

Beyond Traffic: The Smart City Challenge



The City of Shreveport's Vision

February 4, 2016

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Organizational Letters of Support



OFFICE OF THE MAYOR
SHREVEPORT, LOUISIANA

February 4, 2016

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Secretary Anthony Foxx
United States Department of Transportation
1200 New Jersey Ave, SE
Washington, DC 20590

Dear Secretary Foxx:

I am excited to present the City of Shreveport's vision for the United States Department of Transportation's (USDOT) **Smart City Challenge**. This initiative requires bold thinking and dedicated leadership, which is exactly what we propose to deliver. My vision of Shreveport is that we will be a thriving city where every citizen is afforded a safe environment, economic opportunity, education and training, and a great quality of life. Transportation is a critical part of this equation, and our approach to this challenge focuses on giving citizens more and better choices.

Shreveport is on the smaller end of USDOT's mid-sized city range, but from City Council members to department heads, the willingness of Shreveport's leadership to initiate systemic changes is unsurpassed. As a city, we are using data to guide our decision making and are committed to making data available to the public to increase transparency and to support private development. I released a four-year Strategic Plan last year to promote expectations and accountability for all city employees and to give the community insight into our progress and plans for the future. The plan includes goals and performance metrics that we use to measure our progress, and we will use this same performance management approach for the **Smart City Challenge** to assist USDOT and Vulcan with efforts for reproducibility and knowledge sharing.

Our vision narrative includes self-driving electric vans for a downtown trolley service and fully automated electric taxis running on a fixed route network in our urban core. We also propose public vehicle charging infrastructure in our transit facilities to encourage adoption of electric vehicle technology at a household and business level. Less cost intensive aspects of our proposal include "Connection Protection" to allow buses to communicate with one another to coordinate arrivals and departures and a "Civic Communications" system that would use existing hardware on buses, public safety vehicles, and other city platforms to communicate incidents and events such as accidents, road debris, or traffic signal outages to other city departments or end users.

We appreciate your consideration and look forward to providing additional details on Shreveport's vision.

Sincerely,

Ollie S. Tyler
MAYOR



Part 1 – VISION NARRATIVE

I. Introduction

The City of Shreveport (COS) is pleased to submit its proposal for the United States Department of Transportation's (USDOT) Smart City Challenge. Shreveport accounts for more than 66% of the 298,317 population for the Census-designated place and is a regional center for employment, education, medicine and entertainment for the Ark-La-Tex region serving northwest Louisiana, southwest Arkansas, and East Texas. The central business district of downtown Shreveport supports an estimated 14,000 jobs and is seeing renewed growth in the housing, retail, and entertainment sectors. Our urban center is the focus of much of the investment we propose in this narrative, however, we intend to look at technology and solutions that will have an impact throughout the local transportation system by providing citizens with safe and efficient transportation alternatives.

Our approach for this challenge is to focus on transferability and knowledge sharing. We have already started a transformation of our transportation sector and are sharing our lessons with state (Louisiana Public Transit Association) and regional (South West Transit Association) transportation associations through leadership on those boards of directors. The technology and resources available through the Smart City Challenge will allow us to set even more ambitious goals as we rebrand and redefine how transportation systems should work.

Shreveport does not have the infrastructure or technology resources of cities like Austin, Boston, and San Francisco, but by showing successful implementation of innovative technologies in Shreveport, we will demonstrate that forward-thinking transportation strategies are within reach for all mid-sized cities. The activities proposed in this narrative are primarily centered on our public transit system, but we aim to demonstrate that strengthening public transportation can address larger transportation-related constraints such as parking and public safety.

Sending the Right Signals – Expected Outcomes

- **Improve Safety** – Accidents beget accidents; greater access to traffic information can keep citizens off of congested highways and limit secondary collisions.
- **Enhance Mobility** – People do not like to wait. People do however like options. Making it easy to choose the best mode of transportation and facilitating transfers between modes will get people to their destinations faster.
- **Address Climate Change** – More people staying out of their cars and jumping on transit within downtown will decrease congestion and reduce emissions. Doing it with electric vehicles is *lagniappe*.

The USDOT recognizes that the success of this initiative depends largely on leadership and the policy environment of the selected applicant. City leaders in Shreveport are committed to driving change and progress as highlighted in the Mayor's strategic plan for 2015-2019. Through financial support of programs such as the Entrepreneurial Accelerator Program, city involvement in the award-winning Shreveport Common place-making initiative, and recognition by Louisiana Clean Fuels as municipality of the year for 2013 and 2014, the Mayor, City Council, and city department heads are demonstrating that all arms of local government are embracing initiatives focused on improving the quality of life and fostering economic growth.

SporTran, the public transportation system for Shreveport-Bossier City, is following the City's footsteps in implementing new technology and making system changes that align with the Smart City Challenge goals. In 2017, SporTran will introduce a new route structure aimed at decreasing travel time and improving connectivity throughout the city. The new route structure includes a downtown circulator that we propose as an ideal route for introducing and testing driverless vehicles and smart-grid technology. We are in the process of constructing a new intermodal transportation facility that will house SporTran, intercity bus providers, and potentially Amtrak which has scheduled a test train between Dallas and Shreveport later this month on February 16. After the restructuring, the City will also redefine how the current downtown bus terminal is used. This center will remain a transfer station for fixed route bus service, but there are a sufficient number of vehicle lanes to use this facility as a hub for electric and automated vehicle technology.

The City of Shreveport has made major strides in recent years rolling out traffic signal prioritization (TSP), traffic sensors, and other Intelligent Transportation Systems (ITS) equipment to improve traffic flows and enhance public safety. The City coordinates closely with the regional DOTD traffic management center (TMC) for upgrades to aging infrastructure and technological improvements that aid in moving traffic safely and efficiently throughout the Shreveport-Bossier metropolitan area. Expenditures on TSP equipment to date total \$1.2 million, and we look to triple this amount by the end of 2016. Additionally, the Shreveport-Bossier area presently maintains a fiber optic communication ring. This system allows for intelligent transportation element previously deployed to work together and communicate with the municipalities and the TMC. We propose to expand this network to support the connected vehicle and urban analytics solutions described in this proposal and other innovations that are developed out of our collaboration with area technology firms.

In addition to City investments in transportation infrastructure, Caddo Parish government is committed to safety and mobility improvements through such endeavors as the bike-way master plan and Safe Routes to Schools Program. Additionally, the Northwest Louisiana Council of Governments and the Bike Shreveport movement are taking a leading role in advocating for

improved bicycle infrastructure and bike safety efforts. Funding has been allocated for signage and lane striping for an initial five bike routes that connect the new intermodal transit facility with downtown, the Shreveport riverfront, and residential neighborhoods throughout the urban core.

