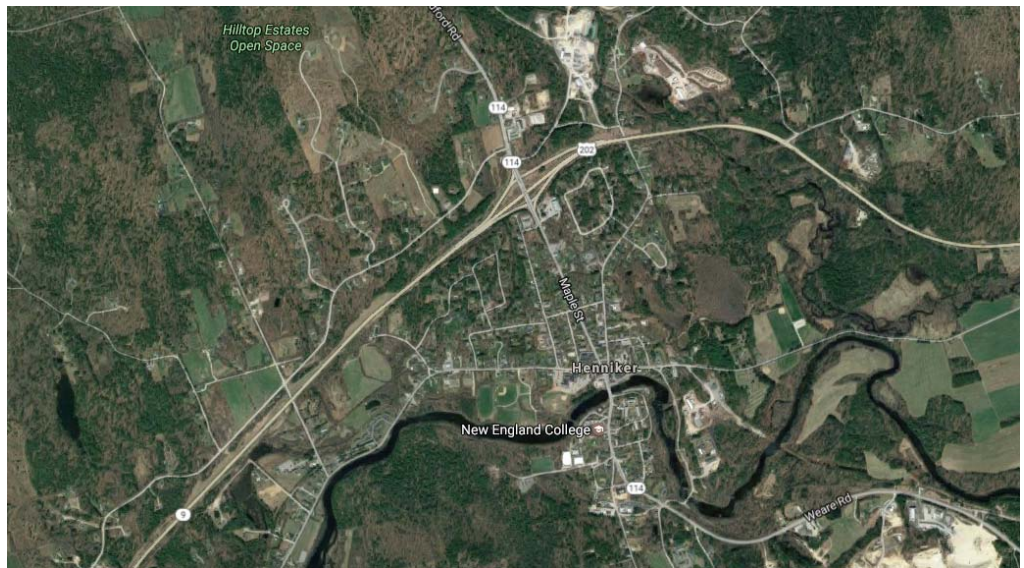




TOWN OF HENNIKER ROAD MANAGEMENT COMMITTEE



1/3/2017

PAVED ROAD EVALUATION & PHASE 1 REPORT

Presented by: Michael Flecchia, *Chair*; Leon Parker, *Vice Chair*; Leo Aucoin; Bill Marko; Robert Morse; Tom Weston, *Road Agent*; Tia Hooper, *Selectwoman*; Robert French, *Selectman*.

Town of Henniker Road Management Committee

PAVED ROAD EVALUATION & PHASE 1 REPORT

1. MISSION:

The Road Management Committees function is to support the Highway Department and Selectmen in the maintenance and building of the transportation infrastructure system of the Town of Henniker. This support includes providing advice on scheduling, work priorities, materials, design, contracting and any other responsibilities of the Highway Department.

2. PLAN OBJECTIVE:

To document the current condition of the Town of Henniker's paved road infrastructure, provide inventory data and tentative schedule with estimated costs for repair.

Provide a basis for annual recommendations to the Town Budget Advisory Committee; Board of Selectmen; and the governing body who are the residents of the Town of Henniker.

Assist the Road Agent with planning and prioritizing projects based on estimates and other important factors such as traffic and roadway significance.

3. INTRODUCTION:

The Town of Henniker currently maintains a total of approximately 50 miles of paved roadway, which does not include arterial roadways maintained by State of New Hampshire Department of Transportation.

The Road Management Committee was re-established and met for the first time on November 12, 2015. The previous committee had last filed a report in 2009 and had not been active since 2010. Since so much time had lapsed, the newly formed committee began again the painstaking process of evaluating the condition of all paved roadways within the town, in order to estimate the cost of repairing and maintaining the current roadway infrastructure in its' current condition. The evaluation was then used by the committee to further assess and prioritize potential yearly road infrastructure projects and improvements.

4. METHODOLOGY

4.1 Road Inventory:

Road inventory data was gathered by the historical calculations produced by the Henniker Fire Department during the 911 renumbering project to accurately account for the length of roadways and points of road intersections known to be utilized for sectioning road repair projects.

