

FINAL OPTIMIZATION RESULTS BEND OPTIMIZED COLLECTION SYSTEM MASTER PLAN

April 17th, 2014

DRAFT RESULTS – SUBJECT TO CHANGE

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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

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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

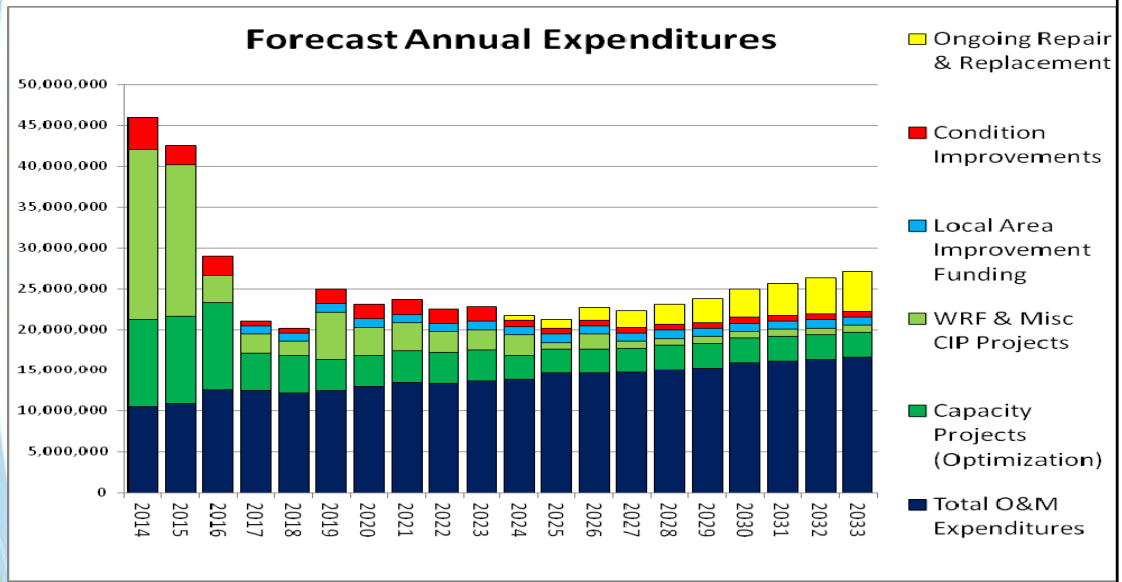
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LAYERS OF THE CAKE

- ◆ Ongoing Operations and Maintenance
- ◆ Water Reclamation Facility & Misc. Improvements
- ◆ Capacity Improvements
- ◆ Condition Improvements
- ◆ Ongoing Repair/Replacement
- ◆ New Layer - Local Area Improvements

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OVERALL SEWER COST COMPONENTS

