Sanitary Sewer Master Plan

City of West Linn

Planning Commission Hearing

July 17, 2019

WATER
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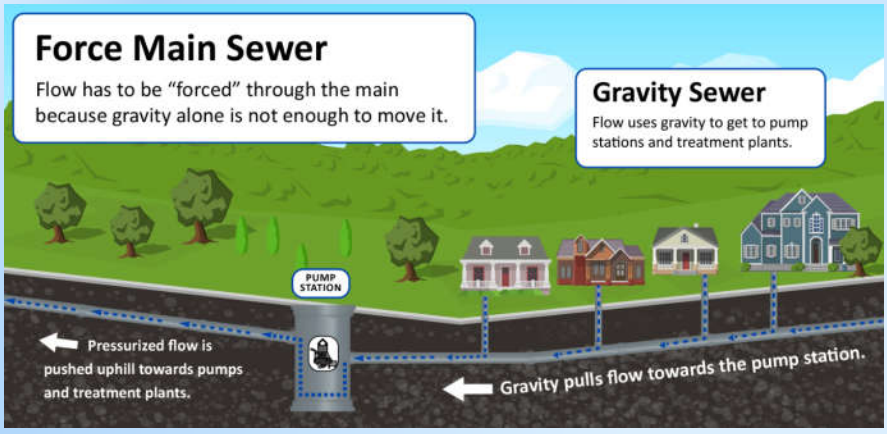
OUR BUSINESS
OUR PASSION

carollo
Engineers...Working Wonders With Water®

City' System comprises of a combination of Gravity and Pressurized Pipes



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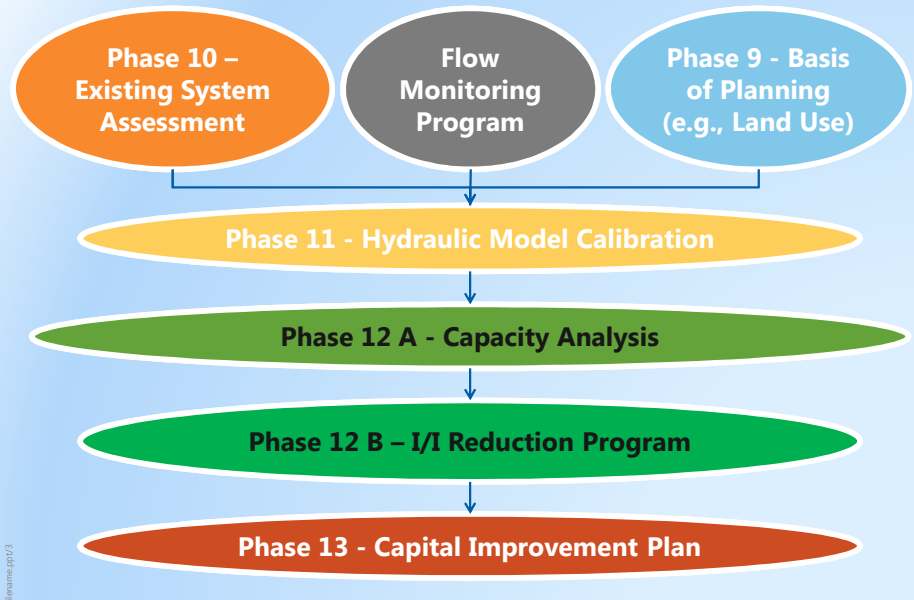
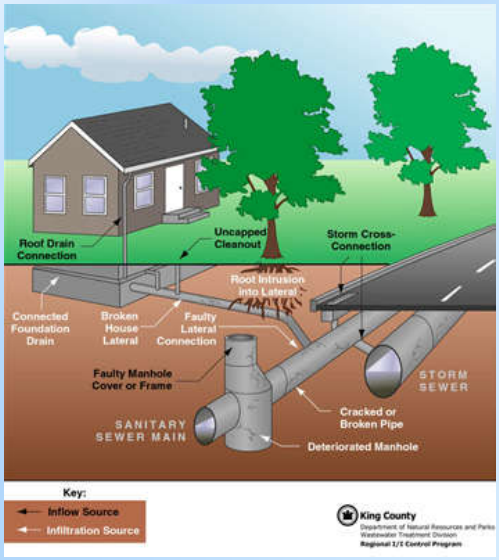
Collection System Planning Approach