4.2 Roadway initial evaluation:

The Road Management Committee then evaluated all paved roads and placed them into 3 general categories:

- A *Category 1* road signifies no improvement proposed for the next 6 years, with the cost of crack sealing calculated to preserve the road for 10 years if appropriate and applicable.
- A *Category 2* – Resurfacing. This involves the application of Shim & Overlay courses of asphalt pavement or cold planning pavement.
- A *Category 3* – Reconstruction, which involves roadway base repair and drainage improvement.

From this assessment the committee was able to calculate the current cost of each road to repair based on the roads condition recorded during the summer of 2016.

4.3 Roadway evaluation based on Traffic Volume and Significance

The committee then evaluated each roadway based on traffic volume and significance (i.e. homes, businesses, detour routes from arterial roadways, etc.).

4.4 Cost Calculation:

The cost of the repairs were calculated by taking into account the current condition as documented in the initial evaluation of paved roads. The calculations examined the condition and cost to repair from the current condition to restored condition. The cost estimates used standards as set by the State of New Hampshire and Federal Government when projecting road construction costs.

5.0 Discussion

5.1 General Condition Evaluation

Category 3 Roads

Meaning roads identified for Reconstruction, which involves roadway base repair and drainage improvement.

ROAD	ROAD
French Pond Rd	Morse Road
Hillside Drive	Pearl Street
Prospect Street	Ruffled Road
Prospect Street	The Oaks
Shore Drive	Depot Hill Road
Bear Hill Road	Fairview Avenue
Old Concord Road	Patterson Hill Road
Bennett Road	Ramsdell Road
Crescent Street	Foster Hill Rd
Cressey Street	Hall Avenue
Echo Lane	Old Hillsboro Road (East of Bacon Road)
Elm Street	Old Hillsboro Road (West of Bacon Road)
Gould Street	Western Avenue (Bridge to TWNL)
Highland Drive	Western Avenue (Main Street-Bridge)
Longview Drive	

Chart 1: Category 3 Roads

Category 2 Roads

A *Category 2* – Resurfacing. This involves the application of Shim & Overlay courses of asphalt pavement or cold planing pavement.

ROAD	ROAD
Bacon Road	Park Street
Cote Hill Road	Pine Hill Road
Stonehenge Drive	Plummer Hill Road
Checkerberry Lane	Union Street
Dodge Hill Rd	Village Green Road
Evergreen Circle	Water Street
Goss Drive	Westwood Lane
Hemlock Corner Loop	Liberty Hill Road
Juniper Ridge	Tanglewood Drive
Morse Circle	Gulf Road
Mt. Hunger Road	Old West Hopkinton Rd
Old Mill Pond Road	

Chart 2: Category 2 Roads

Category 1 Roads

A *Category 1* road signifies no improvement proposed for the next 6 years, with the cost of crack sealing calculated to preserve the road for 10 years if appropriate and applicable.

ROAD
Ridgetop Lane
Davison Road
Flanders Road
Rush Road (town maintained portion)

Chart 3: Category 1 Roads

5.2 Roadway evaluation based on Traffic Volume and Significance

After conducting its evaluation of the paved roadways, the committee further analyzed and classified roads based on traffic volume and significance (i.e.: homes, businesses, detour routes from arterial roadways, etc.). Traffic Volume was taken from traffic count data provided by The New Hampshire Department of Transportation. To rate each road the committee reviewed each road based on the x and y axis values with 1 being the lowest rating and 10 being the highest rating along the axis. In *Chart 4* a chart of the committee's hand written work has been produced for review with an index for reference in *Chart 5*. Based on the position of each road a significant pattern began to develop with clear indication of Group 3, 2, and 1. Group 3 roads are those that scored high on road traffic and significance. Group 2 are roads that scored in the middle and Group 1 are the roads that scored low in both the travel and the significance categories.

