



# North Carolina Central University

Department of Public Administration  
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**Developing an Undergraduate Degree in Public Transportation  
Administration and Management**

***Feasibility Study Results***

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# Executive Summary

## Executive Summary

Experiences and results of research by the North Carolina Central University Department of Public Administration while conducting feasibility study for establishing a new multidisciplinary undergraduate degree in public transportation administration and management are presented.

Multiple research methods yielded information about the perspectives of employees in managerial, supervisory and non-supervisory occupations in the North Carolina public transportation industry. Methods used included a literature review of education and curriculum planning for transportation degrees at public colleges and universities; focus groups (qualitative research) to acquire an understanding and perspectives of employees and stakeholders in the public transportation industry for establishing a degree; interviews and surveys of directors of North Carolina public universities and select University Transportation Centers.

Six key informant groups from the transportation industry participated in focus groups that were held in three regions of North Carolina (western, piedmont, and eastern regions): *Providers (3 subgroups)*--public transportation managers, supervisors, non-supervisors; *Transportation Experts (1 subgroup)*; *Customers (1 subgroup)* of public transportation services; and *Government Officials(1)* whose organizations provide funding for public transportation programs.

### *Among the study's key findings:*

- The formal education and training needs of employees in the North Carolina transportation industry are underserved.
- Support for establishing a new four-year degree at a public North Carolina University from the public transportation industry and its employees is overwhelmingly confirmed.
- Strong emphasis should be placed on meeting the needs of the non-traditional students
- Public transportation employees described the conditions and support they would need to enroll in a four-year program.
- Transportation managers and supervisors described the kinds of support they would be willing to give to employees enrolled in a four-year program.
- Employees described specific options needed to enroll in transportation courses such as certification or short-courses related to promotion opportunities, online courses, and availability of courses within 30 miles of employees' residence.

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## Introduction

Public transportation in North Carolina is a complex array of urban and rural transportation systems whose shared mission is to develop and provide intercity, intra-city, and rural public transportation. Approximately 103 transportation providers make up the NC transportation system. NCDOT public transportation staff has indicated that employees (supervisors and non-supervisors) who work in the various transportation systems would be advantaged by formal education and training in transportation management and operation. The advantages include (1) to ensure that these public transportation services and programs are of the highest quality; and (2) to promote a line of succession that maintains appropriate coverage and continuity of workers' knowledge and skills so that transportation services in the state are not disadvantaged by retirement and turnover.

North Carolina Public transportation practitioners have indicated that in the next 10-15 years, public transportation providers will face significant challenges that will affect their ability to provide quality, well managed, and well-planned public transportation services<sup>1</sup>.

These challenges include:

- the substantial growth in the number of automobiles on city, county and interstate streets and roadways resulting in automobile and truck traffic congestion<sup>2</sup>;
- an increased number of consumers with disabilities that will acquire various accommodations;
- high retirement rates that will reduce the pool of experienced public transportation managers;
- the need to anticipate possible terrorists acts and develop appropriate training and responses;
- continuous accountability and compliance with federal and state environmental mandates; and
- the need to operate public transportation systems efficiently and effectively while using sound economic and management principles.

Given the above challenges reported by the North Carolina Department of Transportation, this feasibility study was conducted to determine the following:

- 1) Identify the level of interest among North Carolina public transportation providers for a degree in public transportation among NC public colleges and universities;
- 2) Identify current and planned courses and curricula relating to managing and operating public transportation at North Carolina public colleges and universities and select University Transportation Centers;
- 3) Assess the feasibility of creating a curriculum or degree in public transportation management and operations at a NC public college or university; and
- 4) Identify the requirements for establishing a degree in public transportation management and operation in the NC public university system.

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<sup>1</sup> Discussions with NCDOT Officials and Transportation Service Providers in Charlotte, Greensboro, Fayetteville, Wilmington, and Alamance, Johnston, Wake, Wilson, Durham, Asheville, and Wilkes County areas.

<sup>2</sup> *Raleigh-Durham congestion getting worse, study finds*, News and Observer May 10, 2005



Centrally, the questions that this research was designed to answer were:

- Q1) Do managers and supervisors that work in the North Carolina public transportation industry think formal training and education is needed to enhance the knowledge and skills of the NC public transportation workforce?
- Q2) Would managers and supervisors support employees who enroll in a formal transportation management education program? Support is defined as—“employees’ jobs would not be endangered, employee would be given some flexibility in order to meet school participation requirements, tuition and leave assistance provided to employees where possible, etc.”
- Q3) What formal education courses would NC public transportation employees participate take?
- Q4) What support is there from the NC public transportation industry for establishing a four-year undergraduate degree program?
- Q5) What are the cautions or reservations among employees of the NC public transportation industry about creating a new formal degree in public transportation management?

## **Background and Review of Related Literature**

A recent needs assessment conducted by San Jose State University indicated the future of public transportation education programs should include concentrations or degrees in public transportation management<sup>3</sup>. Currently there is a significant lack of trained public transportation professionals in the transportation industry. While other universities such as San Jose State University and University of South Florida offer degree programs in public transportation management, no public university in North Carolina offers this type of program. The closest example of public transportation coursework comes from North Carolina A&T State University, a course at North Carolina Central University in public transportation planning and continuing education courses at North Carolina State University. These universities offer a few public transportation classes with an engineering or logistical focus but not a comprehensive management focus.

Initial research revealed that currently, no undergraduate public transportation management programs are offered at a public North Carolina university. However, in order to be as thorough as possible, this feasibility study reviewed courses that are related to transportation management such as transportation planning, certification courses, etc. Most courses were typically offered at the master’s level primarily and concomitantly mostly offered at Universities outside of North Carolina.

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<sup>3</sup> Mineta Transportation Institute (2004). The future of transportation education: A needs assessment of the transportation management program at San José State University. Retrieved December 8, 2004, from <http://transweb.sjsu.edu/publications/Valenty2201/Valenty%20book.htm>

Transportation planning curricula is a part of the public transportation education programs. There is no standard or uniform approach to transportation planning education within either planning schools or non-planning transportation programs. Most non-planning programs that offer transportation planning courses are engineering programs.<sup>4</sup> In addition, Handy et. al., affirmed the importance of communication skills (writing, data presentation, public speaking, and interpersonal relations) for public transportation professionals. The public transportation environment is very dynamic. Therefore, there is a "need for strong and respectful links between the professionals and the educators."<sup>5</sup> Other highlights of this research include: the need for transportation planners/employees to think critically, the need for educators to teach theory in ways that inspire students combine theory and practice in their professional work, the dynamics of the political environment and its impact on public transportation; the importance of multidisciplinary curricula<sup>6</sup>.

Currently, the major growth in public transportation education programs is at the master's level with the introduction of new programs at the University of South Florida<sup>7</sup>, Massachusetts Institute of Technology<sup>8</sup>, and University of Denver Intermodal Transportation Institute<sup>9</sup>.

According to the NCDOT, the transportation industry needs individuals who are educated in the planning, management, and operation of public transportation services. The state's universities and national organizations including the National Highway Institute (NHI), the National Transit Institute (NTI), the Federal Highway Administration (FHWA), Federal Transportation Administration (FTA), and the Travel Model Improvement Program (TMIP) focus on transporting materials, which differs considerably from transporting people. This expertise is typically gained on the job, with nominal formal training, consisting primarily of workshops and seminars. Therefore, individuals interested in careers in public transportation have no avenue to become acquainted with the field through formal coursework and a comprehensive curriculum. According to the Transportation Research Cooperative Project, there is a growing need for transportation managers to be involved and have skills for planning transportation services (effective land use policies, concepts of transportation demand management, facility planning, and inter-modalism).<sup>10</sup>

A university curriculum in public transportation management and operation would not only begin to develop additional transportation professionals, but would produce individuals with a level of expertise beyond what we traditionally see today. A curriculum devoted to public transportation management would make North Carolina a nationally recognized expert for industry training and professional development. As a nationally recognized incubator for public transportation management professionals, the state will benefit at state and local levels from a highly skilled pool of potential public transportation managers and supervisors.

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<sup>4</sup> Transportation Research Record 1812 (2002), Paper No. 02-3494, Education of transportation planning professionals, Handy, S. Weston, L., Song, J., and Lane, K.M.D.

<sup>5</sup> Transportation Research Record 1812 (2002) Handy, Weston, Song, and Lane.

<sup>6</sup> Transportation Research Record 1812 (2002), Paper No. 02-3664, Polzin, S. E. and Ward, B. G.

<sup>7</sup> Transportation Research Record 1812 (2002), Paper No. 02-3664, Polzin, S. E. and Ward, B. G.

<sup>8</sup> Transportation Research Record 1812 (2002), Paper No. 02-3581, Sussman, J. M.

<sup>9</sup> American Public Transportation Association News and Events, July 2006. Denver Institute Offers Master's Degree in Intermodal Management

<sup>10</sup> The Transportation Research Cooperative Project (TRCP)  
<http://www4.trb.org/trb/crp.nsf/reference/appendices/TCRP+Overview>

*Directly Related Publications by Others*

Table 1. Related Research in Progress.  
A review of approximately 1600 entries of research in progress entries with the Transportation Research Board revealed the following related research efforts.

<b>Related Research in Progress</b>	<b>Performing Organization</b>
<b>(1) e-Transit: Electronic Business Strategies for Public Transportation</b>	Mitech Systems, Incorporated Washington, DC and Cambridge, MA
<b>(2) Guidebook for Developing a Transit Performance-Measurement System</b>	Kittelson and Associates, Incorporated
<b>(3) Managing Transit's Workforce in the New Millennium</b>	McGlothin Davis, Incorporated
<b>Related Research in Progress</b>	<b>Performing Organization</b>
<b>(4) Managing Transit's Workforce in the New Millennium</b>	Volpe National Transportation Systems Center
<b>(5) Introduction to Public Transit Training Course</b>	Morgan State University School of Engineering
<b>(6) ITS Deployment, Research and Professional Capacity Building Project</b>	Rutgers University, New Brunswick Center for Urban Policy Research
<b>(7) Planning Capacity Building Program</b>	Volpe National Transportation Systems Center Cambridge, MA
<b>(8) Corporate Culture as the Driver of Transit Leadership Practices</b>	Transportation Research Board Washington, DC
<b>(9) Staffing Plan</b>	New Mexico State Highway and Transportation Department Albuquerque, NM
<b>(10) Building Transit Workforce Skills in Five American Cities</b>	AFL-CIO Working for America Institute Washington, DC

The reports listed above contain information that is most closely related to this feasibility study on developing an undergraduate degree in public transportation. The Reviewers wanted to determine current and anticipated efforts to offer formal training and education

for the public transportation workforce. Our review of these reports indicates that as of 2005-2006 there were no plans underway as reported or funded by the Federal Transportation Administration to offer an undergraduate degree in public transportation management at a public university.

## Research Approach

The central research questions addressed in this feasibility study are somewhat complex in that there is no single organization that addresses education, learning, curriculum development for the public transportation industry. These questions are interrelated and contingent upon environmental, external resources, market, and perspectives of professionals that work in transportation. This complexity caused the research team to use a variety of research methods.

A multi-method research strategy was used because the outcomes of this research would have implications for a number of different “systems”—specifically the public transportation industry, meeting the degree requirements of the North Carolina University system, human resource issues related to promotion and performance in the public transportation industry. Therefore, *methodological triangulation*, which refers to the use of more than one method for gathering data, was used in order to enhance confidence in the ensuing findings (Webb et al. (1966)<sup>11</sup>.

