ 2,970
Thin (3/4 - 1") overlay	\$ 4,752
Shim with 1" overlay	\$ 7,722
Thick (> 1") overlay	\$ 8,554
Overlay w/ 2" cold mix, top w/ 1" HMA"	\$ 13,900

Chandler Cove Road-1 From: South Road To: Casco Bay Landing (Length: 0.20mi., Width: 19.00ft.)

Surface Status: Reconstruct	<u>Estimated Cost</u>
Reclaim pavement, revert to gravel	\$ 3,800
18" new 9.5mm gravel, 2" binder, 1"surface	\$ 42,750
24" new gravel, 2" binder, 2" surface	\$ 57,000

Cottage Road-1 From: North Road To: South Road (Length: 0.07mi., Width: 18.00ft.)

Surface Status: Reconstruct	<u>Estimated Cost</u>
Reclaim pavement, revert to gravel	\$ 1,170
18" new 9.5mm gravel, 2" binder, 1"surface	\$ 13,163
24" new gravel, 2" binder, 2" surface	\$ 17,550

Division Point Road-1 From: North Road To: Shore (Length: 0.15mi., Width: 20.00ft.)

Surface Status: Reconstruct	<u>Estimated Cost</u>
Reclaim pavement, revert to gravel	\$ 3,000
18" new 9.5mm gravel, 2" binder, 1"surface	\$ 33,750
24" new gravel, 2" binder, 2" surface	\$ 45,000

Fenderson Road-1 From: South Road To: Judy Doughy's (Length: 0.04mi., Width: 14.00ft.)

Surface Status: Reconstruct	<u>Estimated Cost</u>
Reclaim pavement, revert to gravel	\$ 574
18" new 9.5mm gravel, 2" binder, 1"surface	\$ 6,458
24" new gravel, 2" binder, 2" surface	\$ 8,610

Costed Repair Options

2010

Firehouse Road-1 From: North Road To: South Road (Length: 0.37mi., Width: 19.00ft.)

Surface Status: Reconstruct	<u>Estimated Cost</u>
Reclaim pavement, revert to gravel	\$ 7,030
18" new 9.5mm gravel, 2" binder, 1" surface	\$ 79,088
24" new gravel, 2" binder, 2" surface	\$ 105,450

Drainage Status: Poor	<u>Estimated Cost</u>
Replace/New culverts	\$ 0
Grade shoulders	\$ 352
Ditching	\$ 1,758

John Small Road-1 From: South Road (West) To: Near Brother Ross (Length: 0.41mi., Width: 18.00ft.)

Surface Status: Preventive	<u>Estimated Cost</u>
Sand Seal	\$ 5,904
Chip seal (latex modified)	\$ 9,225
Thin (3/4 - 1") overlay	\$ 14,760
Shim with 1" overlay	\$ 23,985
Thick (> 1") overlay	\$ 26,568
Overlay w/ 2" cold mix, top w/ 1" HMA"	\$ 43,173

John Small Road-2 From: Near Brother Ross To: Near Ester Knight (Length: 0.50mi., Width: 18.00ft.)

Surface Status: Rehabilitate	<u>Estimated Cost</u>
Reclaim pavement, revert to gravel	\$ 9,000
Shim w/ 2" overlay	\$ 58,500
Reclaim incl 6-8" base, 2" binder, 1/5" surface	\$ 90,000
PM RAP reclamation	\$ 110,250
Reclaim incl 6-8" base, stabilized, 2" binder, 1.5" surface	\$ 110,250

Drainage Status: Poor	<u>Estimated Cost</u>
Replace/New culverts	\$ 0
Grade shoulders	\$ 450
Ditching	\$ 2,250

John Small Road-3 From: Near Ester Knight To: South Road (East) (Length: 0.04mi., Width: 17.00ft.)

Surface Status: Routine	<u>Estimated Cost</u>
Patching	\$ 34
Crack Seal	\$ 782

Landfill Road-1 From: North Road To: Transfer Station (Length: 0.06mi., Width: 19.00ft.)

