Bethany Wastewater Treatment Facility

The city of Bethany, Missouri, is currently constructing a wastewater treatment facility to replace their existing facility. The new facility will provide improved wastewater treatment capabilities to meet current regulations and increase the City's ability to handle peak flows due to rainwater inflow into the sewer. Development of this infrastructure will improve the environmental, social and economic sustainability of the City's wastewater treatment facility.

In 2009, the project commenced with the development of a facility plan. The facility plan analyzed deficiencies in the existing treatment works, developed design criteria for the proposed process, and explored potential treatment solutions. Treatment alternatives were evaluated based upon each option's cost-effectiveness and non-monetary benefits, such as operational ease and flexibility. The selected treatment alternative was an extended aeration treatment facility with capabilities of biological nutrient removal. In 2012, Bethany was awarded funding through Community Development Block Grant and United States Department of Agriculture Rural Development programs.

The project includes construction of pump station improvements, headworks and laboratory building, extended aeration process, ultraviolet disinfection, and other site improvements. The existing wet well will be retrofitted with two influent pumps utilizing variable frequency drives to improve the efficiency of pumping operations. Additionally, a flow equalization pump was added to increase the facility's ability to manage high flows due to rainwater inflow into the sewer system. The extended aeration system was designed with efficient blowers and a sophisticated control system that minimizes electrical consumption during treatment. Prior to discharging wastewater into Big Creek, the wastewater undergoes ultraviolet disinfection that inactivates harmful bacteria and viruses. Other improvements include repurposing of an existing lagoon for bio solids storage and wet weather flow management. Design of the project was completed by Snyder & Associates, Inc.

Bethany's wastewater treatment facility will provide improved treatment capabilities.

The project was bid in August of 2016 and a contract was awarded to Foley Company. Construction of the project commenced in March of 2017. The new facility is being built on the property of the existing facility, creating a design and construction challenge. As portions of the facility are complete, old process units will be decommissioned and new features utilized. Completion of the project is anticipated in June of 2018.

Cape Girardeau: Sinkholes Close Roadway For Years, Require Creative Public Works And Engineering Solution

More than 25 years of repeated dealings with sinkholes along and near a major arterial road in Cape Girardeau will culminate this summer, resulting in a large public works and engineering project that tripled the length of a former bridge and mitigates previous issues that closed the roadway for four years.

South Sprigg Street in Cape Girardeau, as it passes residential areas heading south, increases in importance for truck traffic heading to businesses and the city of Cape Girardeau's former Transfer Station. Sinkholes near South Sprigg, dating back as far as 1991, increased in frequency and severity until 20 new sinkholes formed in fall 2007 over a few months. In 2008, a large hole developed at the north end of a critical bridge along the street, requiring several tons of rock to repair the sinkhole and pavement repairs to the bridge's approach and closing the arterial road for some time.

In 2013, the same sinkhole reappeared bringing "friends" along. The sinkhole caused a section of roadway to collapse and a vast amount of water to flow into a nearby quarry, resulting in yet another roadway closure and traffic detours. Previous attempts to rectify the sinkhole had not worked well, and the City incurred more than $65,000 in expenses. Considering the cost and extensive issues, the City paused to consider more effective alternatives. South Sprigg remained closed to traffic, while solutions were sought for this complicated issue.

A federal disaster declaration allowed the City to access Federal Highway Administration emergency relief funds to assist with sinkhole and bridge project funding.

A federal disaster declaration in December 2013 allowed the City to access Federal Highway Administration emergency relief funds to assist with sinkhole and bridge project funding. Geo-technical and design work began in September 2014 for the new, longer bridge as a sinkhole and roadway solution. Lengthening the bridge will span over the existing problem area, and the new bridge foundations will be set on solid base rock to prevent future sinkholes from compromising the new bridge's structure.

The original bridge was 125 feet long, and the new bridge will be 380 feet long. Additional project work includes capping sinkholes in the right-of-way area in hopes of preventing future development of holes. Construction began in September 2016 with expected completion in August 2017 and an estimated total project cost of $5 million.

Liberty: A First for Design-Build and Treatment Plant Delivery in Missouri

This project is one of the first wastewater plants in Missouri utilizing design-build delivery, and the first design-build in Missouri to utilize State Revolving Funds (SRF).

