

West Linn Surface Water Master Plan

UAB Meeting

April 9 | 2019



Surface Water Master Plan Development Process



Problem Identification

- Data Gathering
- Field Investigations
- Surveys/Interviews
- Public Input
- Hydrologic and Hydraulic Modeling



Project Development

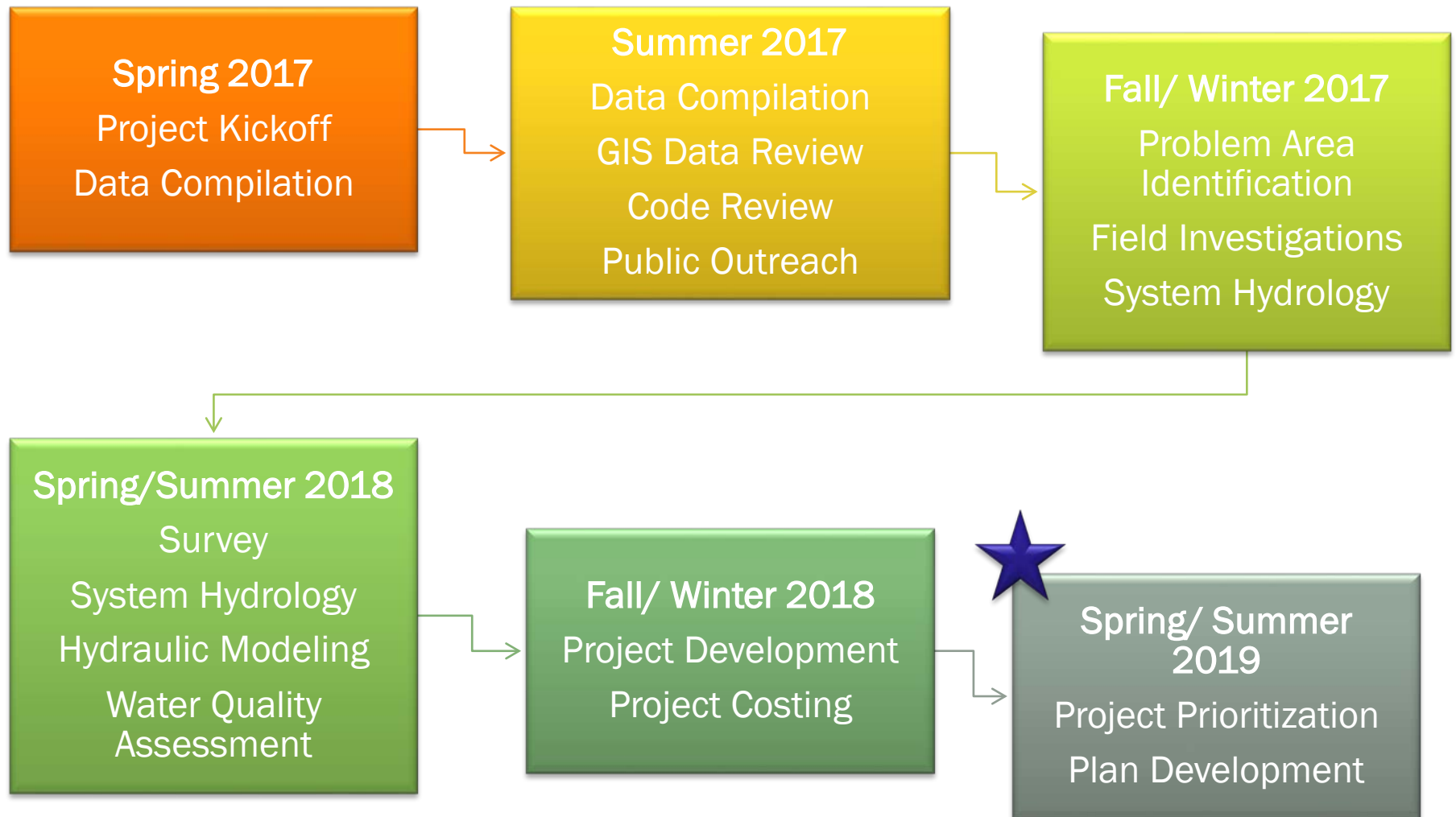
- Alternatives Analysis
- Concept Design
- Programmatic Activities
- Planning Activities
- Cost Estimation



