COMMUNITY OUTREACH MEETING

Storm Drain System Master Plan Update

EXISTING CONDITIONS ASSESSMENT REPORT (ECAR)

Prepared by

Q3 *Consulting*

Project Introduction

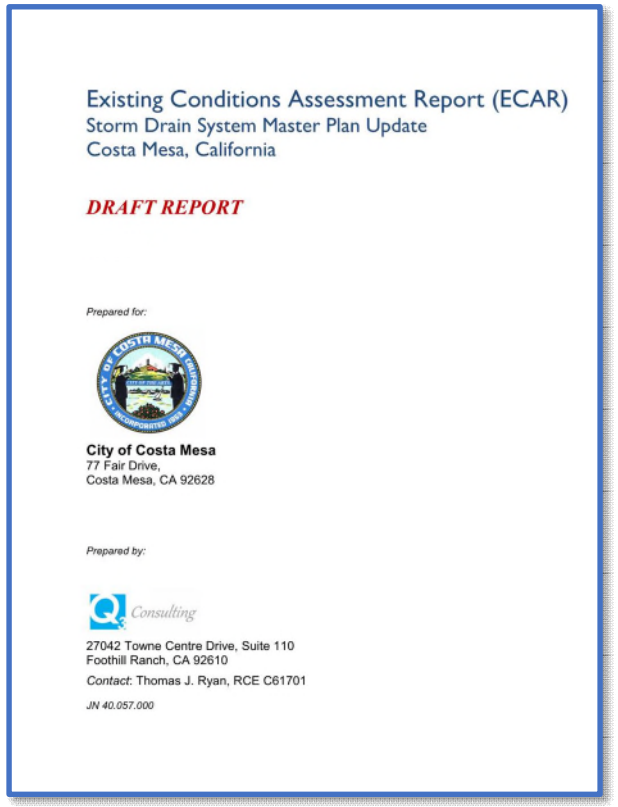
- Purpose for Project
  - Developing New Storm Drain System Master Plan (SDSMP)
- Purpose of the Community Meeting
- History of Drainage Studies
- Overall Goals of the SDSMP
- Two Phases of SDSMP
  - Phase 1: Existing Conditions Assessment
  - Phase 2: Develop Future Stormwater Management Plan

SDSMP Project Description

- Advanced Storm Water Master Plan
- GIS Database Update
- Comprehensive Analysis of Existing Facilities (ECAR)
- Identify and Prioritize Future Drainage Improvements
- Identify Potential Limitations/Hurdles
- Develop More Feasible Solutions (i.e. phasing)
- SMART System (Monitoring/Preparation)
- Water Quality

Existing Conditions Assessment Report (ECAR)

- SDSMP - Phase 1 (Existing System Drainage Evaluation)
- Goals
  - Revise Design Criteria (Preview Criteria vs. Current)
  - To Evaluate City-Owned Mainline Infrastructure
  - Develop Comprehensive Models
  - Calibrate (Correlate) Models
  - Identify System Restrictions
  - Prioritize System Deficiencies


Existing Conditions Assessment Report (ECAR)
Storm Drain System Master Plan Update
Costa Mesa, California

DRAFT REPORT

Prepared for:

City of Costa Mesa
77 Fair Drive,
Costa Mesa, CA 92628

Prepared by:

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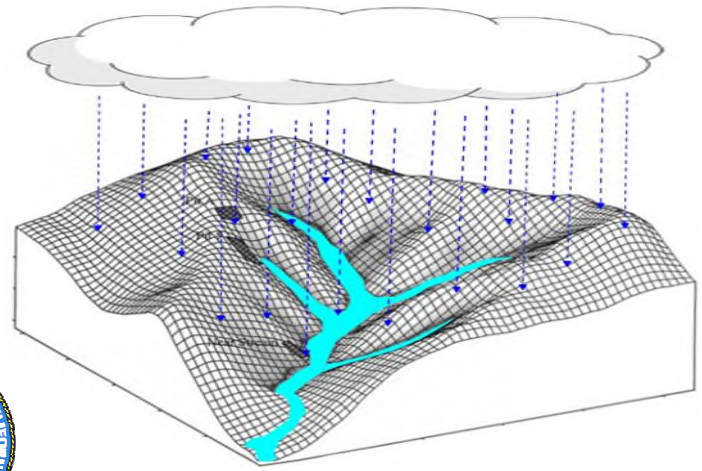
Foothill Ranch, CA 92610
Contact: Thomas J. Ryan, RCE C61701
JN 40.057.000

Advanced Stormwater Modeling

- Software - (XPStorm)
- Hydraulics (Linked 3D Surface to Underground SD)
- Hydrology: Rain-on-Grid (New Approach)
- OC Hydrology: Precipitation, Loss Rates, Storm Pattern
- Best Method for flat areas



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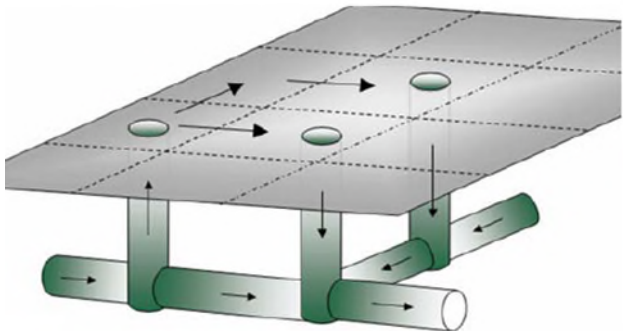

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Benefits of Advanced Stormwater Modeling

- More Realistic Storm Drain Sizing
- Lower Construction Costs
- Comprehensive Model – Track Impacts of Inc. Improvements.
- Easier to Develop Feasible Phasing of Projects

Model Calibration (Correlation)

- December 6th, 2018 Storm Event
  - *Other Storms Considered*
    - *Jan 18, 2010*
    - *Sept 10, 2015*
- 2 Locations
  - 17th Street/Pomona Avenue
  - Anaheim Street/19th Street
- Recorded Data, Measurements, Photos, Video

Anaheim Avenue/19th Street December 6, 2018

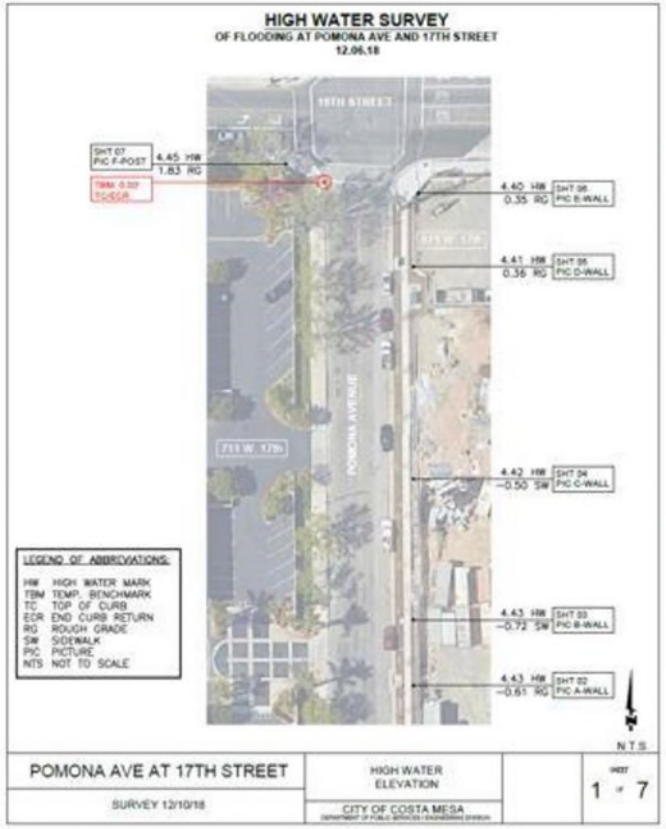
Q3 Consulting

Model Calibration/Correlation (Costa Mesa)