Surface Status: Rehabilitate	<u>Estimated Cost</u>
Reclaim pavement, revert to gravel	\$ 1,102
Shim w/ 2" overlay	\$ 7,163
Reclaim incl 6-8" base, 2" binder, 1/5" surface	\$ 11,020
Reclaim incl 6-8" base, stabilized, 2" binder, 1.5" surface	\$ 13,500
PM RAP reclamation	\$ 13,500

Littlefield Ave-1 From: South Road To: Island Commons (Length: 0.04mi., Width: 17.00ft.)

Surface Status: Rehabilitate	<u>Estimated Cost</u>
Reclaim pavement, revert to gravel	\$ 595
Shim w/ 2" overlay	\$ 3,868
Reclaim incl 6-8" base, 2" binder, 1/5" surface	\$ 5,950
Reclaim incl 6-8" base, stabilized, 2" binder, 1.5" surface	\$ 7,289
PM RAP reclamation	\$ 7,289

Costed Repair Options

2010

North Road-1 From: South Road To: Firehouse Road (Length: 0.51mi., Width: 21.00ft.)

Surface Status: Reconstruct	<u>Estimated Cost</u>
Reclaim pavement, revert to gravel	\$ 10,710
18" new 9.5mm gravel, 2" binder, 1" surface	\$ 120,488
24" new gravel, 2" binder, 2" surface	\$ 160,650

Drainage Status: Poor	<u>Estimated Cost</u>
Replace/New culverts	\$ 0
Grade shoulders	\$ 536
Ditching	\$ 2,678

North Road-2 From: Firehouse Road To: Cemetery (Length: 0.69mi., Width: 21.00ft.)

Surface Status: Reconstruct	<u>Estimated Cost</u>
Reclaim pavement, revert to gravel	\$ 14,490
18" new 9.5mm gravel, 2" binder, 1" surface	\$ 163,013
24" new gravel, 2" binder, 2" surface	\$ 217,350

North Road-3 From: Church To: School House Road (Length: 0.66mi., Width: 21.00ft.)

Surface Status: Preventive	<u>Estimated Cost</u>
Sand Seal	\$ 11,088
Chip seal (latex modified)	\$ 17,325
Thin (3/4 - 1") overlay	\$ 27,720
Shim with 1" overlay	\$ 45,045
Thick (> 1") overlay	\$ 49,896
Overlay w/ 2" cold mix, top w/ 1" HMA"	\$ 81,081

North Road-4 From: School House Road To: Indian Point Road (Length: 0.57mi., Width: 21.00ft.)

Surface Status: Preventive	<u>Estimated Cost</u>
Sand Seal	\$ 9,576
Chip seal (latex modified)	\$ 14,963
Thin (3/4 - 1") overlay	\$ 23,940
Shim with 1" overlay	\$ 38,903
Thick (> 1") overlay	\$ 43,092
Overlay w/ 2" cold mix, top w/ 1" HMA"	\$ 70,025

Drainage Status: Poor	<u>Estimated Cost</u>
Replace/New culverts	\$ 0
Grade shoulders	\$ 599
Ditching	\$ 2,993

Old Cart Road-1 From: North Road To: Turn Around (Length: 0.20mi., Width: 21.00ft.)

Surface Status: Rehabilitate	<u>Estimated Cost</u>
Reclaim pavement, revert to gravel	\$ 4,200
Shim w/ 2" overlay	\$ 27,300
Reclaim incl 6-8" base, 2" binder, 1/5" surface	\$ 42,000
PM RAP reclamation	\$ 51,450
Reclaim incl 6-8" base, stabilized, 2" binder, 1.5" surface	\$ 51,450

Parking Lot Public Safety Bldg-1 From: North Road To: Public Safety Bldg (Length: 0.29mi., Width: 21.00ft.)

Surface Status: Routine	<u>Estimated Cost</u>
Patching	\$ 145
Crack Seal	\$ 3,335

Costed Repair Options

2010

Parking Lot School-1 From: School House Road To: School (Length: 0.13mi., Width: 10.00ft.)

