



2009 - 2010 Annual Report

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About The Mineta Transportation Institute

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.

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 U.S. will not be able to outspend so it 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. MTI's work encompasses all modes of surface transportation, including the interface between those 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 Policy Center), Education, and Communications and Information & Technology Transfer.

Executive 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 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 U.S. 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, MTI was chosen one of the ten continuing Centers of Excellence. Caltrans matched the federal grant, confirming their commitment to MTI.

During this evolutionary period, MTI's ISTEA surface transportation policy and management legislative mandate was honored and became focused on three specialties: 1) security and emergency response management, 2) finance, and 3) land use, transportation, and the environment interrelationships. 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 to the national transportation community on the three priority topics, although other policy issues are studied when requested by US DOT Western Resource Center, Caltrans, and the MTI Trustees. MTI education programs have been broadened to include professional Certificates in Transportation Security Management and in High Speed Rail Management.

The current MTI structure is summarized in the organization diagram in the Appendix and includes three departments with 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) National Transportation Security Center of Excellence (for both US DOT and DHS), 2) National Transportation Finance Center, and 3) National High-Speed Rail Policy 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 is being reported since MTI was fully funded under Tea-21 in 1999.

Research Department

Director Karen Philbrick, PhD

Since 1999, MTI has published 79 expert-conducted, peer-reviewed policy research projects and has 36 more under contract and in process. During the past fiscal year, research supported by the SAFETEA-LU and Caltrans grants

engaged 94 of MTI's 164 certified Research Associates (RA), most of whom are Ph.D.s, as well as 52 student research assistants. Significant research and information transfer efforts (local and regional forums, national symposia or summits, etc.), often sponsored by non-grant funds, have also been completed. Research topics are selected annually through a carefully structured needs assessment process involving designated U.S. DOT and Caltrans committees, the internationally prominent MTI Board of Trustees, and other national transportation leaders. The projects and research teams are chosen 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 MTI. The summary of activities for the three sub-centers in the Research Department follows.

National Transportation

Security Center of Excellence

Director Brian Michael Jenkins

Deputy Director Frances Edwards, PhD

MTI's National Transportation Security Center analyzes threats to surface transportation and how they affect security policy and countermeasures. This includes ongoing detailed case studies of major terrorist attacks and tactics, and updating MTI's chronology of terrorist attacks and other serious crimes against surface transportation. Additionally, the Center conducts research into best practices in emergency preparedness and management, especially as it relates to transportation.

The Center's director and deputy director have made several presentations to state and national transportation leaders and policy makers this year. In particular, Mr. Jenkins has testified in Congress twice – one testimony focused on last year's Mumbai attacks while the other addressed Domestic Threat in the Wake of the Times Square Bomber. He also presented research results at several prestigious conferences, including the APTA Rail Conference in Chicago, the TRB Annual Conference in Washington, DC, and at the GAO Conference on Explosives Detection Technology, also in

Washington, DC. Jenkins was the lead author on seven MTI peer reviewed research reports published this fiscal year.

Dr. Edwards, together with MTI research associate Dan Goodrich, gave an invited presentation on their transportation and campus emergency planning research at the 13th Annual FEMA Higher Education conference. NTSCOE also has been directly involved in developing an updated version of the federally-mandated Continuity of Government / Continuity of Operations (COOP/COG) Plan for transportation agencies, working with Caltrans as a test bed, and in researching the role of exercises in transit and transportation systems' emergency preparedness. Two full reports, a white paper and a supplemental report have resulted from this NTSCOE research on various aspects of the interface of transportation and other elements of emergency planning, training, exercising and response.

National Transportation Finance Center

Director Asha Agrawal, PhD

Transportation finance plays a significant role in transportation policy-making. Therefore, in 2007 MTI established the National Transportation Finance Center (NTFC). The objectives are to conduct surface transportation finance research and present the results 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 two new finance reports and has an additional eight 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 five public events, and five other researchers – Dr. Jennifer Dill, Dr. Hiroyuki Iseki, Dr. Charles Rivasplata, Dr. Geoffrey D. Gosling, and Dr. Jae H. Pyeon – have also made public presentations of MTI finance studies.

Finally, Dr. Agrawal was also appointed to a National Academic of Sciences committee that planned a TRB finance conference held in New Orleans in May 2010.

National High-Speed Rail Policy Center

Acting Director Rod Diridon, Sr.

With voter approval of Proposition 1A in 2008 in California, the allocation of \$8 billion in the American Recovery and Reinvestment Act (ARRA) in 2009, \$2.5 billion approved in the current annual apportion bill, and more funding pending, the prospect for the US to join all of the other industrialized countries with a high speed rail network became real. President Obama and California Governor Schwarzenegger's determination to create high speed rail networks reinforced that priority. MTI began studying high speed rail in 1996 and had completed 32 peer-reviewed studies that indirectly relate and seven studies that directly relate. The MTI executive director, a recognized international expert on the subject, guides a top team of MTI research associates accomplishing state-of-the-art studies on the policy and management aspects of high speed rail. The objective is to support the development, operation, and maintenance of the federally designated 13 national high speed rail corridors now receiving funding from ARRA and local sources.

Education Department

Director Peter Haas, PhD

Nearly 150 California State University accredited Master of Science in Transportation Management (MSTM) degrees have been granted since 1999, and 14 were conferred this fiscal year. Eight professional Certificates in Transportation Management or Transportation Security Management, requiring completion of 12 core units from the MSTM program, were conferred during that time. Currently, 61 active students are enrolled in the MTI MSTM and certificate programs at SJSU. Those students receive instruction four nights a week via the 26-site Caltrans statewide videoconference network. To support this unique instructional capacity, Caltrans installed a state-of-the-art videoconference origination site for MTI, which was subsequently upgraded. Students also use the online courseware and video streaming technology to complement their studies.

These 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, Criminal Justice, Engineering, Library Science, Political Science, Public Administration, Urban Planning, Psychology, Sociology, and others. 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 scholarship assistance to selected aspects of those traditional programs.

The MTI Alumni Association, including current students as well as prior MSTM and certificate recipients, met to elect new officers prior to the 19th Annual MTI Board of Trustees Scholarship Awards Banquet on June 26, 2010. This association assists MTI in tracking the graduates, and offers the opportunity for peer support and networking.

Communications and Information & Technology Transfer Department

Director Donna R. Maurillo

To promote information/technology transfer, MTI has conducted and published the proceedings of 21 national summits and 15 regional or statewide forums since 1999. During the past year, 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 more than 125 media interviews related to MTI research and transportation issues. Those outreach successes will be summarized in the following sections.

In addition, MTI published World in Motion three times this year. This newsletter is distributed to nearly two thousand national transportation leaders by mail and to many thousands more electronically and by way of the MTI web site. The Institute has branched into social media, with a blog and a Facebook presence. Plans are underway to expand that reach and to engage more sophisticated search engine optimization (SEO) techniques so MTI can continue to play

a leading role to attract and educate a new generation of transportation leaders.

TransWeb, the MTI web site, received awards for excellence in the late 1990s. The site gradually became obsolete, so underwent a major upgrade in 2007-08. Prior to the upgrade, TransWeb averaged about 150,000 hits and 5,000 downloaded documents per month. Following the upgrade, TransWeb averaged 216,000 hits and 27,281 downloaded documents per month during the 2008-09 fiscal year. The 2009-10 fiscal year saw those average numbers increase substantially to nearly 250,000 hits and more than 50,000 downloaded documents per month.

Finally, MTI continues to be an adviser in the development of several of the new SAFETEA-LU centers. The MTI executive director and directors continue to attend national UTC-related meetings, assist in pursuing more UTC support for the U.S. DOT modal administrations and provide other related service as directed by the Governor of California, the MTI Board of Trustees and SJSU President. Over the years, the MTI executive director also served as a member or chair of several transportation organizations, including president of the national Council of University Transportation Centers.

Support Staff

MTI has a creative, stable and congenial staff, working hard to meet the needs of our country's transportation systems. The professional staff continues without turnover during the last fiscal year. Education Director Dr. Peter Haas and Education Manager Viviann Ferea remain in their longtime positions – providing oversight for MTI's graduate program, the Master of Science in Transportation Management and the Professional Certificates Program. Donna Maurillo is in her third year as our Director of Communications and ITT, planning and implementing MTI's outreach, communications, media relations, and technology transfer. Research Director Dr. Karen Philbrick has just begun her second year with us, managing MTI's growing list of research projects and their associated research teams. Internationally-noted counter-terrorism expert Brian Michael Jenkins, Director

for MTI's Transportation Security Center of Excellence, continues to work with Deputy Director Dr. Frances Edwards, who provides her expertise in transportation emergency management. MTI's National Transportation Finance Center is directed by Dr. Asha Agrawal, who has completed a number of surveys and research projects related to the challenges of funding our nation's transportation infrastructure. Meg Fitts continues to support the research and transportation security functions. Jill Carter has become essential as MTI's Executive Assistant and Office Manager, working along with Assistant Office Manager Lynda Ramirez Jones, who brings a history of experience in politics. A talented part-time team of San Jose State University students contribute their growing skills, including Vince Alindogan, Ruchi Arya, JP Flores, Joey Mercado, Chris O'Dell, and Sahil Rahimi.

Research Associate recruitment, concentrating on only the finest Ph.D.-level talent, continues with certification required by MTI's SJSU Research Associate Policy Oversight Committee (RAPOC). Certification is required before the 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 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 1 competition successfully completed, MTI is now at full capacity and expects to retain that level of vigor for the remainder of the SAFETEA-LU contract period. The 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 U.S. transportation community, with the help of the national University Transportation Center program, will outsmart the competition and prevail in the global geo-economic competition of the 21st century.

A handwritten signature in black ink, appearing to read "Rod Diridon". The signature is fluid and cursive, with a large initial "R" and "D".

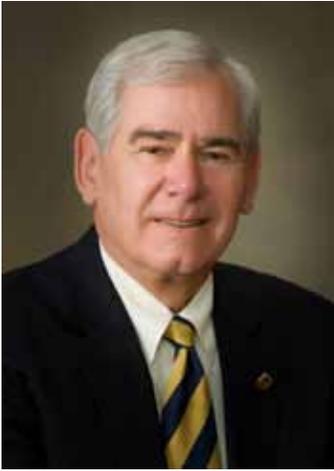
Rod Diridon, Sr.

Executive Director



**ADMINISTRATION
AND STAFF**





Honorable Rod Diridon, Sr.

Executive Director

diridon@mti.sjsu.edu

Rod Diridon, Executive Director of the Mineta Transportation Institute, is considered the father of modern transit in California's Silicon Valley. His political career began in 1971 on the Saratoga City Council. Due to term limits, he retired in 1994 after five terms and six times as chair of both the Santa Clara County Board of Supervisors and its transit board. He is the only person to chair the nine-county, 110-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 the governor's appointee to the California High Speed Rail Authority Board and chair of the American Public Transportation Association's High Speed and Intercity Rail Committee. He chaired the American Public Transit Association in Washington DC, was vice chair of the International Transit Association in Brussels, and continues as a director. Mr. Diridon chaired the National Association of Counties' Transit and Railroads Committee, 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 a B.S. and an M.B.A. 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 has received top awards from the American Public Transportation Association, the national High Speed Ground Transportation Association, and others. The area's main railroad station was renamed the San Jose Diridon Station upon his retirement in 1994 from elected office.

Directors

More detailed profiles of the Directors are listed with their respective sections of this annual report.



Asha Weinstein Agrawal, Ph.D.

Director, NTFC

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



Frances Edwards, Ph.D.

Deputy Director, NTSCOE

kc6thm@yahoo.com

Dr. Frances L. Edwards is Deputy Director of MTI's National Transportation Security Center of Excellence (NTSCOE), and a research associate. She is also a professor and director of the Master of Public Administration program at San Jose State University.



Dr. Peter J. Haas

Director of Education

haas@mti.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, where he manages all facets of the Master of Science in Transportation Management.



Brian Michael Jenkins

Director of NTSCOE

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Brian Michael 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 as a policy adviser to government agencies, international organizations and multinational corporations.



Donna Maurillo

Director of Communications and ITT

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Donna Maurillo joined MTI in 2007, managing information and technology transfer (ITT), such as symposia, forums, and public meetings. She also directs all communications vehicles such as the MTI web site, social media, annual report, media relations, and other public outreach, and she manages special projects. She is a graduate student in MTI's Master of Science in Transportation Management program.



Karen E. Philbrick, Ph.D.

Director of Research

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Dr. Karen Philbrick was appointed as Director of Research in May 2009. She directs all research projects, including those related to transportation security. Prior to joining the MTI team, she was Assistant Director of the University of Denver's UTC. She also 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

Office Manager and Executive Assistant

carter@mti.sjsu.edu

Jill Carter applies her business skills to MTI office management, where she also oversees the student staff and financial records. Ms. Carter also is executive assistant to Rod Diridon. She and her husband own an automobile repair facility, where she managed office operations, accounting, staffing, sales and general administration. At the Campbell School District library, Ms. Carter purchased books and equipment, instructed library skills, and organized the book fair. At Bank of America, she was a bookkeeper and teller.

She is involved with the activities of her five children, including sports, fundraisers, PTA and classroom support. She attended San Jose State University, where she studied liberal arts.



Vivianne Ferea

Education Program Assistant

ferea@mti.sjsu.edu

Vivianne 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. She also is a valuable educational resource for the program's graduate students.

Ms. Ferea received her B.S. 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.



Meg Fitts

Research Project Manager

fitts@mti.sjsu.edu

Meg Fitts joined the MTI staff in December 2007, first as a Communications Assistant and then as a Research Project Manager. She supports the Research Director administering contracts, budget tracking, and research projects, and taking the reports through the publication process of peer review, editing, formatting, and printing. She also is responsible for supporting MTI's National Security Center of Excellence Director in preparing DHS proposals, budgeting, reporting, and contracting.

Ms. Fitts has a background in finance recruitment in New York City and locally, as well as sales support in the high-tech industry in Southern California. She attended Chaminade University of Honolulu and State University of New York, Old Westbury as a math major. Ms. Fitts is active in community boards, is Rotaract District Governor of District 5170, past president of the Rotaract Club of Silicon Valley, and is an advocate of service above self.



Lynda Ramirez Jones

Assistant Office Manager

jones@mti.sjsu.edu

As Assistant Office Manager, Lynda 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 also has been a job training supervisor, a home/school consultant with the Migrant Education Program in Medford OR, and a legislative aide to California State Assembly Member Dominic Cortese.

Ms. Ramirez Jones has been a member of many boards and commissions, and she has worked with several political campaigns. Her education includes paralegal and business management courses at Santa Clara University and West Valley College.

Student Assistants



Vincent Alindogan

Graphic Designer

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



Joey Mercado

Office Operations Assistant

Majoring in Computer Engineering with plans to earn a Master's Degree in Sports Psychology. He has played baseball, basketball, football and handball.



Ruchi Arya

Web Master

Earning her Masters' Degree in Software Engineering and helping to launch a software start-up. Ruchi worked for Motorola in India before coming to SJSU.



Chris O'Dell

Office Operations Assistant

Majoring in Management Information Systems. Chris plays handball on the SJSU team.



JP Flores

Graphic Designer

Majoring in Graphic Design. JP enjoys riding bicycles and documenting cycling related events.



Sahil Rahimi

Technology Assistant

Majoring in Aerospace Engineering. Sahil also loves music, art, and poetry.

Management

Institute activities are overseen by a prestigious board (see inside back cover) that meets twice a year to provide guidance to staff. MTI's Board of Trustees winter meeting was held on January 9, 2010 in Washington DC. Afterwards, one of the MTI graduate students was part of a group honored by the Council of University Transportation Centers (CUTC) at an awards banquet.

The Board's summer meeting was held on June 26, 2010 and was followed that evening by the 19th Annual MTI Board of Trustees Scholarship Awards Banquet and the graduation of this year's 14-member Masters of Science in Transportation Management (MSTM) class. U.S. Department of Transportation Secretary Norman Mineta (ret.), and California State Senator Alan Lowenthal delivered the commencement addresses. The banquet raises scholarship funds for MTI's MSTM and professional certificate students.

Facilities

Mineta Transportation Institute facilities are part of San José State University (SJSU), the oldest and among the largest of the 23 California State University campuses. Located in downtown San Jose, the campus is at the heart of Silicon Valley. Six full-time and one part-time staff, and six part-time student assistants work in offices provided by SJSU.

Financial Controls

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 meets three times a year and is hosted by each of the centers on a rotating basis, by Caltrans in Sacramento, or by telephone. Its objective is to avoid redundancy and to share the best research and education practices.

COUNCIL OF UNIVERSITY TRANSPORTATION CENTERS (CUTC)

After serving as vice chair in 2006, MTI Executive Director Rod 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 workforce development issues and a national transportation library.

JOINTLY SPONSORED SYMPOSIA, FORUMS, AND PROJECTS

During the past fiscal year, MTI has co-sponsored or is in the process of co-sponsoring projects with organizations including AAR, AASHTO, APTA, ARTBA, California Business Roundtable, Caltrans, DHS/TSA, FHWA, FTA, FRA, Transit Cooperative Research Program of TRB, Transportation Trades Department of AFL/CIO, California State Automobile Association, San Francisco Bay Area MTC, Commonwealth Club of California, Bay Area Rapid Transit District, Silicon Valley Leadership Group, and others. These partnerships generated attendance and/or financial support for MTI programs, and they delivered substantial outreach and media attention for MTI and UTC. More importantly, these events allow MTI to transfer its research to public users.

COMMUNITY INVOLVEMENT

MTI Executive Director Rod Diridon and Education Director Dr. Peter Haas are recognized transportation experts with extensive contacts on the local, national, and interna-

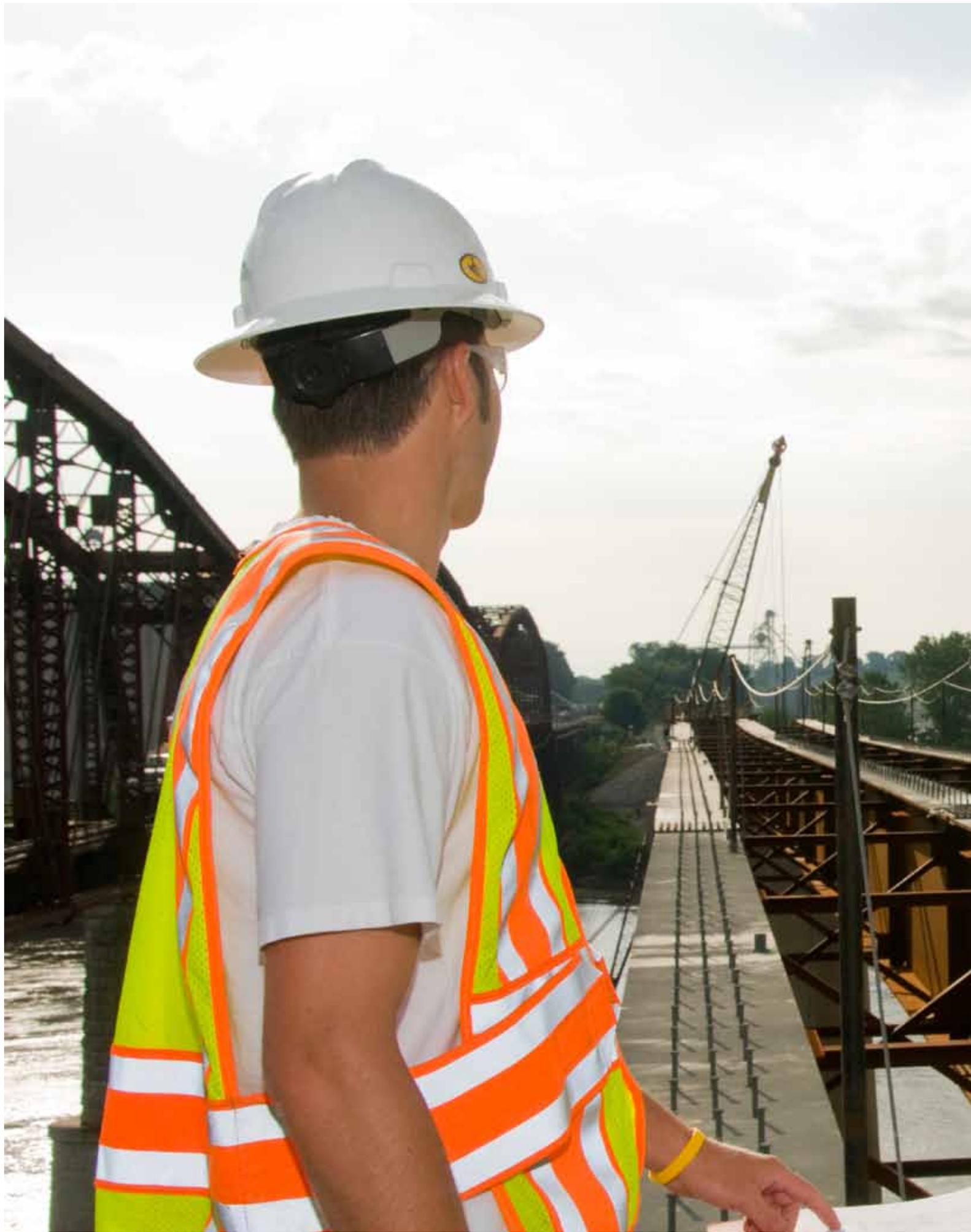
tional levels. For example, Mr. Diridon is past vice chair of the International Transit Association (UITP) in Brussels, chair emeritus of the California High Speed Rail Authority and a member of several other boards and committees. He just completed a term as president of his Rotary club for 2009-10. Dr. Haas, a Fulbright Scholar, is frequently asked to provide expert testimony on both education and transportation topics.

Communications and ITT Director Donna Maurillo is actively engaged in community service, as well. She is a long-time Rotarian (including her club's Rotarian of the Year), has served on or presided over a number of non-profit boards, and directed a \$6 million capital campaign for a new museum. Research Director Dr. Karen Philbrick is also engaged in community service through the San Jose Rotary Club. Assistant Office Manager Lynda Ramirez Jones is engaged in local political activities, including a board membership on the Commission for the Status of Women.

These 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.

Challenges

The Mineta Transportation Institute is expanding rapidly with the addition of the National High-Speed Rail Policy Center and will be challenged to integrate that new responsibility while continuing to exceed the US DOT UTC strategic plan goals. That integration is well advanced, and MTI will to continue to deliver an excellent graduate education program and produce currently applicable, high-quality, and timely research while working within the SAFETEA-LU grant's reduced funding.





RESEARCH



Karen E. Philbrick, Ph.D.

Director of Research

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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 25 new research projects and the publication of 21 peer reviewed research reports.

Before joining MTI, Karen 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 Denver, 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 U.S. delegation to the Asian Pacific Economic Cooperation (APEC) Transportation Working Group since 2000.

With the highest honors, Dr. Philbrick earned a B.A. from California State University, Fresno, an M.A. from Columbia University, an Ed.M. from Columbia University, and a Ph.D. from the University of Denver.

Overview

The Research Director conducts an annual research needs assessment and request for proposals, and 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 certifies all Research Associates (RA) 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 seven department heads or representatives of the SJSU academic departments with which MTI works most closely, reviews the applications and recommends certification where appropriate.



Research Program Goals

The Mineta Transportation Institute Research Program seeks to involve a diverse and growing number of certified RAs 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 staff, Caltrans, the U.S. 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 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 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, improve transportation decision making, and ensure 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

A FULL AND VARIED PROGRAM

MTI contracted for 21 new research projects in fiscal year 2009-10, nine of which were selected in the spring RAPOC session. Additionally, the Institute developed 12 projects independent of the RFP process. As with all proposals, however, these projects were reviewed by RAPOC and Caltrans/FHWA to assure quality.

Of the research projects selected this year, five share funding with MTI's Department of Homeland Security (DHS) National Transportation Security Center of Excellence (NTSCOE). The Institute's primary grant from the US Department of Transportation (DOT) included security research as a high priority, so the shared projects will meet the requirements of both grants.

MTI RESEARCH – AND RESEARCHERS - FEATURED AT TRB ANNUAL MEETING

Six MTI research papers were selected for presentation at the 2010 Transportation Research Board Annual Meeting. Additionally, at least 25 other workshops or poster presentations featured MTI Research Associates, but for non-MTI work. In several instances, the MTI RAs presided at a TRB session.

Presenting MTI research:

- **Dr. Anastasia Loukatou-Sideris:** MTI Project 2611, *What Is Blocking Her Path? Women, Mobility, and Security*
- **Dr. Susan Shaheen:** MTI Project 2612, *Carsharing Parking Policy: A Review of North American Practices and San Francisco Bay Area Case Study*
- **Dr. Elliot Martin:** MTI Project 2702, *Carsharing's Impact on Household Vehicle Holdings: Results from a North American Shared-use Vehicle Survey*

- **Dr. Caroline Rodier:** *MTI Project 2705, Equity Analysis of Land Use and Transportation Plans Using Integrated Spatial Model*
- **Dr. Kevin Krizek:** *MTI Project 2825, Bicycling and Transit: A Marriage Unrealized*
- **Ms. Nina Rohlich:** *MTI Project 2914, Exploring the Effectiveness of Transit Security Awareness Campaigns in the San Francisco Bay Area*

In addition to the TRB Annual meeting, MTI researchers were very much in evidence at TRB's Fourth International Conference on Financing Surface Transportation in the United States, which was held in New Orleans in May 2010. Four research projects were displayed in poster and speaker sessions, presented by researchers Geoffrey Gosling, Jae H. Pyeon, Hiroyuki Iseki, and Asha Weinstein Agrawal. Additional details regarding this presentation can be found in the MTI National Transportation Finance Center section of the annual report.

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 65 academic and professional conferences. Several of these events are reported in the NTFC and NTSCOE sections of this report. While each presentation will not be listed individually, a few are highlighted below.

The American Association of State Highway and Transportation Officials (AASHTO) Annual Conference in October 2010 featured four MTI research reports, the most ever presented at that conference in one year. These included MTI Project 2601-2705, *Phase Two: Evaluating the Environmental Justice Effects of Land Use and Transportation Scenarios in the Sacramento Region with the PECAS Activity Allocation Model and an Advanced Travel Demand Model* (PI: Caroline Rodier, Ph.D.); MTI Project 2612, *Car-sharing and Public Parking Policies: Assessing Benefits, Costs, and Best Practices* (PI: Susan Shaheen, Ph.D.); MTI Project 2702, *Carsharing and Carbon Dioxide Emission Reduction Across Density and Transit Quality Gradients in the U.S.* (PI: Susan Shaheen, Ph.D.); MTI Project 2701, *Public Support for Environmental Transportation Taxes and Fees? A Survey of Californians* (PI: Asha Weinstein Agrawal, Ph.D.)

Also in October, Dr. Loukatou-Sideris delivered the plenary speech at TRB's Fourth International Conference on Women's Issues in Transportation in Irvine, California. The conference is designed to enhance the understanding of gender differences in access, mobility, safety, and personal security needs, and to provide more and better information and

insight to help inform decision making on transportation services and programs to support the safety and mobility of women travelers. The speech titled “What is Blocking Her Path? Women, Mobility, and Security,” drew on the results of MTI sponsored research report 09-01, *How to Ease Women’s Fear of Transportation Environments: Case Studies and Best Practices*.

Three researchers presented findings from their MTI sponsored research projects at the APTA Research and Technology Strategic Planning Workshop in San Francisco. These included:

- **Dr. Wenbin Wei:** MTI Project 2605, *Feasibility Of One-Dedicated-Lane Bus Rapid Transit/Light-Rail Systems And Their Expansion To Two-Dedicated-Lane Systems: A Focus On Geometric Configuration And Performance Planning*
- **Dr. Charles Rivasplata:** MTI Project 2904, *Examination of Regional Transit Service Through Privatization: a Case Study of Public Transit Service Contracting in New Orleans*
- **Mr. Dan Goodrich:** MTI Project 2976, *NIMS/COOP/COG Applications and Implementation for State Transportation Agencies: Best Practices*



Research in the Field

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 we document web site traffic, we see a direct correlation 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 research report 08-07, *“Effect of Suburban Transit Oriented Developments on Residential Property Values,”* was downloaded 19,508 times in January 2010, while report 09-01 *“How to Ease Women’s Fear of Transportation Environments: Case Studies and Best Practices”* was downloaded 14,349 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.

Permission to link to three 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 website to assist in promoting and in increasing citations of the work. According to a recent survey of the 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.

Two MTI reports on selective passenger screening (MTI 06-07, *Selective Screening of Rail Passengers* and MTI 09-05, *Supplement to MTI Study on Selective Passenger Screening in the Mass Transit Rail Environment*) have had significant impact on transit systems worldwide. Report 06-07 was the starting point for work on preventive procedures in the Mass Transit Division of the Transporta-

tion Security Administration. That led to a tabletop exercise and input to the APTA subcommittee developing screening guidelines for system operators. The TSA Deputy Chief Learning Officer asked for a personal briefing on this work and Amtrak used it as the foundation for pilot studies. The MTI NTSCOE team has been invited to Mumbai, India to test applications of selective screening.

MTI publication 08-01, *“Bus Rapid Transit/Light Rail Implemented on One Dedicated Lane: Operational Feasibility, Practicality and Systems Analysis”* has been translated into Chinese and now appears in the Urban Transport of China Journal (volume 8, number 2, March 2010). MTI is credited as the funding source and is thanked for allowing the reprint. Dr. Jacob Tsao and Dr. Wenbin Wei, the study authors, have received requests for this report from several sources, including a principal planner in the MPO serving Broward County, Florida.

MTI report 09-13, *From Buses to BRT: Case Studies of Incremental Bus Rapid Transit Projects in North America*, authored by John Niles, continues to receive exposure. In fact, the Federal Transit Administration is funding new research that builds upon the findings in this publication. The new research will quantify the benefits of specific elements that make up a typical bus rapid transit (BRT) system, such as traffic signal priority and increased station spacing. The FTA project -- managed by Breakthrough Technologies Institute in Washington, DC -- will build upon this work by quantifying the benefits of specific BRT elements in terms of travel time savings. The results will help bus operators better understand how bus system improvements can save money and improve service. Moreover, the research will help show how these improvements can be an important strategy to attract choice riders, improve air quality, and help reduce carbon emissions.

And finally, MTI project 2879, *Terrorist Attack Annual Trends Analysis* (PI: Jenkins), led to MTI’s participation in TSA’s Bomb Squad Response to Transportation Systems (BSRTS) program. Initiated by TSA’s Operation Division in conjunction with the Security Network Management Office,

the Trend Analysis project, which began in the first quarter of FY2010, includes a total of 33 two-day training seminars, three of which have been given, 15 of which will be given later in FY2010, and 14 of which will be given in FY2011. In each of the seminars, MTI researchers will present current trends, focusing on explosives attacks, using updated data and case studies. The three seminars that have been given took place in Chicago (May 26), New Orleans (June 28), and San Antonio (July 21). Four more have been scheduled: two in August (Boston and Miami) and two in September (Los Angeles and Seattle). More will be scheduled in the next federal fiscal year. MTI has received positive feedback yielding requests by other parties for more briefings, and its analyses are providing TSA Bomb Appraisal Officers with a solid foundation on which to conduct vulnerability assessments for surface transportation. The analyses may also assist in responses to bomb threats and explosives devices.

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. MTI research project 2806, *Getting Around When You're Just Getting By: The Travel Behavior and Transportation Expenditures Of Low-Income Adults*, led by Dr. Asha Agrawal expanded that connection to more than 40 students! At the heart of this project, which explores how transportation costs, including transportation taxes and fees, shape transportation options and choices for very low-income adults, are 74 in-depth interviews. Half of these interviews were conducted by SJSU students in an anthropology class teaching students how to use interviews and other qualitative methods. The students were introduced to the transportation field, most for the very first time, as they conducted and analyzed their interviews.

Seven 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, and Dr. Caroline Rodier are involved with MTI as a result of that student experience. In the role of PI, Drs. Ferrell, Hess, Iseki, and Rodier have all been awarded MTI grants for their outstanding research efforts.

MTI Research Director Activities

Research Director Dr. Philbrick was invited by the Ministry of Transport, Socialist Republic of Vietnam to serve as a Professor for a one week seminar titled, "Intermodal Skills Seminar: Developing Core Competencies and Leadership Skills in Planning and Managing Intermodal Systems and Technology." The course was conducted the week of October 26-30, 2009 in Ho Chi Minh City. As part of the core teaching team, Dr. Philbrick spoke on Intermodal and Global Supply Chain issues.

Dr. Philbrick was pleased to accept the invitation to serve as a delegate on two committees this year. These include the APTA Research and Technology Strategic Planning Committee and the Steering Committee for the National Center for Intermodal Transportation.

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 from 1999-2008 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, J.D.

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, Ph.D.

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, Ph.D.

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: Continuing Research on Best Security Practices

Project #9805

Publication #01-07

Principal Investigator: Brian Michael Jenkins

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

Project #9805-2

Publication #01-14

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, Ph.D.

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, Ph.D.

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, Ph.D.

Best Practices in Developing Regional Transportation Plans

Project #9811

Publication #01-10

Principal Investigator: Donald R. Rothblatt, Ph.D.

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, Ph.D.

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, Ph.D.

Developer-Planner Interaction in Transportation and Land Use Sustainability

Project #9905

Publication #01-21

Principal Investigator: Aseem Inam, Ph.D.

Transit Labor Relations Guide

Project #9906

Publication #01-02

Principal Investigator: Herb Oestreich, Ph.D.

