

UNIVERSITY TRANSPORTATION CENTER (UTC) STRATEGIC PLAN for

**The Gulf Coast Research Center for Evacuation and
Transportation Resiliency**

Prepared for the:

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SECTION I. PROGRAM OVERVIEW

This strategic plan serves as a guide for proposed activities with the University Transportation Center (UTC) at Louisiana State University (LSU) and the University of New Orleans (UNO). In addition to the research objectives the Center also seeks to achieve the stated mission and educational, diversity, and technology transfer goals of the United States Department of Transportation's (USDOT) UTC program. The strategic plan also describes a path that will permit the center to become self-sustaining over the long term after the initial four year period of support ends.

A. GLOSSARY

The following list includes definitions of uncommon words and acronyms used in the Strategic Plan document:

CEE:	Department of Civil and Environment Engineering, Louisiana State University
CUPA:	Center for Urban and Public Affairs, University of New Orleans
DHS:	Department of Homeland Security
FEMA:	Federal Emergency Management Agency
FHWA:	Federal Highway Administration
FTA:	Federal Transit Administration
GIS:	Geographic Information Systems
LANL:	Los Alamos National Laboratory
LSU:	Louisiana State University
LSU-HC:	Louisiana State University Hurricane Center
NISAC:	National Infrastructure Simulation and Analysis Center
MPO:	Metropolitan Planning Organization
NCHRP:	National Cooperative Highway Research Program
NISAC:	National Infrastructure Simulation and Analysis Center
PI:	Principle Investigator
PLUS:	Department of Planning and Urban Studies, University of New Orleans
SNL:	Sandia National Laboratory
SUPRS:	School of Urban Planning and Regional Studies, University of New Orleans
TMIP:	Transportation Modeling Improvement Program
TRANSIMS:	Transportation Analysis and Simulation System
TRB:	Transportation Research Board
UNO:	University of New Orleans
UNOTC:	University of New Orleans Transportation Center
USDOT:	United States Department of Transportation and Development
UTC:	University Transportation Center

Center Theme

The theme of the LSU-UNO Gulf Coast Center for Evacuation and Transportation Resiliency is focused on Evacuation and Transportation Resiliency. This theme has been selected to address a multitude of issues that impact transportation processes under emergency conditions such as evacuation and other types of major events as well as the need to develop and maintain the ability of transportation systems to economically, efficiently, and safely respond to the changing conditions and demands that may be placed upon them. Work in this area may include, but is not limited to, the development of modeling and analysis techniques; innovative design and control strategies; and travel demand estimation and planning methods that can be used to predict and improve travel under periods of immediate and overwhelming demand. In addition to detailed analysis of emergency transportation processes, The Center will provide support for the broader study of transportation resiliency. This will include work on the key components of redundant transportation systems, analysis of congestion in relation to resiliency, impact of climate change and peak oil, provision of transportation options, and transportation finance.

Using the concept of resilience as an organizing theme for the Center provides a strong analytic framework for advancing management and policy tools necessary for dealing with future conditions that are increasingly unstable. The need to provide multiple options for both personal transport and commerce is underscored by recent experiences in Louisiana resulting from Hurricane Katrina where transportation systems were stretched to the breaking point. Addressing the multitude of issues that impact transportation processes under emergency conditions and other types of major events will be a central focus of the Center.

The scope of the work anticipated to be conducted will seek to stretch over several different modes including transit, multimodal connectivity and maritime, non-motorized, pedestrian, and obviously automobile-based. In addition to detailed analysis of emergency transportation processes, The Center will provide support for the broader study of transportation resiliency. This will include work on the key components of redundant transportation systems, analysis of congestion in relation to resiliency, impact of climate change and peak oil, provision of transportation options, and transportation finance. The Center theme will provide a strong platform to take advantage of the wealth of knowledge and experience of researchers and practicing professionals in south Louisiana who are actively responding to changing transportation processes and conditions especially in relation to Hurricane Katrina recovery.

1. Need and Purpose

The LSU-UNO UTC brings together a wealth of professional expertise for the study of evacuation and transportation resiliency. Although historically overlooked within the transportation field, emergency and major event conditions occur quite commonly in locations throughout the country that range from mass evacuations to planned special events like sporting events, concerts, and other large-scale civic functions. Over the past several years, agencies like the USDOT have taken a much greater interest and leading role in the development and application of knowledge to facilitate safe and efficient travel under such conditions. Under evacuation and event conditions the amount and timing of the travel demand that is generated often quickly and overwhelmingly exceeds the ability of the transportation network and services

(like highways, busses, trains, etc.) to serve it. Because of this, traffic planning and management for these situations has often been left in the hands of law enforcement and emergency management agencies. While such professionals are experts in areas of command, control, and resource allocation and logistics, they are often not experienced or even familiar with the larger issue of traffic planning, operations and management. Unfortunately, and too often, the results of this lack of expertise have been quite evident and sometimes tragic.

Past research and empirical observation has shown that the movement of people, vehicles, and cargo can benefit greatly from the implementation of special control and management measures that affect the movement in and out of an area by prioritizing certain vehicles, directions of flow, or other issues of need. One obvious example of this has been demonstrated by the use of contraflow operations for evacuation. Under such a strategy, the flow direction in the underutilized inbound lanes of a roadway is reversed to serve traffic in the outbound direction without the time or expense needed to plan, design, and construct additional lanes. Fundamentally, it is a quick and inexpensive way to double the capacity of a road without spending much money or waiting for it to be built.

Although techniques such as contraflow have been around for decades and have been shown to be safe and effective when implemented properly, many highway agencies remain reluctant to use them. This is often because they are viewed as non-effective, risky, or unexplored and without an established record of use. While this is factually incorrect, safety and efficiency problems can occur when these techniques are not used properly. Ultimately this can lead to a self-fulfilling cycle of non-use and poor results. Continuing the contraflow example, the first time it was used on a pre-planned basis in a major US city was for the evacuation of New Orleans in September 2004. Unfortunately, this first-use was also widely viewed as at-best only marginally effective and its discontinuation was suggested. Soon after, however, a team of experts was assembled to study the problem, review research studies, and develop models to evaluate improvement alternatives. When implemented for the Hurricane Katrina evacuation only 11 months later, the improvements were both obvious and significant as the evacuation time required to clear the city was nearly half of the most optimistic of previous estimates.

The positive experience of contraflow in Hurricane Katrina, when contrasted with a far less effective evacuation only two weeks later in Houston and the careless aspects of the New Orleans evacuation that were not effectively planned and managed, demonstrate the enormous need for more research and the development of practices that will lessen the similar experiences in the future. Currently, the vast majority of evacuation plans for major event traffic management strategies are based on professional experience, judgment, and occasionally best-guesses. There are few formalized practices, standards, and guides for such conditions. One of the goals of the Center is to develop and document this type of information by modeling and testing the ideas, techniques, tools and technologies that show how to more effectively use transportation assets in both conventional and unconventional way to facilitate movements under emergency and major event conditions. Then to pass that knowledge on to practitioners so that they are able to improve both the safety and efficiency of transportations during times of emergency or major events and to students so that they become aware of these issues and carry the ideas developed in the Center to more ever more useful and sophisticated levels.

This deep and intensive examination of evacuation planning will be augmented with a broader focus on transportation resiliency as a whole. The New Orleans area and the adjacent coastal parishes are facing unprecedented challenges in re-envisioning and refashioning transportation systems that were stretched past the breaking point in the aftermath of Hurricane Katrina. The broader components of transportation resiliency will be analyzed to help local and regional policy makers and planners meet these unprecedented challenges as well as providing more advanced conceptual insight into the broader transportation resiliency issues that face the nation as a whole. The five overarching areas of transportation resiliency include:

1. Research designed to address the capacity of the transportation system to safely and efficiently accommodate unusual conditions and circumstances ranging from emergency transportation, special events, construction, and basic accessibility of special needs populations such as the elderly, carless, and disabled.
2. Research designed to address the provision and integration of an integrated system of transportation options for personal and freight mobility under both normal and emergency conditions.
3. Research designed to address the design demands of extreme and unexpected conditions for both personal and freight transport.
4. Research designed to address the economic dimension of resilient transportation systems including financing options for resilient transportation projects and economic development impacts of resilient systems and projects.
5. Research that addresses the strategic components of a sustainable transportation system within the context of unstable future conditions.

2. Scope of Activities, Contributions, and Involvement

Although the emphasis of the Center will focus on transportation systems research and analysis, it is envisioned that these activities may also extend to other areas of specialization that bridge the “systems/analysis” and “materials/infrastructure” areas of the discipline. Transportation system activities will seek to both develop new research emphases and continue the history of strong research and development initiatives in emergency and major event traffic engineering and control; geometric highway design to facilitate movement under such conditions; and traffic transportation system modeling. Research in transportation planning will also continue to build upon the accomplishments of researchers at the participating institutions such as emergency transportation demand modeling and decision-making and, as well as appropriate urban planning and land development strategies. With support from the Center, initiatives will also be cultivated to further enhance the working relationships with collaborators with the fields of human behavior, sociology, and psychology to feed into planning work in demand forecasting for evacuees under emergency conditions.

In addition to highway-based vehicle travel research in the systems/analysis area, efforts will also be made to develop more research initiatives in the broader transportation resiliency area with research focusing on transit system and nonmotorized planning, maritime integration, transportation management, and operations for emergency and major event conditions. Building upon their established careers of expertise, the collaborative team members at UNO will take the

lead in developing these areas. It is also anticipated that they will lead research projects involving pedestrian planning and engineering for emergencies and major events. The UNO team also brings a strong background in urban planning, hazard mitigation, GIS, hazard mitigation, and remote sensing. Collaborative ties to bring this expertise together between the two campuses has already been well established on several federally funding projects, including the development of a regional multimodal evacuation simulation model for New Orleans and the State of Practice study for transit-based urban evacuation in the US.