Master Plan Development

- Project Prioritization
- Documentation
- Funding Needs
- Stakeholder Outreach

Project Timeline



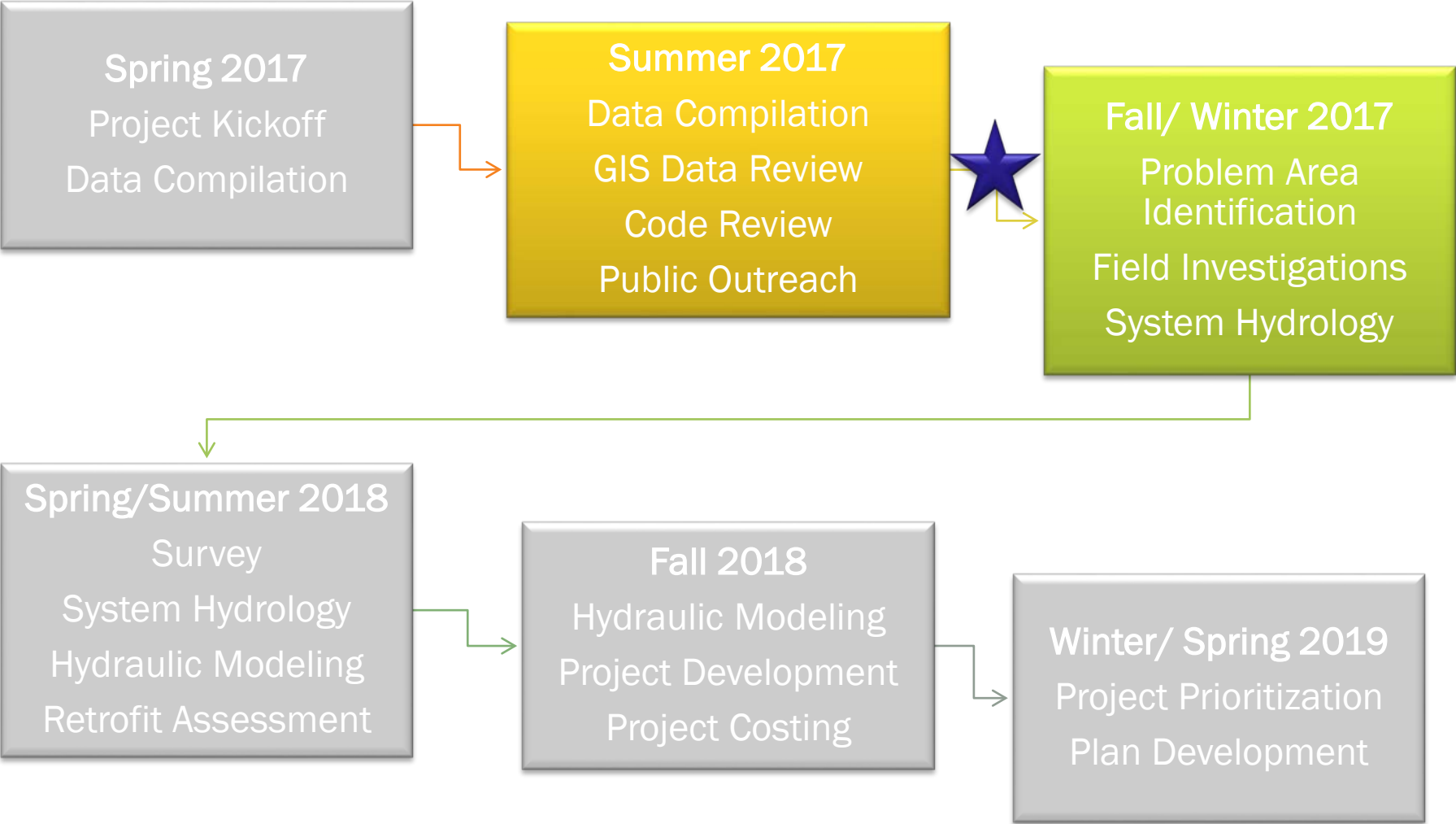
Meeting Goals

- Review surface water master plan development process including public engagement.
- Identify system evaluation results.
- Discuss potential stormwater project and program needs for the capital improvement program.
- Define project next steps.



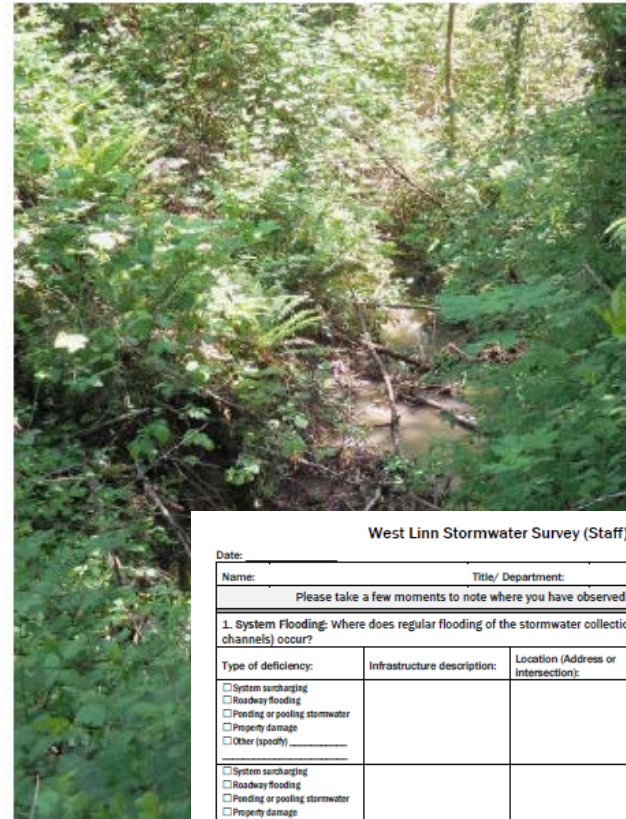
Basis of Planning and Preliminary Project Needs

Project Timeline



Data Review

- Public and Staff Surveys
- Staff discussions/ meetings
- GIS Data Review
- 2006 Stormwater Master Plan CIP Review
- 2015 Hydromodification Assessment Review



West Linn Stormwater Survey (Staff)

Date: _____

Name: _____ Title/ Department: _____

Please take a few moments to note where you have observed the following:

1. System Flooding: Where does regular flooding of the stormwater collection system (pipes, open channels) occur?

Type of deficiency:	Infrastructure description:	Location (Address or Intersection):	Observations:
<input type="checkbox"/> System surcharging <input type="checkbox"/> Roadway flooding <input type="checkbox"/> Pending or pooling stormwater <input type="checkbox"/> Property damage <input type="checkbox"/> Other (specify) _____			
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2. Open channel condition: Are there areas of the open channel collection system that require repair or replacement?