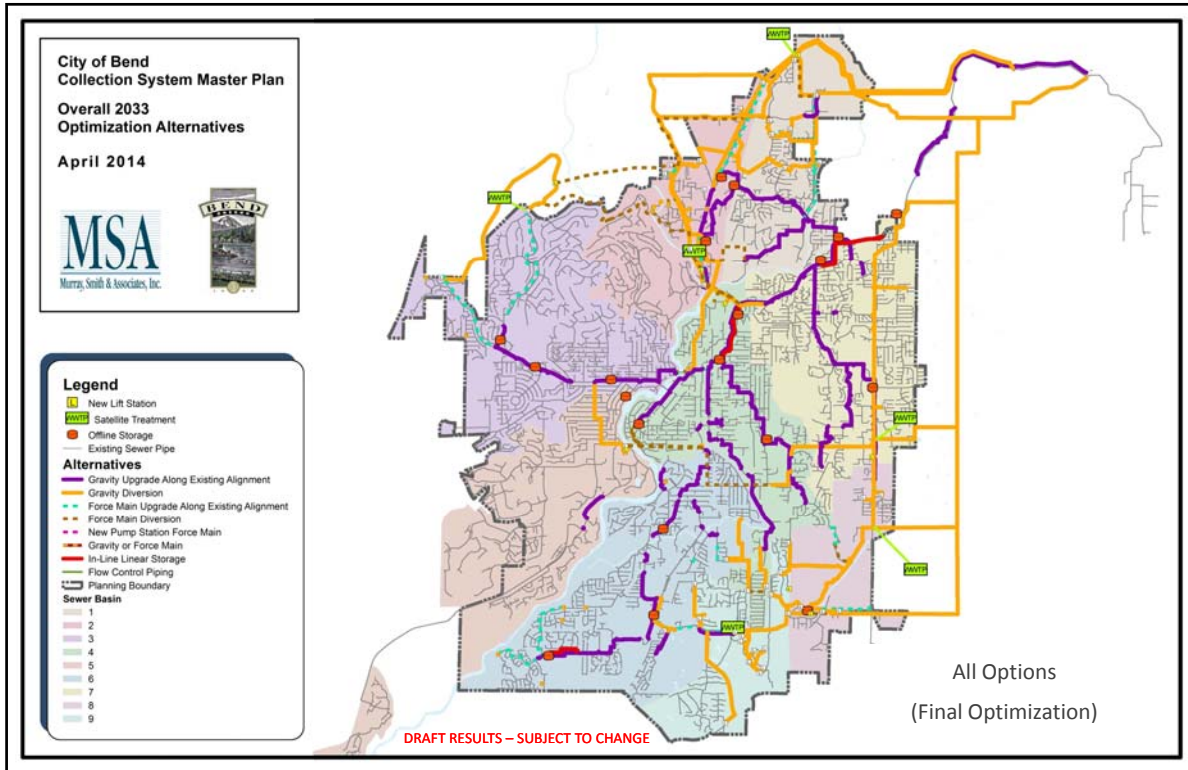


FINAL RESULTS – ADDITIONAL COSTS INCLUDED

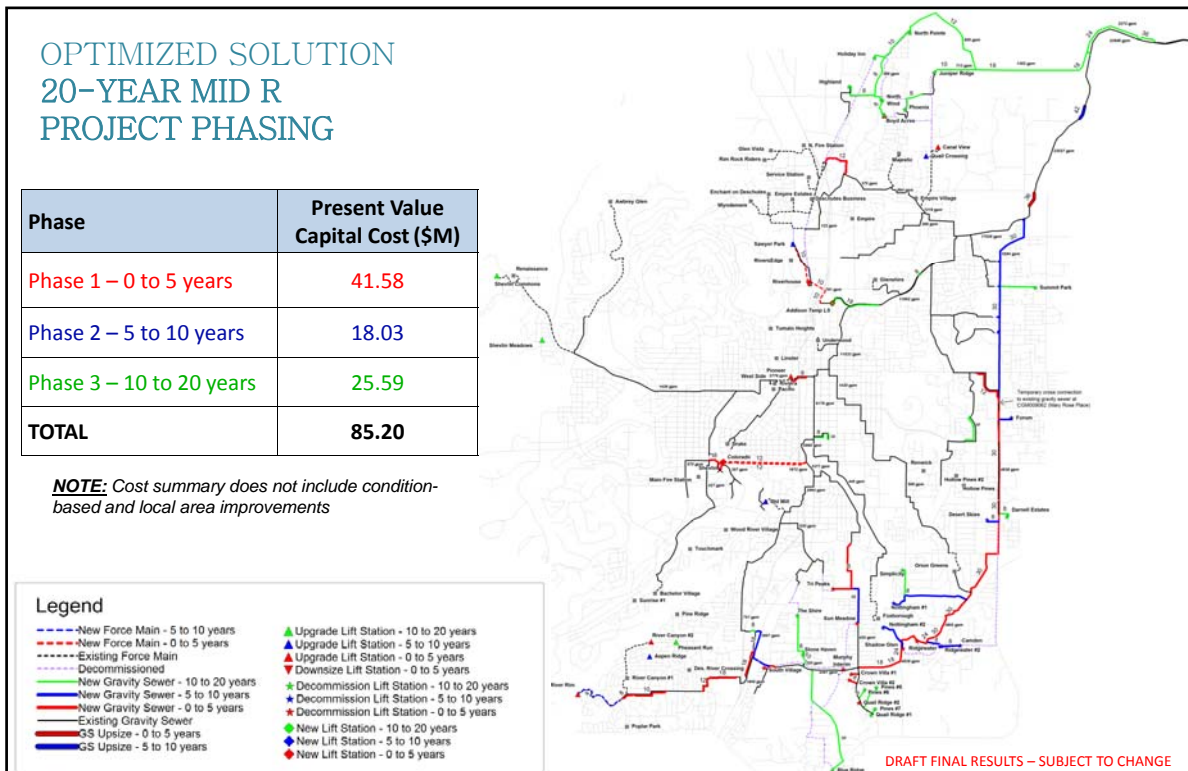
	Hydraulic-Based Pipe and Pump Capital Costs	Pump Condition Improvements	Pipe Condition Improvements	Local-Area Costs
2007 CSMP	✔	✘	✘	✘
Initial Optimization	✔	✔	✘	✘
Intermediate Optimization	✔	✔	✔	✘
Final Optimization	✔	✔	✔	✔
Final CIP	✔	✔	✔	✔
Rate Calculation	✔	✔	✔	✔

