

<b>Recommendation</b>	<b>Planning Level Cost (2011\$)</b>	<b>Typical Range</b>		<b>Source</b>
Invasive Species Management Plan (Watershed-Wide)	\$35,100	\$21,000	\$49,000	Professional engineering experience
<b>Targeted Stormwater Retrofits</b>				
Constructed Wetlands - per acre treated	\$4,700	\$3,400	\$15,600	
Extended Detention - per acre treated	\$6,200	\$3,700	\$12,200	Center for Watershed Protection Urban Stormwater Retrofit Practices (2007)
Wet Ponds - per acre treated	\$14,000	\$5,100	\$4,600	
Water Quality Swale - per acre treated	\$29,300	\$17,500	\$59,000	
Bioretention/infiltration - per acre treated	\$41,000	\$32,000	\$67,000	
Stormwater Curb Extensions - per 4,500 sf IC treated	\$27,000	\$19,500	\$40,000	City of Portland (2005)
Pervious Pavement - per square foot	\$14	\$7	\$21	R.S. Means - includes limited subgrade modifications
Illicit Discharge Investigation	Varies significantly based on methods used			NEIWPCC IDDE Manual (2003), CWP IDDE Manual (2003)
Additional Subwatershed Field Assessments	\$1,000 per stream mile	\$281	\$2,808	Varies depending on volunteer involvement, summary reports prepared, difficulty of terrain
<b>Reforestation and Riparian Buffer Restoration - per acre</b>				
Herbaceous buffer in grassed area	\$2,808	\$1,404	\$4,212	R.S. Means, depends on existing condition
Trees and Shrubs	\$21,060	\$7,020	\$28,080	U.S. Forest Service Urban Watershed Forestry Manual (2006), R.S. Means
Reforestation of Paved Areas	\$105,300	\$70,200	\$140,400	R.S. Means
Streambank Restoration	\$0	\$0	\$0	
Bank Stabilization - linear foot of bank	\$55	\$14	\$140	Derrick (1997), NOAA (2000)
Redirective Techniques - per structure	\$5,500	\$4,200	\$14,000	Professional engineering experience
Channel Rehab. - linear foot of channel	\$42	\$16	\$52	NOAA (2000)
Stream Daylighting - Linear foot of stream	\$1,544	\$420	\$4,200	Small streams at less constrained sites
Priority Stream Cleanups	Varies significantly based on amount of donated supplies and services			
Fish Passage Enhancement	Varies significantly based on methods used			