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, Ph.D.

Using the Internet to Envision Neighborhoods with TOD Potential

Project #2001

Publication #01-24

Principal Investigator: Earl G. Bossard, Ph.D.

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, Ph.D., 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, Ph.D.

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, Ph.D., J.D.

Toward Sustainable Transportation Indicators for California

Project #2106

Publication #02-05

Principal Investigator: Richard Lee, Ph.D.

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, Ph.D.

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

Project #2109 (An MTI Seed Project)

There is no publication for this phase of the project.

Principal Investigator: Richard A. Werbel, Ph.D.

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

Project #2113

Publication #02-02

Principal Investigator: Andrew Nash

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

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

Project #2201

Publication #03-01

Principal Investigator: Linda Valenty, Ph.D.

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

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

Project #2202

Publication # 05-03

Principal Investigator: Daniel Rodriguez, Ph.D.

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

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

Project #2203

Publication # 03-03

Principal Investigator: Marc Schlossberg, Ph.D.
(Former Title: A Pre- and Post-Construction Analysis of Transit-Oriented Developments Using Spatial Indicators: A Case Study of Portland and Silicon Valley)

Higher Density Plans: Tools for Community Engagement

Project #2204

Publication #03-02

Principal Investigator: Kenneth Schreiber, AICP
(Former Title: Assessing the Effectiveness of Tools and Information that Respond to Community Fears and Resistance about the Densification of Communities)

The Impact of Telecommuter Rail Cars on Modal Choice

Project #2205

Publication #04-01

Principal Investigator: James Hayton, Ph.D.

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

Project #2206

Publication #05-04

Principal Investigator: Kenneth C. Gehrt, Ph.D.

Designing and Operating Safe and Secure Transit Systems: Assessing Current Practices in the U.S. and Abroad

Project #2301

Publication # 05-03

Principal Investigator: Brian D. Taylor, Ph.D.
(Former title: System Design for Transit Security)

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, Ph.D.

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

Project #2303

Publication #06-05

Principal Investigator: Richard Lee, Ph.D.

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

Project #2304

Publication #05-01

Principal Investigator: Allison de Cerreño, Ph.D.

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, Ph.D.

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, Ph.D.

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

Project #2403

Publication #08-02

Principal Investigator: Robert Johnston
(Former Title: Welfare to Work: A Simulation of Land Use and Transportation Policies)

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

Project #2404

Publication #06-04

Principal Investigator: Susan Shaheen, Ph.D.
(Former Title: The Elderly and Public Transit: Minimizing Barriers and Maximizing Service)

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

Project #2405

Publication #07-02

Principal Investigator: Christopher Ferrell

(Former Title: Neighborhood Crime and Travel Behavior)

Principal Investigator: Wenbin Wei

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

Project # 2406

Publication #06-06

Principal Investigator: Marc Schlossberg, Ph.D.

Beyond Uncertainty: Urban Models in Transportation and Air Quality Planning

Project #2407

Publication #07-01

Principal Investigator: Caroline Rodier, Ph.D.

Paving the Way: Recruiting Students into the Transportation Professions

Project #2408

Publication #08-03

Principal Investigator: Asha Weinstein Agrawal, Ph.D.

Bus Rapid Transit: A Handbook for Partners

Project # 2426

Publication #06-02

Co-Principal Investigators: Tom Larwin and George Gray

(Former title: Bus Rapid Transit Guidebook)

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.

Exploration of Data Sources for Air Cargo Studies (A Seed Project)

Project #2525

Publication #WP07-01

Principal Investigator: Wenbin Wei

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

Project #2605

Publication #08-01

Principal Investigators: Wenbin Wei, Ph.D.; Jacob Tsao, Ph.D.

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

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

Project #2607

Publication #07-03

Principal Investigator: Gary Binger, AICP

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

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

Project #2608

Publication #08-04

Co-Principal Investigators: Jeffrey Brown, Ph.D. and Gregory Thompson, Ph.D.

Effects of Suburban Transit-Oriented Developments on Residential Property Values

Project #2609

Publication #08-07

Principal Investigator: Shishir Mathur, Ph.D.

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

Project #2613 (An MTI Seed Project)

Publication #WP07-02

Principal Investigator: Asim Zia, Ph.D.

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

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

Project #2614 (An MTI Seed Project)

Publication #WP07-03

Principal Investigator: Triant Flouris, Ph.D.

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

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

Project #2701

Publication #08-05

Principal Investigator: Asha Weinstein Agrawal, Ph.D.

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

The Role of Transportation in a Campus-Level Emergency

Project #2727

Publication #08-06

Principal Investigator: Frances Edwards, Ph.D., CEM

Projects Completed in the Past Year



Barriers to Using Fixed-Route Transit for Older Adults

Project #2402

Publication #09-16

Principal Investigator: Michael Peck, Ph.D., MSW

In the United States, many challenges exist about safe and adequate transportation for the increasing population of adults aged 65 years and older. Currently, we are ill-prepared to provide transportation that is adequate for the growing older adult population. For older adults, transportation needs are associated closely with other needs. Lack of access to transportation can prohibit completion of instrumental activities of daily living, including visiting friends and family, grocery shopping, and obtaining and managing medications and healthcare. If transportation is limited, an older adult may have poor quality of life.

Current transportation challenges also are exacerbated because of increased longevity and the increasing older adult population, that is, the "Graying of America." Now, in the US, there are about 40 million people 65 years and older. By 2030, the population of people 65 years and older is expected to reach 72 million. By 2050, older adults will comprise 21 percent of the population, compared with 12 percent of the population in 2000. The most rapid growth will be in the oldest old cohort; the population aged 85 years and older will double to 9.6 million in 2030.

For many aging adults, fixed-route public transit is available; however, private vehicles are used for 90 % of all older adult transportation needs. Thus, the research presented here examines what older people perceive as barriers to using fixed-route public transit.

To ascertain answers, we use a mixed-methods design to study older adults and their perceptions of fixed-route in Erie County, New York, and the City of San José, California. The first step in the research was to conduct two focus groups in each site and to gather perspectives and viewpoints of older adults about the barriers to using public transit. Each focus group examined issues related (1) access to fixed-route public transit, (2) physical challenges in reaching stations and stops, (3) physical challenges in using vehicles, (4) accessing information about the transit system, and (5) safety and security.

Utilizing findings from the focus groups and an extensive literature review, a 12-page survey was developed and distributed by mail to 1800 older adults. A total of 775 (43.1%) of 1800 surveys were returned. After data input and exclusion of cases, the final sample included 737 cases. In Buffalo, there were 451 (61.2%) cases, and in San José there were 286 (38.8%) cases for the final analyses.

Results found a significant response bias noted in the assessment of older adults' perceptions of transit. This response bias highlights the elusive nature of assessing perceptions. Perceptions represent a complex cognitive appraisal process that may or may not lead to behaviors. The primary finding is that older adults prefer to travel by automobile, but perceive fixed-route public transit as a viable option.

Finding that older adults perceive fixed-route public transit as a viable option suggests that older adults with the requisite physical capacity are primed to change transit-behaviors and ride transit. Thus, this leads to a critical question: How do we encourage older adults to increase their use of public transit?

In this report, there exists an extensive summary of research findings, including descriptive data about the sample, aggregated data about barriers to use and perceptions of transit, and findings about the likelihood of older adults to ride public transit. These findings must be interpreted with caution, due to the bias found in the data. However, the implication is that by reducing perceptions of barriers—whether or not the perception is accurate and the barrier is as severe—may lead to increased ridership of fixed-route public transit by older adults.

After reviewing these findings, a model of behavior change is presented. This model presents one way to think about how to encourage older adults to increase their use of public transit. The model presented suggests ways to market the strengths of fixed-route public transit.

Finally, limitations of the research are discussed, including challenges related to response bias. Implications for future research are presented.



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

The threat of another major terrorist attack in the United States remains high, with the greatest danger coming from local extremists inspired by events in the Middle East. Although the United States removed the Taliban government and destroyed al Qaeda's training camps in Afghanistan, events in Europe and elsewhere have shown that the terrorist network leadership remains determined to carry out further attacks and is capable of doing so.

Therefore, the United States must systematically conduct research on terrorist strikes against transportation targets to distill lessons learned and determine the best practices for deterrence, response, and recovery. Those best practices must be taught to transportation and security professionals to provide secure surface transportation for the nation.

Studying recent incidents in Europe and Asia, along with other research, will help leaders in the United States learn valuable lessons—from preventing attacks, to response and recovery, to addressing the psychological impacts of attacks to business continuity. Timely distillations of the lessons learned and best practices developed in other countries, once distributed to law enforcement, first responders, and rail- and subway-operating transit agencies, could result in the saving of American lives.

This monograph focuses on the terrorist risks confronting public transportation in the United States—especially urban mass transit—and explores how different forms of passenger screening, and in particular, selective screening, can best be implemented to reduce those risks.



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

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

Project #2501-2876

Publication #09-05

Principal Investigator: Brian Michael Jenkins

This supplement updates and adds to MTI's 2007 report on Selective Screening of Rail Passengers (Jenkins and Butterworth MTI 06-07). The report reviews current screening programs implemented (or planned) by nine transit agencies, identifying best practices. The authors also discuss why three other transit agencies decided not to implement passenger screening at this time. The supplement reconfirms earlier conclusions that selective screening is a viable security option, but that effective screening must be based on clear policies and carefully managed to avoid perceptions of racial or ethnic profiling, and that screening must have public support. The supplement also addresses new developments, such as vapor-wake detection canines, continuing challenges, and areas of debate. Those interested should also read MTI S-09-01 Rail Passenger Selective Screening Summit.



Caltrans Statewide Cultural Properties Information System

Project #2502

Publication #09-06

Principal Investigator: Eric Ingbar

This study presents the results of a multi-year planning, assessment, and pilot data conversion study concerning digital information about historic resources. The study had as its goals recommendations concerning the most effective mechanisms for implementing enterprise-wide digital data systems for the inventory, assessment, management, and protection of cultural resources.

The study examined information use in CALTRANS District Offices and the agency's headquarters. Also examined was how other agencies and participants in the cultural resource management process created and used such information, both on paper and (increasingly) in digital forms.

In order to examine how conversion of information from one system to another might affect adoption of an enterprise approach, a specific application and set of data was converted to a different, more widely used, application and data model.

During the course of the study, the agency itself changed its approach to system development. This was beneficial to this study, because it allowed examination of impediments within the organization that a simpler study, focused more on needs assessment, would not have uncovered.



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, Ph.D.

Recent legislation in California seeks dramatic reductions in greenhouse gas (GHG) emissions. The Global Warming Solutions Act, Assembly Bill 32 (AB 32) requires the reduction of GHG emissions to 1990 levels by the year 2020. Senate Bill 375 (SB 375)—commonly known as “California’s anti-sprawl bill”—mandates regional GHG targets link to land use plans and transport policies. This implicitly acknowledges the view that GHG reductions from the transport sector can only be met by changing the way communities grow, switching from low-density auto-oriented development to compact transit-oriented development.¹ The scoping plan for AB 32 places emphasis on SB 375 and tentatively calls for a five million metric ton reduction in CO₂ equivalents annually by 2020 from regional land use and transport plans. Enforceable GHG targets are to be in place in 2012. However, prior to their implementation, AB 32 requires analysis of the economic and equity effects of the mechanisms used to achieve these targets.

Advanced aggregate travel models and activity based travel models (ABMs) have been applied in equity studies in the U.S. that evaluate the distribution of travel time and cost effects of transport and land use policies among different socio-economic groups.² However, newer forms of spatial economic models represent the interactions between the transport system and the broader spatial economic system, enable equity evaluations that encompass a wider range of economic impacts including wages, rents, and consumer surplus household, labor, and industry.

This publication describes a study to investigate how one such spatial economic model was applied to evaluate the equity effects of land use and transport policies intended to reduce greenhouse gas emissions. The Activity Allocation (AA) Module of the PECAS (Production, Exchange, and Consumption Allocation) model of the Sacramento region is used to simulate two future scenarios arising from a recent regional visioning planning process to cope with an estimated doubling of the regional population by the year 2050. The “Preferred Blueprint” plan articulates levels and locations of redevelopment and new transit-oriented development linked to a list of preferred transport projects. The “Business-As-Usual” plan continues previous land use and transport trends, and leads to a larger area of urban coverage and lower development densities. The US Environmental Protection Agency (EPA) permitted the region to use the “Preferred Blueprint” land uses in their official regional transport plan alternative and the “Business-As-Usual” land uses in their base alternative. Similar visioning planning processes have now been conducted in all of the major metropolitan areas in California. The basic participatory planning process has now been codified in SB 375.

The application of the Sacramento PECAS model in this study demonstrates the types of equity and economic measures that can be obtained from spatial economic models.

These include:

- Change in transport costs as a share of wage income;
- Change in rent and value of owned homes by income class;
- Change in wage income by labor category;
- Consumer surplus by income class; and
- Producer surplus by industry sector.

The study uses the AA module of PECAS to allocate employment and housing locations using built form from the “Preferred Blueprint” and the “Business-As-Usual” plans and scenario specific transport costs from the regions’ activity based travel model. The size of the economy is held constant in the simulations. The results suggest equity effects possible given the built form and transport projects in each scenario and constant industry and household growth. Such an analysis is a valuable first step in the evaluation of land use and transport plans, because it allows planners to identify potential benefits and costs to household and industry segments. In this study, the results reveal that a more compact urban form designed around transit stations can reduce travel costs, wages, and housing costs by increasing accessibility, which can lead to substantial net benefits for industry and for lower income households. Higher income households may be net losers, as their incomes are more dependent on reduced wages, they are less willing to switch to higher density dwellings, and they are more likely to own their own home. This study shows how increased accessibility benefits industry directly and indirectly (through lower wages), but it does not represent how industry may grow faster in the region because of this benefit. If a separate model of region-wide economy size were to respond to the model’s producer surplus measures, industry would grow faster, and some of the benefit ascribed to industry would be transferred to households through less wage reductions.

Once planners identify a regional plan, like the “Preferred Blueprint,” that holds the promise of benefiting the regional economy and distributing benefits equitably; the next step is to evaluate the mechanisms to achieve the plan. At this point, the full PECAS model, including developer actions and economic development effects, can be used to evaluate the effectiveness of different mechanisms and their relative benefits and costs to industry and household segments. For example, developers may not “win” in the “Preferred Blueprint” scenario and thus may not want to build its built-form without financial incentives, which could be costly to taxpayers, including both households and businesses.



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

Project #2611

Publication #09-01

Principal Investigator: Anastasia Loukaitou-Sideris, Ph.D.

Past research has shown that the fears and concerns of transit passengers about safety influence their travel decisions. While the relationship between women's fear of crime and public space has been the focus of considerable research, transit environments – which are especially threatening to female passengers – have received much less attention. This study examines the issue of women's safety on transit through a comprehensive review of the literature on the topic, in-depth interviews with representatives of national interest groups, a survey of US transit operators, and presentation of case studies and best practices from the US and abroad.

The women interviewed for this study argued that women as a group have distinct safety/security needs and are often fearful of transit settings with specific social and physical characteristics. Their fear leads them often to adjust their behavior and travel patterns and/or avoid certain travel modes and settings at certain times. This situation is more acute for particular groups of women, who because of age, income, type of occupation, sexual preference, and place of residence may be or feel more vulnerable to victimization and harassment than others. The women interviewed outlined a series of design, policing, security technology, education and outreach strategies that would make women riders feel safer in public settings.

Nevertheless, the survey of transit operators found that only a handful of agencies in the US currently have programs that target the safety and security needs of women riders. Most survey respondents believed that women have distinct safety and security needs, but only one third of them believed that transit agencies should put specific programs into place to address these needs. Additionally, the survey suggested that there is a significant mismatch between the safety and security needs and desires of female passengers and the types and locations of strategies that transit agencies use.

While transit operators in the US have not initiated any particular programs specifically targeting women's safe travel, transit agencies and municipal governments in some other countries and nonprofit groups in the US and other countries have started initiatives that target women's safe and comfortable travel. Based on lessons learned from such initiatives as well as the input of respondents in our interviews and survey, the study proposes a series of suggestions to close the gap between research and practice on the topic of women's safety, and address the mismatch between the needs of women and the practices of transit operators in the US. These include 1) initiation of researcher-practitioner dialogues; 2) incorporation of women's voices in the planning process; 3) collaboration and partnering between transit agencies and nonprofits; 4) prioritization of safety/security needs in the transportation system; 5) tailoring safety/security initiatives to the particular needs of communities; 6) adop-

ting a multipronged approach to safety that utilizes environmental design, policing, security technology, education and outreach strategies and policy initiatives; and 7) initiating pilot programs and policies with the goal of enhancing the safety of women riders.



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

Project # 2612

Publication #09-09

Principal Investigator: Susan Shaheen, Ph.D.

At present, local jurisdictions across North America are evaluating how best to provide parking spaces to carsharing vehicles in a fair and equitable manner. Some have initiated implementation of carsharing parking policies, and many continue to evolve as the demand and need for carsharing grows. Many others are seeking guidance on carsharing parking, based on the fledgling experience of other cities. This study documents the state of the practice with respect to carsharing and parking policies in North America. The study begins by providing background on the evidence of carsharing benefits and an overview of carsharing and parking policy internationally. This is followed, in Section Three, by a more detailed description of carsharing parking policies in North America that highlights key policy attributes, including parking allocation, caps, fees and permits, signage, enforcement, public involvement processes, and impact studies. In Section Four, in-depth case studies are presented for more advanced carsharing parking policies in the United States, including Philadelphia, Pennsylvania; Portland, Oregon; Washington, DC; and the San Francisco Bay Area and the Bay Area Rapid Transit (BART) District. Section Five presents the results of a survey exploring the public's opinion about the provision of on-street parking for carsharing in the San Francisco Bay Area. Finally, in Section Six, key results are summarized to provide policy guidance to local governmental agencies considering the implementation of carsharing parking policies.



Carsharing and Carbon Dioxide Emission Reduction Across Density and Transit Quality Gradients in the U.S.

Project #2702

Publication #09-11

Principal Investigator: Susan Shaheen, Ph.D.

This report presents the results of a study evaluating the greenhouse gas (GHG) emission changes that result from individuals participating in a carsharing organization. The principle of carsharing is simple: individuals gain the benefits of private vehicle use without the costs and responsibilities of ownership. Carsharing is most common in major urban areas where transportation alternatives are easily accessible. Individuals typically access vehicles by joining an organization that maintains a fleet of cars and light trucks deployed in lots located within neighborhoods, public transit stations, employment centers, and colleges/universities. In this study, the authors conducted a survey of carsharing members across the country to develop a robust estimate of GHG emission impacts resulting from carsha-

ring. The results illustrate the annualized change in GHG emissions among members within the largest carsharing organizations across Canada and the United States. GHG emissions from transportation are lower due to carsharing. The average change in emissions across all respondents is -0.58 t GHG per household per year for the observed impact, and -0.84 t GHG per household per year for the full impact. However, it is important that this result is understood in the context of the broad diversity of carsharing impacts. While carsharing does facilitate lower emissions, the reduction is not generalizable across all members or even a majority of members. Rather, carsharing as a system facilitates large reductions in the annual emissions of some households, which compensate for the collective small emission increases of other households. The results also show that respondent households exhibit significant reductions in vehicle ownership after joining carsharing.



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, Ph.D.

The ability of projects to sustain challenges to Environmental Impact Statements based upon forecasts of regional growth will be an important issue for future highway improvement and extensions. A legal precedent for such challenges was established in 1997 when a US District Court judge ruled that the EIS for a proposed Illinois toll road was deficient because the growth projections were the same in the build and no-build scenarios. This paper incorporates popular regional growth forecasting models into a quasi-experimental research design that directly relates new highway investments in three California counties to changes in population and employment location, while controlling for no-build historical counterfactuals. The authors model simultaneous employment and population growth from 1980 to 2000 in Merced, Orange, and Santa Clara counties, three California counties that received substantive highway improvements during the mid-1990s. The strategy permits a comparison of the before-and-after tests for effects of investments on economic growth and land use in three regions that contrast how increased highway access affects development patterns: (1) for an urban center in Santa Clara County, (2) for an exurban region in Orange County, and (3) for a small town in Merced County.

We find that traditional forecast approaches, which lack explicit control selection, can lead to erroneous conclusions about an impact. Our integrated form of the lagged adjustment model confirms results from a conventional form of the model that includes all cross-sectional units as observations; in both forms of the model we estimate a statistically significant increase in employment development in the exurban region in Orange County where new toll roads were constructed. In the case of Santa Clara County, neither our quasi-experimental integrated approach nor the conventional lagged adjustment approach estimates a significant effect on population or employment growth that can be attributed to the new highways constructed in the urban center. For the small town environment in Merced County, the conventional

simultaneous growth regressions produce a materially different estimate than the approach we develop and examine in this paper. Isolating effects to local spatial units where the intervention occurred and their no-build counterfactual produces estimates of a statistically significant decrease in employment growth in the small town near the newly constructed highway bypass.



Case Studies of Incremental Bus Rapid Transit Projects in North America

Project #2704

Publication #09-13

Principal Investigator: John Niles

Bus Rapid Transit (BRT) uses different combinations of techniques to improve service, such as bus-only lanes and roads, pre-boarding fare collection, transit priority at traffic signals, stylish vehicles with extra doors, bus stops that are more like light rail stations, and high frequency service. This study examines five approaches to BRT systems as implemented by public transit agencies in California, Oregon, and Ontario.

The case studies as a group show that BRT can be thought of as a discretionary combination of elements that can be assembled in many different combinations over time. Every element incrementally adds to the quality or attractiveness of the service. This latitude provides transit agencies with many benefits, including the ability to match infrastructure with operating requirements. For example, a BRT service can combine operations serving free flowing arterial roads in the fringes of the downtown with dedicated lanes in areas closer to city center where congestion is greatest. Buses can operate both on and off the guide way, extending the corridors in which passengers are offered a one-seat ride with no transfer required. Transit agencies also can select specific BRT components and strategies, such as traffic signal priority and increased stop spacing, and apply them to existing local bus operations as a way to increase bus speeds and reduce operating costs.

The specific elements selected for a BRT route can be implemented all at once, or in incremental stages either or both geographical extensions or additions of features. All of the case studies showed ridership improvements, but the Los Angeles Metro rapid bus system illustrates the wide geographic coverage, improved ridership, and moderate cost per new rider that is possible with an approach that includes fewer BRT features spread over more miles of route. Quantitative results from the case studies suggest that incremental improvements, applied widely to regional bus networks, may be able to achieve significant benefits at a lower cost than substantial infrastructure investments



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, Ph.D.

This research presents a project time and cost performance simulation model to assist project planners and managers by providing a complete picture during the Incentive/Disincentive (I/D) contracting decision-making process of possible performance outcomes with probabilities based on historical data. This study was performed by collecting transportation construction project data. The collected project data from the Florida Department of Transportation were evaluated using time and cost performance indices and then statistical data analysis was performed to identify important factors that influence construction project time performance. Using Monte Carlo simulation procedures, this study demonstrated a methodology for developing an I/D project time and cost performance prediction model. User-friendly visual interfaces were developed to perform the simulation and report results using Visual Basic Application programming. The developed model was validated using additional cases of transportation construction projects.

Based on statistical analysis, this research found that several project factors influence I/D contracting performance. The important factors that had significant impacts on project performance were the effects of contract type, project type, district, project size, project length, maximum incentive amount, and daily I/D amount. In conclusion, the developed model applied to I/D contracting projects will be a useful tool to assist the project planners and managers during the decision-making process and will promote the efficient use of I/D contracting, which will benefit the traveling public by saving their travel time from construction delays. With additional project data, the developed model can be updated easily and the more data used for the model, the better the accuracy of prediction that can be expected.





Facilitating Telecommuting as a Means of Congestion Reduction

Project #2803

Publication #09-14

Co-Principal Investigators: Nancy Da Silva, Ph.D; Meghna Virick, Ph.D.

Telecommuting, which entails working away from the conventional workplace, has not experienced the growth projections predicted (Mokhtarian, 1998; Pliskin, 1997). Also, academic research on telecommuting in the management and psychology fields is relatively undeveloped, despite a lot of popular press about the benefits and disadvantages of working from home.



This study sought to obtain a better understanding of the factors that help and hinder telecommuting adoption by employees by delving into attitudes and behaviors of employees who telecommute and those who do not telecommute, as well as by examining supervisor attitudes and HR practices in organizations related to telecommuting. For telecommuters, we sought to gain a better understanding of how “extent of telecommuting,” i.e., the number of days a week a telecommuter works away from the office, has an effect on employee satisfaction.

The sample for this project consisted of individuals working in a variety of organizations in Silicon Valley. For each organization, we sought to obtain survey responses from a telecommuter, a non-telecommuter, and their supervisor, with all three working in the same department. The data were collected in 2008. We received 624 surveys. Of these, 262 were telecommuters, 181 non-telecommuters, and 181 supervisors.

Research questions attempted to gain a better understanding of the barriers and facilitators of telecommuting. The first set of research questions centered around understanding the differences between telecommuters and non-telecommuters on job attitudes. Results showed that telecommuters were more committed to the organization (organizational commitment) and were more satisfied with life in general (life satisfaction) than non-telecommuters. However, there were no differences between telecommuters and non-telecommuters on how satisfied they were in their jobs (job satisfaction) and whether they were more likely to leave the organization in which they were employed (turnover intentions).

Furthermore, we wanted to understand the optimal amount of telecommuting. So for the subsample of telecommuters, we examined the relationship between extent of telecommuting and job attitudes. Telecommuters were found to be more satisfied with their jobs when they engaged in moderate levels of telecommuting as opposed to extreme levels of telecommuting (i.e., very high or very low). Telecommuters were also less likely to leave the organization when the extent of telecommuting was moderate.

Personality differences between telecommuters and non-telecommuters were examined. It was found that telecommuters were more likely to be extraverts -- i.e., someone who is sociable and talkative (Barrick & Mount, 1991) -- than non-telecommuters.

Findings also indicated that telecommuters were more likely to experience disruption in their work due to greater family responsibilities. In other words, their family responsibilities tended to interfere with their work (family-interference in work) more than for non-telecommuters.

It was not surprising that telecommuters, on average, commuted for longer distances and for longer time periods than their matched non-telecommuting coworkers. However, telecommuters were less likely to drive to work during rush hours. Furthermore, there were a slightly higher number of telecommuters who reported their commute to be stressful compared to non-telecommuters. One interesting finding was that more than 50% of telecommuting supervisors believed that employees have to be a high performer to telecommute. Among non-telecommuting supervisors, 37% agreed with that statement.

The study also examined whether employees and supervisors would have different perceptions of HR practices depending on whether they telecommute or not. Our finding was that telecommuters have different beliefs and perceptions regarding their organization's support for telecommuting. This was evident in that more telecommuters than non-telecommuters felt that organizational reward structures supported telecommuting, and that adequate training in technology was available for the telecommuter. Telecommuters also experienced greater support from their supervisors and also felt that the performance evaluation system supported those who work offsite.

This study, which was conducted among telecommuters across multiple organizations, strongly suggests that moderate amounts of telecommuting may be the best strategy for companies that are seeking to introduce large scale telecommuting. This seems to provide the best outcomes for employees in terms of commitment and life satisfaction. Results show that personality is an important variable, which should be considered as important for future research. Specific job characteristics were not examined, so future research should examine job characteristics that make certain jobs lend themselves to telecommuting. This would be an extremely worthwhile endeavor because it would help organizations design telecommuting programs that are tailored to certain jobs.



Policy Issues in U.S. Transportation Public-Private Partnerships: Lessons from Australia

Project #2807

Publication #09-15

Principal Investigator: Rick Geddes, Ph.D.

This report examines Australia's experience with transportation public-private partnerships (PPPs) and the lessons that experience holds for the use of PPPs in the United States. Australia is an important country from which to learn because it has decades of experience in PPP use, it has used the approach to deliver billions of dollars of critical transportation projects, it has a comparable history to the United States, and a legal system based on English common-law, which is used in the majority of US states.

Although we explore a range of issues in this report, we focus on four key PPP policy issues: (1) how to distribute the risks inherent in PPP contracts across public and private sector partners; (2) when and how to use non-compete (or compensation) clauses in PPP contracts; (3) how to address concerns about monopoly power; and (4) the role and importance of concession length.

We addressed those and other questions by surveying the relevant literature on PPP use internationally, and by interviewing numerous Australian PPP experts from the public and private sectors, as well as from academia.

The main findings of the study are summarized by listing several "dos" and "don'ts" when approaching transportation PPPs in the United States. Some of these findings relate directly to the four questions above, while others surfaced during the course of interviews as critical issues for consideration.

Ongoing Research Projects



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

Project #2207

Principal Investigator: Richard Werbel, Ph.D.

MTI Project #2109 was the first phase of this project. This second phase was to include a full survey and analysis of three main ethnic groups (Asian, African-American, and Hispanic), in addition to a control group of Caucasians. The research plan used on-board interviews to identify survey participants, who were then to be interviewed by telephone. Early on, the project dropped the Asian component because the large number of different Asian languages complicated the interview process, and not enough participants from the same ethnic group were identified to provide useful data for analysis. The research plan worked well for the Caucasian and African-American populations, but it ran into difficulty with the Hispanic interviews. Though a sufficient number of participants were identified by the on-board interviews, a large number of the potential contacts did not work – generally because the telephone number provided was inaccurate. The survey firm did attempt to identify if the problem was caused by interviewers eager to complete forms, but that did not appear to be the issue. Although the PI did not attempt a more scientific assessment of the exact cause, he and the survey firm concluded that fear of immigration enforcement action may have caused the problem.

Concurrently with the failure of the interviews, the PI requested a suspension of the project for personal reasons. Given the passage of time, completion of a survey raises major problems, and the institute requested the PI complete a white paper summarizing the work he was able to complete and discussing the methodology issues that derailed the project.



Collaborative Funding to Facilitate Airport Ground Access

Project #2503

Principal Investigator: Geoffrey Gosling, Ph.D.

Airports are the principal interchange nodes in the passenger transportation system where local and regional transportation systems interface with those for national and international travel. Airports also play a vital role in facilitating the transfer of air cargo between the surface transportation system and the air transportation system, as well as sometimes serving as major sorting and distribution centers for freight that may be moved entirely by surface transportation.

However, all too often, projects to improve the connectivity between the surface transportation system (including private vehicles, buses, and light and heavy rail systems) and the airport circulation and terminal facilities are hampered by project funding regulations that limit the type and location of projects eligible for funding from the various programs administered by the Federal Aviation Administration (FAA), Federal Highway Administration (FHWA), and the Federal Transit Administration (FTA). Policies regarding the use and allocation of these funds are often so restrictive that projects are unable to be implemented or are rendered much less effective at improving intermodal connectivity.

It is anticipated that the research will result in two products:

- A guide to collaborative funding of intermodal airport ground access projects that will document the various funding programs available and review their current limitations and collaborative strategies to overcome these limitations, as well as present case studies of successful efforts to develop collaborative funding strategies for airport ground access projects.
- A final report that will present an analysis of the past experience with collaborative funding of airport ground access projects and present recommendations for changes to policies and funding allocation procedures at the federal and state levels.



Tribal Corridor Management Plan

Project #2604

Principal Investigators: Mary Scoggin, Ph.D., Joy Adams, Ph.D.

Caltrans and local tribes have expressed interest in creating a plan for design features that highlight Native American culture where a state highway runs through tribal land, a Tribal Corridor Management Plan (TCMP). Tribal symbols, information kiosks, fencing, native plantings, and other non-standard design features can be made consistent with existent transportation and downtown plans. The non-standard principles of the highway project will help guide future transportation plans, construction projects and maintenance activities when located on or near Native American reservations or rancherias in California. This project will also give the public a sense of place when entering tribal lands, and an awareness of the history, culture, and vitality of the area.



In addition to developing a set of guidelines that can be used to develop tribal corridors along highways throughout Caltrans District 1, this project will also create a plan specific to the creation and management of a tribal corridor through the Hoopa territory along Highway 96. The Hoopa have both a Transportation Plan and a Traffic Calming and Safety Enhancement Plan for their downtown area, and the more advanced state of their planning efforts led to the choice of their area for the pilot testing of the TCMP guidelines. The iterative process will allow the real-world experience of working with tribal organizations and other stakeholders to inform the development of and test (“ground truth”) the utility and completeness of the general guidelines.

This is a specialized, context-sensitive solutions project. By reflecting the tribe’s strong sense of pride, it can help deter vandalism and help reduce maintenance and repair costs. Additionally, it might enhance the experience of the traveling motorist and contribute to cross-cultural understanding and appreciation, as well as community pride and economic growth.

The project will produce a Tribal Corridor Management Plan guideline, suitable for application in any tribal area, a more specific plan for the Hoopa area (both products for delivery to Caltrans), and an MTI publication that will document the process used, decisions made, and recommendations. The MTI publication will include the draft Caltrans products as appendices.



Improving Bus Priority Lane Effectiveness in Congested Urban Centers

Project #2606

Principal Investigator: Asha Weinstein Agrawal, Ph.D.

This study will examine the policies and strategies governing the enforcement of bus lanes in major congested urban centers. It will also examine the effectiveness of current bus lane enforcement strategies in several major US cities. The project will be a case study of several municipalities including Midtown and the Upper East Side in New York City, San Francisco, Boston, Chicago, Los Angeles, and London, UK as a best practice case, examining policies and strategies regarding ongoing enforcement of BRT lanes.

