



---

**MILFORD UPPER CHARLES TRAIL**  
**COMPREHENSIVE MAINTNENANCE ASSESSMENT REPORT**  
**(September 2018)**

The Milford Upper Charles Trail Committee expresses its appreciation to the Park Commissioners, Parks and Recreation Director (Mike Bresciani), Highway Surveyor (Scott Crisafulli), and Police Chief (Thomas O'Loughlin) for their co-operation in preparing this report.

Milford Upper Charles Trail Committee  
Reno DeLuzio, Chairman

**MILFORD UPPER CHARLES TRAIL  
COMPREHENSIVE MAINTNENANCE ASSESSMENT REPORT**

**Table of Contents**

	<u>Page</u>
Background and Report Commentary	1
Park Department	3
Highway Department	5
Police Department	7

**Supplemental Information**

**Attachment 1 (Page 8):**

Memorandum of Understanding amongst the Park Commission, Highway Dept., Police Dept, and the Friends of the Trail.

**Attachment 2 (Page 10):**

1. Remediated Design or Construction Deficient Items Paid for by the Highway Department over the Past 10 Years.
2. Remediated Design or Construction Deficient Items Paid for by the Trail Committee Accounts Fund Balances.

## **Background and Report Commentary**

### **Background**

Finance Committee concerns regarding trail maintenance costs during FY18 budget review meetings with the Highway Department and the Parks and Recreation Department prompted the development of this comprehensive maintenance assessment which includes all elements of trail maintenance. This assessment is a result of over 10 years experience in maintaining the trail.

The contributors to trail maintenance include the Highway Department, Parks and Recreation Department, Police Department, and the Friends of the Trail. Their areas of responsibility are defined in a Memorandum of Understanding (See Attachment 1).

A series of meetings were held with Scott Crisafulli and Mike Bresciani (with Park Commissioners approval) to establish the parameters of the assessment, assign action items, and prepare cost estimates. The Police Chief and the Friends of the Trail also provided inputs. Although the report was essentially completed in January 2018, it was decided to delay its release until after the May 2018 Town meeting to reflect the most current cost estimates and FY 2019 budgets.

### **Report Commentary**

#### **Maintenance Tasks Classification:**

Trail maintenance involves annual recurring tasks and periodic or as needed tasks. Annual recurring task cost estimates are straight forward. However, periodic or as needed maintenance task estimates are difficult to predict since they occur at various frequencies over time. All but one Highway Department task are in the periodic or as needed category.

#### **Highway Department and Trail Committee One Time Tasks (See Attachment 2):**

The Report also includes the Highway Department's one time estimated expenditures (\$23.5K) and the Upper Charles Trail Committee's actual one time expenditures (\$30.2K) over the past 11 years (through FY18) to remediate design or construction deficiencies. The Trail Committee expenditures were funded from the Trail Committee Accounts Fund Balances.

#### **Pavement Assessment:**

The Highway Surveyor's pavement assessment of Phase 1 (2.8 mi., 10 yrs. old) on 11/1/17 indicated that a total of approximately 400 ft. (2.7%) of pavement (at various locations) needs attention due to root encroachment. Overall, the 6.7 miles of pavement surface is in good to excellent condition.

#### **Police Department - Flashing Beacon Fixes at Dilla St. and Cedar St.:**

The Dilla St. and Cedar St. fixes were completed in Aug 2017. From Aug. 2017 thru July 2018 (approx. 1 yr.) there have been no battery replacements at these two locations (or at any of the other 5 locations).

**MILFORD UPPER CHARLES TRAIL  
COMPREHENSIVE MAINTNENANCE ASSESSMENT REPORT**

**Budgeting and Cost Accounting:**

In 2011, at the request of the Finance Committee, the Park Department established two line items for Bike Trail Maintenance (Salaries & Wages and General Expenses) to track bike trail maintenance costs. No such budgeting line items were established for the Highway Department or Police Department. Although the Police Dept. does not have a separate line item for the flashing beacons, their repair costs are itemized in their Town Wide Traffic Signal Repair/Maint. Log. During the FY19 budget review a bike trail line item was established for the Highway Department.