On the materials and infrastructure research side, a considerable amount of knowledge has been gained on the impact of mass evacuation and major storm scenarios on the physical infrastructure of transportation networks. Based on this, an area of emphasis within the Center is envisioned to include how such events compromise and physically damage such facilities, speed up the damage process, reduce the usable life-cycles, and shorten scheduled maintenance intervals of roads, bridges, retaining walls, and the like. In addition to issues of resiliency, research will encompass the quick repair of such facilities when damaged by adverse conditions. Researchers from LSU and UNO have well-established careers in the modeling and analysis of highway infrastructure systems that included highway pavements; bridges and other highway structures; geotechnical features like foundations, embankments and retaining wall. A final area of interest to the Center is the interaction of transportation systems and global climate change. Initiatives have already begun to pursue studies within the Gulf Coast region on the impacts of such climatological changes on economics, safety, and efficiency of transportation networks.

Whenever possible, the Center will also seek multidisciplinary participation from areas outside of the traditional civil engineering and planning fields. Such involvement would be encouraged from areas such as systems, electrical, and computer engineering to facilitate research into on-road ITS, electrical, communication, and control systems as well as computer simulation, modeling, and visualization. Another key area will be emergency and disaster science and management. Currently, LSU has one of the nation's few academic programs in this field and involves faculty from a number of disciplines on campus. Finally, the Center will also seek to develop collaborative initiative from researchers in the basic and applied sciences such as mathematics, statistics, and physics supporting both theoretical development and computational process in research projects.

B. CENTER DIRECTOR'S SUMMARY

Although the list of activities to be completed within the funding structure of the grant appears lengthy, the needs for research and understanding to develop future systems, techniques, and need to train people to implement them is even longer. In general, the goal of the four-year funding period is to develop a framework that meets several immediate and some longer-term needs within the field as well as seeds ideas for future more in-depth development leading to fundamentally new methods and systems for moving people, vehicles, and goods during emergency and major events.

The ultimate goal after the expiration of the UTC funding stream is to turn the Center into a permanent self-sustaining entity capable of competing successfully for external funding from public and private funding sources. It is the Director's opinion that the needs for knowledge in

this field are so great, so important to the lives and safety of the public and the security of the country, and so critical for efficient transportation commerce that it should be a viable entity well into the foreseeable future.

The longer term vision for the perpetuation of this Center is also expected to be enhanced with close working relationships that are expected to be cultivated with partners within the National Laboratory system. Over the past two years, the Center Director has worked on site at both the Los Alamos and Sandia National Laboratories in New Mexico and has interacted closely with staff at both the Argonne and Oak Ridge National Laboratories. He hopes to use these relationships to develop collaborative projects that leverage the resources of the Center with computational and systems research capabilities at these facilities. In particular, arrangements will be sought with the National Infrastructure Simulation and Analysis Center (NISAC) to work on basic-research, seek boarder applications of the knowledge created in the Center, and take advantage of their existing enormous computational capabilities.

The ultimate manifestation of these plans can be described within the context of the Center Director's long-term career objective. His goal is to contribute to the creation of a predictive modeling tool that will be able to demonstrate future conditions of surface transportation system operation within specific time frames: hours, days, or even weeks before they occur. The visionary system is best described within the context of an existing system that has been in use for several years within the Louisiana State University Hurricane Center (LSU-HC) in Baton Rouge. Among the goals of the LSU-HC is to provide operational support for emergency management and response agencies in Louisiana (and occasionally elsewhere along the Gulf of Mexico coast). Among the most critical products provided by the LSU-HC are predictive flood forecasts along the Louisiana coastline. LSU-HC researchers are able to provide these forecasts using output from cutting edge coastal storm surge models that have just recently come into reality. These models are a quantum advance beyond those used only a few years ago in that they marry the computational power and speed of LSU super-computing facilities and detailed bathymetric data near the coast with the most advanced computational flood models currently available.

With these ingredients, the researchers are able to use National Weather Service and National Hurricane Center storm forecasts to link the forecasted storm movement, strength, and speed characteristics with other tidal and atmospheric conditions to the coastal model to create storm surge flood forecasts. These forecasts graphically illustrate the areas that are likely to flood, the depth to which they will be covered by water, the time at which flood waters will arrive, and when they will recede, or, as can frequently occur in Louisiana, not recede because it is trapped within various naturally occurring and/or man made levee systems. Based on this system, the PI has long recognized that a very similar system is within the reach of development for transportation systems.

The envisioned evacuation traffic analysis system will use a framework similar to the previously-described flood model in that it will contain a highway infrastructure base network and inventory of transportation assets. This information is already available (and being used by the PIs research team) through existing GIS-based transportation data bases used in mapping, modeling, and navigational tools such as ArcGISTM, TransCADTM, MapQuestTM and GoogleEarthTM.

What is needed to make this model useful and representative of real conditions is a more detailed understanding of travel demand behavior during emergency and major events, including where people begin their trips, where they go, what routes they take, and when they travel. Similar to the flood model, the system would have the ability to predict how much traffic should be expected on the network, when it would occur, what routes it would be on, and specifically forecast when congestion would occur, where it would be located, how long it would last, the magnitude of its impact, and what travel times would be. During an evacuation scenario, this would permit analysts to determine when to issue and terminate evacuation orders, implement proactive traffic management measures and routing strategies, and determine clearance times so that evacuees would not be trapped in traffic queues as hazardous conditions descend upon them. Perhaps more significantly, the visionary system would be able to predict the conditions in real-time: hours, days, or even weeks in advance and respond to the resultant conditions.

In addition to working collaboratively on the evacuation modeling components of the UTC research, the University of New Orleans institutional collaborations bring another set of key transportation professionals together that can help to build long-term sustainability to the Center. At the local and state level, key UNO personnel have actively participated in the transportation committee of the World Trade Center of New Orleans for over two decades and have most recently served as support staff to the Governor's Maritime Advisory Task Force. In addition, UNO has strong ties with the Federal Transit Administration officials at both the regional and national level. UNO is currently the lead investigator on the National Study on Carless and Special Needs Evacuation. UNO faculty are also actively involved in the Transportation Research Board with several committee memberships.

SECTION II. PROGRAM ACTIVITIES

The activities outlined below focus on establishing a research, education, and outreach program that maximizes the effectiveness of the LSU-UNO UTC. The combination and interlinking of research, education, and outreach are considered essential and to be made in the context of a diverse array of students, faculty, and staff capable of addressing dynamic research and educational needs.

A. RESEARCH SELECTION

Goal: An objective process for selecting and reviewing research that balances multiple objectives of the program.

1. Baseline Measures

The LSU-UNO Strategic Plan is based around the overarching goal of advancing the state of practice surrounding the Center's theme of Evacuation and Transportation Resiliency. To advance this goal, the Center is committed to a strong monitoring program designed to provide indicators of success in the key areas of research, education, and outreach programming. Baseline Measures 1 and 2 in the appended document entitled Baseline Measures for University Transportation Centers, referred to hereafter as "Appendix A", provides a categorization of key programmatic data and results-oriented indicators that will provide key data on the impact of the Center.

Outside of projects with basic-research oriented goals, the majority of transportation research selection at Louisiana State University and the University of New Orleans has historically focused on the immediate and applied needs of the Louisiana DOTD and other government clients. Although faculty members have often developed research problem statements of a more scientific nature in addition to those responding to LTRC requests for proposals, projects have typically been selected and funded based on the need to addressing the immediate and practical needs of the DOTD and other client organizations. Accordingly, more fundamental research on the overarching transportation processes has been limited because of the lack of immediacy of need or a less clearly ascertainable direct benefit. Often this process resulted in highly applied work within limited long-term, highly-exploratory or "revolutionary" impacts. One of the Center's goals is to fill this gap through the direct and indirect encouragement of a more balanced transportation research agenda that provides for a balance of both exploratory and practical research. Baseline measurements for research selection are in Appendix A, Baselines 1 and 2.

2. Research Selection Program Outcome

The LSU-UNO Center project funding selection process will be framed to lead to a long-term sustainable program to improve the management of resilient transportation systems that provides for transportation efficiency and options, increased safety and stability, and sound infrastructure in a holistic manner. While the process will balance the exploratory and practical applications of research, the selection process will be responsive with adequate flexibility and fairness to all

submissions. All participating members will also be encouraged to submit proposals and engage in multidisciplinary, multi-institutional research that also has the potential to promote service within the local communities in which they are located.

3. Planned Activities

The selection process for proposed research is designed to encourage strong, sound research through a clearly defined review process. The process will include external peer review to help ensure the highest quality research. As mentioned in the Baseline Measures section, we envision a balanced approach that promotes both advanced research projects as well as applied research that reflects community priorities in advancing the understanding of the Center's theme. The process is designed around providing an objective system that squarely addresses the Center's theme as well leverages potential resources and equitably balances research needs across the two member campuses.

Research proposals will be solicited based around 5 key areas of transportation resiliency (Litman 2007):

- Research designed to address the capacity of the transportation system to safely and efficiently accommodate unusual conditions and circumstances ranging from emergency transportation, special events, construction, and basic accessibility of special needs populations such as the elderly, carless, and disabled. .
- Research designed to address the provision and integration of an integrated system of transportation options for personal and freight mobility under both normal and emergency conditions.
- Research designed to address the design demands of extreme and unexpected conditions for both personal and freight transport.
- Research designed to address the economic dimension of resilient transportation systems including financing options for resilient transportation projects and economic development impacts of resilient systems and projects.
- Research that addresses the strategic components of a sustainable transportation system within the context of unstable future conditions.

Proposal Solicitation

Our UTC will assemble a Research Board comprised of experts in evacuation and transportation resiliency to craft a research solicitation announcement. This announcement will be sent to the community and will follow a similar process used by the Transportation Research Board. The LSU-UNO UTC will solicit proposals from qualified individuals and teams based on research topics relevant to our UTC theme of Evacuation and Transportation Resiliency. In any give year, we will issue one or more requests for proposals (RFPs) for each of our themes - evacuation and transportation resiliency. All RFPs will include a problem statement, background, suggested scope, budget, and time line. The RFP will ask for proposals to respond to how they will implement and/or modify the research to achieve the goals in the problem statement.

