

# FY 2019 BUILD Grant - Monroe Street Corridor Project

BENEFIT COST ANALYSIS SUMMARY

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## Introduction

The proposed Monroe Street Corridor Project (“MSCP” or the “Project”) will connect downtown Ruston, Louisiana Tech University (“Louisiana Tech” or the “University”) and the Louisiana Tech University Enterprise Campus (the “Enterprise Campus”) to the Interstate 20 (“I-20”) corridor. This Project will establish the only multi-modal link from downtown Ruston and the Louisiana Tech campus to the surrounding residential areas. The MSCP will reduce the growing congestion issues experienced throughout the City of Ruston, and the issues that continue to compound as Louisiana Tech looks to achieve its goal of 20% enrollment growth to 15,000 students by the fall of 2020. Louisiana Tech is the premier university within a 200-mile radius of the City of Ruston, and the only university in the state of Louisiana that has a heavy influence in Cyber Engineering and Cyber Security. This influence is demonstrated through the University’s ongoing partnerships with IBM, General Dynamics IT, Air Force Global Strike Command with Barksdale Air Force Base and other cyber security partners located 60 miles to the west in Bossier City, Louisiana. Another new factor that will add to the growing congestion issues will be the City of Ruston’s new Sports Complex (the “Sports Complex”). The Sports Complex will host its first tournament in July of 2019 with an expected 20,000 visitors during the first event alone. This new influx of vehicles will exacerbate the already congested road conditions.

Due to the high level of work coming out of the Enterprise Campus, the University has been able to attract numerous national partners who occupy 40,000 square feet of enterprise space with over 700 employees. With the success of the existing partners on the Enterprise Campus, the University plans to expand this portion of the campus with five additional buildings, adding 400,000 square feet, which will give current and new partners the ability to create 3,500 new jobs.

Currently, to access the Enterprise Campus or the eastern extent of the Louisiana Tech campus, a driver must travel through downtown Ruston or drive through the narrow campus streets. Downtown Ruston and the Louisiana Tech campus have robust sidewalk networks. However, there are no existing connections to the downtown area or the City of Ruston’s Greenway Network, which, once completed, will be the backbone for pedestrian and bicycle traffic.

The MSCP proposal utilizes many innovative techniques to develop a *Complete Streets* design while keeping the total cost of the project to a minimum. Through the utilization of “Brownfield” sites, an abandoned railroad bed, and road diets, the City of Ruston will be able to repurpose previously less valuable property for the construction of this project. In addition to redeveloping dilapidated infrastructure, the Project will create the **Smart Cities Innovation Testbed** (“SCITB” or the “Testbed”). This Testbed will enable communities to mitigate the effects of natural disasters using *Internet-of-Things* based sensor networks. The Testbed will (i) deploy intelligent street lighting to help reduce energy consumption, (ii) develop a dashboard that will allow commuters to see traffic and parking spaces in existing parking lots prior to committing to that location, and (iii) will collect data necessary to predict the intensity and location of damaging weather events and natural disasters.

## Baseline Conditions

The completion of the MSCP is imperative for the safe and efficient movement of pedestrians, commuters, and commerce over the roads and rail systems of Ruston and the surrounding region. According to statistics developed by the Louisiana Department of Transportation and Development (“LADOTD”), there has been a significant increase in the average daily traffic of LADOTD maintained routes over the last five years.

In addition, the volume of traffic accidents on the streets located surrounding the Project area have continued to increase, **36% since 2014, from 242 in 2014 to 330 in 2018**. Further, based on data from a 2016 Road Quality Survey by an experienced engineering firm, that significant investment is needed to maintain the roadways system in a safe and viable condition.

As explained in the Narrative, the majority of the existing roadways marked for improvement in this Project are currently in substandard condition. The local road network has fallen into a state of disrepair that requires continuous maintenance of the road surfaces and will not be alleviated until the roads and subsurface structures are rebuilt. These conditions will continue to be exacerbated due to consistent population growth, both locally and on the Louisiana Tech campus, and the vehicular centric nature of the existing infrastructure. In the areas where the subsurface drainage is inadequate, flooding will continue and further deteriorate the roads and create hazards for drivers.

