

# National Center for Transportation Systems Productivity and Management

## Program Progress Performance Report for University Transportation Centers

U.S. Department of Transportation  
Research and Innovative Technology Administration  
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**Signature of Submitting Official:**



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Michael Hunter, Ph.D.

11/26.2012

Date



## Accomplishments

### What are the major goals of the program?

The National Center for Transportation Systems Productivity and Management (NCTSPM), a Tier I University Transportation Center, was founded to facilitate, coordinate and conduct research and educational programs toward the following goals:

- Conduct multi-disciplinary research on topics relevant to the relationship among transportation infrastructure (state-of-good-repair), economic competitiveness and safety
- Disseminate research results and other products of the Center to the transportation community
- Promote transportation education and professional development on topics relating to Center research topics
- Establish a central point of contact and promotion of best practices (e.g., through a web site or list serve) for materials relating to transportation systems performance and management
- Promote diversity in the workforce through active recruitment of women and minority students into degree programs
- Act as a national resource for the debates and discussions that focus on the evolving national transportation program and future directions
- Explore international cooperative activities with research entities in selected countries where similar research interests exist

### What was accomplished under these goals?

Accomplishments for the reported period are discussed below and organized by major center goal.

#### ***Conduct multi-disciplinary research on topics relevant to the relationship among transportation infrastructure (state-of-good-repair), economic competitiveness and safety***

In consultation with the External Advisory Board, the Center and its partners developed a collection of procedures and policies for solicitation of research projects for funding consideration. Based on these procedures, a call for proposals was issued on February 7, 2012 and an information session for potential participants was held at Georgia Tech on February 14<sup>th</sup>. The Center received eighty-one (81) short-form proposals on or before the March 15, 2012 deadline. External peer-review of these proposals was jointly coordinated by the Georgia Department of Transportation Office of Research and NCTSPM. Based on the results of these review, seventeen (17) projects were selected to receive UTC funding. These projects and their principal investigators are provided in the last section of this report.

***Disseminate research results and other products of the Center to the transportation community***

An initial website has been developed that will serve as a base for disseminating research results from the center in addition to the traditional mechanisms of conference presentations and technical journal presentations. Development has begun on a web-based tool to allow center participants to semi-automatically incorporate content, including research results, into this site as well as streamlining project reporting requirements.

***Promote transportation education and professional development on topics relating to Center research topics***

In March 2012, the Center inaugurated the *Transportation Student Summer Internship Program* (TSSIP) to give students interested in pursuing a transportation career an opportunity to serve professionally in a transportation-related position over the summer months. This program is discussed in more detail below. In addition to TSSIP, a portion of the funds distributed to each partner institution for center activities were allocated for development and execution of educational and professional development services. Each institution, in coordination with NCTSPM is currently developing plans for these programs. At Georgia Tech, discussions are currently ongoing with the Georgia Center for Integrating Education in Science, Mathematics and Computing (CEISMC) to conduct the local programs.

***Establish a central point of contact and promotion of best practices (e.g., through a web site or list serve) for materials relating to transportation systems performance and management***

An initial website has been developed that will be expanded to encompass a wide range of both direct information and links to other sources. In particular, the site will provide extensive access to UTC research (both from NCTSPM and collaborating centers) relevant to transportation systems performance and management.

***Promote diversity in the workforce through active recruitment of women and minority students into degree programs***

The university partners in the center have a long history of active programs in the recruitment and education of minorities and women into technical fields, including transportation. Preliminary discussions regarding extension of existing recruitment programs, or development of new programs, to place additional emphasis on transportation related fields have been undertaken with the Georgia Center for Education Integrating Science, Mathematics, and Computing (CEISMC) and with the other partner institutions for the K-12 level and with Spelman College and other historically minority institutions at the undergraduate level. The NCTSPM internship program has also successfully emphasized recruitment of minority and female students.

***Act as a national resource for the debates and discussions that focus on the evolving national transportation program and future directions***

Many participants in NCTSPM are already national and international leaders in their field of specialization and already actively participate in these national discussions. Others are talented young researchers that will make important contribution to these discussions in the future. To ensure that the Center becomes an important national resource, the proposals selected for funding under the research solicitation were judged not only for their technical excellence but also for their importance regarding important national issues in transportation. As a result, the Center has served not only for sponsoring these projects but also for the creation of numerous new collaborations between universities, transportation agencies and other organizations. To ensure that research remains focused on important national issues, the center has convened a strong external advisory board from both the public and private sector (membership is given in the “Participants” section of this report) to advise center management and ensure the widest possible dissemination of results.