Small ✔ denotes where additional refinement is required

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All Options
(Final Optimization)



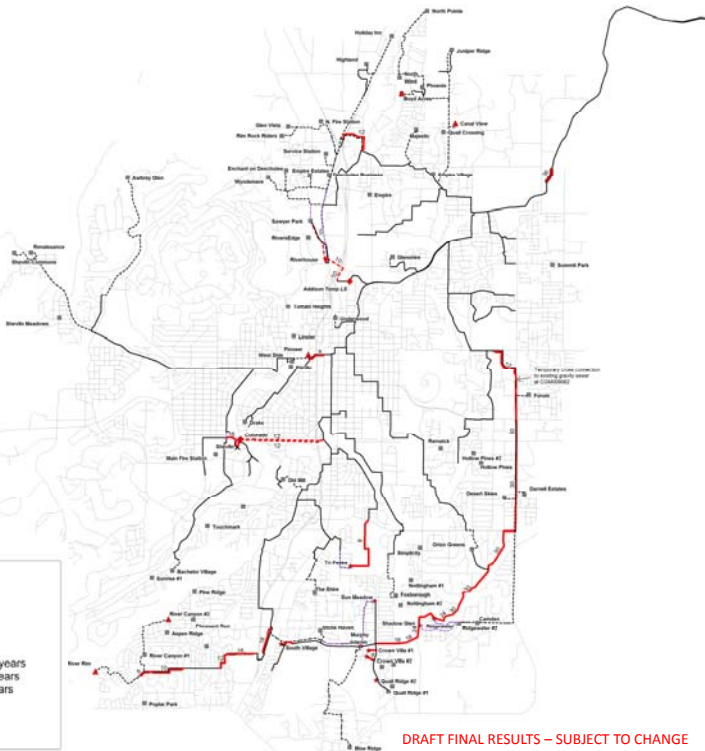
OPTIMIZED SOLUTION

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
Phase 1 Total	41.58

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



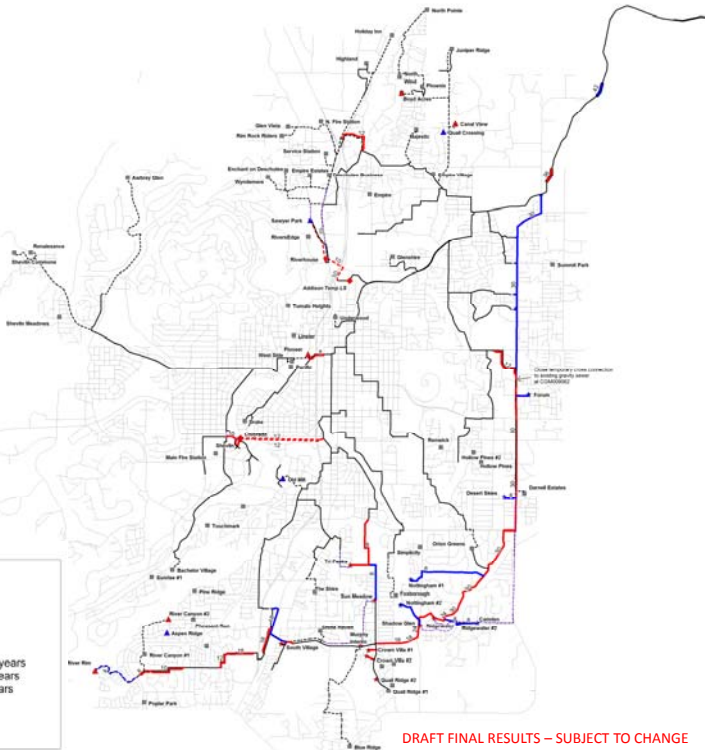
OPTIMIZED SOLUTION

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
Phase 2 Total	18.03

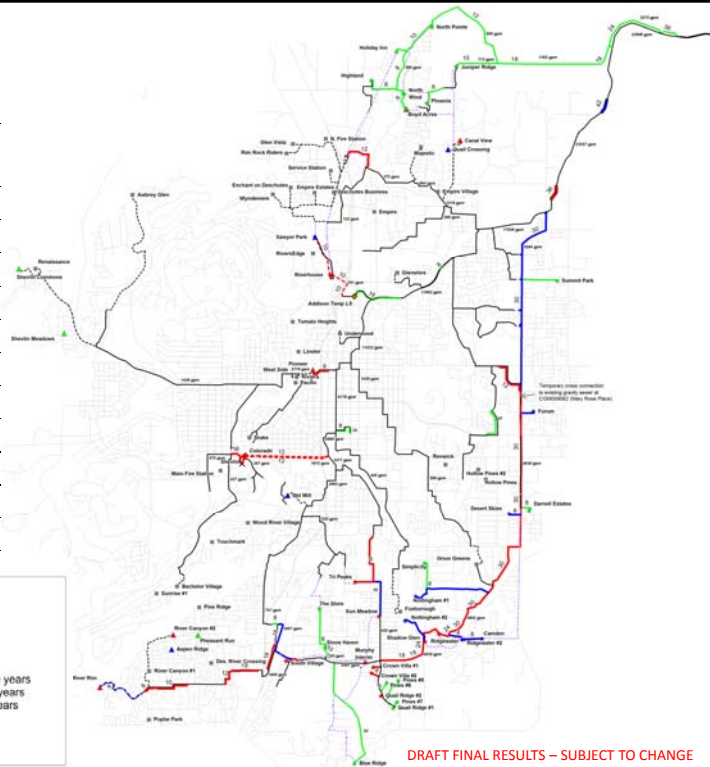
Legend

- New Force Main - 5 to 10 years
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- Existing Force Main
