COMMUNITY OUTREACH MEETING

Storm Drain System Master Plan Update

PROPOSED FACILITIES DISCUSSION

Prepared by

Q3 Consulting

Presenters

Project Manager – Bobby Fouladi, P.E. (City of Costa Mesa)

Consulting Project Manager – Tom Ryan, P.E. (Q3 Consulting)

Consulting Project Engineer – Candace Tong, P.E. (Q3 Consulting)

Project Introduction

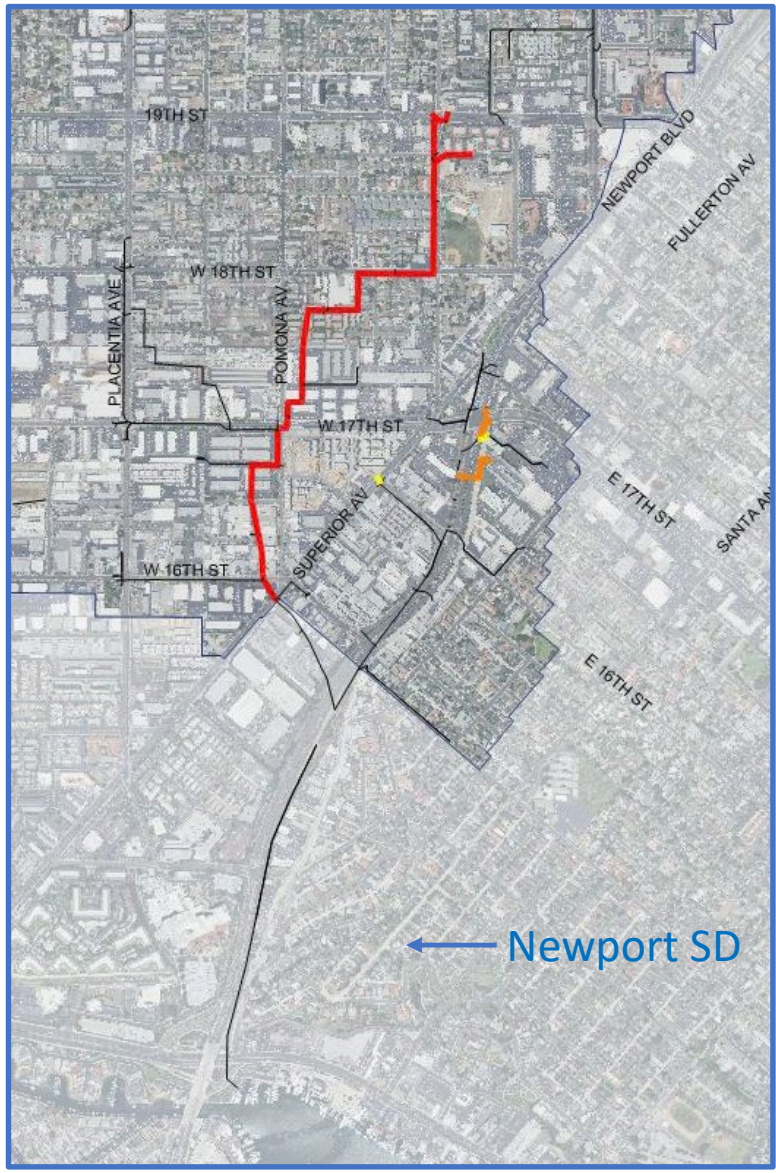
- Purpose for Project
  - Developing New Storm Drain System Master Plan (SDSMP)
  - Includes “Storm Water Alternatives Improvement Map” (SWAIM)
  - Prepare Drainage Fee & Finance Study
- Purpose of the Community Meeting
- History of Drainage Studies (2006, 1984)
- Overall Goals of the SDSMP
- Two Phases of SDSMP
  - Phase 1: Existing Conditions Assessment (ECAR)
  - Phase 2: Develop Future Stormwater Management Plan

SDSMP Project Description

- Advanced Storm Water Master Plan
- GIS Database Update
- Comprehensive Analysis of Existing Facilities (ECAR-Phase 1)
- Identify and Prioritize Future Drainage Improvements
- Identify Potential Limitations/Hurdles
- Develop More Economically Feasible Solutions (Phase 2)
- SMART System (Monitoring/Preparation)
- Water Quality (Regional Facilities Evaluation)

Drainage Improvement Hurdles

- Downstream Restrictions (OC, Newport Beach)
- Environmental Restrictions
- Urbanization (No Room for Storage)
- Flat Topographic Relief = Flat Storm Drain Slopes
- Water Quality Requirements
- Constructability/Feasibility
- Property/Right-of-Way Ownership



Recommended Design Criteria

Future Proposed Flood Control Systems

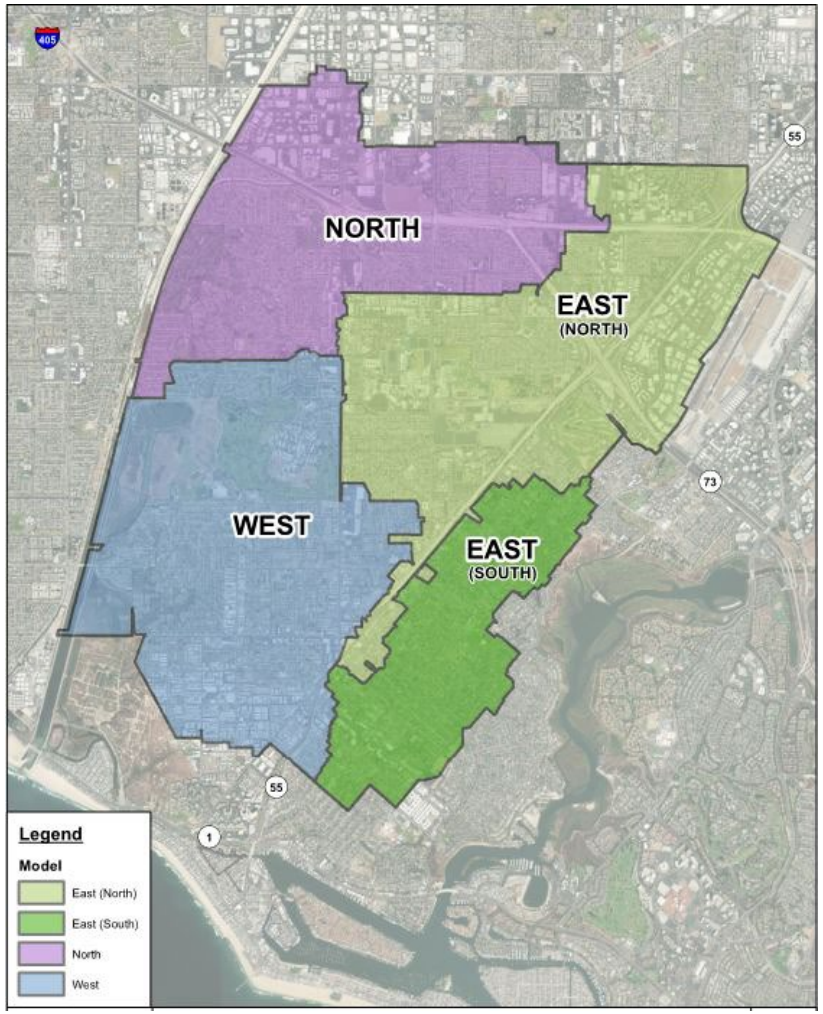
- General Design Storm
  - 25-Year Design Storm Main Lines
    - Water Surface for Local Streets = Top of Curb
    - Water Surface Arterial Highways = Top of Curb (w/ 2 dry lanes)
    - Recommended Criteria = Protecting Buildings
- Areas w/ Major Hurdles (Case-by-Case)
  - Proposed Solution may have “Allowable” Flooding
  - Hurdles are typically more abundant in flooded areas.

Flood Control Mitigation Measures

- Surface Attenuation
  - Detention Basins
  - Shallow surface storage (allowable flooding)
- Subsurface Attenuation
  - In-Line Storage
  - Subsurface Detention
  - Subsurface Retention
- Improved Conveyance
  - Larger drainage facilities
  - Parallel Systems
- Velocity Reduction

Stormwater Model Development

- City Divided Into 4 Watersheds
  - West
  - North
  - East(north)
  - East(south)
- Models Run for 10-, 25-, and 100-Year Existing Condition
- Future Design based on 25-year
- Boundary Conditions

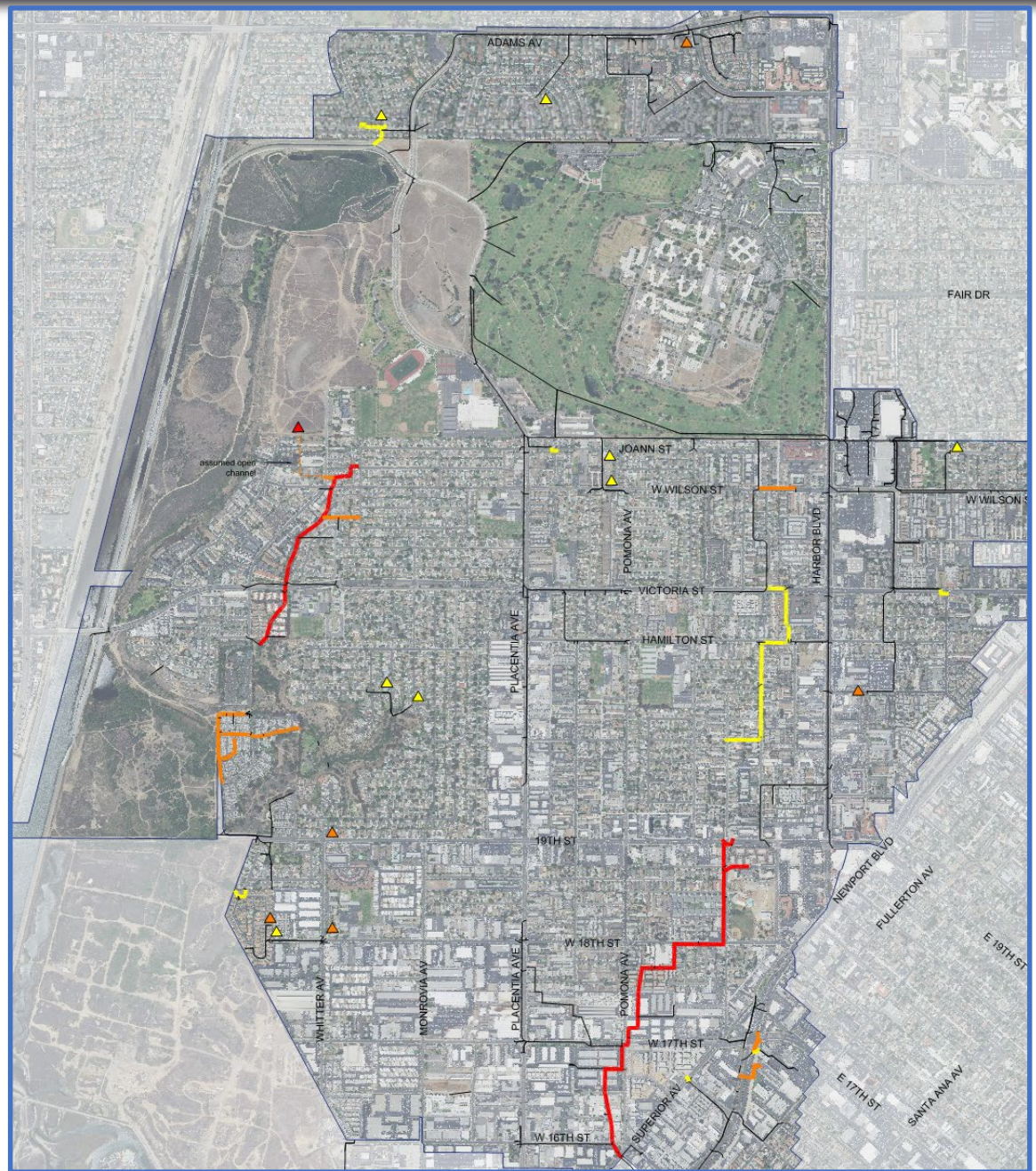


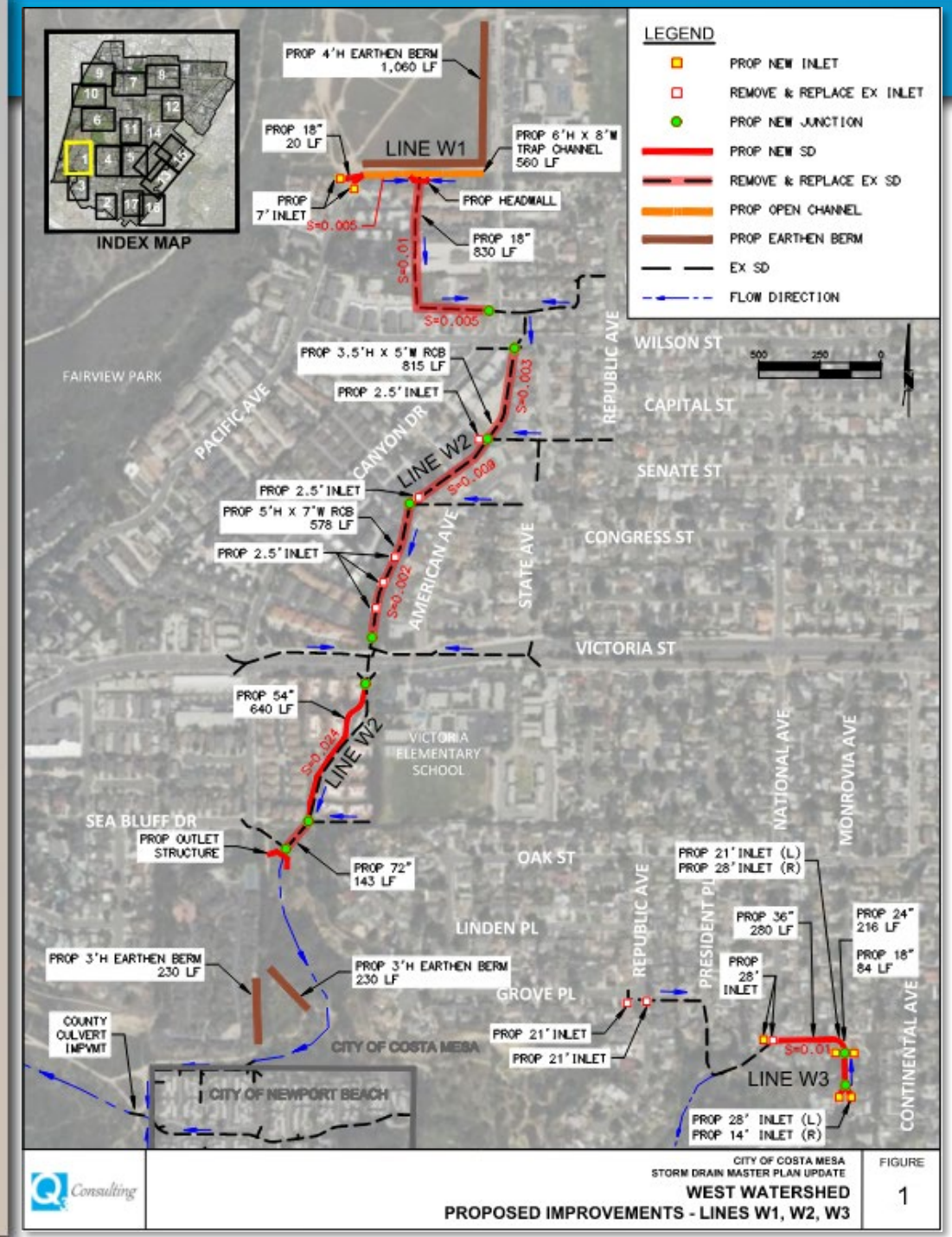
Preliminary Priority Ranking

WEST WATERSHED

LEGEND

- Highest Priority Storm Drain
- Highest Priority Surface Drainage/CB
- High Priority Storm Drain
- High Priority Surface Drainage/CB
- Moderate Priority Storm Drain
- Moderate Priority Surface Drainage/CB
- Model Boundary