***Explore international cooperative activities with research entities in selected countries where similar research interests exist***

While activities during the initial reporting period have largely focused on developing the sponsored research program, preliminary discussions have been held regarding the future international activities of the Center. Most of the initial activities are likely to involve existing international partners, international campuses of the partner institutions (e.g. the Georgia Tech Campus in Metz, France) and internet-based on-line collaborations and instruction. In the latter arena, Georgia Tech has recently agreed to participate with eleven other major research universities (including two international partners) in the *Coursera* collaborative for international educational activities.

**What opportunities for training and professional development has the program provided?**

As mentioned earlier, the major training and professional development activities provided to date are summer internship programs provided by three of the four participating institutions. The largest of the three, the *Transportation Student Summer Internship Program* (TSSIP) at Georgia Tech, matches interested and qualified students with a transportation-related organization in which they may work in a professional capacity under NCTSPM support. During summer 2012, fifteen students are participating at a variety of agencies in Georgia. These agencies are: Federal Transit Administration; Metropolitan Atlanta Rapid Transit Authority (MARTA); Atlanta Regional Commission; Georgia Department of Transportation; Georgia Regional Transportation Authority, and the Georgia State Road and Toll Authority. Similarly, the *University Transportation Center Internship* at Florida International University has placed three students in summer internships with the Florida Department of Transportation and the Miami-Dade County Department of Public Works. Additionally, the *UAB Transportation Internship Program* has placed seven students in summer internships working of the Alabama Department of Transportation, the Regional Planning Commission of Greater Birmingham and Birmingham-Jefferson

County Transportation Authority. Additional information on these twenty-five students and their assignments are given in the last section of this report.

### How have the results been disseminated?

Since in the earliest stages of development research results are limited, information dissemination during the initial funding period has largely focused in increasing awareness of the Center’s mission and capabilities. These outreach activities are essential if the results from the Center’s research are to reach the largest possible audience of practitioners as well as the academic community. To this end, a range of activities have been undertaken. These include continued website development, initiation of a newsletter and press releases. In addition, NCTSPM personnel have had extensive discussions with a wide variety of individuals and organizations with potential interest in the results from the Center’s research.

### What do you plan to do during the next reporting period to accomplish the goals?

There are no planned changes to the overall operating plan. Major activities include initiation of work on all funded research projects, rollout of the improved center website, finalization of any outstanding issues related to subcontracts and cost sharing commitments, development of improved web-based reporting functions and development of final plans for programs for workforce development and educational programs.

### Products

- Website (<http://utc.gatech.edu>)
- UTC Newsletter
- Transportation Student Summer Internship Program (11 participants)

### Participants and Other Collaborating Organizations

#### NCTPSM Participants at Georgia Institute of Technology

The following individuals from Georgia Tech have worked on the NCTSPM at the programmatic level.

Name	<i>Michael Hunter, Ph.D.</i>
Program/Project Role	<i>NCTSPM Director</i>
Number of hours worked during the reporting period	<i>Approximately 150 hrs.</i>
Contribution to Program/Project	<i>Responsible for oversight and governance of the National Center for Transportation Productivity and Management</i>
Funding Support	<i>UTC, GDOT</i>
Collaborated with individual in foreign	<i>N/A</i>

country	
Country(ies) of foreign collaborator	N/A
Travelled to foreign country	N/A
If traveled to foreign country(ies), duration of stay	N/A

Name	<i>Michael D. Meyer, Ph.D.</i>
Program/Project Role	<i>NCTSPM Center Director (Retired)</i>
Number of hours worked during the reporting period	<i>Approximately 200 hrs.</i>
Contribution to Program/Project	<i>Responsible for oversight and governance of the National Center for Transportation Productivity and Management until his retirement</i>
Funding Support	<i>UTC, GDOT</i>
Collaborated with individual in foreign country	N/A
Country(ies) of foreign collaborator	N/A
Travelled to foreign country	Not Related to UTC
If traveled to foreign country(ies), duration of stay	N/A

