

6. Storm Drain Capital Improvement Projects

Collection System Opinion of Probable Construction Cost

Capital Improvement Project Prioritization Criteria

To evaluate the CIP projects and prioritize possible implementation, AECOM developed a ranking matrix to assign ranking factors coded (e.g. A1, B2, etc.) with the following ranking criteria each with a maximum score of 5 based on weighting factors distributed from a total of 100% as coordinated with the City. Final score for projects will be on a scale of 1.00 (Lowest Priority) to 5.00 (Highest Priority) for ranking the final recommended Prioritized CIP.

- **Feasibility:**

Weighting factor	20%
Ranking factor: Discredited based on stakeholder(s) Involvement, starting at a max of 5	
(A1) City Jurisdiction Only	-0
(A2) Involves Private Property	-1
(A3) Involves County Permit	-1
(A4) Involves Major Modification to County Facilities	-1
(A5) Other Specific Agency	-1
- **Cost:**

Weighting factor	10%
Ranking factor: Discretized in descending order based on OPCC.	
(B1) ≤ \$500,000	5
(B2) > \$500,000 ≤ \$1,000,000	4
(B3) > \$1,000,000 ≤ \$2,500,000	3
(B4) > \$2,500,000 ≤ \$5,000,000	2
(B5) > \$5,000,000	1
- **Community Benefit:**

Weighting factor	30%
Ranking factor: Credited based on the following benefits	
(C1) Increases Vegetation	+1
(C2) Improves Water Quality	+1
(C3) Reduces Maintenance on Block/Lateral Road	+1
(C4) Reduces Maintenance on Arterial Road	+1
(C5) Other Specific Benefit	+1
- **Safety:**

Weighting factor	30%
Ranking factor: Credited based on the following flooding resolutions	
(D1) Improves Conditions of Park or Pedestrian Travel Way	+1
(D2) Improves Conditions of up to (Four) Properties	+1
(D3) Improves Conditions of more than (Four) Properties	+1
(D4) Improves Conditions of Lateral Street	+1
(D5) Improves Conditions of Arterial Street	+1
- **Construction Impacts:**

Weighting factor	10%
Ranking factor:	
Discredited based on other Agency Involvement, starting at a max of 5	
(E1) No Significant Public Facility Impacts	-0
(E2) Partial or Full Closure of Park or Pedestrian Way	-1
(E3) Partial or Full Closure of Lateral Street	-1
(E4) Partial or Full Closure of Arterial Street	-2
(E5) Other Specific Impact	-1

Notes: Appendix C contains additional details and definitions for terminology used when developing the CIP.

Prioritized Capital Improvement Program

City Facilities

As a planning tool, AECOM is providing a list of potential projects for the City to evaluate and implement over the next 20 years. This Capital Improvement Program (CIP) has been prioritized based on the total project score developed using the weighted ranking criteria and their respective factors within the ranking matrix (see Appendix C). If two projects had the same score, then the project of lesser cost was ranked higher. If a project was subsequent on construction of another project, it was ranked below the preceding project regardless of score. For reference, the storm drain maps for the existing City storm drain system can be found in Appendix D.

It has been assumed that the City has a maximum available budget of \$500,000 per year such that the total secured funds available over the next 20 years is \$10 million. A program or project threshold was set at \$2.5 million maximum per project to provide a best-value CIP. In order to utilize annual storm drain Capital Improvement Program budget allocation, a project can be designed and constructed in phases. Figures C-2 through C-4 depict the locations of these projects within the four City quadrants separated by Sepulveda Boulevard and Manhattan Beach Boulevard along with their respective project codes. Project codes as they relate to flood IDs are included in the Flood ID table of Appendix B. A few projects may not relate to a flood ID as they have been specifically requested by the City or considered outside of the AECOM model results. The following projects are ranked from highest to lowest priority with a concluding draft schedule for the 20-year CIP.

