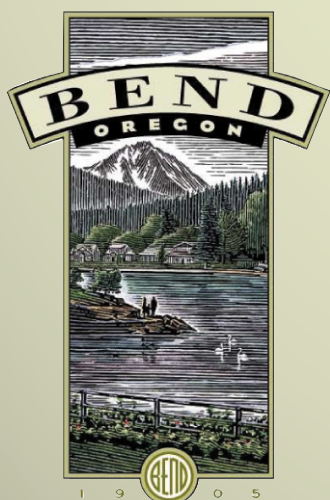




MURRAY, SMITH & ASSOCIATES, INC.  
ENGINEERS|PLANNERS

in association with



**CITY OF BEND**

# COLLECTION SYSTEM MASTER PLAN

CITY PROJECT NO. SW12AA

**VOLUME 2 OF 6**  
DECEMBER 2014

# VOLUME 1 OF 6

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**APPENDIX 1A**  
Sewer Infrastructure Advisory Group (SIAG)

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## **APPENDIX 1A**

### **SEWER INFRASTRUCTURE ADVISORY GROUP**

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#### **Introduction**

A collection system master plan (CSMP) is a comprehensive technical document that identifies current and anticipated deficiencies in a city's primary collection system. It pinpoints the geographic location(s) in need of improvement, assesses the condition, scope and scale of the deficiencies, focuses on affordable short- and long-term solutions, and provides data for analyzing future urban growth boundary (UGB) expansions. Master plans are required by state and federal regulatory agencies and must be kept current.

This CSMP updates the City of Bend's (City) 2007 master plan. The overall goals of the revised CSMP are to evaluate a wide range of system improvement options, to identify a plan that allows phasing of required projects over time so user rates can be increased more gradually, and to enable a more realistic construction schedule to be developed. In contrast, the 2007 master plan required many major projects to be implemented almost immediately.

This CSMP was created by incorporating both previously recommended viable solutions and new, innovative ideas. The result is a prioritized and focused CSMP corrects existing deficiencies and proactively anticipates future system improvement needs.

#### **Sewer Infrastructure Advisory Group (SIAG)**

To successfully meet the overall goals of the CSMP, City Council, the Bend Chamber of Commerce, and the Environmental Center teamed up to create a citizen advisory group. They jointly issued a news release in May 2012 seeking volunteers to serve on the Sewer Infrastructure Advisory Group (SIAG). Applicants were reviewed by all three organizations. Selected members represented a cross-section of Bend citizens. SIAG was tasked with providing input at every step of the master planning project to help ensure financially responsible and structurally sound collection system solutions that would effectively serve Bend residents for decades to come.

SIAG's collective expertise proved invaluable to the City and consultants working collaboratively through the technical exercise of creating the CSMP. Table 1A-1 summarizes the significant differences between a traditional master-planning process and one conducted in close coordination with a group of knowledgeable citizens. For more information, visit Bend's Sewer Infrastructure Advisory Group web page at: <http://bendoregon.gov/index.aspx?page=841>.

**Table 1A-1**  
**Traditional vs. Community-Involvement Master Planning**

<b>Traditional Master Planning</b>	<b>Bend's Master Planning</b>
Focus on engineering solutions	Focus on community values, then engineering solutions
Planning assumptions taken at face value	Planning assumptions closely scrutinized
Solution set limited	Solution set expanded
Approvers: City Council	Approvers: community members, City Staff, & City Council
No special decision-making modeling	Optimization modeling

Tab 1 of this appendix contains SIAG and City Council meeting agendas and minutes, work session summaries, community surveys, financial and technical data, SIAG presentations, and other data that informed SIAG's decisions in drafting the CSMP. (Note: These documents appear in this appendix exactly as they did when presented to SIAG and City Council; therefore, some retain a "Draft" stamp or watermark.) Tab 2 includes City- and SIAG-related press releases and other relevant news items of interest. This appendix summarizes SIAG's role in the overall CSMP process.

SIAG was comprised of 18 City Council-appointed community members with collective expertise in engineering, finance, the environment, land development, land-use law, economic development, community development, land use, and utility management. Following is a list of SIAG members and their affiliations at the time of selection:

Bruce Aylward, Ecosystem Economics  
Nathan Boddie, Physician  
Steve Galash, SIAG Steering Committee, Chamber of Commerce  
Pam Hardy, 1000 Friends of Oregon  
Andy High\*, Central Oregon Builders Association  
Craig Horrell, Deschutes Brewery  
Steve Hultberg, Radler White Parks & Alexander  
Charley Miller, Miller Lumber  
Craig Moore, Pepsi Cola Bottling Company  
Wes Price, CPA  
Lynn Putnam, former Water Commissioner for Tualatin Valley Water District  
John Rexford, Bend-La Pine School District  
Mike Riley, SIAG Steering Committee, Environmental Center  
Casey Roats\*, Roats Water System  
Sharon Smith, SIAG Steering Committee, Bryant Lovelien & Jarvis  
Stacy Stemach, Architect  
Dale Van Valkenburg\*\*, Brooks Resources  
Rob Von Rohr, Hickman, Williams & Associates, Inc.

\*Also served on the Bend Infrastructure Advisory Committee

\*\*Also served on the Bend Economic Development Advisory Board

## City and Consultant Team

Preparing materials for each SIAG meeting involved significant effort. City staff and the Consultant team engaged SIAG and the public with clear and concise presentations regarding complex technical issues associated with system analysis, identification of system deficiencies, and evaluation of solution alternatives.

Several iterations of each presentation were typically required, with a final review conducted by SIAG's Steering Committee. The core City and Consultant team responsible for preparing and making the presentations was comprised of the following members, with other advisors contributing periodically.

Craig Anderson, P.E. – Murray, Smith & Associated, Inc.  
Aaron Collett, P.E. – City of Bend  
Jeff Frey, P.E. – Optimatics  
Doug Gabbard – FCS Group  
Dennis Galinato, P.E. – Murray, Smith & Associates, Inc.  
Tom Hickmann, P.E. – City of Bend  
David Prull, P.E. – Clearwater Engineering Group  
Brian Rankin – City of Bend  
Paul Rheault – City of Bend  
Angie Sanchez-Virnoche – FCS Group  
Jon Skidmore – City of Bend  
David Stangel, P.E. – Murray, Smith & Associates Inc.  
Joel Wilson, P.E. – WCS Engineering

## SIAG's Assignment

As mentioned earlier, SIAG members were tasked with participating in a step-by-step development of the CSMP. They were asked to:

- Identify community priorities
- Review and evaluate short- and long-term collection system needs
- Identify a community supported financial strategy to pay for the needed infrastructure
- Consider the financial, engineering, economic, growth management and political implications of various alternatives
- Meet with community members to provide information on the CSMP project
- Provide updates and a final recommendation to City Council

SIAG met 21 times, from July 2012 to September 2014. This represents over 1,100 hours of volunteer time. The group was led by a three-member steering committee that included Steve Galash, Mike Riley, and Sharon Smith. The steering committee was confirmed by SIAG members after soliciting volunteers from within the group. The steering committee spent considerable additional time outside of SIAG meetings working with City staff and consultants. These efforts included the review of project related information, revising

presentations, coordinating with and presenting to other civic groups and informing the City Council. The process was completed in five major steps:

1. *Orientation:* SIAG members learned about projects already underway and the challenges facing the collection system. They took tours of lift stations and locations where sewage was backing up in manholes to better acquaint themselves with the existing collection system and visually evident deficiencies.
2. *Immediate Capacity Issues:* SIAG members assisted in identifying priority areas and solutions for immediate sewer capacity issues. They also participated in sizing decisions for the Colorado Lift Station, one of the selected projects.
3. *Optimization Inputs:* SIAG recommended policy-level decisions for the optimization model (population growth and density, redevelopment areas, flow), the solution sets that went into the model (pipes, pumps, storage, satellite treatment, conservation), and a financial strategy to pay for improvements. They also selected several sensitivity analyses to run, including water conservation and current and future loading conditions. SIAG's recommendations were informed by the engineering team to ensure they were technically sound, and compliant with state and federal standards.
4. *Solutions:* SIAG reviewed initial, intermediate, and final optimization results. Members also reviewed options for condition improvements, ongoing repair and replacement, and local area improvements, as well as various financial scenarios to pay for improvements and budget for ongoing replacement.
5. *Recommendations:* SIAG members made seven presentations to City Council during the course of the project to inform Council, and request acknowledgment and concurrence with SIAG's early decisions and their final recommendation. SIAG's early policy-level recommendations were approved by City Council, which helped guide subsequent work on the CSMP. This ensured not only community support for the CSMP, but also City Council understanding and approval. Decisions made by SIAG are documented in Table 1A-2 - Bend Sewer Infrastructure Advisory Group Decision Summary.

## **Decision Making**

As discussed, SIAG represented a broad range of experience and perspectives, with all members having an equal role in deliberations and decisions. SIAG meetings were professionally facilitated by Clark Worth and Libby Barg of Barney & Worth, Inc. consulting services. The ultimate goal of these meetings was consensus, but given the complexities of Bend's sewer collection system and range of stakeholder interests, unanimous agreement was not requisite for all SIAG decisions and recommendations. As decisions were reached, dissenting opinions were documented and recorded along with the majority's recommendations. SIAG members who represented or were affiliated with a community organization were encouraged to inform the organization's constituents of SIAG's work, and report any concerns or questions to SIAG.

## Recommendation Summary

SIAG's major CSMP recommendations:

- Immediate improvements to resolve existing collection system deficiencies and provide adequate capacity to serve existing land use approvals and anticipated land uses within the existing UGB through the 20-year planning horizon:
  - Southeast Interceptor
  - Colorado Lift Station
  - North Area Capacity Improvements
- Final optimization improvements to provide adequate capacity to serve anticipated land uses within the existing UGB through the 20-year planning horizon:
  - Approved unanimously
- Approved condition improvements:
  - Valhalla Odor /Corrosion Control improvements 2014 - @ \$1.6M
  - Plant Interceptor condition improvements 2014-2016 - @ \$5.4M
  - Specific lift station condition improvements 2014-2023 - @ \$7.9M (31 lift stations)
  - Other specific pipe condition improvements 2019-2023 - @ \$3.9M
  - Create a long term repair and replacement reserve budget to address aging infrastructure
- Funding scenarios:
  - Start building reserves now to replace aging/failing pipes in the future.
  - Put aside money in 2014 to start solving the problem of Bend's unsewered neighborhoods.
  - Borrow money to pay for improvement projects; pay back through revenues from sewer rates, system development charges and other fees.
  - Implement a higher sewer rate increase in 2014 to pay for immediately required improvements, then smaller increases over time that should keep pace with inflation.

**Table 1A-2**  
**Bend Sewer Infrastructure Advisory Group Decision Summary**  
**(Updated 12/15/14)**

Meeting	Decision / Feedback																										
<b>Meeting # 1: (July 19, 2012)</b> <b>Orientation</b>	<p>Nominated / approved Steve Galash, Mike Riley, Sharon Smith to serve on Steering Committee.</p> <p>Completed a preliminary community value ranking exercise: How important are the following community values on a scale of <i>1 (not important)</i> to <i>7 (very important)</i>.</p> <table> <tr> <th>Community Values</th><th>Ranking</th></tr> <tr> <td>Plan ahead for long-term wastewater services for our growing community</td><td>6.5</td></tr> <tr> <td>Better serve existing employment areas</td><td>6.4</td></tr> <tr> <td>Serve new employment areas</td><td>5.9</td></tr> <tr> <td>Enhance community livability</td><td>5.6</td></tr> <tr> <td>Protect the environment</td><td>5.5</td></tr> <tr> <td>Provide infrastructure for existing residents</td><td>5.5</td></tr> <tr> <td>Provide needed infrastructure for new residents</td><td>5.1</td></tr> <tr> <td>Ensure regulatory compliance</td><td>4.8</td></tr> <tr> <td>Minimize energy consumption</td><td>4.8</td></tr> <tr> <td>Minimize sewer system maintenance costs</td><td>4.6</td></tr> <tr> <td>Minimize operational challenges</td><td>4.1</td></tr> <tr> <td>Plan for today's lowest cost solution</td><td>3.4</td></tr> </table>	Community Values	Ranking	Plan ahead for long-term wastewater services for our growing community	6.5	Better serve existing employment areas	6.4	Serve new employment areas	5.9	Enhance community livability	5.6	Protect the environment	5.5	Provide infrastructure for existing residents	5.5	Provide needed infrastructure for new residents	5.1	Ensure regulatory compliance	4.8	Minimize energy consumption	4.8	Minimize sewer system maintenance costs	4.6	Minimize operational challenges	4.1	Plan for today's lowest cost solution	3.4
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Minimize operational challenges	4.1																										
Plan for today's lowest cost solution	3.4																										
<b>City Council Meeting</b> <b>September 5, 2012</b>	<p>Council approves a contract with Murray Smith and Associates, Inc. (MSA) in the amount of \$1,915,206 for the necessary engineering consultant work to create the Optimized Collection System Master Plan.</p>																										

Meeting	Decision / Feedback
<p><b>Meeting #2: (September 20, 2012)</b>  <b>Projects in Progress: Water Reclamation Facility and Southeast Interceptor</b></p> <p><i>Discussion question:</i> Are there remaining questions / issues regarding the decision to move forward with the wastewater reclamation facility (WRF) expansion?</p>	<p><b>SIAG WRF feedback:</b></p> <ul style="list-style-type: none"> <li>• SIAG’s task is to assure community priorities are being met through the collection system master planning process.</li> <li>• The group acknowledged the WRF decision has been made and the model will be biased, but they want to move on to collection system planning.</li> <li>• Acknowledging the WRF decision has been made should not be considered an endorsement of the project by SIAG.</li> </ul>
<p><i>Discussion question:</i> What is the best option for moving forward on the SE Interceptor?</p>	<p><b>SIAG SE Interceptor feedback:</b></p> <ul style="list-style-type: none"> <li>• Lacking adequate information to compare options the Advisory Group declined to provide feedback on the best option for moving forward on the SE Interceptor.</li> <li>• Acknowledged City Council would make the decision on the SE Interceptor.</li> <li>• Restated their interest in moving forward on the collection system master planning process.</li> </ul>
<p><b>City Council Meeting</b>  <b>October 3, 2012</b></p>	<p>Steve Galash, Nathan Boddie and Jon Skidmore met with the City Council during the work session to discuss the Council’s priorities for SIAG and the Collection System Master Plan.</p> <ul style="list-style-type: none"> <li>• Steve explained that SIAG will need to work with Council on specific funding issues and the concept of “rate tolerance.”</li> <li>• Council explained that immediate solutions need to focus on employment lands and areas with economic development potential.</li> </ul>
<p><b>Meeting #3: (October 25, 2012)</b>  <b>What’s the Problem? What are our Priorities?</b>  Advisory Group members assisted in identifying priority areas for immediate sewer capacity solutions.</p>	<p><b>Priority areas selected by SIAG for immediate capacity solutions:</b></p> <ul style="list-style-type: none"> <li>• Area 2 (Cascade Village Mall)</li> <li>• Area 3 (West Side Pump Station)</li> <li>• Area 5 (Southwest / OSU Cascades area)</li> </ul>

Meeting	Decision / Feedback
<p><b>Meeting #4: (November 15, 2012)</b>  <b>Sewer System Funding and Financing</b></p> <p><i>Discussion question:</i> Should the Advisory Group work to help define affordability now—or do we wait for more information on possible solutions?</p> <p><i>Discussion question:</i> Are Bend’s current Financial Policies and Principles appropriate for sewer collection system funding? Are there any suggestions for City Council consideration?</p>	<p><b>SIAG established affordability goals:</b></p> <ul style="list-style-type: none"> <li>• Use the total cost of Bend’s utilities—water, sewer, stormwater—to measure affordability.</li> <li>• Work to ensure needed sewer projects are completed at the lowest practicable cost.</li> <li>• Use creative funding / financing strategies and project scheduling to minimize impacts on Bend ratepayers.</li> <li>• Activate Bend’s utility assistance program to reach eligible low income, elderly and disabled households.</li> <li>• Ensure all classifications of sewer ratepayers pay a fair share of costs.</li> </ul> <p>SIAG agreed to present a new financial policy / principle to the City Council for consideration: <i>“Build and maintain adequate financial reserves based on a 20-year Capital Improvement Plan.”</i></p>
<p><b>City Council Meeting</b>  <b>December 19, 2012</b></p>	<p>Steve Galash, Mike Riley, Sharon Smith and Jon Skidmore met with the Council during the work session to update the Council on the immediate solutions.</p> <ul style="list-style-type: none"> <li>• Sharon Smith explained that SIAG recommended focusing on Area 2 (Cascade Village Mall), Area 3 (West Side Pump Station) and Area 5 (Southwest / OSU Cascades area).</li> <li>• Mike Riley explained that SIAG will recommend that the Council adopt a policy requiring the city to build reserves for future infrastructure capital projects (build reserves as part of the rate increases).</li> <li>• Jon Skidmore explained that the sewer fund has \$20M in reserves (or will) to pay for the immediate solutions.</li> </ul>

Meeting	Decision / Feedback
<p><b>Meeting #5: (January 17, 2013)</b>  <b>Immediate Capacity Challenges and Solution</b></p> <p>City presented recommended solutions for immediate challenges in the areas prioritized by SIAG at their October meeting. SIAG considered solutions and offered recommendations for City Council action.</p>	<p><b>SIAG's recommended solutions for immediate challenges:</b></p> <ul style="list-style-type: none"> <li>• Areas 3 &amp; 5: "Combo Solution" New <b>Colorado Lift Station and Force Main to 2nd Street</b> \$3,890,000</li> <li>• Area 2: "Solution 5" <b>South Force Main to Butler Market</b> \$5,733,000 (<i>with the understanding SIAG would like a second look after the optimization process</i>).</li> </ul>

Meeting	Decision / Feedback
<b>City Council Meeting January 30, 2013</b>	<p>Steve Galash, Mike Riley, Tom Hickman and Jon Skidmore met with the Council during the regular meeting to describe SIAG’s specific recommended solutions for the three capacity-limited areas.</p> <ul style="list-style-type: none"> <li>• The group recommended two sets of solution projects that will address the capacity issues in the three capacity-limited areas.</li> <li>• The “combo” solution will be a regional type pump station to replace the existing, undersized Shevlin Hixon pump station. It also includes a new force main from the new pump station to 2<sup>nd</sup> Street. This solution relieves pressure for both Area 5 (Southwest / OSU Cascades) and Area 3 (West Side Pump Station).</li> <li>• This new “Colorado Pump Station” will provide capacity for the southwest area including industry and the potential OSU Cascades. Further, the pump station will relieve pressure on the existing West Side Pump Station (Area 3) by intercepting flow that now runs to the West Side Pump Station.</li> <li>• The Area 2 recommendation consists of designing pipeline solutions for the northern triangle area that will relieve flow in the very northern area near the mall and the southern area closer to the River House.</li> <li>• At this time, SIAG recommends to only proceed with design of these solutions and to wait on construction. This is recommended for a few reasons. <ul style="list-style-type: none"> <li>i. First, SIAG wants to have a design ready to meet development pressure.</li> <li>ii. Second, SIAG doesn’t want to construct any improvements unless necessary prior to completion of the optimization modeling so that the ultimate solution has been reviewed by the Optimization modeling.</li> </ul> </li> </ul>
<b>City Council Meeting February 6, 2013</b>	<p>Council voted unanimously to authorize staff to proceed designing for the two immediate short-term solutions identified by SIAG.</p>

Meeting	Decision / Feedback																																		
<p><b>Meeting #6: (February 7, 2013)</b> <b>Modeling and Optimization</b></p> <p>The City presented information about land use inputs and asked for SIAG input on three topics: base assumption, development scenarios, and consideration of extra capacity for special areas.</p> <p>For vacant and redevelopable residential lands, the median densities listed to the right were applied to the buildable acres for each property to estimate the number of units on each property at build-out.</p>	<p><b>SIAG made the following recommendations for the modeling land use inputs:</b></p> <p>City-recommended base assumptions: <b>OK</b></p> <ul style="list-style-type: none"><li>• Development on Platted/Approved Lots – Development densities on individual parcels. Recommendation: Assume what was approved by the city is constructed, and that single-lots are developed with a single unit.</li><li>• Rights-of-Way – Amount of right-of-way take out of large acreages. Recommendation: Use 21% from recent research approved by Land Conservation and Development Commission (LCDC).</li><li>• Parks and Schools – Location of future large parks and elementary, middle, and high schools. Recommendation: Use the 2010 School Siting Plan for best estimates and coordinate with Bend-Metro Parks &amp; Recreation District.</li><li>• People per Household – Factor converts households to people. Recommendation: 2.4 people/household is a stable estimate per 2010 U.S. Census.</li><li>• Density by General Plan Designation – To estimate the number of new dwelling units on vacant and re-developable residential lands, SIAG recommended using the median of allowable residential densities by plan designation. Gross densities in the Development Code were converted to net densities, and then the median was calculated as follows:</li></ul> <table><tr><th rowspan="2">Zones</th><th colspan="2">Gross Density</th><th colspan="2">Net Density</th><th rowspan="2">Median Used in CSMP</th></tr><tr><th>Minimum</th><th>Maximum</th><th>Minimum</th><th>Maximum</th></tr><tr><td>RL</td><td>1.1</td><td>2.2</td><td>1.4</td><td>2.8</td><td>2</td></tr><tr><td>RS</td><td>2</td><td>7.3</td><td>2.5</td><td>9.2</td><td>6</td></tr><tr><td>RM</td><td>7.3</td><td>21.7</td><td>9.2</td><td>27.5</td><td>18</td></tr><tr><td>RH</td><td>21.7</td><td>43</td><td>27.5</td><td>54.4</td><td>41</td></tr></table> <ul style="list-style-type: none"><li>• Special areas for additional capacity: – OSU-Cascade Campus, Central Area, and hospital area (preliminary decision).</li></ul>	Zones	Gross Density		Net Density		Median Used in CSMP	Minimum	Maximum	Minimum	Maximum	RL	1.1	2.2	1.4	2.8	2	RS	2	7.3	2.5	9.2	6	RM	7.3	21.7	9.2	27.5	18	RH	21.7	43	27.5	54.4	41
Zones	Gross Density		Net Density		Median Used in CSMP																														
	Minimum	Maximum	Minimum	Maximum																															
RL	1.1	2.2	1.4	2.8	2																														
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RM	7.3	21.7	9.2	27.5	18																														
RH	21.7	43	27.5	54.4	41																														

Meeting	Decision / Feedback
<p><b>Meeting #7: (February 21, 2013)</b>  <b>Criteria and Life Cycle Costs</b>  The City presented information on “special areas” and a possible approach for the demand forecast, approach and asked for a final review and recommendation from SIAG.</p> <p>The City presented information on the purpose and need for viability criteria and described a process vendors can use to prove their technology or product meets the viability criteria.</p> <p>The City presented information about life cycle cost analysis and asked for SIAG feedback</p>	<p><b>SIAG members agreed on the following special areas:</b></p> <ul style="list-style-type: none"> <li>• OSU Cascade Campus area</li> <li>• Central Area Plan</li> <li>• Hospital zone</li> </ul> <p>Staff agreed to track / provide a list of the companies that are proposing technology through the viability review process</p> <p>SIAG voted unanimously to support a 40-year analysis period.</p>

Meeting	Decision / Feedback
<p><b>Meeting #8: (March 7, 2013)</b>  <b>Pipes, Pumps, and Storage for Optimization</b></p> <p>The City presented recommendations for pumps, pipes and storage options to be included in the optimization model and asked SIAG for feedback.</p>	<p><b>SIAG concurred with the pipe recommendations:</b>  Base cost: PVC pipes and open cut trench</p> <p><b>Unique costs:</b></p> <ul style="list-style-type: none"> <li>• Special pipe installation techniques (bore and jack / directional drilling) assigned in optimization first run</li> <li>• Pipe rehabilitation alternatives (slip lining, cured in place pipe, pipe bursting) assigned in optimization refinement phase</li> </ul> <p>SIAG concurred with the pump stations recommendations. SIAG asked to look at pump station buffers when the facilities can be shown on a map.</p> <ul style="list-style-type: none"> <li>• Area and regional pump stations considered in optimization (not individual pump stations or vacuum sewers)</li> </ul> <p>SIAG concurred with the recommendation to include in-line storage. SIAG asked that off-line storage also be included because of its value as a temporary solution or provide phasing opportunities. SIAG asked to consider possible in-line storage solutions once the solution map has been prepared.</p> <ul style="list-style-type: none"> <li>• Inline storage considered in Optimization.</li> </ul>
<p><b>Meeting #9: (April 4, 2013)</b>  <b>Satellite Treatment Alternatives for Optimization</b></p> <p><i>Discussion question:</i> The City presented an overview of treatment information used in the Optimization model and provided information about satellite treatment alternatives. SIAG provided feedback on considerations used by the engineering team when selecting satellite treatment as a solution option for Optimization.</p>	<p><b>SIAG concurred with the recommendation:</b></p> <p><b>Satellite Treatment System(s) must:</b></p> <ul style="list-style-type: none"> <li>• Offer a year-round solution</li> <li>• Have lower or same cost than collection system</li> <li>• Have known costs</li> <li>• Be tailored to location</li> <li>• Include treatment and disposal</li> </ul> <p><b>Should also consider:</b></p> <ul style="list-style-type: none"> <li>• Odor</li> <li>• Traffic</li> <li>• Public acceptance</li> </ul>

Meeting	Decision / Feedback
<p><b>Meeting #10: (May 16, 2013)</b>  <b>Optimization Input Assumptions</b></p> <p>The City checked in with SIAG on opportunities for process improvements and reviewed loading rates and approach to sensitivity analysis.</p>	<p><b>SIAG requested the following process improvements:</b></p> <ul style="list-style-type: none"> <li>• Get materials in advance: partial / draft materials are acceptable</li> <li>• Review prior meeting decision at the beginning of each meeting</li> <li>• Publicize dates / times of Steering Committee meetings</li> </ul> <p>City shared results of new data that shows an average residential flow of 67 per capita per day. This is a significant decrease from the flow used in the previous master plan (80 to 100 per capita per day).  Sensitivity analysis discussion was postponed to 6/20/13 SIAG meeting.</p>
<p><b>Meeting #11: (June 20, 2013)</b>  <b>Sensitivity Analysis / Community Outreach Plan</b></p> <p><i>Objective:</i> SIAG understanding of planned approach to sensitivity analysis and reviewed community outreach plan.</p>	<p>SIAG reviewed the community outreach plan. They recommended adding more community groups to receive presentations. SIAG also asked for materials and presentation for public outreach to be developed in the fall, in preparation for January 2014 outreach effort.</p> <p>The sensitivity analysis approach was carried over from the 5/16/13 SIAG meeting. SIAG acknowledged that sensitivity analysis could be used for the following items:</p> <ul style="list-style-type: none"> <li>• Cost for Water Treatment and Pipeline alternatives.</li> <li>• Life cost analysis</li> <li>• Electricity/ power costs</li> <li>• Concept of value and useful remaining life for gravity pipe and manhole type solutions.</li> <li>• Loading and growth rates</li> <li>• Wet weather calibration</li> </ul>
<p><b>Meeting #12: (July 11, 2013)</b>  <b>Deficiency Analysis Results: Existing and UGB Build-Out Conditions</b></p> <p><i>Objective:</i> SIAG reviewed extent of collection system problems that need to be fixed.</p>	<p>The City presented the results of the modeling efforts to date. 90%+ of the sewer system has been modeled. Modeling provides a much better understanding of the deficiencies, challenges and opportunities within the system. Results show extent of the problem areas is less than what was covered in the 2007 Master Plan.</p> <p>SIAG voted to forward a recommendation to City Council to support additional flow monitoring and data collection.</p> <p>The community outreach plan was approved as revised to incorporate comments from the 6/20/2103 SIAG meeting.</p>

Meeting	Decision / Feedback
<p><b>Meeting #13: (July 25, 2013)</b>  <b>Colorado Lift Station</b></p> <p><i>Objectives:</i></p> <ul style="list-style-type: none"> <li>• SIAG review of preliminary information for Colorado Lift Station and related conveyance improvements</li> <li>• SIAG recommendation on lift station sizing for design</li> </ul>	<p>SIAG reviewed options for the Colorado lift station sizing based on the area that would be served.</p> <p>SIAG recommended proceeding with design on Option 3 (2,300 gallons per minute), with the assurance design not go too far without the initial Optimatics results which will inform the final design.</p>
<p><b>City Council Work Session</b>  <b>Wednesday, August 7, 2013</b></p>	<p>Jon Skidmore, Tom Hickmann, Craig Horrell and Dale Van Valkenburg updated City Council during a work session, focusing on the modeling efforts done to date and the 7/25/2013 SIAG recommendation for the Colorado lift station.</p> <p>Council thanked SIAG for their work on guiding the sewer collection system master planning.</p>
<p><b>Meeting #14: (September 12, 2013)</b>  <b>Financing Master Plan Improvements</b></p> <p><i>Objectives:</i></p> <ul style="list-style-type: none"> <li>• Review Bend's current financial position</li> <li>• Review alternative funding methods</li> <li>• Provide SIAG a "preview" of funding available at \$65.00 rate benchmark</li> </ul>	<p><b>Summary of committee members' comments:</b></p> <ul style="list-style-type: none"> <li>• A mix of funding scenarios should be used to pay for projects, as well as create a reasonable reserve.</li> <li>• Must be sensitive to the affordability for citizens.</li> <li>• Have a specifically identified rate surcharge identified on the bill (like the Stormwater charge). It makes it easy for a future City Council to adjust once debts are paid. (They can keep it to fund reserves, for example.)</li> </ul>

Meeting	Decision / Feedback
<p><b>Meeting #15: (November 14, 2013)</b>  <b>Review Initial Optimization Results</b></p> <p>Joel Wilson (WCS Engineering) outlined optimization solutions and reviewed high-level takeaways.</p>	<p><b>Main Takeaways from SIAG Roundtable Discussion</b></p> <ul style="list-style-type: none"> <li>• SE interceptor is needed.</li> <li>• More feasibility work is needed on NW interceptor.</li> <li>• Stormwater impacts need to be studied further.</li> <li>• Mid R is a reasonable target.</li> <li>• Just reworking existing lines limits capacity and growth.</li> </ul>
<p><b>Meeting #16: (November 21, 2013)</b>  <b>Review Initial Optimization Results, Part 2</b></p>	<p><b>SIAG SEI Recommendation:</b></p> <ul style="list-style-type: none"> <li>• Move ahead with bid documents to restart construction in 2014.</li> <li>• Revisit the topic to determine whether a 3-year expedited construction schedule is warranted.</li> </ul> <p><i>“Let’s go: we’ve been talking for 8 years.”</i>  <i>“It’s time for a real solution.” “We’re stuck with big costs after doing nothing for 30 years.”</i>  <i>“The SE Interceptor is essential for the whole system – proceed with haste.”</i>  <i>“I thought the SE Interceptor was a boondoggle, now I am totally convinced we need to do this right away.”</i>  <i>“We need the SE Interceptor under any scenario: it is essential for the whole system to function.”</i></p>
<p><b>City Council Work Session</b>  <b>Wednesday, December 4, 2013</b></p>	<p>Jon Skidmore, Tom Hickmann, Mike Riley and Steve Galish updated City Council during a work session, focusing on the initial optimization results.</p> <ul style="list-style-type: none"> <li>• Steve Galish provided an update on prioritizing employee lands.</li> <li>• Mike Riley provided an update on SIAG’s recommendation for the SE Interceptor to move forward in the spring.</li> </ul>

Meeting	Decision / Feedback
<p><b>Meeting #17: (January 16, 2014)</b>  <b>Review Intermediate Optimization Results</b></p> <p>Joel Wilson (WCS Engineering) presented intermediate optimization results.</p>	<p><b>Intermediate Results:</b></p> <ol style="list-style-type: none"> <li>1. The Intermediate Solution is generally consistent with the Initial Solution</li> <li>2. Optimization eliminated more north area lift stations, adding some capital costs, however, reducing overall life cycle costs</li> <li>3. The <u>SE Interceptor</u>, <u>Colorado Lift Station</u> and <u>Riverhouse Diversion</u> selected as high priority projects</li> <li>4. Optimized solutions for existing, 10-year, 20-year and 20-year plus 25% loading, provide insight for project phasing</li> <li>5. Costs have increased due to inclusion of some condition based improvements</li> </ol> <p><b>SIAG Recommendations:</b></p> <ul style="list-style-type: none"> <li>• Run 10% water conservation scenario for Mid-R</li> <li>• Utilize Mid R loading only for the final optimization runs and for subsequent capital improvement plan development</li> <li>• Provide more financial information to SIAG to help inform upcoming phasing decisions</li> </ul>

Meeting	Decision / Feedback
<p><b>Meeting #18: (March 13, 2014)</b>  <b>Financial Discussion</b></p> <p>David Stangel, MSA, and Angie Sanchez, FCS Group provided SIAG an overview of the master plan cost components and funding scenarios.</p>	<p><b>The following cost layers were identified:</b></p> <ol style="list-style-type: none"> <li>1. Ongoing Operation and Maintenance</li> <li>2. Collection System Capacity (Optimization)</li> <li>3. Water Reclamation Facility CIP</li> <li>4. Collection System Condition CIP</li> <li>5. Collection System Ongoing Replacement</li> </ol> <p>SIAG reviewed various financial scenarios presented by Angie Sanchez, FCS Group.</p> <p><b>SIAG's suggestions for financial scenarios:</b></p> <ul style="list-style-type: none"> <li>• Look at effect of low-interest loans</li> <li>• Show growth at higher rate: the current assumption is too conservative.</li> <li>• Consider SDC increases (premature?)</li> <li>• Faster rate increases: early step-up to lower future cost curve</li> <li>• Extra strength charges: potential for added revenues?</li> <li>• Investigate timing of \$5M yearly repair and rehabilitation scenario</li> <li>• Phase-in repair and rehab over 5-7 years: is that too long?</li> <li>• Analyze minimum increase needed to cover mandatory costs</li> </ul>

Meeting	Decision / Feedback
<p><b>Meeting #19 (April 17, 2014)</b>  <b>Final Optimization Results</b></p> <p>Joel Wilson (WCS Engineering) presented intermediate optimization results.</p> <p>David Stangel (MSA) presented information condition improvements, ongoing repair / replacement, and local area improvements.</p>	<p><b>Final Optimization Results</b>  Are these the right projects, phased appropriately over the next 20 years?  <b>Approved (unanimously)</b></p> <p><b>Condition Improvements</b>  Projects, current timing and costs:</p> <ul style="list-style-type: none"> <li>• Valhalla Odor /Corrosion Control improvements 2014 @ \$1.6M</li> <li>• Plant Interceptor condition improvements 2014-2016 @ \$5.4M</li> <li>• Specific lift station condition improvements 2014-2023 @ \$7.9M (31 lift stations)</li> <li>• Other specific pipe condition improvements 2019-2023 @ \$3.9M</li> </ul> <p><i>Any questions about the need or timing for these projects?</i>  <b>Approved</b></p> <p><b>Ongoing Repair / Replacement</b>  Begin funding in year 10 (2024); ramp up funding level to approximately \$5M/year over 10 years  <i>Is this appropriate?</i>  <b>Approved, with the following suggestions:</b></p> <ul style="list-style-type: none"> <li>• Start saving money sooner than 10 years out for pipeline replacement</li> <li>• Begin building reserve in 2017 and 2018 to smooth spending beyond 2016</li> <li>• Develop program that stabilizes the spending over time</li> <li>• Request for May 1 SIAG meeting: show impacts on rate model</li> </ul> <p><b>Local Area Improvements</b>  Two categories: areas currently served by septic and areas where the current system does not operate. City to proactively address issue, start funding \$1M/yr in 2017 and support development of a program.  <i>Is this appropriate?</i>  <b>Approved, with the following suggestions:</b></p> <ul style="list-style-type: none"> <li>• Begin \$1M in 2015 (understanding this may not be the right number, ultimately)</li> <li>• This is a big issue; requires a separate stakeholder process that involves impacted property owners</li> </ul>

Meeting	Decision / Feedback																																												
<p><b>Meeting #20 (May 1, 2014)</b> <b>Funding Prioritization</b></p> <p>David Stangel, MSA, recapped final optimization results and the cost components decisions.</p> <p>Angie Sanchez Virnoche, FCS Group, provided the financial plan components and gave an overview of the funding scenarios.</p> <p>The advisory group used an interactive rate model operated by FCS Group to compare impacts to ratepayers under different rate increase scenarios.</p>	<p><b>Funding Scenarios Discussion Question</b> Which funding scenario is best to fund collection system improvements and support community values?</p> <p><b>SIAG Recommendation</b></p> <ul style="list-style-type: none"><li>• Start building reserves now to replace aging/failing pipes in the future.</li><li>• Put aside money now to start solving the problem of Bend’s unsewered neighborhoods.</li><li>• Borrow money to pay for projects, paid back through revenues from sewer rates, system development charges and other fees.</li><li>• Start with a higher rate increase now to catch up, then smaller increases / rate stability.</li></ul> <p><b>Proposed Rate Adjustment for 10-Year Rate Model</b></p> <table><tr><th></th><th>FY 2015</th><th>FY 2016</th><th>FY 2017</th><th>FY 2018</th><th>FY 2019</th><th>FY 2020</th><th>FY 2021</th><th>FY 2022</th><th>FY 2023</th><th>FY 2024</th></tr><tr><td>Bill Difference</td><td>\$3.99</td><td>\$1.23</td><td>\$1.26</td><td>\$1.30</td><td>\$1.33</td><td>\$1.36</td><td>\$1.40</td><td>\$1.43</td><td>\$1.47</td><td>\$1.51</td></tr><tr><td>Residential Monthly Bill</td><td>\$48.36</td><td>\$49.60</td><td>\$50.86</td><td>\$52.16</td><td>\$53.49</td><td>\$54.85</td><td>\$56.25</td><td>\$57.69</td><td>\$59.16</td><td>\$60.66</td></tr><tr><td>Proposed Rate Increase</td><td>9.00%</td><td>2.55%</td><td>2.55%</td><td>2.55%</td><td>2.55%</td><td>2.55%</td><td>2.55%</td><td>2.55%</td><td>2.55%</td><td>2.55%</td></tr></table> <p>Existing monthly rate: \$44.37</p>		FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Bill Difference	\$3.99	\$1.23	\$1.26	\$1.30	\$1.33	\$1.36	\$1.40	\$1.43	\$1.47	\$1.51	Residential Monthly Bill	\$48.36	\$49.60	\$50.86	\$52.16	\$53.49	\$54.85	\$56.25	\$57.69	\$59.16	\$60.66	Proposed Rate Increase	9.00%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%
	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024																																			
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<p><b>City Council Work Session</b> <b>Wednesday, May 21, 2014</b></p>	<p><b>SIAG presented</b></p> <p>Steering Committee members Sharon Smith, Mike Riley, and Steve Galash presented SIAG’s May 1, 2014 SIAG recommendation to City Council. Council members asked questions and got additional feedback from the Steering Committee and other SIAG members present.</p> <p>On June 18, 2014, the Bend City Council adopted SIAG’s recommended initial 9% rate increase, with one modification—to begin the increase on October 1, 2014 instead of July 1, 2014.</p>																																												

Meeting	Decision / Feedback										
<b>City Council Meeting June 18, 2014</b>	City Council adopted SIAG's recommended initial 9% rate increase, with one modification—to begin the increase on October 1, 2014 instead of July 1, 2014.										
<b>Meeting #21 (September 25, 2014) Final Recommendation CIP/Funding</b>	<p>SIAG unanimously voted to make the following recommendation to Bend City Council:</p> <p>The Sewer Infrastructure Advisory Group recommends Bend City Council adopt the Collection System Master Plan after consideration of public comments.</p> <div> <h3 style="text-align: center;">My Recommendation</h3> <table border="1"> <caption>My Recommendation Data</caption> <thead> <tr> <th>Recommendation</th> <th>Number of Votes</th> </tr> </thead> <tbody> <tr> <td>1. Support the recommendation</td> <td>8</td> </tr> <tr> <td>2. Support with further comments</td> <td>3</td> </tr> <tr> <td>3. Do not support</td> <td>0</td> </tr> <tr> <td>4. Not ready to vote</td> <td>0</td> </tr> </tbody> </table> </div>	Recommendation	Number of Votes	1. Support the recommendation	8	2. Support with further comments	3	3. Do not support	0	4. Not ready to vote	0
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1. Support the recommendation	8										
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3. Do not support	0										
4. Not ready to vote	0										

Meeting	Decision / Feedback
<b>Meeting #22 (October 6, 2014)</b> <b>SIAG Sewer Policies</b>	<p>SIAG approved the following sewer policies for consideration by Bend City Council:</p> <ol style="list-style-type: none"> <li>1. All new development within the Urban Growth Boundary should be connected to City sewer.</li> <li>2. The City is the primary provider of sewage collection and treatment services for the City's service area under Statewide Planning Goal 11.</li> <li>3. To reduce the reliance on individual sewage disposal systems within the Urban Growth Boundary the City will work with unsewered neighborhoods to find solutions for sewer service.</li> <li>4. The City shall collect a sufficient amount of revenue to allow the creation of capital project reserves and to replace aging infrastructure in addition to operational needs of the utility.</li> <li>5. Staff shall report to Council on an annual basis regarding the status of the Collection System Master Plan, Capital Improvement Projects and capacity issues within the collection system.</li> <li>6. The City will annually update its financial model as part of the review of sewer rates and report to Council on any changes in the 20-year financial outlook and subsequent rate impacts.</li> <li>7. The master plan shall be updated at least every 5 years with official review and adoption by Council.</li> <li>8. The preference of the City is to serve development through gravity conveyance and use of the Waste Water Reclamation Facility.</li> <li>9. If lift stations are required to serve new development, regional pump stations shall be relied upon to the extent practicable versus individual or smaller lift stations.</li> <li>10. These policies will be implemented through the City of Bend Public Improvement Construction Procedure Standards &amp; Specifications.</li> <li>11. The City should look for reasonable opportunities to decommission energy- and maintenance-intensive lift stations as part of new development or other City infrastructure projects.</li> </ol> <p>The City will consider the conservation and water reuse measures in the Water Management and Conservation Plan in infrastructure planning to reduce overall impacts to the sewer collection and treatment system.</p>
<b>City Council Meeting</b> <b>Wednesday, December 3, 2014</b>	<p>City Council approved the CSMP.</p>





## **Bend Sewer Infrastructure Advisory Group**

### **Meeting #1: Orientation**

**July 19, 2012 / 4 to 6 p.m.**

**Bend Park & Recreation (799 SW Columbia Street)  
The Riverbend Community Room**

4:00 p.m.	• Welcome	Jon Skidmore Assistant City Manager
4:05	• Introductions	Libby Barg Barney & Worth
4:30	• Advisory Group assignment	Libby Barg
4:40	• Overview: Bend's sewer system	Tom Hickmann, P.E. City Engineer / Assistant Public Works Director
5:10	• Advisory Group values	Libby Barg
5:25	• Advisory Group Questions & Comments	Libby Barg
5:45	• Next Steps <ul style="list-style-type: none"><li>• Meeting #2: August 23, <i>Facilities Tour</i></li><li>• Meeting #3: September, <i>Community Priorities</i></li><li>• Meeting #4: TBD, <i>Immediate Challenges and Solutions</i></li><li>• Meeting #5: TBD, <i>Finance Options</i></li><li>• Meeting #6: TBD, <i>Preliminary Modeling Results</i></li><li>• Meeting #7: TBD, <i>Recommendations</i></li></ul>	Jon Skidmore
5:50	Public Comment	Libby Barg
6:00 p.m.	Adjourn	

For more information, visit the Sewer Infrastructure Advisory Group webpage:

<http://bendoregon.gov/index.aspx?page=841>

## **Sewer Infrastructure Master Plan**

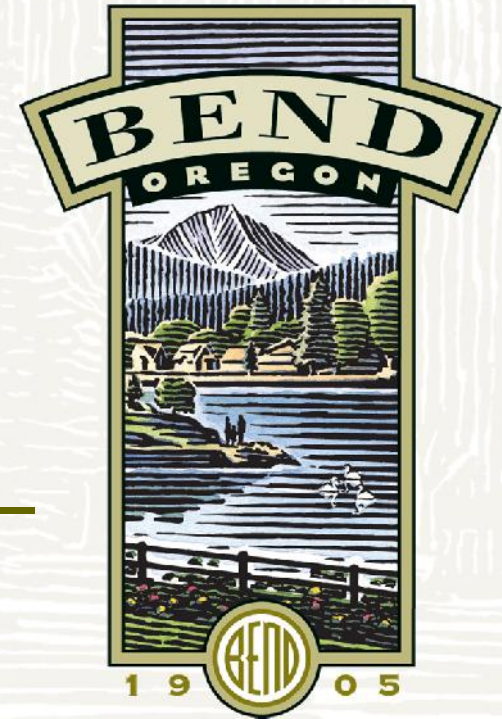
### **Community Values: Electronic Polling Results Advisory Group Meeting #1 (July 19, 2012)**

<b>Community Value</b>	<b>Ranking*</b>
Plan ahead for long-term wastewater services for our growing community	6.5
Better serve existing employment areas	6.4
Serve new employment areas	5.9
Enhance community livability	5.6
Protect the environment	5.5
Provide infrastructure for existing residents	5.5
Provide needed infrastructure for new residents	5.1
Ensure regulatory compliance	4.8
Minimize energy consumption	4.8
Minimize sewer system maintenance costs	4.6
Minimize operational challenges	4.1
Plan for today's lowest cost solution	3.4

\*How important are the following community values on a scale of 1 (*not important*) to 7 (*very important*).

# City of Bend Sewage Collection System Status

SIAG Presentation



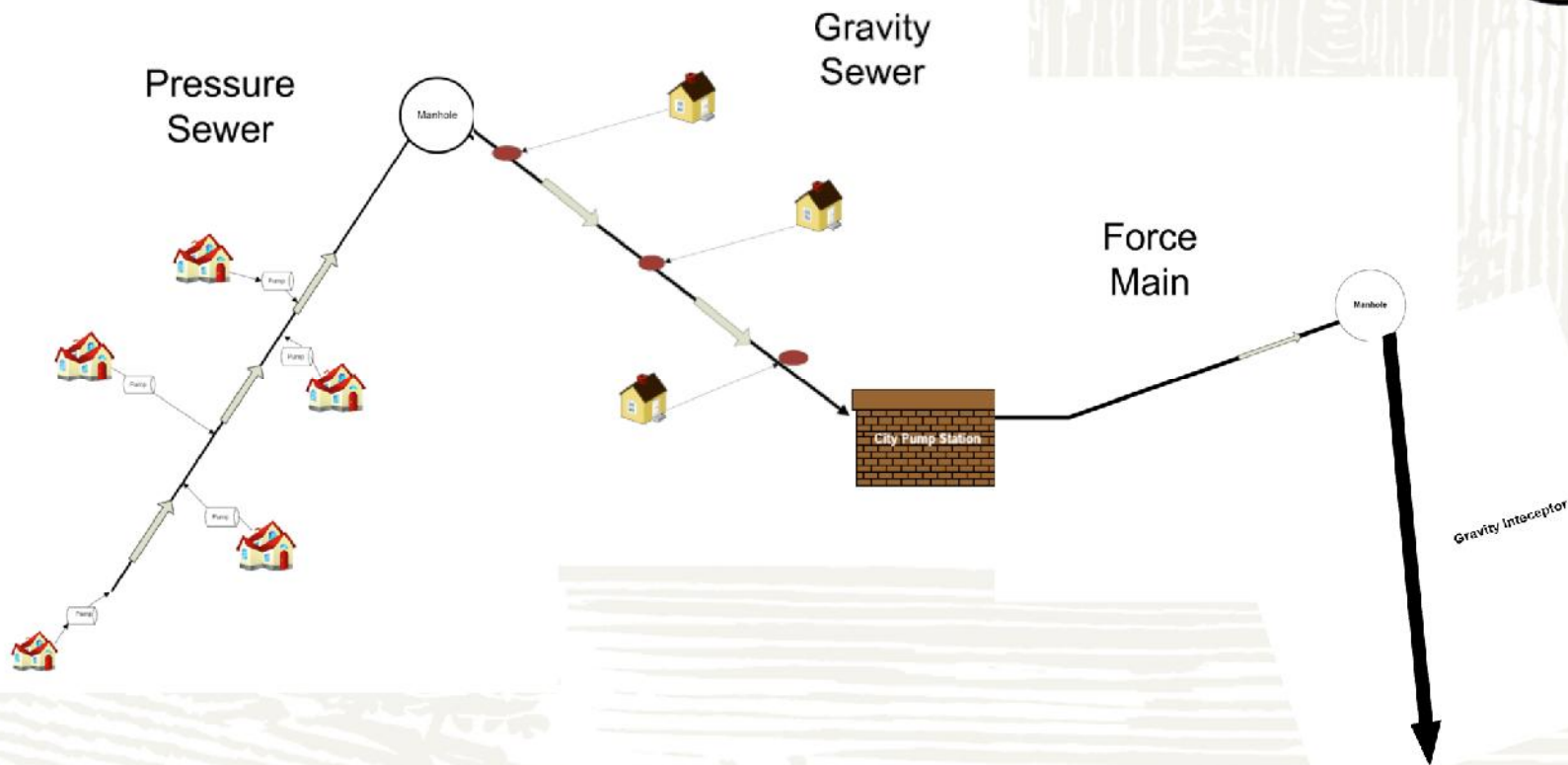
**July 19, 2012**

# Existing Infrastructure and Assets

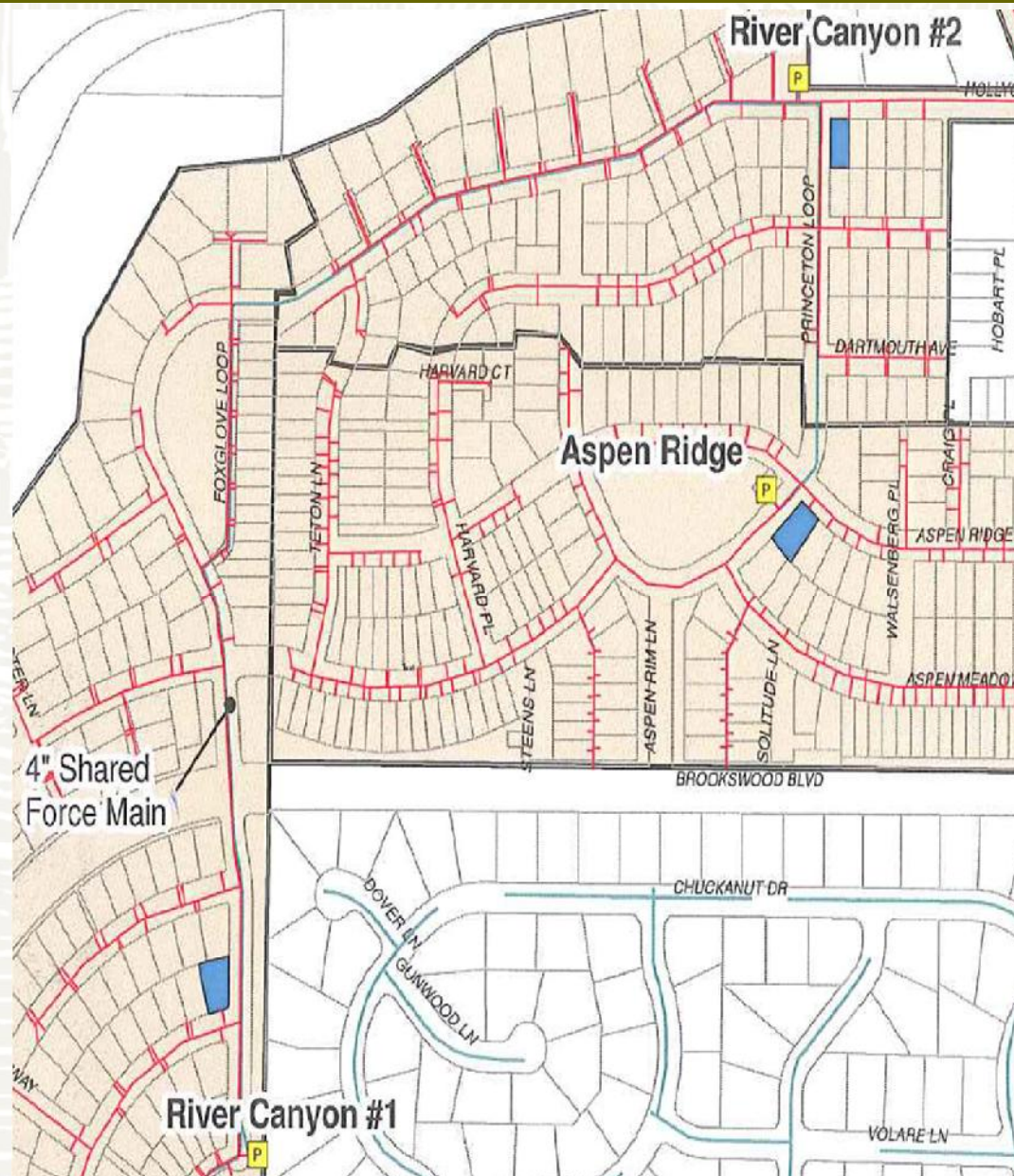


- ❑ 430 Miles of sewer mains
- ❑ 90 sewer pumping stations
- ❑ 246 home pumping stations
- ❑ System contains 4 different types of collection systems
- ❑ Collect 6.5 million gallons per day

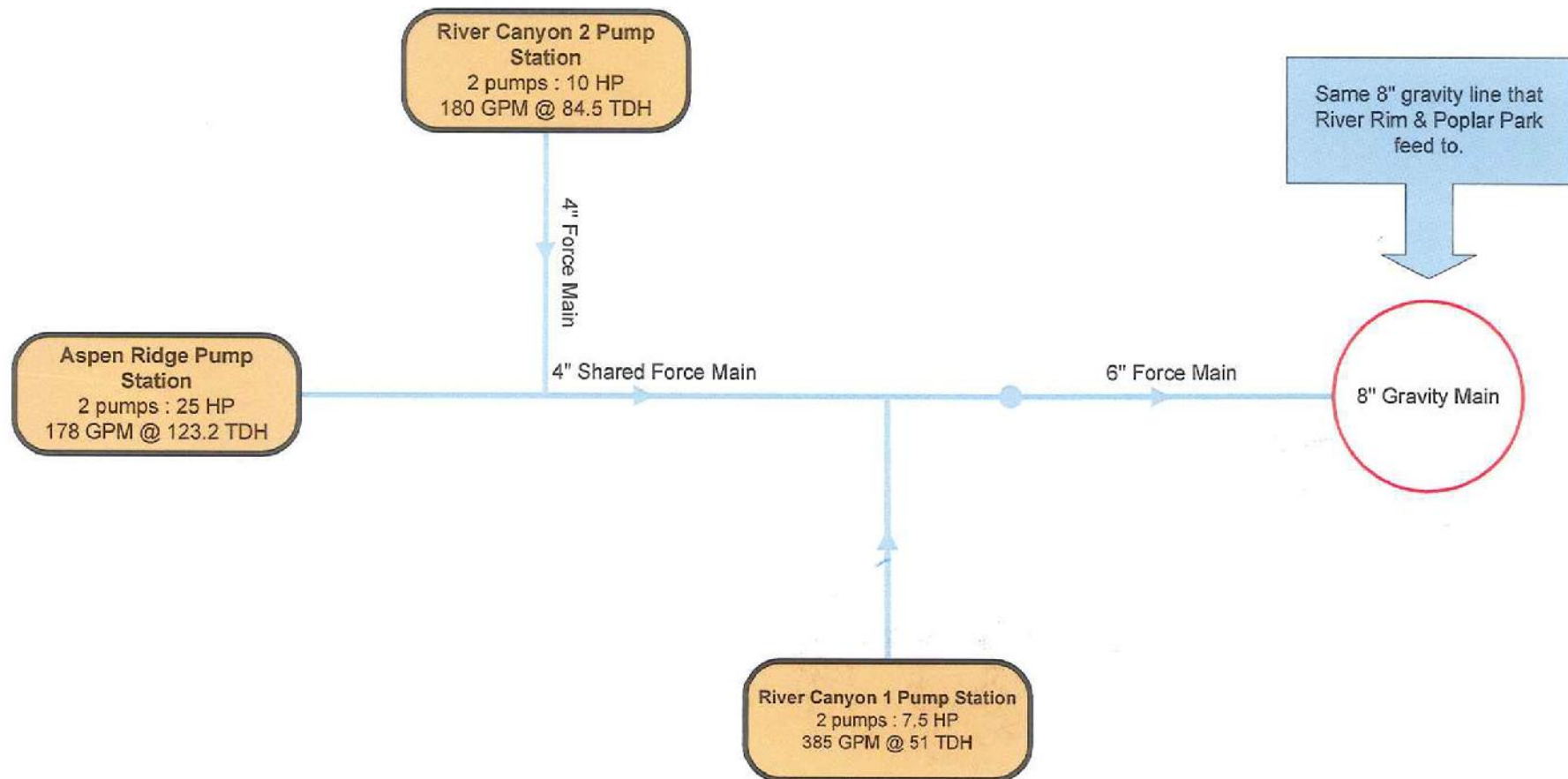
# Simplified Sewer System



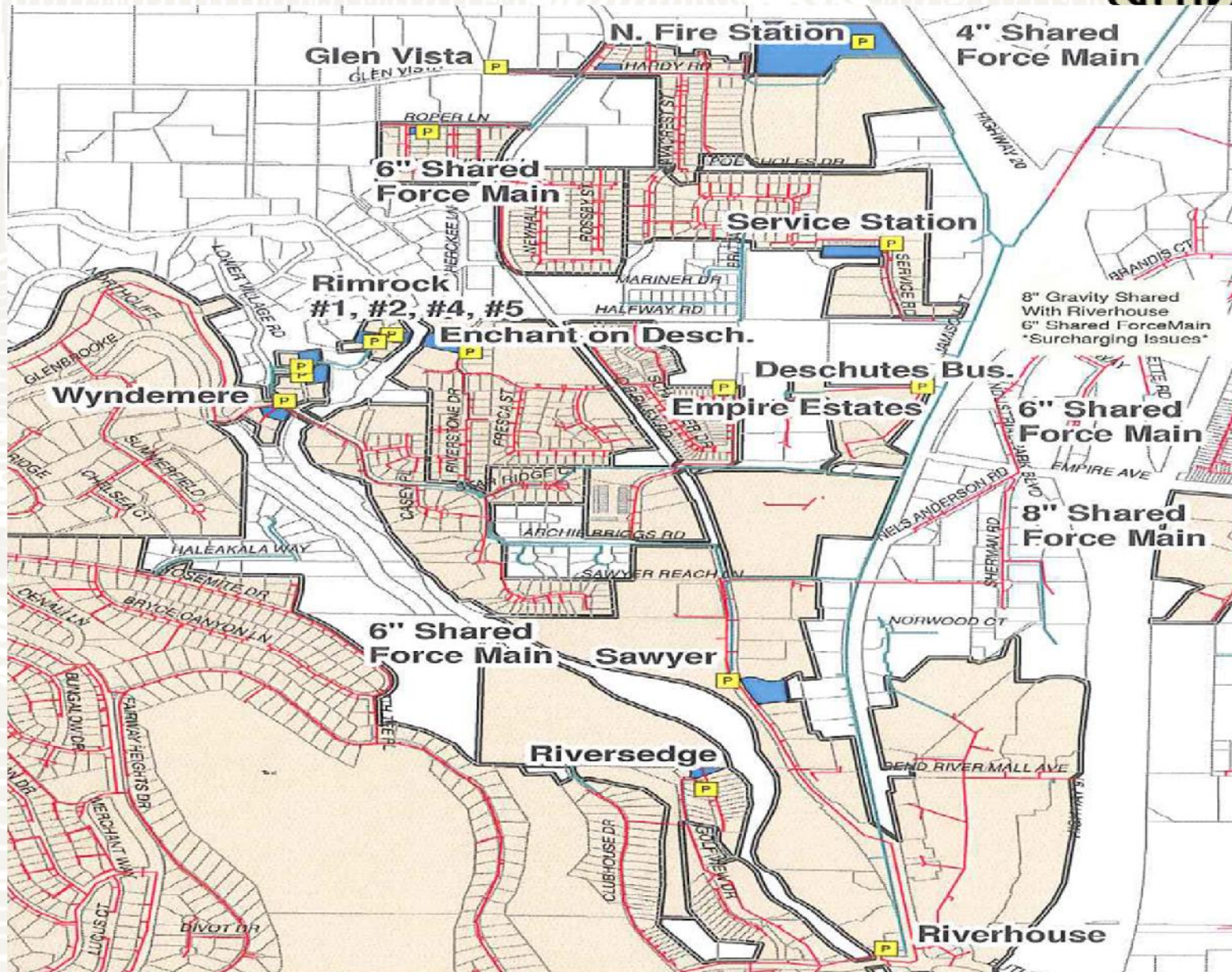
## Problems with City Collections System



## Problems with City Collections System



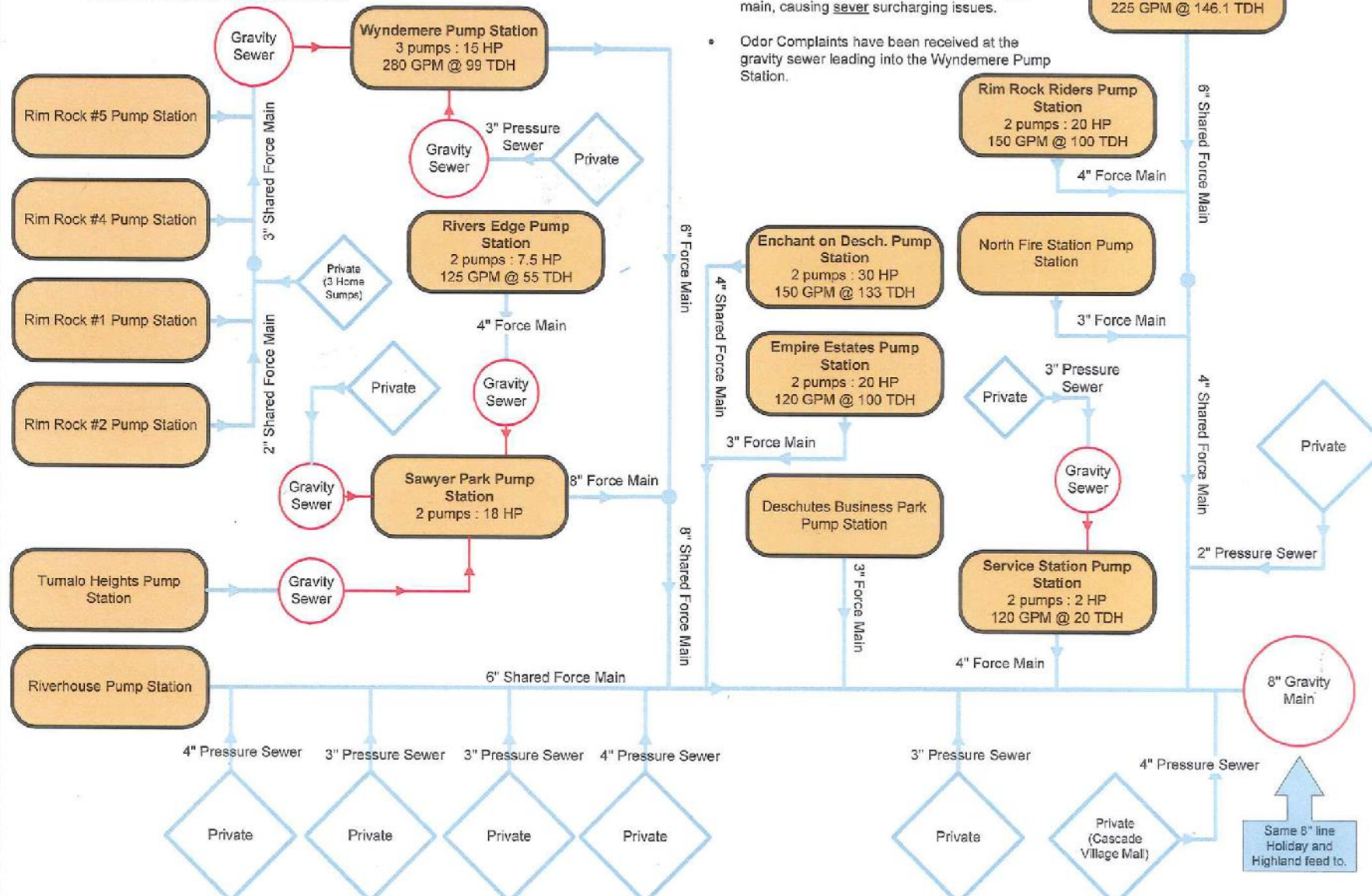
## Problems with City Collections System





Known Issues:

- Glen Vista Pump Station  
2 pumps : 25 HP  
225 GPM @ 146.1 TDH



# Correctly Functioning Manhole

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# Surcharged Manhole in Dry Weather

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# Overflow Due to Wet Weather



# Bolted Down Manhole Lids



# Sewer Overflow

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# Line Collapse



# Gas Line Through Sewer Line



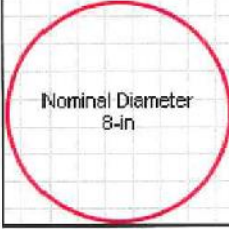
# Correctly Functioning Pipe



## SCATTERGRAPH REPORT

Bend\_003505





**Flow Monitor**  
**Bend\_003505**

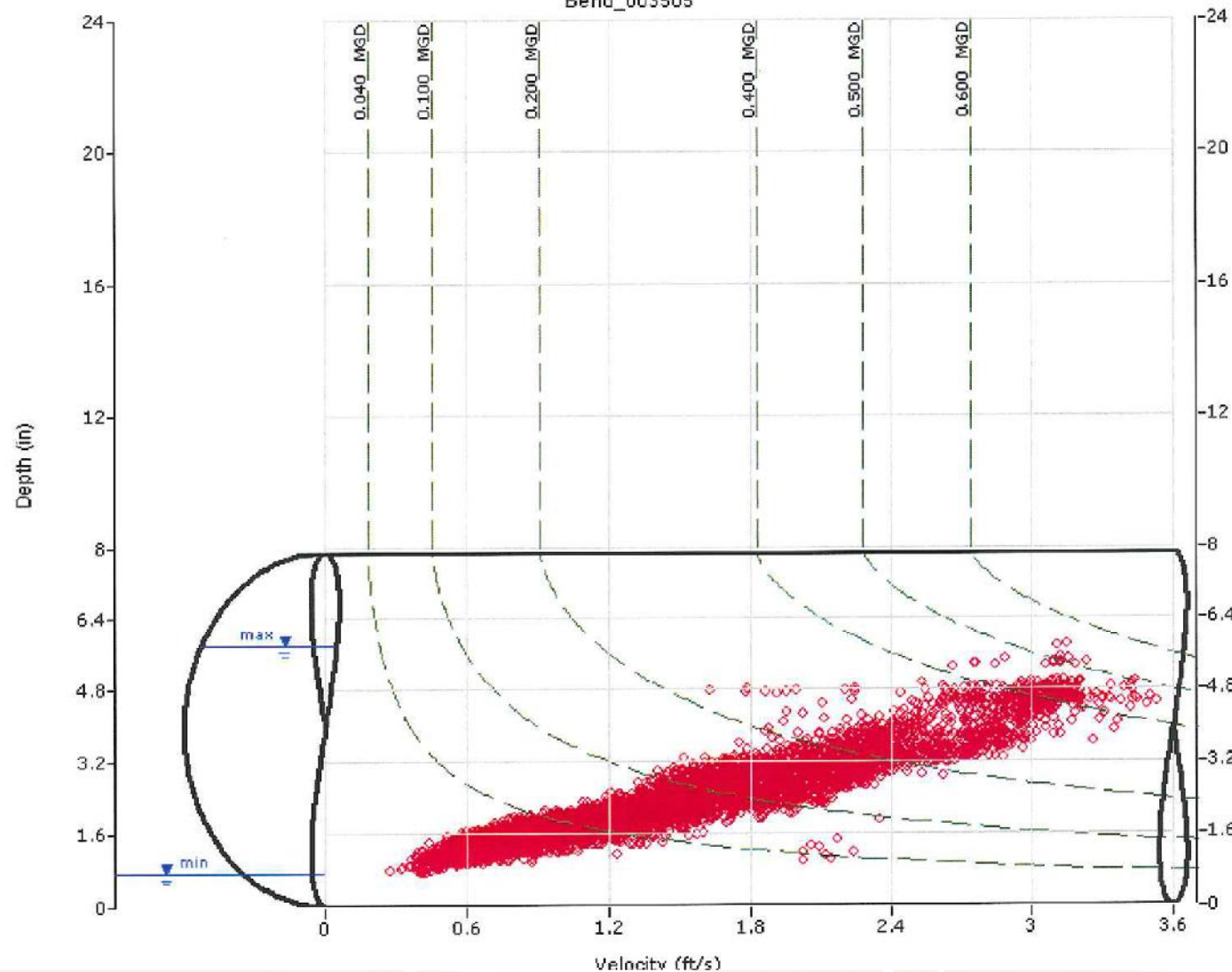


Nominal Diameter  
8-in

**Report Period**  
4/8/2011  
To  
5/9/2011

**Legend**

-  Depth - Velocity
-  Iso-Q<sup>TM</sup>
-  Silt
-  Min-Max Depth



# Problem Flow Pipe



## SCATTERGRAPH REPORT

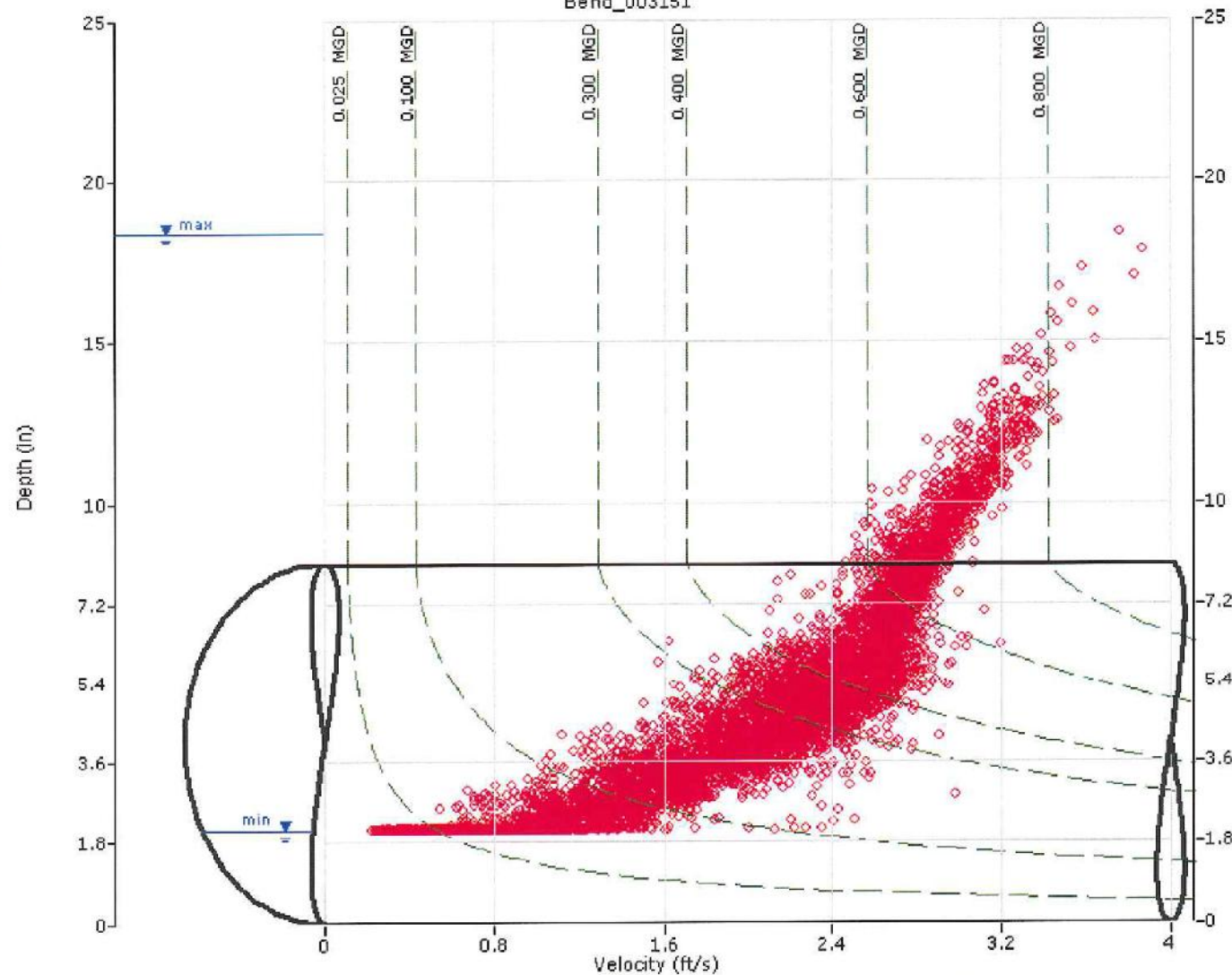
Bend\_003151

**Flow Monitor**  
Bend\_003151

Nominal Diameter  
8-in

**Report Period**  
4/9/2011  
To  
5/9/2011

**Legend**  
○ Depth - Velocity  
--- Iso-Q™  
--- Silt  
▼ Min-Max Depth



# Critical Manhole in System



Site access looking north

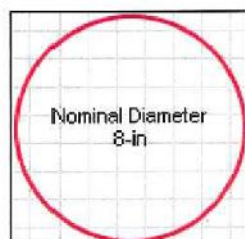
# Flow Profile of Critical Manhole



## SCATTERGRAPH REPORT

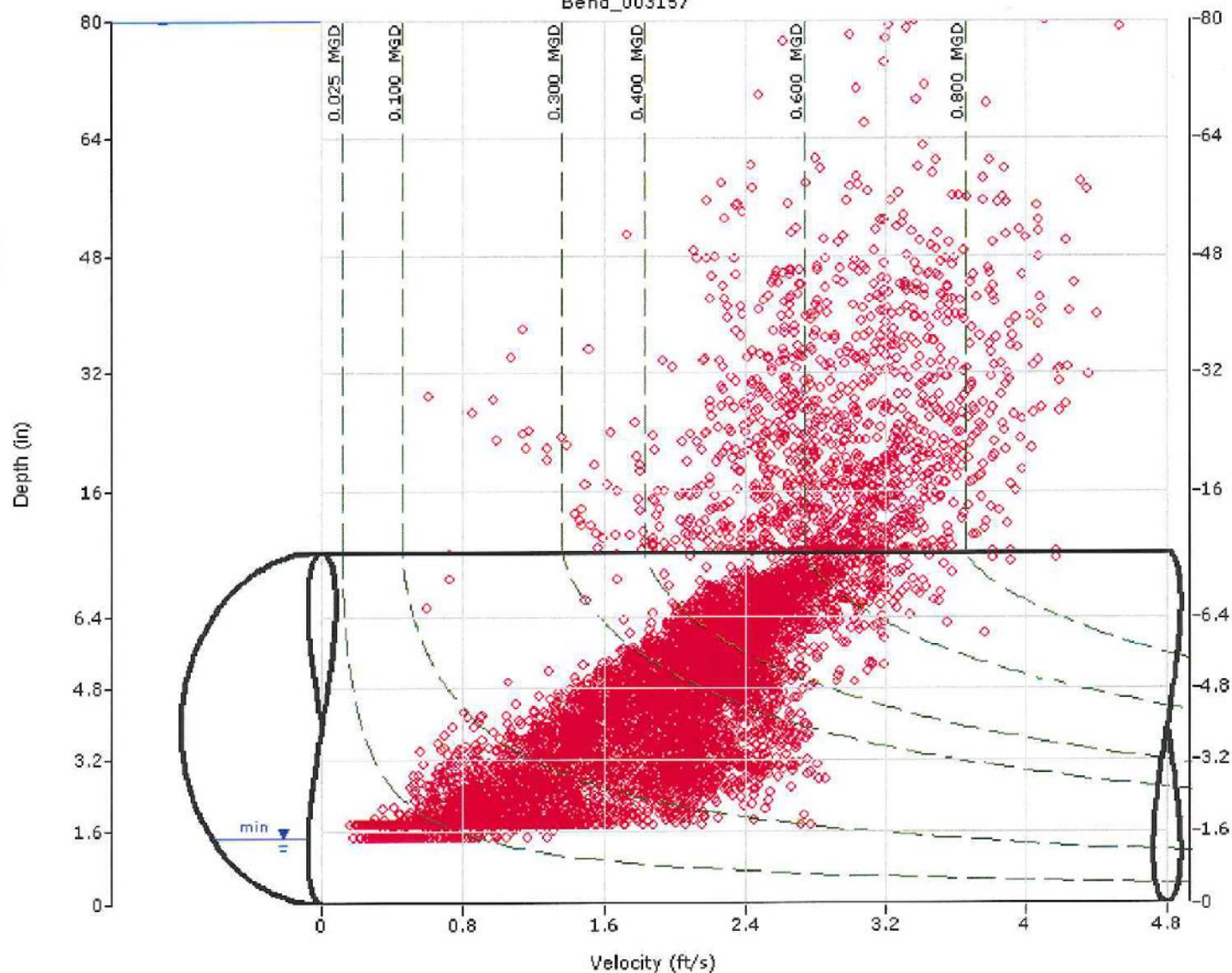
Bend\_003157

Flow Monitor  
Bend\_003157



Report Period  
4/9/2011  
To  
5/9/2011

Legend  
○ Depth - Velocity  
--- Iso-Q™  
--- Silt  
▲ Min-Max Depth



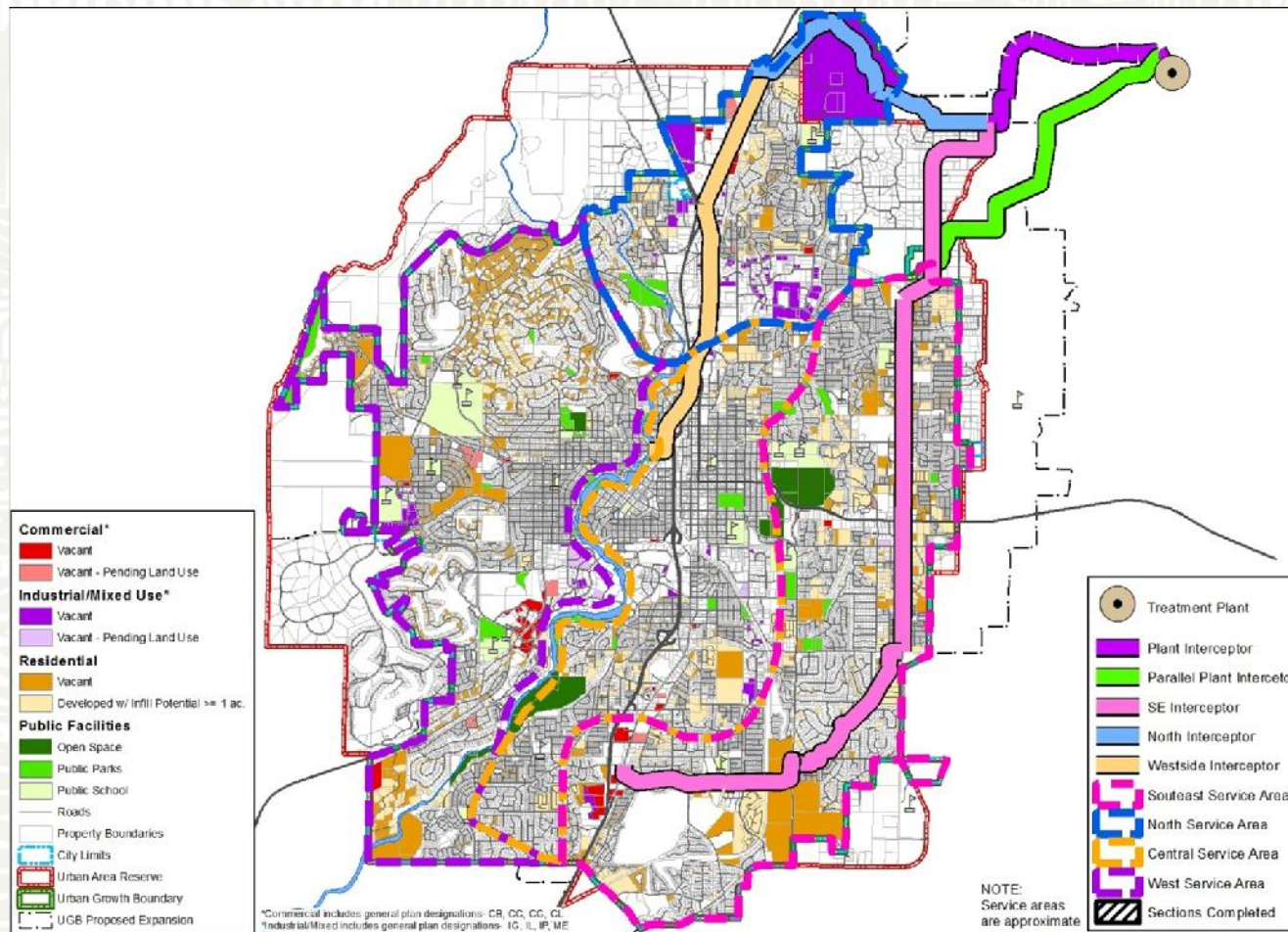


# **Collection System Master Plan**

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- ☐ Focused on customers within existing UGB
- ☐ Intent was on alleviating problem areas
- ☐ Capacity issues addressed
- ☐ Improved access for unsewered areas
- ☐ Implementation Plan
- ☐ Major interceptors to reduce demand on city core
- ☐ CSMP recommendation was to shift to gravity conveyance of wastewater

# North & Complete Central Interceptors & Service Areas



# Summary

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- Areas of serious problems that need immediate Solution
- Areas that are at capacity limit economic growth opportunity
- Areas with failing septic systems

# Updating Bend's Sewer Collection System Master Plan

## Overview

The City of Bend is beginning an update of its Sewer Collection System Master Plan that will guide future improvements for sewer infrastructure. The update is being prepared by City Public Works staff with the assistance of engineering, environmental and financial specialists, and citizen advisors. The goal is for the new Master Plan to be ready by late 2013.

An 18-member citizen committee, the Sewer Infrastructure Advisory Group, has been appointed by Bend City Council to advise the sewer planning.

## About the Master Plan

Bend's current Sewer Collection System Master Plan was adopted in 2007 and needs an update. The Master Plan is an engineering / technical document that shows how wastewater is collected from customers around the city and conveyed to Bend's water reclamation facility located east of town near the Bend Airport. The Master Plan is required by state and federal regulatory agencies and must be kept up-to-date. Wastewater facilities are closely regulated to protect public health and the environment.

The Master Plan update answers important questions such as:

- What factors influence future requirements for Bend's sewer system: service boundaries, condition of the existing collection system, population, employment growth, new regulations?
- What principles and priorities should guide the Master Plan update? (e.g., environmental protection, public health, energy efficiency, cost-effectiveness)
- Which facilities need to be constructed or improved, and when?
- What should be Bend's immediate—midterm—and long-term priorities for the sewer system?
- How will sewer system improvements be financed?

## Bend's Sewer Collection System's Pressing Needs

Bend's sewer collection system has a number of identified deficiencies.

**System at capacity:** In some areas, existing sewer pipes are flowing well above their design capacity and routinely approach overflow levels. In certain parts of the City, Bend would have difficulty serving any major new employers or developments.

**Piecemeal infrastructure:** Bend's growth over the past decade has resulted in a system that is somewhat unusual and complex compared to peer communities. The pattern of development and patchwork sewer system pose unique engineering challenges.

**Unsewered areas:** Large areas of developed land in Bend, especially in the southern part of the city, depend on septic systems. As aging systems fail and state regulations make it difficult for septic systems to continue, Bend struggles to find ways to bring sewer service to these in-town subdivisions.

**High operating costs:** Bend has more sewage pump stations (336) than Portland, Salem, and Eugene combined. Pumps require ongoing maintenance and consume lots of electricity.

## **Waste water Treatment Improvements**

The Sewer Collection Master Plan addresses only the sewer collection system. Planned expansion and improvements for Bend's water reclamation facility are also critical. The treatment plant upgrades are in final design and are scheduled to be completed by 2015.

## **Paying for Sewers**

Under Bend's policies, sewers are part of a wastewater utility that is self-supporting. Wastewater system *operating costs* are paid by customers' monthly sewer rates. These rates are reviewed and adjusted annually and must be approved by Bend City Council.

*Capital costs* are paid through a combination of rates, proceeds from SDCs (systems develop charges) paid by new development, plus funds borrowed through Federal/State loans or the sale of municipal bonds. Debt is most often used to finance major capital projects and must be approved by the City Council. These loans are paid back by customers' monthly sewer rates, SDCs and other sewer system revenues. General Obligation (G.O.) bonds provide another financing method backed by property tax revenues, and must be approved by the City Council and Bend voters. Other alternative funding options include LIDs (local improvement districts), urban renewal, and public / private partnerships.

Updating the Sewer Collection System Master Plan will result in a list of priority improvements that will need to be paid for through a combination of financing options. Because of Bend's critical sewer deficiencies, any solutions will result in rate increases.

## **Coordinating with Other Infrastructure Planning**

Sewer planning must be coordinated with other infrastructure needs. These facilities often serve the same customers and share the same public right-of-way. Bend's sewer, water and transportation systems all need major upgrades, expansion—and investments. Future sewer system improvements rely on funding solutions that must be well coordinated with the City's other financial needs for infrastructure and services.

## **How the Master Plan is Linked to Land Use Planning**

Oregon land use planning laws require Bend and other cities to maintain, as elements of their Comprehensive Plans, public facilities plans for key infrastructure: water, sewer, transportation. These facilities plans must show how future services will be provided inside the city and within its urban growth boundary (UGB) over 20 years.

The updated Sewer Collection System Master Plan will also contribute a component of the data for the sewer public facilities plan and analysis of any future UGB expansions.

## **Learn More**

For more information about Bend's Sewer Collection System Master Plan, contact:

Jon Skidmore  
Assistant City Manager  
[jskidmore@ci.bend.or.us](mailto:jskidmore@ci.bend.or.us)  
(541) 693-2175

Tom Hickmann P.E., City of Bend  
City Engineer / Assistant Public Works Director  
[thickmann@ci.bend.or.us](mailto:thickmann@ci.bend.or.us)  
(541) 317-3029

# Sewer Infrastructure Advisory Group (SIAG)

## MINUTES

JULY 19, 2012

4:00 TO 6:00 PM

RIVERBEND COMMUNITY ROOM

<b>MEETING CALLED BY</b>	Jon Skidmore
<b>SIAG ATTENDEES</b>	Bruce Aylward, Casey Roats, Charlie Miler, Craig Horrell, Dale Van Valenburg, John Rexford, Libby Barg, Lynn Putnam, Mike Riley, Nathan Boddie, Pam Hardy, Sharon Smith, Stacy Stemach, Steve Galash, Steven Hultberg, Tom Hickmann, Wes Price
<b>STAFF ATTENDEES</b>	Jeff England, Terry Burks, Reese Moody, Paul Rheault, Eric King, Sonia Andrews, Scott Ramsey, COB Council, Mary Winters, Mel Oberst, Russ Grayson, Aaron Collett
<b>CITIZEN ATTENDEES</b>	Drake Ward
<b>NOTE TAKER</b>	Kim Kampmann

Agenda topics

### INTRODUCTIONS

**JON SKIDMORE**

Jon gave an overview of the current challenges we face with current and future growth of the communities sewer system and expressed appreciation for this groups formation and willingness to participate in setting priorities and identifying community values. He asked that the group progress through the sequence of tasks and to try not to revisit prior decisions so that the group can move forward.

He introduced the City Engineer / Assistant Public Works Director, Tom Hickmann, P.E., and the consultant chosen for this project, Libby Barg, Vice President, Barney & Worth. Jon reminded the group that the meetings were public meetings and would also be recorded. Information shared with this group will be available on the City website.

SIAG members introduced themselves and provided their reasons for participating.

### GROUP CHAIR NOMINATION AND SELECTION

**JON SKIDMORE**

The group opted for a Steering Committee. Steve Galash, Mike Riley, and Sharon Smith were nominated and approved to serve in this role.

### ADVISORY GROUP ASSIGNMENT

**LIBBY BARG**

The group received a handout "Bend Sewer Infrastructure Advisory Group" and the background and assignment was reviewed as outlined in handout. (See attachments)

### OVERVIEW: BEND'S SEWER SYSTEM

**TOM HICKMANN, PE**

Tom used the presentation to provide a visual of the current system and the immediate and future challenges. He described the huge number of septic systems failing and that 30% of the City is on pump systems. He noted that the SE

Interceptor was chosen as a priority because of the significant amount of sewer that is pulled out of the downtown core. Council has asked the City to pause and wait for a decision from the SIAG group before moving forward. Time was spent describing “manhole 3157” and the challenges of this area of town. (Presentation attached)

Tom explained that the 2006-2007 CSMP was based on traditional modeling. A group of 15 Engineers with various disciplines came up with 54 solutions of how to address the sewer issues in the City. They could not evaluate all 54 different solutions so that gave each engineer five stickers and each person identified with their sticker, the top five. Due to advancement in technology we will be able to use an optimization program that will take out any biases and will provide millions of scenarios.

## QUESTIONS & COMMENTS

## GROUP

- Q: What is the scope of our mission? A: Hard to separate. Decision has been made because we are at capacity. We need to look at our collections system, cost, engineering, economic, environmental public policy, and growth management. Consideration to the 8.3 to 11.9M per day. Big upfront cost as we add expansion in the future and will need help to meet regulatory demands.
- Q: Why do we have so many pump stations. A: Central Oregon provides unique challenges with the abundance of solid rock. Excavating for a gravity line is extremely expensive. Also the growth management issue became a factor and the growth of 60,000. It is the perfect storm of growth, and we were not data driven aware.
- Q: Satellite system? A: Yes, a satellite system is on the table.
- Q: When will the data collection be done. A: 18 months including modeling. 6 to 9 months for the essential data gathering.
- Q: Do you have adequate resources? A: Some additional data analysis gathering, long term costs were not included.
- Q: How are other cities like us doing it? A: We have been looking into this. One example is a community went out and bought every single home their own septic tank. Conveyed the fluids out the system. Vactor trucks go out and suck out their septic.
- Q: Are there other manholes that are surcharging. A: There are 7000 manholes and we had to take an educated assumption which to monitor. Only 100 are being monitored.

**ADVISORY GROUP ASSIGNMENT****LIBBY BARG**

The group received a handout “Bend Sewer Infrastructure Advisory Group” and the background and assignment was reviewed as outlined in handout. (See attachments)



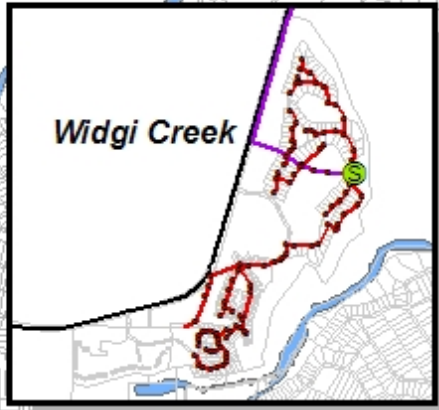
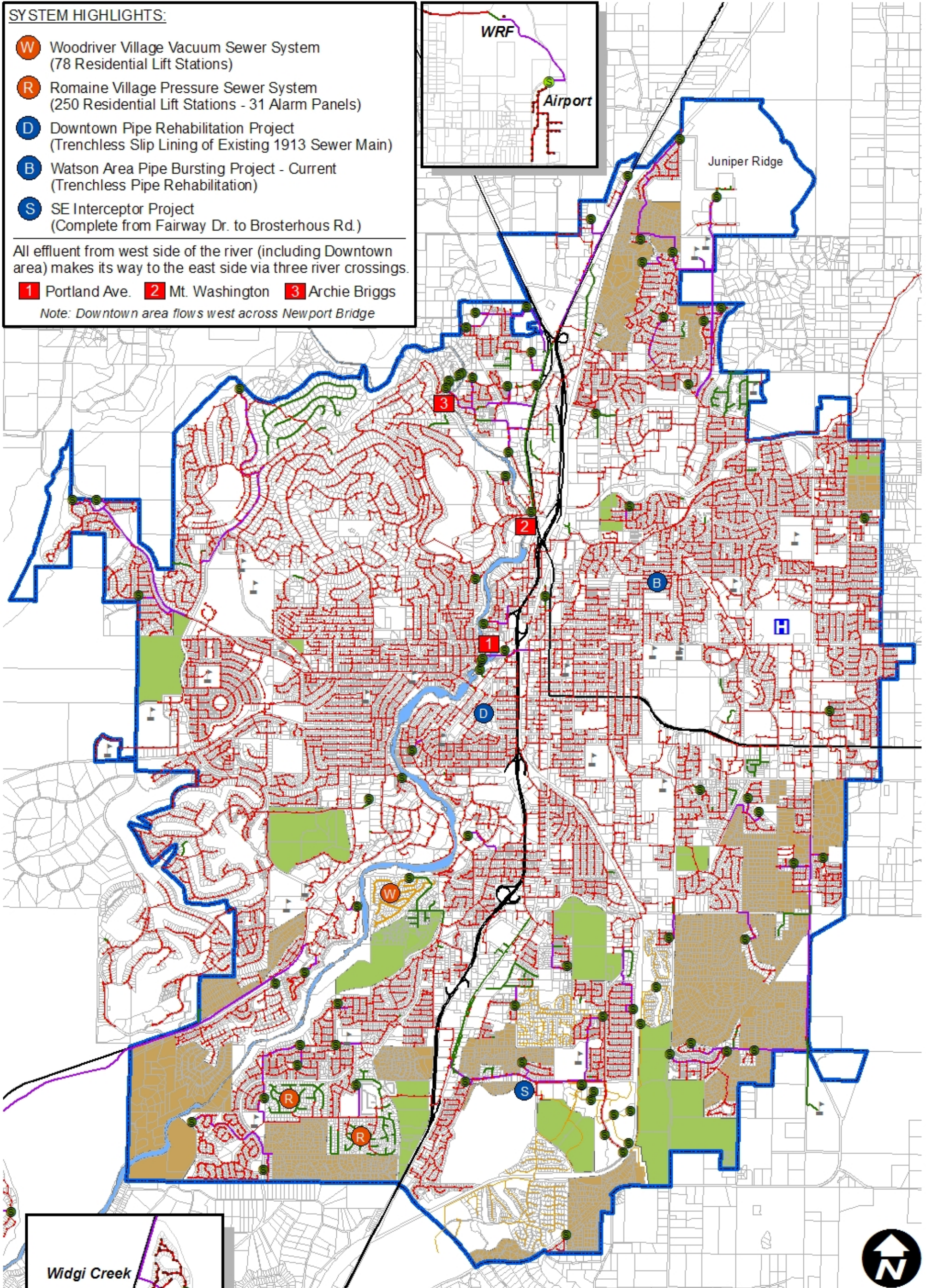
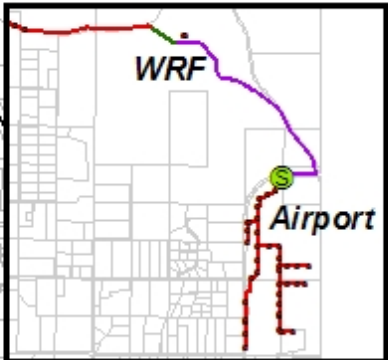
SYSTEM HIGHLIGHTS:

- W** Woodriver Village Vacuum Sewer System (78 Residential Lift Stations)
- R** Romaine Village Pressure Sewer System (250 Residential Lift Stations - 31 Alarm Panels)
- D** Downtown Pipe Rehabilitation Project (Trenchless Slip Lining of Existing 1913 Sewer Main)
- B** Watson Area Pipe Bursting Project - Current (Trenchless Pipe Rehabilitation)
- S** SE Interceptor Project (Complete from Fairway Dr. to Brosterhous Rd.)

All effluent from west side of the river (including Downtown area) makes its way to the east side via three river crossings.

- 1** Portland Ave.
- 2** Mt. Washington
- 3** Archie Briggs

Note: Downtown area flows west across Newport Bridge



CITY OF BEND - COLLECTIONS SYSTEM BASEMAP  
Public Works Department - Utility Division (August, 2012)

- Lift Station**
- Pressurized Main**
- Force Main**
- Vacuum Main**
- Gravity Main**
- City Limits**
- Deschutes River**
- Hospital**
- School**
- Non-Sewered Areas TYPE**
- Existing Residential**
- Future Development**

This map is for reference purposes only. The information was derived from Deschutes County GIS and City of Bend land records. Care was taken in the creation of this map, but it is provided "AS IS". Please contact the City of Bend to verify map information or to report any errors.



# Bend Sewer Infrastructure Advisory Group: Meeting #2: Projects in Progress: Water Reclamation Facility and SE Interceptor

Bend Park and Recreation  
The Riverbend Community Room  
799 SW Columbia St.

September 20, 2012  
4:00-6:00 p.m.

## Preparation Materials (please read before the meeting):

- A Resolution setting forth the policy for evaluating the City's Wastewater Collection System and revised approach to planning for needed capital improvements and the formation of a citizen stakeholder group. This information is available on the SIAG website.

## Agenda

Activity / Topic	Presenter	Time
1. <b>Welcome / Introductions</b>	Jon Skidmore Assistant City Manager	4:00 p.m.
2. <b>City Council Resolution</b> (see prep materials) <i>Objective:</i> Information only	Jon Skidmore	4:10
3. <b>Water Reclamation Facility</b> The planned expansion of the treatment plan (now in design) requires a large initial capital investment estimated at \$38 million, but future expansion costs to add capacity may be very low compared to other alternatives. There is a potential the optimization process will be influenced by the low cost of future expansion at the treatment plant. <i>Objective: Provide information on the treatment plant expansion plans and the potential effect on the optimization process.</i>		4:20
<b>Staff Presentation</b> <ul style="list-style-type: none"><li>• How the City arrived at the planned treatment plant expansion solution</li><li>• Optimization 101 / Effect on optimization</li></ul>	Jim Wodrich, Project Engineer John Cowan, Optimatics	
<b>Advisory Group Q&amp;A / Discussion</b> <ul style="list-style-type: none"><li>• Are there remaining questions / issues regarding the decision to move forward with the wastewater facility expansion?</li></ul>	Libby Barg	

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4.	<b>Southeast Interceptor</b>	4:50
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A decision needs to be made on whether to construct certain segments of the SE Interceptor. Costs could be reduced by constructing these segments when road work takes place in spring 2013.

*Objective: Provide information and facilitate a discussion on the best options for moving forward.*

**Staff Presentation**

Jim Wodrich  
John Cowan

- Background: Why a priority?
- Options / cost comparisons
- Effect on optimization

**Advisory Group Q&A / Discussion of Options**

Libby Barg  
Steering Committee

- What is the best option for moving forward on the SE Interceptor?

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5.	<b>Public Comment</b>	Libby Barg	5:45
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6.	<b>Next Steps</b>	Clark Worth	5:55
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- Meeting #3: October 25
- Meeting #4: November 15
- Meeting #5: December 20
- Meeting #6: January 17, 2013

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	<b>Adjourn / Thank You</b>	Jon Skidmore	6:00 p.m.
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For more information, visit the Bend Sewer Infrastructure Advisory Group webpage:  
<http://bendoregon.gov/index.aspx?page=841>

## Tour Date:

- September 15th

## History:

The construction of the WRF began in 1977 and was placed into service in 1981 along with the collection system. The plant includes preliminary, primary, secondary, and tertiary treatment processes along with disinfection and evaporation/percolation ponds for the treated effluent. Solids facilities include a gravity belt thickener, three high-rate anaerobic digesters, a belt filter press, two sludge degasification basins and sludge drying beds.

The City of Bend WRF was originally a conventional activated sludge plant but was converted to the Modified Ludzack Ettinger (MLE) activated sludge process in 2000 to improve nitrogen removal. Various upgrades over the years has resulted in a daily average design capacity of 6.0 MGD.

The WRF collects, treats and disposes of wastewater under a permit issued by the Department of Environmental Quality. Limits of discharge are defined by this permit with penalties mandated by OAR Chapter 468 if the limits are not met by the City's collection, treatment and disposal processes. Our current permit was issued in 2010 and will expire on November 30, 2015.

## WRF Facts

- 31 Years Old
- Provides effluent reuse water to the Pronghorn Resort during irrigation season
- All Biosolids are land applied in accordance with DEQ approved Biosolids Management Plan
- WRF Designed for ADMM (Average Day Maximum Month) flow of 6.0 MGD
- AAF (Average Annual Flow) of 5.5 MGD
- Peak hourly flow of 8.9 MGD <sup>(1/12)</sup>
- Flows have been stable past 12—18 months but organic loading is has been increasing
- The Water Pollution Control Facility (WPCF) permit contains the following effluent parameters:
  - BOD5/TSS monthly average of 20 mg/L or less.
  - Total Nitrogen annual monthly average of 10 mg/l
  - pH shall be within range of 5.5—9.0
  - E. Coli concentrations shall not exceed 126 organisms per 100 ml monthly geometric mean and no single sample shall be >406 organisms per 100 ml

# Water Reclamation Facility (WRF) Tour

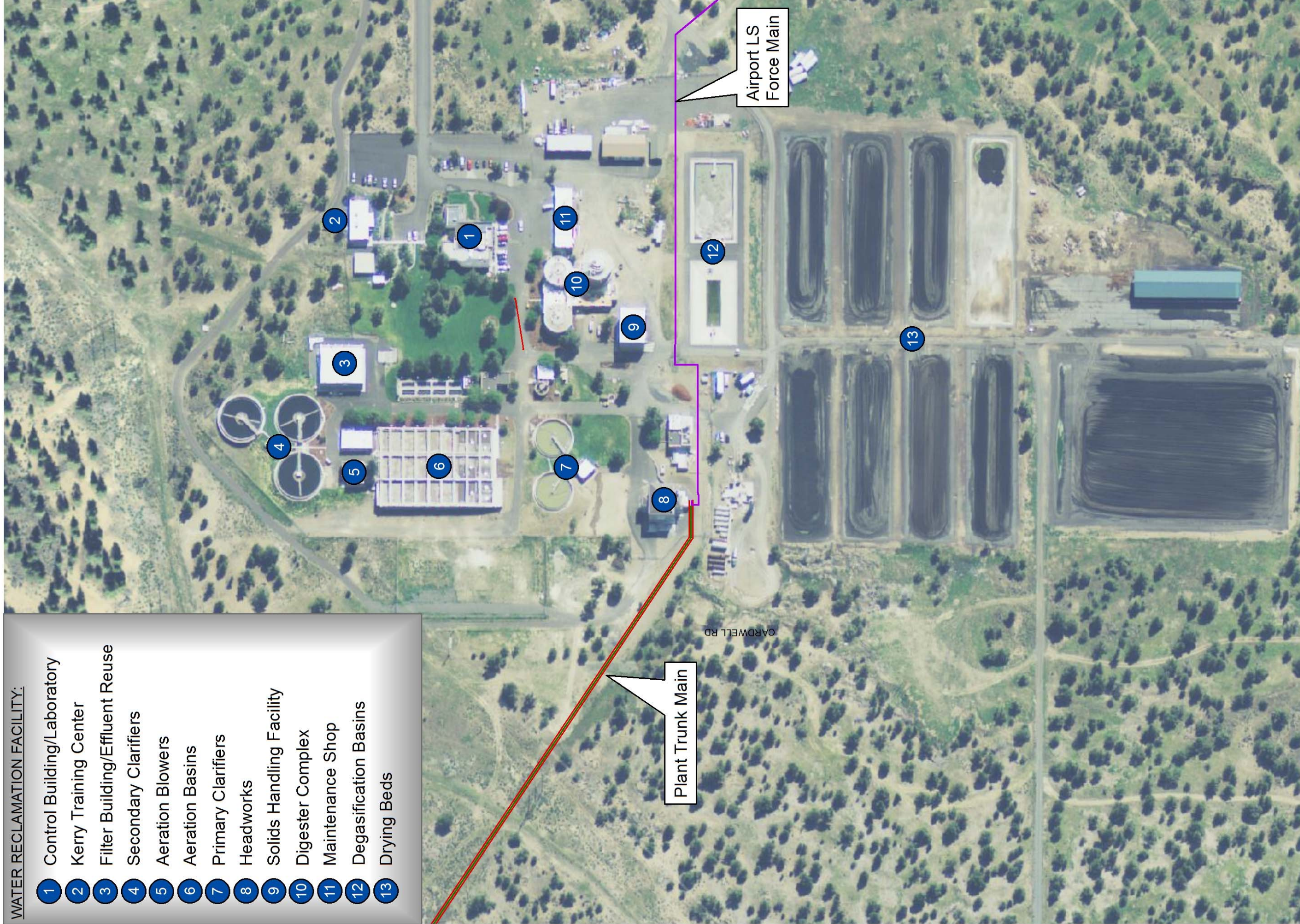


## Sewer Infrastructure & Advisory Group (SIAG)



**WATER RECLAMATION FACILITY:**

- 1 Control Building/Laboratory
- 2 Kerry Training Center
- 3 Filter Building/Effluent Reuse
- 4 Secondary Clarifiers
- 5 Aeration Blowers
- 6 Aeration Basins
- 7 Primary Clarifiers
- 8 Headworks
- 9 Solids Handling Facility
- 10 Digester Complex
- 11 Maintenance Shop
- 12 Degasification Basins
- 13 Drying Beds





**CITY OF BEND - WATER RECLAMATION FACILITY**  
Public Works Department - Utility Division (August, 2012)



-  Lift Station
-  Pressurized Main
-  Force Main
-  Gravity Main

This map is for reference purposes only. The information was derived from Deschutes County G.I.S. and City of Bend land records. Care was taken in the creation of this map, but it is provided "AS IS". Please contact the City of Bend to verify map information or to report any errors.

## RESOLUTION NO. 2875

### **A RESOLUTION SETTING FORTH THE POLICY FOR EVALUATING THE CITY'S WASTEWATER COLLECTION SYSTEM AND REVISED APPROACH TO PLANNING FOR NEEDED CAPITAL IMPROVEMENTS AND THE FORMATION OF A CITIZEN STAKEHOLDER GROUP**

#### Findings

A. The City of Bend has long identified deficiencies, both current and anticipated, in its sewage collection system. Comprised of a system of 336 pump stations, it is a high maintenance and labor intensive system, and also includes areas where existing sewer pipes are flowing significantly above their design capacity and in some locations have either overflowed to the surface or routinely approach overflow levels. Additionally, large areas of un-sewered subdivisions and tracts of land, especially in the south part of town, were annexed into the City in the late 1980s. These un-sewered subdivisions depend upon on-site septic systems that are ageing and highly susceptible to failure. Also the product of less than ideal piecemealing of infrastructure improvements due to Bend's explosive growth over the last decade, the system is somewhat unusual and complex and thus poses unique engineering challenges.

B. Existing City plans call for a series of large sewer gravity mains, known as interceptors, as the ideal and most effective long-term engineering approach to shifting sewer flows from the downtown corridor to the City's perimeter. These interceptors would allow the City to address current and anticipated deficiencies and plan for future growth. Current plans include a parallel plant interceptor to provide a secondary connection from the collection system to the Water Reclamation Facility (WRF), and three other interceptors, the Southeast, the North, and the Central Interceptors, to deliver wastewater to the WRF.

C. The City's Finance Department has calculated the effect on rates if all the interceptors are constructed. Since 2007, the City has been implementing annual increases to sewer rates to finance various sewer improvements. The residential sewer charge was \$26 per month in 2007 and is currently \$41 per month (this \$15.00 increase has been implemented over 4 years). If all the interceptors are constructed, the residential sewer charge will need to be increased from the current \$41 per month to \$75-\$81 per month (another \$34-\$40 more) over the next 10 years to finance these improvements.

D. In an effort to phase in rate increases gradually and lessen the impact on utility customers, the City Council is looking to develop a more fiscally constrained interim project list. Furthermore, the large scale projects will take significant time to complete. The Council has previously prioritized the Southeast Interceptor, but the North Interceptor and a portion of the Central Interceptor may be more urgently needed, given that these interceptors would provide additional capacity to an area zoned for

employment uses and economic development. At a minimum, review of the timing of these large projects is warranted.

E. The City Council recognizes that delaying or not constructing various interceptors impacts the City's ability to serve certain employment and residential land in various areas of the City that are at or nearing capacity, which could restrict desirable economic development. Further, delays in planned capital improvements may result in increased operations and maintenance expenditures throughout the collections system.

F. To mitigate these concerns to the greatest extent possible while balancing the desire to maintain affordable utility rates in the City of Bend, the Council wishes to reprioritize projects to address immediate needs and to obtain additional studies to see if lower-cost solutions are possible. Lower costs may still be in the millions of dollars, but until further studied, the options are speculative and should be explored.

G. To further explain this modified approach, the City has been undergoing an urban growth boundary expansion (UGB) process, which included adoption of a sewer public facility plan (PFP) for the UGB 20 year planning period (2008-2028). The sewer PFP analyzed the current UGB as well as possible future expansion areas. However, on appeal, the State Land Conservation and Development Commission (LCDRC) did not acknowledge the sewer PFP, finding the plans were based on assumptions relating to the location and intensity of future development both inside and outside of the prior UGB that were likely to change as a result of the UGB remand. LCDRC further found that the sewer PFP for the existing UGB could not be bifurcated and therefore remanded the plan back to the City.

H. In 2011, the City produced a document entitled "Addendum 4" to the 2007 Collection System Master Plan (CSMP) Final Report as part of the planning process for the current UGB, which is based on data input of the large diameter collection system mains, or modeling of approximately 30% of the City's wastewater treatment system. Addendum 4 has not been adopted by the City Council, but was put on hold to reconsider a more comprehensive review of the entire system as described below.

I. The Council desires to engage in a more comprehensive planning process for its wastewater collection system that fully identifies the geographic location(s), asset conditions, scope and scale of deficiencies, and focusses on affordable short term solutions as well as optimal long term planning for system wide infrastructure for the existing UGB. This planning process would also provide data and analysis as the foundation for analyzing any future UGB expansion. Therefore, the City believes that funds for modeling and analyzing an updated and comprehensive CSMP for the 20-year planning period is money and time well spent. In addition, the City is fast approaching the usual time for starting the update of the 2007 CSMP, which is done every five years.

J. The intent of the new CSMP is to consider a wide range of system improvement concepts and options, including previously recommended solutions as well as new, innovative ideas that would result in a prioritized and focused CSMP that promotes

strategic economic development while correcting existing deficiencies. Traditional approaches to master planning require many variables to be eliminated prior to an in depth evaluation simply because it was not possible for someone to run all of the potential model scenarios that are involved with multiple solutions. Traditional modeling could evaluate about six potential solutions out of many thousands of potential solutions. New modeling approaches gives engineers a new tool that does not require the elimination of variables, but in fact performs better with more variables. The new approach can evaluate hundreds of thousands of solutions searching for the optimal solution allowing all potential solutions to be evaluated in a transparent fashion.

K. To date, the City has completed 100% design of the SE Interceptor and has spent approximately \$12 million to date on design and construction of the project. The City Council remains committed to the project, but desires to review the timing in light of a reassessment of priorities and the overall system needs. The estimated remaining cost of construction is \$43 million, so it makes sense to put the project on pause for approximately one year pending the CSMP and reassessment of the sewer system as a whole.

L. In pausing the SE Interceptor and undergoing the CSMP process, the City Council understands that rate increases will still be necessary in the future, barring other funding sources. The City recognizes that under any scenario, given the deficiencies in the existing system, significant expenditures are needed. Sewer projects are critical for current and future infrastructure to serve valuable employment land as well as residential areas of the City currently on septic systems. By pausing to reassess the City does not want to deflect from the hard truth that rates support the very real need to correct current deficiencies and plan for future growth. However, the timing of rate increases in this economy is difficult and the City desires to be sure that the community has a full understanding and awareness of the problems as well as buy-in of the various solutions, so that government and the community are working together to resolve the various competing interests, and collectively devising the path forward.