The research team will conduct interviews with transportation departments and law enforcement agencies about their enforcement policies and use the results to produce descriptions of findings for each city, a table comparing legal frameworks in all cities, and a typology of enforcement strategies; and “best practices” case studies. In three cities, the research team will measure bus priority lane “availability,” defined as the share of time that no stopped vehicles are blocking the lane. Statistical analysis of the data collected will provide insight into the variation in bus lane availability by time of day and method of enforcement. It will also provide information on the frequency and duration of lane blockages by vehicle type (passenger cars, delivery trucks, emergency vehicles, etc.). They will also develop guidelines for evaluating the extent to which bus lane violations pose a problem for bus operations, and the types of solutions that are likely to be effective in different situations, along with specific policy recommendations.



Best Practices for Context Sensitive Solutions in Urban Areas

Project #2610

Principal Investigator: Marta Pañero, Ph.D.

Note: This project was initially delayed by the late issuance of a subcontract to the team at New York University. Subsequently the original principal investigator, Dr. Allison de Cerreño, left that institution and new team members were recruited. With the issuance of a revised subcontract, the project has resumed.

This study will clarify the use of the CSS process in finding transportation solutions for planners, designers, and engineers in city and state agencies working in urban areas. CSS and its predecessor, Context Sensitive Design (CSD), are defined in a number of ways around the country. While some practitioners utilize CSD and CSS interchangeably, the general trend has been to move toward utilization of the phrase CSS to emphasize the process involved with finding transportation solutions rather than focusing solely on the design elements themselves.

The project will include an in-depth literature review to identify potential locations for case studies. For cases that look promising, additional information-gathering discussions will be held with individuals at the agencies involved to fill in the gaps and gain a better understanding of the specific dynamics involved in the CSS process.

At least four cases will be developed. Comparisons will be made between these cases to look for similarities and differences and how they affected the end results. The goal is to develop a set of best practices and key features or elements of which practitioners should be aware.



Effects of Neighborhood Crimes on Travel Behavior – Phase 2

Project # 2802

Principal Investigator: Christopher Ferrell, Ph.D.

While urban form is widely assumed to play a role in people's decisions in their choice of modes for travel, the effects are not always empirically as strong as some would expect. Urban density has many social and psychological associations in our culture, sometimes in conflict with what we would anticipate its primary travel effects to be – i.e., density increases the propensity to use transit, bicycle, or walk. In American culture, urban density is often associated with urban decay, poverty, and perhaps most importantly to one's sense of personal security, crime. Automobiles offer relative privacy and consequently, a sense of security not offered by non-automotive modes. To the extent that the propensity to use transit is affected by one's sense of security, perceptions of neighborhood crime are likely to be an important predictive variable in determining transit and non-motorized modal share. This study hypothesizes that urban density and neighborhood crime have been confused in the minds of the public as well as the conceptual and statistical models of transportation researchers. Because each has an opposite effect on mode choice, it is assumed that to the extent that crime rates are higher in older, denser urban areas, crime rates have masked and countered the effects of density on mode choice, reducing our estimations of its importance. This research proposes to study the effects of neighborhood crime on mode choice.

The Phase I study, covering six San Francisco Bay Area cities – Berkeley, Concord, Oakland, Santa Clara, Sunnyvale, and Walnut Creek – found substantiation for the proposition that neighborhood crime rates have an influence on the propensity to choose non-automotive modes of transportation – transit and walking – for home-based trips. Specifically, high vice and vagrancy crime rates were associated with a lowered probability of choosing transit in suburban cities – Concord, Santa Clara, and Walnut Creek – for both work and non-work trips. High property crime rates were associated with a lower probability of walking for work trips in the denser inner-ring suburban cities of Berkeley and Oakland, while high violent crime rates were associated with a lower probability of walking for work trips in suburban cities of Concord, Santa Clara, Sunnyvale, and Walnut Creek. The study did not find statistically significant relationships for all city/trip type model runs, suggesting that these relationships differ depending on the urban form and trip type contexts.

Like this Phase 1 work, this Phase 2 study will empirically estimate (through statistical modeling techniques) the impacts of neighborhood crime rates on travel behavior – specifically, non-automobile mode choice. But while Phase 1 aggregated reported crime events into traffic analysis zones – a geographical unit that is unrelated to crime activities – the proposed Phase 2 study would improve on these methods by using geographically precise crime data (already collected in Phase 1) and travel data (address-matched trip ends obtained from the Metropolitan Transportation Commission). The team has datasets with this geographically precise location information for San Francisco, Oakland, Berkeley, Walnut Creek, Concord, and Santa Clara. These crime datasets will be adequate to the task of aggregating reported crimes into crime “hot spots” that can then be used to spatially correlate with the trip-making behaviors of participants in the BATS 2000 survey. The increased precision should allow better application of crime data in travel demand modeling, better comparisons of the effects of urban form and crime on travel behavior, and a better assessment of the potential for increasing transit ridership by discouraging neighborhood crime activities.



Best Practice Study of Secondary Airport Development

Project #2804

Principal Investigator: Senanu Ashiabor, Ph.D.

MTI has developed a relationship with the Aeronautics Division of Caltrans, in part because SJSU is the only California State University campus with an academic program for aeronautics. The relationship of airport congestion to ground congestion is well-known, and congestion issues exist at all the major airports in the state. Given the projected growth of the state in the coming decades, Caltrans is interested in the potential for growth at secondary airport, and the department requested this study (which was selected as part of the competitive RAPOC process).

This team will use case studies and a literature review to develop a framework to help planners identify which secondary airports to develop as existing major airports in California become more congested. A database of travel time mobility metrics for the State of California will also be developed as part of this research effort.

In the deregulated U.S. airline industry planners have limited control over traffic growth at airports. This is because traffic growth is tied to the airports airlines choose to operate from, and the airlines have been free to select airports since deregulation. Adequate planning for future airport development therefore requires an understanding of airlines, their needs and behavior.

Until recently, the airlines operating hub-and-spoke networks (usually referred to as legacy airlines or carriers) have dominated the airline industry. These legacy airlines sought to gain competitive advantage over each other by building large scale networks, with high departure frequencies, and aggressive ticket pricing schemes. Couple this with the fact that airlines concentrate traffic close to centers of economic activity, and it is clear why past efforts by

planners to convince legacy carriers to move flights from congested to secondary airports have not been successful.

The past ten years have seen the growth of a new category of airlines in the U.S market usually referred to as Low Cost Carriers (LCC). Part of the cost minimizing strategy of the LCC has been to operate out of secondary airports close to urban areas instead of the existing major airports. In California, Southwest Airlines has fueled growth at Oakland airport, and Jet Blue at Long Beach airport. This strategy gives them various advantages such as reduced congestion and fast turn-around times for their aircraft. This approach also gives them the ability to negotiate low fees and charges with airport authorities eager to attract traffic to their airports. When LCCs invest in terminals at airports they tend to favor simple designs in contrast to the elaborate and sophisticated architectural designs at major hubs. In a nutshell, LCCs in addition to dominating traffic growth in the near future, are a key driver of growth of secondary airports in the US in general and California in particular. If LCCs become the dominant clients of airports in the future, then appropriate planning for secondary airports will require planners to understand the needs and behavior of this group of airlines.

This review will focus on two areas. First it will synthesize the key variables that drive the airport selection process of both legacy airlines and LCC. Based on the information synthesized, the similarities and differences between the two groups of airlines' airport selection process will become clearer. Using this and a ranking of facilities at existing airports, it will pinpoint a group of airports that are most likely to develop.

The travel time database and the review will serve as precursor to an expanded study to develop a more rigorous modeling tool for airport growth in California. This in turn will be available to inform planning for ground access.



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

Principal Investigator: Caroline Rodier, Ph.D.

The study will marshal the best available scientific evidence (approximately 100 advanced modeling studies of land use, auto pricing, and transit strategies conducted in California, the U.S., and internationally) to answer the questions of what types of policies, under what kinds of geographic circumstances, and for both near-and long-term time horizons, may produce significant VMT and GHG reductions cost-effectively, without negative equity or broader economic effects.

California led the nation by passing the first global warming legislation in the US. The Global Warming Solutions Act (AB 32) requires California's green house gas (GHG) emissions be reduced to 1990 levels by 2020, and the Governor's Executive Order (S-3-05) targets an additional 80% reduction in GHG emissions below 1990 levels by 2050. Transportation accounts for 36% of total GHG emissions in California and 27% in the US. The California Air Resources Board (CARB) estimates that significant GHG reductions from passenger vehicles can be achieved through improvements in vehicle technology and the low carbon fuel standard; however, these reductions will not be enough to achieve 1990 levels if current trends in vehicle miles traveled (VMT) continue. As a result, land use, auto pricing, and transit policies strategies to reduce growth in VMT are therefore an important part of achieving California's greenhouse gas emission reduction goals.

A large body of evidence suggests that land use, auto pricing, and transit strategies are effective measures to reduce VMT to achieve necessary GHG emissions reductions. As part of a separate study funded by the CARB, Rodier has conducted a comprehensive review of approximately 200 advanced modeling scenarios in more than 50 studies, conducted in California, the U.S., and internationally, on the effectiveness of these strategies to reduce VMT and GHG emissions. The proposed study would capitalize and expand this review to include the cost-effectiveness, economic efficiency, and equity effects of GHG, VMT, and congestion reduction by policy and geographic area type for near- and long-term time horizons. In sum, this review will marshal the best available scientific modeling evidence to answer the questions of what types of policies, under what kinds of geographic circumstances, may produce significant VMT and GHG reductions cost-effectively, without negative equity or broader economic effects.

The proposed study will capitalize and expand on this current research in the following steps to understand the cost-effectiveness, economic efficiency, and equity effects of land use, auto pricing, and transit strategies to reduce VMT and GHG emissions.

1. More studies added to database.

2. More scenarios added to database.
3. Improve precision of magnitude of policy change. An important focus of this study, will be contacting agencies and researchers to obtain more precise representation of the magnitude of change introduced by the policy scenarios (e.g., new transit lane miles, roadway capacity expansion, auto pricing levels, land use density, and jobs and housing balance) where documentation is lacking. This task is very important because it will allow for a more precise and consistent comparison of levels of policy strength necessary to achieve policy goals for different time horizons.
4. Compare results of modeling studies to empirical studies. In this step, Dr. Lee will answer the question of whether these modeling studies are replicating the range of effects documented in the empirical literature from changes in auto pricing, levels of transit service, and land use.
5. Cost-effectiveness analysis. This study will add more cost, revenue, and congestion figures into the database to make per capita calculations of cost per reduced ton of GHG emissions, VMT, and vehicle hour of delay (or some congestion measure). Present value calculations will be applied to estimate cost-effectiveness for 10, 20, 30, and 40 year time horizons. This effort is not minor considering the number of scenarios (over 200) for which cost-effectiveness would need to be conducted as well as the careful and consistent accounting of cost and revenues needed for each scenario across studies (e.g., different infrastructure costs incurred in numerous and different years). The study will focus on per capita changes to address issues of economic development and population growth across regions.
6. Broader economic efficiency or cost-benefit analysis. This study will also move beyond the financial cost-effectiveness evaluation to include broader economic efficiency or cost-benefit analyses that are presented in many of the more advanced modeling studies. The review will describe and evaluate the types of economic efficiency measures represented in the literature; for example, some measures include changes in travel time and cost across all modes while others also include the economic development benefits. This analysis will shed light on the question of whether moving beyond financial cost analyses to economic efficiency measures changes the rank ordering of scenarios. The results of this economic efficiency analysis will be reported and summarized by time horizon, policy, and area type to understand the broader societal costs and benefits of reducing VMT and GHG emissions through land use, auto pricing, and transit options. This analysis will also provide important insights into potential advantages of adopting more advanced modeling tools capable of conducting economic efficiency analyses.
7. Equity analysis. A GHG reduction measure may prove financially cost-effective and economically beneficial to the total region, but still may have negative effects on more

vulnerable socio-economic groups. Modeling studies included in this analysis illustrate a broad range of methods for evaluating the equity effects of simulated policies. The proposed study would summarize these methods and evaluate their relative strength and weaknesses, including, for example, the range of potential effects and breadth of socio-economic groups captured by the analysis. The study would also assess the potential benefits of models that represent more detailed socioeconomic and geographic location characteristics of travelers. Results from Rodier's currently funded Mineta study that examines the potential equity effects as represented by an advanced travel model and a micro-simulation activity based land use model in the Sacramento regions will be included in this analysis. Ultimately, however, the goal of this analysis will be to identify the types of GHG reduction measures that have a greater likelihood of posing equity threats and to illustrate how different policy combinations may redress equity problems. Key limitations of equity analyses will also be identified along with recommendations to improve and make more consistent the analysis of equity in transportation plans conducted by MPOs.



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

Project #2806

Co-Principal Investigators: Asha Weinstein Agrawal, Ph.D.; Evelyn Blumenberg; Ph.D.

How much do people with limited resources pay for cars, public transit, and other means of travel? How does their transportation behavior change during periods of falling employment and rising fuel prices? Using in-depth interviews, this research will examine (1) the travel behavior and transportation expenditures of adults living in low-income households, and (2) how changing transportation prices affect their travel behavior and expenditures. Research on this topic will help policy makers to better evaluate the effect of transportation finance policies such as congestion pricing or gas tax increases on the travel behavior and economic security of low-income families. Understanding how different transportation finance regimes affect low-income families is critical to developing new transportation finance options,



Issues of equity frequently arise in policy discussions related to the rising costs of gasoline, as well as in evaluations of the desirability of adopting transportation finance instruments such as congestion pricing or gas tax increases. Despite these concerns of policymakers and advocates, relatively little information has been collected about the transportation burden of low-income families. Travel surveys do not typically include data on household transportation expenditures, while consumer expenditure surveys do not include data on travel behavior. Therefore, it is impossible to examine how low-income people trade off the costs and benefits associated with travel. Moreover, neither data source allows us to understand how low-income families make travel and expenditure decisions. Therefore, we currently lack the information necessary to make informed predictions about the effects of increasing transportation costs—whether from taxes and fees or from rising fuel prices—on households with limited resources.

To begin filling this data gap, the team will conduct 75 in-depth interviews with adults living in low-income households, examining (1) the interviewees' travel behavior and transportation expenditures, and (2) how changing transportation prices affects both their travel behavior and expenditures. A secondary objective of the research is to explore how the travel choices of low-income adults vary by the relative supply of public transit near their homes.

The study will generate detailed information about the priorities and constraints that shape the travel decisions of low-income adults. With these study results, we can generate sophisticated findings and hypotheses on various topics critical to current policy makers. For example:

- We can hypothesize the relative impacts that different transportation taxes and fees will have on low-income persons and their ability to access jobs and needed services. These hypotheses can then be tested with survey research.
- We can hypothesize what transportation subsidies or transportation programs would most likely provide substantive accessibility benefits to low-income persons. These hypotheses can also be tested with survey research, such as by transit operators or community advocates needing to assess whether proposed new transportation assistance programs would be (cost-effective ways) methods to assist the target population.
- We can assess whether the commonly-used travel diary surveys accurately capture the travel behavior of low-income respondents. If we find that the current survey methods are inadequate, we can recommend modifications to the survey design that would capture more accurate or more complete information.



Carbon Footprinting & Ecodriving: Understanding How Public Education Can Result in Reduced Greenhouse Gas Emissions and Fuel Use

Project #2808

Principal Investigator: Susan Shaheen, Ph.D.

This study focuses on understanding the long-term behavioral impacts of “carbon footprint” and “eco-driving” public education campaigns on greenhouse gas (GHG) emissions and fuel use in light of California’s Global Warming Solution’s Act (AB 32), which requires a 27% reduction in GHGs by 2020.

Rising fuel prices and concerns about climate change are increasing. Transportation is a major contributor of carbon dioxide (CO₂) and other greenhouse gas (GHG) emissions from human activity, accounting for approximately 14% of total anthropogenic emissions globally and about 27% in the U.S. To date, the most dramatic policy measure at the U.S. state level has been the passage of California’s Global Warming Solutions Act (AB 32), which seeks to limit GHG emissions from a wide range of industrial and commercial activities. AB 32 requires that California’s GHG emissions be reduced to 1990 levels by 2020 (a 27% reduction) through an enforceable state-wide cap and in a manner that is phased in starting in 2012 under rules developed by the California Air Resources Board (ARB). Furthermore, Governor Schwarzenegger’s Executive Order S-3-05 includes an 80% reduction in GHG emissions by 2050.

On June 26, 2008, ARB released the Climate Change Draft Scoping Plan: A Framework for Change. In the draft plan, ARB emphasized the importance of public education in bringing about voluntary individual action. Public education through social marketing (marketing directed at promoting a social good through behavioral change) has the potential to change travel behavior to reduce GHG emissions through marketing and promotional strategies.

Traveler information services in Europe, Asia, and North America (to a lesser extent) are increasingly expressing trip options in terms of their carbon contribution (also known as “carbon footprinting”). A carbon footprint measures the impact human activities have on the environment, particularly climate change. In light of new laws and regulations, increased public awareness, and rising fuel prices, there is likely to be growing public and policy interest in this information.

Another exciting area is “eco-driving.” Eco-driving is the concept of changing driving behavior and vehicle maintenance to impact fuel consumption and emissions. This entails technology and education, such as real-time driver feedback (e.g., Toyota Prius in-vehicle navigation screen) and information (i.e., driving habits and vehicle maintenance), to reduce energy consumption and emissions.

The key study question is whether or not travelers will adopt eco-driving and/or use alterna-

tive transportation modes in response to carbon footprint/eco-driving information and how long this behavior will last.

This project's scope consists of a two-year study over 24 months; Project 2808 is the first year study. The second year will require selection and funding in a subsequent RFP cycle. The first year covers: 1) human subjects documentation/review; 2) review of carbon footprinting and eco-driving literature; 3) expert interviews to gather lessons learned from relevant public education campaigns (e.g., Spare the Air); 4) exploratory focus groups on carbon footprinting (traveller information) and eco-driving concepts, response to several educational websites, and attitudes toward climate change and fuel prices; 5) before-and-after survey design; 6) development/identification of educational website for use in this study; 7) study population recruitment (control and experimental groups); 8) before-and-after survey implementation and analysis. A final report will document the results. A second research year is proposed, as it would provide greater understanding of the long-term effects of the educational campaign tested in this study through four additional survey phases (across year two).

The ultimate research objective is to tie this new understanding to the AB 32 policy process in the study's final report, papers, and presentations.



Understanding Household Preferences for Alternative Fuel Vehicle Technologies

Project #2809

Principal Investigator: Hilary Nixon, Ph.D.

The project objective is to estimate preferences and willingness to pay (WTP) for various types of alternative fuel vehicles (AFVs), and to identify the characteristics (demographic, socio-economic, and environmental attitudes) that influence WTP, in order to provide concrete policy recommendations for promoting the adoption of AVFs.

Soaring fuel prices as well as growing concerns about air pollution and global warming have steadily increased interest in alternative fuel vehicles. For households, these vehicles are becoming more attractive, partly because of various measures implemented to promote their use. For a few years, Californians have been expressing interest in hybrid electric vehicles, partly because of the possibility to drive them in HOV lanes. Many alternative fuel vehicles also benefit from federal tax breaks. Increased gasoline prices seem to have changed attitudes as well. A 2008 survey by the Public Policy Institute of California (PPIC) showed that Californians would "seriously consider getting a more fuel-efficient car" for their next vehicle purchase, and that a clear majority (73%) of Californians also favor mandating an increase in vehicle fuel efficiency, even if it results in higher costs, but this survey does not tell us how much higher. Significantly increasing fuel efficiency likely means relying on new technologies, but it is not clear what trade-offs people are willing to make regarding performance, reliability, cost, environmental characteristics, and ease of use.

Understanding these trade-offs is essential for regulators and public agencies concerned about air quality and the environment. Indeed, promoting cleaner vehicles is of interest at multiple levels of government as they have the potential to improve local air quality, reduce dependence on foreign oil, reduce greenhouse gas emissions, and support economic development. Despite higher gas prices, however, alternative fuel vehicles are still more costly to consumers than gasoline vehicles, partly because of US political opposition to taxing gasoline to account for both environmental damages and for the cost of fully financing infrastructure. Uncertainty about new technologies is also likely to slow down private sector innovation, so government intervention (in the form of mandates and/or tax breaks) is called for.

California has been playing a special role in promoting alternative fuel vehicles partly because it was the only state initially authorized to regulate vehicle emissions under §209(b) of the Clean Air Act; Section 177(a) of the CAA then allowed other states to adopt California motor vehicle emission standards. California's Low Emission Vehicle (LEV) Program has a zero emission (ZEV) vehicle component that promotes advanced technology vehicles, including both high efficiency hybrids and low-carbon fuel SULEVs but it has been opposed by automobile manufacturers. Although various manufacturers started producing a limited number of electric vehicles in the 1990s, they were discontinued a decade later, which dealt a blow to California's technology forcing efforts. Several reasons have been advanced to explain this failure but it underscores the crucial need for policy makers to have a good understanding of the trade-offs people are willing to make for new automotive technology.

Currently, however, a robust understanding of these trade-offs appears to be lacking. Project 2809 will start filling this gap using an innovative approach that relies on applying contingent ranking, a stated preference technique, to a randomly selected sample of a large internet panel representative of the US population. Contingent ranking simply asks respondents to rank various scenarios based on their preferences; different respondents are exposed to random combinations of selected characteristics, which allows the team to infer people's preferences with a large enough sample (1,000 respondents or more) and well designed scenarios. They can then quantify trade-offs people are willing to make after making some assumption about the structure of their preferences based on microeconomic theory.



Bicycling Access and Egress to Transit: Informing the Possibilities

Project #2825

Principal Investigator: Kevin Krizek, Ph.D.

The central objective of this research project is to analyze strategies for best integrating cycling and transit use using a cost-effectiveness framework, given various transit station characteristics. Special attention will be given to accommodating the first and last mile of a transit trip without the use of an internal combustion engine.

This research aims to inform key parameters under the framework of cost-effective analysis for three broad alternatives: carrying bicycles aboard the transit vehicle, parking cycles at transit stops, and bicycle sharing at transit stops. The first step is to identify characteristics of transit stops that are likely to be top contenders for attracting high cycle-transit-users (CTU) and subsequently arriving at a protocol to estimate bounds for existing or potential users. Given a likely number of users, the second step involves estimating costs to satisfy demand for given amounts of CTUs. The third step estimates the likely efficacy of different users in terms of increasing cuts. The parameters will be arrived at by: (a) contacting appropriate representatives to glean cost estimates, (b) statistical analysis of secondary data, and (c) an estimated five focus groups/case studies which will then enable them to be used within a framework of traditional cost-effectiveness analysis.

The predominant approach employed to date for integrating cycling and transit involves transporting bicycles aboard the transit vehicle. Bicycle carrying capacity constraints, however, considerably limit widespread use of this alternative (usually two bikes on buses—sometimes three—and possibly three bicycles on rail cars). A further limiting factor revolves around limited capacity on the transit vehicle, the trunk portion of the trip. While existing cycling-transit capacity could be adjusted at the margins using these approaches (e.g., through incentives, exploiting technology to enhance communication between riders), the opportunity is ripe to consider broader solutions.

In terms of a user's decision-making, at least five broad possibilities are available options worthy of consideration:

1. Transporting the owner's bicycle aboard (inside or outside) the transit vehicle
2. Using and parking the owner's bicycle at a transit access location
3. Sharing a bicycle that would be based primarily at the transit access point
4. Using an owner's bike at the egress location
5. Sharing a bicycle that would be based primarily at the transit egress point

Here is the outstanding question: given a variety of urban form contexts, what are the costs of feasible alternatives, and which provides the most effective solution?

Cost-effectiveness analysis will use an approach (described in detail in Krueckeberg, Donald, and Silvers, Arthur, 1974. *Urban Planning Analysis: Methods and Models*) that divides the effectiveness by the costs after standardizing, accounting, and discounting for various informants (effectiveness calculations). The approach is in no way intended to be determinate, but rather it provides a proven and robust framework to inform deliberation of alternatives.

The study will help planners and practitioners in US cities better understand the desirability of bicycle-transit integration and more importantly, how to choose from alternative policy instruments. Finally, this research will shed light on vexing questions such as the potential of folding bicycles and, more broadly, the role of bicycling in transit oriented development. Most importantly, the results will help advise transit agencies with informed suggestions about how they can maintain and improve returns on their investments by overcoming rack capacity limitations and more effectively integrating bicycling and transit.

New Projects



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

Project #2901

Principal Investigator: Anurag Pande, Ph.D.

Transit centers are at the heart of transportation systems in large urban areas. It probably explains why the transit systems of large cities have been the targets of terror attacks historically (Israel, Britain), with recent large scale coordinated attacks in this decade (e.g., Madrid in 2004 and London in 2005). In the event of a disaster, a timely response could save a significant number of lives. However, timely and effective response requires a well coordinated strategy with the key elements of the response (i.e., hospitals, fire and law enforcement) working together. Involvement of multiple elements is part of what makes the emergency response so complicated.

We propose to develop an integrated emergency response system for a transit center in the San Jose area. The transit center located in the San Jose area (e.g., a bus depot) for this study

would be selected based on expert inputs from the Mineta Transportation Institute (MTI) and Caltrans. Some of the research questions that need to be answered while developing a response strategy for a human-caused disaster are as follows:

- What is the optimal routing strategy for dispatching a fleet of emergency response vehicles to the disaster area given the underlying transportation network and dispatch location(s) surrounding the transit center?
- Where are the traffic bottlenecks that may impede the evacuating traffic as well as the fleet of emergency vehicles?
- If the disaster causes some network links to close, what should be the re-routing strategy?
- How does the routing strategy for emergency vehicles fit in with the overall emergency response plans for the facility and the community?

In this project, microscopic traffic simulation model for the network surrounding one of the transit centers in the San Jose area would be developed. Microscopic simulation involves replication of real world transportation system operations to examine the inherent complexity, stochastic, and dynamic nature of these systems. In recent years, simulation modeling has become one of the most widely used tools for network analysis. Simulation models can answer what-if questions to aid system designers in assessing the impact of various changes on existing systems in a cost-effective way. Based on the simulation model for the underlying traffic network one can obtain fastest routes for emergency response vehicles from key dispatch locations (including hospitals, fire stations, and police departments) to the specified disaster area. Similarly, one can devise an optimal routing strategy for evacuating the transit center. Using the microscopic traffic simulation model one can easily assess the changes in the optimal routing strategies under different scenarios, such as unexpected closure of certain routes.

The most critical part of the research will be to integrate the routing strategies identified based on microscopic traffic simulation with the existing overall emergency response framework for San Jose area such that riders and operators of the transit system can play an active role. The existing literature in the area of emergency response planning for human-caused disasters lacks the effective integration of routing strategies within the overall response framework. The investigators would devise an educational strategy to familiarize the users and operators of the transit systems with the routing strategies for the evacuees leaving the disaster area, as well as for the emergency vehicles moving in. If the riders and operators are familiar with the existence of a response plan it would lead to some order in an otherwise chaotic scenario. Effective integration of the routing strategies with community's existing emergency response resources requires coordination between Traffic Operations and Disaster Management Plans. The identified routing strategies would be conveyed to the local first responders. Development of a streamlined, coordinated decision process that utilizes real network routing information has the potential to greatly improve disaster management.



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

Principal Investigator: Caroline Rodier, Ph.D.

This study will evaluate potential economic consequences, by simulating scenarios with the Sacramento land use and transportation models (PECAS and SACMET), of two important aspects of California's Senate Bill 375: 1) the absence of a requirement that local land use plans conform to regional land use plans that demonstrate achievement of green house gas (GHG) targets required by Assembly Bill 32 and 2) the concentration of regional affordable housing in urban areas with high quality transit access.

The study will enable the simulation of scenarios with the Sacramento land use and transportation models (PECAS and SACMET) to explore answers the following questions:

- What is the relative change in benefits among jurisdictions within a region that implement aggressive, moderate, and weak land use and transportation measures to reduce GHG emissions?
- If one or more jurisdiction(s) do not conform to the regional plan, what are the economic effects on the jurisdictions that do and do not conform?
- Where does the location of affordable housing within a region most benefit low income households (i.e., even distribution of affordable housing throughout the region versus concentration in urban areas with high quality transit)?
- What might be the effect of the failure of one or more regions to conform to the regional plan and the concentration of affordable housing in urban areas with high quality transit on the total regional economy?

Study results will illustrate potential economic outcomes to be highlighted or redressed to help promote cooperative local and regional land use planning. For example, scenario results that indicate that those jurisdictions that implement aggressive land use and transportation measures experience greater benefits relative to those jurisdictions that do not, may encourage more local cooperation with a regional plan. Alternatively, scenario results that indicate that jurisdictions that do not conform to the regional plan benefit at the expense of those that do, may suggest implementation policies to redress such inequities. An analysis of the economic effects of affordable housing location may underscore the interaction among the location of affordability housing, the welfare of low income households, and the overall regional economy. A careful analysis of such possible outcomes will help policy makers develop implementation strategies that may enable the revolutionary changes in California's land use planning process needed to achieve California's GHG reduction goals.



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

Project #2903

Principal Investigator: Bradley Flamm, Ph.D.

Studies have found that many Americans find it difficult to reconcile their desires to reduce their impacts on the natural environment with the transportation options that are available to them. Most pro-environment individuals face objective and perceived constraints that prevent them from aligning their attitudes with their actions. This study will explore this attitudes-behavior gap through a series of four focus groups held in the Sacramento, California, metropolitan region. Through the focus groups, we will address the following research questions:

- To what extent do focus group participants perceive that their vehicle ownership and use reflects their environmental attitudes?
- What barriers do focus group participants perceive to aligning their environmental attitudes with their vehicle ownership and use choices?
- What changes in personal circumstances do focus group participants believe would permit them to bring their vehicle ownership and use more closely in line with their environmental attitudes?
- What changes in the travel options available to them do focus group participants believe would permit them to bring their vehicle ownership and use more closely in line with their environmental attitudes?

In addition, the focus group discussions will explore the extent to which a sudden change in travel costs affected actual travel behavior, as well as the participants' perceptions about the travel options available to them:

- Did the spike in U.S. gasoline prices in the Spring and Summer of 2008 lead focus group participants to change their travel behavior?
- If so, what insights did this experience teach the focus groups participants about the ease or difficulty of changing their travel behavior? Did it change their perceptions of the constraints they face in adopting travel behaviors that reflect their environmental attitudes?

This set of focus group sessions is well timed to answer both sets of research questions, for two reasons. First, implementation of the research project will follow by about a year the summer 2008 spike in gasoline and diesel prices. Participants will still have relatively fresh memories of any major changes in travel behavior that household members made in response to the price spike. Second, environmental issues are being addressed more energetically by the new Obama administration, particularly climate change, and the link between vehicle ownership and use decisions to environmental impacts is currently being widely discussed in the popular media, as well as within policymaking circles.



Examination of regional transit service through privatization: a case study of public transit service contracting in New Orleans

Project #2904

Principal Investigator: Hiro Iseki, Ph.D.

Suburbanization and declines in population, jobs, and business in the inner city have caused a significant loss in the local tax-base of these areas, preventing them from funding public services. In contrast, affluent suburbs have enjoyed relatively stable or even increasing tax revenues. At the same time, many transit dependents in the inner city have limited access to the automobile and remain there.

These conditions create a situation that makes regional transit coordination very difficult. First, the distribution of transit service is largely driven by a desire to ensure geographic equity, where transit service is expanded to suburban areas, resulting in lower levels of efficiency and effectiveness. Second, individual transit agencies focus on local services, and do not effectively address the needs of regional transit users that travel across transit systems. Third, in addition to general service improvements, marketing and customer service, the adoption of new technologies (e.g., smart cards, automated vehicle location system, next vehicle arrival notification system) is problematic in a regional transit system because each transit agency has a different level of demand as well as different funding priorities. As a result of political and administrative conflicts among transit agencies, regional coordination is very difficult to achieve, posing challenges to the provision of a viable transportation alternative for transit dependents.

The current situation in Greater New Orleans region represents a unique case in which one private firm has been contracted by two jurisdictions, Orleans Parish and Jefferson Parish, to manage and operate transit service. Historically, many US transit agencies have turned to this sort of service contracting to pursue higher cost efficiency and effectiveness, especially in the face of both declining state and federal aid. By 2000, more than one third of U.S. transit agencies with fixed-route bus services contracted out part or all of their service, spending an estimated total of \$4.3 billion for contracted service (or 13.4 percent of total operating expenses) in 2006. Nevertheless, most policymakers know little about the effects of privatization as a service provision strategy.

Accordingly, this study will examine the possibility of introducing significant service improvements regional transit coordination and economies of scale through privatization, taking into account difficulties in achieving coordination among multiple public agencies, as well as incentives needed for a private firm to pursue more cost-efficient and cost-effective operation. In addition, the study will examine the efficiency and effectiveness of providing transit service at each of these two agencies in New Orleans, carefully taking into account the conditions for regional transit service in New Orleans.

In order to address these issues, we will conduct an in-depth study of two cases of transit service contracting in Greater New Orleans. We will examine various documents (e.g., government reports, requests for proposals, contracts) and analyze available data, such as the National Transit Database and data from local transit agencies, as well as transit user survey data. We will use this data to examine and evaluate: 1) conditions of transit finance, management, and operation in the region over a specified period, 2) processes and contractual terms of transit service outsourcing, 3) transit service performance, and 4) regional transit coordination. We will examine not only factors that are easily quantified, such as cost efficiency measured by cost per vehicle hour and cost per vehicle mile, but also service quality from the viewpoint of the users. These factors include the level of user satisfaction with a variety of service components, such as safety, security, on-time performance, information, and amenities.



