

RAISE Grant 2021



City of
TUSCALOOSA

Tuscaloosa University Boulevard Corridor Project

Department of Transportation RAISE Grant 2021

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I. Project Description

The City of Tuscaloosa requests **\$18,808,404** from the U.S. Department of Transportation for a RAISE grant for the Tuscaloosa University Boulevard Corridor project. On this project, the federal funds will be augmented with at least \$8.5 million from local sources. The Tuscaloosa University Boulevard Corridor project consists of seven components: (1) University Boulevard East Sidewalk Improvement Project - 30th Avenue East to Crescent Ridge Road, (2) Underground Utility Installation - 20th Avenue to 21st Avenue, (3) Security Enhancements - Gene Stallings Avenue to Frank Thomas Avenue, (4) Landscape Improvements - Lurleen Wallace Boulevard North to Greensboro Avenue, (5) Western University Boulevard Section I - 21st Avenue to Queen City Avenue, (6) Western University Boulevard Section II - Queen City Avenue to Reed Street, and (7) Western University Boulevard Section III - Reed Street to Wallace Wade Avenue. The Tuscaloosa University Boulevard Corridor project represents a collaborative initiative between many diverse stakeholders including the City of Tuscaloosa, the University of Alabama (UA), and the Alabama Department of Transportation (ALDOT) to develop a project which will leverage previous investments to provide a broad impact on Tuscaloosa and the West Alabama Region. This is for transportation system improvements around the proximity of University Boulevard and US Highway 82 (US 82) in Tuscaloosa, Alabama.

The project addresses traditionally disparate components of the area in a unified manner and the scope includes innovative approaches to address safety, accessibility in and through West Central Alabama. The project will address aging and functionally obsolete infrastructure, connect pedestrian access across the city, address storm water issues, and make technology upgrades. The project will include transportation improvements, technology upgrades, and storm-water drainage improvements to address resiliency and environmental issues and ensure the overall state of good repair to serve the needs of rural and urban populations effectively and efficiently in this region.

The project focuses investments in an area which generates over \$4 billion annually in economic productivity, serves as a major education, employment, and health care hub in the region, and addresses transportation. The benefits and outcomes of the project are in close alignment with and directly meet the merit criteria and goals of the RAISE grant program.

Figure 1: Project Overview



II. Project Location

Project Area

Early History

Tuscaloosa had long been known to the various Native American tribes as the southernmost part of the Black Warrior River which could be crossed under various conditions. As a result, the area became a converging spot for a network of trails that would later lead white frontiersmen there in the 19th century. The town of Tuscaloosa was incorporated in 1819 following Alabama becoming a territory in 1817. From 1826 to 1846, Tuscaloosa was the state capitol and the University of Alabama was established in 1831. By 1845, the town's population increased but fell significantly when Montgomery was declared the state capitol. By the 1890s, the construction of a system of locks and dams on the Black Warrior River by the U.S. Army Corps of Engineers had opened an inexpensive link to the Gulf seaport of Mobile, stimulating industries in the region. Tuscaloosa continued to grow both in land area and population through the decades but not always proportionally. The city saw a steady growth from the early 1900's up until the 1980s and 1990s. During this time, population growth slowed while land area continued on a similar pace to previous decades. Since the 1990s, most of the city's population growth has been occurring in areas within the existing incorporated area resulting in a slowing annexation rate.

Regional Context

Tuscaloosa is located in Tuscaloosa County and is the center of the West Alabama region which includes Bibb, Fayette, Greene, Hale, Lamar, Pickens and Tuscaloosa counties. The city is well connected to the region by Interstate 20/59 with roughly an hour's drive to Birmingham, the largest city in the state. As part of this corridor, the city is connected to a larger mega-region centered in Atlanta, Georgia, the Birmingham-Atlanta-Greenville-Charlotte region.

Elevate Tuscaloosa

Elevate Tuscaloosa is a community-driven plan and process for strategically investing in education, cultural arts, tourism, parks, recreation, and connectivity. A 30-member volunteer advisory council is led by two co-chairs, who together represent a wide swath of the local economy and community. This body is divided into three subcommittees: Connectivity; Cultural Arts and City of Tuscaloosa Tourism; and Parks and Recreation. From each subcommittee, two members also serve on the Financial Analysis Subcommittee, a group charged with considering accountability, transparency, economic impact, and financial sustainability of Elevate initiatives. When the Elevate Tuscaloosa plan was adopted by the City Council, specific initiatives were included for immediate funding, future construction, or additional study to determine feasibility. The Advisory Council engages with the community, city staff, and technical experts to provide input, ideas, feedback, and guidance for the process. This approach ensures the investments made with Elevate Tuscaloosa will be impactful in the city for years to come.

Elevate is currently proposing to invest \$127,500,000 over the next 10 years in Tuscaloosa’s experience economy. These projected investments include experience venues, outdoor and recreational facilities, and events. The decision to invest in an experience-based economy through Elevate was based on Tuscaloosa’s unique demographics. Three local colleges and universities afford Tuscaloosa with a student enrollment of nearly 40,000, resulting in a noticeably younger population. Currently, nearly three-quarters of graduates choose where to live based on quality-of-life. A major goal of Elevate Tuscaloosa is to expand offerings to residents through high-quality experiences, including performing arts, sporting events, parks, recreation, and others.

Project Location

Tuscaloosa is a regional center for education, employment, and health care opportunities. Key among these are the University of Alabama, Mercedes Benz USI (MBUSI, the North American factory for Daimler), the DCH Health System (DCH), and the Alabama Department of Mental Health Bryce Hospital (ADMH). The table below shows some of their key characteristics.

Key Characteristics			
Key Facilities	Facility Characteristics		
University of Alabama	13,200 Employees	38,500 Students (Tuscaloosa Campus)	
Mercedes Benz USI	7,000 Employees	8,000,000 Square Feet	
Alabama Dept. of Mental Health	539 Employees	268 Beds	300 Patients
DCH Health System	3,500 Employees	568 Beds	600 Patients (per day)

UA in partnership with ALDOT has also been investing in significant infrastructure improvements along the University Boulevard corridor as well as across the UA campus guided by their University Campus Master Plan. The *Tuscaloosa University Boulevard Corridor Project* would align with the University’s goal of creating a more pedestrian-friendly campus and facilitate improved traffic operations.

Project Components

Figure 2: University Boulevard Corridor Improvements Task Order Directive #2



University Boulevard East Sidewalk Improvement Project 30th Avenue East to Crescent Ridge Road

University Boulevard in this area is currently the one of only two east-west connections. The other is Alberta Parkway that extends from 25th Avenue East to Kicker Road. This project component extends connectivity from low-income residential areas to institutions (UA, DCH, ADMH), jobs, grocery stores, and schools, extending the pedestrian network and enhancing pedestrian safety in primarily low-income areas, and making aesthetic improvements along this pedestrian corridor from landscaping and underground utilities.

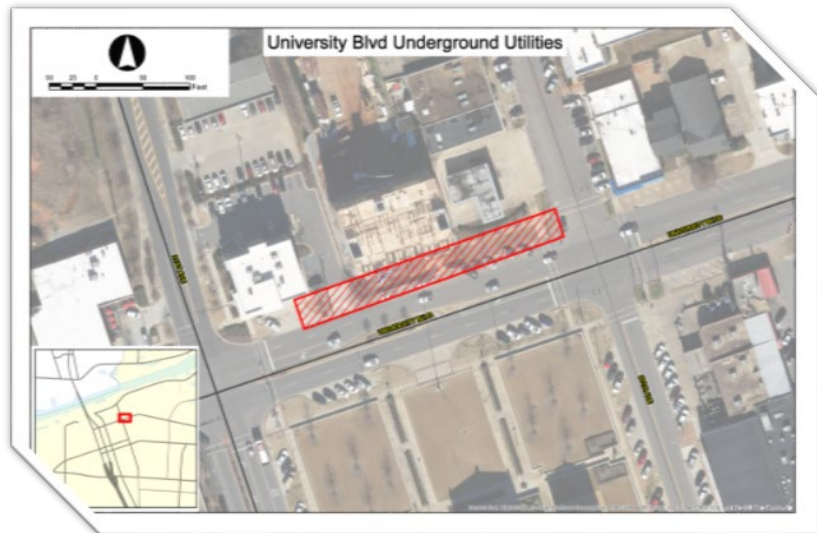


Improvements include curb, gutter, and drainage construction to improve pedestrian safety and roadway safety by reducing standing water and reducing localized flooding in adjacent areas. Landscaping also helps improve

drainage, reduce erosion, and combat the heat island effect. Drainage improvements will support a 25-year storm event.