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- 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 2: 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
Phase 3 Total	25.59



Legend

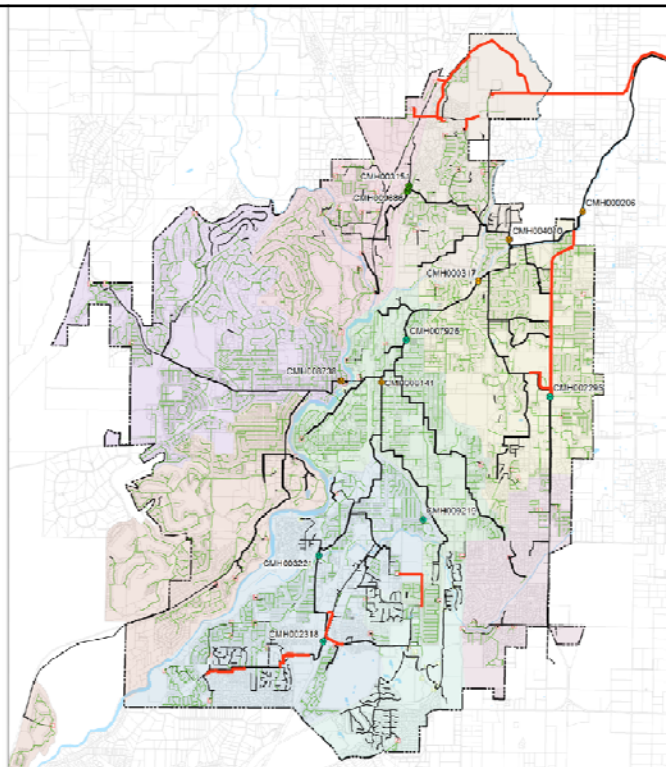
- - - New Force Main - 5 to 10 years
- - - New Force Main - 0 to 5 years
- - - Existing Force Main
- - - Decommissioned
- - - New Gravity Sewer - 10 to 20 years
- - - New Gravity Sewer - 5 to 10 years
- - - New Gravity Sewer - 0 to 5 years
- - - Existing Gravity Sewer
- - - GS Upsize - 0 to 5 years
- - - 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