It should be noted that line item budgeting for the purpose of tracking costs is only effective if the department heads either issue specific work orders or periodically estimate expenditures and make accounting transfers for Bike Trail work. Examination of cost reports indicates this practice has not always been followed. Case in point is the Park Department's acknowledgement that it has recently been supplementing their \$20K Bike Trail Maintenance line items with funds from their general accounts (latest estimate is \$11.7K).

During the FY19 budget negotiations with the Park Department, the Bike Trail maintenance line items did not reflect the FY19 estimated costs (see table below). The Park Department will be correcting this oversight with no increase in Dept. budgets.

FY19 Estimates vs. Fin Com Approved			
	Salaries & Wages	General Expenses	Total
FY19 Estimates (1/31/18)	\$ 26,100	\$ 5,600	\$ 31,700
FY19 Proposed & Fin Com approved	\$ 12,047	\$ 8,776	\$ 20,823
(Under)/Over	\$ (18,053)	\$ 7,176	\$ (10,877)

**Chapter 90 Funds:**

The Bike Trail construction was a Federal/State funded transportation project and is therefore eligible for Chapter 90 funds for the same activities allowed for roadways.

**Total Trail Annual Maintenance Cost Estimates Summary:**

Table 1 below is a summary of the detail trail maintenance cost estimates found in this Report.

**Table 1 – Estimated Trail Maintenance Costs vs. Applicable Budgets Summary**

Department Applicable Line Item	FY19 Applicable Budgets (\$K)	Estimated Costs (\$K)	% of Budget
<b>Park</b>			
Personal Services	546	26.1	4.8
General Expenses	189	5.6	3.0
Park Total	735	31.7	4.3
<b>Highway</b>			
Dept. 421 Personal Services + Dept. 422 Mark/Pave Street	1,221	10.0	<1
<b>Police</b>			
Repair/Maint.: Traffic Signals	40	1.0	2.5
<b>Total</b>	<b>1,333</b>	<b>42.7</b>	<b>3.2</b>

**MILFORD UPPER CHARLES TRAIL  
COMPREHENSIVE MAINTNENANCE ASSESSMENT REPORT**

**Park Department**

**Background**

As a result of the Park Department's request for additional funding in 2011 for bike trail maintenance, the Finance Committee approved a \$20K budget increase in FY2012 for the tasks shown in **Table 1** below. The Park Department then established a separate line item for Bike Trail Salaries & Wages and a separate line item for Misc.Expenses. The Dept. allocated \$12K to the Salaries & Wages:Bike Trail line item and \$8K to their Misc. Expense:Bike Trail line item. It should be noted that the Park Department has also been supplementing the Salaries & Wages:Bike Trail line item with funds from their Salaries and Wages line item. It should also be noted that Bike Trail labor costs are periodically estimated and accounting transfers are made to the Salaries & Wages:Bike Trail line item.

**Table 1 - Park Department Trail Maintenance Estimated Costs by Task**

Annual Recurring Tasks (\$K)			Periodic and As Needed Tasks (\$K)			
Item	Prior to FY19	FY19	Item	Prior to FY19	Beyond FY19	Frequency
1. Mowing		9.0	1. Fence Repair	0		As Needed
2. Trash Removal		5.0	2. Stone Dust Replenishment per 1000 ft.	0.	2.0 (Labor)	4 to 8 Yrs.
3. Brush control 3.1 Labor (\$2K) 3.2 Sub-contract (\$2K)		4.0				
4. Weedwacking		6.2				
5. Leaf Blowing		1.2				
6. Tree Trimming 6.1 Labor (\$2K) 6.1 Sub-contract (\$2K)		4.0				
7. Graffiti removal (Signage and Fencing)		0.4				
8. Maintain Gate Lock Functionality.		0.3				
9. Other Expenses		1.6		0	0.3(material)	
<b>Total</b>	<b>31.7</b>	<b>31.7</b>		0	2.3	
<b>Bike Trail Line Items</b>	20.0	31.7 Note 1				
<b>Dept. Line Items</b>	11.7	0				
Weed, mulch, and trim four landscaped areas ( <i>Friends of the Trail Responsibility</i> )						

Source: Park Department (K=1000)

Misc. Expense:Bike Trail line item costs = (Tasks 3.2+6.2+9) = \$5.6K

Salaries & Wages:Bike Trail line item costs = \$31.7K-\$5.6K = \$26.1K

**FY 19 Applicable Annual Budgets -- Personal Services \$546K (\$26.1K = 4.0%). General Expense \$189K (\$5.6K = 2%)**

Note 1: Park Dept. will adjust the FY19 budgets (as presented in the FY19 budget negotiations) to accurately reflect the Bike Trail Maintenance Line Item costs with no increase in Dept. funding.