M. This resolution addresses only the sewer collection system. Planned expansion improvements to the WRF are critical and are to proceed as scheduled.

N. The CSMP process will be followed by the adoption of a sewer PFP, which is a planning document that will rely on the CSMP as an engineering document to develop a timely, efficient and orderly arrangement of public facilities to support urban development within the City's UGB. The sewer PFP amends the City's comprehensive plan and must be consistent with the Statewide Planning Goals, particularly Goal 11. A PFP is subject to a public process and Planning Commission review and City Council review and adoption. A sewer PFP is necessary to continue work on the City's UGB remand. This resolution provides guidance for the amendment of that plan; it is not a plan or a substitute for the required planning document which, as stated, will be subject to an extensive public process prior to adoption.

O. The Council recognizes that the process outlined in this Resolution for the adoption of a new CSMP will cause a corresponding delay in the sewer PFP process and the UGB remand tasks, but believes that the delay is warranted to achieve greater community engagement in critical infrastructure planning decisions.

Based on these findings, the Bend City Council resolves as follows:

1. The City will further study this current condition of the existing plant interceptor (Yeoman Line) and the timing need for a parallel plant interceptor. The main focus of the study will be the condition of the Yeoman Line. The results of the study may allow the construction of the parallel plant interceptor to be deferred and possibly delay or reduce the rehabilitation costs to the Yeoman Line.
2. There are several smaller critical portions of the proposed Southeast Interceptor that Council acknowledges are ideal to complete now based on prudent financial advantages. These include administrative costs associated with existing expiring permits and right-of-way negotiations.
3. The City will hire a qualified engineering firm to study existing plans as well as the timing of the construction of the Southeast Interceptor, and potential alternatives to and/or alternative timing and design for construction of the, North, and Central Interceptors, as part of a new CSMP for the 20-year planning period (2008-2028). Design and construction of these interceptors will be placed on hold pending the results of the study, which is anticipated to take up to 18 months. The study should focus on cost-effective solutions to existing and anticipated deficiencies, and also include analysis of new and innovative ideas with the goal of resulting in a prioritized and focused CSMP that promotes strategic economic development. To the extent that interceptors or other costly improvements are identified as necessary, the study is to include recommendations on timing of construction of those improvements.
4. The CSMP study should make every effort to also identify short term solutions in a shorter timeframe for areas of the City with known deficiencies, which could be implemented prior to the completion of the entire study. The process to implement any solutions would be brought back to Council at a later date.
5. The focus of the initial effort will be for the existing city limits/UGB, and will be used to form the basis for the sewer PFP for the UGB planning process. The sewer PFP will then go through the public process, including the process before the UGB remand task force, for ultimate adoption as a comprehensive plan amendment by the City Council. Further capacity studies will be done at a later date to comply with the Remand Order related to the locational analysis for the UGB expansion process.
6. The City will work with the Bend Chamber and others to solicit input on the forming of a citizen stakeholder group comprised of a cross-section of citizens to help facilitate the review of the sewer projects and the CSMP process referenced in this Resolution and provide advice and consultation to the City Council and staff. In

general, the goals of the stakeholder group are to: foster communication between the community and the City, identify community priorities, assure that the community understands the problems that need to be addressed, review and evaluate long and short term goals including rate tolerance for those goals, consider the financial, engineering, economic development, growth management and political implications of various alternatives, build a broad base of support in choosing solutions based on community priorities, and make recommendations to City Council. These goals may be further refined as the group is formed and undertakes its tasks.

The Infrastructure Advisory Committee (IAC) should also be used as a resource for consultation and advice to the City Council and staff as the technical review branch of the process. The City should also engage other standing city committees with interest and expertise, such as the Planning Commission and Budget Committee, as appropriate.

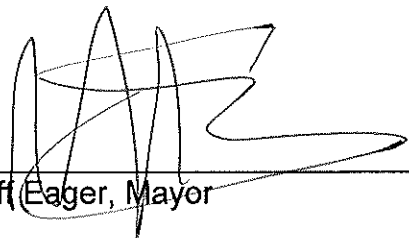
7. The mid-biennial Capital Improvement Project (CIP) review shall reflect the actions referenced in this Resolution related to infrastructure projects, which is scheduled to be brought before Council in June of 2012. At a minimum, proposed amendments to the CIP project list should be brought back before Council as part of the annual budget review to reflect the recommendations that result from the work of the stakeholder citizen group and IAC, proposed short term solutions, and the CSMP once adopted.

8. It is anticipated that this process could help lead to the development of a comprehensive strategy for investment in infrastructure, including water, sewer and transportation, with the potential to focus on strategic areas of the city for economic development and smart, efficient growth. Community involvement is the key to such a strategy and this process is a building block to such future planning.

Adopted by roll call vote of the Bend City Council on May 16, 2012.

YES: Tom Greene  
Scott Ramsay  
Mark Capell  
Jodie Barram  
Jim Clinton  
Kathie Eckman  
Mayor Jeff Eager

NO: None

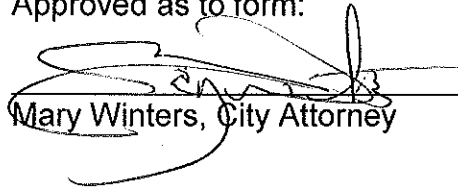


Jeff Eager, Mayor

ATTEST:

  
\_\_\_\_\_  
Robyn Christie, City Recorder

Approved as to form:

  
\_\_\_\_\_  
Mary Winters, City Attorney

<b>Sewer Infrastructure Advisory Group Meeting Summary</b>	<b>Sept 20, 2012</b>
	<b>3:00- 5:00</b>
	<b>Bend Park &amp; Recreation, Riverside Community Room</b>
	<b>Note taker: Adele McAfee</b>
<b>In Attendance:</b> <b>Committee Members:</b> Andy High, Casey Roats, Lynn Putnam, Mike Riley, Dale Van Valkenburg, Craig Horrell, Steven Hultberg, Charley Miller, Steve Galash, Stacey Stemach, Nathan Boddie, <b>Absent with prior arrangement:</b> Bruce Alyward, Pam Hardy, Craig Moore, John Rexford, Sharon Smith, Wes Price <b>COB Staff:</b> Tom Hickmann, Paul Rheault, Jon Skidmore, Aaron Collett, Reese Moody, Jim Wodrich <b>Facilitators:</b> Clark Worth, Libby Barg (Barney & Worth)	
<b>Meeting Summary</b>	
<b>Agenda item:</b> Welcome / Updates	
<ul style="list-style-type: none"> <li>• SIAG website updated with new information (<a href="http://bendoregon.gov/index.aspx?page=841">http://bendoregon.gov/index.aspx?page=841</a>)</li> <li>• City Council work session (10/3/12) report</li> <li>• August 23, 2012 / September 6 collection system tour feedback</li> </ul>	
<b>Agenda item: City Council Resolution</b>	
<ul style="list-style-type: none"> <li>• Reviewed 5/16/2012 City Council CSMP Resolution</li> </ul>	
<b>Agenda Item : Water Reclamation Facility (WRF)</b>	
<ul style="list-style-type: none"> <li>• Jim Wodrich presented information on the WRF project.</li> <li>• Discussion question: Are there remaining questions / issues regarding the decision to move forward with the wastewater facility expansion?</li> <li>• SIAG questions: <ul style="list-style-type: none"> <li>○ What is the budget?</li> <li>○ Will past decisions on the WRF and SE Interceptor prejudice the optimization analysis because they are not classified as fixed assets?</li> <li>○ Does the 2.5 additional capacity get us to 2030?</li> <li>○ What do we need in additional capacity?</li> <li>○ What is the bearable utility rate increase?</li> <li>○ What are the DEQ requirements?</li> </ul> </li> <li>• Summary of SIAG feedback: <ul style="list-style-type: none"> <li>○ SIAG's task is to assure community priorities are being met through the collection system master planning process.</li> <li>○ The group acknowledged the WRF decision has been made and the model will be biased, but they want to move on to collection system planning.</li> <li>○ Acknowledging the WRF decision has been made should not be considered an endorsement of the project.</li> </ul> </li> </ul>	

## **Agenda item: South East Interceptor**

- Jim Wodrich presented information on the SE Interceptor.
- Discussion question: What is the best option for moving forward on the
- SIAG questions / comments:
  - What growth projection was used?
  - What is the cost of putting the pipe in the ground?
  - What is the cost with just the pipe?
  - What is the cost without the pipe?
  - What is the cost sewer pipe after the road has been built?
  - If pipe is put in how much is the stranded investments?
  - How many pump stations come off-line?
  - Will this be a stranded investment if the SE interceptor does not go in?
  - Who is paying for the project? Is ODOT paying any part of this?
  - Was there analysis completed to see if storage would provide system capacity?
  - Is the interceptor a likely part of the long-term solution?
  - What segments can be built that have individual functionality?
  - Why is the committee not looking at short term solutions to problems area that have been identified?
- Summary of SIAG feedback:
  - Lacking adequate information to compare options the committee declined to provide feedback on the best option for moving forward on the SE Interceptor.
  - Acknowledged City Council would make the decision on the SE Interceptor.
  - Restated their interest in moving forward on the collection system master planning process.
- Bruce White written comments on the SE Interceptor provided to committee (see attached).

To Do: Move financial meeting to an earlier date.

Meeting adjourned at 5:04 PM



# Bend Sewer Infrastructure Advisory Group: Meeting #3

## What's the Problem? What are our Priorities?

Bend City Hall  
Council Chambers, First Floor  
710 NW Wall Street

October 25, 2012  
4:00-6:00 p.m.

**Preparation Materials** (please read before the meeting):

- Land Use Technical Memo
- Capacity Challenges maps, PowerPoint
- Others?

## Agenda

Activity / Topic	Presenter	Time
1. <b>Welcome / Introductions</b>	Jon Skidmore	4:00 p.m.
2. <b>Review Meeting Agenda / Goals</b>	Clark Worth	4:10
3. <b>What's the Problem?</b> City staff and Advisory Group members present information on current and future development pressures (business / industrial / residential) on the wastewater collection system. The presentation will highlight areas of the city where development pressure and wastewater collection system deficiencies overlap. <b>Objectives:</b> <b>1 - Clearly show the immediate problems and challenges hindering growth within the City.</b> <b>2 – Advisory Group members assist in identifying priority areas for immediate sewer capacity solutions.</b>		
<b>Existing System &amp; Growth Pressures Presentation</b>		4:15
<ul style="list-style-type: none"><li>• Overview of Bend's sewer system service area</li><li>• Collection System Deficiencies</li><li>• Current Growth Pressures</li><li>• Anticipated Growth Pressures</li></ul>	Jon Skidmore Tom Hickmann / Paul Rheault  Advisory Group members: Sharon Smith Andy High Others	

<b>Advisory Group Q&amp;A / Discussion</b>		Clark Worth emcee	4:45
<ul style="list-style-type: none"> <li>• What are the top priorities?</li> </ul>		Steering Committee	
<ul style="list-style-type: none"> <li>• Where should the evaluation of capacity challenges focus?</li> </ul>		Advisory Group	
<ul style="list-style-type: none"> <li>• What values should drive decisions on timing for system deficiencies?</li> </ul>			
4.	<b>Public Comment</b>		5:45
5.	<b>Next Steps</b>	Clark Worth	5:55
<ul style="list-style-type: none"> <li>• Meeting #4: November 15 Infrastructure Finance and Affordability (Chapter 1)</li> </ul>			
<ul style="list-style-type: none"> <li>• Meeting #5: December 20 Infrastructure Finance and Affordability (Chapter 2)</li> </ul>			
<ul style="list-style-type: none"> <li>• Meeting #6: January 17, 2013 Immediate Capacity Challenges and Solutions</li> </ul>			
<b>Adjourn / Thank You</b>		Jon Skidmore	6:00 p.m.

For more information, visit the Bend Sewer Infrastructure Advisory Group webpage:  
<http://bendoregon.gov/index.aspx?page=841>

## 10/03/12 City Council/SIAG Worksession Summary

Steve Galash addressed the City Council and raised some concerns that he wanted to discuss with the Council. Steve asked for their feedback on what they see as the role of the SIAG. One specific issue he wants to get feedback on is the issue of rate tolerance. Many of the councilors addressed both issues.

Mark Capell:

SIAG needs to help Council in identifying priorities for sewer projects. Council needs SIAG to work through the Optimization process to review possible solutions in order to rank them by cost and effectiveness. By identifying community priorities the SIAG can then make recommendations to the Council on how to proceed with different projects such as the Southeast Interceptor. He would like the SIAG to comment on items such as whether to continue with the Southeast Interceptor or to focus on other more pressing community projects. Mark stated that many of the financing issues will likely be framed by the priorities identified.

Tom Greene:

Similarly, Tom would like the SIAG to focus on identifying community priorities and needs. Further, the SIAG needs to act as a conduit of information between the larger community and City council. He would also like the group to help educate the larger community of the issues facing the SIAG as well as educate the Council on community issues. Tom stated that the "pulse of the community" relating to rate tolerance is a discussion to be held further into the process. His main advice is to focus on identifying priorities.

Jodie Barram:

Jodie stated that the Council needs to take some ownership of the rate tolerance issue. She would like the group to dive deeper into alternative treatment opportunities and what are the trade-offs for different choices. She would like the group to focus on identifying top development and redevelopment areas for employment based uses and finding solutions for those areas. At this time she sees the residential lands as secondary in terms of priority. Jodie would also like the group to make sure that we focus on the long term - as in don't suggest solutions now that will be obsolete in a few years. She would like the group to inform the council of the trade-offs that were considered as recommendations were developed. She also would like recommendations to be accompanied by explanations of who benefits from the recommended solutions. The group should discuss and recommend different funding solutions and opportunities.

Jim Clinton:

Jim would like the group to focus on creating a list of the top sewer deficiencies throughout the city. Jim would then like the group to list the deficiencies, explain why the deficiencies need to be addressed, discuss the costs associated with the best solutions and then prioritize the projects in a manner that addresses the most challenged areas with development/redevelopment potential. He also wants the solutions to be consistent with the master plan - which will be developed through this process so the solutions should be consistent with the yet-to-be-developed Collection System Master Plan.

Kathie Eckmann:


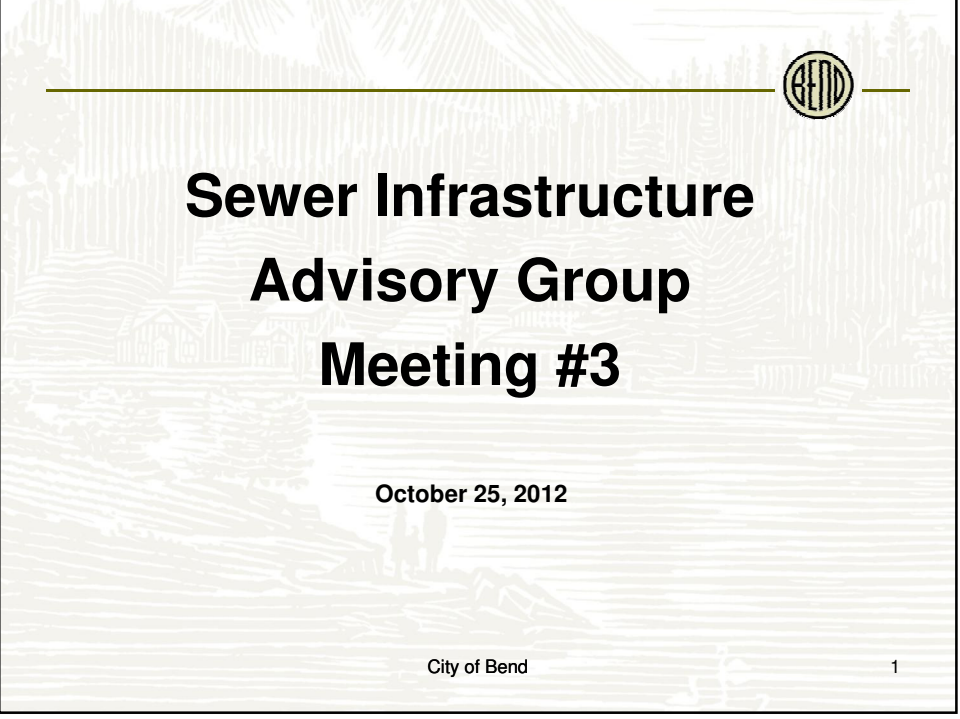
Kathie would like the SIAG to assist the Council in finding simple ways to convey information to the public about why specific projects are necessary as well as the related rate increases. She also wants the group to identify community priorities.

Jeff Eager:

Jeff mentioned that the SIAG was selected so that we had a diverse representation of the community discussing these important issues. Jeff wasn't too concerned on the focus on rate tolerance. Essentially if this group can recommend solutions that work for the community for years to come that are cheaper than the existing solutions that are identified in the old CSMP then the group is heading in the right direction. Jeff would like the group to focus on current challenges that are inhibiting job growth on employment-zoned lands. He suggested that a few early solution recommendations that the group can support will help the SIAG get its "feet underneath" it and show early success.

Scott Ramsay:

Scott would like the group to think outside the box - essentially he is looking to this group to consider sewer solutions that a traditional engineering exercise may not consider. Scott stated that the intent of forming the group is to gather a diverse group of intelligent community members to discuss these issues, consider options and ask questions that a more traditional approach may not. He is very supportive of early and often communication between the SIAG and the Council.




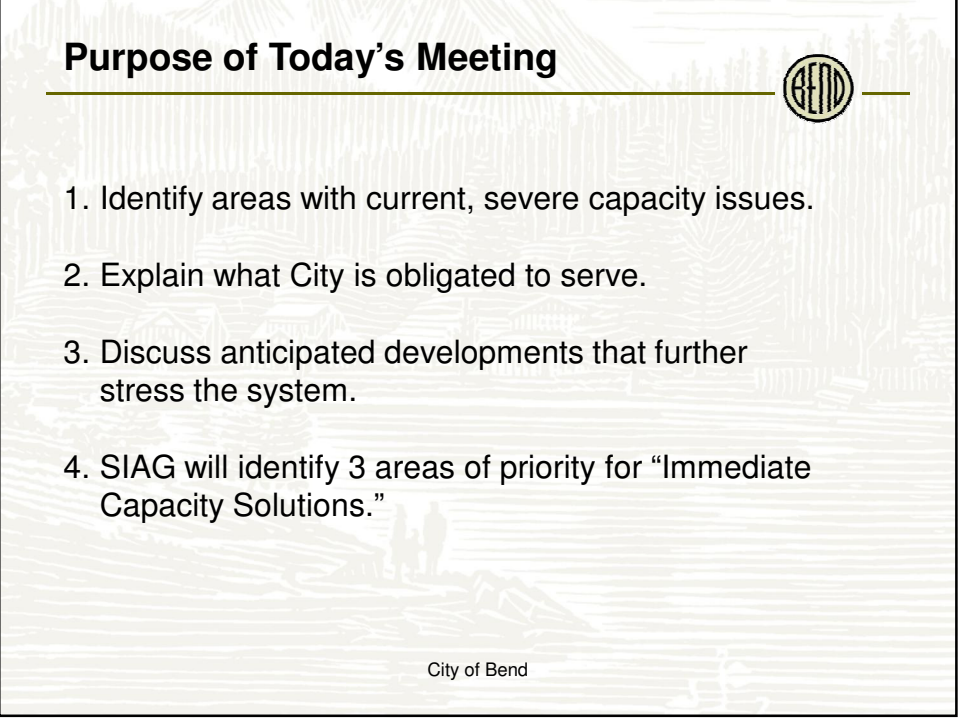
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# **Sewer Infrastructure Advisory Group Meeting #3**

October 25, 2012

City of Bend

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## **Purpose of Today's Meeting**

1. Identify areas with current, severe capacity issues.
2. Explain what City is obligated to serve.
3. Discuss anticipated developments that further stress the system.
4. SIAG will identify 3 areas of priority for "Immediate Capacity Solutions."

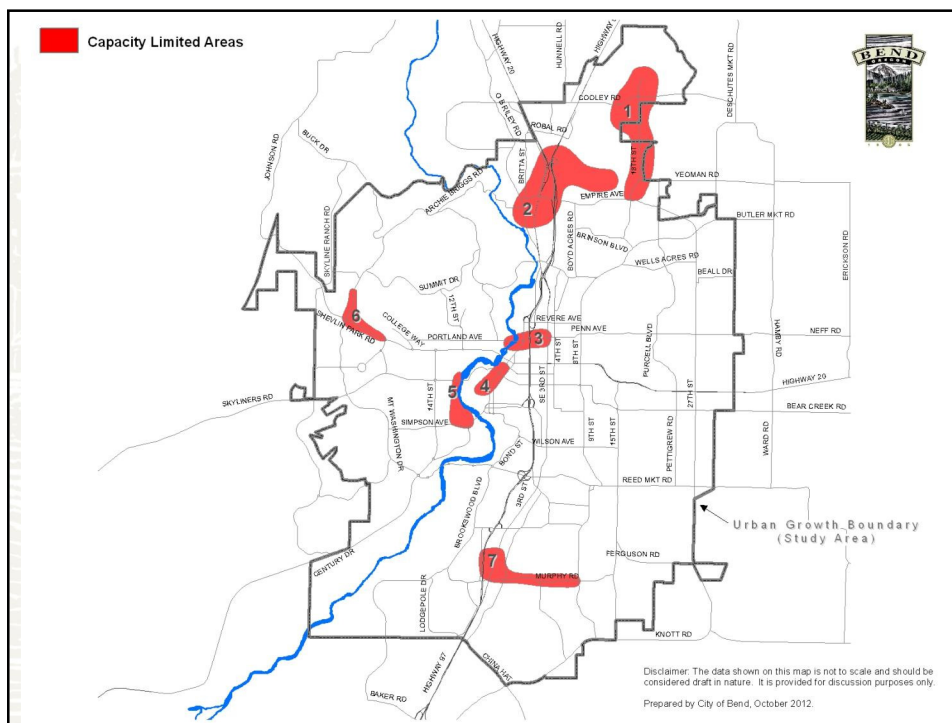
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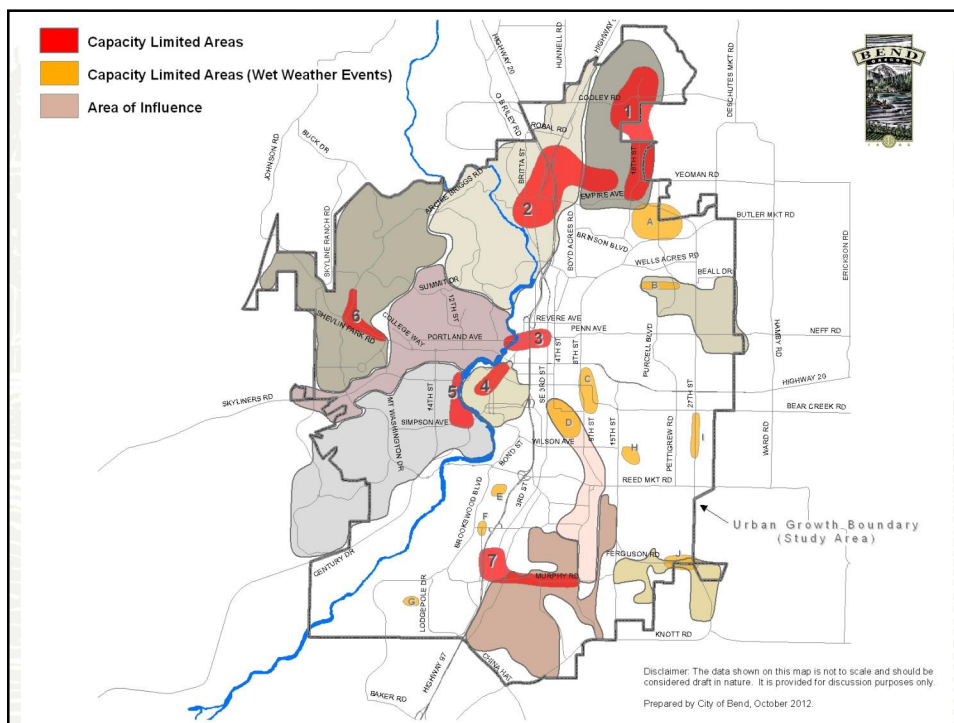
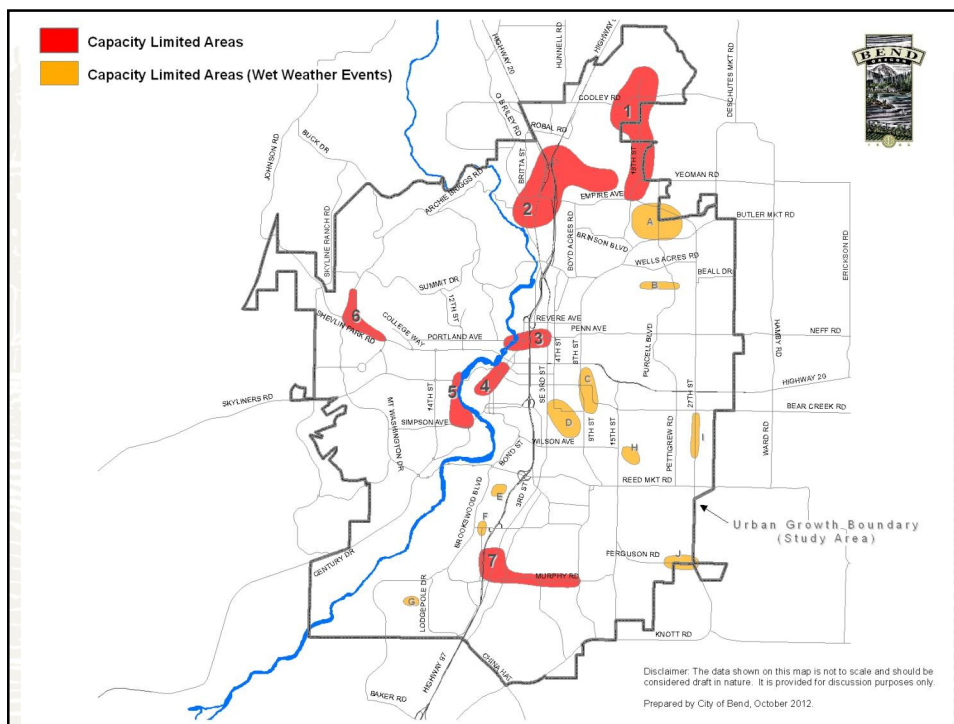
## Definition of “Immediate Capacity Solutions”

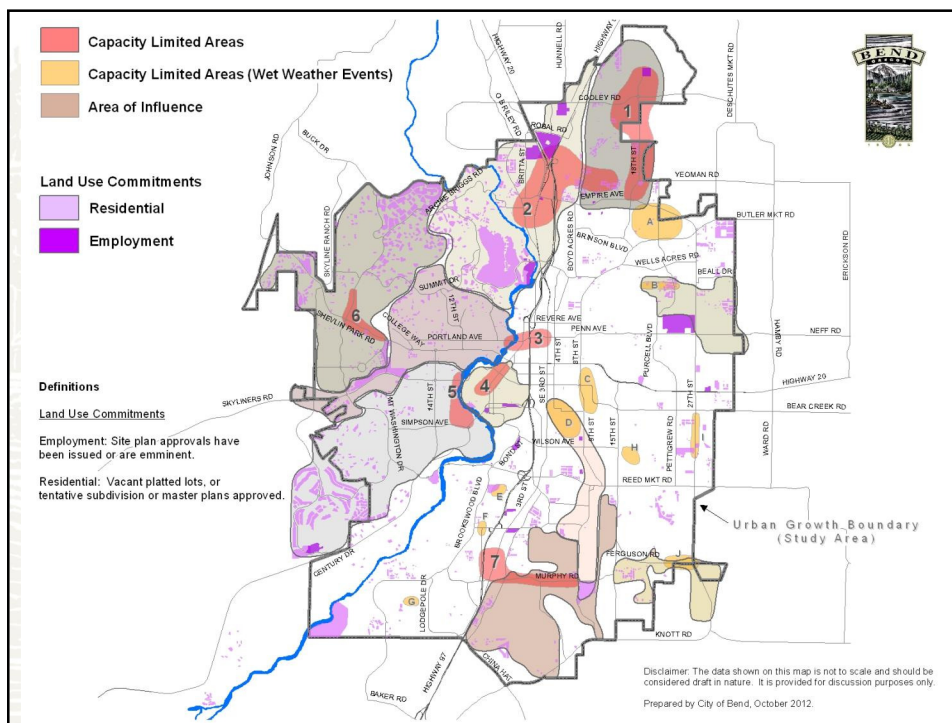
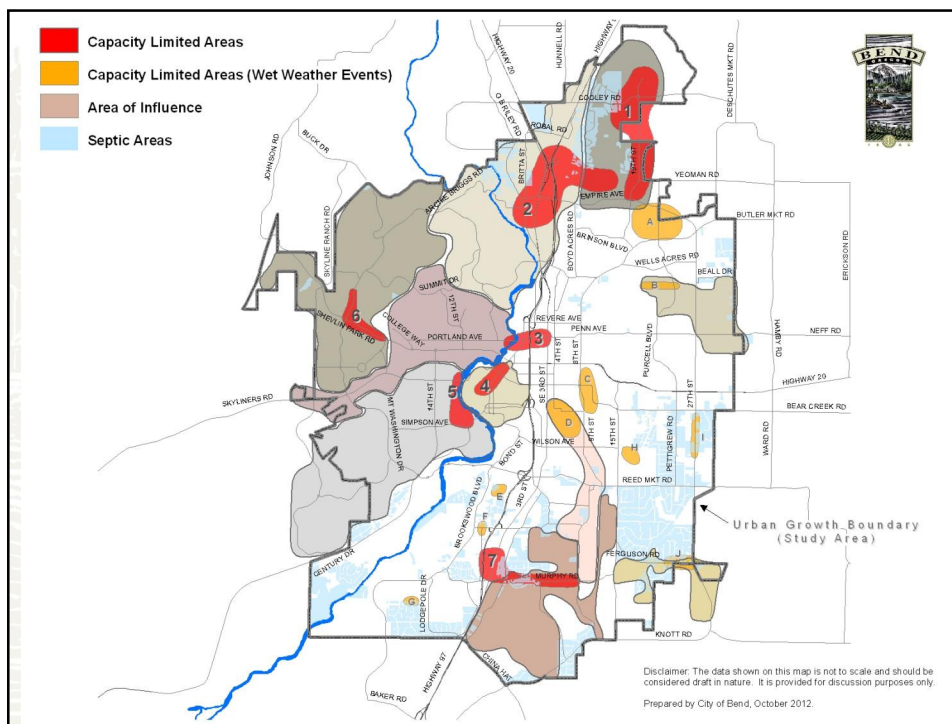


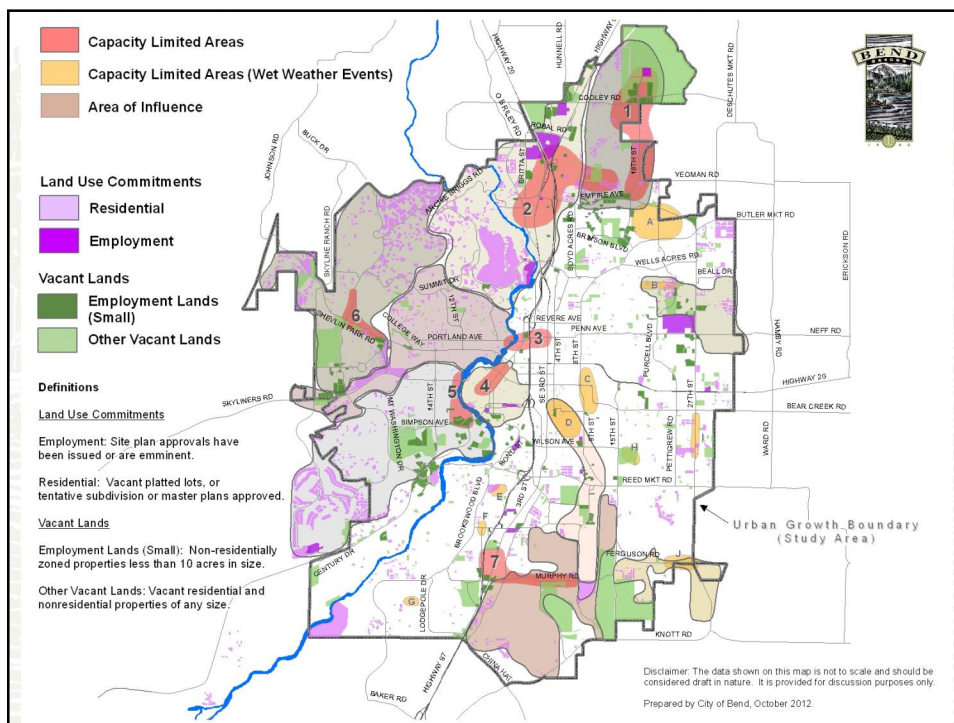
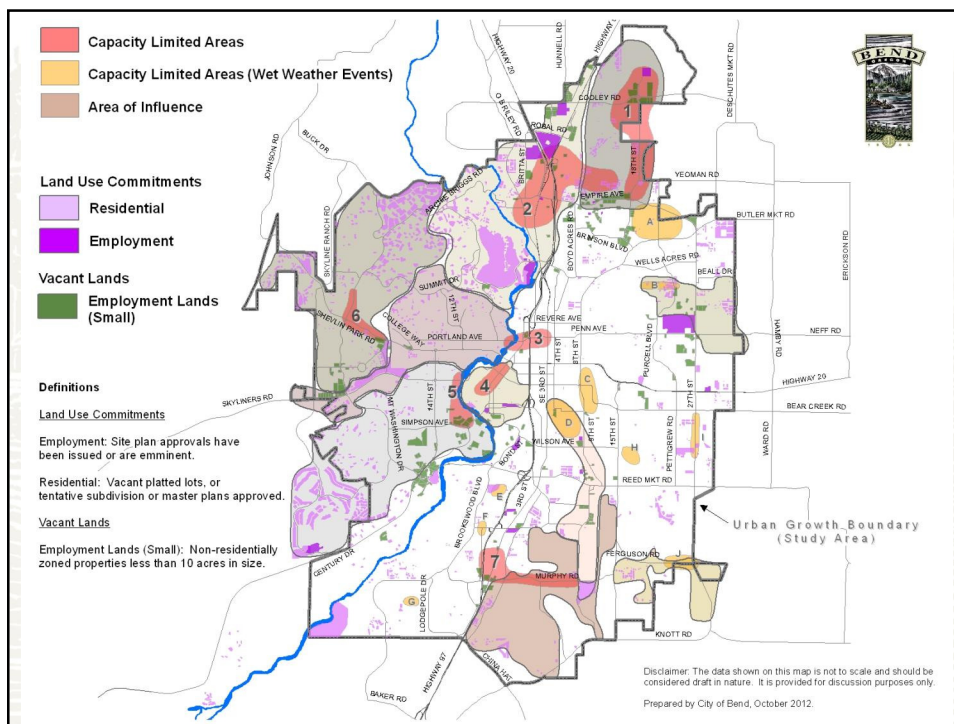
- Design & bid completed in one year.
- Involve pipes or pumps (preferably pipes).
- No environmental permits required.
- Do not require bond funding.
- Comply with our existing DEQ WPCF permit.

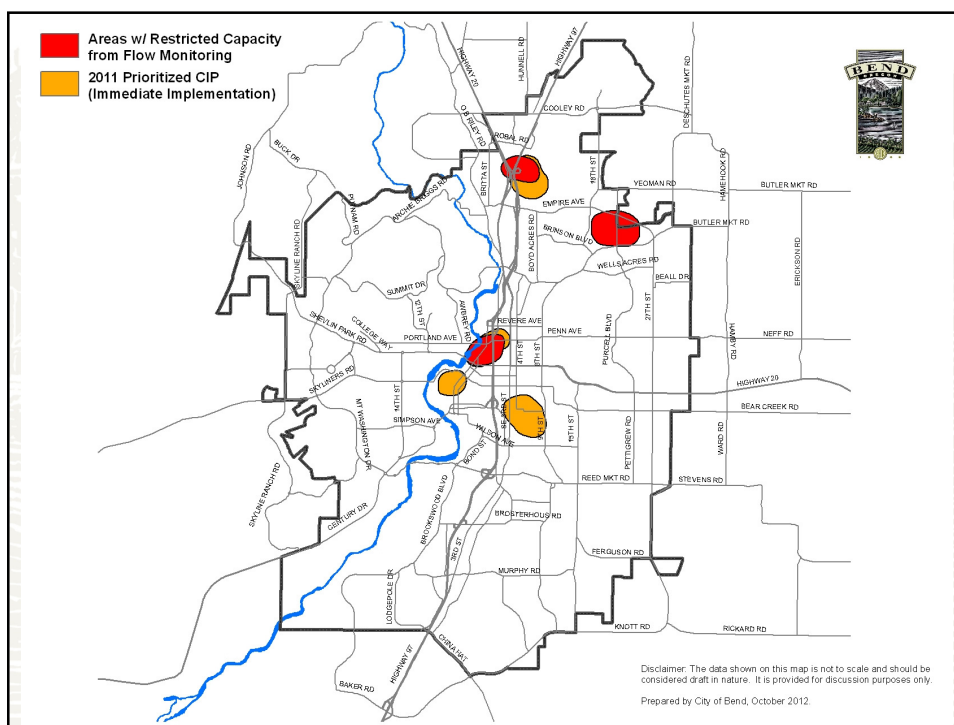
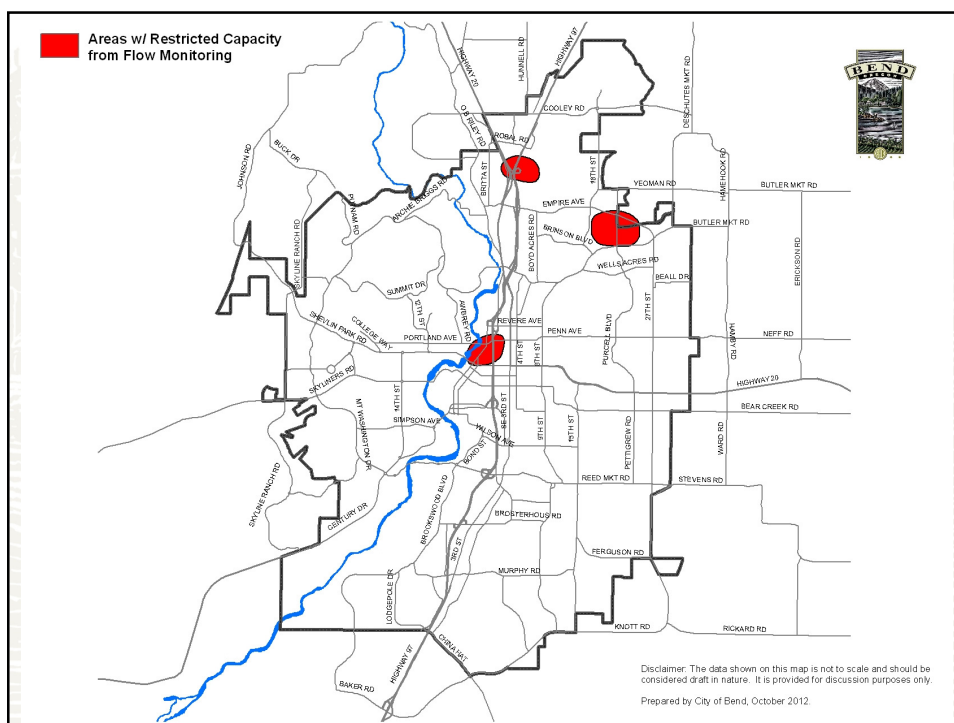
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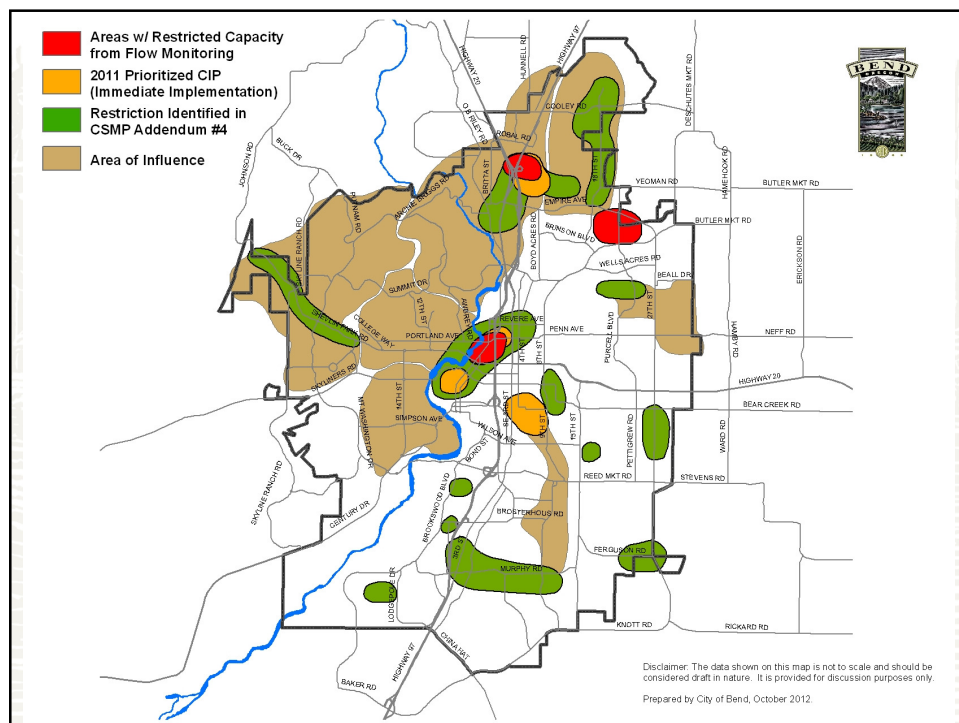
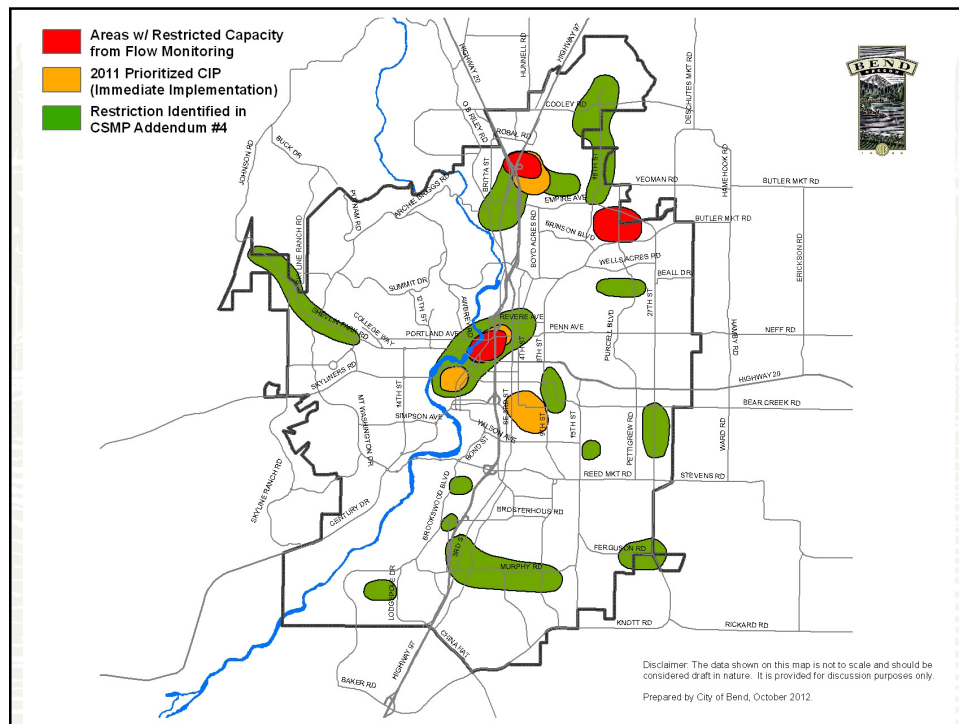


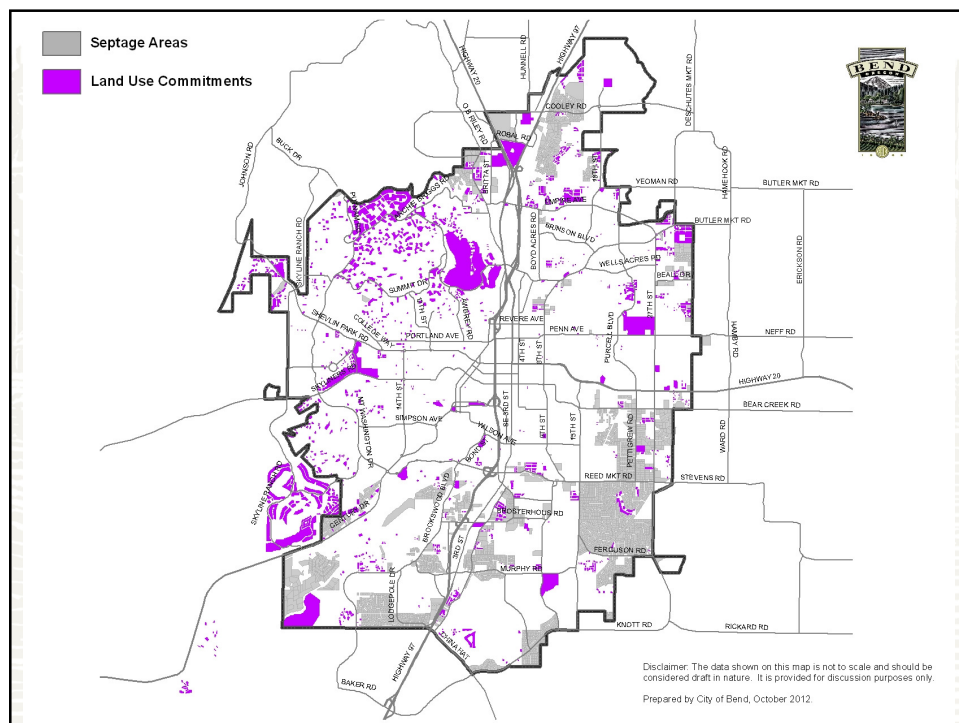
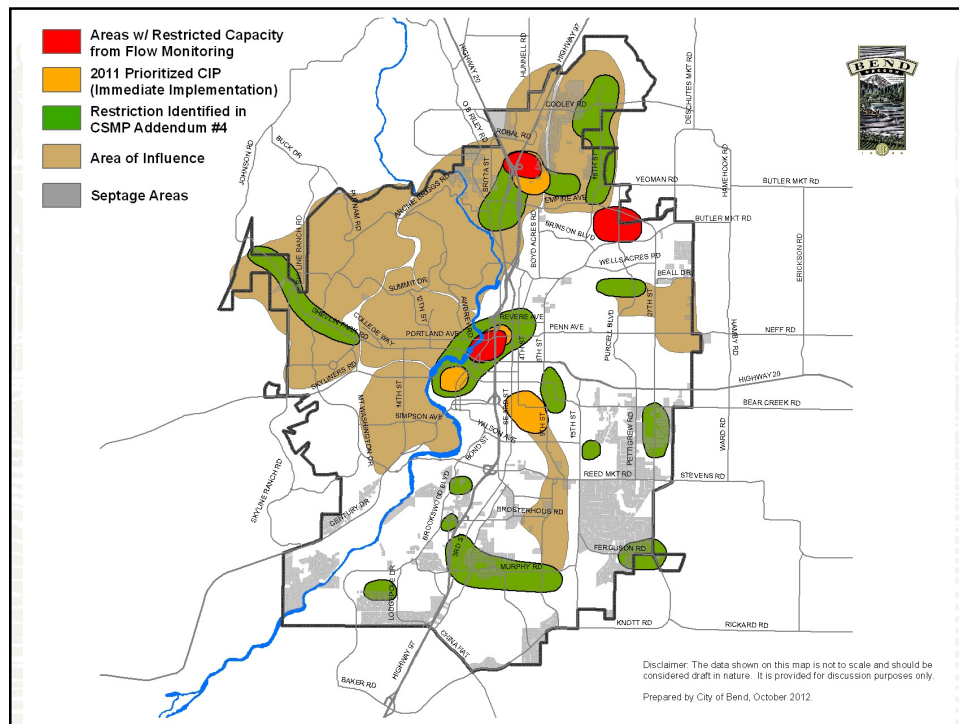


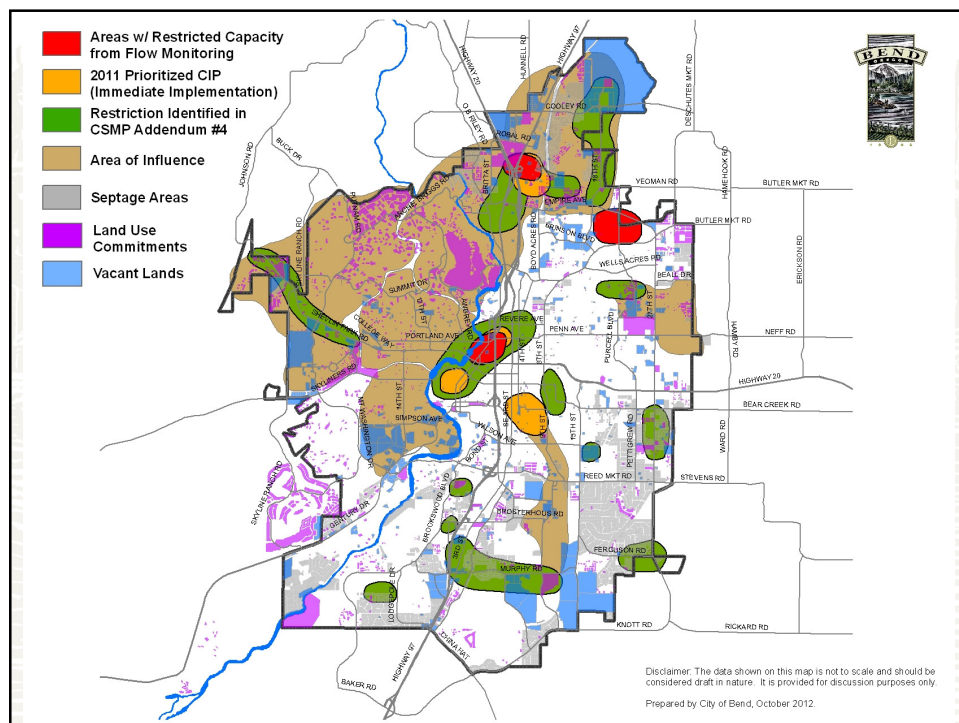
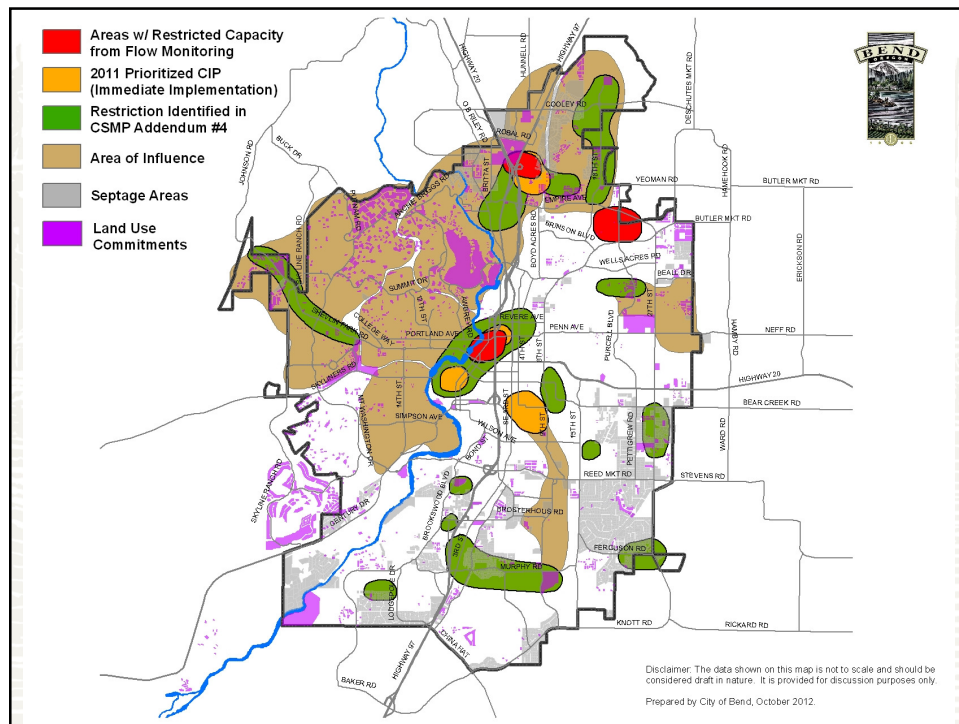












<b>Sewer Infrastructure Advisory Group Meeting Summary</b>	<b>October 25, 2012</b>
	<b>4:00-6:00 p.m.</b>
	<b>Bend Park &amp; Recreation, Riverside Community Room</b>
	<b>Note taker: Adele McAfee</b>
<b>In Attendance:</b> <b>Committee Members:</b> Andy High, Casey Roats, Lynn Putnam, Mike Riley (by phone), Dale Van Valkenburg, Craig Horrell, Steven Hultberg, Charley Miller, Steve Galash, Stacey Stemach, Craig Moore Bruce Alyward Sharon Smith Pam Hardy, Rob von Rohr, Wes Price <b>Absent with prior arrangement</b> Nathan Boddie, <b>COB Staff:</b> Tom Hickmann, Paul Rheault, Jon Skidmore, Aaron Collett, Reese Moody, Paul Rheault, Colin Stephens, Brian Rankin, Eric King, Mary Winters Others – David Stangel (MSA), Dennis Galinato (MSA), Jim Lord (Century West) Eric Hoffman (Century West), Andre Tolman (MWH), Greg Blackmore Facilitators: Clark Worth (Barney & Worth)	

### **Action Items**

1. Prioritized areas selected by the SIAG for immediate capacity solutions:
  - a. Area 2 (Cascade Village Shopping Center)
  - b. Area 3 (Westside lift station – Portland Ave)
  - c. Area 5 (along Columbia / Westside down Simpson to Shevlin lift station)
2. Results of analysis / solutions will be presented to the SIAG on January 17, 2013

### **Agenda Item: Welcome and Updates**

- UGB Class for committee members is being planned
- City Council discussion with SIAG at the work session on 10-03-12
  - Council priorities are employment lands and identifying problem areas with potential solutions

### **Agenda Item: Meeting Goal**

- Identify areas of focus for short term solutions that have current deficiencies

### **Agenda Item: Identifying the problem**

- Presentation on current and future development pressures (business, industrial, residential) on the wastewater collection system.
- SIAG questions:
  - What does it mean that you cannot deny approval (development)?
  - If there is an undeveloped area within the city, that the city can consider different treatment options?
  - Regarding absorption rate for residential – what is the tipping point?
  - Is absorption rate through town equal?
  - When showing vacant employment land does it take into consideration tenant occupancy rate of existing structures? If 100%, will you increase capacity and demand?

- Is Cascade Mall challenged?
  - Is there a cost factor involved? What is it?
  - Are the areas sequenced or separate issues?
  - Do we know how the short-term solution will play in the long-term strategy?
  - Are you looking at solutions that will not become stranded assets?
  - Have you accounted for COCC student housing in the model?
  - How do these choices affect the future of the long-term goals?
  - What is the actual analysis criteria?
  - What is the timing on the model?
- Summary of feedback:
    - The city obligated to serve:
      - Land use obligations (building permit in hand)
      - Anticipated development
    - There are no cost for these areas yet
    - Immediate capacity solutions (definition see hand-out)
      - Presented Maps –
        - **Area 1 (Very north)**
          - Juniper Ridge pump station overcomes other pumps in the area
          - Flows
        - **Area 2 (Cascade Village Shopping Center)**
          - Two major obstructions: under highway 97 and railroad tracks
        - **Area 3 (Westside lift station – Portland Ave))**
          - Issues at the pump station and directly down from pump station
          - Flow
          - Limited capacity at the pump station
        - **Area 4 (Downtown Core)**
          - Dependent on a single clay line, some areas have collapsed
          - Built in 1913
        - **Area 5 (along Columbia on the Westside down Simpson to Shevlin lift station)**
          - Capacity issues
        - **Area 6 (West along Newport Blvd part of Mt Washington)**
          - Constrained
          - Current odor project, moving mainline through this point
          - Hold times creates odor issues
          - COCC
        - **Area 7 (Murphy pump station)**
          - Flows get pump “back”
          - 20 pumps currently feed into this pump station

- Murphy runs 13 hours – doesn't leave much time for other pumps to discharge
  - Odor issues
- o Map showed wet weather events (orange dots)
- o Map -showed neighborhood of 100 homes
- o Completely out of capacity in Areas 7 and 2
- o Other problems: root intrusion, lines with dips, concrete and clay pipes.
- o Maps showed lots that are currently on septic systems.
  - Failure rate is high. DEQ wants these septic systems eliminated and connected to the sewer system.
  - There is no sewer availability in these areas so the homeowner must reinvest in septic systems.
- o When SE Interceptor goes through, homeowners will need to establish a LID to get connected.
- o Reviewed areas of influence:
  - Land use entitlements (these cannot be denied ) 3300 – 3600 lots / 60,000 sq ft of commercial
    - Rivers Edge
    - Tetherow
    - Widgi Creek
    - Market of Choice
    - College
    - Brewery expansion
    - New elementary school
    - New Hotel proposal just came in.
    - New Apartment buildings
- o We are at absolute zero in Area 2 and Area 7. Area 3 is a significant issue because it impacts all of the west side.
- o The group was concerned about how they prioritize without the costs. Pick 3 critical areas and these area will be analyzed. The city does not have the funding to consider all.
- o Map showed vacant areas / vacant commercial lots
- o Map showed vacant non employment land over 10 acres
- o Prioritization: The committee identified the following areas to focus on the short-term solutions: Areas 2, 3 and 5. (A separate tally was taken for the 3rd choice.)

Area 1		1	Area 4		1
<b>Area 2</b>		<b>12</b>	<b>Area 5</b>		<b>10</b>
<b>Area 3</b>		<b>12</b>	Area 6		2
Area 4		4			
Area 5		6			
Area 6		3			
Area 7		1			

- o The short term solutions should be in place within 2 to 3 years.

- Dave Stangel (MSA) gave a high level overview of the project.
- Model should be up and running beginning of next year (2013).
- Optimization is the long-term planning tool and will be ready by the middle of next year.
- In January, the consulting team will bring the analysis regarding immediate capacity solutions.

Meeting Adjourned at 5:45 p.m.



# Bend Sewer Infrastructure Advisory Group: Meeting #4

## SEWER SYSTEM FUNDING AND FINANCING

Bend Park and Recreation  
The Riverbend Community Room  
799 SW Columbia St.

November 15, 2012  
4:00-6:00 p.m.

**Preparation Materials** (please read before the meeting):

- Sewer Funding and Financing (December 13, 2011)
- Sewer Fund: Key Financial Data (November 7, 2012)
- Others?

## Agenda

Activity / Topic	Presenter	Time
1. <b>Welcome / Introductions</b>	Jon Skidmore	4:00 p.m.
2. <b>Review Meeting Agenda / Goals</b>	Libby Barg	4:10
3. <b>Sewer System Funding and Financing</b> City staff presents information on Bend's funding and financing. <b>Objectives:</b> <b>1 -- Ensure the Advisory Group has enough information about Bend's sewer funding and financing to make informed recommendations on priorities for capital improvement projects and funding.</b> <b>2 -- Consider roles for the Advisory Group, City Council, and City staff in determining what is affordable.</b>		
<b>How Bend Pays for Sewers: An Overview</b> <ul style="list-style-type: none"><li>• Sewer Fund: Key Financial Data</li><li>• Sources of Funds</li><li>• Sewer Financial Model</li><li>• Debt Management</li><li>• Bend's Financial Policies and Principles</li></ul>	Sonia Andrews Finance Director	4:15
<b>Advisory Group Q&amp;A / Discussion</b> <i>Are Bend's current Financial Policies and Principles appropriate for sewer collection system funding? Are there any suggestions for City Council consideration?</i>	Libby Barg emcee	4:40

<b>Affordability</b>		Sonia Andrews	5:05
<ul style="list-style-type: none"> <li>• Bend's current sewer rates and trends</li> <li>• How Bend compares to other cities: rate structure / rates / trends</li> <li>• Sewer charges in context of Bend's other utilities: water, stormwater, transportation</li> <li>• Tests of affordability</li> <li>• Examples of rate impacts</li> </ul>			
<b>Advisory Group Q&amp;A / Discussion</b>		Libby Barg emcee	5:15
<p><i>Should the Advisory Group work to help define affordability now—or do we wait for more information on possible solutions?</i></p> <p><i>What is the appropriate role for the Advisory Group in gauging affordability?</i></p>			
4.	<b>Public Comment</b>		5:45
5.	<b>Next Steps</b>	Libby Barg	5:55
<ul style="list-style-type: none"> <li>• Meeting #5: December 20 Long-term Look: Forecast</li> <li>• Meeting #6: January 17, 2013 Immediate Capacity Challenges and Solutions</li> </ul>			
<b>Adjourn / Thank You</b>		Jon Skidmore	6:00 p.m.

For more information, visit the Bend Sewer Infrastructure Advisory Group webpage:  
<http://bendoregon.gov/siag>

## **CITY OF BEND SEWER SYSTEM FUNDING AND FINANCING**

The City operates its sewer system as an enterprise activity based on full cost recovery through user charges. Funding for sewer system operations and capital investment needs come primarily from user rates, system development charges and other user related charges. By law, sewer system enterprise funds cannot be used to supplement other city enterprise or General Funds

This document discusses the sources of funds, financial policies and processes used by the City to determine the funding and financing for its sewer system.

### **1. SOURCES OF FUNDS FOR SEWER SYSTEMS**

The various sources of funds to pay for sewer system operations and capital needs are as follows:

**User Rates and Charges** – Operating expenses of the system are funded by system wide user rates and charges. Capital improvements that benefit the system as a whole are also funded through system wide user rates and charges or financed with debt and repaid over time through user rates and charges.

**Debt Issuance** – When debt is necessary to finance capital improvements, the City either issues revenue bonds, full faith and credit bonds or obtains loans through state agencies such as the Oregon Business Development Department or Department of Environmental Quality that offer municipal infrastructure financing programs. Debt is repaid through user rates and charges and system development charges.

The City may also obtain voter approval for General Obligation (GO) Bonds to finance utility infrastructure improvement that benefit its citizens. GO Bonds were issued in the 1970's to fund improvements to the City's sewer treatment plant. Repayment of GO Bonds is made from property taxes assessed on all properties in the city.

**Grants** – Most grants available from state and federal agencies for sewer infrastructure needs target pilot projects and innovative or "green" projects. Grants are typically not available for standard utility infrastructure needs such as replacing sewer mains or building of pump stations to meet on-going demand. The City researches and applies for grants whenever they are available and applicable.

**System Development Charges (SDCs)** - Growth related capital improvements are funded by SDCs which are assessed on new development. The SDC fee is established by methodology studies and increased each year by the Engineering News Record Index. The City last updated its sewer SDC methodology in 2008. The FY2012-13 sewer SDC for a single family dwelling is \$2,840.

**Private Development Funds** – Sewer infrastructure needed to serve a new residential subdivision or commercial development are typically constructed and funded by the developer and dedicated to the City for on-going maintenance.

**Local Improvement Districts (LIDs) and Surcharges** – Local sewer infrastructure improvements that benefit specific properties in a defined area (such as sewer mains constructed to replace septic tanks) are funded by LID assessments or surcharges (additional monthly charges on top of the regular monthly sewer charge).

## **2. HOW IS FUNDING AND FINANCING DETERMINED**

The City develops long term financial plans for its sewer system by maintaining a 10 year sewer financial model. Adopted policies and principals guide the City in developing the financial model to ensure sound financial management of its sewer business.

### **Financial Policies and Principles**

The following adopted policies and principles reflect industry standards and best practices for managing the finances of the City's utility systems:

1. Utility funds will be self-supporting through user fees
2. Utility rate adjustments will be based on long term financial plans to achieve financial stability. The City will strive to make rate adjustments consistent and not erratic for the customer
3. System development charges will fund growth related capital needs
4. The City will determine the least costly funding method for its capital projects and will obtain grants, contributions and low cost state or federal loans whenever possible
5. The City will utilize "pay-as-you-go" funding for capital improvement expenditures considered recurring, operating or maintenance in nature. The City may also utilize "pay-as-you-go" funding for capital improvements when current revenues and adequate fund balances are available or when issuing debt would adversely affect the City's credit rating
6. The City will consider the use of debt financing for capital projects under the following circumstances:
  - a. When the project's useful life will exceed the terms of the financing
  - b. When resources are deemed sufficient and reliable to service the long-term debt
  - c. When market conditions present favorable interest rates for City financing
  - d. When the issuance of debt will not adversely affect the City's credit rating and coverage ratios

7. The City will strive to maintain debt coverage ratios and percentages that uphold the City's credit rating. Water and Water Reclamation (Sewer) debt coverage ratios should be maintained at a minimum of 1.50 or at a level sufficient to protect the credit rating of the Water and Water Reclamation systems
8. The City will maintain undesignated reserves of at least 25% (or 3 months) of the operating budget for its utility funds

Policies related to the City's utility systems are adopted by the City Council as part of the City of Bend's Fiscal Policies.

### **Sewer Financial Model**

The City maintains a 10 year sewer financial model developed by the City's utility rate consultant (Galardi Consulting) and updated twice a year by city staff. The purpose of the financial model is to:

1. Forecast sewer revenues and expenditures over the next 10 years
2. Determine financing requirements for capital needs
3. Determine reserve requirements
4. Set sewer rates
5. Ensure compliance with city adopted financial policies and principals
6. Generate a long term financial plan for the sewer business

Major assumptions for the financial model are developed as follows:

- Customer growth and water consumption assumptions – these assumptions are based on historical and current trends.
- Operating expenditures – these costs are projected as a percentage increase or decrease from prior year costs based on changes in customer accounts and consumption. Any one time expenditures based on specific operating needs are also identified by staff and included in the model.
- Capital expenditures – 10 year capital improvement needs are based on the latest sewer master plan studies and as refined by the City's Engineering staff.
- Debt assumptions – Capital expenditures too large to be funded from available revenues are financed with 20 to 25 year debt in the financial model. Interest rate assumptions are based on current projections developed by the City's bond financial advisor.
- Reserve assumptions – The financial model calculates 3 months of operating expenses for operating reserves and 1 year of debt service payments as debt reserves for revenue bonds issued.

Based on the assumptions entered, the financial model will determine how much sewer rates need to be adjusted to provide the revenues necessary to fund expenditures and reserves and to repay debt. As noted above, the financial model generates the city's long term financial plan for the sewer system as it establishes revenue and expenditure

projections, identifies long term capital needs, and determines debt and rate requirements in compliance with the city's financial policies and principals.

The debt and rate requirements generated by the financial model are evaluated for affordability as further discussed below.

### 3. SETTING SEWER RATES

As discussed above, sewer rate adjustments are determined through the sewer financial model. The City strives to develop consistent and not erratic rate adjustments for its rate payers. The City also strives for inter-generational equity to avoid burdening future generations in order to benefit current rate payers and vice versa.

#### **Sewer Bill Affordability**

It is important for every community to ensure that its utility rates are affordable for all households in the community. Affordability of utility bills is subjective and can be hard to define. The EPA has determined a national-level affordability measure of 2.5% of median household income for a utility. This measure is a "look across all the households in a given size category of systems and determines what is affordable to the typical, or middle of the road household." This measure does not determine affordability for an individual household (ie. the 2.5% threshold does not mean that each individual household should not pay more than 2.5% of its income for sewer services).

Bond rating agencies also look at affordability of rates and projected rate increases as one of many factors in determining credit quality. Fitch Ratings generally considers rates for combined water and sewer service higher than 2% of median household income (or 1% for individual water and wastewater utilities) to be financially burdensome (*Water and Sewer Revenue Bond Rating Guidelines, FitchRatings August 6, 2008*).

The City of Bend's sewer bill as a percent of median household income over the last few years is as follows:

	Median Household Income (MHI)	Annual Residential Sewer Bill *	% of MHI
2009	\$54,770	\$408	0.7%
2010	\$46,090	\$444	1.0%
2011	\$46,816	\$488	1.0%
2012	not available **	\$517	

\* includes 3% franchise fees

\*\* will be released in 2013

As noted above, affordability of utility bills is hard to measure and is debatable. When raising sewer rates, the City considers the affordability of rate increases on low income households and also the community's rate tolerance and willingness to pay.

The City has developed low income assistance programs to enhance affordability for low income households. Currently the City has a 50% sewer discount program for low income seniors and disabled. The City also has a Utility Billing Assistance program that provides utility bill assistance of up to \$150 for low income households.

#### **4. Debt Management**

When issuing long-term debt, the City will ensure that there is sufficient debt capacity and that the debt is financially manageable by adhering to the following principals:

1. Debt is issued only when necessary for capital improvements too large to be funded by current available resources
2. Capital projects financed through long term debt shall be financed for a period not to exceed the useful life of the project
3. Sources of repayment, debt ratios and the affordability of debt will be analyzed prior to issuance of long term debt

#### **State or Federal Loan Programs**

The City will also determine the least costly financing available. The City evaluates the cost of issuing debt versus applying for loans available through programs administered by state or federal agencies. Currently the Oregon Business Development Department (OBDD) offers the Oregon Bond Bank Water/Wastewater Financing Program while the Department of Environmental Quality (DEQ) offers the Clean Water State Revolving Loan Fund program. These programs may offer loans at low interest rates and if the total cost of obtaining such loans is lower than the total cost of issuing debt, the City will apply for such loans with the OBDD or DEQ. These loan programs have a maximum borrowing limit per year and are also awarded to communities based on certain criteria determined by the state agencies.

The City was recently awarded \$38.8 million in DEQ loans for its Water Reclamation Facility Expansion project.

#### **Bonds Issued by City**

If the City decides to issue debt for its sewer capital improvements, the City works with its bond financial advisor (Western Financial Group) and bond counsel (Orrick Herrington & Sutcliff) to determine debt structure and terms, timing of debt issuance and other requirements of the debt. The City may issue revenue bonds or full faith and credit bonds to finance sewer capital improvements.

Revenue bonds are secured by the revenues of the sewer system and contain covenants and reserve requirements. Covenants typically call for minimum 1.25 debt coverage ratios.

Full faith and credit bonds are secured by the City's full faith and credit and do not contain reserve requirements. Full faith and credit bonds issued for sewer capital improvements are repaid from the revenues of the sewer system. Any full faith and credit bonds issued for sewer system needs are on par with revenue bonds issued for the sewer system and as such are subject to the debt coverage ratio requirements.

### **Credit Rating**

The City strives to maintain debt coverage ratios and percentages that uphold the City's credit rating. The City's sewer revenue bonds are currently rated Aa2 by Moody's Investor Services.

### **Debt Capacity**

The City determines debt capacity for its sewer capital improvement plans by evaluating various debt ratios and percentages.

Debt Service Coverage - The debt service coverage ratio is a measure of debt capacity. It shows the multiple of net revenues to debt service, with higher coverage generally indicating a revenue stream that comfortably covers debt obligations (ie an affordable debt burden). Systems with a lower debt service coverage may experience difficulty in meeting rising operations and maintenance expenses. For FY 2011-12, the City's sewer system's total debt coverage ratio was 3.2.

Debt to Operating Expenses – a high percent of debt to operating expenses may indicate a high debt burden and raise concerns of financial inflexibility. For FY 2011-12, the City debt to operating expense is 28% for its sewer system.

Debt to customer – total outstanding long term debt per customer indicates the existing debt burden (principal payments) attributable to each customer. As of 6/30/12, the City's debt to customer is \$1,137 for its sewer system.

Other debt factors considered include debt to plant (total debt as a percent of the value of the net property, plant and equipment) and liquidity ratios which determine sufficiency of cash on hand for debt service and operations.

Projections of these ratios are made along with projections in the financial model to determine if debt needed are within reasonable debt burden levels for the City's sewer systems.

**CITY OF BEND  
SEWER SYSTEM**

11/7/2012

<b><u>Sewer Customers</u></b>		<b><u>Sep-12</u></b>
Number of residential accounts billed		24,003
Number of non-residential/ commercial accounts billed		2,834
Total number of accounts billed		<u>26,837</u>
<b><u>Sewer Monthly Charge</u></b>		<b><u>FY12-13</u></b>
Fixed charge (\$ / month)	\$ 41.86	Applies to all customers
Volume charge * (\$ / 100 cubic feet over 1000 cf)	\$ 3.29	Applies to nonresidential customers **
* Volume charge based on winter quarter average water consumption		
** Additional extra strength charge applies to nonresidential customers with above domestic strength discharge		
<b><u>Revenues</u></b>		<b><u>For FY11-12</u></b> (in millions)
Revenues from residential accounts	\$ 11.5	66%
Revenues from nonresidential accounts	4.1	23%
SDCs	1.2	7%
Other revenues (other service charges, interest, misc)	0.7	4%
	<u>\$ 17.5</u>	
<b><u>Operating Expenses</u></b>		
Personnel	3.7	33%
Operating expenses	4.9	45%
Debt principal & interest payments	2.4	22%
	<u>\$ 11.0</u>	

**FINANCIAL POSITION**

<b><u>Balance Sheet at 6/30/12 (in millions)</u></b>		<b><u>Financial Ratios</u></b>	<b><u>6/30/2012</u></b>	<b><u>Moody's Aa2 Median</u></b>
Cash	\$ 17.9	Current ratio	7.33	
Accounts receivables	2.2	Accounts receivable turnover	2.09	
Receivable from DEQ	1.7	Net working capital (in millions)	\$ 16.9	
Notes & other receivables	0.3	Net WC as % of operating expenses	153%	
Other assets	0.9	Debt to net assets	0.25	
Capital assets	132.8	Debt coverage ratio	3.23	1.88
<b>Total Assets</b>	<u><b>155.7</b></u>	Credit rating	Aa2	
Accounts payable	0.8	<b><u>Outstanding Debt (in millions)</u></b>		
Accrued liabilities	1.2	Revenue Bonds 1.9% - 4.5%	\$ 18.1	
Long term debt	30.7	ARRA EDRZ Bonds 3.05%	10.7	
<b>Total Liabilities</b>	<u><b>\$ 32.7</b></u>	DEQ loans (\$38.8M committed) 2.5% - 3.3%	1.7	
			<u><b>\$ 30.5</b></u>	
<b>Net Assets</b>	<b>\$ 123.0</b>	Total debt per account	\$ 1,137	current
		Total debt per account (with total \$38.8M)	\$ 1,941	estimate

## History of City of Bend Utility Rate Increases

July	Sewer Rates <u>% Incr</u>	Sewer Charge <u>Flat Rate</u>	With 3% Franchise Fee	
1993		\$ 16.34		
1994	4.4%	\$ 17.06		
1995	0.0%	\$ 17.06		
1996	3.6%	\$ 17.67		
1997	2.7%	\$ 18.14		
1998	2.5%	\$ 18.59		
1999	2.7%	\$ 19.09		
2000	4.0%	\$ 19.85		
2001	4.1%	\$ 20.66		
2002	-6.2%	\$ 19.38		elimination of 1.90 collection service charge
2003	6.0%	\$ 20.54		
2004	6.0%	\$ 21.77		
2005	2.9%	\$ 22.41	\$ 23.08	implementation of 3% franchise fee
2006	6.0%	\$ 23.75	\$ 24.46	
2007	6.0%	\$ 25.18	\$ 25.94	
2008	14.5%	\$ 28.83	\$ 29.69	rate increase plan for treatment expansion and collection sys
2009	14.5%	\$ 33.01	\$ 34.00	
2010	8.8%	\$ 35.90	\$ 36.98	reduced rate increases due to delay in treatment expansion
2011	10.0%	\$ 39.49	\$ 40.67	
2012	6.0%	\$ 41.86	\$ 43.12	reduced rate increase originally planned to reevaluate collection sys

**ESTIMATED RATE INCREASES \* (for discussion purposes only)**

Dated 11/14/2012

\* **Important Note:** Rate increase estimates based on current assumptions of customer growth, project costs, O&M & debt costs and reserve requirements. These assumptions may change which causes changes in estimates. Actual rate increases could also differ from these estimates.

If City proceeded with \$175 million in interceptor and treatment expansion projects						
	Estimated Sewer Rates % Incr *	Estimated Sewer Charge	with 3% Franchise Fee	O/S Debt per Customer DSC		Capital Reserves
2013	14.0%	\$ 47.72	\$ 49.15	1.97	2,095	\$ 11,500,000
2014	14.0%	\$ 54.40	\$ 56.03	1.98	2,617	(3,100,000)
2015	14.0%	\$ 62.02	\$ 63.88	2.07	3,130	(1,400,000)
2016	3.0%	\$ 63.88	\$ 65.79	1.91	3,214	(2,200,000)
2017	3.0%	\$ 65.79	\$ 67.77	1.89	3,318	1,700,000
2018	6.0%	\$ 69.74	\$ 71.83	2.03	3,372	(940,000)
						(2,700,000)
						<u>\$ 2,860,000</u>
						reserves at end of FY2018/19
<b>Assumptions</b>						
1. Customer account growth from 0.5% to 1% per year						
2. Metered volume growth from 0% to 0.5% per year						
3. Additional \$59 million in revenue bonds at 4% - 4.8%						
4. Capital expenditure assumptions:						
		Treatment	Collection Sys	Other	Total	
2011/12		1,996,755	804,162	494,094	3,295,011	
2012/13		5,038,945	13,994,167	2,582,730	21,615,842	
2013/14		11,000,000	13,658,333	950,000	25,608,333	
2014/15		11,000,000	13,158,333	750,000	24,908,333	
2015/16		8,140,000	19,084,888	750,000	27,974,888	
2016/17		1,459,320	11,516,242	750,000	13,725,562	
2017/18		-	16,000,000	1,750,000	17,750,000	
2018/19		-	14,500,000	5,750,000	20,250,000	
2019/20			5,000,000	6,750,000	11,750,000	
2020/21				7,750,000	7,750,000	
		<u>38,635,020</u>	<u>107,716,125</u>	<u>28,276,824</u>	<u>174,627,969</u>	

If City completes treatment expansion and immediate fixes only						
	Estimated Sewer Rates % Incr *	Estimated Sewer Charge	with 3% Franchise Fee	O/S Debt per Customer DSC		Capital Reserves
2013	0.0%	\$ 41.86	\$ 43.12	1.91	1,580	\$ 16,900,000
2014	0.0%	\$ 41.86	\$ 43.12	1.56	1,867	1,900,000
2015	0.0%	\$ 41.86	\$ 43.12	1.33	2,030	1,100,000
2016	2.5%	\$ 42.91	\$ 44.19	1.31	1,941	800,000
2017	2.5%	\$ 43.98	\$ 45.30	1.33	1,797	1,200,000
2018	0.0%	\$ 43.98	\$ 45.30	1.37	1,662	1,500,000
						1,600,000
						<u>\$ 25,000,000</u>
						reserves at end of FY2018/19
<b>Assumptions</b>						
1. Customer account growth from 0.5% to 1% per year						
2. Metered volume growth from 0% to 0.5% per year						
3. No new debt						
4. Capital expenditure assumptions:						
		Treatment	Collection Sys	Other	Total	
2011/12		1,996,755	804,162	494,094	3,295,011	-
2012/13		5,038,945	1,896,220	2,579,908	9,515,073	
2013/14		11,000,000	500,000	1,050,000	12,550,000	
2014/15		11,000,000	500,000	850,000	12,350,000	
2015/16		8,140,000		850,000	8,990,000	
2016/17		1,459,320		850,000	2,309,320	
2017/18		-		850,000	850,000	
2018/19		-		850,000	850,000	
2019/20				850,000	850,000	
				850,000	850,000	
		<u>38,635,020</u>	<u>3,700,382</u>	<u>10,074,002</u>	<u>52,409,404</u>	

<b>Sewer Infrastructure Advisory Group Meeting Summary</b>	<b>November 15, 2012</b>
	<b>4:00-6:00 p.m.</b>
	<b>Bend Park &amp; Recreation, Riverside Community Room</b>
	<b>Note taker: Adele McAfee</b>
<b>In Attendance:</b> <b>Committee Members:</b> Andy High, Casey Roats, Lynn Putnam, Mike Riley, Dale Van Valkenburg, Craig Horrell, Steven Hultberg, Charley Miller, Steve Galash, Stacey Stemach, Bruce Alyward, Sharon Smith, Pam Hardy, Rob von Rohr, Wes Price, Nathan Boddie, <b>Absent with prior arrangement: None</b> <b>COB Staff:</b> Tom Hickmann, Paul Rheault, Jon Skidmore, Aaron Collett, Reese Moody, Colin Stephens, Brian Rankin, Sonia Andrews Others – David Prull, Sally Russell, Rondo Facilitators: Libby Barg (Barney & Worth)	

### **Action Items**

1. Determined Affordability Goals
  - a. Use the total cost of Bend's utilities—water, sewer, stormwater—to measure affordability.
  - b. Work to ensure needed sewer projects are completed at the lowest practicable cost.
  - c. Use creative funding / financing strategies and project scheduling to minimize impacts on Bend ratepayers.
  - d. Activate Bend's utility assistance program to reach eligible low income, elderly and disabled households.
  - e. Ensure all classifications of sewer ratepayers pay a fair share of costs.
2. Council update on December 5<sup>th</sup>. Discussion on three priority areas and financing
3. Provide advisory group with more information on percentage of customers are participating in the discounted rate program.

### **Agenda Item: Welcome and Updates**

- Committee member Craig Moore has resigned
- UGB /Growth management 101 went well. It was an open house format.
- Next meetings: Dec 20 at BPR / Jan 17 – Council Chambers / December 5<sup>th</sup> City Council work session

### **Agenda Item: Meeting Goal**

- Sewer system funding and financing
- Financial Policies and Principals
- Affordability

### **Agenda Item: Video presentation**

- Paul Rheault presented a video about broken sewer line Wall St / Olney. Clay pipe on Olney. This incident was reported to the State.

### **Agenda Item: Sewer System Funding and Financing**

Presentation on sewer financing and how it is funded; Discussion of how sewer finances stand, Rates, and how the city funds capital and operations.

- SIAG questions:
  - Why is a franchise fee for the road charged to the sewer fund?
  - How was it decided what the variable charge would be?
  - Is there a plan to update the extra strength charge?
  - Steering committee asked for the amount of the city's financial commitment to date.
  - Does the model factor in the continued increase of the consumer price index?
  - How close are SDC in covering costs?
  - 66% percent of revenue is generated by residential accounts does that represent capacity and usage of the system?
  - How far out do the capital master plans go?
  - Is there any downside to do a 20 year plan and update?
  - Has there been consideration to implement SDCs in areas where the infrastructure will cost more and less in areas where infrastructure will cost less?
  - Can rate structure be skewed to have nonresidential make up more of the difference?
  - Comment on Council financial policies - Building a reserve is critical (operating and capital)
  
- Summary of feedback:
  - Billing: Summarized how charges are computed for residential and non-residential.
    - Volume
    - Add on charges - Extra Strength Charges
    - 3% Franchise Fees – Goes to Street Construction Fund
  - Franchise fees are charged to utilities for working in the City's right of way.
  - 23% of revenue comes from non-residential
  - Reviewed revenues amounts collected and expenditures, debt principal and interest
  - Collecting more in rates because of rate increases for the treatment expansion and collection system.
  - There is a misallocation of cost between residential and non-residential the methodology will be updated during the work being done on the extra strength charge.
  - Mixed and volume has a rate model which calculates rate and revenue requirement. The cost allocation is revenue neutral and it shifts the cost and does not change the rate model.
  - Advisory Board will be making a recommendation regarding extra strength charges to council in May or June. They are looking how to retool this program.
  - Reviewed current revenues
  - Debt Coverage ratio –This is important allows the city in managing sewer system allows to issue debt at a lower rate. The city has an agreement with the bond holders that we will maintain a 1.25 minimum debt coverage ratio.
  - The city has a policy that it requires the city to plan above 1.5
  - Moody is the City's rating agency.
  - Debt Outstanding:
    - 18.1 million in revenue bond issued in past year for past improvements.
    - Obama Stimulus recovery zone bonds
    - DEQ for the expansion of treatment plant. (38.8 million) only drew a portion ( 1.7 million)
  - Reviewed history of Rate increases.
  - Reviewed estimated rate increases - Two scenarios
    - If City completes treatment expansion and immediate fixes only
    - If the city proceeded with the interceptor and treatment expansion projects.
  - The 10 year model factor in inflation increases

- Reviewed a comparison a snap shot in time of what Bend's utility rates look like in comparison to other cities.
- Reviewed funding and finance memo
  - Sources for funding sewer systems
  - City financial policy adopted by council
  - Rate Model
- Committee reviewed the Council's financial policies on sewer financing
- A 20 year plan becomes inaccurate
- SDCs need a fair and equitable rate structure is what you are putting in the system. It is a rate to pay your fair share.
- Affordability: Every community determines what is affordable. EPA has determined a national affordability measure of 2.5% of median household income for each utility. Fitch ratings combine sewer and water at 2% or 1% for each utility. Bend is at 1%. Bend has a 50% discount for senior or disabled or low income.
  - Other communities have affordability programs that partner with other community groups.
  - Prioritizing projects how much money is there to work with what is affordable How does group work to determine what is affordable . Timing determine now or work when you determine what the project is
  - The first three project had hard time to when there were no costs attach. Does the committee get involved with budget.
  - Committee to consider discussion with council on how to pay for projects beyond using rates.
    - GO Bonds
    - Public Private partnerships

**Agenda Item: Define Affordability**

- Determined affordability goals

Meeting Adjourned at 5:50 p.m.



# Bend Sewer Infrastructure Advisory Group: Meeting #5

## Immediate Challenges and Solutions

City Council Chamber  
710 Northwest Wall Street

January 17, 2013  
4:00-6:00 p.m.

**Materials** (meeting handouts):

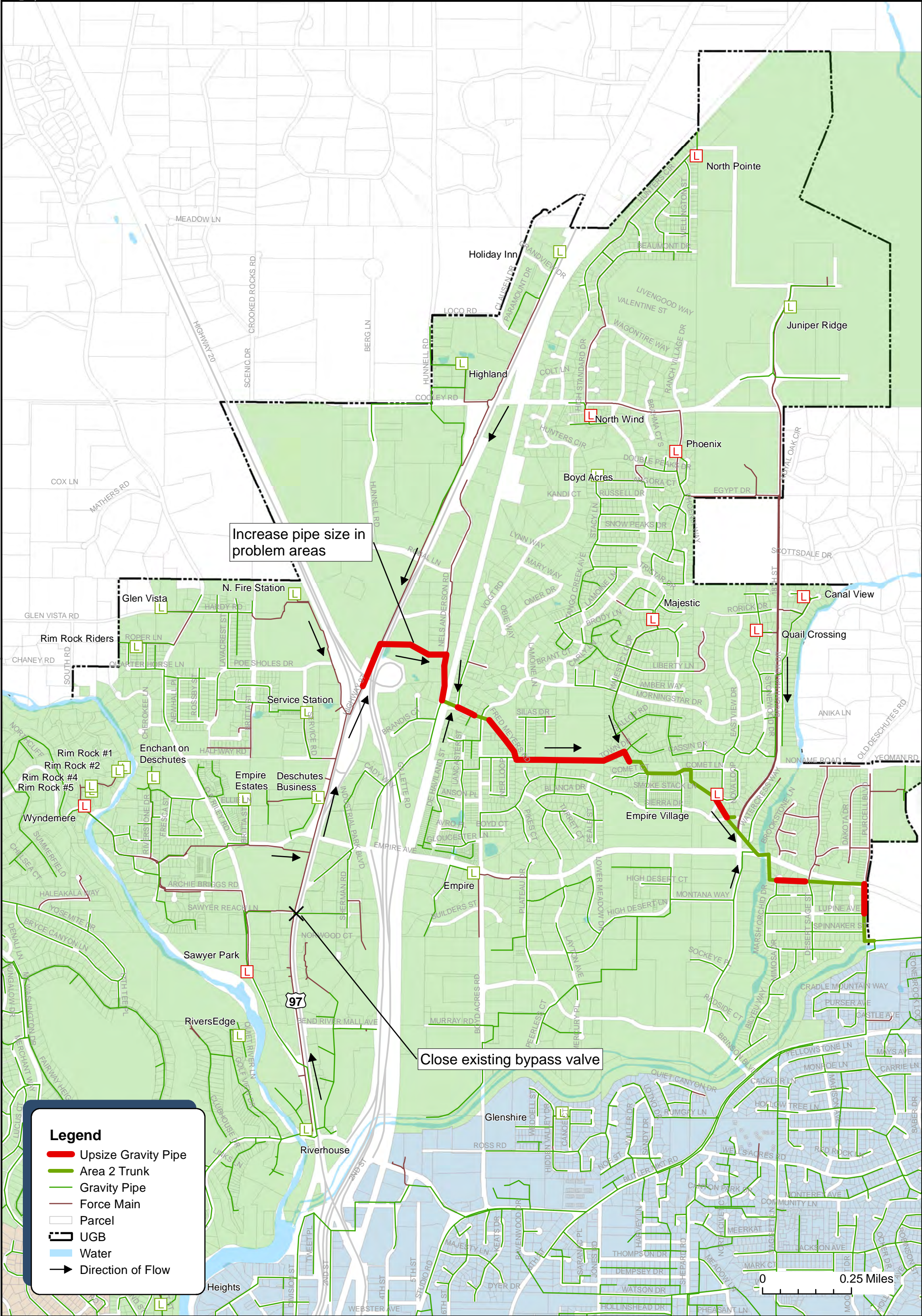
- **Maps – Options for Areas 5, 3, and 2**
- **Solution Worksheet**

## Agenda

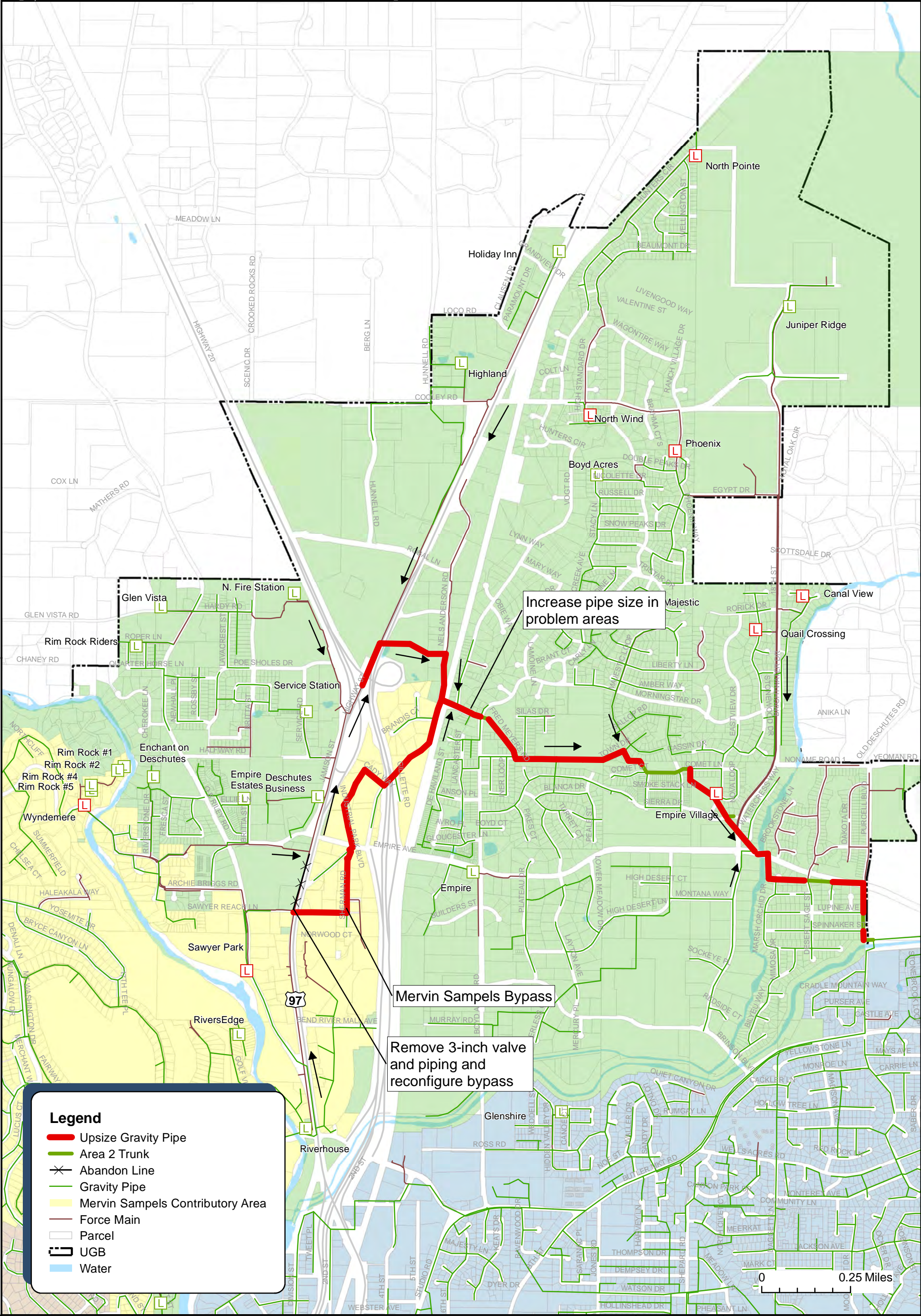
Activity / Topic	Presenter	Time
1. <b>Welcome / Introductions</b>	Jon Skidmore	4:00 p.m.
2. <b>Review Meeting Agenda / Goals</b>	Libby Barg	4:05
3. <b>Recommended Solutions</b> MSA presents recommended solutions for immediate challenges in the areas prioritized by the SIAG at the October 25, 2012 meeting. <b>Objective:</b> SIAG considers solutions and offers recommendations for City Council action.		
<b>Presentation</b>	David Prull, P.E.	4:10
<b>Advisory Group Q&amp;A / Discussion</b> <ul style="list-style-type: none"><li>• Area 3 (Westside lift station – Portland Ave)</li><li>• Area 5 (along Columbia / Westside down Simpson to Shevlin lift station)</li><li>• Area 2 (Cascade Village Shopping Center)</li></ul>	Libby Barg emcee	4:45
4. <b>Public Comment</b>		5:45
5. <b>Next Steps</b> <ul style="list-style-type: none"><li>• Bend City Council – February 20, 2013</li><li>• Review schedule for upcoming meetings:<ul style="list-style-type: none"><li>– February 7 Modeling and Optimization 101</li><li>– February 21 Criteria and Lifecycle Costs</li><li>– March 7 Pumps, Pipes, Storage</li><li>– March 21 Pumps, Pipes, Storage (Cont.)</li><li>– April 4 Treatment Alternatives</li><li>– April 18 Treatment Alternatives (Cont.)</li></ul></li></ul>	Libby Barg	5:55
<b>Adjourn / Thank You</b>	Jon Skidmore	6:00 p.m.

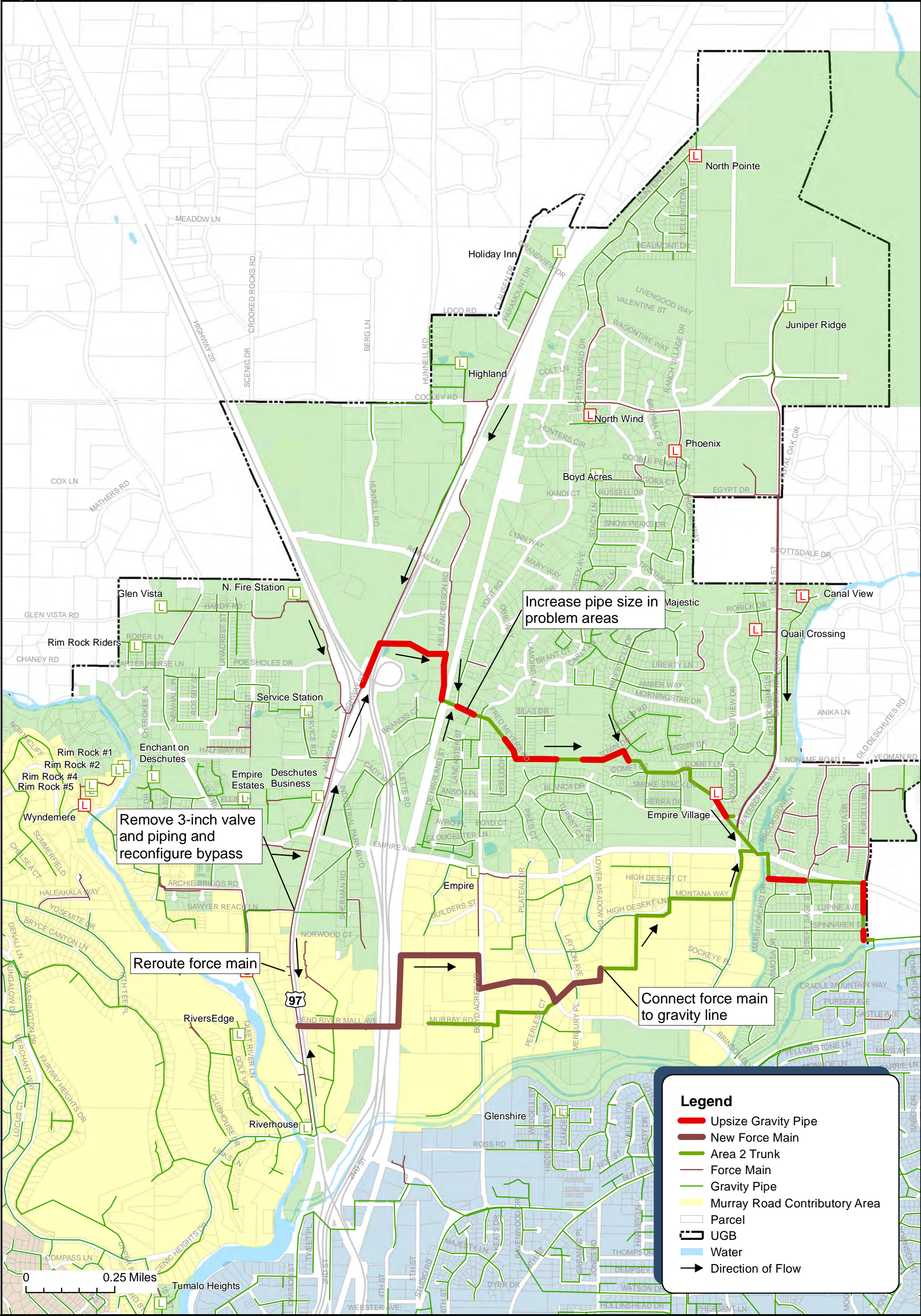
For more information, visit the Bend Sewer Infrastructure Advisory Group webpage:

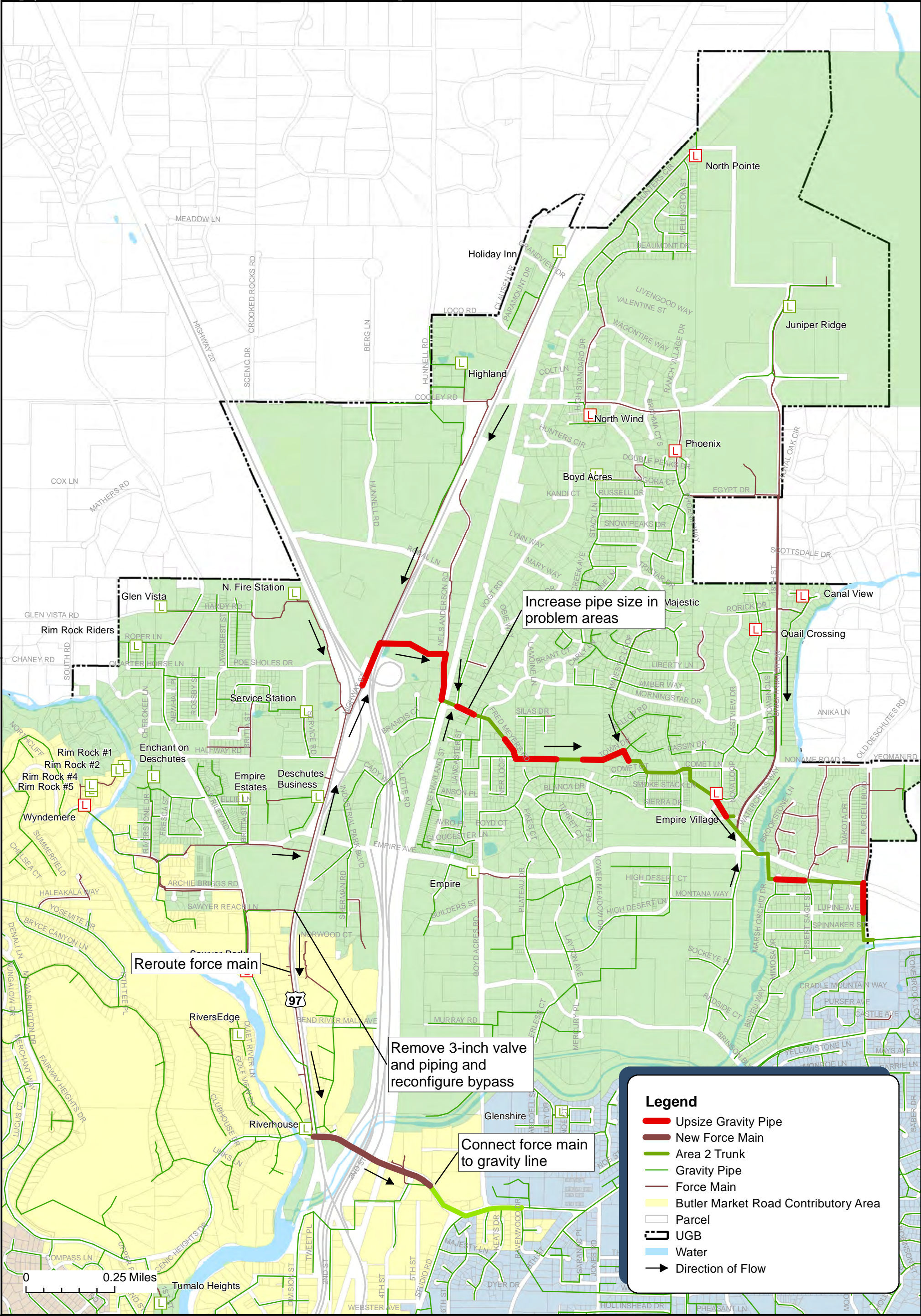
<http://bendoregon.gov/index.aspx?page=841>