Review of Proposals and Selection of Projects

The Research Board will review and rank all of the proposals. Projects will be awarded based on the merit of the proposal. If two or more projects rank with the same number of points, the

project will be chosen by a majority vote of the Research Board. In case of a deadlock, the vote of the Research Board's Chairperson will be the deciding vote. If the Chairperson is unable to vote on the project, the deciding vote will be decided by the Vice Chairperson of the Research Board.

Composition of Research Board

The Research Board will consist of 11 members, however only seven members will constitute a quorum for voting purposes. Each member will serve a 2-year term and will be allowed to serve for up to 4-consecutive terms. Members who serve 4-terms may sit out a term and then be allowed to start the process from the beginning.

LSU and UNO staff and faculty will be allowed to serve on the Research Board, however, to ensure the integrity of the research process, we will appoint a board that is at least 50 percent non-LSU and non-UNO faculty and staff. These members will be comprised of experts in the field of evacuation and transportation resiliency. If any Research Board member is listed on a proposal, they will not be allowed to vote on that set of projects.

The Research Board will elect a Chairperson and Vice Chairperson, who will each serve 2-year terms and will not be allowed to serve more than one term in a row in the same position. The role of the Chairperson is to oversee the proposal solicitation, review and voting process. The role of the Vice Chairperson is to serve as the acting Chairperson in the absence of the Chairperson. The Research Board will also elect a Secretary for a 2-year term who will be responsible for taking notes and ensuring efficient communication between the Board and those who submitted proposals. It will be the responsibility of the Secretary to debrief, in writing, all those who submit proposals, including both the successful and unsuccessful applicants.

These five overarching areas of focus provide a strong and comprehensive framework for analyzing transportation resiliency and fall within the scope of existing strengths within all of the participating personnel associated with the Center. These individuals would include, but not be limited to, the Center administrators, LSU and UNO faculty participating in Center supported activities, students, and other personnel (for example researchers at national laboratories) who may also become involved in the activities of the Center. Ongoing and planned faculty projects within the two universities have provided a strong base of applied and advanced research in these areas. The Center will help to advance these existing efforts. Current areas of expertise within the LSU/UNO team include:

- LSU's in-depth transportation modeling expertise will help to provide a solid foundation for evacuation demand modeling, multi-modal evacuation scenario testing, and modeling of potential impacts of climate change on infrastructure and evacuations.
- UNO's hosting of the National Carless Evacuation Conference and in-depth national and local research on the need for multi-modal transportation options provides a strong foundation for exploring how a balanced transportation system can meet daily needs while providing improved transportation choice in times of emergency or stress.
- LSU's HC faculty is exploring how emergency management programs can be better coordinated through improved communication and coordination.
- UNO's multimodal freight expertise with the National Ports and Waterways Center and

strong transit research focus will provide in-depth knowledge about the important economic and financing trends that will shape maritime and multi-modal transportation needs in the future.

The theme of Evacuation and Transportation Resiliency was chosen specifically to contribute to the needs of the Gulf Coast region; its impacts are expected to be felt throughout the nation for a variety of conditions, both emergency and non-emergency. For example, the techniques and strategies that are applied for the special purpose of mass movements of people and vehicles during emergency conditions, these same techniques can also be applied, with or without modification, to address a wide range of more conventional over-capacity situations that are associated with the everyday movement of traffic in congested areas. As an analogy, the system is similar to the racing programs of large automobile manufacturers who use their racing programs to develop and test advanced systems and technologies for the race track. Ultimately, many of these systems find their way into conventional production vehicles that enhance the safety, comfort, and convenience of all drivers. Many of today's common in-vehicle systems and technologies like active suspensions, anti-lock brakes, clutchless manual shifting and so on all owe their origins to racing and were considered "space age" only 20 years ago. The Center Director feels that we will see many of the same things through the translation of methods and systems from lab to, emergency use (when standards and practice restrictions may be lessened in the interest of immediate life-and-death conditions), to conventional use.

a) Required Activities

Each Center is expected to devise and implement a process for selecting research projects that includes peers and other experts in the field, including at least one individual from the U.S. Department of Transportation. Selection criteria are to be clearly stated, reflective of the Center theme, and supportive of the national strategy for surface transportation research.

The criteria for proposal evaluation will be developed by the Center administrative staff and reviewed by the Advisory Committee to include a wide cross-section of opinions and viewpoints that will ensure fairness and promote the goals and interests of the UTC program, LSU, UNO, USDOT, and the transportation community as a whole. External peer review is considered critical, and will involve, whenever possible, experts in the specific areas of research being addressed. This strategy will allow research to change over time to address emerging topics and other special needs that get identified through review process.

The Advisory Committee is essential to the effectiveness of the UTC. The LSU-UNO UTC Advisory Committee is anticipated to consist of members of local and state government planning and transportation professionals, the two regional MPOs, the private sector (for-profit and nonprofit), and when appropriate advisory subcommittees will be formed with additional

Litman, T., 2007. "Evaluating Transportation Resilience: Evaluating The Transportation System's Ability To Accommodate Diverse, Variable and Unexpected Demands With Minimal Risk," TDM Encyclopedia Victoria Transport Policy Institute.

members selected by the standing committee for specialized areas such as emergency management/law enforcement integration or specialized transit, maritime, or nonmotorized components. The Advisory Committee members will be selected soon after the Center begins operation. Proposals will be distributed for peer review and then be evaluated by the Center's Director and Associate Directors. The proposals will then be sent to the Advisory Committee for review. Standing subcommittees will be established for evacuation and broader resilient transportation-centered projects. Adequate time for a detailed review by the Committee will be provided. The Committee will then meet to discuss proposals, asking for clarification and potential modifications on proposals. The Committee will then rank proposals based on a clear set of criteria that will include the strength of the project, equity across partner campuses, basic versus applied research strength of relevance to the Center's theme, and other pertinent factors. Projects will be funded based upon the order of prioritization of the Committee. As discussed earlier, it is anticipated that project awards will be made once per year, most likely at the beginning of the academic year to give investigators at least one full summer to focus full efforts on the projects, while also being able to dedicate some portion of their academic year effort toward the project.

The Advisory Committee will advise the Center Director on the approval or disapproval of projects, and may be given the authority to place conditional approval on a research project, which would be funded only as modified by the Advisory Committee. This allows the peer-review process to not be merely reactive, but proactive in beneficially revising research objectives and goals so that the maximum benefit can be achieved through each individual project. This also assures research projects address specific needs rather than merely general ones.

The Advisory Committee will also be made aware of the specific goals of USDOT and specifically the Federal Transit Administration (FTA). Among the key aspects of the Center will be research focus on emergency evacuation related research, particularly the planning, management, and operation of transit services in major urban areas. With this in mind, several of the FTA research goals will be emphasized to the Advisory Committee. These include:

- Provide Transit Research Leadership
- Improve Capital & Operating Efficiencies
- Improve Safety & Emergency Preparedness

The desired outcome of our research selection program will be to produce a scope of research projects which are responsive to the needs of the region and state public and private transportation and transit agencies, DOT, businesses, and practitioners. To this end, the Committee will be provided with updates of the projects as they progress. The Committee, which will be selected to represent the broad interests of the transportation community, will review the progress and final reports to ensure the goals of the UTC, the Center, and USDOT are met.

Finally, research results will be required to be submitted for publication in peer-reviewed journals whenever appropriate. This will provide an other layer of expert oversight and give an indication of the quality and level of contribution that is being made by UTC supported research and its suitability to its stated goals.

b) Recommended Activities

The LSU/UNO UTC will work to address key national transportation needs identified by USDOT. Two primary areas are: advanced research and congestion chokepoints.

(a) Advanced Research

Advanced research will be a key component of the research selection process. Current efforts already underway at the two universities provide a strong base of advanced research projects that will be further strengthened through the UTC. Additional partnership opportunities with state agencies and regional MPOs will be encouraged in the future to help broaden the use of advanced research.

(b) Congestion Chokepoints

With a vast marine landscape dominating much of the southern portion of the state, Louisiana has numerous land and marine chokepoints that restrict efficient mobility and commerce. These issues are especially important in emergency transportation planning. With in-depth emergency modeling experience, LSU will work to test various models that will seek to maximize evacuation flow rates. In addition, the National Ports and Waterways Center at UNO has been exploring ways to mitigate maritime commerce chokepoints. This work and the creation of personal mobility chokepoint mitigation strategies and policies for multimodal transportation will be an important area of research within the Center. Research proposals will be encouraged to address these issues.

4. Performance Indicators

An effective way to track performance measures 1, 1a and 2 is to collect the data directly from project PIs and check this with peer-reviewers who are reviewing the project proposals. Proposal forms will include rows to collect key data such as the type of project (basic, advanced, or applied) and to address whether the project addresses the issue of congestion chokepoints. As a check, peer reviewers will then be asked to confirm the information submitted with proposal. The Research Coordinator at LSU will be responsible for the collection and maintenance of this information throughout the term of the UTC grant. The Research Director will also receive assistance from the administrative staffs at both of the participating institutions as required for this task.

B. RESEARCH PERFORMANCE

Goal: An ongoing program of basic and applied research, the products of which are judged by peers or other experts in the field to advance the body of knowledge in transportation.

1. Baseline Measures

Appendix A for this initial submission includes statistics for all LSU and UNO faculty directly engaged in transportation-related research, teaching, and technology transfer activities each of the metric areas.

Additionally, UNO PLUS has been working in partnership with the local MPO (the Regional Planning Commission) to develop a Smart Growth Handbook to use as a guide for recovery and redevelopment in the greater New Orleans area post-Katrina. Smart Growth is a key concept of "community resiliency" regarding the built environment and offers a wide variety of options for implementation within our unique post-disaster reality. Projects reviewed / evaluated have included a CBD conversion of a multi-level parking garage into a "green" apartment building featuring alternative energy technologies; the Musician's Village in the Upper 9th Ward recreating a traditional New Orleans neighborhood; and the Global Green Demo Project in Holy Cross illustrating the options available for "green living" and sustainable development. Two PLUS graduate students have worked on the base data collection, on-site interviews with key stakeholders, and project research involved in this effort.