### **Stone Dust Shoulders - Periodic Stone Dust Replenishment**

#### **Background:**

**1999 - Phase 1 (2.8 mi.)** Loam and Seed shoulders – No reliable information on stone dust requirements and performance.

**2006 -- Phase 2 (2.9 mi.)** The Trail Committee decided to re-evaluate stone dust with weed barrier in lieu of loam and seed to reduce the amount of mowing, edging, and weedwacking. Upon consultation with the Town Engineer, the trail design consultants (GPI) and the Parks and Recreation Director (along with several years of Mansfield's paved trail experience with stone dust shoulders) the Trail Committee decided on stone dust for Phase 2.

**2013 – Phase 3 (1 mi.)** – 30% stone dust/70% loam and seed.

#### **Status:**

**2011-** Phase 2 construction completed

**2014-** Phase 3 construction completed

**2017– Phase 2 (after 6 yrs)** - Some Stone Dust replenishment is required.

Approximately 5000 ft. (15%) of stone dust shoulders needs replenishment (stone dust surface greater than 1" below the pavement surface). Mass Highway district 3 managed construction. Since 85% is in good condition it is suspected that the depletion is a result of MassDOT selected stone dust supplier (vs. Town preferred single source Lorusso), sieve analysis non-compliance, and/or improper application.

Based on Holliston's extensive research and their experience with their trail surface, the replenishment utilized Holliston's specification and source (Kimball Sand & Gravel).

Subcontractor services were engaged to provide labor and equipment. The Subcontractor was paid from the Trail Committee Fund Balance Account (see Attachment 1) and the Parks Department paid material costs.

**2017 – Phase 3 (after 2.5 yrs.)** – No replenishment required. Construction was managed by the Town using stone dust from Kimball Sand and Gravel.

#### **Beyond 2017 – Phases 2 &3**

Periodic Stone Dust Replenishment every 4 to 8 yrs.

Actual Costs for 5,000 ft (2017):

Material----- 91T @ 12.50/T = \$1,130

Subcontracted Labor ----- \$ 9,800

Total            \$10,938 (say \$11,000)

#### **Cost per 1,000 ft.**

Subcontract Labor = (9,800/5,000) x 1,000 = ..... \$1,960.

Material (General Expense) = (1,130/5000) x 1,000 = ..... \$ 226

Total \$2,186

If it appears that stone dust replenishment proves to be ineffective and not cost effective over time, adding loam & seed will be re-evaluated.

**MILFORD UPPER CHARLES TRAIL  
COMPREHENSIVE MAINTNENANCE ASSESSMENT REPORT**

**Highway Department**

**Background**

Prior to FY19 the Highway Department had no dollars specifically earmarked for trail maintenance. My understanding is that they either received funding from the Park Department or they cover their cost from their Highway Dept. funds. See **Table 2** for Highway Department tasks and FY 19 estimated costs. In FY19 the Finance Committee approved a separate line item for Bike Trail Maintenance with a budget of \$10K.

**Pavement Maintenance:**

Like any asphalt surface in New England (e.g. driveways, parking lots, and roadways) the bike trail is susceptible to freeze/thaw cycles and sun exposure. It is also susceptible to root encroachment. Therefore, a certain level of periodic maintenance is required for the surface to reach its expected life of 25 years (or more) before resurfacing may be needed. The 6.7 mile (12 foot wide) bike trail adds 3% to the Town's total 240 lane miles.

The overall Phase 1 (2.8 mile) 11 yr. old trail surface is in very good condition despite some surface cracks and isolated root encroachments. The remaining 3.9 miles, which were paved from 2011 to 2014, are in excellent condition.

