

Michigan Center for Advancing Safe Transportation throughout the Lifespan

M-CASTL

Strategic Plan



**Regents of the University of Michigan
On behalf of**

**University of Michigan Transportation Research Institute
2901 Baxter Rd., Ann Arbor, MI 48109**

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I. PROGRAM OVERVIEW

A. Glossary

AARP	American Association for Retired Persons
ARC	Automotive Research Center
CAN	Controller Area Network
CHGD	Center for Human Growth and Development
CUTC	Consortium of University Transportation Centers
DAS	Data Acquisition System
FTE	Full Time Equivalent
GSRA	Graduate Student Research Assistantship
IoG	Institute of Gerontology
ISR	Institute for Social Research
IT	Information Technology
ITES	Information Technology Education Services
ITS	Intelligent Transportation System
MADRC	Michigan Alzheimer's Disease Research Center
M-CASTL	Michigan Center for Advancing Safe Transportation throughout the Lifespan
MESA	Office of Multi-Ethnic Student Affairs
OVPR	Office for the Vice President of Research
PI	Principal Investigator
PRCM	Prevention Research Center of Michigan
RFP	Request for Proposals
RIPC	Research Information and Publications Center
RITA	Research and Innovative Technology Administration
SROP	Summer Research Opportunity Program
TRB	Transportation Research Board
TR&E	Transportation Research and Education
UROP	Undergraduate Research Opportunity Program
UTC	University Transportation Center
US	United States
US DOT	United States Department of Transportation
U-M	University of Michigan
UMCE	University of Michigan Center for Ergonomics
UMTRI	University of Michigan Transportation Research Institute

B. Center Theme

The theme of the Michigan Center for Advancing Safe Transportation throughout the Lifespan (M-CASTL) is **Safety and Mobility throughout the Lifespan**. The M-CASTL will strive to advance expertise and US technology in the many disciplines comprising the safety and mobility of both young people and older adults. This will be achieved through basic and applied research, and by fostering the application of transportation science and technology through education of new professionals and technology transfer to those in transportation-related fields. Both young people and older adults present unique

safety and mobility challenges. The University of Michigan will establish the M-CASTL to increase understanding of and address—across the different dimensions of the roadway, vehicle, and driver—the risks related to the two ends of the age spectrum. Specific thrusts of the Center will focus on understanding and addressing: the changing perceptual, cognitive, and psychomotor abilities of older drivers; the transportation needs of young people and older adults when they are unable or choose not to drive themselves; and the elevated crash risk of young drivers.

1. Relationship to National Strategy for Surface Transportation Research

The proposed activities of the Center for research, education, and technology transfer coalesce to support each of the US DOT's strategic goals. These relationships are described briefly below:

Safety

The top priority of the US DOT is to improve the safety of the US transportation system. Transportation safety is the cornerstone of the M-CASTL. By focusing the research component of the Center on both young people and older adults, the M-CASTL is targeting the two driver groups with the highest rates of fatal crash involvement per mile driven. Furthermore, targeting efforts at these two difficult demographics will enhance the transportation safety for all age groups.

“Concerns about safe driving by elderly and young drivers may lead to greater restrictions on drivers' license privileges, requiring more public transit and opportunities for walking and bicycling...”

-US DOT's Research, Development and Technology Plan

Several recent national strategic planning efforts have recognized the increasingly important role that changing demographics will play in our nation's ability to provide safe mobility for all citizens (*Department of Transportation Strategic Plan, 2003-2008; Highway Research and Technology: The Need for Greater Investment; US Department of Transportation's Research, Development, and Technology Plan, 4th Edition*). In 1950, less than 10 percent of the population in the United States was over 65 years of age. In 2000, this segment of the population was about 13 percent and by 2030 it is projected to reach nearly 21 percent. In terms of absolute numbers, those 65 years of age and older will increase from 35 million currently to about 70 million in the next 30 years.

In light of this anticipated growth in the population aged 65 and older, it is of great concern that older drivers have a fatal-crash incidence rate that, when adjusted for miles driven, is higher than for any other age group, with the exception of the youngest drivers. This is the case even though older drivers adapt their driving to times and situations in

“Increasing numbers of elderly will present safety risks that must be taken into account when designing and building vehicles and infrastructure.”

-US DOT Strategic Plan

which they feel safest. Moreover, older people have a significantly higher probability of being seriously injured or killed in a crash of given dimensions, due to increased frailty.

The positive correlation of fatal crash rates and increasing age among drivers in the later stages of adulthood is most likely linked to declining abilities related to driving, as well as to medical conditions that can impair driving by causing functional deficits. While there are large individual differences, increasing age in adulthood can lead to declining psychomotor, cognitive, and perceptual abilities.

Young, novice drivers are also a changing demographic. Today's adolescents have been described as "a tribe apart" (*A Tribe Apart*, P. Hersch, 1998), having formed a culture that is increasingly isolated from the culture of other age groups. When compared to earlier cohorts, young drivers of today have greater access to motor vehicles and are driving more miles. The unprecedented social connectivity provided by the proliferation of wireless technology has had the greatest impact on young people, with wide-spread adoption of cellular phones. The connectivity allows adolescents to extend unsupervised social interactions well into the nighttime hours, disrupting normal circadian rhythms. Young drivers are the most frequent users of cellular phones while driving. The increased exposure of young drivers to drowsy- and distraction-related crashes, coupled with other factors that have been shown to increase crash risk in this age group (sensation seeking, immaturity, and inexperience), has resulted in serious societal consequences. In 2002, nearly 6,000 teenagers died from injuries resulting from traffic crashes. Motor vehicle crashes are the leading cause of death for teenagers, with 40 percent of all teenage deaths resulting from traffic crashes. Teenage drivers have a higher crash rate than all other drivers regardless of whether rates are calculated based on population, licensed drivers, or miles driven. These statistics have stimulated major strategic transportation planning efforts to address specific ways to reduce young driver crash rates (*Department of Transportation Strategic Plan, 2003-2008; Highway Research and Technology: The Need for Greater Investment; US Department of Transportation's Research, Development, and Technology Plan, 4th Edition*).

By focusing the education component of the M-CASTL on developing broadly-trained transportation safety professionals, the Center will contribute to transportation safety by providing the US with a workforce that is well informed about transportation safety issues, as well as by training current professionals on these issues. By focusing the technology transfer component of the M-CASTL on effective communication strategies and utilizing cutting-edge information technologies, the research and education results of the Center can reach a national and global audience.

Mobility

Although driving may be a privilege, mobility is a basic human need. The US DOT has stressed that an integral aspect of mobility is accessibility; that is,

transportation must be accessible to all, including those who are elderly, have a low income, or are disabled. It is widely recognized that simply taking away the driving privileges of older adults who are having difficulty driving safely is not the answer to retaining safe mobility. First, there is great variability with respect to driving competence in the older driver group, in part because some have medical conditions that affect driving and some are healthy. Second, older drivers who perform inadequately can, in many cases, regain safe driving performance through education, remediation of physical or mental problems, self-regulation, and/or regulation by licensing authorities. Third, there is building evidence that the ability to drive may be an essential component of an older person's emotional well-being. Because using the US's current public transportation systems, walking, or relying on family members may be impractical or undesirable for many older individuals, driving remains the primary mode of transportation for satisfying those needs. The reduction in driving ability can result in reduced mobility, which can result in a decline in emotional well-being and quality of life.

Global Connectivity

This strategic goal of the US DOT is designed to accelerate economic growth and lead to freer trade. The M-CASTL's focus on safety and mobility across the lifespan encompasses several transportation modes including automobile, transit, trucking, pedal-cycle, and pedestrian. The Center's research and educational activities will serve to improve the linkages among these modes of transportation. Our utilization of information technology to disseminate knowledge will have a global reach. In addition, M-CASTL activities will likely address solutions to the burgeoning problem of providing a safe truck driver workforce. Trends point to an increasing shortage of commercial truck drivers, with few young people coming into the profession and many older drivers retiring. The M-CASTL focus on these two age groups will likely provide solutions that will allow older people to drive safely for longer and encourage safer driving by young drivers.

Environmental Stewardship

Americans are traveling more today than ever before. Annual vehicle miles of travel have quadrupled in the last four decades, with some of the largest increases occurring in the population of older adults and in the young population. Increased travel leads to increased fuel consumption and the production of greenhouse gases. A strong component of the research and education activities of the M-CASTL is to increase the use of non-automobile transportation modes and to improve the ease with which highways are utilized. Thus, the Center's activities will positively impact environmental stewardship.