### Impact on the Louisiana Center for the Blind

The City of Ruston is home to the Louisiana Center for the Blind, which is a nationally recognized school for blind. The Center provides real world training for visually impaired persons, which includes navigating public streets, and sidewalks, which is their primary method of travel to and from their residence, work, and other necessary goods and services. The lack of adequate pedestrian facilities creates life safety risks for the students/residents of the Center. The existing roadways in the City of Ruston lack pedestrian infrastructure in many locations, and, where present, such infrastructure is substandard with large conflict zones.

### Safety and Economic Restrictions

The parking areas that require the driver to reverse into the roadway would remain in place and continue to create vulnerabilities for passing vehicles and increase the likelihood of an accident. In addition to the issues along the roadways, Louisiana Tech would remain on a pedestrian island with no effective means of access outside of a vehicle. While the University has a robust pedestrian network, that network would remain disconnected to the City of Ruston’s pedestrian infrastructure. This lends to a primarily vehicular commuter environment and puts an unnecessary strain on the roadways and congested traffic.

### Innovation Constraints

If conditions remain the same, the City of Ruston and Louisiana Tech would not be able to create the **Smart Cities Innovation Testbed**. Without the data that would be collected and disseminated through the public interface, drivers would not be able to evaluate existing traffic and parking conditions. This would lead to users expending unnecessary time and/or resources and require them to drive around in the hope of finding available parking, ultimately compounding the negative impacts the local roads already face. Without the use of intelligent street lighting the City of Ruston would continue to waste energy during unnecessary times, and inadequately illuminate the roadway during adverse weather

conditions. Without upgrades to the infrastructure and the integration of the sensor nodes in the SCITB, cutting edge research and development in the field of autonomous vehicles will not be possible. In addition, the Enterprise Campus would not be able to support, attract or retain the 21<sup>st</sup> century cyber focused companies that currently contribute a large portion of regional economic stimulus.

If the MSCP does not receive funding, existing congestion on the surrounding roadways will continue to increase, the volume of traffic accidents will continue to increase and existing roadways would continue to fall into a deeper state of disrepair. All groups of people who lack access to vehicular transportation would continue to be susceptible to injury through conflicts with the existing environment. The speed in which transportation and commerce move would continue to be stifled, while innovation and research and development, in 21<sup>st</sup> Century technology, would not be possible.

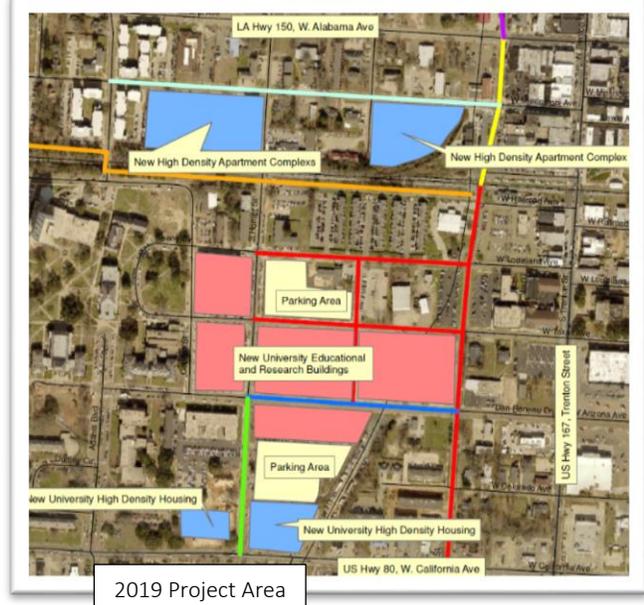
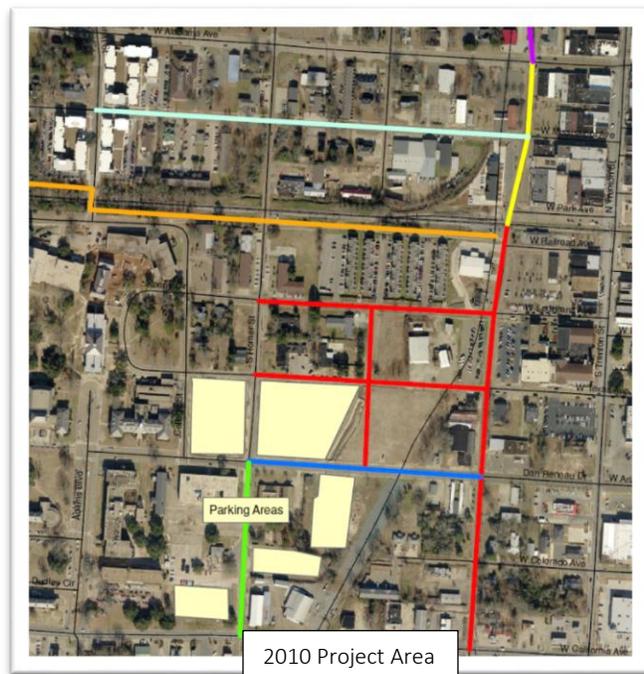
## Existing Travel Patterns