West Watershed

Design Considerations:

- *Line W1 – Environmental Hurdles with Fairview Park and Bluff Stabilization*
- *Line W2 – Narrow RoW adjacent to Canyon Dr.*

Preliminary Engineer's Construction Cost Estimates:

Line W1 = $420,000

Line W2 = $3,070,000

Line W3 = $141,000

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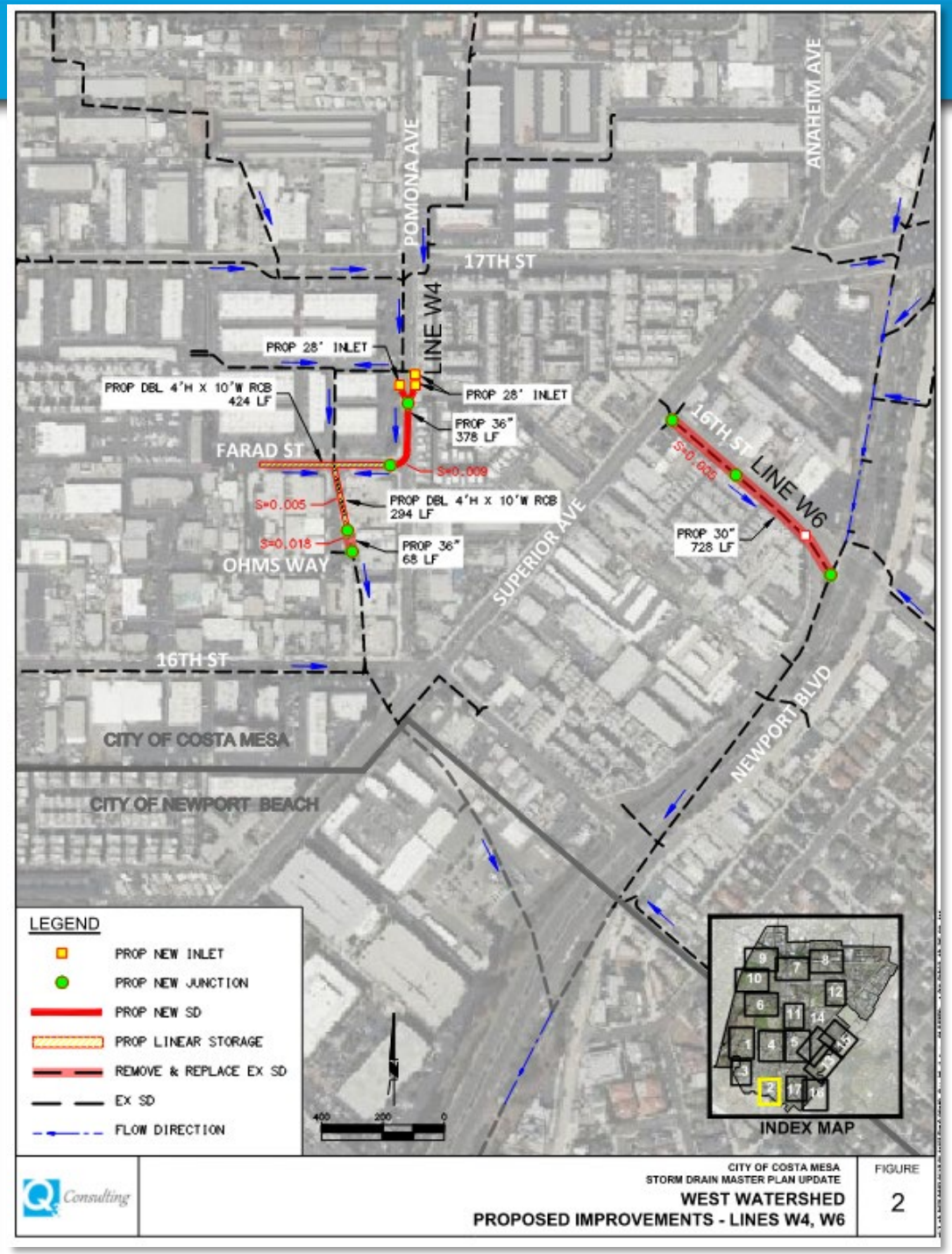

West Watershed

Design Considerations:

- *Line W4 – Downstream Constraints (Newport Beach, Caltrans), Adverse Grades.*
- *Line W6 – Downstream Caltrans Facility*
- *Over 20 local alternatives evaluated*
- *Design Criteria "No building flooded" (Max Depth=4.1')*

Preliminary Engineer's Construction Cost Estimates:

Line W4 = $3,240,000 (Max Flooding 17th/Pomona = 3.1')

Line W4 (Ultimate) = $16,320,000 + $7,130,000 (NB)
(Max Flooding 17th/Pomona = 1.3')

Line W6 = $431,000

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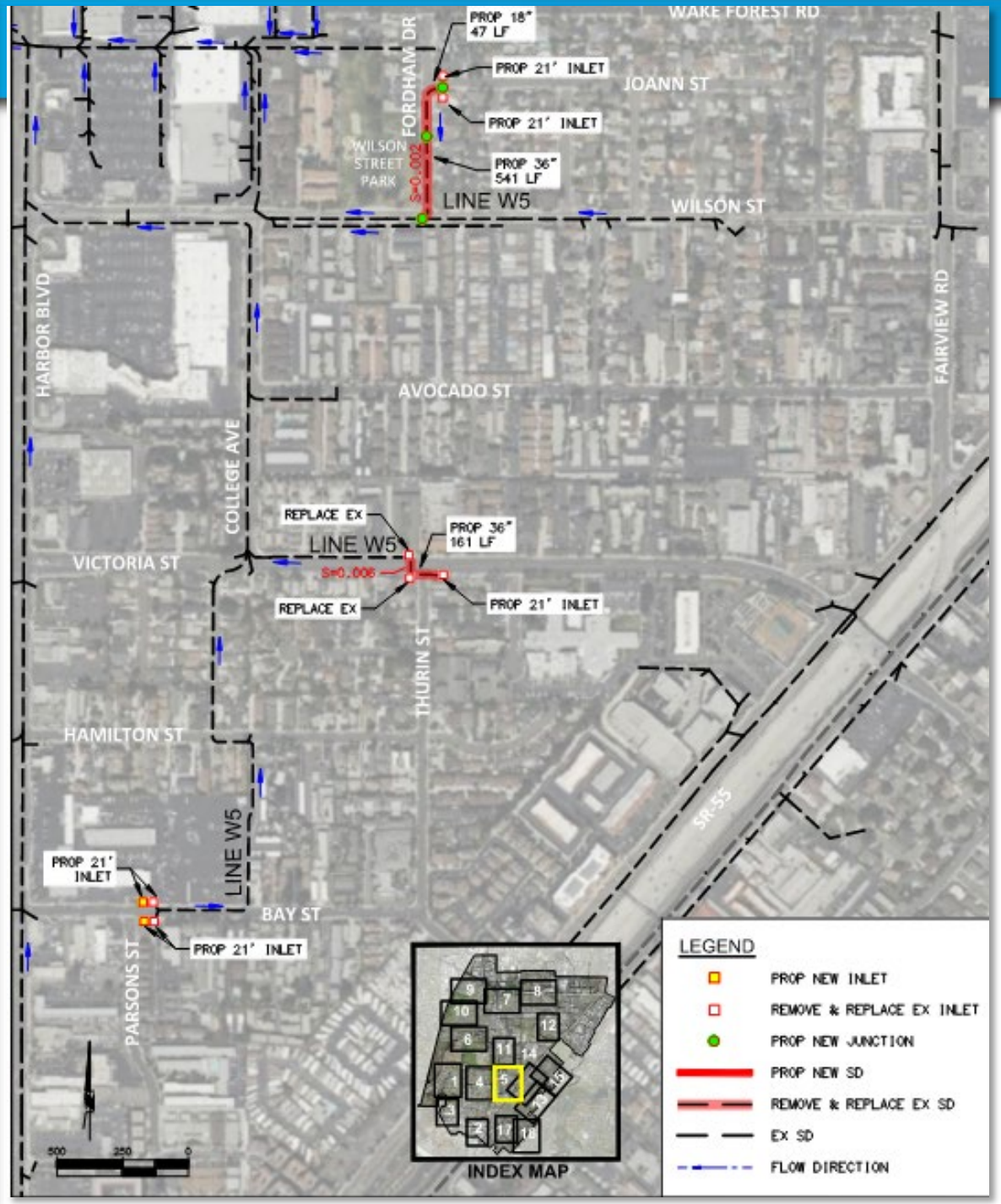

West Watershed

Design Considerations:

- *Line W5- Downstream Facilities near capacity.*

Preliminary Engineer's Construction Cost Estimates:

Line W5 = $510,000

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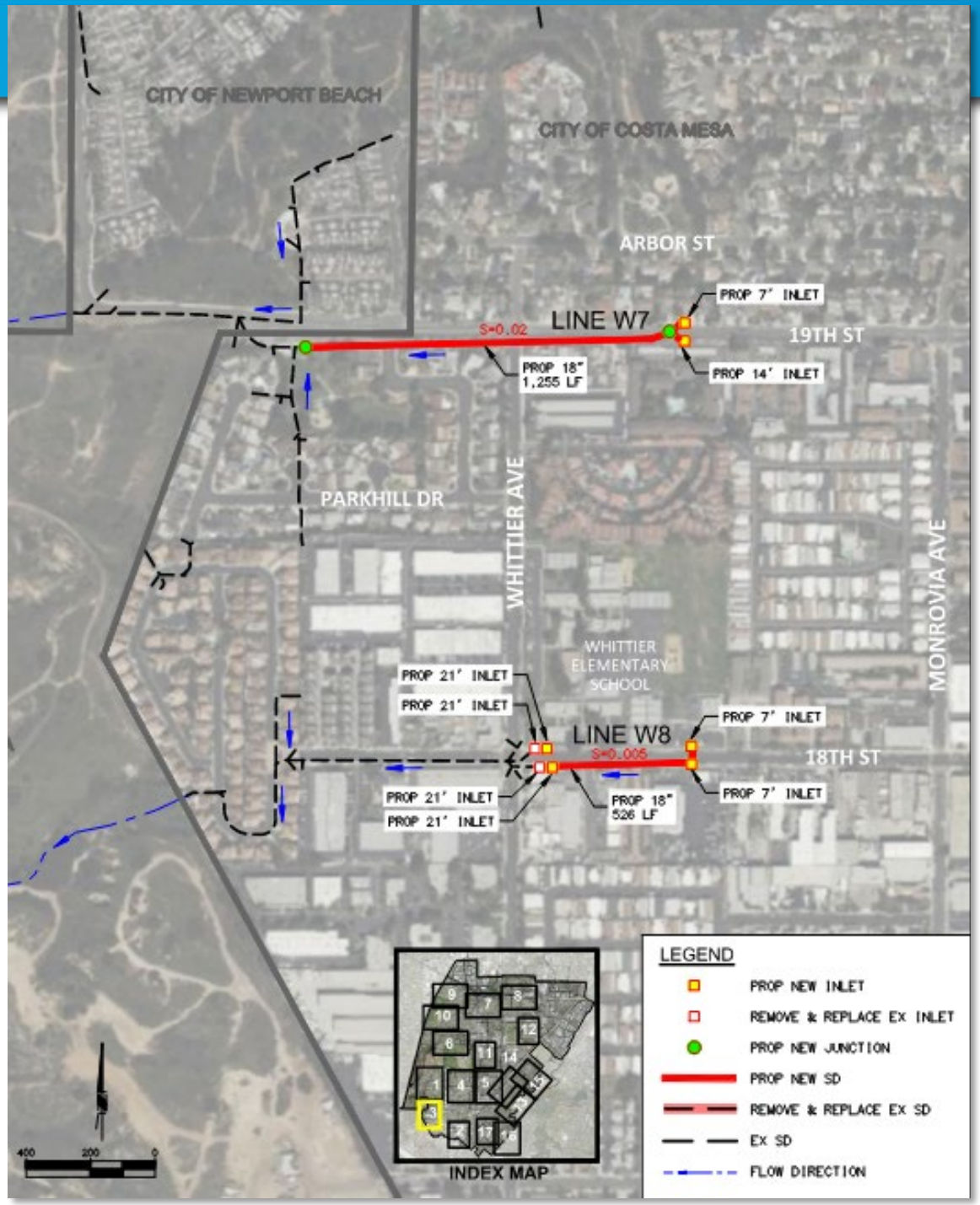

West Watershed

Design Considerations:

- *Line W7 & W8 – Downstream Constraints (Banning Ranch – Environmental)*
- *No upsizing of existing outlet pipes.*
- *No rerouting of flows.*
- *Converting surface flows to subsurface*

Preliminary Engineer's Construction Cost Estimates:

