

MIOH (Michigan Ohio) University Transportation Center

Strategic Plan

First Year: September 1, 2006 – August 30, 2007

**University of Detroit Mercy (lead institution)
Bowling Green State University
Grand Valley State University
University of Toledo
Wayne State University**

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STRATEGIC PLAN TABLE OF CONTENTS

| | | |
|------|---|----|
| I. | Program Overview | 3 |
| | A. Glossary | 3 |
| | B. Center Mission and Theme | 4 |
| | C. Center Director's Summary | 8 |
| II. | Program Activities | 10 |
| | A. Research Selection | 10 |
| | B. Research Performance | 14 |
| | C. Education | 15 |
| | D. Human Resources | 16 |
| | E. Diversity | 19 |
| | F. Technology Transfer | 20 |
| III. | Management Approach, Partners and Resources | 22 |
| | A. Partner Resources | 23 |
| | B. Center Director | 31 |
| | C. Center Faculty and Staff | 31 |
| | D. Multiparty Arrangements | 32 |
| | E. Matching Funds | 35 |
| IV. | Budget Details | 36 |
| | A. Format | 36 |
| | B. Grant Year | 37 |
| | C. Salaries | 37 |
| | D. Scholarships | 37 |
| | E. Equipment | 37 |
| | F. Foreign Travel | 37 |
| | Appendix A – Baseline Measures for the MIOH UTC | 38 |
| | Appendix B – Agendas for MIOH Focused Forums | 40 |
| | Appendix C – MIOH Proposal Review Forms | 43 |

SECTION I – PROGRAM OVERVIEW

I. A. Glossary

| | |
|--------|--|
| AASHTO | American Association of State Highway and Transportation Officials |
| ASCE | American Society of Civil Engineers |
| BGSU | Bowling Green State University |
| CEE | Civil and Environmental Engineering |
| CUTC | Council of University Transportation Centers |
| DOTs | Departments of Transportation |
| EPD | Engineering Professional Development |
| FHWA | Federal Highway Administration |
| GIS | Geographic Information System |
| GIS-T | Geographic Information System for Transportation |
| GVSU | Grand Valley State University |
| ISTEA | Intermodal Surface Transportation Efficiency Act |
| ITS | Intelligent Transportation Systems |
| MDOT | Michigan Department of Transportation |
| MTRB | Michigan Transportation Research Board |
| NAS | National Academy of Science |
| NSF | National Science Foundation |
| ODOT | Ohio Department of Transportation |
| RFP | Request For Proposal |
| SEMCOG | Southeast Michigan Council of Governments |
| SME | Society of Manufacturing Engineers |
| TMACOG | Toledo Metropolitan Area Council of Governments |
| TRB | Transportation Research Board |
| UDM | University of Detroit Mercy |
| USDOT | United States Department of Transportation |
| UT | University of Toledo |
| UTC | University Transportation Center |
| VII | Vehicle Infrastructure Integration |
| VIIC | Vehicle Infrastructure Integration Consortium |
| WSU | Wayne State University |

I.B. Center Theme, Mission and Focal Areas

MIOH UTC's Theme

Alternate energy and system mobility to stimulate economic development.

MIOH'S Mission

MIOH will work to significantly improve transportation efficiency, safety and security in Michigan and Ohio and across the nation by increasing the effective capacity of existing transportation infrastructure, reducing transportation energy dependence thorough alternative fuels, and enhancing supply chain performance.

This will be accomplished through:

1. the development and organization of new knowledge, technology and management systems;
2. the effective transfer of new and existing knowledge to commercial enterprises and educational communities; and
3. the development of a cadre of transportation professionals that is larger, more diverse and better prepared to address the challenges and opportunities of 21st century transportation systems.

MIOH Focal Areas

Transportation System Efficiency and Utilization

MIOH will develop methods that meet future transportation system capacity requirements at minimum costs. To maximize the effectiveness/utilization of the current transportation infrastructure, and thereby minimize future expansion and related costs to taxpayers, MIOH will perform research, education and technology transfer to:

1. increase the utilization of existing assets through the application of technology and innovative management practices,
2. identify innovative design and operational/administrative solutions to bottlenecks and safety/security in transportation systems, and
3. improve the management and planning of maintenance and repair.

Supply Chains

MIOH will focus on the transportation, logistics, and distribution aspects of the supply chain and the interactions between supply chain participants through improved inter-modal connectivity and system-wide efficiency. These efforts will enhance our region's competitive position in the global economy and expand job opportunities. Efforts will:

1. improve supply chain performance through the application of technology and innovative management practices,
2. identify innovative design and operational/administrative solutions to transportation system bottlenecks as they impact supply chains, and
3. improve the security and reliability of the supply chain.

Alternative Fuels

MIOH will develop affordable alternate sources of energy for vehicles and methods to distribute fuels throughout the transportation network, yielding improvements in both security and the efficiency of transportation.

MIOH's contributions in this area may include research, technology transfer, education and outreach to support of the design and development of:

1. hybrid vehicles,
2. bio-fuels and vehicles,
3. hydrogen-based fuels and vehicles,
4. alternative methods to generate sufficient revenue to support, maintain, and improve the transportation network,
5. modifications needed for safe and economical distribution and use of such fuels, and
6. methods to assess the environmental and economic impact of alternative energy-powered vehicles in the region and the nation.

This theme, mission and focal areas are directly responsive to the needs of our region and our nation as defined in key documents of the US Department of Transportation and DOTs of Michigan and Ohio.

The following table couples the MIOH UTC's focal areas to the 2006 DOT Research, Development and Technology Plan:

| DOT RD&T Plan Objectives and Outcomes | MIOH Focal Area(s) Support of DOTs Priorities |
|--|---|
| <p>Mobility Strategic Objective: <i>"Advance accessible, efficient, intermodal transportation for the movement of people and goods."</i></p> <p>Toward this end, DOT RD&T (e.g. Intelligent Transportation Systems) addresses the following priorities:⁴</p> <ol style="list-style-type: none"> 1. Exploiting web-enabled and other secure information technologies to share information on best practices in all modes 2. Examining ways to encourage cargo transport by water to improve the capacity of the intermodal transportation system⁵ 3. In consultation with public and private sector partners, conducting research and expediting the deployment of technologies that improve system efficiency and infrastructure durability 4. Providing technical assistance and training to improve intermodal transportation planning and effective system management and operation | <p>MIOH's Transportation System Efficiency and Utilization focal area directly supports this objective. In particular, the third and fourth priorities will be advanced by the research and educational projects and resulting technology transfer in this focal area. The use of modeling, ITS and VII technologies, linked to improved management systems, promise to increase the effective capacity of existing and future transportation systems.</p> |

| DOT RD&T Plan Objectives and Outcomes | MIOH Focal Area(s) Support of DOTs Priorities |
|--|--|
| <p>Global Connectivity Strategic Objective: <i>“Facilitate a more efficient domestic and global transportation system that enables economic growth and development.”</i></p> <p>The increasingly global economy hinges on smooth supply chains and just-in-time manufacturing. Transportation is critical to both. An intermodal approach is central to DOT’s role in promoting global connectivity. The following are the Department’s RD&T (e.g. National Freight Action Agenda) priorities:⁶</p> <ol style="list-style-type: none"> 1. Encouraging and facilitating intermodal transportation planning worldwide 2. Supporting and conducting research on issues concerning the intersection of passenger and freight transportation 3. Accelerating the use of ITS and other technologies that reduce delays at key intermodal transfer points, in significant freight corridors, and at international border crossings | <p>Supply Chain management and its relationship to transportation systems (especially Intelligent Transportation Systems) provide great promise to advance this objective and the related priorities, especially the second and third ones. In addition, MIOH’s efforts to increase diversity will create a more diverse mix of graduates (including women) who are empowered by their education to start new businesses that are focused on the transportation sector.</p> |
| <p>Environmental Stewardship Strategic Objective: <i>“Promote transportation solutions that enhance communities and protect the natural and built environment.”</i></p> <p>Transportation exerts pressure on environmental resources worldwide. The <i>DOT Strategic Plan</i> calls for a balance between environmental challenges and the need for a safe and efficient transportation network. Among the RD&T (e.g. Crossmodal Initiatives) priorities for achieving this vision are:⁷</p> <ol style="list-style-type: none"> 1. Supporting the President’s Hydrogen Fuel Initiative through research on fuel distribution and delivery infrastructure, transportation of associated hazardous materials, and vehicle safety 2. Supporting interdisciplinary research on connections among transportation, energy, and the environment 3. Adopting transportation policies and promoting technologies that reduce or eliminate environmental degradation 4. Collaborating with Federal agencies, academic institutions, and the private sector to support and conduct research on technologies that improve energy efficiency, foster the use of alternative fuels, and reduce vehicle emissions 5. Working with transportation partners to mitigate the adverse environmental effects of existing transportation systems | <p>MIOH’s focus on Alternative Fuels is directly responsive to and supportive of this objective, especially the fourth priority.</p> <p>In addition, the center’s work to reduce congestion through its work with Transportation System Efficiency and Utilization and Supply Chain management will also support DOT’s efforts to reduce pollution (objective 5).</p> |

In the “ National Strategy to Reduce Congestion on America’s Transportation Network” (<http://isddc.dot.gov/OLPFiles/OST/012988.pdf>), Secretary Mineta establishes Department of Transportation priorities that are clearly consistent with MIOH UTC’s theme, mission and focal areas. Secretary Mineta defines a six point plan for relieving congestion:

1. ***Relieve urban congestion***
2. *Unleash private sector investment resources*
3. ***Promote operational and technological improvements***
4. *Establish a “Corridors of the Future” competition*
5. ***Target major freight bottlenecks and expand freight policy outreach***
6. *Accelerate major aviation capacity projects and provide a future funding framework*

The MIOH UTC’s foci are directly responsive to the first, third and fifth points of this plan.

Similarly, there is synergy between the needs, priorities, opportunities and challenges of MIOH’s regions, as expressed by MDOT and ODOT leaders and plans. For example, at the Michigan ITS Conference on June 13-15, 2006, Kirk Steudle, Director – MDOT, described the state’s aggressive plans to implement ITS and to create four VII test beds in SE Michigan in collaboration with VIIC and automotive and information/communication technology companies. Michigan’s ambitious plans in the ITS and VII arenas and MIOH focal areas of transportation systems and supply chains are not only mutually supportive, but the test beds will provide a tremendous “learning laboratory” for students and researchers and a wonderful source of data for projects that might assess technology, management concepts, data structures and mining, and impact assessments of ITS and VII.

I.C. Center Director's Summary

The MIOH UTC will serve the needs of the nation and region by completing specific educational, research, outreach and technology transfer projects that do just that, serve the needs of both the region and the nation. It will identify and select such projects through processes that directly involve leaders from the US DOT, MDOT, ODOT, regional agencies and a variety of leaders from industry and academia.

MIOH will be much more than a consortium of five universities. Rather, it will be a full partnership of industry, government and academia. In fact, no “advisory committee” will exist because industry and government leaders will be participants in the MIOH Operating Committee (see section III.D of this plan) and its three “Interest Groups” that focus on alternative energy, transportation system efficiency and supply chains. This partnership began through three intense “focused forums” that involved over 75 leaders from industry, government and academia. The agendas for these forums are provided in Appendix B. These forums yielded the initial “cut” of broad themes and over thirty (30) recommended projects for MIOH. Separate meetings with MDOT, ODOT, FHWA, and many other organizations have also created great potential for collaboration on top priorities.

As a result of all of these activities, MIOH has honed its focal areas. This, together with the processes and criteria described herein, will assure that the projects are not only of the highest quality, but also well focused to meet a variety of objectives, including national impact, regional economic development, professional education, attraction of a larger and more diverse cohort of transportation professionals and direct impact on the congestion, the environment, energy efficiency, the competitive position and overall transportation system efficiencies in our region.