- Individual interviews with key resource individuals at NCDOT and the North Carolina Public Transportation Association to gather background information.
- Focus group discussions with supervisory and non-supervisory employees of NC transportation providers and technical experts in the transportation industry
- Telephone interviews with faculty and staff of NC public colleges and universities and selected university transportation centers (UTC's) in other states
- An analysis of primary and secondary service and performance data relating (e.g., employment trends, consumer patterns, and environmental issues) to the public transportation industry
- Two independent analysts were used to interpret the focus group data to enhance confidence in the findings. This method of investigative triangulation ensures that analysis of the focus group data for the six groups (managers, supervisors, non-supervisors, transportation experts, customers, and funders) received objective assessments and helped minimize analyst or rater bias.

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<sup>11</sup> Webb, E. J., Campbell, D. T., Schwartz, R. D., and Sechrest, L. (1966). *Unobtrusive Measures: Nonreactive Measures in the Social Sciences*. Chicago: Rand McNally.

## ***Determining Level of Interest Among North Carolina Public Transportation Providers***

Focus groups forums were held in Charlotte (2), the Research Triangle Park, NC and Greenville, NC to identify the level of interest among North Carolina public transportation providers for offering a degree in public transportation at a state public college or university. This qualitative method was especially useful in the generation of categories for understanding human phenomena and for the investigation of the interpretation and meaning that people give to events; they experience (Polkinghorne, 1991). According to Miles and Huberman (1994), qualitative data are a source of well-grounded, rich descriptions and explanations of processes in identifiable local context. Focus groups are in-depth qualitative interviews with a small number of carefully selected people brought together to discuss a particular topic (American Statistical Association, 1997).

### **Participant Selection—Focus Group**

For purposes of this project and to ascertain a budget associated with this project, the research team used a purposive sample of representative target stakeholder populations to include: funders (i.e. city/county managers, internship sponsors), top-level managers (i.e. administrators, executive directors), middle managers (i.e. supervisors, directors), customers (i.e. students, transportation users), technical experts (i.e. ITRE, planners), and employees.

A list of potential focus group participants selected from among NC Public Transportation Association members; employees of providers -- managers, supervisors, and other employees, technical experts in public transportation was developed. This list along with the proposed focus group questions were reviewed by representatives at NCDOT and members of the Steering Committee to ensure appropriate representation by geographic area of employment, transportation system size, and representation according to rural, urban, metropolitan, para-transit systems, and participant occupation.

### **Instrumentation**

The research team worked with NCDOT to design a discussion schedule of six to eight questions with appropriate probes. After receiving feedback from NCDOT, the researchers pilot tested the focus group discussion schedule with a group of similar participants. The purpose of pilot testing the focus group discussion schedule is to insure that questions are clear, time needed to discuss each question, and to ensure smooth operation of all focus groups. The pilot test will simulate the setting and use the same questions for the actual study. At the conclusion of the pilot focus group, participants gave researchers feedback regarding the wording of questions and participant recruitment materials. Participants in the pilot focus group were not eligible to attend a focus group session. Feedback received from the pilot focus group and telephone interviews were used to revise the focus group questions and data collection techniques.

### **Locations**

The researchers conducted three regional forums – in western (Charlotte, NC), piedmont (Research Triangle Park, NC), and eastern North Carolina (Greenville, NC) -- to assess the level of interest for having a degree in public transportation at a public North

Carolina college or university. These specific city locations were determined in consultation with NCDOT.

### **Data Collection and Analysis**

The research team will conducted focus groups from December 2005 to February 2006. The research team will conduct two focus groups simultaneously until all six focus groups are completed. One and one half hour focus group discussions will be conducted and audio tape-recorded with the participants' consent. In addition to audio tapes, graduate students recorded the discussion on flip charts located to capture each focus group discussion.

Students hired and trained as transcribers converted audio tapes into typed verbatim transcripts to ensure that all data remains in the words of the focus group participants. The tapes were erased after transcription to preserve the participants' confidentiality. Two independent researchers analyzed the data using the inductive, constant comparative method (multiple raters) described by Glaser and Strauss (1967) to identify reoccurring themes from the study data. This method uses two essential processes (unitizing and categorizing) the continual revision, modification, and amendment until all new units are placed into an appropriate category and the inclusion of addition units into categories provides no new information.

### **Analysis of the Transcribed Focus Group Data – Managers and Supervisors**

Data for the analysis were cross-referenced by comparing participant responses based on transcriptions and voice recordings of actual focus group sessions captured on audiocassette. The data was coded and "clumped" in order to identify emerging themes. The direction of the analysis then was on participant responses to a series of predetermined opened questions presented during each focus session. For analysis purposes, the data was organized into eleven categories in order to answer the research questions of interest to the current study. Themes that emerged from the analysis are reflected in each of the eleven categories presented in this section of the report.

# Feasibility Report

## *Results—Focus Group Discussions with Managers and Supervisors*

The analyses show that four main entry-level positions are usually available in the industry. These are **dispatchers, safety operators, drivers, and consultants**. The data indicates that the best employment opportunities for persons with undergraduate degrees in transportation for the near future will be in the above four occupations. However, stratification of career opportunities within these job categories could make each of them attractive degree holders if properly structured. In addition, managers participating in the various focus groups indicate that having a degree will position one for advancement at a more rapid rate than might otherwise be possible.

Under the existing system, the selection of managers and supervisors does not depend specifically on university-based training or degree programs. With few exceptions, most managers and supervisors entering the profession with college degrees have training in areas other than transportation. These administrators have degrees in program areas such as business administration, engineering, public administration, history and education. However, several of these administrators had taken courses in transportation as part of their degree program and at least one had obtained an actual degree in transportation.

Nevertheless, historically there has not been a significant university-based training program available for transportation professionals in North Carolina to ensure the continued refinement of skills of practicing administrators. Nor is there a general procedure to identify and prepare prospective leaders and practitioners for this profession. Focus group participants noted that this was a problem because of the “complexity of transportation” and the fact that it “takes so long to train” new employees.

Focus group participants identified the availability of high quality educational programs as essential in order for the public transportation industry to be successful in carrying out the mission of meeting the transportation needs of all North Carolinians. They also articulated that the availability of training at the bachelors degree level would “provide focus, reduce the learning curve”, and encourage “education” among transportation workers. One participant identified the significance of providing university level training to transportation personnel in stating, “raising the level of required education would give credibility to a position.” Another noted a “degree in the field is needed and beneficial”

## *Results-Future of Public Transportation in North Carolina*

Participants expressed an interest in creating an undergraduate degree in transportation in North Carolina. This interest stemmed from the current difficulty of securing trained personnel without extensive on-the-job training and a belief that public transportation will become more complicated in the future. Responses indicate that participants believe that public transportation will play a more vital role in the State in the years ahead, thus requiring a better educated work force. Factors contributing to this increased role will include the need to decrease the reliance on fossil fuel, the rise of regionalism and increased urbanization accompanied by the aging of the baby boom generation.

## *Results-Cost of Fuel*

The constant rise in the cost of gasoline was identified as a factor contributing to the increased importance of public transportation to North Carolina’s future from both cost and

environmental perspectives. Participants mentioned, “people will use public transportation more as gasoline and cost of fuel increase”, “gasoline prices will bring change”, air quality will determine decisions” and “transit systems should be able to look at what the environmental movement has done”. Other participants perceive that in the future public transportation will play a more vital role in addressing the transportation needs of public school systems.

### *Results-Regionalism*

In identifying the significance of regionalism, one participant noted that public transportation would play a vital role in “bringing together urban and rural neighboring cities/towns”. Another indicated that regionalism would require the availability of “multi-modal systems” where consumers will need to have the ability to “catch a bus and then use light rail”. Participants predicted that the regionalization of transportation services over the next ten years will include both intrastate and interstate compacts. This trend will be fueled largely by demographic shifts and greater cooperation between government agencies.

### *Results-Urbanization*

Increased urbanization along with the aging of the baby boomers<sup>12</sup> will be another factor contributing to the importance of public transportation in the North Carolina during the next decade. It was noted that high density would continue to become the norm in the urban centers of the State as “baby-boomers” move into the cities. This along with the increase in urbanization in general will result in the need for more affordable housing to serve a large population of senior citizens. This is supported by comments such as “senior housing should be within transit routes or you will need to pay more to transport this older generation relying on transportation” of some type and “baby boomers will be at the peak of their need”.

### *Results-A More Acceptable Way of Traveling*

This analysis suggests that in the future public transportation can be expected to play a greater role in addressing the transportation needs of an aging population. Primarily, the population will be reflective of baby boomers living in the urban centers of North Carolina over the next ten years and beyond. However, participants also predict that the manner in which public transportation services are provided will need to be redefined in order to serve the transportation needs of mobile urban professionals moving to North Carolina from throughout the world. In addition, they predict that the use of public transportation will become a “more acceptable way of traveling for all classes of people” and “land use will be more connected to transportation”.

### *Results-Continuing Challenges*

However, participants also expressed concern regarding challenges that must be addressed over the next decade if public transportation is to be readily available to all citizens of North Carolina. Among these challenges:

1. Erasing the stigma that public transportation is for the poor and elderly,
2. Providing and managing public transportation systems in rural areas,

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<sup>12</sup> A **Baby Boomer** is someone who was born during the period of increased birth rates when economic prosperity rose in many countries following World War II. In the United States, the term is iconic and more properly capitalized as *Baby Boomers* and commonly applied to people with birth years after [World War II](#) (WW II) and before the [Vietnam War](#), thus possibly comprising more than one generation. [http://en.wikipedia.org/wiki/Baby\\_boomer](http://en.wikipedia.org/wiki/Baby_boomer), November 2006.



3. Improving collaboration among agencies,
4. Using information technology for problem solutions,
5. The need for adequate funding to provide services in rural and urban areas,
6. More autonomy in working with universities to provide educational programs and logistical services.

### *Results-Identifying the Need for an Undergraduate Degree in Transportation*

This analysis suggests that in general managers and supervisors recognize the need to provide quality training for personnel employed in the public transportation industry. Most respondents were in support of developing a university-based program that would result in an undergraduate degree. Typical responses in considering this issue were “there is a need to provide some level of course work to people” and “a degree is needed and is beneficial” or many “people come with no background in public transportation. They have to attend many workshops. Having a degree will eliminate the need to go to so many workshops”. However, these respondents were also concerned that a centralized program located at one university could not sufficiently serve the needs of public transportation workers throughout the State. While in support of providing an undergraduate degree, these participants recommended that the program be available on a large scale-basis using community-based courses (extension), distance education or other technologies.

These participants expressed support for offering a degree in public administration or another major with a concentration in transportation. Comments such as “a degree will provide a central point to get skills and education” by making people better prepared supported this position. In addition, it was noted “raising the level of education required (in the public transportation industry) would give credibility to a position” allowing one to be compensated “upwardly because of the degree”.

While in support of providing university-based training, some participants expressed concern that “an undergraduate degree may not be the best approach”. Instead, because of the need to offer a broad-based degree due to the “complexity of transportation”, a “concentration or minor may be best with an undergraduate” then offering a degree in transportation at the graduate level. A minority of participants was not in support of providing a university-based program at all. Instead, this group had more of an interest in providing training using of internships, short courses and workshops.