Other members of our team have focused on specific aspects of freight transportation with a special emphasis on maritime, railroads and logistics being employed not only in New Orleans, but throughout the United States and internationally to achieve system resiliency. PLUS faculty have participated in prestigious academic and professional meetings this year regarding global trends in shipping and their impacts on port infrastructure and logistic systems in particular.

2. Research Performance Program Outcome

The LSU-UNO UTC will put together a strong scholarly and applied research program that will build a deep knowledge base in the area of Evacuation and Transportation Resiliency that is relevant to the needs of both the academic and wider transportation community. A peer review process and the building of collaborative relationships among the research and larger transportation community will allow the LSU-UNO UTC to produce high quality research that is relevant to the needs of both transportation practitioners and the larger research community. In addition to the high quality research products, the intergovernmental connections that this collaborative approach will help to establish will be an important structural outcome of the UTC.

3. Planned Activities

The major activities that the LSU-UNO UTC will undertake to bring about the Program outcome are:

Project Progress Reports

It will be the responsibility of the Chairperson of the Research Board discussed in Section II.A.3 of this plan, with the assistance of the Vice Chairperson and Secretary, to keep in contact with each of the principal investigators (PI). All PI's will be responsible for submitting annual reports summarizing progress to the Research Board. Each board meeting will review the progress of each project to ensure that work is completed on-time.

Peer Review

All research conducted by the LSU-UNO UTC will be peer reviewed. The peer review team will be comprised of members of the Research Board, as described above. The Research Board may choose to invite other experts to join the peer review team to oversee all projects funded through the UTC. Each project funded through the UTC will consist of a minimum of three members on

a Project Review Team. A minimum of one person on any Project Review Team must be a member of the Research Board. The Project Review Team must choose a Team Lead. The Team Lead must be a member of the Research Board. Each Project Review Team will report to the Research Board on the status of each project. Principal investigators will submit reports to the Project Review Team. Peer reviewers must choose one of the following options for each deliverable: 1. Accept as is, 2. Accept pending minor revisions, 3. Revise and resubmit. The majority of peer reviewers must vote for either "Accept as is" or "Accept pending minor revisions" for the product to be considered a final document. Principal investigators may appeal to the Research Board. In this scenario, the majority vote of the Research Board will decide any disputes in the peer review process.

Project Progress Reports

One of the most important tools in tracking the progress of projects will be the maintenance of a project tracking system. PIs for each project will be required to send in detailed project updates that will allow tracking of project progress. These data requested in these project progress reports will be crafted to help provide important data for the Annual Report.

Collaboration

A key part of the research design review process is a peer review process that includes representatives from the local transportation community including local and state government planning and transportation professionals, the local MPOs, and the private sector (for-profit and nonprofit). The inclusion of this broad spectrum of stakeholders in the review process was intentional and will help to build a collaborative framework for transportation research that will both produce high quality, relevant scholarship and help to build partnerships between the various entities. During applied projects, it is expected that there will be frequent interactions with partner organizations to help create a product that best meets the needs of the transportation community. In more scholarly research, basic protocols will be observed to help ensure unbiased results.

Dissemination of Research (Publications and Presentations)

Research teams will be encouraged to both present at appropriate conferences that help to widely disseminate results and to publish results in both refereed and applied journals. The level of dissemination activity will be tracked from year to year as part of the Center's performance Indicators that will be compiled and reported each year. Specifically, project data will be collected from project PIs at regular intervals during the research project. This systematic process will be designed to fit with the performance indicators discussed in II.A.4.

4. Performance Indicators

An effective way to track performance of research supported by the Center will be to use methods similar to other research organizations, including the submission of short summary biannual progress reports that briefly describe on the progress made toward completion of the project, budget expended, completion of task items indicated in the proposal, expected tasks to be completed in the next reporting period and any problems or delays that have been or expected to be encountered. The other key indicators of performance will be the timely submission of completed project reports and the presentation and publication of research findings. The

Research Coordinator at LSU will be responsible for the collection and maintenance of this information throughout the term of the UTC grant. The Research Director will also receive assistance from the administrative staffs at both of the participating institutions as required for this task as well as input from the UTC's Research Board.

C. EDUCATION

Goal: A multidisciplinary program of course work and experiential learning that reinforces the transportation theme of the Center

1. Baseline Measures

Appendix A for this initial submission includes statistics for all LSU and UNO faculty directly engaged in transportation-related research, teaching, and technology transfer activities each of the metric areas.

2. Education Program Outcome

During the regular session of the Louisiana State Senate of 2002, Senator Francis Heitmeier (D. - New Orleans) introduced resolution SR No. 49 calling for the establishment of "graduate, undergraduate and continuing education programs in Maritime and Intermodal Transportation Science" which is in the process of being launched at the University of New Orleans (UNO) under the direction of John L. Renne, Ph.D., AICP, Assistant Professor of Transportation Studies and Urban Planning. This program will allow undergraduate students to pursue careers in areas of transportation that are critical to Louisiana and to the field of transportation in general with local, national and international applications. It will include two primary concentrations: the Transportation Planning and Policy Concentration and the Maritime and Intermodal Transportation Concentration. The Maritime Concentration will include a Third Mate Licensing qualification option. The transportation studies program will also reinforce the Masters of Urban and Regional Planning, Masters of Urban Studies, and the Doctorate of Urban Studies degree programs. For example, Dr. Renne is also working to establish transportation planning concentrations within these graduate degrees. The Transportation Studies degree at UNO is currently in the process of being established and should start accepting students for the Bachelor of Transportation Studies during the 2008 – 2009 academic year.

The State of Louisiana and the United States rely on an efficient, safe, secure and environmentally responsible transportation system. In the current highly competitive atmosphere, transportation providers are merging or are entering into business alliances, and are deploying new technologies and strategies to reduce the cost of moving people and goods and to meet the needs of shippers and travelers. They must meet increasingly stringent requirements to successfully compete for business, and must accomplish everything more quickly and with less cost.

Physical infrastructure and information systems must adapt to these changing needs. The ability to move people and cargo freely without infrastructure impediments, congestion delays, compromising security or endangering the environment is essential. Seamless movement of goods and people across transportation modes and geographic areas is needed to minimize

transportation costs to consumers. Infrastructure that has served well in the recent past and is currently serving adequately will become inadequate in the near future, thereby causing unacceptable delays and costs.

The goal of the Transportation Studies Program is to provide instruction in the most technically advanced, secure, efficient, accessible, competitive, dynamic and environmentally responsible system for moving goods and people. The program will be concerned with all modes of transportation – road, rail, maritime and air – and their intermodal connections. Historically, the different modes of transport developed independently of each other and so are not always well coordinated. Intermodal transportation science aims to improve the connections between modes of transportation, and to facilitate the transfer of passengers and cargo from one mode of transportation to another.

This program will be offered by the College of Liberal Arts within the Department of Planning and Urban Studies. It will also include cooperative programming with Delgado Community College. This will provide students with a well-rounded education and will cover the broad range of issues that address transportation in all of its forms.

The program will include instruction in advanced information technology that could greatly improve the efficiency, safety, and security of the transportation industry and its daily operations. Simulation and modeling systems will be used for transportation facility planning, and to aid in preparation for rare but critical events. Such simulations may include traffic management, navigation assistance, vulnerability assessment, incident response, emergency management and law enforcement and security activities. More specific technologies include Intelligent Transportation Systems (ITS) such as Differential Global Positioning Systems (DGPS), Vessel Traffic Services (VTS), Physical Oceanographic Real-Time Systems (PORTS), Electronic Navigational Charts (ENCs), and Geographic Information Systems (GIS).

This program will address state and federal government policies and initiatives concerning modal transportation, intermodal transportation, and transportation security. These policies and initiatives are expressed in federal legislation as well as in reports such as *An Assessment of the U.S. Marine Transportation System* (USDOT, 1999); *Applying Advanced Information Systems to Ports and Waterways Management* (Marine Board and National Science Council, 1999); *Intermodal Access to U.S. Ports, Report on Survey Findings* (USDOT, 2002); and *Louisiana's Statewide Intermodal Transportation Plan (SITP)* of 1996.

In addition to the transportation studies offerings at UNO, LSU offers transportation engineering courses in through it Department of Civil and Environmental Engineering. Although a transportation engineering minor has been offered within the Bachelor of Science curriculum, very few students have expressed an interest in completing it and to date no students have actually completed the program requirements. By the end of the initial UTC funding period, it is expected that perhaps 10 to 12 students will be in the program with perhaps 2 or 3 at completion.

Louisiana State University has also been part of a state-wide Master's Degree program that would be offered through several participating Louisiana universities. Within this program students could take classes remotely at any participating institution via teleconference and/or

actual on site participation. Unfortunately, the development of this program has failed numerous times due to administrative disagreements between the participating institutions. It is hoped that the collaboration fostered within this Center will position the Center Director to renew the momentum for this initiative once again.

Currently, LSU offers transportation engineering courses in through its Department of Civil and Environmental Engineering. Although a transportation engineering minor has been offered within the Bachelor of Science curriculum, very few students have expressed an interest in completing it and to date no students have actually completed the program requirements. By the end of the initial UTC funding period, it is expected that perhaps 10 to 12 students will be in the program with perhaps 2 or 3 at completion. It is anticipated that the increased level of interest in the transportation minor will come from additional incentives to take more transportation-oriented courses from their involvement in and monetary support provided by the Center. It is also expected that the existence of a UTC in the Civil Engineering Department will significantly enhance the stature and visibility of the transportation program within the eyes of LSU civil engineering undergraduate students. Past experience has shown that among of the most effective methods to raise interest in a new program or class in the department is through positive “word of mouth advertising” between students.

Additionally, it is expected that at least one new graduate level course will be developed to focus specifically on emergency evacuation and major event transportation. This course will be offered once every other year as a graduate-level elective course. The Center will also make efforts to offer to host scholars and students (such as those who might be working within the USDOT Eisenhower Program), to increase the exposure of researchers and students at Louisiana State University to the broadest possible backgrounds and perspectives.