Security

While not explicit, the national security goals are indirectly supported by the M-CASTL through efforts to nurture safe mobility across the lifespan and to provide trained professionals needed to develop and maintain these transportation solutions. The original vision of the interstate highway system as an

infrastructure underpinning national security has been transformed into a more comprehensive, technologically advanced transportation system meeting the national security needs in the future. The same programs and technologies that foster safe mobility across the lifespan can be used to protect both the infrastructure and national security. Thus, M-CASTL initiatives that focus on improving the highway infrastructure and the application of advanced technologies will contribute to this strategic goal.

2. Scope

Economic growth and quality of life within the Michigan region and throughout the nation depend on having a safe, available, accessible, acceptable, adaptable, and affordable system of transportation of people and goods, and at the same time, having sound environmental and societal stewardship. A number of regional, national, and global issues and trends have implications for the safety and mobility of the young and older population in the US and will help shape the scope of research and educational activities of the M-CASTL. In part, these issues and trends include:

- The aging of the population which has resulted in a dramatic increase in older drivers who are taking more trips and driving more miles;
- The aging of the commercial driver work force;
- Increasing development of medications with unknown effects on driving abilities;
- Expansion and integration of telecommunications and e-commerce into transportation systems, and the challenges (such as unsafe user practices) that will result;
- Development and implementation of active safety systems that integrate vehicles and the infrastructure;
- Increased technological complexity of transportation systems;
- Increased use of technology for social connectivity by adolescents;
- Growing involvement and influence of state and local governments, private industry, and communities in safety policy implementation;
- Increasing miles driven by young drivers leading to greater exposure to crashes;
- Economic pressures to reduce reliance on oil-based fuels;

To address these issues and trends, the M-CASTL's research, education, and technology transfer efforts will be able to draw on a number of topics within the three thrust areas:

Understanding and addressing the changing perceptual, cognitive, and psychomotor abilities of older drivers to help them maintain safe driving

- Driver, vehicle, and roadway factors related to crash risk;
- Functional abilities related to driving performance;
- Screening and assessment of drivers for fitness to drive;

- Effects of medical conditions and medications on driving;
- Driver fatigue and distraction among older drivers;
- Efficacy of education and training programs for older drivers;
- Vehicle interior and exterior design issues;
- Design and use of Intelligent Transportation Systems technologies;
- Vehicle adaptation issues;
- Roadway infrastructure design elements.

Understanding and addressing the transportation needs of young people and older adults when they are unable or choose not to drive themselves

- The relationship between mobility, social support, and well being;
- Available, accessible, acceptable, adaptable, and affordable transportation options;
- Social consequences of cognitive deterioration and aging;
- Coordination and management of complex transportation systems;
- Land use patterns and livable communities;
- Transport of wheelchair users and other users of mobility devices.

Understanding and addressing the elevated crash risk of young drivers

- Driver, vehicle, and roadway factors related to crash risk;
- Driver training and education;
- Driver drowsiness and distraction among young drivers;
- Efficacy and enhancement of graduated driver licensing programs;
- Vehicle interior and exterior design issues;
- Design and use of Intelligent Transportation System (ITS) technologies;
- Cognitive development and driving;
- Risk perception and risky driving.

C. Center Director's Summary

The M-CASTL will be an internationally recognized leader in research, education, and technology transfer dedicated to promoting safety and mobility across the lifespan. The M-CASTL will strive to conduct advanced research to accelerate the specific considerations of young and old drivers in the integration of vehicles, highways, and ITS technologies. The M-CASTL's multifaceted education program will advance the state of knowledge in transportation safety and mobility and will educate the people who will become the leaders in addressing the nation's complex transportation-related challenges. Technology transfer will play a vital role in the dissemination of results of research and educational efforts. The M-CASTL will excel at translating results into practical guidelines, standards, and other products that can be employed by government and industry professionals to sustain and strengthen our nation's transportation system.

Through its exemplary programs in safety and mobility research, education, and technology transfer, the M-CASTL will become the focal point for linkages between the academic disciplines at the U-M, state and federal government agencies and community organizations, hospitals, schools, and industry. In addition, the M-CASTL will be uniquely positioned to respond to many of the challenges that the transportation system will face over the next decade. For example, as we celebrate the fiftieth anniversary of the interstate highway system, we are facing an infrastructure that is aging. Private and commercial vehicles are lasting longer and new vehicles are being equipped with advanced information technologies. The demographics of the population are changing. Unlike 50 years ago, the majority of today's drivers are facing a lifespan that will extend beyond the time that they can safely drive. Yet their mobility needs will still need to be safely met. The effects of medications on driving will also become an increasingly important safety issue. New drivers face challenges that were not present for previous cohorts. Roadways are more congested than in the past and advances in the transportation system have increased the radius of feasible activities. The influx of wireless technology, such as cellular phones, personal digital assistants, and MP3 players, has led to widespread adoption by adolescents, leading to greater distractions while traveling. This unprecedented connectivity for adolescents has also expanded their peer social interactions well into the sleep period, disrupting circadian rhythms and increasing the frequency of drowsy driving. In responding to these challenges, the M-CASTL will leverage its position as a fully integrated center of excellence within the university to produce world class research, education, and technology transfer to ensure safety and mobility across the lifespan.

Although the U-M is already a leader in transportation research, the M-CASTL will expand and extend this leadership during the three-year grant period. The M-CASTL will be the first to focus on transportation safety and mobility for both young people and older adults. The unique focus, coupled with the extensive resources of the U-M, will attract external funding for research and education that can best be conducted at the U-M. Further, we plan to sustain the M-CASTL after the grant period by pursuing several sources of sponsorship. First, UMTRI has a 40-year history of acquiring sponsorship for transportation-related research. We plan to build on this experience and our established network to generate continuing sponsorship of the M-CASTL after the grant is over. Second, during the grant we will undertake research, education, and technology transfer activities valuable to the members of our External Advisory Board who may, in turn, be able to assist us in securing sponsorships for future Center endeavors. Third, we plan to pursue funding from the National Institute of Aging for a Roybal Center for Translational Research on Aging. Our theme and translational approach fit well with the Roybal program's long-term objectives. Finally, we will pursue sponsorship from the National Institute of Child Health and Development to develop a teen driving research center at the U-M in collaboration with the Prevention Research Center, the Center for Research on

Ethnicity, Culture and Health, Center for Women's Studies, and the Center for Advancing Research and Solutions for Society.

II. PROGRAM ACTIVITIES

A. Research Selection

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

1. Baseline Measures

The baseline measures can be found in Appendix A as Baselines 1 and 2.

2. Research Selection Program Outcome

The Center's research selection process is designed to address the theme of transportation safety and mobility throughout the lifespan. The process will enable creativity, provide fairness and objectivity, facilitate application to real-world problems, and ensure research quality. All U-M faculty and students will be informed of the process and encouraged to participate. The research selection process will involve input from a wide-range of stakeholders and include administrative and peer-review. The criteria for developing research topic areas, proposal evaluation, administrative procedures, and operating procedures will be developed by the Center's Executive Committee to ensure that the research program maintains integrity, operates as intended, and continues to meet M-CASTL's thematic and programmatic goals.

At the start of each year of the grant, the Executive Committee will review the research selection process and make adjustments as necessary. We anticipate that the research program will grow each year, increasing the number of PIs conducting projects and increasing the total expenditures for projects. As the research program grows, the M-CASTL will broaden its efforts to bring in U-M faculty from a wide range of disciplines to help address key national transportation priorities.

3. Planned Activities

3a. Required Activities

The research selection process will rely on the members of the Research Subcommittee to ensure the integrity of the research selection process. Members of the Research Subcommittee will be selected from the Executive Committee at the beginning of each grant year and will be chaired by the M-CASTL Assistant Director.

At the beginning of each year, the M-CASTL Director will lead development of a research synthesis report identifying short and long-term research needs that support the M-CASTL theme and reflecting the US DOT's national transportation research agenda. The intent of this report will be to help focus the Center's research program and to maintain continuity over each year of the grant.

The synthesis report will also serve as the background for an annual M-CASTL Transportation Research and Education (TR&E) meeting. Early in each grant year, the TR&E meeting will bring together members of the M-CASTL Executive Committee (U-M faculty), M-CASTL External Advisory Board (Non U-M stakeholders from industry, federal government, state government, and national foundations/organizations), Center faculty and students, and other appropriate individuals. During the research portion of the TR&E meeting, participants will present and discuss research needs and priorities.