### *Results-Course Offerings and Curricula Topics*

Participants identified a variety of topics perceived to be of significance to a degree in transportation at the undergraduate level. For the purpose of this study, an analysis was conducted in order to identify common themes evident in the suggested topics. Seven course categories emerged, indicating that managers and supervisors perceive a need to provide course work that is not limited specifically to the technical aspects of the transportation industry. Instead, they see a need to include instruction and preparation in organizational management, technology, human resources, law and policy, finance, planning and the social sciences. Topics to be covered in each category are displayed below.

### *Results-Implications of Career Opportunities in the Public Transportation Sector for Holders of Undergraduate Degrees in Transportation*

The system for selecting and developing personnel in the public transportation section is currently industry-based with a focus on general education. Personnel are recruited and then acclimated to the industry through on-the-job training programs.

**Table 2. Suggested Topics for Inclusion in an Undergraduate Degree Program in Transportation**

<b>Organizational Management</b>	<b>Technology</b>	<b>Human Resources</b>	<b>Policy/Law</b>	<b>Finance</b>	<b>Planning</b>	<b>Social Science</b>
Administration	Computers	Labor Relations	Intergovernmental	Budgeting	Geographical	History of Transportation
Operational Management	GIS/GPS Technology	Security	Civil rights laws	Marketing	Scheduling	Psychology
Organizational Theory		Performance	ADA	Grants	Land Use	English
Safety/Security		Public Relations	Federal	Contracts	Productions	Spanish
Routing		Customer Service	DOT Regulations	Revenue	Project Management	Ethics
Personnel		Sensitivity Training	Business	Purchasing		Statistics
Public Speaking.		Driver Training	Transportation	Capital Procurement		Political Science
Leadership Development		Drug Alcohol testing				Cultural Diversity

Participants from the Managers focused groups indicated a preference for offering a degree that is as “broad based as possible due to the complexity of transportation” and augmented with continuing education. Specific topic identified for consideration by this group included: Operational management and planning, grant writing, labor management, intergovernmental relations/ politics, regional planning; public budgeting, marketing; organizational theory; as well as safety and security.

### *Results-Supervisors*

Topics for inclusion identified by the supervisory focus groups included: Driver training, drug and alcohol testing, administration, revenue management, labor relations, civil rights laws, DOT regulations, ADA requirements, sensitivity training, purchasing, capital procurement, budget development, land-use planning, transportation law (federal and state), grant writing, budgeting, financial planning, basic planning courses, geographic information systems (GIS), scheduling, routing, regulations, customer service, marketing, as well as security and safety.

### *Results-Courses Requirements*

Both managers and supervisors identified specific courses that individuals seeking an undergraduate degree in transportation should be required to take. These included classes in organizational management, technology, human resources, law and policy, finance, planning and the social sciences. In addition, participants also identified a need for degree seekers to have strong writing, oral communication and public speaking and bilingual skills.

### *Results-Level of Interest*

As noted previously, managers and supervisors expressed an interest in creating an undergraduate degree in transportation in North Carolina. This interest is related to the current difficulty of finding trained and appropriately educated to work in the industry. Managers and supervisors also expressed a concern that existing approaches to training transportation industry employees will prove insufficient as public transportation systems become more complicated in the future. Observations such as, “ a degree will provide a background and will save time and training” as well as “very little skills from current employees that are being promoted to higher positions”, are informative relative to the level of interest in offering the undergraduate degree. This is emphasized by comments such as “yes, it’s needed because many in the industry fell into it” and “a degree will set a baseline for transportation in NC and all over the nation”.

### *Cautions*

Participants offered cautions that should be considered in developing an undergraduate degree program in transportation. The recommendation was made that courses be taught by individuals with actual operational experiences in the field of transportation because of the necessity to go beyond the theoretical knowledge.

It was furthered cautioned that an undergraduate degree program may not be the best approach to improving the skills of personnel entering the public transportation industry. This concern was expressed because based on traditional career paths in public transportation; an individual may acquire the degree but not be able to use it because of the limited availability of positions requiring college degrees. As an alternative, participants suggests consideration might be given to providing for a concentration in transportation in another degree program and offering an actual degree in transportation at the graduate level.

### *Results-Class Scheduling and Delivery Considerations*

While supporting the availability of an under graduate degree in transportation, participants also expressed a concern that a variety of options be considered in offering classes. Alternatives recommended to the traditional campus-based schedule included weekend and evening offerings, community-based extension approaches and distance education classes. Hands on activities with a limited use of lecture were identified as the preferred method of content delivery.

There was some, although limited interest in the use of professional development programs such as the "Transportation Leadership Development Program" or "National Transit Institute Training" as part of the degree program. However, participants expressed an interest as offering an internship as part of the educational experience.

### *Results-Management Support*

This analysis suggests that managers recognize that employees currently working in the public transportation industry will have a greater probability of successfully completing the undergraduate degree with the support of their particular organization. On an organizational level, managers indicated a willingness to provide “education leave”, “tuition assistance” and to offer “career incentives” for “advancement within the organization”. On a personal level, managers indicated that they would collaborate and “provide encouragement” to employees seeking the degree.

### *Results-Skill Identification*

Participants in both the managers and supervisors focus groups readily identified the skills that are needed for one to be successful within the public transportation industry. Both groups identified vision, interpersonal, communication and mathematical skills as important. Problem-solving, critical thinking, leadership, flexibility and the ability to multitask were also mentioned as desirable skills. This analysis did not reveal that there is a significant difference between the skill-set required for one to be a manager as opposed to a supervisor.

### *Results-Summary of Focus Group Questions*

This analysis identified several themes evident in the data as discussed earlier. This section of the report provides a summary of findings corresponding to the 13 research questions of interest to this aspect of the study.

#### *1. What courses were identified by participants?*

For the purpose of this study, an analysis was conducted in order to identify common themes evident in the suggested topics. Seven categories emerged, indicating that managers and supervisors perceive a need to provide course work that includes study in program areas such as organizational management, technology, human resources, law and policy, finance, planning and the social sciences.

#### *2. What cautions were given to establishing a degree, concentration, or professional development program in public transportation management/operations?*

It was cautioned that an undergraduate degree program might not be the best approach to improving the skills of personnel entering the public transportation industry. This concern was expressed because based on traditional career paths in public transportation; an individual may acquire the degree but not be able to use it because of the limited availability of positions requiring college degrees.

#### *3. Is there interest for creating a transportation degree within the public transportation industry in North Carolina?*

There is an interest on the part of managers and supervisors to create a transportation degree in North Carolina as evidenced throughout the analysis of the data.

#### *4. How much interest, under what circumstances?*

Managers and supervisors expressed an interest in creating an undergraduate degree in transportation in North Carolina. This interest is related to the current difficulty of finding trained personnel without extensive on-the-job training. Managers and supervisors also expressed a concern that existing approaches to training transportation industry employees will prove insufficient as public transportation systems become more complicated in the future. They also expressed a concern that classes offered to program participants be available throughout the State using a variety of approaches such as extension efforts, distance education and online instruction.

*5. What specific course topics need to be addressed in the curricula?*

Specific course topics that need to be addressed in the curricula as identified by managers and supervisors included:

- Operational management and planning
- Grant writing
- Labor management
- Intergovernmental relations
- Regional planning
- Public budgeting
- Marketing
- Organizational theory
- Driver training
- Drug and alcohol testing
- Administration
- Revenue management
- Labor relations
- Civil rights laws
- DOT regulations
- Americans With Disabilities requirements,
- Diversity/Sensitivity training
- Purchasing
- Capital procurement
- Budget development
- Land-use planning
- Transportation law (federal and state)
- Geographic information systems (GIS)
- Scheduling and routing
- Customer service,
- Security and safety

*6. When (time of day, days of week, weeks of the year, etc.) should courses be offered?*

Managers and supervisors expressed an interest in classes that are scheduled during the weekend, in the evening and during other non-traditional times.

*7. What supports are managers willing to give to their employees enrolled in an undergraduate degree program in public transportation management/operations?*

This analysis suggests that managers recognize that employees currently working in the public transportation industry will have a greater probability of successfully completing the undergraduate degree with the support of their particular organization. On an organizational level, managers indicated a willingness to provide “education leave”, “tuition assistance” and to offer “career incentives” for “advancement within the organization”. On a personal level, managers indicated that they would collaborate and “provide encouragement” to employees seeking the degree.

*8. What are the skills that were identified that are needed by people who work in the public transportation industry?*

Participants in both the managers and supervisors focus groups readily identified the skills that are needed for one to be successful within the public transportation industry. Both groups identified vision, interpersonal, communication and mathematical skills as important. Problem-solving, critical thinking, leadership, flexibility and the ability to multitask were also mentioned as important and desirable skills.

*9. What are the entry-level jobs/positions that persons with undergraduate degrees in public transportation management would be qualified for in public transportation?*

The four main entry-level positions into the public transportation industry are dispatchers, safety operators, drivers and consultants. Of these, the most likely entry-level position that a holder of an undergraduate degree in transportation would qualify for is that of consultant and then only if there is significant prior experience.

The present analysis does not reveal that opportunities for holders of undergraduate degrees in transportation other than these will exist for the near future. However, managers participating in focus groups indicate that having such a degree will position the holder for advancement at a more rapid rate than might otherwise be possible.

*10. Do the identified skills differ from occupation-to-occupation (managers/supervisors/employees) within the public transportation industry?*

This analysis does not suggest that there is a significant difference in the skill sets needed by managers and supervisors in order to be effective in the public transportation sector. Both categories of employees require vision, interpersonal, communication and mathematical, analytical problem solving, critical thinking and leadership skills.

*11. What are the preferred methods of delivery? (lectures, online, combination, other, etc.)*

The preferred method of course delivery identified by managers and supervisors is hands on activities with a limited use of lectures. A desire for online instruction was also evident.

*12. What is the preferred schedule of courses (regular academic semesters, summer only, 2-4 week modules, etc.)?*

Managers and supervisors prefer that courses be offered in the evening and on the weekend during the regular academic year and summer. There was also some preference for short courses.

*13. Was there interest in professional development courses (short courses or modules)? If so, to what extent?*

Managers and Supervisors express some, although limited interest in the use of professional development programs such as the “Transportation Leadership Development Program” and “National Transit Institute Training” as part of the degree program. However, participants expressed an interest in offering an internship as part of the educational experience.

***Results—Focus Group Discussions with Public Transportation Employees, Experts, and Customers***

Current transportation employees were overwhelmingly enthusiastic about the establishment of a transportation degree at the undergraduate level. They cited the fact that most current workers do not have formal training to do their jobs and have instead learned the industry “on the job”. Some have entered their profession with no formal training while others have formal degrees in such areas as Social Work, Geography, Urban Studies, Business, Public Administration, and City and Regional Planning to name a few. Additionally, during their employment, some workers have had the opportunity to attend specialized training sessions, conferences, and workshops to gain formal knowledge of transportation systems. Perhaps, their experiences lead to the perception that existing formal education is fragmented and disbursed over many courses of study. This in turn constitutes a valid reason for an undergraduate transportation degree program.