One additional aspect of MIOH that may be different than many other UTC's is the real, substantive outreach into the K-12 educational system to directly impact pre-college student's awareness, interest and preparation for careers as professionals in transportation. This program will involve a partnership between faculty at the University of Detroit Mercy, high school teachers, the Ford Motor Company and the Educational Development Corporation. This partnership will yield content, courseware and methods that will be disseminated to over 80 high schools nationally. More on MIOH's K-12 outreach is provided in section II.D “Programs – Human Resources” below.

While the specific projects in the areas of research and education have not yet been selected, the themes are clearly established. Just as important, the processes and criteria for proposal review have been defined and approved (See sections II.A “Research Selection” and II.C “Education” below.). The request for proposals was sent to faculty at the five partner universities in early June and proposals are due on July 15. Notice of grants will be provided by late August and projects can commence at the beginning of September (assuming that US DOT has approved this strategic plan by late August).

By the end of this four year grant period, the MIOH UTC will be:

- ∞ a partnership of academia, government and industry marked by uniquely open and active dialogues on challenges and opportunities leading to substantive collaborations in response to them;
- ∞ a widely recognized source of knowledge and expertise in the three MIOH focal areas;
- ∞ a pipeline providing a large, diverse supply of transportation professionals who, by studying at the five MIOH universities (or in joint programs provided by multiple universities) possess exceptional competencies related to transportation systems, supply chains and alternative fuels;
- ∞ highly regarded source of continuing education for working professionals; and
- ∞ a catalyst for the generation of new products, services and systems that improve the economies of the MIOH region and its companies to partner and compete in the global marketplace.

If this vision is achieved the MIOH University Transportation Center will be sustainable through continued government and foundation grants, corporate investment, tuition and fee income, and sale of intellectual property.

I am personally excited and immensely pleased at the development of this enterprise and its promise to achieve the objectives of DOT and our many partners in Michigan and Ohio. Together we can and will create new knowledge and impact the efficiencies and effectiveness of our transportation system thereby creating a positive economic impact...we can and will attract and educate a cadre of transportation professionals who are more able to address the opportunities of our region and then nation that their predecessors...and in doing so, we can and will support the sustained and increased strength of our region and our nation.

Dr. Leo E. Hanifin
Director – MIOH University Transportation Center

SECTION II – PROGRAM ACTIVITIES

II.A. Research Selection

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

1. **Baseline Measures**

See Baseline Measures 1, 1a and 2 in Appendix A. These indicate the number and type of projects funded and the total amount of that funding.

2. **Research Selection Program Outcomes**

The outcomes of the research program selection is simply to select projects that individually fulfill the criteria of selection at high levels and collectively constitute a cohesive, synergistic whole when viewed as a research program and when viewed together with the educational, technology transfer and K-12 outreach programs of the MIOH UTC.

The criteria for selection of projects are as follows:

- ∞ Responsive to national transportation strategies/priorities;
- ∞ Responsive to the critical needs, challenges and opportunities in our region;
- ∞ Builds upon and employs current advanced technical and managerial concepts, methods and systems;
- ∞ Objectives that advance the state of knowledge and practice in transportation through provision of new systemic solutions and/or results that are transferable for rapid improvement of transportation systems or economic development;
- ∞ Quality of research team;
- ∞ Involvement of academic, government and/or industrial partners other than the principle investigator's colleagues at his/her institution;
- ∞ Linkage of the research team to education and/or technology transfer projects/objectives of MIOH; and
- ∞ The level and certainty of matching support from non-federal sources.

While individual project evaluations according to these criteria is important, it is also essential that MIOH's research program constitute a cohesive whole while considering the recommendations of the interest groups and overall MIOH objectives, assets and constraints.

Objectives: The MIOH Objectives are articulated through the mission statement, focal area statements and the framing statements of the RFP's. The Operating Committee must also consider the objectives of the US DOT for the UTC's to address advanced research which impacts national issues, as well as the objectives of other key partners, including MDOT, ODOT, regional governments and corporate partners and issues that are important to them (and in which they are willing to invest resources).

Assets: The Operating Committee will develop a program that employs the intellectual and physical assets of all MIOH university partners and maximizes the contributions of assets by other government and corporate partners. Multi-partner projects will be favored to leverage the diverse resources from all of these partners, to increase cross-fertilization of ideas and outcomes, and to maximize the impact on those partners' capabilities. The Operating Committee will seek a research program wherein each partner university is the lead in at least one research project.

Constraints: The most obvious constraint to the development will be the budget. While the USDOT support is substantial, each UTC is required to achieve six objectives, which is an equally substantial “charge” to fulfill. To serve these objectives, the MIOH UTC will develop programs not only in research, but also in education, outreach and technology transfer. Further, MIOH programs will focus on three distinct but somewhat interdependent areas: alternative energy, transportation system efficiency/utilization and supply chains. To assure that MIOH will be able to make substantive contributions in these focal areas and objectives it is essential that:

1. MIOH defines projects to serve different objectives that are linked: e.g. – individual projects or groups of projects in research, education, outreach and technology transfer focused on the same technical/management area.
2. MIOH projects involve multiple universities and substantive collaboration with non-university partners involving such things as
 - ∞ the use of their labs, products and equipment,
 - ∞ their employment of students and faculty,
 - ∞ the involvement of their employees as researchers in university based research,
 - ∞ the involvement of their employees as teachers and students in educational programs,
 - ∞ their financial support of projects, and
 - ∞ their commercialization of research results.

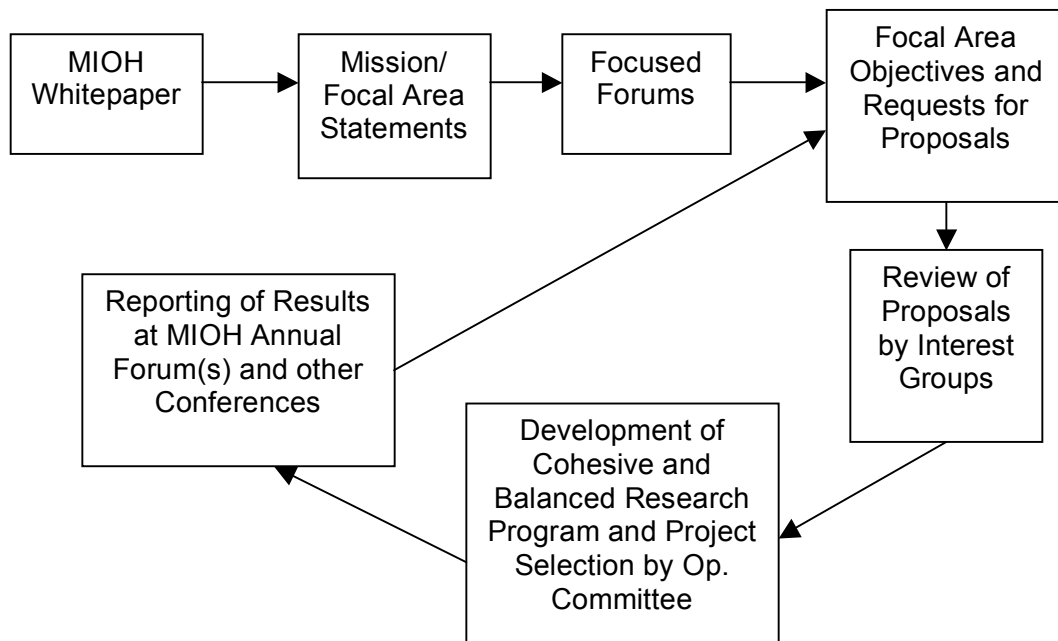
This involvement of non-university partners will also support the achievement of the required one-to-one matching, which, in itself represents a significant constraint, and an opportunity.

3. Planned Activities - MIOH Research Selection Process

The MIOH UTC will employ an inclusive and rigorous process to identify and select research projects that are responsive to the nation’s strategy for surface transportation research. This will be assured by MIOH leadership (Director, Assistant Director and Operating Committee) studying that strategy as expressed in key documents (such as the recently distributed draft DOT Five-year Research Development and Technology Strategic Plan), and by actively engaging the national community of transportation leaders, especially those in the US Department of Transportation and state and local government agencies. Also, one representative of the US DOT will sit on the MIOH Operating Committee.

At the same time the MIOH UTC will consider how those national strategies, challenges and opportunities manifest themselves in the Michigan and Ohio, impacting the citizens and economic enterprise of our region. Efforts to do so will be aided by intensive dialogues with local and state government experts and industrial leaders, “focused forums” that bring industry, government and academia together, and by the inclusion of leaders from all sectors on the MIOH Operating Committee and Interest Groups.

The MIOH research selection process is described graphically as follows:



MIOH Whitepaper: This document was developed by the MIOH university partners as they sought funding from the US DOT. It provides a broadly stated starting point for defining MIOH and its collective resources, focus and objectives.

Mission/Focal Area Statement: In early 2006 the MIOH university partners wrote a brief mission statement and focus statements for the three focal areas of alternative energy, transportation system efficiency/utilization and supply chains. These statements are provided in the Section I.B, Center Mission and Theme, above.

Focused Forums: In early April 2006, three forums were held to further refine the three MIOH focal areas. Each forum began with a series of “framing presentations” by leaders from a broad spectrum of industry and government. Speakers represented such organizations as NextEnergy, Michigan Department of Transportation, IBM, Ford Motor Company, UPS, the Southeast Michigan Council of Governments and the Center for Automotive Research. (The full agendas for these forums are provided in Appendix B.) The forums also provided participants with the opportunity to recommend specific research and educational projects and to network to explore teaming and support opportunities. Over 70 transportation leaders participated in these three forums.



Focused forums will be also be held prior to soliciting research proposals in years two, three and four in order to bring representatives from the broad transportation community together to review and reflect on the results of the preceding year’s research efforts in the context of the overall transportation research and developments in transportation systems, and to consider changing the demands on and environments of those systems. In these years the forums will be incorporated in events that include reporting of progress/results by MIOH team members.

Supply chain forum attendees discuss presentations of industry experts and potential research and educational projects.

Request for Proposals: Following the forums, the MIOH Operating Committee created the MIOH Request and Guideline for Proposals; this included the timeline and process for the submission and review of proposals, and the criteria for selection.

To be considered for review all proposals must:

1. address an area clearly related to the MIOH theme statements provided with the RFP,
2. address the criteria below, and
3. identify the match support that will be provided (at least one-to-one).

Criteria for selection of research projects were presented in Section II.A. 2. "Research Selection Program Outcomes" on page 10 above.

Evaluation of Proposals: Proposals will be evaluated through a four-step peer review by over thirty interest group and operating committee members: Step 1. Interest Group Review and Recommendation, Step 2. Operating Committee Review and Feedback to Proposal Author, Step 3. Revision of Proposal by Author, and Step 4. Review of Revisions by Operating Committee. The peer review process includes evaluations by academics from our five universities and over fifteen external reviewers. These external reviewers include consultants (Cambridge Systematics), industrial transportation leaders (Ford, IBM, GM, NEXT Energy) and governmental transportation leaders (TMACOG, SEMCOG, MDOT) with specific reviewers expert in each of the three focal areas of the UTC. [Note: US DOT participants have been invited to contribute to the proposal review process] .

All proposals for research and educational projects will be evaluated by the relevant interest group that includes some Operating Committee Members and others with specific knowledge and expertise in the focal area. The interest groups will employ the criteria stated above and evaluate, rate and rank all proposals in their area, specifically recommending the projects that they believe should be funded. The form research and educational project evaluations employed for steps 1 and 2 are provided in Appendix C. If there are concerns or recommendations regarding potential partners, budget reductions or matching support sources these will be forwarded along with their evaluations and recommendations to the MIOH Operating Committee.