Comparative Study of the Development of High Speed Rail Projects in the United States
Project #2905

Co-Principal Investigators: Senanu Ashiabor, Ph.D.; Wenbin Wei, Ph.D.

Several states in the US have proposed high-speed rail (HSR) projects in the past. Feasibility studies have been conducted to analyze and assess these projects. Europe and Asia have implemented several HSR projects, while all the proposals in the US have so far been stuck in the planning phase. The fact that none of the HSR projects has been built implies the No-Build Alternative was tacitly selected.



Several arguments have been advanced for and against HSR projects in the US. The California High Speed Rail Authority has advocated for the development of HSR in California based on faster travel times (220 mph speeds), benefits of HSR compared to constructing more freeway lanes and airport runways, increased mobility, reduction in air pollution, and relieving traffic congestion. They argue the system will boost productivity by moving people and goods quicker and cheaper and reduce number of traffic accidents on our roads and highways. A recently released GAO report concludes that 'High speed rail does not offer a quick or simple solution to relieving congestion on our nation's highways and airways. High speed rail projects are costly, risky, take years to develop and build, and require substantial up-front public investment as well as potentially long-term operating subsidies. Yet the potential benefits of high speed rail—both to riders and non-riders—are many' (GAO Report March 2009).

Given the strong arguments on both sides of the debate, there is the need to investigate the actual factors that have prevented the implementation of High Speed Rail projects in the United States. Specifically this project will focus on the factors used to advance the development of High Speed Rail projects in the US by reviewing the history and documentation of three State High Speed Rail projects in California, Texas and Florida.



Lessons for Bike/Pedestrian Integration into the Infrastructure of Urban Communities

Project #2906

Principal Investigator: Cornelius Nuworsoo, Ph.D.

With increasing concern about global warming, greenhouse gas emissions and rising fuel prices, non-motorized modes, such as biking and walking, are gaining importance as viable choices in urban transportation. Having over-emphasized automobile transportation for so many years, many cities in the United States are not accustomed to addressing alternative modes of mobility. This over-emphasis is reflected in personal travel habits which include the fact that at the national level, more than 90% of work trips are typically made by the automobile, 5% by public transit, 2.5% by walking and a mere 0.5% by bicycle (Bureau of Transportation Statistics August, 2008). It is imperative that we increase the level of non-motorized travel to address the concerns about energy use and the environment.

Even where alternative modes are addressed, not all US cities have taken a unified approach to promoting bicycle transportation because bike mode choice is dependent on such important factors as year round weather conditions, topography, trip purpose, and trip length. Even in cities like Davis, Palo Alto and San Luis Obispo, which have strongly promoted biking, there is the need for improved design and planning tools to assess the ridership, mode shift and safety impacts of expanding bicycle networks and facilities. These cities may provide important lessons to others on what is done right and what can be improved. The literature reveals quite a few design guidelines for bike lanes, but there are no specific indications which of the varied treatments in these guides work well for users. While some cities have been tremendously successful in deploying bicycle-friendly facilities, most lag behind and lack the resources to assess what is needed to integrate them with other means of travel.

This study will emphasize policy lessons in the choice of infrastructure and types of operations; mode shifts away from the auto; and how to educate the public with the goal of improving the integration of non-motorized modes into the urban transportation infrastructure. To accomplish this, we will study three cases of cities that have become pedestrian- and bike-friendly by promoting bicycle and pedestrian transportation in order to:

- Elicit transferable lessons for adoption by other cities in terms of treatments that users generally prefer, those that users or accident data reveal as wrong and treatments that could be improved
- Identify program characteristics associated with high ridership levels
- Identify key areas within the Master Planning process that should incorporate bicycling needs

The scope proposes to combine primary data from surveys of non-motorized and public transit users with secondary data from previous study efforts in three California case study cities: Davis, Palo Alto, and San Luis Obispo, to identify program characteristics associated

with high ridership levels and what could be improved in bike/pedestrian planning in urban neighborhoods or small communities.

The anticipated product from this work effort will be a guide. It is envisioned to include visual documentation of examples (and how they are rated by users) with accompanying text and recommended guidelines prepared to be as readable to the general public as to professionals. Recommendations will address such areas as transferable policies, infrastructure systems, public education methods, and key user preferences.

The Caltrans guide book and other references identified in this proposal are primarily design guidelines. They do not link the recommendations to operations and user preferences as this project intends to do.



Non-motorized Transportation Intercept Survey: Development and Testing
Project #2907

Co-Principal Investigators: Kevin Krizek, Ph.D.; Ann Forsyth, Ph.D.

Initiatives to spur more walking and cycling have become increasingly prominent nationwide as one strategy communities are using to tackle the problems of greenhouse gas emissions, traffic congestion, resident quality of life, and public health concerns. But as local governments face hard choices about which programs to fund, decision makers, planners, and residents all seek to understand if proposed policies to increase bicycling and walking—modes referred to as “active travel”—will actually work. However, most communities have terribly unreliable means to know how many active travel trips occur in their jurisdictions, let alone where these trips occur, how the numbers may change over time, and whether those trips may be substituting for driving or transit trips. There is at least one important new initiative to develop walking and cycling surveys, the National Bicycle and Pedestrian Documentation Project (NBPD), and this effort has made strides as a central repository of practices and data (Alta Planning and Design 2009). The proposed project will build on this effort to test and refine survey approaches, extend the reach of the NBPD, and streamline it so that communities could have more choices in reliable, low-budget, well documented, and well-tested means to measure active travel.



To fill this gap, we propose to research, develop, and test a suite of survey modules and associated sampling strategies for measuring non-motorized travel at the local level. The modular approach will allow communities to select a survey appropriate to their needs in terms of focus, level of detail, geographic scale, and cost. We will likely employ some questions

developed in existing surveys such as the National Bicycle and Pedestrian Documentation Project, but we will also create additional and alternative modules so that local communities can gather data to reliably address a number of pressing policy questions. The survey will be designed to help communities answer such questions as:

- How much walking and cycling is occurring in a given community?
- Where do walking and cycling trips occur?
- What is the purpose of walking and cycling trips?
- What is the degree to which such trips are substituting for auto trips?
- How far are cyclists and pedestrians traveling?

In contrast to a mere documentation or demonstration project, the basic and applied research required to robustly complete this work will make several important contributions:

- The surveys will be tested for reliability across administrations—so-called “test-retest reliability”—to ensure that the questionnaire captures the needed data. This reliability testing will be a unique contribution of the research project, as very few travel surveys have been tested for reliability.
- Survey question sources and justifications will be well documented so communities can understand why they are included and where they have been used before. This is again unusual in transportation.
- We will provide alternative sampling strategies with associated rationales so that communities can select the best models for their needs.

The survey modules will assist communities with planning and decision-making across a wide range of activities. For example, the survey modules will allow communities to:

- Assess changes in active travel over time, to see if the community is meeting targets it may have in terms of promoting active travel as a strategy to improve public health or reduce motorized trips and their associated greenhouse gas and air pollution emissions.
- Reliably measure the safety of active travel. Lacking good data on the number and distance of active travel trips, it is extremely difficult to measure pedestrian and bicycle safety, because the number of crashes is most meaningful when expressed in relationship to the amount of travel taking place.
- Assess whether different land-use patterns within the community correlate with different levels of active travel (in terms of numbers of trips, length of trips, etc).
- Incorporate bicycling and walking into the transportation demand modeling process.



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

Project #2908

Principal Investigator: Jae-Ho Pyeon, Ph.D.

The objective of this research project is to develop systematic procedures to determine Incentive/Disincentive (I/D) amounts and enhance the decision-making process for I/D contracting policy in highway transportation construction projects.

The Federal Highway Administration has encouraged state highway agencies to implement I/D contracting provisions to shorten project duration during highway transportation construction. Many state highway agencies, including Caltrans, have implemented I/D provisions to improve a contractor's time performance in transportation projects. Although I/D contracting has been used in many states, there is as yet no systematic and practical decision-making procedure for the determination of I/D dollar amounts to assist project planners and managers and to refine the use of I/D provisions. Therefore, the issue of determining appropriate I/D dollar amounts has been a major barrier for many transportation district project planners and engineers wanting to use I/D provisions for their transportation construction projects. In order to encourage transportation districts to implement I/D provisions more frequently and with confidence, it is necessary to develop improved systematic procedures to determine I/D dollar amounts to assist district project planners and engineers improve the decision-making process. The research team will collect transportation construction I/D project data, evaluate daily and/or maximum I/D dollar amounts in terms of project time performance, and perform data analysis to calculate road user cost per day for I/D projects. Finally, the research team will deliver systematic procedures to determine I/D dollar amounts to assist the decision-making process for district project planners and engineers in order to enhance and strengthen the I/D project decision-making process. The proposed procedure will enable project planners and managers to better set up daily and/or maximum I/D dollar amounts to motivate the contractor to complete a project early.



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

Project #2909

Principal Investigator: Zhan Guo, Ph.D.

This project will analyze data from the 2006-2007 Oregon Road User Fee Pilot program to assess if and how urban form variables correlate with travel behavior changes that participants made in response to the mileage-based fee program.

In 2006 and 2007, the State of Oregon conducted a groundbreaking mileage-based fee pilot program. The program responded to state concern—a concern shared by transportation of-

officials nationally—that fuel taxes will stop serving as a good transportation revenue source because a large proportion of the vehicle fleet will eventually run on little or no petroleum-based fuel, such as hybrid electric vehicles. To prepare Oregon for this future threat to its transportation revenues, the state legislature authorized a pilot program to test a mileage-based fee (MBF) that could potentially replace the state fuel tax. The pilot tested both a flat-rate fee that was the same for any mile driven, and also a variable fee structure that charged drivers a higher fee for miles driven during the rush hour. (ODOT 2007)

Since the pilot ended, researchers have examined many facets of the program’s success, including the performance of the technology and ways that drivers changed their travel behavior once they were paying the flat-rate and variable mileage fees rather than the gas tax. One crucial aspect of the behavioral response that has not yet been studied, however, is whether people’s behavioral responses to the MBF are correlated with any elements of the urban form around their homes. This proposed research project will address that question.

Investigating whether urban form influences people’s behavioral responses to the MBF has various important research and policy implications. Most importantly, urban form patterns might prove the key to better explaining the observed behavioral responses to the MBF program. Empirical studies confirmed a great variation of behavioral responses in the pilot program in Oregon (Rufolo and Kimpel 2008; Rufolo and Kimpel 2009) and another pilot MBF program that was held in Minnesota (Abou-Zeid, et al. 2007), but the studies have failed to explain most of the variation. For example, only 6% of the VMT changes in the Oregon study were explained by household characteristics, access to transit, and personal attitudes. We hypothesize that urban form patterns, which have been overlooked by prior studies, could significantly affect a household’s response to a MBF program and should be taken into account in MBF program design and evaluation.

To test our hypothesis, this project will explore the following research questions:

- Do urban form variables correlate with any of the travel behavior changes that participants made in response to the Oregon MBF pilot program? Are such correlations significant even after controlling for household characteristics (e.g. car ownership, household size, median income), personal attributes (e.g. gender, education, and attitudes), and public transit supply (e.g. access, quality, and frequency)?
- Which urban form factors are most significant in explaining travel behavior variations?
- Do the effects of the urban form variables differ under the two different fee structures tested, the flat-rate fee and variable fee with a higher rate during the peak periods?

Answering these questions will help researchers and policymakers predict important outcomes that could be expected from future MBF programs, including the VMT reduction and revenue that would be generated from communities with different urban forms.

Looking at how the MBF program impacts travel behavior and fee payments depending on urban form will also inform the equity discussions that arise whenever MBF programs are proposed. A common concern raised about MBF programs is that switching from fuel taxes to a MBF program will penalize residents in low-density communities, who have fewer transit options and nearby destinations than residents of more urban communities. Looking at the Oregon data will allow us to add real-world evidence to a debate that has so far largely been conducted without any particular empirical evidence.

Given the increasing national interest in the MBF program, its potential role as a mechanism to implement congestion pricing, and its potential to affect urban form patterns over the long-run, the proposed research fits well with the key MTI, California, and national research priorities related to transportation financing, congestion reduction, and integrated land use-transportation planning.



Emergency Management Training and Exercises for Transportation Agency Operations

Project #2910 (this project was funded and completed in this fiscal year)

Publication # 09-17

Principal Investigator: Frances Edwards, Ph.D.

Training and exercises are an important part of emergency management. Plans are developed based on threat assessment, but they are not useful unless staff members are trained on how to use the plan, and then practice that training. Exercises are also essential for ensuring that the plan is effective, and outcomes from exercises are used to improve the plan. Exercises have been an important part of gauging the preparedness of response organizations since Civil Defense days when full-scale exercises often included the community. Today there are various types of exercises that can be used to evaluate the preparedness of public agencies and communities: seminars, drills, tabletop exercises, functional exercises, facilitated exercises and full-scale exercises.

Police and fire agencies have long used drills and full-scale exercises to evaluate the ability of staff to use equipment, protocols and plans. Transit and transportation agencies have seldom been included in these plans, and have little guidance for their participation in the exercises.

A research plan was designed to determine whether urban transit systems are holding exercises, and whether they have the training and guidance documents that they need to be successful. The main research question was whether there was a need for a practical handbook to guide the development of transit system exercises.



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

Project #2911

Principal Investigator: Peter Haas, Ph.D.

In 2001, MTI published “Factors Influencing Voting Results of Local Transportation Funding Initiatives with a Substantial Rail Transit Component,” a study based on case studies of eleven elections. The study has sparked considerable interest since its publication and was the basis for a journal article in 2004. However, many elections have transpired since the original research was conducted more than eight years ago. This project will (a) seek to replicate the results of the original study, (b) attempt to identify new or evolving factors that are associated with election results. Whereas the 2001 study used on-site visits as the basis for a series of case studies, this project will use telephone interviews and (primarily) online documents to achieve similar results. The goal will be to create an updated, definitive list of factors that are associated with transit tax initiative success and failure.



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

Project #2913

Principal Investigator: Felix Marten, Ph.D.

The purpose of this qualitative case study is to identify the types of obstacles and patterns experienced by a single heavy rail transit agency located in North America that embedded a Reliability Centered Maintenance (RCM) Process. The outcome of the RCM process will examine the impact of RCM on availability, reliability, and safety of rolling stock. This qualitative study will interview managers (10 cases) and non-managers (10 cases) at the transit agency to obtain data. The data may help rail transit leaders determine future strategic directions that would improve this industry. Despite the RCM record in other fields, it has infrequently been used in heavy rail transit agencies. The research method for the first portion of this qualitative case study is to collect data from subjects by administering an open-ended, in-depth personal interview, of manager and non-managers. The second portion of the study will explore how the RCM process affected rolling stock for availability, reliability, and safety. The second portion of the study will use data derived from project documents and reports (such as progress reports, e-mail, and other forms of documentation) to answer questions about the phenomena. The exploration and identification of the patterns and obstacles is important because organizational leaders in other heavy rail transit systems may use this knowledge to assist in embedding the process more smoothly, efficiently, and effectively to obtain the desired end results.



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

Project #2914 (this project was funded and completed in this fiscal year)

Publication #09-19

Principal Investigator: Nina Rohlich

Public transit has been and will likely continue to be a target of terrorist attacks. The terrorist attacks of September 11, 2001 against the Pentagon and the World Trade Center using airplanes highlighted the need for increased security in the United States transportation sector overall, and prompted additional security efforts for many public transit agencies across the US. The March 11, 2004 Madrid commuter train bombings, the July 7, 2005 London transit system bombings, and the March 29, 2010 Moscow metro attacks are more recent reminders of the need for vigilance. Due to its openness and accessibility, public transit is considerably more vulnerable than airports, seaports, and other transportation modes organized around limited access points that can institute widespread security screening measures. In addition to relatively open access points, transit systems often have large numbers of passengers during commute hours, accessible schedules and timetables, are in close proximity to other potential targets, and are critical pieces of infrastructure for urban areas.

Public involvement in alerting officials to suspicious and potentially harmful activity is critical to the overall security of a transit system. As part of an effort to get passengers and the public involved, many transit agencies have created security awareness campaigns. The objective of this research project was to (1) determine how transit agencies seek to make security awareness campaign effective and (2) explore ways in which to measure the effectiveness of such campaigns. This project focused on understanding the types of security awareness campaigns that a select group of transit agencies in the San Francisco, California Bay Area region have implemented, the goals of the campaigns, and whether the agencies are achieving those goals. Furthermore, have campaigns increased security awareness and passenger engagement? If so, how do agencies evaluate the effectiveness of the campaigns? The case study data are comprised of descriptions of the types of security awareness campaigns the agencies have implemented, the goals of the campaigns, and how they attempt to make their campaigns effective, as well as whether and how these agencies measure and determine the effectiveness of their campaigns.

A positive finding of this research is the consistency with which Bay Area transit organizations address the need for passenger awareness as part of their overall security program. However, none of the five agencies analyzed for this study measures the effectiveness of their campaigns. Whereas they all have a similar goal – to increase passenger awareness about security issues – little evidence therefore exists confirming whether they are achieving this goal.

In order to capture the public's response to the campaign and to understand whether they are achieving their campaign goals of increasing awareness, providing tools for action, and encouraging passenger involvement, agencies should implement a combination of output and outcome measurements. At a minimum, agencies should track the level of marketing activities and strive to capture at least one set of meaningful data that captures passenger behavior and comprehension by using internal tracking mechanisms or surveys.



Suicides on Urban Commuter Rail Systems in California – Possible Patterns

Project #2926

Principal Investigator: Jan L. Botha, Ph.D.

The overall objective of the project is to conduct a pilot study to identify possible patterns in suicides associated with urban commuter rail systems in California. The Caltrain commuter rail system in the San Francisco Bay Area will be used as the subject system for the pilot study.

Data will be obtained from Caltrain on all fatalities that occurred as a result of collisions with trains during the last six years. Caltrain has undertaken to provide data. The data associated with each event will consist of the following:

- Location
- Date, time and day of the week
- Site conditions if different from current conditions
- Time
- Ambient conditions
- Age
- Gender
- Whether ruled a suicide

A map showing the major features of the Caltrain system, as well as a DVD showing the route as observed from a locomotive will be obtained from Caltrain.

The data will be analyzed to determine whether patterns, with respect to the categories listed in the previous section, exist and, if so, what the patterns are. Locations, where clusters of fatal events would be possibly detected, will be visited to become familiar with the physical conditions in order to help with pattern detection. The DVD will be utilized in this endeavor.

The conclusions reached in the foregoing sections will be summarized and recommendations made with respect to the following:

- Possible analysis of data related to other rail systems in California
- Modifications to the study method and analysis
- Possible future research



Promoting Bicycle Commuter Safety

Project #2927

Principal Investigator: **Asbjorn Osland, Ph.D.**

The researchers will review the best practices for educating cyclists of all ages on safety and interview at least 30 individuals responsible for bicycle use in their respective cities and counties with the goal of writing a manual and report designed to have an impact on readers. The manual is for cyclists but the report is targeted at public administrators responsible for bicycle safety. Though the rules for safety are rather straight forward (i.e., use of helmets, wearing conspicuous clothing, using lights, and following the rules of the road – abbreviated as HCCLRR), cyclists often ignore them.

There were 10,521 cyclists injured in accidents in California in 2007. Of the 124 cyclists killed in 2007 in California, 99 were not using helmets, according to the California Highway Patrol's Statewide Integrated Traffic Records System. The counties with more than four fatalities in 2007 were: Los Angeles (26), Orange (16), San Diego (11), Riverside (8), Sacramento (7) and San Joaquin (5); the researchers will include the civil servants responsible for bicycle safety in these counties in the interviews. We will also attempt to include the following cities that had more than one fatality in 2007: Los Angeles, San Diego, Fresno, Bakersfield, La Puente, Buena Park, Dana Point, Stockton, San Jose, Modesto, Oakland, Redding, Simi Valley, and Irvine (SWITRS, Table 8N, <http://www.chp.ca.gov/switrs/index.html>). In many instances both the police departments and the transportation divisions have roles in bicycle safety.

We will also include cities or counties where bicycle use is particularly high, such as San Francisco and Davis and other counties or cities referenced in the interviews as having especially good bicycle programs (e.g., Marin). The sometimes less than responsible riding practices of cyclists are further exacerbated by poor path design where the cyclist is put in harm's way by sharing the road with motor vehicles. Therefore paths will also be included in the literature review and the interviews. The fundamental objective is to make an addition to the safety literature by doing the following:

- Carry out a literature review, accident and fatality analysis, and best practices review and analysis

- Write findings and conclusions from Interviews with public officials

The three products that will result from this study are:

- A report documenting the findings from the review of the safety literature and crash analysis and the results of the interviews
- A guide book for training and
- A manuscript to be submitted to a refereed journal



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

Project #2928 (this project was funded and completed in this fiscal year)

Publication #09-18

Principal Investigator: Asha Weinstein Agrawal, Ph.D.

This report summarizes the results of a national, random-digit-dial public opinion poll that asked 1,545 respondents if they would support various tax options for raising federal transportation revenues. The eight specific taxes tested were variations on raising the federal gas tax rate, two options for creating a new mileage tax, and creating a new national sales tax. In addition, the survey collected standard socio-demographic data and asked a few attitudinal questions related to the quality of the transportation system and respondents' priorities for government spending on transportation. These questions were used to assess support levels for the taxes among different population subgroups.

None of the taxes achieved majority support, but three did fairly well, with support levels around 40%. The most popular were a 0.5¢ sales tax (43% support), a 10¢ gas tax increase with revenue to be dedicated for projects that would reduce the transportation system's impact on global warming (42% support), and a 10¢ gas tax spread over five years (39% support).

The report also compares public support for alternative versions of the mileage and gas taxes. The "base" cases tested against alternatives were a flat-rate mileage tax of 1¢ per mile and a 10¢ gas tax with no additional information given about the tax. All variants of these base taxes increased support levels, in most cases significantly. A mileage tax with a rate varying by the vehicle's pollution levels saw a notable increase in support of 12 percentage points compared to the flat-rate (base) mileage tax. For the gas tax, all four alternatives to the base case increased support. At the high end, support jumped 16 percentage points for the gas tax increase spread over 5 years, and a full 19 percentage points for the gas tax increase linked to global warming reduction.

New Projects Jointly Funded by the US Department of Homeland Security

The US Department of Homeland Security (DHS) selected MTI to be part of the National Transportation Security Center of Excellence. To meet the strategic goals of MTI's DOT grant, which calls for a continuation of security/counterterrorism research, multiple research projects share funding. Those that do share funding are reported in the MTI NTSCOE section of the annual report.



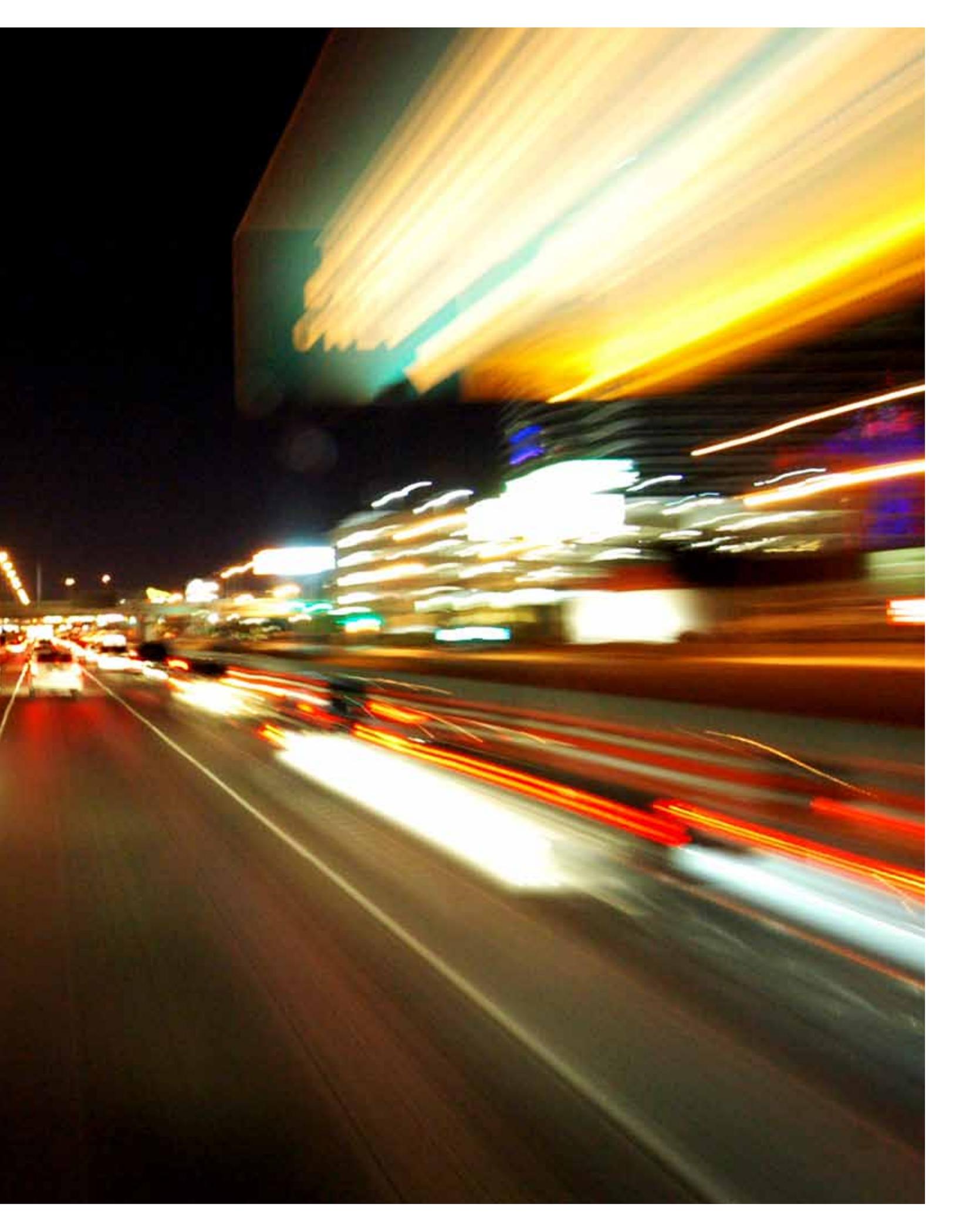
Future Projects

MTI conducted an RFP process in spring 2010. A record 32 qualified proposals were submitted for peer review to the RAPOC committee, Caltrans, and representatives of the US DOT in the Western Resource Center. After a rigorous discussion, the group selected eight of these projects for funding. Additionally, the Institute has developed eight projects independent of the RFP process. As with all proposals, however, these projects were reviewed by RAPOC and Caltrans/FHWA to assure quality.





**NATIONAL
TRANSPORTATION
FINANCE CENTER**





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Director

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Dr. Asha Weinstein Agrawal is Director of the MTI National Transportation Finance Center at San José State University, and also 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 “Congestion as a Cultural Construct: The ‘Congestion Evil’ in Boston in the 1890s and 1920s,” in the *Journal of Transport History*. A complete list of her publications can be found at www.sjsu.edu/faculty/weinstein.agrawal/

Dr. Agrawal earned a B.A. from Harvard University, an M.Sc. from the London School of Economics and Political Science, and a Ph.D. from the University of California, Berkeley.



Overview

Recognizing the critical role that transportation finance plays in transportation policy-making, the Mineta Transportation Institute established in 2008 its National Transportation Finance Center (NTFC). 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 past year the Center published two new research reports, and an additional eight projects are underway. In addition, the Center has approved two more new projects for funding in the coming fiscal year.

The research projects planned and underway cover a wide array of topics, from an assessment of how user reactions to mileage fees correlate with land-use patterns, to lessons from the Australian experience with public-private partnerships, to an exploration of public support for different federal transportation taxes.

Descriptions of the ten projects completed or underway are as follows.

Projects Completed in the Past Year

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

Project #2801

Publication #09-07

Principal Investigator: Jae H. Pyeon, Ph.D.

This research presents a project time and cost performance simulation model to assist project planners and managers by providing a complete picture during the Incentive/Disincentive (I/D) contracting decision-making process of possible performance outcomes with probabilities based on historical data. This study was performed by collecting transportation construction project data. The collected project data from the Florida Department of Transportation were evaluated using time and cost performance indices and then statistical data analysis was performed to identify important factors that influence construction project time performance. Using Monte Carlo simulation procedures, this study demonstrated a methodology for developing an I/D project time and cost

performance prediction model. User-friendly visual interfaces were developed to perform the simulation and report results using Visual Basic Application programming. The developed model was validated using additional cases of transportation construction projects.

Based on statistical analysis, this research found that several project factors influence I/D contracting performance. The important factors that had significant impacts on project performance were the effects of contract type, project type, district, project size, project length, maximum incentive amount, and daily I/D amount. In conclusion, the developed model applied to I/D contracting projects will be a useful tool to assist the project planners and managers during the decision-making process and will promote the efficient use of I/D contracting, which will benefit the traveling public by saving their travel time from construction delays. With additional project data, the developed model can be updated easily and the more data used for the model, the better the accuracy of prediction that can be expected.

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

Project #2928

Publication #09-18

Principal Investigator: Asha Weinstein Agrawal, Ph.D.

This report summarizes the results of a national random-digit-dial public opinion poll that asked 1,545 respondents if they would support various tax options for raising federal transportation revenues. The eight specific tax options tested were variations on raising the federal gas tax rate, creating a new mileage tax, and creating a new national sales tax. In addition, the survey collected standard socio-demographic data and some travel behavior data and asked a few attitudinal questions related to the quality of the transportation system and respondents' priorities for government spending on transportation. These questions were used to assess support levels for the tax options among different population subgroups.

None of the tax options achieved majority support, but three did fairly well, with support levels around 40%. These were a 0.5¢ sales tax (43% support), a 10¢ gas tax increase with revenue to be dedicated to projects that would reduce the transportation system's impact on global warming (42% support), and a 10¢ gas tax increase spread over five years (39% support).

The report also compares public support for alternative versions of the mileage and gas taxes. The base cases tested against alternatives were a flat-rate mileage tax of 1¢ per mile and a 10¢ gas tax with no additional information given about the tax. All variants of these base cases increased support levels, in most cases significantly. Varying the mileage tax by the vehicle's pollution level increased support by 12 percentage points. For the gas tax, all four alternatives to the base case received higher support. Most notably, spreading the gas tax increase over five years increased support by 16 percentage points, and linking the increase to global warming reduction increased support by a full 19 percentage points.

Ongoing Research Projects

Collaborative Funding to Facilitate Airport Ground Access

Project #2503

Status: research underway

Principal Investigator: Geoffrey D. Gosling, Ph.D.

The research will explore the limitations on funding airport ground access projects imposed by the rules on eligible projects for funding allocations for the various programs administered by the FAA, FHWA, and FTA, as well as constraints from state and local statutes in California. The first goal of the research is to identify specific policies and regulations that limit collaborative or cross-jurisdictional funding and the reasons for these limitations. The second goal is to define proposed strategies to overcome these limitations and to develop recommendations for ways to amend the relevant statutes and regulations in a manner that would facilitate

intermodal connectivity without undermining the intent of the existing limitations.

The proposed research will address these goals by undertaking a review and analysis of pertinent literature and funding program regulations and guidelines, in conjunction with interviews with relevant agency officials. This will be supplemented by a case study analysis of recent or planned airport ground access projects that have been able to successfully overcome the limitations of current funding programs through developing collaborative funding arrangements.

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

Project #2806

Status: report in the peer review/publication phase

Principal Investigators: Asha Weinstein Agrawal, Ph.D., and Evelyn Blumenberg, Ph.D.

How much do people with limited resources pay for cars, public transit, and other means of travel? How does their transportation behavior change during periods of falling employment and rising fuel prices? This research uses in-depth interviews with 73 adults to examine how rising transportation costs impact low-income families. The interviews examine four general areas of interest: travel behavior and transportation spending patterns; the costs and benefits of alternative modes of travel; cost management strategies; and opinions about the effect of changing transportation prices on travel behavior.

Key findings include:

1. Most low-income household are concerned about their transportation costs.
2. Low-income individuals actively and strategically manage their household resources in order to survive on very limited means and to respond to changes in income or transportation costs.

3. In making mode-choice decisions, low-income travelers—like higher-income travelers—carefully evaluate the costs of travel (time and out-of-pocket expenses) against the benefits of each of the modes.
4. Some low-income individuals in our sample were willing to endure higher transportation expenditures—such as the costs of auto ownership or congestion tolls—if they believed that they currently benefit or would potentially benefit from these increased expenses.
5. Although low-income households find ways to cover their transportation expenditures, many of these strategies had negative effects on households.

The report concludes with recommendations on how to increase transportation affordability, minimize the impact that new transportation taxes or fees have on low-income people, and develop new research and data collection to support the previous two efforts.

Policy Issues in U.S. Transportation Public-Private Partnerships: Lessons from Australia

Project #2807

Status: report in the peer review/publication phase

Principal Investigator: Rick Geddes, Ph.D.

This report examines Australia’s experience with transportation public-private partnerships (PPPs) and the lessons that experience holds for the use of PPPs in the United States. Australia is an important country from which to learn because it has decades of experience in PPP use, it has used the approach to deliver billions of dollars of critical transportation projects, it has a comparable history to the United States, and a legal system based on English common-law, which is used in the majority of US states.