Line W7 & W8 = $750,000

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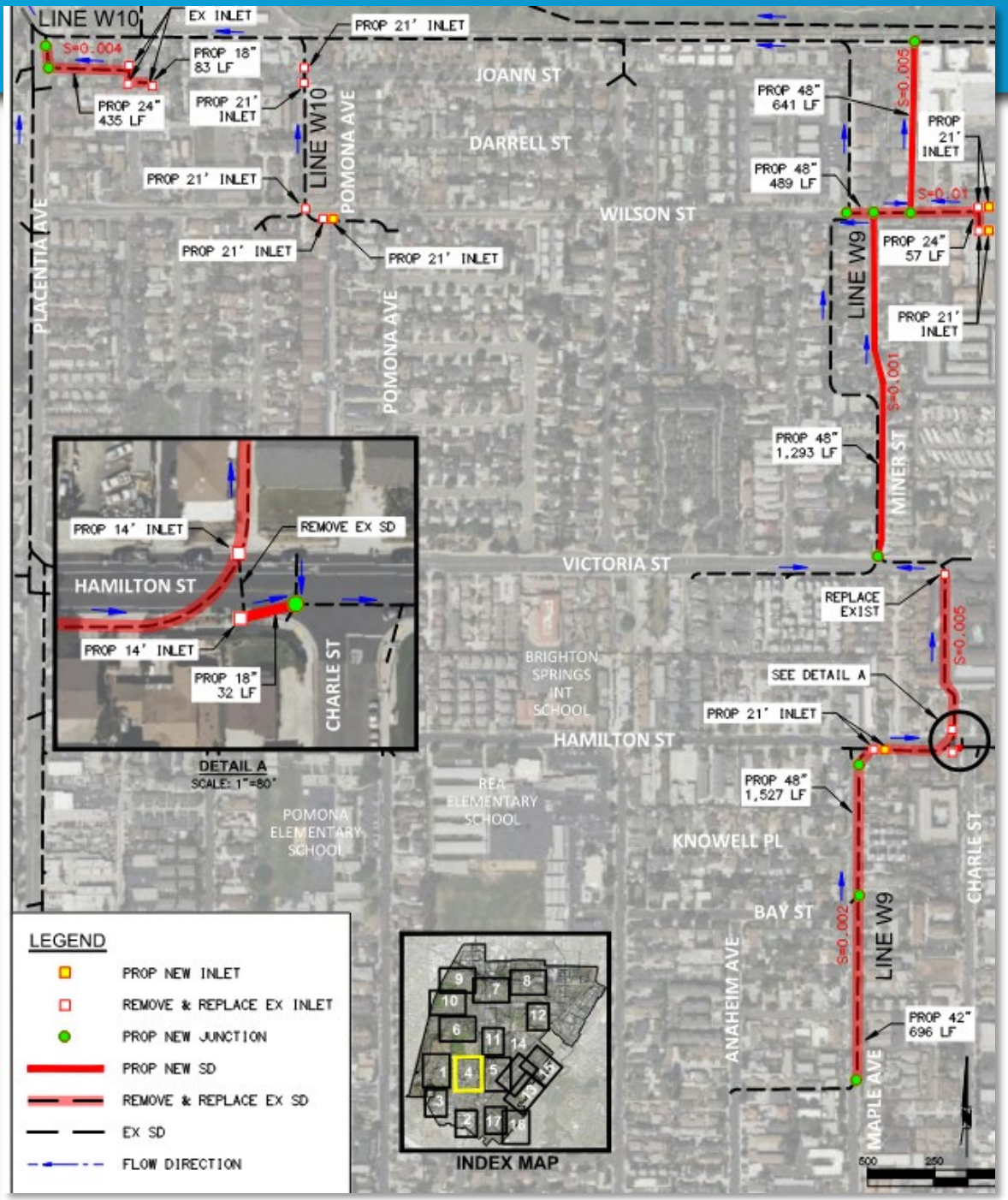

West Watershed

Design Considerations:

- *Line W9 & W10 - Downstream Facilities near capacity.*

Preliminary Engineer's Construction Cost Estimates:

Line W9 = $4,295,000

Line W10 = $510,200

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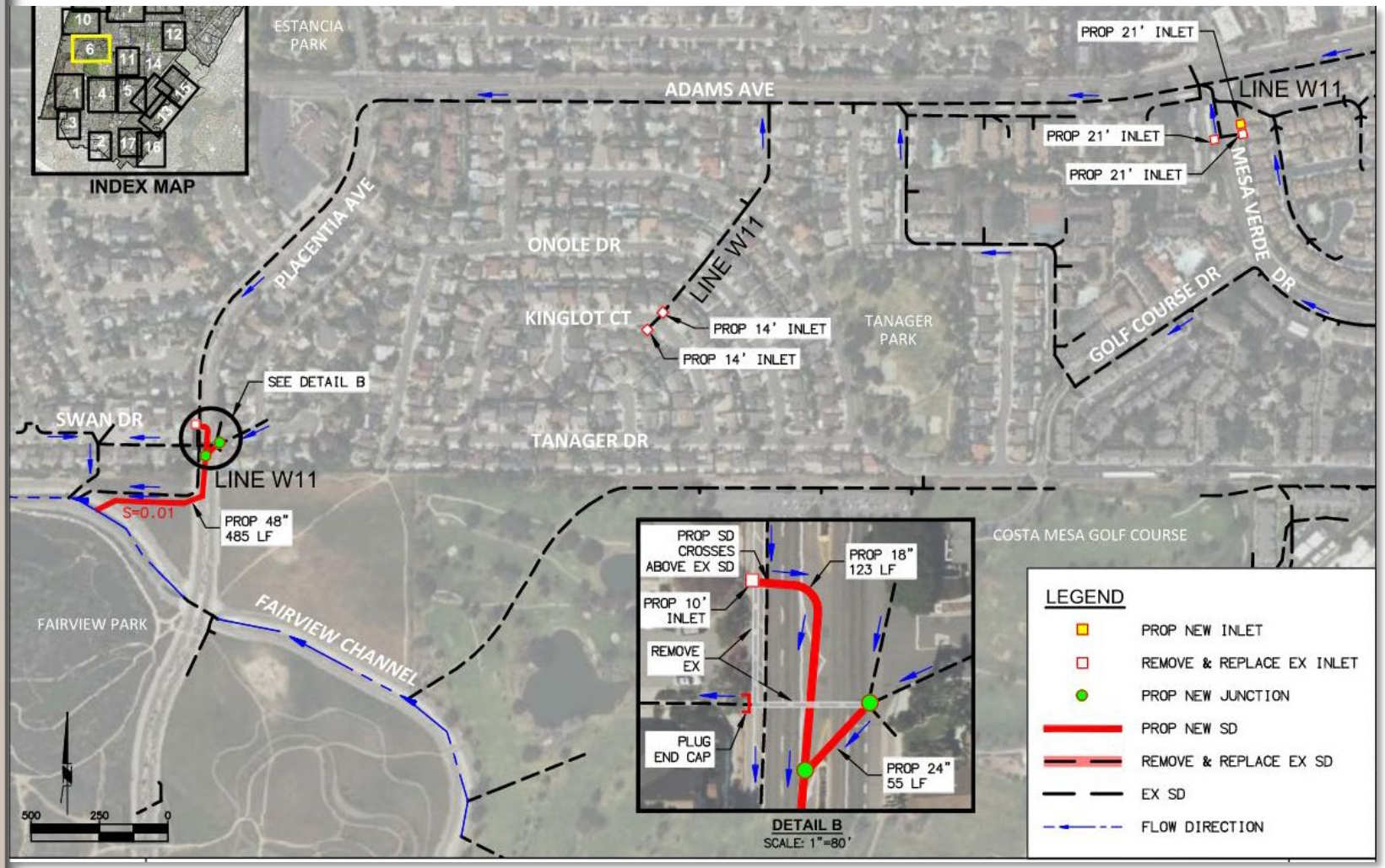
West Watershed



Design Considerations:

- *Line W11 - Downstream Facilities near capacity and County permit required for Fairview Channel.*

Preliminary Engineer's Construction Cost Estimates:

Line W10 = $510,000

Line W11 = $685,000

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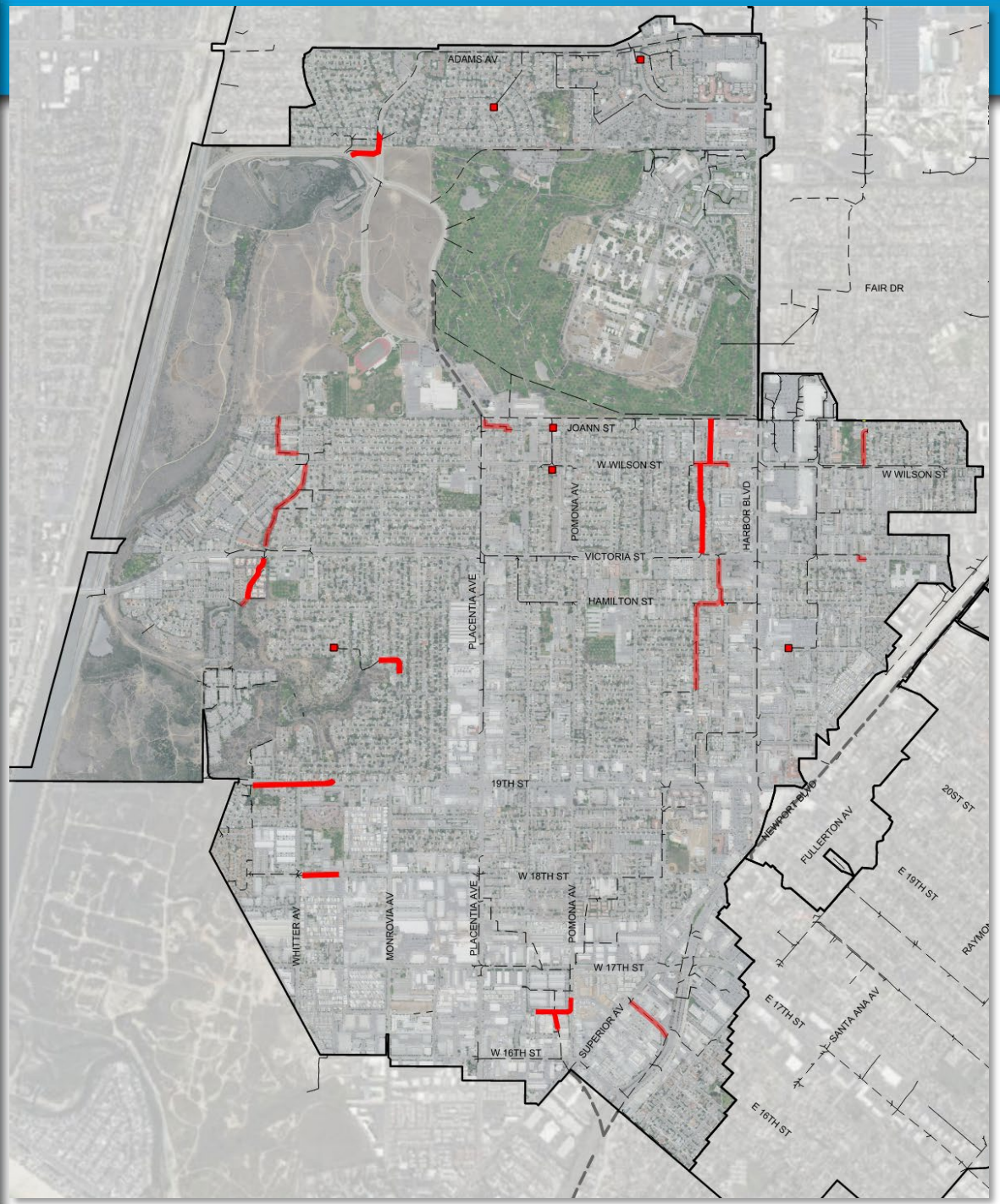

West Watershed Overview
Flood Control Improvements

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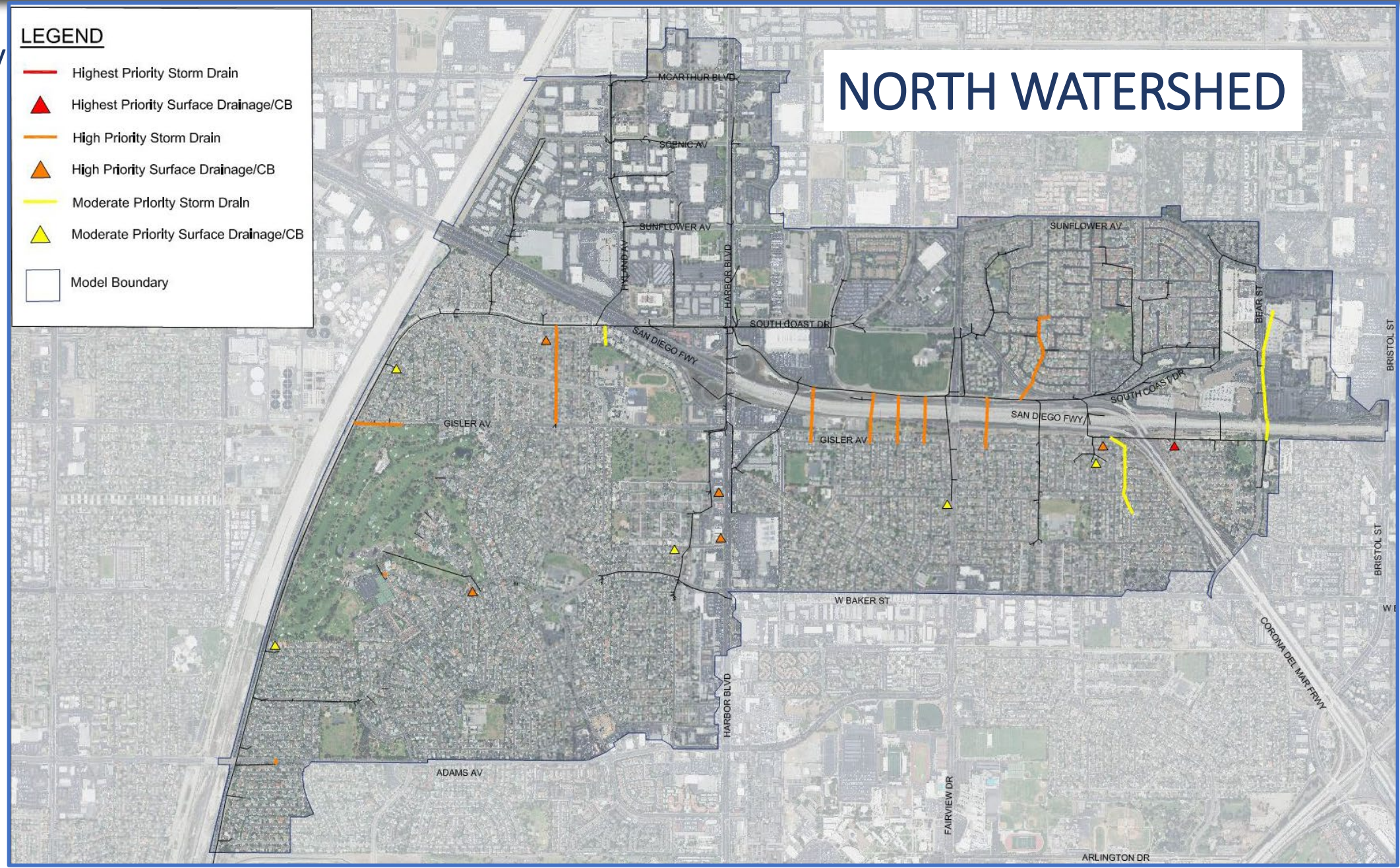
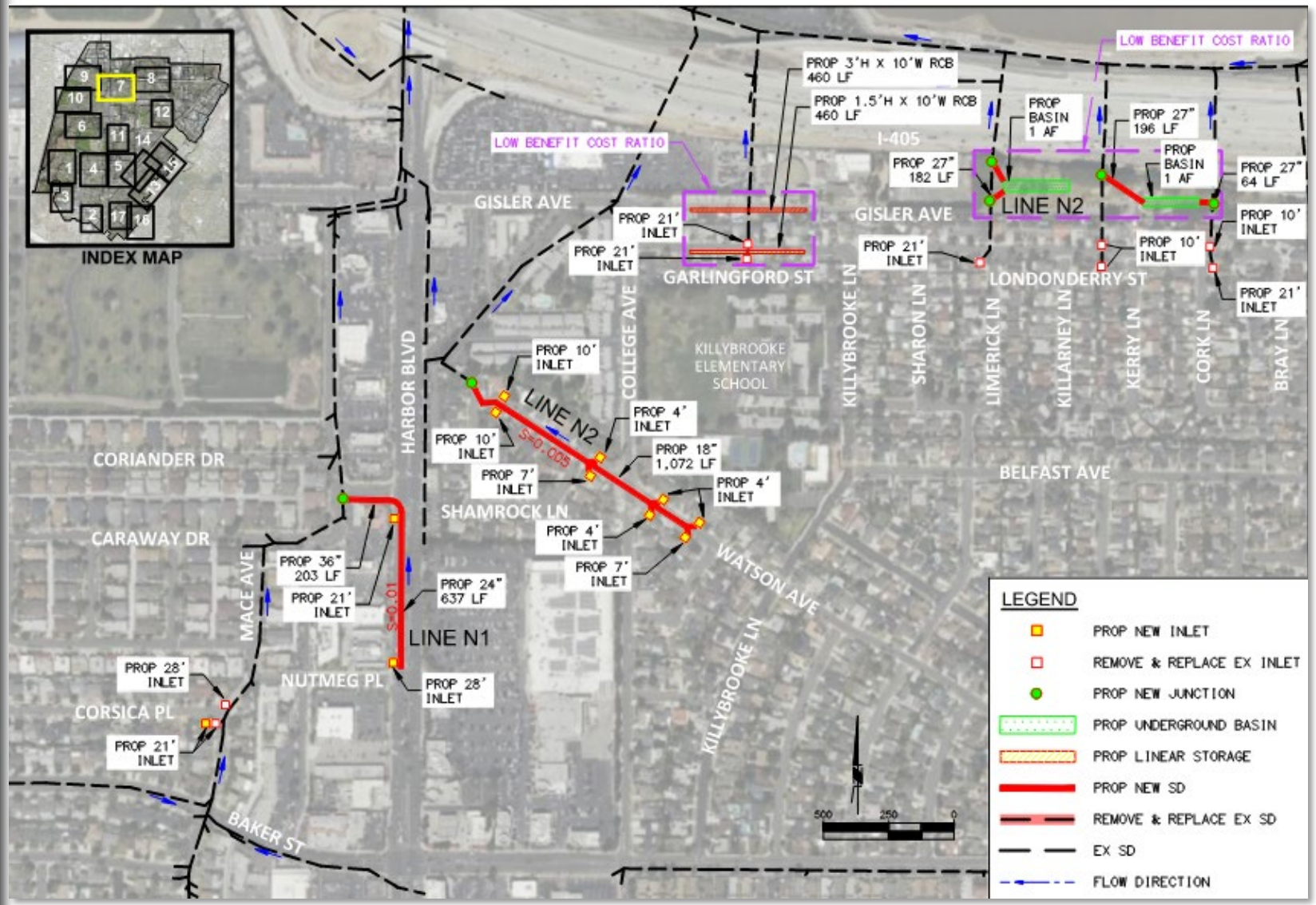
Preliminary Priority Rankings (North)