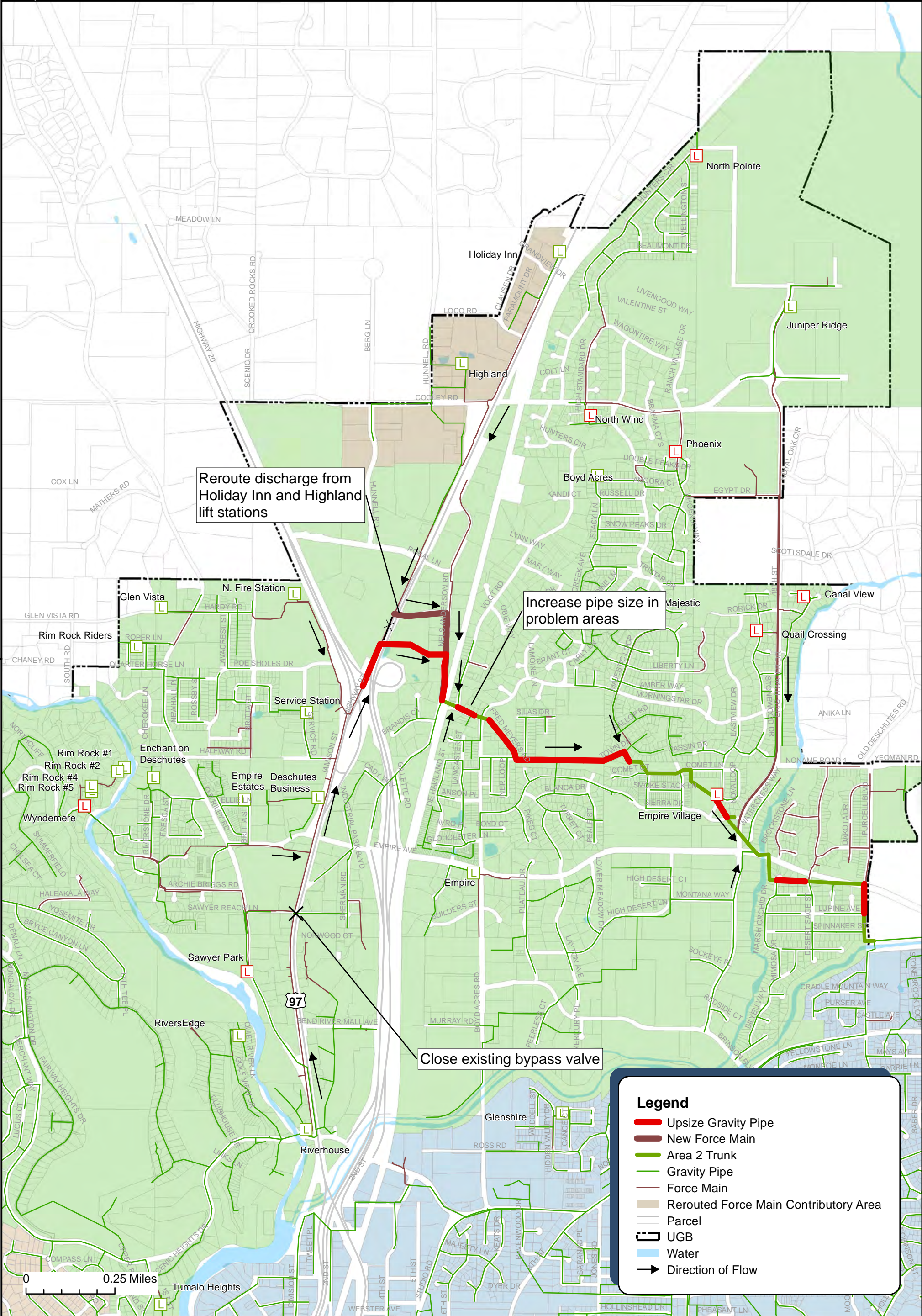


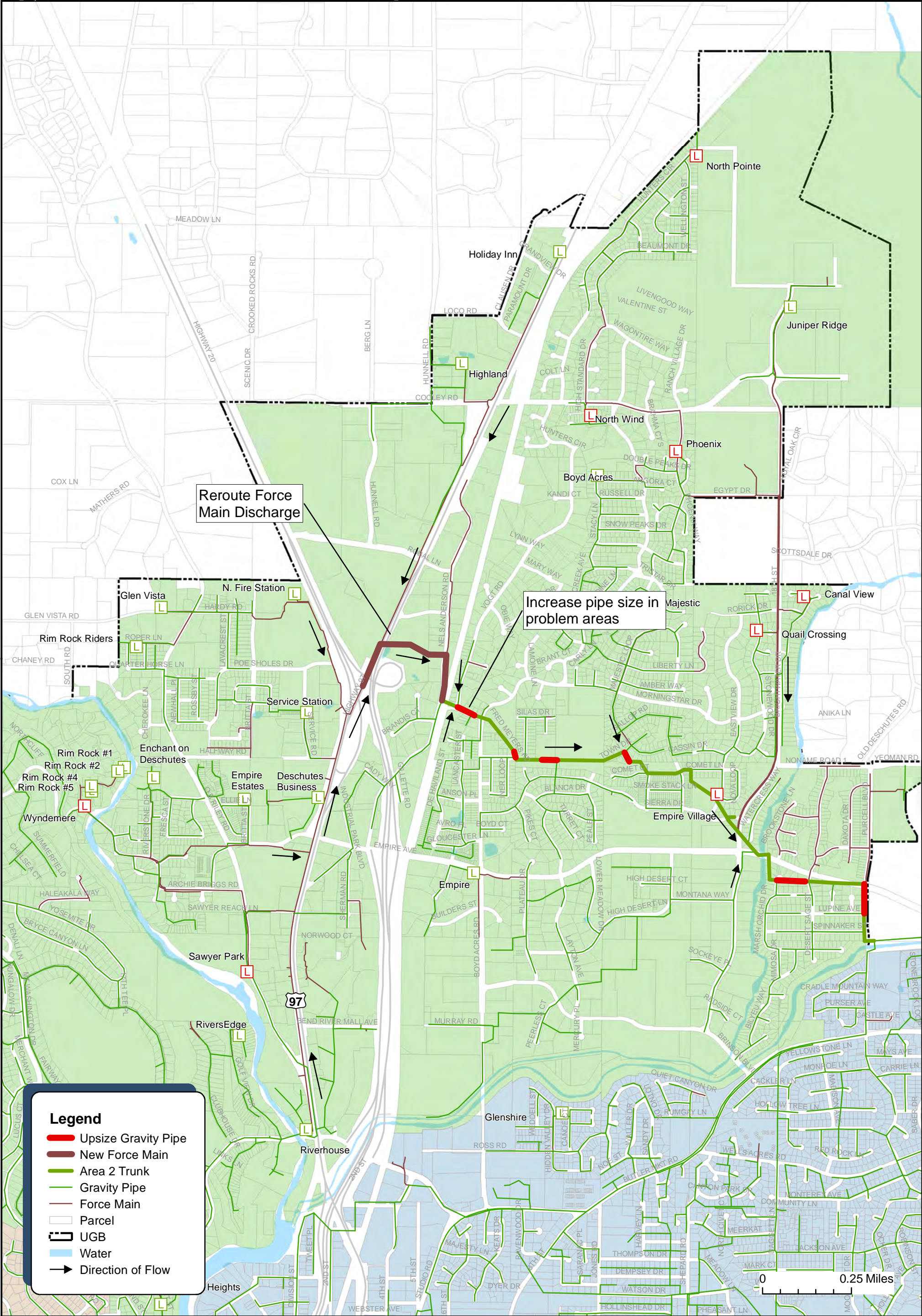


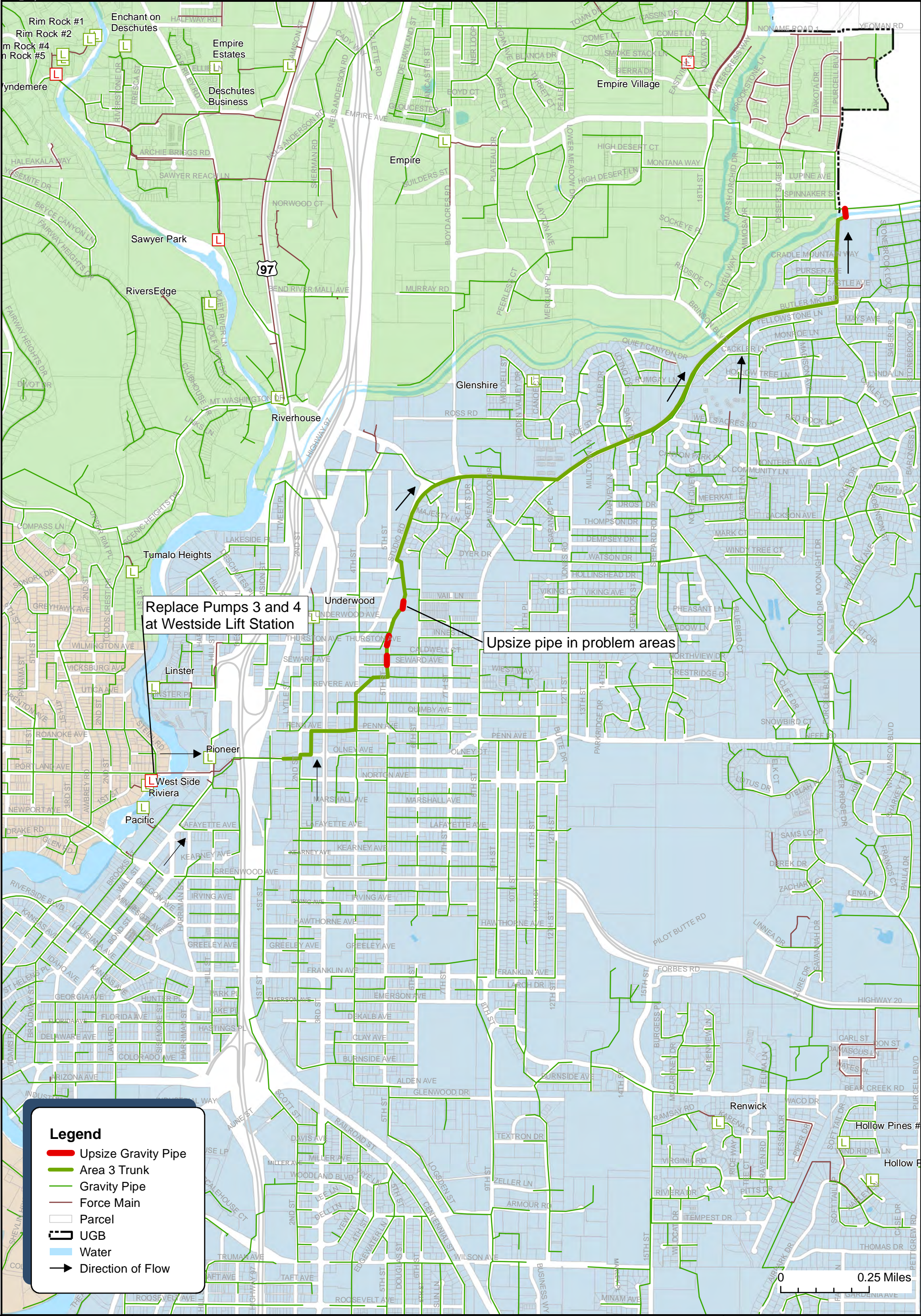


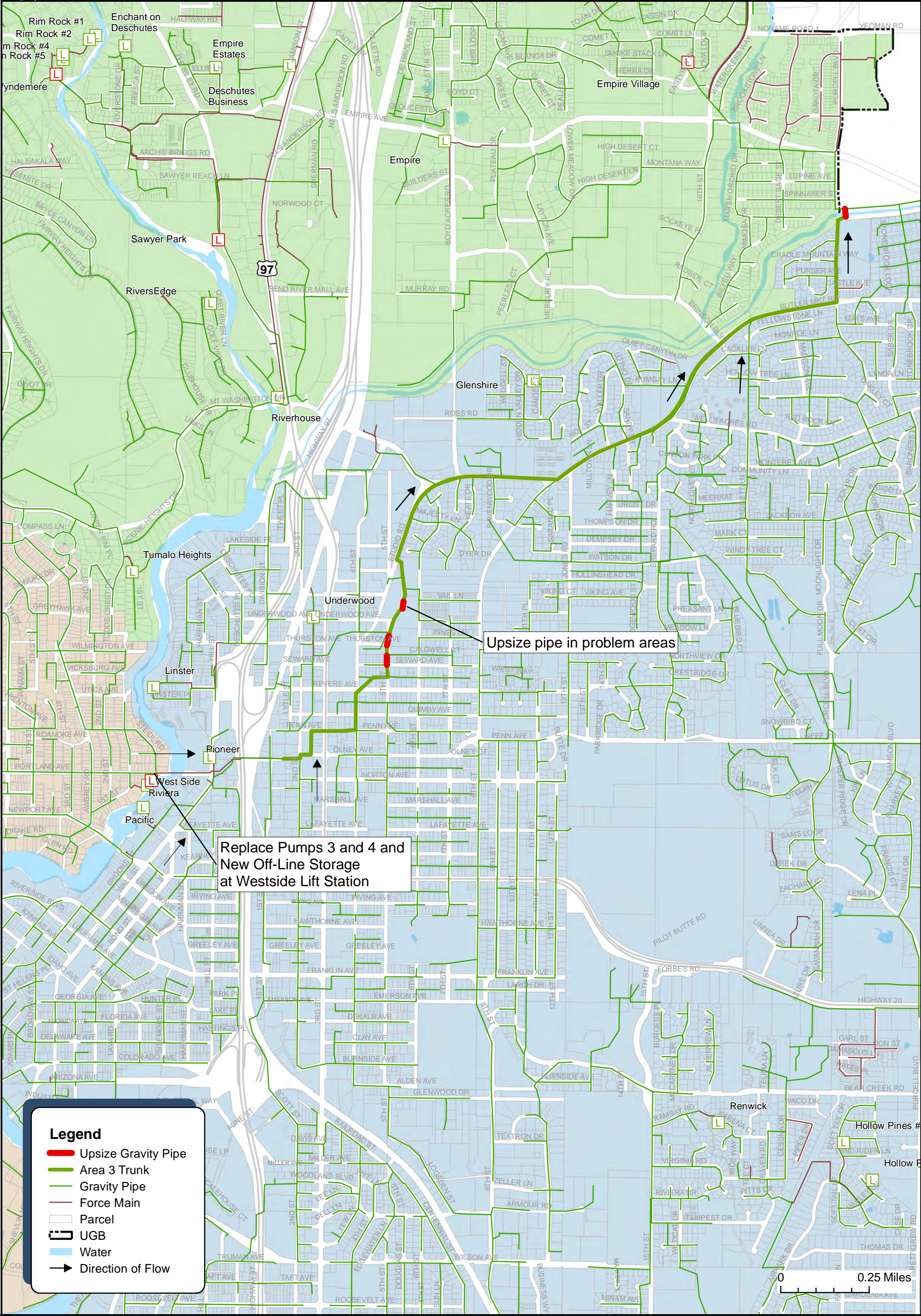


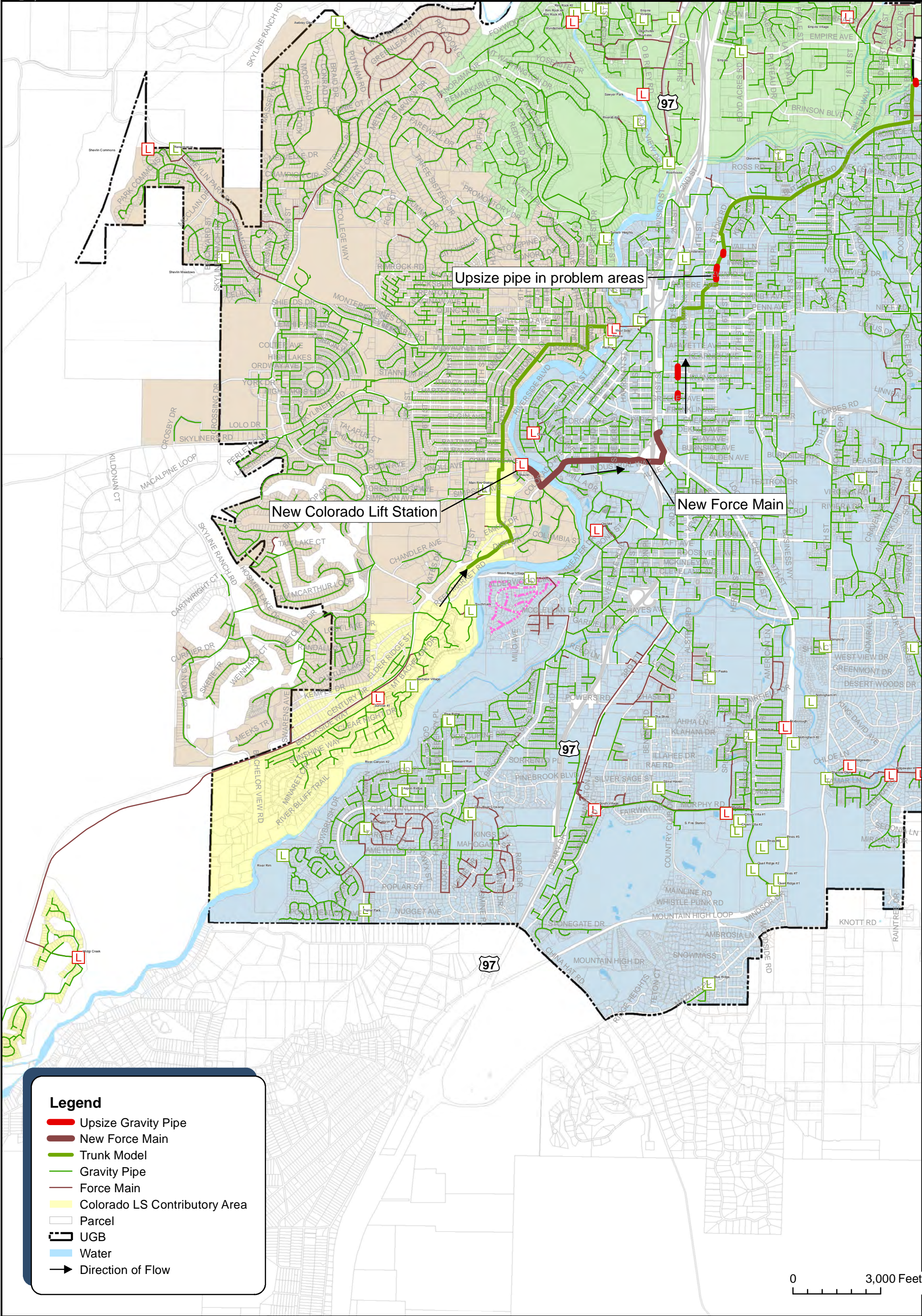


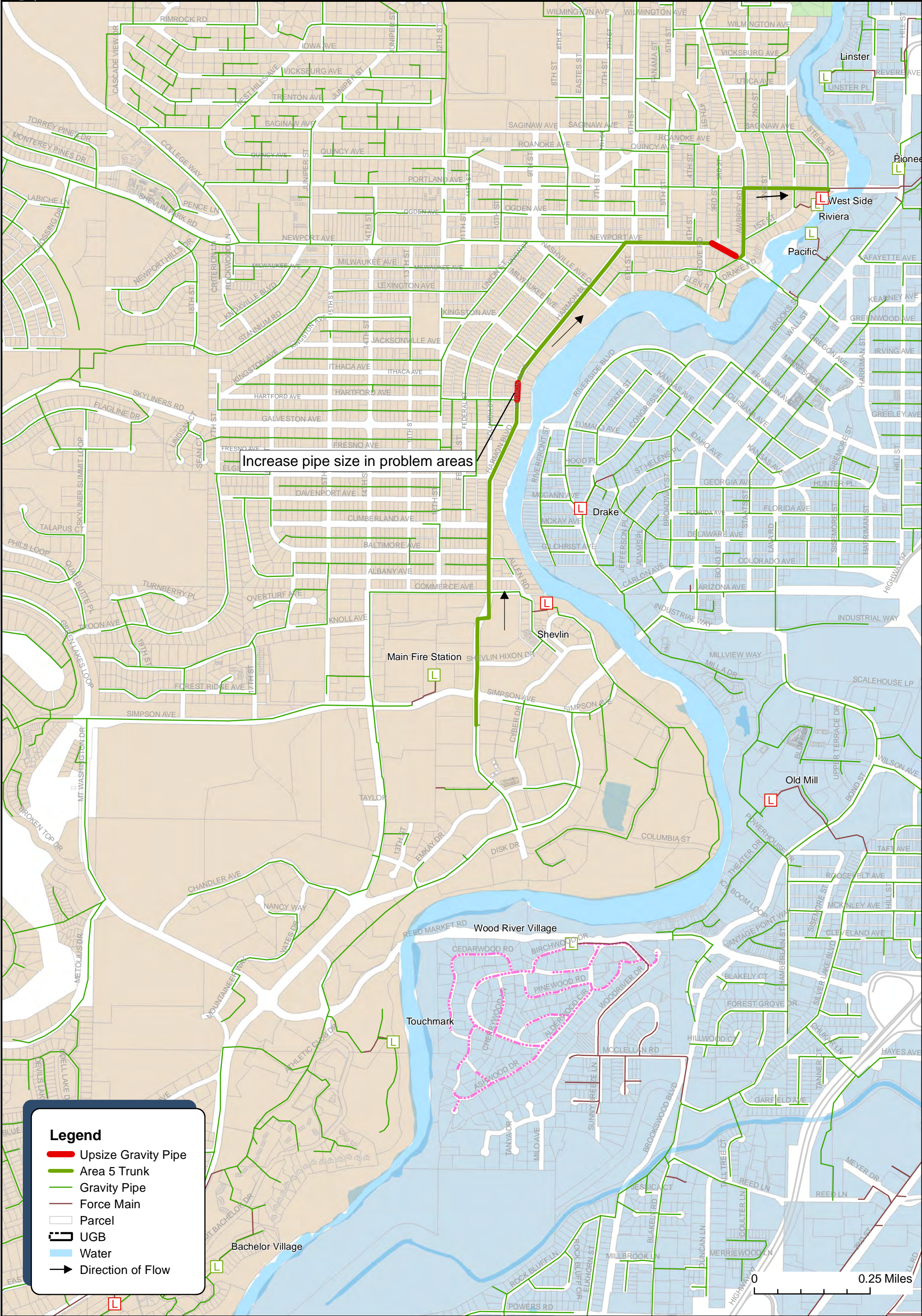


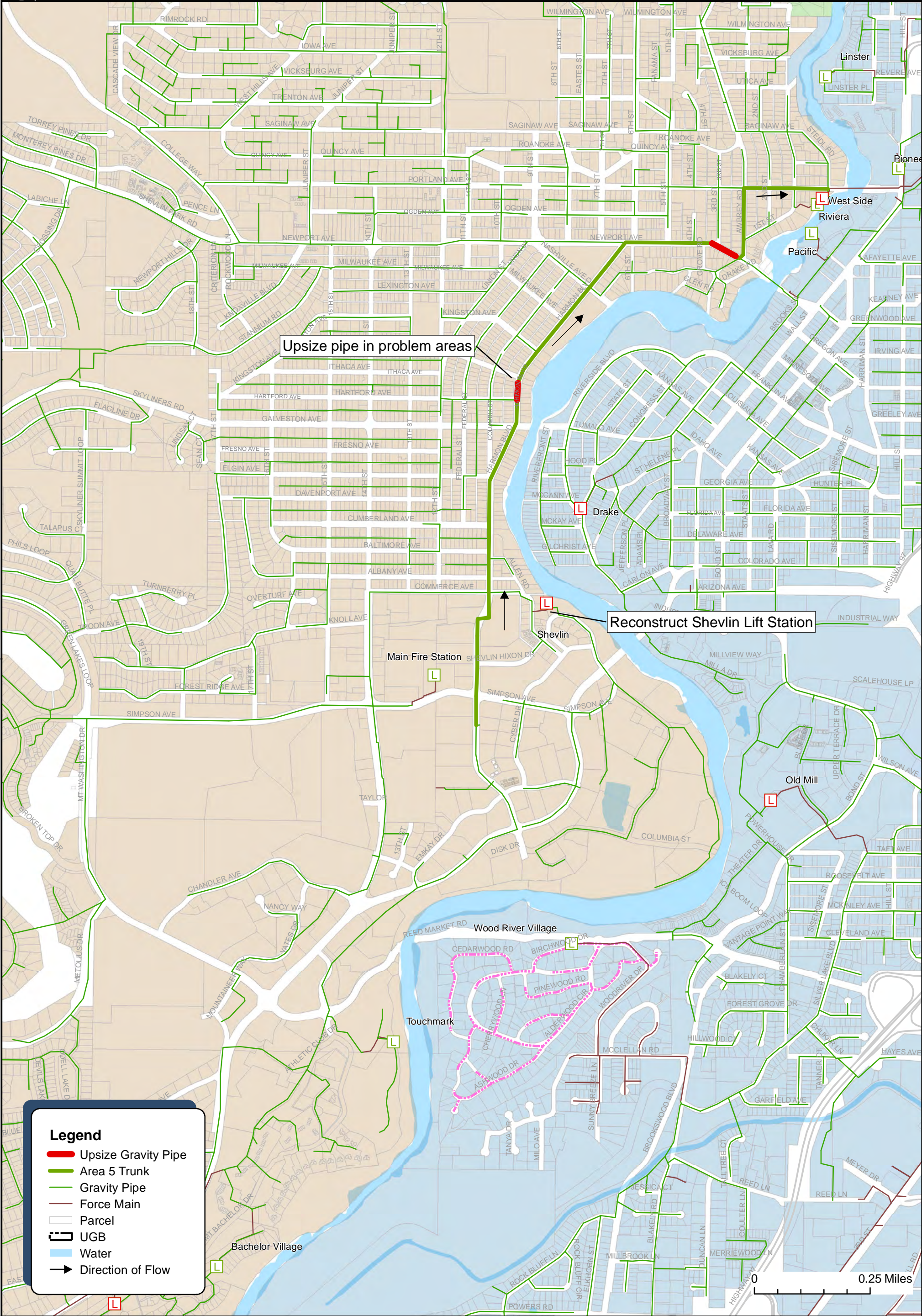












# **BEND SEWER INFRASTRUCTURE ADVISORY GROUP: MEETING 5**

## **Immediate Challenges and Solutions**

January 17, 2013



## **WELCOME AND INTRODUCTIONS**

## MEETING AGENDA / GOALS

- ◉ Review options for immediate solutions
- ◉ Advisory Group feedback



3

## IMMEDIATE TERM SOLUTIONS

Presented by MSA

David Prull, P.E.

Dennis Galinato, P.E.

David Stangel, P.E.



**CITY OF BEND  
COLLECTION SYSTEM MASTER PLAN**



## Immediate Term Alternatives

- ✓ Design & bid completed in one year.
- ✓ Involve pipes or pumps (preferably pipes).
- ✓ No environmental permits required.
- ✓ Comply with our existing DEQ WPCF permit.
- ✓ Do not require bond funding.

### Solution Types

1. Increased capacity
2. Reroute flows
3. Diminish peak flows

## Evaluation Criteria

### ● Cost basis

- Design & construction cost only
- 2011 CSMP (addendum #4) unit costs escalated to 2013 dollars
- Confirmed by recent bids
- Concept level (engineering standard: -30%, +50%)

### ● Assess the value of alternatives

Capacity  
 Certainty of Service  
 Overflow Risk  
 Ease of Construction  
 Operations, Performance and Flexibility

## Introduction to Areas 5 and 3

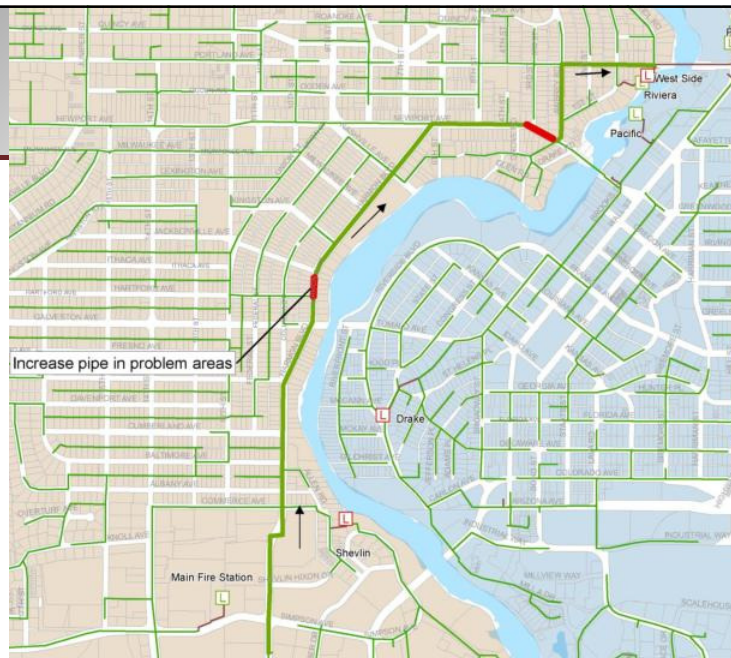
- ◉ Area 5 / Solution 1: Gravity Sewer Upgrades
- ◉ Area 5 / Solution 2: Reconstruct Shevlin Lift Station + Upgrade Gravity Sewer
- ◉ Area 3 / Solution 1: Westside Pump 3 + Pump 4
- ◉ Area 3 / Solution 2: Westside Pump 3 + Pump 4 and Offline Storage
- ◉ COMBO / New Colorado Lift Station and Force Main to 2nd Street

### Area 5 Options

#### Area 5 Solution 1

#### Gravity Sewer Upgrades

**\$256,000**

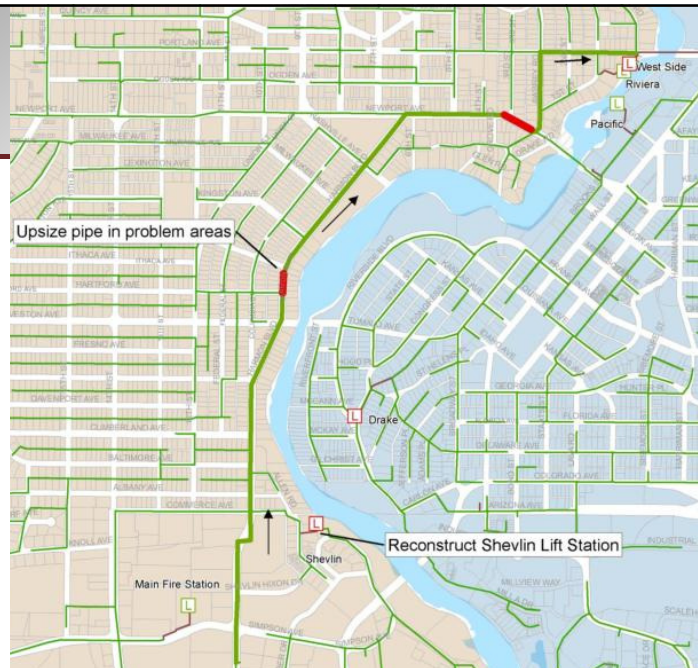


## Area 5 Options

### Area 5 Solution 2

Reconstruct Shevlin Lift Station + Upgrade Gravity Sewer

\$897,000



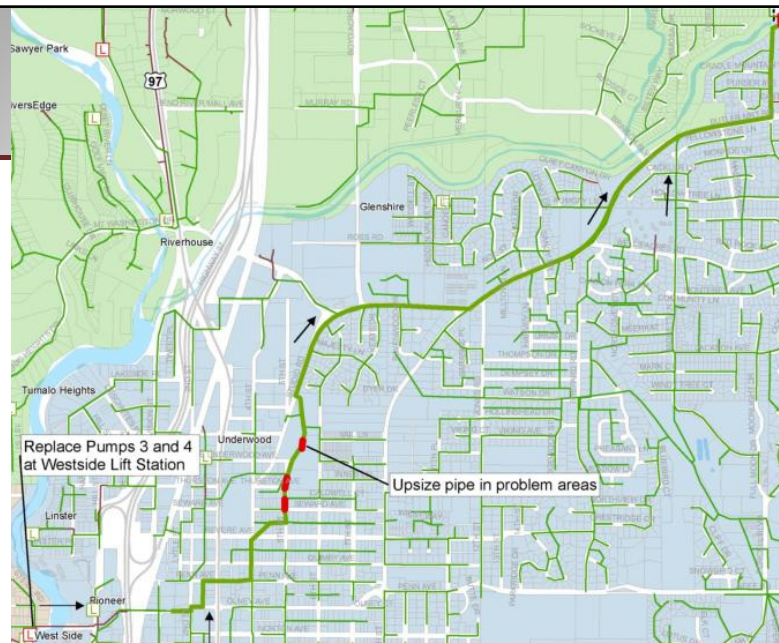
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## Area 3 Options

### Area 3 Solution 1

Westside Pump 3 + Pump 4

\$701,000



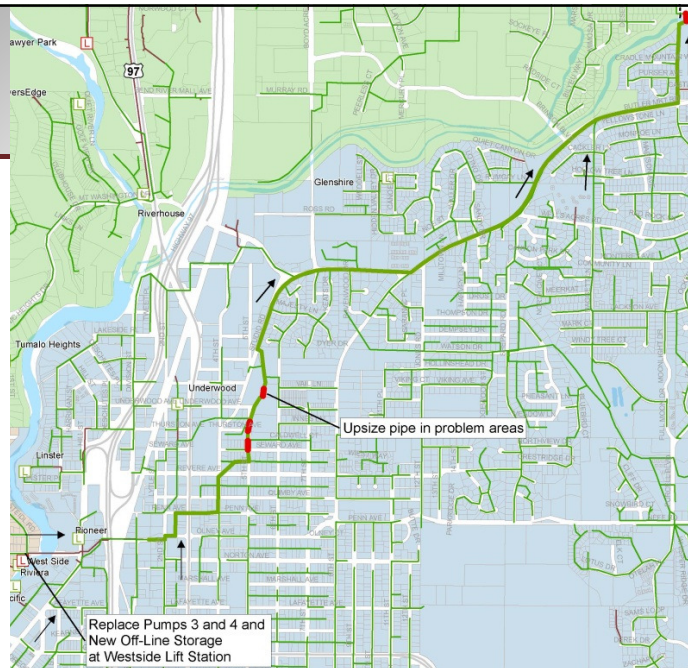
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## Area 3 Options

### Area 3 Solution 2

## Westside Pump 3 + Pump 4 and Offline Storage

**\$1,509,000**



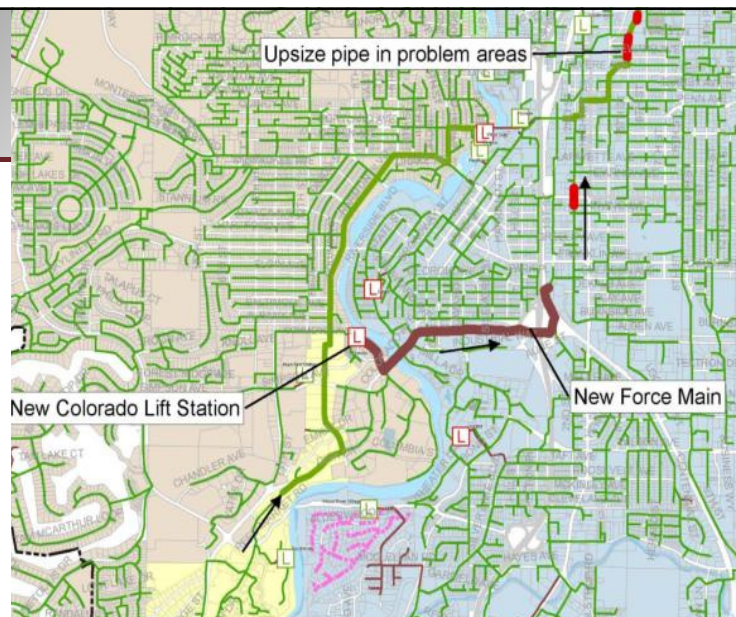
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## Areas 3 & 5 Option

## COMBO

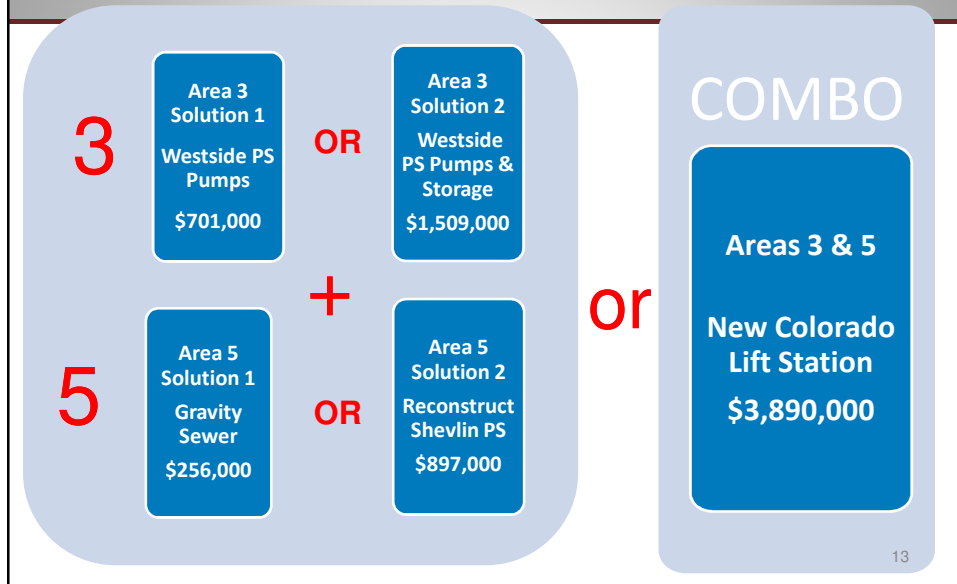
**New  
Colorado  
Lift Station  
and  
Force Main  
to 2nd  
Street**

**\$3,890,000**



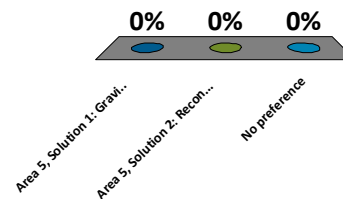
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Which solution do you like best and why?



Which solution did you prefer for Area 5?

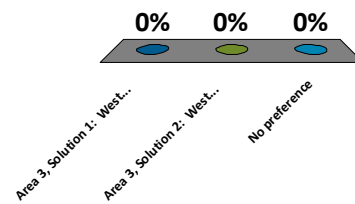
1. **Area 5, Solution 1:**  
Gravity Sewer Upgrades
2. **Area 5, Solution 2:**  
Reconstruct Shevlin LS +  
Upgrade Gravity Sewer
3. **No preference**



14

## Which solution did you prefer for Area 3?

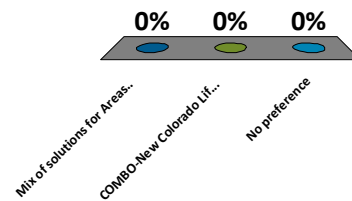
1. **Area 3, Solution 1:**  
Westside Pump 3 +  
Pump 4
2. **Area 3, Solution 2:**  
Westside Pump 3 +  
Pump 4 + Offline Storage
3. **No preference**



15

## Which solution did you prefer for Areas 5 and 3?

1. **Mix of solutions for**  
**Areas 5 & 3**
2. **COMBO-New Colorado**  
**Lift Station, Force Main**  
**to 2nd Street**
3. **No preference**



16

## Introducing Area 2

- Solution 1: Gravity Sewer
- Solution 2: VFD Pumping
- Solution 6: North Force Main to Fred Meyer Rd.
- Solution 8: South Force Main to Fred Meyer Rd.
- Solution 3: South Force Main to Mervin Sampels
- Solution 4: South Force Main to Murray
- Solution 5: South Force Main to Butler Market

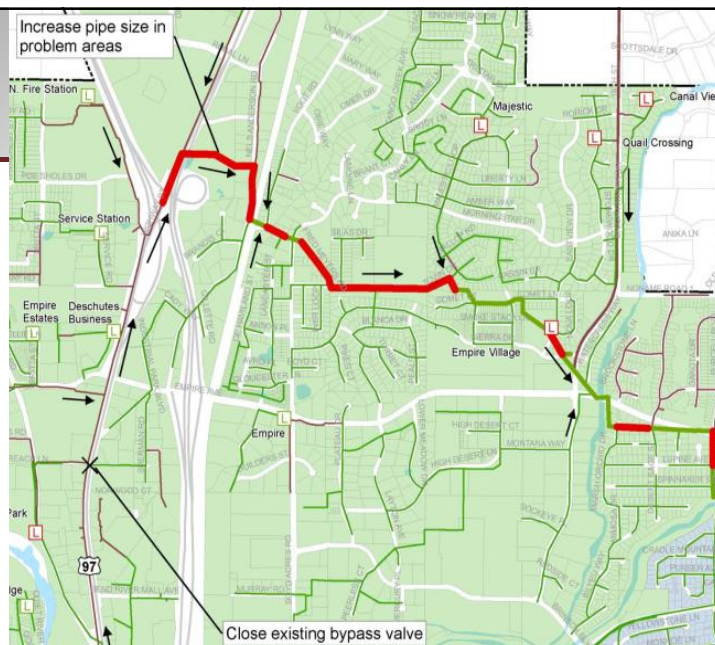
# Area 2 Options

## Area 2

### Solution 1

## Gravity Sewer

**\$4,994,000**



18

## Area 2 Options

**Area 2  
Solution 2**

**VFD  
Pumping**

**\$8,287,000**



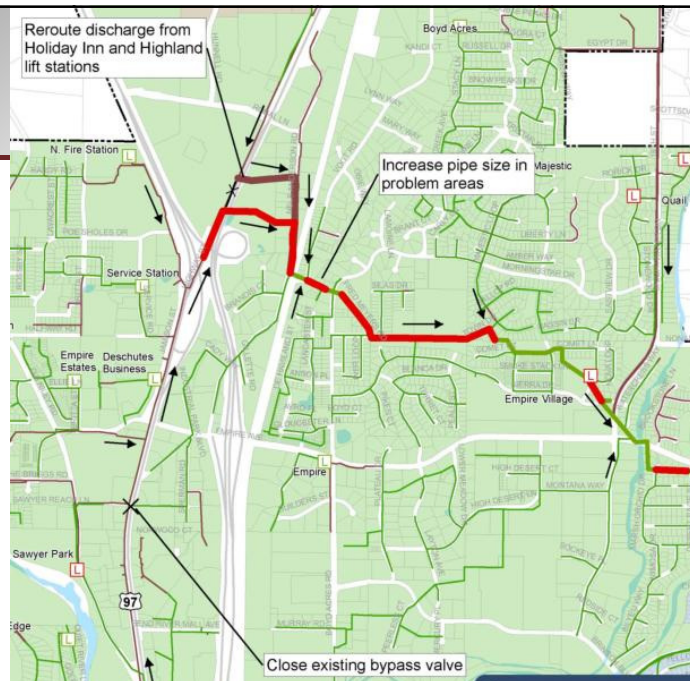
19

## Area 2 Options

**Area 2  
Solution 6**

**North Force  
Main  
to Fred  
Meyer Rd.**

**\$5,342,000**



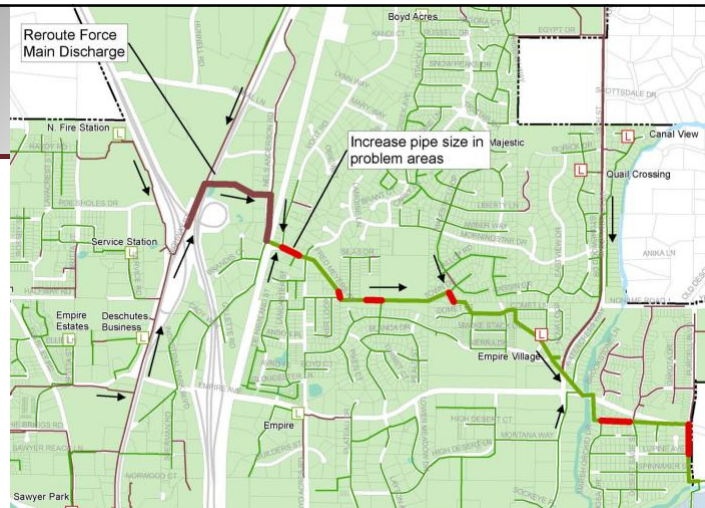
20

## Area 2 Options

### Area 2 Solution 8

**South Force  
Main to  
Fred Meyer  
Rd.**

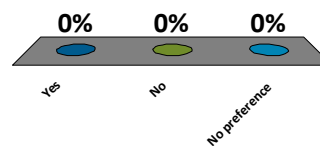
**\$3,023,000**



21

**Should the first four solutions for Area 2 be  
sidelined? (Solution 1, Solution 2, Solution 6, Solution 8)**

1. Yes
2. No
3. No preference



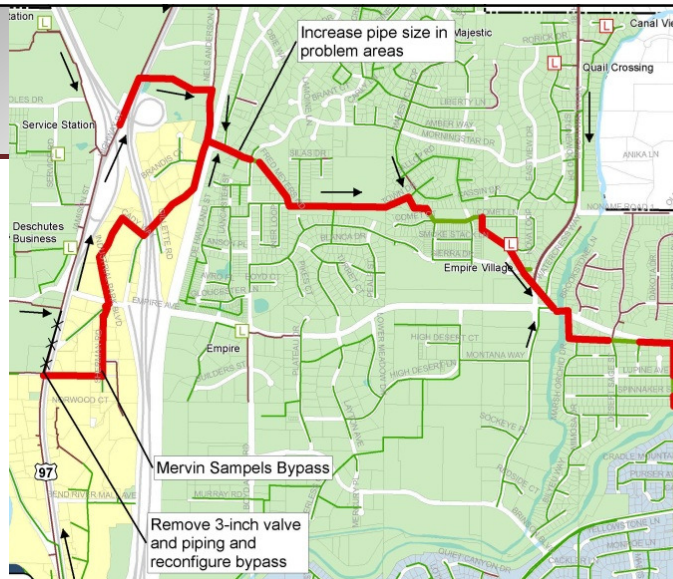
22

## Area 2 Options

### Area 2 Solution 3

South  
Force Main  
to Mervin  
Sampels

\$9,513,000



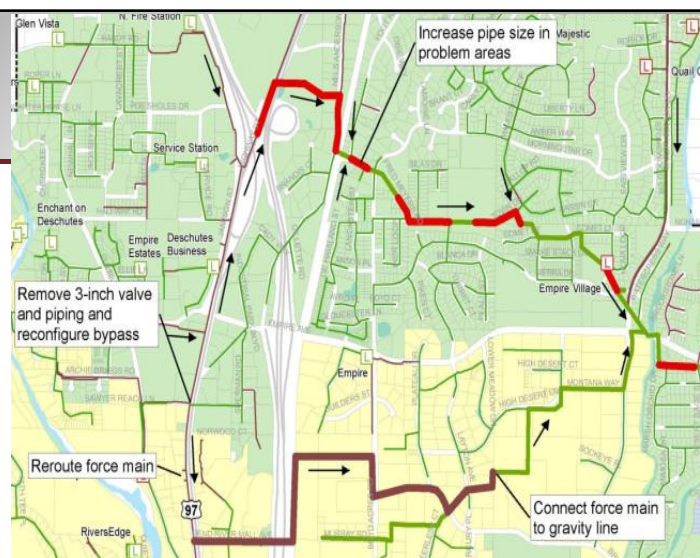
23

## Area 2 Options

### Area 2 Solution 4

South Force  
Main to Murray

\$7,185,000



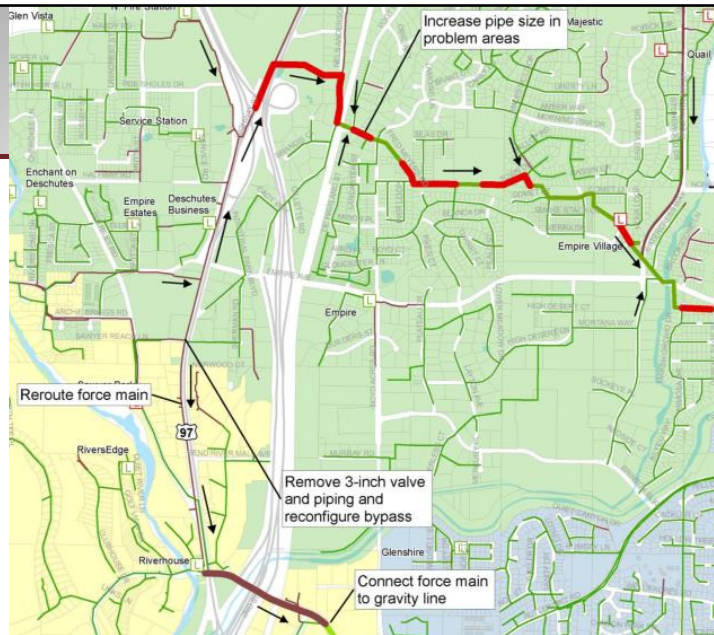
24

## Area 2 Options

### Area 2 Solution 5

**South Force  
Main to  
Butler Market**

**\$5,733,000**



25

## Discussion

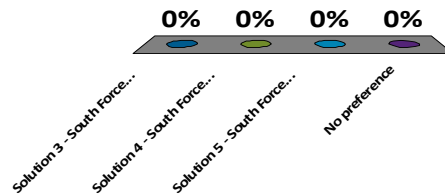
Which solution do you prefer and why?

- Solution 3: South Force Main to Mervin Sampels
- Solution 4: South Force Main to Murray
- Solution 5: South Force Main to Butler Market

26

### Which solution did you prefer for Area 2?

1. Solution 3 - South Force Main to Mervin Sampels
2. Solution 4 - South Force Main to Murray
3. Solution 5 - South Force Main to Butler Market
4. No preference



27

### Recap Results: Advisory Group Feedback

- ⦿ Area 5 – Shevlin Lift Station
- ⦿ Area 3 – Westside Lift Station
- ⦿ Area 2 – Cascade Village Shopping Center

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## Immediate Solutions— Next Steps

Immediate Challenges & Solutions: Report	Feb
SIAG recommendations to City Council	Feb
City Council consideration	Feb 20
Design	March-?
Optimization process begins	Sept
Construction	2013-2014

29

## Upcoming Advisory Group Meetings

February 7	Modeling and Optimization 101
February 21	Criteria and Lifecycle
March 7	Pumps, Pipes, Storage
March 21	Pumps, Pipes, Storage (Cont.)
April 4	Treatment Alternatives
April 18	Treatment Alternatives (Cont.)

30

<b>Sewer Infrastructure Advisory Group Meeting Summary</b>	<b>January 17, 2013</b>
	<b>4:00-6:30 p.m.</b>
	<b>City of Bend Council Chambers</b>
	<b>Note taker: Adele McAfee</b>
<p><b>In Attendance:</b></p> <p><b>Committee Members:</b> Andy High, Casey Roats, Lynn Putnam, Mike Riley, Dale Van Valkenburg, Craig Horrell, Steven Hultberg, Charley Miller, Steve Galash, Stacey Stemach, Bruce Alyward, Sharon Smith, Pam Hardy, Rob von Rohr, Nathan Boddie</p> <p><b>Absent:</b> Wes Price, John Rexford</p> <p><b>COB Staff:</b> Tom Hickmann, Paul Rheault, Jon Skidmore, Aaron Collett, Reese Moody, Colin Stephens, Brian Rankin, Justin Finestone, Russell Grayson, Carolyn Eagan, Craig Chenoweth, Mary Winters</p> <p><b>Consultants:</b> David Prull (Clearwater Engineering Group), David Stangel (MSA), Dennis Galinato (MSA)</p> <p><b>Others:</b> Dayna Ralston, Erik Huffman, Gary Cox, Keith Dagostino, Jim Frost, John Russell, Brady Fuller, Jim Lord, Greg Blackmore</p> <p><b>Facilitators:</b> Libby Barg (Barney &amp; Worth), Clark Worth (Barney &amp; Worth)</p>	

#### **Action Items**

1. SIAG's recommended solutions for immediate challenges:
  - Areas 3 & 5: "Combo Solution"
  - Area 2: "Solution 5" (*with the understanding SIAG would like a second look after the optimization process*)
2. Bend staff will work with Steering Committee on a formal recommendation.
3. SIAG's recommendation will be presented to the City for consideration at their January 30, 2013 meeting.

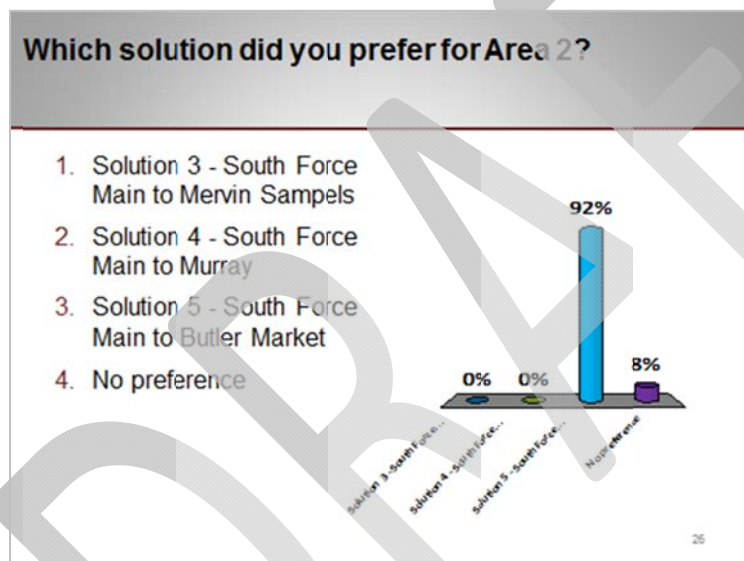
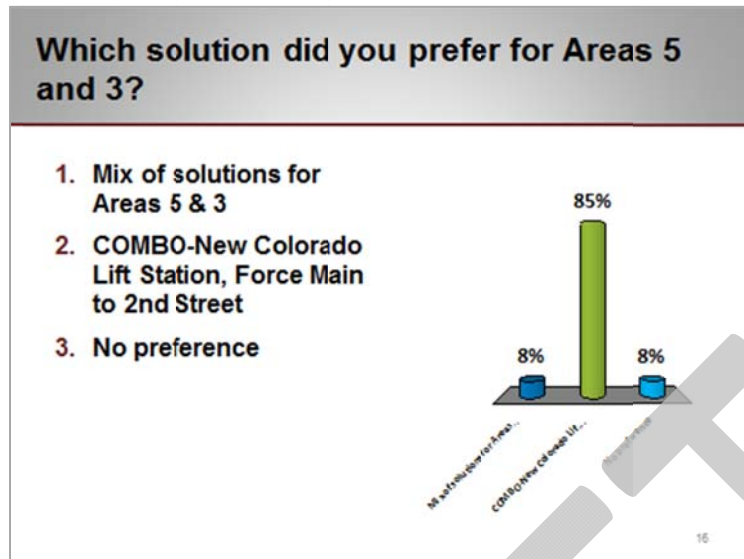
#### **Agenda Item: Welcome and Updates**

- November meeting notes will be approved at the February 7, 2013 SIAG meeting. In the future, notes from the previous meeting will be approved at the start of each new meeting.
- The City proposed holding bi-monthly meetings through April to keep project on schedule.

#### **Agenda Item: Recommended Solutions Presentation**

- David Prull, presented recommended solutions for immediate challenges in the areas prioritized by the SIAG at the October 25, 2012 meeting. Tom Hickmann, Paul Rheault, Mary Winters, David Stangel, and Dennis Galinato provided supporting information and answered SIAG questions.
- SIAG members took straw polls on options (electronic polling), discussed pros and cons, and took a vote (show of hands) on their final recommendations.

## Straw Poll Results



## SIAG Comments on Preferred Options

### Area 5 and Area 3: "Combo" Solution

- Something must be done here ASAP.
- This is better than other possible solutions.
- The solution also works as a long-term fix. It is "scalable"—can be "right-sized", then easily expanded.
- Improves response time for Bend's operations teams.
- Potential here for public / private partnerships.
- Will serve OSU Cascade Campus—sends the right message at the right time.

### Area 2: "Solution 5"

Reasons to support:

- This is the most acute problem area. We must do something.

- It boosts employment opportunities—City Council's top priority.
- There's little confidence in other possible solutions.
- We can't wait for the north interceptor—prospects are uncertain.
- This solution might be beefed up as an alternative to the planned north interceptor.

Further analysis recommendations:

- This may be the best solution. But is it a good investment?
- Stay flexible until the results of optimization are available.
- More exploration is needed to determine the long-term value of a new Butler Road interceptor.
- Will increased SDCs collected in the area help pay for this project?

#### **Results of SIAG Vote**

- Areas 3 & 5 “Combo Solution”: 14 YES
- Area 2 “Solution 5”: 13 YES, 1 NO (*with the understanding SIAG would like a second look after the optimization process*)
- Andy High left meeting prior to vote due to another scheduled event.

Meeting Adjourned at 6:30 p.m.



# Bend Sewer Infrastructure Advisory Group: Meeting #6

## Modeling and Optimization 101

Bend Park and Recreation  
The Riverbend Community Room  
799 SW Columbia St.

February 7, 2013  
4:00-6:00 p.m.

**Preparation Materials** (please read before the meeting):

## Agenda

Activity / Topic	Presenter	Time
1. <b>Welcome / Introductions / Approve Meeting Notes</b>	Jon Skidmore	4:00 p.m.
2. <b>Review Meeting Agenda / Goals</b>	Libby Barg	4:05
3. <b>Optimization 101</b> An overview of the optimization process highlighting opportunities for SIAG input. <b>Objectives:</b> <ul style="list-style-type: none"><li>Strengthen SIAG's understanding of the Optimization tool and how it will be used in developing the Master Plan.</li><li>Communicate how SIAG can participate in and influence the optimization process.</li></ul>		
<b>Presentation</b>	John Cowan, Optimatics	4:10
<b>Advisory Group Q&amp;A / Discussion</b> <ul style="list-style-type: none"><li><i>Questions about the optimization process?</i></li></ul>	Libby Barg emcee	4:40
4. <b>Approach to Land Use Inputs in Hydraulic Model</b> Presentation on the options for determining the type, location, and density of future development in Bend's existing Urban Growth Boundary at buildout. <b>Objective:</b> SIAG provide guidance to City on the method for determining demand forecast for use in the Optimization processes.		
<b>Presentation</b>	Brian Rankin, Bend Community Development	4:50
<b>Electronic Polling / Discussion</b>	Libby Barg emcee	5:20

For more information, visit the Bend Sewer Infrastructure Advisory Group webpage:  
<http://bendoregon.gov/index.aspx?page=841>

5.	<b>Public Comment</b>		5:45
6.	<b>Next Steps</b>	Libby Barg	5:55
	<ul style="list-style-type: none"> <li>• Upcoming SIAG Meetings: <ul style="list-style-type: none"> <li>- February 21 Criteria and Lifecycle Costs</li> <li>- March 7 Pumps, Pipes, Storage</li> <li>- March 21 Pumps, Pipes, Storage (Cont.)</li> <li>- April 4 Treatment Alternatives</li> <li>- April 18 Treatment Alternatives (Cont.)</li> </ul> </li> </ul>		
	<b>Adjourn / Thank You</b>	Jon Skidmore	6:00 p.m.



**Optimatics**  
optimizing wastewater systems

***Optimized Collection System  
Master Plan: Overview of  
SIAG Role and Participation***

## **Outline**

- Introductions
- Presentation Objectives
- Overview of Optimization Process
- Optimization Test Runs on a Hypothetical Bend Collection System Model
- Recent Case Study Example for City in Indiana
- Discussion

## Objectives:

- Strengthen SIAG's understanding of the Optimization tool and how it will be used in developing the Master Plan.
- Communicate how SIAG can participate in and influence the optimization process.

## Optimization Benefits (recap)

- Ability to evaluate thousands of possible options
  - Transparent
  - Identifies lowest life-cycle cost solutions
  - Identifies only solutions that provide capacity
- Unbiased when compared to traditional planning methods
- >\$100M of system improvements = opportunity to look for savings and prioritize investment

## How Does Optimizer WCS™ Work?

**Hydraulic Model**  
(input from SIAG, City of Bend, and MSA Team)

**Improvement Options**  
(input from SIAG, City of Bend, and MSA Team)

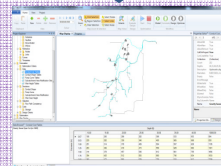
**Costs**  
(input from SIAG, City of Bend and MSA Team)

**Performance Criteria**  
(input from SIAG, City of Bend and MSA Team)

Once initial Optimization Formulation is processed, alternate Scenarios as well as Sensitivity Runs can be performed efficiently



Optimizer WCS™

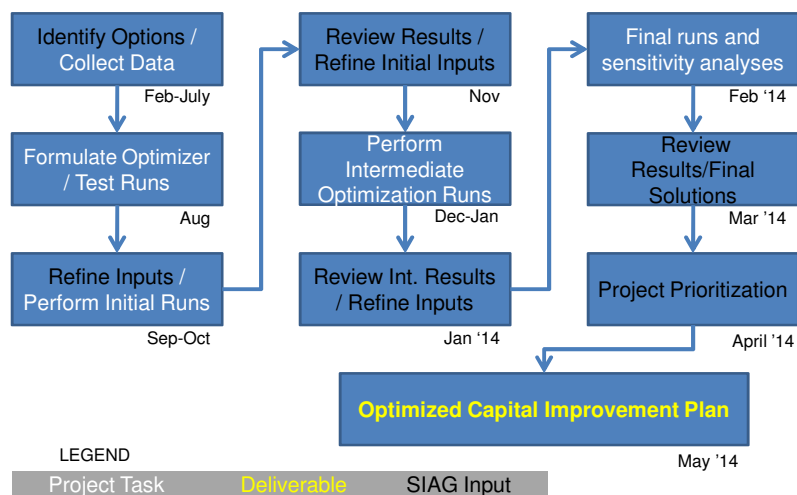


Cost Item	Optimized Solution Cost (\$M)
Pipes	44.4
Pumps	0.8
Storage	19.4
Treatment	0.6
Inflow and Infiltration	55.7
Operating Costs	28.8
<b>TOTAL (\$M)</b>	<b>149.7</b>

## Bend CSMP Optimization SIAG Input

Hydraulic Model (input from SIAG)	Improvement Options (input from SIAG)	Capital / O&M Costs (reviewed by SIAG)	Performance Criteria (reviewed by SIAG)
<b>Land Use</b> - Community values related to density and zoning preferences.	<b>Pipes</b> – Alignment alternatives (e.g., weigh in on location preferences).	<ul style="list-style-type: none"> <li>- Open-cut pipe costs</li> <li>- Trenchless construction costs</li> <li>- Land-use &amp; geol. factors</li> </ul>	<ul style="list-style-type: none"> <li>- Eliminate overflows</li> <li>- System capacity goals</li> </ul>
	<b>Pumps</b> – Provide guidance on location preferences for new pumps and aesthetics	<ul style="list-style-type: none"> <li>- Capital costs for new/upgraded pumps</li> <li>- Energy / O&amp;M costs</li> </ul>	<ul style="list-style-type: none"> <li>- Pump operating requirements</li> <li>- Energy costs</li> </ul>
	<b>Storage</b> – Location preferences and review of storage type/technology	<ul style="list-style-type: none"> <li>- Capital and O&amp;M</li> <li>- Site restoration</li> <li>- Land acquisition</li> <li>- Site specific costs</li> </ul>	<ul style="list-style-type: none"> <li>- Siting requirements</li> <li>- Operating flexibility</li> </ul>
	<b>Treatment</b> – Location preferences, technologies (green and traditional)	<ul style="list-style-type: none"> <li>- Costs for different technologies</li> <li>- Constr / O&amp;M costs</li> </ul>	<ul style="list-style-type: none"> <li>- Land use needs</li> <li>- Nuisance issues</li> <li>- Discharge requirements</li> <li>- Discharge location(s)</li> <li>- Effluent volume limitations</li> </ul>

## Summary of Optimization Milestones and Opportunity for SIAG Involvement



## Key Optimization Tasks and SIAG Inputs

Timing	Tasks	Date
February	<ul style="list-style-type: none"> <li>Intro to Optimization</li> <li>Review Life Cycle, Design Criteria, Viability Criteria</li> </ul>	<ul style="list-style-type: none"> <li>Feb 7 SIAG</li> <li>Feb 21 SIAG</li> </ul>
March	<ul style="list-style-type: none"> <li>Present pipe/pump/storage options for consideration</li> </ul>	<ul style="list-style-type: none"> <li>Mar 7 SIAG</li> <li>Mar 21 (as Req.)</li> </ul>
April	<ul style="list-style-type: none"> <li>Present sewer treatment options for consideration</li> </ul>	<ul style="list-style-type: none"> <li>April 4 SIAG</li> <li>April 18 (as Req.)</li> </ul>
June/July	<ul style="list-style-type: none"> <li>Review location options for pumps, pipes, storage and treatment</li> </ul>	<ul style="list-style-type: none"> <li>Date TBD SIAG</li> </ul>
August	<ul style="list-style-type: none"> <li>Review unit cost assumptions for all options</li> </ul>	<ul style="list-style-type: none"> <li>August 15 SIAG</li> </ul>
November	<ul style="list-style-type: none"> <li>Present initial solutions to SIAG and review all options considered to date</li> <li>SIAG to provide feedback on initial solutions (e.g. options to be added/removed, detailed considerations, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Nov 14 SIAG</li> </ul>

## Key Optimization Tasks and SIAG Inputs

Timing	Tasks	Date
January '14	<ul style="list-style-type: none"><li>• Present intermediate solutions to SIAG</li><li>• SIAG to provide feedback on interim solutions (e.g. options to be added/removed, detailed considerations, etc.)</li></ul>	<ul style="list-style-type: none"><li>• <b>Jan SIAG</b></li></ul>
March '14	<ul style="list-style-type: none"><li>• Review final solutions with SIAG</li></ul>	<ul style="list-style-type: none"><li>• <b>March SIAG</b></li></ul>
May '14	<ul style="list-style-type: none"><li>• Prioritize Capital Improvement Plan</li></ul>	<ul style="list-style-type: none"><li>• <b>May SIAG</b></li></ul>



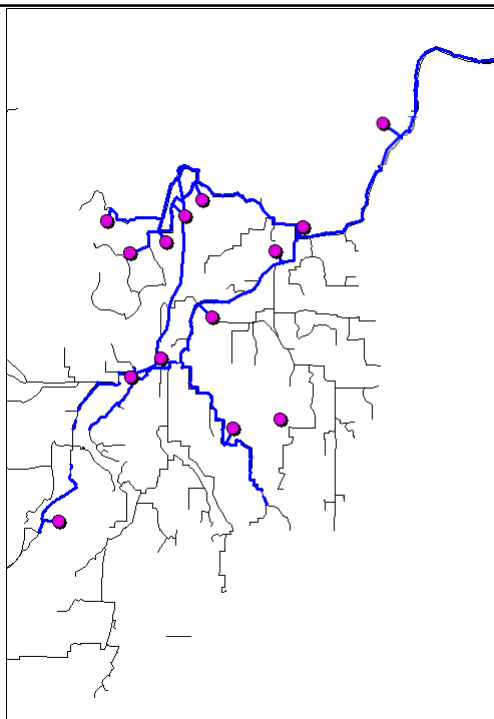
**Optimatics**

optimizing wastewater systems

***Optimizer Test Runs Using  
Hypothetical Bend CS Model***

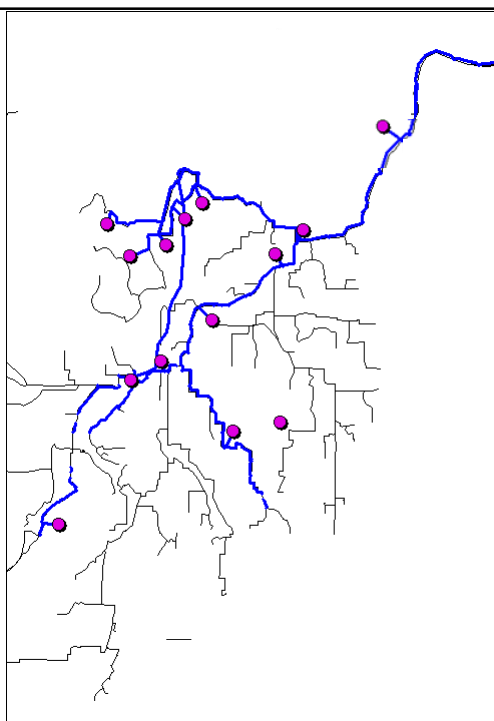
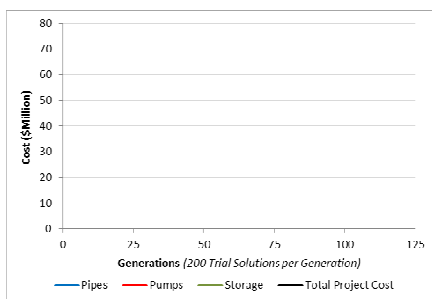
## Bend CS Model Prep. for Optimization

- Pipe and pump options shown in blue
- Storage options shown in purple (14 locations)



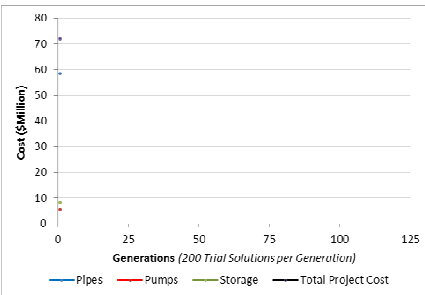
## Optimization Progress for Initial 200 Trial Solution Evaluations

Cost Item	Total Cost (\$ Arb) (Including O&M)
Pipes	
Pumps	
Storage	
Total Project Cost	

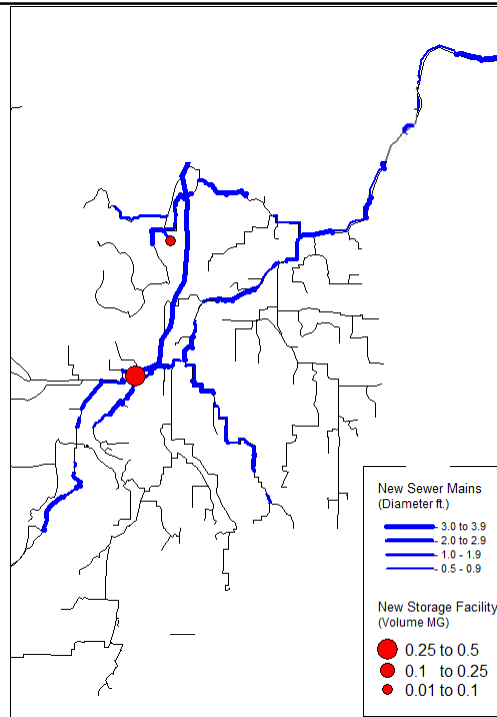


**Generation 1 (200 Trial Solutions)****Best Solution in 1<sup>st</sup> Generation**

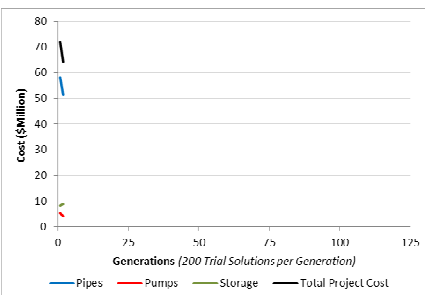
Cost Item	Total Cost (\$ Arb) (Including O&M)
Pipes	58.3
Pumps	5.4
Storage	8.3
<b>Total Project Cost</b>	<b>72.0</b>



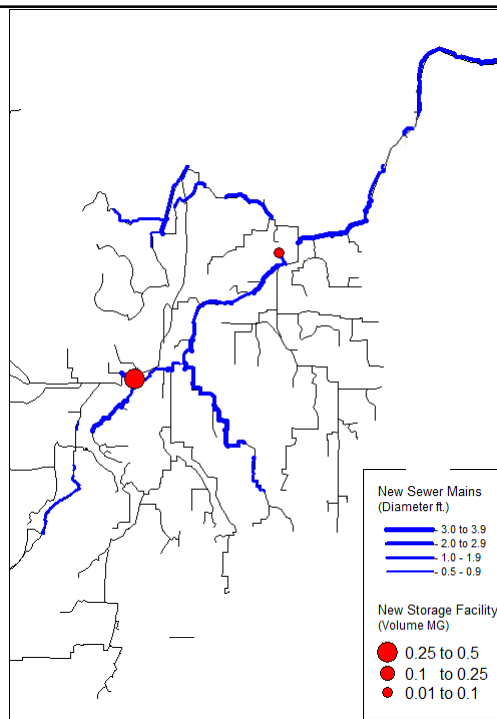
- Actual processing time: 0.15 hours  
(cloud computing using 104 cores in parallel)
- Complete hydraulic analysis of each trial solution
- Detailed life-cycle cost analysis of each trial sol.
- All costs divided by arbitrary value for purpose of demonstration

**Generation 2 (400 Trial Solutions)****Best Solution in 2<sup>nd</sup> Generation**

Cost Item	Total Cost (\$ Arb) (Including O&M)
Pipes	51.3
Pumps	4.3
Storage	8.7
<b>Total Project Cost</b>	<b>64.3</b>

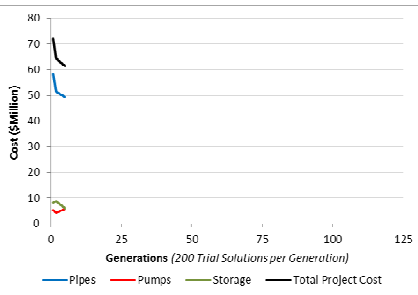


- Actual processing time: 0.3 hours  
(cloud computing using 104 cores in parallel)
- Complete hydraulic analysis of each trial solution
- Detailed life-cycle cost analysis of each trial sol.
- All costs divided by arbitrary value for purpose of demonstration

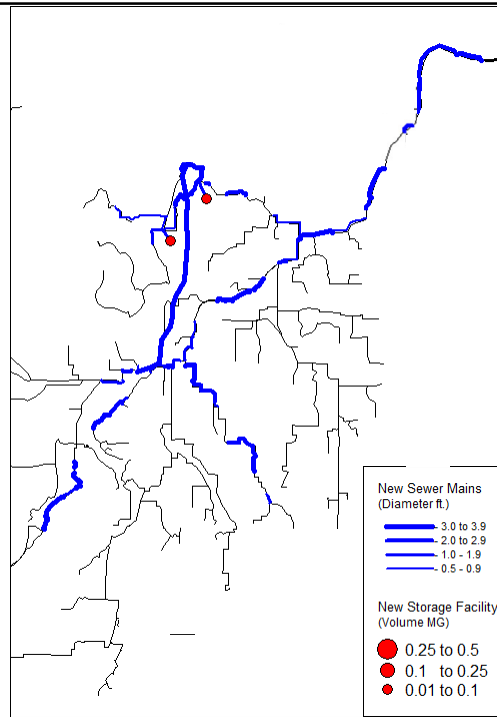


**Generation 5 (1,000 Trial Solutions)****Best Solution in 5<sup>th</sup> Generation**

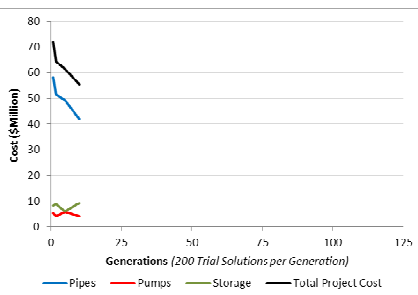
Cost Item	Total Cost (\$ Arb) (Including O&M)
Pipes	49.4
Pumps	5.9
Storage	6.1
<b>Total Project Cost</b>	<b>61.4</b>



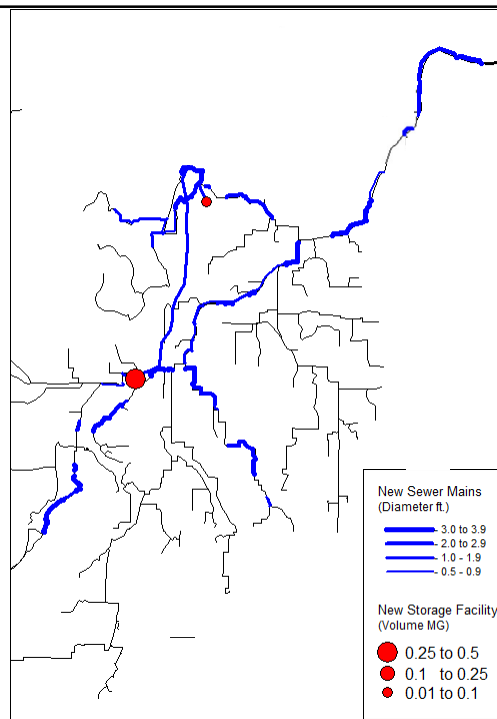
- Actual processing time: 0.75 hours  
(cloud computing using 104 cores in parallel)
- Complete hydraulic analysis of each trial solution
- Detailed life-cycle cost analysis of each trial sol.
- All costs divided by arbitrary value for purpose of demonstration

**Generation 10 (2,000 Trial Solutions)****Best Solution in 10<sup>th</sup> Generation**

Cost Item	Total Cost (\$ Arb) (Including O&M)
Pipes	42.0
Pumps	4.3
Storage	9.3
<b>Total Project Cost</b>	<b>55.6</b>

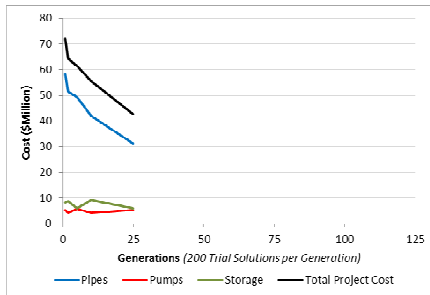


- Actual processing time: 1.50 hours  
(cloud computing using 104 cores in parallel)
- Complete hydraulic analysis of each trial solution
- Detailed life-cycle cost analysis of each trial sol.
- All costs divided by arbitrary value for purpose of demonstration

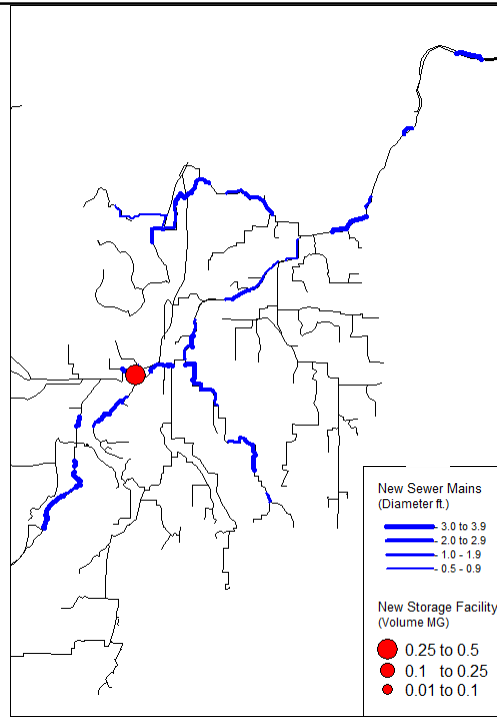


**Generation 25 (50,000 Trial Solutions)****Best Solution in 25<sup>th</sup> Generation**

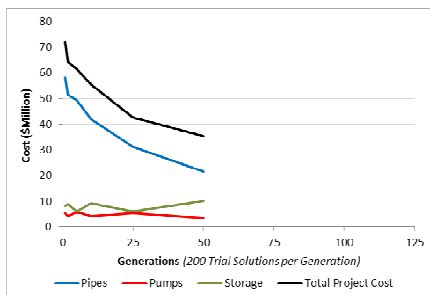
Cost Item	Total Cost (\$ Arb) (Including O&M)
Pipes	31.2
Pumps	5.4
Storage	6.1
<b>Total Project Cost</b>	<b>42.7</b>



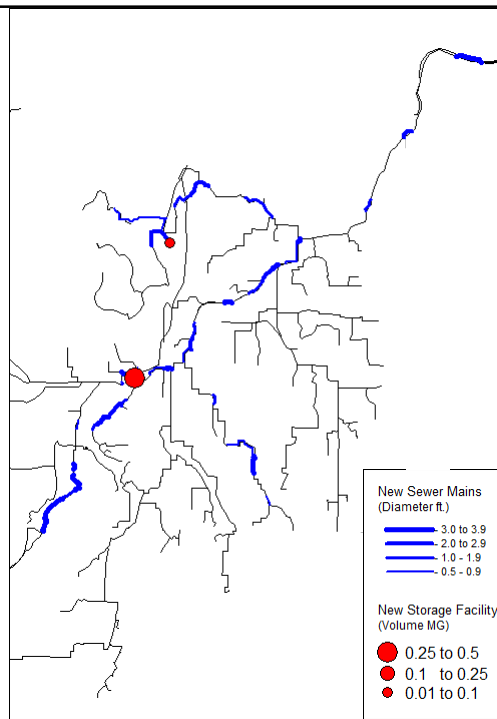
- Actual processing time: 3.75 hours  
(cloud computing using 104 cores in parallel)
- Complete hydraulic analysis of each trial solution
- Detailed life-cycle cost analysis of each trial sol.
- All costs divided by arbitrary value for purpose of demonstration

**Generation 50 (100,000 Trial Solutions)****Best Solution in 50<sup>th</sup> Generation**

Cost Item	Total Cost (\$ Arb) (Including O&M)
Pipes	21.7
Pumps	3.5
Storage	10.1
<b>Total Project Cost</b>	<b>35.3</b>

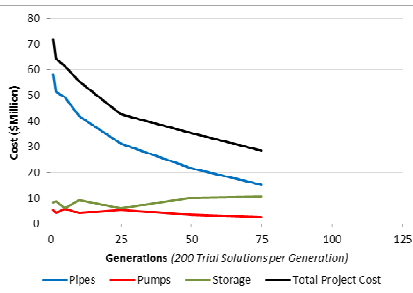


- Actual processing time: 7.50 hours  
(cloud computing using 104 cores in parallel)
- Complete hydraulic analysis of each trial solution
- Detailed life-cycle cost analysis of each trial sol.
- All costs divided by arbitrary value for purpose of demonstration

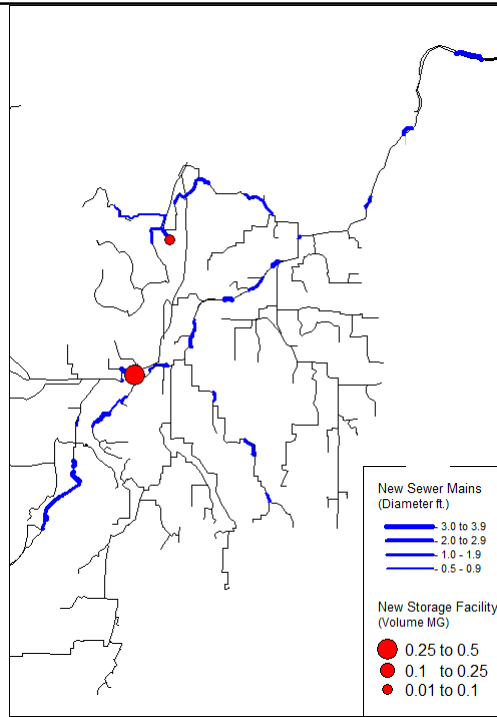


**Generation 75 (150,000 Trial Solutions)****Best Solution in 75<sup>th</sup> Generation**

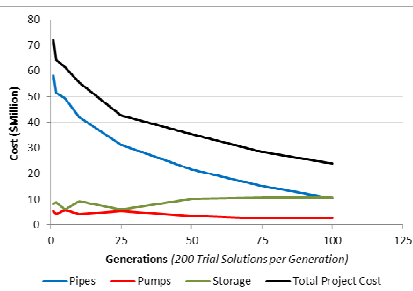
Cost Item	Total Cost (\$ Arb) (Including O&M)
Pipes	21.7
Pumps	3.5
Storage	10.1
<b>Total Project Cost</b>	<b>35.3</b>



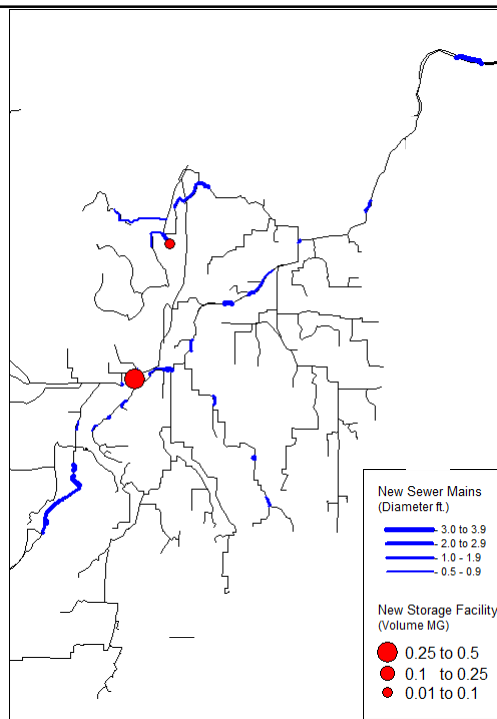
- Actual processing time: 11.25 hours  
(cloud computing using 104 cores in parallel)
- Complete hydraulic analysis of each trial solution
- Detailed life-cycle cost analysis of each trial sol.
- All costs divided by arbitrary value for purpose of demonstration

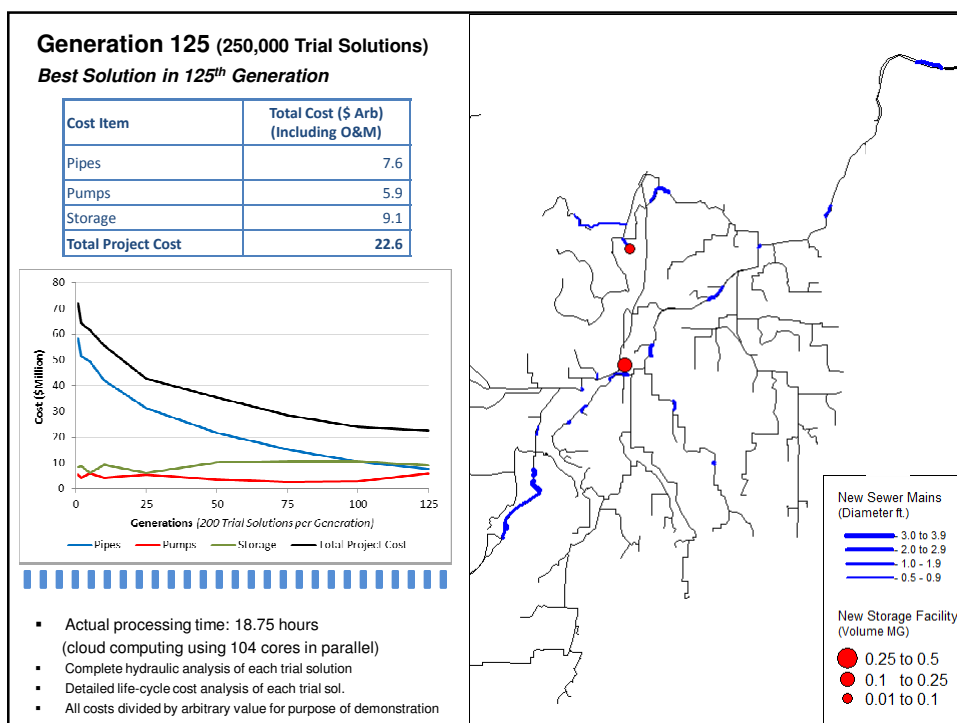
**Generation 100 (200,000 Trial Solutions)****Best Solution in 100<sup>th</sup> Generation**

Cost Item	Total Cost (\$ Arb) (Including O&M)
Pipes	10.4
Pumps	2.7
Storage	10.7
<b>Total Project Cost</b>	<b>23.8</b>



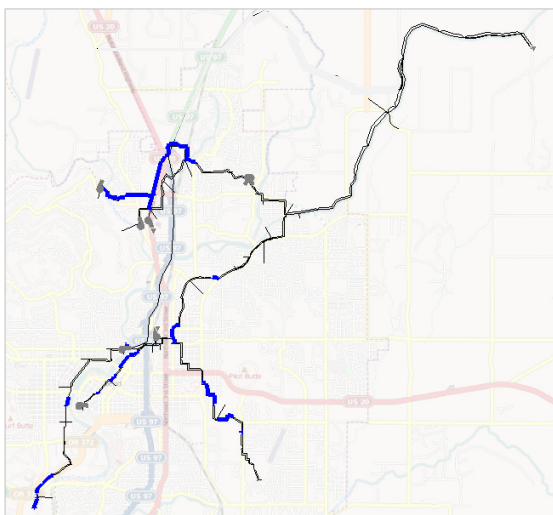
- Actual processing time: 15.00 hours  
(cloud computing using 104 cores in parallel)
- Complete hydraulic analysis of each trial solution
- Detailed life-cycle cost analysis of each trial sol.
- All costs divided by arbitrary value for purpose of demonstration





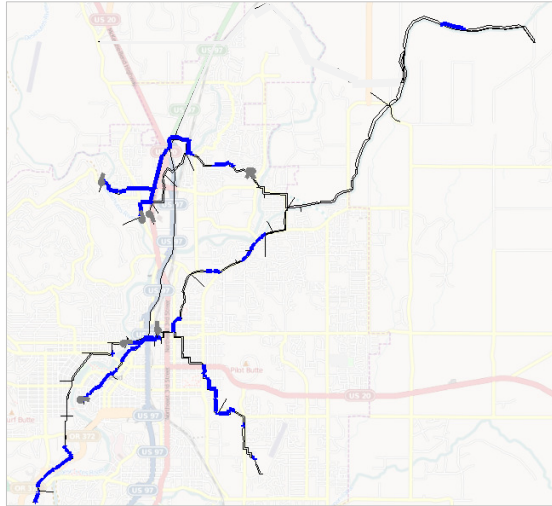
## Example Sensitivity Analysis on Loadings

**Option 1: \$13.7 M in  
Pipe Improvements  
(for Base loading)**



## Example Sensitivity Analysis on Loadings

**Option 2, \$20.2 M in  
Pipe Improvements  
(for Base loading + 20%)**



**Optimatics**

optimizing wastewater systems

***Discussion***



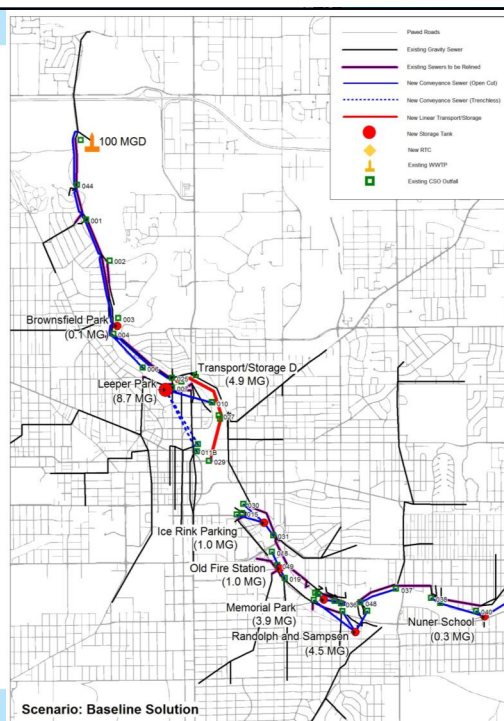
**Optimatics**

optimizing water systems

## CSO LTCP Optimization for South Bend, Indiana

### Baseline LTCP Solution Agreed with EPA

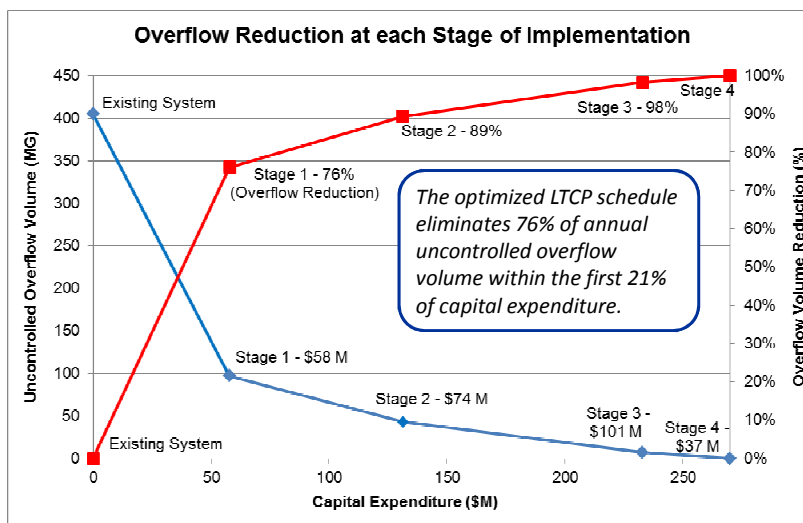
Cost Item	Baseline Solution (\$M)
Conveyance	149.83
Pump Station	0.00
Linear Storage	42.66
Storage Tank	99.81
Relining	13.04
RTC	0.00
Green Technology	0.00
Total Construction Cost	305.34
Eng/Leg/Adm. (20%)	61.07
<b>Total Capital Cost</b>	<b>366.41</b>
Present Worth O&M	45.61
<b>TOTAL PROJECT COST</b>	<b>412.02</b>

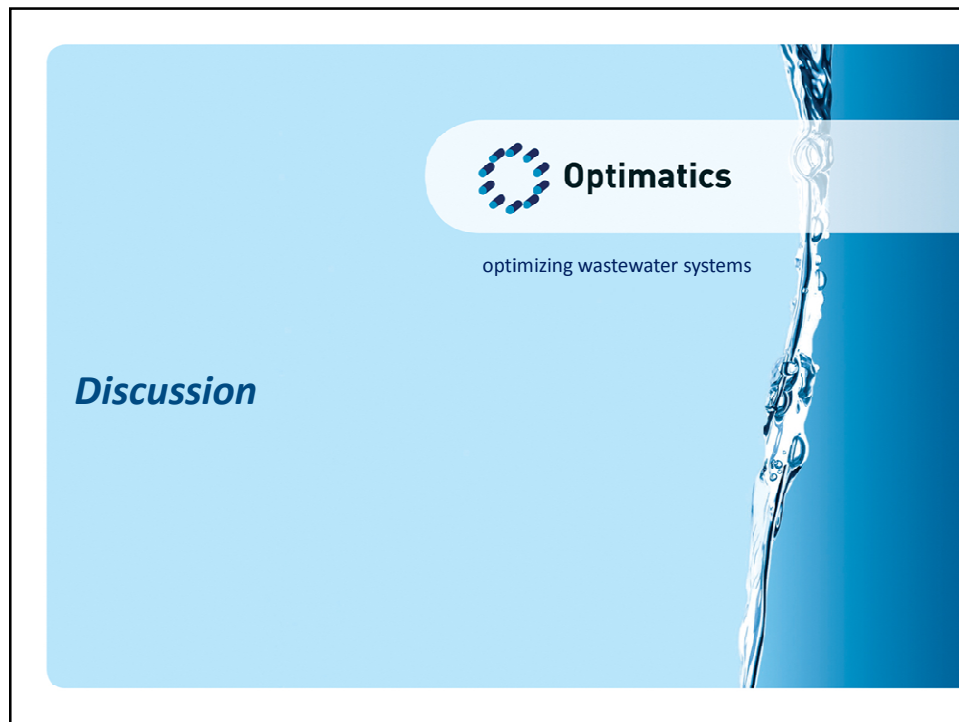



## Comparison of Baseline and Optimized Solutions

Cost Item	Baseline Solution (\$M)	Optimized Solutions				
		Solution 1 (\$M)	Solution 2 (\$M)	Solution 3 Optimized Solution	Solution 4 (\$M)	Solution 5 (\$M)
Conveyance	149.83	114.40	114.40	114.40	114.40	114.40
Pump Station	-	1.25	1.25	1.25	1.25	1.25
Linear Storage	42.66	13.96	13.96	13.96	13.96	13.96
Storage Tank	99.80	123.62	116.82	63.28	95.81	96.68
Relining	13.04	3.51	3.51	2.18	2.67	2.56
RTC	-	-	2.67	2.67	2.67	2.67
Green Technology	-	-	-	27.39	19.04	15.06
Total Construction Cost	305.34	256.75	252.62	225.13	249.80	246.58
Engineering/Legal/Admin (20%)	61.07	51.35	50.52	45.03	49.96	49.32
Total Capital Cost	<b>366.40</b>	<b>308.10</b>	<b>303.14</b>	<b>270.16</b>	<b>299.76</b>	<b>295.90</b>
Present Worth O&M	45.61	42.02	40.84	29.40	37.45	35.92
TOTAL PROJECT COST	<b>412.01</b>	<b>350.11</b>	<b>343.98</b>	<b>299.56</b>	<b>337.21</b>	<b>331.82</b>
Savings		61.90	68.04	112.46	74.80	80.19
		15%	17%	27%	18%	19%

## Prioritization of Projects for Maximum Impact





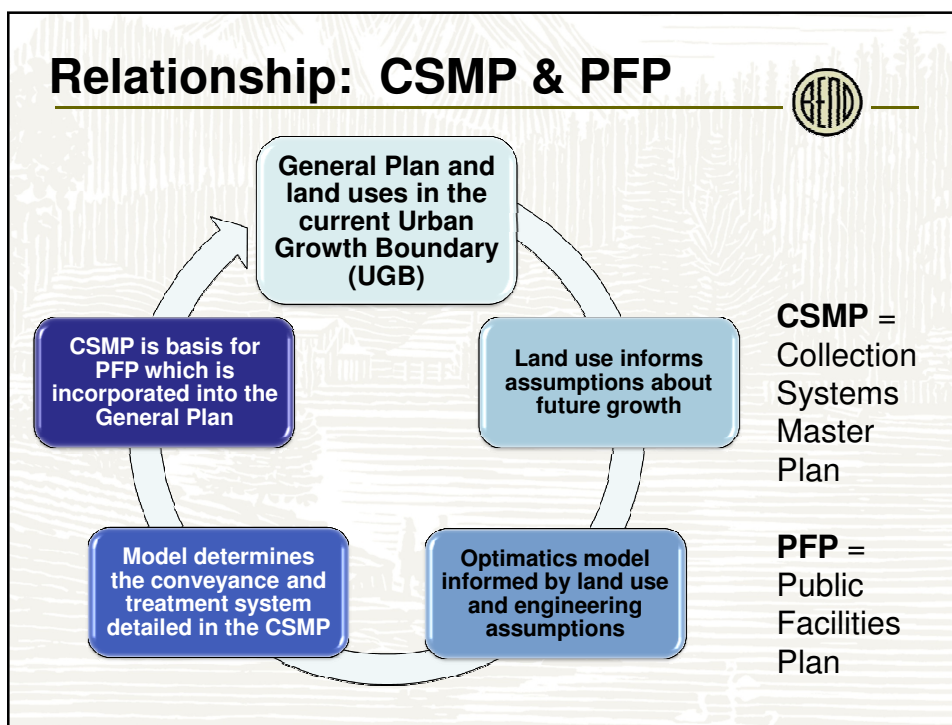


## Approach to Land Use Inputs in Hydraulic Model

*Sewer Infrastructure Advisory Committee*

*Brian Rankin, Principal  
Planner*  
  
*Community Development  
Department*

2/7/13



## CSMP & UGB: Big Picture



CSMP  
for land  
uses in  
the  
existing  
UGB

Sewer  
Public  
Facilities  
Plan (PFP)  
for existing  
UGB

Sewer PFP is basis  
for comparative  
analysis of infill,  
redevelopment, and  
UGB expansion  
scenarios

New acknowledged  
UGB and then re-  
adopt Sewer PFP  
simultaneously or  
later



Today



2014-2015



2015-????

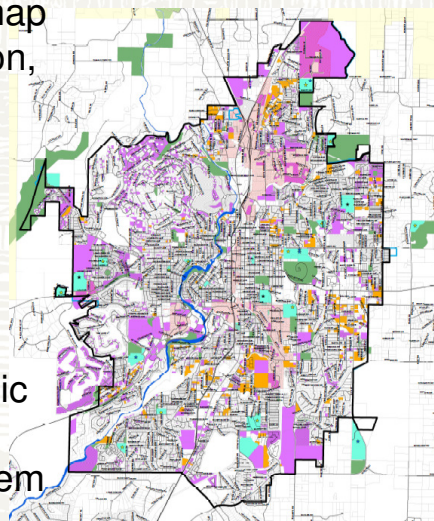


- CSMP should reflect requirements for Public Facility Plans or PFPs (Goal 11, OAR 660-011)
- Based on acknowledged land uses in **current UGB** (vs. unadopted plans)
- Subject to City Council policy direction and goals

## Task at Hand



- **Product** - Database and map calculating the type, location, and density of future development in Bend's existing UGB at *buildout*
- **Guidance from SIAG** - Regarding land use *assumptions* in the hydraulic model resulting in the optimized wastewater system



## Base Assumptions

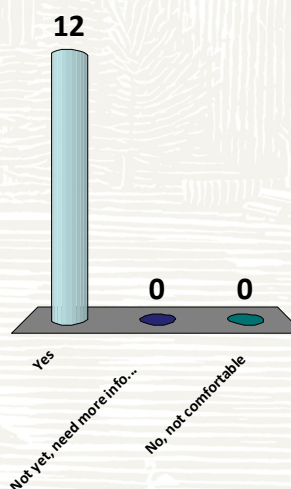


- **Development on Platted/Approved Lots**- Development densities on individual parcels. *Recommendation:* Assume what was approved by the city is constructed, and that single-lots are developed with a single unit.
- **Rights-of-way** - Amount of right-of-way taken out of large acreages . *Recommendation:* Use 21% from recent research approved by Land Conservation and Development Commission (LCDC).
- **Parks and Schools** - Location of future large parks and elementary, middle, and high schools . *Recommendation:* Use the 2010 School Siting Plan for best estimates and coordinate with Bend-Metro Parks & Recreation District.
- **People per Household** – Factor converts households to people. *Recommendation:* 2.4 people/household is a stable estimate per 2010 US Census.

*Is SIAG comfortable using these assumptions with additional documentation?*

## Are you comfortable with these base assumptions?

1. Yes
2. Not yet, need more information
3. No, not comfortable



## Density Assumptions



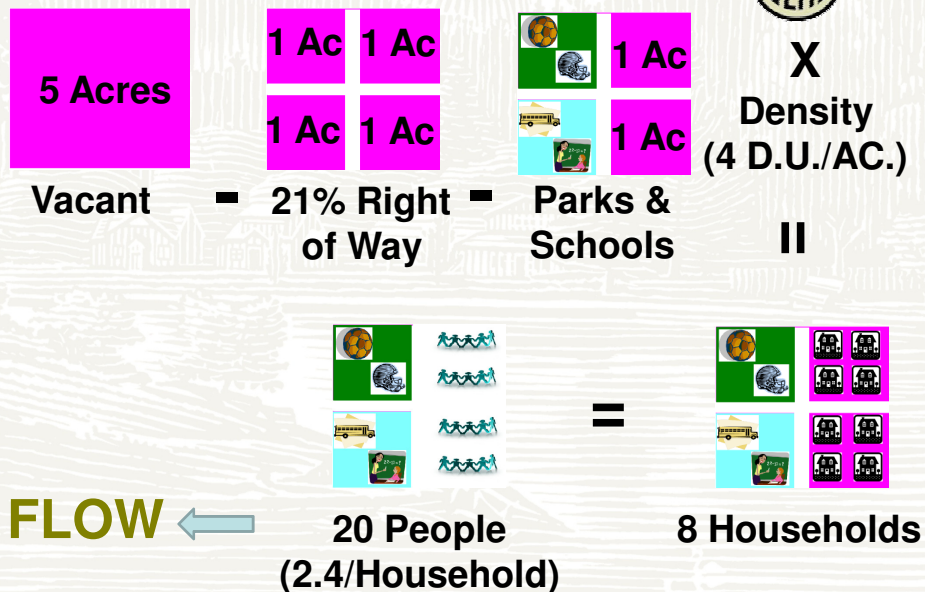
- **Density** - Future residential and employment levels on vacant lands (approximately 3,500 vacant acres).
- **Redevelopment** – Density of redevelopment of residential land based on current plan designations (approximately 700 acres).

Zone	Lowest Density	Medium Density	Highest Density
RL	1.1 dwellings per gross acre	1.7	2.2
RS	2.0	4.7	7.3
RM	7.3	14.5	21.7
RH	21.7	32.4	43

- *Recent analysis suggests residential densities have been at or near the lower end of the allowed range*
- *Redevelopment rates are low and tend to be replacement rather than at much higher densities*

**RL** = Residential Low Density    **RS** = Residential Standard Density  
**RM** = Residential Medium Density    **RH** = Residential High Density

## Applying the Assumptions



## Scenarios & Considerations

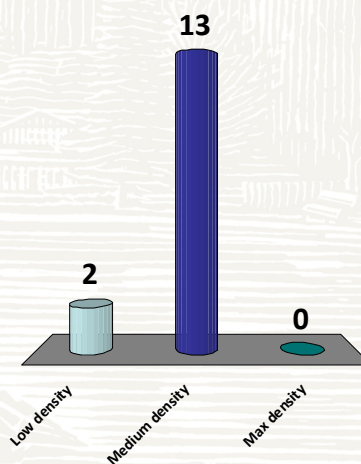


Scenario	Description	Risks
<b>A: Low Density</b>	<ul style="list-style-type: none"> <li>Existing development patterns</li> <li>~4 d.u./ac, 500 d.u. CAP, 600 d.u. transit corridors</li> <li>~110,000 population</li> </ul>	<ul style="list-style-type: none"> <li>Underbuilt system possibly less resilient</li> <li>LCDC rejected assumptions in UGB expansion</li> </ul>
<b>B: Medium Density</b>	<ul style="list-style-type: none"> <li>Bend slightly more urban</li> <li>More flexible system</li> <li>~6 d.u./ac, 1,000 d.u. CAP, 1,200 d.u. transit corridors</li> <li>~120,000 population</li> </ul>	<ul style="list-style-type: none"> <li>Development pattern not exactly what has been seen in the past</li> </ul>
<b>C: Max Density</b>	<ul style="list-style-type: none"> <li>Most density and capacity</li> <li>~8 d.u./ac, 2,000 d.u. in CAP, 2,400 d.u. in transit corridors</li> <li>~150,000 population</li> </ul>	<ul style="list-style-type: none"> <li>Not realistic from market standpoint</li> <li>Potential overbuilt for near term</li> </ul>
<b>Consideration</b>		
Additional Capacity for Special Areas	<ul style="list-style-type: none"> <li>Targets capacity for anticipated development</li> </ul>	<ul style="list-style-type: none"> <li>Some uncertainty regarding exactly how much capacity to add</li> </ul>

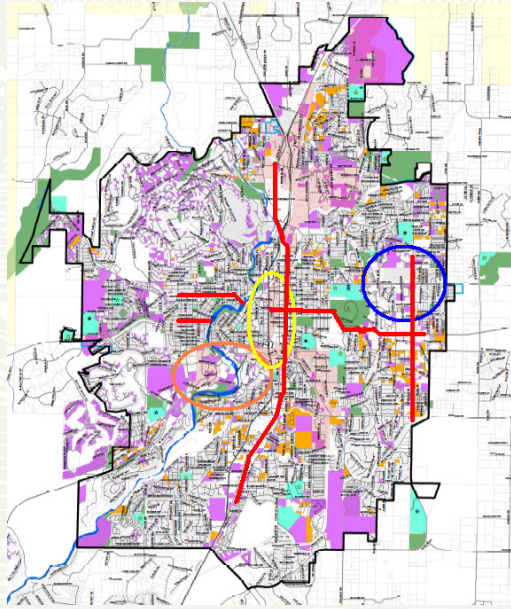
**d.u.** = Dwelling Unit    **CAP** = Central Area Plan    **ac** = Gross Acres

## Which scenario do you prefer?

1. Low density
2. Medium density
3. Max density



## Capacity for Special Areas

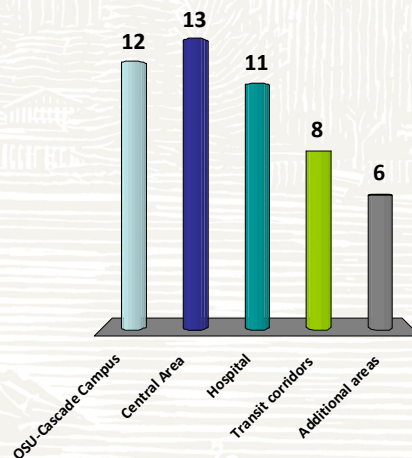


Areas such as:

- Central Area Plan (yellow)
- OSU Cascades campus (orange)
- Transit corridors (red)
- Hospital (blue)
- Additional areas?

## Which special areas should be considered?

1. OSU-Cascade Campus
2. Central Area
3. Hospital
4. Transit corridors
5. Additional areas



## **Testing the Optimized Solution**



Examples:

- Higher population inside the current UGB
- Urban expansion
- These may require:
  - Council direction
  - Scope of Work adjustment

<b>Sewer Infrastructure Advisory Group Meeting Summary</b>	<b>February 7, 2013</b>
	<b>4:00-6:00 p.m.</b>
	<b>Bend Park &amp; Recreation</b> Riverside Community Room
	<b>Note taker: Adele McAfee</b>
<b>In Attendance:</b> <b>Committee Members:</b> Andy High, Casey Roats, Lynn Putnam, Mike Riley, Dale Van Valkenburg, Craig Horrell, Steven Hultberg, Charley Miller, Steve Galash, Stacey Stemach, Bruce Alyward, Sharon Smith, Pam Hardy, Rob von Rohr, Wes Price <b>COB Staff:</b> Tom Hickmann, Paul Rheault, Jon Skidmore, Aaron Collett, Colin Stephens, Brian Rankin, Russell Grayson, Carolyn Eagan, Mary Winters <b>Consultants:</b> – David Prull (Clearwater Engineering Group), David Stangel (MSA), John Cowan (Optimatics), Jeff Frey (Optimatics) <b>Others:</b> Dayna Ralston, Erik Huffman, Jim Frost, John Russell, Jim Lord, <b>Facilitators:</b> Libby Barg (Barney & Worth), Clark Worth (Barney & Worth)	

### Action Items

SIAG made the following recommendation for the modeling land use inputs:

- City recommended base assumptions: **OK**
- Development scenario: **Medium Density**
- Special Areas for Additional Capacity: **OSU-Cascade Campus, Central Area, and hospital area** (preliminary decision)

### Agenda Item: Welcome / Introductions / Approve Meeting Notes

Casey Roats moved to accept the meeting notes (with corrections, if received) for the previous 5 meetings (7/19/12, 9/2012, 10/25/12, 11/15/12, 1/17/13). Motion seconded by Lynn Putnam. Motion passed

### Agenda Item: Optimization 101

Presentation included information about how the optimization tool will be used, schedule, and committee input opportunities.

SIAG question: Could this be done quicker?

Answer: There are a number of steps involved that take time.

- All unit costs need to be developed up front and put into the model.
- What technology will be put into the model needs to be determined.
- Cost and life cycle assumptions need to be validated by SIAG.
- Coordination with City Engineering, Operations and Maintenance.

There may be chance to accelerate the schedule after November.

### Agenda Item: Approach to Land Use Inputs in Hydraulic Model

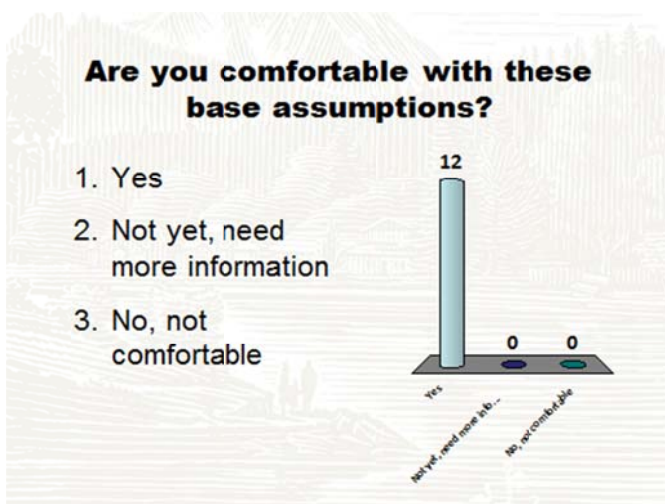
Brian Rankin presented information about land use inputs and asked for SIAG input on three topics: base assumption, development scenarios, and consideration of extra capacity for special areas.

## **Base Assumption**

The following base assumptions were presented to SIAG for their consideration:

- **Development on Platted/Approved Lots** – Development densities on individual parcels. *Recommendation:* Assume what was approved by the city is constructed, and that single-lots are developed with a single unit.
- **Rights-of-way** – Amount of right-of-way taken out of large acreages. *Recommendation:* Use 21% from recent research approved by Land Conservation and Development Commission (LCDC).
- **Parks and Schools** – Location of future large parks and elementary, middle, and high schools. *Recommendation:* Use the 2010 School Siting Plan for best estimates and coordinate with Bend-Metro Parks & Recreation District.
- **People per Household** – Factor converts households to people. *Recommendation:* 2.4 people/household is a stable estimate per 2010 US Census.

SIAG conducted a straw poll on the base assumptions. Following the straw poll, SIAG members relayed they were in agreement with the base assumptions.



## **Development Scenarios**

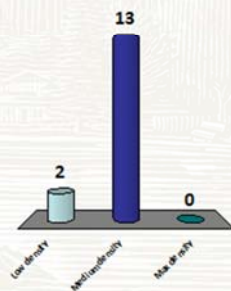
A number of development scenarios were presented to SIAG for their consideration:

Zone	Lowest Density	Medium Density	Highest Density
RL	1.1 dwellings per gross acre	1.7	2.2
RS	2.0	4.7	7.3
RM	7.3	14.5	21.7
RH	21.7	32.4	43

SIAG conducted a straw poll on the development scenarios. Following the straw poll, SIAG members relayed their preference for the medium density scenario.

### Which scenario do you prefer?

1. Low density
2. Medium density
3. Max density

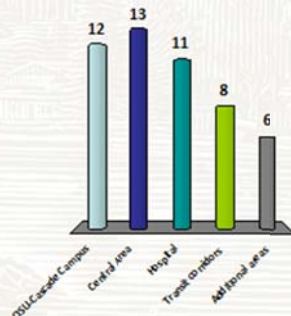


### Capacity for Special Areas

SIAG was asked if there were areas that should be considered for additional capacity (over base assumptions). A straw poll showed support for additional capacity for the OSU-Cascade Campus, Central Area, and hospital area.

### Which special areas should be considered?

1. OSU-Cascade Campus
2. Central Area
3. Hospital
4. Transit corridors
5. Additional areas



A number of additional areas were suggested:

- High water demand area for certain types industry
- Area surrounding OSU (increased residential use)
- Area between COCC and OSU Cascades

Decisions on special areas will be made at the February 21, 2013 SIAG meeting.

**Meeting adjourned 5:58 PM**

# Bend Sewer Infrastructure Advisory Group: Meeting #7

## Modeling and Optimization 101

Bend Park and Recreation  
The Riverbend Community Room  
799 SW Columbia St.

February 21, 2013  
4:00-6:00 p.m.

## Agenda

Activity / Topic	Presenter	Time
1. <b>Welcome / Introductions / Approve Meeting Notes</b>	Jon Skidmore	4:00 p.m.
2. <b>Review Meeting Agenda / Goals</b>	Libby Barg	4:05
3. <b>Demand Forecast: Special Areas</b> Present information on “special areas” and demand forecast adjustment approach. <b>Objectives:</b> <ul style="list-style-type: none"><li>• SIAG review and recommend “special areas” for demand forecast.</li></ul>	Brian Rankin, Bend Community Development David Stangel, P.E., MSA	4:10
<b>Advisory Group Q&amp;A / Discussion</b>	Libby Barg	
4. <b>Viability criteria</b> Present information on the purpose and need for viability criteria and proposed criteria. <b>Objective:</b> <ul style="list-style-type: none"><li>• SIAG provide feedback on viability criteria.</li></ul>	David Stangel	4:25
<b>Advisory Group Q&amp;A / Discussion</b>	Libby Barg	
5. <b>Life Cycle Cost Analysis</b> Present information on life cycle cost analysis, use in modeling, and options. <b>Objective:</b> <ul style="list-style-type: none"><li>• SIAG provide guidance on life cycle cost analysis period.</li></ul>	David Stangel	4:55
<b>Advisory Group Q&amp;A / Discussion / Polling</b>	Libby Barg	
6. <b>Design criteria</b> Present information on proposed design criteria. <b>Objective:</b> <ul style="list-style-type: none"><li>• SIAG provided information on design criteria and implications for modeling.</li></ul>	David Stangel, P.E., MSA	5:40
<b>Advisory Group Q&amp;A / Discussion</b>	Libby Barg	

For more information, visit the Bend Sewer Infrastructure Advisory Group webpage:  
<http://bendoregon.gov/index.aspx?page=841>

7.	<b>Public Comment</b>		5:50
8.	<b>Next Steps</b>	Libby Barg	5:55
	<ul style="list-style-type: none"> <li>Upcoming SIAG Meetings: <ul style="list-style-type: none"> <li>March 7 Pumps, Pipes, Storage</li> <li>March 21 Pumps, Pipes, Storage (Cont.)</li> <li>April 4 Treatment Alternatives</li> <li>April 18 Treatment Alternatives (Cont.)</li> </ul> </li> </ul>		
	<b>Adjourn / Thank You</b>	Jon Skidmore	6:00 p.m.

# DESIGN CRITERIA VIABILITY CRITERIA LIFE CYCLE COST ANALYSIS

Sewer Infrastructure Advisory Group  
February 21, 2013



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

## PRESENTATION CONTENTS

- ◆ Provide information and review of
  - Viability Criteria
  - Design Criteria
- ◆ Provide information and opportunity for input on
  - Life Cycle Cost Analysis



## VIABILITY CRITERIA

### ◆ What are Viability Criteria?

- Used to determine what types of technology will be included in the optimization
  - Treatment Alternatives\*
  - Pipe Alternatives
  - Pump Alternatives
  - Storage Alternatives

\*Primary Focus of Viability Criteria

## PURPOSE OF THE VIABILITY CRITERIA

### ◆ Provides a Cost Baseline

- Optimization compares alternatives on a cost basis
- Reliable cost info is needed to load the model

### ◆ Provides a Confidence Baseline

- The community expects performance for its \$
- Permitting agencies will require performance
- City staff is responsible for performance (e.g. no overflows)

## WHAT ARE THE VIABILITY CRITERIA

### Technology alternatives need to demonstrate:

#### COST

- Life Cycle Costs can be “independently” verified
  - Land area, Initial cost, Energy Use, O&M, Chemicals, etc

#### CONFIDENCE

- Has performed in municipal installations
- Has performed in similar applications
  - Regulatory, Climate, Geology
- Record of multiple years of O&M, energy data
- Support from a U.S. based “supplier” of equipment and parts

### See handout for details

## TREATMENT/EFFLUENT ALTERNATIVES

### Wastewater Treatment Package/Satellite Systems

- Membranes
- Conventional Mechanical
- Innovative Technologies

### Effluent Disposal (must be year-round solution)

- Ground Application
  - Infiltration Pond/Lagoon
  - Wetlands
  - Direct Injection
  - Land Application
  - Reuse
- Surface Water

## SIAG DISCUSSION

- ◆ Q/A/Discussion?

## LIFE CYCLE COST ANALYSIS (LCCA)

- ◆ What is infrastructure life cycle cost analysis?
- ◆ Why should we care about LCCA?
- ◆ What is the useful life of sewer infrastructure?
- ◆ What analysis period is appropriate for use in the CSMP?