In January 2017, a first for wastewater treatment plants began operations in Liberty, Missouri. This project is one of the first wastewater plants in Missouri utilizing design-build delivery, and the first design-build in Missouri to utilize State Revolving Funds (SRF). SRF financing will save the City more than $40 million in interest on this $74 million project when compared with conventional financing. With design-build legislation enacted last summer, the Liberty project paves the way for municipalities throughout Missouri to maximize their dollars utilizing the cost- and schedule-saving efficiencies

of design-build with low-interest SRF financing.

The city of Liberty had outsourced treatment to a neighboring community for decades. Facing near-term rate increases, uncertain future rates and potential treatment capacity issues, Liberty began studying alternatives, and identified that building their own facilities would save the City $27 million in treatment costs over a 30-year period. From there, Liberty worked with consultants to determine the scope, budget and user rates required for such an undertaking. The City estimated that it would take $95 million to construct the facilities, but user rates would be reduced and predicted to level out within five years. In August 2013, the citizens of Liberty voted overwhelmingly (91 percent) in favor of the project.

To maintain promised user rates, the new facilities had to be completed and operational by the first quarter of 2017. In February 2014, request for qualifications were issued. Three teams were shortlisted in April 2014. Following review of conceptual designs, proposals and interviews, the team of Goodwin Brothers and CMT was selected in September 2014. Construction of the new seven million gallons per day (MGD) plant, two 10 MGD pump stations, 18,000 feet of force main; and 6,000 feet of collector roadway, administration and maintenance facilities were completed by December 2016. Treatment operations began on Jan. 3, 2017.

Based on the cost and schedule savings gained through the design-build process, additional scope was added, including more than 6,000 feet of trunk sewer. This work was substantially completed in March 2017 with final completion and close out scheduled for May 2017.

This project is a perfect example of a City looking out for the best interest of its citizens' hard-earned dollars. Rather than continuing the status quo, Liberty pursued different treatment options and innovative delivery methods that will positively impact the citizens of Liberty for future generations to come.

Maplewood Road Project: Phase 3

Maplewood is a more pedestrian-friendly community.

The MetroLink/Metro Bus Center at Manchester and Hanley opened in 2006, offering residents, business owners, and visitors an opportunity to leave their vehicles at home. Maplewood became a more transit-oriented community. Unlike Maplewood's historic downtown that developed during the streetcar era, the area near the MetroLink was not pedestrian friendly. Public Works Director Anthony Traxler sought grants from the federal government and developed a project to create a visually pleasing, safe, and walkable environment. The total cost of the project was $2,784,000. This was paid with a grant with an 80 percent federal match, with the City responsible for the remaining 20 percent. The project contractor was NB West, with consulting engineer Horner Shifrin. The project area is west of Bredell Avenue and proceeds west to the intersection of Manchester Road and Hanley Road. The project is a continuation of two previously federally funded projects. Highlights of the project include:

Bicycle Elements

Manchester Road connects to many designated bike routes. Bicycle travel will be safer with the widened lanes that widened from 10 to 11 feet.

Pedestrian Elements

Sidewalks were added near the MetroLink station. Existing sidewalks were widened and where practicable, were set back five feet (behind the tree lawn) from the curb to provide a safe and comfortable walkway. Existing sidewalk ramps were replaced to meet the latest ADA design standards. Unsafe swale gutters that lacked any curb were replaced with vertical curb and gutters. All of the pedestrian elements were designed to provide a safe route for pedestrians to utilize the Maplewood Manchester MetroLink Station and Metrobus center.

Improved Traffic Flow

Manchester Road traffic counts are approximately 25,000 vehicles per day. This volume can be daunting to a pedestrian. Improved traffic flow was imperative to creating a safer environment. The project entailed widening of drive lanes and the relocation of overhead electric on the north side of Manchester Road; and adjustments of sewers, gas, water, telephone and cable lines were also required. Another traffic flow improvement involved turn lane installation at Manchester and Laclede Station Roads.

Improved Access Management

Removing wide and undefined driveway aprons improved safety.

Beautification Elements

The City added street trees, landscaping and decorative antique street lights from Big Bend Blvd to Hanley Road. These elements have improved the visual appeal of the streetscape.