Above all, the timing is right for this project in Shreveport. From the Mayor down, there is a commitment to improving the quality of life and expanding economic opportunity in the community. The Smart City Challenge will provide a catalyst for integrating government services with the sharing economy, not only in transportation, but in public safety, tourism, economic development, beautification, and more. As the best place to start a business in the United States according to a 2015 WalletHub report, we have the entrepreneurial capacity and business community support to leverage the expertise and resources that the Department of Transportation and Vulcan bring to this initiative. At the same time we recognize that whatever we do must be scalable and making data and research available to the private sector will be one of the keys to making the most of the Smart City Challenge investment.

II. The Shreveport Vision

A. Challenges and Opportunities

There are a number of key challenges that we propose to address through the Smart City Challenge by developing solutions that are cost effective and replicable. Promoting mode choice, expanding the scope of how data is used, and strengthening decision-making through cross-sector collaboration are a few of the ways that we will approach transportation issues in our community.

Tailor-made Transportation. As stated in the introduction, our vision focuses primarily on public transit. As such, making public transit a more attractive alternative is a key challenge that we propose to address. We recognize that the majority of citizens will not use fixed-route bus service as their primary mode of transportation; however, rethinking how and where we operate and introducing new technology can make public transit a more viable option for a larger segment of the population. We have already started adding features such as real-time bus tracking and on-board Wi-Fi (currently in pilot phase), and we plan to roll out pay-by-phone ticketing in 2016. While these features may attract new

ETP: Experience Transit Project

In major urban centers, household economics push people to public transit. In typical mid-sized cities, the cost to commute and park is competitive with public transit. As a result, public transit largely exists to serve the transit dependent population. Our proposed project looks at innovative ways to make public transit more attractive for regular commuters, lunchtime riders, and night owls alike.

riders, they are primarily intended to make transit easier for our current customers. Bringing new riders into the system takes bigger and bolder planning, and innovative technology must be a part of that planning.

A downtown circulator is part of the new SporTran route system that will launch in 2017. The circulator will connect the central business district with a new intermodal transit facility, and there is an opportunity to expand this plan to incorporate driverless vehicles to connect with peripheral parking. We are also exploring the option of adding service designed with the lunch crowd in mind. Combining this approach with public access vehicle charging stations at the peripheral parking locations would help promote clean technology and reduce operating costs over the life of the circulator vehicles. We propose to partner with American Electric Power (AEP) / Southwest Electric Power Company (SWEPCO) and local universities to test the impacts and the viability of electric vehicle infrastructure to help address the “Chicken or the Egg” dilemma noted in the *Beyond Traffic 2045* document.

A much more ambitious proposal is to use automated, electric vehicles for fixed route individual or shared-ride “taxi” service. The route system for this service would not be as extensive as our bus service, but it would introduce a new form of public transportation to appeal to a broader segment of riders – especially at night when service is more limited. We propose to use the current SporTran bus terminal in downtown Shreveport as the hub for this service. The infrastructure is in place to support the vehicle traffic; however, we would need to add charging stations for the taxis that could also support the downtown circulator vehicles as they pass through the facility. The fare for this service would ideally fall between the price of bus service and the cost of taking a taxi or ride service. Testing the pricing model will be a significant part of our project. We appreciate that private providers such as Uber and Lyft are meeting a growing segment of the transportation demand, but there is still an unmet need for more price conscious consumers who might not always have time to wait for traditional bus service.

Letting the Data Loose. The reality is that substantial amounts of data are already available, or could be made available through relatively small investments, but this data does not always benefit the optimal range of stakeholders. Shreveport, like most cities, is already collecting data on a wide range of indicators for internal use and deployment. Over the past two years, SporTran has installed automatic vehicle locator, real-time passenger information, and automated passenger counter systems on its buses to allow for data-driven decision-making and to provide better schedule information to passengers. There are opportunities to expand the pool of users for this data, and for other transportation information, by creating a culture of open data and partnering with private sector companies that can benefit from increased access to data.

Additionally, we will look at ways to get the most out of existing data by looking for new ways to deploy it. “Connection Protection” is a concept we have explored with our Automatic Vehicle Locator (AVL) system provider, Syncromatics Corporation, whereby automated messages would be sent from bus to bus to coordinate arrivals at main connection points/intersections throughout the City. Using this technology, bus operators would be alerted if they need to wait at an intersection to take passengers transferring from another bus. On-board passenger displays could also provide passengers with information on arrival times for connecting routes. These proposed features would reduce the risk of missed connections and help passengers cut down on travel times.

Another idea we would like to pursue builds off of the fact that the City of Shreveport literally has eyes and ears everywhere – city employees who could easily transmit data about events and incidents if there was a technology platform that would support information flows without breaking the bank. Currently, information about roadway debris, accidents, power outages or other events in Shreveport may be called in over a short-wave radio, but the process of getting this information into the right hands is inefficient. A “Civic Communications” system would ideally integrate with existing hardware used by different departments for ongoing data collection, but would result in a back-end messaging system that would get specific data to targeted end users. For example, a bus operator could hit a pre-set icon on the bus’s Mobile Data Terminal/Global Positioning System to send map-based alerts for “excessive litter” to a public works team. Or police responding to the scene of an accident could feed data back into the regional traffic management system and public traffic displays through laptops that are installed on all vehicles. This type of system would have clear benefits for transportation systems by getting information out faster, but the impacts would spill over into other sectors and improve the overall efficiency of government services.



Mobile Data Terminals are an example of smart technology investments that can feed into a comprehensive urban analytics system

A Team Effort. Coordination between different transportation modes is a challenge for all cities, particularly when budgets are constrained and siloed between departments. Our project management approach addresses this challenge by making sure that the right partners and stakeholders are at the table and that decisions on where investments are made are based on the potential reach of the project rather than on the needs of a specific department.

The City of Shreveport currently uses traffic signal prioritization (TSP) for public safety vehicles and has invested more than \$1.2 on TSP infrastructure to date, with an additional \$2.4 million investment in the final design stage. Before the Smart City Challenge, the city traffic engineering division and the public transportation department started discussing funding options for collaborating to get the most out of the city's investments. Expanding this system to include public transit vehicles in this system would facilitate traffic flows and help keep buses on schedule. Since the majority of the cost involved with this system is related to infrastructure at the intersections, the incremental investment in bringing this technology to the public transit fleet is financially feasible – for some parts of some routes.

Although this technology is already widely used for bus rapid transit (BRT), we propose to introduce it throughout our regular route system to demonstrate how this technology can improve the overall on-time performance of fixed route bus service and contribute to increased ridership and improved customer satisfaction. We recognize that trying to bring every traffic signal on every route into the system is not a realistic goal. Using on-time performance data from our AVL system, we can see where our trouble spots are on our routes and coordinate to prioritize future traffic engineering investments that have the greatest payoff for all city departments.