	Unit Cost	Unit	Quantity	Cost (2011\$)	Design and Planning Allowance	Order of Magnitude Cost Range				Lifespan (yrs)	Annual Cost over Lifespan	O&M (% Cost)	O&M (\$/yr)	Total Capitalized Cost/yr over lifespan	Source
						Cost	Total Cost	-30%	50%						
<b>Hernan Ave</b>															
Remove Pavement	4.8	sf	3,700	17760	55%	\$10,000	\$28,000	\$20,000	\$42,000	50	\$1,090	0%	\$0	\$1,090	4
Bioretention Basins	24.57	sf	3,700	90909	55%	\$50,000	\$141,000	\$99,000	\$212,000	15	\$11,810	8%	\$940	\$12,750	1
Hydrodynamic Separator	25,000	ea	1	25000	55%	\$14,000	\$39,000	\$27,000	\$59,000	20	\$2,620	4%	\$100	\$2,720	3
Total							\$208,000	\$146,000	\$313,000		\$15,520		\$1,040	\$16,560	
<b>Beekman Creek</b>															
Remove Pavement	4.8	sf	82,300	395040	30%	118512	\$514,000	\$360,000	\$771,000	100	\$16,270	0%	\$0	\$16,270	4
Pervious pavement	4.2	sf	62,600	262920	30%	78876	\$342,000	\$239,000	\$513,000	20	\$22,990	4%	\$920	\$23,910	4
Bioretention Basins/Green Gutters	24.57	sf	9,700	238329	30%	71498.7	\$310,000	\$217,000	\$465,000	15	\$25,970	8%	\$2,080	\$28,050	1
Stream channel restoration	\$100	lf	630	63000	30%	18900	\$82,000	\$57,000	\$123,000	100	\$2,600	0%	\$0	\$2,600	2
Riparian Buffer Restoration	0.34	sf	28,000	9520	30%	2856	\$13,000	\$9,000	\$20,000	100	\$410	4%	\$20	\$430	1
Floating Walkway	10,000	Lump Sum	1	10000	30%	3000	\$13,000	\$9,000	\$20,000	20	\$870	10%	\$90	\$960	3
Open Bottom Culvert	300,000	Lump Sum	1	300000	30%	90000	\$390,000	\$273,000	\$585,000	50	\$15,160	2%	\$300	\$15,460	3
Total							\$1,664,000	\$1,164,000	\$2,497,000		\$84,270		\$3,410	\$87,680	
<b>Huntington Municipal Lot</b>															
Remove Pavement	4.8	sf	21,200	101760	30%	30528	\$133,000	\$93,000	\$200,000	100	\$4,210	0%	\$0	\$4,210	4
Pervious Pavement	4.2	sf	17,850	74970	30%	22491	\$98,000	\$69,000	\$147,000	20	\$6,590	4%	\$260	\$6,850	4
Bioretention	24.57	sf	3,350	82309.5	30%	24692.85	\$108,000	\$76,000	\$162,000	15	\$9,050	8%	\$720	\$9,770	1
Tree Box Filters	15,000	ea	5	75000	30%	22500	\$98,000	\$69,000	\$147,000	20	\$6,590	5%	\$330	\$6,920	3
Total							\$437,000	\$307,000	\$656,000		\$26,440		\$1,310	\$27,750	
<b>Oyster Bay Train Station</b>															
Remove Pavement	4.8	sf	16,230	77904	30%	23371.2	\$102,000	\$71,000	\$153,000	100	\$3,230	0%	\$0	\$3,230	4
Pervious Pavers	4.2	sf	5,700	23940	30%	7182	\$32,000	\$22,000	\$48,000	20	\$2,150	4%	\$90	\$2,240	4
Pervious Concrete	6	sf	5,900	35400	30%	10620	\$47,000	\$33,000	\$71,000	30	\$2,400	4%	\$100	\$2,500	4
Biofiltration	24.57	sf	4,630	113759.1	30%	34127.73	\$148,000	\$104,000	\$222,000	15	\$12,400	8%	\$990	\$13,390	1
Pocket Gardens	10,000	ea	4	40000	30%	12000	\$52,000	\$36,000	\$78,000	15	\$4,360	8%	\$350	\$4,710	5
Total							\$381,000	\$266,000	\$572,000		\$24,540		\$1,530	\$26,070	
<b>Fireman's Field</b>															
Remove Pavement	4.8	sf	58,500	280800	30%	84240	\$366,000	\$256,000	\$549,000	100	\$11,580	0%	\$0	\$11,580	4
Pervious Pavement	4.2	sf	43,200	181440	30%	54432	\$236,000	\$165,000	\$354,000	20	\$15,860	4%	\$630	\$16,490	4
Biofiltration	24.57	sf	15,300	375921	30%	112776.3	\$489,000	\$342,000	\$734,000	15	\$40,960	8%	\$3,280	\$44,240	1
Tree Box Filters	15,000	ea	13	195000	30%	58500	\$254,000	\$178,000	\$381,000	20	\$17,070	5%	\$850	\$17,920	3
Total							\$1,345,000	\$941,000	\$2,018,000		\$85,470		\$4,760	\$90,230	
<b>Oyster Bay Municipal Parking Lot</b>															
Remove Pavement	4.8	sf	34,080	163584	30%	49075.2	\$213,000	\$149,000	\$320,000	100	\$6,740	0%	\$0	\$6,740	4
Pervious Pavement	4.2	sf	28,300	118860	30%	35658	\$155,000	\$109,000	\$233,000	20	\$10,420	4%	\$420	\$10,840	4
Biofiltration	24.57	sf	5,780	142014.6	30%	42604.38	\$185,000	\$130,000	\$278,000	15	\$15,500	8%	\$1,240	\$16,740	1
Pocket Gardens	10,000	ea	6	60000	30%	18000	\$78,000	\$55,000	\$117,000	15	\$6,530	8%	\$520	\$7,050	3
Total							\$631,000	\$443,000	\$948,000		\$39,190		\$2,180	\$41,370	
<b>Audrey and Shore Avenues</b>															
Remove Pavement	4.8	sf	34,410	165168	30%	49550.4	\$215,000	\$151,000	\$323,000	100	\$6,800	0%	\$0	\$6,800	4