Marshfield Takes Integrated Approach To Addressing Growing Infrastructure Needs

The city of Marshfield's population has almost doubled since 1984, making it one of the fastest-growing communities in Missouri. Not surprisingly, this put a significant strain on its infrastructure. City leaders demonstrated sound judgment when they took an integrated and transparent approach to address these growing pains.

The City recognized that they would have to move forward simultaneously on several fronts to accommodate the fast-paced growth and development, including capital improvements associated with roadways/transportation, the potable water system, and wastewater collection and treatment. This integrated approach is well-suited to smaller communities that have fewer municipal employees, along with limited resources. One of the key elements has been getting the community involved by engaging residents and showing that their feedback is valued. This goes a long way toward earning support any time you're asking the public to invest in infrastructure.

The local transportation network has been particularly affected by growth, so it was determined that a long-term solution would be needed in the form of a new access point with I-44. Several different interchange types are under evaluation to determine the optimal configuration for maximizing safety and traffic flow. The preferred concept must also accommodate increasing residential demand and the City's plans for future economic development in the area, all while minimizing the overall cost.

Improvements are also being made to the water system. The City is currently moving forward with a $4 million project that will improve water quality, address aging components of the system, optimize elevated storage, and ensure sufficient capacity is available for existing and future growth areas. The improvements are financed through the State Revolving Fund (SRF), a low-interest loan program, that will save the City more than $2 million in interest compared with conventional financing.

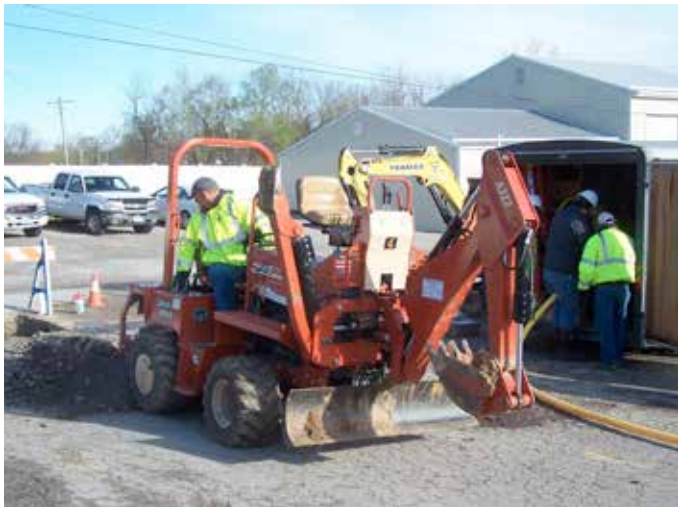
The city of Marshfield's population has almost doubled since 1984, making it one of the fastest-growing communities in Missouri.

The City also needed to take a closer look at its wastewater treatment plant, that was facing very stringent Missouri DNR restrictions due to impairments in the stream into which the plant discharges. The City's engineering consultant discovered that the data used to determine the stream impairment was outdated, inconsistent, and in some instances, irrelevant. Marshfield successfully made the case that current and relevant data indicates the stream is not impaired. The severe restrictions were lifted, saving the City at least $10 million. Some of the savings may now be spent on more meaningful improvements to support this vital and growing community.

Perryville Upgrades And Renovations

Perryville Public Works is in the midst of a multitude of upgrades and renovations. The Department is currently completing the erection of two new elevated water tanks, adding a new Supervisory Control and Data Acquisition (SCADA) package, installing a new pressure reduction valve system and currently out for proposals on a new telemetry system for a network of lift stations. The Department is also involved in a continuing program to line problem sewer mains and all brick manholes. Inflow and infiltration has been reduced approximately 25 percent in less than two years!

On the refuse side, proposals are currently being accepted for two new side load refuse trucks. These trucks will streamline operations and improve service and efficiency for customers. Perhaps the most important aspect of the new trucks is that they will be powered by clean-burning natural gas! Perryville Public Works is currently building a private natural gas fueling station at the main facility. This facility will have four slow-fill hoses and one fast-fill station. The Department recently ordered two new utility trucks that will be powered by natural gas.



Trenching for service line for new NGV fueling station.