### Pedestrians

Currently, in the Monroe Street Corridor Project area, sidewalks are a) either sporadic or non-existent, b) in a state of disrepair, or c) unsafe due to a high frequency of vehicular crossings, with only one four foot wide sidewalk that connects Louisiana Tech Campus to downtown Ruston. In conjunction with the lack of pedestrian infrastructure, the University continues to push commuter parking further away from campus and repurpose the existing parking lots for educational buildings, with over 400 parking spots lost in the last year. This requires commuters to walk further to their destination and forces more students to opt for additional modes of transportation outside of a vehicle. Other users who are dependent upon pedestrian infrastructure, the local underserved community and students of the Louisiana Center for the Blind, are required to walk in the roadways. This unfortunate option puts these users in harm's way as they try to access essential goods and services.

### Bicycles

There are no dedicated paths for bicyclists to access the campus from the surrounding community. The City of Ruston continues to construct a robust network of



multiuse paths in conjunction with the Rock Island Greenway (the “Greenway”). However, the Greenway has not been constructed through downtown Ruston or Louisiana Tech’s Campus. Currently, anyone who opts to commute via bicycle must ride in the roadway which creates hazards for both the bicyclist and the vehicle while also slowing the vehicles travel speed. Upon its completion, the Greenway will act as the backbone for all multi-modal transportation throughout the City of Ruston and the region. Once again, as the University overtakes parking for new buildings, more commuters are electing for alternative means of transportation that require them to face conflicts with vehicular traffic.

## Vehicles

Presently, there are over 11,000 faculty, staff, students, and visitors who commute to and from the campus daily. This high volume of traffic causes existing routes, the majority of which are LADOTD routes, to experience persistent traffic. Due to the lack of an efficient alternative to the state owned roadways, these roadways rely on frequent maintenance to remain effective. The high traffic volumes increase the frequency of traffic accidents (average 297 annually), further slowing the rate of travel and commerce. Due to the vehicle-centric nature of the infrastructure, the majority of commuters rely on parking at the University. Coincidentally, as the University continues to eliminate parking, drivers are forced to drive around for longer durations looking for open parking places, an issue the SCITB would remedy.

On existing roads to be revitalized through the MSCP, vehicles must drive through poorly designed areas. The roadways are plagued with parking that must reverse into the travel lanes, poor surface conditions, and inadequate drainage.

## Project Improvements and Future Travel Patterns

### 1. *North Monroe Street*

The North Monroe Street component will establish a new north/south connection to the Interstate 20 corridor and allow vehicular traffic to travel directly into downtown Ruston, Louisiana Tech Campus, and the surrounding local residential areas. This new route will reduce the dependence on the existing north/south major arterial route, thus reducing the traffic volumes, necessary maintenance, and persistent traffic congestion currently experienced. In conjunction with the new roadway, this component will also establish a critical midsection of the Greenway, providing commuters the option to travel outside of a vehicle and giving the economically or physically limited community a safe and efficient route to jobs, healthcare, and other essential goods and services. This component will tie directly to the next component at the intersection of Monroe Street and Highway-150. Additionally, these improvements will bolster the electrical and fiber optic networks that serve downtown Ruston and the surrounding commercial and residential areas. This component will create time saving and safety benefits for users of the new road and anyone who chooses to use the existing arterial routes.