In addition, the current economic environment, particularly the rising cost of fuel, the increasing societal dependence on transportation systems of all kinds, the current emphasis on the state of highway systems and rail systems, and environmental concerns all support the current interest in developing a cadre of professionally trained personnel in this area. Experts also mentioned the growing complexity of the field as another reason the degree is necessary. There is a belief that Specific benefits of this program included the ability to provide a skilled, knowledgeable workforce and develop/design more advanced transportation systems. Employees, on the other hand, expressed benefits related to career advancement such as the provision of multiple career opportunities, the ability to become effective managers, in addition to an interest in becoming a “trained” workforce.

It is important to note, however, that not all experts and “funders” participating in the focus groups were able to support the creation of a degree program. One participant in the Expert group noted some skepticism about the creation of a program stating “Can skills be taught to current employees?” Similarly, a participant in the “funder” group indicated an inability to predict the need without more knowledge of the benefits of the degree program. Interestingly, members of both groups expressed the need to research/review transportation programs in other communities when developing a degree program in North Carolina.

***Results-Courses and Course Topics***



The identification of specific courses and/or course topics was exhaustive among the three groups (Employees/Funders/Experts) and the results are listed below. It should be noted that there was a suggestion that a transportation degree curricula contain different specializations. Thus, this exhaustive list could be organized according to specific areas of specialty within the transportation arena. The items highlighted with asterisks indicate the multiple occurrences of mention of these courses in the data.

1. Transportation Fundamentals\*\*\*
2. Foreign Language(s)
3. Public Policy Analysis\*\*\*
4. Statistics
5. Geographical Information Systems (GIS)\*\*\*
6. Business Systems - Finance/Budgeting
7. Graphic Software – e.g. ARC Mapping\*\*\*
8. Basic First-Aid
9. Transportation System Modeling\*\*
10. Transportation Planning
11. Political Science
12. Sociology
13. Human Resource Management
14. Grant Writing
15. Organizational Behavior
16. Micro-Macro Economics
17. Urban Geography
18. Psychology
19. Marketing/Sales\*
20. Civil Engineering
21. Public Administration
22. Life Sciences
23. Public Speaking\*\*\*
24. Public Transportation \*\* (UNCC)
25. Urban Design
26. Strategic Planning in Business and Government (NCSU)
27. Internship (Minority Transportation Officials and others)
28. Practicum Courses
29. Transportation Law
30. Homeland Security
31. Grant/Contract Administration
32. Complaint Resolution
33. Civics
34. Urban/Rural Planning
35. Safety and Security\*\*
36. Needs and Assessment
37. Intergovernmental Relations
38. Project Management
39. Communication Skills

Also, in a discussion regarding the skills and abilities of entry-level employees during the expert focus groups the requirement of a transportation degree was identified along with the following knowledge “bases”: Computer software, Accounting, Budgeting, and

Statistics. Additionally, participants in one expert focus group expressed a belief that a Department of Public Administration was a “good fit” for an undergraduate degree in Public Administration.

### Results-Identification of Skills and Abilities

Focus Group Participants (Employees/Funders/Experts) were also asked to identify the skills and abilities necessary to advance in public transportation. Although there was no discussion of the preferred method for skill building within a transportation curriculum, many of these skills/abilities may be taught within established courses or delivered in a variety of other ways including short courses and workshops. The skills and abilities identified by all participants are listed below. The items highlighted with asterisks indicate multiple occurrences of mention of these skills and abilities in the data.

1. Transportation System Analysis\*\*
2. Needs Assessment Preparation \*\*\*
3. Map Reading
4. Customer Service Skills
5. Standardized Form Processing
6. Supervisory Skills
7. Identification of Funding Sources
8. Ability to work with the handicapped population and other special needs populations including the elderly
9. Report Preparation
10. Effective Verbal and Written Communication Skills
11. Public Speaking\*\*\*
12. Public Relations
13. Interpersonal Skills (Dealing with “Difficult” (Different) People)
14. Computer Skills\*\*\*
15. Problem Solving Skills
16. Research Skills
17. Assessment of Legal Environment
18. Grant Writing
19. Cost Analysis

Additionally, experts were asked to identify the skills and abilities they would seek in entry-level employees. The identified skills included communication, computer, and good presentation skills as well as the ability to problem solve and multi-task. Interestingly, all of these skills were identified above by employees as well.

### Results-Time of Course Offerings

There was consensus among working professionals that the day of the week and the time of the courses seemed to depend on the day of the week proposed. Those proposed were:

- Saturday (All day)
- Every other Friday and Saturday (All day)
- Every Thursday evening and Saturday (All day)
- Any night (7-9 pm)

### Results-Method of Course Delivery

Among the three Employee focus groups, online courses were consistently cited as a viable method of course delivery. Flexibility in scheduling was also a common theme. There was support for off-site satellite campus offerings as well. No interest was indicated in traditional, campus based course offerings. This may be due to the unintended expectation that this degree would be offered at the N.C. Central University main campus since distance was mentioned as a reason for online courses and satellite campuses. Participants also suggested conducting a survey to obtain more detailed schedule preferences among potential students.

### Results-Employer Support

Employer support was overwhelming considered essential to pursuing a transportation degree. Suggested forms of support included: leave time; financial assistance – grants, loans, tuition reimbursement, and transportation costs; child care; and incentives such as salary increases and promotional opportunities upon completion of the degree. Interestingly, the expert focus groups indicated similar support needs citing the provision of “flex-time”, financial assistance, and monetary incentives as potential “support” mechanisms. Further, some experts stated that employers should encourage employees to obtain a degree once it is established by providing various incentive programs after examining those currently offered throughout the country.

It should be noted that in addition to thinking about the opportunity for employer support, some participants also indicated things they would need to consider when embarking upon this endeavor. They included a positive attitude, interest in career planning, and consideration of the time that would be necessary away from family in pursuit of a transportation degree.

### Results-Customer Perspective

The questions posed to Customer focus group participants did not explore the value placed on obtaining an undergraduate degree in public administration. However, participants provided their thoughts regarding the inclusion of customer service in a degree curriculum. That discussion primarily focused on the need to be able to identify the “customer” and the importance of understanding the traits of good customer service and the dangers of inadequate customer service. The need for public transportation students to have human relations skills including the ability to work with persons with “different” personalities was also cited during the customer service discussion.

### Additional Results--The Vision for the Future

Experts, funders, and customers were asked to comment on the future of public transportation by thinking 10 years into the future. It should be noted that across these groups the following “visions” emerged.

- A recognition that increased fuel prices would drive the demand for mass transportation alternatives as well as carpooling.
- The increasing need/demand for Para Transit options for the aging population and those with specialized needs such as medical

transportation. (The customer group went a step further by forecasting free transportation for seniors in 10 years.)

- Improved transportation options and services for rural residents also emerged as a common theme.

Also, experts and funders both envisioned improved education and marketing of public transportation options. Passenger rail systems emerged as a common vision for experts and customers but were not mentioned by the funders group. Similarly, the importance of linking Land Use Policy and transportation was envisioned by the experts and the funders but not the customer group.

### *Challenges*

Only the Funders group was asked to comment on challenges in funding public transportation and the following three topics emerged: 1) the availability of matching funds; 2) Current funding is not based on need; and 3) the lack of new local funding sources. These challenges can be used to inform the design of the finance related “offerings” of a public transportation degree.

### *Conclusions and Recommendations*

The analysis of data resulted in findings clearly revealing that middle level managers employed in the public transportation sector of North Carolina support the establishment of an undergraduate program to provide a degree in transportation at North Carolina Central University. Their responses were analyzed using qualitative methods to answer 13 relevant research questions of interest to both the University and the North Carolina Department of Transportation.

This analysis also provides direction for the University to consider in developing concentrations to complement the actual degree. Concentrations might be considered in transportation administration, technology, human resources, law and policy, finance and planning.

In addition, consideration might also be given to providing a concentration in school transportation. This would address an existing need to provide personnel with the education and skills needed to effectively work in transportation programs serving school age populations.

However, an issue that remains to be examined in detail is the types of skills required of employees functioning in an expanded public transportation in North Carolina. Managers and supervisors expressed a concern regarding the current difficulty of securing trained personnel for the industry without extensive on the job training and a belief that public transportation will become more complicated in the future. Responses indicate that participants believe that public transportation will play a more vital role in the future, thus requiring a better educated work force. It is recommended that a future study be conducted to identify jobs to be created because of the expanding role of public transportation in the State and how the undergraduate degree in transportation will help to avoid the coming shortage of trained labor in the industry.

It can be surmised that in the future there will be an increased need for personnel specifically trained in public transportation administration, planning, logistics and technology. In addition, there is an increasing demand for transportation specialists skilled in working with disabled citizens, senior citizens and school age children.

### ***Results--Identification of Existing Academic Programs Offered by NC Public Universities***

It was essential to determine whether the proposed degree duplicates other university programs in the state. A faculty member of the project staff and one graduate student conducted exploratory research to identify all public transportation management courses that are taught at North Carolina public universities.

The graduate student research assistant, undergraduate student research Intern, and undergraduate students will work in teams to identify the appropriate persons to contact at each NC Public University using a set of defining questions prepared by the Graduate Student Research Assistant and the Project Director. They will review respective University directories and make exploratory telephone calls to identify the appropriate parties.

The graduate student research assistant and the Project Director in consultation with NCDOT to ensure that the final list of interviewees is accurate and complete will review the list of potential interviewees at each University. List will be prepared by the Program Assistant. These same teams will make appointments for telephone interviews. The faculty researchers will work with NCDOT to develop a series of five to seven questions to be administered by the graduate student research assistant and the Project Director during telephone interviews. The topic of these interviews will be to determine which, if any, state universities are currently offering or plan to offer courses in public transportation management and operation and related areas.

Tentatively, the institutions and individuals queried included:

- Academic coordinating officers at Schools/Departments of Engineering, Planning,

Business Administration, Geography, Logistics, Policy Administration, and Public Administration in North Carolina four-year public colleges and universities (A&T State University, Appalachian, East Carolina, Elizabeth City, Fayetteville, NC State, UNC-Chapel Hill, UNC-Charlotte, UNC-Greensboro, UNC-Pembroke, UNC-Wilmington, and Winston-Salem State University), and

- Academic Personnel in the University of North Carolina Office of the President and NC Department of Community Colleges.

### *Results-Identification of Existing Academic Programs offered by Universities in Select United States (University Transportation Centers)*

Since 1988, the U.S. Department of Transportation (DOT) has awarded grants to universities throughout the nation to support education. Each grantee is designated as a University Transportation Center (UTC). While the mission and goals are the same for all Centers, the US Department of Transportation encourages creative diversity in the approaches individual Centers take to reach these goals. As a result, many universities have created transportation courses that are a part of a multidisciplinary offering.

There are currently 33 University Transportation Centers.<sup>13</sup> Researchers associated with this study contacted a sample of University Transportation Centers in the United States to identify the curriculum offerings and program attributes at these Centers. The Research Team (an NCCU Public Administration faculty member and a graduate student) developed a series of five to seven questions. The contact at each UTC was the Director.

- The UTC's contacted were selected with opportunity for input from NCDOT and because of their research and teaching efforts in public transportation: City College of New York, George Mason University, Massachusetts Institute of Technology, University of Central Florida, University of Rhode Island, Morgan State University, New Jersey Institute of Technology, Penn State University, Rutgers University, South Carolina State University, and University of South Florida.