North Watershed



Design Considerations:

- *Line N1 & N2 - Downstream Facilities near capacity and crosses Caltrans RoW.*

Preliminary Engineer's Construction Cost Estimates:

Line N1= $697,000

Line N2 = $6,384,000

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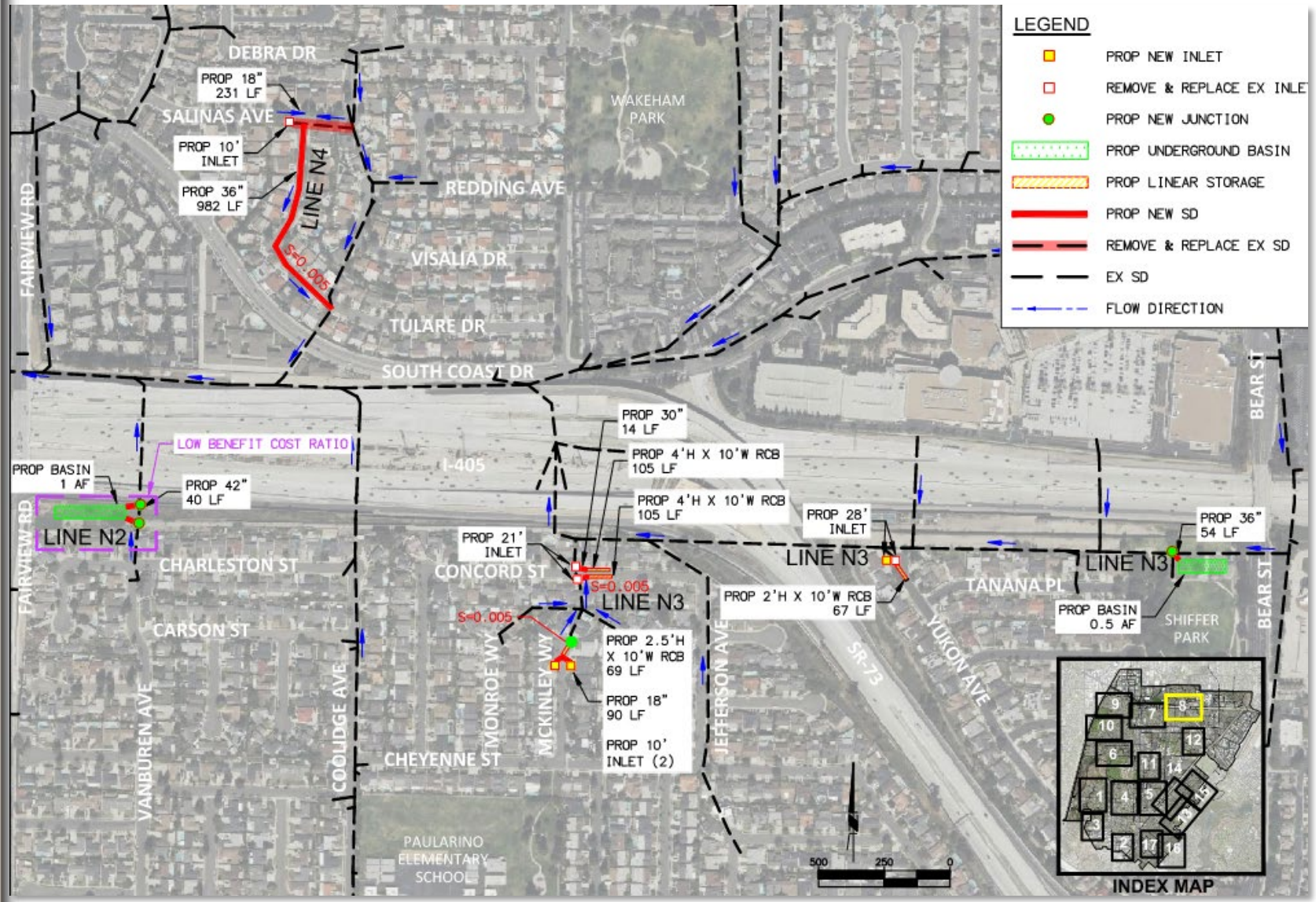
North Watershed



Design Considerations:

- *Line N2 & N3 - Downstream Facilities near capacity and crosses Caltrans RoW.*

Preliminary Engineer's Construction Cost Estimates:

Line N3= $2,110,000

Line N4 = $931,000

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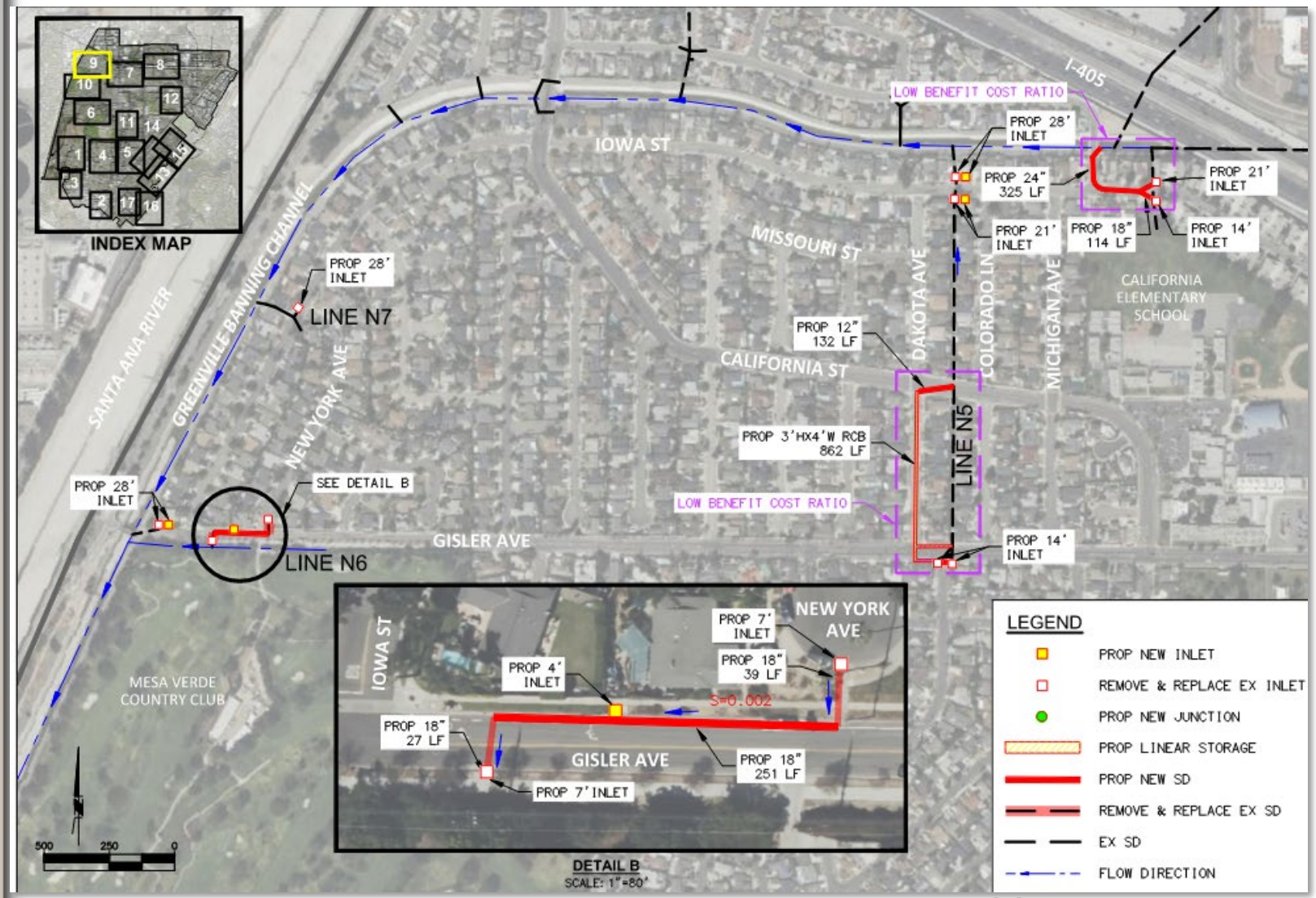
North Watershed



Design Considerations:

- *Some of Line N5 Proposed Improvements May not be cost effective*

Preliminary Engineer's Construction Cost Estimates:

Line N5= $1,167,000

Line N6 = $344,000

Line N7 = $68,400

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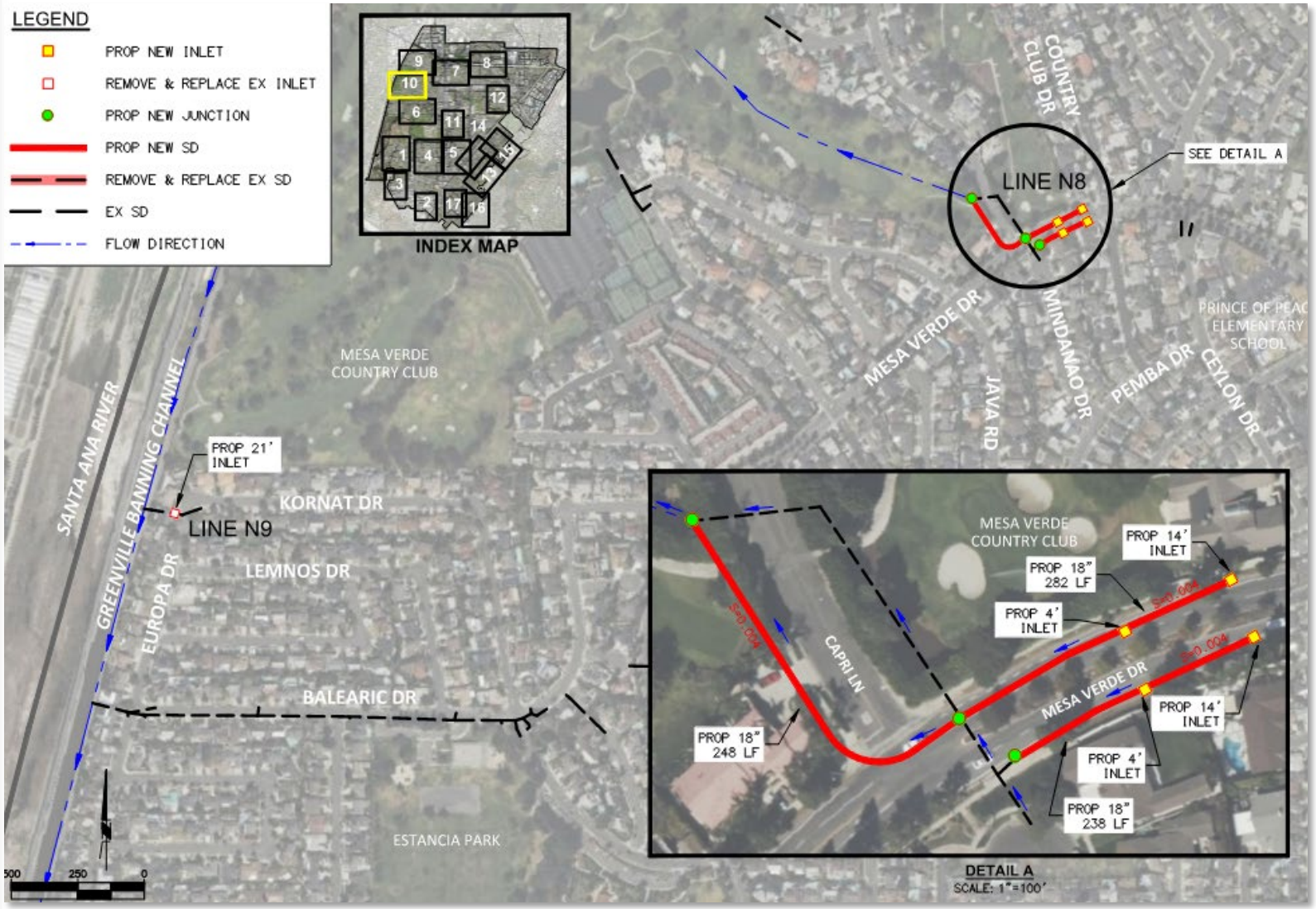
North Watershed



Design Considerations:

- *Line N8 – Tributary to Private Golf Course Storm Drain*
- *Improvements within City RoW*

Preliminary Engineer's Construction Cost Estimates:

Line N8 = $469,000

Line N9 = $84,000

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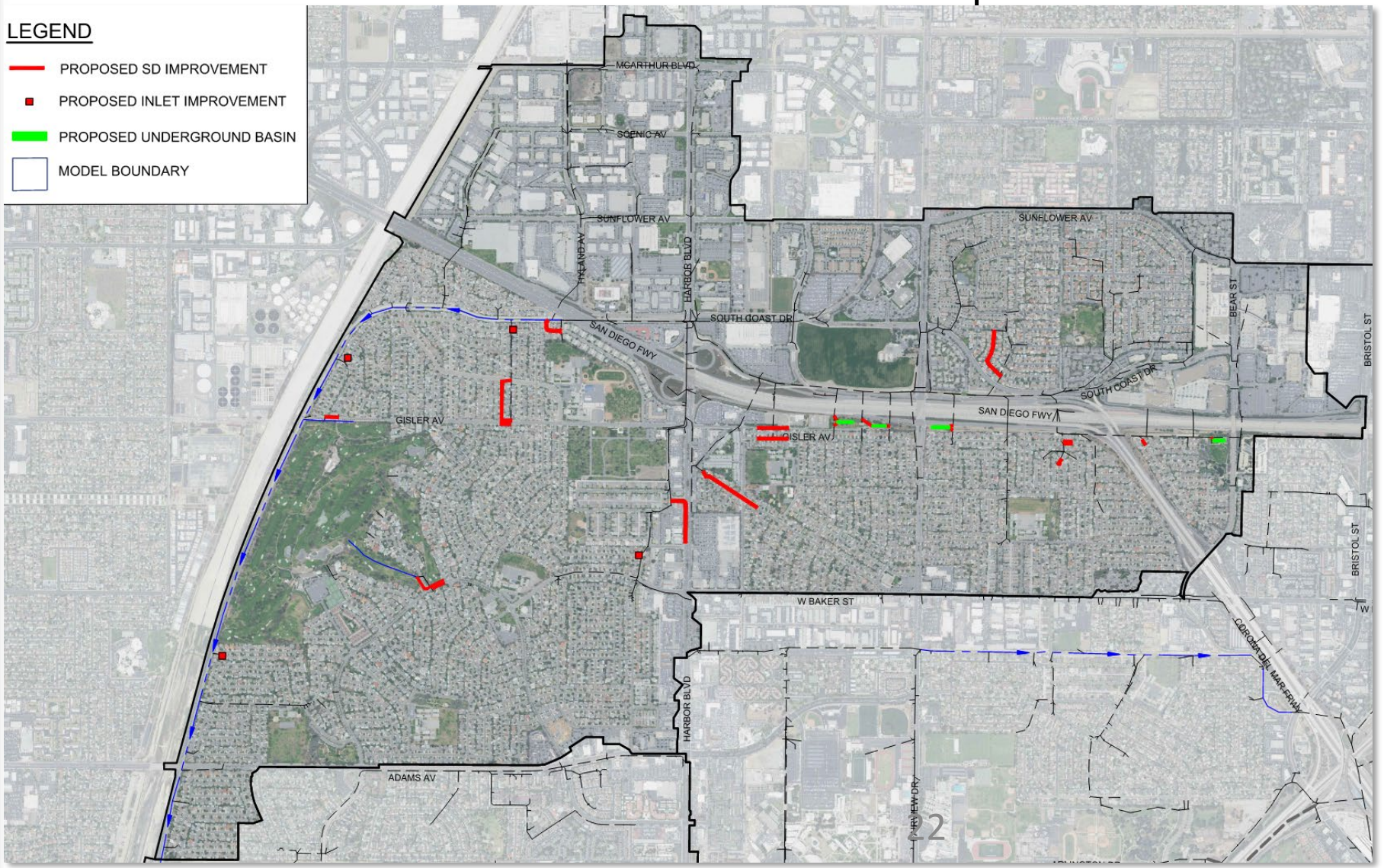
North Watershed Overview

Flood Control Improvements



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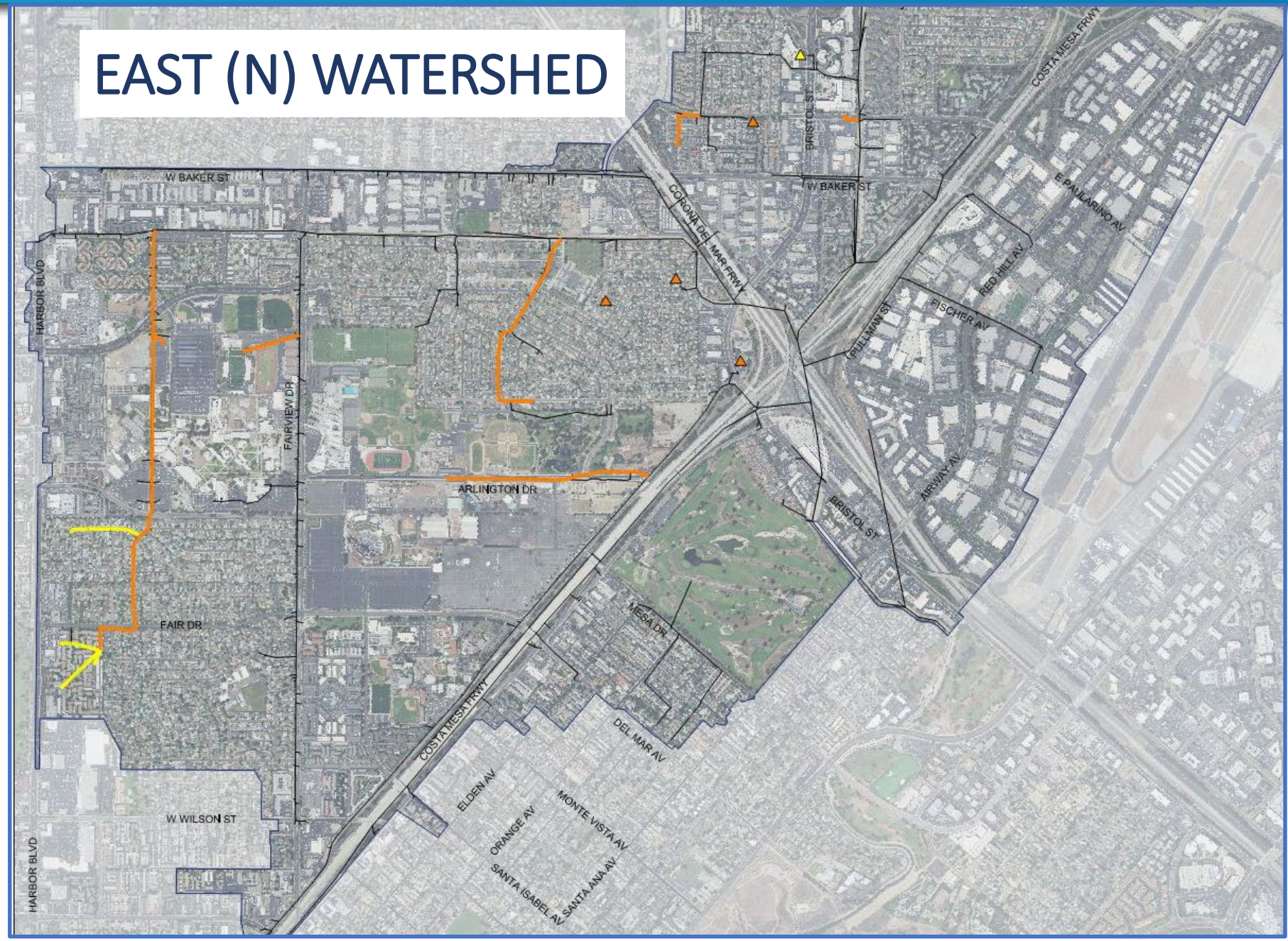
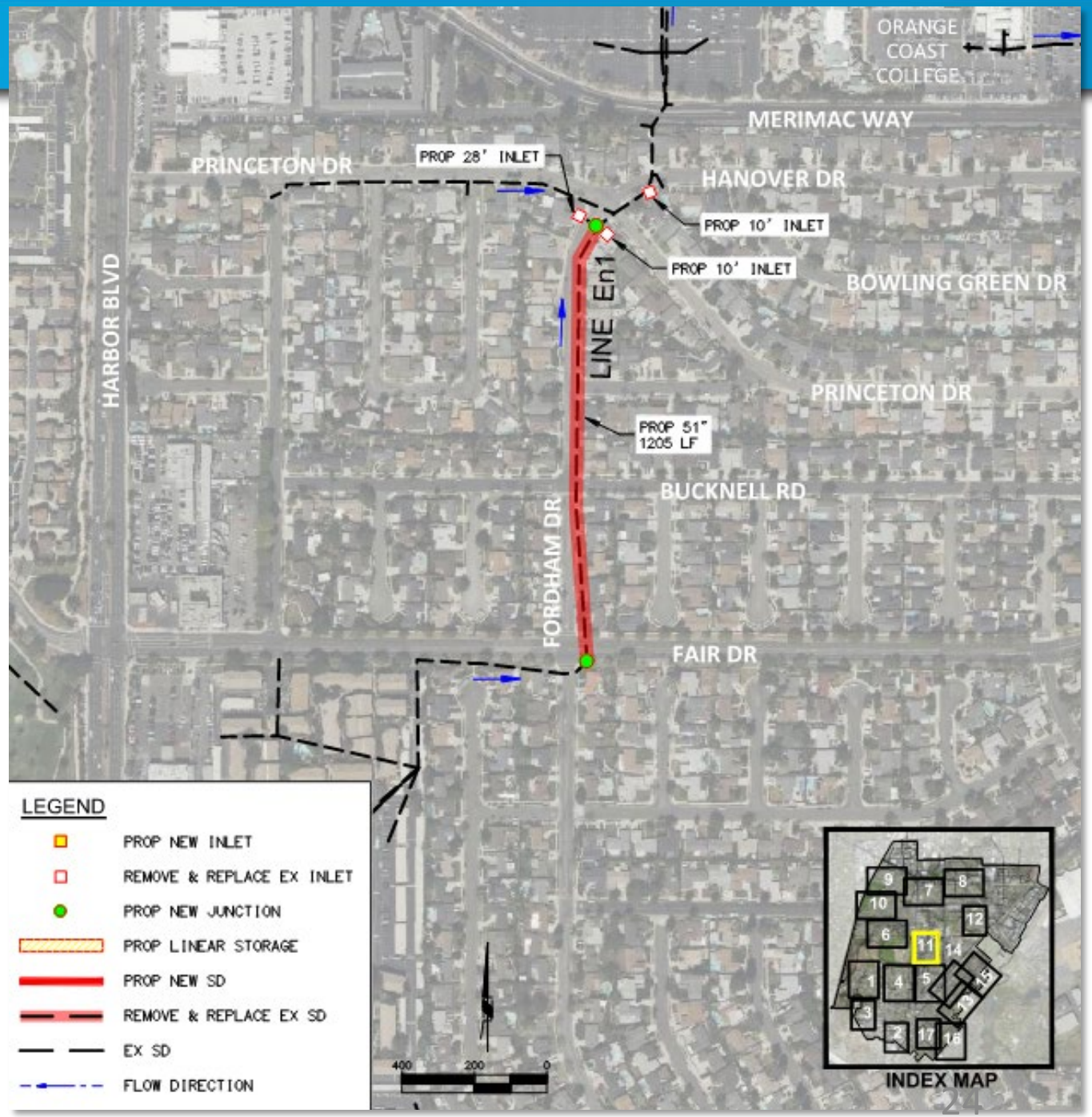
Preliminary Priority Ranking East(N)





East (N) Watershed

Design Considerations:

- *Line En1 – Downstream system near capacity.*

Preliminary Engineer's Construction Cost Estimates:

Line En1 = $1,483,000

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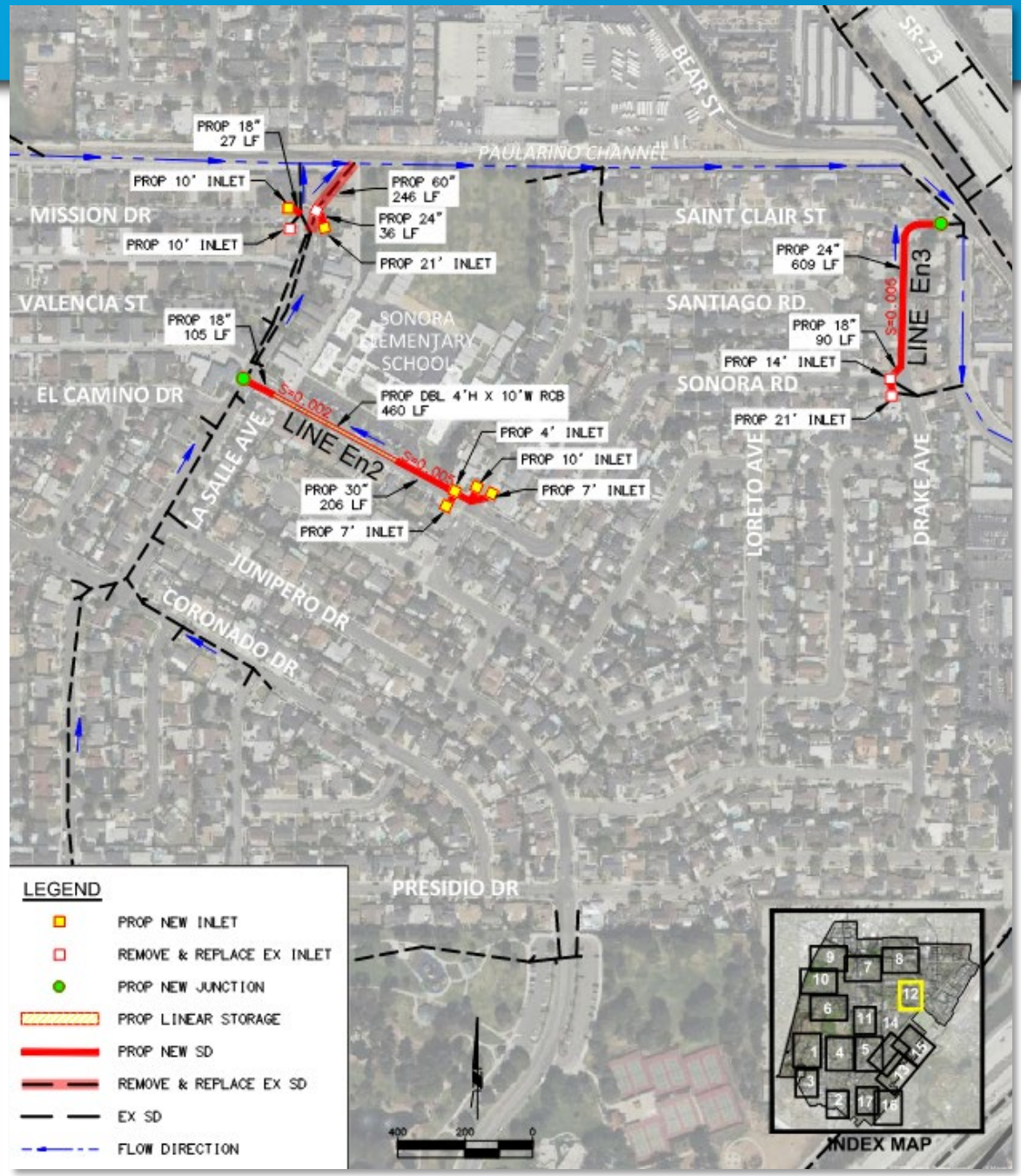