Program Development/Project Selection: Closely related to Step 2 of the project evaluation process is the development of a cohesive program. As it is completing its evaluation of proposals the MIOH Operating Committee will create a cohesive program that both considers the recommendations of the Interest Groups and also all objectives, assets and constraints, as articulated above.

Reporting of Research Results at MIOH and other Conferences: The reporting of research results is both the last step in research and the first step in defining research directions for the next year. While some MIOH projects may have multi-year plans, release of funds for subsequent years will depend upon an evaluation of progress and results as judged by peers and the MIOH Operating Committee. Also, the results from MIOH projects will undoubtedly lead to new objectives and research projects for which new RFP's will be issued.

4. Performance Indicators

The measures of this objective indicated in the baseline measures are the number and types of research project selected for funding and the amount of funding. Since the awards are made by the MIOH UTC office after having received Interest Group recommendations and Operating Committee decisions, the information necessary for reporting these measures is readily available.

Measuring performance in the quality of research selection is difficult, but it is not impossible to separate research selection from research performance. Research selection is the process of deciding what will be done and who will do it, while the research performance is the process of actually performing research. The former is determining the best resources to address the research with the most need or greatest promise; the latter is the achievement of that promise.

In the context of a UTC, performance of research selection is relative, not absolute. The UTC partners need to affirmatively answer questions such as:

- ∞ Did the research selected have more promise than others proposed by UTC partners?
- ∞ Was the research selected the best fit to satisfy the needs of the U.S. DOT, state DOTs, our communities and their people?
- ∞ Is the research team the best that we could attract and support for this research?
- ∞ Did the research selected maximize the leveraging of intellectual and financial capital?

These indicators are reflected in the criteria for selection of projects (provided above). In each case, the interest group reviewing the project proposal will be asked to rate the proposal with respect to each of these criteria, providing a comparison of performance indicators for that group of proposals and, over time, a longitudinal measure of these indicators will be available to assess relative performance of research selection over time.

With regard to the measures prescribed in the baseline data (number of projects selects, categorization of these projects and funding levels) it is extremely easy to collect this data as all decisions are made and announced by the UTC Office.

II.B. Research Performance

Research Performance Goal: *An ongoing program of advanced 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 Baseline Measures 3 and 4 in Appendix A. These count the number of research reports published and the number of presentations at professional meetings.

2. Research Performance Program Outcome

At the end of the four year grant period MIOH will have completed many projects that advance the body of knowledge in transportation as reflected in at least as many peer reviewed and conference papers/presentations as funded projects. (The mix of peer reviewed and conference publications should reflect the mix of advanced and applied research projects, but it is anticipated that at least half of MIOH's research projects will be advanced, leading to peer reviewed papers.) It is also envisioned that MIOH will become recognized by transportation professionals as a source of business and technical expertise in its three focal areas—alternative fuels, transportation system efficiency and utilization and supply chains—and will be sought out for that expertise.

3. Planned Activities

Since MIOH has not yet received its first funds, and has not yet completed its first RFP/proposal/review/selection process, the specific research activities (projects) cannot be described. However, MIOH can assure reviewers of this strategic plan that research performance activities in year one will:

- ∞ include at least five research projects focused on areas that are responsive to national and regional transportation needs/priorities,
- ∞ most projects involving at least two universities, and
- ∞ most projects will involve non-university partners as well.

The DOT guidelines for UTC's indicate that "all research conducted within UTC funding is to be subjected to external, merit-based peer review." In the MIOH UTC that peer review will occur in two ways. First, each project is expected to yield a publication or presentation that is subject to peer review by leaders in the transportation profession. Second, for multi-year projects, funding in subsequent years will be subject to review of the results from the previous year(s) by the peer group constituted by the relevant MIOH Interest Group. This review will evaluate the results against both original criteria employed in the selection (see p. 10 above) and the project proposal, paying special attention to the deliverables/results projected there for the previous year. The evaluation of the results will employ a consistent review process and form developed by the MIOH Operating Committee. (The MIOH operating committee will draft a review procedure, seek comments from the interest groups, and then finalize a standard procedure for all interest groups. The development of this procedure will include the possible inclusion of additional external reviewers outside of interest group members where deemed necessary.) To secure project funding for the upcoming year the project investigators will also submit a new or revised proposal that focuses specifically on the activities, expenses and expected outcomes for the next year. The proposal will be evaluated by the same process described above in Section II.A.3 Research Selection Process. The final decision on project funding will be made by the Operating Committee and confirmed by the Executive Committee in its approval of the MIOH budget for that year.

4. Performance Indicators

The MIOH UTC Assistant Director will, on an ongoing basis, secure research reports and publications from principal investigators and publish them on the center's website in a timely manner. This will allow the Assistant Director to keep count and documentation of such publications and presentations annually. (The MIOH RFP specifies a responsibility to provide data required for DOT reports. The MIOH Director's project award letters will reiterate these reporting requirements.)

II.C. Education

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

The faculty of the MIOH UTC will collaborate between departments and between universities to develop and share new curriculum.

1. Baseline Measures

See Baseline Measures 5 and 6 in Appendix A. These count the number of courses offered in transportation and the number of students participating in transportation research.

2. Education Program Outcome

The outcomes of each educational program and course should be defined separately by the institution(s) creating and delivering them. Outcomes should be written in active, competency-type

statements. That is, “What can the student *do, design, analyze, etc.* after completing this course or program?”—not, “What will the student be *aware of?*”

In the broader sense, the outcome of the MIOH Educational Program will be to develop new and innovative interdisciplinary programs that develop the competencies that future transportation professionals will need to meet emerging regional and national challenges.

At the end of the grant period the MIOH UTC universities, individually and collectively, will have developed and implemented at least three new programs: certificates, minors or degrees at undergraduate and graduate levels to educate transportation professionals in MIOH's focal areas. These programs will have been approved by all relevant academic units and university administrators, launched with effective marketing and populated with adequate student enrollments.

3. Planned Activities

The specific programs that will be developed in year one are not yet determined. However, several educational concepts have been advanced by faculty members during the “focused forums” in April, and proposals for these programs are expected in response to the MIOH RFP. For example, a Master of Science in Supply Chain Management and Technology could be developed by business and engineering faculty members from several MIOH universities. These efforts to develop and deliver new transportation curriculum will be interdisciplinary and will support the national strategy for surface transportation research as identified by a report of the National Highway Research and Technology Partnership entitled “Highway Research and Technology: The Need for Greater Investment” and the programs of the National Research and Technology Program of the Federal Transit Administration.

It is expected that MIOH will support the development of educational programs each year with a combination of awards to continue development, implementation and/or assessment of previously supported programs and awards to initiate new program development.

In addition, MIOH will recognize one individual as its *Student of the Year*, who will receive \$1,000 and the costs to attend an award ceremony in Washington, DC, during the annual winter meeting of the Transportation Research Board (TRB).

4. Performance Indicators

The first performance indicators of the MIOH Educational Program will be the impact on curriculum and on students, as measured in the number of transportation courses offered and the number of students participating in transportation research. The names of courses offered will be provided from registrar's data from each university via their member of the MIOH Operating Committee. The number of student participants will also be provided by the Operating Committee members from each university. (The MIOH RFP specifies a general responsibility to provide data required for DOT reports. The MIOH Director's project award letters will reiterate the reporting requirements in greater detail.)

II.D. Human Resources

Human Resources objective: *An increased number of students, faculty and staff who are attracted to and substantively involved in the undergraduate, graduate and professional programs of the Center.*

MIOH will integrate activities aimed at increasing both the scale and diversity of students and faculty focused on education, research and careers in transportation related fields. This integrated area of human resources and diversity has been called “outreach.” While these objective and programs related to scale and diversity are operationally combined, the scale aspects (“human resources”) will be emphasized in this section of the strategic plan.

The MIOH Outreach Programs focus primarily on informing, motivating and preparing K-12 students for careers in transportation and attracting university level students to such careers. “Outreach” at more advanced levels, that is, efforts to connect with and develop the working transportation professionals, are described under the education section (II.C above) or the technology transfer section (II.F below). MIOH will also engage in a number of direct student recruiting activities to increase enrollments and graduation in transportation programs.

1. Baseline Measures

See Baseline Measures 7, 8 and 9 in Appendix A. These establish the baselines for the number of transportation related advanced degree programs, as well as the numbers of student enrolled in and degrees granted by these programs.

2. Human Resource Program Outcomes

The outcomes in the area of human resources are to substantively increase the total enrollments in and graduates from transportation related degree programs at both undergraduate and graduate levels at the five partner institutions of the MIOH UTC.

3. Planned Human Resource Activities

The outcomes of increased enrollments in and graduates from transportation related programs will be achieved through three types of activities: (1) K-12 Pipeline activities to increase the awareness, interest and preparation of pre-college students regarding transportation studies and careers, (2) direct recruiting and support of students in university transportation education programs and (3) development of new university level programs in transportation areas that are more current and exciting to prospective students.

a. K-12 ”Pipeline Activities”

These pre-college activities will develop a broad awareness of issues of transportation among K-12 students, making them better informed citizens as they make judgments regarding issues of transportation investments and policies. (The number of schools and number of K-12 students that participate in MIOH K-12 outreach activities will be tracked). They will also create educational materials and methods that K-12 educators across the nation can employ to increase awareness of, attraction to, and preparation for careers in transportation.

The University of Detroit Mercy will lead the MIOH activities in the area of K-12 outreach. UDM has extensive experience and success in developing K-12 programs in partnership with area schools, SME and Ford Motor Company (see section III.A.1.c below). The Ford Partnership for Advanced Studies (PAS) and the SME–STEPS Engineering Summer Camp for high school girls will be used as foundational programs for the MIOH K-12 outreach. GVSU also has experience delivering a similar SME–STEPS summer camp focused on aviation for middle school girls. UDM has, for over twenty years, been the leading university in providing courses for the Detroit Area Pre-College Engineering Program (DAPCEP). During the first year, the MIOH UTC’s K-12 program will develop and pilot new courseware for K-12 classrooms (with Ford PAS) and offer a summer camp (built off of the STEPS camp) and a new Saturday class (with DAPCEP), all focused on transportation.

- ∞ **K-12 Transportation Projects and Cases:** The Ford PAS Program consists of five innovative courses that teach a variety of subject areas in the context of engineering, business and environmental projects and cases. In the next year, UDM will collaborate with Ford, the Educational Development Corporation and high school teachers from Southeastern Michigan to develop additional projects and cases that have specific foci on such areas as alternative energy,

supply chains and transportation systems. Since Ford PAS is a national program involving over 100 high schools, the development of these transportation focused cases and projects can, in subsequent years, lead to rapid deployment on a national basis. This can be accomplished by incorporation into annual training workshops run by the Ford PAS Program.

- ∞ **Summer Camp in Transportation:** UDM will build upon its STEPS Summer Engineering Camps for Girls and the Ford PAS Program to create a summer transportation camp focused on alternative energy. GVSU, which also provides a STEPS Summer Engineering Camp for Girls, may also participate by delivering a similar transportation camp in Western Michigan.

This summer camp will focus on types of transportation, transportation flow, alternate fuels and supply chain concepts. It will include simulation modeling of flow and supply chains, experiments in alternative fuels, field trips to transportation operations facilities and NextEnergy, and presentations by faculty members from different departments and by industry leaders. Students will complete one or more projects, presenting the results to parents and transportation professionals. This camp, the instructor team and instructional systems will be developed in the 2006/7 academic year, and the *Transportation Camp* will be piloted in the summer of 2007.