Based on input received at the TR&E meeting and the research goals of M-CASTL, the Executive Committee will select the top three-to-five research priority areas for the year. The Center Director will develop criteria for evaluation and selection of the research proposals for approval by the Executive Committee.

The M-CASTL will issue a Request for Proposals (RFP) to all U-M faculty members. The synthesis report, evaluation criteria, selection process, and example proposal will be provided along with the RFP.

Five-page proposals will be accepted from faculty and reviewed by the Center staff to ensure that each proposal meets the administrative (e.g., multidisciplinary) and financial (e.g., cost match) requirements and is responsive to the RFP. Those that do not meet these criteria will be dropped from the selection process and the PIs will be notified. Those that do meet the requirements will be forwarded to a Research Subcommittee, established to oversee the research selection process, particularly the peer-review process of proposals.

Each proposal will be assigned to a member of the Research Subcommittee. Each member will locate at least three reviewers with appropriate backgrounds with the goal of having one from the US DOT and one from outside of the U-M. Individual reviewers will be provided with the proposal, evaluation instructions, and a scoring sheet for obtaining quantitative data on the proposal.

Once proposal reviews are received, the Research Subcommittee will reconvene. The anonymous written comments and scores for each proposal will be reviewed and discussed. The Subcommittee will then select proposals for funding based on the peer-reviews and priorities of the M-CASTL. PIs of unsuccessful proposals will be notified and provided with the written comments of the reviewers. PIs of successful proposals will be required to sign an agreement stating that they will follow the M-CASTL research project requirements, such as providing progress reports, drafting a final report, and taping a briefing for the Center's webpage.

Progress on projects will be monitored by the Center staff through progress reports, emails, and periodic face-to-face contact. All projects will end with a technical report that summarizes the study purpose, methods, findings, and

implications. A schematic outline of the research selection process can be found in Figure 1.

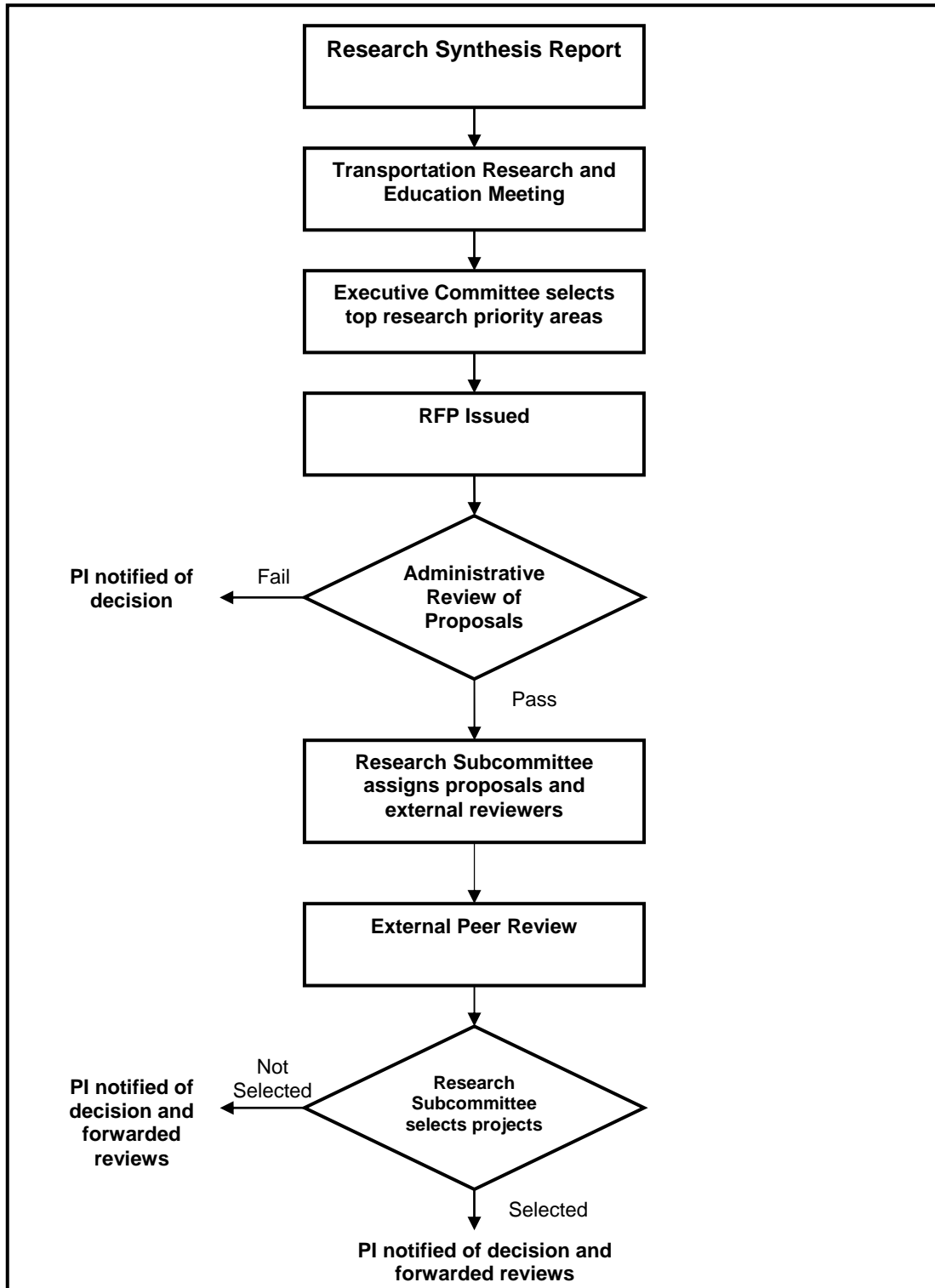


Figure 1: A schematic outline of the research selection process.

3b. Recommended Activities

The M-CASTL will also strive to support national transportation needs by addressing high-priority areas identified by the US DOT and its Operating Administrations. Two US DOT-wide priority areas identified at the time of the initial grant award are: advanced research and congestion chokepoints. As these priority areas shift over the years, M-CASTL will adjust its activities to remain on the forefront of solving the nation's most pressing transportation problems.

3b1. Advanced Research: The M-CASTL will pursue advanced research in collaboration with the State of Michigan entities, and other knowledgeable entities, in support of the Federal Highway Administration's Advanced Research Program requirements or similar requirements of other DOT operating Administrations.

3b2. Congestion Chokepoints: The M-CASTL research activities will indirectly support this priority area. The Center's theme emphasizes the importance of maintaining mobility when driving is not possible and recognizes that safety and mobility are intimately linked. The Center's activity will support efforts to develop and scientifically evaluate alternatives to driving that are available, accessible, acceptable, adaptable, and affordable for all, particularly those people most in need of non-automobile transportation. If transportation alternatives met these requirements, many of the barriers to increasing highway safety and reducing congestion could be ameliorated.

4. Performance Indicators

The M-CASTL will track its progress using Performance Indicators 1 and 2 in Exhibit A of the *Reporting Requirements for University Transportation Centers (3/06)*, referred to hereafter as the "UTC reporting requirements."

The U-M collects some education and research related performance data, but it is not aggregated by topic. M-CASTL, therefore, will allocate the resources necessary to track and summarize indicators including the number of proposals received, the number of funded projects, yearly budgeted costs, the number of PIs, the number of external research partners, and the number of students involved in research. These data will be reported to the Executive Committee and in the annual M-CASTL report.

B. Research Performance

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

1. Baseline Measures.

See Baselines 3 and 4 in Appendix A.

2. Research Performance Program Outcome

Provide matching support for 15 or more research projects that attract an equal number of students into the transportation field.

3. Planned Activities

A primary function of the Center will be to sustain a vigorous research program encompassing basic and applied projects related to improving safety and mobility for young people and older adults. The Center will encourage advanced research; that is, research that involves and draws upon basic research results to provide a better understanding of phenomena and develop innovative solutions to convey its fundamental character, its broader objectives, and the great uncertainty in expected outcomes compared to problem-solving research. The Center's research program will be focused upon three broad, societal thrusts:

- **Understanding and addressing the changing perceptual, cognitive, and psychomotor abilities of older drivers to help them maintain safe driving;**
- **Understanding and addressing the transportation needs of young people and older adults when they are unable or choose not to drive themselves;**
- **Understanding and addressing the elevated crash risk of young drivers.**

The Center will look for opportunities for “seed” monies to leverage interest from outside partners, where their participation will ensure relevance to both regional and national problems. The research program will also serve the educational goals of the Center, not only by the generation of new knowledge, but by attracting faculty and students to the field. At the same time, the educational program will serve not only to attract the best students, but to immerse them in challenging transportation problems.