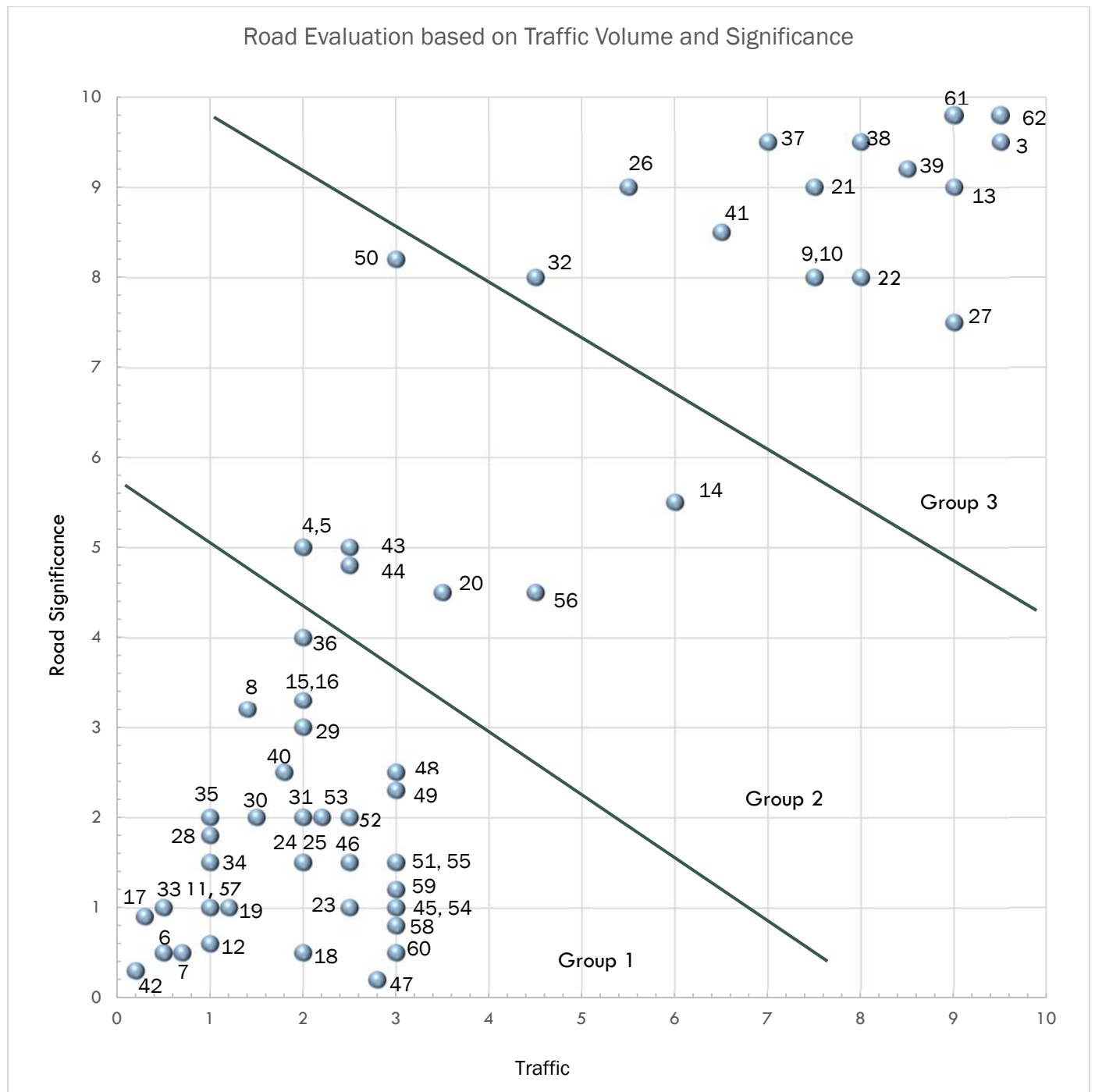


Chart 4: Road Evaluation based on Traffic Volume and Road Significance,

#	Street Name
3	Bacon Road
4	Bear Hill Road (West of Cote Hill Road - Gravel)
5	Bear Hill Road (east of Cote Hill Road)
6	Bennett Road
7	Checkerberry Lane
8	Cote Hill Road
9	Craney Hill Road (South of Morse Road)
10	Craney Hill Road
11	Crescent Street
12	Cressey Street
13	Davison Road
14	Depot Hill Road
15	Dodge Hill Rd (Foster Hill to French Pond Road)
16	Dodge Hill Rd (South of Foster Hill Road)
17	Echo Lane
18	Elm Street
19	Evergreen Circle
20	Fairview Avenue
21	Flanders Road
22	Foster Hill Rd
23	French Pond Rd
24	Goss Drive
25	Gould Street
26	Gulf Road
27	Hall Avenue
28	Hemlock Corner Loop
29	Highland Drive
30	Hillside Drive
31	Juniper Ridge
32	Liberty Hill Road

#	Street Name
33	Longview Drive
34	Morse Circle
35	Morse Road
36	Mt. Hunger Road
37	Old Concord Road
38	Old Hillsboro Road (Western Ave to Bacon Road)
39	Old Hillsboro Road (Bacon Road to Hillsborough TL)
40	Old Mill Pond Road
41	Old West Hopkinton Rd
42	Park Street
43	Patterson Hill Road
44	Patterson Hill Road Extension
45	Pearl Street
46	Pine Hill Road
47	Plummer Hill Road
48	Prospect Street (Hall Ave to 114)
49	Prospect Street (Rush Road to 114)
50	Ramsdell Road
51	Ridgetop Lane
52	Ruffled Road
53	Rush Road
54	Shore Drive
55	Stonehenge Drive
56	Tanglewood Drive
57	The Oaks
58	Union Street
59	Village Green Road
60	Water Street
61	Western Avenue (Bridge to TWNL)
62	Western Avenue (Main Street-Bridge)
63	Westwood Lane

Chart 5: Road Evaluation based on Traffic Volume and Road Significance Index

5.3 Cost Calculation:

The calculation of cost was derived from general standards recommended by the State of New Hampshire and Federal Government.