The International Program for Port Planning and Management (IPPPM) will be one of the key elements of the planned educational outreach. IPPPM was established in response to repeated requests by the international maritime community for greater training opportunities, the Board of Commissioners of the Port of New Orleans, the World Trade Center of New Orleans, and the University of New Orleans Transportation Center/National Ports and Waterways Institute. This is a World-recognized training program and technology dissemination measure with more than 20 years of history. Since its creation in 1985, more than 600 port officials from over 100 countries have completed the program. Unfortunately, due to Hurricane Katrina its activities had to be temporarily suspended. The Program will be reactivated by the LSU-UNO UTC.

Focusing intensively on the unique demands and challenges of the maritime industry, the program consists of a curriculum designed to help maritime industry executives sharpen practical skills and strengthen their conceptual understanding in a total learning environment away from the demands of their administrative responsibilities.

The basic premise of the program is that high-level managers need a broad array of planning and management skills to make both the everyday and long-term decisions demanded by their positions. The program focuses on the general management of port operations in an international environment and seeks to provide participants with a background which will enable them to make those decisions. Top maritime executives, port authority managers, academics, and

researchers serve as lecturers.

Individual courses are structured as interactive sessions which draw upon the skills and expertise of both participants and lecturers. The participant becomes part of a small group in problem-solving sessions, while the instructor serves as the catalyst and moderator in summarizing the material covered. In addition to the problem-solving sessions, participants learn about specific managerial and operational topics. Topics typically include: port planning and development; port pricing, economics, tariffs and cargo projections; port operations, productivity and capacity; strategic planning and port sector reform; container terminal operations and management; development in ship types, size, characteristics, and cargo transfer; port environmental considerations, port operations and cargo handling technologies; port safety and security.

The Port of New Orleans provides a superb environment and an ideal laboratory for IPPPM. The city and its port have been the gateway to the heartland of America for 288 years linking 20 states to world ports.

In 2007, the International Association of Ports and Harbors (IAPH) designated IPPPM as one of six approved training programs for its training scholarship program. The IAPH scholarship is aimed at giving staff of developing ports the opportunity to learn the most advanced and latest knowledge about port management and operations.

3. Planned Activities

Our Center plans to develop training materials and courses that will benefit professionals on the areas of evacuation and resiliency transportation planning. We will work to develop content for the internet-based National Transportation Forum bulletin board as well as look for opportunities to present at professional transportation seminars.

In addition to the aforementioned educational activities the Center will also develop educational activities that will include developing training materials and courses, developing the internet-based National Transportation Forum bulletin board, and presenting at professional transportation seminars. Discussions will also be held with entities such as the FHWA's Office of Transportation Operations, the TRB Bicycle Transportation Committee, and the TRB Subcommittee on Emergency Evacuations to determine educational and training gaps that exist within the field. We also hope that in coordination with the Center, UNO will expand the Bachelor of Transportation Studies into a Masters of Transportation Studies within the next few years.

a) Required Activities

This Center will provide an educational program that will include multidisciplinary course work through the Civil Engineering Program at LSU and the Bachelor of Transportation Studies and the Masters of Urban and Regional Planning at UNO. Students in all of the programs will be encouraged to participate in research activities, as funding and projects will strive to support graduate assistants and student work opportunities. The student pool will be identified and recruited into the program using various classroom and email announcements. The participating

Center faculty will also seek to integrate Center research and teaching activities into existing transportation-oriented course offerings. These courses would include senior capstone design project courses at LSU and the Applied Techniques for Transportation Planners course at UNO. Typically, these courses have an average of about 10 and 15 students.

Students will be identified through the transportation-related programs at LSU and UNO. For paid student positions, we will advertise amongst the student body and ask for a cover letter, resume, and at least two letters of recommendations.

The UTC may choose to make funds available to assist applied transportation research-related classroom activities. Faculty teaching transportation courses at LSU and UNO may choose to submit a proposal to the UTC requesting funds to assist with student projects. Funding may support both classroom/group-based projects or independent study-based projects. Funds provided for classroom/group-based or independent study-based projects are not to be used to compensate any faculty, staff or students for their time. The money may be used to purchase equipment, data, field trips, travel, or other purposes. The intent is to enable funds to spur student interest in transportation through applied study and research. Funds for this purpose should not exceed \$3,000 per semester unless justifiable. Students will not be allowed to submit a proposal to the UTC unless endorsed by a member of the faculty. All proposals should include the exact use of the funds with a description about how these funds will facilitate applied learning in the area of evacuation and transportation resiliency.

(i) Our Center will choose one outstanding student of the year. This student will receive a Student of the Year award funded at \$1000 and will be funded to attend an award ceremony in Washington, DC, during the annual winter meeting of the Transportation Research Board (TRB). Performance Indicators

4. Performance Indicators

Performance Indicators 5 and 6 are anticipated to increase as the availability of quality graduate students and courses increase. Through a shared effort between the two participating universities, graduate and undergraduate students will have a more direct involvement with research activities. It is desired to increase not only the number of students involved in transportation, but also the quality of that education. Finally, through outreach efforts, the Center anticipates recruiting more high school students to participate in transportation engineering and related careers. Finally, through outreach efforts, the center anticipates recruiting more undergraduate and graduate students to participate in transportation engineering and transportation studies programs. The University of New Orleans is embarking on a transportation studies undergraduate program that should accept its first students in the Fall of 2009. UNO will recruit actively for this program and will keep track of enrollment in the program. LSU maintains a transportation engineering track and will keep track of enrollment in this program.

D. HUMAN RESOURCES

Goal: An increased number of students, faculty, and staff who are attracted to and substantively involved in the undergraduate, graduate, and professional programs of the Center.

1. Baseline Measures

Appendix A includes baseline data for all LSU and UNO faculty directly engaged in transportation-related research, teaching, and technology transfer activities.

2. Human Resources Program Outcome

By the end of the grant, the LSU-UNO transportation program will have increased both the number and quality of research funding opportunities, bringing greater numbers of graduate students into transportation engineering curriculum. The effect of this will be to increase the number of practicing professionals who are prepared to manage and operate public and private transportation systems and facilities.

UTC resources will be leveraged to attract an increased number of transportation-related faculty and staff. In addition it is anticipated that there will be significant faculty and staff involvement in Center activities and research.

3. Planned Activities

Although no specific activities are required of all Centers, the planned activities of the proposed LSU-UNO Center will encompass a variety of activities that will recruitment, outreach, and information dissemination. These include activities in faculty recruitment, awareness and student performance incentive opportunities.

The structure of the Center will be attractive for both existing faculty participation and recruitment of new faculty. The Center's resources will make funding, equipment, and facilities accessible to faculty members. One of the anticipated activities will be to use the prospect of UTC research funding to provide leverage to attract new faculty. The Center will assist in the recruitment process as needed and the appointment would require concurrence of both the Center and the Dean of the College to which the faculty appointment would be made.

The Center will also seek to elevate opportunities for transportation study and student awareness of transportation as a profession. These activities will increase the awareness of potential students about transportation career opportunities and specifically about transportation educational opportunities at LSU and UNO. As such the Center will engage in the active recruitment of graduate and undergraduate students, deepening the resource pool available to faculty to perform quality research and offer more diverse experiences to students by allowing a more hands-on approach to education. Student opportunities will start with recruitment and retention within the program. A transportation program must build on not only faculty experience and education, but upon the undergraduate students it educates. The institutional knowledge offered by undergraduates choosing to continue to earn an advanced degree is critical to successful research programs. Accordingly, undergraduate students will be actively involved in research with the intention of attracting those students into the graduate curriculum. However, enthusiasm in research is not sufficient to attract or retain quality graduate students; financial incentives, including covering the costs of graduate students' tuition, will also be included as a recruitment tool.

Additionally, undergraduate financial aid will also be offered in the form of fellowships, research assistantships, and internships. Programs of cost-sharing will be examined in low income areas previously not able to afford offering internships to students. Additionally, underserved areas will be examined for research projects of students in order to reduce transportation costs and increase accessibility to traditionally-underserved areas. The Center will also plan to select (or decline to do so, if appropriate) one Outstanding Student of the Year in transportation and shall award this student with \$1000 and the costs for the student to attend an award ceremony in Washington, DC during the annual meeting of the Transportation Research Board.

Next, the enrollment of quality graduate students will require the development of a successful recruiting program to encourage domestic undergraduates to enter the transportation field. Frequently, students in upper-level engineering courses have already begun to specialize in their engineering courses and even first-year students have decided what courses interest them. Thus, awareness of the Center will be critical for recruiting. Non-traditional students, including county and state engineers and consultants, will also be pursued as students. These engineers have significant experience that can be shared with both undergraduate and graduate students. Working in teaming projects, such as senior design or with collaborative efforts with faculty research projects, these engineers will add depth and breadth to the experiences of both students and faculty.

4. Performance Indicators

The Center will track the Performance Indicators 7, 8, and 9, as set forth in the Appendix. The diverse and broad nature of the Advisory Committee will assist the Center's effort to focus on industry's and government's needs for high-quality, well-trained engineers. The Advisory Committee will be focused on growing the transportation program at Louisiana State University and the University of New Orleans, not only in size, but in quality and its ability to affect to society as a whole

E. DIVERSITY

Goal: Students, faculty, and staff who reflect the growing diversity of the US workforce and are substantively involved in the undergraduate, graduate, and professional programs of the Center

1. Baseline Measures

Because of privacy concerns raised by grantees who received UTC Program grants in prior years, RITA no longer requires the collection of performance measurements regarding diversity. Despite this, Louisiana State University's UTC will be committed to ensuring a diverse and representative workforce and recognizes that growing the diversity of its educational, research, and outreach programs will affect the future of transportation related fields in the United States. As such, the matter of diversity will be considered whenever appropriate in the decisions of Center and its Advisory Committee.

2. Diversity Program Outcome

The faculty of Louisiana State University and the University of New Orleans considers it critical that the program represent the diverse nature of the growing diversity in the United States. Accordingly, the faculty will make every effort to involve minorities and women, particularly Louisiana's under-represented populations in the Center's activities.