Research Excellence Program: Proposals will be requested by the Center that address pressing transportation problems within one or more of the three thrust areas. Specific research topics selected will take into account national transportation needs by addressing high priority areas identified by DOT. Proposals will be required to provide some matching funds for the project cost. Respondents will be required to build a “quad-team” for research projects that consists of faculty members from at least two different U-M units, students, and government/industrial/community representatives. The quad approach will ensure multidisciplinary research, student involvement in projects, and the translation of research results into practical transportation solutions.

As an example of how the Research Excellence Program will operate, the Center may support research investigating the effects of medications on driving.

Researchers from the College of Pharmacy, Medical School, Institute of Gerontology, UMTRI, or the U-M Drive-Ability program might decide to collaborate. At least one student associated with one of these schools would be selected to participate in the project. The fourth member of the quad-team would be a non U-M entity interested in the application of the research results such as a pharmaceutical company, a government agency concerned about determining fitness to drive like a State Department of Motor Vehicles, or a citizen group interested in older driver safety like AARP. A proposal with the required cost sharing would be developed and submitted to the Research Excellence Program. The proposal would be reviewed and scored by knowledgeable reviewers. If the proposal received a high score and met the Center's objectives, then the project would be awarded to the researchers.

4. Performance Indicators

The M-CASTL will obtain the information necessary to track its progress using Performance Indicators 3 and 4 as set forth in Exhibit A of the UTC reporting requirements.

C. Education

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

1. Baseline Measures

The education program Baseline Measures can be found in Baselines 5 and 6 of Appendix A

2. Education Program Outcomes

A major focus of the Center will be to increase the visibility of transportation safety and mobility as a career field by supporting interdisciplinary transportation safety and mobility education at U-M and to provide current transportation safety and mobility practitioners with on-going education and accreditation. The Center's key strengths are its access to the breadth of educational resources at U-M, and its ability to form ties with U-M schools and departments and involve U-M faculty to achieve the Center's educational objective. The diverse specializations available through partnerships within the U-M will enable students to obtain training tailored to the current demands and needs of the transportation safety and mobility field. The following are the education program expected outcomes (with full program descriptions in section 3b):

- Develop a transportation safety certificate program and have six students complete the certificate.
- Provide funding for Ph.D. research to three students.
- Provide scholarship funding to at least three Center students.

- Attract at least three of the best and brightest graduate students to the M-CASTL Scholars Program.
- Conduct at least eight courses or training sessions using cutting edge information technology.

3. Planned Activities

In order to assist the M-CASTL educational program, an Education Subcommittee will be formed, composed of three members of the Executive Committee and chaired by the M-CASTL program coordinator. The education subcommittee will have responsibility for selecting students for the Scholars Program, locating lecturers for the Scholars program, locating appropriate faculty for the professional development program, and conducting the student-of-the-year program.

3a. Required Activities

3a1-3a2: The Center's educational program is based on three principles: multidisciplinary course work and training; student participation in research; and support for the national strategy for surface transportation research and education. The Center's diverse structure was developed to promote the truly interdisciplinary education and training that is needed to develop specialized professionals who can tackle the transportation safety and mobility needs of society, today and in the future.

3b. Planned Activities

The following educational activities are planned:

Transportation Safety and Mobility Certificate Program. An initial educational objective will be to establish a transportation safety and mobility certificate program through the U-M Rackham School of Graduate Studies. The certificate will allow graduate students to add a specialization to their primary graduate degree. No such program currently exists at the university. The certificate program in transportation safety and mobility will be a precursor to the longer-term goal of establishing a Master's degree program.

Doctoral Studies Program. UMTRI and the Office of the Vice President for Research (OVPR) have recently initiated a competition for funds to support doctoral student dissertation research in a transportation-related discipline involving collaboration of U-M faculty and UMTRI faculty. The purposes of the program are to increase opportunities for doctoral students to perform their dissertation research in UMTRI's diverse and dynamic research environment, and to increase research collaborations between UMTRI faculty and U-M school/college faculty. Total funding for the program is \$1,000,000 over three years. It is anticipated that awards will average \$100,000/year, be made annually, and run for two years. Submitted proposals are evaluated and scored by a peer-review panel consisting of at least three senior faculty members with

appropriate expertise. The program will provide funding for Ph.D. students studying transportation safety and mobility at the Center.

Patricia F. Waller Scholarship Program. The Patricia F. Waller Scholarship is offered by UMTRI to eligible graduate and senior undergraduate students from all U-M departments and schools interested in conducting research on human aspects of transportation safety and equity. The Scholarship supports students new to the field of transportation while they complete internships, conduct research for a masters or doctoral thesis, complete an independent study or other special project on an eligible transportation issue. Scholarship recipients are mentored by UMTRI faculty members. Awards range from \$500 to \$5,000. The scholarship is supported with contributions from individuals, businesses and corporations. This UMTRI program will continue to be available to Center students.

Scholars Program. Each year the Center will sponsor graduate student research and education projects by providing funding for up to three graduate Student Research Assistantships (GSRAs) on topics that are relevant to the Center's theme. GSRAs provide graduate students with the opportunity to work closely with a faculty member on an research or educational project. A GSRA also pays the student's tuition and provides a stipend. Prior to the beginning of each academic year, applications will be submitted to the Education Subcommittee. Applications will be required to have a faculty member, a student, and a specific project identified. GSRAs will be selected by the Education Subcommittee members. Selected students will be required to attend a monthly seminar that will focus on two activities. During the first part of the year, researchers from the Center, as well as several U-M Departments who are conducting research on topics relevant to transportation safety and mobility, will present lectures on relevant topics. During the last months of the students with the GSRAs will present their GSRA projects to their peers. The seminar will provide students with direct contact with researchers from a variety of disciplines, provide education on a wide variety of topics relevant to transportation safety and mobility, and give students the opportunity to develop their presentation skills. Because students will be pre-screened, the best and brightest will get to receive practical, advanced training in transportation safety and education.

Professional Education Program. Another primary educational objective of the Center will be to expand the U-M's role in continuing education for transportation safety and mobility practitioners through the use of various media, including typical on-site education, as well as web-casting, video streaming, smart boards, and other media. These approaches will reach widely dispersed audiences efficiently and cost effectively, while eliminating long-distance travel. Topics for courses or training sessions will be developed through input from the Center's Advisory Board, an Annual Conference, and requests from community groups. UMTRI faculty's current use of video streaming to teach courses to remote audiences will be expanded and enhanced as part of the Center's activities. At

least one course will be developed to help transportation safety and mobility specialists from Michigan Metropolitan Planning Organizations stay current with transportation issues. The Center will also provide educational and training opportunities such as transportation safety and mobility training modules, through electronic media such as its web site.

Global Education Program. The M-CASTL plans to provide educational and training opportunities through electronic media such as its web site. Transportation safety and mobility training modules will be developed and placed on the web site, alongside our publications, for global access to English-speaking audiences. Where possible, modules will be translated to Spanish. Topics for possible modules will be developed from input from the Advisory Board and Executive Committees. Content for modules will be developed by interested Core Faculty and converted into a web-based format by the Center's staff.

Outstanding Student of the Year Award Program. Each year M-CASTL will select one outstanding student of the year. This student will be selected by the Education Subcommittee. Students will be nominated by U-M faculty and supported by a statement of the student's accomplishments. The winning students will be funded by the M-CASTL to attend the annual TRB meeting to attend the Student of the Year award ceremony. The student will also receive a \$1,000 award.

The Center's activities will benefit from existing U-M educational activities. Existing activities that will enhance the Center's educational objective include:

- *Independent Study:* Independent studies allow students to do lab or library research under the direct supervision of a faculty member.
- *Education in Graduate Research:* This program provides practical education of students by providing hands-on experience in research and teaching through graduate assistantships.
- *Undergraduate Research Opportunity Program (UROP):* This program creates research partnerships between first and second year students and U-M faculty, with a strong focus on diversity.
- *Summer Research Opportunity Program (SROP):* This program offers talented minority undergraduate students interested in graduate study and academic careers, exposure to the graduate school experience and faculty life through mentor-guided research.
- *Pre- and Post-Doctoral Studies:* There are currently pre- and post-doctoral studies opportunities at various centers, institutes, and departments at the U-M.

4. Performance Indicators

The M-CASTL staff will obtain information necessary to track education progress using Performance Indicators 5 and 6 in Appendix A of the UTC reporting

requirements. Each year, the M-CASTL will summarize these data and present them to the Executive Committee and in the Annual Report.