### 2. *Downtown Monroe Street*

The Downtown Monroe Street component will connect to three (3) other project components on the western edge of downtown Ruston. These improvements will eliminate hazardous parking conditions which require the driver to reverse into the travel lane, while connecting the Rock Island Greenway to the robust network of sidewalks throughout the downtown area. These connections are necessary for all travelers to safely visit any of the downtown attractions, while connecting the area to the bike/pedestrian network established by the Greenway. Downtown Ruston has seen a revitalization of

multiuse buildings, with commercial business on the ground floors and multifamily housing above, these new developments are highly pedestrian centric and essential to developing a healthy economic generator. This component will also add protections for bicyclists and pedestrians as they approach the Kansas City Southern Railroad (“KCSRR”) that runs east and west through downtown. The new infrastructure will reduce the potential of any accidents occurring at the road and rail intersection that could be fatal and inhibit the flow of rail commerce. This component will generate a noticeable safety benefit with the removal of angled parking that currently requires the driver to reverse into the roadway for egress.

### *3. Dan Reneau Drive*

The Dan Reneau Drive component will use innovative design strategies to transform an underutilized undivided four lane road into an efficient and safe route that stretches benefits for all users onto Louisiana Tech Campus. This component will rehabilitate a crumbling road surface and underground infrastructure while reducing the existing maintenance burden brought on by the wide roadway. In addition to creating a new eastern gateway for Louisiana Tech and the Enterprise Campus, this component will (i) consolidate multiple parking lot connections, (ii) establish in-road bike lanes, (iii) connect the remaining sections of the Rock Island Greenway, and (iv) be a critical facet to the SCITB . This components proximity to the research and development currently taking place in adjacent University buildings make this component necessary to implement the new technology in a real world environment and drive future progress in the related fields. The completion of this component will significantly enhance the prospects for development of additional Enterprise Campus property, enabling up to five (5) new multi-tenant facilities totaling over 400,000 square feet. Based on the impact of new economic activity in the first phase of the Enterprise Campus, this next phase, facilitated by the Monroe Street Corridor Project investment, could generate up to 3,500 new jobs with a total economic impact (direct and indirect) of over \$620m annually for the region. This component will provide significant economic benefit.

### *4. South Monroe Street, Texas, Louisiana Oilmill (South Monroe Area)*

The South Monroe Area component will carry improvements from the KCSRR to another major arterial route, US Highway 80, and then towards Louisiana Tech Campus along W. Texas Avenue, W. Louisiana Avenue, and Oil Mill Street. This component will establish a pedestrian activated crosswalk, which will cross the intersection of US Highway 80 and S. Monroe Street. Creating the stop condition will provide users with a safe crossing of the heavily trafficked arterial route and tie the MSCP to the previously revitalized portion of South Monroe Street. The improvements to this intersection will greatly increase the safety for all travelers crossing this juncture. This component will also stretch improvements towards Louisiana Tech Campus, rebuilding the deteriorating roadways and subsurface drainage to alleviate chronic road flooding, connecting the Greenway from the southern edge of the KCSRR to the portion established in the Dan Reneau Drive Component, establish an additional cog of the SCITB and ultimately create a streetscape environment conducive to attracting and retaining a 21<sup>st</sup> century knowledge base workforce. The construction of sidewalks along this component’s roadways will create safe pedestrian routes to serve the multiple apartment complexes adjacent to the Project area, as well as Louisiana Tech’s Early Elementary Education Center.

### *5. South Homer Street*

The Homer Street component will bring the proposed improvements from Dan Reneau Drive to US Highway 80. This area is plagued with prolonged flooding during minor rain events. This roadway is

exceptionally wide for two travel lanes, allowing for innovative design strategies that reduce the lane widths and subsequent pedestrian crossings. This roadway is flanked between new University high density residential buildings and existing research and development buildings making it another key component for the completion of the Smart Cities Innovation Testbed.