Surface Status: Routine	<u>Estimated Cost</u>
Patching	\$ 65
Crack Seal	\$ 1,495

Roy Hill Road-1 From: South Road To: Geoff Summa (Length: 0.13mi., Width: 17.00ft.)

Surface Status: Reconstruct	<u>Estimated Cost</u>
Reclaim pavement, revert to gravel	\$ 2,210
18" new 9.5mm gravel, 2" binder, 1" surface	\$ 24,863
24" new gravel, 2" binder, 2" surface	\$ 33,150

Drainage Status: Poor	<u>Estimated Cost</u>
Replace/New culverts	\$ 0
Grade shoulders	\$ 111
Ditching	\$ 553

School House Road-1 From: North Road To: in front of school (Length: 0.19mi., Width: 17.00ft.)

Surface Status: Preventive	<u>Estimated Cost</u>
Sand Seal	\$ 2,584
Chip seal (latex modified)	\$ 4,038
Thin (3/4 - 1") overlay	\$ 6,460
Shim with 1" overlay	\$ 10,498
Thick (> 1") overlay	\$ 11,628
Overlay w/ 2" cold mix, top w/ 1" HMA"	\$ 18,896

School House Road-2 From: in front of school To: Ralph Munroe (Length: 0.16mi., Width: 17.00ft.)

Surface Status: Rehabilitate	<u>Estimated Cost</u>
Reclaim pavement, revert to gravel	\$ 2,720
Shim w/ 2" overlay	\$ 17,680
Reclaim incl 6-8" base, 2" binder, 1/5" surface	\$ 27,200
Reclaim incl 6-8" base, stabilized, 2" binder, 1.5" surface	\$ 33,320
PM RAP reclamation	\$ 33,320

School House Road-3 From: Ralph Munroe To: South Road (Length: 0.08mi., Width: 17.00ft.)

Surface Status: Reconstruct	<u>Estimated Cost</u>
Reclaim pavement, revert to gravel	\$ 1,360
18" new 9.5mm gravel, 2" binder, 1" surface	\$ 15,300
24" new gravel, 2" binder, 2" surface	\$ 20,400

Soule Road-1 From: South Road To: Steve Johnson's (Length: 0.06mi., Width: 14.00ft.)

Surface Status: Reconstruct	<u>Estimated Cost</u>
Reclaim pavement, revert to gravel	\$ 840
18" new 9.5mm gravel, 2" binder, 1" surface	\$ 9,450
24" new gravel, 2" binder, 2" surface	\$ 12,600

Costed Repair Options

2010

South Road-1 From: Chandler's Cove Rd To: Before John Small (Length: 0.41mi., Width: 20.00ft.)

Surface Status: Reconstruct	<u>Estimated Cost</u>
Reclaim pavement, revert to gravel	\$ 8,200
18" new 9.5mm gravel, 2" binder, 1"surface	\$ 92,250
24" new gravel, 2" binder, 2" surface	\$ 123,000

Drainage Status: Poor	<u>Estimated Cost</u>
Replace/New culverts	\$ 0
Grade shoulders	\$ 410
Ditching	\$ 2,050

South Road-2 From: Before John Small To: Cottage Road (Length: 0.21mi., Width: 20.00ft.)

Surface Status: Rehabilitate	<u>Estimated Cost</u>
Reclaim pavement, revert to gravel	\$ 4,200
Shim w/ 2" overlay	\$ 27,300
Reclaim incl 6-8" base, 2" binder, 1/5" surface	\$ 42,000
PM RAP reclamation	\$ 51,450
Reclaim incl 6-8" base, stabilized, 2" binder, 1.5" surface	\$ 51,450

South Road-3 From: Cottage Road To: School House (Length: 0.17mi., Width: 20.00ft.)