D. Human Resources

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

1. Baseline Measures

The human resources measures can be found in Appendix A as Baselines 7, 8, and 9.

2. Human Resources Program Outcome

The M-CASTL expects to increase the number of students, faculty, and staff substantively involved in activities each year.

3. Planned Activities

3a. Recruitment Activities

The M-CASTL research, education, and technology transfer activities were designed, in part, to attract U-M students, faculty, and staff to the field of transportation safety and mobility while strengthening the opportunities for students, faculty, and staff already working in the field.

Graduate Student Recruitment: Several activities will take place in conjunction with the M-CASTL educational and research programs, in order to recruit the best and brightest graduate students into the transportation field. The Doctoral Studies and Scholars Programs provide financial incentive to learn about and conduct research in transportation safety and mobility. The Certificate Program will also provide students with the opportunity to learn about the multidisciplinary field of transportation safety and mobility. Graduate students can also participate substantively in research projects through the Research Excellence Program, by collaborating with U-M faculty.

Undergraduate Student Recruitment: In order to recruit top undergraduates into the study of transportation safety and mobility, financial incentives can be obtained through the Patricia F. Waller Scholarship Program. Undergraduate students can also participate in research projects through the Research Excellence Program, by collaborating with U-M faculty.

Faculty Recruitment: The M-CASTL will actively recruit U-M faculty to participate in all of the Center's activities, including teaching the Scholars Program seminars and Certificate Program Courses. All of the research programs supported by the M-CASTL include U-M faculty involvement.

3b. Outreach Activities

The M-CASTL will be actively engaged in outreach to U-M students, U-M faculty, the State of Michigan, the nation, and internationally through the various technology transfer programs outlined in section F3 of this plan. These activities include a yearly international conference, web seminars, several types of publications, and briefings on research projects.

4. Performance Indicators

M-CASTL staff will collect information necessary to track human resources progress using performance indicators 7, 8, and 9 in Appendix A of the UTC reporting requirements. Each year, the M-CASTL will summarize these data and present them to the Executive Committee and in the Annual Report.

E. Diversity

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

1. Baseline Measures

RITA no longer requires the collection of performance measures regarding diversity. M-CASTL, therefore, will not have a reporting requirement for this goal.

2. Diversity Program Outcome

The M-CASTL recognizes the rich contribution that a diverse body of students, faculty, and staff will bring to the Center and its programs. The composition of students, faculty, and staff participating in Center activities should reflect the composition of the U-M as a whole. During the grant period, women and minorities will be encouraged to participate in Center activities.

3. Planned Activities

The M-CASTL Director and Assistant Director will work with the U-M Office of Multi-Ethnic Student Affairs (MESA) and the U-M William Monroe Trotter Multicultural Center to ensure that the Center's activities are promoted to a diverse range of students. The Center will leverage its relationship with various University organizations and programs, such as UROP, that have established traditions of valuing and promoting diversity to ensure it reflects a broad spectrum of students and faculty.

4. Performance Indicators

RITA no longer requires the collection of performance measures regarding diversity so M-CASTL will not have a reporting requirement for this goal.

F. Technology Transfer

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

1. Baseline Measures

The technology transfer program baseline measures can be found in Appendix A under Baselines 10 and 11.

2. Technology Transfer Program Outcomes

The dissemination of the knowledge generated from both basic and applied research is a key component of the Center. The U-M has a long tradition of contributing not only to the development of fundamental knowledge but also of translating basic knowledge into practical applications to address real needs in the world of traffic safety. Examples include an annual short course hosted by UMTRI in vehicle dynamics for vehicle designers in industry; the regional community partnership center operated by the Urban and Regional Planning Program to work with community groups to promote transportation equity; contributions by Center faculty to the development of numerous national and international standards for testing, design, and performance of vehicle technology; and the conduct of field operational tests of advanced driver assistance technology in partnership with manufacturers and government agencies to develop and test technologies in the pre-production phase. The following are the M-CASTL program outcomes:

- Host one conference with international representation;
- Implement the website to provide web-casts of transportation seminars;
- Initiate the library of “Web briefings” as projects are completed;
- Publish the newsletters and annual synthesis reports.

3. Planned Activities

Technology transfer is typically accomplished through conferences, scholarly publications (e.g., peer-reviewed journal articles, technical reports, and book chapters), lay-publications (e.g., newsletters), presentations, and web sites. The Center, however, recognizes that an important aspect of technology transfer is synthesizing knowledge into a form that is readily accessible to those who need the information, such as guidelines and standards. The Center’s Technology Transfer Program has been developed to both encourage the synthesis of information and to take advantage of state-of-the-art information technology to reach as wide an audience as possible. The M-CASTL will be actively engaged in technology transfer by conducting the following activities.

3a. Required Activities

3a1. Center Web Site: A website based at the Center will provide updates on research activities, web access to completed projects, host the library of briefings

on completed projects, and provide links to related sites. The website will host training and evaluation tools, such as the *Driving Decisions Workbook*, a self-screening tool for older drivers. The website will also contain the information required by the UTC reporting requirements.

3a2. Participation in UTC/DOT related meetings: The Center will participate in occasional meetings of UTC and/or DOT experts on high-priority topics and will provide expert advice to DOT on technical or educational topics as requested by the DOT.

3b. Other Activities

The following activities will be newly implemented as part of the Center's technology transfer program:

Annual Conference: The Center and its faculty will host an annual conference with international representation from leading researchers and transportation safety practitioners, as well as other stakeholders such as nonprofit organizations representing the aged, vehicle manufacturers, and private industry. The conference will provide an opportunity for researchers to learn about the practical issues faced by transportation practitioners, and for the practitioners to learn about the latest research in their areas of responsibility and interest.

Web Briefings Program: A "Web Briefings" program will provide concise summaries of completed research projects in a video format available through the Center's website. Center-funded research projects will be required to provide a short summary of the findings and the application of the results for safety and mobility. These briefings will provide convenient and rapid access for transportation practitioners to research in areas of current concern, and focus researchers on the need to make their results accessible to a broad audience.

Quarterly Newsletter: The Center will publish a quarterly newsletter detailing Center activities and providing briefs of continuing Center-sponsored research.

Web Transportation Seminar Series: The Center will host a Web Transportation Seminar Series program in which Center-funded researchers can present research results in an informal setting that encourages interchange with transportation practitioners and other stakeholders. These seminars would be similar to "brown bag" colloquia, but use web-cast technology to engage a wide variety of interested parties efficiently.

Annual Synthesis Report: The Center will publish an annual synthesis report, led by the Director, which will provide a written summary of continuing and completed research, relate that research to the issues of safety and mobility, and provide guidance for future research and educational activities.

Annual Report: In addition to the synthesis report, an annual report will summarize the activities and accomplishments of the Center.

The following currently ongoing activities will continue to be encouraged as part of the Center’s technology transfer program:

- *Publications:* Center-funded research projects will result in publications in a variety of forms including scholarly publications in peer-reviewed journals, as well as technical reports, books and book chapters, and guidelines and workbooks to address specific issues.
- *Presentations:* Research results will be presented at scholarly conferences such as the annual meetings of the Transportation Research Board, the Association for the Advancement of Automotive Medicine, and Society of Automotive Engineers.
- *Standards and Guidelines:* Center faculty members have contributed to the development of numerous standards and guidelines in vehicle design, testing, performance standards, and model legislation. These provide a very practical way to translate research into practice. The thrust of Center research will continue to support these activities
- *Committee Membership:* The Center’s faculty serve on international, national, and regional committees, both scientific and advisory. These provide an effective way to lead the nation’s efforts to improve transportation safety and mobility. The Center’s expected faculty is active in developing policy and setting national research agendas through involvement in transportation-related committees.