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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



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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)

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20-YEAR MID R

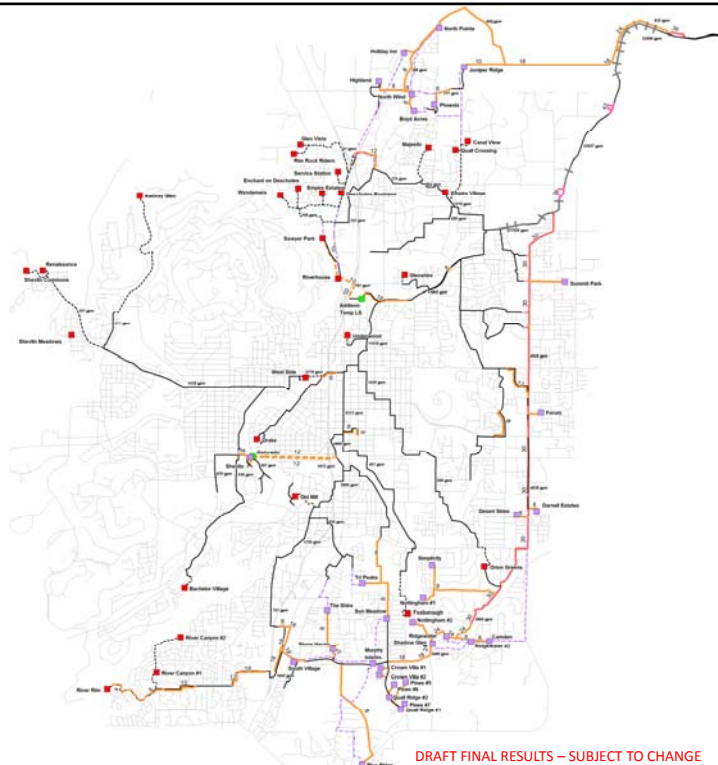
Cost Item	Cost (\$M)
40-Y Life Cycle O&M Cost	27.49
40-Y Life Cycle Elect. Cost	0.69
40-Y Life Cycle Capital Cost	88.10
40-Y Total Life Cycle Cost	116.28

Initial PV Capital Cost	85.20
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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



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20-YEAR MID R - 10% WATER CONSERVATION

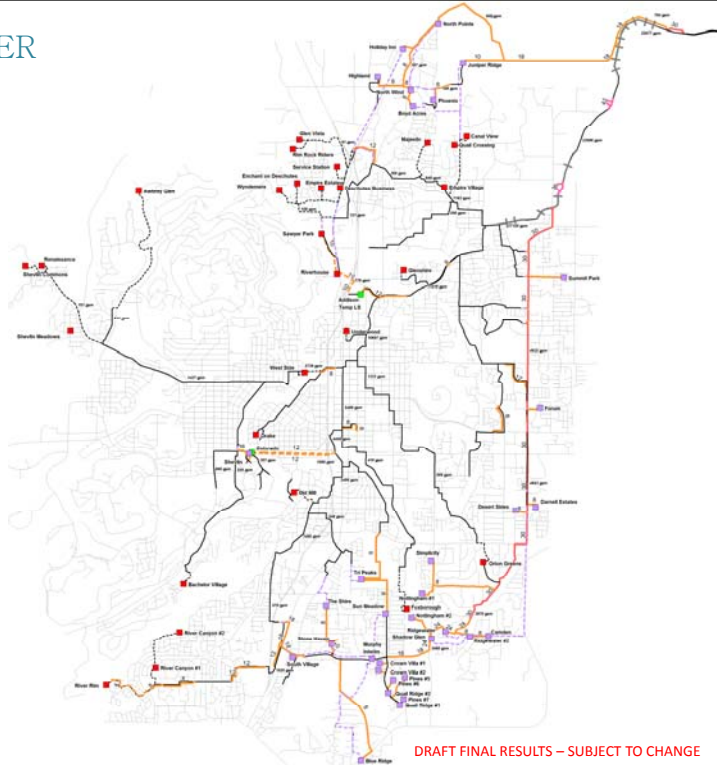
Cost Item	Cost (\$M)
40-Y Life Cycle O&M Cost	27.05
40-Y Life Cycle Elect. Cost	0.69
40-Y Life Cycle Capital Cost	87.70
40-Y Total Life Cycle Cost	115.44