The cost was calculated by using the following:

- Default road width = 24 feet
- Square Yards in a mile = 14,080
- HMA Tons in a mile at 1" = 788 Tons
- Standard rate of \$75.00 per ton for asphalt was used in the calculation. The fluctuation of commodities, such as oil, can cause changes to the cost of asphalt during that year.

Process	Total Cost Per Mile
Crack Seal	\$5000.00
Shim and Overlay	\$103,425.00
Chip Seal / Crack Seal	\$38,792.00
Crack Seal/Sand Seal	\$29,640.00
Reclaim and Repave	\$228,833.00
Reconstruction & Repair	\$332,258.00

Chart 6: Process & Cost per mile

Once the total cost for pavement placement was calculated the total was then multiplied by 10% to consider any additional contingencies for projects under \$250,000 and not classified for reconstruction or reclaiming and repaving. Projects that were under \$250,000 were routinely projects for crack sealing and shim and overlay; where engineering, design, and other improvements, such as culvert replacements, are not needed.

If the total cost for pavement application totaled above \$250,000 or was classified for reconstruction or reclaiming and repaving the total cost was then adjusted by 22% as recommended by the New Hampshire Department of Transportation.¹ An additional 7.7% was also added for any additional contingencies. The New Hampshire Department of Transportation recommends the addition of 15% – 22% for projects to take into account engineering, design, and to account for the cost of modifications to the roads during the reconstruction process (i.e. culverts, widening, ditching as a result of reconstruction or reclaiming and repaving work).

Note: These estimates do not take into account any additional costs associated with the replacement of water or sewer utilities.

