


UPDATED PROJECT SCHEDULE LOADING RATES

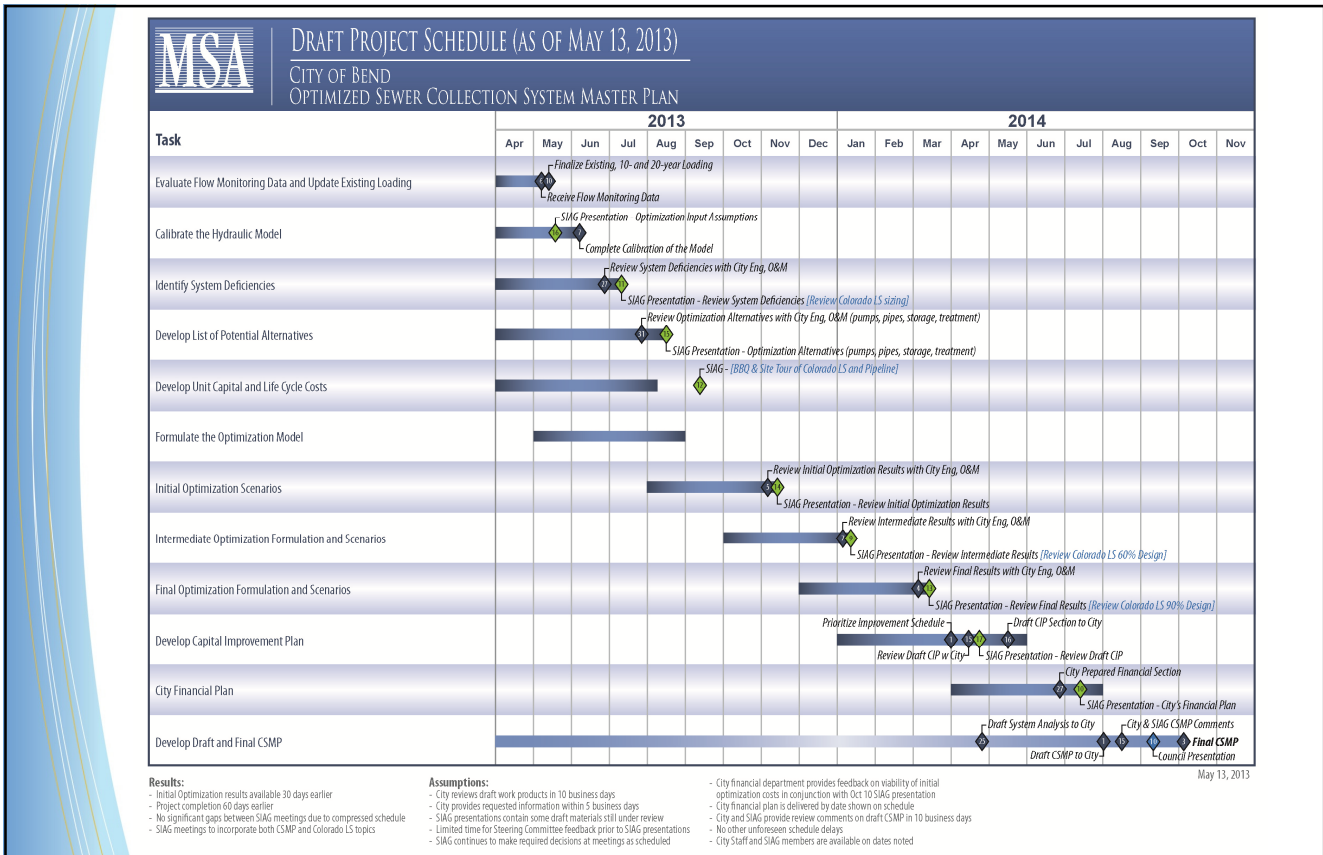
Sewer Infrastructure Advisory Group
May 16, 2013