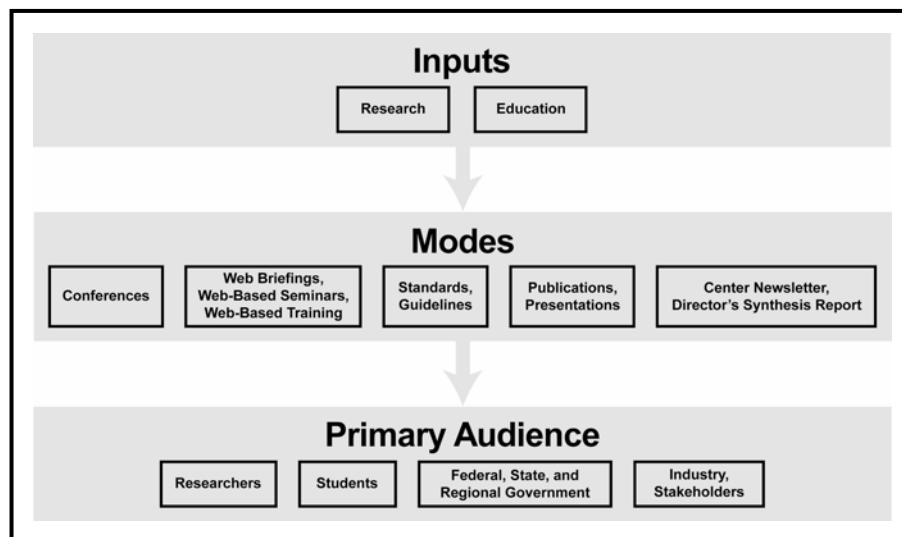


Figure 2: Diagram of the M-CASTL Technology Transfer Activities

III. MANAGEMENT APPROACH

A. Institutional Resources

The U-M was founded in 1817. Today there are more than 40,000 students, about one-quarter of which are graduate students, and an estimated 425,000 living alumni. Degree programs at the bachelors, masters, and doctorate level are offered in a broad range of disciplines including engineering, business, law, public health, psychology, urban planning, and public policy, as well as graduate degrees in medicine, pharmacy, and nursing. Continuing education courses are provided for working professionals in the form of late day and evening classes, as well as summer conferences and short courses.

The Center, which will be housed in the UMTRI building, will complement other U-M resources, serving as a bridge between disciplines and stimulating interactions which otherwise would not occur. We anticipate that this will result in a “transportation presence” felt in the academic units because of the opportunities for new research and student support. The following is a partial list of the vast resources that could be drawn upon by Center faculty and students to help the Center achieve its research, education, and technology transfer objectives, although we would not expect all of them to be involved in the Center’s activities at any given time.

1. The University of Michigan Transportation Research Institute (UMTRI)

UMTRI was founded in 1965 through gift funds to the U-M totaling \$10,000,000, of which \$4,000,000 was used to construct the present four-story building. UMTRI is currently operating a \$16,000,000 per year transportation-research program. The multi-disciplinary approach to solving transportation-related problems taken by UMTRI is reflected in the variety of disciplines represented within the Institute, and by its involvement with other units at the University. Present staff is about 150 including 60 permanent research staff and 12 teaching faculty affiliated with University academic departments. Many basic research questions can best, and in some cases only, be answered by a multi-disciplinary approach seldom possible in the traditional disciplinary structuring of a University. One objective of UMTRI is to provide a setting for University faculty in which this can be accomplished to generate new basic knowledge and to provide student training at several levels. UMTRI houses several resources that are relevant to Center activities.

Research Information and Publications Center (RIPC): This facility provides a specialized information service for Institute staff and other members of the transportation research community. Its collection includes more than 110,000 catalogued documents and more than 210 periodical titles. The subject areas of the collection reflect the many different ways in which transportation problems can be approached, with materials drawn from the literatures of engineering, physics, medicine, public health, law, economics, psychology, sociology,

computer science, and other fields. The RPC employs a unique, computerized, classified topic file to assist retrieval, and provides the UMTRI staff with access to all other U-M library resources. The RPC also has access to a variety of commercial databases and document delivery services.

Driving Simulator: The driving simulator uses custom software to present road scenes and collect driving performance data. Roads in the simulator are displayed on four screens in high resolution. Multiple types of roadways and conditions can be simulated.

Eye Fixation Recording System: UMTRI houses a FaceLab off-head eye fixation recording system designed to be fitted either in a test vehicle or in the simulator. The system is easy to calibrate, works with subjects wearing glasses, and provides real time information concerning the x, y, z, and pitch, roll, yaw of the head, and pitch, roll, and yaw of the eyes, as well as eye lid closure.

Instrumented Vehicle Fleets: UMTRI has a fleet of vehicles with extensive instrumentation onboard to support research on a very wide array of topics. Instrumentation and capabilities include: long and short range radars; cameras for recording inside or outside of the vehicle; in vehicle audio; access to CAN bus signals (e.g., speed, turn signal activation, cruise control activation); global positioning system; lane tracking; vehicle motion sensors; and the ability to collect hundreds of hours of driving data and automatically transmit data to UMTRI through cellular phone service.

Data Acquisition System: The data acquisition system (DAS) is a networked pair of processors with supporting peripherals that serves to record the sensor data during the test-track and the natural use driving studies. The software onboard the DAS is part of an integrated collection and analysis system that loads the onboard data into relational databases, allowing for efficient organization and the application of powerful analysis software tools. DASs can be fitted to a subject's own vehicle.

Naturalistic Driving Database: UMTRI has assembled naturalistic driving data from several large USDOT-funded field operational tests (FOTs). The resulting driving dynamics database is based on some 500,000 miles of driving, involving hundreds of drivers. The databases contain information on drivers (based on questionnaires and demographic data), trips carried out (including GPS data) and some 200 or more channels of time-referenced data such as vehicle dynamics, driver control actions, driving environment, nearby traffic and system status. In addition, video of the driver's face and the forward scene is also available. The database has been constructed to facilitate rapid and comprehensive acquisition of any defined driving scenario using metadata. The database may be used to test associative hypotheses based on the wide range of variables contained in the database. The database may also be used to test algorithms for potential use in technologies for crash risk reduction and crash avoidance.

Sled Impact Test Facility: The UMTRI impact sled is a 2-meter-square platform that travels on an 18-meter track into a pneumatic decelerator to simulate typical crash velocities and decelerations. The duration and magnitude of the impact can be captured and digital high-speed video cameras record the kinematics of vehicle components and instrumented crash dummies. UMTRI has a variety of instrumented test dummies enabling evaluation of restraint systems and vehicle components for a range of occupant sizes.

Impact Biomechanics Facilities: UMTRI's biomedical and impact laboratories include state-of-the-art facilities for handling and testing biological materials and human surrogates. The laboratories include a pendulum impactor for delivering controlled impact loading to test dummies and other test surrogates, facilities for conducting static airbag deployment tests to investigate the biomechanics and injury mechanisms of airbag-induced injuries in simulated automotive environments, an Instron compression/tension testing machine, and a dynamic tissue test device for studying quasi-static and dynamic loading properties of biological tissues and synthetic materials.

Vehicle Ergonomics Laboratories: Data on occupant posture and body dimensions are gathered using portable coordinate measurement equipment and using optical motion-capture equipment. A variety of anthropometric measurement facilities are available to collect standardized body measurements, as well as measurements that describe the posture, position, and movement of motor-vehicle occupants seated in test vehicles or laboratory mockups of vehicle interiors.

2. Engineering Resources

The Automotive Research Center (ARC): The ARC is a U-M-based US Army Center of Excellence for advancing technology of high fidelity simulation of military and civilian ground vehicles. It represents the key basic research partner of the National Automotive Center at the US Army Tank-automotive and Armaments Command in Warren, Michigan. The Center supports development of a realistic distributed interactive simulation network for designing large complex systems, and promotes technical and cultural interaction between the defense and civilian automotive sectors.

Biomechanics Research Laboratory: This laboratory is located in the Department of Mechanical Engineering at the U-M. Theoretical and experimental investigations in the laboratory are aimed at reducing the incidence of unintentional injuries in the population. Research projects are designed to achieve scientific insights, as well as to train undergraduate and graduate students, post-doctoral fellows, and young faculty in state-of-the-art multidisciplinary research procedures.

University of Michigan Center for Ergonomics (UMCE): Located in the College of Engineering, the UMCE was established more than 50 years ago to further

knowledge about human abilities as they relate to how humans interact with equipment in all settings including work, transportation, defense, daily living, education and leisure. Research and models developed at the UMCE are widely used by engineers, designers and safety and health professionals for analysis and design of human machine systems and to address problems related to productivity, quality, safety, health, and aesthetics.

3. Aging-Related Resources

Claude D. Pepper Older American Independence Center. The Center was established in 1989 with a \$6.1 million grant from the National Institute on Aging. Its goals are to advance research on health care problems of the elderly and to train future academic leaders in geriatrics. Drawing on the large base of research currently underway in the fields of geriatrics and gerontology at the U-M, the Center fosters collaborative multidisciplinary research to integrate basic science, clinical science, and health services research relevant to the health care problems of older adults.

The U-M Drive-Ability Program. The program is part of the Occupational Therapy Division in the Department of Physical Medicine and Rehabilitation of the U-M Health System. It provides comprehensive driving evaluations for individuals with physical, visual/perceptual, and/or cognitive impairments. Services are coordinated with certified driver rehabilitation specialists, equipment vendors, and the Michigan Secretary of State. The program is committed to promoting the safe return to driving for the injured, disabled, or aged.