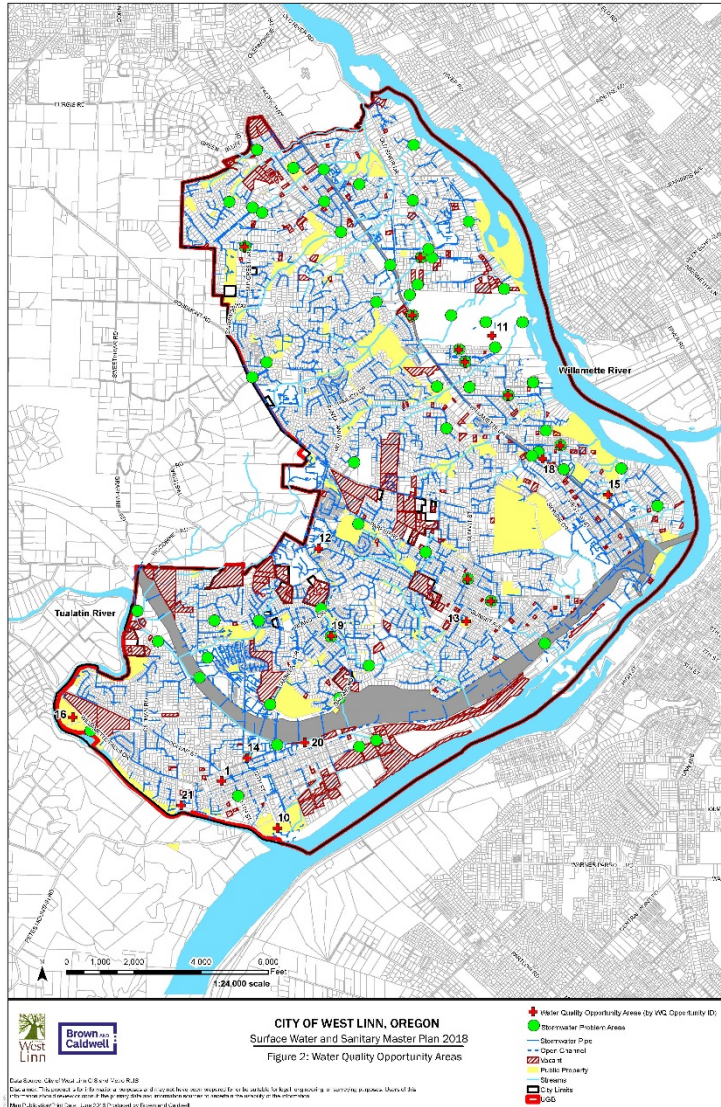
Type of deficiency:	Channel description:	Location (Address or Intersection):	Observations:
<input type="checkbox"/> Bank erosion <input type="checkbox"/> Erosion at outfalls <input type="checkbox"/> Channel deepening/widening <input type="checkbox"/> Channel migration <input type="checkbox"/> Other (specify) _____			
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65 Stormwater “Problem Areas”

Code Review/ Basis of Planning

- Review of the City's stormwater public works/ stormwater design standards and municipal code.
- Goals:
 - Identify basis of design
 - Identify gaps or inconsistencies between code and the NPDES MS4 permit requirements
- Outcomes:
 - Confirm city/ private property responsibilities related to the stormwater collection system
 - Establish design criteria for use in system evaluation and CIP development
 - September 2018 PWS update.

Water Quality Assessment



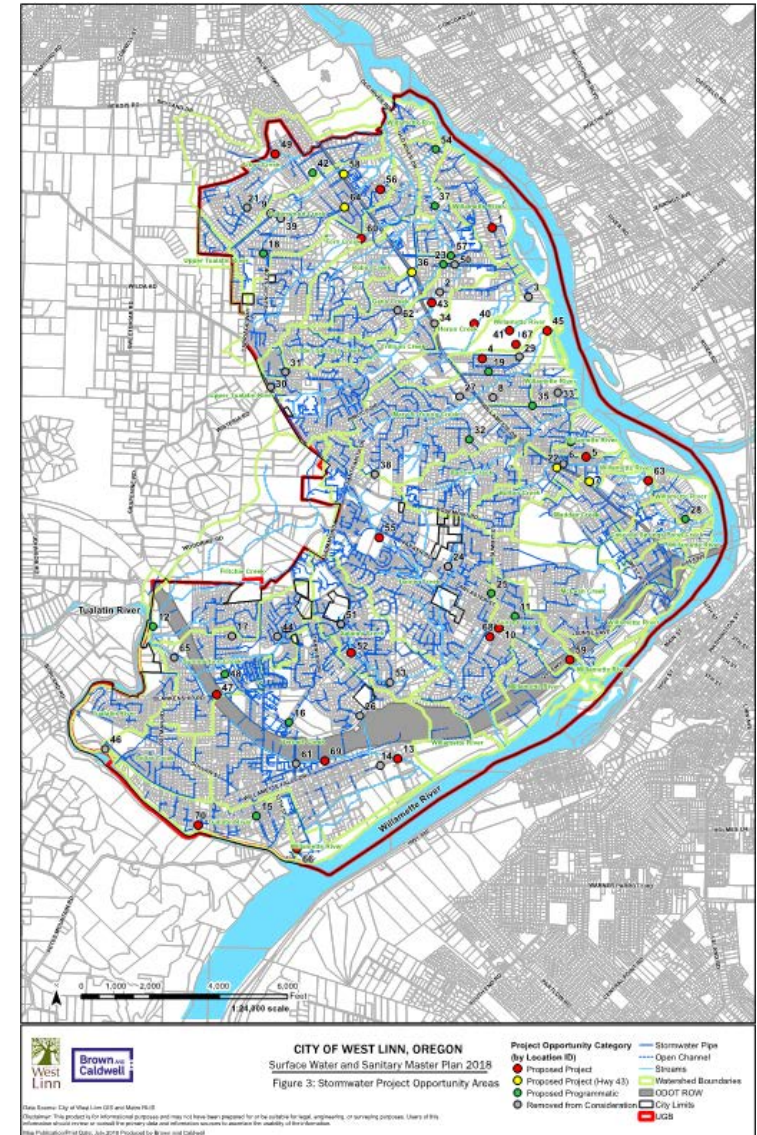
- Water quality retrofits are a priority in the NPDES MS4 permit.
- Four strategies developed to characterize identified water quality projects:
 1. Green infrastructure in public ROW
 2. New facilities on public property
 3. New facilities to directly manage runoff associated with Highway 43 (public property or property acquisition)
 4. Pond retrofits