Although this report explores a range of issues, the authors focus on four key PPP policy issues: (1) how to distribute the risks inherent in PPP contracts across public and private sector partners; (2) when and how to use non-compete (or

compensation) clauses in PPP contracts; (3) how to address concerns about monopoly power; and (4) the role and importance of concession length.

The study examines those and other questions by surveying the relevant literature on PPP use internationally, and by interviewing 23 Australian PPP experts from the public and private sectors, as well as from academia.

Examination of Regional Transit Service Through Privatization: a Case Study of Public Transit Service Contracting in New Orleans

Project #2904

Status: research underway

Principal Investigator: Hiroyuki Iseki, Ph.D.

Suburbanization and declines in population, jobs, and business in the inner city have caused a significant loss in the local tax-base of these areas, preventing them from funding public services. In contrast, affluent suburbs have enjoyed relatively stable or even increasing tax revenues. At the same time, many transit dependents in the inner city have limited access to the automobile and remain there.

These conditions create a situation that makes regional transit coordination very difficult. First, the distribution of transit service is largely driven by a desire to ensure geographic equity, where transit service is expanded to suburban areas, resulting in lower levels of efficiency and effectiveness. Second, individual transit agencies focus on local services, and do not effectively address the needs of regional transit users that travel across transit systems. Third, in addition to general service improvements, marketing and customer service, the adoption of new technologies (e.g., smart cards, automated vehicle location system, next vehicle arrival notification system) is problematic in a regional transit system because each transit agency has a different level of demand as well as different funding priorities. As a result of political and administrative conflicts among transit agencies, regional coordination is very difficult to achieve, posing challenges to the provision of a viable transportation alternative for transit dependents.

The current situation in Greater New Orleans region represents a unique case in which one private firm has been contracted by two jurisdictions, Orleans Parish and Jefferson Parish, to manage and operate transit service. Historically, many U.S. transit agencies have turned to this sort of service contracting to pursue higher cost efficiency and effectiveness, especially in the face of both declining state and federal aid. By 2000, more than one third of U.S. transit agencies with fixed-route bus services contracted out part or all of their service, spending an estimated total of \$4.3 billion for contracted service (or 13.4 percent of total operating expenses) in 2006. Nevertheless, most policymakers know little about the effects of privatization as a service provision strategy.

Accordingly, this study will examine the possibility of introducing significant service improvements regional transit coordination and economies of scale through privatization, taking into account difficulties in achieving coordination among multiple public agencies, as well as incentives needed for a private firm to pursue more cost-efficient and cost-effective operation. In addition, the study will examine the efficiency and effectiveness of providing transit service at each of these two agencies in New Orleans, carefully taking into account the conditions for regional transit service in New Orleans.

In order to address these issues, we will conduct an in-depth study of two cases of transit service contracting in Greater New Orleans. We will examine various documents (e.g., government reports, requests for proposals, contracts) and analyze available data, such as the National Transit Database and data from local transit agencies, as well as transit user survey data. We will use this data to examine and evaluate: 1) conditions of transit finance, management, and operation in the region over a specified period, 2) processes and contractual terms of transit service outsourcing, 3) transit service performance, and 4) regional transit coordination. We will examine not only factors that are easily quantified, such as cost efficiency measured by cost per vehicle hour and cost per vehicle mile, but also service quality from the viewpoint of the users. These factors include the level of user satisfac-

tion with a variety of service components, such as safety, security, on-time performance, information, and amenities.

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

Project #2908

Status: research underway

Principal Investigator: Jae H. Pyeon, P.D.

The Federal Highway Administration has encouraged state highway agencies to implement I/D contracting provisions to shorten project duration during highway transportation construction. Many state highway agencies, including Caltrans, have implemented I/D provisions to improve a contractor's time performance in transportation projects. Although I/D contracting has been used in many states, there is as yet no systematic and practical decision-making procedure for the determination of I/D dollar amounts to assist project planners and managers and to refine the use of I/D provisions. Therefore, the issue of determining appropriate I/D dollar amounts has been a major barrier for many transportation district project planners and engineers wanting to use I/D provisions for their transportation construction projects. In order to encourage transportation districts to implement I/D provisions more frequently and with confidence, it is necessary to develop improved systematic procedures to determine I/D dollar amounts to assist district project planners and engineers improve the decision-making process. The research team will collect transportation construction I/D project data, evaluate daily and/or maximum I/D dollar amounts in terms of project time performance, and perform data analysis to calculate road user cost per day for I/D projects. Finally, the research team will deliver systematic procedures to determine I/D dollar amounts to assist the decision-making process for district project planners and engineers in order to enhance and strengthen the I/D project decision-making process. The proposed procedure will enable project planners and managers to better set up daily and/or maximum I/D dollar amounts to motivate the contractor to complete a project early.

The Intersection of Urban Form & Mileage Fees: Findings from the Oregon Road User Fee Pilot Program
Project #2909

Status: report in the peer review/publication phase

Principal Investigator: Zhan Guo, Ph.D.

This report analyzes data from the 2006-2007 Oregon Road User Fee Pilot program to assess if and how urban form variables correlate with travel behavior changes that participants made in response to the mileage-based fee program. It finds that charging a noticeably higher fee for driving in congested conditions can successfully motivate households to reduce their VMT in those times and places where congestion is most a problem. Households in both traditional (mixed use, dense, transit-accessible) and suburban (single-use, low density) neighborhoods will likely reduce their peak-hour and overall travel under a charging scheme that charges a high-rate for peak-hour travel, though households in the traditional neighborhoods will do so more.

It also finds that a mileage fee program that charges a high rate during the peak hour is likely to strengthen the underlying influence of urban form on travel behavior. In other words, land use probably will matter more to transportation planning if the nation shifts to a new paradigm of mileage-based financing and pricing system. For transportation policy-makers, this finding raises another layer of consideration when designing the optimal rate structure to achieve policy goals—either reduced VMT and congestion or sustained funding sources. For urban planners, this finding offers an opportunity to move towards a sustainable built environment through revised and compatible land use regulation under the context of a mileage-based fee.

The research also reveals that program design could significantly affect a household's response to a mileage-based fee program. Particularly in Portland, the establishment of an endowment account for participants actually increased household VMT when a flat-rate fee was charged, the opposite of policy-makers' expectation. One possible explanation is that paying the mileage-based fees once a month, instead of paying the gas tax at each visit to the pump, may have

encouraged households to drive more due to the reduced gas price at the pump.

Revisiting Factors Influencing Voting Results of Local Transportation Funding Initiatives with a Substantial Rail Transit Component
Project #2911

Status: research underway

Principal Investigator: Peter Haas, Ph.D.

In 2001, MTI published *Factors Influencing Voting Results of Local Transportation Funding Initiatives with a Substantial Rail Transit Component*, a study based on case studies of eleven elections. The study has sparked considerable interest since its publication and was the basis for a journal article in 2004. However, many elections have transpired since the original research was conducted more than eight years ago. This project will (a) seek to replicate the results of the original study, (b) attempt to identify new or evolving factors that are associated with election results. Whereas the 2001 study used on-site visits as the basis for a series of case studies, this project will use telephone interviews and (primarily) online documents to achieve similar results. The goal will be to create an updated, definitive list of factors that are associated with transit tax initiative success and failure.



Participation in Conferences and Events

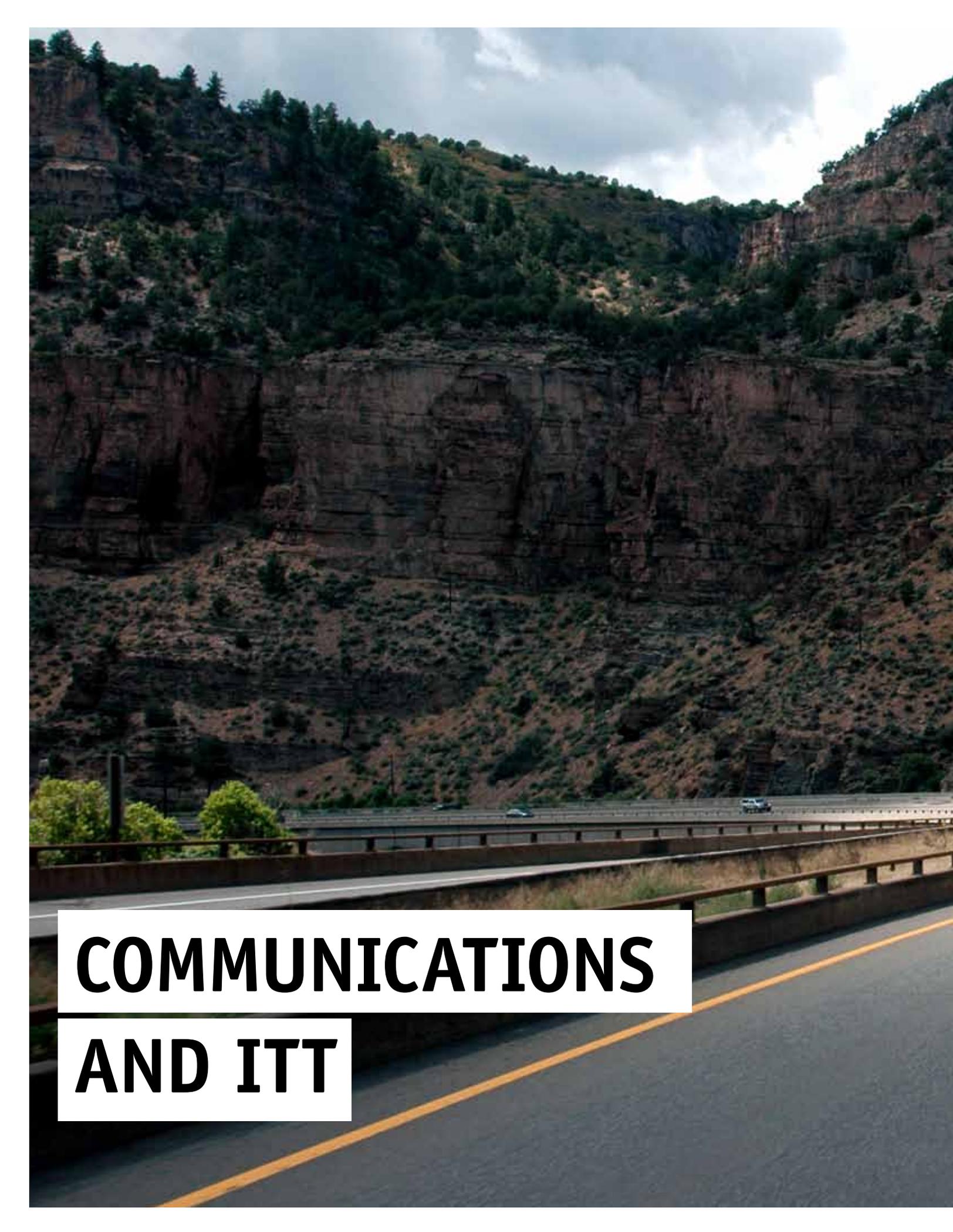
A highlight of the NTFC's educational activities over the past year was a pair of forums on transportation finance offered in partnership with the Commonwealth Club of California in San Francisco. An October 2009 forum entitled "The Next 50 Years: Addressing California's Mobility in a Time of Financial Challenge" featured panelists Therese McMillan deputy administrator of the Federal Transit Agency, Steve Heminger of the Metropolitan Transportation Commission, and Norma Ortega of Caltrans. The panelists engaged in a lively give-and-take with the audience, discussing the causes and consequences of scarce transportation revenues. The second event, held in June 2010, featured a discussion of politically feasible opportunities for increasing transportation revenues at the state and federal levels. The event was moderated by former Secretary of Transportation Norman Mineta and featured California State Senator Alan Lowenthal, AASHTO's John Horsley, APTA's Bill Millar, and the NTFC's Asha Weinstein Agrawal. Both of these forums are highlighted in the Information and Technology Transfer section of this annual report.

In May 2010, the NTFC's researchers were much in evidence at TRB's Fourth International Conference on Financing Surface Transportation in the United States, which was held in New Orleans. Four NTFC research projects were displayed in poster and speaker sessions. Researcher Geoffrey Gosling presented a paper on "Collaborative Funding to Facilitate Airport Ground Access," Jae H. Pyeon presented a poster on "Systematic Procedures to Determine Dollar Amounts Through Incentives-Disincentives for Highway Transportation Construction Projects," Hiroyuki Iseki presented a poster on "Effectiveness of Transit Service Privatization as a Strategy to Financial Resiliency," and Asha Weinstein Agrawal presented a poster on "The Intersection of Urban Form and Mileage Fees: Findings from the Oregon Road User Fee Pilot Program."

Other events at which NTFC researchers spoke or presented research included TRB's 2010 Annual Meeting in Washington, D.C.; a policy forum of the Eno Transportation Foundation held in Washington, D.C. where Asha Weinstein Agrawal presented on "The Public Won't Support Higher Transportation Taxes and Fees, Right . . . Or Wrong? A Look at Some Evidence and a Challenge to Conventional Wisdom"; a Sacramento lunchtime seminar for California policymakers on "Financing California's Transportation System: Strategies for Moving from Crisis to Stability" where Dr. Agrawal spoke on "Public Perceptions of Transportation Financing Options for California"; and AASHTO's 2009 Annual Meeting in Palm Springs, where a poster was presented of Dr. Agrawal's work "'Green' Taxes And Fees: A Politically Acceptable Way to Raise Transportation Revenues?"

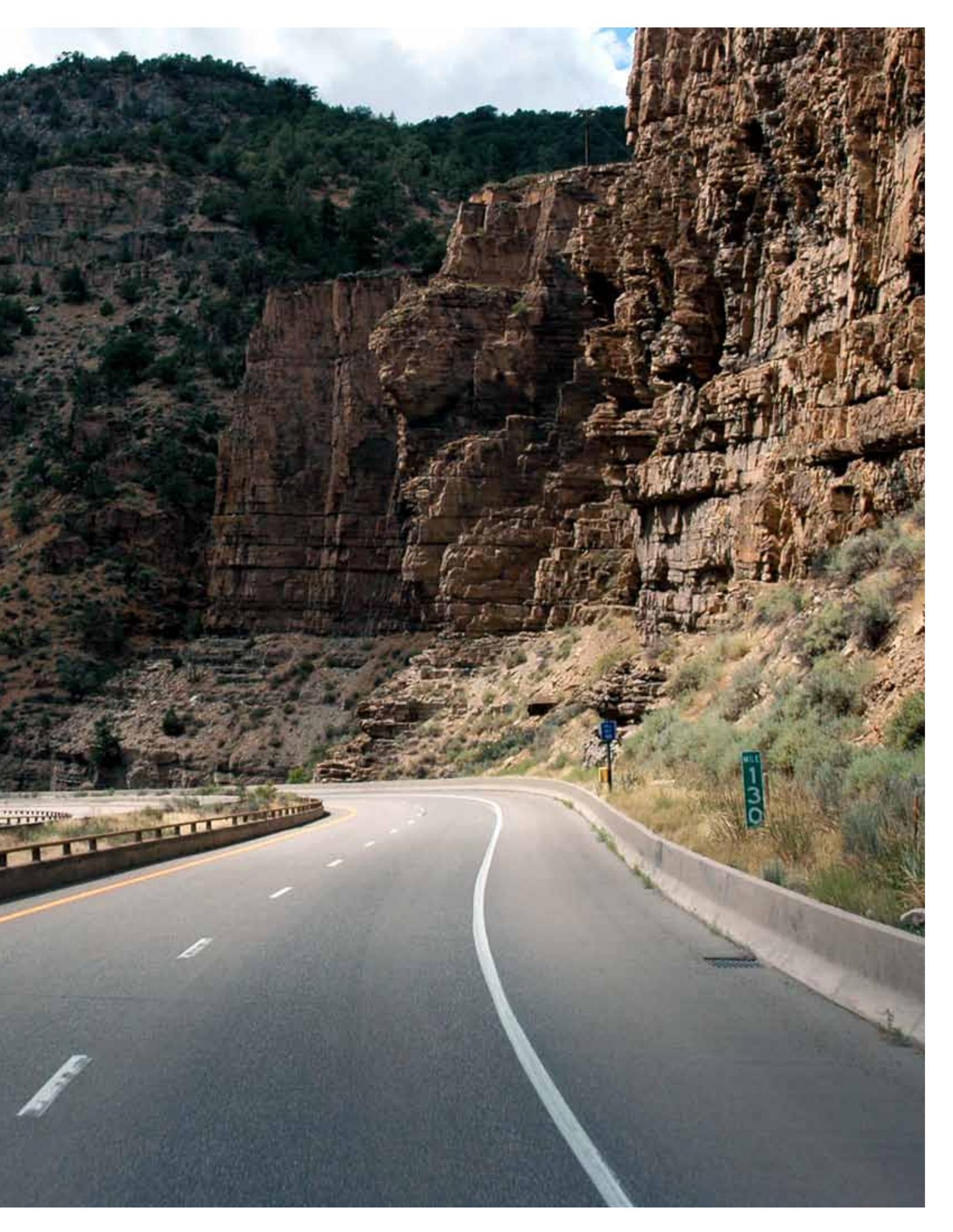
Finally, in February 2010 the NTFC was proud to join with several other local transportation and planning organizations to present a public lecture on parking pricing by UCLA Professor Donald Shoup. Over 250 people attended the standing-room-only event, titled "Everyone Wants a Spot: Why Free Parking is a Bad Idea," which was held at San Jose City Hall.





COMMUNICATIONS

AND ITT





Donna R. Maurillo

Director

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Donna Maurillo joined MTI in 2007, managing information and technology transfer (ITT), such as symposia, forums, and public meetings. She also manages MTI's communications vehicles such as the web site, annual report, media relations, social media, and other public outreach, and she manages special projects.

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 Rotary Club named her Rotarian of the Year, 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.

She earned her B.A. from the University of California and delivered the commencement address. Currently, she is enrolled in MTI's Master of Science in Transportation Management program, and she is a member of the Phi Kappa Phi academic honor society. 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 our 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.

Martin Luther King, Jr. Library

SJSU's 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, the Research Associates Policy Oversight Committee (RAPOC).

The King Library is a joint use facility with the City of San Jose Main Library. It collects more than 300 databases in all disciplines. Many electronic resources, including engineering and business databases are exclusively available to SJSU students who are registered in Master of Science in Transportation Management program and to anyone with a valid SJSU ID. With her contacts with other transportation libraries, including the Institute for Transportation Studies at UC Berkeley, Ms. Wu provides a wide network of resources for students and researchers working on MTI projects.



Forums and Summits

Each year MTI presents 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. As part of its effort to establish the National High-Speed Rail Policy Center, MTI presented or co-presented a number of summits focusing on high-speed rail.

Listed in chronological order, this year's forums and summits include:

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

Project #2960

Publication S-09-04

Project Manager: Donna R. Maurillo, MTI

The 12th Annual Transportation & Infrastructure Summit, held in Irving, Texas on August 11–14, 2009, provided more than 1,100 attendees from 30 states and 13 countries the opportunity to network and interact with elected representatives and influential transportation officials from the United States, and to learn about transportation systems on a global scale.

The summit also hosted the Second Annual Global High-Speed Rail Forum. This year's forum brought together developers, business officials, policy makers and rail experts to discuss the development of high-speed rail corridors around the world and in the United States. Topics included a High-Speed Passenger Rail Stakeholders' meeting, and a pair of special general sessions: "World-Class High-Speed Rail" and "Bringing World-Class High-Speed Rail to America," which

was moderated by Rod Diridon, Sr., executive director of the Mineta Transportation Institute.

This special session featured representatives from three proposed regional high-speed rail projects currently planned for the United States. Fiona Ma, Majority Whip of the California State Assembly, shared information about California's High-Speed Rail Initiative. Assemblywoman Ma talked about her experience on France's record-breaking TGV train and her vision for bringing a similar system to California. Rick Harnish, executive director for the Midwest High-Speed Rail Association discussed how regional initiatives were working toward improving current Midwestern rail corridors and upgrading to high-speed levels to increase mobility. Robert Eckels, chair of the Texas High-Speed Rail and Transportation Corporation, shared his organization's vision and details of Texas' "T-Bone" high-speed rail project. The presentations were followed by a brief question and answer period.

The Vision and the Blueprint: High Speed Rail in the United States and Launching High-Speed Rail in the U.S.

Project #2961

Publication S-09-03

Project Manager: Donna R. Maurillo, MTI

The American Public Transportation Association (APTA) held its annual meeting in Orlando, Florida on October 4–7, 2009, including special sessions on high-speed rail. MTI co-sponsored and participated in the proceedings of two sessions, "The Vision and the Blueprint: High Speed Rail in the United States," and "Launching High-Speed Rail in the U.S.," which were held on October 6 and transcribed for this publication.

For years, the United States' passenger rail system has lagged far behind that of Japan, France, Germany, and even China and South Korea in developing and utilizing high-speed rail. Even though the Transcontinental Railroad was completed in 1869, joining the U.S.'s East and West Coast, and went on to be instrumental in growing the nation, U.S.

interest in rail travel sharply declined with the more widespread use and availability of automobiles and airplane travel in the early to mid-20th century.

Globally, Japan seized the opportunity to build the first true high-speed rail system, the Shinkansen, in 1964, in time for the Olympic games. Today, Japan's 1,528-mile long high-speed rail system is the busiest in the world, moving 15 million passengers a year.

High-speed rail advocates understand that rail can be faster than the car, and for short trips, is superior to air travel due to long lines at airports; can carry larger volumes of people in a limited space; and consume less energy than cars and minimize pollution.

In the latter quarter-decade of the 20th century, several U.S. regions began to explore the possibility of high-speed rail systems to help alleviate highway and airport congestion—too many users, and the creation of infrastructure simply is unable to keep up with demand. These emerging corridors included Los Angeles-San Diego, Tampa-Orlando-Miami, and Dallas/Ft. Worth-Houston-San Antonio. None came to fruition.

The Northeast Corridor's Acela Express became the first high-speed rail system in the U.S. in late 2000. Traveling from Boston to Washington, DC, the all-electric system quickly grew in popularity, and again other regions began to take notice.

The state of California also started considering high-speed rail as a solution to overcrowded airports and congested freeways. In 1996, California's High-Speed Rail Authority was established. With the 2003 election of Governor Arnold Schwarzenegger, an advocate of environmental issues who also supported high-speed rail, Californians began to take notice of the advantages of a possible statewide high-speed rail system. Finally, with the passage of Proposition 1A in November 2008, Californians acknowledged their desire for a high-speed rail system, with 52 percent of voters passing the Safe, Reliable High-Speed Passenger Train Bond Act for

the 21st Century, funding \$9.95 billion in general obligation bonds to build a high-speed rail system.

Funding from 2008's Passenger Rail Investment and Improvement Act (PRIIA) and 2009's American Recovery and Reinvestment Act (ARRA) will bring the dream of high-speed rail to a reality in not only California, but several additional regions. Because there is so much that needs to be done in a short period of time, at its annual meeting in the fall of 2009, the American Public Transportation Association (APTA) held two special sessions on high-speed rail to facilitate communication amongst rail transportation professionals and policymakers.

Introducing the first session, "The Vision and the Blueprint: High Speed Rail in the United States," was Dale Muellerleile, senior vice president and national director for transit engineering for HDR Engineering. Moderator for this session was Rod Diridon, Sr., chair, APTA High Speed and Intercity Rail Committee and executive director, Mineta Transportation Institute (MTI). Panelists included Karen Rae, deputy administrator, Federal Railroad Administration (FRA), who spoke about the process of planning and applying for PRIA and AARA funding; Frank Busalacchi, secretary of transportation, Wisconsin DOT, and chair, States for Passenger Rail, who talked about States for Passenger Rail's role in the high-speed rail expansion and the application process; and Gene Conti, secretary of transportation, North Carolina DOT, and chair, American Association of State Highway and Transportation Officials (AASHTO) Standing Committee on Rail Transportation (SCORT), discussing North Carolina's high-speed rail plans.

Introducing the second session, "Launching High-Speed Rail in the U.S.," was Stephen Beard, senior vice president and national transit director, HDR Engineering. Moderating the second session was Jolene Molitoris, vice chair, APTA High Speed and Intercity Rail Committee, and Ohio Secretary of Transportation. Panelists included Nazih K. Haddad,

executive director, Florida High Speed Rail Authority, and intercity passenger rail manager, Florida Department of Transportation, who talked about the history of high-speed rail in Florida and the state's planned system; Richard Harnish, executive director, Midwest High Speed Rail Association, who discussed his role as a high-speed rail advocate for a Midwestern hub, and plans for that system; William A. Jones, III, CEO, Materials Transportation Company, president, BJB Industries, and mayor of Temple, Texas, who spoke about Texas' attempts at a high-speed rail system and today's plans for the "T-Bone Corridor"; and Rod Diridon, chair, APTA High Speed and Intercity Rail Committee and executive director, Mineta Transportation Institute, who gave an overview of California's planning process and its planned routes between the Bay Area and Southern California, and other offshoots from the main line. Also addressing the attendees was Bill Millar, president of APTA.



San José State University Campus Bicycle Forum

Project #2965

Publication number pending

Project Manager: Donna R. Maurillo, MTI

This forum, which focused on the advantages of bicycle travel in and around San Jose, was created primarily for students, faculty and staff at San José State University. In October 2009, a panel presented facts and data about greenhouse gases, short-distance travel, parking issues, and other problems related to gasoline-powered vehicles. They also presented the advantages and benefits of using bicycles for around-town travel. MTI Executive Director Rod Diridon also participated on the panel.

Norman Y. Mineta National Transportation Policy Summit: The Next Fifty Years: Addressing California's Mobility in a Time of Financial Challenges

Project #2864

Publication S-09-05

Project Manager: Donna R. Maurillo, MTI

On October 29, 2009 the Mineta Transportation Institute hosted the Norman Y. Mineta National Transportation Policy Summit on transportation finance. By 2050, California's population is projected to reach 60 million – nearly double what it was in 2000. This summit addressed several challenges related to that population growth in California and in the nation, as well: How will people move around? With state and federal transportation infrastructure reaching its limits, will we face mobility meltdown? Where will agencies find the billions of dollars for upgrades and maintenance? What happens to gas taxes and vehicle fees? How are federal funds allocated and spent? Why are there shortfalls?

Moderated by Mineta Transportation Institute's Director of National Transportation Finance Center Asha Weinstein Agrawal, Ph.D., the program was taped for broadcast on National Public Radio.

Caltrans' Interim CFO Norma Ortega revealed that the state of California will require approximately \$250 billion over the next ten years to maintain, operate and rehabilitate the current highway system—and Caltrans estimates it will be able to finance only 25 percent of that cost. Metropolitan Transportation Commission Executive Director Steve Heminger suggested that transportation policymakers decide what the specific transportation needs will be for California. How can we know how much it will cost if it's not yet known what we need? Should we expand access to public transportation? Should we expand the number of roads in California? And has our reluctance to take care of the highway system that was built in the 1950s, concentrating instead on expansion versus maintenance, actually going to cost us more in the end? Federal Transit Authority Deputy Administrator Therese McMillan discussed the federal role in state and local transportation issues and the potential benefits

to transportation that will be provided by the 2009 economic recovery act.

After the three panelists' presentations, written audience questions were offered by Dr. Weinstein Agrawal and commented upon by speakers Heminger, Ortega, and McMillan, and by Dr. Weinstein Agrawal. This forum was part one of a two-part series on transportation finance challenges; the second of this series was held in June 2010.

The summit was sponsored by the Mineta Transportation Institute; The Commonwealth Club of California; US DOT Federal Transit Administration; Caltrans; and Bay Area Metropolitan Transportation Commission. Co-sponsors included the American Planning Association's NorCal Chapter; Institute of Transportation Engineers; San Francisco Municipal Transportation Agency; Valley Transportation Authority; and Women's Transportation Seminar.

Expert panels addressed career development, skills gaps, training strategies, outreach, best practices, and more. Participants also met educational service providers and industry representatives in a Showcase Hall. Showcases demonstrated effective programs already underway while allowing participants to meet potential partners and talk to people who have participated in effective workforce development programs.

Ensuring the Growth of California's Transportation Workforce

Project #2962

Publication number pending

Project Manager: Donna R. Maurillo, MTI

A California conference on identifying, educating, and hiring the next generation of transportation professionals was held in Long Beach CA on February 1-2, 2010. The event was held at the request of the Council of University Transportation Centers (CUTC) as a method for regional Centers to contribute input to a national workforce development conference in 2011 in Washington DC. The California conference was a joint effort by the Mineta Transportation Institute at San Jose State University and the METRANS Transportation

Center at the University of Southern California and California State University, Long Beach.

The professional event had four primary goals – to assess the abilities of today's transportation worker and identify the skills necessary for the next generation of California's transportation workforce; to bring together professionals from engineering, goods movement, planning, transit, construction, and other fields to identify partners who will address changing workforce needs; to showcase programs and partnerships that demonstrate innovation in meeting California's transportation workforce challenge; to organize the resulting data and recommendations to become part of a 2010 National Transportation Workforce Development Summit in Washington DC.

The event featured representatives from several universities, public agencies, and private businesses. They included Peter H. Appel, Administrator, Research and Innovative Technology Administration (RITA), US Department of Transportation; Dr. Elizabeth Deakin, Professor of city and regional planning and urban design at the University of California, Berkeley; Tom Holsman, CEO, Association of General Contractors; Jerry Aspland, President Emeritus, California Maritime Academy; Dr. F. King Alexander, President, California State University, Long Beach; Clark Martin, Affiliate Programs Team Leader, Federal Highway Administration, Office of Professional and Corporate Development; and many others.



***2010 High-Speed Rail International Practicum –
Washington, Chicago, Los Angeles***

Project #2964

Publication number pending

Project Manager: Donna R. Maurillo, MTI

MTI co-sponsored this three-city practicum on high-speed rail, set consecutively in Washington, Chicago, and Los Angeles from February 8-13, 2010. The seminar focused on providing to U.S. decision makers information on implementing high-speed rail as America enters this new era. The seminars featured discussions on best practices and lessons learned from European and Asian systems with a perspective on America's unique railroad operating environment.

Topics included:

- Infrastructure
- Rolling Stock
- Operations
- Market and Customers
- Economic and Financial Aspects
- Managerial Aspects
- High-speed and Higher-speed Projects in the Region

In addition to the technical presentations provided by the International Union of Railways (UIC), presentations were given by the leadership of:

- Federal Railroad Administration
- AASHTO and state DOT Secretaries
- US Conference of Mayors
- Regional High-Speed Rail Initiatives
- Association of American Railroads

Tenth National Garrett Morgan Symposium on Sustainable Transportation

Project #2963

Publication S-09-06

Project Manager: Donna R. Maurillo, MTI

On March 23, 2010, the Mineta Transportation Institute continued its support of the United States Department of Transportation's Garrett A. Morgan Technology and Transportation Futures Program by conducting the Tenth Annual National Garrett Morgan Symposium and Video-conference on Sustainable Transportation. The purpose of this national videoconference is to stimulate young people's minds and encourage them to pursue the academic programs that will prepare them for professional careers in transportation engineering, planning, administration and technology.

The Garrett A. Morgan Technology and Transportation Futures Program was established in 1997 by former U.S. Secretary of Transportation Rodney E. Slater. The program has three cornerstone components:

- To establish a partnership among the U.S. Department of Transportation, state departments of transportation, public and private transportation providers and local communities to ensure that today's students are prepared to become the next generation of transportation leaders;
- To develop a curriculum that can interest younger students in transportation and provide learning tools that can guide them to advanced academic and professional levels;
- To provide the technologies that will enable students to develop skills that they can apply to future careers in transportation.

The students were welcomed by MTI's Executive Director Rod Diridon, Sr., American Public Transportation Association (APTA) President Bill Millar, Caltrans Chief Deputy Director Cindy McKim, and MTI's Director of Communica-

tions Donna Maurillo, who moderated the event. Mr. Diridon reminded the students of the videoconference's ultimate goal – to encourage middle-school students to take technical classes in math and science so they can take the technical courses in college that will then allow them to become transportation professionals, building US transportation systems in the future.

This year's research topics included a hybrid bus system that acts as a shuttle to larger systems; the benefits of high-speed rail; electromagnetic powered vehicles; a solar and nitrogen energy-powered airplane; turbo-powered ships, and electric-powered amphibious vehicles to reduce roadway congestion.

The presentations, in alphabetical order:

Kemps Landing Magnet School, Virginia Beach VA, created an Integrated Hybrid Bus System (IHBS). Under the guidance of teacher Dennis Borgerding, students Celine Brass, Zach Burkart, Gary Chen, Anita Desai, Lucy Fitzgerald, Emily Gimlin, Ethan Grogan, Kevin Hu, Ashlee MacDonald, Nicole Saks, Stephen Tang, and Veronica Taylor, described a system of hybrid mini-buses designed to navigate deep into neighborhoods, acting as "shuttle buses" that facilitate connection to more extensive public transportation, including rail, light rail and municipal buses.

Morada Middle School, Stockton CA, presented "Sustainable Multi-Hybrid Transit System for the Twenty-First Century," which suggested an electromagnet system of vehicles designed to eliminate the need for fossil fuels. The "Eternity" system consists of numerous vehicle types, including motorcycles, automobiles, trucks and buses that maximize the number of vehicles on the road yet allow for individual flexibility when exiting the highway. Teacher Maria Mack worked with student presenters Abdul Awnallah, Nick Peterson, Justin Tomlinson, Bryanna Turner, and Susan Yan.

