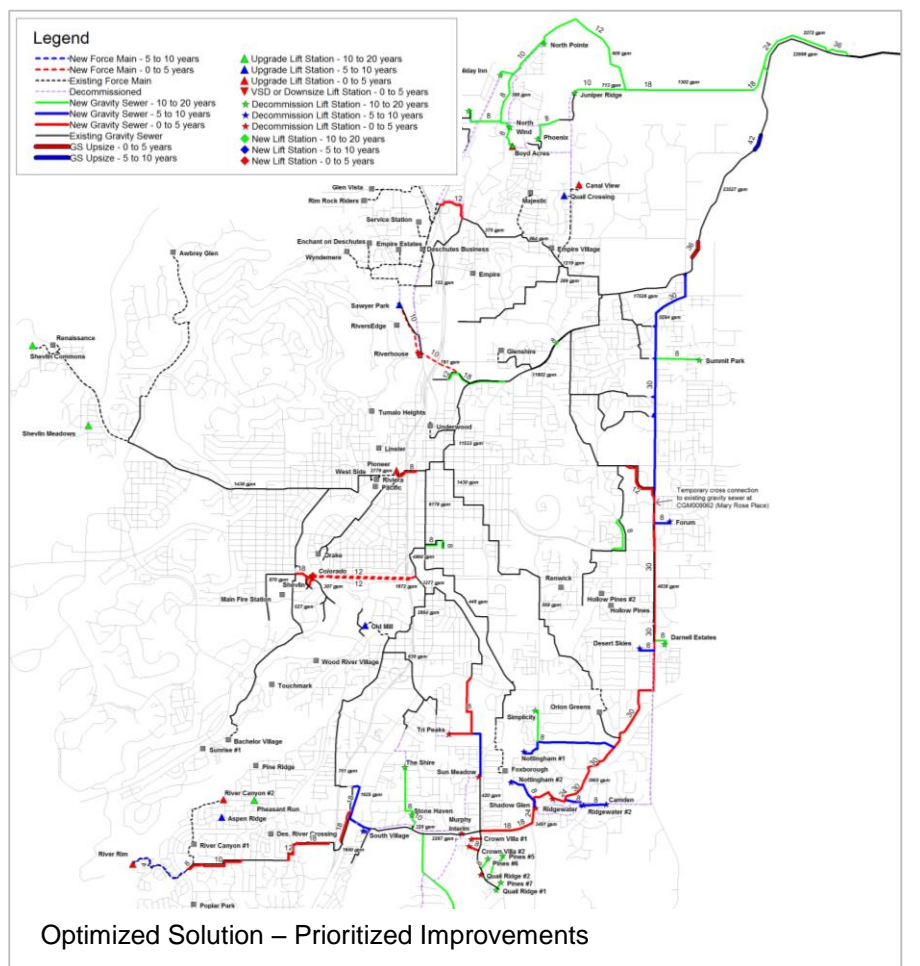
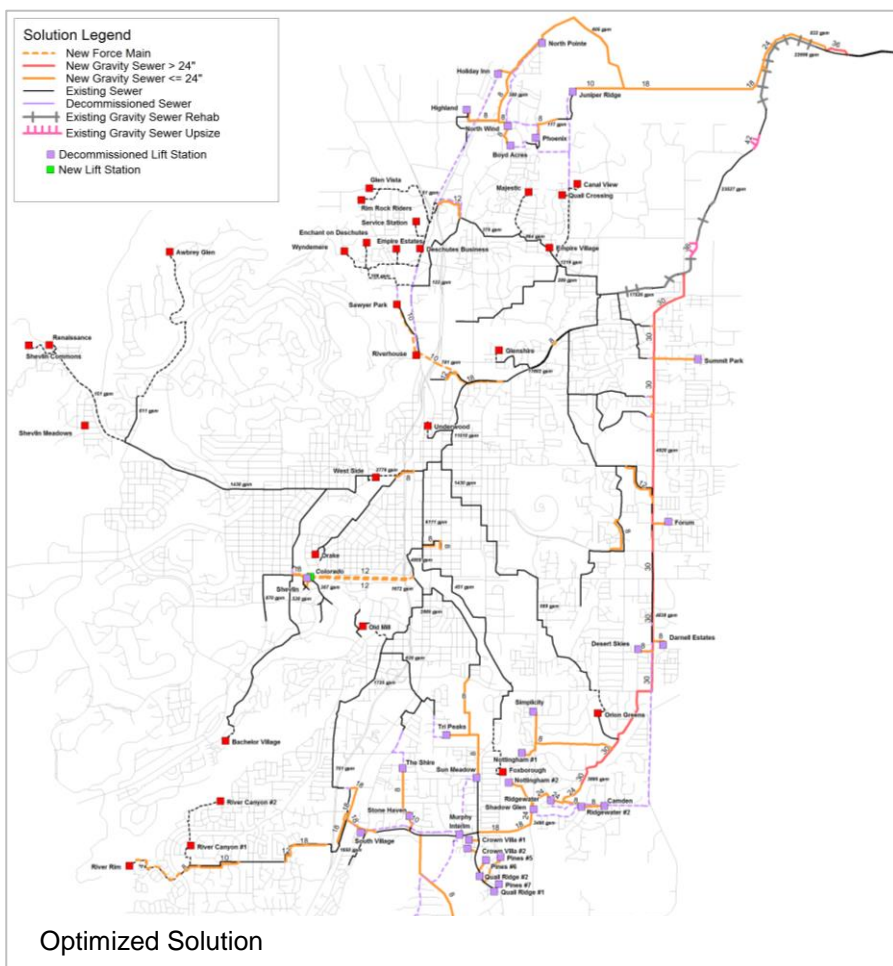
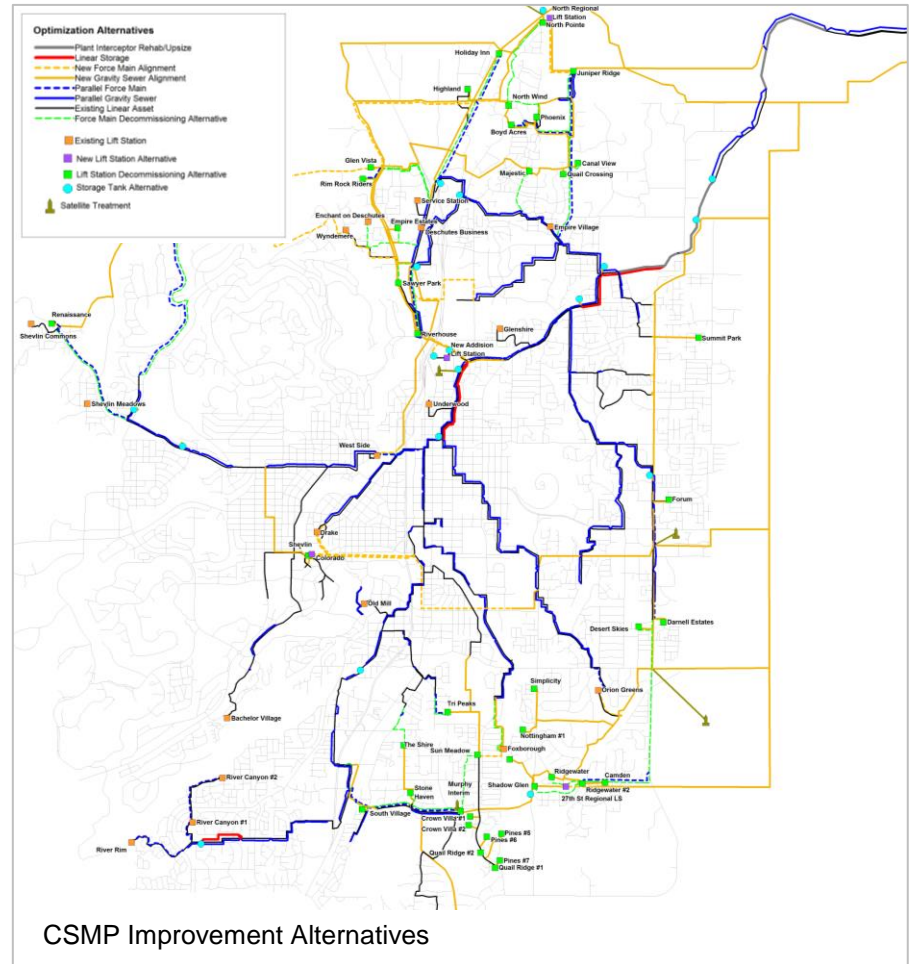
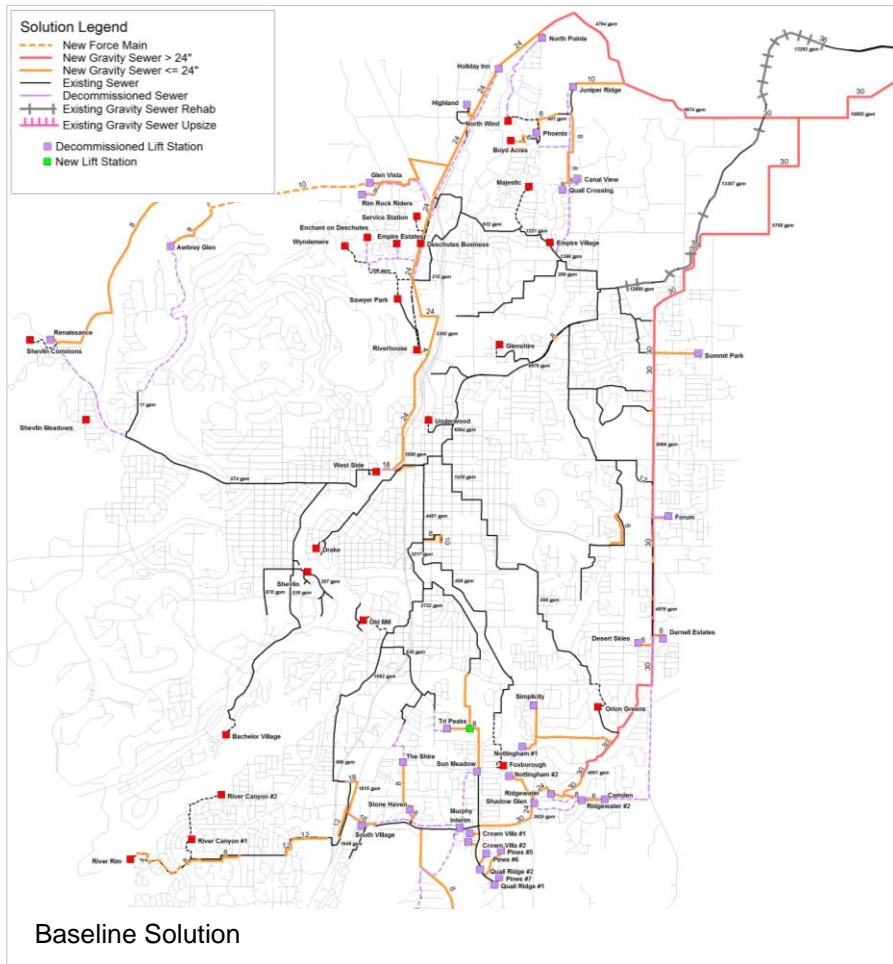


## Project Example – Bend, Oregon

- Comprehensive Collection System Master Plan (CSMP) optimization.
- Integrated analysis of hydraulic and asset condition-based drivers.
- Alternatives evaluated include conveyance, storage, flow diversions, interceptor alignments and satellite treatment.
- Extensive sensitivity analyses to test population growth scenarios, model calibration accuracy and water conservation trends.
- Input and advice from the 18-member Sewer Infrastructure Advisory Group (SIAG) and City Council.
- Transparent and defensible process leading to unanimous approval of the CSMP by SIAG.
- Over \$40 M (25%) savings compared to Baseline Solution.



The City of Bend faces significant future growth with an urgent need to plan for near- and long-term sewer system improvements. The collection system has nine major sewer basins covering some 35 square miles within the current Urban Growth Boundary. The collection system consists of gravity pipes, lift stations, vacuum mains and force mains that convey sewage to the water reclamation facility located in the northeast. Due to its varied topography and historical reliance on mechanical pumping systems, the Bend system has 86 regional lift stations and numerous other private and City pumping facilities within the existing primary sewer network.

Based on the City's prior success with its Water Master Plan optimization, the CSMP RFP stipulated that the Optimizer software be used by the selected project team. Optimatics and WCS Engineering provided the optimization expertise under the leadership of Murray, Smith & Associates. The CSMP team updated the system hydraulic model, projected future loadings, defined service levels, identified deficiencies and allowable options, and optimized a 20-year plan and staging of projects.