Underground Utility Installation 20th Avenue to 21st Avenue

This project component is a continuation of making improvements to University Boulevard for the purpose of converting to underground utilities. In addition to being an aesthetic improvement, underground utilities will decrease power outages and, in effect, reduce the strain on City and contract resources needed to make repairs and associated costs in the event of outages.



Security Enhancements

Gene Stallings Avenue to Frank Thomas Avenue

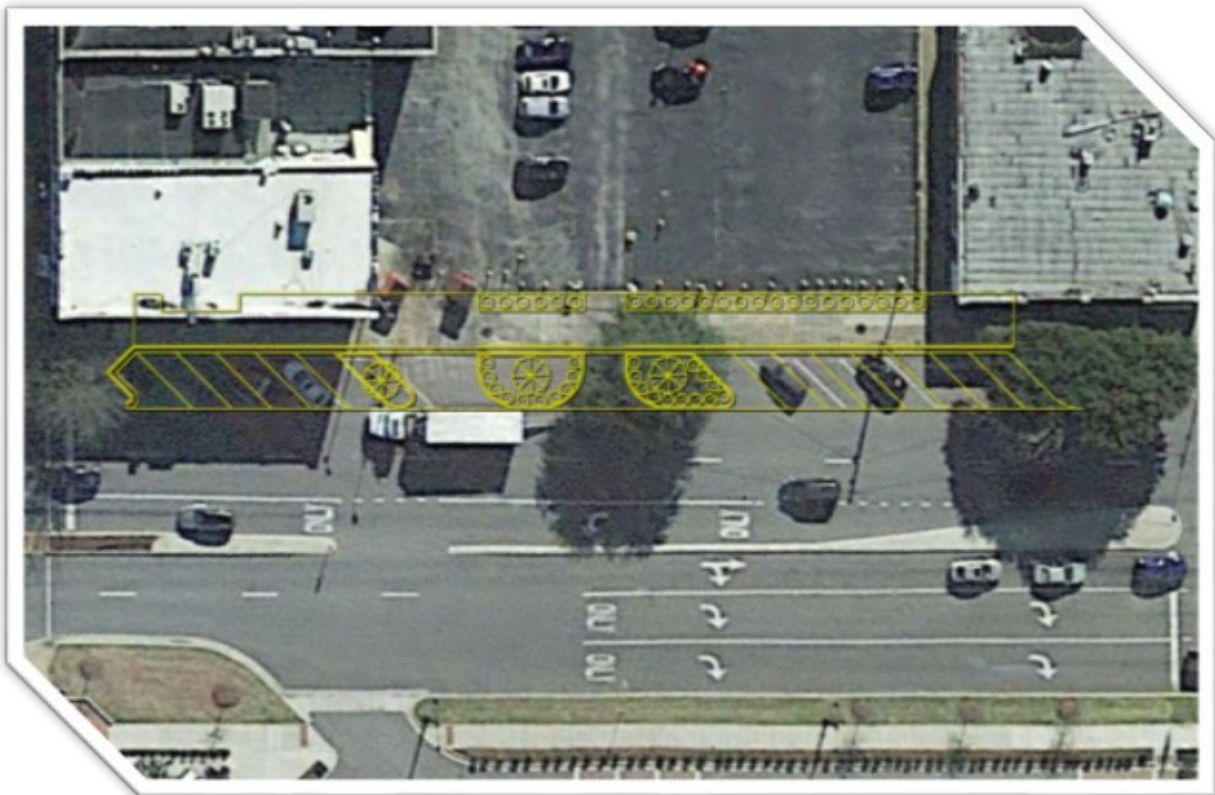
This project component extends connectivity from residential areas and businesses to institutional areas for access to jobs, grocery stores, and retail. Additional bicycle lanes will be added to connect downtown to the University of Alabama, extending the multi-modal pedestrian network. On-street parallel parking will be removed, and one-way side streets will improve traffic circulation, improving traffic flow for emergency vehicles and decreasing carbon emissions from reduced traffic.

Curb, gutter and drainage improvements will enhance pedestrian safety and roadway safety by reducing standing water, and in effect reduce localized flooding in adjacent areas. Landscaping will improve aesthetics and help improve drainage, reduce erosion, and prevent the heat island effect. Landscaping will also improve area aesthetics.

Landscape Improvements

Lurleen Wallace Boulevard North to Greensboro Avenue

This project component consists of landscape improvements and underground utilities. Landscape improvements include items such as median islands and roadside landscaped areas with enhanced landscaping in the public right-of-way. Landscaping also serves to improve drainage, reduce erosion, and prevent the heat island effect.



Western University Boulevard Section 1 21st Avenue to Queen City Avenue

This project component will extend the pedestrian network for both foot and bicycle traffic, extend connectivity from residential areas and businesses to institutions, grocery stores, jobs, and retail, and connect downtown to the University of Alabama with the addition of new bicycle lanes.

Curb, gutter and drainage improvements will enhance pedestrian safety and roadway safety by reducing standing water, and in effect reduce localized flooding in adjacent areas. Drainage improvements will support a 25-year storm event. Landscaping will improve aesthetics and help improve drainage, reduce erosion, and prevent the heat island effect. Landscaping and underground utilities will also improve area aesthetics.

Western University Boulevard Section II Queen City Avenue to Reed Street

This area of improvement extends connectivity from residential areas and businesses to institutional areas, as well as grocery stores and retail, expanding the pedestrian network for both foot and bicycle traffic, connecting downtown to the University of Alabama with additional bicycle lanes.

This improvement will reduce the street from four to three lanes, prioritizing pedestrian safety and mobility. Curb, gutter, and drainage will improve roadway safety and reduce localized flooding in adjacent areas by reducing standing water. Landscaping will also help improve drainage, reduce erosion, and prevent the heat island effect. Drainage improvements support a 25-year storm event. Landscaping as well as underground utilities will aesthetically improve the area.

Western University Boulevard Section III Reed Street to Wallace Wade Avenue

This area of improvement extends connectivity from residential areas and businesses to institutional areas, as well as grocery stores and retail, expanding the pedestrian network for both foot and bicycle traffic, connecting downtown to the University of Alabama with additional bicycle lanes. On-street parallel parking will be removed.

Curb, gutter, and drainage will improve roadway safety and reduce localized flooding in adjacent areas by reducing standing water. Landscaping will also help improve drainage, reduce erosion, and prevent the heat island effect. Drainage improvements support a 25-year storm event. Landscaping as well as underground utilities will aesthetically improve the area.

Comprehensive Plan Informs Project Components

Tuscaloosa’s Comprehensive Plan defines the street design in Tuscaloosa by layering the roadway functional classification with land use context. This helps to create a multimodal transportation system that is consistent with and supportive of land use decisions.

Tuscaloosa's code currently employs the following functional classification system:

- Interstate
- Principal Arterial
- Minor Arterial
- Major/Minor Collector
- Local

These street functional classifications, coupled with the city’s future land use character areas, lead to a street design matrix that provides a framework for decision making and guidance for how to balance competition among travel modes, design, and prioritize the available right-of-way.

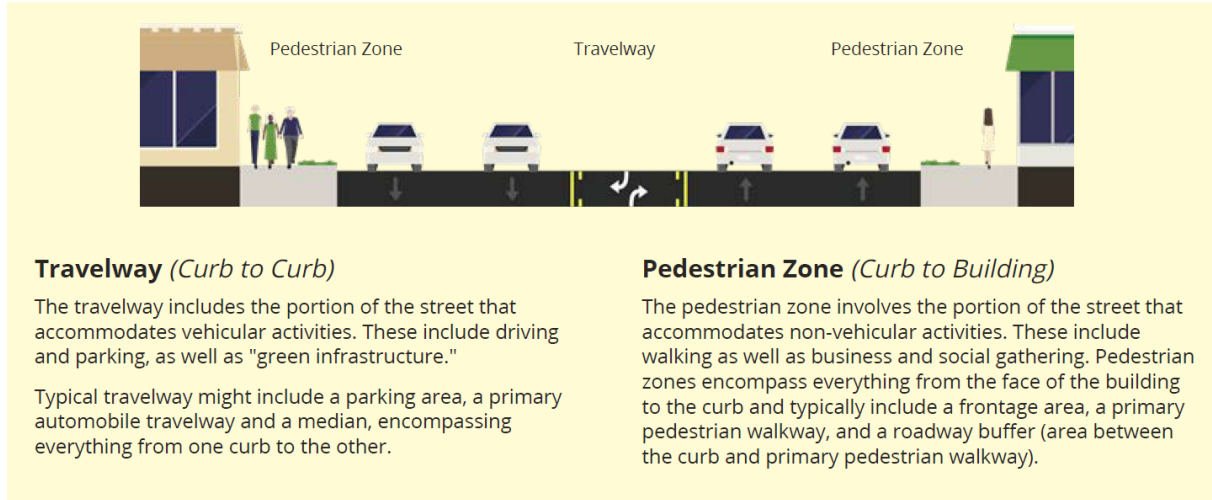
The Future Land Use and Character Map expresses the city’s intent for how Tuscaloosa should use its land resources in the future. For the entire city and its planning jurisdiction, this map

Consolidated Category	Land Use Character Type
Mixed Use and University Centers	Downtown Core Downtown Edge Campus Services University Campus Riverfront Development Civic/Institutional

identifies future character types. These places share attributes of urban form and function, including characteristics of transportation design and mobility. The Functional Class and Land Use Map on the following page references five Character Type groups. These groups are mostly the same as shown on the Future Land Use Map, with one exception. The

university categories and institutional categories have been reassigned to more closely align with the likely mixed-use context. It should be noted that the street design associated with an institutional use is more likely to align with the context (e.g. urban, suburban, ex-urban) in which that use is located.