Shelly St. Improvement Project

This project would involve the construction of storm drain piping, additional catch basins with water quality inserts to improve water quality. It improves the flooding condition for a multitude of properties, with source of flooding being a sump at Shelly Street and South Meadows that impacts school traffic. The project would reduce flooding as well as ease maintenance. Conversion of existing vegetated parkways to bioswales on South Meadows Ave. would increase vegetation and biodiversity while removing impervious areas. The project would involve public outreach and easement enforcement and would require a County permit. Construction would impact pedestrian pathways, arterial street (e.g. South Meadows), and involve private property replacement.

Applied Factors	Total Project Score	ROM Cost (M)
(A2) (A3) (B2) (C1) (C2) (C3) (C4) (C5, School traffic & severe sump) (D1) (D2) (D3) (D5, S Meadows near School) (E2) (E4) (E5, Private property replace)	4.1	\$1.4

Peck Avenue Improvement Project

This project would involve the construction of storm drain piping and additional catch basins with water quality inserts to improve water quality. It would also include improvements to vegetation and biodiversity along Peck Ave. The project would mitigate flooding conditions for a few properties, as well as increase capacity for a lateral and an arterial street as well as improve maintenance. The project would be entirely within City jurisdiction. Construction would impact pedestrian travel ways and an arterial street.

Applied Factors	Total Project Score	ROM Cost (M)
(A1) (B2) (C1) (C2) (C3) (C4) (D1) (D2) (D4) (D5) (E2) (E4)	4.0	\$0.9

Curtis Avenue & Redondo Avenue Improvement Project

This project would involve the construction of storm drain piping and additional catch basins with water quality inserts to improve water quality. The project would mitigate the flooding of pedestrian travel ways, a multitude of properties, lateral streets, improve ease of maintenance, and improve emergency access. The project would require a County permit. Construction would impact pedestrian travel ways and lateral streets.

Applied Factors	Total Project Score	ROM Cost (M)
(A3) (B2) (C2) (C3) (C5, Sump) (D1) (D2) (D3) (D4) (E2) (E3)	3.6	\$0.7

Dianthus Street Improvement Project

This project would include the construction of new catch basins and possible storm drain piping to replace the existing catch basin that has limited capacity at a local sump location. The project would mitigate the flooding of pedestrian travel ways and a few properties that include a multitude of residents in apartment complexes. This project was identified as a priority project by the City. This project would require a County permit. Construction would impact a lateral street.

Applied Factors	Total Project Score	ROM Cost (M)
(A3) (B1) (C3) (C5, special request) (D1) (D2) (D3, Complex) (D4) (E3)	3.5	\$0.4

14th Street Improvement Project

This project would include the construction of new catch basins with water quality inserts to improve water quality. The project would mitigate the flooding condition of a few properties at a sump location at the end of a cul-de-sac. Conversion of existing vegetated and fully paved parkways to bioswales along Cedar and Magnolia Ave would increase vegetation and biodiversity while removing impervious areas. This project would be entirely within City jurisdiction. Construction would have no significant impact on public facilities.

Applied Factors	Total Project Score	ROM Cost (M)
(A1) (B1) (C1) (C2) (C5, sump & pavement removal, 2pt) (D2) (E1)	3.4	\$0.7

Aviation Boulevard & Artesia Blvd. Improvement Project

This project would include the construction of storm drain piping, additional catch basins with water quality inserts, and new dry wells that would provide both flood control and improve water quality. The project would also include landscaping improvements to vegetation and biodiversity (i.e. bioswales) along Artesia Blvd. The project would mitigate flooding at a few properties and an arterial street. The project would involve coordination with the City of Hermosa Beach. Construction would impact an arterial street.

Applied Factors	Total Project Score	ROM Cost (M)
(A5, Hermosa) (B2) (C1) (C2) (C4) (D2) (D5) (E4)	3.2	\$0.9

Maple Avenue Improvement Project

This project would include the construction of storm drain piping, additional catch basins with water quality inserts, and new dry wells for flood control and to improve water quality. The project mitigates the flooding condition of pedestrian travel ways, a multitude of properties, lateral streets and improves maintenance. The project would reduce flooding for a portion of North Valley Drive, and at a severe sump within lateral streets. The project would involve public outreach regarding easement enforcement and require a County permit. Construction would impact a lateral street and private property.