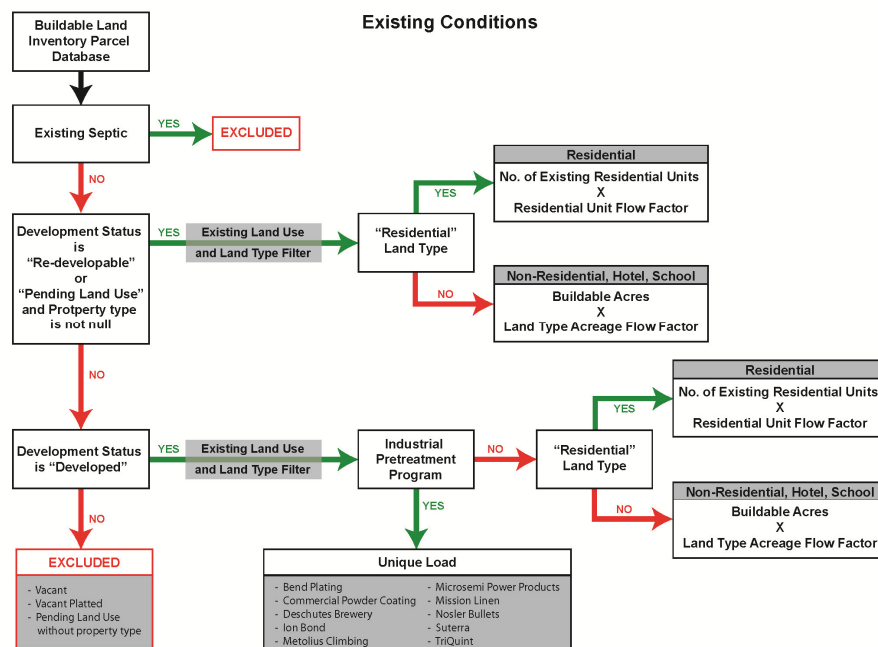
MSA Murray, Smith & Associates, Inc.
Engineers/Planners

PRESENTATION CONTENTS

- Review Updated Schedule
 - City Eng/O&M Workshops
 - SIAG Meetings
 - Initial Optimization
- Flow Development
 - Flow Monitoring
 - Loading Rates and Projections
- Sensitivity Analysis
-  What dials can we turn?