East (N) Watershed

Design Considerations:

- *Line En2 – Ties into County Channel (will need permit)*
- *Line En3 – Downstream system is near capacity.*

Preliminary Engineer's Construction Cost Estimates:

Line En2 = $1,940,000

Line En3 = $443,000

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East (N)Watershed Overview
Flood Control Improvements

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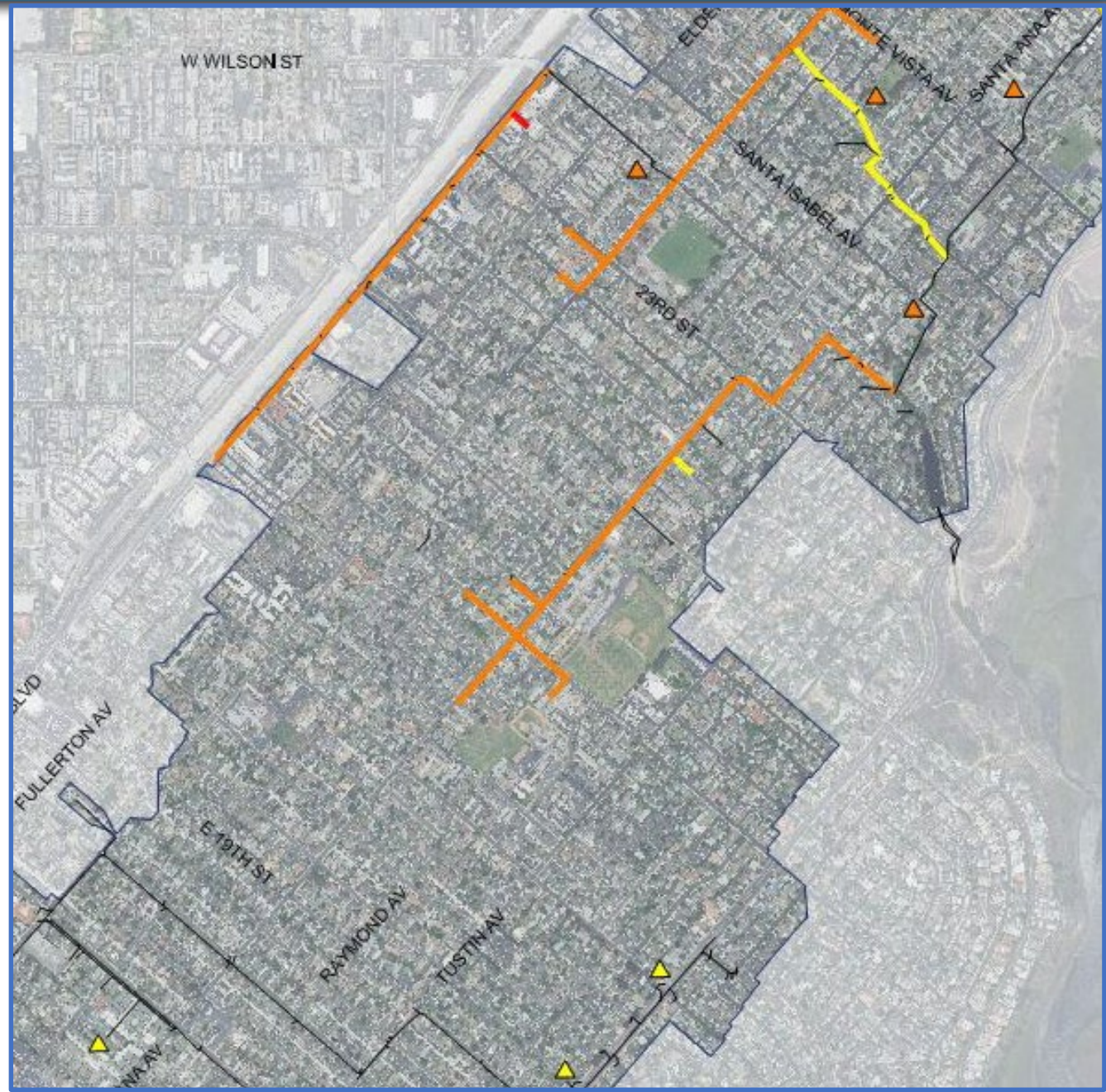
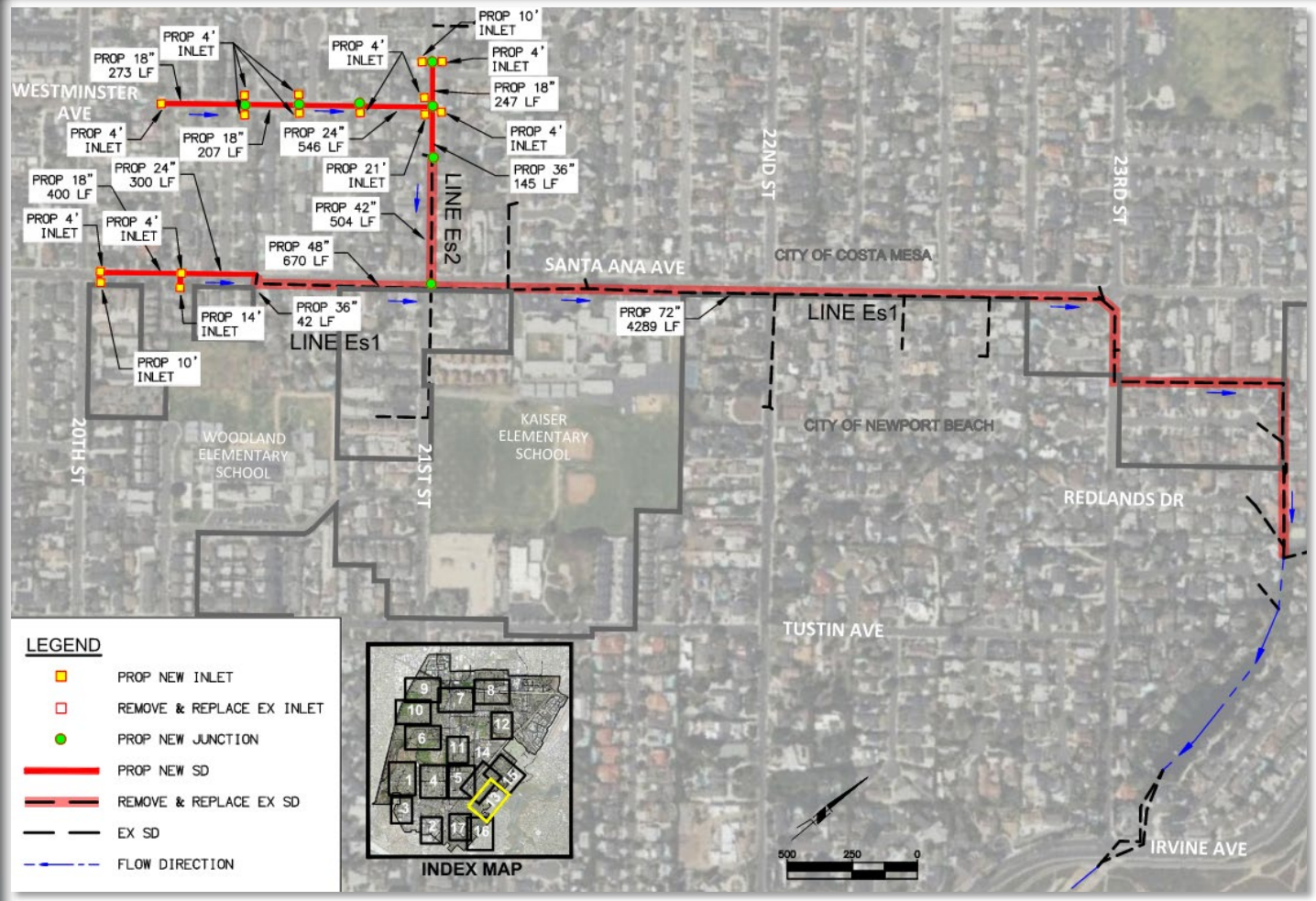
Preliminary Priority Rankings -East (S)



LEGEND

- Highest Priority Storm Drain
- Highest Priority Surface Drainage/CB
- High Priority Storm Drain
- High Priority Surface Drainage/CB
- Moderate Priority Storm Drain
- Moderate Priority Surface Drainage/CB
- Model Boundary



East (S) Watershed

Design Considerations:

- *Line Es1 – Downstream facilities near capacity. Cherry Lake Capacity.*
- *Line Es2 – Downstream system is near capacity.*

Preliminary Engineer's Construction Cost Estimates:

Line Es1 = $6,438,000

Line Es2 = $1,490,000

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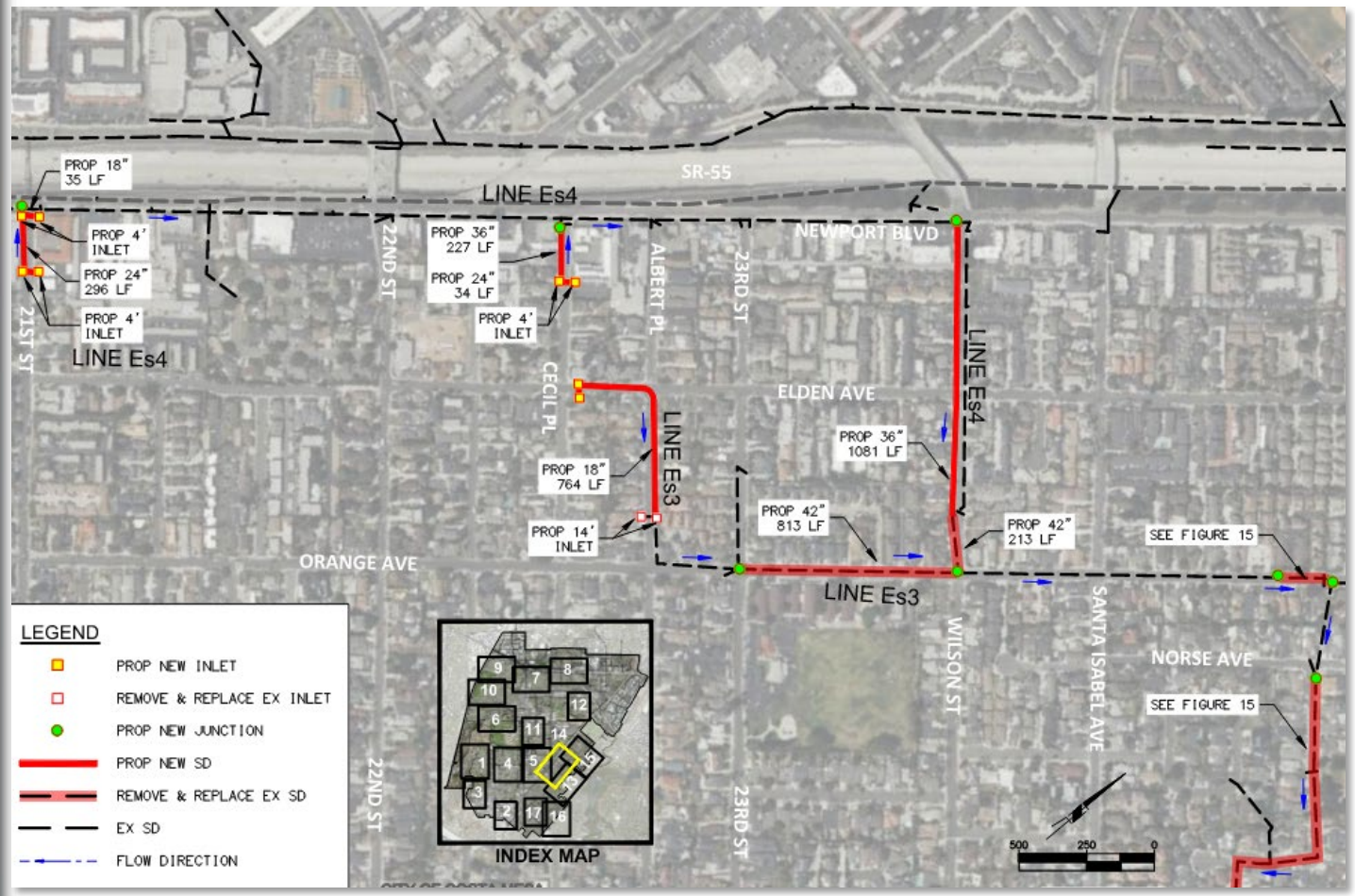
East (S) Watershed



Design Considerations:

- *Line Es3 – Downstream facilities near capacity.*
- *Line Es4 – Downstream system is near capacity.*

Preliminary Engineer's Construction Cost Estimates:

Line Es3 = $4,029,000

Line Es4 = $1,082,000

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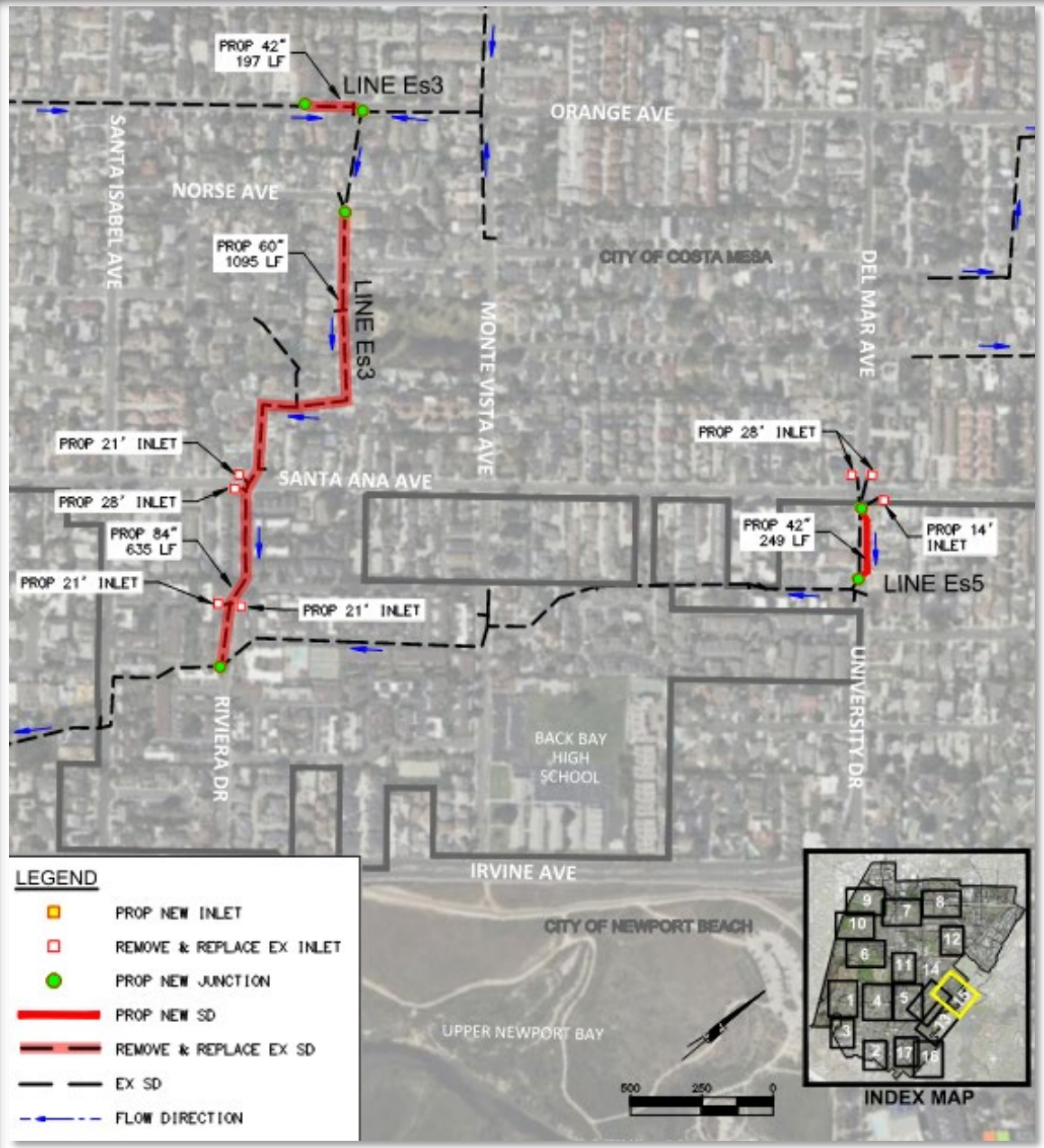