#### *6. West Mississippi Avenue*

The West Mississippi Avenue will extend the streetscape benefits enjoyed throughout Downtown Ruston approximately 1800 feet to Louisiana Tech owned student housing. In addition to rebuilding the substandard roadway and subsurface infrastructure, this component will connect multiple high density housing developments along the roadway, that currently lack multimodal connections, to both Downtown Ruston and Louisiana Techs Campus. These improvements will provide benefits to both safety and vehicle operating costs. Additionally, if users do choose to travel outside of a vehicle to local venues, these improvements could create additional time saving benefits due to the continued reduction of parking availability in both Downtown Ruston and on Louisiana Tech Campus.

#### *7. Louisiana Tech RR Path*

The Louisiana Tech Railroad Path Component will create a multiuse path along the unutilized fringes of the KCS Railroad right of way. Louisiana Tech has previously been granted an easement to construct a path in the outer 35 feet of the existing right of way. This path will produce the only pedestrian route between Downtown Ruston, Louisiana Tech Campus, and all of Louisiana Tech's athletic venues. This component will also be heavily intertwined with technology as well, creating a geofenced area that will be utilized for the research and development of autonomous passenger trollies and personal electric bicycles and scooters. The use of solar powered lighting will eliminate any energy consumption while sound barriers will deflect noise pollution emanating from the passing rail traffic. This component will offer significant savings to anyone who opts to travel outside of a car, mitigating the vehicle operating costs currently experienced.

## Benefits

Using the BCA Guidance for Discretionary Grant Programs, Dec 2018, **we determined the Benefit Cost Ratio to be 3.47**. The proposed improvements will relieve existing issues and produce quantitative benefits on multiple fronts. The establishment of a connection to the bicycle and pedestrian infrastructure between the City of Ruston and the Louisiana Tech campus will allow people to commute to and from school, work, Downtown Ruston, and surrounding attractions. The establishment of a new connection to the I-20 corridor will reduce ongoing congestion while improving local and interstate commerce, while the improvements to the existing infrastructure will improve the persistent flooding caused by inadequate subsurface drainage, and the relocation of overhead electric and telecommunications to underground will prevent future loss of economic output from outages.

## Economic Competitiveness

The Monroe Street Corridor Project, which falls directly in a Louisiana Opportunity Zone, will decrease transportation costs and improve reliable transportation opportunities for all users. These improvements will create new opportunities by providing reliable and efficient connections between frequent destinations. Travel time savings are based upon rerouting 40% of the Louisiana Tech commuter traffic, removing a significant volume of the local traffic from the surrounding LADOTD owned arterial routes ([LADOTD ADT](#)), and improving the efficiency for the current local traffic. Vehicle

operating costs savings were determined by assuming users would opt for transportation outside of a vehicle, thus saving operating costs. All values used came from the tables in the December 2018 USDOT BCA Guide. These improvements are estimated to produce an Economic Competitiveness Savings of **\$3,628,000 annually**.

The project will also relocate all overhead utilities underground, making them less susceptible to damage caused by drivers and adverse weather conditions. The utilities marked for relocation were heavily damaged when an F3 tornado touched down in Ruston on April 24th 2019. Due to the damage experienced during the storm, Downtown Ruston was without electrical and fiber optic telecommunication service for 11 days putting a heavy toll on the local small business community. If these utilities had been previously relocated the outage time could have been significantly mitigated to only a few days or even hours.

## Safety

The reduction in traffic volumes along the exiting arterial routes will have a compounding positive effect on the safety of these roadways. Between 2014 and 2018 the major arterial routes, surrounding the project area, have seen crashes **increase by 36% (242 in 2014 to 330 in 2018)**, largely due to growing congestion. It is assumed that, by providing a safe and efficient alternative route, the Monroe Street Corridor Project will reduce accidents on the major arterial roads surrounding the project area by 5% of the annual average (**15 of the 297 annual crashes**). While the improvements to the existing roadways will reduce accidents in the project area by 20% (**14 of the 69 annual crashes**).