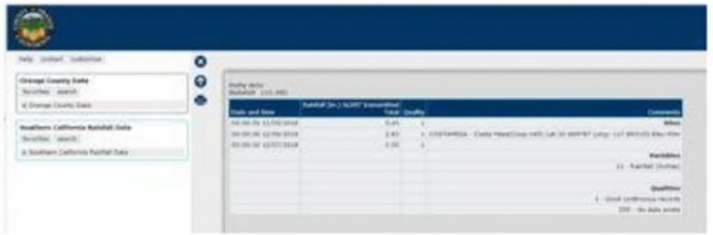
- Model Correlation (12/6/2018)

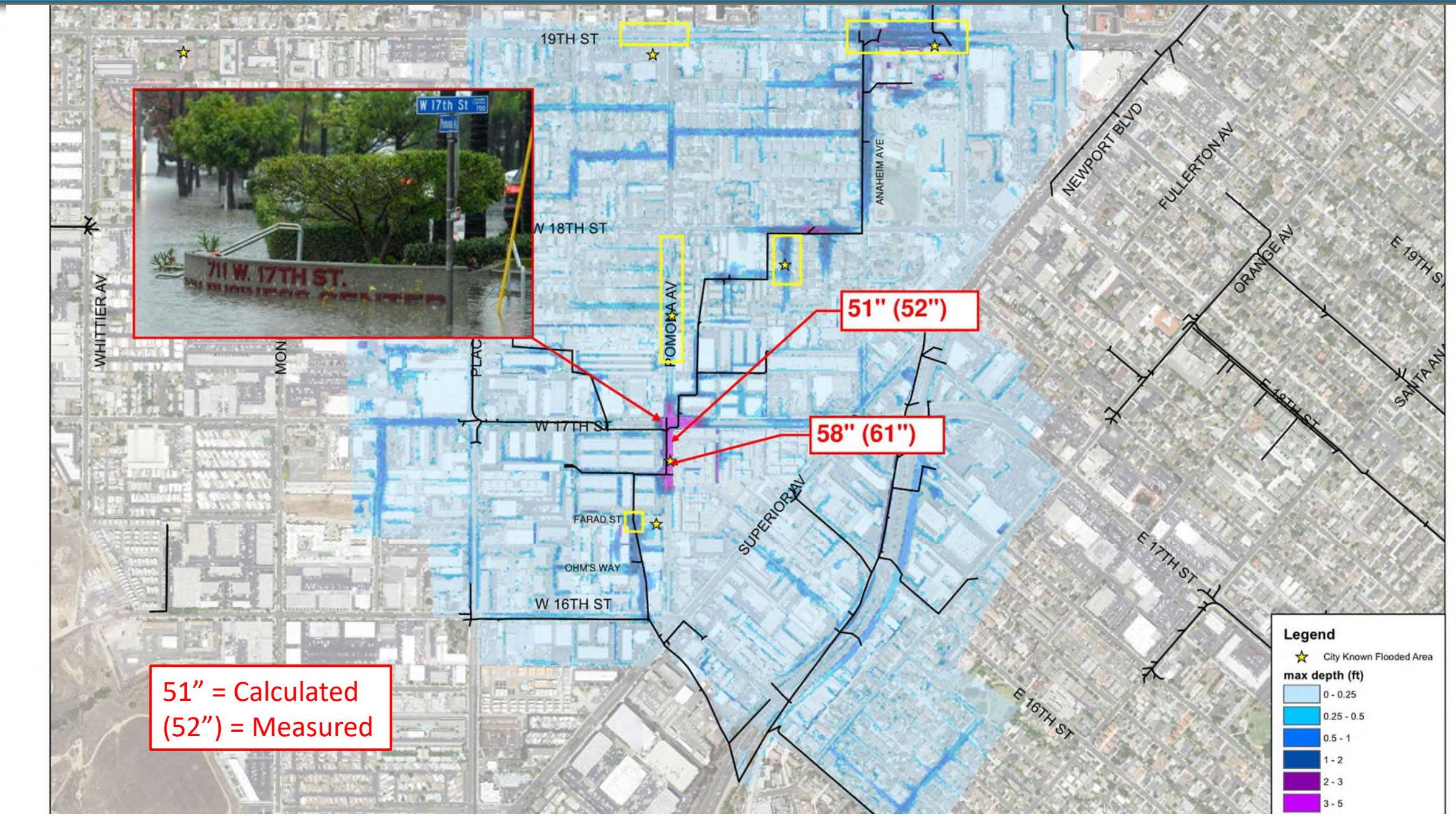
selected durations		5 minutes	30 minutes	1 hour	2 hours	3 hours	6 hours	12 hours
December 6, 2018 duration depths, in *inches*, based on Costa Mesa COOP 165 Precpitation Station		0.18	0.65	1.26	2.06	2.61	2.99	3.18
storm fequencies, in *n*-year	based on NOAA Atlas 14	3	13	58	107	123	53	23
	based on Orange County Standard Precipitation	< 2	7	41	> 100	> 100	46	17

• STORM EVENT 2018-12-06



1690 Pomona Ave
Spot 2018-1




19TH ST
W 18TH ST
W 17TH ST
W 16TH ST
FARAD ST
OHM'S WAY
WHITTIER AV
POMONA AV
ANAHEIM AVE
NEWPORT BLVD
FULLERTON AV
ORANGE AV
SUPERIOR AV
E 19TH ST
E 18TH ST
E 17TH ST
E 16TH ST
SANTA ANA
711 W. 17TH ST.
W 17th St
51" (52")
58" (61")
51” = Calculated
(52”) = Measured
Legend
City Known Flooded Area
max depth (ft)
0 - 0.25
0.25 - 0.5
0.5 - 1
1 - 2
2 - 3
3 - 5


19TH ST
28" (2+')
26" (2-')
ANAHEIM AVE
Legend
City Known Flooded Area
max depth (ft)
0 - 0.25
0.25 - 0.5
0.5 - 1
1 - 2
2 - 3
3 - 5
> 5
28" = Calculated
(2'+) = Visual Estimation

Orange County Design Criteria Change (1986)