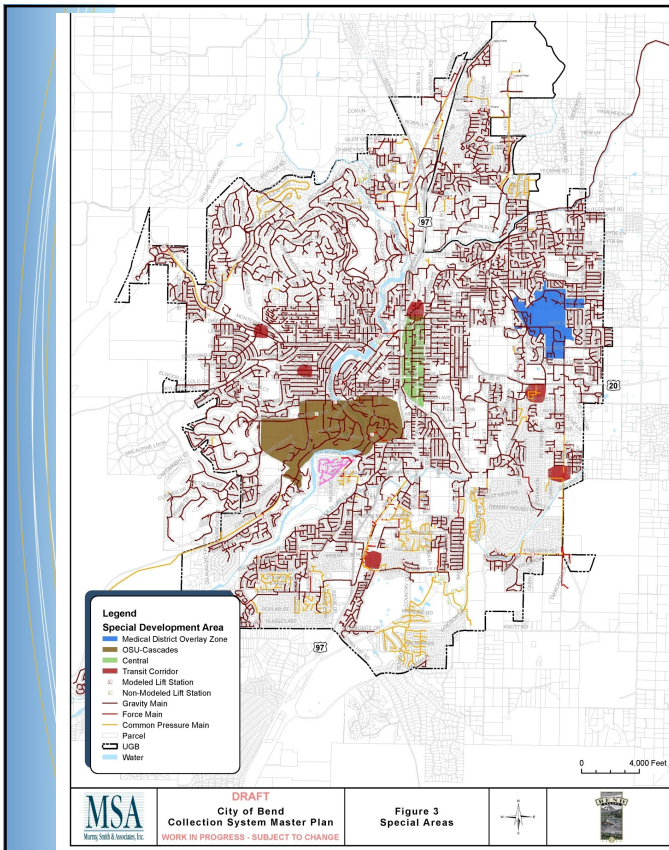
EXISTING LOADING DEVELOPMENT



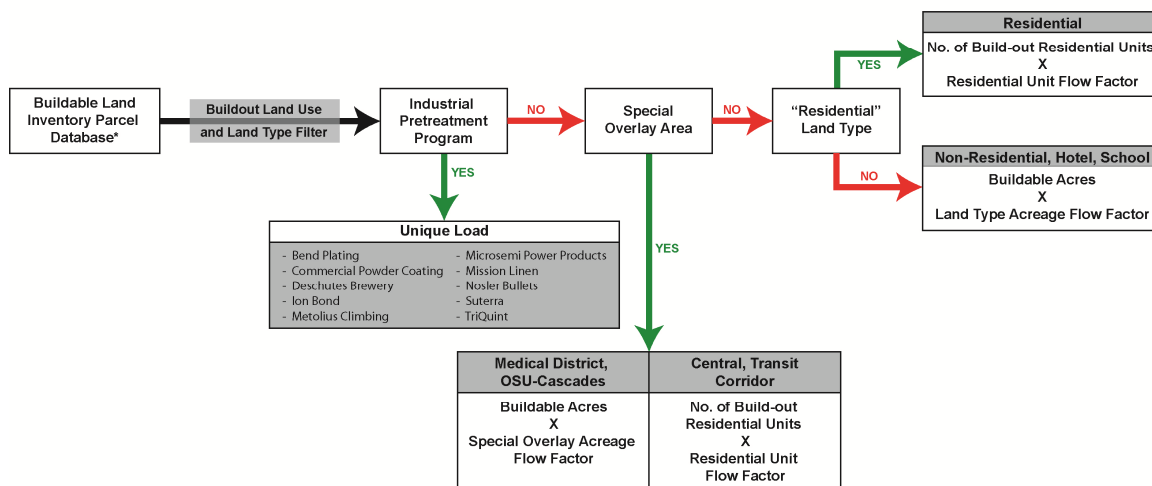
SPECIAL GROWTH AREAS

Areas such as:

- OSU Cascades campus (brown)
- Medical Center (blue)
- Central Area Plan (green)
- Transit corridors (red)