How autonomous vehicles will be deployed is another example of a decision-making process that will best be addressed by a range of stakeholders. Transit decisions are in many cases made independently by transit operators, looking at metrics such as ridership and passenger revenue. While these are important indicators for determining the effectiveness of transit routes, they do not always adequately address needs of other stakeholders such as public safety officials and economic development organizations. For example, moving people from peripheral parking to downtown buildings might not look like a transit success, but in Shreveport, it could open up more than 245,000 square feet of office space that is sitting empty due to a shortage of on-site parking.

B. Program Management Approach

Our vision relies on collaboration between city departments, other local government agencies, community partners, local universities, vendors, and a host of other stakeholders, and fostering an enabling environment that is conducive to innovation will be a primary objective of our project team. Given that the majority of the project elements are directly related to public transportation, the General Manager for SporTran will chair a project steering committee, with the mayor's Executive Assistant of Governmental Affairs serving as vice chair and partnership coordinator. The City Attorney will also be heavily involved in the planning and implementation of the project to help identify and address policy constraints and work with the mayor and City Council to amend or enact legislation as need to support project objectives. The steering

committee will initially oversee the development of the full proposal for submission to USDOT, but will ultimately be responsible for drafting a project work plan, developing a performance monitoring plan, overseeing implementation by city departments, partners, subcontractors, and technology companies, and ensuring that milestones and objectives are met.

Performance management is a key aspect of the Smart City Challenge, and our approach to this project will mirror how we operate as a city. As referenced above, the City of Shreveport released a strategic plan in 2015 as a roadmap for the mayor's first term in office. This plan includes goals and indicators for each department as a way to quantify and publicly disseminate information on how tax dollars are being spent. We present illustrative performance measures in section IX. below, but the fact that we are already implementing a monitoring and evaluation system at the city level demonstrates a commitment to results-based management.

We have included letters of support from local partners as attachments to Part 1 of this application to reflect the coordination that is already taking place, but if we are selected as a finalist, we know that finding industry-leading partners will not be a problem – and that is potentially the most exciting aspect of the Smart City Challenge. We look forward to receiving technical assistance and investments from USDOT partners Vulcan, Mobileye, and other experts in their fields who are looking for the right mix of local leadership, demographics, and infrastructure to bring new technology into the mainstream.

III. Shreveport – A Great Place to Call Home

Shreveport's 2010 Census count put the population at 198,533 out of the 298,317 for the Census-designated place, but as home to Barksdale Air Force Base, the University Health Level 1 trauma center, and the Port of Caddo-Bossier, Shreveport has infrastructure and resources that make it a regional hub for recreation, tourism, transportation, commerce, and social services. With a population density of approximately 1,900 people per square mile, Shreveport has the transportation advantages and challenges that you find in any typical mid-sized U.S. city.

Shreveport has a transportation network that includes I-20 and I-49 and 190 miles of arterial roadways. It is generally accepted that you can get anywhere in Shreveport in approximately 20 minutes, unless you get stopped by a train or come upon an accident on the highway. Looking to the future though, further expansion of this network is becoming cost prohibitive as

Coordination? We do that!

One of the objectives for SporTran in the Strategic Plan for 2015-2019 is to establish a transit improvement committee to get riders and other community stakeholders more involved in planning and problem solving. The committee's first meeting was in January and included stakeholders from largest hospital system in the region, Southern University in Shreveport, and the Shreveport Common cultural district.

infrastructure resources are stretched thin trying to maintain existing roadways and bridges. This situation is typical in most mid-sized U.S. cities, where sprawl is putting a strain on transportation systems. The *Shreveport-Caddo Master Plan 2030* puts an emphasis on integration of land use and transportation, including enhancing public transportation inside the “beltway” as a means to re-establish the urban core.

Politically and financially, Shreveport is stable and the current administration is advancing a number of bond-funded capital improvement projects that were previously stalled. Mayor Tyler and the Shreveport City Council were elected to four year terms in December 2014, and in February 2016 the Mayor will publically release the first annual scorecards for city departments highlighting successes and shortcomings of the administration in her first year. The Mayor was actively involved in transportation planning initiatives during her first year, including conversations with Amtrak about establishing rail service on a Dallas to New York line. Amtrak is conducting a test run later this month and is in discussions with city leaders on a proposed location for a passenger station.

The public transportation system for Shreveport and Bossier City runs bus and Americans with Disabilities Act (ADA) complementary paratransit service from 5:00am to 1:30am Monday – Saturday and from 8:00am to 5:30pm on Sundays. Night service between 7:00pm and 1:30am is a limited service that runs on routes designed through a public planning process in 2007 to align transportation services with retail districts and major employers that have multiple shifts and extended operating hours. The main bus terminal is currently located in downtown, but operations will shift to a new intermodal transportation facility on the western edge of the central business district in 2017 as part of a route restructuring plan designed to decrease passenger travel times. The city will also construct a new southwest Shreveport transfer center this year that will open to coincide with the other route changes in 2017, and the Shreveport Regional Airport has been used as a transfer point for three bus routes since 2014.

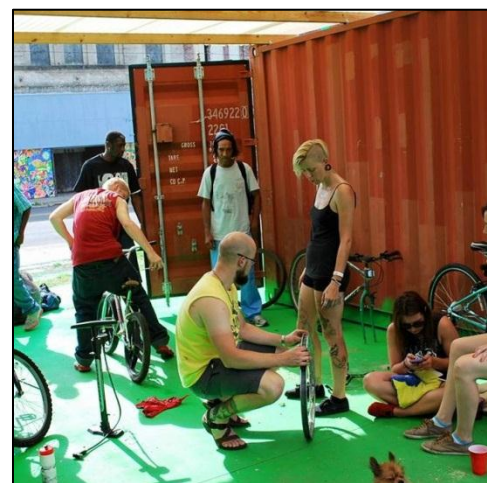


Investments in technology have helped shape the pending redesign of the public transportation system, and they have also made public transit more convenient for citizens who rely on the bus system for daily or occasional transportation in Shreveport and Bossier City. Features such as real-time bus tracking by phone, short message service (SMS), or web and trip planning on

Google transit help regular riders navigate their transportation options. SporTran is exploring additional technology to roll out later this year to improve the rider experience, such as mobile ticketing and Wi-Fi on the full bus fleet.

Shreveport has shown a commitment to innovation and investment in the local economy in the recent past and city leaders are excited about the potential to be an agent of change once again. In the transportation sector, Shreveport was the first city in Louisiana to introduce Compressed Natural Gas vehicles into its public transportation fleet as part of a clean fuels initiative adopted by city leaders. Leveraging an American Recovery & Reinvestment Act (ARRA) grant to build the CNG fueling infrastructure, the City has purchased CNG buses exclusively since 2010 and more than 40% of SporTran buses now run off of natural gas. The city public works department has also adopted CNG for 33% of its garbage truck fleet, contributing to Shreveport's incumbent status as Municipality of the Year for the Louisiana Clean Fuels awards.