The Street Design Priority Matrix establishes the priorities for trade-offs we often debate when dealing with limited right-of-way. The matrix reveals ideal design elements and key priorities (high, medium, and low) for a variety of characteristics based on the functional classification of the roadway and the land use context in which it is located. The matrix organizes these characteristics by street realm (Travelway, Pedestrian Zone, and Other). The purpose of these charts is to guide the planning and design of new roadways, and improvement of existing roadways. Items of high importance should be prioritized in the design process based upon the context in which the road is built.



For clarity, the street design matrix has been divided into four different tables based on the four main land use contexts (Mixed-Use & University Centers, Commercial Centers, Neighborhoods and Residential Areas, and Industrial Centers). Then it is further broken down into three street realm groupings (Travel Way, Pedestrian Zone, and Other). Colored boxes are placed in the table to indicate a high priority, medium priority, or low priority. The street design matrix is intended to be a general reference that helps set basic guidelines as a starting point for associated policies, such as the city of Tuscaloosa Transportation Standards.

Mixed-Use & University Centers

TRAVEL WAY	Principal Arterial	Minor Arterial	Major/Minor Collector	Local
Number of Through Lanes	2 - 4 (6)	2 - 4	2 - 4	2
Width of Travel Lanes (ft)	11' - 12'	10' - 12'	10' - 12'	9' - 11'
Target Speed (mph)	35 - 45	25 - 35	25 - 35	25
Design for Larger Vehicles	MEDIUM	MEDIUM	LOW	LOW
Multimodal Intersection Design	HIGH	HIGH	HIGH	LOW
Vehicle Throughput at Intersections	HIGH	MEDIUM	MEDIUM	LOW
On-Street Parking	LOW	MEDIUM	HIGH	HIGH

PEDESTRIAN ZONE

	Principal Arterial	Minor Arterial	Major/Minor Collector	Local
Landscaping/Street Trees	HIGH	HIGH	MEDIUM	MEDIUM
Buffer Zone	HIGH	HIGH	MEDIUM	LOW
Street Furniture	LOW	HIGH	HIGH	MEDIUM
Standard Sidewalks	MEDIUM	MEDIUM	MEDIUM	HIGH
Wide Sidewalks	HIGH	HIGH	HIGH	LOW
Public Art	MEDIUM	MEDIUM	HIGH	LOW

OTHER

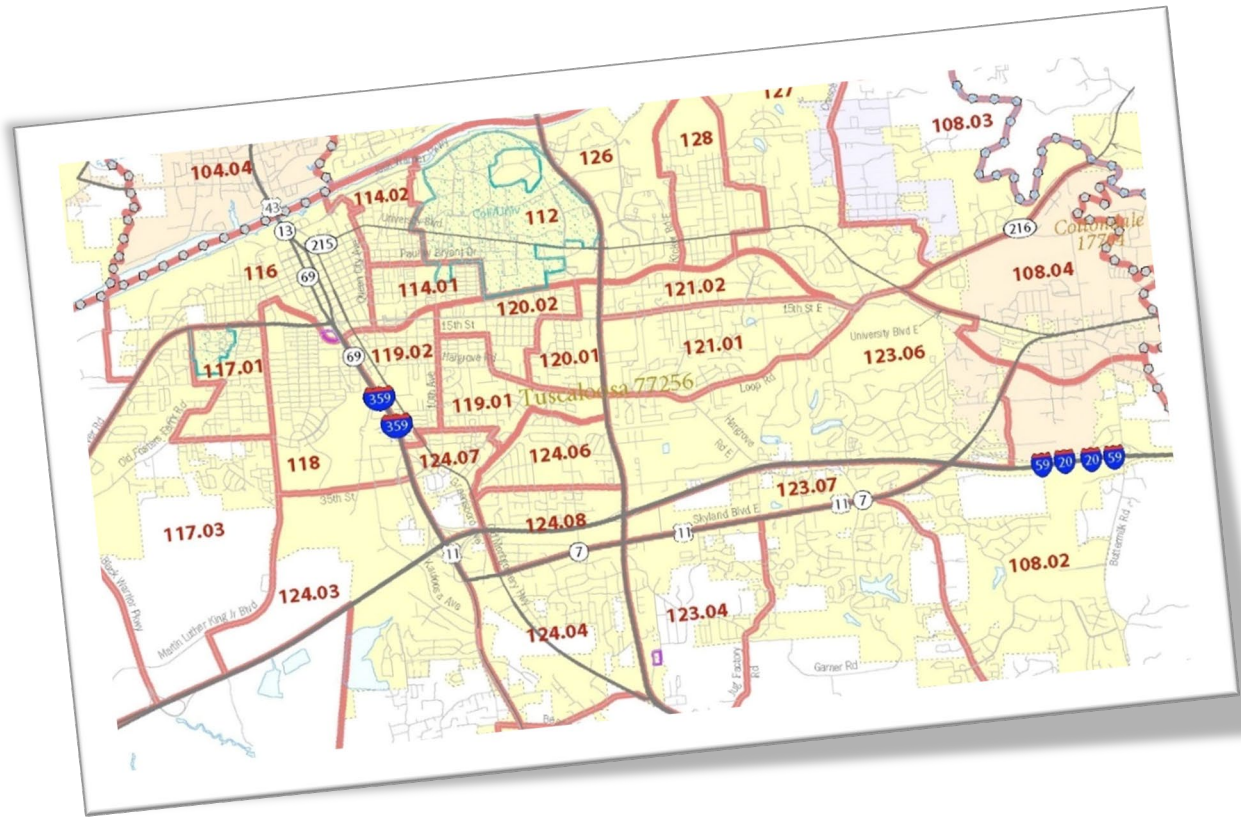
	Principal Arterial	Minor Arterial	Major/Minor Collector	Local
Access Management	HIGH	MEDIUM	LOW	LOW
Medians	HIGH	MEDIUM	LOW	LOW
Bicycle Accommodation	MEDIUM	HIGH	HIGH	LOW
Transit Accommodation	HIGH	MEDIUM	LOW	LOW

MULTIMODAL STREET DESIGN TABLE

	Functional Class	Number of Lanes	Target Speed	Preferred Bike Facility	Preferred Pedestrian Facility
Mixed Use & University Centers	Principal Arterial	2-4	35-45	Multiuse Path	Multiuse Path
	Minor Arterial	2-4	35	Protected Bike Lane	Wide Sidewalks
	Major/Minor Collector	2-4	35		
	Local Streets	2	25	Bike Lane	Standard Sidewalks

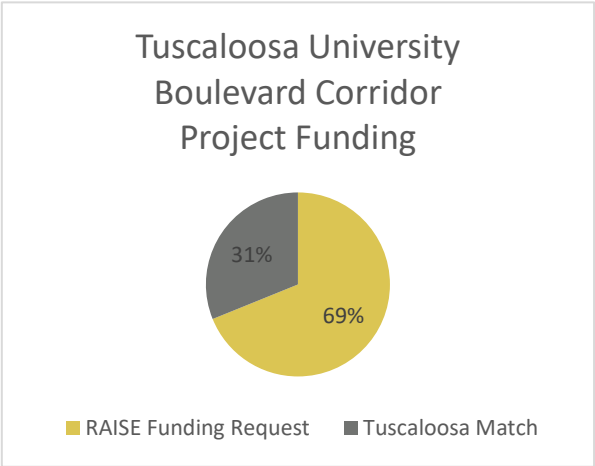
Area of Persistent Poverty

Persistent Poverty Census Tracts Along University Boulevard				
State	County	Census Tract Name	County Meets Definition?	Census Tract Meets Definition?
Alabama	Tuscaloosa County	Census Tract 108.04	No	Yes
Alabama	Tuscaloosa County	Census Tract 112	No	No
Alabama	Tuscaloosa County	Census Tract 114.01	No	Yes
Alabama	Tuscaloosa County	Census Tract 114.02	No	Yes
Alabama	Tuscaloosa County	Census Tract 116	No	Yes
Alabama	Tuscaloosa County	Census Tract 126	No	Yes
Alabama	Tuscaloosa County	Census Tract 127	No	No
Alabama	Tuscaloosa County	Census Tract 128	No	Yes



