



# I/I Reduction Flow Monitoring Results FY 16/17

Napa Sanitation District  
Board of Directors Meeting



# CSMP Overview

- Collection System Master Plan (CSMP) 2007
- \$120 million in capacity expansion projects
- Recommendation of a 5-year I&I Reduction Program
- Results of the 5-year program delayed by lack of rainfall



# Sewer System Rehab

- I/I reduction
- Repair of failing sewers
  - Decrease O&M costs
  - Avoid unexpected failures
- In advance of City of Napa paving



# I/I Project Prioritization

- Overflow locations
- Flow monitoring
- Nighttime reconnaissance
- Smoke testing
- Direction from the Board

Find the problem areas that result in an increase in success per dollar spent.

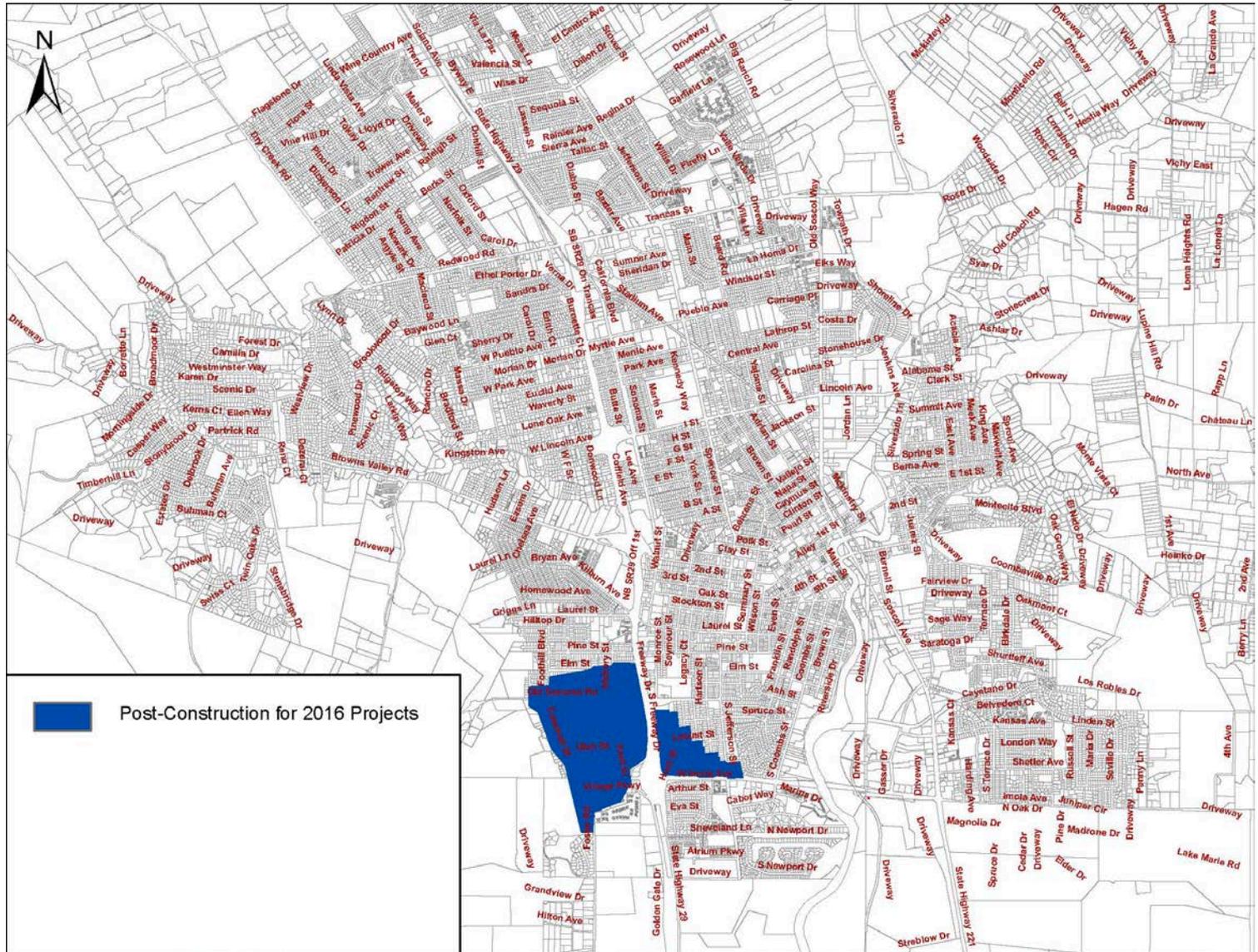


# I/I Reduction Program

- 6 major rehabilitation projects completed
- Pre- and Post-construction flow monitoring to determine reduction in I&I.
  - 16/17 monitoring
    - Post-construction – Summer 2016 projects
    - Pre-construction – Summer 2017, 2018, 2019 projects