The data collected by the Ruston Police Department does not classify the crash data by severity, however due to the high speeds of intersecting roads it is fair to assume that a small portion of the crashes would have a Moderate Severity while the bulk of the crashes would be minor. Due to the unsafe nature or complete lack of pedestrian infrastructure and the frequency that visually impaired students occupy the space one could assume that injuries could be more severe or fatal, however we did not monetize anything over moderate injury reduction. These improvements are estimated to produce a Safety Savings **\$1,936,000 annually**.

## Environmental Sustainability

The reduction of both travel times and miles driven in a vehicle will positively impact the environment by reducing the volume of air pollutants typically produced by automobiles. By increasing the efficiency in which vehicles can travel it is fair to assume that there will be less idling time, and faster routes to and from destinations. Upon completion of the Monroe Street Corridor Project commuters will have the ability to safely travel outside a vehicle. Those who choose this option will also reduce emissions by not driving a vehicle at all. The positive impacts of these improvements will be tracked through sensor motes installed in the **Smart Cities Innovation Testbed**. The resulting reduced emissions and the associated monetary value of this reduction was not quantified.

## Quality of Life

The construction of multiuse paths, sidewalks, bike lanes, and new roadways will improve quality of life by increasing the mobility options for all users. People who are forced to travel outside of a vehicle will have safe and efficient access to necessary goods and services. The value of this benefit was not quantified.

## Non Quantified Benefits

- Intelligent lighting will reduce unnecessary energy consumption
- The data collected through the weather sensors in the SCITB could help predict and mitigate damages from major weather events
- The data collected through the SCITB will be easily scalable for application in both rural and urban environments throughout the United States
- Increased cross connections will establish safer and more efficient routes for emergency responders
- The relocation of electrical and telecommunication infrastructure from overhead to underground will mitigate the potential of disruption during weather events or damages caused by vehicles in the roadway
- Property values of the surrounding areas would increase due to the infrastructure investment and the project would create adequate access to property that is either undeveloped or currently under utilized
- Moving traffic away from existing routes will mitigate maintenance needs on those routes
- The completion of these infrastructure initiatives are paramount to recruiting and retaining 21<sup>st</sup> Century growth companies

## Costs

The proposed project is estimated to have a 30 year life span, with \$50,000 (NPV) of annual maintenance and \$500,000 (NPV) of maintenance every 10 years. With the total non-discounted Costs of \$26,932,504. The total costs for engineering and design, construction, and construction management for all seven components is \$23,628,144. The City of Ruston, with our partner Louisiana Tech University, will pay \$6,508,369, or 27.5%, of the total costs.

|                    | Non Discounted Totals | 7% Discount Rate Totals |
|--------------------|-----------------------|-------------------------|
| Total Benefits     | \$238,915,518         | \$79,703,613            |
| Total Costs        | \$26,932,504          | \$22,991,110            |
| Net Benefits       | \$211,983,014         | \$56,712,503            |
| Benefit-Cost Ratio | 8.87                  | 3.47                    |

## Summary

The proposed project is expected to relieve the regular gridlock on the surrounding arterial routes, decrease crash frequency, increase safety for all modes of transportation, protect the electrical and fiber optic networks, and improve the quality of life for anyone traveling in or through the City of Ruston. These projects, undertaken by the City of Ruston and Louisiana Tech University, will have tremendous benefits in the research and development of autonomous vehicles, environmental protections, and traffic management and will continue to carry the region into the 21<sup>st</sup> Century.

## References

Louisiana Department of Transportation and Development ADT  
<http://wwwapps.dotd.la.gov/engineering/tatv/>

City of Ruston Police Department Crash Data

City of Ruston Master Plan “Ruston Reimagined”

City of Ruston 2016 Street Survey, Lazenby & Associates

Louisiana Tech Enterprise Campus Master Plan

US DOT – Benefit Cost Analysis Guidance for Discretionary Grant Programs, December 2018