- ∞ **DAPCEP Alternative Fuels Course:** During the Fall Term of 2006 UDM faculty and high school teachers will develop a new Saturday course in the area of alternative fuels. This will include hands on experiences in the creation and use of biofuels and a visit to NextEnergy where students will observe and compare six different energy demonstration systems. This Saturday course will be piloted in the Spring Term of 2007. Grade levels 9-11 will be targeted.

While UDM has taken the lead in developing these K-12 programs in year one, subsequent years will involve the transfer of the K-12 courseware and methods to schools that partner with other MIOH universities. In addition to these outreach activities aimed at K-12 students, all MIOH universities will actively promote enrollment in their transportation-related programs to both entering and current students.

b. Direct Recruiting to University Programs

There are many ways that MIOH UTC universities will, collectively and individually, increase their recruiting of students into their programs that educate transportation professionals. These include, but are not limited to:

- ∞ Featuring UTC sponsored research and new educational programs in both web-based and print recruiting materials (It is anticipated that the “hot” new areas of alternative fuels, VII, ITS and Supply Chains will be of great interest to prospective students.)
- ∞ Creating web links between the MIOH UTC website and all of the websites for transportation programs at all MIOH partner universities
- ∞ Increasing the transportation focus at university recruiting events (This has already begun to occur with the participation of four transportation professionals from the Michigan Department of Transportation (MDOT) at UDM’s “Technology Discovery Day” on October 27, 2006 . . . the first time MDOT has participated in this event.)
- ∞ Increasing the transportation focus in university career presentations. (This has already begun to occur with changes in UDM’s “Engineering Roadshow,” presented at approximately thirty high schools annually.)
- ∞ Support of both graduate and undergraduate students in MIOH UTC research and curriculum development projects. It is expected that the MIOH UTC will support between twenty and thirty students per year. In addition, some of the non-university partners (government and industry) have expressed interest in hiring students for co-op and internship assignments.

c. Development of New University Offerings

The new courses, cases and degree programs that are developed by the MIOH UTC's partners will attract new students to the MIOH universities. These activities are described in section II.C.3 above.

4. Performance Indicators

The MIOH Assistant Director will be responsible for collecting and aggregating data on the performance indicator for this objective: the number of transportation related advanced degree programs, and numbers of student enrolled in and degrees granted by these programs. With regard to enrollment and graduation data, such data is available in highly structured and consistent ways by the registrars of all universities; data provided by each MIOH university will be provided by their registrar's offices. (The MIOH RFP specifies a general responsibility to provide data required for DOT reports. The MIOH Director's project award letters will reiterate the reporting requirements in greater detail.)

In addition to this required baseline measure, pre and post attitudinal surveys will measure the effectiveness of pre-college courses in changing attitudes toward transportation careers. Also, requests for and use of MIOH supported courseware by high schools across the nation will be a measure of value of the module developments. This data will be secured from the Ford PAS Program Office at Ford Motor Company.

II.E. Diversity

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

Efforts of MIOH to increase diversity of will especially focus on increasing the number of "underrepresented minorities" involved in transportation as determined by national and regional trends in engineering and business enrollments. Underrepresented minorities in engineering studies are typically African-American, Hispanic-American and Native American students. Since two of the MIOH university partners are located in Detroit, the city with the nation's largest percentage of African Americans, our UTC has a great opportunity to reach out to the general population and to K-12 partner schools and programs to attract African American youth to careers in transportation. These schools, University of Detroit Mercy and Wayne State University, already lead all universities in Michigan for the highest two percentages of underrepresented minorities graduating in engineering.

Diversity also relates to the percentage of women pursuing studies and careers in transportation related fields. Once again, many of the MIOH university partners are leaders in attracting women to engineering and science studies. For example, UDM, the MIOH lead university, is among the top ten percent of engineering schools for the percentage of female engineering students (27%).

1. Baseline Measures

No baseline data is required by US DOT in the area of diversity.

2. Diversity Program Outcomes

The outcome in the area of diversity is to substantively increase the diversity of enrollments in transportation related degree programs at both undergraduate and graduate levels for the total of the five MIOH institutions.

3. Planned Diversity Activities

To a significant degree, all activities described above in Section II.D.3 Human Resources Activities are also Diversity Activities. This will be achieved by focusing those activities on schools and student populations that are heavily minority or female. UDM has been successful in doing so in the past. For example, in 2005/6 3,400 K-12 students participated in UDM's pre-college engineering and science activities; of these students, 61% were minority and 50% were female. Because the MIOH outreach activities will build upon these existing programs, the populations participating in them will be similarly diverse.

4. Performance Indicators

While no baseline data is required by US DOT, MIOH will report on the minority and female participation in Civil Engineering and other transportation related degree programs as reported by Engineering Workforce Commission in their Annual Reports of "Engineering and Technology Degrees" and "Engineering and Technology Enrollments."

II.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.*

MIOH's technology transfer efforts will include activities of four modes of technology transfer: publication of results, direct transfer of specific results into transportation systems and products by research partners, transfer of intellectual property, and technology transfer workshops and seminars.

1. Baseline Measures

See Baseline Measures 10 and 11 in Appendix A. These count the number of transportation seminars, symposia, distance learning classes, etc. conducted for transportation professionals, and the number of professionals attending them.

2. Technology Transfer Program Outcomes

The technology transfer program outcomes are related to the four modes of technology transfer listed above.

| Mode of Technology Transfer | Outcome |
|-----------------------------------|--|
| Publication | Each research, education or outreach project results be presented in at least one refereed or conference paper in a transportation focused journal/conference. While journal publications are favored for advanced research, conferences such as TRB or ASEE may be more appropriate for other types of research or educational development. |
| Transfer of intellectual property | Licensing of intellectual property, including patents that result from MIOH projects. |
| Workshops and seminars | Learning of new knowledge by substantial numbers of attendees/participants |

At the end of this grant it is envisioned that the MIOH UTC will be widely known as a source of technical knowledge that is essential to the development of new transportation products and systems. This knowledge will be provided in the form of publications, tech transfer activities and intellectual property such as patents.

3. Planned Activities

- a. Publication: principal investigators for each MIOH-supported research project will be expected to submit publications to journals or conferences depending upon the nature of the research. All project reports will be submitted to the USDOT and placed on the MIOH Website as required.
- b. Implementation of results: It is hoped that all projects undertaken with governmental or industrial partners will yield results that can be directly implemented. However, some projects of a more advanced nature may require additional development, either in subsequent MIOH projects or independently through the efforts of practicing professionals. For its part, all MIOH investigators will support implementation by providing data, concepts or designs developed with MIOH support to those wishing to implement them in working systems. Additional efforts to further develop such work products would require additional support.
- c. Transfer of Intellectual Property: During the first few months of the MIOH activities all intellectual property policies of MIOH universities will be gathered and studied by the MIOH Director, Assistant Director and UDM Attorney. That team will then develop a proposed MIOH intellectual property statement that can encourage investment in MIOH projects by the private sector, the public sector and universities with confidence.
- d. Workshops and Seminars: During the first year the MIOH UTC will sponsor and coordinate at least one technology transfer activity in each of its three focal areas. Such activities may be offered in partnership with corporations (such as Cambridge Systematics), engineering societies (such as the Engineering Society of Detroit) or not-for-profit coalitions (such as NextEnergy or the Small Business Association of Michigan). All organizations indicated as examples have expressed a desire to partner with MIOH in technology transfer activities.

3a. Required Activities

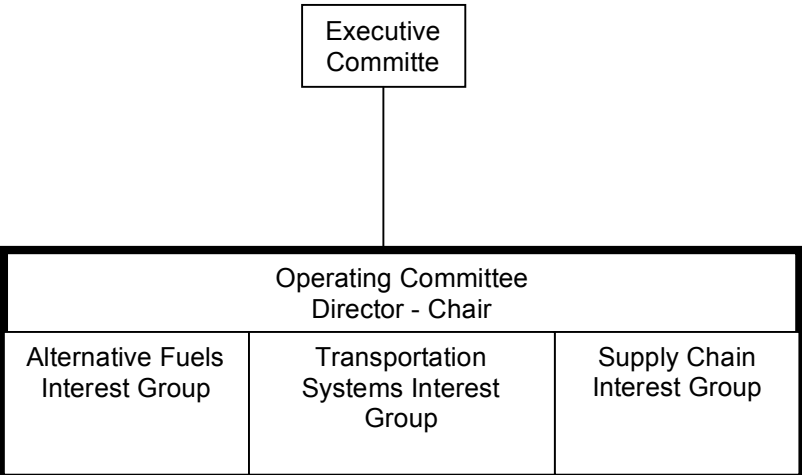
- 3.a.1** The MIOH UTC will maintain an up-to-date Internet home page which contains, at a minimum, the information required by the UTC reporting requirements. This website will be hosted at UDM with the Assistant Director acting as webmaster, with assistance provided by UDM's Marketing and Public Affairs and Information Technology Offices.
- 3.a.2** The MIOH UTC leadership, faculty and staff will participate in occasional meetings of UTC and/or DOT experts on high-priority topics, or will provide expert advice to DOT on technical or education topics. Recently, two MIOH representatives participated in the FHWA Workshop on Congestion Mitigation and four MIOH representatives participated in the CUTC annual meeting.

4. Performance Indicators

| Mode of Transfer | Performance Indicator |
|-----------------------------------|--|
| Publications | Number of publications or conference presentations |
| Implementation of Results | Number of working systems that were created from research results |
| Transfer of Intellectual Property | Development of a unified intellectual property statement for MIOH (1 st year indicator) |
| Workshops and Seminars | Number of workshops and seminars offered and number of professionals attending. |

SECTION III – MANAGEMENT APPROACH, PARTNERS AND RESOURCES

The MIOH UTC’s management approach is one that is open and inclusive of all partners, both at the five MIOH universities and its partner government agencies and corporations. The MIOH organization, summarized in the graphic below, reflects that approach. It does not have an “advisory committee” that is separate from the decision making groups of the UTC. Rather, all university, corporate and government representatives sit on interest groups and/or the MIOH Operating Committee that stimulate, identify and review project proposals and develop and approve the MIOH annual program plan and budget. For more information on the MIOH organizational structure and processes see Sections II.C – Research Selection and III.D – Multiparty Arrangements.



Within the five partner universities, three centers of transportation studies and research currently exist. Below, the three are described in order to document the relationship that will exist between the centers and the UTC, as well as to ensure that UTC work will distinguish itself from work the other centers are undertaking.

BGSU Electric Vehicle Institute (EVI):

The mission of Bowling Green State University’s, Electric Vehicle Institute is to develop and promote advanced electric propulsion technology and transfer these technologies to appropriate corporations and public agencies for production and implementation. The Hybrid-System being developed at Bowling Green State University’s, Electric Vehicle Institute will contribute to domestic energy independence, energy diversity, and environmental quality improvements, and provide the commercial user with a cost-effective solution. While EVI’s activities support the MIOH UTC’s alternative fuel focal area, any projects at EVI funded by MIOH will be distinct and separate from all other EVI projects.

BGSU Supply Chain Management Institute (SCMI):

The mission of BGSU’s SCMI is to support excellence in supply chain education and practice by forging collaborative partnerships with supply chain professionals. The SCMI focuses on the students and employers who hire students from BGSU in the areas of logistics, operations, and supply management. Thus, the collaboration that may occur as a result of the MIOH UTC is consistent with the SCMI, and the research-oriented nature of the MIOH UTC is different from, yet supportive of, the goals of the SCMI.

UT Intermodal Transportation Institute (ITI):

UT's ITI is an interdisciplinary research and education center that focuses on developing technology-enabled intermodal transportation systems and supply chains that promote economic development and quality of life. Early in the development of the ITI, its Executive Committee identified the securing of a U.S. DOT UTC as one of its specific goals.