Applied Factors	Total Project Score	ROM Cost (M)
(A2, Easements through Housing) (A3) (B4) (C2) (C3) (C4) (C5, Severe Sump) (D2) (D3) (D4) ((E3) (E4) (E5, Private replacements)	3.1	\$2.5

36th Street and Blanche Road Improvement Project

This project would include the construction of storm drain piping, cast in place pipe lining, and additional catch basins with water quality inserts to improve water quality. The project may involve public outreach. The project would improve flooding conditions for a multitude of properties and a lateral street. Construction would impact a lateral street, and private property.

Applied Factors	Total Project Score	ROM Cost (M)
(A2) (B2) (C2) (C3) (D2) (D3) (D4) (E3) (E5, Line Under Private)	3.0	\$0.6

2nd Street Diversion Retrofit Project

This project would involve the re-construction of an existing diversion and infiltration system within the Greenbelt to improve hydraulic conditions, reduce flooding of a few properties, an arterial road, and improve water quality. It may involve public outreach. Construction will impact a pedestrian way.

Applied Factors	Total Project Score	ROM Cost (M)
(A5, Public & City itself) (B3) (C2) (C4, Ardmore) (D1) (D2) (D4) (E2)	3.0	\$1.2

20-Year CIP Draft Schedule	ROM Cost (M)	Project Duration*	Project Start	Project End
Shelly St. Improvement Project	\$1.4	3 Years	Jan 2022	Dec 2024
Peck Avenue Improvement Project	\$0.9	2 Years	Jul 2024	Jun 2026
Curtis Avenue & Redondo Avenue Improvement Project	\$0.7	2 Years	Jan 2026	Dec 2027
Dianthus Street Improvement Project	\$0.4	2 Years	Jul 2027	Jun 2029
14 th Street Improvement Project	\$0.7	2 Years	Jan 2029	Dec 2031
Aviation Boulevard & Artesia Blvd. Improvement Project	\$0.9	2 Years	Jul 2031	Jun 2033
Maple Avenue Improvement Project	\$2.5	4 Years	Jan 2033	Dec 2036
36 th Street and Blanche Road Improvement Project	\$0.6	2 Years	Jul 2036	Jun 2038
2 nd Street Diversion Retrofit Project	\$1.2	3 Years	Jan 2038	Dec 2041
Totals	\$9.3	20 Years	Jan 2022	Dec 2041

*Note: Individual project durations include 6-month transitional overlap.

City Facility Projects Beyond 20-Year CIP

The following projects were ranked outside of the available secured funding for the 20-year CIP program. The City should evaluate their implementation in the future as a part of subsequent SDMPs and CIP cycles.

30th Street and Flourney Road Improvement Project

This project would include the construction of an additional catch basin and dry well to remediate localized reported flooding and improve water quality within City jurisdictional property. The project would improve the flooding conditions of a few properties and a lateral street. Construction would impact a lateral street.

Applied Factors	Total Project Score	ROM Cost (M)
(A1) (B1) (C2) (D2) (D4) (E3)	2.8	\$0.5

El Porto Improvement Project

This project would include the construction of storm drain piping, additional catch basins with water quality inserts, new beach outfalls, and improvements to The Strand vegetation and biodiversity. The project would mitigate the flooding conditions of pedestrian travel ways, a few properties, and lateral streets. With construction work proposed along beachfront property, the project would involve significant public outreach and possible Coastal Commission approval. Construction would impact pedestrian travel ways, lateral streets and house front elements of The Strand.