III. Grant Funds, Sources, and Uses of all Project Funding.

The City of Tuscaloosa is requesting **\$18,808,404** in RAISE Grant Funding to match the approximately **\$8.5 million** from Elevate Tuscaloosa and the City of Tuscaloosa General Fund for the construction of the proposed *Tuscaloosa University Boulevard Corridor Project*. The breakdown of funding offered as a match to RAISE Grant funding has been provided in the “Partnership” section of this grant application. Evidence of funding commitment is provided as an appendix. These matching dollars are non-Federal funds that will be used to design and construct the project. There currently are no other federal funds designated to this project. This project represents an excellent example of how private/public partnership can come together to construct a much-needed infrastructure project to enhance the community on multiple levels. This project has community support and financial support from the local government. The Alabama Department of Transportation has also been instrumental in providing funding and technical support to improve this infrastructure through other projects along the University Boulevard corridor.



Project Costs

The following information provides a breakdown of the capital costs associated with the construction of the proposed *Tuscaloosa University Boulevard Corridor Project*. These capital costs were estimated based on quantities developed from the preliminary design of the roadway and applying a bid price to each item based on local historic bid information and Alabama Department of Transportation bid tabs. The project also includes a contingency of 10% to account for unanticipated expense during the design and construction phases.

Tuscaloosa University Boulevard Corridor Project Components	Estimated Cost
University Boulevard East Sidewalk Improvement Project - 30th Avenue East to Crescent Ridge Road	\$7,926,700.00
Underground Utility Installation: 20th Avenue to 21st Avenue	\$142,980.00
University Boulevard Security Enhancements - Gene Stallings Avenue to Frank Thomas Avenue	\$1,400,824.00
Landscape Improvements - Lurleen Wallace Boulevard North to Greensboro Avenue	\$102,400.00
Western University Boulevard Corridor Improvements Section I - 21st Avenue to Queen City Avenue	\$5,651,500.00
Western University Boulevard Corridor Improvements Section II - Queen City Avenue to Reed Street	\$6,399,000.00
Western University Boulevard Corridor Improvements Section III - Reed Street to Wallace Wade Avenue	\$5,685,000.00
Total	\$27,308,404.00

IV. Selection Criteria

Primary Selection Criteria

Safety

The safety benefits from lighting improvements, curbs installation and bike lanes installation completed on the segment of University Boulevard between Gene Stallings Avenue and Frank Thomas Avenue were included in the economic benefits calculations completed for the Western University Boulevard Corridor Improvements Section III - Reed Street to Wallace Wade Avenue to avoid double-counting of these benefits.

Safety Benefits of the University Boulevard Corridor	
University Boulevard Corridor Segment	Safety Benefits
University Boulevard East Sidewalk Improvement Project - 30th Avenue East to Crescent Ridge Road	Installation of curbs, and roadway lighting improvements reduce the number of crashes involving vehicles, bicycles, and pedestrians.
Underground Utility Installation - 20th Avenue to 21st Avenue	Lighting improvements reduce the number of crashes involving vehicles, bicycles, and pedestrians.
University Boulevard Security Enhancements - Gene Stallings Avenue to Frank Thomas Avenue	<p>Installation of bike lanes and curbs, and lighting improvements reduce the number of crashes involving vehicles, bicycles, and pedestrians (for this segment, these quantifiable benefits are included in the University Boulevard Section III safety benefits calculations).</p> <p>Resurfacing of this portion of University Boulevard will generate additional safety benefits by reducing the number of crashes on this segment.</p>
Landscape Improvements - Lurleen Wallace Boulevard North to Greensboro Avenue	Lighting improvements and curbs installation reduce the number of crashes involving vehicles, bicycles, and pedestrians.
Western University Boulevard Corridor Improvements Section I - 21st Avenue to Queen City Avenue	Installation of a landscaped median, curbs and bicycle lanes, and lighting improvements reduce the number of crashes involving vehicles, bicycles, and pedestrians.
Western University Boulevard Corridor Improvements Section II - Queen City Avenue to Reed Street	Installation of bicycle lanes and curbs, and lighting improvements reduce the number of crashes involving vehicles, bicycles, and pedestrians.
Western University Boulevard Corridor Improvements Section III - Reed Street to Wallace Wade Avenue	Installation of bicycle lanes and curbs, and lighting improvements reduce the number of crashes involving vehicles, bicycles, and pedestrians.

Some of the improvements included in the scope of work for each of the seven segments of the University Boulevard Corridor Improvement Project do not result in any quantifiable economic benefits and therefore were not included in the economic benefits calculations. Particularly, the calculations of economic benefits from the following improvements were not included in the BCA: decorative improvements, irrigation, landscaping, improvement of traffic light loop detectors and cameras operations, traffic light signal head adjustments, demolition of existing elements, conduit for underground utilities, water main and sanitary sewer relocation, installation of retractable bollards, and roadway signing and striping. Although these improvements may definitely have a positive impact on the communities affected by the project and improve the quality of life of community members, they may not significantly affect mobility, traffic volume, travel time, speed or safety within the study area.

All segments of the study area, except for the University Boulevard East Sidewalk Improvement Project segment, currently have sidewalks installed. Although improving the condition of existing sidewalks may improve the quality of life in the communities affected by the project, mobility, traffic volume, travel time, speed or safety may not be significantly affected. There are currently no sidewalks installed along the East Sidewalk Improvement Project segment of the University Boulevard. Previous research shows that sidewalk installation may help reduce the number of crashes involving pedestrians, assuming that the volume of pedestrians walking along the studied segment of road remains the same (McMahon, 2002). However, in many cases, it may be expected that the installation of sidewalks may encourage more pedestrian traffic in the area which in turn may lead to an increase in the number of crashes on the studied segment of the road (Alluri et al., 2017; Raihan et al., 2019). Since the effect of sidewalk installation on crash statistics in the study area is unclear without a more extensive analysis, the calculation of safety benefits from sidewalk installation were omitted from this study.

Environmental Sustainability

The *Tuscaloosa University Boulevard Corridor Project* has numerous natural resources that contribute to the social, economic, environmental, and aesthetic qualities of the area. The City of Tuscaloosa has consulted with its team of in-house environmental experts to further develop a better understanding of the environmental issues related to the construction of this project. The review from both the consultant and our in-house experts provided no significant environmental concerns pertaining to construction of this new roadway. A more comprehensive environmental review of the project is expected as the design of the project advances.

Tuscaloosa intends to protect, preserve, and enhance important and fragile ecosystems within developed portions of the community. It will strive to use its natural and open lands for parks and for passive and active recreation.

The citywide Future Land Use Plan has five major themes:

- a. *Protect Tuscaloosa's Green Infrastructure.* Tuscaloosa will protect, preserve, and enhance fragile ecosystems within the Study Area. It will strive to protect, preserve for future generations, and use its natural and open lands for conservation areas, parks, and active and passive recreation.
- b. *Maintain Gateways to the City and Enhance Community Character.* The City will preserve its special qualities, including its green infrastructure, historic buildings, pedestrian scale, university settings, high-quality architecture, and beautiful streets and parks. Maintaining gateways to the City and enhancing the physical qualities of the City is an overarching consideration, incorporated in all parts of the Plan.
- c. *Build a City of Neighborhoods.* Tuscaloosa will grow by replicating the best characteristics of historical Tuscaloosa in selected locations throughout and around the City. Generally, this means that Tuscaloosa will: 1) support, maintain and enhance Downtown Tuscaloosa as the heart of the City; and 2) focus people toward low to medium density neighborhoods and high-density housing in mixed-use areas at strategic locations. Tuscaloosa envisions population growth organized into compact neighborhoods that focus upon and complement a green infrastructure—with mixed use cores supported by a diverse population that reflects the human scale and pedestrian orientation of the community.

d. *Expand Transportation and Accessibility Opportunities.* Tuscaloosa will strive to reduce the dominance of the automobile in development decisions and reduce the impacts of vehicles on the environment through development of integrated, mixed land uses that will improve accessibility options for pedestrians, bicyclists, boaters and transit-users. Over time, Tuscaloosa will place greater emphasis on improving multimodal transit options, and on improvements to its pedestrian, bicycle and boating facilities.

e. *Protect and Reinvest in Older Neighborhoods and Commercial Corridors and Centers.* Tuscaloosa will reinvest in older traditional neighborhoods, primary commercial arterial corridors, and commercial activities that are not up to the standards of the community.

