Concord Downtown
Complete Streets Improvement Project

Benefit/Cost Analysis – State of Good Repair
Expected Annual Maintenance Cost Benefit: Analysis and Estimation

Background

The downtown section of Main Street is currently four lanes, with two travel lanes in each direction and no turning lanes. The existing sidewalk section includes sidewalks along both sides of Main Street with concrete, bituminous, and concrete paver surfaces. The proposed project will convert a substantial portion of Main Street to a three-lane section, with one travel lane in each direction and a center lane area for left turns or median islands and widen the sidewalk sections.

The existing roadway pavement and sidewalk sections were last maintained in the early 1990's and significant improvements to pavement and concrete surfaces are required. There are a number of curb steps throughout downtown that restrict barrier-free access. The project proposes to reconstruct roadway and sidewalk section to a state of good repair and address ADA barrier issues. The project also proposes to install an innovative roadway/sidewalk snow melt system to significantly reduce annual snow removal and ice treatment costs through the life of the project.

Estimated Annual Operations and Maintenance Cost Savings Benefit

Annual operations and maintenance costs have been reviewed for the No-Build and Build conditions. Table 1 outlines current annual maintenance costs in the No-Build scenario and estimates future costs in the Build scenario. Assumptions include:

- 2011 base-year costs per Table 1
- Current annual maintenance includes snow removal, sweeping, general cleaning, striping, catch basin cleaning (3-year program), and paving (25-year paving program)
- Current Main Street pavement schedule in CIP workplan for 2016 (pavement reclamation/pavement improvements
- Project proposes to install street/sidewalk snow melt system to reduce snow removal and ice treatment
- New constructed streets in state of good repair will reduce capital improvement in 20-year life-cycle

Table 1. Annual Operations and Maintenance Costs: Main Street Improvements		
Annual Maintenance Items	No-Build Annual O&M Costs	Build Annual O&M Costs
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Annual Snow Removal (Street and Sidewalk)	$ 7,600.00	
Annual Snow Removal (Street and Sidewalk w/ Removal-Downtown)	$ 22,600.00	
Annual Snow Removal (w/ Snow Melt System-Downtown)		$ 15,000.00
Annual Sweeping	$ 600.00	$ 600.00
Annual Striping	$ 4,000.00	$ 4,000.00
Annual Downtown Cleaning	$ 1,000.00	$ 1,000.00
Catch Basin/Ditch Cleaning (every 3 years)	$ 5,000.00	$ 5,000.00
Cold Plan/Overlay (every 15 years on new pavement)		$ 600,000.00
Reclamation/Pavement (every 25 years on old pavement)	$ 1,000,000.00	
Snow Melt System (annual energy cost)		$ 1,500.00
Snow Melt System (system maint./repair every 10 years)		$ 50,000.00

Project-Life O&M Cost Savings Benefit

Annualized savings of future operations and maintenance costs is computed in Table 2. The present worth (2011) of the project's future operations and maintenance costs savings over a 20-year service life is $599,097. Assumptions include:

- 2011 base-year costs and benefits per Table 1
- 20-year service life (2015 through 2034)
- Discount rate of 7 percent per guidance in OMB Circular A-94[1]
- Effects of potential cost inflation are not included

[1] Executive Office of the President, Office of Budget and Management, *Circular A-94 Guidelines and Discount Rates for Benefit-Cost Analysis for Federal Programs*.

Table 2. Annualized Operations and Maintenance Costs: Main Street

Year	Fiscal Year		Build Annual O&M Costs	Difference Expected O&M Difference	3% Discount Rate	Present Worth (2011 $)	7% Discount Rate	Present Worth (2011 $)
1	FY2013	Design - Permitting						
2	FY2014	Construction						
3	FY2015	$33,200	$22,100	$11,100	0.888487	$9,862	0.816298	$9,061
4	FY2016	$1,028,200	$22,100	$1,006,100	0.862609	$867,871	0.762895	$767,549
5	FY2017	$28,200	$27,100	$1,100	0.837484	$921	0.712986	$784
6	FY2018	$33,200	$22,100	$11,100	0.813092	$9,025	0.666342	$7,396
7	FY2019	$28,200	$22,100	$6,100	0.789409	$4,815	0.622750	$3,799
8	FY2020	$28,200	$27,100	$1,100	0.766417	$843	0.582009	$640
9	FY2021	$33,200	$22,100	$11,100	0.744094	$8,259	0.543934	$6,038
10	FY2022	$28,200	$22,100	$6,100	0.722421	$4,407	0.508349	$3,101
11	FY2023	$28,200	$27,100	$1,100	0.701380	$772	0.475093	$523
12	FY2024	$33,200	$72,100	($38,900)	0.680951	($26,489)	0.444012	($17,272)
13	FY2025	$28,200	$22,100	$6,100	0.661118	$4,033	0.414964	$2,531
14	FY2026	$28,200	$27,100	$1,100	0.641862	$706	0.387817	$427
15	FY2027	$33,200	$22,100	$11,100	0.623167	$6,917	0.362446	$4,023
16	FY2028	$28,200	$22,100	$6,100	0.605016	$3,691	0.338735	$2,066
17	FY2029	$28,200	$627,100	($598,900)	0.587395	($351,791)	0.316574	($189,596)
18	FY2030	$33,200	$22,100	$11,100	0.570286	$6,330	0.295864	$3,284
19	FY2031	$28,200	$22,100	$6,100	0.553676	$3,377	0.276508	$1,687
20	FY2032	$28,200	$27,100	$1,100	0.537549	$591	0.258419	$284
21	FY2033	$33,200	$22,100	$11,100	0.521893	$5,793	0.241513	$2,681
22	FY2034	$28,200	$72,100	($43,900)	0.506692	($22,244)	0.225713	($9,909)
		$1,599,000	**$1,172,000**	**$427,000**		**$537,691**		**$599,097**