FUTURE LOADING DEVELOPMENT

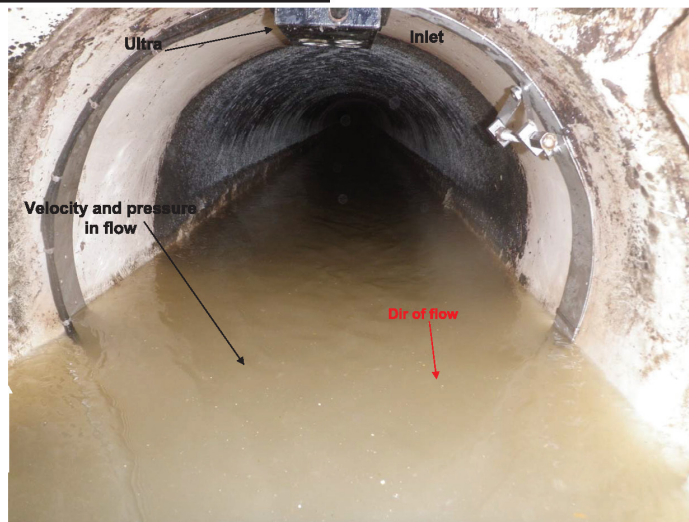


*assumes all septic are sewered

FLOW MONITORING



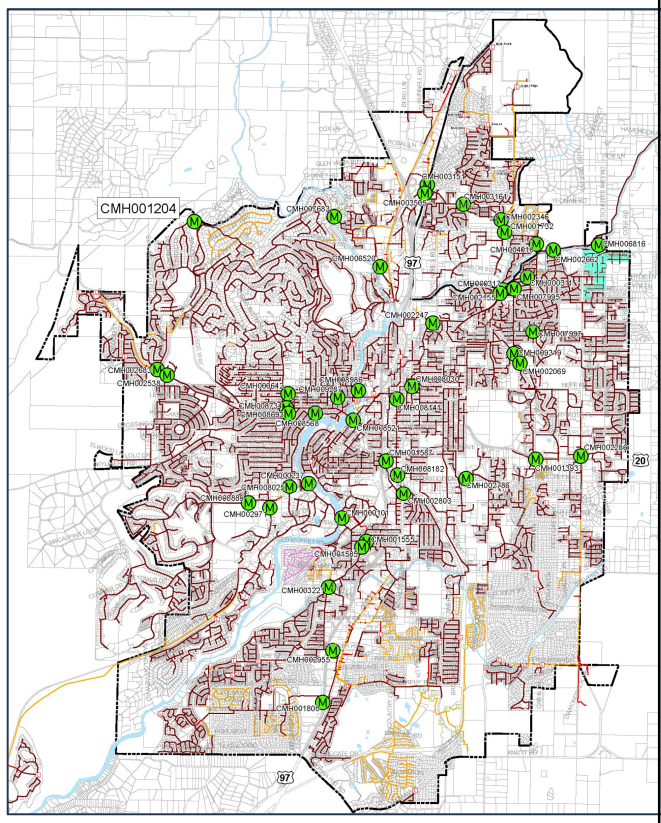
Bend_001962
Site set up



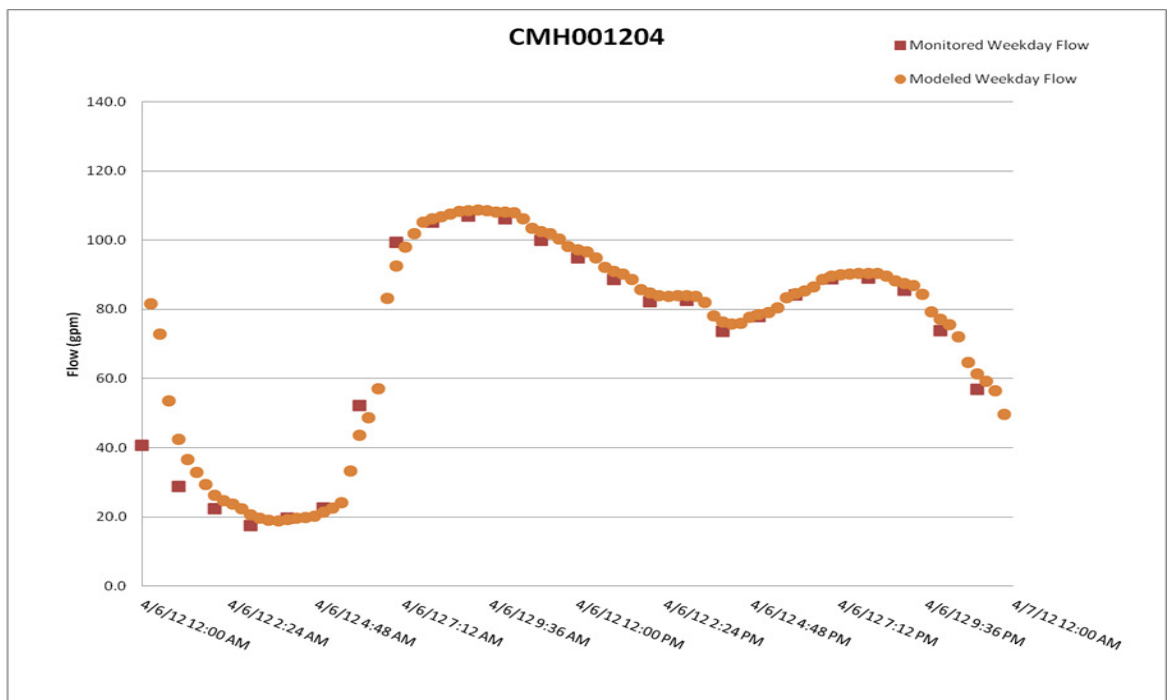
View of sensor placement and site hydraulics