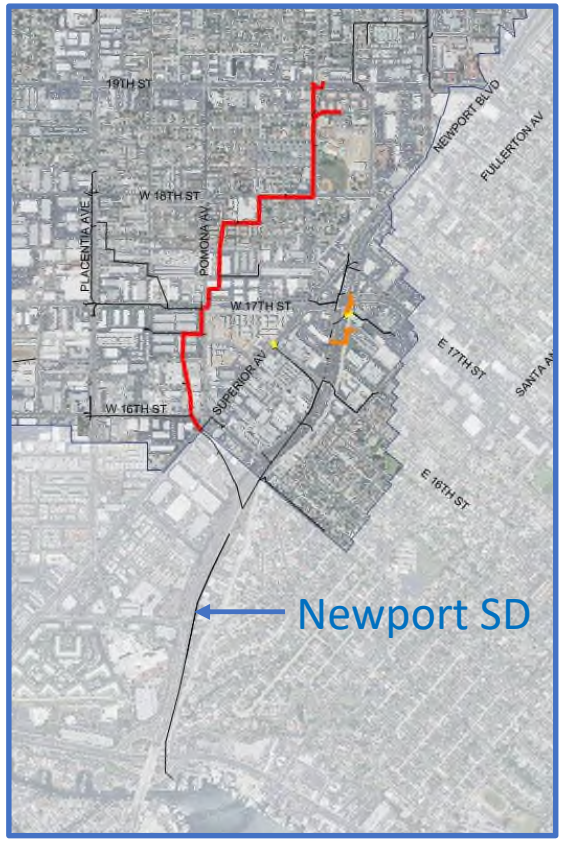
- Building Standards Change over Time.
- Orange County Changed 1986 (After Most of Costa Mesa Drainage Infrastructure Constructed)

CHANGES:

- 10-Year Storm Then = 5-Year Storm Now
- 25-Year Storm Then = 10-Year Design Now
- 100-Year Storm Then = 25-Year Design Now
- County Facilities in Costa Mesa = 25-Year Systems (now)

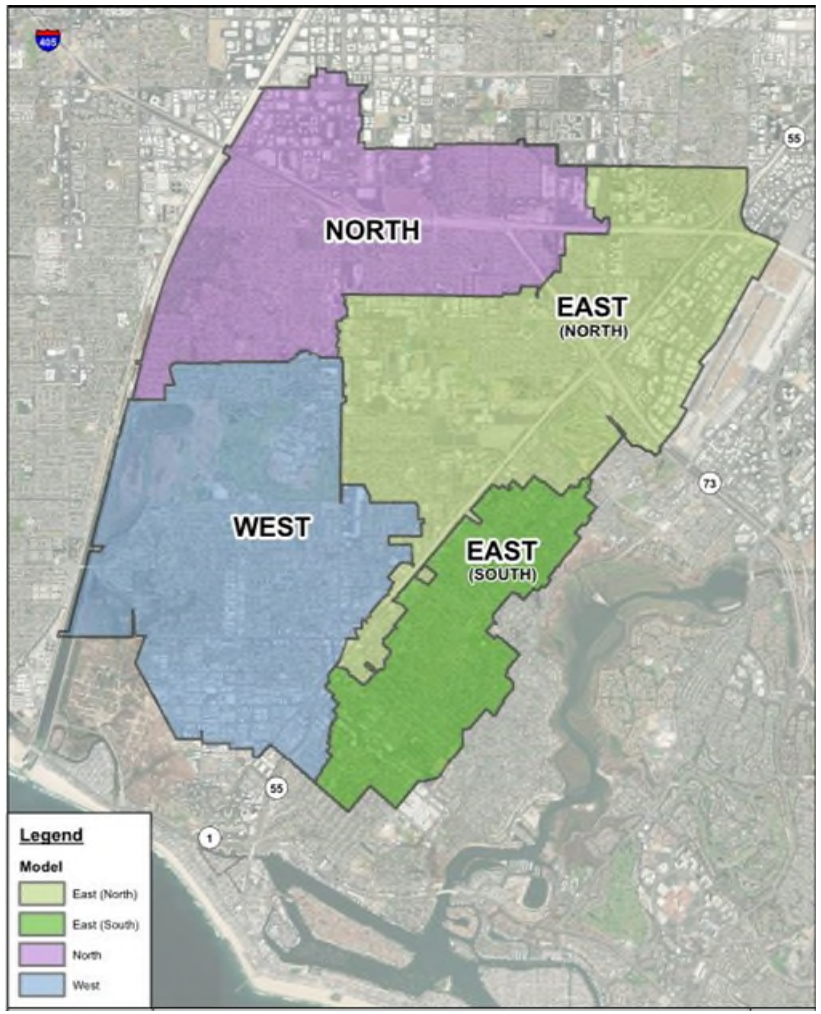
Future Drainage Improvement Hurdles

- Downstream Facility Restrictions (OC Channels, City Newport SD)
- Environmental Concerns/Erosion Potential
- Urbanization (Little Room for Attenuation of Stormwater)
- Flat Topographic Relief = Flat Storm Drain Slopes
- Water Quality Requirements
- Constructability/Feasibility



