

U.S. Business Route 63: Kirksville Safety and Livability Improvements

*TIGER Grant Application on behalf of the Missouri Department of
Transportation (MoDOT) for the City of Kirksville, Missouri*



Pavement and drainage improvements, ADA compliance upgrades to sidewalks, and signal upgrades on U.S. Business 63 (Baltimore Street)

Source of Funds	Amount	Percent
TIGER Grant Request	\$5,417,488	63.2
MoDOT	\$2,850,000	33.3
City of Kirksville	\$300,000	3.5
Total	\$8,567,488	100.0

Submitted to the Office of the Secretary,
U.S. Department of Transportation

October 16, 2017

Project Description:

MoDOT and the City of Kirksville are partnering to complete improvements to U.S. Business 63/Baltimore Street, focusing on the section from Shepherd Avenue/Franklin Street/MO 11 to Illinois Street/MO 6. At approximately two miles, the project features three travel lanes, including a turn lane. The average annual daily traffic (AADT) is 15,200 vehicles. This section of the road is in dire need of repairs and the project will include resurfacing, ADA upgrades/improvements, drainage improvements, signal upgrades and new curb and gutter. Kirksville is the largest city in northeast Missouri, with a population of 17,500 people. Kirksville draws employees, tourists, visitors, students, and shoppers from many of the rural towns in northeast Missouri and southern Iowa. **Kirksville is therefore the cultural, educational, financial, and commercial center of this predominantly rural bi-state region, and Baltimore Street is its main commercial and retail corridor.**

However, Baltimore Street is also prone to extensive flooding for much of the year. This project will improve mobility for the motorists, pedestrians, cyclists, and disabled individuals who access the dozens of businesses along U.S. Business 63/Baltimore Street.

Figure 1: Baltimore Street During Typical Flood Event on June 26, 2015



At Fillmore and Baltimore Streets, vehicles drive through multiple inches of collected storm water. Five inches of rain were recorded the previous day, with an additional 0.6 inches the day this photo was taken.

Project Location:

The project is located in Kirksville, Missouri, a city of 17,500 people. U.S. Business 63/Baltimore Street is the hub of business and pedestrian traffic through Kirksville. Kirksville is located in rural Adair County, and is situated in the Missouri 6th Congressional District, which is represented by Congressman Sam Graves.

Figure 2: Kirksville is located in rural northeastern Missouri (left)



Source: Google Maps

Kirksville is located in the northeastern region of the State of Missouri, and the project (right) is centered in the City's High Density Corridor Zone.

Grant Funds, Sources and Uses of Project Funds:

The total project cost is **\$8,567,000**, with **\$2,850,000 from MoDOT** and **\$300,000 from the City of Kirksville**. MoDOT therefore requests **\$5,417,000 in discretionary TIGER funding**, representing 63.2 percent of the total project cost. Preliminary survey and engineering have been completed and funded on a portion of this project. All project funds will be used for the improvements listed below.

Improving U.S. Business 63/Baltimore Street from Illinois Street/MO 6 south to intersection of Shepherd Avenue/Franklin Street/MO 11, the scope includes:

- Road resurfacing, ADA compliance improvements, improvement of roadway drainage from Illinois Street/MO 6 to LaHarpe Street
- Resurfacing from LaHarpe Street to Shepherd Avenue/Franklin Street
- Upgrade of traffic signals
- Right of way (easements) acquisition to facilitate improvements

Attachment 1, an Excel spreadsheet, has three tabs to show the 1) Total Costs, 2) MoDOT Detailed Estimated Costs and 3) City of Kirksville Detailed Estimated Costs

Merit Criteria:

MoDOT recognizes the competitiveness of the discretionary TIGER grant review process and has summarized the value created by improvements to Baltimore Street in Kirksville with reference to the primary and secondary selection criteria established by the Notice of Funding Opportunity (NOFO).

(1) Primary Selection Criteria:

Below, MoDOT has described the expected benefits in terms of improved outcomes for

safety, state of good repair, economic competitiveness, environmental sustainability, and quality of life.