Applied Factors	Total Project Score	ROM Cost (M)
(A5, Coastal Comm.) (B4) (C1) (C2) (C3) (D1) (D4) (E2, Strand) (E3) (E5, House front on Strand)	2.8	\$2.2

Marine Avenue and Aviation Blvd Improvement Project

This project would include the construction of storm drain piping and additional catch basins. The project would improve the flooding condition for a few properties, lateral streets, and an arterial street along with their maintenance. This project may involve some public outreach, construction within private property, a County permit, and coordination with the City of Redondo Beach. Construction would impact pedestrian travel ways and an arterial street.

Applied Factors	Total Project Score	ROM Cost (M)
(A2) (A3) (A5, Redondo) (B3) (C3) (C4) (D2) (D4) (D5) (E2) (E4)	2.7	\$1.0

The Strand Infiltration Project

This project would include the construction of storm drain piping, additional catch basins with water quality inserts, new beach outfalls with infiltration in order to improve water quality, The Strand vegetation and biodiversity. It improves the flooding condition of pedestrian travel ways and beach quality. With work along beachfront property, the project would involve significant public outreach and possible Coastal Commission involvement. Construction would impact pedestrian travel ways.

Applied Factors	Total Project Score	ROM Cost (M)
(A2, beachfront private) (A5, Coastal Comm) (B3) (C1) (C2) (C5, Beach quality) (D1) (E1)	2.5	\$2.4

Aviation Boulevard & 33rd Street Improvement Project

This project would include the construction of storm drain piping, additional catch basins with water quality inserts to improve water quality. It improves the flooding condition for a few properties and an arterial street along with its maintenance. This project may involve some public outreach or coordination with nearby heavy industrial rail or LADOT and construction within private. Construction would impact pedestrian travel ways, an arterial street, and possible heavy transportation such as shipping or public transit.

Applied Factors	Total Project Score	ROM Cost (M)
(A2) (A5, City Itself, Rail, LADOT) (B4) (C2) (C4) (D2) (D5) (E2) (E4) (E5, Heavy Transit)	2.2	\$2.3

Duncan & Longfellow Parkway Bioswale Improvements

This project would include replacing existing parkway vegetation or concrete with bioswale facilities to improve water quality at the system outfalls and enhance street landscape by increasing vegetation and biodiversity. This project may involve public outreach along with possible existing parkway landscape contestations by residents. It does not provide any specific safety improvements. Construction would impact pedestrian travel ways and lateral streets.

Applied Factors	Total Project Score	ROM Cost (M)
(A2) (B2) (C1) (C2) (D0) (E2) (E3)	2.1	\$0.8

Rosecrans and Aviation Blvd Improvement Project

This project would include a potential public partnership with a large private commercial property to improve the flooding conditions of a single property. Implementation would involve coordination with the City of Redondo Beach. Construction would impact arterial roadways and a major intersection of both Cities.

Applied Factors	Total Project Score	ROM Cost (M)
(A5, Redondo) (B2) (C5, Private partnership) (D2) (E4) (E5, Major intersection)	1.9	\$1.2

Marine and Gateway Dr Improvement Project

This potential project was identified through a flooding area depicted in a Multi-Hazard Confluence Modeling report received by AECOM from the City. AECOM models do not show that this location requires improvements, so it is being excluded from the CIP.

Applied Factors	Total Project Score	ROM Cost (M)
n/a	n/a	n/a

City Multi-Benefit Projects

The following projects are outside of the funding secured 20-year CIP and ranked from highest to lowest priority. This includes projects which may be eligible for Safe Clean Water Program (Measure W) funding or exceed the programs cost threshold of \$2.5m. The City should evaluate their implementation in the future as a part of subsequent SDMPs and CIP cycles or if additional funding is secured. Multi-benefit projects have been depicted specifically on figure C-6. Projects exceeding the program cost threshold are depicted in figures C-2 through C-5 along with the other City and County facility projects. Appendix E contains a memorandum developed by McGowan Consulting LLC that summarized their review of the storm drain capital improvements and multi-benefit project concepts to identify overlap with identified stormwater capture needs in the Updated Beach Cities Enhanced Watershed Management Program.