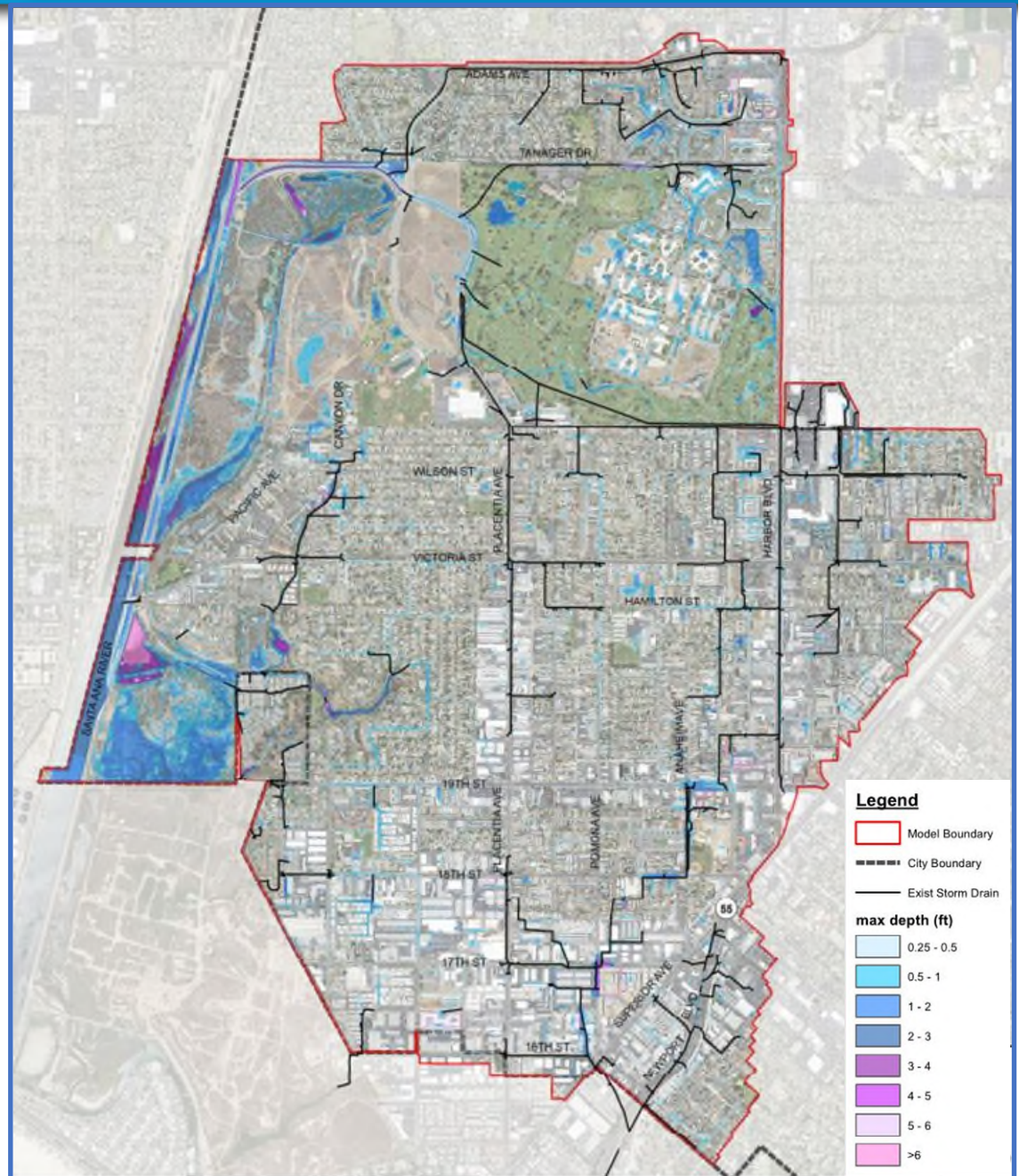
Stormwater Model Development

- City Divided Into 4 Watersheds
  - West
  - North
  - East(north)
  - East(south)
- Models Run for 10-, 25-, and 100-Year
- Boundary Conditions