Redland Middle School, Rockville MD, investigated the benefits of expanding high-speed rail in the United States. Supervised by teacher Kimberly McLurkin-Harris, "High-Speed Rail in the U.S." was presented by students Malik

Butler, Tyaisa Craig, Monica Dewberry, Brittany Earp, Najai Freeman, Acara Huon, Savion Jacks, Brianna Kapoor, and Kiana Williams.

Riverside Meadows Intermediate School, Plumas Lake CA, sent two entries to the videoconference. First up were seventh grade teacher Amy DuShane's students, Hannah Shaw and Katiebeth Shivley. The students invented the Conservation Cruiser, an airplane constructed of recycled ultra-light materials that runs on solar and nitrogen power. The school's second entry was created by a pair of teacher Michelle Deitz's eighth-grade students, Chris Gottschalk and Cesar Medina, who created a hydroelectric-powered, environmentally safe ship that can be used in place of today's diesel-powered ships.

Riverview Middle School, Bay Point CA, presented "Travel on the Bay Bridge and in the San Francisco Bay —The Big Idea" suggested the use of an electric-powered amphibious vehicle that can leave the roadway and travel on top of the waterways, saving time and bypassing the need to sit in traffic waiting to cross a bridge. With the assistance of teacher Rosemary Hatcher, student innovators Bianca Magallon, Azjah Mouton, Kyerstin Neely, Alisa Pecot, Angeleke Robinson, Nicolas Romo-Banuelos, and Danielle Stinson created a model of the Bay Bridge to show how the multi-amphibious vehicles, called MAVs, could work to reduce congestion on the Bay Bridge between Oakland and San Francisco.

A question and answer period followed the presentations, with classes asking questions of each other. Points were awarded to schools for the quality of their questions and answers. At the end of the session, students were addressed by retired United States Secretary of Transportation Norman Y. Mineta and current Secretary of Transportation Ray LaHood, who appeared via videoconference link from the Federal Railroad Administration site in Washington DC.

Winners were announced a week later. Teacher Dennis Borgerding from Kemps Landing Magnet School, three student team members, and a parent traveled to California in June to attend MTI's annual scholarship banquet to accept the grand prize cash award and a plaque. The winning pre-

sentation's PowerPoint slides are included in the publication. The entire videoconference can be viewed at: http://www.dot.ca.gov/research/planning/garrett_morgan_symposium/garrett_morgan_program.htm

Everyone Wants a Spot: Why Free Parking is a Bad Idea
Project #2968

Project Manager: Donna R. Maurillo, MTI

In February 2010, UCLA Professor Donald Shoup, author of "The High Cost of Free Parking," discussed how parking reforms can reduce vehicle travel, traffic congestion, air pollution, energy waste, and greenhouse gas emissions while increasing the supply of housing and improved public services. The event was held at San Jose (Calif.) City Hall. MTI was a principal sponsor, with co-sponsors the Great Communities Collaborative, Greenbelt Alliance, Silicon Valley Bicycle Coalition, Transform, City of San Jose, and San Jose State University's Urban and Regional Planning Department and Urban Planning Coalition.

Meeting the Challenges of Urban Transportation
Project #2969

Publication S-09-07

Project Manager: Donna R. Maurillo, MTI

This "super session" was held during the American Society of Public Administration's (ASPA) 2010 conference, "Invigorating Public Service for Change," which was held in San José, CA, on April 9–13. The "Meeting the Challenges of Urban Transportation" panel included Mineta Transportation Institute (MTI) Executive Director Rod Diridon, Metropolitan Transportation Commission (MTC) CEO Steve Heminger, and Silicon Valley Leadership Group President and CEO Carl Guardino. The presentation was moderated by the Honorable Norman Y. Mineta, former US Secretary of Transportation and founder of MTI.

Secretary Mineta introduced each panelist, each of whom spoke about transportation challenges facing the San Francisco Bay Area—challenges which are not unique to most municipal areas across the United States. Leading off, the

CEO of the Metropolitan Transportation Commission, Steve Heminger, discussed the recently adopted regional transportation plan titled Transportation 2035. This plan addresses numerous specific transportation and transit needs facing the Bay Area, including the need to repair and rehabilitate the existing infrastructure, sustainability requirements for the transit systems in place, plans to reduce transit's effect on the environment, and how, what and where to expand and add service to promote the region's economic growth.

MTI Executive Director Rod Diridon was up next, speaking about the proposed high-speed rail system for California. This type of rail is already in place in Europe and Asia, and there are plans for a system in Mexico. His presentation included an overview of those systems already providing high-speed rail service in France, Germany, Spain, Italy, Japan, Taiwan and China, and the proposed route for the California system.

Silicon Valley Leadership Group President and CEO Carl Guardino talked about the 16.1-mile Bay Area Rapid Transit (BART) train expansion from Alameda County into downtown San José. The six new stations will ensure that nine out of ten residents in Santa Clara County will live within three miles of a BART, Caltrain, or light rail station.

Following the formal presentations, public administrators from throughout the United States and Canada offered their questions to the panel.



***NCIT Transportation Workforce Development
Conference***

Project #2967

Project Manager: Donna R. Maurillo, MTI

On April 29-30, transportation leaders and educators met in a conference at the University of Denver to discuss options for solving the transportation workforce development problem and channeling more young people into transportation careers. The results will become part of a National Workforce Development Summit in Washington DC in 2011.

Session topics included “Overview of Workforce Development Needs,” “Public Sector: Challenges, Changes and Commitments,” “Human Resources: Improving the Attractiveness of Transportation Careers,” “Adjusting Curriculum and Training Programs at the Community College Level,” “Women in Transportation,” and more.

Hosting was Professor Patrick Sherry, director of the University of Denver’s National Center for Intermodal Transportation. Panelists included Kim Kuster Dale, Arapahoe Community College; Mark Jones, Union Pacific Railroad; Charmaine Knighton, Federal Transit Administration; Donna Maurillo, Mineta Transportation Institute; Lydia Mercado, US Department of Transportation; Dr. Karen Philbrick, Mineta Transportation Institute; James Stem, United Transportation Union, National Legislative Union; Dr. Denver Tolliver, Mountain-Plains Consortium; Christina Valencia, Colorado DOT, and several others.

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

Project #2866

Publication number pending

Project Manager: Donna R. Maurillo, MTI

Even as the demands of climate change compel manufacturers to innovate with cleaner vehicles, the world’s demand for mobility is increasing. We appear to be on the cusp of an unprecedented rise to prosperity of billions of people, most of whom will want the same benefits that we in this country

have enjoyed for decades – most notably, automobiles. So how well can electric cars help to meet the combined challenge of plentiful vehicles while also reducing greenhouse gases? Can the advantages of electric vehicles outweigh their shortcomings, and will they eventually become the vehicles of choice?

This May 18, 2010 summit presented a panel of experts who discussed not only the environmental aspects, but also the engineering, market acceptance, and other issues regarding electric vehicles. Is the market ready to have them become the vehicles of the future?

Panelists included Mark Duvall, Ph.D., director of electric transportation at the Electric Power Research Institute (EPRI), an independent, nonprofit center for public interest in energy and environmental collaborative research; Tony Posawatz, vehicle line director of General Motors new Chevy Volt, who has led the development of this vehicle and continues to help lead the development of the 2011 production vehicle; Jit Bhattacharya, CEO of Mission Motors, whose new Mission One motorcycle is being promoted as the fastest production electric motorcycle in the world; and Richard Lowenthal, founder and CEO of Coulomb Technologies, Inc., widely acknowledged as a worldwide leader in electric vehicle charging station infrastructure.

Panelists covered a broad path regarding electric vehicles, including the effect charging would have on the overall power grid; how quickly batteries could be recharged during a lengthy trip; whether charging stations would become ubiquitous; battery disposal and replacement cost; feasibility of installing charging stations in older homes; the environmental effect of trading petroleum-based fuel to coal-powered electric fuel; and other issues.

MTI created the program for anyone who wants to understand the technology behind electric vehicles, the possibilities for the future, and the infrastructure necessary to keep them viable. The program was recorded for later broadcast on the NPR radio network.

Protecting Our Rail Infrastructure: What Are Our Risk Exposures?

Project #2966

Publication number pending

Project Manager: Donna R. Maurillo, MTI

MTI Transportation Security Research Director Brian Michael Jenkins led a panel discussion on strategies to protect the nation's rail infrastructure. The session was part of the annual APTA Rail Conference, held June 6-9 in Vancouver, BC. Panelists discussed why the ability to deter and detect activity is critical for passenger rail given its inherent openness. Therefore, it is imperative to consider design aspects, risk trends, crime and terrorist activity patterns, technology applications, personnel deployment, rail's impact on public safety, and other factors as part of a comprehensive approach to preventing everything from vandalism to terrorism.

Following Mr. Jenkins' in-depth presentation on terrorism trends around the world, panelists offered their particular insights about other facets of rail security. Lance Talbott, manager, strategic services, TransLink Police Service, New Westminster, BC, discussed "Walking the Right-of-Way;" Christopher Crawford, director, transit security solutions, Bombardier Transportation-Propulsion and Controls, Winter Garden, FL, discussed "Integrated Security Systems for Passenger Rail Cars – A Vancouver SkyTrain Case Study;" Lawrence Speed, PMP, chief capital programs manager, Office of Security and Special Operations, Amtrak, Washington, DC, addressed "Amtrak Virtual Perimeter;" Daniel Lindstrom, manager of wayside communications, Los Angeles County Metropolitan Transportation Authority, Los Angeles, CA, and Jon Cook, vice president of engineering, Vidient Systems Inc., Sunnyvale, CA, co-presented "Video and Sensor Applications."

Norman Y. Mineta Regional Summit on Transportation Finance

Project #2865

Publication number pending

Project Manager: Donna R. Maurillo, MTI

MTI presented Part Two of its discussion about transportation finance at the Commonwealth Club of California in San Francisco on June 25. The first session in October 2009 presented the challenges facing California as its increasing population threatens to make mobility more difficult. This June session presented possible solutions. Moderator was MTI Executive Director Rod Diridon. Panelists included Secretary of Transportation (ret.) Norman Y. Mineta; California State Senator Alan Lowenthal; AASHTO Director John Horsley; APTA President William Millar; and MTI Director Dr. Asha Weinstein Agrawal. The proceedings were broadcast later on NPR Radio.

The panel addressed specific funding challenges in California and the US. For example, within the next two decades, the census bureau estimates that the U.S. population will increase by as many as 50 million people, including more than a 25% increase in California's population alone. This population growth, combined with a growing backlog of overdue maintenance work on roads and transit systems, creates a need for significantly expanded transportation revenues. However, the current political climate is generally unfavorable to tax increases. The panel considered that, given these political realities, what new or expanded revenue sources could be generated for transportation? In particular, what options will be politically feasible in the short and medium term?

They also discussed possible revenue options and their likely reception from the public and legislators. To provide a foundation for that discussion, Dr. Agrawal presented the results of a national survey about public attitudes regarding various funding sources, and whether those responses would change if the funding were earmarked for specific greenhouse gas mitigations.

MTI Web Site

Information and Technology Transfer also manages MTI’s web site, TransWeb (www.transweb.sjsu.edu), a transportation information site widely used by people and organizations outside of the Institute. The site provides information about MTI’s purpose, research reports (including downloadable publications in PDF and HTML formats), education programs from middle-school to graduate level, symposia and forums, news coverage, and links to national and international sites related to surface transportation and policy.

The MTI strategic plan 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 increased significantly, especially over the last fiscal year, when a more focused effort was directed at pro-actively attracting web site traffic.

In addition, TransWeb underwent a major design and technology upgrade in FY 2007-08 to bring it up to current practices. Those upgrades continue as MTI now is moving to comply with 2011 requirements to have ADA-supporting technology for all “.edu” sites. We also continue to make incremental design changes as newer technology becomes available, and we are instituting practices that will help the Institute boost its search engine optimization (SEO).

The following table indicates the monthly average for the number of site uses and the number of downloaded documents for the TEA 21 contract (1998-2006), and for the first SAFETEA-LU and Tier 1 competition agreement period (2006-10). However, we have divided this last item into two columns to specifically break out MTI’s performance over the last fiscal year.

Monthly Average	TEA 21 FY 1998-2006	SAFETEA-LU FY 2006-2009	SAFETEA-LU FY 2009-2010
Monthly Uses	173,985	204,634	247,666
Monthly Downloads	~5,000	22,857	50,020

Some of MTI’s most frequently downloaded documents this fiscal year included several that appeared last year and that continue to dominate – showing that MTI research remains relevant. These include MTI Report 08-06 *The Role of Transportation in Campus Emergency Planning*; MTI Report 06-06 *How Far, by Which Route, and Why? A Spatial Analysis of Pedestrian Preference*; and MTI Report 06-03 *High-Speed Rail Projects in the United States: Identifying the Elements of Success-Part 2*. Other frequently-downloaded reports include MTI report 08-07 *Effect of Suburban Transit Oriented Developments on Residen-*

tial Property Values, and MTI report 09-01 *How to Ease Women's Fear of Transportation Environments: Case Studies and Best Practices*. This last report generated significant requests for media interviews.

As a group, several MTI reports on transportation security also dominated, including MTI Report 09-03 *Potential Terrorist Uses of Highway-Borne Hazardous Materials*, and MTI Report 04-05 *Designing and Operating Safe and Secure Transit Systems: Assessing Current Practices in the United States and Abroad*.

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

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

Graduate Transportation Management Program (GTMP) students benefit from additional TransWeb content and functions. The GTMP 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 new web 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.



MTI Newsletter

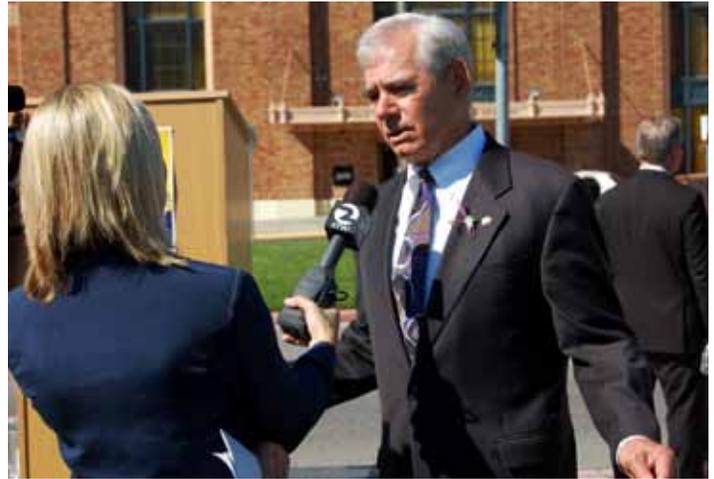
MTI's World in Motion newsletter is an effective medium to inform the transportation community about ongoing MTI surface transportation policy research and education programs. MTI also posts the newsletter online.

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

Media Coverage

By way of active media pitching, MTI has established a growing reputation as a resource for expert opinions about surface transportation issues. During this last fiscal year, MTI was an important part of many news stories in print, online, and broadcast media. Executive Director Rod Diridon was often solicited for opinions on high-speed rail, selective screening of rail passengers, multi-modal strategies, and many other compelling transportation issues. MTI researchers and other associates also were interviewed on their topics of expertise, and the media picked up stories about the Institute's symposia and other events.

Based only on actual interview placements, direct story placements, and media inquiries, MTI improved its media coverage over the last fiscal year by averaging four broadcast placements (radio and TV) and 17 print 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

This year, MTI established a blog and a Facebook fan page named Mineta Transportation Institute. The blog, while reasonably successful, experienced much less traffic than the Facebook page. This falls in line with generally held opinion that most social networking is moving toward formalized channels rather than *ad hoc* blogs because these formal channels already have millions of members from which to draw.

The Facebook site includes all copies of MTI news releases; daily commentary from industry events such as the APTA Rail Conference; links to outside resources such as relevant books and articles; photo albums; direct links to MTI research reports; fan comments; and other material. We expect to focus more attention on the Facebook site, perhaps including interviews, along with updates on MTI's education programs.

Other Successes

Scholarship and Awards Banquet

On the last Saturday in 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. This year, the banquet attracted more than 350 transportation leaders, corporate donors, and friends and families of the graduates. Speakers included Transportation Secretary (ret.) Norman Mineta, California State Senator Alan Lowenthal, Parsons Brinckerhoff consultant and MTI Trustee Mort Downey, and others. International guests included the Consuls General from Japan and Germany. The event typically raises more than \$40,000 per year for scholarships.

Additional Communications Redesigns

MTI continues its move toward designs and formats that are in keeping with current standards. To that end, the web site and graphics teams have been updating the site to conform with ADA requirements for accessibility. The use of Flash and other elements have been replaced with HTML because it can be interpreted by optical screen readers. The site also is undergoing additional changes that are expected to increase MTI results in Internet searches, and the site is being detailed to bring its usability up to current best practices.

Other Outreach

MTI directors and faculty presented at numerous conferences, symposia, and other gatherings. They also have been interviewed for print and broadcast media. This fiscal year, for example, Executive Director Rod Diridon spoke at many high-speed rail conferences, several transportation events, and at The Distinguished Lecturer Series at the University of Arkansas. Transportation Security Director Brian Michael Jenkins has appeared in person and in broadcast interviews discussing counter-terrorism measures. He also has testified before Congress and has written articles for indus-

try publications. Transportation Security Deputy Director Frances Edwards was a key organizer for the ASPA Annual Conference in San Jose CA, appearing also as a speaker. She also presented at the FEMA Higher Education Conference in Emmitsburg MD and at the 35th Annual Natural Hazards Conference at the University of Colorado, Boulder.

National Transportation Finance Center Director Asha Weinstein Agrawal presented at several professional meetings, including TRB's Fourth International Conference on Financing Surface Transportation in the United States, held in New Orleans, and on the steering committee for the 20th Annual "Arrowhead Symposium: The Transportation-Land Use-Environment Connection" to be held later this year in Lake Arrowhead, CA. Education Director Peter Haas presented a paper with Dr. Frances Edwards and graduate student Nina Rohlich at the Transportation Research Board in Washington DC, and he spoke at the Transportation Workforce Development Conference in Long Beach CA and at other industry meetings. Research Director Karen Philbrick was invited by The Ministry of Transport, Socialist Republic of Vietnam, to serve as a professor for a one-week seminar titled, "Intermodal Skills Seminar: Developing Core Competencies and Leadership" in Ho Chi Minh City. This work was completed on behalf of the Asian Pacific Economic Cooperation Transportation Working Group (APEC-TPT).

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



EDUCATION





Peter Haas, Ph.D.

Director of Education

haas@mti.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 Ph.D. 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 various subject areas.



Viviann Ferea

Education Program Assistant

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Viviann Ferea was appointed to the position of Education Program Assistant (EPA) in 2000. As EPA, 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 enhance her ability to promote the program's continued growth and success.

Education Program Goal

The Graduate Transportation Management Program was created to develop and administer a multidisciplinary, state-of-the-art program via 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 2009-2010, the graduate program recorded 230 graduate student enrollments. These enrollments were associated with more than 80 individual, active students. Sixty-seven matriculated Master of Science in Transportation Management students were enrolled during the academic year, and 14 program graduates were recognized on June 26, 2010. These numbers reflect a significant increase from the prior academic year, including a notable increase in the number of matriculated students and a large increase in the number of enrollments and graduates. Approximately 65 students are expected to register for the first fall session classes, which would represent a continuing trend of increases over the past several years.

Summer Transportation Institute

During July 2009, the Education Program again offered the “Summer Transportation Institute” (STI). The program, which is funded by the FHWA via the California Department of Transportation (Caltrans), is a national effort to provide career orientation and educational experiences to motivate secondary school students toward professions in the field of transportation. The transportation industry will continue to need individuals who are prepared to provide the leadership to build the nation’s transportation system for the next century. The primary aim of STI is to encourage high school students – particularly from traditionally underrepresented backgrounds – to seek professional careers in transportation through obtaining a college education. Participants were engaged in a variety of activities including a college-level environmental science class with an emphasis on transportation issues, field trips to a variety of area transportation centers, guest speakers from the industry, hands-on projects, and related enrichment activities.

Education Program Accomplishments

Courses Offered

In Academic Year 2009-10, the Graduate Transportation Management Program offered 11 courses. Class sites follow each course listing below:

Fall 2009

MTM 201: Fundamentals of Transportation Management

Students enrolled in Caltrans Sacramento HQ, Caltrans D4-Oakland, Metropolitan Transportation Authority (MTA)-Los Angeles, D11-San Diego and San Jose State University (SJSU).

MTM 214: Transportation Policy and Regulation

Students enrolled in D4-Oakland, D10-Stockton, D12-Santa Ana, Metropolitan Transportation Authority (MTA)-Los Angeles, Caltrans Sacramento HQ and SJSU.

BUS 286: Project Management

Students enrolled in D3-Marysville, D4-Oakland, D6-Fresno/Manchester, D12- Santa Ana, Metropolitan Transportation Authority (MTA)-Los Angeles and SJSU.

MTM 203: Transportation Markets and Business Development

Students enrolled in D4-Oakland, Metropolitan Transportation Authority (MTA)-Los Angeles, D10-Stockton, D12-Santa Ana, Caltrans Sacramento HQ, and SJSU.

MTM 215: Transportation Systems and Development

Students enrolled in D4-Oakland, D6-Fresno/Manchester, D10-Stockton, and Metropolitan Transportation Authority (MTA)

MTM 296D: Multi Modal Transportation in California

Students enrolled in D3-Marysville, D4-Oakland, D6-Fresno/Manchester, Metropolitan Transportation Authority (MTA)- Los Angeles, Caltrans Sacramento HQ and SJSU.



Spring 2010

MTM 202: Introduction to Transportation Funding & Finance

Students enrolled in D3-Marysville, D4-Oakland, D6-Fresno/Manchester, D7-Los Angeles, Metropolitan Transportation Authority (MTA)-Los Angeles, Orange County Transportation Authority (OCTA), Valley Transportation Authority (VTA), Caltrans Sacramento HQ and SJSU.

MTM 226A: Emergency Management Issues for Transportation Professionals

Students enrolled in D4-Oakland, D6-Fresno/Manchester, D7-Los Angeles, D8-San Bernardino, D12-Santa Ana, and Metropolitan Transportation Authority (MTA)-Los Angeles, OCTA and SJSU.

MTM 226B: Security Issues for Transportation Professionals

Students enrolled in D4-Oakland, D8-San Bernardino, D12-Irvine, Metropolitan Transportation Authority (MTA), Orange County Transit Authority, Caltrans-Sacramento HQ and SJSU.

MTM 217: Leadership and Management of Transportation Organizations

Students enrolled in D3-Marysville, D4-Oakland, D10-Stockton, D12-Santa Ana, Metropolitan Transportation Authority (MTA)-Los Angeles, Transportation Monterey Transit Authority and SJSU.

MTM 283: Independent Research

Students enrolled in D3-Marysville, D4-Oakland, D6-Fresno/Manchester, D10 Stockton, Metropolitan Transportation Authority (MTA), Caltrans Sacramento HQ and SJSU.

MTM 290: Strategic Management in Transportation

Students enrolled in D4-Oakland, D6-Fresno/Manchester, Caltrans-Sacramento HQ, MTA-Los Angeles, Transportation Monterey Transit Authority and SJSU.

MTI will initiate its Certificate in High-Speed Rail Management in the upcoming 2010-11 academic year, starting with one class addressing an overview of the topic, and a second class providing instruction in operations and management.

Graduates

The faculty and staff of MTI and the Lucas Graduate School of Business at SJSU were proud to present the graduating class of 2010 at the 19th Annual MTI Board of Trustees Awards Banquet on June 26, 2010. Fourteen students earned their MSTM degrees. We admire the dedication of these students, each of whom completed 30 units of coursework 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.

Nathaniel Atherstone	David Lor
Ernesto Chaves	Marlon Regisford
Lisa Fabish	Robin Reynolds
Jesus Godinez	Matthew Sandstrom
Susan Heinrich	Herman Sealey
Gary Hsueh	Sarah Smith
Kenneth Johansson	Gezhagen Tizazu

In addition to our MSTM graduates, one student received MTI's graduate Certificate in Transportation Management (CTM):

William Harmon

Seven students received MTI's graduate Certificate in Transportation Security Management (CTSM):

Crystal De Castro	Ashish John
Sarah Christensen	Kenneth Johansson
Susan Heinrich	Donna Maurillo
Gary Hsueh	

The 12-unit CTM and CSTM 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 CTM or CSTM programs. Many students earn their certificates as a significant step toward achieving their MSTM degree.

Continuing Student Performance (CSP) Fellowships

Twice a year, subject to funding availability, MTI awards MSTM and CTM/CTSM Fellowships. Thanks to this generous program, students can continue their studies while meeting their other financial obligations. In the 2009-10 academic year, MTI awarded more than \$36,000 through this program to the following qualified MSTM students:

Fall 2009

Lucinda Brown
Lucas Bryant
Sarah Christensen
Garth D. Fernandez
Jack Hall
Kenneth Johansson
Donna Maurillo
Christine Mikitarian
Xuanthanh Nguyen
Panteleon Rivera
Matthew Sandstrom
Raymond Salvano
Gezhagan Tizazu
John Raaymakers
Wayne Wassell

Spring 2010

Crystal DeCastro
Jesus Godinez
Lisa Harmon
Susan Heinrich
Matthew Sandstrom
Ashish John
Robin Kaufmann
Patrisha Krinke
Michael Litschi
Donna Maurillo
Rodney Noda
Cedric Novenario
Kristin Nwakobi
Nancy Mattingly
Hal McCutchen

Student Successes

US DOT Outstanding Student of the Year

In January, MSTM student Herman Sealey was honored as MTI's "Student of the Year" at the 2010 awards banquet for the Council of University Transportation Centers (CUTC) in Washington, D.C. The award is co-sponsored by the U.S. Department of Transportation. Herman received a check for \$1,000 in honor of his outstanding academic and professional achievements.

Eno Foundation Award Winners

MSTM students continue to succeed in national competition for awards and scholarships. Our candidate for the 2010 Eno Leadership Development Conference, Lisa Fabish, was selected by the Eno Foundation Board of Regents. Twenty Eno Fellows were selected from a field that included 60 nominees, many from extremely prestigious graduate programs. The Eno conference brings top graduate students in transportation together for a first-hand look at how national transportation policies are developed. Eno Fellows go to Washington DC in May for a week of meetings with federal officials and leaders of business and non-profit organizations.

Lisa, the class of 2010 valedictorian, is currently employed with Booz, Allen Hamilton as a consultant. She earned her Masters degree from Yale University School of Management in 1999.

APTA Foundation Award Winners

The American Public Transportation Foundation (APTF) scholarship program honored four students from MTI's Graduate Transportation Management Program. APTF provides scholarships to deserving students who will fill future leadership positions in public transportation. The selection criteria included a demonstrated interest in the public transportation industry as a career, academic achievement, and the need for financial assistance.

MSTM student Kenneth Johnson won an APTF Renewal Award of \$1,000. MSTM student Ernesto Chaves received a \$1,500 for the Donald C. Hyde Memorial Essay Award.



Alumni and Student Achievements

MSTM students continue to succeed in national competition for awards and scholarships.

- Lisa Fabish – Eno Foundation, Outstanding MTI Student of the year for the Lucas Graduate School of Business.
- Herman Sealey - Outstanding Student of the Year Mineta Transportation Institute.
- Kenneth Johansson (Caltrans D11– San Diego) received the American Public Transportation Hall Renewal Scholarship for \$1,000.
- Daren Grilley – won \$1,500 for the 2009 CUTC Parker Award for Best Non-thesis paper in Policy and Planning.
- Richard Tree - The City of Porterville named Richard Tree Director of Transportation for its Public Transit System. He currently serves as Transit Manager. This appointment takes effect upon the retirement of current Director Linda Clark. Richard credits his graduate studies as the key for this promotion. Richard will be the second member of the Tree family to graduate from the Mineta Transportation Institute. His brother, Michael, graduated in 1999 and is currently the City Manager for the City of Twenty-Nine Palms.
- Sarah Swensson – was selected to participate in the Green Field future of Aviation security Workshop. DHS Science & Technology and the Research Council of the United Kingdom are sponsoring the 2½ day event. Young transportation professionals from the US and the UK have been chosen to attend the workshop. It will be held at the Stevens Institute of Technology (SIT) in Castle Point, New Jersey, August 2-4, 2010.
- Matthew Sandstrom – was promoted to Project Manager for the Clean Energy Coalition in Ypsilanti, Michigan.

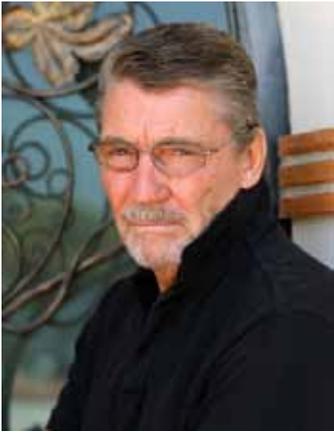
Program Outreach

Education Program Director Dr. Peter Haas recently appeared at a number of public transportation conferences as part of the ongoing effort to publicize the MSTM program and to recruit students. He presented a paper with Dr. Frances Edwards and graduate student Nina Rohlich at the Transportation Research Board in Washington DC, and he spoke at the Transportation Workforce Development Conference in Long Beach CA in February. Dr. Haas also made a presentation for the Caltrans Planning Division professional development workshop, “Planning Horizons,” held at Caltrans headquarters in Sacramento, where more than 50 employees attended. It was also webcast to more than 200 Caltrans employees across the state. He has participated in several other events and served on a number of committees, including the UCLA Lake Arrowhead Transportation-Land Use-Environment Symposium Program Planning Committee, and as Co-Chair, Student Award Committee, for the Council of University Transportation Centers.



**NATIONAL
TRANSPORTATION
SECURITY CENTER**





Brian Michael Jenkins

Director

bmjenk@ix.netcom.com

Brian Michael Jenkins was appointed in 2008 to lead MTT'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.

Mr. Jenkins has a B.A. 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 U.S. 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 U.S. 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, Ph.D.

Deputy Director

kc6thm@yahoo.com

Dr. Frances L. Edwards is the Deputy Director of MTI's National Transportation Security Center and a professor and director of the Master of Public Administration program at San Jose State University. She is a research associate of the Mineta Transportation Institute and an editorial board member of *the Public Administration Review (PAR)*. Dr. Edwards is co-author with Friedrich Steinhausler of two books in the NATO Science Series on terrorism threats and response, and with Brian Jenkins on 9/11. She also authored numerous chapters for text and professional books.

She has written more than 30 professional journal articles, most recently on cross border disaster response issues in *Journal of Contingency and Crisis Management*, and on federal homeland security grants in *State and Local Government Review*. 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 Jose, California, the nation's tenth largest city. She has a Ph.D. and M.U.P. from New York University, an M.A. 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 funded jointly by US DOT and Caltrans grants. In 2007, MTI became part of the new Transportation Security Center of Excellence (a consortium of seven universities and research centers) created by the Department of Homeland Security. Funding was initiated in 2008. The new designation provides more stable support for research overall and permits projects jointly funded by DHS and DOT, thereby ensuring that research will consider transportation and security needs.

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 the NTSCOE director. Mr. Jenkins is assisted by Dr. Frances Edwards, who serves as deputy director, and administratively by Dr. Karen Philbrick.

The primary NTSCOE staff includes Bruce Butterworth, whose career on Capitol Hill, in the U.S. 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. To meet its demands, the NTSCOE has recently expanded its research staff. Renee Haider, a former Director at the Rutgers National Transit Institute, joined MTI in 2010, bringing to the NTSCOE more than 26 years of experience in training, education, and project management focusing on transportation safety. Chris Kozub, also a former Director at the Rutgers National Transit Institute, joined MTI in 2010, bringing 30 years of experience in emergency services and transportation safety and security. The primary team is assisted by a team of specialist consultants recruited worldwide.

MTI NTSCOE 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.

The NTSCOE's 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 lessons learned; 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. The NTSCOE 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.

The NTSCOE's current priorities are to make its computerized database – a compendium of more than 2,300 attacks on surface transportation targets – more rapidly responsive and more powerful. This will enable even more detailed analyses to help stakeholders decide key policy and operational issues; to complete the NTSCOE'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 NTSCOE places great emphasis on delivering usable reports, along with training products, as projects or phases of projects are completed. Between July 1, 2009, and June 30, 2010, the NTSCOE published seven peer-reviewed reports.

Activities

In this past year, the NTSCOE team made several presentations 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. In May 2010, Mr. Jenkins had the honor of providing testimony before the House Homeland Security Committee, Subcommittee on Intelligence, Information Sharing and Terrorism Risk Assessment on domestic threat in the wake of the Times Square bombing attempt.

In March, Mr. Jenkins, Bruce Butterworth, and Dr. Karen Philbrick, represented MTI's NTSCOE at the University Programs Summit, Washington DC. Mr. Jenkins made two presentations - "What Makes the Infrastructure Resilient?" and "Prevention Strategies for Surface Transportation Systems" - while Dr. Philbrick represented MTI's NTSCOE at the COE directors' meeting.

Dr. Edwards, Dan Goodrich and Bill Medigovich worked with Caltrans headquarters staff to develop an updated version of the federally-mandated Continuity of Government/Continuity of Operations (COOP/COG) Plan. MTI's expert staff assisted with Caltrans' participation in both the statewide Golden Guardian Exercise and a special agency-level tabletop exercise for executives. As a result of the lessons learned, the COOP/COG essential functions, line of succession, and alternative facilities information have been updated and brought into alignment with new federal and state essential functions lists.

