

MINETA NATIONAL
TRANSIT RESEARCH CONSORTIUM
AND
MINETA TRANSPORTATION INSTITUTE

2011-2012 **Annual Report**



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About the **Mineta Transportation Institute and Mineta National Transit Research Consortium**

The Mineta Transportation Institute (MTI) was originally designated by Congress as a non-technical, policy research and education center in the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 and reaffirmed by the Institute's Board of Trustees after reauthorization in the Transportation Equity Act for the 21st Century (TEA-21) in 1998. MTI undertakes research, education, and information/technology transfer programs relative to the policy control and management of all surface transportation modes. Within those parameters, MTI produces studies of the best examples of surface transportation policy and management activities in the world, accumulates those into peer-reviewed publications, and communicates best practices to MTI's professors, students, and the nation's transportation leaders via national summits hosted by the world-class MTI trustees and through sophisticated, targeted media distributions. MTI won Tier I designations during the 2002 and 2006 competitions and was selected the lead institution for one of two transit consortia in the 2012 competition.

During the 1991 ISTEA, 1998 TEA-21 and 2005 SAFETEA-LU debates, Congress strongly expressed the desire to assure the international competitiveness of the nation's transportation systems. Because much larger motor vehicle fuel taxes are available in other industrialized countries, the US will not be able to outspend so must outsmart the competition. Therefore, MTI's objective is to identify through research, to teach through education, and to broadly disseminate through information/technology transfer programs the best transportation practices in use throughout the world. Prior to 2012, MTI's work encompassed all modes of surface transportation, including the interface among modes.

MTI is organized by function, with directors operating in each of three departments – Research (including the National Transportation Finance Center, the National Transportation Security Center of Excellence for both US DOT and DHS, and the National High-Speed Rail Connectivity Center), Education, and Communications and Information/Technology Transfer.

In January 2012, MTI was selected as lead institution for a nine-university transit consortium funded by the Federal Transit Administration via the Research and Innovative Technology Administration of the US DOT and tasked with “Delivering Solutions that Improve Public Transportation.” That new organization became the Mineta National Transit Research Consortium (MNTRC). The other eight partners include Bowling Green State University, Grand Valley State University, Howard University, Penn State University, Rutgers University, University of Detroit Mercy, University of Nevada Las Vegas, and University of Toledo.

MNTRC's goal is to expand and synergize each member university's unique abilities and expertise to respond as a group to national transit-related research needs. MNTRC conducts research to meet the US DOT strategic goals of safety, state of good repair, economic competitiveness, livable communities, and environmental sustainability.

Director's Summary

Executive Director Rod Diridon, Sr.

Background

The Mineta Transportation Institute (MTI), formally known as the Norman Y. Mineta International Institute for Surface Transportation Policy Studies, has grown significantly since designation in the Intermodal Surface Transportation Efficiency Act of 1991 as a policy research center attached to the College of Business at San José State University (SJSU). At that time, MTI was the only university transportation center in the nation not affiliated with a college of engineering. At the 1998 end of ISTEA, MTI had a total annual budget of \$500,000 and four research projects in process. A newly accredited Master of Science in Transportation Management (MSTM) and a graduate Certificate in Transportation Management (CTM) were offered but had only a handful of students.

In 1998, MTI was reauthorized to receive a four-year Transportation Equity Act for the 21st Century (TEA-21) grant for \$750,000 per year through the US Department of Transportation's Research and Special Programs Administration (RSPA). The California Legislature provided a matching grant through the California Department of Transportation (Caltrans). TEA-21 required that the 17 Group B and C University Transportation Centers (UTCs) compete, with ten to be selected to continue at \$1 million each per year for the final years of the authorization. After an extremely competitive application and interview process, in 2002 MTI was chosen one of the ten continuing Tier I Centers of Excellence. Caltrans matched the federal grant, confirming the state's long-standing commitment to MTI.

During this evolutionary period, MTI's 1991 ISTEA surface transportation policy and management legislative mandate was honored and became focused on three specialties: 1) safety, security and emergency response management, 2) finance, and 3) the interrelationships among transportation, land use, and the environment. These issues were emphasized after the Tier I program was reauthorized in 2005 and in MTI's 2006 SAFETEA-LU competition against 36 of the nation's top universities. MTI was proud to be chosen again as one of the country's ten Tier I UTCs.

MTI has become a preeminent resource, with over 35 projects in process, to the national transportation community on the three priority topics. Other policy issues are studied when requested during the annual MTI research needs assessments conducted each autumn with the US DOT Western Resource Center (especially the Federal Transit Administrations research liaisons), Caltrans, and the MTI Trustees. MTI education programs, with over 200 students attending classes, have been broadened beyond the MSTM to include professional Certificates in Transportation Management, in Transportation Security Management, and in High-Speed Rail Connectivity Management.

The current MTI structure is summarized in the organization diagram in Appendix B. It includes three departments, plus three more national research centers under the Research Department. The three basic departments are Research, Education, and Information/Technology Transfer. Besides general research under the Research Department, the following three national centers provide unique expertise: 1) MTI's National Transportation Security Center of Excellence (for both US DOT and DHS), 2) MTI's National Transportation Finance Center, and 3) MTI's National High-Speed Rail Connectivity Center. Each of those functions are summarized in the following paragraphs and described in detail in the body of the report. To be consistent with previous annual reports, performance trends are reported since MTI was fully funded in 1999 by TEA-21.

Consortium and Tiered Program Evolution

In 2009, the newly created US DOT Research and Innovative Technology Administration (RITA) reorganized the prior RSPA UTC program around a consortium concept and replaced the prior four-tier system with 22 equally-funded consortia (\$3.5 million federal with a 100 percent match annually). The resulting competition invited any of the nation's accredited universities to compete individually or as part of a consortium. Over 200 universities competed in over 50 consortia. MTI was chosen in early 2012 as the lead institution of a nine-university group designated as one of the two transit consortia among the 22 selected winners. The resulting Mineta National Transit Research Consortium (MNTRC) includes, from east to west, Rutgers, Howard, Penn State, Toledo, Bowling Green, Detroit Mercy, Grand Valley, Nevada Las Vegas, and San José State University, home of the lead institute, MTI. Each will be highlighted in this first MNTRC annual report.

Two calendar years of funding (2012 and 2013) under the RITA consortium program have been guaranteed. Those funds are eligible to be expended through 2015, during which time Congress has authorized, in MAP-21, the replacement of the consortium program with a three-tiered, 35-UTC program. The three competitions to begin that program will occur in early 2013, with an October 1, 2013 MAP-21 tiered UTC program commencement deadline. The consortium and tiered programs will operate in parallel until the consortium program accounts are closed by January 31, 2016.

What This Report Covers

MNTRC has concluded the first year of consortium operation, supported by funding retroactive to January 1, 2012, with a remarkable level of research, education, and information sharing programs in process among the nine universities. The last annual report by MTI, under the prior Tier I program, covered the fiscal year ending on June 30, 2011. Therefore, MNTRC's first-year work-in-progress, as well as the conclusion of MTI's six-year SAFETEA-LU Tier I contract performance (especially the period from July 1, 2011 to June 30, 2012), are the subject of this annual report.

RESEARCH DEPARTMENT

Deputy Executive Director and Research Director Karen Philbrick, PhD

Since 1999, MTI has published 136 expertly-conducted, peer-reviewed policy research projects. MNTRC currently has 36 more under contract and in process, of which 18 are being conducted by MTI research associates. During the past fiscal period from July 2011 (the date of the last MTI annual report) to June 2012, research supported by the SAFETEA-LU and Caltrans grants engaged 70 of MTI's 253 certified Research and Consulting Associates, most of whom are PhDs, as well as 46 Student Research Assistants. Significant research and information transfer efforts (local and regional forums, national symposia or summits, etc.), often sponsored with the Board of Trustees using non-grant funds, have also been completed. Research topics are selected annually through a carefully structured needs assessment process involving designated US DOT and Caltrans committees, the internationally prominent MNTRC/MTI Board of Trustees, and other national transportation leaders. The projects and research teams are chosen annually after a structured bidding and selection process. Final project selection is made by the MTI Research Associate Policy Oversight Committee (RAPOC), which is made up of the seven chairs, or their designees, of the interdisciplinary academic departments at SJSU that are associated with MNTRC/MTI. The summary of activities for the three sub-centers in the Research Department follows.

MTI's NATIONAL TRANSPORTATION SAFETY AND SECURITY CENTER (NTSSC)

Director Brian Michael Jenkins and Deputy Director Frances Edwards, PhD

MTI's National Transportation Safety and Security Center (NTSSC) analyzes how threats to surface transportation affect safety and security policy and countermeasures. This includes 18 completed and ongoing detailed case studies of major terrorist attacks and tactics, along with updates to MTI's chronology of terrorist attacks and other serious crimes against surface transportation. Additionally, the Center conducts research into best practices in transportation emergency preparedness, training, and management. This includes natural disasters, operational emergencies, accidents, and the like.

The Center's Director and Deputy Director have made several presentations to state and national transportation leaders and policy makers this year, including to the Department of Homeland Security (DHS), the Federal Transit Administration (FTA), the Counter Improvised Explosive Device Working Group, and at Transportation Research Board meetings.

Mr. Jenkins has briefed Congressman Peter King, chairman of the House Homeland Security Committee, the staffs of the House and Senate Homeland Security Committees, the House Armed Services Committee, the Canadian Senate, the Senate Homeland Security and Governmental Affairs Committee, the NATO ambassadors, and many more. He also has met with numerous other government officials regarding transportation security, delivered presentations at many leading transportation-focused conferences such as APTA Rail, and is a security adviser to several heads of state around the globe. Most recently, his research was cited extensively in the GAO report on Passenger Rail Security, *Consistent Incident Reporting and Analysis Needed to Achieve Program Objectives*.

Mr. Jenkins is a chief contributor to MTI's proprietary database on terrorist attacks on surface transportation, which goes back nearly a century to document specific details that can be leveraged for security planning, training, and response.

Dr. Frances Edwards, NTSSC Deputy Director, and Research Associate Dan Goodrich completed the Continuity of Operations/Continuity of Government (COOP/COG) Handbook for State Transportation Organizations, Report II-02, and received a DHS grant to deliver a pilot of the COOP/COG Emergency Response Group (ERG) training for FEMA Region I transportation agencies, including the US Coast Guard. This presentation led to an invitation from DHS to present a poster session on Report II-02 and its training support sections for the DHS Resiliency Conference in Boston. Amtrak invited Dr. Edwards and Mr. Goodrich to deliver a COOP/COG ERG training session for its Northeast Corridor emergency planning committee, which also oversees emergency management for the high-speed Acela.

During the reporting period, Dr. Edwards also delivered presentations and poster sessions at the American Society for Public Administration, FEMA Higher Education Conference, University of Central Florida, the California State University Chancellor's Committee on Emergency Management and Homeland Security, the San José State University College of Social Sciences, and to the leadership students from Jinan, China, and the San José Housing Coalition. She was part of the planning committee and served as moderator for the US Department of Transportation's and Chinese Ministry of Transportation's Disaster Assistance Working Group meeting at the Mineta Transportation Institute. She was interviewed on the Loma Prieta Earthquake anniversary by radio stations in San José and San Francisco.

Dr. Edwards and Mr. Goodrich wrote *Introduction to Transportation Security*, published by CRC Press, the first comprehensive textbook in the field, with a foreword by Secretary Norman Y. Mineta. They also wrote chapters on state and local mitigation efforts for an edited volume on mitigation for CRC Press out of the University of New Orleans.

Dr. Edwards also wrote chapters on cultural competency in emergency management for ME Sharpe of Hamline University, and on the new FEMA “whole community” approach for Taylor and Francis/Routledge out of the University of Central Florida. She was also a partner in MTI Project 290I led by Dr. Anurag Pande that examined disaster traffic management systems.

Dr. Edwards and Mr. Goodrich are currently researching emergency exercises for transportation organizations.

Dr. Edwards is also a member of the Transportation Research Board Critical Infrastructure Protection Committee ABE 40 and research project NCHRP 20-05/Topic 44-12 oversight committee.

MTI's NATIONAL TRANSPORTATION FINANCE CENTER (NTFC)

Director Asha Weinstein Agrawal, PhD

Transportation finance plays a significant role in transportation policy-making. Therefore, at the direction of the Board of Trustees, MTI established the NTFC in 2007. The objectives are to conduct and present surface transportation finance research to policy makers. The NTFC also educates decision makers, planners, and the public about current transportation finance debates and opportunities. MTI is especially interested in “smart” finance options, or ways to generate necessary transportation revenues while promoting environmentally sustainable transportation systems, congestion management, and social equity.

In the past year, MTI has published five new finance reports and has an additional three underway. In addition, the Center’s researchers have made ten presentations of MTI finance studies. The Center’s Director, Dr. Asha Weinstein Agrawal, presented her MTI-sponsored finance research at four academic conferences, and four other researchers – Dr. Zhan Guo, Dr. EB Lee, Dr. Shishir Mathur, and Dr. Jae-Ho Pyeon – have also made public presentations of MTI finance studies.

In June, MTI’s NTFC hosted a public forum entitled “Financing Infrastructure for America: Are we Becoming a Second Class Country?” co-sponsored by the Commonwealth Club of California in San Francisco. This event featured a keynote address by former US Deputy Secretary of Transportation Mortimer Downey and included a nationally prominent panel of: San Francisco Area MTC Executive Director Steve Heminger, AASHTO Executive Director John Horsley, former Caltrans Director and OCTA General Manager Will Kempton, and MTI NTFC Director Dr. Asha Weinstein Agrawal. This followed a similar 2011 national summit with a panel of experts at the Commonwealth Club keynoted by US DOT Under Secretary Polly Trottenberg, who was then the Assistant US Secretary for Transportation Policy. These Commonwealth Club sessions were presented to more than 200 attendees and broadcast on the Commonwealth Club’s 230 national radio station affiliates. Another is scheduled for June 21, 2013 on a transportation finance-related subject. During the panel discussions, Dr. Agrawal updates the trends obtained from three prior MTI NTFC annual heavy-sample national surveys on what types of taxes or fees voters would support to fund transportation infrastructure.

MTI's NATIONAL HIGH-SPEED RAIL CONNECTIVITY CENTER (NHSRCC)

Director Stan Feinsod

In 2008, California voters approved \$9.95 billion in high-speed rail bonds in Proposition 1A. Then \$10.1 billion were appropriated in the national American Recovery and Reinvestment Act (ARRA), followed by more recent appropriations, and with more funding pending. Hence, the prospect for the US to join all of the other industrialized nations with a high-speed rail network became real. President Obama's determination, and that of the past four California governors (two Republicans and two Democrats), to create high-speed rail networks reinforced that priority. MTI began studying high-speed rail, especially the needed station area connectivity systems, in 1996, completing 32 peer-reviewed studies that indirectly relate and 11 studies that directly relate. Most of those studies stress the need for seamless connectivity to local transit feeder systems.

NHSRCC Director Feinsod guides a top team of MTI research associates accomplishing state-of-the-art studies on the policy and management aspects of high-speed rail connectivity. The objective is to identify and promote the station-area feeder programs that encourage the development, operation, and maintenance of the 13 national high-speed rail corridors designated by congress and the Secretary of Transportation.

As a foundation for that process, MTI conducted a detailed US High-Speed Rail Workforce Needs Assessment requested by the California High-Speed Rail Authority (CHSRA) Board and in cooperation with the Federal Railroad Administration. That data provided the 2011 California State University System-led multi-jurisdictional task force the foundation upon which to design the education and training programs to meet the workforce needs. The task force, supported by MTI, is led by the CSUs Chancellor's office and includes delegates from the University of California and California Community College systems, organized labor's apprenticeship training programs, and the K through 12th grade programs via the State Superintendent of Schools. The program, in various forms, is under consideration by the CHSRA and has been presented at numerous statewide and national conferences. The *California High-Speed Rail Workforce Needs Assessment* has been presented at the annual TRB conference and was chosen to be published by TRB.

Several additional high-speed rail connectivity studies are in process and will be elaborated upon in the related section of this report.

MTI's EDUCATION DEPARTMENT

Director Peter Haas, PhD

More than 180 California State University accredited Master of Science in Transportation Management (MSTM) degrees have been granted since 1999, and 14 were conferred this academic year. Fifteen professional Certificates in Transportation Management or in Transportation Security Management, requiring completion of 12 core units from the MSTM program, were conferred during the same academic year. Currently, more than 50 active students are enrolled in the MTI MSTM and Certificate programs at SJSU. Those students receive instruction up to four nights a week via the 24-site Caltrans statewide videoconference network. In addition, Caltrans and MTI have provided satellite feeds to outside agencies such as Orange County Transit Authority (OCTA), Los Angeles County Metropolitan Transportation Authority (LA Metro), the Transportation Agency for Monterey County (TAMC), and the Contra Costa Transportation Authority (CCTA).

To support this unique instructional capacity, Caltrans installed a state-of-the-art videoconference origination site for MTI, which is periodically upgraded. Students and faculty complement synchronous learning with Desire2Learn, an online courseware application, as well as video streaming of archived classes.

The MSTM and Certificate programs, specifically granted to MTI by the California State University Board of Trustees, are supplemented by the related traditional SJSU undergraduate and graduate programs relating to transportation policy and management in business, engineering, political science, public administration, and urban planning. A significant number of students from those programs pursue transportation careers, and many of the professors provide transportation policy research through MTI. Consequently, MTI provides recruitment and instructional assistance to selected aspects of those traditional programs.

The MTI Alumni Association, including current students as well as prior MSTM and Certificate recipients, meets to set the vision, values, and goals for the future of the Association annually at a meeting conducted before the annual graduation banquet. This association assists MTI in tracking graduates, and provides social networking applications to enhance opportunities for peer support and networking.

COMMUNICATIONS AND INFORMATION/TECHNOLOGY TRANSFER DEPARTMENT

Director Donna Maurillo

To promote information/technology transfer, MTI has conducted and/or published the proceedings of 39 national summits and 27 regional or statewide forums since 1999. During the past 18 months, MNTRC/MTI Research Associates and staff have testified before legislative committees, given hundreds of speeches and panel presentations on transportation issues throughout the world, and conducted over 150 media interviews related to MNTRC/MTI research. Those outreach successes will be summarized in this report.

In addition, MNTRC/MTI newsletter, *World in Motion*, was published five times in the last 18 months. This newsletter is distributed, by direct mail and electronically, to nearly three thousand national transportation leaders and other interested parties, and is also posted on the MNTRC and MTI web sites. The Institute embraced social media, with an active presence on Facebook and two sites on LinkedIn – one for MNTRC/MTI supporters, and another for MSTM alumni. MTI also launched a Twitter account, @MinetaTrans, and a presence on Google+. The Institute continues to engage more sophisticated search engine optimization (SEO) techniques to guide users to the research reports on the MNTRC/MTI web sites and to continue to attract and educate a new generation of transportation leaders.

The proof of success is in the ever expanding use of TransWeb, the MTI web site, which was upgraded in 2007-08. Prior to the upgrade, TransWeb averaged about 150,000 hits/uses and 5,000 downloaded documents per month. Following the upgrade, TransWeb averaged 226,150 hits/uses and 36,438 downloaded documents per month during the 2009-10 fiscal year. As the aggressive outreach effort proceeded, especially the expanded use of social media, the 2012 calendar year saw those average numbers increase substantially to 460,530 hits/uses and more than 210,900 downloaded documents per month. MNTRC also established a web site in March 2012, transweb.sjsu.edu/mntrc, which will be in-filled with relevant news and research documents as the Consortium progresses.

Finally, MTI continues to advise in the development of several of the new consortia and to assist the MNTRC members. The MNTRC/MTI Executive Director and the Department Directors continue to attend national UTC-related meetings, assist in pursuing more UTC support for the US DOT modal administrations, and provide other related service as requested by the FTA research liaison, the Governor of California, and the MNTRC/MTI Board of Trustees. Over the years, the MNTRC/MTI Executive Director also served as a member or chair of several national transportation organizations, including president of the national Council of University Transportation Centers.

SUPPORT STAFF

MNTRC/MTI has a creative, stable, and congenial staff working hard to meet the country's transportation needs. The professional staff continued without turnover during the past several years. Ten-year veterans Education Director Dr. Peter Haas and Education Program Manager Vivianne Ferea remain in their longtime positions – providing oversight for MTI's graduate and certificate programs. Donna Maurillo is in her sixth year as Director of Communications and Information/Technology Transfer, managing outreach activities, including online presence, media, summits, and other events.

Deputy Executive Director and Research Director Dr. Karen Philbrick began her fourth year, managing MTI's growing list of research projects and teams and has assumed the responsibility of managing the efforts of the eight other MNTRC centers. Internationally-noted counterterrorism expert Brian Michael Jenkins, MTI's NTSSC Director since 1996, continues to work with Deputy Director Dr. Frances Edwards, providing expertise in transportation emergency management for over a decade. MTI's NTFC Director Dr. Asha Weinstein Agrawal has managed an expanding program for over five years. Each of the sub-center directors are part-time.



In her fifth year, Jill Carter is essential as MTI's Executive Administrative Assistant with excellent QuickBooks, office administration, and logistical skills, supported by fifth-year half-time Assistant Office Manager Lynda Ramirez Jones, with strong public policy experience. Half-time Web Administrator Frances Cherman is in her third year and is improving the performance of the Institute's web site. An evolving team of talented part-time San José State University students provide support while skills are acquired. During the last 18 months, those students have included Vince Alindogan, JP Flores, Donghoh Han, Joey Mercado, and Sahil Rahimi. Mistery Alindogan and Flores have progressed into successful careers, as have dozens before them, following the MTI work experience.

Research Associate (RA) recruitment, concentrating on only the finest PhD-level talent, continues with certifications by MTI's SJSU RAPOC. That certification is required before RAs are allowed to propose on MTI projects. Note that, although some of the RAs are not located at SJSU, every MTI research team must have at least one SJSU RA and one student assistant to bring the research knowledge back to the university.

CONCLUSION

During the final year of the TEA-21 authorization, MTI reduced activity levels to retain liquidity during that uncertain time. With SAFETEA-LU enacted and the Tier I competition successfully completed, MTI began operating at full capacity. Now, with the SAFETEA-LU Tier I program concluding and the new consortia in process, MTI and MNTRC are operating at a level beyond any previously experienced or expected. That level of vigor will be retained for the remainder of the consortium contract period and into the coming new MAP-21 tiered competition. As will be seen in the following detailed report, each of the MNTRC and MTI strategic performance measures are being exceeded, some by multiples beyond the goals. Indeed, as the RITA consortium competition was welcomed by MTI, so is MTI now looking forward with enthusiasm to the coming MAP-21 tiered competition.

The MNTRC/MTI staff enjoys this extraordinary opportunity to identify, teach, and share with the nation the world's best surface transportation policy and management practices. Indeed, the US transportation community, with the help of US DOT's University Transportation Centers' program, will outsmart the international competition and succeed in promoting sustainable transportation while prevailing in the global geo-economic competition of the 21st century.



Rod Diridon, Sr.
Executive Director



ADMINISTRATION

AND STAFF





Rod Diridon, Sr.

MTI/MNTRC Executive Director

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MTI Executive Director Diridon is considered the father of modern transit in California's Silicon Valley. His political career began in 1971 on the Saratoga City Council. He retired, because of term limits, in 1994 after five terms and six times as chair of both the Santa Clara County Board of Supervisors and Transit Agency Board. He is the only person to chair the nine-county, 119-city, 27-transit-district San Francisco Bay Area's three regional governments: Metropolitan Transportation Commission, Bay Area Air Quality Management District, and Association of Bay Area Governments.

Mr. Diridon chaired more than 100 international, national, state, and local activities, most regarding transportation and the environment. He is chair emeritus and former governors' (Davis and Schwarzenegger) appointee to the California High-Speed Rail Authority Board and a founding chair of the American Public Transportation Association's High-Speed and Intercity Rail Committee. He chaired the American Public Transit Association in Washington DC in 1994, was vice chair for the Americas of the International Transit Association (UITP) in Brussels for a decade, and continues as a director of both.

Mr. Diridon chaired the National Association of Counties' Transit and Railroads Committee for 18 years, advised the Federal Transit Administration, and chaired the Transportation Research Board's Transit Cooperative Research Program.

In 2007-08 Mr. Diridon chaired the national Council of University Transportation Centers Board. He also serves on the corporate advisory board of Wells Fargo Bank and the corporate board of Empire Broadcasting Company. From 1969 to 1976, he served as founder and president of the Decision Research Institute, which developed a "shared survey" research procedure adopted by UNICEF. He frequently provides testimony to Congress and speaks throughout the world on sustainable transportation. Mr. Diridon earned an accounting BS and an MSBA with a statistics emphasis at San José State University, served two combat tours as a US Navy officer in Vietnam, has been listed in *Who's Who in America* since 1974, and was recently cited by *International Metro Magazine* as one of the 50 who most influenced mass transit in North America in the past century. He received top awards from the American Public Transportation Association, the US High-Speed Rail Association, and others. San José's main railroad station was rededicated the "San José Diridon Station" upon his 1994 retirement from elected office.

Directors

More detailed profiles of the following directors (in alphabetical order) are listed with the respective sections of this annual report.



Asha Weinstein Agrawal, PhD

MTI Director, NTFC

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Dr. Agrawal is Director of the MTI National Transportation Finance Center (NTFC) at San José State University. She is also an Associate Professor and Chair of the Urban and Regional Planning Department at San José State University. Dr. Agrawal's PhD in Urban and Regional Planning is from UC Berkeley.



Frances Edwards, PhD

MTI Deputy Director, NTSCOE

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Dr. Edwards is Deputy Director of MTI's National Transportation Security Center of Excellence (NTSCOE), and is a research associate. She is also a Professor and Director of the Master of Public Administration School at San José State University.



Stan Feinsod

MTI Director, HSRCC

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Mr. Feinsod is Director of MTI's High-Speed Rail Connectivity Center (HSRCC) and an instructor for MTI's Master of Science in Transportation Management program. He contributes more than 25 years of experience in rail operations and project development, and he co-chairs the APTA High-Speed Rail/Commuter Rail Joint Legislative Committee.



Peter Haas, PhD

MNTRC/MTI Director of Education

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A Fulbright Scholar and member of the faculty in MTI's Graduate Transportation Management Program (GTMP) since 1999, Dr. Haas was appointed Education Director in 2001. He manages all facets of the Master of Science in Transportation Management and related certificates programs.



Brian Michael Jenkins

MTI Director, NTSCOE

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Mr. Jenkins was appointed in 1996 to lead MTI's National Transportation Security Center, which was elevated to a Center of Excellence (NTSCOE) by DHS in 2008. Mr. Jenkins and Dr. Edwards continue to guide NTSCOE research on all aspects of safety and the planning for and recovery from major emergencies. As a leading authority on terrorism and sophisticated crime, he is a policy adviser to government agencies, international organizations and multinational corporations and frequently provides legislative testimony.



Donna Maurillo

MNTRC/MTI Director of Communications and Information/Technology Transfer

Donna.Maurillo@sjsu.edu

Ms. Maurillo joined MTI in 2007, managing information/technology transfer (ITT), such as summits/symposia, forums, and public meetings. She also directs all communications such as the MTI web site, social media, annual report, media relations, and other public outreach, and she manages Memoranda of Cooperation (MOC). She earned her Master of Science in Transportation Management through MTI.

**Karen Philbrick, PhD**

MNTRC/MTI Deputy Executive Director and Director of Research

Karen.Philbrick@sjsu.edu

In June 2011, Mr. Diridon, with the consent of the MTI Board of Trustees, promoted Dr. Philbrick to the position of Deputy Executive Director while she simultaneously serves as the Director of Research for both MTI and MNTRC. Prior to joining the MTI team in 2009, Dr. Philbrick was Assistant Director of the University of Denver's UTC and has over ten years of academic research administration experience. She had been extensively involved in studies investigating fatigue management planning and best practices in responding to critical incidents in the transportation industry.

Support Staff

**Jill Carter**

MNTRC/MTI Executive Administrative Assistant

Jill.Carter@sjsu.edu

Ms. Carter applies her extensive business skills to MTI office management, where she also oversees the student staff and financial records. Ms. Carter also provides logistical support to the Directors. Previously, Ms. Carter provided bookkeeping and administrative support in a local business, the Campbell School District, and Bank of America. Ms. Carter's collegiate studies were at San José State University.

**Frances Cherman**

MNTRC/MTI Web Administrator

Frances.Cherman@sjsu.edu

Ms. Cherman joined MTI in July 2010, taking responsibility for the Institute's web site performance. She has been a longtime business consultant specializing in copywriting for direct marketing, sales collateral, and web site content. Her clients have included some of Silicon Valley's best companies, such as Apple, Intuit, Symantec, Netflix, HP, Wells Fargo, IDG Worldwide, Autodesk, and many others. Ms. Cherman earned her BA, with honors, in English from California State University Northridge.

**Viviann Ferea**

MTI Education Program Assistant

Viviann.Ferea@sjsu.edu

Ms. Ferea was appointed to the position of Education Program Assistant in August 2000. In this role, Ms. Ferea is the primary contact for the Graduate Transportation Management Program's marketing and administration. She holds many responsibilities, including continued recruitment and administration for the certificate and master's programs, maintenance and revision of the MTI web site's Education section, and planning and scheduling courses. Ms. Ferea received her BS in business marketing from the University of California Davis. Her studies in public relations and her experience in media sales are assets that help her promote the program's continued growth and success.

**Lynda Ramirez Jones**

MTI Assistant Office Manager

Lynda.RamirezJones@sjsu.edu

Ms. Ramirez Jones administers requisitions, contracts, and other operational documents. Previously, she was a management analyst and executive assistant with the Santa Clara Valley Water District board of directors, where she served for 17 years. She has also been a job training supervisor, a home/school consultant with the Migrant Education Program in Medford OR, and a legislative aide to a California State Assembly Member. Her education includes paralegal and business management courses at Santa Clara University and West Valley College.

Student Assistants



Vincent Alindogan

Graphic Designer (until late 2011)

Earned his degree in graphic design with a minor in photography. Vince was also vice president of the BFA Graphic Design Program.



JP Flores

Graphic Designer (until late 2011)

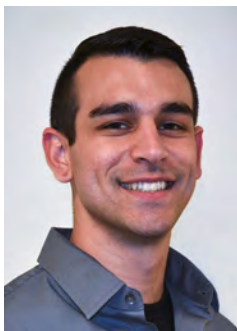
Earned his BA in graphic design from San José State University. JP enjoys making videos about his passion for bicycles.



Donghoh Han

Graphic Designer

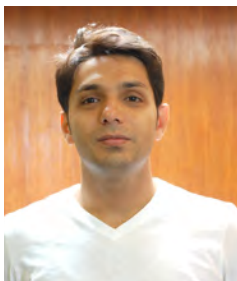
Working on his degree in graphic design at San José State University. This annual report has been designed by Mr. Han.



Joey Mercado

Research Support Assistant

Majoring in psychology with plans to earn a Master's Degree in industrial/organizational psychology. He is exceptionally proficient in baseball, basketball, football and handball.



Sahil Rahimi

Publications Assistant

Majoring in aerospace engineering. Sahil also loves music and poetry.

Management

Institute activities are overseen by a prestigious, hands-on board (see inside back cover) that meets twice a year to provide policy guidance. MNTRC/MTI's Board of Trustees winter meeting was held on January 21, 2012 in Washington DC. Afterward, an MTI graduate student was part of a group honored by the Council of University Transportation Centers (CUTC) at an awards banquet, which the trustees attended.

The Board's summer meeting was held on June 23, 2012 and was followed that evening by the 20th Annual MTI Board of Trustees Scholarship Awards Banquet and the graduation of this year's Master of Science in Transportation Management (MSTM) class. Commencement addresses, during the recent past, were delivered by US Secretary of Transportation (ret.) Norman Y. Mineta, US Assistant Secretary of Transportation Polly Trottenberg, US Deputy Secretary of Transportation (ret.) Mortimer Downey, Caltrans Director Malcolm Dougherty, and others. The banquet raises scholarship funds for MTI's MSTM and professional certificate students.

Facilities

Mineta Transportation Institute facilities are provided by and are part of the San José State University Research Foundation, which supports San José State University (SJSU), the oldest and among the largest of the 23 California State University campuses. The downtown San José campus is at the heart of Silicon Valley. The three sub-center directors maintain offices outside of the MTI facilities. The other eight MNTRC partner centers maintain facilities at their own respective universities.

Financial Controls

MNTRC/MTI uses a QuickBooks accounting system to provide real-time, project-based budget and expenditure information. MTI relies on this system to track expenditures in detail and to supplement the grant-based monthly accounting statements of the SJSU Research Foundation, which provides state and federal fiscal reports and annual audits.

Partnerships

CALIFORNIA UNIVERSITY TRANSPORTATION CENTERS (CAL UTC)

In 1999, encouraged by MTI's executive director, Caltrans created the Cal UTC group consisting of the directors of the California UTCs and Caltrans staff. The group met three times a year and was hosted by each of the centers on a rotating basis, by Caltrans in Sacramento, or by telephone. Its objective was to avoid redundancy and to share the best research and education practices. That process will begin again upon completion of the MAP-21 competition.

COUNCIL OF UNIVERSITY TRANSPORTATION CENTERS (CUTC)

After serving as vice chair in 2006, MTI Executive Director Diridon was elected chair of CUTC at the June 2007 meeting. For a number of years, Mr. Diridon has been working with CUTC leadership to increase the coordination between UTCs and state DOTs. CUTC is also working with RITA on a number of cooperative ventures, including and especially workforce development issues.

JOINTLY SPONSORED SYMPOSIA, FORUMS, AND PROJECTS

During the past several years, MTI (and more recently, MNTRC) has co-sponsored or is in the process of co-sponsoring projects with organizations including AAR, AASHTO, APTA, ARTBA, Bay Area Rapid Transit District, California Business Roundtable, California State Automobile Association, Caltrans, City of San José CA, Commonwealth Club of California, DHS/TSA, FHWA, FTA, FRA, INIST, San Francisco Bay Area MTC, Silicon Valley Leadership Group, Transit Cooperative Research Program of TRB, Transportation Trades Department of AFL/CIO, and others. These partnerships generate attendance and/or financial support for MNTRC/MTI programs, and deliver substantial outreach and media attention for MNTRC, MTI and the UTCs. More importantly, these events allow the transfer of research results to public users.

INTERNATIONAL INVOLVEMENT

With the encouragement of the Secretary of the US DOT and the FTA Administrator, MTI has consummated formal Memoranda of Cooperation with the China Academy of Transportation Sciences, the Fundacion Caminos de Hierro in Cordoba, Spain, and the Maharashtra (Mumbai) Regional Transit Institute. Agreements will be signed soon with the Swedish Royal Academy of Sciences and Pisa University in Italy. Each relationship promotes the sharing of best practices. Expenses are covered by the institution sending the students or researchers to the other. No UTC funds are devoted to this endeavor. While MTI has arranged several Chinese, Indian, and Swedish experiential tours, the expenses were covered by the visitors.

COMMUNITY INVOLVEMENT

MTI Executive Director Diridon is a recognized transportation expert with extensive contacts on the local, national, and international levels. For example, Mr. Diridon is past vice chair of the International Transit Association (UITP) in Brussels, chair emeritus of the California High-Speed Rail Authority, current chair of the US High-Speed Rail Association, past president of the large San José Rotary Club, and a member of several other boards and committees.

Deputy Executive Director and Research Director Dr. Philbrick is also engaged in community service through the San José Rotary Club. In addition, Dr. Philbrick is involved in several national committees and was recently appointed by Secretary of Transportation Ray LaHood to the US Department of Transportation's Transit Rail Advisory Committee for Safety (TRACS) for a 2-year term. This committee advises the Federal Transit Administration on transit safety issues. She also served as a reviewer for TRB's Research on Fatigue in Transit Operations conference proceedings and continues to serve as a US delegate to the Asia Pacific Economic Cooperation (APEC).

Education Director Dr. Haas, a Fulbright Scholar, is frequently asked to provide expert testimony on both education and transportation topics. He also oversees the Summer Transportation Institute, a program to engage high school students with transportation careers. Dr. Haas co-chairs the CUTC Awards Committee.

ITT and Communications Director Maurillo is actively engaged in community service as a longtime Rotarian (including her club's Rotarian of the Year and president-elect), has served on or presided over a number of non-profit boards,

and directed a \$6 million capital campaign for a new art and history museum. She also serves on the CUTC Workforce Development Committee.

Assistant Office Manager Ramirez Jones is engaged in many local political activities, including as a board member on the Santa Clara County Commission for the Status of Women.

These community activities, and many others, are encouraged by SJSU and the MTI Board of Trustees with the understanding that MTI responsibilities come first and that no MTI funding is used to discharge these duties. MTI and the national UTC programs are always mentioned during staff presentations. The benefit conferred to the community is obvious, but these efforts also promote a support network for MTI and the UTC program that is valuable for program effectiveness, development of jointly-sponsored projects, general outreach, and scholarship support for MTI's graduate students.

The Future

While continuing to focus on mass transportation policy research and education programs, MTI is expanding rapidly with a more vigorous National Transportation Safety and Security Center of Excellence (now only partially funded by the Department of Homeland Security), a more mature National Transportation Finance Center, and an emerging National High-Speed Rail Connectivity Center. A recent focus on the first- and last-mile issue have led to several highly regarded studies of bicycle sharing and the integration of bicycles and transit use. These strategically important areas of policy research will be integrated programmatically with the general US DOT/UTC "Livable Communities" strategic plan goals. That integration is well advanced and will become even more imperative as the consortium program is terminated in 2015 and the new MAP-21 tiered program is instituted. MTI will also continue to deliver an excellent graduate education program as a foundation for the California Department of Transportation executive development program and in support of other surface transportation management needs throughout California and the nation.

The MTI trustees and staff enthusiastically support the new MAP-21 tiered competition. MTI was pleased to be selected as the lead institution for a nine-university consortium as one of the two transit consortia and will now compete for a Tier I center leading a smaller, focused four-university consortium. The emphasis will continue to be on multi-modal transportation that promotes livable communities. This focus will retain a strong interest in transit and sustainability while embracing any research challenge referred to the consortium by US DOT and the California Department of Transportation.

Having succeeded in the 2002 and 2006 Tier I competitions and the 2012 Consortium competition, MTI is confident while preparing very carefully to exceed the criteria in the MAP-21 request for proposal. The MTI trustees, professors, research associates, students, and staff look forward to assisting the nation in creating a sustainable transportation system that will continue to succeed in the geo-economic competition of the 21st century.

MNTRC Partner Directors

The Mineta National Transit Research Consortium (MNTRC) includes nine partner university transportation centers and their respective directors. Those directors are listed here in alphabetical order.



Leo Hanifin, PhD

Dean

College of Engineering and Science

University of Detroit Mercy

leo.hanifin@udmercy.edu

Dr. Hanifin is dean of the College of Engineering and Science at the University of Detroit Mercy and the Chrysler Professor of Engineering. Throughout his career, he has been active in development of university, industry and government partnerships. Before joining UDM in 1991, Dean Hanifin directed the launch and growth of the manufacturing center at Rensselaer Polytechnic Institute into a 300-person collaborative research/technology center. At the University of Detroit, he earned his BA in mechanical engineering, design option; a Master of Engineering in solid mechanics; and a PhD in engineering. Dr Hanifin was a Hughes Fellow at the University of California, Los Angeles. Before joining academia, he held positions in the computer, aerospace and automotive industries.



Donald F. Hayes, PhD, PE, DEE

Chair, Department of Civil and Environmental Engineering

Howard Hughes College of Engineering

University of Nevada Las Vegas

Donald.Hayes@unlv.edu

Before arriving at UNLV, Dr. Hayes was director, Institute for Coastal Ecology and Engineering, and the M. Eloi Girard/BORSF Professor of Civil Engineering at the University of Louisiana at Lafayette; associate professor, Department of Civil & Environmental Engineering, at the University of Utah, Salt Lake City; and assistant professor, Department of Civil Engineering, at the University of Nebraska Lincoln. Previous to that, he held several academic and professional engineering positions. He earned his BS in civil engineering (with honors) from Mississippi State University; his MS in civil engineering at Mississippi State University; and his PhD in civil engineering from Colorado State University. Dr. Hayes has won several academic and professional awards, and he is widely published.