Surface Status: Reconstruct	<u>Estimated Cost</u>
Reclaim pavement, revert to gravel	\$ 3,400
18" new 9.5mm gravel, 2" binder, 1"surface	\$ 38,250
24" new gravel, 2" binder, 2" surface	\$ 51,000

South Road-4 From: School House To: Littlefield Ave (Length: 0.41mi., Width: 20.00ft.)

Surface Status: Reconstruct	<u>Estimated Cost</u>
Reclaim pavement, revert to gravel	\$ 8,200
18" new 9.5mm gravel, 2" binder, 1"surface	\$ 92,250
24" new gravel, 2" binder, 2" surface	\$ 123,000

South Road-5 From: Littlefield Ave To: Roy Hill Road (Length: 0.63mi., Width: 20.00ft.)

Surface Status: Preventive	<u>Estimated Cost</u>
Sand Seal	\$ 10,080
Chip seal (latex modified)	\$ 15,750
Thin (3/4 - 1") overlay	\$ 25,200
Shim with 1" overlay	\$ 40,950
Thick (> 1") overlay	\$ 45,360
Overlay w/ 2" cold mix, top w/ 1" HMA"	\$ 73,710

South Road-6 From: Roy Hill Road To: Inn (Length: 1.15mi., Width: 20.00ft.)

Surface Status: Routine	<u>Estimated Cost</u>
Patching	\$ 1,150
Crack Seal	\$ 26,450

South Road-7 From: Inn To: East Shore Road (Length: 0.35mi., Width: 20.00ft.)

Surface Status: Rehabilitate	<u>Estimated Cost</u>
Reclaim pavement, revert to gravel	\$ 7,000
Shim w/ 2" overlay	\$ 45,500
Reclaim incl 6-8" base, 2" binder, 1/5" surface	\$ 70,000
Reclaim incl 6-8" base, stabilized, 2" binder, 1.5" surface	\$ 85,750
PM RAP reclamation	\$ 85,750

Costed Repair Options

2010

Stone Wharf Road-1 From: South Road To: Parking Area (Length: 0.18mi., Width: 22.00ft.)

Surface Status: Preventive	<u>Estimated Cost</u>
Sand Seal	\$ 3,168
Chip seal (latex modified)	\$ 4,950
Thin (3/4 - 1") overlay	\$ 7,920
Shim with 1" overlay	\$ 12,870
Thick (> 1") overlay	\$ 14,256
Overlay w/ 2" cold mix, top w/ 1" HMA"	\$ 23,166

Stone Wharf Road-2 From: Parking Area To: End of Wharf (Length: 0.07mi., Width: 65.00ft.)

Surface Status: Preventive	<u>Estimated Cost</u>
Sand Seal	\$ 3,640
Chip seal (latex modified)	\$ 5,688
Thin (3/4 - 1") overlay	\$ 9,100
Shim with 1" overlay	\$ 14,788
Thick (> 1") overlay	\$ 16,380
Overlay w/ 2" cold mix, top w/ 1" HMA"	\$ 26,618

Appendix D. Road Plan

The following section contains the Road Plan for 2010. It is the recommendation of the task force that the document provided in this appendix becomes a stand-alone document and is reviewed annually.

ROAD PLAN

2010



CHEBEAGUE ISLAND
MAINE

1. Introduction

The road plan is created by a group of local volunteers with the aid of the Road Surface Management System (RSMS). RSMS is software created by the Maine Local Roads Center (MLRC) of the Maine Department of Transportation (MDOT). The goal of the plan is to slowly bring the quality of our road network up to a point where the entire network can be put into a regular cost effective maintenance program. The 2010 road plan is the first road plan that the town of Chebeague Island has undertaken. This plan is focused on the approximately 10 miles of paved roads.