Admittedly, mobility choices outside of the public transportation have been limited in Shreveport, but that is changing with a greater emphasis on bicycle infrastructure and safety initiatives to bring biking into the mainstream. The Bike Shreveport cooperative is an example of a citizen-led initiative that shows that the public is taking an active role in the process to improve the local transportation system and policy environment. The "bike container" in the Shreveport Common district serves as a garage for restoration and repair of bicycles that are then donated to community organizations.



SporTran maintains bike racks on all of its buses, making it easy for citizens to jump from one mode to the next, and the new intermodal terminal will include linkages with a network of bike paths that has been funded and will be entering the implementation stage this year. Bike Shreveport also organizes outings and provides information to public on recommended routes through their website and social media pages in their efforts to put #ButtsOnBikes.

In the graphic that follows, we present a map of our downtown circulator route, one of the primary modes for which we propose to integrate electric, self-driving vehicle technology. Along the circulator route, we identify locations where we intend to develop transportation infrastructure.

These include:

Intermodal Transportation Facility with Electric Vehicle Charging and Parking –

This facility is currently under construction and is expected to be completed in early 2017. The design includes bus lanes for SporTran and bus slips for intercity bus lines. Greyhound is expected to be the largest intercity operator in the facility, but we have also had indications from Megabus that they plan to bring service to Shreveport at this facility. The site has convenient rail and interstate access, and will potentially be expanded to house Amtrak. Two on-site parking lots, owned by the city, can be integrated into the project plan for installation of charging technology and ICT infrastructure.

Electric Taxi/Circulator Station – This site is the current bus terminal for Shreveport and Bossier City, located in downtown Shreveport. Built in 1986, the iconic tent design contributes to citizens’ positive sentiments on the public transit system and will continue to be a prominent feature in the downtown landscape after the planned route restructuring in 2017. Transit bus traffic will be significantly reduced once the new intermodal facility opens, so there is an opportunity to give new life to the station by making it the hub for electronic vehicle operations. The facility is already covered, which makes it an attractive site for a demonstration project. Proximity to entertainment, the Shreveport farmer’s market, and downtown office buildings are also positive features that make taxi service from this location highly marketable.

Vehicle Charging Stations and Information Hub in the Shreveport Common

Cultural District – We propose to build electric charging infrastructure in the Shreveport Common cultural district to support economic development in the area that was named the #1 development project in the nation for 2015-16 by the National Development Council. This arts and culture district is home to the legendary Municipal Auditorium and has already seen \$40 million in city, parish, and private investment since the launch of the project in 2011. On the edge of downtown and adjacent to I-20, this area has ample parking to help address the constraint that is hampering downtown development, and the implementation of the downtown circulator will help provide the missing transportation element that will make this a viable parking option for commuters.

Cohab Shreveport-Bossier – While we do not anticipate any infrastructure at Cohab, we have included it on the map to show the proximity to other project activities. Cohab is a local non-profit that will help lead our efforts to promote data accessibility.

Other technology featured in our proposal such as connected vehicle technology and data-sharing platforms are not presented on the map, but are game-changing ITS solutions that would be easily transferred to other cities to address common transportation challenges. These projects are explained in further detail in the sections that follow.

A Smarter Vision: Shreveport's Planned Downtown Circulator Route and Key Infrastructure Investments for a Forward-Thinking City



Creativity Central - Data Repository



Vehicle Charging Station in the Shreveport Common Cultural District



Shreveport Common

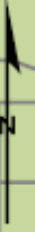
Proposed Electric Taxi/Circulator Station



New Intermodal Terminal Electric Vehicle Charging and Parking



0 0.075 0.15 0.3 Miles



IV. Detailed Approach to Achieving USDOT Vision

In this section, we present our approach to implementing USDOT's vision for a smart city through specific interventions and approaches for each of the 12 high priority and priority vision elements identified in the Smart City Challenge.

Vision Element #1: Urban Automation. The economics of public transportation are a challenge throughout the country. In Shreveport, the cost of labor and benefits is the single biggest cost of operating bus and van service at more than 65% of gross operating costs. Looking past the significantly higher capital investment (for now at least), automated vehicles offer an opportunity to improve the efficiency of public transportation and give passengers more control over when they want to go. Our first proposed investment involves introducing self-driving vans for the downtown circulators that will launch as part of the SporTran route system restructuring in 2017. Tied to the city's signal system and incorporated into the development of either wireless or in-ground technology, an automated electric vehicle that moved from high demand locations along a very basic route would save money, increase efficiency, and pave the way for additional development over time.

This approach could also be extended to neighborhood circulators that are designed to keep heavy duty transit buses out of residential districts. These routes will connect up with the main fixed route service, serving as collectors for the system. These circulators will be small vans or cutaway type shuttles that will operate in areas with a 25 mph maximum speed limit, and thus would be ideal test sites for incorporating automated vehicles into public transportation. ADA accessibility and fare collection are challenges for mid-size transit agency with trained operators on every vehicle. Moving to fully automated vehicles will raise questions beyond the anticipated test of how the vehicles will perform, but neighborhood circulator routes would provide the right environment for assessing both the technology and the approach for integrating automation into public transit.

Another option that we raise is to deploy electric vehicles for fixed route individual or shared-ride "taxi" service. Our downtown bus terminal will have available capacity to support this new mode along with charging stations for both city-owned vehicles and public use. Initially, vehicles may not be fully automated, but the goal would be to move to a driverless system in a short period of time as the technology is tested and advanced. The system could run either on a fixed route structure, or it could accommodate pre-defined route deviations based on passenger demand and travel patterns. A potential pricing model could inversely follow demand, with higher prices in the day when more traditional public transit options are available, and lower prices at night to encourage use and minimize the need for larger vehicles for transit service.

Lastly, although it would require a significant design shift, one of the unique opportunities for automation arises in Shreveport from its partnership with Elio Motors. Introducing automation into the design currently in testing at Elio could allow people to use automated vehicles to assist in parking and mobility in the urban core. This could be an app-based system, tied to the city's planned mobile payment application for parking and transit, whereby parking or transit patrons could access the automated vehicles as shuttles between parking and their end destination. This would lead to a decrease in vehicles in congested centers, improve ride-share usage, and aid in utilization of high demand – yet random – requests of individuals that mass transit finds inefficient to serve. In concept, an individual would access an app in the downtown area where parking is exceptionally limited. The app would dispatch a self-driving vehicle to pick them up and relocate them to a pre-determined parking garage or lot outside of the congested central business district.

In Our Own Backyard

Elio Motors is based in Phoenix, Arizona and is preparing to manufacture its ultra-high-mileage vehicles in Shreveport, using a portion of the former General Motors Shreveport Operations plant. The company has begun taking reservations and as of January 2016, 49,017 reservations have been made.