**David Klinikowski, BSME**

Director, Bus Research and Testing Center
Pennsylvania Transportation Institute
Penn State University
(814) 863-1898
dklinikowski@engr.psu.edu

David Klinikowski directs the activities at Penn State's Bus Research and Testing Center. This federally mandated \$3 million/year program, funded by the Federal Transit Administration and industry, performs comprehensive vehicle testing on transit buses ranging from full-size heavy-duty buses, to modified mini-vans. He also managed the development of the Bus Testing Facility for the Federal Transit Administration, and he developed several test procedures, instruments, and mechanical designs for testing vehicles and roadway materials. He earned his BS in mechanical engineering from The Pennsylvania State University, and he co-authored several research reports.

**Ashok Kumar, PhD, PE, BCEE**

Professor and Chair
Department of Civil Engineering
University of Toledo
akumar@utnet.utoledo.edu

In addition to his current position in the Department of Civil Engineering at the University of Toledo, Dr. Kumar has taught several upper division and graduate courses, including Introduction to Air Pollution, Indoor Air Quality, Industrial Ventilation, Dispersion and Risk Modeling. He also has edited professional publications, served on several professional boards, reviewed journals, and more. Dr. Kumar's work on air pollutants inside and outside transit vehicles is widely published. He earned his BS in mechanical engineering (with honors) from Aligarh University, India; his Master of Applied Science in mechanical engineering from the University of Ottawa; and his PhD in environmental fluid mechanics from the University of Waterloo, Ontario.



Hokey Min, PhD

James R. Good Chair in Global Supply Chain Strategy,
Department of Management, College of Business Administration
Bowling Green State University, Ohio
hmin@bgsu.edu

Dr. Hokey Min has held full and assistant professorships at the University of Louisville, Kentucky; Auburn University, Alabama; Northeastern University, Massachusetts; and University of New Orleans, Louisiana. His transit-relevant research includes several reports on para-transit service, routes, carriers, and other topics. He has won numerous research grants to investigate several issues such as developing an intelligent decision support system for routing long-haul common carriers and their drivers under the most recent hours of service regulations; conducting customer satisfaction surveys to improve the Toledo Area Regional Transit Authority's paratransit services; and more. He earned his MBA in production management from Yonsei University, Korea; his MSBA in operations management/economics from the University of South Carolina; and his PhD in management sciences/logistics from The Ohio State University, Columbus.



Errol C. Noel, PhD, PE, FASCE, FITE

Director
Howard University Transportation Research Center
Howard University
enoel@howard.edu

In addition to directing Howard University's Transportation Research Center, Dr. Errol Noel directs the university's Traffic Safety and Transportation Data Center, and he chairs the university's Civil Engineering Department. He specializes in highway traffic operation and safety, highway engineering, simulation of transit operating in mixed traffic, pavement ride quality, and analysis of safety data. Recently, his focus has been in applied research for solving urban transportation problems. He has more than 35 years of practical engineering experience, especially in highway engineering, traffic engineering, and transportation research, and he has an outstanding record of published articles. Dr. Noel earned his BS in civil engineering and his MS in transportation engineering, both at Howard University, and his PhD in transportation engineering at the University of Maryland, College Park.



Robert B. Noland, PhD

Director

Voorhees Transportation Center

Rutgers University

noland@rutgers.edu

Dr. Robert Noland earned his BA in chemistry at the University of California, and his MSc in energy management and policy, and his PhD in energy management and environmental policy at the University of Pennsylvania. Since then, he has been a researcher at the University of California, Irvine; a policy analyst with the US Environmental Protection Agency; a lecturer and a reader in environmental policy at Imperial College, London; and professor at the Edward J. Bloustein School of Planning and Public Policy, Rutgers University. Dr. Noland's research has been published in several professional journals, and he has been a journal editor, and chair of the Strategic Task Force on Global Climate Change of the Transportation Research Board, among many other activities.



Charles Robert Standridge, PhD

Professor and Assistant Dean

Padnos College of Engineering and Computing

Grand Valley State University

standric@gvsu.edu

Dr. Charles Standridge earned his BS in applied mathematics and computer science at Washington University, St. Louis; and his MS and PhD in industrial engineering at Purdue University. Before arriving at Grand Valley University, he was an associate professor of industrial engineering at FAMU/FSU in Florida and at the University of Iowa, and a consultant in private industry. He consulted on more than 20 projects, received research funding for nine projects, and has been published in nearly 60 journals and reports. His awards include Industrial Design Professor of the Year, and a Book of the Year. Dr. Standridge is active in scientific and professional societies. At Grand Valley, he is also director of the School of Engineering, and chair of the University Wide Intellectual Property Task Force.



RESEARCH





Karen Philbrick, PhD

Deputy Executive Director and Director of Research

Karen.Philbrick@sjsu.edu

Dr. Philbrick was appointed the Director of Research for the Mineta Transportation Institute in May 2009. During her time with MTI, Karen has overseen the selection of 43 new research projects and the publication of 69 peer reviewed research reports. In June 2011, MTI Executive Director Rod Diridon, at the direction of the MTI Board of Trustees, promoted Dr. Philbrick to the position of Deputy Executive Director.

Before joining MTI, Dr. Philbrick served as the Assistant Director of the National Center for Intermodal Transportation, a Title III University Transportation Center based at the University of Denver in Colorado. During her tenure at that Center, her work focused on the assessment, design, and development of planning methodologies and tools, technology, and human resources needed to improve intermodal connectivity. Dr. Philbrick has also been extensively involved in studies investigating Fatigue Management Planning and Best Practices in Responding to Critical Incidents in the Transportation Industry. As part of her research, she interviewed thousands of locomotive engineers and conductors as well as airline pilots, maritime industry representatives, and truck drivers. In addition, she interviewed New York City firefighters directly affected by the events of 9/11. This laid the groundwork for the successful completion of her dissertation, which examined a mathematical model for understanding Emotional Distress in Emergency Workers Following a Terrorist Attack.

On an international level, Dr. Philbrick has contributed to the development of educational and training materials for intermodal specialists. Her work has formed a key portion of an international training effort and seminar, Innovations and Challenges in Intermodal Transportation, which has been delivered in the Philippines, Indonesia, and most recently Vietnam. She has been a member of the US delegation to the Asian Pacific Economic Cooperation (APEC) Transportation Working Group since 2000.

With the highest honors, Dr. Philbrick earned a BA from California State University Fresno, an MA from Columbia University, an EdM from Columbia University, and a PhD from the University of Denver.

Overview

The Research Director conducts an annual research needs assessment and request for proposals, and then manages projects from the approval process through peer review and final publication.

MTI actively recruits academic involvement from many departments at San José State University (SJSU). However, the program is different from most other transportation centers because research teams may also include faculty from other colleges and universities, as well as private sector consultants. The experience and knowledge of individuals from public and private organizations outside academia can bring a “real world” and very practical perspective to MTI research and to the classroom when research is shared with students. Each team includes at least one SJSU academic member and one SJSU student in a substantive role, and projects are conducted in an academic format, including research methodology, report writing, and rigorous peer review of work prior to publication.

MTI requires that all research team members be certified Research Associates (RA) or Consulting Associates (CA) prior to their involvement in any project. Certification requires a completed application with references, a résumé, and a sample of published research. The Research Associates Policy Oversight Committee (RAPOC), composed of the department heads or representatives of the SJSU academic departments with which MTI works most often, reviews the applications and recommends certification where appropriate. Certification is approved by the executive director and must be renewed every five years.



Research Program Goals

The Mineta Transportation Institute Research Program seeks to involve a diverse and growing number of certified RAs, CAs, and student research assistants in a wide spectrum of research projects judged by peers and other experts to advance the body of knowledge in transportation policy and management from an intermodal perspective. MTI does only directly-applicable, not theoretical, research projects, which are selected via a thorough needs-assessment process.

Research Projects

The annual project selection begins with an extensive and structured needs assessment process involving Caltrans, the US DOT Western Resource Center, and MTI's Board of Trustees (BOT). On completion of the needs assessment, MTI issues a formal Request for Proposals (RFP) to the MTI RAs and CAs and broadly announces the availability of the funding opportunity beyond the MTI community. RAPOC, Caltrans, and representatives from the Federal Highway Administration (FHWA), and the Federal Transit Administration (FTA) subject all qualified proposals to peer review. The reviews are then discussed, in detail, at a selection meeting. Few proposals are recommended for funding as submitted; many are tentatively selected subject to revision by the principal investigator, and others are rejected.

Following selection, research proposals and budgets are refined and revised according to RAPOC's direction. In some cases additional review by the committee occurs before the final project description and budget are written and approved by the SJSU Foundation, Caltrans and FHWA. That approval marks the real beginning of the research project, which is then entered into the TRB Research in Progress (RiP) system and posted on the MTI website as a Project Description.

This research needs assessment, project identification, RFP, proposal review, research method refinement, and project selection process is time consuming but guarantees the identification of needed research projects and selection of an optimal research team and methodology.

MTI also offers a Seed Grant program for amounts up to \$5,000. The program's dual purpose is to interest new faculty in the MTI research program and to facilitate the development of their first full-fledged research proposal. Seed grants require a white paper summarizing the research and findings and in most cases the work results in a proposal for funded research in the primary research program.

MTI emphasizes policy and management research, rather than technical research, and seeks projects that improve the development and operation of the nation's surface transportation systems while ensuring the global competitiveness of the United States. MTI selects only research projects with immediate and practical value for transportation officials and practitioners. To that end, MTI, at the direction of its Board of Trustees, has adopted, in priority order, the following areas of emphasis:

- Safety and security of transportation systems
- Financing of transportation infrastructure and operations
- Interrelationships among transportation, land use, the environment (including climate change), and the economy

- Transportation planning and policy development
- Intermodal connectivity and integration
- Sustainability of transportation systems
- Collaborative labor-management issues and strategies
- Transportation decision making and consensus building

Transfer of Research Information

All research is professionally published and printed following successful peer review, author revisions, and editing. Additionally, every new report is available on MTI's website, <http://transweb.sjsu.edu>. MTI has developed a number of other approaches to information transfer, including sponsoring symposia, funding post-research travel for researchers to address professional conferences such as TRB, providing financial incentives for publishing in peer-reviewed journals, and developing cost-effective formats to present research summaries for distribution to practitioners. (See additional details in the Information/Technology Transfer section of this report.)

Research Program Accomplishments

MTI Research and Researchers Featured at TRB Annual Meeting

Nine MTI research papers were selected for presentation at the 2012 Transportation Research Board Annual Meeting. In several instances, the MTI RAs presided at a TRB session.

Presented at TRB:

- Dr. Asha Weinstein Agrawal: MTI Project 1031 *What Do Americans Think About Federal Transportation Tax Options? Results from Year 2 of a National Survey*
- Dr. Asha Weinstein Agrawal: MTI Project 2606 *Share-Use Bus Priority Lanes on City Streets: Case Studies in Design and Management*
- Dr. Christopher Ferrell: MTI Project 2802 *The Influences of Neighborhood Crime on Mode Choice*
- Dr. Bradley Flamm: MTI Project 2903 *Constraints To Green Vehicle Ownership: A Focus Group Study*
- Dr. Peter Haas: MTI Project 1027 *Estimating Workforce Needs for the California High-Speed Rail Network*
- Mr. Brian Michael Jenkins: MTI Project 1075 *Rail Security: Critical Insights and Applications*
- Dr. Elliot Martin: MTI Project 2808 *Understanding How Ecodriving Public Education Can Result in Reduced Fuel Use and Greenhouse Gas Emissions*
- Dr. Jae-Ho Pyeon: MTI Project 2908 *Key Project Factors of Construction Time and Cost Performance during Incentive/Disincentive Highway Projects*
- Dr. Jean-Daniel Saphores: MTI Project 2809 *US Household Preferences for Alternative-Fuel Vehicles: Results from a National Survey*

Strong MTI Presence at Other Conferences

The MTI travel grant program enabled many researchers to present work at a variety of professional conferences during the year. In all, MTI research associates presented the results of MTI sponsored research at more than 56 academic and professional conferences, including the American Public Transportation Associations Rail Conference; the Association of Collegiate Schools of Planning Annual Conference, and the ITS America Annual Meeting.

Research in Action

The well-publicized findings of MTI-sponsored research projects are reaching audiences far and wide. Following each report publication, MTI Communications Director Donna Maurillo issues a press release to news services. These releases are picked up by many domestic and international media outlets, as well as public policy venues. Because MTI documents web site traffic, a direct correlation is apparent between the number of times a report is downloaded from the MTI web site and the time that a press release is issued. For example, MTI Report 11-19, "*Low-Stress Bicycling and Network Connectivity*" was downloaded 55,395 times in one month, while MTI Report 11-05, "*Integration of Bicycling and Walking Facilities into the Infrastructure of Urban Communities*," was downloaded 13,283 times. Every week, many thousands of MTI reports are downloaded, and stories appear in venues ranging from *USA Today* to the TRB newsletter as a result of this effective marketing strategy. In June, MTI released Report 11-26, "*Public Bikes sharing in North America: Early Operator and User Understanding*." Ten original news articles were written about this report alone in less than one month.

Permission to link to nine MTI completed research reports was requested by the purveyor of the SORT clearinghouse, an on-line research repository, at the Institute of Transport Studies, Monash University, Melbourne, Australia. This is a web-based collection of research records related to Social Issues in Transport, which is made available to researchers and the public. SORT managers expect the web site to assist in promoting and in increasing citations of the work. According to a recent survey of users of the SORT website, 22 percent had cited a document from the SORT repository in an academic paper, report or book. MTI granted permission, and this action has also led to increased exposure for MTI reports. Additional requests to link to MTI research reports were received from the Homeland Security Digital Library, the Sustainable Development Law blog site (www.AGCecolaw.com), the Santa Clara Valley Transportation Authority (VTA), and BAE Systems.

In addition to the 31 MTI research reports that were published this fiscal year, findings of the Institute's research were reported in many leading academic journals. Additionally, MTI was pleased that the TRB E-Newsletter featured the results of 18 MTI studies.

MTI researchers have appeared in televised interviews to discuss the findings of their MTI-sponsored work. Dr. Frances Edwards appeared on KRON TV in October 2011 to discuss disaster preparedness as written about in MTI Publication 09-10, *Handbook of Emergency Management For State-Level Transportation Agencies*. Brian Michael Jenkins appeared on NBC News, where he discussed surface transportation security matters, and MTI Executive Director Rod Diridon was interviewed numerous times on MTI's High-Speed Rail Connectivity Center research. MTI has developed a sophisticated system for disseminating research results, and live media interviews are but one example of how this is accomplished.

Research in the Classroom

One special advantage of university-based research is that it connects students with the transportation field, sparking in some an enduring interest that leads to a career in the profession. Recognizing this value, all MTI research projects involve at least one San José State University student. Eight of MTI's current Research Associates initially served as student research assistants on MTI-sponsored projects. Dr. Christopher Cherry, Dr. Michael Clay, Dr. Chris Ferrell, Dr. Shengyi Gao, Dr. Daniel Hess, Dr. Hiro Iseki, Dr. Elliot Martin, and Dr. Caroline Rodier are involved with MTI as a result of that student experience. In the role of Principal Investigator, Drs. Ferrell, Hess, Iseki, and Rodier have been awarded MTI grants for their outstanding research efforts.

Completed Research Projects

The following projects were described in more detail in prior annual reports. They are listed here in chronological order to assure that all completed projects are acknowledged, regardless of which grant or authorization period they represent.

Impacts of the North American Free Trade Agreement on Transportation in the Border Areas of the United States: With Emphasis on the California Border with Mexico

Project 9700

Publication 99-2

Principal Investigator: George Gray

Analysis of Policy Issues Relating to Public Investment in Private Freight Infrastructure

Project 9701

Publication 99-3

Principal Investigator: Dan Evans, JD

Why Campaigns for Local Transportation Funding Initiatives Succeed or Fail: An Analysis of Four Communities and National Data

Project 9702

Publication 00-1

Principal Investigator: Peter Haas, PhD

NAFTA II: California Border Zone Land Transportation Issues

Project 9802

Publication 01-06

Principal Investigator: George Gray

Land Use and Transportation Alternatives: Constraint or Expansion of Household Choice?

Project 9803

Publication 01-19

Principal Investigator: Jonathan Levine, PhD

Applying an Integrated Urban Model to the Evaluation of Travel Demand Management Policies in the Sacramento Region

Project 9804

Publication 01-03

Principal Investigator: Robert Johnston

Protecting Public Surface Transportation Against Terrorism and Serious Crime: An Executive Overview

Project 9805

Publication 01-14

Principal Investigator: Brian Michael Jenkins

Protecting Public Surface Transportation Against Terrorism and Serious Crime: Continuing Research on Best Security Practices

Project 9805-2

Publication 01-07

Principal Investigator: Brian Michael Jenkins

GIS for Livable Communities: Using GIS to Improve Transportation Planning and Community Livability

Project 9806

Publication 01-09

Principal Investigator: Tom Horan, PhD

A New Planning Template for Transit-Oriented Development

Project 9807

Publication 01-12

Principal Investigator: Dick Nelson

The Travel Behavior and Needs of the Poor: A Study of Welfare Recipients in Fresno County, California

Project 9808

Publication 01-23

Principal Investigator: Evelyn Blumenberg, PhD

Implementation of Zurich's Transit Preferential Program

Project 9809

Publication 01-13

Principal Investigator: Andrew Nash

Envisioning Neighborhoods with Transit-Oriented Development Potential

Project 9810

Publication 01-15

Principal Investigator: Earl G. Bossard, PhD

Best Practices in Developing Regional Transportation Plans

Project 9811

Publication 01-10

Principal Investigator: Donald R. Rothblatt, PhD

Construction of Transit-Based Developments: New Policy Initiatives for Governments

Project 9901

Publication 01-05

Principal Investigator: Scott Lefaver, DPA, AICP

How to Best Serve Seniors on Existing Transit Services

Project 9902

Publication 01-04

Principal Investigator: David Koffman

Effects of Online Shopping on Vehicular Traffic Patterns

Project 9903

Publication 01-20

Principal Investigator: Joseph J. Giglierano, PhD

Factors Influencing Voting Results of Local Transportation Funding Initiatives with a Substantial Rail Transit Component: Case Studies of Ballot Measures in Eleven Communities

Project 9904

Publication 01-17

Principal Investigator: Richard A. Werbel, PhD

Developer-Planner Interaction in Transportation and Land Use Sustainability

Project 9905

Publication 01-21

Principal Investigator: Aseem Inam, PhD

Transit Labor Relations Guide

Project 9906

Publication 01-02

Principal Investigator: Herb Oestreich, PhD

Non-Pricing Methods to Optimize High Occupancy Vehicle Lane Usage

Project 9908

Publication 01-11

Principal Investigator: George Gray

***A Statewide Study for Bicyclists and Pedestrians on
Freeways, Expressways, Tunnels and Toll Bridges***

Project 9909

Publication 01-01

Principal Investigator: Thomas C. Ferrara, PhD

***Using the Internet to Envision Neighborhoods with
TOD Potential***

Project 2001

Publication 01-24

Principal Investigator: Earl G. Bossard, PhD

***Applying an Integrated Urban Model in the
Evaluation of Travel Demand Management Policies in
the Sacramento Region: Year Two***

Project 2002

Publication 01-08

Principal Investigator: Robert Johnston

***The California General Plan Process and Sustainable
Transportation Planning***

Project 2003

Publication 01-18

Principal Investigator: Richard Lee, PhD, AICP

***Trucks, Traffic, and Timely Transport: A Regional
Freight Logistics Profile***

Project 2004

Publication 02-04

Principal Investigator: John S. Niles

***Increasing Transit Ridership: Lessons from the Most
Successful Transit Systems in the 1990s***

Project 2005

Publication 01-22

Principal Investigator: Brian D. Taylor, PhD

***Using Fiber Networks to Stimulate Transit Oriented
Development: Prospects, Barriers and Best Practices***

Project 2007

Publication 01-16

Principal Investigator: Walter Siembab

***Bridging the Gap: Planning Interjurisdictional Transit
Services***

Project 2102

Project Cancelled

Principal Investigator: Patrick McGovern, PhD, JD

***Toward Sustainable Transportation Indicators for
California***

Project 2106

Publication 02-05

Principal Investigator: Richard Lee, PhD

***Modeling Long-Range Transportation and Land Use
Scenarios for the Sacramento Region, Using Citizen-
Generated Policies***

Project 2107

Publication 04-02

Principal Investigator: Robert Johnston

***Verifying the Accuracy of Regional Models Used in
Transportation and Air Quality***

Project 2108

Publication 02-03

Principal Investigator: Caroline Rodier, PhD

***Impact of Ethnic Diversity on Transit: How Do Various
Population Groups View and Utilize Various Transit
Modes?***

Project 2109

(MTI Seed Project)

There is no publication for this phase of the project.

Principal Investigator: Richard A. Werbel, PhD

Making Growth Work for California's Communities

Project 2111

Publication 02-01

Principal Investigator: Kenneth R. Schreiber, AICP

Best Practices in Shared Use of High-Speed Rail Systems

(Former title: *Shared Use of Rail Infrastructure by High-Speed Rail: Best Practices in Design and Operations*)

Project 2113

Publication 02-02

Principal Investigator: Andrew Nash

Saving City Lifelines: Lessons Learned in the 9-11 Terrorist Attacks

Project 2114

Publication 02-06

Principal Investigator: Brian Michael Jenkins

The Future of Transportation Education: A Needs Assessment for the Transportation Management Program at San José State University

(Former title: *Needs Assessment: Transportation Management Program at San José State University*)

Project 2201

Publication 03-01

Principal Investigator: Linda Valenty, PhD

Can Consumer Information Tighten the Transportation/Land Use Link? A Simulation Experiment

(Former title: *Decision Making Influences in Land Use and Transportation: An Experiment on the Impact of Transportation and Housing Information*)

Project 2202

Publication 05-03

Principal Investigator: Daniel Rodriguez, PhD

Using Spatial Indicators for Pre- and Post-Development Analysis of TOD Areas: A Case Study of Portland and the Silicon Valley

(Former title: *A Pre- and Post-Construction Analysis of Transit-Oriented Developments Using Spatial Indicators: A Case Study of Portland and Silicon Valley*)

Project 2203

Publication 03-03

Principal Investigator: Marc Schlossberg, PhD

Higher Density Plans: Tools for Community Engagement

(Former title: *Assessing the Effectiveness of Tools and Information that Respond to Community Fears and Resistance about the Densification of Communities*)

Project 2204

Publication 03-02

Principal Investigator: Kenneth Schreiber, AICP

The Impact of Telecommuter Rail Cars on Modal Choice

Project 2205

Publication 04-01

Principal Investigator: James Hayton, PhD

A Consumer Logistics Framework for Understanding Preferences for High-Speed Rail Transportation

Project 2206

Publication 05-04

Principal Investigator: Kenneth C. Gehrt, PhD

Lessons Learned in Attempting to Survey Hard-to-Reach Ethnic Segments Along with the Presentation of a Comprehensive Questionnaire

(Former title: *Impact of Ethnic Diversity on Transit: How Do Various Population Groups View and Utilize Various Transit Modes? – Phase II*)

Project 2207

Publication WVP 10-02 (MTI Seed Project)

Principal Investigator: Richard Werbel, PhD

Designing and Operating Safe and Secure Transit Systems: Assessing Current Practices in the US and Abroad

(Former title: *System Design for Transit Security*)

Project 2301

Publication 05-03

Principal Investigator: Brian D. Taylor, PhD

Verifying the Accuracy of Land Use Models Used in Transportation and Air Quality Planning: A Year-Two Validation Study

Project 2302

Publication 05-02

Principal Investigator: Caroline Rodier, PhD

Applying Smart Growth Principles and Strategies to Resolving Land Use Conflicts Around Airports

Project 2303

Publication 06-05

Principal Investigator: Richard Lee, PhD

High-Speed Rail Projects in the United States: Identifying the Elements for Success

Project 2304

Publication 05-01

Principal Investigator: Allison de Cerreño, PhD

The Pasadena Gold Line: Development Strategies, Location Decisions, and Travel Characteristics Along a New Rail Line in the Los Angeles Region

Project 2305

Publication 04-03

Principal Investigator: Hollie Lund, PhD

High-Speed Rail Projects in the United States: Identifying the Elements for Success – Part 2

Project 2401

Publication 06-03

Principal Investigator: Allison de Cerreño, PhD

Barriers to Using Fixed-Route Transit for Older Adults

Project 2402

Publication 09-16

Principal Investigator: Michael Peck, PhD, MSW

Public Versus Private Mobility for the Poor: Transit Improvements Versus Increased Car Ownership in the Sacramento Region

(Former title: *Welfare to Work: A Simulation of Land Use and Transportation Policies*)

Project 2403

Publication 08-02

Principal Investigator: Robert Johnston

Video Transit Training for Older Travelers: A Case Study of the Rossmore Senior Adult Community, California

(Former title: *The Elderly and Public Transit: Minimizing Barriers and Maximizing Service*)

Project 2404

Publication 06-04

Principal Investigator: Susan Shaheen, PhD

Neighborhood Crime and Travel Behavior: An Investigation of the Influence of Neighborhood Crime Rates on Mode Choice

(Former title: *Neighborhood Crime and Travel Behavior*)

Project 2405

Publication 07-02

Co-Principal Investigators: Christopher Ferrell, PhD; Wenbin Wei, PhD

How Far, by Which Route, and Why? A Spatial Analysis of Pedestrian Preference

Project 2406

Publication 06-06

Principal Investigator: Marc Schlossberg, PhD

Beyond Uncertainty: Urban Models in Transportation and Air Quality Planning

Project 2407

Publication 07-01

Principal Investigator: Caroline Rodier, PhD

Paving the Way: Recruiting Students into the Transportation Professions

Project 2408

Publication 08-03

Principal Investigator: Asha Weinstein Agrawal, PhD

Bus Rapid Transit: A Handbook for Partners

(Former title: *Bus Rapid Transit Guidebook*)

Project 2426

Publication 06-02

Co-Principal Investigators: Tom Larwin; George Gray

The Evolving Nature of Terrorist Acts Against Surface Transportation: Capturing Lessons Learned

Project 2501

Publication 06-07

Selective Screening of Rail Passengers

Principal Investigator: Brian Michael Jenkins

NOTE: This is the first part of a two-part project.

The 1995 Attempted Derailing of the French TGV (High-Speed Train) and a Quantitative Analysis of 181 Rail Sabotage Attempts

(Former title: *The Evolving Nature of Terrorist Acts Against Surface Transportation: Capturing Lessons Learned*)

Project 2501-2

Publication 09-12

Principal Investigator: Brian Michael Jenkins

Caltrans Statewide Cultural Properties Information System

Project 2502

Publication 09-06

Principal Investigator: Eric Ingbar

Exploration of Data Sources for Air Cargo Studies

Project 2525

Publication WP 07-01 (MTI Seed Project)

Principal Investigator: Wenbin Wei, PhD

Evaluating the Environmental Justice Effects of Land Use Scenarios in the Sacramento Region with the PECAS Activity Allocation Model

Project 2601-2705

(Phase I & II were combined in this report)

Publication 09-08

Principal Investigator: Caroline Rodier, PhD

Tribal Corridor Management Planning: Model, Case Study, and Guide for Caltrans District I

(Former title: *Tribal Corridor Management Plan*)

Project 2604

Publication 10-01

Co-Principal Investigators: Mary Scoggin, PhD; Joy Adams, PhD

Feasibility of One-Dedicated-Lane Bus Rapid Transit/Light-Rail Systems and the Expansion to Two-Dedicated-Lane Systems: A Focus on Geometric Configuration and Performance Planning

(Former title: *Bus Rapid Transit/Light Rail Implemented on One Dedicated Lane: Operational Feasibility, Practicality and Systems Analysis*)

Project 2605

Publication 08-01

Co-Principal Investigators: Wenbin Wei, PhD;

Jacob Tsao, PhD

Connecting Transportation Decision Making with Responsible Land Use: State and Regional Policies, Programs, and Incentives

(Former title: *Strategies for Connecting Transportation Funding and Smart Growth: State and Regional Best Practices and Incentives*)

Project 2607

Publication 07-03

Principal Investigator: Gary Binger, AICP

The Influence of Service Planning Decisions on Rail Transit Success or Failure

Project 2608

Publication 08-04

Co-Principal Investigators: Jeffrey Brown, PhD; Gregory Thompson, PhD

Effects of Suburban Transit-Oriented Developments on Residential Property Values

Project 2609

Publication 08-07

Principal Investigator: Shishir Mathur, PhD

How to Ease Women's Fear of Transportation Environments: Case Studies of Best Practices

Project 2611

Publication 09-01

Principal Investigator: Anastasia Loukaitou-Sideris, PhD

Carsharing and Public Parking Policies: Assessing Benefits, Costs and Best Practices

Project 2612

Publication 09-09

Principal Investigator: Susan Shaheen, PhD

An Ambit-Based Activity Model for Evaluation Green House Gas Emission Reduction Policies

(Former title: *Evaluation of Greenhouse Gas (GHG) Emission Reduction Policies in the Transportation Sector of California*)

Project 2613 (MTI Seed Project)

Publication WP 08-01

Principal Investigator: Asim Zia, PhD

Creating an Educational Network in California to Assess and Address its Future Transportation Education Challenges

(Former title: *Exploring the Future of California's Transport System*)

Project 2614 (MTI Seed Project)

Publication WP 07-03

Principal Investigator: Triant Flouris, PhD

"Green" Transportation Taxes and Fees: A Survey of Californians

(Former title: *Public Support for Environmental Transportation Taxes and Fees? A Survey of Californians*)

Project 2701

Publication 08-05

Principal Investigator: Asha Weinstein Agrawal, PhD

Carsharing and Carbon Dioxide Emission Reduction Across Density and Transit Quality Gradients in the US

Project 2702

Publication 09-11

Principal Investigator: Susan Shaheen, PhD

Linking Highway Improvements to Changes in Land Use with Quasi-Experimental Research Design: A Better Forecasting Tool for Transportation Decision Making

Project 2703

Publication 09-02

Principal Investigator: Hilary Nixon, PhD

Case Studies of Incremental Bus Rapid Transit Projects in North America

Project 2704

Publication 09-13

Principal Investigator: John Niles

Evaluating the Environmental Justice Effects of Land Use Scenarios in the Sacramento Region with the PECAS Activity Allocation Model

Project 2601-2705

(Phases I and II were combined in this report)

Publication 09-08

Principal Investigator: Caroline Rodier, PhD

The Role of Transportation in a Campus-Level Emergency

Project 2727

Publication 08-06

Principal Investigator: Frances Edwards, PhD, CEM

Improving Transportation Construction Project Performance: Development of a Model to Support Decision-Making Process for Incentive/Disincentive Construction Projects

Project 2801

Publication 09-07

Principal Investigator: Jae-Ho Pyeon, PhD

Facilitating Telecommuting as a Means of Congestion Reduction

Project 2803

Publication 09-14

Co-Principal Investigators: Nancy Da Silva, PhD; Meghna Virick, PhD

Getting Around When You're Just Getting By: The Travel Behavior and Transportation Expenditures of Low-Income Adults

Project 2806

Publication 10-02

Co-Principal Investigators: Asha Weinstein Agrawal, PhD; Evelyn Blumenberg, PhD

Policy Issues in US Transportation Public-Private Partnerships: Lessons from Australia

Project 2807

Publication 09-15

Principal Investigator: Rick Geddes, PhD

Understanding Household Preferences for Alternative Fuel Vehicle Technologies

Project 2809

Publication 10-11

Principal Investigator: Hilary Nixon, PhD

Bicycling Access and Egress to Transit: Informing the Possibilities

Project 2825

Publication 10-07

Principal Investigator: Kevin Krizek, PhD

Potential Economic Consequences of Local Nonconformity to Regional Land Use and Transportation Plans Using a Spatial Economic Model

(Former title: *An Economic Assessment of Regional Planning, Local Rule, and Regional Housing Needs Assessment in Senate Bill 375: A Case Study in the Sacramento, California, Region*)

Project 2902

Publication 10-10

Principal Investigator: Caroline Rodier, PhD

An Investigation into Constraints to Sustainable Vehicle Ownership and Use: A Focus Group Study

Project 2903

Publication 10-08

Principal Investigator: Bradley Flamm, PhD

Examination of Regional Transit Service Under Contracting: A Case Study in the Greater New Orleans Region

(Former title: *Examination of Regional Transit Service through Privatization: A Case Study of Public Transit Service Contracting in New Orleans*)

Project 2904

Publication 10-09

Principal Investigator: Hiro Iseki, PhD

Measuring Walking and Cycling Using the PABS (Pedestrian and Bicycling Survey) Approach: A Low-Cost Survey Method for Local Communities

(Former title: *Non-motorized Transportation Intercept Survey: Development and Testing*)

Project 2907

Publication 10-03

Co-Principal Investigators: Kevin Krizek, PhD; Ann Forsyth, PhD

The Intersection of Urban Form and Mileage Fees: Findings from the Oregon Road User Fee Pilot Program

Project 2909

Publication 10-04

Principal Investigator: Zhan Guo, PhD

Emergency Management Training and Exercises for Transportation Agency Operations

Project 2910

Publication 09-17

Principal Investigator: Frances Edwards, PhD

Revisiting Factors Influencing Voting Results of Local Transportation Funding Initiatives with a Substantial Rail Transit Component

Project 2911

Publication 10-13

Principal Investigator: Peter Haas, PhD

Reliability Centered Maintenance: A Case Study of Railway Transit Maintenance to Achieve Optimal Performance

Project 2913

Publication 10-06

Principal Investigator: Felix Marten, PhD

Exploring the Effectiveness of Transit Security Awareness Campaigns in the San Francisco Bay Area

Project 2914

Publication 09-19

Principal Investigator: Nina Rohlich

Suicides on Urban Commuter Rail Systems in California – Possible Patterns

Project 2926

Publication 10-05

Principal Investigator: Jan L. Botha, PhD

What Do Americans Think About Federal Transportation Tax and Fee Options? Results from a National Survey

Project 2928

Publication 09-18

Principal Investigator: Asha Weinstein Agrawal, PhD

User Evaluations of Intermodal Travel to Work: Exploratory Studies

Project 1025

Publication WP 10-03 (MTI Seed Project)

Principal Investigator: Steven Silver, PhD

What Do Americans Think About Federal Transportation Tax Options? Results From Year 2 of a National Survey

Project 1031

Publication 10-12

Principal Investigator: Asha Weinstein Agrawal, PhD

Projects Completed in the Past Year



Collaborative Funding to Facilitate Airport Ground Access

Project 2503

Publication 11-27

Principal Investigator: Geoffrey Gosling, PhD

This report presents the findings and conclusions from a research study that has examined the challenges of funding airport ground access projects and the role of collaborative funding strategies between the different agencies that typically become involved in such projects. The report reviews the recent literature on funding airport ground access projects, as well as funding transportation projects more generally. This is followed by a detailed review of current federal transportation funding programs relevant to airport ground access projects, as well as a discussion of state and local funding programs and potential opportunities for private-sector funding.

A major component of the research described in the report consists of detailed case studies of seven selected airport ground access projects, including a major intermodal center, two automated people-mover projects, two airport access highway projects, and two airport rail links. These case studies examine the history of each project, the costs involved, and the funding programs and mechanisms used to finance the projects.

Based on the literature review, the review of current funding programs, and the case study findings, the report identifies potential funding strategies for intermodal airport ground access projects, requirements for effective implementation of these strategies, and a recommended approach to facilitate successful project development and implementation. The report also presents recommended changes to transportation funding program rules and regulations that could facilitate and simplify development of intermodal solutions to future airport ground access needs.



Shared-Use Bus Priority Lane on City Streets: Case Studies in Design and Management

(Former title: *Improving Bus Priority Lane Effectiveness in Congested Urban Centers*)

Project 2606

Publication II-10

Principal Investigator: Asha Weinstein Agrawal, PhD

This report examines the policies and strategies governing the design and, especially, operations of bus lanes in major congested urban centers. It focuses on bus lanes that operate in mixed traffic conditions; the study does not examine practices concerning bus priority lanes on urban highways or freeways. Four key questions addressed in the paper are:

1. How do the many public agencies within any city region that share authority over different aspects of the bus lanes coordinate their work in designing, operating, and enforcing the lanes?
2. What is the physical design of the lanes?
3. What is the scope of the priority use granted to buses? When is bus priority in effect, and what other users may share the lanes during these times?
4. How are the lanes enforced?

To answer these questions, the study developed detailed cases on the bus lane development and management strategies in seven cities that currently have shared-use bus priority lanes: Los Angeles, London, New York City, Paris, San Francisco, Seoul, and Sydney. Through the case studies, the paper examines the range of practices in use, thus providing planners and decision makers with an awareness of the wide variety of design and operational options available to them. In addition, the report highlights innovative practices that contribute to bus lanes' success, where the research findings make this possible, such as mechanisms for integrating or jointly managing bus lane planning and operations across agencies.



The Nature of Context-Sensitive Solutions, Stakeholder Involvement and Critical Issues in the Urban Context

(Former title: *Best Practices for Context Sensitive Solutions in Urban Areas*)

Project 2610

Publication II-03

Principal Investigator: Marta Pañero, PhD

Over the last several decades many transportation and planning agencies have experienced conflicting demands emerging from the need to develop projects in an expeditious manner while at the same time involving stakeholders in the decision-making process, which sometimes is perceived as slowing project delivery and/or increasing costs. Given this tension between apparently conflicting demands, it is important to understand how the

stakeholder involvement is being carried out and what best practices may be recommended. This study examines the issue in the context of a relatively new policy framework – Context Sensitive Solutions (CSS) – which supports the early integration of stakeholders into the planning process.

The report pays particular attention to stakeholders' involvement in projects within urban centers, where there is likely to be more complexity, both in terms of the number of stakeholders and end users affected. CSS is a relatively new process and not consistently interpreted or applied across states and/or agencies. The literature suggests that an underlying assumption when applying CSS principles to community involvement processes is that stakeholders are empowered through clear policies and procedures directed towards their participation. In our research, we found that the extent to which public agencies apply the CSS framework and involve and respond to stakeholders depends on each agency's interest to engage the public in the deliberation process to find the best-fit project for a community.

It is likely that the increased integration of stakeholders into the planning and project development process will not become a state of practice until the benefits flowing from community involvement are clearly understood by the agency staff. The CSS literature describes many benefits associated with comprehensive stakeholder engagement, including gaining constituents' buy-in and support for project financing. A movement toward standardizing CSS policies and directives across the country will facilitate a public discussion about the benefits of engaging communities into the project design phase and away from solely expert-based designs. In addition, there are a number of stakeholder involvement practices that, if adopted, could expedite the integration of communities' views and values in the decision-making process, while at the same time minimizing the chances of protracted consultation processes, time delays and additional costs.



Neighborhood Crime and Travel Behavior: An Investigation of the Influence of Neighborhood Crime Rates on Mode Choice – Phase II

(Former title: *Effects of Neighborhood Crimes on Travel Behavior – Phase 2*)

Project 2802

Publication II-04

Principal Investigator: Christopher Ferrell, PhD

There are considerable environmental and public health benefits if people choose to walk, bicycle, or ride transit, instead of drive. However, little work has been done on the effects of neighborhood crimes on mode choice. Instinctively, we understand that the threats posed by possible criminal activity in one's neighborhood can play a major role in the decision to drive, take transit, walk or ride a bicycle, but so far little empirical evidence supports this notion, let alone guides public infrastructure investments, land use planning, or the allocation of police services.

This report – describing Phase II of a research study conducted for the Mineta Transportation Institute on crime and travel behavior – finds that high crime neighborhoods tend to discourage residents from walking or riding a bicycle. When comparing a high crime to a lower crime neighborhood the odds of walking over choosing auto decrease by 17.25 percent for work trips and 61 percent for non-work trips. For transit access to work trips, the odds of choosing walk/bike to a transit station over auto decrease by 48.1 percent.

Transit trips, on the other hand, are affected by neighborhood crime levels in a similar way to auto trips, wherein high crime neighborhoods appear to encourage transit mode choice. The odds of taking transit over choosing auto increase by 17.25 percent for work trips and 164 percent for non-work trips. Surprised by this last finding, the research team tested two possible explanations for why high levels of neighborhood crime would increase transit use: 1) the mode choice models do not adequately account for the effects and interplay between urban form and crime levels and mode choice; and 2) people who ride in cars or take transit may feel more protected when riding in a vehicle (termed here, the “neighborhood exposure hypothesis”).