2. Elements of a Road Plan

a. Repair Strategies

A small group of local volunteers completes a road section condition survey. The data are entered into the RSMS which categorizes each section of surveyed road and provides possible maintenance options for each type. A cost for each maintenance option is based on the length, width and RSMS category.

b. Priorities

Each road section is also characterized in terms of the traffic load and the importance of the road section. Generally, it is more cost effective to maintain the roads that are in good condition rather than fixing roads that are in poor condition. For Chebeague this means that while we are bringing the quality of our paved roads up we must also maintain the roads that are already in good condition.

c. Programs and Budget

To develop the maintenance program for 2010-2011 the road sections are prioritized based on long-term goals, current road status and immediate priorities. A repair option is selected for the road sections that fall out at the top of the priority list. Similar options are grouped together to provide sufficient mileage to minimize contractor mobilization costs. These are compared to the projected level of reserve funds in the capital budget and a 2-3 year schedule is created. An "Island Factor" is applied to the RSMS estimates which are mainland based.

The Public Works department performs culvert replacement, ditching, patching and grading as part of its operating budget and they are not included in the 2010 road plan recommendations. Public Works will also be involved in preparing roads for the work recommended in this document.

3. Recommendations

a. Gravel Roads

Plan to perform a survey of the 3 miles of gravel roads and incorporate them into the Road Plan for 2011.

b. Financing

Plan to allocate \$150,000 each year. Raise between \$100,000 and \$125,000 each year through tax revenue for the paving capital account (9050). Supplement that each year with a transfer from the undesignated fund balance between \$25,000 and \$50,000 or more if it can be done under the current fund balance policy.

c. 2010-2011 Maintenance, Budget and Administrative Recommendations

1. Request Town Meeting raise \$52,500 for the paving capital account (9050).
2. Request Town Meeting transfer \$53,000 from the undesignated fund balance to the paving capital account (9050)
3. Authorize the Selectmen to spend \$165,000 in fiscal year 2010-2011 from the paving capital account (9050) (leaving any accrued interest and unspent balance in account 9050) and authorize the Board of Selectmen to enter into any required contracts to accomplish the work.
4. Direct the Town Administrator to solicit bids, secure contracts and make any other preparations to accomplish the work described in this plan.
5. Provide a means for the Road Plan to updated annually:
6. Resurvey annually especially newly repaired road section
7. Maintain the RSMS software
8. Publish the plan in advance of the budget process

4. RSMS Road Network Financial Plan

The table below is the result of this year's road survey and analysis. The costs are not modified for inflation. The intended use of the table is as a planning tool and the exact implementation may vary based on other financial or technical considerations.

Road Network Financial Plan

2010

Fiscal Year 2010

<u>Road/Section Name</u>	<u>#</u>	<u>From</u>	<u>To</u>	<u>Length</u>	<u>Recommended Repair</u>	<u>Other</u>	<u>Budget</u>	<u>Actual</u>
Parking Lot Public Safety	1	North Road	Public Safety Bldg	0.29	Crack Seal		3,335	0
Parking Lot Public Safety	1	North Road	Public Safety Bldg	0.29		30% Island Factor	1,000	0
Parking Lot School	1	School House Road	School	0.13	Crack Seal		1,495	0
Parking Lot School	1	School House Road	School	0.13		30% Island Factor	448	0
School House Road	1	North Road	in front of school	0.19	Thin (3/4 - 1") overlay		7,600	0
School House Road	2	in front of school	Ralph Munroe	0.16	Reclaim incl 6-8" base, 2" binder, 1/5" surface		27,200	0
School House Road	2	in front of school	Ralph Munroe	0.16		30% Island Factor	8,160	0
School House Road	3	Ralph Munroe	South Road	0.08	24" new gravel, 2" binder, 2" surface		20,400	0
School House Road	3	Ralph Munroe	South Road	0.08		30% Island Factor	6,120	0
School House Road	1	North Road	in front of school	0.19		30% Island Factor	2,280	0
School House Road	3	Ralph Munroe	South Road	0.08		Replace culvert	500	0
South Road	6	Roy Hill Road	Inn	1.15	Crack Seal		26,450	0
South Road	6	Roy Hill Road	Inn	1.15		30% Island Factor	7,962	0
South Road	4	School House	Littlefield Ave	0.41		Chip Seal	10,250	0
South Road	4	School House	Littlefield Ave	0.41		30% Island Factor	3,075	0
South Road	2	Before John Small	Cottage Road	0.21		Chip Seal	5,250	0
South Road	2	Before John Small	Cottage Road	0.21		30% Island Factor	1,575	0
Stone Wharf Road	1	South Road	Parking Area	0.18	Thick (> 1") overlay		14,256	0
							147,356	0