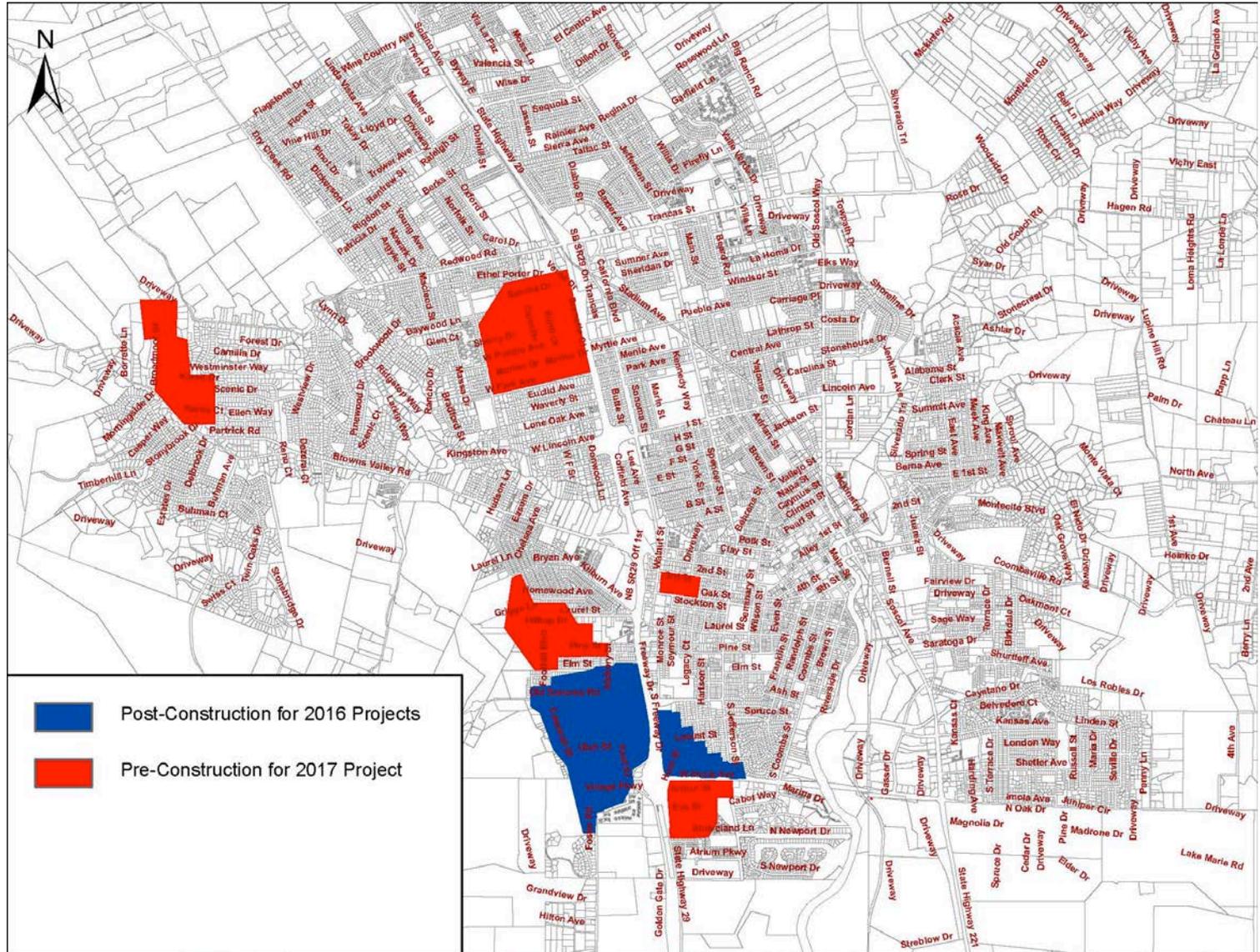


# Flow Monitoring Areas



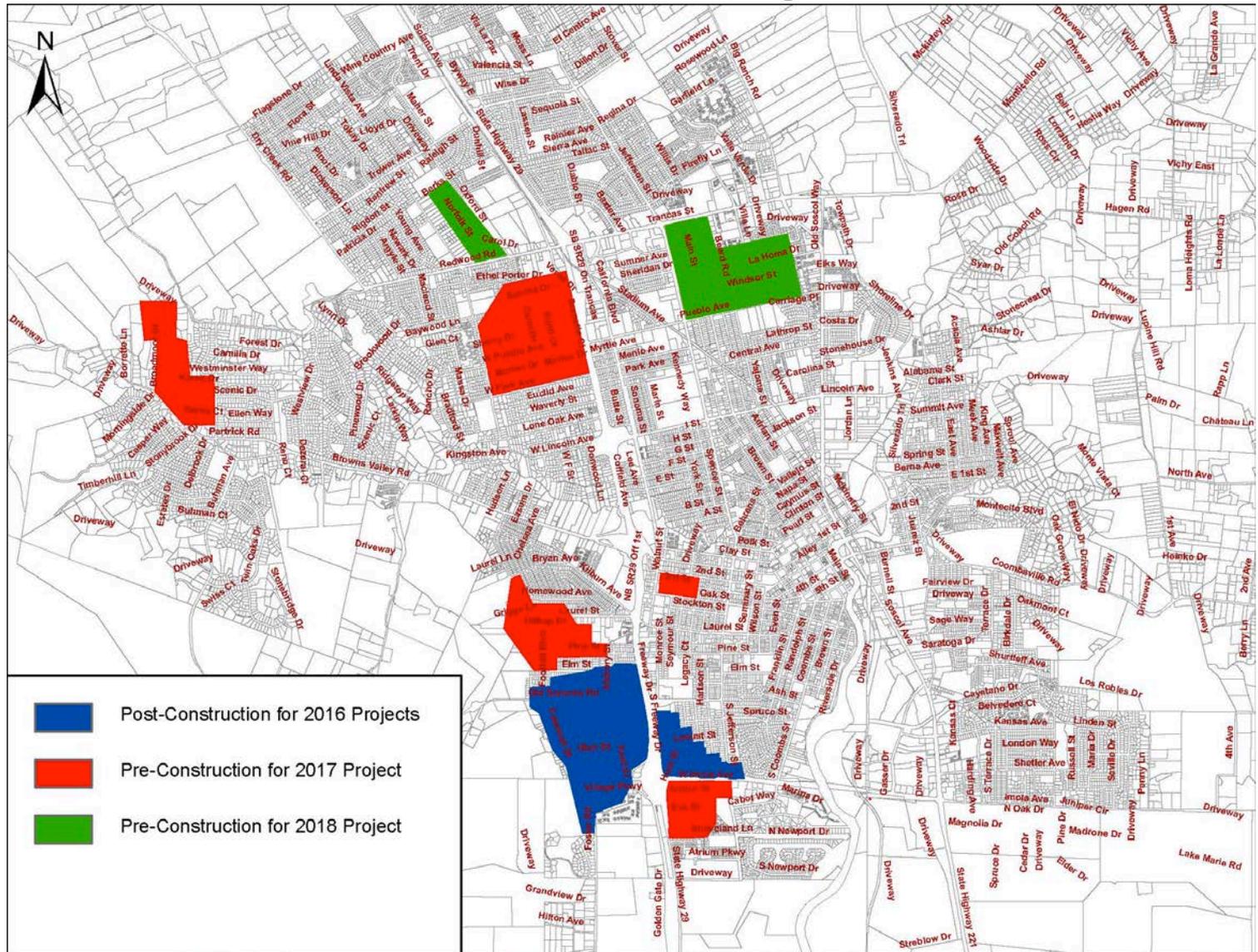


# Flow Monitoring Areas



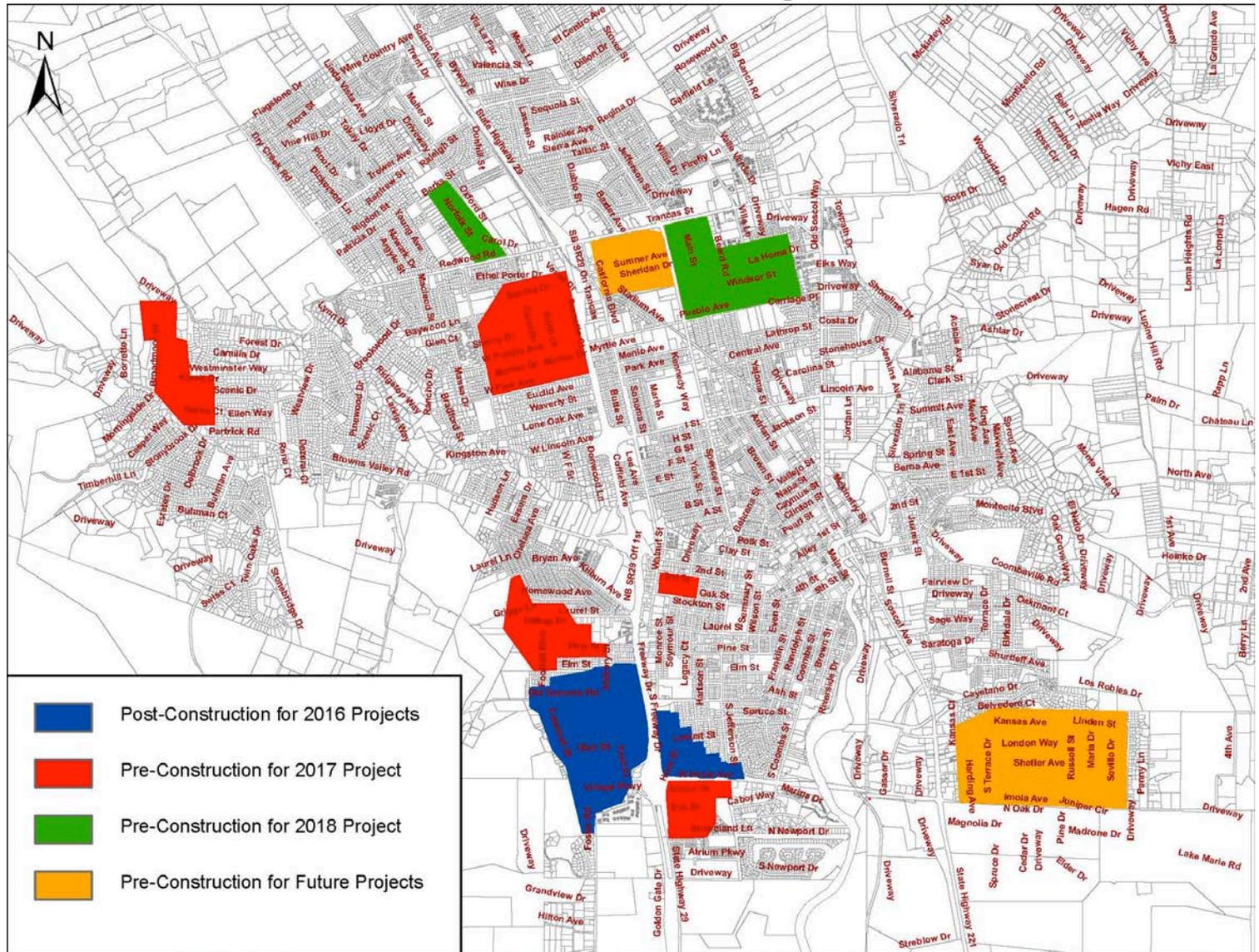


# Flow Monitoring Areas





# Flow Monitoring Areas





# Annual Project Results

Project Name	Year	Cost (\$M)	Project Size (miles)	Cost / Mile (\$M)	Peak Flow Rate Reduction (mgd)	Percent Peak Flow Rate Reduction	Cost to Reduce 1.0 mgd Peak Flow Rate (\$M)
Upper Alphabet Stonecrest	2011	2.06	2.0	1.00	3.55	53%	0.6
Basin L#1	2012	1.65	1.7	0.96	1.40	34%	1.2
Basin L#2	2013	3.04	1.8	1.68	0.11	11%	27.6
Basin L#3	2014	3.22	2.5	1.28	1.45	26%	2.2
Basin L#4	2015	4.28	3.8	1.13	2.18	41%	2.0
Basin L#5	2016	2.07	1.5	1.39	1.20	69%	1.7