In addition the National Transportation Institute was consulted for the purpose of gathering information about existing teaching and research University Transportation Centers.

### ***Feasibility of Developing an Undergraduate Degree at NCCU (Strategy)***

- Conduct literature review and research of National Transportation Institutes, and other academic credentialing bodies such as the Southern Association of Colleges and Schools Accreditation Standard requirements.

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<sup>13</sup> www.UTC.Dot.gov. May 31, 2005

- Examine current professional certification requirements to determine the skills and assessments used for certifying public transportation management and operation personnel
- Examine web-based programs to identify curricula and course requirements and to assess their compatibility with instruction requirements for transportation management and operation personnel
- Identify requisite knowledge, skills, and abilities (position classification review) required of North Carolina public transportation employees and related contracted service systems
- Review public transportation position descriptions developed by technical transportation experts as recommended by NCDOT and providers
- Conduct research accrediting bodies to determine curriculum, learning, and other course requirements needed to establish an undergraduate degree in public transportation.
- Determine requirements of the University of North Carolina Office of the President for establishing an undergraduate degree in public transportation.

### ***Existing University of North Carolina System Transportation Academic Coursework and Program Analysis***

The purpose of this research is to identify the universities in the University of North Carolina (UNC) system currently granting baccalaureate degrees in transportation, transportation coursework, transportation concentrations, and or certifications. Before an undergraduate program in transportation management, planning, and operations at North Carolina Central University is established, it is essential to determine whether the proposed degree duplicates other current university programs in the state. This portion of the report will identify the current and future course offering for an undergraduate degree in public transportation within the next one-to-two years. For the purpose of this research it has been determined that quantitative research, in the form of structured exploratory telephone interviews (see Appendix A) and qualitative survey questions (see Appendix B), will be used to determine current program status and future intentions. This document will describe the research methods used, the processes involved in the method, and how the information will be analyzed.

### *Research Participant Selection Process*

The rationale for selecting the sixteen constituent universities, excluding North Carolina School of the Arts and UNC Asheville, is to ensure that relevant information is given consideration in the final analysis. Each selected university was surveyed to determine their current or future intentions as it relates to offering transportation courses or degrees.

The initial study effort consisted of scripted telephone exploratory interviews of the following UNC System fourteen constituent universities:

- Appalachian State University
- East Carolina University
- Elizabeth City State University
- Fayetteville State University
- North Carolina Agricultural and Technical State University
- North Carolina Central University
- North Carolina State University
- University of North Carolina at Chapel Hill
- University of North Carolina at Charlotte
- University of North Carolina at Greensboro
- University of North Carolina at Pembroke
- University of North Carolina at Wilmington
- Western Carolina University
- Winston Salem State University



Telephone exploratory interviews were conducted with the university deans in the Schools of Business, Sciences, and Engineering to determine their level of involvement in transportation operations or management. They were asked a series of open-ended questions to allow for a wide-range of responses and have maximum latitude to speak freely. The responses from the exploratory interviews were analyzed to determine the institutions to be targeted for an on-line survey response. The primary criteria for selection for the on-line survey were determined by the institutions' current involvement in transportation coursework, transportation certifications, transportation concentrations and the granting of transportation degrees. The objective was to gather information from the appropriate institutional representatives in order to obtain qualitative data, information that is interpreted by the individuals in their natural setting. The collected data will be more detailed as it relates to their involvement in transportation courses, certification, concentration, and degree programs.

### Results-Interviews with NC Public Universities

The data gathered from the telephone interviews determined that the following institutions offered courses and training related to this research:

- North Carolina Agricultural and Technical State University (NCA&TSU)
- Institute for Transportation Research Education housed at North Carolina State University (ITRE), North Carolina State University
- Department of Engineering, University of North Carolina at Charlotte (UNCC)
- University of North Carolina at Greensboro (UNCG).

These institutions were selected to participate in the online survey

North Carolina A&T State University's Transportation Institute confers a degree in transportation for those interested in Logistics and Supply Chain Management Transportation. Supply chain management (SCM) is the process of planning, implementing, and controlling the operations of the supply chain with the purpose to satisfy customer requirements as efficiently as possible. Supply chain management spans all movement and storage of raw materials, work-in-process inventory, and finished goods from point-of-origin to point-of-consumption. The University Transportation Institute (UTI) and The School of Business & Economics offer a curriculum that includes the following; transportation research, education, and technology transfer including the facilitation of relationships among transportation managers, state, local, and federal transportation officials, and emerging transportation professionals. The Transportation Institute is responsible for programmatic and fiscal management of all sponsored transportation programs for the University. The activities of the Transportation Institute include conducting research, coordinating faculty development and student enrichment programs, providing technology transfer, technical assistance and public service, as well as administering other programs in the area of transportation.

The Transportation Institute functions as a national and regional center, offering seminars, workshops, lectures, publications and other information for public and private transportation practitioners, decision-makers, and the general public.

The ITRE program administered by North Carolina State University conducts research, education, and provides technical assistance for a number of projects on a variety of surface transportation issues. ITRE serves all 16 of the UNC campuses.

The departments of civil, construction, and environmental engineering at NC State are among the five largest in the nation. Strong undergraduate and graduate degree programs are offered in a number of specialty areas in civil engineering. The faculty in the civil engineering department includes recipients of national, state, and local awards for excellence in teaching and research.

The mission of the undergraduate program in the Department of Information Systems and Operation Management at the University Of North Carolina at Greensboro is to integrate quality instruction in information systems and operations management with relevant research and professional services. This integration will help students develop an appropriate background and critical skills needed to function effectively in a global, technology-driven environment. The program strives to fulfill its mission as part of the Bryan School of Business and Economics. The primary goal is to provide top-shelf information systems and operations management programs to the citizens of North Carolina.

Undergraduate students from all departments at the University of North Carolina at Chapel Hill can select a minor in Urban Studies and Planning. The aforementioned minor is offered through the Department of City and Regional Planning and consists of five courses. Students are required to take two core courses: PLAN 46 and 47. The two courses will introduce the student to the structure and function of cities and ways planners solve urban problems. In addition to the core curriculum in the Minor, students choose three additional courses from the list of undergraduate offerings from the Department of City and Regional Planning (at least one at the 100 level). These courses enable students to develop knowledge in a planning specialization, such as land-use/environmental planning or transportation planning; or, students may use this opportunity to develop a better understanding of cross-cutting planning issues, such as planning ethics or international issues.

The Geography department undergraduate program at the University of North Carolina at Charlotte is based upon social science methodologies with an emphasis on the importance of geographic location. Traditional regional studies and conceptual courses that deal with land use patterns, transportation systems, industrial location, distribution of retail activities, city planning, and urban systems are augmented by technique-oriented courses such as map design and compilation, computer mapping, analysis of satellite images, statistical methods, and geographic information systems. These courses prepare students in both the concept area as well as methods of contemporary spatial analysis. A major leading to a B.A. degree consists of 29 hours in geography and earth sciences. All major courses must be at the 2100 level or above. Students are encouraged to take additional coursework in related disciplines or to select a second major.

The aim of the Department of Geography at North Carolina Central University is to help undergraduate students develop the analytical and methodological skills necessary to understand the earth's environment. It supports the educational needs of students seeking to develop skills in general and applied geography and other earth sciences, and it promotes the creation and application of new knowledge. More specifically, it supports the educational needs of students seeking to develop skills in applied geography and/or other earth sciences that are useful in achieving entry into, or mid-career advancement in occupations requiring these skills. The department of geography offers undergraduate course GEOG 3510, Urban

Public Transportation Systems, which is an introduction to local, regional, and national public transportation systems.

### *Results-Survey of NC Public Universities*

In an attempt to increase the number of survey respondents the project team contacted the original recipients with follow-up e-mails and telephone calls. There were ten system universities surveyed for this study, only 40% responded. The following four participants completed the survey:

1. North Carolina State University Department of Civil, Construction, and Environmental Engineering.
2. North Carolina Agricultural and Technical State University Transportation Institute.
3. North Carolina State University Department of Mathematical Sciences.
4. The University of North Carolina at Greensboro

The data collected by means of the survey contained four responses. Because the pool of respondents was limited, the impact of each response was significant. The UNC system has only one university currently granting an undergraduate degree in transportation-- North Carolina Technical and Agricultural State University. However, it must be noted there are no institutions in the university system currently granting undergraduate degrees in transportation management and operations. At the time of this research, no NC public universities were providing courses, education or training for transportation employees that lead to an undergraduate degree in transportation management.

The survey respondents and telephone interviewees indicated their institutions were not planning to offer transportation degrees and nor were they planning to add new courses in the transportation discipline. The following universities offer transportation and transportation related courses: The Institute for Transportation Research and Education housed at North Carolina State University, North Carolina State University department of engineering, University of North Carolina at Greensboro, University of North Carolina at Chapel Hill, and the University of North Carolina at Charlotte. The survey findings indicate that within the UNC system undergraduate transportation management and operations education is limited. The aforementioned transportation and transportation related courses that are currently offered utilizing distance learning are listed below:

#### **Distance Learning Course listings**

Business Fundamentals  
Geographic Information Systems (GIS) In Transit Planning and Operations  
Management Communication  
Transit Planning for Fixed Route Service  
Transportation Economics  
Transportation Planning  
Transportation Safety  
Transportation Security  
Transportation System Analysis

## *Results-University Transportation Centers*

### **Purpose and Research Method**

The purpose of this portion of the study is to identify the curriculum offerings and program attributes at six university transportation centers (UTCs) outside of North Carolina that are relevant to establishing an undergraduate degree in public transportation at NC Central University (NCCU). (A separate portion examines the public universities within North Carolina.) While the original thinking was that all six would be in east-coast states for reasons of geographical proximity to NCCU, two California UTCs were added to the mix because of their excellent reputations and the richness of their offerings.

The U.S. Department of Transportation has designated 33 UTCs across the nation (<http://utc.dot.gov/UTC-list.html>), and not all of them focus on public transportation. In consultation with staff of the NC Department of Transportation and other experts in the field, project staff selected six of these UTCs as (1) being relevant to designing an undergraduate degree in public transportation at NCCU and (2) fitting within the time and resource constraints of the present study.

Using telephone interviews, an on-line survey, and websites devoted to UTCs, project staff gathered information from the selected centers. Please see the Appendix for a list of universities and persons contacted and for a copy of the survey instrument.

## *Results-Research and Education Provided by University Transportation Centers*

Based on our investigation of six centers, UTCs focus their efforts primarily on research (60 to 70 percent) and secondarily on education and public service. A UTC is usually organized as a research center set up to receive funding from the federal and state governments, independent authorities, and private foundations and corporations. It is often affiliated with a school or department of engineering or business and maintains working relationships with many other academic units of its university, e.g., urban planning, economics, computer science, management, and architecture. These academic units, not the UTC, offer transportation-related courses and grant transportation-related degrees at the master's and doctoral levels. None of the universities investigated offered an undergraduate degree in transportation. (At one time, South Carolina State had an undergraduate minor in transportation, but this no longer exists. The University of California does not believe in offering a transportation degree at the undergraduate level because that is too narrow a technical field for that level.) Some UTC faculty members teach the transportation courses in the academic units, often on an adjunct basis. The size of the UTCs contacted varies widely from eight or nine faculty up to 140 faculty members.

The public service function can take many forms including technology transfer, outreach, training, workshops, symposia, and lecture series with each form aimed at a specific target audience.