## WHAT IS LCCA?

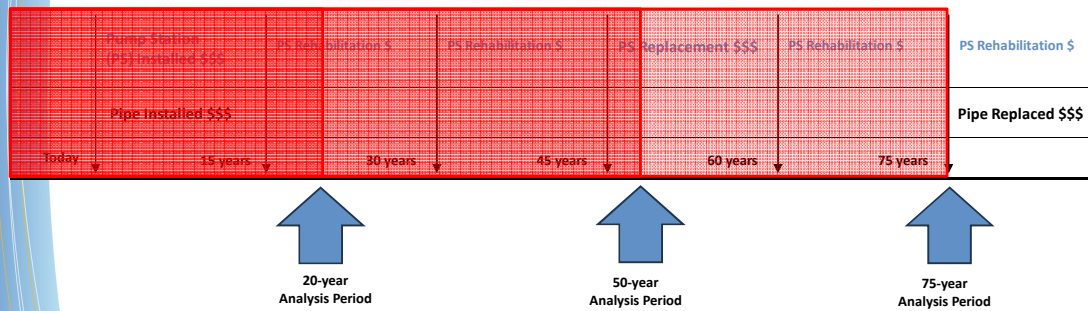
- An economic analysis procedure that uses engineering and financial inputs to compare alternatives over time
- LCCA provides a long term assessment of project effectiveness compared with evaluating up-front capital costs alone
- Expresses results in equivalent dollars - Present Value

## SEWER INFRASTRUCTURE USEFUL LIFE

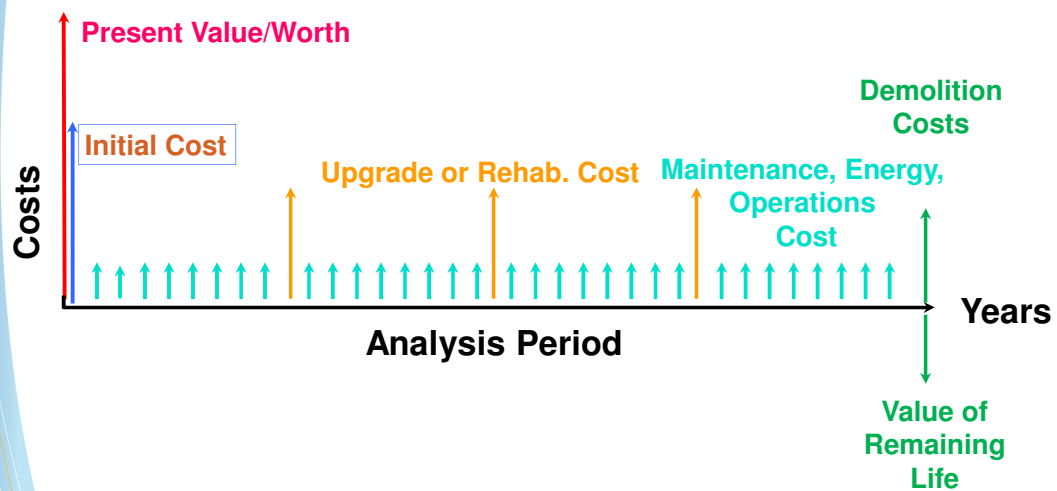
Component	Useful Life (years)
<b>Gravity Sewer Mains</b>	80-100
<b>Treatment Plants – Concrete Structures</b>	50
<b>Treatment Plants – Mechanical and Electrical</b>	15-25
<b>Force Mains</b>	25
<b>Pumping Stations – Concrete Structures</b>	50
<b>Pumping Stations – Mechanical and Electrical</b>	15

- Sources: Environmental Protection Agency (EPA), 2002, American Society of Civil Engineers (ASCE), 2011

## LCCA PERIOD (CAPITAL ONLY EXAMPLE)






## LCCA COMPONENTS



## ANALYSIS PERIOD CONT.

- ◆ Short analysis period (20 years) may not accurately capture the remaining value of long lived assets (e.g. pipes)
- ◆ Long analysis period (> 50 years) may not accurately predict long-term O&M costs and financial factors (e.g. inflation)
- ◆ Medium analysis period (30-40 years) may better balance short and long term uncertainties

## LCCA SENSITIVITY ANALYSIS

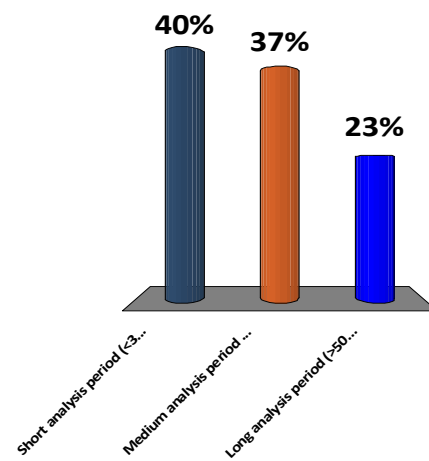
- ◆ The optimization will employ sensitivity analysis to assess one or more of:
  - Analysis Period 
  - Remaining Useful Life 
  - Discount Rate (Time value of money) 
    - Inflation Rate
    - Cost to Borrow Money

## WHAT ANALYSIS PERIOD?

- ◆ Discussion/Questions

## WHAT ANALYSIS PERIOD ARE YOU COMFORTABLE USING?

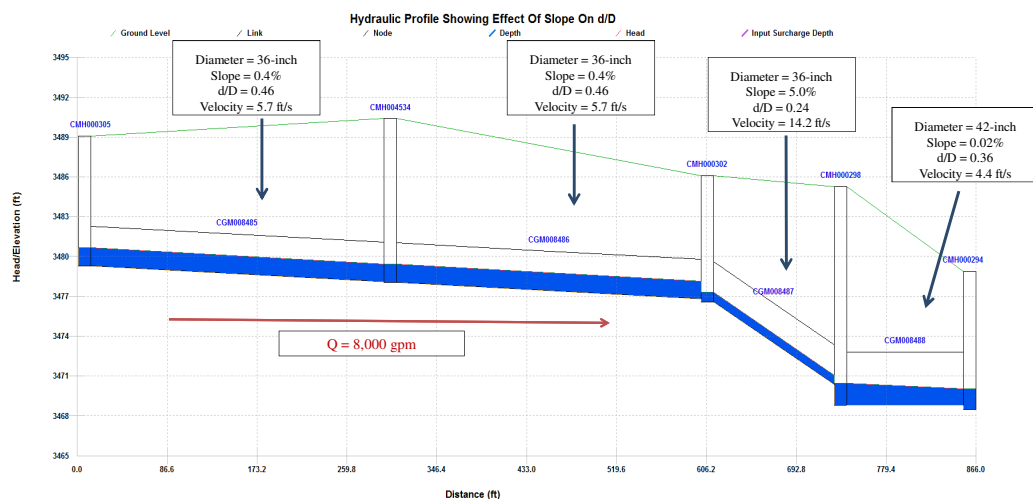
- A. Short analysis period (20 years)
- B. Medium analysis period (30-40 years)
- C. Long analysis period (50 years)



## WHAT ARE DESIGN CRITERIA?

- Define the hydraulic and basic facility parameters used in the optimization analysis:
  - Sewage Level in Pipes/Manholes
  - Flow Velocity
  - Pump Operation Under Dry and Wet Weather
  - Emergency Power at Lift Stations
  - Standard Pipe Sizes
  - Pipe Slope
  - Others (See Handout)
- Used to identify existing deficiencies and set requirements for proposed improvements.

## EXAMPLE - PIPE SLOPE, % FULL, VELOCITY



# WHAT ARE DESIGN CRITERIA BASED ON?

## Regulatory Agency and Industry Standards

- Oregon Department of Environmental Quality (ODEQ)\*
- Bend Standards and Specifications
- Ten States Standards
- Washington State “Orange Book”
- Previous Bend Planning Work
- Engineering Best Practices
- Other Municipalities

\*ODEQ has primacy in Oregon for EPA regulations

## DESIGN CRITERIA SHEET – SEE HANDOUT

### PROPOSED COLLECTION SYSTEM DESIGN CRITERIA FOR THE CITY OF BEND OPTIMIZED SEWER COLLECTION SYSTEM PLAN UPDATE

Category	Bend 2011 Standards and Specifications	Redmond, Oregon	ODEQ Oregon Standards for Design and Construction of Wastewater Pump Stations (May, 2001)*	Composite of Other Sources**	Proposed Standard
During Peak Dry Weather Flows, dfl	≤ 0.8 at peak design flow (Part 2 Section 4.2.6)	NA	Not Mentioned	0.5 – 0.8	0.8
During Peak Wet Weather Flows, dfl	Not Mentioned	≤ 0.8	Not Mentioned	0.5 – 1.0	Covered under freeboard requirements
During peak wet weather flows, maximum surcharge (freeboard from water surface to manhole rim)	Not Mentioned	No Surcharging	Not Mentioned	No surcharging – 2.0 feet from manhole rim	Never less than 2.0 ft of freeboard system wide for unsealed gravity pipelines. Manholes with less than 2.0 ft from crown to rim will be identified and evaluated individually as exceptions or required improvements.
Shallow Manhole (crown of pipe to rim ≤ 2.5 ft, during peak wet weather flows, maximum surcharge (freeboard from water surface to manhole rim))	Not Mentioned	Not differentiated from above criterion	Not Mentioned	No surcharging – 0.5 feet from manhole rim	Covered under freeboard requirements
Pump Station Firm Capacity	Pump capacity to discharge the Peak Hour Flow with one unit out of service, minimum 2 pumps operating alternately and an additional pump as installed backup (Part 2 Section 4.5.3)	Peak hour flow must not exceed lift station capacity with largest pump out of service (firm capacity)	A station with firm capacity to pump the peak hourly and peak instantaneous flows associated with the 5-year, 24-hour storm intensity of its tributary area, without overflows from the station or its collection system. (Part III, pg. 5)	Minimum of 2 pumps installed – Firm capacity must be provided under design storm conditions	Firm capacity will be adequate for peak dry weather flow, total capacity will be adequate for total peak flow during the design wet weather event.
Maximum Force main velocity	8 ft/s at average daily flow rate (Part 2 Section 4.2.11)	8 ft/s	Pump suction lines – 3 to 5 ft/s Pump vertical discharge lines – 6 to 10 ft/s Pump discharge lines including force mains – 3.5 to 8 ft/s (Part VI.A, pg. 13)	5 – 10 ft/s	6 ft/s max under peak dry weather flows, 10 ft/s max under wet weather conditions with all pumps operating
Maximum gravity pipeline velocity	Not Mentioned	Not mentioned	Not mentioned	< 10 ft/s < 15 ft/s, proper anchoring required above 10 ft/s	10 ft/s to identify pipelines that may require anchoring and regular inspection
Minimum cleaning/scouring velocity, gravity pipeline and force main	Gravity – 2 ft/s at average daily flow rate (Part 2 Section 4.2.7) Force Main – 3 ft/s at average daily flow rate (Part 2 Section 4.2.10)	Not mentioned	Pump suction lines – 3 to 5 ft/s Pump vertical discharge lines – 6 to 10 ft/s Pump discharge lines including force mains – 3.5 to 8 ft/s (Part VI.A, pg. 13)	2 ft/s for gravity pipelines 3 – 3.5 ft/s for force mains	2 ft/s flow rate attained during peak dry weather flow to maintain cleaning or identify pipelines in need of flushing.
Minimum cleaning/scouring velocity, siphon (2 barrels required)	Inverted Siphons shall not be permitted.	Not mentioned	Not mentioned	Inverted siphons not permitted – 3 ft/s where permitted	3 ft/s
Backup Power (Response Time)	Emergency Capacity reviewed on case by case basis (Part 2 Section 4.5.1.2). Standby Power required for new lift stations or existing lift stations that go through a “material modification” (Part 2, Section 4.5.3)	“Standby generators at most facilities”.	Part X.U. - Backup Power - For stations without a dedicated backup generator or a secondary electrical feed, install a manual transfer switch and an emergency plug-in power connection to the station for use with an approved portable generator. The plug-in connector shall be as approved by the Owner. Part X.V - Standby Generator - A diesel-oil fueled, engine-driven electric generator unit shall be provided for all pump stations, unless otherwise approved by the Owner. Part VII.C - Wet Well - Stations without on-site standby generators or a second source of power shall be designed for a minimum one hour of holding time at the 5-year peak hourly design flow. Inlet sewers shall not be used to provide wet-well storage, except for linear self-cleaning designs.	Case by case – On-site generator power required at all lift stations	On-site Backup Power or Backup Diesel Pumps should be provided for any large or regional lift stations. Other lift stations (excluding private pumps) should comply with ODEQ guidelines for on-site storage, auxiliary power, etc.

## RECOMMENDED DESIGN CRITERIA

• Q/A/Discussion?

<b>Sewer Infrastructure Advisory Group Meeting Summary</b>	<b>February 21, 2013</b>
	<b>4:00- 6:00</b>
	<b>Bend Park &amp; Recreation, Riverside Community Room</b>
	<b>Note taker: Adele McAfee</b>
<p><b>Committee Members:</b> Andy High, Casey Roats, Lynn Putnam, Mike Riley, Dale Van Valkenburg, Craig Horrell, Steven Hultberg, Charley Miller, Steve Galash, Stacey Stemach, Sharon Smith, Wes Price</p> <p><b>Via conference call:</b> Pam Hardy</p> <p><b>COB Staff:</b> Tom Hickmann, Paul Rheault, Jon Skidmore, Aaron Collett, Brian Rankin</p> <p><b>Consultants:</b> David Stangel (MSA), David Prull ( Clearwater Engineering Group)</p> <p><b>Facilitator:</b> Libby Barg (Barney &amp; Worth)</p> <p><b>Others:</b> Ken Steiger (Bend resident)</p>	

## Meeting Summary

### Action Items

- Demand forecast “special areas” will include OSU Cascade Campus area, Central Area Plan and the Hospital zone.
- Staff agreed to track / provide a list of the companies that are proposing technology through the viability review process
- The SIAG unanimously agreed the life cycle cost analysis period be set at 40 years
- The regular SIAG meeting time will change from 4:00 p.m.-6:00 p.m. to 3:30 p.m.-5:30 p.m.

### **Agenda Item: Demand Forecast: Special Areas**

Brian Rankin, Bend Community Development, presented information on “special areas” and an approach for demand forecast, approach and asked for a final review and recommendation from the SIAG.

SIAG members agreed on the following special areas:

- OSU Cascade Campus area
- Central Area Plan
- Hospital zone

### **Agenda Item Viability Criteria**

David Stangel P. E., MSA, presented information on the purpose and need for viability criteria. He also described a process vendors can use to prove their technology or product meets the viability criteria.

*Q: Are we boxing ourselves with existing technology? Are the criteria limiting?*

A: There are opportunities for flexibility and innovative ideas.

*Q: Will there be individuals approaching the city with new technology?*

A: Yes. The city will also be open to private pilot projects with a private party. The city will be making sure the rate payers are protected. The city does not want to be in a position of taking over a failing private utility.

*Q: Are there any towns that have something different or new technology?*

A: Eagle Crest has a membrane bioreactor. It is a great technology and has a small footprint.

The SIAG discussed if the City should recruit for new and innovative technologies. The consensus was that it was unnecessary, as companies with new products are already actively marketing their projects. The City said they would keep track of companies / technologies that approach the City with products they would like to be considered.

### **Agenda Item: Life Cycle Cost Analysis**

David Stangel presented information about life cycle cost analysis and answered SIAG questions.

*Q: What is the sensitivity range?*

A: A sensitivity range is not 20 to 80 years. If 40 years, the sensitivity analysis period is 30 to 50 years.

*Q: What are the consequences of picking too short or too long of a period?*

A:

- Short analysis period (20 years) may not accurately capture the remaining value of long lived assets (e.g. pipes)
- Long analysis period (> 50 years) may not accurately predict long-term O&M costs and financial factors (e.g. inflation)
- Medium analysis period (30-40 years) may better balance short and long term uncertainties

The SIAG voted unanimously to support a 40-year analysis period.

### **Agenda Item: Design Criteria**

David Stangel presented information about life cycle cost analysis and answered SIAG questions.

### **Public Comment:**

Ken Steiger – Has lived in the SE area for 30 years. The SE Interceptor is important to him as a resident. He stated, the group (SIAG) should make sure they have confidence in the data—septic failure data from that region of town, how many septic repair permits have been issued by the county over the last seven years, and how close we are to getting out of compliance with the state.

Meeting adjourned at 5:58 PM



# Bend Sewer Infrastructure Advisory Group: Meeting #8

## Pipes, Pumps, and Storage for Optimization

City of Bend Council Chambers  
710 NW Wall St.

March 7, 2013  
3:30-5:30 p.m.

### Agenda

Activity / Topic	Presenter	Time
1. <b>Welcome / Introductions / Approve Meeting Notes</b>	Jon Skidmore	3:30 p.m.
2. <b>Review Meeting Agenda / Goals</b>	Libby Barg	3:35
3. <b>Pipes, Pumps, and Storage</b> Overview of information used in the Optimization model Learn more about what's in the "toolbox": pipe, pump, and storage alternatives <b>Objective:</b> <ul style="list-style-type: none"><li>• SIAG concurrence on pipe, pump and storage alternatives to be considered in Optimization</li></ul>	David Prull, P.E.	3:45
<b>Advisory Group Q&amp;A / Discussion</b>	Libby Barg	
4. <b>Public Comment</b>		5:10
5. <b>Next Steps</b> <ul style="list-style-type: none"><li>• Upcoming SIAG Meetings:<ul style="list-style-type: none"><li>- March 21 Pumps, Pipes, Storage (Cont.)?</li><li>- April 4 Treatment Alternatives</li><li>- April 18 Treatment Alternatives (Cont.)</li></ul></li></ul>	Libby Barg	5:20
<b>Adjourn / Thank You</b>	Jon Skidmore	5:30 p.m.

# PIPES, PUMPS, AND STORAGE FOR OPTIMIZATION

Sewer Infrastructure Advisory Group  
March 7, 2013



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

## PRESENTATION CONTENTS

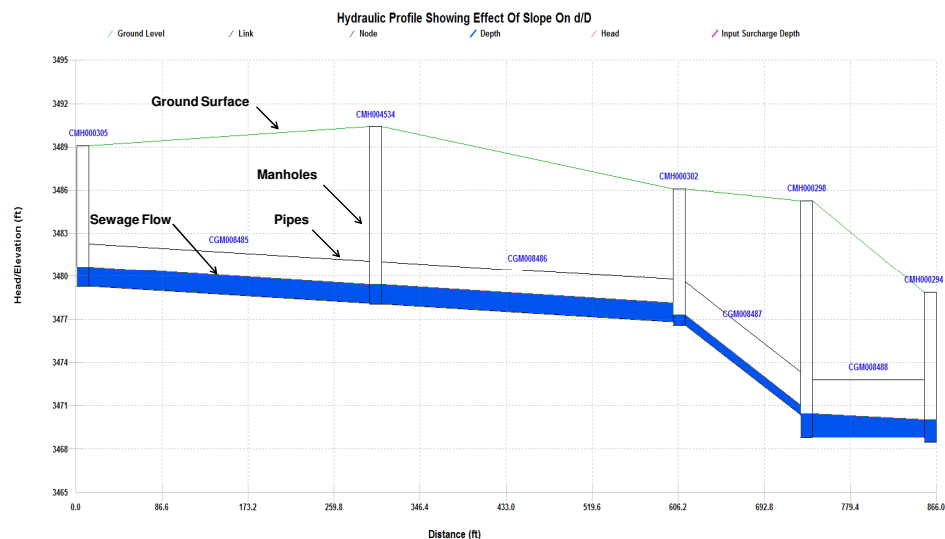
- ◆ Overview of Pipe, Pump, and Storage information used in the Optimization model
- ◆ Provide information about "What's in the Toolbox"
  - Pipe alternatives
  - Pump alternatives
  - Storage Alternatives
- ◆ Discuss how "Community Values" might be considered in Optimization

## Why are We Discussing This?

- To develop common understanding of the elements that comprise conveyance system alternatives
  - Build on our understanding of system deficiencies
  - Verify that we are considering all useful alternatives
  - Hone in on best alternatives for specific issues
  - Discuss using a “Base Cost” for initial Optimization
  - Explore how some higher cost alternatives may have higher value to the community

## Pipe and Pumps in Optimization

- Gravity Pipes – Hydraulic Model Identifies Deficiencies

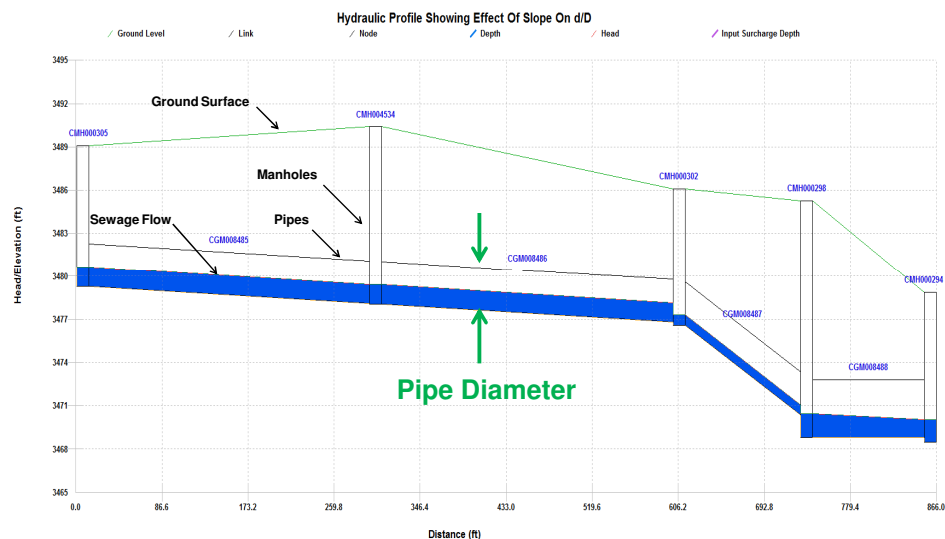


## PIPE AND PUMPS IN OPTIMIZATION

- Pipe Alternatives – In Response to Hydraulic Deficiencies
  - Replace existing pipe in existing alignments
  - Parallel existing pipe in existing alignments
  - New pipe in new alignments
  - Rehabilitate existing pipe in existing alignments
    - In response to pipes in poor condition
    - Lets us continue to use the existing capacity into the future

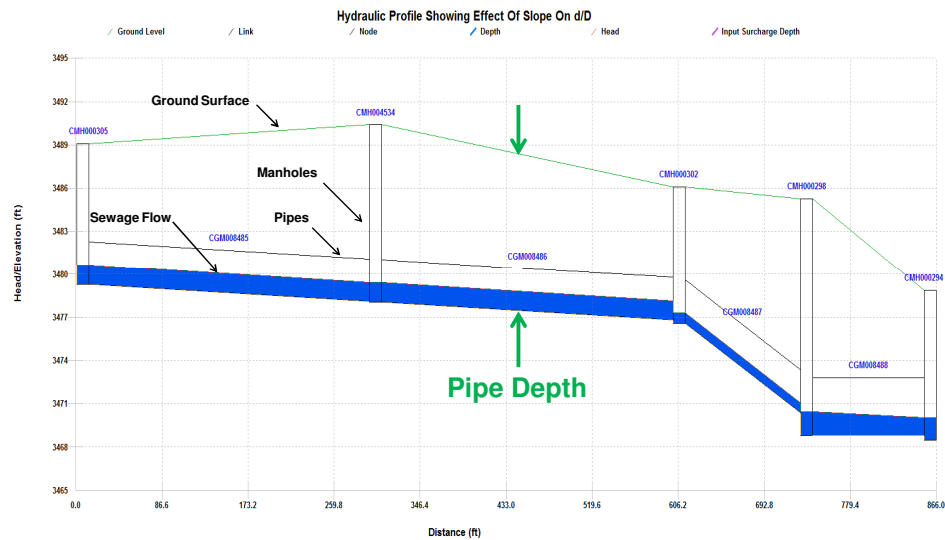
## Pipe and Pumps in Optimization

- Optimization responds to both **hydraulics** and **cost**



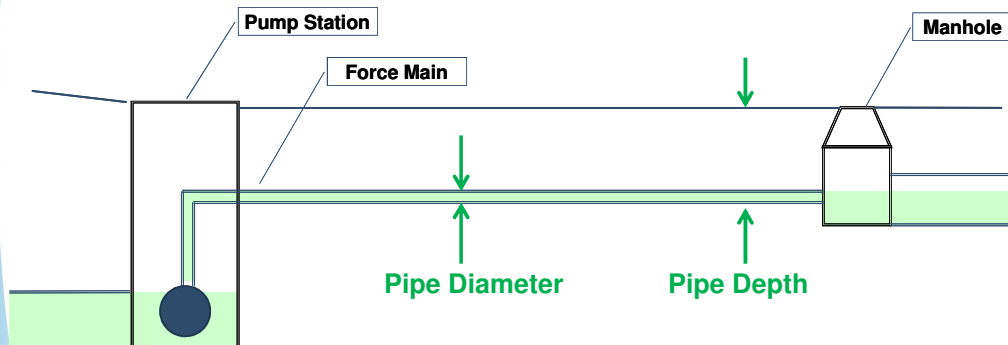
## Pipe and Pumps in Optimization

- Optimization responds to both **hydraulics** and **cost**



## Pipe and Pumps in Optimization

- Force Mains - Optimization responds to both **hydraulics** and **cost**



## Pipe and Pumps in Optimization

- 💧 Optimization responds to both **hydraulics and cost** using;
  - Diameter
  - Depth
  - Material
  - Installation Technique
- To Identify a best cost solution

## TECHNOLOGY SELECTION

- 💧 Remember that comparable costs are critical to the accuracy of the optimization process
- 💧 Life Cycle Costs required for the optimization:
  - Capital
  - Operations
  - Maintenance
  - Energy
  - Replacement
- 💧 Must have confidence in solutions

## PIPE AND MANHOLE MATERIALS

💧 Base Cost in Optimization - PVC (City of Bend Standard Sewer Pipe Material)



Polyvinyl Chloride (PVC)



Concrete Pipe and Manholes (Plastic Lined)



High Density Polyethylene (HDPE) Pipe and Manholes



## PIPE AND MANHOLE INSTALLATION TECHNIQUES

💧 Cost Basis in Optimization – Open Cut Trench



Cut and Cover Trenching



### Issues and Concerns

- Significant area impact



## PIPE INSTALLATION TECHNIQUES - SPECIAL

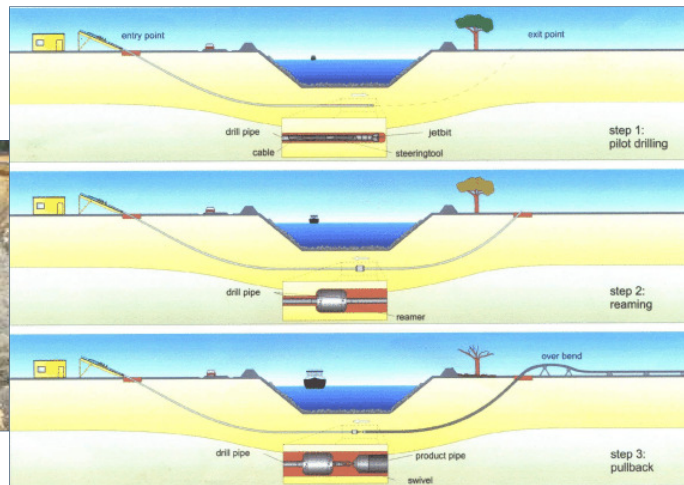
### Unique Costs – Assigned in Optimization first Run

#### Issues and Concerns

- Geotechnical conditions
- Line and grade control



Bore and Jack



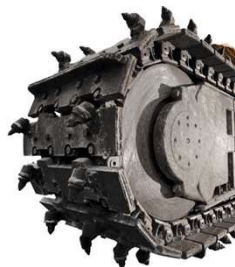
Directional Drilling

## PIPE INSTALLATION - ALTERNATIVES

### Potential Savings Through Innovative Techniques at the Contractors Option – Not Considered in Optimization

#### Issues

- Geotechnical conditions
- Contractor experience
- Availability of equipment



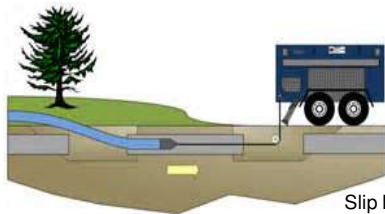
Saw Trenching



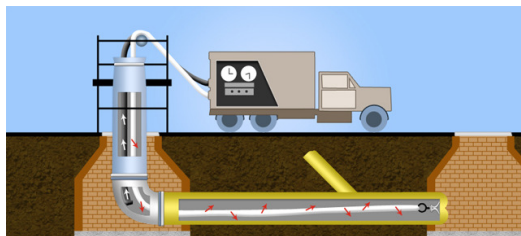
Rock Sawing

## PIPE REHABILITATION - ALTERNATIVES

- ◆ Unique Costs – Assigned in Optimization Refinement Phase
- ◆ Value Proposition for Unique Locations



Slip Lining



Cured in Place Pipe



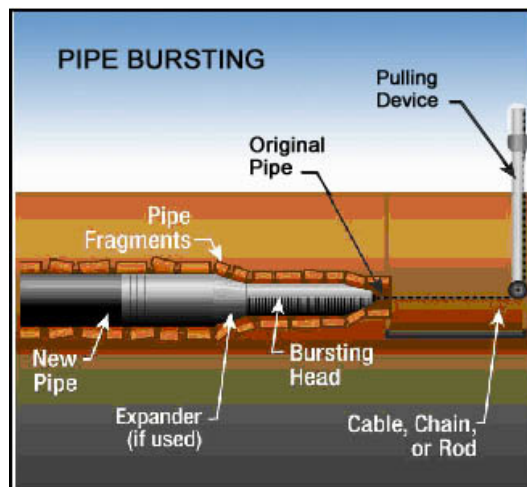
Slip Lining

## PIPE REHABILITATION - ALTERNATIVES

- ◆ Unique Costs - Assigned in Optimization Refinement Phase
- ◆ Value Proposition for Unique Locations

### Issues and Concerns

- Geotechnical conditions
- Depth and size limitations
- Line and grade control



## DISCUSSION

- Are there additional pipe options that should be considered?

## PUMPING FOR OPTIMIZATION

### Pumping Alternatives

- Area Pump Stations
- Regional Pump Stations

#### Objective

- Strategically located Area / regional facilities
- With dedicated Force Mains only
- Per City Standards no shared Force Mains

### What we do not expect to evaluate in Optimization

- Individual Residential Pump Stations (Low Pressure Sewer Networks)
- Vacuum Sewers

- A subject for discrete parcels
- No City-owned Individual Residential Pump Stations

- Not Permitted by City Standards

## PUMPING ALTERNATIVES

### Area Pump Stations

- Variable Speed (VFD) Pumps
- Wet Well
- Standby Power / Pump
- Bypass Pumping Facilities
- Odor Control
- Instrumentation & Controls
- Telemetry



## PUMPING ALTERNATIVES

### Regional Pump Stations

- Variable Speed (VFD) Pumps
- Wet Well
- Standby Power / Pump
- Bypass Pumping Facilities
- Odor Control
- Instrumentation & Controls
- Telemetry



## PUMPING FOR OPTIMIZATION SUMMARY

- ◆ Pumping Alternatives
  - Area Pump Stations
  - Regional Pump Stations
- ◆ Life Cycle Costs required for the optimization
  - Capital ← Value Proposition
  - Operations
  - Maintenance
  - Energy
  - Replacement
- ◆ Must have confidence in solutions
  - Strategically Located Area / Regional Facilities

## DISCUSSION

- ◆ Are there additional pump options that should be considered?

## DISCUSSION

### Value Propositions

- Does SIAG concur with incorporating a buffer zone, and odor control facilities in the capital cost of Pump Stations?
- Where a buffer is needed, how wide should it be? 20 feet setback, 50 feet, 100 feet?

### Sewage Storage for Optimization

- Storage Alternatives – Typically Used for Combined Sewer Systems, not for Sewage Only Sewer Systems
  - Inline Storage
    - Sewage flows through the “pipe” on daily basis
    - Reserve volume is available in the “pipe” to store some of the peak flow as it passes through
  - Offline Storage
    - Sewage does not flow through the storage facility on a daily basis
    - Sewage is diverted to the storage facility during peak wet weather, and is sent back to the system when the peak subsides

## EXAMPLE OF STORAGE TECHNOLOGY

### 💧 In-line Raw Sewage Storage Alternatives



- Usually a big pipe or box culvert
- Probably best deployed 'higher' in the system
- Important to capture the 'real' initial cost for the cost basis
- Important to capture the 'real' O&M cost and resource commitment for the cost basis

## EXAMPLE OF STORAGE TECHNOLOGY

### 💧 Off-line Raw Sewage Storage Alternatives



- Tank or basin or vault
- More applicable 'lower' in the system
- Important to capture the 'real' initial and O&M costs for the cost basis

## DISCUSSION

- Should offline storage be considered as an alternative
- Are there additional storage options that should be considered

<b>Sewer Infrastructure Advisory Group Meeting Summary</b>	<b>March 7, 2013</b>
	<b>3:30- 5:30</b>
	<b>City Council Chambers</b> City Hall
	<b>Note taker: Adele McAfee</b>
<p><b>Committee Members:</b> Casey Roats, Lynn Putnam, Mike Riley, Dale Van Valkenburg, Craig Horrell, Charley Miller, Steve Galash, Stacey Stemach, Sharon Smith, Wes Price, Pam Hardy, Mike Riley (4:38 PM)</p> <p><b>COB Staff:</b> Tom Hickmann, Paul Rheault, Jon Skidmore, Aaron Collett, Russ Grayson</p> <p><b>Consultants:</b> David Stangel (MSA), Craig Anderson (MSA), David Prull (Clearwater Engineering Group), Clark Worth (Barney &amp; Worth)</p> <p><b>Facilitator:</b> Libby Barg (Barney &amp; Worth)</p> <p><b>Absent:</b> Rob Von Rohr, John Rexford, Andy High, Steve Hultberg</p> <p><b>Others:</b> Ken Steiger, Jim Lord, Erik Huffman</p>	

## Meeting Summary

### Action Items

#### **Pipes, Pumps, and Storage Options for Optimization**

- SIAG agreed with the pipe and pump station recommendations.
- SIAG asked to look at pump station buffers when they are ready to put the facilities on the solutions map.
- SIAG agreed with recommendation to include in-line storage.
- SIAG asked that off-line storage also be included because of its value as a temporary solution or provide for phasing opportunities. The committee would like consider these solutions once the solution map has been prepared.

#### **Agenda Item: Steering Committee Update**

Sharon Smith gave a summary of the Steering Committee meeting and discussion of the SE Interceptor.

#### **Agenda Item: Pipes Pumps and Storage**

David Prull, P.E. presented recommendations for specific pumps, pipes and storage options to be included in the optimization model:

#### Pipes

- ✓ Base cost:
  - PVC pipes
  - Open cut trench

- ✓ Unique costs:
  - Special pipe installation techniques (bore and jack / directional drilling) assigned in optimization first run
  - Pipe rehabilitation alternatives (slip lining, cured in place pipe, pipe bursting) assigned in optimization refinement phase

→ *SIAG agreed with the pipe recommendations.*

### Pumps

- ✓ Area and regional pump stations considered in optimization (not individual pump stations or vacuum sewers)

→ *SIAG agreed with the pump stations recommendations.*

→ *SIAG asked to look at pump station buffers when they are ready to put the facilities on the map.*

### Storage

- ✓ In-line storage considered in optimization.

→ *SIAG agreed with recommendation to include in-line storage.*

→ *SIAG asked that off-line storage also be included because of its value as a temporary solution or provide phasing opportunities. The committee would like consider these solutions once the solution map has been prepared.*

**Public Comment:** none

Meeting adjourned at 5:20 PM



# Bend Sewer Infrastructure Advisory Group: Meeting #9

## Satellite Treatment Alternatives for Optimization

Bend Parks and Recreation District  
Riverside Community Room  
799 SW Columbia Street

April 4, 2013  
3:30-5:30 p.m.

## Agenda

Activity / Topic	Presenter	Time
1. <b>Welcome / Introductions / Approve Meeting Notes</b>	Jon Skidmore	3:30 p.m.
2. <b>Review Meeting Agenda / Goals</b>	Libby Barg	3:35
3. <b>SIAG Master Schedule</b> Changes to streamline SIAG schedule	David Stangel, P.E.	3:40
4. <b>Treatment</b> Overview of treatment information used in the Optimization model Learn more about satellite treatment alternatives <b>Objective:</b> <ul style="list-style-type: none"><li>• SIAG understanding of treatment and associated effluent disposal alternatives for Optimization</li></ul>	Craig Anderson, P.E.	3:50
<b>Advisory Group Q&amp;A / Discussion</b> <ul style="list-style-type: none"><li>• What more would you like to know about satellite treatment?</li><li>• When siting satellite treatment facilities to address collection system capacity issues, what considerations are most important to you? (Land use, treatment needs, public perception / neighbor issues, wetland creation, other)</li></ul>	Libby Barg	
5. <b>Public Comment</b>		5:15
6. <b>Next Steps</b> <ul style="list-style-type: none"><li>• April – Vendor Submittals</li><li>• Upcoming SIAG Meetings<ul style="list-style-type: none"><li>April 18 Treatment Alternatives (Cont.)?</li><li>May 16 Guiding Principles and Assumptions for Optimization</li><li>June 20 Colorado Lift Station: update</li></ul></li></ul>	Libby Barg	5:25
<b>Adjourn / Thank You</b>	Jon Skidmore	5:30 p.m.

# SATELLITE TREATMENT FOR OPTIMIZATION

Sewer Infrastructure Advisory Group  
April 4, 2013



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

## WHY ARE WE DISCUSSING THIS?

- ◆ Wastewater Treatment is complex/challenging subject
  - Very few treatment plants are the “same”
  - Satellite Treatment selection factors include:
    - Need for year round use
    - Treatment vs collection costs
    - Economy of Scale/Size
    - Proximity to development
    - Regulations & Treatment Levels
    - Required land
  - Existing plant to accommodate 20 years growth

## PRESENTATION STRUCTURE

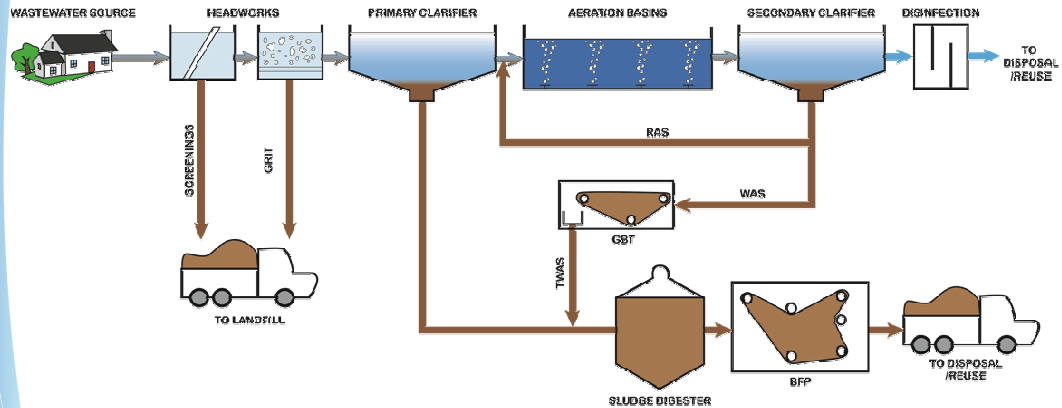
- General wastewater treatment review
- Satellite Treatment Factors
  - Optimization role
  - Economics
  - Liquid Disposal & Treatment Overview
  - Solids Disposal & Treatment Overview
- Summary
- Discussion
  - Next Steps
  - Community Values

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## GENERAL WASTEWATER TREATMENT REVIEW

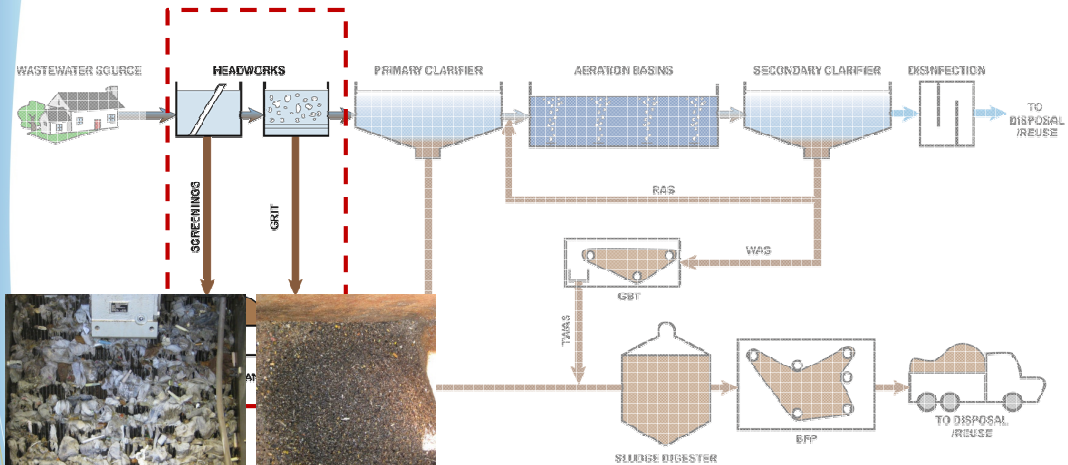
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## WASTEWATER TREATMENT PROCESS



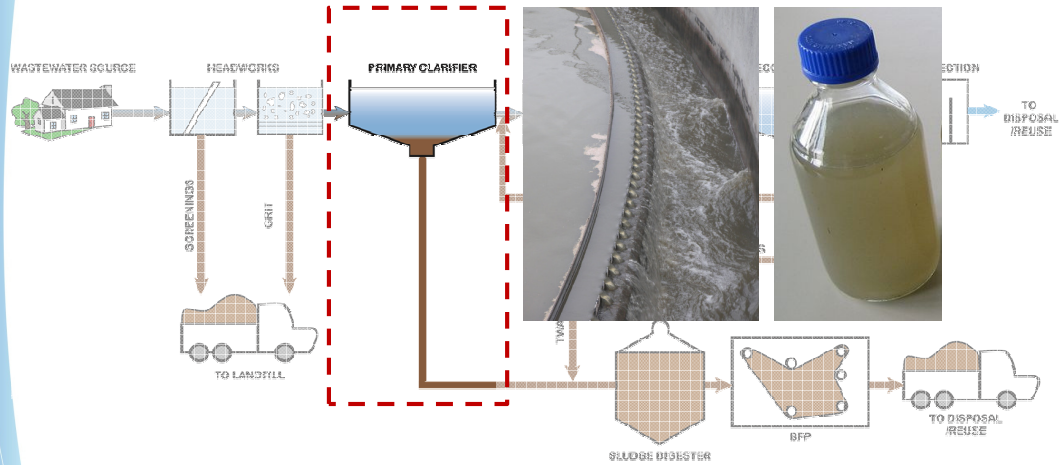
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## PRELIMINARY TREATMENT



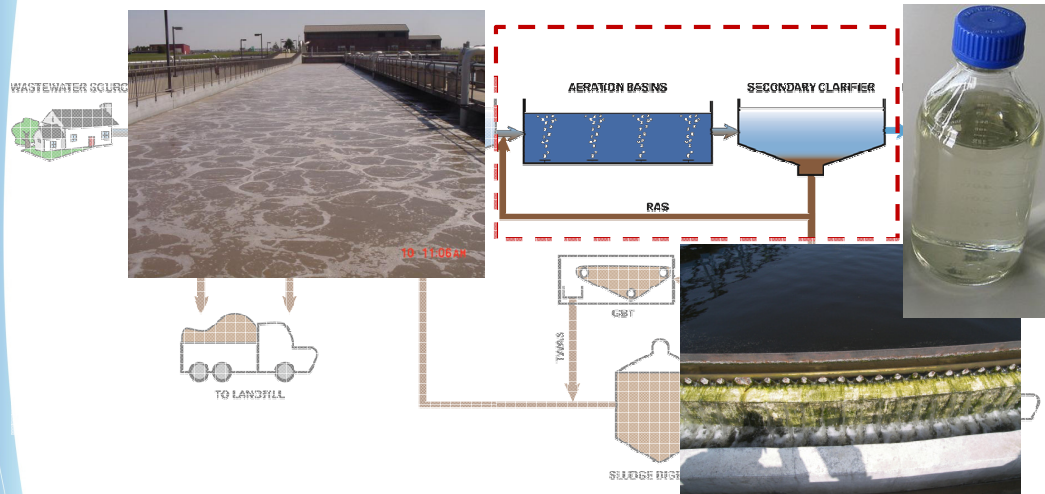
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## PRIMARY TREATMENT



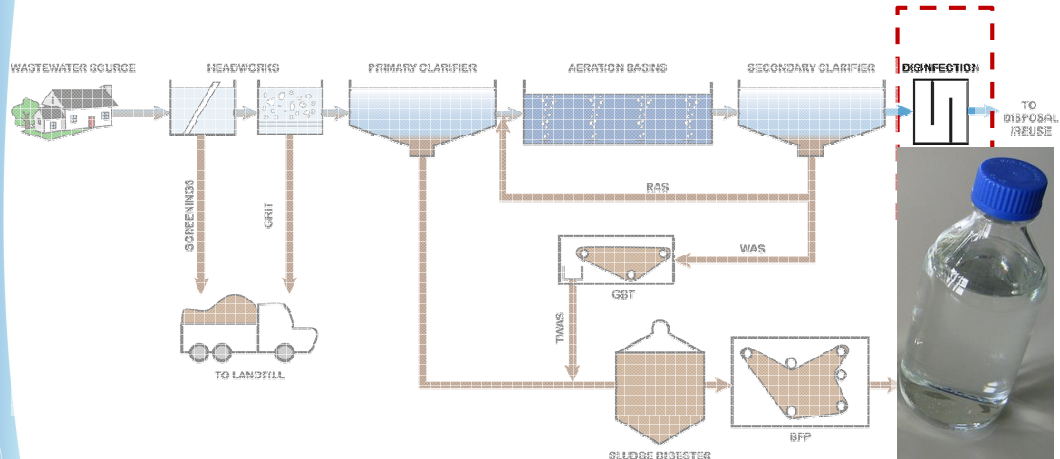
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## SECONDARY TREATMENT



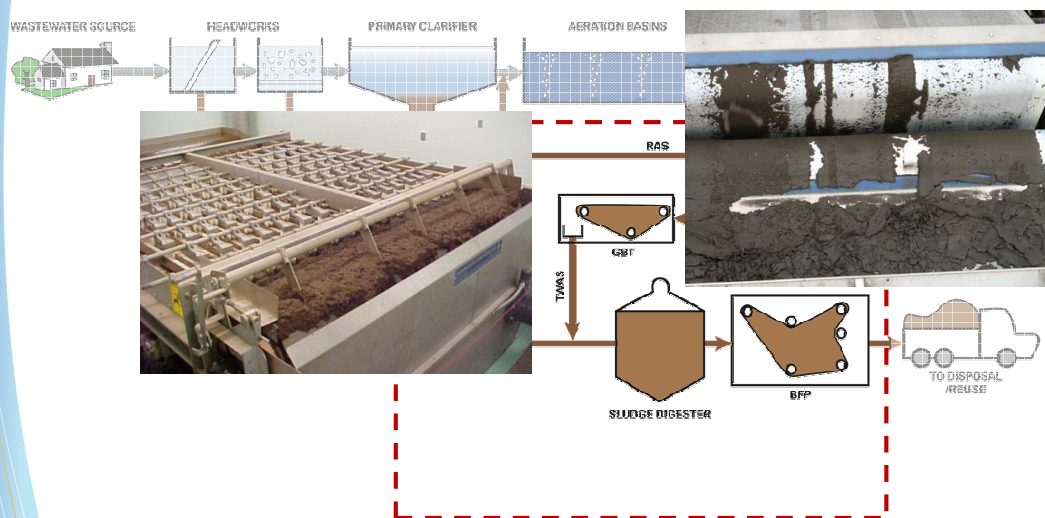
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## DISINFECTION/TERTIARY TREATMENT

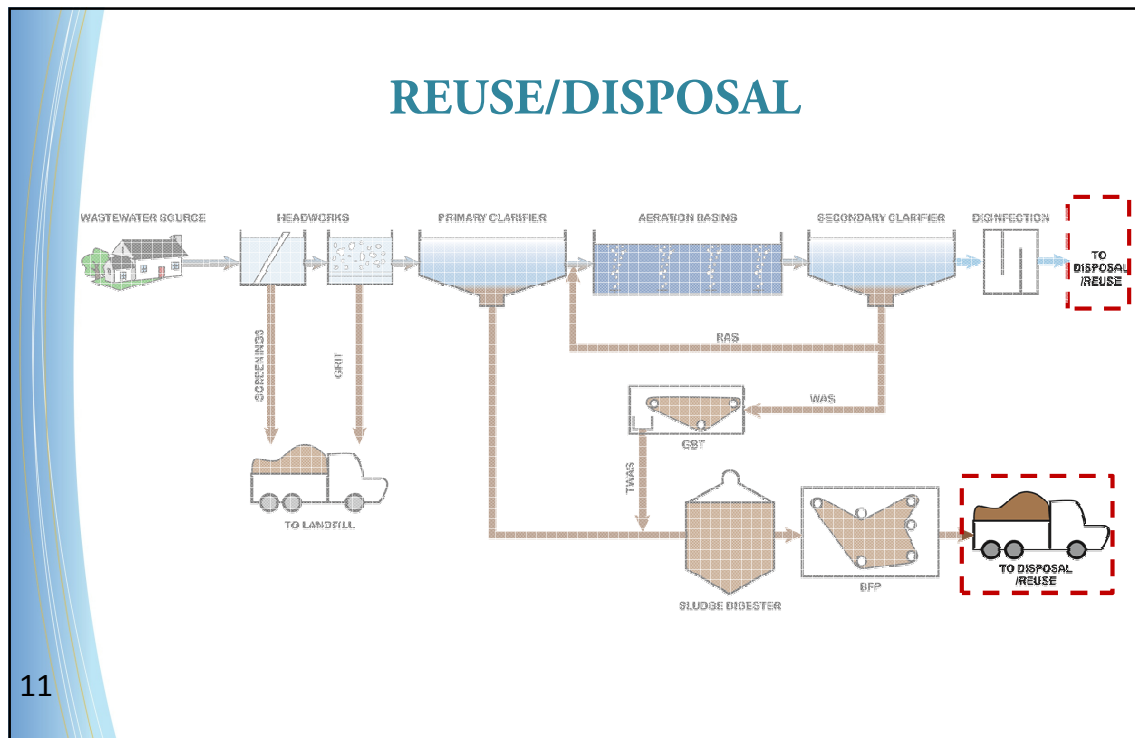


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## SOLIDS TREATMENT



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# QUESTIONS & BREAK

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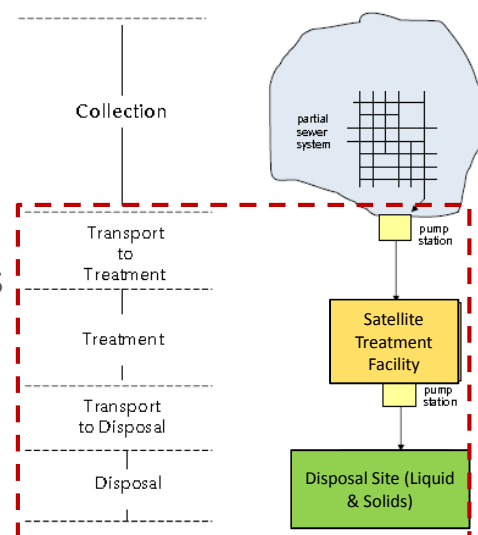
# SATELLITE TREATMENT FACTORS

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Engineers/Planners

## OPTIMIZATION ROLE

- Satellite treatment must operate year-round to offset collection system capacity needs
- Collection system deficiencies and available land determine satellite treatment sites



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## ECONOMICS

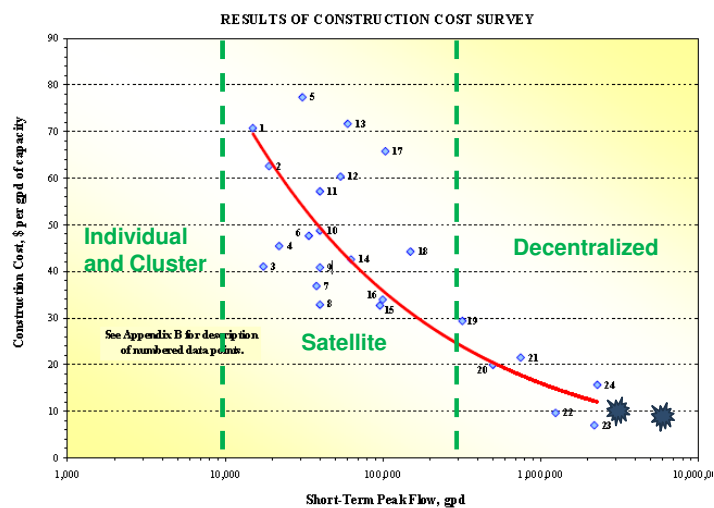
### Treatment Options



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## ECONOMICS

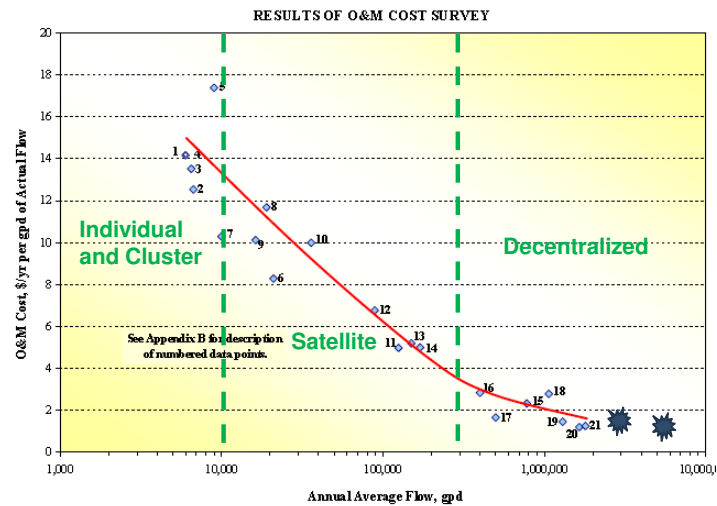
### Construction costs decrease with size



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## ECONOMICS

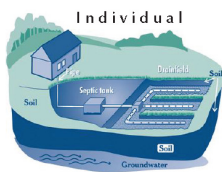
### Annual operational costs decrease with size



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## ECONOMICS

### Limited advantage to individual or cluster systems



#### Economic Disadvantage

- Capital & Annual Costs
- Limited Conveyance Offset**

#### Private vs Public

- Individual vs City decision
- Ownership & Maintenance
- Operational Control
- Permitting Approval
- Permit Compliance
- Number/Distribution

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# LIQUID DISPOSAL

- Disposal Options
  - surface water
  - land application
  - groundwater injection

The diagram shows a cross-section of the ground with three disposal methods. On the left, 'CROP APPLICATION' shows yellow corn plants. In the center, 'SURFACE INFILTRATION' shows blue arrows indicating liquid seeping into the 'VADOSE ZONE' (the sandy layer). To the right, 'SUBSURFACE INJECTION' shows a well with a screen at the bottom, with blue arrows indicating liquid being pumped into the vadose zone. Further right, 'DIRECT INJECTION' shows a deeper well with a screen at the bottom, with blue arrows indicating liquid being pumped directly into the 'GROUNDWATER' (the blue layer at the bottom). On the far right, 'SURFACE WATER' shows a pond with a small dam and a pipe leading into it.

## LIQUID DISPOSAL

### Surface Water

- ◆ Aquatic life protection typically controls treatment
  - Nutrients (N & P), Temperature, Endocrine Disruptors, etc...
- ◆ Permit difficult to get
  - Not used by Redmond & Bend
  - Significant work required
  - Deschutes listed on 303d list
  - TMDL on hold (litigation)
  - ***Long schedule with no guarantee***
- ◆ Lowest land requirement



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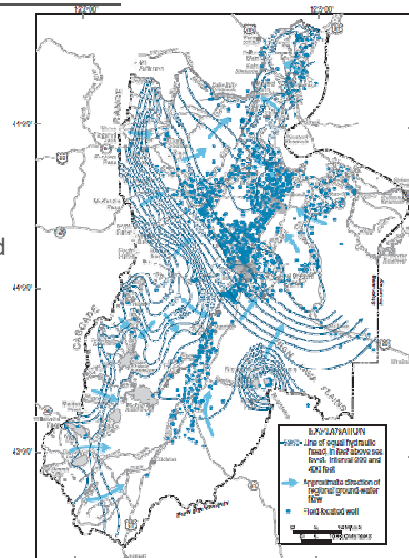
## LIQUID DISPOSAL

### Land Disposal vs Treatment Requirements

- ◆ Nearby wells & groundwater quality impact treatment level
- ◆ Regulations (OAR 340-040) - New vs existing

### Total Nitrogen (TN) Ranges

- ◆ TN > 10 mg/L (*easy*) – crop nitrogen uptake needed
- ◆ TN < 10 mg/L (*moderate to hard*)
  - Presently done by Bend and Redmond
- ◆ TN << 10 mg/L (*difficult*)
  - Nearby wells and/or high quality GW
  - Significant added treatment/cost



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## LIQUID DISPOSAL

### Land Disposal (slow rate/crop application)

- 💧 Crop needs and human consumption of water governs treatment level
  - Crop agronomic nutrient and water needs
  - Safe Drinking Water Act (Nitrate (NO<sub>3</sub>-N) < 10 mg/L at GW)
- 💧 “Easier” to permit
- 💧 Largest land area needs
- 💧 Not year-round solution
  - Storage
  - Alternate Winter Discharge



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## LIQUID DISPOSAL

### Land Disposal (slow rate/residential reuse)

- 💧 Human contact & use governs treatment
  - Human contact concerns elevates treatment requirements
  - Safe Drinking Water Act (Nitrate (NO<sub>3</sub>-N) < 10 mg/L at GW)
- 💧 Seasonally done by Bend
- 💧 Not as “easy” to permit
- 💧 Largest land area needs
- 💧 Significant distribution costs
- 💧 Not year-round solution
  - Storage
  - Alternate Winter Discharge



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## LIQUID DISPOSAL

### Land Disposal (high rate/infiltration)

- ◆ Groundwater regulations governs treatment
  - Safe Drinking Water Act (numerical levels)
  - Nitrate ( $\text{NO}_3\text{-N}$ ) at least  $< 10 \text{ mg/L}$  at GW interface
- ◆ Used by both Bend and Redmond
- ◆ Known permitting requirements
- ◆ Moderate land needs
- ◆ Year-round solution

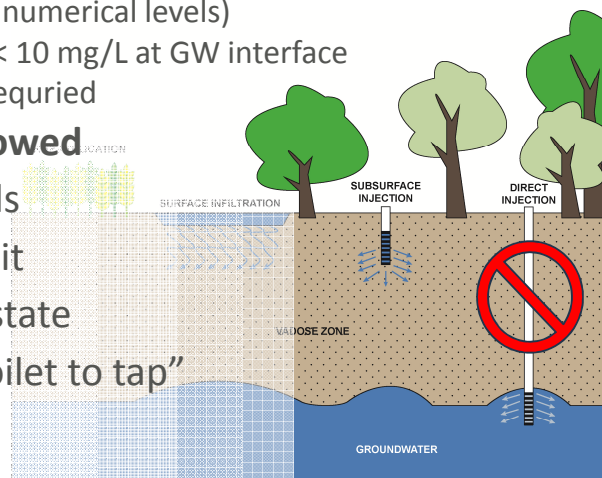


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## LIQUID DISPOSAL

### Disposal by Injection

- ◆ Groundwater and UIC regulations governs treatment
  - Safe Drinking Water Act (numerical levels)
  - Nitrate ( $\text{NO}_3\text{-N}$ ) at least  $< 10 \text{ mg/L}$  at GW interface
  - Drinking Water Quality required
- ◆ **Direct injection not allowed**
- ◆ SI can reduce land needs
- ◆ Highly scrutinized permit
- ◆ No real track record in state
- ◆ Public perception of “toilet to tap”
- ◆ Year-round solution

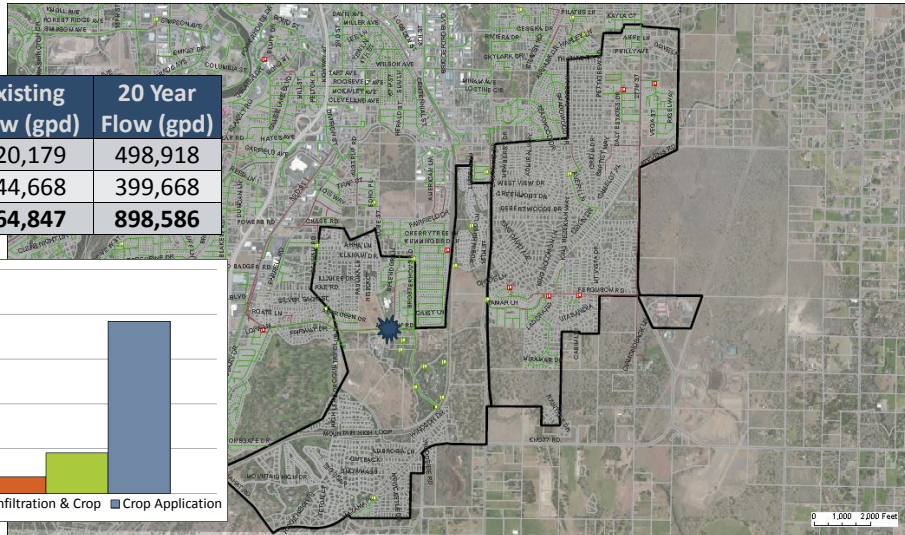
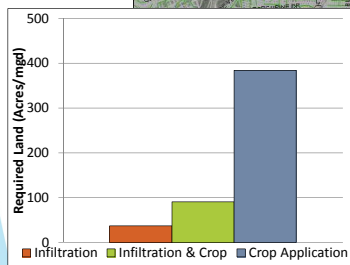


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## LIQUID DISPOSAL

### Murphy Lift Station Area Example

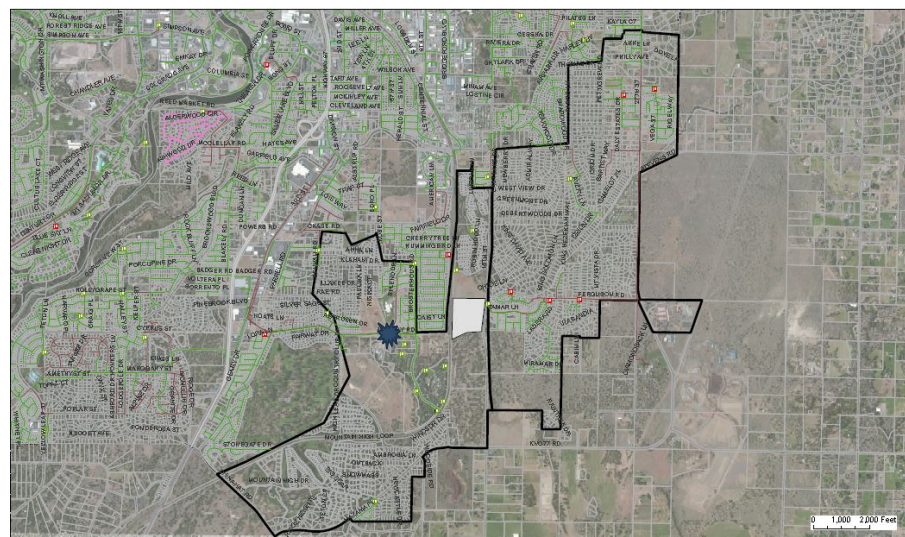
Basin	Existing Flow (gpd)	20 Year Flow (gpd)
8	120,179	498,918
9	144,668	399,668
<b>Total</b>	<b>264,847</b>	<b>898,586</b>



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## LIQUID DISPOSAL

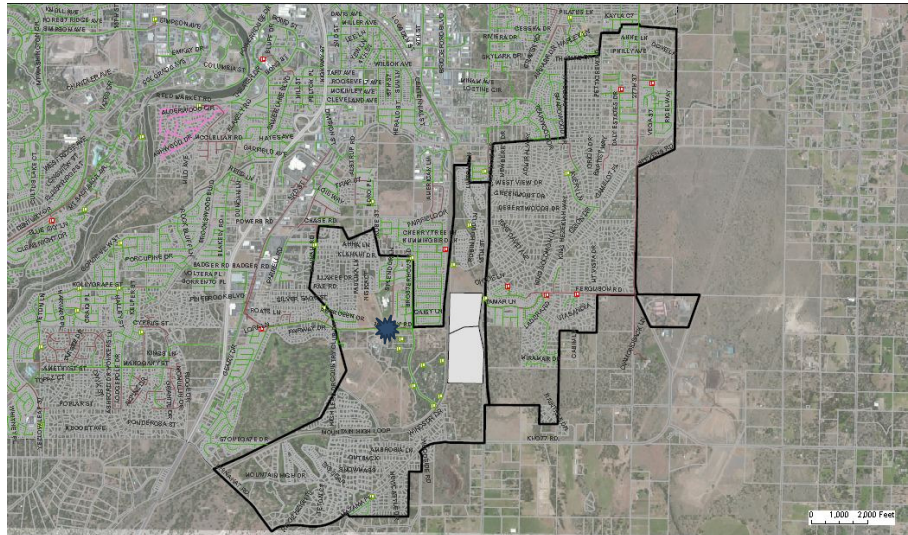
### Infiltration Disposal (33 Acres)



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## LIQUID DISPOSAL

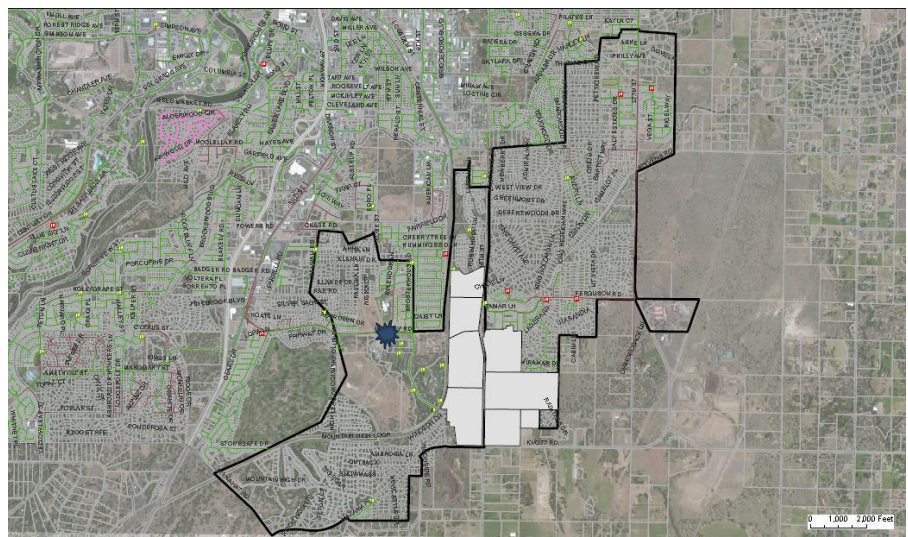
### Infiltration & Crop Disposal (81 Acres)



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## LIQUID DISPOSAL

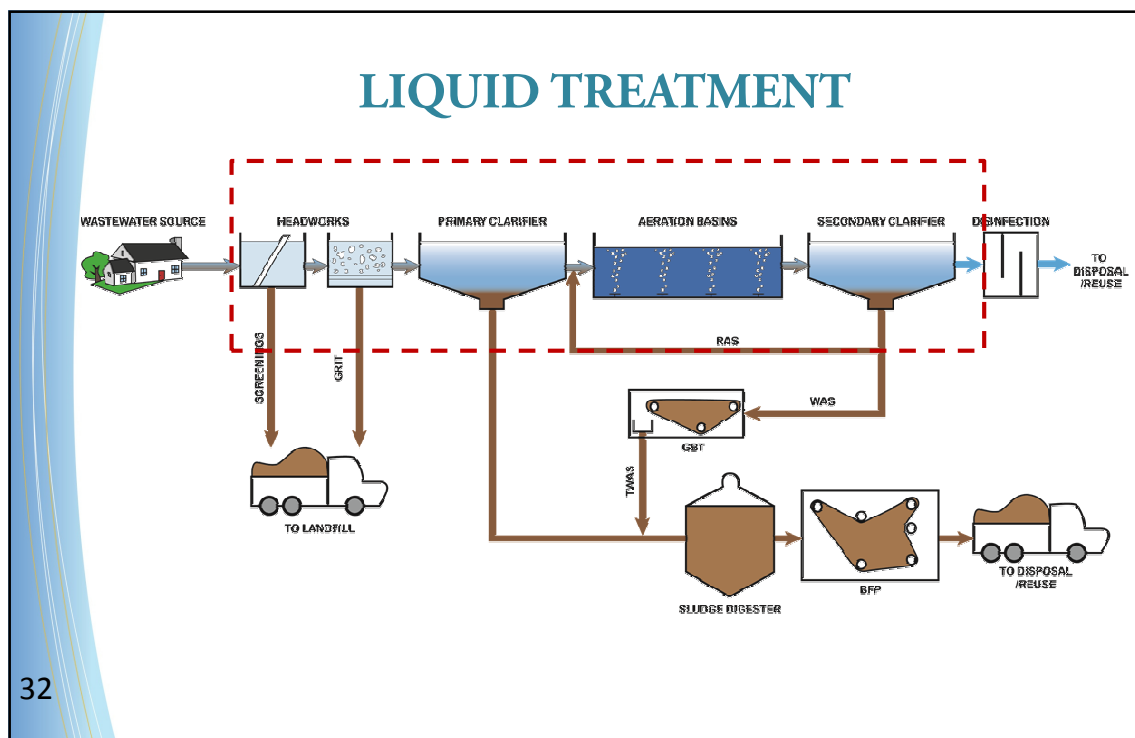
### Crop Disposal (346 Acres)



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# QUESTIONS & BREAK

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# LIQUID TREATMENT

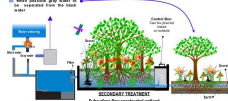
## GENERAL TRENDS

### Lagoons



- Treatment \$ - LOW
- Complexity - LOW
- Treatment Level - LOW
- Land - HIGH

### Wetlands/"Natural"



- Treatment \$ - LOW+
- Complexity - LOW+
- Treatment Level - LOW +
- Land - HIGH

### Oxidation Ditch    Activated Sludge (2<sup>o</sup>)



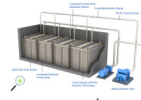
- Treatment \$ - MODERATE
- Complexity - MODERATE
- Treatment Level - MODERATE
- Land - MODERATE

### Activated Sludge (3<sup>o</sup>)



- Treatment \$ - HIGH
- Complexity - HIGH
- Treatment Level - HIGH
- Land - MODERATE +

### Membranes



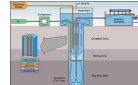
- Treatment \$ - HIGH
- Complexity - HIGH
- Treatment Level - HIGH
- Land - LOW

### IFAS



- Treatment \$ - HIGH
- Complexity - MODERATE +
- Treatment Level - MODERATE +
- Land - LOW

### Deep Shaft



- Treatment \$ - MODERATE ?
- Complexity - MODERATE ?
- Treatment Level - MODERATE
- Land - LOW

### DW Standards



- Treatment \$ - HIGH +
- Complexity - HIGH +
- Treatment Level - HIGH ++
- Land - MODERATE +

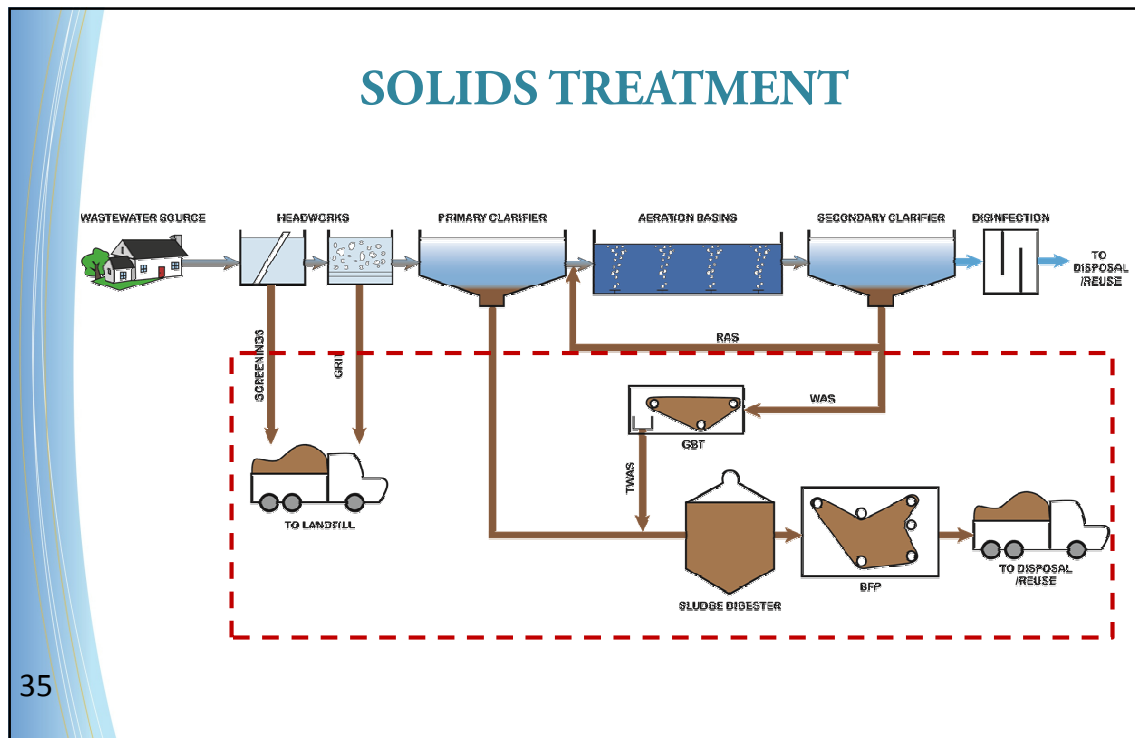
33

# LIQUID TREATMENT

## Overview

- **Smallest** portion of overall land requirements
- Treatment level linked to disposal method &/or site
- Technology used linked to size and treatment level
- Other factors:
  - Odors
  - Traffic
  - Buffers
  - “not in my backyard”

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## SOLIDS TREATMENT

### Solids Treatment Options

- 💧 Truck Haul to existing WRF for treatment
- 💧 Pump to existing WRF for treatment
- 💧 Collection system to existing WRF (limits)
- 💧 **On-Site Treatment and off-site haul/disposal**

### Other Factors

- 💧 Odors
- 💧 Traffic
- 💧 Buffers
- 💧 “not in my backyard”

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## SOLIDS DISPOSAL

### Solids Disposal Options

- 💧 Land Application – City Property
- 💧 Land Application – Private Property/Contracted
- 💧 Landfill – Costly & decreasing support

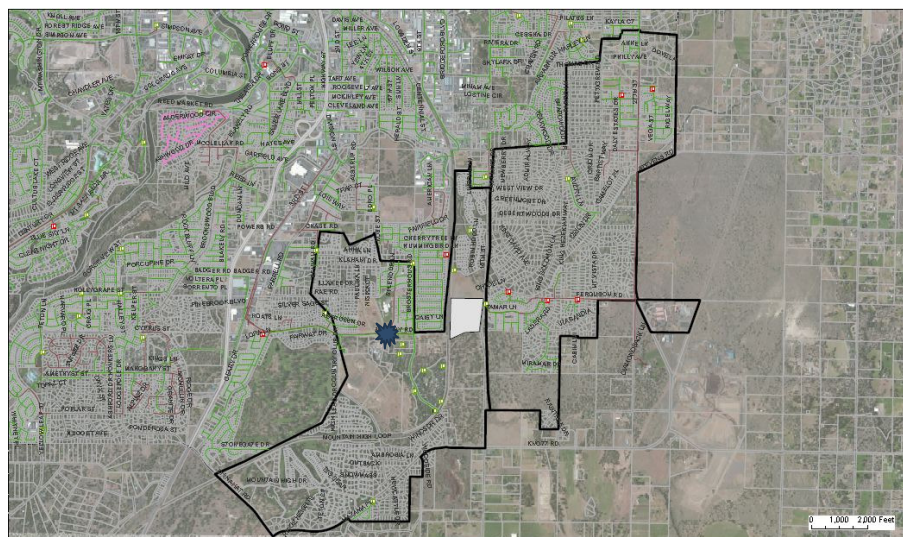
### Other Factors

- 💧 Odors
- 💧 Traffic
- 💧 Buffers
- 💧 “not in my backyard”

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## SOLIDS DISPOSAL

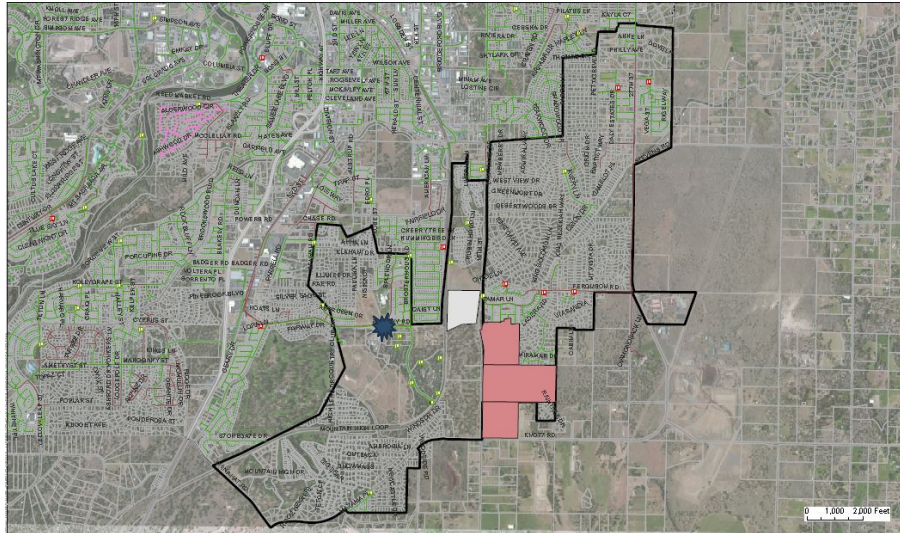
### Murphy Lift Station Area Example



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## SOLIDS DISPOSAL

### Murphy Lift Station Area Example (200 total acres)



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## SUMMARY

### 💧 **Satellite Treatment System(s) must be:**

- Year-round solution
- Lower cost than collection system
- Have known costs
- Tailored to location
- Include treatment AND disposal

### 💧 **Satellite Treatment System(s) should also consider:**

- Odors
- Traffic
- Public Acceptance

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## DISCUSSION

### Next Steps

- 💧 Identify Collection System Deficiencies with model
- 💧 Identify alternatives and locations to address deficiencies (pipes, pumps, treatment, storage)
- 💧 Run Initial Optimization
- 💧 SIAG Regroup
  - Review of results
  - Discuss impacts

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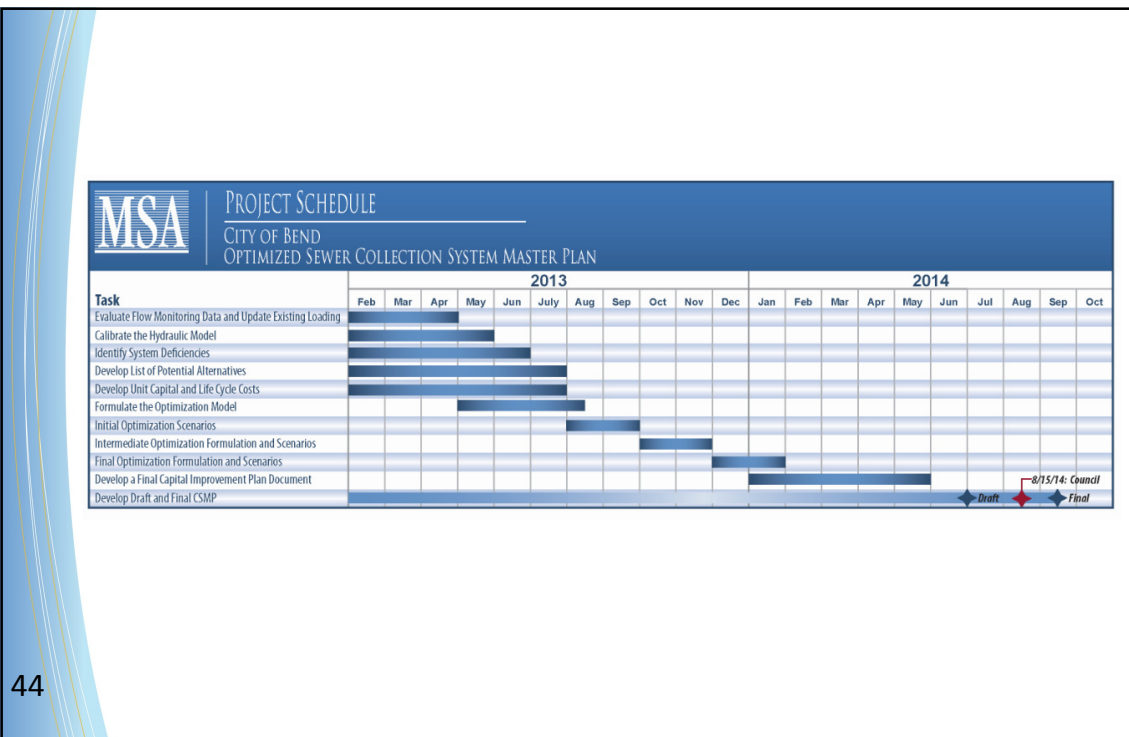
## DISCUSSION

### Community Value Considerations

- 💧 Lower Cost?
- 💧 Wetland/Habit Creation
- 💧 Water Reuse
- 💧 Odors
- 💧 Buffers
- 💧 Landscaping/Shielding
- 💧 Water Quality
- 💧 Public Health

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<b>Sewer Infrastructure Advisory Group Meeting Summary</b>	<b>April 4, 2013</b>
	<b>3:30- 5:30</b>
	<b>City Council Chambers</b>
	<b>Note taker: Adele McAfee</b>
<p><b>Committee Members:</b> Casey Roats, Mike Riley, Dale Van Valkenburg, Craig Horrell, Charley Miller, Steve Galash, Stacey Stemach, Sharon Smith, , Pam Hardy, Mike Riley, Rob Von Rohr Andy High, Steve Hultberg, Bruce Aylward, Nathan Boddie,</p> <p><b>COB Staff:</b> Tom Hickmann, Paul Rheault, Jon Skidmore, Aaron Collett, Russ Grayson, Mary Winters, Shannon Osterdorf, Jim Wodrich</p> <p><b>Consultants:</b> David Stangel (MSA), Craig Anderson (MSA), David Prull (Clearwater Engineering Group), Clark Worth (Barney &amp; Worth), John Cowan (Optimatics)</p> <p><b>Facilitator:</b> Libby Barg (Barney &amp; Worth)</p> <p><b>Absent:</b> John Rexford, Wes Price,</p> <p><b>Others:</b> Ken Steiger, Jim Lord, Erik Huffman, Councilor Knight, Councilor Russell, John Russell, Chuck Arnold</p>	

## Meeting Summary

### Action Items

SIAG concurred with the satellite treatment recommendations:

- Satellite Treatment System(s) must be:
- Year-round solution
- Lower or same cost than collection system
- Have known costs
- Tailored to location
- Include treatment and disposal

SIAG agreed that the engineering team should also consider:

- Odor
- Traffic
- Public acceptance

### **Agenda Item: Master Schedule Overview**

The steering committee has requested the master planning team accelerate the schedule. The team will meet with the steering committee and bring the updated schedule to the SIAG in May.

### **Agenda Item: Treatment Alternatives**

The City presented an overview of treatment information used in the Optimization model and provided information about satellite treatment alternatives. SIAG asked questions and provided

feedback on considerations used by the engineering team when selecting satellite treatment as a solution option for the Optimization model.

SIAG concurred with the recommendations:

- Satellite Treatment System(s) must be:
- Year-round solution
- Lower or same cost than collection system
- Have known costs
- Tailored to location
- Include treatment and disposal

SIAG concurred that engineering team should also consider:

- Odor
- Traffic
- Public acceptance

#### Questions / Comments:

*Is there a way to incentivize less affluent?*

The “per capita” water use is extremely low. Seventy-five percent of Bend is less than 20 years old so there are low flow toilets and efficiency washers. The challenge is to count on those numbers for the future.

*Wouldn't cost for satellite treatment have to be less than or equal to the conveyance cost?*

To be selected as a viable option in the optimization model, satellite treatment would need to be less than or equal to the cost for increasing conveyance.

*What is the likelihood of satellite treatment? Is it probable to have satellite treatment selected as an option if the community doesn't see value beyond the pure costs?*

Comment: SIAG is looking at solutions in the existing UGB and there is not a lot of land that could be utilized for disposal. It is possible satellite treatment could be used when the UGB is expanded.

*Comment:* Conservation should be investigated more rigorously.

*Values discussed by the SIAG:*

- Water conservation
- Prevent long-term environmental degradation
- Protect water wells located in southeast
- Irrigate golf courses with treated wastewater to offset demand from streams
- Community values may indicate a preference for satellite treatment

#### **Agenda Item: Public Comment**

- > Councilor Russell: Satellite treatment should be considered if it is equal or lesser cost, not just if it costs less.

- > Councilor Knight: Looking forward to learning more
- > Ken Steiger: The southeast interceptor project was going to be discussed at the steering committee meeting. Are there any notes available to the public? (Sharon Smith gave an update at last meeting and explained the role of steering meeting.)
- > Chuck Arnold: There are new development and capacity issues in Bend. The priority is to address the pinch point downtown.

**Meeting adjourned at 5:20 PM**



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# Bend Sewer Infrastructure Advisory Group: Meeting #10

## Optimization Input Assumptions

Bend City Council Chambers  
710 NW Wall Street, 1st Floor

May 16, 2013  
3:30-5:30 p.m.

## Agenda

Activity / Topic	Presenter	Time
1. <b>Welcome / Introductions / Approve Meeting Notes</b>	Jon Skidmore	3:30 p.m.
2. <b>Review Meeting Agenda / Goals</b>	Libby Barg	3:35
3. <b>SIAG “Check-in”</b> <ul style="list-style-type: none"><li>• SIAG Decision Summary</li><li>• Questions from April 4 meeting</li></ul>	Jon Skidmore	3:40
4. <b>Project Updates</b> <ul style="list-style-type: none"><li>• Vendor submittals</li><li>• Flow monitoring</li></ul>	Tom Hickmann, P.E.	4:25
5. <b>Project Master Schedule</b>	David Stangel, P.E.	4:40
6. <b>Optimization: Review Loading Rates and Sensitivity Analysis Approach</b>  <i>Objective:</i> <ul style="list-style-type: none"><li>• SIAG understanding of loading rates and approach to sensitivity analysis</li></ul>	David Stangel, P.E.	5:00
<b>Advisory Group Q&amp;A / Discussion</b> <ul style="list-style-type: none"><li>• Is the approach to sensitivity analysis understood / acceptable?</li></ul>	Libby Barg	
7. <b>Public Comment</b>		5:20
8. <b>Next Steps</b> <ul style="list-style-type: none"><li>• Upcoming SIAG Meetings<ul style="list-style-type: none"><li>July 11      Review System Deficiencies</li><li>Aug 15      Optimization Alternatives; Colorado Lift Station (sizing)</li><li>Sept 12      Colorado Lift Station (site/pipeline tour)</li><li>Nov 14      Initial Optimization Results</li></ul></li></ul>	Libby Barg	5:25
<b>Adjourn / Thank You</b>	Jon Skidmore	5:30 p.m.

# UPDATED PROJECT SCHEDULE LOADING RATES SENSITIVITY ANALYSIS

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

```

graph TD
    A[Buildable Land Inventory Parcel Database] --> B[Existing Septic]
    B -- YES --> C[EXCLUDED]
    B -- NO --> D["Development Status is 'Re-developable' or 'Pending Land Use' and Property type is not null"]
    D -- YES --> E[Existing Land Use and Land Type Filter]
    E --> F["Residential" Land Type]
    F -- YES --> G["Residential  
No. of Existing Residential Units X Residential Unit Flow Factor"]
    F -- NO --> H["Non-Residential, Hotel, School  
Buildable Acres X Land Type Acreage Flow Factor"]
    D -- NO --> I["Development Status is 'Developed'"]
    I -- YES --> J[Existing Land Use and Land Type Filter]
    J --> K[Industrial Pretreatment Program]
    K -- YES --> L[Unique Load]
    L --> M["- Vacant  
- Vacant Platted  
- Pending Land Use without property type"]
    K -- NO --> N["Residential" Land Type]
    N -- YES --> O["Residential  
No. of Existing Residential Units X Residential Unit Flow Factor"]
    N -- NO --> P["Non-Residential, Hotel, School  
Buildable Acres X Land Type Acreage Flow Factor"]
  
```

**Existing Conditions**

Buildable Land Inventory Parcel Database

Existing Septic

YES → EXCLUDED

NO → Development Status is "Re-developable" or "Pending Land Use" and Property type is not null

YES → Existing Land Use and Land Type Filter → "Residential" Land Type

YES → Residential  
No. of Existing Residential Units  
X  
Residential Unit Flow Factor

NO → Non-Residential, Hotel, School  
Buildable Acres  
X  
Land Type Acreage Flow Factor

NO → Development Status is "Developed"

YES → Existing Land Use and Land Type Filter → Industrial Pretreatment Program

YES → Unique Load

NO → "Residential" Land Type

YES → Residential  
No. of Existing Residential Units  
X  
Residential Unit Flow Factor

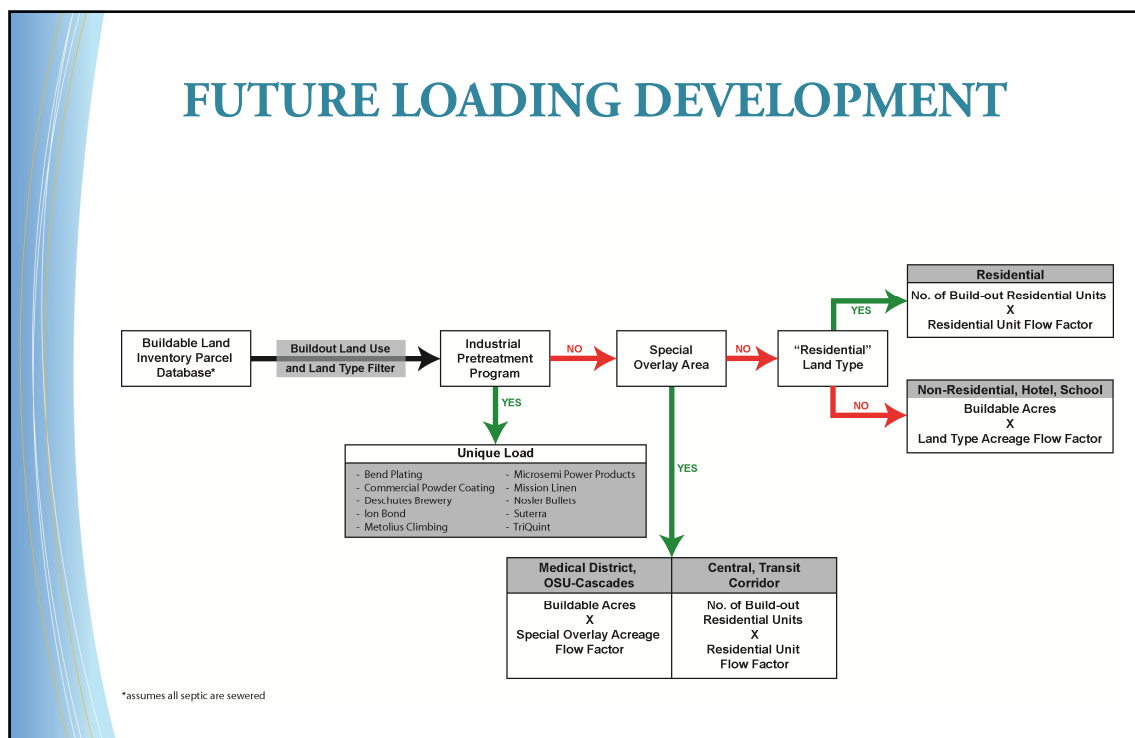
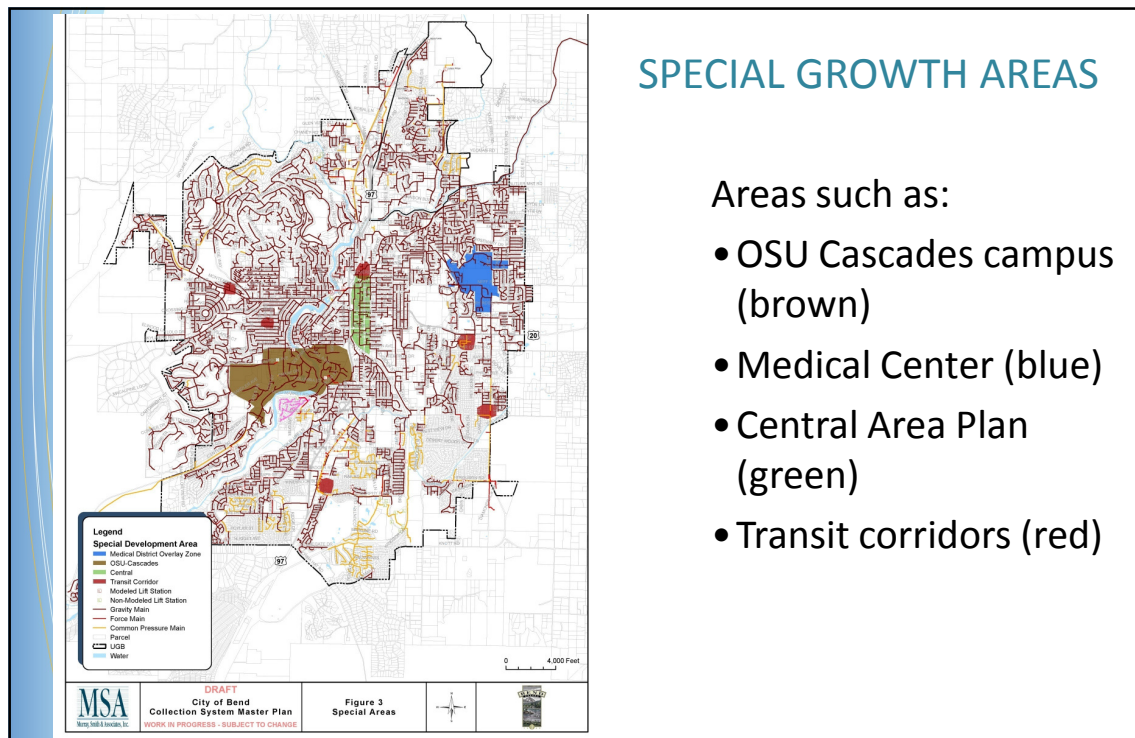
NO → Non-Residential, Hotel, School  
Buildable Acres  
X  
Land Type Acreage Flow Factor

EXCLUDED

- Vacant
- Vacant Platted
- Pending Land Use without property type

Unique Load

- Bend Plating
- Commercial Powder Coating
- Dischures Brewery
- Ion Bond
- Metaluis Climbing
- Microsemi Power Products
- Mission Linen
- Nosler Bullets
- Sutura
- TriQuint

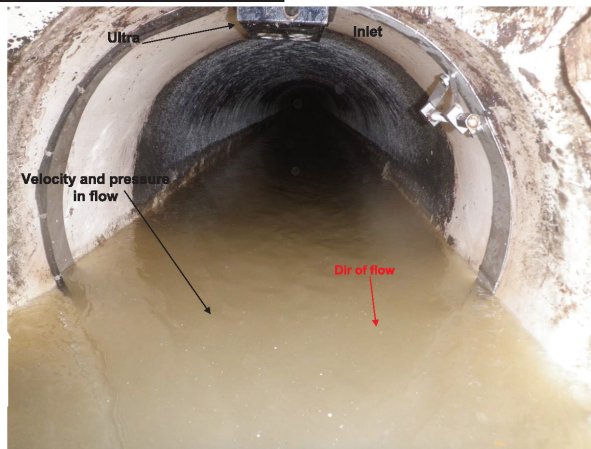


## FLOW MONITORING



Bend\_001962  
Site set up

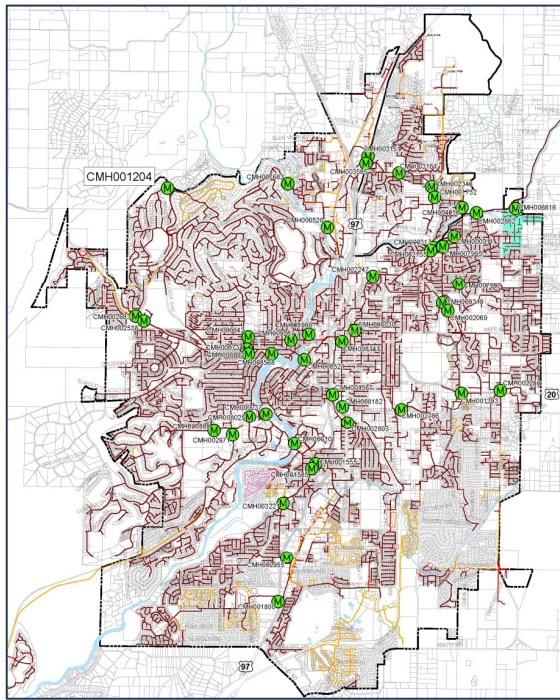
**ADS ENVIRONMENTAL SERVICES®**



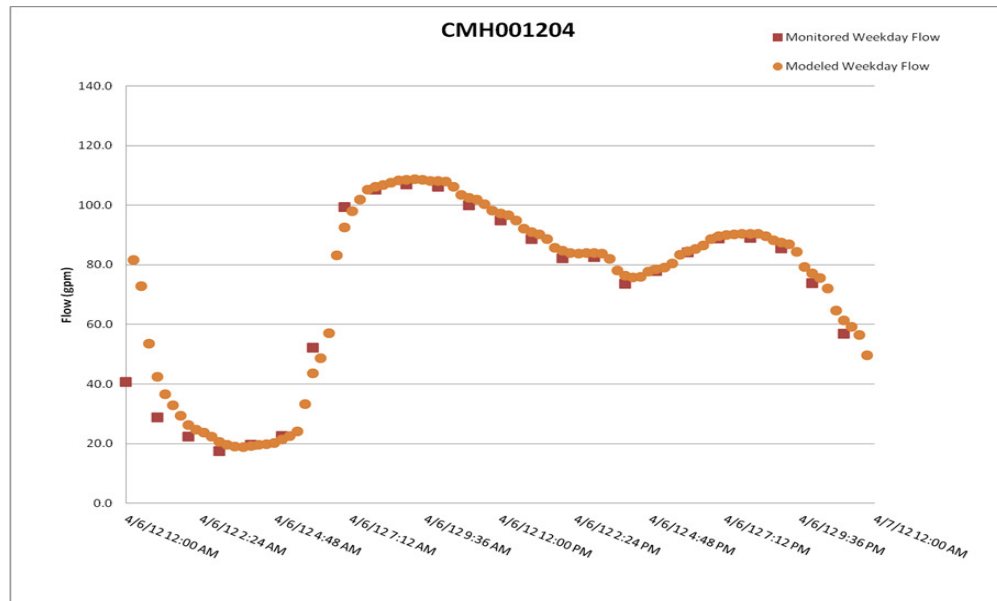
View of sensor placement and site hydraulics

## 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

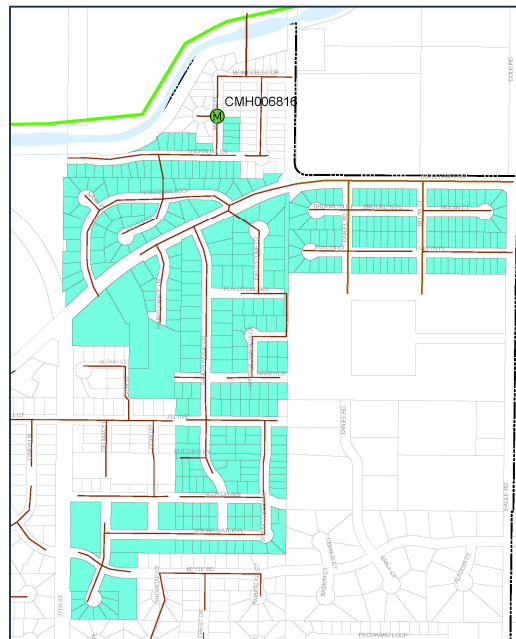


## CALIBRATION



## 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

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## 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

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## 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?

<b>Sewer Infrastructure Advisory Group Meeting Summary</b>	<b>May 16, 2013</b>
	<b>3:30- 5:30 p.m.</b>
	<b>City Council Chambers</b>
	<b>Note taker: Adele McAfee</b>
<p><b>Committee Members:</b> Casey Roats, Mike Riley, Craig Horrell, Charley Miller, Steve Galash, Sharon Smith, Pam Hardy, Rob Von Rohr, Andy High, Steve Hultberg, Bruce Aylward, Wes Price</p> <p><b>COB Staff:</b> Tom Hickmann, Paul Rheault, Jon Skidmore, Aaron Collett, Russ Grayson, Mary Winters, Shannon Osterdorf, Brian Rankin, Patrick Griffiths</p> <p><b>Consultants:</b> David Stangel (MSA), David Prull (Clearwater Engineering Group), Clark Worth (Barney &amp; Worth),</p> <p><b>Facilitator:</b> Libby Barg (Barney &amp; Worth)</p> <p><b>Absent:</b> John Rexford, Stacey Stemach, Dale Van Valkenburg</p> <p><b>Others:</b> Ken Steiger, Jim Lord, Erik Huffman, Councilor Knight, Councilor Russell, John Russell</p>	

### Action Items:

SIAG discussed several opportunities for meeting improvements:

- Get materials in advance: partial / draft materials are acceptable
- Review prior meeting decision at the beginning of each meeting
- Publicize dates / times of Steering Committee meetings
- Post SIAG check-in survey results online
- Schedule public outreach activities

### Meeting Summary

Casey Roats moved to approve meeting notes from 2/7/13, 2/21/13, 3/7/13, and 4/4/13, the motion was seconded by Steve Hultberg.

### Updates

City Council approved the contract for design services with MSA for the Colorado Lift Station (CLS). The basin analysis will be brought back to SIAG for a decision on size. In July /August the committee will consider the various design of the CLS project. Council is supportive of a scalable project

### Survey

A survey was distributed to SIAG committee members for the purpose of gaging the communication and performance of the committee so far. The results of the survey were discussed.

- Committee members would like information earlier so they could come to the meeting prepared.
- On occasion, discussion are too long on one subject matter
- Start each meeting by reviewing decision point of the prior meeting (via minutes)
- When the committee can't reach a decision, a discussion of schedule impact will be considered before postponing.
- Draft materials are acceptable to facilitate earlier distribution.

### South East Interceptor

This project is at 100% design. It will be brought back in September 2013 for a recommendation from SIAG. Before the committee makes a recommendation they requested the optimization results.

## **Steering Committee**

The general committee does not want to consider a rotation of Steering Committee members. The steering committee welcomes other members to participate.

## **Review of Vendor Submittals**

There were two viability criteria packets completed and returned to the city. The International Living Future Institute (ILFI) did not meet the criteria. However, their solution will still be used in the model. Langenberg Technology will need to submit installation information. Morgan Brown did not have a submittal.

## **Project Schedule**

Future project milestones were reviewed and related meeting times were reviewed

**Question: MSA received notice to proceed with the design of the Colorado Lift Station (CLS) at last night council meeting (5/15/13) and SIAG decided on the interim solution in January, why did it take so long?**

Answer: This contract was not directly awarded. The competitive process took two months. Scope and fee negotiations resulted in going to council with conceptual design contract because SIAG will make the decision on aspects of the final design.

**Question: The schedule does not reflect the discussion of the Steering committee which included a longer meeting for a workshop and a meeting a week later. This approach should be reflected on the schedule**

Answer: This is an overall schedule, the absence of follow-up meetings does not mean there will be no meetings. MSA will add dates to schedule.

**Question: On earlier schedules each optimization run was 2 months, on the new schedule it is 3 months. Please explain.**

Answer: MSA is expecting the runs to take two months, unless there are a lot of questions, requests from SIAG about the results.

**Question: When does the sensitivity analysis occur?**

Answer: The sensitivity analysis is at various times in the optimization process.

**Question: There is no place for public feedback. Does the group or the city think this is important? Also, there is no place for discussion of the city's financial plan. We need to discuss the options for financing.**

Answer: This is good suggestions for the schedule. The steering committee can build this in the schedule.

## **Reviewed Loading and Flow Development**

- Worked with the buildable land inventory
- Reviewed the special growth area map.
- Reviewed procedure to measure flow within the system.
- Identified what the residential units are using. Average residential flow 67 per capita per day.
- There is a significant decrease from the flow used in previous years – 80 to 100 per capita per day. There may be some real saving in improvements based on loading rates identified.
- Reviewed assumptions

**Sensitivity analysis will be discussed at the next meeting**

**Meeting Adjourned at 5:30PM**



# Bend Sewer Infrastructure Advisory Group: Meeting #11

## Sensitivity Analysis

### Community Outreach Plan

Bend City Council Chambers  
710 NW Wall Street, 1st Floor

June 20, 2013  
4:00-5:30 p.m.

## Agenda

Activity / Topic	Presenter	Time
1. <b>Welcome / Introductions / Approve Meeting Notes</b>	Jon Skidmore	4:00 p.m.
2. <b>Review Meeting Agenda / Goals</b>		4:05
3. <b>Optimization: Review Sensitivity Analysis Approach</b> <i>Objective:</i> <ul style="list-style-type: none"><li>• SIAG understanding of the planned approach to sensitivity analysis</li></ul>	David Stangel, P.E.	4:10
<b>Advisory Group Q&amp;A / Discussion</b> <ul style="list-style-type: none"><li>• Is the approach to sensitivity analysis understood / acceptable?</li></ul>	Clark Worth	
4. <b>Community Outreach Plan</b> <i>Objective:</i> SIAG review of draft outreach plan developed by the Steering Committee <b>Advisory Group Q&amp;A / Discussion</b> <ul style="list-style-type: none"><li>• Are these the right activities to inform and involve Bend sewer customers and others in the Master Plan?</li><li>• Any volunteers to help with outreach?</li></ul>		5:00
5. <b>Public Comment</b>		5:20
6. <b>Next Steps</b> <ul style="list-style-type: none"><li>• Upcoming SIAG Meetings<ul style="list-style-type: none"><li>July 11      Review System Deficiencies</li><li>July 25      Colorado Lift Station (sizing)</li><li>Aug 15      Optimization Alternatives (pumps, pipes, storage, treatment)</li><li>Sept 12      Colorado Lift Station (site/pipeline tour)</li><li>Nov 14 / 21      Initial Optimization Results</li></ul></li></ul>	Clark Worth	5:25
<b>Adjourn / Thank You</b>	Jon Skidmore	5:30 p.m.

## SENSITIVITY ANALYSIS

Sewer Infrastructure Advisory Group  
May 16, 2013



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

## SENSITIVITY ANALYSIS

• What factors can we turn the dial on?



### Cost of any system alternative

- Upper/lower estimates for capital/O&M costs for storage/treatment
- Develop solutions with or without storage and/or treatment to enable community values to be incorporated into analysis



### Life Cycle Cost Analysis Factors

- Analysis period (40 years selected)
- Discount rate (Inflation rate, Cost to borrow money)
- Electricity costs
- Value of remaining useful life

## SENSITIVITY ANALYSIS

What factors can we turn the dial on?



### Growth/Loading Rates

- Higher Growth/Loading Rates
- Conservation – Lower Growth/Loading Rates
- Point Loading on Periphery of UGB



### Wet-Weather Calibration

- Upper estimate of wet weather loadings
- Lower estimate of wet weather loadings

## SENSITIVITY ANALYSIS

What have we committed to doing?

Committed	Not Currently in Scope
<ul style="list-style-type: none"> <li>• Wet weather calibration sensitivity analysis</li> <li>• Cost rate sensitivity analysis (sensitivity analyses for both storage costs and treatment costs)</li> <li>• Population growth rate sensitivity analysis for conservation (lower loading rate)</li> <li>• One other sensitivity analysis to be identified in November</li> </ul>	<ul style="list-style-type: none"> <li>▪ Life-cycle cost sensitivity analysis</li> <li>▪ Population/loading rate sensitivity analysis for               <ul style="list-style-type: none"> <li>(a) areas outside the UGB</li> <li>(b) additional higher/lower estimates of loading within the UGB</li> <li>(c) varying loading rates by basin or other areas</li> </ul> </li> </ul>

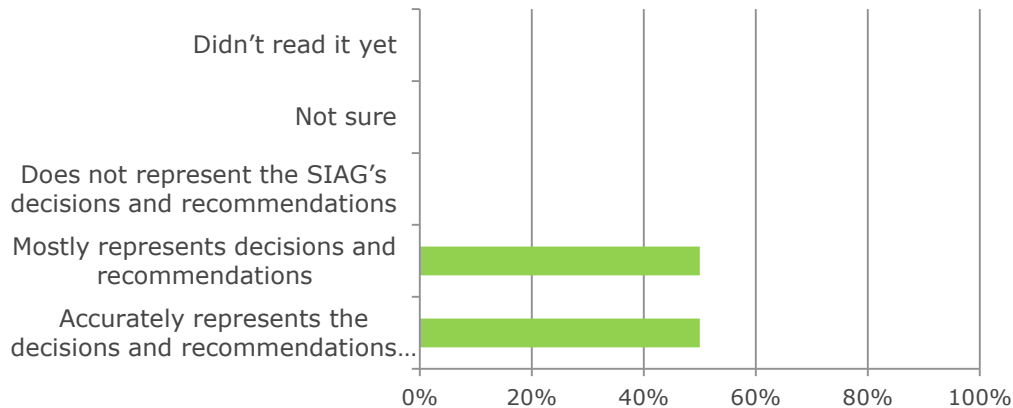
## SENSITIVITY ANALYSIS

• Q/A/Discussion?

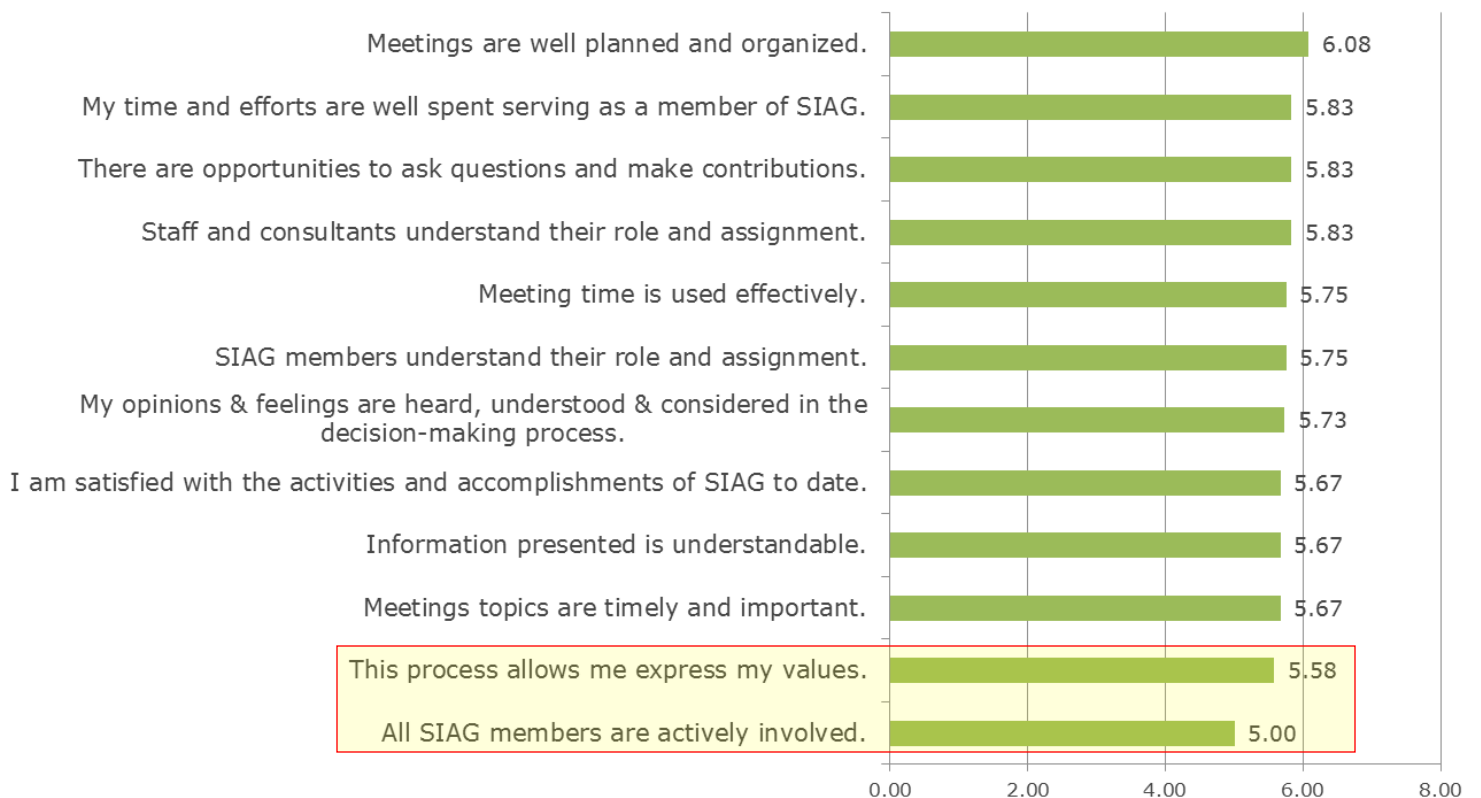
## SIAG Questionnaire Results

May 2013

### I reviewed the decision summary and feel the document:



### On a scale of (1) strongly disagree to (7) strongly agree, how would you rank the following:



**What suggestions can you offer for improving SIAG meetings or the master planning process?**

- Send materials in advance.
- Speed up process.
- Challenge our assumptions/pre-conceived notions--look at the full range of options.
- Keep everyone on the same page as much as possible.