(a) Safety:

There are several areas of concern on U.S. Business 63/Baltimore Street. One of the primary concerns is the lack of drainage along the roadside. During moderate to heavy rains or melting snow, the gutter on either side of the road fills to capacity and overflows onto the street, causing ponding, damage to the road, and potential for hydroplaning vehicles.

Kirksville's municipal drainage system was built in the 1950s. This section of U.S. Business 63/Baltimore Street carries up to 15,200 vehicles per day, with entrances to dozens of businesses and restaurants, and several hundred pedestrians and cyclists accommodated throughout the week. Many of these pedestrians are students from three universities within the city. There have been 209 accidents within this segment of highway in the last five years—including four pedestrians and cyclists—and 31 of the total incidents were on wet pavement. Multiple resurfacing treatments of the highway have contributed to the drainage issue by lowering capacity of the gutter and continuing to contribute to the overall dysfunction of the highway.

(b) State of Good Repair

MoDOT and the City of Kirksville do not have the funds necessary to complete the entire project. The main needs on this corridor are pavement, drainage and ADA compliance for sidewalks and traffic signals. There are several sections of curb and gutter in poor condition. During light rainfall and snow events, the poor curb-and-gutter sections **do** not allow for water to safely flow off of the roadway. Also, when paired with smaller-than-needed drainage structures, frequent flooding of the roadway occurs even during average rainfalls. The poorly functioning drainage causes deterioration on the pavement edges also creating safety concerns with edge drop off. The sidewalks and traffic signals also need to be made ADA compliant for safe movements of pedestrians and non-motorized vehicles moving along and crossing the roadway. The two locations with span wire signals also require frequent maintenance to work properly. All of these factors combined lead to a large project

that will reconstruct the corridor. Should a TIGER Grant be awarded, in conjunction with both entities' committed funding, we can complete this project which will improve safety for vehicles, non-motorized vehicles, pedestrians and employees/patrons of all the businesses that have entrances on this road.

(c) Economic Competitiveness

U.S. Business 63/Baltimore Street is the primary entrance into the City of Kirksville off of U.S. Route 63 from both the north and south. Exponential growth on U.S. Business 63/Baltimore Street has occurred in the last five years north of Illinois Street/MO 6, and is expected to continue to grow. As Kirksville continues to expand its industrial and retail base, additional congestion is expected. Kirksville is the largest city in northeast Missouri, with a population of 17,500 citizens. Kirksville draws employees, tourists, visitors, students and shoppers from many of the rural towns in northeast Missouri and southern Iowa.

As one of the largest cities in northeastern Missouri, Kirksville is surprisingly diverse and home to notable international populations hailing from Central Africa and Latin America. In improving the downtown walkability and livability of this commercial corridor, this project will leverage state, municipal, and University-led efforts to integrate low income populations into the commercial and economic mainstream of northeastern Missouri.

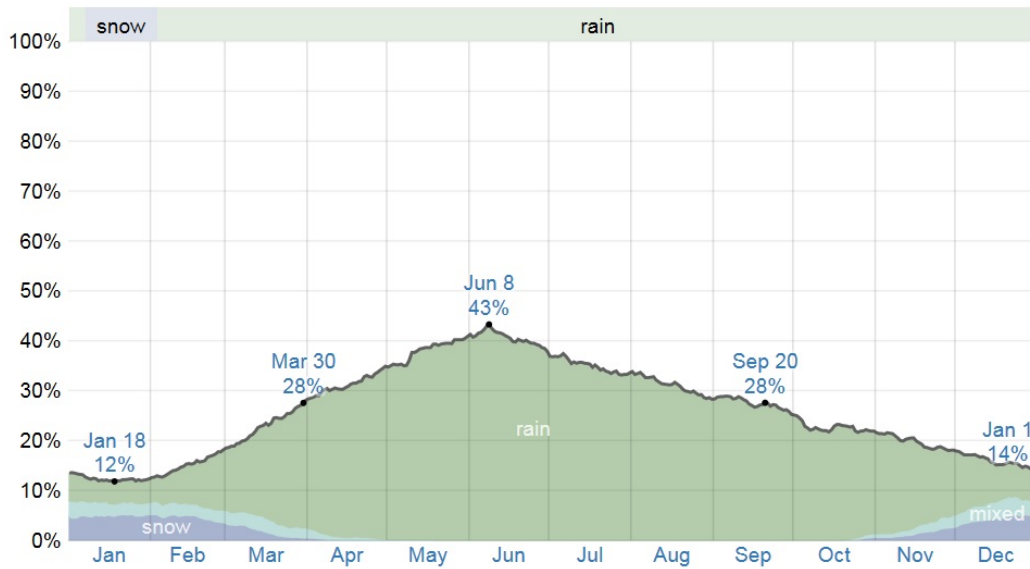
(d) Environmental Sustainability:

The primary environmental benefits of the project include improvements to storm water management on U.S Business 63 in a predominantly rural region, and lessened mobile-source air pollutant emissions as a result of travel time reductions and fewer vehicles idling in highway congestion during flood events (estimated to occur 48 times annually).

Kirksville's rain-heavy season lasts 5.7 months, from March 30 to September 20, with a greater than 28% chance of a given day being a wet day. The chance of a wet day peaks at 43% on June 8. The highest chance of a day with rain alone is 43% on June 8.¹

¹ Weather Spark (2017): Average Weather in Kirksville, Missouri, United States. Available online at: www.weatherspark.com. Accessed October 2017.

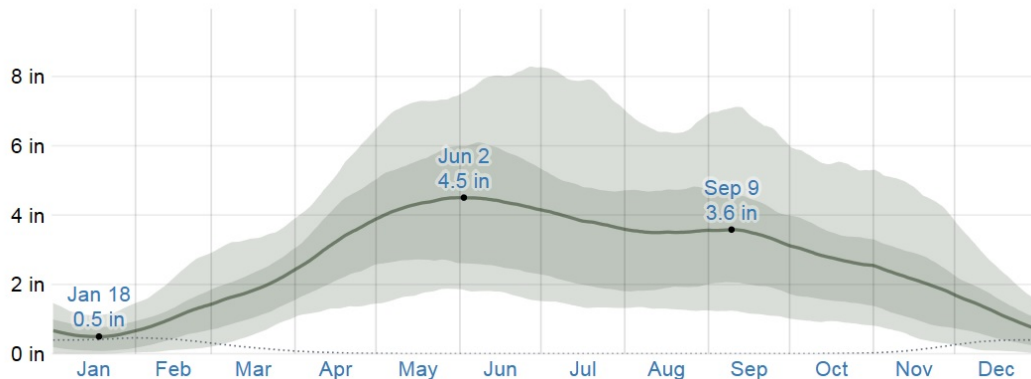
Figure 3: Daily Chance of Precipitation in Kirksville, Missouri



Source: Weather Spark

Kirksville gets 41 inches of rain per year, and the U.S. average is 39. The section of road between Illinois Street/MO 6 and LaHarpe Street is a significant business district, featuring dozens of businesses, churches, and facilities of public accommodation. There are multiple intersections, now impacted by existing flooding problems, and these intersections connect the rest of the community to U.S. Business 63/Baltimore Street.

Figure 4: Monthly Average Precipitation in Kirksville, Missouri



Source: Weather Spark

With any amount of significant rainfall, this section of U.S. Business 63/Baltimore Street floods at entrances and intersections, and up to or over the center lane (middle turn lane) of the highway, causing major concern for the safety of motorists, as well as pedestrians. With any amount of significant rainfall, the storm drains cannot absorb the runoff for several hours, and sometimes into the next day, before the water is gone. This is also an environmental concern, as the water has no place to go (Figure 5).

Figure 5: Flooding on U.S. Business 63/Baltimore Street after a typical rain in Kirksville, Missouri, 2015



U.S. Business 63 at Fillmore Street on June 15, 2015, with vehicles driving through water up to bumper height. This photo was taken 11 days prior to the cover photo.

(e) Quality of Life:

It is currently unsafe for pedestrians, cyclists, and wheelchair users to traverse this section of U.S. Business 63/Baltimore Street. Besides many of the sidewalks being in disrepair, most of them are not ADA accessible (north of LaHarpe St.). As the curbs are crumbling in various sections, it is difficult to navigate in and out of several business entrances.