City's Existing System

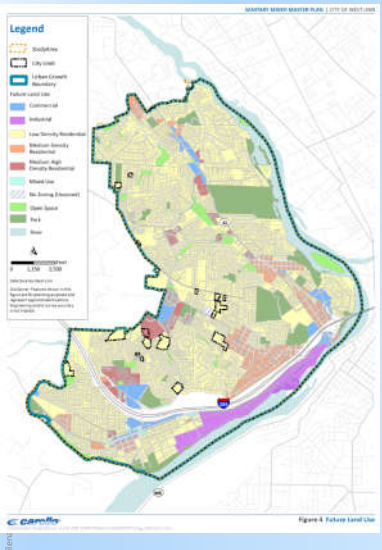
- 120 miles of pipes
- 7 Pump Stations owned by City
- 3 Pump Stations owned by WES
- City flows pumped to Regional WES treatment plant

Sources of Flow in a Sanitary Sewer System



- Note, most inflow sources are not authorized and when found are disconnected (Roof drain connections for instance)

Customer's Flows are anticipated to increase by 11 percent in the next 20 years

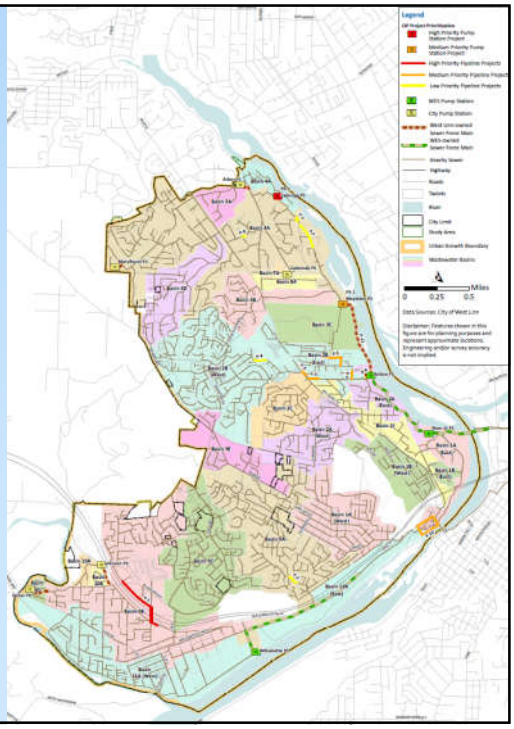


	Existing	Build-out
Dry Weather Flow (mgd)	3.34	3.74

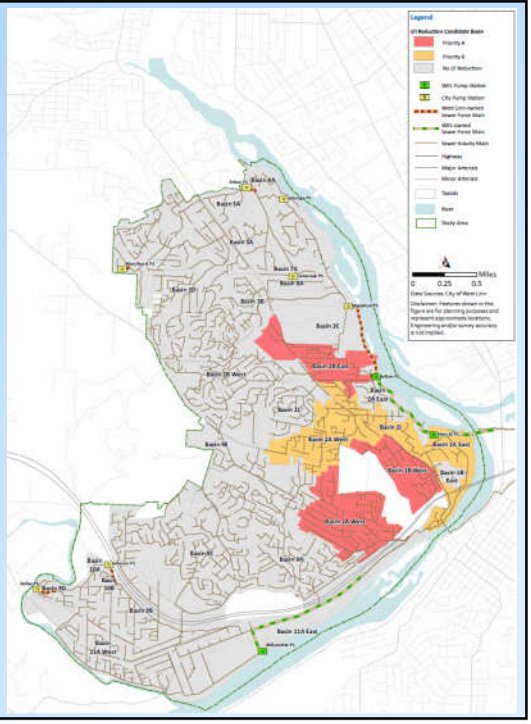
+ 11%

Recommended Improvements

- ~12,000 feet of pipe upsize *(~2 % of total system)*
- PS-1 – Mapleton Pump Station and Force Main
- PS- 2 – Calaroga Pump Station



Six basins identified with relatively elevated I/I are recommended as areas of focus for annual repair and replacement program