Since that time, the ITI has worked to meet this expectation; the outcome has been two UTC's, the MIOH UTC and a second UTC led by UT. The Director of the ITI at UT is the Director of the UTC at UT and is also heavily involved in the design, planning and execution of the UTC at UDM. This allows the close coordination of activities so that redundancies are eliminated and resources are wisely and effectively used. It also facilitates the development of synergistic projects that blend the capabilities and resources across all three entities – the ITI, the MIOH UTC at UDM, and the UTC at UT. It is expected that some projects will be the sole responsibility of one entity while others are jointly completed by two or even three entities. It also requires that the tracking and reporting of projects for these three entities are carefully done. This will be the responsibility of the Assistant Directors of the UTC at UDM and the UTC at UT.

III.A. Partner Resources

Together the five university partners provide a tremendous combination of resources and demonstrated achievements in the MIOH focal areas of supply chain management, alternative fuels and transportation system efficiency. MIOH has also established partnerships with government agencies, K-12 schools, and both for-profit and not-for-profit organizations that bring many additional resources to MIOH. The resources of all current partners are briefly described below.

III.A.1 University Partners

a. Bowling Green State University, Bowling Green, Ohio

Supply Chain Management

The Supply Chain Management specialization in the BGSU's AACSB-accredited College of Business Administration is nationally recognized as a top undergraduate program (*U.S. News and World Report, 2004*). Seven full-time faculty members teach and perform research in supply chain management. In the Fall of 2006, Dr. Hokey Min will be joining the faculty as the James R. Good Chair in Global Supply Chain Strategy. Dr. Min has developed an international reputation for his research in transportation and logistics. He was previously at the University of Louisville where he was the Executive Director of the Logistics and Distribution Institute at University of Louisville.

In 2000, the College of Business Administration established the Supply Chain Management Institute (SCMI). Dr. Amelia Carr is the Director of the Supply Chain Management Institute. The mission of the SCMI is to support excellence in supply chain education and practice by forging collaborative partnerships with supply chain professionals. Currently there are 15 member companies in the SCMI: BP, Bechtel Power Corporation, Bendix, Deere & Company, Eli Lilly, Emerson Climate Control, HP, GlaxoSmithKline, Honda of America Manufacturing, Lowes, Marathon, Nordson Corporation, Owens Corning, Parker Hannifin, and SAIC.

The Electric Vehicle Institute

In 1993, the College of Technology established the Electric Vehicle Institute in order to develop and promote advanced electric propulsion technology and transfer these technologies to corporations and public agencies for production and implementation. The hybrid-drive currently under development at the EVI operates on a combination of diesel fuel and electricity. Future models could operate on biofuel, fuel cells or micro turbines.

This project has yielded two functioning vehicles, each of which features the Hybrid Booster Drive® (HBD) system. One vehicle is a step van, commonly used by parcel delivery services. The second is a medium size bus commonly used in shuttle service. These two vehicles will provide manufacturers and operators with an opportunity to examine first hand the HBD system. Although the medium duty truck and bus applications were the focus of this project, the HBD system is scalable to larger and smaller vehicles.

b. Grand Valley State University, Grand Rapids, Michigan

Supply Chain Management in Business

In the Seidman College of Business at Grand Valley, both the Management and Marketing Departments focus on some dimensions of supply chain management. The Marketing Department recently introduced an *Emphasis* (concentration within the Marketing Major) in *Distribution and Logistics*. This Emphasis focuses on logistics activities related to distribution system design, transportation, warehousing, and inventory planning. Attention is directed towards the strategic management of distribution assets, customer service, finished goods inventory control, transportation, warehousing, and international distribution planning.

The Management Department has an *Emphasis in Operations Management* that focuses on operations research, manufacturing management, and purchasing and is designed to prepare the student in the technical and strategic aspects of producing goods and services. Operations Management involves the application of managerial, quantitative, and computer skills to areas of quality assurance, inventory management, forecasting, and scheduling, with the goal of giving students the tools to effectively manage service and manufacturing operations.

The two departments work together on various aspects of the two Emphasis Programs. Students from these programs are employed in internships or full time positions at firms such as Alticor, Delphi, Johnson Controls, Brunswick, Ryder Dedicated Logistics, Gordon Food Service, Meijer, Inc., Target Corporation, Office Depot, Lean Logistics, Concentrek Logistics, etc.

Supply Chain Management in Engineering

The GVSU School of Engineering has bachelor and masters degree programs in computer engineering, electrical engineering, mechanical engineering as well as product design and manufacturing engineering. Transportation related efforts in the School of Engineering have concentrated on the modeling and analysis of supply chain logistics. Much work has been done in partnership with Shell Global Solutions in the analysis of in plant logistics, inventory management, and multi-plant supply chains. Simulation models, sometimes used jointly with optimization models, have been the primary means of evaluation. Work has focused on issues involving loading strategies, inventory capacities, fleet sizing, and rail yard sizing. Supply chain logistics is taught in the course EGR 642 Material Handling and Facility Layout. Both masters' students and advanced undergraduate students take this course.

c. University of Detroit Mercy (lead institution), Detroit, Michigan

The University of Detroit Mercy (UDM) is the largest private comprehensive university in Michigan. UDM offers engineering degrees in Civil, Electrical (including Computer Engineering concentration), and Manufacturing and Mechanical Engineering at bachelors, masters and doctoral levels. One year of cooperative education assignments are required of undergraduates. The AACSB-accredited College of Business Administration offers undergraduate business and MBA degrees.

In recent years UDM has been a leader in educational innovation and interdisciplinary, interuniversity and corporate collaboration. The following are a few examples:

- ∞ Masters in Product Development (a joint degree in business and engineering) developed through an NSF grant with MIT, RIT and six major companies, including Ford, Xerox, and IBM;

- ∞ Lead university for the launch of the Greenfield Coalition, an NSF Engineering Education Coalition (with Wayne State, Lehigh, Lawrence Tech and Michigan); Leo Hanifin was the Coalition Director;
- ∞ Mexican American Partnership in collaboration with Monterrey Tech and seven corporations to attract Hispanic American students to engineering careers and develop them as international leaders;
- ∞ Ford Partnership for Advanced Studies: a consortium of about ten universities across the nation that is assisting over 80 high schools in introducing courses on technology, business and the environment (Note: this is one of UDM's twelve pre-college programs that involve approximately 3,000 to 4,000 K-12 students each year. These programs served approximately 61% minority students and 50% female students.); and
- ∞ Kern Entrepreneurship Education Network: UDM faculty from business and engineering were recently named Kern Fellows as part of a program to develop entrepreneurship curriculum for both business and engineering students (Understanding of entrepreneurship by both faculty and students will aid the transfer of MIOH's research results into products and systems.).

Alternative Fuels:

Dr. Shula Schlick, of the Chemistry Department, is performing research on fuel cells that has been funded by General Motors Corporation and Ford Motor Company. She is studying membrane degradation in fuel cells using electron spin resonance.

UDM's Civil & Environmental Engineering department also offers Fuel Cells-related courses as part of Master of Engineering and Masters in Product Development Programs.

Also, Dr. Robert Ross, a faculty member in Physics, has performed extensive research and development in the area of solar energy, primarily while working at United Solar Ovonic Corporation, a leader in alternative energy. He and professors Mark Schumack and Arthur Haman (Mechanical Engineering) recently received a grant from the State of Michigan Energy Office (funded by the U.S. Department of Energy) to install an array of solar panels on the roof of the Engineering Building as a demonstration and teaching system.

Transportation Systems:

Dr Utpal Dutta, Professor and Chair of Civil and Environmental Engineering, teaches transportation related courses. He has performed extensive research related to the Detroit People Mover system. In recent years, he has been studying performance indicators of various transportation systems, namely smart signals and road warranty. Another faculty member of Civil & Environmental Engineering, Dr. Alan Hoback, conducts research on walking distance to transit stops and public health facilities using Geographical Information Systems (GIS).

Supply Chain:

Dr. Shahram Taj of the College of Business Administration teaches Supply Chain Management-related courses as a part of UDM's business curriculum. He also consults a number of organizations on Supply Chain Management. Both Professor Taj and Professor Mary Higby (Business) are interested in performing research and developing curriculum related to supply chains.

d. University of Toledo, Toledo, Ohio

Transportation Systems and Supply Chain Management:

In January 2002, the University of Toledo (UT) started the Intermodal Transportation Institute (ITI), an interdisciplinary research, education, and outreach center. The vision for the ITI is to develop technology-enabled intermodal transportation systems and supply chains that promote economic development and quality of life. Its purpose is to work cooperatively with public and private sector partners in the fields of transportation, logistics, and supply chains to develop and implement ideas

that increase safety, mobility, and access. The link between the University and the external community is an integral part of the ITI as demonstrated by the Advisory Board, which contains more than 40 representatives from outside UT. Additionally, ITI engages the community through outreach and partnership, and it supports the local, regional, national, and international communities through research, education, and economic development.

The ITI is currently working with organizations to investigate new transportation-related concepts and technologies and to assess current infrastructure capacity across the Midwest. It offers the potential for sustained external funding, and it provides a vehicle to use resources from across the university in collaboration with government and private sector partners.

The ITI reports directly to the Office of the Provost and is supported by the Colleges of Arts and Sciences, Business Administration, Engineering, and Law. This structure facilitates interdisciplinary programs and projects.

The University of Toledo has undergraduate programs in Transportation Planning in Civil Engineering, in GIS and Transportation in Geography and Planning, and in Supply Chain Management in the College of Business Administration. The Civil Engineering Department has Masters and Ph.D. degrees in Transportation Planning. The Geography and Planning Department offers a Masters degree in GIS and Transportation. The College of Business currently has a Masters degree and a Doctoral degree in Manufacturing Management that are likely to be revised to include offerings in Supply Chain Management. These programs, both graduate and undergraduate, provide talent for research and education projects. There is active and on-going research in transportation planning, infrastructure utilization, and supply chain management.

Alternative Fuels:

UT also has an active research program in alternate energy, including the following initiatives:

- ∞ Its Bio-Diesel Fuel Study project evaluates the impact of using a mixture of bio-fuel and diesel fuel on operating costs, emissions, engine performance, and engine life over a three-year period. This is the only long-term study that uses ultra-low sulfur diesel as the basis for comparison.
- ∞ UT's research in alternate fuel involves the production of hydrogen from sunlight. The hydrogen is then captured and stored for use in a fuel cell that powers a vehicle on UT's campus.
- ∞ In the realm of hybrid vehicles, UT and the ITI have recently submitted a proposal to the state of Ohio to fund research and technology transfer in the area of advanced drive technology. The overarching goal of the Center for Advanced Drive Technologies is to put highly energy efficient vehicles with their associated drive components on the roads and railroads of our nation.

e. Wayne State University, Detroit, Michigan

Transportation Systems:

The College of Engineering offers programs leading to Bachelor's, Master's, and Doctoral degrees in various branches of engineering. The transportation program, which is a part of the Civil and Environmental Engineering Department, conducts research projects that encompass such diverse areas as traffic engineering and control, transit asset management, highway safety, transit planning and operations, transportation economics, transit privatization, use of advanced technology (ITS), social/economical and environmental impact of transit, pavements, bridges, and construction. The transportation program includes a total of six faculty members, with one new member expected to join the faculty in the fall of 2006. Additionally, the nationally renowned Bio-Engineering Program in the College of Engineering focuses on automotive safety.

Transportation research in the WSU Department of Civil Engineering has been supported by various agencies including USDOT, MDOT, National Research Council, Michigan Office of Highway Safety Planning and others.