The City of Perryville is the local natural gas supplier and has researched the pros and cons of natural gas as a vehicle fuel for several years. The conclusion is that fuel costs will be cut by as much as 75 percent, while also decreasing maintenance costs significantly. There are many other benefits, such as the fact that natural gas vehicles (NGV's) are 95 percent cleaner burning than regular vehicles and natural gas is American made. While NGVs cost more up front, payback is just under 4 years.

Strong leadership has allowed Perryville public works to be progressive, with a forward-looking mayor and city administrator. Infrastructure constantly needs upgrading and reinforcing, and Perryville has leaders are preparing for tomorrow.

St. Charles: Maintaining A Diet

When the city of St. Charles evaluates roads for reconstruction, city engineers assess pavement condition, traffic volume and flow, roadway safety and the number of accidents. The City completed the resurfacing and repairing of Kingshighway from Madison to Clark Street in 2016. The project included a road diet where four travel lanes with a 40-foot width were reduced to three travel lanes within the same 40-foot footprint. It was believed that this modification would allow vehicular traffic to flow better, while decreasing the number of accidents and sharing the road with bicycles and pedestrians.

Road diets have been implemented by transportation agencies across the United States for more than three decades. The City has seen the St. Charles transportation network evolve. Today, neighborhoods require access to active living features throughout the City, and road diets are one way to help residents accomplish this. Studies estimate that up to 60 percent of people are interested in biking for leisure or transportation. Unfortunately, most of these residents feel unsafe using streets crowded by trucks, cars and SUVs.

This section of Kingshighway (Madison to Clark), had some of the highest traffic accident rates in the City. The stretch of road had 134 total crashes between October 2011 and March 2016. To date, the road diet has reduced the crash volume by 75 percent while increasing the number of vehicles per day. The volume of traffic before the improvements was 14,500 vehicles per day; the same roadway now has 17,500 vehicles per day.

Thanks to the traffic-calming effect of the Kingshighway road diet, St. Charles has provided valuable public space back to residents to use for walking, running or bicycling, while increasing safety. Kingshighway is for everyone – whether traveling by car, bicycle or wheelchair.

To date, the road diet in St. Charles has reduced the crash volume by 75 percent while increasing the number of vehicles per day. The volume of traffic before the improvements was 14,500 vehicles per day; the same roadway now has 17,500 vehicles per day.

St. Joseph Fire Station Upgrades

Thanks to voter support through the Capital Improvements Program (CIP) sales tax, the city of St. Joseph has embarked on a journey to modernize and/or replace some of the oldest fire stations still in use in Missouri. St. Joseph still operates fire suppression companies in five stations that were built at the turn of the last century when the fire equipment was horse drawn. Four of the stations have a narrow single bay that leaves, literally, inches to spare when backing a truck into the bay. The truck bays are located under the firefighter living quarters, and have no room for any modern amenities. Prior to the passage of the CIP sales tax, the buildings were falling behind on needed maintenance and improvements.

In 2010, the first of these stations was renovated by constructing an addition to the building and repurposing the existing station into meeting space and emergency operations use. The location of the station was adequate to provide the proper response times, so a remodel and expansion of this site was an option. This project saved and renovated a turn-of-the-century building while providing a modern fire station.

During the summer of 2017, two new stations will be built to replace two of the other single-bay antiquated stations. A response time study showed the location of the existing stations did not satisfy the safety needs of the community. As the community continues to grow to the east, the density of the stations in the heart of the City provided overlaps in coverage in some areas while gaps existed in coverage in the newer parts of the City. New sites were acquired that provided better response coverage. The new stations will have multiple bays for first responders and other equipment, modern kitchens, bunk rooms and living spaces.

City officials wish to provide for the reuse or disposition of the old stations. The design professionals for the new stations, WSKF Architects of Kansas City and River Bluff Architects of St. Joseph, are completing an adaptive reuse study to determine the best reuses and the proper way to prepare the old stations for reuse.

(above) Old fire station. (right) The new station, that includes an addition, meeting space and emergency operations space.