6.0 FINDINGS:

The Road Management Committee through its evaluation was able to calculate the total overall cost to the Town of Henniker to repair the roadway infrastructure minus arterial roadways maintained by the State of New Hampshire, Department of Transportation. That cost to repair the roads in their current condition is \$8,245,743.54 for the placement of pavement alone at \$ 75.00 per ton, as calculated in the price per mile indicated in Chart 6. Adding in the engineering and other cost contingencies calculated as explained in the previous section the total overall cost estimate to repair the 50 miles of paved roadway increased to \$10,454,066.28. (See Appendix A for further information)

If the Town were to do nothing and allowed the roads to deteriorate further into the next maintenance category the total cost to the town would be an estimate of \$11,232,764.56 for the placement of pavement at \$75.00 per ton. The total overall cost, including the estimated cost for engineering and contingencies would then increase to an amount of \$14, 477, 255.84, which is a difference of \$4,023,189.56. (See Appendix B for further information)

¹ State of New Hampshire Department of Transportation (2012). Local Public Agency Manual for Development Projects, (Page 45). Retrieved from <https://www.nh.gov/dot/org/projectdevelopment/planning/documents/LPAManual.pdf>

The Road Management Committee also went back to chart 6 to evaluate the cost of Group 1, Group2 and Group 3. The total cost for the groups are listed below:

Current Condition	Total to restore (pavement application @75 per ton)	Eng. and Add Cost 22%	7.7% contingency	Total Cost
Group 1 Total	\$2,902,279.70	\$472,562.56	\$240,823.70	\$3,615,665.97
Group 2 Total	\$1,437,740.59	\$284,842.93	\$113,995.03	\$1,836,578.55
Group 3 Total	\$3,905,723.24	\$787,897.28	\$308,201.24	\$5,001,821.77
Total	\$8,245,743.54	\$1,545,302.77	\$663,019.97	\$10,454,066.28

If allowed to deteriorate	Total to restore (pavement application @75 per ton)	Eng. and Add Cost 22%	7.7% contingency	Total Cost
Group 1 Total	\$4,065,061.27	\$833,611.96	\$319,355.79	\$5,218,029.02
Group 2 Total	\$1,623,887.29	\$357,255.20	\$125,039.32	\$2,106,181.82
Group 3 Total	\$5,543,816.00	\$1,178,002.18	\$431,226.83	\$7,153,045.01
Total	\$11,232,764.56	\$2,368,869.35	\$875,621.93	\$14,477,255.84

Chart 7: Cost of road repair based on groups associated with Chart 4.

The Road Management Committee took all of this data into consideration when carefully constructing its phase 1 recommendation for the Board of Selectmen and the legislative body to choose from. This is just the first phase of the evaluation that is being presented to the Board of Selectmen to assist them in determining and recommending funding for a warrant article and to assist them in prioritizing the overall cost to the town.

The options recommended below are not in any particular order but are high on the list of projects that should be completed based on travel and road significance.

6.1 ROAD REPAIR OPTIONS & RECOMMENDATIONS:

OPTION A

#	Street Name	Repair Recommended	Cost at Current Evaluation	If you wait and let the road deteriorate	Savings
62	Western Avenue (Bridge to TWNL)	Reconstruction	\$ 1,120,915.86	\$ 1,120,915.86	\$ -
		TOTAL	\$ 1,120,915.86	\$ 1,120,915.86	\$ -

OPTION B

#	Street Name	Repair Recommended	Cost at Current Evaluation	If you wait and let the road deteriorate	Savings
62	Western Avenue (Bridge to TWNL)	Reconstruction	\$ 1,120,915.86	\$ 1,120,915.86	\$ -
63	Western Avenue (Main Street-Bridge) Engineering Only	Reconstruction	\$108,359.25	\$108,359.25	\$ -
		TOTAL	\$ 1,229,275.11	\$ 1,229,275.11	\$ -