**Table 2 - Highway Department Trail Maintenance Costs by Task**

Annual Recurring Tasks (\$K)			Periodic or As Needed Tasks (\$K)			
General Budget			General Budget			
Item	FY18	FY19	Item	FY18	FY19	Frequency
1. Mechanical Brush Cutting	2.5	2.5	1. Surface Crack Sealing	0		5 to 10 yrs.
			2. Pavement Repair	1.0		2 to 10 yrs
			3. Root encroachment (Pavement repair and and/or tree removal)	0		2 to 10 yrs
			4. Restripe Trail Center Line	2.0		4 to 8 yrs.
			5. Restripe Road Crossings (6)	3.5		2 to 4 yrs.
			6. Drainage Maintenance	0.4		As Needed
			7. Sign Replacement	0.2		As Needed
			8. Hazardous Tree Removal	0		As Needed
			9. General Expenses	0		As Needed
			10. Misc	0.4		As Needed
<b>(A)Total</b>	2.5	2.5	<b>(B) Total</b>	7.5		
<b>FY19 Annual Line Item Budget = \$10K</b>						

Source: Highway Department (K=1000, M= Million)

**FY19 Applicable Highway Department Budgets (Town Funds) --- Dept. 421 Salaries & Wages \$1.163M + Dept. 422 Mark/Pave Street \$58K =\$1.221M ( \$10K < 1%)**

### **Root Encroachment:**

The Highway Surveyor's pavement assessment of Phase 1 on 11/1/17 indicated a total of approximately 400 ft. (2.7%) of pavement at 15 locations needs attention due to root encroachment. The average repair area is approximately 240 sq. ft. The two areas of concern are:

1. The segment from the Commuter Parking Lot on Main Street to the Milford Pond Dam.
2. Behind the Water Co. from the Charles River crossing to the I-495 off ramp.

### **Police Department**

#### **Flashing Beacons**

Over the past 10 years the Police Dept has been able to cover maintenance costs of the 6 flashing beacon systems within their Town wide traffic signal maintenance budget. However, the Police Chief has expressed concern that he may not be able to continue to do so. An analysis of the Police Department's Town wide traffic repair records over 4 fiscal years is summarized in **Tables 1, 2, and 3** below.

#### **A. Periodic**

##### **Replace batteries every 3 to 5 years**

Average cost of servicing a battery replacement was \$390 (See Table 3)

**Table 1- Battery Replacements**

<b>Location</b>	<b>Approximate Activation Date</b>	<b>Battery Replacement 7/1/13-6/6/17 (4 yrs)</b>
Main St.	Oct. 2011	0
Dilla St.	May. 2009	4
Cedar St.	Oct. 2013	6
Beaver St.	Oct. 2011	0
Rt. 109	Oct. 2011	0
Hayward St.	Oct. 2014	0

Source: Police Department (No data available prior to 7/1/13)

Table 1 reveals a systemic battery problem at Dilla St. and Cedar St.

#### **B. Service History over a Four Year Period.**

As with the Town wide traffic signal equipment failures, the flashing beacons are also subject to equipment failures. Table 2 shows that the bike trail flashing beacon repair orders were 16% of all traffic signal repair orders and the costs accounted for 10% of the Town wide traffic lights repair costs.

However of the 26 bike trail repair orders, 10 were due to battery/charging problems (at only 2 locations) which accounted for 49% of the bike trail repair costs (See Table 3). The remaining 16 repair orders were for a variety of causes with no systemic pattern.



**MILFORD UPPER CHARLES TRAIL  
COMPREHENSIVE MAINTNENANCE ASSESSMENT REPORT**

**Table 2**

<b>TOWN WIDE &amp; BIKE TRAIL TRAFFIC SIGNAL REPAIR SUMMARY 7/1/13 -6/6/17 (4Yrs.)</b>				
	<b>Repair Costs</b>		<b># Repair Order</b>	
		<b>% of</b>		<b>% of All</b>
<b>All Traffic Signals</b>	\$ 79,418	All	164	
<b>Bike trail</b>	\$ 7,886	10%	26	16%
	<b>Repair Costs/Yr.</b>		<b># Repair Orders/Yr.</b>	
		<b>% of</b>		<b>% of All</b>
<b>All Traffic Signals</b>	\$ 19,855	All	41	
<b>Bike trail</b>	\$ 1,972	10%	7	17%