Fiscal Year 2011

<u>Road/Section Name</u>	<u>#</u>	<u>From</u>	<u>To</u>	<u>Length</u>	<u>Recommended Repair</u>	<u>Other</u>	<u>Budget</u>	<u>Actual</u>
Firehouse Road	1	North Road	South Road	0.37	Replace/New culverts	6 culverts replaced	1,000	0
Firehouse Road	1	North Road	South Road	0.37	Reclaim pavement, revert to gravel		7,030	0
Firehouse Road	1	North Road	South Road	0.37		30% Island Factor	2,109	0
Firehouse Road	1	North Road	South Road	0.37		12" of new gravel	30,000	0
John Small Road	1	South Road (West)	Near Brother Ross	0.41	Thick (> 1") overlay		28,044	0
John Small Road	1	South Road (West)	Near Brother Ross	0.41		30% Island Factor	8,413	0
John Small Road	2	Near Brother Ross	Near Ester Knight	0.50	Reclaim incl 6-8" base, 2" binder, 1/5" surface		90,000	0
John Small Road	2	Near Brother Ross	Near Ester Knight	0.50		30% Island Factor	27,000	0
John Small Road	3	Near Ester Knight	South Road (East)	0.04		Thin overly to match othe	3,000	0
John Small Road	1	South Road (West)	Near Brother Ross	0.41		Repair allowance on 7 cu	1,000	0
John Small Road	2	Near Brother Ross	Near Ester Knight	0.50		repair allowance on 5 cul	1,000	0
							198,596	0

Road Network Financial Plan 2010

Fiscal Year 2012

<u>Road/Section Name</u>	<u>#</u>	<u>From</u>	<u>To</u>	<u>Length</u>	<u>Recommended Repair</u>	<u>Other</u>	<u>Budget</u>	<u>Actual</u>
North Road	1	South Road	Firehouse Road	0.51	18" new 9.5mm gravel, 2" binder, 1"surface		120,488	0
North Road	1	South Road	Firehouse Road	0.51		30% Island Factor	36,146	0
							156,634	0

Fiscal Year 2013

<u>Road/Section Name</u>	<u>#</u>	<u>From</u>	<u>To</u>	<u>Length</u>	<u>Recommended Repair</u>	<u>Other</u>	<u>Budget</u>	<u>Actual</u>
North Road	2	Firehouse Road	Cemetery	0.69	18" new 9.5mm gravel, 2" binder, 1"surface		163,013	0
North Road	2	Firehouse Road	Cemetery	0.69		30% Island Factor	48,904	0
							211,917	0

Fiscal Year 2014

<u>Road/Section Name</u>	<u>#</u>	<u>From</u>	<u>To</u>	<u>Length</u>	<u>Recommended Repair</u>	<u>Other</u>	<u>Budget</u>	<u>Actual</u>
North Road	3	Church	School House Road	0.66	Thick (> 1") overlay		74,844	0
North Road	3	Church	School House Road	0.66		30% Island Factor	22,453	0
							97,297	0

Fiscal Year 2015

<u>Road/Section Name</u>	<u>#</u>	<u>From</u>	<u>To</u>	<u>Length</u>	<u>Recommended Repair</u>	<u>Other</u>	<u>Budget</u>	<u>Actual</u>
South Road	5	Littlefield Ave	Roy Hill Road	0.63	Thick (> 1") overlay		45,360	0
South Road	5	Littlefield Ave	Roy Hill Road	0.63		30% Island Factor	13,608	0
							58,968	0