3. Planned Activities

The Center will work with Louisiana State University's College of Engineering's Associate Dean for Women and Minorities as well as the Office of Affirmative Action to identify underrepresented groups and what can best be done to serve those groups. The Center will also advocate expanding successful preexisting recruitment programs at Louisiana State University and the University of New Orleans considers, such as partnerships with Historically Black Colleges and Universities (HBCU) that bring in ethnically-diverse graduate students. Additional partnership programs include Hispanic Serving Institutions (HSIs) and Tribal Colleges, enhancing the availability of diverse graduate students in areas related to transportation research and education.

4. Performance Indicators

Because of privacy concerns raised by grantees who received UTC Grants, it is understood that RITA no longer requires the reporting of Performance Indicators regarding diversity. However, the Louisiana State University and the University of New Orleans UTC considers enhancing diversity critical to its success and will make efforts to improve diversity in an ever-diverse workforce and population.

F. TECHNOLOGY TRANSFER

Goal: Availability of research results to potential users in a form that can be directly implemented, utilized or otherwise applied.

The LSU/UNO UTC technology transfer efforts will include activities in five modes of technology transfer: 1) focused professional, specialized courses, workshops and seminars for private sector entities (business and nonprofits) and government interests, and the public on transport issues (based on the LSU-UNO activities); 2) Research symposia; 3) International Program for Port Planning and Management - reactivated after Katrina temporarily interrupted scheduled activities (hereinafter: IPPPM); 4) Presentations at professional organizations (the LSU-UNO UTC faculty and staff currently participate in the activities of such organizations as: The World Trade Center of New Orleans, Greater New Orleans Inc., the Regional Planning Commission, the Ports Association of Louisiana, the Governor's Maritime Task Force, and a number of other governmental task forces; 5) Publications

1. Baseline Measures

Appendix A for this initial submission includes statistics for all LSU and UNO faculty directly engaged in transportation-related research, teaching, and technology transfer activities each of

the metric areas.

In the future LSU-UNO UTC will provide a number of technology transfer, educational and dissemination activities. The following table includes a listing of the primary planned activities and their anticipated outcomes.

Activity	Outcome
Focused professional, specialized courses and workshops for business entities and government interests	Learning of new knowledge by substantial numbers of attendees/participants. In responding to the stakeholders' needs and demand assessment a large number of stakeholders will receive information on the newest and most effective solutions in maritime and intermodal transportation
Research symposia	Presenting and exchanging the results of the activities conducted by the UTC
IPPPM (reactivated after Katrina temporarily interrupted scheduled activities)	Disseminating best-practices in maritime and intermodal transportation systems and management to participants from the region, national, and international. The course participants will receive a world-recognized certificate. See Section II.C.2 of this plan for a complete description of this activity.
Presentations at professional organizations	Disseminating best-practices in maritime and intermodal transportation systems and management to the most prestigious members of business, transport and international trade communities
Publications	Each LSU/UNO UTC research, education or outreach project results be presented in at least one refereed or conference paper in a transportation focused journal/conference. While journal publications are favored for advanced research, conferences such as TRB or ASEE may be more appropriate for other types of research or educational development

2. Technology Transfer Program Outcome

The technology transfer program outcomes are related to the modes of technology transfer listed in the previous item. At the end of this grant it is envisioned that the LSU/UNO UTC will be widely known in the region, nationally and internationally as a source of technical knowledge that is essential to the development of new transportation products and systems. This knowledge will be provided in all the forms described in the preceding items.

3. Planned Activities

The technology transfer activities planned for the Center will include:

- Focused professional, specialized courses, workshops and seminars for business entities and government interests, and the public on transport issues (based on the LSU-UNO activities). The LSU/UNO faculty and staff and PI's for UTC sponsored projects will serve as presenters or lecturers. It is expected that each PI will make a minimum of two public presentations of his/her project. During this program, the LSU/UNO will sponsor and coordinate at least two technology such transfer activities a year. Such activities may be offered in partnership with regional stake holders (LADOTD, ports, pilots and their associations, international trade associations, regional economic development organizations and US Coast Guard and transport safety related organizations. All listed above have expressed a desire to partner with the LSU/UNO in technology transfer activities in the proposed areas
- Research symposia. The LSU/UNO faculty and staff and PI's for UTC sponsored projects will participate in these seminars and present preliminary or final results of their projects including the implementation and dissemination measures. Such symposia will be carried out semi-annually.
- IPPPM (reactivated after Katrina temporarily interrupted scheduled activities). The course will be conducted by UTC faculty and staff, and adjunct or affiliated members of the LSU/UNO UTC, as well as invited practitioners and guests (national and international). IPPPM will be conducted bi-annually.
- Presentations at professional organizations (the LSU-UNO UTC faculty and staff currently participate in the activities of numerous organizations: The World Trade Center of New Orleans, Greater New Orleans Inc., the Regional Planning Commission, the Ports Association of Louisiana, the Governor's Maritime Task Force, and a number of other public and private sector task forces. These activities will be conducted by all LSU-UNO faculty and staff and PI's of the sponsored projects. A total of ten or more presentations a year are expected.
- Publications: principal investigators for each LSU-UNO UTC research project will be expected to submit publications to journals or conferences depending upon the nature of the research. All project reports will be submitted to the Center Director and placed on the LSU-UNO UTC Website as required.

Objectives for implementation of results

It is expected that that all projects undertaken with governmental or industrial partners within this UTC program will yield results that can be directly implemented. Some more advanced projects may require additional development, either in subsequent LSU-UNO UTC projects or independently through the efforts of practicing professionals. All LSU-UNO UTC faculty, staff and investigators will support implementation activities by providing data, concepts or designs developed with the LSU-UNO UTC support to those wishing to implement them in either a practical environment or in working systems. Additional efforts to further develop such work products will require additional support. The LSU-UNO UTC program will attempt to identify the sources of this additional financial and organizational support.

Transfer of Intellectual Property

During the first six months of the LSU-UNO UTC activities all intellectual property policies of

both universities will be gathered and studied by the UTC Director, Associate Directors, the Research Coordinator and appropriate Attorneys. This team will then develop a proposed intellectual property statement that can encourage investment in LSU-UNO UTC projects by the private sector, the public sector and universities with confidence.

a) Required Activities

The LSU-UNO UTC will maintain an up-to-date Internet home page which contains, at a minimum, the information required by the UTC reporting requirements. This website will be hosted at LSU and UNO with the Assistant Director acting as webmaster. LSU and UNO leadership, faculty and staff will participate in occasional meetings of UTC and/or LADOTD and USDOT experts on high-priority topics, or will provide expert advice to both agencies on technical or education topics. As indicated earlier in this proposal, LSU-UNO representatives have a long history of participating and conducting technology transfer activities.

Performance Indicators

The following table describes outcome measurements for each of the technology transfer activities to be undertaken by the LSU/UNO UTC.

Mode of Technology Transfer	Outcome measurement
Focused professional, specialized courses and workshops for business entities and government interests	Number of participants and program evaluation by the attendees
Research symposia	Number of presented papers and publications
IPPPM (reactivated after Katrina temporarily interrupted scheduled activities)	Number of participants and program evaluation by the attendees
Presentations at professional organizations	Number of participants and program evaluation by the attendees
Publications	Number of articles published and presented, and number of quotations

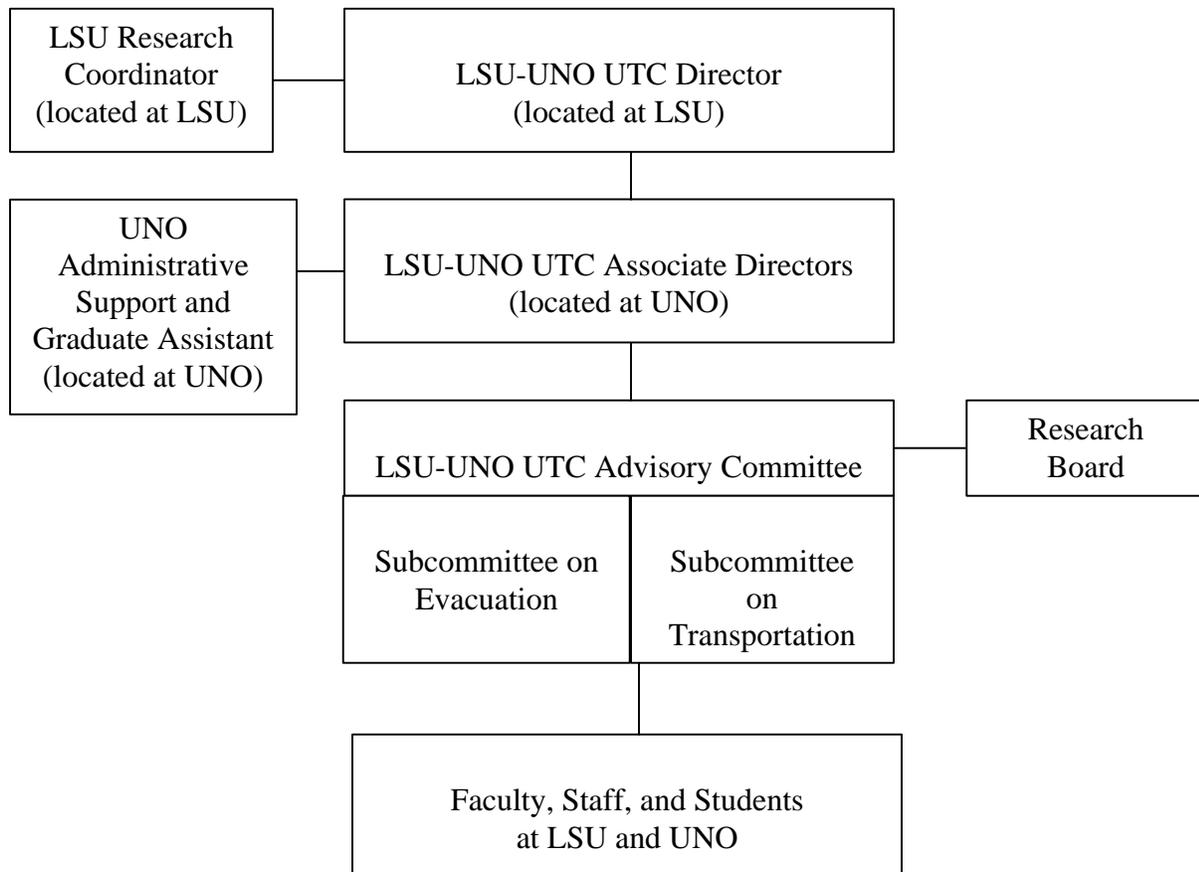
The activities mentioned above show added detail of some specifically proposed Technology Transfer modes and outcomes. These are meant to supplement, though not replace the standard USDOT Technology Transfer metrics that will be compiled at the end of each year of the UTC grant funding period. Specifically these include the number of transportation seminars,

symposia, distance learning classes, that will be conducted for transportation professionals directly and indirectly associated with the Center as well as the number of transportation professionals who will be participating in those events.