Name	<i>Catherine Ross, Ph.D.</i>
Program/Project Role	<i>NCTSPM Deputy Director for Policy, Education and Workforce Development</i>
Number of hours worked during the reporting period	<i>Approximately 100 hrs.</i>
Contribution to Program/Project	<i>Responsible for administrative oversight and faculty coordination; liaison to NCTSPM researchers.</i>
Funding Support	<i>UTC, GDOT</i>
Collaborated with individual in foreign country	N/A
Country(ies) of foreign collaborator	N/A
Travelled to foreign country	N/A
If traveled to foreign country(ies), duration of stay	N/A

Name	<i>Michael O. Rodgers, Ph.D.</i>
Program/Project Role	<i>NCTSPM Deputy Director for Research and Technology Transfer</i>
Number of hours worked during the reporting period	<i>Oversees subcontract reporting requirements and research products and is responsible for coordinating technology transfer activities of the center</i>
Contribution to Program/Project	<i>Approximately 60 hrs.</i>
Funding Support	<i>UTC, GDOT</i>
Collaborated with individual in foreign country	N/A
Country(ies) of foreign collaborator	N/A
Travelled to foreign country	N/A
If traveled to foreign country(ies), duration of stay	N/A

Name	<i>Randy Guensler, Ph.D.</i>
Program/Project Role	<i>Information Systems Management</i>
Number of hours worked during the reporting period	<i>Approximately 20 hrs.</i>
Contribution to Program/Project	<i>Oversees development and implementation of computer-based tools used in compiling information and reporting.</i>
Funding Support	<i>UTC, GT</i>
Collaborated with individual in foreign country	N/A
Country(ies) of foreign collaborator	N/A
Travelled to foreign country	N/A
If traveled to foreign country(ies), duration of stay	N/A

Name	<i>Mr. Kenneth Stewart</i>
Program/Project Role	<i>UTC Board Liaison</i>
Number of hours worked during the reporting period	<i>Approximately 20 hrs.</i>
Contribution to Program/Project	<i>Liaison between UTC management and Board of Advisors.</i>
Funding Support	<i>UTC, GT</i>

Collaborated with individual in foreign country	N/A
Country(ies) of foreign collaborator	N/A
Travelled to foreign country	N/A
If traveled to foreign country(ies), duration of stay	N/A

Name	<i>Ms. Amanda Hall</i>
Program/Project Role	<i>Executive Assistant to Dr. Ross</i>
Number of hours worked during the reporting period	<i>Approximately 80 hrs.</i>
Contribution to Program/Project	<i>Provided initial administrative management and assistance to Center.</i>
Funding Support	<i>UTC, CQGRD</i>
Collaborated with individual in foreign country	N/A
Country(ies) of foreign collaborator	N/A
Travelled to foreign country	N/A
If traveled to foreign country(ies), duration of stay	N/A

Name	<i>Ms. Kenya Wilson</i>
Program/Project Role	<i>UTC Administrative Coordinator</i>
Number of hours worked during the reporting period	<i>Approximately 250 hrs.</i>
Contribution to Program/Project	<i>Responsible for office management and administrative support of Center; provide research and assistance to Directors and UTC management; maintain website</i>
Funding Support	<i>UTC, CQGRD</i>
Collaborated with individual in foreign country	N/A
Country(ies) of foreign collaborator	N/A
Travelled to foreign country	N/A
If traveled to foreign country(ies), duration of stay	N/A

## NCTSPM University Partner Representatives

These individuals have served as liaisons between NCTSPM and their institutions to organize joint efforts related to research, education, technology transfer, and workforce development. These met with the NCTSPM Director and Deputy Director, via teleconference, in an initial kick-off meeting in order to establish governing parameters for the management and coordination of the center’s research and activities. They also coordinated submissions of proposals and cost sharing from their respective institutions and were members of the proposal selection committee. Subsequently, these individuals served to facilitate the subcontracting process within their institutions.