Bell Ave Sub-Basin Facility Project (Concept Design Treatment ID NW02B)

This project would include the construction of storm drain piping, additional catch basins with water quality inserts, new dry wells for flood control and to improve water quality. It improves the flooding condition of pedestrian travel ways, a multitude of properties, lateral streets and Bell Ave that experience School traffic along with their maintenance. It would include the addition of diversion piping from the County Main BI 0286 to an underground storage, infiltration, pump station, and treatment within undeveloped land between Grand View Elementary School and Sand Dune Park. Stormwater would be used to increase vegetation and biodiversity near Sand Dune Park along with improving water quality through infiltration and removal of existing unused pavement. This project would involve significant public outreach and construction within School District property and a County permit. Construction would impact lateral streets, Bell Ave, and School traffic.

Applied Factors	Total Project Score	ROM Cost (M)
(A3) (A5, School) (B5) (C1) (C2) (C3) (C4, Bell ave) (C5, School) (D1) (D2) (D3) (D4) (D5) (E3) (E4) (E5, School Traffic)	3.8	\$7.9

Baseline project without addition of diversion, infiltration and water re-use to be considered a multi-benefit project.

Applied Factors	Total Project Score	ROM Cost (M)
(A3) (A5, City) (B4) (C2) (C3) (C4, Bell Ave) (C5, School) (D1) (D2) (D3) (D4) (D5) (E3) (E4) (E5, School Traffic)	3.6	\$4.0

18th Street Improvement Project (Concept Design Treatment ID NE06)

This project would include the construction of storm drain piping, additional catch basins with water quality inserts, new dry wells for flood control and to improve water quality. It improves the

flooding condition of pedestrian travel ways, a multitude of properties, lateral streets along with their maintenance, and a severe sump within School traffic streets. Stormwater would be diverted and used within Polliwog Park to increase vegetation and biodiversity by use of bioswales along with improving water quality through infiltration. Conversion of existing vegetated parkways to bioswales along N Redondo, Wendy Way, and 19th streets would increase vegetation and biodiversity. This project may involve some public outreach and construction within private property along with possible existing parkway landscape contestations by residents. Construction would impact the park and lateral streets.

Applied Factors	Total Project Score	ROM Cost (M)
(A2) (B4) (C1) (C2) (C3) (C5, sumps, near school) (D1) (D2) (D3) (D4) (E2) (E3)	3.7	\$4.3

North Valley Drive Improvement and Infiltration Project (Concept Design Treatment ID S02B)

This project would include the construction of storm drain piping, additional catch basins with water quality inserts. It improves the flooding condition of pedestrian travel ways, a few properties, lateral and arterial streets along with their maintenance. The addition of a diversion and infiltration system along the Greenbelt would improve water quality. With work through the City center, the project would involve significant public outreach and possible Coastal Commission inclusion. Construction would impact pedestrian travel ways, lateral streets, arterial streets and City center facilities.

Applied Factors	Total Project Score	ROM Cost (M)
(A5, Coastal Comm. or City itself) (B4) (C2) (C3) (C4) (D1) (D2) (D4) (D5) (E2) (E3) (E4) (E5, City center & pier)	3.7	\$4.3

Baseline project without addition of infiltration to be considered a multi-benefit project.

Applied Factors	Total Project Score	ROM Cost (M)
(A5, Coastal Comm. or City itself) (B4) (C3) (C4) (D1) (D2) (D4) (D5) (E2) (E3) (E4) (E5, City center & pier)	3.4	\$3.8

Vorhees Ave Sump Infiltration Project (Concept Design Treatment ID M01)

This project would include the construction of a stormwater detention and infiltration system underneath the existing parking lot along with converting existing impervious swales to bioswales within the park to increase vegetation and biodiversity, improve water quality, and reduce flooding within the parking lot. It would improve the flooding condition of pedestrian travel ways and a few properties around the park. Construction would impact the parking lot capacity. A baseline project that addresses the storage issue alone at this location was not considered as there would be no significant cost difference.