Alternative Fuels:

The College of Engineering has a new graduate (Masters' and Certificate) program in the area of Alternative Energy Technology (AET). The program is not 'housed' in any particular department; rather, it is offered under the larger umbrella of the College and faculty members from all departments participate in various aspects of the program. The development of this graduate program was supported by the Michigan Economic Development Corporation. Classes include Fundamentals of Fuel Cell Systems, Alternative Energy Technologies for Various Transportation Modes and Hydrogen Infrastructure and Alternative Fuel Transportation.

The College is expected to soon start a major research program on bio-diesel in collaboration with Next Energy. In addition to these educational program, the College of Engineering's Center for Automotive Research (CAR) focuses on automotive engines and alternative fuels.

Supply Chain Management:

The College of Engineering, through its Industrial & Manufacturing Engineering (IME) Department, launched a significant Supply Chain Management curriculum to strengthen its graduate program. The *IE7325: Supply Chain Management* course introduces contemporary supply chain and logistics tools and practices to graduate students. The advanced course, limited to doctoral students, *IE8325: Advanced Supply Chain Management*, challenges tools and algorithms available in the literature and calls for further algorithmic advances.

The Supply Chain (SC) research group pursues real-world research that aims to "coordinate" supply chains under conditions of information asymmetry and decentralized decision making. The research group employs novel "collective intelligence" techniques, multi-agent system (MAS) technologies, information theory, game theory, advanced statistical methods (mostly using extremely novel and promising Bayesian and Dynamic Bayesian Network methods, and more broadly Graphical Methods), optimization techniques, and contracts, to pursue supply chain coordination. Its research is supported by the National Science Foundation and industry. The SC Research Group is currently collaborating with General Motors, Ford Motor Company, and DaimlerChrysler.

III.A.2 Government Partners

MIOH has developed active working relationships with key state and regional government agencies in Michigan and Ohio. Each has placed key leaders on the MIOH operating committee and/or interest group(s). This will not only assure that MIOH's programs are focused on the needs and priorities of our regions, but also enable collaborations and the transfer of results.

a. MDOT

MDOT focuses on providing the state of Michigan with integrated transportation services for economic benefit and improved quality of life. MDOT is a national leader in the development and testing of Intelligent Transportation Systems and Vehicle Infrastructure Integration.

Three top leaders at MDOT sit on MIOH committees:

| Name | Title | MIOH UTC Committee |
|--------------|---|--------------------------------------|
| Kirk Steudle | Director – MDOT | Operating Committee |
| Greg Kreuger | Director – Intelligent Transportation Systems | Transportation System Interest Group |
| Tim Hoeffner | Administrator, Intermodal Policy Division | Supply Chain Interest Group |

In addition, MDOT has committed \$200,000 towards matching MIOH UTC's federal SAFETEA-LU earmark funding for its initial year of operation, which is a strong measure of MDOT's level of commitment to the center.

b. ODOT

ODOT works to provide a world-class transportation system that links Ohio to a global economy while preserving the state's unique character and enhancing its quality of life. The department focuses on five main goals that include transportation safety, economic development and quality of life, Efficient, Reliable Traffic Flow, and Resource Management.

Howard Wood, the Deputy Director of ODOT's Division of Planning, will sit on MIOH's Operating Committee to ensure the center's on-going commitment to meeting the agency's needs.

c. SEMCOG

SEMCOG is the Metropolitan Planning Organization for the seven counties that comprise the Southeast Michigan region. SEMCOG supports local government planning in the areas of transportation, environment, community and economic development, and education. SEMCOG assists local governments and educational institutions in planning for common needs and in recognizing regional opportunities. Policy decisions are made by local elected officials of SEMCOG's member governments. SEMCOG advocates for changes in state and federal public policy and is the premier resource for data about Southeast Michigan.

SEMCOG is well-represented in the MI-OH UTC, as its Director of Transportation, Carmine Palombo, sits on its Operating Committee and Transportation Systems Efficiency Interest Group.

d. TMACOG

TMACOG is a non-partisan regional planning partnership made up of members in northwest Ohio and southeast Michigan. The agency is the region's Metropolitan Planning Organization, working across jurisdictions to help plan highways, rail, and transit that will move goods and people safely and efficiently throughout the region. TMACOG's role in environmental planning is to help the region comply with governmental regulations for clean air and water and plan ahead to protect and restore rivers and streams.

Dave Dysard, TMACOG's Vice-President of Transportation, sits on MIOH UTC's Operating Committee.

III.A.3 Research and Economic Development Partners

a. NextEnergy

NextEnergy is a non-profit corporation founded in 2002 to enable the commercialization of energy technologies that positively contribute to economic competitiveness, energy security and the environment. Located in Detroit's Midtown/New Center area, NextEnergy's initial charge was to implement an economic development strategy for the State of Michigan to accelerate research, development and manufacturing of alternative energy technologies (AET) to advance the AET industry in Michigan. NextEnergy's programs are designed to identify and facilitate the commercialization of AET through the development of hydrogen, natural gas, biological and synthetic fuels. Current program areas include: business attraction and acceleration for AET-related companies, collaborative research and development, technical and program management support and initiatives for developing improved energy policies.

NextEnergy's Executive director, Jim Croce, sits on MIOH UTC's Operating Committee as well as its Alternative Fuels Interest Group.

b. Center for Automotive Research (CAR)

The Center for Automotive Research (CAR), a nonprofit organization, is focused on a wide variety of important trends and changes related to the automobile industry and society at the international, federal, state and local levels. CAR conducts industry research, develops new methodologies, forecasts industry trends, advises on public policy, and sponsors multi-stakeholder communication forums. CAR staff possesses expertise in manufacturing systems, economics and business policies, transportation systems, supply chain relationships and general policy assessment. Its research studies investigate how international, federal and local issues influence the industry, and how the industry affects society in such areas as employment, the environment and the consumer. Its Transportation and Information Systems Planning (TISP) group has a special research focus on wireless communication systems between vehicles and infrastructure.

Steve Underwood, a CAR research scientist who has performed numerous studies of transportation systems for MDOT and others, participates in the MIOH UTC via his position on the Transportation Systems Interest Group.

c. Vehicle Infrastructure Integration Coalition (VIIC)

Vehicle Infrastructure Integration (VII) is a national program created to evaluate the business and technical viability of deploying a wireless system for the purpose of safety, mobility and consumer applications. The key stakeholders are USDOT, AASHTO and VIIC, a group of six OEMs. The system under consideration is based on a Dedicated Short Range Communications transceiver which uses dedicated 75 MHz bandwidth at 5.9 GHz allocated by the FCC in 2004. This low latency radio supports vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) interactivity that supports crash avoidance applications for safety and probe vehicle applications for traffic and situational awareness applications. Electronic Payments also support payment transactions for tolling, gasoline purchases and parking fees. This VII evaluation of the business case and technical demonstration is being done within the National VIIC and developed under a joint \$56 million program with the USDOT and VIIC which targets a 2008 decision date for a 2011 launch of a synchronized national deployment.

Ford's Ralph Robinson, who serves as the president of VIIC, has a seat on the MIOH UTC's Transportation Systems Interest Group.

d. Michigan Economic Development Corporation Technology Development Business Unit

The goal of the Michigan Economic Development Corporation is to create and retain jobs in the state. Its Technology Development business unit is responsible for encouraging the development and commercialization of competitive edge technologies in Michigan. Key programs and initiatives managed by this business unit include the 21st Century Jobs Fund, Sector Development Activities, University Technology Transfer and Commercialization Programs, Venture Capital and Angel Fund Investors Network, and the Michigan SmartZone program. The automotive position will manage the MEDC sector development activities for automotive technologies including advanced manufacturing and materials. The position requires significant knowledge of the various aspects of automotive industry as well as experience in developing strategic plans and marketing concepts for the sector. The position will be responsible for activities and opportunities related to research clusters and

collaborations, companies for expansion or attraction efforts, industry leaders, and emerging technologies. This information and knowledge will be used to formulate and manage programs, incentives, and strategies for retaining, growing, and attracting business in Michigan.

III.A.4 Technology Transfer and Outreach Partners

a. Engineering Society of Detroit

Founded in 1895, The Engineering Society of Detroit (ESD) has evolved into one of the country's largest regional multi-disciplinary engineering and scientific societies of its kind. With more than 4,000 members, ESD promotes and celebrates excellence, innovation, cooperation, professional growth and fellowship in the engineering, scientific and allied professions. Working cooperatively with 72 affiliate technical societies and more than 30 construction and design associations, ESD is able to provide access to hundreds of educational programs annually. Over 600 engineers receive ESD training each year to prepare for the state Professional Engineer (PE) licensing exam. ESD is recognized as a leader in fostering the growth and development of engineers and scientists of the future through programs such as the ESD Michigan Regional Future City Competition, where nearly 1,200 students build cities supported by hundreds of engineers volunteering their expertise.

b. Small Business Association of Michigan

The Small Business Association of Michigan (SBAM) promotes free enterprise and the interests of small business owners through leadership and advocacy. Through its existing Information Technology program, SBAM will work with MIOH UTC to share research findings with the state's community of entrepreneurs.

c. Ford Partnership for Advanced Studies (PAS) Program

The University of Detroit Mercy (UDM) is one of the first institutions of higher education that has committed to the nationwide Ford Partnership for Advanced Studies (Ford PAS) program. This commitment currently includes financial and resource support to six local high schools, both urban and suburban as well as public, charter and private. These schools' students represent a very diverse demographic pool of future transportation professionals. Ford PAS provides high school students with high-quality interdisciplinary learning experiences that challenge them academically and develop their problem-solving, critical thinking, and communication skills. Courses encompass themes in Building Foundations, Adapting to Change, Managing and Marketing with Data, Designing for Tomorrow and Understanding a Global Economy. By building strong local partnerships, Ford PAS encourages and prepares students for success in college and professional careers in fields such as business, engineering, and technology. Over the last three year's UDM Ford PAS program has reached 1,200 students.

d. DAPCEP

Both UDM and WSU offer extensive K-12 programs through their partnership with DAPCEP (Detroit Area Pre-College Engineering Program) – a non profit organization whose mission is to increase the number of under-represented minority students who are interested and prepared to pursue a career in engineering, science, math or technology. The program offers Saturday and summer programs for DAPCEP students. UDM is DAPCEP's leading institution in the provision of such programs, reaching approximately 1,600 4th through 12th graders each year.

e. Society of Manufacturing Engineers – STEPS Program

Both UDM and GVSU partner with the Society of Manufacturing Engineers Education Foundation (SME-EF) to offer STEPS engineering summer camps young women across Michigan. Both camps focus on the design, fabrication and testing of “transportation systems” (model airplanes at GVSU and autonomous ground vehicles at UDM). At UDM the camps have hosted eighty female high school students each year since 2002; a total of 380 junior high school-age young ladies have completed GVSU’s camp in its five years of operation. From this partnership with SME-EF, a relationship has been developed with Ford Motor Company, who has funded an effort since 2003 to run a STEPS-like program during the school year for ten area high schools. These STEPS programs offer a platform from which to develop further K-12 programs focused on transportation.

III.B. Center Director

The MIOH UTC’s Director will be Dr. Leo E. Hanifin, Dean – College of Engineering and Science at the University of Detroit Mercy. Dr. Hanifin has extensive experience leading and administrating research and educational organizations. This experience includes the growth and leadership of a 300-person research center at Rensselaer Polytechnic Institute developed through partnership and support of over 100 corporations and both state and federal agencies. He was also the director of the Greenfield Coalition for 2-½ years during its formation and launch. Greenfield was an NSF funded engineering education coalition that included six universities, five corporations, the Society of Manufacturing Engineers and Focus: HOPE.