**Table 3**

<b>Bike Trail Flashing Beacon Battery/Charging Repairs by Location</b>		
<b>Location</b>	<b>Number of Repairs</b>	<b>Battery Repair Costs</b>
Dilla St.	4	\$ 2,609
Cedar St.	6	\$ 1,295
<b>Total</b>	<b>10</b>	<b>\$ 3,904</b>
	<b>% of Bike Trail Repair Cost</b>	<b>49%</b>

Source: Police Dept.,

**Repair/Maint: Traffic Lights FY18 Budget = \$30K (\$1.9K = 6.3%)**

**C. Fix for Dilla St. and Cedar St.**

Upon consultation with the president of Cross Alert (the equipment supplier), it was determined that the battery/charging problem at Dilla St. and Cedar St. is a result of insufficient solar exposure due to excessive tree cover and/or underpowered solar panels.

This design/construction deficiency was corrected by tree trimming/removal and installing higher wattage solar panels. This one time work was paid for with the Trail Committee Accounts Fund Balances (see Attachment 1).

After the fix the average annual repair costs going forward should be reduced from \$1,972 to \$995. **Repair/Maint: Traffic Lights FY19 Budget = \$40K (\$995 = 2.5%)**

**MILFORD UPPER CHARLES TRAIL  
COMPREHENSIVE MAINTNENANCE ASSESSMENT REPORT**

**Attachment 1 (Sheet 1 of 2)**

**Milford Upper Charles Trail  
Maintenance Responsibilities  
Memorandum of Understanding  
Rev1 (Nov. 2013)**

WHEREAS as part of the Federal/State construction funding application and the State's Urban Self Help Land Acquisition grant application, the Town submitted a maintenance plan which identified the Parks Department and Highway Department as the Town agencies responsible for long term maintenance of the Milford Upper Charles Trail, and

WHEREAS upon completion of the Phase 1 Trail, the Parks Department was designated as the lead department responsible for said purpose since the majority of routine maintenance is similar to that being performed by them, and

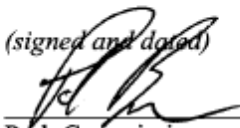
WHEREAS trail maintenance tasks require participation from the Friends of the Milford Upper Charles Trail (a 501c3 non-profit organization) [the Friends], the Parks Department, the Highway Department, and the Police Department,

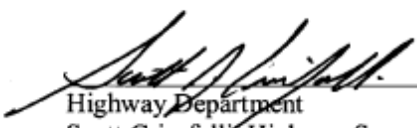
THEREFORE, all parties agree to:


1. The division of responsibility as set forth in the Maintenance Task Responsibility Matrix included herein as Attachment 1.
2. Execution of the tasks as set forth in Attachment 1 shall be based upon the judgment of the particular Department Head in his/her management of the day-to-day operations of their department and within the funding appropriated by Town Meeting. Tasks performed by the Friends will be determined by the Friends consistent with funds raised.
3. The tasks that are the primary responsibility of the Friends, and participation in the execution of other tasks, are subject to the availability of volunteers and suitable equipment, and the resolution of applicable liability issues.
4. The Friends shall designate a contact person from their organization who will be the sole interface with the Parks and Recreation Director for all maintenance related issues.
5. Maintenance issues identified by the Friends that are outside their scope of responsibility shall be directed to the Parks and Recreation Director for resolution.
6. The Parks and Recreation Director shall be the sole interface to the Highway Department and Police Department as may be required.
7. The Park Commission shall be the custodian of this agreement as may be amended.


This agreement may be amended by the unanimous signed approval of the signatories. Any of the signatories, on behalf of their represented agency, may opt out of this agreement at their sole discretion upon written notification of same to the other signatories.

*(signed and dated)*

  
Park Commission  
Paul Braza, Chairman

  
Highway Department  
Scott Crisafulli, Highway Surveyor

  
Friends of the Milford Upper Charles Trail  
Pat Rosenthal, President

  
Police Department  
Thomas O'Loughlin (Police Chief)