Institute of Gerontology: The Institute of Gerontology (IoG) is home to a world-class faculty whose research interests range from the social and economic to the molecular and biological changes that occur in an aging population. While diverse in their own disciplines, IoG faculty is committed to pursuing interdisciplinary/multidisciplinary research projects that look at the changes of aging from all aspects. The IoG director, Dr. Jeffrey Halter, is a member of the Center's Executive Committee.

Michigan Alzheimer's Disease Research Center (MADRC): The Center was established in 1989 at the U-M with funding from the National Institute on Aging. The MADRC strives to ensure that all individuals and families in Michigan have access to the most advanced diagnostic and treatment techniques and the most current information about research findings.

Michigan Center for Urban African American Aging Research: The Michigan Center for Urban African American Aging Research is a collaborative enterprise between the U-M and Wayne State University fostering high quality scholarly and empirical training, research, and interventions focused upon health promotion and health among older racial and ethnic minority populations. The principal investigator for this project, Dr. James Jackson, is a member of the Center's Executive Committee.

U-M Geriatrics Center: The Geriatrics Center was established in 1987 to enhance geriatrics-related research, education, and patient care by improving interaction and cooperation among faculty representing various schools and institutes at the University. Over one hundred affiliated faculty members are principal investigators on grants totaling approximately \$25,000,000 per year in direct costs.

4. Adolescence-Related Resources

Prevention Research Center of Michigan (PRCM): The mission of the PRCM is to expand and share knowledge, thereby strengthening the capacity of the community, the public health system, and the University to improve the public's health. The PRCM conducts community-based participatory prevention research aimed at improving the health status and reducing morbidity and mortality among populations experiencing a disproportionate share of poor health outcomes.

Center for Human Growth and Development (CHGD): The CHGD was established in 1964 to further the understanding of the complex processes by which human beings grow and develop. The CHGD currently has 26 faculty members with tenure appointments in one of the University's schools or colleges, and six faculty associates with research appointments at CHGD. With multidisciplinary collaborations among biomedical, behavioral, and social scientists, the long-range goal of research and training at the Center is to optimize children's physical, cognitive, and socioemotional development.

5. Information Technology Resources

U-M Information Technology Services: The U-M has many computing and information technology (IT) services designed to assist in teaching and research. All U-M faculty and students have access to the vast IT resources available at the U-M, including campus-wide computing sites, and wireless access. The U-M provides several IT services to assist faculty and students, including: UM.SiteMaker (for assisting non-technical people in designing custom web sites); CTools (an online system for research, project and course management); and Virus Busters (a service for controlling and preventing computer viruses).

IT Education Services (ITES): ITES is dedicated to providing quality computer training and education to U-M faculty, staff, students, and others in the larger community. ITES staff helps people acquire and improve their technical skills.

B. Center Director

The M-CASTL will be organized as shown in Figure 3. The M-CASTL will be administered by a Director, an Assistant Director, a Program Coordinator, and an Executive Committee composed of U-M personnel. An Advisory Board consisting of industrial, governmental, community and academic partners from outside of the U-M will provide input into the direction of M-CASTL activities. The core

faculty and students will be from the U-M and will participate in M-CASTL activities.

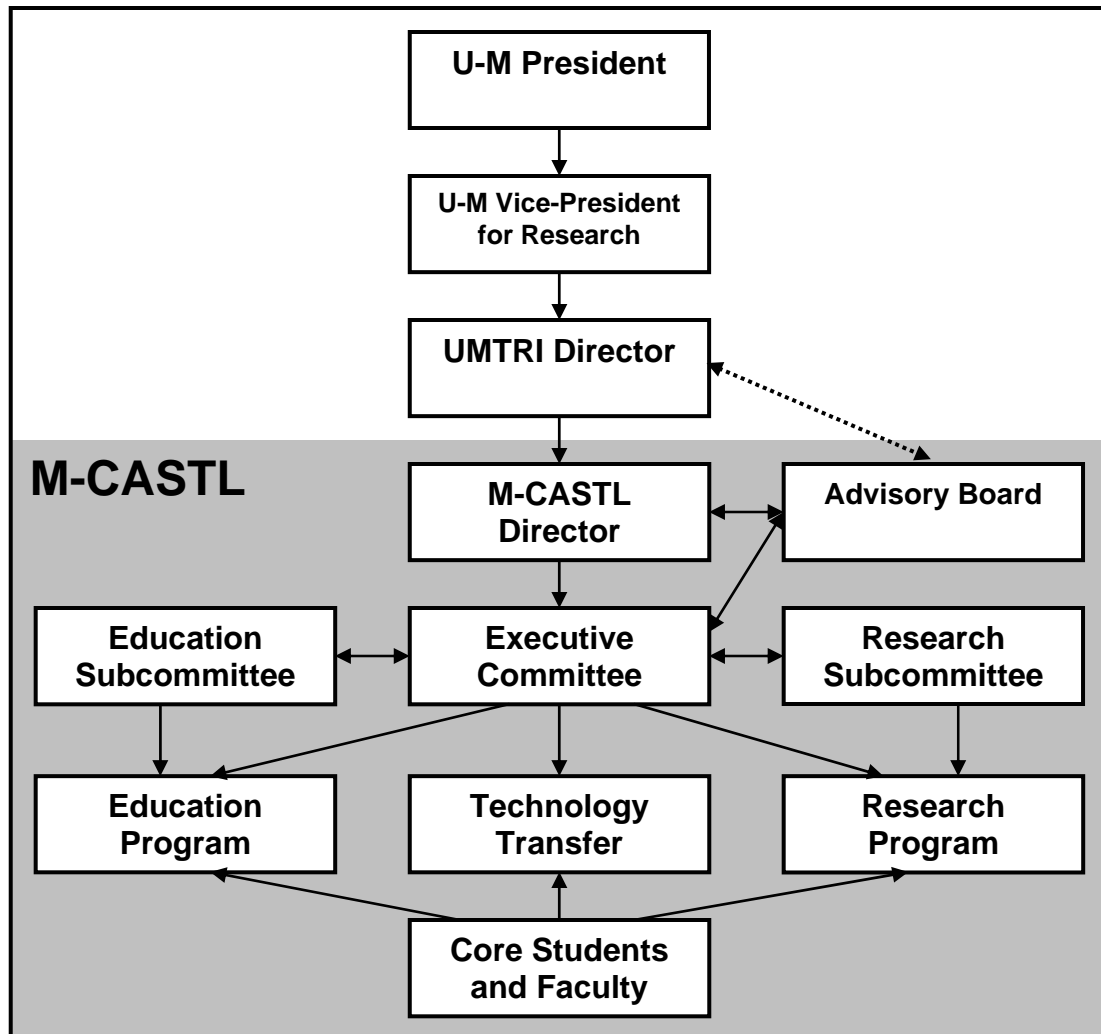


Figure 3: Administrative structure of the M-CASTL.

The Center Director will be David W. Eby, Ph.D. Dr. Eby is a Research Associate Professor and Head of UMTRI's Social and Behavioral Analysis Division. He has been actively engaged in traffic safety research and education for 13 years. Dr. Eby holds a doctorate degree in experimental psychology from the University of California, Santa Barbara. An important component of Dr. Eby's research has been to improve the safety and mobility of older people. He has investigated how in-vehicle navigation assistance systems might be useful for maintaining safe driving in the older population and led the development and testing of a self-screening instrument intended to educate older drivers about their current abilities, what those abilities mean for safe driving, and what older people can do to continue driving safely. He has directed more than 40 projects

and published more the 100 articles and reports. Dr. Eby is a co-convenor for the Transportation and Aging Interest Group of the Gerontological Society of America and an Associate Editor of *Accident Analysis & Prevention*.

Dr. Eby will commit 50% of his time to direct the Center. He will be responsible for implementing the Center's strategic plan and ensuring compliance with all other UTC program requirements. Dr. Eby reports to Dr. Peter Sweatman, the Director of UMTRI. UMTRI is a unit under the U-M Office of the Vice President for Research (OVRP). OVRP reports to the President of the University of Michigan. Dr. Eby's duties will include:

- Interfacing with the Consortium of University Transportation Centers (CUTC);
- Oversight of all Center programs and operations;
- Serving as the primary contact with the US DOT;
- Preparing and disseminating semi-annual and annual reports of the Center;
- Acting as a liaison with Center partners;
- Monitoring financial management activities of the Center;
- Serving as a spokesperson for the Center at regional and national meetings;
- Serving as the Center representative at Center Directors meetings;
- Overseeing the peer-review process for awarding research projects;
- Overseeing publication and dissemination of Center reports;
- Coordinating publicity and dissemination of Center success stories;
- Overseeing Center educational activities and initiatives;
- Chairing the Center Executive Committee meetings.