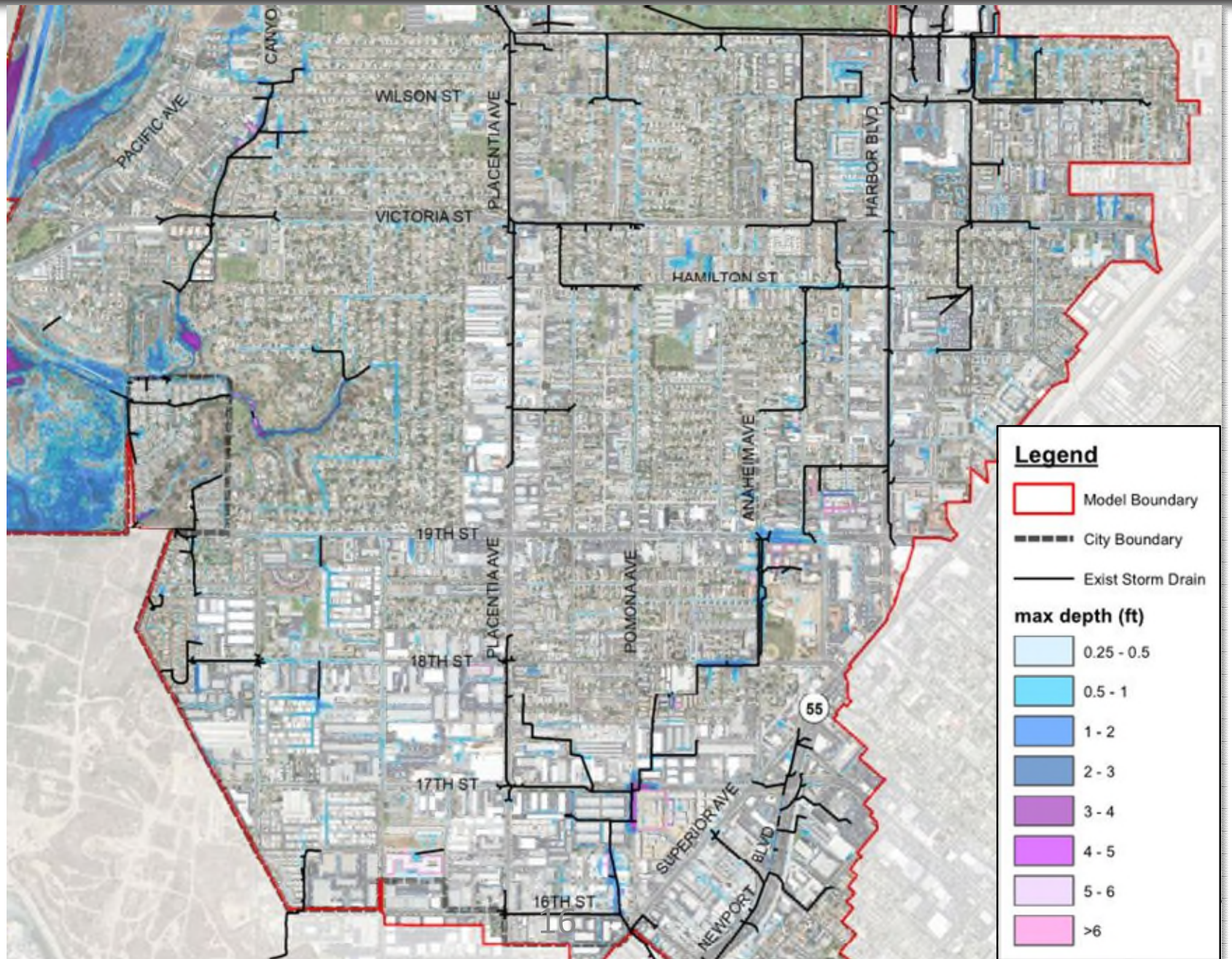


XPStorm Results

- West Watershed
- 25-Year Storm
- Maximum Depths

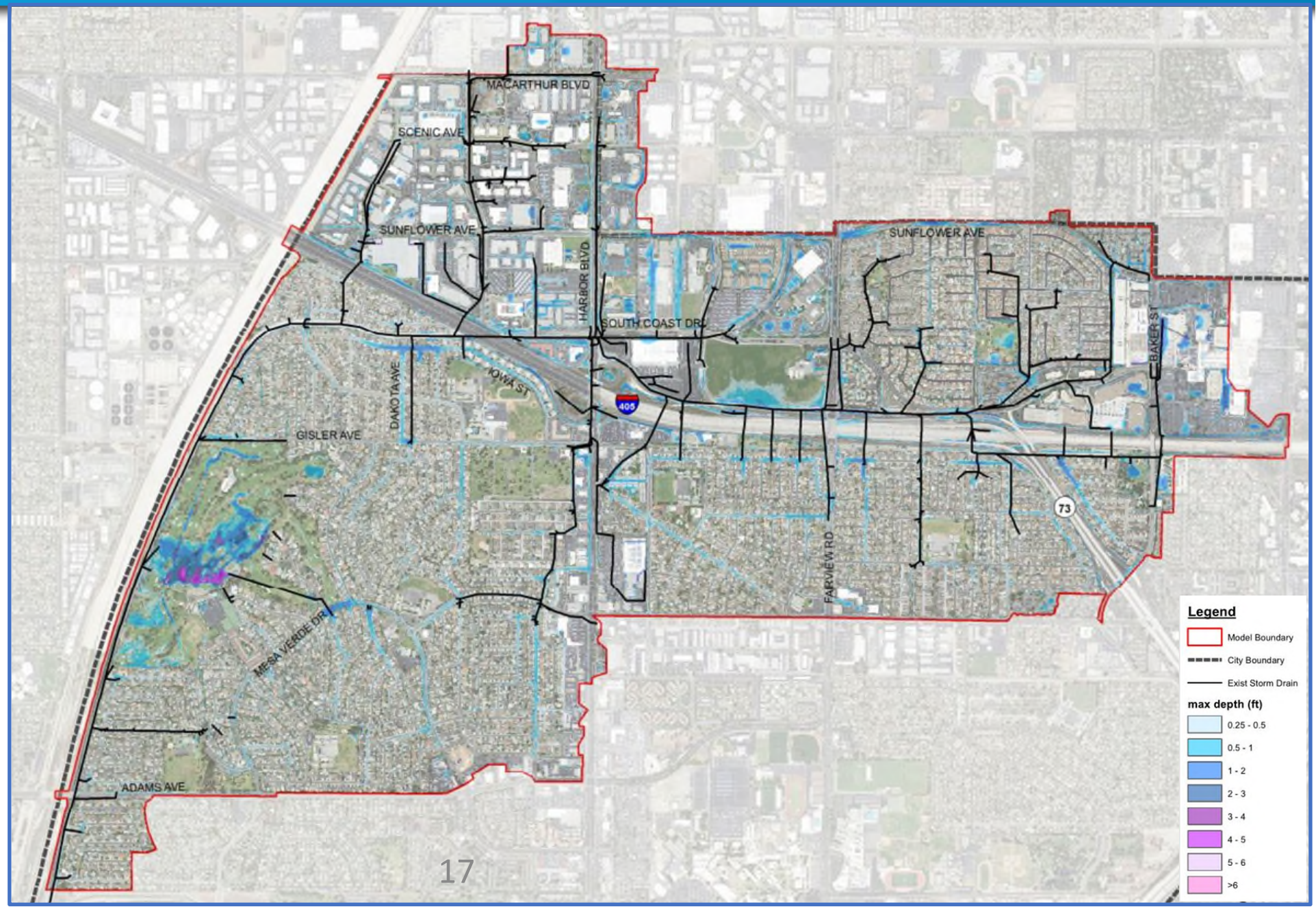


West


WILSON ST
PACIFIC AVE
VICTORIA ST
PLACENTIA AVE
HARBOR BLVD
HAMILTON ST
ANAHEIM AVE
19TH ST
POMONA AVE
18TH ST
55
17TH ST
SUPERIOR AVE
BLVD
16TH ST
NEWPORT
Legend
Model Boundary
City Boundary
Exist Storm Drain
max depth (ft)
0.25 - 0.5
0.5 - 1
1 - 2
2 - 3
3 - 4
4 - 5
5 - 6
>6