Site Visits

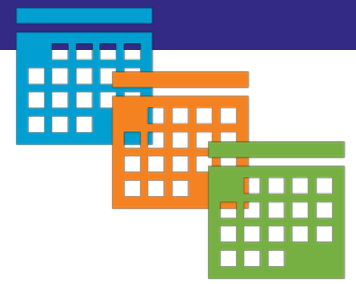


Project Need Workshop

- Projects
 - Capacity Improvement
 - Improve System Configuration
 - Add Infrastructure (with and without water quality)
 - Water Quality
 - System Repair
 - Erosion
- Planning Efforts
- Programs



Modeling Needs Identification



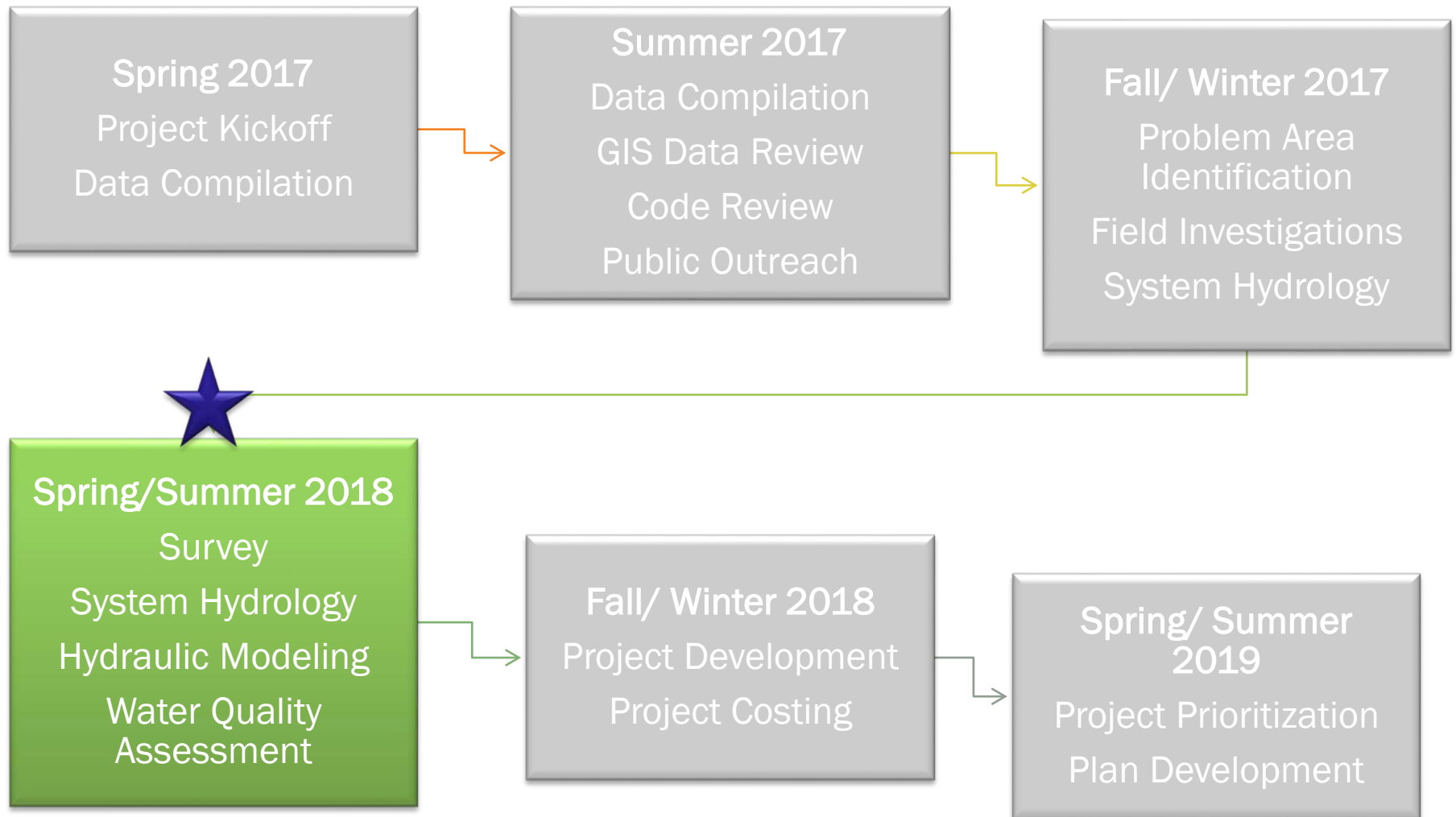
- Project needs were reviewed to determine if modeling would help inform project solutions.
 - Category 1: Detailed hydraulic modeling to inform sources and solutions
 - Category 2: Hydrology modeling only to inform system sizing
 - Category 3: Limited hydraulic modeling to evaluate capacity
 - Category 4: No modeling required
- Survey conducted by City staff in Summer 2018