The City has major points of entries from nearly every direction. These gateways and the corridors they introduce form a major part of the image of the community and should be treated as scarce assets to be protected and preserved.

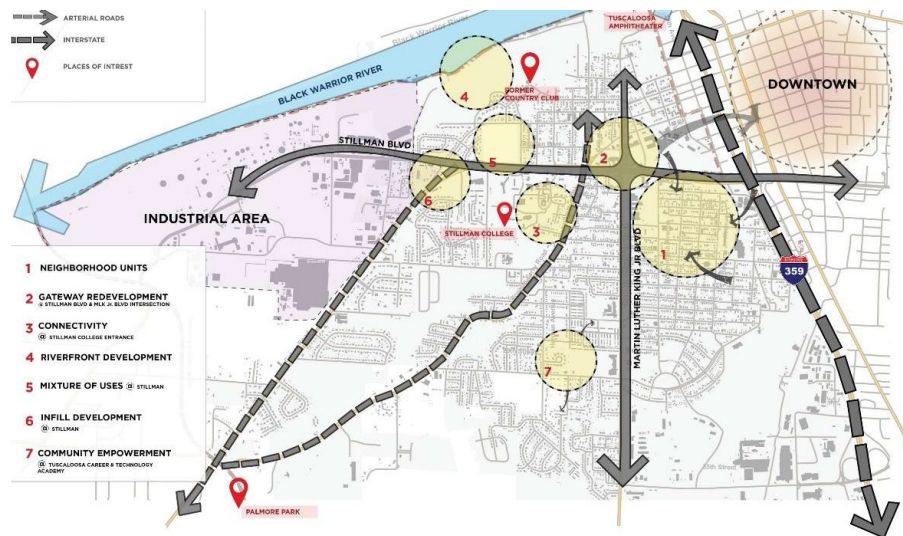
Community identity is strengthened by high-quality gateways, which help establish strong edges, foster a sense of pride and of place, and create a sense of arrival. By taking appropriate care with development along these corridors and adjacent to its major gateways, the city can help to further the community's marketability by helping to attract businesses, visitors, residents and investors.

The community's major streets are the gateways to its development focus areas and neighborhoods, and consequently they tend to convey a lasting image to residents, business and industry, and passersby. They should be safe, comfortable, shaded, calm, connected and interesting. This is not simply a matter of aesthetics; the community's economy is tightly linked to its physical character, and everyone must continually strive to enhance the City of Tuscaloosa's image for it to remain competitive.

Quality of Life

This project improves the quality of life of area residents and employees by supporting five of the six "Livability Principles" developed by USDOT, along with the Department of Housing and Urban Development (HUD) and the Environmental Protection Agency (EPA) as part of the Partnership for Sustainable communities.

Development's impact on the quality of life for a community should be a primary cornerstone of the why, how, and what of a project. Quality of life impact is often an intangible, but ultimately it is reflected in the faces of the citizens and the statistics that are too often used to define a



community. To better understand the impact of the built environment the Community Guide has extensively researched this relationship and demonstrated the clear benefit between design elements, connected services, and the quality of life in a community, and then documented project characteristics that enhance them through the principles of evidence-based design.

This recipe of what creates great communities and place may appear formulaic, but it works. We know it intuitively when we think of places we want to visit and live – it is the tree-lined hometown street with people on the sidewalk, a great river walk, or the “go to” park in a community. It is a place that is comfortable, safe, beautiful, convenient, and connected. It is a place that encourages, supports, and provides access to the functions necessary for a quality human experience – the place well lived-in.

The proposed *Tuscaloosa University Boulevard Project* is special in its ability to achieve this. This project, located in the heart of Tuscaloosa serves as the epicenter for jobs, healthcare and wellness services, recreation and sports, commerce, and education and is the key connective corridor for access to these services.

The *Tuscaloosa University Boulevard Project* will incorporate these proven elements to provide a cohesive experience throughout the Tuscaloosa Community. Tuscaloosa is poised to be a major player in the experiential economy and placemaking will be a key element in the success of that. We have a diverse population with students from across the geographic and demographic spectrum, a high percentage of minorities, and great historic neighborhoods. We are beginning to see a level of connection and positive interaction between these communities that has not been seen before. This is enhancing social interaction and reinforcing the social fabric of the community. Tuscaloosa has the bones, and this project will strengthen and connect them!

Economic Competitiveness

The City of Tuscaloosa and the greater West Alabama region are poised for rapid economic growth, provided the area can keep up with infrastructural demands. Business sources including *Forbes* and *Kiplinger's Personal Finance* magazines, rank the Tuscaloosa/Birmingham region as among the best locations in the nation to start and grow a business. The region offers a variety of colleges, universities and trade schools for undergraduate and graduate study and provides training and education for skilled professionals in a wide range of industries. Healthcare and medicine play significant roles in employment, economic growth, and innovation with four major hospitals in the region. Approximately 30 percent of the non-agricultural workforce of over 95,000 is employed in government, healthcare, and education, and 16 percent is employed in manufacturing. Automotive, electronics, plastic injection molding, steel, wood products, food products and chemicals are just some of the many industries that make up West Alabama's manufacturing core. Quality of life and livability are essential to attracting new businesses, growing lucrative industries, and attracting bright students and skilled workers. In addition, dependable infrastructure helps to ensure supply chain and distribution system security which are needed to attract, retain, and grow industries.

Tuscaloosa is growing and expected to grow faster than most places in Alabama. The city has increased its population by 24% since 2000, faster than the five largest cities in Alabama. Most of this past growth is attributed to growth in enrollment at the University of Alabama, which is projected to stabilize. While the city is forecast to grow, that growth will likely be slower than that

which occurred over the past 20 years. Forecasts suggest that the Tuscaloosa Metropolitan Statistical Area (Tuscaloosa, Hale, and Pickens Counties) will grow by 21.4% between 2010 and 2040, the second largest growth rate in Alabama after Huntsville (39%).

Demographics are shifting. The city's demographics are heavily influenced by the student population, which can mask needs among the permanent resident population. For instance, nearly 19% of the non-student population (and 28% of the city's under-18 population) struggles with poverty. Other demographic challenges include projections that there will be a growing proportion of seniors and slower growth in family households. The slowest growth is forecast for the 25–34-year-old population, which is a concern, as this age group typically includes families with young children and first-time homebuyers.

Most of the recent residential growth has been concentrated in two areas. Since 2012, the vast majority of residential new construction has been either in the area between Downtown and the University of Alabama (along University Boulevard Corridor), or north of the Black Warrior River around Lake Tuscaloosa. As mentioned in the 5-year Affordable Housing Study, recent residential growth has focused on students and the high-end of the market.

Redevelopment in other areas has been slow. Since the April 2011 tornados, there is a large amount of vacant land within the impacted areas including Alberta and Forest Lake. Redevelopment in these areas has been much slower than anticipated. Additionally, there are redevelopment opportunities in other older neighborhoods such as West Tuscaloosa and older commercial centers and corridors such as Skyland Boulevard.

State of Good Repair

The City of Tuscaloosa is committed to maintaining the *Tuscaloosa University Boulevard Corridor Project* as it will become a critical part of the community infrastructure. The investment made to improve the project components will only improve the potential for continued economic development, which will in turn continue to provide additional tax revenue for the City of Tuscaloosa. This increased revenue will provide additional opportunities to increase the maintenance budgets for future maintenance needs.

One of the principal challenges faced by the City of Tuscaloosa, and common to many local governments around the country, is maintaining existing infrastructure with current resources. The Elevate Tuscaloosa plan creates a tax which provides for the maintenance of all Elevate funded projects.

Elevate Tuscaloosa is a community-driven process for strategically investing in education, cultural arts, tourism, parks, recreation, and connectivity.

Secondary Selection Criteria

Partnership

The development of the *Tuscaloosa University Boulevard Corridor Project* is an excellent example of how private and public partnerships can succeed. Financial support has been provided by Elevate Tuscaloosa and City of Tuscaloosa General Fund dollars with a commitment to providing up to \$8.5 million for the construction of this project. In addition to the financial support provided for the project, this project has received overwhelming community support. The City of Tuscaloosa has ten letters of support, provided as an appendix to the RAISE Grant Application,

including letters from United State Representatives and Senators, State and City Legislators, and various stakeholders.