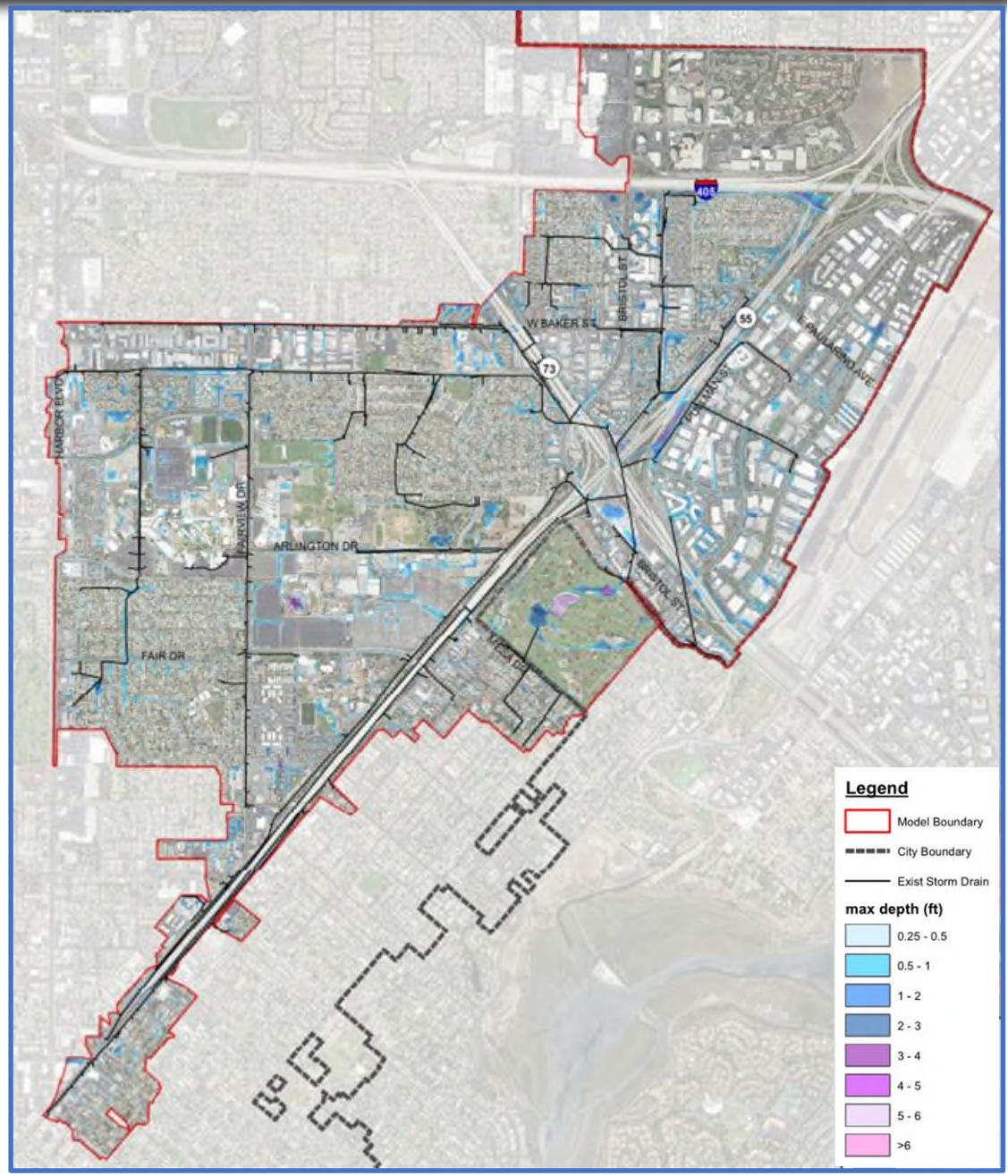
XPStorm

- North Watershed
- 25-Year Storm
- Maximum Depths

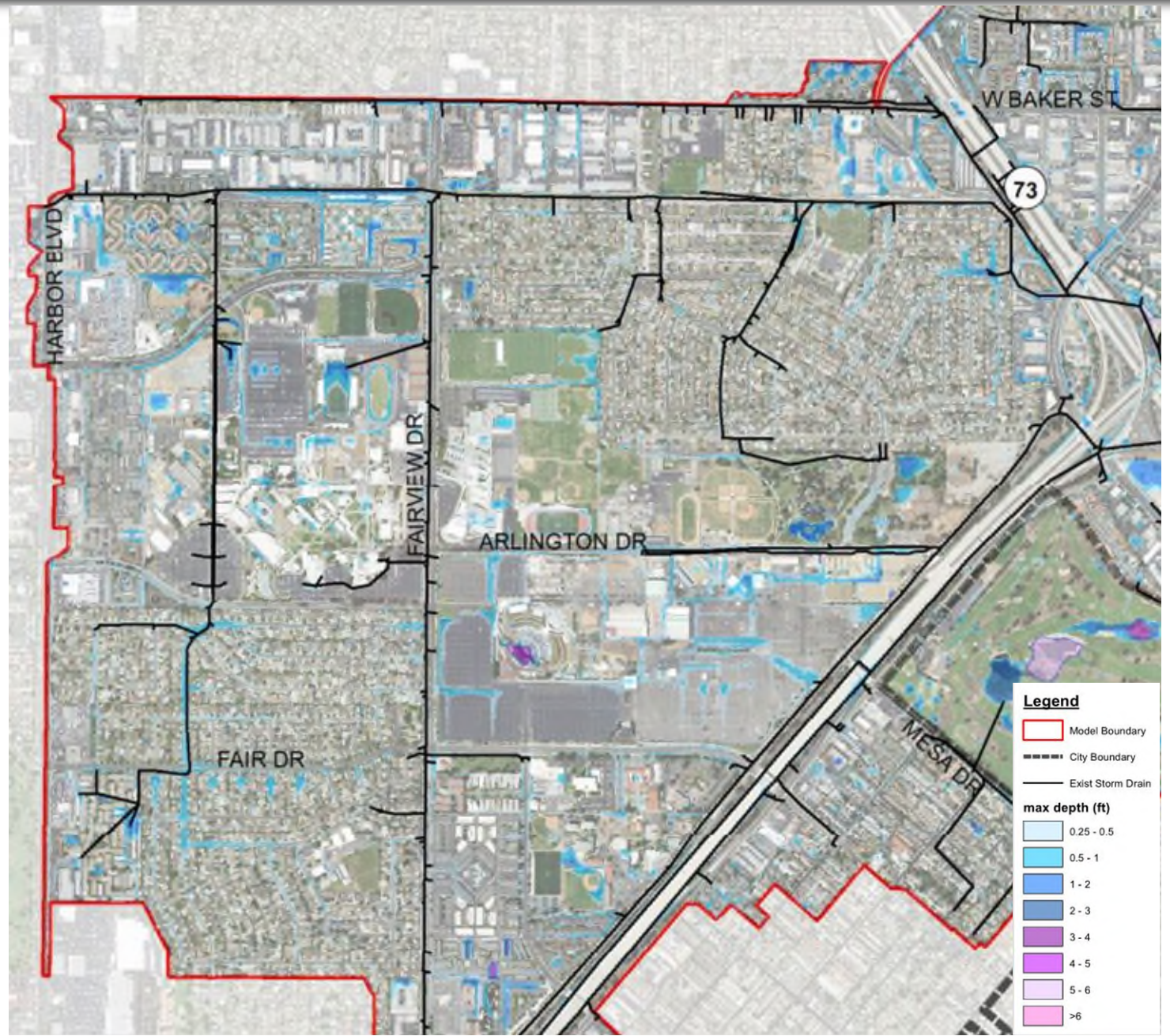


XPStorm Results

- East (north) Watershed
- 25-Year Storm
- Maximum Depths

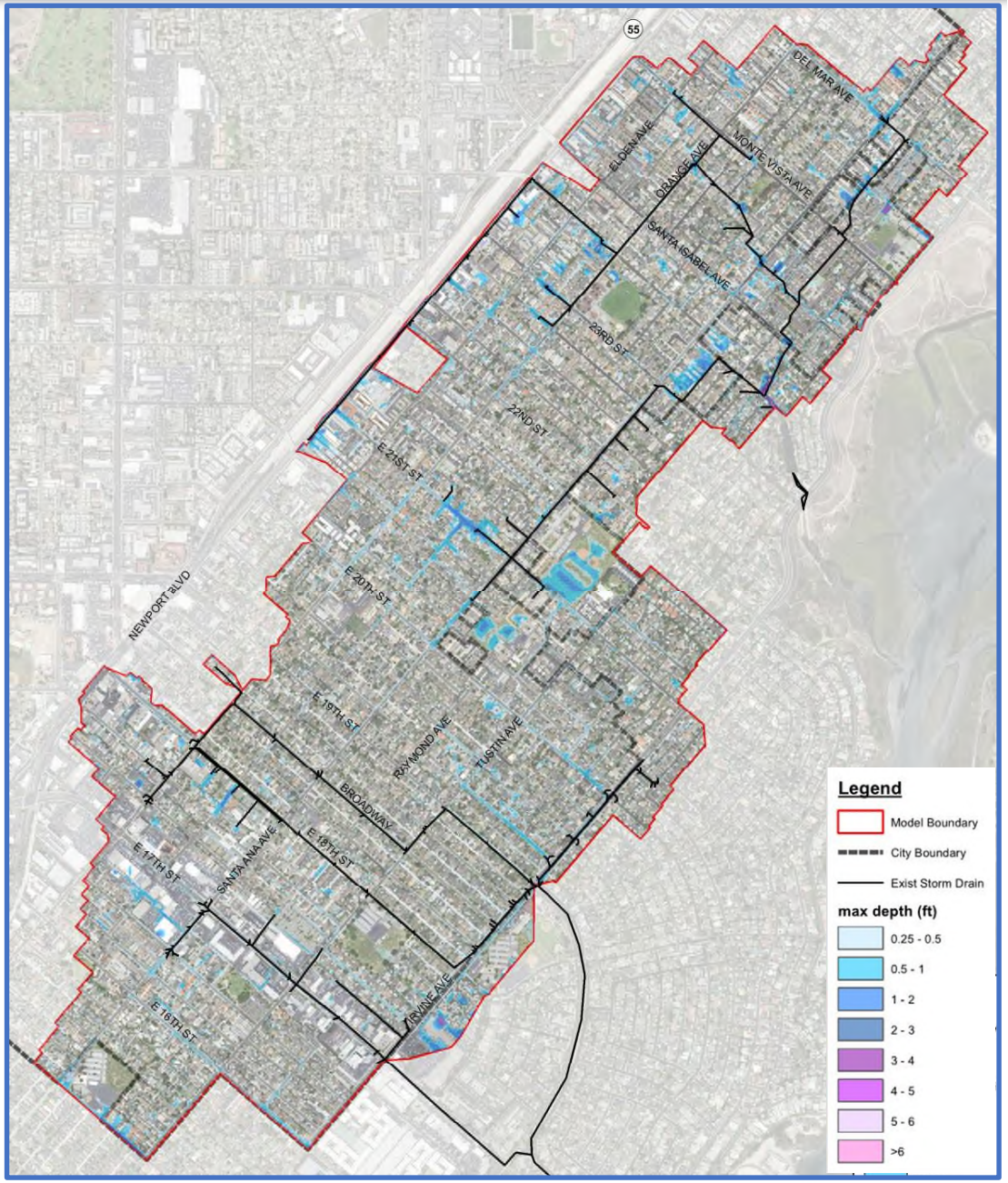


East (N)