To investigate the first explanation, the researchers tested a number of alternative urban form and crime interaction variables to no effect. Digging deeper into the second hypothesis, the researchers tested whether the access portion of transit trips (walking, bicycling, or driving to a transit stop) is sensitive to neighborhood crimes as well, wherein high crime neighborhoods discourage walking and bicycling and encourage driving to transit stations. The report provides evidence that high crime neighborhoods encourage driving to transit stops and discourage walking or bicycling, lending support to the neighborhood exposure hypothesis.



Development Challenges of Secondary and Small Airports in California

(Former title: *Best Practice Study of Secondary Airport Development*)

Project 2804

Publication 11-21

Principal Investigator: Senanu Ashiabor, PhD

This study investigates the development of secondary and smaller airports in California. Low-Cost Carrier (LCC) business is growing at these airports because they offer reduced operating costs, and they have adequate capacity to help LCCs avoid battling with incumbent airlines at the large hubs for limited resources, such as gates.

However, increased LCC aircraft operations at the secondary airports have led to significant noise impacts on the surrounding communities and this has been a challenge for the secondary airport operators. They have imposed operational curfews to limit the noise impacts, but this approach constrains the resident airlines that want to increase their traffic. As a result, some LCCs have begun to initiate flights out of the large hubs.

Statistics from this study show that the LCCs have replaced the legacy airlines as the dominant air provider in the state. With their growing dominance, the LCCs will become more attractive to the large hub airports, and the secondary airports will face increased competition in retaining them. To retain those LCCs, the secondary airports must better understand how LCCs make investment decisions related to airport development. At the same time, they must better educate the LCCs about their airport needs.



Model-based Transportation Performance: A Comparative Framework and Literature Synthesis

(Former title: *Costs and Equity of Reducing Greenhouse Gas Emissions through Land Use and Transportation Measures: A Comprehensive Review of the Advanced Modeling Literature for Practical Application in California*)

Project 2805

Publication 11-09

Principal Investigator: Caroline Rodier, PhD

In an era of limited resources and a proliferation of data, there is increasing pressure to conduct careful evaluations of the economic, environmental, and equity effects of investments and policies that influence transportation and land-use systems. This report compares performance measures recommended to achieve desired goals and reviews the literature to determine the degree to which these measures have been implemented and what they indicate about the relative effectiveness of land-use, transit, and automobile pricing policies. Despite the variation in methods and performance measures implemented in the studies reviewed for this report, the synthesis of study results suggests the direction and relative magnitude of change resulting from different types of policies, as well as potential biases introduced by omitting the representation of the land-use and transportation interaction. Overall, the performance measures indicate that carefully designed transit, land-use, and automobile pricing policies may improve travel, economic, environmental, and equity conditions for communities. However, transit and peak-period automobile pricing policies can, in some situations, lead to negative performance outcomes across some or all measures, as illustrated in studies that explicitly represent the land-use and transportation interaction.



Ecodriving and Carbon Footprinting: Understanding How Public Education Can Reduce Greenhouse Gas Emissions and Fuel Use

(Former title: *Carbon Footprinting & Ecodriving: Understanding How Public Education Can Result in Reduced Greenhouse Gas Emissions and Fuel Use*)

Project 2808

Publication 11-11

Principal Investigator: Susan Shaheen, PhD

Ecodriving is a collection of changes to driving behavior and vehicle maintenance designed to impact fuel consumption and greenhouse gas (GHG) emissions in existing vehicles. Because of its promise to improve fuel economy within the existing fleet, ecodriving has gained increased attention in North America. One strategy to improve ecodriving is through public education with information on how to ecodriven. This report provides a review and study of ecodriving from several angles.

The report offers a literature review of previous work and programs in ecodriving across the world. In addition, researchers completed interviews with experts in the field of public relations and public message campaigns to ascertain best practices for public campaigns. Further, the study also completed a set of focus groups evaluating consumer response to a series of websites that displayed ecodriving information. Finally, researchers conducted a set of surveys, including a controlled stated-response study conducted with approximately 100 University of California, Berkeley faculty, staff, and students, assessing the effectiveness of static ecodriving web-based information as well as an intercept clipboard survey in the San Francisco Bay Area.

The stated-response study consisted of a comparison of the experimental and control groups. It found that exposure to ecodriving information influenced people's driving behavior and some maintenance practices. The experimental group's distributional shift was statistically significant, particularly for key practices including: lower highway cruising speed, driving behavior adjustment, and proper tire inflation. Within the experimental group (N = 51), fewer respondents significantly changed their maintenance practices (16 percent) than the majority that altered some driving practices (71 percent). This suggests intentionally altering driving behavior is easier than planning better maintenance practices. While it was evident that not everyone modifies their behavior as a result of reviewing the ecodriving website, even small shifts in behavior due to inexpensive information dissemination could be deemed cost effective in reducing fuel consumption and emissions.



A Framework for Developing and Integrating Effective Routing Strategies within the Emergency Management Decision Support System for Transit Centers

Project 2901

Publication 11-12

Principal Investigator: Anurag Pande, PhD

This report describes the modeling, calibration, and validation of a VISSIM traffic-flow simulation of the San José, California, downtown network and examines various evacuation scenarios and first-responder routings to assess strategies that would be effective in the event of a no-notice disaster.

The modeled network required a large amount of data on network geometry, signal timings, signal coordination schemes, and turning-movement volumes. Turning-movement counts at intersections were used to validate the network with the empirical formula-based measure known as the GEH statistic. Once the base network was tested and validated, various scenarios were modeled to estimate evacuation and emergency vehicle arrival times. Based on these scenarios, a variety of emergency plans for San José's downtown traffic circulation were tested and validated. The model could be used to evaluate scenarios in other communities by entering their community-specific data.



Advancing High-Speed Rail Policy in the United States

(Former title: *Comparative Study of the Development of High-Speed Rail Projects in the United States*)

Project 2905

Publication 11-18

Principal Investigator: Senanu Ashiabor, PhD

This report builds on a review of international experience with high-speed rail projects to develop recommendations for a high-speed rail policy framework for the United States. The international review looked at the experience of Korea, Taiwan, China, and several countries in Europe. Countries in Asia and Europe have pursued high-speed rail (HSR) to achieve various goals, which include relieving congestion on highway networks, freeing up capacity on rail network for freight train operations, and reducing travel time for travelers. Some of the key rationales do not work well in the US context. As an example, in the US, freight companies own most of the rail network and, hence, do not need government intervention to free up capacity for their operations.

We concluded the potential to reduce travel times coupled with improved travel time reliability and safety will be the strongest selling points for HSR in the US. HSR lines work best in high-density, economically active corridors. Given that there are a limited number of such corridors in the US, our study recommends the US HSR project funding mix be skewed heavily toward state bonds guaranteed by the federal government. This will ensure that the states that benefit directly from the projects pay most of the costs, making it more palatable to states that may not have HSR projects. For the projects that span multiple states, member states may have to negotiate the level of financial responsibility they will bear, and this will require detailed negotiations and financial setups that are not addressed in this report.

Other measures the federal government needs to put in place include designating a key agency and dedicated funding source, and developing regulations and specifications for HSR design and construction. States that embark on HSR projects should start with formal legislation and put in place structures to ensure sustained political support throughout the planning and construction of the project. The federal government also needs to move quickly to foster educational and training centers to build up the HSR workforce in the country.



Integration of Bicycling and Walking Facilities into the Infrastructure of Urban Communities

(Former title: *Lessons for Bike/Pedestrian Integration into the Infrastructure of Urban Communities*)

Project 2906

Publication 11-05

Principal Investigator: Cornelius Nuworsoo, PhD

Several manuals, handbooks and web resources exist to provide varied guidance on planning for and designing bicycle and pedestrian facilities, yet there are no specific indications about which of the varied treatments in these guides work well for users. This project highlights best practices and identifies program characteristics associated with high levels of non-motorized travel, with an emphasis on bicyclists and pedestrians. It highlights practices in the California communities of Davis, Palo Alto and San Luis Obispo. The case studies are used to illustrate how urban communities have integrated non-motorized transportation modes into the physical infrastructure and worked to educate community residents and employees. The most salient themes that emerged from this study are linked to the following user preference: (a) distance to desired land uses and activities; (b) route directness; (c) route connectivity; (d) the separation of motorized and non-motorized transportation modes; (e) safety; (f) convenience; and (g) education and outreach. The aforementioned themes are integrated into key guiding principles that correspond to the trip-making cycle, from the decision to engage in an activity through the choice of route to arrival at the destination.



Systematic Procedures to Determine Incentive/Disincentive Dollar Amount for Highway Transportation Construction Projects

Project 2908

Publication 11-22

Principal Investigator: Jae-Ho Pyeon, PhD

The Federal Highway Administration has encouraged state transportation agencies to implement Incentive/Disincentive (I/D) contracting provisions for early project completion. Although general guidelines to determine the I/D dollar amount for a project are available, there is no systematic and practical tool in use to determine optimum I/D dollar amounts for I/D projects considering road user cost, agency cost, contractor's acceleration cost, and contractor's cost savings. Therefore, systematic procedures and models to assist project planners and engineers in determining an appropriate I/D dollar amount are essential to optimizing the use of I/D contracting techniques.

This research performed a literature review related to the determination of daily I/D dollar amounts. Caltrans I/D project data were then collected and evaluated. Project performance data were analyzed with regard to project outcomes in two key areas: project time and project cost. Statistical analyses were performed to identify the impact of I/D

dollar amount on project time and cost performance. Using Construction Analysis for Pavement Rehabilitation Strategies (CA4PRS) software, Caltrans I/D projects were analyzed to introduce three different levels of CA4PRS implementations for the I/D dollar amounts calculation. Based on the results of the I/D project case studies, the systematic procedures to determine appropriate I/D dollar amounts were developed using the CA4PRS schedule-traffic-cost integration process for the new I-5 rehabilitation project in LA. The proposed procedures were applied to a typical highway pavement rehabilitation project using HMA (hot mix asphalt) materials. Further research is needed to apply the proposed model to other types of highway projects, with adjustment for the type of project.



Promoting Bicycle Commuter Safety

Project 2927

Publication 11-08

Principal Investigator: Asbjorn Osland, PhD

A basic premise in this report is that cycling should be encouraged because as the number of cyclists increases, the attention of motorists and safety improves; however, an important caveat is that the number of cyclists has to be commensurate with the infrastructure built for cycling to enhance their safety.

We present an overview of the risks associated with cycling to emphasize the need for safety. We focus on the application of frameworks from social psychology to education, one of the 5 Es – engineering, education, enforcement, encouragement, and evaluation. We use the structure of the 5 Es to organize information with particular attention to engineering and education in the literature review. Engineering is essential because the infrastructure is vital to protecting cyclists. Education is emphasized since the central focus of the report is safety.

A series of case studies gives first hand information about bicycle safety. The first three in northern California – covering education in relation to safety in San José; engineering and evaluation in Berkeley; engineering, education, and enforcement in Davis – and the Bicycle Transportation Alliance in the Portland, Oregon area, provide an effective example of the education and encouragement dimensions of the 5 Es. We note the need for future research or evaluation, with particular reference to the use of the social psychological model presented herein. Another critical area for future research is the role of enforcement. What are the most effective ways to get cyclists to follow the rules?

We see the value added of the present report to the extant literature as the following: a clear and concise discussion of safety education, case studies that exemplify the 5 Es and permit the reader to more actively engage in the stories told by the case authors, and the social psychological model to consider when designing the 5 Es. The Health Belief Model's key elements could be applied to the 5 Es in the planning process.



Continuity of Operations/Continuity of Government for State-Level Transportation Organizations

Project 2976

Publication II-02

Principal Investigator: Frances Edwards, PhD

The Homeland Security Presidential Directive 20 (HSPD-20) requires all local, state, tribal and territorial government agencies, and private sector owners of critical infrastructure and key resources (CI/KR) to create a Continuity of Operations/Continuity of Government Plan (COOP/COG). There is planning and training guidance for generic transportation agency COOP/COG work, and the Transportation Research Board has offered guidance for transportation organizations. However, the special concerns of the state-level transportation agency's (State DOT's) plan development are not included, notably the responsibilities for the entire State Highway System and the responsibility to support specific essential functions related to the State DOT Director's role in the Governor's cabinet. There is also no guidance on where the COOP/COG planning and organizing fits into the National Incident Management System (NIMS) at the local or state-level department or agency. This report covers the research conducted to determine how to integrate COOP/COG into the overall NIMS approach to emergency management, including a connection between the emergency operations center (EOC) and the COOP/COG activity. The first section is a presentation of the research and its findings and analysis. The second section provides training for the EOC staff of a state-level transportation agency, using a hybrid model of FEMA's ICS and ESF approaches, including a complete set of EOC position checklists, and other training support material. The third section provides training for the COOP/COG Branch staff of a state-level transportation agency, including a set of personnel position descriptions for the COOP/COG Branch members.



Security Awareness for Public Bus Transportation: Case Studies of Attacks Against the Israeli Public Bus System

Project 2978

Publication II-07

Principal Investigator: Bruce Robert Butterworth

This report presents 16 case studies of attacks planned or carried out against Israeli bus targets, along with statistical data on the number, frequency, and lethality of attacks against bus targets that have taken place in Israel since 1970 and during the Second Intifada, which occurred between September 2000 and the end of 2006. The statistical data come from MTI's Database on Terrorist and Serious Criminal Attacks Against Public Surface Transportation. The report also includes an analysis of the effectiveness of different improvised explosive devices and methods of delivering them and raises questions for future discussion.

The case studies of bus attacks were selected not because they are statistically representative, but because they provide a variety of interesting observations. They include both lethal and nonlethal attacks, attacks in which security measures were effective or were not followed or were ineffective, and attacks in which the attackers' tactics and/or devices were lethal or failed or reduced the lethality of the attack.

It is hoped that the cases presented in this report and the accompanying analysis will increase understanding of what can happen and of what can deter, prevent, and/or mitigate the occurrence of terrorist attacks against public bus systems.



Carnage Interrupted: An Analysis of Fifteen Terrorist Plots against Public Surface Transportation

Project 2979

Publication 11-20

Principal Investigator: Brian Michael Jenkins

This report examines 13 terrorist plots against public surface transportation that were uncovered and foiled by authorities between 1997 and 2010 and two failed attempts to carry out attacks. Certainly, this is not the total universe of foiled or failed terrorist plots in these years, but they were selected on the basis of what is known about them and the accessibility of information. The report focuses on terrorist plots in the West. Seven of the 15 plots took place in the United States, and four occurred in the United Kingdom.

These two countries figure prominently as targets of terrorism, and in addition, American and British officials have dealt with terrorist plots through publicized arrests and trials, which provide additional information. Although motive was not a criterion in the selection of the plots, all but one involve individuals or groups inspired by al Qaeda's ideology of violent global jihad against the West. The exception is the 1997 Flatbush plot, in which two terrorists, both of whom had connections with Hamas, angered by events in Palestine, simply wanted to kill as many Jews as possible to express their opposition to US support for Israel. Other sources suggest that the Flatbush plotters wanted to force the release of jailed Islamist terrorists in the United States, including Ramzi Yousef, who participated in the 1993 World Trade Center bombing, and Sheik Omar Abdul-Rahman, who was convicted for his involvement in a plot to carry out additional bombings in New York.



Residential On-Site Carsharing and Off-Street Parking Policy in the San Francisco Bay Area

(Former title: *Communities, Developers, and Residents: Rethinking Residential Parking Policies in Dense Cities in the US*)

Project 1001-Part I

Publication 11-28

Principal Investigator: Charles Rivasplata, PhD

In light of rising motorization, transportation planners have increasingly supported alternatives to the indiscriminate use of the car. Off-street parking policy and carsharing have emerged as credible alternatives for discouraging car ownership. This report explores an initiative that could connect these policy fields and build on their synergy: the provision of on-site carsharing service in residential developments. It evaluates the performance of on-site carsharing programs in the San Francisco Bay Area by interviewing developers, planners, and carsharing service providers.

Interviews were conducted in four Bay Area cities that support the provision of carsharing as an alternative to the private automobile. Based on these interviews, this report identifies the principal factors contributing to the success or failure of on-site carsharing: the unbundling status of off-street parking in residential developments; ties to off-street parking standards; financial constraints; and the level of coordination among stakeholders. The interviews revealed that on-site carsharing has been accepted by developers, planners, and service providers, particularly in densely-populated, transit-rich communities. Nevertheless, there appears to be a gap between on-site carsharing programs and off-street parking standards, and between carsharing programs and carsharing business operations.

The authors recommend that a few models for establishing carsharing policy be tested: a model designed to serve high-density cities with traditional carsharing; and another designed to serve moderately-dense communities, with new carsharing options (e.g., peer-to-peer). In the case of the latter, trip reduction can be achieved through the promotion of alternative modes along major corridors.



Amenity or Necessity? Street Standards as Parking Policy

(Former title: *Communities, Developers, and Residents: Rethinking Residential Parking Policies in Dense Cities in the US*)

Project 1001-Part II

Publication 11-23

Principal Investigator: Zhan Guo, PhD

This paper explores the rationales underlying the use of minimum street width requirements to mandate street parking. A survey of 97 cities reveals that this mandate is not a technical necessity based on safety concerns or an amenity reflecting market demand, two common beliefs held by decision-makers. Many residents are likely unwilling to pay for street parking if it is unbundled from housing. The hidden parking policies should be made transparent and subject to public oversight, the double standard between private and public streets should be eliminated, and parking on residential streets should be optional.



The Impact of Center City Economic and Cultural Vibrancy on Greenhouse Gas Emissions from Transportation

(Former title: *Greenhouse Gas Emissions Generated by Urban Transportation and Land Use Patterns*)

Project 1002

Publication 11-13

Principal Investigator: Matthew Holian, PhD

Urban planners and scholars have focused a great deal of attention on understanding the relationship between the built environment and transportation behavior. However, other aspects of the urban environment – including the vibrancy and quality of life in urban areas – have received little attention. This report seeks to close this gap by analyzing the effects of both land-use and urban vibrancy on transportation patterns. Analysis of data from a variety of sources suggests that in addition to the built-environment, the vibrancy of the urban environment also affects transportation behavior. Moreover, vibrancy affects land-use patterns. By integrating objective measures of center-city quality of life into transportation choice models, our new statistical results inform public policy. We discuss specific public policy options for reducing greenhouse gas emissions and increasing public transit use.



Understanding Transit Ridership Demand for a Multi-Destination, Multimodal Transit Network in an American Metropolitan Area

(Former title: *Understanding Demand for a Multi-Destination, Multi-Modal Transit Network in a Mid-Sized American Metropolitan Area: Lessons for Increasing Choice Ridership While Maintaining Transit Dependent Ridership*)

Project 1003

Publication 11-06

Co-Principal Investigators: Greg Thompson, PhD; Jeffrey Brown, PhD



This study examines the factors underlying transit demand in the multi-destination, integrated bus and rail transit network for Atlanta, Georgia. Atlanta provides an opportunity to explore the consequences of a multi-destination transit network for bus patrons (largely transit-dependent riders) and rail patrons (who disproportionately illustrate choice rider characteristics). Using data obtained from the 2000 Census, coupled with data obtained from local and regional organizations in the Atlanta metropolitan area, we estimate several statistical models that explain the pattern of transit commute trips across the Atlanta metropolitan area.

The models show that bus riders and rail riders are different, with bus riders exhibiting more transit-dependent characteristics and rail riders more choice rider characteristics. However, both types of riders value many of the same attributes of transit service quality (including shorter access and egress times and more direct trips) and their use of transit is influenced by many of the same variables (including population and employment). At the same time, the factors that influence transit demand vary depending on the type of travel destination the rider wishes to reach, including whether it is the central business district (CBD) or a more auto-oriented, suburban destination.

The results of the study offer new insights into the nature of transit demand in a multi-destination transit system and provide lessons for agencies seeking to increase ridership among different ridership groups. The results suggest that more direct transit connections to dispersed employment centers, and easier transfers to access such destinations, will lead to higher levels of transit use for both transit-dependent and choice riders. The results also show that the CBD remains an important transit destination for rail riders but not for their bus rider counterparts. Certain types of transit-oriented development (TOD) also serve as significant producers and attractors of rail transit trips.



***A Decision Support Framework for Using Value Capture to Fund Public Transit:
Lessons from Project-specific Analysis***

Project 1004

Publication 11-14

Principal Investigator: Shishir Mathur, PhD

Local and state governments provide 75 percent of transit funds in the United States. With all levels of governments under significant fiscal stress, any new transit funding mechanism is welcome. Value capture (VC) is one such mechanism. Based on the “benefits received” principle, VC involves the identification and capture of public infrastructure-led increase in land value.

While the literature has extensively demonstrated the property-value impacts of transit investments and has empirically simulated the potential magnitude of VC revenues for financing transit facilities, very little research has examined the suitability of VC mechanisms for specific transit projects. This report aims to fill this research gap by examining five VC mechanisms in depth: tax-increment financing (TIF), special assessment districts (SADs), transit impact fees, joint developments, and air rights.

The report is intended to assist practitioners in gauging the legal, financial, and administrative suitability of VC mechanisms for meeting project-specific funding requirements.



Low-Stress Bicycling and Network Connectivity

(Former title: *A Tool to Evaluate Bicycle Networks*)

Project 1005

Publication 11-19

Principal Investigator: Maaza Mekuria, PhD

For a bicycling network to attract the widest possible segment of the population, its most fundamental attribute should be low-stress connectivity, that is, providing routes between people’s origins and destinations that do not require cyclists to use links that exceed their tolerance for traffic stress, and that do not involve an undue level of detour. The objective of this study is to develop measures of low-stress connectivity that can be used to evaluate and guide bicycle network planning. We propose a set of criteria by which road segments can be classified into four levels of traffic stress (LTS). LTS 1 is suitable for children; LTS 2, based on Dutch bikeway design criteria, represents the traffic stress that most adults will tolerate; LTS 3 and 4 represent greater levels of stress.

As a case study, every street in San José, California, was classified by LTS. Maps in which only bicycle-friendly links are displayed reveal a city divided into islands within which low-stress bicycling is possible, but separated from one another by barriers that can be crossed

only by using high-stress links. Two points in the network are said to be connected at a given level of traffic stress if the subnetwork of links that do not exceed the specified level of stress connects them with a path whose length does not exceed a detour criterion (25 percent longer than the most direct path).

For the network as a whole, we demonstrate two measures of connectivity that can be applied for a given level of traffic stress. One is “percent trips connected,” defined as the fraction of trips in the regional trip table that can be made without exceeding a specified level of stress and without excessive detour. This study used the home-to-work trip table, though in principle any trip table, including all trips, could be used. The second is “percent nodes connected,” a cruder measure that does not require a regional trip table, but measures the fraction of nodes in the street network (mostly street intersections) that are connected to each other.

Because traffic analysis zones (TAZs) are too coarse a geographic unit for evaluating connectivity by bicycle, we also demonstrate a method of disaggregating the trip table from the TAZ level to census blocks. For any given TAZ, origins in the home-to-work trip table are allocated in proportion to population, while destinations are allocated based on land-use data. In the base case, the fraction of work trips up to six miles long that are connected at LTS 2 is 4.7 percent, providing a plausible explanation for the city’s low bicycling share. We show that this figure would almost triple if a proposed slate of improvements, totaling 32 miles in length but with strategically placed segments that provide low-stress connectivity across barriers, were implemented.



Proactive Assessment of Accident Risk to Improve Safety on a System of Freeways

Project I006

Publication II-15

Principal Investigator: Anurag Pande, PhD

This report describes the development and evaluation of real-time crash risk-assessment models for four freeway corridors: US Route 101 NB (northbound) and SB (southbound) and Interstate 880 NB and SB. Crash data for these freeway segments for the 16-month period from January 2010 through April 2011 are used to link historical crash occurrences with real-time traffic patterns observed through loop-detector data. The crash risk-assessment models are based on a binary classification approach (crash and non-crash outcomes), with traffic parameters measured at surrounding vehicle detection station (VDS) locations as the independent variables. The analysis techniques used in this study are logistic regression and classification trees.

Prior to developing the models, some data-related issues such as data cleaning and aggregation were addressed. The modeling efforts revealed that the turbulence resulting from speed variation is significantly associated with crash risk on the US 101 NB corridor. The models estimated with data from US 101 NB were evaluated on the basis of their classification performance, not only on US 101 NB, but also on the other three freeway segments for transferability assessment. It was found that the predictive model derived from one freeway can be readily applied to other freeways, although the

classification performance decreases. The models that transfer best to other roadways were determined to be those that use the least number of VDSs—that is, those that use one upstream or downstream station rather than two or three.

The classification accuracy of the models is discussed in terms of how the models can be used for real-time crash risk assessment. The models can be applied to developing and testing variable speed limits (VSLs) and ramp-metering strategies that proactively attempt to reduce crash risk.



Cost Estimate Modeling of Transportation Management Plan for Highway Projects

Project I007

Publication II-24

Principal Investigator: Jae-Ho Pyeon, PhD

Highway rehabilitation and reconstruction projects frequently cause road congestion and increase safety concerns while limiting access for road users. State Transportation Agencies (STAs) are challenged to find safer and more efficient ways to renew deteriorating roadways in urban areas. To better address the work zone issues, the Federal Highway Administration published updates to the Work Zone Safety and Mobility Rule. All state and local governments receiving federal aid funding were required to comply with the provisions of the rule no later than October 12, 2007. One of the rule's major elements is to develop and implement Transportation Management Plans (TMPs). Using well-developed TMP strategies, work zone safety and mobility can be enhanced while road user costs can be minimized. The cost of a TMP for a road project is generally considered a high-cost item and, therefore, must be quantified. However, no tools or systematic modeling methods are available to assist agency engineers with TMP cost estimating.

This research included reviewing TMP reports for recent Caltrans projects regarding state-of-the-art TMP practices and input from the district TMP traffic engineers. The researchers collected Caltrans highway project data regarding TMP cost estimating. Then, using Construction Analysis for Pavement Rehabilitation Strategies (CA4PRS) software, the researchers performed case studies. Based on the CA4PRS outcomes of the case studies, a TMP strategy selection and cost estimate (STELCE) model for Caltrans highway projects was proposed. To validate the proposed model, the research demonstrated an application for selecting TMP strategies and estimating TMP costs. Regarding the model's limitation, the proposed TMP STELCE model was developed based on Caltrans TMP practices and strategies. Therefore, other STAs might require adjustments and modifications, reflecting their TMP processes, before adopting this model. Finally, the authors recommended that a more detailed step-by-step TMP strategy selection and cost estimate process be included in the TMP guidelines to improve the accuracy of TMP cost estimates.



An Economic and Life Cycle Analysis of Regional Land Use and Transportation Plans

(Former title: *An Economic and Life-Cycle Emissions Assessment of Regional Land Use and Transportation Planning under Senate Bill 375: A Case Study in the Sacramento Region*)

Project 1008

Publication 11-25

Principal Investigator: Caroline Rodier, PhD

Travel and emissions models are commonly applied to evaluate the change in passenger and commercial travel and associated greenhouse gas (GHG) emissions from land use and transportation plans. Analyses conducted by the Sacramento Area Council of Governments predict a decline in such travel and emissions from their land use and transportation plan (the “Preferred Blueprint” or PRB scenario) relative to a “Business-As-Usual” scenario (BAU). However, the lifecycle GHG effects due to changes in production and consumption associated with transportation and land use plans are rarely, if ever, conducted. An earlier study conducted by the authors, applied a spatial economic model (Sacramento PECAS) to the PRB plan and found that lower labor, transport, and rental costs increased producer and consumer surplus and production and consumption relative to the BAU. As a result, lifecycle GHG emissions from these upstream economic activities may increase. At the same time, lifecycle GHG emissions associated with the manufacture of construction materials for housing may decline due to a shift in the plan from larger luxury homes to smaller multi-family homes in the plan. To explore the net impact of these opposing GHG impacts, the current study used the economic production and consumption data from the PRB and BAU scenarios as simulated with the Sacramento PECAS model as inputs to estimate the change in lifecycle GHG emissions. The economic input-output lifecycle assessment model is applied to evaluate effects related to changes in economic production and consumption as well as housing construction.

This study also builds on the findings from two previous studies, which suggest potential economic incentives for jurisdictional non-compliance with Sustainable Communities Strategies (SCSs) under Senate Bill 375 (also known as the “anti-sprawl” bill). SB 375 does not require local governments to adopt general plans that are consistent with the land use plans included in SCSs, and thus such incentives could jeopardize implementation of SCSs and achievement of GHG goals. In this study, a set of scenarios is simulated with the Sacramento PECAS model, in which multiple jurisdictions partially pursue the BAU at differing rates. The PRB is treated as a straw or example SCS. The scenarios are evaluated to understand how non-conformity may influence the supply of housing by type, and holding other factors constant, the geographic and income distribution of rents, wages, commute costs, and consumer surplus.



Estimating Workforce Development Needs for High-Speed Rail in California

Project 1027

Publication 11-16

Principal Investigator: Peter Haas, PhD

This study provides an assessment of the job creation and attendant education and training needs associated with the creation of the California High-Speed Rail (CHSR) network, scheduled to begin construction in September 2012. Given the high profile of national and state commitment to the project, a comprehensive analysis that discusses the education, training, and related needs created during the build out of the CHSR network is necessary. This needs assessment is achieved by means of: 1) analyzing current high-speed rail specific challenges pertaining to 220mph trains; 2) using a more accurate and robust “bottom-up” approach to estimate the labor, education, skills, and knowledge needed to complete the CHSR network; and 3) assessing the current capacity of railroad-specific training and education in the state of California and the nation. Through these analyses, the study identifies the magnitude and attributes of the workforce development needs and challenges that lie ahead for California.

The results of this research offer new insight into the training and education levels likely to be needed for the emergent high-speed rail workforce, including which types of workers and professionals are needed over the life of the project (by project phase), and their anticipated educational level. Results indicates that although the education attained by the design engineers of the system signifies the most advanced levels of education in the workforce, this group is comparatively small over the life of the project. Secondly, this report identifies vast training needs for the construction workforce and higher education needs for a managerial construction workforce. Finally, the report identifies an extremely limited existing capacity for training and educating the high-speed rail workforce in both California and in the US generally.



Wellness Lessons from Transportation Companies

(Former title: *Truck Driver Wellness*)

Project 1028

Publication WP 11-01 (MTI Seed Project)

Principal Investigator: Asbjorn Osland, PhD

The purpose of this report is to describe wellness programs and offer two suggestions for improving how they are delivered to commercial drivers and operators. It is not a large sample empirical study from which generalizations can be made. Rather, the Mineta Transportation Institute commissioned brief case studies of transportation companies to show what several organizations have done.

Stress, nicotine use, sleep apnea, obesity and lack of information are significant barriers to wellness in commercial drivers/operators. Many wellness programs ask the individual driver/operator to lose weight; exercise more; and monitor blood pressure, glucose, cholesterol and other such indicators of health. However, little is done to change the environment or adopt structural interventions such as forbidding nicotine use, as is possible in 20 states. Other structural interventions include those possible at the levels of the company and community, including access to healthy food rather than the junk food drivers often can find on the road. At the societal level, more public transit that gets people walking and out of their cars, cities designed for people to walk and cycle in rather than drive from work to a sprawling suburb, and encouraging food manufacturers to make healthy food (rather than a toxic mix of sodium, fat and sugar to boost one's craving for a particular food) are just a few measures that could improve the health and well being of the public.

The Union Pacific Corporation (rail transportation), and Con-way Freight (trucking) are included because they were willing to share information and are large publicly traded companies. The Utah Transit Authority (UTA) is included because other transit authorities recommended it to the authors, as it has a long history in wellness as part of local government and it too chose to participate.

Two issues are discussed: the first is the importance of using the mitigation of erectile dysfunction in the promotion of wellness programs to commercial drivers/operators and the second issue is to urge employers to consider banning tobacco use, both on and off the job, where legal.



Public Bikesharing in North America: Early Operator and User Understanding

(Former title: *Bikesharing in North America: Understanding the Social and Environmental Impacts through A Case Study of BIXI*)

Project 1029

Publication 11-26

Principal Investigator: Susan Shaheen, PhD

Public bikesharing – the shared use of a bicycle fleet – is an innovative transportation strategy that has recently emerged in major North American cities. Information technology (IT)-based bikesharing systems typically position bicycles throughout an urban environment, among a network of docking stations, for immediate access. Trips can be one-way, round-trip, or both, depending on the operator. Bikesharing can serve as both a first-and-last mile (connector to other modes) and a many-mile solution. As of January 2012, 15 IT-based, public bikesharing systems were operating in the United States, with a total of 172,070 users and 5,238 bicycles. Four IT-based programs in Canada had a total of 44,352 users and 6,235 bicycles.

This study evaluates public bikesharing in North America, reviewing the advances in technology and major events during its rapid expansion. We conducted 14 interviews with industry experts, public officials, and governmental agencies in the United States and Canada during summer 2011/spring 2012 and interviewed all 19 IT-based bikesharing organizations in the United States and Canada in spring 2012. Several bikesharing insurance experts were also consulted in spring 2012. Notable developments during this period include the emergence of a close partnership between vendor and operator and technological advances, such as

mobile bike-docking stations that can be moved to different locations and real-time bike/station tracking to facilitate system rebalancing and provide user information.

During fall 2011 and early 2012, we also completed a user survey (n=10,661) to obtain information on four early IT-based systems: BIXI in Montreal; BIXI in Toronto; Capital Bikeshare in Washington DC; and Nice Ride Minnesota in the Twin Cities (Minneapolis and Saint Paul). The survey found that the most common trip purpose for bikesharing is commuting to either work or school. Not surprisingly, respondents in all cities indicated that they increased bicycling as a result of bikesharing. Respondents in the denser cities generally stated that they walked and rode bus and rail less, while in the Twin Cities, respondents reported that they walked and rode rail more but rode the bus slightly less. These shifts may be a function of city size and density, as open-access bicycles can more quickly and easily serve riders on congested transportation networks. Respondents in all cities overwhelmingly indicated that they drive less as a result of bikesharing, indicating that it reduces vehicle miles/kilometers traveled and vehicle emissions.



Planning for Complementarity: An Examination of the Role and Opportunities of First-tier and Second-tier Cities along the HSR Network in California

Project I030

Publication 11-17

Principal Investigator: Anastasia Loukaitou-Sideris, PhD

The coming of California High-Speed Rail (HSR) offers opportunities for positive urban transformations in both first-tier and second-tier cities. The research in this report explores the different but complementary roles that first-tier and second-tier cities along the HSR network can play in making California more sustainable and less dependent on fossil fuels while reducing mobile sources of greenhouse gas emissions and congestion at airports and on the state's roadways. Drawing from case studies of cities in Northern and Southern California, the study develops recommendations for the planning, design, and programming of areas around California stations for the formation of transit-supportive density nodes.



Assessing Importance and Satisfaction with Factors in Intermodal Work Commuting

Project I033

Publication 11-02

Principal Investigator: Steven Silver, PhD

Users of multiple-mode public transportation were compared to users of privately owned vehicle (POV) transportation in work commuting within two different travel corridors of Santa Clara County, California. In the first corridor, high tech companies were the source of questionnaire respondents; in the second corridor, the respondents were predominately municipal and county office employees. Most intermodal travel in the first corridor was with multiple buses. In the second corridor, commuters who used a bus and light-rail combination were studied.

Survey results from the sample of work commuters who faced a multiple bus combination in travel in the High Tech corridor indicate uncertainty, travel time and distance (the distance from residence to initial mode, interface between modes, and from final stop to work location) were rated as more important, but lower in satisfaction by POV commuters than by public transportation commuters. Results of Importance-Satisfaction Analysis (ISA) of ratings indicated that for POV commuters, travel time, uncertainty, and distance were factors in the quadrant of high importance and low satisfaction, which is most relevant managerially. In the ratings of public transportation commuters, wait time was clearly the factor in this quadrant. Cleanliness and uncertainty were lower satisfaction factors close to the boundary of the high importance quadrant. In survey results from a sample of work commuters to an urban city center who faced a light-rail and bus combination, POV commuters rated most factors as more important, but less satisfactory than commuters who used public transportation. The differences of largest magnitude in both importance and satisfaction were in cost, total travel time, and distance. The largest difference between POV and public transportation commuters in this corridor was in cost.

Design implications of the studies differ across travel corridors. Whereas in the High Tech corridor, improving factors of wait time, travel time, and uncertainty appear to have a priority over cost for both public and POV work commuters. The results in the Downtown corridor suggest the opposite. For public transportation commuters in this corridor, cost is the most important factor. The differences in results in the comparisons across public transportation commuters and POV commuters in each sample strongly suggest that independent studies of travel corridors with different travel mode alternatives can be informative and have different managerial implications, even when they are within the same county.



An Examination of Women's Representation and Participation in Bicycle Advisory Committees in California

(Former title: Are Women Given Equal Opportunity to Influence Bicycle Planning Policy? An Examination of Women's Participation in Bicycle Advisory Committees in California)

Project 1034

Publication WP 11-03 (MTI Seed Project)

Principal Investigator: Hilary Nixon, PhD

In the United States, women bicycle at significantly lower rates than men. One method of remedying this disparity is to ensure that women are engaged in bicycle planning and policy making through, for example, participation in bicycle advisory committees (BACs). No research has been conducted on women's representation and participation in these committees. This study attempts to fill that gap by examining women's membership levels in and experiences serving on California bicycle advisory committees and bicycle/pedestrian advisory committees. In addition, we explore some of the barriers to participation faced by female cyclists.

A survey of 42 committees revealed that women make up approximately 24 percent of members on an average bicycle (and pedestrian) advisory committee in California. Through focus group interviews with 24 women currently serving on BACs, several common themes emerged. Women on these committees are more likely than men to bring up women's and children's issues, and some aspects of the committees themselves

may serve as barriers for women to become more involved. An online survey of 565 women cyclists in California provided insight regarding some of the common barriers women identify as reasons for not becoming involved with a BAC.

Lack of awareness of the committees did not seem to be a barrier: 67 percent of respondents were aware of their local committee. Instead, barriers identified by participants included: time; perceived lack of qualifications; lack of information about the committee; family and household responsibilities; and lack of interest. Recommendations to increase women's representation on BACs include the following strategies: education about the committee; targeted recruitment efforts; and policy and procedural changes.



Generic Continuity of Operations/Continuity of Government Plan for State-Level Transportation Agencies

Project 1080

Publication 11-01

Principal Investigator: Frances L. Edwards, PhD

The Homeland Security Presidential Directive 20 (HSPD-20) requires all local, state, tribal and territorial government agencies, and private sector owners of critical infrastructure and key resources (CI/KR) to create a Continuity of Operations/Continuity of Government Plan (COOP/COG). There is planning and training guidance for generic transportation agency COOP/COG work, and the Transportation Research Board has offered guidance for transportation organizations. However, the special concerns of the state-level transportation agency's (State DOT's) plan development are not included, notably the responsibilities for the entire State Highway System and the responsibility to support specific essential functions related to the State DOT Director's role in the Governor's cabinet. There is also no guidance on where the COOP/COG planning and organizing fits into the National Incident Management System (NIMS) at the local or state-level department or agency. This report covers the research conducted to determine how to integrate COOP/COG into the overall NIMS approach to emergency management, including a connection between the emergency operations center (EOC) and the COOP/COG activity. The first section is a presentation of the research and its findings and analysis. The second section provides training for the EOC staff of a state-level transportation agency, using a hybrid model of FEMA's ICS and ESF approaches, including a complete set of EOC position checklists, and other training support material. The third section provides training for the COOP/COG Branch staff of a state-level transportation agency, including a set of personnel position descriptions for the COOP/COG Branch members.

SAFETEA-LU Performance Metrics: Research

Fiscal Year	2007-08	2008-09	2009-10	2010-11	July 1, 2011 - December 31, 2012*
Number of research projects selected for funding	6	16	21	18	35
Total budgeted costs for those projects	\$299,867	\$822,769	\$719,762	\$953,446	\$3,688,869
Number of reports issued that resulted from transportation research projects funded by the UTC grant	5	12	35	37	41
Number of research papers presented at academic/professional meetings that resulted from projects funded by the UTC grant	17	33	66	71	80
Number of students participating in transportation research projects	28	42	39	40	137

* Includes MNTRC partner research.