Formal Letters of Support for Tuscaloosa University Boulevard Corridor	
Mayor Walt Maddox (City of Tuscaloosa)	University of Alabama – Dr. Bell
Senator Richard Shelby	Congresswoman Terri Sewell
Senator Tommy Tuberville	Congressman Robert Aderholt
State Senator Gerald Allen	State Representative Bill Poole
State Representative Rich Wingo	Alabama DOT- David Kemp

Innovative Technologies

The RAISE Grant initiative will incorporate many innovative intelligent transportation system components, including advanced traffic signals, dedicated short-range communications, dynamic message signs, and deep-learning algorithms for cameras. All these technologies will be integrated into Tuscaloosa Department of Transportation (TDOT) and ALDOT’s central systems and common application platforms that are usable by travelers and transportation system operators. The Tuscaloosa University Boulevard Corridor Project aligns with the US Green Building Council’s commitment to a sustainable, prosperous future through LEED, the leading program for green buildings and communities.

Over the past two years, much of the traffic signal infrastructure has been updated in the project area. This includes technology upgrades at intersections to help traffic move more efficiently through the area. The City has utilized adaptive signal control to enhance the performance of the traffic signal systems. This helps handle special event traffic.

The City of Tuscaloosa operates both a transit system and a demand responsive transit (DRT) service that serves more than 350,000 people. This DRT provides valuable transit coverage to a large rural area so that people can get to jobs, education, and necessary healthcare. UA also has a transit system with more than 2.6 million riders per year and a DRT with 400,000 annual riders. Also, both the city and university transit systems play a key role during special events such as football games when the city’s population doubles.

The Tuscaloosa University Boulevard Corridor Project will implement the following innovative technologies throughout each project component:

Intellistreets: A LED street lighting system wherein each pole has its own microprocessor. This system leverages the existing power supply and can be integrated into current lighting poles. Microprocessors communicate with each other through a wireless mesh system. The connected system optimizes traffic flow and safety, helps guide first responders, and keeps crowds safe in disaster areas. This system uses 25% less energy and 25% less heat, and it does not require underground construction costs.

With patented wireless technology to communicate to individual luminaires, streetlights are able to save up to 70% in energy consumption and extend life to 10 years and beyond. The system provides unique flexibility in dimming and on-demand adjustability. With a centralized interface and wireless transceivers on each pole, the system allows for bidirectional communication between streetlights and other integral sensors. The mesh topology also provides self-healing for the network should one or more light poles become disabled. 180-degree image sensors are concealed and offer a unique method for gauging pedestrian traffic, providing accurate data by the minute, hour or day. This is a powerful tool for tenants, landlords and public safety officials. Intellistreets also features Emergency Call Stations, which are communication devices designed to enable people to easily call for help. Emergency Call stations are available as stand-alone units or mounted to poles, utilizing the Intellistreets audio notifications and alert indicator lights.

Innovative Project Delivery

The elements of work for these are similar and can be narrowly specified in contractor specifications to include specific locations, dimensions, and performance requirements. The projects can be procured in a single package that will provide an expedited schedule and the most cost-effective means to develop this infrastructure.

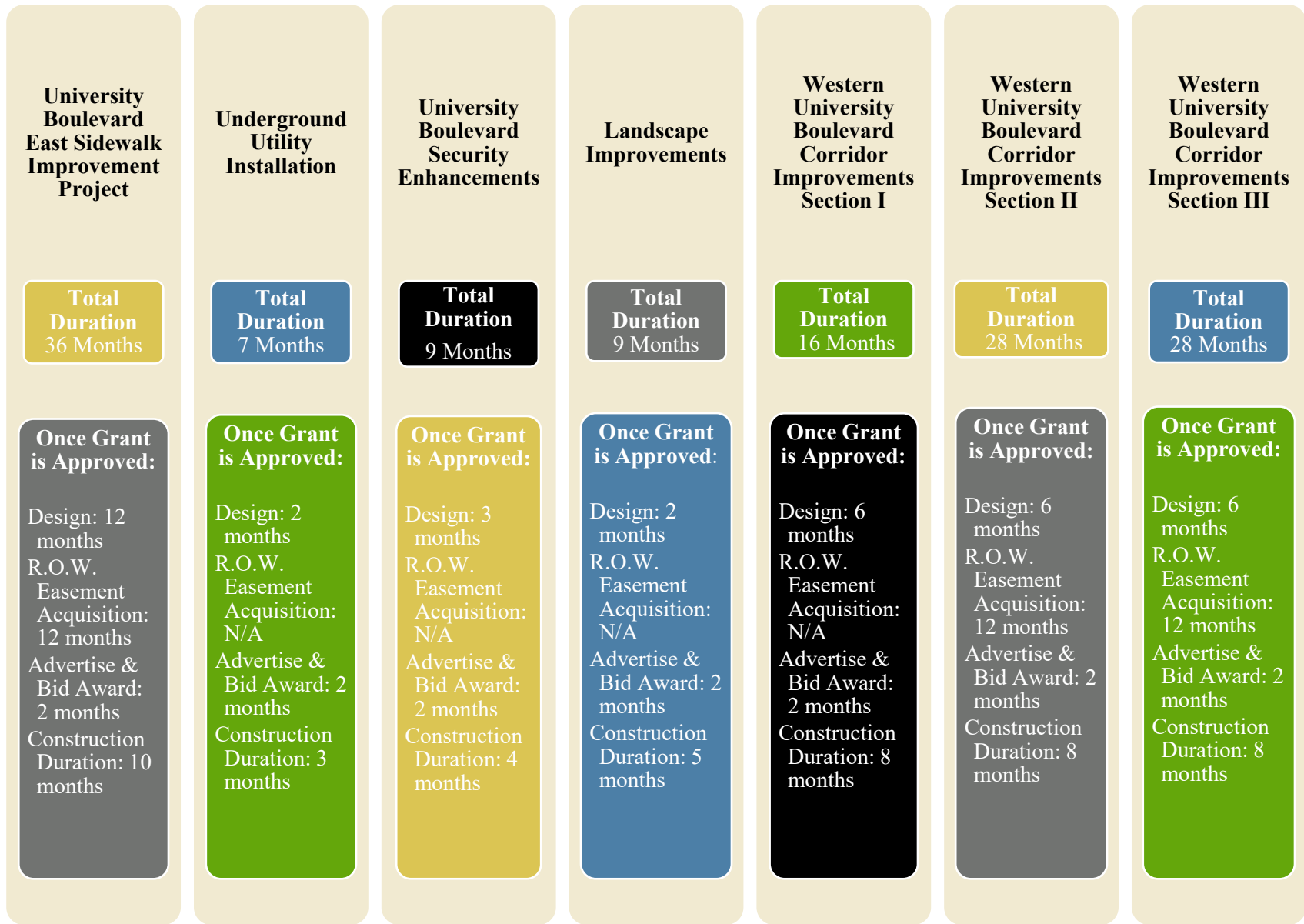
Innovative Financing

\$8.5 million in Elevate Tuscaloosa and the City of Tuscaloosa General Funds will be used as matching funds for RAISE Grant projects. Elevate Tuscaloosa funds are generated by a 1% sales tax increase, effective October 1, 2019, dedicated to strategic investment in connectivity, parks, recreation, cultural arts, education, and tourism in the Tuscaloosa community. In addition to initial funding, an annual percentage of Elevate Tuscaloosa funds will be used for maintenance and upkeep of projects funded by Elevate, including RAISE projects. While this is currently a flat dollar amount, beginning in the 2022 fiscal year of the tax initiative, 10% of the revenues generated are projected to be set aside for this purpose. Doing so provides an innovative vehicle to leverage Elevate funding to optimize the impact and long-term effectiveness of RAISE projects.

V. Environmental Risk Review

Project Schedule

The project schedule provides enough time to ensure that unexpected delays will not put RAISE grant funds at risk of expiring before they are obligated. The *Tuscaloosa University Boulevard Corridor Project* can begin construction quickly upon receipt of the RAISE grant. The grant funds will be spent steadily and expeditiously once construction starts.



Required Approvals

Preparations have been made by ALDOT and Tuscaloosa to prepare stakeholders for the studies to be undertaken as part of the *Tuscaloosa University Boulevard Corridor Project*. No formal approvals, however, are required to execute the planning project. ALDOT and Tuscaloosa will seek the following approvals to advance capital projects identified as long-term solutions through further studies that will follow the *Tuscaloosa University Boulevard Corridor Project*:

National Environmental Policy Act (NEPA)

- ALDOT and Tuscaloosa will be securing NEPA approvals following completion of studies that will precede the *Tuscaloosa University Boulevard Corridor Project*. These future planning efforts will inform the purpose, need, and scope of any environmental work to follow.

Legislative Approvals

- Tuscaloosa City Council passed a Resolution to secure support and match funding for the *Tuscaloosa University Boulevard Corridor Project*.