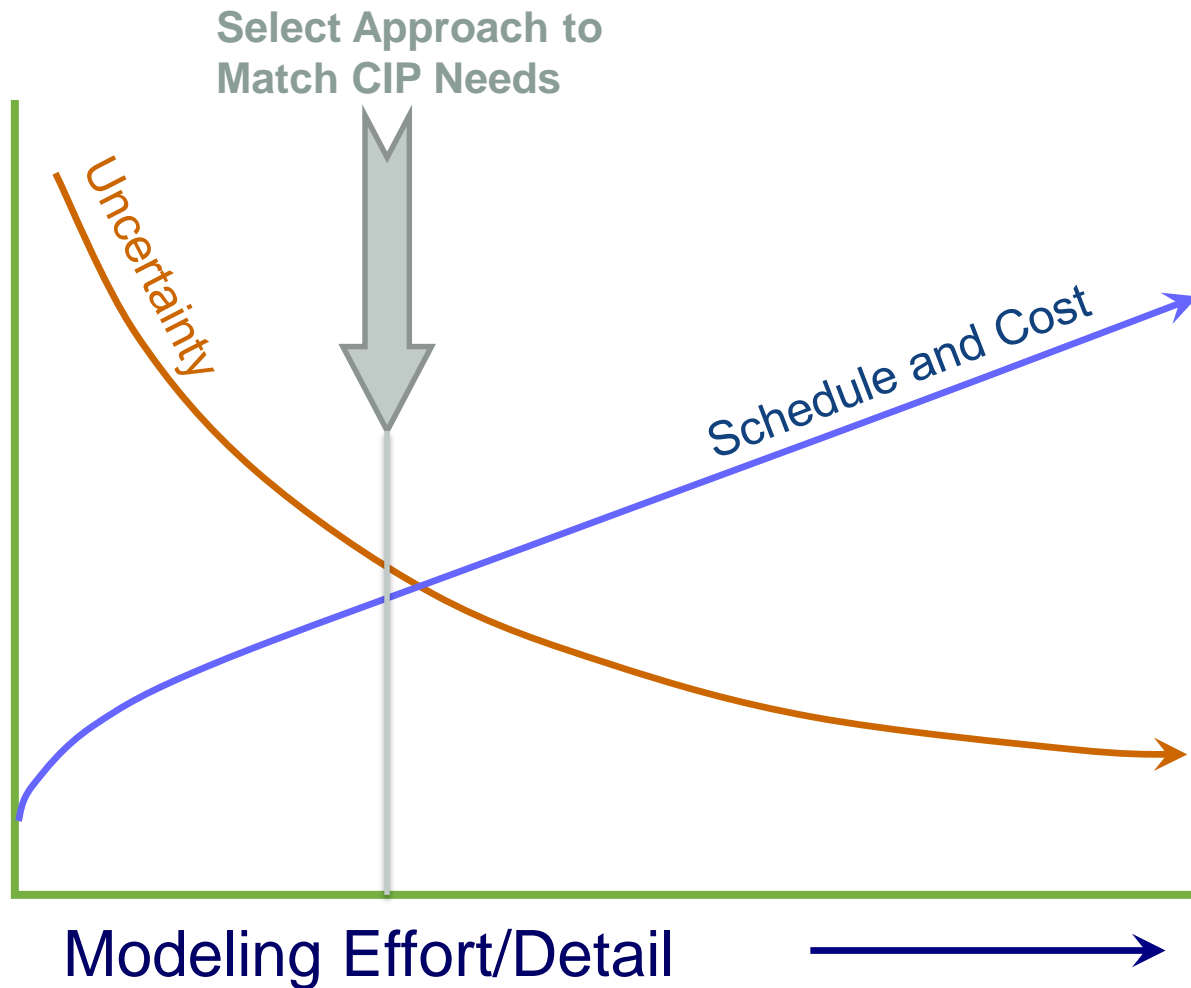


Modeling Evaluation

Project Timeline

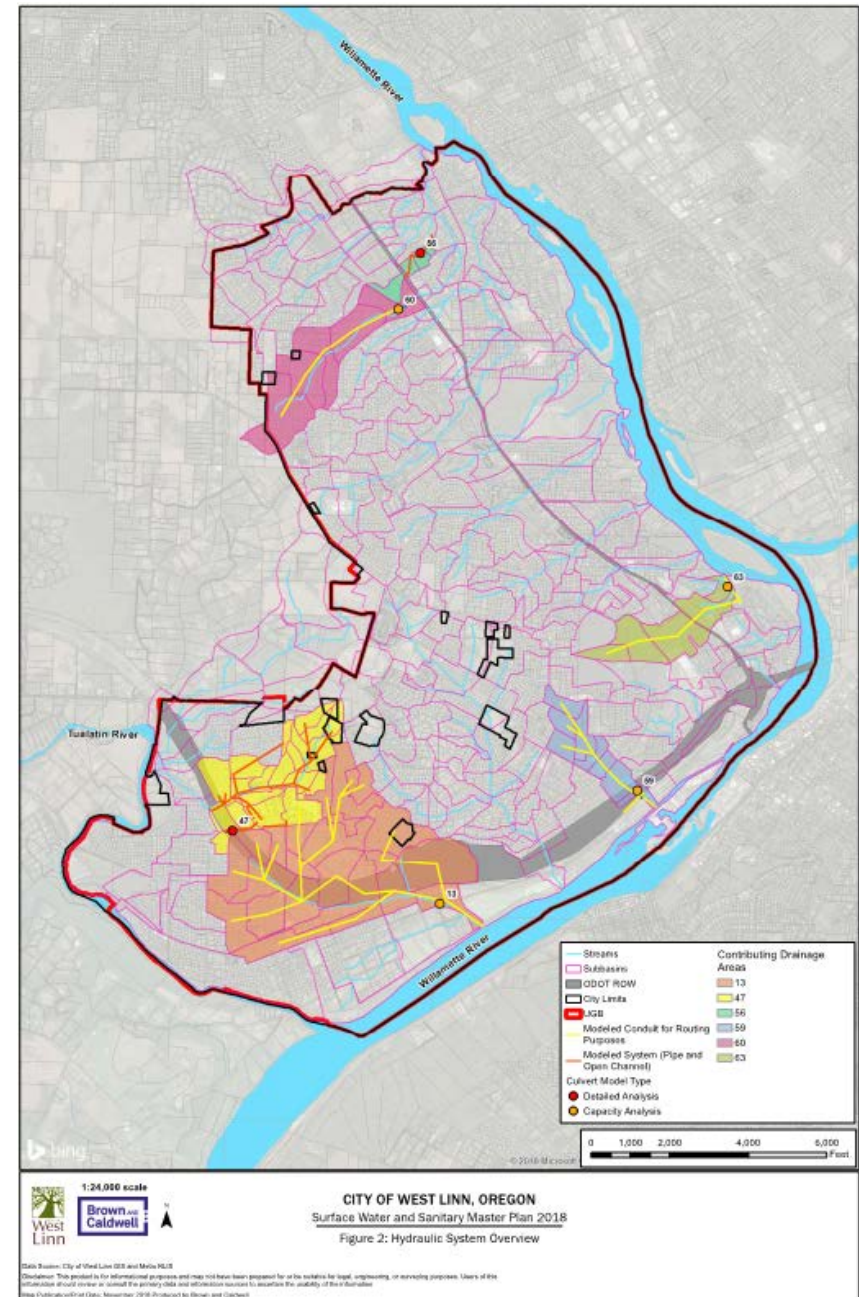


Modeling Approach



Modeling Overview

- Detailed Modeling Areas:
 - Blankenship Road
 - Fairview Way
- Capacity Modeling Areas:
 - 5th Avenue Culvert
 - Sunset Creek at I-205
 - Kantara Way
 - Maddox Creek at River Street
- Highway 43
 - 24 Crossings
 - Upstream and Downstream Structures and Conveyance Channel



Highway 43 System Evaluation Assumptions

- Stemming from the 2016 Highway 43 Concept Plan
- Phase I of the Highway 43 Improvements (Arbor to Hidden Springs)
 - Design: 2018 (Conducted by ODOT), Construction: ~2020
 - Capacity deficient culverts to be sized and costed as a CIP.
 - Water quality improvements not included in CIP concepts.
- Phase II of the Highway 43 Improvements (Hidden Springs to I-205)
- Guidelines:
 - Cooperative Maintenance Agreement (February 2018)
 - City charter amendment (Chapter 11, Section 46) - stormwater management associated with OR43 is an authorized use. Water quality mitigation for Highway 43 may be permitted in parks.

Analysis Criteria Used to Identify “Deficiencies”

- Water Quality Facility Design
 - Portland SWMM
 - 1”/ 24 hour design storm
- Structure Spacing
 - Max 500’ between structures
- Pipe Design
 - 10-year design storm, surcharge is acceptable
 - 12” min pipe size in public ROW
- Culverts
 - 25-year design storm, such that headwater does not exceed 1.5 times culvert diameter.

Modeling Results

- Blankenship Road
 - 2-yr and 10-yr deficiencies
 - Upsizing and realignment
- Fairview Way
 - 10-yr deficiencies
 - Upsizing and relocation

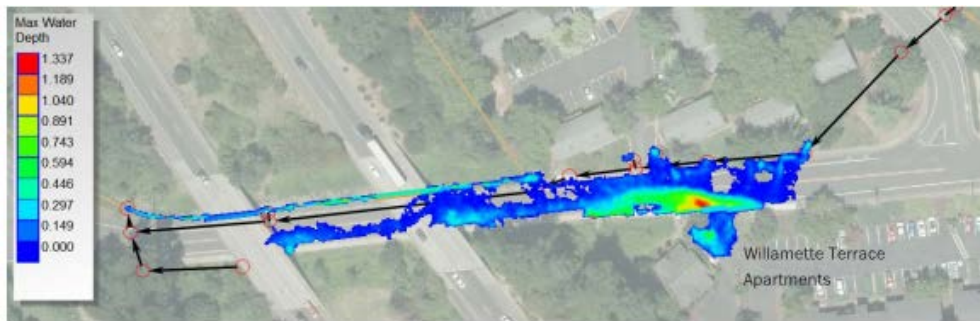
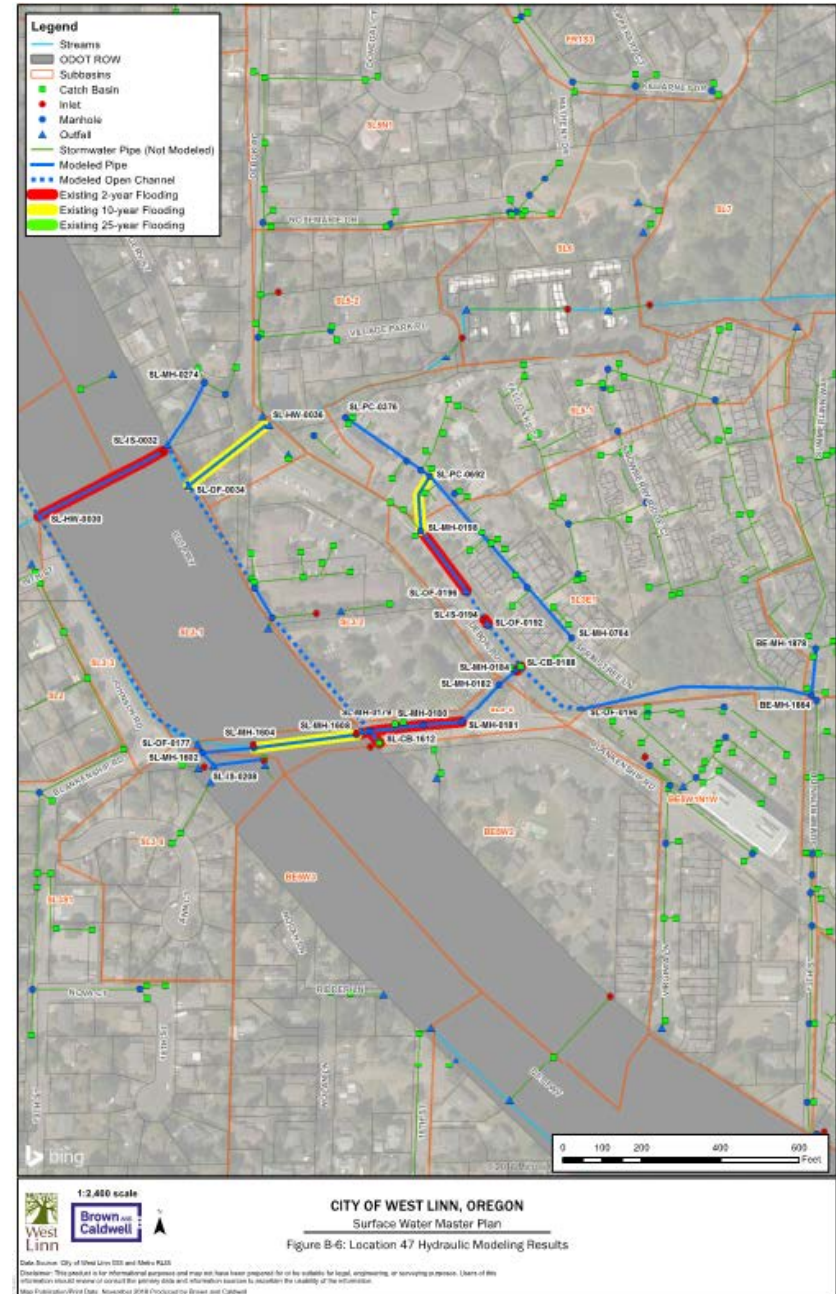