East (S) Watershed

Design Considerations:

- *Line Es5 – Downstream facilities near capacity.*

Preliminary Engineer's Construction Cost Estimates:

Line Es5 = $365,000

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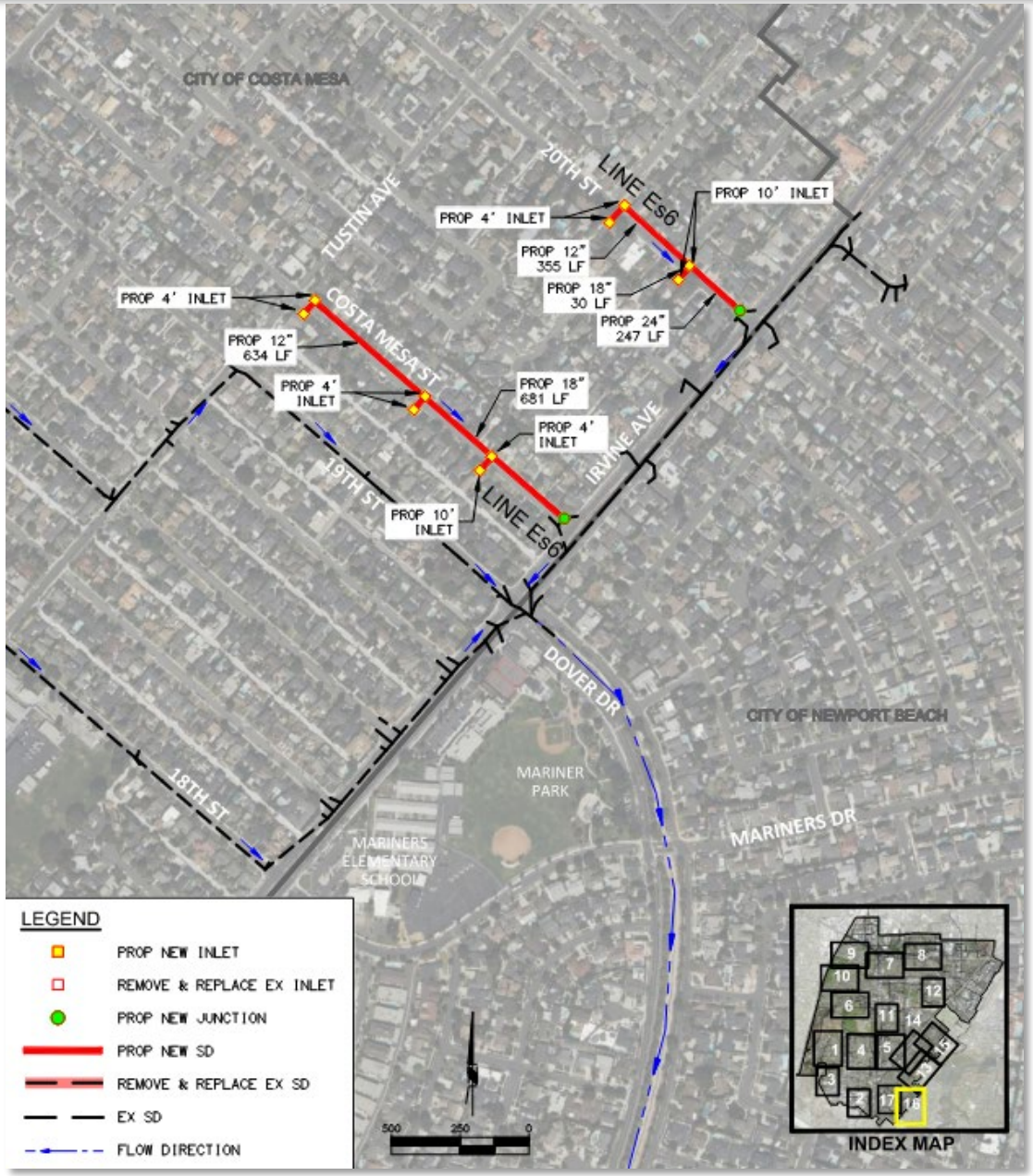

East (S) Watershed

Design Considerations:

- *Line Es6 – Downstream facilities near capacity.*

Preliminary Engineer's Construction Cost Estimates:

Line Es6 = $1,000,000

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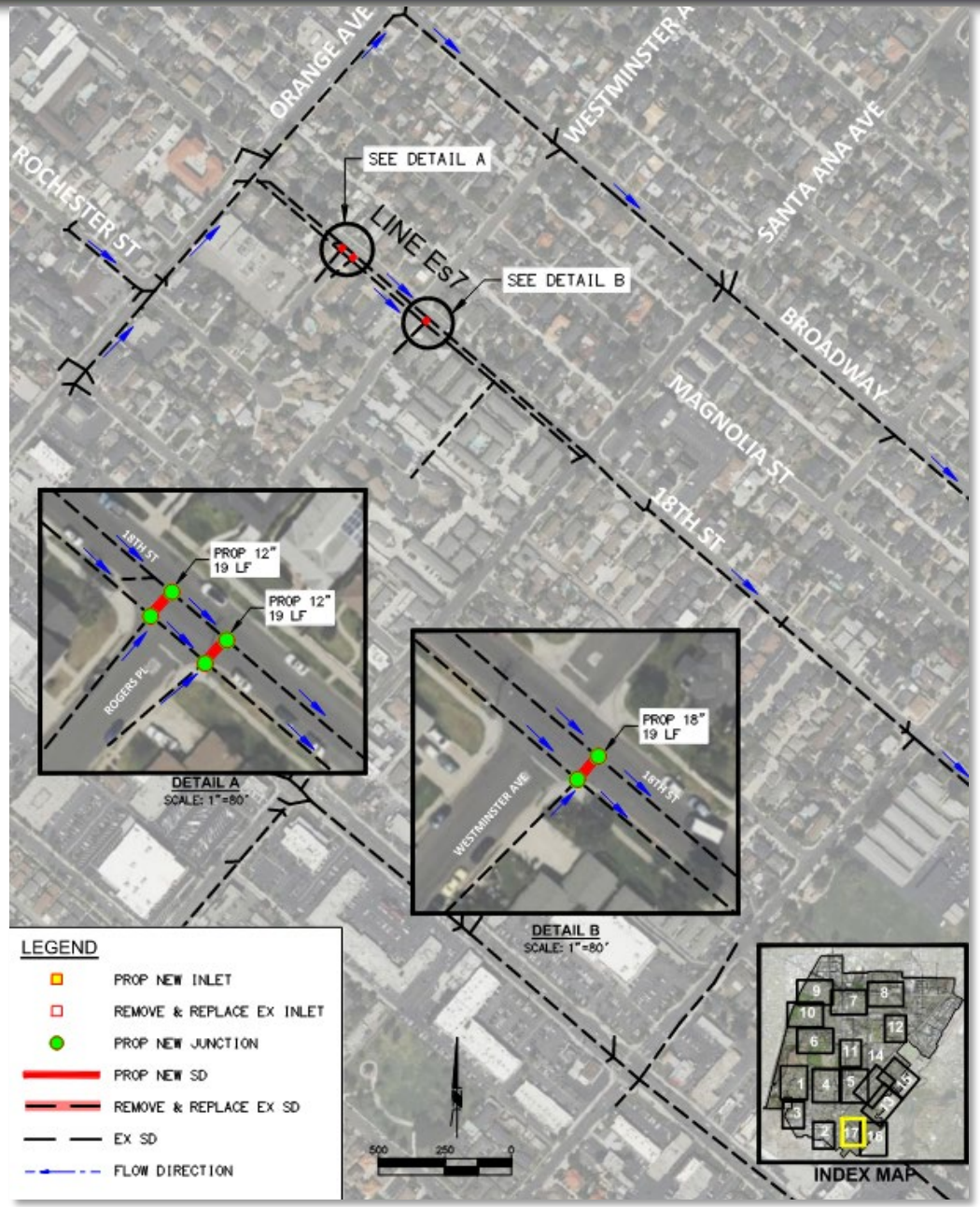
East (S) Watershed



Design Considerations:

- *Line Es7 – Shallow Pipes*

Preliminary Engineer's Construction Cost Estimates:

Line Es7 = $123,000

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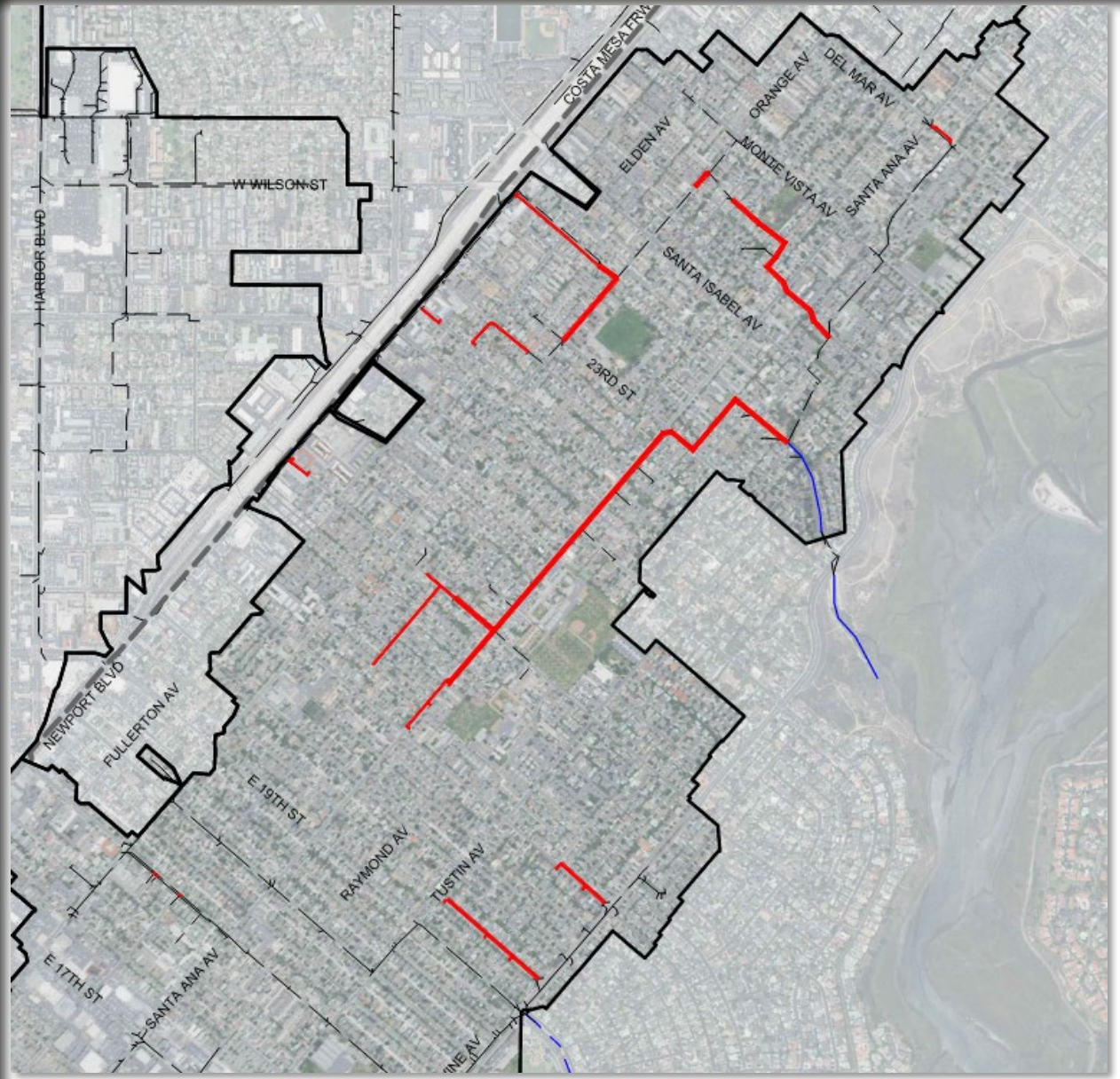

East (S) Watershed Overview

Flood Control Improvements

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Final Cost/Benefit Rankings & Selection

- Hydraulic Deficiency
- Safety Factor (Location)

} ECAR (Preliminary Priority)

- Constructability (Hurdles/Constraints)
- Cost/Benefit (Economically Feasible)

} DRAFT Improvements

- Public Comments
- Finalize Cost/Benefit

} FINAL MPD (SWAIM)