MTI NATIONAL TRANSPORTATION SAFETY AND SECURITY CENTER



SAFETY
ER



Brian Michael Jenkins

Director

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Mr. Jenkins was appointed in 2008 to lead MTI's National Transportation Security Center of Excellence and its continuing research on protecting surface transportation against terrorist attacks. As a leading authority on terrorism and sophisticated crime, he works with government agencies, international organizations and multinational corporations. He is also a senior advisor to the president of RAND. Mr. Jenkins was deputy chairman of Kroll Associates, an international investigative and consulting firm, and he was chair of RAND's political science department, where he directed research on political violence.

He earned a BA in fine arts and a masters' degree in history, both from UCLA. He studied at the University of Guanajuato, Mexico and at the University of San Carlos, Guatemala, where he was a Fulbright Fellow and received a fellowship from the Organization of American States.

Mr. Jenkins was a paratrooper and a captain in the Green Berets. He is a decorated combat veteran, serving in the Special Forces in the Dominican Republic and Vietnam. He returned to Vietnam as a member of the Long Range Planning Task Group, receiving the Department of the Army's highest award for his service.

Since then, he has served on numerous US and international task forces investigating terrorist attacks. In 1996, President Clinton appointed Mr. Jenkins to the White House Commission on Aviation Safety and Security. He was an advisor to the National Commission on Terrorism and served on the US Comptroller General's Advisory Board. Mr. Jenkins is the author of several articles, reports and books, including *International Terrorism: A New Mode of Conflict* and *Will Terrorists Go Nuclear?*





Frances Edwards, PhD

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Dr. Edwards is Deputy Director of MTI's National Transportation Security Center and a professor and director of the Master of Public Administration program at San José State University. She is a Research Associate of the Mineta Transportation Institute and a member of the Transportation Research Board's Critical Infrastructure Protection Committee ABE 40, and TRB research project NCHRP 20-05/Topic 44-12 oversight committee.

Dr. Edwards is co-author with Dan Goodrich of *Introduction to Transportation Security*, and with Friedrich Steinhausler of two books in the NATO Science Series on terrorism threats and response. She is principal investigator or co-author of ten MTI reports. She also authored numerous chapters for text and professional books, most recently on FEMA's new Whole Community approach to emergency planning.

She has written more than 30 professional journal articles, most recently on post-disaster homelessness for *The Public Manager*, and cross-border disaster response issues in *Journal of Contingency and Crisis Management*. She serves on the ASPA Hurricane Katrina Task Force, and was a member of the Executive Session on Domestic Preparedness at Harvard, the Bioterrorism Working Group at Stanford, three NATO expert workshop panels on terrorism, and the California Seismic Safety Commission. For 25 years Dr. Edwards was a practitioner, including 14 years as the Director of Emergency Preparedness for San José, California, the nation's tenth largest city. She has a PhD and MUP from New York University, an MA from Drew University, and a Certificate in Hazardous Materials Management from the University of California, Irvine.

The *New York Times*, *Washington Post* and other national media have identified Dr. Edwards as one of the nation's leading experts on disaster response and recovery planning and training.





Overview

In 2004, with the approval of its Trustees, MTI established the National Transportation Security Center (NTSC) funded jointly by US DOT and Caltrans grants. In 2007, MTI became part of the new National Transportation Security Center of Excellence (NTSCOE - a consortium of seven universities and research centers) created by the Department of Homeland Security (DHS). Funding was initiated in 2008 and concluded in 2012, when the NTSCOE was no longer funded by DHS.

Near the end of 2012, the Center's name was changed to the National Transportation Safety and Security Center (NTSSC) to accurately reflect the broader scope of MTI's research. This includes all threats – not only terrorism, but also natural disasters, accidents, operational emergencies, and other hazards prioritized by the Federal Transit Administration under the new MAP-21 legislation. Specifically, FTA is ushering in a new era for transit safety, and it is committed to working with state leaders to strengthen and help fund robust state safety oversight agencies to carry out this vitally important mission. MTI is already in a position to support that mission.

Brian Michael Jenkins, a former member of the White House Commission on Aviation Safety and Security and advisor to the National Commission on Terrorism, has led MTI's research on terrorism and surface transportation since its inception in 1996. He continues to serve as NTSSC director. Mr. Jenkins is assisted by Dr. Frances Edwards, who serves as deputy director, and administratively by Dr. Karen Philbrick.

The primary NTSSC staff includes Bruce Butterworth, whose career on Capitol Hill, in the US Department of Transportation (DOT) and as a former Director of Operations for Security at the Federal Aviation Administration (FAA) encompasses three decades of government experience. Renee Haider, a former Associate Director at the National Transit Institute, joined MTI in 2010, bringing to the NTSSC more than 19 years of experience in training, education, and project management focusing on transportation industry. The primary team is assisted by a group of specialists consultants recruited worldwide.

MTI's NTSSC focuses its research on five main areas: threat analysis; security policy and procedures; disaster planning and emergency management; safety policy and procedures; and developing training programs and materials for security, safety, and emergency-response activities.

MTI's NTSSC research focuses on examining actual events through detailed case studies and quantitative analysis of its unique and expanding computerized database to identify terrorist targeting, tactics, and methods; to distill the lessons; and to identify best practices. Its research is empirical, that is, based on real data, quantitative where possible. Its findings are intended to be pragmatic and impactful – producing applicable results that can be used by stakeholders to evaluate and sometimes change their practices. MTI's NTSSC is international in outlook, learning lessons from worldwide experience, and it makes its research readily available to users through reports, summit meetings, briefings, training programs, and outreach materials.

This past year, the NTSSC's priorities were to make its computerized database – a compendium of just under 3,500 attacks on surface transportation targets – more rapidly responsive, more powerful, and web based accessible to DHS users. This enabled even more detailed analyses to help stakeholders decide key policy and operational issues; to complete the NTSSC's blueprint for supporting a DHS-sponsored consortium project aimed at refining methods of threat and security analyses; to expand its work in safety analysis and training; and to support urban transit systems and new high-speed-rail projects in the United States with up-to-date research results. The NTSSC places great emphasis on delivering usable reports, along with training products, as projects or phases of projects are completed.

Activities

In this past year, the NTSSC team has made 12 presentations at academic and professional meetings. These included presentations to the Department of Homeland Security (DHS), the Federal Transit Administration (FTA), and at Transportation Research Board (TRB) meetings. It also provided briefings through the Public Transportation and Surface Transportation Information Sharing and Analysis Centers (PT/ST-ISACs) and provided information for seven Congressional Testimonies.

In August 2011, Mr. Jenkins represented MTI's NTSCOE at the TRB Transportation Hazards and Security Summit in Irvine CA. This summit's theme was "Looking Beyond the 10th Anniversary of 9/11," and it featured Mr. Jenkins as the plenary speaker and as the expert to address "Terrorist Threats to Passenger Rail and Rail Infrastructure."

At the 2011 University Programs Summit, MTI's NTSCOE received the Science and Technology Directorate's "Impact Award" – "for analytical Support to TSA Explosives Training." The citation on the award read:

"MTI transitioned research and analytical findings into training for TSA Explosive Operators deployed in mass transit, passenger rail and freight rail environments. MTI's analysts gave TSA officers an operational understanding of the unique threats, hazards and challenges of performing counter-IED operations in the surface transportation domain, including critical situational awareness of comparative lethality among attack vectors, adversary strategies in the use of multiple explosive device, and safe mitigation techniques."

Team member Bruce Butterworth hosted a last training session in Ft. Worth TX in August 2011.

Dr. Edwards and Research Associates Dan Goodrich and Bill Medigovich completed the *Generic COOP COG Plan for State Level Transportation Agencies*, Report 11-01, and Dr. Edwards and Mr. Goodrich created *Continuity of Operations/Continuity of Government for State-Level Transportation Agencies*, Report 11-02, which includes a complete training program and instructor materials for two courses. Transportation organization Emergency Operations Center staff training incorporates FEMA guidance and ICS/NIMS requirements. The Emergency Relocation Group (ERG) course is the first training program for ERG members. While the first offering of the ERG course was completed with Caltrans headquarters, the researchers won a DHS grant to offer the course on the East Coast. It was hosted by FEMA Region I in May 2012 for the region's transportation organizations, including several states, the Coast Guard and Amtrak. As a result of this presentation, they were invited to present a poster session at the DHS Resiliency Conference in Boston in September 2012. Amtrak's Northeast Corridor Emergency Planning Committee invited them to deliver the ERG training to them, also in September 2012.

Dr. Edwards and Mr. Goodrich spoke at the FEMA Higher Education Conference on adult education in emergency management and homeland security. They held a poster session on MTI Security Research at the California State University Chancellor's Committee on Homeland Security and Emergency Management that showcased the MTI report collection. They also held a poster session at the TRB Security Summit on their current research on exercises for transportation organizations. Dr. Edwards spoke at the San José Housing Coalition on the importance of emergency planning, using materials from Report 11-02, and to the San José State University College of Social Sciences faculty on campus emergency preparedness, using materials from Report 08-06.

Dr. Edwards was the plenary session keynote speaker at the University of Central Florida's *Building Disaster Resiliency and Sustainability Workshop*, sponsored by a grant from the US Department of Agriculture. She was invited to turn her paper, "All Hazards, Whole Community: Creating Resiliency," into a chapter for the Routledge Press book, *Disaster Resiliency: Interdisciplinary Perspectives*, edited by Naim Kapucu of the University of Central Florida and published in December 2012. She and Mr. Goodrich co-authored "Chapter 11- Non-FEMA Mitigation: Local Government Actions" and "Chapter 12- State Initiatives" in *Natural Hazard Mitigation*, edited by Alessandra Jerolleman of Save the Children and John Kiefer of the University of New Orleans for CRC Press. Dr. Edwards also wrote an article on post-disaster homelessness for *The Public Manager*, and a chapter on cultural competency in disaster management titled "Doing Good Badly" for *Cultural Competency for Public Managers*, edited by Kristen Norman-Major of Hamline University and Susan T. Gooden of Commonwealth University.

CRC Press invited Dr. Edwards and Mr. Goodrich to write a book on transportation security. That book, *Introduction to Transportation Security*, with a foreword by Secretary Norman Y. Mineta, has been widely acknowledged as unique in its breadth and depth in addressing the security challenges for road, rail, maritime and air freight transportation systems. They are representing MTI on the university's Cyber Security Committee, and Dr. Edwards was invited to meet with Secretary of Homeland Security Janet Napolitano to discuss the development of a graduate level cyber security curriculum. Mr. Goodrich has been asked to revise his Security for Transportation Professionals course as an offering to cyber security students.

MTI Research Associate Renee Haider conducted a webinar with the staff of the TSA Mass Transit and Passenger Rail Surface Division to present the EMCAPS Phase II research conclusions and recommendations. Moreover, the findings from this research were presented to the APTA Standards Development Program Security Risk Management Sub-Committee, which is developing a recommended practice on public awareness programs, and to the Maryland Transit Administration (MTA).

International Activities

Mineta Transportation Institute was invited by the US Department of Transportation to host the Disaster Assistance Working Group meeting in January 2012. This bilateral annual meeting brings together transportation emergency managers from the United States and China to share best practices for emergency management. MTI Directors Donna Maurillo and Dr. Edwards worked with US DOT staff to create the conference and field learning experiences. Dr. Edwards was moderator for the workshop and the principal author for the workshop's official report. Research Associate Col. William Medigovich, USA (ret.) was the banquet speaker, and Mr. Goodrich gave the luncheon talk aboard the *USS Midway* on the use of military transportation vehicles for disaster response and rescue. MTI organized a program of local speakers including representatives of WETA, BART, Golden Gate Bridge Authority, and Caltrans.

Dr. Edwards and Mr. Goodrich delivered a course on emergency management and security to Chinese officials visiting San José from Jinan, China, who were studying leadership at San José State University. Dr. Edwards was selected as a Salzburg Scholar for 2012, and she spent a week in Salzburg collaborating with San José State University and European colleagues on globalizing the university. As a result, she is working with colleagues to revitalize the global studies undergraduate program to include global supply chain security in courses for undergraduates.



NTSSC Research Findings Summary

Terrorists remain obsessed with attacking commercial airliners, as evidenced by the attempt in December 2009 to sabotage a Northwest airliner flying between Amsterdam and Detroit, and the November 2010 attempt to detonate bombs in an all-cargo aircraft flying to the United States. However, public surface transportation is a more accessible killing field that is actively targeted by terrorists. As of July 3, 2012, terrorists had carried out 157 attacks on airliners and airports (outside of the war zones in Iraq, Afghanistan and Somalia) since 9/11. A good many of these caused no casualties and were, for example, rocket, mortar or small arms attacks against commuter airports in Southwest Asia. Only six attacks delivered any fatalities, resulting in a total of 157 killed and 357 injured, yielding an average lethality per attack of just over 2.0 deaths. Taking the two most lethal attacks – twin suicide bombings of Russian airliners in 2004 – lethality per attack was 44 deaths.

Although there have been attacks on some airlines, it is attacks on transit systems that have been extensive. During the same period (from 9/11 to present), terrorists have carried out approximately 2,136 attacks against public surface transportation worldwide, resulting in 5,431 deaths and 14,601 injuries. The average lethality per attack was proportionately higher than in aviation. For passenger trains, it was approximately 3.3 deaths, and for buses, it was 3.3 deaths. Thus, there were proportionately more attacks on transit systems, which yielded a higher lethality rate than the attacks on airlines. In discussing the quantity of people killed, there were also 11 attacks in which 50 or more people were killed. In three of these attacks, the death toll climbed to just below 200. If one were to translate these 11 attacks into transport category hull losses, it would equate to seven airliners lost since 9/11 – a startling finding.

Many of the attacks on surface transportation (including some of the most spectacular) were carried out by individuals and groups connected with the global jihadist terrorist campaign. These include the March 2004 bombing of commuter trains in Madrid, which killed 191 people; the July 2005 bombing of three London subway trains and a bus, which killed 52; and the July 2006 attack on commuter trains in Mumbai, which killed 207. However, other groups, from Palestinian resistance factions in the Middle East to Tamil separatists in Sri Lanka, have also carried out devastating attacks. For example, in May 2010, Maoist guerrillas in India derailed a passenger train onto the tracks of an oncoming freight train, killing 148 people.

NTSSC Analysis of Jihad Versus Non-Jihad Attacks

A recent analysis using the MTI database compared jihadist to non-jihadist attacks, and also to all attacks (jihadist or not) that occurred in Western or analogous cities. The analysis revealed just how lethal jihadist attacks have been. The report identified that 71 percent of non-jihadist attacks resulted in zero deaths, and only 1.8 percent killed 25 people or more. In attacks on Western or Analogous Cities, 85 percent resulted in zero deaths, and 2.7 percent killed 25 people or more, a factor attributable to the inclusion of jihadist attacks in Madrid, London and Moscow.

In contrast, only 38.5 percent of jihadist attacks resulted in zero deaths, 8.3 percent killed 25 or more people, and 5.2 percent killed 50 or more people. Even more interesting, this lethality is high even when compared to attacks in Israel and Sri Lanka, the scenes of very deadly campaigns (54.2 percent killed zero people, 2.2 percent killed 25 or more, and only 1.1 percent killed 50 or more). Finally, compared with attacks in Sri Lanka, which are probably the most bloody in MTI's database, jihadist attacks are still more lethal – 43.9 percent of attacks (compared to 38.5 percent for jihadist attacks)

resulted in zero deaths, 7.3 percent killed 25 or more (compared to 8.3 percent for jihadist attacks), and 3.7 percent killed 50 or more (compared to 5.2 percent for jihadist attacks).

Continued Investigation of Terrorist Behavior against Transit (July 2011-June 2012)

The statistics of attacks against transit systems have been organized, monitored, updated, and analyzed through the NTSC/MTI *Database on Terrorist and Serious Criminal Attacks Against Public Surface Transportation*. This database has the capability to monitor trending in terrorist activity against transit systems. This information has been organized to aid in the decision-making process related to suitable security responses. Findings from the database were recently quoted in the United States House of Representatives Homeland Security Subcommittee on Transportation Security Administration's Surface Inspection Program, May 31, 2012, and in other prominent research.

Discussing general trends in terror activity between July 2011 and June 2012, there have been 136 recorded incidents of terrorism. These attacks have resulted in approximately 1,917 total casualties – 547 killed, and 1,370 injured. In 2012, the two largest attacks resulting in highest death rate occurred in Jamrud, Pakistan, and Kaduna, Northern Nigeria. The attack in Pakistan was assumed to be conducted by known terrorist group Tehrik-i-Taliban on January 10, 2012, which targeted a bus station, killing 30. In Nigeria, Boko Haram was suspected of carrying out activity on a bus station on April 8, 2012 that killed 30. Notable activity has occurred in various regions in Syria and Pakistan, in which buses have been predominately targeted for attack.

The MTI database provides both up-to-date and historical information on terror activity against transit systems. Most recently, information from the database has been organized to assess characteristics of the attacks, such as the time of day and most common day of the week.

Terrorist Plots

NTSC also actively analyzes patterns pertaining to terrorist plots against transit systems. Terrorist plots abroad include a plot to attack London's Heathrow Express in April 2005; a failed attempt in July 2005 to replicate the deadly July 7 bombings; an August 2005 plot to release toxic chemicals on London's Tube; a November 2005 plot to bomb train stations in Melbourne or Sydney; an April 2006 plot to blow up a commuter train in Milan; a failed attempt to bomb German trains in August 2006; and a January 2008 plot to bomb the Barcelona Metro.

Since 9/11, public surface transportation systems in the United States have also been the targets of a number of terrorist plots, including a January 2003 plot to release cyanide on New York subways; an August 2004 plot to blow up a subway station in midtown Manhattan; a July 2006 plot to blow up subway tunnels under the Hudson River; a 2008 plot to attack the Long Island Railroad; and a September 2009 plot to blow up New York subways.

MTI was one of the first research centers to address this trend. Its research on transportation security issues began in 1996 with case studies, a chronology of terrorist attacks, and security summits that brought together operators and government authorities. That focus continued through 2008 as MTI began to assemble its database, starting with its own seminal chronologies, and then maturing more with the help of NTSCOE funding.

Security Projects Completed in Fiscal Years 2009-10 and 2010-11

The following projects were described in more detail in prior annual reports. They are listed here in order of project number to ensure that all completed projects are acknowledged.

Emergency Management Supplemental Report

Project 2727-2

Publication WP 10-01

Investigators: Frances Edwards, PhD; Daniel Goodrich

Handbook of Emergency Management For State-Level Transportation Agencies

Project 2850

Publication 09-10

Investigators: Frances Edwards, PhD; Daniel Goodrich

Explosives and Incendiaries Used in Terrorist Attacks on Public Surface Transportation: A Preliminary Empirical Analysis

Project 2875

Publication WP 09-02

Investigators: Brian Michael Jenkins; Bruce Butterworth

Mass Transit Bus Operator Behavioral Awareness Training Program

Project 2875-II

<http://transweb.sjsu.edu/project/2875-2.html>

Investigators: Chris Kozub; Brian Michael Jenkins

Supplement to MTI Study on Selective Passenger Screening in the Mass Transit Rail Environment

Project 2876

Publication 09-05

Investigators: Brian Michael Jenkins; Bruce Butterworth; Larry Gerston

The 1995 Attempted Derailing of the French TGV (High-Speed Train) and a Quantitative Analysis of 181 Rail Sabotage Attempts

Project 2877/ 2501-2

Publication 09-12

Investigators: Brian Michael Jenkins; Bruce Butterworth; Jean-Francois Clair

Emergency Management Training and Exercises for Transportation Agency Operations

Project 2910

Publication 09-17

Investigators: Frances Edwards, PhD; Daniel Goodrich

Exploring the Effectiveness of Transit Security Awareness Campaigns in the San Francisco Bay Area

Project 2914

Publication 09-19

Investigators: Nina Rohlich; Peter Haas, PhD; Frances Edwards, PhD

Potential Terrorist Uses of Highway-Borne Hazardous Materials

Project 2981

Publication 09-03

Investigators: Brian Michael Jenkins; Bruce Butterworth

Terrorist Attacks on Public Bus Transportation: A Preliminary Empirical Analysis

Project 2982

Publication WP 09-01

Investigators: Brian Michael Jenkins; Bruce Butterworth; Karl Shrum

Projects Completed

July 1, 2011 - December 31, 2012

Bus Operator Awareness Research and Development Training Program: Phase II

Project 2875

<http://www.transweb.sjsu.edu/project/2875-2.html>

Investigators: Brian Michael Jenkins; Chris Kozub

This phase of the BOARD project resulted in a 15-minute summary of the BOARD course material previously developed and distributed by DHS/TSA to transit systems and displayed in operator break rooms, at safety briefings, during annual refresher training sessions, or in other similar settings. This briefing is an auto-run PowerPoint presentation with an audio overlay of narration and music. The relevant visual material, sources, and storyboard were approved by DHS prior to the creation of the PowerPoint.

Continuity of Operations/Continuity of Government for State-Level Transportation Organizations

(Former title: *MTI NTSCOE: NIMS/COOP/COG Applications and Implementation for State Transportation Agencies: Best Practices*)

Project 2976

Publication 11-02

Investigators: Frances Edwards, PhD; Daniel Goodrich

The Homeland Security Presidential Directive 20 (HSPD-20) requires all local, state, tribal, and territorial government agencies, and private sector owners of critical infrastructure and key resources (CI/KR) to create a Continuity of Operations/Continuity of Government Plan (COOP/COG). There is planning and training guidance for generic transportation agency COOP/COG work, and the Transportation Research Board has offered guidance for transportation organizations.

However, the special concerns of the state-level transportation agencies' (State DOTs') plan developments are not included, notably the responsibilities for the entire State Highway Systems and the responsibility to support specific essential functions related to the State DOT Directors' roles in the Governors' cabinets. There is also no guidance on where the COOP/COG planning and organizing fits into the National Incident Management System (NIMS) at the local or state-level department or agency.

This report covers the research conducted to determine how to integrate COOP/COG into the overall NIMS approach to emergency management, including a connection between the emergency operations center (EOC) and the COOP/COG activity. The first section is a presentation of the research and its findings and analysis. The second section provides training for the EOC staff of a state-level transportation agency, using a hybrid model of FEMA's ICS and ESF approaches, including a complete set of EOC position checklists, and other training support material. The third section provides training for the COOP/COG Branch staff of a state-level transportation agency, including a set of personnel position descriptions for the COOP/COG Branch members.

Security Awareness for Public Bus Transportation: Case Studies of Attacks Against the Israeli Public Bus System
(Former title: *Mineta Transportation Institute Data Base of Terrorists Attacks against Public Surface Transportation: Chronologies*)
Project 2978

Publication II-07

Investigators: Bruce Butterworth; Shalom Dolev; Brian Michael Jenkins

This report presents 16 case studies of attacks planned or carried out against Israeli bus targets, along with statistical data on the number, frequency, and lethality of attacks against bus targets that have taken place in Israel since 1970 and during the Second Intifada, which occurred between September 2000 and the end of 2006. The statistical data come from MTI's Database on Terrorist and Serious Criminal Attacks Against Public Surface Transportation. The report also includes an analysis of the effectiveness of different improvised explosive devices and methods of delivering them and raises questions for future discussion.

The case studies of bus attacks were selected not because they are statistically representative, but because they provide a variety of interesting observations. They include both lethal and nonlethal attacks, attacks in which security measures were effective or were not followed or were ineffective, and attacks in which the attackers' tactics and/or devices were lethal or failed or reduced the lethality of the attack.

It is hoped that the cases presented in this report and the accompanying analysis will increase understanding of what can happen and of what can deter, prevent, and/or mitigate the occurrence of terrorist attacks against public bus systems.

Carnage Interrupted: An Analysis of Fifteen Terrorist Plots Against Public Surface Transportation
(Former title: *Terrorist Attack Annual Trends Analysis*)

Project 2979

Publication II-20

Investigators: Brian Michael Jenkins; Joseph Trella

This report examines 13 terrorist plots against public surface transportation that were uncovered and foiled by authorities between 1997 and 2010 and two failed attempts to carry out attacks. Certainly, this is not the total universe of foiled or failed terrorist plots in these years, but they were selected on the basis of what is known about them and the accessibility of information. The report focuses on terrorist plots in the West. Seven of the 15 plots took place in the United States, and four occurred in the United Kingdom. These two countries figure prominently as targets of terrorism, and in addition, American and British officials have dealt with terrorist plots through publicized arrests and trials, which provide additional information. Although motive was not a criterion in the selection of the plots, all but one involve individuals or groups inspired by al Qaeda's ideology of violent global jihad against the West. The exception is the 1997

Flatbush plot, in which two terrorists, both of whom had connections with Hamas, angered by events in Palestine, simply wanted to kill as many Jews as possible to express their opposition to US support for Israel. Other sources suggest that the Flatbush plotters wanted to force the release of jailed Islamist terrorists in the United States, including Ramzi Yousef, who participated in the 1993 World Trade Center bombing, and Sheik Omar Abdul-Rahman, who was convicted for his involvement in a plot to carry out additional bombings in New York.

Understanding Terrorist Threat Analysis and the Unique Challenge of Terrorism to Security (U-CASS Study)

(Former title: *World Trade Center Commerce and Security Study (WTC-CAST)*)

Project 1076

Publication N/A

Investigator: Brian Michael Jenkins

The U-CASS project, a collaborative research effort by the Command, Control, and Interoperability Center for Advanced Data Analysis (CCICADA) at Rutgers University, the Center for Risk and Economic Analysis of Terrorism Events (CREATE) at the University of Southern California (USC), and the Mineta Transportation Institute (MTI), examined the benefits and costs of counterterrorism security in urban commercial environments. It attempted to estimate the economic consequences of successful terrorist attacks, including both the direct costs of security - capital investment, operations and maintenance - and the indirect costs—inconvenience, congestion, etc. It also examine the collateral benefits of heightened security, such as enhanced protection against crime, the feeling of greater safety with regard to terrorism, and the contribution of good security to the avoidance of international crises. For example, if security had prevented the 9/11 attacks, the United States might have avoided a costly war in Afghanistan.

Calculating these diverse costs and benefits required sophisticated economic modeling, which was undertaken by CCICADA and CREATE. MTI was responsible for threat analysis, which included creating the terrorist scenarios to be incorporated into the models and a critical review of threat analysis methodology. MTI's principal task was to provide other participants in the U-CASS project with an overall analysis of the current terrorist threat in the United States. MTI also described the unique challenges of security against terrorism, current and potential future approaches to such security, and ways in which terrorists may try to overcome new security measures.

Engagement of Minority Communities in Public Awareness Programs (EMCAPS)

Project 1078

Publication N/A

Investigator: Renee Haider

In July 2010, the US Department of Homeland Security (DHS) launched a national *If You See Something, Say Something*TM public awareness campaign. The campaign seeks to raise public awareness about potential signs of terrorism, with a strong emphasis on the importance of reporting suspicious activity to law enforcement. In support of this effort, the Transportation Security Administration (TSA) reached out to the National Transportation Security Center of Excellence (NTSCOE) to identify opportunities to enhance the effectiveness of public security awareness campaigns in the mass transit sector. A review of existing programs raised questions about whether security awareness messages were reaching all riders, or if specific strategies and tactics were needed to attract the attention of certain market segments, particularly minority communities.

The Engagement of Minority Communities in Awareness Programs (EMCAPS) research project is a collaborative effort among three of the seven NTSCOE institutions: Tougaloo College; the Mineta Transportation Institute (MTI) at San José State University; and the Center for Transportation Safety, Security and Risk at Rutgers, The State University of New Jersey. It specifically explores the engagement of African Americans in public transit security awareness campaigns since African Americans comprise a significant percentage of mass transit ridership, especially in large urban areas.

The research was organized into two phases. Phase I was completed in August 2011 in collaboration with the Metropolitan Atlanta Rapid Transit Authority (MARTA). During Phase II, the research team worked with the National Capital Region's (NCR) Transit Security Working Group (TSWG) to conduct field research involving its new regional public awareness campaign. The goal of the NCR campaign was to build on the successful *If You See Something, Say Something™* initiative using both traditional and non-traditional communication tools. The design and structure of the campaign was consistent with many of the recommendations presented in Phase I findings. Key Phase II research tasks included NCR transit agency interviews, a quantitative analysis of raw data from MTA's annual Customer Ridership Survey (CRS) over two years, and a series of customer focus groups. In addition, the research team explored alternative performance measures that could be applied by transit agencies to evaluate the effectiveness of public awareness programs.

This *Phase II Final Report* reviews the findings from each project task, documents the research team's conclusions regarding the engagement of African Americans in public awareness programs, offers recommendations for improving campaign effectiveness, and identifies additional research topics.

Practices in Wayside Rail Track/Transit Worker Safety Protection (TCRP Synthesis J-07/Topic SF-15)

Project 1079

Publication N/A

Investigators: Chris Kozub; Renee Haider

Between 2003 and 2008, the nation's heavy rail transit systems experienced eight accidents that resulted in the deaths of ten right-of-way workers, including track inspectors, track workers, and signal technicians, representing a 300 percent increase in the rate of fatalities and injuries from the historic averages in the heavy rail industry. In 2010, two more rail transit right-of-way workers lost their lives when they were struck by a high-rail vehicle.

Of the 19 worker fatalities reported to the National Transit Database (2003-2008) for rail transit, 17 were reported for heavy rail service and two for light rail service. Over half of those fatalities reported occurred on the right-of-way. This is in addition to the track worker injuries and close calls that occurred on the right-of-way during the period.

In 2010 MTI was selected to conduct Transit Cooperative Research Program (TCRP) synthesis study J-07/Topic SF-15 on Practices for Wayside Rail Transit Track Worker Protection. The objective of this study is to report the state of knowledge and practice regarding wayside worker protection programs at selected transit agencies and to document the state of the practice, including lessons learned and gaps in information.

Transit agency personnel interviewed by MTI researchers indicated that in the wake of incidents involving track worker fatalities or near misses, their systems took aggressive actions. For example, as a result of two track worker fatalities on the New York City Transit (NYCT) system, the agency formed a Track Safety Task Force to evaluate the

safety culture, identify deficiencies and strengths, and develop recommendations for improvements. After a near miss incident, the Toronto Transit Commission (TTC) established a Track Level Safety Team. This committee, composed of senior management from all the rail operations disciplines and worker representatives, was charged with developing recommendations on how to improve the safety of employees working at track level. Other systems formed or reconstituted “Rules Committees” to revisit their right-of-way (ROW) rules and procedures and make necessary improvements. The Massachusetts Bay Transportation Authority (MBTA) essentially re-wrote their complete rule book from scratch, in a collaborative effort with labor and management representatives from several departments.

Five systems, including the NYCT and MBTA, participated in the study by providing materials and/or taking part in extensive interviews and site visits. The other three were Maryland Transportation Administration (MTA), the Toronto Transit Commission (TTC), and the New Jersey Transit River LINE operation. These five systems afforded the research team a range of modal, operational, demographic, size, and historical characteristics from which to look at practices and processes.

The study methodology included a literature review, telephone interviews, a review of rail transit documents including rule books, bulletins, training documents, and trend analyses, and selected site visits. During the site visits, the research team also witnessed flagging and worksite procedures in practice. Three key findings were identified as a result of this effort:

- The high-level standard developed by the American Public Transportation Association (APTA) *Standard for Work Zone Safety* authorized by the APTA Rail Transit Standards Executive Committee on June 8, 2003 is the only national resource addressing transit track worker safety.
- Each of the five systems included in the research continually strive to improve the safety and level of protection for their ROW workers.
- Deviations existed in each system’s program depth and complexity. These deviations varied from those that reflected the environmental and operational hazards and characteristics of the systems to those that were more influenced by organizational cultural characteristics and/or historical practices.

Specifically, transit systems are taking steps to:

- Improve their procedures to enhance safety and clarify rules so they are more easily understood.
- Augment their initial and recertification training programs for track workers and flaggers.
- Identify specific pieces of equipment essential to keeping workers safe.
- Implement audit or inspection processes for rules compliance.

The practices, reported by the agencies interviewed to have a positive impact, ranged from minor changes to major initiatives. A sample of these practices includes implementation of a joint labor/management pre-job safety inspection in NYCT; new procedures that require a Transportation Official (supervisor) to be part of setting up certain flagging sites and the deployment of “Emergency Personal Protective Equipment Boxes” throughout rail system at MBTA; implementation of computer-based training for recertification training at MTA; and use of unique-colored vests for watchman/flagman on the River LINE.

While these practices and several others continue to improve track worker safety, they represent pieces of programs that lack industry consistency and an evaluation mechanism. Overall program effectiveness is very difficult to measure given the lack of an industry standard for specific components and practices and for evaluating program strengths and areas in need of improvement. Within the five systems included in the study, there were four distinct processes for determining, establishing, and carrying out track worker protection levels and measures, with significant differences in staffing levels, risk tolerances, training requirements, and audit processes.

Ongoing Research Projects

Safer at Higher Speeds: A Comparative Analysis of International High-Speed Rail Incidents

(Former title: *Safety and Security Best Practices for High-Speed Rail Systems*)

Project 1026

Investigators: Chris Kozub; Brian Michael Jenkins

The objective of this research project is to identify best practices for incorporating and addressing safety and security in the planning, infrastructure and equipment design and construction, operating policies and procedures, and training and customer outreach efforts for high-speed rail systems by studying and evaluating these elements of existing high-speed rail operations in Europe, Asia, and North America.

Task Description:

1. Accident information gathering on six high-speed rail systems: Shinkansen (Japan), TGV (France), Eurostar (UK France/Belgium), ICE (Germany), Nevsky Express (Russia), and ACELA (US) – all dating back to the inception of revenue service on each system
2. Analysis of accidents on the aforementioned high-speed rail systems
3. Analysis of HSR security incidents cataloged within the MTI surface transportation security database (1970 to present)
4. Analysis of major Amtrak (non-HSR) accidents since 1980
5. Comparative analysis of HSR and non-HSR accident conditions and outcomes
6. Final report and briefing on empirical incident data
 - a. Generate a report on the preliminary analysis of HSR accidents to identify past system weaknesses and lessons learned from existing HSR operations as well as incident outcomes that may be desirous of terrorist organizations. This report will include the basic data compiled in the research process.
 - b. Develop a summary briefing on the HSR security incidents within the MTI database.

MTI Web Site

Of note, one particular security report broke all records for a document download. *Carnage Interrupted: An Analysis of Fifteen Terrorist Plots against Public Surface Transportation* generated 119,567 downloads in April 2012, representing 36 percent of all downloads for that month. Other security reports continued to bring in respectable numbers, as well, including 2010's *Explosives and Incendiaries Used in Terrorist Attacks on Public Surface Transportation: A Preliminary Empirical Analysis* and *Terrorist Attacks on Public Bus Transportation: A Preliminary Empirical Analysis*, among others. These two examples prove that MTI security reports continue to attract downloads long after their publication dates.





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Asha Weinstein Agrawal, PhD

Director

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Dr. Asha Weinstein Agrawal is Director of the MTI National Transportation Finance Center at San José State University. She also is an Associate Professor in the Urban and Regional Planning Department at San José State.

Her research and teaching interests in transportation policy and planning focus on transportation finance, pedestrian planning, and transportation history. Her publications include “How to Pay for Transportation? A Survey of Public Preferences in California” with Jennifer Dill in *Transport Policy*; “Unraveling Equity in HOT Lane Planning: A View from Practice” with Gian-Claudia Sciara in the *Journal of Planning Education and Research*; and *Getting Around When You’re Just Getting By: The Travel Behavior and Transportation Expenditures of Low-Income Adults*, published by the Mineta Transportation Institute. A complete list of her publications can be accessed at www.sjsu.edu/faculty/weinstein.agrawal/.

Dr. Agrawal earned a BA from Harvard University, an MSc from the London School of Economics and Political Science, and a PhD from the University of California Berkeley.





Overview

Recognizing the critical role that transportation finance plays in transportation policy-making, the Mineta Transportation Institute established its National Transportation Finance Center (NTFC) in 2008. The NTFC funds research in cutting-edge practices in surface transportation finance and disseminates the results widely to aid policy makers. In addition, the NTFC helps to educate decision-makers, planners, and the public about current transportation finance debates and opportunities.

Within the large arena of transportation finance topics, the NTFC emphasizes research into “smart” finance options – revenue and finance tools that not only raise needed transportation revenues but also promote social goals such as environmentally sustainable transportation systems, congestion management, and social equity.



Activities

Funding Transportation Finance Research

One of the NTFC's central activities is to foster research on transportation finance. During the 12 months from July 1, 2011 through June 30, 2012, the Center published four new research reports. An additional three projects, funded through the Mineta National Transit Research Consortium (MNTRC), are underway.

The research projects cover a wide array of topics, from an assessment of the factors that lead voters to approve local sales taxes for transportation to an examination of the challenges of funding airport ground access projects and the role of collaborative funding strategies between the different agencies that typically become involved in such projects.

Following are descriptions of the four projects completed during the referenced 12-months.

Completed Research Projects

Collaborative Funding to Facilitate Airport Ground Access

Project 2503

Publication 11-27

Principal Investigator: Geoffrey D. Gosling, PhD

This report presents the findings and conclusions from a research study that has examined the challenges of funding airport ground access projects and the role of collaborative funding strategies among the different agencies that typically become involved in such projects. The report reviews the recent literature on funding airport ground access projects, as well as funding transportation projects more generally. This is followed by a detailed review of current federal transportation funding programs relevant to airport ground access projects, as well as a discussion of state and local funding programs and potential opportunities for private-sector funding.

A major component of the research described in the report consists of detailed case studies of seven selected airport ground access projects, including a major intermodal center, two automated people-mover projects, two airport access highway projects, and two airport rail links. These case studies examine the history of each project, the costs involved, and the funding programs and mechanisms used to finance the projects.

Based on the literature review, the review of current funding programs, and the case study findings, the report identifies potential funding strategies for intermodal airport ground access projects, requirements for effective implementation of these strategies, and a recommended approach to facilitate successful project development and implementation. The report also presents recommended changes to transportation funding program rules and regulations that could facilitate and simplify development of intermodal solutions to future airport ground access needs.

Systematic Procedures to Determine Incentive/Disincentive Dollar Amounts for Highway Transportation

Construction Projects

Project 2908

Publication 11-22

Principal Investigator: Jae-Ho Pyeon, PhD

The Federal Highway Administration has encouraged state transportation agencies to implement Incentive/Disincentive (I/D) contracting provisions for early project completion. Although general guidelines to determine the I/D dollar amount for a project are available, there is no systematic and practical tool in use to determine optimum I/D dollar amounts for I/D projects considering road user cost, agency cost, contractor's acceleration cost, and contractor's cost savings. Therefore, systematic procedures and models to assist project planners and engineers in determining an appropriate I/D dollar amount are essential to optimizing the use of I/D contracting techniques.

This research performed a literature review related to the determination of daily I/D dollar amounts. Caltrans I/D project data were then collected and evaluated. Project performance data were analyzed with regard to project outcomes in two key areas: project time and project cost. Statistical analyses were performed to identify the impact of I/D dollar amount on project time and cost performance. Using Construction Analysis for Pavement Rehabilitation Strategies (CA4PRS) software, Caltrans I/D projects were analyzed to introduce three different levels of CA4PRS implementations for the I/D dollar amounts calculation. Based on the results of the I/D project case studies, the systematic procedures to determine appropriate I/D dollar amounts were developed using the CA4PRS schedule-traffic-cost integration process for the new I-5 rehabilitation project in LA. The proposed procedures were applied to a typical highway pavement rehabilitation project using HMA (hot mix asphalt) materials. Further research is needed to apply the proposed model to other types of highway projects, with adjustment for the type of project.

A Decision Support Framework for Using Value Capture to Fund Public Transit:

Lessons from Project-specific Analysis

Project 1004

Publication 11-14

Principal Investigator: Shishir Mathur, PhD

Local and state governments provide 75 percent of transit funds in the United States. With all levels of governments under significant fiscal stress, any new transit funding mechanism is welcome. Value capture (VC) is one such mechanism. Based on the "benefits received" principle, VC involves the identification and capture of public infrastructure-led increase in land value.

While the literature has extensively demonstrated the property-value impacts of transit investments and has empirically simulated the potential magnitude of VC revenues for financing transit facilities, very little research has examined the suitability of VC mechanisms for specific transit projects. This report aims to fill this research gap by examining five VC mechanisms in depth: tax-increment financing (TIF), special assessment districts (SADs), transit impact fees, joint developments, and air rights.