State and Local Planning

- The *Tuscaloosa University Boulevard Corridor Project* conforms with the goals and objectives of Elevate Tuscaloosa, which includes their Transportation Improvement Programs (TIP).

There has been a broad effort to gather input from federal, state, and local agencies along with private entities. This engagement has been useful in evaluating project element alternatives and determining preferred infrastructure locations. The public has also been engaged with several public committee and council meetings related to the overall Elevate program for infrastructure funding. There have been several baseline studies along the project area to date that have included area river mussel surveys, initial stream and wetland field investigations, traffic studies, etc. Based on the final plan that has been developed and is a part of this application, an Environmental Assessment (EA) can be conducted.

As noted in the project schedule provided and available at www.Tuscaloosa.com/RAISE, final detailed studies can begin for documentation. The City plans to have a Public Involvement Meeting to provide the public with detailed information about the project and receive questions and comments. Upon completion of that public involvement process, a draft environmental assessment will be developed for further public comment and a public hearing. Upon addressing any final issues raised during this phase, a final document will be developed and submitted for approval of a Finding of No Significant Impact (FONSI). It is possible that upon consultation with federal representatives that the document could ultimately be developed as a Categorical Exclusion due to the limited potential impacts anticipated with the project. The project schedule and tasks

included assumes some limited non-significant impacts requiring an EA/FONSI to allow for adequate time for project development and completion.

Public Involvement: The city's transportation and mobility network was assessed early in the process by blending the findings from more than 30 previous plans and studies with the outcomes of a series of stakeholder interviews held as part of the Framework process. The intent of the assessment was to identify transportation issues and needs—with particular focus on roadway conditions, biking and walking, public transportation, and freight movements—to establish a baseline understanding of mobility in Tuscaloosa as a precursor to recommending programs and policies as part of the Framework Comprehensive Plan.

Themes for the Framework Comprehensive Plan

The following challenges and opportunities related to mobility and transportation came from targeted interviews, the Forum on the Future, online input, and the Framework steering committee.

- **Growth and Changing Needs.** The city continues to face choices as it balances rising travel demand with an increased interest in walking, bicycling, and transit use. If leveraged appropriately, growth can be an opportunity.
- **Barriers and Obstacles.** Numerous physical barriers divide the city and complicate the delivery of a balanced multimodal transportation system. The Black Warrior River, older bridges, and limited rights-of-way are some of the barriers that face local, regional, and state decision-makers.
- **Economic Implications.** The city has a stated goal of improving intermodal facilities (waterway, interstate system, railways) to maintain and enhance economic prosperity. The varied ownership and controlling interests in these facilities provide both challenges in terms of communication and coordination, but also opportunities to leverage resources across sectors to meet shared goals together.
- **Transit Delivery.** Like many southern cities, operating transit in Tuscaloosa presents challenges, such as a relatively small Downtown, narrow commercial and residential corridors, and gaps in supportive density. However, the presence of a large university in similar sized cities has proven beneficial for delivering a citywide balanced multimodal transportation system.
- **Widespread Needs.** As Downtown redevelopment continues and the economic needs in each council district persists, transportation issues such as parking, public transportation, bicycling and walking, streetscapes, and lighting become critical factors for continued safety, economic growth and sustained quality of life.

Public Feedback that informed the Framework Comprehensive Plan

The following major themes related to mobility and transportation came from targeted interviews, the Forum on the Future, online input, and the Framework steering committee.

- **Enhance gateways.** Gateways and corridors into and throughout the city are critically important and should be aesthetically pleasing and open to various modes of transportation.
- **Coordinate among agencies.** Numerous corridors and various pieces of infrastructure are maintained by other agencies, which require coordination in aesthetic improvements and maintenance to avoid potential barriers for improvements.

- **Improve the multimodal experience.** The community seeks ways to improve the safety and experience of those walking, bicycling, and taking transit. Ideas include creating bicycle and pedestrian plans that included implementable and prioritized recommendations, addressing poor roadway conditions and unsafe crossings, and educating all users on the rules of the road.
- **Consider development regulations.** Development decisions affect transportation delivery, and transportation delivery in turn affects development decisions. The city should continue to explore ways to address street design and multimodal accommodations as part of the development (and redevelopment) process.
- **Strengthen the transit system.** While challenges persist, the public and stakeholders expressed a desire for improved public transportation options, including hours of operation and geographic coverage.
- **Embrace technology.** Technology for all modes of transportation can be upgraded as part of future projects. These upgrades range from coordinating existing traffic signals to setting the stage for emerging transportation technologies.

West Tuscaloosa Community Inventory: In 2017, the City of Tuscaloosa initiated a planning effort to create a strategy to enhance the West Tuscaloosa Community by identifying community indicators, infrastructure deficiencies, and areas where targeted reinvestment could or would have a catalyst effect on community reinvestment. Beginning with the most fundamental inventory of existing Land Uses, Zoning patterns, and physical utility infrastructure, the study was defined as a "Community Inventory." Throughout the Community Inventory, citizen input continuously refined the data and analysis, helping to shape the direction citizens desire for their community.

Assessment of Project Risks and Mitigation Strategies

As with most major planning projects, there are some risks inherent to meeting the project schedule and budget. Mitigation of schedule and budget risk can be accomplished in the following ways:

- ***Schedule Delays*** – As local and statewide planning entities, ALDOT and the City of Tuscaloosa have gained tremendous experience in the implementation of complex, comprehensive planning projects. Both understand the risks associated with such efforts and consider a wide range of risks in the development of project schedules and budgets, such as those presented in this grant application. We stand ready to have our matching funds and contracts in place to ensure the timely activation of the resources needed to carry out the scope of work.
- ***Cost Overruns*** – As with any large planning project, this project runs the risk of experiencing cost overruns. We have used our extensive combined experience on similar projects to mitigate this risk. The estimated costs included in the application are based on industry and agency standards, as well as similar projects being implemented by ALDOT and Tuscaloosa, and include contingencies. Both our agencies' transportation budgets have sufficient capacity in the unlikely event that the project experiences a cost over-run.
- ***Inter-Agency Disputes*** – Schedule delays and cost overruns may occur due to differing preferences and priorities between ALDOT and the City of Tuscaloosa in carrying out the planning project. We will mitigate this risk by defining roles, responsibilities, and a dispute

resolution process in an inter-agency agreement to be executed prior to RAISE grant obligation.

VI. Benefit Cost Analysis

This benefit-cost analysis (BCA) was conducted by the Alabama Transportation Institute at The University of Alabama for the *City of Tuscaloosa University Boulevard Corridor Project*. To the maximum extent possible given available data, the formal BCA prepared in connection with this RAISE grant application reflects quantifiable economic benefits. All analyses contain live formulas, clear documentation of assumptions, and assume 2019 constant dollars. To conduct the analysis, all provided cost estimates were deflated to 2019 dollar values. The results of the BCA presented in this document were inflated to 2021 dollar values. All the calculations and results are included in the spreadsheets accompanying this document.

Separate BCAs were conducted for the seven segments of the Tuscaloosa University Boulevard Corridor Project as described in the scope of work.

Quantifiable Benefits for the University Boulevard Corridor Project			
University Boulevard Corridor Segment	Types of quantifiable Economic Impacts	Affected Populations	Quantifiable Economic benefits
University Boulevard East Sidewalk Improvement Project	Installation of curbs, and roadway lighting improvements reduce the number of crashes involving vehicles, bicycles, and pedestrians	Local drivers, bicyclists, and pedestrians	Safety benefits: reduction in vehicle, bicycle, and pedestrian crashes
Underground Utility Installation	Lighting improvements reduce the number of crashes involving vehicles, bicycles, and pedestrians	Local drivers, bicyclists, and pedestrians	Safety benefits: reduction in vehicle, bicycle, and pedestrian crashes
University Boulevard Security Enhancements	Installation of bike lanes and curbs, and lighting improvements reduce the number of crashes involving vehicles, bicycles, and pedestrians (for this segment, these quantifiable benefits are included in the University Boulevard Section III safety benefits calculations). Resurfacing of this portion of University Boulevard will generate additional safety benefits by reducing the number of crashes on this segment.	Local drivers, bicyclists, and pedestrians	Safety benefits: reduction in vehicle, bicycle, and pedestrian crashes
Landscape Improvements	Lighting improvements and curbs installation reduce the number of	Local drivers, bicyclists, and pedestrians	Safety benefits: reduction in vehicle, bicycle,

	crashes involving vehicles, bicycles, and pedestrians		and pedestrian crashes
Western University Boulevard Corridor Improvements Section I	Installation of a landscaped median and curbs, and lighting improvements reduce the number of crashes involving vehicles, bicycles, and pedestrians	Local drivers, bicyclists, and pedestrians	Safety benefits: reduction in vehicle, bicycle, and pedestrian crashes
Western University Boulevard Corridor Improvements Section II	Installation of bike lanes and curbs, and lighting improvements reduce the number of crashes involving vehicles, bicycles, and pedestrians	Local drivers, bicyclists, and pedestrians	Safety benefits: reduction in vehicle, bicycle, and pedestrian crashes
Western University Boulevard Corridor Improvements Section III	Installation of bike lanes and curbs, and lighting improvements reduce the number of crashes involving vehicles, bicycles, and pedestrians	Local drivers, bicyclists, and pedestrians	Safety benefits: reduction in vehicle, bicycle, and pedestrian crashes

The calculations of safety benefits were conducted using crash data recorded over the time period between 2015-2019 on the seven segments of the University Boulevard listed below. No crash statistics from 2020 were used for this analysis because in 2020, there were significant reductions in the number of crashes due to decreased travel as a result of the COVID-19 pandemic.