Director Responsibilities:

The administrative, financial and technical management of the Center will be performed at the University of Detroit Mercy. The Center Director is responsible for implementing the Center’s Strategic Plan and ensuring compliance with all other UTC Program requirements.

The MIOH UTC Director will have the responsibility of administering the Center’s programs and the coordination of the consortium universities to ensure the productive and high quality performance of the Center. He will also assure proper planning for growth and actively pursue new opportunities to expand the education, research, and technology transfer areas of the Center. He will work with public and private agencies and schools to develop Center activities and programs to increase student and faculty diversity.

The Director and Assistant Director will also communicate with other centers and national transportation institutes and organizations. The Center Director will work closely with the Executive Committee, Operating Committee and all UTC partner contacts. The Center Director will serve on the Executive Committee as a non-voting member. The Director, with support from a full-time Assistant Director, will also oversee the day-to-day management of the center and be responsible for developing and facilitating external relationships with Washington D.C. and MDOT and ODOT, and with corporate and other research partners.

III.C. Center Faculty and Staff

In addition to the Center Director, the Assistant Director is the only faculty or staff member who will spend more than 50% of their time in direct support of the UTC.

Assistant Director Responsibilities:

- ∞ Assist the UTC Director in the development of the UTC strategic plan and the management of coalition activities to achieve the objectives of the plan; this includes the management of the processes and committees that identify and evaluate potential programs, review progress, disseminate results and report on the overall UTC achievements to DOT and to all internal and external partners.

- ∞ Creation and maintenance of a communication/meeting program that creates a rich and broad exchange of information regarding education, research and technology transfer between UTC university partners and the K-12 schools, corporations, government agencies and individuals with interest in and capabilities related to transportation systems.
- ∞ Development of financial and "in kind" support (including matching funds) for the UTC from federal, state and local governments, corporations and foundations.
- ∞ Definition and maintenance of an accounting system that records all income (from all sources) to the UTC, and all expenditures (at all universities) of all UTC funds. (The UDM finance office will assist in this activity.)

Faculty participants: While no faculty members are committed to support MIOH at 50% of their effort or greater, over thirty different faculty members from the engineering, science and business departments at all five universities have presented research concepts for MIOH research and educational projects. This reflects the broad and strong commitment of faculty members from the five MIOH universities to serve as the primary intellectual engine for MIOH.

III.D. Multiparty Arrangements

The MIOH UTC is a consortium of five universities, which, together with government agencies and corporate partners, will define and develop educational, research, technology transfer and K-12 outreach activities in support of the MIOH theme and mission within MIOH's three focal areas. The MIOH Director and leaders from all partner universities are committed to an *active, integrated, open and inclusive* model of collaboration. The *active* collaboration starts by engaging all partners in interest group meetings and focused forums and will continue through the development of the MIOH program and technology transfer activities. The MIOH leadership will develop an array of activities that are *integrated* in several ways:

- ∞ Multi-university educational and research projects are strongly encouraged by the project funding structure defined in the MIOH Request for Proposals. Greater funding is available for projects involving more than one university.
- ∞ Linkage between different types of projects will be a primary objective of the MIOH Operating Committee as it selects projects and negotiates linkages. For example, an educational team may incorporate findings from research projects in the same area in its curriculum. Or, educators may be encouraged to participate in K-12 projects.
- ∞ Creation of collaborative research teams that include both researchers and practitioners from universities, governments and corporations will enable technology transfer of research results into operational systems and products.

An *open and inclusive* model will be reflected in the open request for proposals, open meetings and wide distribution of opportunities and documentation such as meeting minutes. The multiparty relationships will occur in individual projects and also within the overall MIOH UTC structure and processes. Through this structure and processes the MIOH UTC will achieve the following goals:

- ∞ Identify and complete a cohesive mosaic of projects that achieve (individually and/or collectively) outreach, education, research and technology transfer that
 1. support the mission and goals of US DOT,
 2. are synergistic with the mission and goals of state and local governments, especially the MDOT and ODOT,
 3. support the economic development of Michigan and Ohio through improved transportation systems and vehicles,
 4. support the needs and enable the opportunities of UTC members, and
 5. focus on the three "theme areas" of the MI-OH UTC: alternative energy/fuels, transportation system utilization and efficiency, and supply chains.

- ∞ Create and support active partnerships for the successful completion of projects that involve combinations of internal and external contributions of intellect, effort, physical resources and funding.

The following describes the MIOH committee/interest group structure:

| Committee Name | Function/Responsibilities | Membership |
|--|--|--|
| Executive Committee (6 total) | <ol style="list-style-type: none"> 1. Approve UTC Vision, Mission and Broad Objectives. 2. Assist in promoting the visibility, reputation and funding of the UTC. 3. Approve final program and budget (1-2 mtgs/year). | Five Administrative Designees of Five University Presidents and UTC Director (ex officio member) |
| Operating Committee (12-14 members) | <ol style="list-style-type: none"> 1. Develop the strategic focus for the UTC. 2. Contribute to the strategic plan for UTC, especially regarding establishing priorities and processes. 3. Develop the RFP statement and criteria for review of proposals. 4. Define programmatic budget ranges. 5. Receive reviews and recommendations from Interest Groups and devise a cohesive program of research, education, outreach and technology transfer. 6. Each of the university members of this committee will assure timely and complete reporting of results, expenditures and matching funds as defined by the Director and approved by this committee. 7. Support and participate in UTC meetings, reviews and site visits as required by DOT. 8. Support and participate in UTC events, e.g. -symposia, workshops, tech transfer events, etc. 9. Assist in identification of experts to serve on program committees and interest groups, and securing their commitments to do so. 10. Non-university members will assist the MI-OH UTC in developing active engagement of their organizations and others in the performance of UTC programs and achievement of their objectives (approx. one meeting per month during launch period [6-12 months] then every 2-3 months; those elements of business that only concern university members will be dealt with in separate meeting segments). | <ul style="list-style-type: none"> ∞ One academic leader from each of the five university partners, plus UTC Director ∞ US DOT representative ∞ MDOT representative ∞ ODOT representative ∞ SEMCOG rep. ∞ TMACOG rep. ∞ Industry—Representatives from one or two auto companies ∞ Other(s) from freight/shipping, consultants, alternative energy research, etc. |
| Interest Groups in Alternative Energy, Transportation Systems and Supply Chains (7-12 per group) | <ol style="list-style-type: none"> 1. Participate in activities focused on exchange of ideas, information and resources related to the theme areas of MI-OH UTC. 2. Review project proposals based on criteria set by Operating Committee. 3. Recommend projects for funding. 4. Participate in annual meeting that reviews project results in all UTC objective areas of (outreach, education, research and tech transfer). | Internal and external experts in theme areas of the MI-OH UTC's, including those from academia, government (all relevant levels) and industry. |

MIOH UTC Committee Members

Executive Committee

| University | Member |
|-------------------|--|
| GVSU | Paul Plotkowski , Dean of Engineering (alt. H. James Williams – Dean, Business) |
| WSU | Ralph Kummier , Dean of Engineering |
| UDM | Barbara Schirmer , Vice President – Academic Affairs and Provost |
| BGSU | Heinz Bulmahn , Vice Provost for Research and Dean of the Graduate College |
| UT | Frank Calzonetti , Vice Provost for Research and Economic Development |
| MIOH UTC | Leo Hanifin – UTC Director and Dean of Engineering and Science, UDM (ex officio) |

Operating Committee (~13 members)

| | |
|---|--|
| Leo Hanifin | UTC Director |
| Hokey Min | Faculty Representative BGSU |
| Shahram Taj | Faculty Representative UDM |
| Charlie Standridge or John Taylor | Faculty Representative GVSU |
| Mark Vonderembse | Faculty Representative UT |
| Snehamay Khasnabis | Faculty Representative WSU |
| TBD | US DOT |
| Kirk Steudle | MDOT – Director |
| Howard Wood | ODOT - Deputy Director of Planning |
| Jim Croce | NextEnergy , CEO |
| Carmine Palombo | SEMCOG, Director – Transportation |
| Dave Dysard | TMACOG, Vice President for Transportation |
| TBD | Auto Company |

Members may also participate in interest group(s).

Interest Groups (7-12 members each)

Alternative Energy

| | |
|---------------------------|---|
| Jim Saber | Director of Technology Collaborations, NextEnergy |
| Mark Schumack | Faculty, Mechanical Engineering, UDM |
| Martin Abraham | Faculty, UT |
| Snehamay Khasnabis | Faculty, Civil Engineering, WSU |
| Barry Piersol | Assistant to the Dean, College of Technology, BGSU |
| Scott Staley | Director, Hybrid and Fuel Cell, Ford Motor Company |
| TBD | USDOT (3 individuals identified as potential choices by DOT leaders; MIOH emailed to discuss participation; awaiting response) |
| TBD | Other corporate partners |

Transportation Systems

| | |
|---------------------------|---|
| Carmine Palombo | Director of Transportation, SEMCOG |
| Ralph Robinson | Ford and President – VIIC |
| TBD | US DOT (discussions underway) |
| Charlie Standridge | College of Engineering and Computing, GVSU |
| Utpal Dutta | Chair – Dept. of Civil Engineering, UDM |
| Mumtaz Usmen | Chair – Dept. of Civil Engineering, WSU |
| Barry Piersol | Asst. to the Dean, College of Technology, BGSU |
| Pete Lindquist | Chair – Dept. of Geography & Planning, UT |
| Greg Krueger | MDOT, Director – Intelligent Transportation Systems |
| Lou Lambert | Cambridge Systematics |
| Steve Underwood | CAR |
| TBD | Freight/shipping company |

Supply Chain

| | |
|----------------------|---|
| Tim Hoeffner | Administrator, Intermodal Policy Division, MDOT |
| TBD | USDOT (potential choices identified by DOT leaders; MIOH emailed to discuss participation) |
| Chip Napier | Metro Detroit District Engineering Manager, UPS |
| Thomas Madden | Supply Chain Management, General Motors |
| John Drury | Leader -Supply Chain Network Optimization Team, IBM |
| John Taylor | Faculty, Business, GVSU |
| Hokey Min | Faculty, BGSU |
| Shahram Taj | Faculty, Business, UDM |
| Ratna Chinnam | Faculty, WSU |
| Paul Hong | Faculty, UT |
| TBD | Freight/shipping company |
| TBD | Intermodal transit leader (harbor, rail, . . .) |

III.D.1 Resource Concentration at the Grantee University

The MIOH UTC Operating Committee has agreed to comply with the RITA guideline of having at least one-half of the Center's total budget concentrated at the lead university, the University of Detroit Mercy. It is anticipated that the remaining funds would be distributed in a roughly equal level to the remaining universities, given that each university submits a proposal that is highly rated and recommended for funding by an interest group and selected for funding by the Operating Committee.

However, given the complexities of the project definition and budgeting and the desire to provide support for three focal areas and to achieve six UTC objectives, it is unlikely that such even distribution of funds will be achieved.

III.E. Matching Funds

A number of sources have been identified as potential contributors of matching funds for the UTC program, as listed in Table I2. The UTC expects to obtain its matching funds from state SP&R monies, state DOT direct donations, state economic development programs, partner institution/corporate investments, and monies from within the Universities. Based on the intensity and enthusiasm of discussions with these partners, there is clearly potential for far more than one-to-one leveraging of the US DOT funds.

The Operating Committee has established criteria upon which funding determinations will be made. For specific projects it will ultimately be the principal investigator's responsibility to find and attract matching funds. Each consortium institution will be responsible for providing matching funds for its educational and research projects. We expect the most common matches for these educational programs will come from state DOTs. The consortium overall budget will be maintained on a project-by-project and program-by-program basis.