**Which topic(s) you would like addressed by the SIAG at future meetings?**

- ✓ Demand for sewer.
- ✓ Total tolerable system costs, how that will be financed, and impacts to sewer rates.
- ✓ Revenue sources.
- ✓ Conservation as a technology evaluated in optimization along with other technologies, like pipes, inline storage, alternative treatment, etc.
- ✓ Grey water reuse and what role it might play in controlling collections system costs, both with the current UGB and as our community grows in the future. Make a recommendation for the future.
- ✓ Mini-update about what the Council decided to do about the SE interceptor.
- ✓ Review the big picture of what we have left to do and how we're going to do it.
- ✓ Update on the designs for the immediate capacity solutions.
- ✓ Project costs / scope creep.

**SIAG decision summary suggestions:**

Meeting #9: Satellite Treatment Alternatives for Optimization (April 4, 2013)

- ☐ Include discussion of conservation as a technology that will be evaluated, how it will be dealt with (sensitivity analysis), and the need for rational basis for conservation scenarios and costs for comparison.
- ☐ Document decisions/recommendations to use sensitivity analyses to test how well the optimized solutions can deal with variations in densities (that might end up being part of the final response to the UGB remand) and/or to test how well the optimized solutions might deal with a larger population that would come with future growth and associated UGB expansion.

<b>Sewer Infrastructure Advisory Group Meeting Summary</b>	<b>June 20, 2013</b>
	<b>4:00- 5:30 p.m.</b>
	<b>City Council Chambers</b>
	<b>Note taker: Adele McAfee</b>
<b>Committee Members:</b> Casey Roats, Mike Riley, Craig Horrell, Charley Miller, Steve Galash, Sharon Smith, Rob Von Rohr, Steve Hultberg, Bruce Aylward, Wes Price, Dale Van Valkenburg, Lynn Putnam, Nathan Boddie <b>COB Staff:</b> Tom Hickmann, Paul Rheault, Jon Skidmore, Aaron Collett, Russ Grayson, Mary Winters, Shannon Osterdorf, Brian Rankin, <b>Consultants:</b> David Stangel (MSA) <b>Facilitator:</b> Clark Worth (Barney & Worth) <b>Absent:</b> John Rexford, Stacey Stemach, Pam Hardy, Andy High <b>Others:</b> Jim Lord, Erik Huffman, Councilor Knight, John Russell	

#### Action Items:

- DEQ to come to SIAG in October
- Material and presentation for public outreach need to be developed in November /December
- Incorporate suggestion and send out revised community outreach plan

### Meeting Summary

#### Approval of meeting minutes

Mike Riley corrected the meeting notes of 5/16/2013 :Page 1, South East Interceptor: Before the committee makes a recommendation they requested this project to be brought back to SIAG after initial optimization results.

The meeting minutes were approved as corrected by consensus.

#### Updates

Water Reclamation Facility Open House was held earlier in the day. The Regional Director from DEQ was in attendance and mentioned that there was 38.8 million in low interest loan money invested in this project. DEQ may come to SIAG to discuss the agency's regulatory concerns with existing septic.

#### Optimization - Review Sensitivity Analysis Approach

This presentation was carried over from the 5/16/13 SIAG meeting for the purpose of reviewing several presented pieces of the analysis and discuss where the sensitivity analysis could be applied.

- Cost Optimization: Ranges of cost and sensitivity to cost for Water Treatment and Pipeline alternatives.
- Life Cost Analysis –40 years
- Electricity/ Power Costs
- Concept of Value and useful remaining life for gravity pipe and manhole type solutions
- Loading and Growth rates
- Wet Weather Calibration

#### What is the rationale in suggesting the 40 year economic life?

After reviewing an industry analysis, the group decided to look at the 40 year range. Systems have lasted longer than they have in the past. Also, the farther out you go the more unrealistic the cost assumption become. Finance is working on the discount rate.

#### Where is the fairness when comparing alternatives?

The intent of the analysis is not to be fair but balanced out with value and useful life.

A discussion ensued about the 100 year solution and financial constraints.

### **What can be considered regarding the UGB expansion?**

The task of this committee and this process is to come up with a plan that will serve the current UGB. The city will take the plan that is developed by SIAG and consider various expansions scenarios and how it will affect the system that SIAG has recommended.

### **What are we committed to doing?**

- Wet weather sensitivity/ ranges of flow and impact on infrastructure
- Cost rate sensitivity analysis for storage and treatment
- Population growth rate sensitivity or loading rate sensitivity for conservation
- There will be another sensitivity analysis that will be identified in November

There is a limit of what can be done within the current scope.

### **What is in the base?**

- Medium density
- 10 % growth
- Special Areas

### **How do you predict “x” amount of people moving?**

The consultants have worked with Planning Department towards build out of the current UGB. This will occur in approximately 20 years. The location of the population assumptions are based on the City's land-use codes. Each parcel is associated with an individual manhole within the service system.

The consultants will make an effort to guide the group based on what they see in the analysis and recommend where to apply the sensitivity analysis. The analysis will also show what shouldn't be done.

### **Community Outreach Plan**

One of the initial assignments of the group is to carry the discussion out into the community, individually and as a group. The steering committee has worked on an outreach plan to begin the message out.

The draft community outreach plan was distributed.

Starting summer and fall there would be presentation with advisory group members paired with city staff. Starting early next year there would be more presentations. A group list was reviewed. Sign in sheets were passed around.

- Everyone should do one or two to groups where they have an association.
- Materials will be provided
- Go out to the community with solutions

An advisory group member suggested going to City Council after the first optimization results and then go out to the community. The city council would then be educated and able to answer questions from the community.

A discussion regarding the financial aspects and funding options ensued.

### **Schedule Change**

The schedule changes were reviewed. The meeting in November will be longer.

Meeting adjourned: 5:21 PM



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# Bend Sewer Infrastructure Advisory Group: Meeting #12

## Deficiency Analysis Results: Existing and UGB Build-Out Conditions

Bend City Council Chambers  
710 NW Wall Street, 1st Floor

July 11, 2013  
3:30-5:30 p.m.

### Agenda

Activity / Topic	Presenter	Time
1. <b>Welcome / Introductions / Approve Meeting Notes</b>	Jon Skidmore	3:30 p.m.
2. <b>Review Meeting Agenda / Goals</b>		3:35
3. <b>Community Outreach Plan</b>  <i>Objective:</i> SIAG review of updated outreach plan developed by the Steering Committee  <b>Advisory Group Q&amp;A / Discussion</b> <ul style="list-style-type: none"><li>Is the outreach plan approved for implementation?</li></ul>		3:40
4. <b>Deficiency Analysis Results</b>  <i>Objective:</i> <ul style="list-style-type: none"><li>What problems need to be fixed?</li></ul>	David Stangel, P.E.	3:50
<b>Advisory Group Q&amp;A / Discussion</b> <ul style="list-style-type: none"><li>Any questions about the deficiencies?</li><li>Are there other areas / problems that should be considered?</li></ul>	Libby Barg	4:30
5. <b>Public Comment</b>		5:20
6. <b>Next Steps</b> <ul style="list-style-type: none"><li>Upcoming SIAG Meetings</li></ul> <div>July 25      Colorado Lift Station (sizing)</div> <div><b>Aug 15      Cancelled</b></div> <div>Sept 12      Colorado Lift Station (site/pipeline tour)</div> <div>Nov 14 / 21      Initial Optimization Results</div>	Libby Barg	5:25
<b>Adjourn / Thank You</b>	Jon Skidmore	5:30 p.m.

# DEFICIENCY ANALYSIS RESULTS EXISTING AND UGB BUILD-OUT CONDITIONS

Optimized Collection System Master Plan  
City of Bend  
SIAG  
July 11, 2013



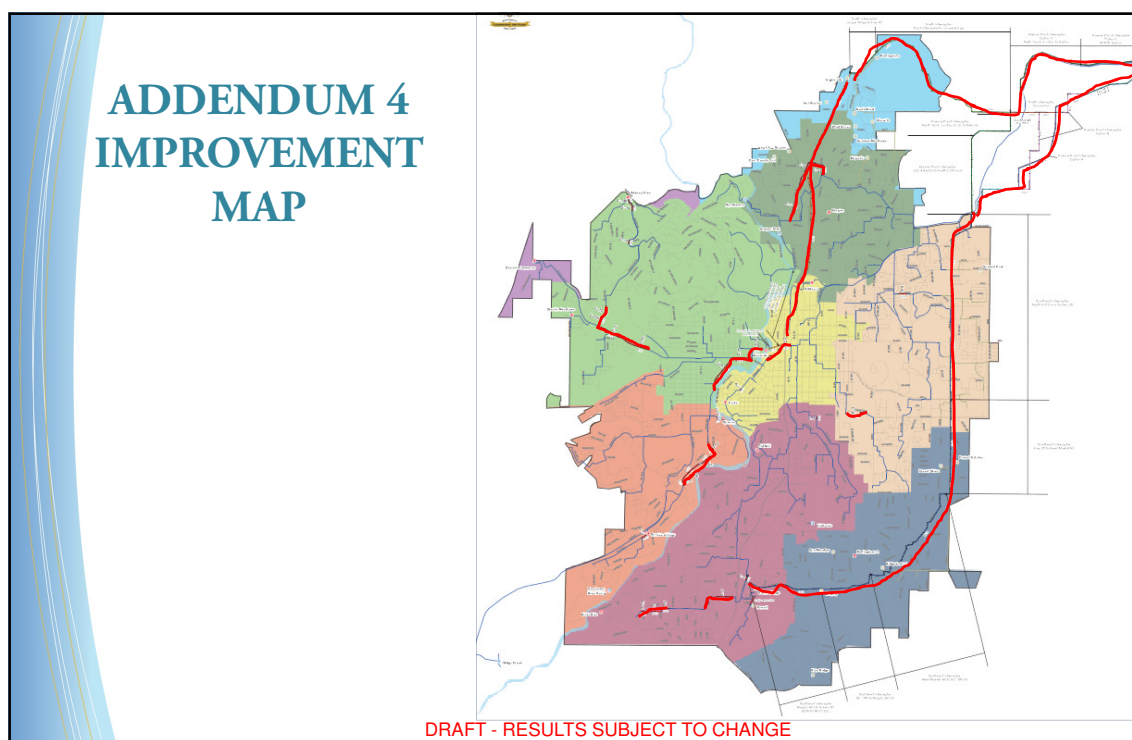
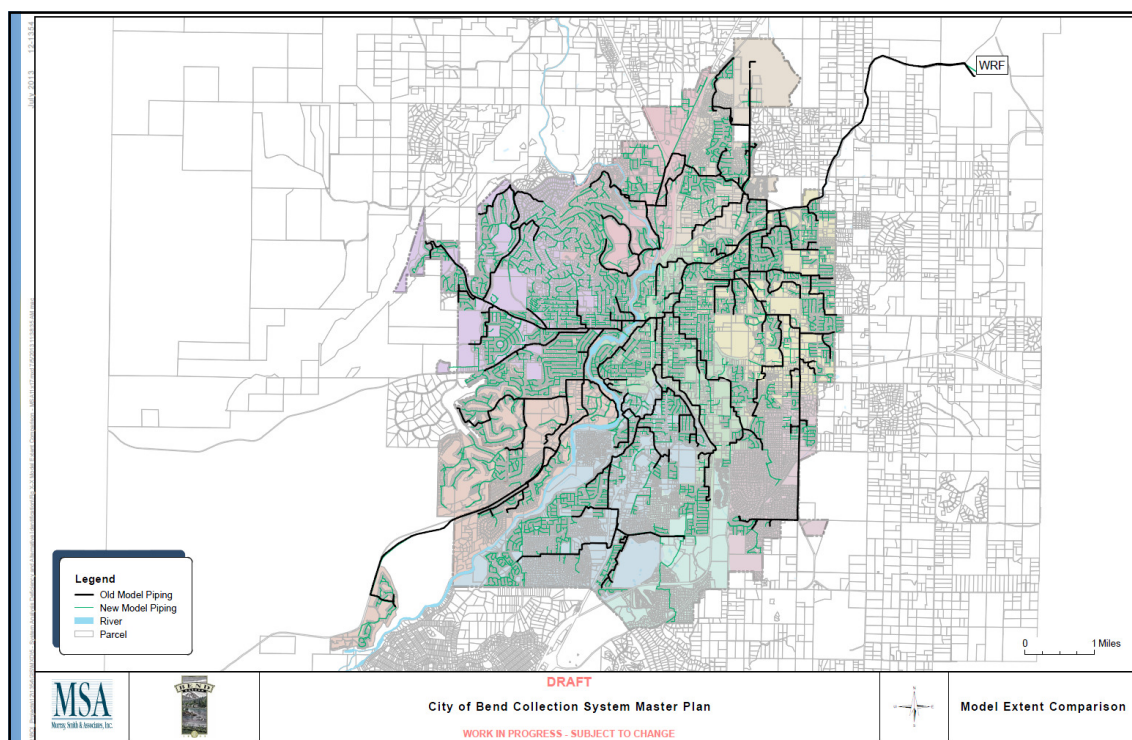
**DRAFT - RESULTS SUBJECT TO CHANGE**

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

## PURPOSE OF PRESENTATION

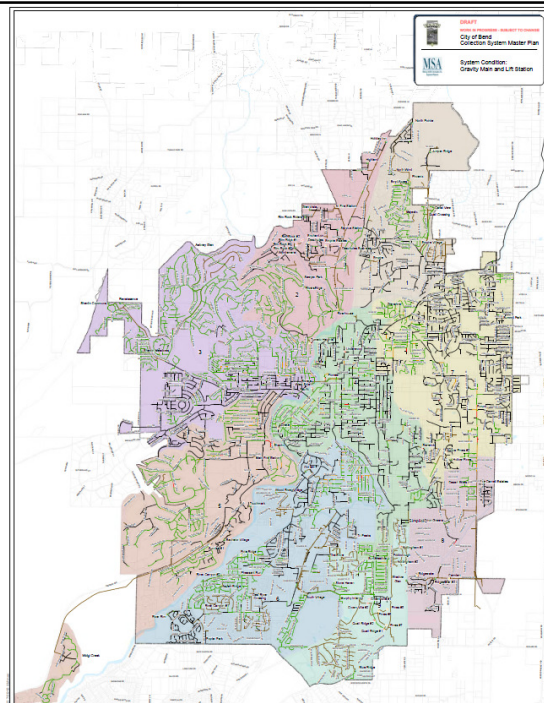
- ◆ 2007 CSMP Model & 2013 CSMP Model
- ◆ Condition Assessment
- ◆ Current Deficiencies
- ◆ Future Deficiencies
- ◆ Varying Rainfall Response
  - Staff Recommendation
- ◆ Comparison of Addendum 4 and Updated Results
- ◆ Next Steps

**DRAFT - RESULTS SUBJECT TO CHANGE**



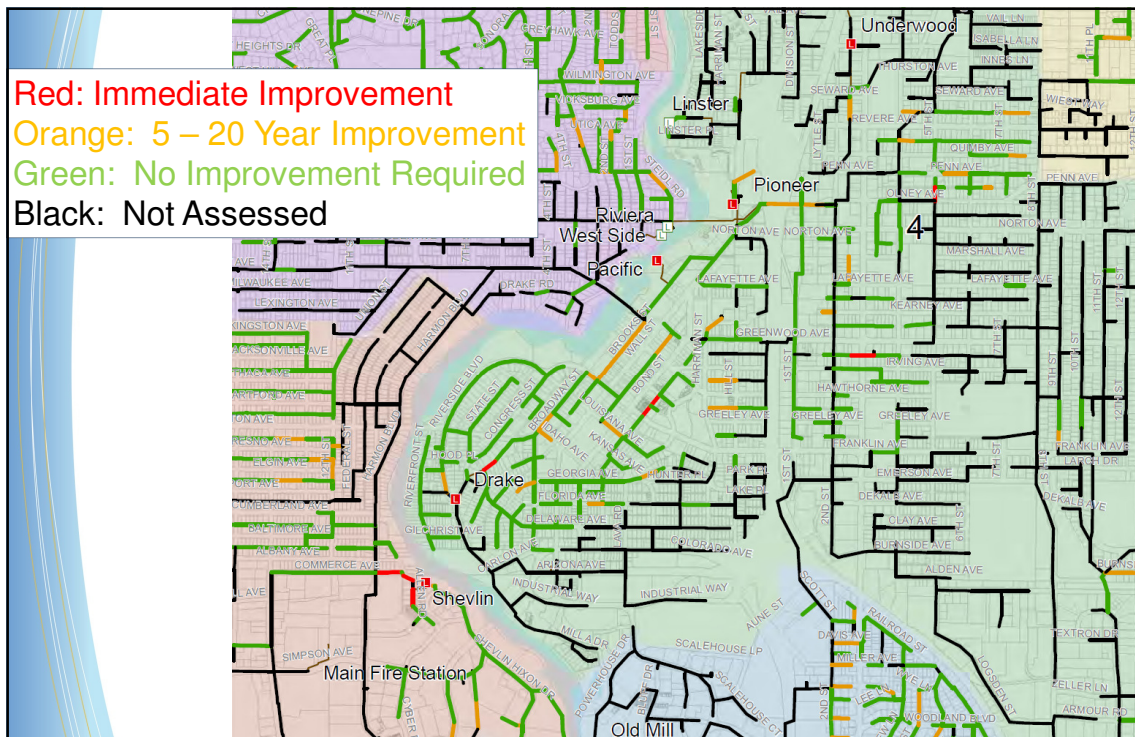
## CONDITION REVIEW

- ◆ Summary of condition information
  - Lift Stations requiring improvement in 5, 10 and 20 years
  - Piping requiring improvement in 5 and 20 years



DRAFT - RESULTS SUBJECT TO CHANGE

Red: Immediate Improvement  
 Orange: 5 – 20 Year Improvement  
 Green: No Improvement Required  
 Black: Not Assessed



## GRAVITY PIPING CONDITION REPLACEMENT VALUE

Grade of Gravity Pipe	Replacement Cost
0 or 1 – Pipe in Excellent Condition	\$178,000,000
2 – Pipe Likely Replaced beyond 20 years	\$8,000,000
3 – Pipe Likely Replaced 10-20 years	\$6,000,000
4 – Pipe Likely Replaced in 5-10 years	\$3,000,000
5 – Pipe Likely Replaced in next 5 years	\$1,000,000
Not Yet Rated	\$230,000,000
<b>Total System Replacement Value</b>	<b>\$426,000,000</b>

- Currently, \$10M in pipe improvements identified in next 20 years (could potentially be rehabilitated for less)
- If Bend was replacing 1%/year (100 year replacement), required investment of \$5M/year (including manholes)

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## LIFT STATION IMPROVEMENT COSTS

Rating	Number of Lift Stations	Improvement Cost
Immediate improvement required	2	\$530,000
Improvement needed in 5 years	17	\$4,505,000
Improvement needed in 5-10 years	17	\$4,505,000
Improvement needed beyond 10 years	48	\$12,720,000
<b>Total</b>	<b>84</b>	<b>\$22,260,000*</b>

Assumes improvements to smaller/medium lift stations at \$265k/station – replacement of pumps, controls and prefabricated wet wells only

*\*Total shown is not replacement cost*

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## TOTAL CONDITION RELATED IMPROVEMENTS IDENTIFIED IN 20 YEARS

- ◆ Gravity piping replacement \$10 M\*
- ◆ Lift station improvements \$22M
- ◆ Total condition related improvements \$25M-\$45M

*\*Piping costs could be approx. half of real costs once full system is assessed*

- Only includes larger area lift stations (approx. 85) and gravity pipe
- Condition related improvements not included in previous CSMP

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## FLOW COMPARISON

Planning Study	Scenario	Ave. Dry Flow (mgd)	Total Peak Flow (mgd)	Reduction from Original
2007 CSMP	Original Build-out	23.1	64.0	---
2008 CIP Update	Revised Build-out	23.1	52.8	18%
2008 CIP Update	2030	15.6	33.5	48%
2013 CSMP	2033/Build-out	10.9	30.2 – 35.5*	45% - 53%

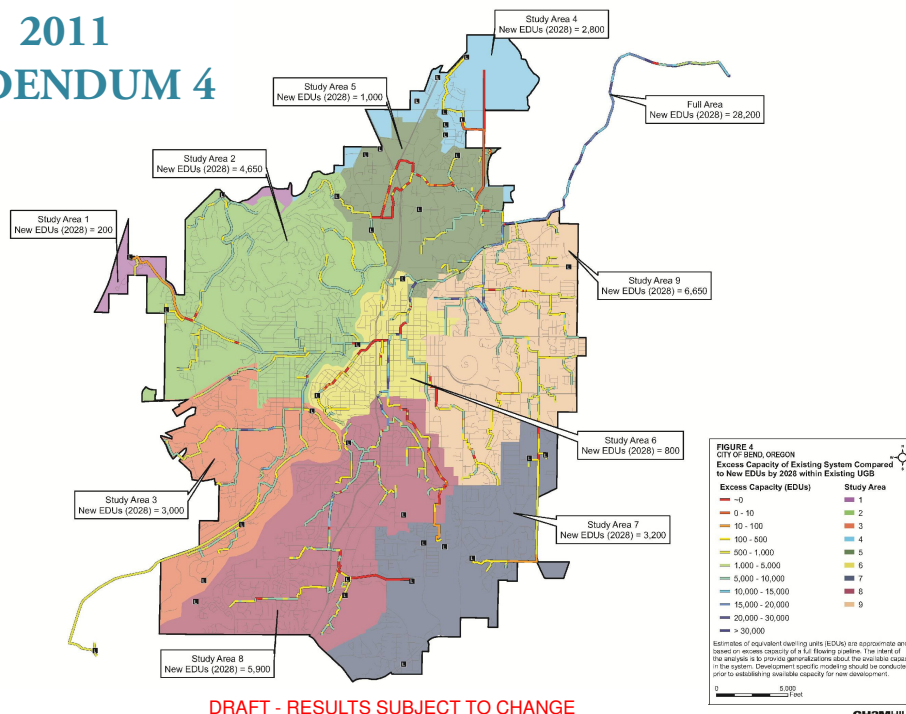
*\*Based on using mid or high rainfall response in model*

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## Tab to PDFs of Existing/Future System Deficiencies Mid and High R

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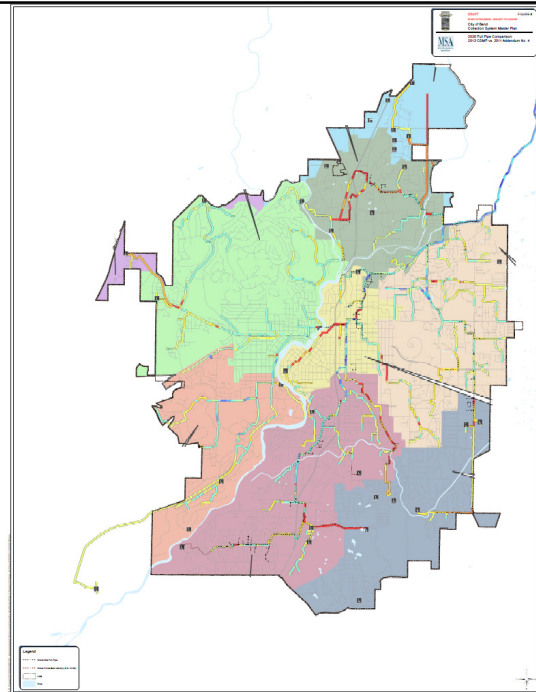
## 2011 ADDENDUM 4



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## 2013 CSMP VS 2011 ADDENDUM 4

Tab to pdf



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## WHAT HAPPENS NOW?

- ◆ Implement long term flow monitoring
- ◆ Run Initial Optimization
  - Identify least cost pipe solution
  - Propose new gravity sewers in new alignments
  - Propose new regional lift stations and force mains
  - Propose new satellite treatment facilities locations
  - Optimize for the best combination of alternatives
- ◆ Bring results back to City and SIAG for direction (Nov)

DRAFT - RESULTS SUBJECT TO CHANGE

## DEFICIENCY ANALYSIS

• Q/A/Discussion?

DRAFT - RESULTS SUBJECT TO CHANGE

<b>Sewer Infrastructure Advisory Group Meeting Summary</b>	<b>July 11, 2013</b>
	<b>3:30- 5:30 p.m.</b>
	<b>City Council Chambers</b>
	<b>Note taker: Adele McAfee</b>
<b>Committee Members:</b> , Steve Galash, Steve Hultberg, Craig Horrell, Sharon Smith (via telephone), Dale VanValkenberg, Andy High, Charley Miller., Lynn Putnam, Mike Riley, Casey Roats <b>COB Staff:</b> Paul Rheault, Jon Skidmore, Aaron Collett, Russ Grayson, Jeff England, Tom Hickmann, <b>Consultants:</b> David Stangel (MSA), <b>Facilitator:</b> Libby Barg & Clark Worth (Barney & Worth) <b>Others:</b> Jim Lord	

#### **Action Items:**

- SIAG recommended City Council invest in flow monitoring for Fall 2013 and permanent “real-time” flow monitoring.
- SIAG approved the Community Outreach Plan.

### **Meeting Summary**

#### **Announcements**

Financial consultants are working with City staff on updating rates and assessing funding options. They will present financial information to the SIAG on September 12.

#### **Community Outreach Plan**

Suggestions from the last meeting were incorporated and distributed. A sign-in sheet went around for SIAG members for outreach volunteers.

There was a consensus of approval of the Community Outreach Plan.

#### **Deficiency Analysis**

The results of the deficiency analysis were shared with SIAG. Additional monitoring data provides a much better understanding of the deficiencies, challenges and opportunities within the system. Result show extent of the problem areas is less than what was covered in the 2007 Master Plan.

#### **Presentation Questions**

##### **How are the pipe prioritized for assessment?**

The City focuses on where the problems have been, as well as service lines to high priority agencies like a school district or hospital.

**The need to repair/replace pipes has been ongoing. Why were costs not included in the previous master plans?**

It has been an operations and maintenance issue in the past. In an effort to be more proactive than reactive, the City is now including system repair in the planning process.

**Is any of the sewer franchise money collected being saved?**

No, it goes into the sewer fund for operations and maintenance.

**Is the City collecting more than what we are spending from rates in anticipation of this project? Isn't there some accrual going on?**

Yes. However, based on what we need to pay for the treatment plant expansion and the solutions for the CSMP, it will disappear quickly.

**Can you describe what it means for Bend to have sewer overflows? Is this a short-term condition or is this an environmental calamity?**

The city will get fined when there are overflows and it is not good for public health. .

**How often does the city have overflows?**

At the end of 2012 there were 6 overflows in a one year period.

**Regarding the Murphy Rd project, if we were further along, could we have made improvements during this construction?**

The City has designed the road to be able to install the sewer without major reconstructing.

**Is there already a new line providing service to Mt Washington?**

The problem in Mt Washington is odor. The City is investigating solutions that solve the odor problem.

**Why weren't there efforts to collect better data in the past?**

There is greater understanding today of the importance of collecting good data.

**What happens next?**

Staff asked SIAG to consider recommending to the council an investment in long-term flow monitoring as this will require a budget adjustment for funding.

**What information would SIAG need to make this recommendation?**

**Comments:**

- "This is a no brainer."
- "Do it as soon as possible."

A vote was taken regarding the committee making a recommendation to Council to make an investment in long-term flow monitoring.

All present voted in favor

(Galash, High, Horrell, Hultberg, Miller, Putnam, Reilly, Roats, Van Valkenburg, and Smith)

There was no public comment

Meeting Adjourned at 5:11PM

## Bend Sewer Infrastructure Advisory Group: Meeting #13

### Colorado Lift Station: Type/Size/Location

Bend City Council Chambers  
710 NW Wall Street, 1st Floor

July 25, 2013  
3:30-5:30 p.m.

# Agenda

Activity / Topic	Presenter	Time
1. <b>Welcome / Introductions / Approve Meeting Notes</b>	Eric King	3:30 p.m.
2. <b>Public Comment</b>	Libby Barg	3:35
3. <b>Review Meeting Agenda / Goals</b>		3:40
4. <b>Colorado Lift Station</b>	Jim Helton, P.E.	3:45
<p><b>Objectives:</b></p> <p>SIAG review of preliminary information for Colorado Lift Station and related conveyance improvements</p> <p>SIAG recommendation on lift station sizing</p>		
<p><b>Advisory Group Q&amp;A / Discussion</b></p> <ul style="list-style-type: none"> <li>Are there questions regarding the preferred lift station location and pipeline alignment?</li> <li>What sizing does SIAG recommend for the lift station design?</li> </ul>		4:25
5. <b>Next Steps</b>	Libby Barg	5:25
<ul style="list-style-type: none"> <li>Upcoming SIAG Meetings</li> </ul>		
<b>Aug 15</b>	<b>Cancelled</b>	
Sept 12	Project Funding	
Nov 14 / 21	Initial Optimization Results	
<b>Adjourn / Thank You</b>	Eric King	5:30 p.m.

For more information, visit the Bend Sewer Infrastructure Advisory Group webpage:  
**[Bendoregon.gov/siag](http://Bendoregon.gov/siag)**

## July 25, 2013 SIAG Straw Poll Results

### 1. What should we do with scenario 1: sideline or continue to discuss?

Responses		
	Percent	Count
Sideline	38%	3
Continue to discuss	63%	5
<b>Totals</b>	<b>100%</b>	<b>8</b>

### 2. What should we do with scenario 2: sideline or continue to discuss?

Responses		
	Percent	Count
Sideline	56%	5
Continue to discuss	44%	4
<b>Totals</b>	<b>100%</b>	<b>9</b>

### 3. What should we do with scenario 3: sideline or continue to discuss?

Responses		
	Percent	Count
Sideline	33%	3
Continue to discuss	67%	6
<b>Totals</b>	<b>100%</b>	<b>9</b>

4. What should we do with scenario 4: sideline or continue to discuss?

Responses		
	Percent	Count
Sideline	67%	6
Continue to discuss	33%	3
<b>Totals</b>	<b>100%</b>	<b>9</b>

5. What should we do with scenario 5: sideline or continue to discuss?

Responses		
	Percent	Count
Sideline	33%	3
Continue to discuss	67%	6
<b>Totals</b>	<b>100%</b>	<b>9</b>

6. Which scenario do you think should be selected for design?

Responses		
	Percent	Count
Scenario 1	11%	1
Scenario 2	11%	1
Scenario 3	33%	3
Scenario 4	0%	0
Scenario 5	44%	4
None of the above	0%	0
Not sure	0%	0
<b>Totals</b>	<b>100%</b>	<b>9</b>

7. Which scenario do you think should be selected for design?

Responses		
	Percent	Count
Scenario 1	11%	1
Scenario 2	0%	0
Scenario 3	89%	8
Scenario 4	0%	0
Scenario 5	0%	0
None of the above	0%	0
Not sure	0%	0
<b>Totals</b>	<b>100%</b>	<b>9</b>

## SEWER INFRASTRUCTURE ADVISORY GROUP MEETING 13

July 25, 2013

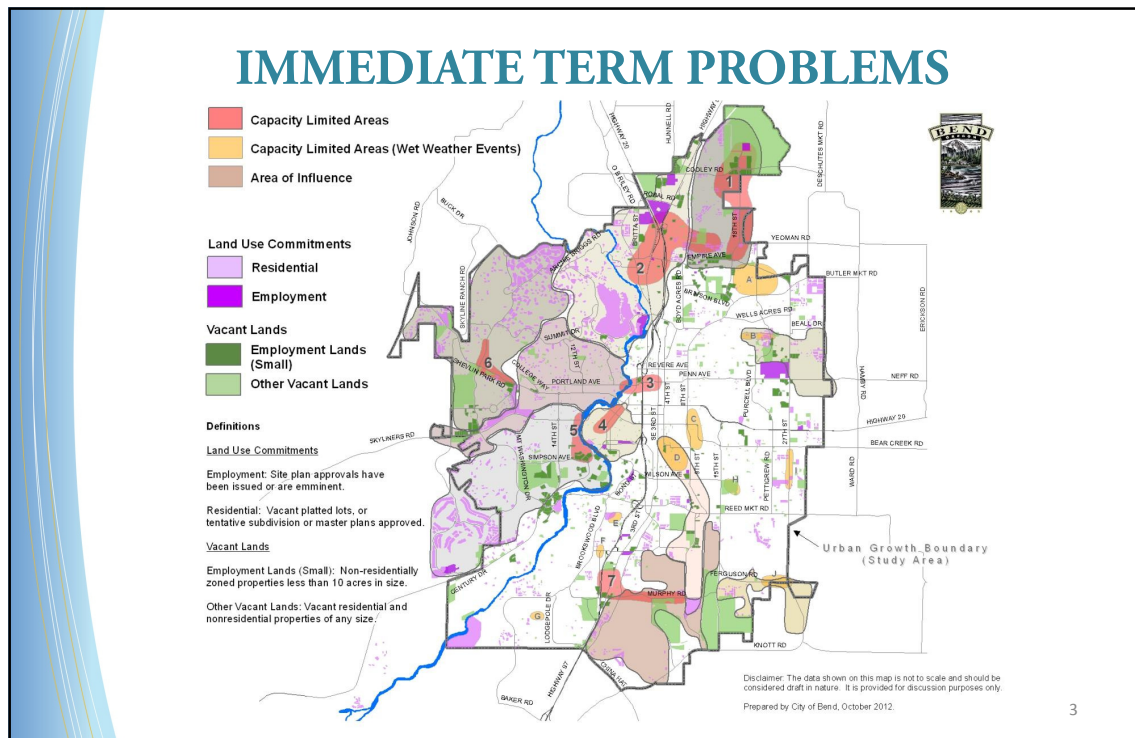


City of Bend

**MSA** Murray, Smith & Associates, Inc.  
Engineers/Planners 1

## PURPOSE OF TODAY'S MEETING

1. Review of Immediate Problems and Solution Development
2. Summarize 4 scenarios for Colorado LS
3. SIAG will identify preferred lift station capacity for 20-year horizon
4. Answer questions regarding lift station design and construction



## REVIEW OF IMMEDIATE PROBLEMS AND SOLUTIONS DEVELOPMENT

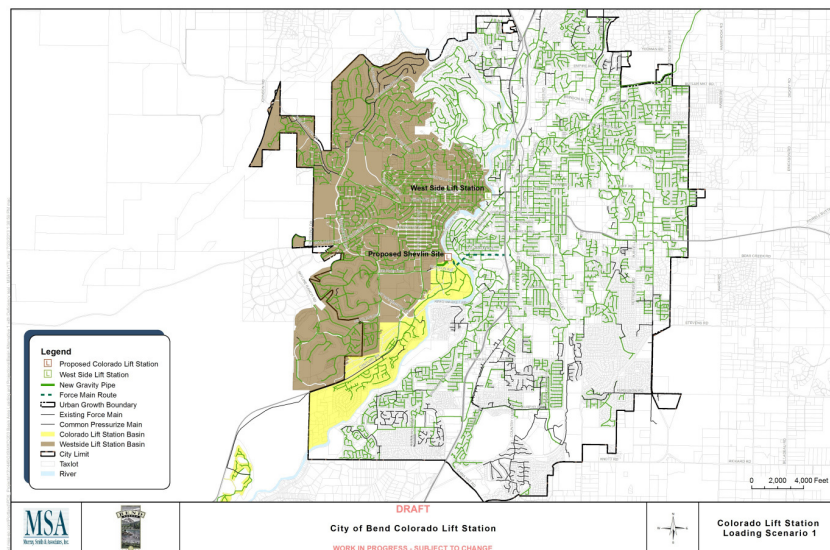
1. SIAG selected 3 areas of limited capacity for analysis (areas 2, 3, and 5)
2. Issues to be managed in the selected Study Areas
  1. Capacity limitations under existing conditions
  2. Potential for sewer overflows
  3. Inadequate capacity to support projected 5-year development
  4. Existing corrosion and odor issues
3. Area 2 solution will be delivered as 2 projects.
  1. First Area 2 project RFP scheduled to be released by early August

## COLORADO LS PROJECT DEVELOPMENT

1. Colorado LS was selected by SIAG as the project to address capacity issues in areas 3 and 5.
2. 700 gpm LS with a total project cost of \$4.1 Million was developed as an option to address capacity issues in areas 3 and 5 in the next 5 years (pipeline and Westside LS).
3. "5-Year" project concept is being further developed into an approach that can serve 20-year buildout.

5

## COLORADO LS LOADING SCENARIO 1



6

## COLORADO LS LOADING SCENARIO 1

- 1,000 - 1,200 gpm capacity to serve 20-year buildout (yellow basin)
- Westside LS capacity potentially exceeded in existing condition (with diversion to Colorado LS). Upgrades needed immediately.
- Additional major renovation needed at Westside LS by Year 10

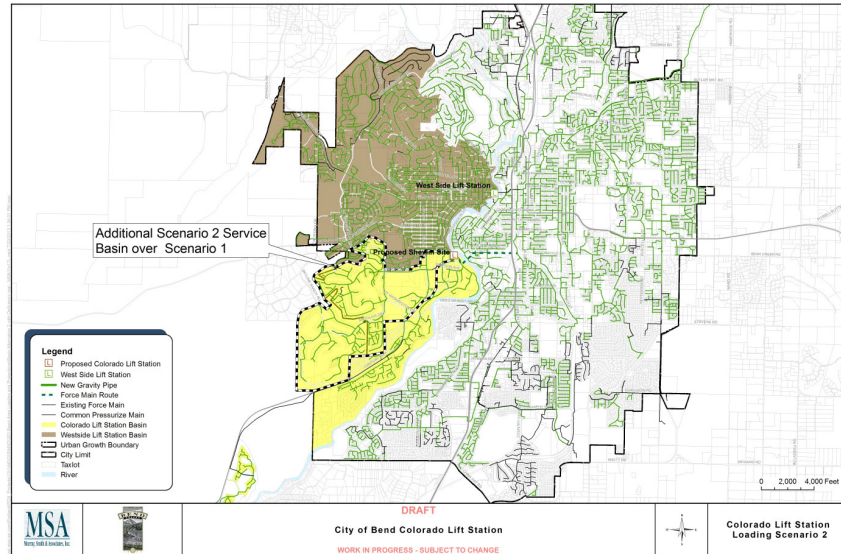
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## COLORADO LS LOADING SCENARIO 1

Flow Loading	Description of Required Improvements					Total Cost
	Colorado Lift Station	Upstream Gravity	Force Main	Westside Lift Station	Downstream Gravity	
<b>CSMP Short Term Project for 5-year</b>	Build Colorado LS with firm capacity of 700 gpm <b>\$1.37 Million</b>	-	Build 6,700 LF 8" <b>\$1.97 Million</b>	-	1,100 LF 30"-48" <b>\$765k</b>	<b>\$4.10 Million</b>
<b>Existing</b>	Build Colorado LS with firm capacity of 1,200 gpm <b>\$3.30 Million</b>	Build 1,300 LF 10" <b>\$540k</b>	Build 5,500 LF 10" <b>\$2.60 Million</b>	Replace pumps 3 and 4 to increase firm capacity to 3,900 gpm <b>\$400k</b>	TBD	<b>\$6.84 Million</b>
<b>5-year</b>	-	-	-	-	TBD	-
<b>10-Year</b>	-	-	-	Expand Westside LS firm capacity to 5,200 gpm <b>\$1.77 Million</b>	TBD	<b>\$1.77 Million</b>
<b>20-Year</b>	-	-	-	-	TBD	
<b>Total 20-Year Investment = \$8.61 Million</b>						

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## COLORADO LS LOADING SCENARIO 2



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## COLORADO LS LOADING SCENARIO 2

1. 1,800 - 2,000 gpm capacity to serve 20-year buildout
2. Pump replacements at Westside LS by year 5
3. Major renovation required at Westside LS by year 20

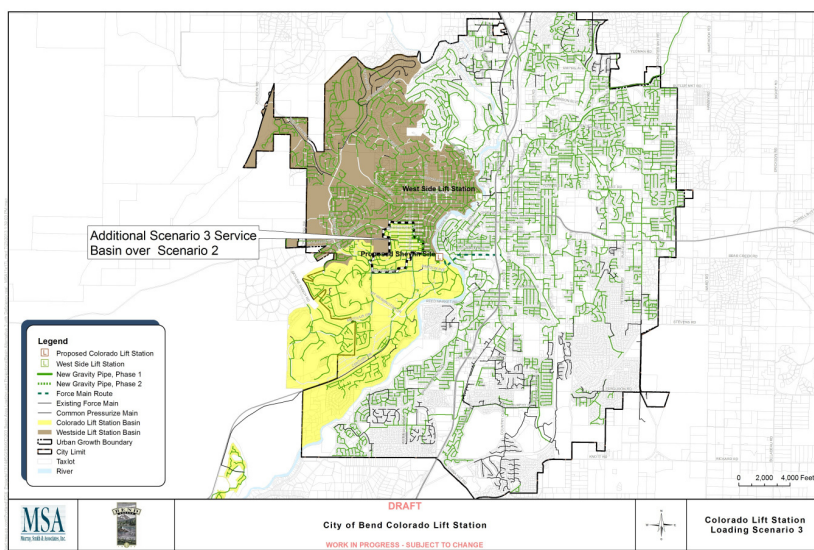
10

## COLORADO LS LOADING SCENARIO 2

Flow Loading	Description of Required Improvements					Total Cost
	Colorado Lift Station	Upstream Gravity	Force Main	Westside Lift Station	Downstream Gravity	
Existing	Build Colorado LS with firm capacity of 2,000 gpm <b>\$4.20 Million</b>	Build 1,300 LF 10" <b>\$1.15 Million</b>	Build 5,500 LF 12" <b>\$3.00 Million</b>	Replace pumps 3 and 4 to increase firm capacity to 3,900 gpm <b>\$400k</b>	TBD	<b>\$8.75 Million</b>
5-year	-	-	-	-	TBD	-
10-Year	-	-	-	-	TBD	-
20-Year	-	-	-	Expand Westside LS firm capacity to 4,400 gpm <b>\$1.27 Million</b>	TBD	<b>\$1.27 Million</b>
Total 20-Year Investment = \$10.02 Million						

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## COLORADO LS LOADING SCENARIO 3



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## COLORADO LS LOADING SCENARIO 3

1. 2,100 – 2,300 gpm capacity to serve 20-year build-out
2. Pump replacement required at Westside LS in year 5

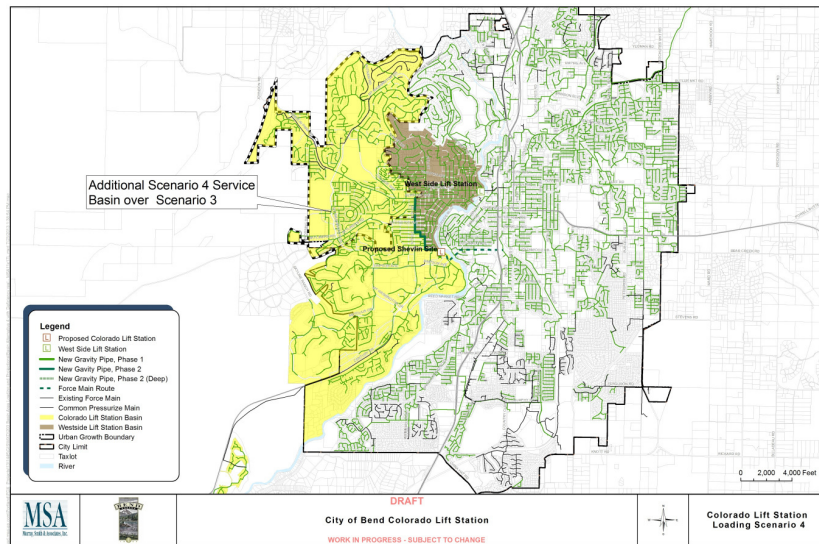
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## COLORADO LS LOADING SCENARIO 3

Flow Loading	Description of Required Improvements					Total Cost
	Colorado Lift Station	Upstream Gravity	Force Main	Westside Lift Station	Downstream Gravity	
Existing	Build Colorado LS with firm capacity of 2,300 gpm \$ 5.60 Million	Build 1,800 LF 18" \$960k	Build 5,500 LF of twin 10" and use one \$ 4.00 Million	-	TBD	\$10.56 Million
5-year	-	Build 3,700 LF 8" (phase 2) \$2.40 Million	Start using second 10"	Replace pumps 3 and 4 to increase firm capacity to 3,900 gpm \$400,000	TBD	\$2.80 Million
10-Year	-	-	-	-	TBD	-
20-Year	-	-	-	-	TBD	-
Total 20-Year Investment = \$13.36 Million						

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## COLORADO LS LOADING SCENARIO 4



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## COLORADO LS LOADING SCENARIO 4

1. 3,500 - 4,000 gpm capacity to serve 20-year build-out
2. No pump replacement required at Westside LS to serve 20-year build-out

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## COLORADO LS LOADING SCENARIO 4

Flow Loading	Description of Required Improvements					Total Cost
	Colorado Lift Station	Upstream Gravity	Force Main	Westside Lift Station	Downstream Gravity	
Existing	Build Colorado LS with firm capacity of 1,800 gpm <b>\$ 7.40 Million</b>	Build 1,400 LF 24" <b>\$ 1.23 Million</b>	Build 5,500 LF of twin 12" and use one <b>\$ 4.90 Million</b>	-	TBD	<b>\$13.53 Million</b>
5-year	Add pump 4 to increase firm capacity to 4,000 gpm <b>\$150k</b>	Build 5,300 LF 18" (phase 2 ) <b>\$ 5.62 Million</b>	Start using second 12"	-	TBD	<b>\$5.77 Million</b>
10-Year	-	-	-	-	TBD	
20-Year	-	-	-	-	TBD	
<b>Total 20-Year Investment = \$19.30 Million</b>						

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## COLORADO LS LOADING SCENARIO 5

1. Hybrid option that can be used to select Loading Scenario 3 initially and provide flexibility to select Loading Scenario 4 with future investment.
2. 3,500 - 4,000 gpm capacity to serve 20-year build-out
3. No pump replacement required at Westside LS to serve 20-year build-out

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## COLORADO LS LOADING SCENARIO 5

Flow Loading	Description of Required Improvements					Total Cost
	Colorado Lift Station	Upstream Gravity	Force Main	Westside Lift Station	Downstream Gravity	
Existing	Build Colorado LS with firm capacity of 2,300 gpm \$ 5.60 Million	Build 1,400 LF 24" \$ 1.23 Million	Build 5,500 LF of twin 12" and use one \$ 4.90 Million	-	TBD	\$11.73 Million
5-year	-	Build 5,300 LF 18" (phase 2 ) \$5.62 Million	-	-	TBD	\$5.62 Million
10-Year	-	-	Start using second 12"	-	TBD	-
20-Year	Add pumps 4 and 5 to increase firm capacity to 4,000 gpm \$1.95 Million	-	-	-	TBD	\$1.95 Million
Total 20-Year Investment = \$19.30 Million						

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## COLORADO LS LOADING SCENARIO SUMMARY

1. All scenarios address need to serve development over the next 5 years while providing different levels of service for the next 20-years (industry standard for lift station design).
2. Timeline for design and construction of 1<sup>st</sup> phase of all loading scenarios is the same.
3. Higher cost options decrease flow to and amount of expansion needed at Westside LS.
4. Higher cost options increase flexibility for City to deal with variability in timing and location of future flows.
5. Design will be checked against 1<sup>st</sup> run Optimization results in the late fall

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Flow Loading Scenario	Colorado LS Design Capacity (gpm)	Required Improvements at Westside LS	Flexibility for Changes in Future Flow Projections	Investment
1	1,200	Upgrades needed immediately Additional major upgrades needed by year 10	None	Initial: \$6.8 Million Year 5: \$0 Year 10: \$1.8 Million Year 20: \$0 <b>Total \$8.6 Million</b>
2	2,000	Upgrades needed by year 5 Additional major upgrades needed by year 20	Low	Initial: \$8.7 Million Year 5: \$0 Year 10: \$0 Year 20: \$1.3 Million <b>Total \$10.0 Million</b>
3	2,300	Upgrades needed by year 5	Medium	Initial: \$10.6 Million Year 5: \$2.8 Million Year 10: \$0 Year 20: \$0 <b>Total \$13.36 Million</b>
4	4,000	None	High – Provides Complete Redundancy for Westside LS	Initial: \$13.5 Million Year 5: \$5.8 Million Year 10: \$0 Year 20: \$0 <b>Total \$19.30 Million</b>
5	4,000	None	High – Combination of Scenario 3 and 4	Initial: \$11.7 Million Year 5: \$5.6 Million Year 10: \$0 Year 20: \$2.0 <b>Total \$19.3 Million</b>



## Straw Poll

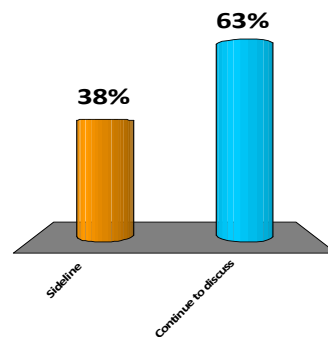


**MSA** Murray, Smith & Associates, Inc.  
Engineers/Planners

## What should we do with scenario 1: sideline or continue to discuss?

Capacity (gpm)	Required Improvements at Westside LS	Flexibility	Total 20-Year Investment
1,200	<ul style="list-style-type: none"> <li>Upgrades needed immediately</li> <li>Additional major upgrades needed by year 10</li> </ul>	None	\$8.6 Million

1. Sideline
2. Continue to discuss

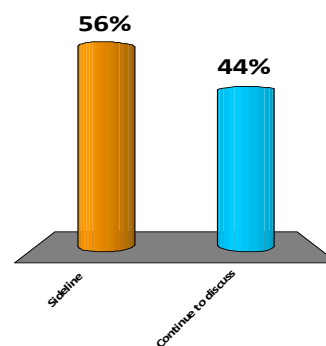


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## What should we do with scenario 2: sideline or continue to discuss?

Capacity (gpm)	Required Improvements at Westside LS	Flexibility	Total 20-Year Investment
2,000	<ul style="list-style-type: none"> <li>Upgrades needed by year 5</li> <li>Additional major upgrades needed by year 20</li> </ul>	Low	\$10.0 Million

1. Sideline
2. Continue to discuss

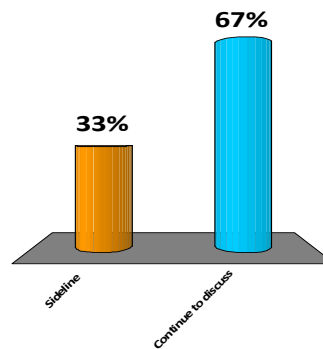


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## What should we do with scenario 3: sideline or continue to discuss?

Capacity (gpm)	Required Improvements at Westside LS	Flexibility	Total 20-Year Investment
2,300	Upgrades needed by year 5	<ul style="list-style-type: none"> <li>• Medium</li> <li>• High if combined with Scenario 4</li> </ul>	\$13.4 Million

1. Sideline
2. Continue to discuss

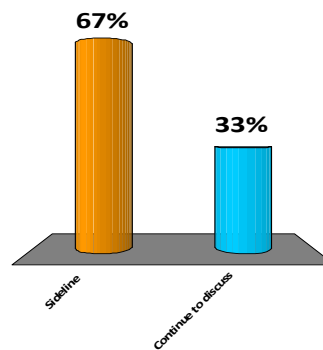


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## What should we do with scenario 4: sideline or continue to discuss?

Capacity (gpm)	Required Improvements at Westside LS	Flexibility	Total 20-Year Investment
4,000	None	High – Can be phased with Scenario 3	\$19.3 Million

1. Sideline
2. Continue to discuss

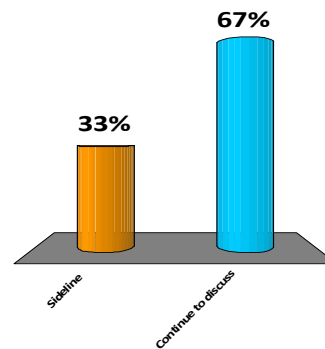


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## What should we do with scenario 5: sideline or continue to discuss?

Capacity (gpm)	Required Improvements at Westside LS	Flexibility	Total 20-Year Investment
4,000	None	High – Combination of Scenario 3 and 4	\$19.3 Million

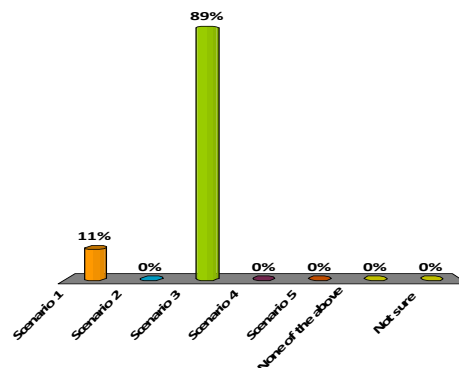
1. Sideline
2. Continue to discuss



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## Which scenario do you think should be selected for design?

1. Scenario 1
2. Scenario 2
3. Scenario 3
4. Scenario 4
5. Scenario 5
6. None of the above
7. Not sure



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## Your recommendation...

SIAG: Colorado Lift Station

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### COLORADO LS NEXT STEPS

1. Concept design in August to determine lift station location and type and force main alignment
  1. Cost
  2. Availability of land/ROW
  3. Impact to adjacent property owners
  4. River crossing construction methods
  5. Pipe type
  6. Lift station type (e.g. submersible pumps, wetwell/drywell)
2. Preliminary Design September-November 2013
3. Final design Winter 2013 - Spring 2014
4. Construction Summer 2014 – Summer 2015

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<b>Sewer Infrastructure Advisory Group Meeting Summary</b>	<b>July 25, 2013</b>
	<b>3:30-5:30 p.m.</b>
	<b>City Council Chambers</b>
	<b>Note taker: Jennifer Engels</b>
<p><b>Committee Members:</b>, Steve Hultberg, Rob von Rohr, Craig Horrell, Sharon Smith, Dale VanValkenberg, Stacey Stemach, Mike Riley, John Rexford, Nathan Boddie</p> <p><b>COB Staff:</b> Paul Rheault, Jon Skidmore, Aaron Collett, Russ Grayson, Brian Rankin, Jeff England, Tom Hickmann (via phone), Eric King, Reese Moody,</p> <p><b>Consultants:</b> David Stangel (MSA), David Prull (Clearwater Engineering Group), Jim Helton (MSA), Dennis Galinato (MSA)</p> <p><b>Facilitator:</b> Clark Worth (Barney &amp; Worth)</p> <p><b>Others:</b> Jim Lord, Erik Huffman, Councilor Knight, John Russell, Ken Roadman,</p>	

#### **Action Items:**

- SIAG recommended proceeding with design on Option 3 (Colorado Lift Station flow loading 2,300) with the assurance design not go too far without the initial Optimatics results which will inform the final design.

### **Meeting Summary**

#### **Public Comment**

Ken Roadman informed SIAG of the odor issues in his neighborhood and asked SIAG to consider including a solution to his neighborhood's issue in the Master Plan.

#### **Colorado Lift Station**

Jim Helton, MSA, presented information on sizing options for the Colorado Lift Station.

	Design Capacity (gpm)
Option1	1,200
Option 2	2,000
Option 3	2,300
Option 4	4,000
Option 5	4,000

All of the scenarios:

- Address need to serve development over the next 5 years while providing different levels of service for the next 20 years
- Timeline for design and construction of 1<sup>st</sup> phase of all loading scenarios is the same
- Higher cost options decrease flow to and amount of expansion needed at Westside lift station
- Higher cost options increase flexibility for City to deal with variability in timing and location of future flows
- Design will be checked against 1<sup>st</sup> run optimization results in late fall

The SIAG conducted a straw poll: Sideline or continue to discuss the scenario?:

<b>Scenario 1</b>	<b>63% continue</b> 38% sideline
Scenario 2	44% continue <b>56% sideline</b>
<b>Scenario 3</b>	<b>67% continue</b> 33% sideline
Scenario 4	33% continue <b>67% sideline</b>
<b>Scenario 5</b>	<b>67% continue</b> 33% sideline

What scenarios do the SIAG think should be selected for design (first poll)?

Option 1	11%
Option 2	11%
<b>Option 3</b>	<b>33%</b>
Option 4	0%
<b>Option 5</b>	<b>44%</b>
None	0%
Not sure	0%

What scenarios do the SIAG think should be selected for design (second poll)?

Option 1	11%
Option 2	0%
<b>Option 3</b>	<b>89%</b>
Option 4	0%
Option 5	0%
None	0%
Not sure	0%

SIAG recommended proceeding with design on Option 3 (Colorado Lift Station flow loading 2,300) with the assurance design not go too far without the initial Optimatics results which will inform the final design.

#### **Next Steps**

- Mike Riley said Gary Fish offered to host the September SIAG meeting at the brewery.
- Eric asked for members to work with him on Council work session presentation. Sharon Smith, Dale Van Valkenburg, and Steve Hultberg offered to help.

Meeting adjourned: 5:37 PM



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# Bend Sewer Infrastructure Advisory Group: Meeting #14

## Financing Master Plan Improvements

Bend City Council Chambers  
710 NW Wall Street, 1st Floor

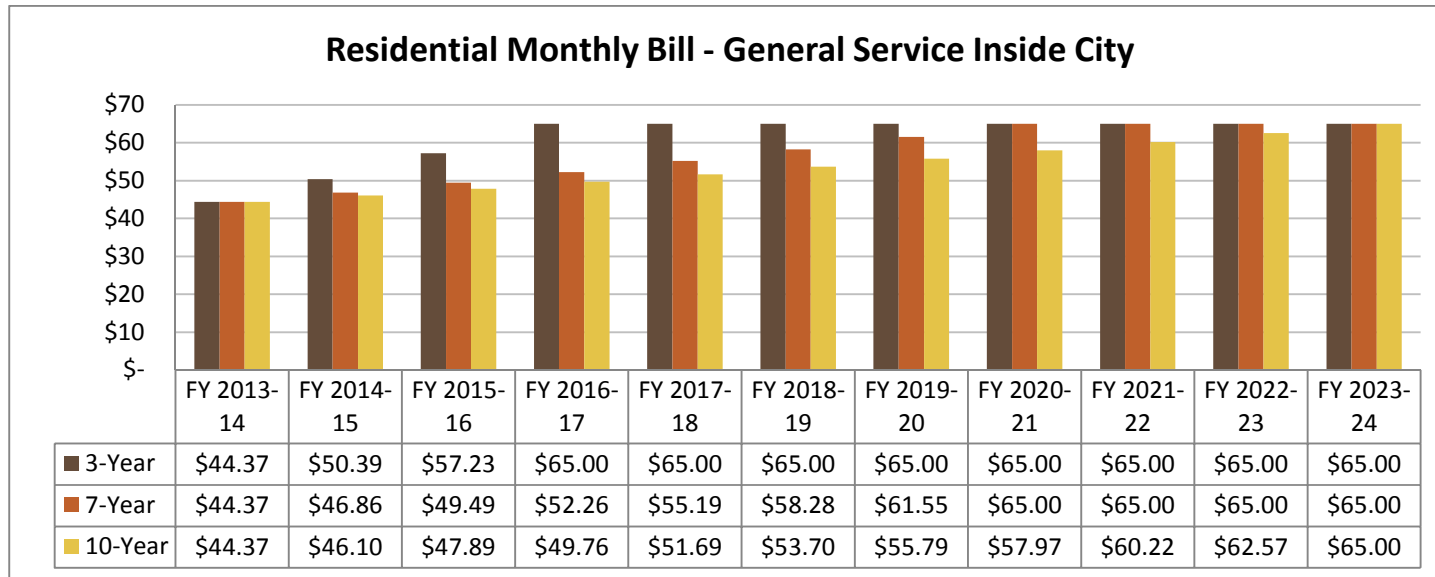
September 12, 2013  
3:30-5:30 p.m.

### Agenda

Activity / Topic	Presenter	Time
1. <b>Welcome / Introductions / Approve Meeting Notes</b>	Jon Skidmore	3:30 p.m.
2. <b>Review Meeting Agenda / Goals</b> <ul style="list-style-type: none"><li>Review Bend's current financial position</li><li>Review alternative funding methods</li><li>Provide SIAG a "preview" of funding available at \$65.00 rate benchmark</li></ul>	Libby Barg	3:35
3. <b>Bend's Current Financial Position</b>	Sonia Andrews	3:40
4. <b>Funding Alternatives</b> <ul style="list-style-type: none"><li>&gt; Traditional / non-traditional funding methods: advantages &amp; disadvantages</li><li>&gt; Peer community examples</li><li>&gt; The role of System Development Charges (SDCs) in paying for needed investments</li></ul> <b>Objective:</b> <ul style="list-style-type: none"><li>What funding strategies are viable for Bend?</li></ul>	John Ghilarducci	3:55
5. <b>Rate Scenarios</b> <ul style="list-style-type: none"><li>&gt; Overview of sewer rate setting</li><li>&gt; Discuss funding available at \$65 benchmark<ul style="list-style-type: none"><li>Alternative rate increases: 3-, 7-, 10-year phase-in</li></ul></li></ul> <b>Objective:</b> <ul style="list-style-type: none"><li>Information / Discussion</li></ul>	Angie Sanchez	4:40
6. <b>Public Comment</b>		5:20
7. <b>Next Steps</b> <ul style="list-style-type: none"><li>Upcoming SIAG Meetings</li></ul> <div>Nov 14 / 21      Initial Optimization Results</div> <div>Jan 9, 2014      Review Intermediate Results</div>	Libby Barg	5:25
<b>Adjourn / Thank You</b>	Jon Skidmore	5:30 p.m.



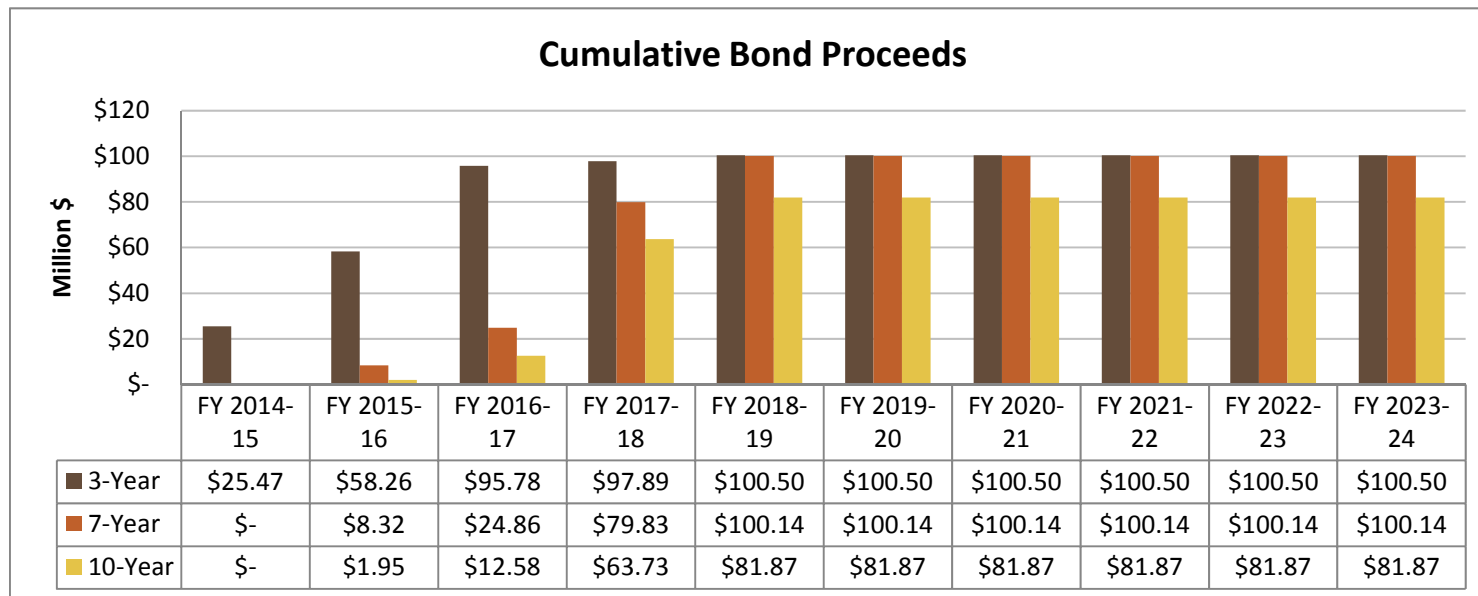
# Monthly Rate Comparison



- 3-year scenario – \$65 by FY 2017; 13.57%/year
- 7-year scenario - \$65 by FY 2021 ; 5.61%/year
- 10-year scenario - \$65 by FY 2024; 3.89%/year
- Rate changes begin in FY 2015



# Bond Proceeds

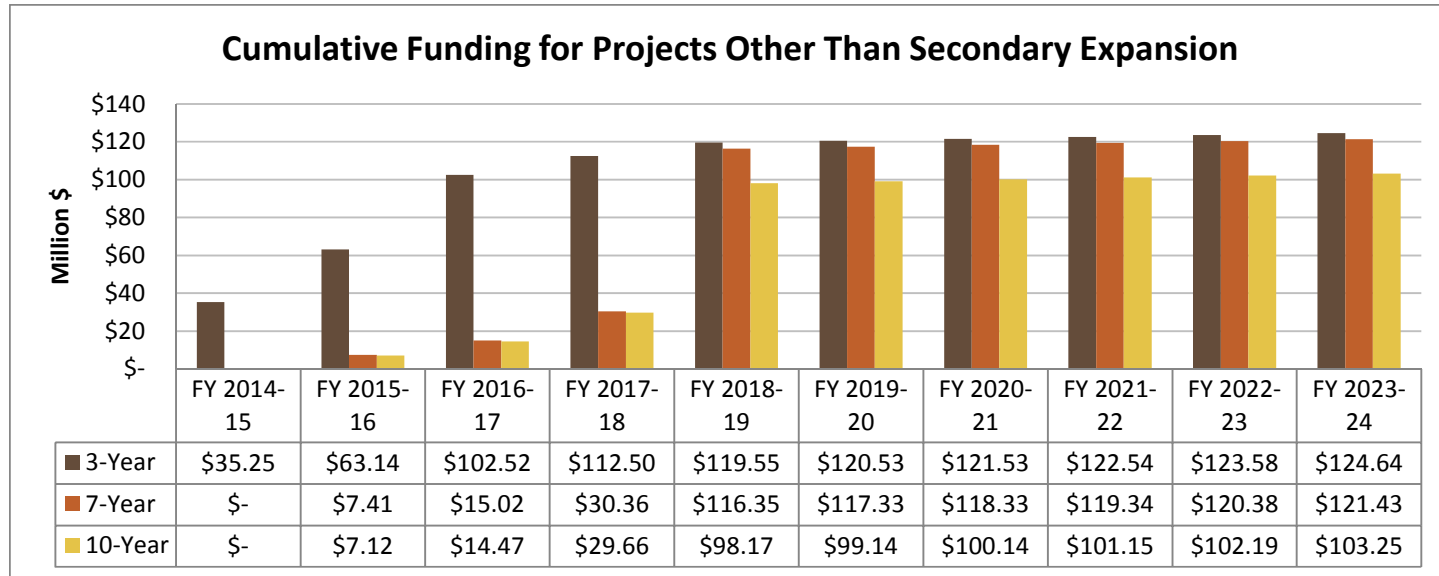


- 3-year scenario – \$100.5 million
- 7-year scenario - \$100.1 million
- 10-year scenario - \$81.9 million
- Bonds issued in first five years



# Capital Funding Capacity

(includes all sources)



- 3-year scenario – \$124.6 million
- 7-year scenario - \$121.4 million
- 10-year scenario - \$103.2 million
- Excludes Secondary treatment expansion project

## Snapshot of UT Bill as Percent of Median Household Income - FY13/14

	Average Monthly Sewer Bill	Median Household Inc (1)	Ave Annual Sewer Bill as % of MHI	Total UT Bill as % of MHI
Newberg	\$ 74.98	\$ 53,426	1.7%	2.7%
Portland	69.60	47,033	1.8%	3.0%
Woodburn	64.47	41,736	1.9%	2.6%
Wilsonville	66.33	55,316	1.4%	2.5%
Lake Oswego	62.55	78,760	1.0%	1.9%
Klamath Falls	61.84	28,771	2.6%	3.3%
McMinnville	56.77	40,946	1.7%	2.4%
Clean Water Services (Washington County)	39.86	62,488	0.8%	1.6%
Average	\$ 62.05	\$ 51,060	1.6%	2.5%

Bend (current sewer rate	\$ 44.37	\$ 46,459	1.1%	2.0%
Bend (assumed rate)	\$ 65.00	\$ 46,459	1.7%	2.5%

### Sources:

(1) 2011 American Community Survey (U.S. Census Bureau)

# SNAPSHOT OF FY 13-14 MONTHLY UTILITY BILL

Cities > 20,000 Population	Water Charge (using 800ccf or 6000 gallons)	Sewer Charge (using 800 ccf or 6000 gallons)	Stormwater Charge	TUF/Public Safety UT Fee	Total Monthly Bill
Portland	37.57	69.60	24.54	0.52	132.23
Lake Oswego	41.49	62.55	10.99	8.01	123.04
Newberg	36.46	74.98	6.22	4.50	122.16
Wilsonville	36.59	66.33	5.10	7.05	115.07
Tigard	50.73	38.46 (1)	8.25	5.56	103.00
Milwaukie	27.96	53.43	11.44	3.35	96.18
Albany	44.69	51.06	-	-	95.75
Oregon City	32.41	38.45	8.55	11.56	90.97
Woodburn	25.66	64.47			90.13
Ashland	37.85	36.18	4.29	8.17	86.49
Springfield	22.08	50.26	12.62	-	84.96
Beaverton	33.16	40.46 (1)	8.25	-	81.87
McMinnville	25.06	56.77			81.83
Gresham	37.63	26.30	9.84	7.50	81.27
West Linn	19.70	32.84	5.31	22.11	79.96
*Forest Grove	29.19	42.20 (1)	7.00		78.39
Klamath Falls	16.50	61.84	-	-	78.34
*Eugene	28.55	37.39	11.39		77.33
Salem	24.75	46.49	3.72	1.25	76.21
<b>Bend (w/o franchis</b>	<b>27.69</b>	<b>44.37</b>	<b>4.00</b>		<b>76.06</b>
Tualatin	26.02	39.73 (1)	5.86	3.92	75.53
Corvallis	25.37	36.14	5.86	6.63	74.00
Hillsboro	24.12	38.46 (1)	6.25	3.18	72.01
Redmond	26.62	35.60	7.06	0.83	70.11
Keizer	14.20	39.44	4.44		58.08
Roseburg	26.54	25.00	5.00	-	56.54
Grants Pass	19.98	29.33	-	3.37	52.68
*Medford	11.80	16.92	6.85	13.80	49.37

\* Bill \$/1,000 gal

Notes:

(1) Served by Clean Water Services






# City of Bend

Sewer Infrastructure Advisory Group Meeting #14

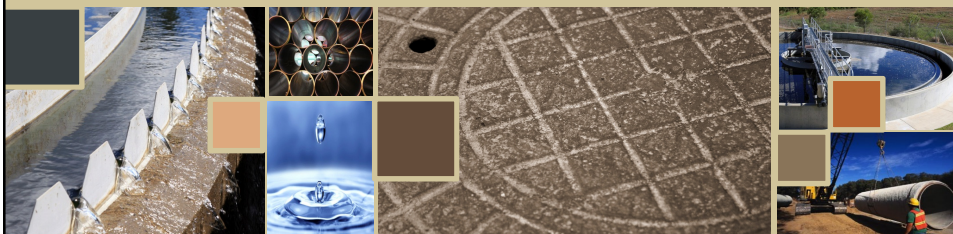
## Financing Master Plan Improvements

September 12, 2013



# City of Bend's Current Financial Position

Presented by: Sonia Andrews, City of Bend Chief Financial Officer



## Current Sewer System Financial Position

FY13-14 Monthly Sewer Rates & SDCs	Sewer Revenues	Operating Exp & Existing Debt Payments	Net Available for Capital, Future Debt and Reserves
Flat rate \$44.37	Operating \$18.5M		
Nonresidential also pays \$0.348/cuft if >1000cuft of winter ave water use	SDCs \$2M	(\$14M)	\$6.5M
Sewer SDC \$2,905 /EDU			

### Current rates can afford the following over the next 5 yrs:

(based on current water consumption and interest rate environment )

- Debt service on \$38.8M DEQ loans for Treatment Expansion
- Additional \$18M in new debt + \$26M in cash = \$44M over next 5 years

## What can Bend Afford


- Depends on
  - How high can we raise rates
  - How much can we raise rates each year
  - Customer growth
- Rates & growth → determines revenues that can be generated → determines how much debt we can issue
- Non-rate funding options



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Solutions-Oriented Consulting

## Funding Alternatives

Presented by: John Ghilarducci, FCS GROUP

## Funding Options

- Pay-as-you-go (cash funding)
  - Rates
  - System Development Charges
- Debt
  - General obligation bond financing
  - Revenue bond financing
  - Full faith and credit financing
  - Special programs
  - Local Improvement Districts

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## Rates

- Description: Adjust rates to meet scheduled capital expenditures on a periodic or annual basis.

Advantages	Disadvantages
Ensures that existing users are keeping system up to date	Causes rate volatility from year to year to match capital expenditure schedule
Allows for greater flexibility in capital funding approaches	Burdens existing ratepayers with the full cost of improvements that will serve future users



## System Development Charges

- Description: One-time fees paid at the time of development by new development

Advantages	Disadvantages
"Growth pays for growth"	Annual Cash flow is volatile due to reliance on growth
Existing ratepayers are protected from costs of growth-related system capacity	Cost recovery occurs over time; timing may not match scheduled needs
	Cannot generally be used to secure debt
	Use of Improvement fee proceeds restricted to "growth-related" project costs



## General Obligation Bond Financing

- Description: Pledges the full, faith and credit of the jurisdiction (taxing power) for debt repayment.

Advantages	Disadvantages
Good terms available	Requires public vote
Does not burden full-time residents / ratepayers with costs of projects that serve full <i>and part time</i> residents / ratepayers	Property value may not correlate with wastewater system needs/impacts
Broadens base of payers	Not all are served by wastewater system
Spreads repayment over years, consistent with users	



## Revenue Bond Financing

- Description: Pledges utility rate revenue to debt repayment.

Advantages	Disadvantages
Spreads repayment over years, consistent with users	Terms not as favorable as general obligation bonds
Can be done by Council action	Requires debt service coverage – rates in excess of payment amounts
	Burdens rate payers with cost of projects that serve others



## Full Faith and Credit Financing

- Description: Bonds that are not secured by a specific, pledged revenue stream

Advantages	Disadvantages
No debt service coverage requirements	Bondholders have an unsecured claim on all revenue streams
Spreads repayment over years, consistent with users	Increase general fund debt burden
Can be repaid by rate revenues, backstopped by tax revenue	



## Special Programs

- Examples:
  - Department of Environmental Quality (DEQ)
    - Clean Water State Revolving fund (CWSRF)
  - Oregon Infrastructure Finance Authority (IFA)
    - Special Public Works Fund (SPWF)
    - Water/Wastewater Financing Program
      - Possible \$750,000 grant based on median household income

Advantages	Disadvantages
Spreads repayment over years, consistent with users	Highly competitive to acquire
Favorable terms	Link to specific project(s)
	May require general fund backing



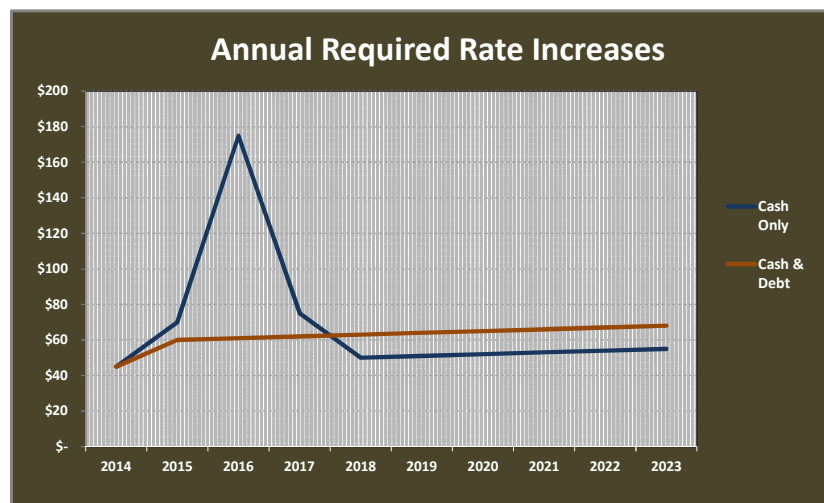
## Local Improvement Districts

- Description: Benefiting properties pay for project debt service through assessments

Advantages	Disadvantages
Spreads repayment over years, consistent with users	Better suited for projects that benefit small, well-defined geographic areas
Can be done by Council action	Terms not as favorable as general obligation bonds
	May require debt service coverage - rates in excess of payment amount
	Amount of assessment limited to increase in AV due to improvement
	Administratively burdensome



## Debt v. Cash Funding Comparison





## Debt Funding Capital

- Useful when cash funding capital will overburden rate payers
  - Keeps near-term rates lower
  - Provides resources to catch up when cash investments in infrastructure have not been made
- Can be used in conjunction with cash funding
- Debt issue should fit projects to be funded
  - Term of debt should be less than useful lives of assets
  - Ongoing R&R/projects should be cash funded
- Current debt environment positive
  - Can inform cash/debt split
- Debt service capacity
  - How much debt can the City/utility afford?



## Funding Options Evaluation

	Provides Sufficient Revenue	Equitable Cost Recovery	Easy to Administer	Politically Palatable	Reliable
Rates	●	○	●	○	●
System Development Charges	◐	●	●	◐	○
General Obligation Bonds	●	◐	◐	◐	●
Revenue Bonds	●	◐	●	◐	●
Full Faith and Credit	●	◐	●	◐	●
Special Programs	◐	◐	◐	●	○
Local Improvement Districts	◐	◐	○	◐	●




## Creative Options

- Voted G.O. bond for equity & financial benefits
  - Broader base
  - Better terms (lower rates)      - 10% of properties not on City sewer
- Combination options
  - Example: Use FF&C and repay with rates / SDCs
- Use a rate stabilization fund to access SDCs for debt repayment
- Pursue a direct appropriation
- Public / Private Partnerships
  - Private funding with reimbursement
  - Private financing



## Discussion

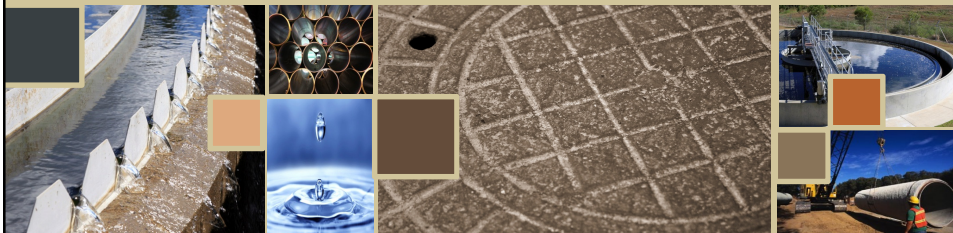

What funding strategies are viable for Bend?



**FCS GROUP**  
Solutions-Oriented Consulting

## Rate Scenarios

Presented by: Angie Sanchez, FCS GROUP

## Overview of Sewer Rate Setting

Key Rate Components	
+	Operating & Maintenance
+	Debt Service (existing & new)
+	Rate Funded Capital (routine)
=	<b>Total Revenue Requirement</b>
-	Miscellaneous Revenue
=	<b>Revenue from Rates</b>

Fund Balance	
	Beginning Balance
-	Target Balance (90 days O&M)
=	<b>Available for Capital</b>

Major Capital	
	Total Capital Projects
-	Fund Balance
-	System Development Charges
-	Grants/Other Contributions
=	<b>Debt Funding (loans/bonds)</b>

*All scenarios must satisfy cash flow needs, fund balance requirements and debt service coverage targets*

**FCS GROUP**  
Solutions-Oriented Consulting

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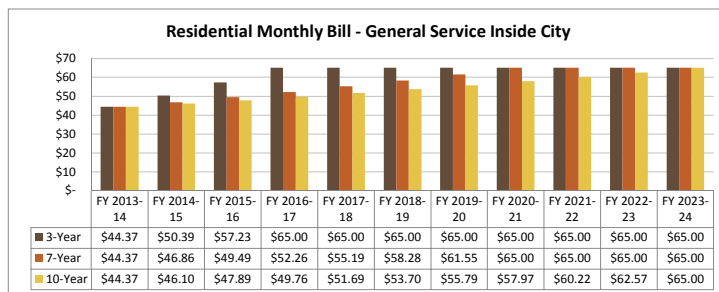


## Rate Scenarios

- Current residential monthly rate \$44.37
- Three \$65 baseline rate scenarios evaluated
  - 3 year rate phase-in by FY 2017
  - 7 year rate phase-in by FY 2021
  - 10 year rate phase-in by FY 2024
- Major assumptions
  - No significant change in growth/consumption
  - Average annual O&M escalation 3.0%
  - Bonds 20 year term, 4.25% interest rate

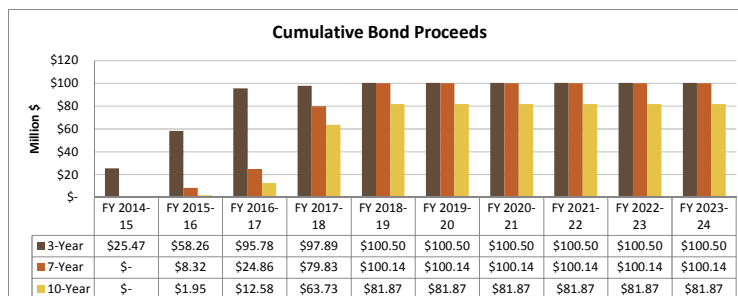


## Monthly Rate Comparison



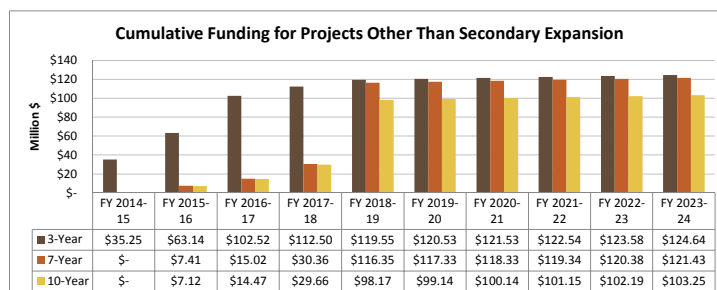
- 3-year scenario – \$65 by FY 2017; 13.57%/year
- 7-year scenario - \$65 by FY 2021 ; 5.61%/year
- 10-year scenario - \$65 by FY 2024; 3.89%/year
- Rate changes begin in FY 2015

## Bond Proceeds



- 3-year scenario – \$100.5 million
- 7-year scenario - \$100.1 million
- 10-year scenario - \$81.9 million
- Bonds issued in first five years

## Capital Funding Capacity (includes all sources)




- 3-year scenario – \$124.6 million
- 7-year scenario - \$121.4 million
- 10-year scenario - \$103.2 million
- Excludes Secondary treatment expansion project



## Summary

- Current \$44.37 rate can support \$44 million in additional capital over next **5** years
- \$65 example rate can support \$100 - \$125 million additional capital funding over next 10 years
- Final rate and funding strategy will be developed when optimization process complete



## Questions / Discussion

City of Bend  
Capital Improvement Program

No	Description	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	TOTAL
<b>Project Financed by DEQ Loans</b>							
1	SW0802 - Secondary Expansion	18,950,000	17,000,000	2,400,000	-	-	38,350,000
<b>Other Projects</b>							
1	SW0806 - SCADA Update/Telemetry	204,000	208,080	212,242	216,486	220,816	1,061,624
2	SW10AA - Existing Plant Interceptor Assessment(Yeoman)	183,700	-	-	-	-	183,700
3	SW11BA - Valhalla Relocation	1,615,800	-	-	-	-	1,615,800
4	SW11CA - Sewer Flow Modeling	-	-	106,121	108,243	110,408	324,772
5	SW11EA - Collection Line Rehabilitation	561,000	572,220	583,664	595,338	607,244	2,919,467
		2,564,500	780,300	902,027	920,067	938,469	6,105,363
6	SW12AA - Collection System Master Plan	923,700	731,600	-	-	-	1,655,300
7	SW13EA - Colorado Lift Station	956,700	3,100,300	399,500	-	-	4,456,500
8	SW13CA - North Area Gravity	1,387,300	3,421,900	190,400	-	-	4,999,600
9	SW13DA - North Area Forcemain	295,500	669,800	54,900	-	-	1,020,200
10	SW0707- SE Interceptor	9,050,000	9,050,000	9,050,000	9,050,000	9,050,000	45,250,000
		12,613,200	16,973,600	9,694,800	9,050,000	9,050,000	57,381,600
Total Other Projects							63,486,963
<b>TOTAL CIP</b>							<b>101,836,963</b>

<b>Funding for Other Projects (At Current Rates with \$18M in New Debt):</b>							
<b>Total Funding Available for Other Projects</b>		15,177,700	7,007,779	7,171,124	7,341,069	7,517,880	44,215,552

<b>Sewer Infrastructure Advisory Group Meeting Summary</b>	<b>September 12, 2013</b>
	<b>3:30-5:30 p.m.</b>
	<b>City Council Chambers</b>
	<b>Note taker: Adele McAfee</b>
<p><b>Committee Members:</b>, Lynn Putnam, Pam Hardy, Mike Riley, John Rexford, Craig Horrell, Sharon Smith, Steve Hultberg, Dale VanValkenberg, Casey Roats, Steve Galash, Charlie Miller, Wes Price</p> <p><b>COB Staff:</b> Paul Rheault, Jon Skidmore, Aaron Collett, Russ Grayson, Brian Rankin, Jeff England, Tom Hickmann, Sonia Andrews</p> <p><b>Consultants:</b> David Stangel (MSA), Dennis Galinato (MSA), David Prull (Clearwater Engineering Group), Angie Virnoche (FCS), John Ghilarducci (FCS), Doug Gabbard (FCS)</p> <p><b>Facilitator:</b> Libby Barg (Barney &amp; Worth)</p> <p><b>Others:</b> Jim Lord, Erik Huffman, Councilor Sally Russell</p>	

#### **Action Items:**

- Approval of meeting minutes (5/15/13, 6/20/13, 7/11/13, 7/25/13) at the November 14, 2013 meeting

### **Meeting Summary**

#### **Introductions /Announcements**

SIAG Committee process is receiving recognition through invitations to present at national and regional conferences (Pacific Northwest Clean Water Association and US Water Alliance). Sharon Smith and Casey Rotes will participate as SIAG representatives.

A budget adjustment will be brought to the City Council September 18 for the Collection System Master Plan / Sewer Infrastructure Advisory Group process (Murray, Smith & Associates, Inc.). This will be for additional funds to complete the sensitivity analysis, continued support for the SAIG meetings, project management, an investment in long term flow monitoring, and on-call modeling services.

#### **Bend's Current Financial Position**

Sonia Andrews, City of Bend Finance Director gave a presentation on Bend's current finances. Handouts included:

- Snapshot of FY13-14 monthly utility bill
- Snapshot of utility bill as percent of median household income
- FY13-14, Capital Improvement Program spreadsheet

#### **Funding Alternatives**

John Ghilarducci, FCS Group, presented funding options (see meeting presentation). He presented a chart which evaluated options against the following criteria: provides sufficient funding, equitable cost recovery, easy to administer, politically palatable, and reliability.

**Questions and comments:**

*Q: Is the city using all current SDC revenue stream to finance debt?*

A: Yes. The City is tapped out if the SDC remains where it is.

*Q: Do SDC cover 100% cost of the anticipated cost of development for sewer?*

The amount of SDC the City is collecting is less than the SDC eligible costs. When the CSMP is complete staff will work to update SDCs to identify which costs will be related to growth.

*Q: When was the last time the sewer SDCs were updated?*

2008. This was based on the 2005 CIP.

*Q: Have we considered something completely out of the box? (For example going after private money.)*

A: Private investors usually want a guarantee from 8% to 20%. The city can issue bonds at 4%. It is hard to get private financing with terms as good as issuing bonds. Ms. Andrews said we will look at this.

Mr. Roats stated it will take significant investment to support the proposed solution because the City is catching up on the infrastructure needs.

Committee members agree when looking at the affordability of various sewer solutions, both water and sewer rates should be considered.

**Committee members' comments on funding options:**

- Leaning towards rates in a pay-as-go scenario because it is stable. If the rates increases are significant, then there should be a mixture of two alternatives.
- A mix of funding scenarios should be used to pay for projects, as well as create a reasonable reserve.
- Don't repeat the situation the city is currently in, with not enough resources to address issues.
- Mix of rates, bonds and SDCs and pay-as-you-go.
- Must be sensitive to the affordability for citizens.
- Full faith credit and revenue bonds have a time limit vs. a rate increase.
- Have a specifically identified rate surcharge identified on the bill (like the Stormwater charge). It makes it easy for a future city council to adjust once debts are paid. They can keep it to fund reserves for example.
- Pay-as-you-go is too volatile. Adequate reserves are needed.

**Rate scenarios**

Angie Virnoche, FCS Group gave an overview of sewer rate setting process (see meeting presentation).

**Next Meeting****Optimization Results**

- Nov 14 3:30 to 6:30 p.m.
- Nov 21 3:30 to 5:30 p.m.

Meeting adjourned at 5:21PM



# **Bend Sewer Infrastructure Advisory Group: Meetings #14 & #15**

## **Review Initial Optimization Results**

Bend Parks and Recreation, Riverbend Community Room  
799 SW Columbia Street

November 14, 2013  
**3:30-6:30 p.m.**

Bend City Council Chambers  
710 NW Wall Street, 1st Floor

November 21, 2013  
**3:30-5:30 p.m.**

## **Agenda Outlines**

<b>November 14-Part One</b>	<b>Presenter</b>	<b>Time (3 hrs.)</b>
1. Welcome	Jon Skidmore	10 min
2. Introduction	Tom Hickmann, P.E. / Libby Barg	15
3. Initial Optimization Results-Overview	David Stangel, P.E. / Joel Wilson, CPEng	40
4. Roundtable Discussion	What are your impressions of the initial results? What questions do you have for optimization?	55
Dinner Break		10
5. Report Back to the Group	Libby Barg	25
6. Summary Points	Libby Barg	10
7. Next Steps	David Stangel, P.E.	10
8. Public Comment		5 min

<b>November 21-Part Two</b>	<b>Presenter</b>	<b>Time (2 hrs.)</b>
1. Welcome	Jon Skidmore	10 min
2. Recap Nov 14 Questions	Libby Barg	5
3. Initial Optimization Results: Answers & Discussion	Tom Hickmann, P.E. / David Stangel, P.E.	45
4. Project Updates <ul style="list-style-type: none"><li>- UGB Expansion</li><li>- SE Interceptor; Colorado LS; North Area RFP</li></ul>	Brian Rankin Tom Hickmann, P.E.	30
5. Community Outreach Materials	Libby Barg	15
6. Next Steps	David Stangel, P.E.	10
7. Public Comment		5 min

For more information, visit the Bend Sewer Infrastructure Advisory Group webpage:  
**[Bendoregon.gov/siag](http://Bendoregon.gov/siag)**

# INITIAL OPTIMIZATION RESULTS BEND OPTIMIZED COLLECTION SYSTEM PLAN

## Presenters:

Tom Hickmann  
David Stangel  
Joel Wilson

DRAFT RESULTS – SUBJECT TO CHANGE

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

## AGENDA

- ◆ Welcome/Introduction
- ◆ Initial Optimization Results – Overview (40 min)
- ◆ Roundtable Discussion/Dinner Break (60 min)
- ◆ Report Back to Group (30 min)
- ◆ Discussion Summary (10 min)
- ◆ Next Steps (10 min)
- ◆ Public Comment (5 min)

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## PRESENTATION CONTENTS

- ◆ Headlines!
- ◆ 2033 Deficiencies
- ◆ Alternatives
- ◆ Summary of Results
- ◆ Initial Optimization Solutions
- ◆ High Level Takeaways
- ◆ Next Steps

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## THE HEADLINES

1. Good news about initial capital costs—more about this later...
2. The SE Interceptor is selected in every optimization run—it's the right solution
3. The Colorado Lift Station is selected every time—it's the right solution
4. North area results: options for consideration
5. But there is more work to be done...



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## LOOKING BACK—SIAG DECISIONS

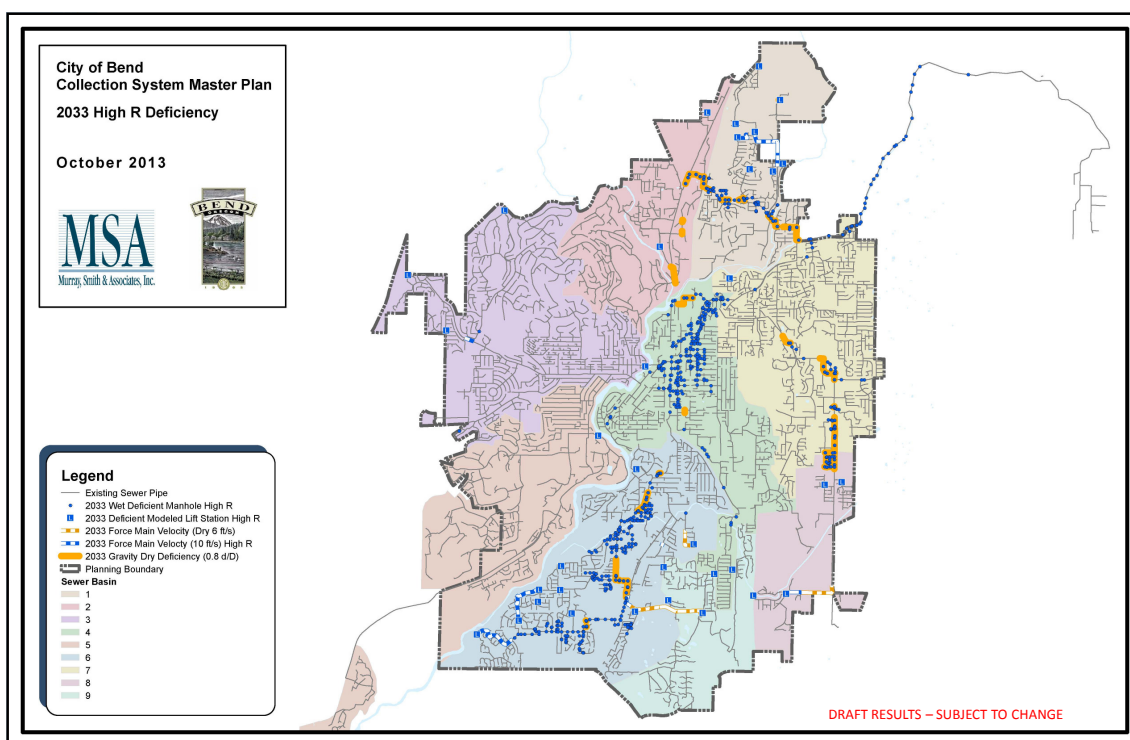
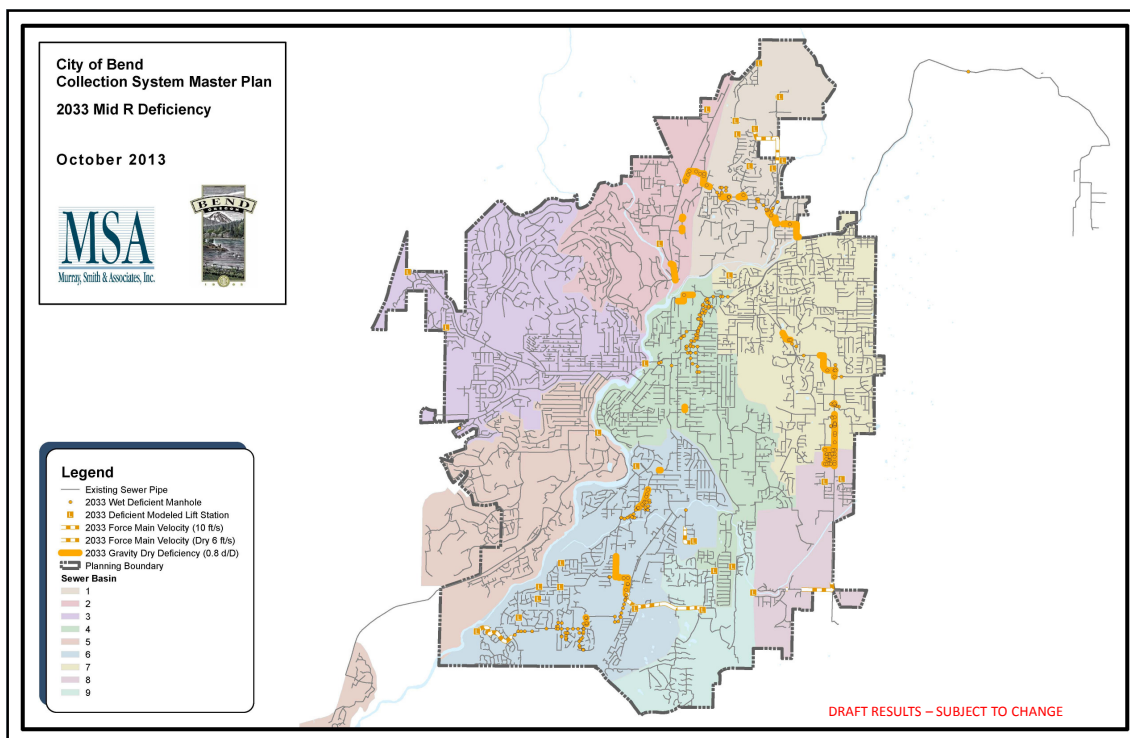
- ◆ Land use inputs:
  - Base assumptions (development densities on individual parcels, rights-of-way, parks & schools, people per household, density by General Plan designation)
  - Special areas (OSU-Cascade Campus, Central Area, and Medical District)
- ◆ Solution types: pipes, pumps, storage, satellite treatment

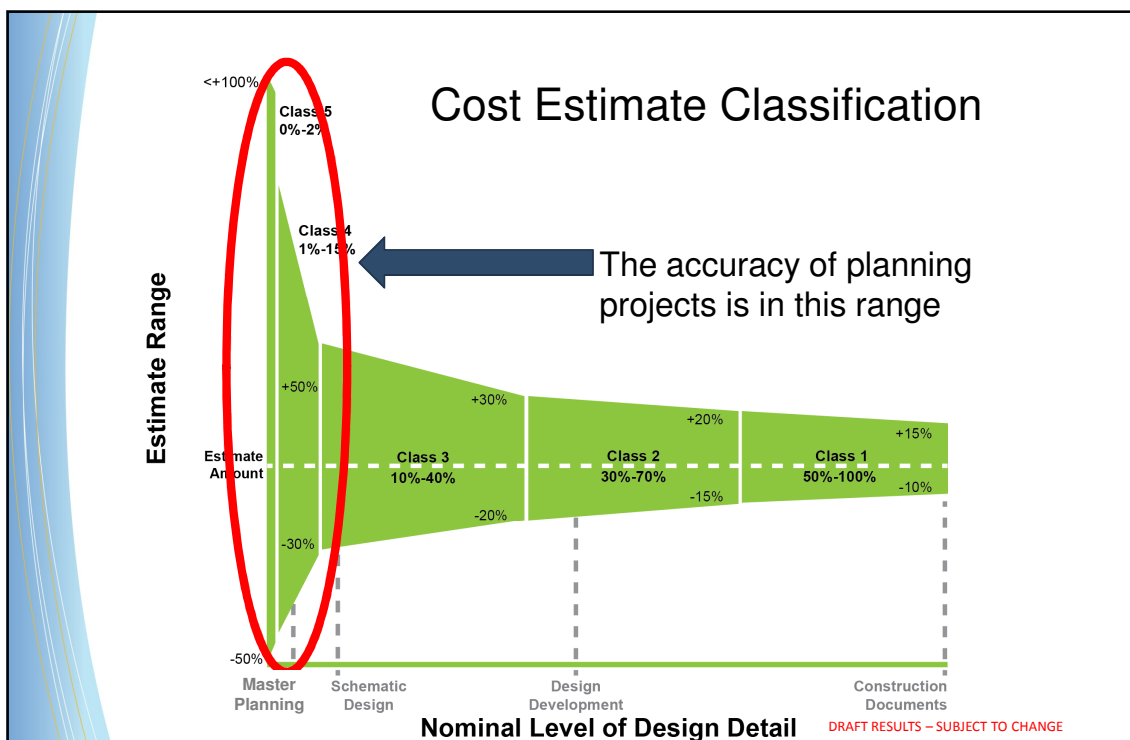
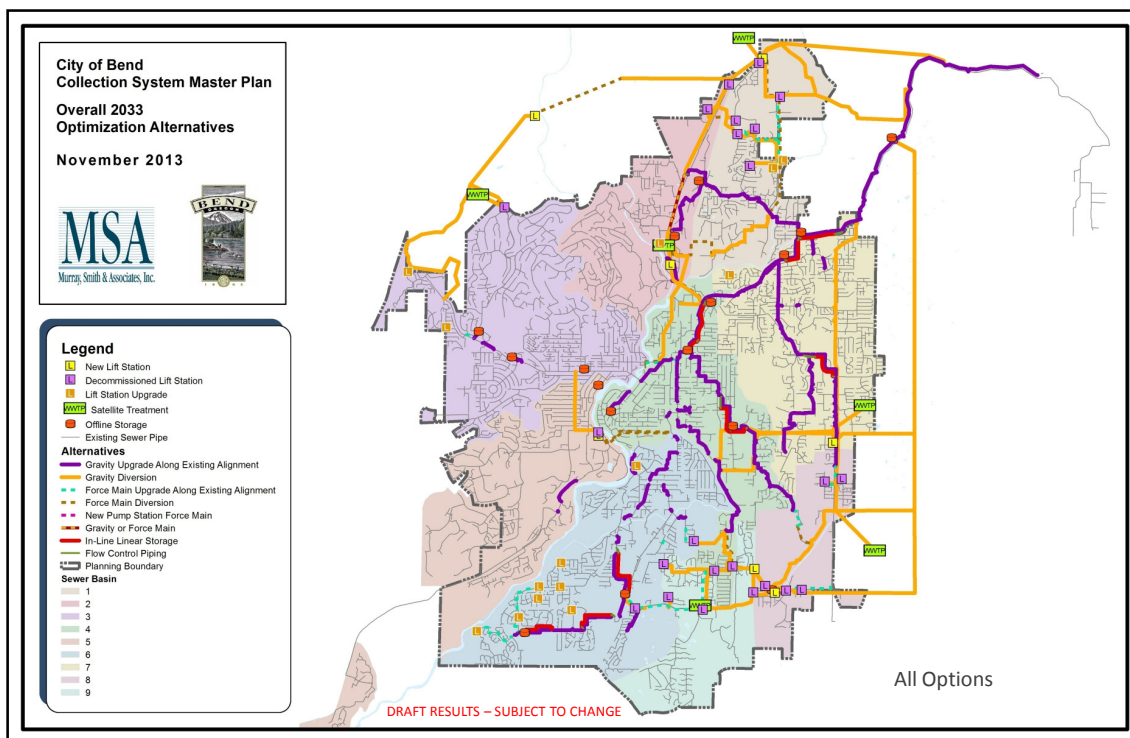
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## LOOKING BACK—SIAG DECISIONS

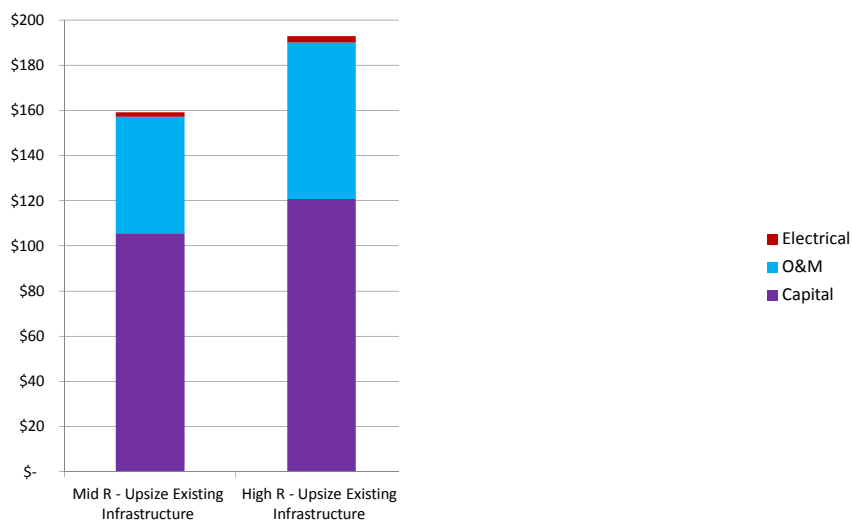
- ◆ Life Cycle Costs: 40-year analysis period
- ◆ Sensitivity analysis completed to date: 
  - Wet weather (High R and Mid R)
  - Upgrade of existing infrastructure only
  - Storage vs no storage
- ◆ Potential sensitivity analysis: 
  - Continued wet weather refinement
  - Loading and growth rates (growth nodes, OSU, etc)
  - Indoor Water Conservation

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## 40 YEAR LIFE CYCLE COSTS (MILLION DOLLARS)



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## SUMMARY COMPARISON OF INITIAL SOLUTIONS

Cost Item	Mid-R Upsize Existing Infrastructure	High-R Upsize Existing Infrastructure
40-Y O&M Life Cycle Cost (\$M)	51.60	69.20
40-Y Elect. Life Cycle Cost (\$M)	2.00	2.80
40-Y Capital Life Cycle Cost (\$M)	105.60	120.80
<b>40-Y Total Life Cycle Cost (\$M)</b>	<b>159.20</b>	<b>192.80</b>

<b>Initial Capital Cost (\$M)</b>	<b>57.23</b>	<b>70.24</b>	<b>68.46</b>	<b>86.14</b>
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Note: Based on Class 5 Cost Estimate

Compared to \$120M in prior capital plan

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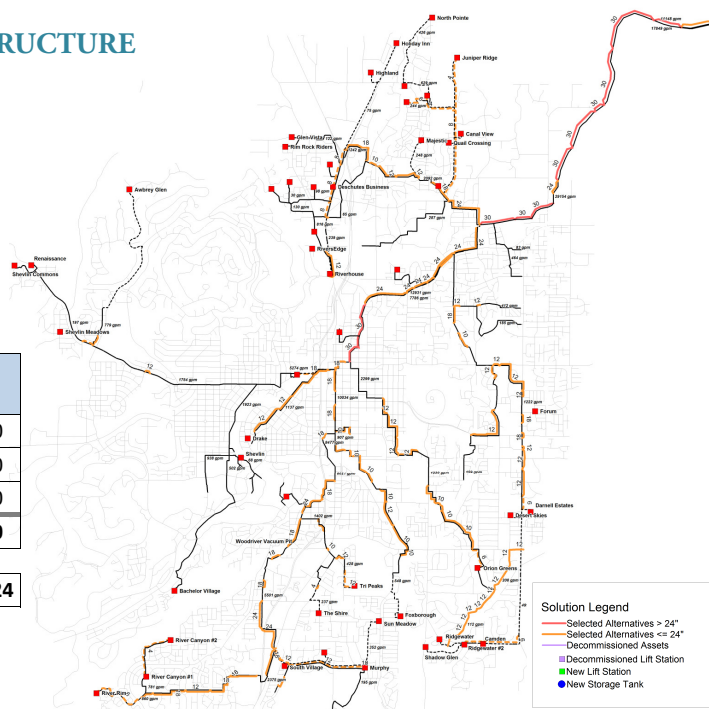
## UPSIZED EXISTING INFRASTRUCTURE

(20-Year, High R)

(No change to existing operational strategy)

Cost Item	Cost (\$M)
40-Y Life Cycle O&M Cost	69.20
40-Y Life Cycle Elect. Cost	2.80
40-Y Life Cycle Capital Cost	120.80
<b>40-Y Total Life Cycle Cost</b>	<b>192.80</b>
<b>Initial Capital Cost</b>	<b>70.24</b>

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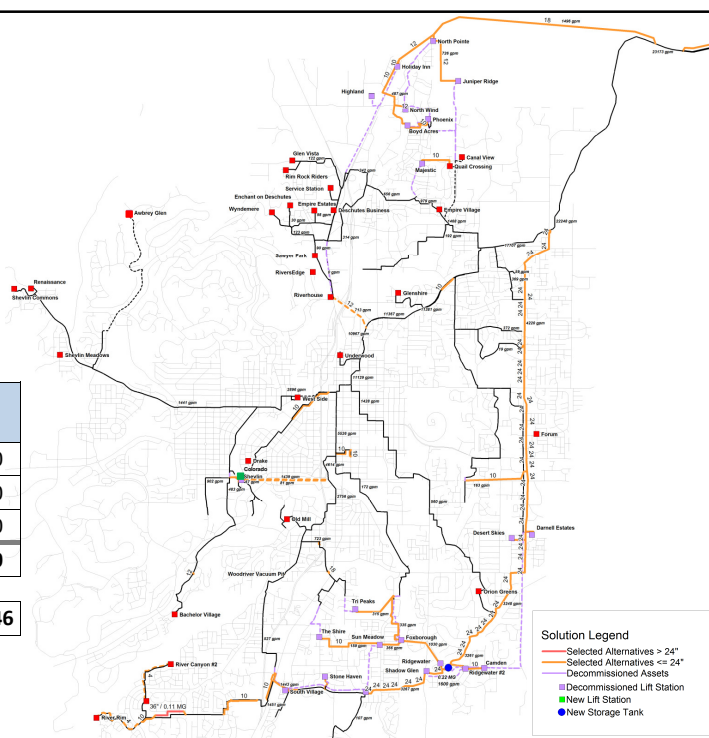


## ALL OPTIONS

(20-Year, Mid R)

Cost Item	Cost (\$M)
40-Y Life Cycle O&M Cost	32.20
40-Y Life Cycle Elect. Cost	1.20
40-Y Life Cycle Capital Cost	73.10
<b>40-Y Total Life Cycle Cost</b>	<b>106.50</b>
<b>Initial Capital Cost</b>	<b>68.46</b>

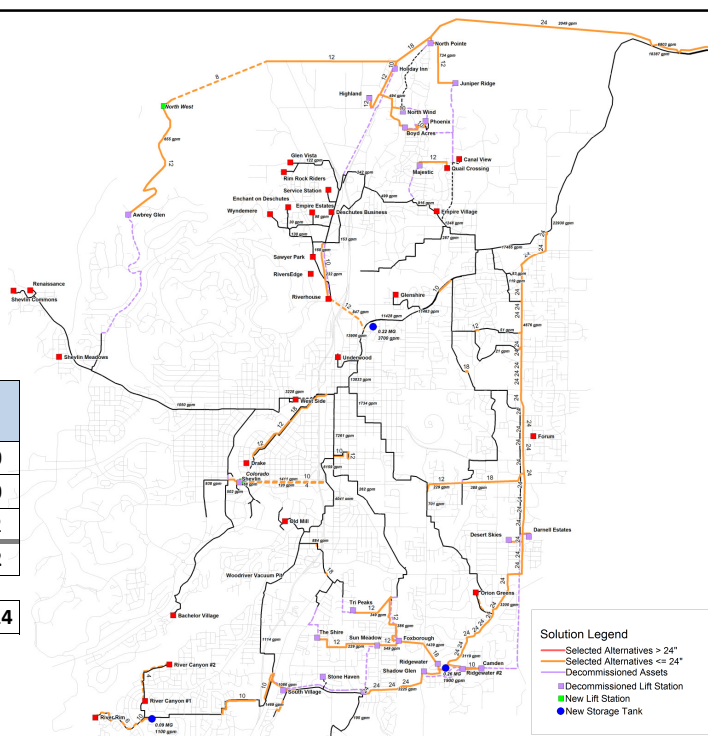
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## ALL OPTIONS (20-Year, High R)

Cost Item	Cost (\$M)
40-Y Life Cycle O&M Cost	36.10
40-Y Life Cycle Elect. Cost	0.40
40-Y Life Cycle Capital Cost	86.72
<b>40-Y Total Life Cycle Cost</b>	<b>123.22</b>
<b>Initial Capital Cost</b>	<b>86.14</b>

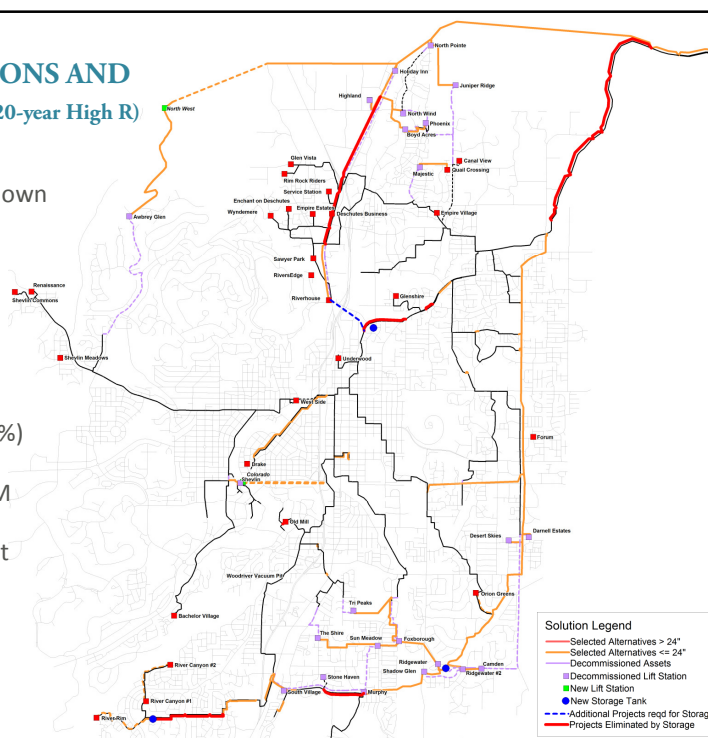
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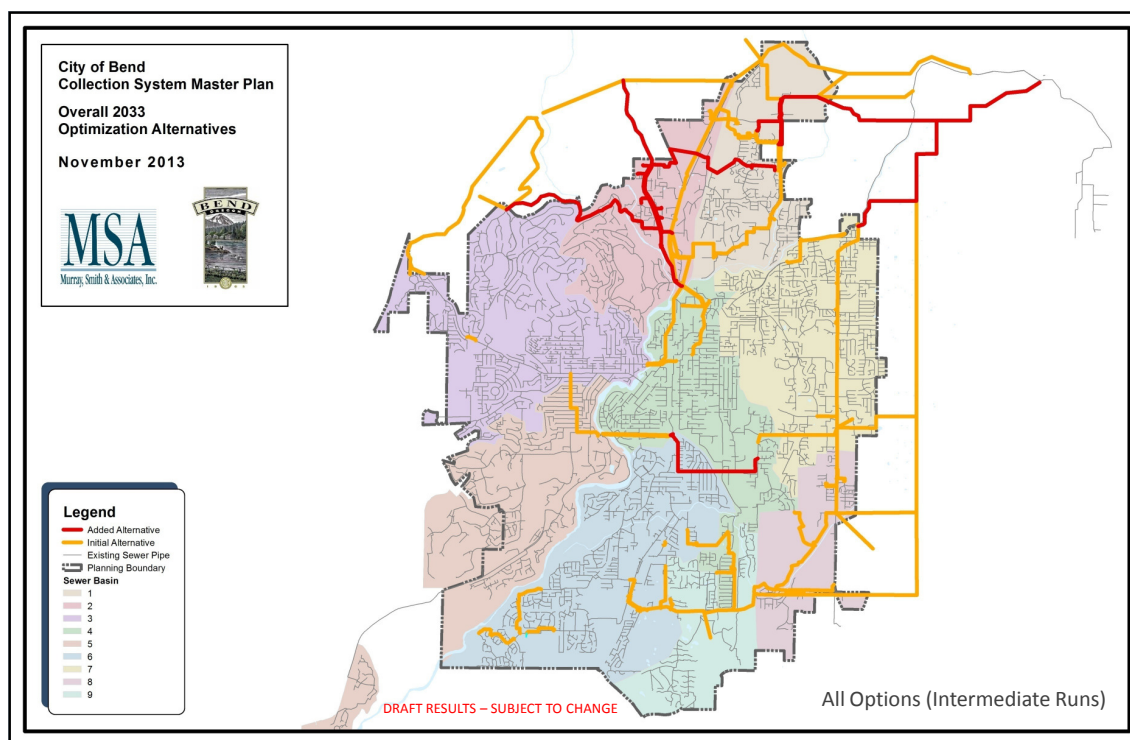


## COMPARISON OF ALL OPTIONS AND NO STORAGE SOLUTIONS (20-year High R)

- Projects eliminated by storage shown in red
- Storage not utilized in DWF
- Avoided length of new pipe construction = 31,000 ft.
- Avoided capital cost = \$13 M (14%)
- 40-Year O&M Cost Savings = \$5 M
- 20-year, High R peak flow to plant reduced from approx. 29,000 to 25,000 gpm

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## HIGH LEVEL TAKEAWAYS

Solution Component	Trends Observed	Additional Refinement
General	<ul style="list-style-type: none"> <li>Similar solutions selected in both Mid R and High R</li> <li>Cost difference between Mid R and High R</li> <li>Upsizing existing infrastructure has higher life cycle costs</li> </ul>	<ul style="list-style-type: none"> <li>Model verification based on add. flow monitoring</li> <li>Evaluate project phasing</li> </ul>
Southeast Interceptor	<ul style="list-style-type: none"> <li>Always selected</li> <li>Size relatively consistent with current design</li> <li>27<sup>th</sup> St alignment selected</li> </ul>	<ul style="list-style-type: none"> <li>Future growth sensitivity</li> <li>Test Colorado extension</li> </ul>
Colorado LS	<ul style="list-style-type: none"> <li>Always selected</li> </ul>	<ul style="list-style-type: none"> <li>Option to connect to SEI</li> </ul>
Storage	<ul style="list-style-type: none"> <li>Three locations consistently selected for storage</li> </ul>	<ul style="list-style-type: none"> <li>Site specific costs</li> </ul>
Northern System	<ul style="list-style-type: none"> <li>Northern Interceptor consistently selected</li> <li>Upgrade of existing gravity/force mains not selected</li> <li>Northwest Interceptor only selected in High R</li> </ul>	<ul style="list-style-type: none"> <li>OB Riley alignment and several other alignment alternatives to be included</li> </ul>
Treatment	<ul style="list-style-type: none"> <li>Low treatment cost used to favor treatment</li> <li>Treatment not selected</li> </ul>	<ul style="list-style-type: none"> <li>No further evaluation anticipated</li> </ul>
Existing Lift Stations	<ul style="list-style-type: none"> <li>Decommission the majority of existing lift stations where gravity alternatives existed</li> </ul>	<ul style="list-style-type: none"> <li>Effect of phasing</li> </ul>

**DRAFT RESULTS – SUBJECT TO CHANGE**

## NEXT STEPS / INTERMEDIATE OPTIMIZATION

### Input Refinement

- Site specific costs
- Review alignments
- Additional alternatives
- Review storage

### Phasing Analyses

- 10-year planning horizon

### Sensitivity Analyses

- Wet-weather flow sensitivity analysis
- Loading sensitivity analysis (growth nodes, OSU, etc)
- Indoor water conservation

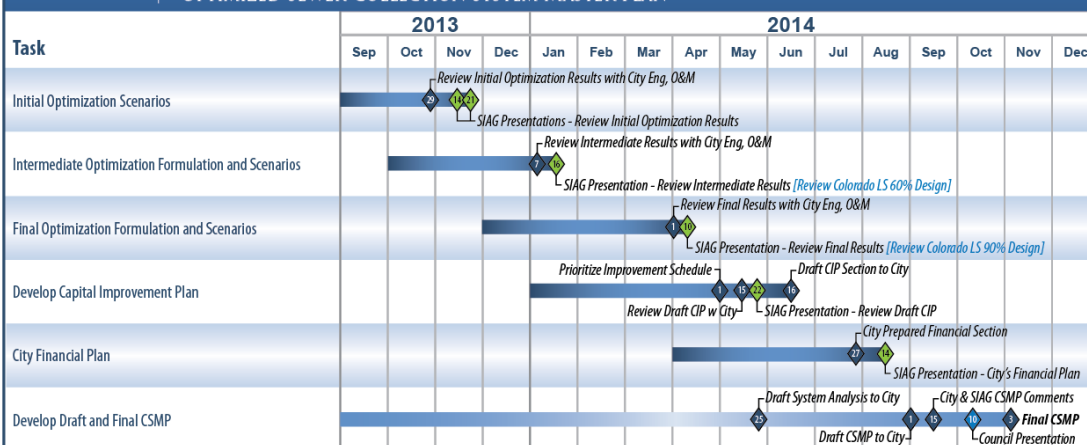
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## SCHEDULE REVIEW



### DRAFT CONDENSED PROJECT SCHEDULE (AS OF NOVEMBER 12, 2013)

CITY OF BEND  
OPTIMIZED SEWER COLLECTION SYSTEM MASTER PLAN



## ROUNDTABLE DISCUSSION

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## TODAY'S TAKEAWAY

- ◆ Cost savings—initial construction and long-term
- ◆ Greater certainty of investment
- ◆ Potential for more good news when the team looks at project phasing opportunities
- ◆ Seeking direction from SIAG related to SE Interceptor on November 21<sup>st</sup> meeting

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# QUESTIONS

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## Action Items

- Send out SIAG Roundtable Question/ MSA Team responses
- November 21, 2013: Discussion of the South East Interceptor
- January 16, 2014: Intermediate results
- Early April 2014: Final results to SIAG

## MEETING SUMMARY

**Committee Members:** Casey Roats, Charley Miller, Dale Van Valkenburg, Mike Riley, Nathan Boddie, Sharon Smith, Steve Galash, Lynn Putnam, Steve Hultberg, Craig Horrell, Bruce Aylward, Wes Price, Stacey Stemach

**City of Bend Staff:** Aaron Collett, Brian Rankin, Jeff England, Jon Skidmore, Paul Rheault, Tom Hickmann, Russ Grayson, Shannon Ossendorf, Mary Winters, Anne Aurand

**Consultants:** David Prull (Clearwater Engineering Group), David Stangel (MSA), Jim Helton (MSA), Joel Wilson (WCS Engineering), Shad Roundy (Murray, Smith & Associates), Jeff Fry (Optimatics)

**Facilitator:** Libby Barg (Barney & Worth)

**Absent:** Andy High, John Rexford, Rob Von Rohr, Pam Hardy

**Others:** Erik Huffman, Matt Rogers, Councilor Russell, Greg Blackmore, Bruce Chambers, Terry Angle, Jim Frost

## Approval of Meeting Summaries

It was moved and seconded to approve the past minutes (May 16, June 20, July 11, July 25, and September 12, 2013). The motion passed unanimously.