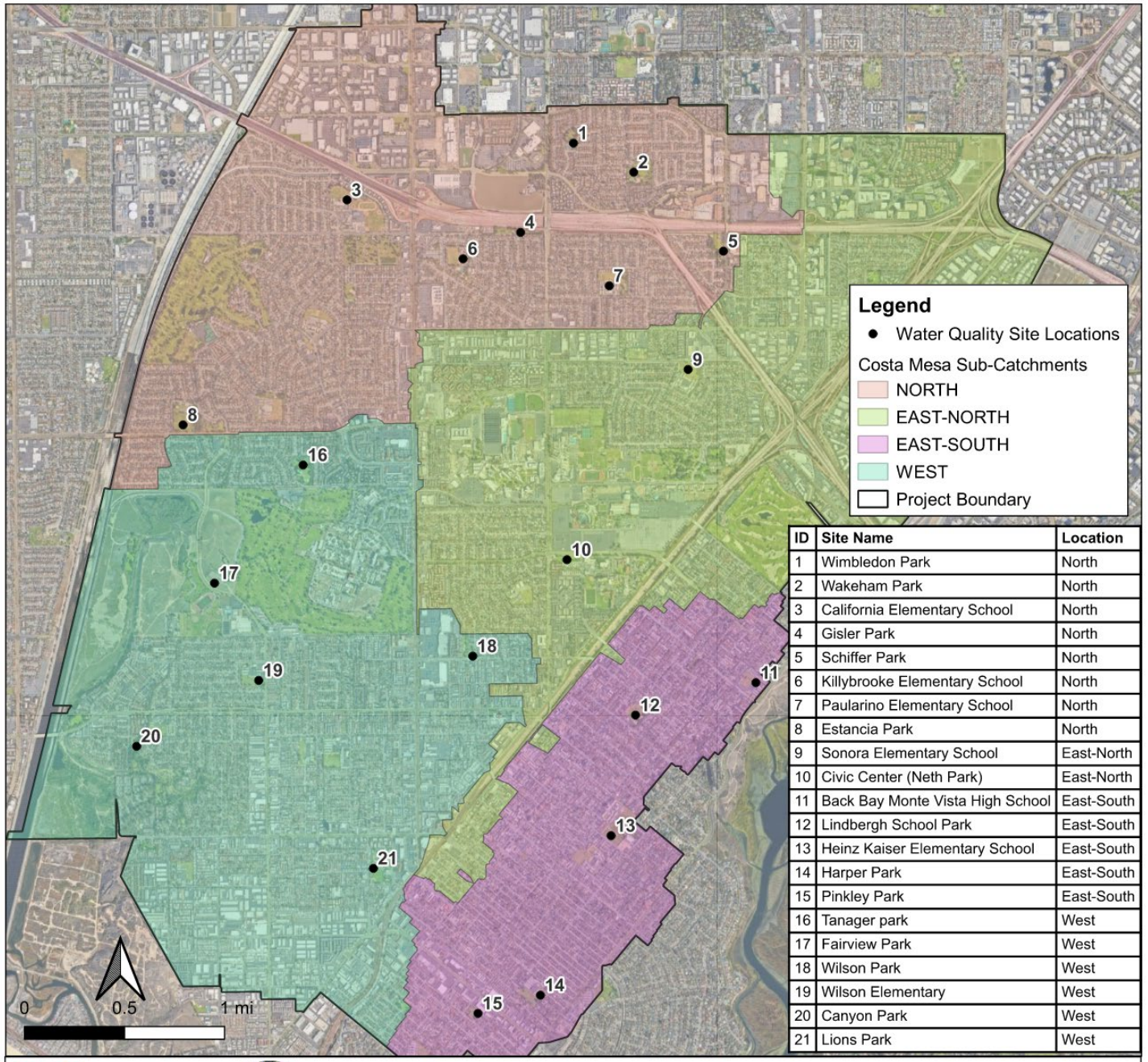
Preliminary
Proposed Flood Control Project Costs

Watershed	Cost
West	$12,855,720
North	$11,251,283
East (N)	$3,421,657
East (S)	$14,523,786
Total:	**$42,052,446**

Regional Water Quality Facilities (Ongoing)

- Screening Process (Identify City-Owned Open Space)
- Site Characteristics (Tributary Drainage Area, Slope, Soil, Land use)
- Receiving Water TMDLs
- Statewide Trash TMDL Amendment
- Hurdles (i.e. Topographic relief, highly urbanized watersheds)
- “Smart” systems (pumping, potentially, and alert system).

Potential Sites Regional BMPs -Screening



ID	Site Name	Location
1	Wimbledon Park	North
2	Wakeham Park	North
3	California Elementary School	North
4	Gisler Park	North
5	Schiffer Park	North
6	Killybrooke Elementary School	North
7	Paularino Elementary School	North
8	Estancia Park	North
9	Sonora Elementary School	East-North
10	Civic Center (Neth Park)	East-North
11	Back Bay Monte Vista High School	East-South
12	Lindbergh School Park	East-South
13	Heinz Kaiser Elementary School	East-South
14	Harper Park	East-South
15	Pinkley Park	East-South
16	Tanager park	West
17	Fairview Park	West
18	Wilson Park	West
19	Wilson Elementary	West
20	Canyon Park	West
21	Lions Park	West

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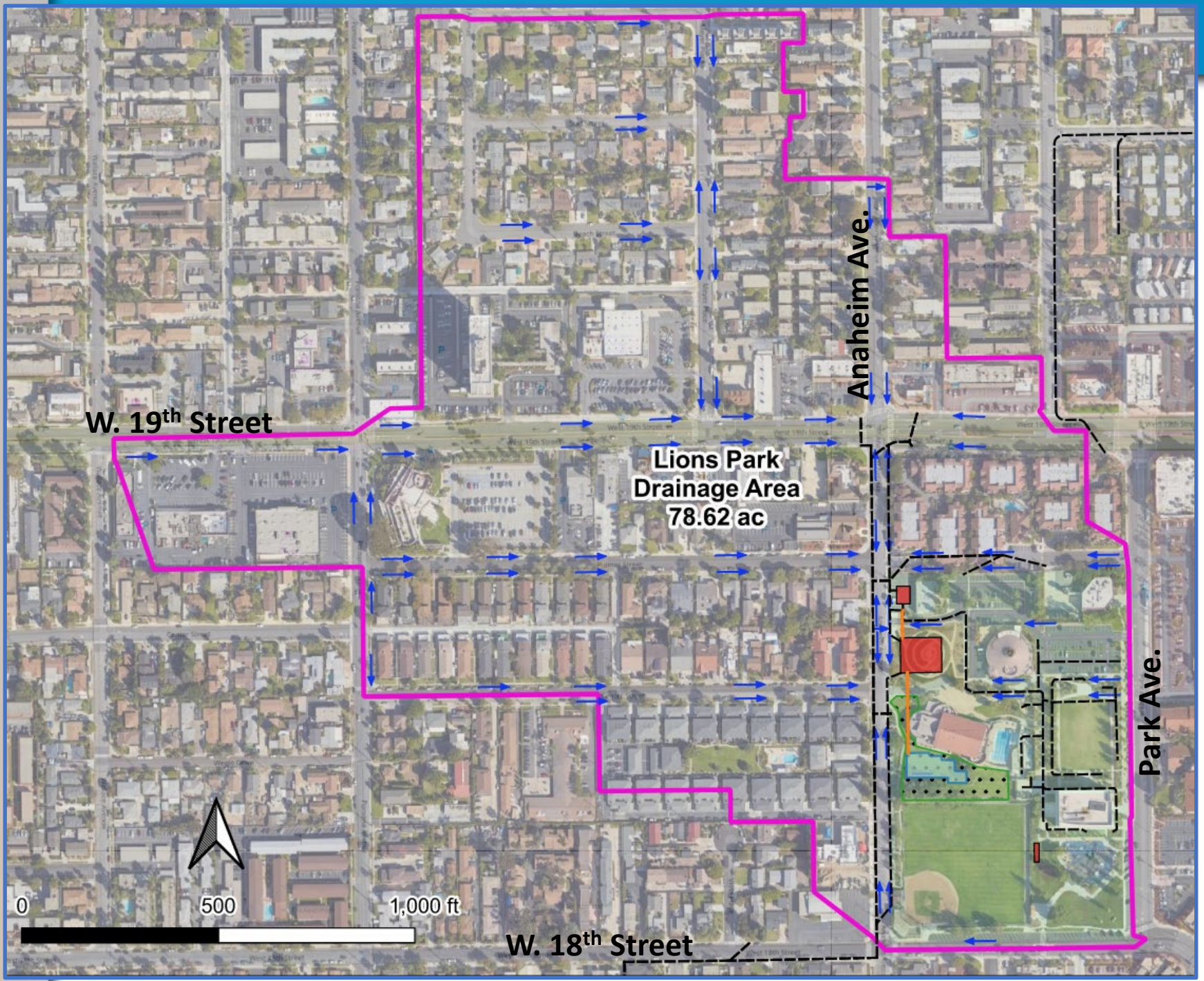
Water Quality Retrofit Opportunities - Vicinity Map

City of Costa Mesa - Storm Drain Master Plan

Water Quality Facility Hurdles

- Schools Sites (Safety)
- Potential Vector Issues (Standing Water)
- Flat Topography = No Gravity Flow
  - Pumped systems require long term O&M
  - “Smart System” Recommended
- Head Losses in Flood Control Systems
- Surface Facilities Require Space
- Subsurface Facilities Typically Cost More



Sample Site

-Lions Park (West)

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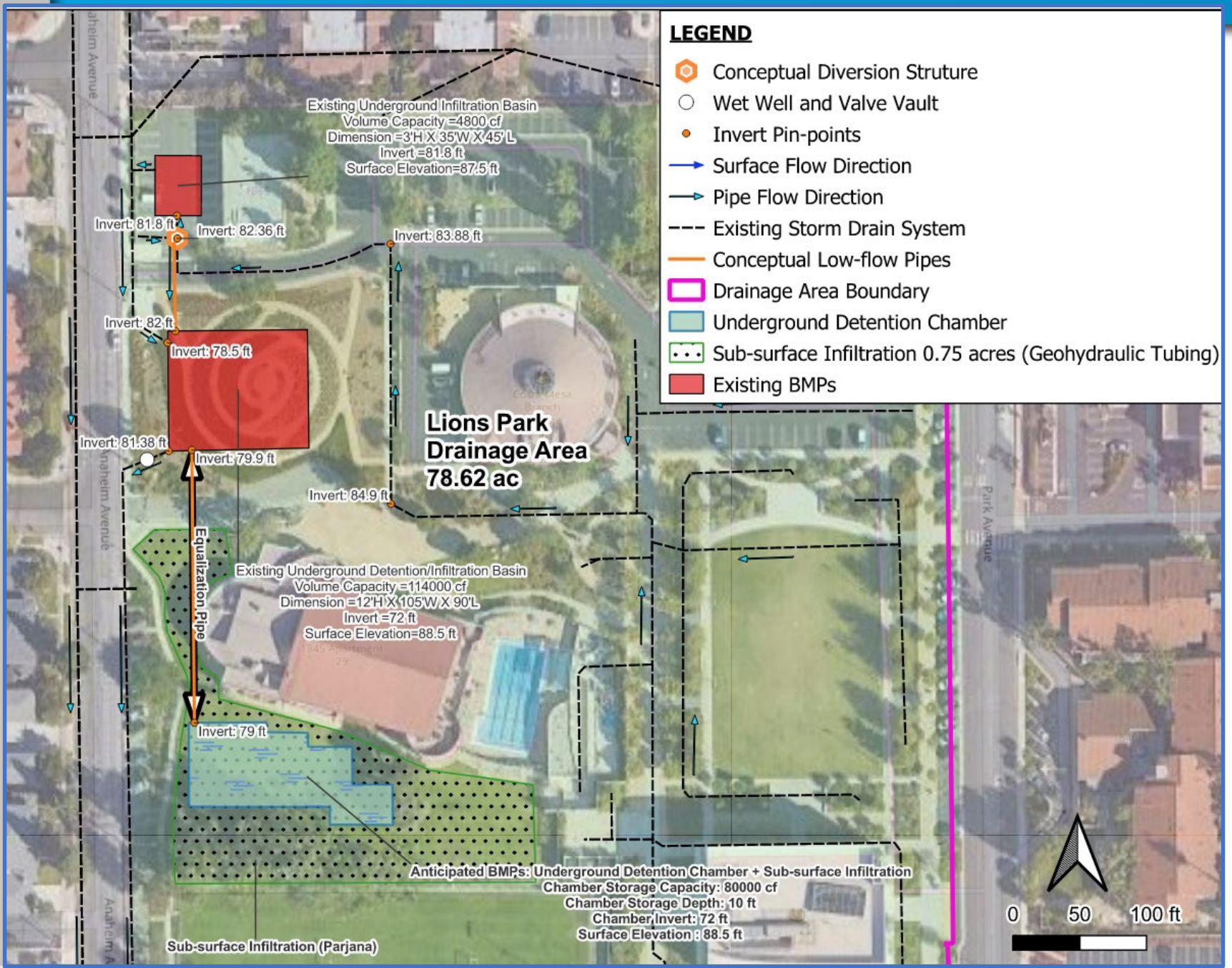

- Retrofit Existing BMPs
- Addition of New BMP

- Approximated Cost: $3.5M

- Alternative Design: Reconstruct Exist Basins

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Trash BMPs

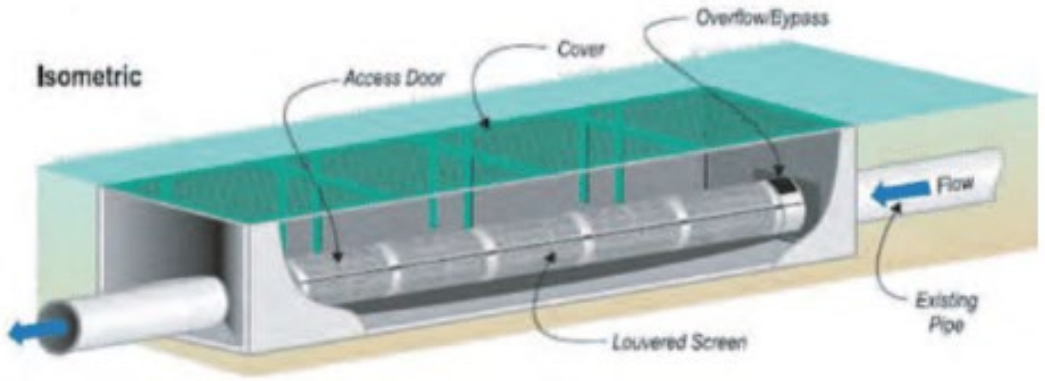
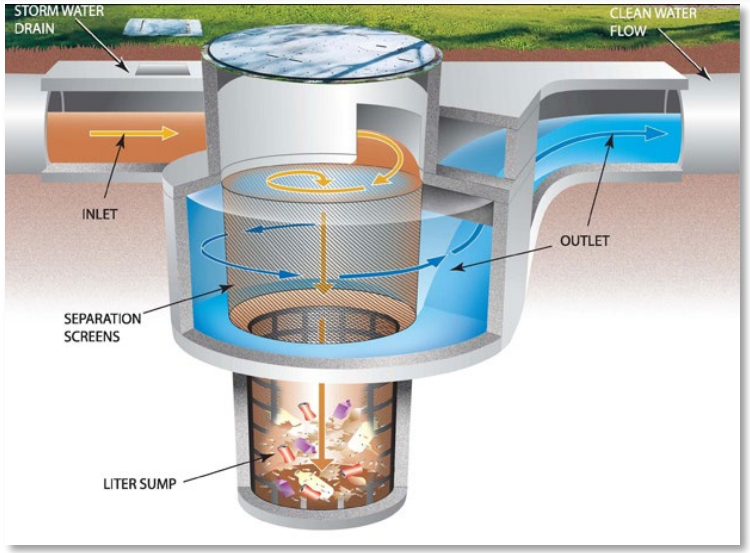


Photo source: Caltrans (2003b).

- 5mm Screening
- *Water Quality Peak Flow (Sizing)*
- *Full Capture/In Line/Offline*



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Summary

- Evaluation and Screening of Proposed Flood Control Facilities & Criteria
- Evaluation/Screening of Regional Water Quality Treatment Facilities
- Acquire Public Comments
- Development of Final Project Rankings (Cost/Benefit)
- Finalize Proposed Drainage/Water Quality Facilities (SWAIM)
- Develop Facility Costs/Drainage Impact Fee Program
- Master Plan of Drainage

Presentation:

https://www.costamesaca.gov/Storm

Email:

STORM@costamesaca.gov

Questions?

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