Figure 6: Many of the existing signals on U.S. Business 63/Baltimore Street in Kirksville are temporary



Five of the signals have issues with non-compliant pedestrian signals with ADA or lack pedestrian signals all together. This project will reduce signal maintenance costs.

Figure 7: Continuous resurfacing of U.S Business 63/Baltimore Street over multiple decades has eliminated much of the capacity of the drainage system in Kirksville



Figure 8: Existing sidewalks and curbs present hazardous conditions for both pedestrians and wheelchair users between LaHarpe and Illinois Streets



(2) Secondary Selection Criteria:

Below, MoDOT has described the expected benefits in terms of improved outcomes for innovation and partnership.

(a) Innovation:

MoDOT and its contractors will implement the latest technologies and practices in storm water management, ADA compliance upgrades to sidewalks, and traffic signal design.

MoDOT is also adept at various innovative project delivery approaches, having delivered 13 design-build projects since 2001.

(b) Partnership:

A City of Kirksville resolution was executed on Oct. 2, 2017 as a formal partnership with MoDOT to execute a joint application for the TIGER Grant (detailed in Attachment 2).

While there are several problems along this section of U.S. Business 63/Baltimore Street that affect other issues, not all are segments owned by one public entity, with responsibility split between the State of Missouri and the City of Kirksville. The drainage system is owned and

maintained by the City, while the sidewalks, entrances, curb and gutter, road surface and signals are owned and maintained by MoDOT. Should a TIGER Grant for \$5,417,000 be awarded, MoDOT will oversee the federal funds and administer the contract or contracts.

MoDOT and the City of Kirksville have been successful partners on several projects including the four-laning of U.S. Route 63 between Kirksville and Macon and completing the alternate route (bypass) of U.S. Route 63. There is also a history of cooperation between the two entities on projects including the City taking on former U.S. Route 63 (now Franklin Street), turning a former MoDOT-owned roadside park into a city park, several planning studies, implementation of a Safe Routes to School program, sidewalk upgrades to be ADA compliant and airport improvements.

Project Readiness:

The City of Kirksville and MoDOT are committed to fund these improvements immediately upon receipt of discretionary TIGER funding. MoDOT and the City have a long history of partnership and collaboration centered upon these improvements, due to the nature of the needed improvements being co-owned by the two public entities. Detailed cost responsibilities are described in Attachment 1.

MoDOT has hired a consultant to complete survey work along the section of U.S. Business 63/Baltimore Street that needs the most significant repairs, including the drainage, sidewalks, and curb and gutters. The City and MoDOT have been working together to solve the drainage and ADA compliance problems, but have been delayed in terms of project delivery due to lack of available funding.

(A) Technical Feasibility:

Specific costs have been determined for the needed repairs, and survey work has been completed on one section of the road, from LaHarpe Street to Illinois Street/MO 6.

(B) Project Schedule:

The sooner this project is completed, the safer it will be for all users of the road and sidewalks. With a TIGER grant award of \$5.41 million, both entities are committed to begin the project according to the terms of any discretionary TIGER grant funding. Construction will start in the spring of 2020. The construction is expected to last into 2021 with completion in the fall.

Attachment 2, an Excel spreadsheet shows detailed project schedule.

(C) Required Approvals:

All necessary permits/clearances will be acquired immediately following the preparation of plans, specifications and estimates. MoDOT does not anticipate that the project will result in significant impacts to natural, social, or economic resources of the City or the region. Any necessary right of way or easements will be obtained within the appropriate timeframes, and MoDOT will follow the NEPA process, submitting for SHPO Section 106 clearance. Additionally, MoDOT and the City have included letters of support from several state and local organizations including the Northeastern Missouri (NEMO) Regional Planning Commission.

Attachment 3 shows three letters of support.

(D) Assessment of Project Risks and Mitigation Strategies

Without additional funding, the City of Kirksville and MoDOT cannot afford to complete the proposed project. Without TIGER funding, MoDOT will continue to seek funding alternatives, and if budget constraints change, MoDOT may consider a phased approach.