Vision Element #2: Connected Vehicles. To better coordinate bus movements in a transportation system of our size, we have discussed the idea of “Connection Protection” with technology firms and feel that this is a solution that is within reach over the demonstration period of this project. In larger systems and on major bus routes, headways between vehicles may be as short as 5 minutes, so missing a bus occasionally might not be a major inconvenience. When you get up to headways of 20-30 minutes though, missing the bus by a minute can be extremely problematic. Our AVL system runs off of cellular networks, communicating bus locations back to servers every three seconds. The system compares this location data to schedule time points and maintains a running record of on-time performance. Currently, this schedule is communicated to passengers to help them track a single bus, but there is a potential to make buses talk to each other through the on-board mobile data terminals so that bus operators can wait for connecting passengers if they know they will be arriving shortly. Once developed in Shreveport, this is a system that would reach scale quickly as an add-on feature to real-time passenger information systems already deployed in a growing number of transit systems.

On-bus technology can support transit efficiency, but there is also an opportunity to use transit as part of a data collection network with broader planning and traffic engineering utility. Installing dedicated short-range communications (DSRC) technology on the City's fixed route buses and LiftLine paratransit vans could take advantage of the fact that city assets are already racking up millions of miles a year on the city's roadway network. Adding in police and fire vehicles, public works trucks, parks department vehicles, and other city vehicles could create a mesh network of real time data collection throughout the city. Currently SporTran has some on-board data

collection systems that communicate in real time over cellular networks and other systems that dump data through a wireless bridge at the main yard, so depending on how quickly data is needed, the cost of collecting and transmitting the data can be fairly insignificant.

Mobileye's support to this challenge brings an additional level of connected vehicles, emphasizing safety as a benefit of connected vehicle technology. SporTran already coordinates with police, engineering, and public works on trouble spots in the route structure, but having real-time quantifiable data would provide a much more powerful tool for planning and for risk mitigation efforts. One additional on-vehicle technology we would like to explore would be transmitters or communication modules that could help reduce the risk of vehicles rear-ending buses at bus stops. Building protected bus stops throughout the city is cost prohibitive, but beyond safety lighting, we propose to explore additional approaches to minimizing the injuries, transit delays, and vehicle down time that are caused by accidents that should be preventable given technology that is available today.

Looking at the transportation system as a whole, the Shreveport-Bossier area presently maintains a fiber optic communication ring. This system allows for intelligent transportation elements previously deployed to work together and communicate with the municipalities and the Traffic Management Center. One concept considered by the region is to utilize this network to install stations that would allow equipped vehicles to receive real-time data on major routes and freeways in the region. This would allow motorists to receive travel data on excessive delay, accidents, or events impacting traffic at a regional level; giving them the opportunity to choose alternate routes. The net result is lower congestion, fewer heavy vehicles involved in incidents, lower secondary incident rates, and fewer emissions. Informed drivers would also have information needed to select routes that avoid construction zones, special events, accidents, and trains (or conversely reach the special event safely & efficiently). With two way communication, the vehicles would provide the system with travel data, congestion levels, and alert authorities the moment an incident occurs.

In addition to its fiber network, Shreveport is in the early stages of installing a supervisory control and data acquisition (SCADA) system. This is a wireless network tied to its water distribution and data collection system. An addition to this system could allow for vehicles to access data and provide data through communication across the internet. Enabled vehicles would then give data on local streets and receive similar information on local roadways in addition to principal routes and freeways. We will explore linking camera systems on buses into this network for live streaming in emergency situations as a first stage of testing the capabilities of the system. There are many more, much lower bandwidth solutions that could also benefit from

this citywide network, and the incremental cost of adding capacity is minimal compared to the capital investment the city has already made.

Vision Element #3: Intelligent, Sensor-Based Infrastructure. A communication network is key to receiving and disseminating information. However, data collection remains the underpinning of such a process. Communication systems easily detect data from equipped vehicles, however, they do not collect data from unequipped vehicles. One method of bringing more vehicles into a connected system is to employ devices such as 3M's Blue Toad to track cell phone signals. This is not an inexpensive endeavor, but as citizens become more accepting of crowdsourcing approaches, individualized data will become increasingly available for planning and investment prioritization. Shreveport envisions a rollout of multiple mobile applications of this nature to capture the presence of these devices without capturing the details associated. Once processed, this data can be turned into data collection for various efforts:

- Daily Traffic Counts
- Congestion Data
- Travel Time
- Routing

Additionally, multiple signals throughout the city currently rely on video and induction loop detection for signal actuation. With available technology, this data can also be collected to provide long term data needed for planning, improvements, and in identifying problem locations. Armed with this level of data, city planners and engineers can focus efforts and limited funding efficiently and fairly. Maybe more importantly however, this data can be made available to the public to foster new and innovative approaches to how traffic information is used.

We also have an opportunity to capitalize on the investments we have made in traffic signal prioritization to expand the functionality of that system. We propose to fund installation of TSP technology on transit vehicles as part of this project to improve on-time performance for the fleet but also to capture additional data on how our transportation system is performing. Monitoring the frequency of TSP interventions for public transportation will provide insight into traffic flows and schedule/route flaws that are currently difficult to quantify and analyze. We anticipate that there will be other non-transit uses for this type of data as well that we can expand on through collaboration with stakeholders and technology partners.

Vision Element #4: Urban Analytics. Connected vehicle technology, social networking, crowdsourcing, and other developments are generating massive amounts of data, but the truth is we are not coming close to using existing data to its full potential. This element is closely tied to the issue of architecture and standards, and cities face the challenge of cost effectively

developing systems that and tools that can leverage data from multiple sources. Our proposed “Civic Communications” project is a fairly simple example of an urban analytics and reporting system, but even this will require collaboration and coordination between vendors who may see this type of initiative as a threat to their business. The shift to a *Software as a Service* (SaaS) model and less reliance on hardware sales in the ITS industry however may reduce some of the barriers that previously existed with attempts to integrate solutions in a common platform.

Livability Scorecard

What makes Shreveport a great place to call home? For starters, it's easy to get around. That is a selling point to businesses looking to relocate to the area, but like many quality of life indicators, it is largely anecdotal. Making data on congestion and travel time more available and accessible could help mid-sized cities measure and improve on the indicators that make them attractive in today's business environment.

“Civic Communications” could be a good test model for this type of central data analysis, starting as a platform for city departments, but eventually expanding to allow for public participation through mobile applications. For example, our AVL provider could easily configure a menu on bus mobile data terminals to create a mechanism for bus operators to report on events that could be exported in real time to a data analytics platform. Or in its current form, raw data on transit vehicle movements and passenger loads is already available for integration into this type of system. Other departments within the city already have their own hardware and systems designed to support their operations, so having them invest in mobile data terminals to match the bus fleet would not make sense. The system would therefore rely on the ability of different technology providers to adapt their products to contribute with the broader needs of the city/client.