Applied Factors	Total Project Score	ROM Cost (M)
(A1) (B4) (C1) (C2) (C5, School) (D1) (D2) (E5, Parking lot)	3.1	\$5.0

19th & 14th St. Improvement Project

This project requires that the County Mains BI 0286 and BI 0552 be improved prior to its feasibility. This project would include the construction of storm drain piping, additional catch basins with water quality inserts, a new dry well for flood control and to improve water quality. It improves the flooding condition of a multitude of properties and lateral streets along with their maintenance including lateral streets that experience School traffic. Construction would impact lateral streets.

Pacific Elementary School Field Facility Project is an alternative that may reduce flood impacts of this area without improvement of County facilities while being considered a multi-benefit project.

Applied Factors	Total Project Score	ROM Cost (M)
(A3) (B4) (C2) (C3) (C5, school traffic) (D2) (D3) (D4) (E3)	3.4	\$2.7

Pacific Elementary School Field Facility Project

This project provides multi-benefits in addition to what is improved in the 19th & 14th St. Improvements Project. It would include the addition of diversion piping from 19th & 14th St to an underground storage, infiltration, pump station, and treatment located along the edge of the Pacific Elementary School Field. Stormwater would be used to increase vegetation and biodiversity through a perimeter of bioswales along with improving water quality through infiltration. Construction would impact portions of the field in addition to lateral streets as in the baseline project.

Applied Factors	Total Project Score	ROM Cost (M)
(A3) (B5) (C1) (C2) (C3) (C5, School Traffic & Better landscape) (D2) (D3) (D4) (E2, Field) (E3)	3.3	\$7.6

North Meadows & 21st St Improvement Project

This project builds upon the prerequisite 18th Street Improvement Project. Although it is not being considered as a multi-benefit project, this project exceeds the programs cost threshold. This project would include the construction of storm drain piping, additional catch basins with water quality inserts, a new dry well for flood control and to improve water quality. Conversion of existing vegetated parkways to bioswales along N Rowell, N Peck, N Herrin, 21st and 23rd streets would increase vegetation and biodiversity. It improves the flooding condition of a multitude of properties and lateral streets along with their maintenance. This project may involve some public outreach and construction within private property along with possible existing parkway landscape contestations by residents. Construction would impact lateral streets and possible private property replacement.

Applied Factors	Total Project Score	ROM Cost (M)
(A2) (B3) (C2) (C3) (D2) (D3) (D4) (E3) (E5, private property replacement)	3.1	\$3.3

31st Street Improvement Project

Although it is not being considered as a multi-benefit project, this project exceeds the programs cost threshold. This project would include the construction of storm drain piping, additional catch basins with water quality inserts, a new beach outfall with infiltration in order to improve water quality, The Strand vegetation and biodiversity. It improves the flooding condition of pedestrian travel ways, a few properties, and lateral streets along with their maintenance. With work along beachfront property, the project would involve significant public outreach and possible Coastal Commission involvement. Construction would impact pedestrian travel ways, lateral streets and Highland Avenue.

Applied Factors	Total Project Score	ROM Cost (M)
(A2, Beachfront Prop) (A5, Coastal Comm.) (B4) (C1, Strand) (C2) (C3) (D1, Strand) (D2) (D4) (E2, Strand) (E3) (E4, Highland)	2.7	\$2.9

American Martyr's Elementary School Improvement Project

This project builds upon the prerequisite N Valley Drive Improvement Project. Although it is not being considered as a multi-benefit project, this project exceeds the programs cost threshold. In addition to storm drain capacity improvements on 18th street, this project would include: increasing the storage capacity of the existing stormwater detention basin, and addition of a small stormwater lift station to convey overflows through a force main down 15th street to an improved system at N Ardmore. As elements of this project occur within a Private Catholic School, the Vatican or similar private agencies may be involved, but a remediation by the City to localized flooding within the School has been specifically requested. The project would improve flooding conditions for a few properties and lateral streets. Construction would impact lateral streets.