Dr. Edwards and Mr. Goodrich were asked to present their research on the role of transportation in university-level emergency planning at several conferences this past year. These included the Natural Hazards Conference in Colorado; the Naval Postgraduate School, Monterey Homeland Security Conference in California, and the FEMA Higher Education Conference in Pennsylvania. Their well received and widely publicized research concluded that the inclusion of a transportation unit inside the operations section would enhance campus response capabilities. The publication of their research includes complete checklists for all ICS/SEMS/NIMS-required Emergency Operations Center positions, which are available as PDFs and as downloadable adaptable versions. Follow-on seed grant work was conducted to determine whether additional supporting documentation of training and exercise support for university emergency operations centers would enhance the adoption of the emergency planning materials.

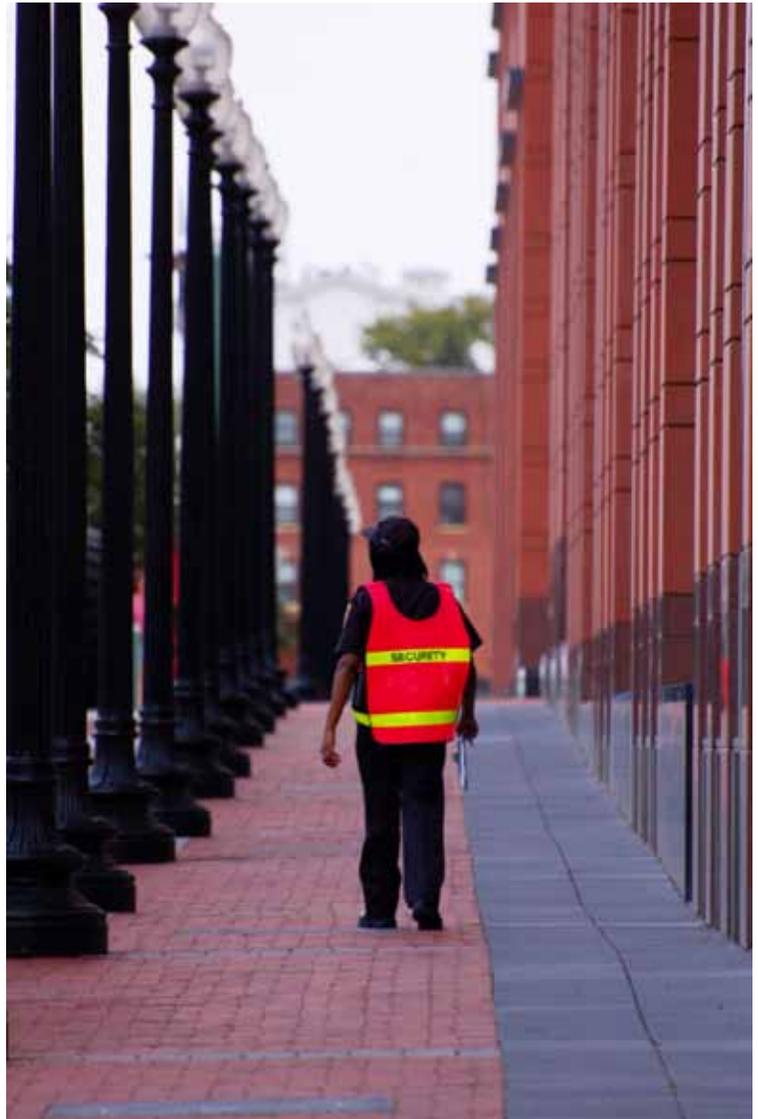
International Activities

Expanding MTI's international partnerships and connections is a priority for MTI's NTSCOE. In September 2009, Brian Jenkins was invited by the U.S. DOT to participate in a series of meetings with transportation officials in Mumbai, India. These meetings were followed by briefings to Indian officials in San Jose, California, in early 2010. Based on these interactions, a memorandum of understanding between the State of Maharashtra, India and MTI was signed in June 2010. This will allow MTI to collaborate in research on transportation security and to assist India in developing secure transportation systems. Jenkins will participate in a second round of meetings in Mumbai in September 2010.

Bruce Butterworth participated in DHS-arranged meetings with Israeli officials in January 2010. An experienced Israeli researcher was subsequently enlisted to produce detailed case studies of terrorist attacks for the DHS-sponsored Bus Operators' Awareness project. Mr. Butterworth also met with officials in the United Kingdom in February 2010, and Brian and Bruce were subsequently invited to the United Kingdom to observe a field exercise in June 2010 on the effects of terrorist bombs on rail coaches. While there, they briefed British officials on the trend analyses and results derived from MTI's database, which UK officials recognize as unique to the field. Cooperation on research issues will continue between British officials and MTI.

Jean-François Clair, a former high-ranking official in France's security service (DST), co-authored an MTI case study of an attempt by terrorists in France to derail a high-speed train. Mr. Clair will also participate in a new MTI survey of security measures at high-speed-rail systems worldwide.

At the request of the U.S. DOT, MTI briefed visiting Ministry of Transportation officials from the People's Republic of China and has agreed to an exchange of research data. MTI also briefed Japanese rail officials at the request of the American Public Transit Association (APTA).



NTSCOE Research Findings Summary

Although terrorists remain obsessed with attacking commercial airliners, as evidenced by the attempt in December 2009 to sabotage a Northwest airliner flying between Brussels and Detroit, they view public surface transportation as a more accessible killing field. As of July 21, 2010, terrorists had carried out eight attacks on airliners and airports (outside of the war zones in Iraq and Afghanistan) since 9/11, resulting in 125 deaths and 222 injuries. During the same period, terrorists carried out 1,149 attacks against public surface transportation worldwide, resulting in 3,266 deaths and 11,346 injuries.

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.

Terrorist plots abroad include a plot to spread ricin on 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.

When successful, terrorists can achieve the high body counts they seek—body counts that are not necessarily in the thousands. In December 2003, a bomb on a train in Stavropol killed 42 people; in February 2004, a bomb in Moscow killed 40; in March 2004, ten bombs killed 191 rail commuters in Madrid; in July 2005, 56 people, including four suicide bombers, were killed by four bombs in London; and in July 2006, seven bombs killed 207 rail passengers in Mumbai. In 2007, a bomb exploded aboard the India-Pakistan Friendship Train, killing 66. In December 2009, a terrorist bomb derailed the Moscow-to-St. Petersburg express, killing 26. The deliberate derailing of a passenger train in West Bengal killed 148. These eight attacks alone killed 776 persons, the rough equivalent of the death toll from 7 to 10 airline crashes. The MTI database contains 48 attacks against bus and train targets that killed more than 25 people and 18 that killed more than 50 since 1970.

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.

Projects Completed in the Past Year

Handbook of Emergency Management For State-Level Transportation Agencies

Project #2850

Publication #09-10

Principal Investigator: Frances Edwards, Ph.D., CEM

State transportation agencies are required to have plans for the continuity of their government functions during any catastrophic disaster, as well as for the continuation of the essential services that they provide to the people of the state, other levels of government, other state agencies, and federal partners during response, recovery and mitigation phases of emergency management. Emergency management guidance is normally provided in state laws, such as an Emergency Services Act, that defines the roles and responsibilities of state-level agencies. Headquarters-level Emergency Management Plans (EOP), Continuity of Government (COG) Plans, and Continuity of Operations (COOP) Plans embody the actions of the specific agency in disasters, with appropriate guidance detailed in checklists and annexes for the various subdivisions of the agency's headquarters staff.

The Incident Command System was created in the 1970s in California by the fire service for use in large scale emergencies. Over time, it has evolved to the command and control system for all emergencies in California. After the terrorist attacks of September 11, 2001, President George W. Bush mandated that all emergency response must be conducted using the National Incident Management System (NIMS) in order to receive the federal share of emergency response funds.¹ Homeland Security Presidential Directive-5 (HSPD-5) was issued by President Bush on February 28, 2003, and ICS became the basis for NIMS.

After Hurricane Katrina, there was a new emphasis on catastrophic emergency planning. Transportation is the basic enabler for all first responders to fulfill their disaster roles. Without open, clear and safe roadways, all forms of response are slowed or stopped. Therefore, a COOP and COG planning process for catastrophic emergencies is essential to augment the Emergency Operations Plan (EOP) that addresses "normal" emergencies.

The overall emergency management structure must be in place to support implementation of the EOP, COOP and COG. The emergency management structure must support organization-wide policy setting for the department while also supporting the governor's need for information. Such a system requires training employees on the plans and their roles, including personal and family emergency preparedness. Exercises are essential to evaluate the success of the training and the completeness of the EOP, COOP and COG. A chain of command including delegation of authority is required, along with alternate EOC locations.

Planning must include recovery, with training and documentation for receiving reimbursements from the Federal Highway Administration (FHWA) and the Federal Emergency

Management Agency (FEMA), and plans for audit and appeal processes. Post-disaster mitigation measures must also be included, recognizing Disaster Mitigation Act 2000 mandates.

The role of the emergency operations center (EOC) must be defined and exercised. It includes support for the governor's policy decision making, and facts to assist in setting statewide priorities for the allocation of scarce resources. The state's transportation agency serves as a link between the local governments that need assistance and the state and federal resources that can be activated. As such, the state transportation department's headquarters EOC coordinates with the department's district EOCs, the state emergency management agency's regional EOCs, and the state-level operations center to manage resource requests and services delivery, based on the department's essential functions.

A hierarchy of emergency plans supports emergency response actions. Standard operations procedures (SOPs) guide behavior at the field level. The EOP guides the department in managing a disaster, while the COOP and COG focus on catastrophic events and the potential loss of executive leadership and headquarters facilities. Department resources must be organized to support the department's own essential functions, as well as federal primary-essential functions and mission-essential functions, as defined in new federal guidelines.

This research project was intended to lay the groundwork for establishing priorities that would lead to a mature management capability for emergencies, disasters, and catastrophes. Because transportation agencies typically have significant experience with "normal emergencies" on the roadways, and they routinely work with state police and state fire agencies in disaster situations, some elements of a mature emergency management capability have not been emphasized. The following activities should be completed by a state level transportation agency to ensure a robust response and recovery capability. An EOC should be created, and reasonable alternative EOC sites selected and developed. The EOP and COOP should be developed, staff should be trained on the plans, and regular exercises should be held.



Supplement to MTI Study on Selective Passenger Screening in the Mass Transit Rail Environment
Project #2876

Publication #09-05

Principal Investigator: Brian Michael Jenkins

MTI analyzes and advances initiatives that can reduce risks and increase security in public surface transportation. An excellent example of such forward-thinking research is MTI's analysis of selective passenger screening in the rail environment. In February 2007, MTI published a groundbreaking analysis of the use of this technique in *Selective Screening of Rail Passengers* (MTI Report 06-07), by Brian Michael Jenkins and Bruce R. Butterworth.

In 2008, at the request of the DHS Science and Technology Directorate, MTI began a review of the implementation of selective screening in various transit systems and in Amtrak to determine best practices and lessons learned. The research continued in 2009 and involved site visits at transit systems and personal and telephone interviews. A supplement to the 2007 report (carefully reviewed to avoid releasing details of any transit system's security program) was published in January 2010 (MTI Report 09-05). The supplement describes screening programs currently implemented (or planned)

by nine transit agencies and identifies best practices. It also discusses why three other transit agencies decided not to implement passenger screening at this time. The analysis reconfirms the earlier conclusion that selective screening is a viable security option, but that it must be based on clear policies and carefully managed to avoid perceptions of racial or ethnic profiling and it must have public support. The supplement also addresses new developments such as vapor-wake detection canines, continuing challenges, and areas of debate.

MTI and the American Public Transportation Association (APTA) co-sponsored a Rail Passenger Selective Screening Summit, which brought together government and industry stakeholders on June 18, 2009, during APTA's annual Rail Conference, in Chicago, Illinois. The summit workshop was moderated by Brian Michael Jenkins, Director of MTI's NTSCOE. Speakers included MTI Research Associate Bruce R. Butterworth, ; Greg Hull, president of the American Public Transportation Association (APTA); Paul MacMillan, chief of police, Massachusetts Bay Transportation Authority, Transit Police Department; Ron Masciana, deputy chief, Metropolitan Transit Authority (MTA), New York; Jesus Ojeda, security coordinator, Southern California Regional Rail Authority; Ed Phillips, operations deputy, Office of Security, Amtrak; and John P. Sammon, assistant administrator, Transportation Sector Network Management, Transportation Security Administration (TSA). The edited transcript of the summit, *Rail Passenger Selective Screening Summit* (MTI Report S-09-01), was published by MTI in October 2009.

Potential Terrorist Uses of Highway-Borne Hazardous Materials

Project #2981 (this project was funded and completed in this fiscal year)

Publication #09-03

Principal Investigator: Brian Michael Jenkins

Potential Terrorist Uses of Highway-Borne Hazardous Materials presents the results of a detailed examination by a diverse team of experts in hazardous materials, explosives, terrorism, and security of truck-borne hazardous material that might be used as weapons by terrorists and the targets against which such materials could be used. The study analyzed the characteristics of each commodity, hazmat commodity flows, accident and criminal theft histories from which terrorists might draw lessons, and the effectiveness of federal and state security regulations. It then reviewed the objectives of terrorist groups to determine how violent radical jihadists might consider the various hazardous materials available to them, in terms of the qualities of each material, the ease with which it might be acquired and delivered, and the targets against which it might be used. The report concluded that terrorists most often seek soft targets that yield significant casualties, such as public buildings and assemblies, and they often choose simple operations promising modest results rather than complex and uncertain operations promising catastrophic results. Terrorists have also discussed substituting fire for harder-to-acquire explosives. Gasoline tankers have particular appeal as targets because they can easily produce intense fires, they operate in target-rich environments with predictable routes, and they pose few security challenges. The report urges government, which has focused primarily on hazmat that can cause catastrophic losses, to also focus—as terrorists tend to—on the most readily available, least protected hazmat. It calls for creation of a clear strategy for increasing and sustaining security, for resolving significant jurisdictional issues between federal and state authorities, and for strengthening hazmat security measures in the field. The report also proposes that careful consideration be given, where appropriate, to implementing vehicle tracking technologies, panic alarms, and immobilization capabilities for vehicles carrying specific hazmat, including gasoline; such measures can also offer safety and anti-crime benefits





Implementation and Development of Vehicle Tracking and Immobilization Technologies

Project #2983 (this project was funded and completed in this fiscal year)

Project #09-04

Principal Investigator: Brian Michael Jenkins

Since the mid-1980s, limited use has been made of vehicle tracking using satellite communications to mitigate the security and safety risks created by the highway transportation of certain types of hazardous materials. However, vehicle-tracking technology applied to safety and security is increasingly being researched and piloted, and it has been the subject of several government reports and legislative mandates.

At the same time, the motor carrier industry has been investing in and implementing vehicle tracking, for a number of reasons, particularly the increase in efficiency achieved through better management of both personnel (drivers) and

assets (trucks or, as they are known, tractors, cargo loads, and trailers).

While vehicle tracking and immobilization technologies can play a significant role in preventing truck-borne hazardous materials from being used as weapons against key targets, they are not a "silver bullet." However, the experience of DTTS and the FMCSA and TSA pilot projects indicates that when these technologies are combined with other security measures, and when the information they provide is used in conjunction with information supplied outside of the tracking system, they can provide defensive value to any effort to protect assets from attacks using hazmat as a weapon. This publication details how vehicle tracking and immobilization technologies have been developed by the federal government, specifically DHS and DOD, and identifies the key issues any mandatory form of implementation would have to address, along with benefits and costs. The report points out certain technologies that would provide the greatest security and safety impact for the lowest cost.

Ongoing Research Projects

Threat Analysis And Policy Research Support For The Department Of Homeland Security/Port Authority For New York And New Jersey (DHS/ PANYNJ) Counter-IED Working Group

Project #2875

Principal Investigator: Brian Michael Jenkins

The objective of this project is to provide up-to-date analyses of improvised explosive device (IED) threats to public surface transportation systems for the Port Authority of New York and New Jersey (PANYNJ) to use in developing security measures to protect the PATH train and other surface transportation systems. The project also provides analyses of terrorist bombings that will assist other members of the Counter-IED Working Group in developing new technology and other countermeasures. MTI staff who are working on this project attend all meetings and briefings of the Counter IED working group in Washington and New Jersey, and they provide update briefings on their research.

This project overlaps MTI's Case Studies, Trend Analysis, and Chronologies projects. Participation in the Counter-IED Working Group enables MTI to identify the relevant research needs of transportation system operators, as well as those involved in related research and development, while briefings by MTI offer members of the Working Group direct access to ongoing analyses of the latest trends in terrorism. These encounters have led to a number of specific requests for MTI assistance not directly connected with PANYNJ.

The original project description called for MTI to assist PANYNJ in developing a tabletop exercise (or several exercises) that will explore responses to terrorist scenarios involving IEDs, focusing on issues raised by new technology that is being deployed. This exercise, with minor modification, will also be available for use by other transportation operators.



New Projects

MTI NTSCOE: NIMS/COOP/COG Applications and Implementation for State Transportation Agencies: Best Practices

Project #2976

Principal Investigator: Dr. Frances Edwards

MTI and the California Department of Transportation (Caltrans) are partnering to develop a National Incident Management System (NIMS) compliant Continuity of Operations (COOP)/ Continuity of Government (COG) review. This will enable the revisions necessary to ensure NIMS compliance, facilitate the development of a meaningful vulnerability assessment leading to mitigation actions, and the creation of a training and exercise program to ensure executive level capability to respond to catastrophes related to transportation systems and infrastructure.

The team – including MTI research associates Dan Goodrich, Waseem Iqbal, and Bill Medigovich – will collaborate with Caltrans senior and executive staff to review the existing COOP/COG plan set for compliance with NIMS and the states Standardized Emergency Management System (SEMS). A thorough review of the existing Caltrans COOP/COG materials will include an evaluation of the existing threat and vulnerability assessment, and the inclusion of lessons from MTIs on-going research into terrorist attacks against transportation systems, and their unique vulnerabilities. Plan revisions will be developed in concert with Caltrans emergency management staff.

MTI research associates also will review the revised Caltrans plans for national applicability. The plan sets will be turned into generic templates with additional guidance for use by state-level transportation agencies nationwide in evaluating their own NIMS-compliant COOP/COG plan to meet DHS requirements and directives. These planning templates and guidance documents will include a full generic plan template, a narrative and a PowerPoint set delineating the relationship between NIMS, COOP/COG and state-level transportation agency functions.

MTI research associates will customize a NIMS Basic class and NIMS Executive class for transportation agencies, including creating a PowerPoint with Notes page for self-study or to guide trainers in their presentations. MTI will then create seminar outlines and a tabletop exercise based around terrorism scenarios that are adaptable to any state transportation agency. These documents will be based on existing best practices and will be nationally applicable. All elements of the project will be piloted in California with Caltrans senior and executive staff members. After-action meetings will be held with them to receive their feedback and suggestions for improvement. The final products will be peer reviewed by at least three CEM emergency managers familiar with the national planning, training and exercise requirements.

Those final products will be a NIMS-compliant plan set for Caltrans, a training program, an exercise program, and a generic plan template that can be used nationwide by state transportation agencies to develop appropriate NIMS-compliant plan sets for their state agencies, and a best practices training and exercise program piloted with Caltrans that can be adopted by state-level transportation agencies.

Mineta Transportation Institute Data Base of Terrorists Attacks against Public Surface Transportation: Chronologies

Project #2978

Principal Investigator: Brian Michael Jenkins

The Chronologies project significantly enhances MTI's ability to provide insightful and timely trend analyses for legislators, makers of government policy and regulations, and transportation operators, indicating ways to mitigate the risks of terrorist and criminal attacks against public surface transportation. This is a high-impact project yielding significant benefits now, with the promise of more in the future. The Chronologies project is one of the main engines feeding the MTI Trend Analysis project (2979, discussed below), among others. The primary task of the Chronologies project is the enhancement of the MTI Database on Terrorist and Serious Criminal Attacks Against Public Surface Transportation. Mr. Jenkins is the Principal Investigator, Research

Associate Bruce Butterworth is the research lead, and MTI independent contractors are also involved.

The methodology is straightforward: Collect into a single database all information on attacks; ensure that the information is accurate; design a database that can cost-effectively generate analyses at an increasingly detailed and useful level; and generate products for the use of DHS and other stakeholders.

The MTI database is unique. No other database is specifically focused on transportation, and therefore no other source can provide the level of detail provided by MTI. The MTI database also fills an important public need. Decision making on public surface transportation must be based on risk, and risk analysis requires a clear understanding of where, how, and why attacks have been carried out, the targets of those attacks, and where and how they have been most lethal.

The MTI database now enables such analysis and, due to its recent conversion from an Excel® flat file to a server-based and secure Microsoft Access® platform, it does so with increasing agility, focusing on an increasing number of specific questions from stakeholders. In fact, because the findings of such analyses are so operationally relevant, public access to the data and public dissemination of all results would be inappropriate because they could provide practical—even tactical—knowledge to terrorists.

However, the MTI database has produced many significant findings appropriate for public dissemination. Among them:

- Sixty-eight percent of all surface transportation attacks result in no casualties, but a few attacks have yielded 50 to 100 casualties, which are sufficiently high body counts for terrorists.
- The number of surface transportation attacks and the associated casualties far exceed the number of airline attacks and casualties. Since 9/11, 1,175 surface transportation attacks have killed 3,266 people, while eight air attacks have killed only 125.

- Bus targets are attacked more often than train targets, but train targets are attacked with much more lethality, particularly when explosives are used.
- There have been more suicide bombings on buses, but suicide bombers have been more lethal in train attacks; single-bomb attacks are more common than multiple-bomb attacks and are often more lethal per device.
- Bombs are used more often than any other attack method and are most deadly in enclosed environments, such as subway trains and underground subway stations.
- However, non-explosive attacks can achieve even higher lethality.
- Certain sizes of bombs tend to be more lethal than others.
- Eighteen percent of attacks are stopped by alert passengers, citizens, security guards, and others.

These findings have significant implications for securing public surface transportation. Findings with greater detail have even more significance for risk and security management.

The Chronologies project has had many accomplishments this year, including:

- The number of attacks in the database grew from 1,049, when it was first briefed to the FTA/TSA Safety and Security Roundtable on July 14, 2009, to the current 2,368. Approximately 110 attacks were added each month through a painstaking review of data in the University of Maryland START database (UM-START)—data that were often coded inconsistently and incorrectly—and the RAND Corporation terrorism database.

- The MTI database has been kept fresh by a daily review of new attacks.
- The database platform was transferred to a Microsoft Access ® platform in early June 2010, with the assistance of a NASA software vendor, allowing standard graphs and charts to be automatically updated and special ad hoc reports to be more easily generated.

The MTI database has been used throughout this year to produce insightful reports and briefings to key stakeholders. For example:

- The database was used to produce three published MTI reports: Explosives and Incendiaries Used in Terrorist Attacks on Public Surface Transportation: A Preliminary Empirical Analysis (MTI Report WP-09-02); Terrorist Attacks on Public Bus Transportation: A Preliminary Empirical Analysis (MTI Report WP 09-01); and The 1995 Attempted Derailing of the French TGV (High-Speed Train) and a Quantitative Analysis of 181 Rail Sabotage Attempts (MTI Report 09-12).
- Information from the database has been used to shape the TSA Bus Security Operator Awareness Training (BOARD) project.
 - a. The data and analyses were formally briefed to a GAO panel evaluating DHS R&D priorities for public transit in August 2009; to the Counter-IED Working Group on in November 2009; and to the UK MI5's National Centre for Infrastructure Protection and a wide assortment of UK officials in June 2010.
 - b. The data were briefed, at TSA's request, to field Bomb Appraisal Officers in Chicago and New Orleans. Many more briefings are to follow.
 - c. The data were used to produce a written report for Chairman James Oberstar of the House Transportation and Infrastructure Committee

to inform Congressional testimony by Amtrak, and to answer specific tactical questions by the transit police chief of a major East Coast city.

In the coming year, MTI will (1) increase the tempo of providing trends and data to stakeholders and the relevance of the information; (2) increase the facility and ease with which the database can produce these trends and data; and (3) become known as the unique source of reliable data analysis on public surface transportation.

Terrorist Attack Annual Trends Analysis Project #2979

Principal Investigator: Brian Michael Jenkins

The objective of the Trend Analysis project is to deliver to governmental authorities and transportation operators—both US and international—comprehensive and focused trend analyses of the terrorist threat against public surface transportation, as revealed through qualitative analyses of attacks and plots. The analyses will help government officials make better risk-based decisions on policy, regulation, and R&D and will enable transportation system managers to operate and invest in their systems, equipment, and personnel in a way that yields the greatest reduction in risk. MTI seeks to increase the awareness of both front-line government and transportation employees. The Trend Analysis project is a high-impact project yielding significant benefits now and promising more in the future. The project uses information from the Chronologies project, and its products often support or are combined with those of the Case Studies project (Project # 2977).

Mr. Jenkins is the Principal Investigator, Research Associate Bruce Butterworth is the research lead, and MTI independent contractors also contribute to the project.

The methodology is straightforward and effective: First, data from the MTI Database on Terrorist and Serious Criminal Attacks against Public Surface Transportation are analyzed in ways that reveal valid statistical trends concerning where (e.g., region and country), against what (55 diffe-

rent targets), and how (51 methods) attacks have been conducted. The database analyses show which of 11 explosives or incendiary devices have been used and 25 ways in which they can be delivered or concealed, along with 5 different outcomes for each device. Eleven new fields have been added to the database, including whether multiple devices have been aimed at responders, the size of the explosives, the detonation and timing mechanisms used, whether devices were found before attacks, whether attacks take place in large or small locations, and whether they occur near iconic targets. The data are culled to determine trends not only in distribution, but also in lethality, measured in terms of average and median fatalities and injuries per attack, per device, and per device exploded on target. The graphs and charts produced provide the quantitative raw material for MTI's trend analyses. As these analyses become more operationally precise, it becomes even more important to ensure appropriate controls over information. For this reason, public access to the MTI database is not planned, and not all of its trend analyses will be publicly available; the analyses with operational value should not and will not be shared with potential adversaries.

The qualitative material for trend analysis comes from the in-depth experience and knowledge resident in MTI's senior staff, particularly Mr. Jenkins. The understanding of evolving worldviews, objectives, and tactics—in combination with the results of MTI's Chronologies project—enables trend analysis that offers both qualitative information and quantitative wisdom. Finally, these factors are combined with information from the Attack Case Studies project to provide the most useful products to stakeholders.

MTI's unique database and staff experience provide results with considerable impact, as did its earlier work on selective screening in passenger rail transportation, which directly influenced decisions of mass transit operators and Amtrak. Another example of the impact of the trend analyses is MTI's participation in TSA's Bomb Squad Response to Transportation Systems (BSRTS) program.

Initiated by TSA's Operation Division in conjunction with the Security Network Management Office, the Trend

Analysis project, which began in the first quarter of FY2010, includes a total of 33 two-day training seminars, three of which have been given, 15 of which will be given later in FY2010, and 14 of which will be given in FY2011. In each of the seminars, MTI researchers will present current trends, focusing on explosives attacks, using updated data and case studies. The three seminars that have been given took place in Chicago (May 26), New Orleans (June 28), and San Antonio (July 21). Four more have been scheduled: two in August (Boston and Miami) and two in September (Los Angeles and Seattle). More will be scheduled in the next federal fiscal year. MTI has received positive feedback yielding requests by other parties for more briefings, and its analyses are providing TSA Bomb Appraisal Officers with a solid foundation on which to conduct vulnerability assessments for surface transportation. The analyses may also assist in responses to bomb threats and explosives devices.

MTI trend analysis has been used in three published reports: *Explosives and Incendiaries Used in Terrorist Attacks on Public Surface Transportation: A Preliminary Empirical Analysis* (MTI Report WP-09-02); *Terrorist Attacks On Public Bus Transportation: A Preliminary Empirical Analysis* (MTI Report WP 09-01); and *The 1995 Attempted Derailing of the French TGV (High-Speed Train) and a Quantitative Analysis of 181 Rail Sabotage Attempts* (MTI Report 09-12). Each report combines the features of qualitative and quantitative analysis, and the report on train derailment attempts in France also presents case studies.

Continuing trend analysis—including analysis addressing specific questions asked by stakeholders—has shaped the TSA Bus Security Operator Awareness Training (BOARD) project. Trend analysis has been provided to UK and Japanese authorities, and it is already being used to provide quantitative background for the analysis of high-speed rail projects (a special data field has been added in the database for this purpose). Trends determined from MTI analyses have also been communicated to the General Accountability Office (GAO) and other agencies that take a broad view of R&D priorities.



In the coming year, MTI will increase the variety and the focus of its trend analyses and will publish additional reports for the general public; additional details (which, if released to the public, could provide terrorist roadmaps) will be provided for key government and industry stakeholders.

Mass Transit Bus Operator Behavioral Awareness Training Program

Project #2982

Principal Investigator: Brian Michael Jenkins

The Transportation Safety Administration (TSA) Bus Operator's Project, which has been renamed the Bus Operator Behavior Awareness Research and Development (BOARD) program, is designed to provide training that will enable bus operators in the United States to "quickly and effectively evaluate individual behavior before that person has a chance to attack, and take actions that can be considered by the bus driver to protect passengers when he/she feels they are at risk." This important program is managed by DHS's Science and Technology Directorate, with funding, input, and direction from TSNM's Mass Transit Division. MTI's contribution to the program falls into three general categories: (1) shaping the training program and its interim and final reports; (2) providing empirical data; and (3) providing case studies to help focus the training on areas where the greatest risk reduction can take place; and creating material that will

make the training realistic for the participants and illustrate the risks they may face, as well as effective countermeasures. MTI's objective, in short, is to make the BOARD training program effective at reducing risk.

TSA's goal is to be responsive in general to customer direction and to provide a wide range of fast-turnaround assistance for product development. Its task methodology for the BOARD program involves using the MTI Database on Terrorist and Serious Criminal Attacks against Public Surface Transportation (see the Chronologies project) to develop statistical trends that identify where attacks against buses are most frequent and most lethal and to statistically illuminate countermeasures that have been most effective. MTI's methodology involves developing case studies from countries where attacks have been frequent (e.g., Israel and the United Kingdom), using its own data and information secured from governmental and associated authorities, for use in the training program.

Mr. Jenkins, the Principal Investigator, and Research Associate Bruce Butterworth, the working lead, are working in close cooperation with all NTSCOE staff, particularly Chris Kozub and Renee Haider (who continue to work on the project for Rutgers University, although they have recently become MTI Research Associates).

While it appears that the primary threat to public surface transportation in the United States is against the heavy-rail mass transit systems of major cities, bus targets share the characteristics of jihadist targets around the world, particularly but not exclusively in major urban areas. Buses are open, valuable targets, both primary and secondary. Their vulnerability is increased by the fact that while behavioral assessment courses and tools are available for rail transportation employees, there are as yet none for bus operators. The BOARD program and MTI's contribution to it therefore could reduce a serious risk before it becomes critical. Its potential impact is significant, given the number of times bus targets have been hit elsewhere and the lethality with which they have been attacked. It is even more significant because of the mutually supportive benefits of such a program for operators who confront common crime and many other safety issues.

MTI has accomplished much since this project was initiated in this reporting period.

First, MTI has produced ground-breaking empirical analyses. Research Associate Bruce Butterworth presented data to bus operator focus groups in Houston, Texas, in November and December 2009. MTI also generated an interim report published in January 2010, *Terrorist Attacks on Public Bus Transportation: A Preliminary Empirical Analysis* (MTI Report WP 09-01). A subsequent report, *Explosives and Incendiaries Used in Terrorist Attacks on Public Surface Transportation: A Preliminary Empirical Analysis* (MTI Report WP-09-02), provided more detailed analyses on bus attacks. MTI met its deliverables deadlines for empirical analysis and has continued to produce data for the developers of the BOARD training outline and materials.

Second, MTI secured groundbreaking case studies on DHS's behalf from Israeli counterparts. MTI has used its own database for cases, and in addition, ten detailed case studies were produced by Israeli explosives and security expert Shalom Dolev. These case studies provide information never seen before. They will be made widely available as an MTI publication, but in the meantime, they have been provided to the course developers. MTI has also secured a copy of the

Israeli Bus Driver Training Course sought by the BOARD course designers.

Third, MTI has been a reliable and conscientious team member on the project, providing assistance to improve the overall quality of the training course. For example, it played a key role in generating useful results from the January 2010 trips to Israel and the United Kingdom as part of a DHS delegation.

In the coming reporting period, MTI will publish a peer-reviewed final report on bus attacks that will present the latest findings from the MTI database, its own case studies, and the detailed case studies from its Israeli contactor. The cases will illustrate instances in which (1) particularly lethal tactics and weapons have been employed, including the use of suicide and non-suicide bombers; (2) actions by on-scene security personnel, operators, or passengers would likely not have stopped or mitigated the attack without significant advance warning; (3) enhanced awareness and actions by security personnel, operators, or passengers did in fact prevent or mitigate attacks; (4) bombs or incendiary devices were particularly lethal; (5) bombs or incendiary devices malfunctioned or were ineffective; and (6) multiple bombs were involved and were timed to detonate when they would cause casualties among emergency responders. This groundbreaking work will contribute to continuing awareness of the need for appropriate bus security measures in the United States and in other countries as well.

MTI will also actively participate in efforts to secure stakeholder input to the design of the course and to understand the operational constraints the training must take into account. It will assist in the final production of the course and will help in its roll-out.