The report is intended to assist practitioners in gauging the legal, financial, and administrative suitability of VC mechanisms for meeting project-specific funding requirements.

Cost Estimate Modeling of Transportation Management Plans for Highway Projects

Project 1007

Publication 11-24

Principal Investigator: Jae-Ho Pyeon, PhD

Highway rehabilitation and reconstruction projects frequently cause road congestion and increase safety concerns while limiting access for road users. State Transportation Agencies (STAs) are challenged to find safer and more efficient ways to renew deteriorating roadways in urban areas. To better address the work zone issues, the Federal Highway Administration published updates to the Work Zone Safety and Mobility Rule. All state and local governments receiving federal aid funding were required to comply with the provisions of the rule no later than October 12, 2007. One of the rule's major elements is to develop and implement Transportation Management Plans (TMPs). Using well-developed TMP strategies, work zone safety and mobility can be enhanced while road user costs can be minimized. The cost of a TMP for a road project is generally considered a high-cost item and, therefore, must be quantified. However, no tools or systematic modeling methods are available to assist agency engineers with TMP cost estimating.

This research included reviewing TMP reports for recent Caltrans projects regarding state-of-the-art TMP practices and input from the district TMP traffic engineers. The researchers collected Caltrans highway project data regarding TMP cost estimating. Then, using Construction Analysis for Pavement Rehabilitation Strategies (CA4PRS) software, the researchers performed case studies. Based on the CA4PRS outcomes of the case studies, a TMP strategy selection and cost estimate (STELCE) model for Caltrans highway projects was proposed. To validate the proposed model, the research demonstrated an application for selecting TMP strategies and estimating TMP costs. Regarding the model's limitation, the proposed TMP STELCE model was developed based on Caltrans TMP practices and strategies. Therefore, other STAs might require adjustments and modifications, reflecting their TMP processes, before adopting this model. Finally, the authors recommended that a more detailed step-by-step TMP strategy selection and cost estimate process be included in the TMP guidelines to improve the accuracy of TMP cost estimates.

New MNTRC Finance Projects

What Do Americans Think About Federal Tax Options to Support Public Transit, Highways, and Local Streets and Roads? Results from Year 3 of a National Survey

Project 1128 (this project was funded and completed in 2012)

Publication 12-01

Principal Investigator: Asha Weinstein Agrawal, PhD

This report summarizes the results of a national random-digit-dial public opinion poll that asked 1,519 respondents if they would support various tax options for raising federal transportation revenues, with a special focus on understanding support for increasing revenues for public transit. Eleven specific tax options tested were variations on raising the federal gas tax rate and creating a new mileage tax, and creating a new federal sales tax. Other questions probed various perceptions related to public transit, including knowledge and opinions about federal taxes to support transit. In addition, the survey collected data on standard socio-demographic factors, travel behavior (public transit usage, annual miles driven, and vehicle fuel efficiency), and attitudinal data about how respondents viewed the quality of their

local transportation system and their priorities for government spending on transportation in their state. All of this information was used to assess support levels for the tax options among different population subgroups.

The survey results show that a majority of Americans would support higher taxes for transportation—under certain conditions. For example, a gas tax increase of 10¢ per gallon to improve road maintenance was supported by 58 percent of respondents, whereas support levels dropped to just 20 percent if the revenues were to be used more generally to maintain and improve the transportation system. For tax options where the revenues were to be spent for undefined transportation purposes, support levels varied considerably by what kind of tax would be imposed, with a sales tax much more popular than either a gas tax increase or a new mileage tax.

With respect to public transit, the survey results from all three years show that most people want good public transit service in their state. However, the 2012 questions exploring different methods to raise new revenues found relatively low levels of support for all of them. Also, large minorities of respondents did not know that all levels of government - local, state, and federal - support transit. The federal government was the least widely recognized source of support.

Net Effects of Gas Price Changes on Transit Ridership in US Urban Areas

Project 1106

Principal Investigator: Hiro Iseki, PhD

This study will examine how changes in gasoline prices affect transit ridership. In order to gauge the net effects of gasoline price changes on transit ridership, this study will apply advanced statistical methods on panel data of retail gasoline prices, transit ridership and operating data in US urban areas, obtained from the Energy Information Administration and the Federal Transit Administration (FTA: the National Transit Database—NTD) and supplemented by other variables that can influence transit ridership.

This study will improve upon research methods used in past studies on the subject as well as transit ridership modeling studies in general. The study will test for statistical problems, such as simultaneity of transit service supply and consumption (ridership), simultaneity among time, gasoline price, and ridership, and omitted variable bias, and address them if problems are identified in the data sets, and examine possibility of non-constant/non-linear relationship between transit ridership and gasoline prices, including different elasticities between gasoline price increase and decrease.

What Do Americans Think About Public Transit? A Review of the US Survey Literature

Project 1132

Principal Investigator: Asha Weinstein Agrawal, PhD

This project will compile and analyze a wide set of US survey data related to public transit, to ascertain themes such as support for transit funding, priorities in terms of service quality, variations in support by transit mode, and geographic variations in support. The research team will collect survey data by searching newspaper archives and the WWW to find reference to surveys completed by government agencies and interest groups, as well as searching traditional library databases for published literature. Once a large group of surveys has been completed, the team will assess the data to look at patterns on a wide variety of factors and prepare a report summarizing the findings. The study results will provide insight into public priorities related to improving public transit service.

Technology Transfer Activities

A highlight of the NTFC's outreach activities was hosting a public forum in June at the Commonwealth Club of California, on the topic of "Financing Infrastructure for America: Are We Becoming a Second Class Country?" The event was moderated by MTI board member Mortimer Downey III, Former US Deputy Secretary of Transportation, and it featured other MTI board members and researchers as panelists: Steve Heminger, John Horsley, Will Kempton, Michael Melaniphy, and Dr. Asha Weinstein Agrawal. In addition, NTFC Director Agrawal has spoken on her finance research at events hosted by the Silicon Valley Leadership Group in San José, UCLA's Lewis Center for Regional Studies, UC Davis's Institute of Transportation Studies, and SJSU's Survey and Policy Research Institute.

In the press, NTFC researchers have been featured in both industry and popular press outlets including The San Francisco Chronicle, AutoBlogGreen, AutoNet, and American City.

NTFC researchers have also been actively presenting their research results across the US and even internationally. Their speaking engagements include presentations at the TRB Annual Meeting in Washington DC; the Association of American Geographers Annual Conference in New York City; the Korean American Scientists and Engineering Association meeting in Los Angeles; and the Association of Collegiate Schools of Planning's Annual Conference in Salt Lake City, among others.



**MTI NATIONAL HIGH-
SPEED RAIL CONNECT
CENTER (NHSRCC)**



TIVITY



Stan Feinsod

Director

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Stan Feinsod is a national leader in the rail, especially high-speed rail movement, and has over three decades of executive-level experience in rail system design and management. He was a founding member and continues to lead the APTA High-Speed Intercity Rail Committee and co-chair APTA's High-Speed and Commuter Rail Joint Legislative Committee. His complete bio is available in the Administration section of this annual report.

Overview

In January 2010, at the direction of the Board of Trustees, MTI established the National High-Speed Rail Connectivity Center funded jointly by US DOT and Caltrans grants. During the past two fiscal years, MTI's competitive grant process selected four high-speed rail (HSR) studies for funding. In addition, MTI sponsored two national high-speed rail Information and Technology Transfer summits. For details on those events, please refer to the Communications and Information Technology Transfer section of this report.

MTI has a long history, beginning in 1998, of studying HSR issues and has published 49 peer-reviewed research reports and has hosted 12 Information and Technology Transfer national summits and regional forums generally related to this subject. Ten of the 45 publications directly relate to HSR connectivity and include the following:

Implementation of Zurich's Transit Preferential Program

Project 9809
Publication 01-13
Principal Investigator: Andrew Nash

Best Practices in Shared Use of High-Speed Rail Systems

Project 2113
Publication 02-02
Principal Investigator: Andrew Nash

A Consumer Logistics Framework for Understanding Preferences for High-Speed Rail Transportation

Project 2206
Publication 05-04
Principal Investigator: Kenneth Gehrt, PhD

High-Speed Rail Projects in the United States: Identifying the Elements for Success

Project 2304
Publication 05-01
Principal Investigator: Allison de Cerreño, PhD

High-Speed Rail Projects in the United States: Identifying the Elements for Success – Part 2

Project 2401
Publication 06-03
Principal Investigator: Allison de Cerreño, PhD

Exploring the Future of California's Transport System

Project 2614
Publication WP 07-03 (MTI Seed Project)
Principal Investigator: Triant Flouris, PhD

Advancing High-Speed Rail Policy in the United States

Project 2905

Publication 11-18

Principal Investigator: Senanu Ashiabor, PhD

Safety and Security Best Practices for High-Speed***Rail Systems***

Project 1026

Publication Phase

Principal Investigator: Brian Michael Jenkins

Estimating Workforce Development Needs for High-Speed Rail in California

Project 1027

Publication 11-16

Principal Investigator: Peter Haas, PhD

Planning for Complementarity: An Examination of the Role and Opportunities of First-Tier and Second-Tier Cities along the HSR Network in California

Project 1030

Publication 11-17

Principal Investigator: Anastasia Loukaitou-Sideris, PhD

To further advance the study of HSR connectivity, MTI established a High-Speed Rail Management Certificate as part of the graduate education program. Two masters level courses specific to high-speed rail connectivity were added to the 2010-11 academic calendar. The first provides an introduction to high-speed rail, including history, development, design, and related issues. The second presents an overview of high-speed rail operations, including management, finance, security, and other operational topics. The need for station area transit connectivity is stressed in both courses. These were the two most heavily attended courses for the MSTM program during the past academic year. Indeed, a large number of graduate students have shown interest in this unique educational track that leads to the professional HSR Management Certificate or a full Master of Science in Transportation Management degree, with emphasis on high-speed rail stressing the need for multimodal connectivity. These and other MTI programs will evolve to meet the workforce needs identified by the North American High-Speed Rail Workforce Needs Assessment conducted by MTI, as requested by the California High-Speed Rail Authority and California State University System. That study has been chosen to be presented at and is scheduled to be published by TRB.

MNTRC has begun an HSR-related cooperative research and outreach program. The University of Nevada Las Vegas is cooperating with MTI on research and in presenting the massive TRB HSR Workshop the first day of TRB on January 13, 2013 in Washington DC. Secretary of Transportation LaHood will keynote the workshop, with Federal Railroad Administrator Joseph Szabo convening the session and introducing the Secretary. Following the keynote will be six panel sessions with 26 of the world's top HSR experts.

Additional information on the popular new MTI and MNTRC research center and education program will be provided in future annual reports as MTI continues to meet the needs of an ever-evolving national transportation system.

Mineta National Transit Research Consortium (MNTRC) – New Projects

MNTRC selected 35 projects for funding in calendar year 2012. Here is a brief description of each project.



Analysis of Transit Travel Demand Change in US Metropolitan Statistical Areas Between 2000 and 2010 Using Two-Stage Least Squares Regression

Project II01

Principal Investigator: Bhuiyan M. Alam, PhD

Proper understanding of the exact nature of transit travel demand models is at the heart of transportation policy making and the success of transit systems. Unfortunately, most of the existing studies have focused on a single or a few transit systems or metropolitan areas to analyze the determinants of transit travel demand change (Lindsey et al. 2010; Thompson et al. 2006). The few studies that have focused on nationwide data have either failed to consider some important variables or are methodologically weak (Taylor et al. 2009; Thompson and Brown 2006). It is difficult to generalize for the whole nation from such studies. This research investigates the big picture of transit travel demand functions at a national level. Using data from the National Transit Database (NTD), US Census Bureau, and the US Bureau of Labor Statistics, this study corrects for the pitfalls of existing studies by:

1. Considering the MSAs as the units of analysis instead of urbanized areas,
2. Analyzing all MSAs in the country instead of few,
3. Using two-stage least squares regression models to control for the reverse causality between the dependent and independent variables,
4. Including more relevant variables that are omitted by the existing studies, and
5. Using passenger trips per capita as the proxy for transit travel demand.

This study expects that service coverage area, service frequency, transit fare, physical orientation of the transit systems, proportion of black women, proportion of Hispanics, population density and automobile ownership level are significant factors affecting transit demand. Because the price of gas has been relatively higher in the last decade compared to the previous ones, this study further expects that gas price will be a significant predictor of transit travel demand change.



Analyzing the Effects of Transit Network Change in a Decentralized, Mid-Sized US Metropolitan Area on Transit Agency Performance and Transit Riders: A Case Study of Tallahassee, Florida

Project 1102

Principal Investigator: Jeffrey Brown, PhD

This project provides a unique opportunity to examine the effects of a change in network structure from one type of network (CBD-radial) to a completely different one (decentralized multi-destination) on transit agency performance (ridership, productivity, cost effectiveness) and the well-being of different classes of transit riders (transit-dependent and choice riders) in a decentralized, mid-sized US metropolitan area.

This study has two important objectives related to transit agency performance and transit rider well-being. First, the study provides the opportunity to examine the effects of transit network restructuring on ridership, productivity (load factor), and cost effectiveness while accounting for other factors that might help to explain agency performance differences highlighted in the existing literature. This is a unique opportunity to have a pre-test, post-test experimental research design, thus remedying a major omission in our understanding of the role of transit service planning decisions in affecting agency performance, as opposed to external factors like area land use patterns and socio-economic factors. Second, the study will allow us to understand whether a decentralized, multi-destination transit network design can serve choice riders while continuing to expand travel opportunities of transit-dependent passengers as compared to a CBD-radial network.

The project uses a case study of Tallahassee FL, a decentralized, mid-sized metropolitan area, to investigate the effects of network change. Star Metro, the local transit agency, moved from a CBD-radial to a decentralized, multi-destination bus transit network in summer 2011, in response to a desire to better serve the dispersed employment and population patterns in the community. Citizens' groups have expressed some concerns about the effects of the service changes on existing riders' access to transit. This case study will provide an opportunity to gather before-and-after data and to conduct interviews with agency employees, policymakers, riders, and other stakeholders about this major network change. The lessons will be relevant to other transit agencies and policymakers concerned about promoting effective transit service throughout the United States.



Handbook: What Transit Security Leaders Need to Know to Improve Emergency Preparedness

Project 1103

Principal Investigator: Frances L. Edwards, MUP, PhD, CEM

The transit and transportation sector is a key critical infrastructure. All other emergency response depends on the availability of functional roads and transportation assets. Police, fire and emergency medical services (EMS) vehicles can only reach disaster victims if passable and safe roads have been inspected and cleared of debris by the transportation agency personnel. Rescue and relief goods can only be delivered to the disaster site if roads, railroads and ports can recover functionality rapidly. This ability to respond to disasters effectively is based on training the transit and transportation agency personnel in advance, and practicing the knowledge and skills needed to ensure the rapid response to disaster events.

The research team of Edwards and Goodrich conducted extensive research through a Mineta Transportation Institute Seed Money Grant that led to a literature review, series of interviews with transit and transportation emergency exercise staff members, and experts in emergency management exercises. This research was published in June 2010 as *Emergency Management Training and Exercises for Transportation Agency Operations*, MTI Report 09-17. This proposed handbook would build on this research and create a practical guide on training and exercises for transportation, based on the literature review and interviews already conducted under 09-16 funding.

The Department of Homeland Security has provided extensive general guidance on developing training and exercise programs for public entities, but little has been done to focus that material on the transportation sector specifically. Most currently available materials focus on police, fire and EMS personnel, and on local and state-level emergency operations centers. The role of the transportation sector in delivering emergency response services is often overlooked, both by the other first responders, and by the transportation sector itself. When transportation agency personnel were interviewed in 2009-2010 they stated that they had little help in developing a thorough and effective training and exercise program specifically for transportation personnel, and often relied on multi-agency training and exercise events focused on police and fire personnel for achieving their exercise goals. This handbook will give them guidance materials, templates and scenarios specific to transit, transportation and multi-modal port training and exercises.



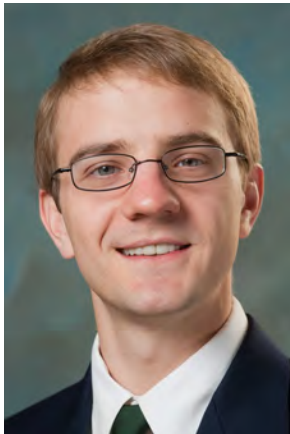
Transit Users' Perceptions of Bike-Friendly Policy Impacts on Accessibility to Transit Services: The First and Last Mile Bridge

Project 1104

Principal Investigator: Bradley Flamm, PhD

The coordination of bicycle and transit modes has received close attention from public transit planners, researchers and advocates in recent years, as US transit agencies have installed bicycle racks on buses and other transit vehicles, implemented bicycles-on-trains policies, and made other efforts to facilitate bicycle-transit integration. Some planners presume that the geographic range of access to transit stops and stations is enlarged by these efforts; however, such changes have not been effectively documented. This research project is designed to assess the extent to which geographic access to public transit services is greater as a result of such facilities and policies, using the results of interviews with planners and a survey of cyclist-transit users (CTUs) of two large American transit systems: the Southeast Pennsylvania Transportation Authority (SEPTA) and the San Francisco Municipal Transportation Authority (SF Muni).

SEPTA and SF Muni are transit agencies with, respectively, low and high bicycle-transit use rates. The survey will address the motivations, practices, and challenges CTUs face in combining bicycle and transit modes. By contrasting CTU behavior in systems with low and high current utilization rates of bicycle-transit facilities and policies, this project will document contrasts in current policies and implementation practices, estimate service-area changes attributable to bicycle-transit integration, and suggest changes that can be made to improve the utilization and accessibility of transit services by cyclists.



Measuring the Value of Transit Infrastructure Using Survey and Voting Data

Project 1105

Principal Investigator: Matthew J. Holian, PhD

The determinants of support for transit-related ballot initiatives will be studied and the research team will explore which groups are most likely to support transit infrastructure projects, and whether their support for transit has increased or decreased over time, by analyzing the results from twenty-two transportation related ballot initiatives that took place in California from 1988 to 2010. The researchers will attempt to validate these findings using survey data, when possible. In addition, ballot-initiative valuation methodology will be used to estimate the social value of transit infrastructure for a subset of these twenty-two initiatives.



Net Effects of Gas Price Changes on Transit Ridership in US Urban Areas

Project 1106

Principal Investigator: Hiroyuki Iseki, PhD

This study will examine how changes in gasoline prices affect transit ridership. In order to gauge the net effects of gasoline price changes on transit ridership, this study will apply advanced statistical methods on panel data of retail gasoline prices, transit ridership and operating data in US urban areas, obtained from the Energy Information Administration and the Federal Transit Administration (FTA: the National Transit Database - NTD) and supplemented by other variables that can influence transit ridership.

This study will improve upon research methods used in past studies on the subject as well as transit ridership modeling studies in general. The study will test for statistical problems, such as simultaneity of transit service supply and consumption (ridership), simultaneity among time, gasoline price, and ridership, and omitted variable bias, and address them if problems are identified in the data sets, and examine possibility of non-constant/non-linear relationship between transit ridership and gasoline prices, including different elasticities between gasoline price increase and decrease.



Neighborhood Crime and Transit Station Access Mode Choice

Project 1107

Principal Investigator: Christopher Ferrell, PhD

There are considerable environmental and public health benefits if people choose to walk, bicycle, or ride transit, instead of drive. Threats posed by possible criminal activity in a person's home neighborhood can play a major role in their decision to drive, take transit, walk or ride a bicycle, even over short distances. The findings of Phase 2 of this research suggest that walking and bicycling trips - often shorter distance trips than auto or transit trips - are particularly sensitive to neighborhood crime levels. Transit trips, on the other hand, appear to respond to neighborhood crime levels in a similar way to auto trips, wherein high crime neighborhoods appear to encourage transit mode choice. However, follow-up analysis performed for Phase 2 found that (though based on a small sample size) transit access trips (walking, bicycling or driving to a transit station) are sensitive to neighborhood crimes as well, wherein high crime neighborhoods discourage walking and bicycling transit access trips and encourage driving.

Increasing transit trips has been a long-standing goal within the transportation planning and engineering professions for environmental, economic and public health reasons. However, not all transit trips are alike. If people have a choice of destinations, say several transit stations, they may choose to drive to a further station if there is a perceived threat to their personal security if they choose to walk to their neighborhood station instead. This choice to drive to avoid the dangers of a high-crime neighborhood, when multiplied by many

people making similar choices, has serious consequences for the environment and our society. Transit trips where people drive from home to a transit station generate substantial air pollution (e.g., cold starts), encourage auto-oriented sprawl and deny travelers the health benefits of walking and bicycling as components of their transit trips.

This study looks at the connection between criminal activity, mode choice and environmental effects. It will build upon previous MTI-funded studies (Phases 1 and 2) conducted by the same researchers. Like these previous phases, this study will empirically estimate (through statistical modeling techniques) the impacts of neighborhood crime rates on Bay Area Rapid Transit (BART) heavy rail transit stations access trip mode choice. While Phases 1 and 2 used travel data from the Bay Area Travel Survey (2000), Phase 3 will delve deeper into the intriguing, preliminary results of Phase 2, which suggested that our “traveler exposure” hypothesis that non-motorized modes of travel (bicycles and pedestrians) are influenced by the perception of high crimes in their neighborhoods, may be true. However, our most intriguing results (as well as the counter-intuitive ones) came from BATS 2000 – a dataset that has a limited number of travel records available for analysis in the six cities for which we have crime data. This is even more true with respect to the tantalizing (but still inconclusive) results we found in Phase 2 from analysis of transit access trips, where we were limited to analyzing a few hundred trip records.

To supplement (and in some applications of our Phase 3 proposal, to replace) the BATS 2000 data, we will use data from BART which performed rider station access surveys in 1998 and in 2008. These new data sets will enhance our understanding of how neighborhood crimes affect an important component of urban travel choice; transit ridership and the ways people choose to travel from home to transit stations. We will also build upon the innovative work done by team-member Bruce Appleyard to develop new and more fine-grained measures of urban form. These measures will allow this study to evaluate the effects of both crimes and urban form characteristics; not only at the origin and destination of each station access trip, but also along the entire corridor of travel for each trip.



Changes in Transit Use Near a New Light Rail Transit Line; Applications of Market Research Methods to Understand Travel Behavior Change

Project 1108

Co-Principal Investigators: Hilary Nixon, PhD; Marlon Boarnet, PhD



Los Angeles is pursuing possibly the most ambitious rail transit investment program in the nation. The Los Angeles Metropolitan Transportation Authority's (MTA) long-range plan commits funds to six new rail transit lines scheduled to open between now and 2019, of which the Expo Line (along Exposition Boulevard) will be the first. In total, those six lines will increase the Los Angeles MTA rail network from 73 to approximately 120 miles, making it larger than the current Washington Metro system. This impressive commitment to transit infrastructure will play out in the context of ambitious state-level greenhouse gas emission reduction targets, making it important to have good data on the impact of rail transit infrastructure on travel behavior. The research team has baseline data, collected autumn 2011, on trip-making and driving for 285 households in and near the Expo Line corridor as well as data from after the line opened in April 2012. Commercial firms routinely use market research techniques to identify and target population segments that are likely to purchase their products. Using this data, researchers will conduct an analysis of the before-after survey

data using similar “marketing” methods to identify individuals who are most likely to change their travel behavior in response to the provision of new light rail service. Researchers will build a model that characterizes the linkages between ridership changes to the combination of new service and individual attitudes and demographics. This will give much more detail on “marketing” relevant information on what kinds of persons/households will likely switch to rail transit.



Active Travel in California: Performance Measures for Transit from an Activity-Based Travel Model

Project 1109

Principal Investigator: Caroline Rodier, PhD

There is increasing awareness of the potentially significant health co-benefits that may result from the implementation of regional land use and transportation plans under SB375 to meet Assembly Bill 32 (California’s Global Warming Solutions Act or AB32) greenhouse gas reduction (GHG) targets. A landmark study published in the Lancet (Woodcock et al, 2009) showed large health benefits from reduced vehicle use and increased transit, walking, and bicycling (i.e., active travel). These benefits were on the order of 10 to 25 percent reduction in years of life lost from heart disease alone, which results in significant reductions in health care costs. Not surprisingly, agencies and departments in California are calling for analyses of the health related benefits that may result from the implementation of their programs and plans. A greater understanding of these benefits may broaden constituent support for implementation of land use and transportation plans that reduce GHG emissions. However, very little research and guidance has been provided, to date, to advise on the range of health related performance measures that can be obtained from available data and tools. This is particularly true for the new generation of travel models that the State and the major regions of California are now poised to implement. There is a considerable gap in stakeholders’ knowledge of the evaluative possibilities of these new models. This study will be one of the first research projects to capitalize on the data developed for the state-of-the-art activity- based California Statewide Travel Demand Model (CSTDM).



Safety Aspects of the Design of Bicycle Transportation Infrastructure

Project 1125

Principal Investigator: Jan L. Botha, PhD

Bicycles have been used for personal transportation for a long time. However, bicycling has not played as significant a role in transportation as has traditionally been the case in Asia and Europe. More recently, US federal legislation has placed more emphasis on non-motorized modes of transportation, and cities like Portland and San José are actively promoting bicycling as a substitute for using motorized transportation. Because bicyclists are relatively unprotected in crashes, as opposed to motorists, and because separate bicycle paths and crossing are not ubiquitous, there are concerns about their safety.

The aims of this project are to investigate the causes of bicycle crashes, as well as the impacts in terms of death and injury, review current policy regarding bicycling and the justification for providing bicycle-dedicated infrastructure, assess the impact on the other elements of the transportation system, project the outcomes of different strategies and policies that can be considered for bicycling and assess the role that the planning and design of bicycle infrastructure can and cannot play in the safety of bicycling. An important aspect of this project will be to articulate the appropriate questions that should be addressed to formulate policies and strategies for bicycling as well as the design and planning for bicycle facilities. It should be noted that safety is only one of the motivations for providing bicycle-dedicated infrastructure, and cannot be evaluated in a vacuum – other considerations have to be considered in tandem. Creating a bicycle design manual is not the objective of the project, but rather the formulation of the issues that should dictate the planning and design of bicycle facilities.

Available data and literature will be used and where it is found deficient, it will be pointed out to identify possible future research projects.



Measuring the Performance of Livability Programs

Project 1126

Principal Investigator: Peter Haas, PhD

Livability programs seek to make communities better places to live, for both current and future generations, by influencing the structure and uses of the land and built environment, including the transportation infrastructure. This project explores the question: how should transportation and partner agencies structure the performance measurement of metropolitan livability programs? It will provide an analysis of the performance measurement approaches used by several mature metropolitan livability programs.



Assessing Importance and Satisfaction Judgments of Intermodal Work Commuters with Electronic Survey Methodology

Project 1127

Principal Investigator: Steven Silver, PhD

This project will use recent advancements in trade-off analysis in an electronic survey to assess user importance and satisfaction judgments over a range of attributes in intermodal work commuting. The methodology allows (1) a larger number of attributes and their interactions; and (2) preferred combinations of attributes when these combinations are subject to cost and design constraints to be assessed. This methodology can offer significant improvements in the quality of measurement in comparison to scale ratings in paper instruments.



What Do Americans Think About Federal Tax Options to Support Public Transit, Highways, and Local Streets and Roads? Results from Year 3 of a National Survey
Project 1128

Principal Investigator: Asha Weinstein Agrawal, PhD

This research project will design and administer a national, random-digit-dial public opinion poll that asks 1,500 respondents their views on various transportation tax and fee options available at the federal level, including questions specifically designed to assess for public-transit related spending. The questionnaire, with most questions identical to those asked in Years 1 and/or 2 of the survey, will be designed to gather information on support levels for a variety of transportation revenue tools, including raising the federal gas tax rate and replacing the gas tax with a mileage fee. In addition, the survey will collect standard socio-demographic data and public transit usage so that the responses can be analyzed by these factors, as well as by region of the country. The data analysis will include a comparison of the results to the results from the Year 1 and Year 2 surveys.



Remedial Actions to Prevent Suicides and Accidental Death on Commuter and Metro Rail Systems

Project 1129

Principal Investigator: Patrick Sherry, PhD

Railway suicides have received increased attention of late and efforts to understand and address the issues have been initiated by the USDOT Federal Railroad Administration (FRA) and the Federal Transit Administration (FTA). Research has demonstrated that approximately one third of suicides using rail occur on transit lines. Efforts to reduce suicide on railways have utilized the erection of physical barriers, the posting of warning signs with telephone numbers for hotline crisis counseling, the training of key personnel to identify and intervene with at-risk individuals, and the careful management of publicity and news media following a suicide to minimize copycat effects. The present study proposes to evaluate the effectiveness of targeted barriers, posted signage, and an ecologically oriented suicide awareness and intervention training program with a wide range of railroad stakeholders.

New Jersey Transit, Metro North on the east coast and Metrolink and Sound Transit on the west coast (east and west coast) have substantial suicide rates and will provide a target for baseline and subsequent comparison evaluation of the proposed interventions suggested and planned in this proposal. The primary interventions examined in this study will consist of training key personnel from security, operations and other groups in awareness, identification, and intervention skills needed to address potential suicidal behavior. In addition, to the extent feasible and as adopted by the participating agencies, the posting of signage will be evaluated. Finally, depending upon budgetary considerations and the availability of capital, agencies that install targeted barriers during the study period

will also be evaluated in terms of the impact of these barriers on rates of attempted and completed suicide. Comparison of suicide rates following the implementation of these programs will serve as the primary method for evaluating their effectiveness. Changes in percentages and incidence ratios (IR) of actual suicides and suicide attempts will be evaluated for practical and statistical significance. In addition, two surveys will be administered to participants in the training programs to assess as well as demonstrate increases in knowledge of risk factors, indicators of potential suicidal behavior, as well as attitudes and behaviors associated with suicide attempts and completion.



Transit and Rail Security: A Critical Assessment of What Works

Project 1130

Principal Investigator: Brian Michael Jenkins

It is difficult to assess the effectiveness of security against terrorism. Unlike ordinary crime, terrorist attacks are statistically rare events, although a successful terrorist attack can have enormous consequences. Strict cost-benefit analysis, therefore, is not easily applied. Yet we now have several decades of security experience documented in detailed case studies of terrorist attacks and campaigns - enough to discern trends, analyses of terrorist plots and failed attempts (including in some cases what terrorists themselves have said), and a detailed database recording thousands of terrorist attacks coded in detail - enough for statistical confidence. This empirical data can be analyzed to provide evidence-based insights into what works and how it works, directly and indirectly. Any assessment must be realistic. A preliminary review suggests that security measures may not prevent determined terrorists from carrying out attacks, but that they can complicate terrorist planning, increase the terrorists' operational difficulties, and sometimes deflect them from the most lucrative targets, thereby saving lives.



Public Bikesharing in North America: Understanding Impacts, Business Models, and Equity Effects of Bikesharing Systems During Rapid Industry Expansion

Project 1131

Principal Investigator: Susan Shaheen, PhD

This study builds on an earlier MTI public bikesharing evaluation (MTI 1029) by implementing an expanded survey of members of current programs operating in Canada, the United States, and Mexico, as well as expert interviews. The number of public bikesharing programs has more than tripled, since the initial MTI study launched in 2010. Today, there are over 20 operating programs; we will invite each to participate in this study (operator survey and user survey).

This project will evaluate the change in travel behavior exhibited by members of different programs in the context of their business models and operational environment. The results will provide a robust understanding of where and how public bikesharing impacts travel behavior, emissions, and public health. In addition to the survey data, researchers

will also explore the possibility of obtaining bicycle operational data from selected programs for a more granular look at the diurnal/seasonal patterns and geospatial distribution of travel to gain a better understanding of use and bicycle redistribution challenges that occur under different operating conditions.

In addition, expert interviews with operators and stakeholders are included in this evaluation to capture key understanding regarding opportunities and obstacles, particularly in light of growing industry expansion. Results from the user survey and expert interviews will lead to policy recommendations to support the ongoing expansion of public bikesharing in North America.

Key research questions to be explored include:

- What is the impact of public bikesharing on walking and bicycling (and public health)?
- What is the impact of public bikesharing on personal driving and taxi use?
- What is the impact of public bikesharing on bus, rail, and other transit ridership?
- How do these impacts vary with the urban environment in terms of population density, bicycling infrastructure, public transit availability, and other urban attributes?
- How do these impacts vary by business model, operational context, and operator?
- What obstacles does public bikesharing face in terms of providing equitable mobility to urban populations? How can public bikesharing provide better access to populations that do not use credit or banking systems?



What Do Americans Think About Public Transit? A Review of the US Survey Literature

Project 1132

Principal Investigator: Asha Weinstein Agrawal, PhD

This project will compile and analyze a wide set of US survey data related to public transit, to ascertain themes such as support for transit funding, priorities in terms of service quality, variations in support by transit mode, and geographic variations in support. The research team will collect survey data by searching newspaper archives and the WWW to find reference to surveys completed by government agencies and interest groups, as well as searching traditional library databases for published literature. Once a large group of surveys has been completed, the team will assess the data to look at patterns on a wide variety of factors and prepare a report summarizing the findings. The study results will provide insight into public priorities related to improving public transit service.



2012 Census of California Water Transit Services

Project 1133

Principal Investigator: Richard Kos, AICP

The US Bureau of Transportation Statistics conducts a nationwide census of ferry boat operators for the US Department of Transportation; the collected information is used for statistical purposes. The Caltrans Division of Local Assistance has been asked by the Federal Highway Administration (FHWA) to gather data regarding ferry operations because MAP-21 includes a new formula program for ferry boats and ferry terminal facilities eligible under 23 USC 129(c). FHWA has asked that Caltrans assure the data are current for MAP-21. The research team will compile a spreadsheet and accompanying maps that include ferry boats, routes, and operators, along with a number of related characteristics including ownership (public or private), daily trip counts, regulation of fares, terminal locations (street address and coordinates), boarding statistics, and route segment lengths. The spreadsheet will contain fields that will allow it to be linked in a Geographic Information System to Caltrans Earth software for further analysis. If possible, we will also provide a description of expansion plans for each provider.



Assessing the Socioeconomic Impacts of Mass Transit Systems on the Small Regional Community, and Improving the Transit Service Quality of the Mass Transit Authority in Small Urban Areas

Project 1135

Principal Investigator: Hokey Min, PhD

The mass transit system not only improves passenger mobility, but also dictates the level of economic activities of its passengers. Thus, mass transit system planning can heavily influence regional economic development. This planning requires a careful consideration of conflicting goals (e.g., better utilization of fleets vs. fare increases, passenger satisfaction vs. driver preferences, improved passenger services vs. increased operating costs, revenue increases vs. tax hikes) which poses a number of problems for policy decisions. In particular, given the public's growing concern over the mounting government budget deficit, the continuous underutilization of a mass transit system can increase public scrutiny for the increased investment in mass transit services. To find ways to better utilize a mass transit system in small urban area such as Toledo, Ohio and make the best use of government funds and taxpayers' monies, this project will identify the leading causes of stagnant mass transit ridership, evaluate the operating efficiency of the current mass transit system relative to other benchmark systems, and then assess the various impacts of mass transit on local community welfare. These impacts include: traffic congestion, air pollution, urban revitalization, energy (fuel) consumption, business growth, public health, and quality of life. In addition, this project will examine how significantly government subsidies (e.g., federal grants) and fare increases affect transit ridership, while investigating how transit employees shape up transit service quality. Furthermore, this project proposes viable mass transit

planning policy guidelines which can help the regional transit authority better utilize its financial and human resources, continuously improve its transit service quality, and efficiently manage its revenues.



A Study of Factors that Inhibit and Enable Effective Development of Sustainable Regional Transit Systems in Southeastern Michigan

Project 1136

Principal Investigator: Leo E. Hanifin, PhD

For many years efforts to develop effective regional mass transit in Metropolitan Detroit have been thwarted by a wide variety of factors. For decades, efforts to integrate regional bus services have failed, leaving Southeastern Michigan (the Metropolitan Detroit Region) with two transit agencies (SMART and DDOT), which serve the suburbs and the city with poor interfaces between them. Initiatives to restore rail-based transit have suffered a similar fate.

This project will analyze the factors that have in the past, and continue today, to inhibit and enable the effective planning, development, and operation of regional transit systems in southeastern Michigan. A team of ten researchers from the University of Detroit Mercy will engage leaders from all related public and private organizations. Methods will include analysis of legal structures, public opinion surveys, ad hoc interviews with key leaders involved, review of previous national and local studies and reports including examining the various methods, processes and structures employed in benchmark urban areas that have developed effective regional transit systems and an assessment of the applicability of them to Detroit. The phases of the study will include an examination of the history of transit in Detroit and the nation, selection of comparable cities, analysis of the current state of transit in Detroit, and development of recommendations. Each phase of the study will examine ten broad areas of factors that potentially inhibit and enable effective transit development.



Remanufacturing, Repurposing and Recycling of Lithium-ion Batteries Used in Public Transit Vehicles

Project 1137

Principal Investigator: Charles R. Standridge, PhD

An industrial-academic partnership to address issues regarding the remanufacturing, repurposing, recycling, and disposing of lithium-ion batteries used in public transit vehicles is the basis for this project. The goal is the development and commercial implementation of manufacturing processes and assessment protocols that successfully provide for the economic remanufacturing, repurposing, recycling, and disposing of lithium-ion batteries used in public transit vehicles. Processes for remanufacturing will be developed, tested, and commercially implemented. Repurposing opportunities must be identified and processes for taking advantage of them developed. Decision criteria as to when to remanufacture versus repurpose versus recycle versus dispose will be created. A partnership with

Sybesma's Electronics has been formed to ensure the commercial viability and future of the processes and protocols developed.

This project supports USDOT goals in the area of environmental sustainability – alternative energy and transit. When successful, this research will reduce the cost of electric battery power, thus making electric powered vehicles a more viable alternative for public transit. The sustainability related benefits of electric vehicles are well known. This work will be of interest to every public transit agency in the United States that is considering electric fueled vehicles.

The project consists of three major components: 1) development, validation, and application of a model capturing the demand and supply as well as the costs associated with lithium-ion batteries both new as well as remanufactured and repurposed (the supply-demand-cost model); 2) addressing issues toward the development of a general model for lithium-ion battery recycling and validating the model for one type of lithium-ion battery (recycling model and process development); and 3) development and improvement of remanufacturing processes for lithium-ion batteries (remanufacturing process development).

The Long-range Energy Alternatives Planning system (LEAP) will be used to develop the supply-demand-cost planning model. This model will be used to assess the economic benefits of employing remanufactured and repurposed batteries along with newly produced batteries over a 20 to 25 year time horizon for various demand scenarios. This assessment helps in determining the utility and value of remanufacturing and repurposing lithium-ion batteries.

Lithium-ion is a class of batteries. Each member of the class has unique material properties. Thus, different recycling processes are needed for each type of lithium-ion battery. On the other hand, the creation of a recycling process for one type of battery can be based on knowledge gained from existing processes for other types of batteries. We will define the issues related to developing such recycling processes and demonstrate solutions to these issues for one particular type of lithium-ion battery. This knowledge will be structured into a model of lithium-ion battery recycling. The demonstration will help establish the economic value of recycling as well as identifying the types of technical issues associated with developing a recycling process and the value of the recycling model.

It appears that lithium-ion battery packs were designed without taking into account the requirements for remanufacturing, particularly disassembly into individual batteries and reassembly with replacement of defective batteries. Remanufacturing processes for at least one battery pack design will be developed and existing processes improved. This process improvement activity will help establish the economic value of remanufactured battery packs.



Long-Term Trends in Patron Satisfaction of DC Circulator

Project 1138

Principal Investigator: Errol C. Noel, PhD

Since 2005 the District Department of Transportation (DDOT) has been collecting data for monitoring the extent of patron satisfaction with the services provided by the DC Circulator, a local transit system designed to facilitate travel to and within the central business area, with connections to Metro rail stations and fringe areas not served by Metro rail. DC Circulator is a public-private enterprise that involves the DDOT, the Washington Metropolitan Transit Authority (WMATA) and DC Surface Transit Inc.

As part of its performance management program, the DDOT conducted consumer attitudinal surveys of patrons over a seven year period, 2005-2011. The data collection was limited to one month in the spring of each year. Although the data provided snap shots of consumer opinion, there was no analysis to examine how the observed variables changed over the years. In addition, the scope of the data collection was not intended to provide information for determining whether there were seasonal variations in patron perception of the quality of service.

