

# Integrated Planning in Action

## Integrated 2012 Wastewater Utilities Plan

Lawrence, Kansas

Kansas River and the Bowersock Dam in downtown Lawrence.  
Photo courtesy of Josh Carson, City of Lawrence.

Lawrence, Kansas, has a population of nearly 100,000 and lies between the Kansas and Wakarusa Rivers. Lawrence operates a separate sewer collection system along with a storm sewer system. Before 2018, it had one wastewater treatment facility<sup>1</sup> that discharged to the Kansas River. This river was historically used for steamboat traffic but is now a popular location for recreation and culture. The portion that flows through Lawrence is literally a work of art: an internationally known earth artist created a rock mural on the bank of the river near downtown.

### Challenges

During heavy storms, stormwater and groundwater entered Lawrence's sanitary sewer system through cracks and improper connections (i.e., infiltration and inflow). This led to sanitary sewer overflows (SSOs) that discharged sewage to the Kansas River. Meanwhile, more stringent effluent limits were about to be set for the wastewater treatment facility due to concerns about nutrient pollution in the Kansas River. The city had just one wastewater treatment facility and Lawrence's growing population required the city to plan for a second wastewater treatment facility to avoid exceeding the existing facility's capacity.

### Integrated Planning in Action

Lawrence used an integrated planning approach to identify affordable projects to increase wastewater treatment and flow capacity. The city created project categories and prioritized projects from these categories based on improvements needed to meet current capacity requirements, followed by those that provided capacity for future growth in the service area. The city then performed a cost-benefit comparison between the projects and calculated the rate impacts on customers under different scenarios. Finally, Lawrence



EPA Region 7

100,000 population



### Project Categories

- Existing collection system improvements
- Existing collection system rehabilitation
- New wastewater treatment facility
- Existing wastewater treatment facility improvements
- Annual wastewater utility maintenance

<sup>1</sup> "Wastewater treatment facilities" (WWTFs) is a generic term for facilities that treat or manage wastewater, including publicly owned treatment works.

city officials sought public input on the population projections used to develop the wastewater master plan through capital improvement planning hearings and a public comment process.

Lawrence considered all of these data and documented the selected projects in the integrated plan:

- The EcoFlow Rapid Rainwater Reduction Program, designed to reduce infiltration and inflow by 35 percent in the defined project area. The program would reduce the flows entering the collection system during wet weather, decreasing the need for collection system capacity projects.
- Construction of new sewer infrastructure to convey flows during large storms to the existing wastewater treatment facility.
- Infrastructure for and construction of a new wastewater treatment facility.
- Improvements to the existing wastewater treatment facility to comply with anticipated nutrient limits.

The cost of the integrated plan was estimated at \$161.2 million through 2030—\$148.3 million for existing system improvements and \$12.9 million for service to future growth areas.

## Results

In 2014, the Integrated 2012 Wastewater Utilities Plan was implemented through a memorandum of understanding between the city and Kansas Department of Health and Environment (KDHE); in 2019, KDHE issued permits for both wastewater treatment facilities that incorporated the memorandum. This agreement included a 20-year implementation schedule for integrated plan projects. In 2014, the city implemented the EcoFlow Rapid Rainwater Reduction Program to reduce infiltration and inflow. As of 2020, Lawrence had completed over 1,900 private property infiltration and inflow repairs, over 600 manhole repairs, and over 400 sanitary sewer repairs, as well as lining approximately 200,000 linear feet of sanitary sewer pipe to reduce infiltration and SSO events. The city finished building its new wastewater treatment facility in the spring of 2018.



Kansas River above the Bowersock Dam, looking south toward Burcham Park Trail. Photo courtesy of Josh Carson, City of Lawrence.