

Attachment 8 Benefits and Cost Analysis

Attachment 8 identifies the benefits described in Attachment 7 – Technical Justification and provides an analysis of benefits to cost ratio. The proposed project contributes to the long-term reduction of flood damages that have been identified in the City of Carpinteria Storm Drain Master Plan. Implementation of the proposed project reduces the potential for flood events to damage residential property and public right-of-way and generate emergency response costs related to flooding. The project, located in the City’s beach area neighborhood, which exists within the local floodplain as defined by the Federal Emergency Management Agency. In addition to being prone to flooding, the area is tidally influenced. During storm events that coincide with high tides and high surf advisories, the likelihood of emergency evacuation of the neighborhood is increased.

The benefits of the Ash Avenue Improvements Project are shown in table 8-1 and detailed below.

Table 8-1 Benefit Overview		
Type of Benefit	Assessment	Beneficiaries
Water Quality	Qualitative	Local
Aesthetic	Qualitative	Local
Ecosystem Improvement	Qualitative	Local
Recreation and Public Access	Qualitative	Local
Flood Damages Reduction	Monetized	Local
Capital and O&M Costs	Monetized	Local

Water Quality

As described in Attachment 6, this project will include a water quality monitoring element. The Carpinteria Salt Marsh is listed as an impaired water body on the 303(d) list for nutrients, organic enrichment/low dissolved oxygen, and priority organics. The Salt Marsh has been identified under the Central Coast Basin Plan to having the following beneficial uses: Water Contact Recreation (REC 1), Non-Contact Recreation (REC 2), Wildlife Habitat (WILD), Warm Freshwater Habitat (WARM), Migration of Aquatic Organisms (MIGR), Fish Spawning (SPWN), Preservation of Biological Habitat of Special Significance (BIOL), Rare, Threatened or Endangered Species (RARE), Estuarine Habitat (EST), Commercial and Sport Fishing (COMM). Both Carpinteria City Beach and State Beach are identified as having the following beneficial uses: REC 1, REC 2, Navigation (NAV), and Marine Habitat (MAR).

Aesthetic

The project is designed to blend with the local landscape. Upgrading the facilities to incorporate native plants by removing deteriorating asphalt and a concrete lined drainage channel provides an aesthetic component to the project.

Ecosystem Improvement

By using native plants and engineered soils, the LID bioretention element of the proposed project enhances the local ecosystem by providing additional habitat and improving the quality of stormwater runoff.

Recreation and Public Access

The proposed project is adjacent to the Carpinteria Salt Marsh Park, a public open space that is frequented by both residents and tourists. Currently, the recreation access ends at the edge of the Park. The Ash Avenue Improvements Project extends the existing walkway and provides additional educational interpretive panels, consistent with the Park facilities.

Flood Damages Reduction

The proposed project is listed in both the City of Carpinteria's Capital Improvements Program and the Storm Drain Master Plan as a high priority project due to the existing impacts of flooding in the area. Flood events damage residential property and increase the City's annual operations and maintenance costs within the public right-of-way. Long-term benefits of this project include a reduction of damages to property, reduced clean-up costs and reduced annual maintenance costs.

Capital and O&M Costs

By implementing this project, the City avoids the future capital costs associated with replacement of the pipeline along the east and west sides of the project area, as well as annual maintenance costs associated with the unimproved swales. Long-term avoided costs also include replacement of the road bed due to flood damages.

**Table 8-2
Annual Costs of Avoided Projects**

Project: Ash Avenue Improvements Project

(a) Year	Costs				Discounting Calculations	
	(b)	(c)	(d)	(e)	(f) Discount Factor	(g) Discounted Costs (e) x (f)
	Alternative (Avoided Project Name): _____					
	Avoided Project Description: Stormdrain replacement, pavement and shoulder deterioration					
	Avoided Capital Costs	Avoided Replacement Costs	Avoided Operations and Maintenance Costs	Total Cost Avoided for Individual Alternatives (b) + (c) + (d)		
2012				\$ -	1.000	\$ -
2013	\$ 240,000.00	\$ 150,000.00	\$ 10,000.00	\$ 400,000.00	0.943	\$ 377,200.00
2014			\$ 10,000.00	\$ 10,000.00	0.899	\$ 8,990.00
2015			\$ 10,000.00	\$ 10,000.00	0.839	\$ 8,390.00
Last Year of Project Life			\$ 10,000.00	\$ 10,000.00	0.750	\$ 7,500.00
Total Present Value of Discounted Costs (Sum of Column (g))						\$ 402,080.00
(%) Avoided Cost Claimed by Project						95%
Total Present Value of Discounted Avoided Project Costs Claimed by alternative Project (Total Present Value of Discounted Costs x % Avoided Cost Claimed by Project)						\$ 381,976.00
Comments: Additional but unmonetized costs include continued and expanded run-off constituents into the adjacent habitat area that are significantly reduced with this project.						