Applied Factors	Total Project Score	ROM Cost (M)
(A5, Vatican) (B4) (C3) (C5, Special request from School) (D2) (D4) (E3)	2.6	\$3.9

County Facilities

The following projects are outside of the funding secured 20-year CIP and would require major modifications to LACFCD facilities within its jurisdiction or significant involvement with LACFCD; they are ranked from highest to lowest. The City should evaluate LACFCD coordination for their implementation in the future as a part of subsequent SDMPs and CIP cycles or if additional funding is secured. Locations of these projects are listed separately but depicted on figures C2 through C-5 along with City facility projects.

Rowell & Manhattan Beach Blvd. Improvement Project

This project was determined to have limited flood improvements with the improvement County Mains BI 0286 and BI 0552. In order to avoid County main improvements, this project would include construction of retrofitted catch basins with water quality inserts and dry wells for flood control and water quality improvements. It improves the flooding condition of a multitude of properties and lateral streets along with their maintenance. It would also include improvements to vegetation and biodiversity around Artesia Blvd. Check-valves would be placed on the laterals connecting to the County system to prevent backflow. This project would require a County permit. Construction would impact pedestrian travel ways and a lateral street.

Applied Factors	Total Project Score	ROM Cost (M)
(A3) (B3) (C1) (C2) (C3) (C5, Sump) (D1) (D2) (D3) (D4) (E2) (E3)	3.7	n/a

Poinsettia Ave Improvement Project

This project would include the construction of storm drain piping, additional catch basins with water quality inserts to improve water quality. It improves the flooding condition of pedestrian travel ways, a multitude of properties, lateral streets and an arterial street along with their maintenance, and a severe sump. This project may involve some public outreach, a County permit, and major modifications to County facilities. Construction would impact pedestrian travel ways, lateral streets and arterial Manhattan Beach Boulevard.

Applied Factors	Total Project Score	ROM Cost (M)
(A3) (A4) (A5, City itself) (B3) (C2) (C3) (C4) (C5, sump) (D1) (D2) (D3) (D4) (D5) (E2) (E3) (E4)	3.6	\$2.1

Marine and Walnut Ave Improvement Project

This project would include the construction of storm drain piping, additional catch basins with water quality inserts to improve water quality. It improves the flooding condition of pedestrian travel ways, a multitude of properties, lateral streets along with their maintenance, and a severe sump. This project would require a County permit and major modifications to County facilities. Construction would impact pedestrian travel ways, lateral streets and arterial Manhattan Beach Boulevard.

Applied Factors	Total Project Score	ROM Cost (M)
(A3) (A4) (B2) (C2) (C3) (C5, Sump) (D1) (D2) (D3) (D4) (D5) (E2) (E3) (E4)	3.5	\$0.9

10th & Herrin St Improvement Project

This project would include the construction of storm drain piping, additional catch basins with water quality inserts to improve water quality. It improves the flooding condition of a multitude of properties and lateral streets along with their maintenance, and a severe sump. Conversion of existing vegetated parkways to bioswales along 8th St. would increase vegetation and biodiversity. This project may involve some public outreach, a County permit, and major modifications to County facilities. Construction would impact lateral streets and include difficult RCB construction within an intersection.

Applied Factors	Total Project Score	ROM Cost (M)
(A3) (A4) (B3) (C1) (C2) (C3) (D2) (D3) (D4) (E3) (E5, RCB in Intersection)	3.0	\$1.9

2nd & Harkness Improvement Project

This project would include the construction of storm drain piping, additional catch basins with water quality inserts, a new dry well for flood control and to improve water quality. It improves the flooding condition of pedestrian travel ways, a multitude of properties, and lateral streets along with their maintenance. This project would involve public outreach and easement enforcement, a County permit and major modifications to County facilities. Construction would impact pedestrian travel ways, lateral streets and private property replacement.