## Initial Optimization Results

- Joel Wilson (WCS Engineering) outlined optimization solutions and reviewed high-level takeaways.
- Southeast Interceptor: Selected in every optimization run
- Colorado Lift Station: Always selected
- Northern Interceptor consistently selected

- Northwest Interceptor only selected in the high-range solution.
- Treatment: Even though low treatment costs were used to favor treatment solutions, treatment was not selected.
- Existing Lift Stations: Decommission majority of existing stations where gravity alternatives exist.

## **Round Table Discussion**

### **Main Takeaways**

- More feasibility work is needed on NW interceptor.
- Stormwater impacts need to be studied further.
- SE interceptor is a have to!
- Mid R is a reasonable target.
- NW interceptor is a non-starter.
- Just reworking existing lines limits capacity and growth.

### **Questions**

- What is the priority of improvements?
- SE interceptor: what are the current commitments / permit agreements? What are the time-sensitive issues?
- Priority and phasing of improvements?
- SIAG has been charged by City Council to find a solution set for the north area. Can we recommend other priorities without solving that problem?
- What is SIAG's role moving forward?
- What is the status of the treatment plant interceptor study?
- How will septic areas be served with sewer?
- Funding plan and prioritization: how will this be done?
- Can pumps be removed in SW triangle?
- What is timing of the north interceptor vis à vis SE interceptor?
- Can pump station life be lengthened? How would that influence the modeling results?
- What will be the impacts if SE interceptor ultimately needs a 30" diameter rather than 24"?
- What are the next decision points?
- Will additional flow monitoring show areas where Bend should focus on stormwater intrusion to reduce sewer costs?
- What is proposed phasing and prioritization on projects?
- How much are we going to get done – how fast – and how much will it cost?

- Is the “westside diversion” at 14<sup>th</sup> and Newport to Colorado lift station still being considered?

## **Worksheets**

### **Main Takeaways**

- SE interceptor is a must.
- Just reworking existing lines limits Bend’s capacity and growth.
- Public outreach will be important to spread the word: should be shown on project schedule.
- Good work team! Better data, good process – optimization works! And the SIAG helped set the parameters.

### **Questions**

- What is the prioritization and phasing of projects?
- What are the key differences between these results and previous CSMP?
- What are the impacts on system of a High R event?
- Do we need to proceed with the SE interceptor immediately?
- What is the cost and solution set for individual pump station areas?
- What is the cost and solution for serving neighborhoods still on septic?
- What’s happening in the north to answer City Council’s objective to support employment lands?
- Will optimization prioritize the CIP projects more discernibly than 5-10-15 years?
- Have right-of-way acquisition concerns been resolved along SE interceptor alignment?
- How does SE interceptor reach unserved areas?
- How do cost factors balance against community values?
- What issues-benefits-risks are addressed by SE interceptor?
- What is the optimized way to fix individual neighborhoods served by pump stations?

**Public Comment** None

**Meeting adjourned: 6:25 p.m.**

# INITIAL OPTIMIZATION RESULTS BEND OPTIMIZED COLLECTION SYSTEM PLAN

November 21<sup>st</sup>, 2013

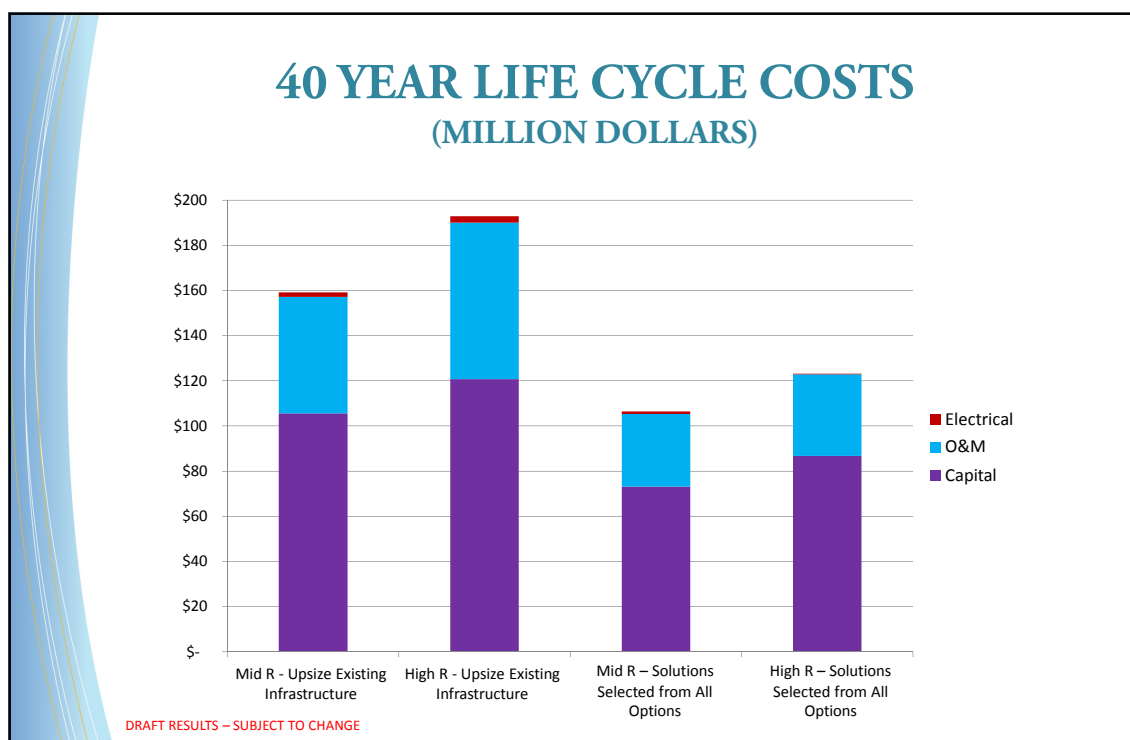
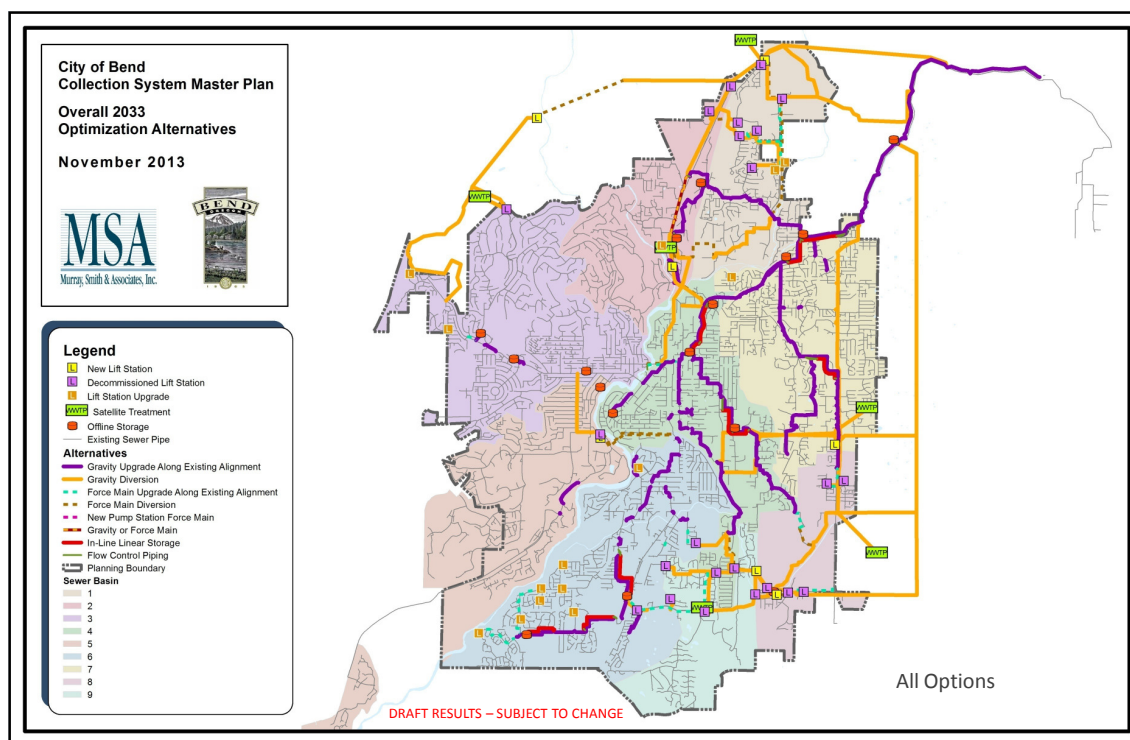
DRAFT RESULTS – SUBJECT TO CHANGE

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

## AGENDA

- ◆ Welcome/Introduction
- ◆ Review of Nov 14 Takeaways
- ◆ Sensitivity Analysis
- ◆ CSMP Related Projects Update/Discussion
- ◆ Community Outreach
- ◆ Next Steps
- ◆ Nov 14 Questions
- ◆ Public Comment

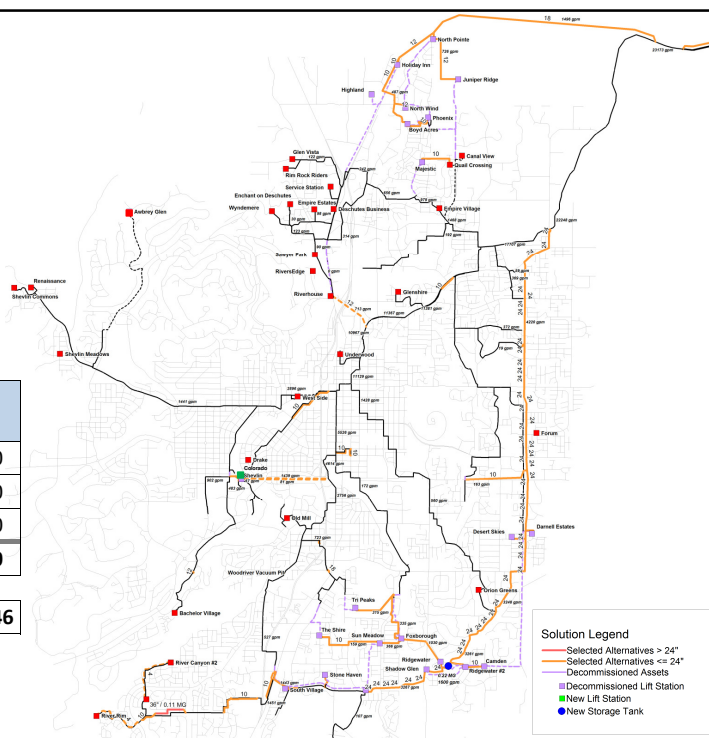
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## ALL OPTIONS (20-Year, Mid R)

Cost Item	Cost (\$M)
40-Y Life Cycle O&M Cost	32.20
40-Y Life Cycle Elect. Cost	1.20
40-Y Life Cycle Capital Cost	73.10
<b>40-Y Total Life Cycle Cost</b>	<b>106.50</b>
<b>Initial Capital Cost</b>	<b>68.46</b>

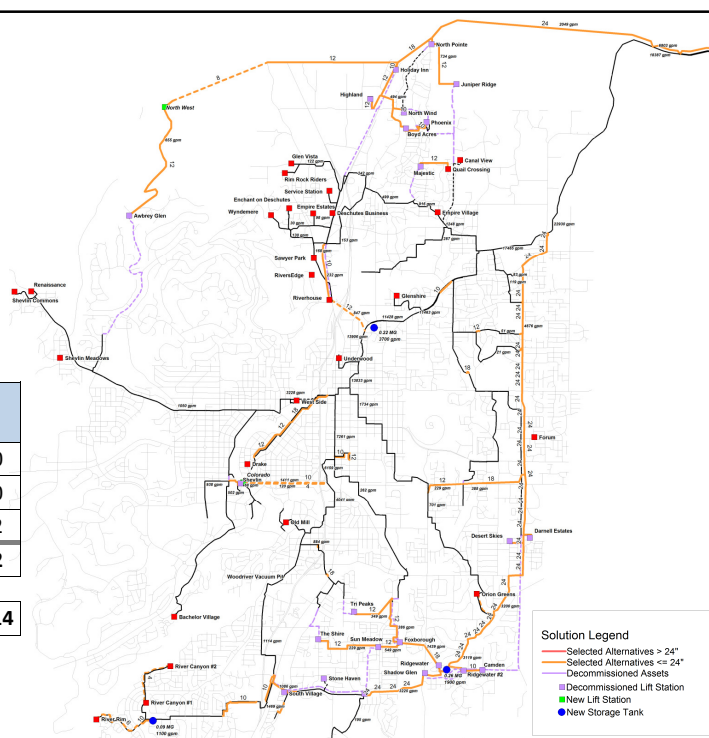
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## ALL OPTIONS (20-Year, High R)

Cost Item	Cost (\$M)
40-Y Life Cycle O&M Cost	36.10
40-Y Life Cycle Elect. Cost	0.40
40-Y Life Cycle Capital Cost	86.72
<b>40-Y Total Life Cycle Cost</b>	<b>123.22</b>
<b>Initial Capital Cost</b>	<b>86.14</b>

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## HIGH LEVEL TAKEAWAYS

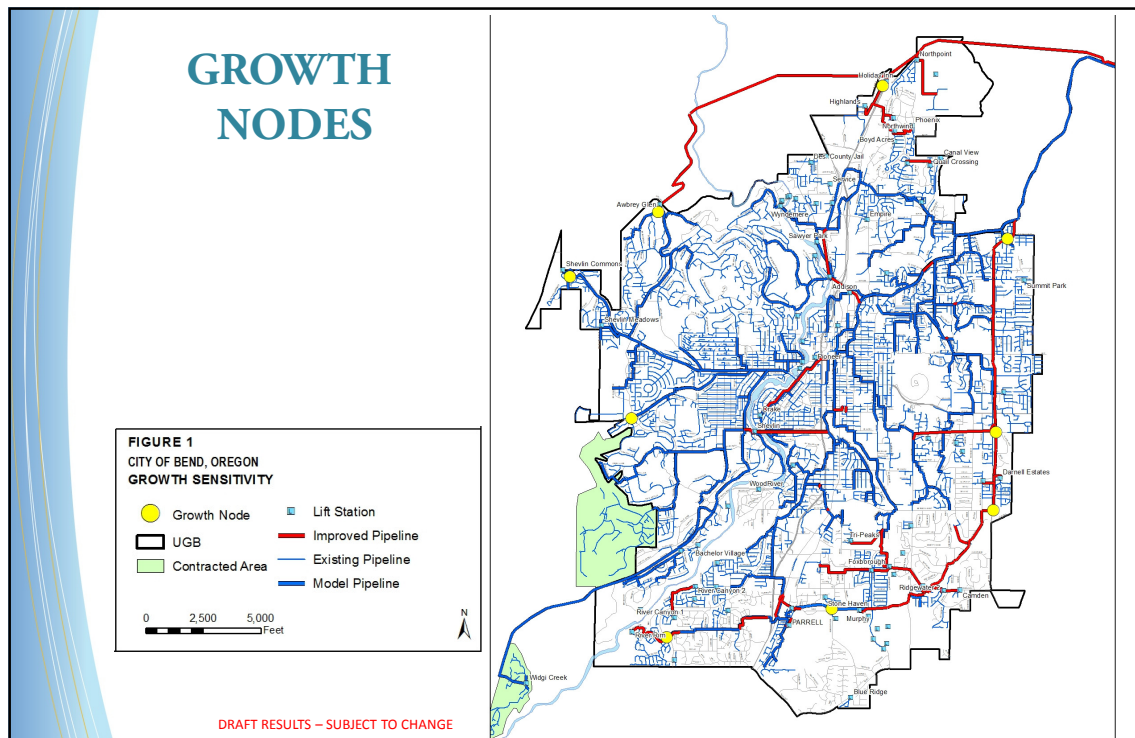
Solution Component	Trends Observed	Additional Refinement
General	<ul style="list-style-type: none"> <li>Similar solutions selected in both Mid R and High R</li> <li>Cost difference between Mid R and High R</li> <li>Upsizing existing infrastructure has higher life cycle costs</li> </ul>	<ul style="list-style-type: none"> <li>Model verification based on add. flow monitoring</li> <li>Evaluate project phasing</li> </ul>
Southeast Interceptor	<ul style="list-style-type: none"> <li>Always selected</li> <li>Size relatively consistent with current design</li> <li>27<sup>th</sup> St alignment selected</li> </ul>	<ul style="list-style-type: none"> <li>Future growth sensitivity</li> <li>Test Colorado extension</li> </ul>
Colorado LS	<ul style="list-style-type: none"> <li>Always selected</li> </ul>	<ul style="list-style-type: none"> <li>Option to connect to SEI</li> </ul>
Storage	<ul style="list-style-type: none"> <li>Three locations consistently selected for storage</li> </ul>	<ul style="list-style-type: none"> <li>Site specific costs</li> </ul>
Northern System	<ul style="list-style-type: none"> <li>Northern Interceptor consistently selected</li> <li>Upgrade of existing gravity/force mains not selected</li> <li>Northwest Interceptor only selected in High R</li> </ul>	<ul style="list-style-type: none"> <li>OB Riley alignment and several other alignment alternatives to be included</li> </ul>
Treatment	<ul style="list-style-type: none"> <li>Low treatment cost used to favor treatment</li> <li>Treatment not selected</li> </ul>	<ul style="list-style-type: none"> <li>No further evaluation anticipated</li> </ul>
Existing Lift Stations	<ul style="list-style-type: none"> <li>Decommission the majority of existing lift stations where gravity alternatives existed</li> </ul>	<ul style="list-style-type: none"> <li>Effect of phasing</li> </ul>

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## PROPOSED SENSITIVITY ANALYSES

- ◆ To be conducted before January SIAG
  - Continued Mid R and High R evaluations
  - Growth Node Evaluation (next slide)
  - Water Conservation (10% reduction in dry loading)
  - Micro Optimization of North Area Common Force Mains and Lift Stations (in conjunction with O.B. Riley Rd. Alt.)
- ◆ Not currently recommended by City
  - OSU Growth Area (believed to be adequately covered in development of future planning data)

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## COLORADO LIFT STATION

- ◆ Colorado LS consistently selected
- ◆ 30% design complete in December
- ◆ Current capacity 2,300 gpm
- ◆ Dual 12-inch force mains
- ◆ Begin construction in Aug/Sep 2014
- ◆ Operational mid 2015

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## NORTH AREA SOLUTIONS

- ◆ NE Interceptor consistently selected
- ◆ Riverhouse diversion likely short-term solution
- ◆ Phasing needs to be confirmed
- ◆ Additional North Area options being evaluated
- ◆ North Area design team selected
- ◆ Design team will work with CSMP team to identify solution(s) over next few months

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## SE INTERCEPTOR

- ◆ SEI consistently selected
  - Regardless of credit for design costs
- ◆ Current design serves build-out of current UGB
- ◆ Key for growth/improvements in other areas
  - SEI creates capacity in central int. allowing city-wide growth
  - Colorado Lift Station
  - Riverhouse Diversion
- ◆ Continued refinement of solution by CSMP team unless directed otherwise by SIAG

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## TOGGLE TO OTHER PRESENTATION

## SE INTERCEPTOR

### • What we know

- SEI consistently selected
  - Regardless of credit for design costs
- Current design serves build-out of current UGB
- Key for growth/improvements in other areas
  - SEI creates capacity in central int. allowing city-wide growth
  - Colorado Lift Station
  - Riverhouse Diversion
- Redesign will delay project approx. 1 year
- Low risk of stranded assets
- ROW acquisition issues

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## SE INTERCEPTOR

### What we don't know

- Phasing of required improvements over next 20 years
- Impact of additional growth on system
- Impact of refined rainfall response
- What other solutions may be identified through optimization process
- Ability to accelerate the SEI construction
  - Construction sequencing
  - Financing capability

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## CURRENT CAPITAL SEWER BUDGET

City of Bend  
Capital Improvement Program

No	Description	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	TOTAL
<b>Project Financed by DEQ Loans</b>							
1	SW0802 - Secondary Expansion	18,950,000	17,000,000	2,400,000	-	-	38,350,000
<b>Other Projects</b>							
1	SW0806 - SCADA Update/Telemetry	204,000	208,080	212,242	216,486	220,816	1,061,624
2	SW10AA - Existing Plant Interceptor Assessment (Yeoman)	183,700	-	-	-	-	183,700
3	SW11BA - Valhalla Relocation	1,615,800	-	-	-	-	1,615,800
4	SW11CA - Sewer Flow Modeling	-	-	106,121	108,243	110,408	324,772
5	SW11EA - Collection Line Rehabilitation	561,000	572,220	583,664	595,338	607,244	2,919,467
6	SW12AA - Collection System Master Plan	923,700	731,600	-	-	-	1,655,300
7	SW13EA - Colorado Lift Station	956,700	3,100,300	399,500	-	-	4,456,500
8	SW13CA - North Area Gravity	1,387,300	3,421,900	190,400	-	-	4,999,600
9	SW13DA - North Area Forcemain	295,500	669,800	54,900	-	-	1,020,200
10	SW0707- SE Interceptor	9,050,000	9,050,000	9,050,000	9,050,000	9,050,000	45,250,000
		15,177,700	17,753,900	10,596,827	9,970,067	9,988,469	63,486,963
	<b>TOTAL CIP</b>	<b>34,127,700</b>	<b>34,753,900</b>	<b>12,996,827</b>	<b>9,970,067</b>	<b>9,988,469</b>	<b>101,836,963</b>
<b>Funding for Other Projects (At Current Rates with \$18M in New Debt):</b>							
	<b>Total Funding Available for Other Projects</b>	<b>15,177,700</b>	<b>7,007,779</b>	<b>7,171,124</b>	<b>7,341,069</b>	<b>7,517,880</b>	<b>44,215,552</b>

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## SE INTERCEPTOR QUESTIONS

- Is SIAG ready to make a recommendation related to SEI?

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## NEXT STEPS / INTERMEDIATE OPTIMIZATION

### Input Refinement

- Site specific costs
- Review alignments
- Additional alternatives
- Review storage

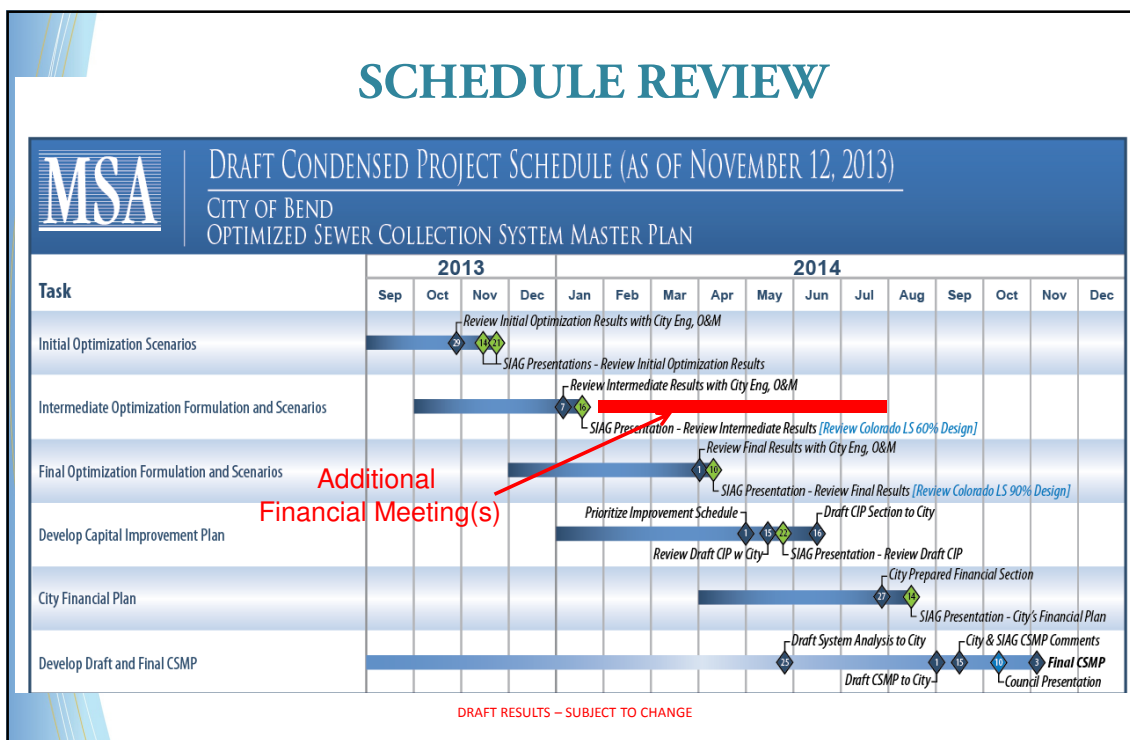
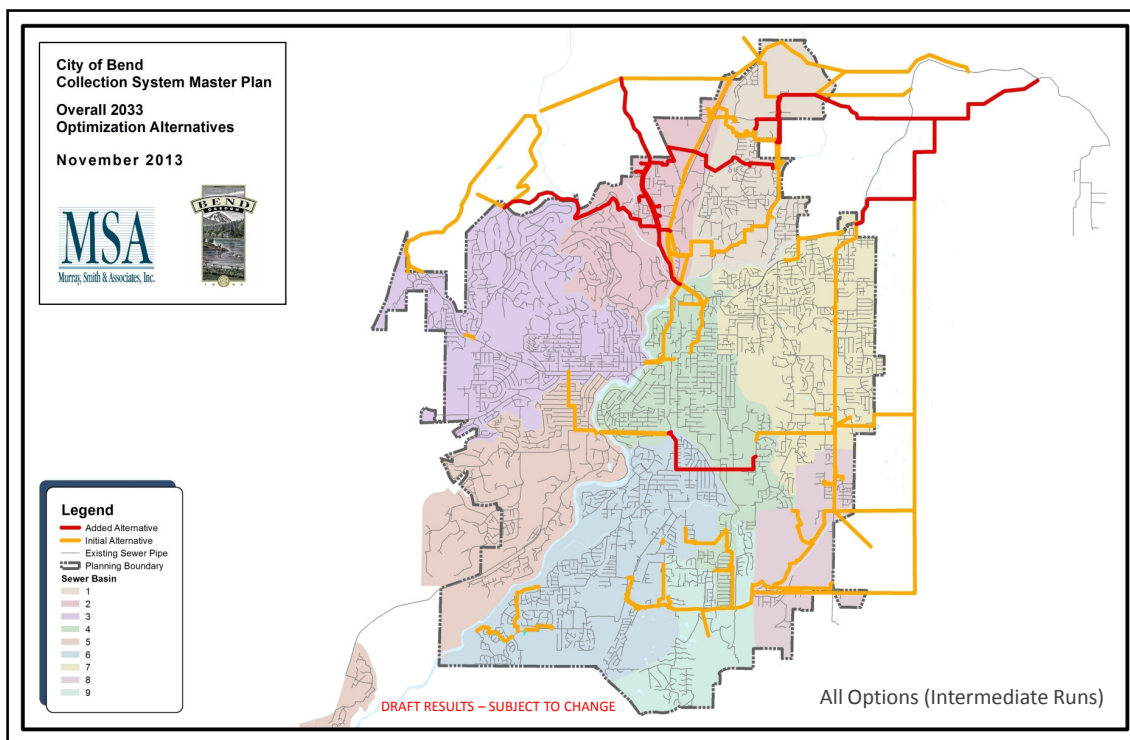
### Phasing Analyses

- 10-year planning horizon

### Sensitivity Analyses

- Wet-weather flow sensitivity analysis
- Loading sensitivity analysis (growth nodes)
- Indoor water conservation

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## OUTREACH SCHEDULE ITEMS

- ◆ Nov: Develop materials
- ◆ Nov-Dec: Schedule 2014 community briefings
- ◆ Jan-Feb: Community briefings / City communications
- ◆ Mid-March: Media Outreach
- ◆ April: Public open house / City communications

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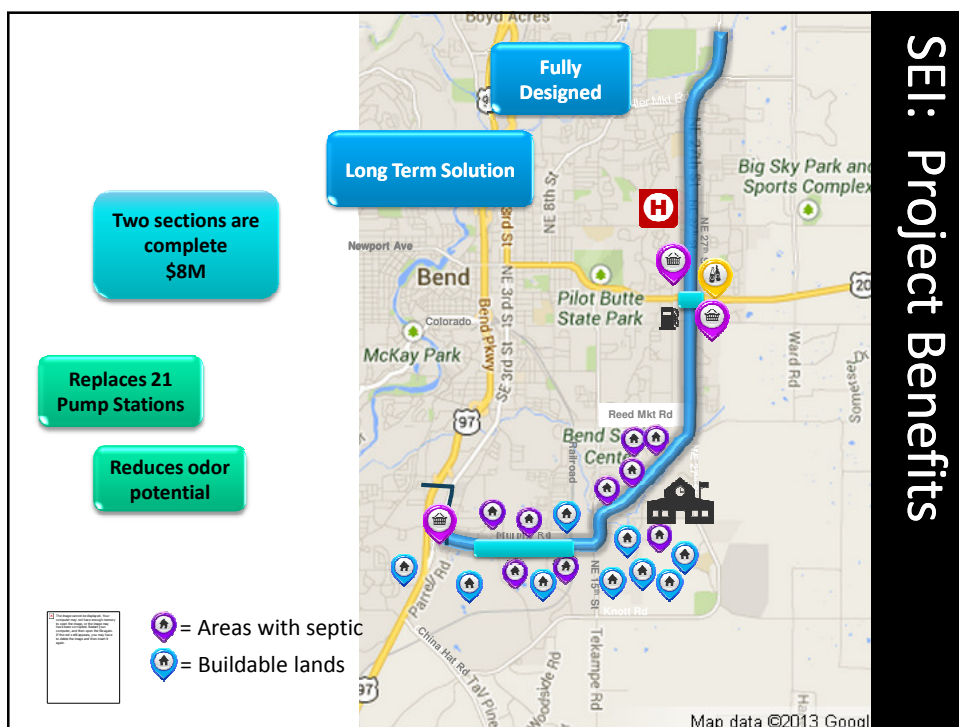
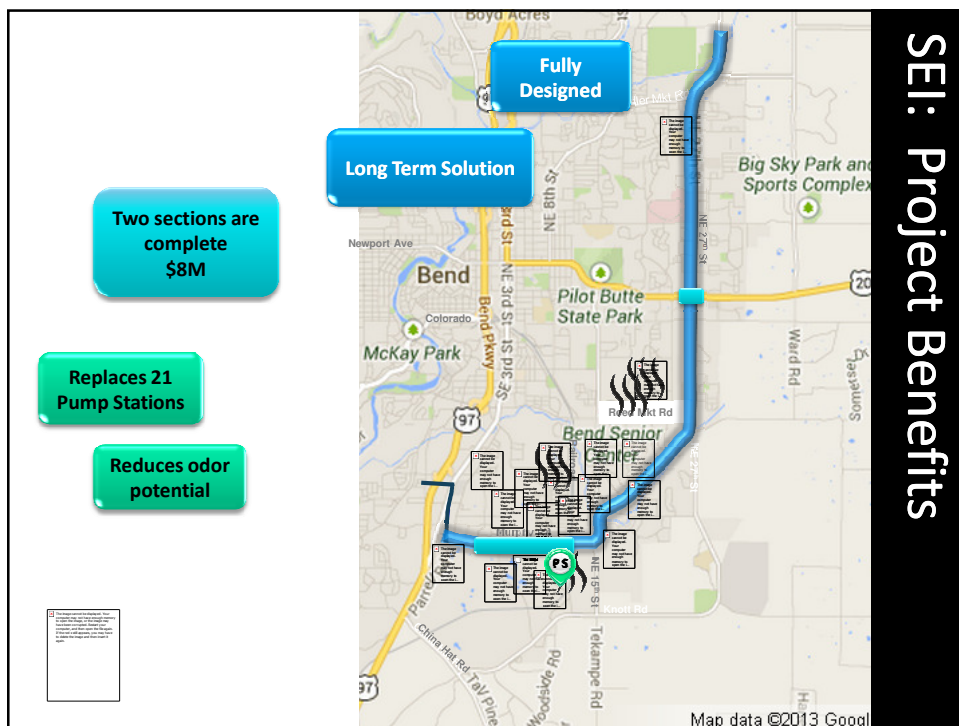
## NOV 14<sup>TH</sup> ROUNDTABLE QUESTIONS

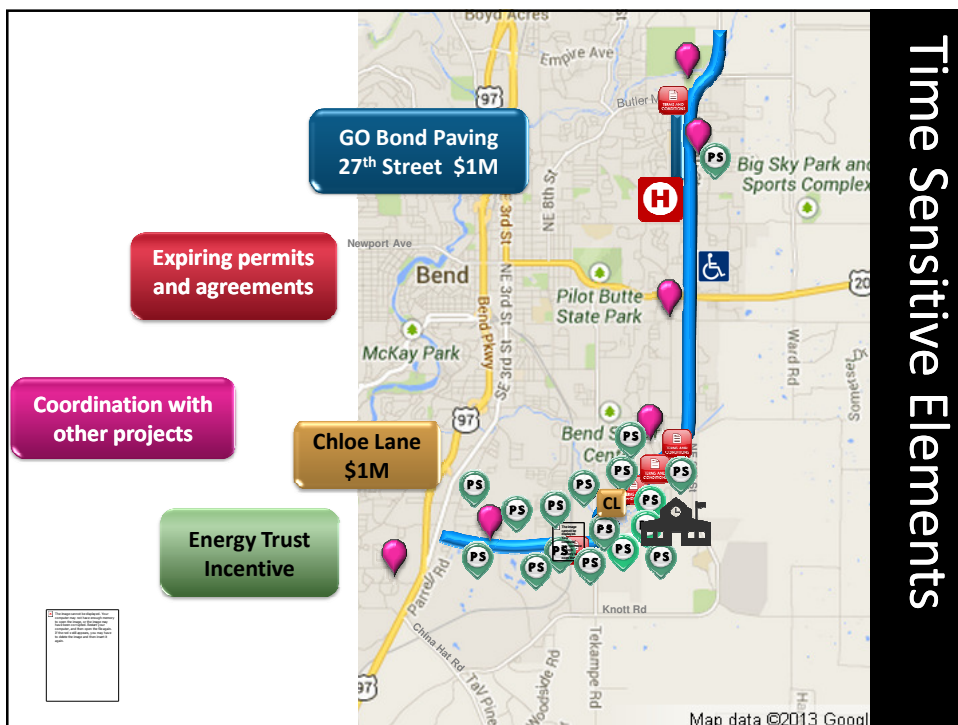
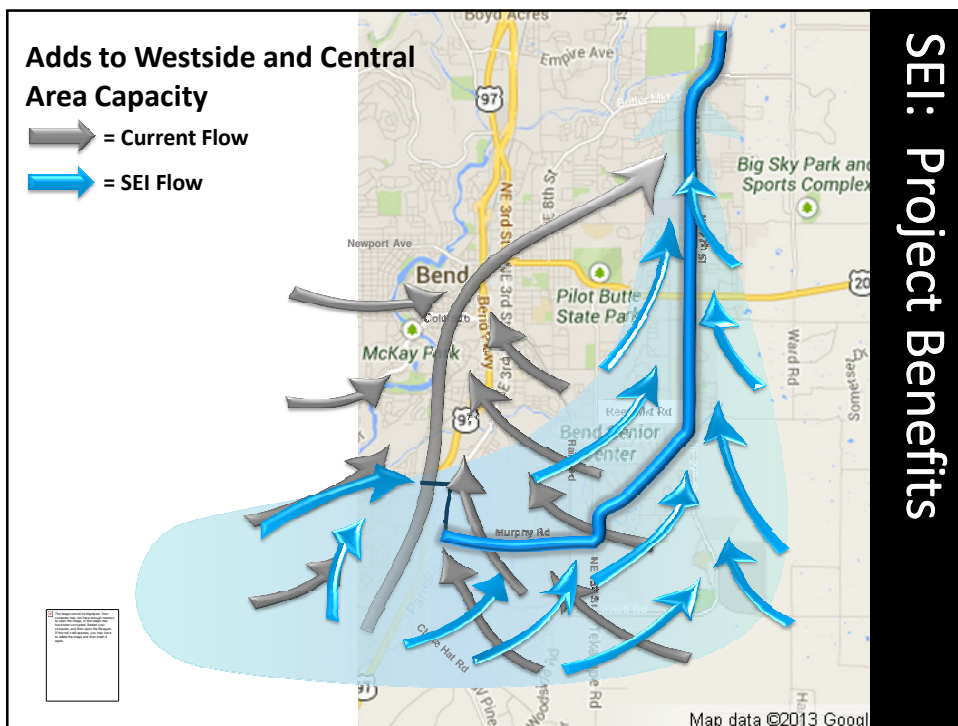
- ◆ See Handout

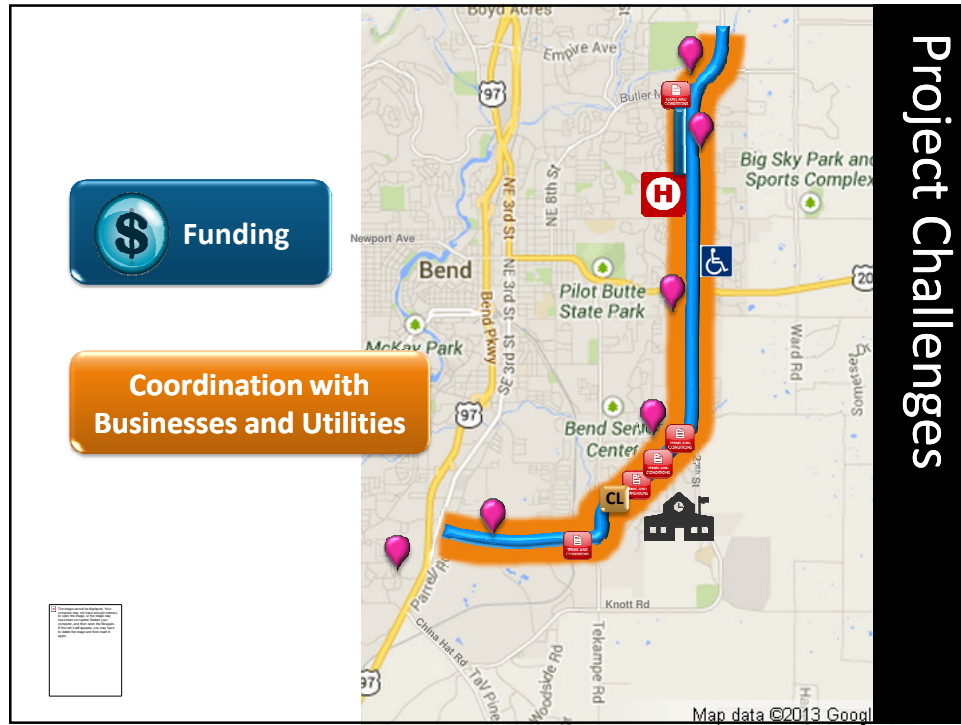
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# QUESTIONS

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# Project Challenges

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## Action Items

- City of Bend, Water Resource Manager, Patrick Griffiths will review the water conservation estimate of 10% (in the sensitivity analysis) and report back to SIAG.
- Keep North end solution on the SIAG agenda
- Schedule public outreach training
- Move ahead with bid documents to restart construction in 2014. Revisit the topic in January to determine whether a 3-year expedited construction schedule is warranted.

## MEETING SUMMARY

**Committee Members:** Casey Roats, Charley Miller, Dale Van Valkenburg, Mike Riley, Sharo Smith, Steve Galash, Lynn Putnam, Craig Horrell, Bruce Aylward, Stacey Stemach, Rob Von Rohr, Andy High

**City of Bend Staff:** Aaron Collett, Brian Rankin, Jeff England, Paul Rheault, Tom Hickmann, Russ Grayson, Mary Winters, Sonia Andrews, Justin Finestone, Patrick Griffiths

**Consultants:** David Prull (Clearwater Engineering Group), David Stangel (MSA), Shad Roundy (Murray, Smith & Associates)

**Facilitator:** Libby Barg (Barney & Worth), Clark Worth (Barney & Worth)

**Absent:** John Rexford, Wes Price, Nathan Boddie, Steve Hultberg

**Others:** Erik Huffman, Matt Rogers, Councilor Knight, Terry Angle, Jim Frost, Ken Steiger, John Russell, Nan Loveland (Infrastructure Advisory Committee), Gary Cox

**Announcements:** Written comments received from SIAG members, Nathan Boddie, and Steve Hultberg were sent to committee members via email. Comments from SAIG member Wes Price (who could not be present) were restated by Tom Hickmann.

SIAG member Pam Hardy resigned via email due to other obligations.

## Project Updates:

### UGB Expansion (Brian Rankin)

- Finish the remand by June 30, 2017
- City Council set a new goal of completing the adoption process by April 2016. Key elements:
  - Add additional resources to the project to support it, such as moving some technical work ahead through community involvement.

- Use a collaborative decision-making process involving local experts and interested parties.
- Facilitate the process, similar to what is being done with SIAG. Staff will still have a role, but that role will be diminished.
- Apply best planning and engineering practices including scenario development and another round of optimizations, similar to what SIAG is doing now, for some of the UGB expansion scenarios.
- Increase public involvement through advisory committees, outreach events, and public

Mr. Rankin summarized the MPO model update process and the approval process the City has to follow to complete the UGB remand to LCDRC's satisfaction (local, county, state). A key question to be answered: once all the models are updated, how much time will the community take to decide where it's going to grow? Brian Rankin estimated at least six months for that work.

### **Initial Optimization Results Recap, Questions and Answer Discussion**

The "Initial Optimization Results, Bend Optimized Collection System Plan" power point was reviewed. MSA answered additional questions and provide clarification from the November 14 SIAG meeting.

### **South East Interceptor (SEI)**

Questions discussed at meeting:

- When will it provide capacity?
- Would redesign slow the project?
- Will optimization show how to phase it?
- Would downsizing the pipe save money?
- Does a smaller pipe accommodate growth?
- Will the Hamby alignment be available later if/when growth occurs there?
- Can we shorten the time to build?
- What else will be learned in January about optimized route, project costs, and rates?
- What is the current status of R.O.W. acquisition?
- Is SE Interceptor needed for other interim projects to work? The projects seem interconnected.

### **SEI discussion points to review in January:**

- What is total project cost? Will there be dollars left for other projects?
- What are projected rates now and over the longer period?

- What other costs are included? Road construction, ADA improvements, etc.? Is it possible to push these unrelated costs onto other funding sources?
- How can the project be phased?

### **SIAG SEI Recommendation:**

Move ahead with bid documents to restart construction in 2014. Revisit the topic in January to determine whether a 3-year expedited construction schedule is warranted.

*“Let’s go: we’ve been talking for 8 years.”*

*“It’s time for a real solution.” “We’re stuck with big costs after doing nothing for 30 years.”*

*“The SE Interceptor is essential for the whole system – proceed with haste.”*

*“I thought the SE Interceptor was a boondoggle, now I am totally convinced we need to do this right away.”*

*“We need the SE Interceptor under any scenario: it is essential for the whole system to function.”*

### **Public Comment:**

Ken Steiger has been a resident of the South East side of Bend for 30 years. He stated that there have been costly septic system issues. He is sensitive to rate increases but encourages the City to move forward with this project.

The public outreach materials were handed out for the committee to review. Committee members would like a training meeting scheduled.

**Meeting adjourned: 5:40 p.m.**



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# **Bend Sewer Infrastructure Advisory Group: Meeting #17**

## **Review Intermediate Optimization Results**

Bend City Council Chambers  
710 NW Wall St., 1<sup>st</sup> Floor

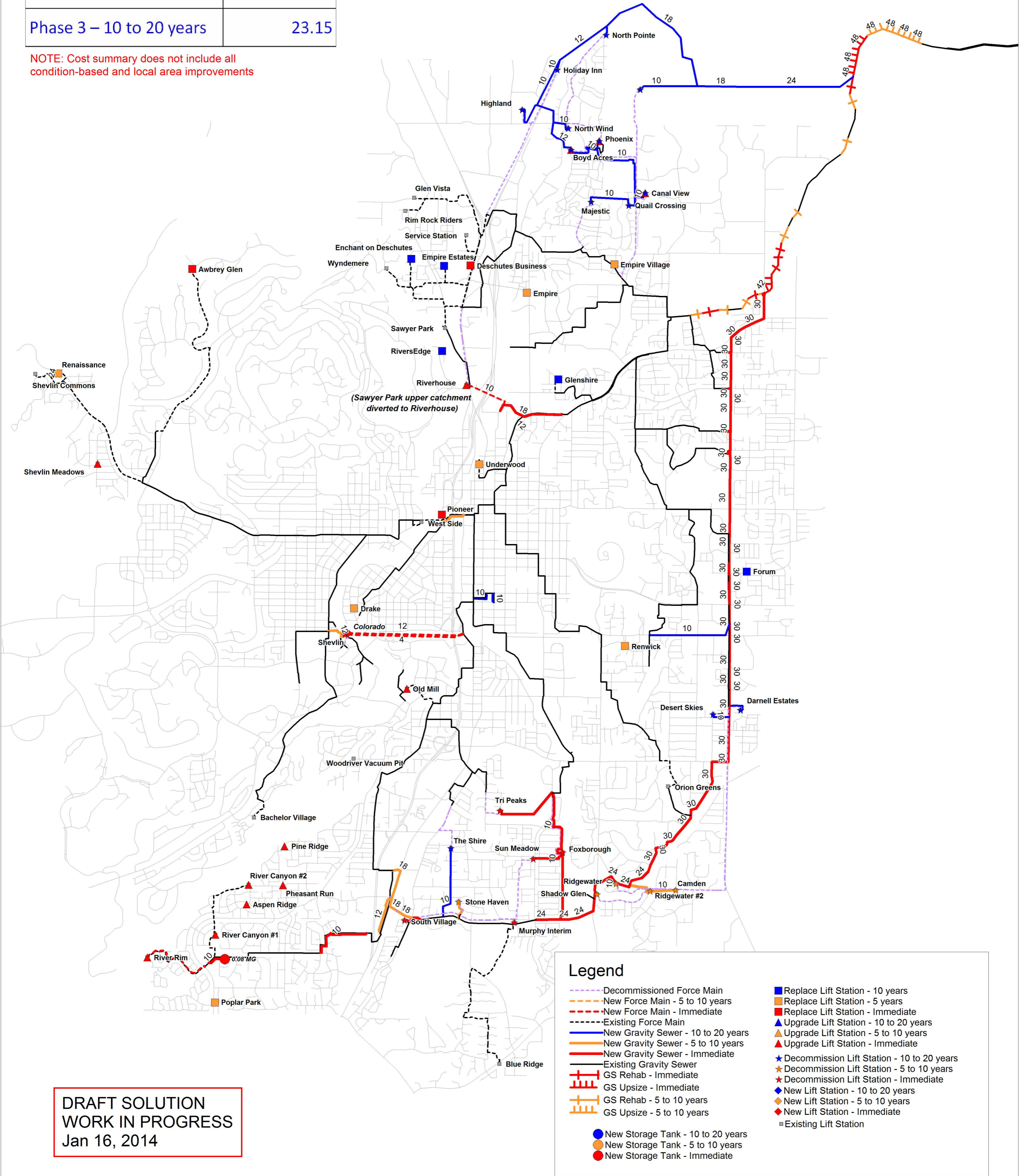
January 16, 2014  
**3:30-5:30 p.m.**

## **Agenda**

	<b>Presenter</b>	<b>Time (2 hrs.)</b>
1. Welcome	Jon Skidmore	10 min
2. Headlines	Tom Hickmann, P.E.	10
3. Optimization Results	David Stangel, P.E. Joel Wilson, CPEng	40
4. Discussion	Libby Barg	40
5. Next Steps	David Stangel, P.E.	5
6. Public Outreach <ul style="list-style-type: none"><li>▪ December16 training</li><li>▪ Materials</li><li>▪ Presentation schedule</li></ul>	Libby Barg	10
7. Public Comment		5 min

Phase	Capital Cost (\$M)
Phase 1 – Immediate	53.85
Phase 2 – 5 to 10 years	11.23
Phase 3 – 10 to 20 years	23.15

NOTE: Cost summary does not include all condition-based and local area improvements



Bend CSMP Optimization - Intermediate Solution: 20-Year Mid R Phased Improvements

## INTERMEDIATE OPTIMIZATION RESULTS BEND OPTIMIZED COLLECTION SYSTEM MASTER PLAN

January 16<sup>th</sup>, 2014

DRAFT RESULTS – SUBJECT TO CHANGE

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

## AGENDA

- ◆ Welcome/Introduction
- ◆ Headlines (10 min)
- ◆ Intermediate Optimization Results (40 min)
- ◆ Discussion (40 min)
- ◆ Public Outreach (10 min)
- ◆ Next Steps (5 min)
- ◆ Public Comment (5 min)

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## PRESENTATION CONTENTS

- ◆ Headlines!
- ◆ New Alternatives, Revisions and Phasing
- ◆ Intermediate Optimization Solutions
- ◆ Detailed Phasing Discussion
- ◆ Summary
- ◆ Next Steps
- ◆ Schedule and Area Specific Projects Update

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## THE HEADLINES

1. The Intermediate Solution is generally consistent with the Initial Solution
2. Optimization eliminated more north area lift stations, adding some capital costs, however, reducing overall life cycle costs
3. The SE Interceptor, Colorado Lift Station and Riverhouse Diversion selected as high priority projects
4. Optimized solutions for existing, 10-year, 20-year and 20-year plus 25% loading, provide insight for project phasing
5. Costs have increased due to inclusion of some condition based improvements

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## INTERMEDIATE SOLUTION – ADDITIONAL COSTS INCLUDED

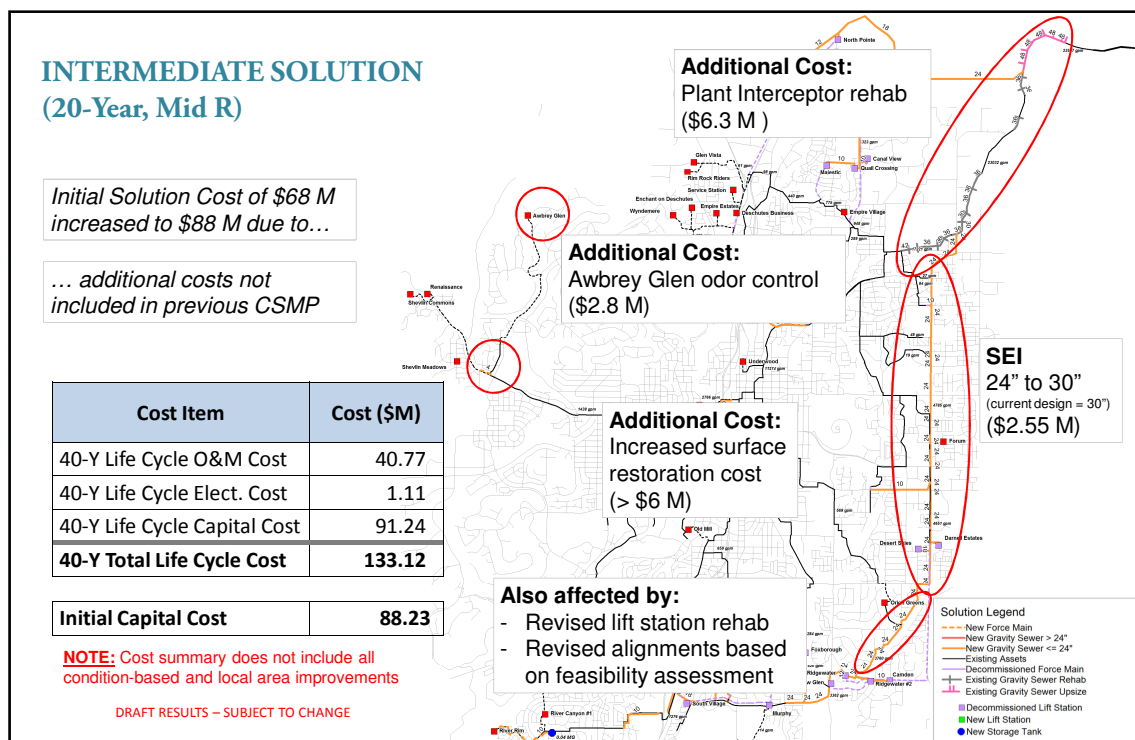
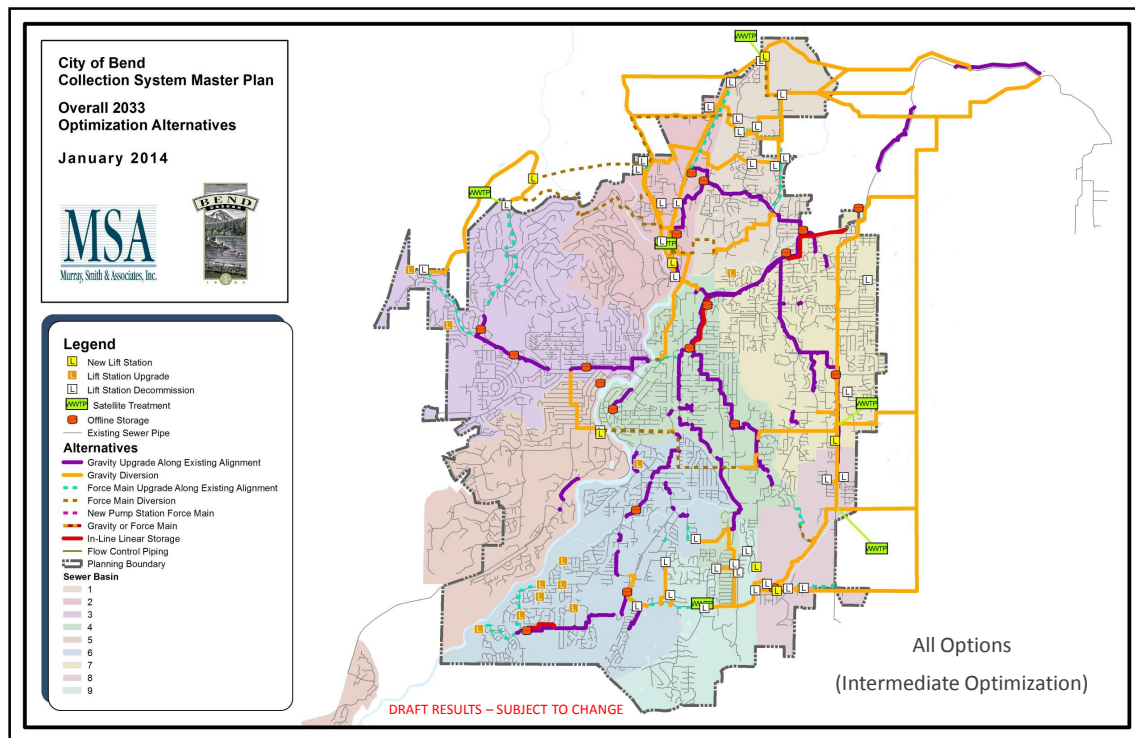
	Hydraulic-Based Pipe and Pump Capital Costs	Pump Condition Improvements	Pipe Condition Improvements	Local-Area Costs
2007 CSMP	✓	✗	✗	✗
Initial Optimization	✓	✓	✗	✗
Intermediate Optimization	✓	✓	✓	✗
Final Optimization	✓	✓	✓	✗
Total CIP	✓	✓	✓	✓
Rate Calculation	✓	✓	✓	✓

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## INTERMEDIATE OPTIMIZATION SCENARIOS

Primary Scenarios and Sensitivity Analyses	20-Year Mid R
	20-Year High R
	10-Year Mid R
	10-Year High R
Additional Scenario	Existing High R
Additional Sensitivity Analyses	20-Y High R with 10% Water Conservation
	20-Y High R with 25% Loading Increase
	SEI without 15% discount
	... and more
Project Phasing	Immediate, 0 to 10 years, 10 to 20 years, 20+

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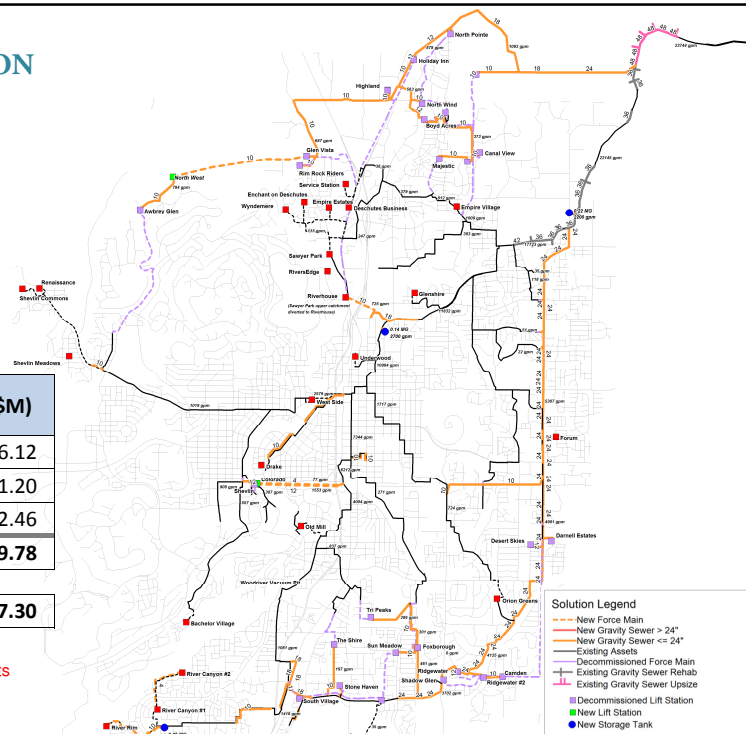
## INTERMEDIATE SOLUTION (20-Year, High R)

Cost Item	Cost (\$M)
40-Y Life Cycle O&M Cost	46.12
40-Y Life Cycle Elect. Cost	1.20
40-Y Life Cycle Capital Cost	112.46
<b>40-Y Total Life Cycle Cost</b>	<b>159.78</b>

<b>Initial Capital Cost</b>	<b>107.30</b>
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**NOTE:** Cost summary does not include all condition-based and local area improvements

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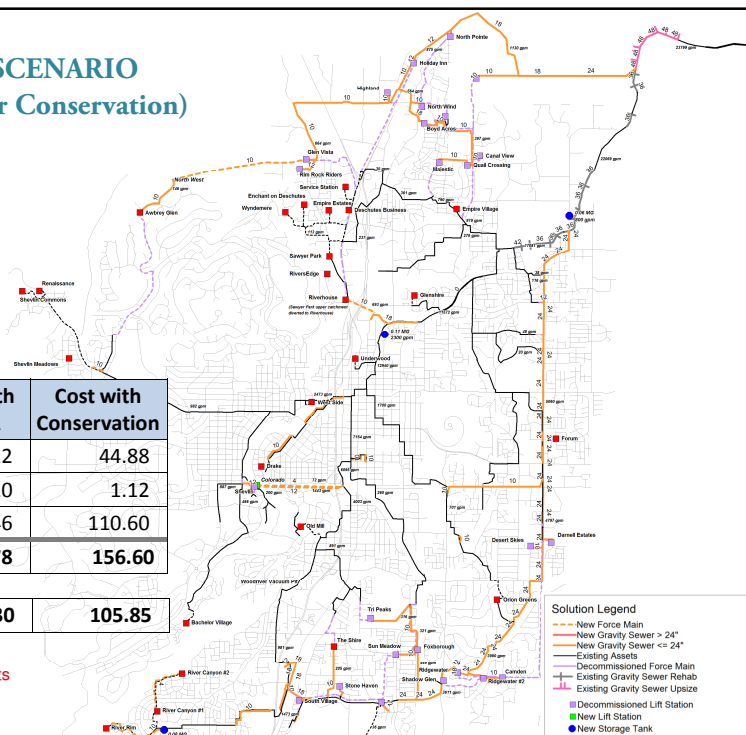
## WATER CONSERVATION SCENARIO (20-Year, High R -10% Water Conservation)

Cost Item	Cost with High R	Cost with Conservation
40-Y Life Cycle O&M Cost	46.12	44.88
40-Y Life Cycle Elect. Cost	1.20	1.12
40-Y Life Cycle Capital Cost	112.46	110.60
<b>40-Y Total Life Cycle Cost</b>	<b>159.78</b>	<b>156.60</b>

<b>Initial Capital Cost</b>	<b>107.30</b>	<b>105.85</b>
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**NOTE:** Cost summary does not include all condition-based and local area improvements

DRAFT RESULTS – SUBJECT TO CHANGE



## WATER CONSERVATION PACKAGE #4 “INDOOR MEASURES” 2011 WMCP

- 0.215 mgd water savings  
(3.5% reduction)
- \$1.485 million direct program costs
- ~\$0.3 million indirect program costs
- ~\$0.15 million (annual) staffing costs



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### STRESS-TEST SCENARIO (20-Year, High R + 25% Loading)

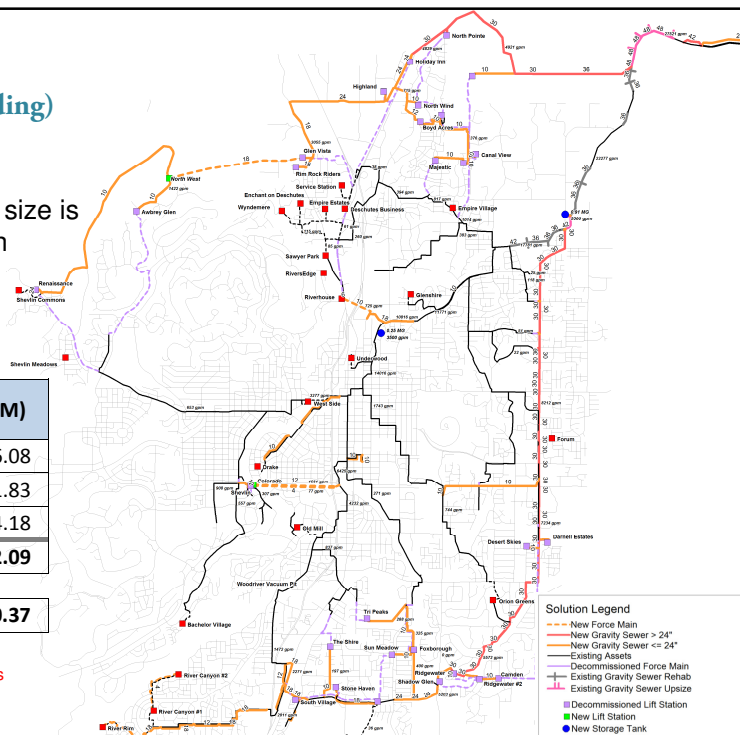
Good News! - SE Interceptor size is consistent with current design

Cost Item	Cost (\$M)
40-Y Life Cycle O&M Cost	56.08
40-Y Life Cycle Elect. Cost	1.83
40-Y Life Cycle Capital Cost	134.18
<b>40-Y Total Life Cycle Cost</b>	<b>192.09</b>

<b>Initial Capital Cost</b>	<b>150.37</b>
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**NOTE:** Cost summary does not include all condition-based and local area improvements

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## INTERMEDIATE SOLUTION – PHASING SUMMARY

Phase	Planning Scenario	Major Projects	Capital Cost (\$M)	Total Capital Cost (\$M)
Phase 1 – Immediate	Existing High R	SEI A, Riverhouse/Sawyer Park diversion, Colorado LS diversion, Awbrey Glen odor control, Plant Interceptor rehab, storage	53.85*	88.23
Phase 2 – 5 to 10 years	10-Y Mid R	SEI-B, Plant Interceptor rehab, minor GS upgrades	11.23	
Phase 3 – 10 to 20 years	20-Y Mid R	Northeast Interceptor, Bear Creek diversion	23.15	
> 20-Y Mid R (A)	20-Y High R	Northwest Interceptor, additional Storage, GS upgrades		
> 20-Y Mid R (B)	+ 25% Growth			

- \* Opportunities for additional deferral once Existing Mid R is evaluated

**NOTE:** Cost summary does not include all condition-based and local area improvements

DRAFT RESULTS – SUBJECT TO CHANGE

## PROJECT PHASING

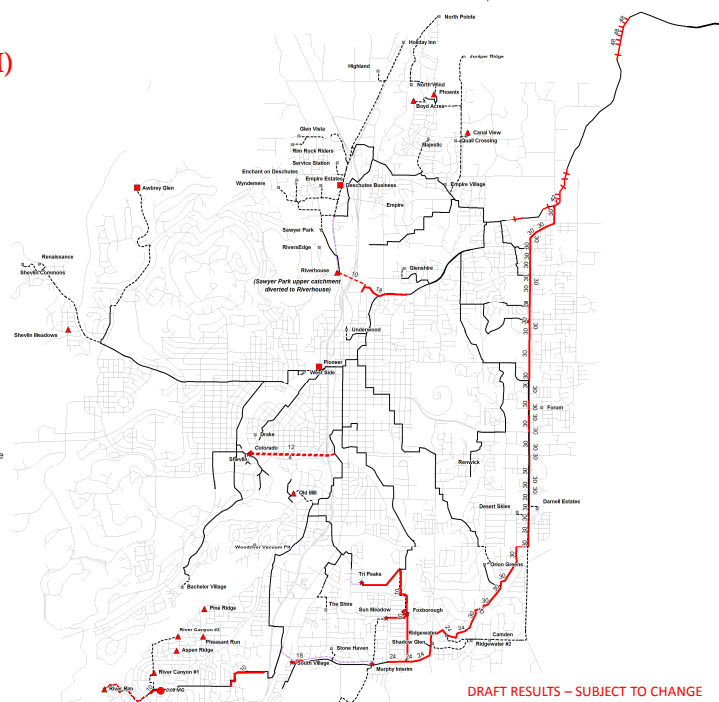
### Phase 1 – Immediate (\$53.85 M)

- SEI (not including u/s section)
- Colorado diversion
- Riverhouse diversion
- Plant Interceptor Grade 5 rehab
- Awbrey Glen Odor Control
- Southern Storage and GS upgrade
- River Rim force main

#### Legend

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>--- Decommissioned Force Main</li> <li>--- New Force Main - Immediate</li> <li>--- Existing Force Main</li> <li>--- New Gravity Sewer - Immediate</li> <li>--- Existing Gravity Sewer</li> <li>--- GS Rehab - Immediate</li> <li>--- GS Upsize - Immediate</li> </ul> | <ul style="list-style-type: none"> <li>■ Replace Lift Station - Immediate</li> <li>▲ Upgrade Lift Station - Immediate</li> <li>★ Decommission Lift Station - Immediate</li> <li>◆ New Lift Station - Immediate</li> <li>● New Storage Tank - Immediate</li> </ul> |
|--|---|

Note: Cost includes SEI at 30" design size



## PROJECT PHASING

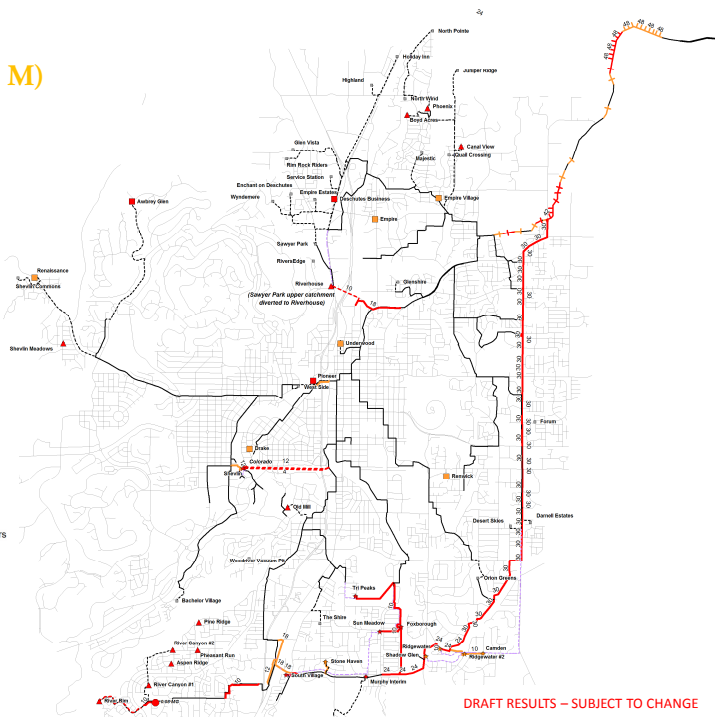
### Phase 2 – 5 to 10 Years (\$11.23 M)

- SEI (u/s Section)
- Plant Interceptor Grade 4 rehab
- GS upgrade d/s Drake
- GS upgrade d/s River Rim

#### Legend

- |   |   |
|---|---|
| --- Decommissioned Force Main           | ■ Replace Lift Station - 5 years            |
| - - - New Force Main - 5 to 10 years    | ■ Replace Lift Station - Immediate          |
| - - - New Force Main - Immediate        | ▲ Upgrade Lift Station - 5 to 10 years      |
| - - - Existing Force Main               | ▲ Upgrade Lift Station - Immediate          |
| - - - New Gravity Sewer - 5 to 10 years |   |
| - - - New Gravity Sewer - Immediate     |   |
| - - - Existing Gravity Sewer            |   |
| - - - GS Rehab - Immediate              | ★ Decommission Lift Station - 5 to 10 years |
| - - - GS Upsize - Immediate             | ★ Decommission Lift Station - Immediate     |
| - - - GS Rehab - 5 to 10 years          |   |
| - - - GS Upsize - 5 to 10 years         |   |
| ● New Storage Tank - 5 to 10 years      | ◆ New Lift Station - 5 to 10 years          |
| ● New Storage Tank - Immediate          | ◆ New Lift Station - Immediate              |
|   | ■ Existing Lift Station                     |

Note: Cost includes SEI at 30" design size



## PROJECT PHASING

### Phase 3 – 10 to 20 Years (\$23.15 M)

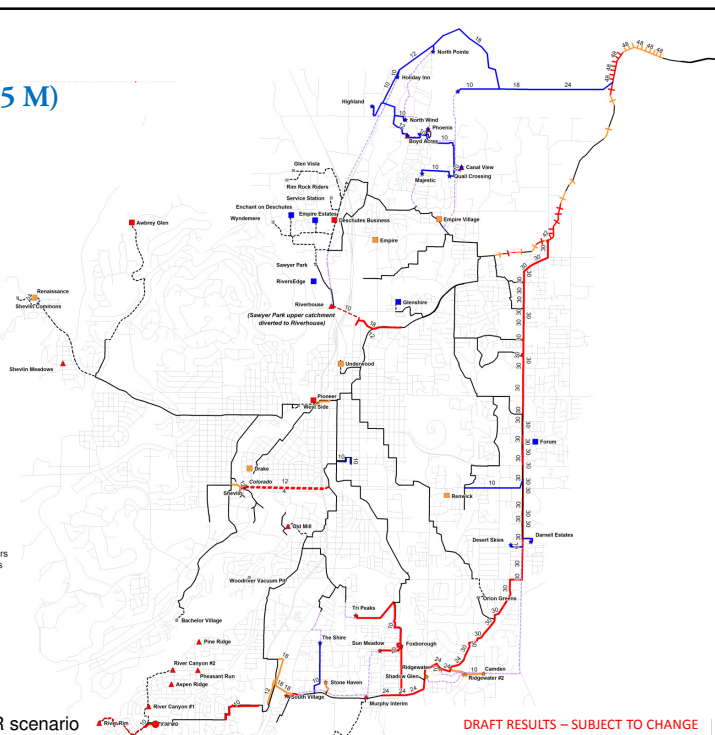
- Northeast Interceptor (NEI)
- Bear Creek GS diversion

#### Legend

- |  |  |
|--|--|
| --- Decommissioned Force Main            | ■ Replace Lift Station - 10 years            |
| - - - New Force Main - 5 to 10 years     | ■ Replace Lift Station - 5 years             |
| - - - New Force Main - Immediate         | ■ Replace Lift Station - Immediate           |
| - - - Existing Force Main                | ▲ Upgrade Lift Station - 10 to 20 years      |
| - - - New Gravity Sewer - 10 to 20 years | ▲ Upgrade Lift Station - 5 to 10 years       |
| - - - New Gravity Sewer - 5 to 10 years  | ▲ Upgrade Lift Station - Immediate           |
| - - - New Gravity Sewer - Immediate      |  |
| - - - Existing Gravity Sewer             |  |
| - - - GS Rehab - Immediate               | ★ Decommission Lift Station - 10 to 20 years |
| - - - GS Upsize - Immediate              | ★ Decommission Lift Station - 5 to 10 years  |
| - - - GS Rehab - 5 to 10 years           | ★ Decommission Lift Station - Immediate      |
| - - - GS Upsize - 5 to 10 years          |  |
| ● New Storage Tank - 10 to 20 years      | ◆ New Lift Station - 10 to 20 years          |
| ● New Storage Tank - 5 to 10 years       | ◆ New Lift Station - 5 to 10 years           |
| ● New Storage Tank - Immediate           | ◆ New Lift Station - Immediate               |
|  | ■ Existing Lift Station                      |

Note: Cost includes SEI at 30" design size

Cost also includes NEI at 18"/24" size per Mid R scenario



## PROJECT PHASING

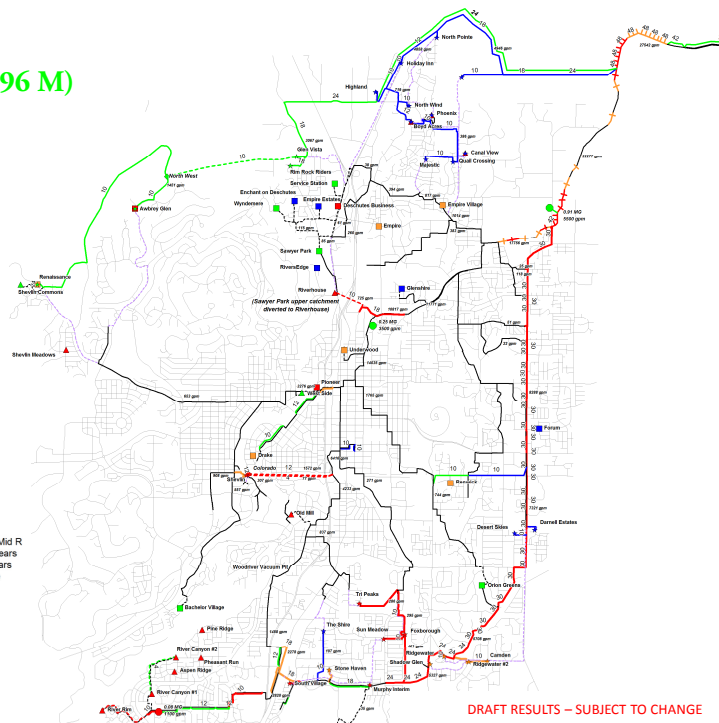
### Flows Above 20-Y Mid R (\$60.96 M)

Projects only required in 20-Y High R  
and 20-Y High R + 25% Loading:

- Northwest Interceptor
- Plant Interceptor storage
- GS upgrades

#### Legend

- Decommissioned Force Main
- New Force Main - >20-year Mid R
- New Force Main - 10 to 20 years
- New Force Main - 5 to 10 years
- New Force Main - Immediate
- Existing Force Main
- New Gravity Sewer - >20-year Mid R
- New Gravity Sewer - 10 to 20 years
- New Gravity Sewer - 5 to 10 years
- New Gravity Sewer - Immediate
- Existing Gravity Sewer
- GS Rehab - Immediate
- GS Upsize - Immediate
- GS Upsize - 5 to 10 years
- GS Upsize - >20-year Mid R
- New Storage Tank - 10 to 20 years
- New Storage Tank - 5 to 10 years
- New Storage Tank - Immediate
- Replace Lift Station - 20 years
- Replace Lift Station - 10 years
- Replace Lift Station - 5 years
- Replace Lift Station - Immediate
- ▲ Upgrade Lift Station - >20-year Mid R
- ▲ Upgrade Lift Station - 10 to 20 years
- ▲ Upgrade Lift Station - 5 to 10 years
- ▲ Upgrade Lift Station - Immediate
- ★ Decommission Lift Station - >20-year Mid R
- ★ Decommission Lift Station - 10 to 20 years
- ★ Decommission Lift Station - 5 to 10 years
- ★ Decommission Lift Station - Immediate
- ◆ New Lift Station - >20-year Mid R
- ◆ New Lift Station - 10 to 20 years
- ◆ New Lift Station - 5 to 10 years
- ◆ New Lift Station - Immediate



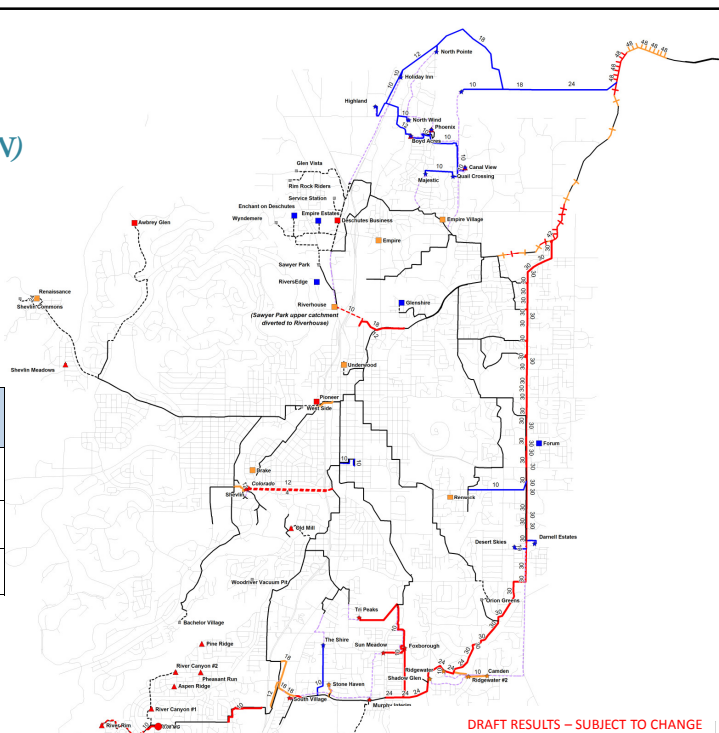
DRAFT RESULTS – SUBJECT TO CHANGE

## 20-YEAR MID R PROJECT PHASING (INTERMEDIATE SOLUTION)

Phase	Capital Cost (\$M)
Phase 1 – Immediate	53.85
Phase 2 – 5 to 10 years	11.23
Phase 3 – 10 to 20 years	23.15

**NOTE:** Cost summary does not include all condition-based and local area improvements

Note: Cost includes SEI at 30" design size and includes NEI at 18"/24" size per Mid R scenario



DRAFT RESULTS – SUBJECT TO CHANGE

## REQUIRED CAPITAL AND RATES

- ◆ Current sewer rate is \$44.37/month
- ◆ Adequate to fund construction of water treatment plant project + an additional \$20M over next 5 years
- ◆ Rates will need to go up
  - Further analysis required by City/FCSG/MSA to determine how much

DRAFT RESULTS – SUBJECT TO CHANGE

## FINAL STEPS

- ◆ Evaluate additional alternatives and refine solutions
  - Northern storage option
  - Colorado discharge to CBD gravity sewer
  - Plant Interceptor upsize Vs parallel line at time of NEI
  - Mid R Conservation analysis and 20-Y Mid R + 25% Growth
- ◆ Practical scheduling of Phase 1 improvements
  - Run Existing Mid R scenario
  - Connecting Riverhouse diversion to Plant Interceptor prior to SEI
  - Connect SEI to existing gravity sewer to delay construction of northern portion
  - Will the Southern Storage facility substantially reduce existing deficiencies
- ◆ Develop preliminary local area solutions
  - Romaine Village
  - Wood River Village
  - Juniper Utility
  - Kings Forest
- ◆ Quantify additional condition-based improvement costs
- ◆ Questions or comments?

## CITY AND SIAG INPUT

- ◆ Should final analysis and subsequent CIP utilize Mid R loading?
- ◆ Are there questions or concerns about proposed phasing?

DRAFT RESULTS – SUBJECT TO CHANGE

## SIAG COMMUNITY BRIEFINGS

Trainings held December 16

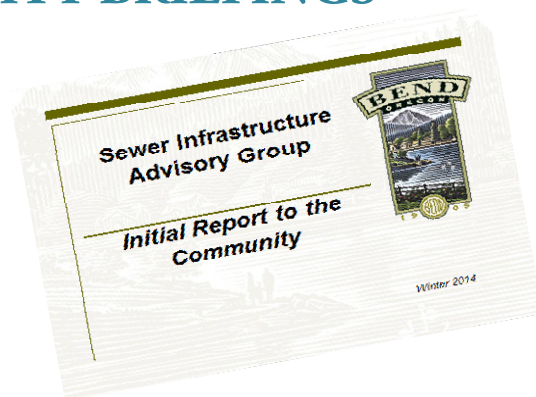
Materials:

- ◆ SIAG Briefing PowerPoint
- ◆ Tell Us What You Think
- ◆ Talking Points
- ◆ Presentation Boards

Scheduled presentations:

January 13	River West NA
January 21	COAR
January 28	Rotary Club of Greater Bend
February 4	BEDAB
March 13	EDCO Board Meeting

*More to come!*

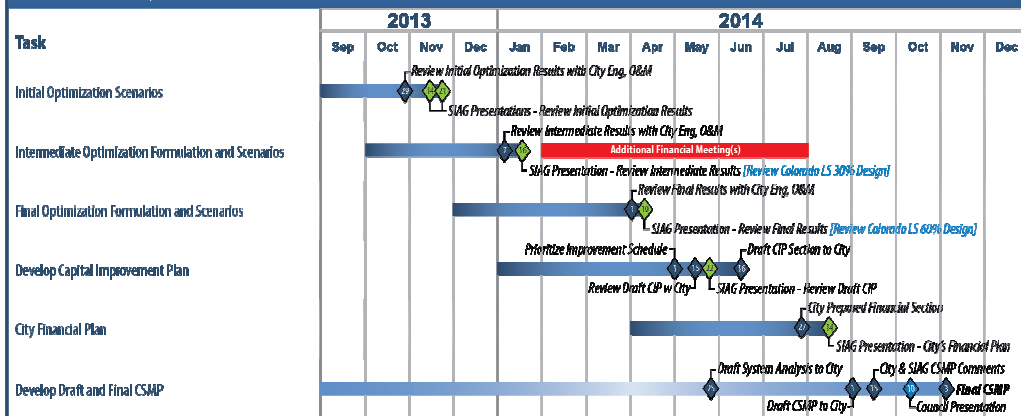


## SCHEDULE REVIEW



DRAFT CONDENSED PROJECT SCHEDULE (AS OF JANUARY 6, 2014)

CITY OF BEND  
OPTIMIZED SEWER COLLECTION SYSTEM MASTER PLAN



DRAFT RESULTS – SUBJECT TO CHANGE

## COLORADO LIFT STATION

- ◆ Colorado LS consistently selected
- ◆ 30% design complete
- ◆ 60% design complete in March
- ◆ Current capacity 2,300 gpm
- ◆ Dual 12-inch force mains
- ◆ Begin construction in Sep 2014
- ◆ Operational Oct 2015

DRAFT RESULTS – SUBJECT TO CHANGE

## NORTH AREA SOLUTIONS

- ◆ Riverhouse diversion immediate solution
- ◆ NE Interceptor selected after 10 years
- ◆ North Area design team selected
- ◆ Additional North Area options being evaluated
- ◆ Design team will work with CSMP team to identify final solutions over next few months

DRAFT RESULTS – SUBJECT TO CHANGE

## SE INTERCEPTOR

- ◆ SEI selected
  - Regardless of credit for design costs
- ◆ Current design serves build-out of current UGB + 25% growth
- ◆ Key for growth/improvements in other areas
  - SEI creates capacity in central int. allowing city-wide growth
  - Colorado Lift Station
  - Riverhouse Diversion

DRAFT RESULTS – SUBJECT TO CHANGE

**Sewer Infrastructure Advisory Group  
Meeting Summary**

**January 16, 2014**

**3:30-5:30 p.m.**

Review Intermediate Optimization Results

**City Council Chambers**

**Note taker: Adele McAfee**

**Committee Members:**, Lynn Putnam, Mike Riley, Sharon Smith, Steve Hultberg, Dale VanValkenberg, Casey Roats, Steve Galash, Charlie Miller, Rob Von Rohr, Stacy Stemach, Nathan Boddie

**COB Staff:** Paul Rheault, Jon Skidmore, Aaron Collett, Tom Hickmann, Patrick Griffiths

**Consultants:** David Stangel (MSA), David Prull (Clearwater Engineering Group), Jeff Frey (Optimatics), Joel Wilson (WCS Engineering)

**Facilitator:** Libby Barg, Clark Worth (Barney & Worth)

**Others:** Jim Lord, Erik Huffman, Councilor Sally Russell, John Russell, Lupe Severson, Erick Peters, Andre Tolme, Terry Angle, Brady Fuller, Jim Frost

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**Action Items:**

- ✓ Run 10% water conservation scenario for Mid-R
- ✓ Utilize Mid R loading only for the final optimization runs and for subsequent capital improvement plan development (voted by a show of hands)
- ✓ Provide more financial information to SIAG to help inform upcoming phasing decisions

**Meeting Summary**

**Introductions announcements**

The SIAG community outreach has kicked off with the first presentation given to the River West NA.

**Intermediate optimization results**

Joel Wilson (WCS Engineering) presented intermediate optimization results and initial phasing.

1. The Intermediate Solution is generally consistent with the Initial Solution
2. Optimization eliminated more north area lift stations, adding some capital costs, however, reducing overall life cycle costs
3. The SE Interceptor, Colorado Lift Station and Riverhouse Diversion selected as high priority projects
4. Optimized solutions for existing, 10-year, 20-year and 20-year plus 25% loading, provide insight for project phasing
5. Costs have increased due to inclusion of some condition based improvements

**SIAG questions / comments**

- **What is the cost of the local improvements?**  
The cost analysis is still underway.
- **When will people with septic systems be connected to the system?**  
That will not be determined as part of the Sewer System Master Plan. The Plan accounts for those homes being connected to the system.

- **The financial model should include the 5, 10, and 20 year projects (as long as the 20 year analysis doesn't slow down the process).**
- **Financial plan should include local area costs and rehabilitation costs.**
- **What's the difference between pipe condition improvements and local area costs?**  
Pipe condition improvements include projects like the treatment plant pipe interceptor line. Immediate fixes are needed. An example of local area costs would be fixing odor problems in a neighborhood.
- **When will SIAG see costs?**  
The cost are continued to be refined through the planning process. The City will present costs at the May 1 SIAG meeting.
- **Why are you adding deferred costs maintenance now?**  
Deferred maintenance requirements (and associated costs) were always a part of the master plan. In order to create a comprehensive master plan/financial plan it is necessary to capture all projects and costs.
- **Are the condition improvements going into the optimization model?**  
No, however if there is an option to divert flow away from a failing pipe or eliminate a pump station, the city will save the costs of rehabilitating by taking that facility out of service.

#### **Next steps**

- Evaluate additional alternatives and refine solutions
- Practical scheduling of Phase 1 improvements
- Develop preliminary local area solutions
- Quantify additional condition-based improvement costs.

Meeting Adjourned: 5:28 PM



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# Bend Sewer Infrastructure Advisory Group: Meeting #18

## Financial Discussion

Bend City Council Chambers  
710 NW Wall St., 1<sup>st</sup> Floor

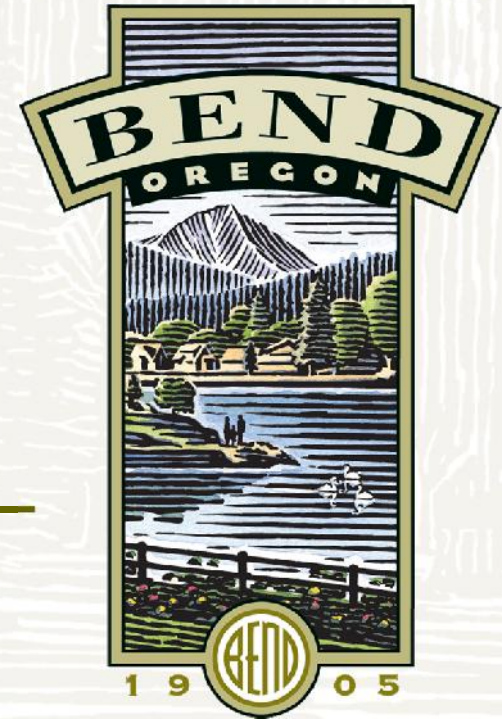
March 13, 2014  
**3:30-5:30 p.m.**

## Agenda

	Presenter	Time (2 hrs.)
1. Welcome	Jon Skidmore	10 min
2. Colorado Lift Station	Aaron Collette, P.E. David Prull, P.E.	20
3. Overview: CSMP Cost Components	David Stangel, P.E. David Prull, P.E.	40
4. Financial Picture	Angie Sanchez Virnoche, FCS Group	30
5. Next Steps <ul style="list-style-type: none"><li>▪ <b>SIAG: Final Optimization Results, April 17</b></li><li>▪ <b>SIAG: Funding Prioritization, May 1 (Workshop)</b></li><li>▪ Community Outreach<ul style="list-style-type: none"><li>- CIP Open House June 19</li><li>- New Presentations (July-Sept)</li></ul></li><li>▪ Financial Plan Complete (August)</li><li>▪ <b>SIAG: Final Recommendations, September 25</b></li><li>▪ City Council Presentation, October 15</li><li>▪ Final Master Plan (November)</li></ul>	Libby Barg	15
6. Public Comment		5 min

# Colorado Lift Station

## SIAG Update



*Prepared by: Aaron  
Collett*

*March 13, 2014*

# Project Status

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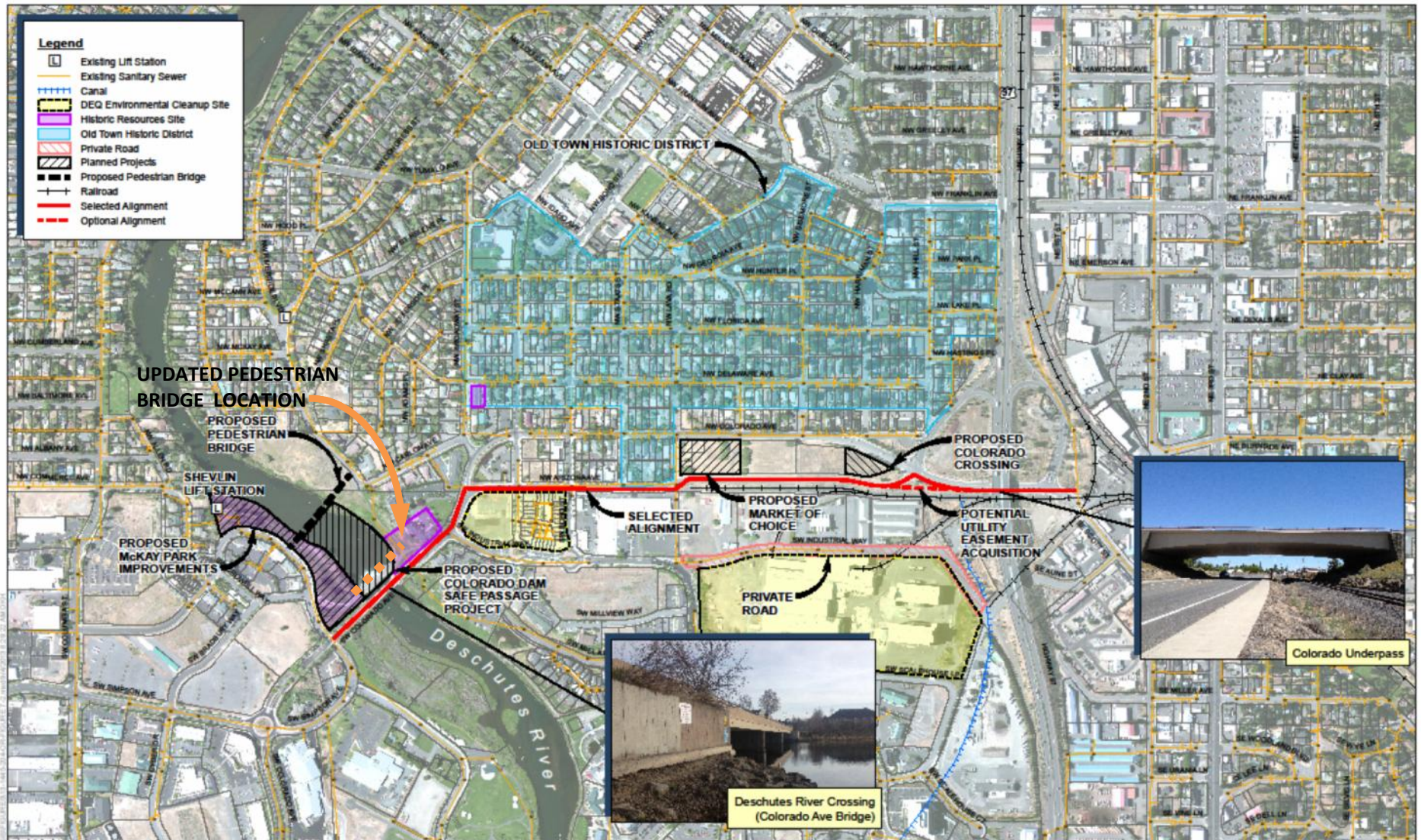
- Phase 1 Complete
  - 30% Design completed
- Phase 2 (approved by Council)
  - Starts final design phase (60%-Final)
  - Engineering support through bid and construction

# Phase 1 Goals

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- Evaluated design alternatives and selected the preferred approach
  - Lift Station Location
  - River crossing method
  - Force main route
  - Lift station service area and size
- Developed detailed scope and fee for Phase 2 for Council approval
  - Approved by Council February 19, 2014

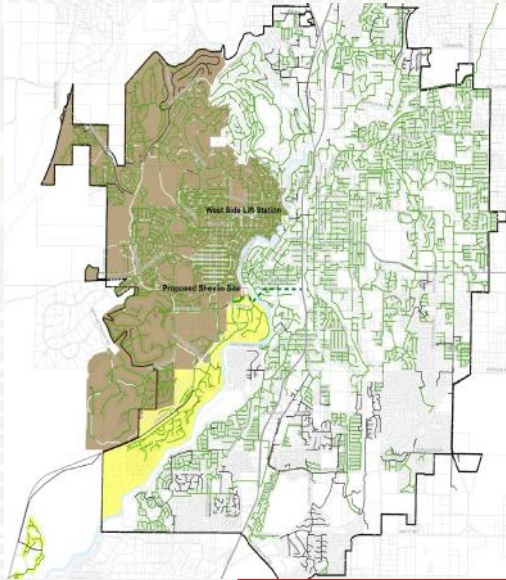


# Colorado LS Loading Scenarios



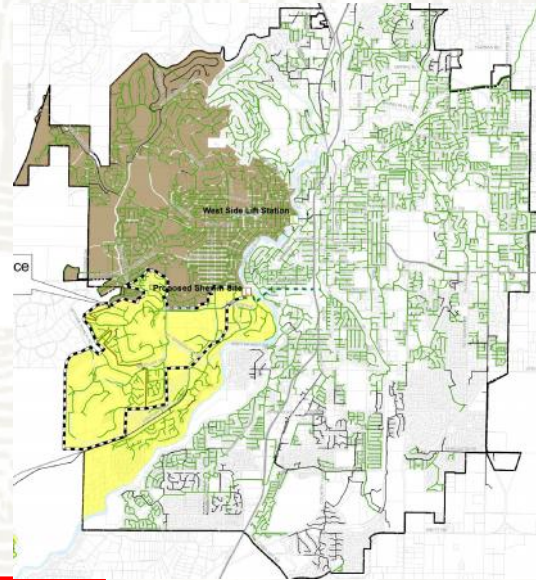
\$8.6 M

Scenario 1



\$10.0 M

Scenario 2



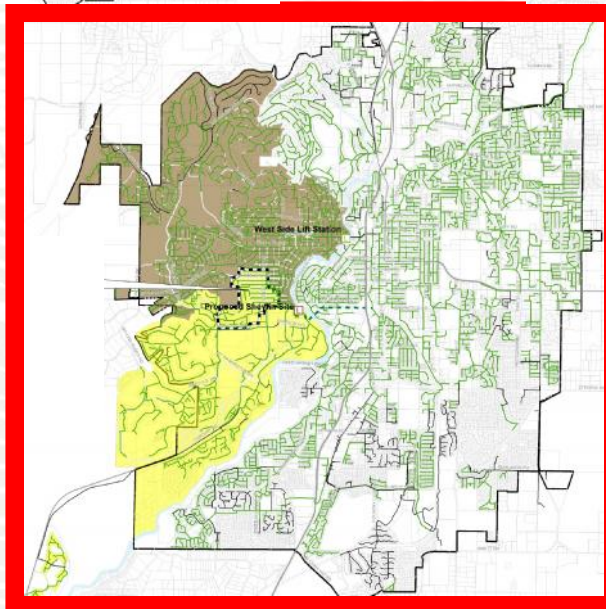
Legend

Colorado Basin

Westside Basin

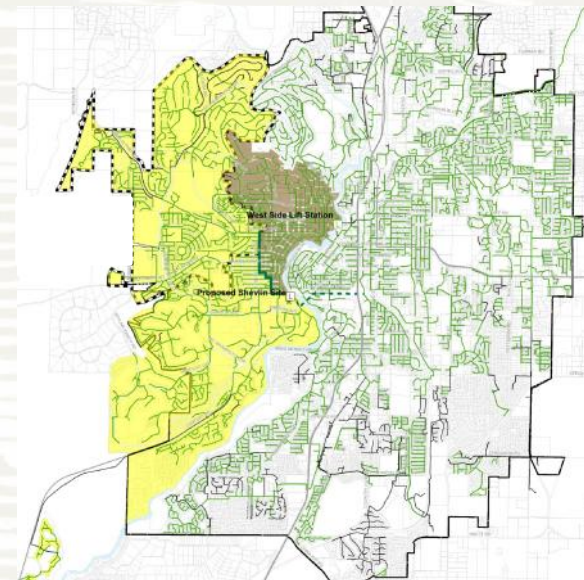
\$13.4 M

Scenario 3



\$19.3 M

Scenario 4



August 2013 SIAG  
Update to Council.