Figure 1. Existing system analysis showing 2-D flooding for the 2-year 24-hour event



Modeling Results

- 2-yr deficiency at all evaluated culverts
- Kantara Way
 - Limited potential for safety impacts
 - No project development



Location #13: 5th Avenue Culvert



Location #60: Kantara Way

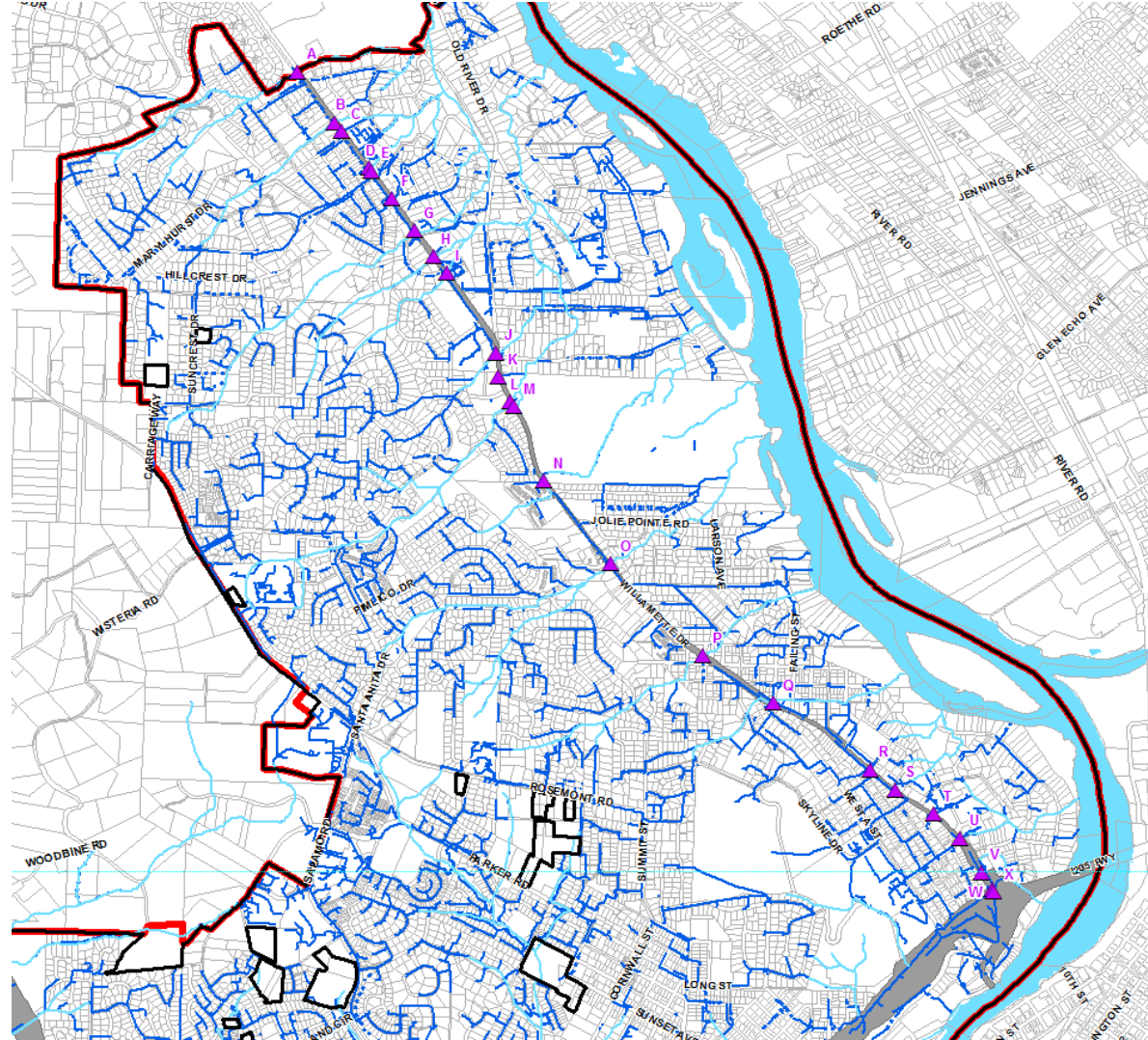


Location #63: Maddox Creek



Modeling Results - Highway 43

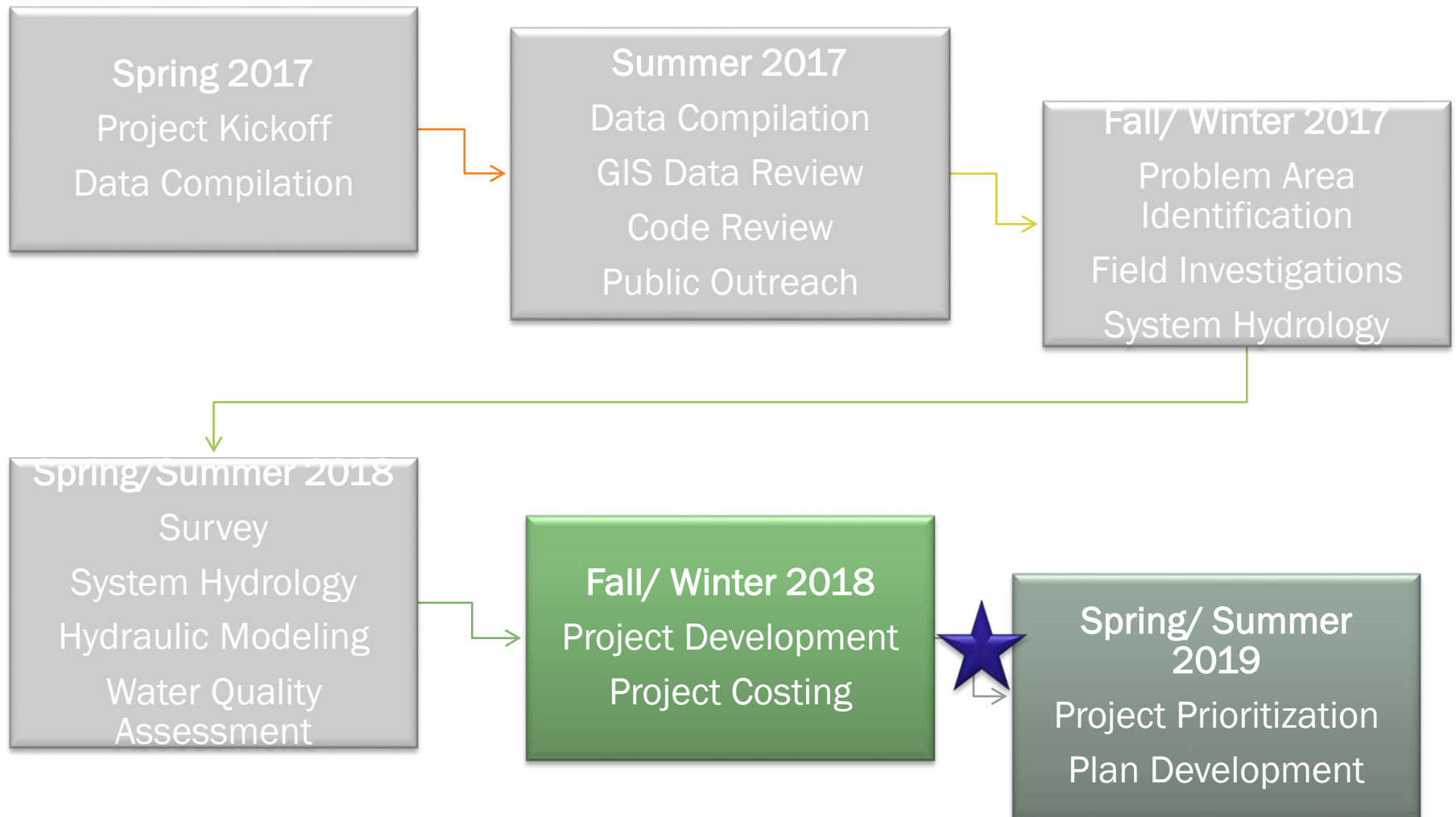
- 24 culverts evaluated
- 13 deficient
 - Flooding
 - Surcharging
- Upsize/
realignment in
conjunction with
Highway 43
improvements





Project and Program Development and Costs

Project Timeline



Priorities and Phasing

- High Priority Needs (2019-2024)
 - Addresses current system flooding
 - Addresses failing infrastructure
 - Project timing in next 5-years
- Medium Priority Needs (2025-2029)
 - Addresses local issue
 - Project timing in next 15-years
- Low Priority/ Unfunded Needs (2030-2039)

Project Efforts

- One-time activity to address a system deficiency or need.
 - Capacity Projects
 - Infrastructure Improvement/ Addition Projects
 - Retrofit/ Erosion Prevention and Control Projects
- Project needs identified as High and Medium Priority are sized and a preliminary cost developed.

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

ESTIMATE CLASS	Primary Characteristic	Secondary Characteristic			
	LEVEL OF PROJECT DEFINITION Expressed as % of complete definition	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

Planning Efforts

- One-time effort to evaluate feasibility and need for a project opportunity
- Planning efforts are all considered Medium Priority and a preliminary cost developed.

Program Efforts

- Ongoing/ annual effort to address routine deficiency.
- Establishing programmatic efforts can be a way of reserving/ dedicating funds
- Funding may supplement existing programs
- Programmatic efforts are identified as an annual cost requirement.

Next Steps

Next Steps

- Finalize Stormwater Capital Improvement Program Costs
- Draft Master Plan (by June)
- Additional stakeholder outreach