Projects Phasing

- **High Priority (2019-2024)**– Projects already started/committed and high priority projects
  - Calaroga PS
  - Project P-1 *(2,500 ft from 10-inch to 15-inch at I-205 crossing)*
- **Medium Priority (2024-2029)** – Projects identified under existing condition modeling, lower priority
- **Low Priority (2030-2039)** – Projects identified under build-out condition modeling

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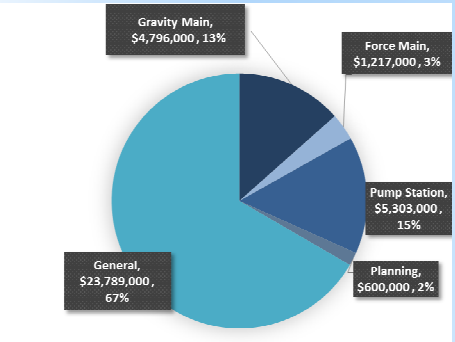
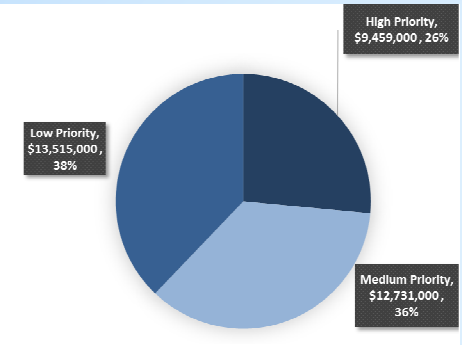
CIP Summary





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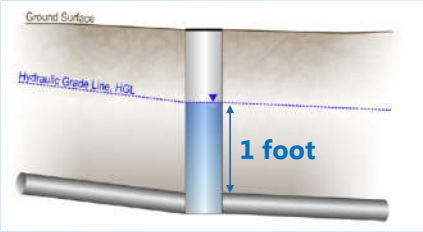
Next Steps

- Presentation to Council Work Session
- Council Adoption
- Finalize Sanitary Sewer Master Plan

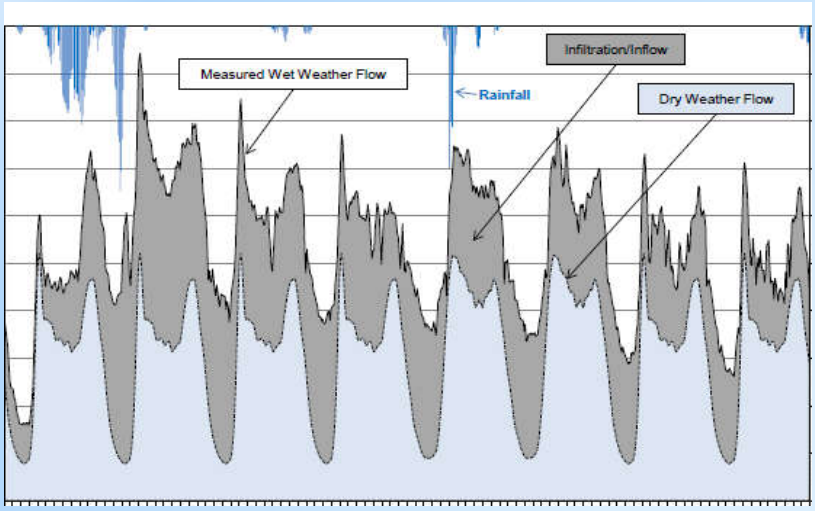
Questions??

To understand system capacity, Criteria were developed to identify "Deficiencies"

- Maximum HGL at 1 foot above the top of pipe
- Pump Stations to handle Peak Wet Weather Flow with firm capacity
- Velocities in force mains:
  - No more than 8 fps

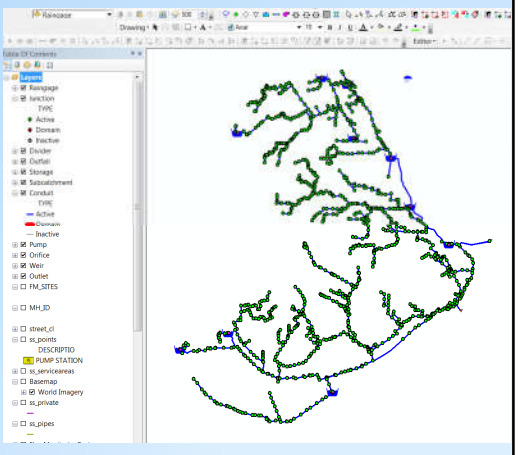


Flow Monitoring helped understand how much is the City's Collection System



Collection System was evaluated with a Hydraulic Model

- Simplified representation of the real world
- Calibrated to ensure trust in results