This research will involve statistical analyses and is intended to characterize trends in patron perception of DC Circulator service using survey data compiled by DDOT over the seven year period and collected by the team in 2012-13. The results will be used to benchmark seasonal variations in the perception of quality of service. DDOT is aware of seasonal variations of patronage based ridership surveys, but has no information regarding patron perception of the quality of service during each of the four seasons of the year.



The Reliability of Bus Transit Schedule in Washington DC

Project 1139

Co-Principal Investigators: Stephen A. Arhin, PhD; Errol C. Noel, PhD

The development of bus transit schedules is a major activity conducted by regional bus transit systems, such as the Washington Metropolitan Area Transit Authority (WMATA). Transit schedules are generally published on printed material at bus stops, and in recent times, they are available on the website of the service provider. As part of their initiatives to provide timely information regarding bus arrivals and travel times, WMATA has real-time online information on the arrival times of buses on various routes.



Patrons can use their smart phones, standard computes and a variation of portable information device to access real-time information on the arrival status of buses at any bus stop. Geographic Information System (GIS) has been incorporated into the WMATA en-route bus information system. The reliability of the route service is a common measure for determining whether a transit system is compliant with the advertised schedules. Reliability

assessments are critical in determining areas for improvement. This research will determine the extent to which bus transit service on heavily traveled routes in Washington DC satisfies the advertised arrival and travel time. Researchers will be collaborating with WMATA in obtaining the data for the research.



***Understanding & Modeling Bus Transit Driver Availability
(Extraboard Management)***

Project 1140

Principal Investigator: Kaan Ozbay, PhD

Transit agencies must employ enough operators of transit vehicles to meet scheduled service and to account for unplanned absences due to illness, vacation, absenteeism, etc. As such, they employ extraboard operators (on-call backups) to meet these situations and ensure service is not interrupted. Overestimation of the number of extraboard operators comes at a cost, thus good extraboard management is important for regular operations. During evacuations, such as due to an impending natural disaster like a hurricane, or a perceived threat, extraboard management is even more critical than during regular conditions. In these cases, it is important to account for problems due to the cause of evacuation, such as inability of personnel to get to their needed locations because of closures or other disruptions to the transportation system.

Transit agencies' burden to meet minimum service requirements (which may be greater or different from regular service) is of high importance. To address these issues, this study has several objectives:

1. Develop stochastic mathematical models that can be used to better plan transit agency needs for drivers under regular conditions.
2. Develop a comprehensive model validation plan to evaluate these models using real-world data from agencies.
3. Quantify benefits that are likely to be gained from using these models for different demand and supply scenarios under various reliability and customer service requirements for risk averse and risk neutral operators.
4. Develop a series of recommendations based on the findings of the study that can be easily adopted by transit agencies that would like to save cost by having a more effective extraboard management strategy.



Using GPS Data from Taxis to Understand Public Transit Demand and Mode Choice

Project 1141

Principal Investigator: Eric J. Gonzales, PhD

As cities around the United States and the world get increasingly congested, the need to provide effective and competitive transit service is also increasing. Although travel demand data has typically been collected using household surveys or passenger counts, the widespread use of GPS-enabled devices presents a new data source with rich potential for studying travel demand and transit use. Specifically, this research project will make use of GPS data from taxi fleets in cities in order to characterize taxi trips, and integrate taxi data with other data sources to gather information about travel demand and the factors affecting mode choice. Taxi data is useful because it provides information about realized trips that could potentially be served by public transit systems. By analyzing the spatial and temporal distribution of trips that use taxis, the goal is to understand the factors that affect transit mode choice. When integrated with other data sources, such as neighborhood socio-economic characteristics, crime, weather, and levels of transit service, this data provides additional information about urban travelers and how they choose to get around. The results will be useful for agencies that want to plan improved transit service and for academics who study transportation demand.



Evaluating the Impacts of Transit-oriented Development in New Jersey: Economic, Environmental, Public Health, and Overall Community Cohesion

Project 1142

Principal Investigator: Robert B. Noland, PhD

Transit-oriented development (TOD) is the development of compact, mixed-use, pedestrian-friendly land uses within walking distance of transit stations/stops. A major goal of TOD is to direct land development to where public transit and infrastructure already exist, with the expectation that transit ridership will increase and auto use will decrease as the convenience of transit leads it to become the mode of choice for residents, employees, and visitors. Increased transit ridership and decreased auto use are generally accepted as public benefits - resulting in reduced air pollution, greenhouse gas emissions, traffic congestion and crashes, as well as increased physical activity if walking trips increase. Additionally, there may be other benefits from TOD, including the creation of a more stable economic base, support for healthier behaviors, and promotion of community.

The primary objective of this study is to assess the myriad impacts of transit-oriented development on residents in or near the developments. These impacts fall into five categories: transportation impacts; economic impacts; health impacts; community impacts; and environmental impacts. The methodology employed in this study is a survey of residents living in or near TODs. The survey consists of questions for each of the five categories outlined above. It will be administered to two populations of residents: those

living in TODs and those living near TODs. The objective is to use the latter as a control group to understand some of the reported differences between the groups.

We anticipate finding some differences in perceived use of transit and, more significantly, local activity levels near the stations among the group of TOD dwellers. We believe that residents of TODs self-select their living arrangements based on the distinct advantages that TODs offer them and that they do in fact take advantage of those benefits.



Evaluation of the Impacts of Rail Investments and Engineering Improvements on Transit

Project 1143

Principal Investigator: Hani Nassif, PhD

Transit agencies own and operate thousands of bridge structures subjected to repetitive train loading. The majority of these bridges were built at the turn of the century and many have exceeded their theoretical fatigue life spans. Moreover, recent increase of freight railcar weight limits from 263,000 pounds to 286,000 pounds raised additional concerns for the transit passenger rail systems because the bridges in the passenger rail systems were not designed based on this increased weight. There is a need to establish procedures to estimate the remaining life and damage accumulation of bridges. This will allow for the prioritization and scheduling of repairs and rehabilitation events. A simplified screening tool to direct attention to the most fatigue critical bridges is needed.

The objective of this study is to introduce a tiered approach to determine the remaining fatigue analysis. The proposed methodology is a combination of analytical and field testing approach. The simplest analysis involves a review of regional passenger and freight train load data with regard to weights, volumes, and number of cycles. The next level involves simulation whereby bridge girder and/or components stresses are determined using simple structural analysis methods. Results from field tests are utilized to verify and validate these computer models. For the considered components and details, stress range and estimated number of load cycles will be simulated using Monte Carlo simulation and structural analysis. This approach offers the simplicity needed to cover thousands of bridge structures.



Examining the Attractiveness of Transit-Oriented Development for Working Age New Jersey Veterans with Disability

Project 1144

Principal Investigator: Robert B. Noland, PhD

New Jersey is home to over 400,000 military veterans, many recently returning from Afghanistan and Iraq (Operation Enduring Freedom/Operation Iraqi Freedom - OEF/OIF). Upon reintegration into civilian life, returning veterans often face myriad challenges due to physical, mental and/or emotional injuries sustained during service. Reintegration

challenges can also relate to meeting housing, employment and/or transportation needs. Case in point, according to 2011 Bureau of Labor Statistics data, male veterans age 18-24 had a 29.1 percent unemployment rate. Both national and state governmental and non-profit entities, including the New Jersey Department of Military and Veterans' Affairs, work to improve the community reintegration outcomes of veterans. However, factors, such as continued unemployment, contribute to persistent problems for veterans and for society, including the number of homeless veterans, estimated at approximately 7,000-8,000 persons in the State.

It is within this context that the study team seeks to better understand and document the housing, employment and transportation needs of the working age New Jersey veteran community who have a disability(s), with a specific emphasis on determining if and how access to transit and transit-oriented development (TOD) housing and employment opportunities could improve community reintegration outcomes. The prime work tasks to be undertaken in this study will include:

1) an analysis of the academic and professional literature on the transportation, employment and housing needs and issues as experienced by the US veteran population with disability(s); 2) a series of informant listening sessions with both government and private non-profit organizations representing the interests of New Jersey veterans; and 3) up to three focus group sessions with New Jersey working age veterans with one or more disabilities. A critical component of this study involves more fully understanding the transportation, employment and housing related needs, experiences, issues and obstacles as directly experienced by the New Jersey veteran community. The study team will facilitate a discussion with each group that seeks to address if and how TODs can help to satisfy veteran needs and how TODs can be better marketed to this specific population.

It is anticipated that the study outcome will yield a better and more thorough understanding of the transportation, housing and employment obstacles working age veterans with disability(s) are experiencing in New Jersey and to a great extent, nationwide. Primary data gathered from the focus groups and the key informant listening sessions will contribute greatly to the dialogue on how to best meet the divergent needs of this targeted population, especially as they relate to transportation. Further, the role TODs may have in addressing some of those needs will be explored through this study and the information acquired will be shared with stakeholders from both the public and private sectors, including but not limited to entities focused on veteran affairs.



Evaluation of How Transit Systems Can Lead to Greater Economic Productivity of Metropolitan Regions

Project 1145

Principal Investigator: Robert B. Noland, PhD

Transit investments can affect the clustering of economic activity within a region due to the changes in accessibility that transit can provide, either by increasing firm-based access to the central business district or increasing effective labor market size. This clustering can lead to what are known as agglomeration benefits that increase overall economic productivity and are external to the decisions taken by individual firms. Cost-benefit analysis of transit investments rarely account for such external benefits. Agglomeration benefits work through several mechanisms. The two mechanisms most likely relevant to transit are knowledge spillovers enabled by firm clustering near rail stops and better labor

matching due to higher labor market access caused by expansions of transit networks. The actual linkages are complex and are not well captured by simple econometric models.

This work will build on previous analysis that has resulted in the development of both a cross-sectional time-series database of MSAs, one of which covers 2002-2008 and the other covers three decadal periods, from 1990 to 2010. Previous work has analyzed two agglomeration measures: total MSA population and employment density. This work will examine a number of additional measures, including population density, and employment density for a wide range of different economic sectors.

The two primary datasets that have been constructed with previous funding offer opportunities for further analysis. Specifically this work will explore various other measures of agglomeration. We will develop population density measures; these can be locally specific near rail stations or more broadly defined on a regional basis. Various economic sectors of the economy have typically been assumed to provide more agglomeration benefits, such as manufacturing industries. Some preliminary analysis has suggested that additional dis-aggregation of employment sectors may provide useful information for understanding the impact of transit capacity on agglomeration. We will explore these measures using both datasets. In addition, we hope to include more robust instrumental variables in our analysis.

This project will also provide the opportunity to fully synthesize the results of previous funding. We will compare the results from different agglomeration measures and transit capacity measures using meta-analysis with the objective of providing meaningful and robust results that are useful for policy makers.



***Combustion Chemistry of Biodiesel for the Use in Urban Transport Buses:
Experiment and Modeling***

Project 1146

Principal Investigators: Ashok Kumar, PhD; Dong-Shik Kim, PhD



Biodiesel has many advantages over petroleum-based diesel and other renewable fuels. The use of biodiesel is less harmful to human health and environment and compared to other renewable energy, biodiesel has a broader range of feedstock resources, and is more economical to produce. Compatibility with the existing diesel engines and infrastructure is also a great advantage. Theoretically, biodiesel may be directly used on the current diesel engines without much extra modification. Not only is there less oxides of nitrogen (NO_x) produced, but the most popular 20 percent biodiesel has demonstrated performance on a par with regular diesel. Most engine manufacturers allow up to 20 percent blends of biodiesel without voiding the warranty. Despite its ever increasing production and consumption, and its potential as a competent alternative energy in the future, there are many unknowns about biodiesel's combustion mechanisms, performance, and environmental and health impacts.

The characterization of the combustion behavior of biodiesel and modeling of its combustion kinetics, have not been investigated in-depth. Thus far, most studies have focused on the effects of engine design, such as injection nozzle locations and cylinder shapes, on power generation and emissions. Most of these studies use existing diesel combustion kinetics.

This is of concern because combustion strategies that are currently being developed are more based on fuel properties than combustion patterns with regard to the engine design. There are biodiesels manufactured from soybean, animal fats, waste oils, and algae. Depending on the applications, some biodiesels are blended with diesel 0, 10, 20, 50, 80, or 100 percent. Due to these variations, biodiesel combustion mechanisms and emissions vary. Accordingly, the engine design and operation conditions must be adjusted to optimize engine performance and to reduce harmful emissions. To address these issues, we have studied fundamental combustion chemistry of biodiesel and basic emission generation models that provide a better understanding of biodiesel combustion characteristics and help to develop more realistic emission generation models.

This study will focus on NO_x and particulate matter (PM) released during combustion. Because, in general, biodiesel produces more NO_x than diesel, its production mechanisms should be more deeply investigated for better pollution control. Furthermore, even if biodiesel's PM emission is lower than diesel, its formation mechanisms must be better understood to reduce it without compromising engine performance. Biodiesels with various compositions and feedstock resources will first be chemically analyzed for their chemical characteristics. The major components will be identified and will then be used for the combustion mechanism study. A high-pressure, high-temperature combustion chamber will be used at controlled temperature and pressure, and GC will be used to analyze the emission gases.

The proposed experimental research is unique because it is oriented towards fundamental chemical reactions. We will look into a simplified combustion reaction model that describes the reaction mechanisms of biodiesel's major components that lead to specific emission species. The results can be correlated to biodiesel source feedstock type, engine temperature, and pressure to specific components in the emissions.

The combustion characteristics and models obtained in this study will help develop a robust and realistic biodiesel combustion model.



Enhancing Transit Service in Rural Areas and Native American Tribal Communities

Project II47

Principal Investigator: Mahomed Kaseko, PhD

Considering the existing financial constraints and the most common transit needs and desires for transit in the rural area of Nevada, this study will determine the best sources of funding for transit services and the optimal allocation of resources to meet the most important transit needs. This analysis will consider the difficulties of obtaining funding from various potential sources and will determine the best strategy to pursue the corresponding funding. Given a fixed budget, a multi-objective optimization approach will be used to determine the optimal allocation of funds to meet transit needs that provide the most benefit to the tribal communities in rural areas in Nevada. The analysis will include the idea of enabling the use of travel substitutes such as remote access to services. In addition, coordination among providers and intercity transit service will be analyzed.



Developing Seamless Connections in the Urban Transit Network: A Look Toward High-Speed Rail Interconnectivity

Project 1148

Principal Investigator: Hualiang (Harry) Teng, PhD

Research on high-speed rail (HSR) has been focused on the economic impact studies that are needed in the early stage of HSR development in the US. As HSR moves to the stage of design and operations, there is a need for guidance on providing effective connectivity at HSR multimodal stations. In this study, the layout of multiple modes of transportation at HSR stations, the operation schedule of these modes, and the resulting transfer time and convenience will be studied. Patterns of multimodal layouts, operation schedules and transfers in other countries will be reviewed and relevant data will be collected to characterize the transfers and models. Recommendations for seamless connections in the US urban transit network will be developed based on this characterization and modeling.



Transportation Futures

Project 1149

Principal Investigator: Caroline J. Rodier, PhD

The transportation sector under a low emissions world looks vastly different from the transportation sector we have now. It would be helpful to envision different transportation futures that would be consistent with the agreement that the United States and other nations have made. (Under the United Nations Framework Convention on Climate Change, nations agreed to limit global warming to 2°C (3.6°F), which would require cutting global greenhouse gas emissions in the range of 50 to 85 percent, with developed nations likely needing to be on the high end of that range). The proposed study would be a broad brush look at what the transportation sector might look like and what implications that would have for the US Department of Transportation and national transportation policy. Such a broad look would complement well the work that has been done by the US DOT in the 2010 report to Congress and by the Transportation Research Board. This research will specifically focus on accounting for current policy trends and identifying what additional measures will be needed to achieve these major reductions in GHG emissions from transportation, by examining several alternative scenarios.



Electrical and Thermal Management of a Lithium Titanate Prismatic Cell Battery System

Project 1150

Principal Investigator: Timothy Cleary, PhD

Improved prediction of state of health (SOH) and state of charge (SOC), along with improved management of thermal flow, in the energy storage systems (ESS) of electric buses and other heavy vehicles will lead to greater efficiencies in, and wider adoption of, an electric vehicle fleet. This project will develop improved models for predicting SOC and SOH for a battery pack consisting of cells that employ lithium titanate chemistry and prismatic shape, and that are contained in a fully electric, class 8, passenger bus. The research also will afford the opportunity for improving the thermal management system in such an ESS. A battery pack from a bus manufactured by Proterra, Inc., will be studied by using the Larson Institute's environmental chamber and Aerovironment AV900 power processing equipment, in which the battery pack will be electrically operated through a simulated drive cycle. Extensive testing will occur in various simulated environments. The battery pack will be evaluated for baseline data up to the manufacturer's limits to characterize its electrical and thermal performance. Then, the present battery management system (BMS) algorithms for SOC and SOH will be evaluated for accuracy, and improvements will be designed and validated. In addition, by using the baseline data, a lumped node Simulink model of the battery pack's thermal performance will be developed, assuming liquid cooling. An optimal thermal management system design will be proposed, and will be validated using CAD (computer aided design) and CFD (computational fluid dynamics) software.



Advanced Low-Floor Vehicle (ALFV) Specification Research

Project 1151

Principal Investigator: Suresh Iyer, PhD

The goals of the proposed research are to:

1. Provide a market analysis for the prototype design. Characterize and document the transit service and operating environment requirements of transit agencies in need of a small, long life bus. The results will be used for the preparation of specifications by transit industry standards organizations in a "white book" and/or for RFP specifications published by transit agencies.
2. Measure the design, reliability, and performance characteristics in a laboratory environment of one or more small, rugged, smooth-riding, low-floor buses with the potential to routinely operate on badly surfaced roads yet provide comfortable service during the same day for commuters or shuttle passengers on well maintained roads.
3. Develop the knowledge and skills of the bus manufacturing and servicing workforce regarding such nimble, long-life buses.



COMMUNICATIONS AND INFORMATION/TECHNOLOGY TRANSFER

AND NOLOGY

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Broadway





Donna R. Maurillo, MSTM

Director

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Donna Maurillo joined MTI in 2007, managing information/technology transfer (ITT), such as symposia, forums, and public meetings. She also manages MTI's communications vehicles, including the web site, annual report, media relations, social media, and other public outreach, and she manages MTI's memoranda of cooperation (MOC) with universities in other countries.

Ms. Maurillo managed corporate communications for Silicon Valley technology companies. She also managed venture capital and technology accounts for Hill & Knowlton and other PR agencies, and she was an instructor and consultant in corporate communications for many years.

She has published more than 50 articles on business, politics, and current issues, she co-authored two books on self-employment, and she writes a weekly newspaper column. Her 150-member Rotary Club named her Rotarian of the Year, and she is incoming president for 2014. She was twice listed in *Outstanding Young Women of America*, and she presided over several non-profit boards, primarily in the arts and social services. She served on staff for former California Secretary of State Bruce McPherson, and she earned an outstanding service award from UCSC after serving ten years as its alumni association president.

Ms. Maurillo earned her BA from the University of California and delivered the commencement address. Most recently, she earned her Master of Science in Transportation Management (MSTM), and she holds counterterrorism certificates. She is a member of the Phi Kappa Phi academic honor society, and she achieved her 30 minutes of fame as a contestant on *Jeopardy*.

Overview

The Communications and ITT function at MTI has become a valuable resource for transportation researchers, policy makers, and professionals around the world, providing:

- Symposia and other events to collaborate with transportation leaders about key topics such as transportation security, workforce development, transportation finance, sustainable vehicles, high-speed rail, and other issues. These are typically organized as stand-alone events sponsored by MTI or in cooperation with other transportation organizations, or they are incorporated as part of larger transportation conferences and professional gatherings.
- Summaries and reports from those meetings, along with promotions for MTI research reports, which are published as hard copy, PDF and HTML documents. These may be downloaded at no cost from the MTI web site.
- Information resources for a broad variety of transportation topics – available on MTI's web site, at libraries, or through our network of other transportation sites. These resources include periodicals, news articles, video clips, databases, research reports, and other materials.
- Educational resources to help students consider the math and science courses that may lead to careers in transportation, or to help future transportation leaders learn about MTI's accredited Master of Science in Transportation Management program. These include classroom materials and workbooks, registration materials for MTI's Summer Transportation Institute, the Garrett Morgan Sustainable Transportation Competition for middle-school students, and more.
- The latest news about MTI's research, information about national transportation issues, opinion polls, insights about mobility trends, transportation funding forecasts, and other timely issues.
- Special research or other special projects funded outside of MTI's usual grants. These may come by way of non grant contracts with government agencies, non-profit organizations, and others.
- Graphics and technical support for MTI outreach, including web design, event planning, PowerPoints, photography, illustrations, charts, marketing materials, handbooks, and other products and services.
- Promotion of MTI and its products and services by way of social media such as the MTI Facebook page, the MSTM Alumni LinkedIn page, the MTI LinkedIn page, Google+, and the @MinetaTrans news dissemination by way of Twitter.

Martin Luther King, Jr. Library

SJSU's Dr. Martin Luther King, Jr. Library has assigned Research Librarian Diana Wu to the transportation area. In addition to functioning as the librarian for the MTI collection and all other transportation issues, Ms. Wu is also a member of the MTI academic advisory committee, and the Research Associates Policy Oversight Committee (RAPOC).

The King Library is a joint-use facility with the City of San José Main Library. It collects more than 300 databases and more than 100,000 e-books in all disciplines. Many electronic resources, including engineering and business databases, are exclusively available to SJSU students who are currently registered in the Master of Science in Transportation Management program and to anyone with a valid SJSU ID. These e-resources are available 24x7 globally. Ms. Wu has close contacts with other transportation libraries, such as the Institute for Transportation Studies at UC Berkeley, and she provides a wide network of resources and assistance for students and researchers working on MTI projects.

This joint-use library is a place for lifelong learning. All users with a valid library card may access resources owned by the San José Public Library, including many useful business databases.

Forums and Summits

Each year MNTRC and MTI present regional forums and state or national summits, either as stand-alone events or as part of larger gatherings of transportation professionals. These events accomplish multiple purposes, such as sharing recent research with practicing professionals, policy makers, other academics, and the larger community; exploring issues that may require further research (part of needs assessment); providing opportunities for networking and collaboration; and creating a record of proceedings that can be shared with a wider audience online and/or in print. To continue its progress toward establishing the National High-Speed Rail Connectivity Center, MTI again presented or co-presented at a number of events focusing on high-speed rail.

Director Maurillo managed each of the following forums and summits. Listed in chronological order, the events presented during the 18-month reporting period include:

MTI-Sponsored Forums and Summits

Summer Transportation Institute

June 20-July 21, 2011 – San José CA

Project 1167

Again this summer, MTI offered its Summer Transportation Institute (STI). The program, which is funded by the Federal Highway Administration through the California Department of Transportation (Caltrans), is part of a national endeavor to provide career orientation and educational experiences to motivate secondary school students toward professions in transportation. The students learn a great deal of material regarding transportation issues that affect their communities. STI's primary goal is to encourage high school students – particularly from traditionally underrepresented backgrounds

– to seek professional careers in transportation by first obtaining a college education. The curriculum is based on Science, Technology, Engineering, and Math (STEM) programs. The students engaged in a variety of activities, including a college-level environmental science class with an emphasis on transportation issues, guest speakers from the industry, hands-on projects, and related enrichment activities. Field trips also were included. Students are recruited primarily from high schools with high concentrations of disadvantaged youth. All who completed the program were given three college credits.

Pacific Cities Sustainability Initiative: Green Transportation Conference

October 24, 2011 – San Francisco CA

October 26, 2011 – Los Angeles CA

Project 1166

MTI was a co-sponsor of the Pacific Cities Sustainability Initiative (PCSI) conference, with a theme of “Mobility, Livability, and Economic Growth: Sustainability Lessons from the Pacific Rim.” It focused on the importance of transit to urban livability and its impact on cities’ economic competitiveness, as well as on innovative sustainable transportation technologies and systems in North America and Asia.

Along with MTI Executive Director Rod Diridon, speakers included Peter Calthorpe, Calthorpe Associates; Wilfred Lau, Arup Hong Kong; Jonathan Thorpe, Gale International; Jeff Tumlin, Nelson/Nygaard; Jeffrey Heller, Heller Manus Architects; Sean Randolph, Bay Area Council Economic Institute; Feng An, Innovation Center for Energy & Transportation; Steve Kline, PG&E; Gene Rodrigues, Southern California Edison Co.; Orville Schell, Asia Society Center on US-China Relations; Egon Terplan, SPUR; and many others.

US & China Transportation Forum: Disaster Assistance Working Group

January 5-8, 2012 – San José CA

Project 1260

The Mineta Transportation Institute hosted a four-day conference with the US Department of Transportation and the People’s Republic of China’s (PRC) Ministry of Transportation. This workshop was an activity of the US & China Transportation Forum, a joint effort of the US Secretary of Transportation and China’s Transport Ministry. The purpose is to coordinate areas of mutual interest between the two nations, including disaster preparedness, urban congestion relief, emissions reduction, high-speed rail issues, and other related topics.

The event was co-chaired by Mr. Michael Lowder, Director, Office of Intelligence Security and Emergency Response, US Department of Transportation, and Mr. Wang Jinfu, Director General, Department of Safety and Supervision, PRC Ministry of Transportation.

This meeting was a continuation of the US & China Transportation Forum’s work on preparing their respective transportation systems for disasters. Although the two government structures are very different, during times of crisis and disaster, there is a common need to provide citizens with the best possible effort to restore transportation services to their communities. This workshop provided an opportunity to compare notes, as well as to learn from the experience and preparedness that California has to offer.

The San José meeting included several agenda items, each presented by experts from both countries. Discussion topics included the March 2011 Japan Earthquake, Tsunami and Power Plant Incident: Impact on Maritime Transportation; Emergency Information Monitoring and Response Systems; Organizing Large-Scale Exercises; Safety and Security of Subway Systems; Building Disaster-Resistant Transportation Systems; Coordinating Transportation Preparedness with Community Preparedness; and Building the Emergency Response Team.

The Workshop objectives were enhanced by visits to the Caltrans District 4 Office in Oakland; the Bay Bridge retrofit information center; the USS Hornet; US Maritime Administration (MARAD) ships; the San Francisco Bay Area Water Emergency Transportation Authority (WETA) and a trip aboard a WETA ferry; and the Golden Gate Bridge. At each site, the group discussed transportation-related disaster preparedness and mitigation.

Rail Security: Critical Insights and Applications

January 22, 2012 – Washington DC

Project I26I

As a continuation of research from the Mineta Transportation Institute's proprietary database on surface transportation, the Transportation Research Board's Intercity and Passenger Rail Committee sponsored a workshop on "Rail Security: Critical Insights and Applications" during its annual meeting.

The meeting noted that security procedures similar to those for air travel have not been applied to surface transportation primarily due to operational and economic differences, such as higher visibility in an open network. However, they are no less important. This has been made clear by recent terrorist attacks on surface transit systems around the world, such as in Madrid, London and Mumbai, and discovery of several terrorist plots in the US and elsewhere. Findings in Osama bin Laden's compound demonstrated that he had rudimentary plans to attack rail infrastructure.

Brian M. Jenkins, director of MTI's National Transportation Safety and Security Center, presided over the half-day panel discussing security for passenger rail and fixed-guideway transit. This workshop covered the most critical issues, and it included discussion of new threat areas for rail operations, changing technology, new and continuing challenges, practical knowledge application, and more.

The keynote address, "MTA: Securely Moving Eight Million People a Day," was given by Nuria Fernandez of the New York Metropolitan Transportation Authority. Additional presenters included Tom Farmer, Association of American Railroads; Robert Pryor, Transportation Security Administration, Department of Homeland Security; Christopher McKay, US Department of Homeland Security; and Chris Bu, Consultant to the British Government.

Garrett Morgan Sustainable Transportation Competition

March 22, 2012 – Nationwide

Project 1262

Will tomorrow's transportation use the power of wind or sun? Can algae produce a viable alternative to gasoline? Could a flying bus make commuting easier? And how can transit services be delivered more profitably?

Those are some of the questions addressed during the videoconferenced annual National Garrett Morgan Sustainable Transportation Competition. MTI works in concert with California's DOT (Caltrans) and the US Department of Transportation to plan and organize this curriculum that challenges middle-school students to think creatively about solving transportation problems. Each student receives a free workbook from MTI, which provides the entire curriculum, including quizzes and thought-provoking questions. Then the student teams create a project that they demonstrate during a live streaming video broadcast.

Students are excited to be introduced to transportation leaders during the broadcast. These have included Transportation Secretary Ray LaHood, retired Transportation Secretary Norman Y. Mineta, Caltrans Director Malcolm Dougherty, AASHTO CEO John Horsley, APTA CEO Michael Melaniphy, MTI Executive Director Rod Diridon, and others.

Each team is judged not only on its project, but also on its presentation skills, professional demeanor, teamwork, and other essential factors. The winning school, Morada Middle School of Stockton CA, received a plaque and a \$1,000 cash award. Second- and third-place teams received plaques. Participants from all teams received certificates personally signed by the Secretaries. The other participating schools included Edna Brewer Middle School, Oakland CA; Monument Middle School, Rio Dell CA; Redland Middle School, Rockville MD; St Callistus School, Garden Grove CA; and two teams from Tupelo Middle School, Tupelo MS.

White House Roundtable

April 12, 2012 – San José CA

Project 1267

More than 40 local business and industry leaders were invited to a White House Roundtable at the Mineta Transportation Institute. Peter Rogoff, Administrator of the Federal Transit Administration, represented the President. Secretary of Transportation (ret.) and MTI founder Norman Y. Mineta was a special guest.

The Administrator congratulated the MTI-led Mineta National Transit Research Consortium (MNTRC) for being selected one of two transit-specific university transportation centers (UTCs.) He said that US DOT is excited about it because for many years the modes had very little input about how research funds were used, or what kind of research products and policy issues they would address. He said that an opportunity exists for some UTCs to become DOT's research arm. He also discussed the status of the transportation bill and its lengthy delays, the value of transit, and the need to repair critical infrastructure before we build new highways.

The two-hour meeting attracted high-profile leaders in and around Silicon Valley, including Dr. Robert Baertsch, VP Engineering, SkyTran; Neil Struthers, CEO, Santa Clara & San Benito Counties Building & Construction Trades Council;

Cindy Chavez, Executive Officer, South Bay Labor Council; Bill Sherry, Director of Aviation, Mineta San José International Airport; Michael Scanlon, General Manager and Chief Executive Officer, San Mateo County Transit District (SamTrans) and Caltrain; Carl Honaker, Director of County Airports, Santa Clara County; and many others.

The group adjourned to attend a groundbreaking for the Bay Area Rapid Transit station extension.

How Can We Make Bicycle Travel Less Stressful?

April 16, 2012 – San José CA

Project 1268

MTI sponsored a forum to present the work of three of its researchers on bicycle network modeling and analysis tools. It included a case study on San José bicycle network data. The research provided network-level metrics that help analysts improve general and trip-based connectivity.

Using the bike riders' perspective, a bicycle network classification scheme has been developed that incorporates categories based traffic stress. It can also be used to rank different networks or improvement schemes. The model uses readily-available data, making it simpler to apply to different regions.

The tools developed could be of use to planners and developers who want to learn what is available and possible to do off/online. The researchers noted that portions of the application could be used off the shelf for planning purposes on projects such as promoting safe routes to school.

Those presenting included Dr. Peter Furth, Northeastern University, Boston MA; Dr. Maaza Mekuria, Axum Design, San José CA; and Dr. Hilary Nixon, San José State University, San José CA.

National Transportation Workforce Development Summit

April 24-26, 2012 – Washington DC

Project 1263

MNTRC partners MTI and Penn State were among the co-sponsors for the event, which was the national culmination of several regional conferences on transportation workforce development, with the Council of University Transportation Centers providing the leadership. The three-day summit's purpose was to engage a variety of perspectives in developing a policy framework for educating and training future transportation workers. All events encompassed education and training through colleges, universities, vocational schools, trade unions, and on-the-job training.

US Secretary of Transportation Ray LaHood delivered the keynote. In his remarks, he pointed out that the last generation gave us the interstate highway system. Yet we have nothing to give the next generation. He noted that high-speed rail should be part of it, and he asked the assembled group to prepare for that with proper training and mentoring because the technologies are so new.

The national event synthesized the results from each of the regional meetings, with break-out sessions that discussed what was learned and how to put that knowledge into action. Besides the Secretary of Transportation, notable speakers included Greg Winfree, Acting Administrator, Research and Innovative Technology Administration; Polly Trottenberg,

Assistant Secretary of Transportation; Brenda Dann-Messier, Assistant Secretary of Education; Jane Oates, Assistant Secretary of Labor; Pamela Boswell, Vice President, American Public Transportation Association; Julie Cunningham, President and CEO, Council of Minority Transportation Officials; Marcia Ferranto, President and CEO, Women's Transportation Seminar; Ed Hamberger, President and CEO, Association of American Railroads; John Horsley, Executive Director, American Association of State Highway and Transportation Officials; Patrick Natale, Executive Director, Chief Staff Officer & Secretary, American Society of Civil Engineers; T. Peter Ruane, President & CEO, American Road & Transportation Builders Association; Edward Wytkind, President Transportation Trades Department, AFL-CIO; and many others.

COOP/COG Training for Transportation Agencies

May 31, 2012 – Cambridge MA

Project 1264

Emergency management leaders from FEMA Region I gathered at the Volpe Center for a day-long workshop on developing continuity of operations/continuity of government plans and training. The morning focused on developing organizational level plans using MTI's Generic Plan format, MTI Project 1080. The afternoon focused on the delivery of emergency relocation group training using MTI's Continuity of Operations/Continuity of Government (COOP/COG) report, project 2976.

The training was conducted by MTI's National Transportation Security Center Deputy Director Frances Edwards, PhD, and MTI Research Associate Daniel Goodrich.

Financing Infrastructure for America: Are We Becoming a Second Class Country?

June 22, 2012 – San Francisco CA

Project 1265

In this annual event at the Commonwealth Club of California, MTI presented an update on its research regarding America's attitudes about transportation infrastructure funding and finance. A panel discussion followed before a group of about 200 people. Moderator was Mortimer Downey III, Former US Deputy Secretary of Transportation.

The experts panel included Dr. Asha Weinstein Agrawal, Director, Mineta Transportation Institute's National Transportation Finance Center; Michael Melaniphy, President of the American Public Transportation Association; John Horsley, Executive Director of the American Association of Highway and Transportation Officials; Steve Heminger, Executive Director, San Francisco Bay Area Metropolitan Transportation Commission; and Will Kempton, CEO, Orange County Transportation Authority.

Dr. Agrawal, reporting from her recent national telephone poll, said that Americans indicated a lack of support for taxes or fees if they were earmarked only for transportation in general. However, if those taxes were given specifically for "green" purposes, such as reducing global warming, then respondents were significantly more favorable. Dr. Agrawal cautioned that if governments wish to raise revenue for this purpose, they must word the proposed legislation very carefully. The research results did not change when compared to the previous two surveys, indicating that people's attitudes have remained rather stable.

The panelists discussed various aspects of US transportation, including transit ballot initiatives; the situation with federal transportation legislation; the condition of the Highway Trust Fund; the viability of highway tolls; and other issues affecting the condition of America's transportation infrastructure. A Q&A period followed.

Summer Transportation Institute

June 25-July 13, 2012 – San José CA

Project 1277

Each summer, MTI offers its Summer Transportation Institute (STI). The program, which is funded by the Federal Highway Administration through the California Department of Transportation (Caltrans), is part of a national endeavor to provide career orientation and educational experiences to motivate secondary school students toward professions in transportation. The transportation industry will continue to need individuals who are prepared to provide the necessary leadership to build the nation's transportation systems for the next century.

STI's primary goal is to encourage high school students – particularly from traditionally underrepresented backgrounds – to seek professional careers in transportation by first obtaining a college education. The students engaged in a variety of activities, including a college-level environmental science class with an emphasis on transportation issues, guest speakers from the industry, hands-on projects, and related enrichment activities. The students took a field trip to the construction site for the new Bay Area Rapid Transit extension in the Berryessa district of San José, and they visited the Diridon Transit Center. This year, 17 students participated, recruited primarily from high schools with high concentrations of disadvantaged youth. All who completed the program were given three college credits.

Transportation Innovation Series

August 15, 2012 – Washington DC, National

Project 1279

At the invitation of the US Department of Transportation's Research and Innovative Technology Administration (RITA), MTI/MNTRC Executive Director Rod Diridon presented an hour-long national podcast as part of RITA's monthly Transportation Innovation Series. Mr. Diridon, who was introduced by Associate Administrator Kevin Womack, presented a series of slides on "California High-Speed Rail and Why It's Important for the Nation."

He noted that the US ranks last in citizen concern about climate change. He also explained the differences in carbon footprints for various travel modes; the history of high-speed rail around the world; why some systems succeeded while others struggled; how China is leaping ahead of all other countries in establishing high-speed rail networks; the advantages of high-speed rail rolling stock over that of conventional rail; a comparison of spending in California for future highways and airports versus spending for high-speed rail; and other critical issues.

Following his presentation, Mr. Diridon took about 30 minutes of questions from the in-house audience. The program has a permanent link at <http://bit.ly/NhnMzO>.

Podcar City, Berlin

September 19-20, 2012 – Berlin, Germany

Project 1266

MTI co-sponsored this event, which was held in conjunction with the InnoTrans Fair. Each year, transportation professionals meet to discuss the planning and implementation of “podcars” or automated guideway transportation (AGT) throughout the world. This concept in personal transit is making a foothold in cities where traditional transit requires connectivity with outlying areas or facilities such as airports.

This year’s theme was Urbanization, Regional City Centers and Sustainable Transportation. Specific discussion topics included the experiences of cities that have already implemented podcars, planning for podcars in the built environment, new sustainable transportation solutions, planning for the future, expanding the use of podcars, strengthening the investment in podcars, and more.

Moderator was Magnus Hunhammar, CEO, Institute for Sustainable Transport. Speakers and panelists included Rod Diridon, Executive Director of MTI; Matthew Lesh, Transportation Program Specialist, Office of Mobility Innovation at Federal Transit Administration, Department of Transportation (US); Ewa Lofvar Konradsson, Deputy Mayor, City of Södertälje (SE); Robbert Lohmann, Commercial Director, 2GetThere (NL); Nathan Koren, Associate: Transport Planning & Technology, Capita Symonds (UK); Jörg Schweizer, Professor, Bologna University (IT); Hans-Josef Fell, member of the Green Party and German Parliament (DE); Hans Larsen, Transportation Director, City of San José, California (US); and many others.

As a conference speaker, Mr. Diridon discussed the inter-connectivity between podcars and high-speed rail. From there, he went on to Uppsala, Sweden to help develop a collaborative relationship between MTI and Uppsala University.

COOP/COG Training for Transportation Agencies

September 28, 2012 – Cambridge MA

Project 1276

This training was conducted by MTI’s National Transportation Security Center Deputy Director Frances Edwards, PhD, and MTI Research Associate Daniel Goodrich.

They provided a four-hour COOP/COG Introduction and Emergency Relocation Group (ERG) Pilot for Amtrak Northeast Corridor ERG staff at South Station, Boston. The presentation was a follow-up to the DHS-sponsored ERG pilot given for FEMA Region I in May 2012. Amtrak staff members who participated in the FEMA event invited MTI to repeat the presentation for their ERG. Amtrak senior personnel attended the training and interacted effectively with each other and the MTI instructors. The post-class evaluation indicated that all Amtrak staff in attendance believed that they learned valuable information about writing the ERG plan and managing an ERG activation. However, all indicated that they would benefit from additional training to be effective in their ERG jobs.

The ERG members were introduced to the MTI publications, Generic COOP/COG Plan and its ERG materials, as well as the ERG report and course materials. They will use these guides to develop position-specific checklists and go-kits.

ThinkBike Workshop

October 22-23, 2012 – San José CA

Project 1274

Why is cycling so successful in the Netherlands, but not so much in San José CA? This workshop was created to help investigate that issue and to formulate a number of possible solutions. First, the assembly (about 200 people) reviewed the situation in the Netherlands, where bike helmets are rarely worn but where injuries are few. Citizens find a much more welcoming environment for bike riders because they are accepted as part of the normal ebb and flow of traffic.