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						Cost	Total Cost	-30%	50%						
Pervious Pavement	4.2	sf	31,280	131376	30%	39412.8	\$171,000	\$120,000	\$257,000	20	\$11,490	4%	\$460	\$11,950	4
Biofiltration	24.57	sf	4130	101474.1	30%	30442.23	\$132,000	\$92,000	\$198,000	15	\$11,060	8%	\$880	\$11,940	1
Treebox Filters	15000	ea	30	450000	30%	135000	\$585,000	\$410,000	\$878,000	20	\$39,320	5%	\$1,970	\$41,290	3
Total							\$1,103,000	\$773,000	\$1,656,000		\$68,670		\$3,310	\$71,980	
<b>South Street</b>															
Remove Pavement	4.8	sf	20,500	98400	30%	29520	\$128,000	\$90,000	\$192,000	100	\$4,050	0%	\$0	\$4,050	4
Pervious Pavement	4.2	sf	18,250	76650	30%	22995	\$100,000	\$70,000	\$150,000	20	\$6,720	4%	\$270	\$6,990	4
Biofiltration	24.57	sf	2,300	56511	30%	16953.3	\$74,000	\$52,000	\$111,000	15	\$6,200	8%	\$500	\$6,700	1
Treebox Filters	15000	ea	15	225000	30%	67500	\$293,000	\$205,000	\$440,000	20	\$19,690	5%	\$980	\$20,670	3
Total							\$595,000	\$417,000	\$893,000		\$36,660		\$1,750	\$38,410	
<b>Pine Hollow Shopping Center</b>															
Remove Pavement	4.8	sf	27,750	133200	30%	39960	\$174,000	\$122,000	\$261,000	100	\$5,510	0%	\$0	\$5,510	4
Pervious Pavement	4.2	sf	18,000	75600	30%	22680	\$99,000	\$69,000	\$149,000	20	\$6,650	4%	\$270	\$6,920	4
Biofiltration	24.57	sf	9,750	239557.5	30%	71867.25	\$312,000	\$218,000	\$468,000	15	\$26,140	8%	\$2,090	\$28,230	1
Treebox Filters	15000	ea	15	225000	30%	67500	\$293,000	\$205,000	\$440,000	20	\$19,690	5%	\$980	\$20,670	3
Total							\$878,000	\$614,000	\$1,318,000		\$57,990		\$3,340	\$61,330	
<b>White's Creek</b>															
Remove Pavement	4.8	sf	39,000	187200	30%	56160	\$244,000	\$171,000	\$366,000	100	\$7,720	0%	\$0	\$7,720	4
Pervious pavement	4.2	sf	13,600	57120	30%	17136	\$75,000	\$53,000	\$113,000	20	\$5,040	4%	\$200	\$5,240	4
Bioretention Basins/Green Gutters	24.57	sf	15,000	368550	30%	110565	\$480,000	\$336,000	\$720,000	15	\$40,210	8%	\$3,220	\$43,430	1
Stream channel restoration	\$70	lf	210	14700	30%	4410	\$20,000	\$14,000	\$30,000	100	\$630	0%	\$0	\$630	2
Riparian Buffer Restoration	0.34	sf	20,800	7072	30%	2121.6	\$10,000	\$7,000	\$15,000	100	\$320	4%	\$10	\$330	1
Open Bottom Culvert	300,000	ea	1	300000	30%	90000	\$390,000	\$273,000	\$585,000	20	\$26,210	2%	\$520	\$26,730	3
Pedestrian Bridge	10000	ea	1	10000	30%	3000	\$13,000	\$9,000	\$20,000	50	\$510	2%	\$10	\$520	3
Total							\$1,232,000	\$863,000	\$1,849,000		\$80,640		\$3,960	\$84,600	

**Note:**

Rate of Inflation used = 4%

Interest (discount) rate used = 7%

\*Projects are proposed for these locations already. Costs estimated in this table are for adding ecological and water quality elements to the assumed original purpose of the proposed projects. Costs include design allowance, no property acquisition required, basic local permitting, and minimal utility conflict for construction

**Sources:**

1. Derived by F&O based on R.S. Means
2. Derrick, David (1997). Harland Creek Bank Stabilization Demonstration Project. Land and Water Magazine, Sept/Oct 1997. Accessed at [www.landandwater.com](http://www.landandwater.com) on July 7, 2010.
3. Estimate from Professional Exp
4. UNH Stormwater Center 2009 Biennial Report