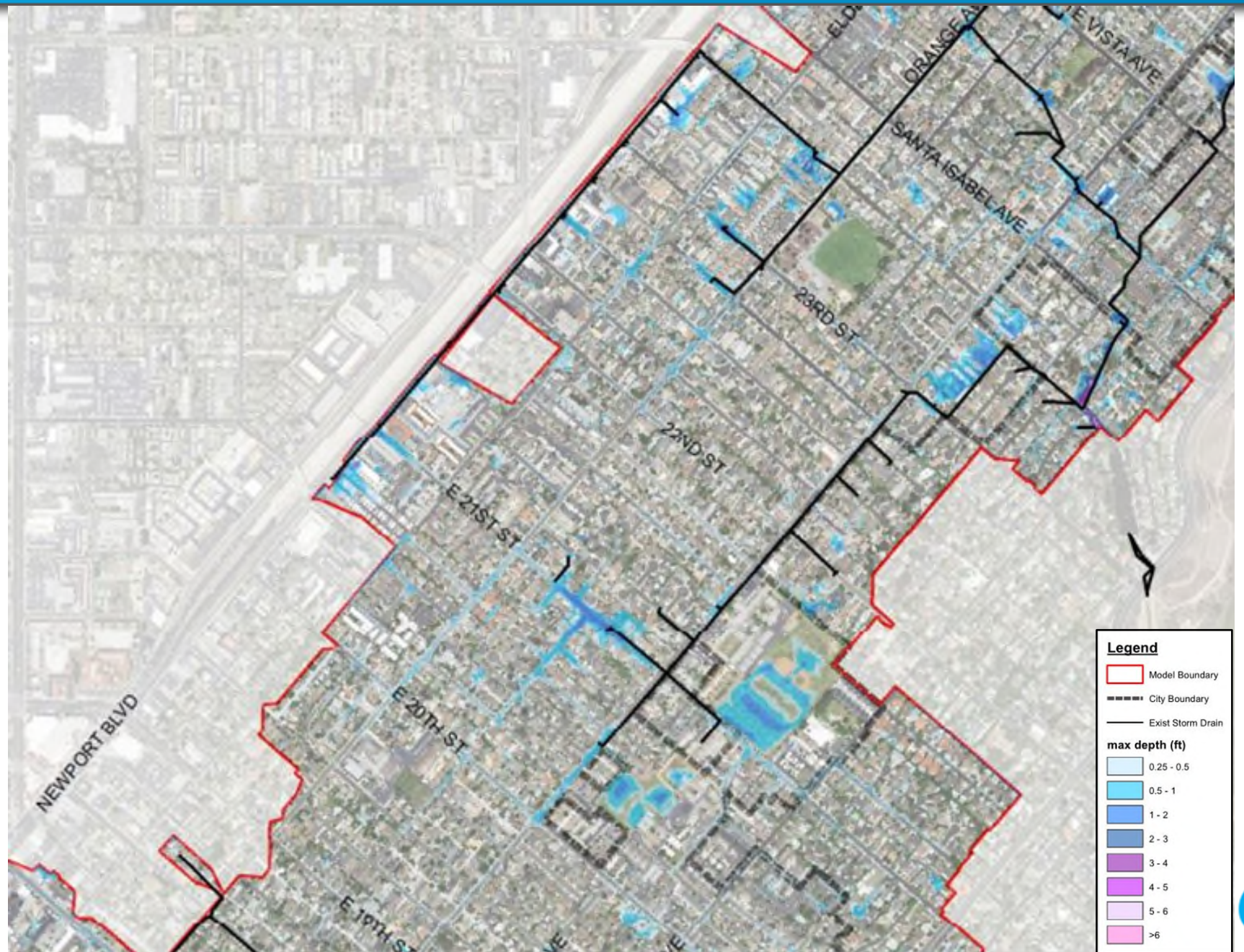

W BAKER ST
73
HARBOR BLVD
FAIRVIEW DR
ARLINGTON DR
FAIR DR
MESA DR
Legend
Model Boundary
City Boundary
Exist Storm Drain
max depth (ft)
0.25 - 0.5
0.5 - 1
1 - 2
2 - 3
3 - 4
4 - 5
5 - 6
>6

XPStorm Results

- East (south) Watershed
- 25-Year Storm
- Maximum Depths



East (S)