Sources of UTC Matching Funds

| Name of Potential Contributor | Estimated Amount (both cash and in-kind match) |
|---|---|
| MDOT | \$200,000 - \$250,000 (firm commitment in place for \$200,000 has been made; specific project support may also be possible) |
| ODOT | \$20,000 - \$50,000 (depending on specific projects selected) |
| UDM | \$100,000 - \$150,000 |
| Other universities | \$100,000 - \$200,000 |
| Ford PAS Program | \$25,00 - 35,000 |
| Engineering Society of Detroit | \$5,000 (in-kind staff and advertising of technology transfer workshops, conferences, etc) |
| NextEnergy | \$10,000 - \$30,000 |
| Michigan Economic Development Corporation | TBD (MEDC is operating a \$2 billion "Next Century Jobs Fund" to support technologically based research and development that will stimulate economic growth in Michigan. It is expected that MIOH faculty with corporate partners will submit proposals in upcoming funding cycles.) |
| Other Corporations | TBD (depending on project selections) |
| Estimated Total Matching Funds | \$500,000 |

IV. Budget Details

IV.A. Format

The MIOH UTC Budget Plan is presented in the format provided in the DOT Strategic Plan Instructions.

MIOH University Transportation Center (UTC) Budget Plan

(Budget Plan not published)

IV.B. Grant Year

The formal grant year is established as September 1, 2006 to August 31, 2007. However, costs for the expenses incurred for strategic plan development between January 1, 2006 and August 31, 2006 are also included (either as expenses to be charged against the DOT funds or matching contributions from the University of Detroit Mercy).

IV.C. Salaries

Until project proposals are reviewed and selected for funding it is not possible to identify the principal investigators' salaries or allocation of efforts in the academic year and summer. The MIOH RFP requires such detail in proposals. The total expenses for faculty salaries is estimated in the budget plan estimates provided above.

IV.D. Scholarships

The MIOH UTC will comply with the limitations set forth in section III.5 of the "General Provisions of Grant Agreements for UTCs:

"Students who receive financial support other than compensation under the UTC Program, including those under consideration for such honorary programs as the UTC Student of the Year Award, must be U.S. citizens or permanent residents of the United States. Should circumstances exist that warrant the support of a foreign national student, prior written approval must be obtained from RITA. The request must contain complete justification for the proposed support of that student."

IV.E. Equipment

Written permission will be obtained from RITA, per section III.3 of the General Provisions, prior to the purchase of any permanent equipment. To date, no requests have been made to purchase such equipment.

IV.F. Foreign Travel

Written permission will be obtained from RITA, per section III.4 of the General Provisions, prior to the initiation of foreign travel. To date, no requests have been made for foreign travel.

APPENDIX A

BASELINE MEASURES FOR UNIVERSITY TRANSPORTATION CENTERS (UTCs)

Report for 2005/6 year (September 1, 2005 to August 31, 2006) for the five institutions comprising the MIOH UTC.

A. Research Selection

Note: No research projects have yet been selected for funding by MIOH UTC. The following data reflects the transportation projects underway at the five MIOH universities in year prior to the launch of MIOH activities.

1. Number of transportation research projects selected for funding: **19**

1a. Number of those projects that you consider to be: basic research (**5**), advanced research (**2**), and applied research (**13**).

Projects may be included in more than one category if applicable.

2. Total budgeted costs for the projects reported in 1 above: **\$1,507,000**

B. Research Performance

3. Number of transportation research reports published: **14**

4. Number of transportation research papers presented at academic/professional meetings: **28**

C. Education

5. Number of courses offered that you consider to be part of a transportation curriculum. Report courses shown in the university course catalog as being offered, whether or not they were conducted during the academic year being reported.

Undergraduate: **32**

Graduate: **23**

6. Number of students participating in transportation research projects. Count individual students (one student participating in two research projects counts as one student).

Undergraduate: **13**

Graduate: **21**

D. Human Resources

7. Number of advanced degree programs offered that you consider to be transportation-related.

Master's Level: **5**

Doctoral Level: **2**

8. Number of students enrolled in those transportation-related advanced degree programs.

Master's Level: **35**

Doctoral Level: **8**

9. Number of students who received degrees through those transportation-related advanced degree programs.

Master's Level: **12**

Doctoral Level: **4**

E. Diversity

No baseline data is requested by DOT for diversity objectives.

F. Technology Transfer

10. Number of transportation seminars, symposia, distance learning classes, etc. conducted for transportation professionals: **15**

11. Number of transportation professionals participating in those events: **359**

Appendix B.1

ALTERNATIVE ENERGY FORUM

**Hosted by the Michigan-Ohio (MIOH) University Transportation Center
at the University of Detroit Mercy – McNichols Campus
(McNichols and Livernois, Detroit)
President's Dining Room**

Monday, April 3, 2006

Agenda

- | | | |
|---------|---|---|
| 8:30 | Introduction to UTC and this forum's purposes and agenda | Dr. Leo E. Hanifin Director – MIOH University Transportation Center |
| 8:45 | Introductions of Participants | |
| 9:00 | Framing Presentations and Panel by Leaders in This Field James A. Croce, Chief Executive Officer, NextEnergy John Wilson, Alternative Energy Consultant Auto Industry Input MDOT Input | |
| 10:30 | Rapid Fire Concept Presentations Forum participants are invited to make two minute presentations of concepts for projects that serve any of the UTC objectives (outreach, education, research and technology transfer); each presenter is encouraged to provide a 1 page flyer on their project (see form below) | |
| 11:15 | Networking session to establish linkages and synergies between organizations and individuals for teaming and support of projects | |
| 12 noon | Adjourn | |

Appendix B.2

TRANSPORTATION SYSTEM EFFICIENCY FORUM

**Hosted by the Michigan-Ohio (MIOH) University Transportation Center
at the University of Detroit Mercy – McNichols Campus
(McNichols and Livernois, Detroit)
President's Dining Room**

Monday, April 3, 2006

Agenda

- | | | |
|------|--|--|
| 1:00 | Introduction to UTC and review of forum's purposes and agenda | Dr. Leo E. Hanifin Director – MIOH University Transportation Center |
| 1:15 | Introductions of Participants | |
| 1:30 | Framing Presentations and Panel by Leaders in This Field: Steve Underwood – Center for Automotive Research, Ann Arbor, MI Ralph Robinson – Ford Motor Company and VII Consortium Carmine Palombo – Director of Transportation, Southeast Michigan Council of Governments Greg Krueger - Director – Intelligent Transportation System Program – Michigan Department of Transportation | |
| 3:00 | Rapid Fire Concept Presentations Forum participants are invited to make two minute presentations of concepts for projects that serve any of the UTC objectives (outreach, education, research and technology transfer); each presenter is encouraged to provide a 1 page flyer on their projects (see form below) | |
| 3:45 | Networking session: to establish linkages and synergies between organizations and individuals for teaming and support of projects | |
| 4:30 | Adjourn | |

Appendix B.3

SUPPLY CHAIN FORUM

**Hosted by the Michigan-Ohio (MIOH) University Transportation Center
at the University of Detroit Mercy McNichols Campus**

(McNichols and Livernois, Detroit)

President's Dining Room

Friday morning, April 7, 2006

Agenda

- | | | |
|---------|---|--|
| 8:30 | Introduction to UTC and this forum's purposes and agenda | Dr. Leo E. Hanifin Director – MIOH University Transportation Center |
| 8:45 | Introductions of Participants | |
| 9:00 | Framing Presentations and Panel by Leaders in This Field John Drury, IBM – Leader -Supply Chain Network Optimization Team Chip Napier, UPS - Metro Detroit District Engineering Manager Giuseppe Rossi, Ford Motor Company – Supply Chain Leader | |
| 10:30 | Rapid Fire Concept Presentations Forum participants are invited to make two minute presentations of concepts for projects that serve any of the UTC objectives (outreach, education, research and technology transfer); each presenter is encouraged to provide a 1 page flyer on their project (see form below) | |
| 11:15 | Networking session to establish linkages and synergies between organizations and individuals for teaming and support of projects | |
| 12 noon | Adjourn | |

Appendix C – MIOH Proposals Review Forms

C.1 **MIOH University Transportation Center – Research Proposal Evaluation Form**

Research Project Name: _____

PI: _____ Lead University: _____

For each of the following criteria indicate one of the following scores:

5: This fulfills this criterion in a truly exemplary way. With regard to this criterion, it is one of the best proposals that I have ever seen.

4 – The proposal fulfills this criterion fully. I see no obvious concerns or shortcomings in this criterion.

3 – This proposal generally fulfills this criterion, but there are some relatively minor concerns or shortcomings. (please explain)

2 – This proposal partially fulfills this criterion, but there are some significant concerns or shortcomings (please explain)

1 – This proposal fails to fulfill this criterion for the following reason(s):

Criteria for selection of research projects:

1. Responsive to national transportation strategies/priorities. Score _____

2. Responsive to the critical needs, challenges and opportunities in our region. Score _____

3. Builds upon and employs current advanced technical and managerial concepts, methods and systems. Score _____

4. Objectives that advance the state of knowledge and practice in transportation through provision of new systemic solutions and/or results that are transferable for rapid improvement of transportation systems or economic development. Score _____

5. Quality of research team. (Consider the number and roles of students as part of this criterion).
Score _____

6. Involvement of academic, government and/or industrial partners other than the principle investigator's colleagues at his/her institution. Score _____

7. Linkage of the research team to *education and/or technology transfer* projects/objectives of MIOH.
Score _____

8. The level and certainty of matching support from non-federal sources. Score _____

.....
Total Score (sum of eight criteria scores): _____

Are there any academic, industrial or governmental partners who might support this project with research participants, information, software or equipment, funding or any other resource? (Provide contact information if possible.)

Is the scale of effort and funding appropriate for the objectives and activities indicated?

Would you recommend this project for funding by the MIOH UTC?

Other Comments:

Overall Proposal Evaluation: Exceptional, Very Good, Good, Marginal, Poor Circle one

My Name: _____ (you name will not be provided to proposal authors)

C.2 MIOH University Transportation Center – Education Proposal Evaluation Form

Education Project Name: _____

PI: _____ Lead University: _____

For each of the following criteria indicate one of the following scores:

5: This fulfills this criterion in a truly exemplary way. With regard to this criterion, it is one of the best proposals that I have ever seen.

4 – The proposal fulfills this criterion fully. I see no obvious concerns or shortcomings in this criterion.

3 – This proposal generally fulfills this criterion, but there are some relatively minor concerns or shortcomings. (please explain)

2. – This proposal partially fulfills this criterion, but there are some significant concerns or shortcomings (please explain)

1 – This proposal fails to fulfill this criterion for the following reason(s):

Criteria for selection of education projects:

9. Responsive to national transportation strategies/priorities. Score _____

10. Responsive to the critical needs, challenges and opportunities in our region. Score _____

11. Builds upon and employs current curriculum and advanced pedagogical concepts, methods and systems. Score _____

12. Development of curriculum and courseware that is transferable, especially through digital means. Score _____

13. Quality of curriculum development team. (Consider the number and roles of students as part of this criterion). Score _____

14. Involvement of academic, government and/or industrial partners other than the principle investigator's colleagues at his/her institution. Score _____

15. Linkage of the research team to *research* projects/objectives of MIOH. Score _____

16. The level and certainty of matching support from non-federal sources. Score _____

.....
Total Score (sum of eight criteria scores): _____

Are there any academic, industrial or governmental partners who might support this project with research participants, information, software or equipment, funding or any other resource? (Provide contact information if possible.)

Is the scale of effort and funding appropriate for the objectives and activities indicated?

Would you recommend this project for funding by the MIOH UTC?

Other Comments:

Overall Proposal Evaluation: Exceptional, Very Good, Good, Marginal, Poor Circle one

My Name: _____ (you name will not be provided to proposal authors)