Applied Factors	Total Project Score	ROM Cost (M)
(A2) (A3) (A4) (B3) (C2) (C3) (D1) (D2) (D3) (D4) (E3) (E5, Significant private)	2.8	\$1.3

8th St Improvement Project

This project would include the construction of storm drain piping, additional catch basins with water quality inserts. It improves the flooding condition of pedestrian travel ways, a few properties, and lateral streets along with their maintenance. This project would involve public outreach and easement enforcement, a Caltrans permit, a County permit and major modifications to County facilities. Construction would impact lateral streets and private property replacement.

Applied Factors	Total Project Score	ROM Cost (M)
(A3) (A4) (A5, Caltrans) (B3) (C2) (C3) (C4) (D1) (D2) (D4) (D5) (E2) (E3) (E4) (E5, CA1)	2.8	\$2.0

County Line BI 0286 Improvement Project

This project included upsizing the County Mains BI 0286 and BI 0552 throughout the City. It would improve the flooding conditions of pedestrian travel ways, a multitude of properties, lateral streets, and arterial streets along with their maintenance. It would provide a significant upgrade to the regional system. It would involve significant public outreach and private property, County permits, major modifications to County facilities, and a significant internal effort by the City. Construction would impact pedestrian travel ways, lateral streets, arterial streets, and require significant stormwater flow management along with street closures.

Applied Factors	Total Project Score	ROM Cost (M)
(A2) (A3) (A4) (A5, City itself & Public) (B5) (C3) (C4) (C5, major upgrade) (D1) (D2) (D3) (D4) (D5) (E2) (E3) (E4) (E5, major flow control & closures)	2.7	\$18.5

2nd & 5th St. Improvement Project

This project would include the construction of storm drain piping, additional catch basins with water quality inserts, a new dry well for flood control and to improve water quality. This project would resolve cross-lot drainage. It improves the flooding condition of a multitude of properties, and lateral streets along with their maintenance. This project would include public outreach and easement enforcement, a County permit and major modifications to County facilities. Construction lateral streets and private property replacement.

Applied Factors	Total Project Score	ROM Cost (M)
(A2) (A3) (A4) (B3) (C1) (C2) (C3) (C5 resolves cross-lot drainage) (D2) (D3) (D4) (E3) (E5, private property replacement)	3.1	\$1.7

Johnson Ave County Pump Station Facility Project

This project would include providing the County with new pumps, the construction of additional stormwater detention and infiltration systems, and addition of bioswales within the site to increase vegetation and biodiversity, improve water quality. It would improve the flooding condition of a multitude of properties around the existing site. Construction would impact lateral streets for construction staging.

Applied Factors	Total Project Score	ROM Cost (M)
(A3) (A4) (B4) (C1) (C2) (D2) (D3) (E2, staging)	2.4	\$5.0

Manhattan Heights & 8th St. Park Infiltration Project (Concept Design Treatment C10)

This project would include the construction of diversion piping from the County system to a stormwater detention and infiltration system underneath the existing park along with adding bioswales within the park to increase vegetation and biodiversity, improve water quality. It would improve the flooding condition of pedestrian travel ways and a few properties around the park. There are no specific safety benefits. Construction would impact the park and lateral streets and require a County permit.

Applied Factors	Total Project Score	ROM Cost (M)
(A3) (B4) (C1) (C2) (D0) (E2) (E3)	1.9	\$2.4

Water Quality Facilities

The following project has been evaluated as scoped by the City, it includes system improvements with a sole focus on water quality without flood control improvement. Potential parkway bioswale areas along with multi-benefit water quality improvement projects are depicted in figure C-7.

Citywide Parkway Bioswale Improvement Project (Concept Design Treatment)

This project has been considered as requested by the City, and provides a top-down view of replacing most existing parkway vegetation or concrete with bioswale facilities to improve water quality at the system outfalls and enhance street landscape by increasing vegetation and biodiversity while maintaining ADA compliance. This project would involve significant public outreach along with possible existing parkway landscape contestations by residents. It does not provide any specific safety improvements. Construction would impact pedestrian travel ways, lateral streets, and arterial streets.

Applied Factors	Total Project Score	ROM Cost (M)
(A2) (B2) (C1) (C2) (D0) (E2) (E3)	1.5	\$8.1