Fiscal Year 2016

<u>Road/Section Name</u>	<u>#</u>	<u>From</u>	<u>To</u>	<u>Length</u>	<u>Recommended Repair</u>	<u>Other</u>	<u>Budget</u>	<u>Actual</u>
South Road	3	Cottage Road	School House	0.17	18" new 9.5mm gravel, 2" binder, 1"surface		38,250	0
South Road	3	Cottage Road	School House	0.17		30% Island Factor	11,475	0
							49,725	0

Road Network Financial Plan

2010

Fiscal Year 2017

<u>Road/Section Name</u>	<u>#</u>	<u>From</u>	<u>To</u>	<u>Length</u>	<u>Recommended Repair</u>	<u>Other</u>	<u>Budget</u>	<u>Actual</u>
Chandler Cove Road	1	South Road	Casco Bay Landing	0.20	18" new 9.5mm gravel, 2" binder, 1"surface		42,750	0
Chandler Cove Road	1	South Road	Casco Bay Landing	0.20		30% Island Factor	12,825	0
							55,575	0

Fiscal Year 2018

<u>Road/Section Name</u>	<u>#</u>	<u>From</u>	<u>To</u>	<u>Length</u>	<u>Recommended Repair</u>	<u>Other</u>	<u>Budget</u>	<u>Actual</u>
South Road	1	Chandler's Cove Rd	Before John Small	0.41	18" new 9.5mm gravel, 2" binder, 1"surface		92,250	0
South Road	1	Chandler's Cove Rd	Before John Small	0.41		30% Island Factor	27,675	0
							119,925	0

Fiscal Year 2019

<u>Road/Section Name</u>	<u>#</u>	<u>From</u>	<u>To</u>	<u>Length</u>	<u>Recommended Repair</u>	<u>Other</u>	<u>Budget</u>	<u>Actual</u>
Cottage Road	1	North Road	South Road	0.07	18" new 9.5mm gravel, 2" binder, 1"surface		13,163	0
Cottage Road	1	North Road	South Road	0.07		30% Island Factor	3,950	0
North Road	4	School House Road	Indian Point Road	0.57	Shim with 1" overlay		38,903	0
North Road	4	School House Road	Indian Point Road	0.57		30% Island Factor	11,671	0
							67,687	0

Fiscal Year 2020

<u>Road/Section Name</u>	<u>#</u>	<u>From</u>	<u>To</u>	<u>Length</u>	<u>Recommended Repair</u>	<u>Other</u>	<u>Budget</u>	<u>Actual</u>
Bar Point Road	1	Division Point Rd	End	0.06	Shim with 1" overlay		3,900	0
Bar Point Road	1	Division Point Rd	End	0.06		30% Island Factor	1,170	0
Division Point Road	1	North Road	Shore	0.15	18" new 9.5mm gravel, 2" binder, 1"surface		33,750	0
Division Point Road	1	North Road	Shore	0.15		30% Island Factor	10,125	0
							48,945	0

Road Network Financial Plan 2010

Fiscal Year 2021

<u>Road/Section Name</u>	<u>#</u>	<u>From</u>	<u>To</u>	<u>Length</u>	<u>Recommended Repair</u>	<u>Other</u>	<u>Budget</u>	<u>Actual</u>
Capps Road	1	South Road	Artist Point PvtRd	0.13	Shim with 1" overlay		7,508	0
Fenderson Road	1	South Road	Judy Doughty's	0.04	18" new 9.5mm gravel, 2" binder, 1"surface		6,458	0
Landfill Road	1	North Road	Transfer Station	0.06	Shim w/ 2" overlay		7,163	0
Littlefield Ave	1	South Road	Island Commons	0.04	Reclaim incl 6-8" base, 2" binder, 1/5" surface		5,950	0
Old Cart Road	1	North Road	Turn Around	0.20	Shim w/ 2" overlay		27,300	0
Roy Hill Road	1	South Road	Geoff Summa	0.13	18" new 9.5mm gravel, 2" binder, 1"surface		24,863	0
Roy Hill Road	1	South Road	Geoff Summa	0.13		30% Island Factor	7,459	0
							<u>86,701</u>	<u>0</u>