Vision Element #5: User-Focused Mobility Services and Choices. The changes that the City of Shreveport has been implementing to its public transportation system are designed to improve mobility for citizens who count on SporTran buses to get to work, school, church, grocery stores, and other places in town that are important to their lives and livelihoods. We have highlighted the changes we are making to bus service, including the launch of a real-time bus tracking system in 2014, but we have been equally aggressive in implementing new technology for our LiftLine paratransit service. Since 2012, ridership for this door-to-door ADA service has increased from 35,000 trips to almost 60,000 trips per year. Technology has made this growth possible, starting with implementation of a new scheduling system on installation of tablets on vehicles to provide drivers with directions and real-time manifest updates. As stated earlier though, our goal as a city is to provide more services to a greater segment of the population, and public transportation is only part of the equation.

One project that is in the design stage is a joint parking and transit mobile payment system. Ideally, citizens will be able to use a common mobile app to pay for these services and use the same system to access bus arrival information and parking availability data. For people parking along the circulator route to access downtown, one application will allow them to find either a paid parking or free spot, pay for their parking if it is in a pay zone, and gauge how long they will wait for the next circulator to pass by.

Mobility services are evolving, and local policies and legislative frameworks are being challenged to keep up. Shreveport has shown the commitment to adjusting local ordinances to support and nurture new transportation solutions. In 2012, the City Council adopted an ordinance amendment to allow for iShuttle, a mobility on demand start-up service to enter into the market. The city is currently finalizing arrangements with Uber begin operations in Shreveport, and is excited about how this will create a more expansive transportation network. Bike share programs have not yet caught on in Shreveport in the way that they have in larger metropolitan areas, however, our locally developed solution Bike Shreveport is a cooperative that is refurbishing and donating bikes to generate interest in biking as a viable mode of transportation in the city. The Bike Shreveport movement has also helped secure funding the Transportation Alternatives Program to create a network of bike lanes to improve bike safety in and around downtown.

Vision Element #6: Urban Delivery and Logistics. As with many of the other vision elements, our approach to urban delivery and logistics starts with identifying solutions that will initially support public transit operations, but that will ultimately have an impact on the transportation system that will benefit all users, including private supply chain operations. Currently, the main conflict between freight and public transportation is the lack of actionable, real-time data related to railroad crossings. Working with our AVL/Computer-Aided Dispatch provider and the regional TMC, we propose to develop a system whereby dispatchers are notified of train movements are able to instruct bus operators to initiate detours via the onboard MDT. We envision that this system would also push alerts out to passengers to reduce the risk of detours resulting in passengers being bypassed.

Vision Element #7: Strategic Business Models and Partnering Opportunities. Our approach for this vision element is to prioritize making data available to both public and private sector clients and promoting the availability of data to private technology developers to help stimulate ideas for new applications and technology. The City has an application program interface (API) for bus location data that can be made readily available for private developers, but promoting the availability of this and data collected through other ITS systems is a low cost way to elevate Shreveport as a testing ground for transportation technology. Shreveport-Bossier is home to the Cyber Innovation Center, Intertech Science Park, and a number of locally grown, national

software development companies such as Praeses, Bowman Systems, and Twin Engines Lab, and these partners have the capacity to lead or support innovations taking place in the transportation sector if they are given a platform to make them competitive in this industry.

One way that we propose to involve the local business community is through the Cohab entrepreneur development programs. Cohab, a local non-profit that provides shared office and meeting space and hosts training courses for area businesses, would be an ideal home for a repository of data feeds as their interactions with start-ups and more advanced “mentor” firms would build awareness about the types of data that are available. Typically, city governments house these types of repositories internally as a protective mechanism, but this does not promote the maximum use of the data. We are not proposing that Cohab would maintain servers, rather, they could simply add a page on their website that links directly to data sources that are maintained elsewhere. This approach would also provide government with a feedback mechanism about what types of data the private sector needs as Cohab would be part of the steering committee assessing what data could be made available and at what cost.

If You Build It...

Building a repository of transportation data feeds can help stimulate tech growth, but it can also take the ITS investment burden off of the public sector. For example, property developers might be willing to purchase traffic information displays to put at the exits of housing developments if technology companies were able to access traffic data and tailor it to client locations.

Vision Element #8: Smart Grid, Roadway Electrification, and Electric Vehicles. To complement our proposed electric automated downtown circulator shuttle and taxi services, our vision includes building public charging stations in both the new intermodal terminal and the downtown transfer hub as well as in the Shreveport Common district along with circulator route. The charging station will support the circulator vehicles and taxis, but will also catalyze efforts to get commuters to park outside of the central business district and use the circulator as last mile transportation. SWEPCO, the electric provider for Shreveport, would be a key partner in this effort, along with the vehicle and charging system manufacturers. Shreveport has been a leader in clean fuel initiatives with CNG, and we welcome this opportunity to diversify our clean technology efforts through electric vehicle technology.

Vision Element #9: Connected, Involved Citizens. As the city releases new mobile applications such as mobile payment apps for transit and parking, there are new opportunities to get data feedback from citizens that can contribute to planning. We commit to involving the public in the technology that we plan to deploy through this challenge, because ultimately the infrastructure in Shreveport is there to serve our citizens. We have discussed the idea of an enterprise system to centralize data collection from various city departments, but thinking bigger, this system could also incorporate a mechanism to pull in data from citizens. The city website includes a complaint

portal that allows citizens to submit inquiries or complaints and track the resolution of their issue. This is an extremely customer-friendly tool; however, adding functionality to allow users to geotag incidents using location services on their phones could improve the city's ability to track and resolve issues.

Vision Element #10: Architecture and Standards. This is a vision element where USDOT's expertise and experience will greatly contribute to project design and efforts to replicate successes from the demonstration projects. In negotiating with vendors and partners, we recognize that we will have to take a firm stand on architecture and standards that will align with the principals of promoting a sharing economy.

Vision Element #11: Low-Cost, Efficient, Secure, and Resilient Information and Communications Technology (ICT). ICT is at the center of almost all of the interventions proposed in our vision, and we share USDOT's view that system design must be approached with fail safe mechanisms and redundancies built in so that failures do not have catastrophic impacts on city operations and transportation systems. The City of Shreveport updates its business resumption plan annually through a process whereby department heads meet and talk through new challenges and additional technology that must be reflected in the plan. Shreveport takes this plan seriously and makes it an active, living document because we understand that any downtime of city systems negatively impacts citizens, costs the city money, and undermines the reputation of city leaders.