SECTION III. MANAGEMENT APPROACH

From an organizational perspective, the Center will reside in the LSU College of Engineering as part of the Department of Civil and Environmental Engineering and the University of New Orleans' Department of Planning and Urban Studies. The Director and Associate Director will formulate any operating policies and administrative procedures not currently addressed by Louisiana State University's administrative policies. These policies and procedures will then be discussed with the Advisory Committees where their input and guidance will be solicited. The Center Director will serve as head of the Center, acting as a liaison between the consumers of transportation research. This includes identifying relationships with State, Parish, and City Engineers, MPO's, transit associations, and other organizations with vested interests in emergency and major event and resilient transportation issues. Additionally, the Director will supervise and guide the outreach and technology transfer activities of the Center and, when appropriate, coordinate those efforts with other organizations in order to achieve the best dissemination of research and information possible.

The Associate Directors will assist in the augmentation of research funding to further the goals of the UTC. Primarily, this will focus on the identification of broader resilient transportation needs where funding is insufficient and develop methods to meet those needs. Additionally, the Associate Directors will serve as the liaison between the University's research partners to ensure the necessary coordination of research efforts and a consistency in Center policy. The Center's management structure is shown in the following diagram.



The Advisory Committee's membership will be selected to match the diverse nature of the transportation community. Although specific members of the committee have yet to be named several potential members are currently under consideration. Members will include representatives from a diverse cross-section of the transportation and planning community and may include various transportation professionals representing transportation federal, state, and local agency representatives; principals and partners in transportation engineering and planning consulting firms; representatives of the parish engineers and public works and planning staffs; emergency management and law enforcement; as well as leaders from important transportation business concerns such as the asphalt and concrete paving industries and maritime and freight-rail interests, and non-profits. The Advisory Committee will be selected specifically for their diverse expertise and points-of-view and their ability to perform peer review of research proposals as well as reviewing the final research project results and reports. While the Advisory Board will not have direct control over expenditures, it will recommend and provide guidance when such expenditures compatible with the goals of the Center.

The Advisory Committee also will be advised the Research Board. The purpose of this Board will be to advise and provide input on technical matters related to the research mission of the Center. The specific duties and composition of the Research Board were described in Section II.A.3 of this Strategic Plan. Basically, their objective is to monitor and advise on the research projects supported by the Center.

A. INSTITUTIONAL RESOURCES

The LSU Civil Engineering Department is housed in the Center for Engineering and Business Administration (CEBA) building. This facility incorporates eleven laboratories covering 23,600 square feet of floor area. Among the laboratories used for graduate studies and research are geotechnical, environmental, structural, mechanics of materials, water resources, and computer laboratories. The TEM/SEM microscopy mineralogical analysis laboratory of the Department of Mechanical Engineering and the remote sensing and image processing facilities of the Division of Engineering Research Units are also used by graduate civil engineering students. The civil and mechanical engineering departments also share a new Wind Tunnel Laboratory.

Laboratories for state-of-the-art materials testing may become available for use at the nearby Louisiana Transportation Research Center (LTRC). The department also shares the Geosynthetic Engineering Research Laboratory with LTRC. The department maintains an array of more than thirty microcomputers for word processing, data acquisition, plotting, and research functions. A general use I/O room with terminals and PCs is also located in CEBA. University Computing Services maintains a high-performance UNIX cluster with 48 IBM RS/6000 servers for research needs.

Faculty Resources

The Civil Engineering faculty at Louisiana State University is diverse in both skills and experience and will be able to partner with other departments with experience in human factors, psychology, and economics. Numerous of Civil Engineering faculty are involved in transportation research at various levels. This includes Drs. Brian Wolshon, Sherif Ishak, and Chester Wilmot in the areas of transportation planning, operations and safety as well as Drs.

Louay Mohammad, Hak Chul Shin, and Mostafa Elseifi who are experts in transportation materials faculty. In addition, several other Civil Engineering faculty including Drs. Khalid Alshibli, Radney Sharma, Steve Cai, and Ayman Okeil perform work in areas related to transportation issues. Dr. Fereydoun Aghazadeh of the Department of Industrial Engineering faculty also works frequently on projects related to human factors and perception in the task of driving. LSU believes that a broad-based approach to transportation issues is important as it is clear that transportation issues frequently encompass multiple areas of civil engineering.

Faculty and staff associated with multiple units within the greater UNO academic community include Dr. John Renne, Associate Professor in the Department of Planning and Urban Studies (PLUS) and Associate Director of the UNO Transportation Center; Dr. Willard (Billy) Fields, Director of the Center for Urban Affairs of PLUS; James R. Amdal, Director of the UNO Transportation Center; Drs. Asaf Ashar, Jay Jayawardana, and Adam Prokopowicz Associate Directors of the National Ports and Waterways Institute; Stan Swigart, Assistant Director of the Mississippi River Corridor Initiative. Each is a recognized specialist in a diverse spectrum of transportation issues including Evacuation for the Car-Less Society; Transportation Oriented Design; Alternative Transportation Planning and Implementation; Intermodal Transportation; Traditional Street Railway System Design / Planning / Finance / Operation; Maritime Transportation Policy; Marine Terminal Analysis and Design; Transportation Finance and Economic Impact Analyses; International Transportation Policy and Eastern European Freight Railroad System Operation and Organization.

B. CENTER DIRECTOR

Brian Wolshon is designated as the LSU Center Director and will devote approximately one-half of his time to directorship responsibilities. Dr. Wolshon is currently an Associate Professor in the Department of Civil and Environmental Engineering Department at LSU. Over the past decade Dr. Wolshon has established himself as one of the nation's leading researchers in the field of evacuation and major event traffic management and operations. In addition to authoring scores of research papers, technical articles, and book chapters; he has also and has served as an expert on numerous panels and committees for the US Federal Highway Administration, National Academies of Science and Engineering, the Transportation Research Board, Institute of Transportation Engineers, and American Society of Civil Engineers. In 2000, he founded and continues to chair the Transportation Research Board's Subcommittee on Emergency Evacuation.

As the Center Director, Dr. Wolshon will be responsible for the overall management of the Center, including reporting, matching fund solicitation, outreach, publications, education, development of the research agenda, and request for proposals/qualifications. He will also serve as the point of contact with the LSU faculty and staff participating in the Center activities.

Dr. Wolshon will form an Advisory Board comprising representatives from faculty, transportation agencies and companies, DOTD, USDOT, and other collaborative partners that are added as the Center moves toward full implementation. The Advisory Board will be used to invite suggestions for research, recommend research activities, and to assist in outreach and technology transfer activities. As the Director he will also represent the Center at external

meetings with both public and private agencies and will be the primary liaison with the USDOT. The Center will be a member of the Council of University Transportation Centers (CUTC) and will meet regularly with other UTC directors.

C. CENTER FACULTY AND STAFF

The Director will spend approximately one-half time on Center responsibilities. Because the Center is being newly initiated it is likely that some of the planned activities will change and staffing requirements will be reevaluated and any needed modifications will be made. Associate Directors at UNO will help to coordinate research and management activities. This will include coordination of the proposal solicitation and review process, project monitoring activities, and overall UTC management, coordination, and dissemination activities. The three Associate Directors at UNO will be Dr. John Renne (Assistant Professor of Urban Planning and Transportation Studies, Associate Director of the University of New Orleans Transportation Center), James Amdal (Director University of New Orleans Transportation Center), and Dr. Billy Fields (Director Center for Urban and Public Affairs University of New Orleans, Assistant Professor-Research). Dr. Renne, James Amdal and Dr. Fields will commit 15% of their time to the coordination of UTC research and management activities. The level of commitment of these individuals during the period of the project is discussed in further detail in the “Budget Details” section of this plan.

The initial plan seeks to hire a full-time Research Coordinator who will serve as the manager of the day-to-day operation of the Center and will be primarily responsible for activities including outreach efforts, research proposal review, Advisory Board meetings, web-site etc. It is anticipated that the Research Coordinator will not be a faculty member and will allocate 100 percent time to Center duties. In addition there will be secretarial support although initially, this may not be a full-time position. However, it is expected that it will transition to full-time in the future.

D. MULTIPARTY ARRANGEMENTS

As the grantee of the UTC Center, the LSU administration has structured the grant contract to include a subcontract arrangement that will result in exactly half of the funds that are awarded to LSU to go directly to UNO. However, considerable effort will be made to collaborate with other universities, institutes and private sector groups with the objective to maximize co-sponsorship activities. We anticipate that we can be particularly helpful in assisting such institutions providing resources to expand the dissemination of reports and research to a wider and more diverse audience, particularly to transportation agencies and practitioners.

1. Resource Concentration at the Grantee University

The arrangements for the Center will involve a 50-50 even split of the Center’s total funding allocation between Louisiana State University and the University of New Orleans.