The conditions were compared with a few specific locations in downtown San José, where biking is less welcome and more difficult. Narrow streets are often shared by cars, delivery trucks, buses, and light rail, leaving little room for cyclists. The prevailing perception is that cycling is only for athletes or for people who cannot afford cars.

Two pre-organized teams were tasked with visiting two particular problem areas for downtown cyclists. Then they were challenged to create workable solutions, perhaps based on what they learned from practices in the Netherlands. Teams were composed of policy makers from the City of San José, the Silicon Valley Bicycle Coalition, the Valley Transportation Authority, and other entities that had the power to create and implement real solutions.

MTI co-sponsored the event, along with the Royal Netherlands Embassy (Washington DC), the City of San José, and the Dutch Cycling Embassy.

Defining the Future of Transit Communications

October 23-24, 2012 – Dallas TX

Project 1269

This event, co-sponsored by MTI, was designed specifically to define the future of transit wireless communications, focusing on utilizing advancing technology and enhancing the passenger experience to advance networks and increase ridership. More than 150 leading transit communication professionals collaborated to share best practices on technology and wireless projects, from the need to engage passengers to the value of onboard wi-fi and radio networks.

In addition to the technical aspects of transit communications, the conference also included presentations about how to engage passengers with more real-time information and more direct communication. MTI Communications Director Donna Maurillo was invited to discuss the value of social media in attracting, involving, and retaining transit riders.

The conference also discussed CCTV, on-board wi-fi access, overcoming spectrum and bandwidth challenges, effective radio systems with narrow-band technologies, and other facets of transit communications.

Asia Pacific Economic Cooperation Conference

October 25, 2012 – San José CA

Project 1270

This conference, co-sponsored by MTI, was part of a project to identify policies and best practices encouraging the use of intermodal freight transportation as a means of reducing greenhouse gas emissions and energy consumption in urban settings. The organizers have been gathering data and have been asked to put together ideas for a policy white paper for the US Department of Transportation and the Asia Pacific Economic Cooperation (APEC) on the benefits of intermodal freight transportation and transit-oriented development. Both topics have been identified by the Secretary of Transportation as having high potential in contributing to sustainable transportation. The recommendations in the white paper will be presented to DOT as well as other governments and ministries of transport in the APEC, which was collectively formed by the US and 21 other countries.

Staff from the National Center for Intermodal Transportation (NCIT) presented the results of two small studies examining the energy savings determined from simulations of intermodal freight transport and transit oriented development in several urban areas. In addition, participants provided discussions of other key developments. Organizers also presented a draft of a working paper containing policy recommendations and practices.

MTI Executive Director Rod Diridon provided opening remarks. The event host was Patrick Sherry, PhD, from the University of Denver. Other participants included Walter Kulyk, Assistant Deputy Administrator for Research, US Federal Transit Authority; Keith Ratner, Professor, Salem State University; Waheed Uddin, Professor, University of Mississippi; William Bourque, Chair, ITI Research Committee; William Van Vleet, Research Associate, University of Colorado, Rob Leachman, Professor, UCLA and UC Berkeley; Richard Sinkoff, Director, Environmental Programs and Planning, Port of Oakland; Juan Acosta, Director, Government Affairs, BNSF; Brian W. Fitzpatrick, San Mateo County Transit District; Daria Serna, RTD, Denver; Allison Bondaza, Research Associate, NCIT, University of Denver; and several others.

Financing the Future: The UCLA Lake Arrowhead Symposium on the Transportation - Land Use - Environment Connection

October 28-30, 2012 - Lake Arrowhead CA

The UCLA Lake Arrowhead Symposium is a collaborative enterprise held each fall that brings together researchers, practitioners, and stakeholders to discuss and debate some aspect of the connections among transportation, land use, and environment. This symposium was created for policy decision-makers and analysts in the public and private sectors whose work concerns land and transportation systems and their environmental consequences. Speakers and audience members are purposely heterogeneous to stimulate thoughtful discussion and debate among all participants.

All levels of government in the US are at fiscal crossroads, and the public finance of its transportation and land use systems is no exception. Population and travel continue to grow, albeit more slowly in recent years. At the same time, mainstay sources of revenues, from property taxes, motor fuels taxes, and the like, have been lagging behind our needs for years. New revenue sources, like special assessments and local option transportation sales taxes, have increasingly, but only partially, filled the widening gap. Calls on limited property taxes – for fire and police, schools, streets and roads, and so on – have never been greater, and projections show that fuel tax rates might need to be tripled to catch up with

growing needs just to maintain crumbling street, highway, and public transit systems. Despite pressing needs, increasing property taxes in California remains beyond the political pale, and there is, if anything, declining political will to raise fuel tax rates at either the federal or state levels.

Instead, citizens have turned more and more to local transportation sales taxes, bonds, public/private partnerships, tolls, fees, and special assessments in what is becoming an increasingly *ad hoc* – and inadequate – system of sidewalk, street, road, highway, and transit finance. Given the unprecedented scale and the urgency of the infrastructure funding crisis, particularly in transportation, the symposium addressed several important questions:

- How are our systems of sidewalk, street, road, highway, and transit finance changing before our eyes?
- How might the federal and state roles change further in the coming decade? How are the enormous pressures on local government finance affecting local transportation investment choices?
- What new sources of revenues have been picking up the slack, where are looming shortfalls the greatest?
- What are the most promising options and strategies for addressing public finance shortfalls in transportation at different levels of government – in the near-term and in the long-term?
- What are the pros and cons of various options and strategies, and which are most suited to meeting our future needs? How do we make trade-offs between these options, considering issues such as efficiency and equity, growth and sustainability, and changing travel behaviors?
- How do voters view transportation finance alternatives, and how can these views help shape politically effective finance strategies and programs? What innovative strategies and tactics are on the horizon for paying for our transportation systems vis-à-vis building consensus in an era of political impasse?
- When do environmental and behavioral programs become revenue sources and vice versa?
- How much should the public sector invest in sidewalk, street, road, highway, and transit? What do we really know about the long-term costs of under- or over-investment?

Panels and discussions included Paying for Transportation and Related Infrastructure; Strengthening the Linkages between Finance and Green Policies; Putting Innovative Transportation Pricing into Practice; Financing High-Speed Rail; Land Use and Local Governments; and more.

California's High-Speed Rail: Lessons from Asia

November 7, 2012 – San Francisco CA

November 8, 2012 – Los Angeles CA

Projects 1271 and 1273

High-speed trains have been zooming across Europe and Asia for decades. Now, after years of contentious debate, the state of California has approved the first phase of construction for the much anticipated – yet controversial – high-speed rail project linking Los Angeles and San Francisco. The nation's first high-speed rail, and one of its largest public infrastructure projects, will cover 800 miles of track and reach speeds of up to 220mph, allowing passengers to travel from LA to SF in just 2.5 hours. Although it is cheered by many who see it as a boon for business, commerce, and a step toward environmental sustainability, others view it as project 'doomed to fail' when the state is on shaky fiscal legs. This program will analyze models in Asia, such as Japan's Shinkansen, as well as those in Korea and China, to understand how high-speed rail systems have impacted travel, business, and livability. Will such an undertaking in California bring about similar changes, or is it simply a waste of public funding?

Asia Society Northern California and Pacific Cities Sustainability Initiative hosted the events, which were co-sponsored by MTI. The program covered micro innovations vs. mega projects; economy and communities, and sustainability. MTI Executive Director Rod Diridon was a presenter.

US High-Speed Rail Association Conference

December 3-5, 2012 – Los Angeles CA

Project I275

The Rail Conference addressed numerous issues vital to high-speed rail, including the benefits, opportunities, and challenges of a major new infrastructure project; project updates from California, Texas, Illinois, New York, the Southwest, and more; how US mayors are preparing for 21st century transportation, economic development, major real estate investment, new facilities, and jobs; conditions for investing, an infrastructure bank, public-private partnerships, and developing legislation to encourage private involvement in HSR systems; major real estate developments at rail stations; first-hand experience from other countries; and much more.

Besides MTI Executive Director Rod Diridon, speakers included many leading experts, such as California Governor Jerry Brown; US Congress Member Loretta Sanchez; California State Senator Leland Yee; California Assembly Members Fiona Ma and Norma Torres; Mayor of Irving TX Beth Van Duyne; LA Deputy Mayor for Transportation Borja Leon; USHSR Board Chairman Dan Richard and its CEO Andy Kunz; California HSR Authority CEO Jeff Morales; LA Metro CEO Arthur Leahy; and President of GEODATA Italy Piergiorgio Grasso.

Also, Dominic Spaethling of Parsons Brinckerhoff; Dan Krause of Californians for HSR; Tim Smart of CH2M Hill; Patricia Petitto of IRWA; Joe Reed of Balfour Beatty Capital; Dwayne Sampson of MTA New York; Rick Harnish of Midwest HSRA; Katherine Perez of ELP Advisors; and many more.

At the conference, Mr. Diridon officially assumed his role as Advisory Board Chairman of the US High-Speed Rail Association. He also was given a lifetime achievement award.

MNTRC Partner Forums and Summits

Introduction to Practical Railway Engineering

March 21-23, 2012 – Las Vegas NV

Project I281 (IPRI) and I282 (AREMA)

Project Manager – Hualiang “Harry” Teng, PhD

The University of Nevada Las Vegas hosted a three-day seminar – Introduction to Practical Railway Engineering (IPRE). This is one of the most important seminars offered at the American Railway Engineering and Maintenance-of-way Association (AREMA) meeting. More than 20 professionals from across the US attended the seminar.

The seminar instructors were well-known professionals in railroad industries, including railroad transit. They included John G. Green from HALCROW – A CH2M Hill Company; Mark Engels from Escorrt, LLC; Michael McGinley from SCRRRA; and B. Coy Horton from Union Pacific Railroad.

Key topics included train operations, railway equipment, tractive effort, train-track dynamics, railway track alignment design, track inspection and maintenance, civil and track construction, railway structures, environmental regulations and permitting, highway-railway grade crossings, and communications and signals. The seminar culminated with a field trip to a railroad road in Las Vegas.

Transportation Summer Camp

July 9-19, 2012 – Reno and Las Vegas NV

Project I285

Project Manager – Hualiang “Harry” Teng, PhD

Zongzhong Tian, PhD, from the University of Nevada Reno led a Transportation Summer Camp, which had activities in Reno and Las Vegas. Hualiang “Harry” Teng, PhD, oversaw activities in Las Vegas. The summer camp was designed for high school students.

A bus-riding competition was held in Reno. Each student received a bus map, schedule, and pass. Starting from the Main Street Station, a team of four students rode and transferred buses until they returned to the starting point. Each student was given three hours to travel as far as possible in the Reno-Sparks region.

Given this time constraint, the teams were to develop their own strategies. For example, students could take fewer but longer routes, while others might use shorter, but quicker routes. While creating these travel plans, teams had to minimize waiting times during bus transfers. After plans were established, the teams implemented them in the field. With distances measured from the Main Street Station, and locations logged through photos, the first-place team accumulated more than 35 miles, proving the efficiency and convenience of the Reno-Sparks public transit system.

While in Las Vegas, the students were given a presentation by Mr. David Swallow about the public transportation system, RTC Transit, operated by the Regional Transportation Commission (RTC) of Southern Nevada. RTC Transit consists of various public transportation modes, including regular buses, rapid transit buses, and para-transit. RTC's bus rapid transit

(BRT) system is one of the best in the nation. In the field, the students learned how the BRT system runs, as well as the technologies that make buses move efficiently through the system.

The students also toured a state-of-the-art transit terminal, Bonneville Transit Center, designed to complement the redevelopment and revitalization of the downtown Las Vegas area. From these activities, the students understood how important public transportation is to a society. Parents commented that it was the first time they had understood how the transportation systems worked, including public transit.

The camp was so successful that transportation summer camps likely will be continued, giving more focus on public transportation.

Transit Summer Camp

July 30-August 3 and August 6-10, 2012 – Detroit MI

Project I283

Project Manager – Leo Hanifin, PhD

University of Detroit Mercy held its sixth Transit Summer Camp, in which students from the greater Detroit area spend a week at the University exploring transportation engineering as a career. They also learn how transit systems affect their communities. The summer program focuses on underrepresented students, with collaboration among university, corporate and government partnerships.

Hands-on projects, guest speakers from industry, field trips, and expert university input from civil and manufacturing engineers provided information that opened new career ideas for the students. Specific topics included Traffic Control Management, Vehicle Infrastructure Integration, Social Justice in Transportation and Flow of Transportation concepts, Identification and Innovative Solutions to Transit and Para-transit Problems, the History of Transit, and Workforce Development Issues. Each morning, students heard from corporate and university speakers, and in the afternoon, they worked with the LEGO SMART MOVES Curriculum and Challenge.

Instructors included Pamela Rhoades Todd, Director of Pre-College Programs, College of Engineering and Science; Tiffany Gunter, Southeast Michigan Council of Government; Peter Guenther, High School Teacher; Christina Heximer and members of the Detroit Collaborative Design Center; Dr. James Lynch, UDM Professor; Dr. Alan Hoback, UDM Faculty; and Cheryl Gregory, Spalding DeDecker.

A field trip to the Road Commission for Oakland County is always the highlight. This is a professional facility that shows how traffic is tracked and controlled. Presenters Dawn Bierlein and Danielle Deneau provided an overview of current and future technology that helps control traffic safety and flow.

Dr. Utpal Dutta of the UDM faculty demonstrated a computer simulation that helped students understand “Traffic Flow at Signalized Intersections.” Students left this session thinking about important intersections in their neighborhoods and why many of them have problems.

Program participants conducted final testing of their robots and final tweaks to their PowerPoint presentations for the closing ceremony and competition.

Distinguished Lecturer Series

November 13 and 15, 2012 – Las Vegas NV

Project 1284

Project Manager – Hualiang “Harry” Teng, PhD

The University of Nevada Las Vegas (UNLV) presented two distinguished seminars with the support of MNTRC and the Institute of Transportation Engineers Intermountain Section, Nevada Chapter. Several student organizations also participated in this seminar, including AREMA Student Chapter at UNLV, ITE Student Chapter at UNLV, and ASCE Student Chapter at UNLV. Students from the CEE 495/695 Railroad Engineering course also attended, along with faculty, graduate students, and undergraduate students from various engineering departments.

The first seminar – “Railroads, Civil Engineering, and Nation Building” – was given by Edward Neumann, PhD, a senior faculty specialized in transit technology in transportation engineering of the Civil Engineering Department at UNLV.

In his presentation, Dr. Neumann provided an historic overview of railroad construction in the US, from the first railroad to the formation of a national railroad network. He provided the background of railroad technology development, the financial mechanism for construction, the engineering characteristics of initial railroads, the manpower required to construct the railroads, including Chinese participation, how some railroads failed, and the people who became wealthy from railroad construction.

The discussion had implications regarding high-speed rail currently under construction in the US. For example, what should be the financial mechanism to fund high-speed rail? Would private investment always be profitable? How could railroad engineering firms work together? These issues are relevant to current high-speed rail construction because it is critical to avoid the mistakes from the past.

Metropolitan planning, transit, and street operations were addressed in the second distinguished lecturer seminar. This was given by Ms. Tina Quigley, General Manager of the Regional Transportation Commission (RTC). She covered RTC’s three primary functions – metropolitan planning organization in Southern Nevada, transit service, and freeway and surface street operations. RTC is the only agency combining these three major functions under one roof, making them easier to integrate and coordinate.

Ms. Quigley introduced the contributions RTC made in each of three areas, with significant coverage on transit service in southern Nevada. By presenting the bus rapid transit (BRT) map, she demonstrated how BRT has evolved and expanded to serve the entire metropolitan area. The audience also was interested in the likelihood of constructing a light rail line in the valley, particularly along the Maryland Parkway connecting Las Vegas downtown to Las Vegas Airport and running through a variety of land uses such as university, shopping mall, hospital, and other locations.

Previously Completed

SAFETEA-LU Summits and Forums

The following Norman Y. Mineta National Summits and Regional Forums were completed in previous years under SAFETEA-LU funding, starting with FY2007-08. They are included here to acknowledge MTI's increasing outreach and information transfer under that legislation. Except for the first summit, all projects were managed by Communications and Information/Technology Transfer Director Donna R. Maurillo.

The Crisis in Workforce Development

October 6, 2007 – Charlotte NC

Project 2751

Project Manager: Leslee Hamilton

Using Bicycles for the First and Last Mile of Transit Commutes

June 3, 2009 – San José CA

Project 2862

Eighth National Garrett Morgan Videoconference and Symposium on Sustainable Transportation

April 1, 2008 - Nationwide

Project 2750

Selective Screening of Rail Passengers: A Summary of the Pilot Tests

June 18, 2009 – Chicago IL

Project 2876

Town Hall Meeting on Our Bicycle Safety Crisis

June 28, 2008 – San José CA

Project 2753

Bringing World-Class High-Speed Rail to America: Special General Session, 12th Annual Transportation and Infrastructure Summit

August 11–14, 2009 – Irving TX

Project 2960

Second Annual Transportation & Infrastructure Convention

March 11–13, 2009 – Washington DC

Project 2861

The Vision and the Blueprint: High-Speed Rail in the United States and Launching High-Speed Rail in the US

October 4–7, 2009 – Orlando FL

Project 2961

Ninth National Garrett Morgan Videoconference and Symposium on Sustainable Transportation

March 25, 2009 - Nationwide

Project 2860

San José State University Campus Bicycle Forum

October 2009 – San José CA

Project 2965

Beyond the Crossroads: A National Discourse on Transportation Infrastructure and Regulatory Policy

May 27–28, 2009 – Denver CO

Project 2863

The Next Fifty Years: Addressing California's Mobility in a Time of Financial Challenges

October 29, 2009 – San Francisco CA

Project 2864

Ensuring the Growth of California's Transportation Workforce

February 1-2, 2010 – Long Beach CA
Project 2962

2010 High-Speed Rail International Practicum

February 8-13, 2010 – Washington, Chicago, Los Angeles
Project 2964

Everyone Wants a Spot: Why Free Parking is a Bad Idea

February 2010 – San José CA
Project 2968

Tenth National Garrett Morgan Videoconference and Symposium on Sustainable Transportation

March 23, 2010 - Nationwide
Project 2963

Meeting the Challenges of Urban Transportation

April 9-13, 2010 – San José CA
Project 2969

NCIT Transportation Workforce Development Conference

April 29-30, 2010 – Washington DC
Project 2967

Turning over a New Leaf: The Start of an Electric Vehicle Revolution

May 18, 2010 – San Francisco CA
Project 2866

Protecting Our Rail Infrastructure: What Are Our Risk Exposures?

June 6-9, 2010 – Vancouver BC
Project 2966

Norman Y. Mineta Regional Summit on Transportation Finance

June 25, 2010 – San Francisco CA
Project 2865

Inter-City Passenger Rail: Opportunities & Challenges for Colorado

September 16, 2010 – Denver CO
Project 1065

Norman Y. Mineta Transportation Forum: High-Speed Rail in California

September 24, 2010 – San José CA
Project 1063

Podcar City San José: The Fourth International Conference on Personal Rapid Transit

October 27-29, 2010 – San José CA
Project 1060

Eleventh National Garrett Morgan Videoconference and Symposium on Sustainable Transportation

March 30, 2011 - Nationwide
Project 1061

Ensuring the Growth of California's HSR Workforce

April 29, 2011 – San José CA
Project 1068

2011 International Practicum on Implementing High-Speed Rail in the US

May 3-5, 2011 – Baltimore MD
Project 1067

2011 APTA Rail Conference

June 12-15, 2011 – Boston MA
Project 1062

From Point A to Point B: Fixing America's Transportation Problems

June 24, 2011 – San Francisco CA
Project 1066

Performance Metrics

Fiscal Year	2007-08	2008-09	2009-10	2010-11	July 1, 2011 - December 31, 2012*
Events	4	6	13	8	25
Attendance	301	353	1,325	1,472	2,477

* Includes four MNTRC partner events.

Other Performance

MNTRC and MTI Web Sites

Information and Technology Transfer also manages MTI's web site, TransWeb (<http://transweb.sjsu.edu>), a transportation information site widely used by individuals and organizations outside of the Institute. ITT also manages the MNTRC site (<http://transweb.sjsu.edu/mntrc>). The sites provide information about MTI's and MNTRC's purposes, research reports (including downloadable publications in PDF, with HTML formats available on request), education programs from middle-school to graduate level, symposia and forums, news coverage, and links to national and international sites related to transit policy and technologies.

The required strategic plan for both organizations identifies two web site quality control variables to be tracked – the number of hits per month, and the number of downloaded documents per month. Both metrics have continued to increase significantly, starting with FY 2009-10 and continuing to increase throughout the 18 months of this reporting period. This comes as a direct result of marketing and outreach efforts, which have been further refined and broadened to attract a wider and deeper audience.

MTI's webmaster has improved the MTI site's performance and search engine optimization while aligning it with current best practices. She also has established a site for the MNTRC, based on best practices and optimization.

MTI Web Site Metrics

The following table indicates the monthly average for the number of MTI web site uses (hits) and the number of downloaded documents for the TEA 2I contract (1998-2006), and for the first SAFETEA-LU and Tier I competition agreement period (2006-11). However, this last item has been divided into two columns to specifically break out MTI's performance over the 18 months since its last report.

Monthly Average	TEA 21 FY 1998-2006	SAFETEA-LU FY 2006-11	July 1, 2011 - December 31, 2012
Monthly Uses	173,985	232,733	354,076
Monthly Downloads	~5,000	42,559	152,446

It is also noteworthy that, during the last 18 months, the MTI web site reached a record-breaking benchmark of 6.4 million uses (or 4.2 million based on a 12-month average). Likewise, the site reached a record benchmark of 2.7 million downloaded documents (or 1.8 million based on a 12-month average).

Some of MTI's most frequently downloaded documents this fiscal year demonstrated a notable interest in cycling and/or pedestrian issues. Some of the most popular research reports include MTI Report 11-19 *Low-Stress Bicycling and Connectivity*; MTI Report 11-05 *Integration of Bicycling and Walking Facilities into the Infrastructure of Urban Communities*; and MTI Report WP 11-03 *An Examination of Women's Representation and Participation in Bicycle Advisory Committees in California*.

Other frequently-downloaded reports focused on transportation security, which has proven to attract long-term interest, sometimes showing up in government or private reports. Some examples include MTI Report 11-20 *Carnage Interrupted: An Analysis of Fifteen Terrorist Plots against Public Surface Transportation* (this report composed 36 percent of total downloads for April 2012); MTI Report WP 09-02 *Explosives and Incendiaries Used in Terrorist Attacks on Public Surface Transportation: A Preliminary Empirical Analysis* (this report remains popular nearly three years after publication); MTI Report 11-07 *Security Awareness for Public Bus Transportation: Case Studies of Attacks Against the Israeli Public Bus System*; and several others.

As a group, several MTI reports on buses also dominated, including MTI Report 09-13 *From Buses to BRT: Case Studies of Incremental BRT Projects in North America* (still popular nearly three years after publication); MTI Report 11-10 *Shared-Use Bus Priority Lanes On City Streets: Case Studies in Design and Management*; MTI Report 11-12 *A Framework for Developing and Integrating Effective Routing Strategies Within the Emergency Management Decision-Support System*; and several more.

Some reports were cited in news stories or in government documents. These include a San Francisco Chronicle story on rail suicides, which cited MTI Report 10-05 *Suicides on Commuter Rail in California: Possible Patterns: A Case Study*; The Federal Register cited MTI Report 06-06 *How Far, by Which Route, and Why? A Spatial Analysis of Pedestrian Preference*; The (California) Assembly Committee on Appropriations: High-Speed Rail Workforce Educational Needs referenced MTI Report 11-16 *Estimating Workforce Development Needs for High-Speed Rail in California*; among several others.

Seven MTI security research reports were requested by the chief of police with South Korea's Ministry of Land, Transport, and Maritime as a guide for developing its transit security policies and procedures.

The MTI brochure on its Master of Science in Transportation Management also proved popular, typically showing in the top downloads each month.

The MTI and MNTRC Research pages provide research proposal information, downloadable forms for research associates, project descriptions for all active research, and links to full-text files for all final research reports. The MTI web site also includes reports completed before the University Transportation Center grant program required online posting.

MTI's Master of Science in Transportation Management (MSTM) students benefit from additional web site content and functions under the Education section. The MSTM pages are designed especially for current students, who can view upcoming class schedules, register for classes on an interactive form, and request information about the program. The updated web site design has helped MTI to streamline the process. Video recordings of all classes are also maintained. It allows students to keep up with any missed lessons, review important sessions, and take advantage of guest speakers from past sessions.

Web site traffic metrics are tracked by way of third-party monthly reports, which list aggregate traffic, busiest and slowest days, document download rankings, page visit rankings, and other information.

MNTRC Newsletter

MNTRC's *World in Motion* newsletter is an effective medium to inform the transportation community and MNTRC supporters about its ongoing transit research and education programs. The newsletter is posted online on both the MNTRC and MTI sites.

First published in 1994, *World in Motion* updates readers about the consortium's education, research, and information transfer. Every issue includes an update from Executive Director Rod Diridon, along with topical articles and program updates by MNTRC directors and graduate students. The profile of a selected Board of Trustees member is featured in every issue.

This is a digital newsletter emailed to a proprietary list of thousands, as well as to the news media and other interested groups. The move from an earlier hard copy to the current digital publication has helped eliminate the costs of printing and mailing while using a more eco-friendly distribution. Second, the inclusion of active links in the newsletter allows readers to go directly to the web sites for more information on particular topics. The links also direct the reader to other important sites, such as the Transportation Research Board, US Department of Transportation, the American Public Transportation Association, and others. And third, the digital newsletter can be forwarded, tweeted, or otherwise shared with additional audiences.

Media Coverage

By way of active media pitching, MTI and MNTRC have established a growing reputation as resources for expert opinions about transit and connectivity issues. Regional and national media often phone unprompted, but MNTRC staff also maintains strong relationships with reporters and editors to whom story ideas can be submitted. MNTRC also subscribes to Profnet, a service that lists dozens of requests each day from editors who are searching for expert sources for particular articles. In addition, 45 news releases were issued during the 18-month reporting period, with 38 of those issued during the 2012 consortium year.

During this reporting period, MTI and MNTRC experts were an important part of many news stories in print, online, and broadcast media. Executive Director Rod Diridon was often solicited for opinions on national and California high-speed rail connectivity, approaches to more effective transit systems, and other current issues. NTSSC Director Brian Michael Jenkins was interviewed frequently regarding national security as it related to terrorism and the terrorists' playbook, while NTSSC Deputy Director Frances Edwards, PhD, was a popular interviewee regarding disaster and safety mitigations

and management. MTI researchers and other associates also were interviewed on their topics of expertise, especially following the release of each new research report, and the media picked up stories about MNTRC symposia and other events.

Based only on actual interview placements, direct story placements, and media inquiries, MTI averaged five broadcast placements (radio and TV) and more than 20 print and/or online placements per month. It is impossible to calculate actual metrics for every placement because news stories are customarily picked up by several other media, including blogs and local news services, and repeated into their own markets. Therefore, when all multiplying factors are taken into account, actual news coverage is reasonably assumed to be significantly higher.

Social Media

During the 18-month reporting period, MTI and MNTRC enjoyed expanded social media presence. The Facebook fan page has grown to more than 405 followers. Every weekday, the site features transportation news, copies of its news releases, commentary, photos, and other items relevant to its mission, including links to sister sites on Facebook, such as the Transportation Research Board, RITA, Secretary Ray LaHood's page, and other sites.

MTI also established its presence on LinkedIn with two separate pages. One of those pages, "Mineta Transportation Institute," is dedicated to users who have an interest in transportation news and issues. The other page, "MTI MSTM Alumni," is focused on those who have graduated from the Master of Science in Transportation Management program. Essentially, it serves as an alumni association site. Postings to both pages include active links back to the MTI and/or MNTRC web sites wherever appropriate, or to transportation-related news stories.

MTI's Twitter account, @MinetaTrans, has continued to attract a growing audience, with new followers every day. At the start of the reporting period, followers were negligible because the account was newly established. However, the count stood at 674 followers as of December 31, 2012. Twitter is being leveraged to post news and announcements that link back to the MTI and/or MNTRC web sites, or to distribute news items in which followers have an interest.

Memoranda of Cooperation

The Mineta Transportation Institute is playing a role in helping to create more cooperation among nations through its growing list of Memoranda of Cooperation (MOCs) with international universities. Earlier this year, MTI hosted Dr. Wenjeng Jia, who came to San José State University for two months to learn more about US transit systems. His home base is in Beijing at the China Academy of Transportation Studies (CATS), with which MTI has an active MOC.

MTI organized tours for Dr. Jia at several Silicon Valley transit agencies, such as Bay Area Rapid Transit (BART), Caltrain, the Bay Bridge Authority, and Valley Transportation Authority. He also traveled to Washington DC to meet with officials at the American Public Transportation Association (APTA), the US Department of Transportation, and other entities. MTI plans to host other visitors, as well. Current MOCs are with Spain's University of Cordoba and Sweden's KTH Royal Institute of Technology. Others are in negotiation, including with Italy's University of Pisa and Japanese Railway East's research laboratory.

MTI is especially enthusiastic about its MOCs because the US can learn from the many other countries that are forging ahead in terms of integrating sustainable transportation.

Other Successes

Scholarship and Awards Banquet

On a Saturday evening in late June, MTI holds a banquet to raise scholarship funds, to award the Garrett Morgan Symposium winners, and to hood the graduates from the MSTM program. On June 23, 2012 the banquet attracted more than 350 transportation leaders, corporate donors, and friends and families of the graduates. The keynote address was delivered by Caltrans Director Malcolm Dougherty, with guest comments by Secretary of Transportation (ret.) Norman Y. Mineta. Outgoing Board of Trustees Chair Mortimer Downey also was honored, as the new Chair Steve Heminger, CEO of the Metropolitan Transportation Commission, was welcomed.

Corporate sponsors included Wells Fargo Bank, AAA, Parsons Brinckerhoff, Central Japan Railway Company, US High-Speed Rail Association, HNTB, CH2M Hill, CDM Smith, Granite Construction, Gilbert Tweed, CJ Lake LLC, and many more. The event typically nets more than \$60,000 per year for scholarships.

Additional Outreach

MTI directors and faculty presented at numerous conferences, symposia, and other gatherings. They also have been interviewed for print and broadcast media. During the 18-month reporting period, for example, Executive Director Rod Diridon spoke at several high-profile transportation conferences, he was interviewed frequently as a transportation and rail expert, and he presented at international conferences in Germany and Sweden.

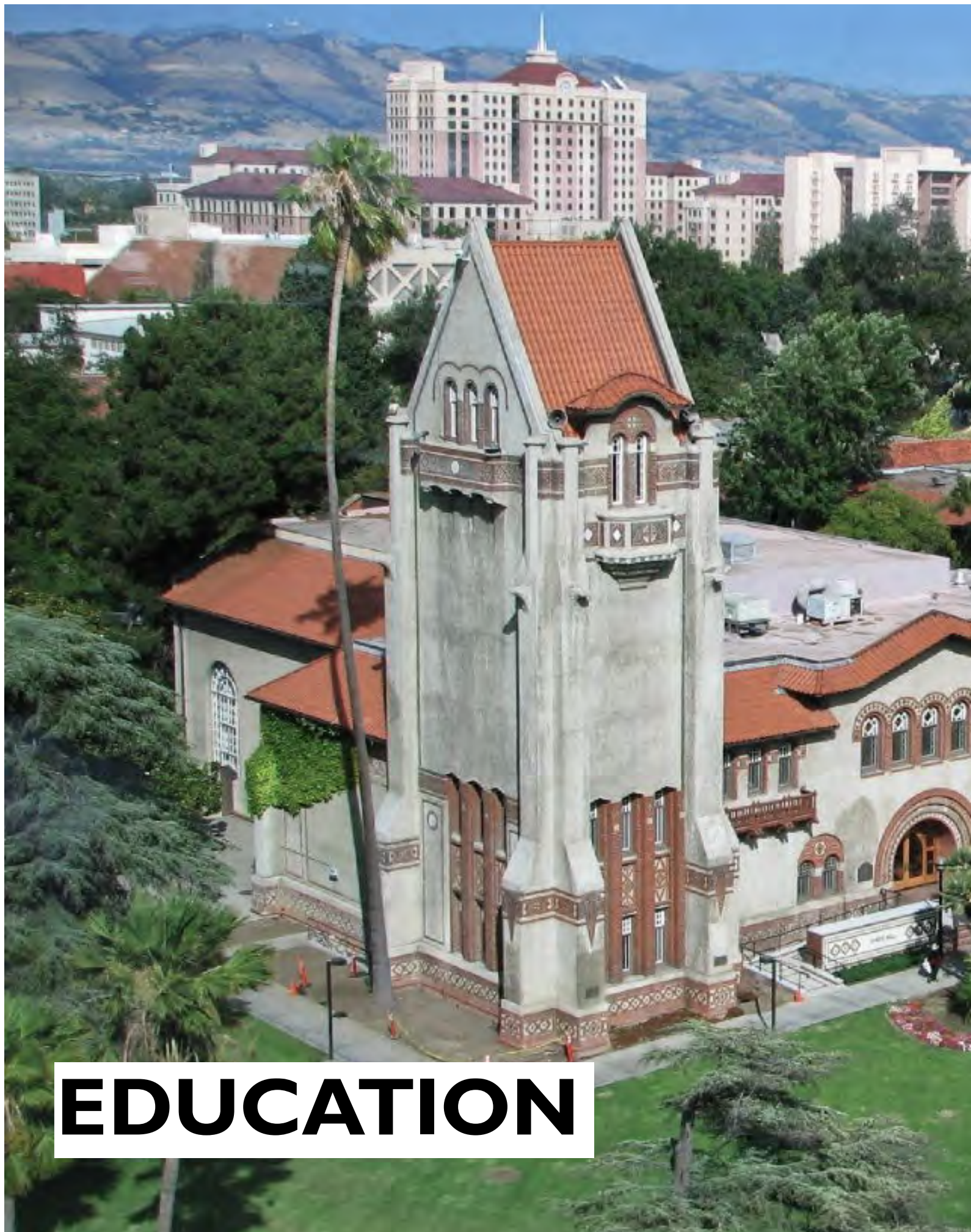
As noted above, NTSSC Director Brian Michael Jenkins has appeared in person and in broadcast interviews discussing counterterrorism measures. He also has testified before Congress and has written articles for industry publications. NTSSC Deputy Director Frances Edwards has been interviewed numerous times regarding safety and disaster management. She also is a frequent guest speaker and trainer.

Also noted above, National Transportation Finance Center Director Asha Weinstein Agrawal presented at a Commonwealth Club of California event about her research on public opinion of transportation taxes. In addition, she has spoken about her finance research at events hosted by the Silicon Valley Leadership Group in San José, UCLA's Lewis Center for Regional Studies, UC Davis's Institute of Transportation Studies, and SJSU's Survey and Policy Research Institute.

Education Director Dr. Peter Haas makes regular visits to MSTM Education Program classroom sites around California to recruit and advise students. He also promotes the program at other transportation agencies and related meetings and conferences, such as the Southern California CEOs monthly meeting and the annual San Joaquin Valley Policy Conference, both in December 2012. He also presented the MTI high-speed rail workforce development study at a September conference in Chicago sponsored by the American Railway Engineering and Maintenance-of-Way Association (AREMA).

Research Director Dr. Karen Philbrick was appointed by Secretary of Transportation Ray LaHood to the US Department of Transportation's Transit Rail Advisory Committee for Safety for a 2-year term. This committee advises the Federal Transit Administration on transit safety issues. Dr. Philbrick also served on the Transportation Research Board Committee for Research on Fatigue in Transit Operations. Dr. Philbrick continues to represent the United States at the Asian Pacific Economic Cooperation (APEC) Transportation Working Group meetings.

Additional details are available in each director's respective section of this report.



EDUCATION





Peter Haas, PhD

Director

Peter.Haas@sjsu.edu

A member of the faculty in MTI's Graduate Transportation Management Program (GTMP) since 1999, Dr. Peter Haas was appointed Education Director in 2001. He earned a PhD in political science (public policy and public administration) from the University of North Carolina at Chapel Hill in 1985. He is a former director of the SJSU Master of Public Administration Program, and he has consulted at every level of government and for nonprofit agencies. Dr. Haas has authored numerous reports and other publications in the field of transportation and co-authored the text, *Applied Policy Research: Concepts and Cases*. A Fulbright Scholar, he also regularly contributes to MTI research projects in several subject areas.



Viviann Ferea

Education Program Assistant

Viviann.Ferea@sjsu.edu

Viviann Ferea was appointed to the position of Education Program Assistant in 2000. She is the primary contact for marketing and administration of the Graduate Transportation Management Program. Among her many responsibilities are continued efforts to recruit for the certificate and master's programs, to revise and maintain the Education portion of the MTI website, and to plan and schedule courses. Ms. Ferea received her BS in business marketing from the University of California Davis. Her studies in public relations and experience in media sales are a valuable resource to help her promote the program's continued growth and success.



Education Program Goal

The Graduate Transportation Management Program was created to develop and administer a multi-disciplinary, state-of-the-art program by way of videoconferencing and Internet technologies. It consists of coursework and experiential learning that provides students the skills and knowledge to manage and lead transportation systems.

Overview

Enrollment Trends

During Academic Year 2011-12, the graduate program recorded 195 student enrollments. These were associated with more than 79 individual, active students, including 63 matriculated Master of Science in Transportation Management students. Seventeen program graduates were recognized on June 23, 2012. These numbers reflect a notable increase in the number of matriculated students.

Summer Transportation Institute

During the summers of 2011 and 2012, the Education Program again offered MTI's Summer Transportation Institute (STI). The program, which is funded by the Federal Highway Administration through the California Department of Transportation (Caltrans), is part of a national endeavor to provide career orientation and educational experiences to motivate secondary school students toward professions in transportation. The transportation industry will continue to need individuals who are prepared to provide the necessary leadership to build the nation's transportation systems for the next century.



STI's primary goal is to encourage high school students – particularly from traditionally underrepresented backgrounds – to seek professional careers in transportation by first obtaining a college education. Participants are engaged in a variety of activities, including a college-level environmental science class with an emphasis on transportation issues, field trips to a several local transportation centers, guest speakers from the industry, hands-on projects, and related enrichment activities. Approximately 20-30 students participate each year, recruited primarily from high schools with high concentrations of disadvantaged youth.

Education Program Accomplishments

Courses Offered

In Academic Year 2011-12, the Graduate Transportation Management Program offered 11 courses. Class sites follow each course listing below:

Fall 2011

MTM 201: Fundamentals of Transportation Management – Students enrolled at Caltrans Sacramento HQ, Caltrans D4-Oakland, Caltrans D8-San Bernardino, Caltrans D11-San Diego, Los Angeles County Metropolitan Authority (Metro), Orange County Transportation Authority, and San José State University (SJSU).

MTM 214: Transportation Policy and Regulation – Students enrolled at Caltrans Sacramento HQ, Caltrans D4-Oakland, Caltrans D7-Los Angeles, Caltrans D11-San Diego, Los Angeles County Metropolitan Authority (Metro), and San José State University (SJSU).

MTM 203: Transportation Markets and Business Development – Students enrolled at Caltrans Sacramento HQ, D4-Oakland, D7-Los Angeles, Orange County Transportation Authority (OCTA)-Anaheim, Los Angeles County Metropolitan Transportation Authority (Metro), and San José State University (SJSU).

MTM 215: Transportation Systems and Development – Students enrolled at Caltrans D4-Oakland, Caltrans D7-Los Angeles, Caltrans D8-San Bernardino, Caltrans D11-San Diego, Los Angeles County Metropolitan Transportation Authority (Metro), Orange County Transportation Authority (OCTA)-Anaheim, and San José State University (SJSU).

Spring 2012

MTM 202: Introduction to Transportation Funding & Finance – Students enrolled at Caltrans Sacramento HQ, Caltrans D4-Oakland, Caltrans D10-Stockton, Los Angeles County Metropolitan Transportation Authority (Metro) Orange County Transportation Authority (OCTA)-Anaheim, and San José State University (SJSU).

MTM 226A: Emergency Management Issues for Transportation Professionals – Students enrolled at Caltrans D4-Oakland, Caltrans D7-Los Angeles, Orange County Transportation Authority (OCTA)-Anaheim, and San José State University (SJSU).