The vehicles and electric grid infrastructure we are proposing will require significant capital investments, but the ICT solutions are much lower cost interventions that have the potential to impact our city as much as or more than these elements. We maintain separate servers for most ICT applications in use in our transportation network, either on site or through *Software as a Service* vendors, but linking these back to an enterprise system to strengthen our urban analytics capabilities will be the next phase of integrating these data sets to expand on the potential uses for the data that we are collecting and will begin collecting through connected vehicle technology and sensor-based infrastructure.

Adopting new technology brings new risks, and data security is a real concern for the city and our citizens. As we bring on new tools such as mobile payment technology for public transit and parking, we will also create powerful data sets that provide greater insights into customer behavior and travel patterns than current farebox and automated passenger counter systems generate. Security standards for financial transactions provide a strong framework for how this data is shared, but as we roll out other technology that is not linked to financial transactions, emphasizing standards that protect Personal Identifiable Information (PII) will be key to creating systems that are replicable and scalable.

Vision Element #12: Smart Land Use. Our project focuses on the downtown area to complement other ongoing efforts to re-establish the urban core. Shreveport is very much a typical mid-sized city with sprawl and expansion to the suburbs, but there is a growing understanding that this approach to development is unsustainable given the strain that it puts on the budget for upkeep and maintenance of the associated infrastructure network. Over the past five years, private developers have repurposed historic buildings to construct five new apartment and condominium complexes, and three additional large scale mixed-use developments are in the planning and construction phase. Shreveport and Caddo Parish have also drafted a new unified development code (UDC) to replace outdated zoning ordinances and promote smarter land use and investment moving forward. The UDC is currently available for public comment and is expected to be adopted by the middle of 2016.

V. Project Risks and Risk Mitigation Strategies

Cutting edge technology and innovation undoubtedly involve some level of risk. However, without a forward focus, it groups can easily miss out on opportunities to develop concepts that the nation desperately needs to improve. Self-driving vehicles, electric vehicle innovations, and mass transit inventions fit this category. Despite the risks involved in such undertaking, the benefits from success overcome the negative impact of doing nothing or failing to move forward.

The classification of this challenge as a research projects supports the notion that there are significant risks with new technology, but identifying the right test sites in the right city is the primary risk mitigation approach for this initiative. We believe that the projects that we are proposing will not be disruptive to the transportation system or to public transportation in Shreveport; rather, they are projects that will complement and expand on the systems already in place.

While there is risk in some of Shreveport's proposal, there are sections that are extremely low risk factors. A combined effort in such a setting virtually guarantees that a level of improvement will be achieved. Even in areas that may not see immediate success, the platform will be in place for future efforts and can serve as a learning experience for others to build on. Some of the efforts being considered in this initiative are based on solid, tried and true technology. Mass transit priority at signals and emergency vehicle preemption are based on proven technology and programs that can be easily implemented with exceptional results once funding is secured. These concepts will provide outstanding, easily discernable results with minimum risk. However these key elements are only part of the vision in Shreveport.

A risk that is specific to the Shreveport proposal is that the emphasis we are placing on the public transportation system. This focus may deter other local stakeholders from getting involved in the effort if we are unable to effectively communicate how the project will reach a much broader segment of the population than public transportation has traditionally served. This is a low risk; however, as there is widespread interest in the changes that have been taking place with public transit and city support from a financial perspective remains strong. Additionally, the commitment of the mayor and local leadership to this project will ensure that this project secures cross-sector involvement at the city, parish, and state government level as the benefit to the region of being selected for this project would have far reaching effects.

Lastly, there is a policy risk associated with the project for Shreveport as there would be for any City. New technology does not always fit with existing legislation and ordinances, so there must be a willingness of leaders and the public to adapt local laws to allow for change. Shreveport's City Council has showed this willingness, including in the transportation sector with legislation in 2012 to update the rules and regulations that governed taxi and limousine services to allow for an on-demand mobile app-based service to enter the market. Additionally, the City Attorney for Shreveport has extensive experience with technology contracts and data rights issues and is a firm believer in crafting ITC contracts that are forward-looking will allow the city to make the most of its investments by allowing for interoperability increased in the future.

VI. Partnering for Success

Our project team will be led by city employees from public transportation and engineering, but will be guided by a steering committee of stakeholders from USDOT, existing vendors, new technology partners, local universities, the local business community and users of public transportation alternatives. As stated in Section II.B. above, we feel that it is too early to commit to specific partners outside of our local team, in large part because being selected as a finalist will open new doors and create new partnership opportunities that are less viable at this stage in the solicitation process. We have a number of local universities that we will involve in the project at different levels, including for monitoring and evaluation activities, but we want to work with the most advanced technologies available, which will require collaboration with a number of new partners and research institutions with which we do not currently have established relationships.

The City of Shreveport's role will be to present our challenges and facilitate an environment in which these new partners can test jointly developed solutions. We want outside help, but we will be actively involved in all aspects of implementation to make sure that projects and activities fit with our long-term goals for a livable Shreveport. We will assign a project manager for each

intervention to oversee the work plan elements and take the lead on monitoring and evaluation for that intervention. The project manager will be responsible for coordinating the activities of sub-partners, and will report back to the steering committee so that interventions are not implemented in isolation, but rather they remain part of an overall vision for system wide improvements for the city and transportation network.

VII. Overview of Existing Transportation Infrastructure

As described above, Shreveport has a sufficient roadway system with 51.70 miles of interstate, 68.87 miles of principle arterial roads, and 121.5 miles of minor arterials. The Shreveport-Bossier region maintains a fiber optic network on its freeways and several of its most traveled roadways. Adequate capacity exists to employ this network as it was installed with the intent of expansion. Additionally, the Louisiana Department of Transportation and Development maintains a regional TMC that is staffed at all times. Devices such as variable message signs, fog warning systems, video surveillance, motorist assistance patrol, and modern traffic signal systems have already been employed within the region.

SporTran provides fixed route service on 14 daytime routes and four night routes in Shreveport. An additional four daytime routes and two night routes provide connections in Bossier City. The main bus terminal is located in the central business district with the Shreveport Regional Airport serving as a transfer center on the west side of town. SporTran also provides paratransit service throughout the city limits of Shreveport and Bossier. In 2015, SporTran ran 2.25 million vehicle revenue miles and provided more than 2.75 million passenger trips. We have expanded three routes for 2016, but will implement a major route restructuring in 2017 with the opening of a new intermodal terminal and construction of a new transfer center in Southwest Shreveport.

Since 2010, SporTran has aggressively introduced new technology and continues to add features focused on data collection and analysis and passenger amenities. System changes include:

- Fuel diversification through addition of 25 Compressed Natural Gas (CNG) fixed route and paratransit vehicles
- Installation of bike racks on all fixed route vehicles
- Real Time Passenger Information System (www.sportranbus.com)
- Installation of Automated Passenger Counters
- Implementation of Automatic Vehicle Locator/Computer-Aided Dispatch
- Upgraded on-vehicle camera systems

SporTran is also currently working on a solicitation for a pay-by-phone mobile payment system for transit with a link to a pay-by-phone downtown parking app. This technology aims to

improve the ridership experience and promote mode choice by linking with other transportation systems.