Table 8-3 Non-monetized Benefits Checklist		
No.	Question	Enter “Yes”, “No” or “Neg”
	Community/Social Benefits	
	Will the proposal	
1	Provide education or technology benefits?	Yes
	Educational interpretive panels will be used to describe the project and how it improves water quality. These panels will be installed at the location of the completed project and designed to complement the panels in the existing Carpinteria Salt Marsh Park. The panels will emphasize behavioral changes to become a watershed steward, such as cleaning up after pets and properly disposing of waste. Staff also plans to make a Youtube video touring and describing the function of the completed project. The video, similar to the successful series 'Watchdog Diaries' created by the Santa Barbara Channel Keepers, is intended to attract target audiences who increasingly use the internet to gain information. Lastly, an Owner's Handbook will be created to educate both the public and municipal maintenance staff regarding long-term sustainability of the project..	
2	Provide social recreation or access benefits?	Yes
	The project will expand access to the City Beach and Salt Marsh Park by improving the walking trail connecting over 100 homes to these outdoor recreation opportunities and open space.	
3	Help avoid, reduce or resolve various public water resources conflicts?	Yes
	Is there a state mandate that we are following?	
	This project is consistent with the California State Water Boards National Pollution Discharge Elimination System Permit.	
4	Promote social health and safety?	Yes
	The educational element promotes environmental health and is anticipated that changes social behavior will be one of the positive impacts of this project.	
	Additionally, the flood control improvements will enhance public safety by reducing flood hazards.	
5	Have other social benefits?	No
	Environmental Stewardship Benefits:	Yes
	Will the proposal	
6	Benefit wildlife or habitat in ways that were not quantified in Attachment 7?	Yes
	The bio-retention system will expand the wildlife and biological habitat throughout the project, as shown under the description 'Ecosystem Improvements'.	

7	Improve water quality in ways that were not quantified in Attachment 7?	No
	As described in Attachment 6 and Attachment 7, this project will include a water quality monitoring element. The Carpinteria Salt Marsh is listed as an impaired water body on the 303(d) list for nutrients, organic enrichment/low dissolved oxygen, and priority organics. The Salt Marsh has been identified under the Central Coast Basin Plan to having the following beneficial uses: Water Contact Recreation (REC 1), Non-Contact Recreation (REC 2), Wildlife Habitat (WILD), Warm Freshwater Habitat (WARM), Migration of Aquatic Organisms (MIGR), Fish Spawning (SPWN), Preservation of Biological Habitat of Special Significance (BIOL), Rare, Threatened or Endangered Species (RARE), Estuarine Habitat (EST), Commercial and Sport Fishing (COMM). Both Carpinteria City Beach and State Beach are identified as having the following beneficial uses: REC 1, REC 2, Navigation (NAV), and Marine Habitat (MAR). Through the treatment opportunities within the proposed bio-retention system, the quality of runoff will be improved.	
8	Reduce net emissions in ways that were not quantified in Attachment 7?	Yes
	By using LID, the project has the potential to reduce the use of vehicles and associated emissions; increases native vegetation which uses carbon, uptake oxygen and provide shading, all of which address greenhouse gases and warming; increases capacity for stormwater infiltration, which is needed to address climate change precipitation, and; demonstrates City leadership to the public by reducing their carbon footprint and demonstrating the use of sustainable, climate friendly techniques.	
9	Provide other environmental stewardship benefits, other than those claimed in Sections D1, D3 or D4?	Yes
	Sustainability Benefits:	
	Will the proposal	
10	Improve the overall, long-term management of California groundwater resources?	No
11	Reduce demand for net diversions for the regions from the Delta?	NA
12	Provide a long-term solution in place of a short-term one?	Yes
	The project is designed to enhance the drainage system to provide significant enhancements to the environment whereas a straight replacement project would continue to transmit drainage into the Salt Marsh habitat.	
13	Reduce water consumption on a permanent basis?	No
14	Promote energy savings or replace fossil fuel based energy sources with renewable energy and resources?	No
15	Improve water supply reliability in ways not quantified in Attachment 7?	No
16	Other (If the above listed categories do not apply, provide non-monetized benefit description)?	No