FLOW MONITORING

- ◆ 2013 – 47 locations plus Water Reclamation Facility
 - No Rain
- ◆ 2011 – 33 locations plus Water Reclamation Facility
 - No Rain
- ◆ 2007 – 15 locations
 - Two Rain Events

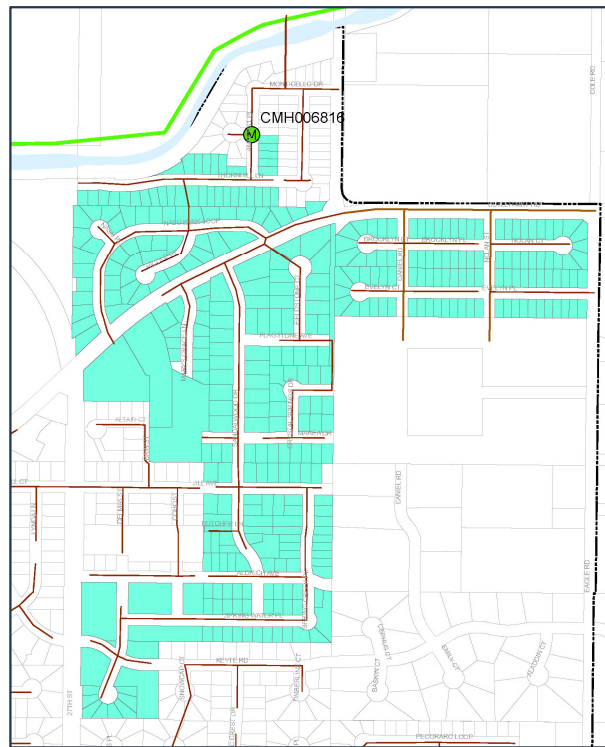


CALIBRATION



RESIDENTIAL LOADING

- Monitored 3 discrete residential areas of the system with a known number of units
 - 60, 75 and 65 gal/capita/day



COMPARATIVES

- Metcalf and Eddy, 2003 Textbook values

 - Low: 58, Medium: 72, High: 77

- Northwest Utilities

 - Bend: 67, Kennewick: 75, Nampa: 60

 - Spokane County: 100, Pocatello: 95

Note: All units in gal/capita/day

FLOW SUMMARY

- ◆ How much flow is generated in the system?
 - 5.9 mgd (average flow)
- ◆ What portion of that is residential and non-residential
 - Residential: 4.7 mgd, Non-Residential: 1.2 mgd
- ◆ What are the usage rates for residential customers
 - 67 gal/capita/day, (80-100 used previously) 160 gal/unit/day (180-230 used previously)
- ◆ What are the usage rates for non-residential customers
 - Com., Ind., Inst., etc.: 370 gal/acre/day (630-1300 used previously)
 - Schools: 300 gal/acre/day

NATIONAL TRENDS FOR DECLINING DEMAND

1. Weather
2. Economic Factors
 - The recession
3. Demographic Factors
 - Declining household size
 - Densification
4. Conservation
 - Imposed – Building code changes
 - Improved – Technology / efficiency
 - Incentivized – Pricing
 - Informed – Education programs

CONSERVATION: CODE / TECHNOLOGY

■ Energy Policy Act of 1992

- ✓ Effective in 1994 (1997 for toilets)
- ✓ A family living in a house built after 1994 uses 10-13 fewer gallons per day than the identical family in an older house ("North American Residential Water Usage Trends Since 1992," Table 5.3)



■ New Technology (i.e., LEED standards)

- ✓ New buildings can utilize 70-82% less water
- ✓ And 40-46% less energy than older buildings

FLOW PROJECTIONS

- Existing Average: 5.9 mgd
- 2033/Build-out Average: 10.8 mgd
 - All septic customers are sewerred
 - 10% increase in base loading rates
 - 20% peaking of OSU Campus and Medical Overlay
 - Additional 2,200 units loaded in Transit Corridors and Central Business District on specific parcels
- No Peaking or add'nl units - 2033/BO flow = 9.7 mgd

FLOW PROJECTIONS

• Q/A/Discussion?