VIII. Overview of Current Data Collection Systems

In presenting our ideas for new interventions, we have highlighted some of the technology that is currently in use for data collection in Shreveport. We also do quite a bit of manual data collection that is cumbersome to capture and integrate into enterprise systems. We hope to fundamentally change our data collection systems through this challenge and demonstrate that major change can be accomplished with investments that are affordable to most mid-sized cities. Getting the approach right and testing different models is an expense that Shreveport cannot bear alone though, but the Smart City Challenge provides a platform for helping Shreveport and other mid-sized cities develop workable solutions to typical data collection challenges.

We currently collect data through a number of automated systems and manual approaches, specific to the needs of various departments. Analysts in Shreveport's traffic engineering division utilize counting devices to collect daily traffic counts. They also manually collect turning movement, speed, and classification data as needed for projects or requests. This data is shared with all agencies in need throughout the region. Additionally, counts are updated annually and shared on the internet for historical and current analysis. One of the advantages to future efforts will be the automation of much of this data. What is presently being collected manually, can instead be automated. This increases the reliability and accuracy of the data. Sharing the data becomes a matter of uploading a file or automating data integration instead of the lengthy process of data entry, processing, and eventual upload.

On the transit side, we collect data on typical transportation indicators such as ridership, revenue, and on-time performance. We have been using automated data collection systems for years through on-board electronic fareboxes, but we only recently replaced manual data collection systems for many of our indicators through implementation of our automatic vehicle locator and automated passenger counter systems. This automation has allowed us to make more informed decisions about route changes, bus stop locations, transit amenity (benches and shelters) projects and other aspects of how we operate so that we can become more efficient as a city.

With a modern system, raw data once collected by individual divisions (e.g. transit, public works, and engineering) and processed for their own uses becomes available for use by anyone with a need. Unprocessed data serves as a foundation that others can build upon instead of the filtered counterpart that may not fit the needs of other entities. We have proposed a "Civic Communications" enterprise system as an example of way to collect and disseminate data to a range of stakeholders, without requiring new investments in hardware and department-level infrastructure.

From a regional ITS perspective, a good degree of integration presently exists between the multiple agencies in the region and regional data feeds into the Long Range Transportation Plan process at the project prioritization level. However, most data is not presently in a format that is useable by the various groups, so coordination with the state and other stakeholders will be an important part of our approach to introducing new ITS systems, a process that is currently managed through the metropolitan planning organization (MPO). On this note, both the City of Bossier and the City of Shreveport have contracts with the Louisiana Department of Transportation to share data and perform studies. These City/State agreements give the framework for sharing of traffic data collected and used to answer a variety of requests: new roads, problem areas, signal issues, speed issues, etc.

IX. Performance Monitoring and Impact Evaluation

Our performance monitoring plan (PMP) will include goals, objectives and indicators at the project level, and also for individual vision elements so that we can test the effectiveness of activities and show how the vision elements contribute to overarching performance measures that show an increasingly efficient and effective transportation system. Our project steering committee will develop a full set of goals and objectives during the design phase, but we have established the set of principles below that guide our proposed interventions.

Through the Smart City Challenge, we aim to:

- Identify solutions that will ultimately strengthen the city's financial position through improved operational efficiency and economic growth
- Set a new standard for safe transportation infrastructure through connected vehicle technology and vehicle automation
- Leverage efforts of individual departments and stakeholders to unleash the potential of our ICT investments

The indicators that we will use to measure project impacts will reflect the needs of all of our stakeholders. For transit, project activities such as "Connection Protection" and the launch of automated circulators should increase public transportation ridership, but we will go deeper in analyzing the impacts to look at the cost-benefit and other effects of these types of interventions. For example, the Downtown Development Authority (DDA) tracks office space occupancy as a critical indicator of economic performance. We envision that improved downtown transportation systems will have a significant impact on this indicator, and will explore this through independent evaluation to depict the full impact of transportation investments on our city.

Public safety is an area where benchmark data is widely available in Shreveport and around the country and is an area where there is significant potential to make improvements using the smart technology proposed in our vision and in the USDOT ITS Strategic Plan framework. Connected vehicle technology such as the Mobileye solutions that are already commercially available will help cut down on accidents and loss of life, which has an enormous and easily calculated cost benefit for cities. Promoting mode choice and introducing more accessible mobility options can also significantly benefit Shreveport, and our M&E approach will attempt to tell this complete story by incorporating indicators that are important to all stake holders, such as a reduction in drunk driving that may be attributable to the proposed automated taxi service.

Involvement of university and research partners will help assess more complicated indicators as attribution will be a challenge given the variables that come into play with transportation and development. For example, current gas prices are negatively impacting public transportation usage, but the model for measuring elasticity of demand for transit is outdated, especially in mid-sized cities where fuel prices make up a greater share of the overall cost of transportation than in larger urban settings where parking and tolls influence decisions on mode choice.

X. Organizational Capacity

The City of Shreveport manages a large portfolio of capital projects and federal grant programs across sectors, including projects funded through the Federal Aviation Administration, Federal Highway Administration, the Federal Transit Administration, and the Department of Housing and Urban Development. To implement these projects, we rely on sound purchasing and financial systems, a coordinated approach to risk management, a proactive City Attorney's office, and leadership that is committed to providing technical and financial support.

Our public transit system stands out for the leadership role it plays in defining public transportation policy for the state and region. The SporTran General Manager currently serves as President of the Louisiana Public Transit Association and is the Secretary/Treasurer for the South West Transit Association that covers nine states, including Louisiana, Texas, Arizona, Colorado and Oklahoma. Staffed with federal purchasing, safety, grants, and M&E specialists, SporTran has the departmental resources necessary to lead this program and coordinate multi-stakeholder activities envisioned in our submittal.

Lastly, the City of Shreveport is committed to identifying opportunities for public-private partnerships and to bringing local funds to the table to implement projects identified in this proposal and to expand on them after the USDOT demonstration phase ends. We presently have money identified from our 2011 bond issue set aside for similar projects, such as the \$2.4 TSP

investment we referenced above that will focus on the King's Highway corridor which is an area where we will launch expanded bus service in 2017. While these local investments represent only a small share of the request associated with the Smart City Challenge projects, they stand as a commitment by Shreveport to see these types of projects through to completion.

We present letters of support from local partners on the pages that follow to demonstrate that community partners are actively involved in city efforts to upgrade technology and systems that will serve as the foundation for a more dynamic Shreveport in the future. We are excited about this opportunity and appreciate USDOT's creative approach to tackling the transportation challenges of the future.