## *Results-Internships/ Apprenticeships*

UTCs play an extremely important role in securing internships and apprenticeships for graduate students with a transportation focus. Transportation providers, city and county governments, consulting firms, nonprofits, and other agencies are the clients for the interns, and most of the funding for paid positions comes through the various research projects housed at the UTC. (Students also accept unpaid positions.) Alumni, friends, and associates of faculty help make the contacts with the client organizations. Positions may be structured as summer jobs, part-time jobs during the school year, or short-term

assignments lasting from a few days to a few weeks. UTCs also host job fairs, where students can meet potential employers, and resume banks for students who are looking for jobs.

Although the internship/apprenticeship is generally not a degree requirement, the work provides crucial experience and money for the students. Many of them, particularly first-generation Americans, could not attend school without these earnings. When they graduate, the work experience makes them more competitive in the professional labor market.

### *Results-The Future*

Two major trends are evident in public transportation. First, public transportation will become much more high-tech as the rate of technology integration increases. Real-time control of the vehicle fleet and real-time information to customers will become more widespread. This will change the nature of jobs in the industry, and university curricula must keep up.

Second, paying for public transportation will become increasingly difficult as demands on the public purse will only increase. The implication here is that public officials at all levels, particularly legislators who deal with appropriations, must continually be a key part of planning and evaluation processes in public transportation. One good way to do this is to ensure their attendance at conferences and discussions of emerging issues so they remain aware of funding needs.

To meet these challenges, UTCs themselves are poised for growth. One center is competing for Regional Center status and planning to add five new faculty positions; another is building a new \$70 million facility to accommodate its expanding operations, which include a recently established environmental policy institute.

### *Results-Conclusions*

In addition to the need to update curricula and involve public officials, two broad conclusions may be drawn from this portion of the study. First, university transportation centers will be an important resource for any transportation degree program that may be established at NC Central University. The centers' work in research, education, apprenticeships, and public service can provide valuable guidance in designing, starting up, and expanding a degree program in public transportation.

Second, in establishing a transportation degree at the undergraduate level, the university must be careful to avoid premature specialization. The goal is to educate transportation professionals who can think and communicate extremely well; this will require strong basic preparation in mathematics, English, and oral and written communication in addition to liberal arts that broaden a student's perceptions of the world. This is essentially the same kind of problem that has been solved successfully in other professional undergraduate majors such as business administration, social work, and public administration. The program will need to incorporate and maintain a balance between broad liberal arts and critical thinking on the one hand and specialized transportation coursework on the other.

The decision to propose a new undergraduate degree at a North Carolina public university necessitates careful study, research, collaboration, and planning by the sponsoring University Department and the University Administration. The feasibility portion of this study involved assessing the level of support and interest for a new degree, as well as understanding the roles and responsibilities of several key stakeholder entities, namely, the

NC public transportation industry, state and federal governmental organizations, and the NC University System. Development of conclusions and recommendations for the feasibility portion of this study are based upon:

- the findings and results from focus group forums held statewide;
  - research on existing public transportation degree programs and courses offered by North Carolina public universities;
  - research on training and education programs typically provided by University Transportation Centers; and
  - a delineation of the process and requirements for establishing a new degree at a UNC University member institution<sup>14</sup>
1. There is overwhelming support for establishing a new undergraduate degree in Public Transportation Management and Administration at North Carolina Central University in the Department of Public Administration.
  2. There is sufficient interest expressed by employees in the NC public transportation industry regarding their intent to pursue a first, second or third degree in public transportation.
  3. There is sufficient interest expressed by employees in the NC public transportation industry regarding their intent to obtain certification in various public transportation skill areas through short courses such as transportation and community development, public transportation planning and operations, customer service, transportation management budgeting and purchasing.
  4. Utilize a variety of service delivery strategies in the new undergraduate degree program to accommodate the career goals, work, and family commitments of the public transportation workforce. These strategies should include: offering the NCCU degree via various satellite locations, offering core courses online and directly, explore options for granting academic credit for previous related work experience, develop inter-institutional agreements for the new degree.
  5. Establish an Advisory Board with representation from the various NCCU Academic Departments, NC Department of Transportation, and providers of public transportation services in North Carolina to oversee the degree and to ensure that the content of the curricula meets the needs of the public transportation industry.
  6. Evaluate the quality of the instruction and the new curriculum and its ability to meet the needs of the public transportation industry periodically.
  7. Plan for and implement a new undergraduate degree in public transportation management and administration. The proposed degree should be structured as follows: see Table 2
    - a. 124 Total Credit Hours Required
    - b. Ten Core Courses (Listed Below) 30 Hours
    - c. Five Non-Major Required Courses = 15 Hours (Courses A-E)
    - d. *Concentration/Electives (Courses Noted as F) =79 Hours*

**Proposed Core Course Concepts for an Undergraduate Degree (BS) Program in Transportation Administration and Management (30 Hours)**

1. **Introduction to Public Transportation** (overview of public transportation systems, operations, includes history of public transportation in N.C, leadership and ethics)
2. **Organizational Theory** (includes management of public transportation, business and finance of public transportation)
3. **Public Transportation Operations Planning I** (includes scheduling, route planning with software, Transportation Development Program (TDP), Transportation Improvement Program (TIP), dispatching, run cutting, Bus assignment, personnel training for Fixed Route)
4. **Public Transportation Operations Planning II** (includes scheduling, route planning with software, dispatching, roster, bus assignment, personnel training for **Para-transit**-Carpooling, Vanpooling, TDM)
5. **Computer Applications in Public Transportation** (includes report generation, statistical analysis of service, includes statistical applications, new technological tools for data collection and analysis, National Transit Database compilation)
6. **GIS, Land Use and Environmental Issues related to Public Transportation** (includes Long Range Transportation Plan, TDP, TIP, route analysis).
7. **Public Transportation Policy** (Labor laws, FTA/DOT Regulations, DOT regulations, Civil Rights, Title VI, DBE, Americans with Disabilities Act , Drugs & Alcohol, Federal / State Funding Programs Triennial Reviews)
8. **Business Fundamentals Public Transportation Marketing and Public Relations**
9. **Student Apprenticeship**

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<sup>14</sup> Intent to Plan (Appendix 6).

**Table 3: Proposed Course Concepts and Topics for an Undergraduate Degree Program in Transportation**

Core Subject Areas	Organizational Management	Planning	Technology	Policy/Law	Finance	Human Resources	SOCIAL SCIENCES/ COMMUNICATION
Proposed Core Courses	(1) Introduction to Public Transportation Administration includes Leadership and Ethics  (2) Organizational Theory	(3) Public Transportation Operation and Planning I  (4) Public Transportation Operation and Planning II	(5) Computer and Statistical Applications in Public Transportation  (6) GIS, GPS, Land Use and Environmental Issues Related to Public Transportation	(7) Public Transportation Policy	(8) Business Fundamentals  (9) Transportation Management (Budgeting and Purchasing)	(10) Student Apprenticeship	
	<i>Transportation Security (F)</i>	Urban Administration <b>OR</b> Intergovernmental Relations and Community Relations/Partnerships <b>(Non-Major Requirement) A</b>	<i>Management of Transportation Information Systems and Data (F)</i>	American Government <b>(Non-Major Requirement) B</b>	Micro Economics <b>OR</b> Macro Economics <b>OR</b> Economic Consequences <b>(Non-Major Requirement) C</b>	Personnel Administration <b>(Non-Major Requirement) D</b>	English Composition/Technical Writing <b>(Non-Major Requirement) E</b>
Concentration and Elective Courses	<i>Transportation Communications (Dispatcher) (F)</i>	<i>Productions(F)</i>			<i>Contract Management (F)</i>	<i>Services for Special Needs Populations: Senior Citizens, Disabled, Public School Students (F)</i>	<i>Foreign Language (Spanish Recommended) (F)</i>
		<i>Project Management(F)</i>			<i>Revenue (F)</i>		<i>Psychology (F)</i>
		<i>Public Transportation Operation Research (F)</i>			<i>Public Transportation Marketing and Public Relations(F)</i>		<i>Sociology(F)</i>
		<i>Logistics Management(F)</i>			<i>Capital Procurement/ Equipment Management (F)</i>		<i>Political Science (F)</i>
		<i>Routing and Scheduling (F)</i>					<i>Philosophy(F)</i>



**Table 4. Feasibility Plan for Establishing an Undergraduate Degree at North Carolina Central University**

Activity or Task	Responsible Entity	Target Date	Status
Conduct a Comprehensive Feasibility Study for Establishing A New Degree	NC Department of Transportation and North Carolina Central University (Department of Public Administration)	2005-2006	Study Completed Draft Report Submitted
Identify Courses Topics and Concepts for a New Curriculum	North Carolina Central University (Department of Public Administration in Collaboration with other NCCU Academic Departments <sup>15</sup> )	December 2006	Completed
Obtain approval to plan undergraduate degree in Public Transportation Management at North Carolina Central University	North Carolina Central University-- Department of Public Administration	May 2007	Approval Received
Finalize Feasibility Study Report	NC Department of Transportation and North Carolina Central University (Department of Public Administration)	May 2007	Completed
Obtain Funding for Curricula Development	North Carolina Central University-- Department of Public Administration	July 2007	Pending
Develop course Curricula for New Undergraduate Degree in Public Transportation Management at North Carolina Central University	NC Department of Transportation  North Carolina Central University (Department of Public Administration in Collaboration with other NCCU Academic Departments <sup>16</sup> )	December 2007	Pending
Obtain Approval to Offer a New Degree	North Carolina Central University-- Department of Public Administration	January 2008	Pending
Establish Inter-Institutional Agreements with NC A&T State University, UNC-Charlotte, UNC-Chapel Hill	North Carolina Central University-- Department of Public Administration NC Department of Transportation	January 2008	Pending
Develop Certification Program for Public Transportation Short Courses	NC Department of Transportation  North Carolina Central University (Department of Public Administration in Collaboration with other NCCU Academic Departments <sup>17</sup> )	March 2008	Pending

<sup>15</sup> See Intent to Plan Undergraduate Degree in Public Transportation Administration and Management—Appendix 6

<sup>16</sup> See Intent to Plan Undergraduate Degree in Public Transportation Administration and Management—Appendix 6

<sup>17</sup> See Intent to Plan Undergraduate Degree in Public Transportation Administration and Management—Appendix 6

## Results and Recommendations

The decision to propose a new undergraduate degree at a North Carolina public university necessitates careful study, research, collaboration, and planning by the sponsoring University Department and the University Administration. The feasibility portion of this study involved assessing the level of support and interest for a new degree, as well as understanding the roles and responsibilities of several key stakeholder entities, namely, the NC public transportation industry, state and federal governmental organizations, and the NC University System. Development of conclusions and recommendations for the feasibility portion of this study are based upon:

- the findings and results from focus group forums held statewide;
  - research on existing public transportation degree programs and courses offered by North Carolina public universities;
  - research on training and education programs typically provided by University Transportation Centers; and
  - a delineation of the process and requirements for establishing a new degree at a UNC University member institution<sup>18</sup>
1. There is overwhelming support for establishing a new undergraduate degree in Public Transportation Management and Administration at North Carolina Central University in the Department of Public Administration.
  1. There is sufficient interest expressed by employees in the NC public transportation industry regarding their intent to pursue a first, second or third degree in public transportation.
  2. There is sufficient interest expressed by employees in the NC public transportation industry regarding their intent to obtain certification in various public transportation skill areas through short courses such as transportation and community development, public transportation planning and operations, customer service, transportation management budgeting and purchasing.
  3. The implementation plan for the new degree should include a variety of service delivery strategies in the new undergraduate degree program to accommodate the career goals, work, and family commitments of the public transportation workforce. These strategies should include: offering the NCCU degree via various satellite locations, offering core courses online and directly, explore options for granting academic credit for previous related work experience, develop inter-institutional agreements for the new degree.
  4. Establish an Advisory Board with representation from the various NCCU Academic Departments, NC Department of Transportation, and providers of public transportation services in North Carolina to oversee the degree and to ensure that the content of the curricula meets the needs of the public transportation industry.