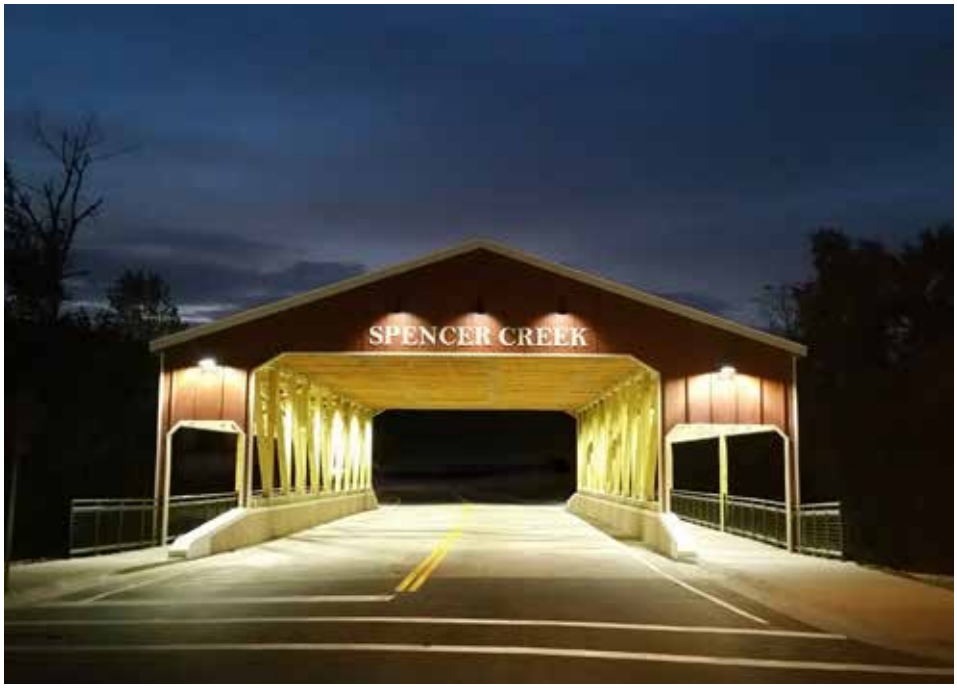
St. Peters: Iconic Spencer Creek Covered Bridge

Spencer Creek winds its way through the heart of St. Peters, flowing under several bridges maintained by the city of St. Peters as it makes its way to a Mississippi River tributary. By far, the most iconic of those bridges is a covered structure located at Sutters Mill Road.

Built as a private structure in the Spencer Creek neighborhood by local builder Charlie Adams in 1977, the Spencer Creek Covered Bridge quickly became a local landmark with a design tied to the community's agricultural heritage. In time, the city of St. Peters accepted ownership of the covered bridge and maintained the structure to preserve its unique character.

Nearly 40 years after construction, however, time came to replace the entire bridge structure. In rebuilding the Spencer Creek Covered Bridge, a landmark would be reshaped. The city of St. Peters sought a design that would please nearby residents, improve safety and keep costs low for taxpayers.

Sutters Mill Road is a busy street running through several St. Peters' neighborhoods and crossing a popular city park and well-used trail. The Spencer Creek Covered Bridge is centrally located where the street, park and trail meet. City officials met with nearby residents during neighborhood watch meetings for project updates and for input on how to maintain the bridge's character while making changes to integrate the park trail system.



The city of St. Peters rebuilt the Spencer Creek Covered Bridge to maintain the community landmark's character while making updates to pedestrian/biking acccess, safety and lighting.

The final design would take on similar elements of the original covered bridge, but was updated with a new color scheme, decorative lighting and safety features for pedestrians and bicyclists. A six-foot sidewalk and 10-foot-wide multi-use path for biking/hiking were added on either side of the covered bridge, with protective barriers separating them from the road. The new lighting also improves safety at night, and strikes a dramatic evening view.

Construction on the project began in May 2016 and the bridge reopened in October. The total cost was about $1,145,700, although the City of St. Peters obtained 80 percent grant funding through the St. Charles County Road Board and Federal Surface Transportation Improvement reimbursement grant administered by the East-West Gateway Council of Governments and Missouri Department of Transportation (MoDOT).

In the end, city of St. Peters taxpayers paid just under $226,400 for a newly enhanced landmark bridge that preserves community identity with modern updates that meet safety standards for today and the future.