World Trade Center Commerce and Security Study (WTC-CAST)

Project #2985

Principal Investigator: Brian Michael Jenkins

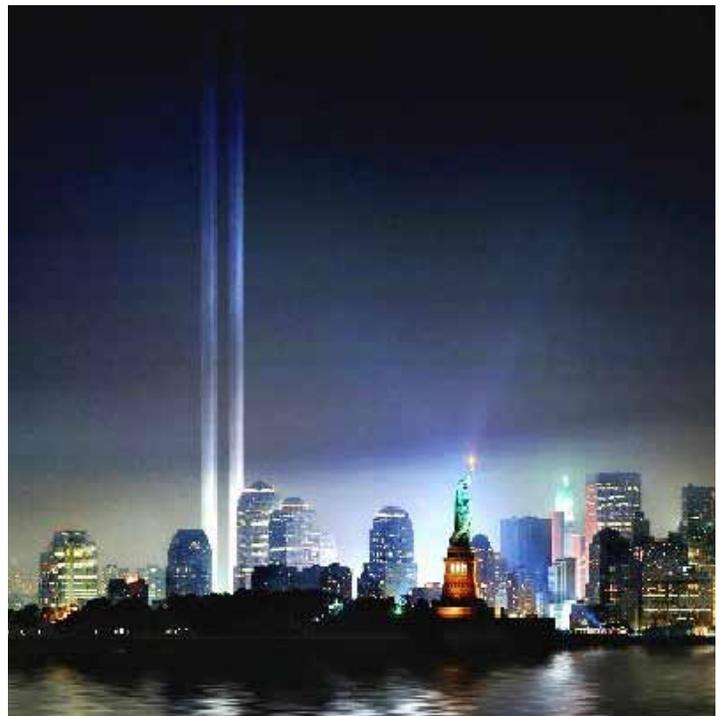
The World Trade Center Commerce and Security (WTC-CAST) project will conduct a risk-based analysis to assess, within a cost-benefit-analysis framework, varying combinations of security measures, policies, and procedures that can be put into place at the WTC. Working with CCICADA at Rutgers University, the Department of Homeland Security Center of Excellence University of Southern California's CREATE, and officials of the Port Authority of New York and New Jersey, MTI will examine (1) the terrorist threats to the WTC site, including the WTC acreage and surrounding properties that comprise New York's lower Manhattan financial district; (2) the major potential direct and indirect economic consequences of possible terrorist actions; (3) the portfolio of security measures that can be developed against the threats; and (4) the costs and benefits that can be derived from these security measures.

MTI's NTSCOE will assume the lead in this consortium for threat analysis and attack-scenario generation and will also participate in identifying and evaluating possible security countermeasures. MTI will also assist DHS and other researchers in liaison with the New York Police Department (NYPD) and other public and private sector officials who will be key factors to the project's successful execution.

As an initial step in this effort, MTI will prepare a white paper that outlines terrorist motives, reviews current methodologies for assessing and ranking terrorist threats, identifies and establishes contact with NYPD and other key public and private sector officials, and lays out a plan of action for further threat analysis.

Specifically, MTI will:

- Examine possible terrorist motives that could drive their objectives, selection of targets, and choice of tactics.
- Review various approaches used to generate terrorist scenarios, elicit expert opinion, assess threats, identify key experts, and indicate how they might contribute to the research.
- Conduct an initial reconnaissance of the WTC and surrounding properties, review currently envisioned security measures (location of perimeters, deployment, procedures, etc.), and initiate discussions with NYPD and other key individuals who may assist in the effort.



- Participate in the planning sessions of the consortium.
- Lay out a more detailed plan of action for the analysis of the terrorist threat, production of attack scenarios, and determining how these may interact with security.
- Attempt to estimate risk reduction (scenario-by-scenario and overall).
- Identify additional security countermeasures.

In the overall project, MTI will:

- Define the terrorist threat.
- Identify and describe relevant historical cases (London, Mumbai, Tokyo, etc.)
- Review existing databases and design and construct a set of data specifically tailored to this project (including significant terrorist attacks on nationally important commercial centers) from which MTI will be able to extract terrorist motives, attack modes, intended and actual consequences, and security countermeasures.
- Using historical analysis, a review of previous analyses of the terrorist threat to New York, and “red team” exercises, develop a playbook of detailed, plausible attack scenarios.
- Review current methods of ranking or quantifying terrorist scenarios and apply these to the identified threats.
- Catalogue previous security responses, current security measures, and recent and projected technological developments. (For security reasons, formal documentation will not identify or evaluate what New York currently has in place or contemplates doing.)
- Again, through red team analysis, consider how terrorists might attempt to overcome or obviate these security measures.

Efforts in the overall project have thus far focused on project organization, defining more precisely the roles that will be played by the participants, and dealing with local authorities in New York. During this period, MTI, which joined the effort after the others, participated in discussions in Washington, Los Angeles, and New York. MTI prepared a detailed briefing and presented it at the organizational meeting hosted by CREATE on May 17. This briefing, which was considered to be highly informative by the participants and influenced the direction of the project, has been changed to incorporate comments made at the meeting and has been expanded to an outline of the White Paper. MTI also conducted a search of the literature on threat and risk assessment methods. MTI NTSCOE Director Jenkins made two trips to New York to discuss the project with NYPD’s Police Commissioner and Deputy Commissioner and review the details of the NYPD’s existing Lower Manhattan Security Initiative. During these trips, he also met with private sector stakeholders to elicit their support. The white paper will be completed and submitted in August 2010.

Changes within management at the WTC have put the overall project on temporary hold. The delay may last until after the November 2010 state elections. The white paper, however, will recommend that research continue on the broader issues involved, which do not depend on active involvement of Port Authority or WTC officials, for two reasons. First, New York’s financial district is much larger than the WTC property and involves numerous stakeholders. Second, the work addressing broader issues will be fungible even if the study’s venue is changed.

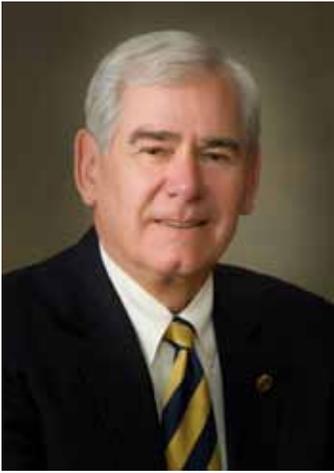


NATIONAL

HIGH-SPEED RAIL

POLICY CENTER





Rod Diridon, Sr.

Interim Director

diridon@mti.sjsu.edu

Rod Diridon, Sr., is serving as Interim Director of MTI's National High-Speed Rail Policy Center during the initial organization. He is also MTI's Executive Director. A 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 Policy Center funded jointly by US DOT and Caltrans grants. During this fiscal year, MTI's competitive grant process, will selected one high-speed rail (HSR) study for funding with three more research projects planned for fiscal year 2010-11. In addition, MTI sponsored three directly related high-speed rail Information and Technology Transfer forums. For details on these events, please refer to the Communications and Technology Information Transfer sections of this report.

MTI has a long history of studying HSR and has published 37 peer reviewed research reports and has hosted 11 Information and Technology Transfer national summits and regional forums generally related to this subject in prior years. Five of the 37 publications directly relate to HSR 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

(Formerly Shared Use of Rail Infrastructure by High Speed Rail: Best Practices in Design and Operations)

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

Project # 2206

Publication #05-04

Principal Investigator: Kenneth Gehrt, Ph.D.

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

Project # 2304

Publication #05-01

Principal Investigator: Allison de Cerreño, Ph.D.

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

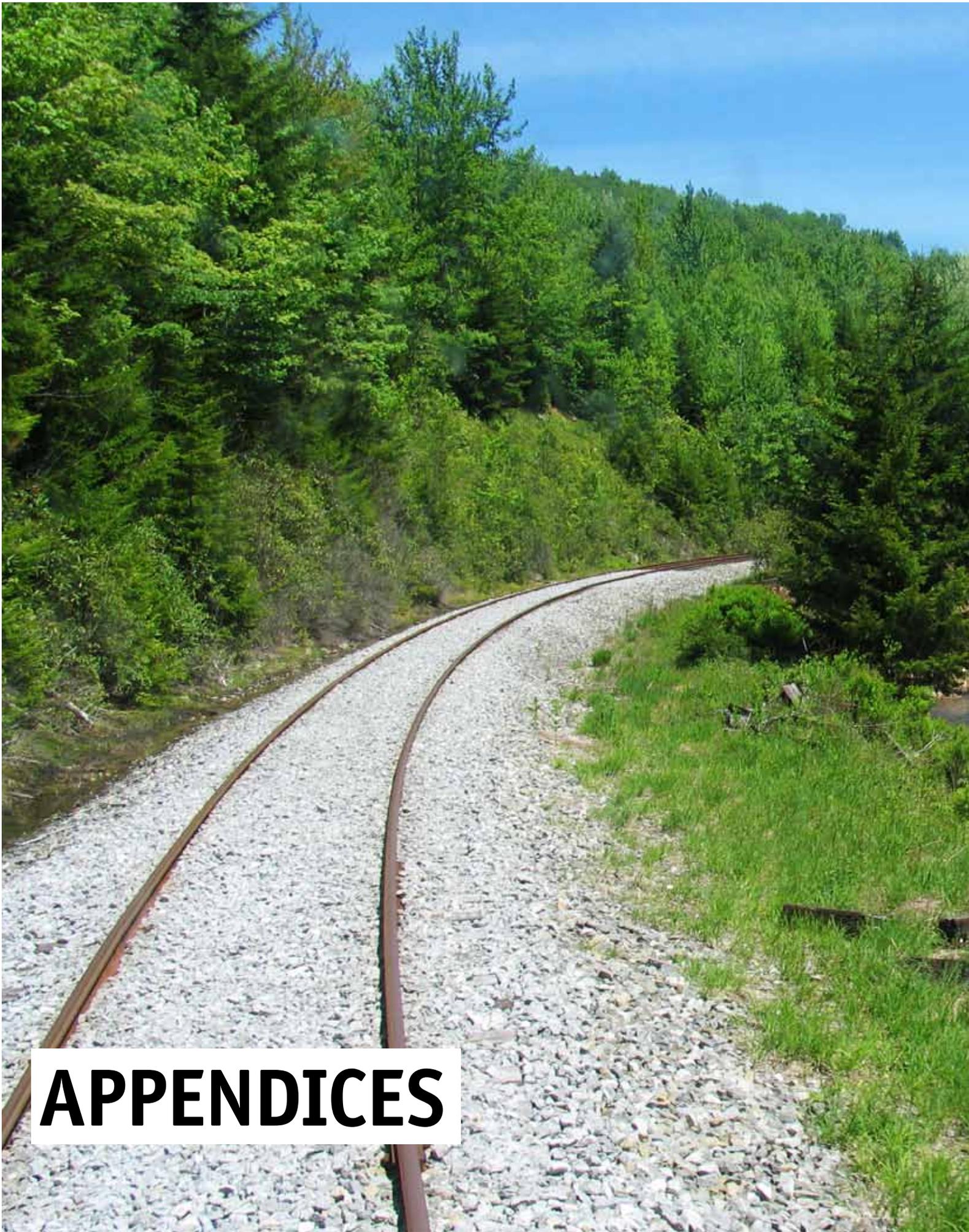
Project #2401

Publication #06-03

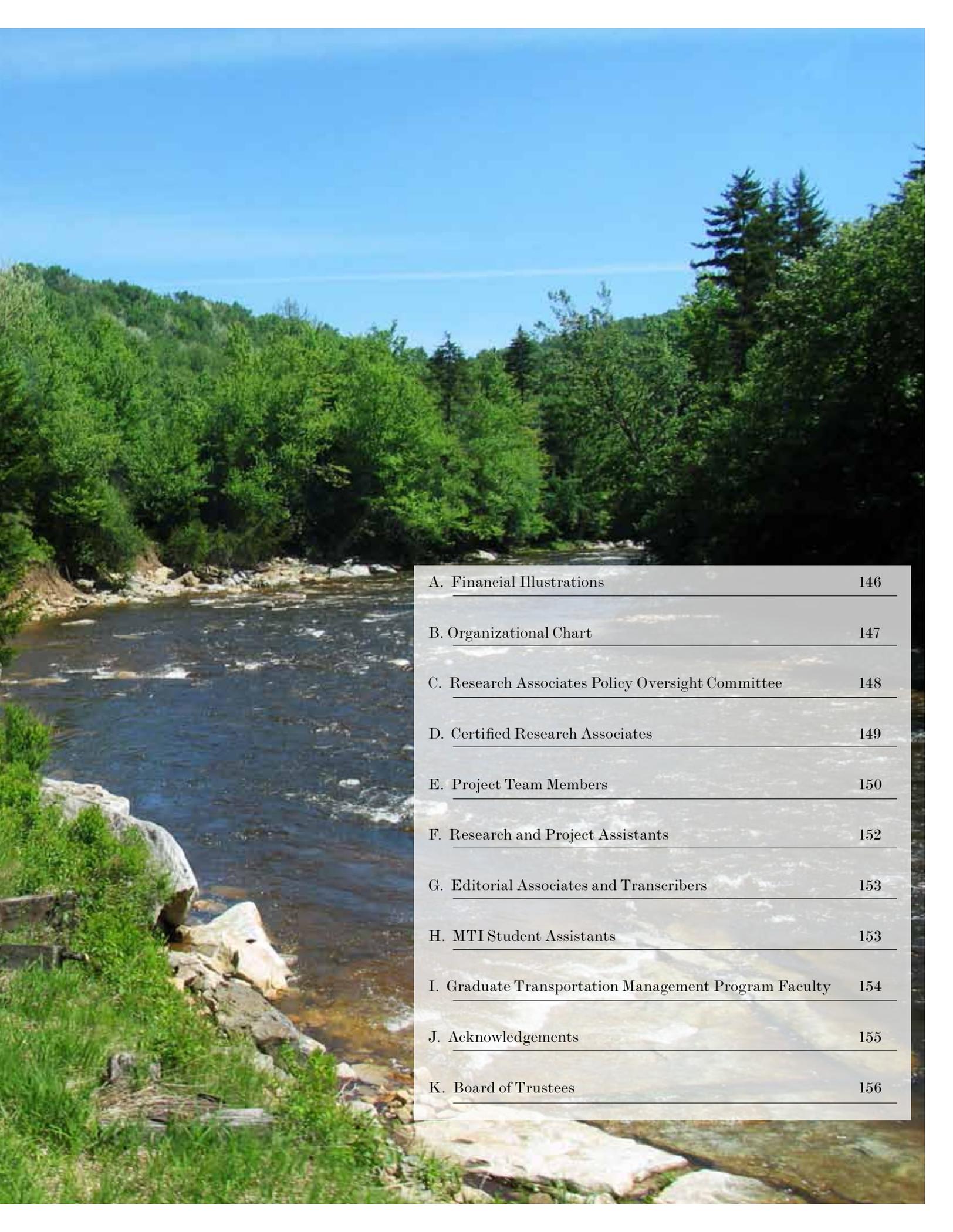
Principal Investigator: Allison de Cerreño, Ph.D.

To further advance the study of HSR, MTI established a High-Speed Rail Management Certificate as part of its graduate education program. Two classes specific to high-speed rail will be added to the 2010-11 academic calendar. The first will provide an introduction to high-speed rail, including history, development, design, and related issues; and the second will present an overview of high-speed rail operations, including management, security, and other operational topics. A number of graduate students have shown interest in this unique educational track that leads to the professional HSR Management Certificate or a full Masters of Science in Transportation Management with emphasis on high-speed rail. These and other MTI programs will evolve to meet the workforce needs identified by the North American High-Speed Rail Workforce Needs Assessment being conducted by MTI, as requested in April by the California High-Speed Rail Authority and California State University System.

Additional information on this newly-formed Center will be provided in the next annual report, as MTI continues developing the framework in the coming year.



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Appendix A

Financial Illustrations

Illustration of Funding Sources MINETA TRANSPORTATION INSTITUTE

Fiscal Year 2009-10

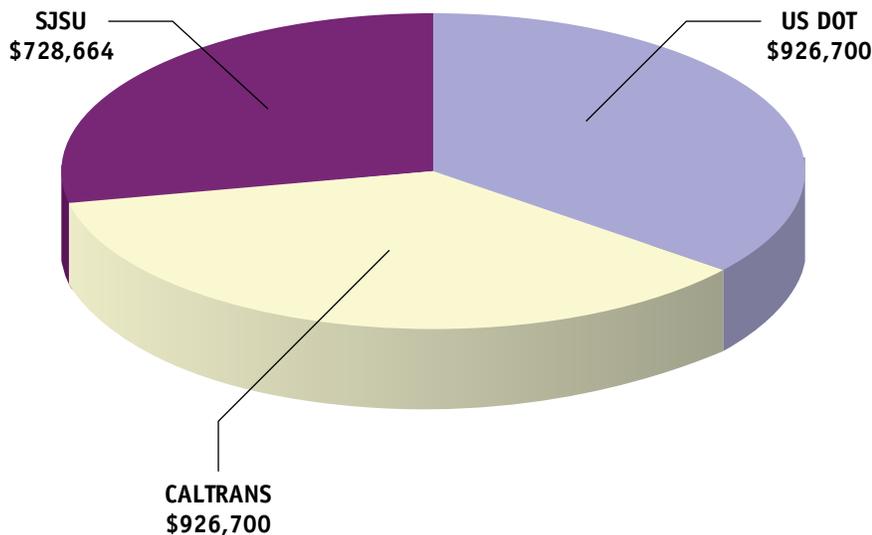
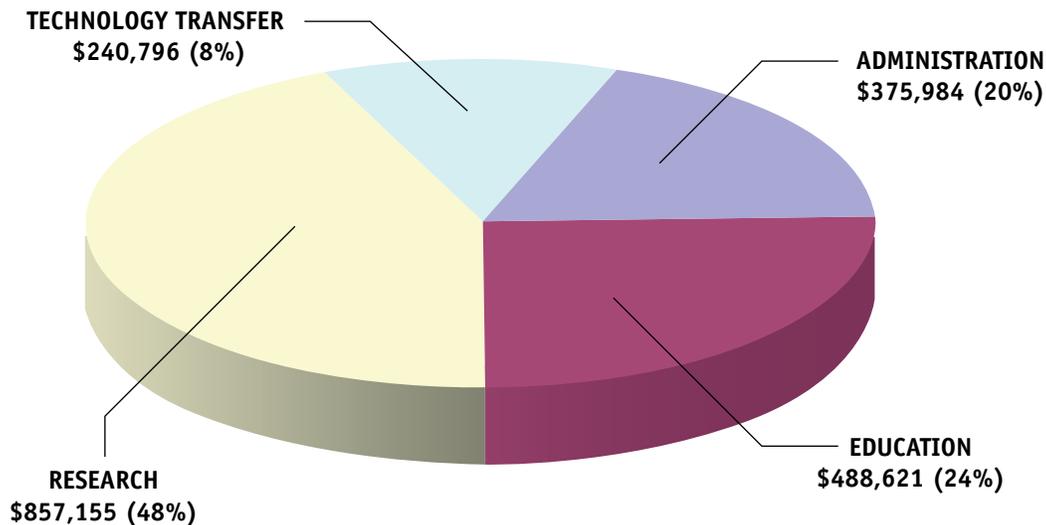


Illustration of Expenditures MINETA TRANSPORTATION INSTITUTE

Fiscal Year 2009-10

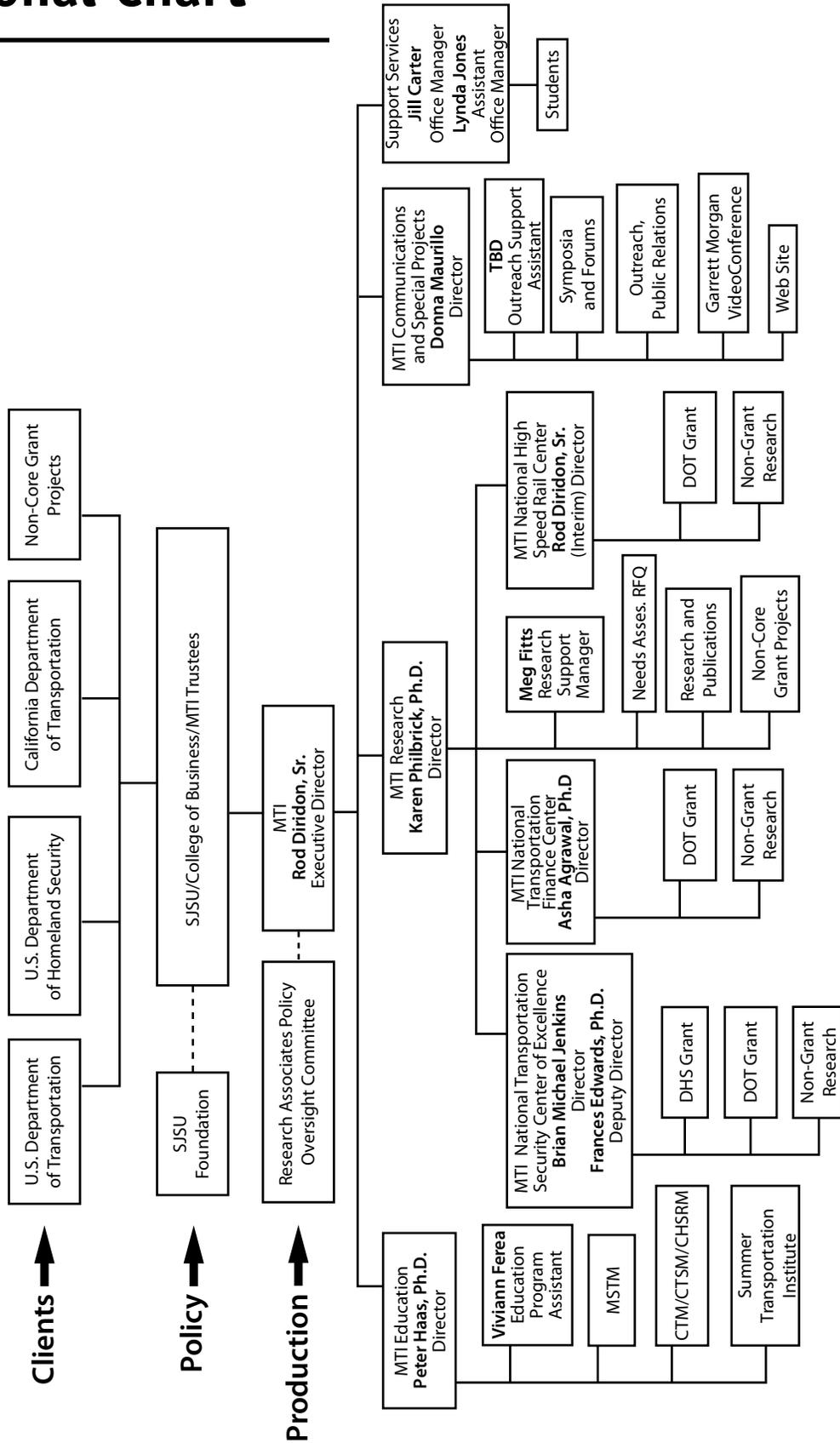


In addition to the funding noted above, MTI also received \$775,000 in grants to conduct security, counterterrorism, and disaster preparedness research projects. This funding was available only because of the research, education, and outreach capacity created by the core US DOT and Caltrans grants.

Appendix B

Organizational Chart

Mineta Transportation Institute (Created by Congress in 1991) in the College of Business at San Jose State University



Rev. 2.8.10

Appendix C

Research Associates Policy Oversight Committee (RAPOC)

Chair

Dr. Asha Weinstein Agrawal
Urban & Regional Planning

Members

Dr. Jan Botha
Civil & Environmental Engineering

Dr. Catherine Kao Cushing
Environmental Studies

Dr. David Czerwinski
Marketing and Decision Sciences

Dr. Frances Edwards
Political Science

Dr. Taeho Park
Organization and Management

Diana Wu
Martin Luther King, Jr. Library

Ex-Officio

Christine Azevedo
California Department of Transportation

Nancy Chinlund
California Department of Transportation

Rod Diridon
MTI Executive Director

Nicole Longoria
California Department of Transportation

Bob O’Laughlin
Federal Highway Administration

Dr. Karen Philbrick
MTI Research Director

Appendix D

Certified Research Associates

* = *students who became RAs*

Joy K. Adams	Mortimer L. Downey	Eric E. Ingbar
Asha Agrawal	Matthew Dresden	Hiroyuki (Hiro) Iseki*
Bhuiyan M. Alam	Frances Edwards	Brian Michael Jenkins
Gila Albert	Daniel Evans	Michael G Jones
Lewis T. Ames	Rolanda P. Farrington	Eugene Jud
Senanu Ashiabor	Stan Feinsod	Kevin Keck
Patricia R. Backer	Thomas C. Ferrera	Norman Kelley
Arthur Bauer	Christopher Ferrell*	Dongsung Kong
Michael Bernick	Robert B. Fields	Chris Kozub
Robert L. Bertini	Bradley Flamm	Kevin Krizek
Evelyn Blumenberg	Triant Flouris	Stephen Kwan
Marlon Boarnet	Ann Forsyth	Thomas F Larwin
Earl G. Bossard	Lawrence D. Frank	Anne T Lawrence
James Brent	Richard G. Funderburg, II	Eul-Bum (E.B.) Lee
Thomas Brightbill	Shengyi Gao *	Richard W Lee
Jeffrey Brown	Rick Geddes	Scott Lefaver
Bruce R. Butterworth	Kenneth Gehrt	Alan Leventhal
Lisa Callaghan	Shahin Gerami	Jonathan Levine
Peter Chun-Hung Chen	Larry N. Gerston	Sherman L Lewis III
Xeuming (Jimmy) Chen	Cynthia Glenn	Edward Lopez
Christopher Cherry*	Todd Goldman	Anastasia Loukaitou-Sideris
Woodrow W. Clark II	Daniel C. Goodrich	Paul Lukes
Michael J. Clay*	Eileen O. Goodwin	Frank Markowitz
Steven B. Colman AICP	Geoffery Gosling	Felix A. Marten
Dana Cuff	Robert Graham	Shishir Mathur
Elaine Curran	George E. Gray	Mark D McCoy
Katherine Kao Cushing	Zhan Guo	Warren McHone
David Czerwinski	Renee Haider	William Medigovich
Nancy Da Silva	Susan Handy	Marco Meniketti
Constantine P. Danopoulos	Peter J. Haas	Sudeshna Mitra
Charles Darrah	James R. Helmer	James E Moore II
Allison L. C. de Cerreño	Daniel Hess*	William F Morrison
Randy Deshazo	Aharon Hibshoosh	Gail Murray
Subhankar Dhar	Harrison (Tim) Higgins	Andrew Nash
Jennifer Dill	Judy Hilliard	John S Niles
Rod Diridon	Aseem Inam	Hilary Nixon

Cornelius Nuworsoo
Matthew O'Brien
Herbert H Oestreich
Asbjorn Osland
Robert Paaswell
Anurag Pande
Marta Alicia Panero
Taeho Park
Michael D Peck
Howard Permut
Andru M Peters
Joseph Michael Pogodzinski
Patti Post
Jae-Ho Pyeon
William J Reekmeyer
Charles Rivasplata
Caroline J Rodier*
Daniel Rodriguez
Nina Rohlich

Donald N Rothblatt
Jeffrey Sachse
Dayana M Salazar
Jean-Daniel Saphores
Deborah Salon
Brian T Scales
Justin L Scheidt
Marc Schlossberg
Mary Scoggin
Kevan Shafizadeh
Susan A Shaheen
Yoram Shiftan
Hyeon-Shic Shin
Sarah J Siwek
George C. Smith
Craig Stauffer
Ruth L Steiner
Edward C Sullivan
Ronald D Sylvia

Brian D Taylor
Gregory L Thompson
Louis Thompson
Howard Permut Turetsky
Linda O Valenty
Stephen Van Beek
Itzhak Venezia
William Vincent
Meghna Virick
Robert P Vitale
Ya Wang
Wenbin Wei
Kent Webb
John West
George Whaley
Traci Williams
Richard Willson
Asim Zia

Appendix E

Project Team Members

Since the inception of the TEA-21 grant, 138 Research Associates 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, Ph.D.
Joy K. Adams, Ph.D.
Gary Binger, AICP
Evelyn Blumenberg, Ph.D.
Marlon Boarnet, Ph.D.
Earl G. Bossard, Ph.D.
Jan Botha, Ph.D.
James Brent, Ph.D.
Jeffrey Brown, Ph.D.
Bruce R. Butterworth
Lisa Callaghan-Jerram
Dennis Church

Steven Colman, AICP
Katherine Cushing, Ph.D.
Nancy Da Silva, Ph.D.
Allison de Cerreño, Ph.D.
Donald de la Peña
Jennifer Dill, Ph.D.
Rod Diridon, Sr.
Shalom Dolev
Marilyn Easter, Ph.D.
Frances L. Edwards, Ph.D.
Daniel N. Evans, J.D.
Robert Ewers

Thomas C. Ferrara, Ph.D.
Christopher Ferrell, Ph.D.
Bradley Flamm, Ph.D.
Triant Flouris, Ph.D.
Ann Forsyth, Ph.D.
Richard G. Funderburg, Ph.D.
Kenneth C. Gehrt, Ph.D.
Shahin Gerami, Ph.D.
Larry Gerston, Ph.D.
Reed Gibby, Ph.D.
Joseph Giglierano, Ph.D.
Todd Goldman, Ph.D.

Daniel Goodrich
Eileen Goodwin
Geoffrey Gosling, Ph.D.
Steven Graham, Ph.D.
George Gray
Zhan Guo, Ph.D.
Peter J. Haas, Ph.D.
Renee Haider
Leslee Hamilton
Stuart Harvey
James Hayton, Ph.D.
Daniel Hess, Ph.D.
Aharon Hibshoosh, Ph.D.
Judith Hilliard
Thomas Horan, Ph.D.
Megumi Hosoda, Ph.D.
Doug Hunt, Ph.D.
Aseem Inam, Ph.D.
Eric Ingbar
Waseem G. Iqbal
Hiroyuki (Hiro) Iseki, Ph.D.
Brian Jenkins
Robert A. Johnston
Eugen Jud
John Kevin Keck
Norman Kelley
David Koffman
Dongsung Kong, Ph.D.
Chris Kozub
Cobbie Kwasi Harris, Ph.D.
Kathy Lapido
Thomas F. Larwin
E.B. Lee, Ph.D.
Richard Lee, AICP, Ph.D.
Scott Lefaver, DPA, AICP

Alan Leventhal
Jonathan Levine, Ph.D.
Robin Liggett, Ph.D.
Anastasia Loukaitou-Sideris, Ph.D.
Hollie Lund, Ph.D.
Stanley Malos, Ph.D.
Felix Marten, Ph.D.
Shishir Mathur, Ph.D.
R. Stephen Mattoon
Mark D. McCoy, Ph.D.
Patrick McGovern, Ph.D., J.D.
William Medigovich
Marco Meniketti, Ph.D.
Sudeshna Mitra, Ph.D.
Andrew Nash
Dick Nelson, Ph.D.
Edward Nelson, Ph.D.
John S. Niles
Hilary Nixon, Ph.D.
Cornelius Nuworsoo, Ph.D.
Matthew O'Brien, Ph.D.
Herbert Oestreich, Ph.D.
Asbjorn Osland, Ph.D.
Robert Paaswell, Ph.D.
Anurag Pande, Ph.D.
Larry Patterson
Michael Peck, Ph.D., MSW
Howard Permut
J. Michael Pogodzinski, Ph.D.
Mahesh Rajan, Ph.D.
Donald Reed, Ph.D.
Steven Reiner, AICP
Charles Rivasplata, Ph.D.
Caroline Rodier, Ph.D.
Daniel Rodriguez, Ph.D.

Nina Rohlich
Maria (Malu) Roldan, Ph.D.
Donald N. Rothblatt, Ph.D.
Dayana Salazar
Roger Salstrom, Ph.D.
Gail Sansbury, Ph.D.
Marc Schlossberg, Ph.D.
Kenneth R. Schreiber, AICP
Mary Scoggin, Ph.D.
Saloua Sehili, Ph.D.
Susan Shaheen, Ph.D.
Karl Shrum
Walter Siembab
Edward C. Sullivan, Ph.D.
Ronald Sylvia, Ph.D.
Richard Taketa, Ph.D.
Brian D. Taylor, Ph.D.
Gregory Thompson, Ph.D.
Joseph E. Trella
Jacob Tsao, Ph.D.
Linda Valenty, Ph.D.
John Vargo
William Vincent, J.D.
Martin Wachs, Ph.D.
Paul Wack, AICP
Wenbin Wei, Ph.D.
Asha Weinstein-Agrawal, Ph.D.
Richard Werbel, Ph.D.
George Whaley, Ph.D.
Andrea Whitaker, Ph.D.
Richard Willson, Ph.D.
Hing Wong, AICP
Asim Zia, Ph.D.

Appendix F

Research and Project Assistants

* = *students who became RAs*

One hundred sixty students ranging from senior-level undergraduates to Ph.D. candidates have served as research and project assistants on MTI studies, with several on more than one project. They attend school at San José State University, University of Michigan, University of California at Davis, Claremont Graduate School, California State University

at Chico, New York University, University of California at Los Angeles (UCLA), University of California at Berkeley, California Polytechnic State University (Cal Poly) at San Luis Obispo and Pomona, and University of Buffalo (State University of New York, SUNY), University of Oregon, Portland State University, and University of New Orleans.

Theresa Applegate	Adam Cohen	Judy Glickman
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