MTM 226B: Security Issues for Transportation Professionals – Students enrolled at Caltrans Sacramento HQ, Caltrans D4-Oakland, Caltrans D7-Los Angeles, Caltrans D8-San Bernardino, Los Angeles County Metropolitan Transportation Authority (Metro), Orange County Transit Authority (OCTA)-Anaheim, and San José State University (SJSU).

MTM 217: Leadership and Management of Transportation Organizations – Students enrolled at Caltrans D4-Oakland, Caltrans D6-Fresno, Caltrans D7-Los Angeles, Caltrans D11-San Diego, Orange County Transportation Authority (OCTA)-Anaheim, and San José State University (SJSU).

MTM 296F: High-Speed Rail Management, Part I – Students enrolled at Caltrans Sacramento HQ, Caltrans D4-Oakland, Caltrans D11-San Diego, Los Angeles County Metropolitan Transportation Authority (Metro), and San José State University (SJSU).

MTM 283: Independent Research – Students enrolled at Caltrans Sacramento HQ, Caltrans D4-Oakland, Contra Costa Transportation Authority (CCTA), Los Angeles County Metropolitan Transportation Authority (Metro), and San José State University (SJSU).

MTM 290: Strategic Management in Transportation – Students enrolled at Caltrans D3-Marysville, Caltrans D4-Oakland, D6-Fresno/Manchester, D10-Stockton, Los Angeles County Metropolitan Transportation Authority (Metro), and San José State University (SJSU).

Fall 2012

MTM 201: Fundamentals of Transportation Management – Students enrolled at Caltrans Sacramento HQ, Caltrans D3-Marysville, Caltrans D4-Oakland, Caltrans D5-San Luis Obispo, Caltrans D7-Los Angeles, Caltrans D8-San Bernardino, Caltrans D11-San Diego, Los Angeles County Metropolitan Authority (Metro), Orange County Transportation Authority (OCTA), Transit Authority for Monterey County (TAMC), and San José State University (SJSU).

MTM 203: Transportation Marketing and Communications Management – Students enrolled at Caltrans Sacramento HQ, Caltrans D3-Marysville, Caltrans D4-Oakland, Caltrans D7-Los Angeles, Orange County Transportation Authority (OCTA)-Anaheim, Los Angeles County Metropolitan Transportation Authority (Metro), and San José State University (SJSU).

MTM 214: Transportation Policy and Regulation – Students enrolled at Caltrans Sacramento HQ, Caltrans D4-Oakland, Caltrans D6-Fresno/Manchester, Caltrans D7-Los Angeles, Caltrans D8-San Bernardino, Caltrans D11-San Diego, Los Angeles County Metropolitan Authority (Metro), Orange County Transportation (OCTA), and San José State University (SJSU).

MTM 215: Transportation Systems and Development – Students enrolled at Caltrans Sacramento HQ, Caltrans D2-Redding, Caltrans D3-Marysville, Caltrans D4-Oakland, Caltrans D6-Fresno/Manchester, Caltrans D7-Los Angeles, Caltrans D8-San Bernardino, Caltrans D11-San Diego, Los Angeles County Metropolitan Transportation Authority (Metro), Orange County Transportation Authority (OCTA), Transit Authority for Monterey County (TAMC), and San José State University (SJSU).

MTM 230: Multimodal Transportation in California – Students enrolled at Caltrans Sacramento HQ Caltrans, Caltrans D2-Redding, Caltrans D4-Oakland, Caltrans D6-Fresno/Manchester, Caltrans D7-Los Angeles, Caltrans D8-San Bernardino, Caltrans D11-San Diego, Los Angeles County Metropolitan Transportation Authority (Metro), Orange County Transportation Authority (OCTA), Transit Authority for Monterey County (TAMC), and San José State University (SJSU).

MTM 296F: High-Speed Rail Management – Students enrolled at Caltrans Sacramento HQ, Caltrans D4-Oakland, Caltrans D11-San Diego, Los Angeles County Metropolitan Transportation Authority (Metro), and San José State University (SJSU).

MTM 283: Independent Research – Students enrolled at Caltrans Sacramento HQ, Caltrans D4-Oakland, Contra Costa Transportation Authority (CCTA), Los Angeles County Metropolitan Transportation Authority (Metro), and San José State University (SJSU).

MTM 290: Strategic Management in Transportation – Students enrolled at Caltrans D3-Marysville, Caltrans D4-Oakland, D6-Fresno/Manchester, D10-Stockton, Los Angeles County Metropolitan Transportation Authority (Metro), and San José State University (SJSU).

MSTM Class of 2012

The faculty and staff of MTI and the Lucas Graduate School of Business were proud to present the graduating class of 2012 at the 21st Annual MTI Board of Trustees Awards Banquet and Convocation on June 23, 2012. Seventeen students earned their MSTM degrees. We admire the dedication of these students, each of whom completed 30 units of coursework, including an original research paper, while meeting the duties of full-time professional employment.

The following MSTM graduates were hooded during MTI's annual scholarship banquet. Copies of their capstone research projects are available upon request.

Trent Bachman	Lisa Harmon	Robin O'Hara
Rashidi Barnes	Carolyn Helmke	Pantaleon D. Rivera III
Milad Boosheri	Matthew Kennedy	Bill Shao
Lucinda Brown	Patricia Krinke	Kevin Tucker
Ann Calnan	Michael Lemon	Edel Vizcarra
Sarah Christensen	Kristine Lowe	

Graduate Certificates

The 12-unit Graduate Certificate programs are rigorous and intense, each consisting of four core courses from the MSTM program. These students' hard work and determination during this academic year have helped them successfully complete the Certificate programs. Many students earn their certificates as a significant step toward achieving their MSTM degrees.

Graduate Certificate in Transportation Management

In addition to all our MSTM graduates earning a certification, one other student received MTI's graduate Certificate in Transportation Management (CTM): Jason Kwan

Graduate Certificate in Transportation Security Management

Ten students received MTI's graduate Certificate in Transportation Security Management (CSTM):

Trent Bachman	Seth Cutter	Robin O'Hara
Martin Barna	Steven King	Sarah Swensson
Milad Boosheri	Patricia Krinke	
Sarah Christensen	Kristine Lowe	

Graduate Certificate in High-Speed Rail Management

Six students received MTI's graduate Certificate in High-Speed Rail Management (CHSRM):

Rashidi Barnes	William Boston	Ann Calnan
Roger Bazely	Lucinda Brown	Jeffrey Windham

Continuing Student Performance (CSP) Fellowships

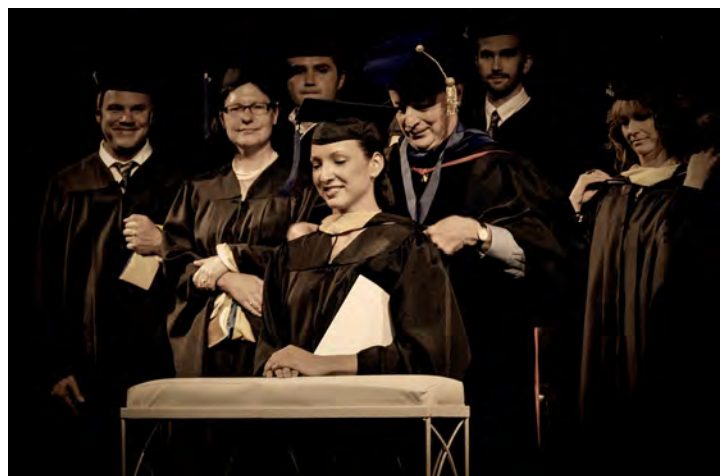
Twice a year, subject to funding availability, MTI awards MSTM and Certificate Fellowships. Thanks to this generous program, students can continue their studies while meeting their other financial obligations. In the 2011-12 academic year, MTI awarded more than \$31,000 to the following qualified students.

MSTM Students:

Lucinda Brown	Kristine Lowe	Bill Shao
Seth Cutter	Luis Melendez	Jeffrey Windham
Christopher Espiritu	Gregory Natoli	
James Famolare	Jeffrey Purdie	

CTM Students:

Allison Busch-Lovejoy
Anna Chavez
Troy Webb



MSTM Class of 2012, Graduate Research Papers

All graduate students in the MSTM program are required to produce an original research paper reflecting what they have learned during their regular coursework. Papers must propose a problem, include a section on research methodology, follow standard formatting, include citations, properly list tables and illustrations, and otherwise follow standard practices for producing a research paper. The variety of topics investigated by this year's class demonstrates the broad transportation areas that their graduate education has covered. In order of author's name, these papers include:

Trent R. Bachman – *Switching Tracks: How Amtrak's Northeast Corridor Management Can Influence Its Employees to Provide Excellent Service and Thus Improve Customer Satisfaction*

Rashidi Barnes – *Electric Bus Technology in the US: Will It Change the Future of Public Transportation?*

Millad Booshehri – *How Can Social Media Be Used to Increase Transit Rider Satisfaction?*

Ann Calnan – *Biological Mitigation for Linear Transportation Projects that Result in Minor Impacts in California's Urban Areas*

Sarah E. Christensen – *Improving the Safety Performance of Express Lanes in California: An Application of Existing Policy and Procedures*

Lisa Harmon – *The "Wicked Problem" of Integrating Airports in Community Planning*

Carolyn Helmke – *Flexibility and Road Design*

Gary Hsueh – *Policy Implications of the Provision of Real-Time Transit Information for Smartphone App Development*

Matthew M. Kennedy – *Positive Train Control: Safety and Efficiency*

Trisha Krinke – *Public Outreach and Construction Impact Mitigation*

Michael Lemon – *Alternative Fuel Opportunities for Diesel Locomotives*

Robin O'Hara – *How Can Social Media Be Used to Affect Behavior Regarding Transportation Issues? "Carmageddon" and the Perfect Social Media Storm*

Pantaleon Rivera – *What Are the Advantages and Disadvantages of Using In-State Design Engineers Versus Private Contractors in Engineering Projects?*

Bill Shao – *What Are the Actual Costs of Transit Signal Priority? A Synthesis of Transit Signal Priority Implementation Experience in Los Angeles*

Kevin Tucker – *Using Transportation Operations to Reduce Greenhouse Gases*

Edel Vizcarra – *Terrorism and the Security of Public Transit: A Case for the Implementation of Crime Prevention Through Environmental Design*

Selected Student Successes

In January, MSTM student Robin O'Hara was honored as MTI's Student of the Year at the 2012 awards banquet for the Council of University Transportation Centers (CUTC) in Washington DC. The award is co-sponsored by the US Department of Transportation. Robin received a check for \$1,000 in honor of her outstanding academic and professional achievements. Additionally, Ann Calnan was honored as the Lucas Graduate School of Business Outstanding Student for the 2011-12 academic year.

MSTM students continue to succeed in national competition for honors and scholarships. Michael Litschi won the national competition for the CUTC Parker Award for Outstanding Non-Thesis Paper in Policy and Planning with his capstone paper, "Video-Based Driver Risk Management Systems: Evaluating Effectiveness at Improving Transit Safety." Michael was honored at the 2012 awards banquet and received a \$1,500 cash award.

Sarah Swensson won a national competition to be selected as an Eno Transportation Foundation Fellow for 2012. The award includes a week in Washington DC, where Fellows meet with transportation policy makers and experts.



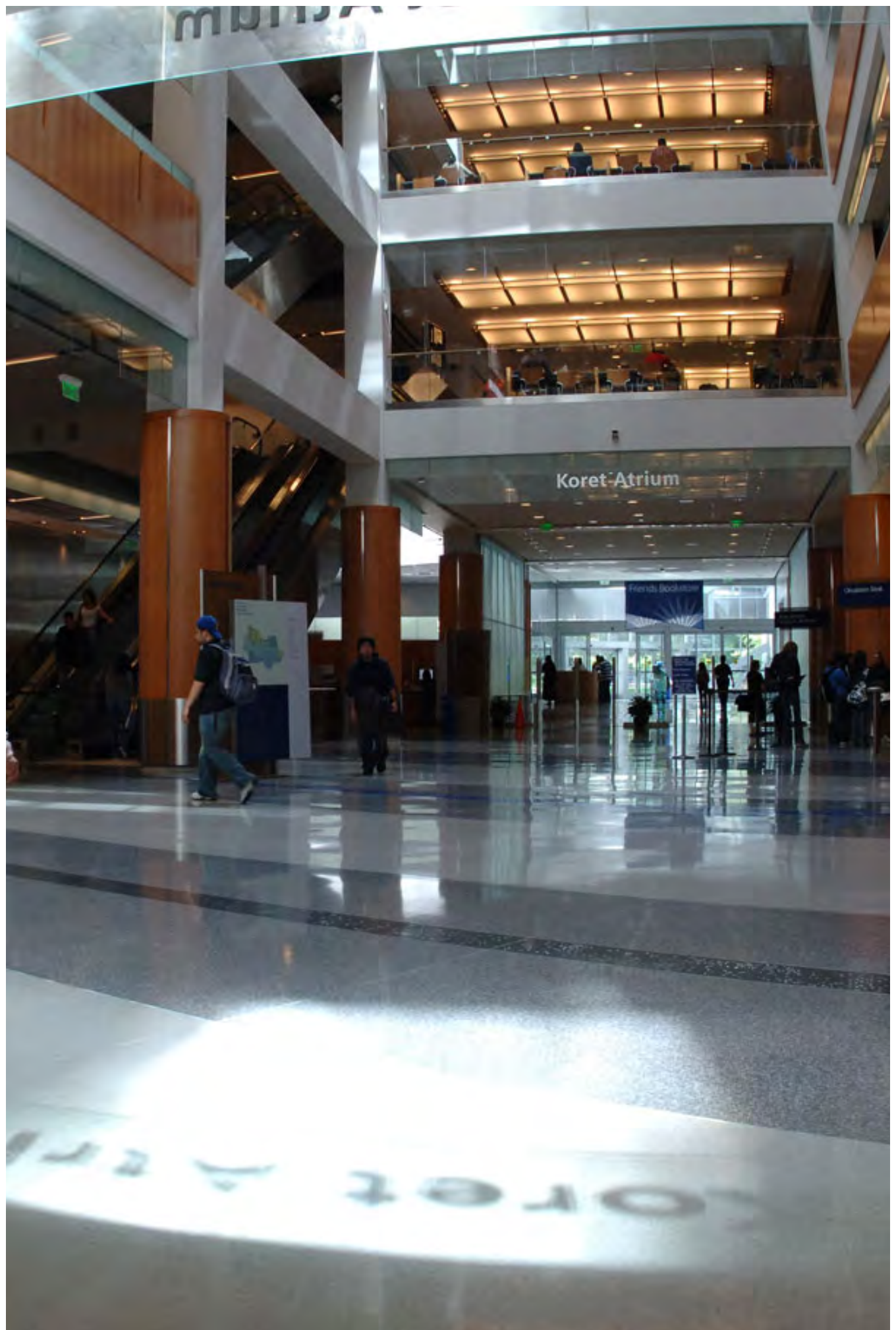
Program Outreach and Faculty Achievements

Education Program Director Dr. Peter Haas appeared at a number of public transportation meetings and conferences as part of the ongoing effort to publicize the MSTM program and to recruit students. He spoke about workforce development at the University Transportation Centers' National Transportation Workforce Summit in Washington DC on April 24, 2012 and was invited to appear at the Los Angeles Region-wide CEOs' Meeting on October 19, 2012. Dr. Haas continues to serve on a number of committees, including as Co-Chair, Student Award Committee, for the Council of University Transportation Centers and as a Member of the Board of Regents of the Eno Transportation Foundation.

MSTM faculty members Dr. Frances Edwards and Dan Goodrich published a groundbreaking textbook on transportation security, *Introduction to Transportation Security* (CRC Press, 2012). Dr. Edwards also co-authored a research monograph for MTI, "A Framework for Developing and Integrating Effective Routing Strategies Within the Emergency Management Decision-Support System (with Anurag Pande and Joseph Yu).

SAFETEA-LU Performance Metrics: Education

Fiscal Year	July 1, 2011 - December				
	2007-08	2008-09	2009-10	2010-11	31, 2012
MTI Master of Science in Transportation Management Enrollment	44	45	67	63	65
MTI Master of Science in Transportation Management Graduates	15	19	14	14	17





APPENDICES

- A. Financial Illustrations
- B. Organizational Chart
- C. Research Associates Policy Oversight Committee
- D. Certified Research Associates
- E. Project Team Members
- F. Research and Project Assistants
- G. Editorial Associates and Transcribers
- H. MTI Student Assistants
- I. Graduate Transportation Management Program Faculty
- J. Acknowledgements



Appendix A

Financial Illustrations

Illustration of Expenditures
Mineta National Transit Research Consortium
CY 2012 Expenses = \$2,000,610

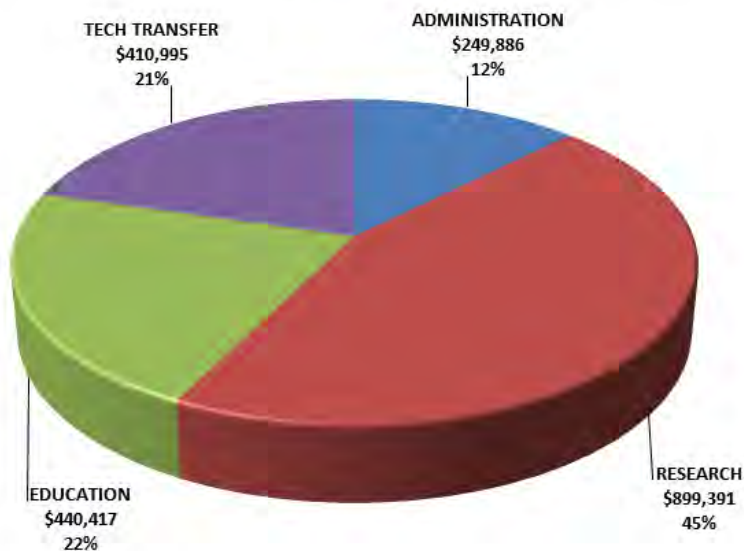
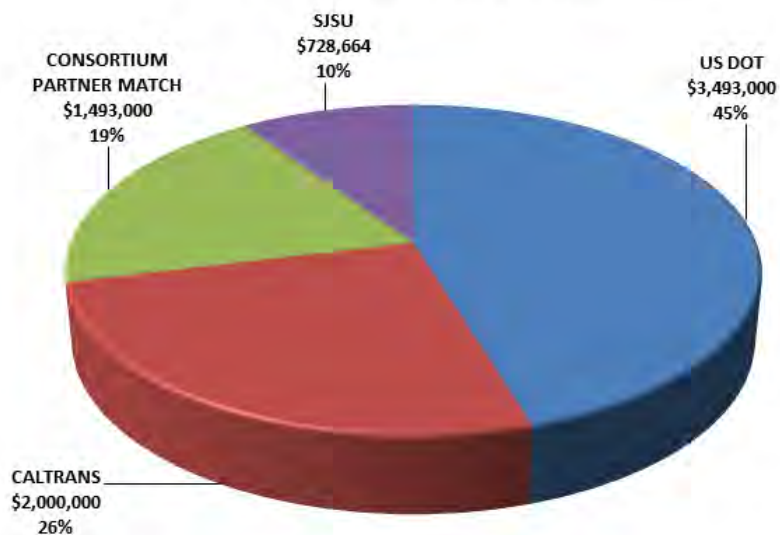


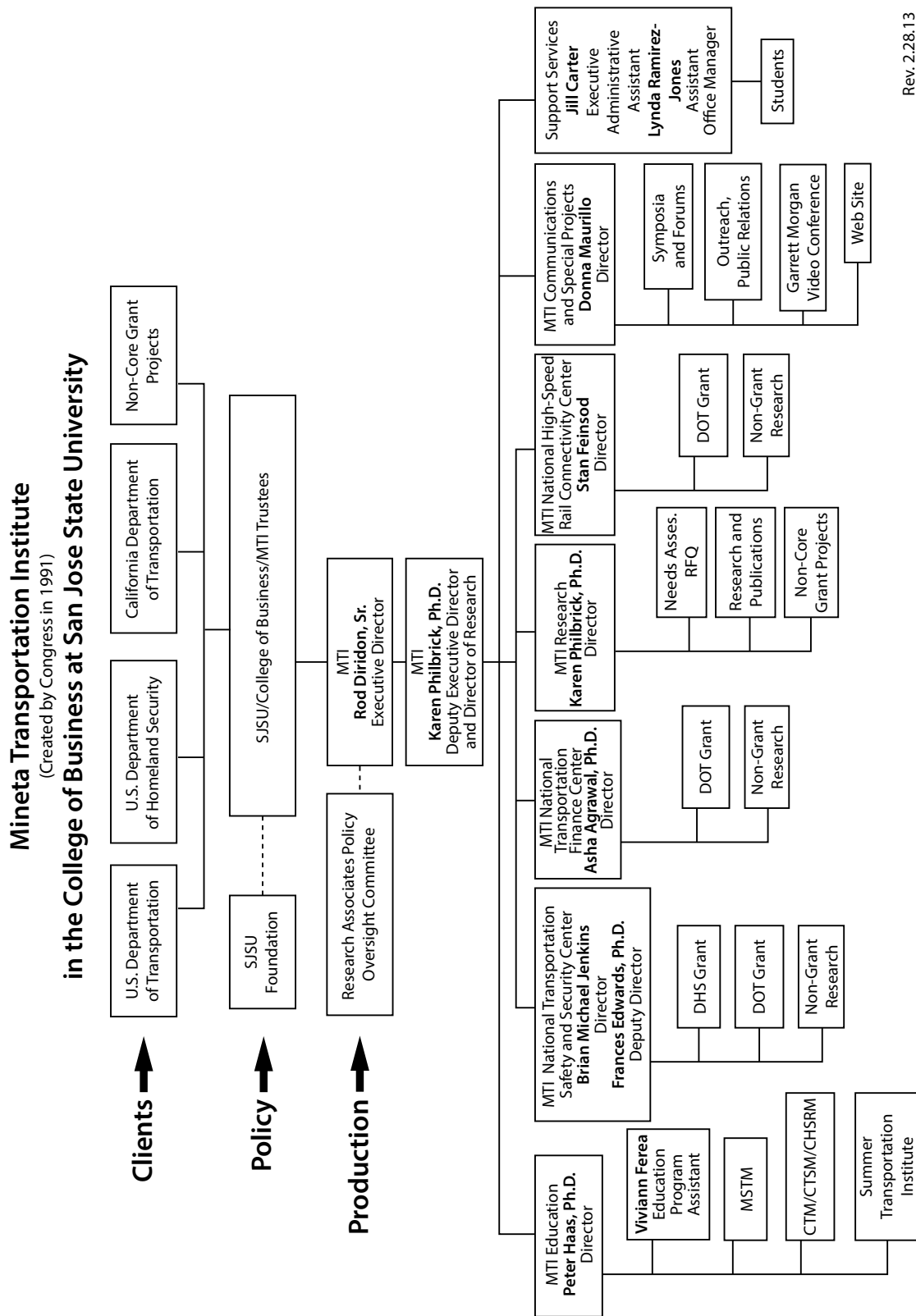
Illustration of Revenue
Mineta National Transit Research Consortium
Total Grant Revenue = \$7,714,664*



* An additional annual allocation of an equal amount was announced to be received in 2013. It will be apportioned approximately the same way to maintain a vital and productive consortium program through 2015.

Appendix B

Organizational Chart



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Appendix C

Research Associates Policy Oversight Committee (RAPOC)

Chair



**Asha Weinstein
Agrawal, PhD**
Urban & Regional
Planning



David Czerwinski, PhD
Marketing and Decision
Sciences

Members



Jan Botha, PhD
Civil & Environmental
Engineering



Frances Edwards, PhD
Political Science



**Katherine Kao
Cushing, PhD**
Environmental Studies



Taeho Park, PhD
Organization and Management



Diana Wu
Martin Luther King, Jr. Library

Ex-Officio



Christine Azevedo
California Department of
Transportation



Rod Diridon
MTI Executive Director



Karen Philbrick, PhD
MTI Deputy Executive Director
and Director of Research

Not pictured:

Nancy Chinlund
California Department of
Transportation

Nicole Longoria
California Department of
Transportation

Bob O'Loughlin
Federal Highway
Administration

Appendix D

Certified Research and Consulting Associates

* Students who became RAs and/or CAs.

Joy Adams	Dana Cuff	Shengyi Gao*
Asha Weinstein Agrawal	Elaine Curran	Rick Geddes
Bhuiyan Alam	Katherine Kao Cushing	Kenneth Gehrt
Gila Albert	David Czerwinski	Shahin Gerami
Lewis Ames	Nancy Da Silva	Larry Gerston
Bruce Appleyard	Constantine Danopoulos	Cynthia Glenn
Stephen Arhin	Charles Darrah	Todd Goldman
Senanu Ashiabor	Marcia Daszko	Daniel Goodrich
Patricia Backer	Seebany Datta-Barua	Eileen Goodwin
Arthur Bauer	Allison de Cerreño	Geoffrey Gosling
Peter Benjamin	Neil Denari	Robert Graham
Michael Bernick	Omkar Deo	George Gray
Robert Bertini	Randy Deshazo	David Greene
Evelyn Blumenberg	Subhankar Dhar	Zhan Guo
Marlon Boarnet	Jennifer Dill	Peter Haas
Earl G. Bossard	Stephanie DiPetrillo	Renee Haider
Jan Botha	Rod Diridon	Susan Handy
James Brent	Frank Douma	Leo Hanifin
Thomas Brightbill	Mortimer Downey	Donald Hayes
Jeffrey Brown	Matthew Dresden	James Helmer
Ralph Buehler	Utpal Dutta	Daniel Hess*
Shaunna Burbidge	Frances Edwards	Aharon Hibshoosh
Bruce Butterworth	Magdalini Eirinaki	Harrison (Tim) Higgins
Lisa Callaghan	Sam Elrahman	Judy Hilliard
Michael Carroll	Daniel Evans	Alan Hoback
Jean Casey	Rolanda Farrington	Matthew Holian
Wendy Casper	Stan Feinsod	Doug Houston
Daniel Chatman	Christopher Ferrell*	Tai Hsu
Peter Chun-Hung Chen	Robert Fields	Aseem Inam
Xeuming “Jimmy” Chen	Bradley Flamm	Eric Ingbar
Christopher Cherry*	Camille Fink	Hiroyuki (Hiro) Iseki*
Yong Cho	Rachel Finson	Reza Jafari
Kunhee Choi	Bradley Flamm	Brian Michael Jenkins
Woodrow Clark II	Triant Flouris	Camille Johnson
Michael J. Clay*	Ann Forsyth	Michael Jones
Adam Cohen*	Lawrence Frank	Eugene Jud
Steven Colman	Richard Funderburg II	Matthew Kahn
Lindsay Corneal	Peter Furth	TC Kao

Mohammed Kaseko
Kevin Keck
Norman Kelley
Changmo Kim
Dohyung Kim
Dong-Shik Kim
Sungyop Kim
David Klinikowski
Dongsung Kong
Richard Kos
Chris Kozub
Kevin Krizek
Ashok Kumar
Stephen Kwan
Changhyun Kwon
Jacob LaRiviere
Thomas Larwin
Anne Lawrence
Thuy Le
Eul-Bum (E.B.) Lee
Richard Lee
Scott Lefaver
Alan Leventhal
Jonathan Levine
Sherman Lewis III
Timothy Lipman
Arvinder Loomba
Edward Lopez
Anastasia Loukaitou-Sideris
Paul Lukes
Paul Ma
Suresh Mani
Pedro Maria-Sanchez
Frank Markowitz
Felix Marten
Elliot Martin*
Shishir Mathur
Warren McHone
William Medigovich
Bing Mei
Maaza Mekuria
Emanuel Melanchrinoudis
Marco Meniketti

Hokey Min
Sudeshna Mitra
James Moore II
William Morrison
Gail Murray
Andrew Nash
Hani Nassif
Gregory Newmark
John Niles
Hilary Nixon
Errol Noel
Robert Noland
Cornelius Nuworsoo
Matthew O'Brien
Michael Oakes
Herbert Oestreich
Asbjorn Osland
Kaan Ozbay
Robert Paaswell
Anurag Pande
Marta Panero
JiYoung Park
Moonseo Park
TaeHo Park
Alexander Paz
Michael Peck
Howard Permut
Andru Peters
Eric Peterson
Joseph Michael Pogodzinski
Patti Post
Jae-Ho Pyeon
William Reckmeyer
Jason Rife
Charles Rivasplata
Caroline Rodier*
Daniel Rodriguez
Nina Rohlich*
Gabriel Roth
Donald Rothblatt
Jeffrey Sachse
Dayana Salazar
Deborah Salon

Jean-Daniel Saphores
Brian Scales
Justin Scheidt
Marc Schlossberg
Gian-Claudia Sciara
Mary Scoggin
Kevan Shafizadeh
Susan Shaheen
Patrick Sherry
Yoram Shiftan
Hyeon-Shic Shin
Steven Silver
Sarah Siwek
George Smith
Charles Standridge
Craig Stauffer
Ruth Steiner
Walt Stringer
Edward Sullivan
Ronald Sylvia
Brian Taylor
Hualiang Teng
Gregory Thompson
Louis Thompson
Howard Permut Turetsky
Linda Valenty
Stephen Van Beek
Itzhak Venezia
William Vincent
Meghna Virick
Robert Vitale
Faye Wachs
Martin Wachs
Ya Wang
Kent Webb
Wenbin Wei
John West
George Whaley
Traci Williams
Richard Willson
Stacey Worley
Allison Yoh
Asim Zia

Appendix E

Project Team Members

Since the inception of the TEA-21 grant, 186 Research and Consulting Associates (RAs and CAs) have been active on Research and Information Transfer Projects, with several on more than one project. Those who served as Principal Investigator are listed in **bold type**.

John Abraham, PhD

Joy Adams, PhD

Asha Weinstein Agrawal, PhD

Bhuiyan Alam, PhD

Scott Anderson

Bruce Appleyard, PhD

Stephen A. Arhin, PhD

Steve Atkinson

Claudia Bernasconi

Gary Binger, AICP

Evelyn Blumenberg, PhD

Marlon Boarnet, PhD

Earl Bossard, PhD

Jan Botha, PhD

James Brent, PhD

Jeffrey Brown, PhD

Bruce Butterworth

Lisa Callaghan-Jerram

Daniel Chatman, PhD

Dennis Church

Adam Cohen

Steven Colman, AICP

Lindsay Corneal, PhD

Dana Cuff, PhD

Katherine Cushing, PhD

Nancy Da Silva, PhD

Allison de Cerreño, PhD

Donald de la Peña

Jennifer Dill, PhD

Stephanie DiPetrillo

Rod Diridon, Sr.

Shalom Dolev

Utpal Dutta, PhD

Marilyn Easter, PhD

Frances Edwards, PhD

Ralph Ellis, PhD

Daniel Evans, JD

Robert Ewers

Stan Feinsod

Thomas Ferrara, PhD

Christopher Ferrell, PhD

Rachel Finson

Bradley Flamm, PhD

Triant Flouris, PhD

Ann Forsyth, PhD

Richard Funderburg, PhD

Peter Furth, PhD

Kenneth Gehrt, PhD

Shahin Gerami, PhD

Larry Gerston, PhD

Reed Gibby, PhD

Joseph Giglierano, PhD

Todd Goldman, PhD

Eric Gonzales, PhD

Daniel Goodrich

Eileen Goodwin

Geoffrey Gosling, PhD

Steven Graham, PhD

George Gray

Zhan Guo, PhD

Peter Haas, PhD

Renee Haider

Leslee Hamilton

Leo E. Hanifin, PhD

Christopher Hanson, PhD

Stuart Harvey

James Hayton, PhD

Daniel Hess, PhD

Aharon Hibshoosh, PhD

Harrison (Tim) Higgins

Judith Hilliard

Alan Hoback, PhD

Matthew Holian, PhD

Thomas Horan, PhD

Megumi Hosoda, PhD

Doug Houston, PhD

Doug Hunt, PhD

Aseem Inam, PhD

Eric Ingbar

Waseem Iqbal

Hiroyuki Iseki, PhD

Brian Michael Jenkins

Robert Johnston

Eugen Jud

Matthew Kahn, PhD

TC Kao, PhD

Mahomed Kaseko, PhD

John Kevin Keck

Norman Kelley

Dong-Shik Kim, PhD

David Koffman

Dongsung Kong, PhD

Chris Kozub

Ashok Kumar, PhD

Cobbie Kwasi Harris, PhD

Kathy Lapido

Thomas F. Larwin

E.B. Lee, PhD

Richard Lee, AICP, PhD

Scott Lefaver, DPA, AICP

Alan Leventhal

Jonathan Levine, PhD

Robin Liggett, PhD

Anastasia Loukaitou-Sideris, PhD

Andrea Lubin

Hollie Lund, PhD

Stanley Malos, PhD

Suresh Mani, PhD

Felix Marten, PhD

Elliot Martin, PhD

Patricia Martinico

Shishir Mathur, PhD

R. Stephen Mattoon

Mark D. McCoy, PhD

Patrick McGovern, PhD, JD

William Medigovich

Maaza Mekuria, PhD

Emanuel Melachrinoudis, PhD

Marco Meniketti, PhD

Hokey Min, PhD

Sudeshna Mitra, PhD

Andrew Nash

Hani Nassif, PhD

Dick Nelson, PhD

Edward Nelson, PhD

John Niles

Hilary Nixon, PhD

Errol C. Noel, PhD

Robert B. Noland, PhD

Cornelius Nuworsoo, PhD

Matthew O'Brien, PhD

Herbert Oestreich, PhD

Asbjorn Osland, PhD

Kaan Ozbay, PhD

Robert Paaswell, PhD

Anurag Pande, PhD

Taeho Park, PhD

Larry Patterson

Marta Panero, PhD

Michael Peck, PhD, MSW

Howard Permut

J. Michael Pogodzinski, PhD

Jae-Ho Pyeon, PhD

Mahesh Rajan, PhD

Donald Reed, PhD

Steven Reiner, AICP

Charles Rivasplata, PhD

Caroline Rodier, PhD

Daniel Rodriguez, PhD

Nina Rohlich

Maria (Malu) Roldan, PhD

Donald Rothblatt, PhD

Dayana Salazar, PhD

Roger Salstrom, PhD

Gail Sansbury, PhD

Marc Schlossberg, PhD

Kenneth Schreiber, AICP

Mary Scoggin, PhD

Saloua Sehili, PhD

Lloyd A. Semple

Susan Shaheen, PhD

Karl Shrum

Walter Siembab

Steven Silver, PhD

Charles R. Standridge, PhD

Edward Sullivan, PhD

Ronald Sylvia, PhD

Richard Taketa, PhD

Brian Taylor, PhD

Hualiang "Harry" Teng, PhD

Gregory Thompson, PhD

Louis Thompson

Joseph Trella

Jacob Tsao, PhD

Nicholas Tulach

Linda Valenty, PhD

Stephen Van Beek

John Vargo

William Vincent, JD

Martin Wachs, PhD

Paul Wack, AICP

Wenbin Wei, PhD

Richard Werbel, PhD

George Whaley, PhD

Andrea Whitaker, PhD

Richard Willson, PhD

Hing Wong, AICP

Asim Zia, PhD

Appendix F

Research and Project Assistants

More than 200 students ranging from senior-level undergraduates to PhD candidates have served as research and project assistants on MTI studies, with several working on more than one project. They attend school at San José State University, Bowling Green State University, California State University at Chico, California Polytechnic State University (Cal Poly) at San Luis Obispo and Pomona, Claremont Graduate School, Florida State University, Grand Valley State University, Howard University, New York University, Penn State University, Portland State University, Rutgers University, State University of New York at Buffalo, University of California Berkeley, University of California Davis, University of California Los Angeles, University of Detroit Mercy, University of Michigan, University of Nevada Las Vegas, University of New Orleans, University of Oregon, University of Toledo, and others.

* Students who became RAs and/or CAs.

Theresa Applegate	Charles Chapin	Grant Engel
Miriam Ayllon	Manoj Chavali	Katherine Estrada
Monica Baptista	Christopher Cherry*	Rachel Factor
Peter Ballard	Kevin Chiu	Zheng Fan
Tuna Batuhan	Stephanie Chow	Jenny Fang
Jon Baumgardner	Dan Cicuth	Kevin Fang
Vanessa Bekkouché	Michael Clay*	Amy Fauria
Lewis Bell	Sara Liz Cloutman	G. Ferguson
Torsha Bhattacharya	Adam Cohen	Chris Ferrell*
Julie Blue	Erin Cooper	Camille Fink
Harika Boga	Ember Crouch	Meaghan Foster
Olga Bokhonuskaya	Angela Crumley	Kacie Freibell
Paul Boone	James S. D'Albora	Larry Gamino
Swathi Boreda	Olaoluwa Dario	Eric Ganther
Amanda Bornstein	Judy Deertrack	Shengyi Gao*
Annabelle Boyd	Catherine Deluca	Brian Geremia
Brent Boyd	Pranjali Deshmukh	Jeff Gerlach
Tracy Braden	Jeremy J. Deubler	Judy Glickman
Ava Bromberg	Mangesh Dhumne	Julie Gotham
Britta Buys	David Dixon	Frances Grammer
Hazel Cadelina	Kelly Dixon	James Griffith
Alasdair Cain	Jennifer Donlen	Young Han
Jean Casey	Stella D'Oro	Nancy Hannaford
Diego Castaneda	Scott Douglas	Matthew Hannigan
Diana Castillo	John Du	Michael Harold
Ellen Cavanaugh	Scott Duiven	Babak Hedjazi
Akshay Chada	Kristina Elmasu	Michael Heggli

Paul Hernandez
Daniel Hess*
Paul Hierling
Jeff Hobbs
Franziska Holtzman
Rebecca J. Houtman
Karthik Indukuri
Katja Irvin
Hiroyuki (Hiro) Iseki*
Michal Jaroszynski
Maria-Louise Javier
Ameya Kadam
Sangeetha Kaushik
Andrew Kay
Tara Kelly
David Keyon
Daniel Kim
Sean Joo Kim
Basavasai Konuru
Ashutosh Kumar
Sheung-Kuen Kwan
Kwa Saup Lee
Phil Leitzell
Jerusha Hew Len
David Levitan
Kanhong Lin
Peng Lou
Alexis Lynch
Eugene Maeda
Ramses Madou
Sanhita Mallick
Elliot Martin*
Kristen S. Massey
Nancy Matheson
Gabriele Matthews
Erin Mayer
Carolyn McAndrews
Scott McKay
Mark McGovern
Grant McMurran
Emy Mendoza
Jackson Mi
Jeremy Miller

Ender F. Morgul
Allen Mulch
Richard Murphy
Vinay Murthy
Ross Nakasone
Hazma Narzullayevich
Patrick Naughton
Jessica Navarro
Sara Oliver
Hamid Omidvarborna
John Omweg
Darci Palmer
Adam Parania
Aliza Paz
Tanvi Parikh
Jeff Peters
Yeseni Pina
Jennifer Piozet
Matthew Piven
Scott Plambaeck
Vanessa Potter
Agus Pratma
Megan Quirk
Melissa Reese
J. Darius Roberts
Caroline Rodier*
Adrian Rodriguez
David Roemer
Chisagarn Rohanasoonthon
Monica Rowden
Rhys Rowland
Navid Sadri
Mellownie Salvador
Randolph Schmidt
Kara Serrano
Aanal Shah
Kaushik Shandilya
Chen Shen
Victoria Sherman
Kimiko Shiki
Heather Simonovich
Adam Smith
Jesse Solorio

Jumin Song
Denise Staudt
Andrea Subotic
Marlene Subhashini
Tiffany Sudar
Allison Suggs
Sean Patrick Summers
Miho Tomura
Griffith Tonkin
Laurel Torney
Gwo-Wei Torng
Ehvan Tran
Suzanne Tringali
Tran Tung
Hamza Tursunov
Aastha Vashist
Kelly Vasquez
Cecile Vo
Thanh-Thuy Vo
Carla Wachneldt
Pin-Yuan Wang
Peter Weshler
Blair Whitney
Mike Winton
Lisa Wise
Norman Wong
Kevin Yahne
Luo Yanhui
Ed Yarbrough
Tin Yeung
Alison Yoh
Joseph Yu
Dali Zhang
Qiong Zhang
Jessica Zqobis

Appendix G

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Appendix J

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Annual Report Production Team

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