Q3 Consulting

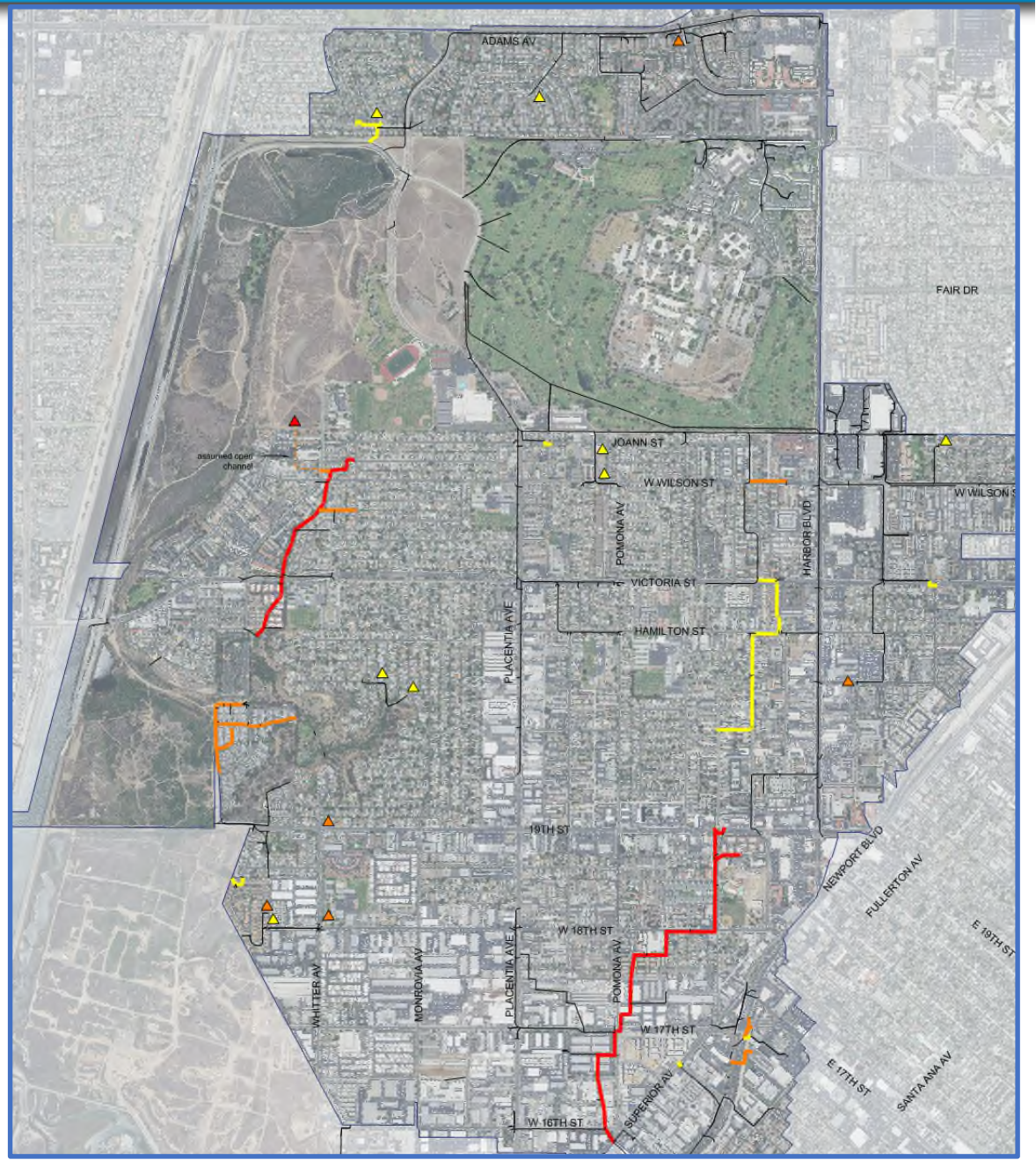
System Priority Rankings

- Hydraulic Deficiency (Based on new OC Criteria)
  - Ponding Depths
  - Inlets & Pipes
  - Ranking Point System (0 – 10) 10 being the most deficient
- Safety Factor Identification
  - Location
  - Essential Facilities
  - Highly Traveled Roadways
  - Proximity to Multiple Homes/Buildings
  - Known Flooded Areas
  - Ranking Point System (0 – 10) 10 being highest risk for safety

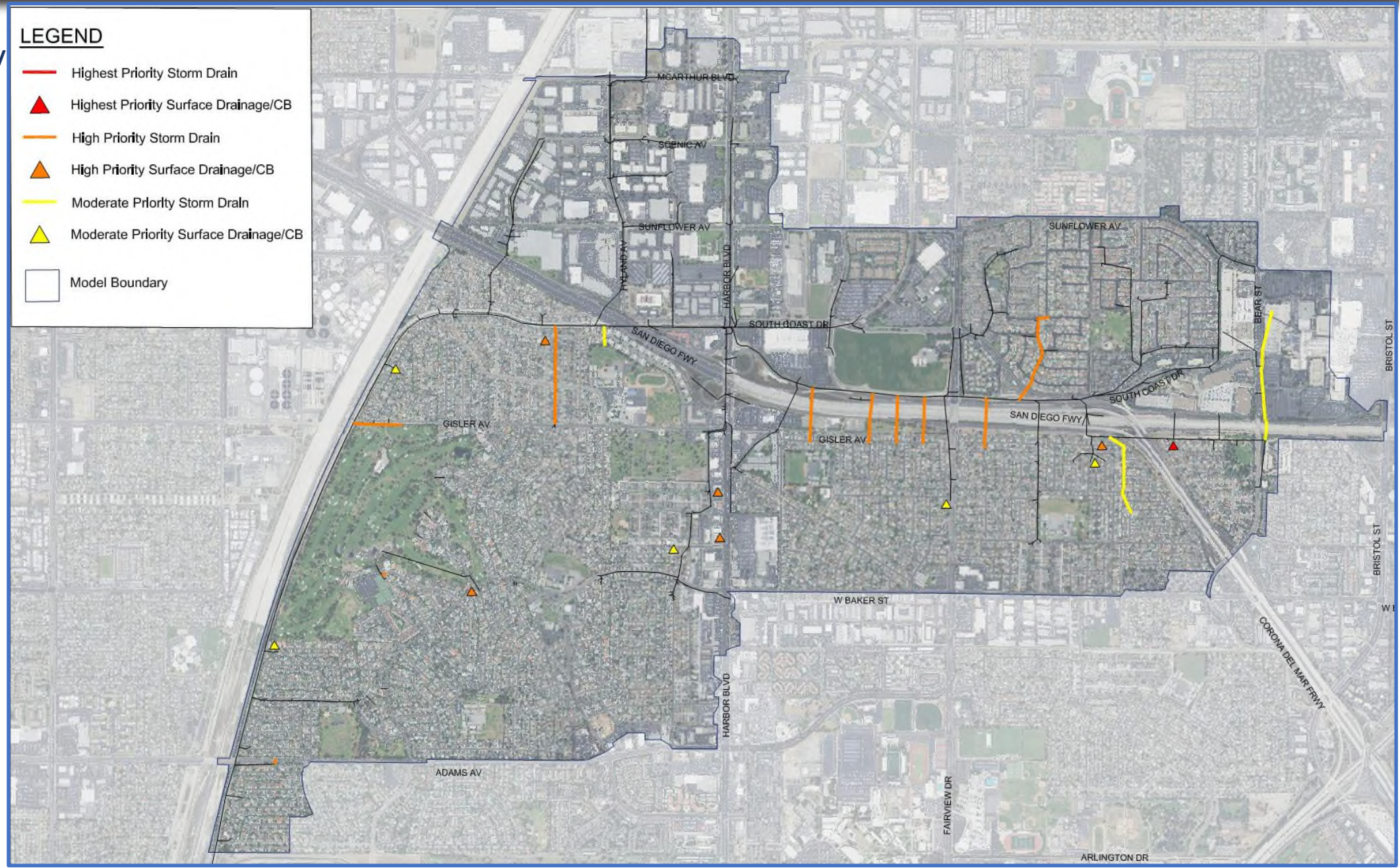
Preliminary Priority Rankings (West)

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



Preliminary Priority Rankings (North)



Preliminary Priority Ranking East(N)

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

Summary

- Extensive Review of Existing Facilities and Records of Previous Ponding
- Development of Comprehensive State-of-the-Art Stormwater Model
- Correlation/Validation of Models Using Known Rainfall/Ponding Documentation
- Identification of Systems' Functionality
- Development of Preliminary Priority Ranking
- Acquire Public Comments & Finalize ECAR
- Next Phase of SDSMP = Development of Proposed Improvements

Draft Existing Conditions Assessment Report:

https://www.costamesaca.gov/Storm

Email:

STORM@costamesaca.gov

Questions?