- University Boulevard East Sidewalk Improvement Project - 30th Avenue East to Crescent Ridge Road
- Underground Utility Installation - 20th Avenue to 21st Avenue
- University Boulevard Security Enhancements - Gene Stallings Avenue to Frank Thomas Avenue
- Landscape Improvements - Lurleen Wallace Boulevard North to Greensboro Avenue
- Western University Boulevard Corridor Improvements Section I - 21st Avenue to Queen City Avenue
- Western University Boulevard Corridor Improvements Section II - Queen City Avenue to Reed Street
- Western University Boulevard Corridor Improvements Section III - Reed Street to Wallace Wade Avenue

Some of the improvements included in the scope of work for each of the seven segments of the Tuscaloosa University Boulevard Corridor Project do not result in any quantifiable economic benefits and therefore were not included in the economic benefits calculations. Particularly, the calculations of economic benefits from the following improvements were not included in the BCA: decorative improvements, irrigation, landscaping, improvement of traffic light loop detectors and cameras operations, traffic light signal head adjustments, demolition of existing elements, conduit for underground utilities, water main and sanitary sewer relocation, installation of retractable bollards, and roadway signing and striping. Although these improvements may definitely have a

positive impact on the communities affected by the project and improve the quality of life of community members, they may not significantly affect mobility, traffic volume, travel time, speed or safety within the study area.

Additionally, the calculations of economic benefits from the installation of sidewalks were not included in the analysis for several reasons explained below. All segments of the study area, except for the University Boulevard East Sidewalk Improvement Project segment, currently have sidewalks installed. Although improving the condition of existing sidewalks may improve the quality of life in the communities affected by the project, mobility, traffic volume, travel time, speed or safety may not be significantly affected. There are currently no sidewalks installed along the East Sidewalk Improvement Project segment of University Boulevard. However, the calculations of the benefits from sidewalk installation on this segment were omitted because our analysis of the crash data recorded from 2015-2019 for the portion of University Boulevard between 30th Avenue East to Crescent Ridge Road showed that there have not been any crashes involving pedestrians recorded on this segment during the specified time period. Since all the crash modification factors (CMF) that were identified for this analysis using the CMF Clearinghouse database are to be used for computation of the effect of sidewalk installation on pedestrian crashes, it would not be possible to use any of these CMFs to compute the effect of sidewalk installation on other types of crashes (such as vehicle-to-vehicle, vehicle-to-bicycle, and others). Second, a more complex analysis would be needed to examine the effect of sidewalk installation on crash statistics within the study segment of University Boulevard. Previous research shows that sidewalk installation may help reduce the number of crashes involving pedestrians, assuming that the volume of pedestrians walking along the studied segment of road remains the same (McMahon, 2002). However, in many cases, it may be expected that the installation of sidewalks may encourage more pedestrian traffic in the area which in turn may lead to an increase in the number of crashes on the studied segment of the road (Alluri et al., 2017; Raihan et al., 2019). Since the effect of sidewalk installation on crash statistics in the study area is unclear without a more extensive analysis, the calculation of safety benefits from sidewalk installation were omitted from this study.

Benefit Cost Analysis

The benefit-cost ratios for the City of Tuscaloosa University Boulevard Corridor Project were computed using a seven percent real discount rate recommended by the [Benefit-Cost Analysis Guidance for Discretionary Grant Programs](#). The BCA compares the capital construction costs to the quantifiable benefits of the project for an analysis period of 21 years with construction occurring in the first year. The quantifiable economic benefits include safety benefits from a reduced number of crashes as a result of proposed improvements.

For the following segments of the project, construction is expected to start in 2022, and project benefits are expected to begin in 2023: (1) Landscape Improvements (Lurleen Wallace Boulevard North to Greensboro Avenue), (2) Underground Utility Installation (20th Avenue to 21st Avenue), (3) Security Enhancements (Gene Stallings Avenue to Frank Thomas Avenue), and (4) Western University Boulevard Corridor Improvements Section I (21st Avenue to Queen City Avenue). For

the following segments of the project, construction is expected to start in 2023, and project benefits are expected to begin in 2024: (1) Western University Boulevard Corridor Improvements Section II (Queen City Avenue to Reed Street), and (2) Western University Boulevard Corridor Improvements Section III (Reed Street to Wallace Wade Avenue). The safety benefits from lighting improvements, curbs installation and bike lanes installation completed on the segment of University Boulevard between Gene Stallings Avenue and Frank Thomas Avenue were included in the economic benefits calculations completed for the Western University Boulevard Corridor Improvements Section III (Reed Street to Wallace Wade Avenue) to avoid double-counting of these benefits. For the University Boulevard East Sidewalk Improvement Project (30th Avenue East to Crescent Ridge Road), the construction is expected to start in 2024 and project benefits are expected to begin in 2025.

Discount Rates

Federal guidance recommends that applicants discount future benefits and costs and present discounted rates of both the stream of benefits and the stream of costs. For this analysis, final streams of benefits and costs are presented at a seven percent discounted rate.

Project Description and Cost Estimates

For BCA calculations, all 2021 dollar amounts were deflated to 2019 dollars as recommended by the [2021 Benefit-Cost Analysis Guidance for Discretionary Grant Programs](#). For convenience, below are presented the BCA results of the entire program that includes all the seven segments of the University Boulevard Corridor project, in both 2021 dollars and 2019 dollars. The table on the next page is the 2019 dollars.

In 2021 dollars, total project costs, including annual maintenance costs over the 20-year period were estimated at \$36.2 million (undiscounted). At a seven percent discount rate, the total project cost is \$27.8 million. Total project benefits were estimated at \$68.7 million. At seven percent discount rate, the total project benefits are \$27.1 million. The project benefit-cost ratio (undiscounted) is 1.899. The benefit-cost ratio discounted at 7% is 0.976. The net present value of the project is \$32.5 million. At seven percent discount rate, the net present value of the project is -\$0.68 million. Table 2 below provides a brief summary of estimated project construction costs, project benefits, benefit/cost ratios and net present values (NPV) for each project included in the analysis.

Cumulative BCA results for the entire program (2019)				
Project	Project Benefits (Undiscounted)	Project Benefits (Discounted at 7%)	Project Costs (Undiscounted)	Project Costs (Discounted at 7%)
University Boulevard East Sidewalk Improvement Project 30th Avenue East to Crescent Ridge Road	\$20,886,057.90	\$7,934,769.02	\$11,992,700.00	\$8,716,760.46
Underground Utility Installation 20th Avenue to 21st Avenue	\$2,306,325.90	\$932,744.35	\$142,980.00	\$124,884.27
University Boulevard Security Enhancements Gene Stallings Avenue to Frank Thomas Avenue	\$132,156.50	\$61,143.68	\$1,452,750.00	\$1,268,888.11
Landscape Improvements Lurleen Wallace Boulevard North to Greensboro Avenue	\$8,763,746.20	\$4,054,644.59	\$357,000.00	\$201,729.23
Western University Boulevard Corridor Improvements Section I 21st Avenue to Queen City Avenue	\$9,614,202.00	\$4,277,887.46	\$6,630,000.00	\$5,367,797.83
Western University Boulevard Corridor Improvements Section II Queen City Avenue to Reed Street	\$22,266,999.90	\$7,714,850.02	\$8,280,000.00	\$6,418,733.00
Western University Boulevard Corridor Improvements Section III Reed Street to Wallace Wade Avenue	\$4,685,631.20	\$2,124,429.85	\$7,300,000.00	\$5,677,780.78
Total	\$68,655,119.70	\$27,100,468.97	\$36,155,430.0	\$27,776,573.7
Benefit/Cost Ratio, Undiscounted:				1.899
Benefit/Cost Ratio, Discounted at 7%:				0.976
NPV, Undiscounted:				\$32,499,688
NPV, Discounted at 7%:				-\$676,105