OPTION C

#	Street Name	Repair Recommended	Cost at Current Evaluation	If you wait and let the road deteriorate	Savings
63	Western Avenue (Main Street-Bridge) Construction	Reconstruction	\$ 530,467.80	\$ 530,467.80	\$ -
		TOTAL	\$ 530,467.80	\$ 530,467.80	\$ -

OPTION D

#	Street Name	Repair Recommended	Cost at Current Evaluation	If you wait and let the road deteriorate	Savings
63	Western Avenue (Main Street-Bridge) Engineering & Construction	Reconstruction	\$ 638,837.05	\$ 638,837.05	\$ -
		TOTAL	\$ 638,837.05	\$ 638,837.05	\$ -

OPTION E

#	Street Name	Repair Recommended	Cost at Current Evaluation	If you wait and let the road deteriorate	Savings
42	Old West Hopkinton Rd	Shim & Overlay or Chip Seal	\$ 164,949.29	\$ 418,381.74	\$253,432.46
29	Highland Drive	Reclaim & Repave	\$ 365,767.84	\$ 515,098.83	\$149,330.99
		TOTAL	\$ 530,717.12	\$ 933,480.57	\$402,763.45

OPTION F

#	Street Name	Repair Recommended	Cost at Current Evaluation	If you wait and let the road deteriorate	Savings
15	Dodge Hill Rd to French Pond Road	Shim and Overlay or Chip Seal	\$ 55,240.13	\$ 118,830.98	\$63,590.85
16	Dodge Hill Rd(South of Foster Hill Road)	Shim and Overlay or Chip Seal	\$ 41,390.90	\$ 89,038.92	\$47,648.02
35	Morse Circle	Reclaim & Repave	\$ 92,748.88	\$ 92,748.88	\$0.00
		TOTAL	\$ 189,379.91	\$ 300,618.78	\$111,238.87

OPTION G

#	Street Name	Repair Recommended	Cost at Current Evaluation	If you wait and let the road deteriorate	Savings
26	Gulf Road	Shim and Overlay or Chip Seal	\$ 176,318.22	\$ 447,218.21	\$ 270,899.99
5	Bear Hill Road (east of Cote Hill Road)	Reconstruction	\$ 561,407.86	\$ 561,407.86	\$ -
		TOTAL	\$ 737,726.08	\$ 1,008,626.07	\$ 270,899.99

OPTION H

#	Street Name	Repair Recommended	Cost at Current Evaluation	If you wait and let the road deteriorate	Savings
3	Bacon Road	Shim & Overlay	\$ 161,278.18	\$ 346,937.01	\$ 185,658.82
32	Liberty Hill Road	Shim and Overlay or Chip Seal	\$ 44,134.62	\$ 94,941.12	\$ 50,806.50
		TOTAL	\$ 205,412.80	\$ 441,878.13	\$ 236,465.33

OPTION I

#	Street Name	Repair Recommended	Cost at Current Evaluation	If you wait and let the road deteriorate	Savings
39	Old Hillsboro Road (Western Ave to Bacon Road)	Reconstruction	\$ 328,675.33	\$ 328,675.33	\$ -
40	Old Hillsboro Road (Bacon Road to Hillsborough TL)	Reconstruction	\$ 774,983.49	\$ 774,983.49	\$ -
		TOTAL	\$ 1,103,658.82	\$ 1,103,658.82	\$ -

OPTION J

#	Street Name	Repair Recommended	Cost at Current Evaluation	If you wait and let the road deteriorate	Savings
44	Patterson Hill Road	Reconstruction	\$ 485,730.21	\$ 485,730.21	\$ -
		TOTAL	\$ 485,730.21	\$ 485,730.21	\$ -

Total Cost of Project Options	Total Cost of project if you wait	Savings
\$ 5,012,377.85	\$ 6,033,745.49	\$1,021,367.64

Chart 8: Recommendations with cost of Engineering and Additional Cost

Note: The total cost calculations contain one calculation for Western Ave Construction from the Bridge to the Town Line and one calculation for Western Ave Construction from Main Street to the Bridge.