### University of Alabama, Birmingham

Fouad H. Fouad, Professor and Chair, Department of Civil Construction and Environmental Engineering  
 Email: [ffouad@uab.edu](mailto:ffouad@uab.edu)

Name	<i>Fouad H. Fouad, Ph.D.</i>
Program/Project Role	<i>NCTSPM Partner Representative/University of Alabama, Birmingham</i>
Number of hours worked during the reporting period	<i>Approximately 20 hrs.</i>
Contribution to Program/Project	<i>Liaison between UTC and the University of Alabama, Birmingham</i>
Funding Support	<i>UTC, ADOT, UAB</i>
Collaborated with individual in foreign country	N/A
Country(ies) of foreign collaborator	N/A
Travelled to foreign country	N/A
If traveled to foreign country(ies), duration of stay	N/A

### Florida International University

Dr. Albert Gan, Email: [gana@fiu.edu](mailto:gana@fiu.edu)

Name	<i>Albert Gan, Ph.D.</i>
Program/Project Role	<i>NCTSPM Partner Representative/Florida International University</i>
Number of hours worked during the reporting period	<i>Approximately 20 hrs.</i>
Contribution to Program/Project	<i>Liaison between UTC and Florida International University</i>
Funding Support	<i>UTC, FDOT, FIU</i>
Collaborated with individual in foreign country	N/A

Country(ies) of foreign collaborator	N/A
Travelled to foreign country	N/A
If traveled to foreign country(ies), duration of stay	N/A

**University of Central Florida**

Dr. Essam Radwan, Executive Director, Center for Advanced Transportation Systems Simulation  
 Email: [Ahmed.Radwan@ucf.edu](mailto:Ahmed.Radwan@ucf.edu)

Name	<i>Essam Radwan, Ph.D.</i>
Program/Project Role	<i>NCTSPM Partner Representative/University of Central Florida</i>
Number of hours worked during the reporting period	<i>Approximately 20 hrs</i>
Contribution to Program/Project	<i>Liaison between UTC and the University of Central Florida</i>
Funding Support	<i>UTC, FDOT, UCF</i>
Collaborated with individual in foreign country	N/A
Country(ies) of foreign collaborator	N/A
Travelled to foreign country	N/A
If traveled to foreign country(ies), duration of stay	N/A

## Advisory Board and Other Collaborators

### The following are members of the NCTSPM Advisory Board:

James Balloun	Financial Investor and Former CEO
Harold Barley	Executive Director, MetroPlan Orlando
Mark Bartlett	FHWA Division Administrator, Alabama
Jeffrey W. Brown	Alabama DOT Bureau Chief, Research and Development
Tom Cousins	Developer
Tread Davis	Lawyer & Board Member, Atlanta Regional Commission
Daniel L. Rodgers	President, Dunn Investment Company
Shirley Franklin	Former Mayor of Atlanta
Michelle Livingston	VP for Supply Chain Distribution, The Home Depot
Todd Long	GDOT Director of Planning
Bill Millar	Past President APTA
Wick Moorman	CEO, Norfolk Southern Railway
Dr. Bud Peterson	President, Georgia Tech, <i>Ex Officio</i>
Beverly Scott	General Manager, MARTA
George Overstreet	Executive Board of the Alabama Trucking Association, VP Operations
Randy Stashick	Global Vice President of Engineering for UPS
Bill Johnson	Port of Miami
Vidya Mysore	Florida DOT
Yvette Taylor	Regional Administrator, FTA

### Other Partnering Organizations:

Georgia Department of Transportation (GDOT)  
Florida Department of Transportation (FDOT)  
Alabama Department of Transportation (ADOT)

### Other Collaborators:

Morehead State University  
Saint Louis University  
Georgia State University  
Georgia Southern University  
Spelman College  
Southern Polytechnic State University

## Impact

### What is the impact on the development of the principal discipline(s) of the program?

The development of NCTSPM has significantly increased the level of collaboration between member institutions, especially in the area of joint research proposals. The proposal development process, even for projects not selected for funding has produced research

partnerships that are likely to be significant both in the immediate and longer term future. Likewise, the Center has had the impact of improving existing relationships between the Departments of Transportation in several southeastern states.

### **What is the impact on other disciplines?**

The relatively broad scope of the NCTSPM has had the impact of drawing well qualified researchers (e.g. in the area of Public Policy) in other disciplines with only limited exposure to transportation related projects to begin to apply their analytical methods toward transportation related concerns.

### **What is the impact on the development of transportation workforce development?**

The partner universities in NCTSPM individually have a strong record in training transportation professionals, especially in the area of minority and women graduates. The enhanced level of cooperation present between these institutions due to NCTSPM and its associated projects should significantly enhance this already strong record.