C. Center Faculty and Staff

Ms. Lisa J. Molnar, M.H.S.A. will serve as the M-CASTL's Assistant Director. Ms. Molnar is a Lead Research Associate in the Social and Behavioral Analysis Division of UMTRI where she has worked since 1986. Ms. Molnar will commit 50% of her time to help oversee and administer Center activities. She will also coordinate the Center's research activities and facilitate the translation of these activities into the various technology transfer activities. Specifically her duties will include:

- Assisting the Director in Center oversight;
- Coordinating with state, federal, and other Center partners to identify new program needs;
- Coordinating the research selection process and Chairing the Research Subcommittee;
- Assisting in monitoring of ongoing research projects;
- Facilitating the translation of research products into technology transfer activities;

- Co-organizing the annual conference.

Mr. Jonathon M. Vivoda will serve as the Center's Program Coordinator. Mr. Vivoda is a Research Associate in the Social and Behavioral Analysis Division of UMTRI where he has worked since 1998. Mr. Vivoda will commit 50% of his time to this position and will have responsibility for the development and coordination of the Center's educational activities. Specifically his duties will include:

- Coordinating with state, federal, and other Center partners to identify new program needs;
- Coordinating the Center's educational programs;
- Chairing the Center Education Subcommittee;
- Facilitating the translation of educational products into technology transfer activities;
- Co-organizing the annual conference.

The Center's financial and clerical responsibilities will be met by Ms. Judy Settles, a grants and contracts specialist, who will devote 25% of her time to the Center and an account/student services specialist who will devote 75% of his or her time to the Center. The responsibilities of this team will include:

- Maintaining financial records, including: preparing a detailed annual budget for the Center, assisting in the preparation of budgets for individual projects, monitoring all expenditures, and tracking and documenting matching funds;
- Administrative support functions, including: scheduling and recording committee meetings, obtaining and preparing information requested by the US DOT, responding to external queries about Center functions, maintaining and archiving project documentation, and maintaining the Center directory;
- Reporting functions, including: maintaining a database of all publications, distributing publications, preparing project descriptions, and helping to generate quarterly and annual reports.

The Center will also employ an Editor (Ms. Monica Milla; 10% effort), a Senior Graphic Artist (Ms. Shekinah Errington, 10% effort), and a Web Site Programmer (Mr. Robert Kennedy; 25% effort). All will work with the Center's personnel to develop effective educational and technology transfer content. Specific responsibilities of the Editor, Graphic Artist, and Web Programmer will include:

- Design and development of the Center's web page;
- Development of content for the Center's web page and newsletter;
- Editing and graphic art services for all Center publications;
- Assisting in the development of news releases for Center findings and activities;

- Development of content for Center publicity.

The Executive Committee is composed of an academically and ethnically diverse group of U-M faculty, an OVPR representative, and six UMTRI representatives. This committee will meet formally four times per year and maintain communication through email and the Center's website between meetings. The responsibilities of the Executive Committee members are:

- Development and implementation of the Center's Strategic Plan;
- Development of programmatic research areas;
- Development of programmatic educational opportunities;
- Selection of research projects based on peer-review scores and Center needs;
- Guidance for all Center activities.

The following U-M faculty members have agreed to serve on the Executive Committee:

Frank Ascione, *Professor of Social and Administrative Sciences, Dean, College of Pharmacy;*

William Barsan: *Chair and Professor of Emergency Medicine, Medical School;*

Rosina Bierbaum: *Dean and Professor of Natural Resources and Environment, School of Natural Resources and Environment;*

Richard Gonzalez: *Professor and Chair, Department of Psychology;*

Jeffrey Halter: *Professor of Internal Medicine, Chief, Division of Geriatric Medicine, Director, Geriatrics Center, Medical School, Research Professor, Institute of Gerontology;*

James Jackson: *Director, Institute of Social Research, Faculty Associate, Institute of Gerontology, Professor Health Behavior and Health Education Department, Professor, Department of Psychology, Research Professor, Research Center for Group Dynamics;*

Daniel P. Keating: *Director and Research Professor, Center for Human Growth and Development, Professor, Psychology/Psychiatry/ Pediatrics;*

Jonathan Levine: *Academic Program Chair and Professor, A. Alfred Taubman College of Architecture and Urban Planning;*

James MacBain: *Director, Government Relations, College of Engineering;*

Kenneth E. Warner: *Dean and Avedis Donabedian Distinguished University Professor, School of Public Health.*

The following OVPR representative and UMTRI Faculty have agreed to serve on the Executive Committee:

C. Raymond Bingham: *Research Associate Professor, UMTRI, Research Associate Professor, Psychiatry Substance Abuse, Medical School;*

Daniel Blower: *Associate Research Scientist, UMTRI;*

Steven Ceccio: *Associate Vice President, OVPR;*

Timothy Gordon: *Research Professor and Head of Engineering Research Division, UMTRI, Professor of Mechanical Engineering;*

Paul A. Green: *Research Professor, UMTRI, Adjunct Associate Professor, Industrial and Operations Engineering, College of Engineering.*

Walter S. McManus: *Research Scientist and Head of Automotive Analysis Division, UMTRI;*

Lawrence Schneider: *Research Professor and Head of Biosciences Division, UMTRI, Research Professor, Biomedical Engineering.*

The M-CASTL's Advisory Board is composed of non U-M stakeholders who have an interest in the Center's activity. The Board will be chaired by Dr. Peter Sweatman. Confirmed committee members represent local, regional, and national transportation interests. The Advisory Board will have an annual meeting each year with the Center Director, Executive Committee, and representatives of the US DOT. Throughout the year communication will be maintained through e-mail and the Center's web site. The responsibilities of Advisory Board members will include:

- Provision of input for research program development;
- Provision of input for educational program development;
- Provision of financial support to assist in matching costs for non governmental members.

The following members of stakeholder organizations have agreed to serve on the Advisory Board:

Peter Sweatman (Chairperson): *Director, UMTRI;*

Alby Berman: *US Director of Marketing, Takata;*

Brent Blair: *Managing Director, Oakland County Road Commission;*

Frank Cardimen: *Executive Director, Transportation Improvement Association, Oakland County;*

Robert M. Clarke: *President, Truck Manufacturers Association;*

Greg Cook: *Executive Director, Ann Arbor Transportation Authority;*

Ann Dellinger: *Epidemiologist and Team Leader, Deputy Associate Director for Science (Acting), Centers for Disease Control and Prevention;*

John Dierberber: *State Program Manager, Federal Motor Carrier Administration Michigan Division;*

Mark Huber: *Manager, Advanced Technology, Daimler Chrysler;*

Peter Kissinger: *President and CEO, AAA Foundation for Traffic Safety;*

David S. McClimon: *President, Con-way Freight, Inc.;*

Donald McNamara, *Regional Administrator, National Highway Traffic Safety Administration Great Lakes Region V;*

David Morena: *Safety and Traffic Engineer, Federal Highway Administration;*

Michael Prince: *Division Director, Michigan Office of Highway Safety Planning;*

Linda Scarpetta: *Manager, Childhood and Unintentional Injury Prevention Section, Michigan Department of Community Health;*

Marisol Simón, *Regional Administrator*, Federal Transit Administration Great Lakes Region V (Membership is pending FTA Headquarters Approval);
Kirk Steudle: *Director*, Michigan Department of Transportation;
James P. Vondale: *Director Automotive Safety Office*, Ford Motor Company.
Drew Alan Walker: Michigan Offices for Services to the Aging

D. Multiparty Arrangements

There will be no multiparty arrangements. All research, education, and technology transfer activities will be managed by U-M faculty and staff.

E. Matching Funds

Matching funds will come from a variety of sources including the University of Michigan Office for the Vice President of Research, The University of Michigan Transportation Research Institute, and Center conference fees. Matching funds will also come from a variety of sources including salaries, fringes, and imputed indirect cost for U-M paid personnel who will work for the Center and U-M funded educational activities that are part of the Center. A total of \$1,005,982 have been identified as matching funds for the first year of the Center. All matching fund use will conform to 2CFR215 (OBM Circular A-110), including funding allowed under section 503, 504(b), or 505 of Title 23 USC.