Benefit Cost Analysis:

The primary economic benefits of these improvements are safety (reduced incidence of accident and injury on this two-mile segment of U.S. 63) and value of time savings accruing to highway users and freight shippers and receivers.

Value of time savings

The proposed highway improvements will eliminate two-day flooding events that impact an existing segment of U.S. 63 that currently records an AADT of 15,200 vehicles. It is estimated that vehicles during extensive flooding travel at 10 miles per hour (MPH), and will thereafter be able to travel at 30 MPH. Assuming 48 flood events (impacting 96 days annually), these improvements will positively affect the downtown journeys of 1,459,200 vehicles using this two-mile segment.

Figure 9: Assumptions informing monetized time savings on U.S. 63

60 MPH = 1.000 miles per minute, two miles at two minutes
30 MPH = 0.500 miles per minute, two miles at four minutes
10 MPH = 0.167 miles per minute, two miles at twelve minutes

Improving the aggregate speed of travel on U.S. 63 in downtown Kirksville from 10 MPH to 30 MPH after significant rain events will therefore amount to eight minutes per (two-mile) journey. For the 1,459,200 vehicles traveling this segment during flood events each year, this amounts to 11,673,600 minutes annually, or **194,560 hours of delay prevented each year**.

Imputing a value of time of \$16.00 (estimate)—from the most recent value of \$17.67 per hour for St. Louis and Kansas City metropolitan areas from the Texas Transportation Institute (TTI)—this project will therefore produce monetized benefits of **\$3,112,960 each year in time savings**. At discount rates of three and seven percent, this project produces a net benefit in light of the total project cost of \$8,567,000.

Reduction in fatalities and injuries

The City and MoDOT estimate that the renovations to U.S. 63 will result in a 25 percent reduction in accidents, or 205 accidents total, over 20 years. Considering we anticipate an

increase in cyclists and pedestrians in the area, 25% could be a high number. There have currently been no fatal accidents over the past 3 years. However, if even one life is saved during the 20 years following the project completion, that would equate to a Project Benefit of \$9,400,000 according to the 2015 USDOT Guidance on Value of Life.

Net public benefit

Over the twenty year asset life of the proposed improvements to U.S. Business 63/Baltimore Street, MoDOT estimates that \$57,589,760 in value of time savings will accrue to drivers. This estimate does not include savings (from reduced inventory costs) accrued as value of time savings to freight shipments.

If these improvements eliminate one additional highway fatality during the asset life of the highway improvements, the additional \$9,400,000 would result in accruing for a net public benefit of \$66,989,760, against a total project cost of \$8,567,000. **Undiscounted, this represents a benefit-cost ratio of 6.72-to-1 (with the averted fatality considered) and 7.82-to-1 (without any reduced fatalities or injuries considered).** Therefore, this project results in immense net public benefit based on value of time savings alone.

This estimate assumes an 18-month construction period, and thus an asset life of 18.5 years. Though not included in the above calculations, the residual value of the improvements remaining at 20 years (240 months) after the availability of federal funds, will only add to the net public benefit enabled by the project.

Federal Wage Rate Requirement:

Contractors on MoDOT projects are required to pay either the state or federal prevailing hourly wage rate (whichever is higher) for any craft or type of worker required to perform the work, except when expressly provided by the contract document. The state and federal wage rates are posted on MoDOT's website for each monthly letting. Via the Web link, select the desired letting date, click the "View Letting" button and then proceed to State Wage Rates and Current Federal Wage Rates. http://www.modot.org/business/contractor_resources/bidOpenIndex.shtml

Link to Job Special Provision that appears in every MoDOT contract that has Federal-aid:

<http://www3.modot.mo.gov/jobspec2.nsf/40d8d12ad121cf2f862567bb004c65ce/7e062915b7ed8ee18625762e004adda0?OpenDocument>.

MoDOT certifies that it will comply with the requirements of subchapter IV of chapter 31 of Title 40, U.S. Code (Federal wage rate requirements), as required by the FY 2010 Appropriations Act.