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<sup>18</sup> Intent to Plan (Appendix 6).

5. Evaluate the quality of the instruction and the new curriculum and its ability to meet the needs of the public transportation industry periodically.
7. Plan for and implement a new undergraduate degree in public transportation management and administration. The proposed degree should be structured as follows: see Table 3.
  - a. 124 Total Credit Hours Required
  - b. Ten Core Courses (See Courses 1-10 listed Below) 30 Hours
  - c. Five Non-Major Required Courses = 15 Hours (Courses A-E)
  - d. *Concentration/Electives (Courses Noted as F) =79 Hours*

**Proposed Core Course Concepts for an Undergraduate Degree (BS) Program in Transportation Administration and Management (30 Hours)**

1. **Introduction to Public Transportation** (overview of public transportation systems, operations, includes history of public transportation in N.C, leadership and ethics)
2. **Organizational Theory** (includes management of public transportation, business and finance of public transportation)
- 3-4. **Public Transportation Operations Planning I** (includes scheduling, route planning with software, Transportation Development Program (TDP), Transportation Improvement Program (TIP), dispatching, run cutting, Bus assignment, personnel training for Fixed Route)
5. **Public Transportation Operations Planning II** (includes scheduling, route planning with software, dispatching, roster, bus assignment, personnel training for **Para-transit**-Carpooling, Vanpooling, TDM)
6. **Computer Applications in Public Transportation** (includes report generation, statistical analysis of service, includes statistical applications, new technological tools for data collection and analysis, National Transit Database compilation)
7. **GIS, Land Use and Environmental Issues related to Public Transportation** (includes Long Range Transportation Plan, TDP, TIP, route analysis).
8. **Public Transportation Policy** (Labor laws, FTA/DOT Regulations, DOT regulations, Civil Rights, Title VI, DBE, Americans with Disabilities Act , Drugs & Alcohol, Federal / State Funding Programs Triennial Reviews)
9. **Business Fundamentals Public Transportation Marketing and Public Relations**
10. **Student Apprenticeship**

8. It is anticipated that the non-traditional students (age 25 and over, employed, with family responsibilities) will be the majority of the students enrolled in this program. Specific focus should be given to non-traditional students to ensure that their work and learning needs are met by offering incentive programs, tuition and academic funding, flexibility in scheduling, and satellite locations throughout the state.
9. Establish a formal collaborative relationship with North Carolina Agricultural and Technical State University that includes planning and sharing resources where possible.

# INFORMATION AND TECHNOLOGY TRANSFER PLAN

## Research Products

The following products were generated from this research:

- Focus Group Questions for key stakeholder groups: Managers, Supervisors, Employees, Customers, Funders and Technical Experts
- A Curriculum Plan for an undergraduate degree in transportation management and operations
- Qualitative Research Findings about the needs and interests of the North Carolina transportation industry and its employees

## Who Should Use These Products in the Department of Transportation?

These products were developed to assist the mission and goal attainment of the various North Carolina public transportation providers and the NC Department of Transportation.

## How Products Should Be Used

The list of courses were researched and developed by the North Carolina Central University (NCCU) Department of Public Administration to be used in the development of an undergraduate curriculum in transportation management at NCCU and within the North Carolina University System.

The Focus group questions may be used as a reference for related qualitative research.

## Training Needed for Implementation

The data that were generated in this research are largely qualitative. Users of this data are reminded that most qualitative research is designed to obtain the perspective and understanding of the target group and not designed to yield broad generalizations about a social science event or situation.

It is suggested that the Department of Transportation Human Resource Management Division be involved in the Department's strategic planning and implementation of this new degree. It is expected that this Division will be able to provide training and awareness programs for managers, supervisors, and employees that will prepare the organizations for the impact formal education and training will have on advancement, promotion, compensation opportunities.

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## APPENDICES

### Appendix A. Glossary of Terms

**Certification:** Training in courses designed to improve a specific set of skills for which the student receives official recognition of the newly acquired knowledge. Typically, courses that lead to certification are taught in short courses over one to four weeks for a specified number of instruction hours. Certifications programs may be offered as part of planned institutes, during professional conferences for the convenience of employees and their sponsoring organizations.

**Formal Education:** A formal education program is the process of training and developing people in knowledge, skills, mind, and character in a structured and accredited program. Typically offered through two and four year institutions.

**Funders of Public Transportation:** Public transportation is a large enterprise that requires financial resources, sanction, support, planning, and involvement from multiple levels of government-- federal, state, regional, county and municipal. For the purposes of this research, "funders" are viewed as those governing bodies and their representatives within the state who provide financial resources for public transportation services.

**Non-Urbanized Areas:** An area not included within an urbanized area boundary as defined by the Bureau of Census. May include both rural and small urban areas with population less than 50,000.

**Public transportation:** Includes transportation services by bus, rail or train, van, ferryboat or other modes, including ride sharing in carpools or vanpools. Public transportation systems may be owned or operated by local, state or federal government or managed by private companies under contract to government agencies.<sup>19</sup> Also referred to as public transportation, mass transportation /mass transportation.

**Training:** Imparting a set of established facts and skills to obtain a uniform predictable behavior from the trainees. Training is learning how to perform a specific behavior in order to improve performance.

**University Transportation Centers:** Education and research programs located at select universities that are funded by grants from the U. S. Department of Transportation with the mission of supporting the Transportation Industry.

**Urbanized Areas:** Comprises an incorporated place and adjacent densely settled surrounding area that together have a minimum population of 50,000.

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<sup>19</sup> North Carolina Department of Transportation. FAQ Public Transportation. Retrieved December 4, 2005, from <http://www.ncdot.org/faq/#PublicTransportation>

## **Appendix B. Study Limitations**

Qualitative research increases the understanding of the perspectives and views of stakeholders and participants. The primary focus of this research was to document the amount of interest for a new undergraduate degree in public transportation management among key member groups of the North Carolina public transportation industry. This study was not an evaluation of the quality or availability of public transportation services in North Carolina. Recognizing that the amount of forthcoming financial and political support are related to the level of understanding among key persons and organizations in the public transportation industry, this study was undertaken to assess level of interest in the public transportation industry and overall support of a new degree within the higher education community.

Each NC public transportation organization is managed and or coordinated with a city, county, regional or state governmental entity. Therefore, there is no central repository for data about the operations and management of the transportation providers. The absence of a centralized database about the NC public transportation industry required that estimates be developed for the number of employees in the state's public transportation systems, as well as distribution by occupational group, education, experience, etc.

For the purposes of this study, a customer is a person who uses public transportation services for commuting for the following reasons: work, pleasure/social, medical or other business needs. Customers for the focus groups were identified by various means. These included contacts with public transportation officials both locally and at the state level. The input from customers was narrow in that the perspective sought from them related to their views of quality of service and consistency service received.

## **Appendix C. Focus Group Questions**

### **Managers**

1. Lets go around the room and describe any formal education and public transportation related training you may have.
2. Think ahead ten years or so, what is your vision for the future of North Carolina public transportation?
3. Do you think a public transportation undergraduate degree is needed? If so, why or why not?
4. Describe the topics (planning, security, managing people, scheduling) you feel should be included in a public transportation college degree program?
5. In your opinion, what knowledge, skills and abilities do individuals need to advance in public transportation?
6. If you were going to fill an entry-level position in your organization or hire a public transportation intern, what skills and abilities would you want them to have?



7. As a manager or supervisor, what support (financial assistance, leave time, balancing of family and work responsibilities) would you provide to your employees so that they could obtain an undergraduate degree in public transportation management?

What support (financial assistance, leave time, balancing of family and work responsibilities) would you need if you were enrolled in an undergraduate public transportation degree program?

### **Supervisors**

1. Lets go around the room and describe any formal education and public transportation related training you may have.
2. Think ahead ten years or so, what is your vision for the future of North Carolina public transportation?
3. Do you think a public transportation undergraduate degree is needed? If so, why or why not?
4. Describe the topics (planning, security, managing people, scheduling) you feel should be included in a public transportation college degree program?
5. In your opinion, what knowledge, skills and abilities do individuals need to advance in public transportation?
6. If you were going to fill an entry-level position in your organization or hire a public transportation intern, what skills and abilities would you want them to have?
7. As a manager or supervisor, what support (financial assistance, leave time, balancing of family and work responsibilities) would you provide to your employees so that they could obtain an undergraduate degree in public transportation management?

What support (financial assistance, leave time, balancing of family and work responsibilities) would you need if you were enrolled in an undergraduate public transportation degree program?

### **Funders**

1. Think ahead ten years or so, what is your vision for the future of North Carolina public transportation?
2. Describe your work experience related to public transportation.
3. What are the challenges related to funding public transportation in North Carolina?
4. Do you think a public transportation undergraduate degree is needed? If so, why or why not?

5. Describe the topics (planning, security, managing people, scheduling) you feel should be included in a public transportation college degree program?

### **Employees**

1. Describe your work experience related to public transportation.
2. Lets go around the room and describe any formal education and public transportation related training you may have.
3. Do you think a public transportation undergraduate degree is needed? If so, why or why not?
4. In your opinion, what knowledge, skills and abilities do individuals need to advance in public transportation?
5. Describe the topics (planning, security, managing people, scheduling) you feel should be included in a public transportation college degree program?
6. As a working professional, what days of the week and hours of the day would work best for you if you were enrolled in an undergraduate degree program in public transportation management?
7. As a working professional, what support (financial assistance, leave time, balancing of family and work responsibilities) would you need while you pursue an undergraduate degree in public transportation management?

### **Experts**

1. Think ahead ten years or so, what is your vision for the future of North Carolina public transportation?
2. Lets go around the room and describe any formal education and public transportation related training you may have.
3. Do you think a public transportation undergraduate degree is needed? If so, why or why not?
4. Describe the topics (planning, security, managing people, scheduling) you feel should be included in a public transportation college degree program?
5. If you were going to fill an entry-level position in your organization or hire a public transportation intern, what skills and abilities would you want them to have?
6. As working professional, what support (financial assistance, leave time, balancing of family and work responsibilities) would you provide to your employees so that they could obtain an undergraduate degree in public transportation management?

## **Customers**

1. How often do you use public transportation and are you a regular user?
2. Think ahead ten years or so, what is your vision for the future of North Carolina public transportation?
3. What public hearings, information sessions or public meetings have you attended where the subject was public transportation (bus routes, schedules, price of fares, etc.)?
4. As a user of public transportation, how would you describe good customer service?
5. Thinking about customer service, what should public transportation students be taught about customer service?