Initial PV Capital Cost	84.75
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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)

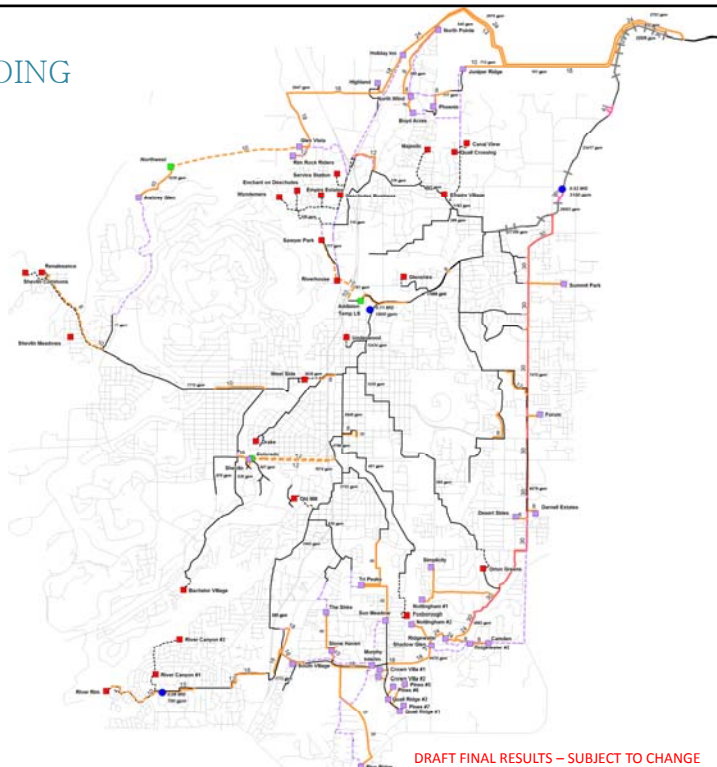
Cost Item	Cost (\$M)
40-Y Life Cycle O&M Cost	42.81
40-Y Life Cycle Elect. Cost	1.32
40-Y Life Cycle Capital Cost	112.89
40-Y Total Life Cycle Cost	157.02

Initial PV Capital Cost	109.20
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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
40-Y Total Life Cycle Cost	151.25