**Selected**

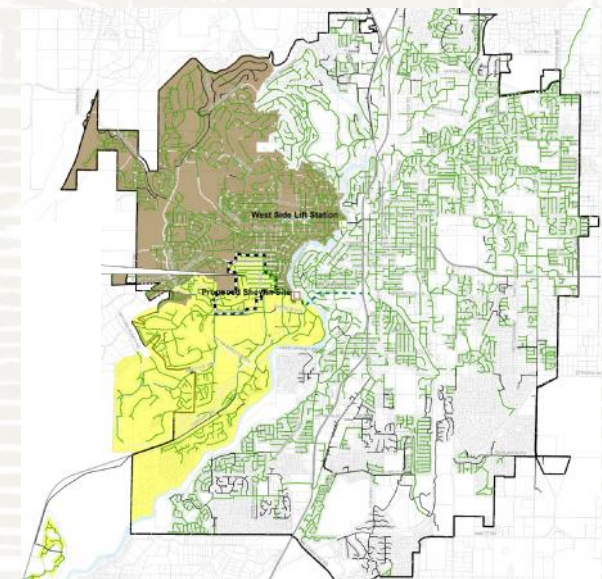
\*Class 5 cost estimates (+50%, - 30%)

# Selected Scenario and Cost



- Long-Term & Short Term Solution
- \$13.4 Million project cost\*
- Serves area in Scenario 3 (yellow) for 20+ years
- Recommended by SIAG
  - Staff preferred Scenario 4 for flexibility & redundancy
  - Designing flexibility into Scenario 3 for future expandability

Scenario 3



\*Class 5 cost estimates (+50%, - 30%)

# Outreach/Community

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- Ongoing coordination
  - SIAG
  - Bend Parks & Recreation
  - Street's Department
- Developing Outreach Plan
  - Stakeholders such as Bend Parks & Recreation, Old Mill District, Water Overlay Zone, residents, businesses, etc.
  - Conduct open houses and outreach to educate public about project
  - Leverage internal resources of City **Business Advocate** and **Community Relations Manager**
- Goal - minimize disruption during construction

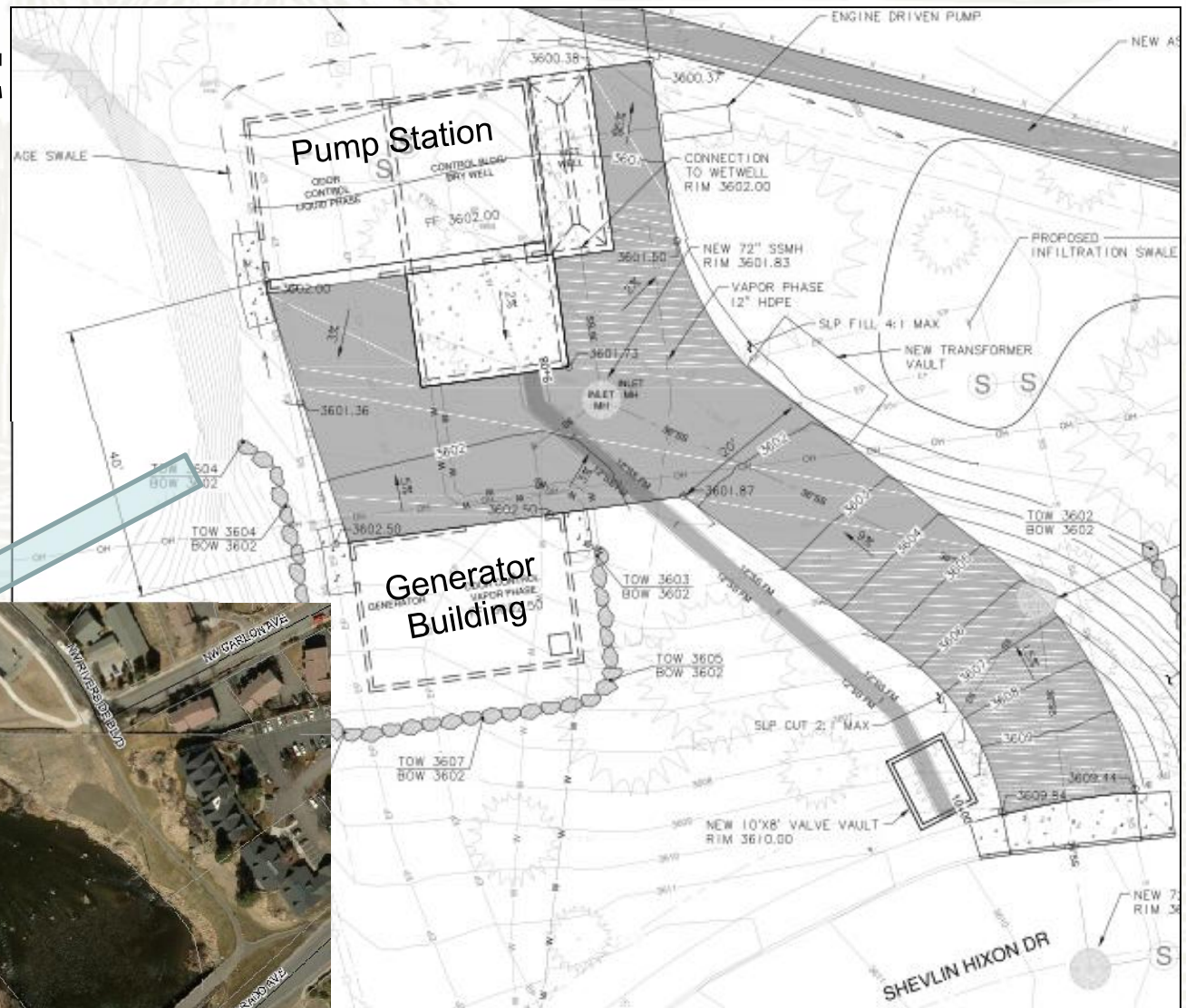
# Other Noteworthy Items

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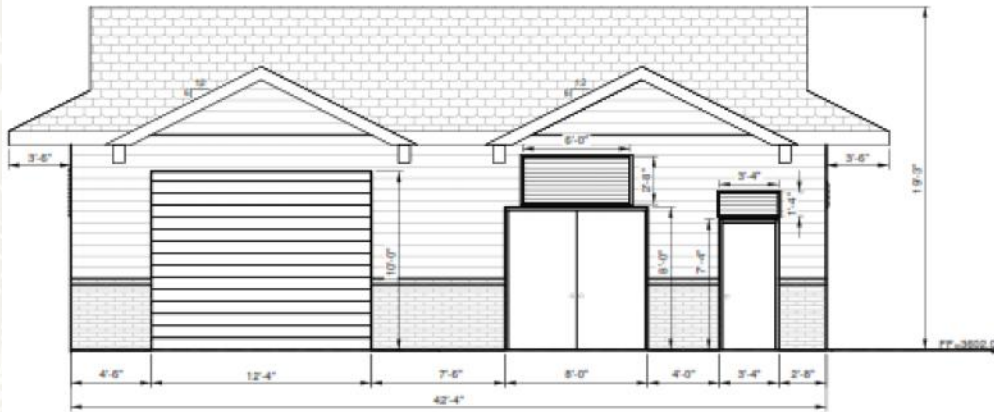


- **Deschutes agreement**
  - A Colorado Lift Station accommodates future growth at Deschutes Brewery
  - Funds previously negotiated towards a Columbia sewer improvement will be contributed to offset a portion of Colorado Lift Station cost
- **Station provides service through build-out for the Old Mill District**

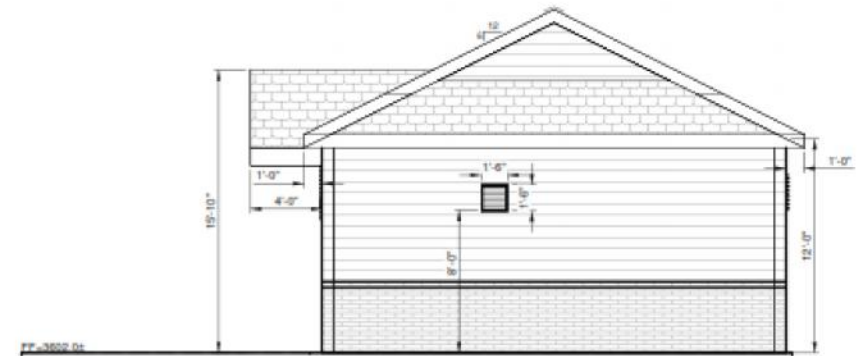
# Site Layout Concept (30% Draft)



# Building Elevation Examples\*

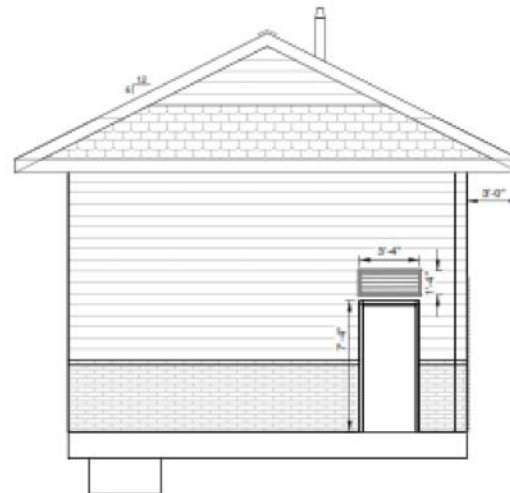
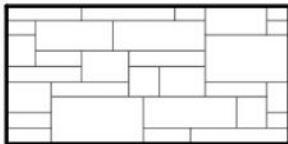


LIFT STATION SOUTH ELEVATION  
SCALE: 1/8"=1'-0"

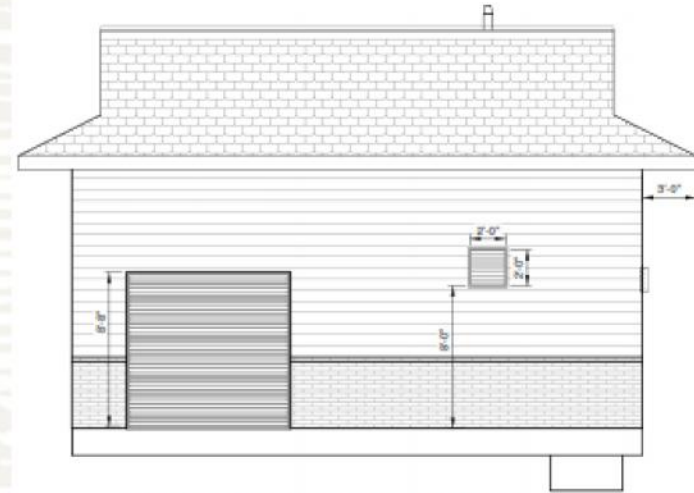


LIFT STATION EAST ELEVATION  
SCALE: 1/8"=1'-0"

Example block pattern  
– Courtesy Bend Parks  
& Recreation



GENERATOR BUILDING WEST ELEVATION  
SCALE: 1/8"=1'-0"



GENERATOR BUILDING SOUTH ELEVATION  
SCALE: 1/8"=1'-0"

\*30% Draft  
Concepts

City of Bend

# Schedule Assumptions

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- Council Approval of Phase 2 – February 19
- Complete Design ~ 7-8 months
- Bidding Process ~ 2 months
- Construction ~ 1 year

# Questions?

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Thank you.

City of Bend

# **SEWER SYSTEM COSTS PRIMER**

## **BEND OPTIMIZED COLLECTION SYSTEM MASTER PLAN**

**March 13, 2014**

DRAFT RESULTS – SUBJECT TO CHANGE

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

## **PRESENTATION CONTENTS**

- ◆ Layers of the cake
- ◆ Flexibility to defer
- ◆ Ongoing replacement funding levels
- ◆ Financial overview
- ◆ Flow monitoring update
- ◆ Schedule

DRAFT RESULTS – SUBJECT TO CHANGE

## LAYERS OF THE CAKE

- ◆ Ongoing Operations and Maintenance
- ◆ Collection System Capacity CIP (Optimization)
- ◆ Water Reclamation Facility CIP
- ◆ Collection System Condition CIP
- ◆ Collection System Ongoing Replacement CIP

Note: Local area improvement costs are not included



DRAFT RESULTS – SUBJECT TO CHANGE

## ONGOING OPERATIONS & MAINTENANCE

- ◆ Example Costs
  - Staff Salary and Overhead
  - Electricity to run WRF and Lift Stations
  - Materials for WRF and Lift Stations
  - Chemicals for WRF
  - Vehicles and Equipment

DRAFT RESULTS – SUBJECT TO CHANGE

## COLLECTION SYSTEM CAPACITY CIP (OPTIMIZATION)

### Example Projects

- SE Interceptor
- Colorado LS and Force Main
- NE Interceptor
- North Area Force Main
- Other specific projects

DRAFT RESULTS – SUBJECT TO CHANGE

## WATER RECLAMATION FACILITY CIP

### Example Projects

- Secondary Treatment Expansion
- Digester Upgrade
- Other Projects

DRAFT RESULTS – SUBJECT TO CHANGE

## COLLECTION SYSTEM CONDITION CIP

### Example Projects

- Awbrey Glen Lift Station and Valhalla Odor improvements
- Specific Lift Station improvements
- Plant Interceptor condition improvements
- Other specific pipe condition improvements

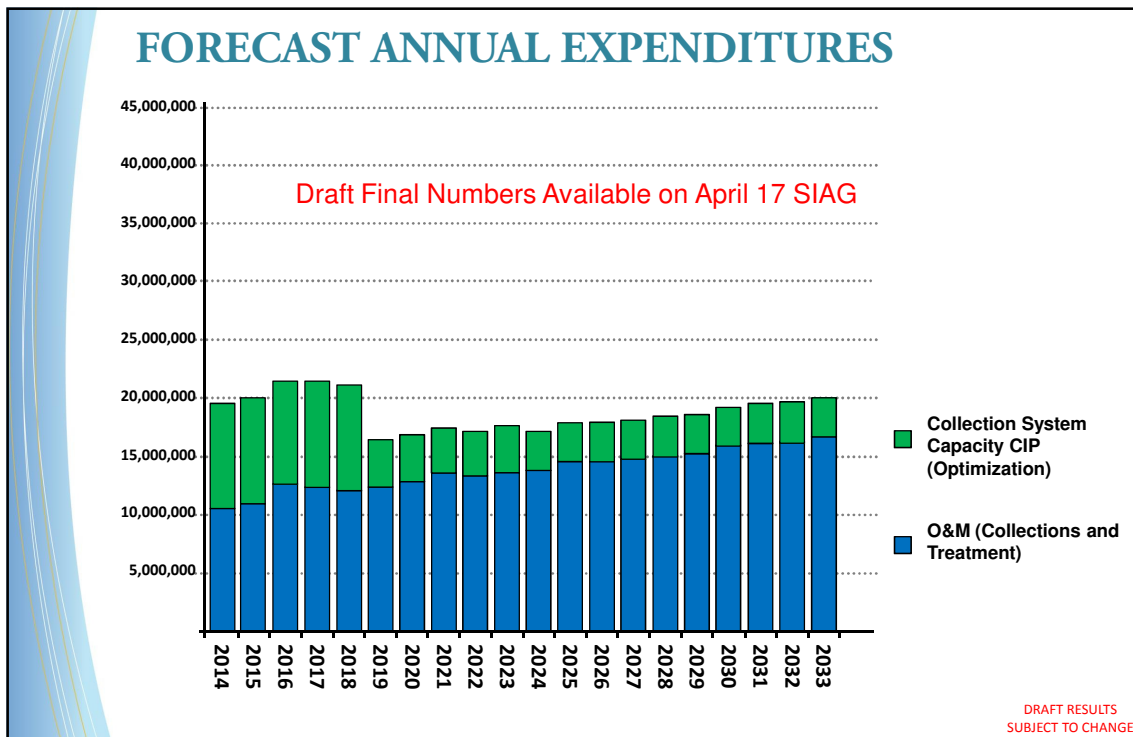
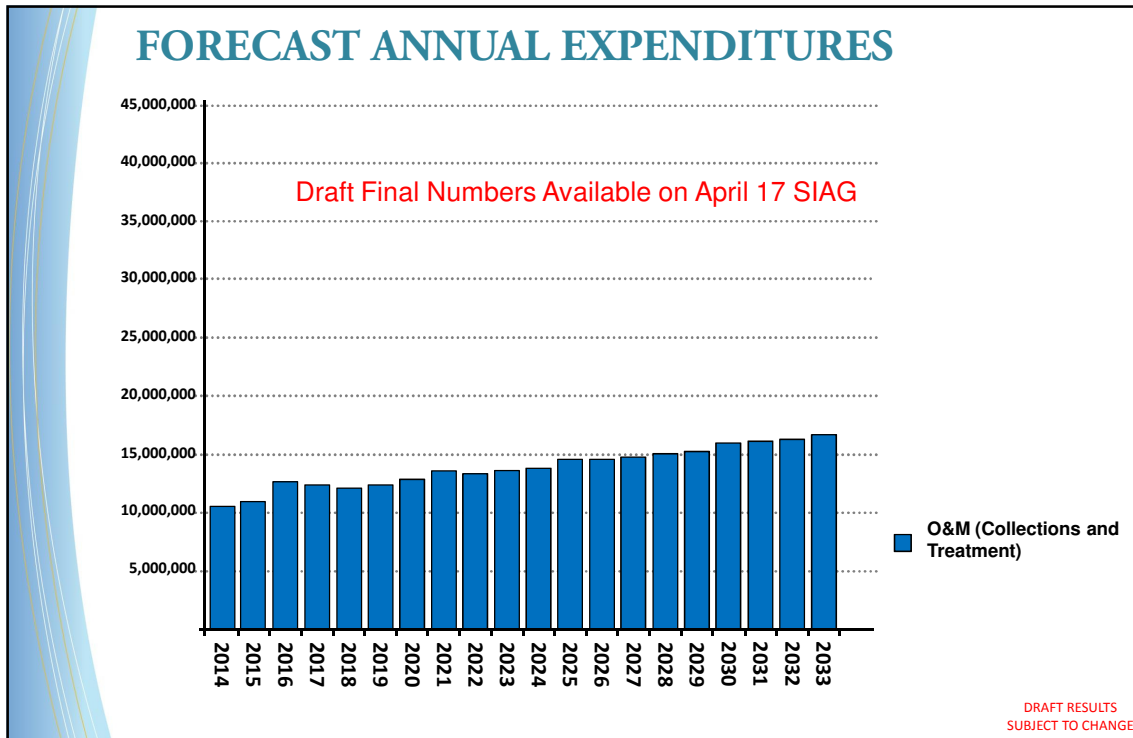
DRAFT RESULTS – SUBJECT TO CHANGE

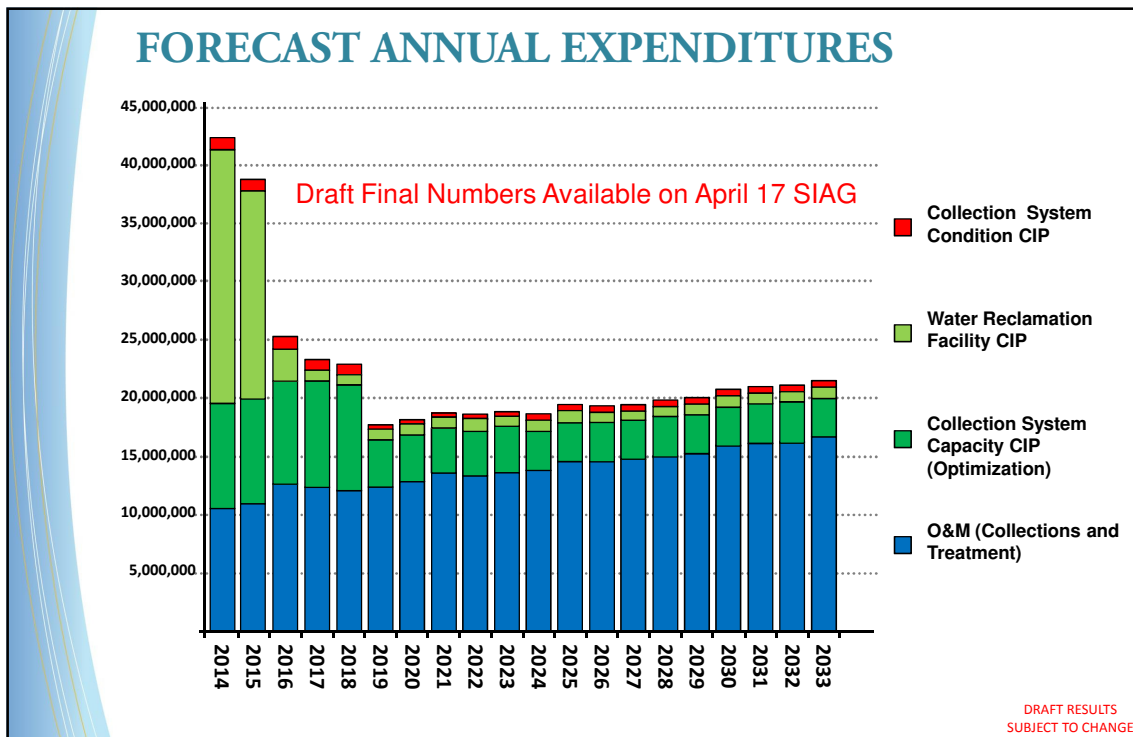
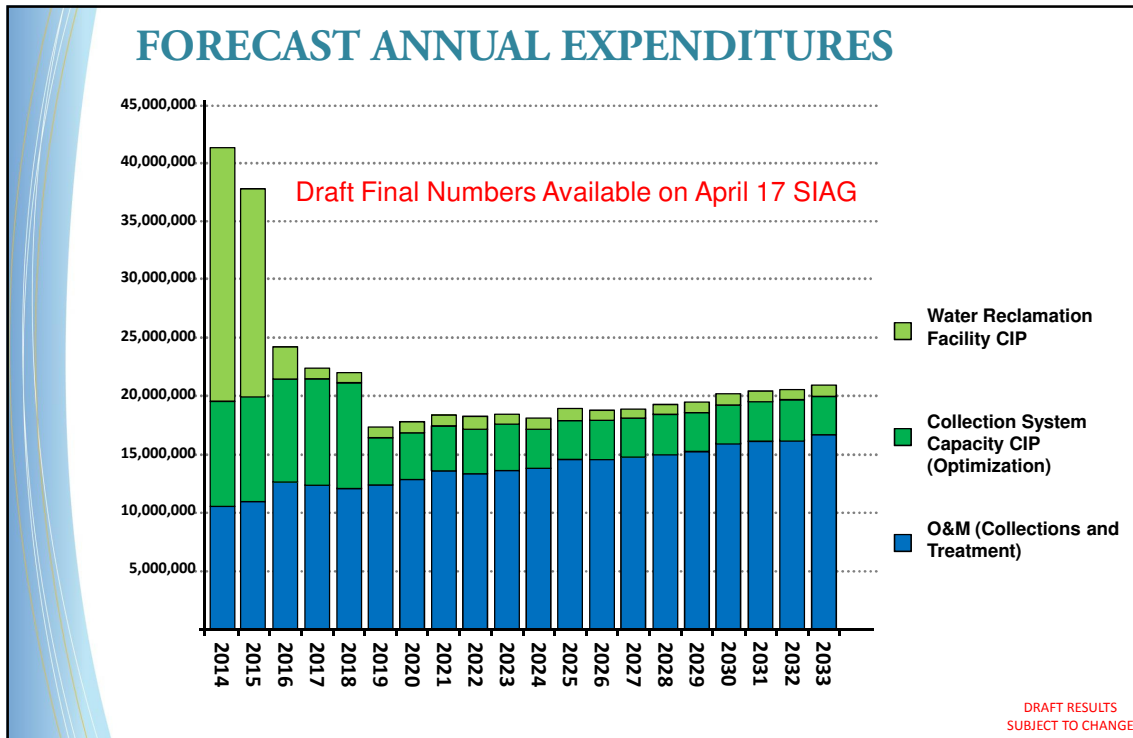
## COLLECTION SYSTEM ONGOING REPLACEMENT CIP

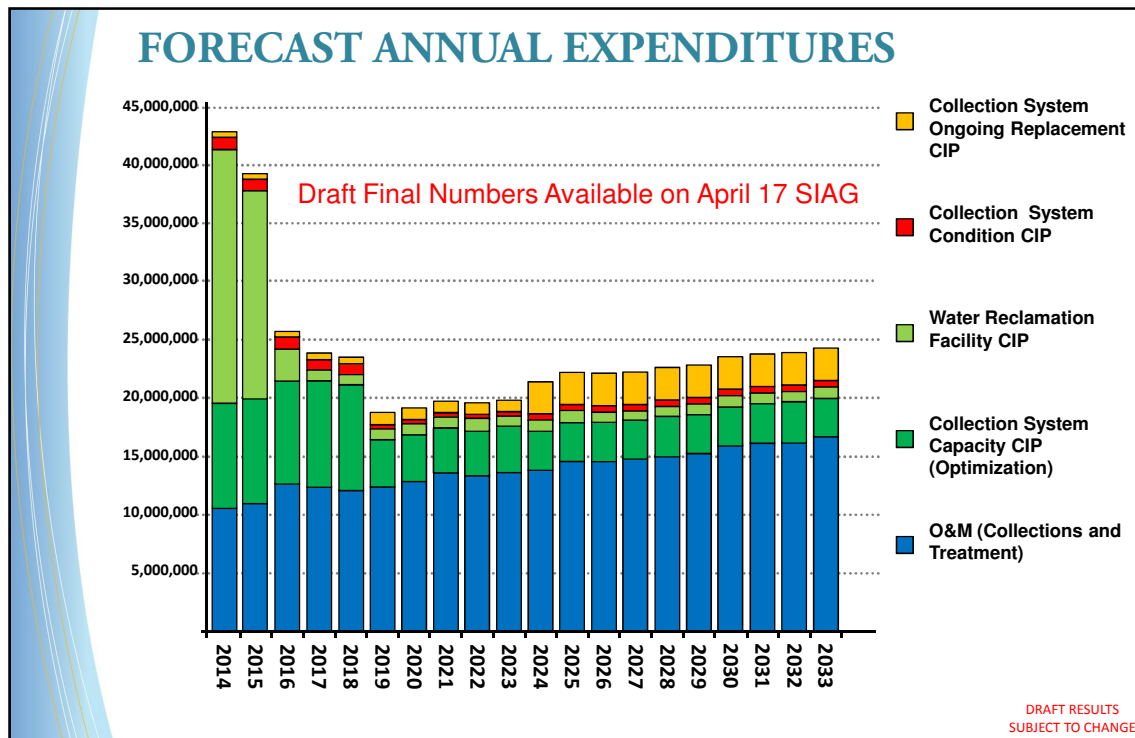
### Example Projects

- Ongoing pipe replacement/rehabilitation
  - Gravity – including manholes
  - Force Main
  - Common Pressure Main
  - Vacuum Main
- Ongoing lift station replacement/rehabilitation

DRAFT RESULTS – SUBJECT TO CHANGE







## WHAT CAN BE DEFERRED?

### Why defer?

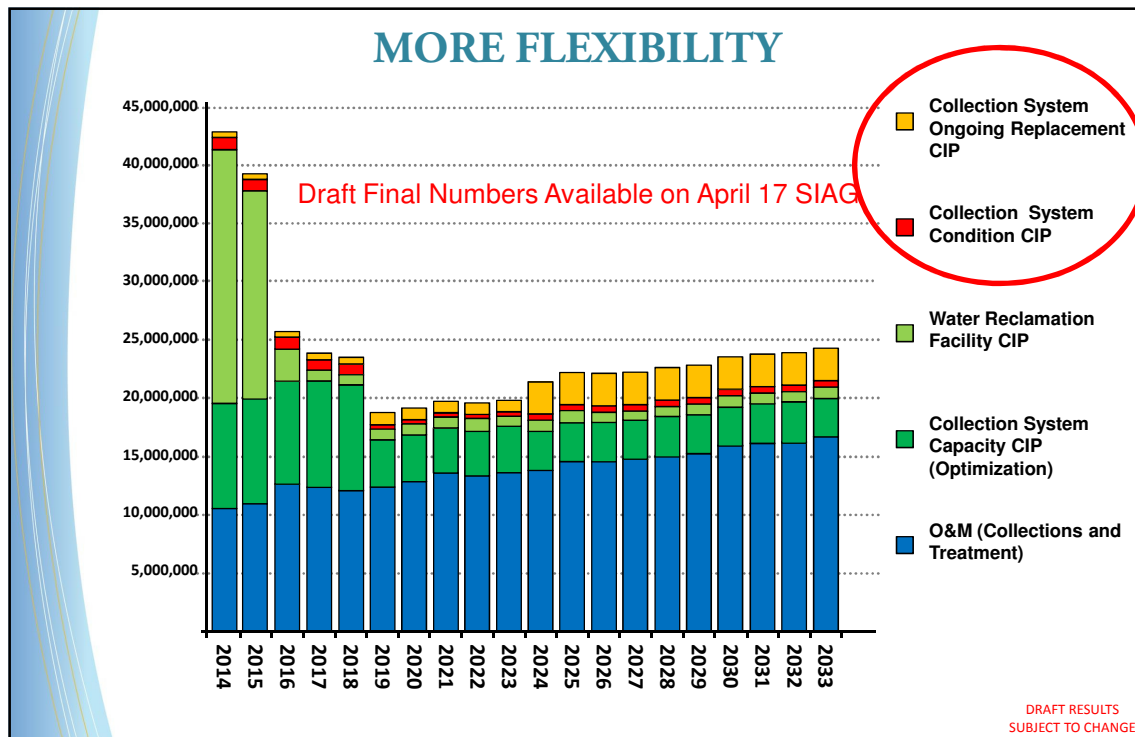
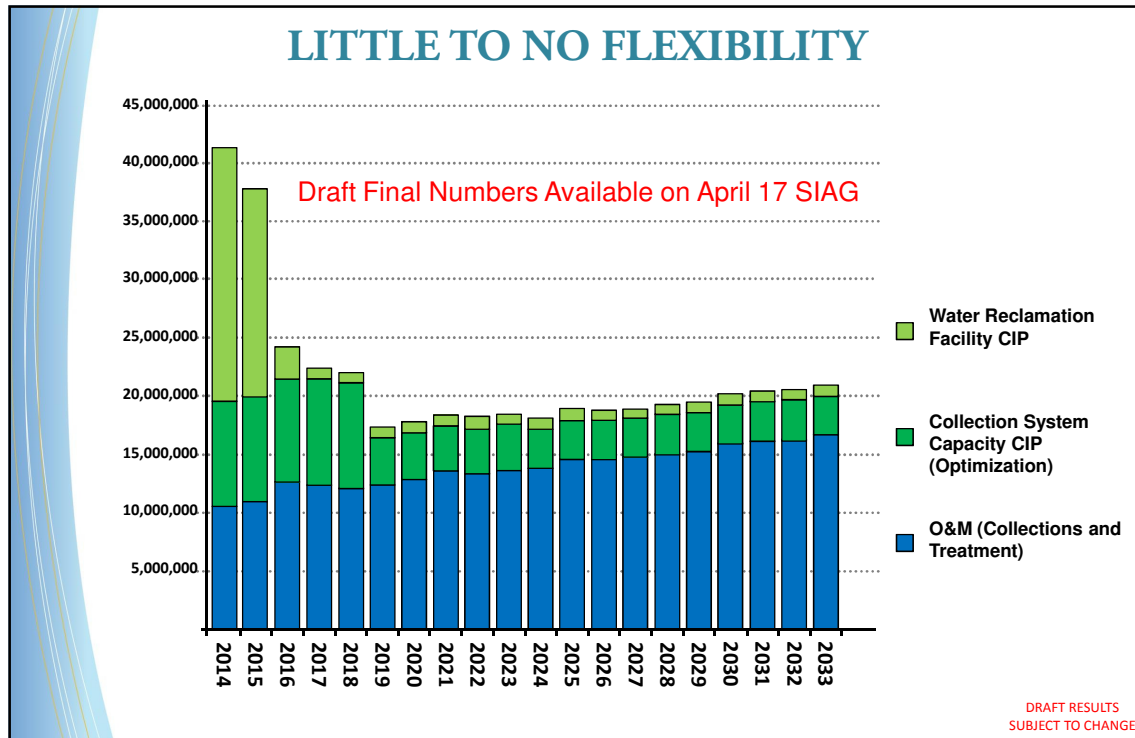
- Potentially decreases how fast rates may change
- Potentially decreases how much rates may increase

### Why not defer?

- Stakeholder interests including Operations, Community Development, Rate Payers, Jobs and the Economy, Public Health Risks

### What can be deferred ...

DRAFT RESULTS – SUBJECT TO CHANGE



## POTENTIAL FUNDING LEVELS FOR ONGOING REPLACEMENT

### Example 1

Sewer Collection System Infrastructure Full Replacement Cost				
Component	Type of Improvement	Useful Life (years)	Replacement Cost	Required Investment
Gravity	Replacement	80	\$700,000,000	\$8,800,000
Force Main	Replacement	50	\$20,000,000	\$400,000
Common Pressure Main	Replacement	50	\$56,000,000	\$1,100,000
Vacuum Main	Replacement	50	\$3,000,000	\$60,000
Lift Station	Replacement	35	\$80,000,000	-
Residential Lift Station	Replacement	20	\$2,000,000	\$100,000
Total			\$861,000,000	\$10,000,000

DRAFT RESULTS  
SUBJECT TO CHANGE

## POTENTIAL FUNDING LEVELS FOR ONGOING REPLACEMENT

### Example 2

Sewer Collection System Infrastructure Repair and Rehabilitation Cost				
Component	Type of Improvement	Useful Life (years)	Rehabilitation/ Replacement Cost	Required Investment
Gravity	CIPP Rehabilitation	80	\$297,000,000	\$3,700,000
Force Main	Pipe Bursting	50	\$13,000,000	\$260,000
Common Pressure Main	Pipe Bursting	50	\$37,000,000	\$740,000
Vacuum Main	Pipe Bursting	50	\$2,000,000	\$40,000
Lift Station	Rehabilitation	35	\$28,000,000	-
Residential Lift Station	Rehabilitation	20	\$2,000,000	\$100,000
Total			\$379,000,000	\$5,000,000

DRAFT RESULTS  
SUBJECT TO CHANGE

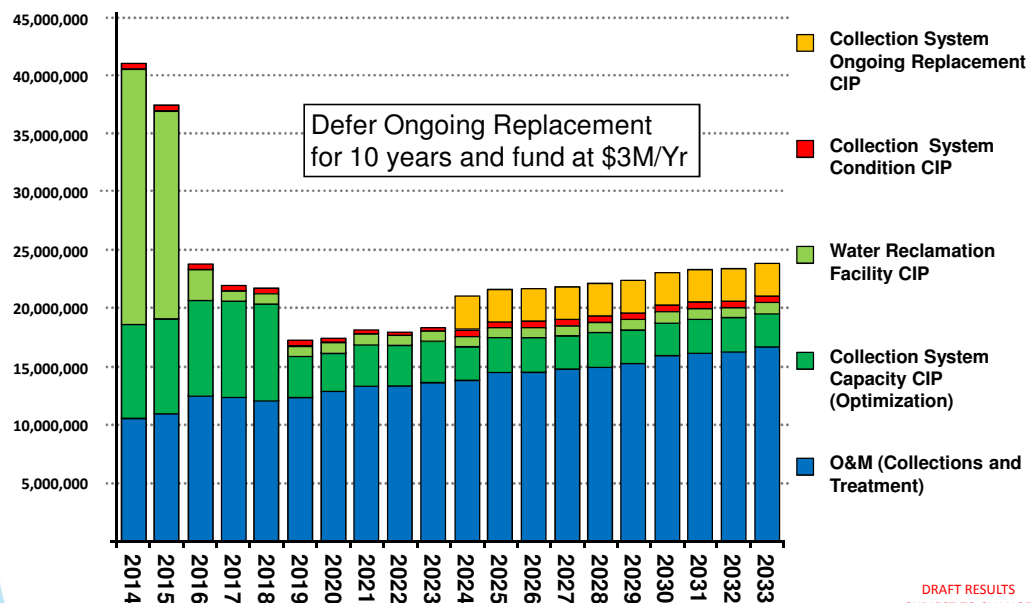
## POTENTIAL FUNDING LEVELS FOR ONGOING REPLACEMENT

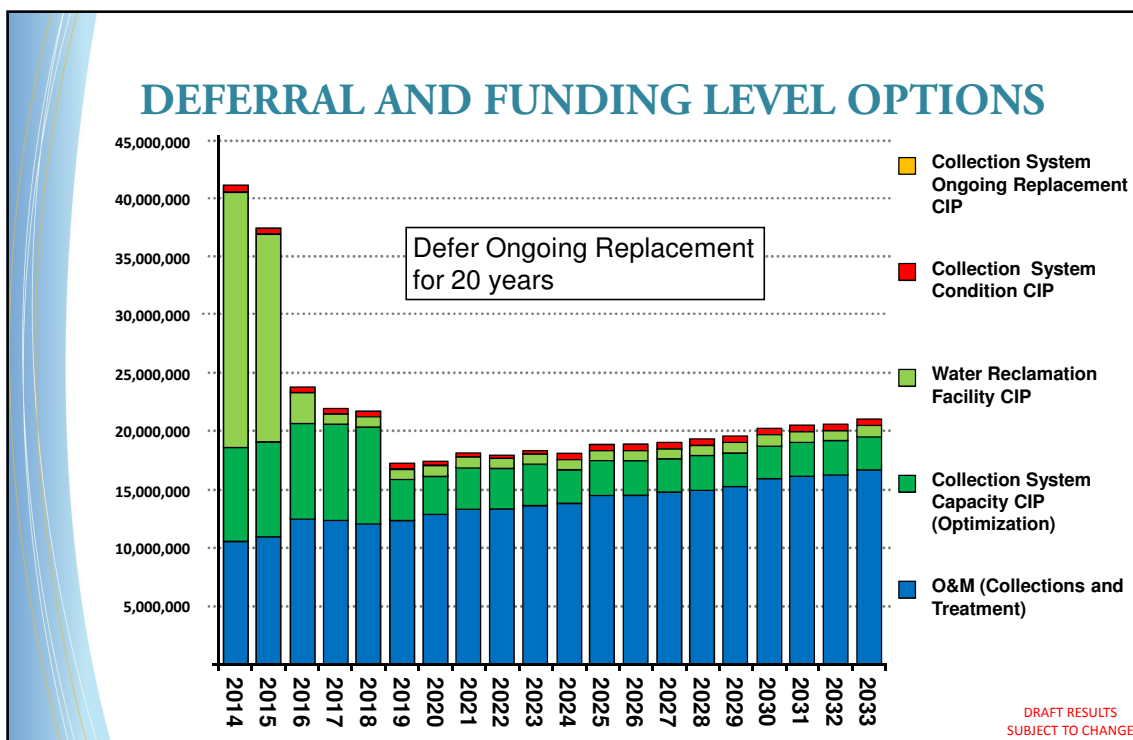
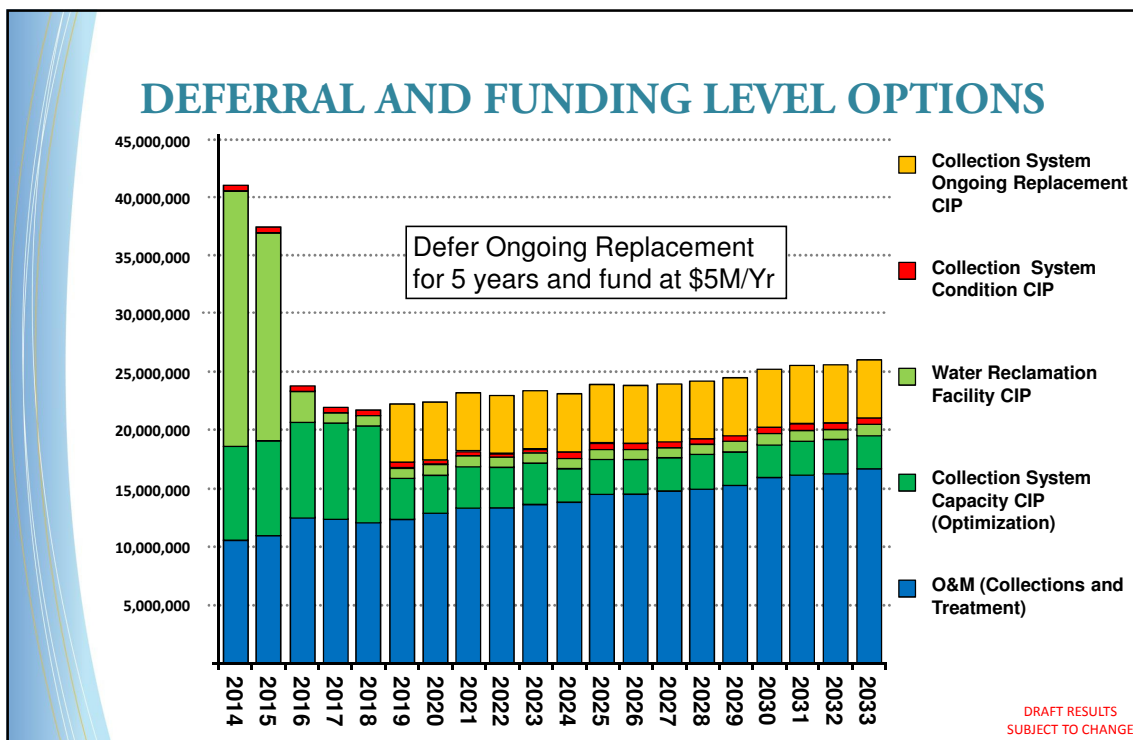
Example 3

Sewer Collection System Infrastructure Repair and Rehabilitation Cost				
Component	Type of Improvement	Useful Life (years)	Rehabilitation/Replacement Cost	Required Investment
Gravity	CIPP Rehabilitation	160	\$297,000,000	\$1,900,000
Force Main	Pipe Bursting	50	\$13,000,000	\$260,000
Common Pressure Main	Pipe Bursting	50	\$37,000,000	\$740,000
Vacuum Main	Pipe Bursting	50	\$2,000,000	\$40,000
Lift Station	Rehabilitation	35	\$28,000,000	-
Residential Lift Station	Rehabilitation	20	\$2,000,000	\$100,000
Total			\$379,000,000	\$3,000,000

DRAFT RESULTS  
SUBJECT TO CHANGE

## DEFERRAL AND FUNDING LEVEL OPTIONS





## RATE MODEL KEY ASSUMPTIONS

- ◆ No significant change (0.2% per year) in customer accounts
- ◆ SDC revenue included at current charges
- ◆ Bonds 20-year term, 4.25% interest rate
- ◆ Minimum operating reserve met (90 days of operating expenditures)
- ◆ Minimum debt service coverage 1.5


DRAFT RESULTS SUBJECT TO CHANGE

## WHAT'S INCLUDED?

(MINIMUM NEEDED FOR FUNCTIONING SYSTEM)


 Water Reclamation Facility CIP

 Collection System Capacity CIP (Optimization)

 O&M (Collections and Treatment)

## WHAT'S NOT INCLUDED (YET)?

(TO BE CONSIDERED BY SIAG AT APRIL & MAY MEETINGS)

 Collection System Ongoing Replacement CIP

 Collection System Condition CIP

DRAFT RESULTS SUBJECT TO CHANGE

## AS A REMINDER:



Collection System Ongoing Replacement CIP

- Example 1 (Full Replacement) \$10M
- Example 2 (Repair & Rehab-Medium) \$5M
- Example 3 (Repair & Rehab-Minimum) \$3M

DRAFT RESULTS SUBJECT TO CHANGE

## HOW MUCH WILL THE REVENUES SUPPORT?

Costs = ■ Water Reclamation Facility CIP + ■ Collection System Capacity CIP (Optimization) + ■ O&M (Collections & Treatment)

Year	Current Rate \$44.37
2014	(\$2.1 million)
2015	(\$3.6 million)
2016	(\$3.7 million)
2017	(\$3.8 million)
2018	(\$3.6 million)
2019	\$0
2020	\$0
2021	\$0
2022	\$0
2023	\$0
2024	\$0

DRAFT RESULTS SUBJECT TO CHANGE

## HOW MUCH IS LEFT TO PAY FOR:

■ Collection System Ongoing Replacement CIP Options:  
Example 1 \$10M    Example 2 \$5M    Example 3 \$3M

## HOW MUCH WILL THE REVENUES SUPPORT?

Costs = ■ Water Reclamation Facility CIP + ■ Collection System Capacity CIP (Optimization) + ■ O&M (Collections & Treatment)

Year	Current Rate \$44.37	Phase-In to \$55.00
2014	(\$2.1 million)	\$0
2015	(\$3.6 million)	\$0
2016	(\$3.7 million)	\$0
2017	(\$3.8 million)	\$0
2018	(\$3.6 million)	\$0
2019	\$0	\$1.3 million
2020	\$0	\$1.3 million
2021	\$0	\$1.3 million
2022	\$0	\$1.4 million
2023	\$0	\$1.4 million
2024	\$0	\$4.7 million

DRAFT RESULTS SUBJECT TO CHANGE

## HOW MUCH IS LEFT TO PAY FOR:

■ Collection System Ongoing Replacement CIP Options:

Example 1 \$10M

Example 2 \$5M

Example 3 \$3M

## HOW MUCH WILL THE REVENUES SUPPORT?

Costs = ■ Water Reclamation Facility CIP + ■ Collection System Capacity CIP (Optimization) + ■ O&M (Collections & Treatment)

Year	Current Rate \$44.37	Phase-In to \$55.00	Phase-In to \$65.00
2014	(\$2.1 million)	\$0	\$0.3 million
2015	(\$3.6 million)	\$0	\$0.3 million
2016	(\$3.7 million)	\$0	\$0.3 million
2017	(\$3.8 million)	\$0	\$0.4 million
2018	(\$3.6 million)	\$0	\$0.4 million
2019	\$0	\$1.3 million	\$5.7 million
2020	\$0	\$1.3 million	\$5.9 million
2021	\$0	\$1.3 million	\$6.0 million
2022	\$0	\$1.4 million	\$6.1 million
2023	\$0	\$1.4 million	\$6.2 million
2024	\$0	\$4.7 million	\$6.3 million

DRAFT RESULTS SUBJECT TO CHANGE

## HOW MUCH IS LEFT TO PAY FOR:

■ Collection System Ongoing Replacement CIP Options:

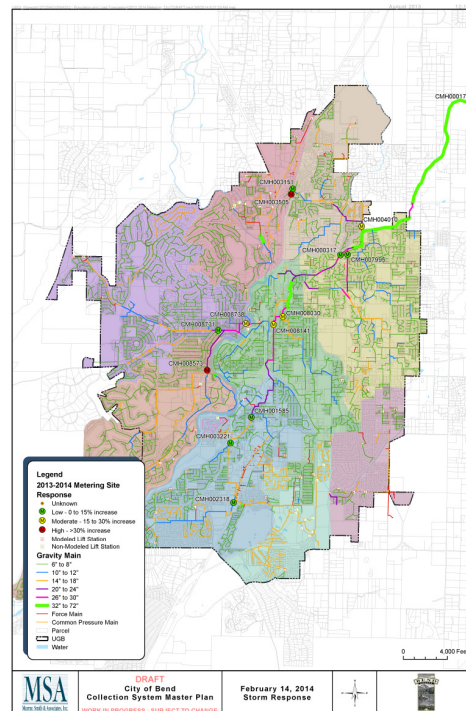
Example 1 \$10M

Example 2 \$5M

Example 3 \$3M

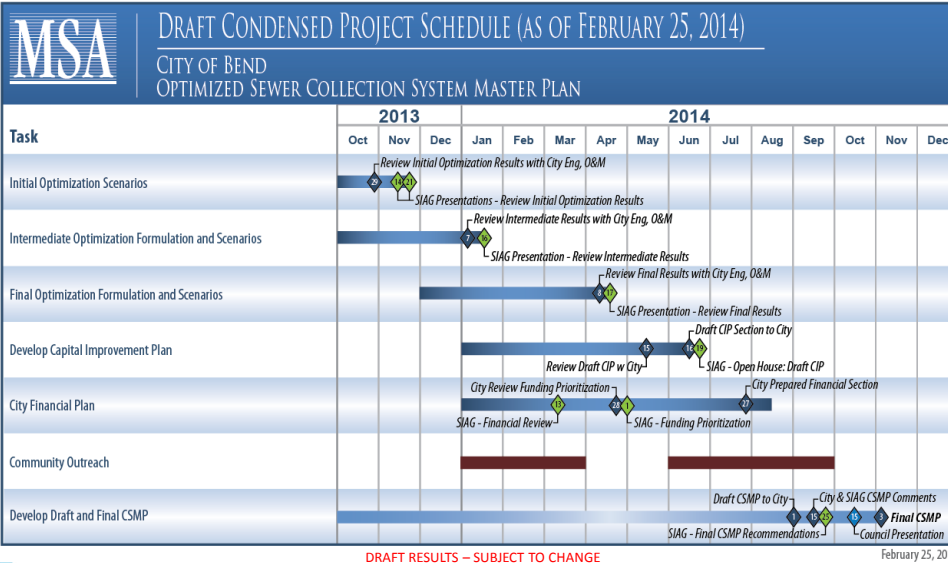
What questions do you have for the  
finance team?  
(to be answered at the  
May 1 SIAG meeting)

## FLOW MONITORING



DRAFT RESULTS – SUBJECT TO CHANGE

# SCHEDULE



**Sewer Infrastructure Advisory Group  
Meeting Summary**

**March 13, 2014  
3:30-5:30 p.m.**

Financial Discussion

**City Council Chambers**

**Note taker: Adele McAfee**

**Committee Members:** Lynn Putnam, Mike Riley, Sharon Smith, Steve Hultberg, Dale VanValkenberg, Casey Roats, Steve Galash, Charlie Miller, Rob Von Rohr, Stacy Stemach, Craig Horrell, Andy High, John Rexford

**COB Staff:** Paul Rheault, Jon Skidmore, Aaron Collett, Tom Hickmann, Dana Wilson, Gillian Ockner, Shannon Ostendorf, Mary Winters, Brian Rankin

**Consultants:** David Stangel (MSA), David Prull (Clearwater Engineering Group), Angie Sanchez (FCS), Doug Gabbard (FCS)

**Facilitator:** Libby Barg, Clark Worth (Barney & Worth)

**Others:** Jim Lord, Erik Huffman, Councilor Sally Russell, Andre Tolme, Terry Angle, Rondo

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**Action Items:**

- Prepare public outreach comment sheet summary for next meeting
- Update public outreach materials for next round of presentations. Schedule another training session on the new materials in late May.
- Schedule work session with City Council on final optimization results and project prioritization.

**Meeting Summary**

**Introductions announcements**

- Ground breaking for the Bridge Creek Pipeline Replacement Project took place in the morning (3/13/14).
- Committee members reported that public outreach presentations are going well.

**Colorado Lift Station Updates**

Aaron Collette, P.E. provided an update on the Colorado Lift Station project.

- Phase 1 is completed (determined alternatives: river crossing, placement of force main etc.)
- Phase 2 covers design and engineering consultant support through the project's bidding and construction. Current activity:
  - Confirmed loading scenario
  - Working on outreach plan for affected neighbors and businesses
  - Coordinating with Bend Park & Rec.

**CSMP Cost Component**

David Stangel, MSA, and Angie Sanchez, FCS provided SIAG an overview of the master plan cost components and funding scenarios.

The following cost layers were identified:

- 1) Ongoing Operation and Maintenance
- 2) Collection System Capacity (Optimization)
- 3) Water Reclamation Facility CIP
- 4) Collection System Condition CIP
- 5) Collection System Ongoing Replacement

SIAG reviewed potential funding levels for ongoing replacement costs and deferral options. They reviewed various scenarios of how much capital the revenue can support at various rate levels.

**SIAG questions:**

- Is there a required investment associated with lift stations?
- Regarding phasing, is there ability in the CIP optimization to phase-in as well?
- Was the rate calculated with the extra strength charge?
- How do you differentiate existing conditions that are being addressed as part of the optimization immediate solutions, and existing conditions that may be more flexible?
- Has a phasing analysis already happened?
- What can you defer?

**SIAG's suggestions for financial scenarios:**

- Look at effect of low interest loans
- Show growth at higher rate: the current assumption is too conservative. Potential for more revenues?
- Ask Planning Department to provide a growth assumption
- SDC increases (premature?)
- Faster rate increases: early step-up to lower future cost curve
- Extra strength charges: potential for added revenues
- Investigate timing of \$5M yearly repair and rehabilitation scenario
- Phase-in repair and rehab over 5-7 years: is that too long?
- Analyze minimum increase needed to cover mandatory costs

**SIAG Schedule**

Libby Barg, Barney & Worth provided an update on the project schedule through completion.

April 17	Review final results
May 1	Prioritize projects and review rate scenarios
May- Sept	Second round of community outreach / Hold open house (June 19 <sup>th</sup> )
August	Financial Plan completed
Sept 25	Last SIAG Meeting
Oct 15	Presentation to council

**Public Comment**

None

**Meeting Adjourned: 5:27 PM**



# Bend Sewer Infrastructure Advisory Group: Meeting #19

## FINAL OPTIMIZATION RESULTS

Bend City Council Chambers  
710 NW Wall St., 1<sup>st</sup> Floor

April 17, 2014  
3:30-5:30 p.m.

## Agenda

	Presenter	Time (2 hrs.)
1. Welcome	Jon Skidmore	5 min
2. The Headlines	Tom Hickmann, P.E.	5
3. Updated CSMP Cost Components (Layers of the Cake)	David Stangel, P.E.	10
4. Final Optimization Results <i>Are these the right projects, phased appropriately over the next 20 years?</i>	Joel Wilson, CPEng	50
5. Other Cost Components <u>Condition Improvements</u> <i>Any questions about need or timing for these projects?</i> <u>Ongoing Repair/Replacement</u> <i>Funding for ongoing work starts in year 10, ramped up to \$5M per year. Is this appropriate?</i> <u>Local Area Improvements</u> <i>Funding to support development of a program to address local area improvements starts in 2017 at \$1M per year. Is this appropriate?</i>	David Stangel, P.E.	20
6. Cost Summary <i>Does the overall allocation of cost/budget adequately address Bend's sewer infrastructure needs?</i>		10
7. Next Steps <b>SIAG: Funding Prioritization, May 1 (Workshop)</b> <b>City Council Workshop, May 21</b> Community Outreach <ul style="list-style-type: none"><li>- CIP Open House June 19</li><li>- Second Round of Presentations (June-Sept)</li></ul> Financial Plan Complete (August) <b>SIAG: Final Recommendations, September 25</b> City Council Presentation, October 15 Final Master Plan (November)	Libby Barg	5
8. Public Comment		5 min

For more information, visit the Bend Sewer Infrastructure Advisory Group webpage:  
**[Bendoregon.gov/siag](http://Bendoregon.gov/siag)**

**1. The Audience**

City of Bend residents	26
Bend business owner/operator representative	8
Work /Shop / Dine	9

**2. Benefits of fixing Bend's Wastewater collection system that are most important:**

Protecting public health and the environment	22
Having an upgraded and expanded wastewater collection system that will last in the future	17
Meeting the capacity needs of current and future residents and businesses	19
Supporting jobs and the economy	13

**Comments:**

- Having a system that is able to meet city requirements
- Supporting jobs does not apply
- Finding the balance of appropriate ratio of liquids and solids to carry sewage volumes
- ratio of liquids and solids to carry sewage volumes

**3. I want to know about:**

Current sewer system problems	6
Possible improvements	9
Timing of improvements	7
Project costs and sewer rates	8
Upcoming SIAG Meetings	2
How to get involved	1

**Comments:**

- Rate Increases
- South East Interceptor

**Additional Comments and Questions:**

- Good Presentation
- SDC's should cover costs of additional capacity required by new connections and increases. SDCs should also share in cost/value of existing systems
- How can sewage systems accommodate the storm water that leaks into manhole covers and the smell that escapes from them
- Please fix the sewer in Valhalla Heights. We've been promised every year it will be fixed and every year it has NOT!

**Additional Comments and Questions ( continued):**

- Great presentation. I appreciate the committee members' presentation better than staff and consultants. Better to sell!
- Great presentation. Thanks for taking the time to do this work and to present this info!
- Why is residential rate the same for all homes? (Small home 1 bath – Large home 3 – 4 baths)
- Please protect the wildlife habitat created by the settlement ponds (sic)
- Have you considered in-line turbines on the gravity feed pipes to generate electricity?
- Overdue and probably most important and basic need for our infrastructure.
- Need more specific area maps
- Fine job to date – keep at it – Thanks
- Well done

**Presentations- Completed**

<b>City Council</b>	
<b>Bend Kiwanis Club</b>	Casey Roats (back up), Lynn Putnam
<b>Bend La Pine School District</b>	Lynn Putnam, Mike Riley
<b>Bend Park &amp; Rec District Board -</b>	Wes Price
<b>Central Oregon Association of Realtors</b>	Casey Roats, Stacey Stemach,
<b>Central Oregon Builders Association</b>	Andy High
<b>COCC Board</b>	Sharon Smith, Rob Von Rohr
<b>Deschutes Co Board of Commissioners</b>	Lynn Putnam, Rob Von Rohr
<b>EDCO</b>	Wes Price, Steve Hultberg
<b>Environmental Interests</b>	Mike Riley and Wes Price
<b>Infrastructure Advisory Committee -</b>	Casey Roats & Andy High
<b>Neighborhood Assoc.- Mtn. View</b>	TBD
<b>Neighborhood Assoc.-River West</b>	Stacey Stemach
<b>Planning Commission</b>	Casey Roats, Stacey Stemach
<b>Rotary Club of Greater Bend</b>	Casey Roats, Sharon Smith
<b>Building a Better Bend</b>	Stacey and Sharon

**Presentations – What we missed**

- Bend Chamber
- City Club
- Brewing Industry
- Additional service organization (Lions, Elks)

# **FINAL OPTIMIZATION RESULTS BEND OPTIMIZED COLLECTION SYSTEM MASTER PLAN**

**April 17<sup>th</sup>, 2014**

DRAFT RESULTS – SUBJECT TO CHANGE

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

## **PRESENTATION CONTENTS**

- ◆ Headlines!
- ◆ Sewer Cost Components (layers of cake)
- ◆ Final Optimization Results
- ◆ Long Term Flow Monitoring (flow triggers)
- ◆ Condition Improvements
- ◆ Ongoing Repair/Replacement Funding
- ◆ Local Area Improvements
- ◆ Summary/Next Steps

DRAFT RESULTS – SUBJECT TO CHANGE

## THE HEADLINES

1. The final results are generally consistent with the Initial and Intermediate Solutions
2. The SE Interceptor, Colorado Lift Station and North Area Diversion confirmed as high priority projects (1-3 year implementation)
3. SE Interceptor and Colorado LS set at design size
4. Final Optimization runs based on Mid R
5. Optimized solutions were completed for existing, 10-year, 20-year, 20-year plus 25% loading (with and without NW Diversion), and 20-year minus 10% water conservation
6. Costs developed for all “layers of the cake”
7. Deferral of projects beyond 5 years where possible

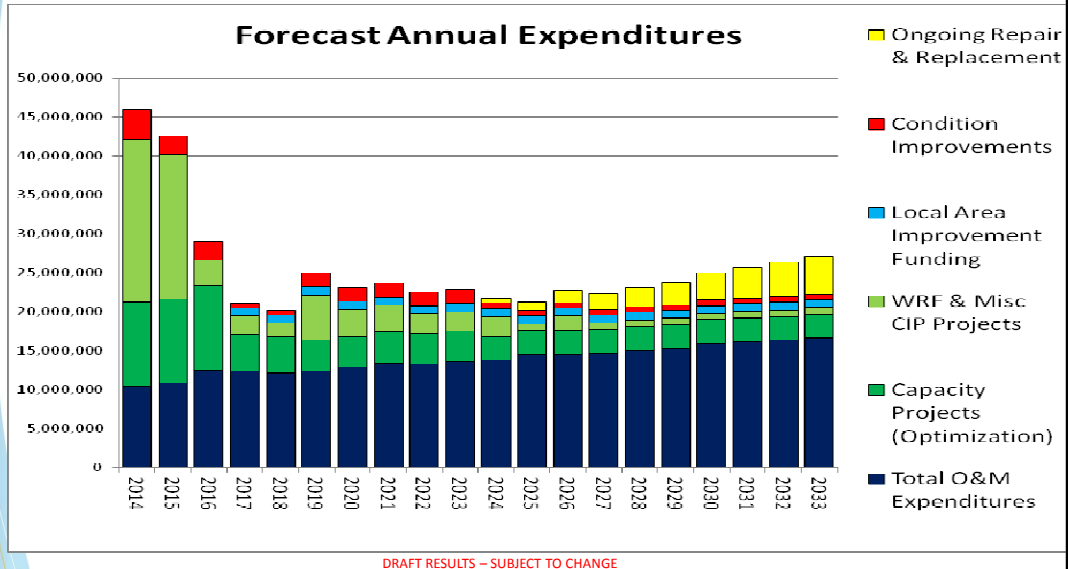
DRAFT RESULTS – SUBJECT TO CHANGE

## LAYERS OF THE CAKE

- ◆ Ongoing Operations and Maintenance
- ◆ Water Reclamation Facility & Misc. Improvements
- ◆ Capacity Improvements
- ◆ Condition Improvements
- ◆ Ongoing Repair/Replacement
- ◆ New Layer - Local Area Improvements

DRAFT RESULTS – SUBJECT TO CHANGE

## OVERALL SEWER COST COMPONENTS

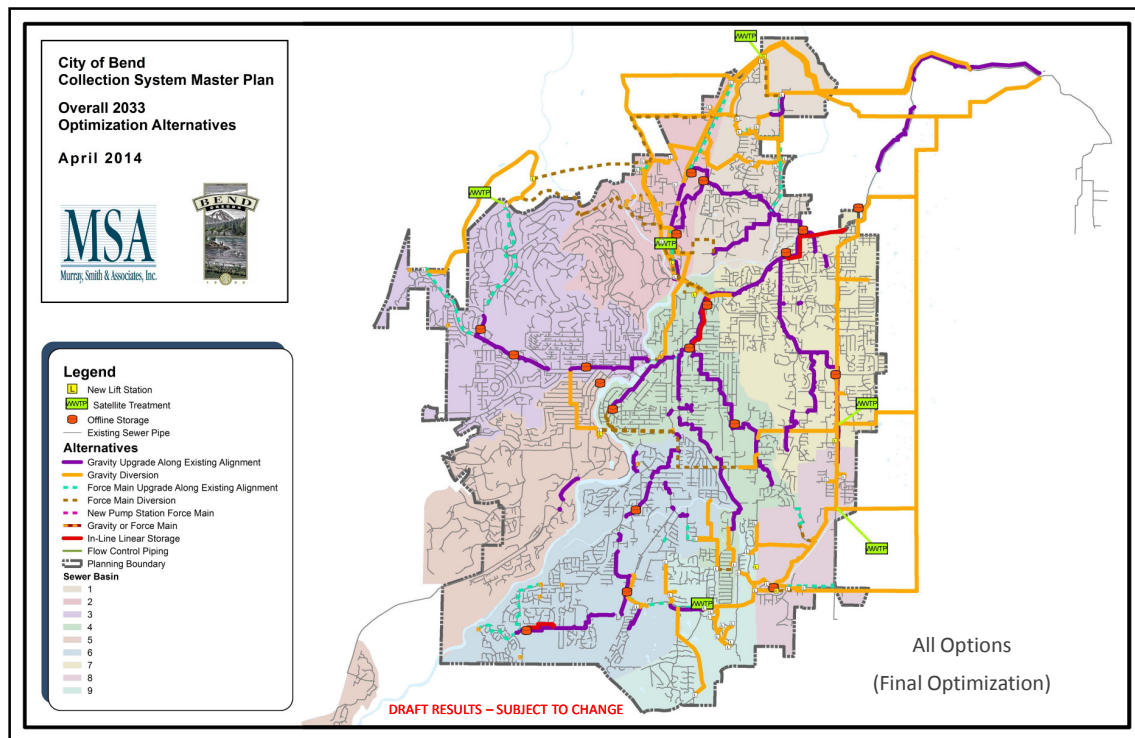


## FINAL RESULTS – ADDITIONAL COSTS INCLUDED

	Hydraulic-Based Pipe and Pump Capital Costs	Pump Condition Improvements	Pipe Condition Improvements	Local-Area Costs
2007 CSMP	✓	✗	✗	✗
Initial Optimization	✓	✓	✗	✗
Intermediate Optimization	✓	✓	✓	✗
Final Optimization	✓	✓	✓	✓
Final CIP	✓	✓	✓	✓
Rate Calculation	✓	✓	✓	✓

Small ✓ denotes where additional refinement is required

DRAFT RESULTS – SUBJECT TO CHANGE



## FINAL OPTIMIZATION SCENARIOS

### Primary Scenarios:

- Existing Mid R
- 10-Year Mid R
- 20-Year Mid R

### Water Conservation:

- 20-Year Mid R -10% Water Conservation

### Stress Test:

- 20-Year Mid R +25% Loading (with NW Diversion option)
- 20-Year Mid R +25% Loading (without NW Diversion option)

**DRAFT RESULTS – SUBJECT TO CHANGE**

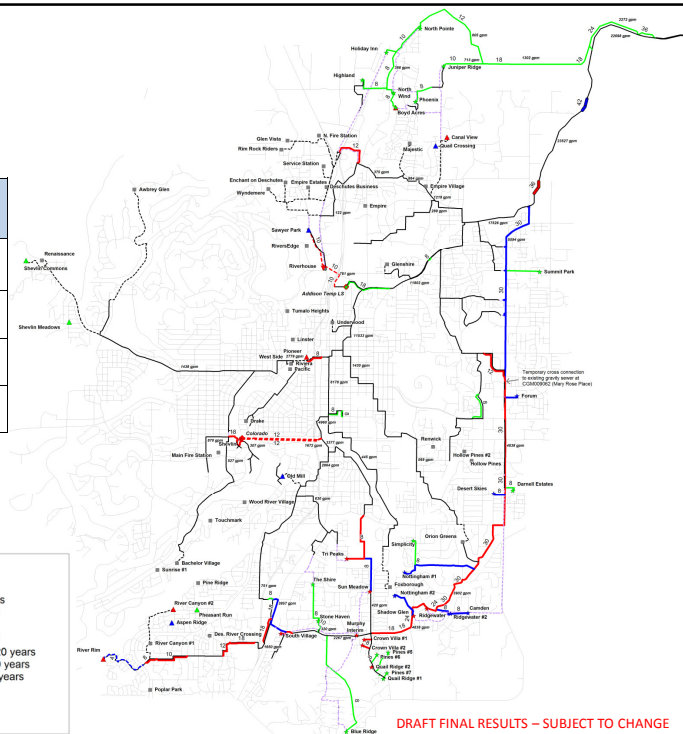
## OPTIMIZED SOLUTION 20-YEAR MID R PROJECT PHASING

Phase	Present Value Capital Cost (\$M)
Phase 1 – 0 to 5 years	41.58
Phase 2 – 5 to 10 years	18.03
Phase 3 – 10 to 20 years	25.59
<b>TOTAL</b>	<b>85.20</b>

**NOTE:** Cost summary does not include condition-based and local area improvements

### Legend

- New Force Main - 5 to 10 years
- New Force Main - 0 to 5 years
- Existing Force Main
- Decommissioned
- New Gravity Sewer - 10 to 20 years
- New Gravity Sewer - 5 to 10 years
- New Gravity Sewer - 0 to 5 years
- Existing Gravity Sewer
- GS Upsize - 0 to 5 years
- GS Upsize - 5 to 10 years
- ▲ Upgrade Lift Station - 10 to 20 years
- ▲ Upgrade Lift Station - 5 to 10 years
- ▲ Upgrade Lift Station - 0 to 5 years
- ▼ Downsize Lift Station - 0 to 5 years
- ★ Decommission Lift Station - 10 to 20 years
- ★ Decommission Lift Station - 5 to 10 years
- ★ Decommission Lift Station - 0 to 5 years
- ◆ New Lift Station - 10 to 20 years
- ◆ New Lift Station - 5 to 10 years
- ◆ New Lift Station - 0 to 5 years

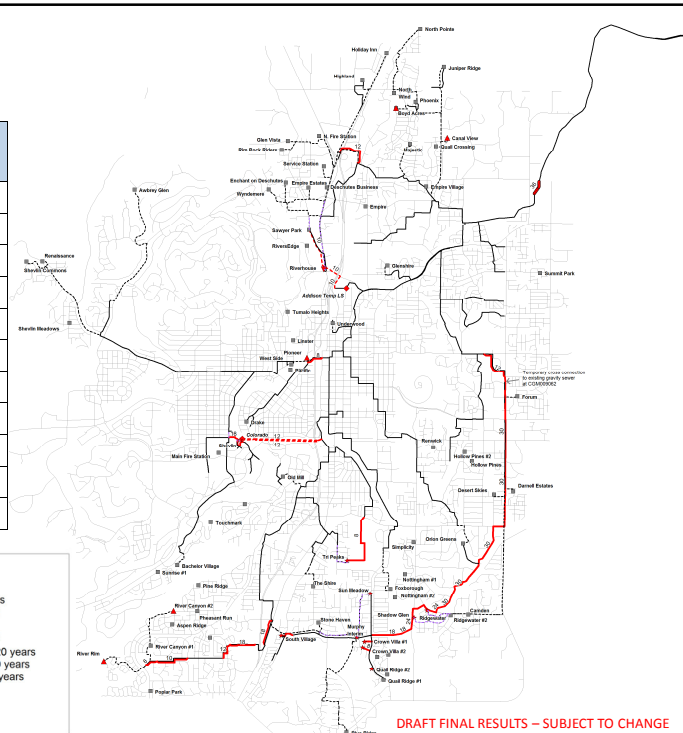


## OPTIMIZED SOLUTION Phase 1: 2014 - 2018

Project	Phase 1: 2014 - 2018 Present Value (\$M)
Southeast Interceptor	19.64
SEI Associated	1.66
Colorado	9.79
North Area FM	2.86
Plant Interceptor Upsize	0.54
Northeast Interceptor	-
NEI Associated	-
West of Hwy 97	2.21
Miscellaneous	0.60
Existing Lift Stations	4.28
<b>Phase 1 Total</b>	<b>41.58</b>

### Legend

- New Force Main - 5 to 10 years
- New Force Main - 0 to 5 years
- Existing Force Main
- Decommissioned
- New Gravity Sewer - 10 to 20 years
- New Gravity Sewer - 5 to 10 years
- New Gravity Sewer - 0 to 5 years
- Existing Gravity Sewer
- GS Upsize - 0 to 5 years
- GS Upsize - 5 to 10 years
- ▲ Upgrade Lift Station - 10 to 20 years
- ▲ Upgrade Lift Station - 5 to 10 years
- ▲ Upgrade Lift Station - 0 to 5 years
- ▼ Downsize Lift Station - 0 to 5 years
- ★ Decommission Lift Station - 10 to 20 years
- ★ Decommission Lift Station - 5 to 10 years
- ★ Decommission Lift Station - 0 to 5 years
- ◆ New Lift Station - 10 to 20 years
- ◆ New Lift Station - 5 to 10 years
- ◆ New Lift Station - 0 to 5 years



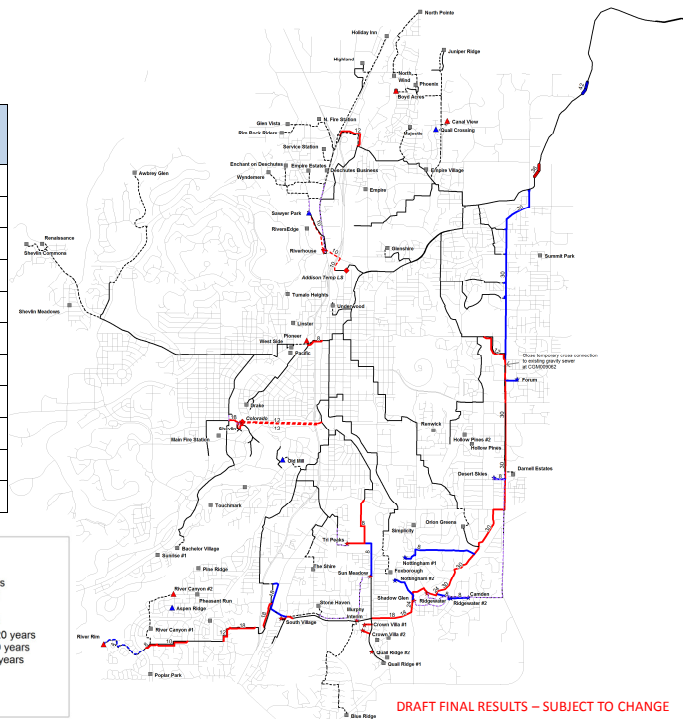
## OPTIMIZED SOLUTION

### Phase 2: 2019 - 2023

Project	Phase 2: 2019 - 2023 Present Value (\$M)
Southeast Interceptor	9.48
SEI Associated	5.21
Colorado	-
North Area FM	-
Plant Interceptor Upsize	0.45
Northeast Interceptor	-
NEI Associated	-
West of Hwy 97	-
Miscellaneous	0.64
Existing Lift Stations	2.25
<b>Phase 2 Total</b>	<b>18.03</b>

#### Legend

- New Force Main - 5 to 10 years
- New Force Main - 0 to 5 years
- Existing Force Main
- Decommissioned
- New Gravity Sewer - 10 to 20 years
- New Gravity Sewer - 5 to 10 years
- New Gravity Sewer - 0 to 5 years
- Existing Gravity Sewer
- GS Upsize - 0 to 5 years
- GS Upsize - 5 to 10 years
- ▲ Upgrade Lift Station - 10 to 20 years
- ▲ Upgrade Lift Station - 5 to 10 years
- ▲ Upgrade Lift Station - 0 to 5 years
- ▼ Downsize Lift Station - 0 to 5 years
- ★ Decommission Lift Station - 10 to 20 years
- ★ Decommission Lift Station - 5 to 10 years
- ★ Decommission Lift Station - 0 to 5 years
- ◆ New Lift Station - 10 to 20 years
- ◆ New Lift Station - 5 to 10 years
- ◆ New Lift Station - 0 to 5 years



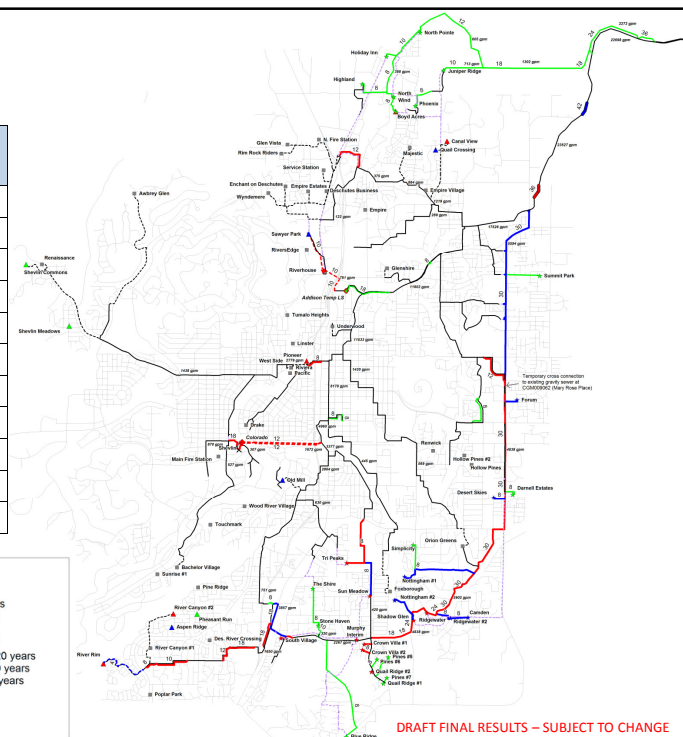
## OPTIMIZED SOLUTION

### Phase 3: 2024 - 2033

Project	Phase 3: 2024 - 2033 Present Value (\$M)
Southeast Interceptor	-
SEI Associated	4.72
Colorado	-
North Area FM	1.10
Plant Interceptor Upsize	-
Northeast Interceptor	13.70
NEI Associated	3.57
West of Hwy 97	-
Miscellaneous	0.74
Existing Lift Stations	1.76
<b>Phase 3 Total</b>	<b>25.59</b>

#### Legend

- New Force Main - 5 to 10 years
- New Force Main - 0 to 5 years
- Existing Force Main
- Decommissioned
- New Gravity Sewer - 10 to 20 years
- New Gravity Sewer - 5 to 10 years
- New Gravity Sewer - 0 to 5 years
- Existing Gravity Sewer
- GS Upsize - 0 to 5 years
- GS Upsize - 5 to 10 years
- ▲ Upgrade Lift Station - 10 to 20 years
- ▲ Upgrade Lift Station - 5 to 10 years
- ▲ Upgrade Lift Station - 0 to 5 years
- ▼ Downsize Lift Station - 0 to 5 years
- ★ Decommission Lift Station - 10 to 20 years
- ★ Decommission Lift Station - 5 to 10 years
- ★ Decommission Lift Station - 0 to 5 years
- ◆ New Lift Station - 10 to 20 years
- ◆ New Lift Station - 5 to 10 years
- ◆ New Lift Station - 0 to 5 years

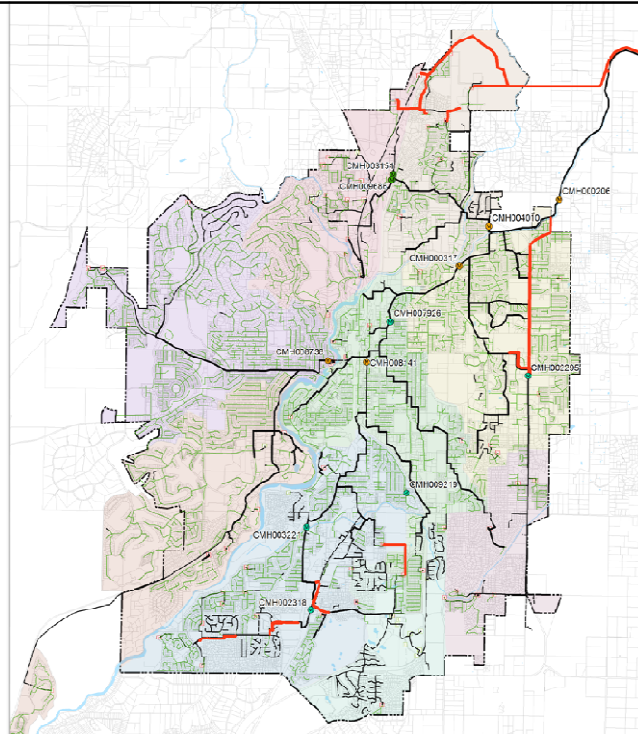


## LONG TERM FLOW MONITORING WILL TRIGGER NEED FOR FUTURE PROJECTS

### Summary of Approach:

- ◆ Identify sites that will trigger CIP projects
- ◆ Determine peak dry weather flow trigger at each site
- ◆ Once the flow trigger is reached, the CIP should be implemented
- ◆ Other long term monitoring sites are also included
- ◆ 12 sites selected

DRAFT FINAL RESULTS – SUBJECT TO CHANGE



## 20-YEAR MID R

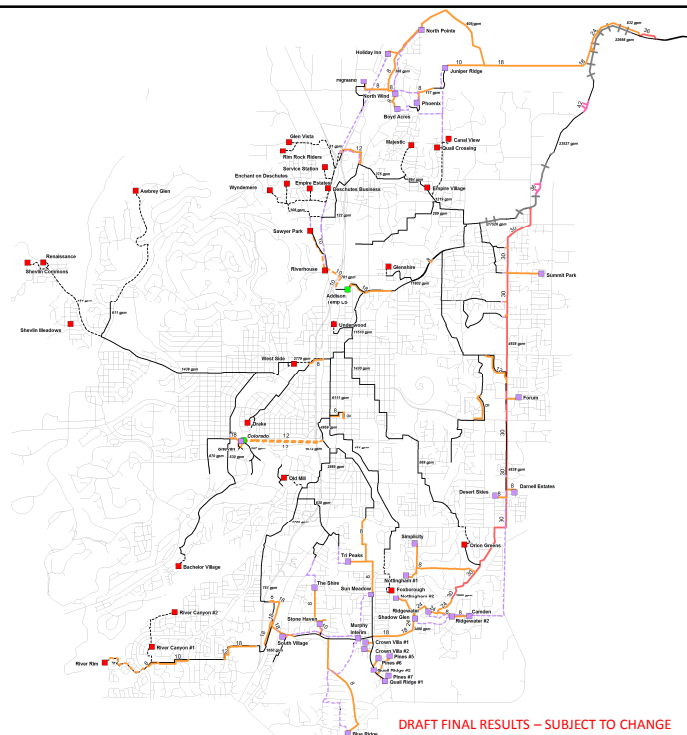
Cost Item	Cost (\$M)
40-Y Life Cycle O&M Cost	27.49
40-Y Life Cycle Elect. Cost	0.69
40-Y Life Cycle Capital Cost	88.10
<b>40-Y Total Life Cycle Cost</b>	<b>116.28</b>

<b>Initial PV Capital Cost</b>	<b>85.20</b>
--------------------------------	--------------

**NOTE:** Cost summary does not include condition-based and local area improvements

### Solution Legend

- New Force Main
- New Gravity Sewer > 24"
- New Gravity Sewer <= 24"
- Existing Assets
- Decommissioned Force Main
- Existing Gravity Sewer Rehab
- Existing Gravity Sewer Upsize
- Decommissioned Lift Station
- New Lift Station
- New Storage Tank



DRAFT FINAL RESULTS – SUBJECT TO CHANGE

## 20-YEAR MID R -10% WATER CONSERVATION

Cost Item	Cost (\$M)
40-Y Life Cycle O&M Cost	27.05
40-Y Life Cycle Elect. Cost	0.69
40-Y Life Cycle Capital Cost	87.70
<b>40-Y Total Life Cycle Cost</b>	<b>115.44</b>

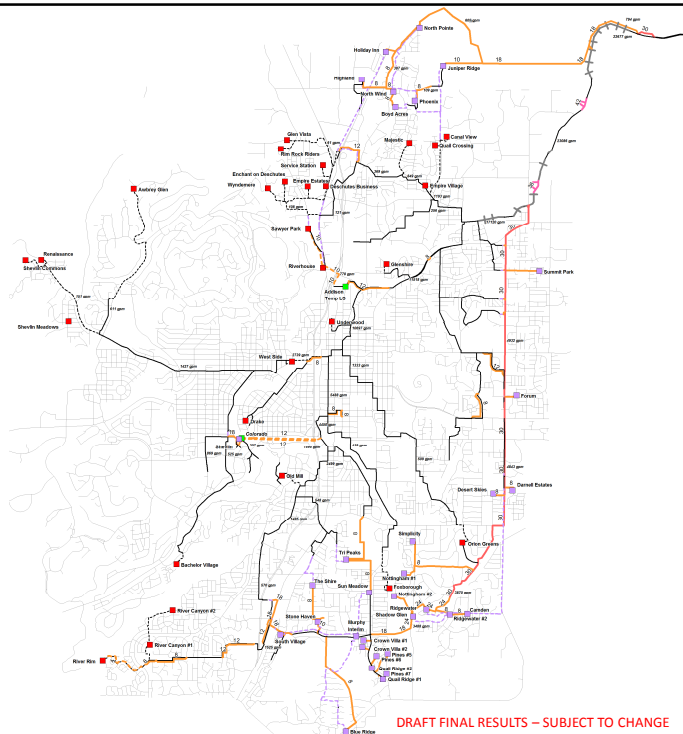
<b>Initial PV Capital Cost</b>	<b>84.75</b>
--------------------------------	--------------

**PV Capital Cost Savings = \$0.44 M**

**40-Y Life Cycle Cost Savings = \$0.84 M**

### Solution Legend

- New Force Main
- New Gravity Sewer > 24"
- New Gravity Sewer <= 24"
- Existing Assets
- Decommissioned Force Main
- Existing Gravity Sewer Rehab
- Existing Gravity Sewer Upsize
- Decommissioned Lift Station
- New Lift Station
- New Storage Tank



## 20-YEAR MID R +25% LOADING (With NW Diversion)

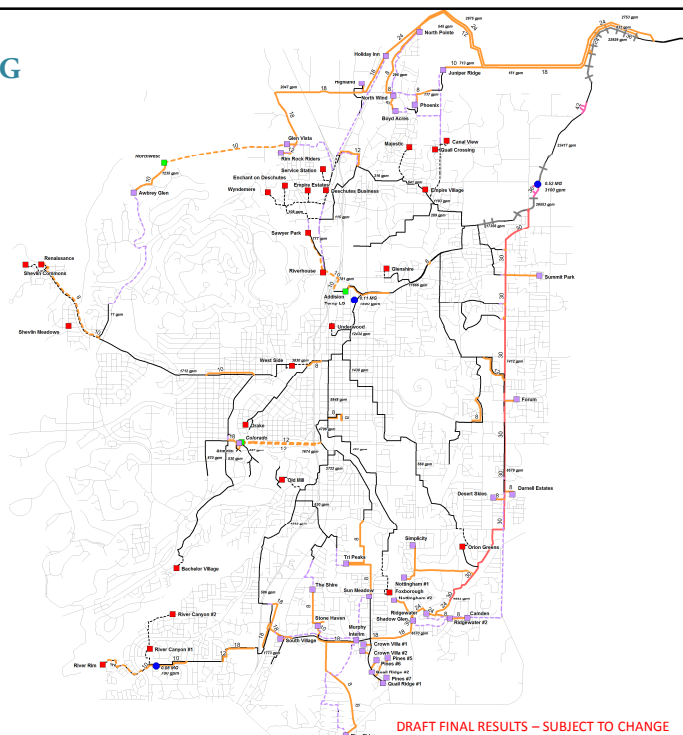
Cost Item	Cost (\$M)
40-Y Life Cycle O&M Cost	42.81
40-Y Life Cycle Elect. Cost	1.32
40-Y Life Cycle Capital Cost	112.89
<b>40-Y Total Life Cycle Cost</b>	<b>157.02</b>

<b>Initial PV Capital Cost</b>	<b>109.20</b>
--------------------------------	---------------

**NOTE:** Cost summary does not include condition-based and local area improvements

### Solution Legend

- New Force Main
- New Gravity Sewer > 24"
- New Gravity Sewer <= 24"
- Existing Assets
- Decommissioned Force Main
- Existing Gravity Sewer Rehab
- Existing Gravity Sewer Upsize
- Decommissioned Lift Station
- New Lift Station
- New Storage Tank



## 20-YEAR MID R +25% LOADING (Without NW Diversion)

Cost Item	Cost (\$M)
40-Y Life Cycle O&M Cost	36.60
40-Y Life Cycle Elect. Cost	0.69
40-Y Life Cycle Capital Cost	113.96
<b>40-Y Total Life Cycle Cost</b>	<b>151.25</b>

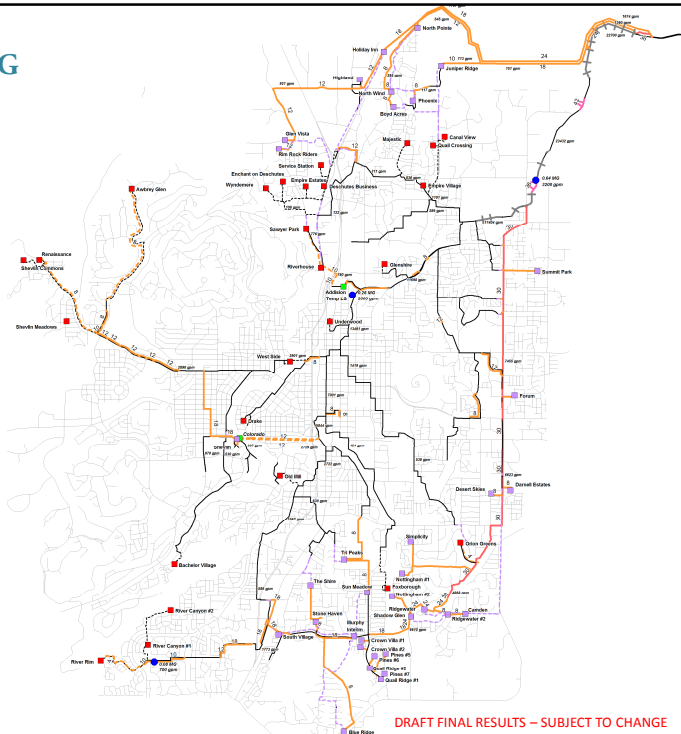
<b>Initial PV Capital Cost</b>	<b>111.12</b>
--------------------------------	---------------

**40-Y Life Cycle Cost Savings = \$5.77 M**

**Additional PV Capital Cost = \$1.92 M**

### Solution Legend

- New Force Main
- New Gravity Sewer > 24"
- New Gravity Sewer ≤ 24"
- Existing Assets
- Decommissioned Force Main
- Existing Gravity Sewer Rehab
- Existing Gravity Sewer Upsize
- Decommissioned Lift Station
- New Lift Station
- New Storage Tank



## OPTIMIZATION TAKEAWAYS

- 💡 Over 10,000,000 individual model runs completed
- 💡 Overall solution strategy is robust
  - Consistent strategy in all sensitivity analyses
  - Short term projects have flexibility for additional growth
  - Contingency projects for High R and/or +25% growth are compatible
- 💡 Based on current UGB, NEI is not required for 10 years
- 💡 A better understanding of long-term growth is required
  - NEI alignment, size and schedule affected by extent of growth in the North
  - Northwest interceptor vs. Westside/Colorado improvement alternatives are sensitive to extent of growth to the west
- 💡 Ongoing flow monitoring critical to future CSMP updates
- 💡 Consider near term acquisition of storage sites

DRAFT RESULTS - SUBJECT TO CHANGE

## DISCUSSION

- ◆ *Are these the right projects, phased appropriately over the next 20 years?*

DRAFT RESULTS – SUBJECT TO CHANGE

## OTHER COST COMPONENTS

- ◆ Condition Improvements
- ◆ Ongoing Repair/Replacement
- ◆ Local Area Improvements

DRAFT RESULTS – SUBJECT TO CHANGE

## CONDITION IMPROVEMENTS

- ◆ Includes specific condition related projects
- ◆ Projects, current timing and costs
  - Valhalla Odor /Corrosion Control improvements
    - 2014 @ \$1.6M
  - Plant Interceptor condition improvements
    - 2014-2016 @ \$5.4M
  - Specific Lift Station improvements
    - 2014-2023 @ \$7.9M (31 lift stations)
  - Other specific pipe condition improvements
    - 2019-2023 @ \$3.9M

DRAFT RESULTS – SUBJECT TO CHANGE

## CONDITION IMPROVEMENTS

- ◆ Deferral of projects has occurred where possible beyond 5 years
- ◆ *Any questions about need or timing for these projects?*

DRAFT RESULTS – SUBJECT TO CHANGE

## ONGOING REPAIR/REPLACEMENT

- ◆ Required for the long term replacement of the system – projects are not currently identified
- ◆ Example Projects
  - Ongoing pipe repair/replacement
    - Gravity – including manholes
    - Force Main
    - Common Pressure Main
    - Vacuum Main
  - Ongoing lift station repair/replacement

DRAFT RESULTS – SUBJECT TO CHANGE

## ONGOING REPAIR/REPLACEMENT

- ◆ Current representation of costs
  - Begin funding in year 10 (2024)
  - Ramp up funding level to approximately \$5M/Year over 10 years
    - \$5M/yr represents mid funding level using rehabilitation (in lieu of replacement) methods where possible
    - Funding level based on March 13 SIAG input
- ◆ *Is this appropriate?*

DRAFT RESULTS – SUBJECT TO CHANGE

## LOCAL AREA IMPROVEMENTS

- Two categories
  - Areas currently served by septic ~ 1400 customers
    - Kings Forest, Pinebrook, others
    - \$23M to install a new gravity system @ \$17k/connection
  - Areas where the current system does not operate effectively/efficiently - ~ 900 customers
    - Romaine Village (north and south), Wood River Village, 3<sup>rd</sup> Street, Juniper Utility, others
    - \$19M to install a replacement gravity system @ \$21k/connection

DRAFT RESULTS – SUBJECT TO CHANGE

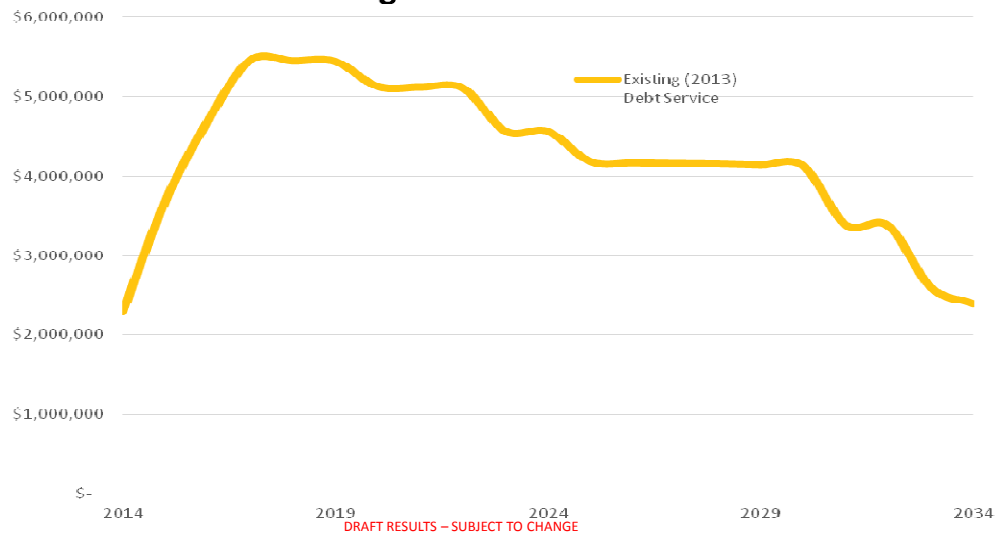
## LOCAL AREA IMPROVEMENTS

- City to proactively address issue, start funding \$1M/yr in 2017 and support development of a program
- *Is this appropriate?*

DRAFT RESULTS – SUBJECT TO CHANGE

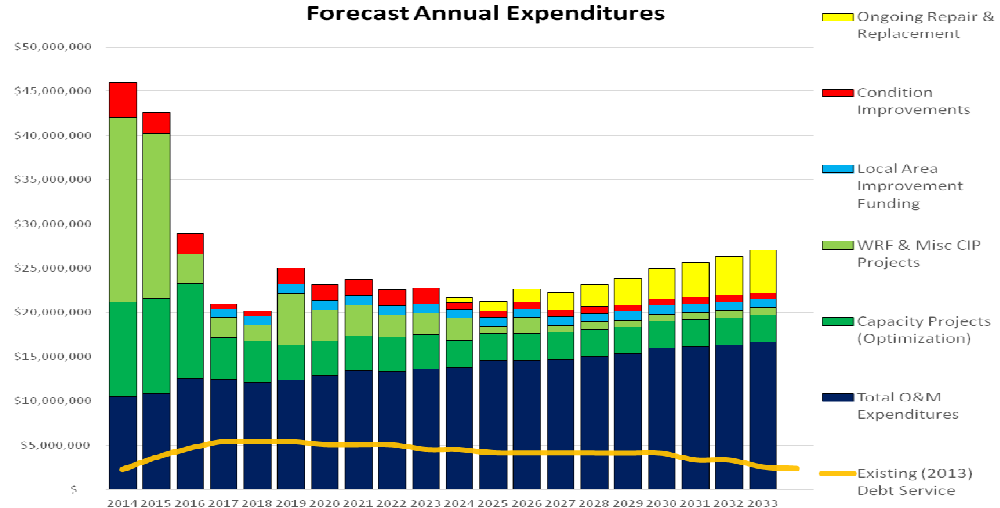
## SEWER DEBT SERVICE

Existing Sewer Debt Service



## OVERALL SEWER COST COMPONENTS

Forecast Annual Expenditures



## DISCUSSION

- ◆ *Does the overall allocation of cost/budget adequately address Bend's sewer infrastructure needs?*

DRAFT RESULTS – SUBJECT TO CHANGE

## SUMMARY

- ◆ “Big 4” projects prioritized in the CIP (years 1-3)
  - SEI, Colorado, North Area, Plant Interceptor Rehab
  - Everything else deferred if possible
- ◆ Core 0-10 year improvements provide flexibility for additional growth
- ◆ Biggest difference between current CSMP and previous planning efforts is the ability to "defer" improvements
  - Instead of constructing \$80+M today we are looking at \$40M

DRAFT RESULTS – SUBJECT TO CHANGE

## SUMMARY CONT.

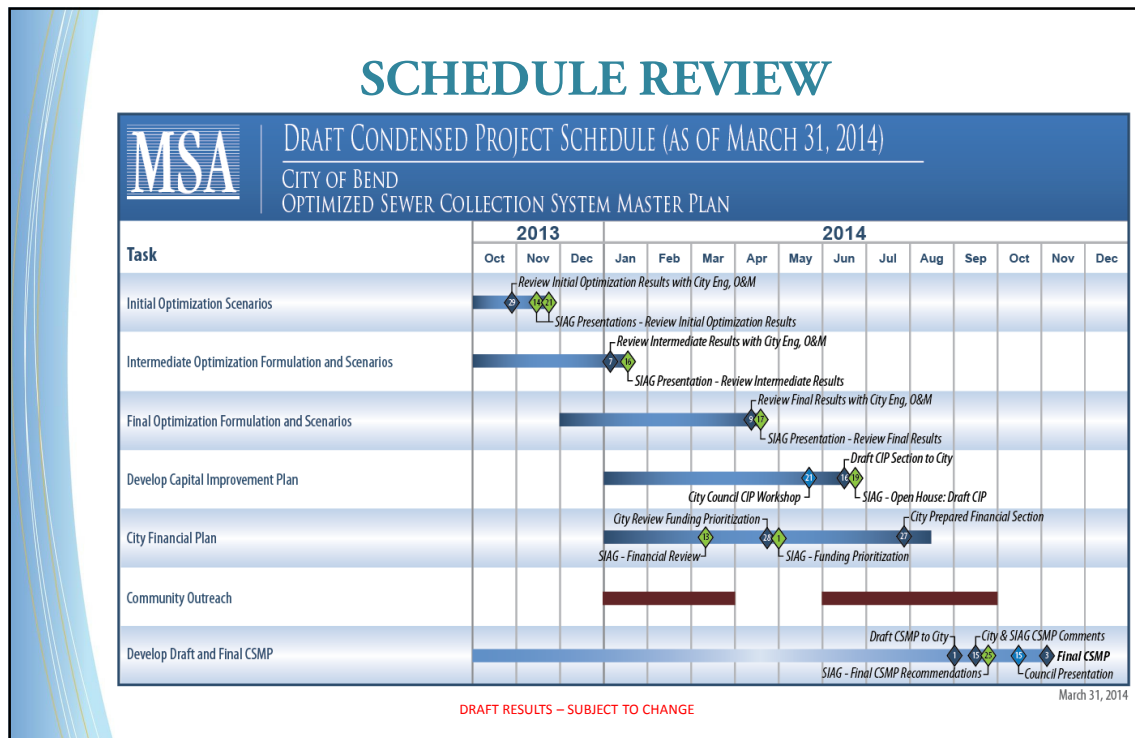
- ◆ All projects selected due to lowest overall life cycle costs
- ◆ Future projects linked to “flow triggers” instead of projected population or flows
- ◆ CSMP includes costs for:
  - Ongoing O&M
  - Condition improvements
  - Long term asset replacement

DRAFT RESULTS – SUBJECT TO CHANGE

## NEXT STEPS

- ◆ SIAG: Funding Prioritization, May 1 (Workshop)
- ◆ May 21 City Council Rate Workshop
- ◆ Community Outreach
  - CIP Open House June 19
  - New Presentations (June-Sep)
- ◆ Financial Plan Complete (August)
- ◆ SIAG: Final Recommendations, September 25
- ◆ City Council Presentation, October 15
- ◆ Final Master Plan (November)

DRAFT RESULTS – SUBJECT TO CHANGE



**Final Optimization Results**

**City Council Chambers**

**Note taker: Adele McAfee**

**Committee Members:** Mike Riley, Sharon Smith, Steve Hultberg, Dale VanValkenberg, Casey Roats, Steve Galash, Charlie Miller, Rob Von Rohr, Stacy Stemach, Craig Horrell, Andy High, John Rexford

**COB Staff:** Paul Rheault, Jon Skidmore, Aaron Collett, Tom Hickmann, Brian Rankin

**Consultants:** David Stangel (MSA), David Prull (Clearwater Engineering Group), Jeff Frey (Optimatics), Joel Wilson (Optimatics), Doug Gabbard (FCS)

**Facilitator:** Libby Barg, Clark Worth (Barney & Worth)

**Others:** Councilor Sally Russell, Councilor Doug Knight, Rondo, Matt Rogers

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**Meeting Summary**

**To-Do**

- Request for May 1 SIAG meeting: show impacts on rate model
- Recommendation to council to set aside some funding and collaborate with neighborhoods currently on septic systems to discuss alternatives and solutions.

**Meeting Summary Approval**

Andy High moved to approve the meeting summaries for 11/14, 11/21, 1/16, and 3/13. Steve Galash seconded. Motion approved.

**Final Optimization Results**

Are these the right projects, phased appropriately over the next 20 years?

✓ Approved (unanimously)

Comments:

- Fact based results; just what we wanted
- Balances residential / business needs
- This and future collection system master plans now tied to real need (based on flow monitoring) rather than population forecasts.
- Cost within reason
- The big difference is phasing: lower up-front costs; savings at least \$20M – important Coordinate construction when tearing up pavement
- \$80M estimate for next 5 years has been cut in half
- UGB expansion gives some pause—will we need to do more sooner
- Like the strategic approach, but can we respond to something really big?
- Will model be run for new UGB options? (When?)

- Will this provide certainty for developers: enough capacity in time? At what cost?
- Should some areas of the city pay higher SDCs?
- Master plan to be updated every 5 years; updates will be based on best information available
- Bend can continue to prioritize the CIP based on real projects and costs

### **Condition Improvements**

Projects, current timing and costs:

- Valhalla Odor /Corrosion Control improvements 2014 @ \$1.6M
- Plant Interceptor condition improvements 2014-2016 @ \$5.4M
- Specific Lift Station improvements 2014-2023 @ \$7.9M (31 lift stations)
- Other specific pipe condition improvements 2019-2023 @ \$3.9M

*Any questions about the need or timing for these projects?*

- ✓ Approved

### **Ongoing Repair / Replacement**

Begin funding in year 10 (2024); ramp up funding level to approximately \$5M/Year over 10 years

*Is this appropriate?*

- ✓ Approved, with the following suggestions:
  - Start saving money sooner than 10 years out for pipeline replacement
  - Develop program that stabilizes the spending over time

### **Local Area Improvements**

Two categories: areas currently served by septic and areas where the current system does not operate. City to proactively address issue, start funding \$1M/yr in 2017 and support development of a program.

*Is this appropriate?*

- ✓ Approved, with the following suggestions:
  - Start \$1M 2015 (understand it may not be the ultimately right number)
  - This is a big issue; requires a separate stakeholder process that involves impacted property owners

No public comment

Meeting Adjourned 5:25PM



# Bend Sewer Infrastructure Advisory Group: Meeting #20



## Funding Prioritization

Bend City Council Chambers  
710 NW Wall St., 1<sup>st</sup> Floor

May 1, 2014  
3:30-5:30 p.m.

## Agenda

	Presenter	Time (2 hrs.)
1. Welcome	Jon Skidmore	5 min
2. Recap April 17 SIAG <ul style="list-style-type: none"><li>Final Optimization Results</li><li>Cost Components Decisions (Layers of the Cake)</li></ul>	David Stangel, MSA Libby Barg, B&W	10
3. Overview: Financial Plan Components	Angie Sanchez Virnoche, FCS Group	10
4. Funding Scenario Overview		10
5. Rate Model Dashboard	Doug Gabbard, FCS Group	45
6. Discussion (electronic polling) <i>Which funding scenario is best to fund collection system improvements and support community values?</i>	Libby Barg	30
7. Next Steps <b>City Council Workshop, May 21</b> Community Outreach <ul style="list-style-type: none"><li>CIP Open House June 19</li><li>Second Round of Presentations (June-Sept)</li></ul> Financial Plan Complete (August) <b>SIAG: Final Recommendations, September 25</b> City Council Presentation, October 15 Final Master Plan (November)	Libby Barg	5
8. Public Comment		5 min

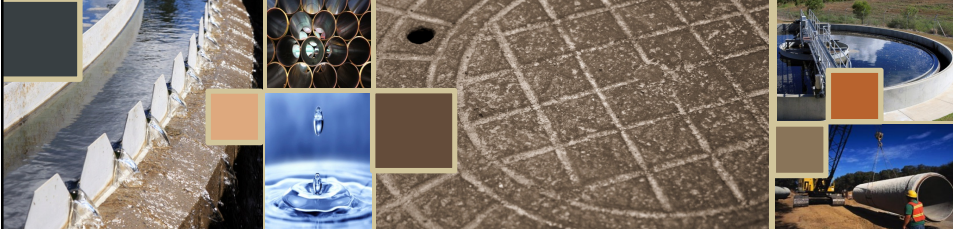




# City of Bend

Sewer Infrastructure Advisory Group Meeting

## Optimized CSMP Financial Plan


May 1, 2014

## Financial Plan Overview

- Identify the level of revenue needed to support the total sewer system
  - Total resources: rates, system development charges, fund balance
  - Total costs: O&M, debt service, capital (projects and reserves)
  - Financial targets (fund balance/debt coverage)
- Craft annual rate strategy to meet needs

**Focus for CSMP is Identifying Total Size of Needs**

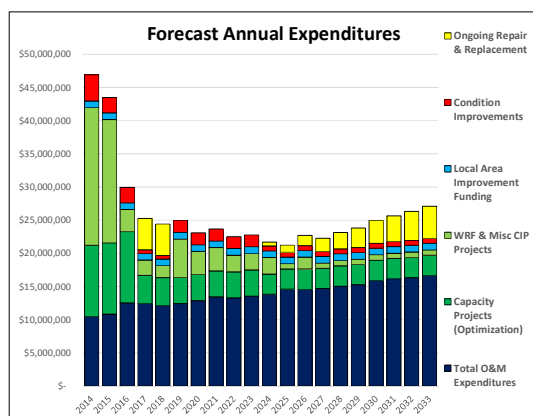


## Key Factors

- FY 2013/2015 biennial budget as baseline
- Average annual O&M escalation 2.6%
- Customer account growth rate 1.39% per year
- Existing debt service obligations included
- SDC revenue included at current charges (indexed to inflation)
- Bonds 20-year term, 4.25% interest rate
- Minimum operating reserve = 90 days
- Minimum debt service coverage 1.5

## Capital Costs

- Capital costs from Optimized Collection System Master Plan
- All available resources of City incorporated
- New debt is required
- Building funds for Local area improvements (LAI) and ongoing repair & replacement (R&R)





## Funding Strategy: Higher Initial Year Rate Increase

	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24
<b>Proposed Rate Increase</b>	9.00%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%
Residential Mo. Bill	\$ 48.36	\$ 49.60	\$ 50.86	\$ 52.16	\$ 53.49	\$ 54.85	\$ 56.25	\$ 57.69	\$ 59.16	\$ 60.66
<i>Bill Difference</i>	\$ 3.99	\$ 1.23	\$ 1.26	\$ 1.30	\$ 1.33	\$ 1.36	\$ 1.40	\$ 1.43	\$ 1.47	\$ 1.51
Cumulative R&R and LAI Fund (\$000)	\$ 1,020	\$ 2,060	\$ 3,122	\$ 9,335	\$ 15,672	\$ 16,798	\$ 17,947	\$ 19,119	\$ 20,314	\$ 21,533

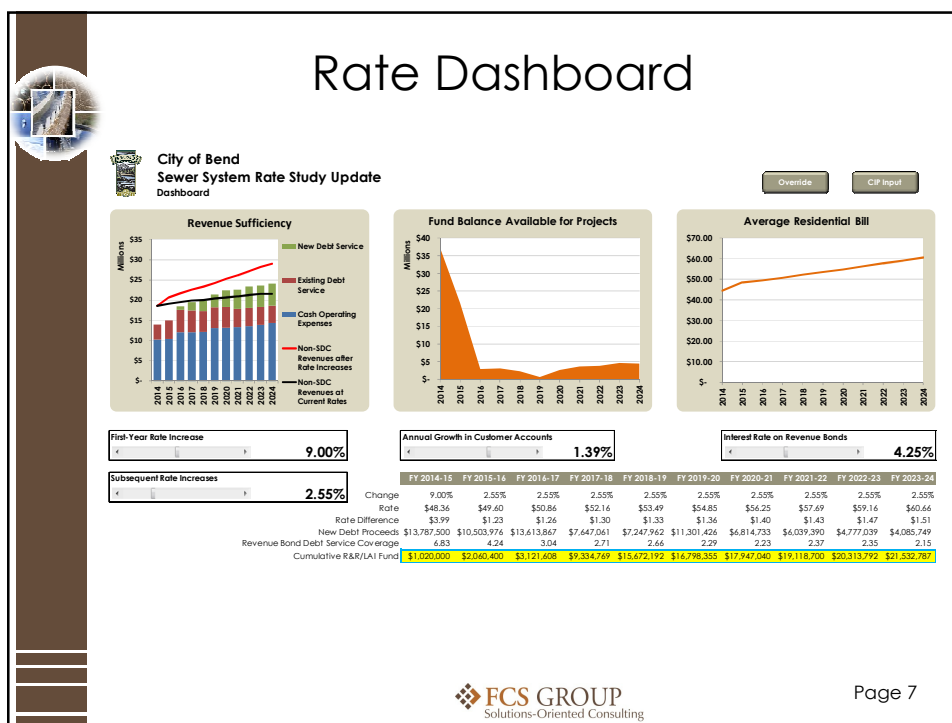
- 9.0% first year increase, followed by 2.55% annual increases through FY 2024
- Building LAI and ongoing R&R fund in FY 2015
- \$868K - \$5.6 million in new annual debt service
- Existing monthly rate \$44.37



## Funding Strategy: Even Rate Increases per Year

	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24
<b>Proposed Rate Increase</b>	4.10%	4.10%	4.10%	4.10%	4.10%	4.10%	4.10%	4.10%	4.10%	4.10%
Residential Mo. Bill	\$ 46.19	\$ 48.08	\$ 50.05	\$ 52.11	\$ 54.24	\$ 56.47	\$ 58.78	\$ 61.19	\$ 63.70	\$ 66.31
<i>Bill Difference</i>	\$ 1.82	\$ 1.89	\$ 1.97	\$ 2.05	\$ 2.14	\$ 2.22	\$ 2.32	\$ 2.41	\$ 2.51	\$ 2.61
Cumulative R&R and LAI Fund (\$000)	\$ 1,020	\$ 2,060	\$ 3,122	\$ 9,335	\$ 15,672	\$ 16,798	\$ 17,947	\$ 19,119	\$ 20,314	\$ 21,533

- 4.10% annual increases
- Building LAI and ongoing R&R fund in FY 2015
- \$935K - \$5.4 million in annual debt service
- Existing monthly rate \$44.37

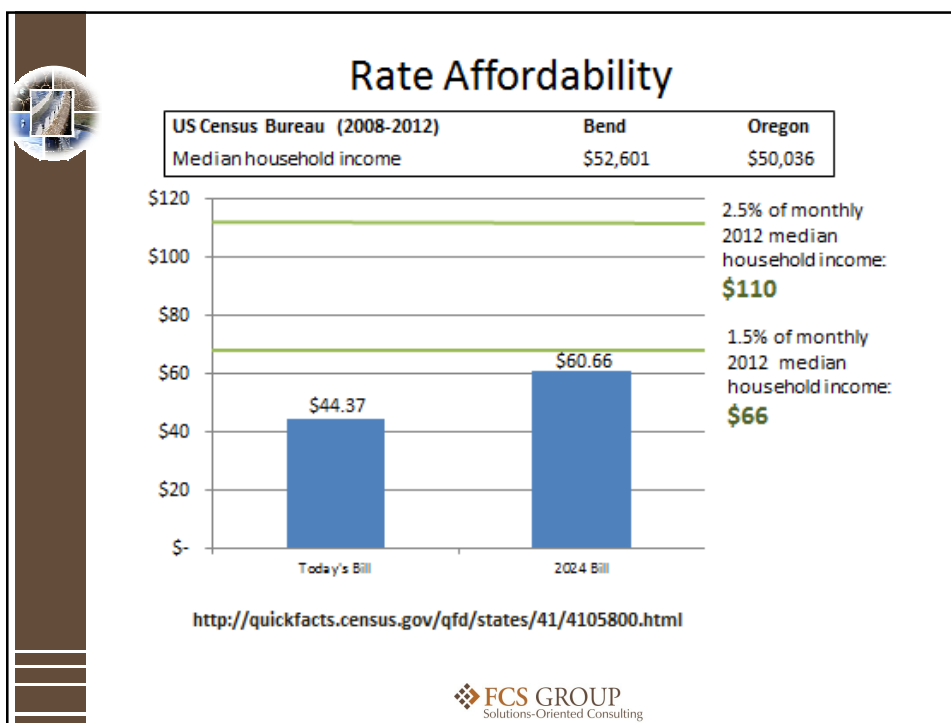


## Rate Affordability

- Affordability is a measure of ability to pay
- Often, affordability measures simply measure “community-wide” affordability
- Water and Sewer Utilities
  - Typically based upon local community's median household income and the % of median household income dedicated to utility bills
  - For a water or sewer utility, an affordability range can be **1.5% to 2.5% of median household income** (each utility)

FCS GROUP  
Solutions-Oriented Consulting

8



#### SNAPSHOT OF FY 13-14 MONTHLY UTILITY BILL

Cities > 20,000 Population	Water Charge (using 800ccf or 6000 gallons)	Sewer Charge (using 800 ccf or 6000 gallons)	Stormwater Charge	TUF/Public Safety UT Fee	Total Monthly Bill
Portland	37.57	69.60	24.54	0.52	132.23
Lake Oswego	41.49	62.55	10.99	8.01	123.04
Newberg	36.46	74.98	6.22	4.50	122.16
Wilsonville	36.59	66.33	5.10	7.05	115.07
Tigard	50.73	38.46 (1)	8.25	5.56	103.00
Milwaukie	27.96	53.43	11.44	3.35	96.18
Albany	44.69	51.06	-	-	95.75
Oregon City	32.41	38.45	8.55	11.56	90.97
Woodburn	25.66	64.47	-	-	90.13
Ashland	37.85	36.18	4.29	8.17	86.49
Springfield	22.08	50.26	12.62	-	84.96
Beaverton	33.16	40.46 (1)	8.25	-	81.87
McMinnville	25.06	56.77	-	-	81.83
Gresham	37.63	26.30	9.84	7.50	81.27
West Linn	19.70	32.84	5.31	22.11	79.96
*Forest Grove	29.19	42.20 (1)	7.00	-	78.39
Klamath Falls	16.50	61.84	-	-	78.34
*Eugene	28.55	37.39	11.39	-	77.33
Salem	24.75	46.49	3.72	1.25	76.21
<b>Bend (w/o franchis</b>	<b>27.69</b>	<b>44.37</b>	<b>4.00</b>		<b>76.06</b>
Tualatin	26.02	39.73 (1)	5.86	3.92	75.53
Corvallis	25.37	36.14	5.86	6.63	74.00
Hillsboro	24.12	38.46 (1)	6.25	3.18	72.01
Redmond	26.62	35.60	7.06	0.83	70.11
Keizer	14.20	39.44	4.44	-	58.08
Roseburg	26.54	25.00	5.00	-	56.54
Grants Pass	19.98	29.33	-	3.37	52.68
*Medford	11.80	16.92	6.85	13.80	49.37

\* Bill \$/1,000 gal

Notes:  
(1) Served by Clean Water Services

**FCS GROUP**  
Solutions-Oriented Consulting

Optimized solution  
20-Year Mid R  
Project Phasing

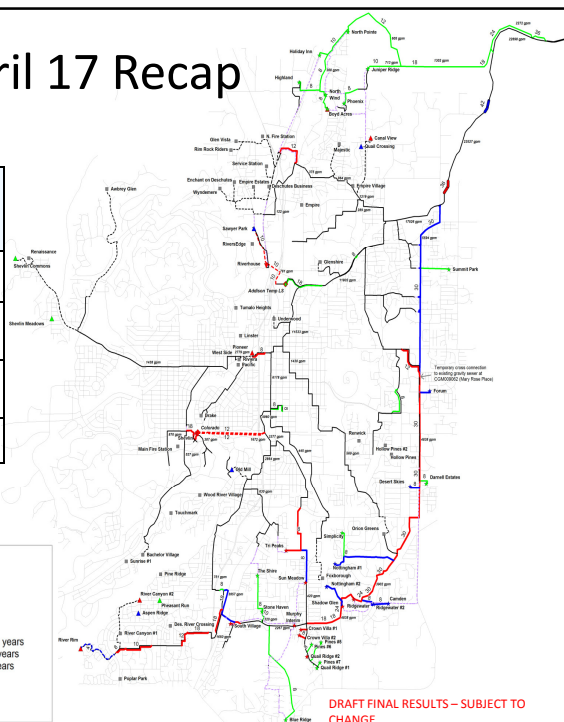
## April 17 Recap

Phase	Present Value Capital Cost (\$M)
Phase 1 – 0 to 5 years	40.67
Phase 2 – 5 to 10 years	18.03
Phase 3 – 10 to 20 years	25.59
<b>TOTAL</b>	<b>84.29</b>

**NOTE:** Cost summary does not include condition-based and local area improvements

### Legend

- New Force Main - 5 to 10 years
- New Force Main - 0 to 5 years
- Existing Force Main
- Decommissioned
- New Gravity Sewer - 10 to 20 years
- New Gravity Sewer - 5 to 10 years
- New Gravity Sewer - 0 to 5 years
- Existing Gravity Sewer
- GS Upsize - 0 to 5 years
- GS Upsize - 5 to 10 years
- ▲ Upgrade Lift Station - 10 to 20 years
- ▲ Upgrade Lift Station - 5 to 10 years
- ▲ Upgrade Lift Station - 0 to 5 years
- ▼ Downsize Lift Station - 0 to 5 years
- ★ Decommission Lift Station - 10 to 20 years
- ★ Decommission Lift Station - 5 to 10 years
- ★ Decommission Lift Station - 0 to 5 years
- ◆ New Lift Station - 10 to 20 years
- ◆ New Lift Station - 5 to 10 years
- ◆ New Lift Station - 0 to 5 years



## SIAG Recommendations

### Condition Improvements:

Valhalla Odor /Corrosion Control improvements 2014 @ \$1.6M  
Plant Interceptor condition improvements 2014-2016 @ \$5.4M  
Specific lift station improvements 2014-2023 @ \$7.9M (31 lift stations)  
Other specific pipe condition improvements 2019-2023 @ \$3.9M

✓ **Approved**

### Ongoing Repair / Replacement

Begin funding in year 10 (2024); ramp up to approximately \$5M/year over 10 years

✓ **Approved, with the following suggestions:**

- Start saving money sooner than 10 years out for pipeline replacement
- Develop program that stabilizes the spending over time

### Local Area Improvements

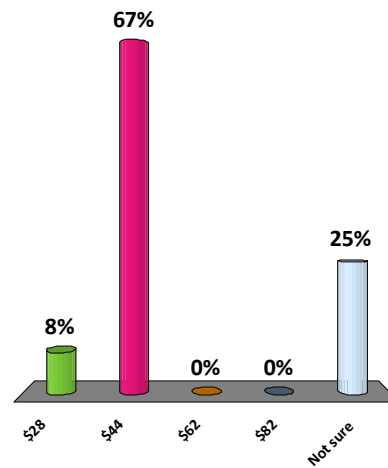
City to proactively address issue, start funding \$1M/year in 2017

✓ **Approved, with the following question / suggestion:**

- Begin \$1M funding in 2015

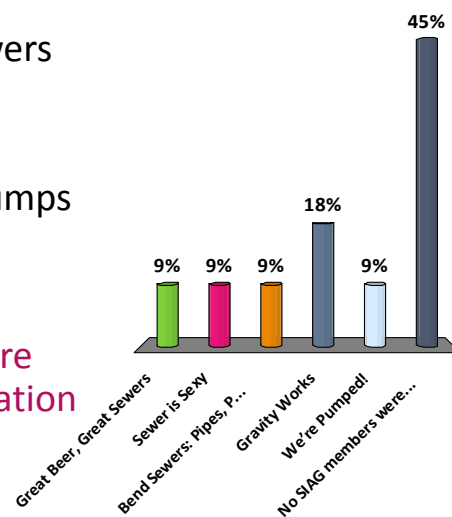
What is the current monthly sewer rate for a typical Bend household?