## **Appendix D. Survey Participant List (Survey of NC Public Universities)**

Dr. Daniel Solomon  
Department Chair, Mathematical Sciences  
North Carolina State University

Nagui Roupail  
Director of ITRE  
North Carolina State University

George List  
Department Head  
Department of Civil, Construction, and Environmental Engineering  
North Carolina State University

Micheal Simmons  
Department Director  
Transportation Institute, North Carolina A&T

Dr. John Cole, Interim Chair  
Economics and Transportation/Logistics  
North Carolina A&T State University

Asad Khattak, Director  
UNC Transportation Program  
University of North at Chapel Hill

Dr. Gerald L. Ingalls  
Department of Geography and Earth Sciences  
University of North Carolina at Charlotte

Stuart Allen, Head  
Department of Economics  
University of North Carolina at Greensboro

Daniel T. Winkler, Head  
 Department of Business Administration  
 University of North Carolina at Greensboro

Dr. Jeffery Patton, Head  
 Department of Geography  
 University of North Carolina at Greensboro

**Appendix E. Universities and Persons Contacted—University Transportation Centers**

University	University Transportation Center Web Site	Persons Contacted
South Carolina State University-Orangeburg	James E. Clyburn University Transportation Center <a href="http://www.utc.scsu.edu/index.htm">http://www.utc.scsu.edu/index.htm</a>	Dr. Leola Adams Ms. Janice Guinyard
University of South Florida-Tampa	Center for Urban Transportation Research <a href="http://www.cutr.usf.edu/index2.htm">http://www.cutr.usf.edu/index2.htm</a>	Mr. Joel Volinski Dr. Steve Polzin
San Jose State University	Mineta Transportation Institute <a href="http://transweb.sjsu.edu/">http://transweb.sjsu.edu/</a>	Mr. Ron Diridon
University of California-Berkeley	The University of California Transportation Center <a href="http://www.uctc.net/">http://www.uctc.net/</a>	Dr. Elizabeth Deakin
City University of New York	University Transportation Research Center <a href="http://www.utrc2.org/">http://www.utrc2.org/</a>	Dr. Robert Paaswell
Rutgers University	The Center for Advanced Infrastructure and Transportation <a href="http://www.cait.rutgers.edu/">http://www.cait.rutgers.edu/</a>	Prof. Ali Maher Mr. Patrick J. Szary

## Appendix F. Intent to Plan—Undergraduate Degree in Public Transportation Administration and Management

*THE PURPOSE OF ACADEMIC PROGRAM PLANNING: Planning a new academic degree program provides an opportunity for an institution to make the case for need and demand and for its ability to offer a quality program. This notification, and the planning activity to follow, does not guarantee that authorization to establish will be granted.*

Constituent Institution:	NC Central University
CIP Discipline Specialty Title:	Public
CIP Discipline Specialty Number:	44.0401
Level:	B
Exact Title of the Proposed Program:	Public
Exact Degree Abbreviation	B. S.

1. Describe the proposed new degree program. The description should include: a) a brief description of the program and a statement of educational objectives.

a. Transportation is increasingly recognized as a critical element of the economy and quality of life. This new undergraduate degree (124 credit hours) in public transportation administration and management will focus on core public transportation knowledge requirements and translate this knowledge into a curriculum for the North Carolina public transportation industry. The degree will be multi-disciplinary. Degree content will meet the learning and practice needs of the Transportation industry and its workforce (existing and future) by using primary and secondary research from real world providers, practitioners from the public transportation industry, and the academic expertise at North Carolina Central University (NCCU). NCCU has partnered with the NC Department of Transportation-Public Transportation Division to develop this new degree program.

### CORE CURRICULUM AREAS:

There are six discipline subject areas in this new degree. **Organizational Management** (administration, public transit operations, organizational theory, safety, leadership); **Technology** (computer applications, GIS/GPS), **Human Resource Management** (labor relations, security, performance, customer service, driver training, drug/alcohol testing), **Policy and Law** (intergovernmental relations, business, transportation, US and NC Department of Transportation regulations), **Finance** (budgeting, grants and contracts, capital Procurement), and **Transportation Planning** (scheduling, land use, environmental studies, project management).

See attachment A—*Proposed Courses/ Topics for an Undergraduate Degree Program in Public Transportation Administration and Management.*

### Educational Objectives

1) Provide an interdisciplinary curriculum for the public transportation workforce that will increase their knowledge and training in the above areas;

- 2) Provide students with learning and experiential training opportunities that relate directly to the industry;
- 3) Provide a curriculum that includes communication and writing skill training, critical thinking, decision making in a political context; multidisciplinary connections, and exposure to the proven public transportation practices and operations; and
- 4) Positively impact trends that are harmful to the industry's ability to provide safe and effective public transportation services by reducing employee turnover and supporting succession planning and development.

#### Program Specifics

The first phase of the degree planning effort that supports this proposal was funded by the North Carolina Department of Public Transportation (September 2005- July 2006). This research has identified some specific characteristics that this degree must fulfill in order to be most useful to the needs of the public transportation workforce and the students that will be enrolled.

1. This undergraduate degree is designed primarily for existing and new employees in the public transportation industry. Program requirements include the following: 30 core hours required; 15 hours non-major requirements, and an apprenticeship (3-6 months-- TBD). The requirement for the Apprenticeship may be waived for students that have worked more than two years consecutively in the public transportation industry prior to enrolling in the program. See Attachment B.
  2. It is anticipated that the majority of the students in these courses will be non-traditional, i.e. ages 28- 60 and many will have worked in the transportation industry prior to enrolling in the undergraduate program. Therefore, courses will be offered with as much flexibility as possible: evening, weekend, distance learning (online), teleconferenced broadcasts, and satellite locations. Inter-institutional agreements will need to be developed.
  3. Faculty and instructors will be experienced practitioners from the public transportation industry. Selection criteria will include previous teaching and instruction experience as well.
  4. Collaboration with NCDOT Human Resources for succession planning initiatives will be encouraged as much as possible.
  5. Establishment of an Advisory Sub-committee to include professionals from the public transportation industry, representatives of the academic arena to ensure that the learning and instruction meets the employment needs of the industry on an ongoing basis.
  6. Offer short courses in Transportation in areas such as GIS/Transportation Safety and Security/Dispatch/Transportation Consultant/Technology/Planning/Research as part of future expansions.
- b) The relationship of the proposed new program to the institutional mission and how the program fits into the institution's strategic plan.

North Carolina Central University's mission is *to prepare students academically and professionally to become leaders prepared to advance the consciousness of social responsibility in a diverse, global society*. Establishment of this degree will be the latest indication of our University's intent

to meet the needs of new and emerging workforces in the state and the nation. Presently, an undergraduate degree for the public transportation industry is not readily available in North Carolina. By establishing this degree, NC Central University will demonstrate academic leadership for this underserved population.

Academic and professional excellence components of the University's mission are reflected in the program's strategies to 1) form partnerships with public transportation system professionals and organizations and 2) attract capable and experienced faculty and staff to lead the program. Teaching and learning that are closely tied to these University's strategic goals will ensure that the program will help fulfill our mission for developing diverse and socially responsible leaders.

Our core values are:

- Excellence in Teaching, Research, Scholarship, and Creativity
- Access to Education and Effective Development Opportunities
- Promotion of Citizenship, Service, and Social Justice
- Appreciation of and Respect for Diverse Perspectives
- Superb Customer Service
- Commitment to Life Long - Learning

### **Relationship to North Carolina Central University Strategic Plan Objectives**

**Strategic Planning Objective 1.1--** *Promote and sustain high quality and innovative teaching through implementation of technology throughout the curriculum.*

This degree will involve teaching and learning of technology related public transportation scheduling, planning, performance metrics, geographic information systems, etc. This degree will be designed to prepare students in most facets of public transportation (ground, air, and rail public transportation).

**Strategic Planning Objective 1.4 --***Sustain and leverage NCCU's reputation as a leader in curriculum-based community service activity.*

This degree is being planned with the cooperation and sanction of the North Carolina Department of Transportation. This collaborative partnership supports this objective by incorporating existing resources (state agency/university collaboration), involving members of the public transportation industry and promoting experiential learning for students.

**Strategic Planning Objective 2.2--***Develop new programs to meet the evolving needs of society, with emphasis upon the strategic priorities of the University of North Carolina and service to the stakeholders of North Carolina Central University.*

The Public Transportation Industry workforce has reported to North Carolina Central's extensive research with them that they endorse the creation of the new degree program. There is no undergraduate degree in public transportation management and administration that is offered by any public or private university in the state. North Carolina Central University offers the only undergraduate degree in public administration in the triangle area. The involvement of the states transportation agency in developing this degree has given sanction and endorsement for meeting the unmet learning needs of this workforce.

**Strategic Planning Objective 3.3--***Increase the number of non-traditional students enrolled by making classes more accessible to them and by encouraging the enrollment of re-entry students.*

Courses offered to this non-traditional workforce must be offered during evenings, weekends, and short sessions, online and at satellite locations in the state to meet the needs of public transportation employees. Public transportation employees who will avail themselves to this degree will be over age 25 years and have family and job responsibilities that will require that courses be offered during alternative times.

c) The relationship of the proposed new program to other existing programs at the institution

Students enrolled in this new degree will take multi-disciplinary courses that are taught in the Department of Public Administration, Departments in the new College of Social and Behavioral Sciences and the College of Technology and Sciences at NCCU. These Departments include: Public Administration, Geography and Earth Science, Criminal Justice (Homeland Security), Business, and English. These Departments are participating in the planning and development of this new degree program. A transportation planning course is taught at North Carolina Central University- Department of Geography and Earth Science. This course will be integrated into this undergraduate degree.

d) Special features or conditions that make the institution a desirable, unique, or appropriate place to initiate such a degree program.

1. North Carolina Central University (NCCU) is the only public university in the North Carolina Triangle region that offers an undergraduate degree in Public Administration. The Public Administration program is one of the primary disciplinary areas for this new degree.
2. The NCCU Department of Geography and Earth Science currently offers a transportation course that is highly correlated with the planned course offerings for this degree.
3. NCCU Department of Public Administration has spent the past year conducting major research on this topic. Further the Department has sponsored a research team which conducted focus group sessions in Charlotte, Research Triangle Park, and Greenville. This effort has established in the mind of the NC public transportation workforce that our University plans to offer this program. We have become identified across the State as the University that will provide this academic training.

2. List all other public and private institutions of higher education in North Carolina currently operating programs similar to the proposed new degree program.

Our research indicates that no other public or private institution of higher education in North Carolina and no other public institution of higher education in South Carolina offer an undergraduate degree in public transportation administration and management.

North Carolina A&T State University offers a Bachelor of Science Degree and Transportation Logistics and Economics. Our discussions with this University reveals no duplication with a degree in public transportation administration and management because the degree offered by NC A&T is related to moving goods and services and is therefore not related to public transportation (ground, air, water, rail movement of people).

Single courses related to transportation planning or engineering have been identified at the University of North Carolina at Greensboro, the University of North Carolina at Chapel Hill (Department of City and Regional Planning offers a graduate transportation planning course), the University of North Carolina at Charlotte, and North Carolina State University (Institute for Transportation Research and Education) but again none of these courses lead to a formal or terminal degree in public transportation administration and management.

5. List the names, titles, e-mail addresses and telephone numbers of the person(s) responsible for planning the proposed program.



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