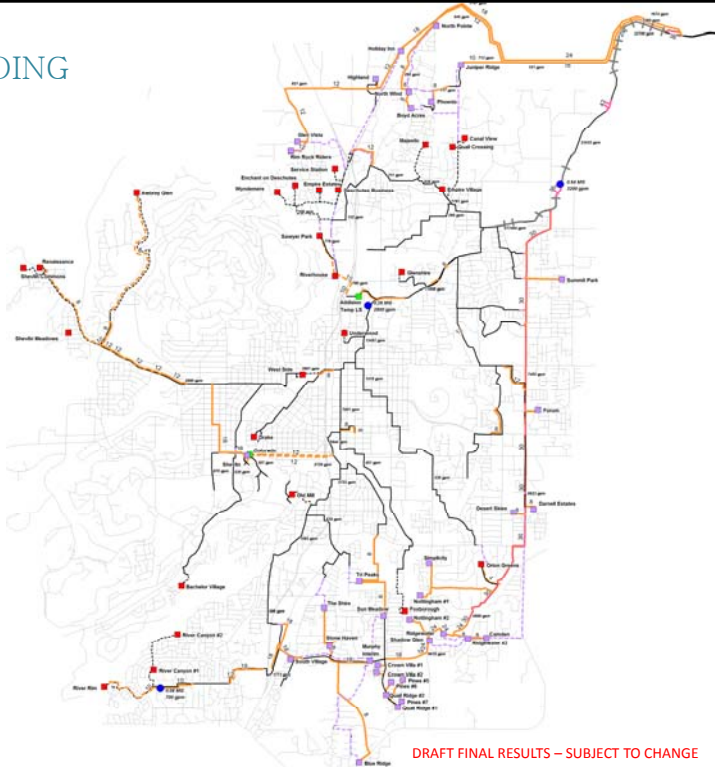
Initial PV Capital Cost	111.12
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40-Y Life Cycle Cost Savings = \$5.77 M

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

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OTHER COST COMPONENTS

- ◆ Condition Improvements
- ◆ Ongoing Repair/Replacement
- ◆ Local Area Improvements

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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

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CONDITION IMPROVEMENTS

- Deferral of projects has occurred where possible beyond 5 years
- Discussion?

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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

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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

• Discussion?

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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, 3rd Street, Juniper Utility, others
 - \$19M to install a replacement gravity system @ \$21k/connection

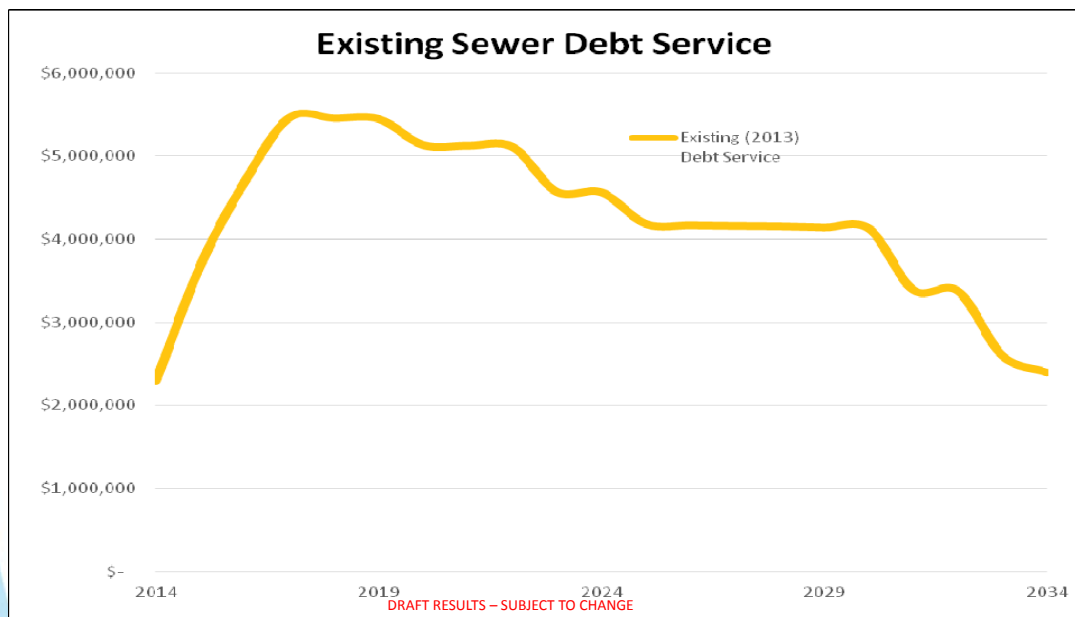
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LOCAL AREA IMPROVEMENTS