### **What is the impact on physical, institutional and information resources at the university or other partner institutions?**

Even in major research universities, the presence of a national research center has a significant ability to raise the visibility and level of interest in transportation related research. While difficult to quantify, the long-term implications for the ability of the university research community to produce the research results necessary to address the wide range of societal concerns regarding transportation is very positive.

### **What is the impact on technology transfer?**

The reconstituted university transportation centers program, of which NCTSPM is a part, has significantly increased the interest of state transportation officials in university transportation research. When combined with the significant investment in technology transfer proposed by NCTSPM, there should be a significant improvement in the ability to move research “out of the laboratory” and into professional practice.

### **What is the impact on society beyond science and technology?**

Both economic competitiveness and quality of life are strongly linked to the ability of the transportation system to provide mobility for both passengers and freight and minimum total societal cost (including both direct and indirect costs). Thus the emphasis of the NCTSPM on

transportation system performance and efficiency offers great promise for significant broader societal impacts.

## Changes/Problems

**Changes in approach and reasons for change:** *Nothing to Report*

**Actual or anticipated problems or delays and actions or plans to resolve them:** *On June 1, 2012, the Director of NCTSPM and the Georgia Transportation Institute (GTI) retired from Georgia Institute of Technology to pursue other opportunities. Dr. Michael Hunter, the former deputy director of GTI was nominated by Georgia Tech management as Dr. Meyer's replacement both as Director of NCTSPM and GTI. Both changes were approved by RITA/DOT and GDOT respectively.*

**Changes that have a significant impact on expenditures:** *Nothing to Report*

**Significant changes in use or care of human subjects, vertebrate animals and/or biohazards:** *Nothing to Report*

**Change of primary performance site location from that originally proposed:** *Nothing to Report*

## Special Reporting Requirements

### Specific Requirements

**Website:** Created and operational. Will be updated to reflect new information as it becomes available

**Directory of Key Personnel:** Information available on the program website. Will be updated to reflect recent personnel changes

**Financial and Annual Share Reports:** The SF425 requirements will be met by separate report.

**FFATA Subaward and Executive Compensation Report:** Will be met by separate submission

**Research Project Descriptions:** Available on program website. The projects selected and funded by the center are provided below.

## Projects Selected for Funding by NCTSPM

*Integrating Safety in Developing a Variable Speed Limit System*  
Dr. Mohamed Abdel-Aty  
University of Central Florida  
Collaborating with Georgia Institute of Technology

*Mobile Technology Usage amongst the Transit-Riding Populace*

Dr. Kari Edison Watkins

Civil and Environmental Engineering

Georgia Institute of Technology

Collaborating with Saint Louis University and St. Louis Metro

*Next-Generation Wireless Bridge Weigh-in-Motion (WIM) System Incorporated with Nondestructive Evaluation (NDE) Capability for Transportation Infrastructure Safety*

Dr. Yang Wang

Civil and Environmental Engineering

Georgia Institute of Technology

Collaborating with the University of Alabama in Birmingham

*Reducing Service Interruptions in Linear Infrastructure Systems (Transportation and Water/Sewer) by Synchronizing Schedules for Selected Maintenance Activities*

Dr. Berrin Tansel

Florida International University

Collaborating with Georgia Institute of Technology

*Development of a Prototype Evidence-Based Database and Planning Tool: Applying Performance Management Principles in Asset Management Program Development*

Dr. Adjo Amekudzi

Civil and Environmental Engineering

Georgia Institute of Technology

*Performance Measurements of Transportation Systems based on Fine-Grained Data Collected by AVI and AVL Systems*

Dr. Mohammed Hadi

Florida International University

Collaborating with the University of Central Florida and the City of Orlando

*Economic Development and Workforce Impacts of State DOT Highway Expenditures*

Dr. Danny Boston

School of Economics

Georgia Institute of Technology

Collaborating with Georgia Department of Transportation

*Freight Movement and Economic Competitiveness from the Megaregion Perspective*

Dr. Myungje Woo

Center for Quality Growth and Regional Development

Georgia Institute of Technology

Collaborating with ATRI and Georgia State University

*Full-Scale Wall of Wind Testing of Variable Message Signs (VMS) Structures to Develop Drag Coefficients for AASHTO Supports Specifications*