Projects will use AACE Class 4 Capital Estimates and will be in 2018 ENR dollars

ESTIMATE CLASS	Primary Characteristic: LEVEL OF PROJECT DEFINITION Expressed as % of complete definition	Secondary Characteristic: END USAGE Typical purpose of estimate	METHODOLOGY Typical estimating method	EXPECTED ACCURACY RANGE Typical variation in low and high ranges [a]	PREPARATION EFFORT Typical degree of effort relative to least cost index of 1 [b]
Class 5	0% to 2%	Concept Screening	Capacity Factored, Parametric Models, Judgment, or Analogy	L: -20% to -50% H: +30% to +100%	1
Class 4	1% to 15%	Study or Feasibility	Equipment Factored or Parametric Models	L: -15% to -30% H: +20% to +50%	2 to 4
Class 3	10% to 40%	Budget, Authorization, or Control	Semi-Detailed Unit Costs with Assembly Level Line Items	L: -10% to -20% H: +10% to +30%	3 to 10
Class 2	30% to 70%	Control or Bid/ Tender	Detailed Unit Cost with Forced Detailed Take-Off	L: -5% to -15% H: +5% to +20%	4 to 20
Class 1	50% to 100%	Check Estimate or Bid/Tender	Detailed Unit Cost with Detailed Take-Off	L: -3% to -10% H: +3% to +15%	5 to 100

Notes: [a] The state of process technology and availability of applicable reference cost data affect the range markedly. The +/- value represents typical percentage variation of actual costs from the cost estimate after application of contingency (typically at a 50% level of confidence) for given scope.
[b] If the range index value of "1" represents 0.005% of project costs, then an index value of 100 represents 0.5%. Estimate preparation effort is highly dependent upon the size of the project and the quality of estimating data and tools.

Figure 1. – Cost Estimate Classification Matrix for Process Industries

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Why Reduce Inflow and Infiltration?

- Peaking Factors & I/I Flow Factors are not acceptable
- Indicates poor condition of an asset
  - Requires a fiscal investment to retain asset value
- Reduce peak flows to pump stations and WWTP
- Diminish need for additional infrastructure

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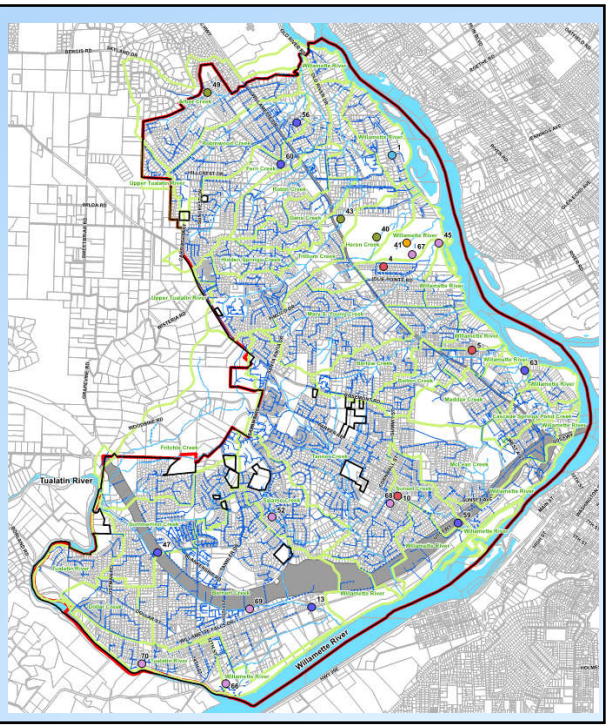
Basins Identified Correlated with Stormwater Problem Areas



Project Objective
- Capacity Improvement
- Erosion
- Add Infrastructure
- System Configuration
- System Repair
- Water Quality Retrofit

- Stormwater Pipe
- Open Channel
- Streams
- Watershed Boundaries
- ODOT ROW
- City Limits
- UGB