E. MATCHING FUNDS

At the outset of the LSU-UNO UTC all required matching funds will come directly from the participating institutions. Senior administrators from both universities have committed to provide all required funds to meet the Center's matching requirements. These matching funding will be used to fund all aspects of the Center including staff salary and benefits, equipment, travel, research projects and technology transfer projects. In addition the Center will actively pursue additional matching funds to exceed the dollar-for-dollar requirement by identifying possible grant and contractual relationships. In the long term, it is hoped that the activities of the Center can, in whole or in part, continue for many years beyond the end of this UTC funding period. The continuation of the Center would obviously hinge on some significant source of funding. While this source has yet to be determine, current sources under examination include funding arrangement from the State of Louisiana or some consortium of state governments; federal sources from agencies how would be interested or would benefit from Center activities, such as the Department of Homeland Security, the Nuclear Regulatory Commission, and one or more of the National Laboratories; or various other private or quasi-governmental entities who have a keen interest in developing and learning about new techniques for emergency evacuation and the other related activities proposed to be addressed within the Center scope and mission.

1. Eligibility as Matching Funds

Matching funds, which may be cash or in-kind, will serve to accomplish the program objectives and the purpose of the grant. Furthermore, these matching funds will be fully documented and carefully accounted for in the Center's records. The rules governing the use of in-kind and cash contributions as matching funds are set forth specifically in the most recent revision of OMB Circular A-110.

2. Special Rule for UTC Program

All matching fund use will conform to 2 CFR 215, including funding allowed under section 503, 504(b), or 505 of 23 USCA. These sections refer to the technology deployment, local technical assistance, and state planning and research programs managed by the Federal Highway Administration.

SECTION IV. BUDGET DETAILS

Although the Center will receive a multi-year grant, for which this multi-year Strategic Plan was developed, RITA will make such funding available in annual increments in the amounts authorized under 49 U.S.C.A. 5338, 5505, or 5506 (subject to availability of funding). The itemized budget for the first year of the Center's operation is found in Exhibit II.

It is noted that the amount of Federal funding stated in the Grant Agreement is matched by non-Federal funding. None of the Federal funding is pass-through funding from the Federal government and is compliant with the Grant Agreement.

A. FORMAT

The Center Budget Plan presents line items using the cost categories indicated in Exhibit III, Instructions for Preparing a UTC Strategic Plan. The Center Budget Plan includes attachments showing the calculations by which the line items were derived. Because the research projects have not yet been selected, many of the costs have been estimated.

B. GRANT YEAR

The beginning and ending dates of LSU Grant Year are July 1, 2008, through June 30, 2009. This period will be reflected in the Center's Budget Plan and Financial Status Reports, and the Center understands that future funding awards under multiyear grants will be made at approximately the beginning of the Grant Year, or as soon thereafter as funding is available.

C. SALARIES

The Center is proposed to be run through the combined efforts of a Director and an Associate Director. To more effectively maximize the ability of the management team to run the Center's activities, a management structure with a half-time Director appointment and Associate Director appointed at full-time is proposed. This arrangement will reduce burden of the higher salaried Director on the overall Center budget while permitting him to maintain his faculty commitments to the university and will permit the Associate Director to maintain a full focus on Center business. The Director's will be supported by one full-time administrative assistant and a small group of student workers.

Center Director. A total of approximately 6.5 months support (0.55 FTE) is requested for the Center Director, who will coordinate and be in responsible charge of all Center activities. This effort will be allocated in the form of 2.0 summer months and 4.5 academic-year months that will include a two-course per year release time to work on Center related activities. The Louisiana State University has pledged to provide all but 2 months of this salary as part of its matching funds.

Associate Center Directors. Direction of the UNO portion of the Center will be jointly coordinated by three Associated Directors who will coordinate and be in responsible charge of all Center activities. This effort will be led by Drs. Fields, Renne, and Amdal using \$20,000 of

US-DOT funds and a UNO match of \$32,682.

Center Research Coordinator. Funding for a total of 12 months of salary (1.0 FTE) is requested for the Center's Research Coordinator, who will manage the day-to-day research and educational / administrative activities within the Center at Louisiana State University. This position will be dedicated to coordinating activities with UNO and any other collaborative endeavors with partners of the Center. The Research Coordinator is also expected to hold a Ph.D. to facilitate in-depth involvement with research projects and to lead the development of research proposals to bring in additional external funding into the Center.

Other Faculty and Staff Salaries. The budget had been developed to include funds dedicated to faculty and staff salaries on future research projects that will be selected collectively by the Center Administration and Advisory Committee. The University of New Orleans has pledged to match \$48,000 for staff time who will be working on Center related activities.

Faculty Salaries. It is anticipated that approximately 29 percent of the overall budget will be dedicated to faculty salaries to fund independent and external research projects that will be selected collectively by the Center administration.

Student Salaries. It is anticipated that three percent of the overall budget will be dedicated to student salaries, that will be divided between undergraduate and graduate students engaged in research projects selected by the Advisory Committee.

Fringe Benefits. The fringe benefit rate of 34 percent of faculty and staff salary were used when developing the budget and are effective for the period July 1, 2008 through June 30, 2009.

D. SCHOLARSHIPS

\$9,225 of the Center funding will be designated to provide student scholarships that are not compensation for labor. These scholarships are subject to the limitations set forth in Section III.5 of the General Provisions of Grant Agreements for UTCs. This total includes honorary award programs such as the UTC "Student of the Year" Award.

E. EQUIPMENT

A total of \$8,200 is requested for expendable supplies, primarily for education and outreach about the Center and the maintenance of the Center's website and the National Transportation Forum bulletin board website. An additional \$15,000 is budgeted for permanent equipment. This equipment is expected to be used by researchers working on Center-related projects.

A written (hard copy or e-mail) request will be submitted to RITA for approval prior to the purchase of "permanent equipment" that has a unit acquisition cost of \$5,000 or more. Unless otherwise requested by the Grantee, all legal rights to equipment purchased with UTC funds shall vest in the Grantee upon acquisition. The Center recognizes that permission is not required for the purchase of "Expendable Property, Supplies, and Services" which is a category that includes such tangible items as expendable office and laboratory supplies and services such as

telecommunications.

F. DOMESTIC AND FOREIGN TRAVEL

A total of \$25,000 has been budgeted to cover the cost of travel expenses to UTC-related meetings, technical conferences and committees, outreach activities, and other activities designed to enhance the research related to Center activities. No travel is planned to any destination outside of the United States and its territories. If such travel is sought, written permission will be obtained from RITA, per Section III.4 of the General Provisions, prior to the initiation of such travel.

G. OTHER DIRECT COSTS

H. FACILITIES & ADMINISTRATIVE (INDIRECT) COSTS

Facilities and Administrative (F&A or “indirect”) Costs are those incurred for common or joint objectives and cannot be identified readily and specifically within a particular project or program. Thus, the Louisiana State University federally negotiated rate of 47 percent of all direct costs (exclusive of permanent equipment) for Facilities and Administrative Costs has been used for budgetary purposes.

Exhibit III

University Transportation Center (UTC) Budget Plan

Name of Grantee: Louisiana State University Grant Year: 7/01/08 thru 6/30/09
 (Date) (Date)

CATEGORIES	LSU	UNO	Total Budgeted Amount	Explanatory Notes
Center Director Salary	\$65,452	\$0	\$65,452	
Faculty Salaries	\$70,682	\$166,930	\$237,612	29% of the overall project budget
Administrative Staff Salaries	\$55,000	\$5,000	\$60,000	Associate Directors and research support staff
Other Staff Salaries	\$0	\$48,000	\$48,000	UNO administrative support staff
Student Salaries	\$10,000	\$15,000	\$25,000	3% of the overall project budget for graduate and undergraduate students
Staff Benefits	\$64,986	\$32,275	\$97,261	Charged at the LSU and UNO standard rates of 32% and 28%, respectively
Total Salaries and Benefits	\$266,120	\$267,205	\$533,325	
Scholarships/Tuition	\$5,000	\$4,225	\$9,225	UTC \$3,000 scholarships and \$1,000 Undergraduate Student of the Year Award at both institutions
Permanent Equipment	\$0	\$15,000	\$15,000	To be determined my research proposal submissions
Expendable Property, Supplies, and Services	\$3,200	\$5,000	\$8,200	To be determined my research proposal submissions
Domestic Travel	\$5,000	\$20,000	\$25,000	UTC directors meetings & research conferences meetings
Foreign Travel	\$0	\$0	\$0	
Other Direct Costs (Specify)	\$0	\$0	\$0	
Total Direct Costs	\$279,320	\$311,430	\$590,750	
F&A (Indirect) Costs	\$150,680	\$118,570	\$269,250	
TOTAL COSTS*	\$430,000	\$430,000	\$860,000	
Federal Share	\$215,000	\$215,000	\$430,000	
Matching Share	\$215,000	\$215,000	\$430,000	

*Includes Federal and Matching Shares

APPENDIX A

BASELINE MEASURES FOR UNIVERSITY TRANSPORTATION CENTERS (UTCs)

Report for the most recently completed academic year and for the institution(s) comprising your UTC.

Research Selection

1. Number of transportation research projects selected for funding.

30

1a. Number of those projects that you consider to be: basic research 4, advanced research 6, and applied research 30. Projects may be included in more than one category if applicable.

2. Total budgeted costs for the projects reported in 1 above.

\$5,090,009.00

Research Performance

3. Number of transportation research reports published.

19

4. Number of transportation research papers presented at academic/professional meetings.

28

Education

5. Number of courses offered that you consider to be part of a transportation curriculum. Report courses shown in the university course catalog as being offered, whether or not they were conducted during the academic year being reported.

Undergraduate: 10

Graduate: 11

6. Number of students participating in transportation research projects. Count individual students (one student participating in two research projects counts as one student).

Undergraduate: 16

Graduate: 24

Human Resources

7. Number of advanced degree programs offered that you consider to be transportation-related.

Master's Level: _____3_____

Doctoral Level: _____3_____

8. Number of students enrolled in those transportation-related advanced degree programs.

Master's Level: _____30_____

Doctoral Level: _____13_____

9. Number of students who received degrees through those transportation-related advanced degree programs.

Master's Level: _____8_____

Doctoral Level: _____1_____

Technology Transfer

10. Number of transportation seminars, symposia, distance learning classes, etc. conducted for transportation professionals.

_____27_____

11. Number of transportation professionals participating in those events.

_____2,510_____