Dr. Arindam Chowdhury

Florida International University

Collaborating with the University of Alabama in Birmingham

*Information Services in Social Networked Transportation*

Dr. Hans Klein  
School of Public Policy  
Georgia Institute of Technology

*Traffic Management Centers: Challenges, Best Practices, and Future Plans*

Dr. Xia Jin  
Florida International University

*Digital Advertising Billboards and Driver Distraction*

Dr. Virginia Sisiopiku  
University of Alabama in Birmingham  
Collaborating with Florida International University

*Impact and Feasibility Study of Solutions for Doubling Heavy Vehicles*

Dr. Nasim Uddin  
University of Alabama in Birmingham  
Collaborating with Florida International University and the University of Central Florida

*Optimizing EMS Through The Use of Intelligent Transportation Systems (ITS) Technologies*

Dr. Andrew Sullivan  
University of Alabama in Birmingham  
Collaborating with Florida International University

*Efficient Utilization of the Existing Its System and the Viability of a Proactive Traffic Management System for the Orlando-Orange County Expressway Authority System*

Dr. Mohamed Abdel-Aty  
University of Central Florida  
Collaborating with the Orlando-Orange County Expressway Authority

*Factors Influencing Visual Search in Complex Driving Environments*

Dr. Michael Hunter  
Civil and Environmental Engineering  
Georgia Institute of Technology  
Collaborating with Morehead State University and the University of Central Florida

*Bringing Freight Components into Statewide and Regional Travel Demand Forecasting*

Dr. David Lee  
School of City and Regional Planning  
Georgia Institute of Technology  
Collaborating with the University of Alabama in Birmingham

## NCTSPM Student Summer Internship Programs

During summer 2012 there are twenty-five graduate students from four institutions participating in summer internships with transportation, transit and planning agencies across the southeast. Outcomes from these internships will be featured in upcoming NCTSPM newsletters and annual reports. The participants (where available) and their assignments are given below:

### **Georgia Institute of Technology**

Andrew Babb, Civil Engineering, Metropolitan Atlanta Rapid Transit Authority

Margaret Carragher, Civil Engineering, Metropolitan Atlanta Rapid Transit Authority

Matthew Crane, Civil Engineering, Georgia Department of Transportation

Alexanda Frackleton, Civil Engineering, Metropolitan Atlanta Rapid Transit Authority

Darren Harris, Civil Engineering, Metropolitan Atlanta Rapid Transit Authority

Arnold Huguet, Civil Engineering, Metropolitan Atlanta Rapid Transit Authority

Amy Ingles, Civil Engineering, Atlanta Regional Commission (MPO)

Brian Maddox, Civil Engineering, Federal Transit Authority

Jamie Montague, Civil Engineering, Georgia Regional Transportation Authority

Alex Poznanski, Civil Engineering, Metropolitan Atlanta Rapid Transit Authority

Denise Smith, Civil Engineering, Atlanta Regional Commission (MPO)

Amanda Wall, Civil Engineering, Metropolitan Atlanta Rapid Transit Authority

Richard Wilson, Civil Engineering, Georgia State Road and Toll Authority

### **University of Georgia**

Anna Shoji, Geography, Metropolitan Atlanta Rapid Transit Authority

### **Florida International University**

Eileen Cabrera, Transportation Engineering, Florida Dept. of Transportation (District 4)

Anita Pourji, Transportation Engineering, Miami-Dade County Dept. of Public Works

Elizabeth Muir, Transportation Engineering, Florida Dept. of Transportation (District 6)

## University of Alabama at Birmingham

Seven graduate students in Civil Engineering from UAB have been selected to participate in summer 2012 internships at one of the following locations:

- *Alabama Department of Transportation (3<sup>rd</sup> Division Office)*  
Students will assist with plan reviews, cost estimating, and field inspection of ALDOT construction projects.
- *The Regional Planning Commission of Greater Birmingham*  
Students will assist in the development of regional transportation planning models, collect and analyze transportation and demographic data, and assist in the preparation of the Transportation Improvement Program.
- *The Birmingham-Jefferson County Transportation Authority*  
Students will assist the Birmingham transit authority with ridership data collection and analysis, route assessments, and maintenance records.