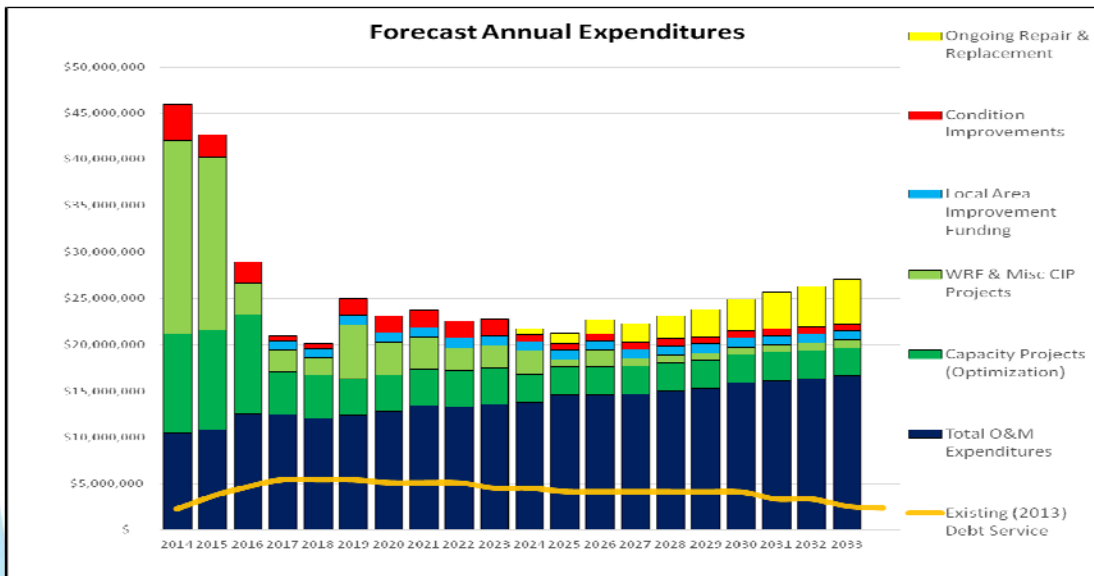
- City to proactively address issue, start funding \$1M/yr in 2017 and support development of a program
- Discussion?

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SEWER DEBT SERVICE



OVERALL SEWER COST COMPONENTS



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

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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

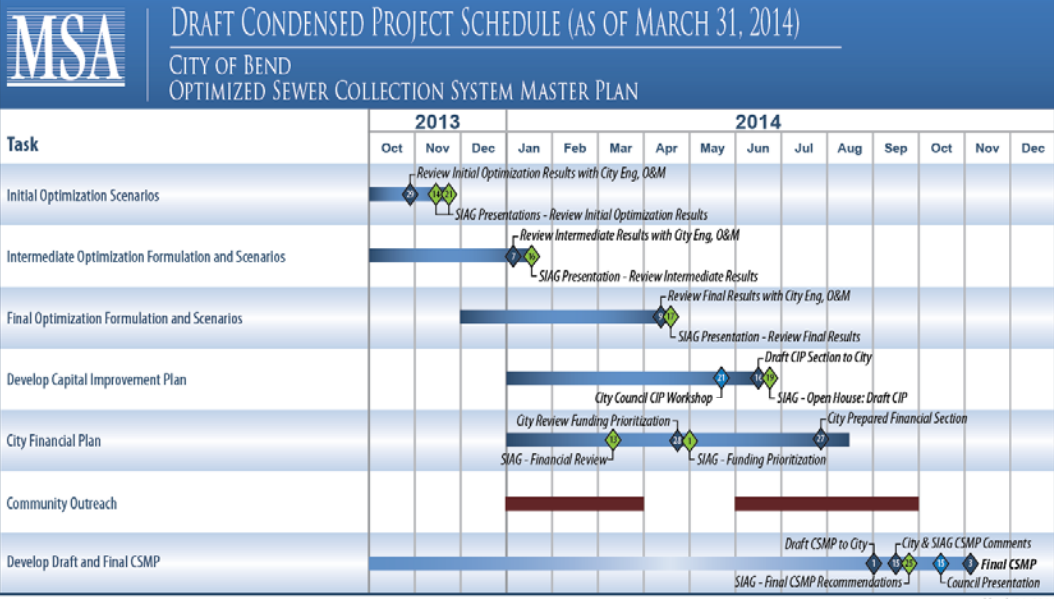
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NEXT STEPS

- ◆ 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)

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SCHEDULE REVIEW



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March 31, 2014