<b>TOTAL</b>		<b>16.32</b>	<b>13.3</b>	<b>1.23</b>	<b>9.89</b>	<b>40%</b>	<b>1.6</b>



# Special Project Results

Project Name	Year	Cost (\$M)	Peak Flow Reduction (mgd)	Percent Peak Flow Rate Reduction	Cost to Reduce 1.0 mgd Peak Flow Rate (\$M)
Nipak MH Phase 1	2011	0.05	1.08	17%	0.04
Nipak MH Phase 1	2016	0.09	0.90	17%	0.10
Upper Lateral Spring Street	2010	0.12	0.06	32%	2.0
Upper Lateral Basin L - 1	2015	0.10	0.11	61%	0.9



# Analysis

- Variables that impact results:
  - Percentage of system rehab
  - Age of system
  - Pipe material
  - Soil conditions
  - Topography
  - Groundwater
  - Inflow



# Analysis

- 6 Years of projects – data points
- Industry expected results 30-70%
  - Partial to complete system rehab
- NapaSan results 11-69% (Avg 40%)
  - Based on partial system rehabilitation



# Upcoming Projects

- Summer 2018 Project – big project
- Upper lateral pilot project (#4)
- Flow monitoring (winter 2017/18)
  - Post
    - 2017 project
    - Basin H manholes
    - Upper lateral pilot (Oak St)
  - Pre
    - 2019 and 2020 project areas
    - Upper lateral pilot project areas



# Next Steps

1. Continue I/I projects
2. Focus on infiltration and inflow
3. Implement more pilot projects
4. Continue flow monitoring
5. Continue evaluation of results
6. Collection System Master Plan in FY 19/20  
– 2 more years of project data

# Questions?