**MILFORD UPPER CHARLES TRAIL  
COMPREHENSIVE MAINTNENANCE ASSESSMENT REPORT**

**Attachment 1 (Sheet 2 of 2)**

<i>Trail Maintenance Memorandum of Understanding</i>							
Attachment 1							
Rev 1 (Nov. 2013)							
<b>Milford Upper Charles Trail</b>							
<b>Maintenance Task Responsibility</b>							
<b>Primary Responsibility</b>							
<b>Task</b>	<b>Parks Dept.</b>	<b>Highway Dept</b>	<b>Friends</b>	<b>Police Dept.</b>	<b>Comments</b>		
Empty Trash Receptacles	X						
Mowing	X						
Edging	X						
Sweeping with Street Sweeper		X			As requested by Parks Dept.		
Periodic Clean Up Days			X				
Weed Landscaped Areas			X				
Mulch Landscaped Areas			X				
Water Landscaped Areas			X				
Graffiti Removal	X						
Drainage Maintenance		X			As requested by Parks Dept.		
Erosion Repair		X			As requested by Parks Dept.		
Re-Stripe Trail & Road Markings		X			As requested by Parks Dept.		
Tree Trimming	X						
Brush Control Incl Road Crossing Vegetation	X						
Invasive Species Control	X						
Doggie Station Maintenance			X				
Doggie Station Supplies			X				
Fence Repair	X						
Flashing Beacon Maintenance				X	As requested by Parks Dept.		
Policing				X			
Bollards & Gates -- Lock Maintenance	X						
Pine Needles, Leaves, and Silt Removal	X						
Mile Markers			X				
Pavement Maintenance		X			As requested by Parks Dept.		

**Attachment 2**

**Remediated Design or Construction Deficient Items  
Paid for by the Highway Department over the Past 10 Years**

<b>Item</b>	<b>Task</b>	<b>Est. Cost (\$K)</b>
1	Installed a drain pipe under the trail behind the Water Co. to prevent flooding of the trail that resulted from MassDOT's reconstruction of the I-495 off ramp after the trail was built.	2.5
2	Removed a dirt hump at the Beaver St. Crossing to improve site distance.	-
3	Paved 25 ft. of the Town Forest gravel Road to prevent siltation from washing onto the trail.	0.3
4	Supplied loam for bank stabilization work at 4 locations from Louisa Lake to the Town Forest Road.	1.2
5	Laser graded a 10 foot section of pavement to facilitate drainage.	1.0
6	Installed trail directional signs (provided by the Trail Committee) from the Commuter Lot on East Main St. to Mt. Pleasant St. and at Veterans Memorial Drive.	0.4
7	Painted a yellow line from the Commuter Lot to Mt. Pleasant St.	
8	Highway Surveyor preferred to pave the 425 foot connection to Holliston's stone dust trail in lieu of having Holliston extend their stone dust trail into Milford.	8.0
9	Paved the turn off from the Bike Trail to the Mountain Bike trails on the Hopkinton segment to prevent erosion at this location.	0.1
10	FY18- Repaired the collapsed trail at the Dilla St. crossing due to a failed sewer pipe under the trail. Trail design did not evaluate the pipe's integrity.	10.0
	<b>Total</b>	<b>23.5</b>

Source: Highway Dept. (K=1000)

**Remediated Design or Construction Deficient Items  
Paid for by the Trail Committee Accounts Fund Balances  
(Authorized by Oct. 2014 Town Meeting)**

<b>Item</b>	<b>Task</b>	<b>Actual Cost (\$K)</b>
1	Subcontracted Bank Stabilization work at 4 locations from Louisa Lake to the Town Forest Road.	9.8
2	Purchased directional signs to mark the trail route from the Commuter Lot on East Main St. to Mt. Pleasant St. and at Veterans Memorial Drive.	1.0
3	Purchased pedestrian bush buttons. Subcontractor services engaged to install them on flashing beacons that did not have them.	3.5
4	Insufficient solar exposure for the Flashing Beacons at Dilla St. and Cedar St. – Subcontractor services engaged to trim/remove trees and install higher wattage solar panels.	4.8
5	Subcontractor services engaged to replenish approximately 5000 ft. (15%) of stone dust in the Phase 2 shoulders.	9.8
6	Phase 3 Additional Fencing – Subcontractor services engaged to install 3 eight foot stockade fencing panels to improve 2 abutter's screening.	1.3
	<b>Total</b>	<b>30.2</b>

Source: Trail Committee (K=1000)

**Note: The Trail Committee Accounts Fund Balances are part of the Town's 10% share of the Federal Highway Administration/MassDOT funded project.**