1. \$28
- ✓ 2. \$44
3. \$62
4. \$82
5. Not sure



Tagline for Collection System Master Plan

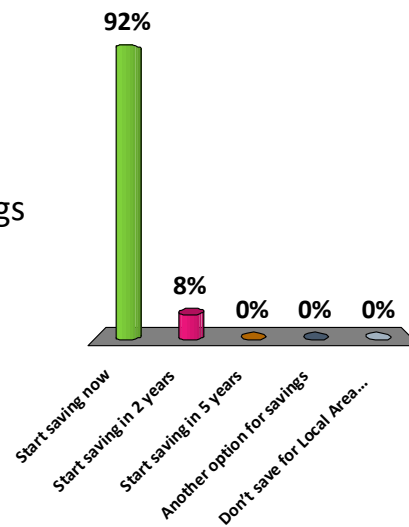
1. Great Beer, Great Sewers
2. Sewer is Sexy
3. Bend Sewers: Pipes, Pumps—and More Pumps
4. Gravity Works
5. We're Pumped!
6. No SIAG members were harmed in the preparation of this master plan



## When should Bend start saving for Local Area Improvements?

1. Start saving now
2. Start saving in 2 years
3. Start saving in 5 years
4. Another option for savings
5. Don't save for Local Area Improvements

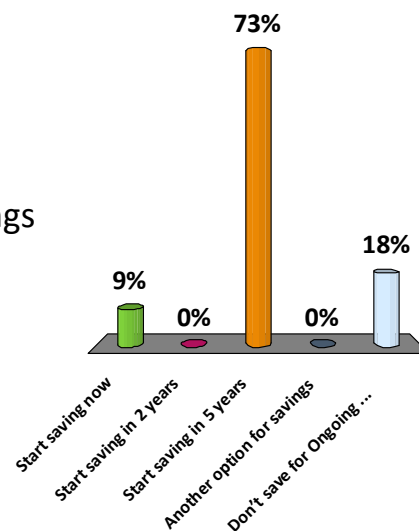
*SIAG Financial Strategy*



## When should Bend start saving for Ongoing Repair/Replacement?

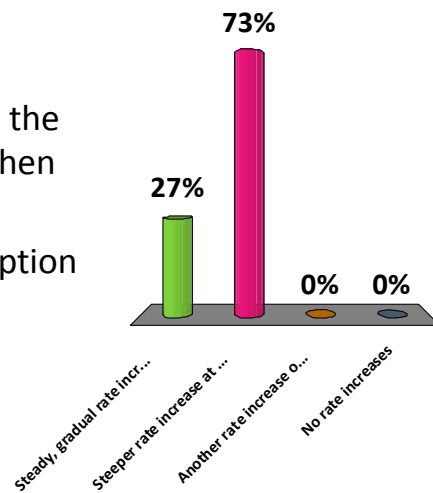
1. Start saving now
2. Start saving in 2 years
3. Start saving in 5 years
4. Another option for savings
5. Don't save for Ongoing Repair/Replacement

*SIAG Financial Strategy*



## How should Bend raise sewer rates?

1. Steady, gradual rate increases
2. Steeper rate increase at the beginning to catch up, then smaller increases
3. Another rate increase option
4. No rate increases

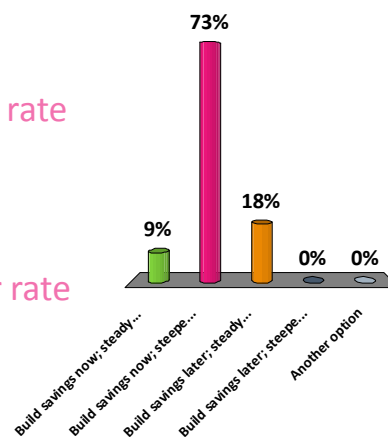


*SIAG Financial Strategy*

## Final Recommendation

*SIAG Financial Strategy*

1. Build savings now; steady, gradual rate increases
2. Build savings now; steeper rate increase at the beginning
3. Build savings later; steady, gradual rate increases
4. Build savings later; steeper rate increase at the beginning
5. Another option



City Council Workshop  
May 21  
5:00 p.m.

**Volunteers please!**

### Next Steps

- Community Outreach
  - CIP Open House June 19
  - Second Round of Presentations (June-Sept)
- Financial Plan Complete (August)
- **SIAG: Final Recommendations, September 25**
- City Council Presentation, October 15
- Final Master Plan (November)

**Funding Prioritization**

**City Council Chambers**

**Note taker: Adele McAfee**

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**COB Staff:** Paul Rheault, Jon Skidmore, Aaron Collett, Tom Hickmann, Carolyn Eagan

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**Facilitator:** Libby Barg (Barney & Worth), Clark Worth (Barney & Worth)

**Others:** Jim Lawrence, Greg Anderson

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**Meeting Summary**

**Financial Planning Components**

Information presented:

**Financial Plan & Strategy:**

- What are the current obligations
- Incorporating CSMP prioritized projects
- Consider total resources
- Cost of system

**Key Factors:**

- Start with approved budget ( 2013-15)
- Apply various escalation factors – 20 year time period
- Customer account growth
- Existing debt service obligations
- Look at SDC Revenues
- Revenue bond debt
- Minimum operating reserves

**Committee reviewed funding strategy:**

- Higher initial year rate increases
- Even rate increases per year

**SIAG Questions/ Comments:**

**Is debt service included in OM?** *It is included in the financial plan.*

**What is the cumulative plan?** *The amount of funding available for ongoing repair & replacement, and local area improvement projects.*

**Everyone knows we are behind the ball on investing in infrastructure everyone is expecting a jump, 9% doesn't seem like a huge jump.**

**The assumptions in the initial rate increase assume it will result in a savings in ten years, this depends on a set of assumption that in 10 years may have changed. If less of an increase is considered in the first year, what sort of things would have changed to make that irrelevant? City council is looking for a recommendation on a strategy. These assumptions could change the numbers that are being presented illustrate what a strategy might look like.**

**Is the local area improvement a city council policy discussion?** Yes, there is a lot of discussion that needs to happen. In theory, the model has at the end of 10 years, \$10 Million set aside for local area improvements. The concept is to “get going” on the local area improvements. In a period of 3 years there should be a better idea of what needs to be done. If there is a savings that money could go into repair and replacement.

**The reserves will go up quicker. The existing debt service will be paid off during the same 10 year period at the same time rate will be covering the debt. There will be additional cash flow that becomes available in that equation.**

**The idea of incentivizing is a good.**

**I support an early jump because there is a lot of money that will be spent upfront. The closer you match the revenue with the expenditures the less you push the costs down the road.**

**Reserves are important. The rate the reserves are being accumulated it seems that we are taking rate payer money now to solve problem for the future. The current rate payers are burden to put rates high enough to build reserves not to repeat the same situation in the future.**

The FCS consultants presented an interactive rate model dashboard that allowed the committee to test various rate scenarios by adjusting:

- Test rate increases
- Growth in customer accounts
- See different interest rate scenarios

### **SIAG Polling:**

When should Bend start saving for local area improvements?

92% - Start saving now

When should Bend start saving for ongoing repair replacement?

73% - Go along with the plan as shown

How should Bend raise sewer rates?

70% - Steeper rate increases

30% - Steady/ gradual

### **Final results on strategy:**

73% Build savings now - steeper rates

18% Build savings latter - steeper rates

9% Build saving now increase rates steady gradual

The June 19 Open House at the River Front Plaza was announced.

Next meeting Sept 25, 2014

No public comment

**Meeting Adjourned 4:36 PM**

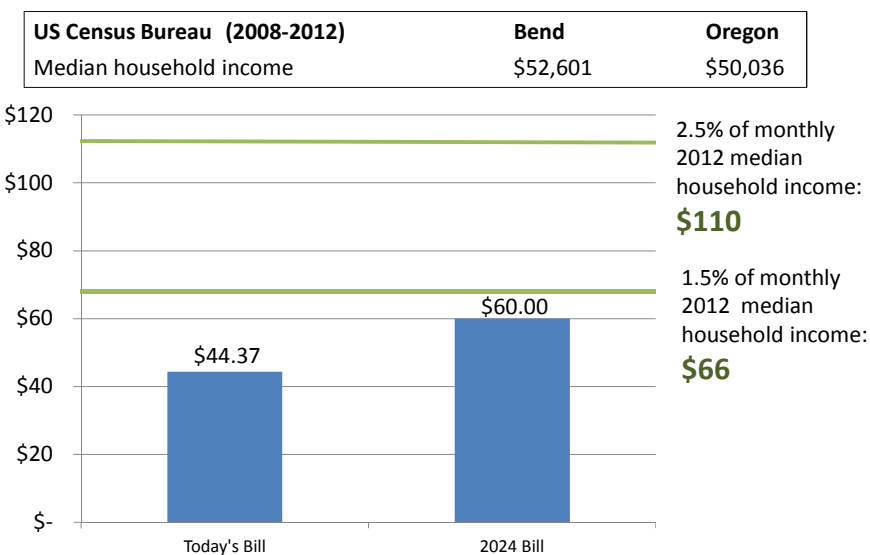
DRAFT

## Rate Affordability

- Affordability is a measure of ability to pay
- Often, affordability measures simply measure “community-wide” affordability
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  - Typically based upon local community’s median household income and the % of median household income dedicated to utility bills
  - For a water or sewer utility, an affordability range can be **1.5% to 2.5% of median household income** (each utility)

1

## Rate Affordability



<http://quickfacts.census.gov/qfd/states/41/4105800.html>

## Sewer Infrastructure Advisory Group

### *Recommendation to the City Council*

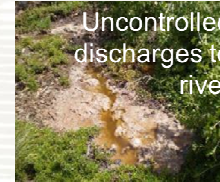
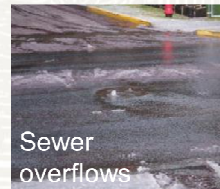
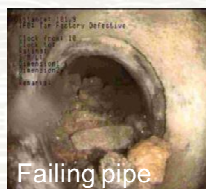


May 21, 2014

## **Bend's Sewer Collection System** *Protecting Public Health & the Environment* *Vital for Jobs and the Economy*

### **What's the problem?**

The system is  
cobbled together  
and near capacity.



## Community invited to help solve the problems.

### Sewer Infrastructure Advisory Group:

- 16-member citizen committee
- Appointed by Bend City Council in 2012
- Advises master planning
- **Over 1100 volunteer hours**



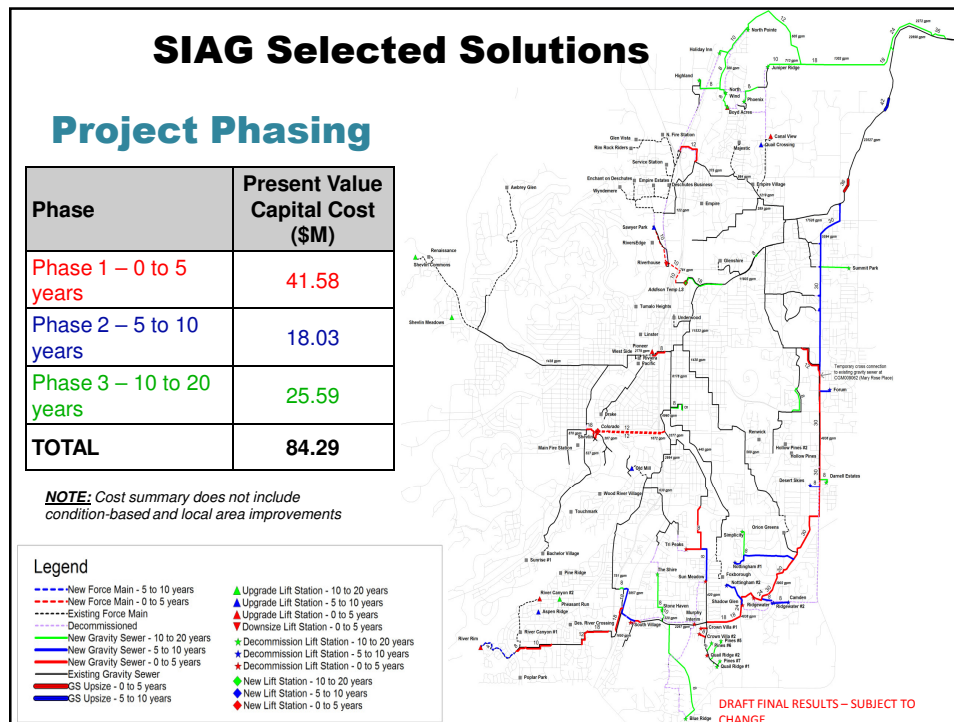
**The Assignment:** Develop *affordable* collection system capital improvements for Bend —within the current Urban Growth Boundary.

3

## Major Policy Direction from SIAG

- Creation of reserves: primarily for future capital needs, also for unserved areas
- Medium density population range
- Denser redevelopment areas
- Medium Intensity Rain Events
- Immediate Solutions
- Pipes, Pumps, Storage, Satellite Treatment, Conservation

4

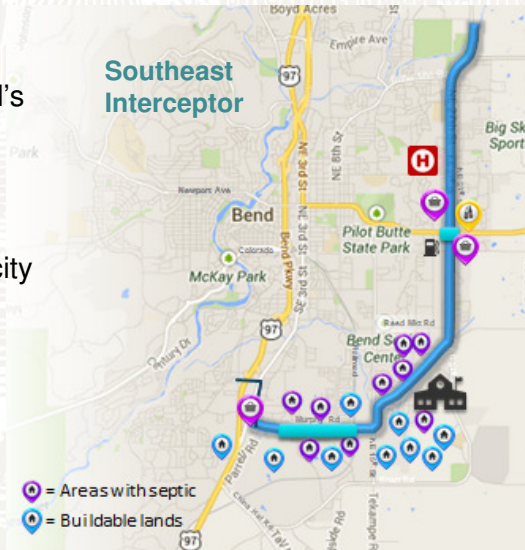


## Good News!

- ✓ Projects can be phased and scaled to meet demands.
- ✓ 2007 CSMP 5-year project list: \$80 million
- ✓ Optimized and phased list: \$40 million (first 5-years)
- ✓ Sewer flow data will signal need/timing for future projects and adjustments to the plan.

## Three critical projects confirmed for the first five years.

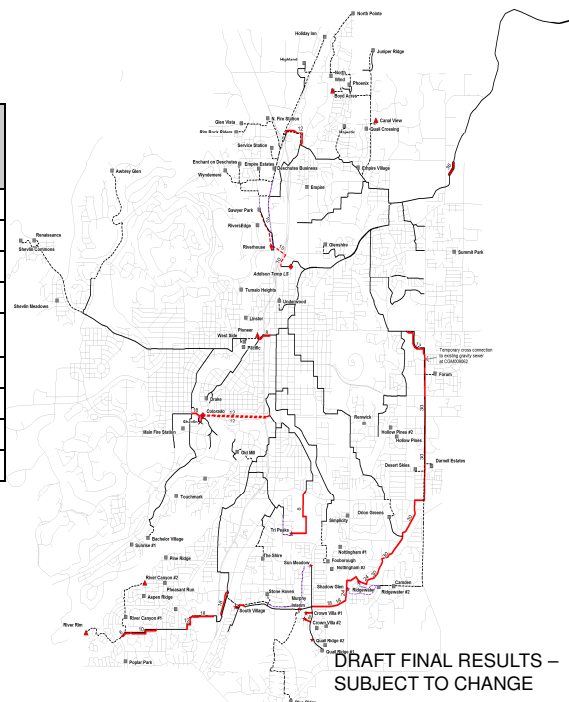
- **Southeast Interceptor**  
Linchpin for solving Bend's sewer problems!  
(Under construction)
- **Colorado Lift Station**  
Relieves Westside capacity issues.  
(In design)
- **North Area Capacity Improvements**  
Adds capacity to serve NE employment lands  
(In design)



7

## All Phase 1 Projects

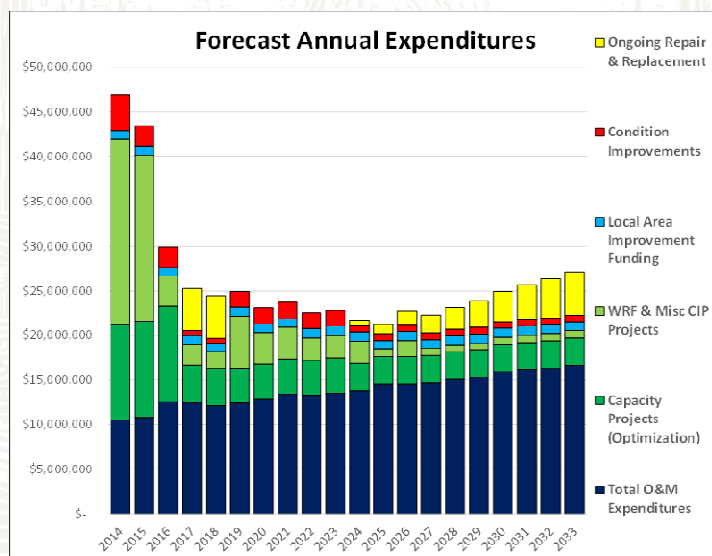
Project	Phase 1: Present Value (\$M)
Southeast Interceptor	19.64
Colorado L.S.	9.79
North Area FM	2.86
SEI Associated	1.66
Plant Interceptor Upsize	0.54
West of Hwy 97	2.21
Miscellaneous	0.60
Existing Lift Stations	4.28
<b>Phase 1 Total</b>	<b>41.58</b>



## SIAG Financial Strategy

- ✓ Start building reserves now to replace aging/failing pipes in the future.
- ✓ Put aside money now to start solving the problem of Bend's unsewered neighborhoods.
- ✓ Borrow money to pay for projects, paid back through revenues from sewer rates, system development charges and other fees.
- ✓ Start with a higher rate increase now to catch up, then smaller increases / rate stability.

9



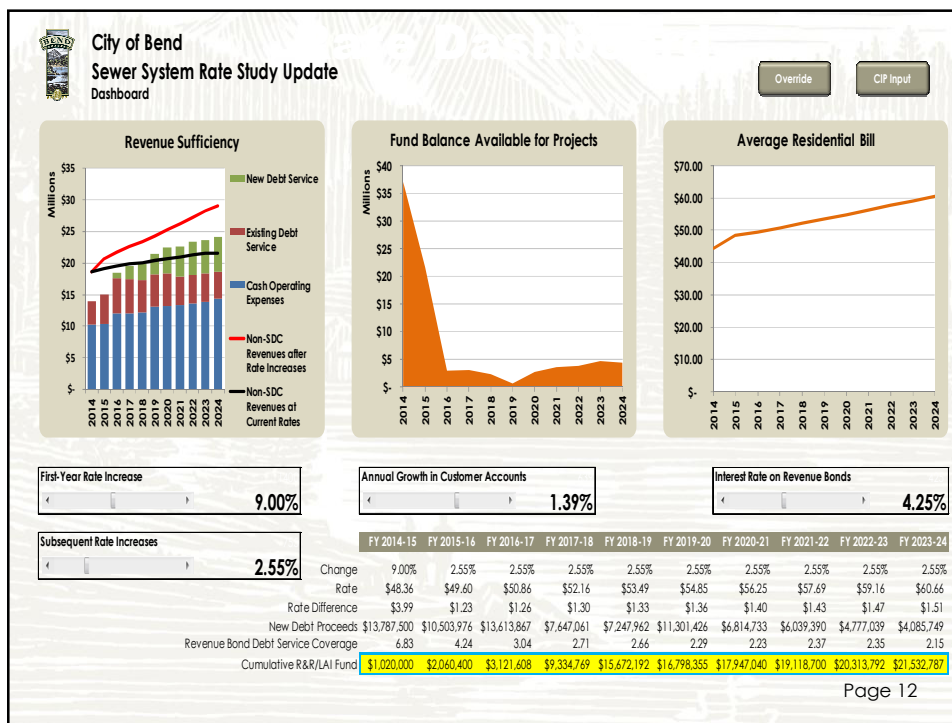
DRAFT RESULTS – SUBJECT  
TO CHANGE

## Proposed Rate Adjustments for 10-Year Rate Model

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Bill Difference	\$3.99	\$1.23	\$1.26	\$1.30	\$1.33	\$1.36	\$1.40	\$1.43	\$1.47	\$1.51
Residential Monthly Bill	\$48.36	\$49.60	\$50.86	\$52.16	\$53.49	\$54.85	\$56.25	\$57.69	\$59.16	\$60.66
Proposed Rate Increase	9.00%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%

Existing monthly rate \$44.37

11



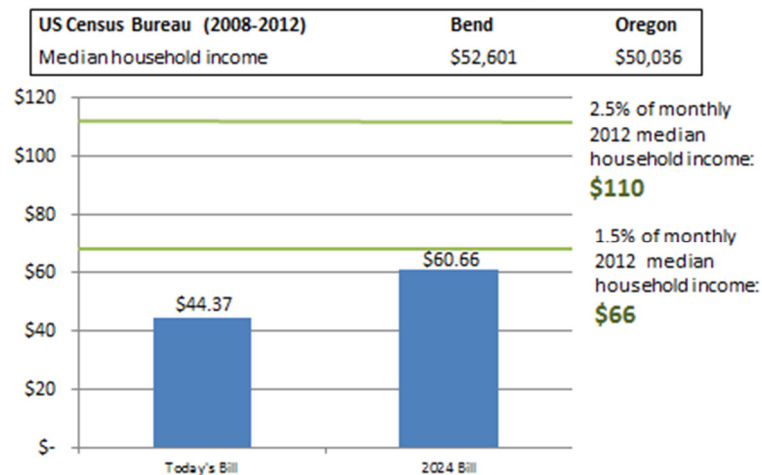
SNAPSHOT OF FY 13-14 MONTHLY UTILITY BILL					
Cities > 20,000 Population	Water Charge (using 800ccf or 6000 gallons)	Sewer Charge (using 800 ccf or 6000 gallons)	Stormwater Charge	TUF/Public Safety UT Fee	Total Monthly Bill
Portland	37.57	69.60	24.54	0.52	132.23
Lake Oswego	41.49	62.55	10.99	8.01	123.04
Newberg	36.46	74.98	6.22	4.50	122.16
Wilsonville	36.59	66.33	5.10	7.05	115.07
Tigard	50.73	38.46 (1)	8.25	5.58	103.00
Milwaukie	27.56	53.43	11.44	3.35	95.78
Albany	44.69	51.06	-	-	95.75
Oregon City	32.41	38.45	8.55	11.56	90.97
Woodburn	25.66	64.47	-	-	90.13
Ashland	37.85	36.18	4.29	8.17	86.49
Springfield	22.08	50.26	12.62	-	84.96
Beaverton	33.16	40.46 (1)	8.25	-	81.87
McMinnville	25.06	56.77	-	-	81.83
Gresham	37.63	26.30	9.84	7.50	81.27
West Linn	19.70	32.84	5.31	22.11	79.96
*Forest Grove	29.19	42.20 (1)	7.00	-	78.39
Klamath Falls	16.50	61.84	-	-	78.34
*Eugene	28.55	37.39	11.39	-	77.33
Salem	24.75	46.49	3.72	1.25	76.21
Bend (w/o franchis	27.69	44.37	4.00	-	76.06
Tualatin	26.02	39.73 (1)	5.86	3.92	75.53
Corvallis	25.37	36.14	5.86	6.63	74.00
Hillsboro	24.12	38.46 (1)	6.25	3.18	72.01
Redmond	26.62	35.60	7.05	0.83	70.11
Keizer	14.20	39.44	4.44	-	58.08
Roseburg	26.54	25.00	5.00	-	56.54
Grants Pass	19.98	29.33	-	3.37	52.68
*Medford	11.80	16.92	6.85	13.80	49.37

\* Bill \$/1,000 gal

Notes:  
(1) Served by Clean Water Services

13

## Rate Affordability



<http://quickfacts.census.gov/qfd/states/41/4105800.html>

US EPA Definition of Rate Affordability: 1.5 – 2.5% of household income for each utility.

14

## Benefits to Ratepayers of Strategy

- ✓ Saves money over time - 10 years from now, rate is less because of higher initial rate increase (\$60 compared to \$66)
- ✓ Build and maintain adequate financial reserves



15

## What's next?

**Public Outreach**

**Now-Fall**

**Capital Improvement Plan    June 19**  
**Open House @ Brooks Plaza**

**Financial Plan**

**August**

**Final Sewer Master Plan**

**October**

16



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# Bend Sewer Infrastructure Advisory Group: Meeting #21

## SIAG Recommendation

Bend City Council Chambers  
710 NW Wall St., 1<sup>st</sup> Floor

September 25, 2014  
**3:30-5:30 p.m.**

## Agenda

	Presenter	Time (2 hrs.)
<ul style="list-style-type: none"><li>Welcome<ul style="list-style-type: none"><li>Update on Community Outreach</li></ul></li></ul>	Jon Skidmore	5 min
<ul style="list-style-type: none"><li>Review Agenda<ul style="list-style-type: none"><li>SIAG Survey Results</li><li>Decision Matrix</li></ul></li></ul>	Libby Barg, B&W	5
<ul style="list-style-type: none"><li>Recap May 1 SIAG meeting</li></ul>	Tom Hickmann, PE	10
<ul style="list-style-type: none"><li>Collection System Master Plan (Draft)</li></ul>	David Stangel, MSA	20
<ul style="list-style-type: none"><li>Public Facilities Plan</li></ul>	Jon Skidmore	10
<ul style="list-style-type: none"><li>Final Recommendation<ul style="list-style-type: none"><li>SIAG Recommendation</li><li>Electronic Polling</li></ul></li></ul>	Steering Committee	10
<ul style="list-style-type: none"><li>SIAG Members' Closing Statements<ul style="list-style-type: none"><li><i>Support the recommendation</i></li><li><i>Support with further comments</i></li><li><i>Do not support (and why)</i></li><li><i>Not ready to vote</i></li></ul></li></ul>		40
<ul style="list-style-type: none"><li>Update on Priority Projects<ul style="list-style-type: none"><li>Colorado Lift Station</li><li>North Area Improvements</li><li>Southeast Interceptor</li></ul></li></ul>	Aaron Collett	10
<ul style="list-style-type: none"><li>Next Steps<ul style="list-style-type: none"><li>See schedule on back</li></ul></li></ul>	Libby Barg	5
<ul style="list-style-type: none"><li>Public Comment</li></ul>		5 min

# Bend Collection System Master Plan / Public Facilities Plan

## Tentative Schedule

October 6, 2014	Notice to DLCD
October 13	Planning Commission work session for PFP
October 31	Public notice for hearings
November 10	Planning Commission hearing for PFP
November 19	City Council work session
December 3	City Council hearing (1 <sup>st</sup> reading) <ul style="list-style-type: none"><li>• CSMP</li><li>• Stormwater PFP</li><li>• Sewer PFP</li></ul>
December 17	City Council (2 <sup>nd</sup> reading)
December 19	Notice to DLCD & others
January 8	Deadline for appeal; Stormwater/Sewer PFP Acknowledgement

# **SIAG RECOMMENDATION**

## **BEND OPTIMIZED COLLECTION SYSTEM MASTER PLAN**

September 25, 2014

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

## **AGENDA**

- Recap May 1 SIAG meeting
- Collection System Master Plan (Draft)
- Final Recommendation
- Public Facility Plan
- SIAG Members' Closing Statements
- Update on Priority Projects
- Next Steps
- Public Comment

## MAY 1 SIAG MEETING RECAP

### SIAG Financial Strategy

- ✓ Start building reserves now to replace aging/failing pipes in the future.
- ✓ Put aside money now to start solving the problem of Bend's unsewered neighborhoods.
- ✓ Borrow money to pay for projects, paid back through revenues from sewer rates, system development charges and other fees.
- ✓ Start with a higher rate increase now to catch up, then smaller increases / rate stability.

3

## PROPOSED RATE ADJUSTMENTS FOR 10-YEAR RATE MODEL

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Bill Difference	\$3.99	\$1.23	\$1.26	\$1.30	\$1.33	\$1.36	\$1.40	\$1.43	\$1.47	\$1.51
Residential Monthly Bill	\$48.36	\$49.60	\$50.86	\$52.16	\$53.49	\$54.85	\$56.25	\$57.69	\$59.16	\$60.66
Proposed Rate Increase	9.00%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%

**Existing monthly rate \$44.37**

Note: Section 8, Financial Plan shows future ongoing rate increase as 3%.

4

## CITY COUNCIL ACTION

**City Council Work Session** SIAG May 1 recommendation presented  
**Wednesday, May 21, 2014** to City Council.

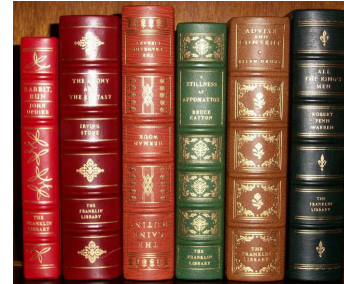
**City Council Meeting** City Council adopted SIAG's  
**June 18, 2014** recommended initial 9% rate increase,  
with one modification—to begin the  
increase on October 1, 2014 instead of  
July 1, 2014.

## SYSTEM DEVELOPMENT CHARGES UPDATE

- ◆ Financial plan assumes existing SDCs
- ◆ A study will be underway to:
  - Determine what projects are SDC eligible
  - The appropriate SDC level
  - Implementation schedule
- ◆ Asking for volunteers from SIAG to participate in the community input process (yet to be determined)

## WHAT'S IN THE COLLECTION SYSTEM MASTER PLAN?

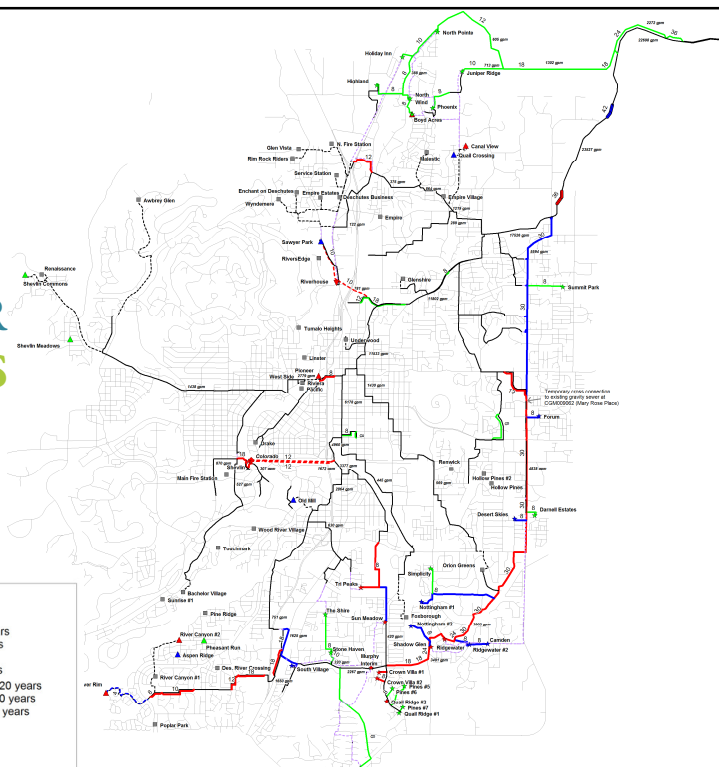
- ◆ Six Volumes (5 are appendices)
- ◆ Volume 1 (the meat of the plan)
  - **Section 1: Executive Summary**
  - Section 2: Existing System Description
  - Section 3: Wastewater Flow Projections
  - Section 4: System Analysis
  - Section 5: Project Unit Costs and Cost Analysis
  - Section 6: Optimization
  - Section 7: Capital Improvement Program
  - **Section 8: Financial Strategy**
- ◆ Volume 3 (Public Facility Plan)



## WHAT'S IN THE COLLECTION SYSTEM MASTER PLAN? PROJECTS

### Legend

- |  |  |
|--|--|
| --- New Force Main - 5 to 10 years     | ▲ Upgrade Lift Station - 10 to 20 years      |
| --- New Force Main - 0 to 5 years      | ▲ Upgrade Lift Station - 5 to 10 years       |
| --- Existing Force Main                | ▼ Downsize Lift Station - 0 to 5 years       |
| --- Decommissioned                     | ★ Decommission Lift Station - 10 to 20 years |
| --- New Gravity Sewer - 10 to 20 years | ★ Decommission Lift Station - 5 to 10 years  |
| --- New Gravity Sewer - 5 to 10 years  | ★ Decommission Lift Station - 0 to 5 years   |
| --- New Gravity Sewer - 0 to 5 years   | ◆ New Lift Station - 10 to 20 years          |
| --- Existing Gravity Sewer             | ◆ New Lift Station - 5 to 10 years           |
| --- GS Upsize - 0 to 5 years           | ◆ New Lift Station - 0 to 5 years            |
| --- GS Upsize - 5 to 10 years          |  |



## WHAT'S IN THE COLLECTION SYSTEM MASTER PLAN? PHASING

### OPTIMIZED SOLUTION 20-YEAR MID R PROJECT PHASING

Phase	Present Value Capital Cost (\$M)
Phase 1 – 0 to 5 years	39.72
Phase 2 – 5 to 10 years	18.00
Phase 3 – 10 to 20 years	25.46
<b>TOTAL</b>	<b>83.18</b>

**NOTE:** Cost summary does not include condition-based and local area improvements

## WHAT'S IN THE COLLECTION SYSTEM MASTER PLAN? HOW TO PAY FOR IT

**Table 8-1**  
**Capital Expenditures by Funding Source**

Funding Source	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19
Debt Proceeds	\$31,208,000	\$28,744,000	\$17,551,000	\$ 7,232,000	\$12,250,000
Sewer SDCs	\$2,023,000	\$1,838,000	\$1,863,000	\$1,893,000	\$1,923,000
Sewer Rates and Available Fund Balance	\$3,387,000	\$2,982,000	\$63,000	\$4,987,000	\$65,000
Total Capital Expenditures	\$36,618,000	\$33,564,000	\$19,477,000	\$14,112,000	\$14,238,000

General notes: Sources: MSA (project costs); Engineering News Record (inflation).  
FY = Fiscal Year (July 1 through June 30). SDCs = System Development Charges.

## QUESTIONS



## TENTATIVE APPROVAL SCHEDULE

<b>October 6, 2014</b>	Notice to DLCD
<b>October 13</b>	Planning Commission work session for PFP
<b>October 31</b>	Public notice for hearings
<b>November 10</b>	Planning Commission hearing for PFP
<b>November 19</b>	City Council work session
<b>December 3</b>	City Council hearing (1 <sup>st</sup> reading) <ul style="list-style-type: none"> <li>• CSMP</li> <li>• Stormwater PFP</li> <li>• Sewer PFP</li> </ul>
<b>December 17</b>	City Council (2 <sup>nd</sup> reading)
<b>December 19</b>	Notice to DLCD & others
<b>January 8</b>	Deadline for appeal Stormwater/Sewer PFP Acknowledgement

[www.bendoregon.gov/CSMP](http://www.bendoregon.gov/CSMP) Online comments through November 10, 2014

## IMPLEMENTATION POLICIES (PFP)

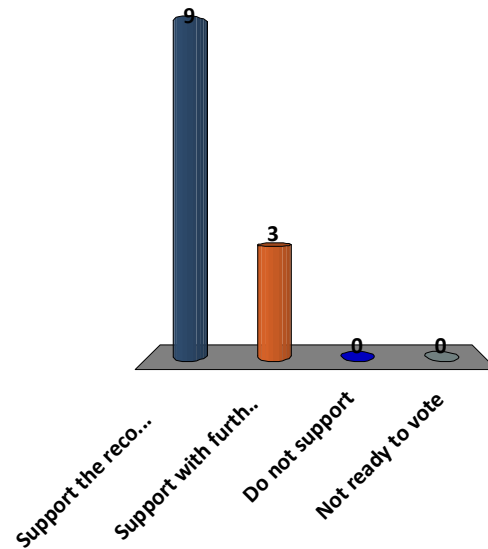
- ◆ PFP findings may include aspirational policies about how sewers are designed and constructed
- ◆ Goal: make sure we don't end up in the same mess!
- ◆ Proposed policies will go through public review
- ◆ Process begins Oct 13 at Planning Commission meeting

## SIAG RECOMMENDATION

The Sewer Infrastructure Advisory Group recommends Bend City Council adopt the Collection System Master Plan after consideration of public comments.

## My Recommendation

1. Support the recommendation
2. Support with further comments
3. Do not support
4. Not ready to vote



## SIAG CLOSING STATEMENTS

- ◆ Provided to City Council as part of SIAG recommendation
- ◆ 3 minutes each
- ◆ Please provide comment on why you:
  1. Support the recommendation
  2. Support with further comments
  3. Do not support
  4. Not ready to vote

# Capital Project Update to SIAG

*North Area Sewer Capacity Improvements  
Colorado Lift Station  
Southeast Interceptor*



*Presenter : Aaron Collett  
Department : EIPD  
Date : September 25, 2014*

## North Area Sewer Capacity Improvements



- Addresses “Area 2”
- Renamed to “North Area Sewer Capacity Improvements”
- Phase 1 analyzed capacity constraints and developed recommended solutions
  - Coordinated with CSMP team



City of Bend

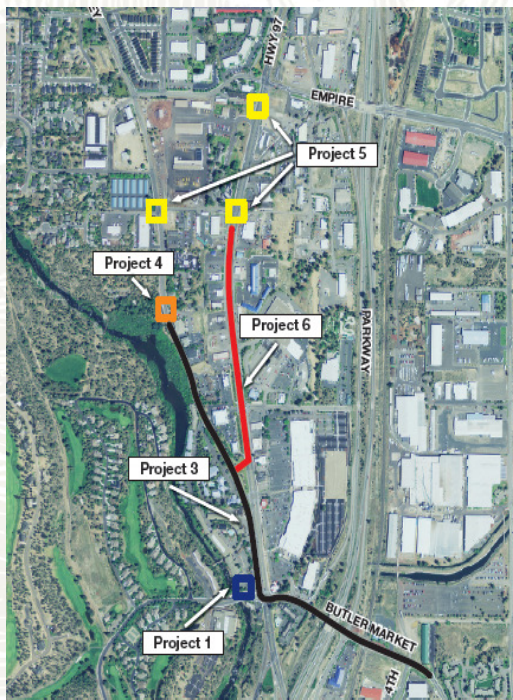
## North Area - Continued



- Phase 2 provides final design & construction services
  - Approved by Council August 20, 2014
- New project manager – George Franklet



City of Bend



## North Area Schedule Estimates



- Sub-project #2 – Gravity Upgrade
  - Design Complete – March 2015
  - Construction Complete end of 2015
- Remaining Sub-projects (1\*, 3, 4, 5, 6)
  - Design Complete – September 2015
  - Construction Complete in 2016
  - \*Sub-Project 1 not in this project



City of Bend

## Colorado Lift Station



- Currently reviewing 100% design documents
- Bidding: October – December 2014
- Construction: December 2014 through June 2016



City of Bend

## Colorado LS Project Components



Gravity Line

Colorado Lift Station

Pressure Lines

January 2016 – June 2016

December 2014 – June 2016  
(operational December 2015)

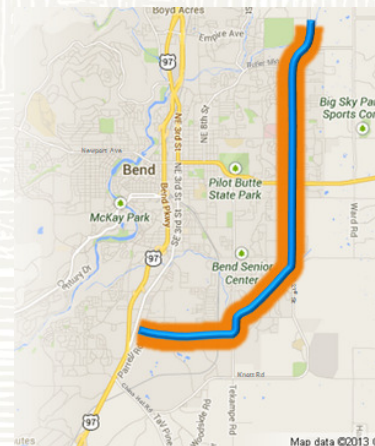
December 2014 – December 2015

23

## Southeast Interceptor



- Schedule F & G: *Brosterhous to Ferguson (Murphy Alignment)*  
Bids received on September 11, 2014  
Low bid = \$4.98 million  
Estimated to start construction November 1, 2014
- Next Phase: *From Neff, south on 27<sup>th</sup>*  
Bid opening early summer 2015



City of Bend



## Questions?



City of Bend

## PUBLIC COMMENT



A REALLY BIG  
THANK YOU

## **Bend Sewer Infrastructure Advisory Group – September 25, 2014**

### **Meeting Notes**

#### **Attending:**

*SIAG:* Hultberg, Miller, Stemach, Von Rohr, Galash, Roats, Smith, Price, Putnam, High, Riley, Boddie

*Staff:* Skidmore, Hickmann, Collett, McAfee, Rheault

*Consultants:* Stangel, Prull, Barg, Worth

#### **SIAG Recommendation**

9 – Support the recommendation

3 – Support with comments

Preliminary comments on final report/recommendations:

- Needs a cover memo with high-level highlights (Riley)
- Something should be added to describe optimization (Putnam)
- Thanks to the City of Bend for their commitment to/investment in the SIAG process (Von Rohr)
- The report should include the sentiment: “We don’t want to get back into this mess again in the future.” (Hultberg)
- The report should reference SIAG recommendations and City policies on unsewered areas. (Skidmore)

#### **SIAG Comments**

Hultberg: *Support*

- 2 years of hard work; deliberative process; compromises reached along the way
- Excellent team of experts earned SIAG confidence

Miller: *Support*

- Diverse group; group process well facilitated
- Replaced/updated earlier Master Plan (never adopted) using better data
- Looked carefully at alternatives including conservation

Boddie: *Support with comments*

- Valuable outcome: lower price tag
- There’s room to transmit SIAG members’ comments to City Council, including minority opinions. This will make the report a more powerful document.
- The SIAG process was compartmentalized focusing on sewage collection. It should be repeated for other infrastructure systems: wastewater treatment, stormwater, the UGB decision

Putnam: *Support*

- SIAG brought together smart people, gave them good information, for a lot of meetings.
- SIAG members came to trust staff, consultants and other good minds on SIAG
- Still worried about combined price tag for these and other infrastructure needs. Wonder if City Council will have the courage to sustain the, necessary rate increases

Smith: *Support*

- Thanks to staff, consultants and cooperative committee members
- Good process; would recommend it for other community needs
- Would like to hear any SIAG dissenting opinions clarified – don't recall hearing many.

Roats: *Support*

- SIAG's membership was a big success
- Projects on the priority list are entirely defensible
- City staff have been informative, patient, courteous – and did not drive the process

Price: *Support*

- No reservations
- Learned more about sewers
- Hope the SIAG process serves as a model for Bend's other infrastructure decisions. The finalized model is a sound tool and could be used for other infrastructure elements
- Plan should be reviewed every five years or more often
- Personal highlight: making a presentation to the Oregon League of Conservation Voters, as part of the very effective community outreach
- SIAG process produced "one voice from many diverse opinions"

Galash: *Support*

- Process surprisingly good; initially expected SIAG to be an audience for staff presentations
- Steering Committee was effective: those meetings were exciting, and transformed the SIAG process
- Staff and consultants worked for the committee
- "Facilitation couldn't have been better"

Riley: *Support with comments*

- The value of conservation needs to be given higher priority by the City. Bend is lagging behind peer utilities
- Staff and consultants were "fantastic": "I learned more than I thought was possible"
- A good choice was to invite environmental community participation early in the process.
- The Steering Committee was helpful in shaping the process

- The SIAG approach would produce a good solution for the upcoming UGB decisions, which are important to the environmental community
- SIAG members disagreed on very little

High: *Support*

- Thanks to the Steering Committee; their time commitment tripled that of other SIAG members
- The recommended plan is the right thing for ratepayers; but afraid that City Council may not move it forward (based on past experience with development codes, stormwater, other topics)
- Thanks to SIAG members who served as presenters in the community. They did a great job.

Stemach: *Support with comments*

- SIAG was given time to comprehend the information and reach decisions in an open forum
- Information was thorough and complete
- “The SIAG process was transparent at the highest level.” The facilitation was successful and a model for other citizen processes; overcoming the challenge of how to interest and meaningfully involve the public
- Conservation’s role should be noted, to lower impacts on the system starting with new development. This will yield measurable benefits and lower system costs.

Von Rohr: *Support*

- Don’t limit innovative conservation ideas to new development.
- The process was well facilitated. Meetings were well prepared by Steering Committee, staff, consultant team
- At its core, SIAG was an education process

Van Valkenburg (absent): *Support*

### **Public Comment**

- Fred Meyer development proposal: accolades to the SIAG but we regret not participating earlier
- An adaptive process is needed to update the Master Plan and account for unforeseen circumstances, including development proposals that bring economic value to Bend and Central Oregon
- Councilor Russell: This is the first and best model for Bend’s diverse voices to be present and heard at one place/time. The results and cost savings are “miraculous”. Outdated assumptions have been replaced with more robust information. Thanks to SIAG, staff and consultants for a huge investment of time. City Council is already implementing the recommendations. Decisions are expected by December: “The voice of SIAG is present”. “On we go.”



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## Bend Sewer Infrastructure Advisory Group: Meeting #22

### Sewer Policies

Bend City Council Chambers  
710 NW Wall St., 1<sup>st</sup> Floor

October 6, 2014  
**3:30-5:30 p.m.**

## Agenda

	Presenter	Time (2 hrs.)
• Welcome	Jon Skidmore	5 min
• Review Agenda	Libby Barg	5
• Final Recommendation Summary	Mike Riley	30
• Review Sewer Policies <ul style="list-style-type: none"><li>▪ Existing</li><li>▪ Suggested updates to existing</li><li>▪ Suggested new policies</li></ul>	Jon Skidmore	30
• Electronic Polling & Discussion	Libby Barg	40
• Next Steps <ul style="list-style-type: none"><li>▪ See schedule on back</li></ul>	Jon Skidmore	5
• Public Comment		5 min

# Bend Collection System Master Plan / Public Facilities Plan

## Tentative Schedule

October 6, 2014	Notice to DLCD
October 13	Planning Commission work session for PFP
October 31	Public notice for hearings
November 10	Planning Commission hearing for PFP
November 19	City Council work session
December 3	City Council hearing (1 <sup>st</sup> reading) <ul style="list-style-type: none"><li>• CSMP</li><li>• Stormwater PFP</li><li>• Sewer PFP</li></ul>
December 17	City Council (2 <sup>nd</sup> reading)
December 19	Notice to DLCD & others
January 8	Deadline for appeal; Stormwater/Sewer PFP Acknowledgement

**SIAG Proposed Sewer Policies**  
**SIAG Meeting October 6, 2014**

1. All new development within the Urban Growth Boundary should be connected to City sewer.
2. The city is the primary provider of sewage collection and treatment services for the City's service area under Statewide Planning Goal 11.
3. To reduce the reliance on individual sewage disposal systems within the Urban Growth Boundary the city will work with unsewered neighborhoods to find solutions for sewer service.
4. The city shall collect a sufficient amount of revenue to allow the creation of capital project reserves and to replace aging infrastructure in addition to operational needs of the utility.
5. Staff shall report to Council on an annual basis regarding the status of the Collection System Master Plan, Capital Improvement Projects and capacity issues within the collection system.
6. The City will annually update its financial model as part of the review of sewer rates and report to Council on any changes in the 20-year financial outlook and subsequent rate impacts.
7. The master plan shall be updated at least every 5 years with official review and adoption by Council.
8. The preference of the City is to serve development through gravity conveyance and use of the Waste Water Reclamation Facility.
9. If lift stations are required to serve new development, regional pump stations shall be relied upon to the extent practicable versus individual or smaller lift stations.
10. These policies will be implemented through the City of Bend Public Improvement Construction Procedure Standards & Specifications.
11. The City should look for reasonable opportunities to decommission energy- and maintenance-intensive lift stations as part of new development or other City infrastructure projects.
12. The City will consider the conservation and water reuse measures in the Water Management and Conservation Plan in infrastructure planning to reduce overall impacts to the sewer collection and treatment system.

# SIAG SEWER POLICIES BEND OPTIMIZED COLLECTION SYSTEM MASTER PLAN

October 6, 2014

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

## AGENDA

- Final Recommendation Summary
- Review Sewer Policies
  - ❖ Existing
  - ❖ Suggested updates to existing
  - ❖ Suggested new policies
- Electronic Polling & Discussion
- Next Steps
- Public Comment

## **FINAL RECOMMENDATION SUMMARY**

3

## **SEWER POLICIES OVERVIEW**

1. Existing
2. Suggested updates to existing
3. Suggested new policies

## EXISTING SEWER POLICIES

1. The city shall encourage development of serviced land prior to unserved land or require the extension of sewer lines as part of any development within the UGB.
2. The city shall coordinate the provision of sewer service with other providers within the Urban Growth Boundary.
3. All development within the Urban Growth Boundary shall be sewered or provide for sewers through a binding sewer service agreement with the city.
4. No further special districts shall be formed to provide sewer service within the Urban Growth Boundary, nor shall any annexation be allowed to an existing district.
5. The city shall be the primary provider of sewage collection and treatment services for the Bend urban area.
6. To reduce the reliance on individual sewage disposal systems within the Urban Growth Boundary the city will assist established neighborhoods that commit to a sewage collection system by extending pressure or gravity lines to the subdivision.

## EXISTING SEWER POLICIES DLCD NOTICE

1. The city shall encourage development of serviced land prior to unserved land or require the extension of sewer lines as part of any development within the UGB.
- ~~2. The city shall coordinate the provision of sewer service with other providers within the Urban Growth Boundary.~~
3. All development within the Urban Growth Boundary shall be ~~sewered or provide for sewers through a binding sewer service agreement with the city-served with City sewer.~~
4. No further special districts shall be formed to provide sewer service within the Urban Growth Boundary, nor shall any annexation be allowed to an existing district-
5. The city ~~shall be~~ the primary provider of sewage collection and treatment services for the ~~Bend urban~~ City's service area- under Statewide Planning Goal 11.
6. To reduce the reliance on individual sewage disposal systems within the Urban Growth Boundary the city will ~~assist~~ work with established neighborhoods ~~that commit to a sewage collection system by extending pressure or gravity lines to the subdivision~~ find affordable solutions for sewer service.

## EXISTING SEWER POLICIES SUGGESTED ADDITIONAL CHANGES

- ~~1. The city shall encourage development of serviced land prior to unserviced land or require the extension of sewer lines as part of any development within the UGB.~~
2. All **new** development within the Urban Growth Boundary shall be served with City sewer, **except as provided below.**
- ~~3. No further special districts shall be formed to provide sewer service within the Urban Growth Boundary, nor shall any annexation be allowed to an existing district.~~
4. The city is the primary provider of sewage collection and treatment services for the City's service area under Statewide Planning Goal 11.
5. To reduce the reliance on individual sewage disposal systems within the Urban Growth Boundary the city will work with established neighborhoods to find affordable solutions for sewer service.

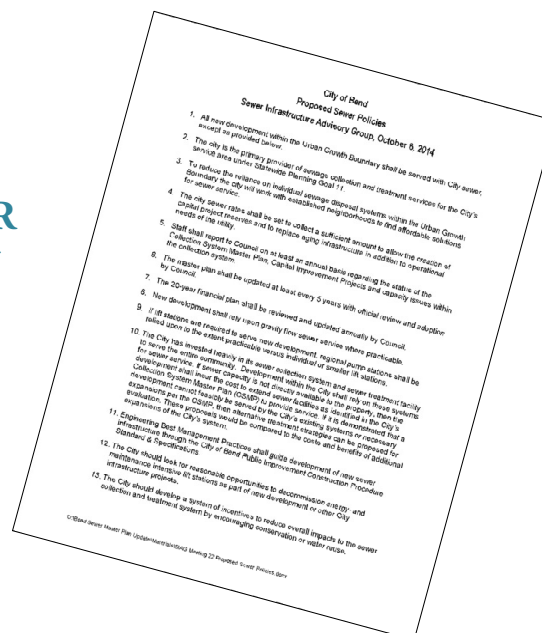
## PROPOSED NEW SEWER POLICIES: APPROPRIATE FOR GENERAL PLAN?

1. The city sewer rates shall be set to collect a sufficient amount to allow the creation of capital project reserves and to replace aging infrastructure in addition to operational needs of the utility.
2. Staff shall report to Council on at least an annual basis regarding the status of the Collection System Master Plan, Capital Improvement Projects and capacity issues within the collection system.
3. The master plan shall be updated at least every 5 years with official review and adoption by Council.
4. The 20-year financial plan shall be reviewed and updated annually by Council.

## PROPOSED NEW SEWER POLICIES

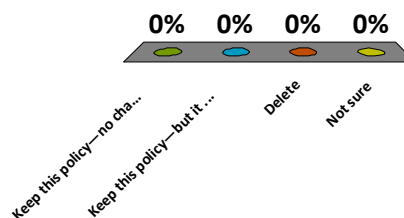
1. The City shall encourage the use of gravity conveyance and the existing treatment system to serve new development and shall discourage the use of new pump stations and onsite alternative treatment systems.
2. If lift stations are required to serve new development, regional pump stations shall be relied upon to the extent practicable versus individual or smaller lift stations.
3. Engineering Best Management Practices shall guide development of new sewer infrastructure through the City of Bend Public Improvement Construction Procedure Standard & Specifications.
4. The City should look for reasonable opportunities to decommission energy- and maintenance-intensive lift stations as part of new development or other City infrastructure projects.
5. The City will consider the conservation and water reuse measures in the Water Management and Conservation Plan in infrastructure planning to reduce overall impacts to the sewer collection and treatment system.

## PROPOSED POLICIES FOR DISCUSSION



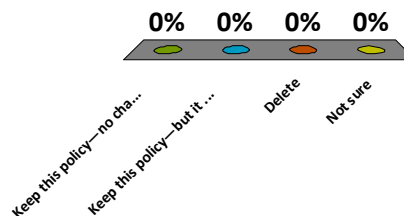
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4. Not sure



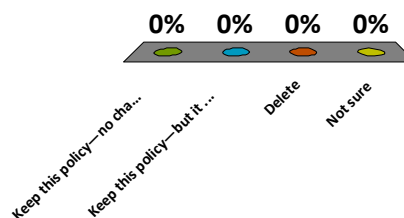
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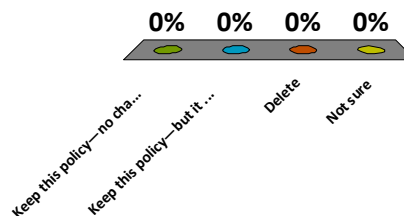
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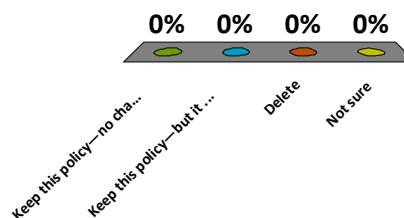
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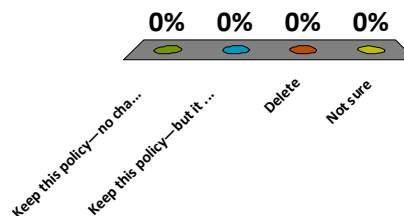
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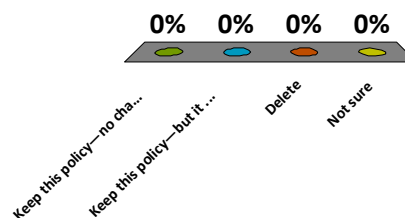
6. The master plan shall be updated at least every 5 years with official review and adoption by Council.

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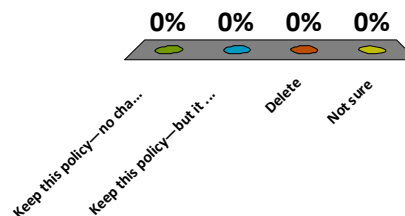
7. The 20-year financial plan shall be reviewed and updated annually by Council.

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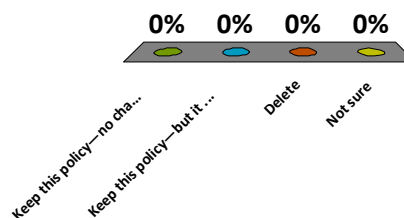
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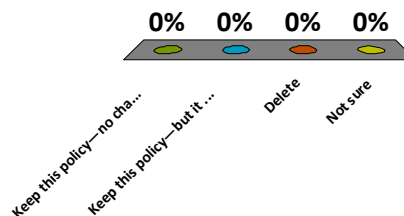
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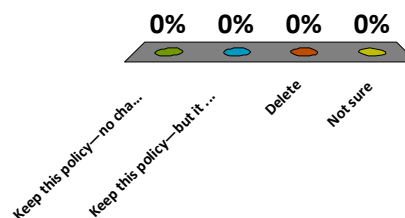
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11. The City should look for reasonable opportunities to decommission energy- and maintenance-intensive lift stations as part of new development or other City infrastructure projects.

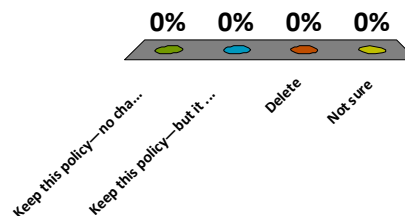
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12. The City will consider the conservation and water reuse measures in the Water Management and Conservation Plan in infrastructure planning to reduce overall impacts to the sewer collection and treatment system.

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## TENTATIVE APPROVAL SCHEDULE

<b>October 6, 2014</b>	Notice to DLCD
<b>October 13</b>	Planning Commission work session for PFP
<b>October 31</b>	Public notice for hearings
<b>November 10</b>	Planning Commission hearing for PFP
<b>November 19</b>	City Council work session
<b>December 3</b>	City Council hearing (1 <sup>st</sup> reading) <ul style="list-style-type: none"> <li>• CSMP</li> <li>• Stormwater PFP</li> <li>• Sewer PFP</li> </ul>
<b>December 17</b>	City Council (2 <sup>nd</sup> reading)
<b>December 19</b>	Notice to DLCD & others
<b>January 8</b>	Deadline for appeal Stormwater/Sewer PFP Acknowledgement

[www.bendoregon.gov/CSMP](http://www.bendoregon.gov/CSMP) Online comments through November 10, 2014

## PUBLIC COMMENT

**October 31, 2014**

**TO: Bend City Council**

**FR: Mike Riley, Sharon Smith and Steve Galash  
Co-Chairs and on behalf of the Sewer Infrastructure Advisory Group (SIAG)**

**RE: Summary of SIAG's Recommendations on Bend's Collection System Master Plan**

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Below is a summary of the key recommendations from the Sewer Infrastructure Advisory Group (SIAG) on the City of Bend's Collection System Master Plan (CSMP) and related issues. Our task was to develop an infrastructure and funding plan that provides adequate sewer collection capacity to existing and projected future development (i.e., full build out) within the current urban growth boundary. We wanted to make sure that you had a concise summary of our recommendations for future reference, rather than having to wade through the entire CSMP document and/or summaries of our meetings. These recommendations reflect the consensus of SIAG, except for some disagreement on #5 as noted below.

**1. Amend the City's sewer/utility financial policies to include the following language about building reserves: "Build and maintain adequate financial reserves based on a 20-year capital improvement plan."**

SIAG strongly recommends that the City build reserves "as-we-go" to pay for future capital replacement needs. One of the primary reasons we are faced with such a large capital replacement bill today, and why we have experienced significant rate increases recently, is that Council did not direct staff to begin building adequate reserves until very recently. We should not make the same mistake today and thus place a similar burden on future rate payers.

**2. Priorities for addressing immediate challenges and solutions for employment lands, as requested by the City Council:**

- Build a new Colorado Lift Station and a force main from it to 2<sup>nd</sup> Street: solves current problems/risks associated with the west side pump station's capacity limits ("Area 3") and expected near-term growth in Southwest Bend/OSU-Cascades area ("Area 5").
- North Area Capacity Improvements: solves problem in employment lands in and around Cascade Village Mall ("Area 2").

**3. SIAG endorses the capital improvement plan summarized below**

**Table 1-8**  
**Summary of Final Optimization Phasing Costs**

Group	Project Group	Total Capital Cost (\$M) <sup>1</sup>			
		Short-Term (0 to 5 Years)	Long-Term (6 to 10 Years)	Long-Term (11 to 20 Years)	Total
1	Southeast Interceptor	19.55	10.33	-	29.88
2	Southeast Interceptor Associated	1.56	5.58	5.37	12.51
3	Colorado	9.80	-	-	9.80
4	North Area FM	2.52	-	1.51	4.03
5	Northeast Interceptor	-	-	16.52	16.52
6	Northeast Interceptor Associated	-	-	3.91	3.91
7	West of Hwy 97	2.21	-	-	2.21
8	Miscellaneous Piping Improvements	0.58	0.72	0.87	2.17
9	Plant Interceptor	0.54	0.49	-	1.03
10	Existing Lift Station Capacity Upgrades	2.97	2.51	2.10	7.58
<b>Total</b>		<b>39.73</b>	<b>19.63</b>	<b>30.28</b>	<b>89.64</b>

<sup>1</sup> 2013 dollars.

**Table 1-8, pg 1-22, Executive Summary of the Draft CSMP, September 2014.**

**4. In general, SIAG decided against imposing specific technology limits (such as like only gravity lines) to ensure that we took full advantage of the optimization process.**

**5. 10-year Funding/Rate Plan**

- One more large rate increase immediately (7/1/14) : 9%
- Followed by an annual increase of ~ 2.55% there after
- Start building capital replacement reserves as soon as possible and no later than within the first 5 years
- Start building an “unsewered” areas reserve of \$1 million/year in 2015.
- Borrow money as needed to implement the recommended capital improvements in the CSMP, to be paid back from rates and SDCs.

Note: While all SIAG members supported this overall funding framework, a few SIAG members felt that the increase on 7/1/14 should be smaller and/or be phased in over time to reduce the impact on rate payers.

**6. Develop a plan to bring sewer service to current “unsewered” areas as soon as possible.**

A significant portion of our community remains on old septic systems. Moving these systems to sewer is in the best interests of the community as well as the environment but can pose substantial financial burdens on individual property owners. The City should work cooperatively and collaboratively with residents and impacted property owners in these “unsewered” areas, as well as with Oregon DEQ, to develop an action plan and financial strategy to bring sewer service to these areas and properties.

**7. Optimization is a very useful tool that should be used on future capital improvement planning efforts.**

Optimization, while an expensive upfront investment, resulted in a plan that is significantly cheaper than earlier CSMP proposals and thus will save our community money over the medium and long-term. Collecting complete and current data about the system was key to its' success.

**8. Include funding for on-going flow monitoring in the sewer utility's annual operating budget to ensure timely and complete data and feedback about collection system performance, planning assumptions and the timing of investments.**

Current and complete data about system function and performance was essential to the success of the optimization process generally and particularly to reducing the overall cost of the final capital improvement plan. Such data collection is relatively new for the City, should remain the standard as we go forward, and will be essential to understanding actual system performance (versus plan assumptions/projections) and making cost-effective adjustments to the current plan as we move forward.

**9. The CSMP should be formally reviewed and updated every five years, based on regular monitoring of system performance, actual growth patterns to-date, and updated growth projections.**

**10. The SIAG process worked—we reduced costs and achieved consensus on most decisions/recommendations—and can serve as a useful model for future public engagement efforts on large, potentially controversial City projects.**

Key reasons for SIAG's success include:

- SIAG Selection Committee: The City formally engaged representatives from the business and environmental community in selecting SIAG members.
- Diverse: The committee included a wide range of perspectives and knowledge about sewer systems.

- Committee Size: The committee was large. 18 individuals were appointed to serve, which ensured adequate brain power and diversity at each meeting and throughout the process despite some attrition over time.
- SIAG members made it clear from the start that they wanted the consultants and City staff to facilitate and provide the information that SIAG needed and requested to make decisions and come to recommendations, not just what City staff wanted to discuss.
- The Steering Committee: We chose a three member steering committee that represented different perspectives. The committee focused on clarifying the specific questions SIAG needed to answer and then ensuring that meeting agendas and presentations were structured to answer those questions.
- SIAG worked hard to stay at a relatively high level of discussion and, mostly, out of the detail weeds. We worked to set overall general principals and direction and less on specific technology solutions.
- Professional facilitation: External, professional facilitators were important to moving individual meetings and the overall process along, helping to clarify issues, ensure they got addressed, and then moving to conclusions/decisions.

Finally, all SIAG members voted to “support” these recommendations and the draft CSMP at our last meeting on 9/25/14; a few members voted “Support, with comments”. A summary of the vote and the comments made at that final meeting is attached to this memo.

# **Bend Sewer Infrastructure Advisory Group – September 25, 2014**

## **Meeting Notes**

### **Attending:**

*SIAG:* Hultberg, Miller, Stemach, Von Rohr, Galash, Roats, Smith, Price, Putnam, High, Riley, Boddie

*Staff:* Skidmore, Hickmann, Collett, McAfee, Rheault

*Consultants:* Stangel, Prull, Barg, Worth

### **SIAG Recommendation**

9 – Support the recommendation

3 – Support with comments

Preliminary comments on final report/recommendations:

- Needs a cover memo with high-level highlights (Riley)
- Something should be added to describe optimization (Putnam)
- Thanks to the City of Bend for their commitment to/investment in the SIAG process (Von Rohr)
- The report should include the sentiment: “We don’t want to get back into this mess again in the future.” (Hultberg)
- The report should reference SIAG recommendations and City policies on unsewered areas. (Skidmore)

### **SIAG Comments**

Hultberg: *Support*

- 2 years of hard work; deliberative process; compromises reached along the way
- Excellent team of experts earned SIAG confidence

Miller: *Support*

- Diverse group; group process well facilitated
- Replaced/updated earlier Master Plan (never adopted) using better data
- Looked carefully at alternatives including conservation

Boddie: *Support with comments*

- Valuable outcome: lower price tag
- There’s room to transmit SIAG members’ comments to City Council, including minority opinions. This will make the report a more powerful document.
- The SIAG process was compartmentalized focusing on sewage collection. It should be repeated for other infrastructure systems: wastewater treatment, stormwater, the UGB decision

Putnam: *Support*

- SIAG brought together smart people, gave them good information, for a lot of meetings.
- SIAG members came to trust staff, consultants and other good minds on SIAG
- Still worried about combined price tag for these and other infrastructure needs. Wonder if City Council will have the courage to sustain the, necessary rate increases

Smith: *Support*

- Thanks to staff, consultants and cooperative committee members
- Good process; would recommend it for other community needs
- Would like to hear any SIAG dissenting opinions clarified – don't recall hearing many.

Roats: *Support*

- SIAG's membership was a big success
- Projects on the priority list are entirely defensible
- City staff have been informative, patient, courteous – and did not drive the process

Price: *Support*

- No reservations
- Learned more about sewers
- Hope the SIAG process serves as a model for Bend's other infrastructure decisions. The finalized model is a sound tool and could be used for other infrastructure elements
- Plan should be reviewed every five years or more often
- Personal highlight: making a presentation to the Oregon League of Conservation Voters, as part of the very effective community outreach
- SIAG process produced "one voice from many diverse opinions"

Galash: *Support*

- Process surprisingly good; initially expected SIAG to be an audience for staff presentations
- Steering Committee was effective: those meetings were exciting, and transformed the SIAG process
- Staff and consultants worked for the committee
- "Facilitation couldn't have been better"

Riley: *Support with comments*

- The value of conservation needs to be given higher priority by the City. Bend is lagging behind peer utilities
- Staff and consultants were "fantastic": "I learned more than I thought was possible"
- A good choice was to invite environmental community participation early in the process.
- The Steering Committee was helpful in shaping the process

- The SIAG approach would produce a good solution for the upcoming UGB decisions, which are important to the environmental community
- SIAG members disagreed on very little

High: *Support*

- Thanks to the Steering Committee; their time commitment tripled that of other SIAG members
- The recommended plan is the right thing for ratepayers; but afraid that City Council may not move it forward (based on past experience with development codes, stormwater, other topics)
- Thanks to SIAG members who served as presenters in the community. They did a great job.

Stemach: *Support with comments*

- SIAG was given time to comprehend the information and reach decisions in an open forum
- Information was thorough and complete
- “The SIAG process was transparent at the highest level.” The facilitation was successful and a model for other citizen processes; overcoming the challenge of how to interest and meaningfully involve the public
- Conservation’s role should be noted, to lower impacts on the system starting with new development. This will yield measurable benefits and lower system costs.

Von Rohr: *Support*

- Don’t limit innovative conservation ideas to new development.
- The process was well facilitated. Meetings were well prepared by Steering Committee, staff, consultant team
- At its core, SIAG was an education process

Van Valkenburg (absent): *Support*

### **Public Comment**

- Fred Meyer development proposal: accolades to the SIAG but we regret not participating earlier
- An adaptive process is needed to update the Master Plan and account for unforeseen circumstances, including development proposals that bring economic value to Bend and Central Oregon
- Councilor Russell: This is the first and best model for Bend’s diverse voices to be present and heard at one place/time. The results and cost savings are “miraculous”. Outdated assumptions have been replaced with more robust information. Thanks to SIAG, staff and consultants for a huge investment of time. City Council is already implementing the recommendations. Decisions are expected by December: “The voice of SIAG is present”. “On we go.”



# Bend sewer problems identified

Hillary Borrud / The Bulletin Published Nov 19, 2012 at 04:00AM

An advisory group of businesspeople, conservationists and other citizens in Bend has identified three problem spots in the city sewer system where short-term fixes could prevent sewage overflows and allow new development to continue while the city figures out a long-term solution.

A 2007 city master plan calls for increasing sewer capacity with new gravity trunk lines around the city, but that could cost as much as \$170 million. The city already began work on that plan and spent \$12 million to install part of a southeast Bend trunk line before the City Council voted unanimously in mid-May to delay construction of the southeast interceptor and re-examine sewer priorities. To complete the southeast interceptor would cost an additional \$43 million.

The first job of the Sewer Infrastructure Advisory Group was to identify three priority areas for short-term fixes. After the city decides how to tackle those areas, the group will work on a new master plan for long-term solutions.

Examples of possible long-term approaches include sticking with the new all-gravity trunk lines, treating wastewater at regional facilities around the city or installing new regional pump stations, Assistant City Manager Jon Skidmore said.

The short-term solutions are supposed to be fast and relatively inexpensive, Skidmore said. It must be possible to design and go to bid on the projects within a year, without additional permitting through the Oregon Department of Environmental Quality. However, the city has not identified how it would pay for this work.

"The idea is that if there's a solution that seems very reasonable and buys us a lot of time, but would require us to find funding other than reserves or current rates, we'd go back to (the City Council)," Skidmore said.

## Overflows in North Bend

The first priority area the advisory group identified is on the north end of the city, starting near Empire Avenue and U.S. Highway 97 and continuing up to the Cascade Village Shopping Center. Tom Hickmann, the city's engineer and assistant public works director, said there are a few manholes in the area where wastewater rises above acceptable levels during storms and other wet weather.

"Depending on the depth of that manhole, it can get very deep, or if it's a shallow manhole, it can overflow," Hickmann said. "We have one manhole in particular that surcharges on a daily basis to within inches of overflowing," even during dry weather.

Solutions to the sewer problems in this area are "far more complex" than in other areas, Hickmann said, because there's a network of pump stations feeding to the same line. One possibility is to install "inline storage," a wider spot in a sewer line where excess wastewater can go when the sewer flow backs up.

## Backups on Portland Avenue

The west-side pump station is at Northwest Portland Avenue where the street crosses the Deschutes River. “A lot of the (sewer) lines from downtown and then the pump station coming from the west all intercept and then head east to the treatment plant, so that's an area where we see some challenges and constraints,” Skidmore said. Hickmann said the station collects nearly all the sewer flow from the west side.

The pump system is almost at the limit of how much sewage it can feed into the nearby gravity line. “Within the next five years, we see it as a point that could become restrictive to further economic development,” Hickmann said.

The wet well, a tank where wastewater accumulates until it is pumped out, is too small, Hickmann said. “What happens to us is there is so much flow going onto that tank that if something goes wrong there, we have very little time to respond before that tank can fill up and potentially overflow,” he said. “If you don't deal with it, you then have raw sewage overflows to the river.” This happens infrequently, and Hickmann said he could not recall the last occurrence.

“The long-term fix is very expensive and it's basically a complete rebuild of that lift station, which would include enlarging the wet well capacity, modification to the pumps and control stations,” Hickmann said. Lower-cost options include installing additional or larger pumps, but there could also be negative consequences as more wastewater is forced into other areas of the system that are not ready for it.

## Southwest Bend

In southwest Bend, officials are worried a shortage of sewer capacity could slow planned development projects. Oregon State University-Cascades Campus plans to expand in the area if it receives the funding necessary to become a four-year university. Earlier this fall, William Smith Properties Inc. filed a preliminary application with the city outlining its agreement to sell land for a 110-room Hampton Inn and Suites hotel to be built south of the Les Schwab Amphitheater. However, city planning officials said capacity must first be increased at a nearby water pump station to accommodate the hotel. Deschutes Brewery is also in the area and, like other breweries, produces a large amount of wastewater.

“All the flow from that area goes to a single pipe before you even get to the west-side (pump) station and that point becomes an issue,” Hickmann said. “We don't have much remaining capacity for that area.” Solutions could include installing larger pipes in some areas, modifying some pump stations and even running a pipe across the Colorado Avenue bridge to send the wastewater to a different section of the sewer system and avoid the west-side pump station, Hickmann said.

The advisory group will meet again in January to discuss what work to do in each of the three problem areas, Skidmore said.



## NEWS

### **Citizen advisory group makes sewer fix recommendations to Council**

**Posted Date:** 1/31/2013

After months of study, the Sewer Infrastructure Advisory Group (SIAG) recommended two solutions to relieve specific City sewer system capacity issues. SIAG members presented their findings to the City Council last night, and Councilors are scheduled to formally vote on the proposals at their February 6 meeting.



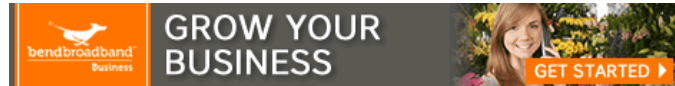
SIAG recommended solutions to relieve three critical areas of the City's sewer collection system: Southwest Bend near the Old Mill and Deschutes Brewery, the West Side Pump Station on Portland Avenue, and north Bend near the Cascade Village Shopping Center. Criteria for the chosen solutions included the ability to design and bid the project within one year, no need for new bond funding to pay for the project and no new environmental permitting requirements with the state. One of the group's key factors in focusing on these areas was that these solutions create sewer capacity in employment areas within Bend.

SIAG recommended immediately proceeding with a project that will relieve pressure at both the West Side Pump Station and Southwest Bend at an estimated cost of \$3.8 million. However, the committee only recommended doing design work for the project in north Bend. This will allow further study on long-term sewer solutions for that part of the City.

SIAG is composed of 17 citizen members from diverse backgrounds appointed by the City Council. SIAG members are responsible for assisting the City in updating its Sewer Collection System Master Plan which will guide future improvements to the City's sewer collection infrastructure. The goal is for the new Master Plan to be ready in 2014.

For more information, visit [bendoregon.gov/SIAG](http://bendoregon.gov/SIAG).

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## Bend Citizen Advisory Group Makes Sewer Fix Recommendations to Council

Feb 05, 2013

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After months of study, the Sewer Infrastructure Advisory Group (SIAG) recommended two solutions to relieve specific City sewer system capacity issues. SIAG members presented their findings to the Bend City Council last week and Councilors are scheduled to formally vote on the proposals at their February 6 meeting.

SIAG recommended solutions to relieve three critical areas of the City's sewer collection system: Southwest Bend near the Old Mill and Deschutes Brewery, the West Side Pump Station on Portland Avenue, and north Bend near the Cascade Village Shopping Center. Criteria for the chosen solutions included the ability to design and bid the project within one year, no need for new bond funding to pay for the project and no new environmental permitting requirements with the state. One of the group's key factors in focusing on these areas was that these solutions create sewer capacity in employment areas within Bend.

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## NEWS

### **Bend's new sewer plan may yield cost savings**

**Posted Date:** 11/15/2013

The results of Bend's initial sewer modeling were announced this week and the news is good. Engineers see potential to save on the total cost for needed sewer system upgrades, compared to earlier plans.

Master planning for Bend's sewer collection system has been underway since 2012, guided by a 17-member citizen panel—the Sewer Infrastructure Advisory Group. The advisory panel was appointed by the City Council to pinpoint the most urgent priorities for sewer system upgrades, and to find opportunities for cost savings.

In recent months, the engineering work has focused on optimization modeling which uses thousands of computer simulations to find the right mix of pipes, pumps, storage and treatment for Bend's future sewer system.

The initial findings confirm that two major sewer upgrades already underway are needed under any future scenario. The Southeast Interceptor is a gravity pipeline that will serve most of Bend's neighborhoods in the south and southeast. The Colorado Lift Station is the other critical project, needed to transport wastewater from Bend's west side.

Two other preliminary findings point to more opportunities for cost savings. Bend could avoid construction of almost six miles of pipeline construction by building underground storage to hold flows during wet weather. Another opportunity is decommissioning dozens of pumps, which are costly to operate and maintain. With over 300 pumps in service, Bend has more pumps than any other city in Oregon—and more than New Orleans, which is below sea level.

Advisory Group members will present the initial optimization findings to Bend City Council on December 4. The group is also offering to give presentations to neighborhood associations, civic groups and other organizations. Community members can learn more at [bendoregon.gov/SIAG](http://bendoregon.gov/SIAG).

Optimization modeling will continue through next March. Further in-depth analysis will look for ways to phase-in sewer improvements to reduce impacts of rate increases for customers. Project cost estimates and effects on sewer rates will be analyzed in the spring.

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## Politics & Government

10:35 AM MON NOVEMBER 18, 2013

# Bend Sewer System To Get Overhauled

By GRAHAM SPRAGUE

The city of Bend is currently in the planning stages for a new sewer system. This new infrastructure is being set up with help from the community.

## Listen

1:04

With more than 300 in service, Bend has more sewer pumps than any city in Oregon. This is due to its rapid growth and leaders have recognized the old system is inefficient. The city is working with a citizen panel to cut costs on original plans. The 17-member Sewer Infrastructure Advisory Group, or [SIAG](#) (<http://bendoregon.gov/SIAG>), includes doctors, engineers and rate payers. Assistant City Manager Jon Skidmore says the panel has been helpful.



(<http://mediad.publicbroadcasting.net/p/klcc/files/201311/BEND.jpg>)

“We really aimed at being as transparent as possible and I think some of the folks on the SIAG probably got a little bit more than what they were hoping for because we do get extremely technical, but it's been extremely helpful to have this group thinking through these things and helping us set up the model.”

Skidmore estimates that the SIAG would save the city more than \$40 million over previous models. The group is set to present their initial findings to the Bend City Council on December 4th. Skidmore says that while smaller parts of the project have already begun, the system overhaul won't begin for at least another year.

**TAGS:** [Bend \(/term/bend\)](#) [Sewer \(/term/sewer\)](#) [SIAG \(/term/siag\)](#) [Jon Skidmore \(/term/jon-skidmore\)](#) [Bend City Council \(/term/bend-city-council\)](#) [overhaul \(/term/overhaul\)](#)



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## City of Bend Claims New Sewer Plan May Yield Cost Savings

Nov 19, 2013

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The results of Bend's initial sewer modeling were announced this week and now engineers are reporting they see potential to save on the total cost for needed sewer system upgrades, compared to earlier plans. Master planning for Bend's sewer collection system has been underway since 2012, guided by a 17-member citizen panel—the Sewer Infrastructure Advisory Group.

The advisory panel was appointed by the City Council to pinpoint the most urgent priorities for sewer system upgrades, and to find opportunities for cost savings. In recent months, the engineering work has focused on optimization modeling which uses thousands of computer simulations to find the right mix of pipes, pumps, storage and treatment for Bend's future sewer system.

According to the City of Bend the initial findings confirm that two major sewer upgrades already underway are needed under any future scenario. The Southeast Interceptor is a gravity pipeline that will serve most of Bend's neighborhoods in the south and southeast. The Colorado Lift Station is the other critical project, needed to transport wastewater from Bend's west side.

Two other preliminary findings point to more opportunities for cost savings. Bend could avoid construction of almost six miles of pipeline construction by building underground storage to hold flows during wet weather. Another opportunity is decommissioning dozens of pumps, which are costly to operate and maintain.

With over 300 pumps in service, Bend has more pumps than any other city in Oregon—and more than New Orleans, which is below sea level. Advisory Group members will present the initial optimization findings to Bend City Council on December 4. The group is also offering to give presentations to neighborhood associations, civic groups and other organizations.

Community members can learn more at [www.bendoregon.gov/SIAGOoptimization](http://www.bendoregon.gov/SIAGOoptimization) modeling will continue through next March. Further in-depth analysis will look for ways to phase-in sewer improvements to reduce impacts of rate increases for customers. Project cost estimates and effects on sewer rates will be analyzed in the spring.

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## NEWS

### **Bend Council gives final okay to key infrastructure investments**

**Posted Date:** 2/19/2014

The Bend City Council took action on February 19 to move ahead on two high priority water and sewer projects.

First, the Council voted to approve a contract with M.A. Mortenson Construction to build the new membrane system that will filter Bend's drinking water. The contract has a "guaranteed maximum price" of just under \$24 million that cannot be exceeded without Council approval.

The drinking water filter plant meets a federal standard that protects public health from infection caused by *Cryptosporidium*, a potentially fatal parasite. This is the same pathogen that sickened two dozen residents in Baker City last year.



The membrane technology will also make it possible to operate the water filtration plant even in if there is a fire in Bend's forested watershed or in case of heavy rainfall, due to high levels of silt in the water. Other treatment methods would require shutdown under those conditions.

Last Friday, a federal judge refused to further delay construction of a ten-mile long drinking water pipeline that will replace two existing pipelines that date from the 1920s and 1950s. The replacement pipeline will connect the new membrane filtration facility to Bend's main Bridge Creek water source. Construction is expected to begin immediately to take advantage of cost savings made possible by coordinating installation of the pipeline with Skyliners Road reconstruction being planned by Deschutes County.

A second action by Council on Wednesday approved a \$2.2 million contract with Murray, Smith and Associates for final design and construction support for the Colorado Lift Station and associated piping.

The lift station will house large pumps that convey untreated wastewater from the westside through pressurized and gravity pipelines to Bend's wastewater treatment plant near the airport. The facility addresses some of Bend's most urgent sewer capacity issues for the westside and downtown core area.

The lift station site is close to Deschutes Brewery, one of Bend's major sewer customers that will be served. The new OSU Cascade Campus is also in the area to be served.

In 2013, a 17-member citizen advisory group identified this facility as the top priority for sewer system upgrades. The City Council accepted the citizen group's recommendation and ordered preliminary design work

to begin immediately. Lift station construction is anticipated to be completed in 2015.

The Sewer Infrastructure Advisory Group's final recommendations for other sewer system improvements will be presented to the Bend City Council in late 2014.

For more information on the water pipeline project, visit [bendoregon.gov/bridgecreekpipe](http://bendoregon.gov/bridgecreekpipe). To learn more about prioritizing city sewer projects, visit [bendoregon.gov/SIAG](http://bendoregon.gov/SIAG).

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## Pints & Politics with OLCV: City of Bend Sewer Infrastructure Update

When: Thu., Feb. 20, 7 p.m. 2014

Phone: 541.728.0703

Email: info@BTBSbend.com

Price: Free.



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## Bend's Sewer Infrastructure Advisory Committee Speaks at Kiwanis Meeting February 27, 2014

FEBRUARY 27, 2014 4:23 AM \ KIWANISADMIN

Bend's Sewer Infrastructure Advisory Committee members from the City of Bend will present a speakers forum at our club meeting on February 27, 2014 at Noon at the Bend Golf & Country Club. Visitors Welcome!

The Committee Members:

Lynn Putnam is a relative new Bend resident, but long-time Oregonian interested in representing citizen concerns on city infrastructure projects. Trained in environmental science, she was a planner for Metro and Clackamas County on wetlands and watershed projects. She served two years on the board of Tualatin Valley Water District, a municipal water provider in Beaverton, OR.

Casey Roats is a lifelong resident and owner of Roats Water, a privately owned water company in Bend. He has used his knowledge and technical background in operations and maintenance, and general utilities infrastructure in his service on the Sewer Infrastructure Advisory Group and Infrastructure Advisory Committee for the City of Bend. He also served on the National FFA Officer nomination committee.

Staffer: Tom Hickmann is a civil engineer with over 20 years' experience in wastewater, stormwater, water supply, water rights, system design, distribution design and operations, hydraulic modeling, utility management, and utility master planning.

Mr. Hickmann is the City of Bend Engineering & Infrastructure Planning Department Director focusing on oversight and implementation of all master plans and capital improvement projects.

He has been credited with bringing innovative ideas to the City, solving challenging issues. The City was the first entity to use low cost tank mixing technology. He introduced hydraulic modeling techniques, and implemented an enhanced modeling analysis which has been used as an example nationally, for assessing future infrastructure needs of growing communities.

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This event has passed.

## Meeting Speaker: City of Bend's Sewer Infrastructure Advisory Group

February 27 @ 12:00 pm - 1:00 pm

A presentation from the City of Bend's Sewer Infrastructure Advisory Group. Master planning for Bend's sewer collection system has been underway since 2012, guided by a 17-member citizen panel—the Sewer Infrastructure Advisory Group (SIAG). This advisory panel was appointed by the City Council to pinpoint the most urgent priorities for sewer system upgrades, and to find opportunities for cost savings. The SIAG will be updating us about Bend's critical need for sewer infrastructure and taking feedback on its findings.

### Details

**Date:**

February 27, 2014

**Time:**

12:00 pm - 1:00 pm

### Organizer

Kiwanis Club of Bend

### Venue

Bend Golf & Country Club

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**Infrastructure****1:46 PM FRI APRIL 18, 2014**

## Three Major Upgrades Needed For Bend's Sewer System

By [DESMOND O'BOYLE \(/PEOPLE/DESMOND-OBOYLE\)](#)

Three major upgrades are needed for Bend's sewer system, and they need to happen soon. That's according to results from two private engineering firms hired to provide modeling solutions.

### Listen

0:50

Bend's Sewer Infrastructure Advisory Group was presented the results Thursday. The upgrades include a large gravity pipeline, a sewage pumping facility, and several pipe capacity upgrades in the northern part of the city. Assistant City Manager Jon Skidmore says in some areas, existing sewer pipes routinely approach overflow levels.



[http://mediad.publicbroadcasting.net/p/klcc/files/201404/bendlogo.JPG\\_.gif](http://mediad.publicbroadcasting.net/p/klcc/files/201404/bendlogo.JPG_.gif)

Skidmore: "I think it's kind of the result of an area that grew by 8 and 1/2 people a day for twenty years straight. I think our infrastructure had a tough time keeping pace with that, and now we need to asses it and invest in it so it continues to serve our growing community."

Skidmore says the proposed projects can be completed for around \$40 million phased over the next 20 years. The recent model shows significant savings compared to an earlier plan. Bend's City Council will hear recommendations from the Sewer Advisory Group in May.

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**TAGS:** [Bend \(/term/bend\)](#) [Sewer \(/term/sewer\)](#) [SIAG \(/term/siag\)](#) [Sewer Infrastructure Advisory Group \(/term/sewer-infrastructure-advisory-group\)](#) [Jon Skidmore \(/term/jon-skidmore\)](#)

# Bend considers sewer bill hike

By Hillary Borrud The Bulletin Published May 22, 2014 at 12:01AM

A citizen committee recommended on Wednesday night that Bend increase the residential sewer rate by 9 percent on July 1, to pay for sewer construction projects .

City officials are considering an \$85.2 million plan to address the city's worst sewer problems, including an estimated \$41.6 million in work for the next five years. The Bend sewer system is at capacity in some areas, and sewer pumps and mismatched pipes create problems throughout the city.

The rate hike would translate to an additional \$3.99 on each household's monthly sewer bill, and committee members said a larger increase upfront would allow the city to keep rate increases smaller and more consistent in the future.

Lawyer Sharon Smith, a member of the Sewer Infrastructure Advisory Group, said that in addition to paying for near-term projects, the committee wants to save a small amount each year to pay for future projects.

"We don't want the community 10, 20, 30 years from now to be where we are today," Smith said. For future years, the committee proposed annual sewer rate increases of 2.55 percent. The current monthly sewer charge in Bend is \$44.37.

Mike Riley, a committee member and executive director of the educational nonprofit The Environmental Center, said the group compared whether it would cost more to spread the rate increases evenly over the next 10 years, or adopt a larger increase in the first year. If the city increases the sewer charge by 9 percent this year and then smaller amounts in the future, the city estimated the monthly charge will be \$60 in 10 years.

If the increases are spread evenly over all years, the city estimated the monthly bill would be \$66 in 10 years. "So it's a 10 percent savings in year 10, by doing this first step," Riley said.

City Manager Eric King said the City Council will vote June 4 on the sewer rate proposal and other fees for the new budget year that begins in July. Some city councilors said the initial increase might be painful, but they support the goal. Mayor Jim Clinton said the committee's recommendation is "totally understandable, totally justifiable," but does not address the differences in how much residential users — for example, a single person in a small house versus a large family — affect the sewer system. "There's a significant number of people in town for whom the connection between their monthly bill and their need or use for the infrastructure is very low," Clinton said.

Dale Van Valkenburg, director of development for Brooks Resources Corp. and a member of the committee, said he was skeptical at first of the city plan to complete a major sewer trunk line in southeast Bend. Van Valkenburg said the project seemed unrelated to the sewer problems he knew existed in other areas of Bend, until he learned the line would divert sewage that currently flows through the city center. "Instead of spending money on the symptoms, we're getting at the underlying problem," Van Valkenburg said.

In other business Wednesday night, the City Council voted to approve a tax break for a small data center that plans to open soon in Bend. The tax break could cost the city as much as \$287,000 in lost tax revenue,

according to a city staff report.

Cascade Divide COLO Inc. is a subsidiary of the Canadian company Cascade Divide Enterprises, Inc., according to a city staff report. The company provides data storage for government agencies and companies, and it purchased the building for its new Bend data center at 213 S.W. Columbia St. in 2012, The Bulletin reported.

An Oregon enterprise zone tax exemption generally lasts three years and abates local taxes on new investments in the building and equipment. However, cities can extend the tax abatement for two years, if the employer meets compensation standards for the new jobs created.

For example, Cascade Divide COLO Inc. plans to hire at least 15 employees and pay total compensation — including benefits — of 150 percent of the average annual wage in Deschutes County, which is roughly \$57,000, according to the city. The company plans to spend \$11.5 million on the new data center in southwest Bend, including \$8.5 million for improvements to the building and \$3 million to purchase equipment.

This is the second significant business tax break the City Council approved this year. In February, it approved a tax break for Deschutes Brewery that is expected to cost the city as much as \$573,000 in lost tax revenue over five years.

— Reporter: 541-617-7829, [hborrud@bendbulletin.com](mailto:hborrud@bendbulletin.com)



# Bend considers utility rate hikes

By Hillary Borrud The Bulletin

Published Jun 5, 2014 at 12:01AM / Updated Jun 5, 2014 at 06:09PM

The Bend City Council will consider a proposal later this month to raise the sewer rate by 9 percent and the water rate by 5 percent for all customers. The changes would take effect July 1 and increase by more than \$5 the total monthly bill for an average residential customer, city employees said.

Several budget committee members and some city councilors said they support the rate increases, during a meeting Wednesday night. However, only five of the seven city councilors were present for the discussion and it was unclear whether a majority of the council will ultimately vote in favor of the proposed increases. One city councilor said he would prefer to spread out the increases.

City Manager Eric King said he will bring the issue back for a formal vote at the June 18 City Council meeting. The city wants to raise sewer rates to pay for an \$85.2 million plan to address the city's worst sewer problems. Sewer pumps and mismatched pipes create problems throughout the city, and the Bend sewer system is at capacity in some areas.

The 9 percent sewer rate hike would translate to an additional \$3.99 on each household's monthly sewer bill. In May, a members of citizen committee recommended Bend increase the residential sewer rate by 9 percent on July 1, because they said a larger increase upfront would allow the city to keep rate increases smaller and more consistent in the future . The current monthly residential sewer charge in Bend is \$44.37. The median monthly residential water bill is \$23.57 during the winter and \$48.24 during the summer, according to a fall 2013 city presentation.

The 5 percent water rate increase would add \$1.38 monthly to an average residential bill. It is largely necessary to pay for water supply and treatment projects, which are under construction and could cost roughly \$62.5 million. A new pipeline and water intake equipment west of Bend will cost an estimated \$24 million. The city expects to spend up to \$33.5 million to complete a water filtration plant, on top of at least \$5 million it spent on the project design as of fall 2013. Under federal law, the city must begin treating or filtering the water it takes from Bridge and Tumalo creeks.

City Councilor Doug Knight said he would prefer to raise sewer rates by 6.5 percent annually for two years, instead of 9 percent this year and zero to 3 percent in the future, because it is important for rates to be reasonable and predictable.

City Councilor Mark Capell said water and sewer customers will notice the fact that their utility bills increase, more than the difference between a 9 percent or 6.5 percent sewer rate hike. "I think it comes down to that

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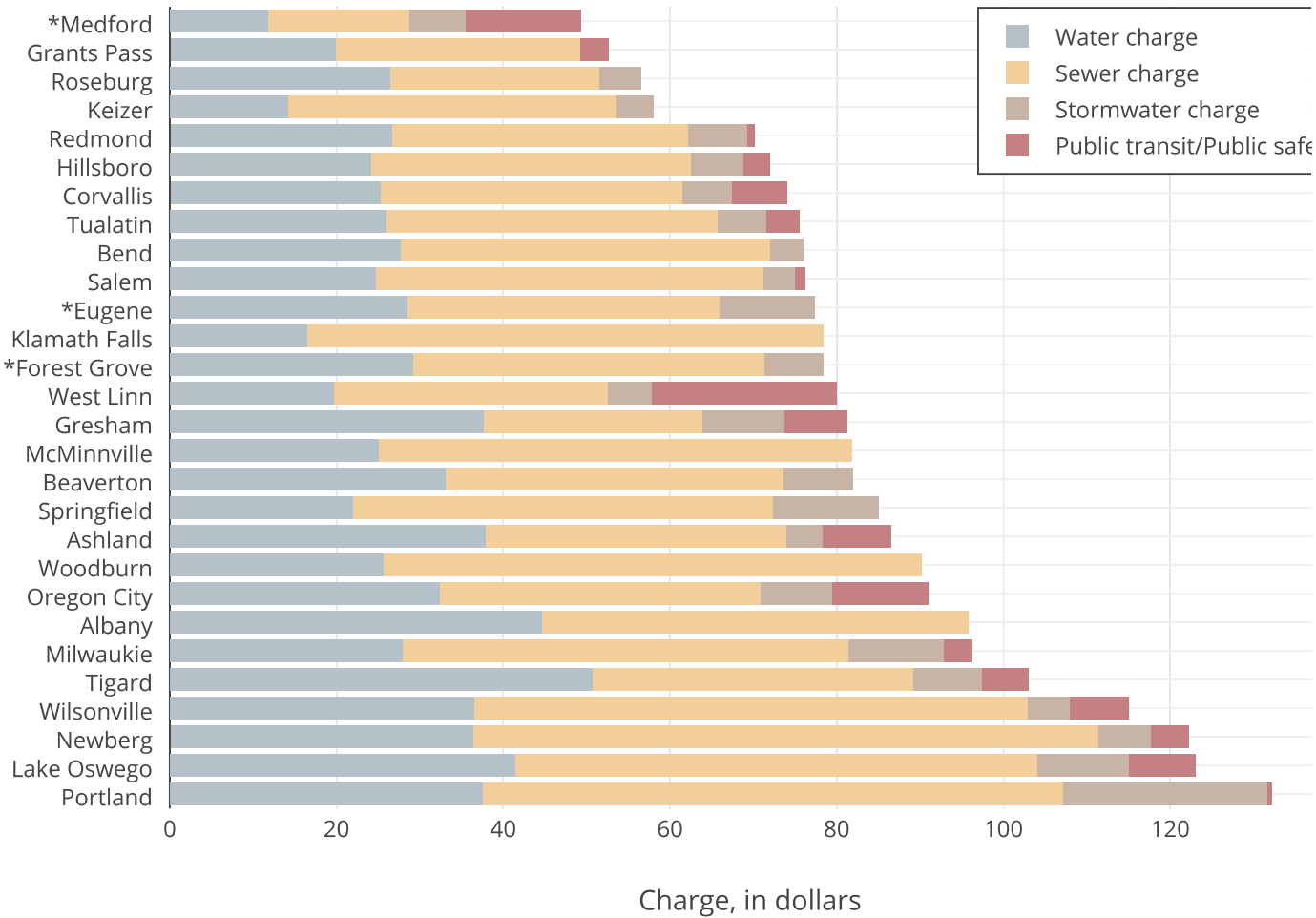
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old ad, you can pay me now or pay me later,” Capell said.

Mayor Jim Clinton said he was initially opposed to increasing rates by the highest proposed percentages, but as of Wednesday night he was less concerned about the rate increase than the city’s planned overhaul of the utility rate structure later this year. Clinton has criticized the city’s existing water rate structure for years. “To me, it’s not a totally relevant debate,” he said of the rate increases discussed Wednesday night.

— Reporter: 541-617-7829, [hborrud@bendbulletin.com](mailto:hborrud@bendbulletin.com)

# Average monthly utility rates in Oregon cities



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# Editorial: Biggest rate increases are really the best

Published Jun 8, 2014 at 12:01AM

Water and sewer rates in Bend need to go up. The city needs to make improvements to meet demand now and for the future.

The Bend City Council will likely make a decision later this month about what the increase in rates will be.

The council should pick the option with the biggest initial increases. That would be a 9 percent increase for sewer and a 5 percent increase for water.

It's the biggest initial shock, but best choice for a number of reasons.

It gives the city the money it needs now. It creates more reserves. It better protects the city's bond rating. It provides the best cushion against shocks to the economy.

And the difference between that choice and the city's other options are just a couple bucks a month for most people.

For instance, on the sewer rates, a 9 percent increase on sewer will mean an increase of \$3.99 on each household bill in 2014. The city would be able to then quickly switch to a rate increase in 2015 that keeps pace with inflation — zero to 3 percent a year.

A second option would be to approve an increase of 6.5 percent, which translates to \$2.88 a month on each household bill. The city would have to add another 6.5 percent increase in 2015 and then could switch to an inflation based rate in 2016.

The third option would be for the city to approve a 4.2 percent increase this year, which would be \$1.86 on each household bill. The city would have to keep increasing by 4.2 percent until at least 2025. Then it could switch to an inflation-based rate.

Nobody likes to pay more. But the improvements are needed. The council should not shy away from supporting the biggest initial increase.



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## Bend to hold sewer plans open house on June 19th

**By KTVZ.COM news sources**

POSTED: 5:19 PM PDT June 13, 2014

**BEND, Ore. -**

It's hard to believe, but until the 1980s, the only sewer pipes Bend owned were located in the downtown area. In other areas, Bend homeowners and businesses got rid of sewage individually, either by a drain hole or by septic tank and drain field.

Even today, Bend's sewer collection system is still a hodgepodge of undersized pipes and hundreds of pumps. There are a few parts of town still not connected to sewer lines.

The Sewer Infrastructure Advisory Group is a citizen panel appointed by the City Council to find an affordable solution for Bend's pressing sewer problems.

The Advisory Group invites the public to an Open House on Thursday, June 19 at the Brooks Street Riverfront Plaza (875 Brooks St.) from 4 p.m. to 6 p.m. to learn more about their recommended solutions.

Bend's Public Works Department will also display the large equipment used to clean and maintain sewer lines and pump stations.

Food and refreshments will be served. SIAG members and the City of Bend encourage residents to bring their friends and family to this child friendly event and learn more about Bend's sewer system—and what it will take to fix it.

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# Bend utility rates going up — in October

By Hillary Borrud The Bulletin Published Jun 19, 2014 at 12:01AM

Bend residents will face higher utility bills this fall than last, after the City Council voted Wednesday night to raise sewer and water rates to pay for multimillion-dollar projects.

The 4-3 vote was a compromise. An earlier proposal called for rate hikes July 1 in the middle of summer irrigation season, but City Councilor Sally Russell suggested a delay so the increase would be less painful for ratepayers.

The city will raise sewer rates by 9 percent and water rates by 5 percent for all customers, which will increase by more than \$5 the total monthly bill for an average residential customer, according to the city.

"The plan we put together today can really serve as a legacy for the city," Russell said, referring to the plan to improve the sewer system. "But the 9 percent is a really big gulp."

The current monthly residential sewer charge in Bend is \$44.37. The median monthly residential water bill is \$48.24 during the summer and \$23.57 during the winter, according to a fall 2013 city presentation.

Money from the utility rate increases will help pay for major sewer and water projects the City Council already approved. An \$85.2 million sewer plan is supposed to remedy the city's worst sewer problems.

The sewer system is at capacity in some areas, which can make it difficult for new businesses to open. Other problems include sewer pumps and mismatched pipes throughout the city.

The 9 percent sewer rate hike will mean an additional \$3.99 on each household's monthly sewer bill. The proposal had the support of the members of a citizen committee, which in May recommended Bend increase the residential sewer rate by 9 percent on July 1, because they said a larger increase upfront would allow the city to keep rate increases smaller and more consistent in the future.

The 5 percent water rate increase would add \$1.38 monthly to an average residential bill. Much of the water rate increase will pay for water supply and treatment projects that could cost roughly \$62.5 million. The city has already raised water rates over several years to pay for the projects. A new pipeline and water intake equipment west of Bend will cost an estimated \$24 million, and the city already started to build the pipeline. In addition, the city expects to spend up to \$33.5 million to complete a water filtration plant, on top of at least \$5 million it spent on the project design as of fall 2013. Under federal law, the city must begin treating the water it takes from Bridge and Tumalo creeks.

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Mayor Jim Clinton, Mayor Pro Tem Jodie Barram and City Councilors Sally Russell and Doug Knight voted "yes" on the compromise. City Councilors Scott Ramsay, Mark Capell and Victor Chudowsky voted "no" on the motion to raise rates Oct. 1.

The three city councilors who voted against the utility rate compromise said they wanted the city to move ahead sooner with the increases.

City Councilor Scott Ramsay said previous city officials failed to make tough decisions to raise utility rates, which left the city short of the money it needs for major infrastructure upgrades. He said the city should not raise utility rates too frequently, but this is a necessary reset.

"We're sitting here today with the result of those previous decisions, and I think it's fiscally responsible and prudent of us to get back on track," Ramsay said.

"We are at capacity (with sewers) in many parts of the city, which is hindering economic growth, it's hindering job growth."

Mayor Jim Clinton ultimately voted for the compromise to postpone the increases until October, but said the city should not raise rates until it overhauls the rate structure. The City Council will begin discussing different rate structures — for example, whether to change the base and per unit water charges — this fall.

"These rate increases have been totally out of sync with what residents have been experiencing with their income," Clinton said.

— Reporter: 541-617-7829, [hborrud@bendbulletin.com](mailto:hborrud@bendbulletin.com)

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## Bend water, sewer rates set to rise again

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Posted: Thursday, June 19, 2014 12:28 am

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Instead, councilors agreed to a motion from Councilor Sally Russell, seconded by colleague Doug Knight, to delay the planned July 1st rate hikes to October 1st, pushing them past the irrigation season when people pay the most for water.

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"This is a really difficult decision for me," Russell said, knowing her proposed delay will cost the city some of the funds it's trying to put toward millions of dollars in water and sewer projects. City Manager Eric King said just the three-month delay is expected to cost the city \$600,000 to \$700,000 in revenues it otherwise would collect in sewer and water bills.

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"From my perspective, the ratepayers are already experiencing some sticker shock," said Knight, noting that residents have seen rates double over the past 10 years and "want some relief."

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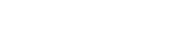
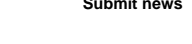
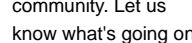
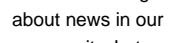
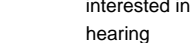
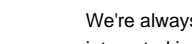
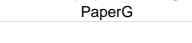
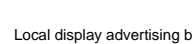
"Yes, a rate increase can be a very difficult thing, and from the council's perspective can be the hardest thing we can vote on," generating the most e-mails and negative reaction, Capell told his colleagues.

"It's not a pleasant thing to do, but it's the responsible thing to do," he said. "We can postpone it, or spread it out over a couple of years. But in both cases, the ratepayers will end up paying more" down the road.

"I think the responsible thing to do is rip the Band-Aid off, take the heat," he said.

Colleague Jodie Barram sided with Russell, saying the proposed rate is valid, but she's "also very sensitive to community concerns." Having been told the delay won't stall the projects in the pipeline, she said, "I think (the delay) shows care for the community. ... It mitigates some of

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And there has been pain, all agree. Mayor Jim Clinton pulled out a chart he'd done, showing that combined water-sewer rates in Bend have jumped 72 percent since 2007, including a whopping 91 percent on sewer bills, while the Consumer Price Index rose just 14 percent over that time - and Bend's median household income actually fell 1 percent.

"These rate increases have been totally out of sync from what residents have experienced, in terms of income and all the other costs of services they buy," Clinton said.

The mayor urged colleagues to defer the rate hikes a few months, until a renewed discussion early next year of overhauling the whole water and sewer rate structure. Clinton has pushed for years for a fairer structure in which heavy users pay more than lighter ones, both in water and sewer capacity - something that's not the case now. Councilors have agreed, but it's a complex issue, easier said than done.

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"Unlike Mark, who wants to divorce the rate hike from the structures (decision), I think they are intimately intertwined," Clinton said. "Smaller homes have been overpaying (on sewer bills) for a long, long time."

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"We're expecting by the first quarter to be adjusting the rate structure to have a more fair process," Capell said, telling Clinton, "I love Ross Perot graphs like that. You can do a lot with numbers."

The goal in the rate structure changes, Capell said, is a "revenue-neutral change. The goal is for large users to pay more, small users to pay less ... but you have a revenue (need) they have to hit."

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Knight brought up the often-discussed option of lining the canals instead. Capell said that would not only reduce the flow needed for the hydroelectric plant but eliminate stock runs in the winter, as the freeze-thaw cycle would cause freeze-thaw cycle problems with the concrete

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Ramsay said it's unfortunate for people living in a neighborhood called Canal View Estates, but added, "We have to make a decision about the greater good of the entire community, and piping our canals is going to be critical long-term for the health of our rivers and water conservation."

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## Bend water, sewer rates set to rise again

### But in 4-3 vote, council delays rate hikes until fall

By [Barney Lerten](#)

POSTED: 12:28 AM PDT June 19, 2014    UPDATED: 5:36 PM PDT June 19, 2014



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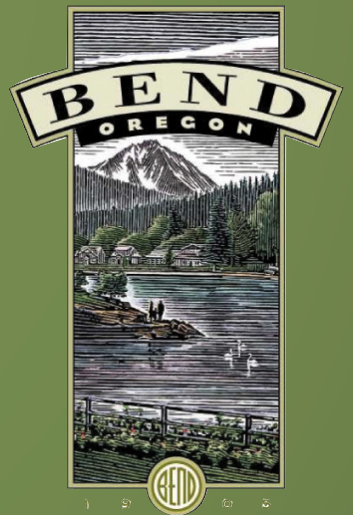
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